Cavity Filters

K&L Microwave's series of cavity filters covers the frequency range from 30 MHz to 40 GHz. These filters are available with 2 to 17 resonant sections and bandwidths from 0.2% to 50%. Although standard designs offer VSWR specifications of 1.5:1 maximum, the series lends itself to specifications as low as 1.2:1.

While the standard product offers excellent characteristics, K&L can enhance parameters such as insertion loss and power handling capacity (both peak and average) through special package design. As seen with the examples below, K&L's design engineers work with our customers to meet specialized package configurations.

The combline filter series provides an extremely small high "Q" device suitable for rugged environmental requirements in a practically unlimited range of applications. As a result of computer aided design and computerized machining equipment, the package size for this series can be optimized for performance requirements; therefore, there are no limitations of fixed package size.

Waveguide Filters

K&L Microwave offers as many solutions to customer requirements as there are applications. We have several state-of-the art design packages that can meet the most stringent customer demands as well as custom designs to fit the needs of the point-to-point radio market, which requires high volume product at competitive pricing. K&L also offers waveguide solutions for lower quantities with specialized applications.

K&L will quote the right solution to meet your company's waveguide requirements. Call our factory today and discuss your specific application with our technical sales staff.

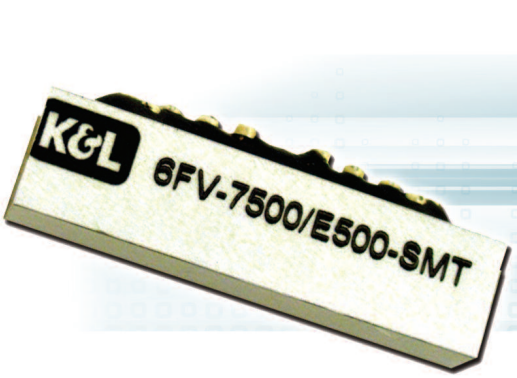
Rectangular Mode

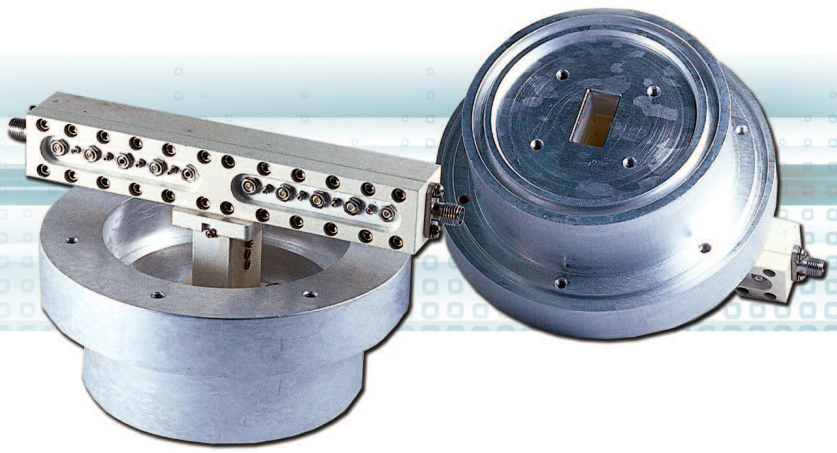
K&L offers rectangular waveguide in the TE 101 mode from 2.5 to 94 GHz. Types of filters offered include bandpass filters, diplexers and lowpass filters. K&L utilizes high performance proprietary and purchased software that minimizes tuning time and maximizes performance. K&L offers multiple diplexer configurations including "Tee" and "Y" junctions as well as rectangular transmit and receive ports with circular antenna ports. Rectangular waveguides are available from 1 to 20 % bandwidth with 2 to 20 sections.

Waveguide filters come with any choice of connectors or flange mounts available for your frequency range. K&L will create customer specific mounting applications to ensure mechanical fit to your special requirements.

Circular Mode

K&L offers circular mode waveguide filters that are Te111 mode filters available from .1 to 1.8 % bandwidth. These circular filters are offered from 2 to 6 sections and are part of K&L's C60 series products.





High Frequency, Medium Bandwidth — FV Series

Features:

- Small Package Design, High "Q" Response
- Ruggedized Package Design
- Covers the 500 MHz to 40 GHz Frequency Range
- Combline Design Results in Low Insertion Loss Performance
- 3 dB BW Available from 3-18%
- Designs Available in 3-17 Sections
- Custom Package Designs Available

Specifications:

Model	Frequency (GHz)	3 dB % BW	VSWR	Insertion Loss	Passband Return	Impedance (Ohms)	No. of Sections	Shock	Vibration	Temperature	Relative Humidity
FV-50	.5-2	3-18	1.5:1	0.1 dB per section @ BW ≥ 5%	≥ 3.5 X f_0	50	3-17	20 G's, 1/2 Sine, 11 Ms	10 G's, 10 Hz-2000 Hz	-55 to +85 °C	0-95%
FV-40	2-5										
FV-30	3-8										
FV-20	4-10										
FV-10	7-18										

To Order:

5 FV 20 — 6575 / T 750 - O / O
1 2 3 4 5 6 7 8

Code	Description
1	Number of Sections
2	Series (FV-Combline)
3	Package Designator 20 Series
4	Center Frequency (MHz)
5	Supplemental Codes (See Page 13)
6	Bandwidth (MHz)
7	Input Connector
8	Output Connector

Connectors:

Connector	Code
SMA Female	O
SMA Male	OP
N Female	N*
N Male	NP*
TNC Female	T*
TNC Male	TP*
RF Pins	P
Removable SMA	RO
Blind Mate	OB

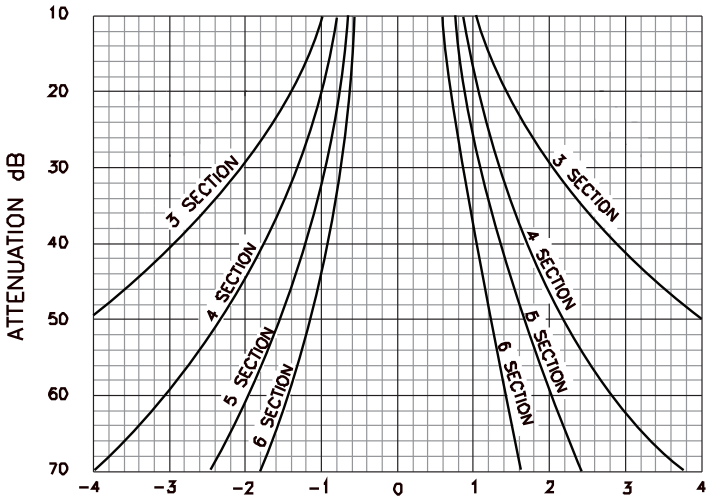
*Requires .75 W and .75 H

High Frequency, Medium Bandwidth — FV Series

Attenuation:

The adjacent curve is used to determine the out-of-band or stopband attenuation for K&L's combline filters. This curve shows the attenuation as multiples of the 3 dB bandwidth for filters up to 13 sections. The formula for approximate stopband attenuation:

$$\text{3 dB BW from } f_0 = \frac{\text{Reject Frequency-Center Frequency}}{\text{3 dB BW}}$$



Note: For more stringent rejection requirements, contact the factory.

Example:

Center Frequency = 6575 MHz
3 dB Bandwidth = 750 MHz
Number of Sections = 6

Find the attenuation at 5600 MHz and 7550 MHz by substituting in the formula:

$$\text{3 dB BW from } f_0 = \frac{5600-6575}{750} = -1.3 \text{ BW}$$

$$\text{3 dB BW from } f_0 = \frac{7550-6575}{750} = +1.3 \text{ BW}$$

From the 6 section curves -1.3 BW and +1.3 BW yield approximately 54 dB.

Mechanical:

The mechanical dimensions and mounting hole locations are dependent upon the design parameters specified by the customer. Contact K&L Microwave for details.

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Email: sales@klmicrowave.com

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Salisbury, MD 21801

High Frequency, Broadband — ED Series

Features:

- High "Q" Design Allows Small Package Size While Offering Low Loss
- Covers the 1 GHz to 18 GHz Frequency Range
- 3 dB BW Available from 5-50% (f_0)
- Designs that Cover up to 40 GHz Also Available

Specifications:

Model	Frequency (GHz)	8 dB % BW	VSWR	Passband Return	Impedance (Ohms)	No. of Sections
ED50	1-3	5-50%	1.5:1	≥ 2.1 X f_0	50	3-15
ED40	3-5	5-50%	1.5:1			
ED30	5-7	5-50%	1.7:1			
ED20	7-10	5-50%	1.7:1			
ED10	10-18	5-50%	1.7:1			

Mechanical:

The mechanical dimensions and mounting hole locations are dependent upon the design parameters specified by the customer. Contact K&L Microwave for details.

To Order:

7	ED	50	—	2500	/	E	500	-	O	/	O
1	2	3		4		5	6		7		8

Code	Description
1	Number of Sections
2	Series (Interdigital)
3	Package Designation
4	Center Frequency (MHz)
5	Supplemental Codes (See Page 13)
6	Bandwidth (MHz)
7	Input Connector
8	Output Connector

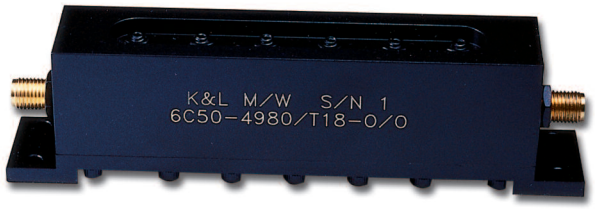
Connectors:

Connector	Code
SMA Female	O
SMA Male	OP
N Female	N
N Male	NP
TNC Female	T
TNC Male	TP
RF Pins	P
Removable SMA	RO
Blind Mate	OB

Narrow Bandwidth — C Series

Features:

- High "Q" Design Allows Narrow Bandwidth While Offering Low Loss
- "Q" Values of up to 10,000
- 3 dB BW Available from 0.1% to 3.5% (f_0)
- Covers the 60 MHz to 30 GHz Frequency Range
- Low Ripple Chebyshev Response
- Ruggedized Package to Withstand Severe Environmental Stress



Specifications:

Model	Frequency (MHz)	3 dB % BW	VSWR	Passband Return	Avg. Power (Watts)	Impedance (Ohms)	No. of Sections	Shock	Vibration	Temperature	Relative Humidity
C20	30-140	.2-3.5	1.5:1	≥ 3.5 X f_0	5	50	3-6	Contact Factory			
C30	141-450	.2-3.5	1.5:1	≥ 3.5 X f_0	5	50	3-6				
C40	451-2000	.2-3.5	1.5:1	≥ 1.5 X f_0	5	50	3-6				
C42	800-2500	.2-3.5	1.5:1	≥ 1.5 X f_0	5	50	3-7	20 G's, 1/2 Sine, 11 Ms	10 G's, 10 Hz-2000 Hz	-20 to +50 °C	0-95%
C45	1000-3000	.2-3.5	1.5:1	≥ 1.5 X f_0	5	50	3-7				
C50	2000-10000	.2-3.0	1.5:1	≥ 2.1 X f_0	5	50	3-9				
C52	8000-12000	.2-3.0	1.5:1	≥ 2.1 X f_0	5	50	3-9				
C60	6000-30000	.1-1.8	1.5:1	≥ 1.6 X f_0	5	50	3-9				

Insertion Loss:

The following formula is used to determine the approximate insertion loss at center frequency:

$$\text{Loss at } f_0 = \left(\frac{(\text{Loss Constant})(\text{No. of Sections} + 0.5)}{\%\ 3\ \text{dB BW}}\right) + 0.2$$

Example:

Model = 6C40-1000/T20-O/O
Center Frequency = 1000 MHz
3 dB Bandwidth = 20 MHz
Number of Sections = 6

$$\text{The \% 3 dB BW} = \frac{20 \times 100}{1000} = 2\%$$

Loss constant from table = 0.35

$$\text{Insertion Loss} = \left(\frac{(0.35)(6+.50)}{2}\right) + 0.2 = 1.4 \text{ dB}$$

Loss Constant:

Center Frequency (MHz)	Series							
	C20	C30	C40	C42	C45	C50	C52	C60
30-50	1.7							
51-65	1.6							
66-100	1.5							
101-400	1.4	1.2						
401-600		1.0	0.70					
601-900			0.40	0.25				
901-1300			0.35	0.20	0.25			
1301-1800			0.30	0.20	0.22			
1801-3000			0.30	0.20	0.20	0.30		
3001-30000						0.25	0.27	0.10

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Email: sales@klmicrowave.com

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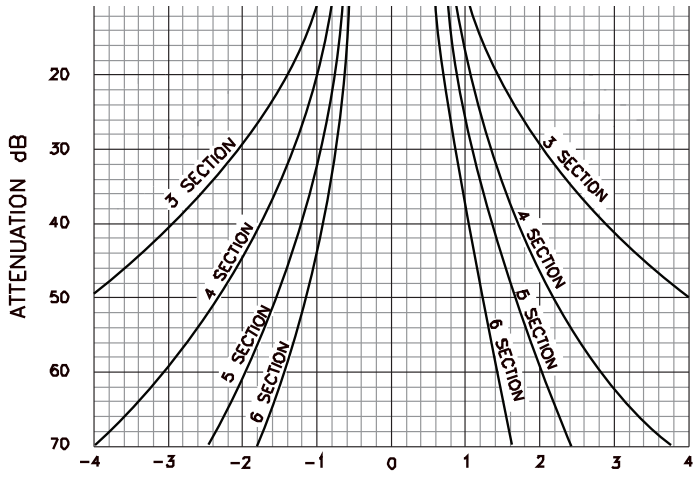
Attenuation

The adjacent curve is used to determine the out-of-band or stopband attenuation for K&L's cavity filters. This curve shows the attenuation as multiples of the 3 dB bandwidth for filters with 2 to 6 sections.



The following formula is used to determine the approximate stopband attenuation:

$$\text{3 dB BW from } f_0 = \frac{\text{Reject Frequency-Center Frequency}}{\text{3 dB BW}}$$

Center frequency = 300 MHz
3 dB Bandwidth = 6 MHz
Number of sections = 4

Find the attenuation at 288 MHz and 312 MHz by substituting in the formula:

$$\text{3 dB BW from } f_0 = \frac{288-300}{6} = -2 \text{ BW}$$

$$\text{3dB BW from } f_0 = \frac{312-300}{6} = +2 \text{ BW}$$

Referring to the attenuation curves, we find the attenuation in dB for a 4-section response +2 bandwidths from f_0 to yield 48 dB and -2 bandwidths from f_0 to yield 44 dB.

To Order:

5 C 20 — 140 / U 4 - N / NP
1 2 3 4 5 6 7 8

Code	Description
1	Number of Sections
2	Series
3	Package Designator
4	Center Frequency
5	Supplemental Codes (See Page 13)
6	Bandwidth (MHz)
7	Input Connector
8	Output Connector

Connectors:

Connector	Code	Length
SMA Female	O	.34-.38" / 8.64-9.65mm
SMA Male	OP	.51" / 12.95mm
N Female	N	.75" / 19.05mm
N Male	NP	.79" / 20.06mm
TNC Female	T	.75" / 19.05mm
TNC Male	TP	.85" / 21.59mm
BNC Female	B	.72" / 18.29mm
BNC Male	BP	.88" / 22.35mm
2.92 mm Female	K	
2.92 mm Male	KP	

Narrow Bandwidth — C Series

Mechanical:

Series	Frequency (MHz)	W Inches / mm	H- Max. Inches / mm	Length vs. Number of Sections (Inches / mm)				Fig.
				3	4	5	6	
C20	30-50	1.24 / 31.50	3.88 / 98.55	3.63 / 92.20	4.75 / 120.65	5.88 / 149.35	7.00 / 177.80	1
	51-65	1.24 / 31.50	2.88 / 73.15					
	66-100	1.24 / 31.50	2.38 / 60.45					
	101-140	1.24 / 31.50	1.88 / 47.75					
C30	141-450	1.24 / 31.50	1.88 / 47.75	3.63 / 92.2	4.75 / 120.65	5.88 / 149.35	7.00 / 177.8	1
C40	451-600	1.24 / 31.50	5.28 / 134.11	3.63 / 92.20	4.75 / 120.65	5.88 / 149.35	7.00 / 177.80	1
	601-900	1.24 / 31.50	4.28 / 108.71					
	901-1300	1.24 / 31.50	3.28 / 83.31					
	1301-1800	1.24 / 31.50	2.78 / 70.61					
	1801-2000	1.24 / 31.50	2.28 / 57.91					

Figure 1:

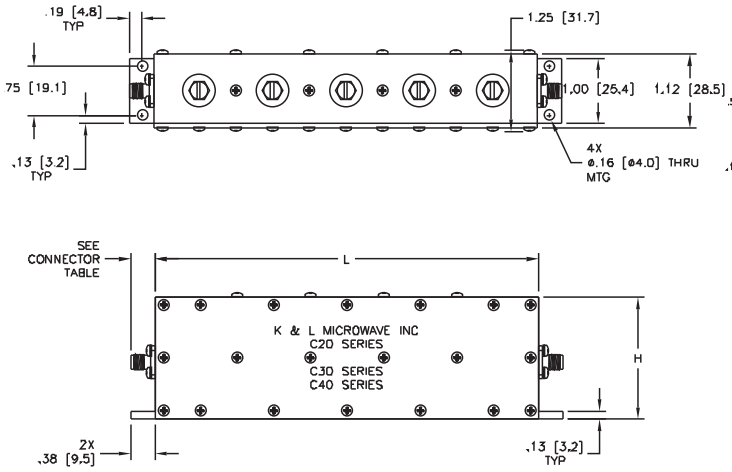
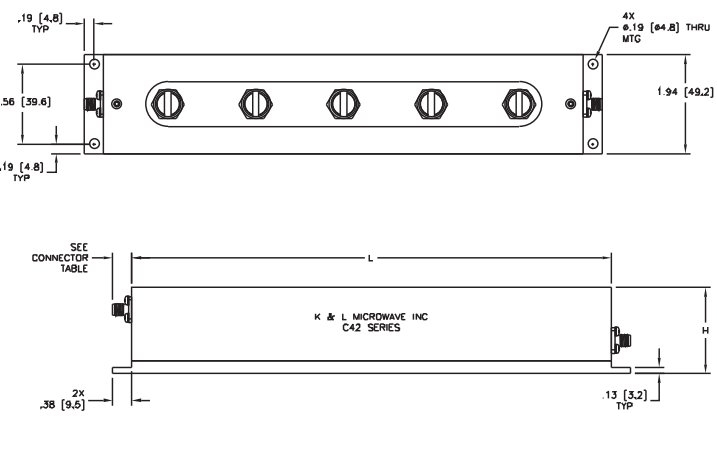


Figure 2:



Series	Frequency (MHz)	W Inches / mm	H- Max. Inches / mm	Length vs. Number of Sections (Inches / mm)				Fig.
				3	4	5	6	
C42	801-1000	1.94 / 49.28	4.25 / 107.95	5.63 / 143.00	7.50 / 190.50	9.38 / 238.25	11.25 / 285.75	2
	1001-1300	1.94 / 49.28	3.5 / 88.90					
	1301-1600	1.94 / 49.28	2.8 / 71.12					
	1601-1900	1.94 / 49.28	2.4 / 60.96					
	1901-2300	1.94 / 49.28	2.1 / 53.34					
	2301-2500	1.94 / 49.28	1.85 / 46.99					

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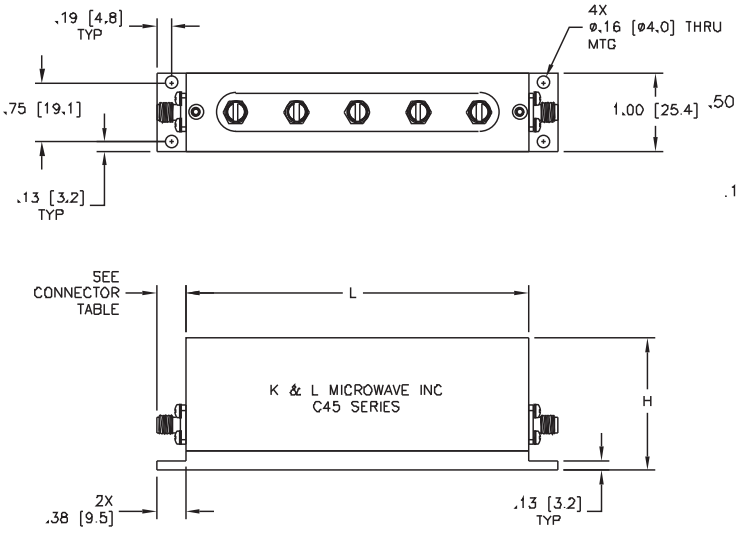
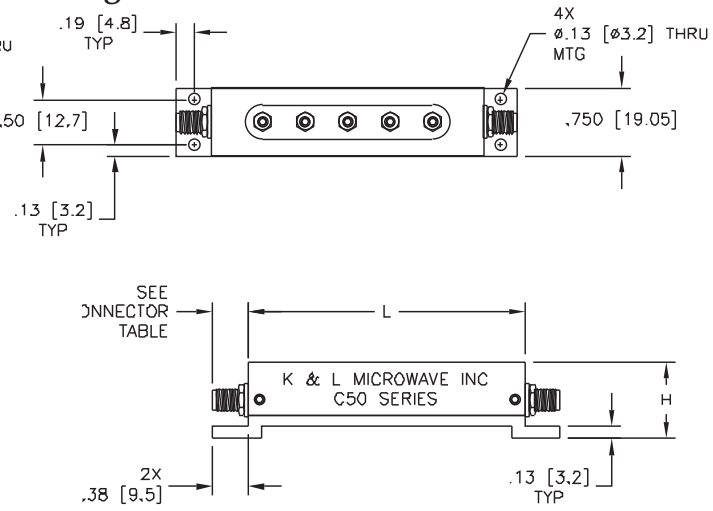
Series	Frequency (MHz)	W Inches / mm	H- Max. Inches / mm	Length vs. Number of Sections (Inches / mm)				Fig.
				3	4	5	6	
C45	1000-1200	1.0 / 25.40	3.5 / 88.90	2.80 / 71.12	3.60 / 91.44	4.40 / 111.76	5.20 / 132.08	3
	1201-1500	1.0 / 25.40	2.95 / 74.93					
	1501-1800	1.0 / 25.40	2.5 / 63.50					
	1801-2100	1.0 / 25.40	2.2 / 55.88					
	2101-2400	1.0 / 25.40	1.95 /49.53					
	2401-2700	1.0 / 25.40	1.8 / 45.72					
	2701-3000	1.0 / 25.40	1.65 / 41.91					

◆ **Figure 3:**



◆ **Figure 4:**

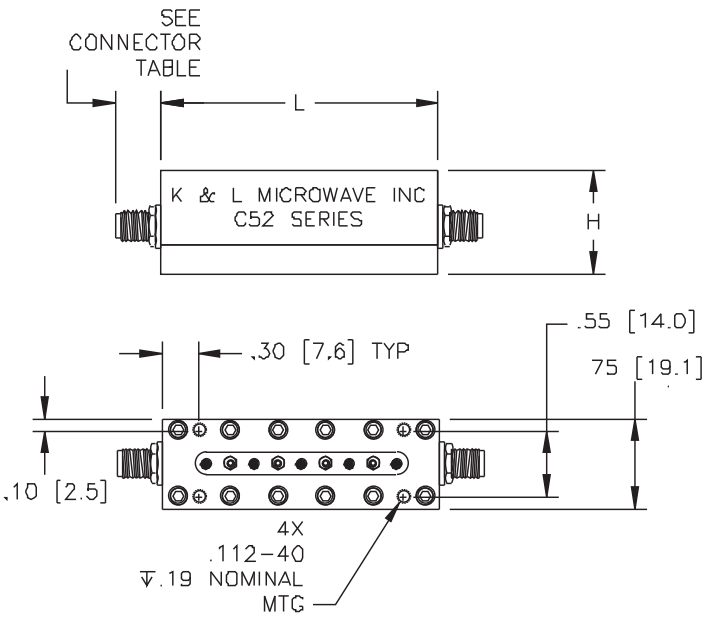


Series	Frequency (MHz)	W Inches / mm	H- Max. Inches / mm	Length vs. Number of Sections (Inches / mm)				Fig.
				3	4	5	6	
C50	2000-2500	0.75 / 19.05	2.0 / 50.80	2.00 / 50.80	2.50 / 63.50	3.00 / 76.20	3.50 / 88.90	4
	2501-3000	0.75 / 19.05	1.7 / 43.18					
	3001-4000	0.75 / 19.05	1.5 / 38.10					
	4001-6000	0.75 / 19.05	1.25 / 31.75					
	6001-10000	0.75 / 19.05	1.0 / 25.40					

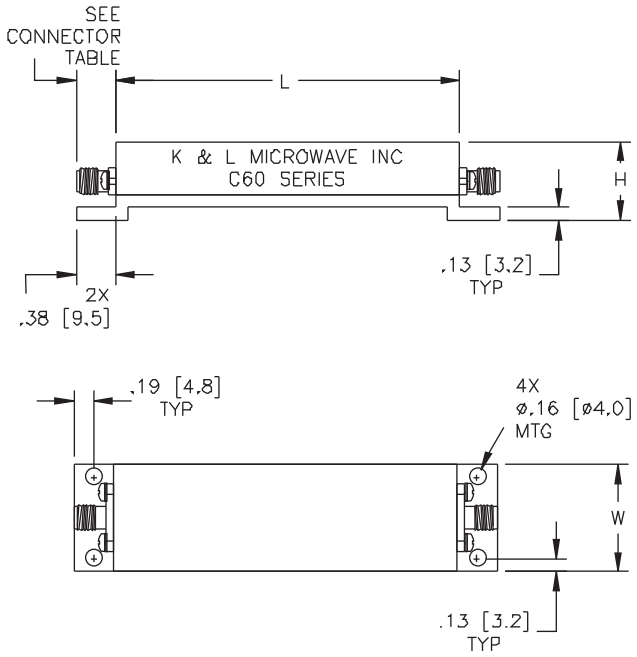
Narrow Bandwidth — C Series

Series	Frequency (MHz)	W Inches / mm	H- Max. Inches / mm	Length vs. Number of Sections (Inches / mm)				Fig.
				3	4	5	6	
C52	8000-10000	0.75 / 19.05	0.87 / 22.10	1.50 / 38.10	1.90 / 48.26	2.30 / 58.42	2.70 / 68.58	5
	10000-12000	0.75 / 19.05	0.8 / 20.32					

◆ **Figure 5:**



◆ **Figure 6:**



Series	Frequency (MHz)	W Inches / mm	H- Max. Inches / mm	Length vs. Number of Sections (Inches / mm)				Fig.
				3	4	5	6	
C60	6000	1.742 / 44.25	1.0 / 25.40	5.04 / 128	6.56 / 166.6	8.09 / 205.5	9.61 / 244.1	6
	8000	1.369 / 34.77	0.85 / 21.59	3.92 / 99.6	5.07 / 128.7	6.22 / 158	7.37 / 187.2	
	10000	1.145 / 29.08	0.75 / 19.05	3.25 / 82.6	4.18 / 106.1	5.10 / 129.4	6.03 / 153.1	
	12000	0.996 / 25.3	0.75 / 19.05	2.80 / 71.1	3.58 / 90.9	4.36 / 110.7	5.14/ 130.6	
	14000	0.889 / 22.58	0.75 / 19.05	2.48 / 63.0	3.15 / 80.0	3.82 / 97.0	4.49 / 114.1	
	18000	0.747 / 18.97	0.75 / 19.05	2.06 / 52.3	2.58 / 65.5	3.11 / 79.0	3.64 / 92.5	
	22000	0.657 / 16.69	0.75 / 19.05	1.79 / 45.5	2.22 / 56.4	2.66 / 67.6	3.10 / 78.7	
	30000	0.52 / 13.20	0.52 / 13.21	Contact Factory				

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Email: sales@klmicrowave.com

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Salisbury, MD 21801

Features:

- Covers the 30 to 10000 MHz Frequency Range
- Low Passband Insertion Loss
- High Notch Attenuation
- 3 dB BW Available from 0.5% to 5% (f_0)
- Low Ripple Chebyshev Design Response

Specifications:

Model	Frequency (MHz)	3 dB % BW	VSWR	Average Power (Watts)	Impedance (Ohms)	No. of Sections	Shock	Vibration	Temp.	Rel. Humidity	Mechanical
N30	30-450	1-5	1.5:1	1.5	50	3-6	Contact Factory			0-95%	Fig. 1
N40	451-800	1-5	1.7:1	10	50	3-6					Fig. 2
N45	801-3000	0.5-5	1.7:1	10	50	3-6					Fig. 3
N50	3001-10000	0.5-5	1.7:1	10	50	3-6					Fig. 4

Figure 1:

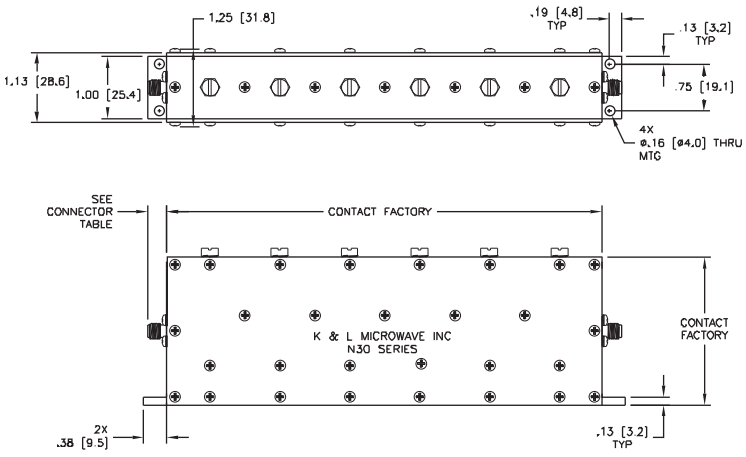
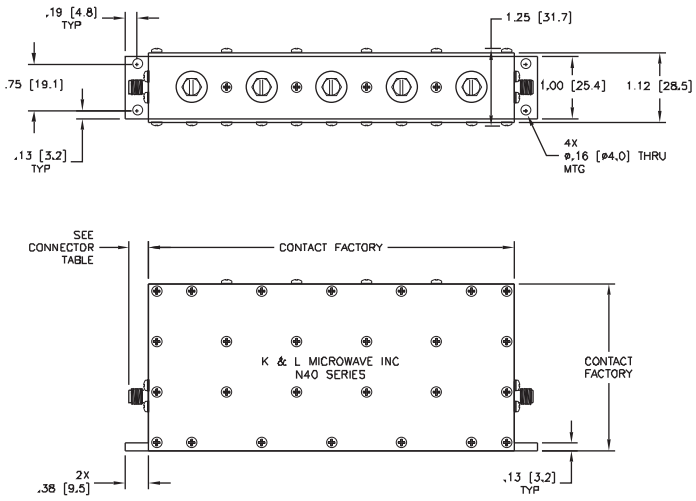


Figure 2:



Bandreject — N Series

Figure 3:

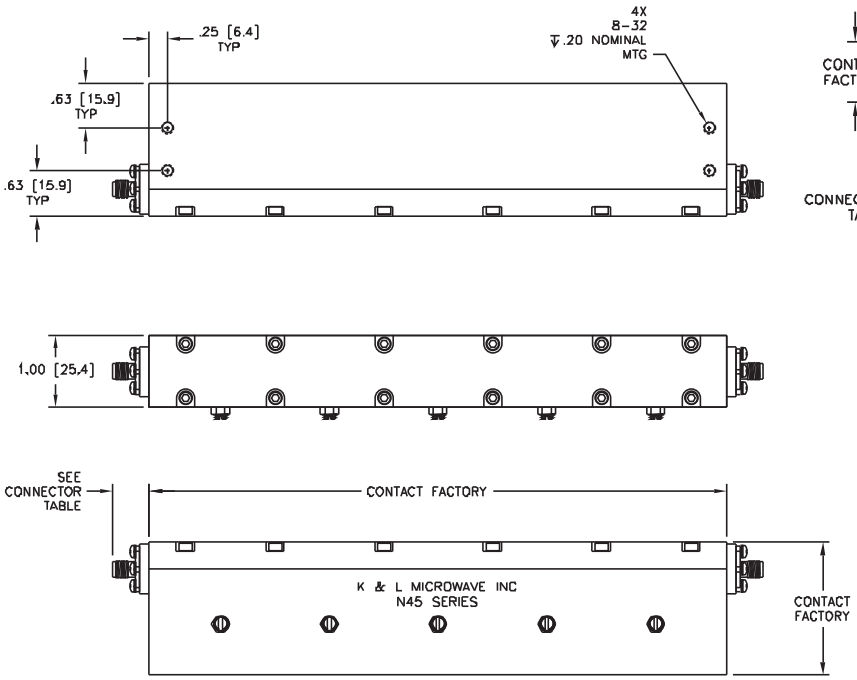
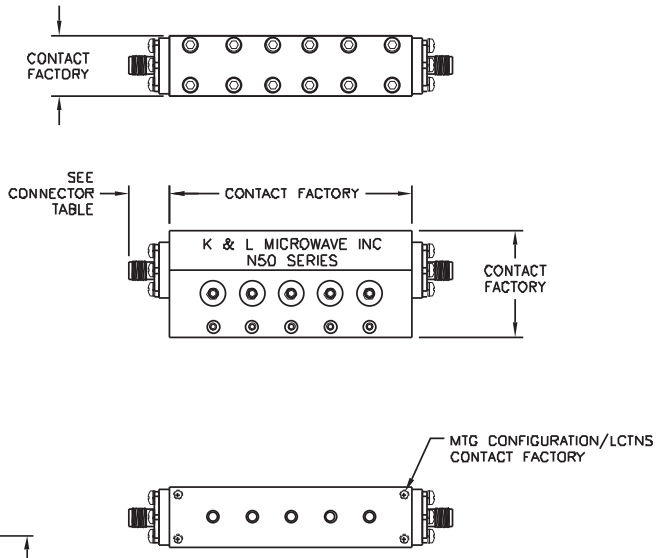


Figure 4:



To Order:

5 N 30 — 162 / E 3 - O / O
1 2 3 4 5 6 7 8

Code	Description
1	Number of Sections
2	Series (Notch)
3	Package Designator
4	Center Frequency (MHz)
5	Supplemental Codes (See Page 13)
6	Bandwidth (MHz)
7	Input Connector
8	Output Connector

Connectors:

Connector	Code	Length
SMA Female	O	.34-.38" / 8.64-9.65mm
SMA Male	OP	.51" / 12.95mm
N Female	N	.75" / 19.05mm
N Male	NP	.79" / 20.06mm
TNC Female	T	.75" / 19.05mm
TNC Male	TP	.85" / 21.59mm
BNC Female	B	.72" / 18.29mm
BNC Male	BP	.88" / 22.35mm

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Features:

- Radar and Airborne Applications
- Meets Military Environmental Requirements
- Weight Reduction—Reduced up to 80%
- Volume Reduction—Reduced up to 75%
- Surface Mount Package
- Exceptional Ultimate Attenuation
- Low Loss

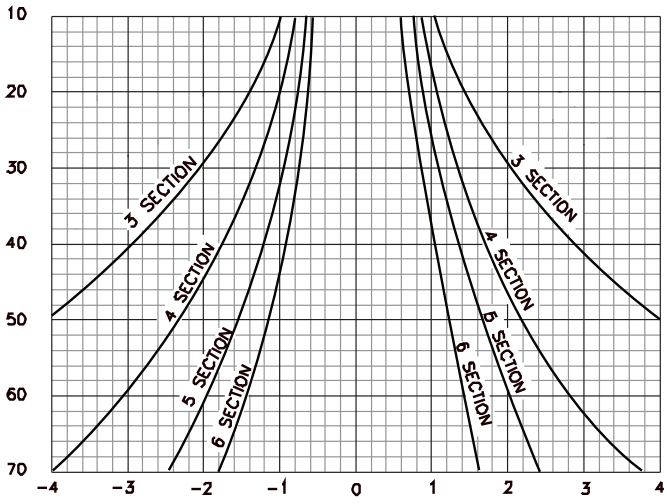
Specifications:

Frequency (GHz)	No. of Sections	3 dB % BW	VSWR	Impedance (Ohms)	Shock	Vibration	Temperature	Relative Humidity
6-18	4-10	3-10%	1.5:1 Max	50	20 G's, 1/2 Sine, 11 Ms	10 G's, 10 Hz-2000 Hz	-55 to +85 °C	0-95%

Attenuation:

The adjacent curve is used to determine the out-of-band or stopband attenuation for K&L's combline filters. This curve shows the attenuation as multiples of the 3 dB bandwidth for filters up to 13 sections. The formula for approximate stopband attenuation:

3 dB BW from f_0 = Reject Frequency-Center Frequency / 3 dB BW



Note: For more stringent rejection requirements, contact the factory.

To Order:

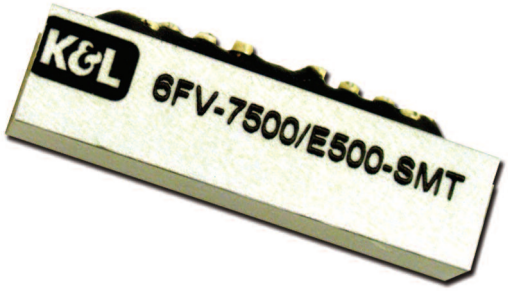
8 MP 20 — 7410 / H 500 - PX/PX
1 2 3 4 5 6 7

Code	Description
1	Number of Sections
2	Mini-Pack®
3	Package Designator
4	Center Frequency (MHz)
5	Supplemental Codes (See Page 13)
6	Bandwidth (MHz)
7	Connectors

Surface Mount High Frequency

Features:

- Leadless - Designed to Mount on RO4003, .012" Thick, with 50-ohm Line .026" Wide (Other Types of Printed Wiring Board are Available upon Request.)
- Cavity (TEM) Combline: High Q, Low Loss, Excellent Ultimate Rejection
- Option to Hermetically Seal
- Up to 18 GHz and Relative Bandwidths up to 8%
- Mechanical Configuration can Support All Types of Filters



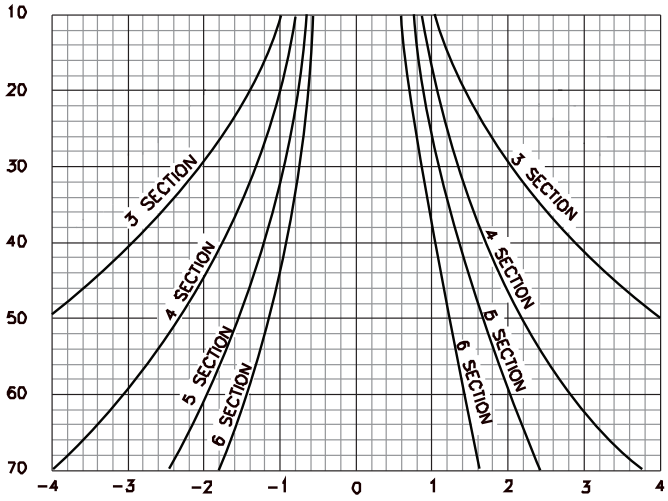
Specifications:

Frequency (GHz)	No. of Sections	3 dB % BW	VSWR	Impedance (Ohms)	Shock	Vibration	Temperature	Relative Humidity
2-20	3-10	3-10%	1.5:1 Max	50	20 G's, 1/2 Sine, 11 Ms	10 G's, 10 Hz-2000 Hz	-55 to +85 °C	0-95%

Attenuation:

The adjacent curve is used to determine the out-of-band or stopband attenuation for K&L's combline filters. This curve shows the attenuation as multiples of the 3 dB bandwidth for filters up to 13 sections. The formula for approximate stopband attenuation:

3 dB BW from f_0 = Reject Frequency-Center Frequency / 3 dB BW



Note: For more stringent rejection requirements, contact the factory.

Part Numbering:

6FV-7500/E500 - SMT
1 2 3 4 5

1: Number of Sections: from 2 to 9
2: Center Frequency: from 2000 - 18000 MHz
3: Pass-Band Definition:
E: Equal-Ripple; H: 0.5dBc; U: 1.0dBc; T: 3.0dBc; X: Special
4: Band-Width: from 0.5% to 8% of center frequency
5: Leadless, Surface Mount Technology

Reflow Profile:

Please refer to page 46 in the catalog or to http://www.klmicrowave.com/minimax.php.

www.klmicrowave.com
Phone: 410-749-2424 • FAX: 443-260-2268
Email: sales@klmicrowave.com

www.klfilterwizard.com
2250 Northwood Drive
Salisbury, MD 21801

Features:

- Custom mechanical packages designed for customer specific requirements
- Higher "Q" with less insertion loss
- Higher power handling capabilities
- Versatile choice of connectorized ports
- Flanges have less insertion loss than connectors
- Custom flanges manufactured to customer requirements

38 GHz Bandpass Filter:

The 6WP01-38775-E350-K/V is a 6 section 38 GHz design that requires WR-28 Flanges on the input port and K-Connectors on the output port. This design also requires an angled bend to meet the customer's mounting configuration.

11 GHz Tunable Bandpass Filter:

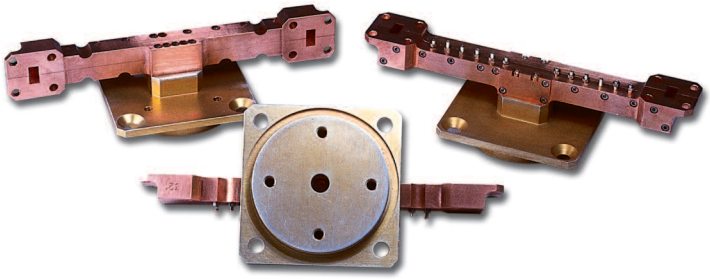
The IT5C50-10700/11700-E24-O/O is a tunable waveguide bandpass filter that maintains a constant bandwidth of 24 MHz with minimal insertion loss degradation over a 1 GHz band.

11 GHz Tunable Diplexer:

The 5WZ02-10700/11700-E24-O/O/V is a tunable diplexer for the point-to-point radio market. The diplexer maintains a constant bandwidth over the 10.7 to 11.7 GHz band. This product has 1.5 dB insertion loss and 85 dB Tx/Rx isolation.

38 GHz Diplexer:

The 6WZ01-39475/38775-E350-V/V is a 38 GHz short haul waveguide point-to-point radio diplexer. This unit has WR-28 Tx/Rx flanges with a customer specified circular antenna port for easy mounting.



6 GHz Diplexer:

The 5WZ02-6400/7100-E28-O/O/V is a 6 GHz long haul point-to-point radio diplexer. This product is tunable over the 6.4 to 7.1 GHz band and maintains a constant bandwidth over the full band. This product has 1.5 dB insertion loss and 85 dB Tx/Rx isolation.

21 GHz Antenna Lowpass:

The 7WZ/C/L/P-22400/E2400-V/V is a 21-23 GHz antenna connection with a harmonic rejection lowpass, a 90 degree twist and a circulator for Tx/Rx isolation.

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Email: sales@klmicrowave.com

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Salisbury, MD 21801

Waveguide - mm-Wave Filters & Couplers for V&W Bands

Features:

- High "Q" from 0.2% to 5% Relative Bandwidths
- Elliptic Response with Mixed and By-passed Modes
- "No Tune" Filters are Available
- Custom Solutions

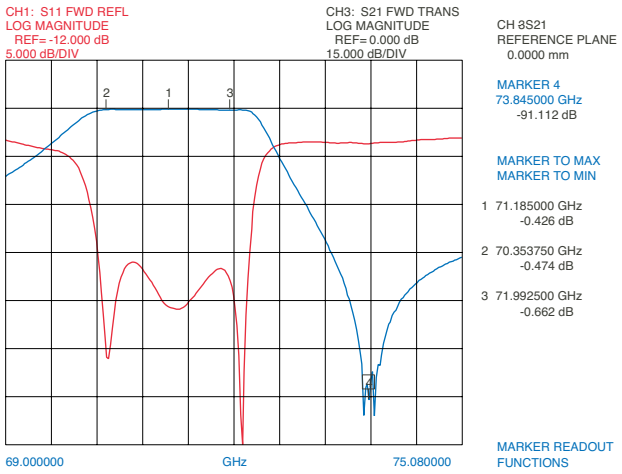
Bandpass Filters - Typical Performance

Center Frequency (GHz)	B.W. (3 dB) (GHz)	I.L. (dB) @ $f0$	R.L. (dB) min.	Rejection min.	Flange Type	Size
58.7	1.4	1.5	14	50 dB @ 60.2 GHz	WR-15	1.925" x .75" x .75"
62.3	1.4	1.5	14	50 dB @ 60.8 GHz	WR-15	1.925" x .75" x .75"
62.175	0.16	2.5	15	40 dB @ 61.9 GHz	WR-15	2.23" x .75" x .75"
73.5	5	0.4	12	70 dB @ 81 GHz	WR-12	1.0" x .75" x .75"
83.5	5	0.4	12	70 dB @ 76 GHz	WR-12	1.0" x .75" x .75"
72	1.6	2.0	14	90 dB @ 75 GHz	WR-12	1.925" x .75" x .75"
75	1.6	2.0	14	90 dB @ 72 GHz	WR-12	1.925" x .75" x .75"
71.175	1.65	0.5	14	30 dB @ 73.3 GHz	WR-12	1.02" x .75" x .75"
75.425	1.65	0.5	14	40 dB @ 73.3 GHz	WR-12	1.02" x .75" x .75"

To Order:

N W P - $f0$/ X BW - V / V
1 2 3 4 5

Code	Description
1	Number of Sections (TBO by factory)
2	Type of Filter P = Bandpass L = Lowpass H = Highpass
3	Center Frequency in GHz for Bandpass Cut-off Frequency for Lowpass/Highpass
4	Passband Definition E = Equal Ripple H = 0.5 dB U = 1.0 dB T = 3.0 dB
5	Bandwidth in GHz



	Cutoff Frequency (GHz)	I.L. (dB)	R.L. (dB)	Rejection	Flange Type	Size
Lowpass Filters Typical Performance	76	0.2	14	70 dB @ 81 GHz	WR-12	1.3" x .5" x .75"
Highpass Filters Typical Performance	92 81	0.5 0.4	14 14	25 dB @ 76 GHz 70 dB @ 76 GHz	WR-10 WR-10	1.0" x .75" x .75" 1.3" x .5" x .75"

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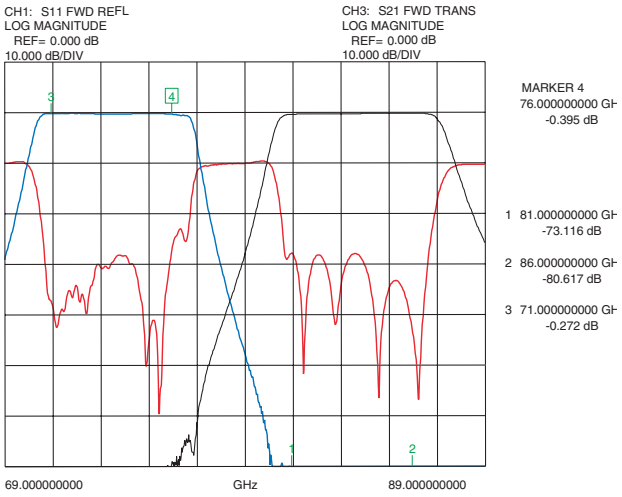
Waveguide - mm-Wave Filters & Couplers for V&W Bands

Diplexers	Frequency Range (GHz)	I.L. (dB)	R.L. (dB)	Rejection (dB) at (GHz)	Flange Type	Size
Channel 1 Channel 2	71 to 76 81 to 86	0.4 0.4	14 14	60 dB @ 81 GHz 60 dB @ 76 GHz	WR-12 WR-12	1.925" x .75" x .75"
Channel 1 Channel 2	71 to 76 81 to 86	0.5 0.5	14 14	75 dB @ 81 GHz 75 dB @ 76 GHz	WR-12 WR-12	1.925" x .75" x .75"
Channel 1 Channel 2	71.2 to 72.8 74.2 to 75.8	2.0 2.0	14 14	90 dB @ 75 GHz 90 dB @ 72 GHz	WR-12 WR-12	3.5" x .75" x .75" .925 @ center port
Channel 1 Channel 2	58 to 59.4 61.6 to 63	1.5 1.5	14 14	50 dB @ 60.2 GHz 50 dB @ 60.8 GHz	WR-15 WR-15	3.5" x .75" x .75" .95 @ center port

◆ To Order:

NWZ - f_1/ f_2/X BW - V / V
1 2 3 4 5

Code	Description
1	Number of Sections (TBO by factory)
2	Center Frequency of Channel 1
3	Center Frequency of Channel 2
4	Passband Definition E = Equal Ripple H = 0.5 dB U = 1.0 dB T = 3.0 dB
5	Bandwidth in GHz



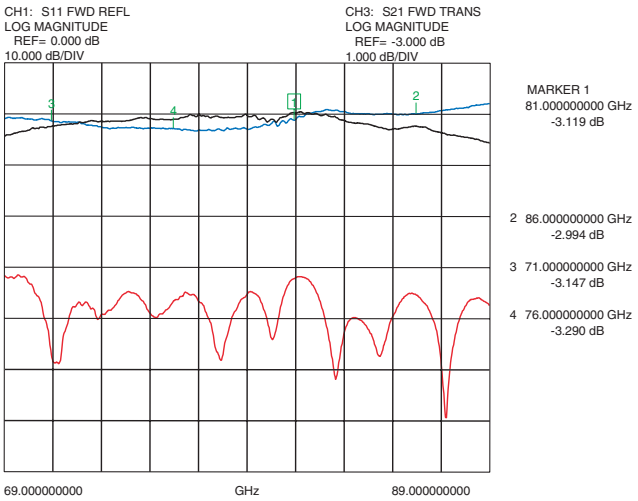
mm Wave Couplers

Frequency Range (GHz)	Coupling Value (dB) nom.	Coupling Var. +- (dB)	R.L. (dB) min.	Isolation (dB) min.	Flange Type	Size
71 to 86	-3	0.3	15	25	WR-12	1.59" x 1.56" x .73"

◆ To Order:

WDC - BW / C - V / V
1 2

Code	Description
1	Bandwidth of Operation Between f_L & f_H
2	Coupling Value in dB



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