



# 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> Number	Inductance @ Irated (μH MIN)	Irated (A)	DCR (MAX) (mΩ)	ET (V-μsec)	Inductance @0Adc (μH ±10%)	100 Gauss ET <sub>100</sub> (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  $IDC^2 * RN$ .
5. For core loss (mW), using frequency (f in Hertz) and operating flux density (B in Gauss), calculate  $6.11 * 10^{-18} * B^{2.7} * f^{2.04}$ .
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 orstedts. 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 P0174NLT).
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.

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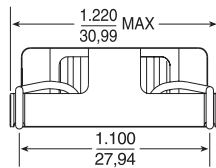
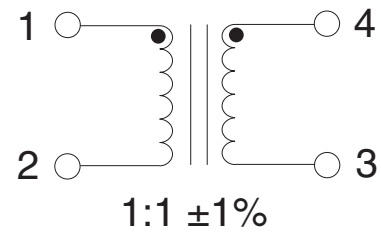
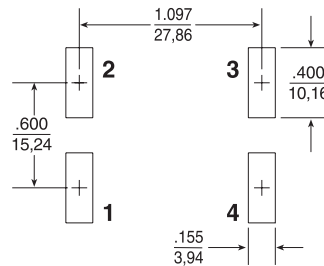
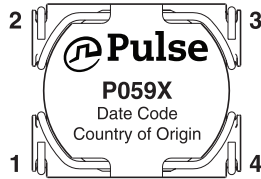
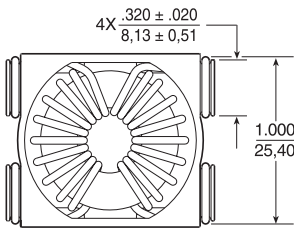
Toroid - Polecat Series



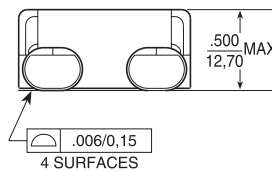
## Mechanical

## Schematic

POTXXNL



### 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:  $\pm \frac{0.10}{0.25}$

## For More Information

### Pulse Worldwide Headquarters

15255 Innovation Drive Ste 100  
 San Diego, CA 92128  
 U.S.A.

### Pulse Europe

Pulse Electronics GmbH  
 Am Rottland 12  
 58540 Meinerzhagen  
 Germany

### Pulse China Headquarters

Pulse Electronics (ShenZhen) CO., LTD  
 D708, Shenzhen Academy of  
 Aerospace Technology,  
 The 10th Keji South Road,  
 Nanshan District, Shenzhen,  
 P.R. China 518057

### Pulse North China

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

### Pulse South Asia

3 Fraser Street 0428  
 DUO Tower  
 Singapore 189352

### Pulse North Asia

1F., No.111 Xiyuan Road  
 Zhongli District  
 Taoyuan City 32057  
 Taiwan (R.O.C)

Tel: 858 674 8100  
 Fax: 858 674 8262

Tel: 49 2354 777 100  
 Fax: 49 2354 777 168

Tel: 86 755 33966678  
 Fax: 86 755 33966700

Tel: 86 21 62787060  
 Fax: 86 2162786973

Tel: 65 6287 8998  
 Fax: 65 6280 0080

Tel: 886 3 4356768  
 Fax: 886 3 4356820

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