

SMT POWER INDUCTORS

Shielded Drum Core - PG0085/PG0086 Series



- Height:** 1.8mm Max
- Footprint:** 4.3mm x 4.3mm Max
- Current Rating:** up to 1.5A
- Inductance Range:** 0.7 μ H to 3500 μ H

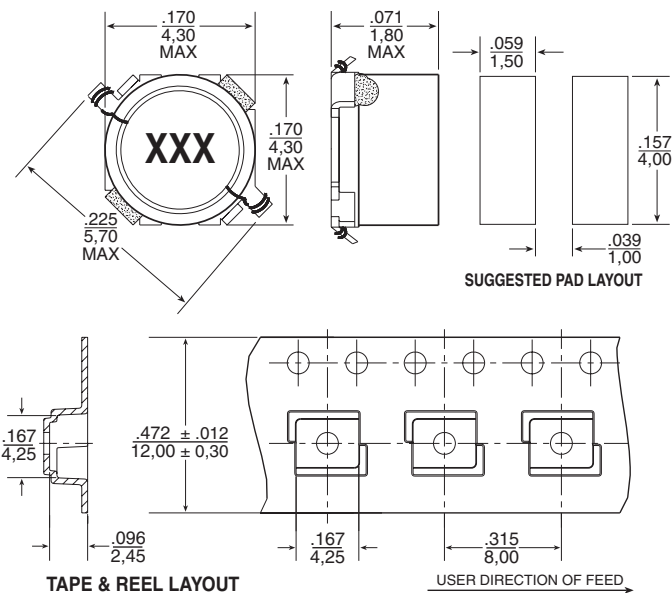
Electrical Specifications @ 25°C — Operating Temperature -40°C to +130°C¹

Part ⁷ Number	Inductance @0Adc (μ H \pm 20%)	Inductance @Irated (μ H TYP)	Irated ⁵ (A)	DCR (Ω)		Saturation ⁶ Current IsAT -40% (A)	Heating ⁷ Current Idc +40°C (A)	Core Loss ⁸ Factor (K2)	SRF (MHz)
				TYP	MAX				
PG0085 SERIES									
PG0085.102	1.0	0.7	1.50	0.026	0.033	1.50	3.00	1300	>40
PG0085.152	1.5	1.0	1.30	0.033	0.038	1.30	2.60	1500	>40
PG0085.222	2.2	1.5	1.10	0.038	0.046	1.10	2.20	1900	>40
PG0085.332	3.3	2.3	1.00	0.060	0.077	1.00	2.00	2200	>40
PG0085.472	4.7	3.3	0.86	0.080	0.100	0.86	1.60	2800	>40
PG0085.682	6.8	4.8	0.66	0.093	0.115	0.66	1.30	3300	38
PG0085.103	10	7.0	0.55	0.152	0.182	0.55	1.10	3600	29
PG0085.153	15	10.5	0.45	0.207	0.235	0.45	0.90	4800	36
PG0085.223	22	15.4	0.40	0.330	0.360	0.40	0.80	5500	33
PG0085.333	33	23.1	0.30	0.463	0.510	0.30	0.60	7300	16
PG0085.473	47	32.9	0.28	0.655	0.780	0.28	0.55	8200	14
PG0085.683	68	47.6	0.26	0.930	1.200	0.26	0.50	10000	12
PG0085.104	100	70	0.18	1.450	1.750	0.18	0.35	12000	10
PG0085.154	150	105	0.16	1.780	2.000	0.16	0.30	15000	8.0
PG0085.224	220	154	0.13	2.800	3.500	0.13	0.26	18000	6.0
PG0086 SERIES									
PG0086.334	330	231	0.080	4.76	5.40	0.080	0.16	23000	5.0
PG0086.474	470	329	0.072	5.82	6.70	0.072	0.14	28000	4.5
PG0086.604	600	420	0.058	8.00	8.80	0.058	0.12	31000	4.2
PG0086.684	680	476	0.055	8.30	9.00	0.055	0.11	33000	3.7
PG0086.824	820	574	0.050	9.50	10.50	0.050	0.10	36000	3.4
PG0086.105	1000	700	0.045	10.70	11.50	0.045	0.09	40000	3.1
PG0086.155	1500	1005	0.043	20.00	22.00	0.043	0.08	50000	2.6
PG0086.205	2000	1400	0.037	24.00	26.00	0.037	0.07	58000	2.0
PG0086.305	3000	2100	0.034	37.60	41.50	0.034	0.06	47000	1.7
PG0086.505	5000	3500	0.024	58.60	62.80	0.024	0.05	90000	1.3

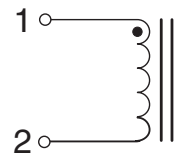
NOTES FROM TABLE: (See page 43)

Mechanical

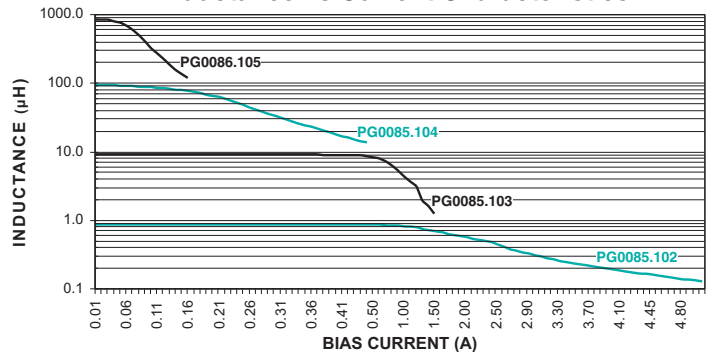
Schematic



Weight0.1 grams
 Tape & Reel2850/reel
 Dimensions: $\frac{\text{Inches}}{\text{mm}}$
 Unless otherwise specified,
 all tolerances are $\pm \frac{.004}{0,10}$



Inductance vs Current Characteristics



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Shielded Drum Core Series



Notes from Tables (pages 27 - 42)

1. Unless otherwise specified, all testing is made at 100kHz, 0.1VAC.
2. Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number (i.e. P1166.102 becomes P1166.102T). Pulse complies with industry standard Tape and Tape & Reel specification EIA481.
3. To order RoHS compliant part, add the suffix "NL" to the part number (i.e. P1166.102 becomes P1166.102NL and P1166.102T becomes P1166.102NLT).
4. Temperature of the component (ambient plus temperature rise) must be within specified operating temperature range.
5. The rated current (I_{rated}) as listed is either the saturation current or the heating current depending on which value is lower.
6. The saturation current, I_{sat}, is the current at which the component inductance drops by the indicated percentage (typical) at an ambient temperature of 25°C. This current is determined by placing the component in the specified ambient environment and applying a short duration pulse current (to eliminate self-heating effects) to the component.
7. The heating current, I_{dc}, is the DC current required to raise the component temperature by the indicated delta (approximately). The heating current is determined by mounting the component on a typical PCB and applying current for 30 minutes. The temperature is measured by placing the thermocouple on top of the unit under test.

8. In high volt*time (Et) or ripple current applications, additional heating in the component can occur due to core losses in the inductor which may necessitate derating the current in order to limit the temperature rise of the component. In order to determine the approximate total loss (or temperature rise) for a given application, both copper losses and core losses should be taken into account.

Estimated Temperature Rise:

$$\text{Trise} = [\text{Total loss (mW)} / K0]^{.833} (\text{°C})$$

$$\text{Total loss} = \text{Copper loss} + \text{Core loss (mW)}$$

$$\text{Copper loss} = I_{RMS}^2 \times \text{DCR (Typical)} \text{ (mW)}$$

$$I_{rms} = [I_{DC}^2 + \Delta I^2/12]^{1/2} \text{ (A)}$$

$$\text{Core loss} = K1 \times f \text{ (kHz)}^{1.23} \times B_{ac}(Ga)^{2.38} \text{ (mW)}$$

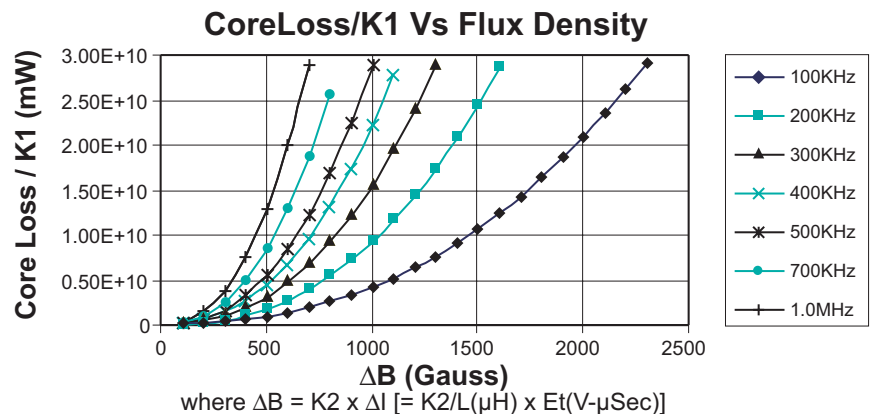
$$\text{Bac (peak to peak flux density)} = K2 \times \Delta I \text{ (Ga)}$$

$$[= K2/L(\mu H) \times Et(V-\mu Sec) \text{ (Ga)}]$$

where f varies between 25kHz and 1MHz, and Bac is less than 2500 Gauss.

K2 is a core size and winding dependant value and is given for each p/n in the proceeding datasheets. K0 & K1 are platform and material dependant constants and are given in the table below for each platform.

Part No.	Trise Factor (K0)	Core Loss Factor (K1)
PG0085/86	2.3	5.29E-10
PG0087	5.8	15.2E-10
PG0040/41	0.8	2.80E-10
P1174	0.8	6.47E-10
PF0601	4.6	14.0E-10
PF0464	3.6	24.7E-10
PF0465	3.6	33.4E-10
P1166	1.9	29.6E-10
P1167	2.1	42.2E-10
PF0560NL	5.5	136E-10
P1168/69	4.8	184E-10
P1170/71	4.3	201E-10
P1172/73	5.6	411E-10
PF0552NL	8.3	201E-10
PF0553NL	7.1	411E-10



Take note that the component's temperature rise varies depending on the system condition. It is suggested that the component be tested at the system level, to verify the temperature rise of the component during system operation.