SMT POWER INDUCTORS
Shielded Drum Core - P1174NL Series

Pulse
A TECHNITROL COMPANY

RoHS COMPLIANT



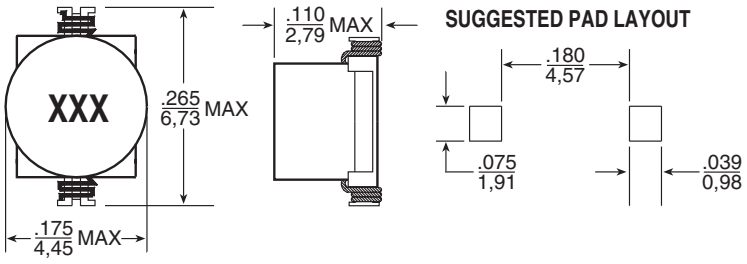
- **Height:** 2.8mm Max
- **Footprint:** 6.7mm x 4.5mm Max
- **Current Rating:** up to 3.0A
- **Inductance Range:** 1µH to 5000µH

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

Part [2,3] Number	Inductance @ 0ADC (uH ±20%)	Inductance @ Irated Typical	Irated [5] (ADC)	DCR (mΩ) (MAX)	Saturation [6] Current -30% (A)	Heating [7] Current +30°C (A)	Core Loss [8] Factor (K2)	SRF (MHz)
P1174.102NL	1.0	0.7	3	13	3	3.0	1600	>40
P1174.152NL	1.5	1.0	2.0	15	2.0	2.8	1900	>40
P1174.222NL	2.2	1.6	1.7	18	1.7	1.8	2300	>40
P1174.332NL	3.3	2.3	1.3	21	1.3	1.6	3400	>40
P1174.472NL	4.7	3.4	1.0	30	1.0	1.4	4100	>40
P1174.682NL	6.8	4.8	0.90	51	0.90	1.2	4500	34
P1174.103NL	10	7.2	0.80	73	0.80	1.0	5400	31
P1174.153NL	15	14	0.60	90	0.60	0.8	6300	25
P1174.223NL	22	18	0.50	120	0.50	0.7	8000	20
P1174.333NL	33	26	0.40	188	0.40	0.6	10000	16
P1174.473NL	47	32	0.35	230	0.35	0.5	11000	14
P1174.683NL	68	45	0.32	370	0.32	0.4	14000	11
P1174.104NL	100	74	0.28	470	0.28	0.3	17000	9.0
P1174.154NL	150	109	0.22	620	0.22	0.26	21000	8.0
P1174.224NL	220	161	0.15	950	0.15	0.22	26000	6.0
P1174.334NL	330	208	0.14	1340	0.14	0.20	32000	5.0
P1174.474NL	470	350	0.13	1800	0.13	0.19	39000	3.9
P1174.604NL	600	412	0.12	2550	0.12	0.18	43000	3.7
P1174.684NL	680	500	0.10	2650	0.10	0.17	47000	3.6
P1174.105NL	1000	744	0.07	4000	0.07	0.15	57000	2.6
P1174.335NL	3300	2300	0.065	11000	0.065	0.09	99000	1.6
P1174.505NL	5000	4900	0.05	18500	0.05	0.05	130000	1.2

NOTES FROM TABLE: *(See page 43)*

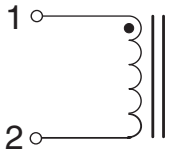
Mechanical

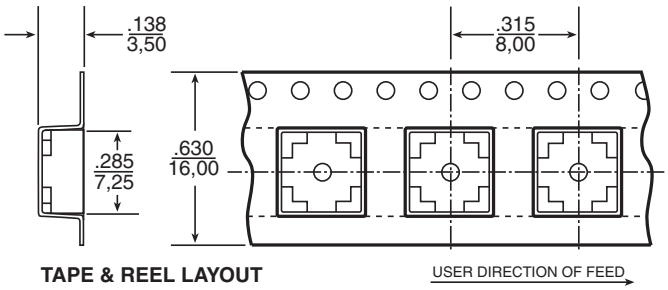


Weight . . . . . 0.1 grams
Tape & Reel 2500/reel
Dimensions: Inches / mm

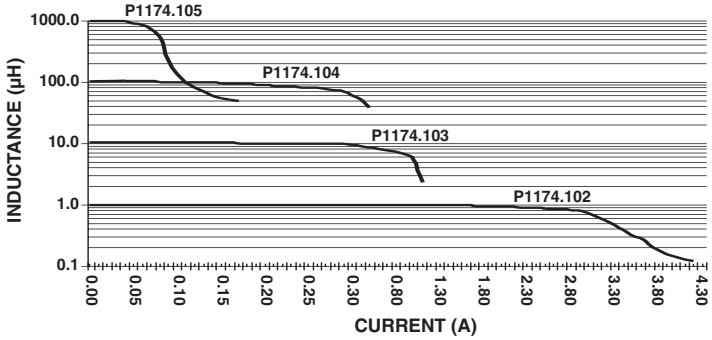
Unless otherwise specified, all tolerances are ± .010 / 0,25

Schematic





TYPICAL INDUCTANCE VS. DC BIAS



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. P1166.102NL becomes P1166.102NL**T**). 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**" suffix, 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 (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]$^{.833}$ (^{o}C)

Total loss = Copper loss + Core loss (mW)

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

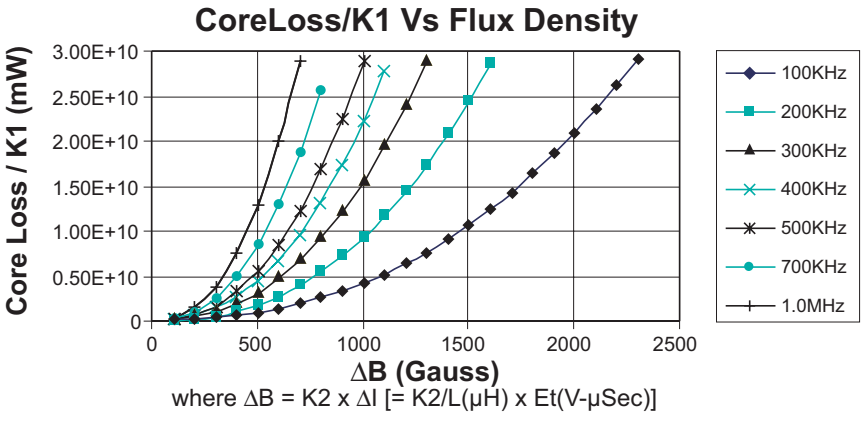
Irms = [I_{DC}^2 + $\Delta I^2/12$]$^{1/2}$ (A)

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



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.