



Linear Active DIP Filters

6-Pole Bessel Low-Pass Filter

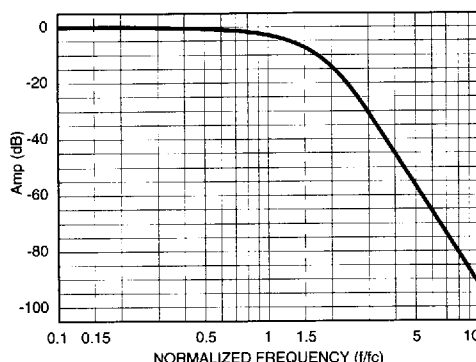
Description

The D70L6L is an 6-pole low-pass Bessel transfer function, has a monotonic roll-off in the passband and the stopband, and its final rolloff rate is 36 dB/octave in the stopband. It exhibits a constant delay in the passband and has an overshoot free step response.

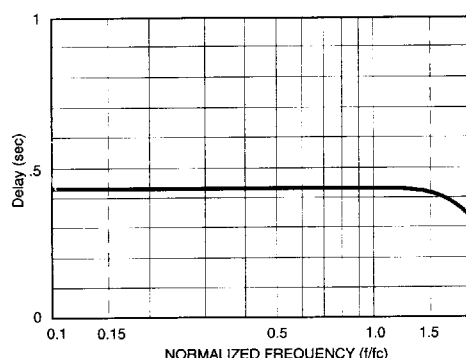
Specifications

Transfer Function	6-pole Bessel Low-Pass
Size	0.825" x 0.625" x 0.3"
Range f_c	500 Hz to 50 kHz
Passband Ripple (theoretical)	0.0 dB
DC Voltage Gain (non-inverting)	0 ± 0.2 dB typ.
Stopband Attenuation Rate	36 dB/octave
Cutoff Frequency f_c (-3 dB)	
Accuracy	$\pm 2\%$ max.
Stability	$\pm 0.02\%$ / °C
Phase	-155°
Filter Attenuation	(theoretical)
1.89 dB	$0.80 f_c$
3.01 dB	$1.00 f_c$
60.0 dB	$5.41 f_c$
80.0 dB	$7.99 f_c$
Phase Match ²	
Amplitude Accuracy ²	
Total Harmonic Distortion @ 1kHz	< -90 dB
Wide Band Noise (5 Hz - 2 MHz)	200 μ V _{RMS} typ.
Narrow Band Noise (5 Hz - 100 kHz)	50 μ V _{RMS} typ.

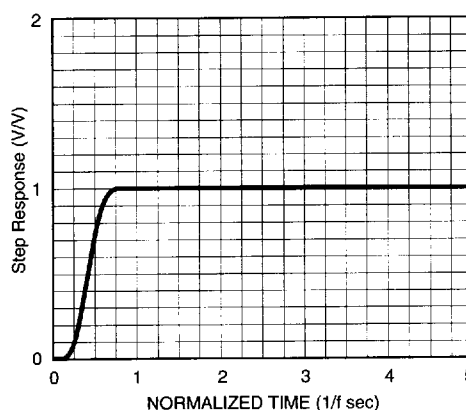
Frequency Response



Delay (Normalized)



Step Response



Theoretical Transfer Characteristics

f/f_c (Hz)	Amp (dB)	Phase (deg)	Delay ¹ (sec)
0.00	0.00	0.00	.430
0.10	-0.029	-15.5	.430
0.20	-0.116	-31.0	.430
0.30	-0.261	-46.5	.430
0.40	-0.465	-62.0	.430
0.50	-0.728	-77.4	.430
0.60	-1.05	-92.9	.430
0.70	-1.44	-108	.430
0.80	-1.89	-124	.430
0.85	-2.15	-132	.430
0.90	-2.42	-139	.430
0.95	-2.70	-147	.430
1.00	-3.01	-155	.430
1.10	-3.68	-170	.429
1.20	-4.44	-186	.428
1.30	-5.29	-201	.426
1.40	-6.23	-216	.422
1.50	-7.29	-232	.416
1.60	-8.46	-246	.401
1.70	-9.74	-261	.393
1.80	-11.1	-275	.376
1.90	-12.6	-287	.357
2.00	-14.2	-300	.335
2.25	-18.3	-328	.279
2.50	-22.6	-351	.228
2.75	-26.7	-369	.187
3.00	-30.7	-385	.156
3.25	-34.5	-398	.131
3.50	-38.1	-408	.111
4.00	-44.7	-426	.083
5.00	-55.9	-449	.052
6.00	-65.2	-465	.036
7.00	-73.2	-476	.026
8.00	-80.1	-484	.020
9.00	-86.2	-490	.015
10.0	-91.6	-495	.013

2. Phase Match and Amplitude Accuracy are within $\pm 2\%$ max., $\pm 1\%$ typ. of the theoretical transfer characteristics.

1. Normalized Group Delay: The above delay data is normalized to a corner frequency of 1.0 Hz. The actual delay is the normalized delay divided by the actual corner frequency (f_c).

$$\text{Actual Delay} = \frac{\text{Normalized Delay}}{\text{Actual Corner Frequency } (f_c) \text{ in Hz}}$$