

## DSL Filter DT60-0052AP

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### Introduction:

Plain old telephone service (POTS) splitters and microfilters are used on telephone lines to ensure voice and data call quality. This document describes splitters and microfilters and how and when to use them. POTS splitters result in the best data and voice performance when the router and the telephone are used on the same telephone line.

### Features:

- All Delta ADSL Microfilters are used to block any noise generated by other phones, fax, answering machines and analog modems are being introduced on the POT line, and pass high frequency signal to ADSL Modem.
- Complies with Full Rate G.dmt(G.992.1) or G.lite(G.992.2) ADSL.
- Use one Microfilter for each telephone device. If several devices are connected to the same telephone wall jack, use only one Microfilter between the first device and the wall jack.
- Supports up to 5 Microfilters without any degradation in line quality.
- Minimize voice band interference transmission, signaling and supervision.
- Our in-line DSL filter design electronically isolates the high-speed DSL data streams from the voice band Plain Ordinary Telephone Service (POTS) This design effectively blocks the ADSL and other radio frequencies up to 10 Megahertz.
- G Lite, V.90 and Metallic Loop Testing compatible.
- FCC CFR 47 Part 68 and UL 1950 Compliant and listed.

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### Description:

Microfilters are installed on telephones to improve voice call quality when voice and data equipment are using the same telephone line (twisted pair). The Filter series is an in-line filter designed to expedite the service delivery and improve the performance of Asymmetric Digital Subscriber Line (ADSL) services. This model filters all telephone sets, facsimile machines, answering machines, etc individually or in groups on line 1 only.

### Applications:

The Filter series filters are used with other filters distributed throughout the subscribers' premises to isolate all voice band equipment devices such as telephone sets (including cordless types), answering machines, facsimile (fax) machines, 56Kb/s and lower rate modems, automatic dialers, and recorder connectors. The filters may also be used to isolate the telephone network jack connected to a digital cable and/or satellite television set-top box. The Filter series in-line DSL filter is one of many filters manufactured by Delta Electronic, Inc. for subscriber installed digital services within homes, offices, and hotels.

### DSL Filter DT60-0052AP series Specification:

		Standard Specification	Product Part #: DT60-0052AP Specification	Product Part #: DT60-0052AP Test data	Comments
<b>I</b>	<b>General:</b>				
1	Over Voltage	47 CFR 68.302 (b) and (c) Telephone line surge type A and type B	47 CFR 68.302 Type A & Type B	OK	
2	Safety	UL 1950	UL1950	compliant	
3	POTS line test capability	Max capacitance to ground from Tip or Ring less than 1nF in the 20 – 68 Hz band	<1nF	OK	
4	Compliance for FCC voice	CFR 47 part 68	CFR 47 part 68	FCC part 68	

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	band equipment	registrations		on-going	
5	Caller ID compatibility	Required	Required	OK	
6	Voice band data compatibility	Required	Required	OK	
7	Hazardous material – cable etc	MS spec H00594	Pb<90 ppm Cr < 25 ppm	OK	
<b>II</b>	<b>Electrical General:</b>				
1	DC Resistance Tip – Ring at the Network port	Less than 25 ohms	< 25 $\Omega$ at 5mA ~ 90mA	OK	
2	DC Resistance to ground from any terminal				
2a	DC voltages 0- 100V	Greater than 10 Mega ohms	> 10M	OK	
2b	DC voltages 101 - 200V	Greater than 30 Kilo ohms	> 30K	OK	
3	Operating DC Current	5 ma – 90 ma	5mA ~ 90mA	OK	
4	Operating DC voltage	0 to -80 V	0 to -80V	OK	
5	Ringing Signal	40 – 106 Vrms (17-23 HZ) superimposed on -20 to -80 Vdc	superimposed on -20 to -80 Vdc	OK	
<b>III</b>	<b>ON-Hook Voice Band (0.2 KHZ to 2.8 KHZ) specs:</b>	Under 0 ma DC current, -48V DC bias. Max of Five filters			
1	ON-HOOK <b>Insertion Loss</b> at 1004 HZ	With and without ZHP-r			
1a	Single Filter	Between 1.5 db and -0.5 db	+1.5 -0.5 dB	+1.33 dB	
1b	Five Filter	Between 6.5 db and -1.0 db	+6.5 -1.0 dB	+3.91 dB	
2	ON-HOOK <b>Insertion Loss Distortion</b>				
2a	0.2 KHZ to 1 KHZ, Single Filter	Between 1.5 db and -1.5 db	+1.5 -1.5 dB	+0.6 dB	
2b	0.2 KHZ to 1 KHZ, Five Filter	Between 2.0 db and -5.5 db	+2.0 -5.5 dB	+0.8 dB	
2c	1 KHZ to 2.8 KHZ, Single Filter	Between 1.5 db and -1.5 db	+1.5 -1.5 dB	+1.24 dB	
2d	1 KHZ to 2.8 KHZ, Five Filter	Between 2.0 db and -2.0 db	+6.0 -2.0 dB	+5.4 dB	

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3	<b>ON-HOOK Insertion Envelop Delay Distortion</b> (between 0.3 KHZ to 2.8 KHZ relative to a reference frequency close to 1800 HZ)	Less than 250 Micro sec	<250 us	27 us	
<b>IV</b>	<b>OFF-Hook Voice Band (0.2 KHZ to 4 KHZ) specs:</b>				
1	<b>OFF-HOOK Insertion Loss at 1004 HZ</b>				
1a	Single Filter	Between 0.5 db and -0.5 db	+0.5 -0.5 dB	+0.01dB	
1b	Five Filter	Between 1.0 db and -1.0 db	+1.0 -1.0 dB	+0.26 dB	
2	<b>OFF-HOOK Insertion Loss Distortion</b>				
2a	0.2 KHZ to 3.4 KHZ, Single Filter	Between 0.5 db and -1.0 db	+0.5 -1.0 dB	+0.31 dB	
2b	0.2 KHZ to 3.4 KHZ, Five Filter	Between 2.5 db and -1.5 db	+4.0 -1.5 dB	+3.56 dB	
2c	3.4 KHZ to 4.0 KHZ, Single Filter	Between 1.0 db and -1.5 db	+1.0 -1.5 dB	+0.5 dB	
2d	3.4 KHZ to 4.0 KHZ, Five Filter	Between 3.25 db and -2.0 db	+5.5 -2.0 dB	+4.77 dB	
<b>V</b>	<b>OFF-HOOK Impedance Distortion</b>				
1	Phone Port				
1a	SRLL	Min 13 db	Min 15 dB	21 dB	
1b	ERL	Min 9 db	Min 7 dB	10 dB	
1c	SRLH	Min 3 db	Min 2 dB	3 dB	
2	Network Port				
2a	SRLL	Min 12 db	Min 26 dB	29 dB	
2b	ERL	Min 10 db	Min 15 dB	18 dB	
2c	SRLH	Min 5 db	Min 8 dB	10 dB	

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<b>VI</b>	<b>OFF-HOOK Inter modulation distortion</b>				
1	Phone Port measurement				
1a	Second order distortion	57 db below main received signal	>57 dB	64 dB	
1b	Third order distortion	60 db below main received signal	>60 dB	72 dB	
2	Network Port measurement				
2a	Second order distortion	57 db below main received signal	>57 dB	65 dB	
2b	Third order distortion	60 db below main received signal	>60 dB	77 dB	
<b>VII</b>	<b>OFF-HOOK Insertion Envelop Delay Distortion</b>				
1	Phone port	Less than 250 Micro sec	<250 us	43 us	
2	Network port	Less than 250 Micro sec	<250 us	44 us	
<b>VIII</b>	<b>Transverse balance</b>				
1	OFF-HOOK, 7– 90 ma				
1a	0.2 – 1 KHZ	40 db	>40 dB	53 dB	
1b	1 – 12 KHZ	40 db	>40 dB	47 dB	
1c	12 KHZ – 1.544 MHZ	35 db	>35 dB	43 dB	
1d	1.544 – 12 MHZ	30 db	>30 dB	37 dB	
2	ON-HOOK, 0 ma				
2a	0.2 – 1 KHZ	60 db	>60 dB	66 dB	
2b	1 – 12 KHZ	40 db	>40 dB	46 dB	
2c	12 KHZ – 1.544 MHZ	35 db	>35 dB	41 dB	
2d	1.544 – 12 MHZ	30 db	>30 dB	39 dB	
<b>IX</b>	<b>High Frequency band (25 KHZ – 12 MHZ) performance:</b>				
1	ON-HOOK stop band attenuation				
1a	25 – 50 KHZ	Minimum 12 db	>12 dB	22 dB	
1b	50 KHZ – 10 MHZ	Minimum 12 db	>12 dB	35 dB	

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2	OFF-HOOK stop band attenuation				
	Loop current between 20ma and 90 ma				
2a	25 – 50 KHZ	Minimum 21 db	>21 dB	21.5 dB	
2b	50 KHZ – 12 MHZ	Minimum 25 db	>25 dB	32 dB	
	Loop current 7 ma				
2c	25 – 50 KHZ	Minimum 13 db	>13 dB	21.5 dB	
2d	50 KHZ – 12 MHZ	Minimum 22 db	>22 dB	33 dB	
3	OFF-HOOK bridging loss				
	One Filter				
3a	25 KHZ – 1.2 MHZ	Max 0.5 db	<0.5 dB	0.01 dB	
3b	1.2 MHZ – 12 MHZ	Max 3.0 db	<3.0 dB	0.51 dB	
	Five Filters				
3c	25 KHZ – 1.2 MHZ	Max 1.25 db	<1.25 dB	0.02 dB	
3d	1.2 MHZ – 12 MHZ	Max 4.0 db	<4.5 dB	3.97 dB	
<b>X</b>	<b>ADSL band inter modulation distortion</b>				
1	Upstream ON-HOOK (0 ma Loop current)	Not exceeding –140 dbm /HZ	<-140 dB/Hz	-152 dB/Hz	
2	Upstream OFF-HOOK (20 and 90 ma Loop current)	Not exceeding –130 dbm /HZ	<-130 dB/HZ	-130 dB/Hz	
3	Downstream ON-HOOK (0 ma Loop current)	Not exceeding –114 dbm /HZ	<-114 dB/Hz	-114 dB/Hz	
4	Downstream OFF-HOOK (20 and 90 ma Loop current)	Not exceeding –114 dbm /HZ	<-114 dB/ Hz	-114 dB/Hz	

**Table 1: Specification List**

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