Series UV22IN, Interdigital Band-Pass Filters, 1 to 18 GHz, 2 to 50% Bandwidth

- Equal Ripple Chebyshev Design
- Optimal Trade-Off between Low Insertion Loss and Sharp Stop-Band Rejection

Specifications

Parameter	Specification
Center Frequency Range (F_O)	1 to 18 GHz
3 dB Relative Bandwidth	2 to 50%
Number of Sections	3 to 16
Impedance	50 ohms
VSWR at F_O	1.5:1 typical
Insertion Loss	Related to bandwidth and number of sections (see Figure 20)
Stopband Rejection	Related to bandwidth and number of sections (see rejection curves, Figures 21 to 25)
Average Input Power	2 to 100 W
Connectors	N, BNC, TNC, SMA
Size	Related to bandwidth and number of sections (details upon request)
Temperature Range	0° to +50° (standard)

Options

- Special connectors and packaging
- Design specifications and development conforming to stringent military requirements.

How to order

Standard Models

Please specify your order by stating the model number according to the specifications table and the example below:

$$\frac{\text{UV22 IN}}{1} - \frac{7}{2} - \frac{8000}{3} / \frac{400}{4} - \frac{\text{SF}}{5} - \frac{\text{SF}}{6}$$

Legend:

1: Basic model number (UV 22IN)
2: Number of sections
3: Center frequency (MHz)
4: Relative 1 dB bandwidth (MHz)
5: Input connector code
6: Output connector code

Connector	Code	
	Male	Female
SMA	SM	SF
BNC	BM	BF
TNC	TM	TF
N	NM	NF

Custom Models

Please specify your order by following the example below:

a. Determination of Insertion Loss

The typical insertion loss at center frequency is determined as follows: $\frac{LC(N+0.4)}{1\,\text{dB}\;BW(\%)}+b\;\text{dB}$

Where: LC = Loss Constant (see Figure 20)

N = Number of sections

	0	up to 10% BW
	0.15	10 to 30% BW
b =	0.20	31 to 40% BW
	0.30	41 to 50% BW

$$1\,\text{dB}\;BW(\%)=\frac{1\,\text{dB}\;BW\;(\text{MHz})\times 100}{\text{Center Frequency}\,(\text{MHz})}$$

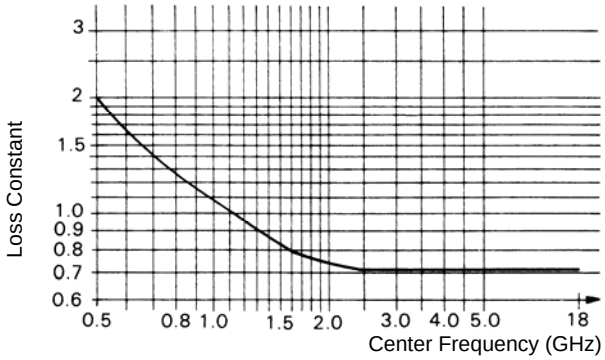


Figure 20. Loss Constant vs Center Frequency

b. Rejection Curves and Determination of Number of Sections

The rejection frequency is plotted in steps of 1 dB BW from the center frequency (F_O):

The number of 1 dB bandwidth = W

$$W_{\pm}=\frac{\text{Rejection Frequency}\,(\text{MHz})\text{ - }F_O\;(\text{MHz})}{\text{Minimum}\,1\,\text{dB}\;BW\;(\text{MHz})}$$

Example:

Center frequency	8000 MHz
1 dB BW	400 MHz
Rejection at 7200 and 8800 MHz	50 dB min.

1 dB relative bandwidth will be: $\frac{400\times 100}{8000}=5\%$

Therefore, use the value of W to find the number of the required sections from Figure 25:

$$\frac{F_{AL}-F_O}{BW}=\frac{7200-8000}{400}=-2\;\text{ and }\;\frac{F_{AH}-F_O}{BW}=\frac{8800-8000}{400}=+2$$

We see that five sections are required.

From Figure 20 the Loss Constant is 0.7. Then the Insertion Loss at Center Frequency will be:

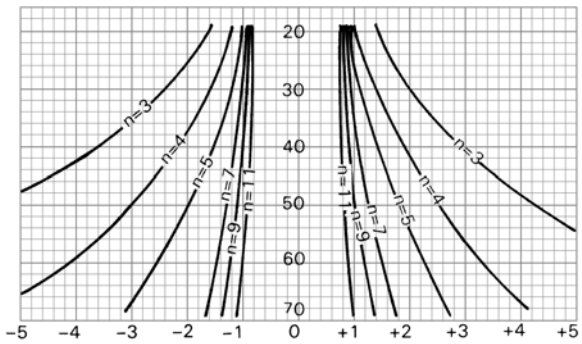
$$\frac{0.7\times(5+0.4)}{5}+0=0.76\,\text{dB}$$

The part number will be:

$$\frac{\text{UV22IN}}{1}-\frac{5}{2}-\frac{8000}{3}/\frac{400}{4}-\frac{\text{SF}}{5}-\frac{\text{SF}}{6}$$

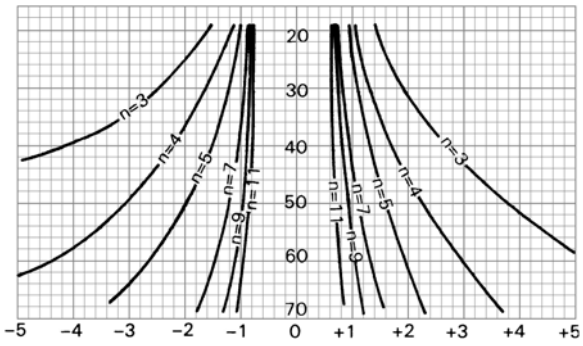
Legend:

1: Basic model number (UV22IN)
2: Number of sections
3: Center frequency (MHz)
4: Relative 1 dB bandwidth (MHz)
5: Input connector code
6: Output connector code



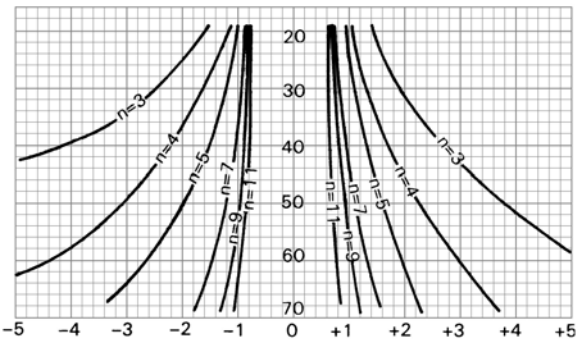
No. of 1 dB Bandwidths

Figure 21. Rejection Curves (dBs), 1dB BW = 5%



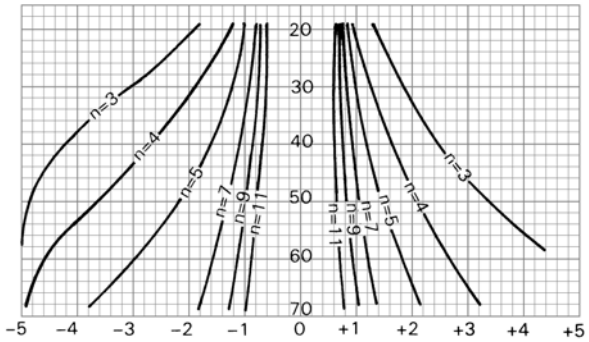
No. of 1 dB Bandwidth

Figure 22. Rejection Curves (dBs), 1 dB BW = 10%



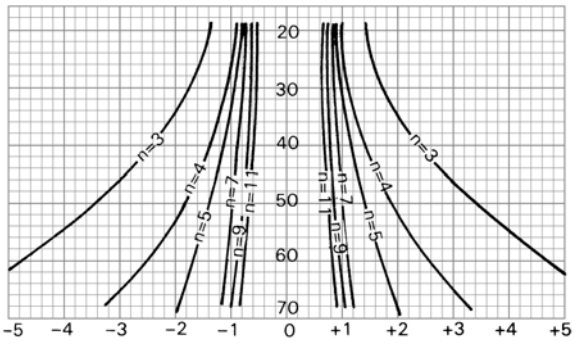
No. of 1 dB Bandwidths

Figure 23. Rejection Curves (dBs), 1 dB BW = 20%



No. of 1 dB Bandwidth

Figure 24. Rejection Curves (dBs), 1 dB BW = 40%



No. of 1 dB Bandwidths

Figure 25. Rejection Curves, (dBs), 1dB BW = 50%