Miniature Transformers LPD5030V

With 1500 Vdc (1000 Vrms) isolation and a small package size, the LPD5030V series is ideal for use in high density isolated circuit applications.

**Functional Safety Listed by UL.**
UL Certified per File E219588. Functional insulation class for TNV-1 to SELV applications. Functional insulation with a maximum 60 Vdc, 42.4 V peak input/output voltages with working voltages up to 210 Vdc. (Report #E219588-A6)

These miniature transformers provide tight coupling, high inductance and excellent current handling.

They can be used as
- Flyback transformers
- Coupled inductors in SEPIC applications
- Common mode filter chokes

**Designer’s Kit C481** contains 3 parts of each value in the LPD5030V and LPD8035V series.

**Core material** Ferrite

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

**Environmental** RoHS compliant, halogen free

**Terminations** RoHS compliant matte tin over nickel over silver

**Weight** 210 – 225 mg

**Ambient temperature** -40°C to +85°C with (40°C rise) Irms 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 reflows 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** 750/7” reel; 2500/13” reel Plastic tape: 12 mm wide, 0.32 mm thick, 8 mm pocket spacing, 3.1 mm pocket depth

**Recommended pick and place nozzle** OD: 5 mm; ID: ≤ 2.5 mm

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

### Typical Flyback Converter

![Typical Flyback Converter Diagram](image)

### Typical Buck Converter with auxiliary output

![Typical Buck Converter Diagram](image)

### Typical SEPIC schematic

![Typical SEPIC Schematic](image)

Refer to Application Note, Document 639, "Selecting Coupled Inductors for SEPIC Applications"
### LPD5030V Transformers for Flyback Applications

<table>
<thead>
<tr>
<th>Part number</th>
<th>Inductance at 0 A (\pm20%) (µH)</th>
<th>Inductance at 1 pk (\pm20%) (µH)</th>
<th>DCR max (\Omega)</th>
<th>Leakage Inductance (\pm20%) typ (µH)</th>
<th>Isolation (Vrms)</th>
<th>Turns ratio</th>
<th>Ipk (\Omega)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPD5030V-472MR</td>
<td>4.7</td>
<td>3.3</td>
<td>0.322</td>
<td>0.109</td>
<td>1000</td>
<td>1 : 1</td>
<td>1.90</td>
</tr>
<tr>
<td>LPD5030V-682MR</td>
<td>6.8</td>
<td>4.7</td>
<td>0.395</td>
<td>0.109</td>
<td>1000</td>
<td>1 : 1</td>
<td>1.55</td>
</tr>
<tr>
<td>LPD5030V-103MR</td>
<td>10</td>
<td>7.0</td>
<td>0.490</td>
<td>0.130</td>
<td>1000</td>
<td>1 : 1</td>
<td>1.30</td>
</tr>
<tr>
<td>LPD5030V-333MR</td>
<td>33</td>
<td>23</td>
<td>0.895</td>
<td>0.195</td>
<td>1000</td>
<td>1 : 1</td>
<td>0.67</td>
</tr>
<tr>
<td>LPD5030V-473MR</td>
<td>47</td>
<td>33</td>
<td>1.40</td>
<td>0.300</td>
<td>1000</td>
<td>1 : 1</td>
<td>0.50</td>
</tr>
<tr>
<td>LPD5030V-154MR</td>
<td>150</td>
<td>105</td>
<td>3.82</td>
<td>0.456</td>
<td>1000</td>
<td>1 : 1</td>
<td>0.31</td>
</tr>
<tr>
<td>LPD5030V-224MR</td>
<td>220</td>
<td>154</td>
<td>5.25</td>
<td>0.541</td>
<td>1000</td>
<td>1 : 1</td>
<td>0.24</td>
</tr>
</tbody>
</table>

1. When ordering, please specify packaging code:

LPD5030V-224MR

Packaging: C = 7” machine-ready reel. EIA-481 embossed plastic tape (750 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 C.

D = 13” machine-ready reel. EIA-481 embossed plastic tape. Factory order only, not stocked (2500 parts per full reel).

2. Inductance is the primary, measured at 100 kHz, 0.1 Vrms, 0 A on an Agilent/HP 4284A LCR meter or equivalent.

3. Peak primary current drawn at minimum input voltage.

4. DCR is for each winding.

5. Leakage Inductance is for the primary winding with the secondary windings shorted.

6. 1000 Vrms, one minute isolation (hipot) between windings. Designed to provide Functional Insulation only; does not protect against electrical shock; nor intended for the isolation of SELV circuits from Hazardous Voltage circuits.

7. Electrical specifications at 25°C.

Refer to Doc 362 “Soldering Surface Mount Components” before soldering.

### LPD5030V Coupled Inductors for SEPIC Applications

<table>
<thead>
<tr>
<th>Part number</th>
<th>Inductance (\pm20%) (µH)</th>
<th>DCR (\pm20%) (µH)</th>
<th>SRF typ (MHz)</th>
<th>Coupling Coefficient typ</th>
<th>Leakage Inductance (\pm20%) typ (µH)</th>
<th>Isolation (Vrms)</th>
<th>10% drop</th>
<th>20% drop</th>
<th>30% drop</th>
<th>Ipk A (\Omega)</th>
<th>Irms A (\Omega)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPD5030V-472MR</td>
<td>4.7</td>
<td>0.322</td>
<td>55.0</td>
<td>0.97</td>
<td>0.109</td>
<td>1000</td>
<td>1.45</td>
<td>1.70</td>
<td>1.90</td>
<td>0.65</td>
<td>0.92</td>
</tr>
<tr>
<td>LPD5030V-682MR</td>
<td>6.8</td>
<td>0.395</td>
<td>49.9</td>
<td>0.97</td>
<td>0.109</td>
<td>1000</td>
<td>1.30</td>
<td>1.50</td>
<td>1.55</td>
<td>0.59</td>
<td>0.83</td>
</tr>
<tr>
<td>LPD5030V-103MR</td>
<td>10</td>
<td>0.490</td>
<td>37.1</td>
<td>0.97</td>
<td>0.130</td>
<td>1000</td>
<td>1.10</td>
<td>1.20</td>
<td>1.30</td>
<td>0.54</td>
<td>0.76</td>
</tr>
<tr>
<td>LPD5030V-333MR</td>
<td>33</td>
<td>0.895</td>
<td>19.2</td>
<td>0.98</td>
<td>0.195</td>
<td>1000</td>
<td>0.49</td>
<td>0.59</td>
<td>0.67</td>
<td>0.43</td>
<td>0.61</td>
</tr>
<tr>
<td>LPD5030V-473MR</td>
<td>47</td>
<td>1.40</td>
<td>16.0</td>
<td>0.98</td>
<td>0.300</td>
<td>1000</td>
<td>0.46</td>
<td>0.48</td>
<td>0.50</td>
<td>0.35</td>
<td>0.50</td>
</tr>
<tr>
<td>LPD5030V-154MR</td>
<td>150</td>
<td>3.82</td>
<td>8.1</td>
<td>0.98</td>
<td>0.456</td>
<td>1000</td>
<td>0.25</td>
<td>0.29</td>
<td>0.31</td>
<td>0.18</td>
<td>0.25</td>
</tr>
<tr>
<td>LPD5030V-224MR</td>
<td>220</td>
<td>5.25</td>
<td>6.5</td>
<td>&gt;0.99</td>
<td>0.541</td>
<td>1000</td>
<td>0.16</td>
<td>0.21</td>
<td>0.24</td>
<td>0.16</td>
<td>0.22</td>
</tr>
</tbody>
</table>

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### Coupled Inductor Core and Winding Loss Calculator

This web-based utility allows you to enter frequency, peak-to-peak (ripple) current, and Irms current to predict temperature rise and overall losses, including core loss. Go to online calculator.
**LPD5030V Miniature Transformers**

**Typical L vs Current**

<table>
<thead>
<tr>
<th>Current (A)</th>
<th>Inductance (µH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>150 µH</td>
</tr>
<tr>
<td>0.1</td>
<td>220 µH</td>
</tr>
<tr>
<td>1</td>
<td>33 µH</td>
</tr>
<tr>
<td>10</td>
<td>10 µH</td>
</tr>
</tbody>
</table>

**Typical L vs Frequency**

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Inductance (µH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>150 µH</td>
</tr>
<tr>
<td>0.1</td>
<td>220 µH</td>
</tr>
<tr>
<td>1</td>
<td>33 µH</td>
</tr>
<tr>
<td>10</td>
<td>10 µH</td>
</tr>
</tbody>
</table>

**Dimensions**

- **Dash number**
- **Internal code**
- **Winding direction**
- **Dot indicates pin 1**

*Dimensions are of the case not including the termination. For maximum overall dimensions including the termination, add 0.005 in / 0.13 mm.*

For optional tin-lead and tin-silver-copper terminations, dimensions are for the mounted part. Dimensions before mounting can be an additional 0.005 inch / 0.13 mm.

**Recommended Land Pattern**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th><strong>inches</strong></th>
<th><strong>mm</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.134</td>
<td>3.40</td>
<td></td>
</tr>
<tr>
<td>0.099</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>0.030</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>0.134</td>
<td>3.40</td>
<td></td>
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<td>0.197</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>0.069</td>
<td>1.75</td>
<td></td>
</tr>
</tbody>
</table>

* Dimensions are in inches **mm**

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**Notes:**

- These parts are preproduction products for electrical evaluation only.
- Specification subject to change without notice.
- This product may not be used in medical or high risk applications without prior Coilcraft approval.
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- Please check web site for latest information.

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**Contact Information:**

- **US** +1-847-639-6400  sales@coilcraft.com
- **UK** +44-1236-730595  sales@coilcraft-europe.com
- **Taiwan** +886-2-2264 8074  sales@coilcraft.com.tw
- **China** +86-21-6218 8074  sales@coilcraft.com.cn
- **Singapore** +65-6484 8412  sales@coilcraft.com.sg

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