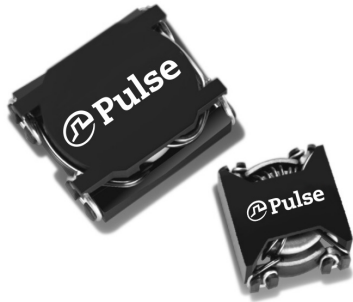


# SMT Power Inductors

Toroid - SLIC Series



- Fifteen package sizes
- Current Rating: up to 23.8A<sub>DC</sub>
- Frequency Range: up to 1MHz

Electrical Specifications @ 25°C - Operating Temperature -40°C to +130°C<sup>6</sup>

| Pulse <sup>4,5</sup><br>Part<br>Number | Inductance<br>@ I <sub>rated</sub><br>(μH) | I <sub>rated</sub><br>(A) | DCR (mΩ) |      | Inductance<br>@ 0A <sub>DC</sub><br>(μH) | Reference<br>ET<br>(Volt - μsec) | Flux Density<br>Factor<br>(K1) | Core Loss<br>Factor<br>(K2) | Temp. Rise<br>Factor<br>(K3) |
|--|--|---------------------------|----------|------|--|----------------------------------|--------------------------------|-----------------------------|------------------------------|
|  |  |                           | TYP      | MAX  |  |                                  |                                |                             |                              |
| <b>LCI-20</b>                          |  |                           |          |      |  |                                  |                                |                             |                              |
| PE-53630NL                             | 1.01                                       | 3.40                      | 9.35     | 11   | 1.1                                      | 0.53                             | 5.43                           | 3.29E-11                    | 323.9                        |
| PE-53600NL                             | 6.2  | 1.40                      | 59.5     | 70   | 7  | 1.33                             | 2.17                           | 3.29E-11                    | 323.9                        |
| PE-53601NL                             | 17.6                                       | 1.00                      | 106.25   | 125  | 22.7                                     | 2.4                              | 1.21                           | 3.29E-11                    | 323.9                        |
| <b>LCI-30</b>                          |  |                           |          |      |  |                                  |                                |                             |                              |
| PE-53650NL                             | 3.8  | 4.80                      | 14.705   | 17.3 | 5.2                                      | 1.76                             | 1.28                           | 1.39E-10                    | 148.0                        |
| PE-53631NL                             | 9.4  | 2.80                      | 36.89    | 43.4 | 12.3                                     | 2.7                              | 0.83                           | 1.39E-10                    | 148.0                        |
| PE-53602NL                             | 29.7                                       | 1.40                      | 141.1    | 166  | 35.3                                     | 4.6                              | 0.49                           | 1.39E-10                    | 148.0                        |
| PE-53606NL                             | 114  | 0.94                      | 365      | 405  | 167                                      | 10                               | 0.23                           | 1.39E-10                    | 148.0                        |
| <b>LCI-37</b>                          |  |                           |          |      |  |                                  |                                |                             |                              |
| PE-53661NL                             | 2.5  | 8.00                      | 7.055    | 8.3  | 3.8                                      | 1.77                             | 1.30                           | 1.87E-10                    | 114.2                        |
| PE-53651NL                             | 5.1  | 5.40                      | 15.045   | 17.7 | 7.5                                      | 2.51                             | 0.92                           | 1.87E-10                    | 114.2                        |
| PE-53632NL                             | 16.2                                       | 2.70                      | 63       | 72   | 21.9                                     | 4.29                             | 0.54                           | 1.87E-10                    | 114.2                        |
| PE-53604NL                             | 58.1                                       | 1.30                      | 246.5    | 290  | 73                                       | 7.83                             | 0.29                           | 1.87E-10                    | 114.2                        |
| PE-53608NL                             | 192  | 0.90                      | 476      | 560  | 292                                      | 15.7                             | 0.15                           | 1.87E-10                    | 114.2                        |
| PE-53611NL                             | 383  | 0.72                      | 732.7    | 862  | 672                                      | 23.5                             | 0.10                           | 1.87E-10                    | 114.2                        |
| <b>LCCI-20</b>                         |  |                           |          |      |  |                                  |                                |                             |                              |
| PE-53717NL                             | 43.6                                       | 1.1                       | 247.2    | 309  | 77                                       | 7.83                             | 0.295                          | 1.87E-10                    | 114.23                       |
| <b>LCI-44</b>                          |  |                           |          |      |  |                                  |                                |                             |                              |
| PE-53662NL                             | 4.9  | 7.80                      | 10.54    | 12.4 | 7.9                                      | 3.04                             | 0.67                           | 3.35E-10                    | 85.7                         |
| PE-53652NL                             | 9  | 5.50                      | 25       | 28   | 14                                       | 4.06                             | 0.51                           | 3.35E-10                    | 85.7                         |
| PE-53633NL                             | 29.1                                       | 2.70                      | 85       | 100  | 40.5                                     | 6.9                              | 0.30                           | 3.35E-10                    | 85.7                         |
| PE-53613NL                             | 645  | 0.74                      | 1062.5   | 1250 | 1134                                     | 36.5                             | 0.06                           | 3.35E-10                    | 85.7                         |
| <b>HCI-37</b>                          |  |                           |          |      |  |                                  |                                |                             |                              |
| PE-53690NL                             | 0.81                                       | 14.30                     | 2.125    | 2.5  | 1.25                                     | 1.035                            | 2.23                           | 1.87E-10                    | 114.2                        |
| PE-53680NL                             | 1.32                                       | 11.50                     | 3.4      | 4.0  | 2.1                                      | 1.33                             | 1.74                           | 1.87E-10                    | 114.2                        |
| <b>LCCI-44</b>                         |  |                           |          |      |  |                                  |                                |                             |                              |
| PE-53718NL                             | 21.9                                       | 2.7                       | 72.4     | 90.5 | 39.5                                     | 6.9                              | 0.297                          | 3.35E-10                    | 85.71                        |

Electrical Specifications @ 25°C - Operating Temperature -40°C to +130°C<sup>6</sup>

| Pulse <sup>4,5</sup><br>Part<br>Number | Inductance<br>@ I <sub>rated</sub><br>(μH) | I <sub>rated</sub><br>(A) | DCR (mΩ) |      | Inductance<br>@ 0A <sub>DC</sub><br>(μH) | Reference<br>ET<br>(Volt-μsec) | Flux Density<br>Factor<br>(K1) | Core Loss<br>Factor<br>(K2) | Temp. Rise<br>Factor<br>(K3) |
|--|--|---------------------------|----------|------|--|--------------------------------|--------------------------------|-----------------------------|------------------------------|
|  |  |                           | TYP      | MAX  |  |                                |                                |                             |                              |
| <b>HCI-44</b>                          |  |                           |          |      |  |                                |                                |                             |                              |
| PE-53691*NL                            | 1.68                                       | 13.90                     | 3.06     | 3.6  | 2.8                                      | 1.83                           | 1.12                           | 3.35E-10                    | 85.7                         |
| PE-53681NL                             | 2.5  | 11.40                     | 4.59     | 5.4  | 4.2                                      | 2.23                           | 0.92                           | 3.35E-10                    | 85.7                         |
| <b>LCI-50</b>                          |  |                           |          |      |  |                                |                                |                             |                              |
| PE-53663NL                             | 9.3  | 7.20                      | 15.895   | 18.7 | 16                                       | 4.92                           | 0.41                           | 4.52E-10                    | 67.9                         |
| PE-53653NL                             | 16.1                                       | 5.10                      | 27.2     | 32.0 | 25.9                                     | 6.27                           | 0.32                           | 4.52E-10                    | 67.9                         |
| PE-53634NL                             | 50   | 2.60                      | 113.05   | 133  | 72.9                                     | 10.5                           | 0.19                           | 4.52E-10                    | 67.9                         |
| PE-53614NL                             | 1070                                       | 0.71                      | 1445     | 1700 | 1950                                     | 54.4                           | 0.04                           | 4.52E-10                    | 67.9                         |
| <b>LCCI-50</b>                         |  |                           |          |      |  |                                |                                |                             |                              |
| PE-53719NL**                           | 4.025                                      | 6.4                       | 18.4     | 23   | 6.575                                    | 3.135                          | 0.638                          | 4.52E-10                    | 67.89                        |
| <b>HCI-50</b>                          |  |                           |          |      |  |                                |                                |                             |                              |
| PE-53692*NL                            | 3.5  | 12.40                     | 5.61     | 6.6  | 6.5                                      | 3.1                            | 0.64                           | 4.52E-10                    | 67.9                         |
| PE-53682NL                             | 4.7  | 10.40                     | 7.055    | 8.3  | 8.4                                      | 3.58                           | 0.56                           | 4.52E-10                    | 67.9                         |
| <b>HCCI-44</b>                         |  |                           |          |      |  |                                |                                |                             |                              |
| PE-53361NL                             | 0.53                                       | 23.8                      | 1.0      | 3    | 0.88                                     | 1                              | 2.020                          | 3.35E-10                    | 85.71                        |
| <b>HCCI-50</b>                         |  |                           |          |      |  |                                |                                |                             |                              |
| PE-53362NL                             | 1.1  | 21                        | 1.7      | 2.5  | 2.1                                      | 1.75                           | 1.116                          | 4.52E-10                    | 67.89                        |
| <b>HCI-68</b>                          |  |                           |          |      |  |                                |                                |                             |                              |
| PE-53700*NL                            | 5.2  | 15.40                     | 5.27     | 6.2  | 10.5                                     | 5.21                           | 0.35                           | 9.58E-10                    | 44.6                         |
| PE-53683NL                             | 9.4  | 10.90                     | 10.455   | 12.3 | 17.6                                     | 6.84                           | 0.27                           | 9.58E-10                    | 44.6                         |
| <b>HCCI-68</b>                         |  |                           |          |      |  |                                |                                |                             |                              |
| PE-53363NL                             | 2.1  | 22.4                      | 2.5      | 3.4  | 4  | 3.25                           | 0.559                          | 9.58E-10                    | 4.56                         |

**Notes:**

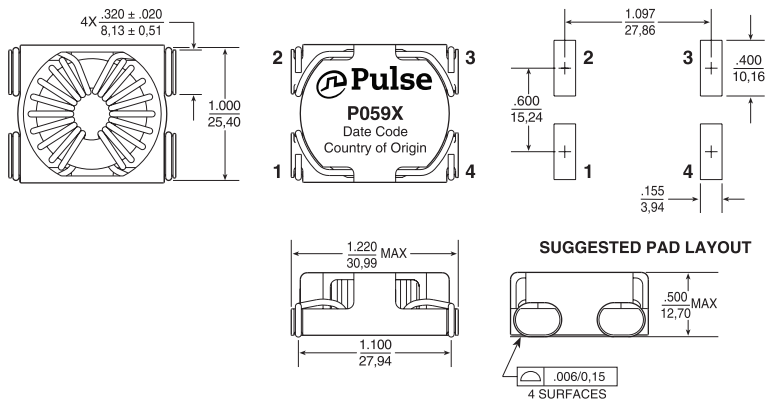
- Reference values are for an inductor with a 55°C temperature rise. The core loss is 10% of the copper loss at the ET listed and 500kHz.
- Core does not saturate abruptly. The ET and DC current are limited by the desired inductance and temperature rise.
- In high volt-time applications, additional heating in the component can occur due to core losses in the inductor which may necessitate derating the current in order to limit the temperature rise of the component. In order to determine the approximate total losses (or temperature rise) for a given application, both copper and core losses should be taken into account.
- Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number (i.e. P0595NL becomes P0595NLT). Pulse complies to industry standard tape and reel specification EIA481.
- 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.  
\*\* Contact Pulse for availability

Estimated Temperature Rise:

$$\begin{aligned} \text{Trise} &= K3 * (\text{Coreloss (W)} + \text{Copperloss (W)})^{0.833} \text{ (C)} \\ \text{CopperLoss} &= I_{\text{rms}}^2 * \text{DCR\_Typical (m}\Omega\text{)} / 1000 \\ \text{CopperLoss} &= K2 * (\text{Freq\_kHz})^{1.26} * (\Delta B)^{2.11} \\ \Delta B &= K1 * \text{Volt-}\mu\text{sec} * 100 \end{aligned}$$

## Mechanical

### High Current Inductors (HCI)

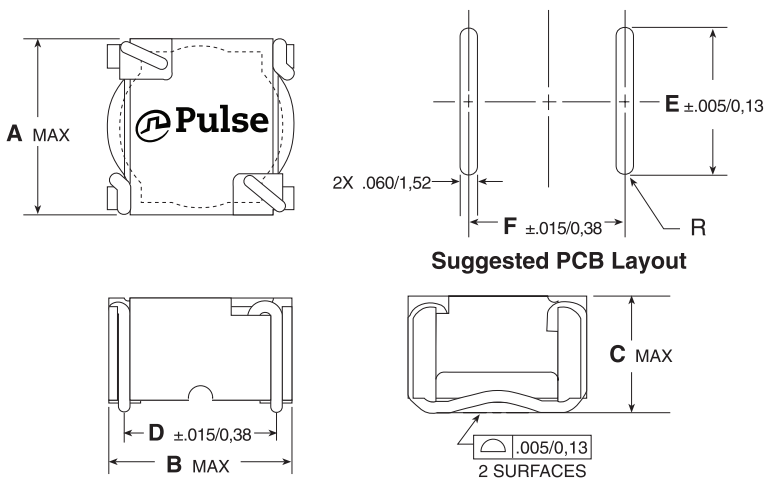


| PKG    | A             | B             | C             | D             | E             | F             |
|--------|---------------|---------------|---------------|---------------|---------------|---------------|
| HCI-37 | .620<br>15,75 | .605<br>15,37 | .370<br>9,40  | .500<br>12,70 | .440<br>11,18 | .500<br>12,70 |
| HCI-44 | .670<br>17,02 | .670<br>17,02 | .390*<br>9,91 | .560<br>14,22 | .490<br>12,45 | .570<br>14,48 |
| HCI-50 | .740<br>18,80 | .740<br>18,80 | .390*<br>9,91 | .630<br>16,00 | .560<br>14,22 | .640<br>16,26 |
| HCI-68 | .940<br>23,88 | .940<br>23,88 | .390*<br>9,91 | .820<br>20,83 | .700<br>17,78 | .830<br>21,08 |

\* Dimension "C" is .400/10,16 for the marked models because of heavier wire gage.

## Mechanical

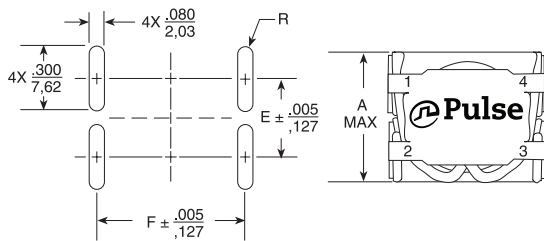
### Low Current Inductors (LCI)



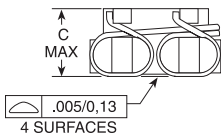
| PKG    | A             | B             | C            | D             | E             | F             |
|--------|---------------|---------------|--------------|---------------|---------------|---------------|
| LCI-20 | .340<br>8,64  | .340<br>8,64  | .270<br>6,86 | .260<br>6,60  | .300<br>7,62  | .270<br>6,86  |
| LCI-30 | .435<br>11,05 | .440<br>11,18 | .360<br>9,14 | .350<br>8,89  | .400<br>10,16 | .360<br>9,14  |
| LCI-37 | .565<br>14,35 | .570<br>14,48 | .360<br>9,14 | .450<br>11,43 | .520<br>13,21 | .460<br>11,68 |
| LCI-44 | .600<br>15,24 | .620<br>15,75 | .390<br>9,91 | .500<br>12,70 | .550<br>13,97 | .500<br>12,70 |
| LCI-50 | .670<br>17,02 | .700<br>17,78 | .390<br>9,91 | .580<br>14,73 | .620<br>15,75 | .590<br>14,99 |

## Mechanicals (continued)

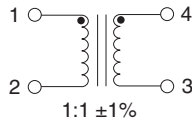
### High Current Coupled Inductors (HCCI)



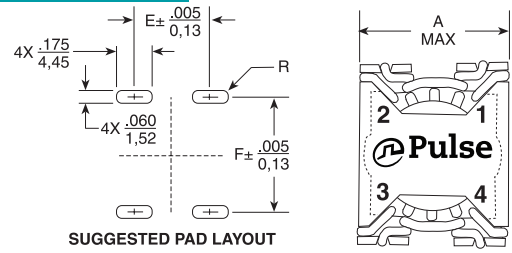
SUGGESTED PAD LAYOUT



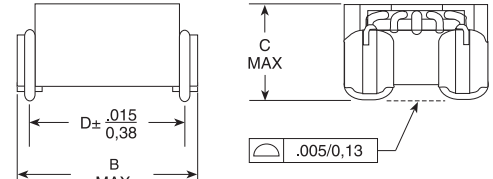
Schematic



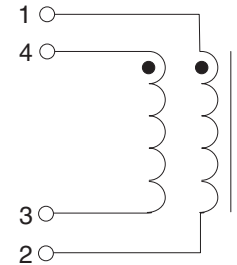
### Low Current Coupled Inductors (LCCI)



SUGGESTED PAD LAYOUT



Schematic



| Size Codes |            |            |             |            |            |            |
|------------|------------|------------|-------------|------------|------------|------------|
|            | HCCI-44    | HCCI-50    | HCCI-68     | LCCI-37    | LCCI-44    | LCCI-50    |
| <b>A</b>   | .715/18,16 | .800/20,32 | 1.000/25,40 | .560/14,22 | .590/14,99 | .670/17,02 |
| <b>B</b>   | .865/21,97 | .910/23,11 | 1.110/28,19 | .645/16,38 | .715/18,16 | .770/19,56 |
| <b>C</b>   | .390/9,91  | .390/9,91  | .390/9,91   | .350/8,89  | .390/9,91  | .390/9,91  |
| <b>D</b>   | .760/10,30 | .800/20,32 | 1.000/25,40 | .520/13,21 | .600/15,24 | .650/16,51 |
| <b>E</b>   | .360/9,14  | .440/11,18 | .620/15,75  | .340/8,64  | .370/9,40  | .445/11,30 |
| <b>F</b>   | .770/19,56 | .810/20,57 | 1.010/13,46 | .530/13,46 | .610/15,49 | .660/16,76 |

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