Shielded Coupled Inductors  MSD1048

- Tight coupling (k ≥ 0.97)
- 200 V isolation
- Ideal for use in a variety of circuits including flyback, multi-output buck, SEPIC, Ćuk and Zeta.
- High efficiency and excellent current handling
- Can also be used as two single inductors connected in series or parallel, as a common mode choke or as a 1:1 transformer.

**Typical Flyback Converter**

**Typical Buck Converter with auxiliary output**

**Typical SEPIC schematic**

**Typical Zeta schematic**

*For optional tin-lead and tin-silver-copper terminations, dimensions are for the mounted part. Dimensions before mounting can be an additional 0.012 inch (0.3 mm).*

Dimensions are in inches/ millimeters.
## Shielded Coupled Inductors – MSD1048 Series

<table>
<thead>
<tr>
<th>Part number</th>
<th>Inductancea (µH)</th>
<th>DCR maxb (Ohms)</th>
<th>SRF typc (MHz)</th>
<th>Coupling coefficient typ</th>
<th>Leakage Inductanceb (µH)</th>
<th>Isatb (A)</th>
<th>Irsma (A)</th>
<th>both windings</th>
<th>one winding</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD1048-222NE_</td>
<td>2.2 ±30%</td>
<td>0.019</td>
<td>65</td>
<td>0.97</td>
<td>0.30</td>
<td>9.1</td>
<td>2.4</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>MSD1048-103ME_</td>
<td>10 ±20%</td>
<td>0.053</td>
<td>27</td>
<td>&gt;0.99</td>
<td>0.40</td>
<td>4.3</td>
<td>1.5</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>MSD1048-223ME_</td>
<td>22 ±20%</td>
<td>0.098</td>
<td>17</td>
<td>&gt;0.99</td>
<td>0.45</td>
<td>2.9</td>
<td>1.3</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>MSD1048-473ME_</td>
<td>47 ±20%</td>
<td>0.208</td>
<td>12</td>
<td>&gt;0.99</td>
<td>0.50</td>
<td>2.0</td>
<td>1.1</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>MSD1048-683ME_</td>
<td>68 ±20%</td>
<td>0.297</td>
<td>9.0</td>
<td>&gt;0.99</td>
<td>0.55</td>
<td>1.7</td>
<td>1.0</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>MSD1048-104ME_</td>
<td>100 ±20%</td>
<td>0.387</td>
<td>7.3</td>
<td>&gt;0.99</td>
<td>0.80</td>
<td>1.3</td>
<td>0.85</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>MSD1048-224KE_</td>
<td>220 ±10%</td>
<td>0.840</td>
<td>4.8</td>
<td>&gt;0.99</td>
<td>1.0</td>
<td>0.90</td>
<td>0.62</td>
<td>0.87</td>
<td></td>
</tr>
</tbody>
</table>

1. When ordering, please specify termination and packaging codes:

   **Termination:** E = RoHS compliant matte tin over nickel over phos bronze.
   Special order: Q = RoHS tin-silver-copper (95.5/4/0.5) or P = non-RoHS tin-lead (63/37).
   **Packaging:** D = 13” machine-ready reel. EIA-481 embossed plastic tape. (800 parts per full reel). Quantities less than full reel available: in tape (not machine ready) or with leader and trailer ($25 charge).
   B = Less than full reel. In an effort to simplify our part numbering system, Coilcraft is eliminating the need for multiple packaging codes. When ordering, simply change the last letter of your part number from B to D.

2. Inductance shown for each winding, measured at 100 kHz, 0.1 Vrms, 0 Aac on an Agilent/HP 4284A LCR meter or equivalent. When leads are connected in parallel, inductance is the same value. When leads are connected in series, inductance is four times the value.

3. DCR is for each winding. When leads are connected in parallel, DCR is half the value. When leads are connected in series, DCR is twice the value.

4. SRF measured using an Agilent/HP 4191A or equivalent. When leads are connected in parallel, SRF is the same value.

5. Leakage Inductance is for L1 and is measured with L2 shorted.

6. DC current at 25°C that causes a 30% (typ) inductance drop from its value without current. It is the sum of the current flowing in both windings.

7. Equal current when applied to each winding simultaneously that causes a 40°C temperature rise from 25°C ambient. This information is for reference only and does not represent absolute maximum ratings. To predict temperature rise go to online calculator.

8. Maximum current when applied to one winding that causes a 40°C temperature rise from 25°C ambient. This information is for reference only and does not represent absolute maximum ratings. To predict temperature rise go to online calculator.

9. Electrical specifications at 25°C.

Refer to Doc 639 “Selecting Coupled Inductors for SEPIC Applications.”
Refer to Doc 362 “Soldering Surface Mount Components” before soldering.

### Coupled Inductor Core and Winding Loss Calculator

This web-based utility allows you to enter frequency, peak-to-peak (ripple) current, and I rms current to predict temperature rise and overall losses, including core loss. Go to online calculator.

#### Core material
Ferrite

#### Core and winding loss
Go to online calculator

#### Terminations
RoHS compliant matte tin over nickel over phos bronze. Other terminations available at additional cost.

#### Weight
1.5–1.8 g

#### Ambient temperature
−40°C to +85°C with (40°C rise) I rms current.

#### Maximum part temperature
+125°C (ambient + temp rise).

#### Storage temperature
Component: −40°C to +125°C.

#### Tape and reel packaging:
−40°C to +80°C

#### Resistance to soldering heat
Max three 40 second refloys at +260°C, parts cooled to room temperature between cycles

#### Moisture Sensitivity Level (MSL)
1 (unlimited floor life at <30°C / 85% relative humidity)

#### Packaging
800/13” reel Plastic tape: 24 mm wide, 0.35 mm thick, 16 mm pocket spacing, 5.1 mm pocket depth

#### PCB washing
Tested to MIL-STD-202 Method 215 plus an additional aqueous wash. See Doc787_PCB_Washing.pdf.

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[Specification subject to change without notice. Please check web site for latest information.]
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L vs Current

L vs Frequency