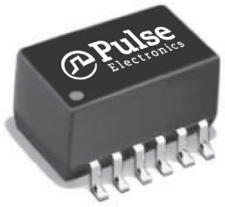
# T1/Cept/ISDN-PRI Transformers

*Dual Surface Mount, 1500 Vrms, Extended & Standard Temperature Range*



- *RoHS 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*

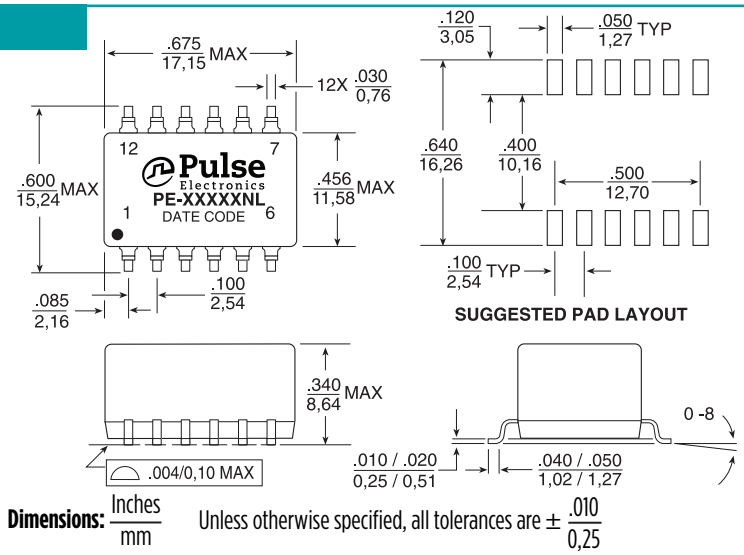
| Electrical Specifications @ 25°C | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RoHS-6 Compliant Part Number | Turns Ratio[B] (Pri:Sec ±2%) | OCL @ 25˚C (mH MIN) | $L_L$ (µH MAX) | $C_{w/w}$ (pF MAX) | DCR Pri (Ω MAX) | DCR Sec (Ω MAX) | Package/ Schematic | Primary Pin |
| **Extended Temperature 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-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-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-68836NL[E] | 1:1/1.26 & 1:1/1.26 | 1.50 & 1.50 | 0.40 & 0.40 | 45 & 35 | 0.80 & 0.80 | 1.00 & 1.00 | AN/5 | 12-10, 9-7 |

**Notes:** To order Tape & Reel packaging, add a "**T**" suffix to the part number (i.e. PE-68864NL becomes PE-68864NL**T**).

See Page 7 and 8 for Table Notes.

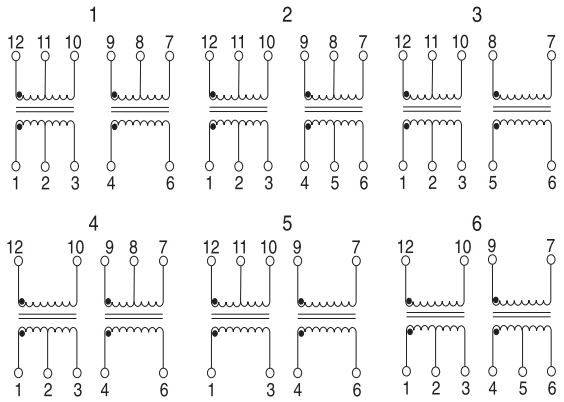
## Mechanical

**AN**




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

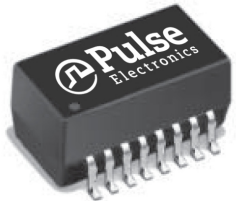
## Schematics




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

# T1/Cept/ISDN-PRI Transformers

*Dual Surface Mount, 1500 Vrms, Small Package*



- *RoHS 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**

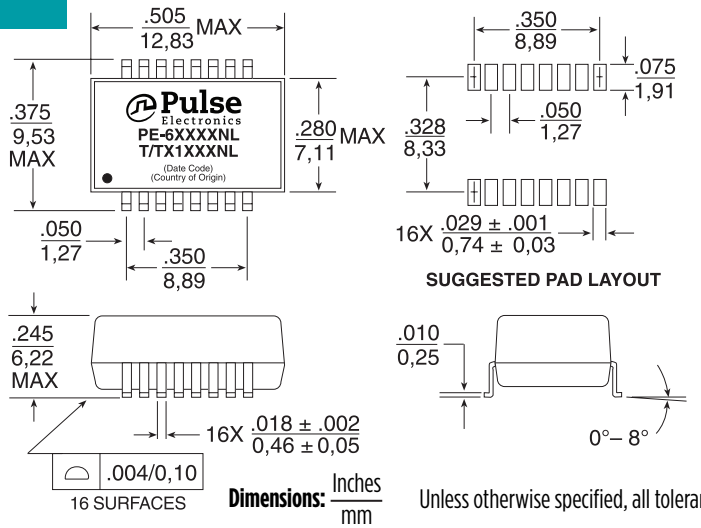
| RoHS-6 Compliant Part Number | | Turns Ratio [B] (Pri:Sec ±5%) | OCL (mH MIN) | $C_{w/w}$ (pF MAX) | $L_L$ (µH MAX) | DCR Pri (Ω MAX) | Package/ Schematic | Primary Pins |
|---|---|---|---|---|---|---|---|---|
| STD Temp | EXT Temp | | | | | | | |
| PE-65861NL | T1090NL | 1CT:2CT & 1CT:2CT | 1.20 & 1.20 | 30 & 30 | .60 & .60 | 0.70 & 0.70 | BH/1 | 16-14, 6-8 |
| - | T1076NL | 1:1.15CT & 1CT:2CT | 1.20 & 1.20 | 30 & 30 | .60 & .60 | 0.70 & 0.70 | BH/2 | 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:1.4CT & 1CT:1.41CT | 1.00 & 1.00 | 30 & 30 | .60 & .60 | 0.70 & 0.70 | BH/1 | 16-14, 11-9 |
| T1023NL | - | 1CT:1.4CT & 1CT:1.41CT | 1.00 & 1.00 | 30 & 30 | .60 & .60 | 0.70 & 0.70 | BH/1 | 1-3, 11-9 |
| T1021NL | - | 2CT:1/1.26CT & 2CT:1/1.26 | 1.50 & 1.50 | 40 & 40 | .50 & .50 | 0.70 & 0.70 | BH/1 | 1-3, 11-9 |
| 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 & 1CT:2CT | 1.00 & 1.00 | 35 & 35 | 1.00 & 1.00 | 0.80 & 0.80 | BH/4 | 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:1CT & 1CT:2CT | 1.20 & 1.20 | 30 & 30 | .80 & .80 | 1.00 & 1.00 | BH/3 | 16-14, 11-9 |

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

See pages 7 and 8 for table notes.

## Mechanicals

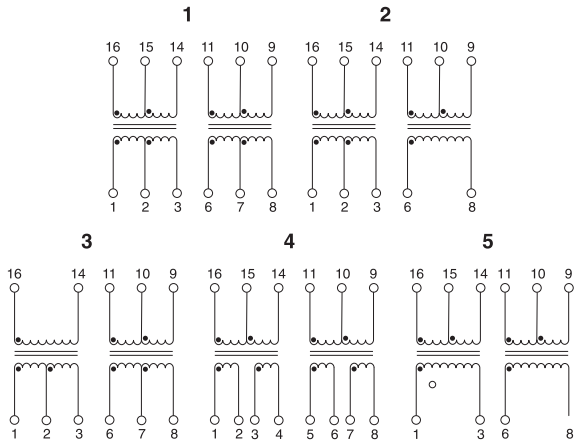
**BH**




**Dimensions:** Inches / mm

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

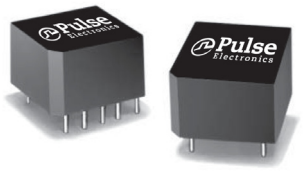
## Schematics




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

# T1/Cept/ISDN-PRI Transformers

*Single Reinforced Insulation, 3 kVrms*



- *RoHS 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*

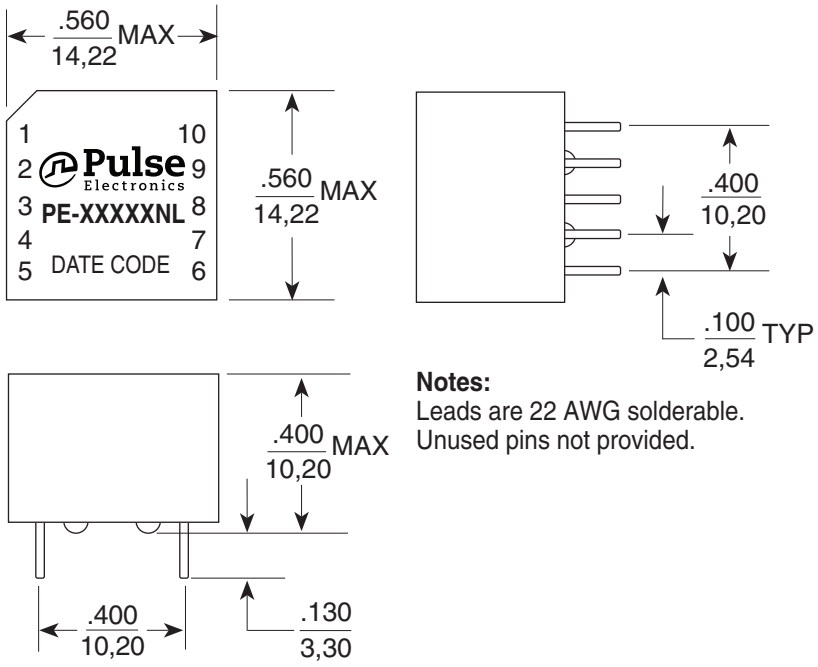
**Electrical Specifications @ 25˚C – Operating Temperature 0˚C to 70˚C (Unless Otherwise Noted)**

| RoHS-6 Compliant Part Number | Turns Ratio[B] (Pri:Sec ±5%) | [B]OCL [C] (mH MIN) | w/w [L] (pF MAX) | L (µH MAX) | DCR Pri (Ω MAX) | DCR Sec (Ω MAX) | Package/ Schematic | Primary Pins |
|---|---|---|---|---|---|---|---|---|
| **PE-65830NL** | 1.27CS:1 | .800 | 15 | 0.70 | 0.50 | 0.35 | IS/3 | 1-5 |
| **PE-65832NL** | 1:1.36CT | 1.20 | 35 | 0.60 | 0.70 | 0.90 | IS/4 | 10-6 |
| **PE-65833NL**[A] | 1CT:2CT | 1.20 | 20 | 0.30-0.55 | 0.50 | 0.90 | IS/1 | 1-5 |
| **PE-65834NL** | 1:1 | 1.20 | 20 | 0.50 | 0.50 | 0.50 | IS/2 | 1-5 |
| **PE-65835NL** | 1CT:2CT | 1.20 | 15 | 0.80 | 0.70 | 1.10 | IS/1 | 1-5 |
| **PE-65838NL** | 1:1.14CT | 1.50 | 30 | 1.00 | 0.70 | 0.90 | IS/4 | 10-6 |
| **PE-65839NL**[E] | 1:1/1.26 | 1.50 | 35 | 0.60 | 0.70 | 1.10 | IS/4 | 10-6 |
| **PE-68646NL**[E] | 1:1.58/2 | 1.50 | 20 | 0.70 | 0.70 | 1.20 | IS/4 | 10-6 |

or table notes.

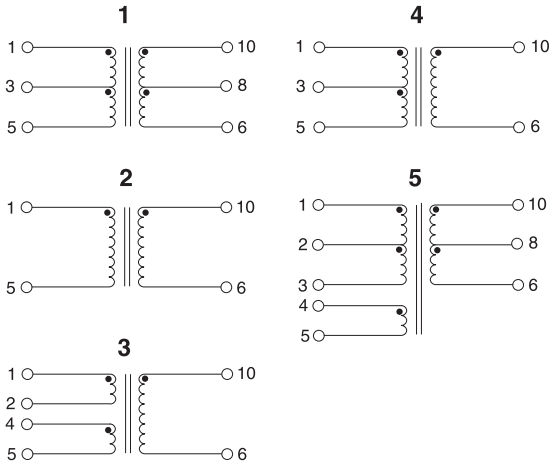
## Mechanical

### IS




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

## Schematics



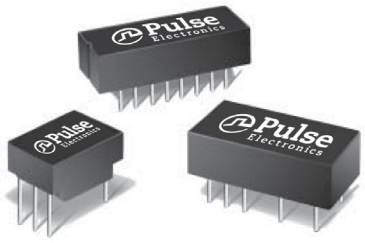

**Dimensions:** Inches / mm  Unless otherwise specified, all tolerances are ± .010 / 0,25

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


USA 858 674 8100  Germany 49 7032 7806 0  Singapore 65 6287 8998  Shanghai 86 21 62787060  China 86 755 33966678  Taiwan 886 3 4356768

# T1/Cept/ISDN-PRI Transformers

*Single Through Hole, 1500Vrms*



- *RoHS peak reflow temperature rating: 245˚C*
- *Extended and standard temperature range*
- *Dual and single through hole models available*
- *Models matched to leading transceiver ICs*
- *UL recognized*
- *Isolation Voltage: 1500 Vrms MIN*

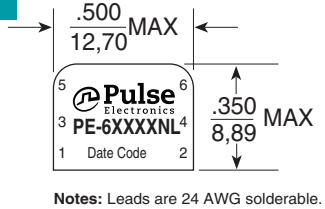
**Electrical Specifications @ 25ºC**

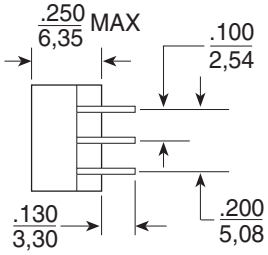
| RoHS-6 Compliant Part Number | Turns Ratio[B] (Pri:Sec ±2%) | OCL @ 25˚C (mH MIN) | $C_{w/w}$ (pF MAX) | $L_L$ (µH MAX) | DCR Pri (Ω MAX) | DCR Sec (Ω MAX) | Package/ Schematic | Primary Pins |
|---|---|---|---|---|---|---|---|---|
| **Standard Temperature Range Single Transformers - Operating Temperature 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-64934NL | 1:1w | 1.20 | 25 | 0.50 | 0.70 | 0.70 | HC/1 | 1-2 |
| PE-64936NL[E] | 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-65351NL | 1:2CT | 1.20 | | 0.50 | 0.70 | 1.30 | HC/3 | 2-6 |
| PE-65363NL | 1:4CT | 0.50 | 40 | 1.00 | 0.70 | 1.50 | 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-68644NL | 1CT:1 | 0.70 | 20 | 0.70 | 0.20 | 0.80 | HC/3 | 1-5 |
| **Extended Temperature Range Single Transformer - Operating Temperature -40˚C to +85˚C** | | | | | | | | |
| 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 |
| TX1252NL | 1CT:1 | 1.20 | 40 | 1.00 | 1.00 | 1.00 | HC/3 | 1-5 |

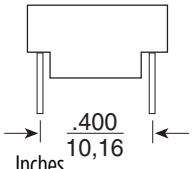
ages 7 and 8 for Table Notes.

## Mechanical

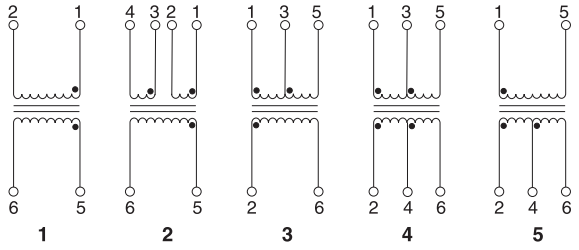
**HC**




## Schematic




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

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

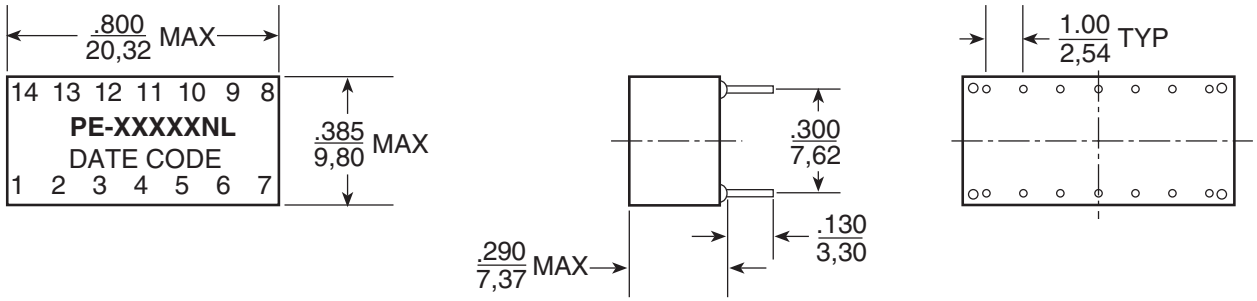
USA 858 674 8100 Germany 49 7032 7806 0 Singapore 65 6287 8998 Shanghai 86 21 62787060 China 86 755 33966678 Taiwan 886 3 4356768

| 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 Single Transformers - Operating Temperature 0°C to +70°C** | | | | | | | | |
| **PE-64952NL** | 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-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 |

See Pages 7 and 8 for Table Notes.

## Mechanicals

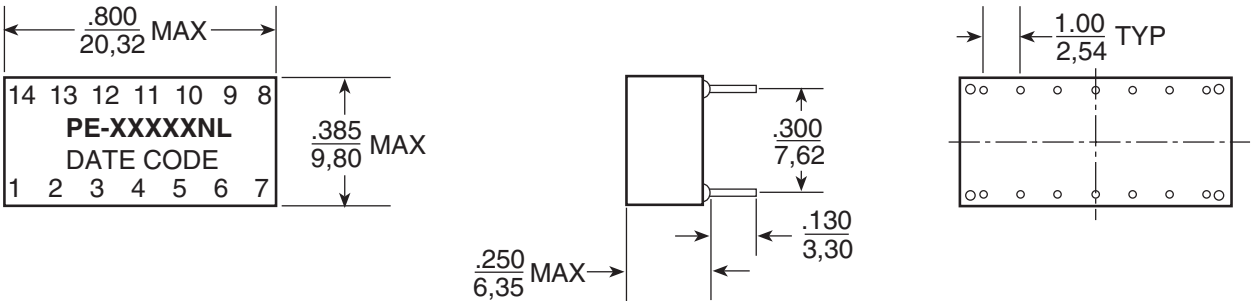
### TD DUAL




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

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

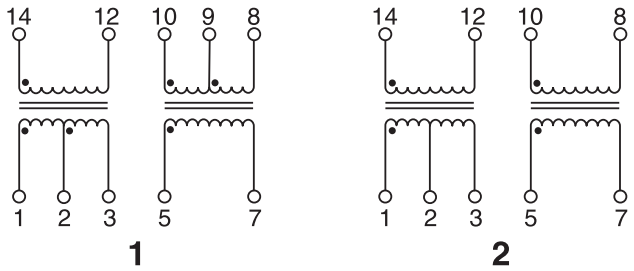
### HD DUAL




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

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

## Schematics



# T1/Cept/ISDN-PRI Transformers

*Transformer Selection Guide*

Pulse Electronics

| 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 k Vrms | |
| | | | TX & RX | TX & RX | TX & RX | TX & RX | TX | RX | TX | RX | TX & RX | TX & RX | TX | RX |
| **Mindspeed** (Conexant) | **BT8510** | T1/E1 | - | - | - | PE-68826NL | PE-65389NL | PE-65351NL | - | PE-65771NL | - | - | PE-65839NL | PE-65835NL |
| | **BT8510** | T1/E1 | - | - | T1021NL | PE-68826NL | PE-65389NL | PE-65351NL | - | PE-65771NL | - | - | PE-65839NL | PE-65835NL |
| | **BT8370/5/6** | Better RL | - | - | - | PE-68822NL | PE-64937NL | PE-64936NL | - | PE-65771NL | PE-64952NL | - | PE-65832NL | PE-65834NL |
| | **BT8370/5/6** | Low Power | - | T1076NL | - | - | PE-65388NL | PE-64936NL | - | PE-65771NL | PE-65565NL | - | 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-65835NL | PE-65835NL |
| | **61318** | 75 E1 | - | - | - | - | - | PE-64936NL | - | PE-65778NL | - | - | PE-68646NL | PE-65835NL |
| | **61577** | T1 & E1 | PE-65861NL | T1090NL | - | PE-68841NL | PE-65351NL | PE-65351NL | - | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **61304A/5A/535A/574A,/75** | T1 | - | T1076NL | - | - | PE-65388NL | PE-65351NL | PE-65770NL | PE-65771NL | PE-65565NL | - | PE-65838NL | PE-65835NL |
| | **61304A/5A/535A/574A,/75** | 75 E1 | - | - | - | PE-68826NL | PE-65389NL | PE-65351NL | - | PE-65771NL | - | - | PE-65839NL | PE-65835NL |
| | **61304A/5A/535A/574A,/75** | 120 E1 | - | - | - | PE-68826NL | PE-65389NL | PE-65351NL | - | PE-65771NL | - | - | PE-65839NL | PE-65835NL |
| | **61582, 61583** | | PE-65870NL | - | PE-68874NL | PE-68874NL | PE-65388NL | PE-65388NL | PE-65770NL | PE-65770NL | - | - | PE-65838NL | PE-65838NL |
| | **61582, 61581** | | PE-68678NL | T1094NL | PE-68877NL | PE-68877NL | PE-65351NL | PE-64936NL | PE-65771NL | PE-68778NL | - | - | PE-65835NL | PE-65835NL |
| | **61582, 61581** | Host | - | - | - | - | PE-65351NL | PE-65351NL | PE-65771NL | PE-68771NL | - | - | PE-65835NL | PE-65835NL |
| | **61881** | | - | T1076NL | - | - | PE-65388NL | PE-65351NL | PE-65770NL | PE-68771NL | - | - | PE-65835NL | PE-65835NL |
| | **61584/84A** | IQ3 | PE-65861NL | T1090NL | - | PE-68841NL | PE-65351NL | PE-65351NL | PE-65771NL | PE-68771NL | - | - | PE-65835NL | PE-65835NL |
| | **61584/82/83/A** | IQ5 | PE-65870NL | - | PE-68874NL | PE-68874NL | PE-65388NL | PE-65388NL | PE-65770NL | PE-68770NL | - | - | PE-65838NL | PE-65838NL |
| **Maxim** (Dallas) | **DS2196** | | PE-68678NL | T1094NL | PE-68877NL | PE-68877NL | PE-65351NL | PE-64936NL | PE-65771NL | PE-65778NL | - | - | PE-65835NL | PE-65838NL |
| | **DS2151/2152/2153/2154** | | - | T1076NL | - | - | PE-65388NL | PE-64936NL | PE-65770NL | PE-65778NL | PE-65565NL | - | PE-65838NL | PE-65834NL |
| | **DS2151/2152/2153/2154** | | - | - | - | PE-68822NL | - | PE-64936NL | - | PE-65778NL | PE-64952NL | - | PE-65832NL | PE-65834NL |
| | **DS2148/Q48** | 3V | PE-68678NL | T1094NL | PE-68877NL | PE-68877NL | PE-65351NL | PE-64936NL | PE-65771NL | PE-65778NL | - | - | PE-65838NL | PE-65838NL |
| | **DS2148/Q48** | 5V | - | - | - | PE-68822NL | - | PE-64936NL | - | PE-65778NL | PE-64952NL | - | PE-65832NL | PE-65834NL |
| | **DS21352/Q352,DS21354/ Q354** | | PE-65878NL | T1094NL | PE-68874NL | PE-68877NL | PE-65351NL | PE-64936NL | PE-65771NL | PE-65778NL | - | - | PE-65838NL | PE-65838NL |
| | **DS21552/Q552, DS21354/ Q554** | | - | T1076NL | - | - | PE-65388NL | PE-64936NL | PE-65770NL | PE-68778NL | PE-65565NL | - | PE-65838NL | PE-65834NL |
| | **DS21552/Qww52, DS1554/ Q554** | | - | - | - | PE-68822NL | - | PE-64936NL | - | PE-68778NL | PE-64952NL | - | PE-65832NL | PE-65834NL |
| **Exar** | **T5683A, 59L91** | | PE-65861NL | T1090NL | - | PE-68841NL | PE-65415NL | PE-65415NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **T5894, T5897, T5997** | | PE-65861NL | T1090NL | PE-65861NL | PE-68841NL | PE-65415NL | PE-65415NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **T5791/T93/94/95** | | - | - | - | PE-68826NL | PE-65389NL | PE-64934NL | - | PE-65778NL | - | - | PE-65839NL | PE-65834NL |
| | **T5894, T5897, T5997** | | - | - | - | PE-68822NL | PE-64937NL | PE-65415NL | - | PE-65771NL | PE-64952NL | - | PE-65832NL | PE-65835NL |
| | **83L30/34/38** | | PE-65861NL | T1090NL | PE-65861NL | PE-68841NL | PE-65415NL | PE-65415NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **82L34/38** | | - | - | - | - | - | - | - | - | - | - | - | - |
| | **T5684, T7288, 82D20** | | - | - | - | PE-68822NL | PE-64937NL | PE-65351NL | - | PE-65771NL | PE-64952NL | - | - | PE-65835NL |
| **Infineon Technologies** | **PEB 2254/55** | E1/T1 & J1 | PE-68786NL | - | - | - | - | - | - | - | - | - | - | - |
| | **PEB 2254/55** | E1/T1 & J1 | T1023NL | - | - | - | - | - | - | - | - | - | - | - |
| **Intel** (Level One) | **LXT 300/301** | | PE-65861NL | T1090NL | - | PE-68841NL | PE-65351NL | PE-65351NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **LXT 304/305/307** | E1, T1 | PE-65861NL | T1090NL | - | PE-68841NL | PE-65351NL | PE-65351NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **LXT 304/305/307** | T1 | - | T1076NL | - | - | PE-65388NL | PE-65351NL | PE-65770NL | PE-65771NL | PE-65565NL | - | PE-65838NL | PE-65835NL |
| | **LXT 304/305/307** | 75E1, 120E1 | - | - | - | PE-68826NL | PE-65389NL | PE-65351NL | - | PE-65771NL | - | - | PE-65839NL | PE-65835NL |
| | **LXT 304/305/307** | DSX-1, D4 | - | - | - | - | - | PE-65351NL | - | - | - | - | - | - |
| | **LXT 310/317/318** | | PE-68678NL | T1094NL | - | - | PE-65351NL | PE-64936NL | PE-65771NL | PE-65778NL | - | - | PE-65835NL | PE-65834NL |
| | **LXT 312/313/315** | | - | - | - | - | - | PE-64936NL | - | PE-65778NL | - | - | - | PE-65834NL |
| | **LXT 331** | T1, E1 | PE-68678NL | T1094NL | PE-68877NL | PE-68877NL | PE-65351NL | PE-65351NL | PE-65771NL | PE-65778NL | - | - | PE-65835NL | PE-65834NL |
| | **LXT 331, LXT 332** | | PE-65861NL | T1090NL | - | PE-68841NL | PE-65351NL | PE-65351NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **LXT 331, LXT 332** | | - | - | - | - | - | PE-65351NL | - | - | - | - | - | - |
| | **LXT 331, LXT 332** | | - | T1076NL | - | - | PE-65388NL | PE-65351NL | PE-65770NL | PE-65771NL | PE-65565NL | - | PE-65838NL | PE-65835NL |
| | **LXT 334, LXT 335** | T1, E1 | PE-65861NL | T1090NL | - | PE-68841NL | PE-65351NL | PE-65351NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **LXT 334, LXT 335** | 120/75 E1 | - | - | - | PE-68822NL | - | PE-65351NL | - | PE-65771NL | PE-64952NL | - | PE-65832NL | PE-65835NL |
| | **LXT 334, LXT 335** | 75 E1 | - | - | - | PE-68826NL | PE-65389NL | PE-65351NL | - | PE-65771NL | - | - | PE-65839NL | PE-65835NL |
| | **LXT 334, LXT 335** | | - | - | - | - | - | PE-64936NL | - | - | - | - | - | - |
| | **LXT 336** | | PE-65861NL | T1090NL | PE-68828NL | PE-68828NL | - | PE-65351NL | - | PE-65778NL | - | - | - | 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-65835NL | PE-65834NL |
| | **LXT 350, LXT 351** | | - | T1076NL | - | - | PE-65388NL | PE-65351NL | PE-65770NL | PE-65771NL | PE-65565NL | - | PE-65838NL | PE-65835NL |
| | **LXT 350, LXT 351** | 120, E1 | - | - | - | - | - | 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-65835NL | PE-65834NL |
| | **LXT 360/361/362/363** | | - | T1076NL | - | - | PE-65388NL | PE-65351NL | PE-65770NL | PE-65771NL | PE-65565NL | - | PE-65838NL | PE-65835NL |
| | **LXT 360, LXT 361** | 120, E1 | - | - | - | - | - | 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-65835NL | PE-65834NL |
| | **LXT 380/381/384/386/388** | T1, E1 | PE-65861NL | T1090NL | - | PE-68841NL | PE-65351NL | PE-65351NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | **LXT 3104, LXT 3108** | | PE-65861NL | T1090NL | - | PE-68841NL | PE-64936NL | PE-4936NL | PE-65778NL | PE-65778NL | - | - | PE-65835NL | PE-65835NL |
| | **LXT 3104, LXT 3108** | | - | - | - | - | - | - | - | - | - | - | - | - |
| **Lucent Technologies** | **T7288, T290A** | CEPT | - | - | - | PE-68822NL | - | PE-65415NL | - | PE-65771NL | PE-64952NL | - | PE-65832NL | PE-65835NL |
| | **T7289A** | DS1 | - | T1076NL | - | - | - | PE-65351NL | PE-65770NL | PE-65771NL | PE-65565NL | - | PE-65838NL | PE-65835NL |
| | **T7688, T7690, T7698** | CEPT | - | - | PE-68884NL | PE-68884NL | - | - | - | - | - | - | PE-65832NL | PE-65832NL |
| | **T7689, T7690, T7698** | DS1 | PE-65870NL | - | PE-68874NL | PE-68874NL | - | - | PE-65770NL | PE-65770NL | - | - | PE-65838NL | PE-65838NL |
| | **T7693, T7697** | CEPT | T1137NL | TX1287NL | - | - | - | - | - | - | - | - | - | - |
| | **TLIU04C1** | DS1 | PE-65870NL | - | PE-68874NL | PE-68874NL | - | - | PE-65770NL | PE-65770NL | - | - | PE-65838NL | PE-65838NL |
| | **TLIU04C1** | CEPT | - | - | PE-68884NL | PE-68884NL | - | - | - | - | - | - | 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-65835NL | PE-65834NL |
| **PMC-Sierra** | **PM4318** | | - | - | - | PE-68822NL | PE-649376NL | PE-65351NL | - | PE-65771NL | PE-64952NL | - | PE-65832NL | PE-65835NL |
| | **PM4351/4354** | | PE-65861NL | T1090NL | - | PE-68841NL | PE-65351NL | PE-65351NL | PE-65771NL | PE-65771NL | - | - | PE-65835NL | PE-65835NL |
| | | COMET | T1137NL | TX1287NL | - | - | - | - | - | - | - | - | - | - |

## Application Notes

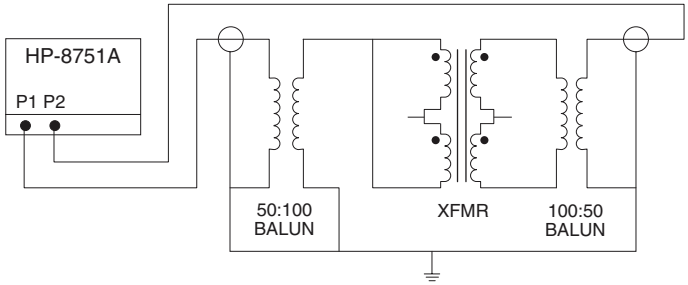
**1. Extended Temperature Range Models** - For extended temperature range transformers (-40˚C to +85˚C operating temperature range), OCL (Open Circuit Inductance for the primary winding) is specified at both -40˚C and +25˚C. At -40˚C, OCL is 600 µH minimum for all low temperature models. All other paratmeters are specified at +25C only. Standard temperature range is 0˚C to +70˚C.

**2. ET Product** - All coils have an ET product of 10 V-µsec minimum.

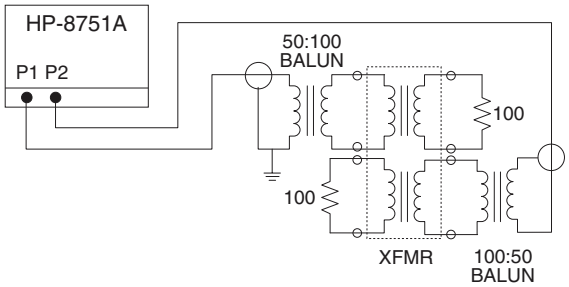
**3. Flammability** - Materials used in the products are recognized as UL94-VO approved. Products meet the requiremens of IEC 695-2-2 (Needle Flame Test).

**4. Balance Characteristics** - The transformers meet the requirements for longitudinal balance of FCC part 68.

**5. Common Moe Rejection Ratio** - The CMRR for all transformers is better than 50 dB at 1 MHz. A typical test circuit is shown below.




**6. Crosstalk Attentuation** - 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 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).

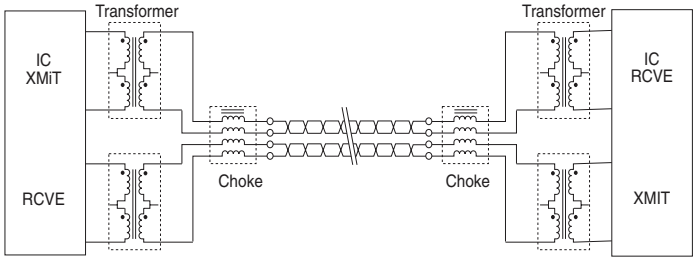
**Transformers with Reinforced Insulation according to IEC950, such as PE-68646NL** (pg. 3) **is certified by the following organizations:**

| Code | Certificate Information |
|---|---|
| T | TUV, EN60 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.** Tolerance 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 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

| Part Number | Turns Ratio 1 | Secondary Pins | Turns Ratio 2 | Secondary Pins |
|---|---|---|---|---|
| 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-68826NL | 1:1 | 2-3 | 1:1.26 | 1 - 3 |
| PE-68836NL | 1:1 | 2-3/5-6 | 1:1.26 | 1 3/4 - 6 |

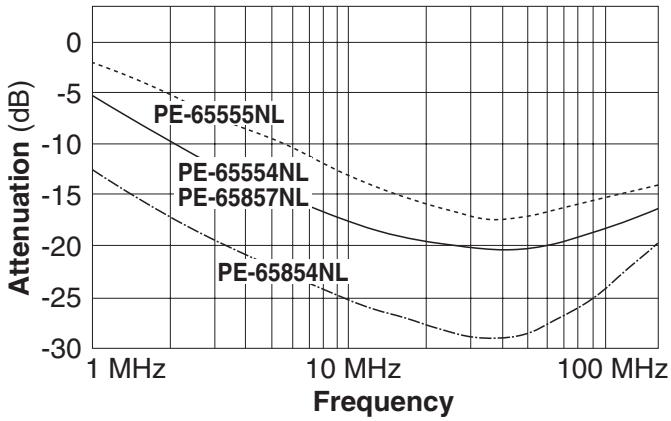
**F.** Standard packaging for surface mount "AN" and "LA" packages is ant-static tubes. Optional Tape & Reel packaging can be ordered by adding "T" suffix to the part number (i.e. PE-68864NLT).

**G.** Safety Agency approvals pending.

**H.** 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 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.

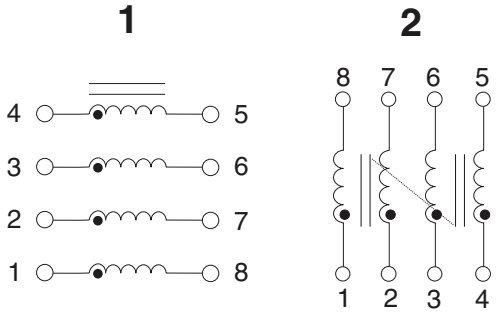
| Electrical Specifications @ 25°C - Operating Temperature 0°C to 70°C | | | |
|---|---|---|---|
| **Pulse Part Number** | **Turns Ratio** (±5%) | **OCL** (µH MIN) | **Package/Schematic** |
| **HIGH FREQUENCY COMMON MODE CHOKES, 4-LINES** | | | |
| PE-65554NL | 1:1:1:1 | 24.0 | IN/1 (ThroughHole) |
| PE-65555NL | 1:1:1:1 | 8.0 | IN/1 (ThroughHole) |
| PE-65854NL | 1:1:1:1 | 47.0 | SH/1 (Surface Mount) |
| PE-65857NL | 1:1:1:1 | 24.0 | LA/2 (Surface Mount) |

**Notes:** 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**

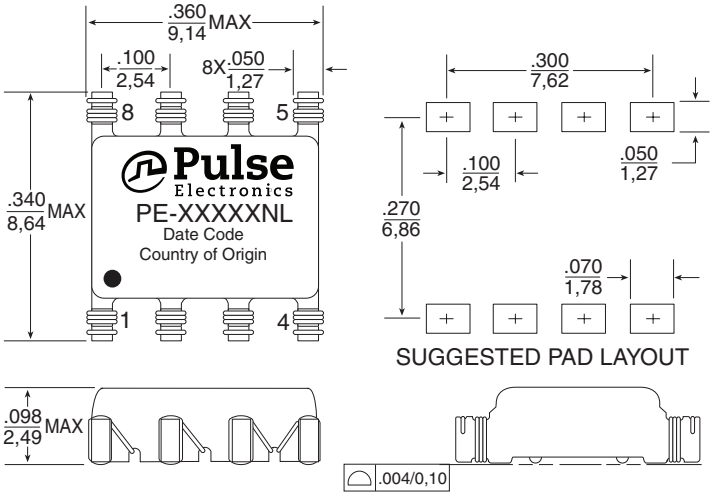


# Common Mode Chokes For Telecom Applications

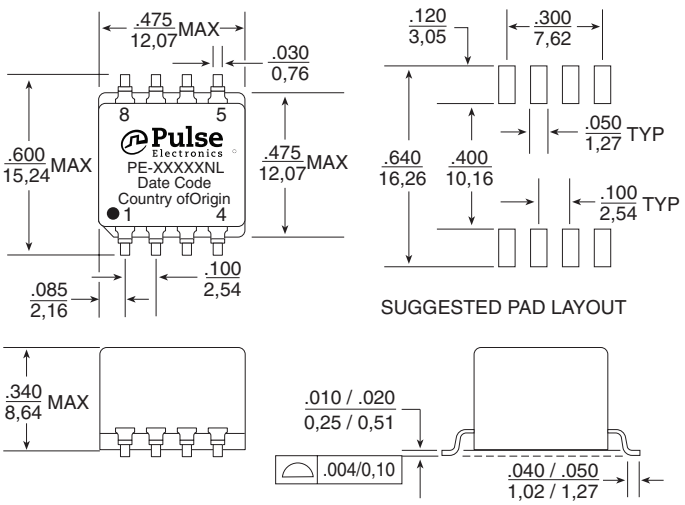
*For EMI Reduction*

## Mechanicals

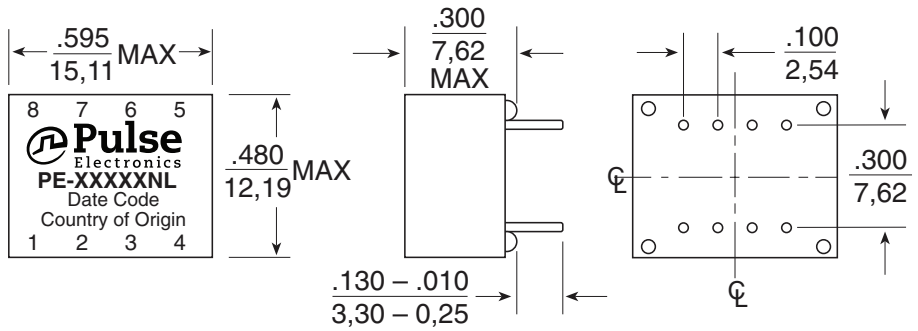
### SH




### 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

## For More Information


**Pulse Worldwide Headquarters**
12220 World Trade Drive
San Diego, CA
92128
U.S.A.

Tel: 858 674 8100
Fax: 858 674 8262

**Pulse Europe**
Einsteinstrasse 1
D-71083 Herrenberg
Germany

Tel: 49 7032 78060
Fax: 49 7032 7806 135

**Pulse China Headquarters**
B402, Shenzhen Academy of Aerospace Technology Bldg.
10th Kejinan Road
High-Tech Zone
Nanshan District
Shenzen, PR China
518057
Tel: 86 755 33966678
Fax: 86 755 33966700

**Pulse North China**
Room 2704/2705
Super Ocean Finance Ctr.
2067 Yan An Road West
Shanghai 200336
China

Tel: 86 21 62787060
Fax: 86 2162786973

**Pulse South Asia**
135 Joo Seng Road
#03-02
PM Industrial Bldg.
Singapore 368363

Tel: 65 6287 8998
Fax: 65 6287 8998

**Pulse North Asia**
3F, No. 198
Zhongyuan Road
Zhongli City
Taoyuan County 320
Taiwan R. O. C.
Tel: 886 3 4356768
Fax: 886 3 4356823 (Pulse)
Fax: 886 3 4356820 (FRE)



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