7. POTS Splitter interface testing

7.1 DC Loop Resistance

7.1.1 Purpose：To verify that the POTS Splitter DC Loop Resistance is in compliance with the requirements specified in 6.1.

7.1.2 measurement arrangement：

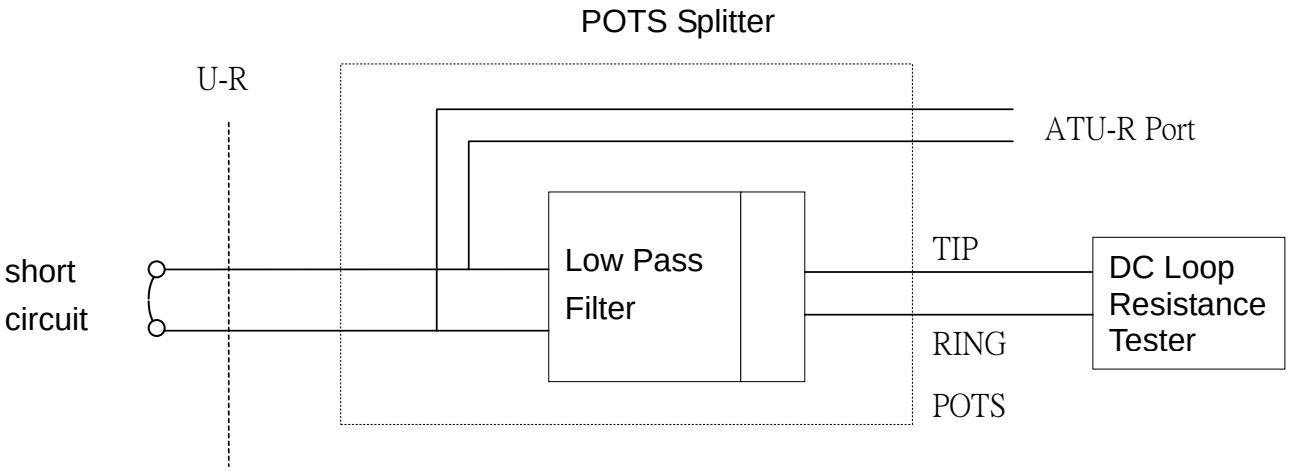


Figure 1 The DC Loop resistance test from tip-to-ring at the POTS interface.

7.1.3 Method of measurement：

（1） The measurement arrangement is given in Figure 1.

（2） The U-R interface shorted and to adjust the POTS loop currents to 10mA.

（3） To measurement DC voltage from tip-to-ring at the POTS interface.

（4） To calculate DC Loop Resistance.

（5） Repeat step (3),(4) for adjusting the POTS loop currents to 20mA.,60mA and 100mA.

（6） To calculate the DC Loop resistance from tip-to-ring at the POTS interface.

7.2 Insulation Resistance

7.2.1 Purpose：To verify that the POTS Splitter DC Insulation Resistance is in compliance with the requirements specified in 6.1.

7.2.2 measurement arrangement：

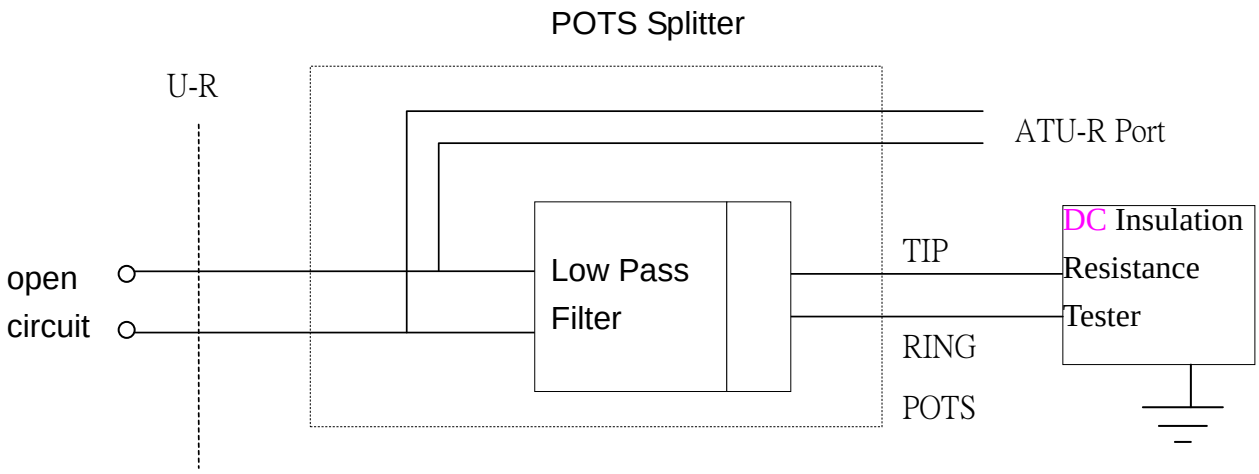


Figure 2 The insulation resistance test from tip-to-ground, ring-to-ground or tip-to-ring at the POTS interface. and record test result

7.2.3 Method of measurement：

（1） The measurement arrangement is given in Figure 2.

（2） The U-R interface opened and to adjust the insulation resistance tester output voltage to DC100V。

（3） To measurement the insulation resistance from ring-to-ground at the POTS interface.

（4） To measurement the insulation resistance from tip-to-ground at the POTS interface.

（5） To measurement the insulation resistance from tip-to-ring at the POTS interface.

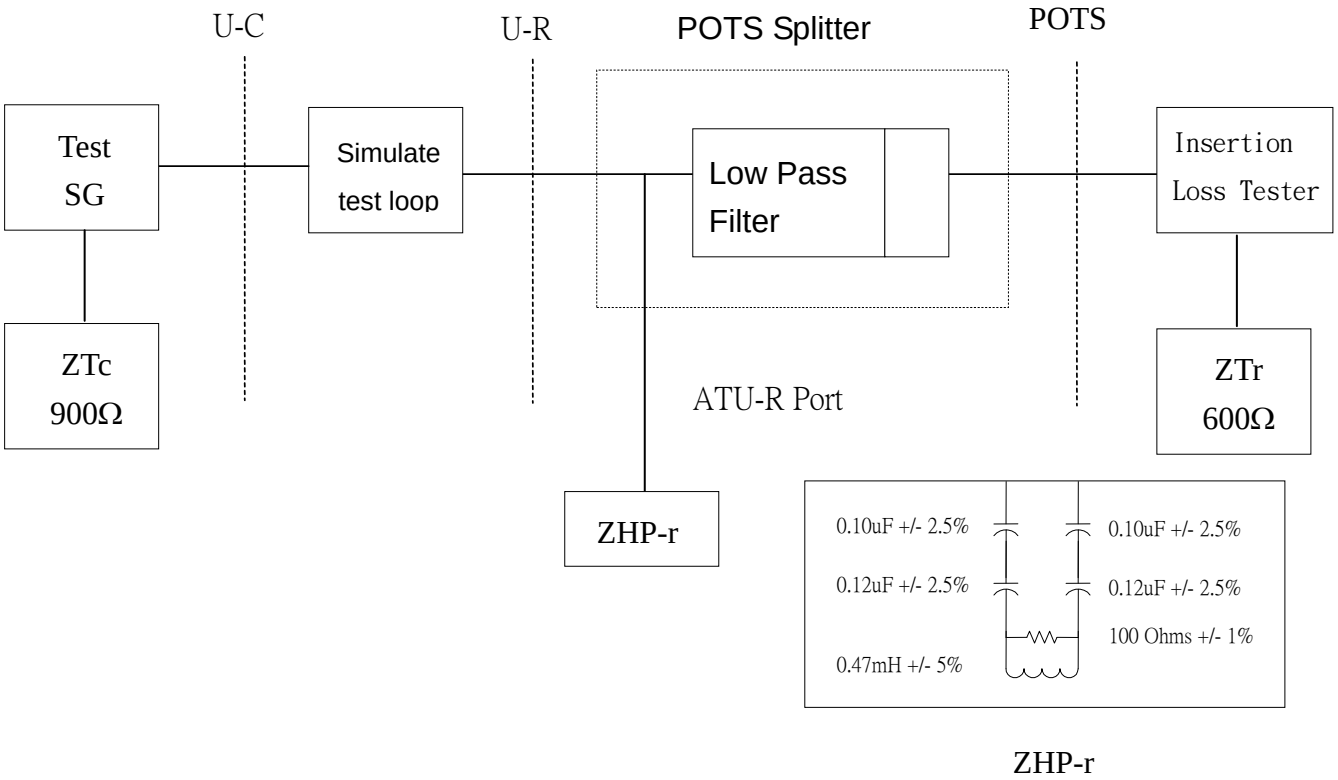
7.3 Insertion Loss in the Voice Band

7.3.1 Purpose：To verify that the POTS Splitter insertion loss in the voice band

(1004Hz) is in compliance with the requirements specified in 6.1.

Simulate test loop ：0,0.5kft,2.0kft,5.0 kft pairs of 26 AWG Cable.

7.3.2 measurement arrangement：



Note—The ZHP-r component specifications are defined in Figure 4.

Figure 4 Measurement of the POTS splitter Insertion Loss Test in the Voice Band.

7.3.3 Method of measurement：

（1） The measurement arrangement is given in Figure 4.

（2） To choose 26AWG 0ft Cable test loop, the insertion loss at 1004 Hz from the source to the termination shall be measured and without the POTS Splitter/ZHP-r combination inserted.

（3） the insertion loss at 1004 Hz from the source to the termination shall be measured and with the POST Splitter/ZHP-r combination inserted.

（4） To choose 26AWG 5kft Cable , ANSI Loop13, CSA Loop4, Loop8 test loop, repeat step (2),(3).

（5） To calculate insertion loss. and record test result

7.4 Attenuation in the ADSL Band

7.4.1 Purpose：To verify that the POTS Splitter attenuation in the ADSL band is in compliance with the requirements specified in 6.1.

7.4.2 measurement arrangement：

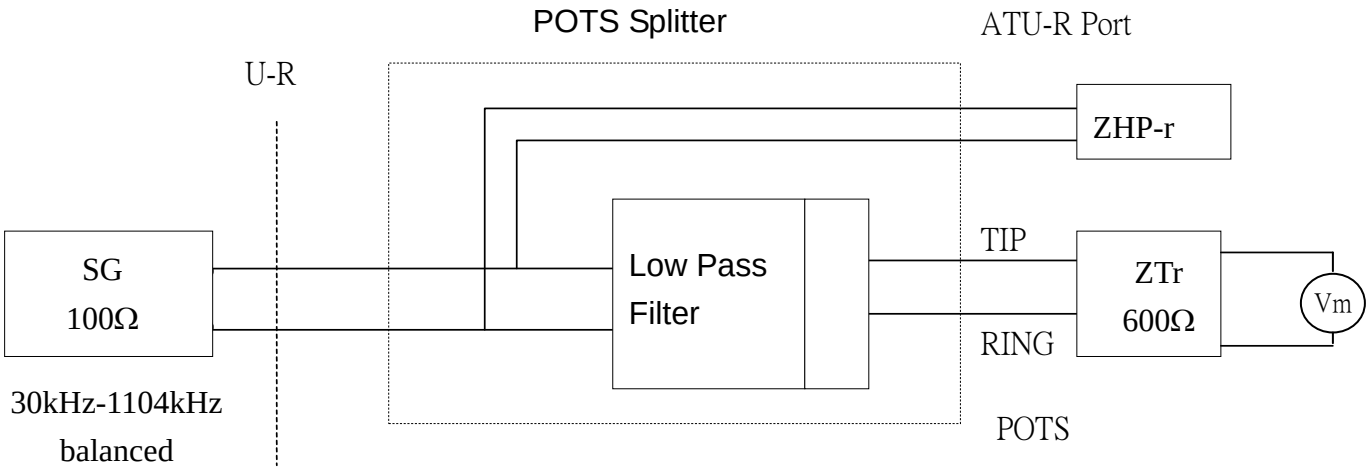


Figure 5 Measurement of the POTS splitter attenuation in the ADSL band.

7.4.3 Method of measurement：

（1） The measurement arrangement is given in Figure 5.

（2） To measurement of the POTS splitter attenuation in the ADSL band. and record test result

7.5 Attenuation Distortion in the Voice Band

7.5.1 Purpose：To verify that the POTS Splitter attenuation distortion in the voice band is in compliance with the requirements specified in Table 1.

7.5.2 measurement arrangement：

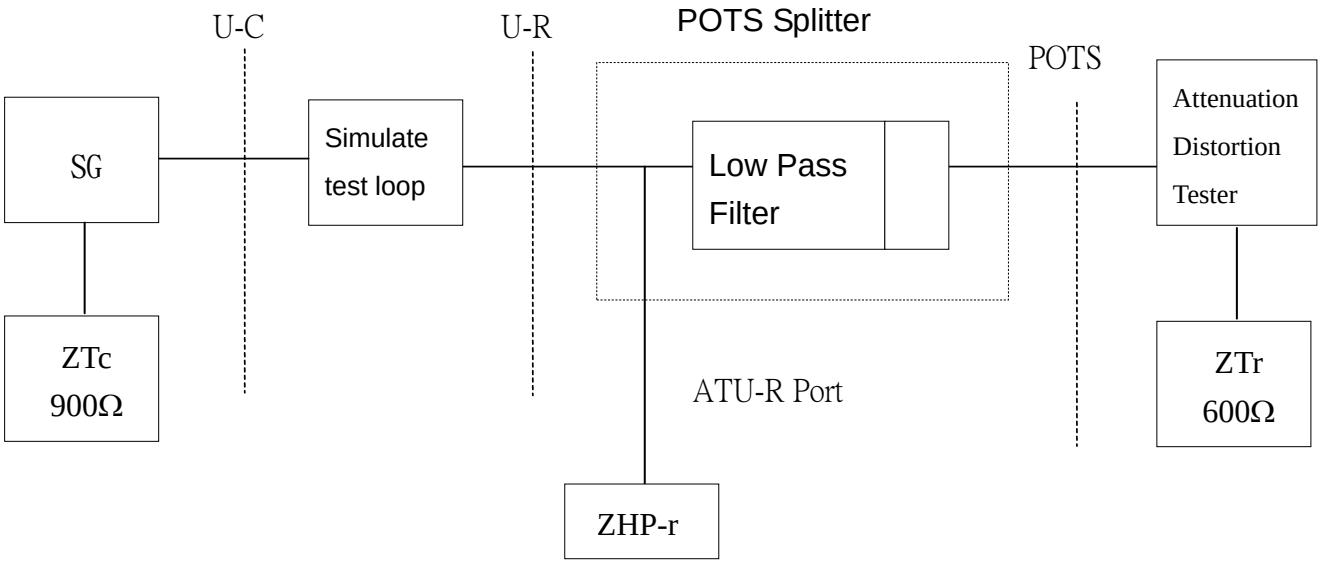


Figure 6 Measurement of the POTS splitter attenuation distortion in the voice band.

7.5.3 Method of measurement：

（1） The measurement arrangement is given in Figure 6.

（2） To choose 26AWG 0ft Cable test loop, the insertion loss at 200Hz to 3400Hz test signal from the source to the termination shall be measured and without the POTS Splitter/ZHP-r combination inserted.

（3） The attenuation distortion at 200Hz to 3400Hz test signal from the source to the termination shall be measured and with the POTS Splitter/ZHP-r combination inserted.

（4） The attenuation distortion at 1004Hz test signal from the source to the termination shall be measured and with the POTS Splitter/ZHP-r combination inserted. To compare the attenuation distortion at 200Hz to 3400Hz test signal.

（5） Repeat step (2),(3),(4) and to measurement the attenuation distortion at 3400Hz to 4000Hz test signal. To compare the attenuation distortion at 1004Hz test signal.

（6） To choose 26 AWG 0.5kft , 2.0kft, 5kft Cable test loop, repeat step (2),(3),(4),(5). and record test result

7.6 Delay Distortion in the Voice band

7.6.1 Purpose：To verify that the POTS Splitter delay distortion in the voice band is in compliance with the requirements specified in Table 2.

7.6.2 measurement arrangement：

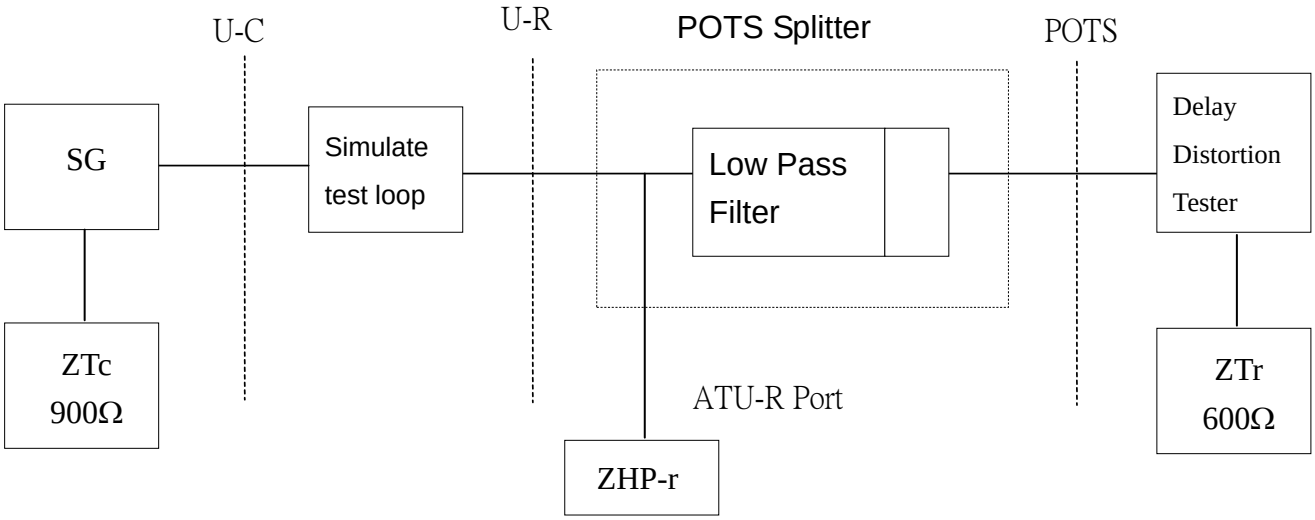


Figure 7 Measurement of the POTS splitter delay distortion in the voice band.

7.6.3 Method of measurement：

（1） The measurement arrangement is given in Figure 7.

（2） To choose 26AWG 0ft Cable test loop, the signal delay at 600Hz to 3200Hz test signal from the source to the termination shall be measured and without the POTS Splitter/ZHP-r combination inserted.

（3） The signal delay at 600Hz to 3200Hz test signal from the source to the termination shall be measured and with the POTS Splitter/ZHP-r combination inserted. To compare the signal delay for (2).

（4） To choose 26AWG 0ft Cable test loop, the signal delay at 200Hz to 4000Hz test signal from the source to the termination shall be measured and without the POTS Splitter/ZHP-r combination inserted.

（5） The signal delay at 20Hz to 4000Hz test signal from the source to the termination shall be measured and with the POTS Splitter/ZHP-r combination inserted. To compare the signal delay for (4). and record test result

（6） To choose 26 AWG 0.5kft , 2.0kft, 5kft Cable test loop, repeat step (2),(3),(4),(5). and record test result

7.7 Return Loss in the Voice band

7.7.1 Purpose：To verify that the POTS Splitter return loss in the voice band is in compliance with the requirements specified in Table 3.

7.7.2 measurement arrangement：

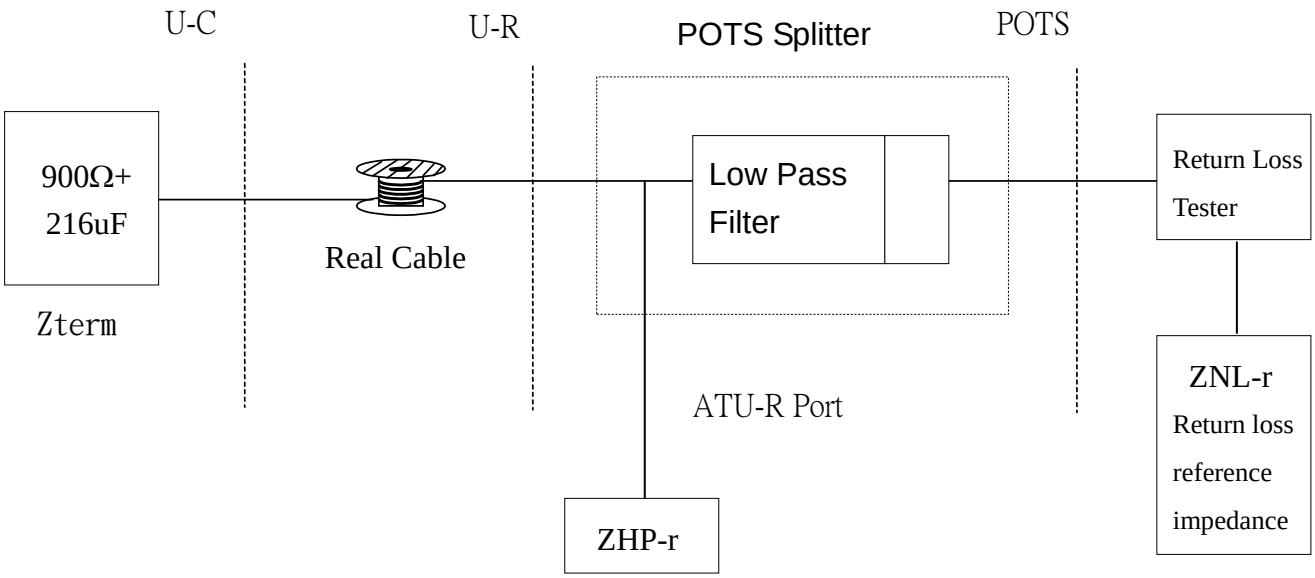


Figure 8 POTS splitter return loss setup

Note 1：ZNL-r is1330Ω in parallel with the series connection of a 348Ω resistor and a 100nF capacitor. that return loss is reference to terminal impedance

Note 2：ZHP-r is a high pass impedance presented to the Post connection by an ATU-R.

Note 3：Real Cable(1kft pairs of 26AWG Cable)

7.7.3 Method of measurement：

（1） The measurement arrangement is given in Figure 8.

（2） To measurement return loss.

（3） To choose Individual frequencies start at 2200 Hz and sweep to 3400 Hz., repeat step (2),(3). and record test result

7.8 Longitudinal Balance Testing in the Voice band

7.8.1 Purpose：To verify that the POTS Splitter longitudinal balance testing in the voice band is in compliance with the requirements specified in 6.1.

7.8.2 measurement arrangement：

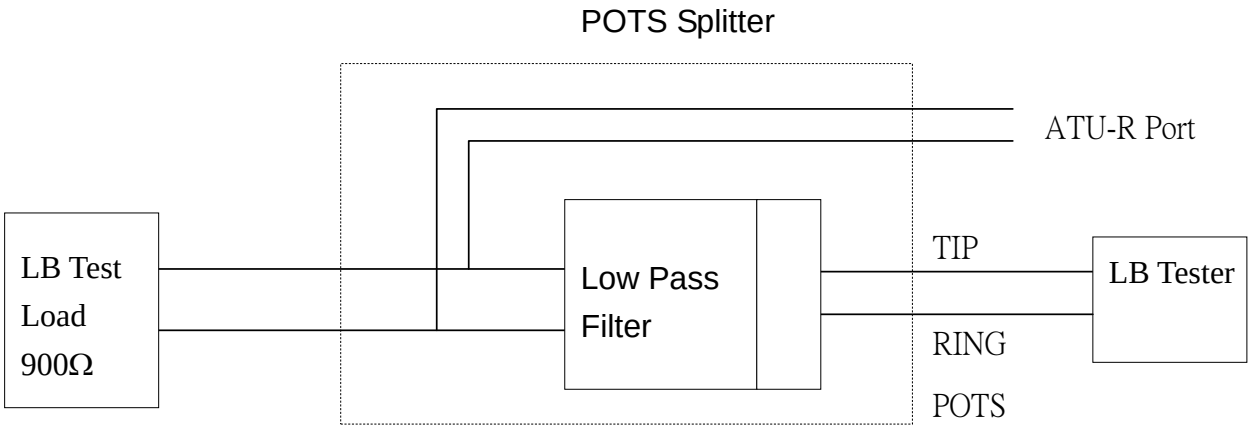


Figure 9 POTS splitter longitudinal balance test setup

Note：Prior to testing, a test circuit balance (calibration) of 77 dB (58 + 19 dB), the applied longitudinal voltage shall be not more than 3.0 V p-p, and a DC bias current of 25mA will be applied.

7.8.3 Method of measurement：

（1） The measurement arrangement is given in Figure 9, and a DC bias current of 25mA will be applied.

（2） To measurement longitudinal balance. and record test result

7.9 Transparent Capacitor

7.9.1 Purpose：To verify that the POTS Splitter transparent capacitor is in

compliance with the requirements specified in 6.1.

7.9.2 measurement arrangement：

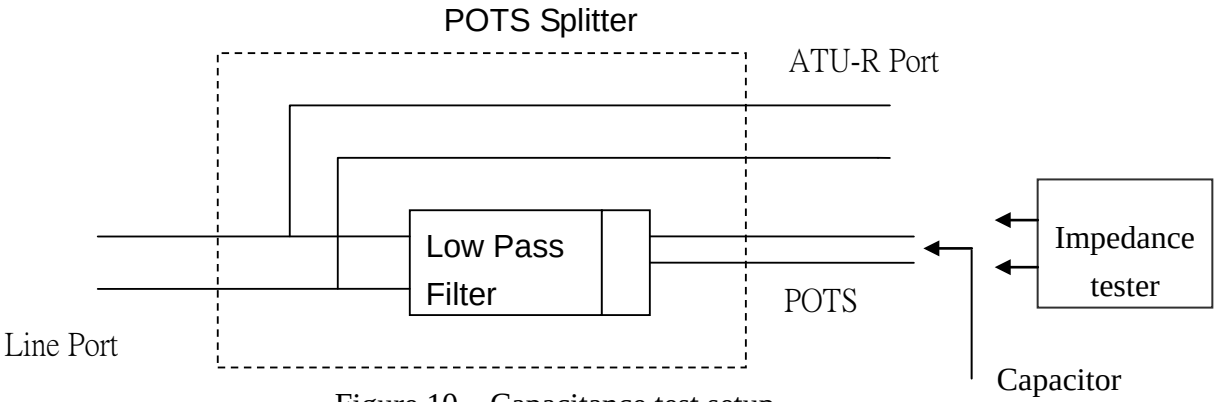


Figure 10 – Capacitance test setup

7.9.3 Method of measurement：

（1） The measurement arrangement is given in Figure 10.

（2） To measurement the POTS Splitter capacitance at the POTS interfaces in the frequency range of 20-30 Hz.

（3） To measurement the stray capacitance to ground from either leg (TIP or RING) of the POTS splitter. and record test result

7.10 Surge Testing

7.10.1 Purpose：To verify that the POTS Splitter U-R interface after applying the surge test, all the operational functions must work well.

7.10.2 measurement arrangement：

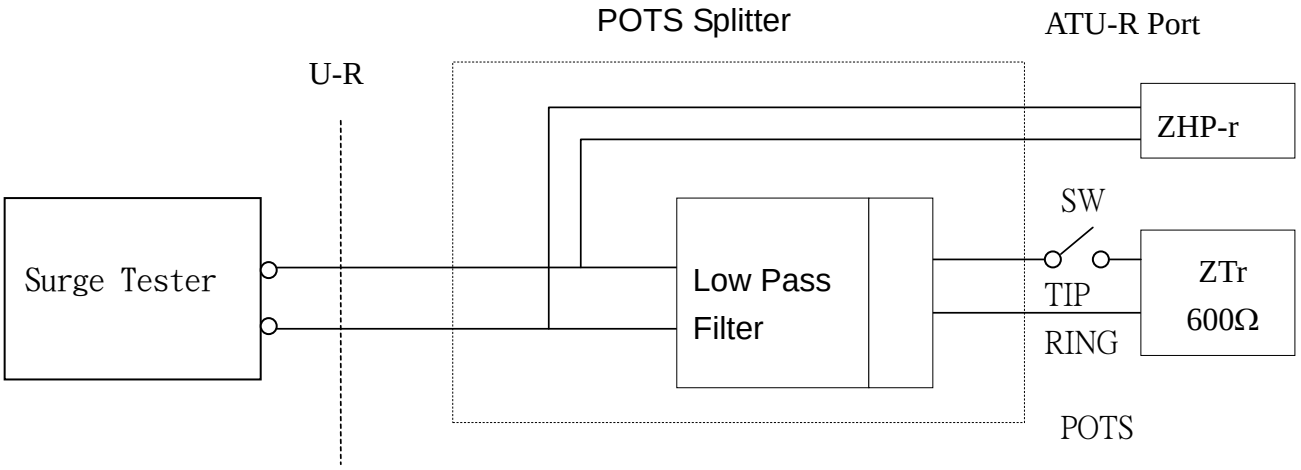


Figure 11 surge test setup

7.10.3 Method of measurement：

（1） The measurement arrangement is given in Figure 11.

（2） Metallic surge wave form :

Type A：

Open Circuit Voltage ：Front time〔Tf〕≦10 μs、decay time 〔Td〕≧560 μs and peak voltage≧800V.

Short Circuit Current ：Front time〔Tf〕≦10 μs、decay time 〔Td〕≧560 μs, the surge generator should support over 100A peak current.

Type B：

Open Circuit Voltage ：Front time〔Tf〕≦9 μs、decay time 〔Td〕≧720 μs and peak voltage≧1000V.

Short Circuit Current ：Front time〔Tf〕≦5 μs、decay time 〔Td〕≧320 μs, the surge generator should support over 25A peak current.

（3） SW OFF, apply one surge of each polarity between two leads.

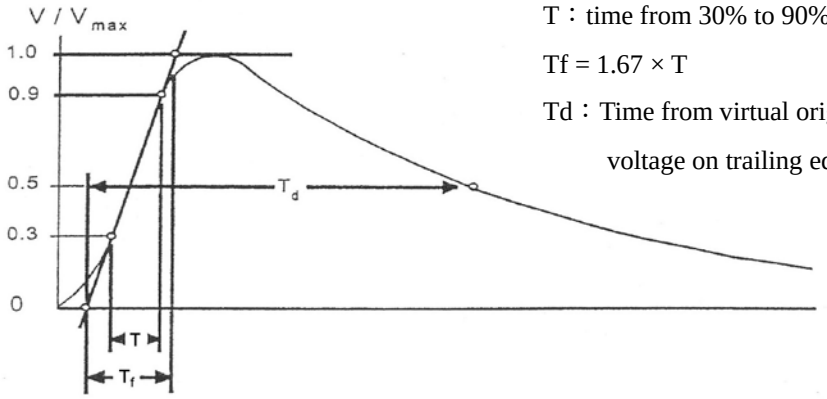
（4） SW ON, apply one surge of each polarity between two leads.

（5） To check the POTS Splitter complying with the conformance requirement section 6.1.

Note：The figure of Voltage Wave-shape of Surge

Front Time (Tf) = 1.67 × T , where T is time from 30% to 90% of peak voltage.

Decay Time (Td): Time from virtual origin to 50% of peak voltage on trailing edge



T：time from 30% to 90% of peak voltage

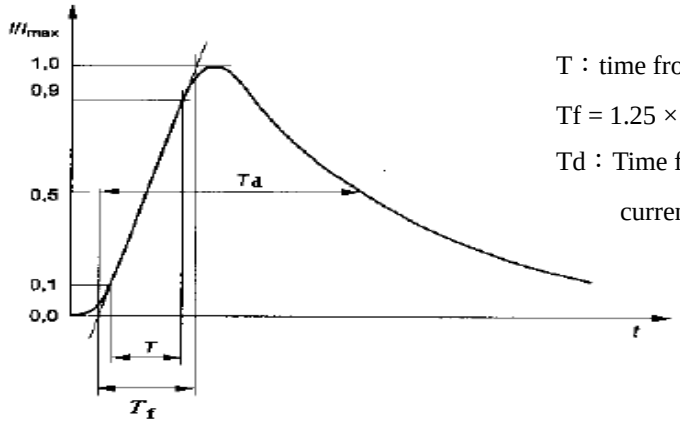
Tf = 1.67 × T

Td：Time from virtual origin to 50% of peak voltage on trailing edge

Note：The figure of Current Wave-shape of Surge

Front Time (Tf) = 1.25 × T , where T is time from 10% to 90% of peak current.

Decay Time (Td): Time from virtual origin to 50% of peak current on trailing edge



T：time from 10% to 90% of peak current

Tf = 1.25 × T

Td：Time from virtual origin to 50% of peak current on trailing edge