

# SMT Power Inductors

Shielded Drum Core - PG0085NL Series



- Height:** 1.8mm Max
- Footprint:** 4.3mm x 4.3mm Max
- Current Rating:** up to 1.5A
- Inductance Range:** 0.7μH to 220μH

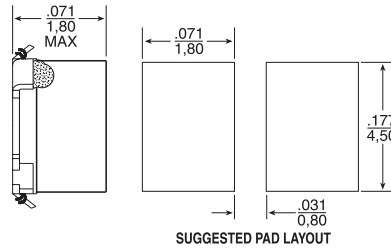
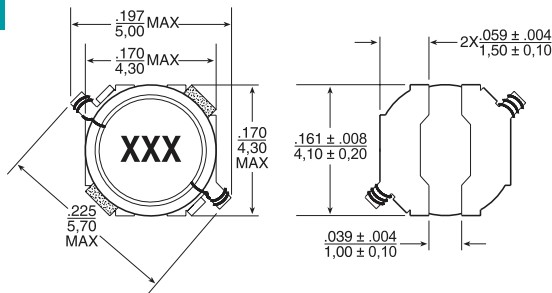
Electrical Specifications @ 25°C - Operating Temperature -40°C to +130°C<sup>1</sup>

Part <sup>2,3</sup> Number	Inductance @ OADC (μH ±20%)	Inductance @ Irated (μH TYP)	Irated <sup>5</sup> (A)	DCR (Ω)		Saturation <sup>6</sup> Current -40% (A)	Heating <sup>7</sup> Current IDC +40°C (A)	Core Loss <sup>8</sup> Factor (K2)	SRF (MHz)
				TYP	MAX				
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	.013	0.26	18000	6.0

## Mechanical

## Schematic

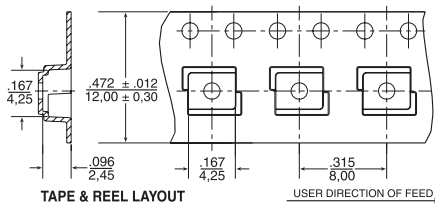
PG0085.XXX



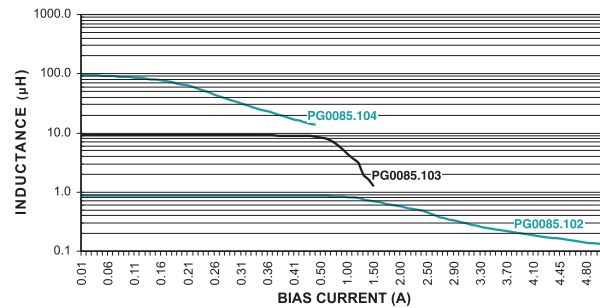
Weight .....0.1 grams  
 Tape & Reel .....2850/reel

Dimensions: Inches  
 mm

Unless otherwise specified,  
 all tolerances are ± .010  
 0,25



Inductance vs Current Characteristics



### Notes:

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 P1166.102NL becomes P1166.102NLT). Pulse complies with industry standard Tape and Tape & Reel specification EIA481.
3. The "NL" suffix indicates an RoHS-compliant part number. Non-NL suffixed parts are not necessarily RoHS compliant, but are electrically and mechanically equivalent to NL versions. If a part number does not have the "NL" version, but an RoHS compliant version is required, please contact Pulse for availability.
4. Temperature of the component (ambient plus temperature rise) must be within specified operating temperature range.
5. The rated current (I<sub>rated</sub>) as listed is either the saturation current or the heating current depending on which value is lower.
6. The saturation current, I<sub>sat</sub>, is the current at which the component inductance drops by the indicated percentage (typical) at an ambient temperature of 25C. 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<sub>dc</sub>, 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:

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

$$Total\ Loss = Copper\ loss + Core\ loss\ (mW)$$

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

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

$$Core\ loss = K1 \times f\ (kHz)^{1.25} \times Bac\ (Ga)^{2.38}\ (mW)$$

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

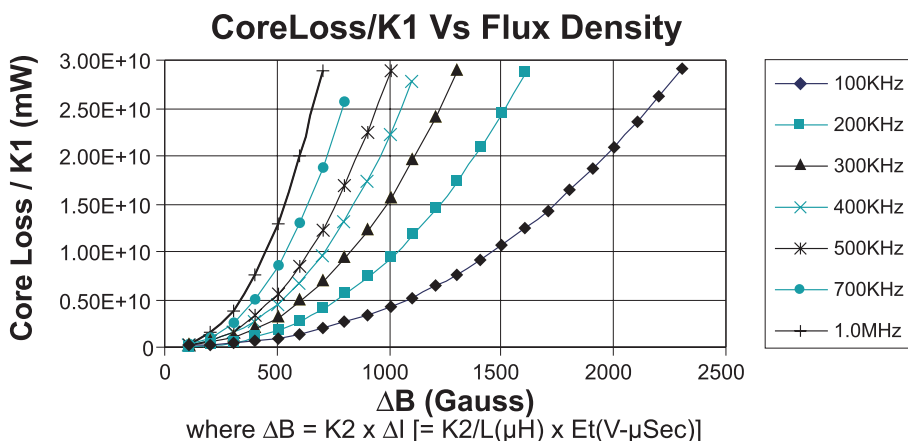
$$[= K2/L\ (\mu H) \times Et\ (V-\mu Sec)\ (Ga)]$$

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

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

\* Contact Pulse for availability

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.

## For More Information

### Pulse Worldwide Headquarters

15255 Innovation Drive Ste 100  
San Diego, CA 92128  
U.S.A.

### Pulse Europe

Pulse Electronics GmbH  
Am Rottland 12  
58540 Meinerzhagen  
Germany

### Pulse China Headquarters

Pulse Electronics (ShenZhen) CO., LTD  
D708, Shenzhen Academy of  
Aerospace Technology,  
The 10th Keji South Road,  
Nanshan District, Shenzhen,  
P.R. China 518057

### Pulse North China

Room 2704/2705  
Super Ocean Finance Ctr.  
2067 Yan An Road West  
Shanghai 200336  
China

### Pulse South Asia

3 Fraser Street 0428  
DUO Tower  
Singapore 189352

### Pulse North Asia

1F., No.111 Xiyuan Road  
Zhongli District  
Taoyuan City 32057  
Taiwan (R.O.C)

Tel: 858 674 8100  
Fax: 858 674 8262

Tel: 49 2354 777 100  
Fax: 49 2354 777 168

Tel: 86 755 33966678  
Fax: 86 755 33966700

Tel: 86 21 62787060  
Fax: 86 2162786973

Tel: 65 6287 8998  
Fax: 65 6280 0080

Tel: 886 3 4356768  
Fax: 886 3 4356820

Performance warranty of products offered on this data sheet is limited to the parameters specified. Data is subject to change without notice. Other brand and product names mentioned herein may be trademarks or registered trademarks of their respective owners. © Copyright, 2019. Pulse Electronics, Inc. All rights reserved.