

**WIDEBAND INTERFACE TRANSFORMER****P2881****Features**

- \* Ultra-low profile, 7mm
- \* Excellent characteristics
- \* IEC 950, EN 60950 and EN 41003 certified
- \* CSA NRTL/C Certificate of Compliance
- \* BABT Certificate of Recognition
- \* 1:1 ratio
- \* Vacuum encapsulated

**Applications**

- \* ADSL
- \* Basic Rate ISDN

---

**DESCRIPTION**

P2881 is a microprofile transformer for ADSL and ISDN S<sub>0</sub> applications requiring safety-critical isolation to international standards.

P2881 is certified to safety standards IEC 950, EN 60950 and EN 41003 for supplementary insulation, 250V working voltage. P2881 is supported by an IEC CB Test Certificate, CSA Certificate of Compliance and BABT Certificate.

ADSL requirements for good balance and frequency response, with low levels of distortion are satisfied.

For ISDN applications, P2881 is suitable for interfaces complying with ITU-T I.430 Basic Rate requirements (2B+D at 192kbits/s).

The requirements of I.430 are easily achieved due to propriety construction which yields low leakage inductance and coupling capacitance whilst being fully compliant with international safety requirements.



to Electronic Techniques  
(Anglia) Limited

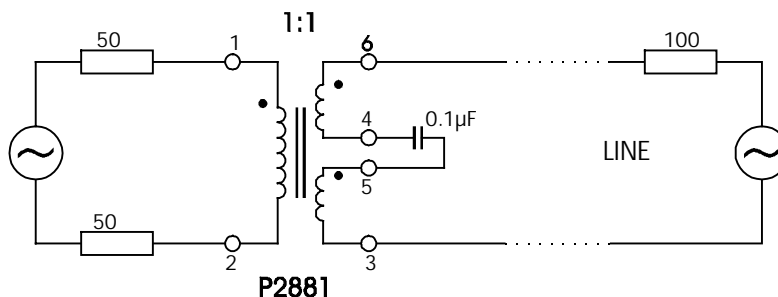
## SPECIFICATION

### Electrical

At T = 25°C and reference circuit Fig 1 unless otherwise stated. The convention used in this datasheet is that 'primary' windings are on the line side and 'secondary' windings are on the equipment side.

| Parameter                 | Conditions                        | Min  | Typ   | Max  | Units   |
|---------------------------|-----------------------------------|------|-------|------|---------|
| Turns ratio               | (2-1) : (3-5)+(4-6):              | 0.98 | 1.00  | 1.02 |         |
| Primary inductance        | 3-6 (4 and 5 linked)              |      |       |      |         |
|                           | 2kHz, 100mV                       | 23   | 36    | -    | mH      |
|                           | 10kHz, 100mV                      | 23   | 32    | -    | mH      |
|                           | 20kHz, 100mV                      | 22   | 32    | -    | mH      |
| Leakage inductance        | 3-6 (1 and 2 linked) 10kHz        | -    | 4     | 10   | μH      |
| Shunt loss                | 3-6 (4 and 5 linked)              |      |       |      |         |
|                           | 2kHz 100mV                        | -    | 8     | -    | kΩ      |
|                           | 10kHz 100mV                       | 20   | -     | -    | kΩ      |
| Winding DC resistance     | 3-6 (4 and 5 linked)              | -    | 3.6   | -    | Ω       |
|                           | 1-2                               | -    | 0.8   | -    | Ω       |
| Parallel capacitance      | 3-6 (4 and 5 linked)              | -    | 90    | -    | pF      |
|                           | 1-2                               | -    | 20    | -    | pF      |
| Interwinding capacitance  | 1 & 2 linked to 3, 4, 5, 6 linked | -    | 30    | -    | pF      |
| Insertion loss            | 500kHz                            | -    | 0.2   | -    | dB      |
| Frequency response        | 30kHz - 1.1MHz                    | -    | ±0.15 | -    | dB      |
| Phase response            | 30kHz - 1.1MHz                    | -    | ±8    | -    | degrees |
| Longitudinal balance      | 30kHz - 1.1MHz                    | 46   | -     | -    | dB      |
| Return loss               | 30kHz - 500kHz                    | 16   | -     | -    | dB      |
|                           | 500kHz - 1.1MHz                   | -    | 14    | -    | dB      |
|                           | 1.1MHz - 2MHz                     | -    | 12    | -    | dB      |
| Total Harmonic Distortion | 4Vrms<br>30kHz - 1.1MHz           | -    | -     | -80  | dBc     |
| Voltage isolation         | 50Hz                              | 2.12 | -     | -    | kVrms   |
|                           | DC                                | 3.0  | -     | -    | kV      |
| Operating range:          | Ambient temperature               |      |       |      |         |
|                           | Functional                        | 0    | -     | +70  | °C      |
| Storage                   |                                   | -40  | -     | +125 | °C      |

**Fig. 1 Reference Circuit - ADSL**



**Note:**

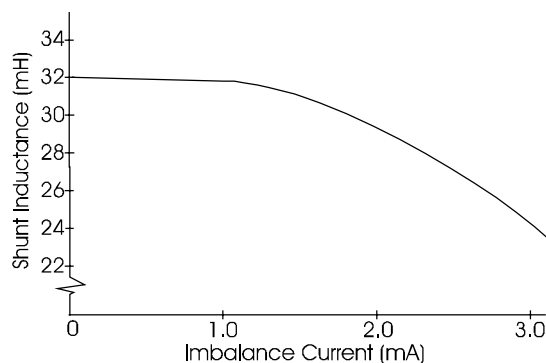
The 0.1μF capacitor is fitted to block DC. It may be placed, as an alternative, in either leg of the line pair.

## CHARACTERISTICS - ISDN

### DC Imbalance

If required, P2881 will support a small degree of DC current imbalance between its primary windings, e.g. during phantom powering. DC current imbalance, however, should be limited to 1mA if P2881 is fully to comply with its specification. Fig 2 shows the effect of current imbalance on typical primary inductance.

Fig 2 Effect of DC Imbalance on Typical Shunt Inductance

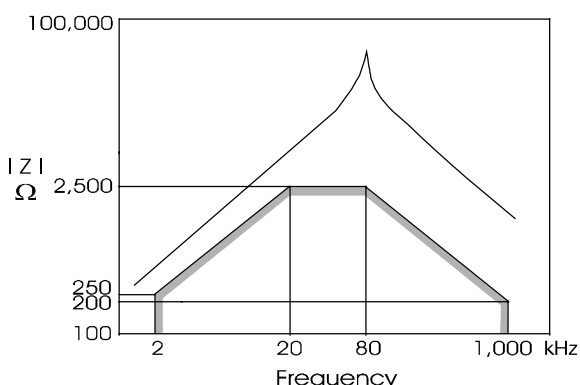


### Input/Output impedance

In the inactive, powered down or binary ONE transmission states the interface point must present a high impedance in accordance with the templates given in I.430 sections 8.5 and 8.6.

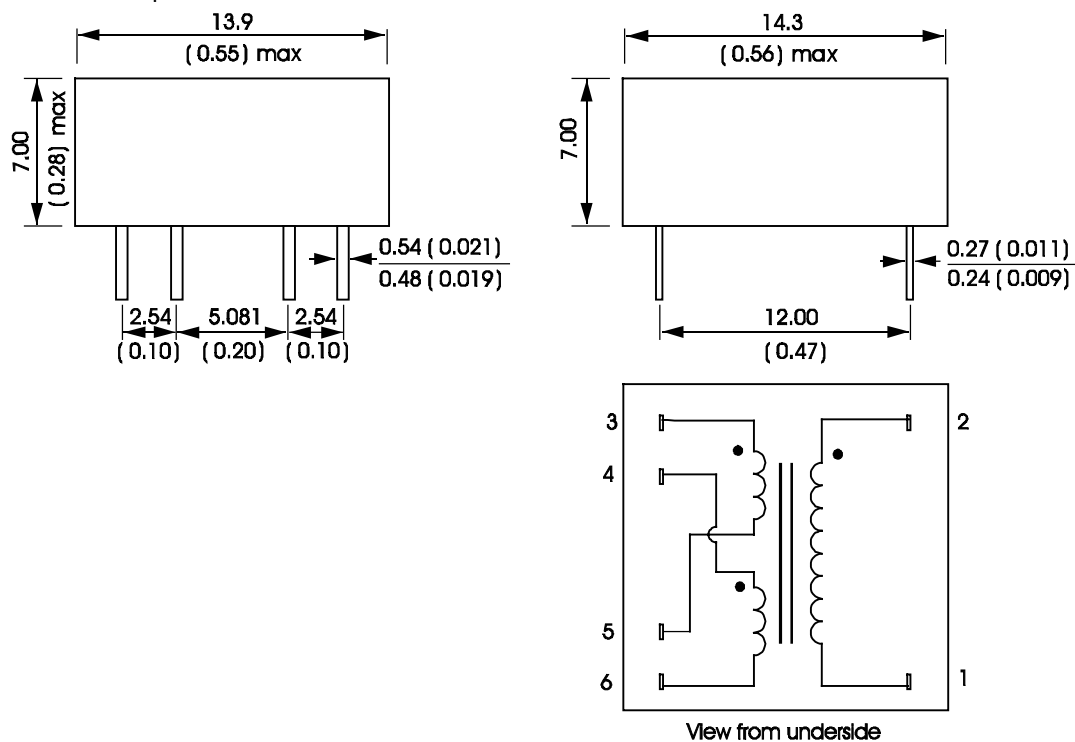
Fig 3 shows the typical primary impedance characteristic of P2881 stimulated with 100mVrms sinusoidal from 2kHz to 1MHz across pins 3 and 6 (4 & 5 linked) against the I.430 TE impedance template.

Fig 3 Impedance Characteristic



## CONSTRUCTION

Fig 4 Mechanical Specification



Dimensions shown are in millimetres (inches).

Geometric centres of outline and pin grid coincide within a tolerance circle of Ø0.6mm.

Recommended PCB hole size Ø0.8mm.

Terminal pins electroplated Sn Pb 60/40 µm min.

**SAFETY**

Constructed in accordance with IEC 950:1991, EN 60950:1992 (BS 7002:1992), supplementary insulation and BS EN 41003:1997, 250Vrms working.

**ABSOLUTE MAXIMUM RATINGS**

(Ratings of components independent of circuit).

|                                   |                      |
|-----------------------------------|----------------------|
| Short term isolation voltage (1s) | 2.12kVrms<br>3.0kVDC |
| Storage temperature               | -40°C to<br>+125°C   |
| Lead temperature, 10s             | 260°C                |

**CERTIFICATION**

Certified by BSI to IEC 950:1991/A4:1996 (IEC CB Test Certificate No. GB541W) sub-clauses 2.2.2, 2.9.2, 2.9.3, 2.9.4, 2.9.6, 2.9.7, 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 3 environment, supplementary insulation.

CAN/CSA C22.2 No. 950-95/UL1950, certified by CSA, Third Edition, including revisions through to revision date March 1, 1998, based on Fourth Amendment of IEC 950, Second Edition, maximum working voltage 250Vrms, Pollution Degree 2, supplementary insulation.

CSA Certificate of Compliance 1107696 (Master Contract 1188107).  
Certified by BABT to EN 60950.  
BABT Certificate CR/0160.

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.

**COPYRIGHT**

ETAL and P2881 are Trade Marks of Profec Technologies Ltd.

The Trade Mark and Service Mark ETAL are 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.

© 2001 Profec Technologies Ltd.

Reproduction prohibited.

**PROFEC**  
TRANSFORMING THE FUTURE



ISO 9001  
FM 25326

Profec Technologies Ltd, 10 Betts Avenue, Martlesham Heath, Ipswich, IP5 3RH, England  
Telephone: +44 (0) 1473 611422 Fax: +44 (0) 1473 611919  
Websites: [www.etal.ltd.uk](http://www.etal.ltd.uk) [www.profec.com](http://www.profec.com)  
Email: [info@etal.ltd.uk](mailto:info@etal.ltd.uk) [sales@profec.com](mailto:sales@profec.com)