

SDQ

Low-profile dual winding shielded drum inductor/transformer



Applications

- Transformer: (1:1), SEPIC, flyback
- Buck, boost, coupled inductor
- Mobile phones
- Notebook and laptop power
- Digital cameras
- Media players
- PCMCIA cards
- GPS systems

Product features

- Dual winding inductors that can be used as either a single inductor, or in coupled inductor/transformer applications (1:1 turns ratio)
- Windings can be connected in series or parallel, offering a broad range of inductance and current ratings
- Current range from 0.063 A to 6.43 A
- Inductance range from 0.47 μ H to 4.03 mH
- Ferrite shielded, low EMI
- Ferrite core material
- 500 Vdc isolation between windings

Environmental Data

- Storage temperature range (Component): -40 °C to +125 °C
- Operating temperature range: -40 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant



Product specifications

| Part Number | Rated Inductance (μH) | Part Marking | Parallel Ratings | | | | | Series Ratings | | | | |
|-------------|-----------------------|--------------|------------------------------|-------------------------------------|-------------------------------------|-----------------------------|-----------------------------------|------------------------------|-------------------------------------|-------------------------------------|----------------|-----------------------------------|
| | | | OCL ⁽¹⁾ ±20% (μH) | I _{rms} ⁽²⁾ (A) | I _{sat} ⁽³⁾ (A) | DCR ⁽⁴⁾ (Ω) typ. | Volts ⁽⁵⁾ (u-sec) typ. | OCL ⁽¹⁾ ±20% (μH) | I _{rms} ⁽²⁾ (A) | I _{sat} ⁽³⁾ (A) | DCR Ω (4) typ. | Volts ⁽⁵⁾ (u-sec) typ. |
| SDQ12-R47-R | 0.47 | A | 0.49±30% | 2.78 | 4.34 | 0.0325 | 2.45 | 1.96±30% | 1.39 | 2.17 | 0.1298 | 4.90 |
| SDQ12-1R0-R | 1 | B | 0.81 | 2.49 | 3.38 | 0.0403 | 3.15 | 3.24 | 1.25 | 1.69 | 0.1611 | 6.30 |
| SDQ12-1R5-R | 1.5 | C | 1.69 | 1.69 | 2.34 | 0.0870 | 4.55 | 6.76 | 0.847 | 1.17 | 0.3481 | 9.10 |
| SDQ12-2R2-R | 2.2 | D | 2.25 | 1.60 | 2.03 | 0.0977 | 5.25 | 9.00 | 0.800 | 1.01 | 0.3908 | 10.5 |
| SDQ12-3R3-R | 3.3 | E | 3.61 | 1.28 | 1.60 | 0.1527 | 6.65 | 14.44 | 0.640 | 0.800 | 0.6106 | 13.3 |
| SDQ12-4R7-R | 4.7 | F | 4.41 | 1.12 | 1.45 | 0.1990 | 7.35 | 17.64 | 0.560 | 0.724 | 0.7959 | 14.7 |
| SDQ12-6R2-R | 6.2 | G | 6.25 | 1.02 | 1.22 | 0.2387 | 8.75 | 25.00 | 0.512 | 0.608 | 0.9548 | 17.5 |
| SDQ12-8R2-R | 8.2 | H | 8.41 | 0.868 | 1.05 | 0.3318 | 10.15 | 33.64 | 0.434 | 0.524 | 1.33 | 20.3 |
| SDQ12-100-R | 10 | J | 9.61 | 0.831 | 0.981 | 0.3620 | 10.85 | 38.44 | 0.416 | 0.490 | 1.45 | 21.7 |
| SDQ12-150-R | 15 | K | 15.21 | 0.658 | 0.779 | 0.5766 | 13.65 | 60.84 | 0.329 | 0.390 | 2.31 | 27.3 |
| SDQ12-220-R | 22 | L | 22.09 | 0.548 | 0.647 | 0.8332 | 16.45 | 88.36 | 0.274 | 0.323 | 3.33 | 32.9 |
| SDQ12-330-R | 33 | M | 32.49 | 0.439 | 0.533 | 1.29 | 19.95 | 130.0 | 0.220 | 0.267 | 5.18 | 39.9 |
| SDQ12-470-R | 47 | N | 47.61 | 0.401 | 0.441 | 1.55 | 24.15 | 190.4 | 0.201 | 0.220 | 6.21 | 48.3 |
| SDQ12-680-R | 68 | O | 68.89 | 0.326 | 0.366 | 2.36 | 29.05 | 275.6 | 0.163 | 0.183 | 9.43 | 58.1 |
| SDQ12-820-R | 82 | P | 82.81 | 0.309 | 0.334 | 2.62 | 31.85 | 331.2 | 0.154 | 0.167 | 10.49 | 63.7 |
| SDQ25-R47-R | 0.47 | A | 0.392±30% | 3.71 | 6.43 | 0.0181 | 2.31 | 1.57±30% | 1.86 | 3.21 | 0.0725 | 4.62 |
| SDQ25-R82-R | 0.82 | B | 0.648±30% | 3.37 | 5.00 | 0.0221 | 2.97 | 2.59±30% | 1.68 | 2.50 | 0.0883 | 5.94 |
| SDQ25-1R0-R | 1 | C | 0.97 | 3.15 | 4.09 | 0.0252 | 3.63 | 3.87 | 1.58 | 2.05 | 0.1007 | 7.26 |
| SDQ25-1R5-R | 1.5 | D | 1.35 | 2.97 | 3.46 | 0.0283 | 4.29 | 5.41 | 1.49 | 1.73 | 0.1130 | 8.58 |
| SDQ25-2R2-R | 2.2 | E | 2.31 | 2.67 | 2.65 | 0.0351 | 5.61 | 9.25 | 1.34 | 1.32 | 0.1402 | 11.2 |
| SDQ25-3R3-R | 3.3 | F | 2.89 | 2.50 | 2.37 | 0.0399 | 6.27 | 11.55 | 1.25 | 1.18 | 0.1595 | 12.5 |
| SDQ25-4R7-R | 4.7 | G | 5 | 1.96 | 1.80 | 0.0653 | 8.25 | 20.00 | 0.98 | 0.900 | 0.2612 | 16.5 |
| SDQ25-6R8-R | 6.8 | H | 6.73 | 1.84 | 1.55 | 0.0741 | 9.57 | 26.91 | 0.918 | 0.776 | 0.2964 | 19.1 |
| SDQ25-8R2-R | 8.2 | J | 8.71 | 1.57 | 1.36 | 0.1015 | 10.9 | 34.85 | 0.785 | 0.682 | 0.4059 | 21.8 |
| SDQ25-100-R | 10 | K | 9.8 | 1.53 | 1.29 | 0.1068 | 11.6 | 39.20 | 0.765 | 0.643 | 0.4273 | 23.1 |
| SDQ25-150-R | 15 | L | 14.79 | 1.24 | 1.05 | 0.1632 | 14.2 | 59.17 | 0.619 | 0.523 | 0.6526 | 28.4 |
| SDQ25-220-R | 22 | M | 22.47 | 1.01 | 0.849 | 0.2431 | 17.5 | 89.89 | 0.507 | 0.425 | 0.9724 | 35.0 |
| SDQ25-330-R | 33 | N | 33.8 | 0.812 | 0.692 | 0.3795 | 21.5 | 135.2 | 0.406 | 0.346 | 1.52 | 42.9 |
| SDQ25-470-R | 47 | O | 47.43 | 0.749 | 0.584 | 0.4461 | 25.4 | 189.7 | 0.374 | 0.292 | 1.78 | 50.8 |
| SDQ25-680-R | 68 | P | 69.19 | 0.603 | 0.484 | 0.6865 | 30.7 | 276.8 | 0.302 | 0.242 | 2.75 | 61.4 |
| SDQ25-820-R | 82 | Q | 81.61 | 0.580 | 0.446 | 0.7435 | 33.3 | 326.4 | 0.290 | 0.223 | 2.97 | 66.7 |
| SDQ25-101-R | 100 | R | 98.57 | 0.499 | 0.405 | 1.00 | 36.6 | 394.3 | 0.249 | 0.203 | 4.02 | 73.3 |
| SDQ25-151-R | 150 | S | 150.2 | 0.408 | 0.328 | 1.50 | 45.2 | 600.6 | 0.204 | 0.164 | 6.00 | 90.4 |
| SDQ25-221-R | 220 | T | 223.1 | 0.326 | 0.269 | 2.36 | 55.1 | 892.4 | 0.163 | 0.135 | 9.42 | 110 |
| SDQ25-331-R | 330 | U | 329.7 | 0.292 | 0.222 | 2.93 | 67.0 | 1318.7 | 0.146 | 0.111 | 11.71 | 134 |
| SDQ25-471-R | 470 | V | 472.4 | 0.243 | 0.185 | 4.25 | 80.2 | 1889.6 | 0.121 | 0.093 | 16.99 | 160 |
| SDQ25-681-R | 680 | W | 677.4 | 0.197 | 0.155 | 6.45 | 96.0 | 2709.8 | 0.098 | 0.077 | 25.78 | 192 |
| SDQ25-821-R | 820 | X | 824.3 | 0.186 | 0.140 | 7.25 | 106 | 3297.3 | 0.093 | 0.070 | 28.99 | 212 |
| SDQ25-102-R | 1000 | Y | 1008.2 | 0.160 | 0.127 | 9.82 | 117 | 4032.8 | 0.080 | 0.063 | 39.26 | 234 |

(1) Test Parameters: 100 kHz, 0.25 Vrms 0.0 Adc

(2) I_{rms}: DC current for approximately ΔT of 40 °C without core loss. It is recommended that the temperature of the part not to exceed +125 °C. Derating is necessary for AC currents

(3) I_{sat}: Peak current for approximately 30% rolloff @ +20 °C

(4) DCR limits @ +20 °C

(5) Applied Volt-Time product (V-μs) across the inductor at 100 kHz necessary to generate a core loss equal to 10% of the total losses for a 40 °C temperature rise. Derating of the I_{rms} is required to prevent excessive temperature rise.

Part Number Definition:

SDQ12-XXX-R

SDQ12 = Product code and Size

XXX = Inductance in uH, R = Decimal point

If no R is present, third character = # of zeros.

-R suffix indicated RoHS compliant

Dimensions- mm



Part marking: Line 1 (1st digit inductance value per part marking designator in chart above) (2nd digit is a bi-weekly production date code) (3rd digit is the last digit of the year produced)
Line 2: xx (indicates the product size code)
Do not route traces or vias underneath the inductor

Packaging- mm

SDQ12



SDQ25



Core loss



Inductance characteristics



Solder reflow profile



Table 1 - Standard SnPb Solder (T_c)

| Package Thickness | Volume mm ³ <350 | Volume mm ³ ≥350 |
|-------------------|-----------------------------|-----------------------------|
| <2.5mm) | 235°C | 220°C |
| ≥2.5mm | 220°C | 220°C |

Table 2 - Lead (Pb) Free Solder (T_c)

| Package Thickness | Volume mm ³ <350 | Volume mm ³ 350 - 2000 | Volume mm ³ >2000 |
|-------------------|-----------------------------|-----------------------------------|------------------------------|
| <1.6mm | 260°C | 260°C | 260°C |
| 1.6 – 2.5mm | 260°C | 250°C | 245°C |
| >2.5mm | 250°C | 245°C | 245°C |

Reference JEDEC J-STD-020

| Profile Feature | Standard SnPb Solder | Lead (Pb) Free Solder |
|--|----------------------|-----------------------|
| Preheat and Soak | | |
| • Temperature min. (T _{smin}) | 100°C | 150°C |
| • Temperature max. (T _{smax}) | 150°C | 200°C |
| • Time (T _{smin} to T _{smax}) (t _s) | 60-120 Seconds | 60-120 Seconds |
| Average ramp up rate T _{smax} to T _p | 3°C/ Second Max. | 3°C/ Second Max. |
| Liquidous temperature (T _L) | 183°C | 217°C |
| Time at liquidous (t _L) | 60-150 Seconds | 60-150 Seconds |
| Peak package body temperature (T _p)* | Table 1 | Table 2 |
| Time (t _p)** within 5 °C of the specified classification temperature (T _c) | 20 Seconds** | 30 Seconds** |
| Average ramp-down rate (T _p to T _{smax}) | 6°C/ Second Max. | 6°C/ Second Max. |
| Time 25°C to Peak Temperature | 6 Minutes Max. | 8 Minutes Max. |

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.
** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

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Printed in USA
Publication No. 4339 SB-BU08352
August 2017

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