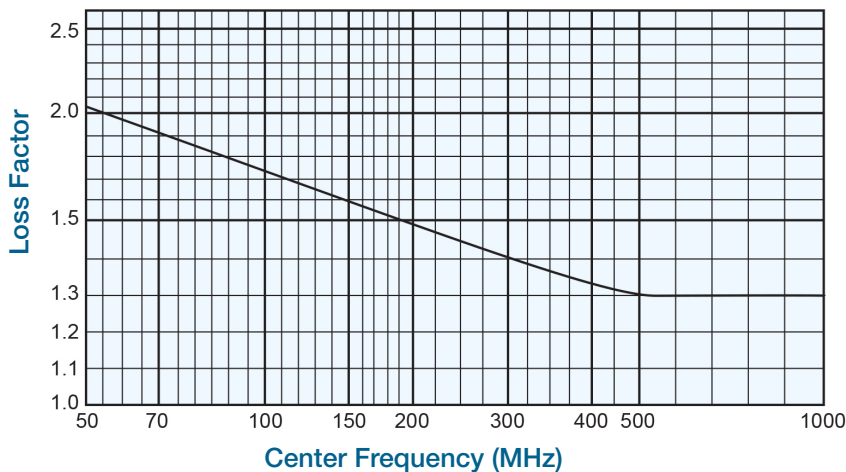


No. of Sections	2	3	4	5	6 or more
1.5/1 VSWR BW	0.4	0.7	0.8	0.85	0.9
MIN 3 dB BW					



Specification	Standard	*Special
<b>Electrical</b>		
Center Frequency (Fc)	60 to 700 MHz	50 to 900 MHz
3dB Relative Bandwidth (% of Fc)	4 to 40	4 to 50
Number of Sections Available	3 to 8	2 to 10
Nominal Impedance	50Ω	50Ω
Maximum Insertion Loss	See Curve	See Curve
Maximum VSWR	1.5/1	1.3/1
Attenuation in the Stopband	See Page 50	See Page 50
Maximum Input Power (Average) (Watts to 10,000 ft.)	$\frac{1000 \times 3\text{dB BW (MHz)}}{(\text{LOSS FACTOR})(F_c \text{ MHz})}$	See Standards
Maximum Input Power (Peak) (Watts to 10,000 ft.)	$\frac{750 \times 3\text{dB BW (MHz)}}{F_c \text{ (MHz)}}$	5,000
<b>Environmental</b>		
Shock	15 G's	25 G's
Vibration	5 G's	10 G's
Humidity	90% relative	100% relative
Altitude	Unlimited	Unlimited
Temperature Range (Operating)	- 25°C to + 50°C	- 54°C to + 85°C
Temperature (Non-Operating)	- 54°C to + 70°C	- 54°C to + 100°C
<b>Mechanical</b>		
Approximate Weight	1.25 oz. per inch	1.25 oz. per inch
Mounting Provisions	See Page 53	See Page 53

\*Contact Benchmark Lark Engineering for Special Configurations



#### Insertion Loss:

The maximum Insertion Loss at center frequency is equal to:

$$\frac{LF \times (N=0.5)}{\% \text{ 3 dB BW}} + 0.2$$

Where:

LF = Loss Factor N = Number of Sections

% 3dB BW:

$$\frac{3\text{dB BW (MHz)} \times 100}{\text{Center Frequency (MHz)}}$$

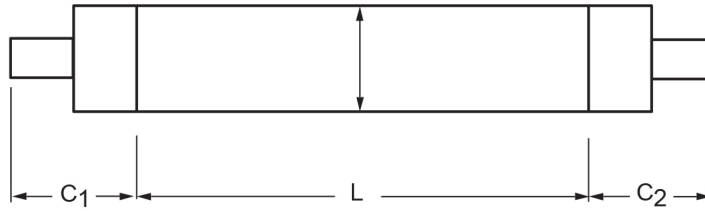
Example:

A 5 section 2B with a center frequency of 5000 MHz and a 3dB BW of 500 MHz would have:

$$\frac{1.5 \times 3.5}{10} = \frac{5.25}{10} = .525$$

$$.525 + 0.2 = 0.8\text{dB}$$

1 1/4 inch DIA.  
(31.75mm)



HP 200 - 30 - 3 A A

SERIES      CENTER FREQUENCY (MHz)      MINIMUM 3dB RELATIVE BANDWIDTH (MHz)      NUMBER OF SECTIONS      INPUT CONNECTOR      OUTPUT CONNECTOR

### CONNECTORS AVAILABLE ON HP SERIES:

LARK CODE	TYPE	C DIM. INCHES	C DIM. MM	LARK CODE	TYPE	C DIM. INCHES	C DIM. MM
A	SMA JACK	.800	20.3	G	N JACK	1.625	41.3
B	SMA PLUG	.885	22.5	H	N PLUG	1.585	40.3
C	TNC JACK	1.350	34.3	S	SPECIAL		
D	TNC PLUG	1.280	32.5				
E	BNC JACK	1.350	34.3				
F	BNC PLUG	1.280	32.5				

### LENGTH:

The approximate length of a Lark HP series filter can be determined by the formula:

$$\frac{(0.5 N + 2) \times LC}{\% BW} = L$$

Where N is the number of sections used, % BW is:

$$\frac{3dB BW (MHz) \times 100}{\text{CENTER FREQUENCY (MHz)}}$$

CENTER FREQUENCY (MHz)

LC is the length constant at the specified center frequency, L is the dimension between the connectors; C<sub>1</sub> and C<sub>2</sub> are the connector lengths as shown above. All of the length information given here is approximate. Exact length specifications must be quoted by the factory. If a special length is needed, please submit all of your requirements - both electrical and mechanical. This will enable Lark Engineering to quote the optimum design for your application.

Example:

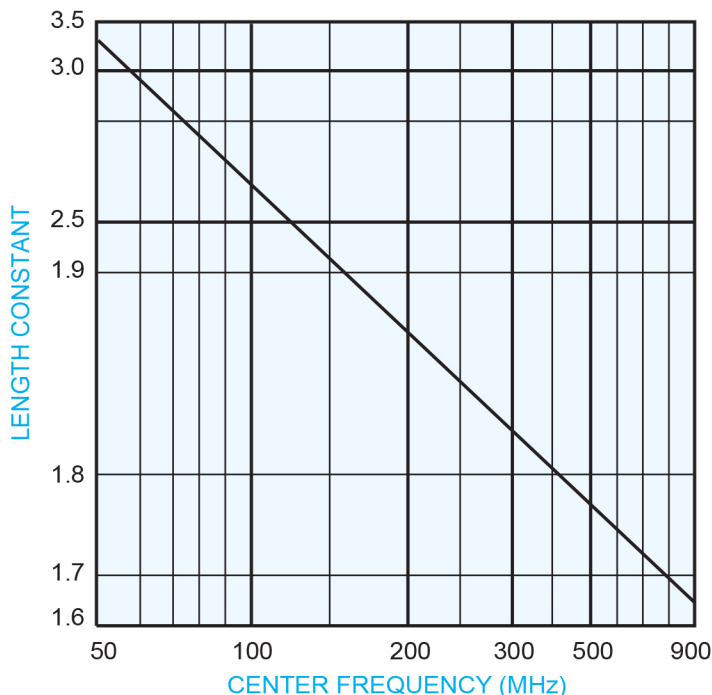
A 3 section HP with a center frequency of 200 MHz a 3dB BW of 20 MHz and SMA jack input and output connectors would be:

$$(1.5 + 0.2) \times 1.87 = 3.179 + C_1 + C_2$$

In most cases, the L dimension is rounded to the nearest 1/4 inch which in this instance would be 3.25 inches and the O.A.L. is:

$$3.25 + .800 + .800 = 4.85 \text{ inches.}$$

To convert inches to millimeters multiply x 25.40.



# Stopband Attenuation

The graphs on the following pages define the normal specification limits on attenuation for Lark bandpass filter series HP, HQ, SF, and SM. The minimum level of attenuation in dB is shown as a “number of 3dB bandwidths from center frequency”.

Since the frequency characteristics vary for differing bandwidths, it is necessary to establish specifications for each bandwidth of filter. The different graphs represent various 3dB percentage bandwidths. Intermediate values should be interpolated. The 3dB percentage bandwidth is defined as follows:

$$\frac{3\text{dB Bandwidth (MHz)} \times 100}{\text{Center Frequency (MHz)}}$$

The exact relationship is as follows:

$$\text{Rejection Frequency (MHz)} - \text{Center Frequency (MHz)} = \frac{3\text{dB Bandwidth (MHz)}}{1}$$

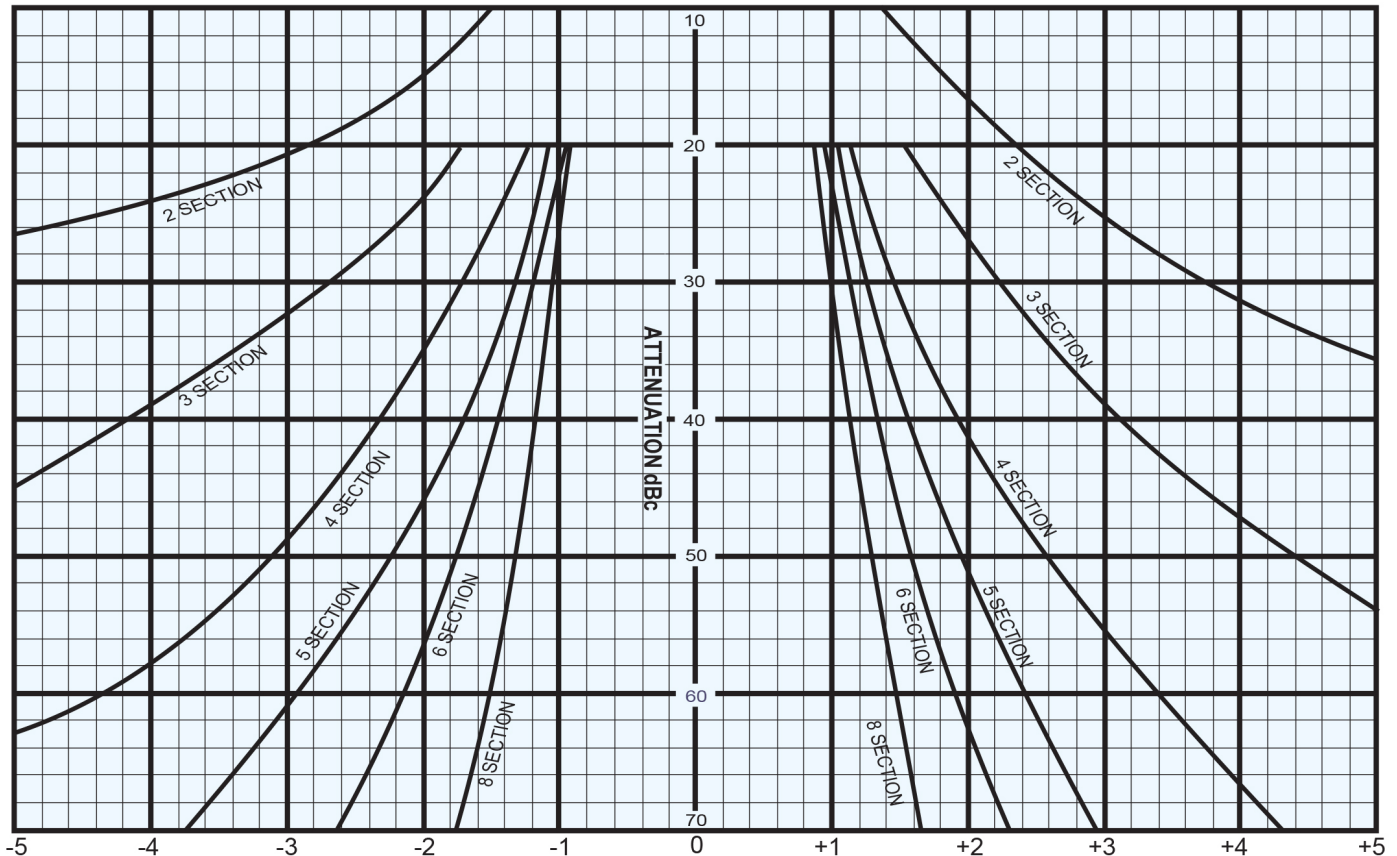
Example:

2. Center Frequency = 300 MHz  
Minimum 3dB Bandwidth = 30 MHz  
Number of Sections = 5  
Find: Minimum attenuation levels at 255 MHz and 348 MHz.

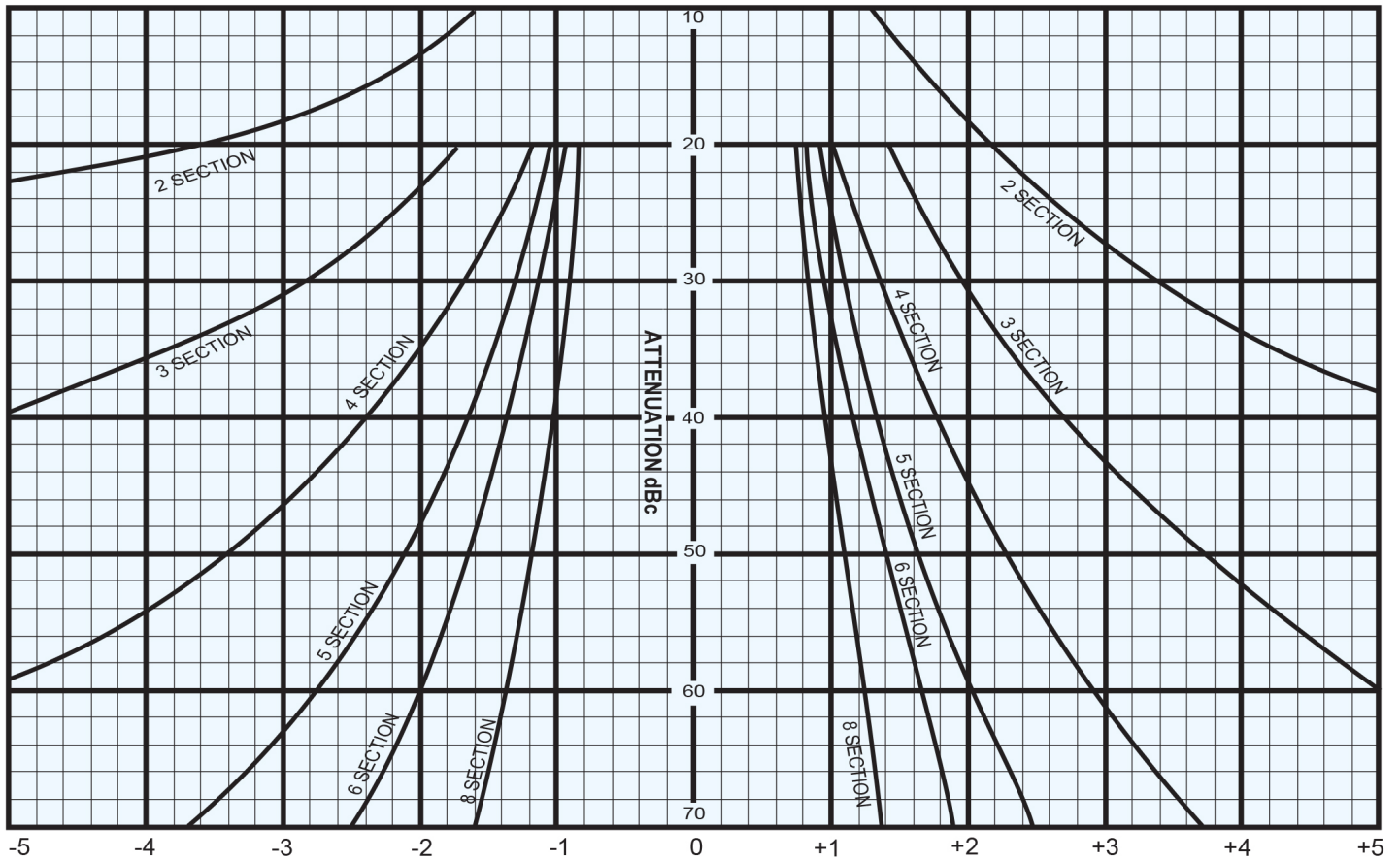
$$\begin{aligned} 3\text{dB BW's from } F_c &= \frac{255 - 300}{30} = -1.5 \\ &\text{and } \frac{5800 - 5000}{30} = +1.6 \end{aligned}$$

As the 3dB bandwidth is exactly 10% of the center frequency, the answer can be read directly from the 10% graph. Using the 5 section curve at the point -1.5 (255 MHz) we find the minimum level of attenuation is 36dB. At +1.6 (348 MHz) the minimum level of attenuation is 48dB.

For special requirements, please contact our Application Engineering Department.

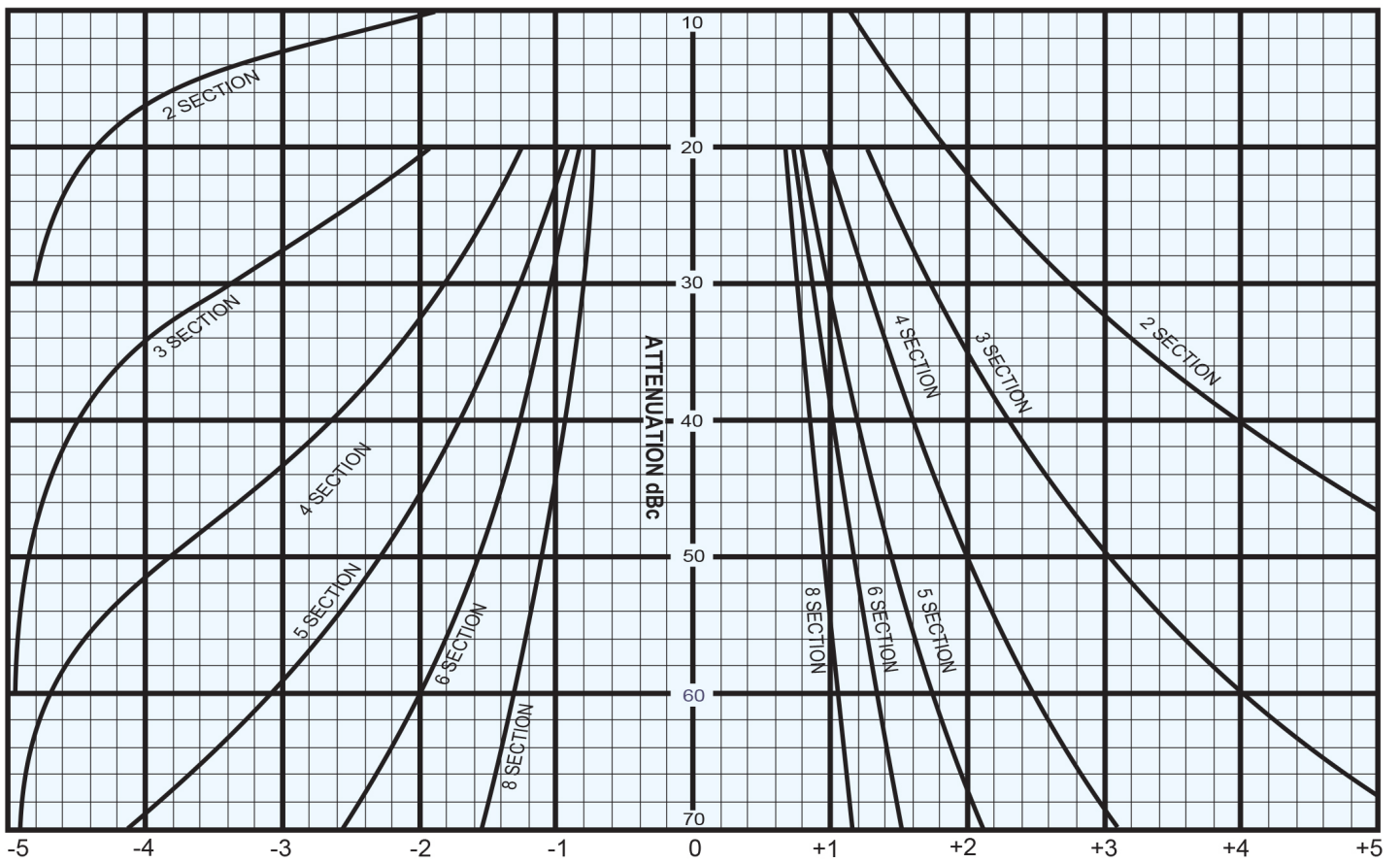


# Tubular Series



NO. OF 3dB BANDWIDTHS

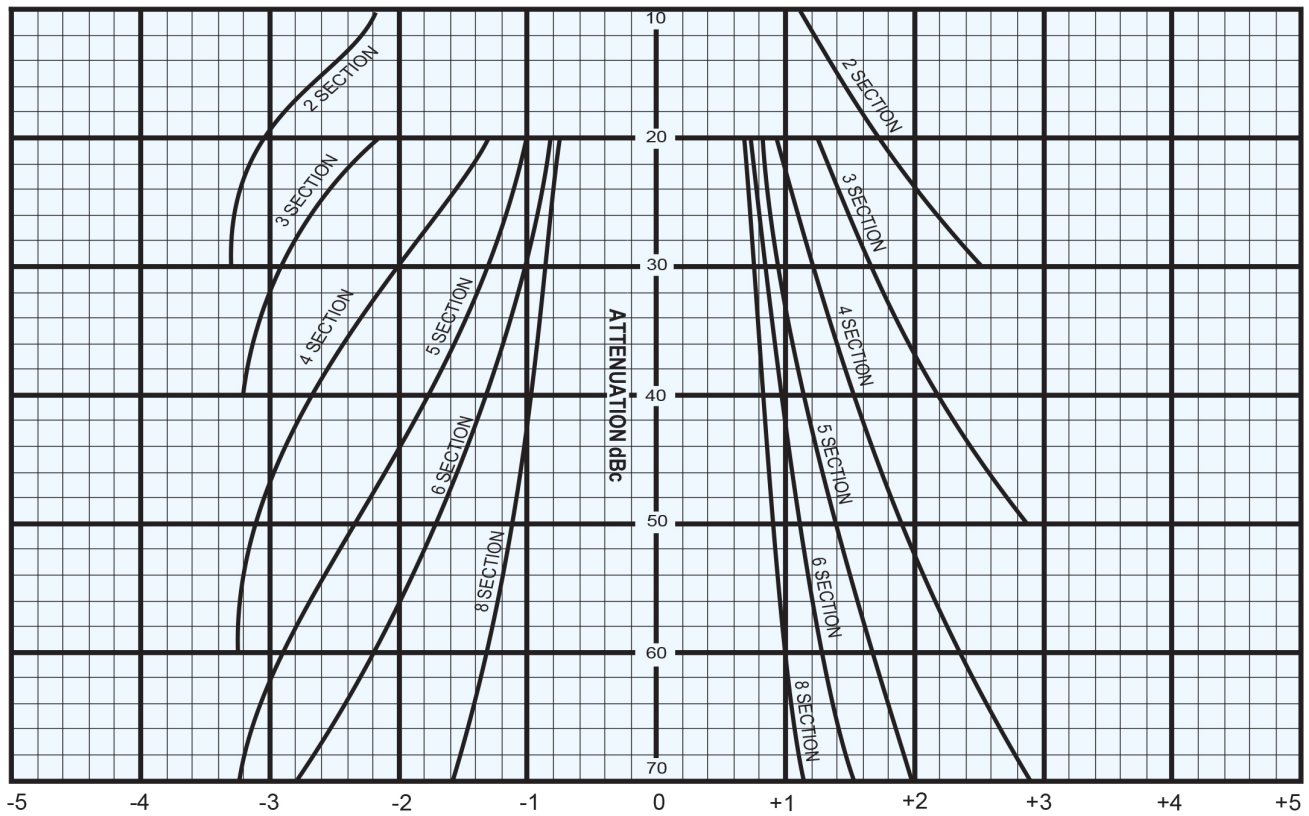
3dB BANDWIDTH APPROX. 10% OF  $F_c$



NO. OF 3dB BANDWIDTHS

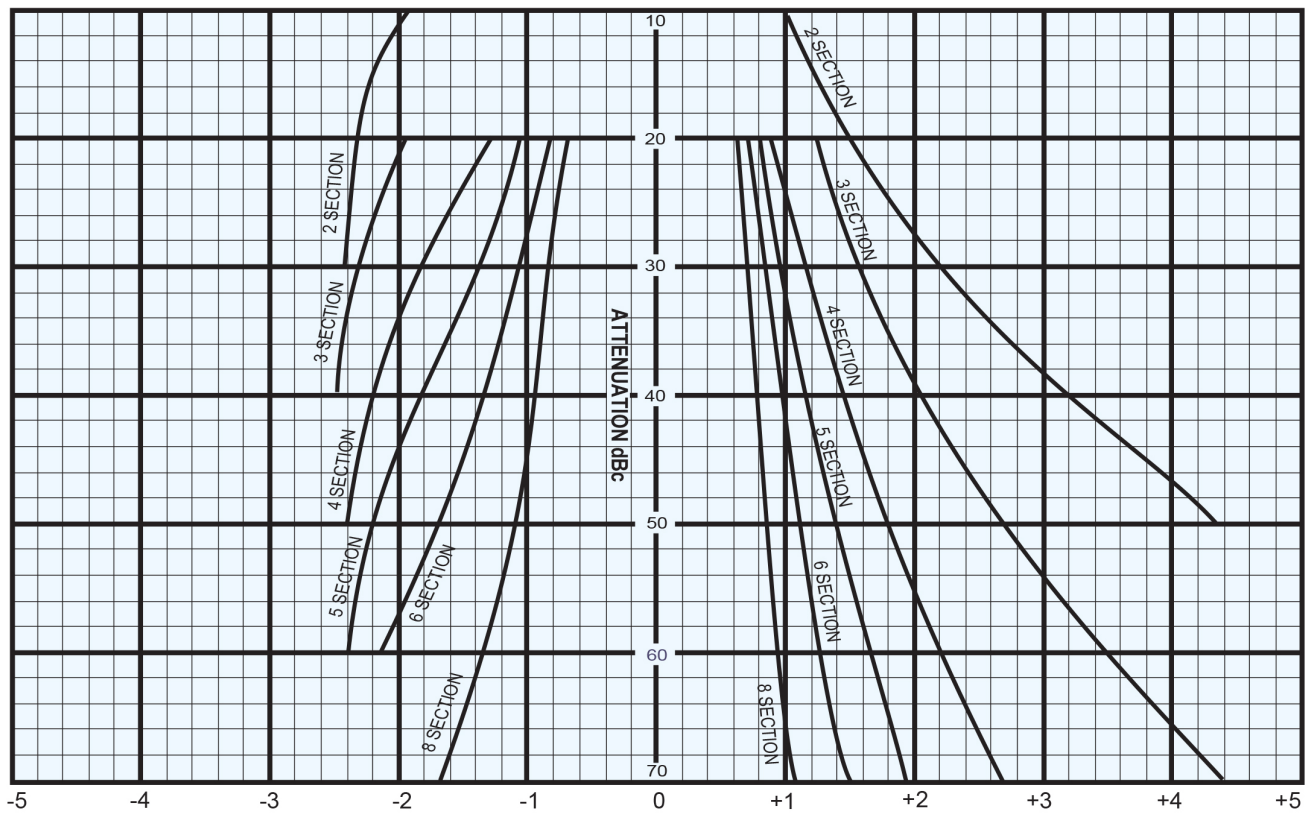
3dB BANDWIDTH APPROX. 20% OF  $F_c$

## Tubular Series



NO. OF 3dB BANDWIDTHS

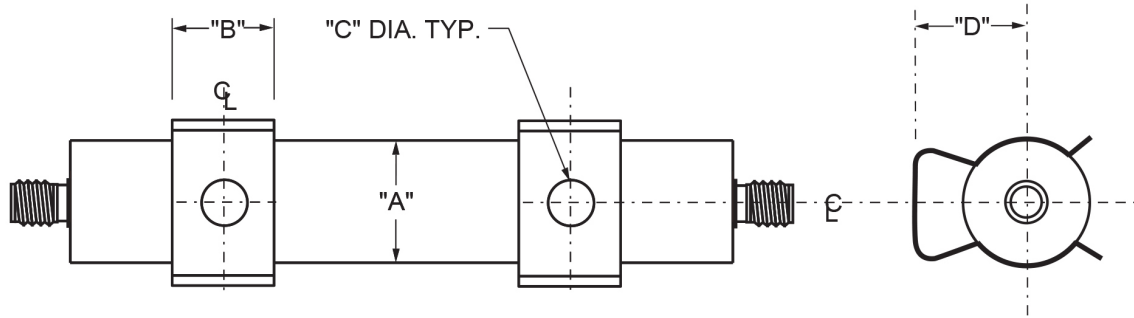
3dB BANDWIDTH APPROX. 30% OF  $F_c$



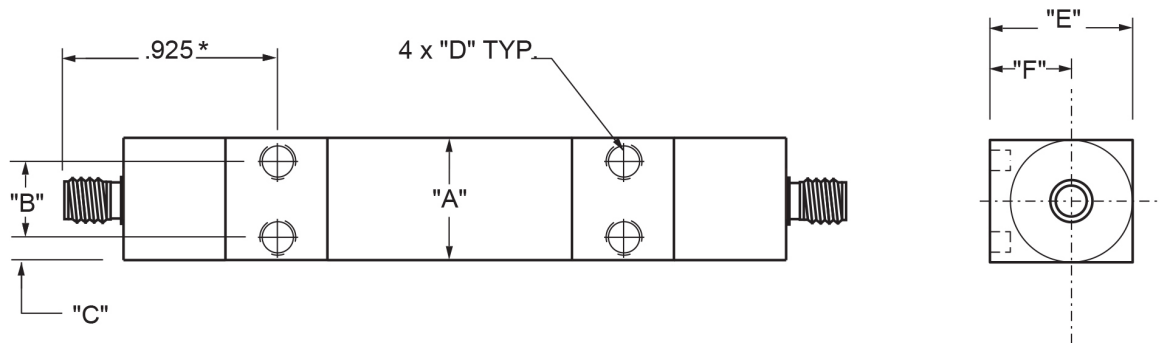
NO. OF 3dB BANDWIDTHS

3dB BANDWIDTH APPROX. 40% OF  $F_c$

## Mounting Dimensions Adjustable Clips



MODEL	"A" DIA.	"B"	"C" DIA	"D"
SM	3/8"	.360	.170	.310
SF	1/2"	.390	.170	.420
HQ	3/4"	.625	.265	.620
HP	1 1/4"	.625	.265	.820



MODEL	"A" DIA.	"B"	"C"	"D"	"E"	"F"
SM	3/8"	.187	.094	2-56 UNC-2B x 3/32 DP	.438	.250
SF	1/2"	.312	.094	4-40 UNC-2B x 3/16 DP	.625	.375
HQ	3/4"	.500	.125	6-32 UNC-2B x 1/4 DP	.875	.500
HP	1 1/4"	1.000	.125	10-32 UNC-2B x 1/4 DP	1.500	.875

\*Dimension from connector tip to mounting holes are shown only for SMA jacks. For other connectors, add or subtract the difference of C dimension from connector code.

/M after the part number denotes mounting blocks  
/C after part number denotes mounting clips  
Refer to page 106 for correct part number sequence and usage.