FREQUENCY DEVICES™

Model D70L8L

Linear Active DIP Filters

8-Pole Bessel Low-Pass Filter

Description

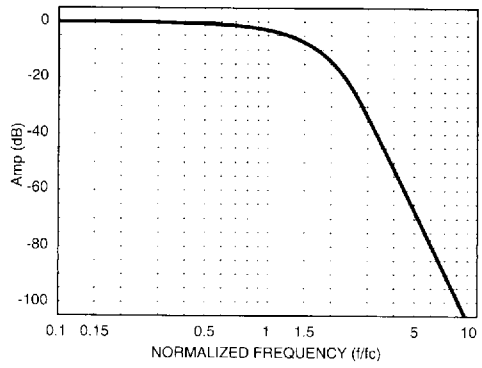
The D70L8L is an 8-pole low-pass Bessel transfer function, has a monotonic roll-off in the passband and the stopband, and its final rolloff rate is 48 dB/octave in the stopband. It exhibits a constant delay in the passband and has an overshoot free step response.

Specifications

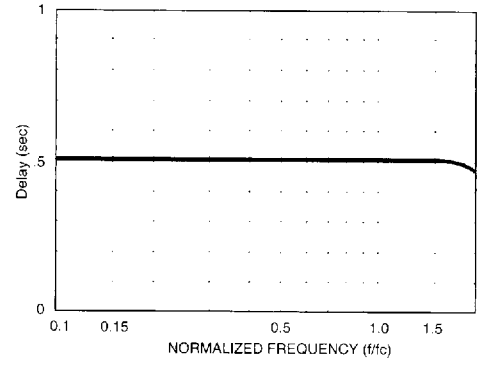
Transfer Function	8-pole Bessel Low-Pass
Size	0.825" x 0.625" x 0.3"
Range f_c	500 Hz to 50 kHz
Passband Ripple (theoretical)	0.0 dB
DC Voltage Gain (non-inverting)	0 ± 0.2 dB typ.
Stopband Attenuation Rate	48 dB/octave
Cutoff Frequency f_c (-3 dB)	
Accuracy	± 2 % max.
Stability	± 0.02 % / °c
Phase	– 182°
Filter Attenuation	(theoretical)
1.91 dB	0.80 f_c
3.01 dB	1.00 f_c
60.0 dB	4.52 f_c
80.0 dB	6.07 f_c
Phase Match [2]	
Amplitude Accuracy [2]	
Total Harmonic Distortion @ 1kHz	< – 90 dB
Wide Band Noise (5 Hz - 2 MHz)	200 μV_{RMS} typ.
Narrow Band Noise (5 Hz - 100 kHz)	50 μV_{RMS} typ.

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

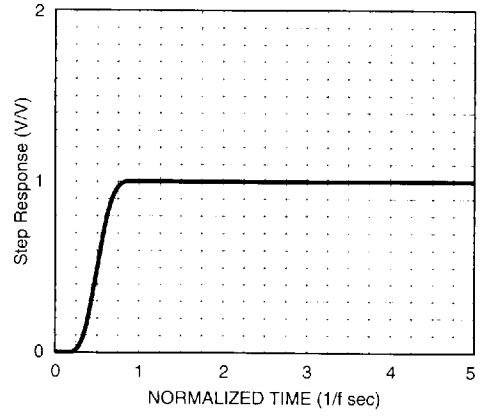
Frequency Response



Delay (Normalized)



Step Response



Theoretical Transfer Characteristics

f/fc (Hz)	Amp (dB)	Phase (deg)	Delay [1] (sec)
0.00	0.00	0.00	.506
0.10	-0.029	-18.2	.506
0.20	-0.117	-36.4	.506
0.30	-0.264	-54.7	.506
0.40	-0.470	-72.9	.506
0.50	-0.737	-91.1	.506
0.60	-1.06	-109	.506
0.70	-1.45	-128	.506
0.80	-1.91	-146	.506
0.85	-2.16	-155	.506
0.90	-2.42	-164	.506
0.95	-2.71	-173	.506
1.00	-3.01	-182	.506
1.10	-3.67	-200	.506
1.20	-4.40	-219	.506
1.30	-5.20	-237	.506
1.40	-6.10	-255	.505
1.50	-7.08	-273	.504
1.60	-8.16	-291	.502
1.70	-9.36	-309	.498
1.80	-10.7	-327	.492
1.90	-12.1	-345	.482
2.00	-13.7	-362	.468
2.25	-18.1	-402	.417
2.50	-23.1	-436	.352
2.75	-28.3	-465	.291
3.00	-33.4	-489	.241
3.25	-38.3	-509	.201
3.50	-43.1	-526	.170
4.00	-51.8	-552	.126
5.00	-66.8	-587	.077
6.00	-79.2	-610	.052
7.00	-89.8	-626	.038
8.00	-99.0	-638	.029
9.00	-107	-647	.023
10.0	-114	-655	.018

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 (fc).

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

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