

# SMT Power Inductors

Toroid - Polecat Series



-  **Height:** 5.5mm Max
-  **Footprint:** 12.7mm x 12.7mm Max
-  **Current Rating:** up to 8.3A
-  **Inductance Range:** 2.0μH to 364μH

Electrical Specifications @ 25°C - Operating Temperature -40°C to +130°C<sup>11</sup>

| Part <sup>9,10</sup><br>Number | Inductance<br>@ Irated<br>(μH MIN) | Irated<br>(A) | DCR (MAX)<br>(mΩ) | ET<br>(V-μsec) | Inductance<br>@0Adc<br>(μH ±10%) | 100 Gauss<br>ET <sub>100</sub><br>(V-μsec) | 1 Amp DC<br>H1<br>(Orsted) | Connection |
|--------------------------------|------------------------------------|---------------|-------------------|----------------|----------------------------------|--------------------------------------------|----------------------------|------------|
| P0174NL                        | 2.0                                | 8.30          | 7.6               | 7.31           | 2.2                              | 1.20                                       | 5.43                       | Parallel   |
| P0175NL                        | 2.4                                | 7.20          | 10.9              | 7.81           | 2.6                              | 1.33                                       | 5.97                       | Parallel   |
| P0176NL                        | 5.0                                | 5.20          | 19.0              | 11.72          | 5.5                              | 1.93                                       | 8.69                       | Parallel   |
| P0174NL                        | 7.0                                | 4.16          | 32.0              | 14.61          | 8.75                             | 2.41                                       | 10.86                      | Series     |
| P0177NL                        | 9.3                                | 3.80          | 29.8              | 16.12          | 10.4                             | 2.65                                       | 11.95                      | Parallel   |
| P0175NL                        | 8.4                                | 3.78          | 43.6              | 15.62          | 10.4                             | 2.65                                       | 11.95                      | Series     |
| P0178NL                        | 14.1                               | 3.10          | 45.3              | 19.73          | 15.7                             | 3.25                                       | 14.66                      | Parallel   |
| P0179NL                        | 19.8                               | 2.60          | 66.3              | 23.45          | 22.1                             | 3.86                                       | 17.38                      | Parallel   |
| P0176NL                        | 17.9                               | 2.60          | 76.0              | 23.43          | 22.45                            | 3.86                                       | 17.38                      | Series     |
| P0180NL                        | 29.3                               | 2.20          | 106               | 28.50          | 32.8                             | 4.70                                       | 21.18                      | Parallel   |
| P0177NL                        | 33.8                               | 1.89          | 120               | 32.25          | 41.7                             | 5.30                                       | 23.89                      | Series     |
| P0181NL                        | 42.6                               | 1.80          | 151               | 34.49          | 47.6                             | 5.66                                       | 25.52                      | Parallel   |
| P0178NL                        | 50.9                               | 1.54          | 182               | 39.46          | 62.8                             | 6.51                                       | 29.32                      | Series     |
| P0182NL                        | 61.3                               | 1.50          | 224               | 40.85          | 67.5                             | 6.75                                       | 30.41                      | Parallel   |
| P0179NL                        | 71.5                               | 1.30          | 266               | 46.90          | 88.2                             | 7.71                                       | 34.75                      | Series     |
| P0183NL                        | 84.2                               | 1.20          | 324               | 46.22          | 91.0                             | 7.83                                       | 35.30                      | Parallel   |
| P0180NL                        | 106.1                              | 1.07          | 404               | 57.00          | 131.0                            | 9.40                                       | 42.36                      | Series     |
| P0181NL                        | 154.2                              | 0.89          | 604               | 68.99          | 190.3                            | 11.33                                      | 51.05                      | Series     |
| P0182NL                        | 218.9                              | 0.74          | 888               | 81.70          | 270.2                            | 13.50                                      | 60.82                      | Series     |
| P0183NL                        | 295.0                              | 0.64          | 1272              | 92.43          | 364.0                            | 15.66                                      | 70.59                      | Series     |

## Notes:

- Temperature rise is 50°C in typical buck or boost circuits at 250kHz and with the reference ET applied to the inductor.
- Total loss in the inductor is 380mW for a 50°C temperature rise above ambient.
- To estimate temperature rise in a given application, determine copper and core losses, divide by 380 and multiply by 50.
- For the copper loss (mW), calculate  $IDC^2 * RN$ .
- For core loss (mW), using frequency (f in Hertz) and operating flux density (B in Gauss), calculate  $6.11 * 10^{-18} * B2.7 * f2.04$ .
- For flux density (B in Gauss), calculate ET (V-sec) for the application, divide by  $ET_{100}$  from the table, and multiply by 100.
- Limit the DC bias (H) to 46 orsted. Calculate H by multiplying H1 from the table IDC of the application.
- The maximum DCR listed is approximately 17% over the nominal DCR.
- Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number (i.e. P0174NL becomes P0174NL<sup>T</sup>).
- The "NL" suffix indicates an RoHS-compliant part number. Non-NL suffixed parts are not necessarily RoHS compliant, but are electrically and mechanically equivalent to NL versions. If a part number does not have the "NL" suffix, but an RoHS compliant version is required, please contact Pulse for availability.
- The temperature of the component (ambient plus temperature rise) must be within the stated operating temperature range.

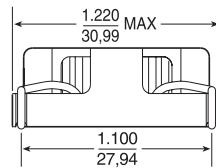
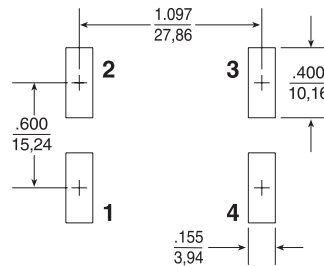
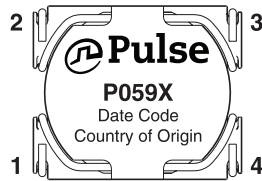
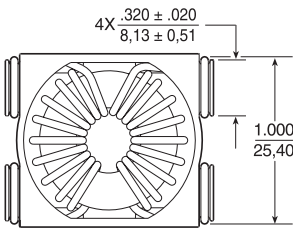
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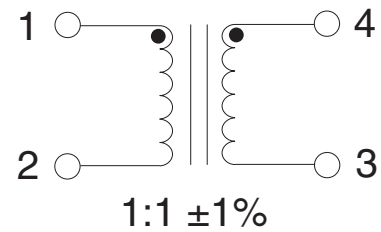
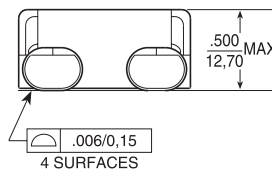
## Mechanical

## Schematic

P01XXNL



### SUGGESTED PAD LAYOUT



**Weight** .....1.5grams

**Tape & Reel** .....500/reel

**Tube** .....35/tube

**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are:  $\pm \frac{0.010}{0.25}$

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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
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