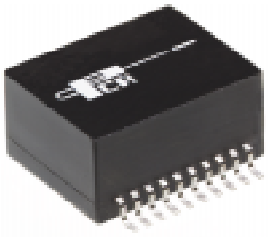
Miniature 10 Base-T Multiport Module with Enhanced Common Mode Attenuation

EPE6250S



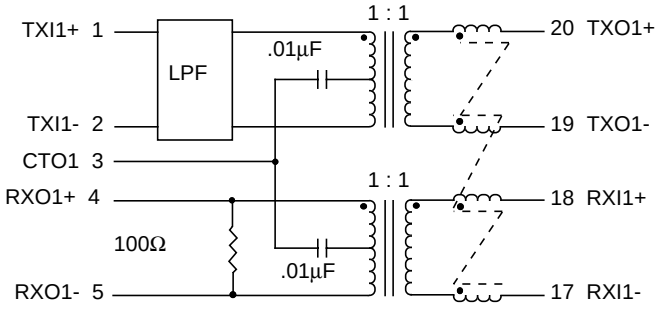
- Optimized for AMD 79C984 Integrated Multiport Repeater
- Robust Construction allows for toughest Reflow Processing
- Complies with or exceeds IEEE 802.3, 10 Base-T Requirements

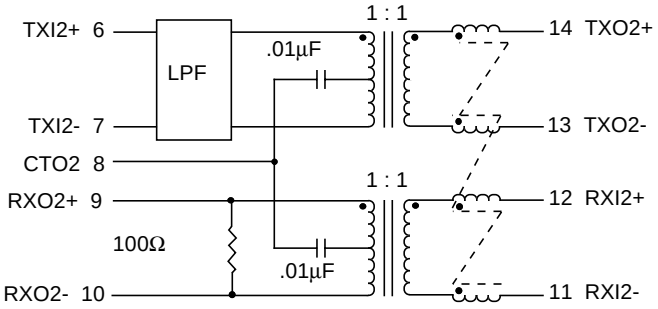
Electrical Parameters @ 25° C

Cut-off Frequency (MHz)		Insertion Loss (dB Max.)		Return Loss (dB Min.)		Attenuation (dB Min.)						Common Mode Rejection (dB Min.)						Crosstalk (dB Min.)	
±1.5 MHz		1-10 MHz		5-10 MHz		@ 25 MHz		@ 30 MHz		@ 40 MHz		@ 50 MHz		@ 100 MHz		@ 200 MHz		@ 1-10 MHz	
Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv
22.5	---	-1	-1	-15	-25	-3	-1	-5	-1	-10	-1	-40	-35	-35	-25	-35	-20	-30	-30

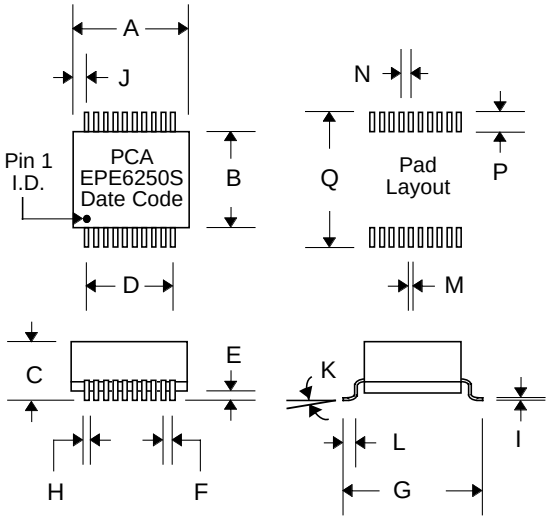
- **Isolation** : meets or exceeds 802.3 IEEE Requirements • **Characteristic Filter Impedance** : 100 Ω •

Schematic





Package



Dimensions

Dim.	(Inches) Min.	Max.	Nom.	(Millimeters) Min.	Max.	Nom.
A	.590	.610		25.15	25.4	
B	.490	.510		6.60	7.11	
C	.310	.330		7.87	8.38	
D	.450	Typ.		17.78	Typ.	
E	.003	.020		0.076	.508	
F	.050	Typ.		2.54	Typ.	
G	.630	.650		10.16	10.67	
H	.015	.021		.381	.533	
I	.008	.012		.203	.305	
J	.050	Typ.		1.27	Typ.	
K	0°	.060		0°	8°	
L	.050	Typ.		1.27	Typ.	
M			.030			.762
N			.050			1.27
P			.090			2.29
Q			.680			17.27

PCA ELECTRONICS, INC.
16799 SCHOENBORN ST.
NORTH HILLS, CA 91343

TEL: (818) 892-0761
FAX: (818) 894-5791
http://www.pca.com

Miniature 10 Base-T Multiport Module with Enhanced Common Mode Attenuation

EPE6250S

The circuit below is a guideline for interconnecting PCA's EPE6250S with AMD IMR 10 Base-T PHY repeater chip over UTP cable. Further details of system design, such as chip pin-out, etc. can be obtained from the specific chip manufacturer.

Typical insertion loss of the isolation transformer/filter is 0.7dB. This parameter covers the entire spectrum of the encoded signals in 10 Base-T protocols. However, the predistortion resistor network introduces some loss which has to be taken into account in determining how well your design meets the Standard Template requirements. Additionally, the following need to be considered while selecting resistor values :

a. The filter needs 100Ω termination, thus the Thevenin's equivalent resistance seen by the filter looking into the transmit outputs from the chip must be equal to a value close to 100Ω. The typical driver output impedance is 5Ω. Thus choose the driving resistor values that provide effective 100Ω termination to the filters in the transmit channels.
   Following these guidelines will guarantee that the return loss specifications are satisfied at all extremes of cable impedance (i.e. 85Ω to 115Ω) while the module is installed in your system.
b. That the template requirements are satisfied under the worst case Vcc (i.e. 4.5V), will impose a further constraint on resistor selection, in that they ought to be the minimum derived from the calculations.

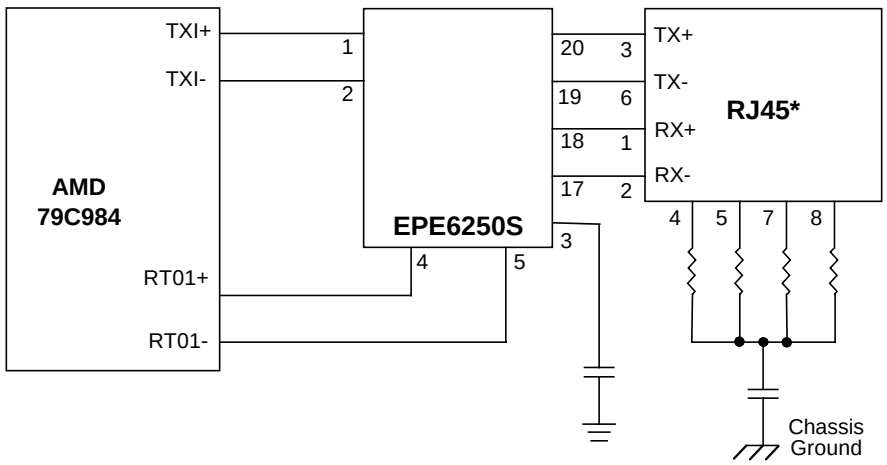
Note that the receiver channels are properly terminated with 100Ω inside. System designers thus, need to provide transmit side terminations following the above suggestions. Also, please note that some systems have auto polarity detection and some do not. If not, be certain to follow the proper polarity.

It is recommended that system designers ground the chip side center taps at pins 3 and 8; the decoupling capacitors are integrated in the module and optimally chosen for best common mode decoupling to the system side ground path.
The Bob Smith Common mode termination resistors used around the unused pins of the RJ45 connector have been known to suppress unwanted radiation that unused wires pick up from the immediate environment. Their placement and use are to be considered carefully before a design is finalized.

It is recommended that there be a neat separation of ground planes in the layout. It is generally accepted practice to limit the plane off at least 0.08 inches away from the chip side pins of EPE6250S. There need not be any ground plane beyond this point.

For best results, PCB designer should design the outgoing traces preferably to be 50Ω, balanced and well coupled to achieve minimum radiation from these traces.

Typical Application Circuit (only one port shown)



Notes: *Pin-outs shown are for Hubs/Repeaters only.
For NIC, swap pins 1-2 with pins 3-6.

PCA ELECTRONICS, INC.
16799 SCHOENBORN ST.
NORTH HILLS, CA 91343

TEL: (818) 892-0761
FAX: (818) 894-5791
http://www.pca.com