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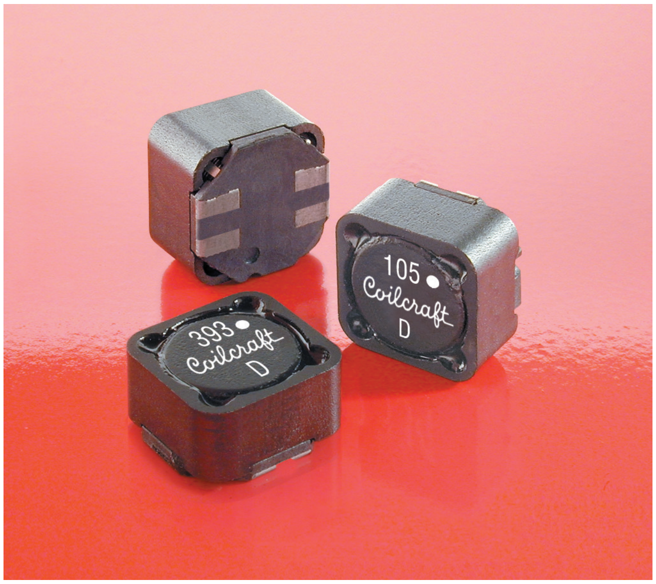
High Reliability Coupled Inductors MS612PND

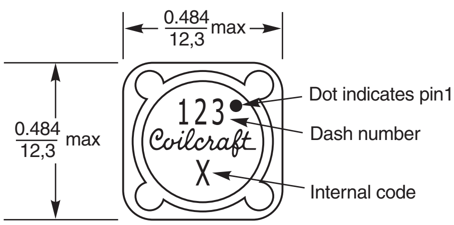


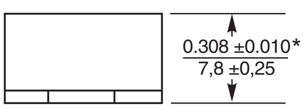
The MS612PND series of coupled inductors was designed for high temperature applications – up to 155°C. Tin-lead (Sn-Pb) terminations are used for the best possible board adhesion.

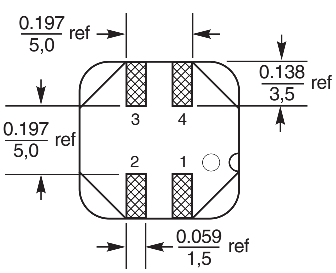
The excellent coupling coefficient (k ≥ 0.98) makes it ideal for use in SEPIC applications. In SEPIC topologies, the required inductance for each winding in a coupled inductor is half the value needed for two separate inductors, allowing selection of a part with lower DCR and higher current handling.

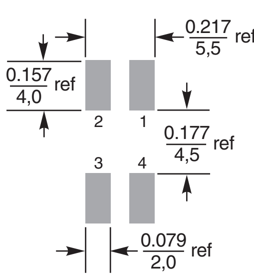
These inductors provide high inductance, high efficiency, excellent current handling and 500 V isolation in a very rugged part. They are well suited for use as VRM inductors in high-current DC-DC and VRM/VRD controllers.

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

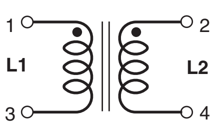






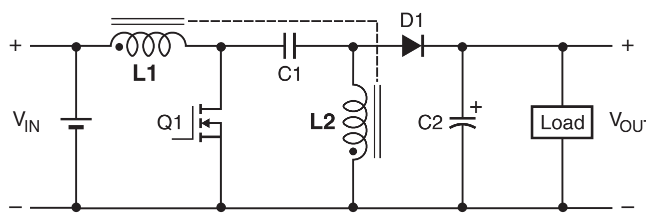


Suggested Land Pattern



* Dimensions are for the mounted part. Dimensions before mounting can be an additional 0.012 inch (0,3 mm).

Dimensions are in $\frac{\text{inches}}{\text{mm}}$



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

Core material Ferrite

Core and winding loss Go to online calculator

Terminations Tin-lead (63/37) over tin over nickel over phos bronze

Weight: 3.8 g – 4.6 g

Ambient temperature –55°C to +105°C with Irms current

Maximum part temperature +155°C (ambient + temp rise).

Storage temperature Component: –55C to +155°C.
Tape and reel packaging: –55°C to +80°C

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)

Winding-to-winding and winding-to-core isolation 500 Vrms

Enhanced crush-resistant packaging 500/13″ reel;
Plastic tape: 24 mm wide, 0.4 mm thick, 16 mm pocket spacing, 8.1 mm pocket depth

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MS612PND Series (1278)

Part number[1]	Inductance[2] (µH)	DCR max[3] (Ohms)	SRF (MHz)[4] min	SRF (MHz)[4] typ	Coupling coefficient typ	Leakage L 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]
MS612PND472MSZ	4.7 ±20%	0.040	26.0	33.0	0.98	0.22	13.90	15.20	16.36	3.16	4.47
MS612PND562MSZ	5.6 ±20%	0.046	24.0	30.0	0.98	0.23	13.38	14.86	15.74	2.87	4.06
MS612PND682MSZ	6.8 ±20%	0.048	18.0	23.0	0.98	0.22	12.10	13.56	14.20	2.81	3.98
MS612PND822MSZ	8.2 ±20%	0.055	16.0	20.0	0.98	0.34	10.30	11.52	12.20	2.76	3.90
MS612PND103MSZ	10 ±20%	0.058	14.0	17.0	0.98	0.34	8.80	10.00	10.66	2.56	3.62
MS612PND123MSZ	12 ±20%	0.062	12.0	15.0	0.98	0.36	8.20	9.18	9.74	2.48	3.50
MS612PND153MSZ	15 ±20%	0.072	10.0	13.0	0.99	0.41	7.40	8.36	9.03	2.30	3.25
MS612PND183MSZ	18 ±20%	0.080	9.6	12.0	0.99	0.37	6.50	7.38	7.86	2.18	3.08
MS612PND223MSZ	22 ±20%	0.096	8.8	11.0	0.99	0.41	6.00	6.80	7.26	1.99	2.81
MS612PND273MSZ	27 ±20%	0.120	8.0	10.0	0.99	0.43	5.80	6.56	7.02	1.78	2.52
MS612PND333MSZ	33 ±20%	0.150	7.6	9.5	0.99	0.56	5.50	6.10	6.52	1.59	2.25
MS612PND393MSZ	39 ±20%	0.161	6.8	8.5	0.99	0.64	4.70	5.26	5.60	1.54	2.18
MS612PND473MSZ	47 ±20%	0.180	6.0	7.5	0.99	0.70	3.70	4.34	4.60	1.45	2.05
MS612PND563MSZ	56 ±20%	0.190	5.6	7.0	0.99	0.76	3.60	4.18	4.50	1.41	2.00
MS612PND683MSZ	68 ±20%	0.210	5.2	6.5	0.99	0.88	3.50	4.04	4.32	1.35	1.90
MS612PND823MSZ	82 ±20%	0.280	4.0	5.0	0.99	0.85	3.30	3.72	4.02	1.16	1.65
MS612PND104MSZ	100 ±20%	0.300	3.6	4.5	>0.99	0.90	2.80	3.24	3.46	1.13	1.59
MS612PND124KSZ	120 ±10%	0.410	3.4	4.3	0.99	1.31	2.60	2.94	3.16	0.96	1.36
MS612PND154KSZ	150 ±10%	0.460	3.3	4.1	>0.99	1.46	2.20	2.54	2.70	0.91	1.29
MS612PND184KSZ	180 ±10%	0.510	3.2	4.0	>0.99	0.93	2.10	2.42	2.58	0.86	1.22
MS612PND224KSZ	220 ±10%	0.690	2.7	3.4	>0.99	1.54	1.90	2.16	2.28	0.74	1.05
MS612PND274KSZ	270 ±10%	0.900	2.5	3.1	>0.99	1.17	1.70	1.94	2.10	0.65	0.92
MS612PND334KSZ	330 ±10%	1.02	2.3	2.9	0.99	4.14	1.50	1.70	1.84	0.61	0.86
MS612PND394KSZ	390 ±10%	1.12	2.2	2.7	>0.99	1.64	1.40	1.60	1.70	0.58	0.82
MS612PND474KSZ	470 ±10%	1.53	1.8	2.2	>0.99	0.25	1.30	1.50	1.60	0.50	0.70
MS612PND564KSZ	560 ±10%	1.69	1.6	2.0	>0.99	2.68	1.20	1.34	1.46	0.47	0.67
MS612PND684KSZ	680 ±10%	2.29	1.4	1.7	>0.99	2.11	1.00	1.08	1.22	0.41	0.58
MS612PND824KSZ	820 ±10%	2.55	1.1	1.4	>0.99	2.39	0.900	1.04	1.18	0.39	0.55
MS612PND105KSZ	1000 ±10%	2.87	1.0	1.3	>0.99	4.28	0.850	0.948	1.05	0.37	0.52

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

   MS612PND105KSZ

   Testing: **Z** = Unscreened
   H = Group A screening per Coilcraft CP-SA-10001
   T = Screening per MIL-STD-981
   U = Screening per EEE-INST-002
   F = Screening per ESCC 3201
   All screening performed to the document's latest revision
   Custom screening also available
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 25°C that causes the specified inductance drop 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.

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.

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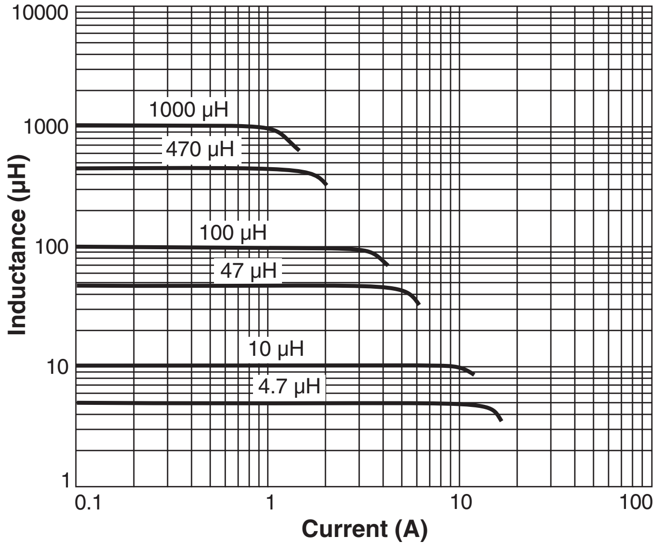
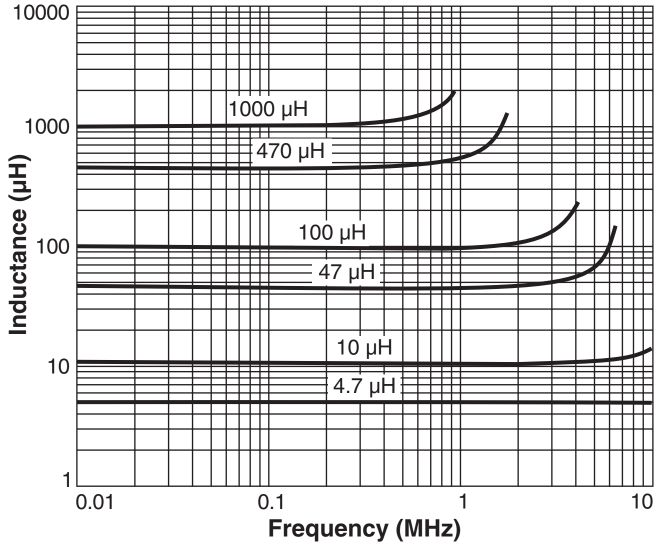
MS612PND Series (1278)

Typical L vs Current



Typical L vs Frequency



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