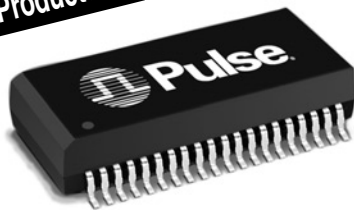


T1/E1/CEPT/ISDN-PRI TRANSFORMERS

Quad Port T1/E1 with 8 Transformers, 1500 Vrms, Extended and Standard Temperature Range



New Extended Temperature Products!



- Eight transformers in a surface mount package supports 4 transmit and 4 receive channels
- Crosstalk: -65 dB or better
- Models matched to leading quad and dual T1/E1/CEPT/ISDN-PRI transceivers
- UL1950 recognized (some parts pending approval)
- Many parts BAPT approved to EN60950

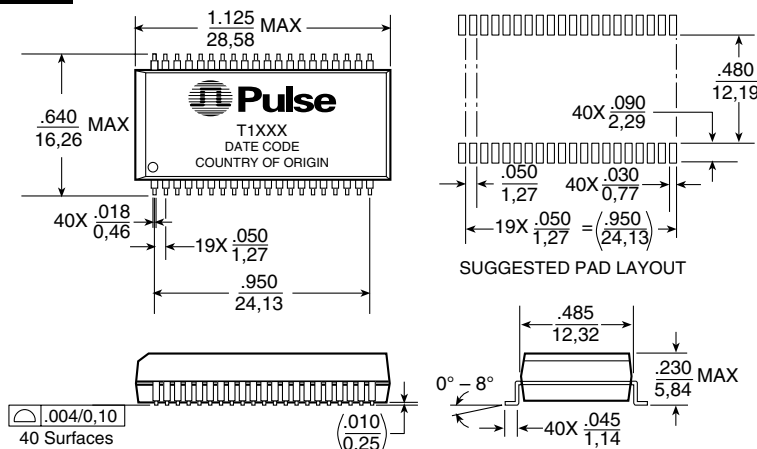
Electrical Specifications @ 25°C

STD Temp.	EXT Temp.	Turns Ratio ^{A,B} (Pri:Sec ±2%)		OCL @ 25°C (mH MIN) ^F		L _L (μH MAX)		C _{ww} (pF MAX)		Package/ Schematic ^E	Primary Pins	
		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 ^D	T1111 ^D	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 ^D	—	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	1.2	.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	1.2	.6	.6	35	35	TOU/2	1-2, 6-7, 11-12, 16-17	21-22, 26-27, 31-33, 36-37

NOTE: Standard (STD) operating temperature range is 0° to 70°C. Extended (EXT) operating temperature range is -40° to +85°C.

Mechanical

TOU



Weight 4.0 grams
Tape & Reel250/reel
Tube15/tube

Dimensions: $\frac{\text{Inches}}{\text{mm}}$
Unless otherwise specified, all tolerances are $\pm \frac{.010}{0.25}$

T1/E1/CEPT/ISDN-PRI TRANSFORMERS

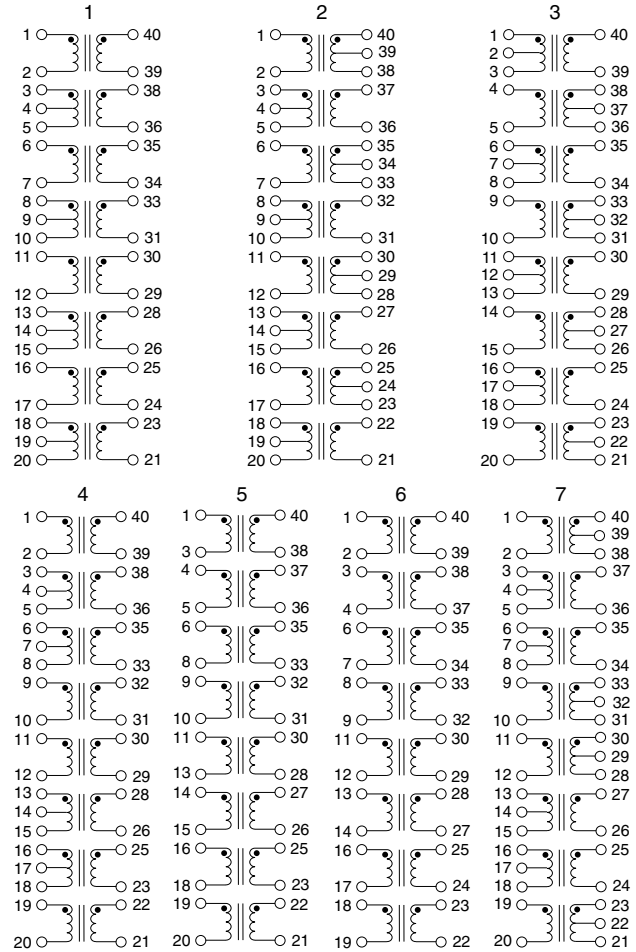
Quad Port T1/E1 with 8 Transformers, 1500 Vrms, Extended and Standard Temperature Range



Transformer Selection Guide

Company	IC Part Number	Comments	Pulse Part # STD temp	Pulse Part # EXT temp	
Conexant Systems/ Rockwell Semi	BT8370	T1, E1	T1067	T1107	
	CN8380	T1, E1	T1124	T1114	
	R8069, R8069A, R8069B	-	T1068	T1108	
Cirrus Logic/ Crystal Semi	61534, 61544, 61574, 6158, 61535	T1 & PCM-30	T1065	T1105	
	61535A, 61574A, 61575, 6158A	T1	T1070	T1110	
	61535A, 61574A, 61575, 6158A	E1	T1065	T1105	
	6152	-	T1067	T1107	
	61583	T1/E1 (3.3 V)	T1073	T1103	
	61583	T1/E1 (5.0 V)	T1072	T1112	
Dallas Semi-conductor	61584, 61584a	IQ3	T1065	T1105	
	DS2186, DS2187	-	T1067	T1107	
	DS2151, DS2152, DS2153, DS2154	T1, E1	T1067	T1107	
	DS21Q352, DS21Q354	3V Quad	T1068	T1108	
	DS21Q552, DS21Q554	5V Quad	T1067	T1107	
Exar	T5650, T5620, T5675, T5681, T5683	-	T1065	T1105	
	56L22, 56L85, C240, C260, C262, C277	-	T1065	T1105	
	T5793, T5794	Quad E1	T1071	T1111	
	T5684	T1	T1067	T1107	
	T7288	CEPT	T1067	T1107	
	T5894	Quad E1	T1065	T1105	
	T5897	7-Channel E1	T1065	T1105	
	Level One/ Intel	LXT300/301/305	-	T1065	T1105
		LXT304A/305A	T1	T1070	T1110
LXT304A/305A		PCM-30/75/120°	T1071	T1111	
LXT310/311		-	T1068	T1108	
LXT317/318		T1/E1	T1065	T1105	
LXT317/318		T1/E1 (Alternate)	T1066	T1106	
LXT317/318		T1/E1 (Alternate)	T1068	T1108	
LXT331		E1	T1068	T1108	
LXT332		E1	T1065	T1105	
LXT332		E1 (Alternate)	T1066	T1106	
LXT334		Quad E1	T1067	T1107	
LXT334		Quad T1	T1068	T1108	
LXT335		Quad E1	T1067	T1107	
LXT360/361/370		T1/E1	T1068	T1108	
LXT380/381/384/386/388	T1/E1	T1068	T1108		
LXT380/381/384/386/388	T1/E1	T1124	T1114		
Lucent Technologies	T7288	CEPT	T1067	T1107	
	T7289	DS1	T1070	T1110	
	T7290	T1 & CEPT	T1067	T1107	
	T7633	Dual T1/E1	T1181/82	-	
	T7683	Quad T1	T1065	T1105	
	T7688	Quad E1	T1063	T1103	
	T7689	Quad T1	T1064	T1104	
	T7690	DS1	T1064	T1104	
	T7690	CEPT	T1063	T1103	
	PMC-Sierra	PM4341, PM6341	-	T1067	T1107
PM4314		-	T1067	T1107	
PM4351		Comet	T1180	-	
Infineon/ Siemens	PEB 2254/2255	5V	T1069	T1109	
	PEB 22554/22504	3.3V	T1142/45	T1231	
	PEB 22504	5V	-	T1226	
VLSI	VPI4Q574	T1	T1070	T1110	
	VPI4Q574	E1	T1070	T1110	
	VP14Q575	T1	T1070	T1110	
	VP14Q575	E1 75	T1070	T1110	

Schematics



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
T1071 and T1111	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
	1:1	25-24	1:1.26	25-23
T1145	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.

G. T1063 through T1073 are all UL1950 recognized and BABT approved to EN60950 as a basic insulation level. All other transformers have safety approvals pending.

NOTES FROM TABLES

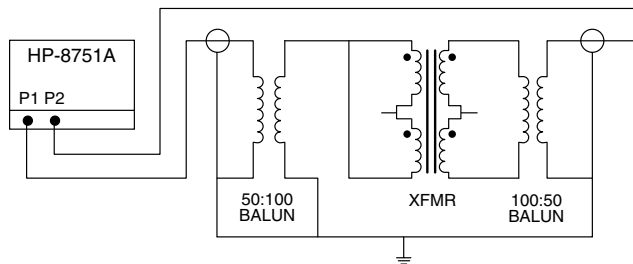
- OCL (primary inductance) is measured at the primary winding. Turns ratio is specified primary: secondary. (CT = Center Tap).
- To make a 1CT:1 ratio from a 1CT:2CT ratio, use only one-half of the secondary (2CT) winding.
- It is possible to use the same transformer model for the three impedance levels of T1 (100 Ω) and CEPT (75 Ω & 120 Ω). For specific connection information and resistor values, refer to IC vendors' data book.

T1/E1/CEPT/ISDN-PRI TRANSFORMERS

Quad Port T1/E1 with 8 Transformers, 1500 Vrms, Extended and Standard Temperature Range

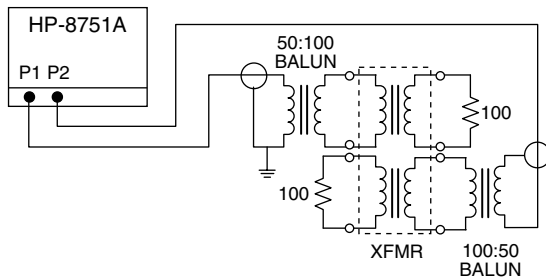


- ET Product** — All coils have an ET product of 10 V- μ sec minimum.
- Flammability** — Materials used in the products are recognized as UL94-VO approved. Products meet the requirements of IEC 695-2-2 (Needle Flame Test).
- Balance Characteristics** — The transformers meet the requirements for longitudinal 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.

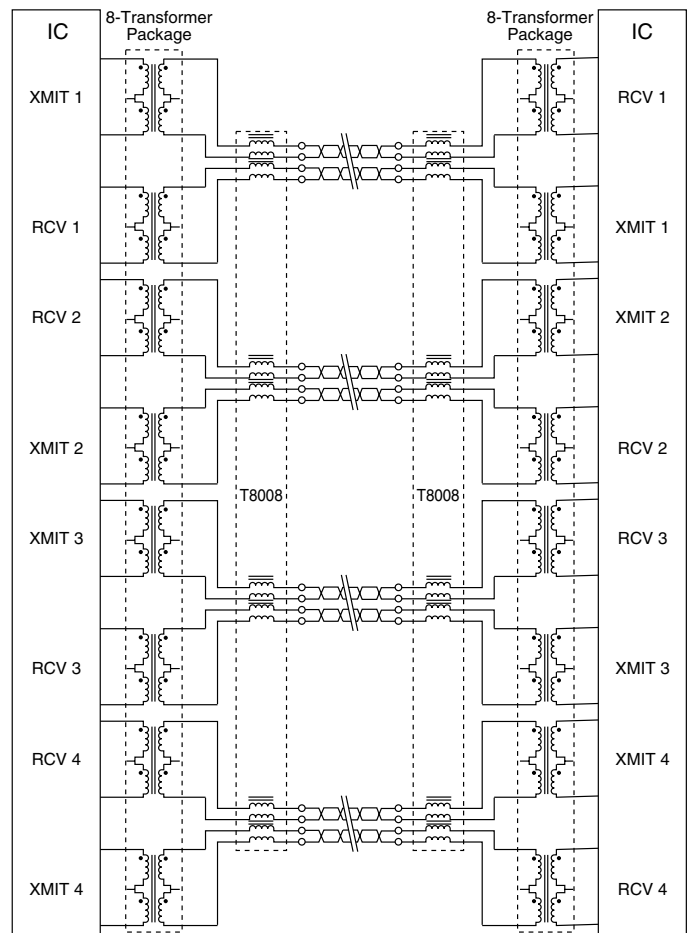
Frequency	50-100 KHz	100 KHz-2 MHz	2-3 MHz
Return Loss			
XMIT	9 dB	15 dB	11 dB
RCV	12 dB	18 dB	14 dB

- 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 μ sec

Longitudinal Voltage: 2,400 V peak, 10/700 μ sec

Typical Application



T1/E1/CEPT/ISDN-PRI TRANSFORMERS

Quad Port T1/E1 with 8 Transformers, 1500 Vrms, Extended and Standard Temperature Range



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

Pulse Part Number	Number of Lines	Turns Ratio (±5%)	OCL (µH MIN)	C _{w/w} (pF MAX)	L _L (µH MAX)	DCR (Ω MAX)	Isolation (Vrms MIN)	Package/Schematic
HIGH FREQUENCY COMMON MODE CHOKES								
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 sheet G002.

Mechanicals

Schematics

IN

SH

LA

1

2

SH LA IN

Weight0.3 grams2 grams2.5 grams
Tape & Reel . . .1500/reel250/reel(N/A)
Tube25/tube30/tube35/tube

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

Unless otherwise specified all tolerances are $\pm \frac{.010}{0.25}$

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