### Coupled Inductors – LPR4012

The LPR4012 miniature shielded coupled inductors are only 1.1 mm high and 4 mm square. The excellent coupling coefficient \( k = 0.95 \) makes them ideal for use as flyback transformers in DC-DC converters or as coupled inductors in buck regulators to provide multiple outputs. The wide selection of turns ratios makes them suitable for a variety of voltage step-up and step-down applications. They can also be used in autotransformer applications.

The high \( I_{\text{sat}} \) and low DCR ratings of these low profile parts provide high efficiency and excellent current handling in a rugged, low cost design.

Custom inductance values and turn ratios are available upon request.

<table>
<thead>
<tr>
<th>Part number</th>
<th>Primary (L1) inductance (µH)</th>
<th>Turns ratio</th>
<th>DCR max (Ohms)</th>
<th>SRF typ (MHz)</th>
<th>Isat (A)</th>
<th>Ims (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPR4012-202AMR_</td>
<td>2.0</td>
<td>1:1.5</td>
<td>0.240</td>
<td>0.325</td>
<td>61.5</td>
<td>1.70</td>
</tr>
<tr>
<td>LPR4012-202BMR_</td>
<td>2.0</td>
<td>1:2</td>
<td>0.240</td>
<td>0.480</td>
<td>49.4</td>
<td>1.70</td>
</tr>
<tr>
<td>LPR4012-202DMR_</td>
<td>2.0</td>
<td>1:3</td>
<td>0.240</td>
<td>1.15</td>
<td>31.0</td>
<td>1.70</td>
</tr>
<tr>
<td>LPR4012-202LMR_</td>
<td>2.0</td>
<td>1:10</td>
<td>0.240</td>
<td>11.62</td>
<td>7.43</td>
<td>1.70</td>
</tr>
<tr>
<td>LPR4012-103AMR_</td>
<td>10.0</td>
<td>1:2</td>
<td>0.600</td>
<td>1.55</td>
<td>19.5</td>
<td>0.62</td>
</tr>
<tr>
<td>LPR4012-103BMR_</td>
<td>10.0</td>
<td>1:2</td>
<td>0.600</td>
<td>3.71</td>
<td>12.8</td>
<td>0.62</td>
</tr>
<tr>
<td>LPR4012-223AMR_</td>
<td>22.0</td>
<td>1:2</td>
<td>1.16</td>
<td>3.65</td>
<td>11.2</td>
<td>0.43</td>
</tr>
<tr>
<td>LPR4012-223BMR_</td>
<td>22.0</td>
<td>1:3</td>
<td>1.16</td>
<td>7.08</td>
<td>8.00</td>
<td>0.43</td>
</tr>
</tbody>
</table>

1. When ordering, please specify termination and packaging codes:
   - LPR4012-223XMR:
     - **R** = RoHS compliant matte tin over nickel over silver.
     - Special order: **Q** = RoHS tin-silver-copper (95.5/4/0.5) or **P** = non-RoHS tin-lead (63/37).
   - **C** = 7″ machine-ready reel. EIA-481 embossed plastic tape (1000 parts per full reel).
   - **B** = Less than full reel. In tape, but not machine ready. To have a leader and trailer added ($25 charge), use code letter **D** instead.
   - **D** = 13″ machine-ready reel. EIA-481 embossed plastic tape. Factory order only, not stocked (3500 parts per full reel).

2. Inductance is measured at 100 kHz, 0.1 Vrms, 0 Adc on an Agilent/HP 4284A LCR meter or equivalent.
3. SRF measured using an Agilent/HP 4191A or equivalent. When leads are connected in parallel, SRF is the same value.
4. DC current applied to L1, at which the inductance drops the specified amount from its value without current.
5. Current applied to L1 that causes the specified temperature rise from 25°C ambient.

Refer to Doc 362 “Soldering Surface Mount Components” before soldering.
**Coupled Inductors – LPR4012 Series**

**Core material** Ferrite  
**Weight** 54 – 64 mg  
**Terminations** RoHS compliant matte tin over nickel over silver. Other terminations available at additional cost.  
**Ambient temperature** –40°C to +85°C with Irms current, +85°C to +125°C with derated current  
**Storage temperature** Component: –40°C to +125°C. Tape and reel packaging: –40°C to +80°C  
**Winding to winding isolation** 100 V  
**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)  
**Mean Time Between Failures (MTBF)** 28,315,789 hours  
**Failures in Time (FIT)** 38 per one billion hours  
**Packaging** 1000/7″ reel; 3500/13″ reel Plastic tape: 12 mm wide, 0.25 mm thick, 8 mm pocket spacing, 1.32 mm pocket depth  
**Recommended pick and place nozzle** OD: 4 mm; ID: ≤ 2 mm  
**PCB washing** Only pure water or alcohol recommended  

**Typical Buck Converter with auxiliary output**

**Typical Flyback Converter**

**Current Derating**

**Dimensions are in** inches or mm

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**Mean Time Between Failures (MTBF)**

**Failures in Time (FIT)**

**Packaging**

**Recommended pick and place nozzle**

**PCB washing**

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