# THE DATASHEET OF

# P0174NL

# SMT Power Inductors

*Toroid - Polecat Series*

Pulse
A YAGEO Company

- ***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[11] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Part[9,10] Number** | **Inductance @ Irated** (µH MIN) | **Irated** (A) | **DCR (MAX)** (mΩ) | **ET** (V-µsec) | **Inductance @0A$_{DC}$** (µH ±10%) | **100 Gauss ET$_{100}$** (V-µsec) | **1 Amp DC H1** (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 |

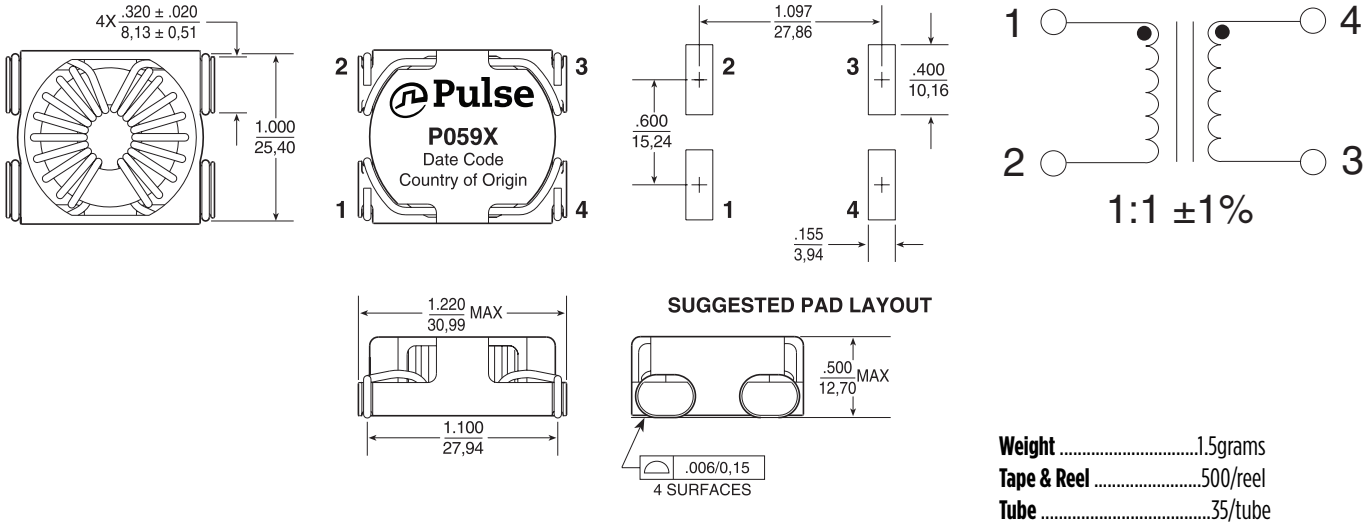
**Notes:**

1. Temperature rise is 50°C in typical buck or boost circuits at 250kHz and with the reference ET applied to the inductor.
2. Total loss in the inductor is 380mW for a 50°C temperature rise above ambient.
3. To estimate temperature rise in a given application, determine copper and core losses, divide by 380 and multiply by 50.
4. For the copper loss (mW), calculate IDC2 * RN.
5. 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.
6. For flux density (B in Gauss), calculate ET (V-sec) for the application, divide by $ET_{100}$ from the table, and multiply by 100.
7. Limit the DC bias (H) to 46 orsteds. Calculate H by multiplying H1 from the table IDC of the application.
8. The maximum DCR listed is approximately 17% over the nominal DCR.
9. Optional Tape & Reel packaging can be ordered by adding a "**T**" suffix to the part number (i.e. P0174NL becomes P0174NL**T**).
10. 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.
11. The temperature of the component (ambient plus temperature rise) must be within the stated operating temperature range.

## Mechanical

## Schematic

**P01XXNL**




**Weight** .....1.5grams
**Tape & Reel** .....500/reel
**Tube** .....35/tube
**Dimensions:** Inches / mm
Unless otherwise specified,
all tolerances are: $\pm\frac{.010}{0,25}$


## For More Information

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