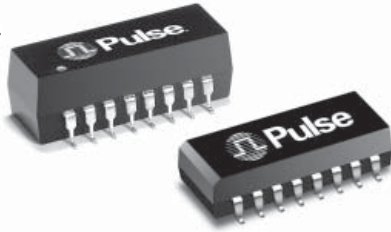


10/100 BASE-T SINGLE PORT TRANSFORMER MODULES

With 1:1 Transmit Turns Ratios



- RoHS peak reflow temperature rating: 245°C
- Compatible with Broadcom, Intel, Micrel, National Semiconductor, ICS, and TDK Transceivers
- Meets IEEE 802.3 specification

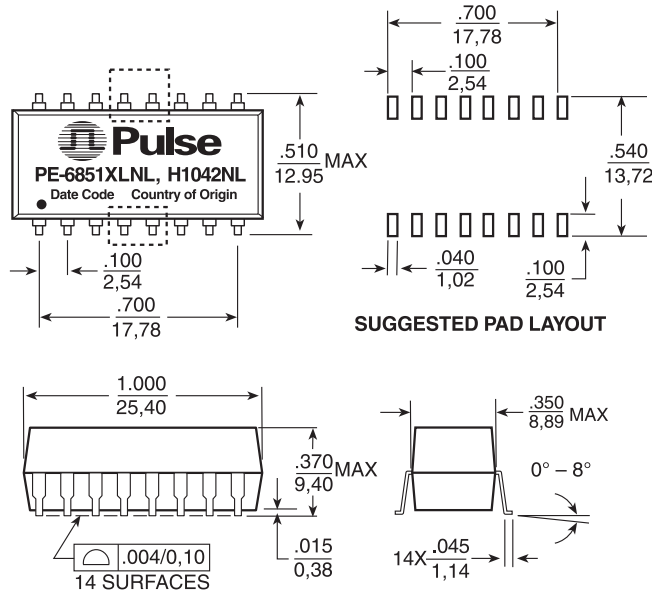
Electrical Specifications @ 25°C — Operating Temperature 0°C to 70°C

| RoHS Compliant Part Number | Insertion Loss (dB MAX) | Return Loss (dB MIN @ 100 Ω) | | | | Differential to Common Mode Rejection (dB MIN) | | | Crosstalk (dB TYP) | | | Hipot (Vrms MIN) |
|----------------------------|-------------------------|------------------------------|----------|--------|--------|--|--------|--------|--------------------|--------|--------|------------------|
| | | 0.1-100 MHz | 1-30 MHz | 40 MHz | 50 MHz | 60-80 MHz | 30 MHz | 60 MHz | 100 MHz | 30 MHz | 60 MHz | |
| H1012NL ^{4d} | -1.0 | -20 | -20 | -18 | -14 | -42 | -36 | -33 | -50 | -40 | -40 | 1500 |
| H1019NL ^{4c} | -1.0 | -20 | -18 | -18 | -14 | -45 | -40 | -35 | -45 | -40 | -35 | 1500 |
| H1042NL ^{4c} | -1.0 | -16 | -13.5 | -11.5 | -10 | -45 | -40 | -35 | -40 | -38 | -35 | 1500 |
| H1086NL ^{4c} | -1.0 | -22 | -20 | -18 | -12 | -45 | -40 | -35 | -50 | -40 | -40 | 1500 |
| H1089NL ^{4c} | -1.0 | -22 | -20 | -18 | -12 | -42 | -38 | -32 | -50 | -40 | -40 | 1500 |
| H1138NL ^{4a} | -0.8 | -18 | -16 | -14 | -12 | -42 | -37 | -33 | -50 | -40 | -40 | 1500 |
| HX1148NL ^{2,4d} | -1.5 | -18 | -13.5 | -11.5 | -10 | -42 | -37 | -33 | -50 | -40 | -40 | 1500 |
| HX1178NL ^{2,4d} | -1.5 | -18 | -13.5 | -11.5 | -10 | -42 | -37 | -33 | -50 | -40 | -40 | 1500 |
| PE-68515LNL ^{4d} | -1.0 | -18 | -18 | -16 | -12 | -50 | -45 | -40 | -55 | -50 | -50 | 1500 |
| PE-68517LNL ^{4d} | -1.0 | -18 | -16 | -15 | -12 | -45 | -40 | -35 | -50 | -40 | -40 | 1500 |
| H1338NL ^{4a} | -1.1 | -18 | -16 | -14 | -12 | -42 | -37 | -35 | -40 | -40 | -35 | 1500 |

1. Rise time optimized for National's DP83843.
2. Operating temperature: -40°+ 85°C.
3. When ordering Tape & Reel packaging, add a "T" suffix to the end of the part number, e.g. H1012NLT
4. MSL = Moisture Sensitivity Level: a = 1, b = 2, c = 3, d = 4.

Mechanical

PE-68515LNL, PE-68517LNL, H1042NL



NOTE: The PE-68515L pins 4 and 13 are removed.
The PE-68517L pins 5 and 12 are removed.

Weight 3.5 grams
Tube 20/tube
Tape & Reel 160/reel

10/100 BASE-T SINGLE PORT TRANSFORMER MODULES

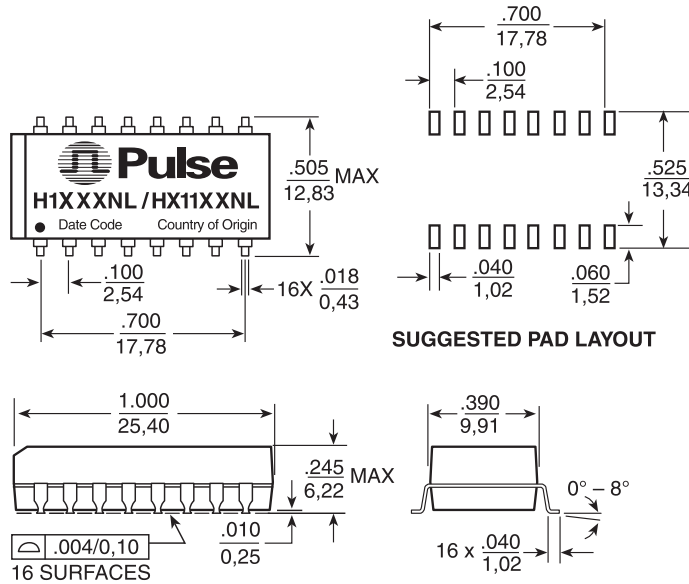
With 1:1 Transmit Turns Ratios



Mechanicals (continued)

H1012NL, H1019NL, H1086NL, H1089NL, H1138NL

HX1148NL, HX1178NL

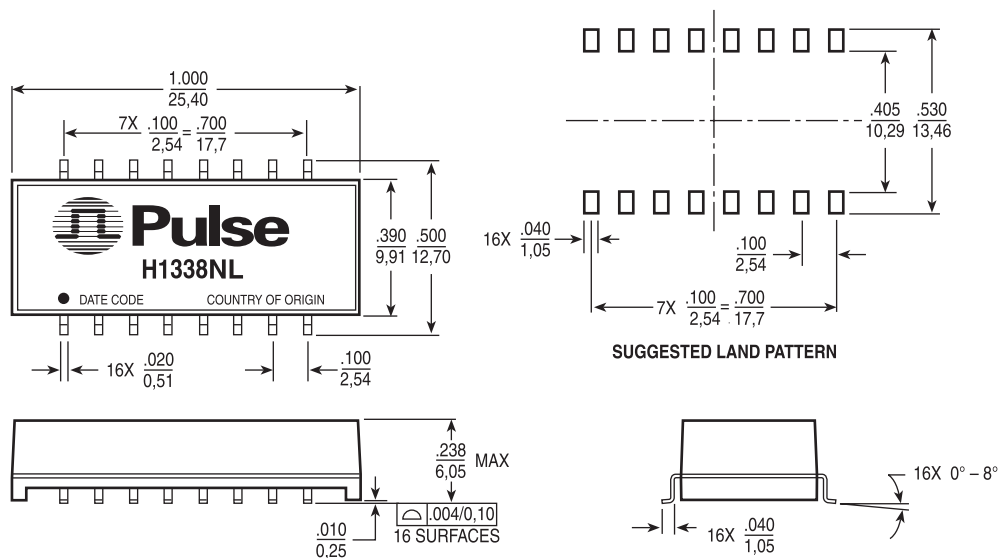


SUGGESTED PAD LAYOUT

Dimensions: $\frac{\text{Inches}}{\text{mm}}$ Unless otherwise specified, all tolerances are $\pm \frac{.010}{0,25}$

Weight 3.0 grams
 Tube 20/tube
 Tape & Reel 300/reel

H1338NL



SUGGESTED LAND PATTERN

Dimensions: $\frac{\text{Inches}}{\text{mm}}$ Unless otherwise specified, all tolerances are $\pm \frac{.010}{0,25}$

Weight 3.0 grams
 Tube 20/tube
 Tape & Reel 300/reel

10/100 BASE-T SINGLE PORT TRANSFORMER MODULES

With 1:1 Transmit Turns Ratios

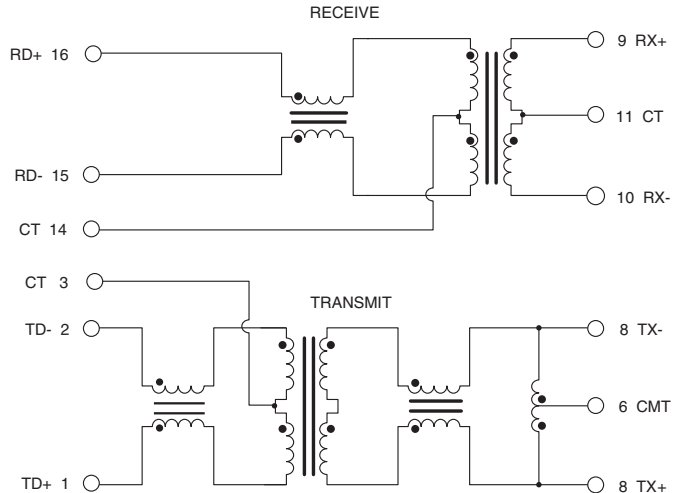
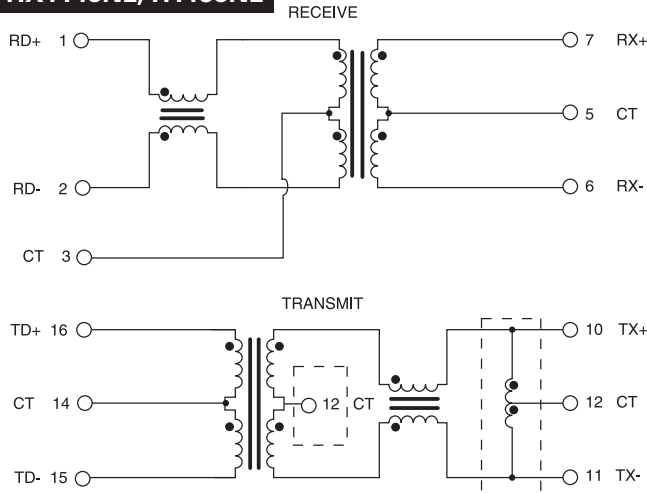


Schematics

PE-68515LNL, H1012NL, H1086NL, H1089NL

PE-68517LNL, H1019NL

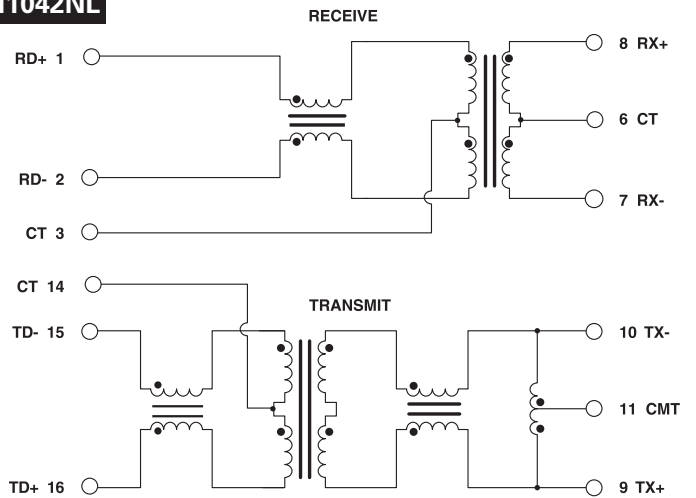
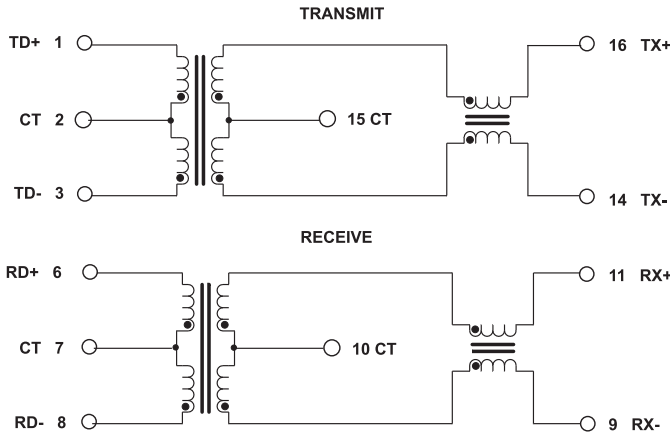
HX1148NL, H1138NL



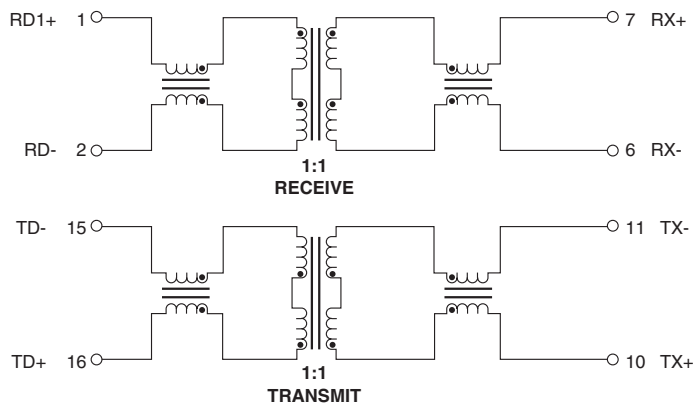
Center-tapped inductor not included in H1089. So, pin 12 connects to the transformer center tap.

HX1178NL

H1042NL



H1338NL



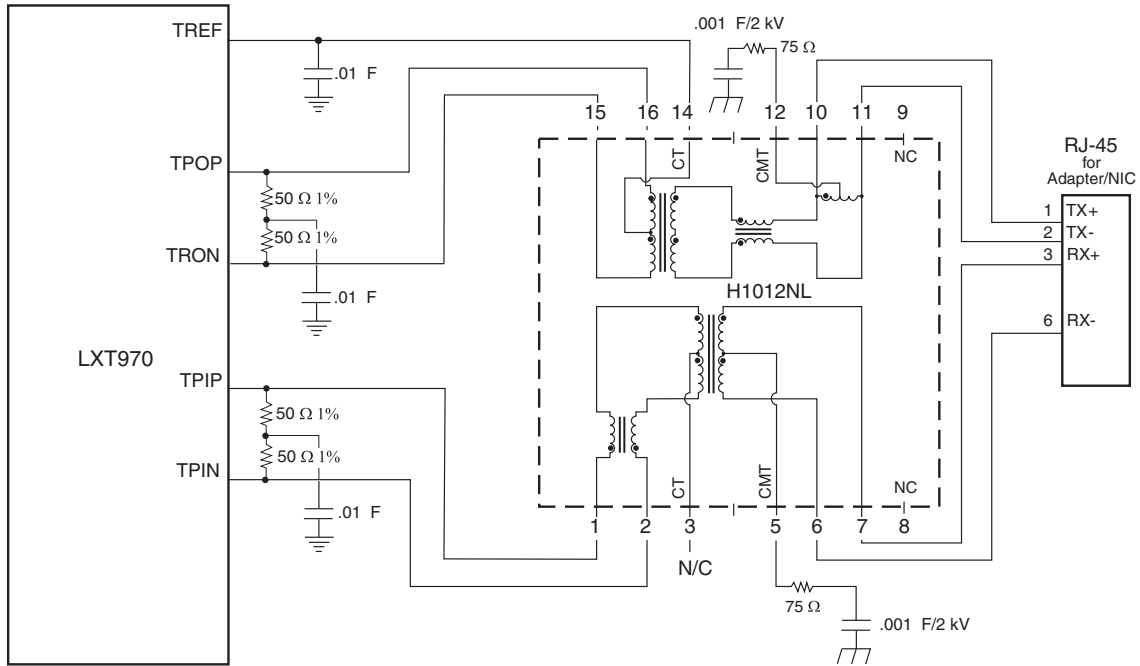
10/100 BASE-T SINGLE PORT TRANSFORMER MODULES

With 1:1 Transmit Turns Ratios

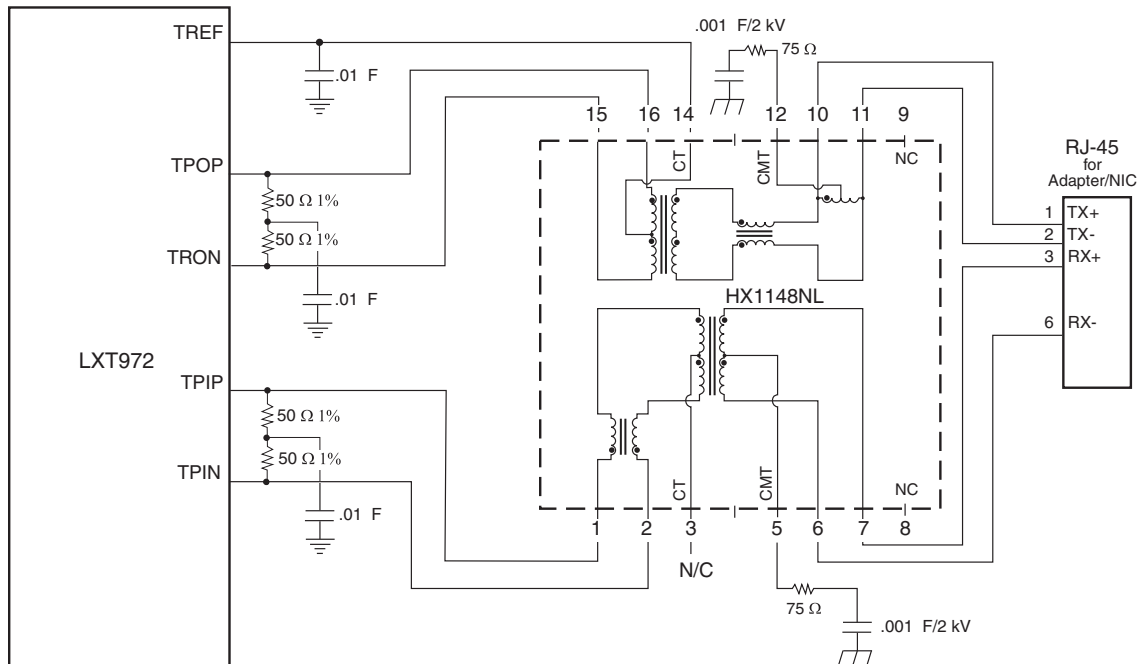


Typical Application Circuits

H1012NL, H1138NL



HX1148NL



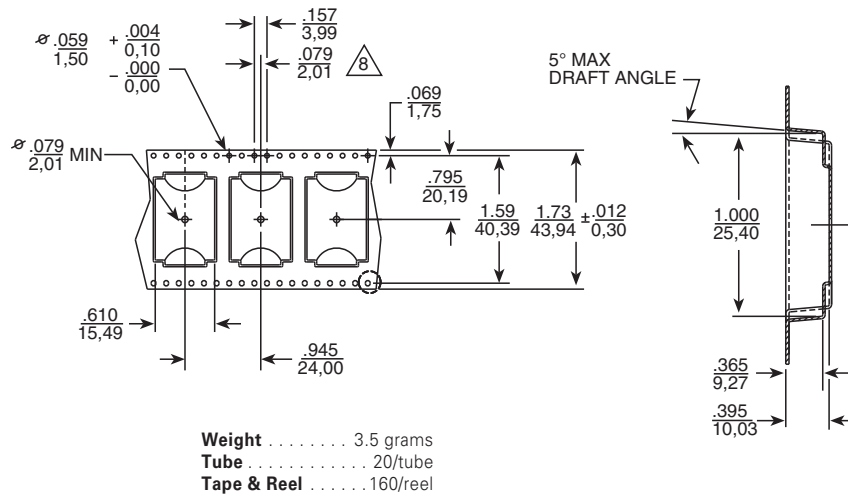
10/100 BASE-T SINGLE PORT TRANSFORMER MODULES

With 1:1 Transmit Turns Ratios



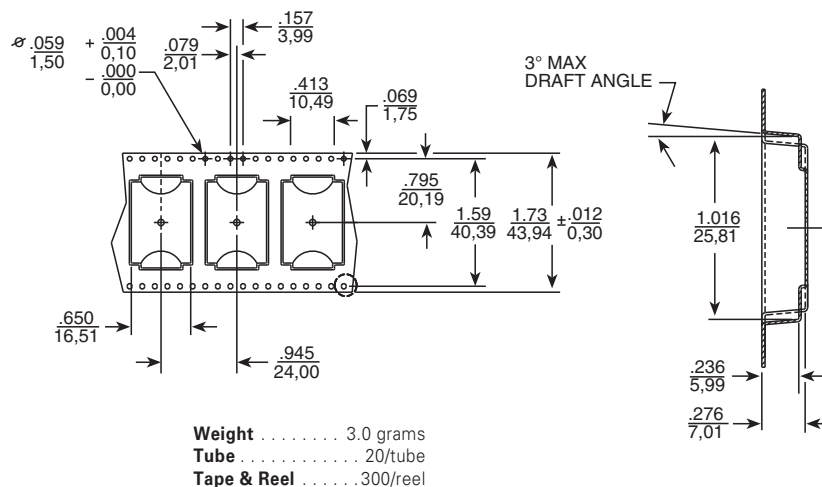
Tape & Reel Specifications

PE-68515LNL, PE-68517LNL, H1042NL



H1012NL, H1019NL, H1086NL, H1089NL, H1138NL,

H1338NL, HX1148NL, HX1178NL



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