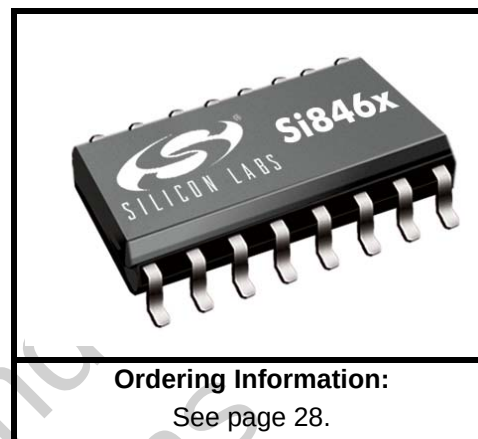


## LOW POWER SIX-CHANNEL DIGITAL ISOLATOR

### Features

- High-speed operation
  - DC to 150 Mbps
- No start-up initialization required
- Wide Operating Supply Voltage: 2.70–5.5 V
- Wide Operating Supply Voltage: 2.70–5.5V
- Ultra low power (typical) 5 V Operation:
  - < 1.6 mA per channel at 1 Mbps
  - < 6 mA per channel at 100 Mbps
- 2.70 V Operation:
  - < 1.4 mA per channel at 1 Mbps
  - < 4 mA per channel at 100 Mbps
- High electromagnetic immunity
- Up to 2500 V<sub>RMS</sub> isolation
- 60-year life at rated working voltage
- Precise timing (typical)
  - <10 ns worst case
  - 1.5 ns pulse width distortion
  - 0.5 ns channel-channel skew
  - 2 ns propagation delay skew
  - 6 ns minimum pulse width
- Transient Immunity 25 kV/μs
- Wide temperature range
  - –40 to 125 °C at 150 Mbps
- RoHS-compliant packages
  - SOIC-16 narrow body



**Ordering Information:**  
See page 28.

### Applications

- Industrial automation systems
- Hybrid electric vehicles
- Isolated switch mode supplies
- Isolated ADC, DAC
- Motor control
- Power inverters
- Communications systems

### Safety Regulatory Approvals

- UL 1577 recognized
  - Up to 2500 V<sub>RMS</sub> for 1 minute
- CSA component notice 5A approval
  - IEC 60950-1, 61010-1 (reinforced insulation)
- VDE certification conformity
  - IEC 60747-5-2 (VDE0884 Part 2)

### Description

Silicon Lab's family of ultra-low-power digital isolators are CMOS devices offering substantial data rate, propagation delay, power, size, reliability, and external BOM advantages when compared to legacy isolation technologies. The operating parameters of these products remain stable across wide temperature ranges throughout their service life. For ease of design, only VDD bypass capacitors are required.

Data rates up to 150 Mbps are supported, and all devices achieve worst-case propagation delays of less than 10 ns. All products are safety certified by UL, CSA, and VDE and support withstand voltages of up to 2.5 kVrms. These devices are available in a 16-pin narrow-body SOIC package.

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## 1. Electrical Specifications

**Table 1. Recommended Operating Conditions**

| Parameter                                                                                                                                | Symbol    | Test Condition       | Min  | Typ | Max | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------|------|-----|-----|------|
| Ambient Operating Temperature*                                                                                                           | $T_A$     | 150 Mbps, 15 pF, 5 V | -40  | 25  | 125 | °C   |
| Supply Voltage                                                                                                                           | $V_{DD1}$ |                      | 2.70 | —   | 5.5 | V    |
|                                                                                                                                          | $V_{DD2}$ |                      | 2.70 | —   | 5.5 | V    |
| *Note: The maximum ambient temperature is dependent on data frequency, output loading, number of operating channels, and supply voltage. |           |                      |      |     |     |      |

**Table 2. Absolute Maximum Ratings<sup>1</sup>**

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                      | Symbol             | Min  | Typ | Max            | Unit      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|-----|----------------|-----------|
| Storage Temperature <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                               | $T_{STG}$          | -65  | —   | 150            | °C        |
| Ambient Temperature Under Bias                                                                                                                                                                                                                                                                                                                                                                                 | $T_A$              | -40  | —   | 125            | °C        |
| Supply Voltage (Revision A) <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                       | $V_{DD1}, V_{DD2}$ | -0.5 | —   | 5.75           | V         |
| Supply Voltage (Revision B) <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                       | $V_{DD1}, V_{DD2}$ | -0.5 | —   | 6.0            | V         |
| Input Voltage                                                                                                                                                                                                                                                                                                                                                                                                  | $V_I$              | -0.5 | —   | $V_{DD} + 0.5$ | V         |
| Output Voltage                                                                                                                                                                                                                                                                                                                                                                                                 | $V_O$              | -0.5 | —   | $V_{DD} + 0.5$ | V         |
| Output Current Drive Channel                                                                                                                                                                                                                                                                                                                                                                                   | $I_O$              | —    | —   | 10             | mA        |
| Lead Solder Temperature (10 s)                                                                                                                                                                                                                                                                                                                                                                                 |                    | —    | —   | 260            | °C        |
| Maximum Isolation Voltage (1 s)                                                                                                                                                                                                                                                                                                                                                                                |                    | —    | —   | 3600           | $V_{RMS}$ |
| <b>Notes:</b> <ol style="list-style-type: none"> <li>1. Permanent device damage may occur if the absolute maximum ratings are exceeded. Functional operation should be restricted to conditions as specified in the operational sections of this data sheet.</li> <li>2. VDE certifies storage temperature from -40 to 150 °C.</li> <li>3. See "5. Ordering Guide" on page 28 for more information.</li> </ol> |                    |      |     |                |           |

**Table 3. Electrical Characteristics**

( $V_{DD1} = 5\text{ V} \pm 10\%$ ,  $V_{DD2} = 5\text{ V} \pm 10\%$ ,  $T_A = -40$  to  $125\text{ }^\circ\text{C}$ ; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                            | Symbol          | Test Condition          | Min                                       | Typ | Max  | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------|-------------------------------------------|-----|------|------|
| High Level Input Voltage                                                                                                                                                                                                                                                                                                                                                             | V <sub>IH</sub> |                         | 2.0                                       | —   | —    | V    |
| Low Level Input Voltage                                                                                                                                                                                                                                                                                                                                                              | V <sub>IL</sub> |                         | —                                         | —   | 0.8  | V    |
| High Level Output Voltage                                                                                                                                                                                                                                                                                                                                                            | V <sub>OH</sub> | I <sub>oh</sub> = −4 mA | V <sub>DD1</sub> , V <sub>DD2</sub> − 0.4 | 4.8 | —    | V    |
| Low Level Output Voltage                                                                                                                                                                                                                                                                                                                                                             | V <sub>OL</sub> | I <sub>ol</sub> = 4 mA  | —                                         | 0.2 | 0.4  | V    |
| Input Leakage Current                                                                                                                                                                                                                                                                                                                                                                | I <sub>L</sub>  |                         | —                                         | —   | ±10  | μA   |
| Output Impedance <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                        | Z <sub>O</sub>  |                         | —                                         | 85  | —    | Ω    |
| DC Supply Current (All inputs 0 V or at Supply)                                                                                                                                                                                                                                                                                                                                      |                 |                         |                                           |     |      |      |
| Si8460Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |                 |                         |                                           |     |      |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 1.7 | 2.6  | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 3.3 | 5.0  |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 7.7 | 11.6 |      |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 3.5 | 5.3  |      |
| Si8461Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |                 |                         |                                           |     |      |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 2.1 | 3.2  | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 3.4 | 5.1  |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 7.1 | 10.7 |      |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 4.5 | 6.8  |      |
| Si8462Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |                 |                         |                                           |     |      |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 2.5 | 3.8  | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 3.0 | 4.5  |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 6.5 | 9.8  |      |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 5.0 | 8.3  |      |
| Si8463Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |                 |                         |                                           |     |      |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 2.8 | 4.2  | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 2.8 | 4.2  |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 6.0 | 9.0  |      |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 6.0 | 9.0  |      |
| Notes:                                                                                                                                                                                                                                                                                                                                                                               |                 |                         |                                           |     |      |      |
| 1. The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces. |                 |                         |                                           |     |      |      |
| 2. t <sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.                                                                                                                                                                                        |                 |                         |                                           |     |      |      |
| 3. Start-up time is the time period from the application of power to valid data at the output.                                                                                                                                                                                                                                                                                       |                 |                         |                                           |     |      |      |

**Table 3. Electrical Characteristics (Continued)**(V<sub>DD1</sub> = 5 V±10%, V<sub>DD2</sub> = 5 V±10%, T<sub>A</sub> = -40 to 125 °C; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Symbol | Test Condition | Min | Typ | Max | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------|-----|-----|-----|------|
| <b>1 Mbps Supply Current</b> (All inputs = 500 kHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                |     |     |     |      |
| <b>Si8460Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.0 | 6.0 |      |
| <b>Si8461Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.5 | 6.8 |      |
| <b>Si8462Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.3 | 6.5 |      |
| <b>Si8463Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 |      |
| <b>10 Mbps Supply Current</b> (All inputs = 5 MHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                |     |     |     |      |
| <b>Si8460Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 |      |
| <b>Si8461Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.0 | 7.2 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.7 | 8   |      |
| <b>Si8462Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.2 | 7.3 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.4 | 7.6 |      |
| <b>Si8463Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |                |     |     |     |      |
| <ol style="list-style-type: none"> <li>1. The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.</li> <li>2. t<sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.</li> <li>3. Start-up time is the time period from the application of power to valid data at the output.</li> </ol> |        |                |     |     |     |      |

**Table 3. Electrical Characteristics (Continued)**

( $V_{DD1} = 5 V \pm 10\%$ ,  $V_{DD2} = 5 V \pm 10\%$ ,  $T_A = -40$  to  $125^\circ C$ ; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Symbol             | Test Condition | Min | Typ  | Max  | Unit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|-----|------|------|------|
| <b>100 Mbps Supply Current</b> (All inputs = 50 MHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                |     |      |      |      |
| <b>Si8460Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 5.0  | 7.5  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 28.8 | 36   |      |
| <b>Si8461Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 9.0  | 11.3 | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 25   | 30   |      |
| <b>Si8462Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 13.3 | 16.6 | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 20.8 | 26   |      |
| <b>Si8463Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 17.2 | 21.5 | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 17.2 | 21.5 |      |
| <b>Timing Characteristics</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                |     |      |      |      |
| <b>Si846xAx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| Maximum Data Rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                | 0   | —    | 1.0  | Mbps |
| Minimum Pulse Width                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                | —   | —    | 250  | ns   |
| Propagation Delay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | $t_{PHL}, t_{PLH}$ | See Figure 1   | —   | —    | 35   | ns   |
| Pulse Width Distortion<br>$ t_{PLH} - t_{PHL} $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PWD                | See Figure 1   | —   | —    | 25   | ns   |
| Propagation Delay Skew <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | $t_{PSK(P-P)}$     |                | —   | —    | 40   | ns   |
| Channel-Channel Skew                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | $t_{PSK}$          |                | —   | —    | 35   | ns   |
| <b>Si846xBx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| Maximum Data Rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                | 0   | —    | 150  | Mbps |
| Minimum Pulse Width                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                | —   | —    | 6.0  | ns   |
| Propagation Delay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | $t_{PHL}, t_{PLH}$ | See Figure 1   | 3.0 | 6.0  | 9.5  | ns   |
| Pulse Width Distortion<br>$ t_{PLH} - t_{PHL} $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PWD                | See Figure 1   | —   | 1.5  | 2.5  | ns   |
| Propagation Delay Skew <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | $t_{PSK(P-P)}$     |                | —   | 2.0  | 3.0  | ns   |
| Channel-Channel Skew                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | $t_{PSK}$          |                | —   | 0.5  | 1.8  | ns   |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                |     |      |      |      |
| <ol style="list-style-type: none"> <li>1. The nominal output impedance of an isolator driver channel is approximately <math>85 \Omega</math>, <math>\pm 40\%</math>, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.</li> <li>2. <math>t_{PSK(P-P)}</math> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.</li> <li>3. Start-up time is the time period from the application of power to valid data at the output.</li> </ol> |                    |                |     |      |      |      |

**Table 3. Electrical Characteristics (Continued)**(V<sub>DD1</sub> = 5 V±10%, V<sub>DD2</sub> = 5 V±10%, T<sub>A</sub> = -40 to 125 °C; applies to narrow-body SOIC package)

| Parameter                      | Symbol          | Test Condition                          | Min | Typ | Max | Unit  |
|--------------------------------|-----------------|-----------------------------------------|-----|-----|-----|-------|
| <b>All Models</b>              |                 |                                         |     |     |     |       |
| Output Rise Time               | t <sub>r</sub>  | C <sub>L</sub> = 15 pF<br>See Figure 1  | —   | 3.8 | 5.0 | ns    |
| Output Fall Time               | t <sub>f</sub>  | C <sub>L</sub> = 15 pF<br>See Figure 1  | —   | 2.8 | 3.7 | ns    |
| Common Mode Transient Immunity | CMTI            | V <sub>I</sub> = V <sub>DD</sub> or 0 V | —   | 25  | —   | kV/μs |
| Start-up Time <sup>3</sup>     | t <sub>SU</sub> |                                         | —   | 15  | 40  | μs    |

**Notes:**

1. The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.
2. t<sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.
3. Start-up time is the time period from the application of power to valid data at the output.

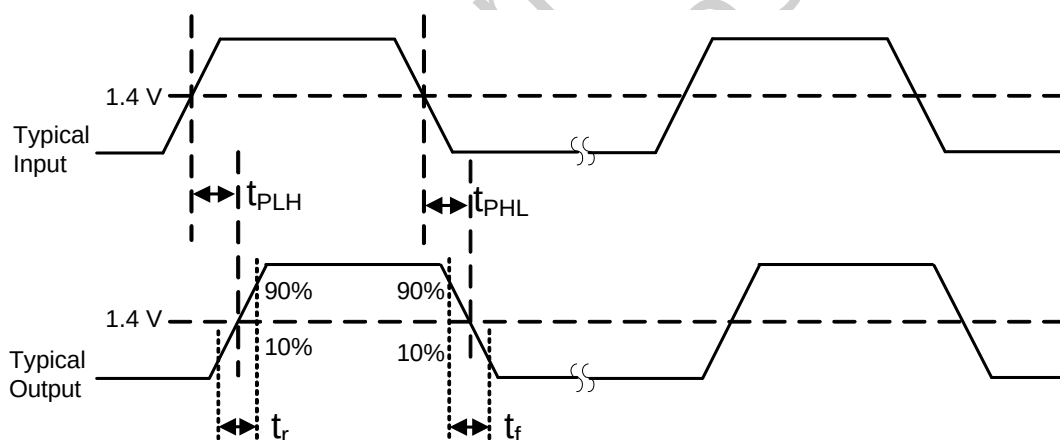
**Figure 1. Propagation Delay Timing**

**Table 4. Electrical Characteristics**

( $V_{DD1} = 3.3 \text{ V} \pm 10\%$ ,  $V_{DD2} = 3.3 \text{ V} \pm 10\%$ ,  $T_A = -40 \text{ to } 125 \text{ }^\circ\text{C}$ ; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                            | Symbol          | Test Condition          | Min                                       | Typ | Max  | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------|-------------------------------------------|-----|------|------|
| High Level Input Voltage                                                                                                                                                                                                                                                                                                                                                             | V <sub>IH</sub> |                         | 2.0                                       | —   | —    | V    |
| Low Level Input Voltage                                                                                                                                                                                                                                                                                                                                                              | V <sub>IL</sub> |                         | —                                         | —   | 0.8  | V    |
| High Level Output Voltage                                                                                                                                                                                                                                                                                                                                                            | V <sub>OH</sub> | I <sub>oh</sub> = −4 mA | V <sub>DD1</sub> , V <sub>DD2</sub> − 0.4 | 3.1 | —    | V    |
| Low Level Output Voltage                                                                                                                                                                                                                                                                                                                                                             | V <sub>OL</sub> | I <sub>ol</sub> = 4 mA  | —                                         | 0.2 | 0.4  | V    |
| Input Leakage Current                                                                                                                                                                                                                                                                                                                                                                | I <sub>L</sub>  |                         | —                                         | —   | ±10  | μA   |
| Output Impedance <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                        | Z <sub>O</sub>  |                         | —                                         | 85  | —    | Ω    |
| DC Supply Current (All inputs 0 V or at supply)                                                                                                                                                                                                                                                                                                                                      |                 |                         |                                           |     |      |      |
| Si8460Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |                 |                         |                                           |     |      |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 1.7 | 2.6  | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 3.3 | 5.0  |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 7.7 | 11.6 |      |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 3.5 | 5.3  |      |
| Si8461Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |                 |                         |                                           |     |      |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 2.1 | 3.2  | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 3.4 | 5.1  |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 7.1 | 10.7 |      |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 4.5 | 6.8  |      |
| Si8462Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |                 |                         |                                           |     |      |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 2.5 | 3.8  | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 3.0 | 4.5  |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 6.5 | 9.8  |      |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 5.0 | 8.3  |      |
| Si8463Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |                 |                         |                                           |     |      |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 2.8 | 4.2  | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 0 DC         | —                                         | 2.8 | 4.2  |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 6.0 | 9.0  |      |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                     |                 | All inputs 1 DC         | —                                         | 6.0 | 9.0  |      |
| Notes:                                                                                                                                                                                                                                                                                                                                                                               |                 |                         |                                           |     |      |      |
| 1. The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces. |                 |                         |                                           |     |      |      |
| 2. t <sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.                                                                                                                                                                                        |                 |                         |                                           |     |      |      |
| 3. Start-up time is the time period from the application of power to valid data at the output.                                                                                                                                                                                                                                                                                       |                 |                         |                                           |     |      |      |

**Table 4. Electrical Characteristics (Continued)**(V<sub>DD1</sub> = 3.3 V±10%, V<sub>DD2</sub> = 3.3 V±10%, T<sub>A</sub> = -40 to 125 °C; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Symbol | Test Condition | Min | Typ | Max | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------|-----|-----|-----|------|
| <b>1 Mbps Supply Current</b> (All inputs = 500 kHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                |     |     |     |      |
| <b>Si8460Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.0 | 6.0 |      |
| <b>Si8461Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.5 | 6.8 |      |
| <b>Si8462Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.3 | 6.5 |      |
| <b>Si8463Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 |      |
| <b>10 Mbps Supply Current</b> (All inputs = 5 MHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                |     |     |     |      |
| <b>Si8460Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 |      |
| <b>Si8461Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.0 | 7.2 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.7 | 8.0 |      |
| <b>Si8462Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.2 | 7.3 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.4 | 7.6 |      |
| <b>Si8463Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |                |     |     |     |      |
| <ol style="list-style-type: none"> <li>1. The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.</li> <li>2. t<sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.</li> <li>3. Start-up time is the time period from the application of power to valid data at the output.</li> </ol> |        |                |     |     |     |      |

**Table 4. Electrical Characteristics (Continued)**

( $V_{DD1} = 3.3 \text{ V} \pm 10\%$ ,  $V_{DD2} = 3.3 \text{ V} \pm 10\%$ ,  $T_A = -40 \text{ to } 125 \text{ }^\circ\text{C}$ ; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Symbol             | Test Condition | Min | Typ  | Max  | Unit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|-----|------|------|------|
| <b>100 Mbps Supply Current</b> (All inputs = 50 MHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                |     |      |      |      |
| <b>Si8460Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 4.8  | 7.2  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 20   | 25   |      |
| <b>Si8461Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 7.4  | 9.3  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 17.7 | 22.1 |      |
| <b>Si8462Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 10.2 | 12.8 | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 15   | 18.8 |      |
| <b>Si8463Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 12.7 | 15.9 | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                | —   | 12.7 | 15.9 |      |
| <b>Timing Characteristics</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                |     |      |      |      |
| <b>Si846xAx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| Maximum Data Rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                | 0   | —    | 1.0  | Mbps |
| Minimum Pulse Width                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                | —   | —    | 250  | ns   |
| Propagation Delay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | $t_{PHL}, t_{PLH}$ | See Figure 1   | —   | —    | 35   | ns   |
| Pulse Width Distortion<br>$ t_{PLH} - t_{PHL} $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PWD                | See Figure 1   | —   | —    | 25   | ns   |
| Propagation Delay Skew <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | $t_{PSK(P-P)}$     |                | —   | —    | 40   | ns   |
| Channel-Channel Skew                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | $t_{PSK}$          |                | —   | —    | 35   | ns   |
| <b>Si846xBx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                |     |      |      |      |
| Maximum Data Rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                | 0   | —    | 150  | Mbps |
| Minimum Pulse Width                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                | —   | —    | 6.0  | ns   |
| Propagation Delay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | $t_{PHL}, t_{PLH}$ | See Figure 1   | 3.0 | 6.0  | 9.5  | ns   |
| Pulse Width Distortion<br>$ t_{PLH} - t_{PHL} $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PWD                | See Figure 1   | —   | 1.5  | 2.5  | ns   |
| Propagation Delay Skew <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | $t_{PSK(P-P)}$     |                | —   | 2.0  | 3.0  | ns   |
| Channel-Channel Skew                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | $t_{PSK}$          |                | —   | 0.5  | 1.8  | ns   |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                |     |      |      |      |
| <ol style="list-style-type: none"> <li>1. The nominal output impedance of an isolator driver channel is approximately <math>85 \Omega</math>, <math>\pm 40\%</math>, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.</li> <li>2. <math>t_{PSK(P-P)}</math> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.</li> <li>3. Start-up time is the time period from the application of power to valid data at the output.</li> </ol> |                    |                |     |      |      |      |

**Table 4. Electrical Characteristics (Continued)**(V<sub>DD1</sub> = 3.3 V±10%, V<sub>DD2</sub> = 3.3 V±10%, T<sub>A</sub> = -40 to 125 °C; applies to narrow-body SOIC package)

| Parameter                      | Symbol          | Test Condition                          | Min | Typ | Max | Unit  |
|--------------------------------|-----------------|-----------------------------------------|-----|-----|-----|-------|
| <b>All Models</b>              |                 |                                         |     |     |     |       |
| Output Rise Time               | t <sub>r</sub>  | C <sub>L</sub> = 15 pF<br>See Figure 1  | —   | 4.3 | 6.1 | ns    |
| Output Fall Time               | t <sub>f</sub>  | C <sub>L</sub> = 15 pF<br>See Figure 1  | —   | 3.0 | 4.3 | ns    |
| Common Mode Transient Immunity | CMTI            | V <sub>I</sub> = V <sub>DD</sub> or 0 V | —   | 25  | —   | kV/μs |
| Start-up Time <sup>3</sup>     | t <sub>SU</sub> |                                         | —   | 15  | 40  | μs    |

**Notes:**

1. The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.
2. t<sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.
3. Start-up time is the time period from the application of power to valid data at the output.

**Table 5. Electrical Characteristics<sup>1</sup>**

( $V_{DD1} = 2.70\text{ V}$ ,  $V_{DD2} = 2.70\text{ V}$ ,  $T_A = -40\text{ to }125\text{ }^{\circ}\text{C}$ ; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                            | Symbol   | Test Condition  | Min                      | Typ | Max  | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|--------------------------|-----|------|------|
| High Level Input Voltage                                                                                                                                                                                                                                                                                                                                                             | $V_{IH}$ |                 | 2.0                      | —   | —    | V    |
| Low Level Input Voltage                                                                                                                                                                                                                                                                                                                                                              | $V_{IL}$ |                 | —                        | —   | 0.8  | V    |
| High Level Output Voltage                                                                                                                                                                                                                                                                                                                                                            | $V_{OH}$ | loh = −4 mA     | $V_{DD1}, V_{DD2} - 0.4$ | 2.3 | —    | V    |
| Low Level Output Voltage                                                                                                                                                                                                                                                                                                                                                             | $V_{OL}$ | lol = 4 mA      | —                        | 0.2 | 0.4  | V    |
| Input Leakage Current                                                                                                                                                                                                                                                                                                                                                                | $I_L$    |                 | —                        | —   | ±10  | μA   |
| Output Impedance <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                        | $Z_O$    |                 | —                        | 85  | —    | Ω    |
| DC Supply Current (All inputs 0 V or at supply)                                                                                                                                                                                                                                                                                                                                      |          |                 |                          |     |      |      |
| Si8460Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |          |                 |                          |     |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 0 DC | —                        | 1.7 | 2.6  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 0 DC | —                        | 3.3 | 5.0  |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 1 DC | —                        | 7.7 | 11.6 |      |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 1 DC | —                        | 3.5 | 5.3  |      |
| Si8461Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |          |                 |                          |     |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 0 DC | —                        | 2.1 | 3.2  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 0 DC | —                        | 3.4 | 5.1  |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 1 DC | —                        | 7.1 | 10.7 |      |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 1 DC | —                        | 4.5 | 6.8  |      |
| Si8462Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |          |                 |                          |     |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 0 DC | —                        | 2.5 | 3.8  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 0 DC | —                        | 3.0 | 4.5  |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 1 DC | —                        | 6.5 | 9.8  |      |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 1 DC | —                        | 5.0 | 8.3  |      |
| Si8463Ax, Bx                                                                                                                                                                                                                                                                                                                                                                         |          |                 |                          |     |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 0 DC | —                        | 2.8 | 4.2  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 0 DC | —                        | 2.8 | 4.2  |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 1 DC | —                        | 6.0 | 9.0  |      |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                            |          | All inputs 1 DC | —                        | 6.0 | 9.0  |      |
| Notes:                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                          |     |      |      |
| 1. Specifications in this table are also valid at VDD1 = 2.6 V and VDD2 = 2.6 V when the operating temperature range is constrained to T <sub>A</sub> = 0 to 85 °C.                                                                                                                                                                                                                  |          |                 |                          |     |      |      |
| 2. The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces. |          |                 |                          |     |      |      |
| 3. t <sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.                                                                                                                                                                                        |          |                 |                          |     |      |      |
| 4. Start-up time is the time period from the application of power to valid data at the output.                                                                                                                                                                                                                                                                                       |          |                 |                          |     |      |      |

**Table 5. Electrical Characteristics<sup>1</sup> (Continued)**(V<sub>DD1</sub> = 2.70 V, V<sub>DD2</sub> = 2.70 V, T<sub>A</sub> = -40 to 125 °C; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Symbol | Test Condition | Min | Typ | Max | Unit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------|-----|-----|-----|------|
| <b>1 Mbps Supply Current</b> (All inputs = 500 kHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                |     |     |     |      |
| <b>Si8460Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.0 | 6.0 |      |
| <b>Si8461Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.5 | 6.8 |      |
| <b>Si8462Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.3 | 6.5 |      |
| <b>Si8463Ax, Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 |      |
| <b>10 Mbps Supply Current</b> (All inputs = 5 MHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                |     |     |     |      |
| <b>Si8460Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 4.7 | 7.1 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 |      |
| <b>Si8461Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.0 | 7.2 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.7 | 8.0 |      |
| <b>Si8462Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.2 | 7.3 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.4 | 7.6 |      |
| <b>Si8463Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                |     |     |     |      |
| V <sub>DD1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 | mA   |
| V <sub>DD2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                | —   | 5.5 | 7.7 |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |                |     |     |     |      |
| <ol style="list-style-type: none"> <li>Specifications in this table are also valid at VDD1 = 2.6 V and VDD2 = 2.6 V when the operating temperature range is constrained to T<sub>A</sub> = 0 to 85 °C.</li> <li>The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.</li> <li>t<sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.</li> <li>Start-up time is the time period from the application of power to valid data at the output.</li> </ol> |        |                |     |     |     |      |

**Table 5. Electrical Characteristics<sup>1</sup> (Continued)**

( $V_{DD1} = 2.70\text{ V}$ ,  $V_{DD2} = 2.70\text{ V}$ ,  $T_A = -40\text{ to }125\text{ }^{\circ}\text{C}$ ; applies to narrow-body SOIC package)

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Symbol             | Test Condition | Min | Typ  | Max  | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|-----|------|------|------|
| <b>100 Mbps Supply Current</b> (All inputs = 50 MHz square wave, CI = 15 pF on all outputs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                |     |      |      |      |
| <b>Si8460Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | —   | 4.8  | 7.2  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | —   | 15.8 | 19.8 |      |
| <b>Si8461Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | —   | 6.7  | 8.4  | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | —   | 14.2 | 17.8 |      |
| <b>Si8462Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | —   | 8.7  | 10.9 | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | —   | 12.2 | 15.3 |      |
| <b>Si8463Bx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                |     |      |      |      |
| $V_{DD1}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | —   | 10.5 | 13.1 | mA   |
| $V_{DD2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                | —   | 10.5 | 13.1 |      |
| <b>Timing Characteristics</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                |     |      |      |      |
| <b>Si846xAx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                |     |      |      |      |
| Maximum Data Rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                | 0   | —    | 1.0  | Mbps |
| Minimum Pulse Width                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                | —   | —    | 250  | ns   |
| Propagation Delay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $t_{PHL}, t_{PLH}$ | See Figure 1   | —   | —    | 35   | ns   |
| Pulse Width Distortion<br>$ t_{PLH} - t_{PHL} $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PWD                | See Figure 1   | —   | —    | 25   | ns   |
| Propagation Delay Skew <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | $t_{PSK(P-P)}$     |                | —   | —    | 40   | ns   |
| Channel-Channel Skew                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | $t_{PSK}$          |                | —   | —    | 35   | ns   |
| <b>Si846xBx</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                |     |      |      |      |
| Maximum Data Rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                | 0   | —    | 150  | Mbps |
| Minimum Pulse Width                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                | —   | —    | 6.0  | ns   |
| Propagation Delay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $t_{PHL}, t_{PLH}$ | See Figure 1   | 3.0 | 6.0  | 9.5  | ns   |
| Pulse Width Distortion<br>$ t_{PLH} - t_{PHL} $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PWD                | See Figure 1   | —   | 1.5  | 2.5  | ns   |
| Propagation Delay Skew <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | $t_{PSK(P-P)}$     |                | —   | 2.0  | 3.0  | ns   |
| Channel-Channel Skew                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | $t_{PSK}$          |                | —   | 0.5  | 1.8  | ns   |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                |     |      |      |      |
| <ol style="list-style-type: none"> <li>Specifications in this table are also valid at <math>V_{DD1} = 2.6\text{ V}</math> and <math>V_{DD2} = 2.6\text{ V}</math> when the operating temperature range is constrained to <math>T_A = 0\text{ to }85\text{ }^{\circ}\text{C}</math>.</li> <li>The nominal output impedance of an isolator driver channel is approximately <math>85\text{ }\Omega</math>, <math>\pm 40\%</math>, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.</li> <li><math>t_{PSK(P-P)}</math> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.</li> <li>Start-up time is the time period from the application of power to valid data at the output.</li> </ol> |                    |                |     |      |      |      |

**Table 5. Electrical Characteristics<sup>1</sup> (Continued)**(V<sub>DD1</sub> = 2.70 V, V<sub>DD2</sub> = 2.70 V, T<sub>A</sub> = -40 to 125 °C; applies to narrow-body SOIC package)

| Parameter                      | Symbol          | Test Condition                          | Min | Typ | Max | Unit  |
|--------------------------------|-----------------|-----------------------------------------|-----|-----|-----|-------|
| <b>All Models</b>              |                 |                                         |     |     |     |       |
| Output Rise Time               | t <sub>r</sub>  | C <sub>L</sub> = 15 pF<br>See Figure 1  | —   | 4.8 | 6.5 | ns    |
| Output Fall Time               | t <sub>f</sub>  | C <sub>L</sub> = 15 pF<br>See Figure 1  | —   | 3.2 | 4.6 | ns    |
| Common Mode Transient Immunity | CMTI            | V <sub>I</sub> = V <sub>DD</sub> or 0 V | —   | 25  | —   | kV/μs |
| Start-up Time <sup>4</sup>     | t <sub>SU</sub> |                                         | —   | 15  | 40  | μs    |

**Notes:**

- Specifications in this table are also valid at VDD1 = 2.6 V and VDD2 = 2.6 V when the operating temperature range is constrained to T<sub>A</sub> = 0 to 85 °C.
- The nominal output impedance of an isolator driver channel is approximately 85 Ω, ±40%, which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces.
- t<sub>PSK(P-P)</sub> is the magnitude of the difference in propagation delay times measured between different units operating at the same supply voltages, load, and ambient temperature.
- Start-up time is the time period from the application of power to valid data at the output.

**Table 6. Regulatory Information\***

|                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CSA</b>                                                                                                                                                                                                     |
| The Si84xx is certified under CSA Component Acceptance Notice 5A. For more details, see File 232873.                                                                                                           |
| 61010-1: Up to 300 V <sub>RMS</sub> reinforced insulation working voltage; up to 600 V <sub>RMS</sub> basic insulation working voltage.                                                                        |
| 60950-1: Up to 130 V <sub>RMS</sub> reinforced insulation working voltage; up to 600 V <sub>RMS</sub> basic insulation working voltage.                                                                        |
| <b>VDE</b>                                                                                                                                                                                                     |
| The Si84xx is certified according to IEC 60747-5-2. For more details, see File 5006301-4880-0001.                                                                                                              |
| 60747-5-2: Up to 560 V <sub>peak</sub> for basic insulation working voltage.                                                                                                                                   |
| <b>UL</b>                                                                                                                                                                                                      |
| The Si84xx is certified under UL1577 component recognition program. For more details, see File E257455.                                                                                                        |
| Rated up to 2500 V <sub>RMS</sub> isolation voltage for basic insulation.                                                                                                                                      |
| <b>*Note:</b> Regulatory Certifications apply to 2.5 kV <sub>RMS</sub> rated devices which are production tested to 3.0 kV <sub>RMS</sub> for 1 sec. For more information, see "5. Ordering Guide" on page 28. |

**Table 7. Insulation and Safety-Related Specifications**

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Symbol          | Test Condition | Value            | Unit             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------|------------------|------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |                | NB SOIC-16       |                  |
| Nominal Air Gap (Clearance) <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | L(IO1)          |                | 3.9 min          | mm               |
| Nominal External Tracking (Creepage) <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | L(IO2)          |                | 3.9 min          | mm               |
| Minimum Internal Gap (Internal Clearance)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |                | 0.008            | mm               |
| Tracking Resistance<br>(Proof Tracking Index)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | PTI             | IEC60112       | 600              | V <sub>RMS</sub> |
| Erosion Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ED              |                | 0.019            | mm               |
| Resistance (Input-Output) <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | R <sub>IO</sub> |                | 10 <sup>12</sup> | Ω                |
| Capacitance (Input-Output) <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | C <sub>IO</sub> | f = 1 MHz      | 2.0              | pF               |
| Input Capacitance <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | C <sub>I</sub>  |                | 4.0              | pF               |
| <b>Notes:</b> <ol style="list-style-type: none"> <li>1. The values in this table correspond to the nominal creepage and clearance values as detailed in “6. Package Outline: 16-Pin Narrow Body SOIC”. VDE certifies the clearance and creepage limits as 4.7 mm minimum for the NB SOIC-16 package. UL does not impose a clearance and creepage minimum for component level certifications. CSA certifies the clearance and creepage limits as 3.9 mm minimum for the NB SOIC-16 package.</li> <li>2. To determine resistance and capacitance, the Si84xx is converted into a 2-terminal device. Pins 1–8 are shorted together to form the first terminal and pins 9–16 are shorted together to form the second terminal. The parameters are then measured between these two terminals.</li> <li>3. Measured from input pin to ground.</li> </ol> |                 |                |                  |                  |

**Table 8. IEC 60664-1 (VDE 0844 Part 2) Ratings**

| Parameter                   | Test Condition                              | Specification |
|-----------------------------|---------------------------------------------|---------------|
| Basic Isolation Group       | Material Group                              | I             |
| Installation Classification | Rated Mains Voltages ≤ 150 V <sub>RMS</sub> | I-IV          |
|                             | Rated Mains Voltages ≤ 300 V <sub>RMS</sub> | I-III         |
|                             | Rated Mains Voltages ≤ 400 V <sub>RMS</sub> | I-II          |
|                             | Rated Mains Voltages ≤ 600 V <sub>RMS</sub> | I-II          |

Table 9. IEC 60747-5-2 Insulation Characteristics for Si84xxxB\*

| Parameter                                                                                                                           | Symbol     | Test Condition                                                                                                         | Characteristic | Unit     |
|-------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------|----------------|----------|
| Maximum Working Insulation Voltage                                                                                                  | $V_{IORM}$ |                                                                                                                        | 560            | V peak   |
| Input to Output Test Voltage                                                                                                        | $V_{PR}$   | Method b1<br>( $V_{IORM} \times 1.875 = V_{PR}$ , 100%<br>Production Test, $t_m = 1$ sec,<br>Partial Discharge < 5 pC) | 1050           | V peak   |
| Transient Overvoltage                                                                                                               | $V_{IOTM}$ | $t = 60$ sec                                                                                                           | 4000           | V peak   |
| Pollution Degree (DIN VDE 0110, Table 1)                                                                                            |            |                                                                                                                        | 2              |          |
| Insulation Resistance at $T_S$ , $V_{IO} = 500$ V                                                                                   | $R_S$      |                                                                                                                        | $>10^9$        | $\Omega$ |
| *Note: Maintenance of the safety data is ensured by protective circuits. The Si84xx provides a climate classification of 40/125/21. |            |                                                                                                                        |                |          |

Table 10. IEC Safety Limiting Values<sup>1</sup>

| Parameter                                                                                                                                                                                                                                               | Symbol | Test Condition                                                                         | Min | Typ | Max        | Unit |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------|-----|-----|------------|------|
|                                                                                                                                                                                                                                                         |        |                                                                                        |     |     | NB SOIC-16 |      |
| Case Temperature                                                                                                                                                                                                                                        | $T_S$  |                                                                                        | —   | —   | 150        | °C   |
| Safety input, output, or supply current                                                                                                                                                                                                                 | $I_S$  | $\theta_{JA} = 105$ °C/W (NB SOIC-16),<br>$V_I = 5.5$ V, $T_J = 150$ °C, $T_A = 25$ °C | —   | —   | 215        | mA   |
| Device Power Dissipation <sup>2</sup>                                                                                                                                                                                                                   | $P_D$  |                                                                                        | —   | —   | 415        | mW   |
| <b>Notes:</b><br>1. Maximum value allowed in the event of a failure; also see the thermal derating curve in Figure 2.<br>2. The Si846x is tested with $VDD1 = VDD2 = 5.5$ V, $T_J = 150$ °C, $CL = 15$ pF, input a 150 Mbps 50% duty cycle square wave. |        |                                                                                        |     |     |            |      |

Table 11. Thermal Characteristics

| Parameter                             | Symbol        | Test Condition | Min | Typ        | Max | Unit |
|---------------------------------------|---------------|----------------|-----|------------|-----|------|
|                                       |               |                |     | NB SOIC-16 |     |      |
| IC Junction-to-Air Thermal Resistance | $\theta_{JA}$ |                | —   | 105        | —   | °C/W |

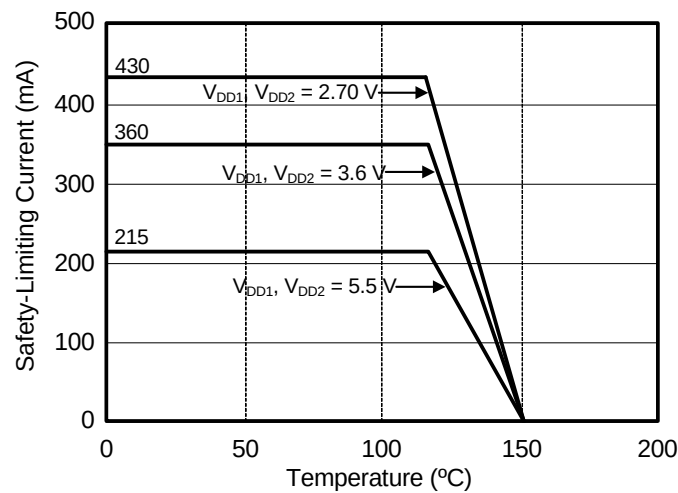


Figure 2. (NB SOIC-16) Thermal Derating Curve, Dependence of Safety Limiting Values with Case Temperature per DIN EN 60747-5-2

## 2. Functional Description

### 2.1. Theory of Operation

The operation of an Si846x channel is analogous to that of an opto coupler, except an RF carrier is modulated instead of light. This simple architecture provides a robust isolated data path and requires no special considerations or initialization at start-up. A simplified block diagram for a single Si846x channel is shown in Figure 3.

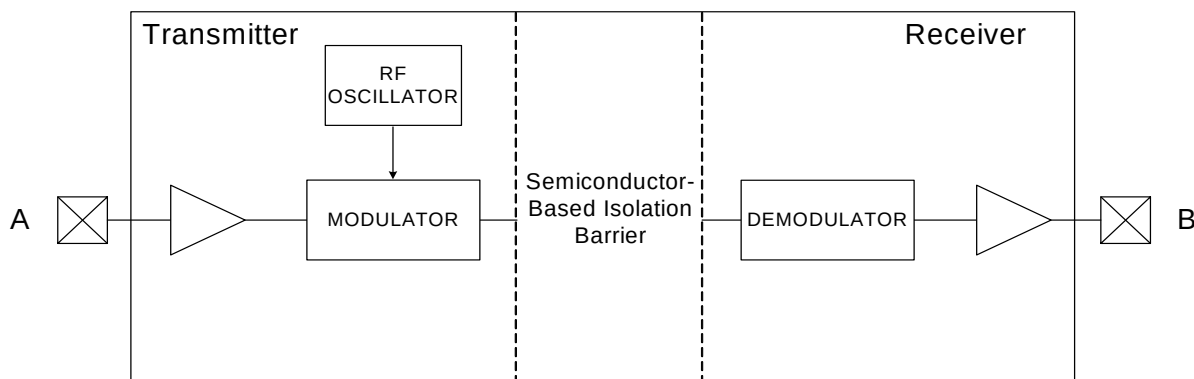


**Figure 3. Simplified Channel Diagram**

A channel consists of an RF Transmitter and RF Receiver separated by a semiconductor-based isolation barrier. Referring to the Transmitter, input A modulates the carrier provided by an RF oscillator using on/off keying. The Receiver contains a demodulator that decodes the input state according to its RF energy content and applies the result to output B via the output driver. This RF on/off keying scheme is superior to pulse code schemes as it provides best-in-class noise immunity, low power consumption, and better immunity to magnetic fields. See Figure 4 for more details.

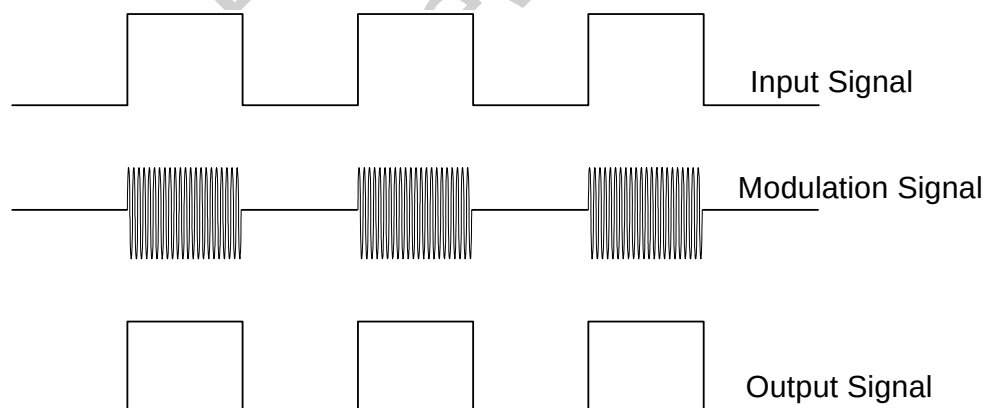


**Figure 4. Modulation Scheme**

## 2.2. Eye Diagram

Figure 5 illustrates an eye-diagram taken on an Si8460. For the data source, the test used an Anritsu (MP1763C) Pulse Pattern Generator set to 1000 ns/div. The output of the generator's clock and data from an Si8460 were captured on an oscilloscope. The results illustrate that data integrity was maintained even at the high data rate of 150 Mbps. The results also show that 2 ns pulse width distortion and 250 ps peak jitter were exhibited.

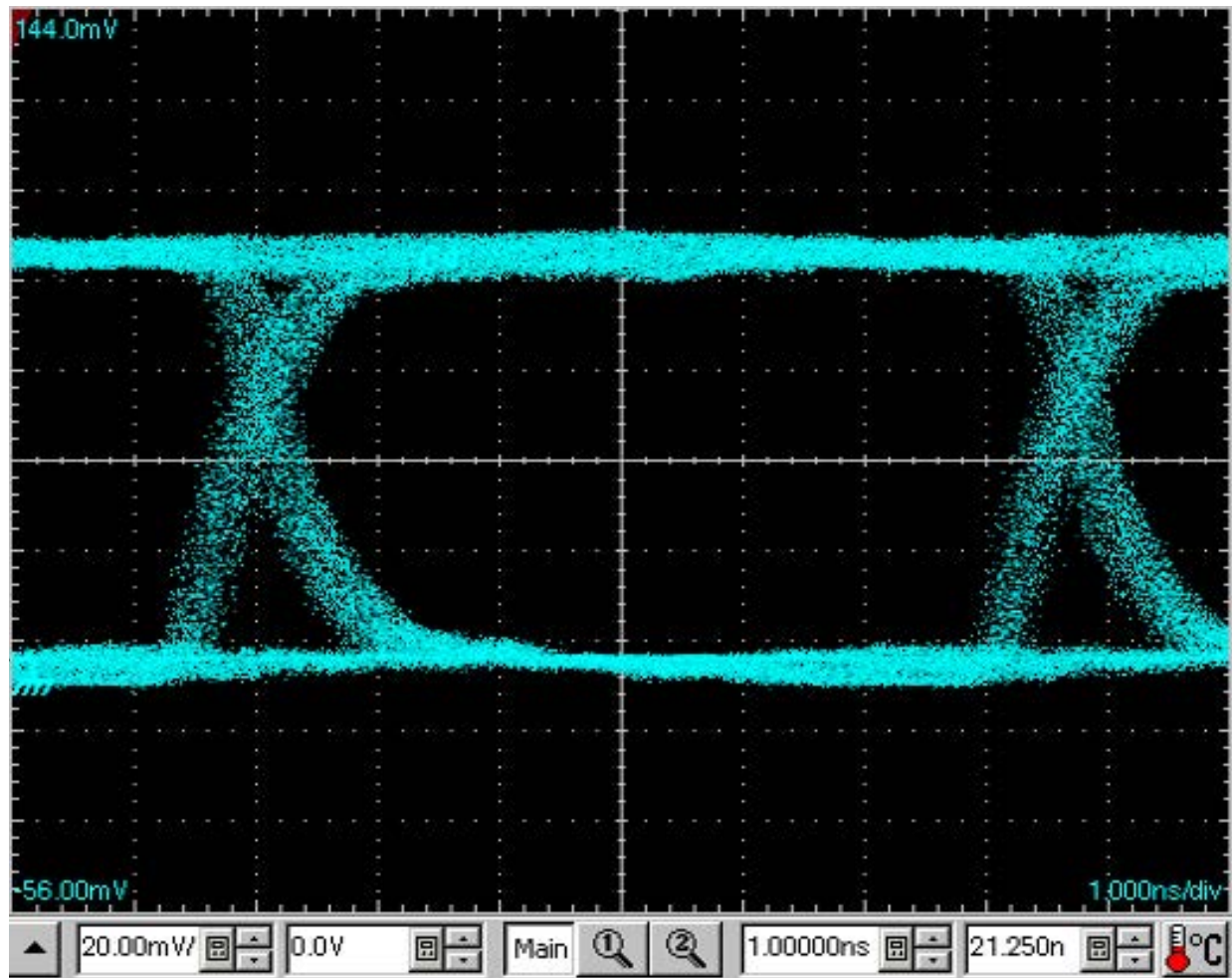


Figure 5. Eye Diagram

## 2.3. Device Operation

Device behavior during startup, normal operation, and shutdown is shown in Table 12.

**Table 12. Si846x Logic Operation Table**

| $V_I$<br>Input <sup>1,2</sup> | VDDI<br>State <sup>1,3,4</sup> | VDDO<br>State <sup>1,3,4</sup> | $V_O$ Output <sup>1,2</sup> | Comments                                                                                                            |
|-------------------------------|--------------------------------|--------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------|
| H                             | P                              | P                              | H                           | Normal operation.                                                                                                   |
| L                             | P                              | P                              | L                           |                                                                                                                     |
| $X^5$                         | UP                             | P                              | L                           | Upon transition of VDDI from unpowered to powered, $V_O$ returns to the same state as $V_I$ in less than 1 $\mu$ s. |
| $X^5$                         | P                              | UP                             | Undetermined                | Upon transition of VDDO from unpowered to powered, $V_O$ returns to the same state as $V_I$ within 1 $\mu$ s.       |

**Notes:**

1. VDDI and VDDO are the input and output power supplies.  $V_I$  and  $V_O$  are the respective input and output terminals.
2. X = not applicable; H = Logic High; L = Logic Low; Hi-Z = High Impedance.
3. "Powered" state (P) is defined as 2.70 V < VDD < 5.5 V.
4. "Unpowered" state (UP) is defined as VDD = 0 V.
5. Note that an I/O can power the die for a given side through an internal diode if its source has adequate current.

## 2.4. Layout Recommendations

To ensure safety in the end user application, high voltage circuits (i.e., circuits with  $>30\text{ V}_{AC}$ ) must be physically separated from the safety extra-low voltage circuits (SELV is a circuit with  $<30\text{ V}_{AC}$ ) by a certain distance (creepage/clearance). If a component, such as a digital isolator, straddles this isolation barrier, it must meet those creepage/clearance requirements and also provide a sufficiently large high-voltage breakdown protection rating (commonly referred to as working voltage protection). Table 6 on page 15 and Table 7 on page 16 detail the working voltage and creepage/clearance capabilities of the Si84xx. These tables also detail the component standards (UL1577, IEC60747, CSA 5A), which are readily accepted by certification bodies to provide proof for end-system specifications requirements. Refer to the end-system specification (61010-1, 60950-1, etc.) requirements before starting any design that uses a digital isolator.

The following sections detail the recommended bypass and decoupling components necessary to ensure robust overall performance and reliability for systems using the Si84xx digital isolators.

### 2.4.1. Supply Bypass

Digital integrated circuit components typically require  $0.1\text{ }\mu\text{F}$  ( $100\text{ nF}$ ) bypass capacitors when used in electrically quiet environments. However, digital isolators are commonly used in hazardous environments with excessively noisy power supplies. To counteract these harsh conditions, it is recommended that an additional  $1\text{ }\mu\text{F}$  bypass capacitor be added between VDD and GND on both sides of the package. The capacitors should be placed as close as possible to the package to minimize stray inductance. If the system is excessively noisy, it is recommended that the designer add  $50$  to  $100\text{ }\Omega$  resistors in series with the VDD supply voltage source and  $50$  to  $300\text{ }\Omega$  resistors in series with the digital inputs/outputs (see Figure 6). For more details, see "3. Errata and Design Migration Guidelines" on page 26.

All components upstream or downstream of the isolator should be properly decoupled as well. If these components are not properly decoupled, their supply noise can couple to the isolator inputs and outputs, potentially causing damage if spikes exceed the maximum ratings of the isolator ( $6\text{ V}$ ). In this case, the  $50$  to  $300\text{ }\Omega$  resistors protect the isolator's inputs/outputs (note that permanent device damage may occur if the absolute maximum ratings are exceeded). Functional operation should be restricted to the conditions specified in Table 1, "Recommended Operating Conditions," on page 3.

### 2.4.2. Pin Connections

No connect pins are not internally connected. They can be left floating, tied to  $V_{DD}$ , or tied to GND.

### 2.4.3. Output Pin Termination

The nominal output impedance of an isolator driver channel is approximately  $85\text{ }\Omega$ ,  $\pm 40\%$ , which is a combination of the value of the on-chip series termination resistor and channel resistance of the output driver FET. When driving loads where transmission line effects will be a factor, output pins should be appropriately terminated with controlled impedance PCB traces. The series termination resistor values should be scaled appropriately while keeping in mind the recommendations described in "2.4.1. Supply Bypass" above.

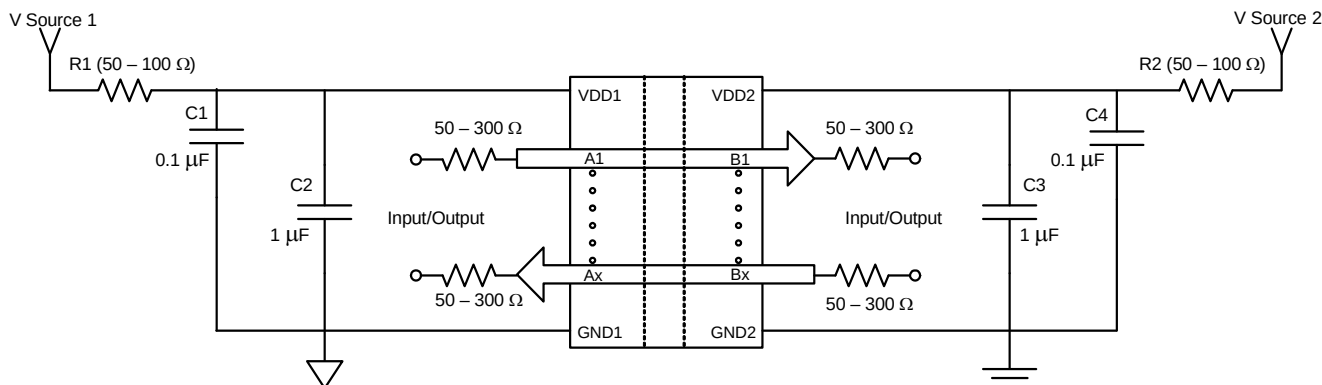


Figure 6. Recommended Bypass Components for the Si84xx Digital Isolator Family

## 2.5. Typical Performance Characteristics

The typical performance characteristics depicted in the following diagrams are for information purposes only. Refer to Tables 3, 4, and 5 for actual specification limits.

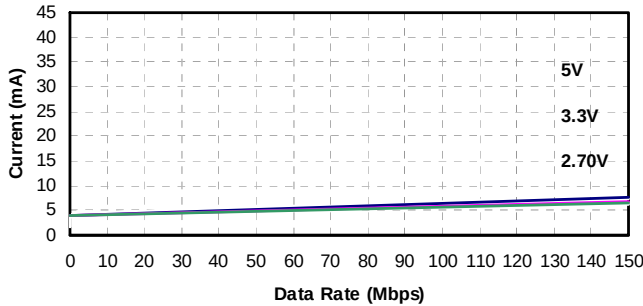


**Figure 7. Si8460 Typical  $V_{DD1}$  Supply Current vs. Data Rate 5, 3.3, and 2.70 V Operation**

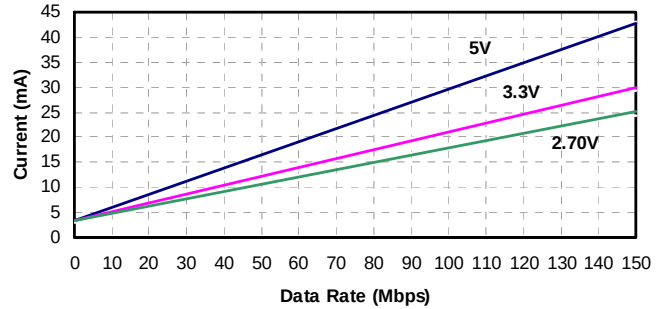


**Figure 10. Si8460 Typical  $V_{DD2}$  Supply Current vs. Data Rate 5, 3.3, and 2.70 V Operation (15 pF Load)**

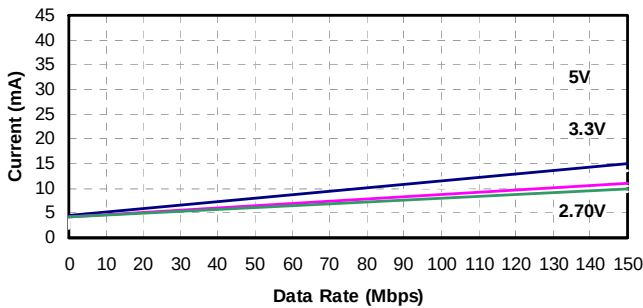


**Figure 8. Si8461 Typical  $V_{DD1}$  Supply Current vs. Data Rate 5, 3.3, and 2.70 V Operation (15 pF Load)**

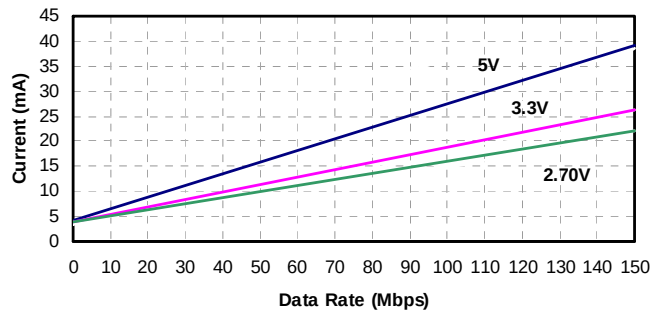


**Figure 11. Si8461 Typical  $V_{DD2}$  Supply Current vs. Data Rate 5, 3.3, and 2.70 V Operation (15 pF Load)**

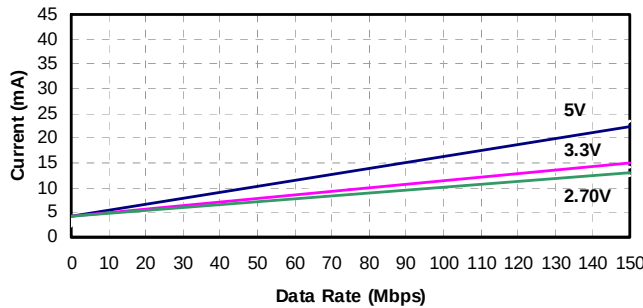


**Figure 9. Si8462 Typical  $V_{DD1}$  Supply Current vs. Data Rate 5, 3.3, and 2.70 V Operation (15 pF Load)**

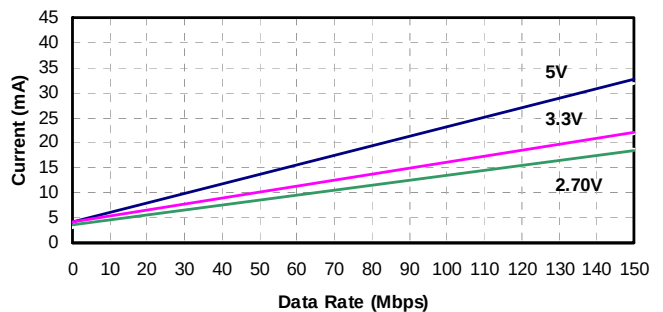


**Figure 12. Si8462 Typical  $V_{DD2}$  Supply Current vs. Data Rate 5, 3.3, and 2.70 V Operation (15 pF Load)**

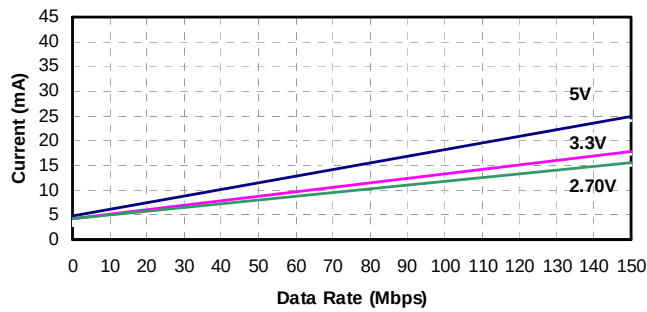


**Figure 13. Si8463 Typical  $V_{DD1}$  or  $V_{DD2}$  Supply Current vs. Data Rate 5, 3.3, and 2.70 V Operation (15 pF Load)**

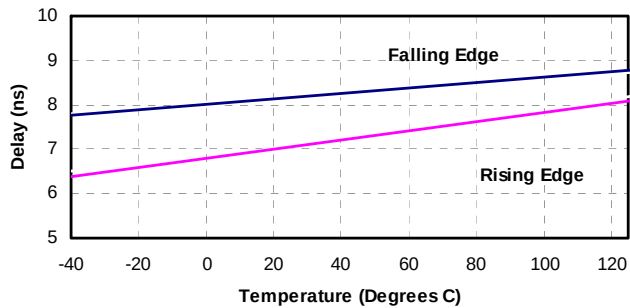


**Figure 14. Propagation Delay vs. Temperature**

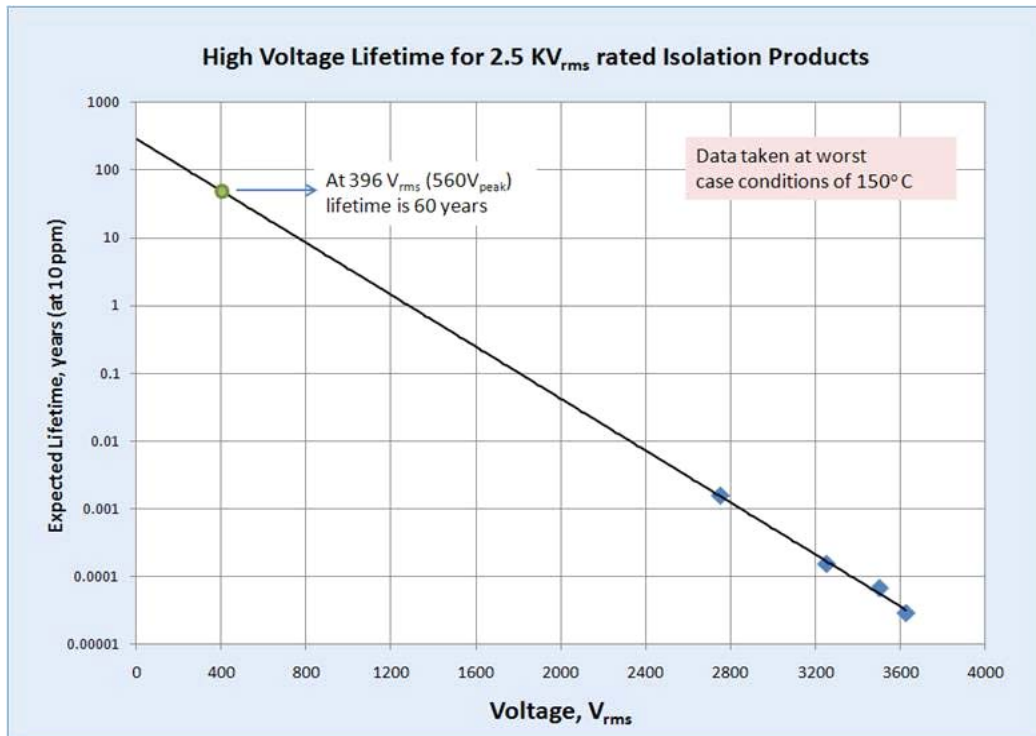


Figure 15. Si84xx Time-Dependent Dielectric Breakdown

## 3. Errata and Design Migration Guidelines

When using the new Si846x products, or when migrating from Silicon Labs' legacy isolators, designers must consider and adhere to the following requirements.

### 3.1. Power Supply Bypass Capacitors (Revision A and Revision B)

When using the Si846x isolators with power supplies  $\geq 4.5$  V, sufficient VDD bypass capacitors must be present on both the VDD1 and VDD2 pins to ensure the VDD rise time is less than  $0.5 \text{ V}/\mu\text{s}$  (which is  $> 9 \mu\text{s}$  for a  $\geq 4.5$  V supply). Although rise time is power supply dependent,  $\geq 1 \mu\text{F}$  capacitors are required on both power supply pins (VDD1, VDD2) of the isolator device.

#### 3.1.1. Resolution

For recommendations on resolving this issue, see "2.4.1. Supply Bypass" on page 22. Additionally, refer to "5. Ordering Guide" on page 28 for current ordering information.

### 3.2. Latch Up Immunity (Revision A Only)

Latch up immunity generally exceeds  $\pm 200$  mA per pin. Exceptions: Certain pins provide  $< 100$  mA of latch-up immunity. To increase latch-up immunity on these pins,  $100 \Omega$  of equivalent resistance must be included in series with *all* of the pins listed in Table 13. The  $100 \Omega$  equivalent resistance can be comprised of the source driver's output resistance and a series termination resistor.

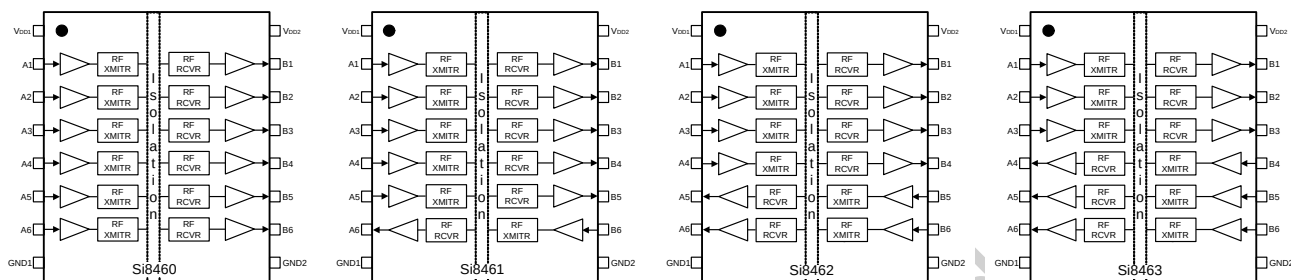
#### 3.2.1. Resolution

This issue has been corrected with Revision B of the device. Refer to "5. Ordering Guide" on page 28 for more information.

**Table 13. Affected Ordering Part Numbers (Revision A Only)**

| Affected Ordering Part Numbers*                                            | Device Revision | Pin# | Name | Pin Type        |
|----------------------------------------------------------------------------|-----------------|------|------|-----------------|
| SI8460SV-A-IS/IS1, SI8461SV-A-IS/IS1, SI8462SV-A-IS/IS1, SI8463SV-A-IS/IS1 | A               | 2    | A1   | Input           |
|                                                                            |                 | 6    | A5   | Input or Output |
|                                                                            |                 | 10   | B6   | Input or Output |
|                                                                            |                 | 14   | B2   | Output          |
| *Note: SV = Speed Grade/Isolation Rating (AA, AB, BA, BB).                 |                 |      |      |                 |

## 4. Pin Descriptions



| Name             | SOIC-16 Pin# | Type           | Description                     |
|------------------|--------------|----------------|---------------------------------|
| V <sub>DD1</sub> | 1            | Supply         | Side 1 power supply.            |
| A1               | 2            | Digital Input  | Side 1 digital input.           |
| A2               | 3            | Digital Input  | Side 1 digital input.           |
| A3               | 4            | Digital Input  | Side 1 digital input.           |
| A4               | 5            | Digital I/O    | Side 1 digital input or output. |
| A5               | 6            | Digital I/O    | Side 1 digital input or output. |
| A6               | 7            | Digital I/O    | Side 1 digital input or output. |
| GND1             | 8            | Ground         | Side 1 ground.                  |
| GND2             | 9            | Ground         | Side 2 ground.                  |
| B6               | 10           | Digital I/O    | Side 2 digital input or output. |
| B5               | 11           | Digital I/O    | Side 2 digital input or output. |
| B4               | 12           | Digital I/O    | Side 2 digital input or output. |
| B3               | 13           | Digital Output | Side 2 digital output.          |
| B2               | 14           | Digital Output | Side 2 digital output.          |
| B1               | 15           | Digital Output | Side 2 digital output.          |
| V <sub>DD2</sub> | 16           | Supply         | Side 2 power supply.            |

## 5. Ordering Guide

These devices are not recommended for new designs. Please see the Si866x data sheet for replacement options.

**Table 14. Ordering Guide for Valid OPNs<sup>1</sup>**

| Ordering Part Number (OPN)                                               | Alternative Part Number (APN) | Number of Inputs VDD1 Side | Number of Inputs VDD2 Side | Maximum Data Rate (Mbps) | Isolation Rating | Package Type |
|--------------------------------------------------------------------------|-------------------------------|----------------------------|----------------------------|--------------------------|------------------|--------------|
| Revision B Devices <sup>2</sup>                                          |                               |                            |                            |                          |                  |              |
| Si8460AA-B-IS1                                                           | Si8660BA-B-IS1                | 6                          | 0                          | 1                        | 1 kVrms          | NB SOIC-16   |
| Si8460BA-B-IS1                                                           | Si8660BA-B-IS1                | 6                          | 0                          | 150                      |                  |              |
| Si8461AA-B-IS1                                                           | Si8661AB-B-IS1                | 5                          | 1                          | 1                        |                  |              |
| Si8461BA-B-IS1                                                           | Si8661BB-B-IS1                | 5                          | 1                          | 150                      |                  |              |
| Si8462AA-B-IS1                                                           | Si8662AB-B-IS1                | 4                          | 2                          | 1                        |                  |              |
| Si8462BA-B-IS1                                                           | Si8662BB-B-IS1                | 4                          | 2                          | 150                      |                  |              |
| Si8463AA-B-IS1                                                           | Si8663AB-B-IS1                | 3                          | 3                          | 1                        |                  |              |
| Si8463BA-B-IS1                                                           | Si8663BB-B-IS1                | 3                          | 3                          | 150                      |                  |              |
| Si8460AB-B-IS1                                                           | Si8660AB-B-IS1                | 6                          | 0                          | 1                        | 2.5 kVrms        | NB SOIC-16   |
| Si8460BB-B-IS1                                                           | Si8660BB-B-IS1                | 6                          | 0                          | 150                      |                  |              |
| Si8461AB-B-IS1                                                           | Si8661AB-B-IS1                | 5                          | 1                          | 1                        |                  |              |
| Si8461BB-B-IS1                                                           | Si8661BB-B-IS1                | 5                          | 1                          | 150                      |                  |              |
| Si8462AB-B-IS1                                                           | Si8662AB-B-IS1                | 4                          | 2                          | 1                        |                  |              |
| Si8462BB-B-IS1                                                           | Si8662BB-B-IS1                | 4                          | 2                          | 150                      |                  |              |
| Si8463AB-B-IS1                                                           | Si8663AB-B-IS1                | 3                          | 3                          | 1                        |                  |              |
| Si8463BB-B-IS1                                                           | Si8663BB-B-IS1                | 3                          | 3                          | 150                      |                  |              |
| Notes:                                                                   |                               |                            |                            |                          |                  |              |
| 1. All packages are RoHS-compliant.                                      |                               |                            |                            |                          |                  |              |
| 2. Revision A and Revision B devices are supported for existing designs. |                               |                            |                            |                          |                  |              |

Table 14. Ordering Guide for Valid OPNs<sup>1</sup>

| Ordering Part Number (OPN)                                               | Alternative Part Number (APN) | Number of Inputs VDD1 Side | Number of Inputs VDD2 Side | Maximum Data Rate (Mbps) | Isolation Rating | Package Type |
|--------------------------------------------------------------------------|-------------------------------|----------------------------|----------------------------|--------------------------|------------------|--------------|
| Revision A Devices <sup>2</sup>                                          |                               |                            |                            |                          |                  |              |
| Si8460AA-A-IS1                                                           | Si8660BA-B-IS1                | 6                          | 0                          | 1                        | 1 kVrms          | NB SOIC-16   |
| Si8460BA-A-IS1                                                           | Si8660BA-B-IS1                | 6                          | 0                          | 150                      |                  |              |
| Si8461AA-A-IS1                                                           | Si8661AB-B-IS1                | 5                          | 1                          | 1                        |                  |              |
| Si8461BA-A-IS1                                                           | Si8661BB-B-IS1                | 5                          | 1                          | 150                      |                  |              |
| Si8462AA-A-IS1                                                           | Si8662AB-B-IS1                | 4                          | 2                          | 1                        |                  |              |
| Si8462BA-A-IS1                                                           | Si8662BB-B-IS1                | 4                          | 2                          | 150                      |                  |              |
| Si8463AA-A-IS1                                                           | Si8663AB-B-IS1                | 3                          | 3                          | 1                        |                  |              |
| Si8463BA-A-IS1                                                           | Si8663BB-B-IS1                | 3                          | 3                          | 150                      |                  |              |
| Si8460AB-A-IS1                                                           | Si8660AB-B-IS1                | 6                          | 0                          | 1                        | 2.5 kVrms        | NB SOIC-16   |
| Si8460BB-A-IS1                                                           | Si8660BB-B-IS1                | 6                          | 0                          | 150                      |                  |              |
| Si8461AB-A-IS1                                                           | Si8661AB-B-IS1                | 5                          | 1                          | 1                        |                  |              |
| Si8461BB-A-IS1                                                           | Si8661BB-B-IS1                | 5                          | 1                          | 150                      |                  |              |
| Si8462AB-A-IS1                                                           | Si8662AB-B-IS1                | 4                          | 2                          | 1                        |                  |              |
| Si8462BB-A-IS1                                                           | Si8662BB-B-IS1                | 4                          | 2                          | 150                      |                  |              |
| Si8463AB-A-IS1                                                           | Si8663AB-B-IS1                | 3                          | 3                          | 1                        |                  |              |
| Si8463BB-A-IS1                                                           | Si8663BB-B-IS1                | 3                          | 3                          | 150                      |                  |              |
| Notes:                                                                   |                               |                            |                            |                          |                  |              |
| 1. All packages are RoHS-compliant.                                      |                               |                            |                            |                          |                  |              |
| 2. Revision A and Revision B devices are supported for existing designs. |                               |                            |                            |                          |                  |              |

## 6. Package Outline: 16-Pin Narrow Body SOIC

Figure 16 illustrates the package details for the Si846x in a 16-pin narrow-body SOIC (SO-16). Table 15 lists the values for the dimensions shown in the illustration.

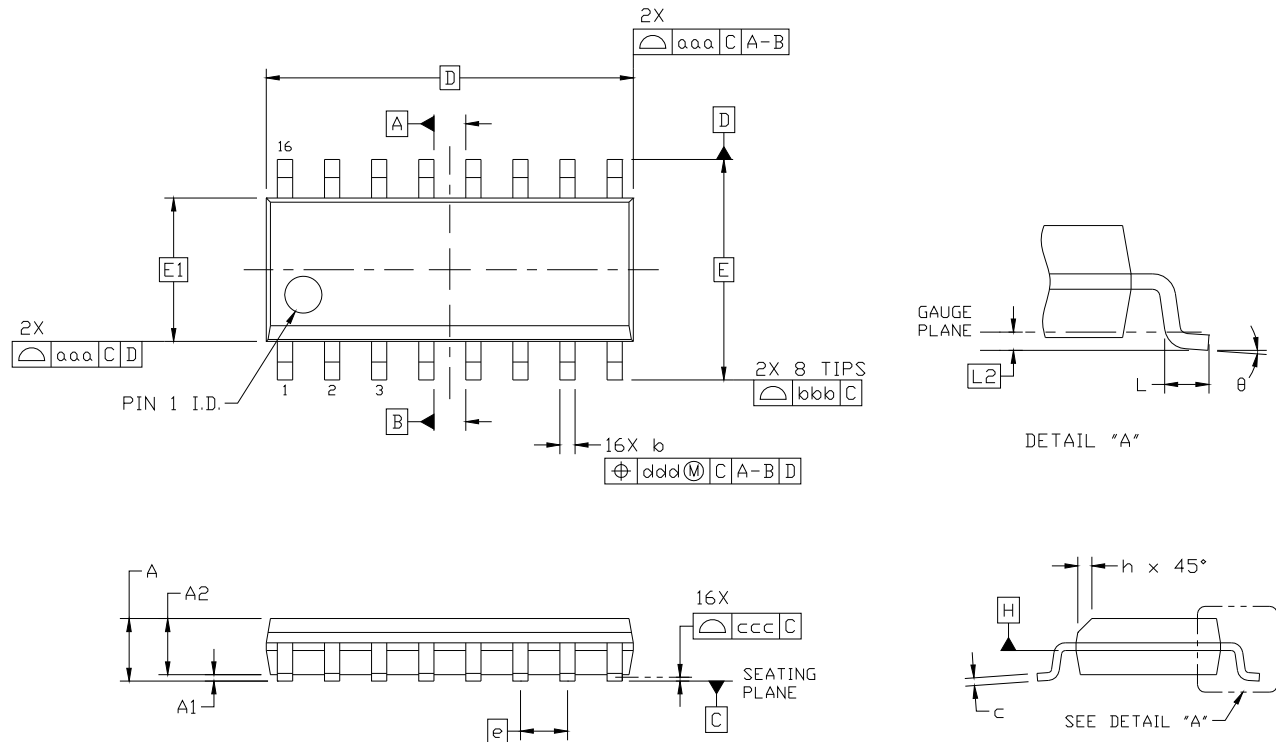


**Figure 16. 16-pin Small Outline Integrated Circuit (SOIC) Package**

**Table 15. Package Diagram Dimensions**

| Dimension | Min      | Max  |
|-----------|----------|------|
| A         | —        | 1.75 |
| A1        | 0.10     | 0.25 |
| A2        | 1.25     | —    |
| b         | 0.31     | 0.51 |
| c         | 0.17     | 0.25 |
| D         | 9.90 BSC |      |
| E         | 6.00 BSC |      |
| E1        | 3.90 BSC |      |
| e         | 1.27 BSC |      |
| L         | 0.40     | 1.27 |
| L2        | 0.25 BSC |      |

Table 15. Package Diagram Dimensions (Continued)

| Dimension | Min  | Max  |
|-----------|------|------|
| h         | 0.25 | 0.50 |
| θ         | 0°   | 8°   |
| aaa       | 0.10 |      |
| bbb       | 0.20 |      |
| ccc       | 0.10 |      |
| ddd       | 0.25 |      |

**Notes:**

1. All dimensions shown are in millimeters (mm) unless otherwise noted.
2. Dimensioning and Tolerancing per ANSI Y14.5M-1994.
3. This drawing conforms to the JEDEC Solid State Outline MS-012, Variation AC.
4. Recommended card reflow profile is per the JEDEC/IPC J-STD-020 specification for Small Body Components.

7. Land Pattern: 16-Pin Narrow Body SOIC

Figure 17 illustrates the recommended land pattern details for the Si846x in a 16-pin narrow-body SOIC. Table 16 lists the values for the dimensions shown in the illustration.

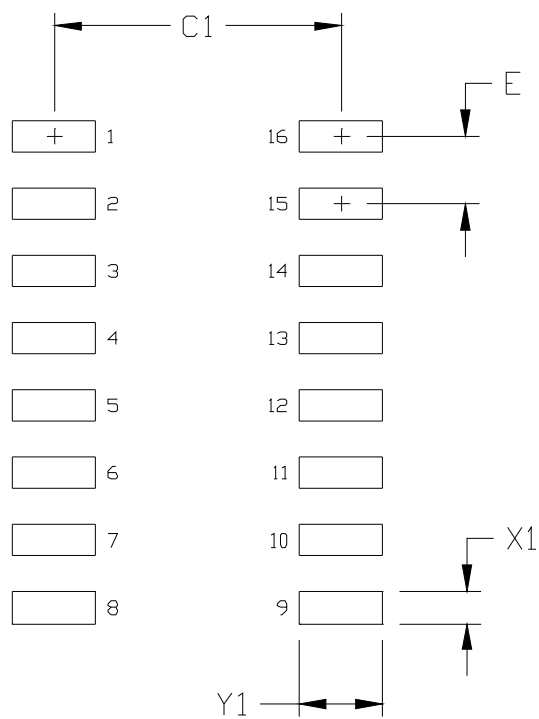


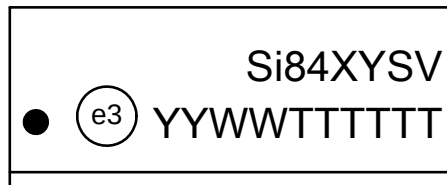
Figure 17. 16-Pin Narrow Body SOIC PCB Land Pattern

Table 16. 16-Pin Narrow Body SOIC Land Pattern Dimensions

| Dimension                                                                                                                                                                                                                                                                 | Feature            | (mm) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|
| C1                                                                                                                                                                                                                                                                        | Pad Column Spacing | 5.40 |
| E                                                                                                                                                                                                                                                                         | Pad Row Pitch      | 1.27 |
| X1                                                                                                                                                                                                                                                                        | Pad Width          | 0.60 |
| Y1                                                                                                                                                                                                                                                                        | Pad Length         | 1.55 |
| <b>Notes:</b><br>1. This Land Pattern Design is based on IPC-7351 pattern SOIC127P600X165-16N for Density Level B (Median Land Protrusion).<br>2. All feature sizes shown are at Maximum Material Condition (MMC) and a card fabrication tolerance of 0.05 mm is assumed. |                    |      |

## 8. Top Marking: 16-Pin Narrow Body SOIC

### 8.1. 16-Pin Narrow Body SOIC Top Marking



### 8.2. Top Marking Explanation

|                        |                                                                                        |                                                                                                                                                                                                                                                     |
|------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Line 1 Marking:</b> | Base Part Number<br>Ordering Options<br><br>(See Ordering Guide for more information). | Si84 = Isolator product series<br>XY = Channel Configuration<br>X = # of data channels (6, 5, 4, 3, 2, 1)<br>Y = # of reverse channels (3, 2, 1, 0)<br>S = Speed Grade<br>A = 1 Mbps; B = 150 Mbps<br>V = Insulation rating<br>A = 1 kV; B = 2.5 kV |
| <b>Line 2 Marking:</b> | Circle = 1.2 mm Diameter                                                               | "e3" Pb-Free Symbol                                                                                                                                                                                                                                 |
|                        | YY = Year<br>WW = Work Week                                                            | Assigned by the Assembly House. Corresponds to the year and work week of the mold date.                                                                                                                                                             |
|                        | TTTTTT = Mfg code                                                                      | Manufacturing Code from Assembly Purchase Order form.                                                                                                                                                                                               |
|                        | Circle = 1.2 mm diameter                                                               | "e3" Pb-Free Symbol.                                                                                                                                                                                                                                |

## **DOCUMENT CHANGE LIST**

### **Revision 0.1 to Revision 0.2**

- Updated all specs to reflect latest silicon.
- Added "3. Errata and Design Migration Guidelines" on page 26.
- Added "8. Top Marking: 16-Pin Narrow Body SOIC" on page 33.

### **Revision 0.2 to Revision 1.0**

- Updated document to reflect availability of Revision B silicon.
- Updated Tables 3, 4, and 5.
  - Updated all supply currents and channel-channel skew.
- Updated Table 2.
  - Updated absolute maximum supply voltage.
- Updated Table 7.
  - Updated clearance and creepage dimensions.
- Updated "3. Errata and Design Migration Guidelines" on page 26.
- Updated "5. Ordering Guide" on page 28.

### **Revision 1.0 to Revision 1.1**

- Updated Tables 3, 4, and 5.
  - Updated notes in tables to reflect output impedance of 85  $\Omega$ .
  - Updated rise and fall time specifications.
  - Updated CMTI value.

### **Revision 1.1 to Revision 1.2**

- Updated document throughout to include MSL improvements to MSL2A.
- Updated "5. Ordering Guide" on page 28.
  - Updated Note 1 in ordering guide table to reflect improvement and compliance to MSL2A moisture sensitivity level.

### **Revision 1.2 to Revision 1.3**

- Updated "Features" on page 1.
- Moved Tables 1 and 2 to page 3.
- Updated Tables 6, 7, 8, and 9.
- Updated Table 12 footnotes.
- Added Figure 15, "Si84xx Time-Dependent Dielectric Breakdown," on page 25.

### **Revision 1.3 to Revision 1.4**

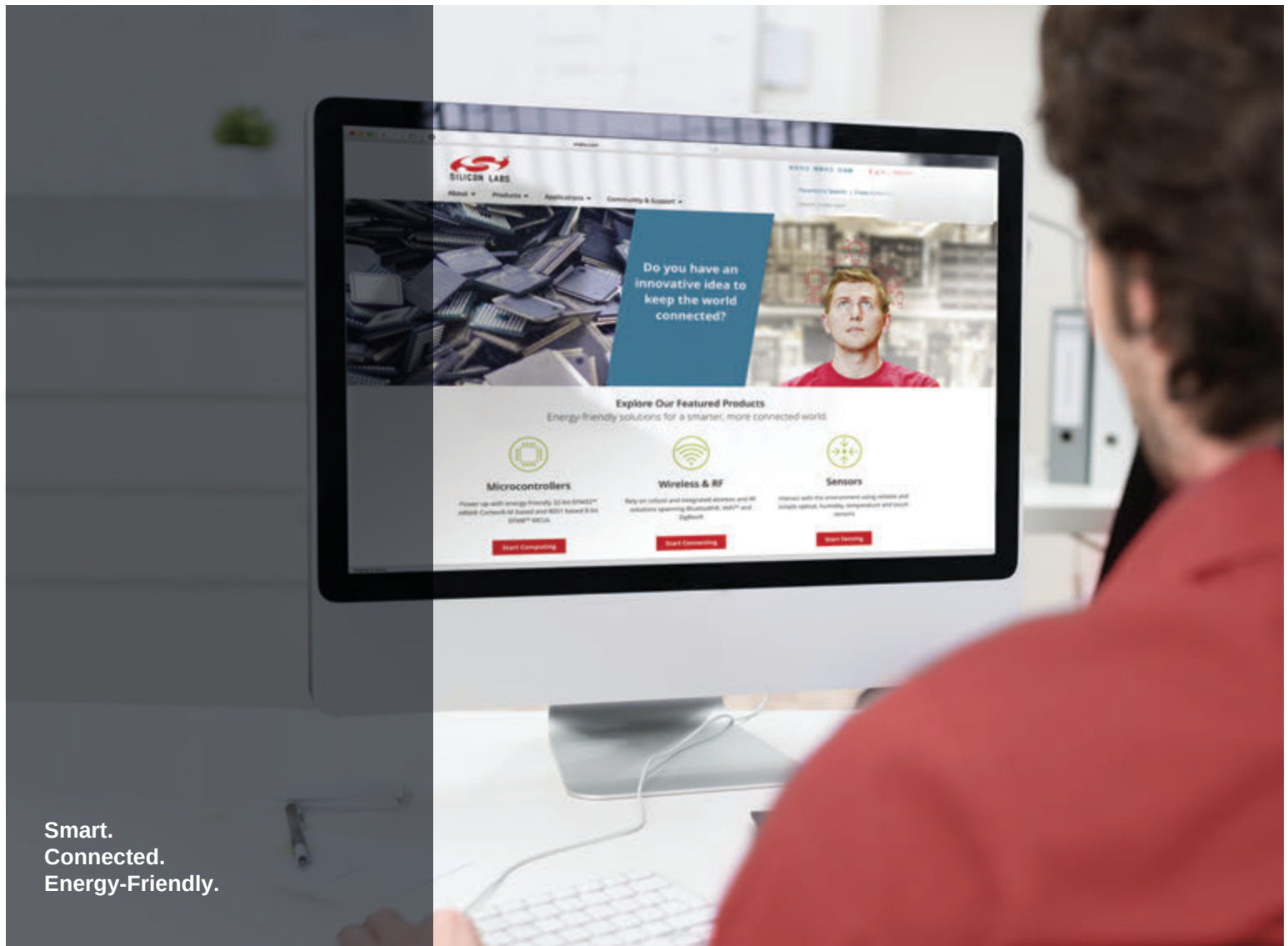
- Updated "4. Pin Descriptions" on page 27.
  - Removed note for narrow-body devices.
- Updated "2.4.1. Supply Bypass" on page 22.
- Added Figure 6, "Recommended Bypass Components for the Si84xx Digital Isolator Family," on page 22.
- Updated "3.1. Power Supply Bypass Capacitors (Revision A and Revision B)" on page 26.

### **Revision 1.4 to Revision 1.5**

- Updated "5. Ordering Guide" on page 28 to include new title note and "Alternative Part Number (APN)" column.

### **Revision 1.5 to Revision 1.6**

- Deleted references to MSL ratings throughout document to eliminate redundancy and maintain compliance with corporate data sheet format requirements. The MSL ratings are specified in the Qualification Report for the product.

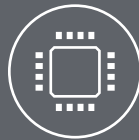


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