


**FREQUENCY
DEVICES™**
Model D01L4L

Linear Active DIP Filters

4-Pole Bessel Low-Pass Filter

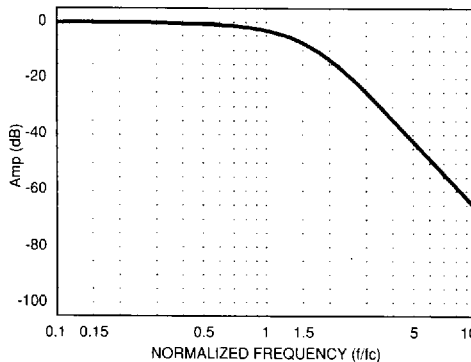
Description

The D01L4L is an 4-pole low-pass Bessel transfer function, has a monotonic roll-off in the passband and the stopband, and its final rolloff rate is 24 dB/octave in the stopband. It exhibits a constant delay in the passband and has an overshoot free step response.

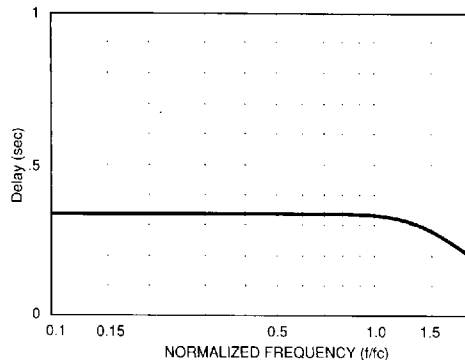
Specifications

Transfer Function	4-pole Bessel Low-Pass
Size	1.80" x 0.8" x 0.30"
Passband Ripple (theoretical)	0.0 dB
DC Voltage Gain (non-inverting)	0 ± 0.1 dB typ. 0 ± 0.2 dB max.
Stopband Attenuation Rate	24 dB/octave
Cutoff Frequency f_c (-3 dB)	
Accuracy	± 5 % max.
Stability	± 0.02 % / °C
Range f_c	100 Hz to 1 MHz
Phase	- 121°
Filter Attenuation (theoretical)	
1.91 dB	0.80 f_c
3.01 dB	1.00 f_c
60.0 dB	8.48 f_c
80.0 dB	15.12 f_c
Phase Match ²	
Amplitude Accuracy ²	
Total Harmonic Distortion @ 2.5 V _{RMS}	
1 kHz	< - 80 dB typ.
100 kHz	< - 65 dB typ.
Wide Band Noise (20 Hz - 4 MHz)	70 μV _{RMS} typ.
Narrow Band Noise (20 Hz - 100 kHz)	20 μV _{RMS} typ.

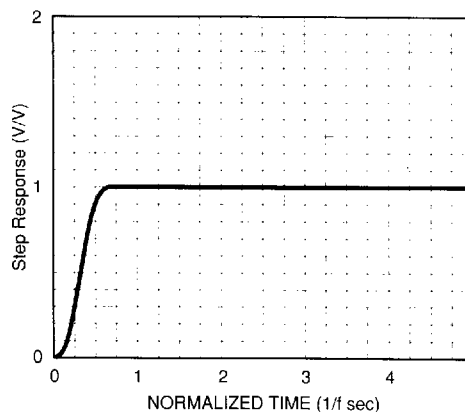
Frequency Response



Delay (Normalized)



Step Response



Theoretical Transfer Characteristics

f/f _c (Hz)	Amp (dB)	Phase (deg)	Delay ¹ (sec)
0.00	0.00	0.00	.336
0.10	-0.028	-12.1	.336
0.20	-0.111	-24.2	.336
0.30	-0.251	-36.3	.336
0.40	-0.448	-48.4	.336
0.50	-0.705	-60.6	.336
0.60	-1.02	-72.7	.336
0.70	-1.41	-84.8	.336
0.80	-1.86	-96.8	.335
0.85	-2.11	-103	.334
0.90	-2.40	-109	.333
0.95	-2.69	-115	.332
1.00	-3.01	-121	.330
1.10	-3.71	-133	.325
1.20	-4.51	-144	.318
1.30	-5.39	-156	.308
1.40	-6.37	-166	.295
1.50	-7.42	-177	.280
1.60	-8.54	-187	.263
1.70	-9.71	-195	.246
1.80	-10.9	-204	.228
1.90	-12.2	-212	.211
2.00	-13.4	-219	.194
2.25	-16.5	-235	.158
2.50	-19.5	-248	.129
2.75	-22.4	-259	.107
3.00	-25.1	-267	.089
3.25	-27.6	-275	.076
3.50	-30.0	-281	.065
4.00	-34.4	-291	.049
5.00	-41.9	-305	.031
6.00	-48.1	-315	.021
7.00	-53.4	-321	.016
8.00	-58.0	-326	.012
9.00	-62.0	-330	.009
10.0	-65.7	-333	.008

2. Phase Match and Amplitude Accuracy in the pass band are within ±5% max. 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).

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