

# 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 336μH

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

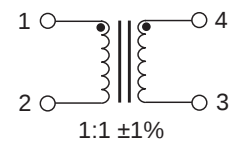
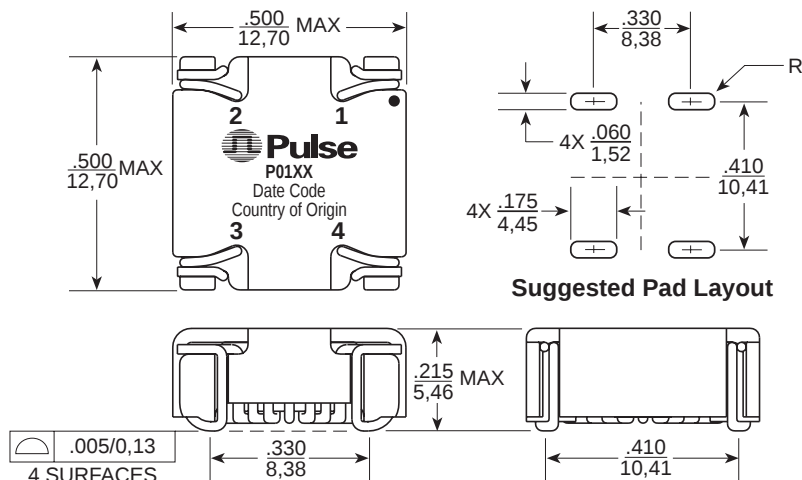
| Part Number | Inductance @ I <sub>rated</sub> (μH) | I <sub>rated</sub> (A) | DCR (MAX) (mΩ) | ET (V-μsec) | Inductance @ 0A <sub>dc</sub> (μH ±20%) | 100 Gauss ET <sub>100</sub> (V-μsec) | 1 Amp DC H <sub>1</sub> (Orsted) | Connection |
|-------------|--------------------------------------|------------------------|----------------|-------------|-----------------------------------------|--------------------------------------|----------------------------------|------------|
| P0174       | 2.0                                  | 8.30                   | 7.6            | 7.31        | 2.2                                     | 1.20                                 | 5.43                             | Parallel   |
| P0175       | 2.4                                  | 7.20                   | 10.9           | 7.81        | 2.6                                     | 1.33                                 | 5.97                             | Parallel   |
| P0176       | 5.0                                  | 5.20                   | 19.0           | 11.72       | 5.5                                     | 1.93                                 | 8.69                             | Parallel   |
| P0174       | 7.8                                  | 4.15                   | 30.3           | 14.61       | 8.6                                     | 2.41                                 | 10.86                            | Series     |
| P0177       | 9.3                                  | 3.84                   | 29.8           | 16.12       | 10.4                                    | 2.65                                 | 11.95                            | Parallel   |
| P0175       | 9.6                                  | 3.60                   | 43.6           | 15.62       | 10.4                                    | 2.65                                 | 11.95                            | Series     |
| P0178       | 14.1                                 | 3.12                   | 45.3           | 19.73       | 15.7                                    | 3.25                                 | 14.66                            | Parallel   |
| P0179       | 19.7                                 | 2.64                   | 66.3           | 23.45       | 22.1                                    | 3.86                                 | 17.38                            | Parallel   |
| P0176       | 20.0                                 | 2.60                   | 76.0           | 23.43       | 22.1                                    | 3.86                                 | 17.38                            | Series     |
| P0180       | 29.3                                 | 2.16                   | 106            | 28.50       | 32.8                                    | 4.70                                 | 21.18                            | Parallel   |
| P0177       | 37.3                                 | 1.92                   | 119            | 32.25       | 41.7                                    | 5.30                                 | 23.89                            | Series     |
| P0181       | 42.6                                 | 1.80                   | 151            | 34.49       | 47.6                                    | 5.66                                 | 25.52                            | Parallel   |
| P0178       | 56.2                                 | 1.56                   | 181            | 39.46       | 62.8                                    | 6.51                                 | 29.32                            | Series     |
| P0182       | 61.3                                 | 1.48                   | 224            | 40.85       | 67.5                                    | 6.75                                 | 30.41                            | Parallel   |
| P0179       | 79.0                                 | 1.32                   | 265            | 46.90       | 88.2                                    | 7.71                                 | 34.75                            | Series     |
| P0183       | 84.2                                 | 1.22                   | 324            | 46.22       | 91.0                                    | 7.83                                 | 35.30                            | Parallel   |
| P0180       | 117.3                                | 1.08                   | 424            | 57.00       | 131.0                                   | 9.40                                 | 42.36                            | Series     |
| P0181       | 170.3                                | 0.90                   | 603            | 68.99       | 190.3                                   | 11.33                                | 51.05                            | Series     |
| P0182       | 245.3                                | 0.74                   | 897            | 81.70       | 270.2                                   | 13.50                                | 60.82                            | Series     |
| P0183       | 336.7                                | 0.61                   | 1295           | 92.43       | 364.0                                   | 15.66                                | 70.59                            | Series     |

#### NOTES:

- The reference inductance at rated DC current is a typical value.
- 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 380mWatts 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, calculate  $I_{DC}^2 \times R_N$ .
- For core loss, using frequency (f) and operating flux density (B), calculate  $6.11 \times 10^{-18} \times B^{2.7} \times f^{2.04}$ .
- For flux density (B), calculate ET (V-μsec) for the application, divide by ET<sub>100</sub> from the table, and multiply by 100.
- Limit the DC bias (H) to 46 orstedts. Calculate H by multiplying H<sub>1</sub> from the table by I<sub>DC</sub> of the application.
- The maximum DCR listed is approximately 17% over the nominal DCR.
- Add suffix "T" to part number for tape and reel package (i.e. P0183T).

## Mechanical

## Schematic



Weight ..... 1.5 grams  
Tape & Reel ..... 500/reel  
Tube ..... 40/tube

Dimensions: Inches  
mm  
Unless otherwise specified,  
all tolerances are ± .010  
0.25