Broadcast - Filters & Components

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Ordering & Warranty Information

Ordering and Warranty Information

Orders may be placed through our local sales Representative or directly with the factory. Final determination of price, delivery, terms and acceptance of orders may be made only by the staff at Microwave Filter Company, Inc. in East Syracuse, New York.

Ordering Address:

Microwave Filter Company, Inc.
6743 Kinne Street
East Syracuse, New York USA 13057
Ordering: 888-206-6610
Main Telephone: 315-438-4700 or 800-448-1666
Fax: 315-463-1467

E-mail: mfcsales@microwavefilter.com
Web site: www.microwavefilter.com
Cage code: 27834

Quotations and Prices:

Prices are F.O.B. shipping point and will be invoiced at current prices in effect on date of purchase. Quotations are for immediate acceptance only. Prices are subject to change without notice. All clerical errors made by Microwave Filter Company, Inc. are subject to correction at its sole discretion.

Payment/Credit Terms:

Terms are Net 30 days to customers who have an established open account. If an open account has not been established, we will require prepayment (certified check or wire transfer). We will also accept Visa, American Express and MasterCard.

Shipping/Freight Claims:

Shipments are made F.O.B. shipping point. All charges related to the shipment are the responsibility of the customer. If the customer does not specify method of shipment, the Company reserves the right to select the carrier of choice. The shipment must be inspected upon receipt. If damaged, it is the responsibility of the customer to file a claim with the carrier.

Sales Tax:

When applicable, sales tax will appear as a separate line item on Microwave Filter Company, Inc. invoices unless a copy of your sales tax exemption certificate has been previously submitted.

Warranty:

Products returned to Microwave Filter Company, Inc. within one year of the date of purchase for original defects will be replaced or repaired free of charge or refunded, at our option, if we confirm the defects. Otherwise, we will notify you of the repair charges before we do any work. This is the full extent of our warranty. Microwave Filter Company, Inc. does not accept responsibility for consequential or collateral damages.

Unit Weights and Dimensions: All unit weights and dimensions shown in this catalog are approximate.

RoHS Compliance: Optional

About Microwave Filter Company

Microwave Filter Company, Inc. (MFC) has been a leader in the design, development and manufacture of high quality filter products since 1967. MFC offers products covering the frequency range from 5 Hz to 50 GHz for customers around the world. Designs include waveguide, stripline/microstrip, lumped element and cavity/coaxial topologies. Filter types and accessories include bandpass, bandstop, combiners, couplers, diplexers, highpass, lowpass and adaptors.

All MFC filters are produced within our facility by a staff that is "Committed to Excellence". In fact, MFC has received awards for its outstanding performance in providing excellent customer service, quality product and fast turn-around for large OEM programs.

The Company has been the recipient of the Defense Supply Center Columbus Supplier Excellence Silver Awards. Award winners have met the stringent quality and delivery requirements established by the Defense Logistics Agency.

MFC is an ISO 9001:2008 Registered Company.

The products described in this catalog are just a sampling of the designs that have been developed for our customers over the years. Since there are thousands of designs in our archives, it would be impossible to present them all in this format. We invite you to call on our experienced applications' engineers to design the filter to meet your specifications.

Facilities

The company occupies a modern 40,000 square foot facility located in the heart of Central New York (East Syracuse). The facility is equipped with an impressive complement of analytical and design software, test instrumentation, prototype and manufacturing equipment to create passive filters, components and sub systems in the frequency range from 5 Hz to 50 GHz. This manufacturing facility includes a state-of-the-art CAD-CAM system, a test department with automated network analyzers to 50 GHz, a high capacity conveyorized soldering oven, fully compliant finishing operation and a TQM/ISO9000 based quality assurance program to insure the intrinsic quality of the products produced.

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LTE Bandstop Filter (Upper 700 MHz Band / Lower C-Block)

Model # 17720

Application:
Prevent **(C-block)** LTE services from interfering with adjacent **(A-block)** services (e.g. private licensed secure wireless network)

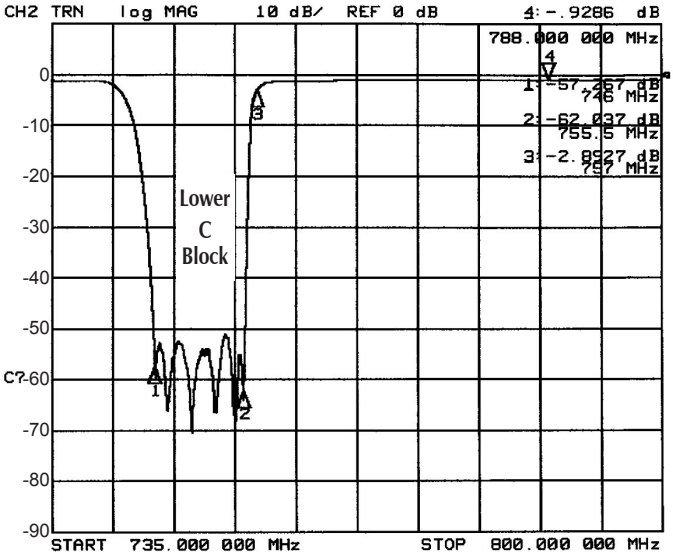
Solution:
Install a selective bandstop filter that will provide deep rejection of the **C-block** without degrading the **A-block**.

Features:
- High Selectivity - Utilizes an (8) Element Design.
- Low Passband Loss - Typically less than 1 dB (excluding passband edge)
- Also available for other 700 MHz Band / Block Applications

Specifications:

Passband:	(757-806) MHz **(A, B, D, upper C & Public Safety Blocks)**
Passband Loss:	3 dB Typ @ passband edge
Passband Power (CW):	1 Watt Max
Stopband:	(746-755.5) MHz **(lower C Block)**
Stopband Attenuation:	> 50 dB Typ; 40 dB Min
Impedance:	50 ohms
Connectors:	N Female
Environment:	Indoor Use Only
Weight:	5.7 lbs (2.59 kg)
Dimensions:	9″L x 5″W x 8″H (Approx.) (229mm x 127mm x 203mm)
Finish:	Grey Lacquer

Marker 1: 746 MHz
Marker 2: 755.5 MHz
Marker 3: 797 MHz



Model 17720 - Typical Response

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LTE Block (A, B or C) Bandpass Filter (Lower 700 MHz Band)

Model # 17890

Application:

Paired block LTE operations **(A, B or C)** conflict with each other causing interference to one of the blocks.

Solution:

Install a bandpass filter on the affected block that will isolate it from the interfering block.

Features:

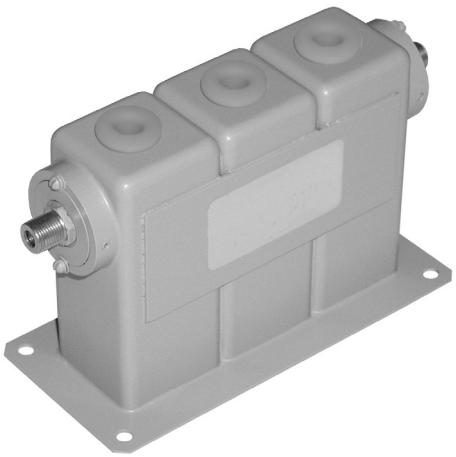
- True "bandpass" response provides isolation from virtually all other out-of-band sources of interference.
- Models also available for unpaired D and E block applications.

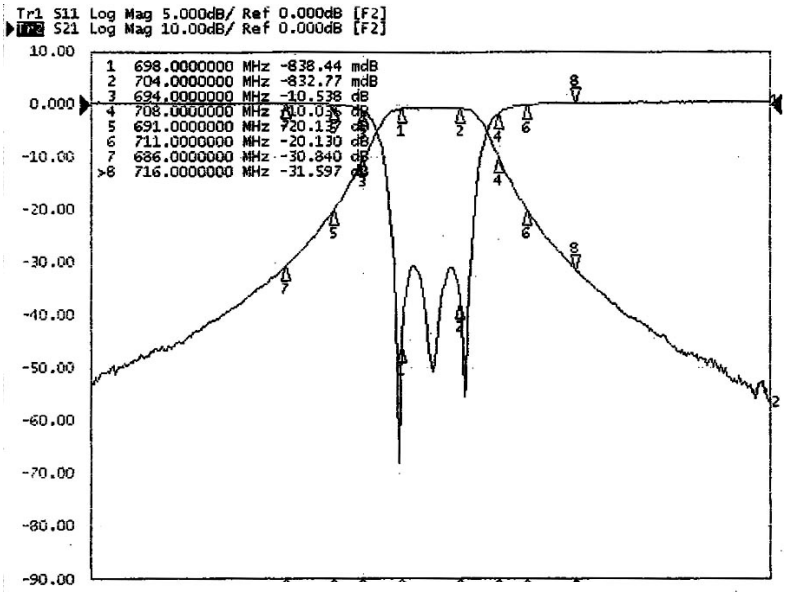
Specifications:

Model #	Passband	Paired Block Rejection (Typ.)
17890-A(L)	698-704 MHz ***(Lower A)***	45 dB @ 728 MHz ***(Upper A)***
17890-A(U)	728-734 MHz ***(Upper A)***	45 dB @ 704 MHz ***(Lower A)***
17890-B(L)	704-710 MHz ***(Lower B)***	45 dB @ 734 MHz ***(Upper B)***
17890-B(U)	734-740 MHz ***(Upper B)***	45 dB @ 710 MHz ***(Lower B)***
17890-C(L)	710-716 MHz ***(Lower C)***	45 dB @ 740 MHz ***(Upper C)***
17890-C(U)	740-746 MHz ***(Upper C)***	45 dB @ 716 MHz ***(Lower C)***

Common Specifications:

Passband Loss: ..... 1 dB Typ
Passband VSWR: ..... 1.5:1 Max
Rejection: ..... 20 dB Typ ± 10 MHz from Passband Center
30 dB Typ ± 15 MHz from Passband Center
50 dB Typ ± 35 MHz from Passband Center
Impedance: ..... 50 ohms
Connector: ..... N, SMA or BNC (Female)
Weight: ..... 1 lb (0.455 kg)
Dimensions: ..... 5.2"L x 2.4"W x 3.3"H (excluding connectors)
(132mm x 61mm x 84mm)
Finish: ..... Grey Lacquer





Model 17890 - A(L) - Typical Response

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DTV (UHF) Simple Mask Filter

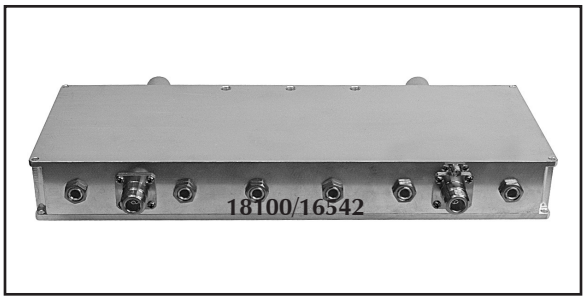
These filters suppress out-of-band emissions in conformance with FCC *digital mask* requirements for UHF Single Channel Broadcasts.

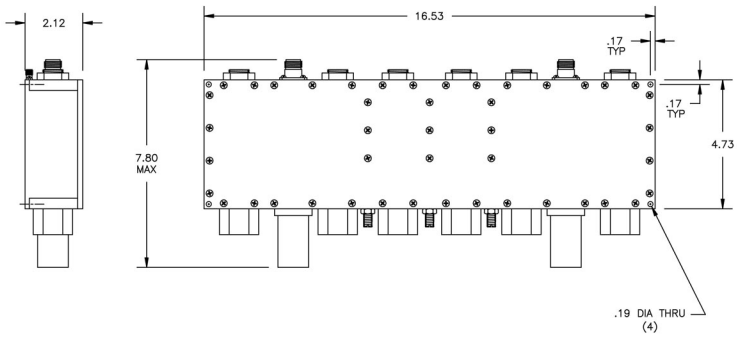
Features **:**

- 6-pole design provides ultra-selectivity
- Optional connectors available
- Special configurations available upon request (e.g. multi-channel combining)
- 50 ohm Impedance

Model 18100-(Ch) 250 Watt (Tunable)

Specifications	
Available Channels (Tunable)	DTV (14-36)
Channel Insertion Loss	1.5 dB Max
Channel VSWR	1.15:1 Max
Group Delay Variation	150 ns Max
Selectivity (Min.) (Relative to Channel Center)	6 dB ± 3.5 MHz 24 dB ± 6.0 MHz 36 dB ± 9.0 MHz
Power Rating (CW)	250 Watts Max
Standard Connectors	N Female





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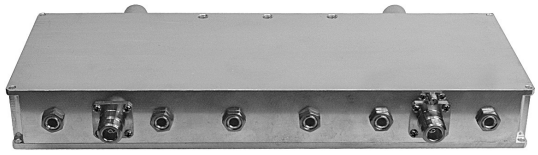
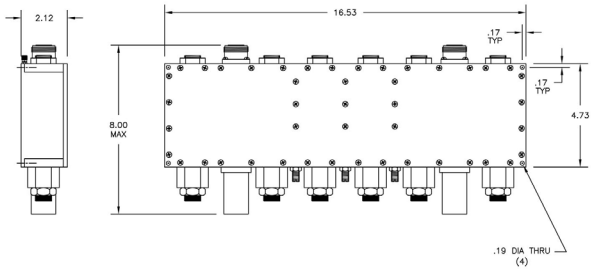
DTV (UHF) Simple Mask Filter

MFC supplies critical equipment for your UHF Repack requirement.

This filter, along with a UHF transmitter, allows your system to conform to the FCC spectral mask.





Features **:**

- 6-pole design provides ultra-selectivity
- Optional connectors available
- Special configurations available upon request (e.g. multi-channel combining)
- 50 ohm Impedance

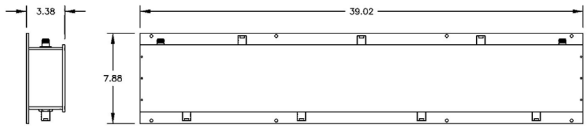
Model 16542-(Ch) 250 Watt (Fixed)

Specifications	
Channel Option	Ch 14-36
Insertion Loss @ Fo	0.9 dB Max
Passband	(Fo) ± 2.7 MHz
Passband Loss	1.5 dB Max @ Passband Edges
Passband VSWR	1.135:1
Passband Power	250 Watts Max
Passband Delay Variation	150 nSEC Max
Rejection	6 dB Min @ (Fo) ± 3.5 MHz 24 dB Min @ (Fo) ± 6 MHz 36 dB Min @ (Fo) ± 9 MHz
Impedance	50 Ohms
Connectors	N Female

DTV (UHF) Stringent Mask Filters

MFC supplies critical equipment for your UHF Repack requirement.

This filter, along with a UHF transmitter, allows your system to conform to the FCC spectral mask.



17427- 36

Model 17427-(Ch) 500 Watts (Fixed)

Specifications	
Available Channels (Fixed)	DTV (14-51)
Channel Insertion Loss	1.5 dB Max
Channel VSWR	1.2:1 Max
Group Delay Variation	150 ns Max
Selectivity (Relative to Channel Center)	6 dB Typ ± 3.5 MHz 26 dB Min ± 6.0 MHz 45 dB Min ± 9.0 MHz
Power Rating (CW)	500 Watts Max
Standard Connectors	N Female

Features **:**

- 7-pole design provides ultra-selectivity for UHF broadcasts
- Optional connectors available
- Special configurations available upon request (e.g. multi-channel combining)
- 50 ohm Impedance

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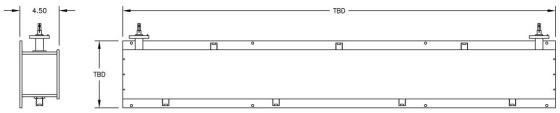
DTV (UHF) Stringent Transmit Bandpass Filter

MFC supplies critical equipment for your UHF Repack requirement.

This filter, along with a UHF transmitter, allows your system to conform to the FCC spectral mask.



Features **:**

- 7-pole design provides ultra-selectivity for UHF broadcasts
- Optional connectors available
- Special configurations available upon request (e.g. multi-channel combining)
- 50 ohm Impedance

Model 17500-(Ch) 1 kW (Fixed)

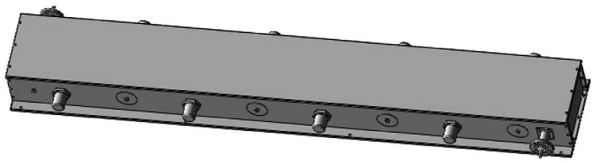
Specifications	
Channel Option	Ch 14-36
Insertion Loss @ Fo	0.6 dB Approx
Passband	(Fo) ± 2.7 MHz
Passband Loss	1.0 dB Approx @ Passband Edges
Passband VSWR	1.2:1 Max
Passband Power	1 kW Max - continuous
Passband Delay Variation	150 nSEC Max
Rejection	6.0 dB Approx @ (Fo) ± 3.5 MHz 26 dB Min @ (Fo) ± 6.0 MHz 45 dB Min @ (Fo) ± 9.0 MHz
Impedance	50 Ohms
Connectors	See chart
Operating Temperature	25°C, ± 10°C

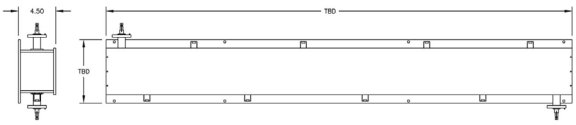
(*)	Connector Option
NF	Type N Female
78	7/8 EIA Flange
DN	7/16 DIN Female

DTV (UHF) Full Service Mask Transmit Bandpass Filter

MFC supplies critical equipment for your UHF Repack requirement.

This filter, along with a UHF transmitter, allows your system to conform to the FCC spectral mask.





Features **:**

- 8-pole design provides ultra-selectivity for UHF broadcasts
- Optional connectors available
- Special configurations available upon request (e.g. multi-channel combining)
- 50 ohm Impedance

Model 19946-(Ch) 1 kW (Fixed)

Specifications	
Channel Option	Ch 14-36
Insertion Loss @ Fo	0.8 dB Approx
Passband	(Fo) ± 2.7 MHz
Passband Loss	1.2 dB Approx @ Passband Edges
Passband VSWR	1.2:1 Max
Passband Power	1 kW Max - continuous
Passband Delay Variation	200 nSEC Max
Rejection	6 dB Approx @ (Fo) ± 3.5 MHz 55 dB Min @ (Fo) ± 6.0 MHz 85 dB Min @ (Fo) ± 9.0 MHz
Impedance	50 Ohms
Connectors	See chart
Operating Temperature	25°C, ± 10°C

(*)	Connector Option
NF	Type N Female
78	7/8 EIA Flange
DN	7/16 DIN Female

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DTV (UHF) Tunable Channel Mask Filter

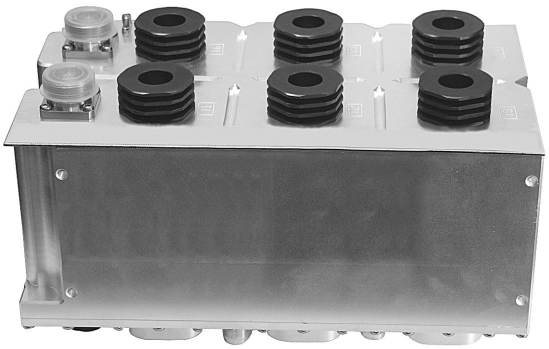
Model 16543

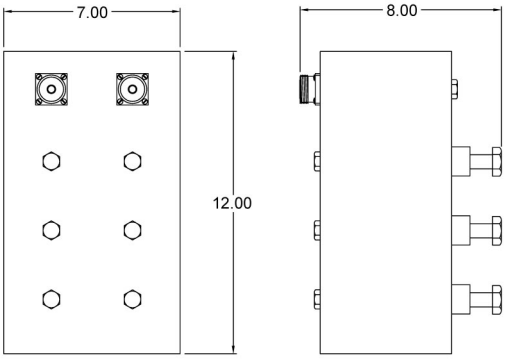
This tunable bandpass filter suppresses out-of-band emissions in conformance with FCC digital mask requirements for UHF single channel broadcasts.

Model 16543

Specifications	
Available Channels (Tunable)	DTV (14 - 51)
Channel Insertion Loss	1.20 dB Max @ Fc ± 2.7 MHz
Channel VSWR	1.11:1 Max
Group Delay Variation	150 nS Max
Selectivity (Relative to Channel Center)	6 dB Min +/- 3.5 MHz 26 dB Min +/- 6 MHz 45 dB Min +/- 9 MHz
Power Rating (CW)	500 Watts Max
Impedance	50 Ohms
Standard Connectors	7/16 (DIN) - female

Alternate Connectors are Available Upon Request





DTV (VHF-H) Tunable Channel Mask Filter

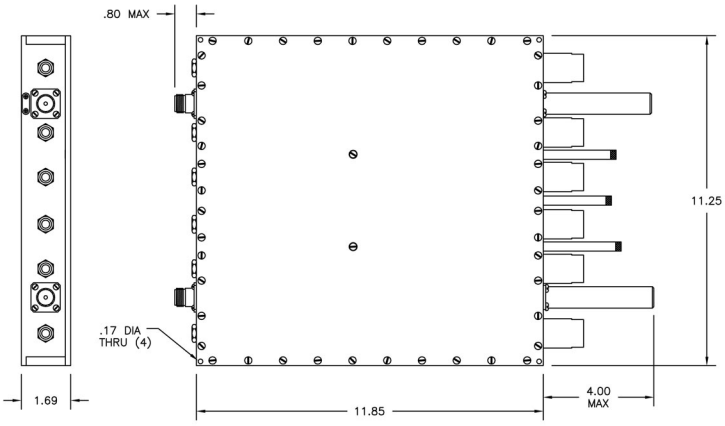
Model 16691

This tunable bandpass filter suppresses out-of-band emissions in conformance with FCC digital mask requirements for VHF-H single channel broadcasts.

Model 16691

Specifications	
Available Channels (Tunable)	DTV (7 - 13)
Channel Insertion Loss	1.65 dB Max
Channel VSWR.	1.14:1 Max
Group Delay Variation	150 nS Max
Selectivity (Relative to Channel Center)	6 dB Min +/- 3.5 MHz 24 dB Min +/- 6 MHz 36 dB Min +/- 9 MHz
Power Rating (CW)	250 Watts Max
Impedance	50 Ohms
Standard Connectors	N Female

Alternate Connectors are Available Upon Request



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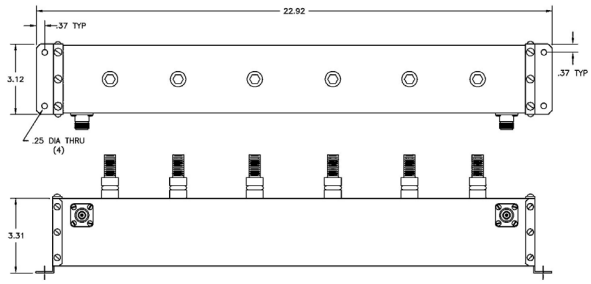
DTV (VHF) Transmit Mask Filters



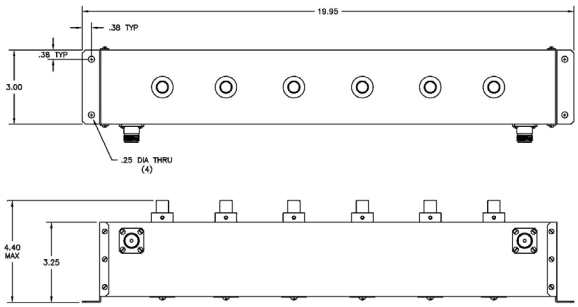
17560-(Ch)

Model 17560-(Ch) 100 Watt (Fixed)

Specifications	
Available Channels (Fixed)	DTV (7-13)
Channel Insertion Loss	1.0 dB (Approx)
Channel V.S.W.R.	1.25:1 Max
Group Delay Variation	150 ns Max
Selectivity (Relative to Channel Center)	6 dB Typ ± 3.5 MHz 26 dB Min ± 6.0 MHz 45 dB Min ± 9.0 MHz
Power Rating (CW)	100 Watts Max
Standard Connectors	N Female

Features **:**

- 6-pole design provides ultra-selectivity for VHF broadcasts
- Optional connectors available
- Special configurations available upon request (e.g. multi-channel combining)
- 50 ohm Impedance



17360 - (Ch)

Model 17360-(Ch) 250 Watt (Fixed)

Specifications	
Available Channels (Fixed)	DTV (2-6)
Channel Insertion Loss	1.0 dB Max
Channel V.S.W.R.	1.25:1 Max
Group Delay Variation	150 ns Max
Selectivity (Relative to Channel Center)	6 dB Typ ± 3.5 MHz 26 dB Min ± 6.0 MHz 45 dB Min ± 9.0 MHz
Power Rating (CW)	250 Watts Max
Standard Connectors	N Female

DTV-UHF Lowpass Filters

These lowpass filters **prevent** DTV-UHF **receiver overload** from undesired adjacent (700 MHz) band transmissions.

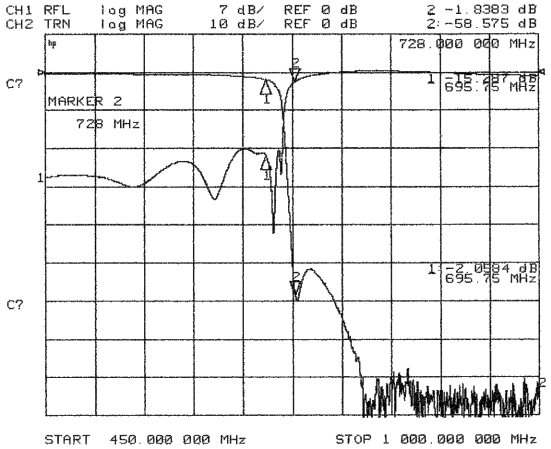
Model 3322-695/728(50)

Features **:**

- Fully suppresses 700 MHz (downlink) bands **12, 13, 14** and **17**
- Allows for clean reception of DTV-UHF channels **14-50** and all DTV-VHF channels **2-13**
- Also suppresses GSM 850 & GSM 900 bands

Specifications:

Passband	5 - 695 MHz
Passband Loss	3 dB Typ @ 695 MHz
	1 dB Typ in Remainder of Passband
Stopband	728 - 1000 MHz
Stopband Attenuation	50 dB Min
Impedance	75 ohms
Connectors	F-female
Size	4" x 1.5" x 1.1" Approx



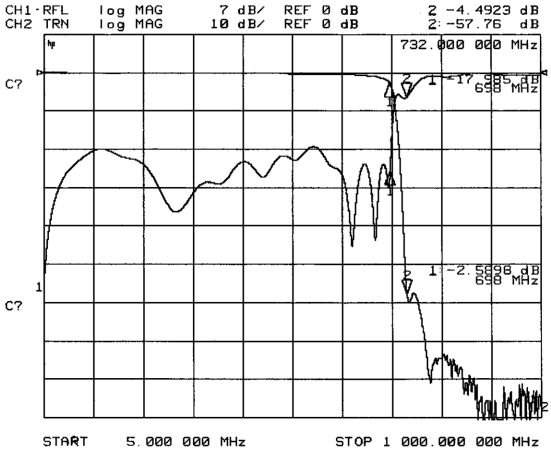
Model 3322-698/732

Features **:**

- Fully suppresses 700 MHz (downlink) bands **13, 14** and **17**
- Allows for clean reception of all DTV-UHF channels **14-51** and all DTV-VHF channels **2-13**
- Also suppresses GSM 850 & GSM 900 bands

Specifications:

Passband	5 - 698 MHz
Passband Loss	3 dB Typ @ 698 MHz
	1 dB Typ in Remainder of Passband
Stopband	732 - 1000 MHz
Stopband Attenuation	50 dB Min
Impedance	75 ohms
Connectors	F-female
Size	4" x 1.5" x 1.1" Approx



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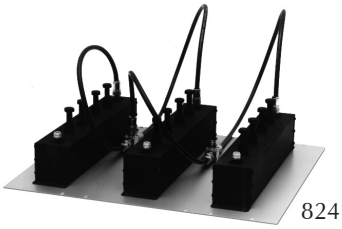
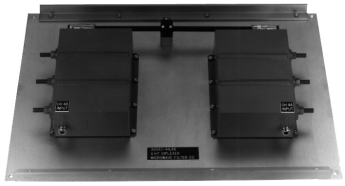
DTV (UHF & VHF) Channel Transmit Combiners

8604D(2)



8241D(3)



8291D(2)

VHF Channels 2-13 & UHF Channels 14-36

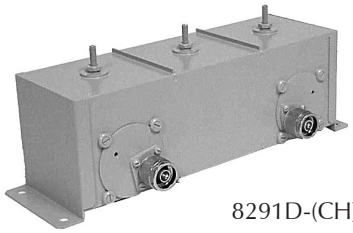
These combiners connect multiple channel transmitters to a common tower transmission line. Special combiners can be designed for your application.

Specifications:

	8604D (*)	8241D (*)	8291D (*)	17494 (*)	6464D (*)
Channels	DTV (2-6)	DTV (7-13)	DTV (14-36)	DTV (14-36)	DTV (14-36)
Max Number of channels combined	3	3	15	8	8
Loss (Max)	1 dB	1 dB	1 dB	1 dB	0.75 dB
Selectivity (Relative to Channel Center)	20 dB Min ±9 MHz	20 dB Min ±9 MHz	15 dB Min ±9 MHz	20 dB Min ±9.75 MHz	20 dB Min ±9 MHz
Power Rating Max (Per Channel)	250 Watts	100 Watts	100 Watts	500 Watts	1 kW
Channel VSWR Max	1.33:1	1.33:1	1.33:1	1.33:1	1.33:1
Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Input Connectors	N Female	N Female	N Female	N Female	7/8″ EIA

(*) = Number of channels to be combined

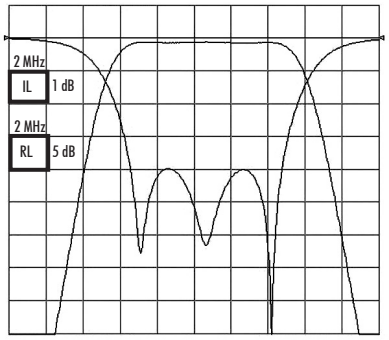
DTV (UHF & VHF) Channel Transmit Bandpass Filters



8291D-(CH)

These DTV bandpass filters are installed at the transmitter output to suppress out-of-band emissions which may interfere with other channels. They feature low loss to maximize station coverage. Special bandpass filters can be designed to meet your specific needs.

- 50 ohm Impedance
- N Female Connectors, except:
  Model 6464D (7/8″ EIA)
  Model 18030 (1 5/8″ EIA)



Typical Frequency Response of 17494

Specifications:

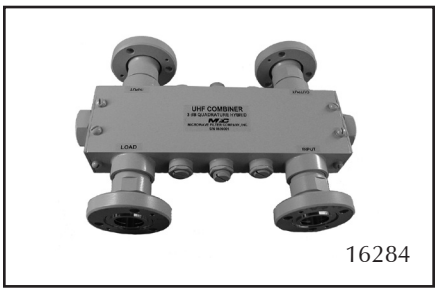
	8603D-(CH)	8241D-(CH)	8291D-(CH)	17494-(CH)	6464D-(CH)
Available Channels	DTV (2-6)	DTV (7-13)	DTV (14-36)	DTV (14-36)	DTV (14-36)
Channel Insertion Loss	1 dB Max	1 dB Max	1 dB Max	1 dB Max	0.75 dB Max
Selectivity (Relative to Channel Center)	20 dB Min ±9.0 MHz	20 dB Min ±9.0 MHz	15 dB Typ ±9.0 MHz	20 dB Min ±9.75 MHz	20 dB Min ±9.0 MHz
Channel VSWR	1.2:1 Max	1.2:1 Max	1.2:1 Max	1.2:1 Max	1.25:1 Max
Power Rating	250 Watts Max	100 Watts Max	250 Watts Max	500 Watts Max	1 kW Max

DTV (UHF) Couplers

UHF Hybrid Couplers

Model 16284

These couplers provide a 90° phase shift of the transmit signal(s) between input & output ports, allowing the user to combine (or split) the signal(s) with a limited amount of transmission line components - making them ideal for those special antenna configurations. When used in conjunction with dual bandpass filters, these devices can also combine (2) **adjacent** UHF analog ***or*** digital channels.



16284

Specifications:

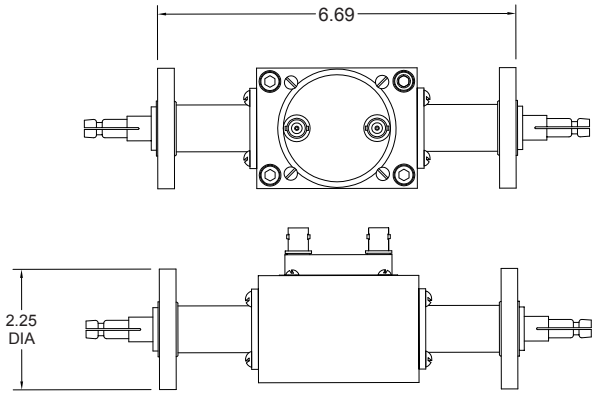
Frequency Range	470-806 MHz
Coupling	3 dB, ±0.4 dB Max
Isolation	20 dB Min
Phase Balance	±0.5° Max
VSWR	1.18:1 Max
Impedance	50 ohms
Power Rating	1500 Watts Max
Operating Temperature Range	0° to 50° C
Connectors	7/8″ EIA
Optional Connectors	1 5/8″ EIA

UHF Directional Couplers

Installed between the transmitter and the antenna, a directional coupler provides the broadcaster with a convenient method of monitoring the transmitter's forward and reflected power.

MFC directional couplers are available with a variety of connector options. Simply choose the model best suited for your application.

Model 16901



Specifications:

Passband	470-806 MHz
Coupling	50 dB ±3.0 dB
Mainline Insertion Loss	0.5 dB Max
Mainline VSWR	1:25:1 Max
Power Rating	1600 Watts Max
Directivity	20 dB Min. 25 dB Typ
Impedance	50 ohms
Input/Output Connectors	7/8″ EIA Flange
Operating Temperature Range	0°C to +50°C

Ordering Information:
16901-(*)

(*) Coupled Port Connectors

Coupled Port Connectors	(*)
BNC Female 75 ohms	B75
BNC Female 50 ohms	B50
SMA Female	S
N Female	N

Example: Directional coupler with (75 ohm) BNC Female (coupled port) connectors = Model 16901-B75

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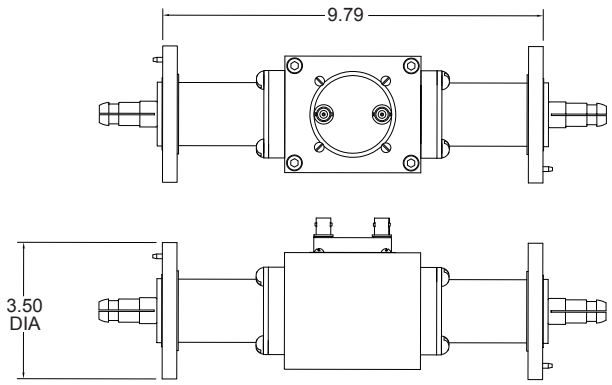
UHF Directional Couplers (continued)

Model 16902



Specifications:

Passband	470-806 MHz
Coupling	50 dB ±3.0 dB
Mainline Insertion Loss	0.5 dB Max
Mainline VSWR	1:25:1 Max
Power Rating	3000 Watts Max
Directivity	20 dB Min. 25 dB Typ
Impedance	50 ohms
Input/Output Connectors	1 5/8″ EIA Flange
Operating Temperature Range	0°C to +50°C

Ordering Information:
16902-(*)

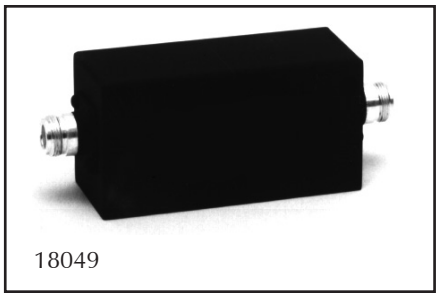
(*) Coupled Port Connectors

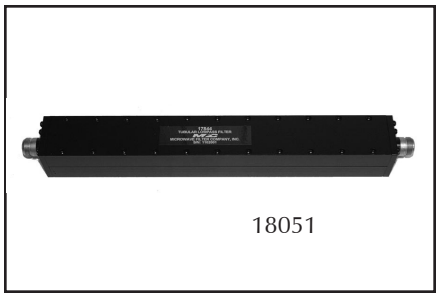
Coupled Port Connectors	(*)
BNC Female 75 ohms	B75
BNC Female 50 ohms	B50
SMA Female	S
N Female	N

Example: Directional coupler with SMA Female (coupled port) connectors = Model 16902-S

UHF and VHF Harmonic Reject Filters

These lowpass transmit filters provide strong harmonics rejection – eliminating potential interference to other broadcast & telecom services operating above the transmit band.


18049


18051

Specifications:

Model	18048	19077	18049	18050	18051	18052
Transmit Band	VHF-L	VHF-L	VHF-H	UHF	UHF	UHF
Max. Power (CW)	250 W	600 W	250 W	50 W	250 W	500 W
Passband (MHz)	54-88	54-88	174-216	470-698	470-698	470-698
Insertion Loss (Max)	0.7 dB	0.5 dB	0.3 dB	0.3 dB	0.3 dB	0.3 dB
VSWR (Max.)	1.36:1	1.25:1	1.30:1	1.30:1	1.30:1	1.30:1
Harmonic Band (MHz) Rejection (Typ)	108-176 > 50 dB	108-176 > 50 dB	348-432 > 60 dB	940-2094 > 50 dB	940-1396 > 50 dB	940-1396 > 50 dB
Harmonic Band (MHz) Rejection (Typ)	176-440 > 70 dB	176-960 > 50 dB	522-1080 > 70 dB	------	1410-3490 > 70 dB	1410-3490 > 70 dB
Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Connectors	N Female	7/16 DIN	N Female	N Female	N Female	7/16 DIN

STL (7 GHz) / ISM (5.8 GHz) Diplexer

Model 16940

This diplexer allows broadcasters to run their station's IP operations (ISM band) through the same antenna as their broadcast auxiliary services (STL band).

The model **16940** provides a low band path (5.725-5.850 GHz) for the ***unlicensed*** ISM feed and a high band path (6.875 - 7.125 GHz) for the STL feed.

- *Optimizes Performance* – No need to "patch-in" the ISM through the STL antenna via "lossy" circulator/filter assemblies.

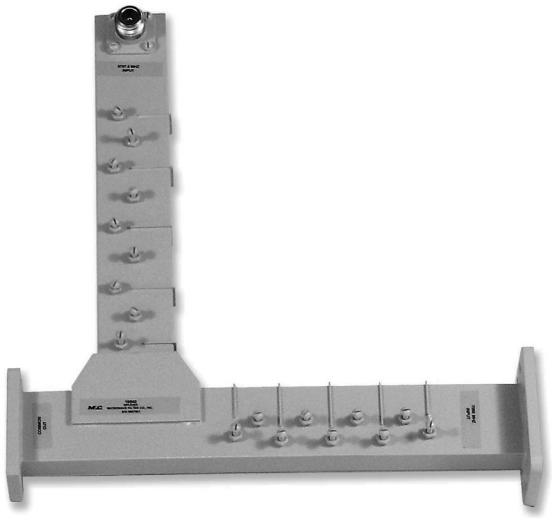
- *Saves Revenue*
  – Eliminates the need for a separate ISM antenna system.
  – Eliminates the need for a separate STL (7 GHz) filter.

Specifications:

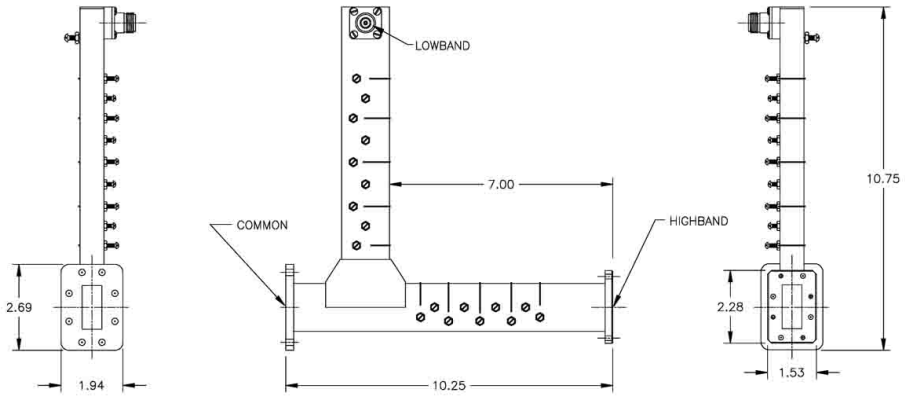
Passbands ..... Low band: 5.725-5.850 GHz
High band: 6.875-7.125 GHz
Passband Loss ..... Low band: 0.1 dB Typ; 0.2 dB Max
High band: 0.2 dB Typ; 0.3 dB Max
Passband Return Loss..... 20 dB Min
Power Rating (CW) ..... 5 Watts Max
Mutual Isolation..... 60 dB Typ; 50 dB Min
Interface ..... N Female (Low band port)
CMR137 (High band port)
CPR137F (Common port)

Alternate flange/connector configurations are available upon request

For **Licensed** (Lower 6 GHz) ISM band applications, see our model 18857 diplexer



	Interface		
Model	Lowband	Highband	Common
16940	N-female	CMR137	CPR137
16940-CMR	N-female	CMR137	CMR137
16940-CPR	N-female	CPR137	CPR137
16940-UG344	N-female	CMR137	UG344



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IP Radio (11 GHz) / BAS (13 GHz) Diplexer

Model 18444

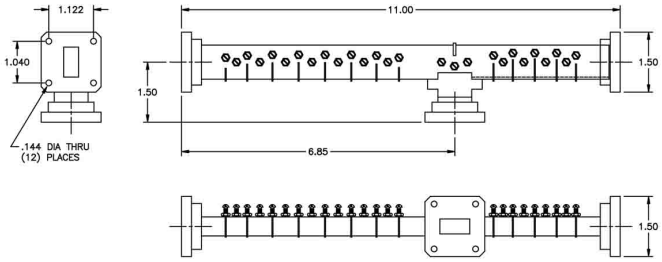
This diplexer enables broadcasters to run their (11 GHz licensed) IP radio through the same antenna as their (13 GHz) broadcast auxiliary services.

Utilizing high "Q" band filtering components, the model 18444 provides excellent isolation between the two bands with minimal signal degradation.

- *Reduces Costs* - Dual operations through a single antenna system means less equipment needed
- *Versatile* - Compatible with virtually any (11 GHz) IP radio & (13 GHz) BAS equipment
- *Alternate Flange Configurations are Available Upon Request*

Specifications:

Passband # 1 (IP Radio)	10.7 - 11.7 GHz
Passband #2 (BAS)	12.7 - 13.2 GHz
Passband Insertion Loss	0.20 dB Typ; 0.35 dB Max
Passband V.S.W.R.	1.30: 1 Max
Passband Power (CW)	100 Watts Max / Band
Mutual Isolation	50 dB Min
Interface	WR75 Cover Flanges
Dimensions	11.0" x 1.5" x 1.5" (279 mm x 38 mm x 38 mm)



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STL (7 GHz) / ISM (5.8 GHz) Diplexer

Model 17322
This diplexer allows broadcasters to run their station's IP operations (ISM band) through the same antenna as their broadcast auxiliary services (STL band).

The model **17322** provides a low band path (5.725-5.850 GHz) for the ***unlicensed*** ISM feed and a broadband path for the STL (7 GHz) feed.

Ideal for applications that use pre-filtered (7 GHz) radios.
Note: When using non-filtered radios, refer to our model 16940 diplexer.

• *Optimizes Performance* – No need to "patch-in" the ISM through the STL antenna via "lossy" circulator/filter assemblies.

• *Saves Revenue* – Eliminates the need for a separate ISM antenna system.

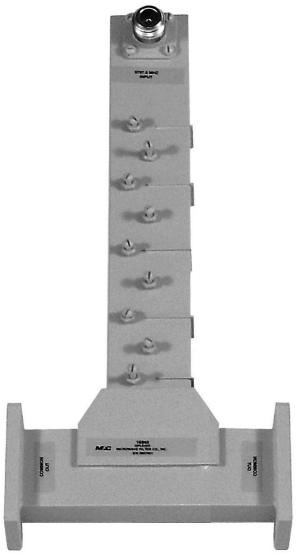
Specifications:

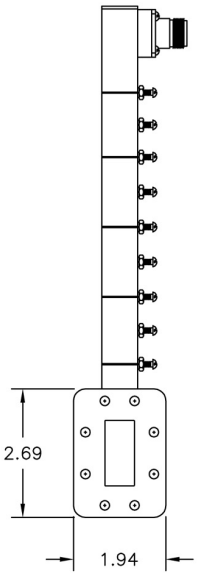
Lowband ..... 5.725-5.850 GHz
Lowband Loss..... 0.5 dB Max
Lowband Return Loss..... 20 dB Min
Lowband Rejection..... 60 dB Typ; 50 dB Min @ (6.875-7.125) GHz
Broadband..... STL (7 GHz) Feed
Power ..... 5 Watts
Interface ..... See Chart

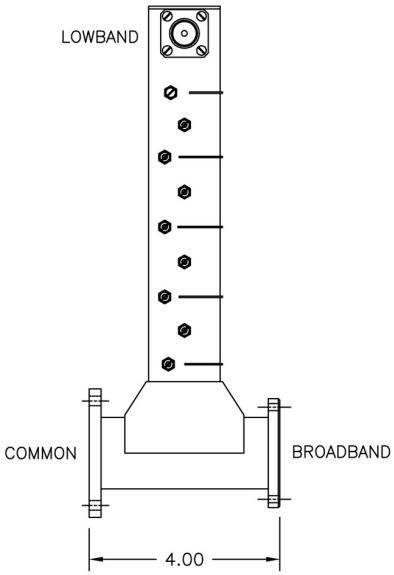
Note:
Alternate flange/connector configurations are available upon request

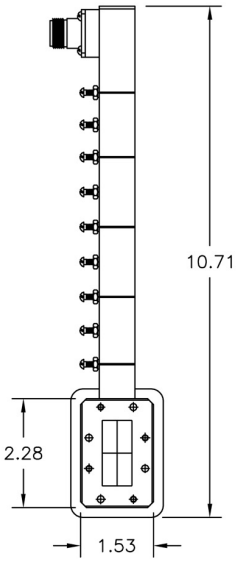
	Interface		
Model	Lowband	Broadband	Common
17322	N-female	CMR137	CPR137
17322-CPR	N-female	CPR137	CPR137
17322-CMR	N-female	CMR137	CMR137
17322-UG344	N-female	* UG344/U	* UG344/U

* Circular Cover









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STL (7 GHz) / ISM (Lower 6 GHz) Diplexer

Model 18857
This diplexer allows broadcasters to run their station's IP operations (ISM band) through the same antenna as their broadcast auxiliary services (STL band).

The model **18857** provides a low band path (5.925-6.425 GHz) for the ***licensed*** ISM feed and a high band path (6.875 - 7.125 GHz) for the STL feed.

- *Reduces Costs* – Eliminates the need for a separate ISM antenna system
  – Eliminates the need for a separate STL (7 GHz) filter

- *Optimizes Performance* – No need to "patch-in" the ISM feed through the STL antenna via "lossy" circulator/filter assemblies

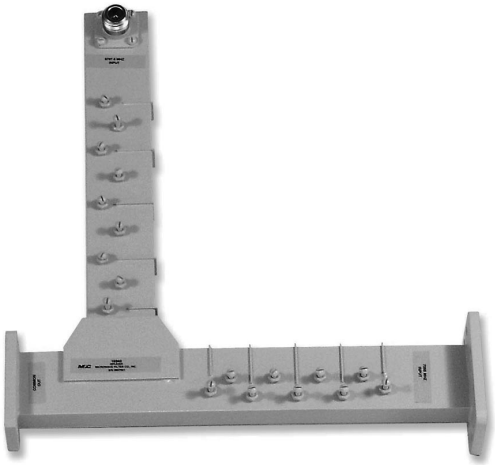
- *Robust IP Capability* – The **licensed** (lower 6 GHz) ISM band provides 4X more bandwidth than the **unlicensed*** (5.8 GHz) ISM band.

Specifications:

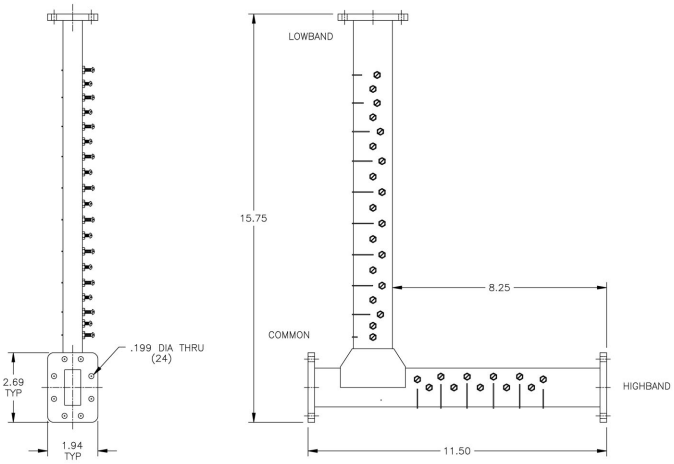
Passbands ..... Low band: 5.925-6.425 GHz
High band: 6.875-7.125 GHz
Passband Loss ..... Low band: 0.75 dB Typ
High band: 0.5 dB Typ
Passband Return Loss ..... 20 dB Min
Power ..... 5 Watts
Mutual Isolation ..... 40 dB Min
Connectors ..... See chart

Alternate flange/connector configurations are available upon request.

* For **unlicensed** (5.8 GHz) ISM band applications see our model **16940** diplexer.



	Interface		
Model	Lowband	Highband	Common
18857	CPR137F	CPR137F	CPR137F
18857-1	N-female	CPR137F	CPR137F



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STL (7 GHz) / ISM (Upper 6 GHz) Diplexer

Model 19381

This diplexer allows broadcasters to run their licensed (upper) 6 GHz ISM band operations through the same antenna as their broadcast auxiliary services (STL).

The model 19381 consists of a low band (6.540 - 6.740 GHz) for the ISM feed and a high band (6.875 - 7.125 GHz) for the STL feed ….. resulting in superior isolation between the two feeds.

- *Reduces Costs* – Eliminates the need for a separate ISM antenna system.
  – Eliminates the need for a separate STL (7 GHz) filter.

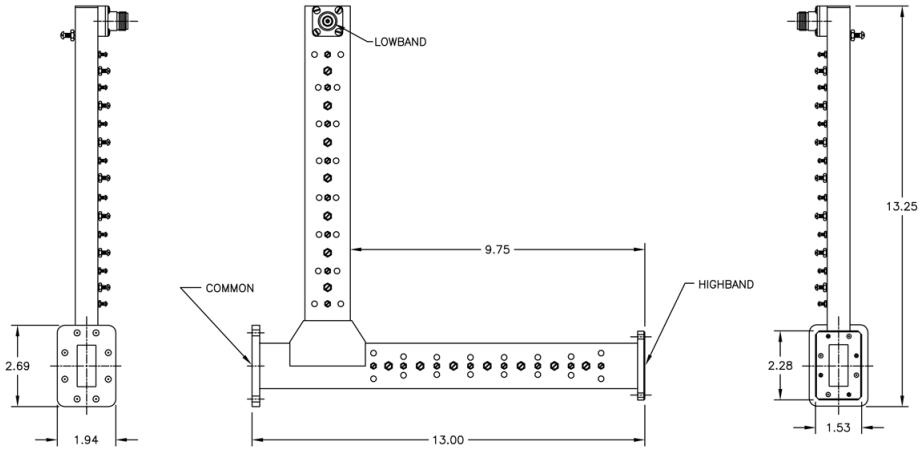
- *Optimizes Performance* – No need to "patch-in" the ISM feed through the STL antenna via "lossy" circulator/filter assemblies.

Specifications:

Passbands	Low band: 6.540 - 6.740 GHz High band: 6.875-7.125 GHz
Passband Loss	Low band: 0.3 dB Approx High band: 0.3 dB Approx
Passband Return Loss	20 dB Min
Power	5 Watts
Mutual Isolation	60 dB Typ; 50 dB Min
Interface	CPR137F (Common) CMR137 (High band) N-female (Low band)

Alternate flange/connector configurations are available upon request.

* For **unlicensed** (5.8 GHz) ISM band applications see our model **16940** diplexer.



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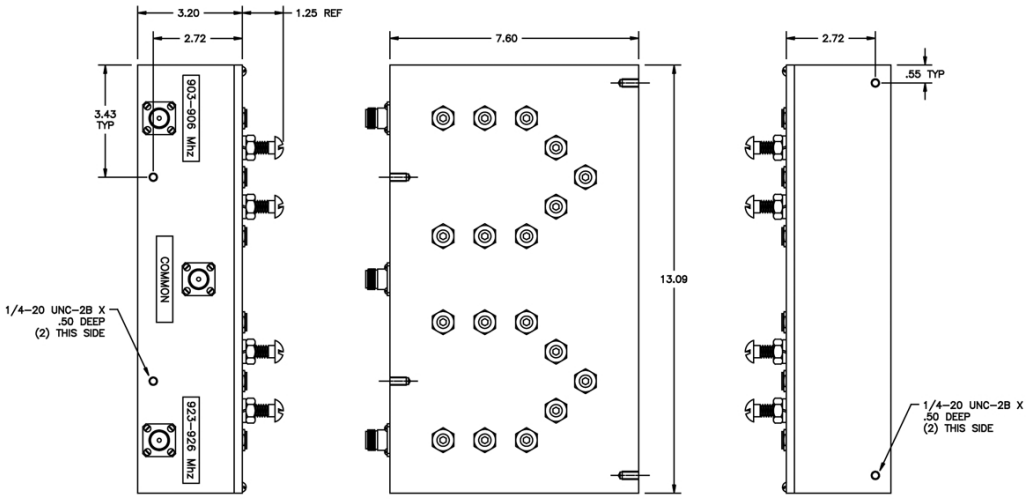
ISM (900 MHz) Band Diplexer

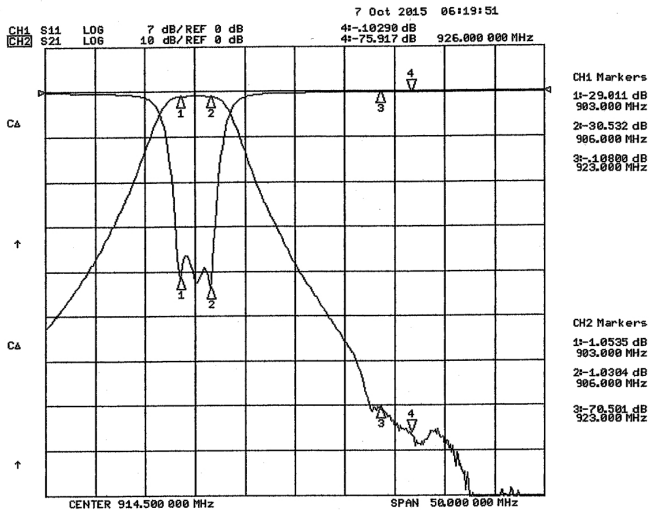
Model 19427

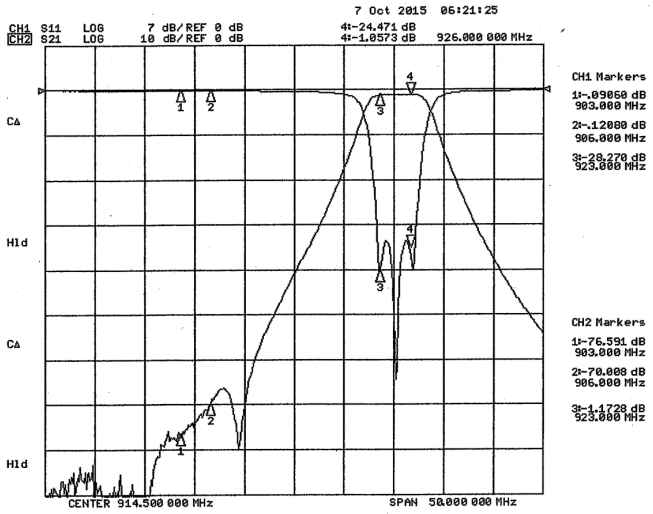
This diplexer provides excellent isolation between the transmit and receive bands with minimal signal degradation.

Specifications:

Passbands	903-906 MHz 923-926 MHz
Passband Loss	2.0 dB Max
Passband VSWR	1.2:1 Max
Passband Power (CW)	10 Watts Max
Mutual Isolation	70 dB Approx
Impedance	50 ohms
Connectors	N-female
Operating Temp. Range	-10˚C to +55˚C Indoor Use Only







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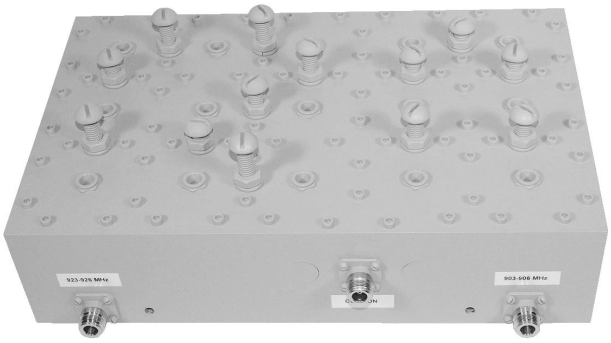
ISM (900 MHz) Band Diplexer

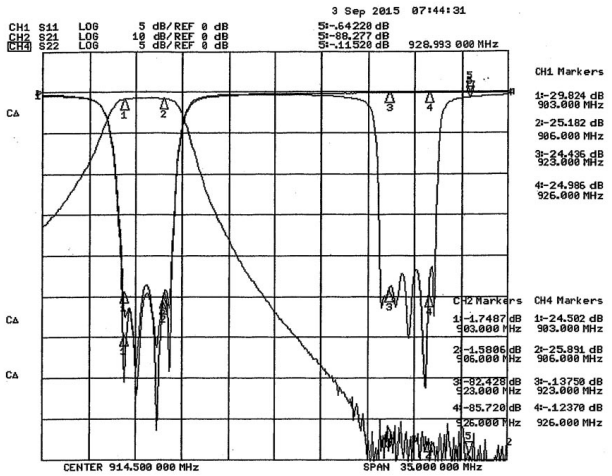
Model 19433

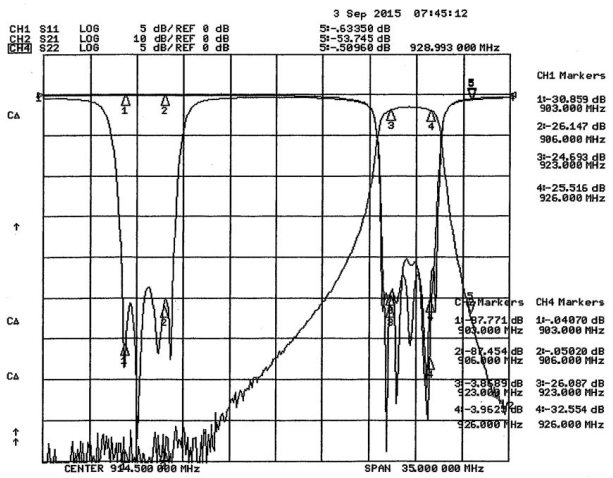
This diplexer provides excellent isolation between the transmit and receive bands with minimal signal degradation.

Specifications:

Passband #1	903-906 MHz
Passband #2	923-926 MHz
Passband #1 Insertion Loss	1.5 dB Approx @ Center Band 4.5 dB Max @ Band Edges
Passband #2 Insertion Loss	4.5 dB Max @ Center Band 6.0 dB Max @ Band Edges
Passband VSWR	1.2:1 Max
Passband Power (CW)	50 Watts Max
Mutual Isolation	120 dB Approx
Additional Rejection:	60 dB Approx @ 929 MHz except 55 dB Approx @ Temp. Extremes
Impedance	50 ohms
Connectors	N-female
Operating Temp. Range	-17˚C to +57˚C Indoor Use Only







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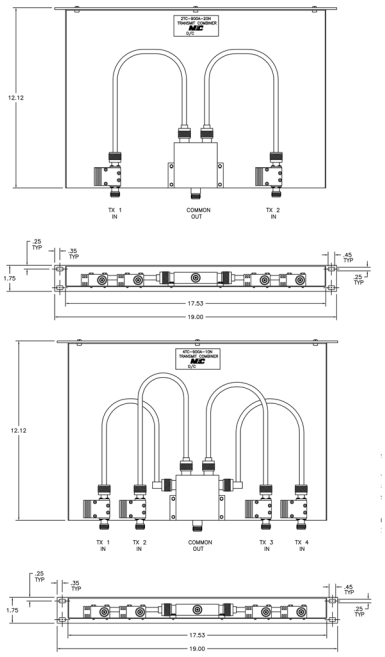
Transmitter (Ferrite) Combiners

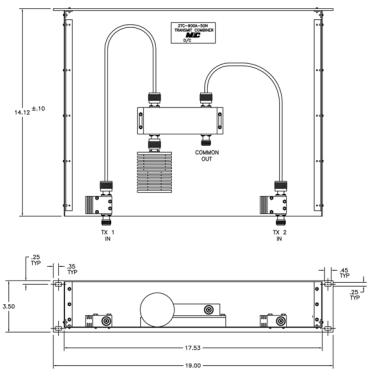
Designed for transmit applications between 806-960 MHz, this series of combiners provide excellent isolation between the combined transmit signals.

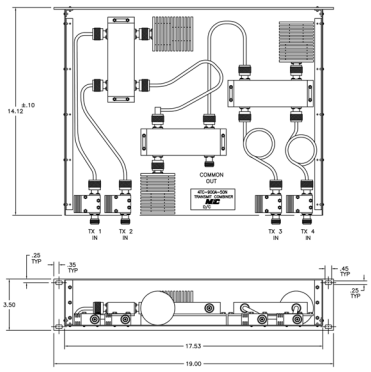
Utilizing ferrite components, these combiners are an economical alternative to cavity filter combiners.

- *Ideal for STL broadcast applications*
- *Available for 10, 20 and 50 Watt transmit applications.*
- *Typically "In Stock" for fast turnaround*

Model Number	2TC-900A-20N	4TC-900A-10N	2TC-900A-50N	4TC-900A-50N
Frequency Range (MHz)	806-960	806-960	806-960	806-960
Number of Channels	2	4	2	4
Power per Channel (Max)	20 W	10 W	50 W	50 W
Insertion Loss (Tx-Ant)	3.9 dB Typ	7 dB Typ	3.6 dB Typ	7 dB Typ
VSWR	1.25:1 Max	1.25:1 Max	1.25:1 Max	1.25:1 Max
Isolation (Tx-Tx)	50 dB Min	50 dB Typ	50 dB Typ	40 dB Min 50 dB Typ
Isolation (Antenna-Tx)	25 dB Min	28 dB Min	28 dB Typ	28 dB Typ
Operating Temp. Range (˚C)	-20˚ to +60˚	-20˚ to +60˚	-20˚ to +60˚	-20˚ to +60˚
Rack Chassis Mount	1 RU	1 RU	2 RU	2 RU







All units are furnished with N-female connectors

ISM (900 MHz) / STL (950 MHz) Diplexer

Model 18486
This diplexer enables broadcasters to run their (ISM) wireless operations through the same antenna as their (STL) broadcast auxiliary services.

The model 18486 utilizes highly-selective bandpass filter components resulting in excellent isolation between the two bands.

- *Reduces Costs* - Dual operations through a single antenna system

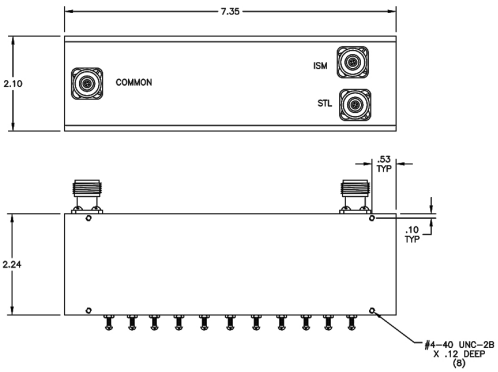
  - No need for separate ISM bandpass filter

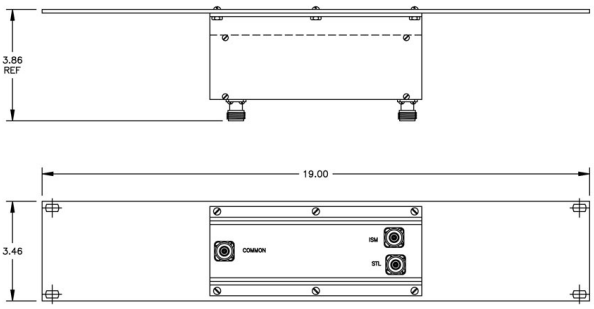
- *Full Compatibility* - Works with any brand of ISM 900 radio

Specifications:

Passband #1 (ISM)	902 - 928 MHz
Passband #2 (STL)	See Chart
Passband Insertion Loss	1.5 dB Typ; 2.0 dB Max
Passband V.S.W.R	1.5:1 Max
Passband Power (CW)	10 Watts Max / Band
Mutual Isolation	70 dB Typ; 60 dB Min
Operating Temp	+23˚C to +5˚C
Connectors	N Female
Dimensions	7.35" x 2.24" x 2.10"
	(187 mm x 57 mm x 53 mm)
Rack Mount (Optional)	Available Upon Request

Model	Passband (STL)
18486	944-952 MHz
18486-1	953-960 MHz





Panel mount option available.
Order as P18486

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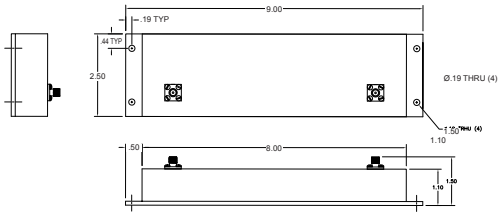
BAS (2 GHz) Bandpass Filters

15956



Full Band BAS Bandpass Filter

This bandpass filter is ideal for isolating the entire BAS band - operating on channels A1-A7 (2025-2110 MHz) - from other surrounding communication services, such as the PCS and BRS-EBS bands.

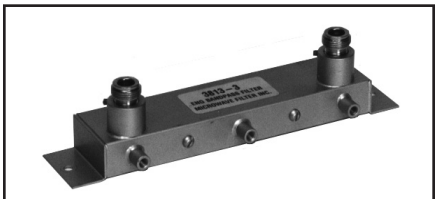
The model 15956 offers low insertion loss and is suitable for indoor or outdoor use.

15956 Specifications:

	15956
Passband	2025-2110 MHz
Passband Loss	2 dB Max
Rejection	45 dB Typ @ 1995 MHz
Impedance	50 ohms
Connectors	SMA (Female)
Operating Temperature	-20° to +60°C
Weatherized for outdoor use	

Bandpass Filters

These filters can be used for broadcast services operating in the (2025-2110) MHz and (2450-2500) MHz bands.



3813

Model 3813

Specifications:

Center Band Loss	3 dB
1 dB Relative Bandwidth	8 MHz Min
30 dB Rejection (+/-)	11 MHz
Impedance	50 ohms
Connectors (Female)	N, TNC or SMA

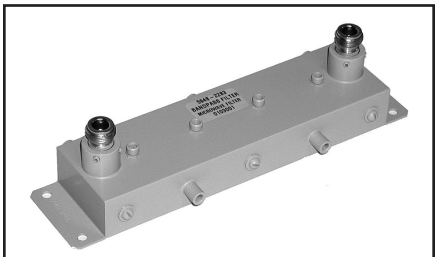
Ordering Information:

3813- (Fo <u>or</u> Channel#) (X)

(Fo <u>or</u> Channel#) - designates center frequency (MHz) <u>or</u> Channel#

(X) - designates connector type

Connectors: N, S (SMA) or T (TNC) - Female



5948

Model 5948

Specifications:

Center Band Loss	1.0 dB Typ - Chs 1-7 1.5 dB Typ - Chs 8-10
1 dB Relative Bandwidth	16 MHz Min
25 dB Rejection (+/-)	16 MHz
Impedance	50 ohms
Connectors (Female)	N, TNC

Ordering Information:

5948- (Fo <u>or</u> Channel#) (X)

(Fo <u>or</u> Channel#) - designates center frequency (MHz) <u>or</u> Channel#

(X) - designates connector type

Connectors: N, S (SMA) or T (TNC) - Female

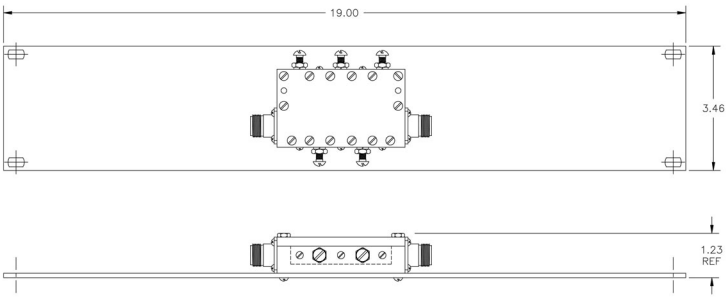
BAS Full Band Bandpass Filter

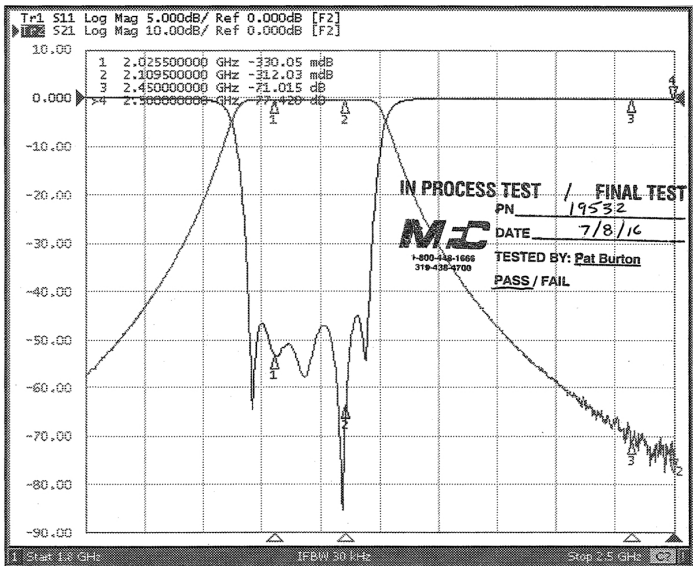
Model 19532

This bandpass filter isolates the lower 2 GHz BAS band (chs. 1-7) from the upper 2 GHz BAS band (chs. 8-10).

Specifications:

Passband	2025.5 – 2109.5 MHz
Passband Loss	0.5 dB Approx
Passband VSWR	1.22:1 Max
Rejection	70 dB Typ.; 60 dB Min from 2450 – 2500 MHz
Impedance	50 ohms
Connectors	N – female
Dimensions	19″ x 3.46″ x 1.23″ Approx (482 mm x 88 mm x 31 mm)
Environment	Rack Panel Mounted for Indoor Use





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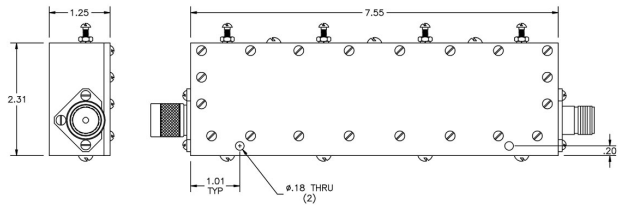
2 GHz TV Mobile Microlinks Bandpass Filter (Brazil)



Model 19205

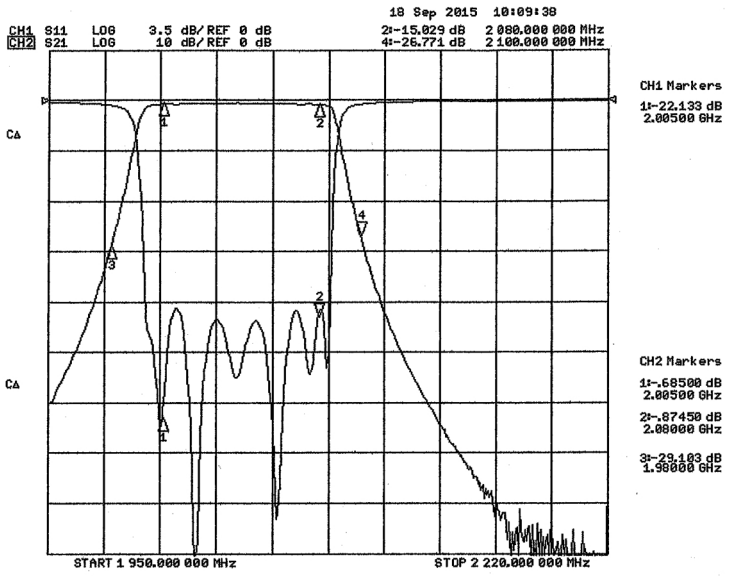
This bandpass filter isolates this auxiliary TV band from potential interference caused by other sources of communication (e.g. – fixed wireless services).

Specifications:

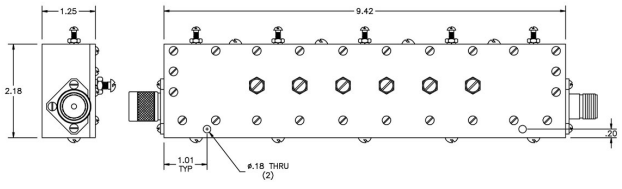
Passband	2005 – 2080 MHz
Passband Loss	1.0 dB Approx
Passband VSWR	1.5:1 Approx
Passband Power	5 Watts Max
Rejection	25 dB Min @ 1980 MHz
	25 dB Typ; 20 dB Min @ 2100 MHz
Impedance	50 ohms
Connectors	N – male (Input)
	N – female (Output)
Operating Temp	+60 °F to +90 °F

Indoor/Outdoor Use - Non-Weatherized*

* Requires placement in weatherized housing for outdoor use



2 GHz TV Mobile Microlinks Bandpass Filter (Brazil)



Model 19206

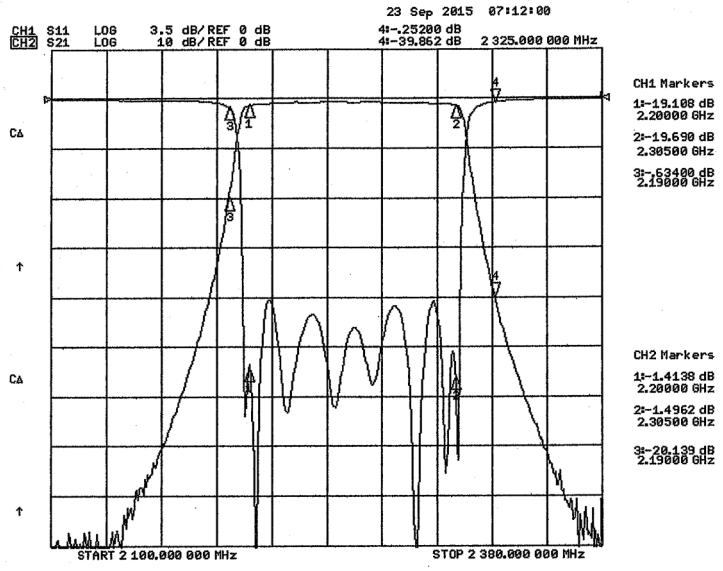
This bandpass filter isolates this auxiliary TV band from potential interference caused by other sources of communication (e.g. – fixed wireless services).

Specifications:

Passband	2200 – 2305 MHz
Passband Loss	1.5 dB Approx.
Passband VSWR	1.5:1 Max
Passband Power	5 Watts Max
Rejection	15 dB Min @ 2190 MHz
	35 dB Min @ 2325 MHz
Impedance	50 ohms
Connectors	N – male (Input)
	N – female (Output)
Operating Temp	+60 °F to +90 °F

Indoor/Outdoor Use - Non-Weatherized*

* Requires placement in weatherized housing for outdoor use



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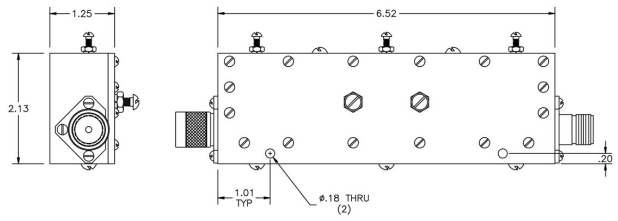
2 GHz TV Mobile Microlinks Bandpass Filter (Brazil)



Model 19216

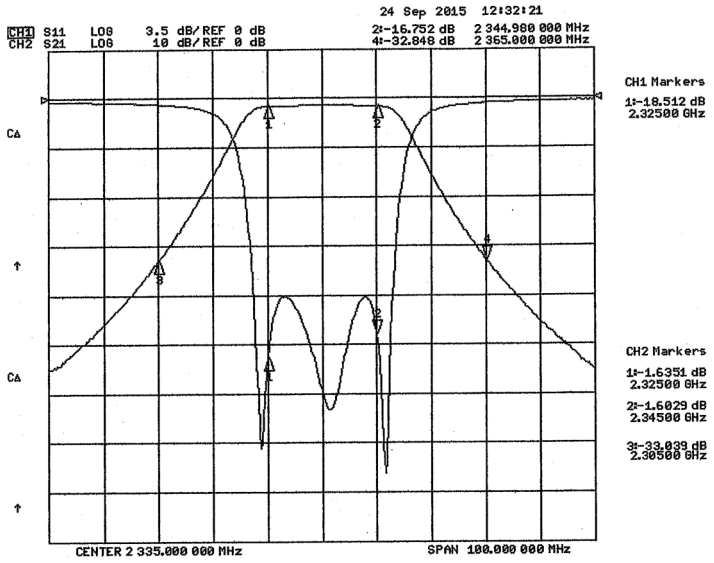
This bandpass filter isolates this auxiliary TV band from potential interference caused by other sources of communication (e.g. – fixed wireless services).

Specifications:

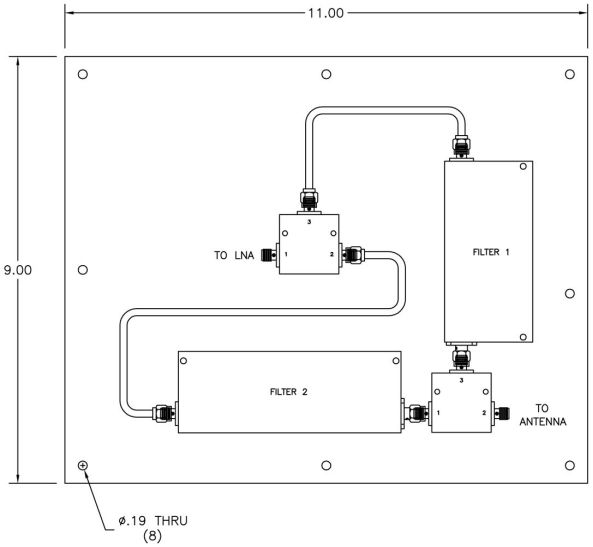
Passband	2325 – 2345 MHz
Passband Loss	1.5 dB Approx; 2 dB Max
Passband VSWR	1.5:1 Max
Rejection	30 dB Approx @ 2305 MHz
	30 dB Approx @ 2365 MHz
Impedance	50 ohms
Connectors	N – male (Input)
	N – female (Output)
Operating Temp	+60 °F to +90 °F

Indoor/Outdoor Use - Non-Weatherized*

* Requires placement in weatherized housing for outdoor use



2 GHz TV Mobile Microlinks Dual Band Bandpass Filter (Brazil)

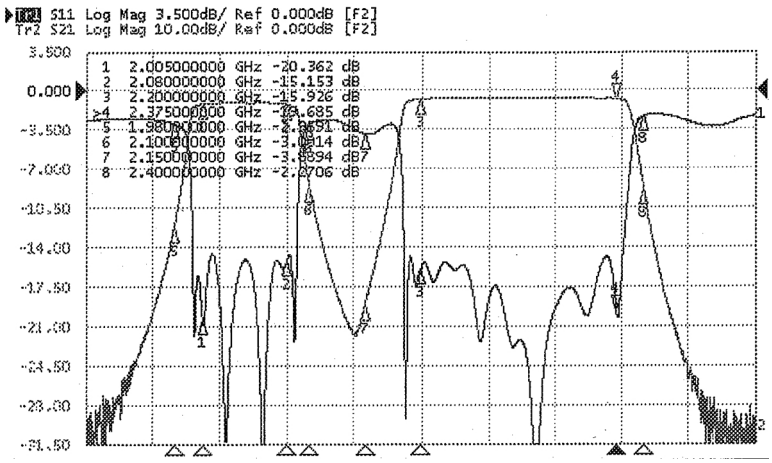


Model 19294

This dual band bandpass filter isolates these auxiliary TV bands from potential interference caused by other sources of communication (e.g. – fixed wireless services).

Specifications:

Passband #1	2005 – 2080 MHz
Passband #2	2200 – 2375 MHz
Passband #1 Insertion Loss	3.5 dB Approx
Passband #2 Insertion Loss	2.5 dB Approx
Passband VSWR	1.5:1 Max
Rejection	25 dBc Min @ 1980 MHz
	15 dBc Min @ 2100 MHz
	45 dBc Min @ 2150 MHz
	20 dBc Min @ 2400 MHz
Impedance	50 ohms
Connectors	SMA – Female



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Broadcast Auxiliary Band (7 GHz) Bandpass Filters

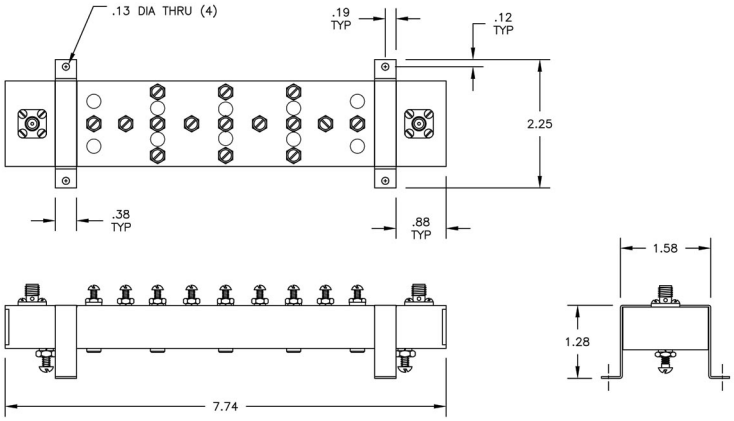
Model 19322-(Fo)

These bandpass filters isolate the desired 7 GHz auxiliary band channel from virtually all potential sources of interference operating above and below the designated channel - including other 7 GHz band transmissions.

Specifications:

Center Frequency (Fo) Option	6.9 - 7.1 GHz
Passband Bandwidth	25 MHz Min
Passband Insertion Loss	2.0 dB Max
Rejection	50 dB Typ ± 150 MHz from Fo
Impedance	50 ohms
Connectors	SMA - female
Environment	Indoor Use

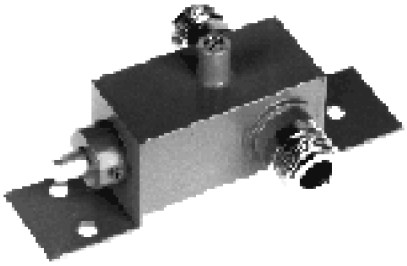
Alternate connectors are available upon request.



BAS (2 GHz) Tunable Notch Filter

Model 14001-1

This filter protects (2 GHz) BAS channel operations from other (undesired) BAS channel transmissions or any other potential source of interference between (1900 - 2400) MHz.



Features:

- Coarse Tune and Self-Locking Fine Tune Adjustments for Smooth Operation
- Minimal Impact on Desired Carrier(s)
- Cascade Multiple Units for Additional Notch Depth or to Suppress Several Carriers

Specifications:

	14001-1
Notch (Fo) Tuning Range	1900 - 2400 MHz
Notch Depth	25 dB Approx
Bandwidth (3 dB Points)	± 25 dB Approx. from Fo
Impedance	50 ohms
Connectors	N - female
Dimensions ..... (excl. connectors)	3.875" x 1.57" x 1.00" (98 mm x 40 mm x 25 mm)
Finish	Gray Lacquer

For (1640 - 1900 MHz) Tuning Range - order Model 14001-2
For (2400 - 2500 MHz) Tuning Range - order Model 14001-3

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LTE 700 MHz Band Filters

Product Description:

18536 - Upper Band Highpass Filter
Isolates the entire upper 700 MHz band (upper C/D & Public Safety blocks) from all DTV-UHF channel broadcasts. Rejects any undesired signals below 700 MHz. Weatherized for outdoor use.

18606 - Upper C Downlink Bandpass Filter
Passes the Upper C (downlink) block while rejecting the Upper C (uplink) block and the entire GSM 850 band. Rejects most of the Lower 700 MHz band. Alternate connectors available.

Model 18536

18607 - Upper C Uplink Bandpass Filter
Passes the Upper C (uplink) block while rejecting the Upper C (downlink) block and the entire GSM 850 band. Rejects all of the Lower 700 MHz band. Alternate connectors available.

18608 - Upper C&D Full Block Bandpass Filter
Passes the Upper C&D (full) block while rejecting all DTV-UHF band and GSM 850 band transmissions. Rejects all signals below the 700 MHz band. Alternate connectors available.

Model 18608

18609 - Lower A Full Block Bandpass Filter
Passes the Lower A (full) block while rejecting the Upper C (uplink) block and the entire GSM 850 band. Also rejects Upper D (uplink) block. Alternate connectors available.

18610 - Full Band Bandpass Filter
Passes the entire 700 MHz band while rejecting most of the DTV-UHF band and the entire GSM 850 band. Rejects DTV-UHF channels 14-50. Alternate connectors available.

Technical Specifications:

Model	Passband (MHz)	Passband I/L	Passband R/L	Stopband (s) (MHz)	Stopband Attenuation	Connectors
18536	746-894	1 dB Typ at PB Edge	14 dB Min	0-700	40 dB Min	7/16 DIN female (Std) N-female (Opt)
18606	746-757	1 dB Max	20 dB Min	698-740 & 776-896	60 dB Min	N-female SMA-female (Opt)
18607	776-787	1.5 dB Typ	20 dB Min	698-757 & 824-896	60 dB Min	N-female
18608	740-800	1 dB Max	20 dB Min	DC-696 & 806-896	30 dB Min	N-female SMA-female (Opt)
18609	698-734	1 dB Max	20 dB Min	776-896	30 dB Min	N-female SMA-female (Opt)
18610	698-806	1 dB Typ	10 dB Typ	695 DC-690 624-695	20 dB Typ 70 dB Typ 70 dB Typ	N-female

DTV "Mask Emission/Compliance" Bandstop Test Filters

Models 16150 and 16560

These bandstop filters are used by broadcasters to measure DTV mask emissions - in accordance with the IEEE's recommended **"Practice for Measurement of 8-VSB Digital (US) Television Mask Compliance".**

These single channel filters are available for any DTV broadcast channel (2-51).

- Standard 50 ohm impedance w/N Female connectors.
- Standard Rack Chassis or Plate Mount Configuration.

"Full Service" Mask Compliance Test Filter **(Model 16150)**:

Electrical Specifications :
Fc = Center of Test Channel
Fc ± 5 MHz : 3 dB Max
Fc ± 3 MHz : 43 dB Min
Fc ± 2.5 MHz : 49 dB Min
Operating Bandwidth : (470-695) MHz - DTV Chs. (14-51)
(57-213) MHz - DTV Chs. (2-13)

"Stringent or Simple" Mask Compliance Test Filter **(Model 16560)**:

Electrical Specifications :
Fc = Center of Test Channel
Fc ± 5 MHz : 3 dB Max
Fc ± 3 MHz : 20 dB Min
Operating Bandwidth : (470-695) MHz - DTV Chs. (14-51)
(57-213) MHz - DTV Chs. (2-13)

Mechanical Specifications (Models 16150 and 16560):
Plate Mount: 9″ x 5″ x 8″ (Approx)
Rack Chassis Mount: 19″ x 3.5″ (2RU) x 13″ (Approx)

Ordering Information:
Plate Mount: **16150**-(channel #)
16560-(channel #)

Rack Chassis Mount: **R16150**-(channel #)
R16560-(channel #)

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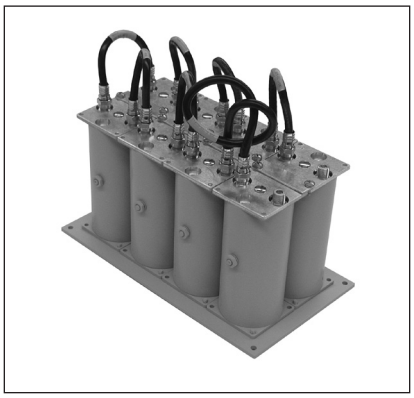
DTV Adjacent Channel Eliminator

3271ABU (UHF) / 3271ABH (VHF - High)

3271 For Mid/High/Super/Hyper



R3271 For Mid/High/Super/Hyper

3271ABU & 3271ABH Series

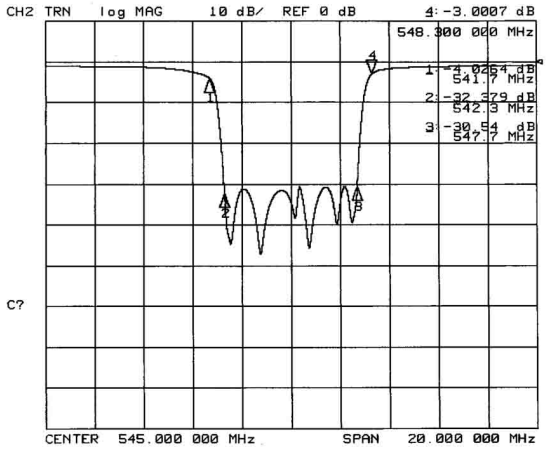
These filters are used to prevent a single DTV channel from interfering with adjacent DTV channel(s) reception.

Utilizing "High Q" components, the model 3271AB fully suppresses the undesired channel without degrading adjacent channels.

Features **:**

- *Typically provides > 20 dB of isolation between adjacent DTV channels.*
- *Ideal for use in those "fringe" receive areas where adjacent channel signals co-exist (e.g. translator sites).*
- *Broadband Performance – Receive all other DTV channels VHF (2-13) & UHF (14–36) - excluding the undesired channel.*
- *Available in Plate Mount or Rack Mount configurations.*
- *Standard - 75 ohm impedance with F Female connectors.*
  Optional - 50 ohm impedance with N, SMA or BNC F Female connectors.

Model Number	Available for DTV Channels	Rejection of (Undesired) Channel	Insertion Loss on Adjacent Channels
3271ABL Series	2 to 6	25 dB Min	4 dB Typ
3271ABH Series	7 to 13	25 dB Min	4 dB Typ
3271ABU Series	14 to 36	25 dB Min	4 dB Typ



Typical Frequency Response of 3271ABU

Mechanical Specifications:

3271ABL: 19″ x 5.25″ (3RU)
3271ABH / 3271ABU : 9″ x 5″ Baseplate Dimensions
R3271ABH / R3271ABU : 19″ x 3.5″ (2RU) x 13″ Rack Chassis Dimensions

Ordering Information:

VHF(L) - Panel Mount : 3271ABL-**Ch.**(5.4)25
(suitable for Rack, Wall or Table Installation)

VHF(H) - Plate Mount : 3271ABH-**Ch.**(5.4)25
Rack Mount : R3271ABH-**Ch.**(5.4)25

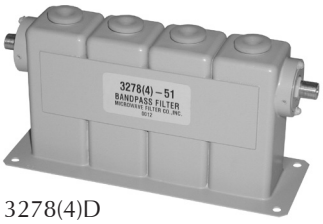
UHF - Plate Mount : 3271ABU-**Ch.**(5.4)25
Rack Mount : R3271ABU-**Ch.**(5.4)25

DTV (UHF & VHF) Channel Bandpass Filters *(Selective)*

UHF Channel Bandpass Filter

3278(2)D

3278(3)D



3278(4)D

3278D Series

Series 3278D bandpass filters are available in two, three or four cavity models to provide three different configurations that are increasingly selective. They are used for UHF processor cleanup or for pre-amp protection against overload from strong out-of-band interference. They are factory tuned to a specified UHF channel, but can be factory retuned to any other UHF channel (14 - 36).

	2 Cavity	3 Cavity	4 Cavity
Channel Insertion Loss:	1.0 dB Max	2.0 dB Max	3.0 dB Max
25 dB Typ rejection from Fo:	± 26 MHz	± 11 MHz	± 8 MHz
Return Loss: 14 dB Min			

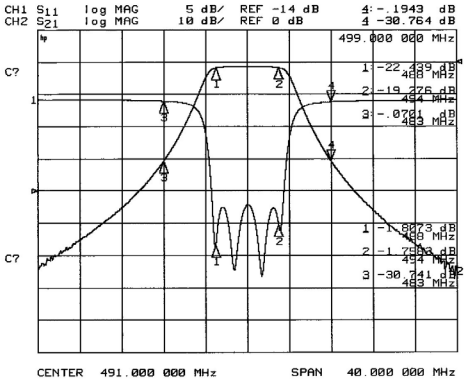
Mechanical Specifications:

Model 3278(2)D Baseplate Dimensions: 3.8" x 2.4"
Model 3278(3)D Baseplate Dimensions: 5.2" x 2.4"
Model 3278(4)D Baseplate Dimensions: 6.6" x 2.4"
Rack Mount Available Upon Request
Connectors: F-female (Std.); N, SMA or BNC-female (Opt.)
Impedance: 75 Ohm (Std.); 50 Ohm (Opt.)

Ordering Information:

3278(#)D(X)(Y) - (CH)

(X) = Female Connector Type
= (No Designation) F
= (B) BNC, (S) SMA or (N) N
(Y) = Impedance
= (No Designation) 75 Ohm
= (50) 50 Ohm
(CH) = channel #



Typical Frequency Response of 3278D

VHF Channel Bandpass Filter

3160D

3160D Series

A general purpose, low insertion loss, channel bandpass filter, the model 3160D suppresses most out-of-band interference. Its applications include processor clean-up before combining or filtering off air receptions.

Available DTV Channels	Selectivity (relative to Channel Center)	Channel Insertion Loss (Max)
2 to 13	25 dB Typ ±9MHz	2 dB
Return Loss: 14 dB Min		

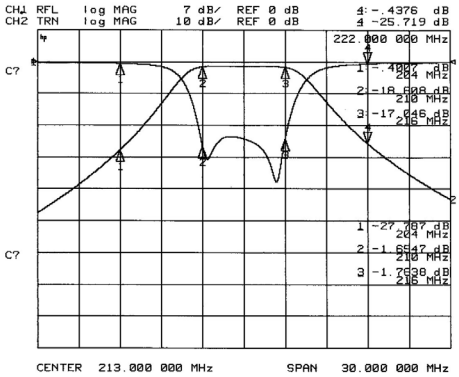
Mechanical Specifications:

Baseplate Dimensions: 6" x 2.25"
Rack Mount Available Upon Request
Connectors: F-female (Std.); N, SMA or BNC-female (Opt.)
Impedance: 75 Ohm (Std.); 50 Ohm (Opt.)

Ordering Information:

3160D(X)(Y) - (CH)

(X) = Female Connector Type
= (No Designation) F
= (B) BNC, (S) SMA or (N) N
(Y) = Impedance
= (No Designation) 75 Ohm
= (50) 50 Ohm
(CH) = channel #



Typical Frequency Response of 3160D

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DTV (UHF & VHF) Channel Bandpass Filters *(Ultra-Selective)*

UHF Channel Bandpass Filters

14584D

14584D Series

Designed for any UHF channel (14 to 51), the 14584D suppresses strong adjacent channel interference while maintaining low insertion loss on the desired channel.

Available DTV Channels	Channel Insertion Loss (Max)	Selectivity (Relative to Channel Center)	Group Delay
14 to 51	5.0 dB	35 dB Min ±5MHz	180 ns Typ
Return Loss: 18 dB Min			

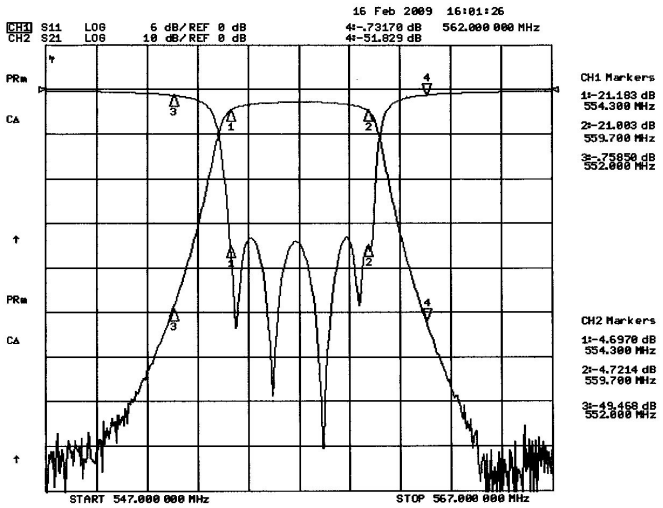
Mechanical Specifications:

Available in rack or wall mount versions
Connectors: F-female (Std.); N, SMA or BNC-female (Opt.)
Impedance: 75 Ohm (Std.); 50 Ohm (Opt.)

Ordering Information:

14584D(X)(Y) - (CH)U

(X) = Female Connector Type
= (No Designation) F
= (B) BNC, (S) SMA or (N) N
(Y) = Impedance
= (No Designation) 75 Ohm
= (50) 50 Ohm
(CH) = channel #



Typical Frequency Response of 14584D

VHF Channel Bandpass Filters

3303D

3303D Series

This premium channel filter suppresses virtually all out-of-band interference (including adjacent channels) while maintaining low insertion loss on the desired channel.

Available DTV Channels	Channel Insertion Loss (Max)	Selectivity (Relative to Channel Center)	Group Delay
2 to 6	3.0 dB	40 dB Typ ±5MHz	150 ns Typ
7 to 13	4.5 dB	35 dB Typ ±5MHz	150 ns Typ
Return Loss: 14 dB Min			

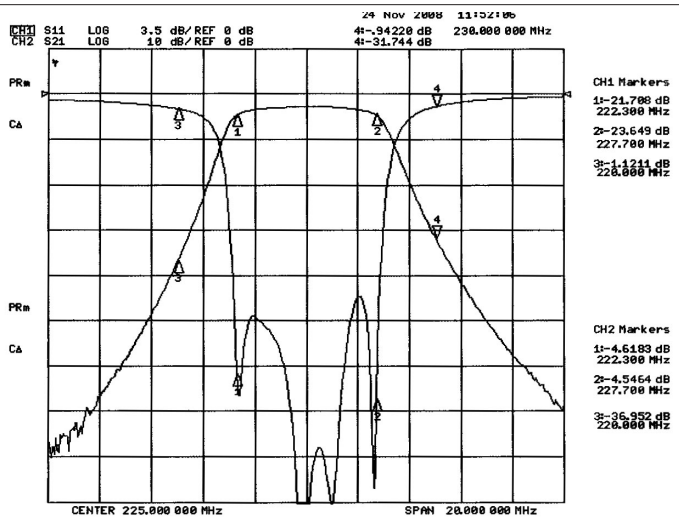
Mechanical Specifications:

Baseplate Dimensions: 10.25" x 1.50"
Rack Mount Available Upon Request
Connectors: F-female (Std.); N, SMA or BNC-female (Opt.)
Impedance: 75 Ohm (Std.); 50 Ohm (Opt.)

Ordering Information:

3303D(X)(Y) - (CH)

(X) = Female Connector Type
= (No Designation) F
= (B) BNC, (S) SMA or (N) N
(Y) = Impedance
= (No Designation) 75 Ohm
= (50) 50 Ohm
(CH) = channel #



Typical Frequency Response of 3303D

DTV-VHF/UHF Bandpass Filter

This bandpass filter allows for clean reception of the DTV-VHF high band and the DTV-UHF band by eliminating potential sources of interference operating below that VHF band and above the UHF band.

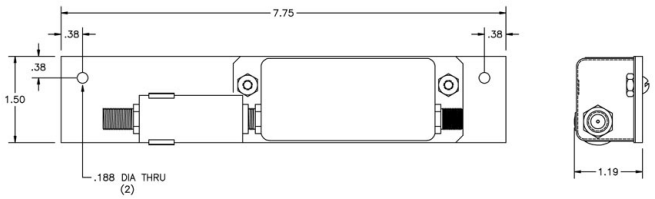
Model 19520

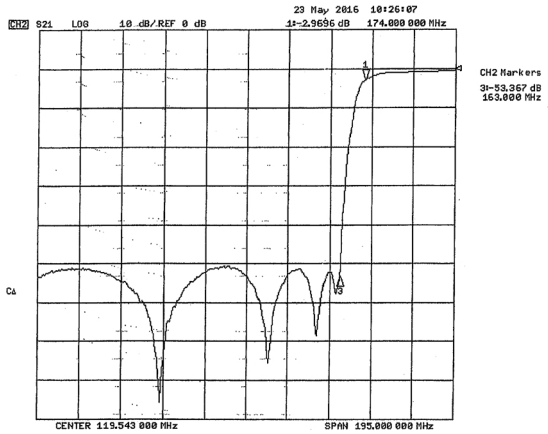
Features:

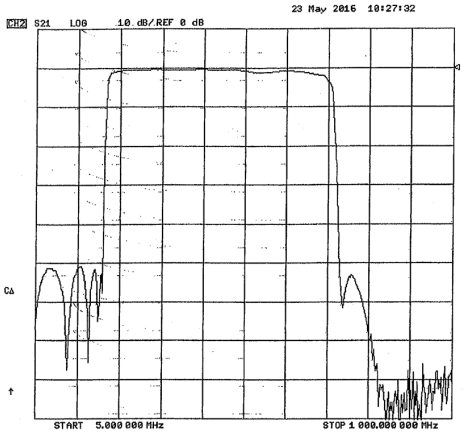
- Suppresses 700 MHz (downlink) transmit bands 12, 13, 14 and 17
- Allows for clean reception of DTV-UHF channels 14-50 and all DTV-VHF-High band channels 7-13
- Also suppresses GSM 850 & GSM 900 bands

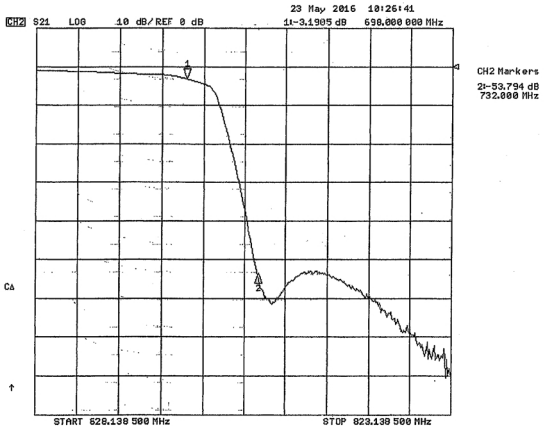
Specifications:

Passband:	174 - 698 MHz
Passband Loss:	3 dB Typ @ Passband Edges 1-2 dB Typ in Remainder of Passband
Stopbands:	5 - 163 MHz and 732 - 1000 MHz
Stopband Attenuation:	50 dB Typ
Impedance:	75 ohms
Connectors:	F-female
Size:	7.75" x 1.50" x 1.19" Approx









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FM Harmonic Reject Filters

These FM transmit filters provide deep suppression of harmonics with minimal impact on the fundamental transmit signal.

18150

Model 18150

- **300 Watt** (CW) Transmit Power Rating
- **2nd thru 10th Harmonics Suppression**
  Ideal for eliminating potential interference to these bands:
  - *DTV - **VHF-Hi** (7-13)*
  - *DTV - **UHF** (14-51)*
  - *Wireless - **700 MHz***
  - *Wireless - **850 MHz***

7123

Model 7123

- **500 Watt** (CW) Transmit Power Rating
- **2nd thru 10th Harmonics Suppression**
  Ideal for eliminating potential interference to these bands:
  - *DTV - **VHF-Hi** (7-13)*
  - *DTV - **UHF** (14-51)*
  - *Wireless - **700 MHz***
  - *Wireless - **850 MHz***

19586

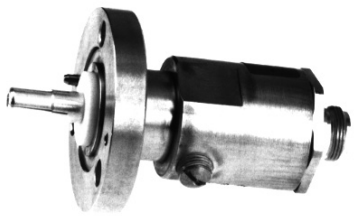
Model 19586

- **2000 Watt** (CW) Transmit Power Rating
- **Multiple Harmonics Suppression**
  Ideal for eliminating potential interference to these bands:
  - *DTV – **VHF-Hi** (7-13)*
  - *DTV – **UHF** (14-51)*
  - *Wireless – **700 MHz***
  - *Wireless – **850 MHz***

See Chart Below for Additional Information on these products

Model Number	Passband (MHz)	Passband Loss	Passband VSWR	Rejection	Dimensions	Connectors
18150	88 - 108	0.20 dB Typ 0.25 dB Max	1.15:1 Max	70 dB Min from 176 - 540 MHz 60 dB Min from 528 - 1080 MHz	9.50″ x 3.00″ x 1.50″	N-female
7123	88 - 108	0.10 dB Typ 0.25 dB Max	1.25:1 Max	50 dB Min from 176 - 216 MHz 60 dB Min from 264 - 432 MHz 80 dB Min from 440 - 1080 MHz	5.85″ x 1.75″ x 2.125″	N-female
19586	88 - 108	0.3 dB Max	1.25:1 Max	40 dB Min from 176 – 648 MHz 50 dB Min from 649 – 894 MHz	15.00″ x 5.00″ x 5.14″	7/16 DIN-female

Transmission Line Accessories



9125

Adapters Between Line Sizes Specifications:

	9125	9126	9127
Connectors	N to 7/8″ EIA	N to 1 5/8″ EIA	N to 3 1/8″ EIA
Loss	0.1 dB Max	0.1 dB Max	0.1 dB Max
Return Loss			
DC-500 MHz	23 dB Min	23 dB Min	23 dB Min
500-1,000	18 dB Min	18 dB Min	18 dB Min
Power Rating*	2,500 W Max	2,500 W Max	2,500 W Max
Impedance	50 ohms	50 ohms	50 ohms
Weight	1.3 lbs (0.6 kg)	2.8 lbs (1.3 kg)	5.7 lbs (2.6 kg)

	9128	9129	9130
Connectors	7/8″ to 1 5/8″	1 5/8″ to 3 1/8″	3 1/8″ to 6 1/8″
Loss	0.1 dB Max	0.1 dB Max	0.1 dB Max
Return Loss			
DC-500 MHz	23 dB Min	23 dB Min	23 dB Min
500-1,000	18 dB Min	18 dB Min	18 dB Min
Power Rating*	5,000 W Max	15,000 W Max	50,000 W Max
Impedance	50 ohms	50 ohms	50 ohms
Weight	1.7 lbs (0.77 kg)	4.0 lbs (1.8 kg)	11.0 lbs (5.0 kg)

*Rating at 100 MHz

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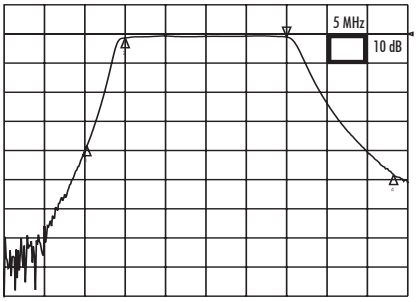
FM (Wideband) Preselectors

3303FM Bandpass Filters

3303FM-16/3303FM-20



Typical Frequency Response of 3303FM-20

3303FM-16 & 3303FM-20

These wideband filters are used to isolate the FM band from reception of VHF, paging and other potentially interfering off-air sources.

Specifications:	***3303FM-16***	***3303FM-20***
Passband	92-108 MHz	88-108 MHz
Insertion Loss	1.5 dB Max	1.5 dB Max
Rejection at 87.75 MHz	25 dB Min	3 dB Max
Rejection at 83.25 MHz	50 dB Min	30 dB Typ
Rejection at 121.25 MHz	50 dB Min	50 dB Typ
Return Loss	14 dB Min	14 dB Min

Mechanical Specifications:

Baseplate Dimensions: 10.25″ x 1.5″
Rack Mount Available Upon Request
Connectors: F-female (Std.); N, SMA or BNC-female (Opt.)
Impedance: 75 Ohm (Std.); 50 Ohm (Opt.)

Ordering Information:

3303FM(X)(Y) - (BW)

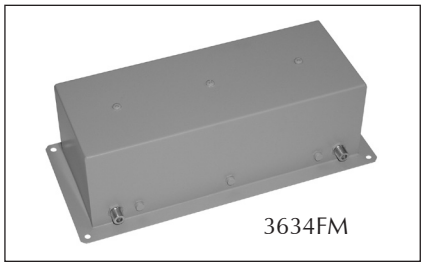
(X) = Female Connector Type
= (No Designation) F
= (B) BNC, (S) SMA or (N) N

(Y) = Impedance
= (No Designation) 75 Ohm
= (50) 50 Ohm

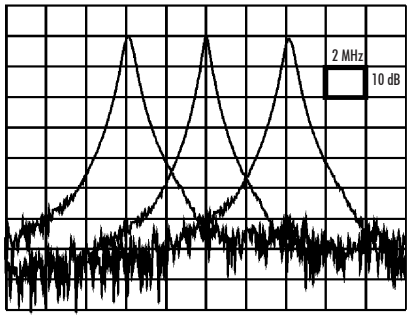
(BW) = Receive Bandwidth
= (16) 16 MHz
= (20) 20 MHz

FM (Single Channel) Preselector

3634FM Tunable Bandpass Filters



3634FM



Typical Frequency Response of 3634FM

3634FM Series

This high "Q" FM preselector isolates the desired channel from unwanted interference. Three self-locking tuning adjustments provide full FM tunability in the field. Factory tuned to your channel at no additional charge.

Specifications:

3 dB bandwidth ..... 350 KHz ±10%
Insertion Loss at Tuned Frequency ..... 5 dB Max
Rejection ..... 20 dB Min ±800 KHz
Return Loss ..... 14 dB Min

Mechanical Specifications:

Baseplate Dimensions: 10" x 4.5"
Rack Mount Available Upon Request
Connectors: F-female (Std.); N, SMA or BNC-female (Opt.)
Impedance: 75 Ohm (Std.); 50 Ohm (Opt.)

Ordering Information:

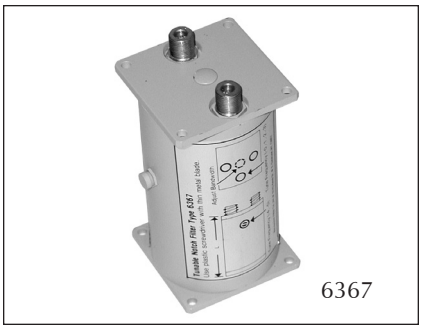
3634(X)(Y) - (Fo)

(X) = Female Connector Type
= (No Designation) F
= (B) BNC, (S) SMA or (N) N

(Y) = Impedance
= (No Designation) 75 Ohm
= (50) 50 Ohm

FM Tunable Notch Filters

6367 Single Cavity Tunable Notch Filters



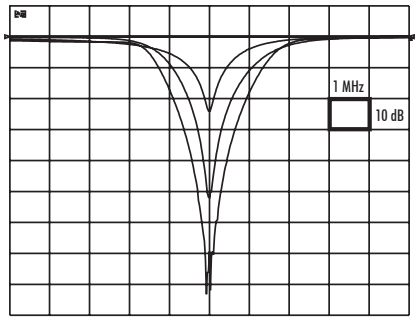
6367

6367 Series

Model 6367 is easily tuned through its full frequency range. A second control allows adjusting the 3 dB bandwidth over a wide range. The adjustable bandwidth feature of these filters allows suppression of an unwanted carrier with minimum impact on adjacent, desired frequencies.

Cascade It For A Deeper Notch

For spot frequency applications, two or three identical units may be cascaded to produce a notch twice or three times as deep with the similar 3 dB bandwidth. Be sure to complete the model number by inserting the desired bandwidth.



Typical Frequency Response of
F6367-3, FD6367-3, FT6367-3

Model #	50 Ohm Notch Depth (dB)**	75 Ohm Notch Depth (dB)**	Height (L-inches)	Tuning Range** (MHz)
6367-2	23	26	4.500	50-108
**With 3 dB bandwidth adjusted to 3 MHz				

Mechanical Specifications:

Baseplate Dimensions: 2" x 2" (single), 5" x 2" (double), 7" x 2" (triple)
Rack Mount Available Upon Request
Connector Options: 50 ohm-Type N, SMA or BNC
75 ohm-Type F

Ordering Information:

(X)(Y)6367-(Fo)/(BW$_3$)

(X) - designates the connector type
Connectors: 50 ohm - BNC (B)
SMA (S)
Type N (N)
75 ohm - Type F (F)
(Y) - designates number of cavities
Cavities: (D) Double
(T) Triple
(Fo) - designates the notch frequency (MHz)
(BW$_3$) - designates the 3 dB bandwidth (MHz)

Note: Orders for double and triple cavity 6367's *must* specify notch frequency and 3 dB bandwidth.

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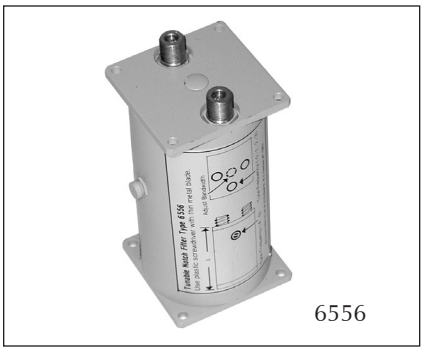
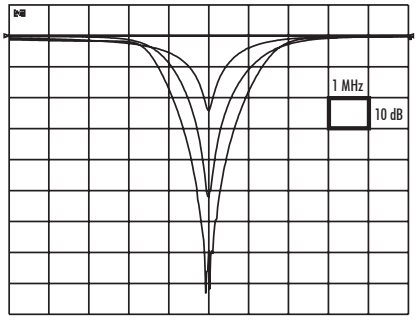
Narrow Notch Filters

6556 Custom Built To Frequency



6556



Typical notch loss for one, two and three cavity assemblies for 3 dB bandwidth = 5 MHz.

6556 Series

These notch filters are cut to your specified frequency (Fo). The 6556 can be used to notch out an undesired carrier or to notch out Terrestrial Interference in the block band of your headend TVRO. They are fine tunable and are available as one, two or three cavity assemblies to give the notch loss required.

Specifications:

Notch Frequency Option (Fo) ..... 900-1450 MHz
3 dB Bandwidth Option ..... 1-5 MHz
(3 MHz Standard)
Notch Loss ..... 16 dB Min for 3 dB BW of 3 MHz

Mechanical Specifications:

Baseplate Dimensions: 2" x 2" (single), 5" x 2" (double), 7" x 2" (triple)
Rack Mount Available Upon Request
Connector Options: 50 ohm-Type N, SMA or BNC
75 ohm-Type F

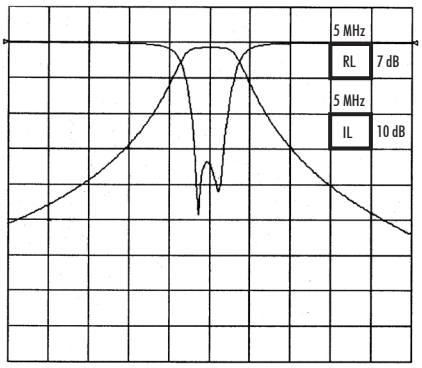
Ordering Information:

(X)(Y)6556-(Fo)/(BW3)

(X) - designates the connector type
Rack Mount Available Upon Request
Connectors: 50 ohm - BNC (B)
SMA (S)
Type N (N)
75 ohm - Type F (F)
(Y) - designates number of cavities
Cavities: (D) Double
(T) Triple
(Fo) - designates the notch frequency (MHz)
(BW_3) - designates the 3 dB bandwidth (MHz)

Studio To Transmitter Link (STL) Bandpass Filter

8855



Typical Frequency Response of 8855

The series 8855 bandpass filter is used to eliminate interference in STL receivers caused by other nearby transmitters, such as cellular.

Center Frequency Option (Fo) ..... 900-960 MHz
Passband Bandwidth ..... 5 MHz
Passband Return Loss ..... 14 dB Min
Passband Insertion Loss ..... 2 dB Max
Power Rating ..... 1 Watt Max
20 dB Rejection ..... Fo±10 MHz
30 dB Rejection ..... Fo±20 MHz

Mechanical Specifications:

Baseplate Dimensions: 5.2" x 2.4"
Rack Mount Available Upon Request
Connector Option: 50 ohm-Type N, SMA or BNC-female

Ordering Information:

8855(X)(Y)-(Fo)
(X) - designates connector type BNC(B), SMA(S), N or F
(Y) - designates impedance (ohms) (50) or (75)
(Fo) - center frequency (MHz)

High "Q" Cavity Bandpass & Notch Filters

Models 9494, 9507 & 9512 (Bandpass)
Models 9604, 9607 & 9612 (Notch)

These high "Q" cavity filters utilize adjustable loop coupling and tunable resonators that provide tunability from Fo +/- 5%.

These quarter wave cavity filters are ideal for cleaning up spurious transmit signals and can also be used as receive preselectors.

Invar tuning rods ensure temperature stable performance.

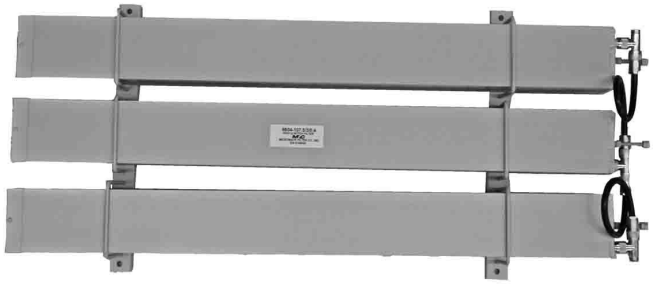
Standard models are available in single, double and triple cavity arrays covering a broad frequency range of 88 – 950 MHz.

Custom configurations are available upon request.

High Q Cavity Bandpass Filter

9494

High Q Cavity Notch Filter



9604

Specifications:

Bandwidth ……..	Up to 3% (BW/Fo)
Return Loss ……	14 dB Min
Power Rating ……..	Up to 400 Watts* (9494 & 9604 series)
	Up to 900 Watts* (9507 & 9607 series)
	Up to 1200 Watts* (9512 & 9612 series)
Temperature Stability ……..	0.0005 MHz / °C
Approximate Size ……	Diameter x ¼ Wavelength
Impedance ……..	50 ohms
Connectors ……..	N-female (Standard)

Alternate connectors are available upon request.

* Dependent upon passband insertion loss.

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High "Q" Cavity Combiners

Models 19494, 19507 and 19512 Series

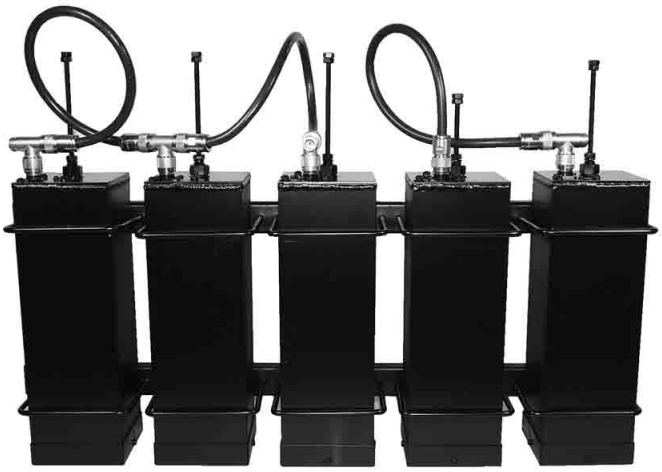
Available for transmit or receive applications combining two or more frequencies between 88-950 MHz

These combiners utilize high "Q" cavity filter components that are electrically phased together via "tee-ing" networks.

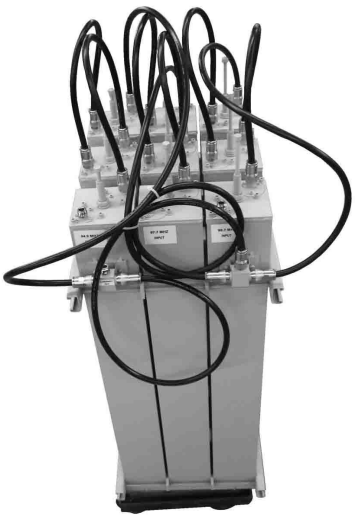
Choose from our 4", 7" and 12" cavity arrays – based on your power and/or insertion loss requirements

Each filter section uses invar tuning rods to ensure temperature stable performance.

High Q Cavity Diplexer



High Q Cavity Triplexer



Specifications:

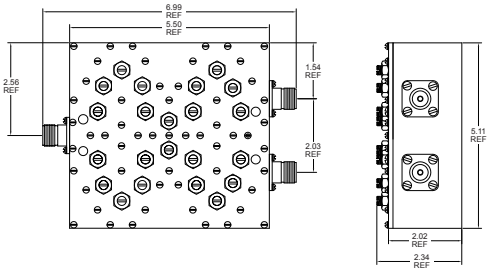
Bandwidth ……..	Up to 3% (BW/Fo) per frequency
Return Loss …….	14 dB Min
Power Rating ……..	Up to 400 Watts* per frequency (19494 series)
	Up to 900 Watts* per frequency (19507 series)
	Up to 1200 Watts* per frequency (19512 series)
Temperature Stability ……..	0.0005 MHz / °C
Impedance ……..	50 ohms
Available Connectors ……..	N, 7/16 DIN, 7/8 EIA and 1-5/8 EIA

* Dependent upon passband insertion loss.

GSM-900 Filters

EGSM-900 Duplexer

14540



Model 14540

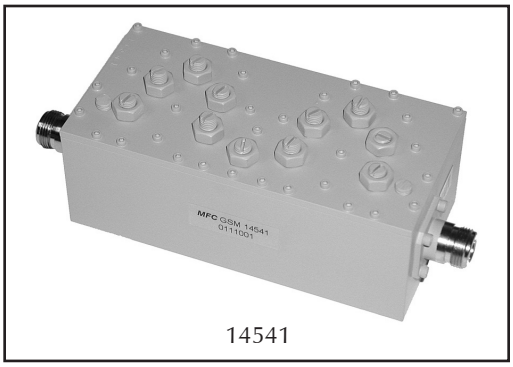
Combining (2) highly selective bandpass filters in (1) configuration, this duplexer allows the cellular operator to receive and transmit without interference to or from all other communications from DC to 2000 MHz.

- GSM-900 and EGSM-900 compatible.

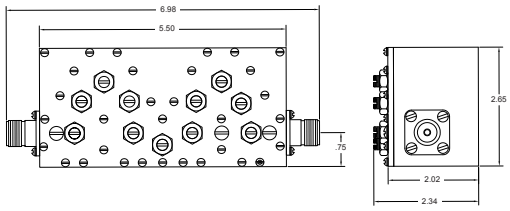
Specifications:

Passband	
Receive	880-915 MHz
Transmit	925-960 MHz
Passband Insertion Loss	1.2 dB Max
Passband Return Loss	18 dB Min
Common Out to Receive Rejection	
DC-845 MHz	40 dB Min
925-2000 MHz	40 dB Min
Common Out to Transmit Rejection	
DC-915 MHz	40 dB Min
995-2000 MHz	40 dB Min
Transmit to Receive Isolation	40 dB Min
Maximum Transmit Power Handling	
CW	20 Watts
Peak Instantaneous	200 Watts
Operating Temperature	0˚C to +50˚C
Storage Temperature	-40˚C to +85˚C
Operating Humidity	Up to 90%, Non-Condensing
Connectors	N Female (Optional 7/16 DIN)
Impedance	50 ohms

EGSM-900 Transmit Filter



14541



Model 14541

This transmit (downlink) filter provides superior rejection of “out-of-band” frequencies from DC to 2000 MHz. Ideal for base station operators looking to clean up their transmit signal.

- GSM-900 and EGSM-900 compatible.

Specifications:

Passband:	
Transmit Band	925-960 MHz
Passband Insertion Loss	1.2 dB Max
Passband Return Loss	18 dB Min
Rejection	
DC-915 MHz	40 dB Min
995-2000 MHz	40 dB Min
Maximum Transmit Power Handling	
CW	20 Watts
Peak Instantaneous	200 Watts
Operating Temperature	0˚C to +50˚C
Storage Temperature	-40˚C to +85˚C
Operating Humidity	Up to 90%, Non-Condensing
Connectors	N Female (Optional 7/16 DIN)
Impedance	50 ohms

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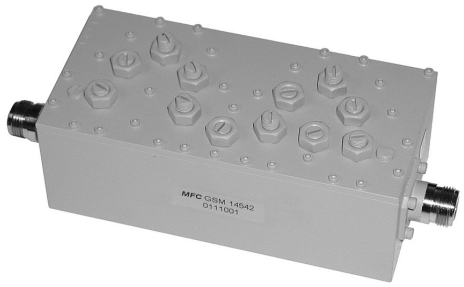
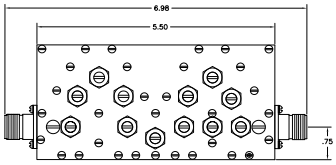
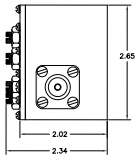
GSM-900 Filters (continued)

EGSM-900 Receive Filter



14542





Model 14542

This bandpass filter isolates the receive band from potential interference from the transmit band and virtually all other transmissions from DC to 2000 MHz.

- GSM-900 and EGSM-900 compatible.

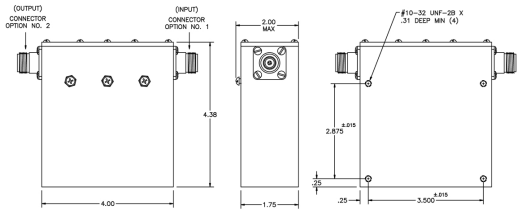
Specifications:

Passband	
Receive Band	880-915 MHz
Passband Insertion Loss	1.2 dB Max
Passband Return Loss	18 dB Min
Rejection	
DC-845 MHz	40 dB Min
925-2000 MHz	40 dB Min
Operating Temperature	0˚C to +50˚C
Storage Temperature	-40˚C to +85˚C
Operating Humidity	Up to 90%, Non-Condensing
Connectors	N Female (Optional 7/16 DIN)
Impedance	50 ohms

ISM (900 MHz) Interference Filters

MFC provides various filters for use in wireless broadband systems operating within the ISM band of (902-928) MHz. These filters remove interference originating from services operating in nearby frequency bands (e.g. paging systems & cellular phone providers).

15345W



Model 15345W ISM Notch Filter

This weatherized notch filter is designed specifically to eliminate interference caused by high-powered paging systems operating at 930 MHz.

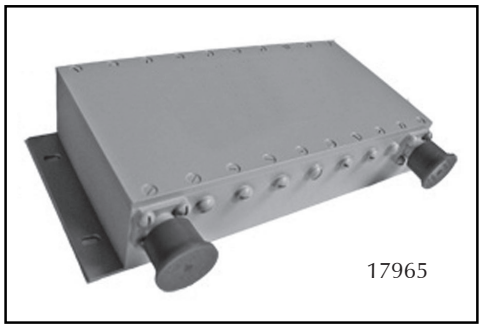
It is compact and sturdy and operates over a wide temperature range, making it ideal for installation in virtually any indoor or outdoor enclosed environment.

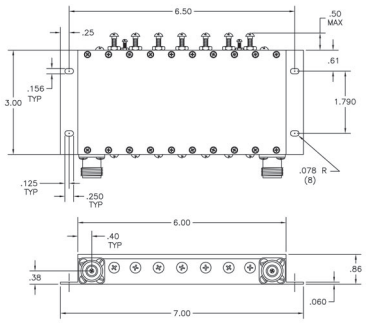
Specifications:

Notch Frequency	930 MHz
Notch Depth	35 dB Min
Passband	902.5-927.5 MHz (1 Watt Max)
Passband Loss	1.0 dB Typ, 3 dB Typ at 927.5 MHz
Impedance	50 ohms
Connectors	See chart
Temperature Range	-20°C to +50° C

MODEL NO.	CONNECTOR OPTION NO.1	CONNECTOR OPTION NO.2
15345W	N-FEMALE	N-FEMALE
15345W(F/M)	N-FEMALE	N-MALE
15345W(M/F)	N-MALE	N-FEMALE
15345W(M/M)	N-MALE	N-MALE

ISM (900 MHz) Interference Filters (continued)





For unenclosed, outdoor applications, order the weatherized version, Model 17965W.

Model 17965 ISM Bandpass Filter

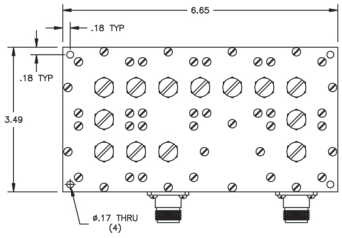
This bandpass filter allows smooth operation within the (902-928) MHz ISM band by providing superior attenuation of other services operating above or below the ISM band (e.g. cellular phone providers).

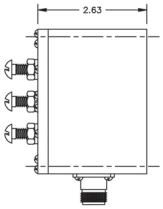
Specifications:

Center Frequency (F_O) ... 915 MHz
Relative BW3 ..... 26 MHz Min
Insertion Loss at (F_O) ..... 1.5 dB Typ
VSWR (F_O) ..... 1.5:1 Max
Rejection ..... 30 dB Min @ 896 MHz
..... 30 dB Min @ 934 MHz
..... >70 dB Typ @ 5-875 MHz and 955-2000 MHz
Impedance ..... 50 ohms
Power ..... 90 Watts CW
Connectors ..... N Female
Operating Temp ..... -10°C to +65° C

	Connector Configuration	
Model #	**Input**	**Output**
17965	N Female	N Female
17965-1	SMA Female	SMA Female

ISM (900 MHz) Partial Band Bandpass Filters



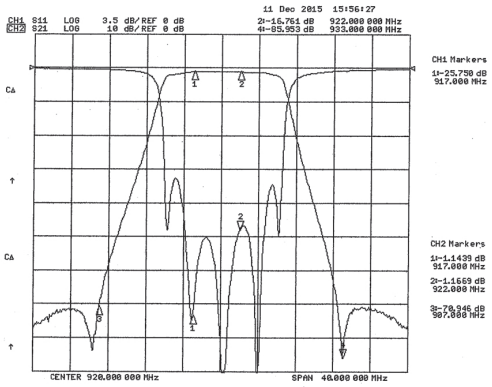


Model 19384

This bandpass filter isolates a portion of the ISM (900 MHz) band from potential interference from out of band transmissions.

Specifications:

Passband ..... 917 - 927 MHz
Passband Insertion Loss ..... 2 dB Approx
Passband VSWR ..... 1.5:1 Max
Rejection ..... 70 dB Min @ 907 MHz and 933 MHz
Impedance ..... 50 Ohms
Connectors ..... N-female



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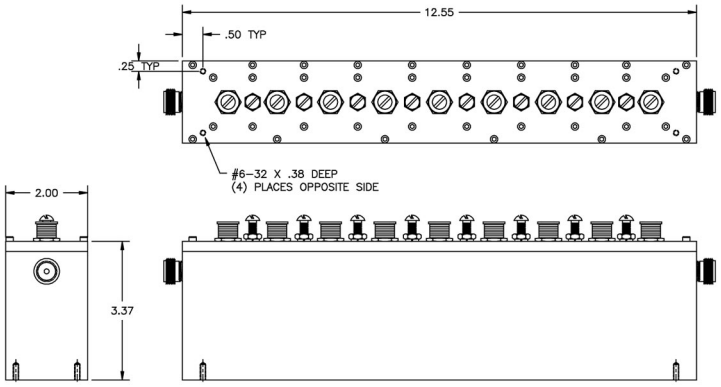
ISM Band (900 MHz) Bandpass Filters

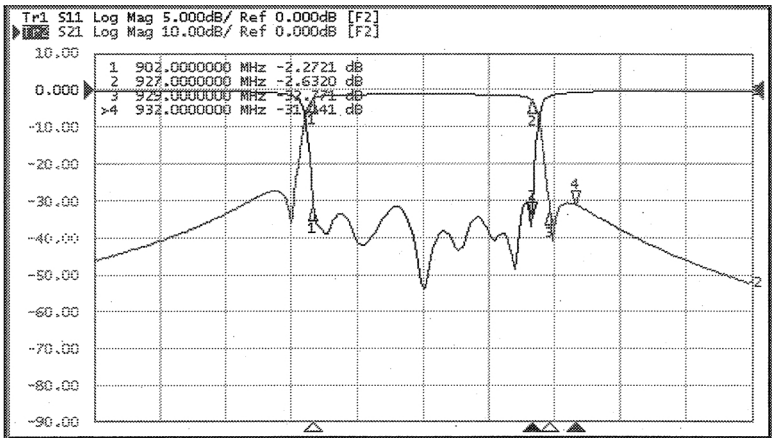
Model 19513

This highly selective bandpass filter prevents undesired inter-action between the 900 MHz band and adjacent bands operating above and below the 900 MHz band.

Specifications:

Passband:	902 - 927 MHz
Passband Loss:	3.0 dB Max
Passband VSWR:	1.5:1 Max
Passband Power (CW):	10 Watts Max
Rejection:	25 dB Typ @ 894 MHz
	30 dB Min from 929 - 932 MHz
Impedance:	50 Ohms
Connectors:	N-female
Dimensions:	12.55" x 2.00" x 3.37"
	(319 mm x 51 mm x 86 mm)





ISM (2.4 GHz) BAS (2 GHz) Diplexer

Model 19483

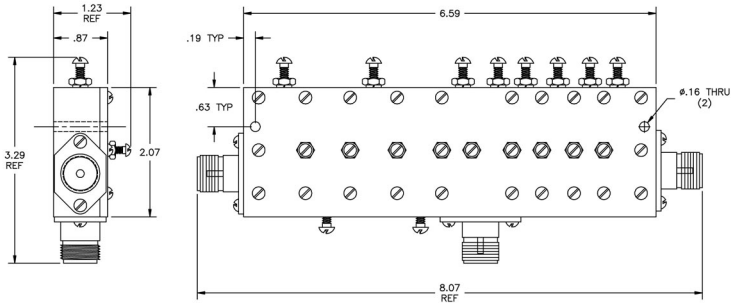
This diplexer enables broadcasters to run their (ISM) wireless operations through the same antenna as their (BAS) broadcast auxiliary services.

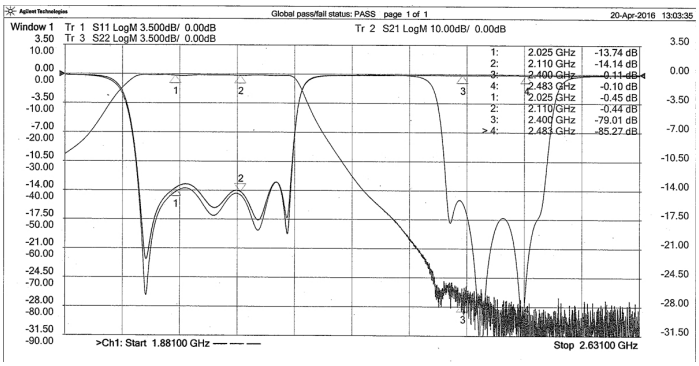
The model 19483 utilizes highly-selective bandpass filter components – resulting in excellent isolation between the two bands.

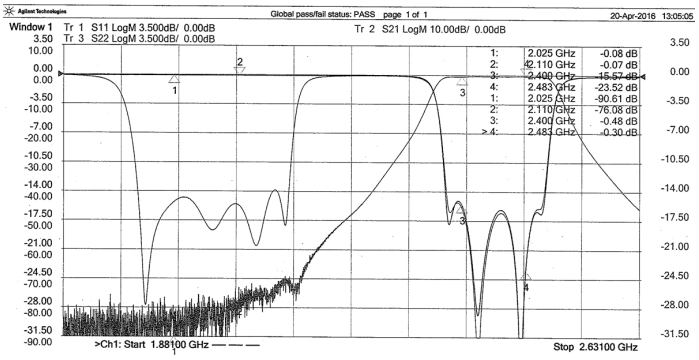
- *Reduces Costs* - Dual operations through a single antenna system

Specifications:

Passband # 1 (BAS): .....2025 - 2110 MHz
Passband #2 (ISM): .....2400 - 2483.5 MHz
Passband Loss:.....0.6 dB Max
Passband VSWR.: .....1.5:1 Typ
Passband Power (CW): .....2 Watts Max / Band
Mutual Isolation: .....70 dB Min
Connectors:.....N-female
Dimensions: .....8.07" x 3.29" x 1.23"
(205 mm x 84 mm x 31 mm)
Impedance:.....50 Ohms







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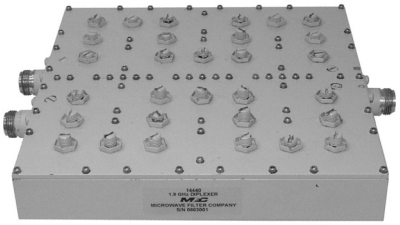
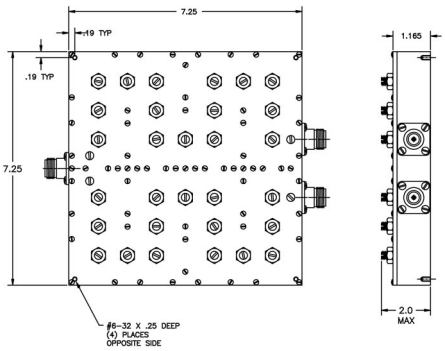
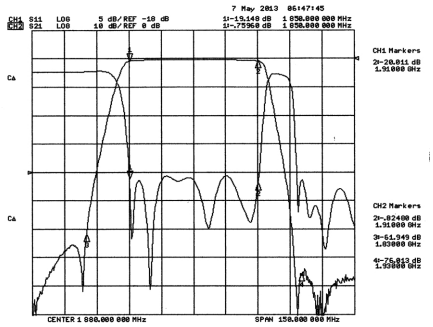
PCS-1900 Duplexer

PCS Duplexer



14440





Model 14440

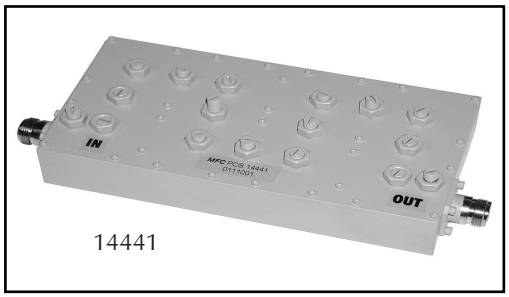
This duplexer not only provides superior isolation between the (PCS) Transmit and Receive Bands, but also suppresses potential interference from other transmission sources outside of the PCS band.

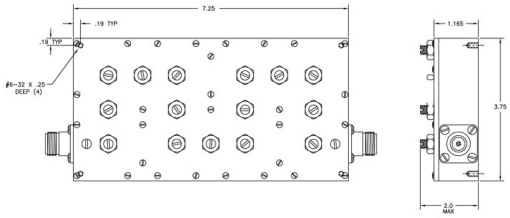
Specifications:

Passband	
Receive	1850-1910 MHz
Transmit	1930-1990 MHz
Passband Insertion Loss	1.0 dB Max
Passband Return Loss	18 dB Min
Common Out to Receive Rejection	
DC-1830 MHz	60 dB Min
1930-1990 MHz	75 dB Min
1990-3930 MHz	55 dB Min
Common Out to Transmit Rejection	
DC-1910 MHz	75 dB Min
2010-3980 MHz	55 dB Min
Transmit to Receive Isolation	75 dB Min
Maximum Transmit Power Handling	
CW	50 Watts
Peak Instantaneous	800 Watts
Operating Temperature	-25˚C to +70˚C
Storage Temperature	-40˚C to +85˚C
Operating Humidity	Up to 90%, Non-Condensing
Connectors	N Female (Optional 7/16 DIN)
Impedance	50 ohms

PCS-1900 Bandpass Filters

PCS Transmit Filter





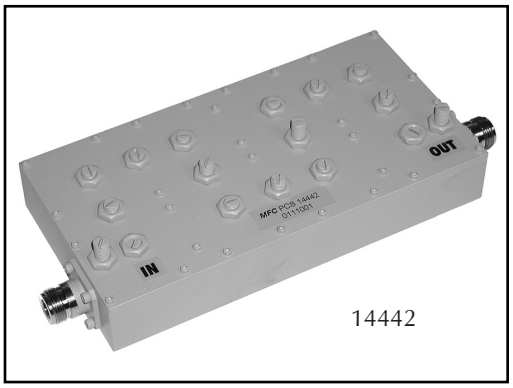
Model 14441

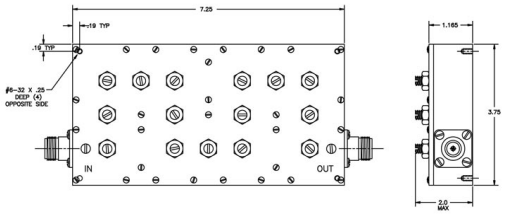
Clean up your transmit signal with this sharp-skirted bandpass filter. The model 14441 strongly suppresses out-of-band emissions that could disrupt PCS reception and other broadcasting services (e.g. Wi-Fi, BRS-EBS, etc.)

Specifications:

Passband Transmit	1930-1990 MHz
Passband Insertion Loss	1.0 dB Max
Passband Return Loss	18 dB Min
Rejection	
DC-1910 MHz	70 dB Min
2010-3980 MHz	55 dB Min
Maximum Transmit Power Handling	
CW	50 Watts
Operating Temperature	-25˚C to +70˚C
Storage Temperature	-40˚C to +85˚C
Operating Humidity	Up to 90%, Non-Condensing
Impedance	50 ohms
Connectors	N Female (Optional 7/16 DIN)

PCS Receive Filter





Model 14442

Ideal for use in broadcast-dense locations, this bandpass filter provides superior isolation from virtually all undesired transmissions ... from AM to WiMax!

Specifications:

Passband Receive	1850-1910 MHz
Passband Insertion Loss	1.0 dB Max
Passband Return Loss	18 dB Min
Rejection	
DC-1830 MHz	60 dB Min
1930-1990 MHz	70 dB Min
1990-3930 MHz	55 dB Min
Operating Temperature	-25˚C to +70˚C
Storage Temperature	-40˚C to +85˚C
Operating Humidity	Up to 90%, Non-Condensing
Impedance	50 ohms
Connectors	See chart below

	Connector Configuration	
Model #	**Input**	**Output**
14442	N Female	N Female
14442-1	N Male	N Female

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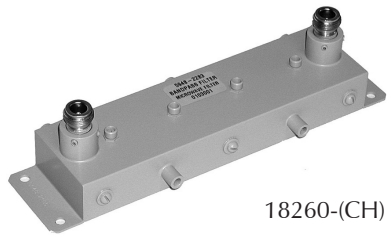
BAS (2 GHz) Bandpass Filters



18260-(CH)

Single Channel BAS Bandpass Filter

This single channel bandpass filter is used for Broadcast Auxiliary Services operating in the relocated 2 GHz band.

The 18260-(CH) offers low loss on the desired channel and it's sharp selectivity not only eliminates potential interference from out-of-band sources such as PCS & WiFi, but also provides superior isolation from virtually all other BAS channels, which is key in any area where other broadcasters operate.

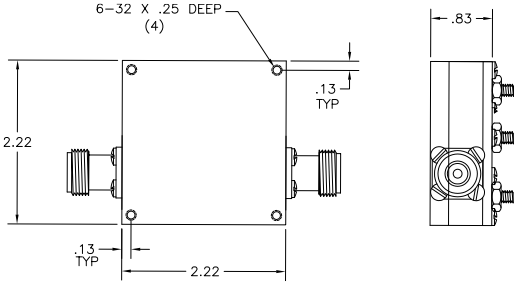
18260 Specifications:

	18260 - (CH)
Channel Availability	BAS CHS. 1-7 (2025-2110 MHz)
Channel Bandwidth	(Fo) ± 6 MHz Min
Channel Insertion Loss	2 dB Typ; 3 dB Max
Rejection	25 dB Typ; 20 dB Min ± 12 MHz from Center CH. 45 dB Typ; 40 dB Min ± 18 MHz from Center CH.
Impedance	50 ohms
Connectors	N Female SMA Female - Order as 18260S-(CH)

ISM (2.4 GHz) Single Channel Bandpass Filters

MFC offers a variety of single channel bandpass filters for use in Wi-Fi networks operating within the (2.4-2.5) GHz ISM band.

16692

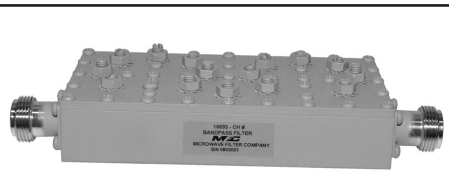


Model 16692 Single Channel Bandpass Filter

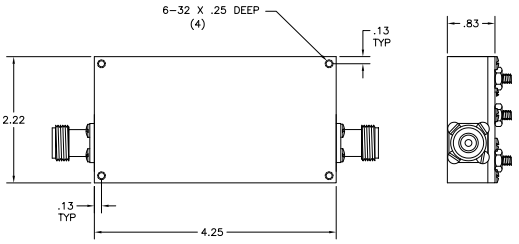
This compact bandpass filter isolates the desired channel from co-located, non-overlapping channels and other transmission sources.

Specifications:

Channel Option	1, 3, 6, 9, 11
Channel Bandwidth	22 MHz
Channel Insertion Loss	2 dB Typ
Channel Return Loss	15 MHz Min
Bandwidth (3dB)	30 MHz
Rejection (20 dB Typ)	±25 MHz from channel center
Impedance	50 ohms
Power Rating	50 Watts (CW)
Connectors	N Female
Operating Temperature Range	-40˚C to +85˚C
Dimensions	2.2″x2.2″x0.8″



16693



Model 16693 Single Channel (Ultra-Selective) Bandpass Filter

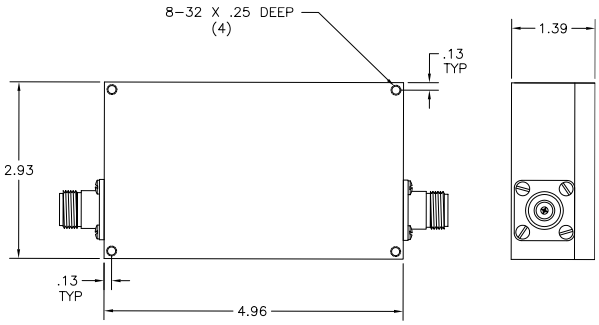
This bandpass filter utilizes additional poles to isolate the desired channel from co-located, overlapping channels in addition to other transmission sources.

Specifications:

Channel Option	1, 3, 6, 9, 11
Channel Bandwidth	22 MHz
Channel Insertion Loss	3 dB Typ
Channel Return Loss	15 dB Min
Rejection (20 dB Typ)	±15 MHz from channel center
Impedance	50 ohms
Power Rating	50 Watts (CW)
Connectors	N Female
Operating Temperature Range	-40˚C to +85˚C
Dimensions	4.3″x2.2″x0.8″

16694

... and for those unenclosed, outdoor applications we also offer a weatherized version, **Model 16694**, with the same electrical performance as the model 16693 filter.



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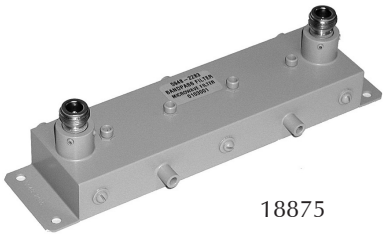


18875

Half Channel BAS (2 GHz) Bandpass Filter

Model 18875 – Ultra-Selective

This bandpass filter is used for **half** channel (6 MHz BW) applications in the BAS (2 GHz) band.
The model 18875 provides strong isolation from virtually all potential sources of out-of-band interference.

- *Ultra-Selective – Ideal for rejecting adjacent BAS channels*
- *Ideal for use in "spectrum-crowded" cities/regions*
- *Available for BAS channels (**1-7**) - including (+) & (-) offset channels*

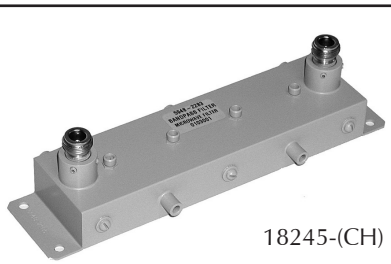
18875 Specifications:

	18875 - (CH)
Passband	(Fo) ± 3 MHz Min
Insertion Loss	4.5 dB Typ
VSWR	1.5:1 Typ
Rejection	30 dB Typ ± 6 MHz from Center Channel 50 dB Typ ± 10 MHz from Center Channel
Impedance	50 ohms
Connectors	N Female (Standard) / SMA Female (Optional)
Environment	Indoor Use

Ordering Information:
18875(X)-(CH)

(X) = designates connector type
= **(No Designation)** N-female
= **(S)** SMA-female

CH: Channel Number [Standard or Offset (e.g.… **1, 3-, 6+, etc.**)]



18245-(CH)

Half Channel BAS Bandpass Filter

Model 18245 – Low Insertion Loss

This bandpass filter is used for **half** channel (6 MHz BW) applications in the BAS (2 GHz) band.
The model 18245 provides strong isolation from most potential sources of out-of-band interference.

- *Low Insertion Loss – Ideal for low signal strength applications*
- *Ideal for use in "spectrum-crowded" cities/regions*
- *Available for BAS channels (**1-7**) - including (+) & (-) offset channels*

18245 Specifications:

	18245 - (CH)
Operating Bandwidth	6 MHz Min
Insertion Loss	3 dB Typ
VSWR	1.5:1 Typ
Rejection	30 dB Typ ± 8 MHz from Center Channel 50 dB Typ ± 12 MHz from Center Channel
Impedance	50 ohms
Connectors	N Female (Standard) / SMA Female (Optional)
Environment	Indoor Use

Ordering Information:
18245(X)-(CH)

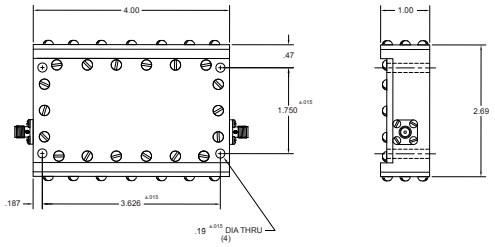
(X) = designates connector type
= **(No Designation)** N-female
= **(S)** SMA-female

CH: Channel Number [Standard or Offset (e.g.… **1, 3-, 6+, etc.**)]

ISM (2.4 GHz) Full Band Bandpass Filters

MFC offers a selection of full band bandpass filters for wireless broadband applications in the ISM (2.4-2.5GHz) band.

16420



Model 16420 Full Band (Ultra-Low Loss) Bandpass Filter

This filter isolates the full ISM Band by providing deep suppression of other transmission sources (GPS, BAS, BRS, EBS) and it's extremely low-loss assures smooth operation with minimal signal degradation.

Specifications:

Center Frequency (Fo)	2448 MHz
Insertion Loss @ Fo	0.5 dB Typ
Ripple	0.25 dB Max
Relative 0.5 dB Bandwidth	100 MHz Min
Power	50 Watts Max
Rejection	80 dB Min @ 2000 MHz 60 dB Min @ 2700 MHz
Impedance	50 ohms
Connectors	N or SMA Female (See chart below)
Operating Temperature Range	-40˚C to +85˚C
Weatherized	

	Connector Configuration	
Model #	**Input**	**Output**
16420	SMA Female	SMA Female
16420-1	N Female	N Female

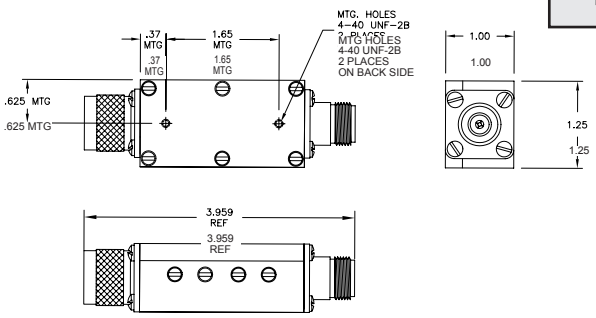
13944

Model 13944 Full Band (Economical) Bandpass Filter

This model bandpass filter provides full band isolation from other transmission sources in an economical and compact design.

Specifications:

Center Frequency (Fo)	2442 MHz
Insertion Loss @ Fo	1.5 dB Max
Relative 3 dB Bandwidth	100 MHz Min
Rejection	40 dB Typ @ 2242 MHz 40 dB Typ @ 2642 MHz
Impedance	50 ohms
Connectors	N (Female and Male)
Operating Temperature Range	-30˚C to +50˚C



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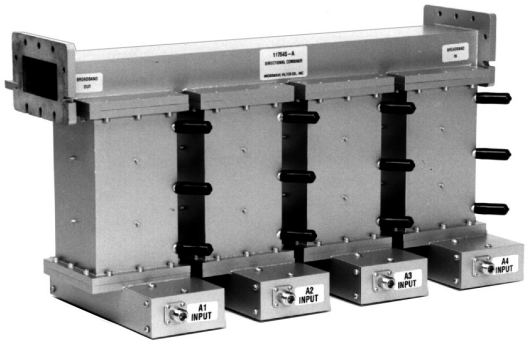
BRS-EBS (MMDS) Channel Combiners

The 11750 series of channel combiners can be used for digital or analog transmit applications and offers the following features :

- 64/256 QAM or NTSC/PAL Compatibility
- Copper Construction provides :
  - Extremely Low Loss
  - Optimum Delay performance
  - Excellent Temperature Stability
- Non-Adjacent or Adjacent* Channel Combining
- Available in Single or Multiple Channel Configurations
- Manual or Automatic Shutters Option
  { for agile transmit capability at the broadband input }
- Custom configurations available upon request

** Requires additional components.*

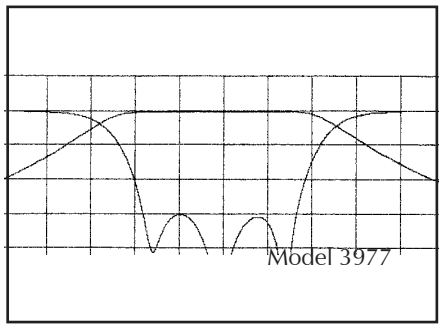


Model 11754 Semi-adjacent (4)-Channel Combiner

General Specifications For a 4 Channel Combiner:

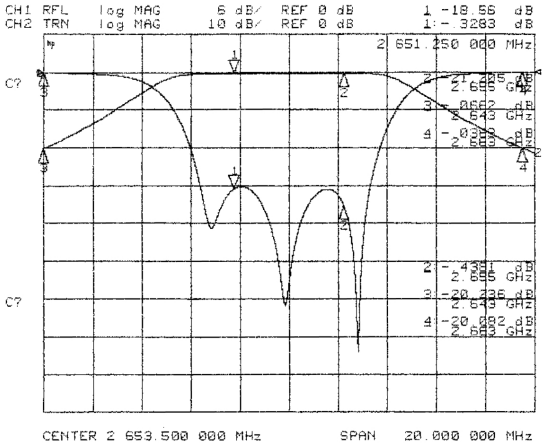
Frequency Range	2300 – 2900 MHz	2300 – 2900 MHz
Channel Bandwidth	6 MHz	8 MHz
Insertion Loss	< 0.9 dB	< 1 dB
Return Loss	21dB Min	21dB Min
Delay Variation	< 20 ns (± 10 nS)	< 40 ns (± 20 nS)
Mutual Isolation	> 30 dB ; 35 dB Typ	> 30 dB
Directivity	20 dB Typ	20 dB Typ
Power Rating (per channel)	250 Watts Max	250 Watts Max
Interface (TX Input)	N Female	N Female
Interface (Mainline)	CPR 340	CPR 340
Temperature Stability	43 kHz / °C	43 kHz / °C

Interference Filters For MMDS



Specifications:

Frequency Range	2496 to 2690 MHz
Insertion Loss	0.5 dB Max
Channel Bandwidth	6 MHz
Selectivity	20 dB Min. ± 9 MHz from center
Return Loss	18 dB Min
Power Rating	500 watts Max
Connectors	50 ohm N Female



Model 3977

Single channel BRS-EBS channel filters remove spurious signals from the output of single channel transmitters.

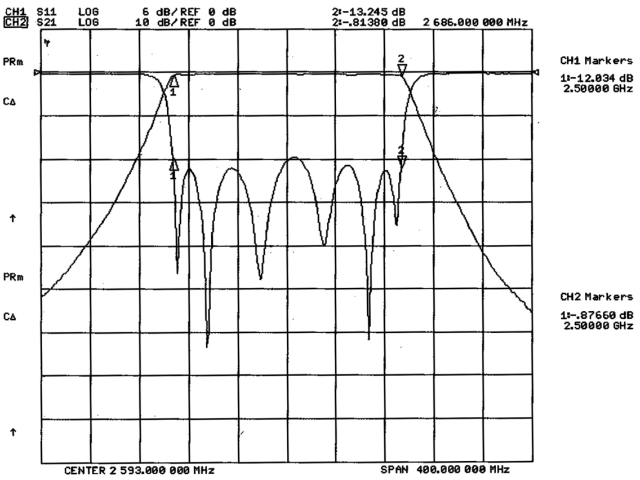
* Custom configurations available upon request.

Radar Interference Filters

Model 10457

Specifications:

Passband	2500-2686 MHz
Insertion Loss	1.2 dB Max
Reject band:	60 dB, 1.8-2.05 GHz
22 dB @ 2.4 GHz,12 dB @ 2.72 GHz, 45 dB @ 2.8 GHz	
Connectors	N Female
Impedance	50 ohms



Model 10457, Preselector

This bandpass filter provides attenuation on both sides of the band and is also useful for cleaning up low power relay signals.

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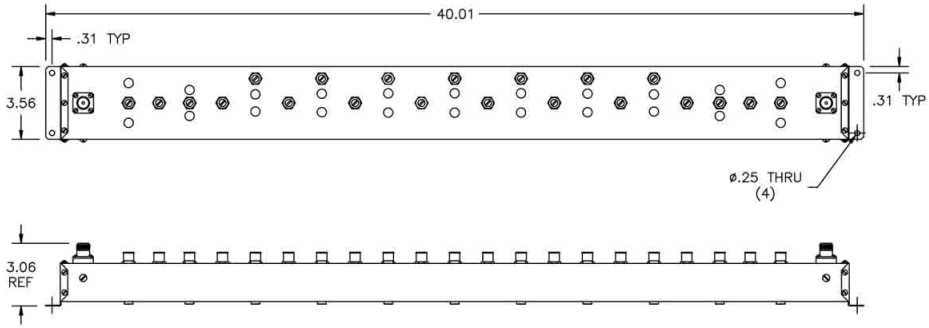
BRS-EBS (2.5 GHz) Band Transmit Bandpass Filter

Model 19036

This filter isolates the middle of the BRS-EBS band from potential interference from other operations above and below the band.

Specifications:

Passband:	2572 – 2614 MHz
Passband Insertion Loss:	0.5 dB Approx @ Center Band 1.0 dB Approx @ Band Edges
Passband VSWR:	1.3:1 Typ
Passband Power (CW):	50 Watts Max
Rejection:	50 dB Min @ 2562 MHz 50 dB Min @ 2624 MHz
Impedance:	50 Ohms
Connectors:	N-female
Dimensions:	40.01" x 3.56" x 3.06" (1016mm x 90mm x 78mm)



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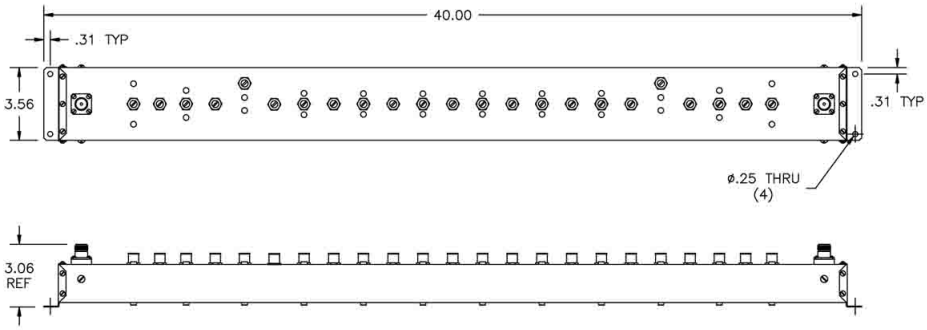
BRS-EBS (2.5 GHz) Band Transmit Bandpass Filter

Model 19066

This filter isolates the majority of the BRS-EBS band from potential interference from other operations above and below the band.

Specifications:

Passband:	2557 – 2690 MHz
Passband Insertion Loss:	0.5 dB Approx
Passband VSWR:	1.3:1 Typ
Passband Power (CW):	50 Watts Max
Rejection:	15 dB Min @ 2547 MHz 15 dB Min @ 2700 MHz
Impedance:	50 Ohms
Connectors:	N-female
Dimensions:	40.00" x 3.56" x 3.06" (1016mm x 90mm x 78mm)



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BRS-EBS (2.5 GHz) Band Bandpass Filter

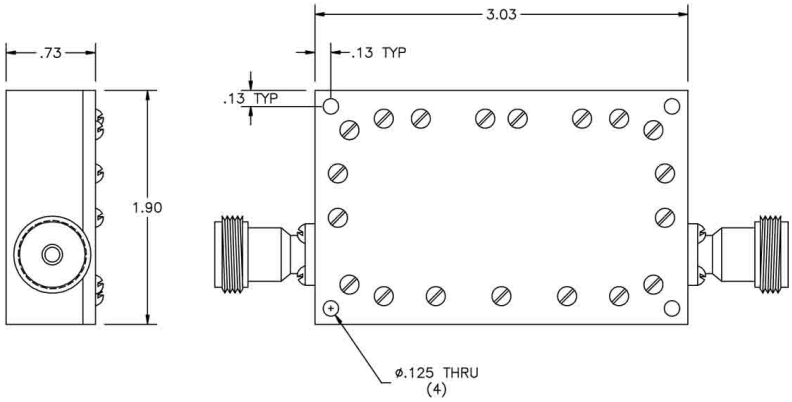
Model 19125

This filter isolates the upper portion of the BRS-EBS band from potential interference from other operations above and below the band.

Specifications:

Passband:	2624 – 2690 MHz
Passband Insertion Loss:	1 dB Max
Passband VSWR:	1.5:1 Max
Rejection:	20 dB Min @ 2568 MHz 20 dB Min @ 2746 MHz
Impedance:	50 Ohms
Connectors:	N-female
Dimensions:	3.03" x 0.73" x 1.90" (77 mm x 19 mm x 48 mm)

Weatherized for Outdoor/Indoor Use



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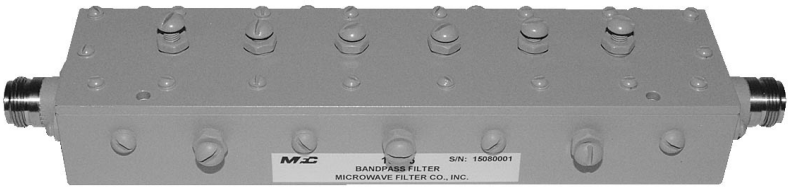
BRS-EBS (2.5 GHz) Band Bandpass Filter

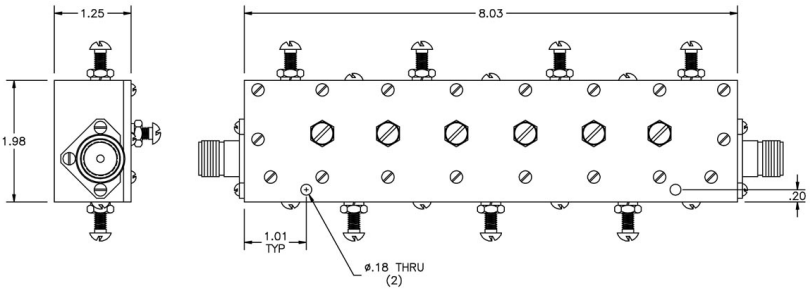
Model 19336

This filter isolates the upper portion of the BRS-EBS band from potential interference from other operations above and below the band.

Specifications:

Passband:	2620 – 2690 MHz
Passband Insertion Loss:	1 dB Max
Passband VSWR:	1.5:1 Max
Rejection:	60 dB Approx @ 2570 MHz 60 dB Approx @ 2740 MHz
Connectors:	N-female
Dimensions:	8.03” x 1.98” x 1.25” (204 mm x 50 mm x 32 mm)





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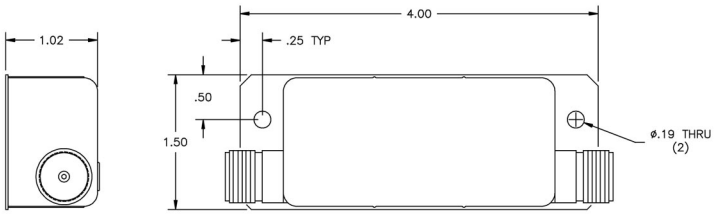
Mobile Radio (Tetrapol - Euro) Bandpass Filter

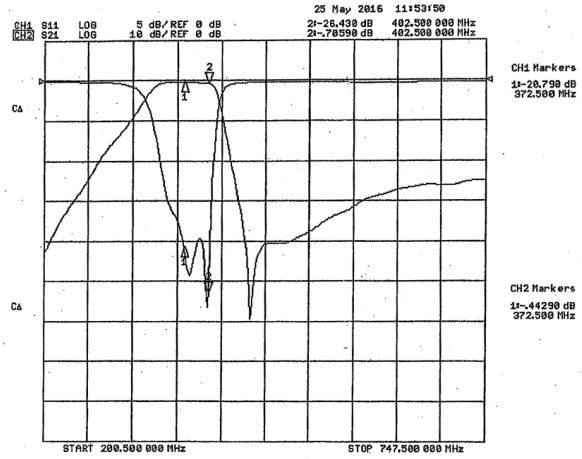
Model 19340

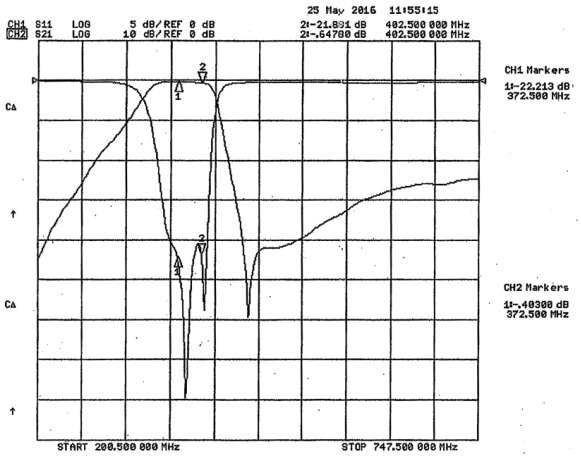
This bandpass filter prevents undesired interaction between this mobile radio band and other bands operating above and below this band.

Specifications:

Passband:	372.5 - 402.5 MHz
Passband Loss:	1 dB Max
Passband VSWR:	1.23:1 Typ
Passband Power (CW):	10 Watts Max
Rejection:	40 dB Typ @ 200.5 MHz 20 dB Min @ 255 MHz 20 dB Min from 474 - 747.5 MHz
Impedance:	50 Ohms
Connectors:	N-female
Dimensions:	4.00" x 1.50" x 1.02" (102 mm x 38 mm x 26 mm)







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BRS-EBS (MMDS) Waveguide Adapters

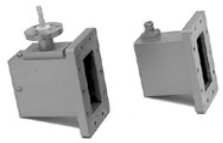
Microwave Filter offers a complete line of copper waveguide to coax adapters. They can be ordered in virtually any connector orientation with your choice of connector types. These adapters allow for easy mounting and cable access. Where space availability is limited, choose the adapter orientation that matches this limitation.

All 11756, 11757 and 11758 Models adapt the specified waveguide to coaxial connections with 1.15:1 VSWR and 0.2 dB maximum loss.

Model 11756

Model 11756 End Launch Waveguide Adapter

Model #	Connector	Freq. Range	Flange
11756-1	N Female	2.0-2.3 GHz	CPR 430
11756-2	7/8″ EIA	2.0-2.3 GHz	CPR 430
11756-3	N Female	2.15-2.7 GHz	CPR 340
11756-4	7/8″ EIA	2.15-2.7 GHz	CPR 340



Model 11757

Model 11757 Narrow Wall Waveguide Adapter

Model #	Connector	Freq. Range	Flange
11757-1	N Female	2.0-2.3 GHz	CPR 430
11757-2	7/8″ EIA	2.0-2.3 GHz	CPR 430
11757-3	N Female	2.5-2.7 GHz	CPR 340
11757-4	7/8″ EIA	2.5-2.7 GHz	CPR 340
11757-5	N Female	2.3-2.5 GHz	CPR 340
11757-6	7/8″ EIA	2.3-2.5 GHz	CPR 340

Model 11758

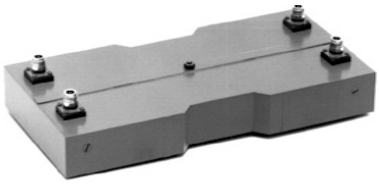
Model 11758 Broadwall Waveguide Adapter

Model #	Connector	Freq. Range	Flange
11758-1	N Female	2.0-2.3 GHz	CPR 430
11758-2	7/8″ EIA	2.0-2.3 GHz	CPR 430
11758-3	N Female	2.5-2.7 GHz	CPR 340
11758-4	7/8″ EIA	2.4-2.7 GHz	CPR 340
11758-5	N Female	2.15-2.17 GHz	CPR 340
11758-6	7/8″ EIA	2.15-2.17 GHz	CPR 340

BRS-EBS (MMDS) Accessories

Model 6915 & 11047 3 dB Quadrature Hybrid

Splits input power with a 90 degree phase shift between the two equal outputs for power combining and special antenna configurations. *Ideal for use when combining adjacent digital channels to one antenna.*



Model 6915-2

Specifications

Model	Freq.(MHz)	Connector	Outputs	Return Loss	Loss*	Power Rating
6915-1	2050-2400	N Female	3dB ± 0.5dB	21 dB Min	0.5 dB Max	400W Max
6915-2	2500-2700	N Female	3dB ± 0.5dB	21 dB Min	0.5 dB Max	400W Max
11047-1	2050-2400	7/8″ EIA	3dB ± 0.5dB	19 dB Min	0.5 dB Max	1800W Max
11047-2	2500-2700	7/8″ EIA	3dB ± 0.5dB	19 dB Min	0.5 dB Max	1800W Max

**Net of 3 dB split loss*

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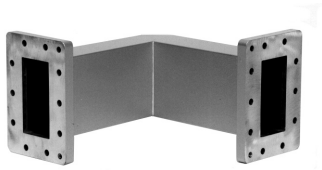
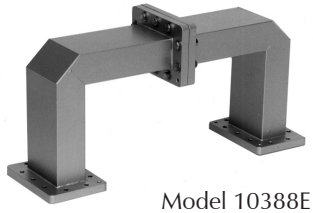
BRS-EBS (MMDS) Accessories



Model 10814E

E & H Bends

10814E..... WR340, Aluminum, 90° E-Plane
10814H..... WR340, Aluminum, 90° H-Plane
11814E..... WR340, Copper, 90° E-Plane
11814H..... WR340, Copper, 90° H-Plane



Model 10388E

U Bends

10388E..... WR340, Aluminum, E-Plane
10388H..... WR340, Aluminum, H-Plane
11388E..... WR340, Copper, E-Plane
11388H..... WR340, Copper, H-Plane

The Bend's length varies based on customer's specifications.

Accessories are custom built to customer specifications.
Contact the company for a quotation on any other custom accessories.

Model 4662 Low VSWR Terminations

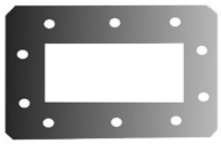
Model 4662

Model	Connector	Impedance	Frequency (MHz)	Return Loss	Power Rating
4662-01	N Male	50 ohm	0-1000 1000-2900	32 dB Min 21 dB Min	1W Max
4662-10	N Male	50 ohm	0-1000 1000-2900	32 dB Min 21 dB Min	10W Max
4662-25	N Male	50 ohm	0-1000 1000-2900	32 dB Min 21 dB Min	25W Max

Model 11600

Model 10600 & 11600 Termination End Plate

Used to block off the one side of the broadband waveguide. Complete with hardware. Model 10600 is made of aluminum and 11600 is made of copper.



Model 10601

Model 10601 Spacer

This spacer mates to UG-1712/U WR340 flange and provides a non-galvanic transition from copper/brass flanges to aluminum flanges.

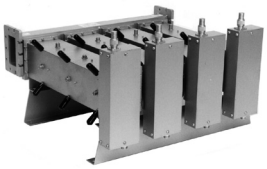
Model 10602 Mounting Bracket Kit

All combiners shipped include mounting brackets and hardware. Please designate preference on all combiner orders. Additional kits may be ordered separately.

Model 10602-1

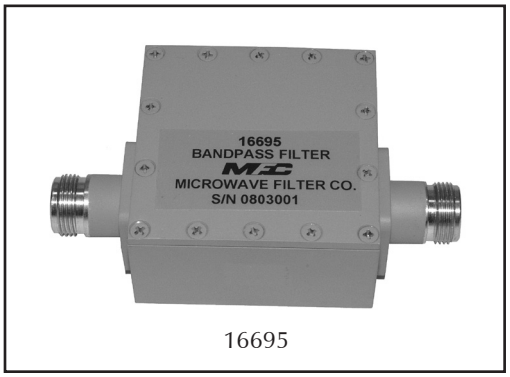
10602-1 — A pair of mounting plates for "upright" combiner mounting.

10602-2 — Optional mounting kit for low ceiling clearance and easy access.

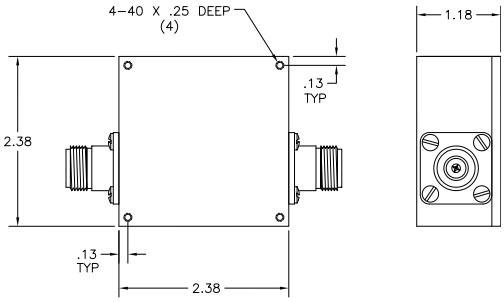


Model 10602-2

PPDR (4.9 GHz) Full Band Bandpass Filter



16695



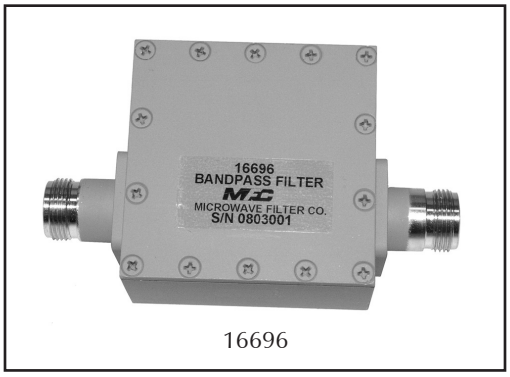
Model 16695

This filter achieves low loss within the 4.9 GHz band and provides superior isolation from virtually all other transmission sources above and below the band. Ideal for use in PPDR (Public Protection and Disaster Relief) telecom applications such as Homeland Security and other Public Safety Services.

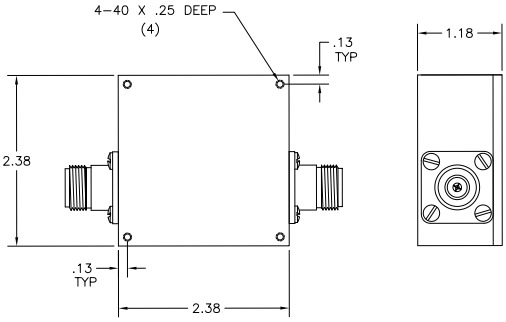
Specifications:

Passband	4940-4990 MHz
Passband Loss	1 dB Max
Rejection	10 dB Min @ 4890 MHz 10 dB (Min) @ 5040 MHz
Power Rating	50 Watts (CW)
Impedance	50 ohms
Connectors	N Female
Dimensions	2.3″ x 2.3″ x 1.1″

ISM (5.8 GHz) Full Band Bandpass Filter



16696



Model 16696

This compact bandpass filter isolates the full ISM (5.8 GHz) band from other transmission sources above and below the band, and is ideal for high data rate applications.

Specifications:

Passband	5725-5875 MHz
Passband Loss	0.5 dB Max
Rejection	10 dB Typ @ 5610 MHz 10 dB (Min) @ 6000 MHz
Power Rating	50 Watts (CW)
Impedance	50 ohms
Connectors	N Female
Dimensions	2.3″ x 2.3″ x 1.1″

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C-Band Interference Elimination Filters

Eliminate WiMAX, RADAR and Other Sources of Interference at your C-Band Receive Antenna

- ***Low Insertion Loss* – Typically less than 1 dB**
- ***Also Rejects Transmit Band (5800-6725 MHz) >70 dB Typ* – Eliminating the need for a separate TRF**
- ***Low Group Delay Variation* - 8 ns Max**
- ***Compact Size* – For easy installation on single or multi-feed LNBs**
- ***Superior VSWR Performance* - 1.5:1 Max**
- ***Quick Turnaround* – Most orders ship within (1-5) days ARO**

Historically, the solution for eliminating **out-of-band** interference (e.g. RADAR) has been to install a highly-selective bandpass filter. Specifically, a filter with a passband corresponding to that region's standard footprint (i.e. **3700-4200** MHz, **3400-4200** MHz, etc.).

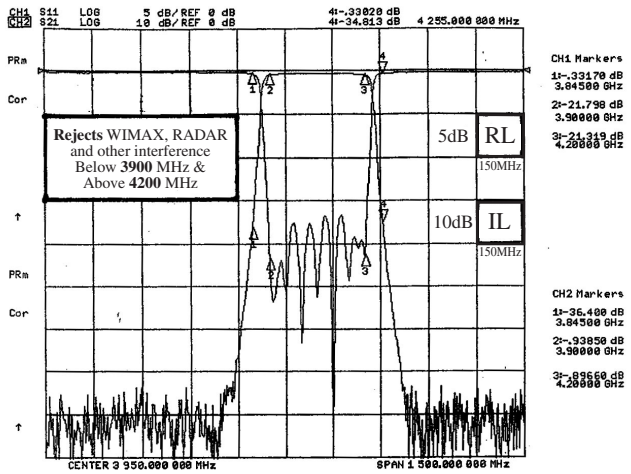
However, not long ago, WiMAX began operating in the (**3400-3800**) MHz frequency band in many regions around the world. This **common band** operation causes **in-band** interference at C-band receive sites that cannot be eliminated with "standard footprint" BPFs.

Example : WiMAX - operating at **3700** MHz - causes interference at a C-band receive site (where the footprint is **3700-4200** MHz). A standard footprint BPF will pass **all** frequencies from 3700 4200 MHz (i.e. - **including** the interfering WiMAX signal).

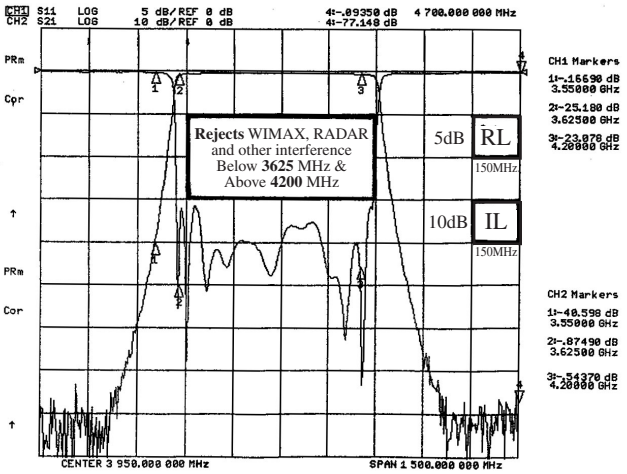
Solution : Install an MFC model **7893D-3780/4200** bandpass filter that will provide **30** dB **rejection** at **3700** MHz and will pass all remaining C-band from (**3780-4200**) MHz.

Following are just some of our many filtering solutions for eliminating WiMAX, RADAR and other C-band interference:

Model Number	Passband (MHz)	LOWER Rejection (Min./Typ. dB)	UPPER Rejection (Min./Typ. dB)
7893D-3400/4200	3400-4200	25/30 dB @ 3300 MHz	25/30 dB @ 4300 MHz
11383-3550/4150	3550-4150	25/-- dB @ 3500 MHz	25/-- dB @ 4200 MHz
11383	3600-4200	--/25 dB @ 3550 MHz --/45 dB @ 3500 MHz	--/25 dB @ 4250 MHz 70/-- dB @ 4400 MHz
11383-3625/4200	3625-4200	10/13 dB @ 3600 MHz 25/-- dB @ 3575 MHz -- /40 dB @ 3550 MHz	--/20 dB @ 4285 MHz --/40 dB @ 4325 MHz 60/-- dB @ 4400 MHz
7893D-3665/4165	3665-4165	25/30 dB @ 3615 MHz 60/65 dB @ 3515 MHz 70/80 dB @ 3465 MHz	25/30 dB @ 4215 MHz 60/70 dB @ 4315 MHz 70/80 dB @ 4365 MHz
7893D	3700-4200	25/-- dB @ 3650 MHz 60/70 dB @ 3550 MHz 70/80 dB @ 3500 MHz	25/-- dB @ 4250 MHz 60/70 dB @ 4350 MHz 70/80 dB @ 4400 MHz
7893D-3740/4160	3740-4160	--/25 dB @ 3690 MHz --/40 dB @ 3650 MHz	--/25 dB @ 4210 MHz --/40 dB @ 4250 MHz
7893D-3780/4200	3780-4200	10/-- dB @ 3725 MHz 30/-- dB @ 3700 MHz 50/-- dB @ 3650 MHz	30/-- dB @ 4325 MHz 60/-- dB @ 4400 MHz
7893D-3900/4200	3900-4200	25/35 dB @ 3845 MHz	25/35 dB @ 4255 MHz



7893D-3900/4200 Typical Response



11383-3625/4200 Typical Response

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C-Band Interference Elimination Filter

Model 13961W

Ideal for eliminating interference from WiMAX, RADAR and virtually any other potential source of out-of-band interference.

The model 13961W combines innovative design techniques with the solid performance of its renowned predecessor (model 13961).

No other manufacturer's C-band interference elimination filter offers all of these features:

Length	5.49" (13.9 cm)
Weight	1.125 lb. (0.51 kg)
Passband VSWR	1.44:1 Typ; 1.5:1 Max
Group Delay Variation	7 ns Max
Rejection	45 dB Min @ 3.65 GHz/4.25 GHz 60 dB Typ @ 3.55 GHz/4.35 GHz 70 dB Typ @ 3.50 GHz/4.40 GHz

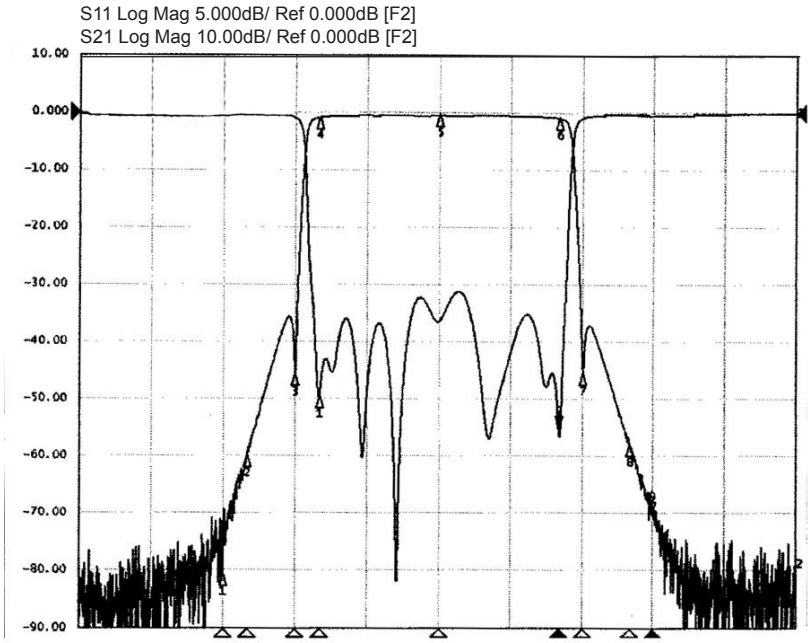
Utilizing a durable and true one piece body/flange construction, the 13961W is shipped with hardware & gasketing and is ready to install between the feedhorn and the LNB/LNA.

International bands are also available.

Other Specifications:

Passband	3.7-4.2 GHz
Passband Loss	0.5 dB Approx @ center band 0.5 dB Approx roll off @ band edges
Transmit Band Rejection	> 70 dB Typ from 5.8-6.725 GHz
Flanges	CPR229G (Input) CPR229F (Output)

Marker	
1	3.5000000 GHz - 80.580 dB
2	3.5500000 GHz - 59.765 dB
3	3.6500000 GHz - 45.593 dB
4	3.7000000 GHz - 0.7973 dB
5	3.9500000 GHz - 0.4502 dB
6	4.2000000 GHz - 0.8706 dB
7	4.2500000 GHz - 45.423 dB
8	4.3500000 GHz - 57.927 dB
9	4.4000000 GHz - 70.079 dB



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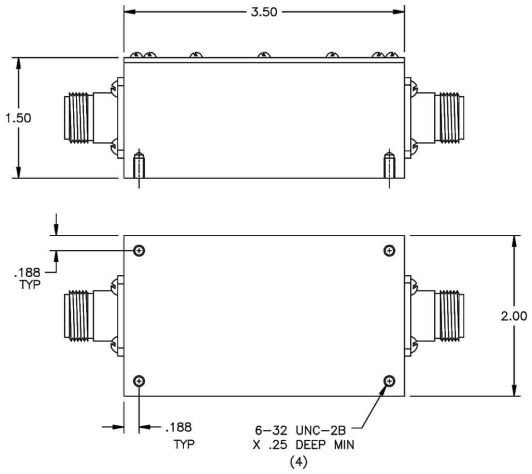
VHF/UHF LMR Harmonic Reject Filter

Model 18923

This filter prevents VHF & UHF land mobile radio transmitter harmonic emissions from interfering with wireless services operating between (698 - 2000) MHz.



Features:

• Compact Size for Easy Installation

Applications:

• Prevent Interference to Collocated or Nearby Wireless Services (e.g. – 700 MHz Band, GSM 850, GSM 1900, etc.)

Specifications:

Passband:	150 - 465 MHz
Passband Loss:	1 dB Approx
Passband VSWR:	1.5:1 Max
Power Rating (CW):	100 Watts Max
Rejection:	80 dB Min from 698 - 2000 MHz
Impedance:	50 ohms
Connectors:	N - female
Dimensions:	3.5" x 2.0" x 1.5" (89mm x 51mm x 38mm)