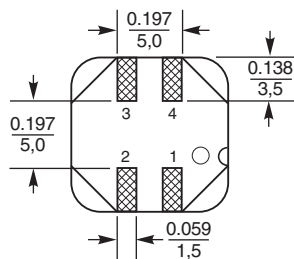
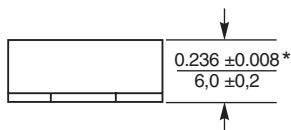
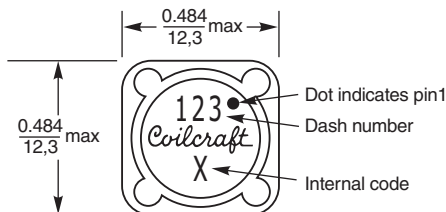


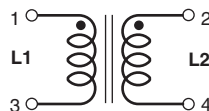
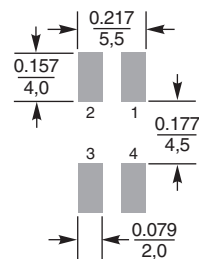
High Reliability Coupled Inductors MS590PND



*Dimensions are for the mounted part.
Dimensions before mounting can be
an additional 0.006 inch (0,152 mm).

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

Suggested Land Pattern

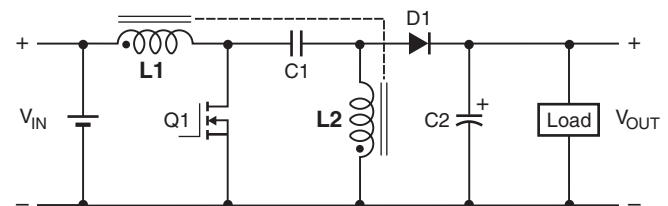


The MS590PND series of shielded coupled inductors was designed specifically for high temperature applications – up to 155°C. Tin-lead (Sn-Pb) terminations are used for the best possible board adhesion.

The excellent coupling coefficient ($k \geq 0.98$) 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.



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: 2.8 – 3.2 g

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

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

Storage temperature Component: –55°C to +155°C.

Tape and reel packaging: –55°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)

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

Enhanced crush-resistant packaging 500/13" reel;

Plastic tape: 24 mm wide, 0.35 mm thick, 16 mm pocket spacing, 6.6 mm pocket depth

MS590PND Series (1260)

Part number ¹	Inductance ² (μ H)	DCR max ³ (Ohms)	SRF (MHz) ⁴		Coupling coefficient typ	Leakage L typ (μ H)	Isat (A) ⁵			Irms (A)	
			min	typ			10% drop	20% drop	30% drop	both windings ⁶	one winding ⁷
MS590PND332MSZ	3.3 \pm 20%	0.020	41.0	52.0	0.98	0.20	11.50	12.90	14.10	3.60	6.10
MS590PND472MSZ	4.7 \pm 20%	0.036	30.0	38.0	0.98	0.20	9.00	10.18	11.08	3.16	4.47
MS590PND562MSZ	5.6 \pm 20%	0.040	24.0	30.0	0.98	0.20	8.00	9.06	9.84	3.00	4.24
MS590PND682MSZ	6.8 \pm 20%	0.048	22.0	27.0	0.98	0.24	7.00	8.00	8.64	2.75	3.88
MS590PND822MSZ	8.2 \pm 20%	0.052	21.0	26.0	0.98	0.25	6.44	7.38	7.98	2.63	3.72
MS590PND103MSZ	10 \pm 20%	0.060	18.0	22.0	0.99	0.26	5.40	6.32	6.88	2.45	3.46
MS590PND123MSZ	12 \pm 20%	0.074	16.0	20.0	0.99	0.28	5.30	6.18	6.70	2.21	3.12
MS590PND153MSZ	15 \pm 20%	0.085	14.4	18.0	0.99	0.32	4.60	5.30	5.80	2.06	2.92
MS590PND183MSZ	18 \pm 20%	0.097	13.0	16.0	0.99	0.40	4.50	5.22	5.68	1.93	2.73
MS590PND223MSZ	22 \pm 20%	0.116	12.0	15.0	0.98	0.67	4.00	4.62	5.02	1.76	2.49
MS590PND273MSZ	27 \pm 20%	0.124	10.0	13.0	0.99	0.50	3.60	4.14	4.50	1.70	2.41
MS590PND333MSZ	33 \pm 20%	0.134	10.0	12.4	0.99	0.65	3.30	3.80	4.14	1.64	2.32
MS590PND393MSZ	39 \pm 20%	0.142	9.6	12.0	0.99	1.09	3.00	3.48	3.82	1.59	2.25
MS590PND473MSZ	47 \pm 20%	0.174	9.3	11.6	0.99	0.80	2.70	3.12	3.40	1.44	2.03
MS590PND563MSZ	56 \pm 20%	0.198	8.4	10.5	0.99	0.75	2.50	2.90	3.14	1.35	1.91
MS590PND683MSZ	68 \pm 20%	0.216	8.0	10.0	>0.99	0.57	2.30	2.66	2.88	1.29	1.83
MS590PND823MSZ	82 \pm 20%	0.274	6.9	8.6	0.99	1.52	2.10	2.40	2.60	1.15	1.62
MS590PND104MSZ	100 \pm 20%	0.322	6.2	7.8	0.99	1.41	1.90	2.18	2.38	1.06	1.50
MS590PND124KSZ	120 \pm 10%	0.418	5.5	6.8	0.99	1.34	1.60	1.84	2.04	0.93	1.31
MS590PND154KSZ	150 \pm 10%	0.476	5.1	6.4	0.99	1.52	1.50	1.76	1.92	0.87	1.23
MS590PND184KSZ	180 \pm 10%	0.536	4.9	6.1	0.99	1.80	1.40	1.64	1.78	0.82	1.16
MS590PND224KSZ	220 \pm 10%	0.691	4.4	5.5	>0.99	1.60	1.30	1.48	1.60	0.72	1.02
MS590PND274KSZ	270 \pm 10%	0.806	3.4	4.3	>0.99	2.23	1.10	1.30	1.40	0.67	0.95
MS590PND334KSZ	330 \pm 10%	1.09	3.2	4.0	>0.99	2.39	1.00	1.16	1.26	0.57	0.81
MS590PND394KSZ	390 \pm 10%	1.20	2.9	3.6	>0.99	3.72	0.950	1.11	1.23	0.55	0.77
MS590PND474KSZ	470 \pm 10%	1.59	2.4	3.0	>0.99	2.89	0.900	0.994	1.09	0.48	0.67
MS590PND564KSZ	560 \pm 10%	1.81	2.2	2.8	>0.99	2.55	0.800	0.908	0.948	0.45	0.63
MS590PND684KSZ	680 \pm 10%	2.06	2.1	2.6	>0.99	5.76	0.700	0.804	0.874	0.42	0.59
MS590PND824KSZ	820 \pm 10%	2.65	2.0	2.5	>0.99	2.86	0.640	0.732	0.802	0.37	0.52
MS590PND105KSZ	1000 \pm 10%	3.06	1.9	2.4	>0.99	4.32	0.590	0.674	0.728	0.34	0.49

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

MS590PND105KSZ

Screening: Z = Unscreened

Y = Unscreened (SLDC Option A)

W = Unscreened (SLDC Option B)

H = Coilcraft CP-SA-10001 Group A

G = Coilcraft CP-SA-10001 Group A (SLDC Option A)

D = Coilcraft CP-SA-10001 Group A (SLDC Option B)

1 = EEE-INST-002 (Family 1) Level 1

2 = EEE-INST-002 (Family 1) Level 2

3 = EEE-INST-002 (Family 1) Level 3

4 = MIL-STD-981 (Family 04) Class B

5 = MIL-STD-981 (Family 04) Class S

F = ESCC3201 (F4 operational life performed at 105°C)

- Screening performed to the document's latest revision.
- Lot qualification (Group B) available.
- Testing T and U have been replaced with more detailed codes 4, 5, and 1, 2, 3, respectively. Codes T and U can still be used, if necessary. Custom testing also available.
- Country of origin restrictions available; prefix options G or F.

- 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.
- 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.
- SRF measured using an Agilent/HP 4191A or equivalent. When leads are connected in parallel, SRF is the same value.
- 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.
- Equal current when applied to each winding simultaneously that causes a 40°C temperature rise from 25°C ambient.
- Maximum current when applied to one winding that causes a 40°C temperature rise from 25°C ambient.
- 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.](#)



CRITICAL PRODUCTS & SERVICES

© Coilcraft, Inc. 2023

1102 Silver Lake Road
Cary, IL 60013
Phone 800-981-0363

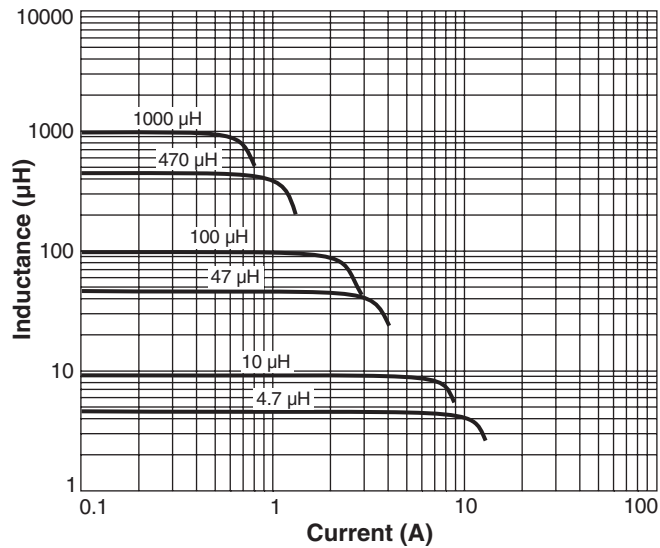
Fax 847-639-1508
Email cps@coilcraft.com
www.coilcraft-cps.com

Document MS703-2 Revised 04/25/23

This product may not be used in medical or high risk applications without prior Coilcraft approval. Specifications subject to change without notice. Please check our web site for latest information.

MS590PND Series (1260)

Typical L vs Current



Typical L vs Frequency

