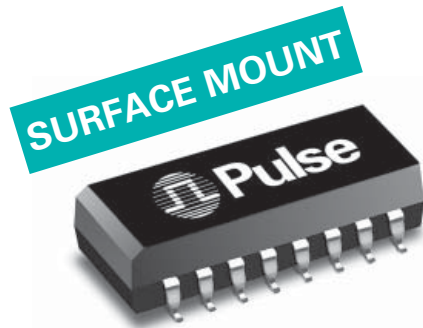






# SURFACE MOUNT 10BASE-T INTERFACE MODULES

Fully Integrated for Adapter, Hub, and Motherboard Applications



-  Available in enhanced or standard design versions
-  Low profile surface mount package
-  E2000 series part numbers designed for AMD, DEC, LSI, Motorola, and National transceivers
-  RoHS peak reflow temperature rating 245°C

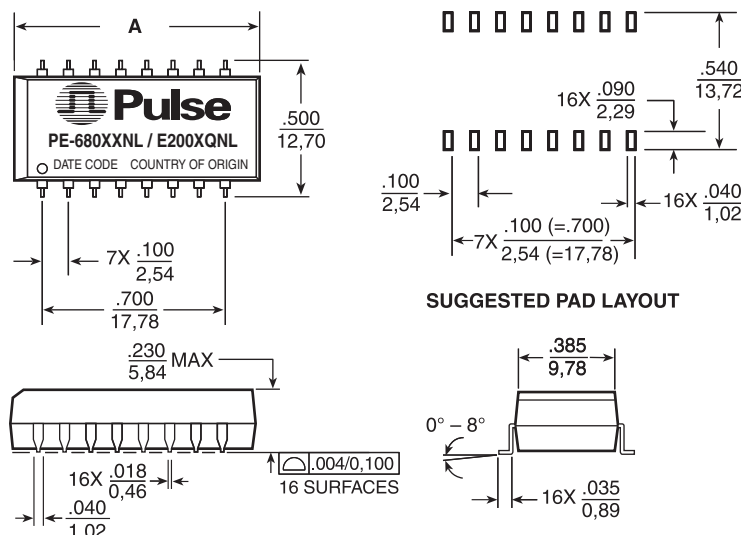
## Electrical Specifications @25°C / Operating Temperature 0°C to +70°C

RoHS Compliant Part Number	Insertion Loss to 10 MHz (dB MAX)	Attenuation (TX) (dB MIN)			Return Loss 5 MHz to 10 MHz (dB MIN)		Crosstalk (db MIN)	Common Mode Rejection (TX) (dB MIN)					Hipot (Vrms MIN)
		30 MHz	40 MHz	100 MHz	100 Ω	98 ±13 Ω		5-10 MHz	5 MHz	10 MHz	50 MHz	100 MHz	
PE-68025QNL*	-6.0	-35	-35	-35	-18	-15	-35	-60	-60	-55	-50	-45	1500
PE-68026NL*	-1.0	-30	-35	-35	-18	-15	-35	-60	-60	-55	-50	-45	1500
PE-68027QNL*	-6.5	-35	-35	-35	-18	-15	-35	-60	-60	-55	-50	-45	1500
PE-68056NL	-1.0	-30	-27	-27	-18	-15	-30	-40	-30	-50	-45	—	1500
E2001QNL	-5.5	-30	-30	-35	-18	-15	-30	-35	-30	-55	-50	—	1500
E2003QNL	-6.0	-30	-27	-27	-18	-15	-35	-40	-35	-45	-30	—	1500
E2007QNL	-5.0	-30	-35	-40	-18	-15	-25	-35	-30	-55	-50	—	1500
E2009QNL	-1.0	-30	-27	-27	-18	-15	-35	-40	-35	-45	-45	—	1500

**NOTE:** Part numbers indicated with an asterisk (\*) are enhanced performance parts. All transmit turns ratios are 1:1, except the E2009 which is 1: 1.414. For the PE-680XXNL part series, the receive and transmit sides meet IEEE 802.3i 1993 specifications, while transmit side is enhanced for FCC/VDE Class B system emissions requirement. Specifications reflect filter sections. Additional attenuation is due to predistortion resistors.

## Mechanical

### PE-680XXNL, E200XQNL



Part Number	Dimension A
E200XQNL	1.00/25,40
PE-680XX/Q/NL	.920/23,37

Weight ..... 2.5 grams  
 Tube ..... .20/tube  
**Tape & Reel**  
 PE-680XX ..... 250/reel  
 E200X ..... 300/reel

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

# SURFACE MOUNT 10BASE-T INTERFACE MODULES



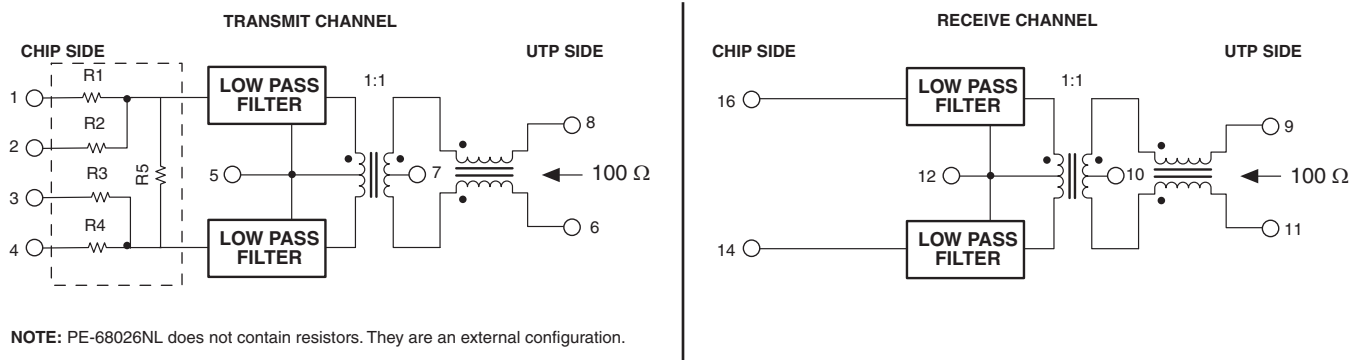
Fully Integrated for Adapter, Hub, and Motherboard Applications

## Resistor Values ( $\Omega$ )

Part Number	IC Manufacturer	R1	R2	R3	R4	R5	R6	R7
PE-68025QNL	AMD	TXD (+) = 61.9	TXP (+) = 422	TXD (-) = 61.9	TXP (-) = 422	1.2k	RX (+) = 49.9	RX (-) = 49.9
PE-68026NL	Various	—	—	—	—	—	—	—
PE-68027QNL	National	TXOD (+) = 274	TXO (+) = 66.5	TXO (-) = 66.5	TXOD (+) = 274	806	RX (+) = 49.9	RX (-) = 49.9

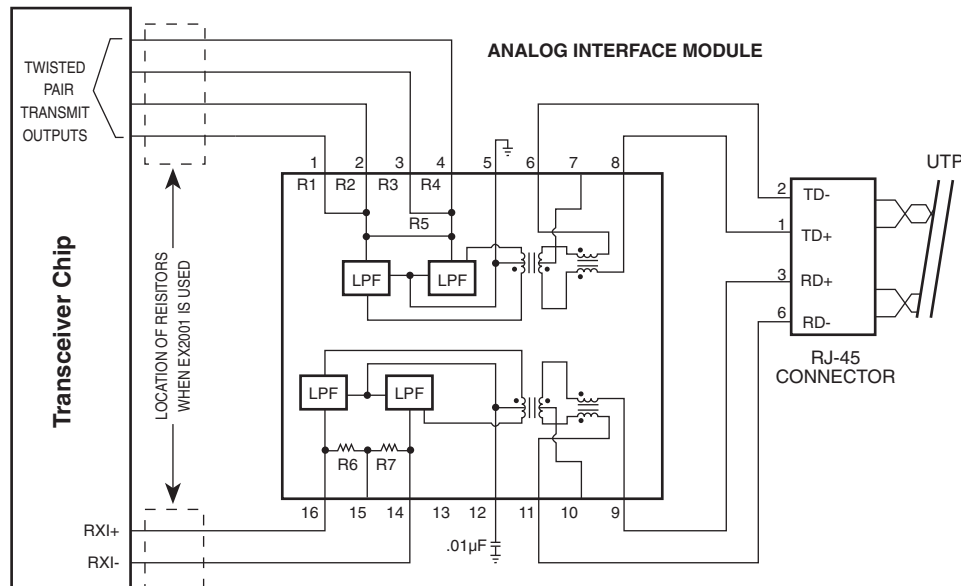
## Schematic

### PE-68025QNL, PE-68026NL, PE-68027QNL



## Typical Application Circuit

### PE-68025QNL, PE-68026NL, PE-68027QNL



# SURFACE MOUNT 10BASE-T INTERFACE MODULES



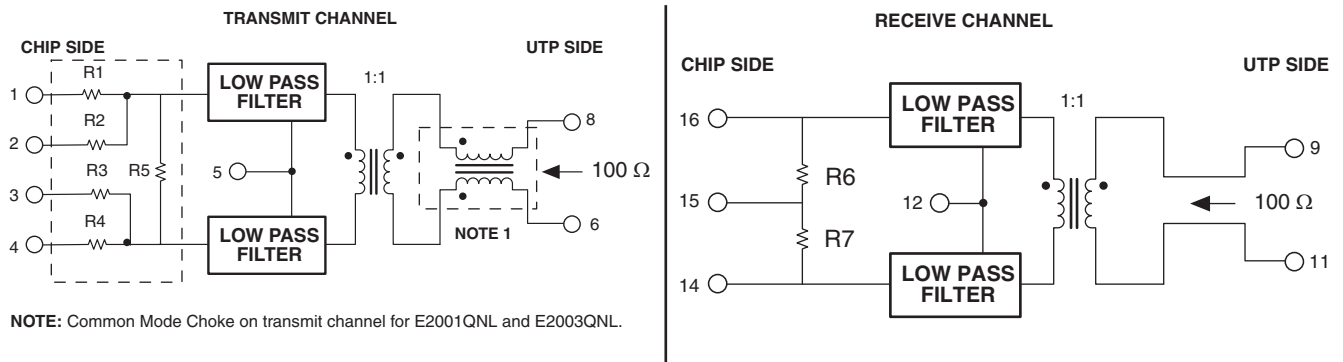
Fully Integrated for Adapter, Hub, and  
Motherboard Applications

## Resistor Values ( $\Omega$ )

Part Number	IC Manufacturer	R1	R2	R3	R4	R5	R6	R7
E2001QNL	National	348.0	53.6	53.6	348.0	806	49.9	49.9
E2003QNL	AMD	61.9	422.0	61.9	422.0	1,210	49.9	49.9
E2007QNL	Motorola	39.0	—	39	—	—	49.9	49.9

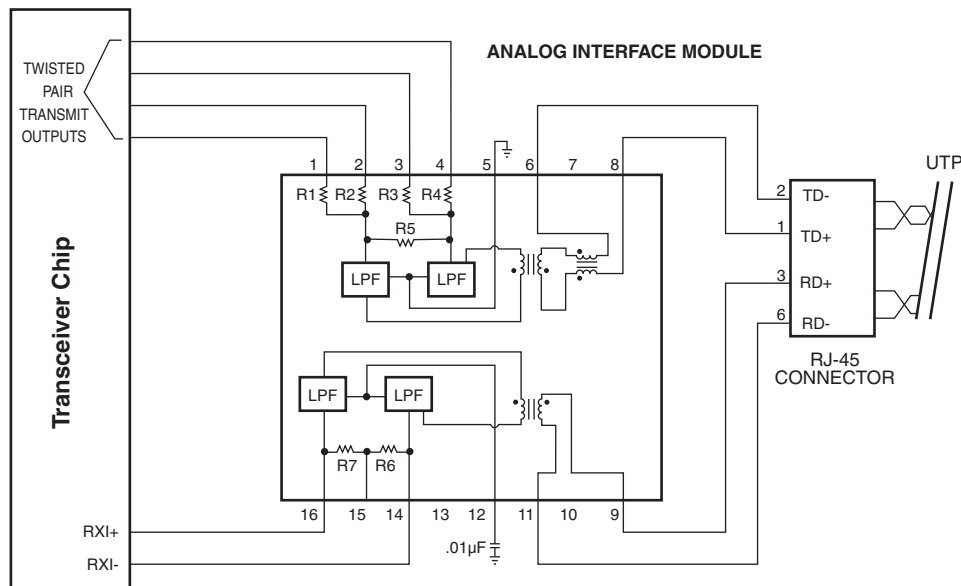
## Schematic

### E2001QNL, E2003QNL, E2007QNL



## Typical Application Circuit

### E2001QNL, E2003QNL, E2007QNL



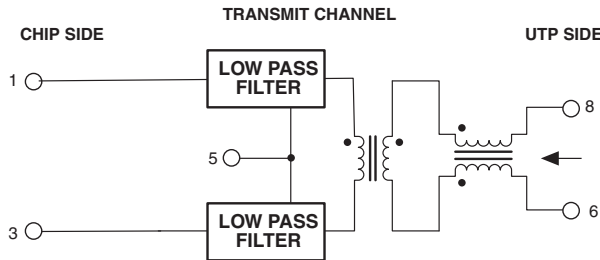
# SURFACE MOUNT 10BASE-T INTERFACE MODULES

## Fully Integrated for Adapter, Hub, and Motherboard Applications

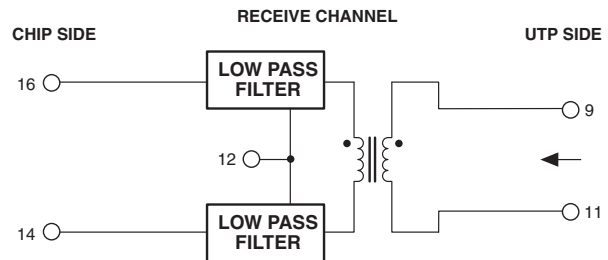


### Schematic

#### E2009QNL, PE-68056NL



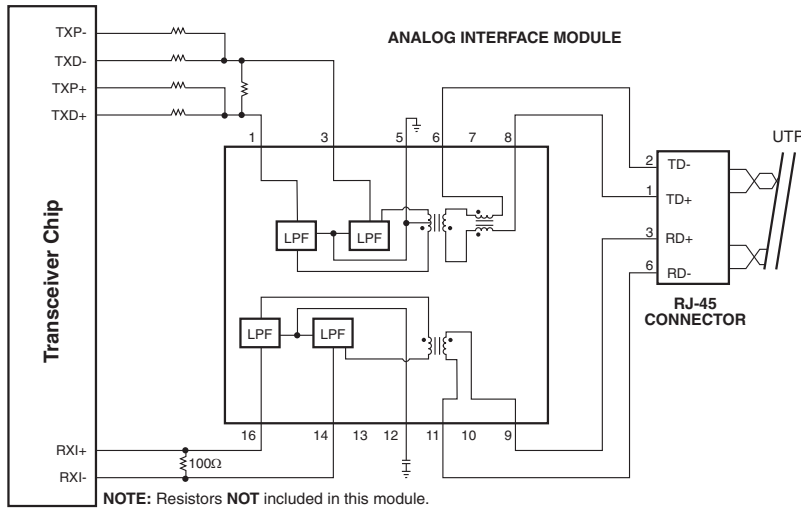
Turns Ratio for Transmit: PE-68056NL is 1:1; E2009QNL is 1:1.414.



**NOTE:** The PE-68056NL is designed for use with most transceivers requiring a turns ratio of 1:1 on transmit. The E2009QNL is designed for use with DEC and most other transceivers requiring a turns ratio of 1:1.414 on transmit.

### Typical Applications Circuit

#### E2009QNL, PE-68056NL



**NOTE:** Resistors NOT included in this module.

### Application Notes

Each module in this application contains low pass filters, isolation transformers, and common mode chokes. These components provide impedance matching, equipment isolation, and EMI suppression to comply with IEEE 802.3 requirements. The E2001QNL, E2003QNL, E2007QNL, PE-68025QNL and PE-68027QNL also provide the necessary data and pre-emphasis resistors recommended by most transceiver manufacturers.

User compliance with FCC/CSPR Class B requirements can be achieved by applying rigorous design guidelines to suppress noise mechanisms. Attention to high frequency signal paths, proper PCB grounding techniques, and component placement are critical. Pins 5 and 12, when grounded, provide noise return paths. For PE-68025QNL, PE-68026NL, and PE-68027QNL, one of these pins (typically pin 12) must be decoupled with a bypass capacitor. The E2001QNL, E2003QNL, E2007QNL, E2009QNL, and PE-68056NL do not require the bypass capacitor, and pins 5 and 12 may be connected directly to ground.

Recommended module orientation with respect to the RJ-45 connector is illustrated in each application circuit. Output pins 6 through 11 should be routed with short, matched traces to the connector for optimum EMI performance.

Surface mount devices manufactured by Pulse are designed to meet all published specifications after exposure to surface mount soldering temperatures. The products in this data sheet are transfer molded or open header in IC-style packaging, making them robust enough to withstand convection and infrared reflow solder temperatures up to 245°C. In addition, compliant leads provide excellent solder-joint reliability with a coplanarity of ±.002" (0,05mm).

For Tape & Reel orders, please add the suffix "T" to the end of the part number (i.e. PE-68025QNLT).

### For More Information:

#### Pulse Worldwide Headquarters

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

#### Pulse Europe

Einsteinstrasse 1  
D-71083 Herrenberg  
Germany

#### Pulse China Headquarters

B402, Shenzhen Academy of  
Aerospace Technology Bldg.  
10th Kejinan Rd.  
High-Tech Zone  
Nanshan District  
Shenzhen, PR China 518057

#### Pulse North China

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

#### Pulse South Asia

135 Joo Seng Rd.  
#03-02  
PM Industrial Bldg.  
Singapore 368363

#### Pulse North Asia

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

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

Tel: 858 674 8100

Fax: 858 674 8262

Tel: 49 7032 7806 0

Fax: 49 7032 7806 135

TEL: 86 755 33966678

FAX: 86 755 33966700

Tel: 86 21 54643211/2

Fax: 86 21 54643210

TEL: 65 6287 8998

FAX: 65 6280 0080

Tel: 886 3 4643715

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, 2009. Pulse Engineering, Inc. All rights reserved.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.