



# Coupled Inductors – LPR4012

## For Step-Up, Resonant & Flyback Applications



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 Isat 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.

| Part number <sup>1</sup> | Primary (L1) inductance <sup>2</sup> ± 20% (µH) | Turns ratio | DCR max (Ohms) |       | SRF typ <sup>3</sup> (MHz) | Isat (A) <sup>4</sup> |          |          | Irms (A) <sup>5</sup> |           |
|--------------------------|-------------------------------------------------|-------------|----------------|-------|----------------------------|-----------------------|----------|----------|-----------------------|-----------|
|                          |                                                 |             | L1             | L2    |                            | 10% drop              | 20% drop | 30% drop | 20°C rise             | 40°C rise |
| LPR4012-202AML_          | 2.0                                             | 1:1.5       | 0.240          | 0.325 | 61.5                       | 1.70                  | 1.73     | 1.74     | 1.10                  | 1.45      |
| LPR4012-202BML_          | 2.0                                             | 1:2         | 0.240          | 0.480 | 49.4                       | 1.70                  | 1.73     | 1.74     | 1.10                  | 1.45      |
| LPR4012-202DML_          | 2.0                                             | 1:3         | 0.240          | 1.15  | 31.0                       | 1.70                  | 1.73     | 1.74     | 1.10                  | 1.45      |
| LPR4012-202LML_          | 2.0                                             | 1:10        | 0.240          | 11.62 | 7.43                       | 1.70                  | 1.73     | 1.74     | 1.10                  | 1.45      |
| LPR4012-103BML_          | 10.0                                            | 1:2         | 0.600          | 1.55  | 19.5                       | 0.62                  | 0.64     | 0.65     | 0.52                  | 0.70      |
| LPR4012-103DML_          | 10.0                                            | 1:3         | 0.600          | 3.71  | 12.8                       | 0.62                  | 0.64     | 0.65     | 0.52                  | 0.70      |
| LPR4012-223BML_          | 22.0                                            | 1:2         | 1.16           | 3.65  | 11.2                       | 0.43                  | 0.45     | 0.46     | 0.43                  | 0.57      |
| LPR4012-223DML_          | 22.0                                            | 1:3         | 1.16           | 7.08  | 8.00                       | 0.43                  | 0.45     | 0.46     | 0.43                  | 0.57      |

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

**LPR4012-223XMLC**

**Termination:** L = RoHS compliant Silver-palladium-platinum-glass frit.  
Special order: T = RoHS tin-silver-copper (95.5/4/0.5) or  
S = non-RoHS tin-lead (63/37).

**Packaging:** 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).

- Inductance is measured at 100 kHz, 0.1 Vrms, 0 A dc on an Agilent/HP 4284A LCR meter or equivalent.
  - SRF measured using an Agilent/HP 4191A or equivalent. When leads are connected in parallel, SRF is the same value.
  - DC current applied to L1, at which the inductance drops the specified amount from its value without current.
  - Current applied to L1 that causes the specified temperature rise from 25°C ambient.
- Refer to Doc 362 "Soldering Surface Mount Components" before soldering.



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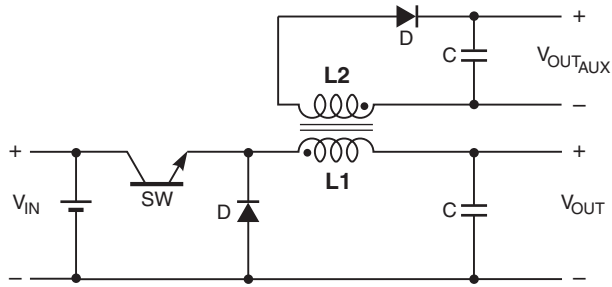
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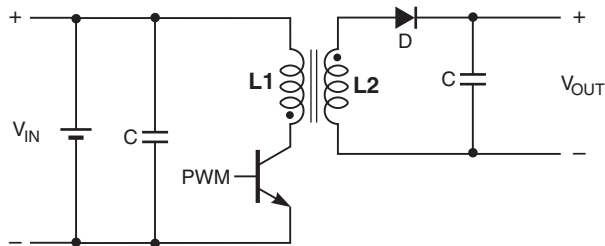
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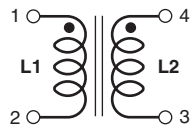
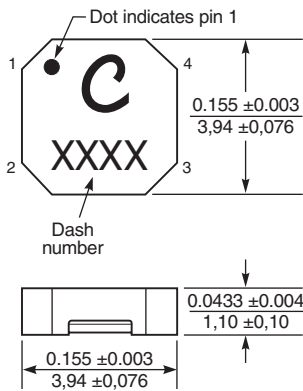
# Coupled Inductors – LPR4012 Series



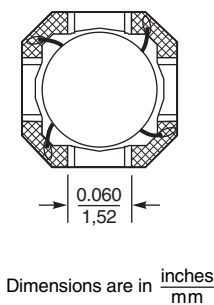
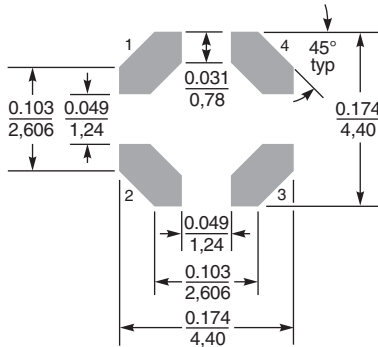
**Typical Buck Converter with auxiliary output**



**Typical Flyback Converter**



**Recommended Land Pattern**



Dimensions are in inches  
mm

**Core material** Ferrite

**Weight** 54 – 64 mg

**Terminations** RoHS compliant silver-palladium-platinum-glass frit. Other terminations available at additional cost.

**Ambient temperature** –40°C to +85°C with I<sub>rms</sub> 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)** 26,315,789 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

## Current Derating

