

# SMT POWER INDUCTORS

## Power Beads - PA0766NL Series



- Two independent inductors integrated into a single package
- Less board space and lower cost than two separate inductors
- Ideal for multi-phase and single phase applications
- Current Rating: 76A<sub>pk</sub>**
- Inductance Range: 148nH to 1140nH**
- Footprint: 14.0 x 13.5mm Max**
- Height: 7.0mm Max**

### Electrical Specifications @ 25°C — Operating Temperature -40°C to +130°C<sup>10</sup>

#### Dual Phase Integrated Inductor Specifications for Multi-phase Systems<sup>2</sup>

| Part Number   | Inductance @I <sub>rated</sub><br>(nH TYP) |     | I <sub>rated</sub> <sup>5</sup><br>(A <sub>DC</sub> ) |      | DCR/phase <sup>2,3</sup><br>(mΩ) |      | Inductance <sup>1</sup><br>@0A <sub>DC</sub><br>(nH ± 20%) |     | Saturation Current <sup>6</sup><br>(A <sub>DC</sub> ) |      | Heating <sup>7</sup><br>Current<br>(A <sub>DC</sub> ) |    |
|---------------|--------------------------------------------|-----|-------------------------------------------------------|------|----------------------------------|------|------------------------------------------------------------|-----|-------------------------------------------------------|------|-------------------------------------------------------|----|
|               | L1                                         | L2  | L1                                                    | L2   | L1                               | L2   | L1                                                         | L2  | L1                                                    | L2   | L1                                                    | L2 |
| PA0766.281NLT | 285                                        | 285 | 26                                                    | 26   | 0.75                             | 0.75 | 296                                                        | 296 | 38                                                    | 38   | 26                                                    | 26 |
| PA0766.341NLT | 325                                        | 325 | 26                                                    | 26   |                                  |      | 352                                                        | 352 | 31.5                                                  | 31.5 |                                                       |    |
| PA0766.421NLT | 395                                        | 395 | 25                                                    | 25   |                                  |      | 435                                                        | 435 | 25                                                    | 25   |                                                       |    |
| PA0766.561NLT | 495                                        | 495 | 18.5                                                  | 18.5 |                                  |      | 568                                                        | 568 | 18.5                                                  | 18.5 |                                                       |    |

#### Single Phase Inductor Specifications for Series and Parallel Connections<sup>1</sup>

| Part Number   | Inductance @I <sub>rated</sub><br>(nH TYP) | I <sub>rated</sub> <sup>5</sup><br>(A <sub>DC</sub> ) | DCR <sup>2,3</sup><br>(mΩ) | Inductance @0A <sub>DC</sub> <sup>1</sup><br>(nH ± 20%) | Saturation Current <sup>6</sup><br>(A <sub>DC</sub> ) | Heating Current <sup>7</sup><br>(A <sub>DC</sub> ) | Connection |
|---------------|--------------------------------------------|-------------------------------------------------------|----------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|------------|
| PA0766.281NLT | 148                                        | 52                                                    | 0.38                       | 148                                                     | 76                                                    | 52                                                 | Parallel   |
| PA0766.341NLT | 160                                        | 52                                                    |                            | 176                                                     | 63                                                    |                                                    |            |
| PA0766.421NLT | 180                                        | 50                                                    |                            | 218                                                     | 50                                                    |                                                    |            |
| PA0766.561NLT | 240                                        | 37                                                    |                            | 284                                                     | 37                                                    |                                                    |            |
| PA0766.281NLT | 635                                        | 26                                                    | 1.50                       | 592                                                     | 38                                                    | 26                                                 | Series     |
| PA0766.341NLT | 700                                        | 26                                                    |                            | 704                                                     | 31.5                                                  |                                                    |            |
| PA0766.421NLT | 770                                        | 25                                                    |                            | 870                                                     | 25                                                    |                                                    |            |
| PA0766.561NLT | 1000                                       | 18.5                                                  |                            | 1140                                                    | 18.5                                                  |                                                    |            |

#### NOTES:

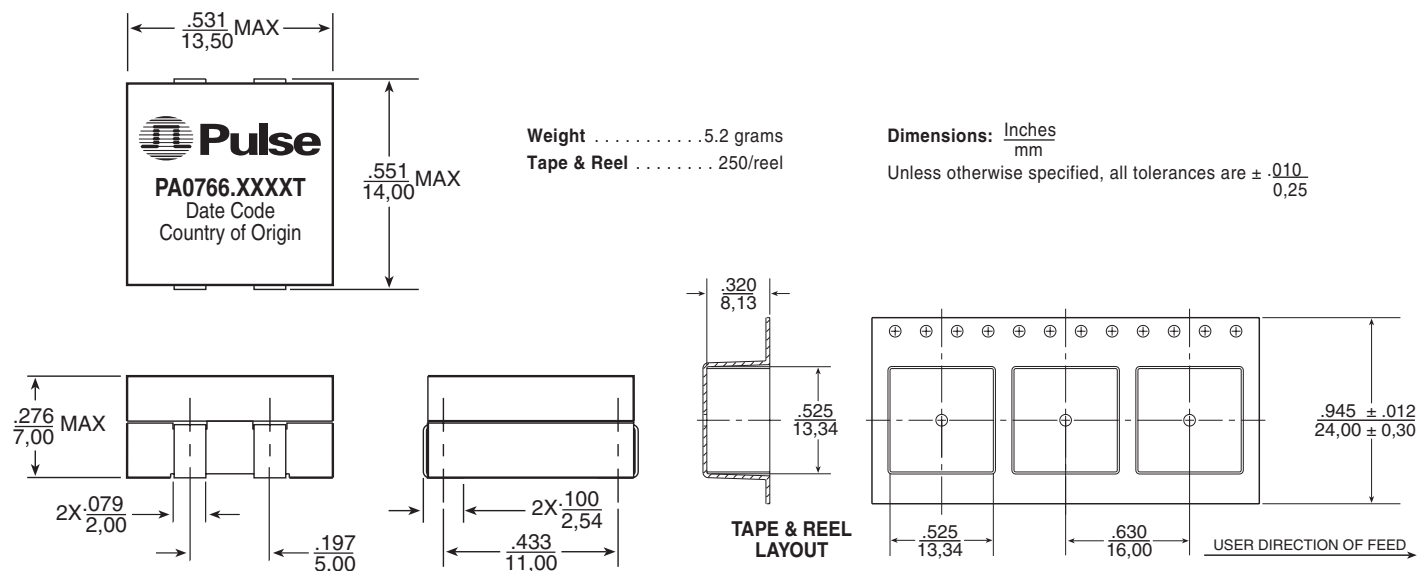
- Inductance is measured at 500kHz, 100mVrms.
- The **PA0766** consists of two separate and independent inductors integrated into a single package. The two inductors can be used for two separate phases within dual output or multi-phase application or they can be connected in series or parallel to form a single inductor within a single phase application.
- The nominal DCR has a tolerance of ±9%. This tolerance is guaranteed by design, but is not a manufacturing production test. The nominal DCR is measured from point a to point b, as shown below on the mechanical drawing.
- For manufacturing production test, a maximum DCR value of 0.9mΩ per phase is used.
- The rated current as listed is either the saturation current or the heating current depending on which value is lower.
- The saturation current is the current which causes the inductance to drop a maximum of 26% from the nominal inductance at 0A<sub>DC</sub> at the stated ambient temperatures (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.
- The heating current is the DC current which causes the part temperature to increase by approximately 40°C. This current is determined by soldering the component on a typical application PCB, and then applying the current to the device for 30 minutes.
- 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. To determine the approximate total losses (or temperature rise) for a given application, the coreloss and temperature rise curves can be used.
- Pulse complies with industry standard tape and reel specification EIA481.
- The temperature of the component (ambient plus temperature rise) must be within the stated operating temperature range.

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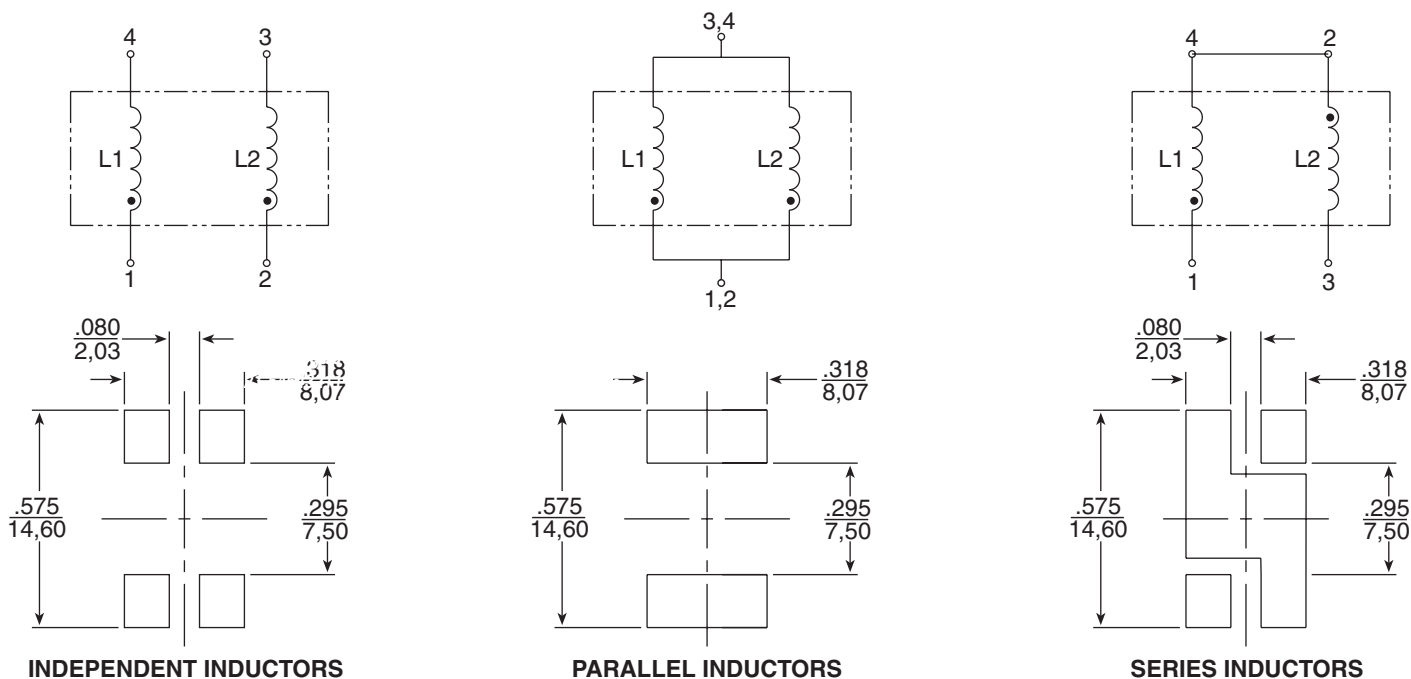
## Power Beads - PA0766NL Series



### Mechanical



### Schematics and Footprints



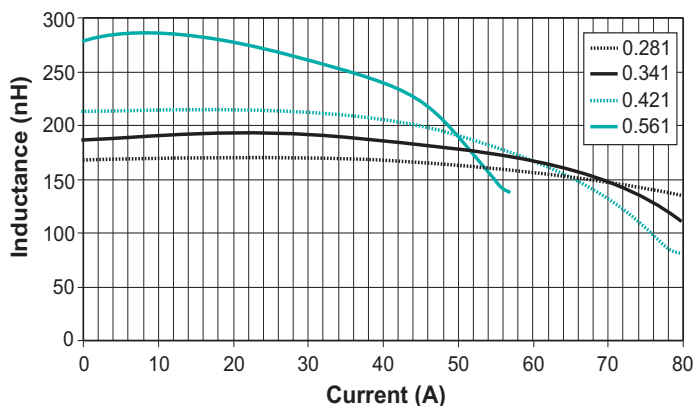
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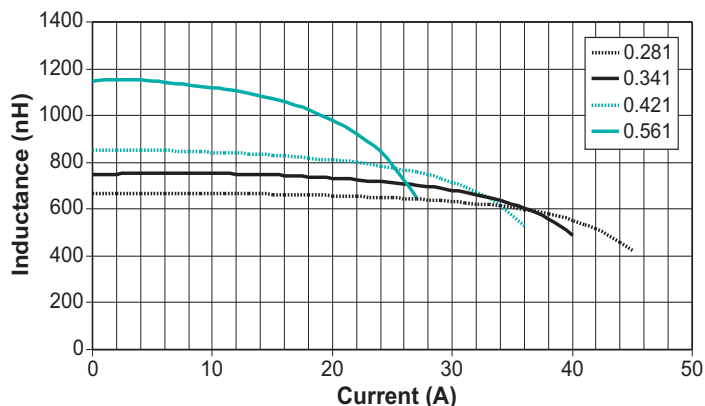


### Typical Inductance vs Current

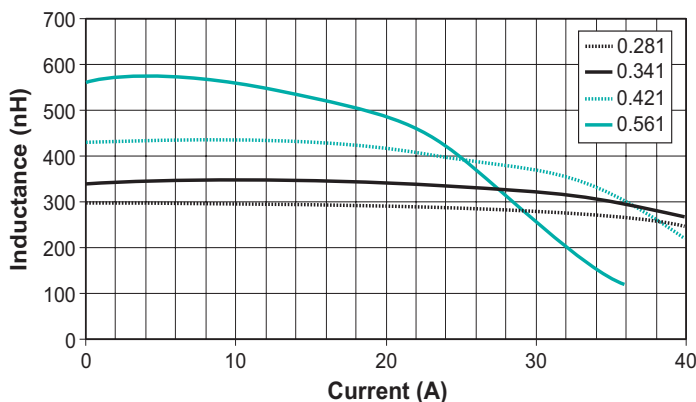
Single Inductor Parallel Connection



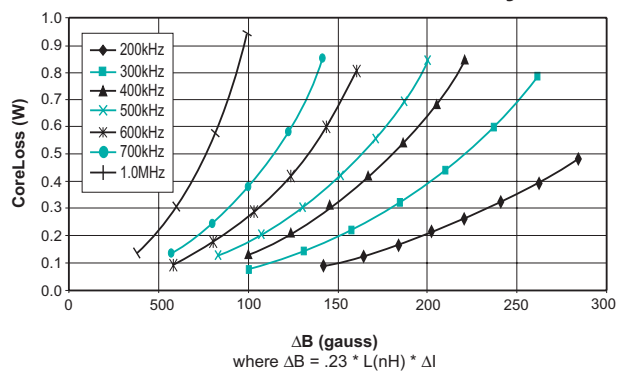
Single Inductor Series Connection



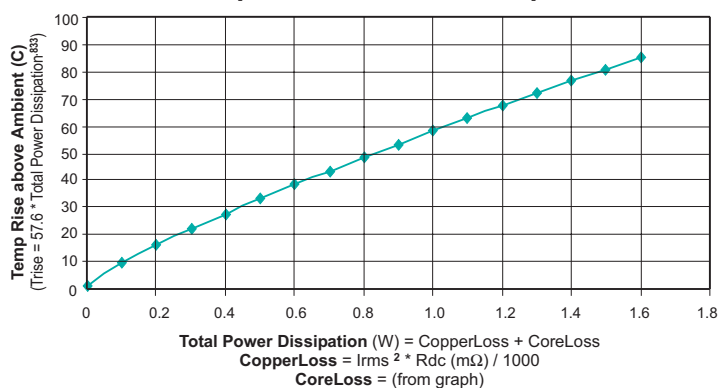
Two Independent Inductors



CoreLoss vs Flux Density



Temp Rise vs Power Dissipation



**NOTE:** When inductors are used as two independent inductors in multi-phase applications, the copper loss in both phases needs to be calculated.