PCA ELECTRONICS INC.

10 Base-T Hub Module with Enhanced CMA and Resistor Network
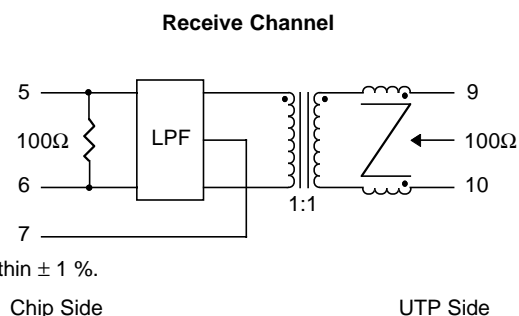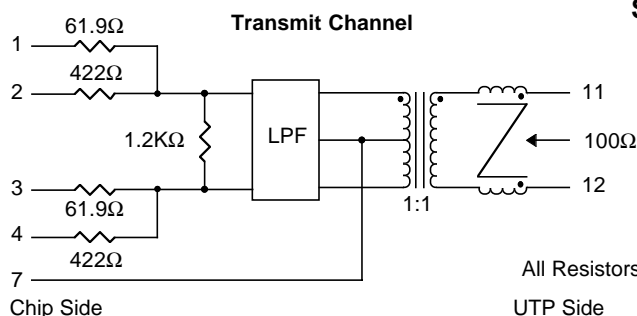
EPE6066

- Optimized for AMD/PHY Controllers •
- Robust construction allows for severe solder processes •
- Complies with or exceeds IEEE 802.3, 10 Base-T Requirements •

Electrical Parameters @ 25° C

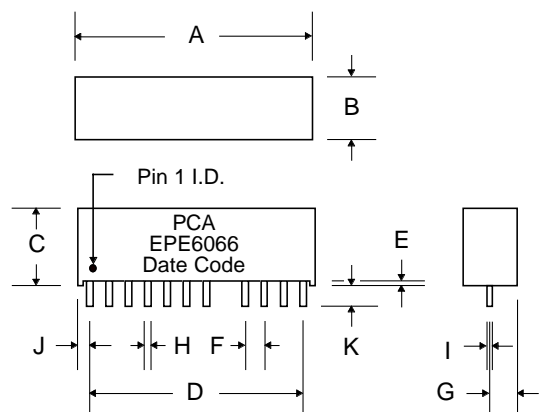| Cut-off Frequency (MHz)		Insertion Loss (dB Max.)		Return Loss (dB Min.)		Attenuation (dB Min.)								Common Mode Rejection (dB Min.)						Crosstalk (dB Min.)	
± 1.0 MHz		1-10 MHz		5-10 MHz		@ 20 MHz		@ 25 MHz		@ 30 MHz		@ 50-70 MHz		@ 50 MHz		@ 100 MHz		@ 200 MHz		@ 1-10 MHz	
Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv	Xmit	Rcv
17	17	-1	-1	-15	-15	-7	-5	-18	-11	-30	-20	-33	-26	-30	-30	-30	-30	---	---	-35	-35

- **Isolation** : meets or exceeds 802.3 IEEE Requirements • **Characteristic Filter Impedance** : 100 Ω •
- Referenced to the filter output @ 5 MHz for filter only, excluding resistor network •

Schematic

Transmit Channel

1 — 61.9Ω
2 — 422Ω
1.2KΩ — LPF — 11
100Ω
3 — 61.9Ω — 12
4 — 422Ω
7
1:1

Chip Side   UTP Side

Receive Channel

5
100Ω — LPF — 9
100Ω
6 — 10
7
1:1

Chip Side   UTP Side

All Resistors are matched within ± 1 %.

Package

A
B
Pin 1 I.D.
PCA
EPE6066
Date Code
C
E
J H F K I
D G

Dimensions

Dim.	(Inches)			(Millimeters)		
	Min.	Max.	Nom.	Min.	Max.	Nom.
A	1.220	1.240		30.99	31.50	
B	.310	.330		7.87	8.38	
C	.400	.430		10.16	10.92	
D	1.100	Typ.		27.94	Typ.	
E	.020	.023		.508	.584	
F	.100	Typ.		2.54	Typ.	
G	.165	Typ.		4.19	Typ.	
H	.018	.022		.457	.559	
I	.010°	Typ.		.254	Typ.	
J	.065	Typ.		1.65	Typ.	
K	.120	.140		3.05	3.56	

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EPE6066

The circuit below is a guideline for interconnecting PCA's EPE6066 with AMD 79C96X and -970, PCnet chip family as reference controllers. 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.

Users are encouraged to verify if this network best suits their application needs with the chip manufacturer before choosing a specific set of values. Additionally, use should make sure that these resistor values provide 802.3 Return Loss specification complaince at either extremes of the cable impedance, namely; 85Ω to 115Ω. Implement only those parts in the design that will meet this requirement.
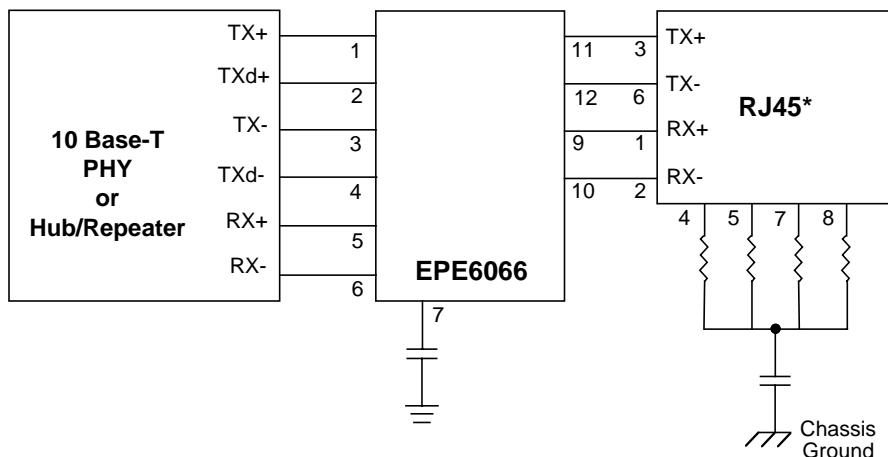
A quick calculation of the effective Thevenin's termination impedance for the filter follows: $1/R(\text{termination}) = 2(61.9//422)//1.2K \approx 100\Omega$. Thus, when measuring the return loss of these parts on the bench, it is not necessary to provide a shunting resistor across the four outputs.

The phantom resistors shown around 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 of EPE6066. 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 for UTP. Shown for one port only.

Notes : * Pin-outs shown are for multiport configurations.
For NIC swap pins 1-2 with pins 3-6.