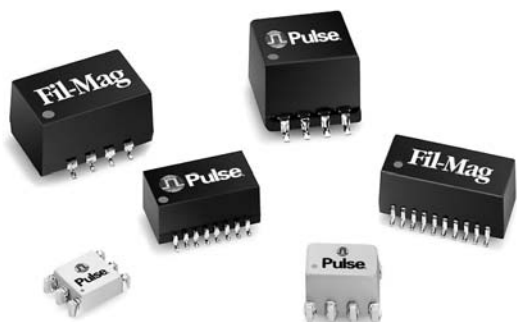






# SURFACE MOUNT COMMON MODE CHOKES

## 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 Lines | Primary Inductance OCL (µH MIN) | Common Mode Attenuation (dB TYP) |       |        |        |        |         |         |         |       |      | DCR (Ω MAX) | Page Number of 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           |                               |
| R0003       | 3            | 20                              | 6                                | 14    | 27     | 30     | 30     | 30      | 30      | 28      | 25    | 0.40 | 2           |                               |
| 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-65738    | 4            | 37                              | 8                                | 21    | 28     | 28     | 28     | 27      | 25      | 22      | —     | 0.30 | 3           |                               |
| PE-65854    | 4            | 47                              | 3                                | 19    | 32     | 36     | 35     | 29      | 12      | 6       | —     | 0.38 | 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           |                               |
| PE-68602    | 6            | 21                              | 6                                | 19    | 28     | 34     | 35     | 36      | 34      | 29      | 1     | 0.35 | 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           |                               |

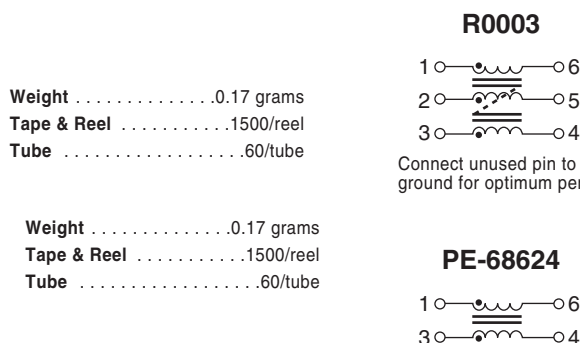
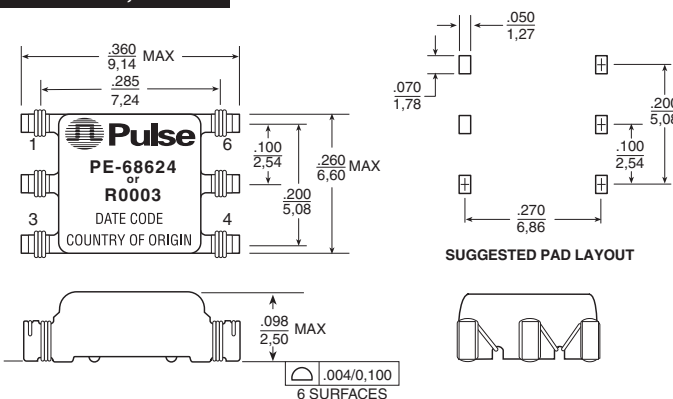
\* When ordering Tape & Reel packaging, add a "T" at the end of the part number (i.e. PE-65738T or 23Z106SMT).

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

## Mechanicals

## Schematics

### PE-68624, R0003



Weight .....0.17 grams  
Tape & Reel .....1500/reel  
Tube ......60/tube

Weight .....0.17 grams  
Tape & Reel .....1500/reel  
Tube ......60/tube

# SURFACE MOUNT COMMON MODE CHOKES

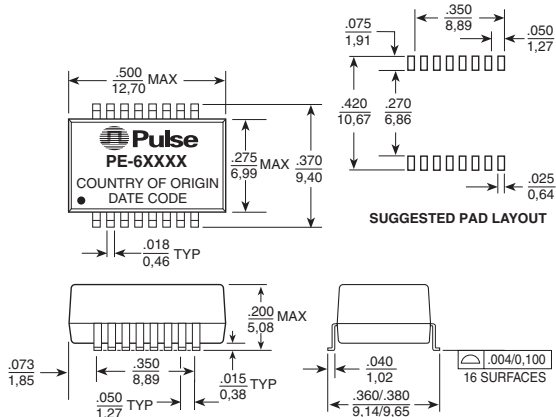
## Suited for LAN and Telecom Applications



### Mechanicals

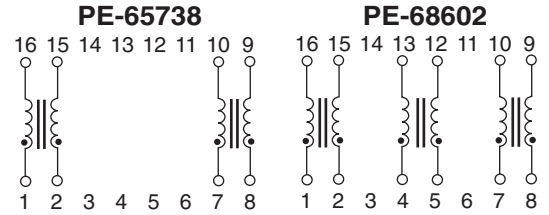
### Schematics

#### PE-65738, PE-68602, PE-69011

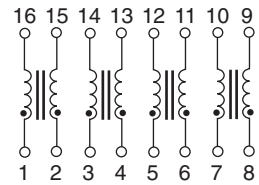


**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

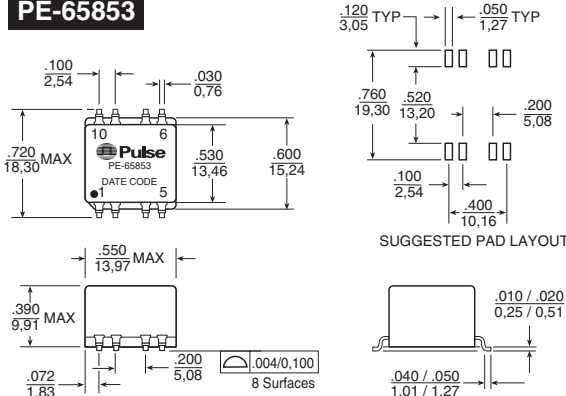
**Weight** . . . . .0.83 grams  
**Tape & Reel** . . . . .900/reel  
**Tube** . . . . .40/tube



#### PE-69011



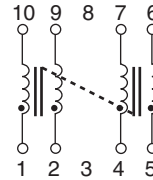
#### PE-65853



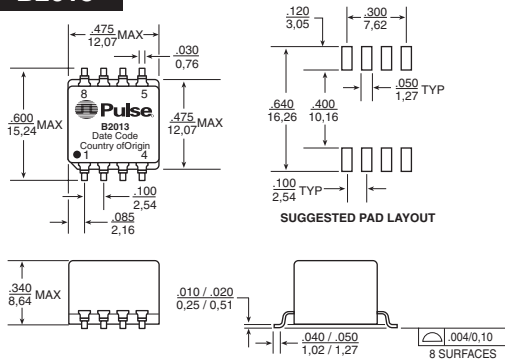
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

**Weight** . . . . .4.0 grams  
**Tape & Reel** . . . . .150/reel  
**Tube** . . . . .35/tube

#### PE-65853



#### B2013



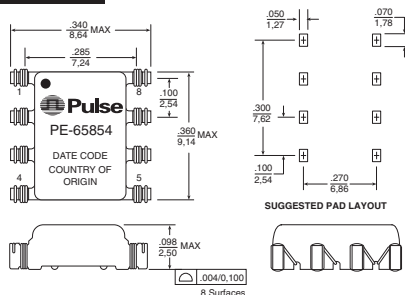
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

**Weight** . . . . .9.5 grams  
**Tray** . . . . .30/tray

#### B2013



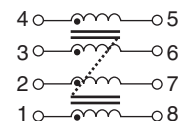
#### PE-65854



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

**Weight** . . . . .0.3 grams  
**Tape & Reel** . . . . .1500/reel  
**Tube** . . . . .60/tube

#### PE-65854



# SURFACE MOUNT COMMON MODE CHOKES

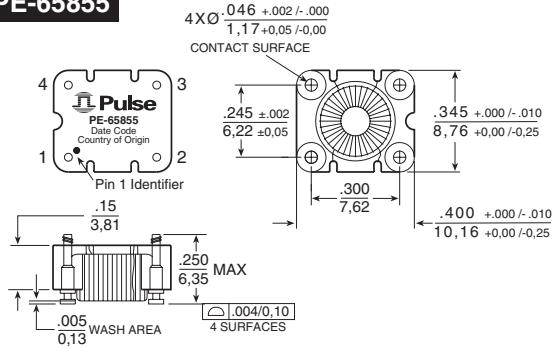
Suited for LAN and Telecom Applications



## Mechanicals

## Schematics

### PE-65855



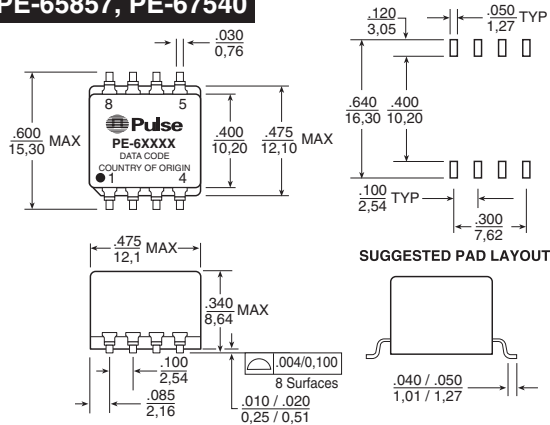
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0.25}$

**Weight** ..... .069 grams  
**Tape & Reel** ..... .800/reel  
**Tube** ..... .40 /tube

### PE-65855



### PE-65857, PE-67540

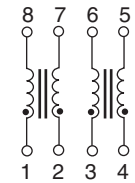
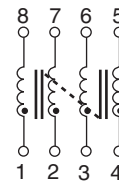


**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0.25}$

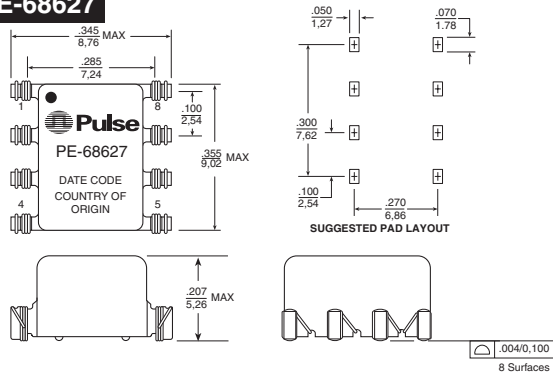
**Weight** ..... .2.0 grams  
**Tape & Reel** ..... .250/reel  
**Tube** ..... .40/tube

### PE-65857

### PE-67540



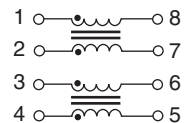
### PE-68627



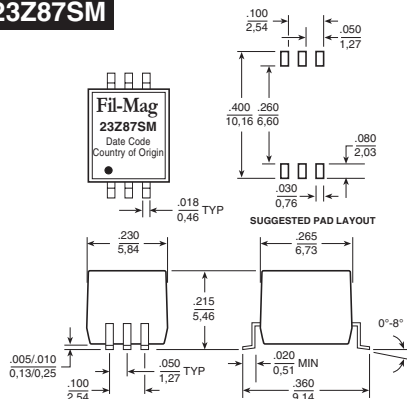
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0.25}$

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

### PE-68627



### 23Z87SM



**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.005}{0.13}$

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

### 23Z87SM



# SURFACE MOUNT COMMON MODE CHOKES

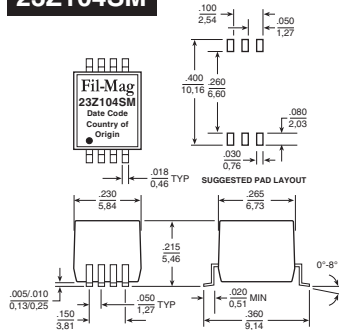
## Suited for LAN and Telecom Applications



### Mechanicals

### Schematics

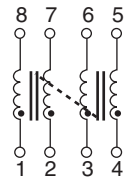
#### 23Z104SM



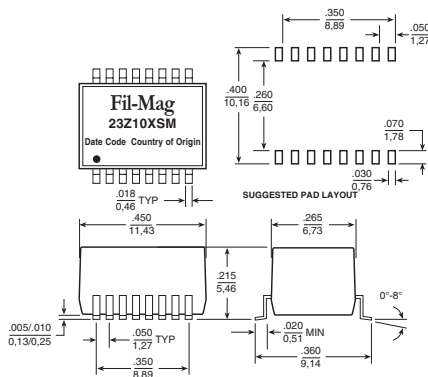
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm .005$   
 $0,13$

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

#### 23Z104SM



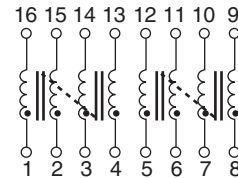
#### 23Z105SM, 23Z106SM



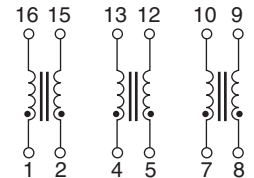
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm .005$   
 $0,13$

23Z105SM 23Z106SM  
Weight . . . . .0.8 grams . . . 1.0 grams  
Tape & Reel . . . . .750/reel . . . 750/reel  
Tube . . . . .50/tube . . . . .50/tube

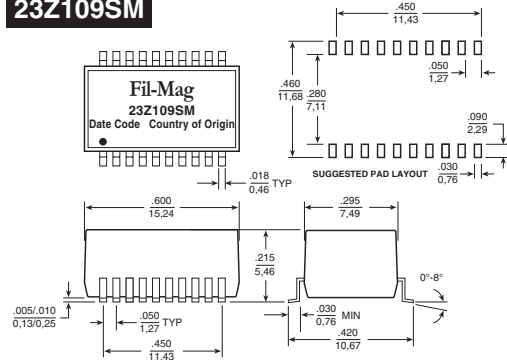
#### 23Z105SM



#### 23Z106SM



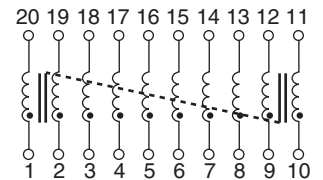
#### 23Z109SM



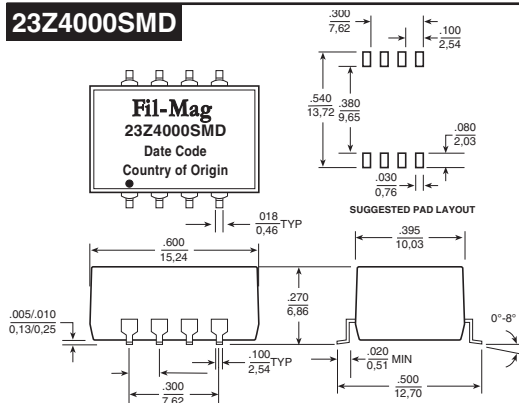
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm .005$   
 $0,13$

Weight . . . . .1.3 grams  
Tape & Reel . . . . .500/reel  
Tube . . . . .38/tube

#### 23Z109SM



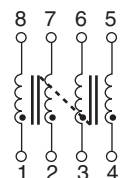
#### 23Z4000SMD



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

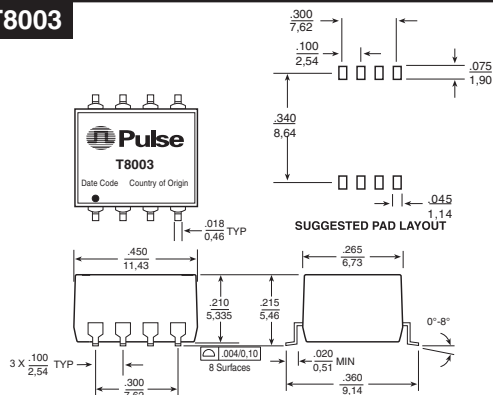
Suited for LAN and Telecom Applications



## Mechanicals

## Schematics

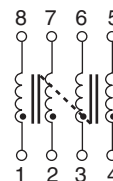
### T8003



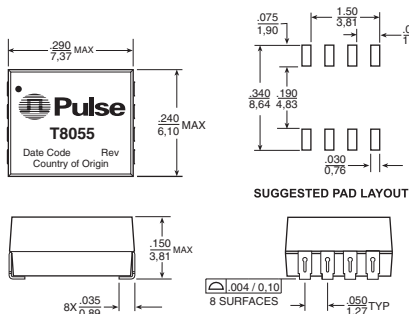
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.005}{0,13}$

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

### T8003



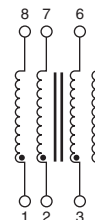
### T8055



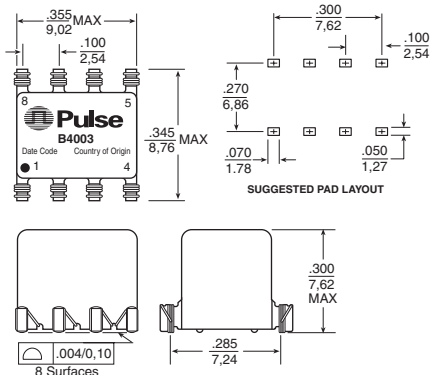
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

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

### T8055



### B4003



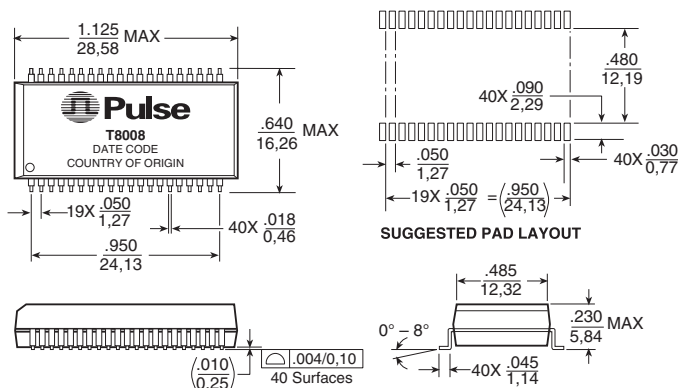
**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

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

### B4003



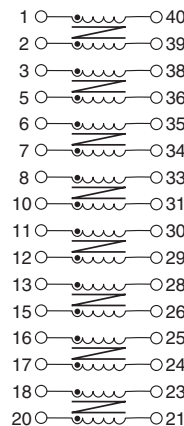
### T8008



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

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

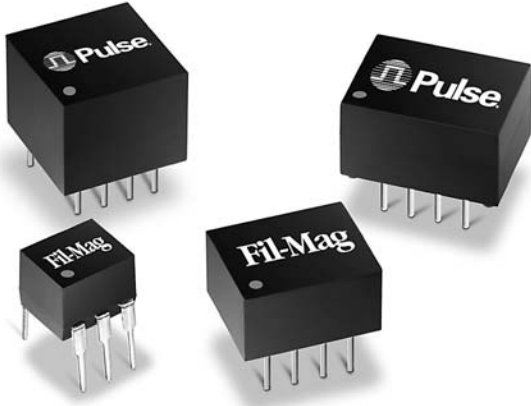
### T8008







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

# 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 of 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        | 9                             |
| 23Z107      | 2            | 68                              | 8                                | 25    | 33     | 32     | 30     | 27      | 18      | 12      | —     | 0.20        | 11                            |
| 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                            |
| 23Z87       | 3            | 69                              | 8                                | 22    | 29     | 29     | 28     | 26      | 20      | 15      | —     | 0.20        | 10                            |
| PE-65554    | 4            | 24                              | —                                | 21    | 32     | 38     | 39     | 34      | 24      | 13      | —     | 0.30        | 8                             |
| 42Z4000     | 4            | 36                              | 8                                | 24    | 37     | 40     | 40     | 38      | 30      | 24      | —     | 0.20        | 11                            |
| PE-67501    | 4            | 50                              | 14                               | 34    | 45     | 49     | 50     | 47      | 20      | 15      | 10    | 0.30        | 9                             |
| 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        | 12                            |
| 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        | 11                            |
| PE-64683    | 6            | 25                              | 6                                | 18    | 32     | 38     | 37     | 32      | 21      | 17      | —     | 0.35        | 8                             |
| 23Z106      | 6            | 85                              | 8                                | 23    | 30     | 29     | 28     | 27      | 21      | 15      | —     | 0.20        | 10                            |

# THROUGH HOLE COMMON MODE CHOKES

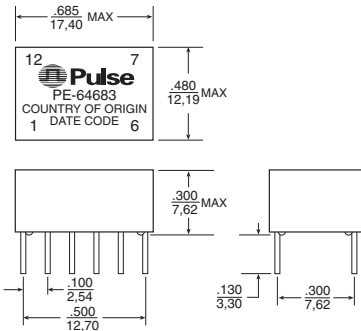
Suited for LAN and Telecom Applications



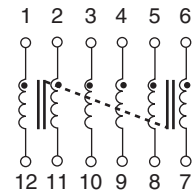
## Mechanicals

## Schematics

### PE-64683



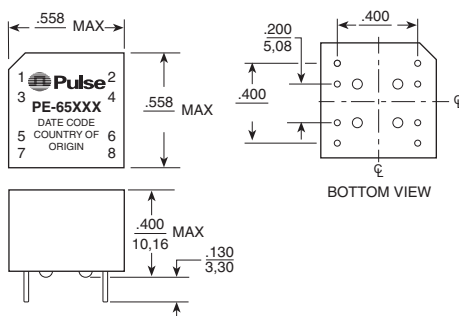
### PE-64683



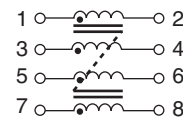
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

Weight .....0.27 grams  
Tube .....30/tube

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



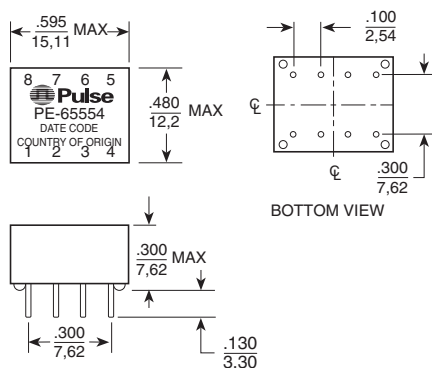
### PE-65541 PE-65542 PE-65950



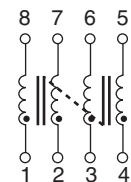
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

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

### PE-65554



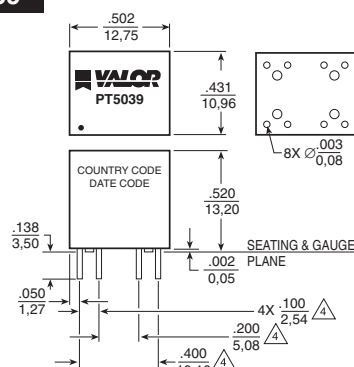
### PE-65554



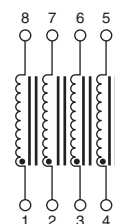
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

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

### PT5039



### 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

# THROUGH HOLE COMMON MODE CHOKES

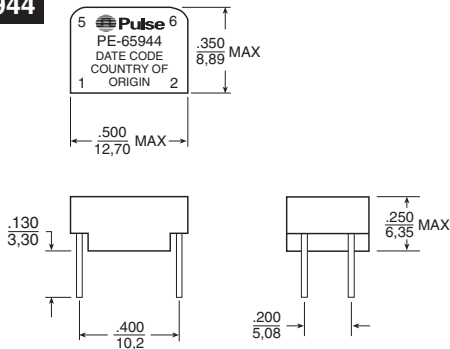
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## Mechanicals

## Schematics

### PE-65944



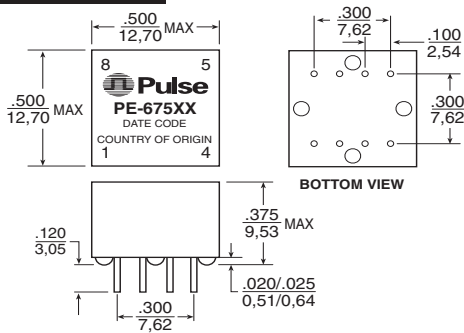
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

### PE-65944



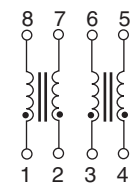
Weight ..... 1.07 grams  
Tube ..... .30/tube

### PE-67501, PE-67539



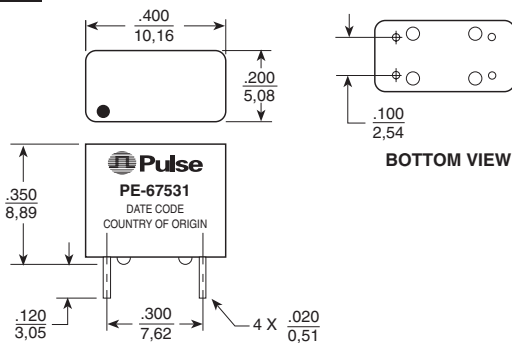
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

### PE-67501 PE-67539



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

### PE-67531



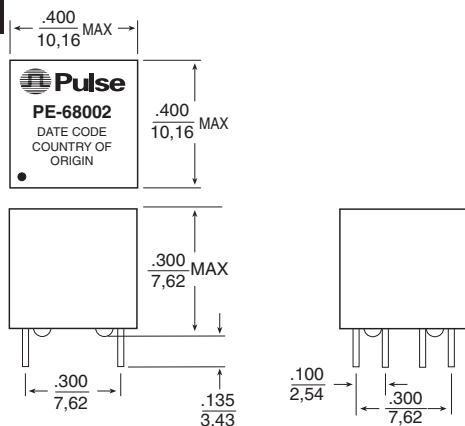
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.010}{0,25}$

### PE-67531



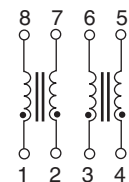
Weight ..... 0.76 grams  
Tube ..... .40/tube

### PE-68002



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

### PE-68002



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



# THROUGH HOLE COMMON MODE CHOKES

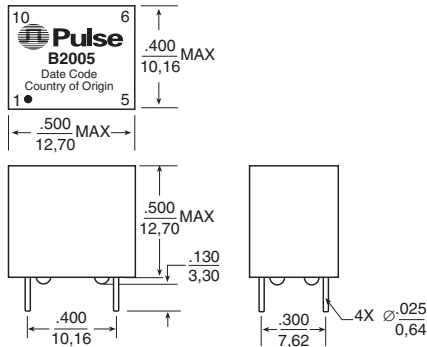
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## Mechanicals

## Schematics

**B2005**

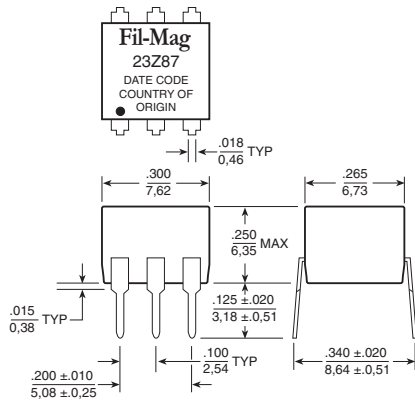


Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.005}{0,13}$

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

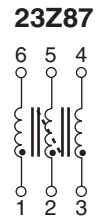


**23Z87**

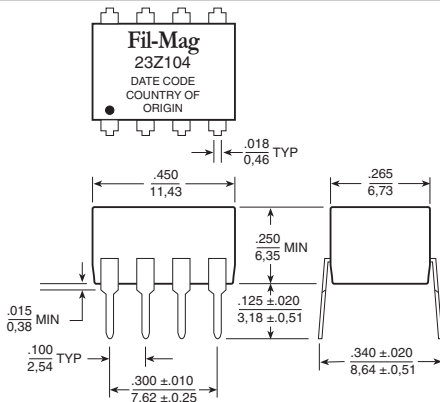


Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.005}{0,13}$

Weight . . . . .0.7 grams  
Tube . . . . .76/tube

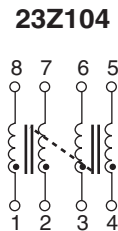


**23Z104**

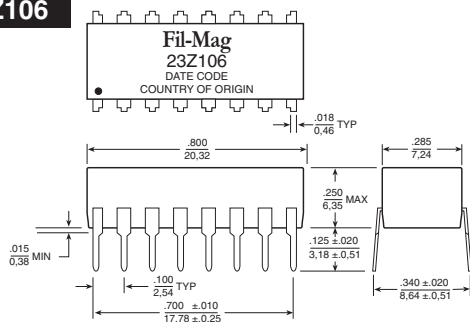


Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
Unless otherwise specified,  
all tolerances are  $\pm \frac{.005}{0,13}$

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

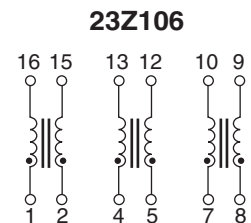


**23Z106**



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

Weight . . . . .1.9 grams  
Tube . . . . .28/tube



# THROUGH HOLE COMMON MODE CHOKES

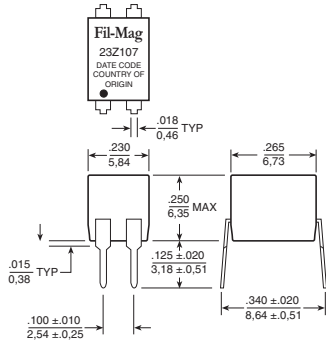
## Suited for LAN and Telecom Applications



### Mechanicals

### Schematics

#### 23Z107



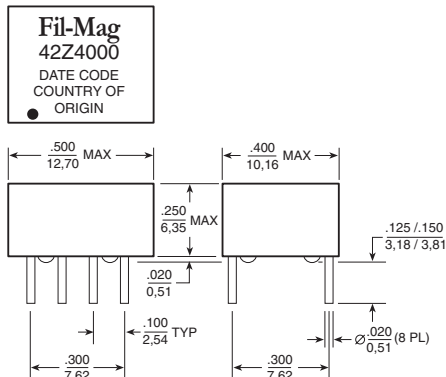
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
 Unless otherwise specified,  
 all tolerances are  $\pm \frac{.005}{0,13}$

Weight ..... .045 grams  
 Tube ..... .100/tube

#### 23Z107



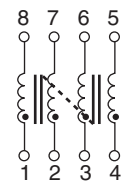
#### 42Z4000



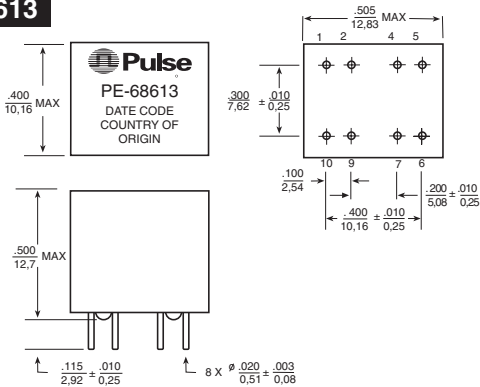
Dimensions:  $\frac{\text{Inches}}{\text{mm}}$   
 Unless otherwise specified,  
 all tolerances are  $\pm \frac{.010}{0,25}$

Weight ..... 1.5 grams  
 Tube ..... .47/tube

#### 42Z4000



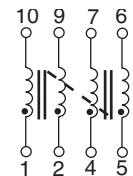
#### PE-68613



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



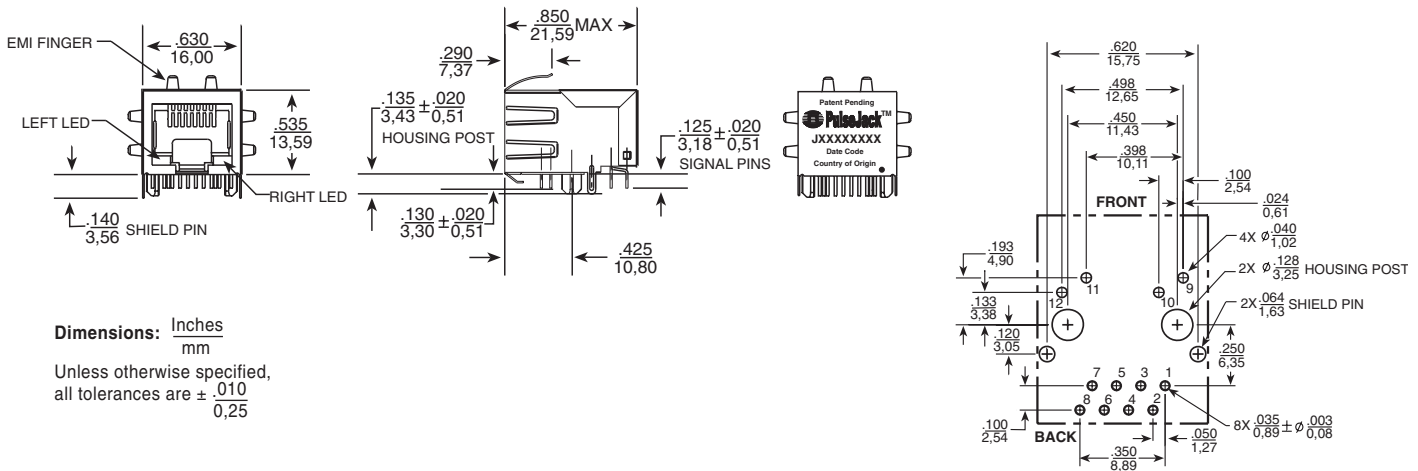
# THROUGH HOLE COMMON MODE CHOKES

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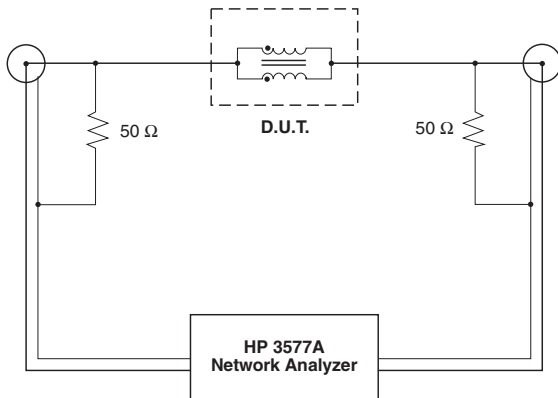


## Mechanical

### 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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