

TABLE of CONTENTS

ISOLATION TRANSFORMERS

10BASE-T

Electrical Specifications: Surface Mount and Through Hole	2
---	---

ETHERNET

Electrical Specifications: Surface Mount and Through Hole	3
---	---

APPLICATION CIRCUITS

10Base-T	4
Ethernet	5

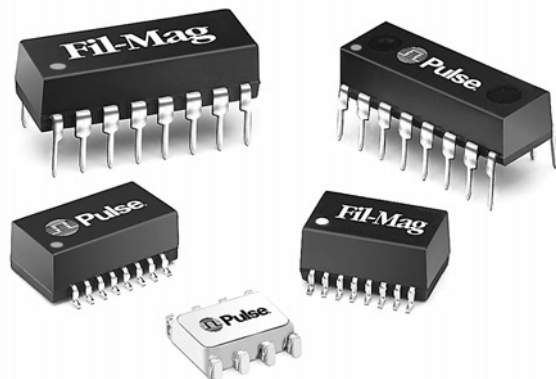
SCHEMATICS	6
-------------------------	---

MECHANICALS

Surface Mount	8
Through Hole	10

ISOLATION TRANSFORMERS FOR 10BASE-T

For Adapter Cards, MAUs, Hubs, and Motherboard Applications



- Designed to meet or exceed IEEE 802.3, 10Base-T specifications
- Available with common mode chokes for EMI suppression
- Surface mount, IC grade, transfer-molded package withstands 235°C peak temperature profile
- Through hole, auto-insertable, 16-pin DIP package

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

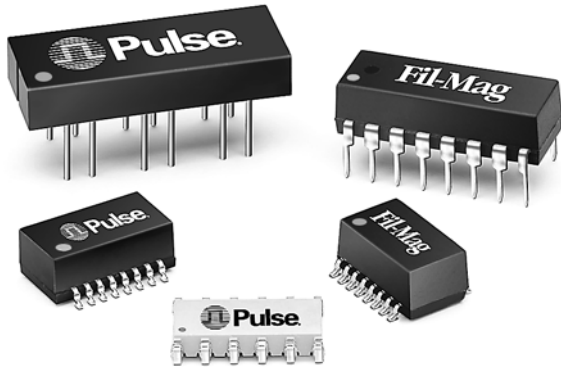
Part Number	Turns Ratio (±5%)		Primary Pins	Common Mode Choke	Sine Wave Inductance OCL ¹ (μH MIN)	Interwinding Capacitance C _{ww} ¹ (pF MAX)	Leakage Inductance L _L ¹ (μH MAX)	DCR (Ω MAX)	Hi-Pot (Vrms)	Schem.	Mech.
	Transmit	Receive									
SURFACE MOUNT ²										pages 6-7	pages 8-9
PE-65454	1:1.414	1:1	3-4/1-2		140	12	0.2	0.4	2000	T1	SMT2
E5017	1CT:1CT	1CT:1CT	1-3/6-8	X	200	10	0.25	1.0	1500	T6	SMT4
PE-65726	1CT:1CT	1CT:1CT	1-3/6-8		200	10	0.2	0.3	2000	T4	SMT4
23Z114SM	1CT:1CT	1CT:1CT	1-3/6-8		200	12	0.3	0.3	2000	T4	SMT5
PE-68048	1CT: 1.414CT	1CT:1CT	6-8/1-3	X	110	15	0.4	1.0	1500	T5	SMT4
PE-65745	1CT: 1.414CT	1CT:1CT	6-8/1-3		140	12	0.2	0.3	2000	T4	SMT4
23Z128SM	1CT:1.414CT	1CT:1CT	6-8/1-3		200	15	0.5	0.4	2000	T4	SMT5
E2023	1CT: 2.5CT	1CT: 1CT	6-8/1-3	X	200	15	0.5	0.4	2000	T10	SMT4
E4005	1CT: 2.5CT	1CT: 1CT	6-8/1-3	X	200	10	0.4	0.5	1500	T10	SMT4
EX2024 ³	1CT: 2.5CT	1CT:1CT	6-8/1-3	X	350	30	0.8	0.6	2000	T10	SMT4
23Z356SM	1CT:1.414CT	1CT:1CT	6-8/1-3	X	200	12	0.5	0.6	2000	T7	SMT5
23Z435SM	2CT:1CT	1CT:1CT	1-3/6-8		100	10	0.4	0.5	2000	T4	SMT5
PE-68052	2CT:1CT	1CT:1CT	1-3/6-8	X	140	12	0.3	1.0	1500	T6	SMT4
E4001	1CT:2CT	1CT:1CT	6-8/1-3	X	112	8	0.3	0.8	3000	T5	SMT4
PE-68041	1CT:2CT	1CT:1CT	6-8/1-3		112	8	0.3	0.5	1500	T4	SMT4
23Z467SM	1CT:2CT	1CT:1CT	6-8/1-3	X	140	12	0.2	0.6	2000	T7	SMT5
PE-68023	1CT:2CT	1CT:1CT	1-3/6-8	X	200	12	0.3	1.0	1500	T6	SMT4
PE-68042	2.828CT:1	1:1	2-4/7-9		200	14	1	0.5	1500	T9	SMT1
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		140	12	0.2	0.4	2000	T3	SMT4
THROUGH HOLE										pages 6-7	page 10
23Z435	2CT:1CT	1CT:1CT	1-3/6-8		80	10	0.4	0.5	2000	T4	TH3
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

NOTES:

- OCL, C_{ww} and L_L are measured at 20 mVrms, 100 kHz.
- To order Tape & Reel packaging for surface mount parts, add the suffix "T" to the part number. Example: PE-65454T. The "T" will appear on all paper work, but will not be marked on parts.
- Part numbers denoted "EX" are extended temperature parts -40°C to 85°C, electrical specifications @ 25°C.

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

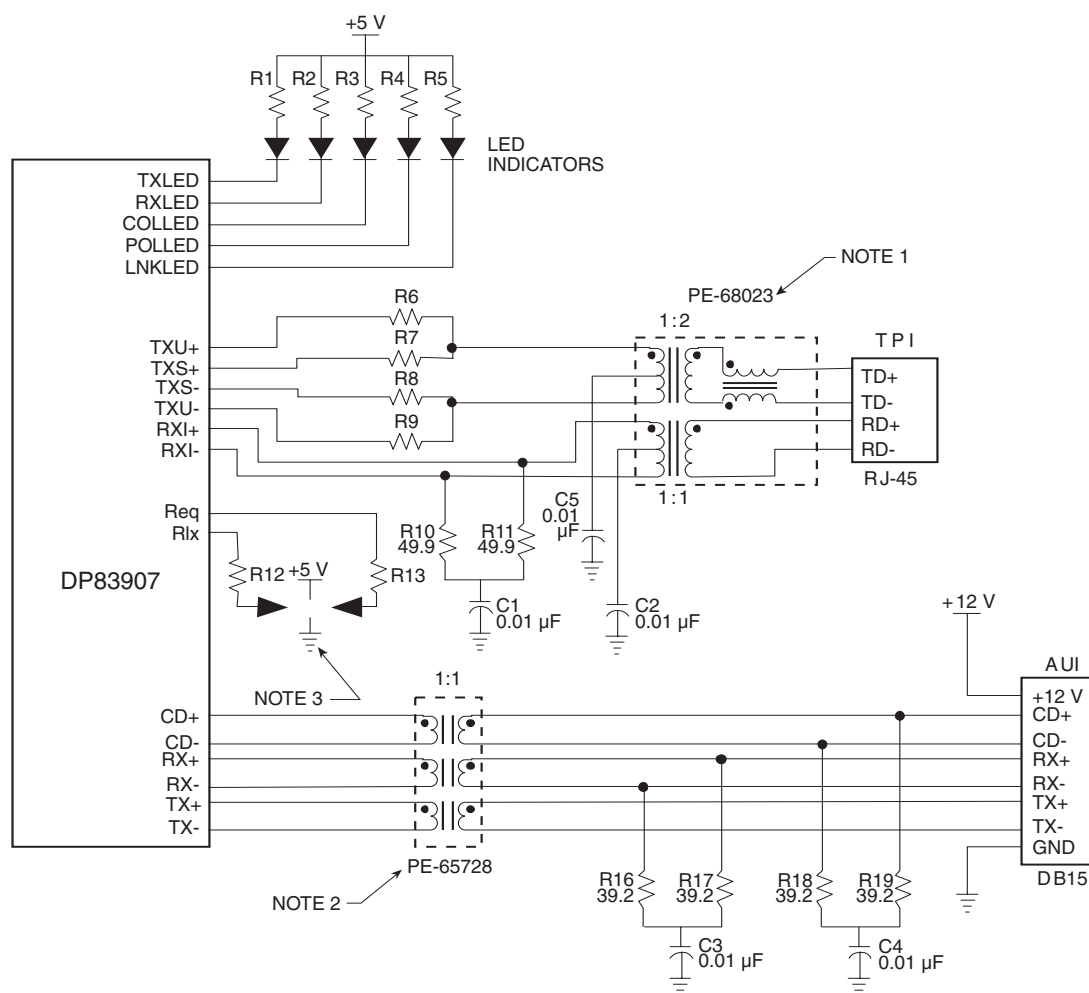
Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C

Part Number	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 MOUNT ³									pages 6-7	pages 8-9	
E6002	1:1	1-2/4-5/7-8	40 (MIN)	2.1	3.0	8	0.20	0.25	T2	SMT4	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-68801	1:1	1-2/3-4/5-6	75	1.8	3.0	12	0.20	0.30	T8	SMT3	2000
23Z90SM	1:1	1-2/4-5/7-8	75	2.4	3.0	10	0.20	0.20	T2	SMT5	2000
PE-65728	1:1	1-2/4-5/7-8	100	1.8	3.0	9	0.20	0.30	T2	SMT4	2000
23Z91SM	1:1	1-2/4-5/7-8	100	2.4	3.0	10	0.20	0.30	T2	SMT5	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-65733	1:1	1-2/4-5/7-8	350	2.6	3.5	16	0.30	0.35	T2	SMT4	2000
23Z108SM	1:1	1-2/4-5/7-8	350	2.5	3.5	16	0.30	0.35	T2	SMT5	2000
THROUGH HOLE									pages 6-7	page 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-64107	1:1	1-2/4-5/7-8	75	2.4	3.5	10	0.25	0.30	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-64103	1:1	1-2/4-5/7-8	100	2.1	3.0	10	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-64503	1:1	1-2/4-5/7-8	100	2.1	3.0	10	0.20	0.30	T2	TH4	2000
PE-64104	1:1	1-2/4-5/7-8	150	2.1	3.5	12	0.20	0.30	T2	TH4	500
PE-64109	1:1	1-2/4-5/7-8	150	3.0	3.0	15	0.20	0.45	T2	TH2	2000

NOTES:

- OCL, C_{ww} and L_L are measured at 20 mVrms, 100 kHz.
- Rise time is measured in 75 Ω systems.
- To order Tape & Reel packaging for surface mount parts, add the suffix "T" to the part number.
Example: PE-65723T. The "T" will appear on all paper work, but will not be marked on parts.

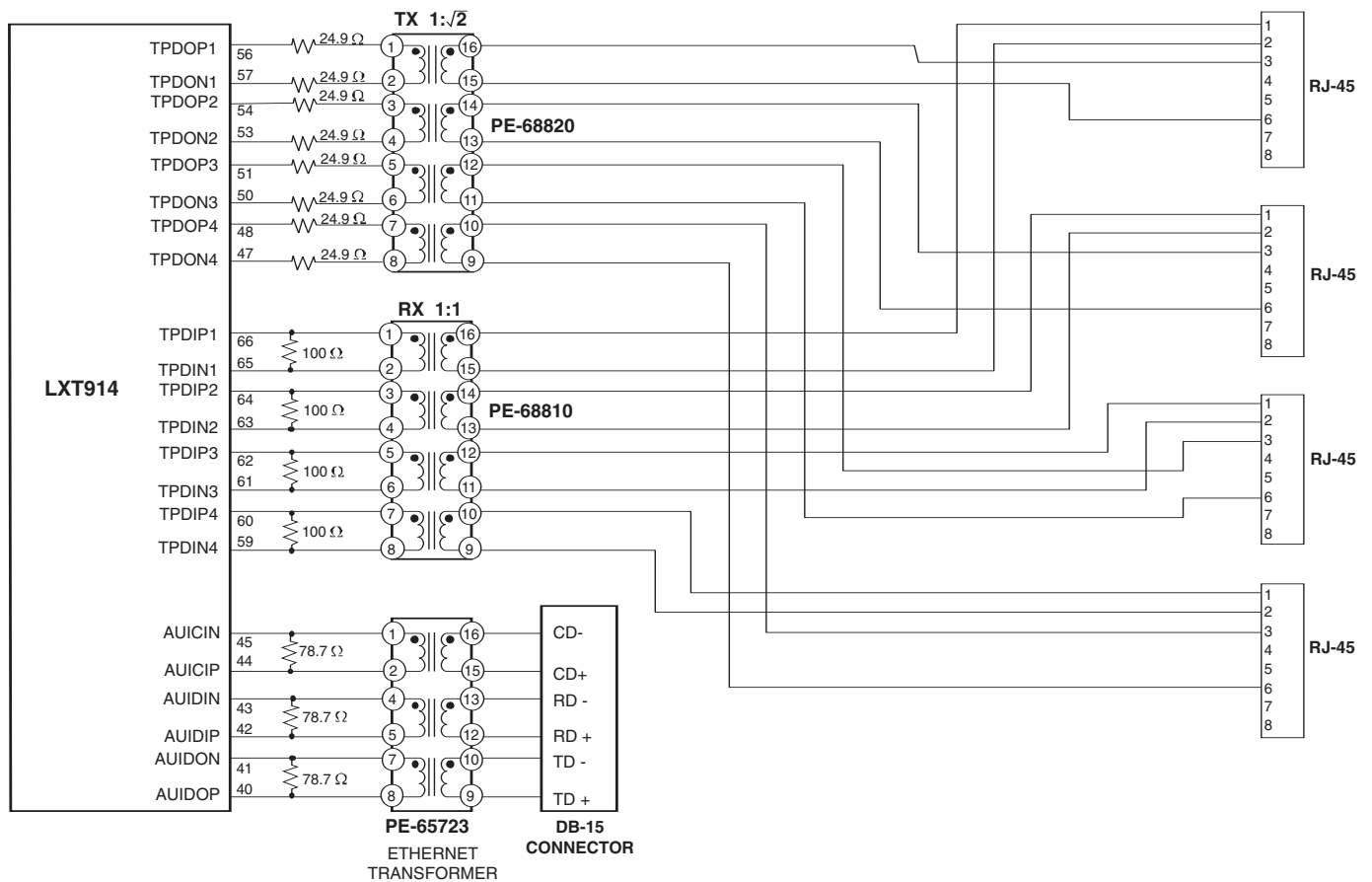
Typical Application Circuit



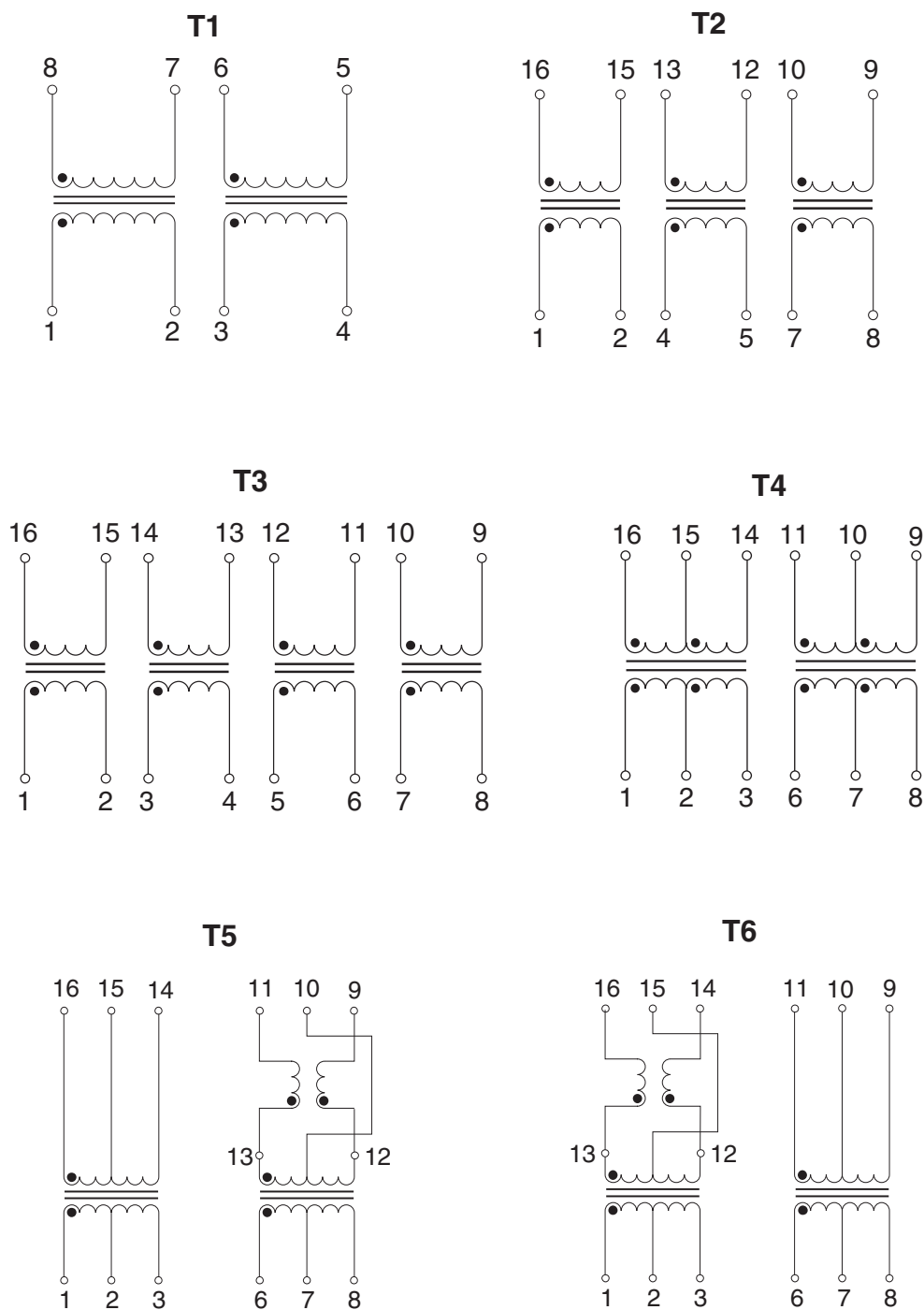
NOTES:

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

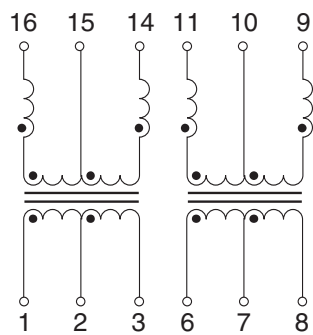


Schematics

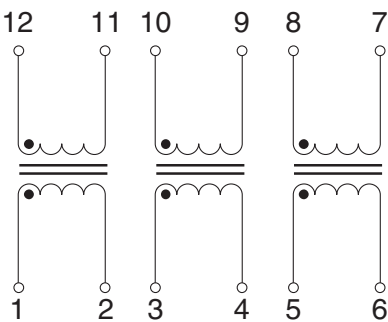


Schematics (continued)

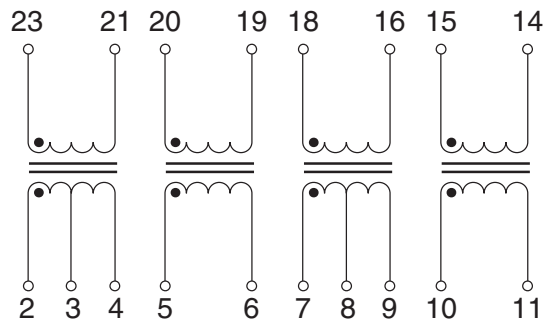
T7



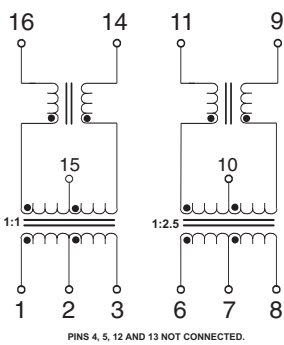
T8



T9



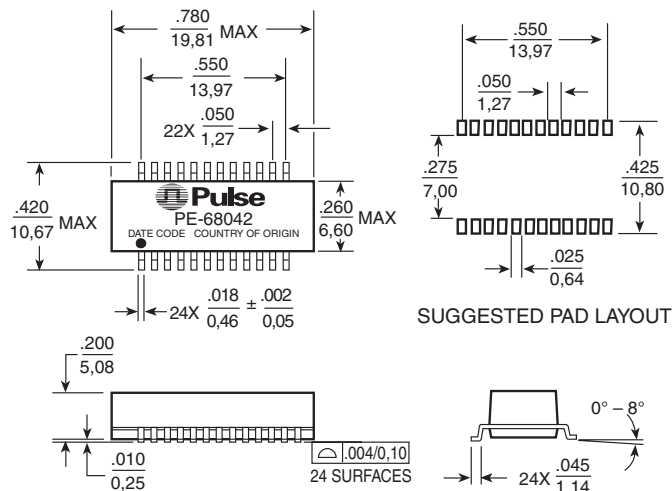
T10





Surface Mount Mechanicals

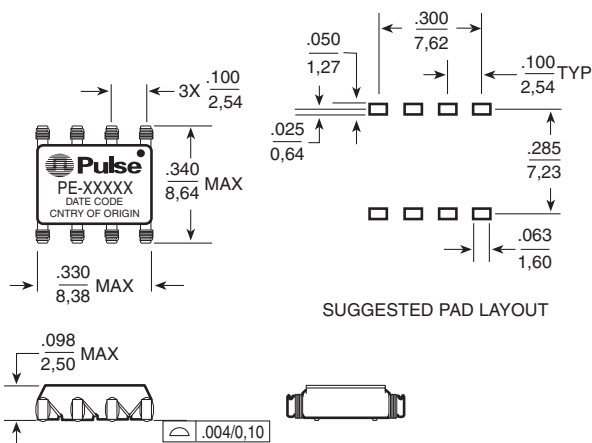
SMT1



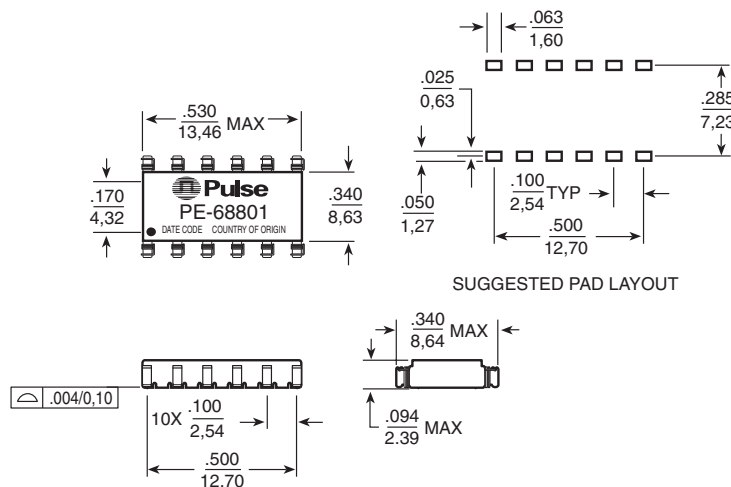
Dimensions: $\frac{\text{Inches}}{\text{mm}}$
 Unless otherwise specified,
 all tolerances are $\pm .010$
 0,25

Weight 1.15 grams
Tube25/tube
Tape & Reel350/reel

SMT2



SMT3



Weight 0.22 grams
Tube60/tube
Tape & Reel1500/reel

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

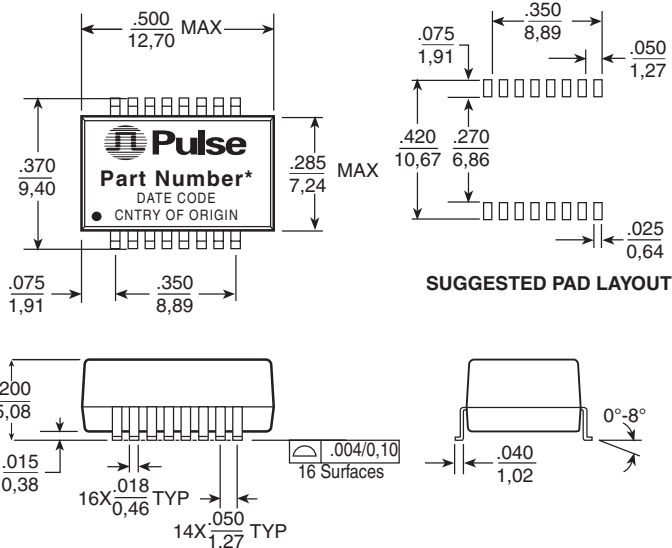
Weight 0.28 grams
Tube35/tube
Tape & Reel1500/reel



Surface Mount Mechanicals (continued)

SMT4

*PE-6XXXX, EXXX, EX2XXX



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

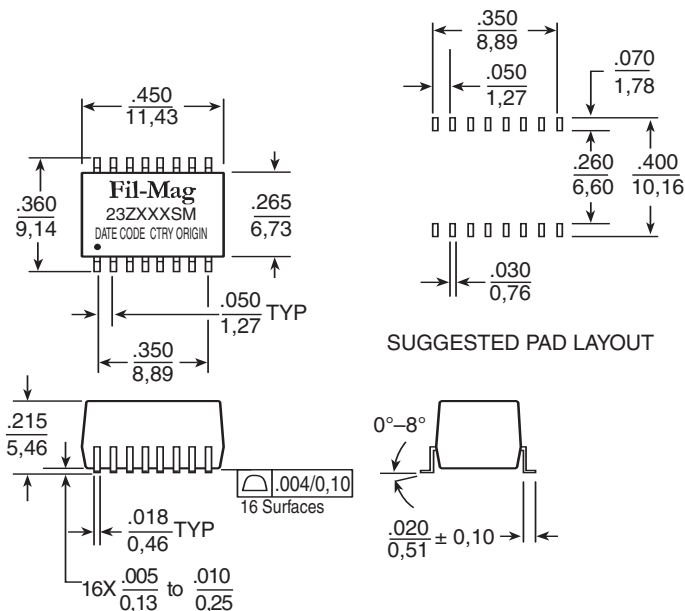
Unless otherwise specified, all tolerances are $\pm \frac{.010}{0,25}$

Weight 0.82 grams

Tube40/tube

Tape & Reel900/reel

SMT5



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

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

Weight 0.85 grams

Tube50/tube

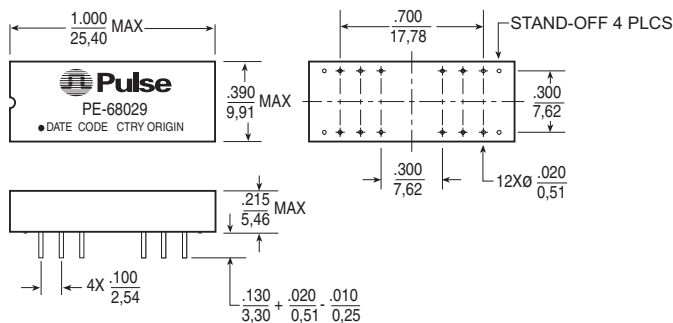
Tape & Reel750/reel

ISOLATION TRANSFORMERS



Through Hole Mechanicals

TH1



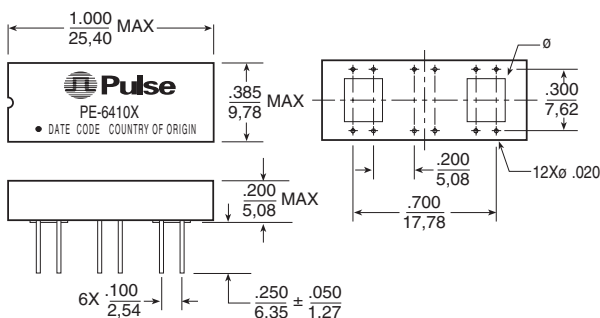
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

Weight 2.17 grams

Tube20/tube

TH2



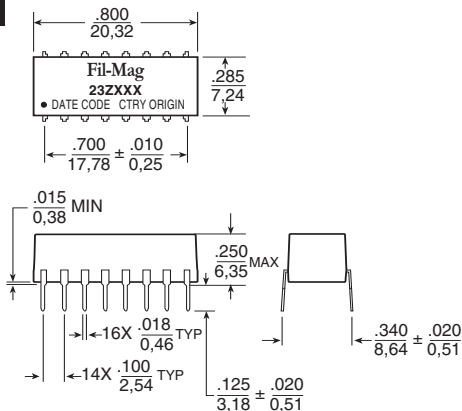
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

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

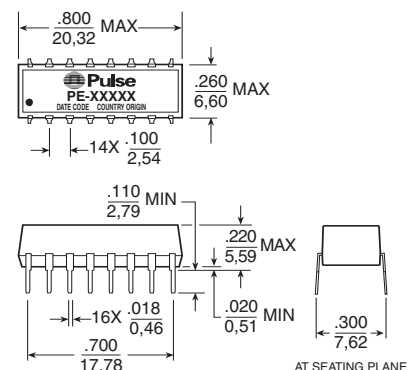
Weight 2.18 grams

Tube20/tube

TH3



TH4



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

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

Weight 1.7 grams

Tube28/tube

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

For More Information :

UNITED STATES (Worldwide)

12220 World Trade Drive
San Diego, CA 92128
U.S.A.
<http://www.pulseeng.com>
TEL: 858 674 8100
FAX: 858 674 8262

UNITED KINGDOM (Northern Europe)

1 & 2 Huxley Road
The Surrey Research Park
Guildford, Surrey GU2 5RE
United Kingdom
TEL: 44 1483 401700
FAX: 44 1483 401701

FRANCE (Southern Europe)

Zone Industrielle
F-39270
Orgelet
France
TEL: 33 3 84 35 04 04
FAX: 33 3 84 25 46 41

SINGAPORE (Southern Asia)

150 Kampong Ampat
#07-01/02
KA Centre
Singapore 368324
TEL: 65 287 8998
FAX: 65 280 0080

TAIWAN, R.O.C. (Northern Asia)

3F-4, No. 81, Sec. 1
HsinTai Wu Road
Hsi-Chih, Taipei Hsien
Taiwan, R.O.C.
Tel: 886 2 2698 0228
FAX: 886 2 2698 0948

HONG KONG (Great China)

19/F, China United Plaza
1008 Tai Nan West Street
Cheung Sha Wan, Kowloon
Hong Kong, China
Tel: 852 2788 6588
FAX: 852 2776 1055

DISTRIBUTOR

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.

Printed on recycled paper. ©2002, Pulse Engineering, Inc.