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8 Bit Programmable 4-Pole Pair Filters

8161

FREQUENCY DEVICES™



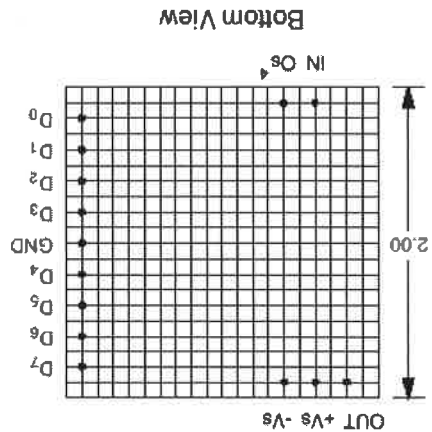
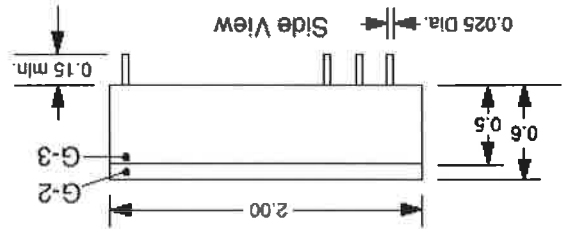
Band Reject

Description:

The 8161 is 4-pole-pair, 8-bit digitally programmable band-reject (notch) active filter with a "Q" of 10. The 8161 filter is factory tuned for frequencies from 100 Hz to 25.6 kHz in 100 Hz steps.

Retuned to within $\pm 2\%$ of the center frequency, 8161 band-reject (notch) filters sharply attenuate those frequencies that are bound and defined by the bottom of the notch (min. 40 dB).

Pin-Out and Package Data



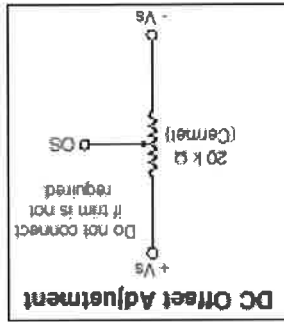
Specifications: (25°C and $V_S \pm 15Vdc$)

Parameter	Value
Analog Input Characteristics	
Impedance	10 k Ω min.
Voltage Range	± 10 Vpeak
Max. Safe Voltage	$\pm V_S$
Analog Output Characteristics	
Impedance (Closed Loop)	1 Ω typ.
Linear Operating Range	± 10 V
Maximum Current ²	± 2 mA
Offset Voltage ³	2 mV typ.
Offset Temp. Coeff.	20 mV max.
	50 $\mu V/^\circ C$
Power Supply ($\pm V$)	
Rated Voltage	± 15 Vdc
Operating Range	± 12 to ± 18 Vdc
Maximum Safe Voltage	± 18 Vdc
Quiescent Current	± 25 mA typ.
Temperature	
Operating	0 to $+70^\circ C$
Storage	-25 to $+85^\circ C$

Notes:

1. Input and output signal voltage referenced to supply common.
2. Output is short circuit protected to common.
3. Adjustable to zero.
4. Units operate with or without offset pin connected.

DC Offset Adjustment



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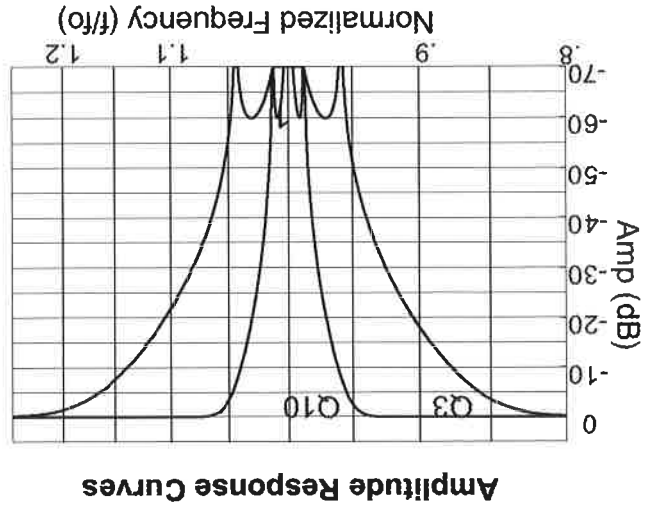
1. Q – Quality Factor for band-reject filters. $Q = f_0 / (f_H - f_L)$
 $f_0 = \sqrt{f_H f_L}$

Model	8161
Product Specifications	Band-Reject
Size G-3	2.0" x 2.0" x 0.5"
Range f_0	100 Hz to 25.6 KHz
256 steps @	100 Hz
Q Accuracy¹	±10%
Theoretical Transfer Characteristics	Appendix A Pages 43
Notch Attenuation	Min 40 db.
Pass-Band Gain (non-inverting)	0± 0.25 dB typ. 0± 0.50 dB max.
Attenuation Rate	24 dB/octave
Center Frequency Stability	f_0 ±2% max. ±0.01%/°C
Narrow Band Noise (20 Hz – 100 KHz)	100 μ Vrms typ.

Band-Reject
8-Bit Programmable 4 – Pole Pair Filters

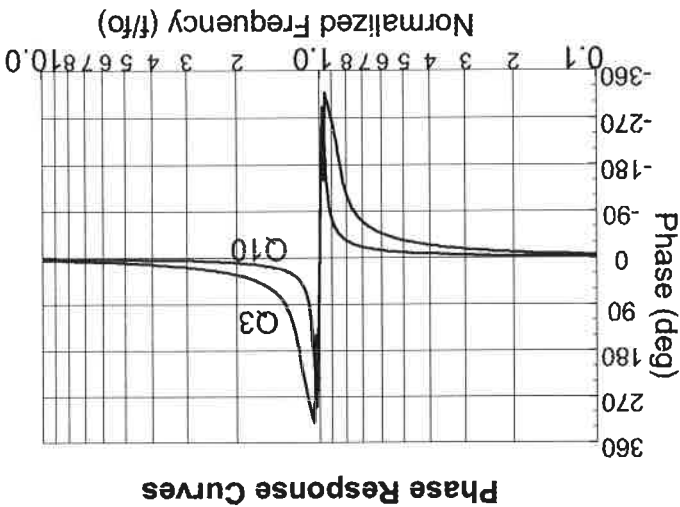
8161





Normalized Theoretical Amplitude Data

Amp (dB)	Q = 3		Q = 10	
	f/fo	f/f _o	f/fo	f/f _o
-60.00	0.954	1.048	0.986	1.014
-55.00	0.952	1.050	0.985	1.015
-50.00	0.949	1.054	0.984	1.016
-45.00	0.945	1.059	0.983	1.017
-40.00	0.939	1.065	0.982	1.019
-35.00	0.933	1.072	0.979	1.021
-30.00	0.925	1.081	0.977	1.024
-25.00	0.916	1.092	0.974	1.027
-20.00	0.905	1.105	0.97	1.030
-15.00	0.892	1.121	0.966	1.035
-10.00	0.877	1.140	0.961	1.040
-5.00	0.858	1.165	0.955	1.047
-3.00	0.847	1.180	0.951	1.051
-2.50	0.844	1.185	0.95	1.053
-2.00	0.839	1.191	0.949	1.054
-1.50	0.835	1.198	0.947	1.056
-1.00	0.828	1.208	0.945	1.059
-0.50	0.818	1.223	0.941	1.062
-0.25	0.809	1.236	0.938	1.066
-0.10	0.799	1.251	0.935	1.069



Normalized Theoretical Phase Data

Phase (deg)	Q = 3		Q = 10	
	f/fo	f/f _o	f/fo	f/f _o
1.0	0.020	49.66	0.067	14.88
2.5	0.050	19.91	0.164	6.087
5.0	0.100	10.03	0.306	3.268
10.0	0.194	5.160	0.504	1.985
15.0	0.279	3.590	0.621	1.609
20.0	0.352	2.838	0.696	1.437
25.0	0.416	2.405	0.746	1.340
30.0	0.470	2.129	0.783	1.278
35.0	0.515	1.940	0.810	1.235
40.0	0.555	1.803	0.831	1.204
45.0	0.588	1.700	0.848	1.180
50.0	0.617	1.620	0.861	1.161
60.0	0.664	1.505	0.882	1.133
70.0	0.701	1.427	0.897	1.115
80.0	0.729	1.372	0.909	1.101
90.0	0.752	1.330	0.917	1.090
120.0	0.797	1.255	0.934	1.071
150.0	0.824	1.214	0.943	1.060
180.0	0.844	1.185	0.950	1.052
210.0	0.862	1.160	0.957	1.045



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