T1/CEPT/ISDN-PRI TRANSFORMERS
Dual Surface Mount, 1500 Vrms, Extended & Standard Temperature Range

Pulse
A TECHNITROL COMPANY



- RoHS-6 peak reflow temperature rating: 245°C
- Dual SMT package contains transmit and receive transformers
- Models matched to leading transceiver ICs
- Isolation voltage: 1500 Vrms
- UL recognized

Electrical Specifications @ 25°C

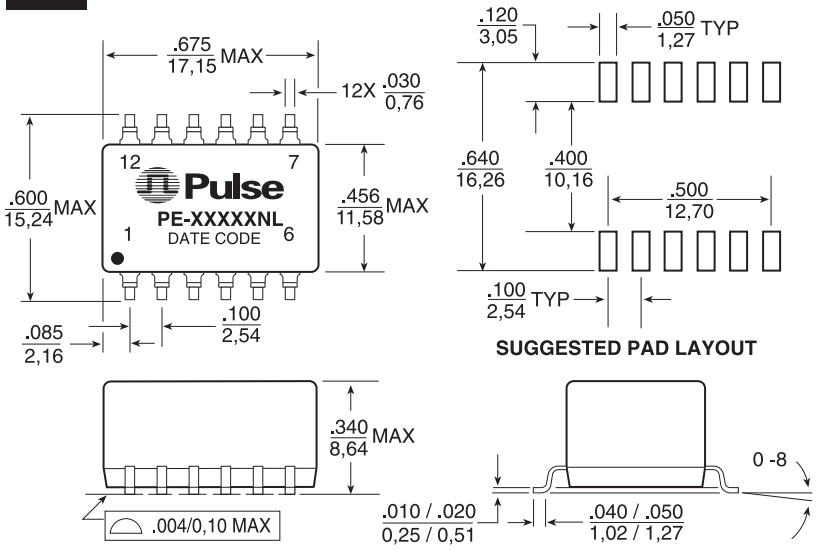
RoHS-6 Compliant Part Number	Turns Ratio [B] (Pri:Sec ± 2%)	OCL @ 25°C (mH MIN)	L_L (µH MAX)	$C_{w/w}$ (pF MAX)	DCR Pri (Ω MAX)	DCR Sec (Ω MAX)	Package/ Schematic	Primary Pins
EXTENDED TEMPERATURE RANGE MODELS [1] – OPERATING TEMPERATURE -40°C TO +85°C								
PE-68841NL	1CT:2CT & 1CT:2CT	1.20 & 1.20	0.80 & 0.80	50 & 50	1.00 & 1.00	1.70 & 1.70	AN/2	12-10, 4-6
PE-68822NL	1CT:2CT & 1:1.36CT	1.60 & 1.60	1.00 & 0.80	60 & 55	1.70 & 1.70	2.00 & 1.70	AN/1	12-10, 4-6
PE-68826NL [E]	1:1/1.26 & 1:2CT	1.20 & 1.20	0.80 & 0.80	50 & 60	1.00 & 1.00	1.10 & 1.70	AN/4	12-10, 4-6
PE-68827NL	1:1CT & 2:1	1.60 & 1.60	1.30 & 1.30	55 & 40	1.10 & 1.10	1.10 & 0.70	AN/5	1-3, 4-6
PE-68828NL	1CT:1CT & 1CT:1CT	1.20 & 1.20	0.80 & 0.80	50 & 50	1.00 & 1.00	1.00 & 1.00	AN/2	1-3, 4-6
PE-68874NL	1CT:1.15CT & 1CT:1.15CT	1.20 & 1.20	0.80 & 0.80	50 & 50	1.20 & 1.20	1.40 & 1.40	AN/2	1-3, 4-6
PE-68877NL	1CT:1CT & 1CT:2CT	1.20 & 1.20	0.80 & 0.80	50 & 50	1.00 & 1.00	1.00 & 1.80	AN/2	1-3, 4-6
PE-68884NL	1CT:1.36CT & 1CT:1.36CT	1.20 & 1.20	0.80 & 0.80	50 & 50	1.20 & 1.20	1.40 & 1.40	AN/2	1-3, 4-6
STANDARD TEMPERATURE RANGE MODELS – OPERATING TEMPERATURE 0°C TO +70°C								
PE-68861NL	1CT:2CT & 1CT:2CT	1.20 & 1.20	0.60 & 0.60	35 & 35	0.70 & 0.70	1.20 & 1.20	AN/2	12-10, 4-6
PE-68864NL [A]	1CT:2CT & 1:1	1.20 & 1.20	0.30-0.55 & 0.80	30 & 30	0.70 & 0.70	1.20 & 0.70	AN/3	1-3, 5-6
PE-68866NL [E]	1:1/1.26 & 1:2CT	1.50 & 1.20	0.40 & 0.50	40 & 40	0.70 & 0.70	0.90 & 1.20	AN/4	12-10, 4-6
PE-68836NL [E]	1:1/1.26 & 1:1/1.26	1.50 & 1.50	0.40 & 0.40	45 & 45	0.80 & 0.80	1.00 & 1.00	AN/6	12-10, 9-7

NOTE: To order Tape & Reel packaging add a **"T"** suffix to the part number (i.e. PE-68861NL becomes PE-68861NL**T**).

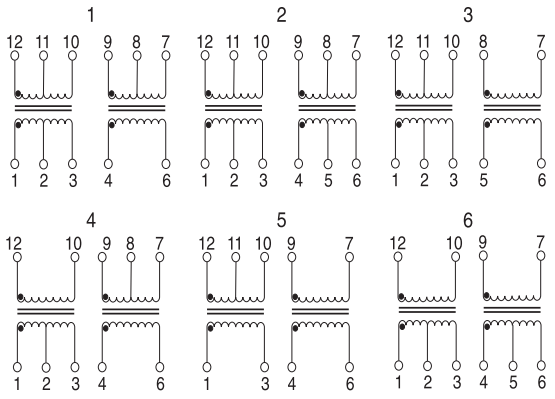
See Pages 6 and 7 for Table Notes.

Mechanical

AN



Schematics



Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Weight . . . . . 4.0 grams
Tape & Reel 250/reel
Tube 30/tube

T1/CEPT/ISDN-PRI TRANSFORMERS
Dual Surface Mount, 1500Vrms, Small Package

Pulse
A TECHNITROL COMPANY

RoHS COMPLIANT



- RoHS-6 peak reflow temperature rating: 245°C
- Dual SMT package contains transmit and receive transformers
- Models matched to leading transceiver ICs
- UL recognized (some parts pending approval)

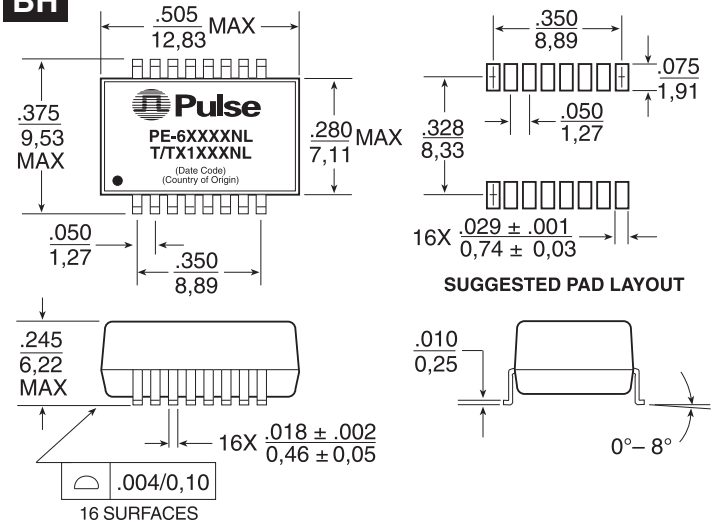
Electrical Specifications @ 25°C

RoHS-6 Compliant Part Number		Turns Ratio [B] (Pri:Sec ±5%)	OCL (mH MIN)	$C_{W/W}$ (pF MAX)	L_L (µH MAX)	DCR Pri (Ω MAX)	Package/ Schematic	Primary Pins
STD TEMP	EXT TEMP							
PE-65861NL	T1090NL	1CT:2CT & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	16-14, 6-8
–	T1091NL	1CT:2CT & 1:1.36CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/2	16-14, 6-8
–	T1076NL	1:1.15CT & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/3	16-14, 6-8
PE-65870NL	–	1CT:1.15CT & 1CT:1.15CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	1-3, 6-8
PE-68678NL	T1094NL	1CT:1CT & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	16-14, 6-8
PE-68786NL	–	1CT:1.41CT & 1CT:1.41CT	1.00 & 1.00	30 & 30	.60 & .60	0.70 & 0.70	BH/1	16-14, 11-9
T1023NL	–	1CT:1.41CT & 1CT:1.41CT	1.00 & 1.00	30 & 30	.60 & .60	0.70 & 0.70	BH/1	1-3, 11-9
T1021NL [I]	–	2CT:1/1.26 & 2CT:1/1.26	1.50 & 1.50	40 & 40	.50 & .50	0.70 & 0.70	BH/1	1-3, 11-9
T1075NL [I]	–	2CS:1.57/2 & 2CS:1.57/2	1.50 & 1.50	40 & 40	.50 & .50	0.70 & 0.70	BH/4	1-2, 5-6
T1137NL	TX1287NL	1CT:2.42CT & 1CT:2.42CT	1.20 & 1.20	25 & 25	.60 & .60	0.70 & 0.70	BH/1	1-3, 6-8
–	T1146NL	1:2/2.4 & 1:0.79/1	1.00 & 1.00	35 & 35	1.00 & 1.00	0.80 & 0.80	BH/5	1-3, 6-8
–	TX1188NL	1CT:2CT & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	1-3, 6-8
–	TX1089NL	1CT:1CT & 1CT:1CT	1.20 & 1.20	30 & 30	.80 & .80	0.70 & 0.70	BH/1	1-3, 6-8
–	TX1467NL	1CT:1:1 & 1CT:1:1	1.20 & 1.20	30 & 30	.80 & .80	1.00 & 1.00	BH/4	16-14, 11-9

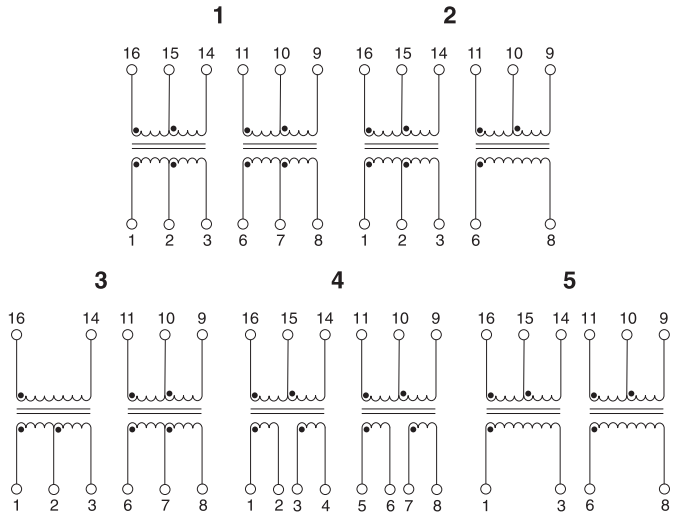
NOTE: Standard (STD) operating temperature range is 0°C to 70°C. Extended (EXT) operating temperature range is -40°C to +85°C. *See pages 6 and 7 for table notes.*

Mechanical

BH



Schematics



Weight . . . . . 1.0 grams
Tape & Reel 600/reel
Tube 40/tube

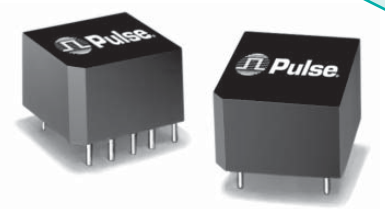
Dimensions: Inches / mm Unless otherwise specified, all tolerances are ± .010 / 0,25

T1/CEPT/ISDN-PRI TRANSFORMERS
Single Reinforced Insulation, 3 kVrms

Pulse
A TECHNITROL COMPANY

RoHS COMPLIANT

REINFORCED INSULATION!



- RoHS-6 peak reflow temperature rating: 245°C
- Certified for reinforced insulation per UL
- For T1/CEPT line interfaces
- Matched to leading transceiver ICs
- Designed to meet ITU-T G.703

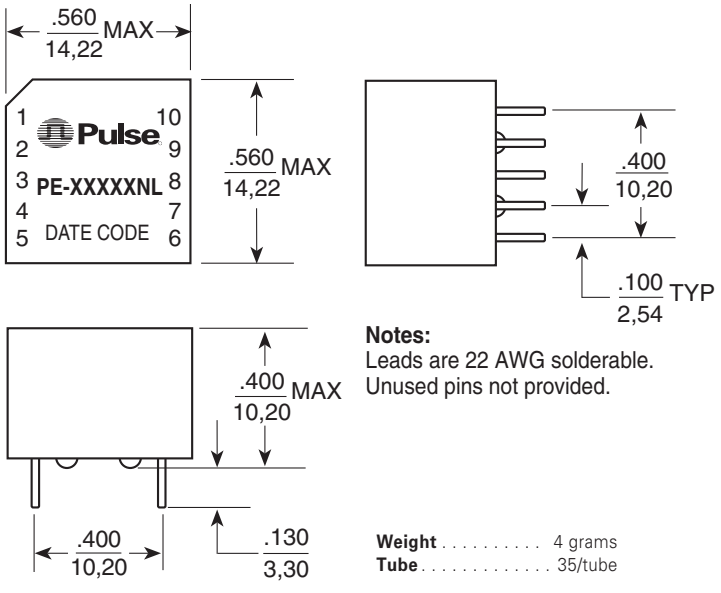
Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C (Unless Otherwise Noted)

RoHS-6 Compliant Part Number	Turns Ratio [B] (Pri:Sec ±5%)	OCL [B] (mH MIN)	$C_{W/W}$ (pF MAX)	L_L (µH MAX)	DCR Pri (Ω MAX)	DCR Sec (Ω MAX)	Safety Agency Recognition [10]	Package/ Schematic	Primary Pins
PE-65830NL	1.27CS:1	.800	15	0.70	0.50	0.35	C,T,U,B	IS/3	1-5
PE-65831NL	1CS:1	.800	15	0.70	0.50	0.45	C,T,U,B	IS/3	1-5
PE-65832NL	1:1.36CT	1.20	35	0.60	0.70	0.90	C,T,U,B	IS/4	10-6
PE-65833NL[A]	1CT:2CT	1.20	20	0.30-0.55	0.50	0.90	C,T,U,B	IS/1	1-5
PE-65834NL	1:1	1.20	20	0.50	0.50	0.50	C,T,U,B	IS/2	1-5
PE-65835NL	1CT:2CT	1.20	15	0.80	0.70	1.10	C,T,U,B	IS/1	1-5
PE-65836NL	1CT:3CT:1	.600	30	0.80	0.70	1.70	C,T,U,B	IS/5	1-3
PE-65837NL[E]	1:1.08/1.36	1.50	20	0.60	0.70	0.90	C,T,U,B	IS/4	10-6
PE-65838NL	1:1.14CT	1.50	30	1.00	0.70	0.90	C,T,U,B	IS/4	10-6
PE-65839NL[E]	1:1/1.26	1.50	35	0.60	0.70	1.10	C,T,U,B	IS/4	10-6
PE-68646NL[E]	1:1.58/2	1.50	20	0.70	0.70	1.20	C,T,U,B	IS/4	10-6
PE-68788NL	1CT:1.41CT	1.20	20	0.80	0.60	0.80	T,U,B	IS/1	10-6

See pages 6 and 7 for table notes.

Mechanical

IS



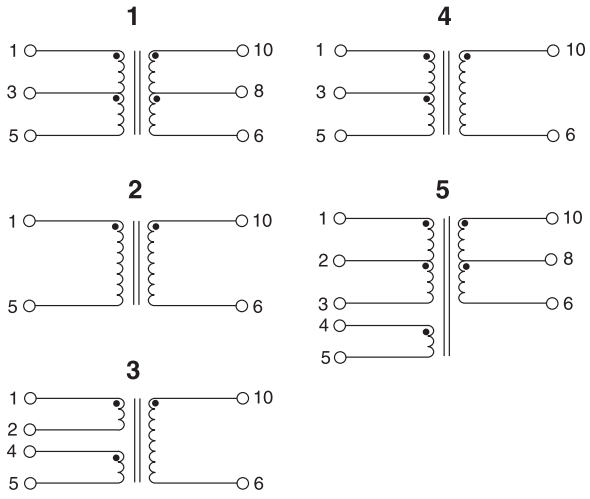
Notes:
Leads are 22 AWG solderable.
Unused pins not provided.

Weight . . . . . 4 grams
Tube 35/tube

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0,25

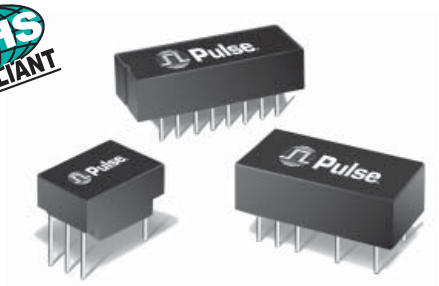
Schematics



T1/CEPT/ISDN-PRI TRANSFORMERS
Single Through Hole, 1500Vrms

Pulse
A TECHNITROL COMPANY

RoHS COMPLIANT



- RoHS-6 peak reflow temperature rating: 245°C
- Extended and standard temperature range
- Dual and single through hole models available
- Models matched to leading IC transceivers
- UL recognized
- Isolation Voltage: 1500 Vrms MIN

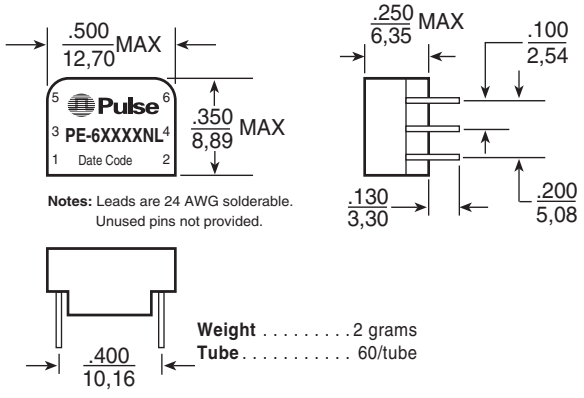
Electrical Specifications @ 25°C

RoHS-6 Compliant Part Number	Turns Ratio [B] (Pri:Sec ±5%)	OCL @ 25°C (mH MIN)	Cw/w (pF MAX)	LL (µH MAX)	DCR Pri (Ω MAX)	DCR Sec (Ω MAX)	Package/ Schematic	Primary Pins
STANDARD TEMPERATURE RANGE SINGLE TRANSFORMERS – OPERATING TEMPERATURE 0°C TO +70°C								
PE-64931NL	1:1:1 (1:2CS)	1.20	25	0.50	0.70	0.70 & 0.70	HC/2	1-2
PE-64933NL	1CT:3CT	1.20	30	0.50	0.70	1.60	HC/4	1-5
PE-64934NL	1:1w	1.20	25	0.50	0.70	0.70	HC/1	1-2
PE-64936NL	1CT:1	1.20	25	0.80	0.70	0.70	HC/3	1-5
PE-64937NL	1:1.36	1.20	35	0.80	0.70	0.80	HC/1	5-6
PE-64940NL	1.26CS:1 (1:1:1.58)	0.30	30	0.60	0.80	0.60	HC/2	1-4
PE-64941NL [D]	1CS:1	0.80	30	0.60	0.80	0.60	HC/2	1-4
PE-64942NL	1CS:1.31	0.80	30	0.40	0.80	0.60	HC/2	1-4
PE-64943NL [A]	1CT:2CT	1.20	30	0.30-0.55	0.70	1.20	HC/4	1-5
PE-65351NL	1:2CT	1.20		0.50	0.70	1.30	HC/3	2-6
PE-65363NL	1:4CT	0.50	40	1.00	0.50	1.50	HC/5	1-5
PE-65379NL	1:1.14CT	1.20	35	0.80	0.70	0.80	HC/5	1-5
PE-65388NL	1:1.15CT	1.50	35	0.60	0.70	0.90	HC/3	2-6
PE-65389NL [E]	1:1/1.26	1.50	40	0.40	0.70	0.90	HC/3	2-6
PE-65415NL	1CT:2CT	1.20	30	0.50	0.70	1.20	HC/4	1-5
PE-65558NL	1:2.3CT	1.20	35	0.80	0.70	1.40	HC/5	1-5
PE-65586NL	1:1.36CT	1.20	35	0.80	0.70	0.90	HC/5	1-5
PE-65755NL	1CT:1CT	1.20	25	0.80	0.80	0.80	HC/4	1-5
PE-68644NL	1CT:1	0.70	20	0.70	0.20	0.80	HC/3	1-5
PE-68645NL	1:1.36CT	0.70	20	0.70	0.50	0.40	HC/5	1-5
T1054NL	1:1.5CT	1.20	30	0.60	0.70	1.00	HC/3	2-6
EXTENDED TEMPERATURE RANGE SINGLE TRANSFORMERS [1] – OPERATING TEMPERATURE -40°C TO +85°C								
PE-65340NL	1:1.36	1.20	35	0.80	0.90	1.20	HC/1	5-6
PE-65770NL	1:1.15CT	1.50	40	0.80	0.90	1.00	HC/3	2-6
PE-65771NL	1CT:2CT	1.20	50	0.60	1.00	2.00	HC/4	2-6
PE-65778NL	1CT:1CT	1.20	40	1.00	1.00	1.00	HC/4	1-5
PE-68600NL	1CT:3CT	1.20	60	0.80	0.90	2.70	HC/4	1-5
PE-68664NL [E]	1:1/1.26	1.50	50	0.80	0.90	1.10	HC/3	2-6
TX1252NL	1CT:1	1.20	40	1.00	1.00	1.00	HC/3	1-5

See pages 6 and 7 for table notes.

Mechanical

HC



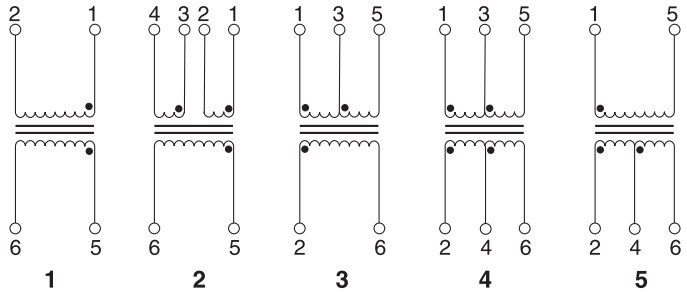
Notes: Leads are 24 AWG solderable.
Unused pins not provided.

Weight . . . . . 2 grams
Tube 60/tube

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0,25

Schematics



T1/CEPT/ISDN-PRI TRANSFORMERS
Dual Through Hole, 1500 Vrms

Pulse
A TECHNITROL COMPANY

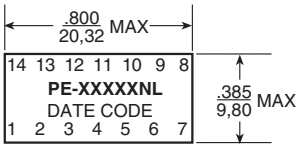
Electrical Specifications @ 25°C

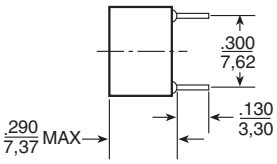
RoHS-6 Compliant Part Number	Turns Ratio [B] (Pri:Sec ±5%)	OCL @ 25°C (mH MIN)	$C_{W/W}$ (pF MAX)	L_L (µH MAX)	DCR Pri (Ω MAX)	DCR Sec (Ω MAX)	Package/ Schematic	Primary Pins
STANDARD TEMPERATURE RANGE DUAL TRANSFORMERS – OPERATING TEMPERATURE 0°C TO +70°C								
PE-64951NL	1:2CT & 1:2CT	1.20 & 1.20	35 & 35	0.50 & 0.50	0.70 & 0.70	1.20 & 1.20	HD/1	14-12, 5-7
PE-64921NL	1:2CT & 1:1.36	1.20 & 1.20	35 & 35	0.50 & 0.80	0.80 & 0.80	1.20 & 1.00	HD/2	14-12, 5-7
PE-64953NL	1:2CT & 1:2CT	2.00 & 2.00	50 & 50	0.60 & 0.60	1.00 & 1.00	2.00 & 2.00	HD/3	14-12, 10-8
PE-64954NL[A]	1CT:2CT & 1:1	1.20 & 1.20	30 & 30	0.30-0.55 & 0.50	0.70 & 0.70	1.20 & 0.70	HD/4	1-3, 5-7
PE-64955NL	1:1.26CT & 1.58:1	0.80 & 0.80	30 & 30	0.50 & 0.50	0.60 & 0.60	0.70 & 0.30	HD/5	1-3, 5-7
PE-64956NL	1:1CT & 2:1	0.80 & 0.80	30 & 30	0.60 & 0.60	0.50 & 0.50	0.50 & 0.20	HD/5	1-3, 5-7
PE-64957NL	1CT:1.31 & 2.62:1	1.20 & 1.20	30 & 30	0.80 & 0.80	0.60 & 0.60	0.50 & 0.30	HD/5	1-3, 5-7
PE-65565NL	1:1.15CT & 1:2CT	1.50 & 1.20	35 & 40	0.60 & 0.50	0.70 & 0.70	1.10 & 1.30	TD/1	14-12, 5-7
PE-65566NL [E]	1:1/1.26 & 1:2CT	1.50 & 1.20	40 & 40	0.50 & 0.40	0.70 & 0.70	0.90 & 1.30	TD/1	14-12, 5-7
EXTENDED TEMPERATURE RANGEDUAL TRANSFORMERS 1 – OPERATING TEMPERATURE -40°C TO +85°C								
PE-65567NL	1:1.15CT & 1:2CT	1.50 & 1.20	40 & 60	0.80 & 0.80	0.90 & 0.90	1.00 & 1.70	TD/1	14-12, 5-7
PE-65568NL [E]	1:1/1.26 & 1:2CT	1.50 & 1.20	50 & 60	0.80 & 0.80	0.90 & 0.90	1.00 & 1.70	TD/1	14-12, 5-7
PE-65774NL	1CT:2CT & 1:1.36CT	1.20 & 1.20	50 & 50	0.96 & 0.80	1.00 & 1.00	1.70 & 1.20	TD/7	14-12, 5-7
PE-68618NL [G]	1CT:1CT & 3CT:1CT:.25	1.20 & 32.0	40 & 65	0.80 & 0.80	1.00 & 3.00	1.00 & 1.20	BD/6	1-3, 11-9
PE-64950NL [G]	1CT:1CT & 1CT:3CT:1	1.20 & 0.60	50 & 50	0.80 & 0.80	1.00 & 0.80	1.00 & 2.00	BD/6	1-3, 4-6

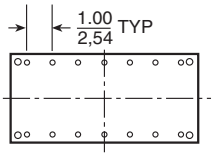
(See Pages 6 and 7 for Table Notes)

Mechanicals

TD DUAL

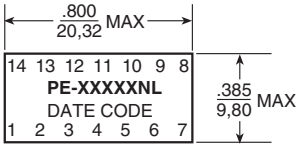


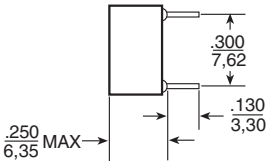


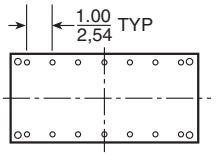


Weight . . . . . 2.6 grams
Tube 25/tube

HD DUAL

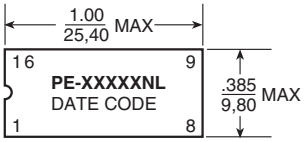


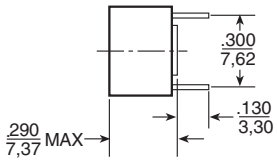


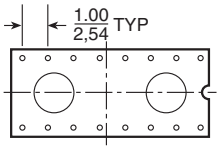


Weight . . . . . 2.3 grams
Tube 25/tube

BD DUAL







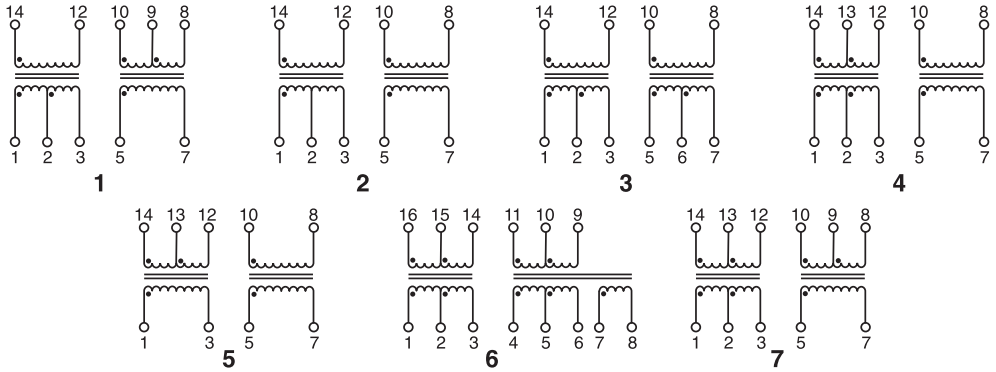
Weight . . . . . 3.1 grams
Tube 25/tube

Note: Leads are 24 AWG solderable.

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± 010 / 0,25

Schematics



T1/CEPT/ISDN-PRI TRANSFORMERS
Transformer Selection Guide

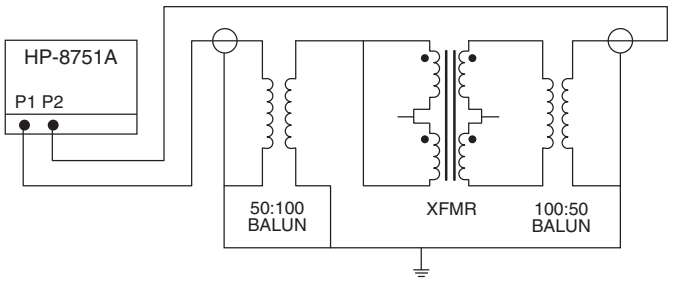
Pulse
A TECHNITROL COMPANY

IC Manufacturer/ IC Part Number		Com_ments	Dual SMT (BH Pkg.)		Dual SMT (AN Pkg.)		Single Through Hole				Dual Through Hole		Single Through Hole	
			Std Temp	Ext Temp	Std Temp	Ext Temp	Standard Temp		Extended Temp		Std Temp	Ext Temp	Reinforced 3 kVRMS	
			TX & RX	TX & RX	TX & RX	TX & RX	TX	RX	TX	RX	TX & RX	TX & RX	TX	RX
Mindspeed (Conexant)	BT8510	T1/E1	—	—	PE-68868NL	PE-68826NL	PE-65389NL	PE-65351NL	PE-68664NL	PE-65771NL	PE-65566NL	PE-65568NL	PE-65839NL	PE-65835NL
	BT8510	T1/E1	T1021NL	—	T1021NL	PE-68826NL	PE-65389NL	PE-65351NL	PE-68664NL	PE-65771NL	PE-65566NL	PE-65568NL	PE-65839NL	PE-65835NL
	BT8370/5/6	Better RL	—	T1091NL	—	PE-68822NL	PE-64937NL	PE-64936NL	PE-65340NL	PE-65771NL	PE-64921NL	PE-65774NL	PE-65832NL	PE-65834NL
	BT8370/5/6	Low Power	—	T1076NL	—	—	PE-65388NL	PE-64936NL	PE-65770NL	PE-65771NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65834NL
Cirrus Logic (Crystal)	61318	120 E1	PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64951NL	PE-65568NL	PE-65835NL	PE-65835NL
	61318	75 E1	—	—	—	—	T1229NL	PE-64936NL	T1229NL	PE-65778NL	—	—	PE-68646NL	PE-65835NL
	61577	T1 & E1	PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	61304A/5A/535A/574A,/75	T1	—	T1076NL	—	—	PE-65388NL	PE-65351NL	PE-65770NL	PE-65771NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65835NL
	61304A/5A/535A/574A,/75	75 E1	—	—	—	PE-68826NL	PE-65389NL	PE-65351NL	PE-68664NL	PE-65771NL	PE-65566NL	PE-65568NL	PE-65839NL	PE-65835NL
	61304A/5A/535A/574A,/75	120 E1	—	—	—	PE-68826NL	PE-65389NL	PE-65351NL	PE-68664NL	PE-65771NL	PE-65566NL	PE-65568NL	PE-65839NL	PE-65835NL
	61582, 61583		PE-65870NL	—	PE-68874NL	PE-68874NL	PE-65388NL	PE-65388NL	PE-65770NL	PE-65770NL	—	—	PE-65838NL	PE-65838NL
	61310, 61581		PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-68778NL	PE-64951NL	PE-65568NL	PE-65835NL	PE-65835NL
	61310, 61581	Host	—	—	—		PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	61881		—	T1076NL	—	—	PE-65388NL	PE-65351NL	PE-65770NL	PE-65771NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65835NL
	61584/84A	IQ3	PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	61584/82/83/A	IQ5	PE-65870NL	—	PE-68874NL	PE-68874NL	PE-65388NL	PE-65388NL	PE-65770NL	PE-65770NL	—	—	PE-65838NL	PE-65838NL
Maxim (Dallas)	DS2196		PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64951NL	PE-65568NL	PE-65838NL	PE-65838NL
	DS2151/2152/2153/2154		—	T1076NL	—	—	PE-65388NL	PE-64936NL	PE-65770NL	PE-65778NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65834NL
	DS2151/2152/2153/2154		—	T1091NL	—	PE-68822NL	PE-65586NL	PE-64936NL	PE-65340NL	PE-65778NL	PE-64921NL	PE-65774NL	PE-65832NL	PE-65834NL
	DS2148/Q48	3V	PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64951NL	PE-65568NL	PE-65838NL	PE-65838NL
	DS2148/Q48	5V	—	T1091NL	—	PE-68822NL	PE-65586NL	PE-64936NL	PE-65340NL	PE-65778NL	PE-64921NL	PE-65774NL	PE-65832NL	PE-65834NL
	DS21352/Q352,DS21354/ Q354		PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64951NL	PE-65568NL	PE-65838NL	PE-65838NL
	DS21552/Q552,DS21554/ Q554		—	T1076NL	—	—	PE-65388NL	PE-64936NL	PE-65770NL	PE-65778NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65834NL
	DS21552/Qww52,DS21554/ Q554		—	T1091NL	—	PE-68822NL	PE-65586NL	PE-64936NL	PE-65340NL	PE-65778NL	PE-64921NL	PE-65774NL	PE-65832NL	PE-65834NL
Exar	T5683A, 59L91		PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65415NL	PE-65415NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	T5894,T5897,T5997		PE-65861NL	T1090NL	PE-65861NL	PE-68841NL	PE-65415NL	PE-65415NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	T5791/93/94/95		PE-65 866NL	—	PE-68866NL	PE-68826NL	PE-65389NL	PE-64934NL	PE-68664NL	PE-65778NL	PE-65566NL	PE-65568NL	PE-65839NL	PE-65834NL
	T5894,T5897,T5997		—	T1091NL	—	PE-68822NL	PE-64937NL	PE-65415NL	PE-65340NL	PE-65771NL	PE-64921NL	PE-65774NL	PE-65832NL	PE-65835NL
	83L30/34/38		PE-65861NL	T1090NL	PE-65861NL	PE-68841NL	PE-65415NL	PE-65415NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	82L34/38		—	—	—	—	—	—	—	—	—	—	—	—
	T5684,T7288,82D20		—	T1091NL	—	PE-68822NL	PE-64937NL	PE-65351NL	PE-65340NL	PE-65771NL	PE-64921NL	PE-65774NL	PE-65837NL	PE-65835NL
Infineon Technologies	PEB 2254/55	E1/T1 & J1	PE-68786NL	—	—	—	—	—	—	—	—	—	PE-68788NL	PE-68788NL
	PEB 2254/55	E1/T1 & J1	T1023NL	—	—	—	—	—	—	—	—	—	—	—
Intel (Level One)	LXT 300/301		PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	LXT 304/305/307	T1,E1	PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	LXT 304/305/307	T1	—	T1076NL	—	—	PE-65388NL	PE-65351NL	PE-65770NL	PE-65771NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65835NL
	LXT 304/305/307	75E1,120E1	—	—	PE-68866NL	PE-68826NL	PE-65389NL	PE-65351NL	PE-68664NL	PE-65771NL	PE-65566NL	PE-65568NL	PE-65839NL	PE-65835NL
	LX T 304/305/307	DSX-1, D4	—	—	—	—	PE-65558NL	PE-65351NL				—	—	—
	LXT 310/317/318		PE-68678NL	T1094NL	—	—	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64954NL	—	PE-65835NL	PE-65834NL
	LXT 312/ 313/ 315		—	—	—	—	PE-64933NL	PE-64936NL	PE-68600NL	PE-65778NL		PE-64950NL	PE-65836NL	PE-65834NL
	LXT 331	T1,E1	PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64954NL	—	PE-65835NL	PE-65834NL
	LXT 331, LXT 332		PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	LXT 331, LXT 332		—	—	—	—	PE-65558NL	PE-65351NL				—	—	—
	LXT 331, LXT 332		—	T1076NL	—	—	PE-65388NL	PE-65351NL	PE-65770NL	PE-65771NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65835NL
	LXT 334, LXT 335	T1/E1	PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL		PE-65835NL	PE-65835NL
	LXT 334, LXT 335	120/75 E1	—	T1091NL	—	PE-68822NL	PE-65586NL	PE-65351NL	PE-65340NL	PE-65771NL	PE-64921NL	PE-65771NL	PE-65832NL	PE-65835NL
	LXT 334, LXT 335	75 E1	—	—	PE-68866NL	PE-68826NL	PE-65389NL	PE-65351NL	PE-68664NL	PE-65771NL	PE-65566NL	PE-65568NL	PE-65839NL	PE-65835NL
	LXT 334, LXT 335		—	—	—	—	T1054NL	PE-64936NL	—	—	—	—	—	—
	LXT 336		PE-65861NL	T1090NL	PE-68828NL	PE-68828NL	—	PE-65351NL	—	PE-65778NL	PE-64951NL	—	—	PE-65835NL
	LXT 350, LXT 351, LXT 359	T1,E1	PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64954NL	—	PE-65835NL	PE-65834NL
	LXT 350, LXT 351		—	T1076NL	—	—	PE-65388NL	PE-65351NL	PE-65770NL	PE-65771NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65835NL
	LXT 350, LXT 351	120 E1	—	—	—	—	PE-65558NL	PE-65351NL	—	—	—	—	—	—
	LXT 360/361/362/363	T1,E1	PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64954NL	—	PE-65835NL	PE-65834NL
	LXT 360/361/362/363		—	T1076NL	—	—	PE-65388NL	PE-65351NL	PE-65770NL	PE-65771NL	PE-65565	PE-65567NL	PE-65838NL	PE-65835NL
	LXT 360, LXT361	120 E1	—	—	—	—	PE-65558NL	PE-65351NL	—	—	—	—	—	—
	LXT 380/381/384/386/388	T1/E1	PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64936NL	PE-65771NL	PE-65778NL	PE-64954	—	PE-65835NL	PE-65834NL
	LXT 380/381/384/386/388	T1/E1	PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	LXT 3104, LXT 3108		PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-64936NL	PE-64936NL	PE-65778NL	PE-65778NL	PE-64951NL	—	PE-65835NL	PE-65835NL
	LXT 3104, LXT 3108		TX1099NL	TX1099NL	—	—	—	—	—	—	—	—	—	—
Lucent Technologies	T7288, T290A	CEPT	—	T1091NL	—	PE-68822NL	PE-65586NL	PE-65415NL	PE-65340NL	PE-65771NL	PE-64921NL	PE-65774NL	PE-65832NL	PE-65835NL
	T7289A	DS1	—	T1076NL	—	—	PE-65379NL	PE-65351NL	PE-65770NL	PE-65771NL	PE-65565NL	PE-65567NL	PE-65838NL	PE-65835NL
	T7688, T7690, T7698	CEPT	—	—	PE-68884NL	PE-68884NL	PE-65586NL	PE-65586NL	PE-65340NL	PE-65340NL	—	—	PE-65832NL	PE-65832NL
	T7689, T7690, T7698	DS1	PE-65870NL	—	PE-68874NL	PE-68874NL	PE-65379NL	PE-65379NL	PE-65770NL	PE-65770NL	—	—	PE-65838NL	PE-65838NL
	T7693,T7697	CEPT	T1137NL	TX1287NL	—	—	—	—	—	—	—	—	—	—
	TLIU04C1	DS1	PE-65870NL	—	PE-68874NL	PE-68874NL	PE-65379NL	PE-65379NL	PE-65770NL	PE-65770NL	—	—	PE-65838NL	PE-65838NL
	TLIU04C1	CEPT	—	—	PE-68884NL	PE-68884NL	PE-65586NL	PE-65586NL	PE-65340NL	PE-65340NL	—	—	PE-65832NL	PE-65832NL
Zarlink	MT9071, MT9076		T1137NL	TX1287NL	—	—	—	—	—	—	—	—	—	—
	MT9074, MT9075		PE-68678NL	T1094NL	PE-68877NL	PE-68877NL	PE-65351NL	PE-64934NL	PE-65771NL	PE-65778NL	PE-64954NL	PE-65568NL	PE-65835NL	PE-65834NL
PMC-Sierra	PM4318		—	T1091NL	—	PE-68822NL	PE-649376NL	PE-65351NL	PE-65340NL	PE-65771NL	PE-64921NL	PE-65774NL	PE-65832NL	PE-65835NL
	PM4351/4354		PE-65861NL	T1090NL	PE-68861NL	PE-68841NL	PE-65351NL	PE-65351NL	PE-65771NL	PE-65771NL	PE-64951NL	—	PE-65835NL	PE-65835NL
		COMET	T1137NL	TX1287NL	—	—	—	—	—	—	—	—	—	—

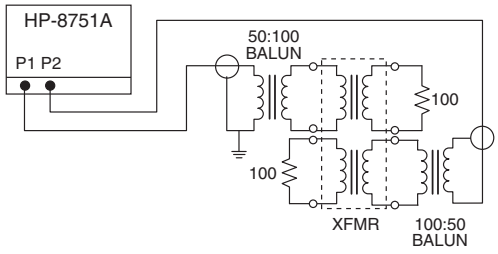
NOTE: For Quad Port Transceiver products, refer to data sheet **T620**. For Reinforced Insulation Models, refer to data sheet **T617**. For Octal SMT packages, refer to data sheet **T622**.

Application Notes

1. **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 for all low temperature models with the exception of PE-68827NL which is 800 µH minimum and PE-65836NL which is 300 µH minimum. All other parameters are specified at +25°C only. Standard temperature range is 0°C to +70°C.
2. **ET Product** — All coils have an ET product of 10 V-µsec minimum.
3. **Flammability** — Materials used in the products are recognized as UL94-VO approved. Products meet the requirements of IEC 695-2-2 (Needle Flame Test).
4. **Balance Characteristics** — The transformers meet the requirements for longitudinal balance of FCC part 68.
5. **Common Mode Rejection Ratio** — The CMRR for all transformers is better than 50 dB at 1 MHz. A typical test circuit is shown below.



6. **Crosstalk Attenuation** — In the dual 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 50 dB or better from 100 kHz to 10 MHz. This result was established with the test circuit shown below.



7. **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			
TX	9 dB	15 dB	11 dB
RX	12 dB	18 dB	14 dB

8. **Surge Voltage Capability** – All transformers and chokes meet surge voltage tests according to the most stringent regulatory documents when system designs include the proper voltage and current suppression devices:

   Metallic Voltage: 800 V peak, 10/560 µsec
   Longitudinal Voltage: 2,400 V peak, 10/700 µsec

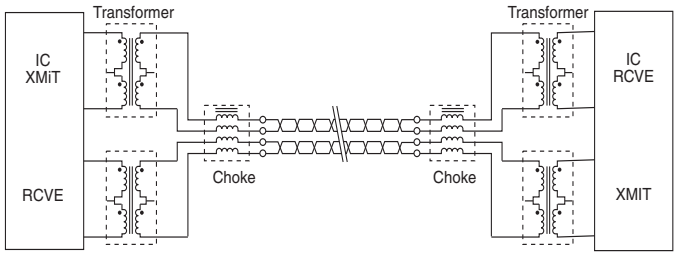
9. **Isolation Voltage** — 100% of transformers are tested during production to the specified isolation voltage level.
10. **Safety Agency Recognition** — Parts listed as "Recognized" or "Certified" meet Underwriter Laboratories, UL 1459 and UL 1950 per file E133523 (S).

    Transformers with Reinforced Insulation according to IEC950 series PE-68630NL—PE-68788NL (pg. 3) **are certified by the following organizations:**

Code	Certificate Information
T	TÜV, EN 60 950/EN 41003, Cert. R9371358, reinforced insulation.
U	UL 1459/UL1950, File E133523 (S), reinforced insulation.

11. **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.
12. **Common Mode Chokes** — The "high-frequency" 4-lines common mode chokes shown in this data sheet provide an effective means of compliance with national and international regulations on EMI. They are designed to be used in conjunction with Pulse's T1/CEPT transformers as shown in the typical application below. Crosstalk is typically -70 dB at 1 MHz and -55 dB at 10 MHz.

Typical Application



NOTES FROM TABLES (pages 1 - 6):

A. Toleranced leakage inductance: .30 µH min to .55 µH MAX.

B. OCL (primary inductance) and L_L (leakage inductance) are measured at the primary winding. Turns ratio is specified primary: secondary. (CT = Center Tap; CS = Split Center Tap).

C. To make a 1CT:1 ratio from a 1CT:2CT ratio, use only one half of the secondary (2CT) winding.

D. For Reinforced 3 kVrms Dual SMT Transformers, refer to data sheet T617. For Quad SMT Transformers, refer to data sheet T615. For Octal SMT Transformers, refer to data sheet T622.

E. Dual Ratio Transformers: 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 the desired turns ratio:

Part Number	Turns Ratio 1	Secondary Pins	Turns Ratio 2	Secondary Pins
PE-65837NL	1:1.08	3-5	1:1.36	1 - 5
PE-65839NL	1:1	3-5	1:1.26	1 - 5
PE-68646NL	1:1.58	3-5	1:2	1 - 5
PE-65389NL	1:1	3-5	1:1.26	1 - 5
PE-65566NL	1:1	2-3	1:1.26	1 - 3
PE-65568NL	1:1	2-3	1:1.26	1 - 3
PE-68866NL	1:1	2-3	1:1.26	1 - 3
PE-68826NL	1:1	2-3	1:1.26	1 - 3
PE-68664NL	1:1	3-5	1:1.26	1 - 5
PE-68836NL	1:1	2-3/5-6	1:1.26	1¾ - 6

F. Standard packaging for surface mount "AN" and "LA" packages is anti-static tubes. Optional Tape & Reel packaging can be ordered by adding "T" suffix to the part number, (i.e. PE-65866NLT).

G. PE-68618NL and PE-64950NL: The fault locate winding is (7-8).

H. Safety Agency approvals pending.

I. The turns ratio of these devices have been designed, in conjunction with semiconductor vendor recommendations, to allow connections to various terminations (e.g. 75 Ω or 120 Ω with the same transformer). For example T1075NL can be used with the Siemens PEB 2235 to achieve connection to the 75 Ω or 120 Ω cable. For 75 Ω termination, the PEB 2235 requires the following turns ratio: 1:1.57 (TX) and 1:1.26 (RX) which can be achieved using pins (1-2):(15-16) for TX and (10-11):(5-8) for RX. For 120 Ω, the following turns ratio are required: 1:2 (TX) and 1:1 (RX), which are pins (1-2):(16-14) for TX and (9-11):(5-8) for RX on the T1075NL.

COMMON MODE CHOKES FOR TELECOM APPLICATIONS

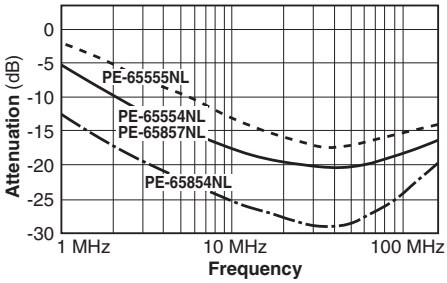
For EMI Reduction

Pulse
A TECHNITROL COMPANY

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

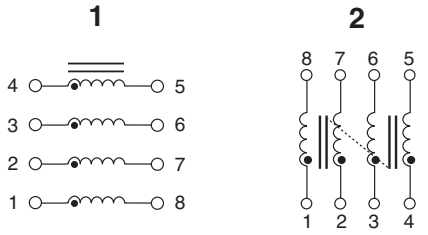
Pulse Part Number	Turns Ratio (±5%)	OCL (µH MIN)	Package/Schematic
HIGH FREQUENCY COMMON MODE CHOKES, 4-LINES			
PE-65554NL	1:1:1:1	24.0	IN/1 (Through Hole)
PE-65555NL	1:1:1:1	8.0	IN/1 (Through Hole)
PE-65854NL	1:1:1:1	47.0	SH/1 (Surface Mount)
PE-65857NL	1:1:1:1	24.0	LA/2 (Surface Mount)

NOTE: For additional Common Mode Chokes, refer to data sheet **G002**.



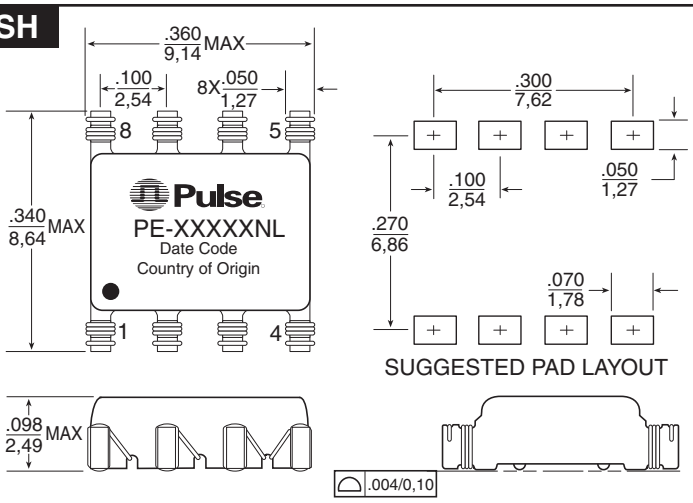
Typical common mode attenuation for high-frequency common mode chokes based on a 100 Ω system.

Schematics

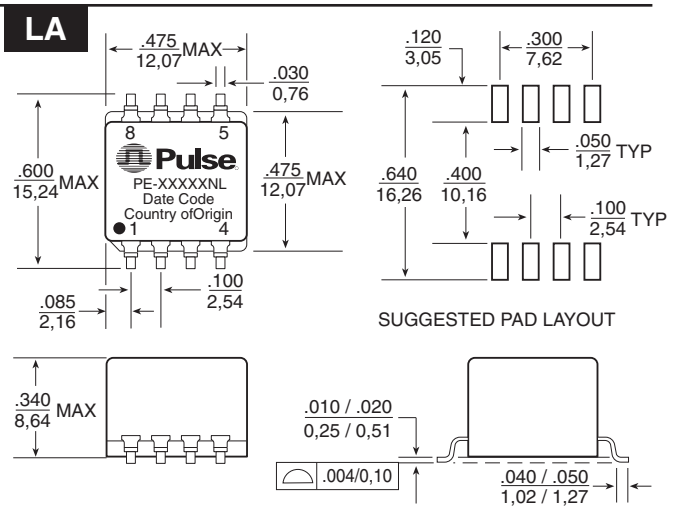


Mechanicals

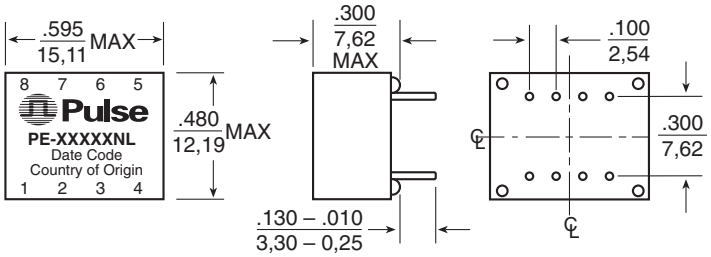
SH



LA



IN



	SH	LA	IN
Weight	0.3 grams	2 grams	2.5 grams
Tape & Reel	1500/reel	250/reel	(N/A)
Tube	25/tube	30/tube	35/tube

Dimensions: Inches / mm

Unless otherwise specified all tolerances are ± .010 / 0,25

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