

### FEATURES

Netcom's 5697 is a Multi-Tune High pass/Low pass tunable filter which covers the frequency range of 750MHz to 1500MHz.

This filter offers 32 tuning states which are available on both the High pass and Lowpass sections.

The filter can be controlled by the Serial Interface . The cutoff frequency  $f_1$  of the High pass filter and the cutoff frequency  $f_2$  of the Lowpass filter can be tuned independently through the SPI interface.

The following table shows the typical performance of the filter.

## Specifications

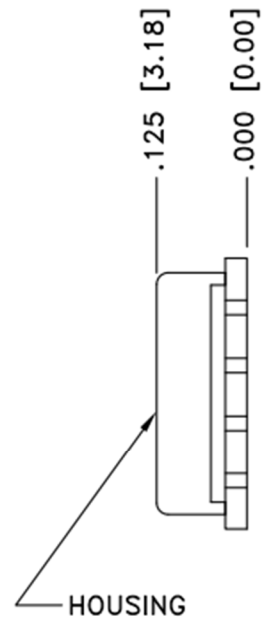
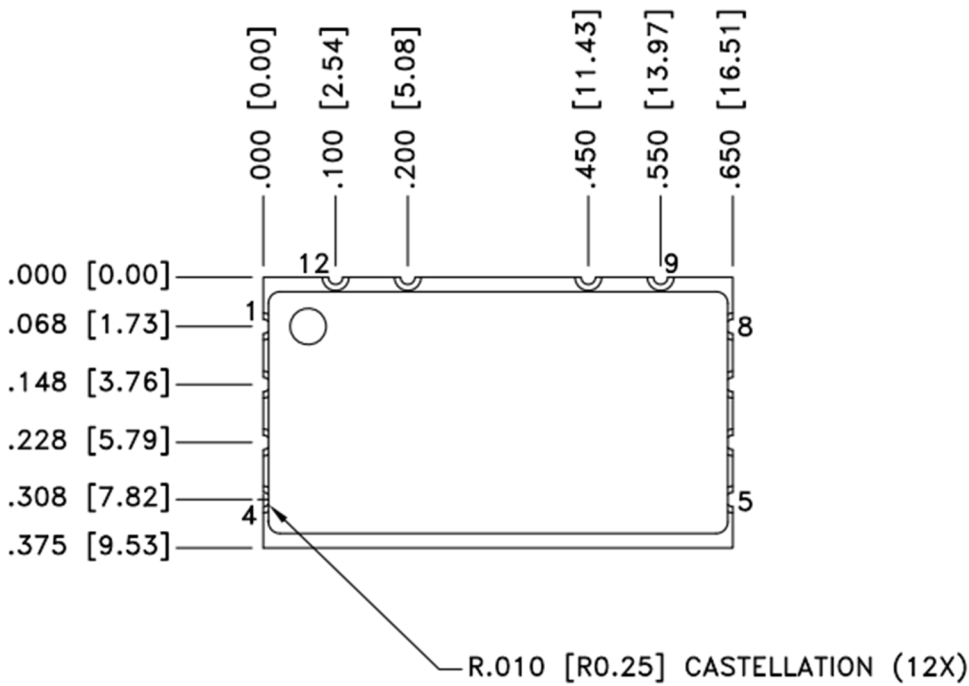


Frequency Range	750 to 1500 MHz
Highpass Cutoff Frequency Range (f1)	700 - 1250 MHz
Lowpass Cutoff Frequency Range (f2)	790 - 1500 MHz
Center Frequency*	$(f_1 + f_2) / 2$
Passband Insertion Loss for BW > 40MHz	3.5dB max
Rejection at $f_1 - 20\%$ (Typical)	18dB min
Rejection at $f_2 + 20\%$ (Typical)	15dB min
Impedance (Input/Output)	50 $\Omega$
Passband VSWR	2.5:1
RF Power Handling (Max)	+27dBm
IIP3	+40 dBm
Switching Speed, 90% RF Power (typical)	10 $\mu$ sec
DC Power	
DC Voltage	3.3V
DC Current	3mA
Operating Temperature Range	-40 to +85°C
Control Interface	SPI interface
Dimensions	0.650 x 0.375 x 0.125 inches 16.510 x 9.525 x 3.180 mm

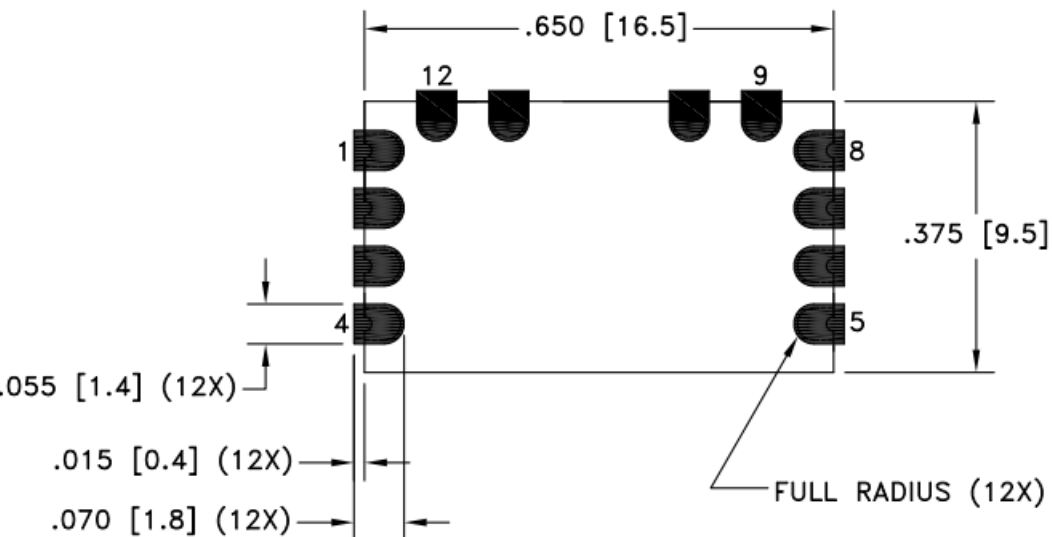
\*See Center Frequency Table Pages 10 and 11

Note: Parameters subject to change

# Mechanical Filter



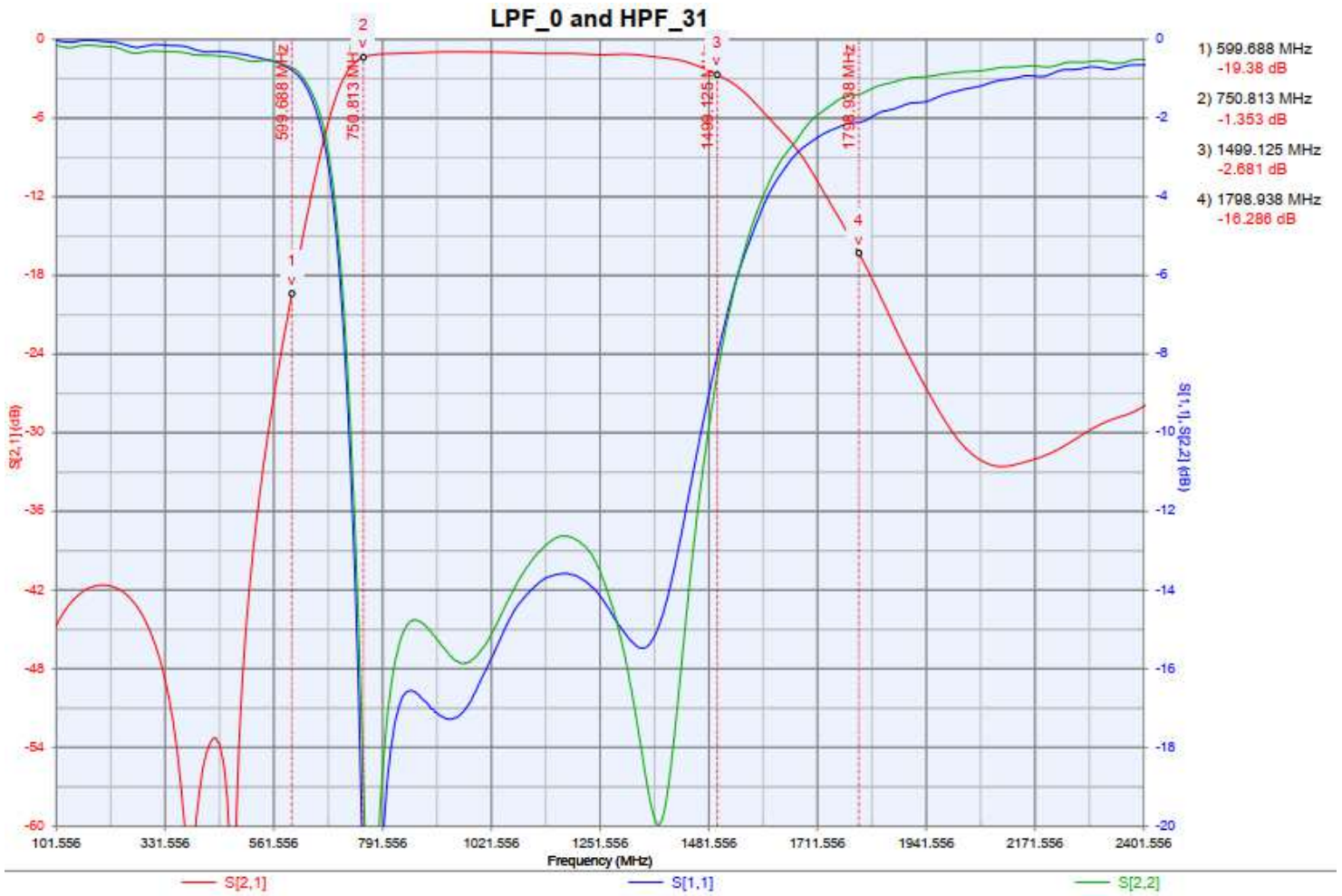
**RECOMMENDED LAYOUT PATTERN  
TOP VIEW**



PIN DESIGNATORS	
PIN NUMBER	DESCRIPTION
1	SENS_1
2	GND
3	RF_IN
4	GND
5	GND
6	RF_OUT
7	GND
8	SENS_2
9	3.3V
10	SDATA
11	SCLK
12	GND

# Maximum Passband Response - Actual Unit

## Wideband Response



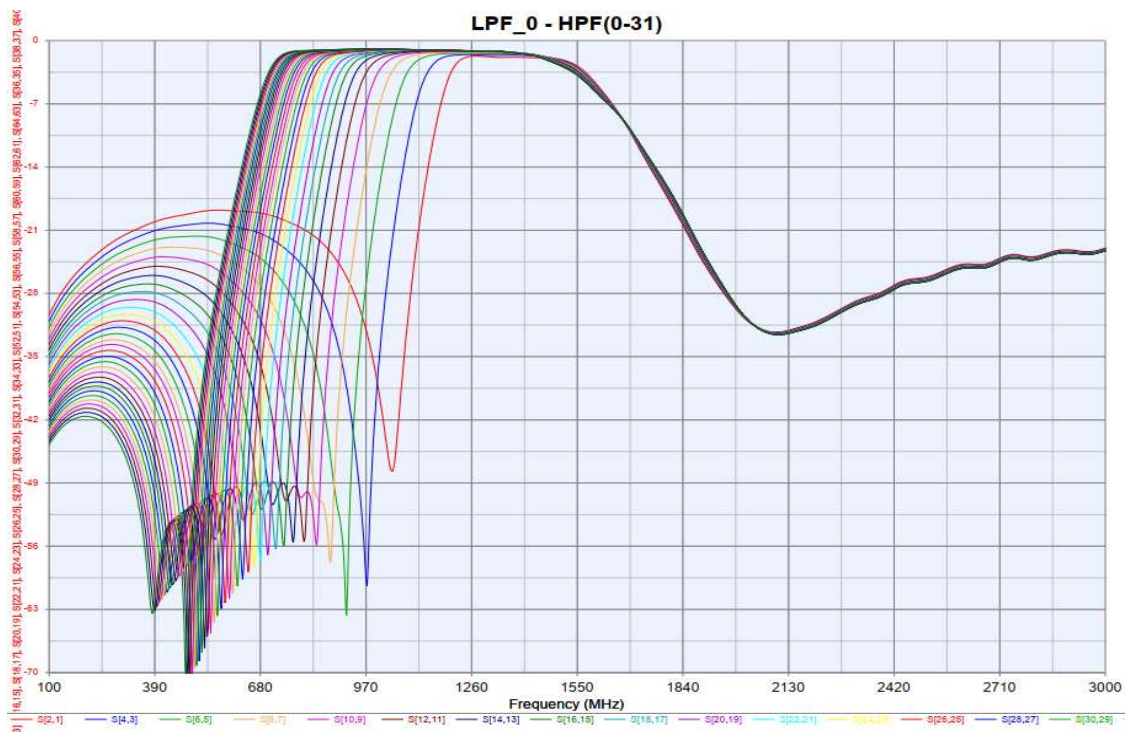
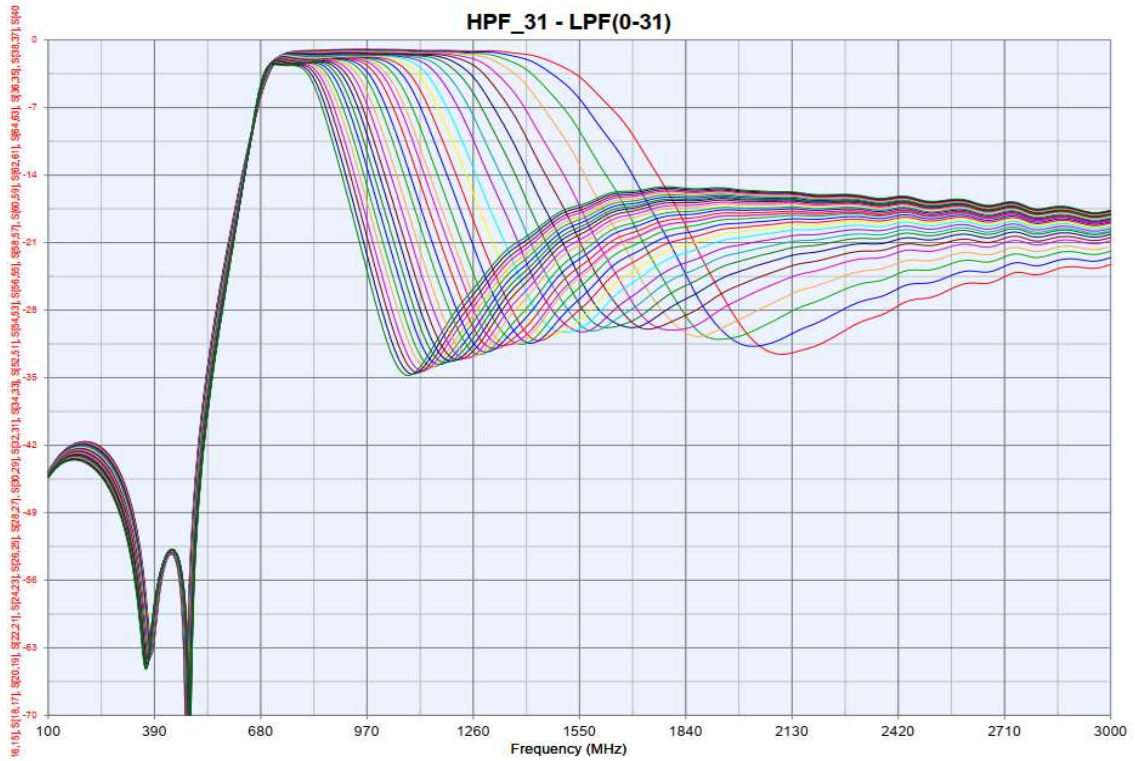
Note: Tuning State HPF Channel, LPF Channel

# Low and High Frequency Response - Actual Unit



Note: Tuning State HPF Channel, LPF Channel

# Sweep Frequency Response- Actual Unit



## HPF(typical) Cutoff Frequency

Dec							HPF(typ) Cutoff Freq (Mhz)
0	0	0	0	0	0		1250
1	0	0	0	0	1		1180
2	0	0	0	1	0		1130
3	0	0	0	1	1		1090
4	0	0	1	0	0		1030
5	0	0	1	0	1		990
6	0	0	1	1	0		960
7	0	0	1	1	1		940
8	0	1	0	0	0		920
9	0	1	0	0	1		900
10	0	1	0	1	0		885
11	0	1	0	1	1		870
12	0	1	1	0	0		850
13	0	1	1	0	1		835
14	0	1	1	1	0		820
15	0	1	1	1	1		815
16	1	0	0	0	0		800
17	1	0	0	0	1		790
18	1	0	0	1	0		780
19	1	0	0	1	1		775
20	1	0	1	0	0		770
21	1	0	1	0	1		765
22	1	0	1	1	0		760
23	1	0	1	1	1		755
24	1	1	0	0	0		750
25	1	1	0	0	1		738
26	1	1	0	1	0		735
27	1	1	0	1	1		730
28	1	1	1	0	0		725
29	1	1	1	0	1		720
30	1	1	1	1	0		710
31	1	1	1	1	1		700

## LPF(typical) Cutoff Frequency

Dec						LPF(typ) Cutoff Freq (Mhz)
0	0	0	0	0	0	1540
1	0	0	0	0	1	1470
2	0	0	0	1	0	1430
3	0	0	0	1	1	1390
4	0	0	1	0	0	1340
5	0	0	1	0	1	1300
6	0	0	1	1	0	1260
7	0	0	1	1	1	1230
8	0	1	0	0	0	1200
9	0	1	0	0	1	1150
10	0	1	0	1	0	1120
11	0	1	0	1	1	1080
12	0	1	1	0	0	1050
13	0	1	1	0	1	1030
14	0	1	1	1	0	1000
15	0	1	1	1	1	985
16	1	0	0	0	0	970
17	1	0	0	0	1	950
18	1	0	0	1	0	940
19	1	0	0	1	1	930
20	1	0	1	0	0	910
21	1	0	1	0	1	900
22	1	0	1	1	0	890
23	1	0	1	1	1	880
24	1	1	0	0	0	870
25	1	1	0	0	1	850
26	1	1	0	1	0	840
27	1	1	0	1	1	830
28	1	1	1	0	0	815
29	1	1	1	0	1	804
30	1	1	1	1	0	792
31	1	1	1	1	1	780





# Combination Support List (HPF channel 16 to 31)

HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF	HPF LPF
16 0	17 0	18 0	19 0	20 0	21 0	22 0	23 0	24 0	25 0	26 0	27 0	28 0	29 0	30 0	31 0
16 1	17 1	18 1	19 1	20 1	21 1	22 1	23 1	24 1	25 1	26 1	27 1	28 1	29 1	30 1	31 1
16 2	17 2	18 2	19 2	20 2	21 2	22 2	23 2	24 2	25 2	26 2	27 2	28 2	29 2	30 2	31 2
16 3	17 3	18 3	19 3	20 3	21 3	22 3	23 3	24 3	25 3	26 3	27 3	28 3	29 3	30 3	31 3
16 4	17 4	18 4	19 4	20 4	21 4	22 4	23 4	24 4	25 4	26 4	27 4	28 4	29 4	30 4	31 4
16 5	17 5	18 5	19 5	20 5	21 5	22 5	23 5	24 5	25 5	26 5	27 5	28 5	29 5	30 5	31 5
16 6	17 6	18 6	19 6	20 6	21 6	22 6	23 6	24 6	25 6	26 6	27 6	28 6	29 6	30 6	31 6
16 7	17 7	18 7	19 7	20 7	21 7	22 7	23 7	24 7	25 7	26 7	27 7	28 7	29 7	30 7	31 7
16 8	17 8	18 8	19 8	20 8	21 8	22 8	23 8	24 8	25 8	26 8	27 8	28 8	29 8	30 8	31 8
16 9	17 9	18 9	19 9	20 9	21 9	22 9	23 9	24 9	25 9	26 9	27 9	28 9	29 9	30 9	31 9
16 10	17 10	18 10	19 10	20 10	21 10	22 10	23 10	24 10	25 10	26 10	27 10	28 10	29 10	30 10	31 10
16 11	17 11	18 11	19 11	20 11	21 11	22 11	23 11	24 11	25 11	26 11	27 11	28 11	29 11	30 11	31 11
16 12	17 12	18 12	19 12	20 12	21 12	22 12	23 12	24 12	25 12	26 12	27 12	28 12	29 12	30 12	31 12
16 13	17 13	18 13	19 13	20 13	21 13	22 13	23 13	24 13	25 13	26 13	27 13	28 13	29 13	30 13	31 13
16 14	17 14	18 14	19 14	20 14	21 14	22 14	23 14	24 14	25 14	26 14	27 14	28 14	29 14	30 14	31 14
16 15	17 15	18 15	19 15	20 15	21 15	22 15	23 15	24 15	25 15	26 15	27 15	28 15	29 15	30 15	31 15
16 16	17 16	18 16	19 16	20 16	21 16	22 16	23 16	24 16	25 16	26 16	27 16	28 16	29 16	30 16	31 16
16 17	17 17	18 17	19 17	20 17	21 17	22 17	23 17	24 17	25 17	26 17	27 17	28 17	29 17	30 17	31 17
16 18	17 18	18 18	19 18	20 18	21 18	22 18	23 18	24 18	25 18	26 18	27 18	28 18	29 18	30 18	31 18
16 19	17 19	18 19	19 19	20 19	21 19	22 19	23 19	24 19	25 19	26 19	27 19	28 19	29 19	30 19	31 19
16 20	17 20	18 20	19 20	20 20	21 20	22 20	23 20	24 20	25 20	26 20	27 20	28 20	29 20	30 20	31 20
16 21	17 21	18 21	19 21	20 21	21 21	22 21	23 21	24 21	25 21	26 21	27 21	28 21	29 21	30 21	31 21
16 22	17 22	18 22	19 22	20 22	21 22	22 22	23 22	24 22	25 22	26 22	27 22	28 22	29 22	30 22	31 22
16 23	17 23	18 23	19 23	20 23	21 23	22 23	23 23	24 23	25 23	26 23	27 23	28 23	29 23	30 23	31 23
16 24	17 24	18 24	19 24	20 24	21 24	22 24	23 24	24 24	25 24	26 24	27 24	28 24	29 24	30 24	31 24
	17 25	18 25	19 25	20 25	21 25	22 25	23 25	24 25	25 25	26 25	27 25	28 25	29 25	30 25	31 25
		18 26	19 26	20 26	21 26	22 26	23 26	24 26	25 26	26 26	27 26	28 26	29 26	30 26	31 26
		18 27	19 27	20 27	21 27	22 27	23 27	24 27	25 27	26 27	27 27	28 27	29 27	30 27	31 27
			19 28	20 28	21 28	22 28	23 28	24 28	25 28	26 28	27 28	28 28	29 28	30 28	31 28
					21 29	22 29	23 29	24 29	25 29	26 29	27 29	28 29	29 29	30 29	31 29
					21 30	22 30	23 30	24 30	25 30	26 30	27 30	28 30	29 30	30 30	31 30
						22 31	23 31	24 31	25 31	26 31	27 31	28 31	29 31	30 31	31 31

HPF State Fixed and sweep LPF from State 0 to 31

# Serial Address Input Timing Diagram

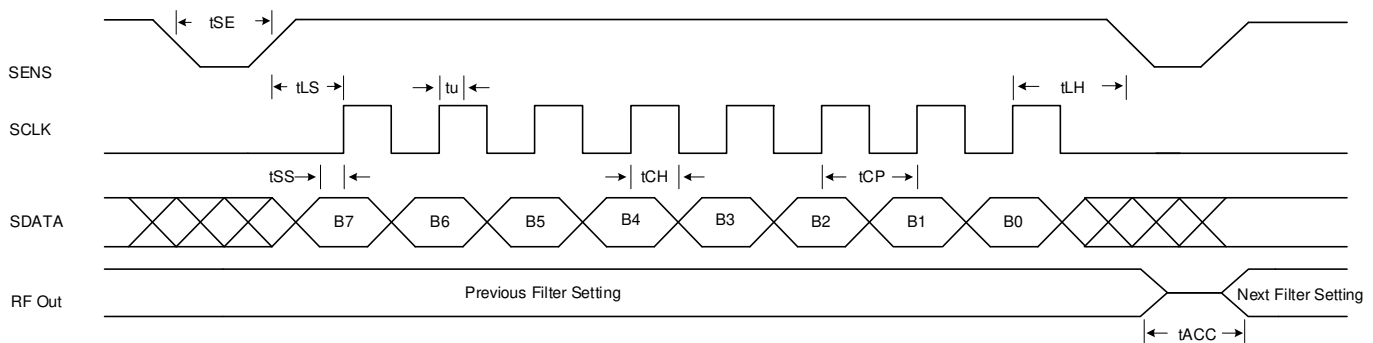
To tune the High Pass Filter (HPF)

- Take the SENS\_1 line from low to high state (active)
- Data is loaded from MSB (B7) to LSB (B0).
- Data is clocked in on the leading edge of the clock.
- Only the last 8 data bits clocked in are set as the data input.
- Take the SENS\_1 line from high to low state (deactivate)
- Data set on the falling edge of SENS\_1

To tune the Low Pass Filter (LPF)

- Take the SENS\_2 line from low to high state (active)
- Data is loaded from MSB (B7) to LSB (B0).
- Data is clocked in on the leading edge of the clock.
- Only the last 8 data bits clocked in are set as the data input.
- Take the SENS\_2 line from high to low state (deactivate)
- Data set on the falling edge of SENS\_2

Symbol	Parameter	Min	Max	Units
tLS	Setup time SENS rising edge to SCLK*	20		ns
tSS	Setup time MOSI Data to SCLK*	15		ns
tu	Hold Time MOSI Data	15		ns
tCH	Clock High Time	20		ns
tCP	Clock Period	40		ns
tLH	Setup time rising edge SCLK to SENS falling edge	20		ns
tSE	SENS falling edge to SENS rising edge	40		ns
tACC	Access time from Last SCLK edge to Fo		10	us



## Serial Data Map

B7	B6	B5	B4	B3	B2	B1	B0
0	0	0	D4	D3	D2	D1	D0

Tune as follows:

- B7 is first bit clocked in (MSB)
- B7, B6, and B5 data bits must be set as shown in chart second row.
- D4, D3, D2, D1, and D0 data bits are the LPF or HPF tune values (0 to 31)
- B0 is last bit clocked in (LSB)

## Ordering Information

Model Number	( - )	Options	Add “-EB” for Unit Mounted on Evaluation Board	
5697	( - )		( - )	EB

Options:

A:  
B:  
C:

## RF In/Out Note:

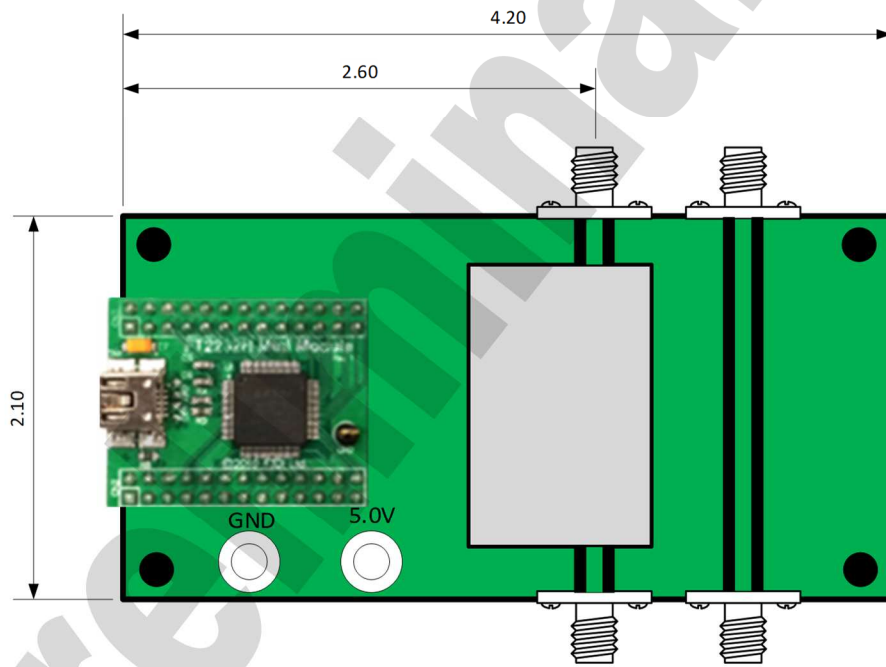
When connecting the RF signals:

- Use a coupling capacitor if DC power is expected on the RF Input or Output.

# Corresponding Evaluation Board

The EB5697 Evaluation Board is designed to test and evaluate Netcom's Model 5697 Multi-Tune Filter. The evaluation board provides the option of using a separate 5 volt power supply input to provide power to the unit and the User USB interface or use of the USB interface to provide the unit power. The Evaluation board provides tuning control to facilitate measurements of the filter's RF parameters.

The EB5697 Evaluation Board includes a separate RF thru path for calibration of test equipment to improve the accuracy of RF measurements.



**NETCOM**  
RF & MICROWAVE TECHNOLOGY

599 Wheeling Road  
Wheeling, IL 60090  
USA  
Phone 847.537.6300  
Fax 847.537.2700  
[www.netcominc.com](http://www.netcominc.com)