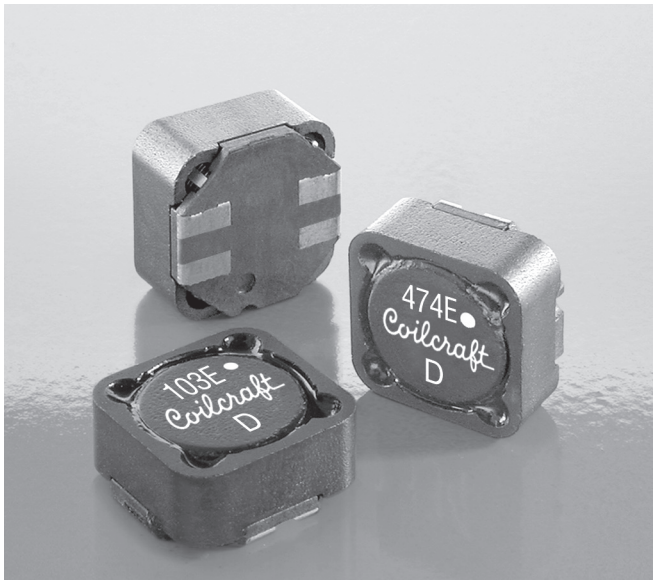
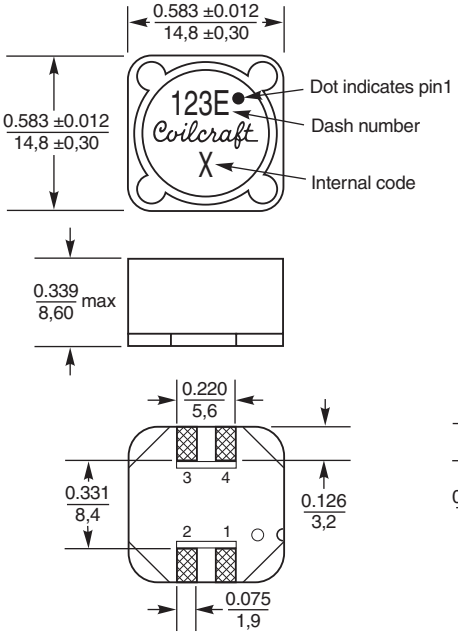
NEW!

Coupled Inductors – MSD1583

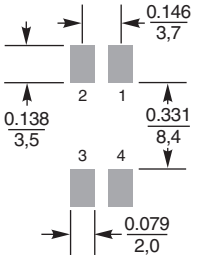
For Flyback, SEPIC and other Applications

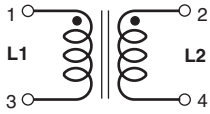




Dimensions are in inches / mm

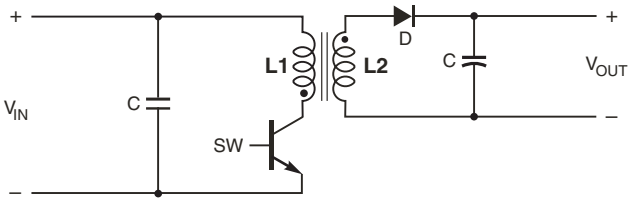
Recommended Land Pattern



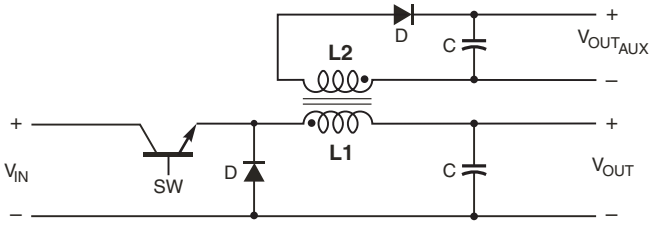


Excellent coupling coefficient (k ≥ 0.98) and 500 Vrms isolation makes the MSD1583 series of coupled inductors ideal for use in a variety of circuits including flyback, multi-output buck and SEPIC. These parts provide high inductance, high efficiency and excellent current handling.

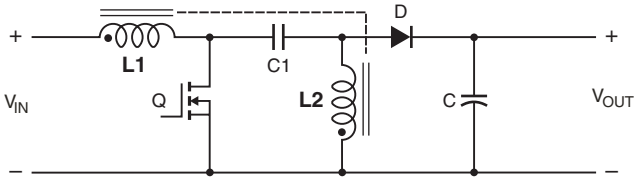
In SEPIC topologies, the required inductance for each winding is half the value needed for two separate inductors, allowing selection of a part with lower DCR and higher current handling.



Typical Flyback Converter



Typical Buck Converter with auxiliary output



Typical SEPIC schematic

Core material Ferrite

Environmental RoHS compliant, halogen free

Terminations RoHS compliant matte tin over nickel over phos bronze. Other terminations available at additional cost.

Weight: 3.7 – 4.4 g

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 500 Vrms

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 300/13″ reel; Plastic tape: 32 mm wide, 0.5 mm thick, 24 mm pocket spacing, 8.6 mm pocket depth

PCB washing Only pure water or alcohol recommended

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NEW!

MSD1583 Coupled Inductors for SEPIC applications

Part number[1]	Inductance[2] (µH)	DCR (Ohms)[3] typ	DCR (Ohms)[3] max	SRF typ[4] (MHz)	Coupling coefficient typ	Leakage inductance typ (µH)	Isat (A)[5] 10% drop	Isat (A)[5] 20% drop	Isat (A)[5] 30% drop	Irms (A) both windings[6]	Irms (A) one winding[7]
MSD1583-103ME_	10 ±20%	0.026	0.031	16.0	0.98	0.33	11.7	13.3	14.5	3.68	5.20
MSD1583-123ME_	12 ±20%	0.029	0.037	14.5	0.98	0.36	10.6	12.1	13.2	3.54	5.00
MSD1583-153ME_	15 ±20%	0.039	0.045	12.0	0.99	0.38	9.50	10.8	11.8	3.18	4.50
MSD1583-183ME_	18 ±20%	0.042	0.048	11.5	0.99	0.40	8.70	9.90	10.8	3.04	4.30
MSD1583-223ME_	22 ±20%	0.054	0.065	10.5	0.99	0.40	7.90	8.95	9.80	2.44	3.45
MSD1583-333ME_	33 ±20%	0.083	0.095	8.0	0.99	0.54	6.40	7.30	8.00	2.16	3.05
MSD1583-473ME_	47 ±20%	0.100	0.115	7.1	0.99	0.46	5.40	6.10	6.70	1.98	2.80
MSD1583-683ME_	68 ±20%	0.145	0.165	5.7	0.99	0.79	4.50	5.10	5.50	1.56	2.20
MSD1583-104KE_	100 ±10%	0.230	0.260	5.1	>0.99	0.59	3.70	4.20	4.60	1.24	1.75
MSD1583-154KE_	150 ±10%	0.340	0.380	3.7	>0.99	0.70	3.00	3.42	3.75	1.06	1.50
MSD1583-224KE_	220 ±10%	0.420	0.460	3.2	>0.99	0.89	2.50	2.83	3.10	0.92	1.30
MSD1583-474KE_	470 ±10%	0.950	1.04	2.2	>0.99	1.16	1.70	1.93	2.12	0.65	0.92
MSD1583-105KE_	1000 ±10%	2.20	2.40	1.6	>0.99	2.02	1.17	1.32	1.45	0.42	0.60

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

MSD1583-105KED

Termination: **E** = RoHS compliant matte tin over nickel over phos bronze. Special order: **Q** = RoHS tin-silver-copper (95.5/4/0.5) or **P** = non-RoHS tin-lead (63/37).

Packaging: **D** = 13″ machine-ready reel. EIA-481 embossed plastic tape (300 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.

2. 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.
3. 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.
4. SRF measured using an Agilent/HP 4191A or equivalent. When leads are connected in parallel, SRF is the same value.
5. 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.
6. Equal current when applied to each winding simultaneously that causes a 40°C temperature rise from 25°C ambient. .
7. Maximum current when applied to one winding that causes a 40°C temperature rise from 25°C ambient. See temperature rise calculation.
8. 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 = $(I_{L1}^2 + I_{L2}^2) \times$ DCR (max) in Watts (W)

Temperature rise (Δt) = Winding power loss $\times \frac{47.0°C}{W}$

$\Delta t = (I_{L1}^2 + I_{L2}^2) \times \text{DCR (max)} \times \frac{47.0°C}{W}$

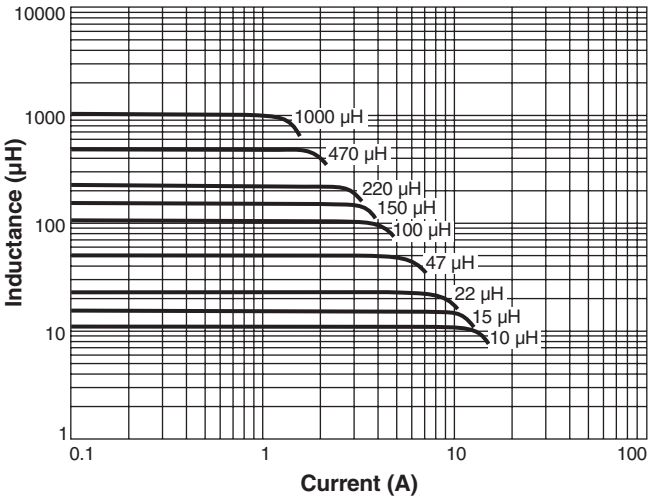
Example 1. MSD1583-154 (Equal current in each winding)
Winding power loss = $(1.06^2 + 1.06^2) \times 0.38 = 0.854$ W

$\Delta t = 0.854 \text{ W} \times \frac{47.0°C}{W} = 40.1°C$

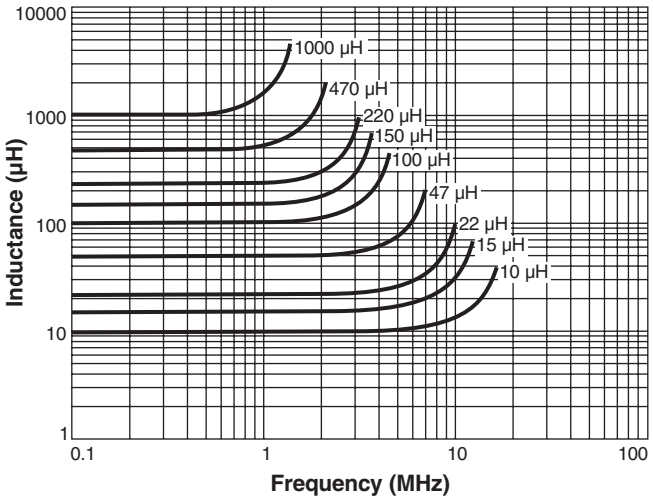
Example 2. MSD1583-154 ($I_{L1} = 1.3$ A, $I_{L2} = 0.55$ A)
Winding power loss = $(1.3^2 + 0.55^2) \times 0.38 = 0.757$ W

$\Delta t = 0.757 \text{ W} \times \frac{47.0°C}{W} = 35.6°C$

Typical L vs Current



Typical L vs Frequency



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NEW!

MSD1583 Coupled Inductors for Flyback applications

Part number[1]	Inductance at 0 A[2] (µH)	Inductance at Ipk A[3] typ (µH)	DCR max (Ohms)	Leakage inductance[4] typ (µH)	Turns ratio	Ipk[3] (A)
MSD1583-103ME_	10 ±20%	7.0	0.031	0.33	1 : 1	14.5
MSD1583-123ME_	12 ±20%	8.4	0.037	0.36	1 : 1	13.2
MSD1583-153ME_	15 ±20%	10.5	0.045	0.38	1 : 1	11.8
MSD1583-183ME_	18 ±20%	12.6	0.048	0.40	1 : 1	10.8
MSD1583-223ME_	22 ±20%	15.4	0.065	0.40	1 : 1	9.80
MSD1583-333ME_	33 ±20%	23.1	0.095	0.54	1 : 1	8.00
MSD1583-473ME_	47 ±20%	32.9	0.115	0.46	1 : 1	6.70
MSD1583-683ME_	68 ±20%	47.6	0.165	0.79	1 : 1	5.50
MSD1583-104KE_	100 ±10%	70.0	0.26	0.59	1 : 1	4.60
MSD1583-154KE_	150 ±10%	105	0.38	0.70	1 : 1	3.75
MSD1583-224KE_	220 ±10%	154	0.46	0.89	1 : 1	3.10
MSD1583-474KE_	470 ±10%	329	1.04	1.16	1 : 1	2.12
MSD1583-105KE_	1000 ±10%	700	2.4	2.02	1 : 1	1.45

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

MSD1583-105KED

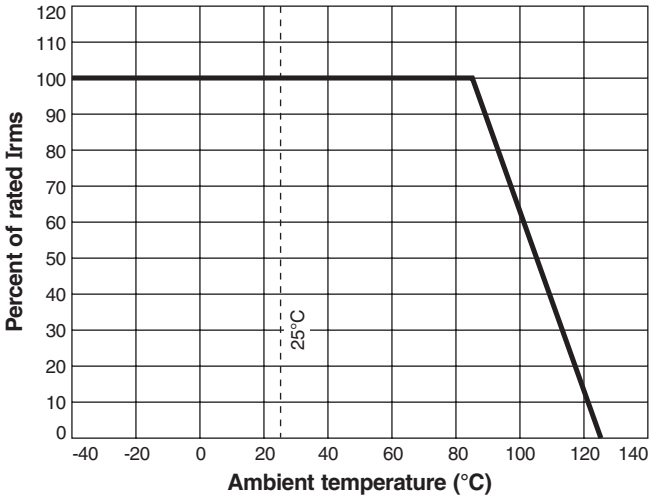
Termination: **E** = RoHS compliant matte tin over nickel over phos bronze.
Special order: **T** = RoHS tin-silver-copper (95.5/4/0.5) or **S** = non-RoHS tin-lead (63/37).

Packaging: **D** = 13″ machine-ready reel. EIA-481 embossed plastic tape (300 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.

2. Inductance is for the primary (L1), 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. Leakage inductance is for the primary winding (L1) with the secondary winding (L2) shorted.
5. Electrical specifications at 25°C.

Refer to Doc 362 “Soldering Surface Mount Components” before soldering.

Irms Derating



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