

**NEW!**

Coupled Inductors—LPD3015 Series

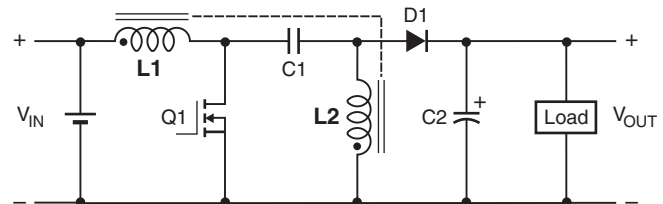
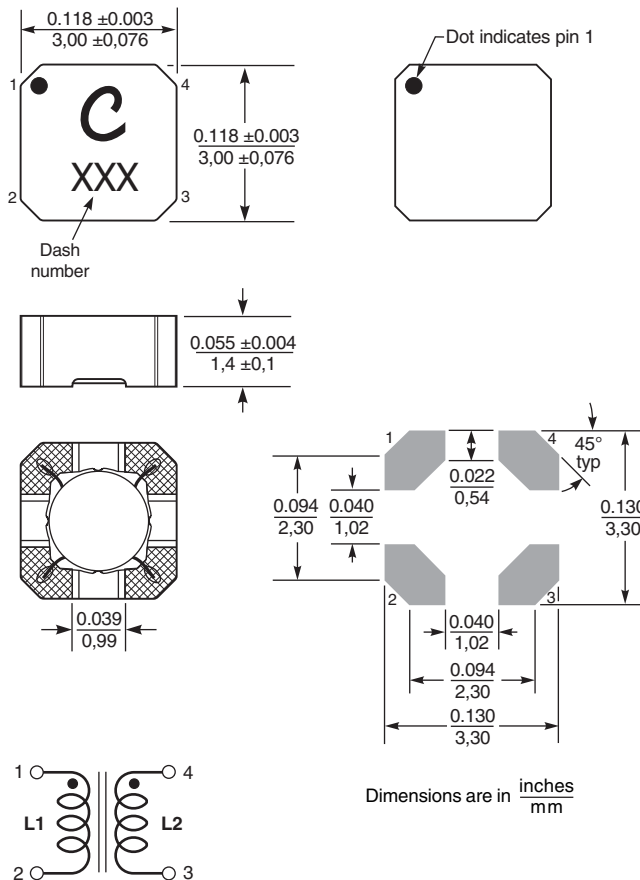
For SEPIC
Applications



At only 1.4 mm high and 3 mm square, the LPD3015 is Coilcraft's smallest shielded coupled inductor. The excellent coupling coefficient ($k \geq 0.97$) makes it ideal for use in SEPIC applications. In SEPIC topologies, the required inductance for each winding in a coupled inductor is half the value needed for two separate inductors, allowing selection of a part with lower DCR and higher current handling.

These inductors provide high efficiency and excellent current handling in a rugged, low cost part.

They can also be used as two single inductors connected in series or parallel, as a common mode choke or as a 1 : 1 transformer.



Typical SEPIC schematic

Refer to Application Note, Document 639,
"Selecting Coupled Inductors for SEPIC Applications"

Core material Ferrite

Weight 45 – 52 mg

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

Ambient temperature -40°C to $+85^{\circ}\text{C}$ with I_{rms} current, $+85^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ with derated current

Storage temperature Component: -40°C to $+125^{\circ}\text{C}$.
Packaging: -40°C to $+80^{\circ}\text{C}$

Winding to winding isolation 100 Vrms

Resistance to soldering heat Max three 40 second reflows at $+260^{\circ}\text{C}$, parts cooled to room temperature between cycles

Moisture Sensitivity Level (MSL) 1 (unlimited floor life at $<30^{\circ}\text{C}$ / 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, 0.26 mm thick, 8 mm pocket spacing, 1.65 mm pocket depth

Recommended pick and place nozzle OD: 3 mm; ID: ≤ 1.5 mm

PCB washing Only pure water or alcohol recommended

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Please check our website for latest information.

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Coupled Inductors for SEPIC - LPD3015 Series

Part number ¹	Inductance ² ±20% (µH)	DCR max ³ (Ohms)	SRF typ ⁴ (MHz)	Isat (A) ⁵			Irms (A)	
				10% drop	20% drop	30% drop	both windings ⁶	one winding ⁷
LPD3015-391ML_	0.39	0.071	289	3.2	3.3	3.4	1.45	2.05
LPD3015-561ML_	0.56	0.079	235	2.7	2.8	2.8	1.37	1.94
LPD3015-102ML_	1.0	0.129	160	2.0	2.1	2.2	1.08	1.52
LPD3015-152ML_	1.5	0.204	140	1.6	1.7	1.8	0.86	1.20
LPD3015-182ML_	1.8	0.243	135	1.5	1.6	1.6	0.78	1.10
LPD3015-222ML_	2.2	0.263	110	1.5	1.6	1.6	0.75	1.05
LPD3015-332ML_	3.3	0.337	90	1.0	1.1	1.2	0.67	0.94
LPD3015-472ML_	4.7	0.503	79	0.86	0.87	0.88	0.54	0.76
LPD3015-682ML_	6.8	0.622	58	0.77	0.78	0.79	0.49	0.69
LPD3015-103ML_	10	1.040	48	0.58	0.59	0.60	0.38	0.53
LPD3015-153ML_	15	1.420	35	0.49	0.50	0.51	0.32	0.46
LPD3015-183ML_	18	1.550	33	0.46	0.47	0.48	0.31	0.44
LPD3015-223ML_	22	1.89	30	0.42	0.43	0.44	0.28	0.40
LPD3015-333ML_	33	2.84	23	0.34	0.35	0.36	0.23	0.32
LPD3015-473ML_	47	4.03	17	0.28	0.29	0.30	0.19	0.27
LPD3015-683ML_	68	6.11	14	0.24	0.25	0.26	0.16	0.22
LPD3015-104ML_	100	8.54	11	0.20	0.21	0.22	0.13	0.19
LPD3015-124ML_	120	9.23	9.0	0.19	0.20	0.20	0.13	0.18
LPD3015-154ML_	150	12.40	8.0	0.16	0.17	0.18	0.11	0.16
LPD3015-184ML_	180	15.32	7.5	0.15	0.16	0.17	0.10	0.14
LPD3015-224ML_	220	18.56	6.0	0.13	0.14	0.15	0.09	0.13
LPD3015-334ML_	330	27.70	5.0	0.11	0.12	0.12	0.07	0.10

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

LPD3015-564ML C

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.
- 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.

Temperature rise calculation based on specified Irms

Winding power loss = $(I_{L1}^2 + I_{L2}^2) \times \text{DCR}$ in Watts (W)

Temperature rise = Winding power loss $\times \frac{135^\circ\text{C}}{\text{W}}$

Examples for LPD3015-152ML:

Equal current in each winding (1.2 A):

Winding power loss = $(1.2^2 + 1.2^2) \times 0.204 = 0.301 \text{ W}$

Temperature rise = $0.301 \text{ W} \times \frac{135^\circ\text{C}}{\text{W}} = 40.6^\circ\text{C}$

Unequal current ($I_{L1} = 1.0 \text{ A}$, $I_{L2} = 0.6 \text{ A}$):

Winding power loss = $(1.0^2 + 0.6^2) \times 0.204 = 0.277 \text{ W}$

Temperature rise = $0.277 \text{ W} \times \frac{135^\circ\text{C}}{\text{W}} = 37.4^\circ\text{C}$

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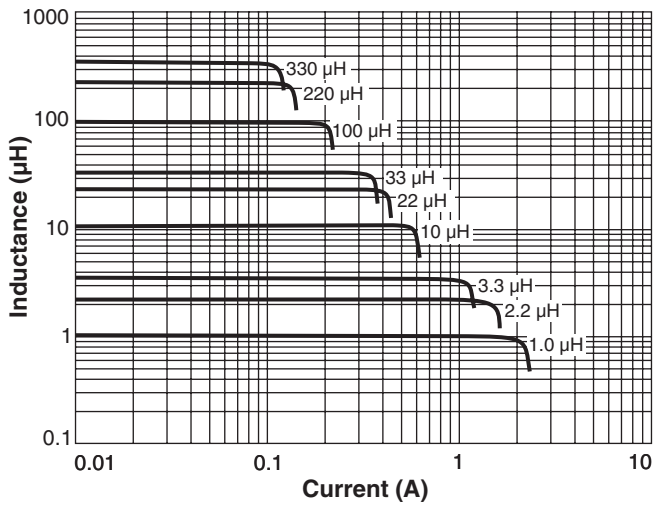
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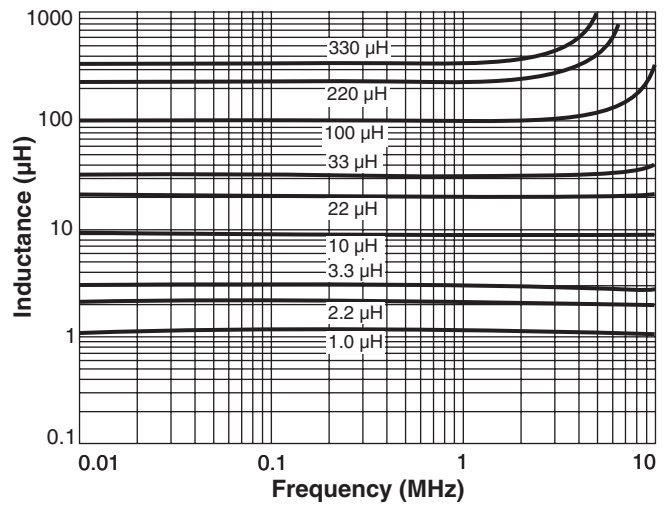
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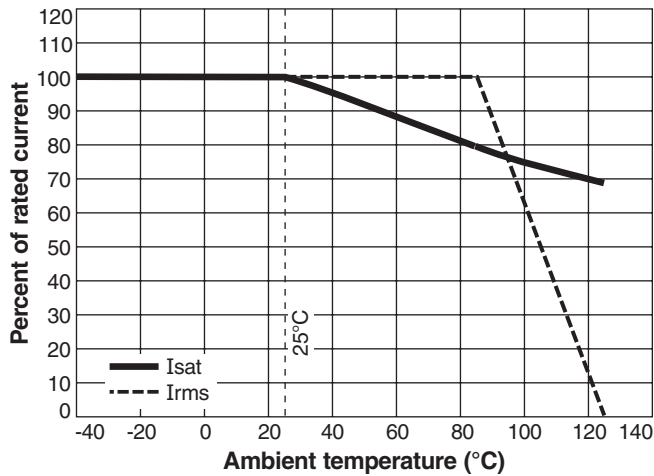
Typical L vs Current



Typical L vs Frequency



Typical Current Derating



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