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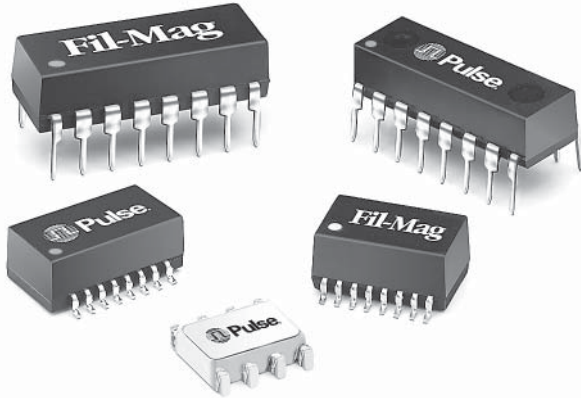
MECHANICALS

Surface Mount 8

Through Hole 10

ISOLATION TRANSFORMERS FOR 10BASE-T

For Adapter Cards, MAUs, Hubs,
and Motherboard Applications



- ☑ Meets IEEE 802.3 specification
- ☑ Available with common mode chokes for EMI suppression
- ☑ Through hole, auto-insertable, 16-pin DIP package

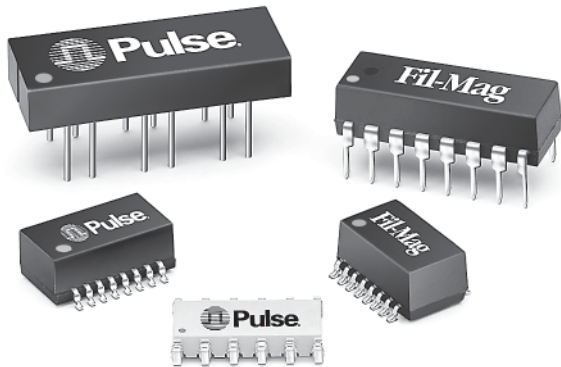
Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C




| Part ² Number | Turns Ratio (±5%) | | Primary Pins | Common Mode Choke | Sine Wave Inductance OCL (μH MIN) | Interwinding Capacitance C _{ww} ¹ (pF MAX) | Leakage Inductance L _l ¹ (μH MAX) | DCR (Ω MAX) | Hipot (Vrms) | Schem. | Mech | |
|----------------------------------|----------------------|----------|--------------------|-------------------------|--|---|--|----------------|-----------------|--------|-----------|-----------|
| | Transmit | Receive | | | | | | | | | | |
| SURFACE MOUNT² | | | | | | | | | | | PAGES 6-7 | PAGES 8-9 |
| 23Z128SM | 1CT:1.414CT | 1CT:1CT | 6-8/1-3 | — | 200 | 15 | 0.5 | 0.4 | 2000 | T4 | SMT5 | |
| 23Z356SM | 1CT:1.414CT | 1CT:1CT | 6-8/1-3 | ✓ | 200 | 12 | 0.5 | 0.6 | 2000 | T7 | SMT5 | |
| 23Z467SM | 1CT:2CT | 1CT:1CT | 6-8/1-3 | ✓ | 140 | 12 | 0.2 | 0.6 | 2000 | T7 | SMT5 | |
| E2023 ⁴ | 1CT:2.5CT | 1CT:1CT | 6-8/1-3 | ✓ | 200 | 15 | 0.5 | 0.4 | 2000 | T10 | SMT4 | |
| E4001 | 1CT:2CT | 1CT:1CT | 6-8/1-3 | ✓ | 112 | 8 | 0.3 | 0.8 | 3000 | T5 | SMT4 | |
| EX2024 ³ | 1CT:2.5CT | 1CT:1CT | 6-8/1-3 | ✓ | 350 | 30 | 0.8 | 0.6 | 2000 | T10 | SMT4 | |
| PE-65454 | 1:1.414 | 1:1 | 3-4/1-2 | — | 140 | 12 | 0.2 | 0.4 | 2000 | T1 | SMT2 | |
| PE-65745 | 1CT:1.414CT | 1CT:1CT | 6-8/1-3 | — | 140 | 12 | 0.2 | 0.3 | 1500 | T4 | SMT4 | |
| PE-68023 | 1CT:2CT | 1CT:1CT | 1-3/6-8 | ✓ | 200 | 12 | 0.3 | 1.0 | 1500 | T6 | SMT4 | |
| PE-68048 | 1CT:1.414CT | 1CT:1CT | 6-8/1-3 | ✓ | 110 | 15 | 0.4 | 1.0 | 1500 | T5 | SMT4 | |
| PE-68052 | 2CT:1CT | 1CT:1CT | 1-3/6-8 | ✓ | 140 | 12 | 0.3 | 1.0 | 1500 | T6 | SMT4 | |
| PE-68810 | — | 1:1 (4X) | 1-2/3-4 | — | 140 | 12 | 0.2 | 0.4 | 2000 | T3 | SMT4 | |
| PE-68820 | 1:1.414 (4X) | — | 1-2/3-4 5-6/7-8 | — | 40 | 12 | 0.2 | 0.4 | 2000 | T3 | SMT4 | |
| THROUGH HOLE | | | | | | | | | | | PAGE 6 | PAGE 10 |
| 23Z128 | 1CT: 2CT | 1CT:1CT | 6-8/1-3 | — | 140 | 15 | 0.5 | 0.4 | 2000 | T4 | TH3 | |

1. OCL, C_{ww} and L_l are measured at 20 mVrms, 100 kHz.
2. For Tape & Reel packaging, add the suffix "T" to the end of the part number when ordering. e.g. E2023T.
3. Part numbers denoted "EX" are extended temperature parts -40°C to 85°C, electrical specifications @ 25°C.
4. E2023NL is the RoHS compliant version of E2023.

ISOLATION TRANSFORMERS FOR ETHERNET

AUI Transformers



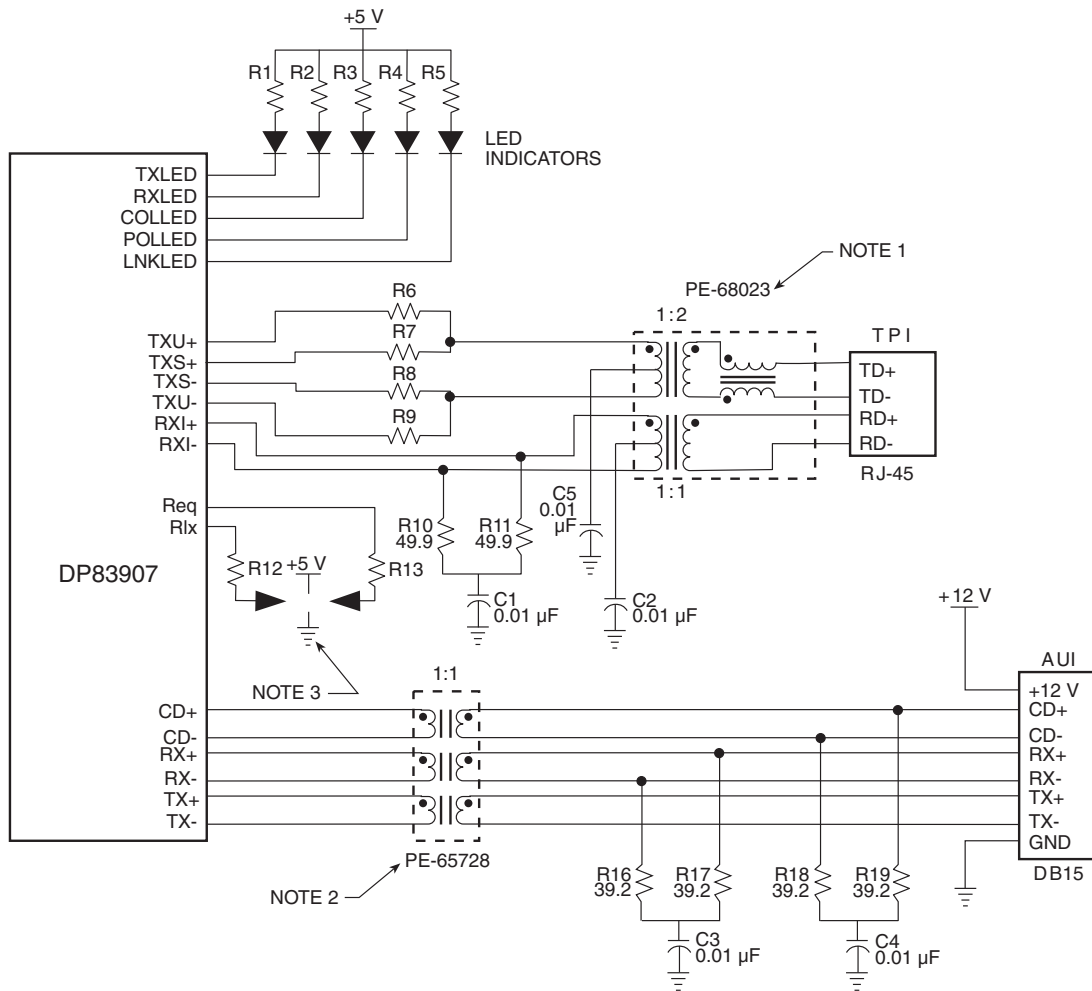
-  Low leakage inductance and coupling capacitance for faster rise times
-  Small form factor, 50 mil lead spacing
-  Through hole, auto-insertable, 16-pin DIP package

Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C

| Part Number ³ | Turns Ratio (±5%) | Primary Pins | Primary Sine Wave OCL ¹ (μH ±20%) | Primary ET-Constant (V-μs MIN) | Rise Time ² (ns MAX) | Interwinding Capacitance C _{ww} ¹ (pF MAX) | Leakage Inductance L _L ¹ (μH MAX) | DCR (Ω MAX) | Schem. | Mech. | Hipot (Vrms) |
|----------------------------------|-------------------|--------------|--|--------------------------------|---------------------------------|--|---|-------------|---------|-----------|--------------|
| SURFACE MOUNT³ | | | | | | | | | | | |
| | | | | | | | | | PAGE 6 | PAGES 8-9 | |
| 23Z90SM | 1:1 | 1-2/4-5/7-8 | 75 | 2.4 | 3.0 | 10 | 0.20 | 0.20 | T2 | SMT5 | 2000 |
| 23Z91SM | 1:1 | 1-2/4-5/7-8 | 100 | 2.4 | 3.0 | 10 | 0.20 | 0.30 | T2 | SMT5 | 2000 |
| 23Z108SM ⁵ | 1:1 | 1-2/4-5/7-8 | 350 | 2.5 | 3.5 | 16 | 0.30 | 0.35 | T2 | SMT5 | 2000 |
| PE-65723 | 1:1 | 1-2/4-5/7-8 | 75 | 1.8 | 3.0 | 8 | 0.20 | 0.30 | T2 | SMT4 | 2000 |
| PE-65727 | 1:1 | 1-2/4-5/7-8 | 150 | 1.2 | 3.0 | 12 | 0.20 | 0.30 | T2 | SMT4 | 2000 |
| PE-65728 | 1:1 | 1-2/4-5/7-8 | 100 | 1.8 | 3.0 | 9 | 0.20 | 0.30 | T2 | SMT4 | 2000 |
| THROUGH HOLE | | | | | | | | | | | |
| | | | | | | | | | PAGES 6 | PAGE 9-10 | |
| PE-64102 | 1:1 | 1-2/4-5/7-8 | 75 | 2.1 | 3.0 | 10 | 0.20 | 0.20 | T2 | TH4 | 500 |
| PE-64103 | 1:1 | 1-2/4-5/7-8 | 100 | 2.1 | 3.0 | 10 | 0.20 | 0.30 | T2 | TH4 | 500 |
| PE-64104 | 1:1 | 1-2/4-5/7-8 | 150 | 2.1 | 3.5 | 12 | 0.20 | 0.30 | T2 | TH4 | 500 |
| PE-64108 | 1:1 | 1-2/4-5/7-8 | 100 | 2.1 | 3.5 | 10 | 0.25 | 0.40 | T2 | TH2 | 2000 |
| PE-64109 | 1:1 | 1-2/4-5/7-8 | 150 | 3.0 | 3.0 | 15 | 0.20 | 0.45 | T2 | TH2 | 2000 |
| PE-64502 | 1:1 | 1-2/4-5/7-8 | 75 | 2.1 | 3.0 | 10 | 0.20 | 0.20 | T2 | TH4 | 2000 |
| PE-64503 | 1:1 | 1-2/4-5/7-8 | 100 | 2.1 | 3.0 | 10 | 0.20 | 0.30 | T2 | TH4 | 2000 |

1. OCL, C_{ww} and L_L are measured at 20 mVrms, 100 kHz.
2. Rise time is measured in 75 W systems.
3. For Tape & Reel packaging, add a suffix "T" to the end of the part number when ordering. e.g. PE-65723T.

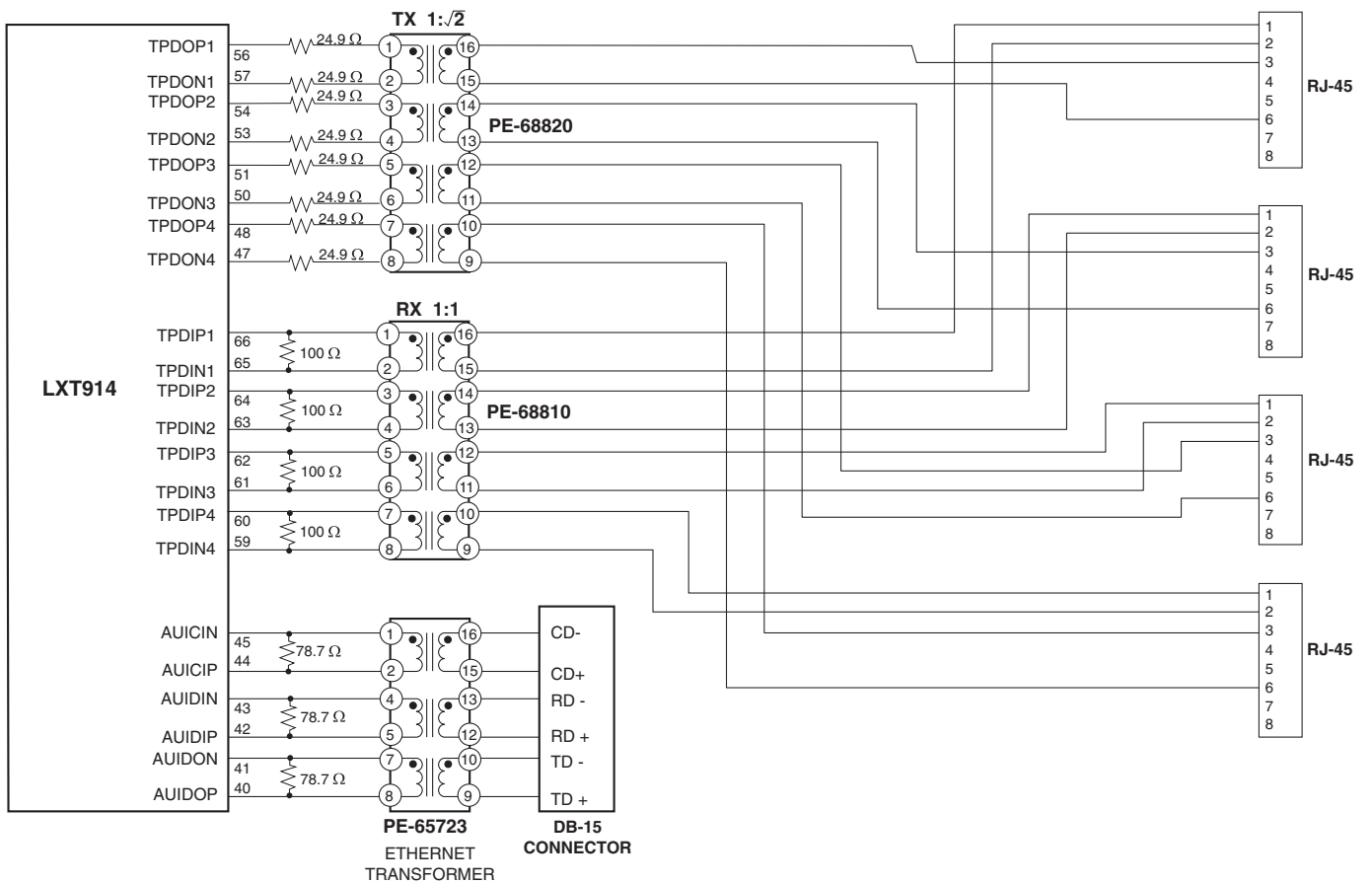
Typical Application Circuit



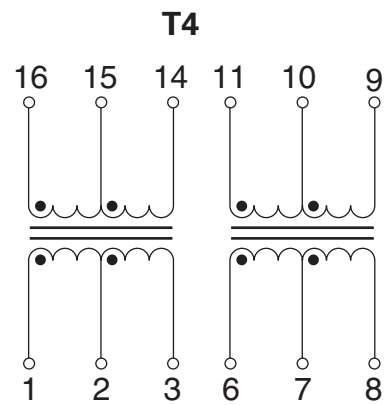
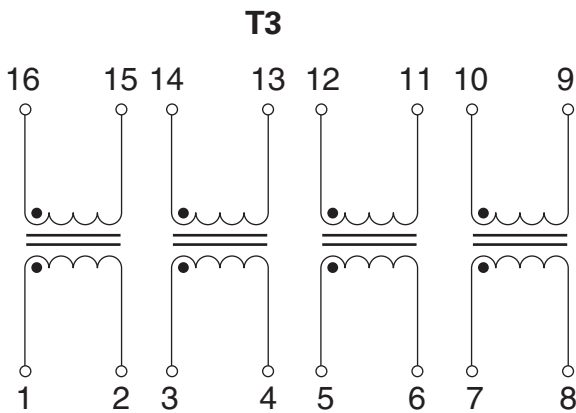
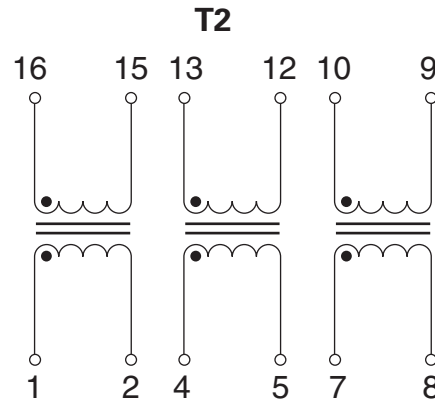
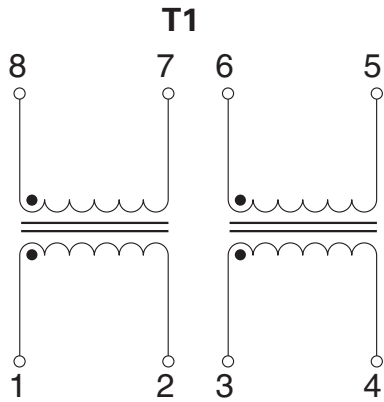
NOTES:

1. Connections at pins 12 and 13 apply to PE-68023 only. These are test points. Do not ground.
2. For specific information, see pages 2 and 3 in this catalog.
3. For specific connection, refer to National's Application Notes.

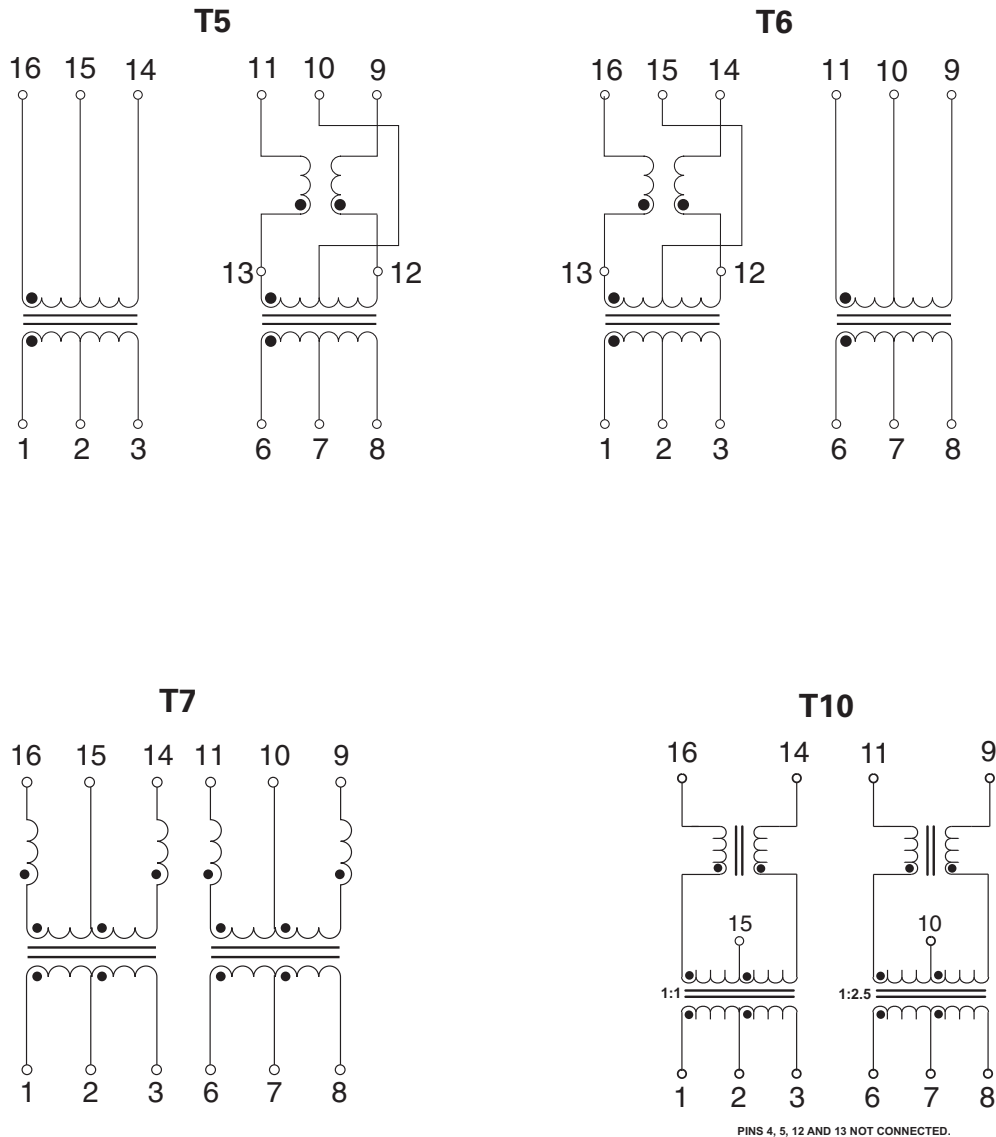
Typical 10Base-T Application Circuit



Schematics

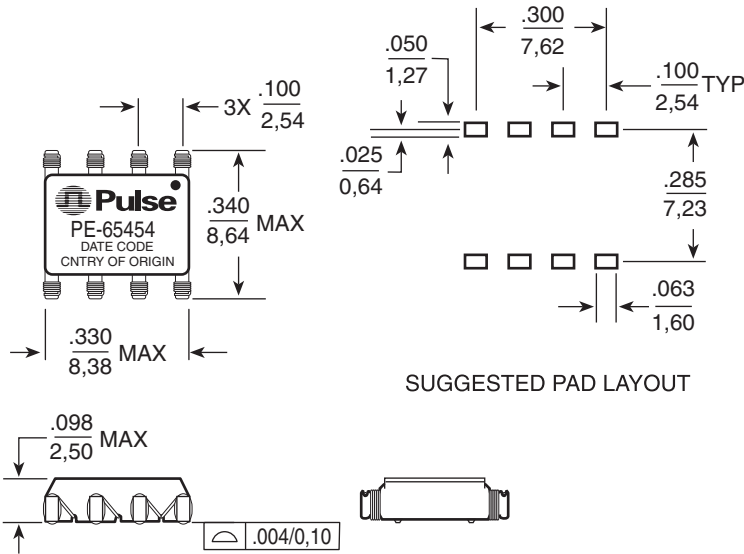


Schematics (continued)



Surface Mount Mechanicals

SMT2

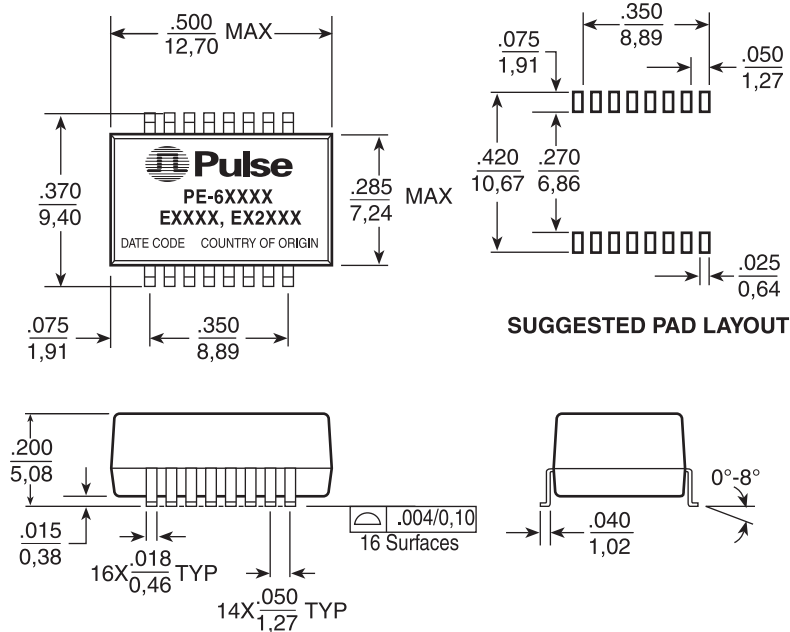


Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

Weight 0.22 grams
 Tube60/tube
 Tape & Reel 1500/reel

SMT4



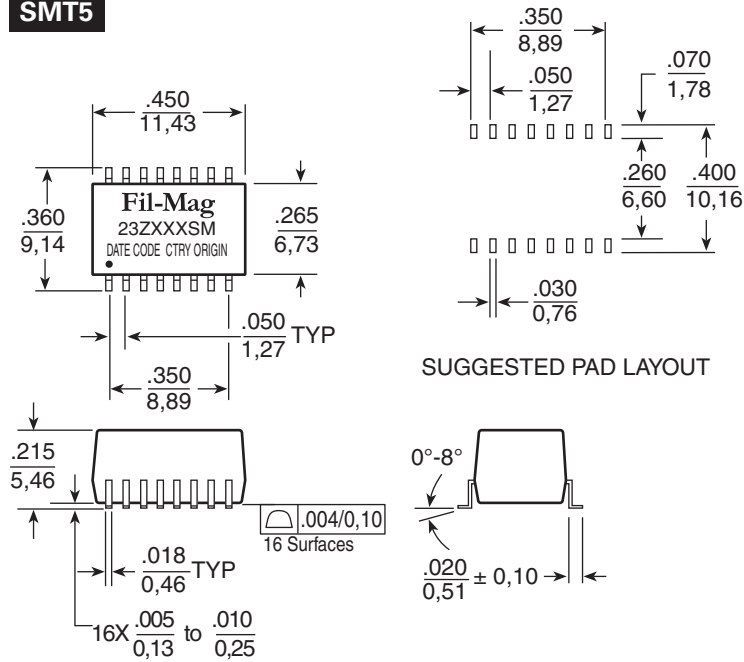
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

Weight 0.82 grams
 Tube40/tube
 Tape & Reel 900/reel

Through Hole Mechanicals - (continued)

SMT5



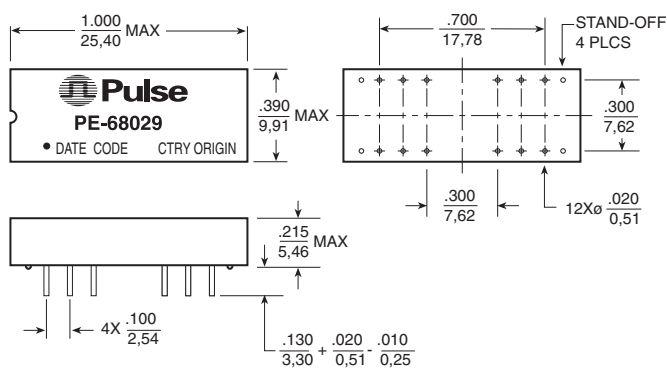
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

Weight 0.85 grams
 Tube50/tube
 Tape & Reel 750/reel

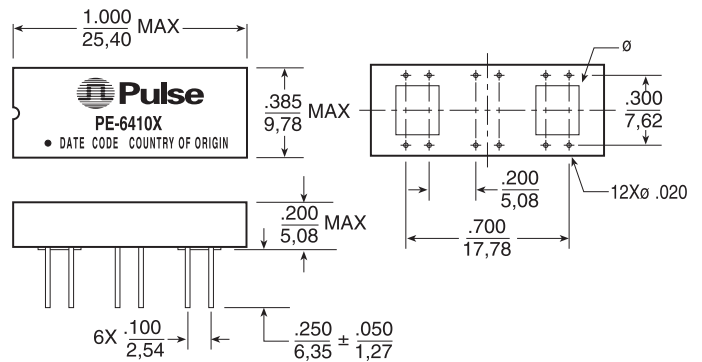
Through Hole Mechanicals

TH1



Weight 2.17 grams
 Tube 20/tube

TH2

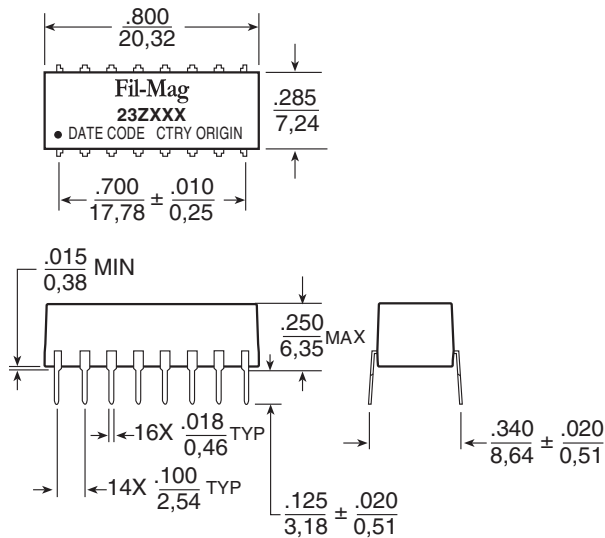


Weight 2.18 grams
 Tube 20/tube

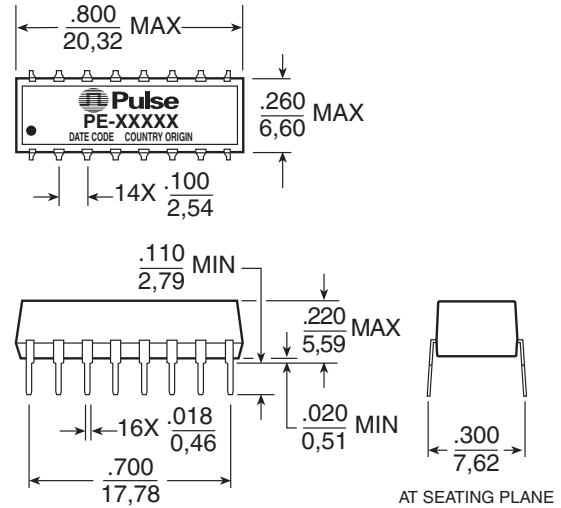
Dimensions: $\frac{\text{Inches}}{\text{mm}}$ Unless otherwise specified, all tolerances are $\pm \frac{.010}{0,25}$

Through Hole Mechanicals - *continued*

TH3



TH4



Weight 1.7 grams

Tube 28/tube

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

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

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

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

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