



FREQUENCY DEVICES INC

T-64-05

FEATURES

- Third, Half And Octave Bandwidths
- Center Frequencies From 25Hz to 20kHz
- Response conforms To ANSI S1.11
- Passband Gain 0dB $\pm$ 0.5dB

APPLICATIONS

- Contiguous Comb Filtering
- Noise Analysis
- Harmonic Studies
- Equalization

DESCRIPTION

Frequency Devices' 765 Series filters are ready-to-use, general purpose, fixed frequency bandpass filters that provide third, half or full octave wide passbands. They are complete and ready for installation; external components or trimming adjustments are not required. The desired center (midband) frequency is locked in at the factory. Any center frequency between 25Hz and 20kHz may be specified.

The frequency response of all 765 Series filters meets the requirements of American Standard Specification ANSI S1.11 for Octave, Half-Octave and Third-Octave Band Filter Sets. The standard center (midband) frequencies for Type E, Type R and Type O Filter Sets are listed on page 2.

The various 765 Series filters are modified leap-frog designs with frequency response characteristics similar to either 0.1dB Tchebyscheff or Butterworth type bandpass responses. Passband Gain (Transmission Loss) is 0dB $\pm$ 0.5dB. The input impedance of all 765 Series filters is 100k Ω . High performance output characteristics include $\pm$ 10V linear signal swing with less than 50 μ V RMS of noise. The 765 Series filters will operate on $\pm$ 5Vdc to $\pm$ 18Vdc power supplies and meet the ANSI S1.11 specifications over the temperature range from 0°C to 70°C.

AVAILABLE MODELS

f _o (f _m) RANGE, HERTZ		PASSBAND			40dB ATTENUATION FREQUENCIES		CASE	TERMINAL DIAGRAM	SOCKET	MODEL NUMBER
		OCTAVE	3dB FREQUENCIES							
MIN	MAX			f ₁ , MAX	f ₂ , MIN	f ₃ , MIN	f ₄ , MAX			
25	20k	1	0.750f _o	1.33f _o	0.133f _o	7.52f _o	G-1	G-04	S1006	765-11-f
25	20k	1	0.750f _o	1.33f _o	0.240f _o	4.18f _o	H-1	H-02	S1006	765-12-f
25	20k	½	0.857f _o	1.17f _o	0.267f _o	3.75f _o	G-1	G-04	S1006	765-22-f
25	20k	½	0.857f _o	1.17f _o	0.438f _o	2.28f _o	H-1	H-02	S1006	765-23-f
25	20k	⅓	0.900f _o	1.11f _o	0.352f _o	2.84f _o	G-1	G-04	S1006	765-32-f
25	20k	⅓	0.900f _o	1.11f _o	0.552f _o	1.81f _o	H-1	H-02	S1006	765-33-f


**FREQUENCY
DEVICES™**
**765 SERIES ANSI S1.11
THIRD-, HALF AND FULL
OCTAVE BAND FILTERS**

FREQUENCY DEVICES INC

ANSI STANDARD S1.11

ANSI Standard S1.11 establishes a standard method of noise analysis using sets of standard bandpass filters. The center (or mean) frequencies are specified as shown in the table below. The frequency response characteristics are grouped under three classes (I, II, or III) depending upon the steepness of the slope of the attenuation vs. frequency curve.

Class I is a low slope response defined for octave band filters to provide a measurement standard for tests that can be conducted with relatively low discrimination filters. Class II is a moderate slope response defined for octave, half-octave and third-octave band filters that provides sufficient discrimination for most applications. Class III is a high slope, sharp response defined for half-octave and third-octave band filters to meet the needs of users requiring greater discrimination. The ANSI frequency response limits are shown on the 765 Series frequency response curves starting on page 4.

The filter sets themselves are grouped into three types, Restricted (Type R), Extended (Type E), and Optional (Type O), depending upon the frequency range coverage of and the corresponding number of filters in the set. As shown in the table below, types R and E define specific complete filter sets. Type designation O leaves the filter selection up to the user. See the HOW TO ORDER section on page 8 for ordering instructions.

ANSI STANDARD FILTER BANDS AND SETS

BAND	CENTER FREQUENCY f_c or f_m (HERTZ)	OCTAVE 765-11-f (I) 765-12-f (II)		HALF-OCTAVE 765-22-f (II) 765-23-f (III)		THIRD-OCTAVE 765-32-f (II) 765-33-f (III)		ANY BAND
		TYPE R	TYPE E	TYPE R	TYPE E	TYPE R	TYPE E	
14	25.0						•	
15	31.5		•		•		•	
16	40.0						•	
16.5	45.0				•			
17	50.0				•		•	
18	63.0		•		•		•	
19	80.0						•	
19.5	90.0				•			
20	100					•	•	
21	125	•	•	•		•	•	
22	160					•	•	
22.5	180			•	•			
23	200					•	•	
24	250	•	•	•	•	•	•	
25	315			•	•	•	•	
25.5	355							
26	400					•	•	
27	500	•	•	•	•	•	•	
28	630					•	•	
28.5	710			•	•			
29	800							
30	1.00k	•	•	•	•	•	•	
31	1.25k					•	•	
31.5	1.40k			•	•			
32	1.60k						•	
33	2.00k	•	•	•	•	•	•	
34	2.50k							
34.5	2.80k			•	•			
35	3.15k					•	•	
36	4.00k	•	•		•	•	•	
37	5.00k					•		
37.5	5.60k							
38	6.30k				•			
39	8.00k		•				•	
40	10.0k						•	
40.5	11.2k				•			
41	12.5k						•	
42	16.0k		•				•	
43	20.0k						•	

ANY OCTAVE, HALF-OCTAVE AND/OR THIRD-OCTAVE BANDS REQUIRED

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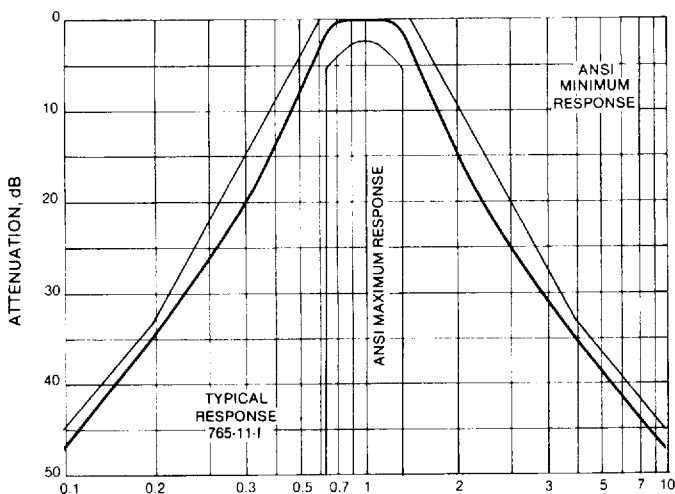
	MIN	TYP	MAX	UNITS
CENTER FREQUENCY				
Available Range	25	—	20k	Hz
Tolerance				
765-11- f_o , 765-12- f_o	—	—	± 2	%
765-22- f_o , 765-23- f_o	—	—	± 1	%
765-32- f_o , 765-33- f_o	—	—	± 1	%
PASSBAND				
Gain at f_o	-0.5	0	+0.5	dB
Minimum 3dB Bandwidth Limits ²				
765-11- f_o , 765-12- f_o	$0.750f_o$	—	$1.33f_o$	Hz
765-22- f_o , 765-23- f_o	$0.857f_o$	—	$1.17f_o$	Hz
765-32- f_o , 765-33- f_o	$0.900f_o$	—	$1.11f_o$	Hz
INPUT				
Impedance	95	100	105	k Ω
Voltage	-10	—	+10	V
Maximum Safe Voltage	$-V_S$	—	$+V_S$	V
OUTPUT				
Impedance	0	1	10	Ω
Rated Output at 5mA ³	-10	—	+10	V
Offset Voltage	-25	0	+25	mVdc
Drift	0	± 3	± 10	$\mu V/^\circ C$
Noise ⁴	—	—	50	μV RMS
POWER SUPPLY ($\pm V_S$)				
Operating Voltage	± 5	—	± 18	Vdc
Supply Current				
765-11- f_o , 765-22- f_o , 765-32- f_o	—	8	15	mA
765-12- f_o , 765-23- f_o , 765-33- f_o	—	10	20	mA
TEMPERATURE				
Operating	0	—	70	$^\circ C$
Storage	-25	—	85	$^\circ C$

- NOTES 1 Typical at 25 $^\circ C$ and $V_S = \pm 15$ Vdc.
 2 Actual response will be outside these limits.
 3 Short circuit protected to ground.
 4 Dc to 50kHz excluding dc offset, input grounded.

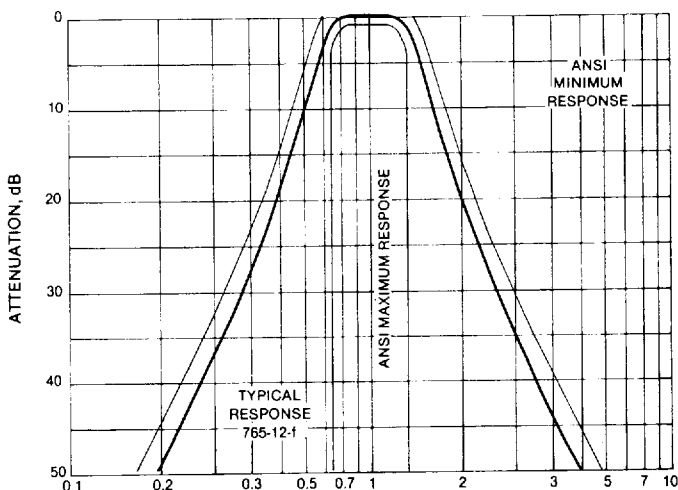
Specifications subject to change without notice.

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765-11-f

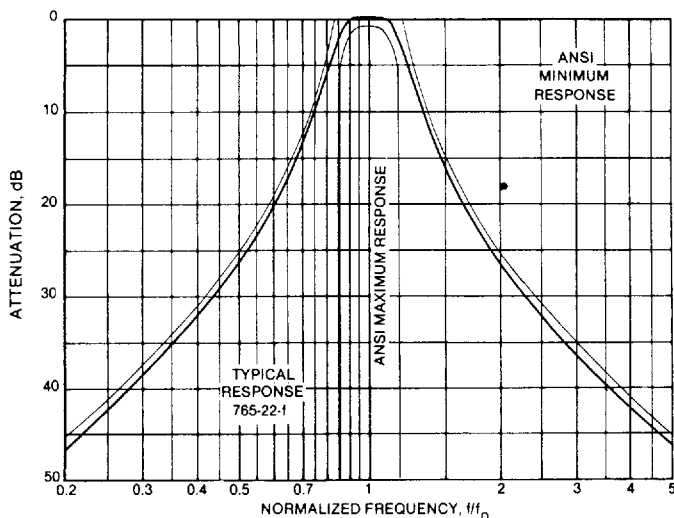
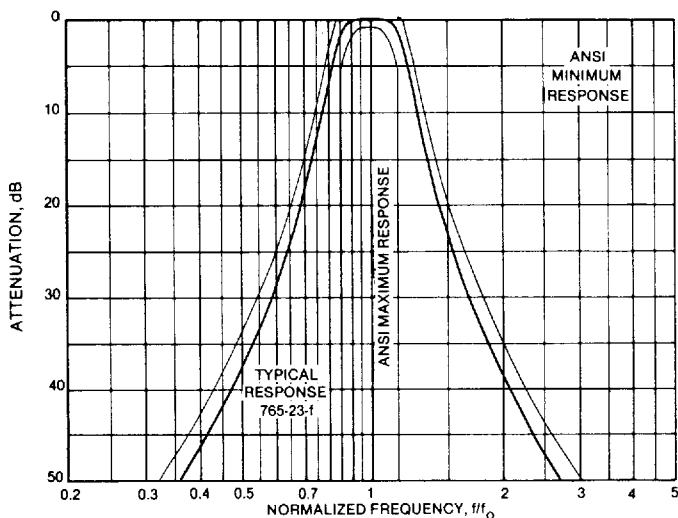


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**FREQUENCY
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**765 SERIES
FREQUENCY RESPONSES
HALF-OCTAVE BAND FILTERS**

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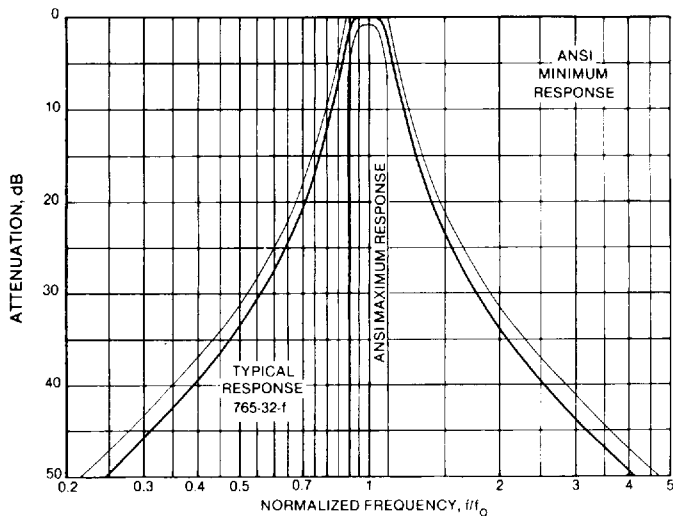
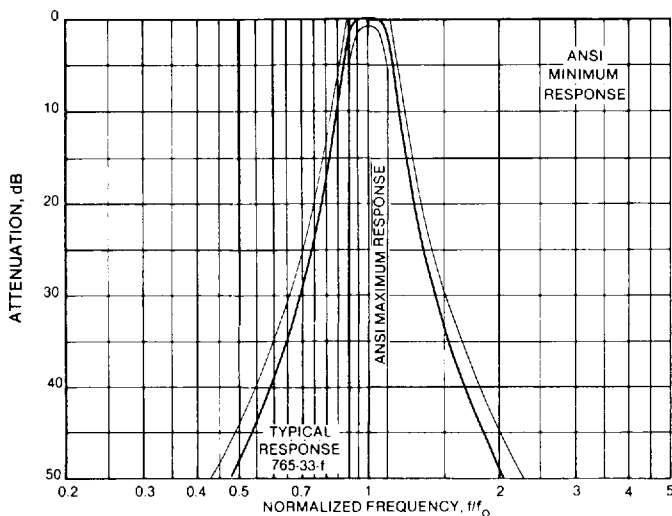
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765-23-f


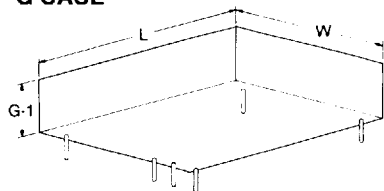
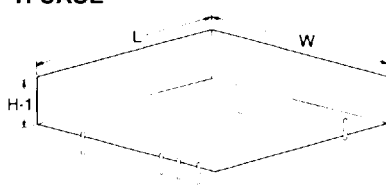
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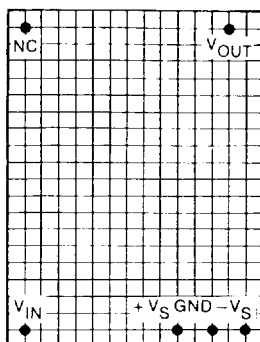
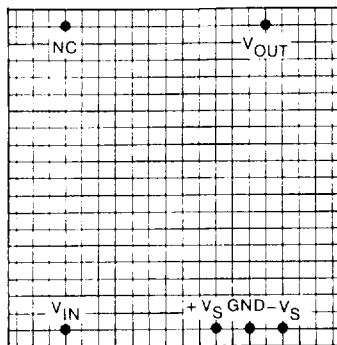
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**FREQUENCY
DEVICES**
765 SERIES
FREQUENCY RESPONSE
THIRD-OCTAVE BAND FILTERS
FREQUENCY DEVICES INC
765-32-f

765-33-f



FREQUENCY DEVICES INC
G CASE

H CASE


DIMENSION	MILLI-METERS	INCHES	DIMENSION	MILLI-METERS	INCHES
G-1	10.2	0.4	H-1	10.2	0.4
L	50.8	2.0	L	50.8	2.0
W	38.1	1.5	W	50.8	2.0
PIN LENGTH	5.1 MIN	0.2 MIN	PIN LENGTH	5.1 MIN	0.2 MIN
PIN DIA	1.02	0.04	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
G-04

BOTTOM VIEWS
H-02

0.1 INCH GRIDS
TERMINAL KEY

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


**FREQUENCY
DEVICES**

765 SERIES

**SOCKET AND ORDERING
INFORMATION**
FREQUENCY DEVICES INC
HOW TO ORDER
INDIVIDUAL FILTERS, ANY FREQUENCY

The six basic model numbers of the 765 Series are listed in the Available Models table on page 1. In each case a center frequency code (f) must be added to complete the part number. The center frequency code is formed simply by writing the frequency in Hertz using either a letter A instead of a decimal point or a letter K instead of a thousands comma as shown in these examples:

FREQUENCY	CODE (f)	PART NUMBER
31.5 Hz	31A5	765-12-31A5
630Hz	630A or K630	765-32-630A
2,800Hz	2K80	765-22-2K80

COMPLETE ANSI STANDARD FILTER SETS are ordered as a single part number as shown in this table:

BANDWIDTH	CLASS	RESTRICTED RANGE TYPE R SET	EXTENDED RANGE TYPE E SET
OCTAVE	I	765-11-R	765-11-E
OCTAVE	II	765-12-R	765-12-E
1/2 OCTAVE	II	765-22-R	765-22-E
1/2 OCTAVE	III	765-23-R	765-23-E
1/3 OCTAVE	II	765-32-R	765-32-E
1/3 OCTAVE	III	765-33-R	765-33-E

INDIVIDUAL ANSI STANDARD FILTERS are ordered simply by using the ANSI Standard center frequencies listed in the ANSI Standard Filter Bands and Sets table on page 2.

		SOCKET S1006	
DIMEN SION	MILLI METERS	INCHES	
L	76	3.0	
LH	64	2.5	
W	38	1.5	
WH	25	1.0	
H1	2.3	0.09	
H2	7.9	0.31	
H3	12	0.47	
DIA	3.5	0.14	

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