


**FREQUENCY
DEVICES™**
FREQUENCY DEVICES INC
**534 SERIES
ACTIVE BANDPASS
MODEM FILTERS**

183

T-7533-07

FEATURES

- CCITT Standard Frequency Channels
- Alternate User Specified Frequencies
- Passband Gain $0 \pm 0.5\text{dB}$
- Adjacent Channel Rejection 28dB Min.
- Single Ended Power Supply Operation

APPLICATIONS

- Modems
- Control Systems
- Telegraph Systems
- Computer Data Communication Systems
- FSK Systems
- Traffic Control
- Telemetry

DESCRIPTION

Frequency Devices' 534 Series consists of over 100 ready-to-use, high performance, fixed frequency bandpass active filters that provide Standard CCITT frequency channels for 60, 75, 110, 150, 300 and 600 baud data transmission applications. They are complete and ready for installation; external components or trimming adjustments are not required. The desired center frequency is locked in at the factory.

The complete part numbers for the Standard CCITT channels are listed on page two. For systems using one of the standard baud rates with an alternative set of channel frequencies, ANY intermediate center frequencies within the overall center frequency range indicated for each standard baud rate may be specified.

The 534 Series are precision bandpass filters. A computer-optimized state-variable design provides a sharp frequency response that is arithmetically symmetrical about the center frequency. The gain at the center frequency is $0 \pm 0.5\text{dB}$ inverted. The in-channel space and mark frequencies are attenuated by less than 1.5dB. The adjacent channels are rejected by over 28dB.

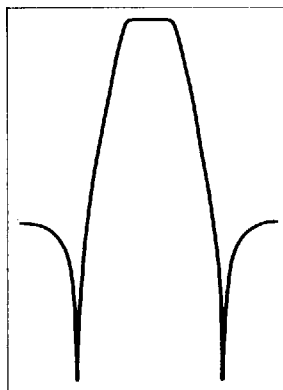
The input impedance of all 534 Series filters is $20\text{k}\Omega$. High performance output characteristics include short circuit protection, a 1Ω output impedance level, a 2mA output current capability and less than $50\mu\text{V}$ RMS of noise in the 1Hz-to-50kHz bandwidth.

All 534 Series filters operate from a single-ended power supply that may range from +10 to +30Vdc.

As an option, all models can be supplied for operation from dual supplies between $\pm 12\text{Vdc}$ and $\pm 18\text{Vdc}$.

The 534 Series filters are low profile encapsulated devices measuring $2'' \times 2'' \times 0.4''$. The $0.04''$ diameter gold-plated terminal pins located on $0.1''$ centers are designed for either solder-in or plug-in installation.

The 534 Series filters offer quick and economical solutions for filtering requirements ranging from control, telemetry and computer data transmission to high and low speed telegraph systems.




**FREQUENCY
DEVICES**
**CCITT STANDARD
60-600 BAUD CHANNEL
BANDPASS FILTERS**
FREQUENCY DEVICES INC

PART NUMBERS FOR CCITT STANDARD CHANNEL FILTERS			
60 BAUD MODEL - FREQ	75 BAUD MODEL - FREQ	110 BAUD MODEL - FREQ	150 BAUD MODEL - FREQ
534- 60- 365	534- 75- 420	534-110- 425	534-150- 480
534- 60- 465	534- 75- 540	534-110- 595	534-150- 720
534- 60- 565	534- 75- 660	534-110- 765	534-150- 960
534- 60- 665	534- 75- 780	534-110- 935	534-150-1200
534- 60- 765	534- 75- 900	534-110-1105	534-150-1440
534- 60- 865	534- 75-1020	534-110-1275	534-150-1680
534- 60- 965	534- 75-1140	534-110-1445	534-150-1920
534- 60-1075	534- 75-1260	534-110-1615	534-150-2160
534- 60-1175	534- 75-1380	534-110-1785	534-150-2400
534- 60-1275	534- 75-1500	534-110-1955	534-150-2640
534- 60-1375	534- 75-1620	534-110-2125	534-150-2880
534- 60-1475	534- 75-1740	534-110-2295	534-150-3120
534- 60-1575	534- 75-1860	534-110-2465	534-150-3360
534- 60-1675	534- 75-1980	534-110-2635	534-150-3600
534- 60-1775	534- 75-2100	534-110-2805	
534- 60-1875	534- 75-2220	534-110-2975	300 BAUD
534- 60-2000	534- 75-2340	534-110-3145	534-300- 915
534- 60-2100	534- 75-2460	534-110-3315	534-300-1515
534- 60-2200	534- 75-2580	534-110-3485	534-300-2115
534- 60-2300	534- 75-2700	534-110-3655	534-300-2715
534- 60-2400	534- 75-2820		534-300-3315
534- 60-2500	534- 75-2940		
534- 60-2600	534- 75-3060		600 BAUD
534- 60-2700	534- 75-3180		534-600-1815
534- 60-2800	534- 75-3300		
534- 60-2900	534- 75-3420		
534- 60-3000	534- 75-3540		
534- 60-3100	534- 75-3660		
534- 60-3200			
534- 60-3300			
534- 60-3400			
534- 60-3500			
534- 60-3600			

For applications employing one of these standard baud rates with an alternative channel frequency arrangement, ANY intermediate center frequencies may be specified. The allowable center frequency ranges are listed in the Frequency Response Specifications Table on page four. Simply insert the desired standard baud rate and alternative center frequency in this format: 534-BAUD-HERTZ.


**FREQUENCY
DEVICES**
**534 SERIES
OPERATING
CHARACTERISTICS**

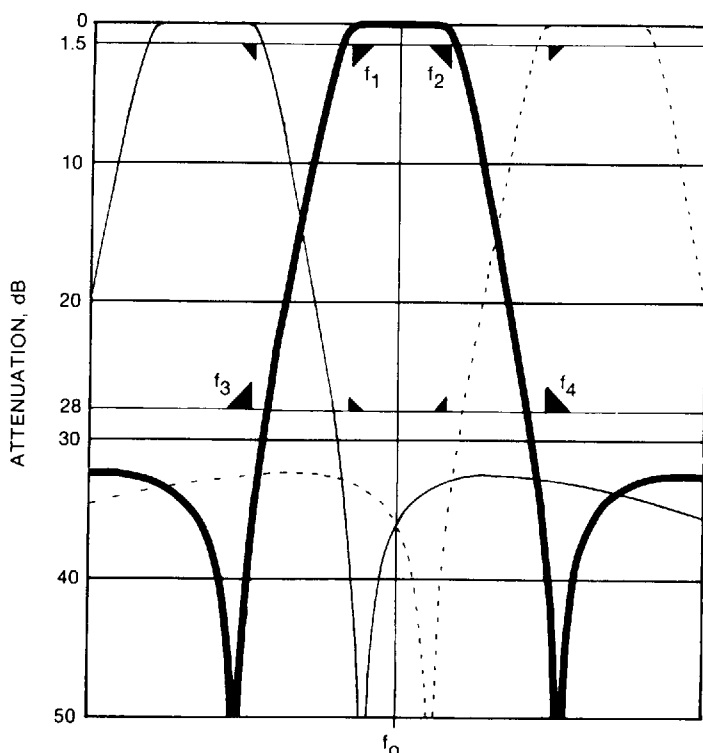
185

FREQUENCY DEVICES INC

	MIN	TYP	MAX	UNITS
CENTER FREQUENCY RANGE	365	-	3660	Hz
PASSBAND Inverting Gain	-0.5	0	+0.5	dB
ATTENUATION FLOOR	28	30	-	dB
INPUT				
Impedance	20	-	-	k Ω
Voltage, $V_S = +12V$	-	-	2.8	V RMS
$V_S = +10V$	-	-	2.1	V RMS
Maximum Safe Voltage	-	-	$V_S/2$	V P-P
OUTPUT				
Impedance	-	1	10	Ω
Current ²	-	-	2	mA
Offset Voltage	+5	+6	+7	Vdc
Noise ³	-	50	-	μV RMS
POWER SUPPLY ($+V_S$)⁴				
Operating Voltage	+10	+12	+30	Vdc
Current	-	18	25	mA
TEMPERATURE				
Operating	0	-	+70	$^{\circ}C$
Storage	-30	-	+85	$^{\circ}C$

- NOTES**
- 1 Typical at 25 $^{\circ}C$ and $V_S = +12Vdc$ except as noted
 - 2 Short circuit protected to ground.
 - 3 Dc to 50 kHz excluding dc offset, input grounded.
 - 4 For applications where dual supply operation is desired, contact the factory.

Specifications subject to change without notice.


**FREQUENCY
DEVICES**
**534 SERIES
FREQUENCY
RESPONSE**
FREQUENCY DEVICES INC


This graph shows the typical frequency response of the 534 Series filters and the relationship to the responses of the 534 Series filters for the immediately adjacent CCITT Standard channels.

The frequencies above and below the adjacent channels' passbands are shaded to highlight the typical adjacent channel rejection characteristics of the 534 Series filters.

FREQUENCY RESPONSE SPECIFICATIONS

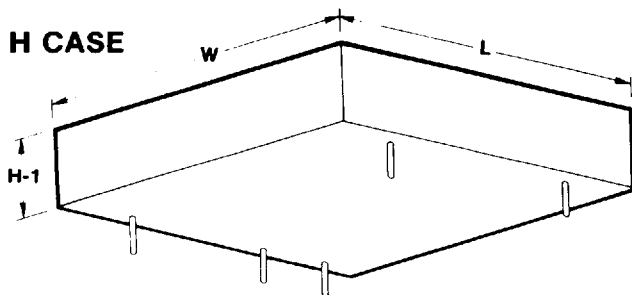
MODEL NUMBER	CENTER FREQUENCY RANGE, Hz	MIN 1.5dB BANDWIDTH ¹		MAX 28dB BANDWIDTH ²	
		f ₁ , Hz	f ₂ , Hz	f ₃ , Hz	f ₄ , Hz
534- 60-f ₀	365 - 3600	f ₀ - 25	f ₀ + 25	f ₀ - 75	f ₀ + 75
534- 75-f ₀	420 - 3660	f ₀ - 30	f ₀ + 30	f ₀ - 90	f ₀ + 90
534-110-f ₀	425 - 3655	f ₀ - 42.5	f ₀ + 42.5	f ₀ -127.5	f ₀ +127.5
534-150-f ₀	480 - 3600	f ₀ - 60	f ₀ + 60	f ₀ -180	f ₀ +180
534-300-f ₀	915 - 3315	f ₀ -120	f ₀ +120	f ₀ -360	f ₀ +360
534-600-f ₀	1815 - 1815	f ₀ -240	f ₀ +240	f ₀ -720	f ₀ +720

All attenuation specifications are relative to the response at f₀.

- Between f₁ and f₂ the attenuation is ≤ 1.5dB.
- Below f₃ and above f₄ the attenuation is ≥ 28dB.

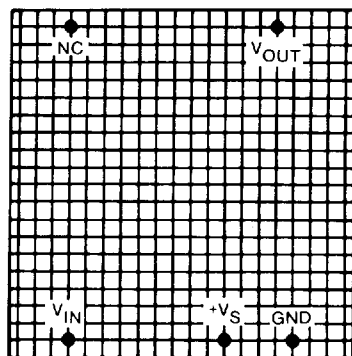

**FREQUENCY
DEVICES**
**534 SERIES
PACKAGE DATA**

187

FREQUENCY DEVICES INC
H CASE


DIMENSION	MILLIMETERS	INCHES
H-1	10.2	0.4
L	50.8	2.0
W	50.8	2.0
PIN LENGTH	5.1 MIN	0.2 MIN
PIN DIA	1.02	0.04

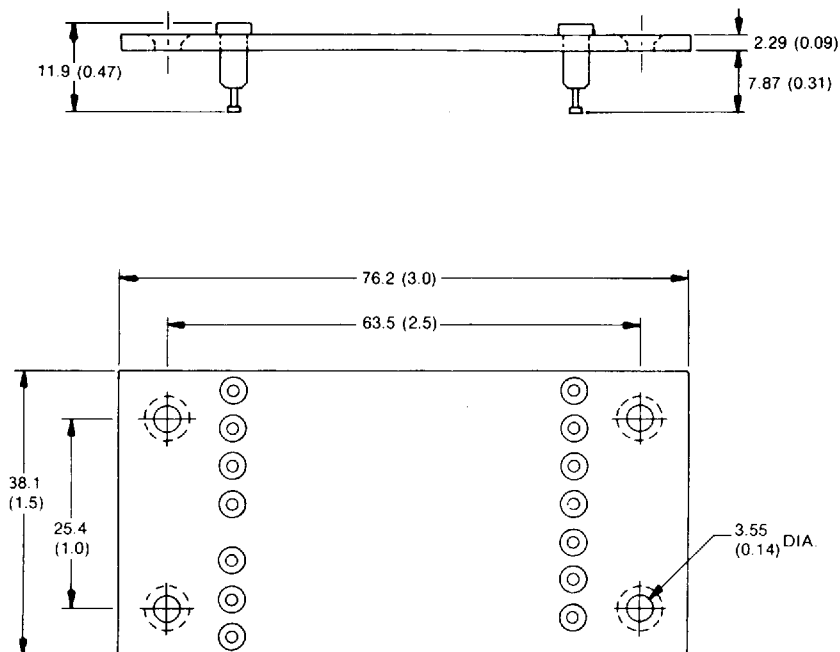
Case dimensions are nominal. Pin location is ± 0.13 mm (0.005 in) referenced to an ideal grid.

TERMINAL DIAGRAM

BOTTOM VIEW
0.1 INCH GRID
TERMINAL KEY

V_{IN}	Signal Input
V_{OUT}	Signal Output
NC	No Connection
+V_S	Power Supply Voltage, Positive
GND	Ground, Supply Common


**FREQUENCY
DEVICES™**
**534 SERIES
SOCKET AND ORDERING
INFORMATION**
FREQUENCY DEVICES INC
SOCKET S1006

DIMENSIONS IN MM (INCHES)


HOW TO ORDER

The complete 534 Series part numbers are listed in the table on page two. To order, enter the complete part number on your purchase order.

For single frequency narrow band applications or multi-frequency, multi-channel applications employing one of the standard 534 Series baud rates with an alternative channel frequency arrangement, ANY intermediate center frequencies may be specified. The allowable center frequency ranges are listed in the Frequency Response Specifications table on page four. To order, indicate the desired baud rate and center frequency in this format: 534-BAUD-HERTZ.

The standard 534 Series units operate from single-ended power supply voltages. For applications where bipolar power supply operation is desired, contact the factory.

Installation sockets, F.D.I. part number S1006, are ordered by listing as a separate line item on the P.O.

CALL FOR ACTION

Frequency Devices' sales engineering staff is ready to answer any application questions and to help match specific requirements to the most cost effective filter. You'll find our number at the bottom of every page. Call now for the answer that's right for you!