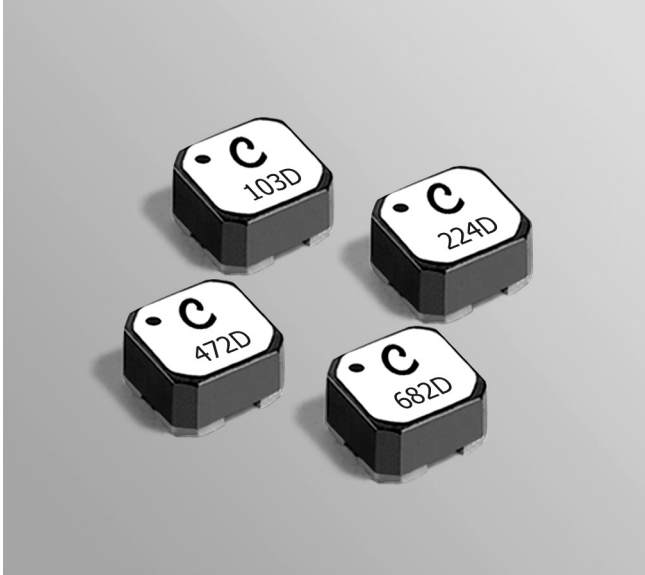




Miniature Transformers LPD5030V



Core material Ferrite

Environment RoHS compliant, halogen free

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

Weight 210 – 225 mg

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

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

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 750/7" reel; 2500/13" reel Plastic tape: 12 mm wide, 0.32 mm thick, 8 mm pocket spacing, 3.1 mm pocket depth

Recommended pick and place nozzle OD: 5 mm; ID: ≤ 2.5 mm

PCB washing Tested with pure water or alcohol only. For other solvents, see Doc787_PCB_Washing.pdf.

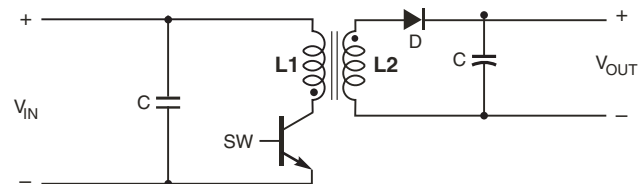
With 1500 Vdc (1000 Vrms) isolation and a small package size, the LPD5030V series is ideal for use in high density isolated circuit applications.

UL® **Functional Safety Listed by UL.** Functional insulation class for TNV-1 to SELV applications. Functional insulation with a maximum 60 Vdc, 42.4 V peak input/output voltages with working voltages up to 210 Vdc. (Report #E219588-A6)

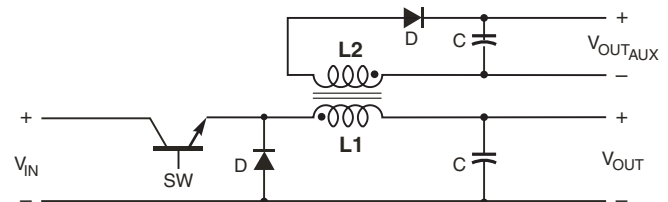
These miniature transformers provide tight coupling, high inductance and excellent current handling.

They can be used as

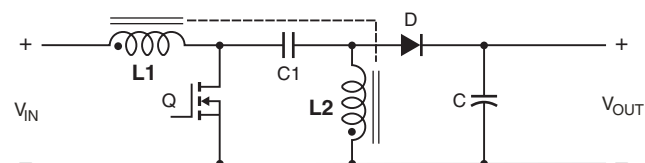
- Flyback transformers
- Coupled inductors in SEPIC applications
- Common mode filter chokes.



Typical Flyback Converter



Typical Buck Converter with auxiliary output



Typical SEPIC schematic

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



LPD5030V Transformers for Flyback Applications

Part number ¹	Inductance at 0 A ² ±20% (µH)	Inductance at I _{pk} ³ ±20% (µH)	DCR i _{max} ⁴ (Ohms)	Leakage inductance ⁵ typ (µH)	Isolation ⁶ (Vrms)	Turns ratio	I _{pk} ³ (A)
LPD5030V-472ME_	4.7	3.3	0.322	0.109	1000	1 : 1	1.90
LPD5030V-682ME_	6.8	4.7	0.395	0.109	1000	1 : 1	1.55
LPD5030V-103ME_	10	7.0	0.490	0.130	1000	1 : 1	1.30
LPD5030V-333ME_	33	23	0.895	0.195	1000	1 : 1	0.67
LPD5030V-154ME_	150	105	3.82	0.456	1000	1 : 1	0.31
LPD5030V-224ME_	220	154	5.25	0.541	1000	1 : 1	0.24

1. When ordering, please specify **packaging** code:

LPD5030V-224MEC

Packaging: **C** = 7" machine-ready reel. EIA-481 embossed plastic tape (750 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 (2500 parts per full reel).

2. Inductance is for the primary, measured at 100 kHz, 0.1 Vrms, 0 Adc on an Agilent/HP 4284A LCR meter or equivalent.

3. Peak primary current drawn at minimum input voltage.

4. DCR is for each winding.

5. Leakage inductance is for the primary winding with the secondary windings shorted.

6. Designed to provide Functional Insulation only; does not protect against electrical shock; nor intended for the isolation of SELV circuits from Hazardous Voltage circuits.

7. Electrical specifications at 25°C.

Refer to Doc 362 "Soldering Surface Mount Components" before soldering.

LPD5030V Coupled Inductors for SEPIC Applications

Part number ¹	Inductance ² ±20% (µH)	DCR max ³ (Ohms)	SRF typ ⁴ (MHz)	Coupling coefficient typ	Leakage inductance ⁵ typ (µH)	Isolation ⁶ (Vdc)	Isat (A) ⁷			Irms (A)	
							10% drop	20% drop	30% drop	both windings ⁸	one winding ⁹
LPD5030V-472ME_	4.7	0.322	55.0	0.97	0.109	1500	1.45	1.70	1.90	0.65	0.92
LPD5030V-682ME_	6.8	0.395	49.9	0.97	0.109	1500	1.30	1.50	1.55	0.59	0.83
LPD5030V-103ME_	10	0.490	37.1	0.97	0.130	1500	1.10	1.20	1.30	0.54	0.76
LPD5030V-333ME_	33	0.895	19.2	0.98	0.195	1500	0.49	0.59	0.67	0.43	0.61
LPD5030V-154ME_	150	3.82	8.1	0.98	0.456	1500	0.25	0.29	0.31	0.18	0.25
LPD5030V-224ME_	220	5.25	6.5	>0.99	0.541	1500	0.16	0.21	0.24	0.16	0.22

1. When ordering, please specify **packaging** code:

LPD5030V-224MEC

Packaging: **C** = 7" machine-ready reel. EIA-481 embossed plastic tape (750 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 (2500 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.
- Designed to provide Functional Insulation only; does not protect against electrical shock; nor intended for the isolation of SELV circuits from Hazardous Voltage circuits.
- 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 $\times \frac{142^\circ\text{C}}{\text{W}}$

Examples for LPD5030V-103:

Equal current in each winding (0.50 A):

Winding power loss = $(0.50^2 + 0.50^2) \times 0.490 = 0.245 \text{ W}$

Temperature rise = $0.245 \text{ W} \times \frac{142^\circ\text{C}}{\text{W}} = 34.8^\circ\text{C}$

Unequal current ($I_{L1} = 0.70 \text{ A}$, $I_{L2} = 0.15 \text{ A}$):

Winding power loss = $(0.70^2 + 0.15^2) \times 0.490 = 0.251 \text{ W}$

Temperature rise = $0.251 \text{ W} \times \frac{142^\circ\text{C}}{\text{W}} = 35.6^\circ\text{C}$



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Document 924-2 Revised 06/14/13

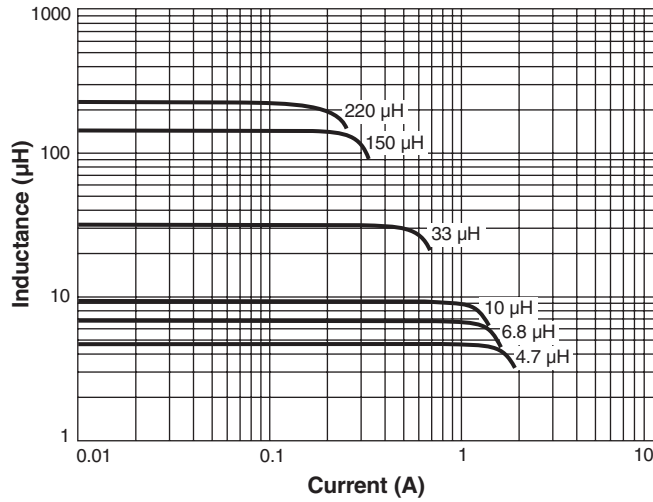
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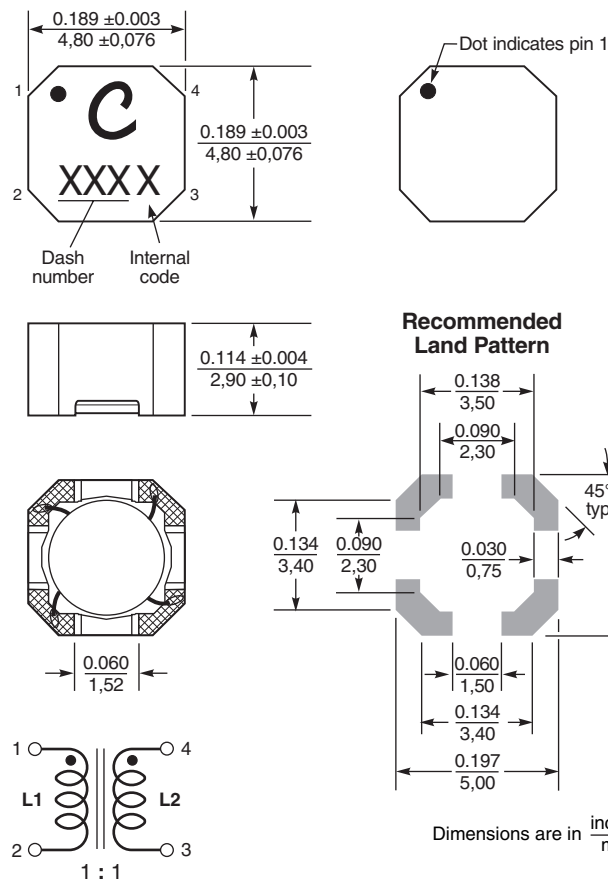
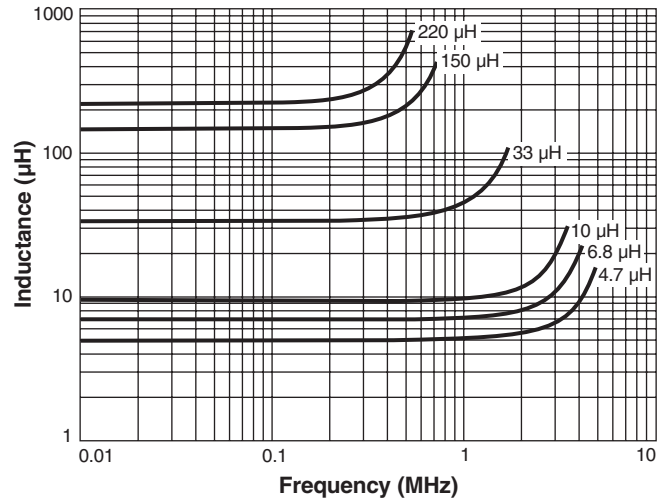


LPD5030V Miniature Transformers

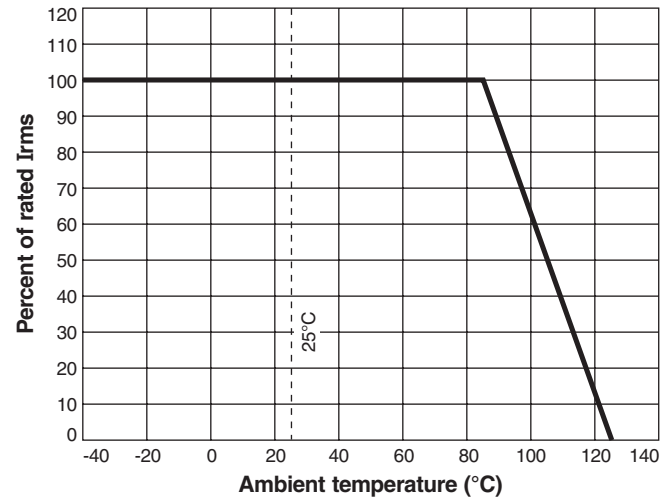
Typical L vs Current



Typical L vs Frequency



Typical Irms Derating



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