## *ADSL POTS SPLITTER for Customer Premises*


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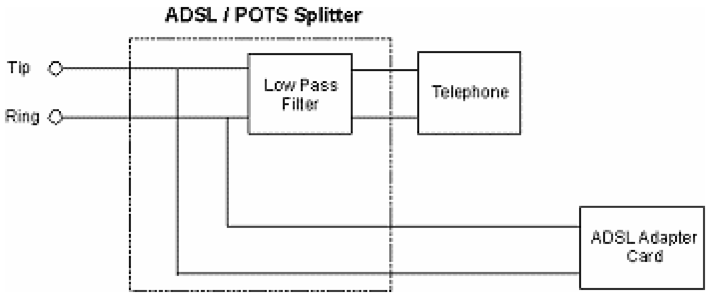
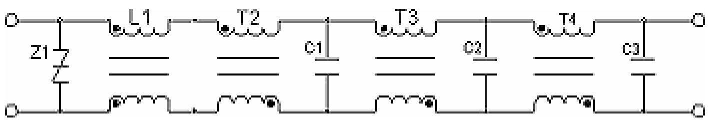
The ADSL POTS Splitter takes full advantage of the 1.1MHz copper line frequency spectrum. ADSL technology operates between 26KHz and 1.1 MHz while voice calls operate between 300Hz and 3.4KHz. Because the two frequency spectrums do not overlap, it follows that both data and voice can be present at the same time on a single pair of copper wire.




The ADSL POTS splitter is simply a series of coupled inductors and parallel capacitors forming a low pass filter that attenuates the higher frequency ADSL data and permits only the voice frequencies to reach the telephone. The following is the recommended circuit for an ADSL POTS splitter application:




**6th ORDER POTS SPLITTER PARTS LIST:**
T2 40101 Coupled Inductor
T3 & T4 40109 Coupled Inductor
*L1 40864 Common-mode Choke
C1 & C2 68nF Capacitor
C3 47nF Capacitor
*Z1 Surge Arrester

*Elements Z1 and L1 are used to control undesirable signals frequently encountered on telecommunication lines. The surge arrester Z1 is utilized to deflect voltage spikes while the common-mode choke L1 is used as a filter to eliminate noise common to both lines.

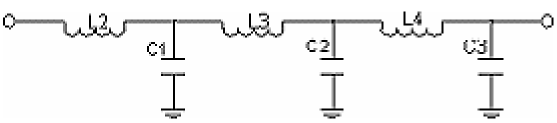



**Figure 1**

The low pass circuitry L2, L3, L4 and C1, C2, C3 can be modeled as a triple L filter realized in figure 1. At low frequencies, the reactance of the series inductors decreases while the reactance of the shunt capacitors becomes very large. In effect, these components are transparent as the source signal is delivered to the load. At higher frequencies, the series and shunt reactance becomes significant and impedes energy transferred to the load as graphically illustrated in figure 2.

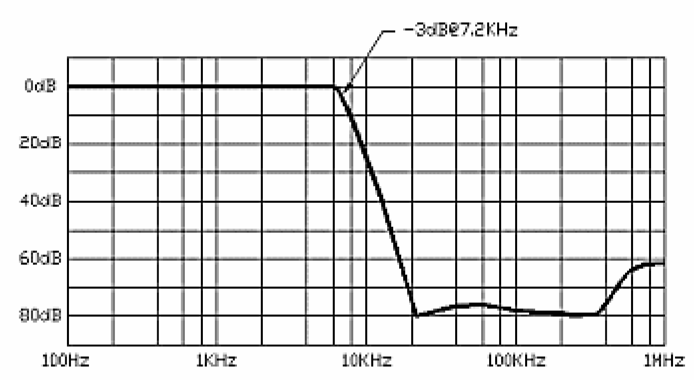



**Figure 2**

Economical filtering can be accomplished with the 3rd order low pass filter presented in figure 3. Unlike the previously suggested circuit, this filter contains no surge or noise protection and is intended for direct connection at the phone. This low pass filter offers a unique characteristic in that the phone line connection can be made on either end of the filter. Thus increasing manufacturability and possibly eliminating any confusing installation procedures for the consumer.

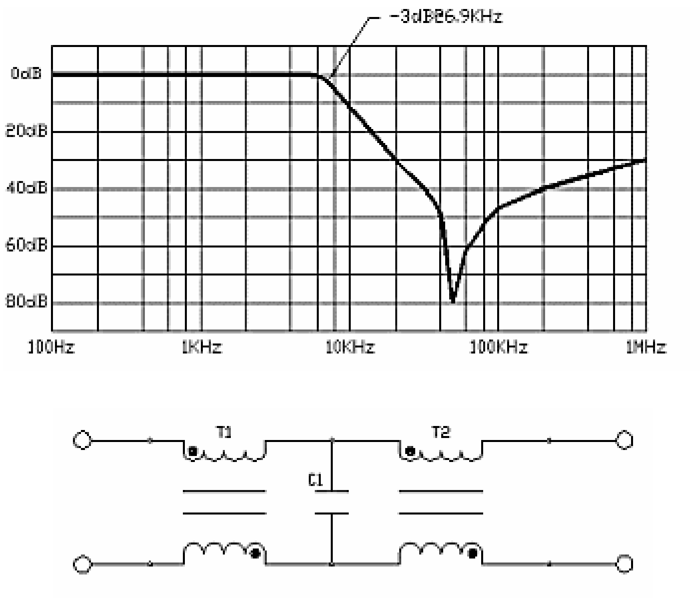
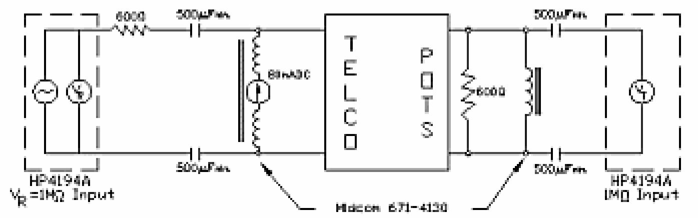



**Figure 3**

**3rd ORDER POTS SPLITTER PARTS LIST:**
T1 & T2 40109 Coupled Inductor
C1 47nF Capacitor

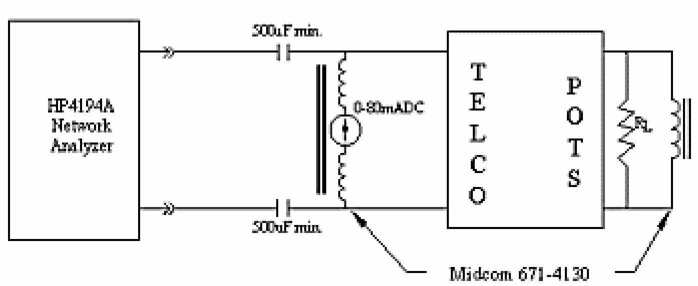
In order to measure the true characteristic output of a low pass POTS filter, it is paramount that the correct test methods are employed. The following diagrams exemplify the proper test setup for each fundamental characteristic.

**Frequency Response/Insertion Loss/Delay Distortion/Attenuation:**




Note: Ramp D.C. slowly to avoid damage to the analyzer.

**Return Loss:**




Note: Ramp D.C. slowly to avoid damage to the analyzer. $R_L$ is defined as 600 Ohms minus the D.C. resistance of the low pass circuitry.

**Common-Mode Rejection:**