

File No	RDPS-MF034	
Revision	R0	
System Application	Asymmetric Digital Subscriber Line	
Product Type	Micro Filter for ADSL CPE SIDE	
Product Name	MF601HK	
Date	Jan . 03 <sup>th</sup> , 2002	
Issued By	Bert Lin - Design Engineer, R&D_1	
	<a href="mailto:bert@ycl.com.tw">bert@ycl.com.tw</a>	
Approved By	Roger Wu – Manager, R&D_1	
	<a href="mailto:roger@ycl.com.tw">roger@ycl.com.tw</a>	
Issued Date		



## YCL Electronics Co., Ltd.

No.95, Feng Jen Road. Feng Shan City, Kaohsiung, Taiwan, R.O.C.

This controlled document is the property of YCL Electronics Co., Ltd. Any duplication reproduction or transmission by unauthorized parties without the prior written permission of YCL Electronics Co., Ltd. is prohibited.

### General Description

The in-Line Micro filter has been specifically designed to implement the functionality of low pass filter in G.Lite system.

G.Lite technology is similar to full rate ADSL in using DMT technology but operates at a lower data rate of up to 1.5Mbps downstream and 512Kbps upstream ,depending on line conditions and lengths.

This in-line filter will block the high frequency energy from reaching the POTS devices and provide isolation from impedance effects of the POTS device on G.Lite.

In addition , this filter will also attenuate any wideband impulse noise generated by the POTS device due to the interruption of loop current(e.g. pulse dialing or on hook / off hook transition)

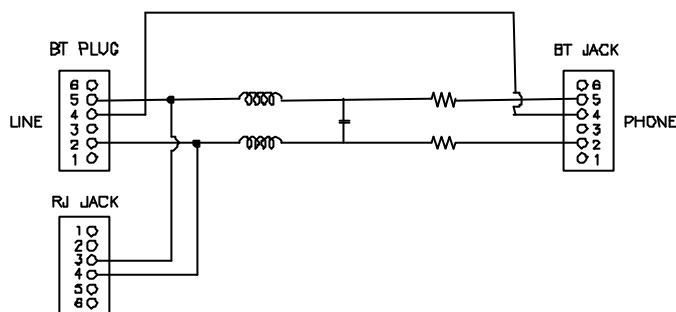
### Features

- .. Consist exclusively of passive element.
- .. Handle all POTS loop currents from 0mA to 100mA.
- .. Designed for implementation of ADSL CPE application.
- .. Provides excellent isolation between DSL and POTS.
- .. Designed to meet G.Lite requirement.

### Specifications

Parameter	Condition	Min.	Typ.	Max	Unit
Filter order			2		
Impedance	@300-4KHz		600Ω		
Attenuation	@25KHz~50KHz	-22			dB
	@50KHz~1100KHz	-40			dB
DCR	Each line			50	Ω
Group delay	@0.6-3.2KHz			100	μs
DC Current				100	mA
Longitudinal balance	@0.2-3KHz	-58			dB
Insertion Loss	@200Hz~4KHz			-1	dB
Return loss into line side	@300Hz~2000Hz	-18			dB
	@2200Hz~3000Hz	-14			dB
	@3400Hz~3900Hz	-12			dB
Return loss into Phone side	@300Hz~2000Hz	-18			dB
	@2200Hz~3000Hz	-14			dB
	@3400Hz~3900Hz	-12			dB

### Schematic



## Introduction

ADSL Lite is proposed as a lower speed version of ADSL that will eliminate the need for telecom to install and maintain a premises based POTS splitter.

Recent field trials of DSL Lite equipment jointly carried out by a group of manufacturers and a North America network operator has proved the technology, achieving maximum data rate for distance up to 15000 feet. It was found necessary to include one or more low pass filters in series with the POTS terminals in order to reliably achieve maximum data rates.

For POTS voice band service, the low pass filter provide protection from ADSL signal which may impact through non-linear or other effects remote devices (handset, fax, voice band modem etc) and central office operation.

For ADSL signal, it also provide protection from the high frequency transient and impedance effect that occur during POTS operation (ringing transients, on-hook, off-hook transient and so on).

## DC characteristic

All requirement of this specification can be met in the presence of all POTS loop currents from 0mA to 100mA.

This in line filter can pass POTS tip-to-ring dc voltages of 0V to 105V and ringing signals of 40V to 150Vrms at any frequency from 15.3Hz to 68Hz with a dc component in the range from 0V to 105V.

The dc resistance from tip-to-ring at the line port interface with the phone interface shorted, shall be less than or equal to 100 ohms.

The DC resistance from tip-to-ground and from ring-to-ground at the POTS interface with the U-R interface open shall be greater than or equal to 5 Megohms.

The ground point shall be local building or green wire ground. As an objective, the dc resistance should exceed 10MΩ.

## ZHP-r Defined

To facilitate testing of the inline filter independently of the actual modem or specific vendor, ZHP-r is defined to allow proper termination of the XDSL port during voice band testing. The ZHP-r is valid only for voice band frequency.

The combination of capacitors in the ZHP-r is only representative. The input shall be 27nF however derived. ZNP-r equivalent circuit is shown in Figure 1.

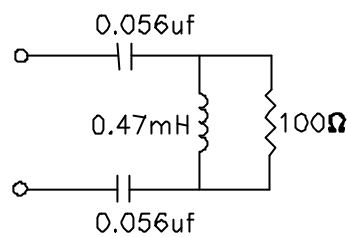


Figure 1

### POTS band added insertion loss

In general , the insertion loss is defined as the ratio , expressed in dB of the power delivered to a load with the circuit in place and the power delivered to a load without the circuit in place.

The added insertion loss shall be measured using the test up in Figure 2. For measuring POTS band insertion for single filter module also a single filter with four added parallel load filters

### Return loss

Return loss is essentially defined as the ratio of the power incident upon a given transmission system to the power reflected caused by impedance mismatch with respect to reference impedance at the interface between source and device.

Return loss shall be measured using the test setup in Figure 3.

### Installation

This unit have been equipped with two RJ11 Jack on both telephone interface and line interface which are 6 position modular Jack , with conductor 3 and 4 loaded.

Indicatory making( eg. Phone , line) have been provided on the top side of this unit to assist in position during installation.

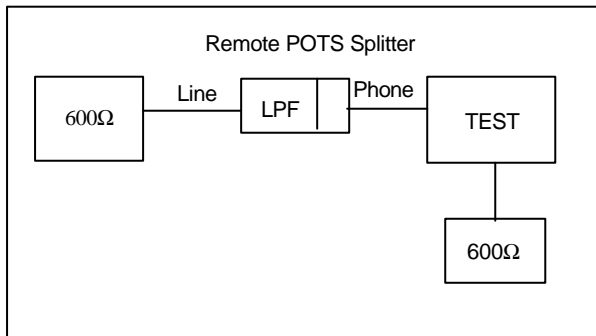


Figure 2. POTS Band Insertion loss Test Setup

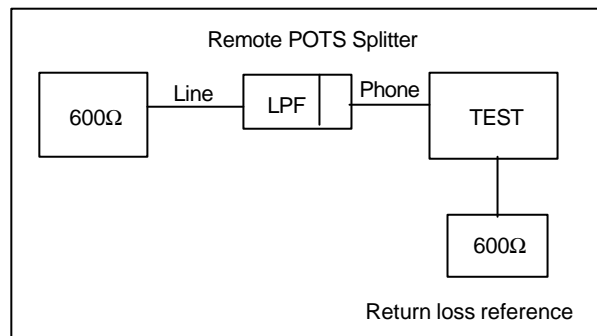


Figure 3. POTS Band Return loss Test setup

Dimension

