SMT Power Inductors

Power Beads - Volta 1 & 2 series

- ***Height:*** *3.2mm and 4.5mm Max*
- ***Footprint:*** *7.0 x 6.4mm Max and 8.9 x 6.4mm Max*
- ***Current Rating:*** *up to 16A*
- ***Inductance Range:*** *0.1µH to 0.6µH*
- ***Frequency Range:*** *up to 2MHz*

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

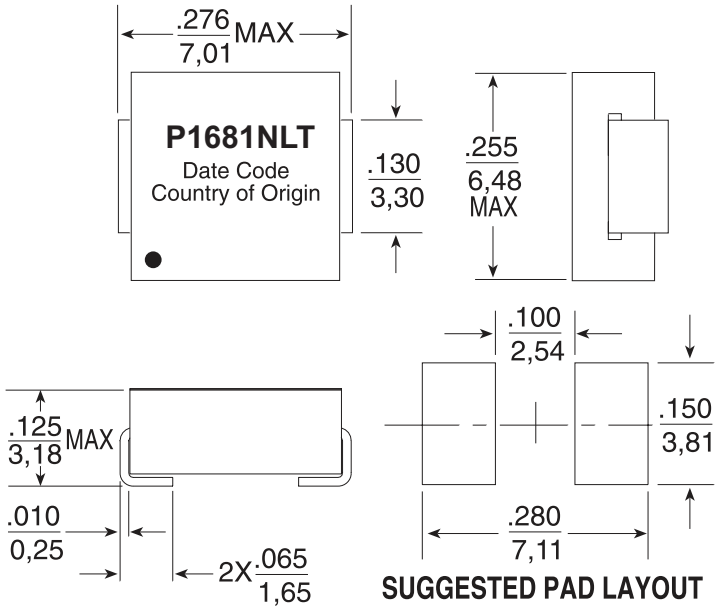
Part[5,6] Number	Inductance @ Irated (nH ± 20%)	Irated (A_{DC})	DCR (mΩ) TYP	DCR (mΩ) MAX	Inductance @ 0A_{DC} (nH ± 20%)	Saturation Current[2] (A_{DC}) 25°C	Saturation Current[2] (A_{DC}) 100°C	Heating[3] Current (A)	Trise[4] Factor K0	Core Loss Factor[4] K1	Core Loss Factor[4] K2
Volta 1											
P1681NLT	95	15	0.31	0.39	100	18	16.2	15	1.0032	.00319	.07381
Volta 2											
PA0229NL	92	16	0.68	0.80	100	36	30	16	2.2458	.00638	.03975
P2005 NL**	142.5	15	0.45	0.56	150	18	16.2	15	2.2458	.00638	.05961
P2004NL	190	15	0.45	0.56	200	16.8	15.1	15	2.2458	.00638	.07949
PA0277 NL**	600*	10.7	2.3	95	700	12.6	8.0	10.7	2.0400	.01276	.13196

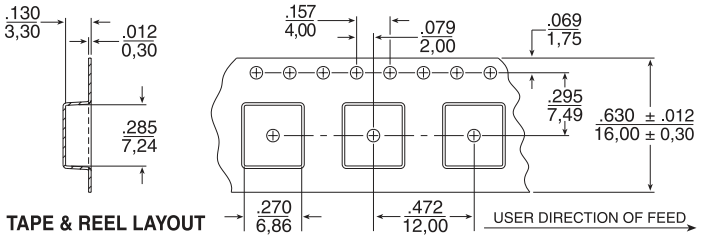
* DCR and Inductance rating for indicated parts is for both windings tied in series.

** Contact Pulse for availability

Mechanical

Volta 1





Weight .....0.464 grams

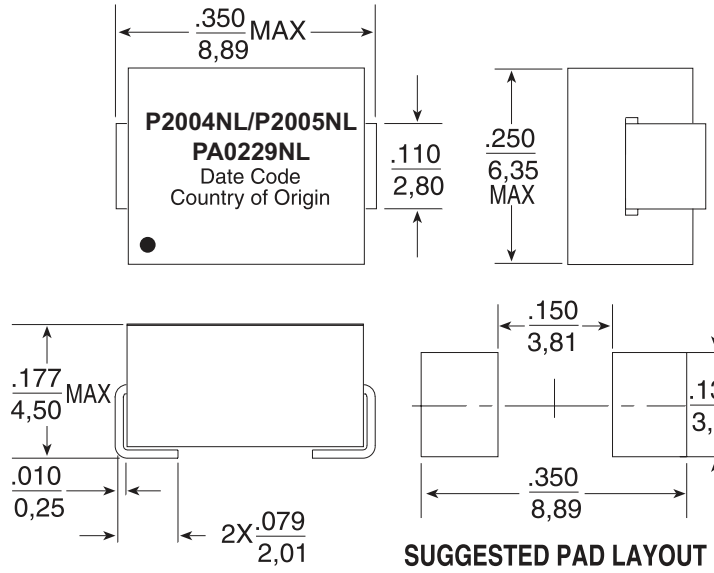
Tape & Reel 1500/reel

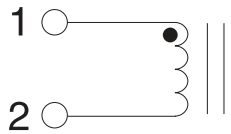
Dimensions: Inches / mm Unless otherwise specified, all tolerances are ± .010 / 0,25

Mechanicals *(continued)*

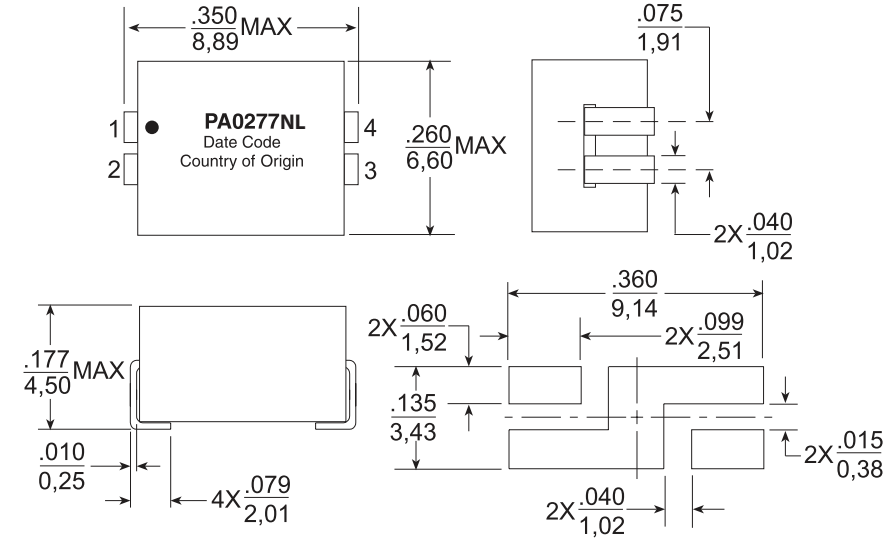
Schematics

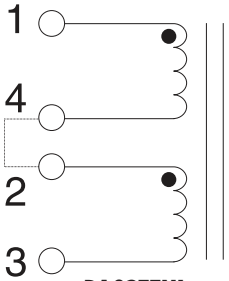
Volta 2



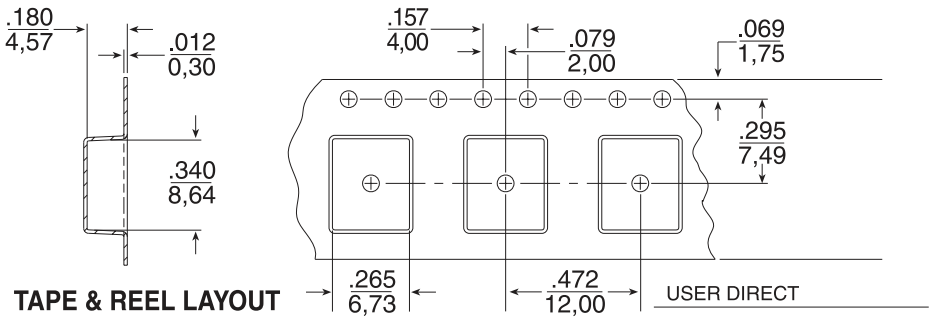


P1681NL
P2004NL
P2005NL
PA0229NL





PA0277NL



Weight .....0.945 grams
Tape & Reel 1000/reel

Dimensions: Inches / mm

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

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Notes:

1. The rated current as listed is either the saturation current or the heating current depending on which value is lower.
2. The saturation current is the current which causes the inductance to drop by 10% at the stated ambient temperatures (-40°C, 25°C, 125°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.
3. The heating current is the DC current which causes the temperature of the part to increase by approximately 30°C. This current is determined by mounting the component on a PCB with .25" wide, 3 oz. equivalent copper traces, and applying the current to the device for 30 minutes.
4. In high volt*time applications, additional heating in the component can occur due to core losses in the inductor which may neccessitate derating the current in order to limit the temperature rise of the component. In order to determine the approximate total losses (or temperature rise) for a given application both copper losses and core losses should be taken into account.
5. Optional Tape & Reel packaging can be ordered by adding a "**T**" suffix to the part number, (i.e. PA0277NL**T**).

Estimated Temperature Rise:

$$\textbf{Trise} = \left[\frac{\text{Coreloss (mW)} + \text{Copper Loss (mW)}}{K0}\right]^{.833} \quad (°C)$$

$$\textbf{Coreloss} = K1 * (Fsw\ (kHz))^{1.6688} * (K2 * dI)^{2.17} \quad (mW)$$

$$\textbf{Copper Loss} = Irms^2 * DCR\ (m\Omega) \quad (mW)$$

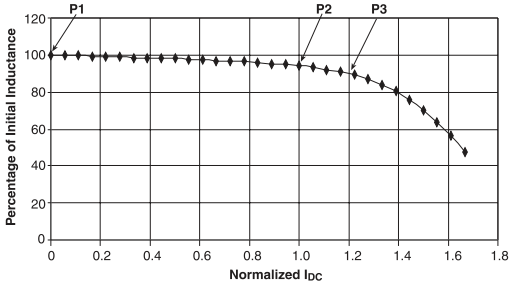
$$\textbf{Irms} = \left[IDC^2 + \left(\frac{dI}{12}\right)^2\right]^{1/2} \quad (Arms)$$

Fsw(kHz) = switching frequency (kHz)

dI = delta I across the component (A)

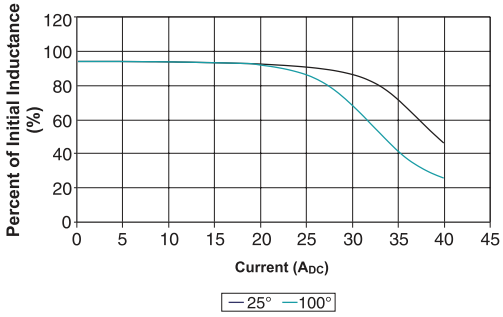
The temperature of the component (ambient temperature + temperature rise) should be within the listed operating temperature range.

Inductance vs Current Characteristics
P1681NLT, P2005NL, P2004NL

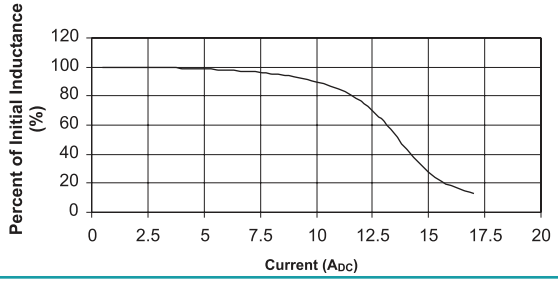


P1 - Initial Inductance, Lo (.1V_{RMS}, 1MHz, 0A_{DC}, 25°C)
P2 - Inductance (typically 95% L_O) at Rated I_{DC}.
P3 - Inductance (typically 90% L_O) at I_{PK}.

PA0229NL Inductance vs. DC Current at 25°C



PA0277NL Inductance vs. DC Current at 25°C



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