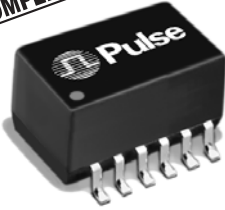


# T1/E1/CEPT/ISDN-PRI INTERFACE MODULES

## Dual Surface Mount Transformer Modules, 1500Vrms, Extended Temperature Range



-  Optimized for enhanced EMC performance
-  Extended temperature range
-  Dual SMT package contains transformers with Common Mode Chokes on both transmit and receive channels
-  Models matched to leading transceiver ICs
-  Patented Interlock Base construction for high reliability
-  UL1950 approved

### Electrical Specifications @ 25°C

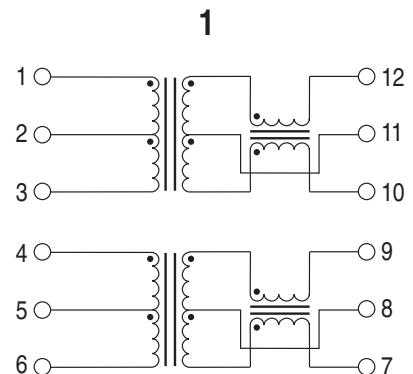
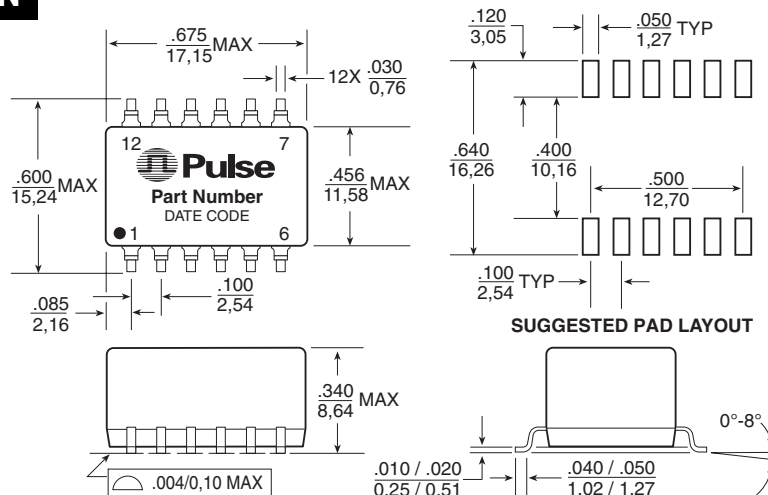
| RoHS-5<br>Compliant<br>Part No.                                                             | RoHS-6<br>Compliant<br>Part No. | Turns Ratio <sup>2</sup><br>(Pri:Sec ± 2%) | Secondary<br>OCL @ 25°C<br>(mH MIN) | L <sub>L</sub><br>(μH MAX) | C <sub>w/w</sub><br>(pF MAX) | DCR Pri<br>(Ω MAX) | Package/<br>Schematic | Primary<br>Pins |
|---------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------|-------------------------------------|----------------------------|------------------------------|--------------------|-----------------------|-----------------|
| <b>EXTENDED TEMPERATURE RANGE MODELS<sup>1</sup> – OPERATING TEMPERATURE -40°C TO +85°C</b> |                                 |                                            |                                     |                            |                              |                    |                       |                 |
| T1207                                                                                       | T1207NL                         | 1CT:2CT & 1CT:2CT                          | 1.20                                | .60                        | 25                           | .60                | AN/1                  | 1-3, 4-6        |
| T1208                                                                                       | T1208NL                         | 1CT:2CT & 1CT:1.36CT                       | 1.20                                | .60                        | 30                           | .70                | AN/1                  | 1-3, 4-6        |
| T1209                                                                                       | T1209NL                         | 1CT:1.15CT & 1CT:2CT                       | 1.20                                | .60                        | 35                           | .80                | AN/1                  | 1-3, 4-6        |
| T1210                                                                                       | T1210NL                         | 1CT:1.26CT & 1CT:2CT                       | 1.20                                | .60                        | 30                           | .80                | AN/1                  | 1-3, 4-6        |
| T1220                                                                                       | T1220NL                         | 1CT:1CT & 1CT:1CT                          | 1.20                                | .60                        | 35                           | .90                | AN/1                  | 1-3, 4-6        |
| T1211                                                                                       | T1211NL                         | 1CT:1.15CT & 1CT:1.15CT                    | 1.20                                | .60                        | 35                           | .80                | AN/1                  | 1-3, 4-6        |
| T1212                                                                                       | T1212NL                         | 1CT:1CT & 1CT:2CT                          | 1.20                                | .60                        | 35                           | .90                | AN/1                  | 1-3, 4-6        |
| T1213                                                                                       | T1213NL                         | 1CT:1.15CT & 1CT:1CT                       | 1.20                                | .60                        | 35                           | .90                | AN/1                  | 1-3, 4-6        |
| T1214                                                                                       | T1214NL                         | 1CT:1.36CT & 1CT:1.36CT                    | 1.20                                | .60                        | 30                           | .80                | AN/1                  | 1-3, 4-6        |
| T1215                                                                                       | T1215NL                         | 1CT:1.41CT & 1CT:1.41CT                    | 1.20                                | .60                        | 30                           | .70                | AN/1                  | 1-3, 4-6        |
| T1216                                                                                       | T1216NL                         | 1CT:2.3CT & 1CT:2CT                        | 1.20                                | .60                        | 25                           | .60                | AN/1                  | 1-3, 4-6        |
| T1217                                                                                       | T1217NL                         | 1CT:2.42CT & 1CT:2.42CT                    | 1.20                                | .60                        | 25                           | .60                | AN/1                  | 1-3, 4-6        |
| T1218                                                                                       | T1218NL                         | 1CT:1CT & 1CT:1.36CT                       | 1.20                                | .60                        | 35                           | .90                | AN/1                  | 1-3, 4-6        |
| T1219                                                                                       | T1219NL                         | 1CT:2.4CT & 1CT:1CT                        | 1.20                                | .60                        | 35                           | .90                | AN/1                  | 1-3, 4-6        |

**NOTE:** Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number (ex: T1207T and T1207NLT).

### Mechanical

### Schematics

**AN**



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

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

Weight ..... .40 grams  
Tape & Reel ..... .250/reel  
Tube ..... .30/tube

# T1/E1/CEPT/ISDN-PRI INTERFACE MODULES

## Dual Surface Mount Transformer Modules, 1500Vrms, Extended Temperature Range



### Notes From Tables

- Extended Temperature Range Models** — For extended temperature range transformers (-40°C to +85°C operating temperature range), OCL (Open Circuit Inductance) is specified at both -40°C and +25°C. At -40°C, OCL is 600  $\mu$ H minimum. All other parameters are specified at +25°C only. Standard temperature range is 0°C to +70°C.
- Turns ratio is specified primary: secondary (CT = Center Tap).
- 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. T1220T).

### Application Notes

- ET Product** — All coils have an ET product of 10V- $\mu$ 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 50dB at 1MHz. A typical test circuit is shown below.
- 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 65dB 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   | 50-100kHz | 100kHz-2MHz | 2-3MHz |
|-------------|-----------|-------------|--------|
| Return Loss |           |             |        |
| XMIT        | 9 dB      | 15dB        | 11dB   |
| RCV         | 12dB      | 18dB        | 14dB   |

- 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: 800V peak, 10/560 $\mu$ sec
  - Longitudinal Voltage: 2,400V peak, 10/700 $\mu$ sec
- 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 1.544Mbps (T1), 2.048Mbps (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.
- Transformer Selection Guide** — Please contact Pulse Application Engineering or see our website for the latest Pulse Transformer Selection Guide.

### For More Information:

#### Pulse Worldwide Headquarters

12220 World Trade Dr.  
San Diego, CA 92128  
U.S.A.

[www.pulseeng.com](http://www.pulseeng.com)

TEL: 858 674 8100

FAX: 858 674 8262

#### Pulse Europe

Einsteinstrasse 1  
D-71083 Herrenberg  
Germany

Tel: 49 7032 7806 116

Fax: 49 7032 7806 135

#### Pulse China Headquarters

No. 1  
Industrial District  
Changan, Dongguan  
China

Tel: 86 769 85538070

Fax: 86 769 85538870

#### Pulse North China

Room 1503  
XinYin Building  
No. 888 YiShan Rd.  
Shanghai 200233  
China

Tel: 86 21 54643211/2

Fax: 86 21 54643210

#### Pulse South Asia

150 Kampong Ampat  
#07-01/02  
KA Centre  
Singapore 368324

Tel: 65 6287 8998

Fax: 65 6280 0080

#### Pulse North Asia

No. 26  
Kao Ching Rd.  
Yang Mei Chen  
Taoyuan Hsien  
Taiwan, R. O. C.

Tel: 886 3 4641811

Fax: 886 3 4641911

Performance warranty of products offered on this data sheet is limited to the parameters specified. Data is subject to change without notice. Other brand and product names mentioned herein may be trademarks or registered trademarks of their respective owners.

© Copyright, 2006. Pulse Engineering, Inc. All rights reserved.

[www.pulseeng.com](http://www.pulseeng.com)

T660.B (6/06)