





# MINIATURE SURFACE MOUNT POWER INDUCTORS



-  Reliable self-leaded design
-  Very small size and cost-effective
-  High energy storage and low DC resistance
-  Ideal for DC/DC conversion in notebook computers, PDAs, step-up or step-down converters

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

| Pulse Part Number | Reference Values      |                              |             | Control Values     |               | Calculation Data          |
|-------------------|-----------------------|------------------------------|-------------|--------------------|---------------|---------------------------|
|                   | I <sub>dc</sub> (amp) | L @ I <sub>dc</sub> MIN (μH) | ET (V-μsec) | L w/o DC ±15% (μH) | DCR ±15% (mΩ) | ET <sub>10</sub> (V-μsec) |
| <b>ROS 1</b>      |                       |                              |             |                    |               |                           |
| P0430T            | 2.00                  | 0.51                         | 0.8         | 0.7                | 14            | 476.2                     |
| P0431T            | 1.90                  | 0.76                         | 0.8         | 1.1                | 18            | 370.4                     |
| P0432T            | 1.50                  | 0.85                         | 1.2         | 1.1                | 18            | 370.4                     |
| P0433T            | 1.20                  | 1.44                         | 1.8         | 1.9                | 28            | 277.8                     |
| P0434T            | 1.20                  | 1.87                         | 1.8         | 2.6                | 34            | 238.1                     |
| P0435T            | 1.00                  | 2.72                         | 2.3         | 3.9                | 40            | 196.1                     |
| P0436T            | 0.70                  | 4.33                         | 3.1         | 6.0                | 73            | 158.7                     |
| P0437T            | 0.60                  | 5.35                         | 3.3         | 7.1                | 100           | 144.9                     |
| P0438T            | 0.50                  | 8.84                         | 4.4         | 12.2               | 140           | 111.1                     |
| P0439T            | 0.45                  | 10.79                        | 5.0         | 14.7               | 155           | 101.0                     |
| P0440T            | 0.34                  | 17.59                        | 6.5         | 23.8               | 250           | 79.4                      |
| P0441T            | 0.29                  | 25.50                        | 8.4         | 33.8               | 280           | 66.7                      |
| P0442T            | 0.24                  | 35.80                        | 9.8         | 49                 | 440           | 55.6                      |
| P0443T            | 0.20                  | 52.70                        | 12          | 72                 | 650           | 45.7                      |
| P0444T            | 0.17                  | 79                           | 14          | 110                | 1050          | 37.0                      |
| P0445T            | 0.16                  | 88                           | 15          | 122                | 1065          | 35.1                      |
| P0446T            | 0.14                  | 127                          | 18          | 179                | 1600          | 29.0                      |
| <b>ROS 2</b>      |                       |                              |             |                    |               |                           |
| P0450T            | 5                     | 0.51                         | 3.0         | 0.64               | 7.6           | 181.8                     |
| P0451T            | 5                     | 0.67                         | 3.1         | 0.86               | 8.7           | 151.5                     |
| P0452T            | 5                     | 1.09                         | 0.5         | 1.5                | 11.4          | 113.6                     |
| P0453T            | 5                     | 1.53                         | 1.0         | 2.3                | 13            | 90.9                      |
| P0454T            | 3                     | 1.78                         | 7.5         | 2.3                | 15            | 90.9                      |
| P0455T            | 2.5                   | 3.74                         | 10.5        | 5.13               | 23            | 60.6                      |
| P0456T            | 2                     | 4.76                         | 13          | 6.3                | 26            | 56.8                      |
| P0457T            | 1.8                   | 5.61                         | 14          | 7.5                | 33            | 50.5                      |
| P0458T            | 1.5                   | 9.09                         | 15          | 13.2               | 70            | 39.5                      |
| P0459T            | 1.3                   | 11.47                        | 21          | 15.5               | 60            | 35.0                      |
| P0460T            | 1                     | 22.95                        | 31          | 34                 | 90            | 24.6                      |
| P0461T            | 0.9                   | 39.10                        | 39          | 57.2               | 123           | 18.9                      |
| P0462T            | 0.8                   | 40.80                        | 35          | 62.5               | 240           | 18.2                      |
| P0463T            | 0.6                   | 69.70                        | 55          | 100                | 245           | 14.0                      |
| P0464T            | 0.5                   | 76.50                        | 54          | 103                | 305           | 14.2                      |
| P0465T            | 0.4                   | 137                          | 78          | 180                | 481           | 10.0                      |
| P0466T            | 0.35                  | 182                          | 87          | 254                | 682           | 8.7                       |
| P0467T            | 0.3                   | 272                          | 105         | 380                | 1030          | 7.0                       |
| P0468T            | 0.25                  | 357                          | 130         | 500                | 1200          | 6.1                       |

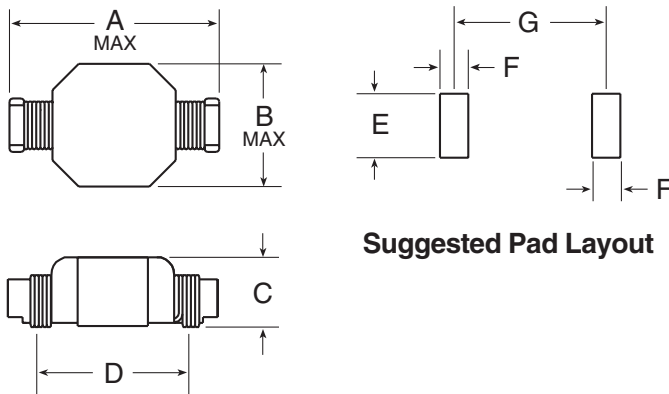
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## Notes:

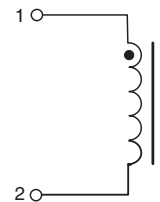
1. Temperature rise is 55° C in typical buck or boost circuits with the rated I<sub>OC</sub> current and reference ET applied to the inductor.
2. Total loss in the inductor is 80 mWatts (ROS 1) and 280 mWatts (ROS 2) for 55°C temperature rise above ambient.
3. To estimate temperature rise in a given application, you must determine the total losses (copper losses + core losses) and apply the following formula:  
 ROS 1: TempRise (C) = (Total Losses (mW))<sup>.833</sup> x 1.45  
 ROS 2: TempRise (C) = (Total Losses (mW))<sup>.833</sup> x .508
4. To determine copper losses, calculate:  
 CopperLoss (mW) = I<sub>OC</sub><sup>2</sup> x DCR
5. For core loss in mWatts, using frequency f (in Hz) and operating flux density B (in Gauss), calculate:  
 ROS 1: CopperLoss (mW) = .127 x 10<sup>-10</sup> x f<sup>1.26</sup> x B<sup>2.11</sup>  
 ROS 2: CopperLoss (mW) = .887 x 10<sup>-10</sup> x f<sup>1.26</sup> x B<sup>2.11</sup>
6. For flux density (B), calculate ET (V-μsec) for the application, and multiply by ET<sub>10</sub> factor from the table.

## Mechanical



Suggested Pad Layout

## Schematic



Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
 Unless otherwise specified, all tolerances are  $\pm \frac{.010}{0,25}$

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

Weight ..... ROS 1 ..... ROS 2  
 .....0.29 grams .....1.1 grams  
 Tape & Reel .....2000/reel .....600/reel