PRODUCT DATA SHEET

MICROPROFILE LINE MATCHING TRANSFORMER

P358X
(Family P3580-P3589)

Features

* Low Distortion
* Low real estate
* 4.4mm Height (PC Card)
* 4.7mm Height (SMD)
* Choice of Pinout
* Simple Matching
* Supplementary Insulation
* IEC 950, EN 60950 and EN 41003 Certified
* Reflow Solderable
* Wide Operating Temperature Range
* Equivalent to KH Series

Applications

* V.90 Modems
* PC Card/PCMCIA on-card DAAs
* Laptop Computers

DESCRIPTION

P358X family is intended for 56kbps modems and other high-speed applications where very low height and PCB real estate are available. Versions are available in a variety of pin-outs to suit PC Card/PCMCIA on-card DAAs, where typically the body of the device sits within a PCB cut-out, and for conventional surface-mount applications requiring sub-5mm seated height. The components are rated for use at elevated temperatures, as commonly encountered where semiconductors dissipate heat in restricted space.

The P358X family is designed for conventional production reflow processes and directly replaces alternative sources with possible added benefits of improved performance and reduced real estate.

The family is certified to IEC 950, EN 60950 and EN 41003.

Patents Pending

1998
to Electronic Techniques (Anglia) Limited

SPECIFICATIONS

Electrical

At T = 25ºC and as circuit Fig. 2 unless otherwise stated.

Parameter	Conditions	Min	Typ	Max	Units
Insertion Loss	Source/Load = 600Ω	2.8	-	3.5	dB
Frequency Response	300Hz - 3.4kHz	-	±0.05	-	dB
Return Loss	200Hz – 4kHz	-	22	-	dB
Third Harmonic Distortion[1]	600Hz - 10dBm in line 150Hz - 3dBm in line	- -	-95 -58	- -	dBm dBm
Voltage Isolation[2]	50Hz DC	1.5 2.12	- -	- -	kVrms kV
Operating Range: Functional Storage	Ambient temperature	 -40 -40	 - -	 +155 +155	 ºC ºC

Lumped equivalent circuit parameters as Fig. 1

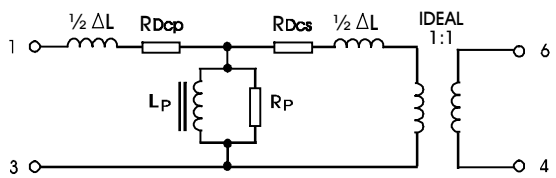
DC resistance[3]					
R_{DCP}	Primary resistance	-	160	-	Ω
R_{DCS}	Secondary resistance	-	205	-	Ω
Leakage inductance, ΔL		-	2.2	-	mH
Shunt inductance, Lp[4]	200Hz -43dBm	-	6	-	H
Shunt loss, Rp	200Hz -43dBm	-	18	-	kΩ

Notes:

1. Third harmonic typically exceeds other harmonics by 10dB.
2. Components are 100% tested at 1750Vrms minimum.
3. Caution: do not pass DC through windings. Telephone line current must be diverted using semiconductor line hold circuit or equivalent.
4. At signal levels greater than –20dBm, Lp will increase and Rp will decrease slightly but the effect is usually favourable to the return loss characteristic.

Equivalent Circuit

Fig. 1



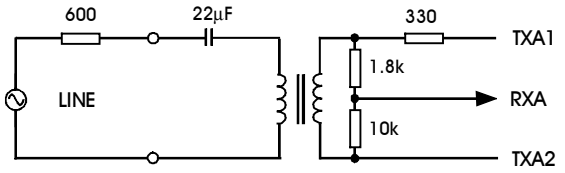
MATCHING RECOMMENDATIONS

The following implementations assume a low impedance balanced TX drive and a relatively high impedance RX input, as is commonly available, though use with other TX/RX arrangements is straightforward. Note that there need be no changes to components on the line side, or in the hybrid, whether 600Ω or complex reference impedance selected, thus assisting country configuration. For complex impedance, the matching circuits derived are suitable for reference impedances of the type 270 + 750//150nF e.g. European CTR21 and 220 + 820//120nF (or 115nF) e.g. Australia, South Africa, etc., and yield similar performance characteristics. For other impedances, please contact Profec Technologies.

Minimum Cost Implementations

600Ω

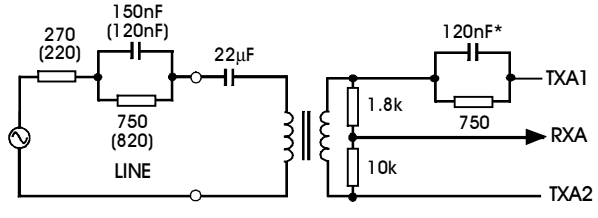
Fig. 2



Frequency Response : ±0.2dB 30Hz – 10kHz
Return Loss: 22dB 200Hz – 4kHz
Transhybrid Loss: 18dB 200Hz – 4kHz

European CTR21/(Australia, etc.)

Fig. 3



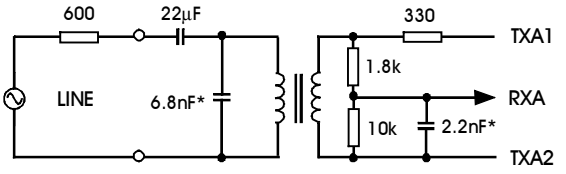
*Note: 120nF capacitor should have a temperature stable dielectric

Frequency Response : ±0.3dB 50Hz – 4kHz
Return Loss: 14dB 200Hz – 4kHz
Transhybrid Loss: 13dB 200Hz – 4kHz

Effect of extra capacitors on 600Ω circuit

600Ω

Fig. 4



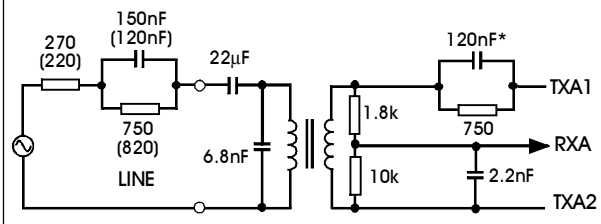
*Note: These capacitors are not required, but included for commonality with Fig.5.

Frequency Response : ±0.1dB 30Hz – 4kHz
Return Loss: 24dB 200Hz – 4kHz
Transhybrid Loss: 18dB 50Hz – 4kHz

Improved complex matching and hybrid

European CTR21/(Australia, etc.)

Fig. 5

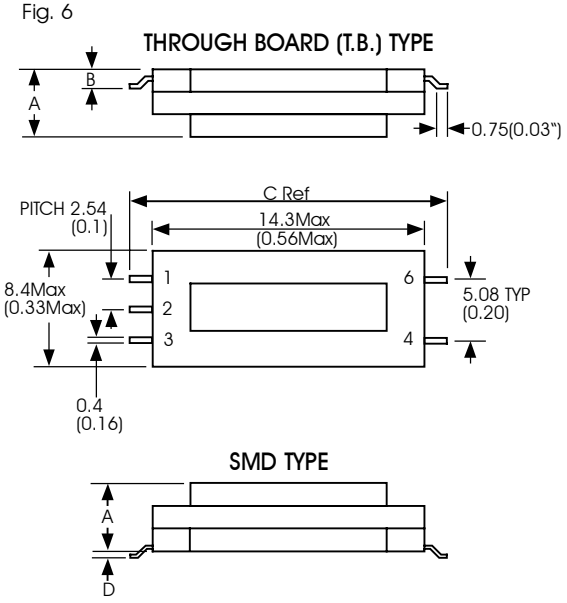


*Note: 120nF capacitor should have a temperature stable dielectric

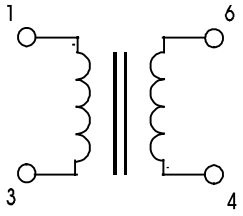
Frequency Response : ±0.5dB 50Hz – 4kHz
Return Loss: 17dB 200Hz – 4kHz
Transhybrid Loss: 16dB 200Hz – 4kHz

CONSTRUCTION

Dimensions
Fig. 6



Connections
Fig. 7



Dimensions shown are in millimetres (inches).
Windings may be used interchangeably as primary or secondary.

Recommended PCB pad sizes 1.2 x 0.65mm (0.047" x 0.026") on centres dimension C-0.7mm (C-0.028")

Note: to prolong solderability, circuit terminals are shipped with a very fine solderable surface protection. This surface coating assists soldering and is completely depleted during the soldering process. However, this coating is not removed by other means of attachment e.g. conductive epoxy. Parts suitable for use with conductive epoxy can be supplied on special order.

Identity	Type	A max	B*	C ref	D*	Other
P3580	T.B.	4.37 (0.172")	1.27 (0.050")	16.8 (0.66")	--	--
P3581	T.B.	4.37 (0.172")	2.44 (0.096")	18.8 (0.74")	--	4 pin version. Only pins 1,3,4,6 present
P3585	SMD	4.70 (0.185")	--	16.8 (0.66")	0.13 (0.005")	--

*Tolerance on dimensions B and D ±0.076mm (±0.003").
For other custom configurations please contact Profec Technologies.

SAFETY

Constructed in accordance with IEC 950:1991, EN 60950:1992 (BS7002:1992), supplementary insulation, 200Vrms maximum working voltage.

Components should be installed in such a way that the core is separated from accessible conductive parts by a creepage of 2.0mm, clearance of 2.0mm, or by solid insulation of minimum thickness 0.4mm, or appropriate thin film.

CERTIFICATION

Certified to IEC 950:1991, EN 60950:1992 (BS 7002:1992) sub-clauses 2.2.2, 2.9.1 and 5.3.2, and BS EN 41003:1997 sub-clauses 4.2.2 and 4.5.3 for a maximum working voltage of 200V, nominal mains supply voltage not exceeding 300V, and a maximum operating temperature of +155ºC in Pollution Degree 2 environments.

ABSOLUTE MAXIMUM RATINGS

(Ratings of components independent of circuit).

Short term isolation voltage (60s)	1.5kVrms, 2.12 kVDC
DC current	100µA
Storage temperature	-40ºC to +155ºC
Reflow/terminal temperature.	250ºC

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