PRODUCT DATA SHEET

MICROPROFILE LINE MATCHING TRANSFORMER

P369X
(Family P3690-P3699)

Features

* Ultra Low Distortion
* 4.4mm Height (PC Card)
* 4.7mm Height (SMD)
* Choice of Pinout
* Simple Matching
* Reflow Solderable
* Wide Operating Temperature Range
* Meets MIL-T-27
* Equivalent to KS Series

Applications

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

DESCRIPTION

P369X family is intended for 56kbps modems and other high-speed applications where a very low height profile is required. 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, and comply with MIL-T-27.

The P369X family is designed for conventional production reflow processes and directly replaces alternative sources with possible added benefits of improved performance and reduced real estate. In particular, the signal distortion characteristics of the P3690 family are exceptional.

The family satisfies the requirements of UL 1459 and Can/CSA-C22.2 No. 225-M90.

Patents Pending

SPECIFICATIONS

Electrical

At T = 25ºC and as circuit Fig. 4 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	-	24	-	dB
Third Harmonic Distortion[1]	600Hz - 10dBm in line 150Hz - 3dBm in line	- -	-112 -75	- -	dBm dBm
Voltage Isolation[2]	50Hz DC	1.25 1.77	- -	- -	kVrms kV
Operating Range: Functional Storage	Ambient temperature	 -40 -40	 - -	 +155 +155	 ºC ºC

Lumped equivalent circuit parameters as Fig. 1

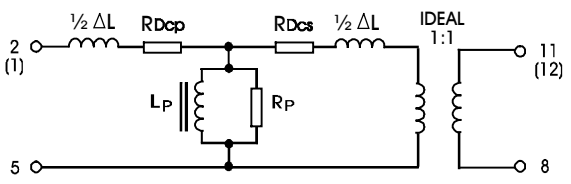
DC resistance[3]					
R_{DCP}	Primary resistance	-	160	-	Ω
R_{DCS}	Secondary resistance	-	190	-	Ω
Leakage inductance, ΔL		-	0.8	-	mH
Shunt inductance, Lp[4]	200Hz -43dBm	-	12	-	H
Shunt loss, Rp	200Hz -43dBm	-	40	-	kΩ

Notes:

1. Third harmonic typically exceeds other harmonics by 10dB.
2. Components are 100% tested at 1.75kVrms 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.

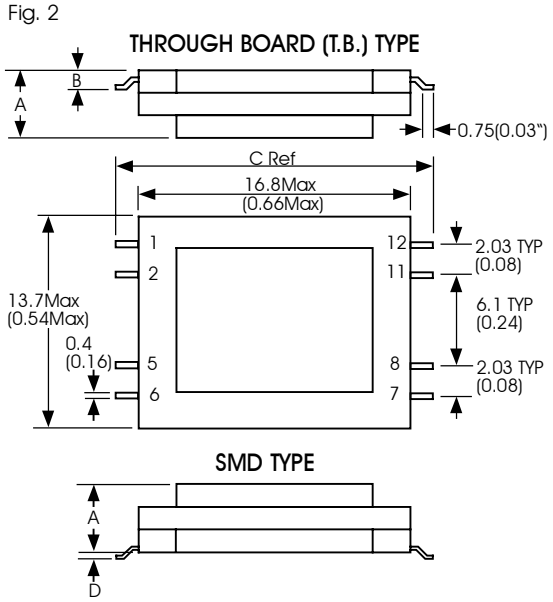
Equivalent Circuit

Fig. 1

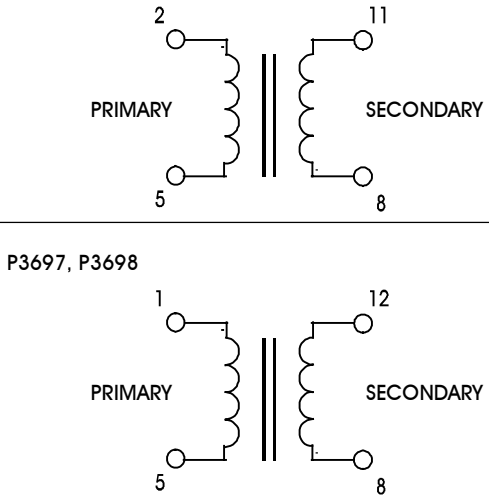


CONSTRUCTION

Dimensions
Fig. 2



Connections
Fig. 3



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

Recommended PCB pad sizes 1.2 x 0.8mm (0.047" x 0.031") on centres dimension C-0.7mm (C-0.028")

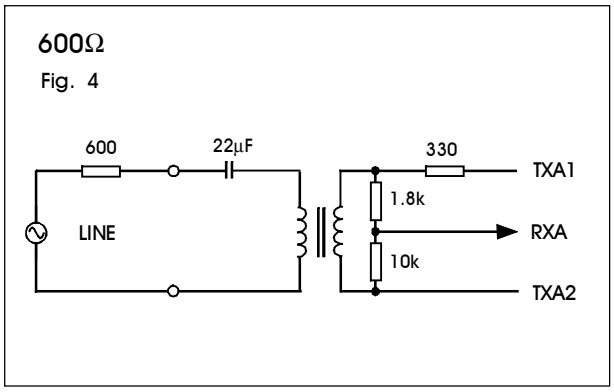
Note: to prolong solderability, circuit terminals are shipped with a very fine solderable surface protection. This surface coating assists soldering and is completely depleted during the soldering process. However, this coating is not removed by other means of attachment e.g. conductive epoxy. Parts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

Identity	Type	A max	B*	C ref	D*	Other
P3690	T.B.	4.37 (0.172")	1.27 (0.050")	19.8 (0.78")	--	--
P3691	T.B.	4.37 (0.172")	2.44 (0.096")	21.8 (0.86")	--	--
P3695	SMD	5.08 (0.200")	--	19.8 (0.78")	0.13 (0.005")	--
P3696	SMD	4.50 (0.177")	--	19.8 (0.78")	0.13 (0.005")	--
P3697	T.B.	4.27 (0.168")	2.44 (0.096")	20.6 (0.81")	--	4 Pin versions. Only pins 1, 5, 8, 12 present
P3698	T.B.	4.37 (0.172")	2.44 (0.096")	20.1 (0.79")	--	

*Tolerance on dimensions B and D ±0.076mm (±0.003").
For other custom configurations please contact ETAL.
For international applications, see associated family P370X.

MATCHING RECOMMENDATION

The following implementation assumes 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, if a complex reference impedance is to be matched, thus assisting country configuration.



Frequency Response : ±0.1dB 30Hz – 10kHz
Return Loss: 25dB 200Hz – 4kHz
Transhybrid Loss: 18dB 200Hz – 4kHz

ABSOLUTE MAXIMUM RATINGS

(Ratings of components independent of circuit).

Short term isolation voltage (1s)	1.25kVrms, 1.77kVDC
DC current	100µA
Storage temperature	-40°C to +155°C
Reflow/terminal temperature.	250°C

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