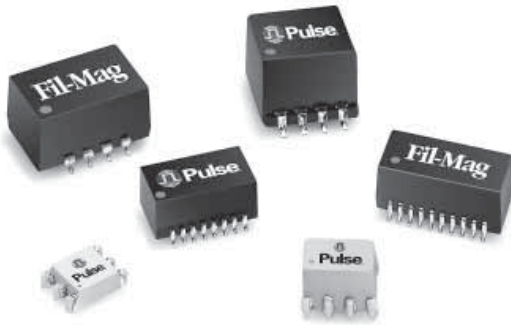


# SURFACE MOUNT COMMON MODE CHOKES

## Suited for LAN and Telecom Applications



-  Reduces radiated EMI emissions
-  Filters common mode noise for EMI reduction
-  Common mode attenuation from 100 kHz to 1 GHz
-  Tape & Reel packaging available for surface mount parts\*

### Electrical Specifications @ 25°C

| Part Number | No. of Ports | Primary Inductance OCL (μH MIN) | Common Mode Attenuation (db TYP) |       |        |        |        |         |         |         |       | DCR (Ω MAX) | Page Number Mech & Schem |
|-------------|--------------|---------------------------------|----------------------------------|-------|--------|--------|--------|---------|---------|---------|-------|-------------|--------------------------|
|             |              |                                 | 100 KHz                          | 1 MHz | 10 MHz | 30 MHz | 50 MHz | 100 MHz | 300 MHz | 500 MHz | 1 GHz |             |                          |
| PE-68624    | 2            | 47                              | 11                               | 27    | 40     | 44     | 42     | 36      | 26      | 17      | —     | 0.40        | 2                        |
| PE-65855    | 2            | 4700                            | 41                               | 43    | 49     | 39     | 34     | 26      | 20      | 20      | 12    | 1.0         | 4                        |
| B2013       | 2            | 6300                            | 46                               | 47    | 43     | 32     | 25     | 29      | 21      | 14      | 16    | 1.0         | 3                        |
| B4003       | 2            | 4700                            | 42                               | 41    | 48     | 38     | 33     | 21      | 22      | 23      | 17    | 1.0         | 6                        |
| 23Z87SM     | 3            | 69                              | 9                                | 24    | 31     | 30     | 29     | 27      | 21      | 16      | —     | 0.20        | 4                        |
| PE-65857    | 4            | 22.5                            | 7                                | 20    | 30     | 37     | 38     | 34      | 24      | 13      | —     | 0.22        | 4                        |
| PE-68627    | 4            | 24                              | 8                                | 21    | 32     | 36     | 37     | 36      | 30      | 20      | —     | 0.25        | 4                        |
| T8003       | 4            | 33                              | 9                                | 13    | 32     | 32     | 30     | 27      | 16      | 17      | 13    | 0.20        | 6                        |
| 23Z4000SMD  | 4            | 36                              | 7                                | 23    | 35     | 38     | 38     | 36      | 29      | 24      | —     | 0.50        | 5                        |
| PE-65854    | 4            | 47                              | 3                                | 19    | 32     | 36     | 35     | 29      | 12      | 6       | —     | 0.40        | 3                        |
| 23Z104SM    | 4            | 68                              | 8                                | 22    | 28     | 28     | 27     | 25      | 20      | 15      | —     | 0.20        | 5                        |
| PE-67540    | 4            | 100                             | 14                               | 33    | 44     | 48     | 49     | 44      | 34      | 29      | 20    | 0.60        | 4                        |
| PE-65853    | 4            | 4700                            | 40                               | 51    | 38     | 30     | 25     | 20      | 14      | 13      | —     | 1.20        | 3                        |
| 23Z106SM    | 6            | 68                              | 8                                | 22    | 29     | 30     | 30     | 29      | 24      | 19      | —     | 0.20        | 5                        |
| PE-69011    | 8            | 36                              | 8                                | 24    | 36     | 39     | 35     | 29      | 18      | 11      | —     | 0.35        | 3                        |
| 23Z105SM    | 8            | 68                              | 8                                | 24    | 30     | 29     | 27     | 24      | 16      | 11      | —     | 0.20        | 5                        |
| 23Z109SM    | 10           | 7.5                             | 4                                | 9     | 20     | 25     | 26     | 24      | 16      | 11      | —     | 0.20        | 5                        |
| T8008       | 16           | 47                              | 7                                | 27    | 40     | 44     | 42     | 36      | 26      | —       | —     | 0.40        | 6                        |

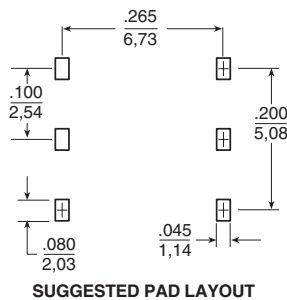
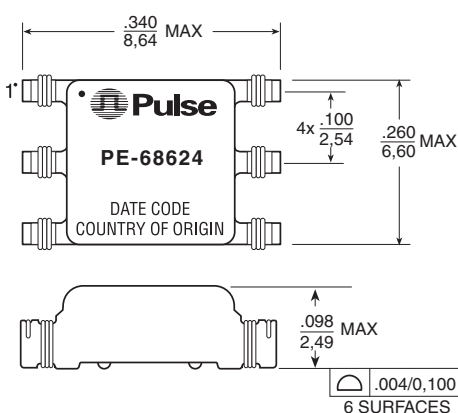
\* When ordering Tape & Reel packaging, add a "T" at the end of the part number (i.e. PE-65738T or 23Z106SMT).

**NOTE:** Additional common mode chokes are available. Please contact Applications Engineering.

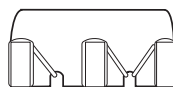
### Mechanical

### Schematic

#### PE-68624



SUGGESTED PAD LAYOUT



Weight ..... 0.17 grams  
Tape & Reel ..... 1500/reel  
Tube ..... 85/tube

#### PE-68624



# SURFACE MOUNT COMMON MODE CHOKES

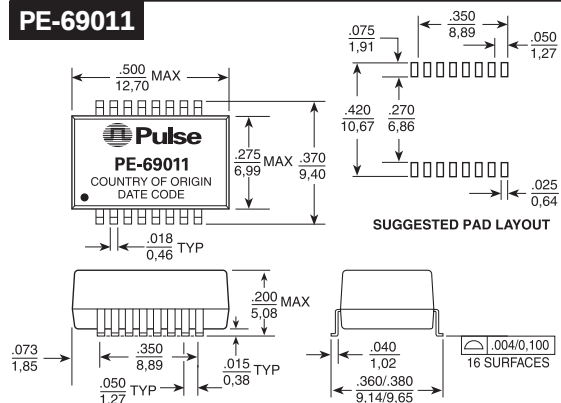
## Suited for LAN and Telecom Applications



Mechanical

Schematic

### PE-69011



Dimensions: Inches  
mm

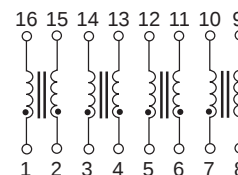
Unless otherwise specified,  
all tolerances are  $\pm .010$   
0,25

Weight . . . . . 0.83 grams

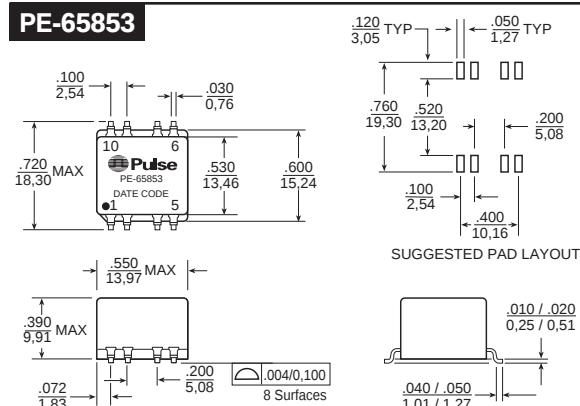
Tape & Reel . . . . . 900/reel

Tube . . . . . 40/tube

### PE-69011



### PE-65853



Dimensions: Inches  
mm

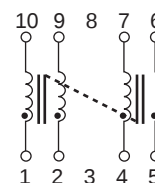
Unless otherwise specified,  
all tolerances are  $\pm .010$   
0,25

Weight . . . . . 4.0 grams

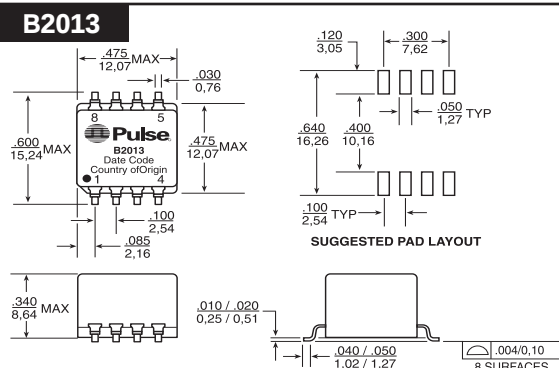
Tape & Reel . . . . . 150/reel

Tube . . . . . 35/tube

### PE-65853



### B2013



Dimensions: Inches  
mm

Unless otherwise specified,  
all tolerances are  $\pm .010$   
0,25

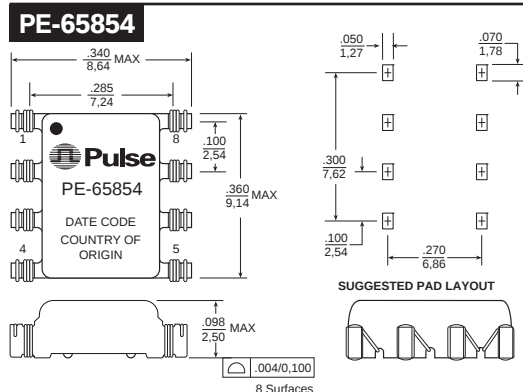
Weight . . . . . 9.5 grams

Tray . . . . . 30/tray

### B2013



### PE-65854



Dimensions: Inches  
mm

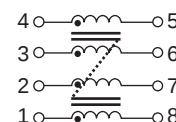
Unless otherwise specified,  
all tolerances are  $\pm .010$   
0,25

Weight . . . . . 0.3 grams

Tape & Reel . . . . . 1500/reel

Tube . . . . . 60/tube

### PE-65854





### Schematic

[illegible]

**Weight . . . . . 0.69 grams**  
**Tape & Reel . . . . . 800/reel**  
**Tube . . . . . 40 /tube**

**PE-65857, PE-67540**

Top view dimensions: .030 / 0,76 (pin pitch), .600 / 15,30 MAX (package width), .475 / 12,10 MAX (package height), .400 / 10,20 (body width), .120 / 3,05 (top pad width), .050 / 1,27 TYP (top pad spacing), .640 / 16,30 (bottom pad width), .400 / 10,20 (bottom pad width), .100 / 2,54 TYP (bottom pad spacing), .300 / 7,62 (bottom pad spacing).

Side view dimensions: .475 / 12,1 MAX (package width), .340 / 8,64 MAX (package height), .100 / 2,54 (pin pitch), .085 / 2,16 (pin width), .010 / .020 / 0,25 / 0,51 (lead thickness).

**SUGGESTED PAD LAYOUT**

Pad dimensions: .040 / .050 / 1,01 / 1,27 (pad width), .004 / 0,100 / 8 Surfaces (lead thickness).

**Weight** . . . . . 2.0 grams  
**Tape & Reel** . . . . . 250/reel  
**Tube** . . . . . 40/tube

A diagram of a 4-strand braid. The strands are labeled 1, 2, 3, and 4 from bottom to top. Strands 1 and 2 cross each other, with strand 1 passing over strand 2. Strands 3 and 4 cross each other, with strand 3 passing over strand 4. The crossings are represented by two vertical lines with dots at the ends, and the strands are connected by horizontal lines at the top and bottom.

**PE-68627**

Top View Dimensions:

- Overall Width: .345 MAX (8.76)
- Overall Height: .285 (7.24)
- Pin 1 to Pin 8 Distance: .100 (2.54)
- Pin 1 to Pin 5 Distance: .365 (9.02) MAX

Side View Dimensions:

- Pin Height: .207 (5.26) MAX

**Pulse**

PE-68627

DATE CODE

COUNTRY OF ORIGIN

**SUGGESTED PAD LAYOUT**

Pad Layout Dimensions:

- Pin Pitch: .060 (1.27)
- Pin Width: .070 (1.78)
- Pin Spacing: .300 (7.62)
- Pin Width: .100 (2.54)
- Pin Spacing: .270 (6.86)

0.004/0.100  
8 Surfaces

**Weight** . . . . . 0.3 grams  
**Tape & Reel** . . . . . 1500/reel  
**Tube** . . . . . 55/tube

**Weight** . . . . . 0.5 grams  
**Tape & Reel** . . . . . 750/reel  
**Tube** . . . . . 100/tube

# SURFACE MOUNT COMMON MODE CHOKES

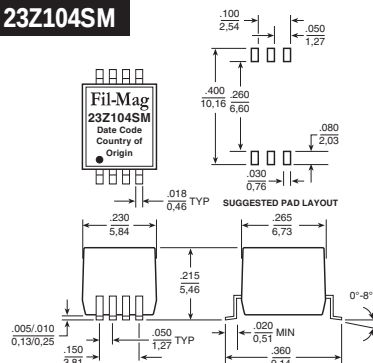
## Suited for LAN and Telecom Applications



Mechanical

Schematic

### 23Z104SM



Dimensions: Inches  
mm

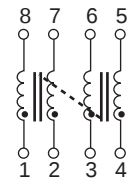
Unless otherwise specified,  
all tolerances are  $\pm .005$   
0,13

Weight . . . . . 0.5 grams

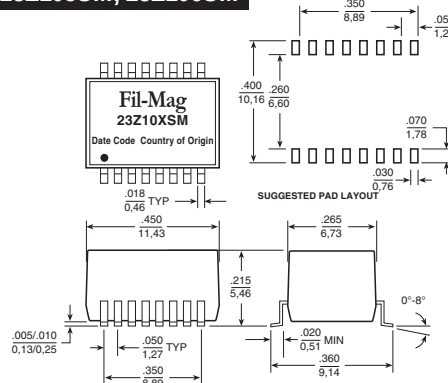
Tape & Reel . . . . . 750/reel

Tube . . . . . 100/tube

### 23Z104SM



### 23Z105SM, 23Z106SM



Dimensions: Inches  
mm

Unless otherwise specified,  
all tolerances are  $\pm .005$   
0,13

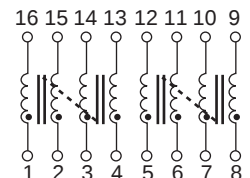
23Z105SM 23Z106SM

Weight . . . . . 0.8 grams . . . . . 1.0 grams

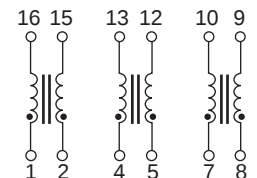
Tape & Reel . . . . . 750/reel . . . . . 750/reel

Tube . . . . . 50/tube . . . . . 50/tube

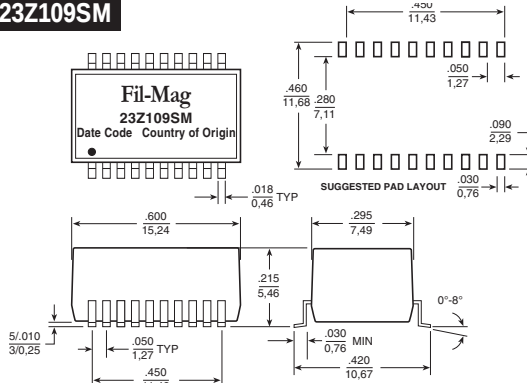
### 23Z105SM



### 23Z106SM



### 23Z109SM



Dimensions: Inches  
mm

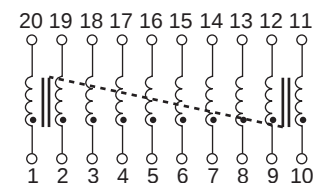
Unless otherwise specified,  
all tolerances are  $\pm .005$   
0,13

Weight . . . . . 1.3 grams

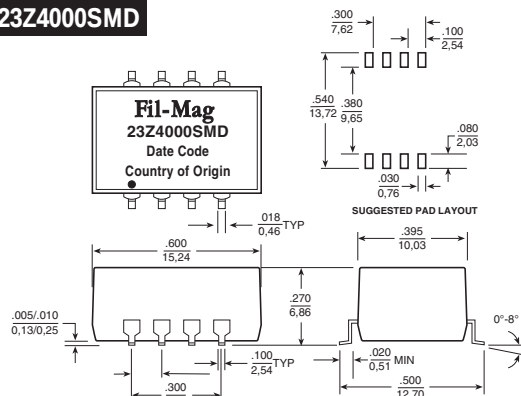
Tape & Reel . . . . . 500/reel

Tube . . . . . 38/tube

### 23Z109SM



### 23Z4000SMD



Dimensions: Inches  
mm

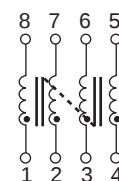
Unless otherwise specified,  
all tolerances are  $\pm .005$   
0,13

Weight . . . . . 2.1 grams

Tape & Reel . . . . . 350/reel

Tube . . . . . 38/tube

### 23Z4000SMD



# SURFACE MOUNT COMMON MODE CHOKES

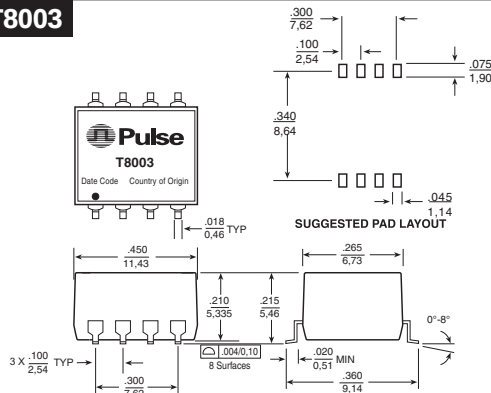
## Suited for LAN and Telecom Applications



Mechanical

Schematic

### T8003

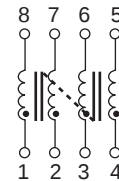


Dimensions:  $\frac{\text{Inches}}{\text{mm}}$

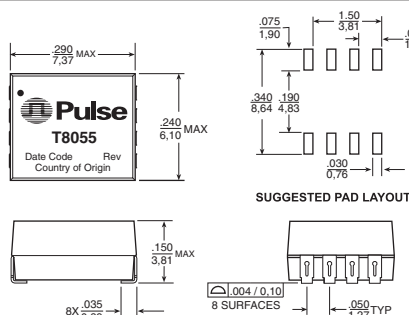
Unless otherwise specified,  
all tolerances are  $\pm .005$   
0,13

Weight . . . . . 0.84 grams  
Tape & Reel . . . . . 750/reel  
Tube . . . . . 100/tube

### T8003



### T8055

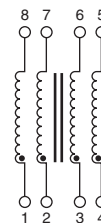


Dimensions:  $\frac{\text{Inches}}{\text{mm}}$

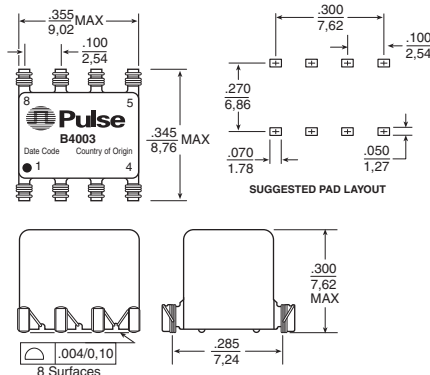
Unless otherwise specified,  
all tolerances are  $\pm .010$   
0,25

Weight . . . . . 0.2 grams  
Tape & Reel . . . . . 1750/reel  
Tube . . . . . 80/tube

### T8055



### B4003

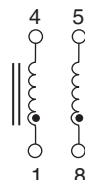


Dimensions:  $\frac{\text{Inches}}{\text{mm}}$

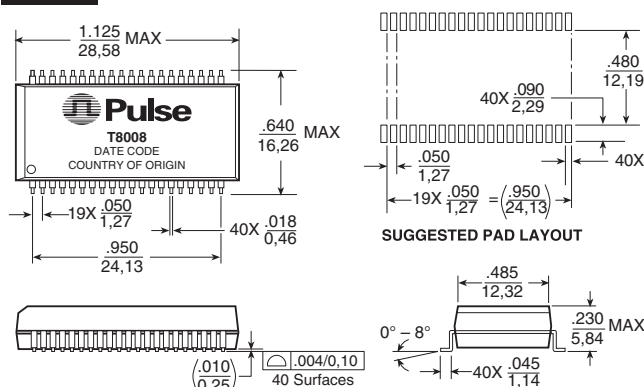
Unless otherwise specified,  
all tolerances are  $\pm .010$   
0,25

Weight . . . . . 1.0 grams  
Tape & Reel . . . . . 425/reel  
Tube . . . . . 50/tube

### B4003



### T8008

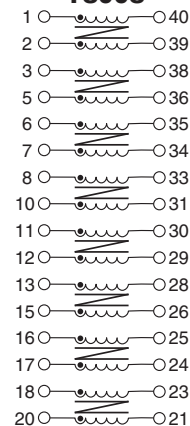


Dimensions:  $\frac{\text{Inches}}{\text{mm}}$

Unless otherwise specified,  
all tolerances are  $\pm .010$   
0,25

Weight . . . . . 4.0 grams  
Tape & Reel . . . . . 250/reel  
Tube . . . . . 15/tube

### T8008



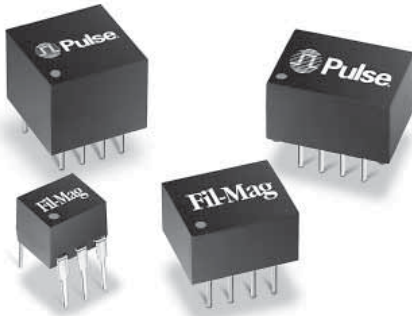
**NOTE:** The common mode test circuit for surface mount is the same as for through hole and is on the back page.

USA 858 674 8100 • Germany 49 7032 7806 0 • Singapore 65 6287 8998 • Shanghai 86 21 32181071 • China 86 755 33966678 • Taiwan 886 3 4643715

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# THROUGH HOLE COMMON MODE CHOKES

## Suited for LAN and Telecom Applications



-  Reduces radiated EMI emissions
-  Filters common mode noise for EMI reduction
-  Common mode attenuation from 100 kHz to 1 GHz
-  Tube packaging available for through hole parts

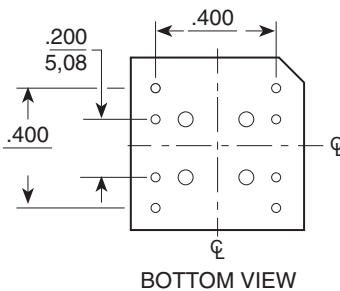
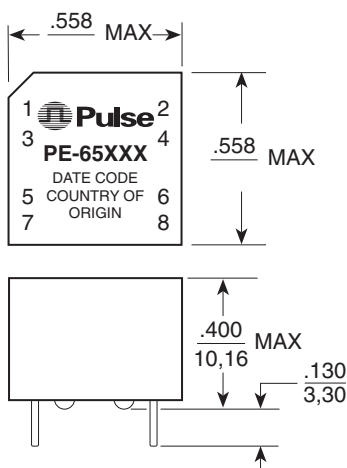
Electrical Specifications @ 25°C

| Part Number | No. of Lines | Primary Inductance OCL (μH MIN) | Common Mode Attenuation (dB TYP) |       |        |        |        |         |         |         |       | DCR (Ω MAX) | Page Number Mech & Schem |
|-------------|--------------|---------------------------------|----------------------------------|-------|--------|--------|--------|---------|---------|---------|-------|-------------|--------------------------|
|             |              |                                 | 100 kHz                          | 1 MHz | 10 MHz | 30 MHz | 50 MHz | 100 MHz | 300 MHz | 500 MHz | 1 GHz |             |                          |
| PE-65944    | 2            | 24                              | 1                                | 14    | 28     | 32     | 33     | 28      | 13      | 5       | —     | 0.30        | 8                        |
| PE-67531    | 2            | 140                             | 14                               | 34    | 45     | 49     | 50     | 47      | 38      | 32      | 25    | 0.60        | 9                        |
| B2005       | 2            | 9000                            | 47                               | 47    | 41     | 30     | 22     | 33      | 21      | 15      | 15    | 1.0         | 10                       |
| PE-65554    | 4            | 24                              | —                                | 21    | 32     | 38     | 39     | 34      | 24      | 13      | —     | 0.30        | 8                        |
| PE-68002    | 4            | 68                              | 7                                | 24    | 37     | 41     | 42     | 40      | 31      | 27      | —     | 0.35        | 9                        |
| 23Z104      | 4            | 85                              | 8                                | 23    | 29     | 29     | 28     | 25      | 17      | 11      | —     | 0.20        | 10                       |
| PE-67539    | 4            | 140                             | 14                               | 33    | 44     | 48     | 48     | 43      | 33      | 28      | 19    | 0.60        | 9                        |
| PE-65542    | 4            | 1000                            | 28                               | 41    | 42     | 32     | 22     | —       | —       | —       | —     | 0.70        | 8                        |
| PT5039      | 4            | 3600                            | 42                               | 43    | 42     | 32     | 27     | 17      | 15      | 9       | 13    | 0.50        | 8                        |
| J0010D11    | 4            | —                               | 9                                | 13    | 32     | 35     | 35     | 29      | 13      | 24      | 19    | 0.50        | 10                       |
| PE-65950    | 4            | 4700±30%                        | 40                               | 51    | 37     | 28     | 23     | 20      | —       | —       | —     | 1.00        | 8                        |
| PE-65541    | 4            | 6000                            | 44                               | 54    | 33     | 32     | 29     | —       | —       | —       | —     | 1.40        | 8                        |
| PE-68613    | 4            | 3290                            | 40                               | 51    | 37     | 28     | 23     | 20      | —       | —       | —     | 1.00        | 10                       |

### Mechanical

### Schematic

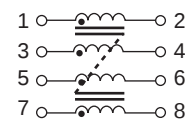
#### PE-65541, PE-65542, PE-65950



Dimensions: Inches  
mm  
Unless otherwise specified,  
all tolerances are ± .010  
0,25

Weight ..... 0.38 grams  
Tube ..... 35/tube

#### PE-65541 PE-65542 PE-65950



# THROUGH HOLE COMMON MODE CHOKES

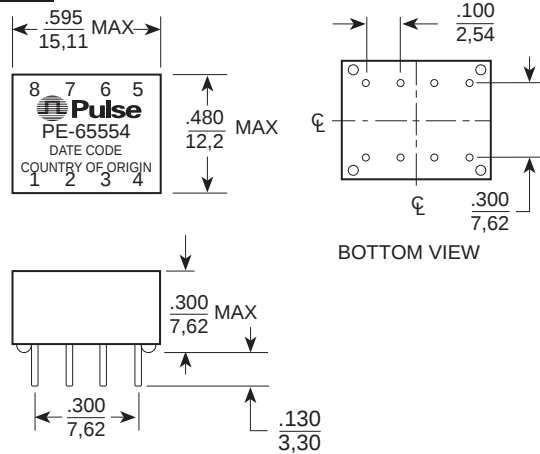
## Suited for LAN and Telecom Applications



Mechanical

Schematic

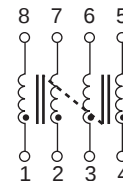
### PE-65554



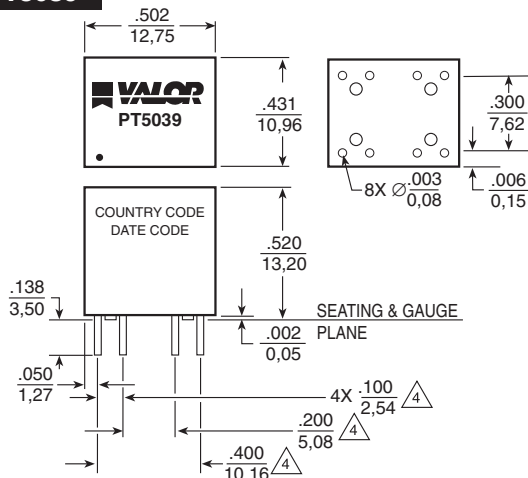
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0.25}$

**Weight** ..... 2.5 grams  
**Tube** ..... 35/tube

### PE-65554



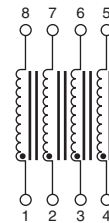
### PT5039



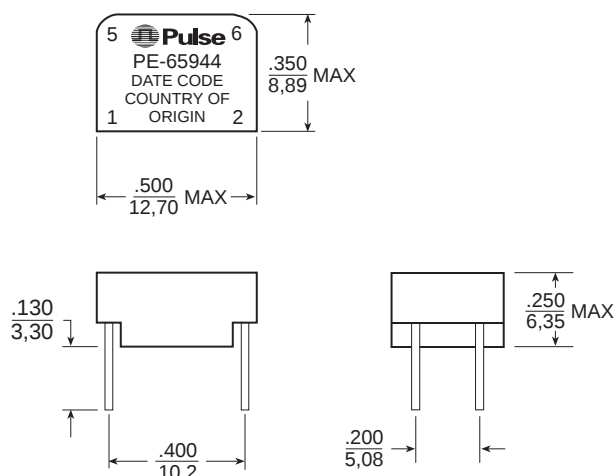
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0.25}$

**Weight** ..... 2.5 grams  
**Tube** ..... 35/tube

### PT5039



### PE-65944



**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0.25}$

**Weight** ..... 1.07 grams  
**Tube** ..... 30/tube

### PE-65944



# THROUGH HOLE COMMON MODE CHOKES

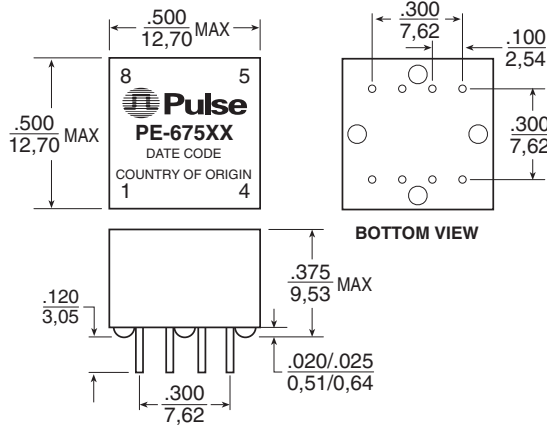
## Suited for LAN and Telecom Applications



Mechanical

Schematic

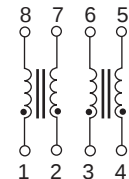
### PE-67539



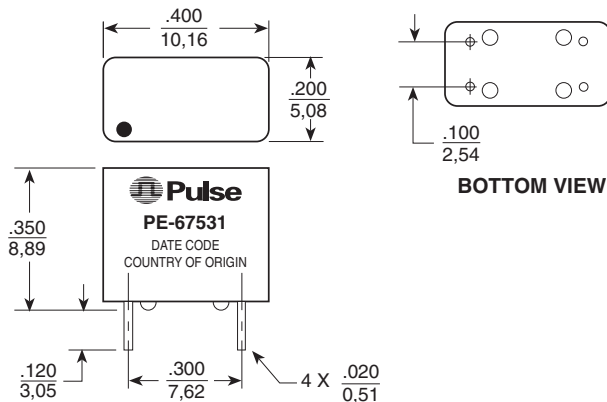
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

**Weight** . . . . . 2.4 grams  
**Tube** . . . . . 40/tube

### PE-67539



### PE-67531



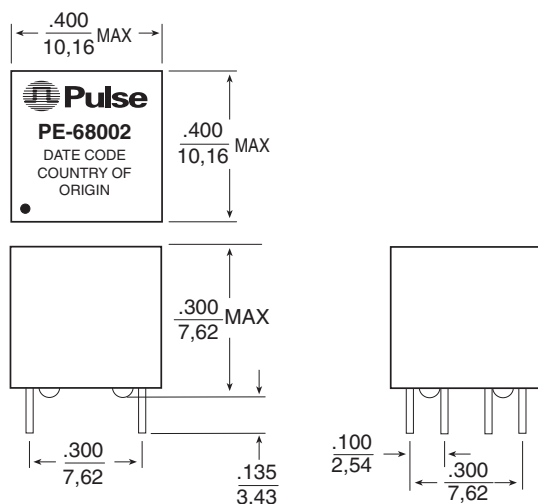
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

**Weight** . . . . . 0.76 grams  
**Tube** . . . . . 40/tube

### PE-67531



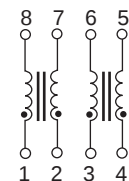
### PE-68002



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

**Weight** . . . . . 1.4 grams  
**Tube** . . . . . 50/tube

### PE-68002



# THROUGH HOLE COMMON MODE CHOKES

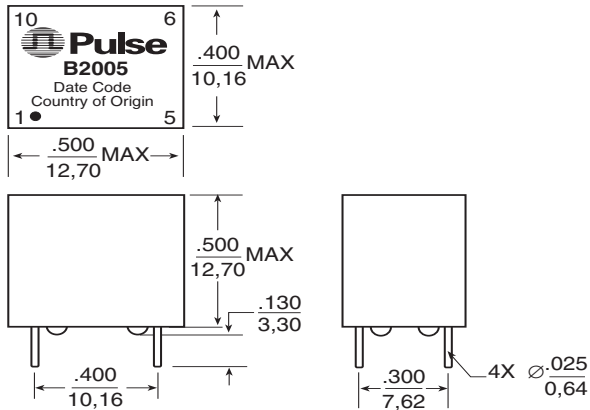
## Suited for LAN and Telecom Applications



### Mechanical

### Schematic

#### B2005



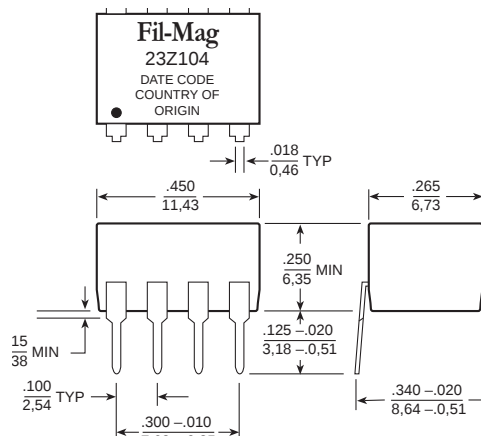
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.005}{0,13}$

**Weight** . . . . . 3.7 grams  
**Tube** . . . . . 40/tube

#### B2005



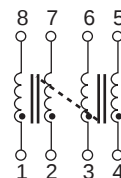
#### 23Z104



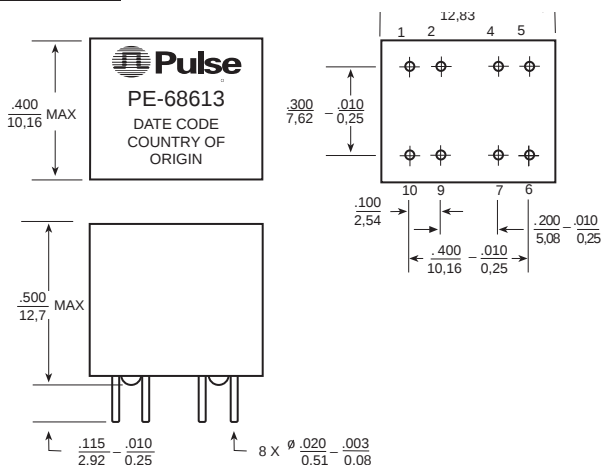
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.005}{0,13}$

**Weight** . . . . . 1.0 grams  
**Tube** . . . . . 50/tube

#### 23Z104



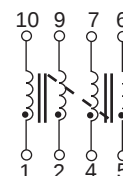
#### PE-68613



**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.005}{0,127}$

**Weight** . . . . . 3.5 grams  
**Tube** . . . . . 40/tube

#### PE-68613

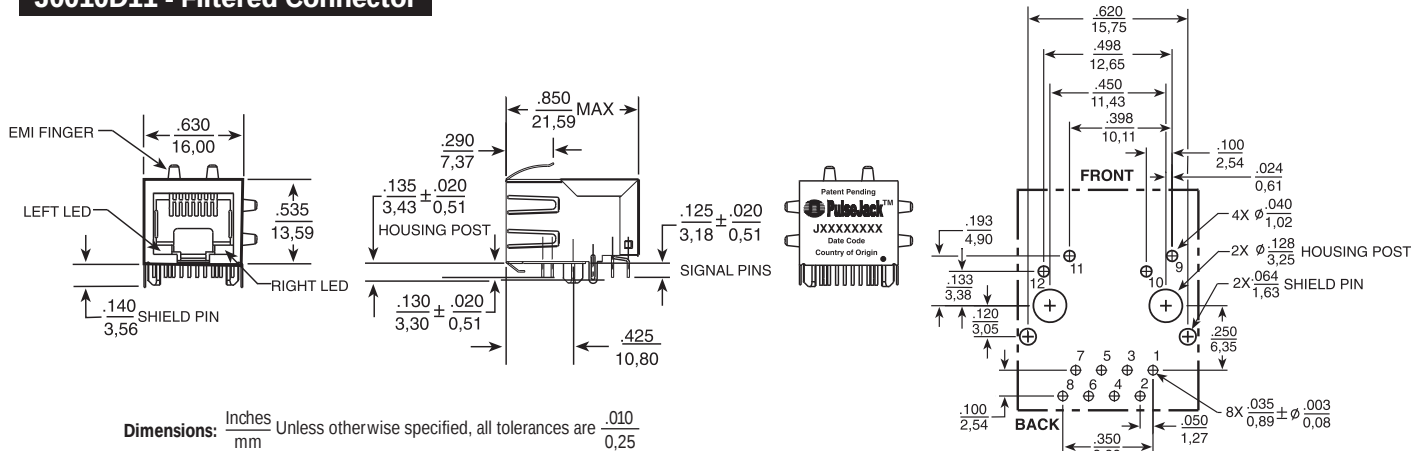


# THROUGH HOLE COMMON MODE CHOKES

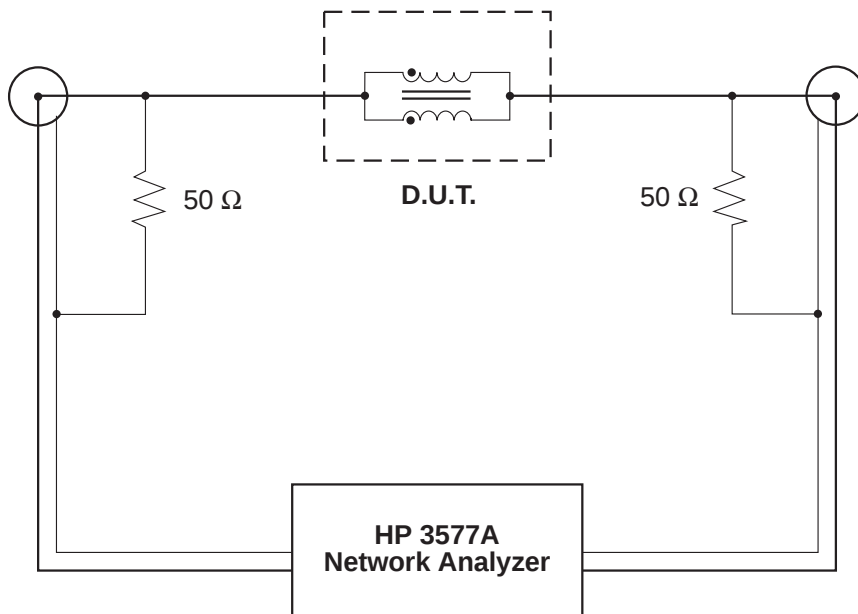
## Suited for LAN and Telecom Applications



### J0010D11 - Filtered Connector



### Common Mode Test Circuit for Surface Mount and Through Hole



#### Test Notes:

1. Network analyzer calibrated to compensate for 50  $\Omega$  resistors.
2. All windings on a core are connected in parallel for the test.
3. For multi-core chokes, test data is for one core only. The windings on the other core(s) are left unconnected (i.e. open).

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