

T-64-05

**DIGITALLY
PROGRAMMABLE
FREQUENCY FILTER****AD2
AD3
AD8
AD10**

AD2Miniature 2 BIT
Programmable Filter**Features**

- 2 BIT CMOS, TTL compatible
- 4 frequency settings
- Independent or Binary weighed
- 4th or 8th orders

AD33 BIT, 8 SETTING
Programmable Filter**Features**

- 3 BIT CMOS, TTL compatible
- 8 independent frequency settings
- Butterworth, Bessel, Chebyshev
Elliptic, & Linear Elliptic

AD88 BIT, 255 STEPS
w/ Memory**Features**

- uP compatible
- Instantaneous selection
- Latching available for memory
- 255 continuous steps
- Customer specified frequency

AD1010 BIT, 1024 STEPS
DIP Switch Input**Features**

- 10 BIT Build-in DIP Switch
 - No external binary bus
 - no latching
 - Frequency set by DIP switch
 - Support all filter functions
 - implement most filter response
-

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ELECTRICAL & MECHANICAL CHARACTERISTICS

	AD2	AD3	AD8	AD10
Filter Type	Analog RC	Analog RC	Analog RC	Analog RC
No. of BITS	2	3	8	10
Frequency Settings	4	8	255	1024
Control Format	Binary	Binary	Binary	Build-in DIP Switch
Logic	CMOS, TTL compatible	CMOS, TTL compatible	CMOS, TTL compatible	CMOS, TTL compatible
Supply Voltage	+/- 15 V.	+/- 15 V.	+/- 15 V.	+/- 15 V.
Supply Current	20 mA/4 pole	20 mA/4 pole	30 mA/4 pole	30 mA/4 pole
Input Impedance	> 500 kohm	> 500 kohm	> 20 kohm	> 20 kohm
Output Impedance(DC)	< 1.0 ohm	< 1.0 ohm	< 1.0 ohm	< 1.0 ohm
Maximum Input Voltage	+/- 12 V.	+/- 12 V.	+/- 12 V.	+/- 12 V.
Output Swing(2k load)	+/- 12 V.	+/- 12 V.	+/- 12 V.	+/- 12 V.
DC offset	< 2 mV	< 2 mV	< 2 mV	< 2 mV
Offset Among Settings	< 0.5 mV	< 0.5 mV	< 10.0 mV	< 10.0 mV
External Adjustable	yes	yes	yes	yes
Filter Function ₁	L,H,B,N	L,H,B,N	L,H,B,N	L,H,B,N
Filter Function ₂	B,L,C	B,L,C	B,L,C,E,Z	B,L,C,E,Z
Filter Order	4, 8	4,6,8,10	4,6,8	4,6,8
Passband Output	0, or w/ gain	0, or w/ gain	0, or w/ gain	Programmable
Dimension	2.75"x1.35"x0.7"	3.5"x2.5"x0.5"	3.5"x2.5"x0.5"	3.5"x2.5"x0.5"
Pin Diameter	0.025"	0.025"	0.025"	0.025"
Case Material	Black Epoxy	Black Epoxy	Black Epoxy	Black Epoxy

₁ L = Lowpass, H = Highpass, B = Bandpass, N = Band-reject

₂ B = Butterworth, L = Bessel, C = Chebyshev, E = Elliptic, Z = Linear Elliptic

OPTIONS

<u>Suffix</u>	<u>Descriptions</u>
-L	Low power consumption (10 mA/4 order)
-I	Industrial temp. range (-25 C to 85 C)
-M	Military temp. range (-55 C to 125 C)
-A1	10x amplification
-A2	100x amplification
-A3	1000x amplification

AVENS SIGNAL EQUIPMENT Corporation
P.O. Box 1057, Knickerbocker Station, New York, NY 10002

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FREQUENCY SELECTION TABLE

AD2 : 2 BITS / 4 SELECTIONS

Binary Bit		Selection Scheme			
2	1	A	B	C	D
0	0	F ₀	F ₀	F ₀	F ₀
0	1	2F ₀	2F ₀	2F ₀	F ₁
1	0	4F ₀	F ₁	3F ₀	F ₂
1	1	8F ₀	2F ₁	4F ₀	F ₃

AD3 : 3 BITS / 8 SELECTIONS

Binary Bit			Selection Scheme			
3	2	1	A	B	C	D
0	0	0	F ₀	F ₀	F ₀	F ₀
0	0	1	2F ₀	2F ₀	2F ₀	F ₁
0	1	0	4F ₀	F ₁	3F ₀	F ₂
0	1	1	8F ₀	2F ₁	4F ₀	F ₃
1	0	0	16F ₀	F ₂	5F ₀	F ₄
1	0	1	32F ₀	2F ₂	6F ₀	F ₅
1	1	0	64F ₀	F ₃	7F ₀	F ₆
1	1	1	128F ₀	2F ₃	8F ₀	F ₇

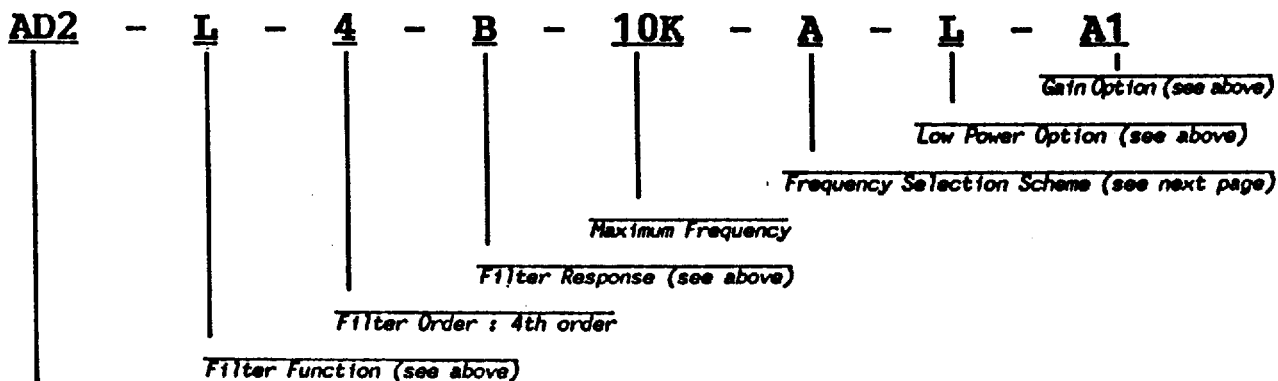
AD8 : 8 BITS / 255 CONTINUOUS STEPS

F _{max} (Hz)	Step size(Hz)	F _{min} (Hz)
102.0 k	400	400
51.0 k	200	200
25.5 k	100	100
12.7 k	50	50
10.2 k	40	40
5.1 k	20	20
2,550.	10	10
1,275.	5	5
1,020.	4	4
510.	2	2
255.	1	1
25.5	0.1	0.1

AD10 : 10 BITS / 1024 CONTINUOUS STEPS

F _{max} (Hz)	Step size(Hz)	F _{min} (Hz)
102.4 k	100	100
51.2 k	50	50
20.5 k	20	20
10.2 k	10	10
5,120.	5	5
2,050.	2	2
1,024.	1	1
102.4	0.1	0.1

PART NUMBER SYSTEM



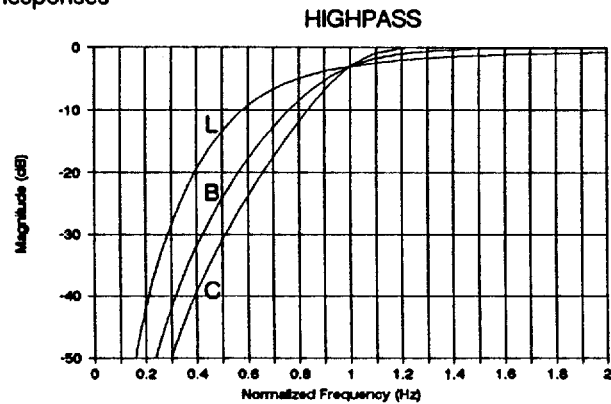
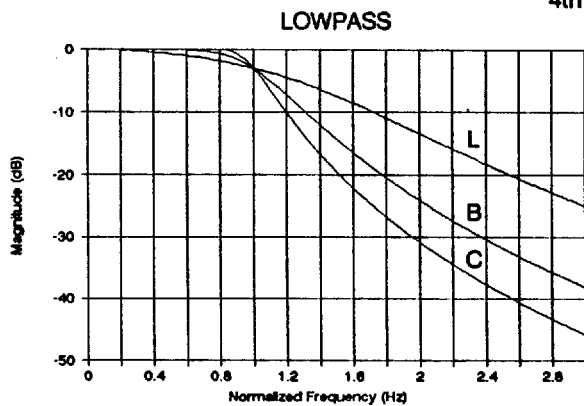
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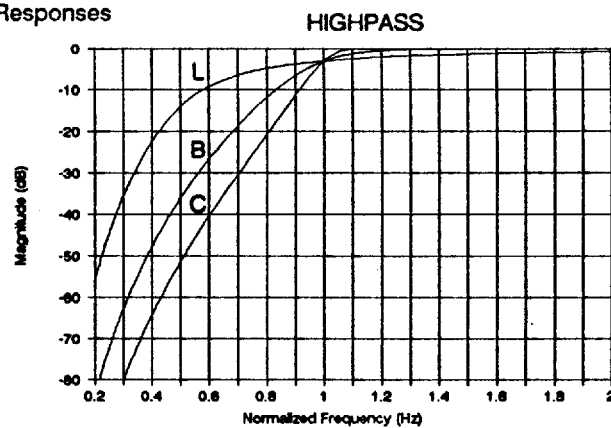
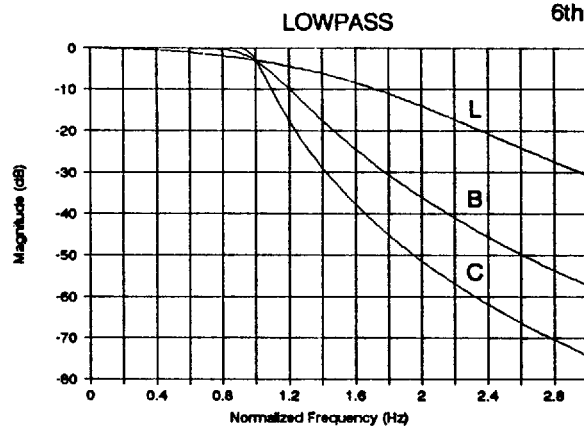
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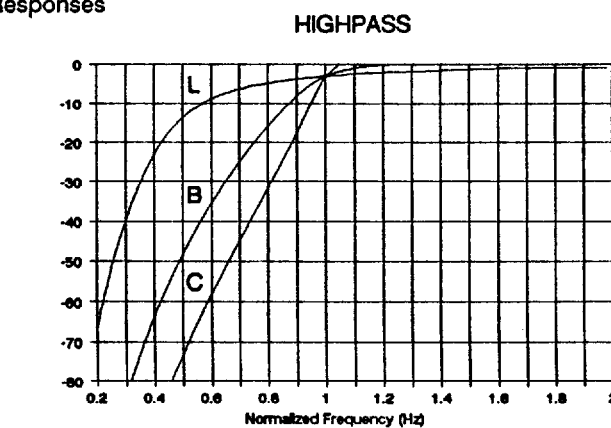
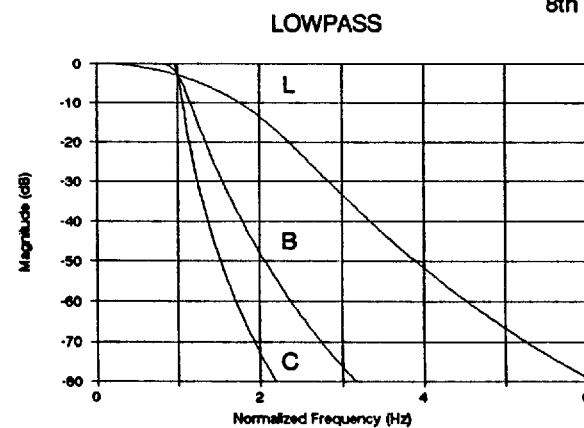
4th order Responses



6th order Responses



8th order Responses



L = BESSEL, B = BUTTERWORTH, C = CHEBYSHEV

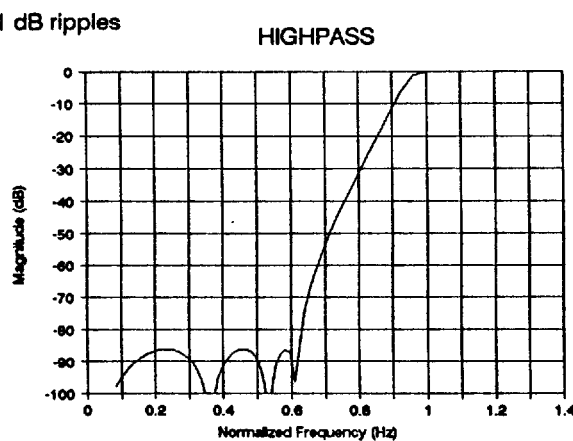
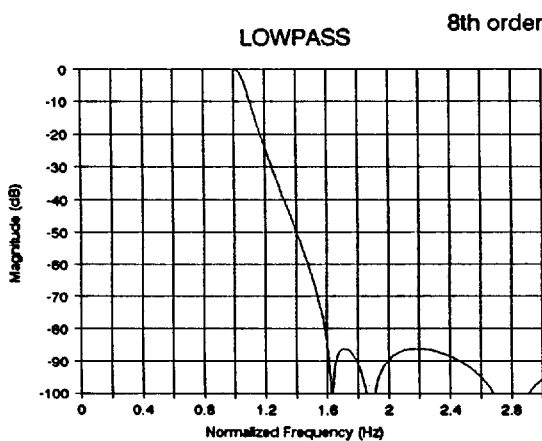
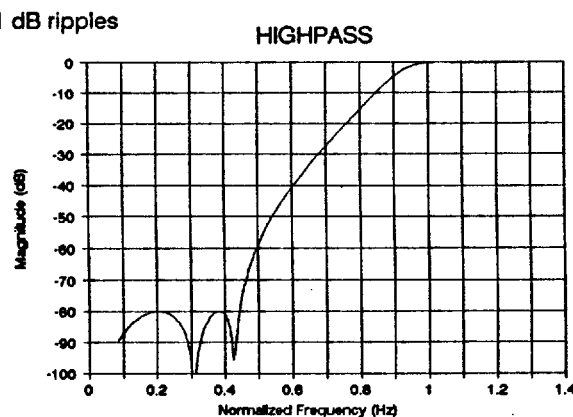
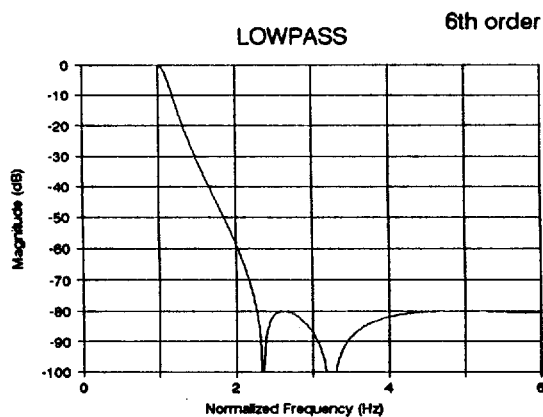
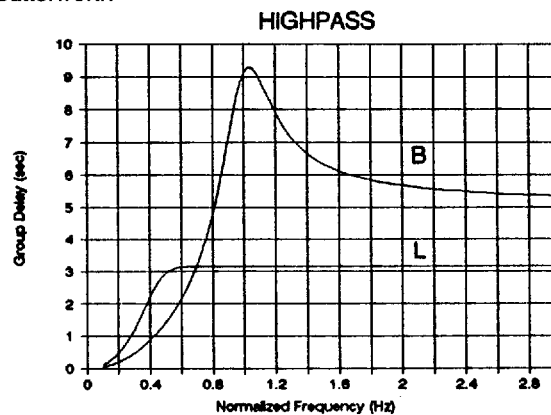
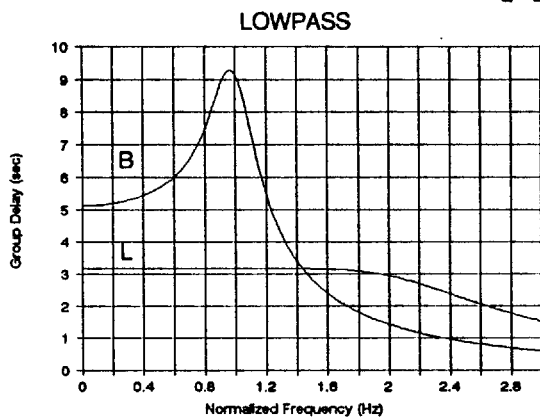
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8th order Group Delay
L=Bessel, B=Butterworth



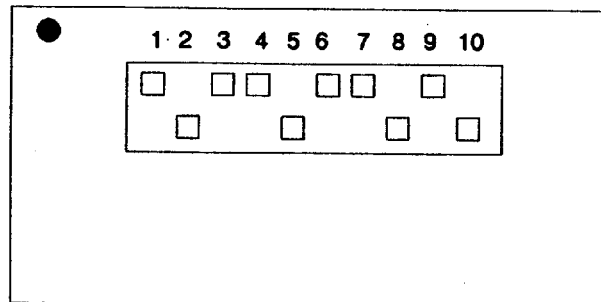
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AD10 DIP SWITCH LOCATION



TOP VIEW (white dot on pin 1)

ON = 1, OFF = 0

DIP SWITCH POSITION

1 2 3 4 5 6 7 8 9 10

-3 dB Frequency (Hz)

1 1 1 1 1 1 1 1 1 1	1024
0 0 0 0 0 0 0 0 0 1	512
0 0 0 0 0 0 0 0 1 0	255
0 0 0 0 0 0 0 1 0 0	128
0 0 0 0 1 1 1 0 0 0	112
0 0 0 0 0 1 1 0 0 0	96
0 0 0 0 1 0 1 0 1 0	80
0 0 0 0 0 0 1 0 0 0	64
0 0 0 0 1 1 0 0 0 0	48
0 0 0 0 0 1 0 0 0 0	32
0 0 0 0 1 0 0 0 0 0	16
1 1 1 1 0 0 0 0 0 0	15
0 1 1 1 0 0 0 0 0 0	14
1 0 1 1 0 0 0 0 0 0	13
0 0 1 1 0 0 0 0 0 0	12
1 1 0 1 0 0 0 0 0 0	11
0 1 0 1 0 0 0 0 0 0	10
1 0 0 1 0 0 0 0 0 0	9
0 0 0 1 0 0 0 0 0 0	8
1 1 1 0 0 0 0 0 0 0	7
0 1 1 0 0 0 0 0 0 0	6
1 0 1 0 0 0 0 0 0 0	5
0 0 1 0 0 0 0 0 0 0	4
1 1 0 0 0 0 0 0 0 0	3
0 1 0 0 0 0 0 0 0 0	2
1 0 0 0 0 0 0 0 0 0	1
0 0 0 0 0 0 0 0 0 0	undefined

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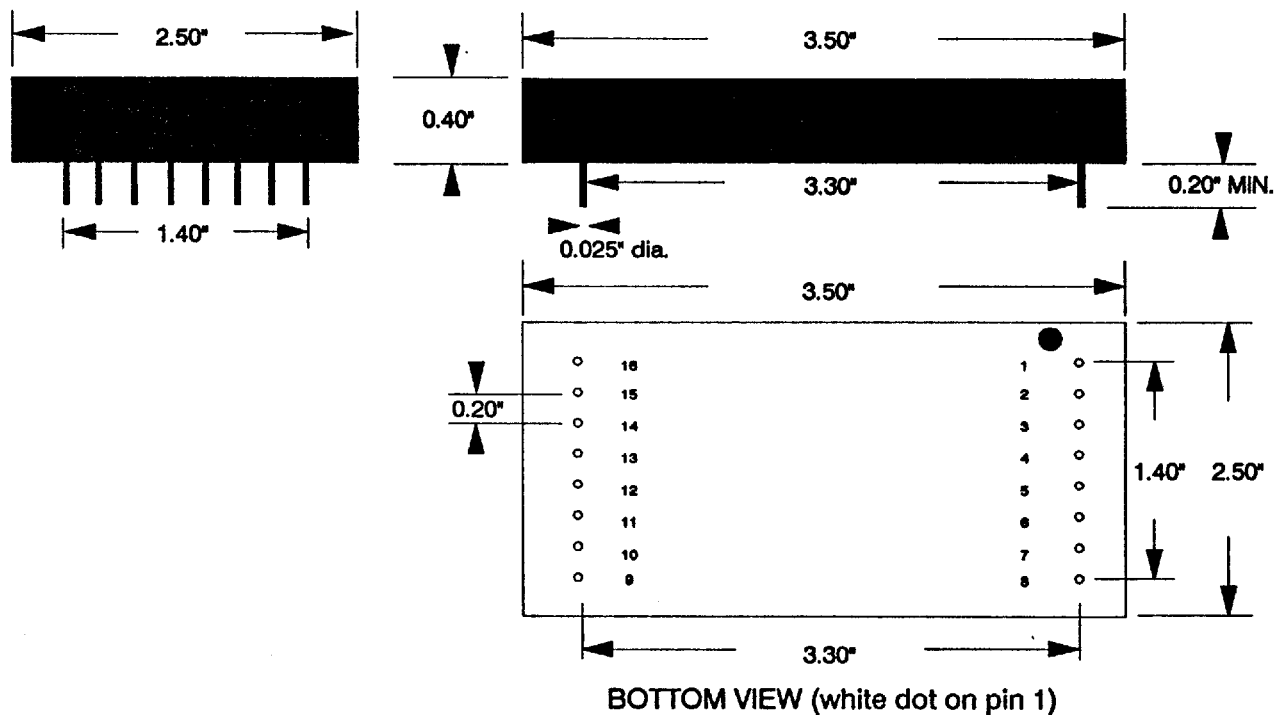
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PIN ASSIGNMENT

Pin No.	Model : AD3	Model : AD8	Model : AD10
1	N/C*	Filter Input	Filter Input
2	N/C	+15 V	Ground
3	N/C	-15 V	V +
4	Ground	Ground	BIT 9 (MSB)
5	Filter Input	Bit 7 (MSB)	BIT 8
6	Bit 1	Bit 6	BIT 7
7	Bit 2	Bit 5	BIT 6
8	Bit 3	Bit 4	BIT 5
9	+15 V	Bit 3	BIT 4
10	-15 V	Bit 2	BIT 3
11	Ground	Bit 1	BIT 2
12	N/C	Bit 0 (LSB)	BIT 1
13	DC Adjust	Ground	BIT 0 (LSB)
14	Filter Output	DC Adjust	V -
15	N/C	WR, Data Latch	DC Adjust
16	N/C	Filter Output	Filter Output

* N/C : No Connection

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