# SMT Power Inductors

*Shielded Toroid Series - Ros1/Ros2 Series*

- ***Height:*** *3.2mm and 5.3mm Max*
- ***Footprint:*** *8.1mm x 5.3mm and 14.mm x 10.2mm*
- ***Current Rating:*** *up to 5A*
- ***Inductance Range:*** *.51µH to 357µH*

| Electrical Specifications @ 25°C – Operating Temperature -40°C to +130°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pulse Part Number | Inductance @ Irated (µH MIN) | Irated (A) | DCR (mΩ) | | Inductance @ OADC (µH +/- 15%) | Reference ET (V*µsec) | Trise Factor (Ko) | Coreloss Factor (K1) | ET Factor (K2) |
| | | | TYP | MAX | | | | | |
| **Ros 1 Series** | | | | | | | | | |
| **P0430NL** | 0.51 | 2.00 | 14 | 16.1 | .7 | .8 | 1.45 | 1.27E-11 | 476.2 |
| **P0432NL** | 0.85 | 1.50 | 18 | 20.7 | 1.1 | 1.2 | 1.45 | 1.27E-11 | 370.4 |
| **P0435NL** | 2.72 | 1.00 | 40 | 46 | 3.9 | 2.3 | 1.45 | 1.27E-11 | 196.1 |
| **P0438NL** | 8.84 | 0.50 | 140 | 161 | 12.2 | 4.4 | 1.45 | 1.27E-11 | 111.1 |
| **P0439NL** | 10.79 | 0.45 | 155 | 178 | 14.7 | 5.0 | 1.45 | 1.27E-11 | 101.0 |
| **P0441NL** | 25.50 | 0.29 | 280 | 322 | 33.8 | 8.4 | 1.45 | 1.27E-11 | 66.7 |
| **P0445NL** | 88 | 0.16 | 1065 | 1225 | 122 | 15 | 1.45 | 1.27E-11 | 35.1 |
| **P0446NL** | 127 | 0.14 | 1600 | 1840 | 179 | 18 | 1.45 | 1.27E-11 | 29.0 |
| **Ros 2 Series** | | | | | | | | | |
| **P0450NL** | 0.51 | 5.00 | 8.1 | 9.3 | .65 | 3 | .508 | 8.87E-11 | 181.8 |
| **P0452NL** | 1.09 | 5.00 | 11.4 | 13.1 | 1.5 | .5 | .508 | 8.87E-11 | 113.6 |
| **P0453NL** | 1.53 | 5.00 | 13.0 | 15 | 2.3 | 1.0 | .508 | 8.87E-11 | 90.9 |
| **P0454NL** | 1.78 | 3.00 | 15.0 | 17.3 | 2.3 | 7.5 | .508 | 8.87E-11 | 90.9 |
| **P0456NL** | 4.76 | 2.00 | 26.1 | 30 | 6.3 | 13 | .508 | 8.87E-11 | 56.8 |
| **P0460NL** | 22.95 | 1.00 | 90.4 | 104 | 34 | 31 | .508 | 8.87E-11 | 24.6 |
| **P0461NL** | 39.10 | 0.90 | 123.5 | 142 | 57.2 | 39 | .508 | 8.87E-11 | 18.9 |
| **P0462NL** | 40.80 | 0.80 | 240.0 | 276 | 62.5 | 35 | .508 | 8.87E-11 | 18.2 |
| **P0463NL** | 69.70 | 0.60 | 245.2 | 282 | 100 | 55 | .508 | 8.87E-11 | 14.0 |
| **P0465NL** | 137 | 0.40 | 480.9 | 553 | 180 | 78 | .508 | 8.87E-11 | 10.0 |
| **P0466NL** | 182 | 0.35 | 681.7 | 784 | 254 | 87 | .508 | 8.87E-11 | 8.7 |
| **P0467NL** | 272 | 0.30 | 1030.4 | 1185 | 422.5 | 105 | .508 | 8.87E-11 | 7.0 |
| **P0468NL** | 357 | 0.25 | 1200.0 | 1380 | 500 | 130 | .508 | 8.87E-11 | 6.1 |

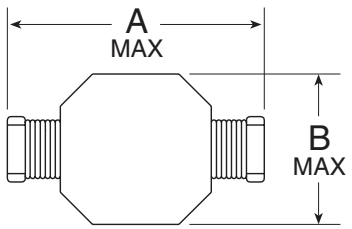
**Notes:**

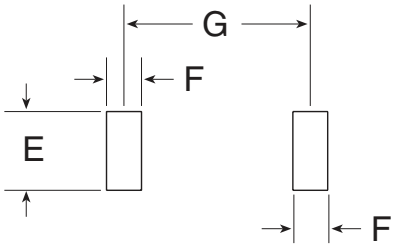
1. Temperature rise is 55C in typical buck or boost circuits with the rated IDC current and reference ET applied to the inductor.
2. Total loss in the inductor is 80 mW (ROS1) and 280 mW (ROS 2) for 55C temperature rise above ambient.
3. To estimate temperature rise in a given application, you must determine the total losses (copper losses + core losses) and apply the following formula:
   Temp Rise (C) = (Total Losses (mW) $^{.833}$ * K0 (from table)
4. To determine copper losses, calculate:
   Copper Loss (mW) = $I_{DC}^2$ x DCR
5. For core loss in mWatts, using frequency f (in Hz) and operating flux density B (in Gauss), calculate:
   Copper Loss (mW) = K2 * $f^{1.26}$ * $B^{2.11}$
6. For flux density (B), calculate ET (V-µsec) for the application, and multiply by $ET_{10}$ factor from the table.

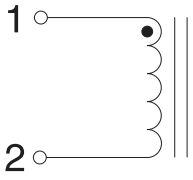
## Mechanical

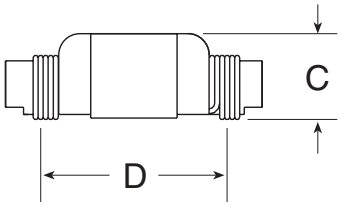
## Schematic

**PXXXX**




## Suggested Pad Layout

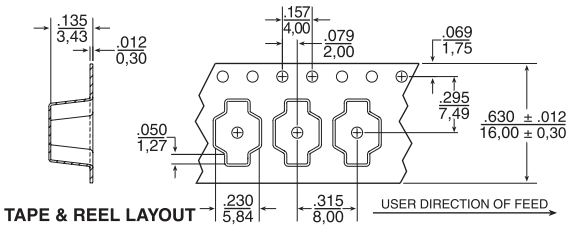
| PKG | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| ROS 1 | .335<br>8,51 | .225<br>5,72 | .125<br>3,18 | .250<br>6,35 | .100<br>2,54 | .050<br>1,27 | .250<br>6,35 |
| ROS 2 | .545<br>13,84 | .390<br>9,91 | .215<br>5,46 | .440<br>11,18 | .120<br>3,05 | .065<br>1,65 | .440<br>11,18 |

| | ROS 1 | ROS 2 |
|---|---|---|
| **Weight** | 0.29 grams | 1.1 grams |
| **Tape & Reel** | 2000/reel | 600/reel |

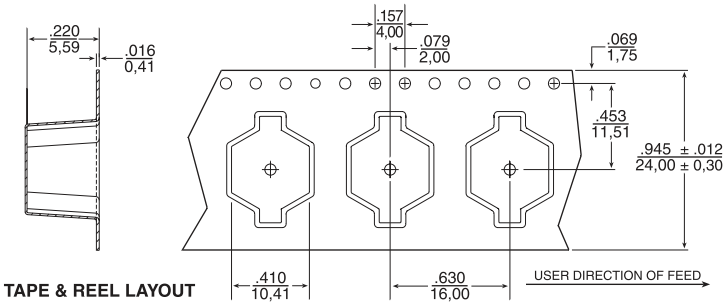
**Dimensions:** Inches / mm

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

### ROS 1




### ROS 2



## For More Information


**Pulse Worldwide Headquarters**
12220 World Trade Drive
San Diego, CA
92128
U.S.A.

Tel: 858 674 8100
Fax: 858 674 8262

**Pulse Europe**
Einsteinstrasse 1
D-71083 Herrenberg
Germany

Tel: 49 7032 78060
Fax: 49 7032 7806 135

**Pulse China Headquarters**
B402, Shenzhen Academy of Aerospace Technology Bldg.
10th Kejinan Road
High-Tech Zone
Nanshan District
Shenzen, PR China
518057
Tel: 86 755 33966678
Fax: 86 755 33966700

**Pulse North China**
Room 2704/2705
Super Ocean Finance Ctr.
2067 Yan An Road West
Shanghai 200336
China

Tel: 86 21 62787060
Fax: 86 2162786973

**Pulse South Asia**
135 Joo Seng Road
#03-02
PM Industrial Bldg.
Singapore 368363

Tel: 65 6287 8998
Fax: 65 6287 8998

**Pulse North Asia**
3F, No. 198
Zhongyuan Road
Zhongli City
Taoyuan County 320
Taiwan R. O. C.
Tel: 886 3 4356768
Fax: 886 3 4356823 (Pulse)
Fax: 886 3 4356820 (FRE)