

# LOW COST, LOW DISTORTION LINE MATCHING TRANSFORMER

# P3311

## Features

- \* Low Cost
- \* Low Distortion
- \* 12.6mm (0.5") Seated Height
- \* Industry Standard Pinout
- \* IEC 950, UL 1950 and EN 60950 Certified
- \* UL Recognized Component
- \* BABT Certificate of Recognition
- \* Extended Frequency Response
- \* Flat TX and RX Responses
- \* High Thermal Stability
- \* Directly replaces 2811B and ATS-273

## Applications

- \* V.90 and V.92 Modems
- \* V.34 Modems

## DESCRIPTION

P3311 is intended for V.90 and V.92 (56kbps) modems and other high-speed applications where ultra-low distortion at moderate power levels and very low voiceband frequencies is required at a most competitive price.

P3311 is offered as a direct replacement for 2811B and ATS-273 in existing circuits without changes to matching components.

P3311 exhibits stable core characteristics over its operating temperature range to maximize data throughput under varying environmental conditions without the need for modem retraining.

P3311 uses patented design and construction methods to achieve excellent signal performance and safety isolation to international standards at truly low cost. P3311 is certified to EN 60950, IEC 950, UL1950 and EN 41003. P3311 is a UL Recognized Component and is supported by a BABT Certificate of Recognition and an IEC CB Test Certificate.

FOR NEW DESIGNS  
P3356 IS RECOMMENDED

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## SPECIFICATIONS

### Electrical

At T = 25°C and as reference circuit Fig. 2 unless otherwise stated.

Parameter	Conditions	Min	Typ	Max	Units
Insertion Loss	f = 2kHz, R <sub>L</sub> = 600Ω	-	-	2.0	dB
Frequency Response	LF -3dB cutoff	-	10	-	Hz
	HF -3dB cutoff	-	30	-	kHz
	100Hz – 4kHz	-	-	±0.1	dB
Return Loss	200Hz – 4kHz	20	-	-	dB
Third Harmonic Distortion <sup>(1)</sup>	150Hz -3dBm in line	-	-	-78	dBm
Voltage Isolation <sup>(2)</sup>	50Hz	2.12	-	-	kVrms
	DC	3.0	-	-	kV
Operating Range:	Functional	0	-	+70	°C
	Storage	-40	-	+85	°C

Lumped equivalent circuit parameters as Fig. 1

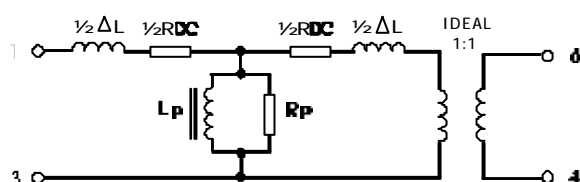
DC resistance <sup>(3)</sup> , R <sub>DC</sub>	Sum of windings	227	-	270	Ω
Leakage inductance, ΔL		4.3	-	7.2	mH
Shunt inductance <sup>(4)</sup> , L <sub>p</sub>	200Hz 10mV	9	-	-	H
Shunt loss <sup>(4)</sup> , R <sub>p</sub>	200Hz 10mV	18	-	-	kΩ

#### Notes:

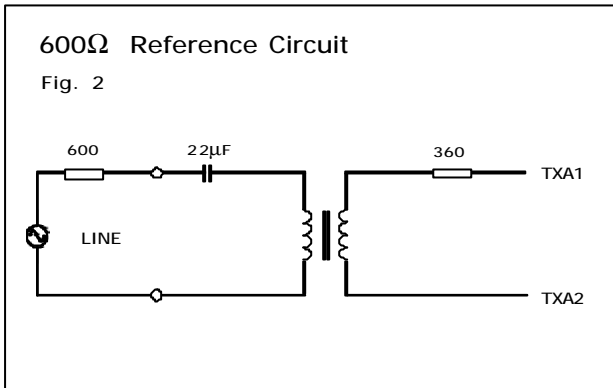
1. Third harmonic typically exceeds other harmonics by 10dB.
2. Components are 100% tested at 3.25kVDC.
3. Caution: do not pass DC through windings. Telephone line current must be diverted using semiconductor line hold circuit or choke.
4. At signal levels greater than -20dBm, L<sub>p</sub> will increase and R<sub>p</sub> will decrease slightly but the effect is usually favourable to the return loss characteristic.

#### Equivalent Circuit

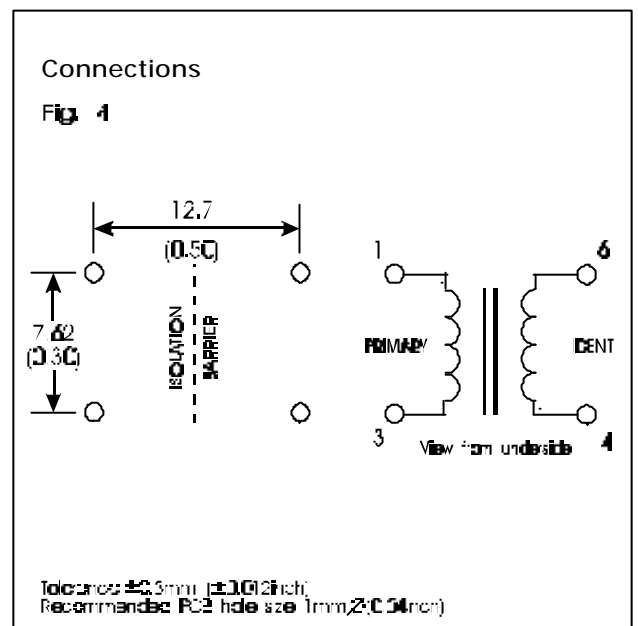
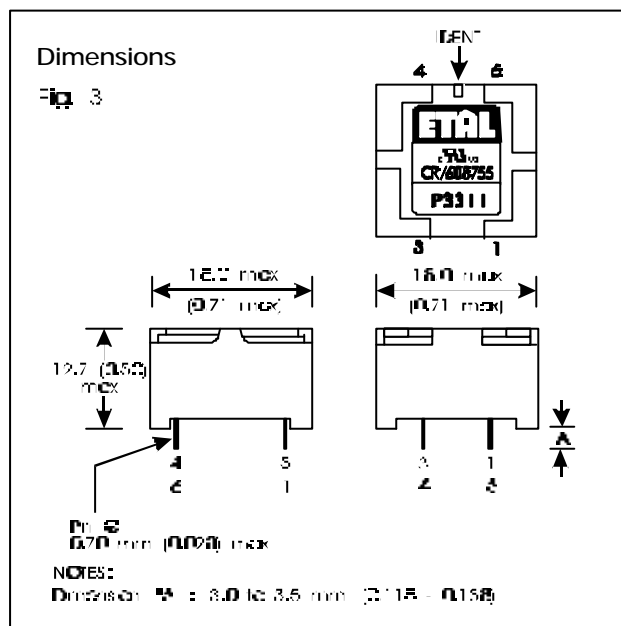
Fig. 1



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## CONSTRUCTION



Dimensions shown are in millimetres (inches).  
Geometric centres of outline and pin grid coincide within a tolerance circle of 0.6mm $\varnothing$ .  
Windings may be used interchangeably as primary or secondary.  
Total weight typically 7g.

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**SAFETY**

Constructed in accordance with IEC 950:1991, EN 60950:1992 (BS7002:1992), supplementary insulation, 250Vrms maximum working voltage, flammability class V-0.

There are no special installation requirements (beyond attending to usual PCB track separations) since the integral cover provides supplementary insulation from its external faces to internal core and windings.

**CERTIFICATION**

Certified under the IEC CB scheme (Certificate GB445W) to IEC 950:1991, up to amendment 4, sub-clauses 1.5, 1.5.1, 1.5.3, 2.2, 2.2.3, 2.2.4, 2.9.2, 2.9.3, 2.9.4, 4.4, 4.4.3.2 (class V-0) and 5.3 for a maximum working voltage of 250Vrms, nominal mains supply voltage not exceeding 300Vrms and a maximum operating temperature of 70°C in Pollution Degree 2 environments.

Recognized under the Component Recognition Program of Underwriters Laboratories Inc. to US and Canadian requirements CAN/CSA C22.2 No. 950-95/UL1950, Third Edition, including revisions through to revision date March 1, 1998, based on Fourth Amendment of IEC 950, Second Edition, maximum working voltage 180Vrms (creepage), 420V peak (clearance), Pollution Degree 2, supplementary insulation.

UL File number E203175.  
Approved and certified by BABT to EN 60950 and EN 41003.  
BABT Certificate of Recognition 608755

Additionally, Profec Technologies certifies all transformers as providing voltage isolation of 2.12kVrms, 3kV DC minimum. All shipments are supported by a certificate of conformity to current applicable safety standards.

**ABSOLUTE MAXIMUM RATINGS**

(Ratings of components independent of circuit).

Short term isolation voltage (1s)	2.12kVrms, 3.0 kVDC
DC current	100µA
Storage temperature	-40°C to +85°C
Lead temperature, 10s	260°C

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P3311 design and construction are protected by patents and registered design.  
British Patent No. 2333646.  
British Patent No. 2340667.  
UK Registered Design No. 2077360.  
French Registered Design No. 991512.  
Germany Registered Design 49902311.0.  
United States Registered Design 426, 815.  
Other patents and registered designs pending.

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ISO 9001  
FM 25326

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