SMT POWER INDUCTORS
Shielded Drum Core - P1168/P1169 Series

Pulse
A TECHNITROL COMPANY

RoHS COMPLIANT

- **Height:** 4.5mm Max
- **Footprint:** 12.2mm x 12.2mm Max
- **Current Rating:** up to 14A
- **Inductance Range:** .32µH to 750µH

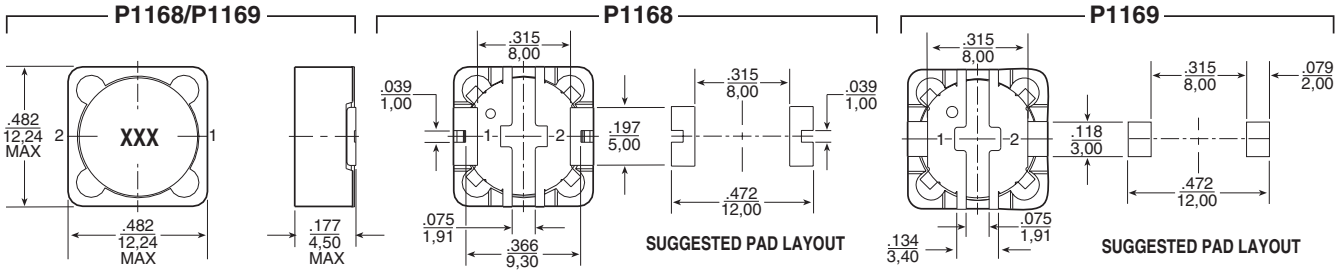
Electrical Specifications @ 25°C — Operating Temperature -40°C to +130°C

Part Numbers [2,3]		Inductance @0ADC (µH)	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)
P1168.501	P1169.501	0.5*	0.32	14	1.9	2.3	18	14	100	>40
P1168.102	P1169.102	1.0*	0.65	11	3.0	3.7	14	11	150	>40
P1168.162	P1169.162	1.6*	1.0	8.5	5.4	6.3	10	8.5	180	>40
P1168.242	P1169.242	2.4*	1.6	7.5	6.9	8.1	8.1	7.5	220	>40
P1168.332	P1169.332	3.3*	2.2	6.4	9.5	11	7.3	6.4	260	>40
P1168.452	P1169.452	4.5*	2.9	6.0	11	13	6.4	6.0	310	35
P1168.562	P1169.562	5.6*	3.6	5.5	13	15	5.7	5.5	340	30
P1168.682	P1169.682	6.8*	4.4	4.6	18	22	5.2	4.6	370	27
P1168.103	P1169.103	10	7.5	3.6	29	35	4.1	3.6	440	21
P1168.123	P1169.123	12	9.0	3.5	32	37	3.8	3.5	490	19
P1168.153	P1169.153	15	11.3	3.1	40	47	3.3	3.1	570	17
P1168.183	P1169.183	18	13.5	2.8	48	58	2.9	2.8	590	15
P1168.223	P1169.223	22	16.5	2.6	55	67	2.7	2.6	640	13
P1168.273	P1169.273	27	20.3	2.4	67	79	2.4	2.4	740	12
P1168.333	P1169.333	33	24.8	2.2	76	94	2.2	2.2	820	11
P1168.393	P1169.393	39	29.3	1.9	101	126	2.0	1.9	880	10
P1168.473	P1169.473	47	35.3	1.8	112	140	1.9	1.8	980	9.0
P1168.563	P1169.563	56	42.0	1.7	129	157	1.7	1.7	1000	8.0
P1168.683	P1169.683	68	51.0	1.5	169	202	1.5	1.6	1200	7.0
P1168.823	P1169.823	82	61.5	1.4	191	232	1.4	1.5	1300	6.0
P1168.104	P1169.104	100	75.0	1.2	222	270	1.2	1.4	1400	6.0
P1168.124	P1169.124	120	90.0	1.1	252	316	1.1	1.3	1500	5.5
P1168.154	P1169.154	150	113	1.0	346	456	1.0	1.1	1700	4.9
P1168.184	P1169.184	180	135	0.90	385	497	0.90	1.1	1900	4.4
P1168.224	P1169.224	220	165	0.80	506	681	0.80	0.93	2100	3.7
P1168.274	P1169.274	270	203	0.70	596	775	0.70	0.85	2300	3.3
P1168.334	P1169.334	330	248	0.66	764	955	0.66	0.75	2600	2.8
P1168.394	P1169.394	390	293	0.62	870	1087	0.62	0.71	2800	2.6
P1168.474	P1169.474	470	353	0.57	1150	1403	0.57	0.61	3100	2.4
P1168.564	P1169.564	560	420	0.53	1283	1623	0.53	0.58	3300	2.2
P1168.684	P1169.684	680	510	0.50	1493	1824	0.50	0.54	3700	2.1
P1168.824	P1169.824	820	615	0.44	1924	2355	0.44	0.47	4000	1.7
P1168.105	P1169.105	1000	750	0.40	2174	2850	0.40	0.45	4500	1.5

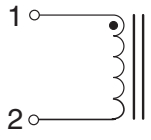
*Inductance at 0ADC tolerance on indicated part numbers is ±30%; tolerance is ±20% on all other parts.

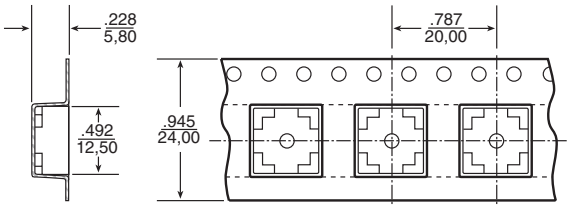
NOTES FROM TABLE: *(See page 43)*

Mechanical



Schematic:





TAPE & REEL LAYOUT

Weight . . . . . 2.5 grams
Tape & Reel 500/reel

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .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)

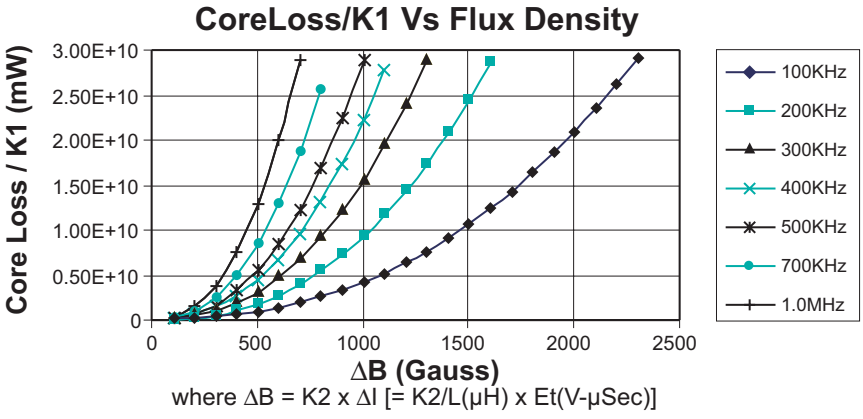
Copper loss = I_{RMS}^2 x DCR (Typical) (mW)

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



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.