

# 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 Compliant Part No.                                                                   | RoHS-6 Compliant Part No. | Turns Ratio <sup>2</sup><br>(Pri:Sec ± 2%) | Secondary 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 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 ..... 4.0 grams  
Tape & Reel ..... .250/reel  
Tube ..... .30/tube

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### 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.

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