



preliminary

# Sonic Fast Recovery Diode

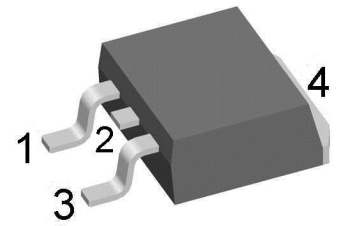
|           |   |              |
|-----------|---|--------------|
| $V_{RRM}$ | = | <b>600 V</b> |
| $I_{FAV}$ | = | <b>30 A</b>  |
| $t_{rr}$  | = | <b>35 ns</b> |

High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 Single Diode

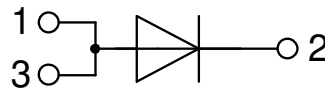
**Part number**

**DHG30IM600PC**

Marking on Product: *DHG30IM600PC*



Backside: cathode



**Features / Advantages:**

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low  $I_{rm}$ -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low  $I_{rm}$  reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

**Applications:**

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

**Package:** TO-263 (D2Pak)

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

**Disclaimer Notice**

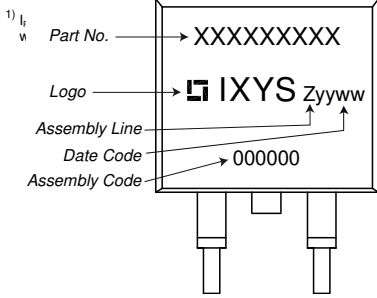
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| Fast Diode |  |   |                              | Ratings |      |            |  |
|------------|--|---|------------------------------|---------|------|------------|--|
| Symbol     | Definition                                   | Conditions  | min.                         | typ.    | max. | Unit       |  |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}C$                                    |                              |         | 600  | V          |  |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}C$                                    |                              |         | 600  | V          |  |
| $I_R$      | reverse current, drain current               | $V_R = 600 V$   | $T_{VJ} = 25^{\circ}C$       |         | 50   | $\mu A$    |  |
|            |  | $V_R = 600 V$   | $T_{VJ} = 125^{\circ}C$      |         | 4    | mA         |  |
| $V_F$      | forward voltage drop                         | $I_F = 30 A$  | $T_{VJ} = 25^{\circ}C$       |         | 2.26 | V          |  |
|            |  | $I_F = 60 A$  |                              |         | 3.11 | V          |  |
|            |  | $I_F = 30 A$  | $T_{VJ} = 125^{\circ}C$      |         | 2.22 | V          |  |
|            |  | $I_F = 60 A$  |                              |         | 3.20 | V          |  |
| $I_{FAV}$  | average forward current                      | $T_C = 95^{\circ}C$<br>rectangular $d = 0.5$              | $T_{VJ} = 150^{\circ}C$      |         | 30   | A          |  |
| $V_{FO}$   | threshold voltage                            | } for power loss calculation only                         | $T_{VJ} = 150^{\circ}C$      |         | 1.17 | V          |  |
| $r_F$      | slope resistance                             |   |                              |         | 32   | m $\Omega$ |  |
| $R_{thJC}$ | thermal resistance junction to case          |   |                              |         | 0.6  | K/W        |  |
| $R_{thCH}$ | thermal resistance case to heatsink          |   |                              | 0.25    |      | K/W        |  |
| $P_{tot}$  | total power dissipation                      |   | $T_C = 25^{\circ}C$          |         | 210  | W          |  |
| $I_{FSM}$  | max. forward surge current                   | $t = 10 ms; (50 Hz), sine; V_R = 0 V$                     | $T_{VJ} = 45^{\circ}C$       |         | 200  | A          |  |
| $C_J$      | junction capacitance                         | $V_R = 400 V$ $f = 1 MHz$                                 | $T_{VJ} = 25^{\circ}C$       |         | 16   | pF         |  |
| $I_{RM}$   | max. reverse recovery current                | } $I_F = 35 A; V_R = 400 V$<br>$-di_F / dt = 600 A/\mu s$ | $T_{VJ} = 25^{\circ}C$       |         | 12   | A          |  |
|            |  |   | $T_{VJ} = \text{ }^{\circ}C$ |         | tbd  | A          |  |
| $t_{rr}$   | reverse recovery time                        |   | $T_{VJ} = 25^{\circ}C$       |         | 35   | ns         |  |
|            |  |   | $T_{VJ} = \text{ }^{\circ}C$ |         | tbd  | ns         |  |



| Package TO-263 (D2Pak) |                              |                            | Ratings |      |      |      |
|------------------------|------------------------------|----------------------------|---------|------|------|------|
| Symbol                 | Definition                   | Conditions                 | min.    | typ. | max. | Unit |
| $I_{RMS}$              | RMS current                  | per terminal <sup>1)</sup> |         |      | 35   | A    |
| $T_{VJ}$               | virtual junction temperature |                            | -55     |      | 150  | °C   |
| $T_{op}$               | operation temperature        |                            | -55     |      | 125  | °C   |
| $T_{stg}$              | storage temperature          |                            | -55     |      | 150  | °C   |
| <b>Weight</b>          | <b>Product Marking</b>       | <b>Part description</b>    |         | 2    |      | g    |
| $F_C$                  | mounting force with clip     |                            | 20      |      | 60   | N    |



D = Diode  
H = Sonic Fast Recovery Diode  
G = extreme fast  
30 = Current Rating [A]  
IM = Single Diode  
600 = Reverse Voltage [V]  
PC = TO-263AB (D2Pak) (2)

| Ordering    | Ordering Number  | Marking on Product | Delivery Mode | Quantity | Code No. |
|-------------|------------------|--------------------|---------------|----------|----------|
| Standard    | DHG30IM600PC-TRL | DHG30IM600PC       | Tape & Reel   | 800      | 503501   |
| Alternative | DHG30IM600PC-TUB | DHG30IM600PC       | Tube          | 50       | 525078   |

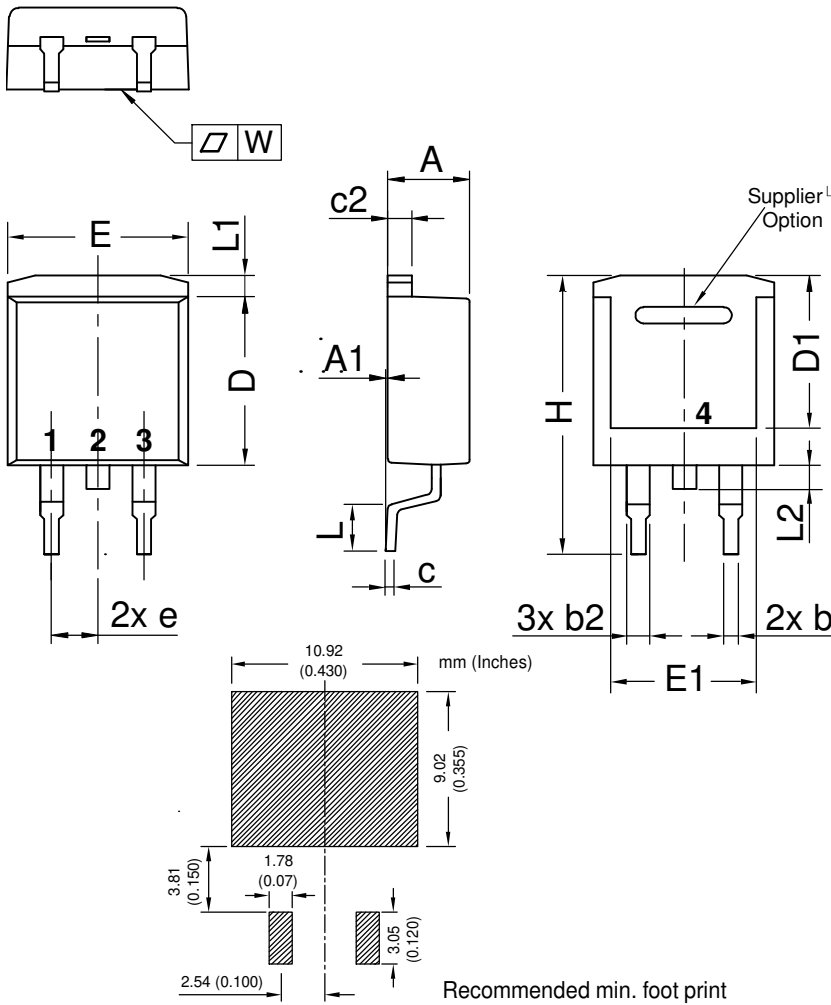
| Similar Part | Package      | Voltage class |
|--------------|--------------|---------------|
| DHG30I600PA  | TO-220AC (2) | 600           |
| DHG30I600HA  | TO-247AD (2) | 600           |

**Equivalent Circuits for Simulation** \* on die level  $T_{VJ} = 150\text{ }^\circ\text{C}$

| Symbol             | Definition         | Value | Unit |
|--------------------|--------------------|-------|------|
| $V_{0\text{ max}}$ | threshold voltage  | 1.17  | V    |
| $R_{0\text{ max}}$ | slope resistance * | 29    | mΩ   |



**Outlines TO-263 (D2Pak)**



| Dim. | Millimeter |       | Inches      |       |
|------|------------|-------|-------------|-------|
|      | min        | max   | min         | max   |
| A    | 4.06       | 4.83  | 0.160       | 0.190 |
| A1   | typ. 0.10  |       | typ. 0.004  |       |
| A2   | 2.41       |       | 0.095       |       |
| b    | 0.51       | 0.99  | 0.020       | 0.039 |
| b2   | 1.14       | 1.40  | 0.045       | 0.055 |
| c    | 0.40       | 0.74  | 0.016       | 0.029 |
| c2   | 1.14       | 1.40  | 0.045       | 0.055 |
| D    | 8.38       | 9.40  | 0.330       | 0.370 |
| D1   | 8.00       | 8.89  | 0.315       | 0.350 |
| D2   | 2.5        |       | 0.098       |       |
| E    | 9.65       | 10.41 | 0.380       | 0.410 |
| E1   | 6.22       | 8.50  | 0.245       | 0.335 |
| e    | 2.54 BSC   |       | 0.100 BSC   |       |
| e1   | 4.28       |       | 0.169       |       |
| H    | 14.61      | 15.88 | 0.575       | 0.625 |
| L    | 1.78       | 2.79  | 0.070       | 0.110 |
| L1   | 1.02       | 1.68  | 0.040       | 0.066 |
| W    | typ. 0.02  | 0.040 | typ. 0.0008 | 0.002 |

*All dimensions conform with and/or within JEDEC standard.*

