

- For RoHS part add suffix NL⁵
- Peak solder temperature rating per Table 5-2 in IPC/ JEDEC J-STD-020C
- Family of parts common foot print and pinout with a choice of filtering for customized EMI performance
- Space-efficient 12 ports across 3.6 inches for optimal PCB layout

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

| Part Number | RoHS | Transformer Turns Ratio (±2%) | Sine Wave Inductance OCL (µH MIN) ¹ | Interwinding Capacitance Cww (pF MAX) ² | Leakage Inductance L _L (µH MIN) ¹ | Return Loss 5-10 MHz (db MIN) | | Common Mode Rejection Transmit (dB MIN) | | | | Hipot (Vrms MIN | |
|-----------------------|---------------------|-------------------------------------|---|---|--|-------------------------------------|-----------------|---|--------|--------|---------|---------------------------|------|
| | | Transmit | | | | 100 Ω | 98 ±13 Ω | 5 MHz | 10 MHz | 50 MHz | 100 MHz | 200 MHz | |
| PE-68051 ³ | not available | 1CT:1CT | 100 | _ | _ | -20 | -15 | -55 | -50 | -35 | -25 | -15 | 1500 |
| PE-68062L | NL ^{6, 7d} | 1CT:1.141CT | 150 | 10 | 0.30 | -20 | -15 | -60 | -50 | -30 | -25 | -20 | 1500 |
| PE-68065L | not available | 1CT:1.141CT | 150 | 10 | 0.30 | -20 | -15 | -60 | -50 | -30 | -20 | -15 | 1500 |
| E5002 ¹ | NL ^{7d} | 1CT:2CT | 180 | 10 | 0.30 | -20 | -15 | -50 | -40 | -30 | -20 | -14 | 1500 |

- 1. OCL are measured at 20mVrms, 100KHz.
- 2. Cww and LL are measured at 20mVrms, 100KHz.
- 3. PE-68051 contains additional low pass filtering.
- For Tape & Reel packaging, add a suffix "T" to the end of the part number when ordering. e.g. E5002T.
- Add suffix NL for RoHS compliant parts, e.g: E5002 changes to E5002NL or E5002NLT (for Tape & Reel).
- 6. Contact Pulse for RoHS compliant part availability.
- 7. MSL=Moisture Sensitivity Level a=1 b=2 c=3 d=4.

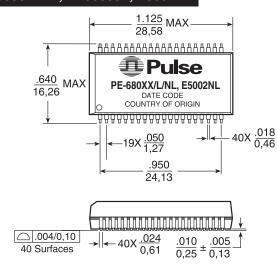
GENERAL SPECIFICATIONS: U.S. Patent No. 5,015,981

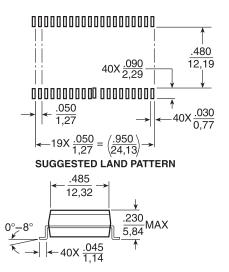
Insertion Loss: Typically -0.5 dB maximum from 1 to 10 MHz PE-68051 typically is -1dB maximum.

Crosstalk: From 1 to 10 MHz is -35 dB minimum.

Mechanical

PE-68051, PE-68062LNL, PE68065L, E5002NL





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

Unless otherwise specified, all tolerances are $\pm \frac{.010}{0.25}$

 Weight
 4.0 grams

 Tube
 15/tube

 Tape & Reel
 250/reel



Application Notes

Pulse's 10BASE-T Quad SMT transformer modules are designed to interface with transceiver chips offered with internal wave shaping and filtering. Pulse developed the modules working closely with IC chip vendors for this "filter-on-chip" application such as: AMD, Crystal, Level One, National Semiconductor and Texas Instruments. The Pulse modules are available with varying turns ratios optimized for available transceiver chips. A cross-reference table listing chip vendor and part number by Pulse part number is illustrated below.

The Pulse modules offer different levels of electrical performance to meet all applications.

The Pulse PE-68065L contains transmit and receive isolation transformers to maintain signal integrity, suppress common mode noise, and supply equipment isolation per the IEEE 802.3 standard.

The Pulse PE-68062LNL and E5002NL provide transmit and receive isolation transformers as well as the high impedance common mode chokes. The common mode chokes are incorporated for added EMI suppression and are often necessary for FCC and CISPR 22 Class B certification.

The Pulse PE-68051 also provides transmit and receive transformers, transmit chokes and includes a low pass filter on each transmit path. This added transmit filtering when combined with the internal filtering of the IC improves the attenuation for designers striving to achieve compliance with the IEEE 802.3 standard.

In typical multiport applications, many channels are in close proximity. User compliance with FCC/CISPR 22 Class B requirements can be achieved

by applying rigorous design guidelines to suppress noise mechanisms. Attention to high-frequency signal paths, good PCB grounding techniques, and component placement are critical. Refer to the suggested layout on page 8.

All eight modules are encapsulated in a 40-pin surface mountable package. Mechanical features include:

- 1. Lightweight approximately 4 grams for rapid pick-and-place.
- 2. Compliant leads provide excellent solder joint reliability.
- **3. Low profile** under 6 mm to accommodate industry standard pick and place equipment capabilities.
- **4. Compact form factor** footprint allows the user to lay out four ports within the space of two double-stacked RJ-45 connectors or a total of 12 ports to a high density 50-pin connector.

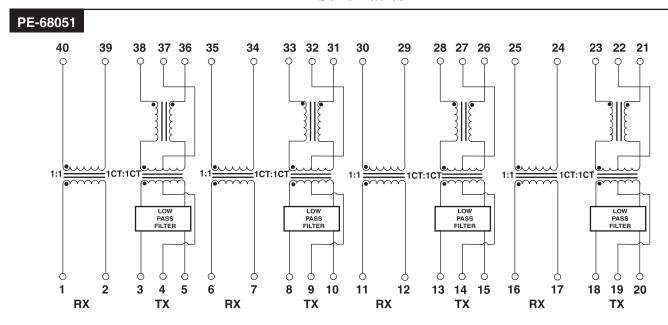
Modules are packaged in tubes unless Tape & Reel is specified. Please add the suffix "T" such as PE-68049LT for Tape & Reel packaging, in increments of 250 pieces.

Pulse also offers a full line of 10Base-T filter modules, designed to IEEE specifications. We provide other pin-out configurations within this package. For more information, please contact one of the locations listed on the back page of this data sheet or check the Product Finder on the Pulse Web site at http://www.pulseeng.com.

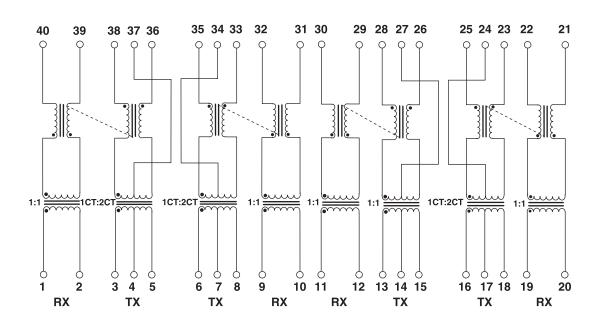
| IC Manufacturers | | | | | | | | | | |
|----------------------|---|--------------------------------------|--|---|------------------------------------|--|--|--|--|--|
| Pulse Part Number | AMD's QuIET™ QuEST™ eIMR™, eIMR+™ | Crystal Semiconductor's CS8904 | Level One's LXT901/944 and LXT 914 | National Semiconductor's DP 83953 | Texas Instrument's TNETE2004 | | | | | |
| PE-68051 | Yes | _ | _ | _ | _ | | | | | |
| PE-68062LNL | _ | Yes | Yes | _ | Yes | | | | | |
| PE-68065L | _ | Yes | Yes | _ | Yes | | | | | |
| E5002NL | _ | _ | _ | Yes | _ | | | | | |



Schematics



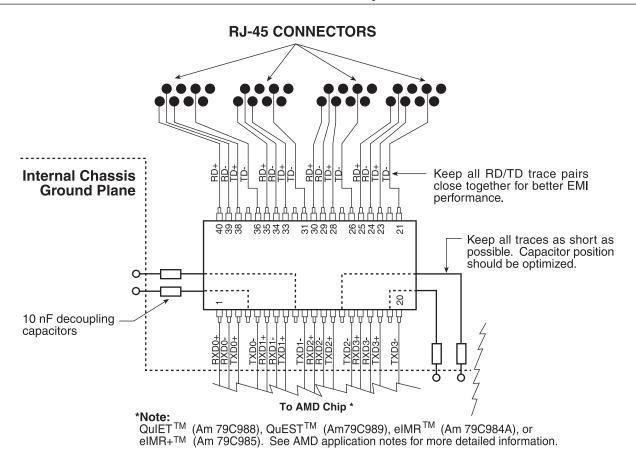
E5002NL



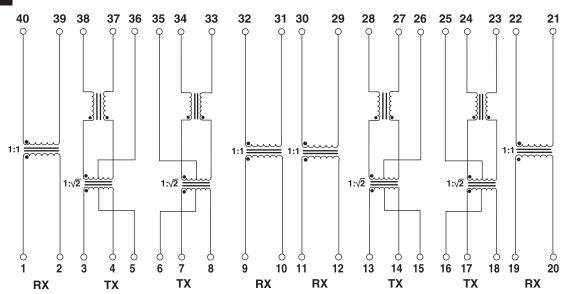


For AMD's QuIET™, QuEST™, elMR™, and elMR+™ Device Chipsets

Recommended Layout



PE-68062LNL



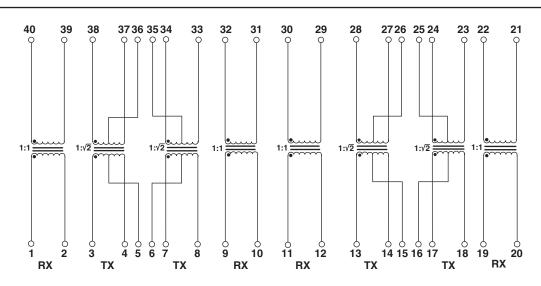
USA 858 674 8100 • Germany 49 7032 7806 0 • Singapore 65 6287 8998 • Shanghai 86 21 32181071 • China 86 755 33966678 • Taiwan 886 3 4643715



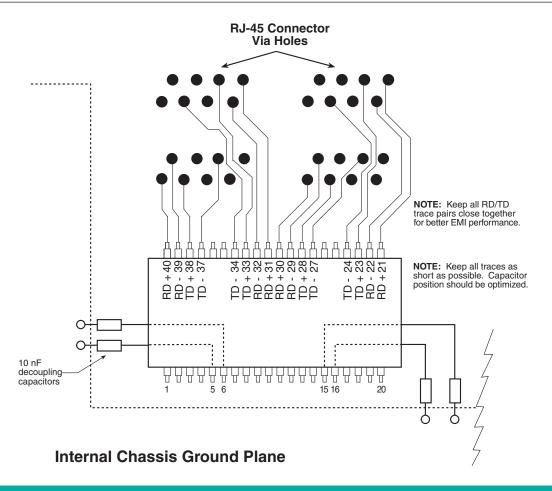
Designed for Level One, Texas Instruments, and Crystal Multiport ICs

Schematics

PE-68065L



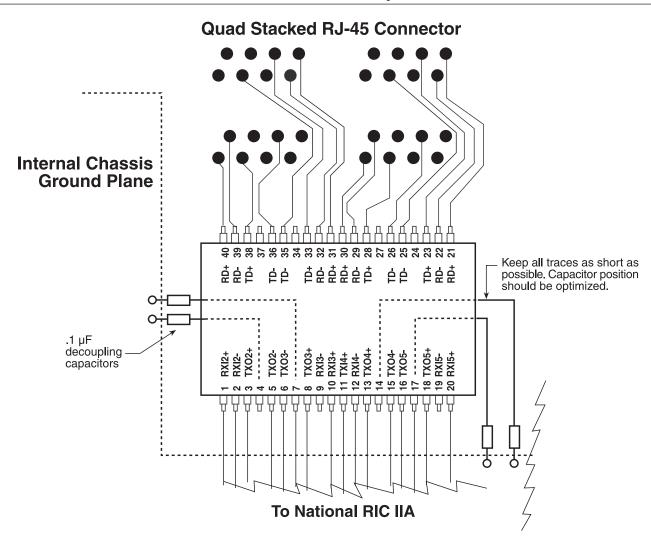
Recommended Layout for Multi-port Hubs with Double-stacked RJ-45s





For Use with National Semiconductor's **RIC IIA™**

Recommended Layout



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