

# SMT POWER INDUCTORS

## Power Beads - PA0135 Series



- Height:** 7.1mm Max
- Footprint:** 13.0mm x 13.0mm Max
- Current Rating:** up to 40A
- Inductance Range:** .074μH to 0.9μH

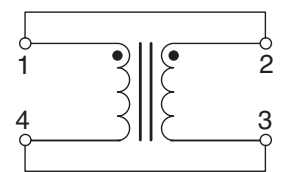
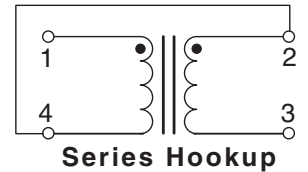
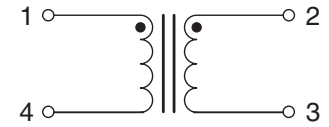
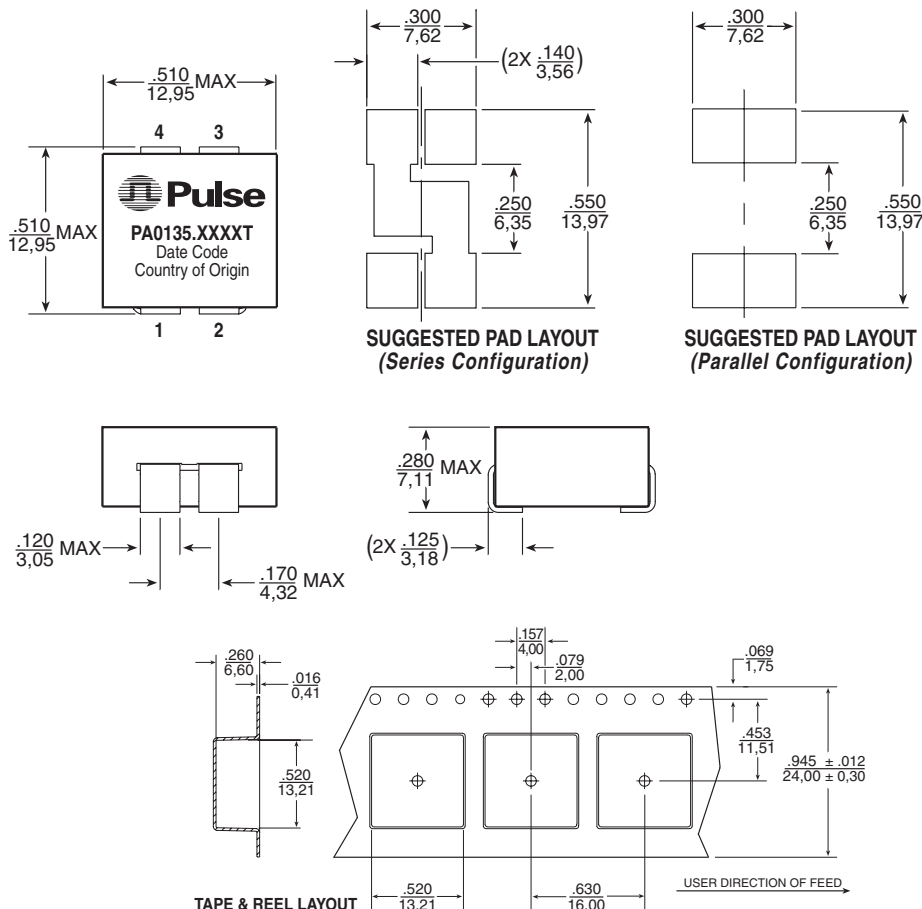
### Electrical Specifications @ 25°C — Operating Temperature -40°C to +130°C

Part Number <sup>5,6</sup>	Inductance @ Irated (nH ± 20%)	Irated <sup>3</sup> (A dc)	DCR (mΩ)		Inductance @ 0A dc (nH ± 20%)	Saturation Current <sup>2</sup> (A dc)		Heating Current <sup>3</sup> (A)	Trise <sup>4</sup> Factor K0	Core Loss Factor <sup>4</sup>		Connection
			TYP	MAX		25°C	125°C			K1	K2	
<b>VOLTA 5</b>												
PA0135.331	74	40	0.18	0.225	82.5	40+	40+	40	6.38037	0.02566	0.01547	Parallel
PA0135.471	105	40	0.18	0.225	118	40+	40+	40	6.38037	0.02566	0.02204	Parallel
PA0135.681	153	34	0.18	0.225	170	40+	34	40	6.38037	0.02566	0.03188	Parallel
PA0135.102	225	24	0.18	0.225	250	35	24	40	6.38037	0.02566	0.04689	Parallel
PA0135.331	297	20	0.74	0.9*	330	40+	32	20	6.38037	0.02566	0.03094	Series
PA0135.471	423	20	0.74	0.9*	470	37	26	20	6.38037	0.02566	0.04407	Series
PA0135.681	612	19	0.74	0.9*	680	25	19	20	6.38037	0.02566	0.06377	Series
PA0135.102	900	14	0.74	0.9*	1000	18	14	20	6.38037	0.02566	0.09377	Series

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

### Mechanical

### Schematic



**Parallel Hookup**

**Weight** . . . . . 4.15 grams  
**Tape & Reel** . . . . . 500/reel

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

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### Notes from Tables

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 40°C. This current is determined by mounting the component on a PCB with .25" wide, 2 oz. equivalent copper traces, and applying the current to the device for 30 minutes. In the series hookup mode, the resistance of the interconnection needs to be taken into account when calculating temperature rise.
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. PA0135.102T).

6. To order RoHS compliant part, add the suffix "NL" to the part number (i.e. PA0135.102 becomes PA0135.102NL and PA0135.102T becomes PA0135.102NLT).

### Estimated Temperature Rise:

$$T_{rise} = \left[ \frac{Coreloss (mW) + DCRLoss (mW)}{K0} \right]^{.833} (^\circ C)$$

$$Coreloss = KI * (F_{sw}(kHz))^{1.6688} * (K2 * dI)^{2.17} (mW)$$

$$DCRLoss = I_{rms}^2 * DCR(m\Omega) (mW)$$

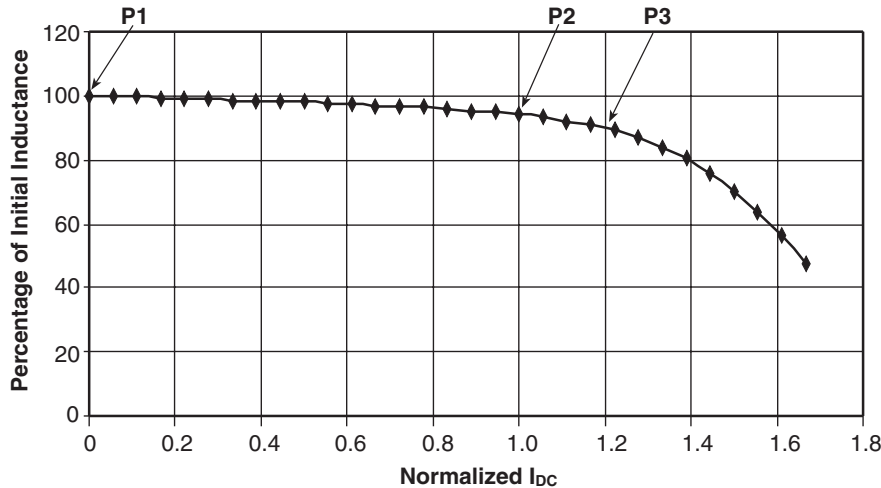
$$I_{rms} = \left[ IDC^2 + \left[ \frac{dI}{12} \right]^2 \right]^{1/2} (Arms)$$

$$F_{sw}(kHz) = \text{switching frequency (kHz)}$$

$$dI = \text{delta I across the component (A)}$$

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

### Inductance vs Current Characteristics



P1 - Initial Inductance, L<sub>0</sub> (.1V<sub>RMS</sub>, 300kHz, 0A<sub>DC</sub>, 25°C)

P2 - Inductance (typically 95% L<sub>0</sub>) at Rated I<sub>DC</sub>.

P3 - Inductance (typically 90% L<sub>0</sub>) at I<sub>PK</sub>.

—◆— Normalized Inductance

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