NEW!

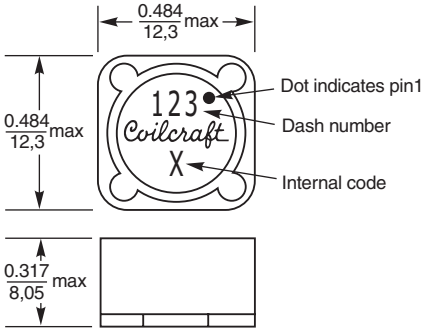
Coupled Inductors – MSC1278

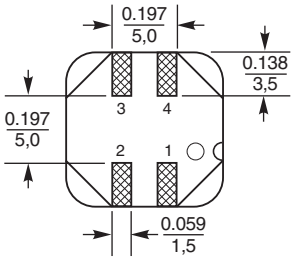
For SEPIC Applications

The MSC1278 coupled inductors are designed with high leakage inductance for use in SEPIC applications. The loosely coupled windings (K ≈ 0.8) improve SEPIC efficiency by reducing circulating current and provide twice the ripple current reduction of separate inductors.

These inductors offer high efficiency and excellent current handling in a rugged, low cost part. They are well suited for use as a VRM inductors in high-current DC-DC converters and VRM/VRD controllers.

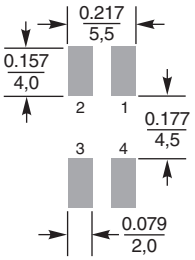
They can also be used as two single inductors connected in series or parallel.

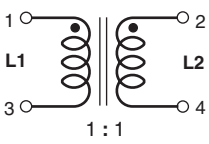


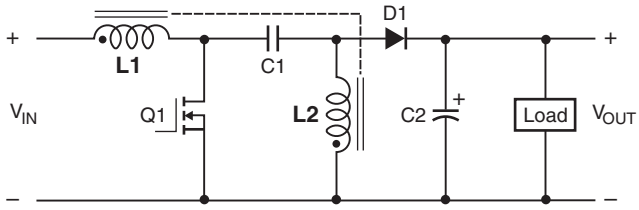


Dimensions are in inches / mm

Recommended Land Pattern







Typical SEPIC schematic

Refer to Application Note, Document 639, "Selecting Coupled Inductors for SEPIC Applications." Visit http://www.coilcraft.com/apps/sepic/selector_2.cfm for the Coilcraft on-line SEPIC Inductor Selector tool.

Core material Ferrite

Core and winding loss Go to online calculator

Terminations RoHS compliant matte tin over nickel over phos bronze. 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 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, 0.4 mm thick, 16 mm pocket spacing, 8.1 mm pocket depth

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

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NEW!

Coupled Inductors for SEPIC – MSC1278 Series

Part number[1]	Inductance[2] (µH)	DCR max[3] (Ohms)	SRF typ[4] (MHz)	Coupling coefficient typ	Leakage inductance[5] typ (µH)	Isat (A)[6] 10% drop	Isat (A)[6] 20% drop	Isat (A)[6] 30% drop	Irms (A) both windings[7]	Irms (A) one winding[8]
MSC1278-103ML_	10 ±20%	0.058	20	0.80	2.75	8.80	10.0	10.66	2.56	3.62
MSC1278-223KL_	22 ±10%	0.096	12	0.82	5.85	6.00	6.80	7.26	1.99	2.81
MSC1278-333KL_	33 ±10%	0.15	9.5	0.85	10.1	5.50	6.10	6.52	1.59	2.25
MSC1278-473KL_	47 ±10%	0.18	7.8	0.83	14.5	3.70	4.34	4.60	1.45	2.05

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

   MSC1278-473KLD

   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).

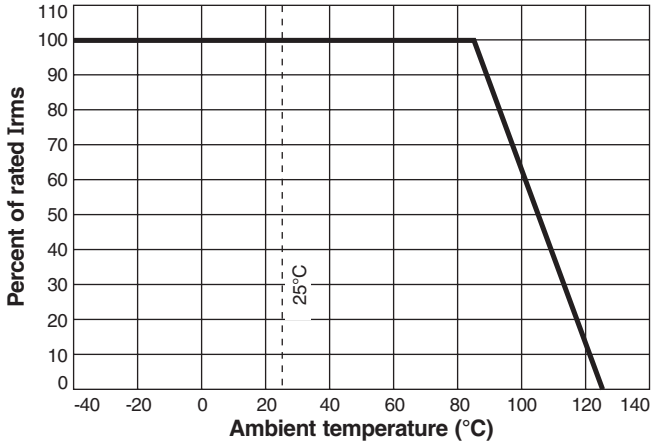
   Packaging: D = 13″ machine-ready reel. EIA-481 embossed plastic tape (500 parts per full reel).
   B = Less than full reel. In tape, but not machine ready. To have a leader and trailer added ($25 charge), use code letter D instead.
2. Inductance shown for each winding, measured at 100 kHz, 0.1 Vrms, 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. Leakage inductance is for L1 and is measured with L2 shorted.
6. 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.
7. Equal current when applied to each winding simultaneously that causes a 40°C temperature rise from 25°C ambient. See temperature rise calculation.
8. Maximum current when applied to one winding that causes a 40°C temperature rise from 25°C ambient. See temperature rise calculation.
9. 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.

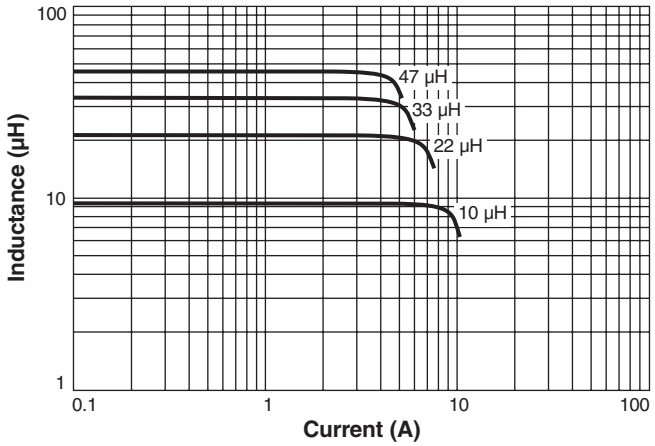
Coupled Inductor Core and Winding Loss Calculator

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.

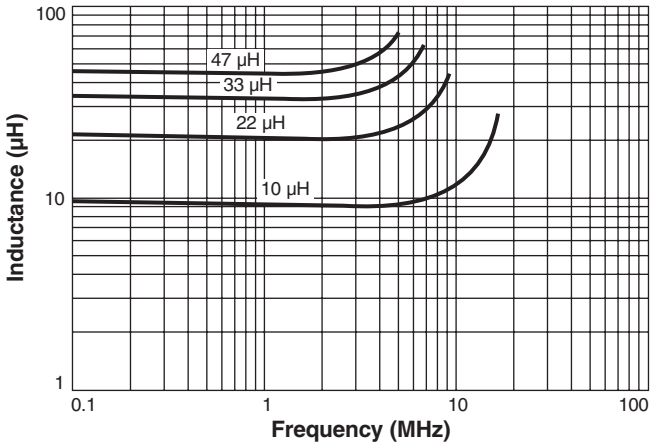
Current Derating



L vs Current



L vs Frequency



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