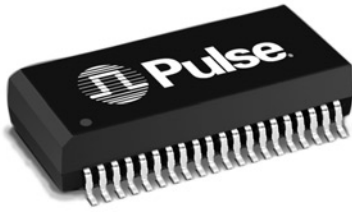


# T1/E1/CEPT/ISDN-PRI TRANSFORMERS

## Quad Port T1/E1 with 8 Transformers, 1500 Vrms



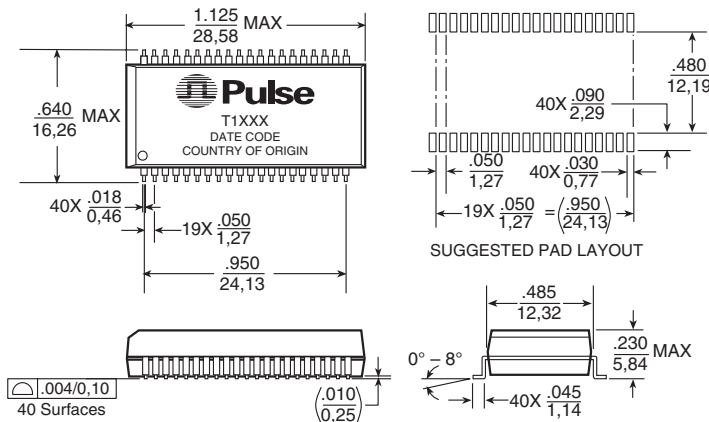
- Models matched to leading quad and dual T1/E1/CEPT/ISDN-PRI transceivers
- Crosstalk: -65 dB or better
- UL1950 recognized (some parts pending approval)
- Many parts BABT approved to EN60950

### Electrical Specifications @ 25°C

Part Number <sup>G</sup>		Turns Ratio <sup>A,B</sup> (Pri:Sec ±2%)		OCL @ 25°C (mH MIN) <sup>F</sup>		LL (μH MAX)		C <sub>ww</sub> (pF MAX)		Package/ Schematic <sup>E</sup>	Primary Pins	
STD Temp.	EXT Temp.	Transmit	Receive	Transmit	Receive	Transmit	Receive	Transmit	Receive		Transmit	Receive
T1063	T1103	1:1.36	1:1.36CT	1.2	1.2	.6	.6	35	35	TOU/1	1-2, 6-7, 11-12, 16-17	38-36, 33-31, 28-26, 23-21
T1064	T1104	1:1.14	1:1.14CT	1.2	1.2	.6	.6	35	35	TOU/1	1-2, 6-7, 11-12, 16-17	38-36, 33-31, 28-26, 23-21
T1065	T1105	1:2CT	1:2CT	1.2	1.2	.8	.8	35	35	TOU/3	4-5, 9-10, 14-15, 19-20	24-25, 29-30, 34-35, 39-40
T1066	T1106	1:2	1:2CT	1.2	1.2	.6	.6	35	35	TOU/4	1-2, 9-10, 11-12, 19-20	23-25, 26-28, 33-35, 36-38
T1067	T1107	1:1.36CT	1:2CT	1.2	1.2	.6	.6	35	35	TOU/3	24-25, 29-30, 34-35, 39-40	4-5, 9-10, 14-15, 19-20
T1068	T1108	1:2CT	1:1CT	1.2	1.2	.6	.6	35	35	TOU/2	1-2, 6-7, 11-12, 16-17	21-22, 26-27, 31-32, 36-37
T1069	T1109	1CT:1.41	1CT:1.41	1.2	1.2	.6	.6	35	35	TOU/3	1-3, 6-8, 11-13, 16-18	21-23, 26-28, 31-33, 36-38
T1070	T1110	1:1.15	1:2CT	1.2	1.2	.6	.6	35	35	TOU/1	1-2, 6-7, 11-12, 16-17	21-23, 26-28, 31-33, 36-38
T1071 <sup>D</sup>	T1111 <sup>D</sup>	1:1/1.26	1:2CT	1.2	1.2	.6	.6	35	35	TOU/2	1-2, 6-7, 11-12, 16-17	21-22, 26-27, 31-32, 36-37
T1072	T1112	1:1.15	1:1.15	1.2	1.2	.6	.6	35	35	TOU/5	1-3, 6-8, 11-13, 16-18	4-5, 9-10, 14-15, 19-20
T1073	T1113	1:2	1:2	1.2	1.2	.6	.6	35	35	TOU/5	1-3, 6-8, 11-13, 16-18	4-5, 9-10, 14-15, 19-20
T1078	—	1:1.08	1.08CT:1	1.2	1.2	.4	.5	35	35	TOU/1	1-2, 6-7, 11-12, 16-17	38-36, 33-31, 28-26, 23-21
T1124	T1114	1:2CT	1CT:2	1.2	1.2	.6	.6	35	35	TOU/3	4-5, 9-10, 14-15, 19-20	1-3, 6-8, 11-13, 16-18
T1125	—	1:1.70	1:1.36CT	1.2	1.2	.8	.6	35	35	TOU/1	1-2, 6-7, 11-12, 16-17	21-23, 26-28, 31-33, 36-38
T1129	—	1:1.36CT	1:1CT	1.2	1.2	.6	.6	35	35	TOU/3	24-25, 29-30, 34-35, 39-40	4-5, 9-10, 14-15, 19-20
T1142	T1231	1:2.4	1:1	1.0	1.0	.5	.5	35	35	TOU/6	1-2, 8-9, 11-12, 18-19	24-25, 27-28, 34-35, 37-38
—	T1226	1:1.5	1.41:1	1.0	1.0	.5	.5	35	35	TOU/6	1-2, 8-9, 11-12, 18-19	24-25, 27-28, 34-35, 37-38
T1145 <sup>D</sup>	—	1:2/2.4	1:0.79/1	1.0	1.0	1.0	1.0	35	35	TOU/7	1-2, 9-10, 11-12, 19-20	37-36, 35-34, 27-26, 25-24
T1180	—	1:2.42	1:2.42	1.2	1.2	.6	.6	35	35	TOU/5	1-3, 6-8, 11-13, 16-18	4-5, 9-10, 14-15, 19-20
T1181	—	1:2.1CT	1:2.1CT	1.2	.6	.6	.6	35	35	TOU/2	1-2, 6-7, 11-12, 16-17	21-22, 26-27, 31-32, 36-37
T1182	—	1:2.45CT	1:2.45CT	1.2	.6	.6	.6	35	35	TOU/2	1-2, 6-7, 11-12, 16-17	21-22, 26-27, 31-33, 36-37
—	TX1262	1:2	1:2	1.2	1.2	.7	.7	35	35	TOU/6	1-2, 6-7, 11-12, 16-17	3-4, 8-9, 13-14, 18-19
—	TX1264	1:2CT	1CT:1	1.2	1.2	.6	.6	35	35	TOU/3	4-5, 9-10, 14-15, 19-20	1-3, 6-8, 11-13, 16-18
—	TX1292	1:1.36	1:1	1.2	1.2	.6	.6	40	40	TOU/5	1-3, 6-8, 11-13, 16-18	4-5, 9-10, 14-15, 19-20
—	TX1294	1:1CT	1:1CT	1.2	1.2	.6	.6	35	35	TOU/3	4-5, 9-10, 14-15, 19-20	24-25, 29-30, 34-35, 39-40
—	TX1295	1:1.26CT	1:1.26CT	1.2	1.2	.6	.6	35	35	TOU/3	4-5, 9-10, 14-15, 19-20	24-25, 29-30, 34-35, 39-40
—	TX1298	1:1	1:1	1.2	1.2	.7	.7	35	35	TOU/5	1-3, 6-8, 11-13, 16-18	4-5, 9-10, 14-15, 19-20

### Mechanical

#### TOU



Weight ..... 4.0 grams  
 Tape & Reel ..... .250/reel  
 Tube ..... .15/tube

Dimensions: Inches  
 mm  
 Unless otherwise specified, all tolerances are ± .010  
 0,25

# T1/E1/CEPT/ISDN-PRI TRANSFORMERS

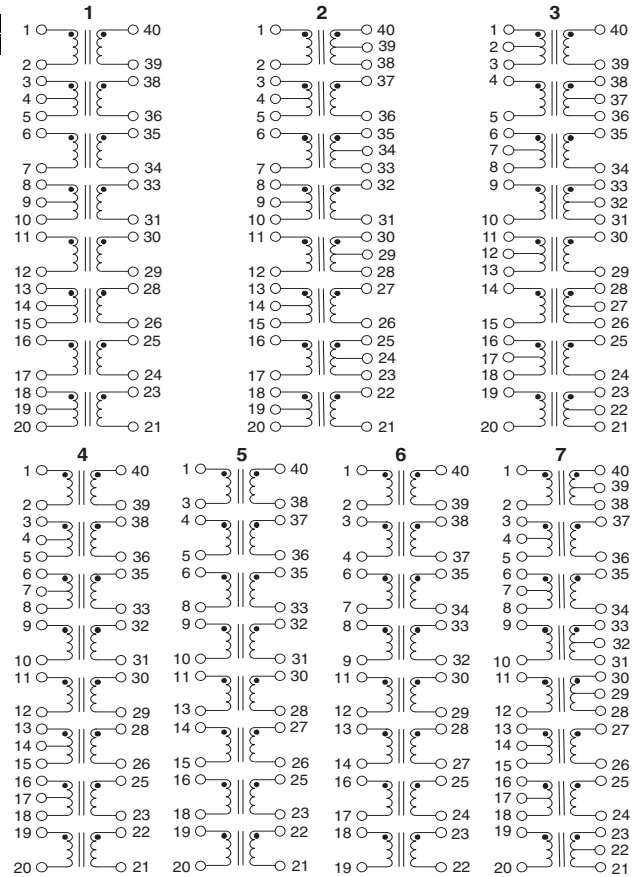
## Quad Port T1/E1 with 8 Transformers, 1500 Vrms



### Transformer Selection Guide

### Schematics

IC Mfr.	IC Part Number	Comments	Octal SMT	
			STD temp	EXT temp
Mindspeed (Conexant)	BT8510	T1/E1	T1071	T1111
	BT8510	T1/E1	T1071	T1111
	CN8380		T1124	T1114
	BT8370/5/6	Better RI	T1067	T1107
	BT8370/5/6	Low Power	T1070	T1110
Cirrus Logic (Crystal)	61318	120 E1	T1068	T1108
	61577	T1 & E1	T1065	T1105
	61304A/5A/535A/574A,/75	T1	T1070	T1110
	61304A/5A/535A/574A,/75	75 E1	T1068	T1108
	61304A/5A/535A/574A,/75	120 E1	T1071	T1111
	61582, 61583		T1064	T1104
	61310, 61581		T1068	T1108
	61881		T1070	T1110
	61584/84A	IQ3	T1065	T1105
	61584/82/83/A	IQ5	T1064	T1104
Maxim (Dallas)	DS2196		T1068	T1108
	DS2151/2152/2153/2154		T1070	T1110
	DS2151/2152/2153/2154		T1067	T1107
	DS2148/Q48	3V	T1068	T1108
	DS2148/Q48	5V	T1067	T1107
	DS21352/Q352_DS21354/Q354		T1068	T1108
	DS21552/Q552_DS21554/Q554		T1070	T1110
Exar	T5683A, 59L91		T1065	T1105
	T5894, T5897, T5997		T1065	T1105
	T5791/93/94/95		T1071	T1111
	81L27, 82L24, 82D20		T1067	T1107
	83L30/34/38		T1065	T1105
	T5684, T7288, 82D20		T1067	T1107
	Infineon Technologies (Siemens)	PEB 2254/55	E1/T1 & J1	T1069
PEB 2254/55		E1/T1 & J1	T1069	T1109
PEB 22504		3.3V	T1142	T1231
PEB 22504		5V	T1226	T1226
PEB22554		3.3V	T1142	T1231
PEB2256 3.3 V		E1/T1/J1	T1142	T1231
Intel (Level One)	LXT 300/301		T1065	T1105
	LXT 304/305/307	T1,E1	T1065	T1105
	LXT 304/305/307	T1	T1070	T1110
	LXT 304/305/307	75E1,120E1	T1071	T1111
	LXT 310/317/318		T1068	T1108
	LXT 331	T1,E1	T1068	T1108
	LXT 331, LXT 332		T1065	T1105
	LXT 331, LXT 332		T1070	T1110
	LXT 334, LXT 335	T1/E1	T1065	T1105
	LXT 334, LXT 335	120/75 E1	T1067	T1107
	LXT 334, LXT 335	75 E1	T1071	T1111
	LXT 336		T1065	T1105
	LXT 350, LXT 351, LXT 359	T1,E1	T1068	T1108
	LXT 350, LXT 351		T1070	T1110
	LXT 360/361/362/363	T1,E1	T1068	T1108
	LXT 360/361/362/363		T1070	T1110
	LXT 380/381/384/386/388	T1/E1	T1068	T1108
	LXT 380/381/384/386/388	T1/E1	T1124	T1114
LXT 3104, LXT 3108		T1068	T1108	
Lucent Technologies	T7288, T290A	CEPT	T1067	T1107
	T7289A	DS1	T1070	T1110
	T7688, T7690, T7698	CEPT	T1063	T1103
	T7689, T7690, T7698	DS1	T1064	T1104
	T7693, T7697	CEPT	T1180	
	TLIU04C1	DS1	T1064	T1104
	TLIU04C1	CEPT	T1063	T1103
Zarlink (Mitel)	MT9071, MT9076		T1180	
	MT9076, MT9075		T1142	T1231
	MT9074, MT9075		T1068	T1108
PMC-Sierra	PM4341/6341/4314		T1067	T1107
	PM4318		T1065	T1105
	PM4351/4354	COMET	T1180	TX1299



#### NOTES FROM TABLES

- A.** OCL (primary inductance) is measured at the primary winding. Turns ratio is specified primary: secondary. (CT = Center Tap).
- B.** To make a 1CT:1 ratio from a 1CT:2CT ratio, use only one-half of the secondary (2CT) winding.
- C.** It is possible to use the same transformer model for the three impedance levels of T1 (100 Ω) and CEPT (75 Ω & 120 Ω). For specific connection information and resistor values, refer to IC vendors' data book.
- D.** Dual Ratio Transformer (**T1071, T1111 and T1145**) — These transformers have tapped secondary windings to provide two turns ratios (T/R). Use the entire primary winding and connect the secondary pins listed below to obtain desired turns ratio:
 

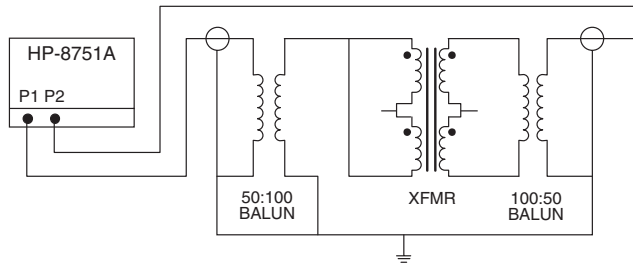
Part Number	Turns Ratio 1	Secondary Pins	Turns Ratio 2	Secondary Pins
<b>T1071 and T1111</b>	1:1	40-39	1:1.26	40-38
	1:1	35-34	1:1.26	35-33
	1:1	30-29	1:1.26	30-28
<b>T1145</b>	1:1	25-24	1:1.26	25-23
	1:2	40-39	1:2.4	40-38
	1:2	33-32	1:2.4	33-31
1:2	30-29	1:2.4	30-28	
1:2	23-22	1:2.4	23-21	
- E.** Standard packaging for the surface mount package is anti-static tubes. Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number, (i.e. T1063T).
- F.** **Extended Temperature Range Models** — For extended temperature range transformers (-40°C to +85°C operating temperature range), OCL (Open Circuit Inductance for the primary winding) is specified at both -40°C and +25°C. At -40°C, OCL is 600 μH minimum. All other parameters are specified at +25°C only. Standard temperature range is 0°C to +70°C.

# T1/E1/CEPT/ISDN-PRI TRANSFORMERS

## Quad Port T1/E1 with 8 Transformers, 1500 Vrms

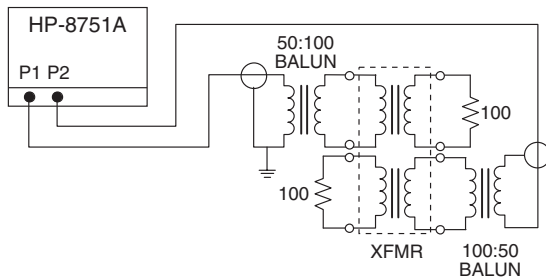


- ET Product** — All coils have an ET product of 10 V- $\mu$ sec minimum.
- Flammability** — Materials used in the products are recognized as UL94-VO approved. Products meet the requirements of IEC 695-2-2 (Needle Flame Test).
- Balance Characteristics** — The transformers meet the requirements for longitudinal balance of FCC part 68.
- Common Mode Rejection Ratio** — the CMRR for all transformers is better than 50 dB at 1 MHz. A typical test circuit is shown below.



- Isolation Voltage** — 100% of transformers are tested during production to the specified isolation voltage level.
- General Information** — The transformers are specifically designed for use in 1.544 Mbps (T1), 2.048 Mbps (CEPT) and ISDN Primary rate (PRI) interface applications. They are matched to the majority of the line interface transceiver ICs currently available. Use of the proper transformer allows the interface circuit to comply with ITU-T G.703 and other standards regarding pulse waveform, return loss, and balance.
- Common Mode Chokes** — Additional high-frequency 4-line common mode chokes may be used to provide an effective means of complying with national and international regulations on EMI. The common mode chokes are designed to be used in conjunction with Pulse's T1/CEPT transformers as shown in the typical application below. Crosstalk is typically -65 dB or better.

- Crosstalk Attenuation** — In the packages which contain transmit and receive transformers side by side, sufficient crosstalk attenuation is achieved by the inherent characteristics of the toroid cores as well as by their proper positioning. The crosstalk attenuation is typically 65 dB or better. This result was established with the test circuit shown below.



- Return Loss** — ITU-T G.703 and European national regulatory documents specify minimum return loss levels. The transformers will allow these limits to be complied within the situations where they are applicable.

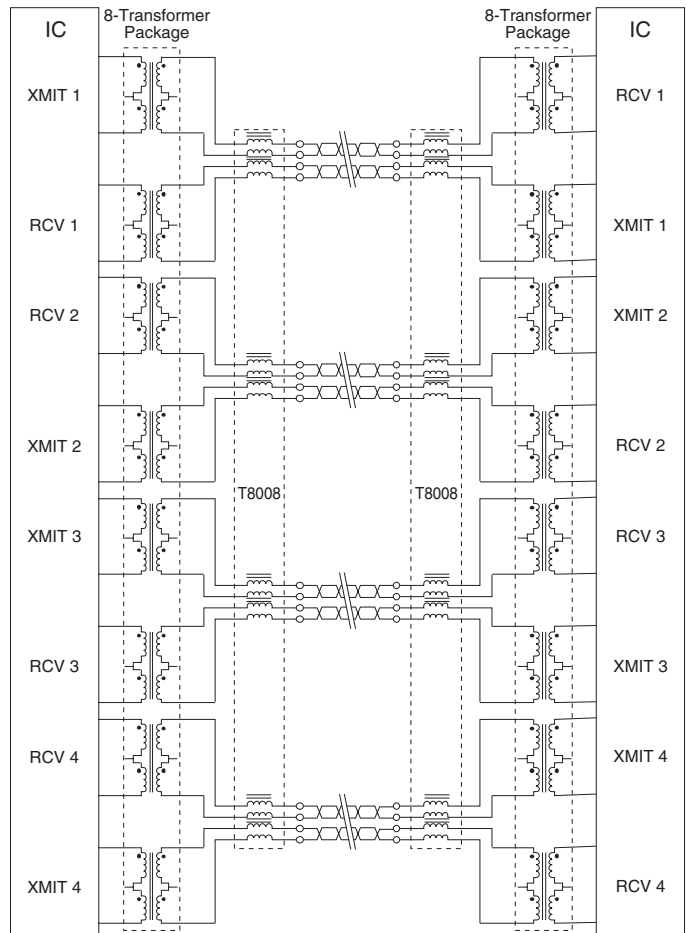
Frequency	50-100 KHz	100 KHz-2 MHz	2-3 MHz
Return Loss			
XMIT	9 dB	15 dB	11 dB
RCV	12 dB	18 dB	14 dB

- Surge Voltage Capability** — All transformers and chokes meet surge voltage tests according to the most stringent regulatory documents, when used with the proper voltage and current suppression devices:

Metallic Voltage: 800 V peak, 10/560  $\mu$ sec

Longitudinal Voltage: 2,400 V peak, 10/700  $\mu$ sec

## Typical Application



# T1/E1/CEPT/ISDN-PRI TRANSFORMERS

## Quad Port T1/E1 with 8 Transformers, 1500 Vrms



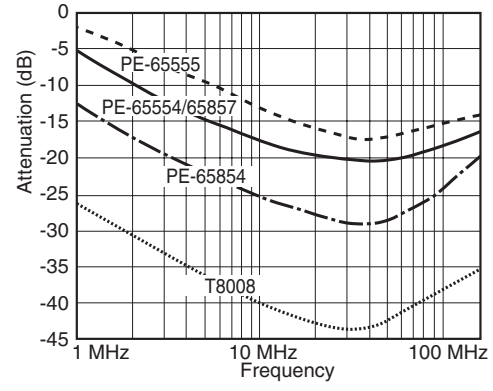
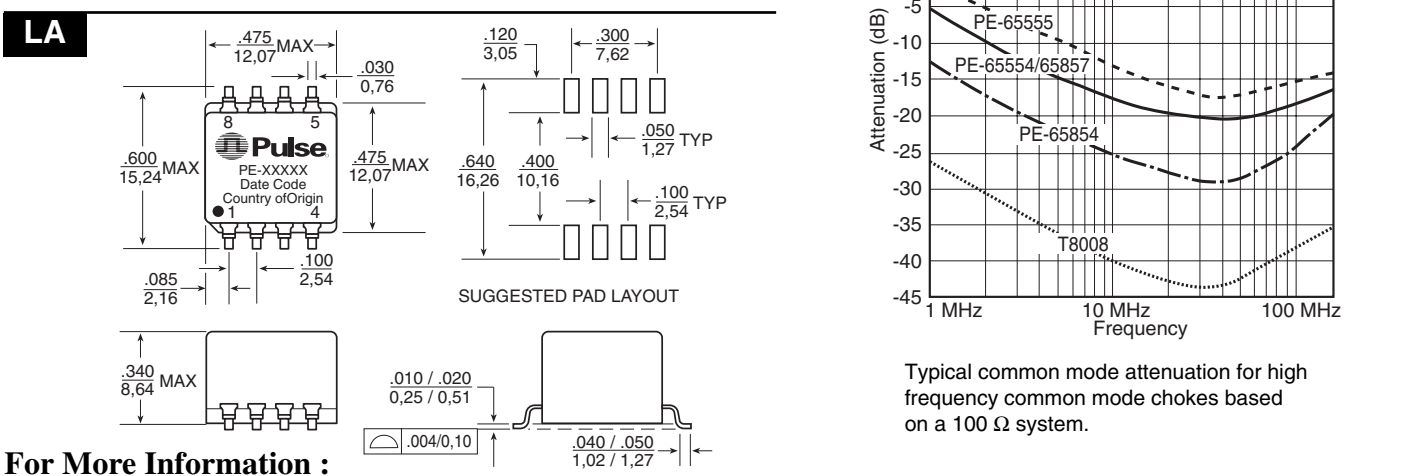
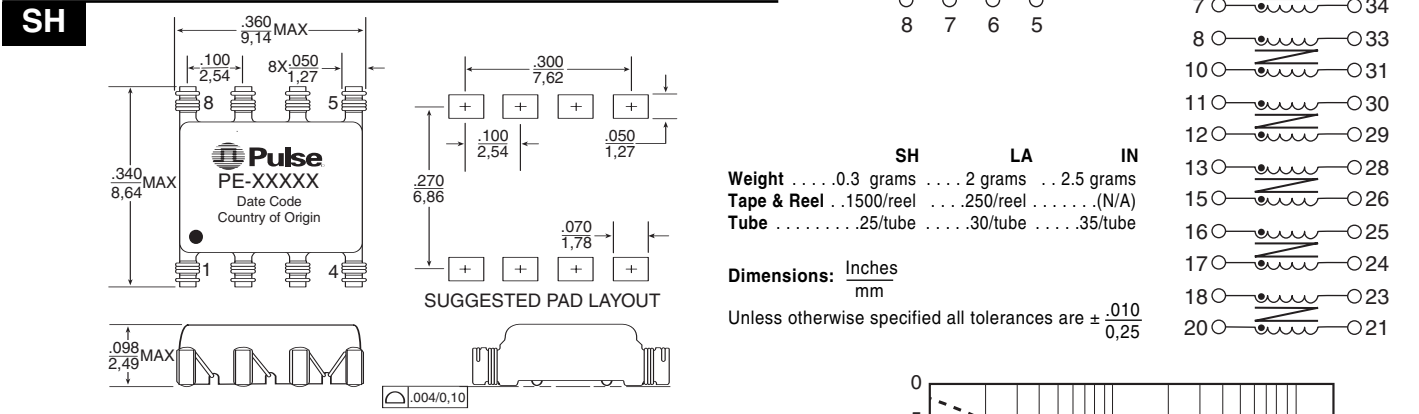
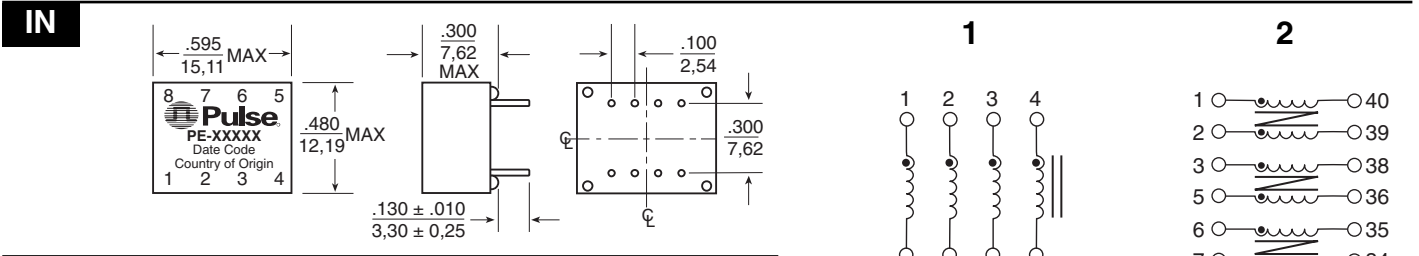
### Electrical Specifications @ 25°C

Pulse Part Number	Number of Lines	Turns Ratio (±5%)	OCL (μH MIN)	C <sub>w/w</sub> (pF MAX)	L <sub>L</sub> (μH MAX)	DCR (Ω MAX)	Isolation (Vrms MIN)	Package/Schematic
<b>HIGH FREQUENCY COMMON MODE CHOKES</b>								
T8008	16 (8 x 2 line)	1:1 (8 places)	47.0	25	.18	0.40	500	TOU/2 (Surface Mount)
PE-65554	4	1:1:1:1	24.0	15	.20	0.30	500	IN/1 (Through Hole)
PE-65555	4	1:1:1:1	8.0	10	.20	0.25	500	IN/1 (Through Hole)
PE-65854	4	1:1:1:1	47.0	16	.20	0.30	500	SH/1 (Surface Mount)
PE-65857	4	1:1:1:1	24.0	15	.23	0.30	500	LA/1 (Surface Mount)

NOTE: For additional Common Mode Chokes, refer to data sheets G002, T627, T661, T639 and T673.

### Mechanicals

### Schematics



### For More Information :

<p><b>UNITED STATES (Worldwide)</b>                  12220 World Trade Drive                  San Diego, CA 92128                  U.S.A.                  http://www.pulseeng.com                  TEL: 858 674 8100                  FAX: 858 674 8262</p>	<p><b>UNITED KINGDOM (Northern Europe)</b>                  1 &amp; 2 Huxley Road                  The Surrey Research Park                  Guildford, Surrey GU2 5RE                  United Kingdom                  TEL: 44 1483 401700                  FAX: 44 1483 401701</p>	<p><b>FRANCE (Southern Europe)</b>                  Zone Industrielle                  F-39270                  Orgelet                  France                  TEL: 33 3 84 35 04 04                  FAX: 33 3 84 25 46 41</p>	<p><b>SINGAPORE (Southern Asia)</b>                  150 Kampong Ampat                  #07-01/02                  KA Centre                  Singapore 368324                  TEL: 65 6287 8998                  FAX: 65 6280 0080</p>	<p><b>TAIWAN, R.O.C. (Northern Asia)</b>                  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</p>	<p><b>HONG KONG (China/Hong Kong)</b>                  9/F, Phase 2, Tai Sang                  Shatin Warehouse Centre                  6 Wong Chuk Yeung Street                  Fotan, Shatin, Hong Kong                  TEL: 852 2788 6588                  FAX: 852 2776 1055</p>	<p><b>DISTRIBUTOR</b></p>
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