

TABLE of CONTENTS

ISOLATION TRANSFORMERS

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

Electrical Specifications: Surface Mount and Through Hole 2

ETHERNET AUI TRANSFORMERS

Electrical Specifications: Surface Mount and Through Hole 3

APPLICATION CIRCUITS

10Base-T 4

Ethernet 5

SCHEMATICS 6

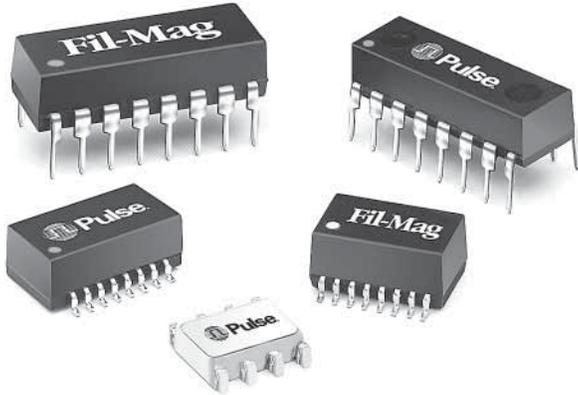
MECHANICALS

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

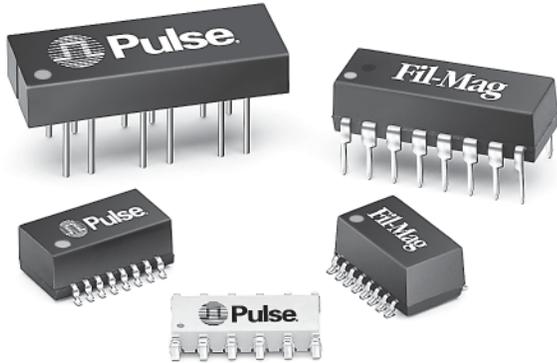
Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C

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 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

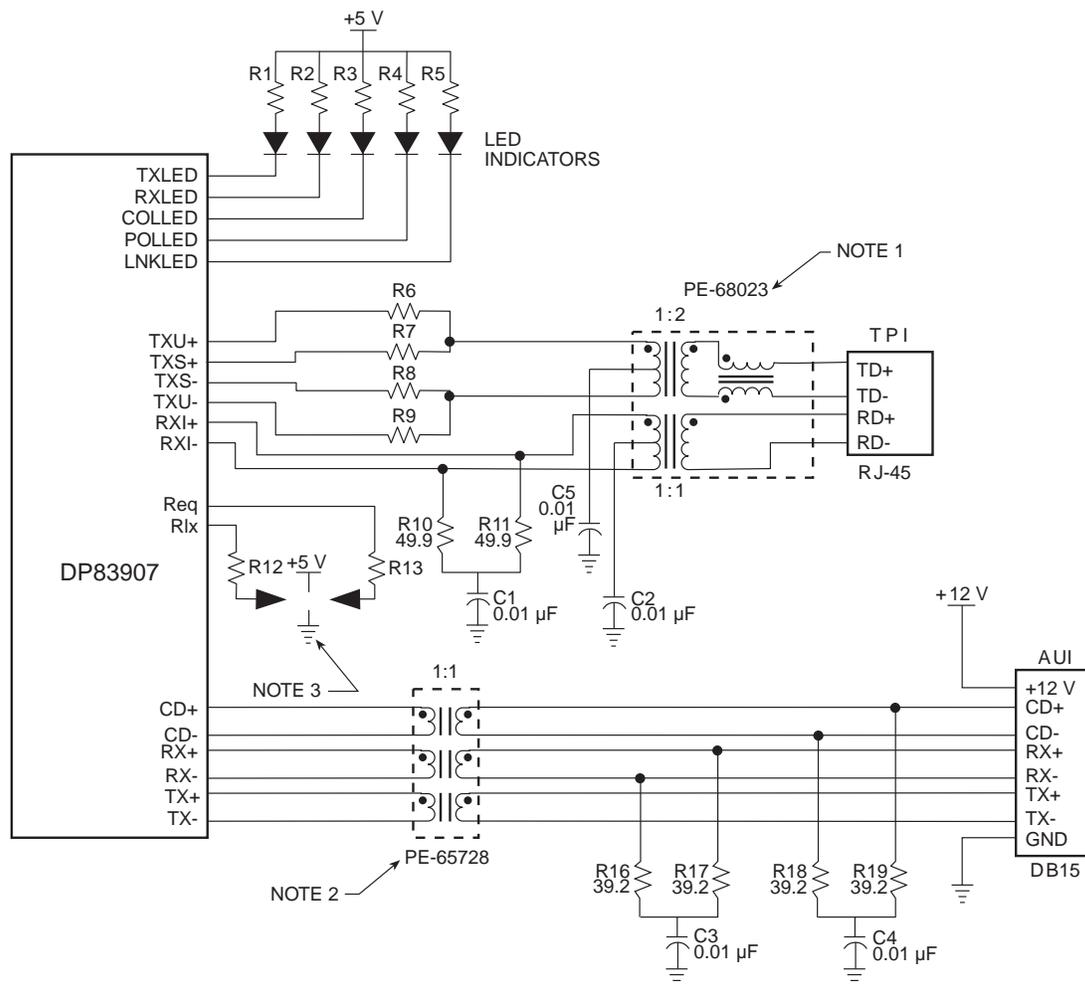
Part Number ³	Turns Ratio (±5%)	Primary Pins	Primary Sine Wave OCL ¹ (μH ±20%)	Primary ET-Constant (V-μs MIN)	Rise Time ² (ns MAX)	Interwinding Capacitance C _{ww} ¹ (pF MAX)	Leakage Inductance L _L ¹ (μH MAX)	DCR (Ω MAX)	Schem.	Mech.	Hipot (Vrms)
SURFACE MOUNT³											
									PAGE 6	PAGES 8-9	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

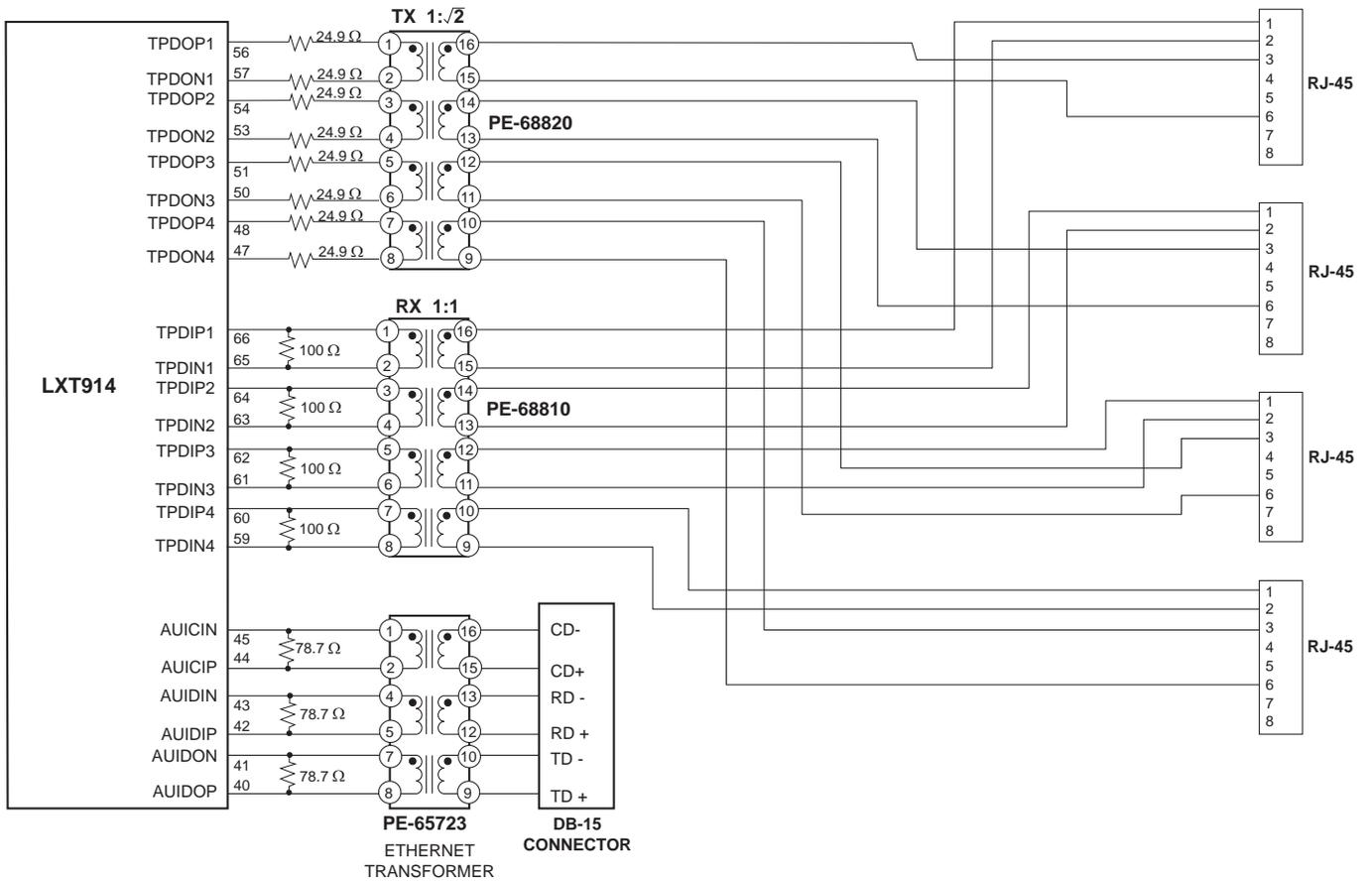
Typical Application Circuit



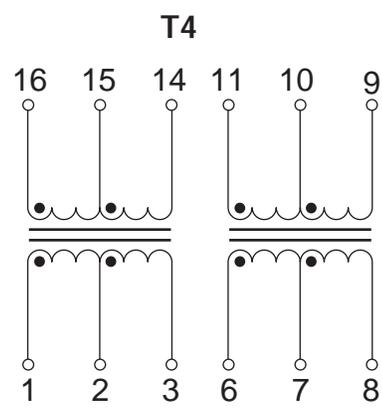
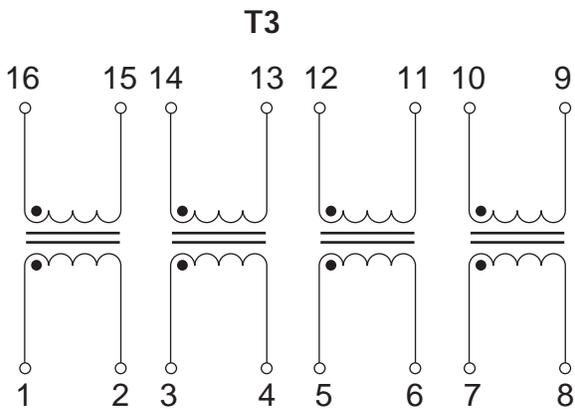
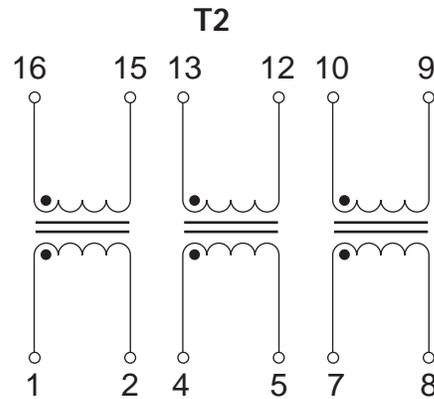
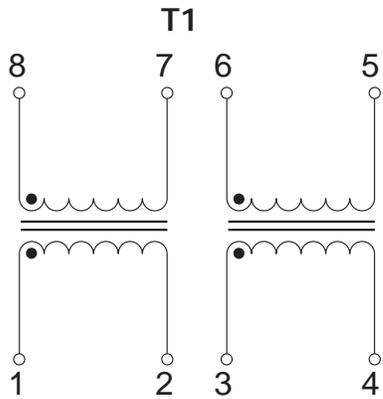
NOTES:

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.

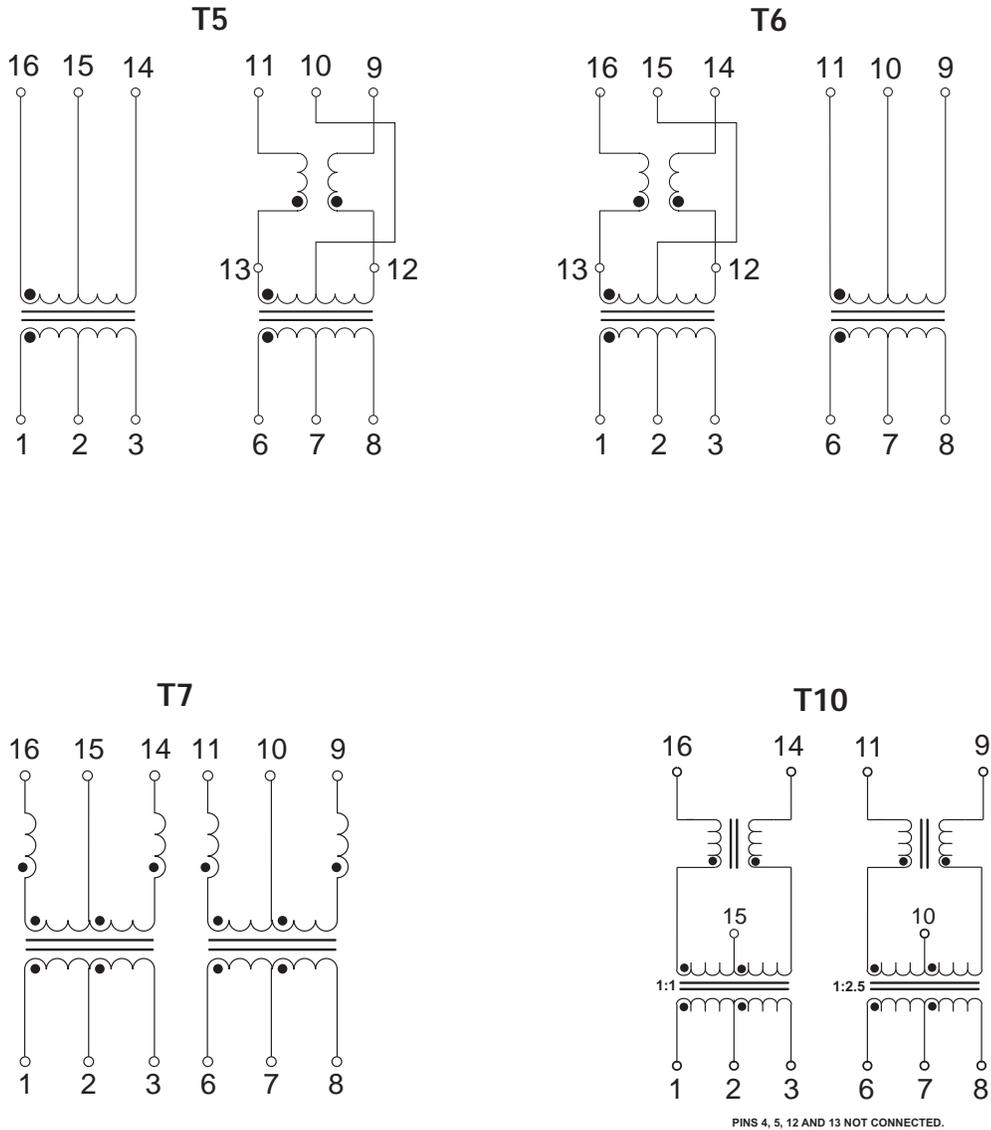
Typical 10Base-T Application Circuit



Schematics

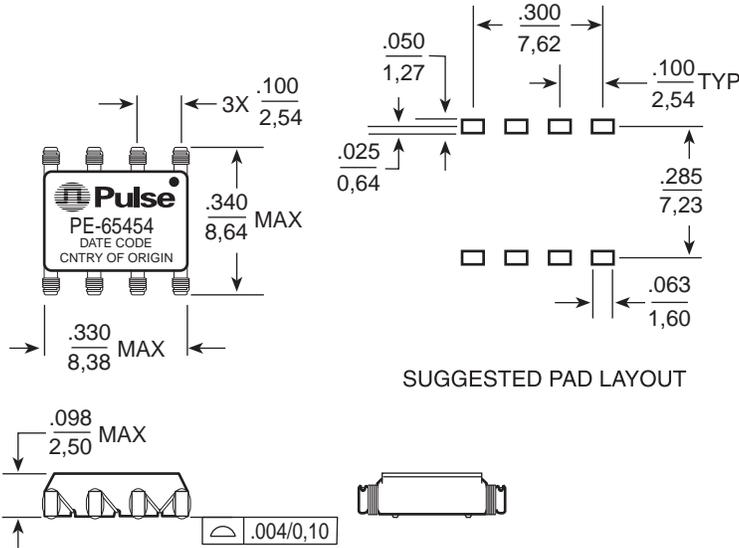


Schematics (continued)



Surface Mount Mechanicals

SMT2

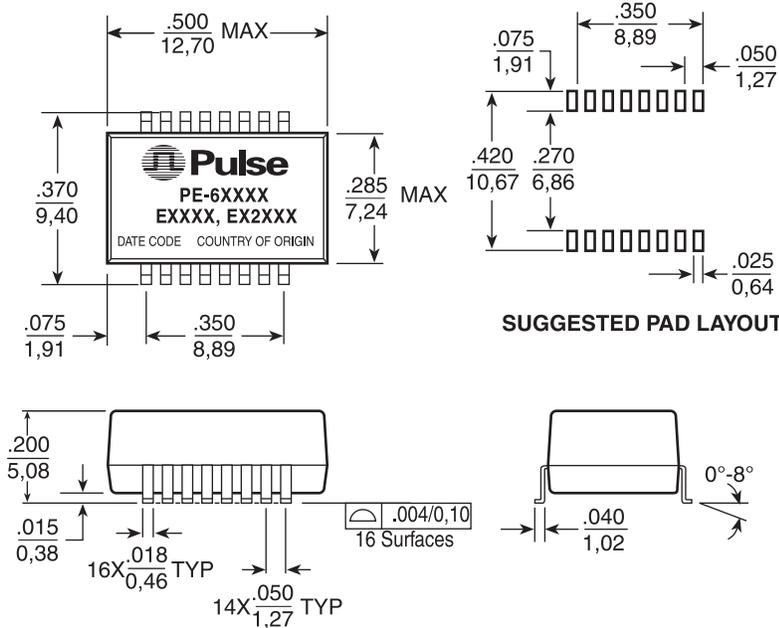


Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

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

SMT4



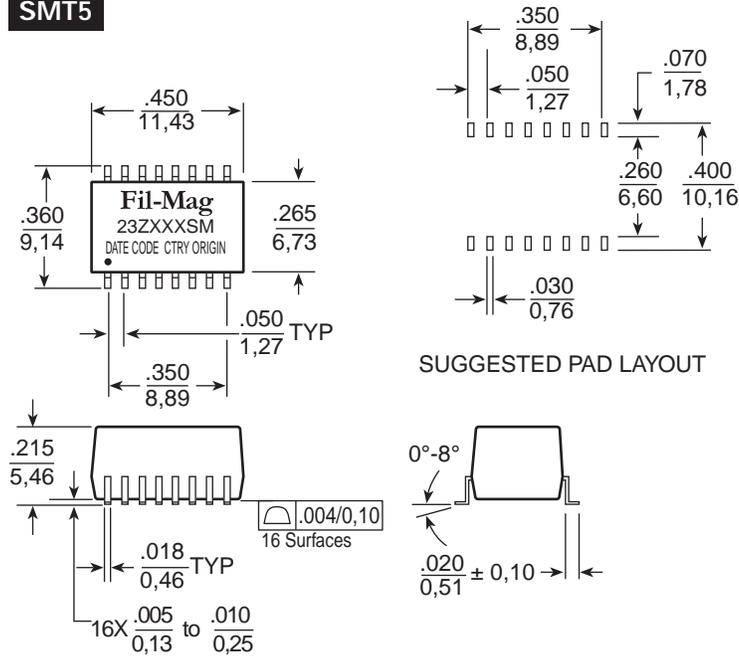
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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



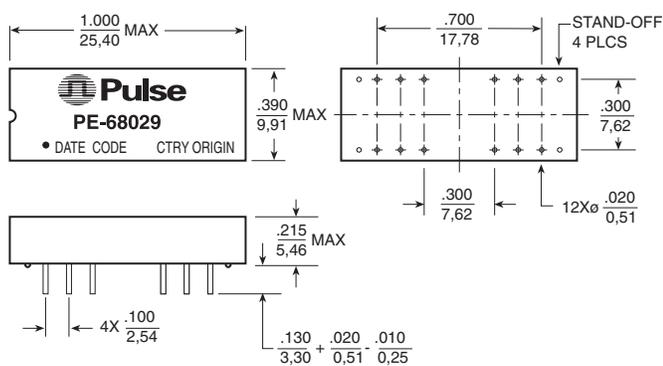
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

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

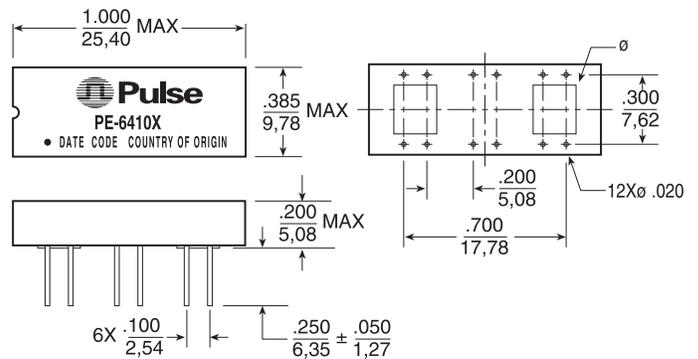
Through Hole Mechanicals

TH1



Weight 2.17 grams
 Tube 20/tube

TH2

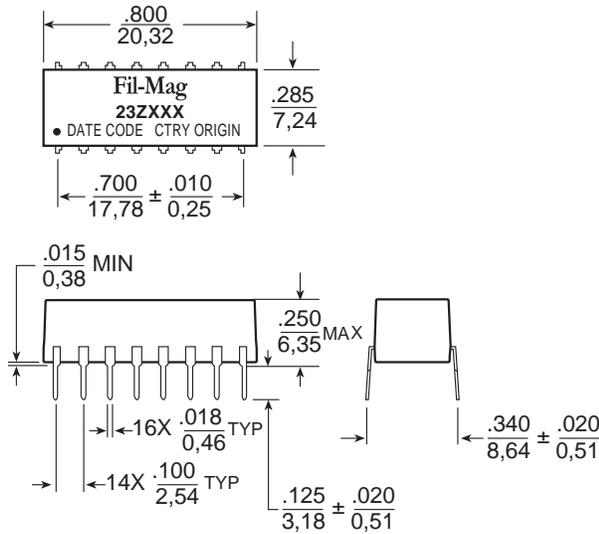


Weight 2.18 grams
 Tube 20/tube

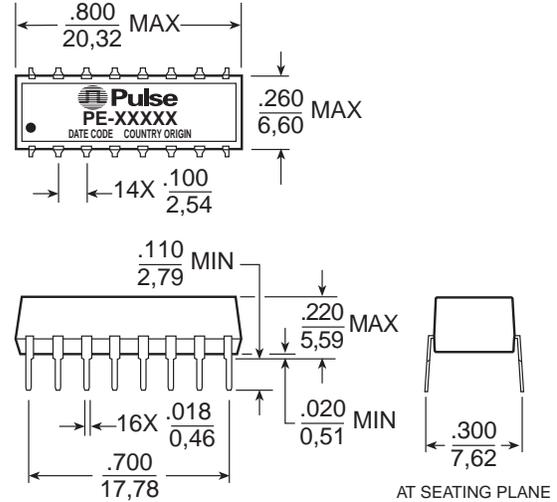
Dimensions: $\frac{\text{Inches}}{\text{mm}}$ Unless otherwise specified, all tolerances are $\pm \frac{.010}{0,25}$

Through Hole Mechanicals - *continued*

TH3



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

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

Performance warranty of products offered on this data sheet is limited to the parameters specified. Data is subject to change without notice. Other brand and product names mentioned herein may be trademarks or registered trademarks of their respective owners.

© Copyright, 2009. Pulse Engineering, Inc. All rights reserved.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Pulse:

[23Z356SM-T](#) [23Z90SM-T](#) [23Z90SM](#) [23Z108SM](#) [23Z108SM-T](#) [23Z91SM-T](#) [23Z128SM](#) [23Z128SM-T](#) [23Z128](#)
[23Z467SM-T](#) [23Z356SMQNL](#) [23Z356SMQNLT](#) [23Z90SMNL](#) [23Z90SMNLT](#) [23Z91SMNL-T](#) [23Z108SMNL](#)
[23Z108SMNL-T](#)