NEW!

Coupled Inductors – MSD1260T

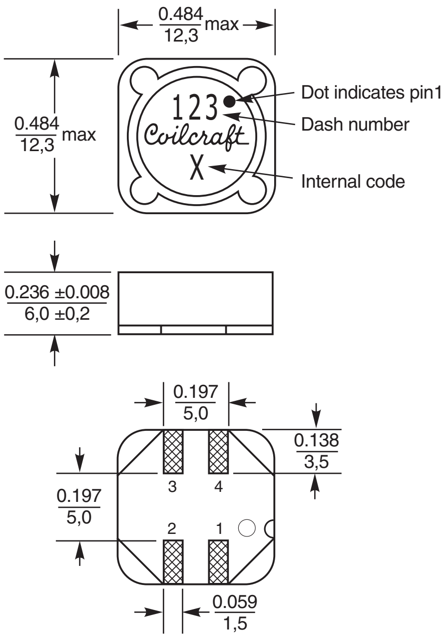
For high temperature applications

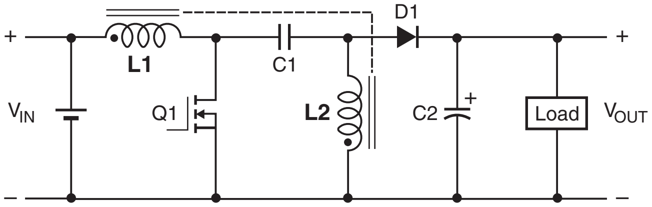
RoHS COMPLIANT

The MSD1260T series of shielded coupled inductors was designed specifically for high temperature applications – up to 125°C. The excellent coupling coefficient (k ≥ 0.94) 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 parts provide high inductance, high efficiency and excellent current handling in a rugged, low cost part. They are well suited for use as VRM inductors in high-current DC-DC and VRM/VRD controllers.

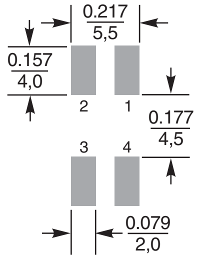
They can also be used as two single inductors connected in series or parallel, or as 1 : 1 transformers.



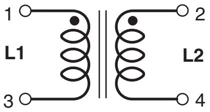


Typical SEPIC schematic
Refer to Application Note, Document 639, “Selecting Coupled Inductors for SEPIC Applications”

Recommended Land Pattern



Dimensions are in inches / mm



Core material Ferrite

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

Weight: 2.8 – 3.2 g

Ambient temperature –40°C to +125°C with Irms current, +125°C to +165°C with derated current

Storage temperature Component: –40°C to +165°C. 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 500/13″ reel; Plastic tape: 24 mm wide, 0.35 mm thick, 16 mm pocket spacing, 6.6 mm pocket depth

PCB washing Only pure water or alcohol recommended

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High Temperature Coupled Inductors for SEPIC – MSD1260T

Part number[1]	Inductance[2] (µH)	DCR max[3] (Ohms)	SRF typ[4] (MHz)	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]
MSD1260T-472ML_	4.7 ±20%	0.036	38.0	9.00	10.18	11.08	3.16	4.47
MSD1260T-562ML_	5.6 ±20%	0.040	30.0	8.00	9.06	9.84	3.00	4.24
MSD1260T-682ML_	6.8 ±20%	0.048	27.0	7.00	8.00	1.64	2.75	3.88
MSD1260T-822ML_	8.2 ±20%	0.052	26.0	6.44	7.38	7.98	2.63	3.72
MSD1260T-103ML_	10 ±20%	0.060	22.0	5.40	6.32	6.88	2.45	3.46
MSD1260T-123ML_	12 ±20%	0.074	20.0	5.30	6.18	6.70	2.21	3.12
MSD1260T-153ML_	15 ±20%	0.085	18.0	4.60	5.30	5.80	2.06	2.92
MSD1260T-183ML_	18 ±20%	0.097	16.0	4.50	5.22	5.68	1.93	2.73
MSD1260T-223ML_	22 ±20%	0.116	15.0	4.00	4.62	5.02	1.76	2.49
MSD1260T-273ML_	27 ±20%	0.124	13.0	3.60	4.14	4.50	1.70	2.41
MSD1260T-333ML_	33 ±20%	0.134	12.4	3.30	3.80	4.14	1.64	2.32
MSD1260T-393ML_	39 ±20%	0.142	12.0	3.00	3.48	3.82	1.59	2.25
MSD1260T-473ML_	47 ±20%	0.174	11.6	2.70	3.12	3.40	1.44	2.03
MSD1260T-563ML_	56 ±20%	0.198	10.5	2.50	2.90	3.14	1.35	1.91
MSD1260T-683ML_	68 ±20%	0.216	10.0	2.30	2.66	2.88	1.29	1.83
MSD1260T-823ML_	82 ±20%	0.274	8.6	2.10	2.40	2.60	1.15	1.62
MSD1260T-104ML_	100 ±20%	0.322	7.8	1.90	2.18	2.38	1.06	1.50
MSD1260T-124KL_	120 ±10%	0.418	6.8	1.60	1.84	2.04	0.93	1.31
MSD1260T-154KL_	150 ±10%	0.476	6.4	1.50	1.76	1.92	0.87	1.23
MSD1260T-184KL_	180 ±10%	0.536	6.1	1.40	1.64	1.78	0.82	1.16
MSD1260T-224KL_	220 ±10%	0.691	5.5	1.30	1.48	1.60	0.72	1.02
MSD1260T-274KL_	270 ±10%	0.806	4.3	1.10	1.30	1.40	0.67	0.95
MSD1260T-334KL_	330 ±10%	1.09	4.0	1.00	1.16	1.26	0.57	0.81
MSD1260T-394KL_	390 ±10%	1.20	3.6	0.950	1.11	1.23	0.55	0.77
MSD1260T-474KL_	470 ±10%	1.59	3.0	0.900	0.994	1.09	0.48	0.67
MSD1260T-564KL_	560 ±10%	1.81	2.8	0.800	0.908	0.948	0.45	0.63
MSD1260T-684KL_	680 ±10%	2.06	2.6	0.700	0.804	0.874	0.42	0.59
MSD1260T-824KL_	820 ±10%	2.65	2.5	0.640	0.732	0.802	0.37	0.52
MSD1260T-105KL_	1000 ±10%	3.06	2.4	0.590	0.674	0.728	0.34	0.49

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

   MSD1260T-105KLD

   Termination: **L** = 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 (500 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. See temperature rise calculation.
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 in Watts (W)

Temperature rise (Δt) = Winding power loss $\times \frac{55.6°C}{W}$

$\Delta t = (I_{L1}^2 + I_{L2}^2) \times DCR \times \frac{55.6°C}{W}$

Example 1. MSD1260T-153ML (Equal current in each winding)
Winding power loss = $(2.06^2 + 2.06^2) \times 0.085 = 0.721$ W

$\Delta t = 0.721\ W \times \frac{55.6°C}{W} = 40°C$

Example 2. MSD1260T-153ML (I_{L1} = 2.4 A, I_{L2} = 1.3 A)
Winding power loss = $(2.4^2 + 1.3^2) \times 0.085 = 0.633$ W

$\Delta t = 0.633\ W \times \frac{55.6°C}{W} = 35.2°C$

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. Visit www.coilcraft.com/coupledloss.

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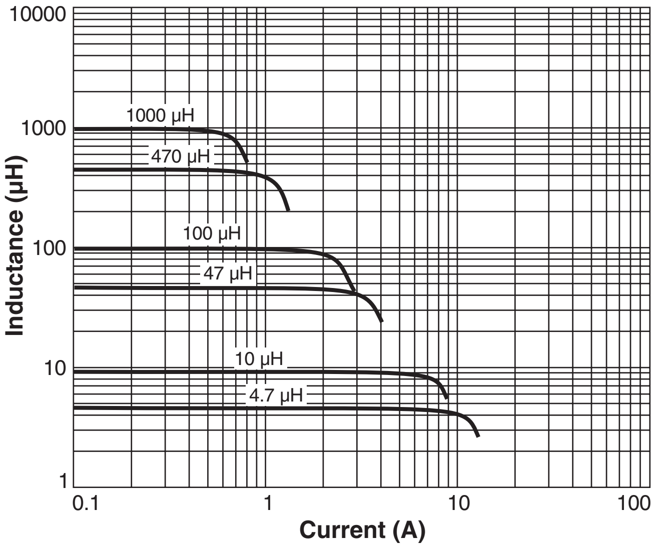
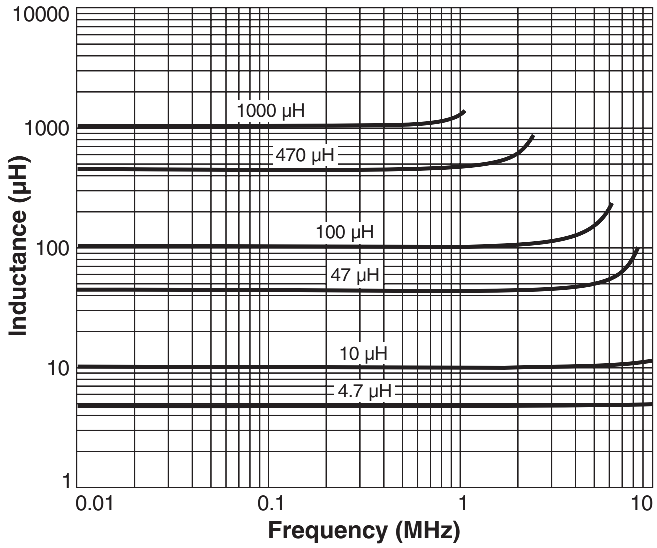
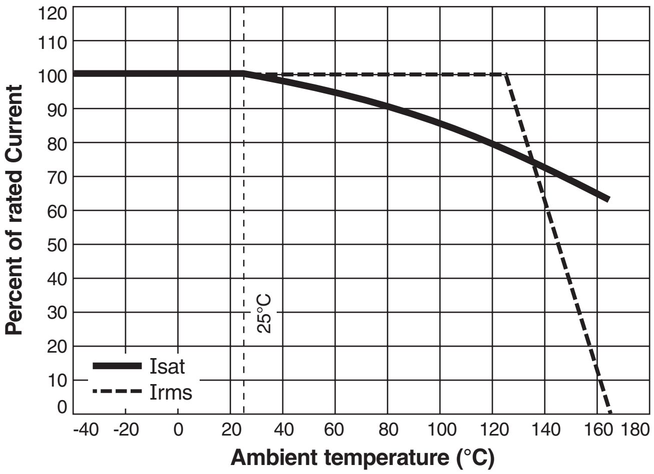
Typical L vs Current



Typical L vs Frequency



Current Derating



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