

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

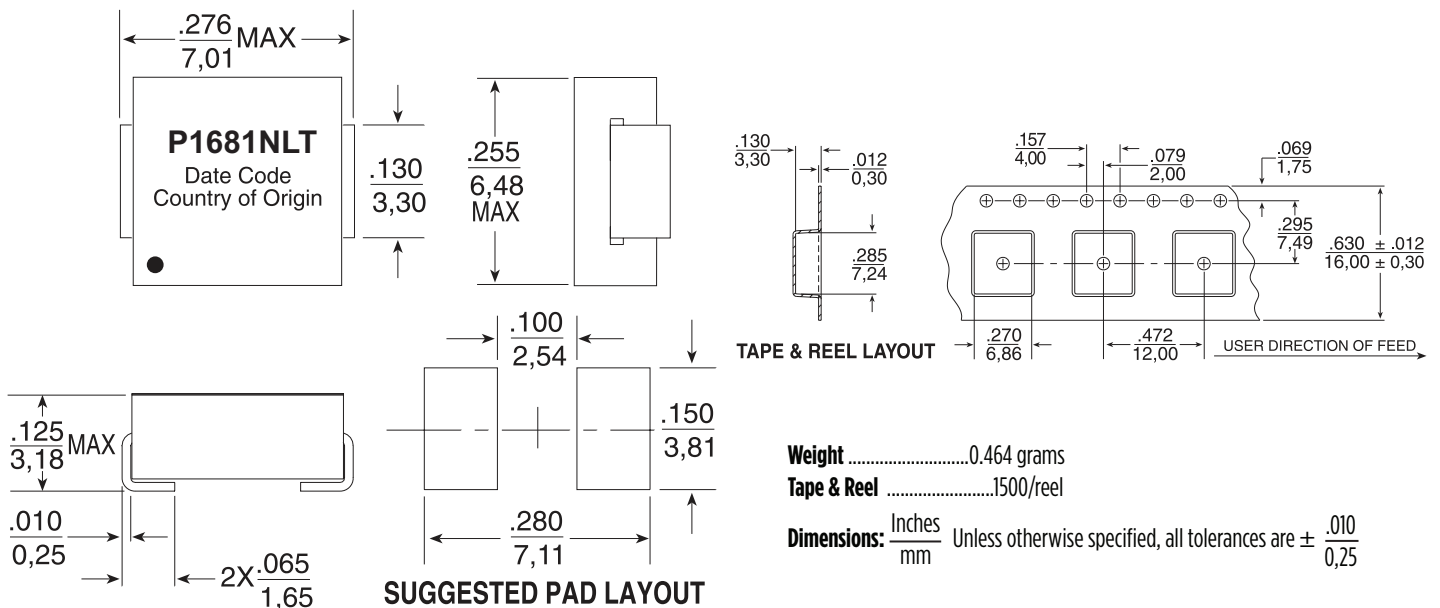
| Part ^{5,6} Number | Inductance @ I _{rated} (nH ± 20%) | I _{rated} (A _{DC}) | DCR (mΩ) | | Inductance @ 0A _{DC} (nH ± 20%) | Saturation Current ² (A _{DC}) | | Heating ³ Current (A) | Trise ⁴ Factor K0 | Core Loss Factor ⁴ | |
|-------------------------------|--|--|-------------|------|--|---|-------|--|------------------------------------|-------------------------------|--------|
| | | | TYP | MAX | | 25°C | 100°C | | | K1 | 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



USA 858 674 8100

Germany 49 7032 7806 0

Singapore 65 6287 8998

Shanghai 86 21 62787060

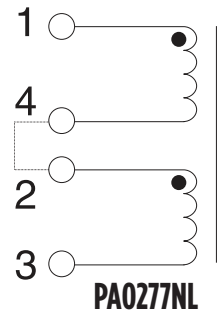
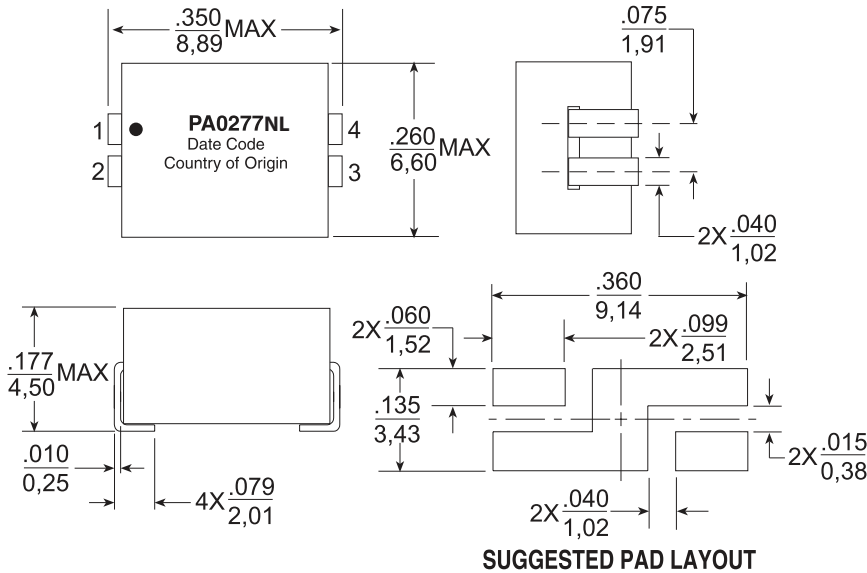
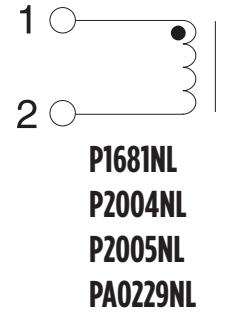
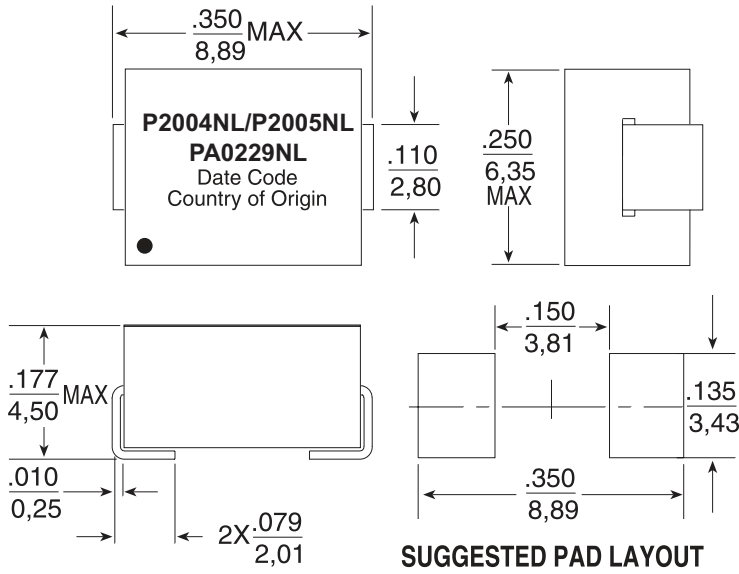
China 86 755 33966678

Taiwan 886 3 4356768

Mechanicals (continued)

Schematics

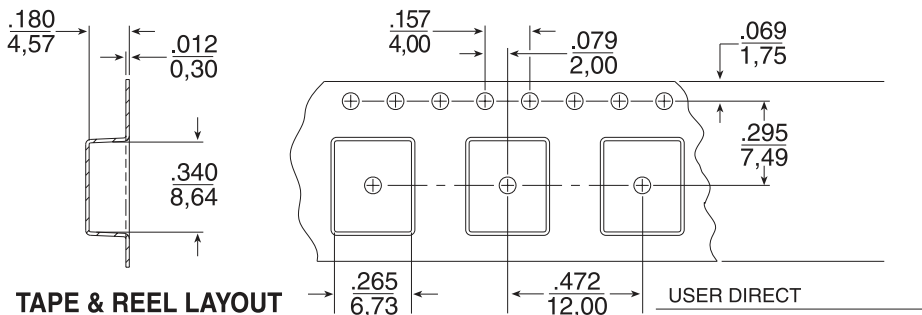
Volta 2



Weight0.945 grams
Tape & Reel1000/reel

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

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



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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 necessitate 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. PA0277NLT).

Estimated Temperature Rise:

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

$$\text{Coreloss} = K1 * (\text{Fsw (kHz)})^{1.6688} * (K2 * \text{dl})^{2.17} \text{ (mW)}$$

$$\text{Copper Loss} = \text{Irms} * \text{DCR (m}\Omega\text{)} \text{ (mW)}$$

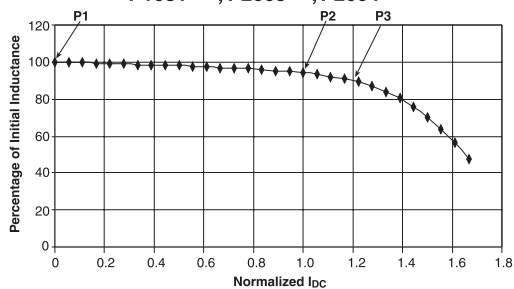
$$\text{Irms} = \left[\text{IDC}^2 + \left(\frac{\text{dl}}{12} \right)^2 \right]^{1/2} \text{ (Arms)}$$

$$\text{Fsw(kHz)} = \text{switching frequency (kHz)}$$

$$\text{dl} = \text{delta l across the component (A)}$$

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

Inductance vs Current Characteristics
P1681NLT, P2005NL, P2004NL



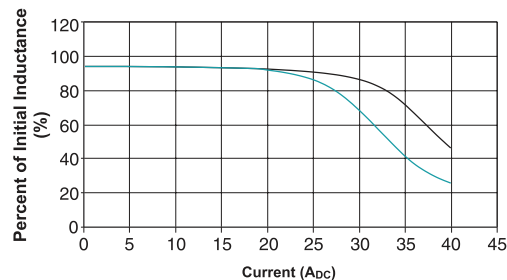
P1 - Initial Inductance, Lo (.1V_{RMS}, 1MHz, 0A_{DC}, 25°C)

P2 - Inductance (typically 95% Lo) at Rated Ioc.

P3 - Inductance (typically 90% Lo) at I_{PK}.

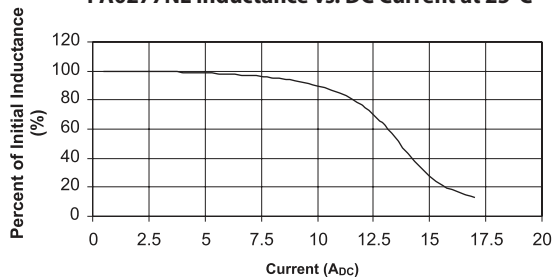
— Normalized Inductance

PA0229NL Inductance vs. DC Current at 25°C



— 25° — 100°

PA0277NL Inductance vs. DC Current at 25°C



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