

FEATURES

- Digitally programmable
- 4- and 5-Pole Cauer response
- Cascadable 7 Pole Cauer response
- Cutoff Frequencies to 1.2 MHz
- Small 32-pin DIP
- -55 °C to +125 °C operation

GENERAL DESCRIPTION

DATEL's FLT-DL series of 4- and 5-pole digitally programmable active filters are functionally complete, simple to use, and offer a wide range of frequency response options. The models offered operate over the frequency ranges of 100 KHz to 470 KHz and 250 KHz to 1200 KHz.

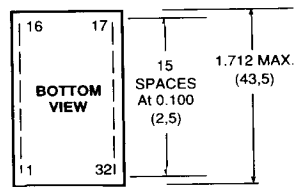
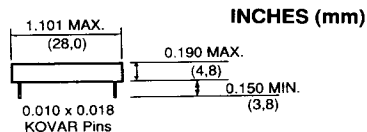
The FLT-DL Series are Cauer response filters which can be cascaded to provide equivalent 7 pole Cauer performance.

DATEL's FLT-DL Series filters are manufactured using thick-film and thin-film hybrid technology and unique laser trimming schemes. These filters are packaged in a space-saving 32-pin ceramic DIP. Units are specified for operation over the commercial temperature range of 0 to +70 °C and the military temperature range of -55 to +125 °C.

TECHNICAL NOTES

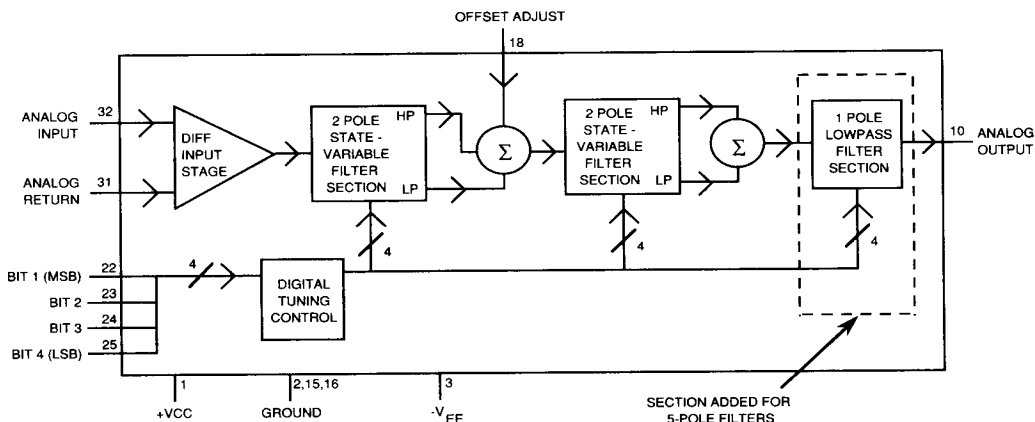
1. Use an external 50 Kohm potentiometer to reduce the small initial offset error to zero. Tie the wiper to pin 18, OFFSET ADJUST. Connect the other terminals of the potentiometer to the +/-15 volt power supplies. For operation without adjustments, leave pin 18 unconnected.

MECHANICAL DIMENSIONS



0.900 (22,9) NOTE: Pins have 0.025 Inch ±0.01 standoff from case.

PIN	FUNCTION
1	+VCC
2	GROUND
3	-VEE
4-9	NO CONNECTION
10	ANALOG OUT
11-14	NO CONNECTION
15	GROUND
16	GROUND
17	NO CONNECTION
18	OFFSET ADJUST
19-21	NO CONNECTION
22	BIT 1 (MSB)
23	BIT 2
24	BIT 3
25	BIT 4 (LSB)
26-30	NO CONNECTION
31	ANALOG RETURN
32	ANALOG INPUT



ABSOLUTE MAXIMUM RATINGS

PARAMETERS	LIMITS	UNITS
+15V Supply (pin 1)	-0.3 to +18	V dc
-15V Supply (pin 3)	+0.3 to -18	V dc
Digital inputs (pins 22- 25)	-Vcc to +15	Vdc
Analog input (pin 31,32)	-25 to +25	V dc
Lead temperature (10 sec.)	300	°C
Junction temperature (Tj)	+175	°C
Storage Temperature	-65 to +150	°C
Power dissipation	3	Watts

Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

FUNCTIONAL SPECIFICATIONS

Apply at 25°C and at ±15Vdc power supply voltages unless otherwise specified.

INPUTS	MIN	TYP	MAX	UNITS
Input Voltage Range	±10	—	—	Volts
Input Impedance (Noninverting)				
Pin 1	4	—	—	Kohms
Pin 3	6	—	—	Kohms
DIGITAL INPUTS				
Logic Threshold	.1Vcc ±20%			Volts
Logic Input Impedance	100	—	—	Kohms
OUTPUT CHARACTERISTICS				
Output Voltage Range	±10	—	—	Volts
DC Output Resistance	1	—	—	Ohms
Output Current Limit (Short Circuit Protected)	—	—	±25	mA
Recommended Load Resistance	2	—	—	Kohms
FILTER CHARACTERISTICS				
Freq. Range (cascaded pair)				
FLT-DL41/51	100	—	400	KHz
FLT-DL42/52	250	—	1000	KHz
Programming Bits	4	—	—	—
Programming Frequency Increments				
FLT-DL41/51	20	—	—	KHz
FLT-DL42/52	50	—	—	KHz
Programming Accuracy	TBD	—	—	—
Voltage Gain	Unity	—	—	—
Passband Ripple FLT-DL	.7	—	—	%
Settling Time (to 0.01%)				
fc=1MHz FLT-DL42	—	6	—	µSec
FLT-DL52	—	7	—	µSec
fc=100KHz FLT-DL41	—	60	—	µSec
FLT-DL51	—	60	—	µSec
Transition Slope				
FLT-DL41/42	30	—	—	dB/oct
FLT-DL51/52	50	—	—	dB/oct
FLT-DL4/5	80	—	—	dB/oct
StopBand Attenuation (to 10MHz)				
FLT-DL41/42	30	—	—	dB
FLT-DL51/52	50	—	—	dB

FILTER CHARACTERISTICS CONT.	MIN	TYP	MAX	UNITS
Offset Voltage	—	—	TBD	—
Offset Voltage Drift				
0 to +70 °C	—	—	TBD	—
-55 to +125 °C	—	—	TBD	—
Noise	—	—	TBD	—
POWER REQUIREMENTS				
Rated Voltage	±14.25	±15	±15.75	Volts
Quiescent Current FLT-DL5	±70	—	—	mA
FLT-DL4	±60	—	—	mA
Power Dissipation	—	—	3	W
PHYSICAL/ENVIRONMENTAL				
Operating Temperature Range	MC 0 to +70 °C MM -55 to +125 °C			
Storage Temperature Range	-65 to +150 °C			
Case	Ceramic 32-Pin DIP			
Weight	TBD			

2. Bypass each power supply with a 0.1 microfarad tantalum electrolytic capacitor.
3. Digital inputs are binary. The truth table (Table 1) details the cutoff frequency for each filter and for cascaded pairs of filters as a function of input coding.
4. The frequency responses of the 4-pole and 5-pole Gauer filters are shown in Figures 2 and 3 respectively. Figure 4 details the response of a cascaded pair of frequency matched 4- and 5-pole filters. The response for a cascaded pair is similar to a 7-pole Gauer, as shown in Figure 5.
5. When cascading a 4-and a 5-pole filter pair, the order of connection is not important. The filters must, however, be frequency matched.

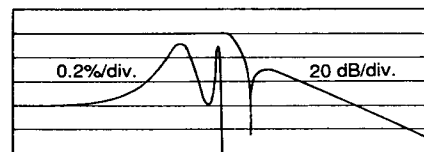


Figure 2. 4-Pole CAUER Response

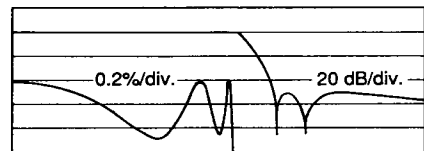


Figure 3. 5-Pole CAUER Response

Table 1. Cutoff Frequencies for Digitally Tuned Filters, and for Cascaded Combinations of Two Filters

DIGITAL INPUT (BIN)	CUTOFF FREQUENCY (KHz)					
	FLT-DL41	FLT-DL42	FLT-DL51	FLT-DL52	CASCADED	
					41X51	42X52
0000	103.8	259.5	121.5	303.8	100	250
0001	124.6	311.4	145.0	364.5	120	300
0010	145.3	363.3	170.1	425.3	140	350
0011	166.1	415.2	194.4	486.0	160	400
0100	186.8	467.1	218.7	546.8	180	450
0101	207.6	519.0	243.0	607.5	200	500
0110	228.4	570.9	267.3	668.3	220	550
0111	249.1	622.8	291.6	729.0	240	600
1000	269.9	674.7	315.9	789.8	260	650
1001	290.6	726.6	340.2	850.5	280	700
1010	311.4	778.5	364.5	911.3	300	750
1011	332.2	830.4	388.8	972.0	320	800
1100	352.9	882.3	413.1	1032.8	340	850
1101	373.7	934.2	437.4	1093.5	360	900
1110	394.4	986.1	461.7	1154.3	380	950
1111	415.2	1038.0	468.0	1215.0	400	1000

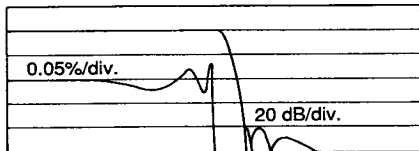


Figure 4. 4- and 5-Pole Pair Response

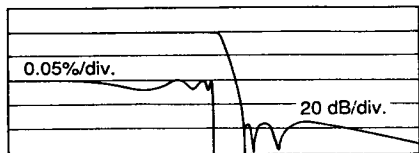


Figure 5. 7-Pole CAUER Response

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	TEMP. RANGE
FLT-DL41MC	100 KHz, 4 Pole	0 to 70 °C
FLT-DL41MM	100 KHz, 4 Pole	-55 to 125 °C
FLT-DL51MC	100 KHz, 5 Pole	0 to 70 °C
FLT-DL51MM	100 KHz, 5 Pole	-55 to 125 °C
FLT-DL42MC	250 KHz, 4 Pole	0 to 70 °C
FLT-DL42MM	250 KHz, 4 Pole	-55 to 125 °C
FLT-DL52MC	250 KHz, 5 Pole	0 to 70 °C
FLT-DL52MM	250 KHz, 5 Pole	-55 to 125 °C

Receptacle for PC board mounting can be ordered through AMP Inc., Part #3-331272-8 (Component Lead Socket) 24 required.

For availability of MIL-STD-883 versions, contact DATEL.