- ***24 MHz to 3000 MHz***
- ***Direct Readout***
- ***Octave Tuning***
- ***High Power***
- ***Digital and Manual Tuning Available***
- ***Diplexer Configuration***
- ***Ruggedized Applications***

Lorch Microwave's tunable filter products are designed to provide high performance in a single package. While typically used in test and measurement applications, these products can also be ruggedized for mobile and remote applications.

Lorch Microwave offers several standard Bandpass and Bandreject Tuners covering the frequency range of 24 MHz to 3000 MHz in octave bands. Cellular and PCS units cover less than full octaves, however they feature greater dial resolution. All standard units offer direct frequency read-out, high power, and narrow bandwidth.

Lorch Microwave's standard products may be customized to meet specific requirements; including Digitally Controlled, Diplexed, and Ruggedized options. Contact the factory for your specific requirements.

An additional feature of Lorch Microwave's Tunable Filter Product Line is the ability to ship standard bandpass and bandreject filters overnight from stock.

Tunable Filter Part Number Description

5 TF - 200/400 - 5 S
1 2 3 4 5

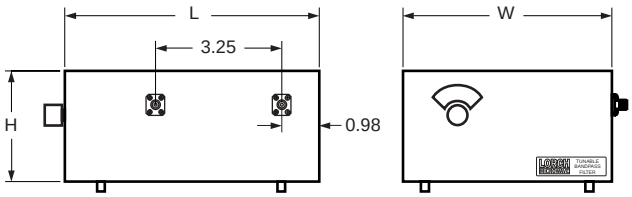
1. Number of Sections
2. Series (TF)
3. Frequency Range, MHz
4. Percent Bandwidth 3 dB BW and Designator
5. Connectors

Bandwidth	Designator
3 dB	/(blank)
special	/X

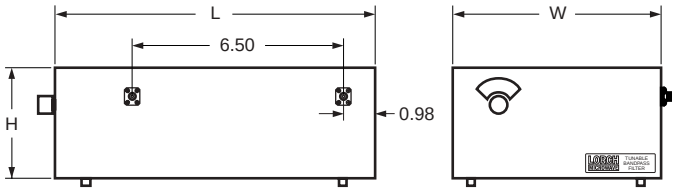
Connectors

Connector Type	Designator
BNC Female	B
F	F
N Female	N
SMA - Female	S
TNC - Female	T

3 Section Tunable Bandpass



5 Section Tunable Bandpass



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Standard Cellular and PCS Tunable Bandpass Filters

Part Number	No. of Sec.	Freq. Range (MHz)	Insert. Loss dB (Typ.)	Nominal Bandwidth	VSWR (Typ.)	Avg. Power (watts)	Dial Acc.	30 dB/ 3 dB Ratio	50 dB/ 5 dB Ratio	Length Inches (mm)	Width Inches (mm)	Height Inches (mm)
Cellular Bandpass												
3BT-800/1000-1S	3	800-1000	1.25	1%	1.5:1	50 watts	+/- 0.5%	3.5:1	N/A	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
5BT-800/1000-1S	5	800-1000	2	1%	1.5:1	50 watts	+/- 0.5%	2.2:1	3.5:1	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
PCS Bandpass												
3BT-1800/2200-1S	3	1800-2200	1	1%	1.5:1	50 watts	+/- 0.5%	3.5:1	N/A	6.57”	2.0”	2.0”
5BT-1800/2200-1S	5	1800-2200	1.5	1%	1.5:1	50 watts	+/- 0.5%	2.2:1	3.5:1	9.86”	2.0”	2.0”

Standard Tunable Bandpass Specifications

Number of Sections	Frequency Range (MHz)	Nominal Bandwidth	VSWR	Average Power (watts)	Dial Accuracy	30 dB/3dB Ration	50 dB/3dB Ration
3	30-3000	5%	1.5:1	50	+/- 1%	3.5:1	N/A
5	30-3000	5%	1.5:1	50	+/- 1%	2.2:1	3.5:1

3 Section Tunable Bandpass

Stock 3 Section Units	Insertion Loss dB (Typical)	Length Inches (mm)	Width Inches (mm)	Height Inches (mm)
3TF-24/48-5S	1.0	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-30/76-5S	1.0	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-32/64-5S	0.8	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-48/95-5S	0.8	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-63/125-5S	0.8	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-95/190-5S	0.8	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-125/250-5S	0.8	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-200/400-5S	0.8	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-225/400-5S	0.8	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-250/500-5S	0.7	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-375/750-5S	0.7	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-500/1000-5S	0.7	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-750/1500-5S	0.7	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3TF-1000/2000-5S	0.7	5.0 (127.0)	2.9 (73.7)	2.8 (71.1)
3TF-1500/3000-5S	0.7	5.0 (127.0)	2.9 (73.7)	2.8 (71.1)

5 Section Tunable Bandpass

Stock 3 Section Units	Insertion Loss dB (Typical)	Length Inches (mm)	Width Inches (mm)	Height Inches (mm)
5TF-24/48-5S	1.3	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-30/76-5S	1.3	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-32/64-5S	1.3	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-48/95-5S	1.3	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-63/125-5S	1.3	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-95/190-5S	1.3	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-125/250-5S	1.3	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-200/400-5S	1.3	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-225/400-5S	1.0	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-250/500-5S	1.0	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-375/750-5S	1.0	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-500/1000-5S	1.0	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-750/1500-5S	1.0	9.8 (248.9)	5.4 (137.2)	2.8 (71.1)
5TF-1000/2000-5S	1.0	7.4 (188.0)	2.9 (73.7)	2.8 (71.1)
5TF-1500/3000-5S	1.0	7.4 (188.0)	2.9 (73.7)	2.8 (71.1)

All width dimensions are excluding connectors.

- *24 MHz to 2000 MHz*
- *Direct Readout*
- *Octave Tuning*
- *Digital and Manual Tuning Available*
- *Extended Passband*
- *High Power Application*
- *Custom Bandwidths*
- *Ruggedized Applications*

Tunable Filter Part Number Description

3 NF - 200/400 - 5 S
1 2 3 4 5

1. Number of Sections
2. Series (NF)
3. Frequency Range, MHz
4. Percent Bandwidth (as a percentage of 3 dB BW)
5. Connectors

Bandwidth	Designator
3 dB	/(blank)
special	/X

Connectors

Connector Type	Designator
BNC Female	B
F	F
N Female	N
SMA - Female	S
TNC - Female	T

Digital Filter Options

Lorch Microwave can provide a wide selection of tunable bandpass and bandreject options, including digitally controlled filters. Standard bandpass and bandreject tuners can be configured to provide digital frequency control. Tuning is accomplished by utilizing a servo-type stepping motor to drive the gear assembly.

A programmable microprocessor-based system is used. Many control logic options exist including serial, RS-232, RS-422, IEEE-488, and BCD.

Note: Outline drawings for Bandreject Filters are the same as Tunable Filters. See page .

Standard Cellular and PCS Tunable Bandreject Filters

Part Number	No. of Sec.	Freq. Range (MHz)	Insert. Loss dB (Typ.)	Nominal Bandwidth	VSWR (Typ.)	Avg. Power (watts)	Dial Acc.	Notch Depth	Length Inches (mm)	Width Inches (mm)	Height Inches (mm)
Cellular Bandreject											
3NF-800/1000-1S	3	800-1000	1	1%	1.5:1	50 watts	+/- 0.5%	50 dB	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
5NF-800/1000-1S	5	800-1000	1	1%	1.5:1	50 watts	+/- 0.5%	75 dB	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
PCS Bandreject											
3NF-1800/2200-1S	3	1800-2200	1	1%	1.5:1	50 watts	+/- 0.5%	50 dB	6.57”	2.0”	2.0”
5NF-1800/2200-1S	5	1800-2200	1	1%	1.5:1	50 watts	+/- 0.5%	75 dB	9.86”	2.0”	2.0”

Standard 3 section Tunable Bandreject Filters

Stock 3 Section Units	Insertion Loss dB (Typical)	3 dB BW (MHz)	40 dB BW min. (KHz)	Notch Depth (dB)	Length Inches (mm)	Width Inches (mm)	Height Inches (mm)
3NF-25/50-S	1.0	1-2.5	100	50	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3NF-30/76-S	1.0	1-2.5	100	50	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3NF-50/100-S	1.0	3-6	300	50	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3NF-100/200-S	1.0	3-6	300	50	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3NF-200/400-S	1.0	3-7	300	50	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3NF-250/500-S	1.0	3-7	300	50	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3NF-375/750-S	1.0	6-16	400	50	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3NF-500/1000-S	1.0	6-16	400	50	6.6 (167.6)	5.4 (137.2)	2.8 (71.1)
3NF-1000/2000-S	1.0	9-24	400	50	5.2 (132.1)	2.9 (73.7)	2.8 (71.1)

All width dimensions are excluding connectors.

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- ***24 MHz to 3000 MHz***
- ***Octave Tuning***
- ***High Position Resolution***
- ***Built in Backlash Compensation***
- ***Simple Command Structure***

Lorch's Standard Digitally Controlled Bandpass Filters are available with 3 or 5 sections in the frequency range of 25 MHz to 3000 MHz. The typical insertion loss at center frequency ranges from 0.7 dB to 1.0 dB and standard tuners have a 3 dB passband bandwidth of 5%. Digitally Controlled Bandreject Filters are also available. Standard Bandreject Filters have 3 or 5 sections with a center frequency between 25 MHz to 220 MHz and a notch depth of 50 dB to 75 dB. The rejection bandwidth is typically 1%. All Standard Digitally Controlled Filters have a dial accuracy of better than 0.5%. The filter is controlled by sending commands as ASCII strings to the RS232 port.

Communications:

The controller communicates via a RS232-C port with the following settings:
9600 BAUD, 8 Bits/Byte, No parity, 1 stop bit. If a PC us used to send commands to the controller, a standard serial cable must be connected to the RS232 port of the filter.

Power Supply:

The digitally controlled filter is supplied with a 24 VDC, 0.625 mA, universal power supply. Typically a filter draws about 250 mA of current.

Lifetime Expectancy & Servicing:

Lorch's Digitally Controlled Filters do not require servicing. The meantime to failure is calculated at approximately 1,000,000 tune commands (based on 1 tune command every 30 seconds over 1 year) and is mainly determined by the limited number of write cycles to EEPROM to keep track of the current frequency setting.