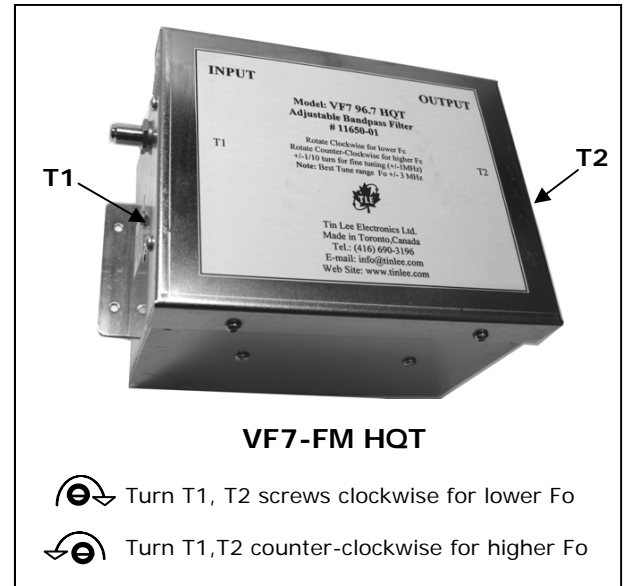




### Description

Model VF7-FM HQT is a frequency tunable FM Narrow Band pass filter, designed to pass a specific FM signal, and reject adjacent signals as close as  $F_o \pm 1$  MHz. Band pass default frequency is 98 MHz, or, User specified and optimized for thru loss (2.75 dB) and return loss (20 dB) at  $F_o$ . VF7-FM-HQT ( $F_o$ ) is adjustable via High-Q trimmers: T1 and T2.

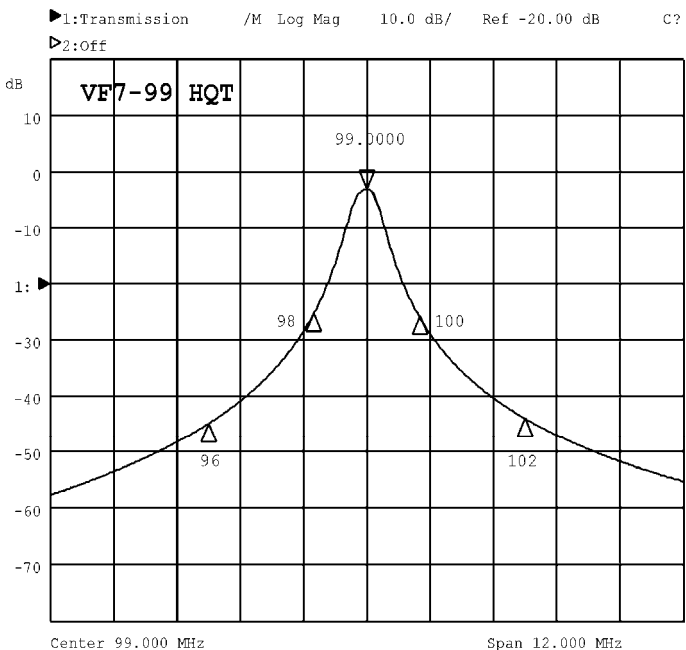
- Narrow Pass band:  $\pm 0.25$  MHz 3dB BW
- Pass band insertion loss 2.75 to 3.5 dB at  $F_o$  (88-108 MHz)
- Stop band 20dB:  $F_o \pm 1.0$  MHz,  $>40$  dB:  $F_o \pm 3.0$  MHz
- Stop band  $>55$  dB: 5 to 80 MHz, 116-400 MHz
- Frequency Tuning Range: 88 to 108MHz
- Connectors: F type, 75 ohms (BNC 75 optional)
- Connectors for 50 ohms option: BNC, N, or SMA



### Specifications

Frequency	Insertion Loss	VSWR	Return Loss (dB)	Attenuation 25dB	-3dB Bandwidth
88	3.5 dB	1.5:1	$>14$	$\pm 0.9$ MHz	$\pm 0.20$ MHz
99	3.0 dB	1.3:1	$>18$	$\pm 1.0$ MHz	$\pm 0.25$ MHz
108	2.75 dB	1.4:1	$>16$	$\pm 1.15$ MHz	$\pm 0.30$ MHz
Tune Range		88 to 108 MHz (or optimize at $F_o \pm 3$ MHz)			
Attenuation ( $>50$ dB)		5 to 84MHz and 115 to 400MHz (option 1000Mz)			
RF power: 1 Watts		Dimensions (l/w/h): 7.0 x 3.5 x 4.25 (in), 18 x 9 x 10.5 (cm)			
Connectors: 75 ohms Impedance		F-type female; BNC (female) optional			
Connectors: 50 ohms Impedance		BNC; N; SMA (female)			

### Example Frequency Response



### Bandpass Adjustments

To adjust frequency of band pass, use small flat head screwdriver to turn T1 or T2 screws. Use RF Network Analyzer or a spectrum analyzer with tracking generator to view frequency response of the filter: VF7 passband can be tuned to a higher or lower frequency by adjusting screw trimmers T1 or T2, turn one screw at a time, to desired frequency.

- Turn Screw T1/T2 clockwise for lower  $F_o$
- Turn Screw T1/T2 counter-clockwise for higher  $F_o$

**Note:** Adjust screws with small flathead screw driver. Frequency tune screw - in 1/4 turn increments. Fine tune using 1/10 turns.

### Order as: VF7-FM( $F_c$ )-HQT

Specify: Pre-set  $F_c$ , Connectors/Impedance, e.g., VF7-FM 99-HQT





**Passband Optimization**

The VF7-FM HQT passband can be tuned from 88 to 108 MHz. Thru loss can vary by 1.5 dB and return loss can vary by 6 dB. These parameters can be optimized by adjusting internal tuners TC1 and TC2.

Tuners: TC1 and TC2, are located internally, below plugs (see photo). TC1 and TC2 are intended for factory adjustment. They are used to increase, or decrease, the coupling between the Input port and resonator1, and Output port and resonator2. This coupling affects return loss, thru loss and selectivity of the passband at specific Fo.

To access TC1 and TC2 tuners, remove plug and use small flat head screwdriver to turn screws located underneath. Use RF Network Analyzer or a spectrum analyzer with tracking generator to view frequency response of the filter:

VF7 passband can be tuned to a higher or lower frequency by adjusting screw trimmers T1 or T2, turn one screw at a time, to desired frequency.

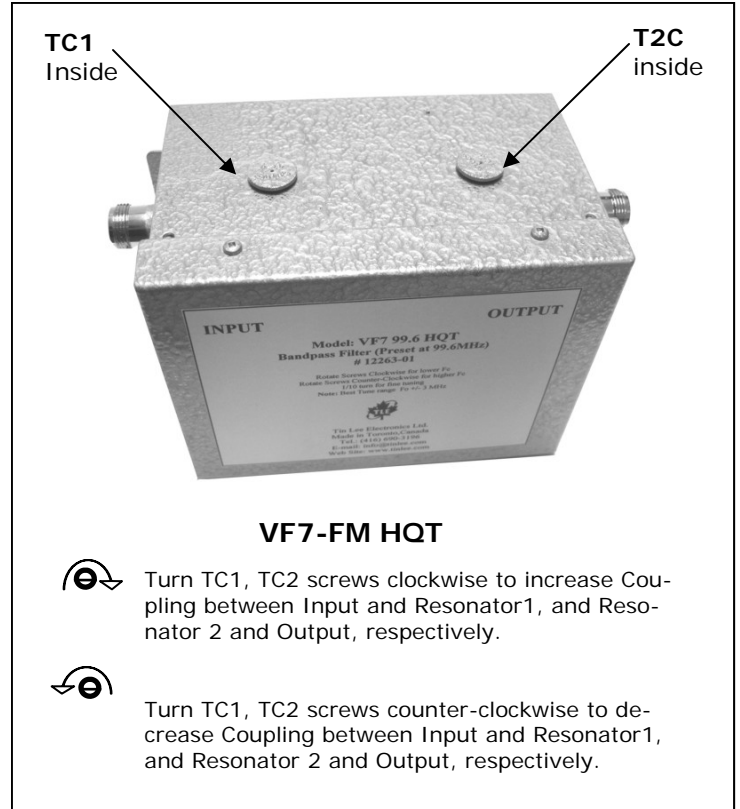
**Making Adjustments**

In General, initial passband is optimized at, e.g., 99 MHz. After moving passband away from Fo (>±3 MHz) TC1 and TC2 can be adjusted to re-optimize the passband.

**Example 1:**

Tune Fo to a lower frequency , e.g., 99 MHz to 90 MHz

1. Follow frequency tuning instructions to relocate passband from 99 MHz to 90 MHz.
2. Access TC1 and TC2, tune the internal screw(s) approximately 1/4 turn clockwise to increase the coupling. This should improve return loss and reduce thru loss. This will also increase passband frequency slightly.
3. Re-adjust to desired frequency.
4. Fine tune - repeat step 2—increase or decrease TC1 and TC2 adjustments to optimize return loss and thru loss. Repeat step 3 after adjusting TC1 or TC2.



**Example 2:**

Tune Fo to higher frequency, e.g., 99 MHz to 108 MHz

1. Follow frequency tuning instructions to relocate passband from 99 MHz to 108 MHz.
2. Access TC1 and TC2, tune the internal screw(s) approximately 1/4 turn counter-clockwise to decrease the coupling. This should improve return loss and reduce thru loss. This will also decrease passband frequency slightly.
3. Re-adjust to desired frequency.
4. Fine tune - repeat step 2—increase or decrease TC1 and TC2 adjustments to optimize return loss and thru loss. Repeat step 3 after adjusting TC1 or TC2.

