

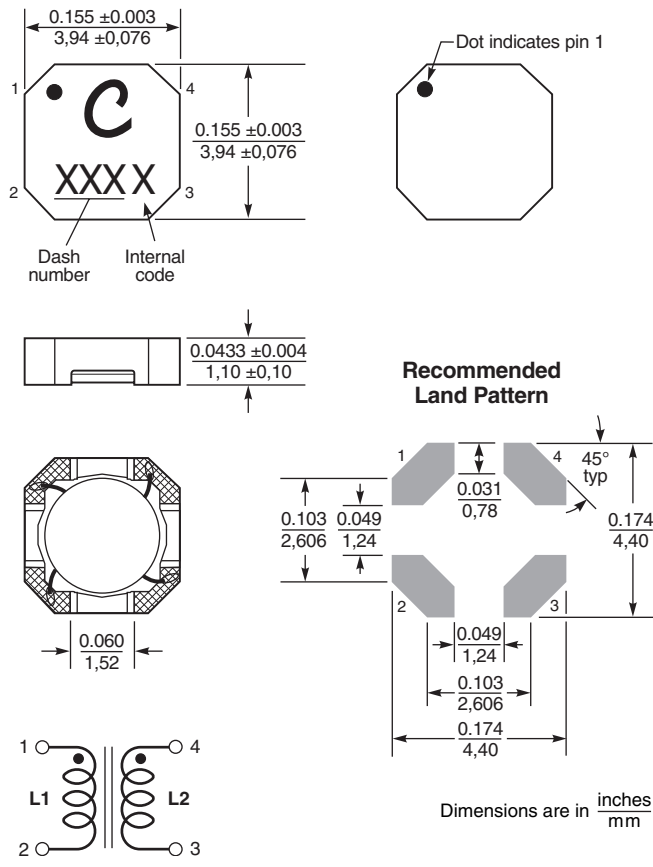
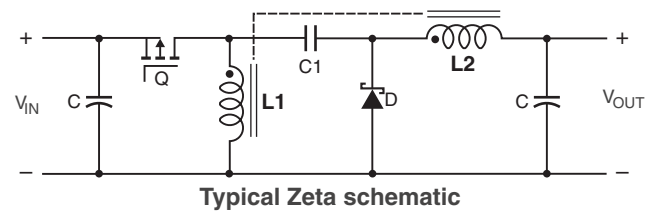
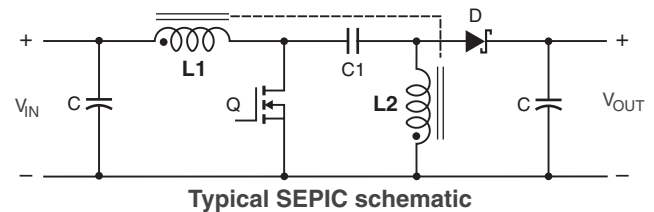
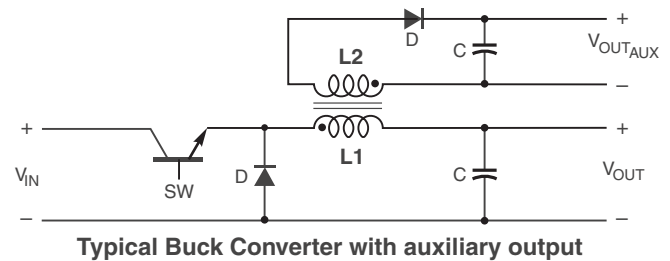
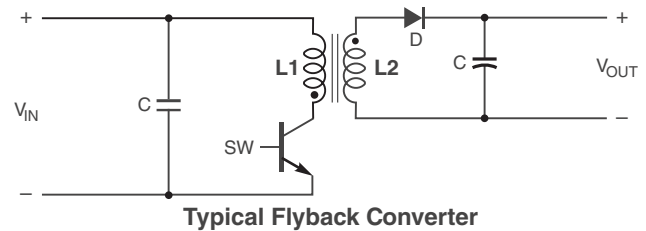


# Coupled Inductors LPD4012 For Flyback, SEPIC, Zeta and other Applications

**Improved version now available.**  
 These parts are not recommended for new designs. They are replaced by new lead free and halogen free versions which are identical in form, fit and function. See [www.coilcraft.com/lpd4012.cfm](http://www.coilcraft.com/lpd4012.cfm).



- Only 1.1 mm high and 4 mm square
- Ideal for use in flyback, multi-output buck, SEPIC and Zeta 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.



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# Coupled Inductors for SEPIC Applications – LPD4012 Series

Part number <sup>1</sup>	Inductance <sup>2</sup> ( $\mu$ H)	DCR max <sup>3</sup> (Ohms)	SRF typ <sup>4</sup> (MHz)	Coupling coefficient typ	Leakage L typ <sup>5</sup> ( $\mu$ H)	Isat (A) <sup>6</sup>			Irms (A)	
						10% drop	20% drop	30% drop	both windings <sup>7</sup>	one winding <sup>8</sup>
LPD4012-331NL_	0.33 $\pm$ 30%	0.042	255	0.94	0.06	5.2	5.4	5.6	1.87	2.65
LPD4012-561NL_	0.56 $\pm$ 30%	0.087	185	0.95	0.08	3.7	3.8	3.9	1.30	1.84
LPD4012-821NL_	0.82 $\pm$ 30%	0.100	130	0.97	0.09	3.2	3.3	3.4	1.21	1.72
LPD4012-152NL_	1.5 $\pm$ 30%	0.185	86	0.97	0.11	2.50	2.81	2.91	1.15	1.62
LPD4012-222NL_	2.2 $\pm$ 30%	0.235	70	0.98	0.14	2.30	2.40	2.50	0.95	1.35
LPD4012-332NL_	3.3 $\pm$ 30%	0.320	48	0.98	0.16	1.80	1.90	2.00	0.75	1.06
LPD4012-472ML_	4.7 $\pm$ 20%	0.500	39	0.98	0.18	1.60	1.70	1.80	0.65	0.92
LPD4012-562ML_	5.6 $\pm$ 20%	0.620	32	0.99	0.20	1.50	1.60	1.60	0.55	0.78
LPD4012-682ML_	6.8 $\pm$ 20%	0.530	31	0.99	0.22	1.20	1.52	1.63	0.60	0.86
LPD4012-822ML_	8.2 $\pm$ 20%	0.600	29	0.99	0.24	1.10	1.20	1.30	0.55	0.78
LPD4012-103ML_	10 $\pm$ 20%	0.750	25	0.99	0.26	0.98	1.00	1.10	0.50	0.71
LPD4012-153ML_	15 $\pm$ 20%	1.13	21	0.99	0.30	0.90	0.92	0.94	0.43	0.60
LPD4012-223ML_	22 $\pm$ 20%	1.63	15	0.99	0.34	0.70	0.82	0.84	0.34	0.48
LPD4012-333ML_	33 $\pm$ 20%	1.83	12	>0.99	0.41	0.37	0.57	0.58	0.31	0.44
LPD4012-473ML_	47 $\pm$ 20%	2.52	8.8	>0.99	0.51	0.33	0.39	0.40	0.28	0.39
LPD4012-683ML_	68 $\pm$ 20%	3.23	7.8	>0.99	0.66	0.27	0.36	0.37	0.25	0.36
LPD4012-823ML_	82 $\pm$ 20%	3.66	7.3	>0.99	0.75	0.27	0.27	0.29	0.23	0.31
LPD4012-104ML_	100 $\pm$ 20%	4.76	6.1	>0.99	0.86	0.22	0.28	0.29	0.20	0.27
LPD4012-124ML_	120 $\pm$ 20%	5.54	5.3	>0.99	0.98	0.21	0.26	0.27	0.19	0.27
LPD4012-154ML_	150 $\pm$ 20%	6.90	4.6	>0.99	1.19	0.18	0.26	0.27	0.17	0.23
LPD4012-184ML_	180 $\pm$ 20%	8.75	4.1	>0.99	1.40	0.16	0.21	0.23	0.14	0.18
LPD4012-224ML_	220 $\pm$ 20%	11.24	3.3	>0.99	1.66	0.15	0.16	0.17	0.12	0.17
LPD4012-334ML_	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:

#### LPD4012-334MLC

**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 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 which the inductance drops the specified amount 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. See temperature rise calculation.
- Maximum current when applied to one winding that causes a 40°C temperature rise from 25°C ambient. See temperature rise calculation.
- 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.](#)

**Core material** Ferrite

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

**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 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)

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

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

**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

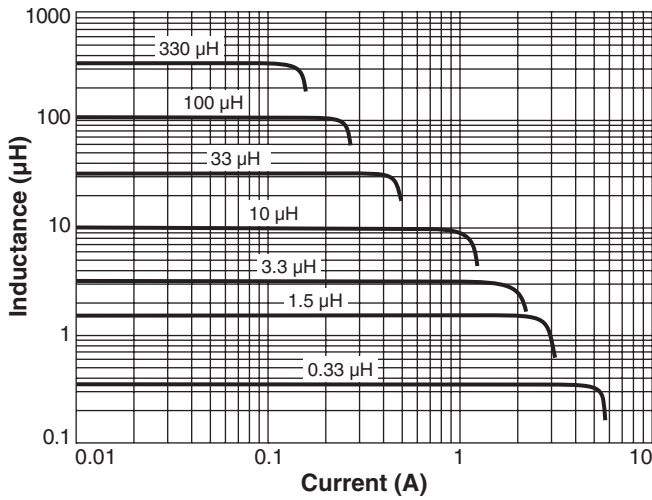
**Recommended pick and place nozzle** OD: 4 mm; ID:  $\leq$  2 mm

**PCB washing** Tested with pure water or alcohol only. For other solvents, see [Doc787\\_PCB\\_Washing.pdf](#).

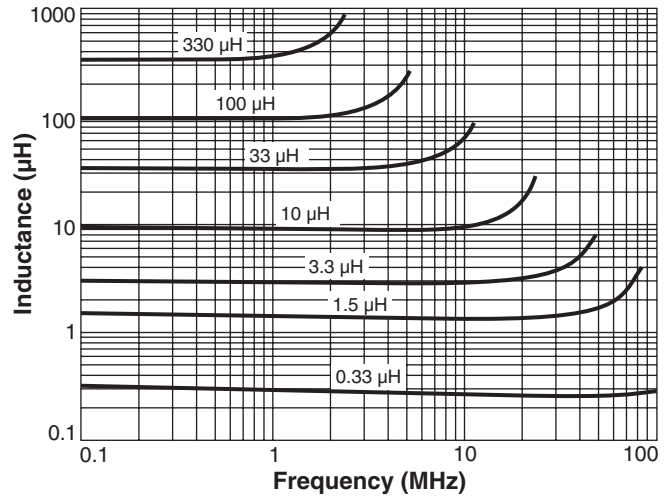


# Coupled Inductors for SEPIC Applications – LPD4012 Series

## Typical L vs Current



## Typical L vs Frequency



## Typical Current Derating

