

PRODUCT DATA SHEET

**LOW DISTORTION
LINE MATCHING TRANSFORMER**

9004

Features

- * Low Insertion Loss
- * Lead-free (Pb-free)
- * RoHS compliant
- * 14.6mm Seated Height
- * Industry Standard Pinout
- * IEC 60950 and UL 60950 Certified
- * UL Recognized Component
- * Simple Matching
- * Low Insertion Loss
- * Vacuum encapsulated

Applications

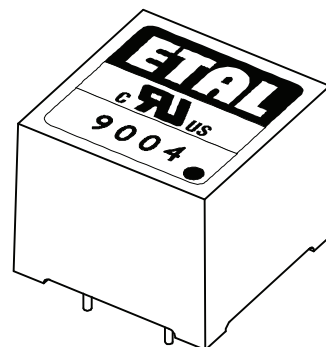
- * V.34 Modems
- * Fax Machines
- * Instrumentation

DESCRIPTION

9004 is intended for medium speed modems to V.34 (33.6kbps).

9004 is completely lead-free, compliant with RoHS Directive 2002/95/EC, and suitable for lead-free and conventional processing.

9004 is certified to IEC 60950 and UL 60950. 9004 is a UL Recognized Component and is supported by an IEC CB Test Certificate.



RoHS
COMPLIANT



Patented

SPECIFICATIONS

Electrical

At T = 25 °C and 600Ω source and load unless otherwise stated.

Parameter	Conditions	Min	Typ	Max	Units
Insertion Loss	f = 200Hz – 4kHz	-	1.0	1.1	dB
Frequency Response	200Hz – 4kHz	-	-	±0.4	dB
Return Loss	200Hz – 4kHz, circuit figure 2.	21	-	-	dB
Third Harmonic Distortion ⁽¹⁾	200Hz -3dBm in line	-	-68	-62	dBm
Voltage Isolation ⁽²⁾	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

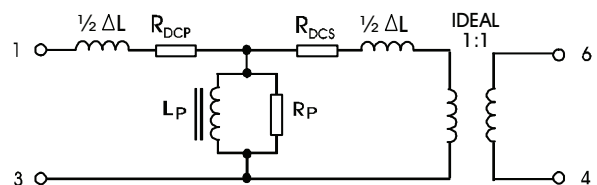
DC resistance ⁽³⁾	Primary resistance R _{DCP}	27	32	37	Ω
	Secondary resistance R _{DCS}	36	42	48	Ω
Leakage inductance, ΔL		0.7	-	1.6	mH
Shunt inductance, L _p	200Hz 250mV	1.9	4.5	-	H
Shunt loss, R _p	200Hz 250mV	2.0	7.0	-	kΩ

Notes:

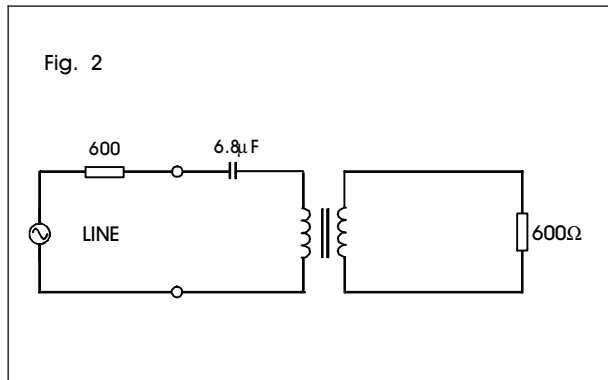
1. Third harmonic typically exceeds other harmonics by 10dB.
2. Components are 100% tested at 6.5kVDC.
3. Caution: do not pass DC through windings. Telephone line current must be diverted using semiconductor line hold circuit or choke.

Equivalent Circuit

Fig. 1



REFEFENCE CIRCUIT



SAFETY

Constructed in accordance with IEC 60950-1:2005, Second Edition, reinforced insulation, 250Vrms maximum working voltage, flammability class V-0. Distances through solid insulation 0.4mm minimum.

CERTIFICATION

Certified under the IEC CB Scheme (Certificate DK-15467) to IEC 60950-1:2005 sub-clauses 1.5, 1.7, 2.9, 2.10, 4.7 and 5.2 (Denmark, Finland, Germany, Norway, Ireland, Korea, Spain, Sweden, Switzerland, USA, Canada and UK national deviations) for a maximum working voltage of 250Vrms, nominal mains supply voltage not exceeding 250Vrms and a maximum operating temperature of +70°C in Pollution Degree 2 environment, reinforced insulation.

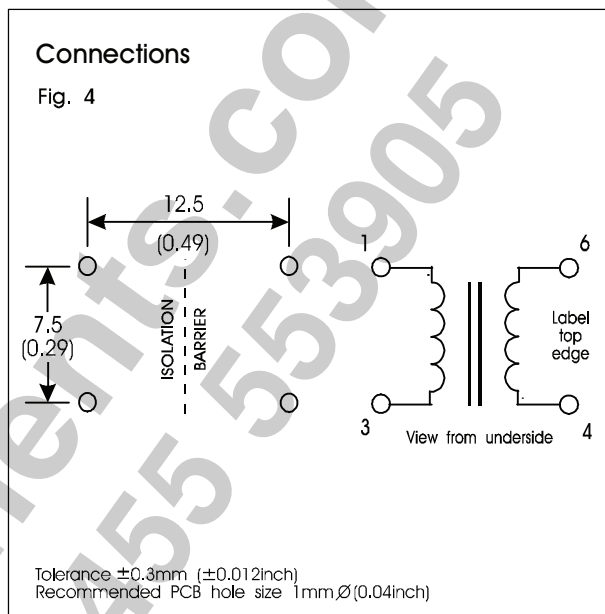
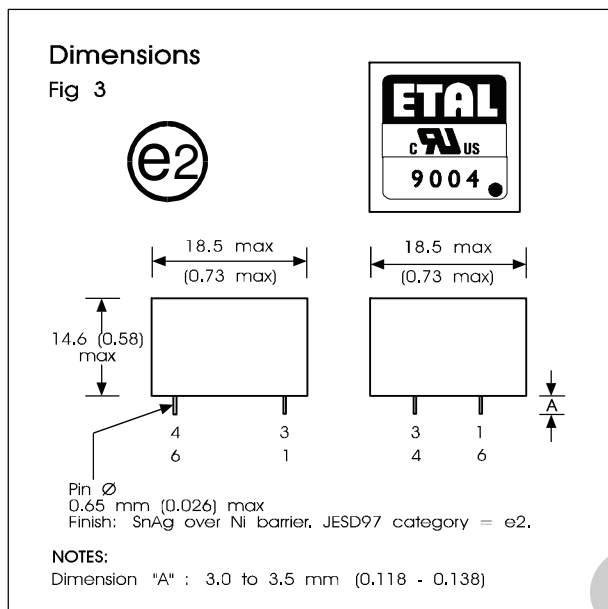
Recognized under the Component Recognition Program of Underwriters Laboratories Inc. to US and Canadian requirements CSA C22.2 No. 60950-1/UL60950-1, Second Edition, based on IEC 60950-1, Second Edition, maximum working voltage 250Vrms, Pollution Degree 2, reinforced insulation.

UL File number E203175.

Additionally, ETAL certifies all transformers as providing voltage isolation of 3.88kVrms, 5.5kV DC minimum. All shipments are supported by a Certificate of Conformity to current applicable safety standards.

Patented

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.

ABSOLUTE MAXIMUM RATINGS

(Ratings of components independent of circuit).

Short term isolation voltage (1s)	3.0kVrms, 4.3kVDC
DC current	100 μ A
Storage temperature	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Lead temperature, 10s	260 $^{\circ}$ C

INTELLECTUAL PROPERTY RIGHTS

ETAL is the Trade Mark of Profec Technologies Ltd (wholly owned by ElektronikGruppen BK AB). The Trade Mark ETAL is registered at the UK Trade Marks Registry.

Profec Technologies Ltd. is the owner of the design right under the Copyright Designs and Patents Act 1988 and no rights or licences are hereby granted or implied to any third party.

© 1998 - 2009 ETAL Group AB.

Reproduction prohibited.