

### ADSL POTS SPLITTER

#### ATF049AR

#### 1. Introduction

This document describes tests procedures and tests setup used to perform the measures.

#### 2. Scope

This report is applicable to MAG PN: AS0004-ZY1

#### 3. Reference Document

Production file : AS0004-ZY1

#### 3. Serial Numbers

180400001~180400005 ALL PASS

#### 4. Abbreviations

**ADSL:** Asymmetric Digital Subscriber Line

**ZT-c:** Termination impedance,Central office end

**ZT-r:** Termination impedance,Remote termial end

**ZHP-r:** ADSL terminating impedance for CPE side

#### 5. Definitions

ZHP-r:

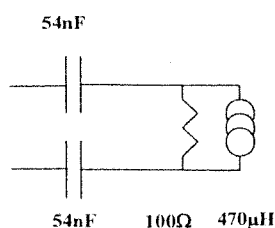


Fig.1

ZT:

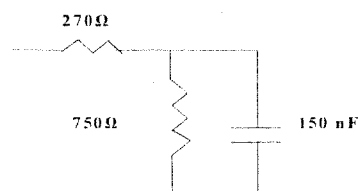


Fig.2

## 6.Filters insertion loss

### 6.1 Specifications

Insertion loss is defined by the equation:

$$IL=20.\log_{10} |V_o/V_i| \text{ dB}$$

$V_o$ =voltage value measured across the line side.

$V_i$ =voltage value measured across the phone side.

Table 1  
Insertion loss

| Description                                                                             | Loss                                |
|-----------------------------------------------------------------------------------------|-------------------------------------|
| ZT-c=270 $\Omega$ +(750 $\Omega$ //150nF),<br>ZT-r=270 $\Omega$ +(750 $\Omega$ //150nF) | <1.0dB(F=1000Hz)                    |
| ZT-c=270 $\Omega$ +(750 $\Omega$ //150nF),<br>ZT-r=270 $\Omega$ +(750 $\Omega$ //150nF) | @1000Hz<br>$\pm 1.1$ dB(200Hz-4kHz) |

### 6.2 Equipment

1- Generator (33120A) /Oscilloscope/ (54621A) or equivalent

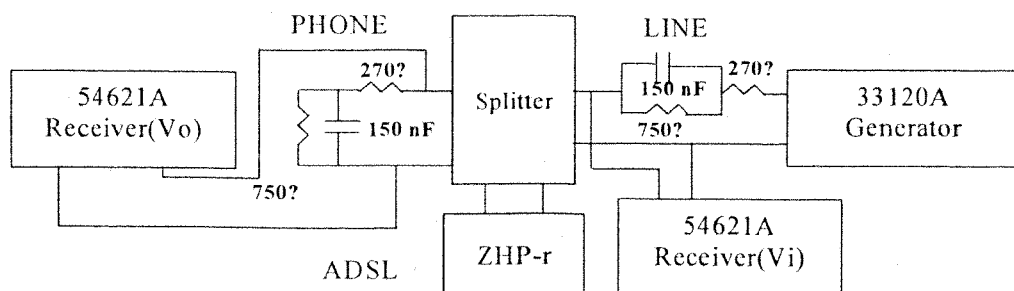
2- ZHP-r as shown in figure 1

### 6.3 Test Procedure

1-Connect the load ZT-r across the Phone side and ZT-c across Phone side

2-Measure the insertion loss expressed in decibel:

Mode SWEEP/Freq. 200Hz-4KHz,  $V=1$  V



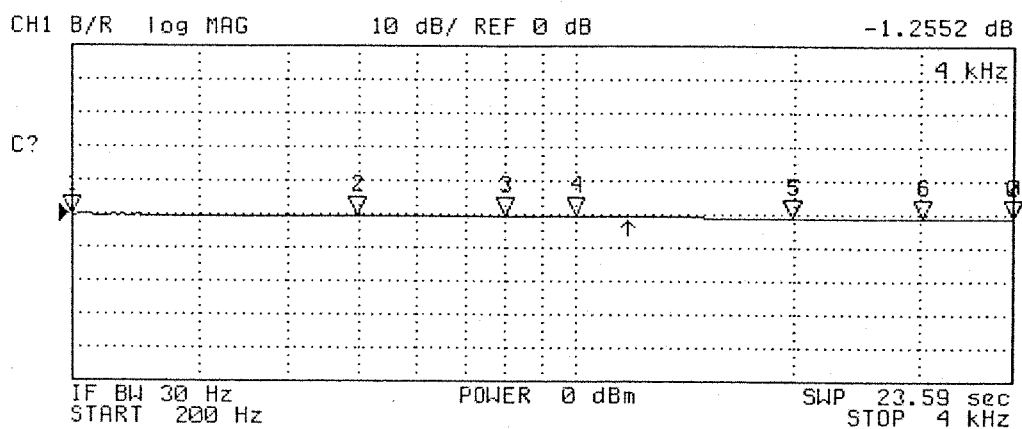


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## 6.4 Test RESULTS



SELECT  
LETTER

SPACE

BACK  
SPACE

ERASE  
TITLE

| N | SWP PARAM | VAL        |
|---|-----------|------------|
| 0 | 4 kHz     | -1.2552 dB |
| 1 | 200 Hz    | -.3273 dB  |
| 2 | 500 Hz    | -.4087 dB  |
| 3 | 800 Hz    | -.5905 dB  |
| 4 | 1 kHz     | -.7068 dB  |
| 5 | 2 kHz     | -1.0583 dB |
| 6 | 3 kHz     | -1.1491 dB |
| 7 | 4 kHz     | -1.2552 dB |

DONE

STOR DEV  
[DISK]

CANCEL

## 7. ADSL Band Attenuation

### 7.1 Specifications

The ADSL band attenuation test set up is shown in figure 3. Minimum value across the ADSL band are given in Table 2.

Table 2

| Attenuation                                                                             |               |                |
|-----------------------------------------------------------------------------------------|---------------|----------------|
| Description                                                                             | 32KHz<f<60KHz | 60KHz<f<600KHz |
| ZT-c=270 $\Omega$ +(750 $\Omega$ //150nF),<br>ZT-r=270 $\Omega$ +(750 $\Omega$ //150nF) | >15dB         | >25dB          |

### 7.2 Equipment

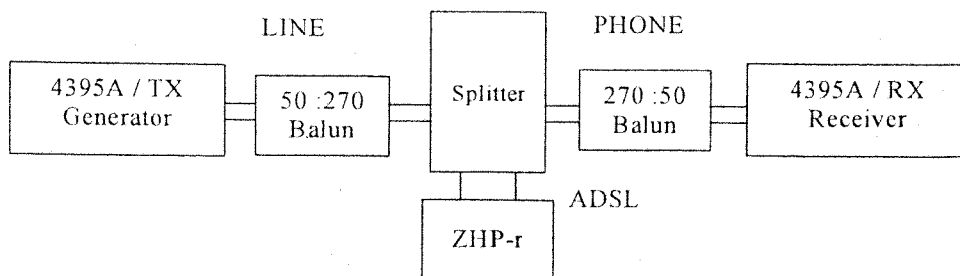
- 1- Analyzer( Agilent 4395A)/ Balun (50:270) or equivalent
- 2- ZHP-r as shown in figure 1

### 7.3 Test Procedure

- 1- Connect the TX source HP4395 to the phone side of the splitter and RX to the line side
- 2- Select AUTOSTEP mode on the (Agilen 4395)

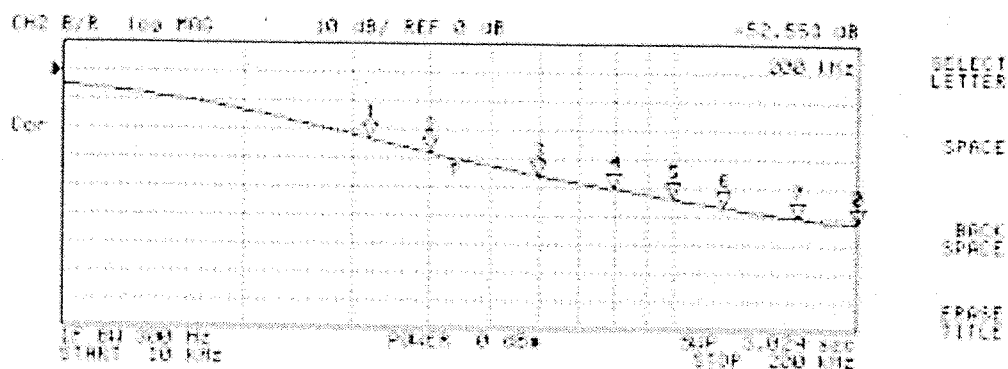
Measure the band attenuation expressed in decibel:

Mode SWEEP/Freq. 30KHz-600KHz, Level:0 dBm



### 7.4 Test Data

#### 32KHz~200KHz



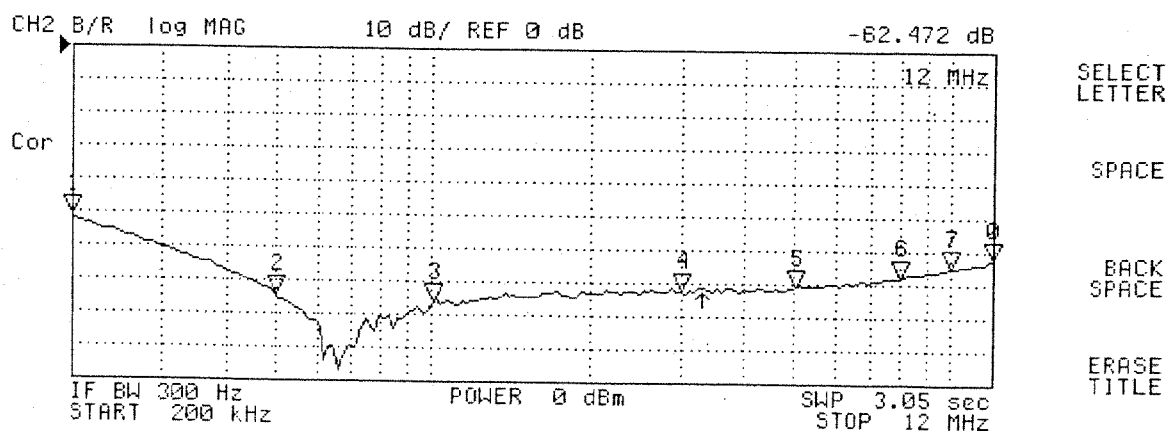
| N | SWP PARAM | VAL        |
|---|-----------|------------|
| 0 | 200 KHz   | -52.553 dB |
| 1 | 32 KHz    | -23.22 dB  |
| 2 | 40 KHz    | -29.157 dB |
| 3 | 60 KHz    | -35.971 dB |
| 4 | 80 KHz    | -40.710 dB |
| 5 | 100 KHz   | -44.009 dB |
| 6 | 120 KHz   | -46.901 dB |
| 7 | 160 KHz   | -50.6 dB   |

DONE

STOR DEV [DISK]

CANCEL

#### 200KHz~12MHz



| N | SWP PARAM | VAL        |
|---|-----------|------------|
| 0 | 12 MHz    | -62.472 dB |
| 1 | 200 kHz   | -51.478 dB |
| 2 | 500 kHz   | -74.46 dB  |
| 3 | 1 MHz     | -76.088 dB |
| 4 | 3 MHz     | -72.51 dB  |
| 5 | 5 MHz     | -70.999 dB |
| 6 | 8 MHz     | -67.996 dB |
| 7 | 10 MHz    | -65.186 dB |

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STOR DEV [DISK]

CANCEL

### 8. Return Loss

#### 8.1 Specification

Table 3

| Frequency                                                                               | 300Hz-500Hz | 500Hz-2kHz | 2kHz-3.4kHz |
|-----------------------------------------------------------------------------------------|-------------|------------|-------------|
| ZT-c=270 $\Omega$ +(750 $\Omega$ //150nF),<br>ZT-r=270 $\Omega$ +(750 $\Omega$ //150nF) | >14 dB      | >18 dB     | >14 dB      |

#### 8.2 Equipment

- 1-Analyzer( Agilent 4284) or equivalent
- 2- ZHP-r as shown in figure 1

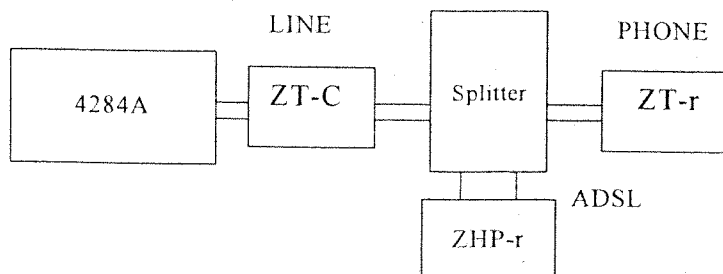
#### 8.3 Test Procedure

- 1- Connect ZT-r load to the Line side of the splitter
- 2- Connect ZT-c load on the Phone side- Select Return Loss mode on the (Agilent 4284A)

Measure the return loss expressed in decibel:

$$RL=20.\log|Z_r+Z_m/Z_r-Z_m|$$

Mode SWEEP/Freq. 300Hz-3.4KHz, @ R-X mode, 1V



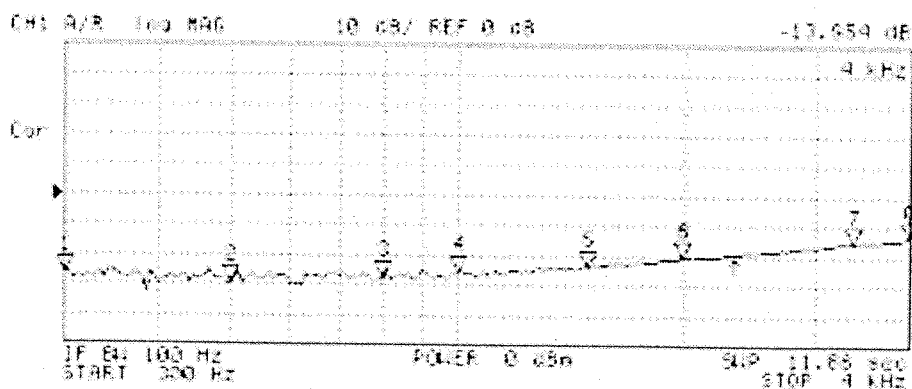


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### 8.3 Test Data



| N | SWP PARAM | VAL        |
|---|-----------|------------|
| 0 | 4 kHz     | -13.954 dB |
| 1 | 300 Hz    | -26.842 dB |
| 2 | 500 Hz    | -29.46 dB  |
| 3 | 800 Hz    | -27.372 dB |
| 4 | 1 kHz     | -25.631 dB |
| 5 | 1.5 kHz   | -23.592 dB |
| 6 | 2 kHz     | -20.805 dB |
| 7 | 3.4 kHz   | -15.546 dB |

SELECT  
LETTER

SPACE

BACK  
SPACE

ERASE  
TITLE

DONE

STOP DEV  
(015x)

CANCEL

### 9. Tip to Ring DC resistance

#### 9.1 Specification

Table 4

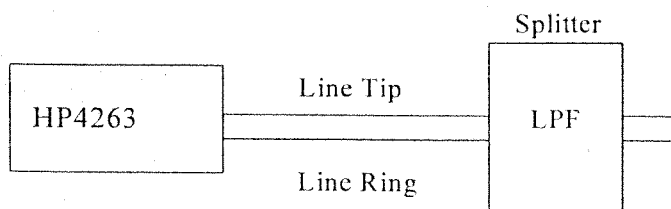
| Value | $< 50\Omega$ |
|-------|--------------|
|-------|--------------|

#### 9.2 Equipment

LCR Multimeter Agilent 4263A or equivalent

#### 9.3 Test procedure

- 1- Connect the 4263A
- 2- Short-circuit the phone side
- 3- Measure the resistance value



#### 9.4 Test RESULTS

$42\Omega \sim 46\Omega$        $< 50\Omega$



### 10. Isolation resistance between Tip and Ring

#### 10.1 Specification

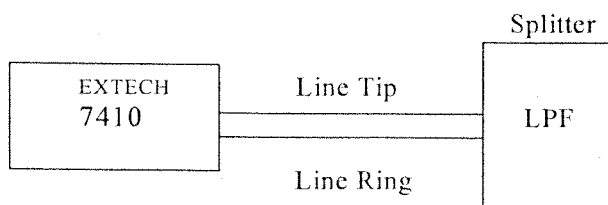
|                |          |
|----------------|----------|
| Test condition | 100 V DC |
| Value          | >25 MΩ   |

#### 10.2 Equipment

EXTECH 7410 or equivalent

#### 10.3 Procedure

- 1- Set the measurement voltage level to 100Vdc
- 2- Connect line tip & ring to the Megohmmeter
- 3- Measure the isolation resistance value between tip and ring



#### 10.4 Teat RESULTS

> 99 MΩ

### 11. Longitudinal conversion loss(LCL)

#### 11.1 Specification

| Frequency range   | Value of R   | value  |
|-------------------|--------------|--------|
| 200 Hz to 3000 Hz | 300 $\Omega$ | >53 dB |

#### 11.2 Equipment

1- Generator/analyzer PCM-4 or equivalent

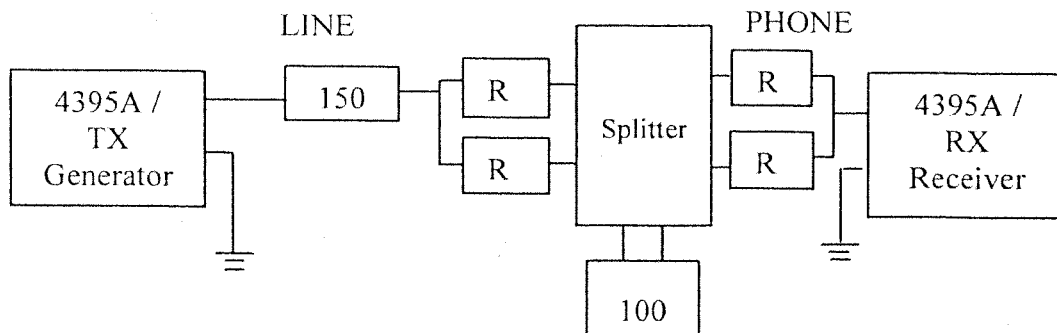
#### 11.3 Test Procedure

1- Connect the TX source HP4395 to the line side of the splitter and RX to the phone side

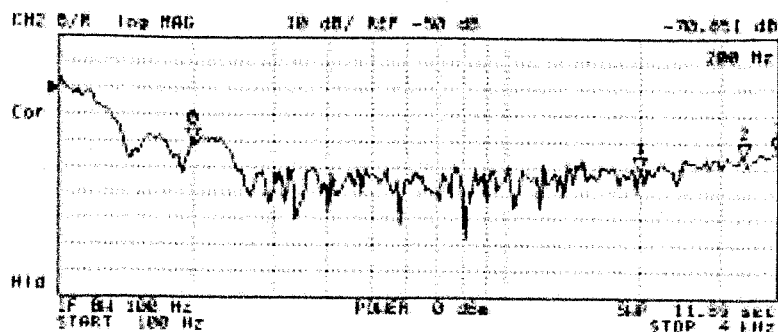
2- Select AUTOSTEP mode on the (Agilen 4395)

Measure the band attenuation expressed in decibel:

Mode SWEEP/Freq. 0.2KHz-5MHz, Level:0 dBm



#### 11.4 Test RESULTS



| N | SVP PARAM | VAL        |
|---|-----------|------------|
| 0 | 200 Hz    | -70.851 dB |
| 1 | 2 kHz     | -81.269 dB |
| 2 | 3.4 kHz   | -75.513 dB |
| 3 | 4 kHz     | -73.985 dB |