SDQ
Low-profile dual winding shielded drum inductor/transformer

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 µH to 4.03 mH
- Ferrite shielded, low EMI
- Ferrite core material
- 500 Vdc isolation between windings

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

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

Pb FREE
RoHS
## Technical Data

Effective August 2017

[www.eaton.com/el](www.eaton.com/el)ectronics

Low-profile dual winding shielded drum inductor/transformer

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rated Inductance (µH)</th>
<th>Part Marking</th>
<th>OCL ±20% (µH)</th>
<th>l\text{rms} (A)</th>
<th>l\text{sat} (A)</th>
<th>DCR @ 20°C typ.</th>
<th>Volts @ 100kHz</th>
<th>OCL ±20% typ.</th>
<th>l\text{rms} (A)</th>
<th>l\text{sat} (A)</th>
<th>DCR @ 4°C typ.</th>
<th>Volts @ 100kHz</th>
</tr>
</thead>
</table>

**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

**SDQ12-100-R**
- 10 J 0.83 0.98 3.64 0.0385 2.91 2.21 0.3497 6.39

**SDQ12-150-R**
- 15 K 0.85 0.99 3.78 0.0403 3.14 2.29 0.3706 6.85

**SDQ12-220-R**
- 22 L 0.86 0.99 3.91 0.0421 3.37 2.37 0.3916 7.31

**SDQ12-330-R**
- 33 M 0.88 1.0 4.03 0.0440 3.59 2.45 0.4126 7.77

**SDQ12-470-R**
- 47 N 0.90 1.01 4.14 0.0460 3.81 2.54 0.4336 8.23

**SDQ12-680-R**
- 68 O 0.92 1.02 4.25 0.0479 4.04 2.62 0.4546 8.69

**SDQ12-820-R**
- 82 P 0.94 1.03 4.36 0.0499 4.27 2.71 0.4756 9.15

**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 1.2 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 22.09 1.01 0.849 0.2431 17.5 89.89 0.507 0.425 0.9724 35.0

**SDQ25-330-R**
- 33 N 32.49 0.439 0.533 1.29 19.95 130.0 0.220 0.267 5.18 13.9

**SDQ25-470-R**
- 47 O 47.61 0.401 0.441 1.55 24.15 190.4 0.201 0.220 4.15 14.7

**SDQ25-680-R**
- 68 P 69.19 0.326 0.366 2.36 29.05 275.6 0.163 0.183 9.43 58.1

**SDQ25-820-R**
- 82 Q 81.61 0.292 0.334 2.62 31.85 331.2 0.154 0.167 10.49 63.7

**SDQ25-101-R**
- 100 R 1008.2 0.160 0.127 9.82 117 4032.8 0.080 0.063 39.26 234

Test Parameters: 100 kHz, 0.25 Vrms 0.0 A dc.

Irms: DC current for approximately 45°C without core loss. It is recommended that the temperature of the part not exceed +125°C. Derating is necessary for AC currents.

Isat: Peak current for approximately 30% rolloff @ +20°C

DCR limits @ +20°C

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 Irms is required to prevent excessive temperature rise.

Part Number Definition:
- **SDQ12-XX-R**
  - SDQ12 = Product code and Size
  - XXX = Inductance in µH, R = Decimal point
  - If no R is present, third character = # of zeros.
  - -R suffix indicates RoHS compliant
SDQ
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Dimensions- mm

<table>
<thead>
<tr>
<th>View</th>
<th>Dimension</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top View</td>
<td>1.5 Dia. min.</td>
<td>(Note A)</td>
</tr>
<tr>
<td>Side View</td>
<td>1.5 typ ref</td>
<td></td>
</tr>
<tr>
<td>Bottom View</td>
<td>1.5 Typ. 4 Ref</td>
<td></td>
</tr>
<tr>
<td>Recommended Pad Layout</td>
<td>2 PAD LAYOUT</td>
<td>4 PAD LAYOUT</td>
</tr>
</tbody>
</table>

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

Packaging- mm

SDQ12

Supplied in tape-and-reel packaging, 3800 parts per reel, 13" diameter reel.

SDQ25

Supplied in tape-and-reel packaging, 2900 parts per reel, 13" diameter reel.
Core loss

Inductance characteristics

OCL vs I_{sat}
SDQ12

OCL vs I_{sat}
SDQ25
Solder reflow profile

![Diagram of solder reflow profile]

**Reference JDEC J-STD-020**

<table>
<thead>
<tr>
<th>Profile Feature</th>
<th>Standard SnPb Solder</th>
<th>Lead (Pb) Free Solder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preheat and Soak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Temperature min. (T_{min})</td>
<td>100°C</td>
<td>150°C</td>
</tr>
<tr>
<td>• Temperature max. (T_{max})</td>
<td>150°C</td>
<td>200°C</td>
</tr>
<tr>
<td>• Time (T_{min} to T_{max}) (t_P)</td>
<td>60-120 Seconds</td>
<td>60-120 Seconds</td>
</tr>
<tr>
<td>Average ramp up rate T_{max} to T_{P}</td>
<td>3°C/ Second Max.</td>
<td>3°C/ Second Max.</td>
</tr>
<tr>
<td>Liquidous temperature (T_L)</td>
<td>183°C</td>
<td>217°C</td>
</tr>
<tr>
<td>Time at liquidous (t_L)</td>
<td>60-150 Seconds</td>
<td>60-150 Seconds</td>
</tr>
<tr>
<td>Peak package body temperature (T_P)**</td>
<td>Table 1</td>
<td>Table 2</td>
</tr>
<tr>
<td>Time (t_P)** within 5 °C of the specified classification temperature (T_c)</td>
<td>20 Seconds**</td>
<td>30 Seconds**</td>
</tr>
<tr>
<td>Average ramp-down rate (T_P to T_{max})</td>
<td>6°C/ Second Max.</td>
<td>6°C/ Second Max.</td>
</tr>
<tr>
<td>Time 25°C to Peak Temperature</td>
<td>6 Minutes Max.</td>
<td>8 Minutes Max.</td>
</tr>
</tbody>
</table>

* 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.

Table 1 - Standard SnPb Solder (T_c)

<table>
<thead>
<tr>
<th>Package Thickness</th>
<th>Volume mm³</th>
<th>Volume mm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2.5mm</td>
<td>250°C</td>
<td>220°C</td>
</tr>
<tr>
<td>≥2.5mm</td>
<td>220°C</td>
<td>220°C</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Package Thickness</th>
<th>Volume mm³</th>
<th>Volume mm³</th>
<th>Volume mm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1.6mm</td>
<td>260°C</td>
<td>260°C</td>
<td>260°C</td>
</tr>
<tr>
<td>1.6 – 2.5mm</td>
<td>260°C</td>
<td>250°C</td>
<td>245°C</td>
</tr>
<tr>
<td>&gt;2.5mm</td>
<td>250°C</td>
<td>245°C</td>
<td>245°C</td>
</tr>
</tbody>
</table>

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