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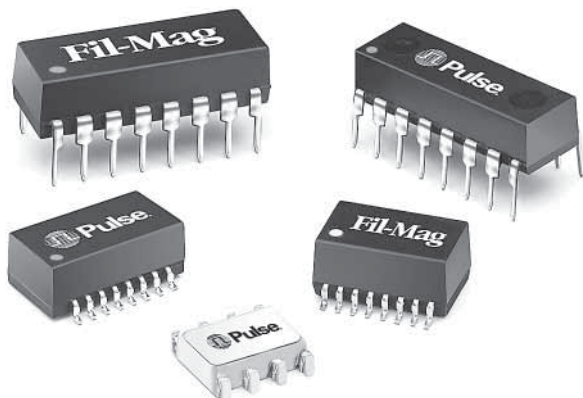
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ISOLATION TRANSFORMERS FOR 10BASE-T

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 (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 MOUNT ²											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.

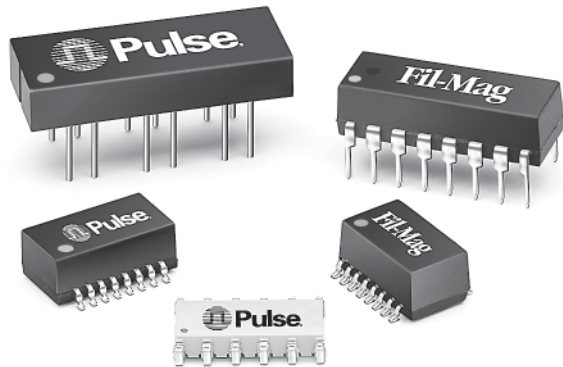
2. For Tape & Reel packaging, add the suffix "T" to the end of the part number when ordering. e.g. E2023T.

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

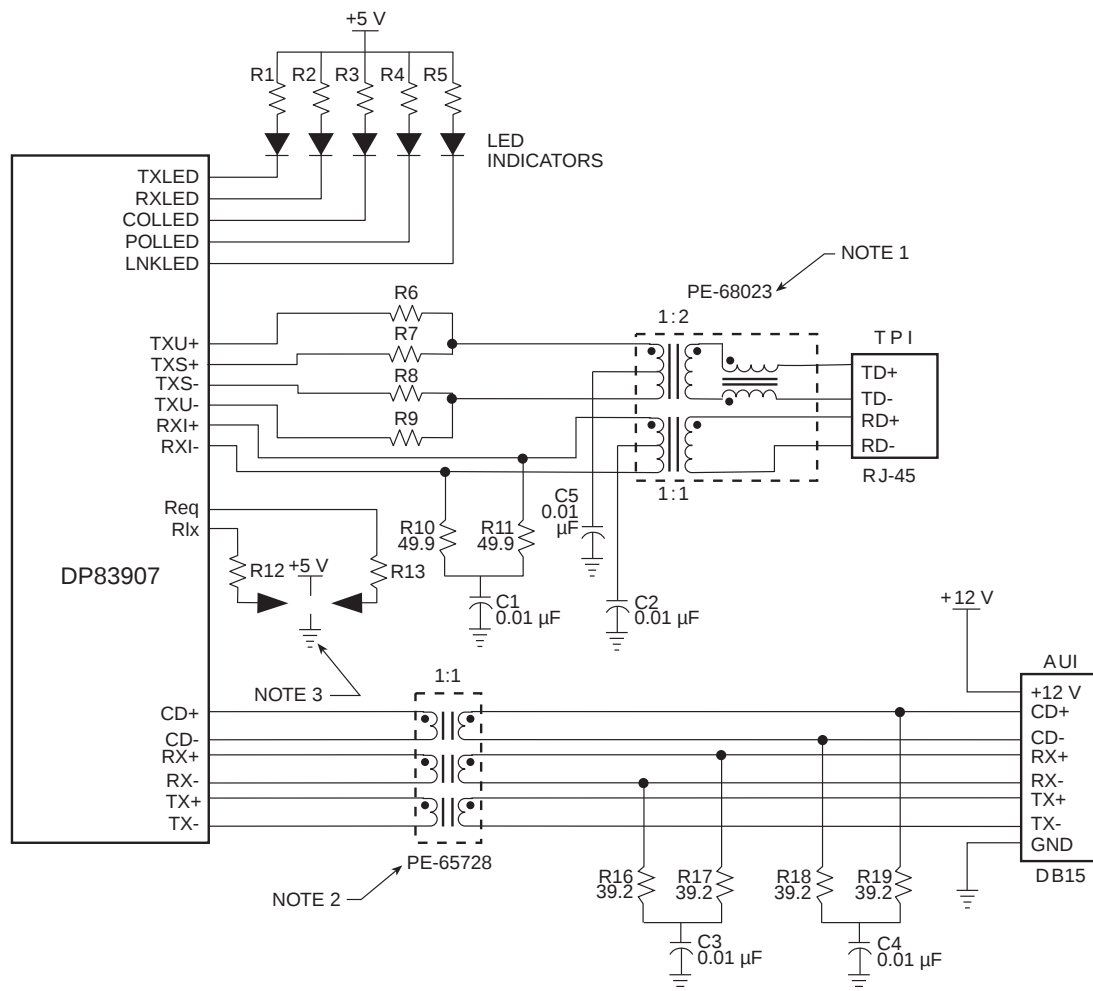
Part Number ³	Turns Ratio (±5%)	Primary Pins	Primary Sine Wave OCL ¹ (μH ±20%)	Primary ET-Constant (V-μs MIN)	Rise Time ² (ns MAX)	Interwinding Capacitance C _{ww} ¹ (pF MAX)	Leakage Inductance L _L ¹ (μH MAX)	DCR (Ω MAX)	Schem.	Mech.	Hipot (Vrms)
SURFACE MOUNT³									PAGE 6	PAGES 8-9	
23Z90SM	1:1	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
23Z108SM⁵	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-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

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.

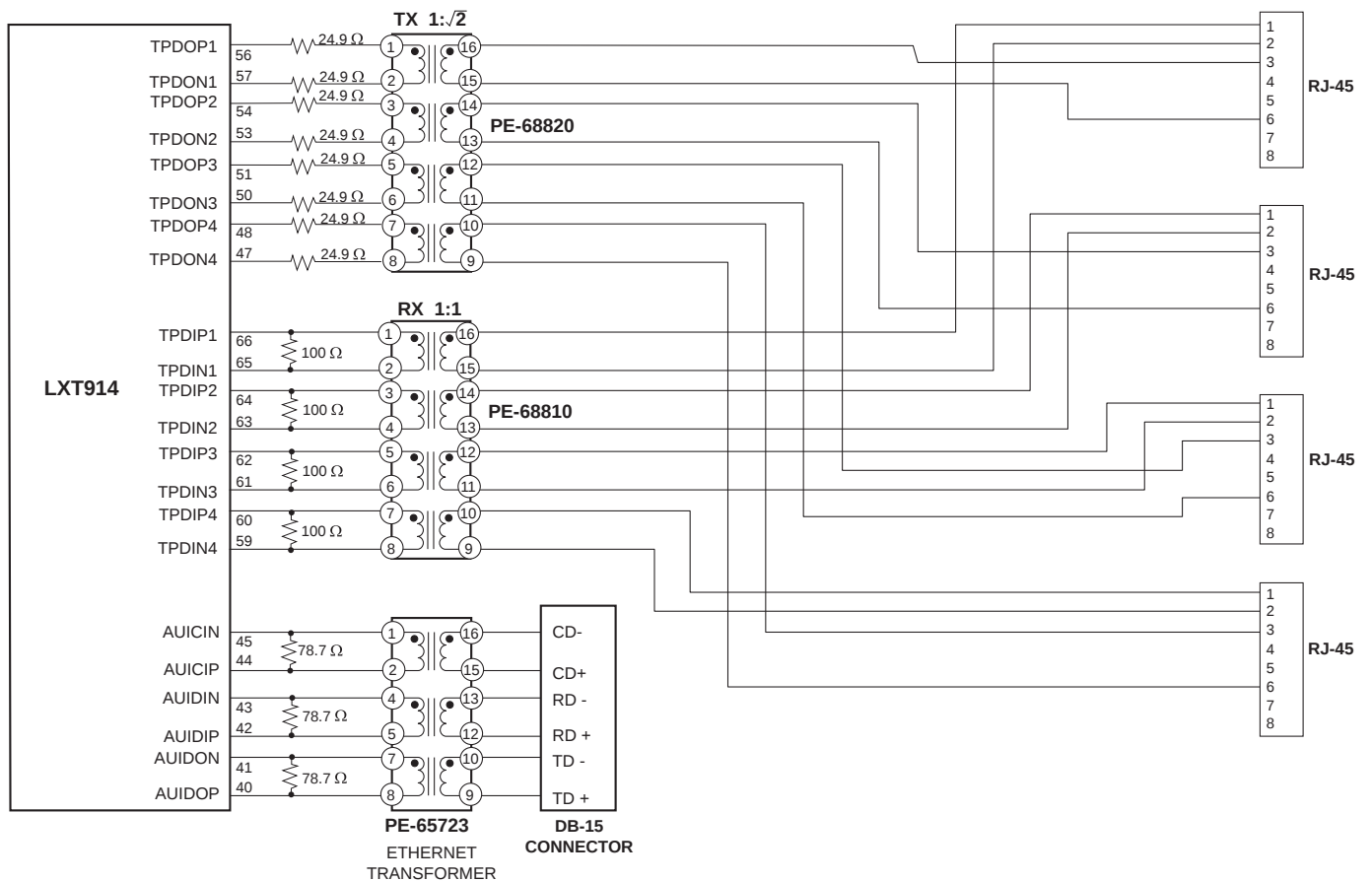
Typical Application Circuit



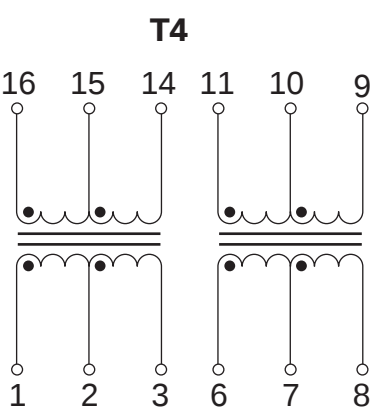
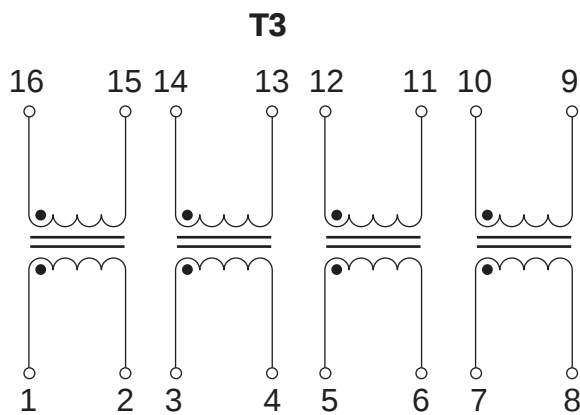
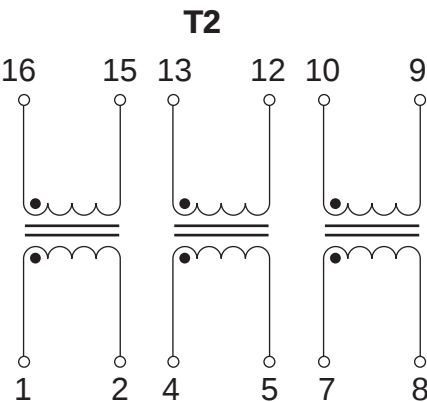
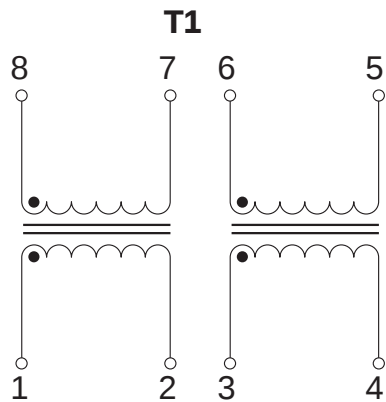
NOTES:

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.

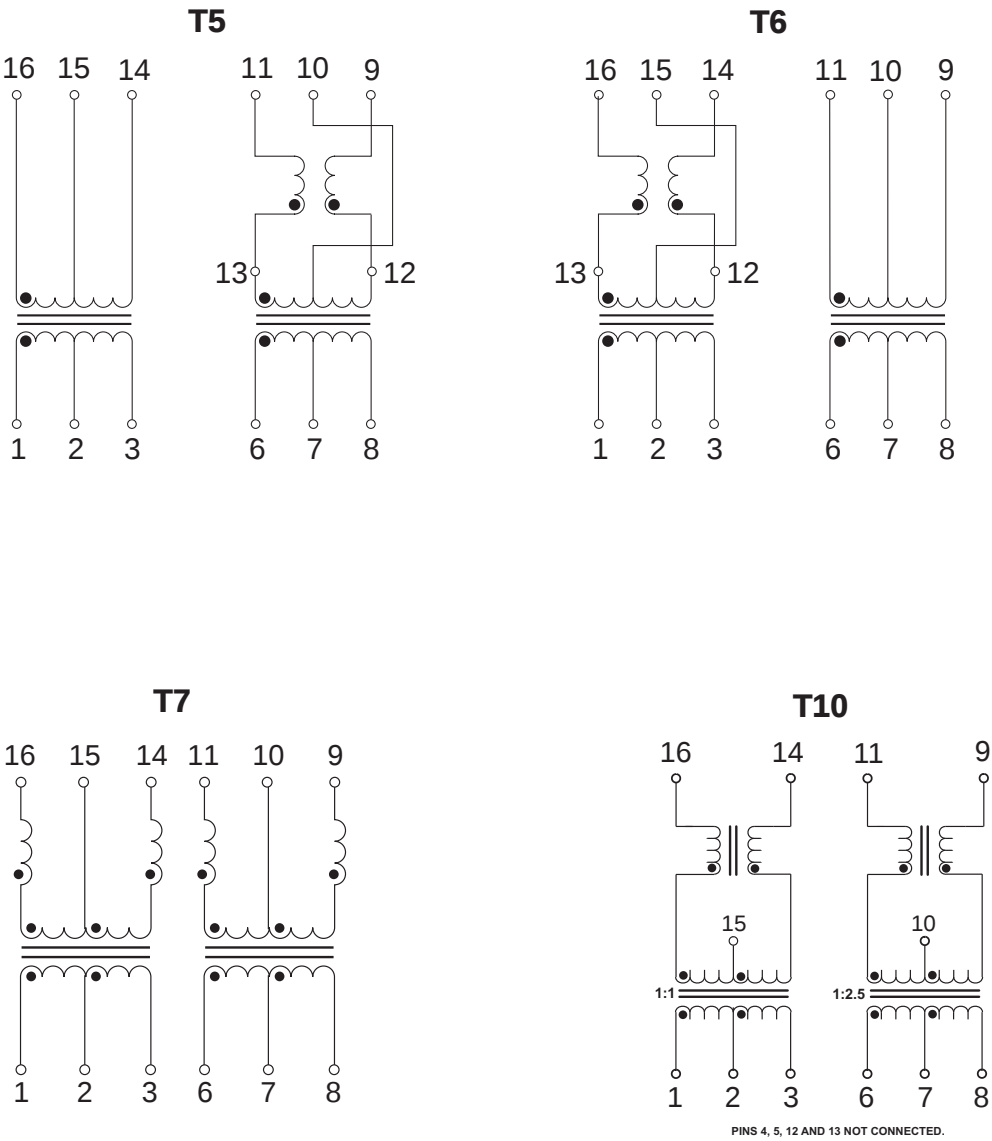
Typical 10Base-T Application Circuit



Schematics

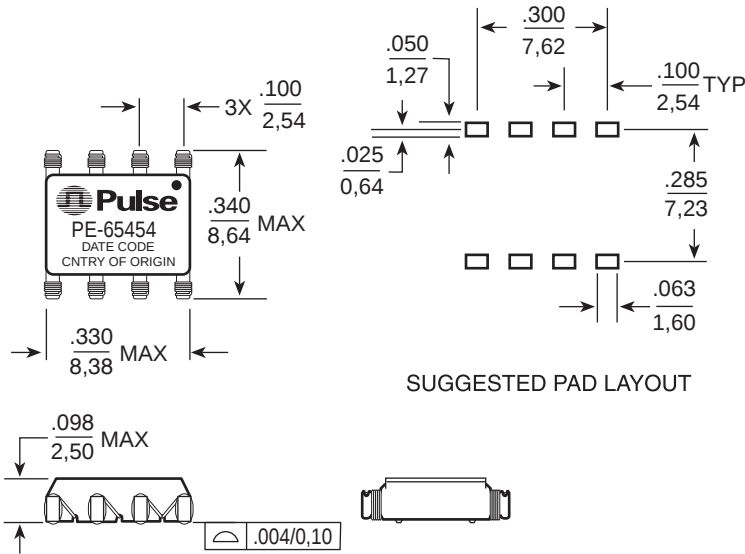


Schematics (continued)



Surface Mount Mechanicals

SMT2

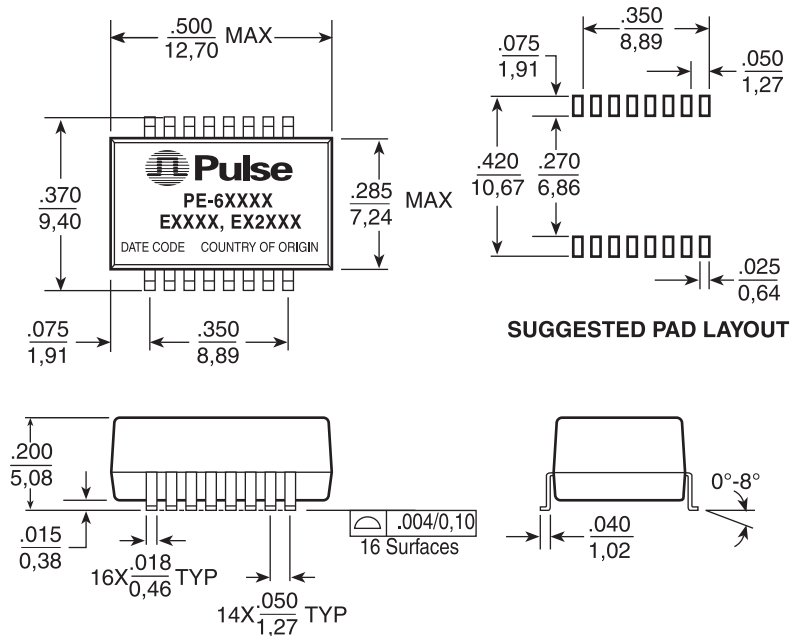


Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

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

SMT4



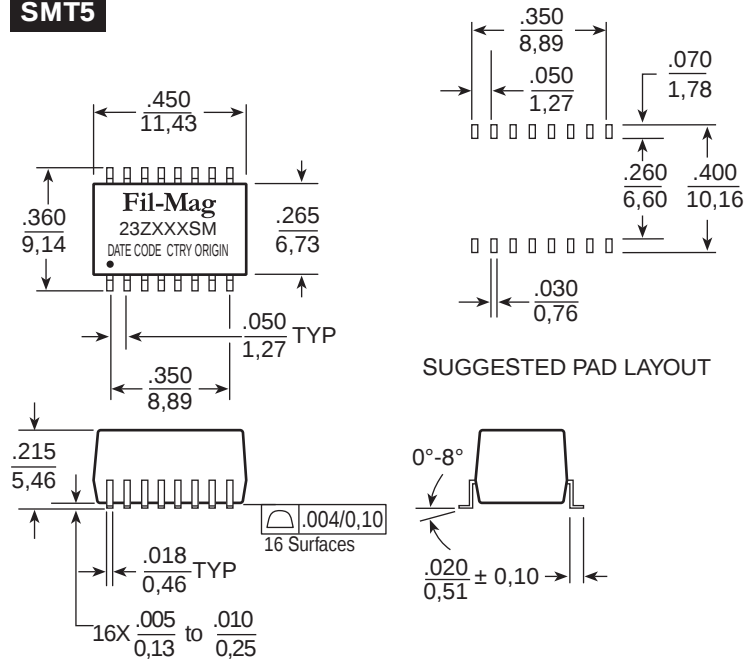
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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 $\pm \frac{.005}{0,13}$

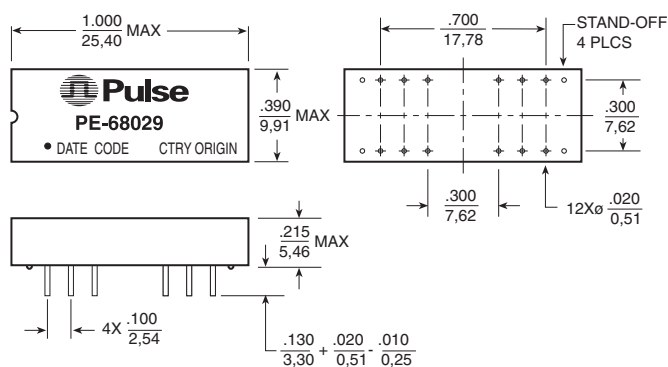
Weight 0.85 grams

Tube50/tube

Tape & Reel 750/reel

Through Hole Mechanicals

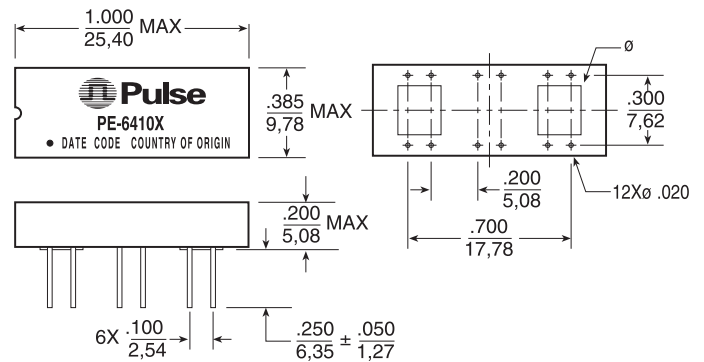
TH1



Weight 2.17 grams

Tube 20/tube

TH2



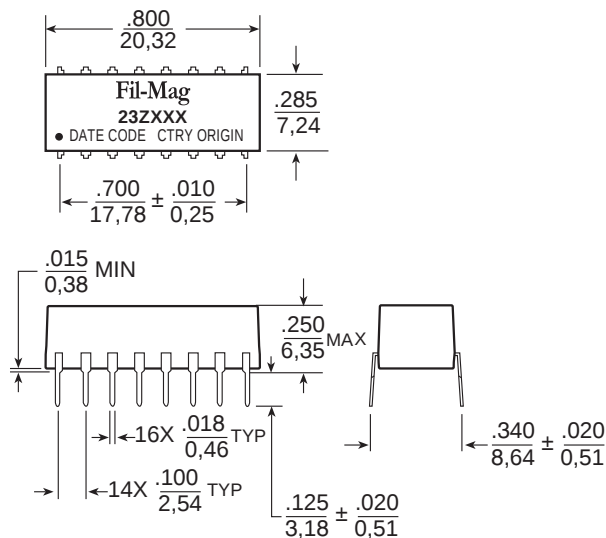
Weight 2.18 grams

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



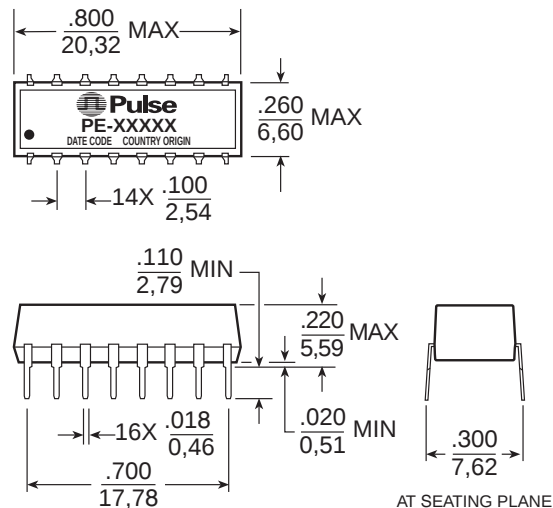
Weight 1.7 grams

Tube 28/tube

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 $\pm \frac{.010}{0,25}$

For More Information:

Pulse Worldwide Headquarters
 12220 World Trade Dr.
 San Diego, CA 92128
 U.S.A.

www.pulseeng.com

Tel: 858 674 8100
 Fax: 858 674 8262

Pulse Europe
 Einsteinstrasse 1
 D-71083 Herrenberg
 Germany

Tel: 49 7032 7806 0
 Fax: 49 7032 7806 135

Pulse China Headquarters
 B402, Shenzhen Academy of
 Aerospace Technology Bldg.
 10th Kejinan Rd.
 High-Tech Zone
 Nanshan District
 Shenzhen, PR China 518057
 TEL: 86 755 33966678
 FAX: 86 755 33966700

Pulse North China
 Room 1503
 XinYin Building
 No. 888 YiShan Rd.
 Shanghai 200233
 China

Tel: 86 21 54643211/2
 Fax: 86 21 54643210

Pulse South Asia
 135 Joo Seng Rd.
 #03-02
 PM Industrial Bldg.
 Singapore 368363

TEL: 65 6287 8998
 FAX: 65 6280 0080

Pulse North Asia
 No. 26, Kao Ching Rd.
 Yang Mei Chen
 Taoyuan Hsien
 Taiwan
 R. O. C.

Tel: 886 3 4643715
 Fax: 886 3 4641911

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Телефон: +7 812 627 14 35

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Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331