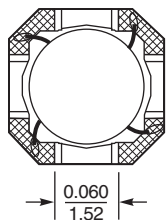
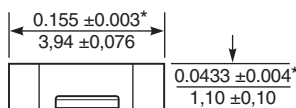
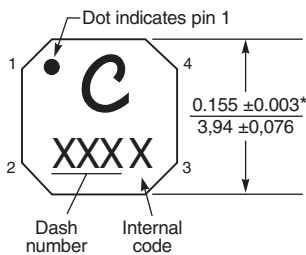
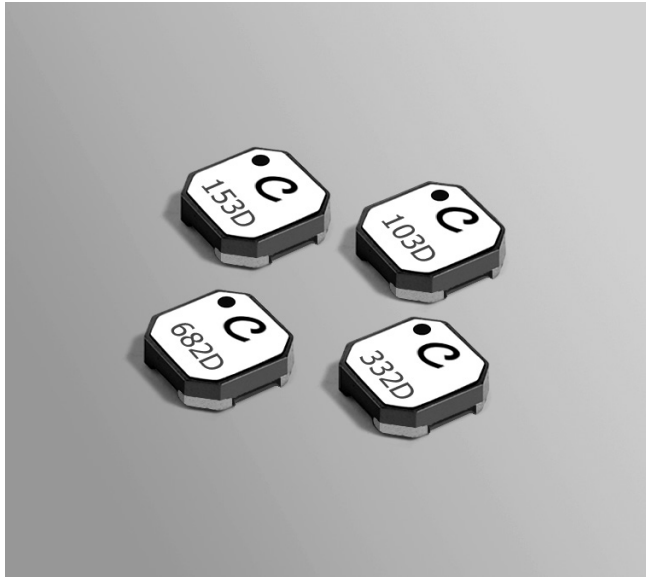
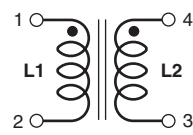


# Shielded Coupled Inductors LPD4012

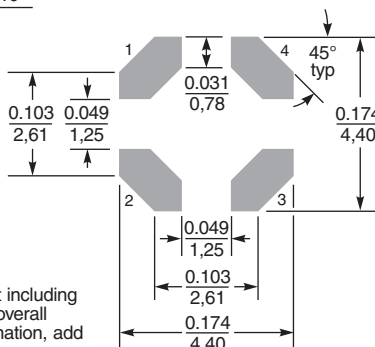


\* Dimensions are of the case not including the termination. For maximum overall dimensions including the termination, add 0.005 in / 0.13 mm.

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



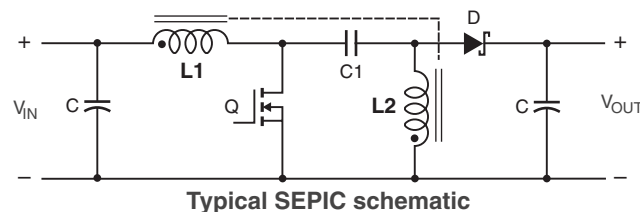
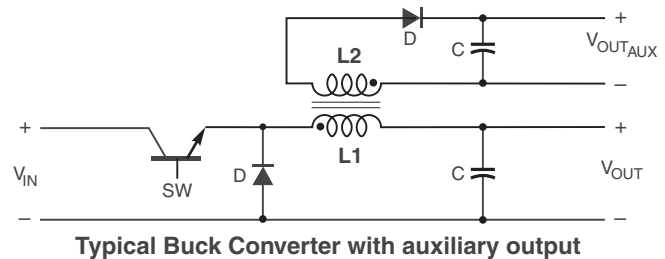
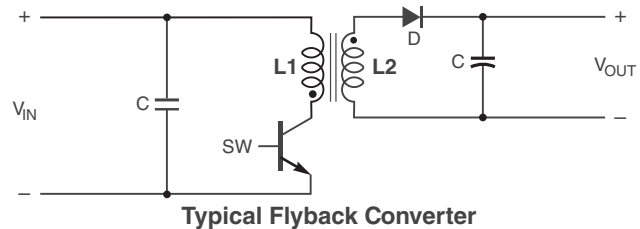
## Recommended Land Pattern



Dimensions are in  $\frac{\text{inches}}{\text{mm}}$

**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

- Only 1.1 mm high and 4 mm square
- Ideal for use in flyback, multi-output buck and SEPIC applications.
- High inductance, high efficiency and excellent current handling
- Can also be used as two single inductors connected in series or parallel or as a common mode choke.



**Core material** Ferrite

**Core and winding loss** [Go to online calculator](#)

**Weight** 54 – 64 mg

**Environmental** RoHS compliant, halogen free

**Terminations** RoHS compliant matte tin over nickel over silver. Other terminations available at additional cost.

**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

**Winding to winding isolation** 100 Vrms, one minute

**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)

**Failures in Time (FIT) / Mean Time Between Failures (MTBF)**

38 per billion hours / 26,315,789 hours, calculated per Telcordia SR-332

**PCB washing** Tested to MIL-STD-202 Method 215 plus an additional aqueous wash. See [Doc787\\_PCB\\_Washing.pdf](#).



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Document 580-1 Revised 02/24/17

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# Coupled Inductors for SEPIC Applications – LPD4012 Series

| Part number <sup>1</sup> | Inductance <sup>2</sup><br>( $\mu$ H) | DCR max <sup>3</sup><br>(Ohms) | SRF typ <sup>4</sup><br>(MHz) | Coupling<br>coefficient<br>typ | Leakage<br>L typ <sup>5</sup><br>( $\mu$ H) | Isat (A) <sup>6</sup> |             |             | Irms (A)                      |                             |
|--------------------------|---------------------------------------|--------------------------------|-------------------------------|--------------------------------|---|-----------------------|-------------|-------------|-------------------------------|-----------------------------|
|                          |                                       |                                |                               |                                |   | 10%<br>drop           | 20%<br>drop | 30%<br>drop | both<br>windings <sup>7</sup> | one<br>winding <sup>8</sup> |
| LPD4012-331NR_           | 0.33 $\pm$ 30%                        | 0.042                          | 255                           | 0.94                           | 0.06  | 5.2                   | 5.4         | 5.6         | 1.87                          | 2.65                        |
| LPD4012-561NR_           | 0.56 $\pm$ 30%                        | 0.087                          | 185                           | 0.95                           | 0.08  | 3.7                   | 3.8         | 3.9         | 1.30                          | 1.84                        |
| LPD4012-821NR_           | 0.82 $\pm$ 30%                        | 0.100                          | 130                           | 0.97                           | 0.09  | 3.2                   | 3.3         | 3.4         | 1.21                          | 1.72                        |
| LPD4012-152NR_           | 1.5 $\pm$ 30%                         | 0.185                          | 86                            | 0.97                           | 0.11  | 2.50                  | 2.81        | 2.91        | 1.15                          | 1.62                        |
| LPD4012-222NR_           | 2.2 $\pm$ 30%                         | 0.235                          | 70                            | 0.98                           | 0.14  | 2.30                  | 2.40        | 2.50        | 0.95                          | 1.35                        |
| LPD4012-332NR_           | 3.3 $\pm$ 30%                         | 0.320                          | 48                            | 0.98                           | 0.16  | 1.80                  | 1.90        | 2.00        | 0.75                          | 1.06                        |
| LPD4012-472MR_           | 4.7 $\pm$ 20%                         | 0.500                          | 39                            | 0.98                           | 0.18  | 1.70                  | 1.80        | 1.90        | 0.65                          | 0.92                        |
| LPD4012-562MR_           | 5.6 $\pm$ 20%                         | 0.620                          | 32                            | 0.99                           | 0.20  | 1.60                  | 1.70        | 1.80        | 0.55                          | 0.78                        |
| LPD4012-682MR_           | 6.8 $\pm$ 20%                         | 0.530                          | 31                            | 0.99                           | 0.22  | 1.20                  | 1.52        | 1.63        | 0.60                          | 0.86                        |
| LPD4012-822MR_           | 8.2 $\pm$ 20%                         | 0.600                          | 29                            | 0.99                           | 0.24  | 1.10                  | 1.20        | 1.30        | 0.55                          | 0.78                        |
| LPD4012-103MR_           | 10 $\pm$ 20%                          | 0.750                          | 25                            | 0.99                           | 0.26  | 0.98                  | 1.00        | 1.10        | 0.50                          | 0.71                        |
| LPD4012-153MR_           | 15 $\pm$ 20%                          | 1.13                           | 21                            | 0.99                           | 0.30  | 0.90                  | 0.92        | 0.94        | 0.43                          | 0.60                        |
| LPD4012-223MR_           | 22 $\pm$ 20%                          | 1.63                           | 15                            | 0.99                           | 0.34  | 0.70                  | 0.82        | 0.84        | 0.34                          | 0.48                        |
| LPD4012-333MR_           | 33 $\pm$ 20%                          | 1.83                           | 12                            | >0.99                          | 0.41  | 0.37                  | 0.57        | 0.58        | 0.31                          | 0.44                        |
| LPD4012-473MR_           | 47 $\pm$ 20%                          | 2.52                           | 8.8                           | >0.99                          | 0.51  | 0.33                  | 0.39        | 0.40        | 0.28                          | 0.39                        |
| LPD4012-683MR_           | 68 $\pm$ 20%                          | 3.23                           | 7.8                           | >0.99                          | 0.66  | 0.27                  | 0.36        | 0.37        | 0.25                          | 0.36                        |
| LPD4012-823MR_           | 82 $\pm$ 20%                          | 3.66                           | 7.3                           | >0.99                          | 0.75  | 0.27                  | 0.27        | 0.29        | 0.23                          | 0.31                        |
| LPD4012-104MR_           | 100 $\pm$ 20%                         | 4.76                           | 6.1                           | >0.99                          | 0.86  | 0.22                  | 0.28        | 0.29        | 0.20                          | 0.27                        |
| LPD4012-124MR_           | 120 $\pm$ 20%                         | 5.54                           | 5.3                           | >0.99                          | 0.98  | 0.21                  | 0.26        | 0.27        | 0.19                          | 0.27                        |
| LPD4012-154MR_           | 150 $\pm$ 20%                         | 6.90                           | 4.6                           | >0.99                          | 1.19  | 0.18                  | 0.26        | 0.27        | 0.17                          | 0.23                        |
| LPD4012-184MR_           | 180 $\pm$ 20%                         | 8.75                           | 4.1                           | >0.99                          | 1.40  | 0.16                  | 0.21        | 0.23        | 0.14                          | 0.18                        |
| LPD4012-224MR_           | 220 $\pm$ 20%                         | 11.24                          | 3.3                           | >0.99                          | 1.66  | 0.15                  | 0.16        | 0.17        | 0.12                          | 0.17                        |
| LPD4012-334MR_           | 330 $\pm$ 20%                         | 17.00                          | 2.8                           | >0.99                          | 2.45  | 0.13                  | 0.16        | 0.16        | 0.10                          | 0.14                        |

1. Please specify **termination** and **packaging** codes:

## LPD4012-334MRC

**Termination: 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).

**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 C instead.

**D** = 13" machine-ready reel. EIA-481 embossed plastic tape. Factory order only, not stocked (3500 parts per full reel).

- Inductance shown for each winding, measured at 100 kHz, 0.1 Vrms, 0 Adc 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.
- 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.
- SRF measured using an Agilent/HP 4191A or equivalent. When leads are connected in parallel, SRF is the same value.
- Leakage Inductance is for L1 and is measured with L2 shorted.
- DC current at 25°C that causes the specified inductance drop from its value without current. It is the sum of the current flowing in both windings.
- 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.
- 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.
- 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 Irms current to predict temperature rise and overall losses, including core loss. [Go to online calculator.](#)



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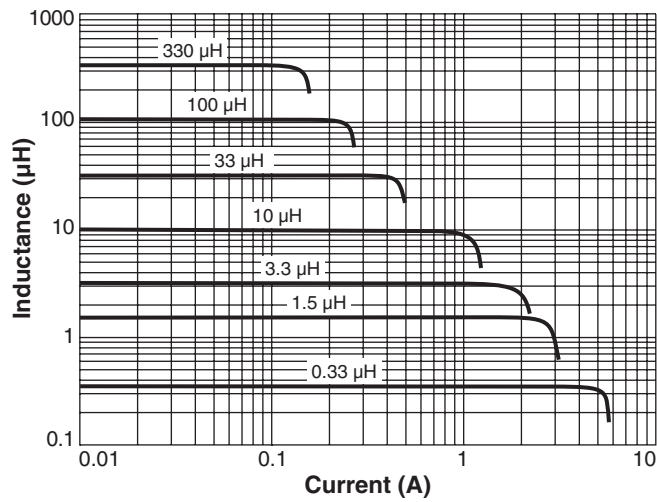
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# Coupled Inductors for SEPIC Applications – LPD4012 Series

## Typical L vs Current



## Typical L vs Frequency



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