

APPENDIX 1

Testing Requirements

A1

General

A1.1

Most of the Tests are required to be tested on a system, eg. FXO module and a packet (IP) phone or an analogue port (FXS module). Where core functionality (setting up and clearing down calls) is provided by separate equipment – e.g. a "gatekeeper", this must also be included in the test set-up. A block diagram of the system tested shall be included as part of the test report for any system and/or component. The tests methods which follow are only those which are not specified in other referenced documents (principally PTC200).

A1.2

All systems shall have as an option a G.711 A-law codec. All losses between the gateway network interface and either the IP phone (or an analogue port) shall be measured with the codecs set to G.711. This is because the tones used to measure loudness ratings are not accurately reproduced with low bit rate codecs, and the measurements cannot be interpreted with any degree of confidence. Until alternative repeatable methods of measuring losses though non-waveform codecs are standardised, it is assumed that such codecs will sound similar in loudness when tested subjectively. It is the responsibility of the Telepermit holder to ensure that this is so.

- *The measurement of transmission losses using non waveform codecs may be introduced subject to suitable measurement techniques becoming standardised.*
- *The use of analogue interfaces to the PSTN is strongly discouraged as the additional 2-wire/4-wire conversions introduce the potential for echo which is exacerbated by the delay which is inherent in IP networks. It is also more difficult to achieve satisfactory phone to phone performance within the IP network.*
- *The mixing of analogue and digital network interfaces to the same IP network is strongly discouraged, as phones ideally require different LRs for each type of interface for optimal operation.*

2.3

Transmission Losses

All 2-wire analogue ports shall be terminated in a BT3 network for loss testing. Phones, and other pieces of equipment may be used to set up transmission paths, however these shall be removed when the measurements are made. Where battery feeds or d.c. shunts are required, these shall be via 10H chokes, or active circuits with similarly high a.c. impedance at audio frequencies. Where decoupling capacitors are required between the DUT and the test equipment, these shall be not less than 470uF.

As measurements are required to the private network 0dBr reference point, the means of determining this point shall be detailed in the test report. It is expected that the manufacturer will provide methods of measuring to and from this point.

Delay

Delay is to be measured at 1000Hz. This is best achieved by injecting a 500uS 1/2 sinewave pulse, and observing the input and output pulses on a dual trace oscilloscope.

FXO analogue port impedance

This test is similar to the CPE return loss measurement used in PTC200. The test set-up is shown in the figure below. A phone should be connected to the port to set-up a call to a "quiet" termination. Once the call is established, the phone should be disconnected, and the return loss against BT3 test performed.

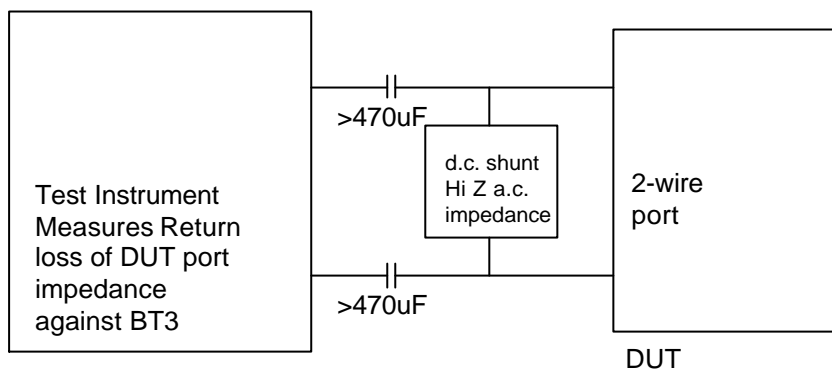


Fig A1 Test Set-up for measuring 2-wire port impedance

Terminal Balance Return Loss (TBRL)

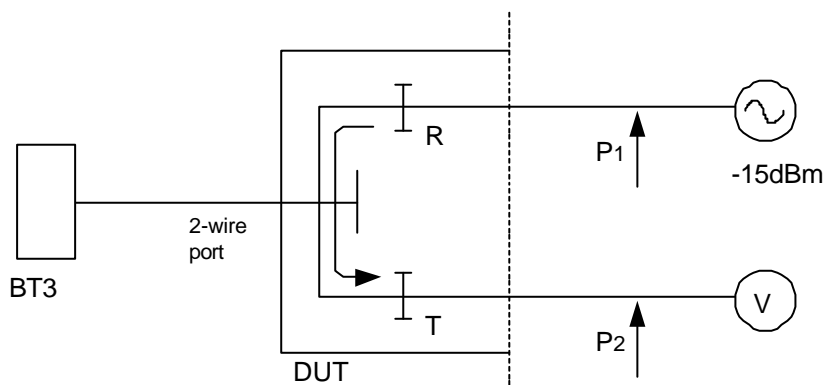


Fig A2 Test Set-up for measuring Terminal Balance Return Loss (TBRL)

Notes

$TBRL(f) = P1(f) - P2(f) + T + R$ where $P1(f)$ and $P2(f)$ are powers in dBm at frequency f , and T and R are the losses of the T and R PADS respectively in dB.

2. The loss shall be measured at:
300, 500, 800, 1300, 2000, 2500, 3400 Hz

3. A Phone will initially need to be connected in parallel to BT3 load to initiate call using DTMF dialling. It should be disconnected while measurements are being undertaken.

4. The instruments must be connected at a suitable 4 wire point, and the instrument impedances matched to the network. The instruments may be connected to a "calibrated" network if a suitable interface is not available in the DUT (see Fig A3)

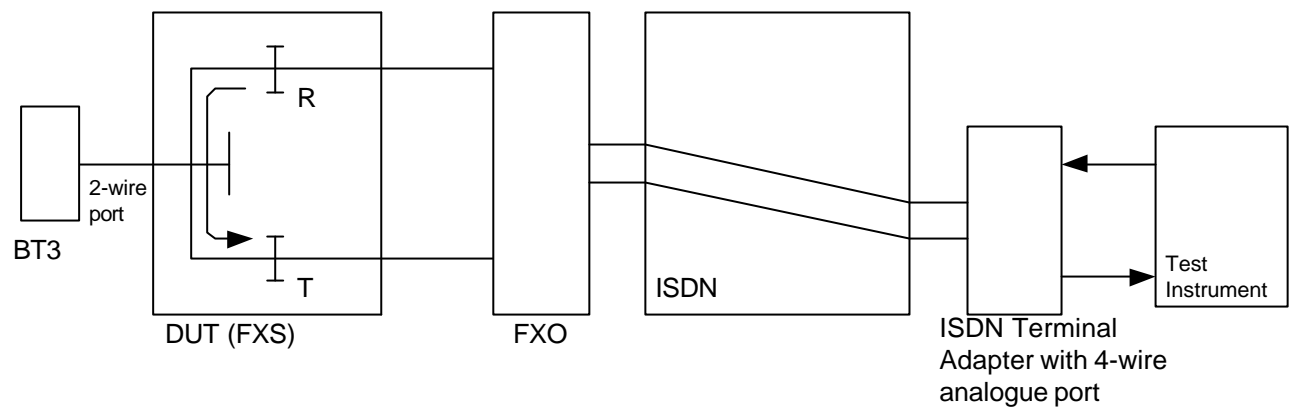


Fig A1 Test Set-up for measuring Terminal Balance Return Loss (TBRL) using a network connection.

Note: All losses/gains in the FXS, FXO and TA must be compensated for in the final loss calculation.