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ISOLATION TRANSFORMERS

10BASE-T FOR ADAPTER CARDS, MAUS, HUBS AND MOTHERBOARD APPLICATIONS

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|---|---|

ETHERNET AUI TRANSFORMERS

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APPLICATION CIRCUITS

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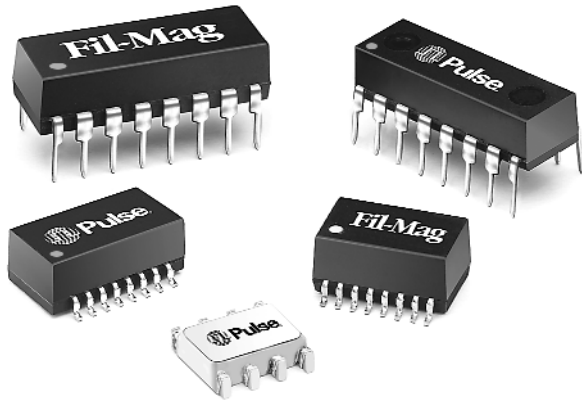
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ISOLATION TRANSFORMERS FOR 10BASE-T

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

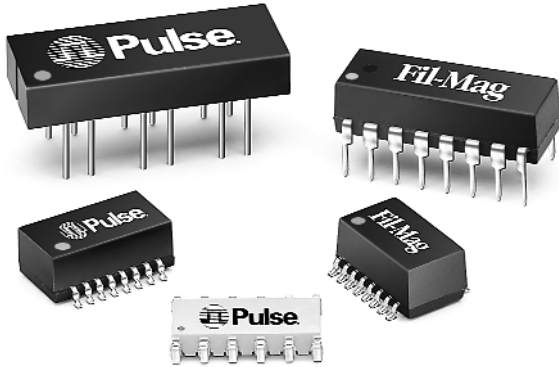
Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C




| Part ² Number | Turns Ratio (±5%) | | Primary Pins | Common Mode Choke | Sine Wave Inductance OCL ¹ (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 |
| 23Z114SM | 1CT:1CT | 1CT:1CT | 1-3/6-8 | | 200 | 12 | 0.3 | 0.3 | 2000 | T4 | SMT5 |
| 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 | X | 200 | 12 | 0.5 | 0.6 | 2000 | T7 | SMT5 |
| 23Z467SM | 1CT:2CT | 1CT:1CT | 6-8/1-3 | X | 140 | 12 | 0.2 | 0.6 | 2000 | T7 | SMT5 |
| E2023 ⁴ | 1CT: 2.5CT | 1CT: 1CT | 6-8/1-3 | X | 200 | 15 | 0.5 | 0.4 | 2000 | T10 | SMT4 |
| E4001 | 1CT:2CT | 1CT:1CT | 6-8/1-3 | X | 112 | 8 | 0.3 | 0.8 | 3000 | T5 | SMT4 |
| E5017 | 1CT:1CT | 1CT:1CT | 1-3/6-8 | X | 200 | 10 | 0.25 | 1.0 | 1500 | T6 | SMT4 |
| EX2024 ³ | 1CT: 2.5CT | 1CT:1CT | 6-8/1-3 | X | 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-65726 | 1CT:1CT | 1CT:1CT | 1-3/6-8 | | 200 | 10 | 0.2 | 0.3 | 2000 | T4 | SMT4 |
| 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 | X | 200 | 12 | 0.3 | 1.0 | 1500 | T6 | SMT4 |
| PE-68041 | 1CT:2CT | 1CT:1CT | 6-8/1-3 | | 112 | 8 | 0.3 | 0.5 | 1500 | T4 | SMT4 |
| PE-68048 | 1CT: 1.414CT | 1CT:1CT | 6-8/1-3 | X | 110 | 15 | 0.4 | 1.0 | 1500 | T5 | SMT4 |
| PE-68052 | 2CT:1CT | 1CT:1CT | 1-3/6-8 | X | 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 | | | | | | | | | | | |
| | | | | | | | | | | pages 6 | page 10 |
| 23Z128 | 1CT: 2CT | 1CT:1CT | 6-8/1-3 | | 140 | 15 | 0.5 | 0.4 | 2000 | T4 | TH3 |
| PE-65263 | 1CT:1CT | 1CT:1CT | 1-3/6-8 | | 200 | 15 | 0.25 | 0.3 | 2000 | T4 | TH4 |

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



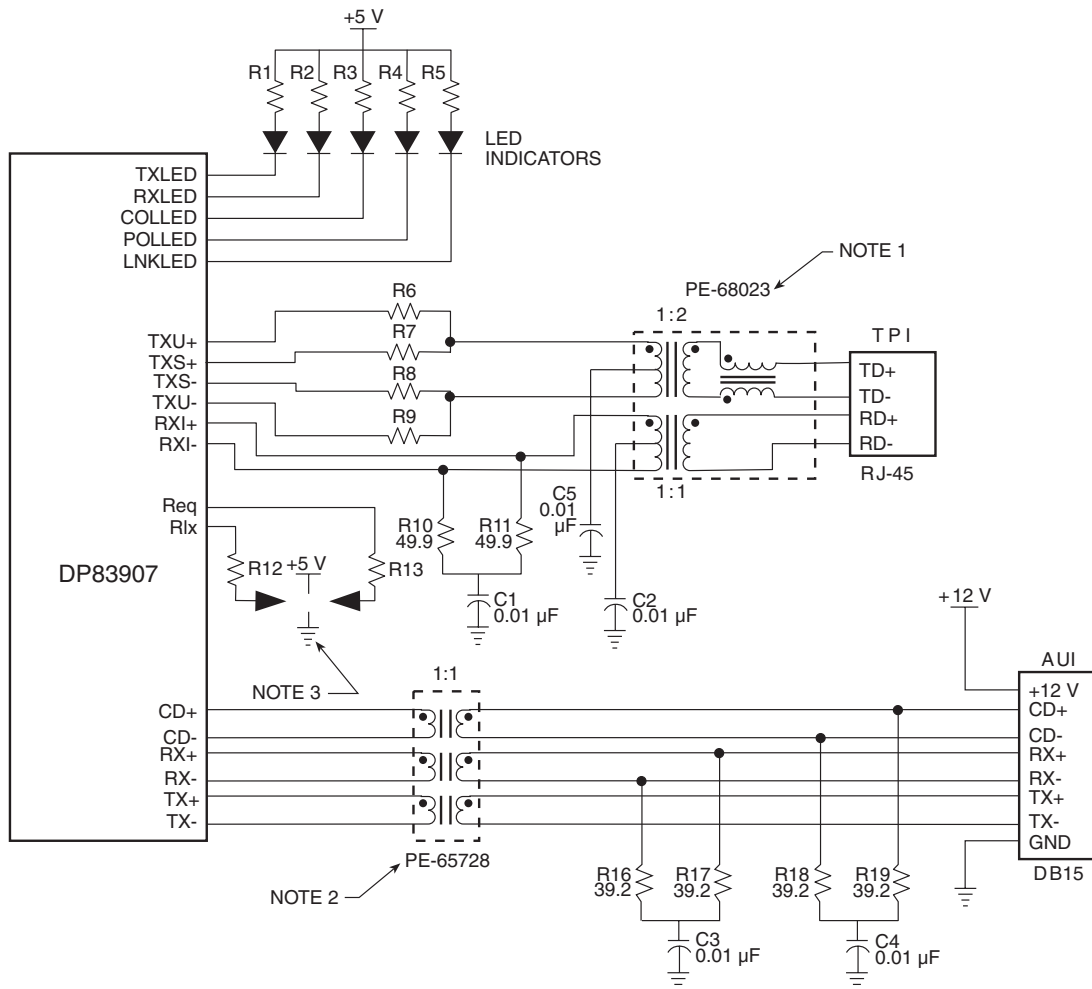
-  Low leakage inductance and coupling capacitance for faster rise times
-  Small form factor, 50 mil lead spacing
-  Through hole, auto-insertable, 16-pin DIP package

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-64107 | 1:1 | 1-2/4-5/7-8 | 75 | 2.4 | 3.5 | 10 | 0.25 | 0.30 | T2 | TH2 | 2000 |
| 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 Ω systems.
3. For Tape & Reel packaging, add a suffix "T" to the end of the part number when ordering. e.g. PE-65723T.

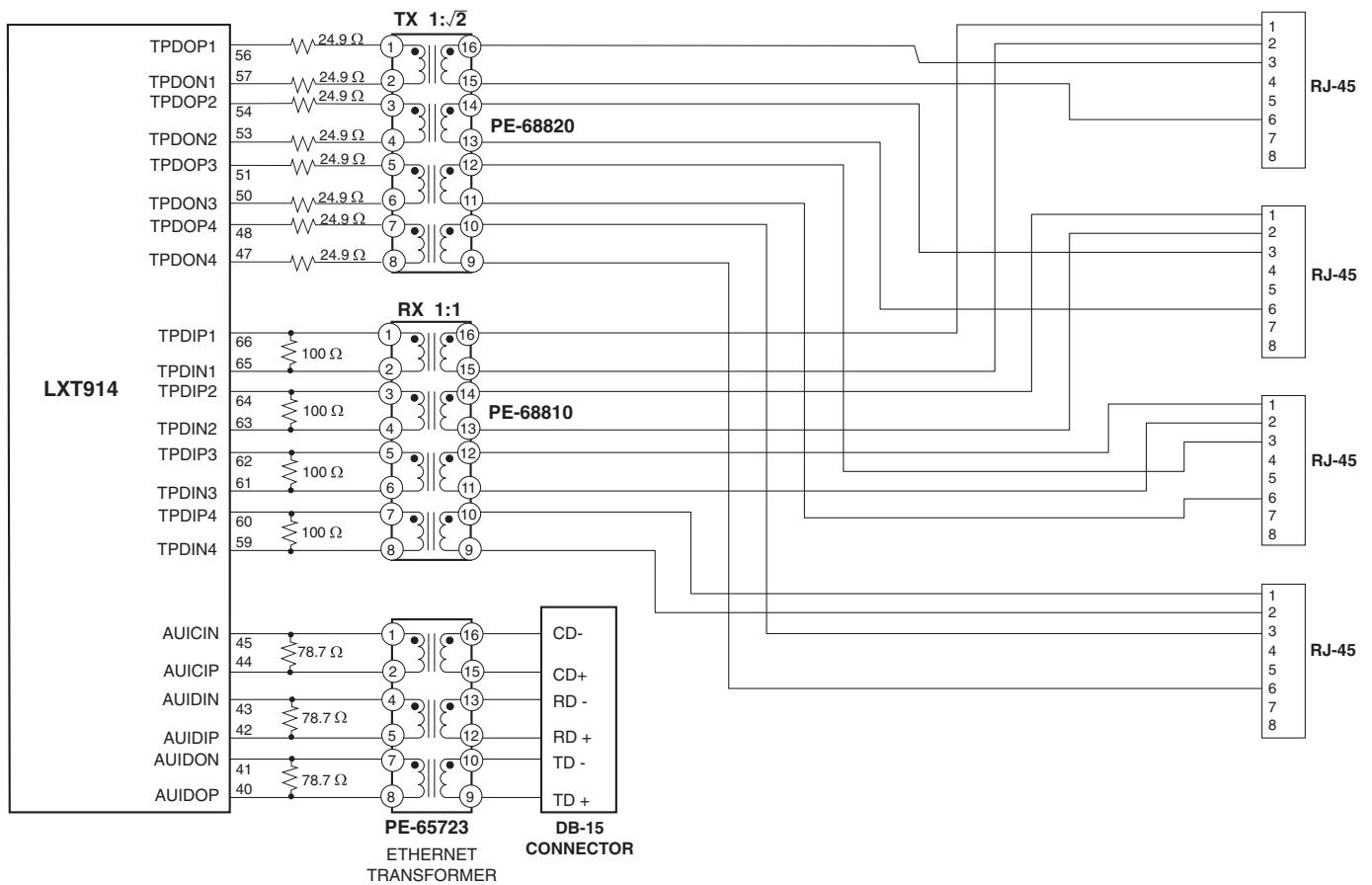
Typical Application Circuit



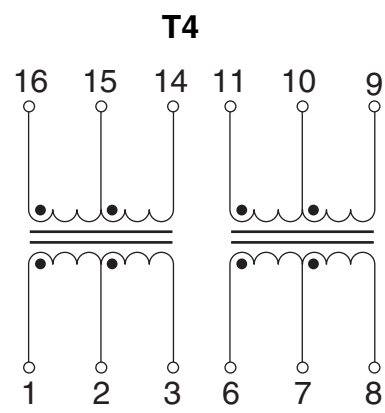
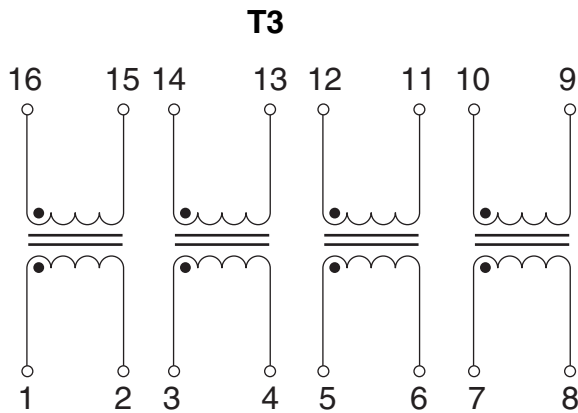
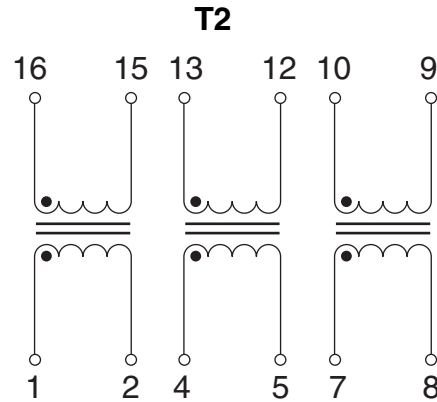
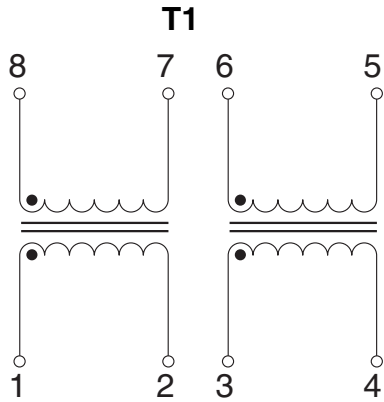
NOTES:

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

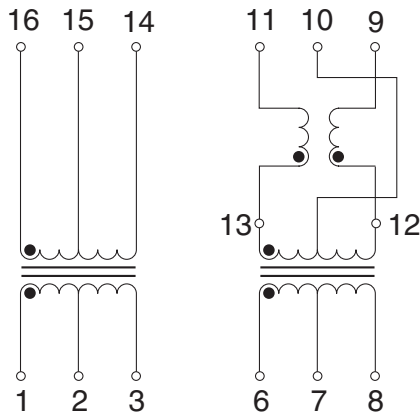


Schematics

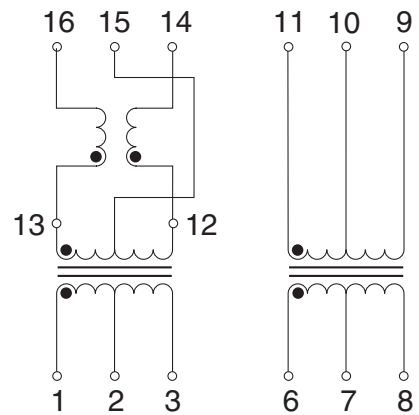


Schematics (continued)

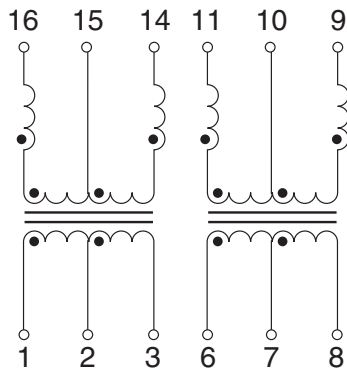
T5



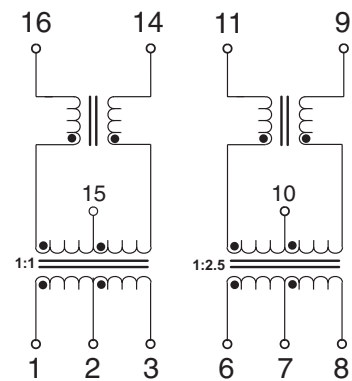
T6



T7



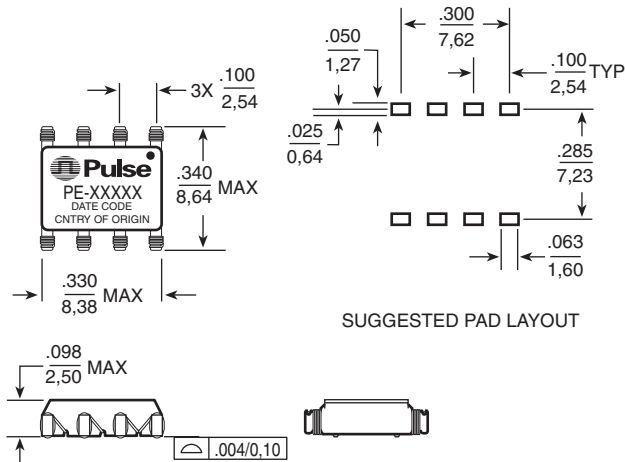
T10



PINS 4, 5, 12 AND 13 NOT CONNECTED.

Surface Mount Mechanicals

SMT2



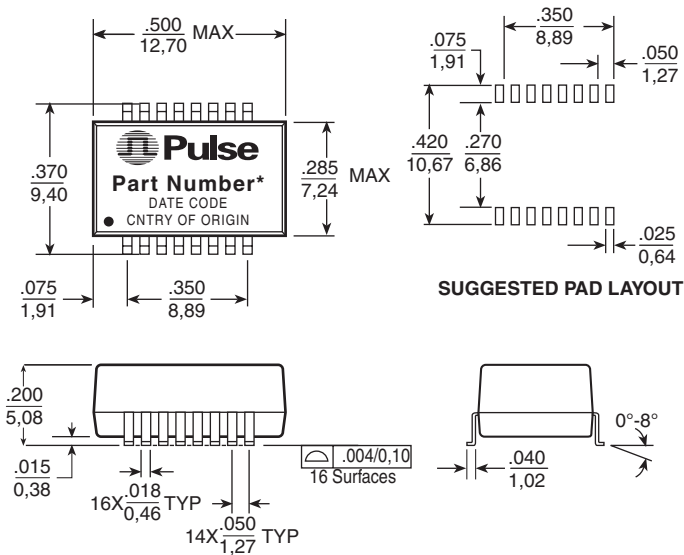
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

Weight0.22 grams
 Tube60/tube
 Tape & Reel1500/reel

SMT4

*PE-6XXXX, EXXX, EX2XXX



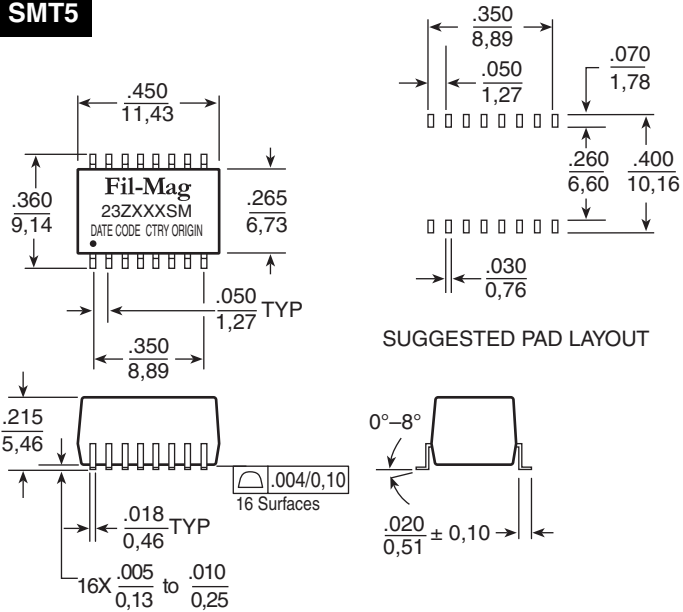
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

Weight0.82 grams
 Tube40/tube
 Tape & Reel900/reel

Surface Mount Mechanicals *(continued)*

SMT5



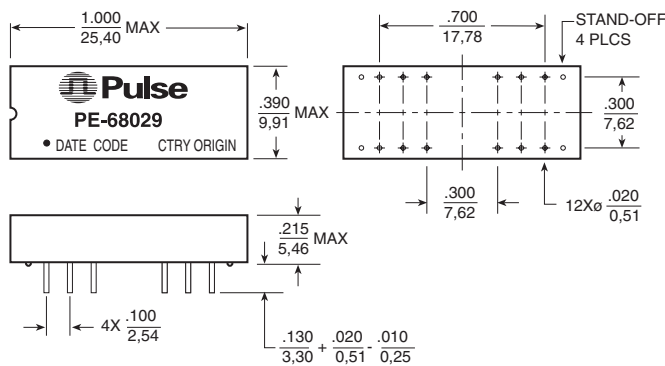
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

Weight085 grams
 Tube50/tube
 Tape & Reel750/reel

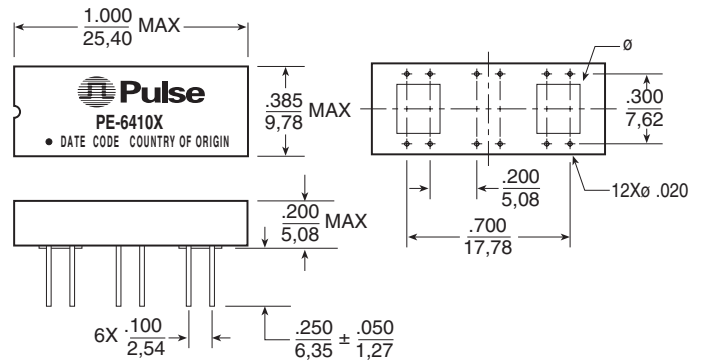
Through Hole Mechanicals

TH1



Weight217 grams
 Tube20/tube

TH2

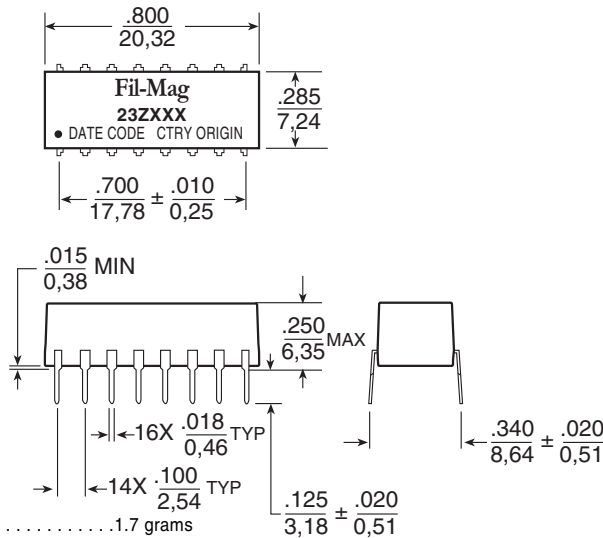


Weight218 grams
 Tube20/tube

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

Through Hole Mechanicals - *continued*

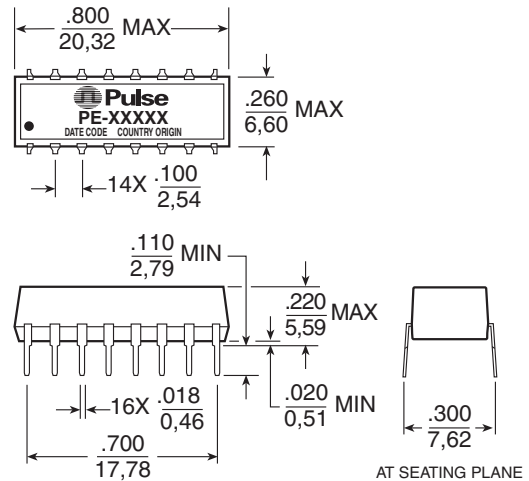
TH3



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

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

TH4



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

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

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