NEW!

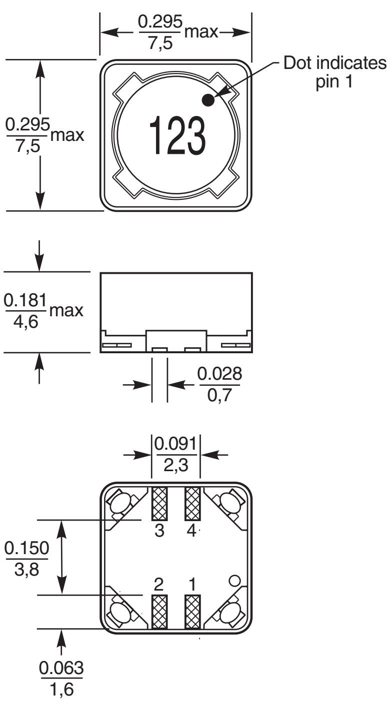
Coupled Inductors–MSD7342 Series

For SEPIC Applications

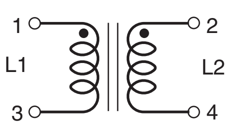
The excellent coupling coefficient (k ≥ 0.94) makes the MSD7342 series of coupled inductors ideal for use in SEPIC applications. In SEPIC topologies, the required inductance for each winding in a coupled inductor is half the value needed for two separate inductors, allowing selection of a part with lower DCR and higher current handling.

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

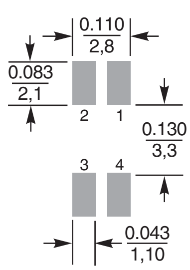
They can also be used as two single inductors connected in series or parallel, as a common mode choke or as a 1 : 1 transformer.

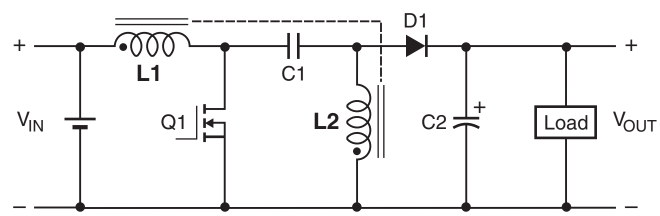


Dimensions are in inches / mm



Recommended Land Pattern





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

Core material Ferrite

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

Weight 0.76 – 0.87g

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. Packaging: –40°C to +80°C

Winding to winding isolation 200 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 250/7″ reel; 1000/13″ reel Plastic tape: 16 mm wide, 0.4 mm thick, 12 mm pocket spacing, 4.9 mm pocket depth

PCB washing Only pure water or alcohol recommended

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RoHS COMPLIANT

Coupled Inductors for SEPIC Applications – MSD7342 Series

Part number[1]	Inductance[2] ±20% (µH)	DCR max[3] (Ohms)	SRF typ[4] (MHz)	Isat (A)[5] 10% drop	20% drop	30% drop	Irms (A) both windings[6]	one winding[7]
MSD7342-252ML_	2.5	0.033	55	6.0	6.2	6.3	2.17	3.06
MSD7342-332ML_	3.3	0.037	43	5.2	5.3	5.4	2.05	2.89
MSD7342-472ML_	4.7	0.051	35	4.1	4.3	4.6	1.74	2.46
MSD7342-562ML_	5.6	0.063	32	3.9	4.1	4.2	1.57	2.22
MSD7342-682ML_	6.8	0.070	30	3.7	3.8	3.9	1.49	2.10
MSD7342-822ML_	8.2	0.075	27	3.3	3.4	3.5	1.44	2.03
MSD7342-103ML_	10	0.100	22	2.8	2.9	3.0	1.24	1.76
MSD7342-123ML_	12	0.120	20	2.5	2.6	2.7	1.14	1.61
MSD7342-153ML_	15	0.130	18	2.2	2.3	2.4	1.09	1.54
MSD7342-183ML_	18	0.170	15	2.0	2.2	2.3	0.95	1.35
MSD7342-223ML_	22	0.220	13.5	1.9	2.0	2.1	0.84	1.19
MSD7342-273ML_	27	0.250	12.0	1.7	1.8	1.9	0.79	1.11
MSD7342-333ML_	33	0.270	11.0	1.5	1.6	1.7	0.76	1.07
MSD7342-393ML_	39	0.380	10.0	1.3	1.4	1.5	0.64	0.90
MSD7342-473ML_	47	0.420	9.5	1.2	1.3	1.4	0.61	0.86
MSD7342-563ML_	56	0.460	8.7	1.1	1.2	1.3	0.58	0.82
MSD7342-683ML_	68	0.600	7.3	1.0	1.1	1.2	0.51	0.72
MSD7342-823ML_	82	0.680	6.2	0.90	1.00	1.1	0.48	0.67
MSD7342-104ML_	100	0.770	5.5	0.80	0.92	0.98	0.45	0.63
MSD7342-124ML_	120	1.03	4.5	0.70	0.80	0.90	0.39	0.55
MSD7342-154ML_	150	1.35	4.0	0.65	0.76	0.80	0.34	0.48
MSD7342-184ML_	180	1.52	3.8	0.62	0.66	0.73	0.32	0.45
MSD7342-224ML_	220	1.72	3.5	0.59	0.62	0.66	0.30	0.42
MSD7342-274ML_	270	2.41	3.3	0.55	0.57	0.60	0.25	0.36
MSD7342-334ML_	330	2.70	3.0	0.49	0.52	0.54	0.24	0.34
MSD7342-394ML_	390	3.05	2.8	0.45	0.47	0.50	0.23	0.32
MSD7342-474ML_	470	4.00	2.6	0.41	0.43	0.46	0.20	0.28
MSD7342-564ML_	560	4.43	2.5	0.38	0.40	0.42	0.19	0.26
MSD7342-684ML_	680	5.00	2.3	0.36	0.37	0.38	0.18	0.25
MSD7342-824ML_	820	6.80	2.2	0.30	0.32	0.35	0.15	0.21
MSD7342-105ML_	1000	7.80	2.0	0.27	0.29	0.31	0.14	0.20

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

   MSD7342-105MLC

   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: C = 7″ machine-ready reel. EIA-481 embossed plastic tape (250 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 C instead.

   D = 13″ machine-ready reel. EIA-481 embossed plastic tape. Factory order only, not stocked (1000 parts per full reel).
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 $\times \frac{129°C}{W}$

$$\Delta t = (I_{L1}^2 + I_{L2}^2) \times DCR \times \frac{129°C}{W}$$

Example 1. MSD7342-123ML (Equal current in each winding)
Winding power loss = $(1.14^2 + 1.14^2) \times 0.120 = 0.312$ W

$$\Delta t = 0.312\ W \times \frac{129°C}{W} = 40°C$$

Example 2. MSD7342-123ML ($I_{L1} = 1.4$ A, $I_{L2} = 0.6$ A)
Winding power loss = $(1.4^2 + 0.6^2) \times 0.120 = 0.278$ W

$$\Delta t = 0.278\ W \times \frac{129°C}{W} = 36°C$$

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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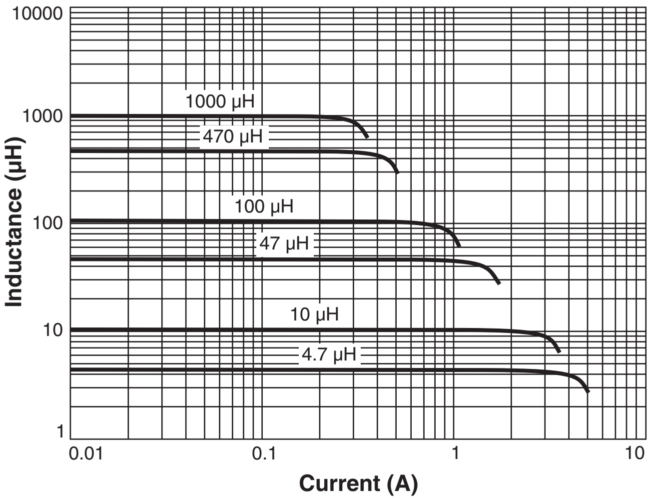
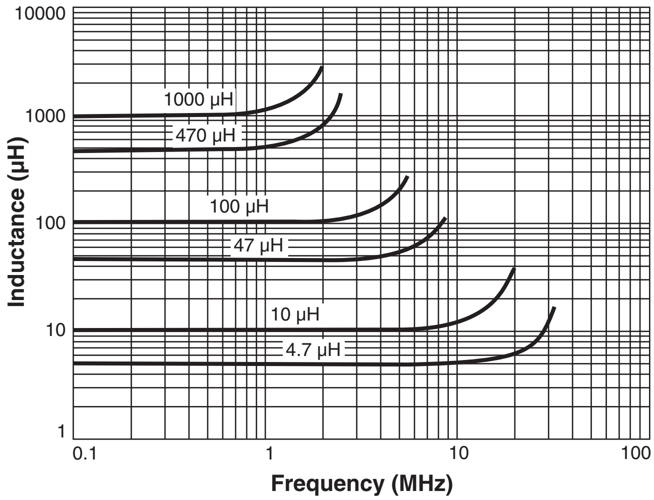
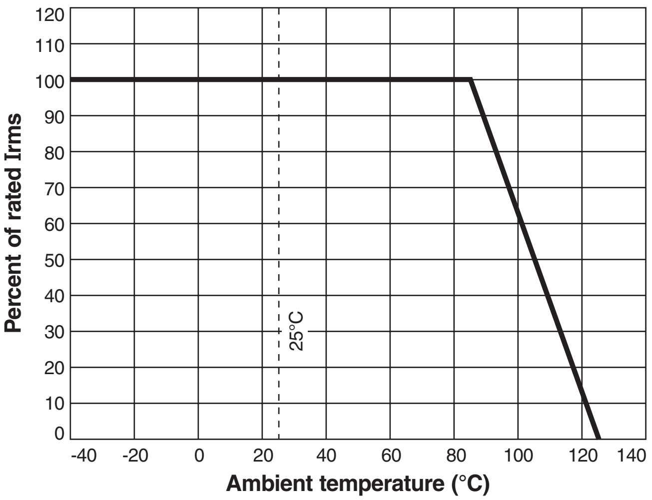
Typical L vs Current



Typical L vs Frequency



Irms Derating



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