SMT POWER INDUCTORS
Shielded Drum Core - P1167 Series

Pulse®
A TECHNITROL COMPANY

RoHS COMPLIANT

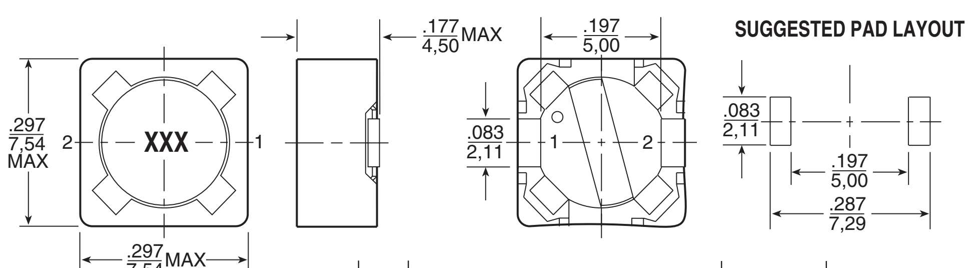
- **Height:** 4.8mm Max
- **Footprint:** 7.5mm x 7.5mm Max
- **Current Rating:** up to 3.5A
- **Inductance Range:** 1.8µH to 750µH

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

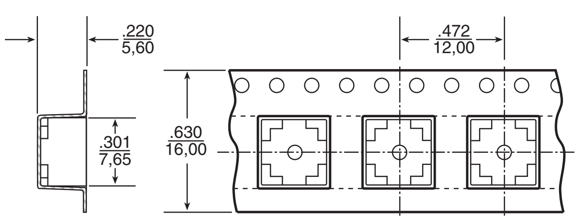
Part Number	Inductance @0ADC (µH ±20%)	Inductance @Irated (µH) MIN	Irated [5] (ADC)	DCR (mΩ) TYP	DCR (mΩ) MAX	Saturation [6] Current -25% (A)	Heating [7] Current +40°C(A)	Core Loss [8] Factor (K2)	SRF (MHz)
P1167.272	2.7*	1.8	3.5	13	16	3.5	3.6	590	>40
P1167.362	3.6*	2.3	3.1	15	20	3.1	3.4	690	>40
P1167.452	4.5*	2.9	2.6	25	30	2.9	2.6	770	>40
P1167.542	5.4*	3.5	2.5	27	33	2.7	2.5	840	>40
P1167.632	6.3*	4.1	2.4	30	35	2.5	2.4	900	36
P1167.103	10	7.5	2.0	42	50	2.1	2.0	1100	26
P1167.123	12	9.0	1.9	46	57	1.9	1.9	1200	24
P1167.153	15	11.3	1.7	53	66	1.7	1.8	1300	20
P1167.183	18	13.5	1.5	59	73	1.5	1.7	1400	18
P1167.223	22	16.5	1.4	87	105	1.4	1.4	1700	17
P1167.273	27	20.3	1.2	100	130	1.2	1.3	1800	15
P1167.333	33	24.8	1.1	139	170	1.1	1.1	2000	13
P1167.393	39	29.3	1.0	156	200	1.0	1.0	2200	12
P1167.473	47	35.3	0.94	173	220	0.94	1.0	2400	10
P1167.563	56	42	0.86	225	270	0.86	0.86	2600	9.2
P1167.683	68	51	0.78	251	310	0.78	0.81	2900	8.8
P1167.823	82	61.5	0.7	282	350	0.7	0.77	3200	8.0
P1167.104	100	75	0.63	317	390	0.63	0.72	3500	6.2
P1167.124	120	90	0.57	418	530	0.57	0.63	3900	6.1
P1167.154	150	113	0.52	497	610	0.52	0.58	4300	5.6
P1167.184	180	135	0.47	635	820	0.47	0.51	4800	4.5
P1167.224	220	165	0.43	745	930	0.43	0.47	5200	4.3
P1167.274	270	203	0.39	840	1040	0.39	0.44	5700	3.8
P1167.334	330	248	0.35	1162	1470	0.35	0.38	6400	3.0
P1167.394	390	293	0.32	1237	1570	0.32	0.37	6900	2.8
P1167.474	470	353	0.29	1688	2180	0.29	0.31	7600	2.6
P1167.564	560	420	0.26	2240	2960	0.26	0.27	8300	2.4
P1167.684	680	510	0.23	2402	3180	0.23	0.26	9300	2.1
P1167.824	820	615	0.21	2702	3500	0.21	0.25	10000	2.0
P1167.105	1000	750	0.19	3703	4930	0.19	0.21	11000	1.8

*Inductance at 0ADC tolerance on indicated part numbers is ±30%; tolerance is ±20% on all other parts. ***NOTES FROM TABLE:*** *(See page 43)*

Mechanical

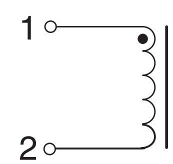


Weight . . . . 0.9 grams
Tape & Reel. 900/reel



TAPE & REEL LAYOUT

Schematic



Dimensions: $\frac{\text{Inches}}{\text{mm}}$

Unless otherwise specified, all tolerances are ± $\frac{.010}{0,25}$

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 P1166.102**NL** and P1166.102T becomes P1166.102**NL**T).
4. Temperature of the component (ambient plus temperature rise) must be within specified operating temperature range.
5. The rated current (Irated) as listed is either the saturation current or the heating current depending on which value is lower.
6. The saturation current, Isat, 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, Idc, 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]$^{.833}$ (°C)

Total loss = Copper loss + Core loss (mW)

Copper loss = I_{RMS}^2 x DCR (Typical) (mW)

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

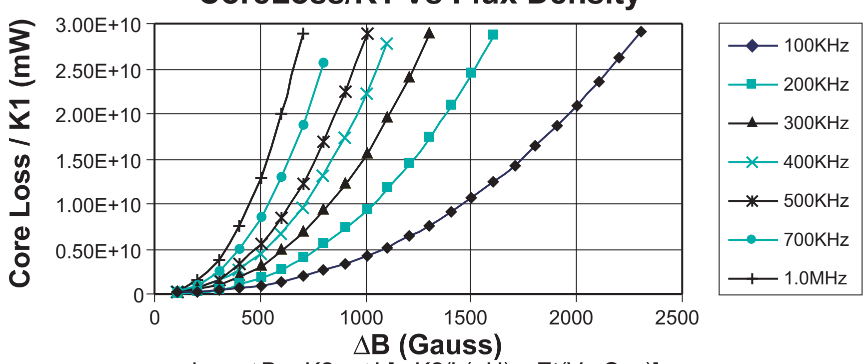
Core loss = K1 x f (kHz)$^{1.23}$ x Bac(Ga)$^{2.38}$ (mW)

Bac (peak to peak flux density) = K2 x ΔI (Ga)
[= K2/L(µH) x Et(V-µSec) (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

CoreLoss/K1 Vs Flux Density



where ΔB = K2 x ΔI [= K2/L(µH) x Et(V-µSec)]

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.