RF & MICROWAVE TECHNOLOGY

Model 5560 - 5.5 Tunable Filter
960 - 1240 MHz

Specifications

FEATURES

Netcom's 5560 is a tunable filter covering the frequency range of 960 MHz to 1240 MHz.

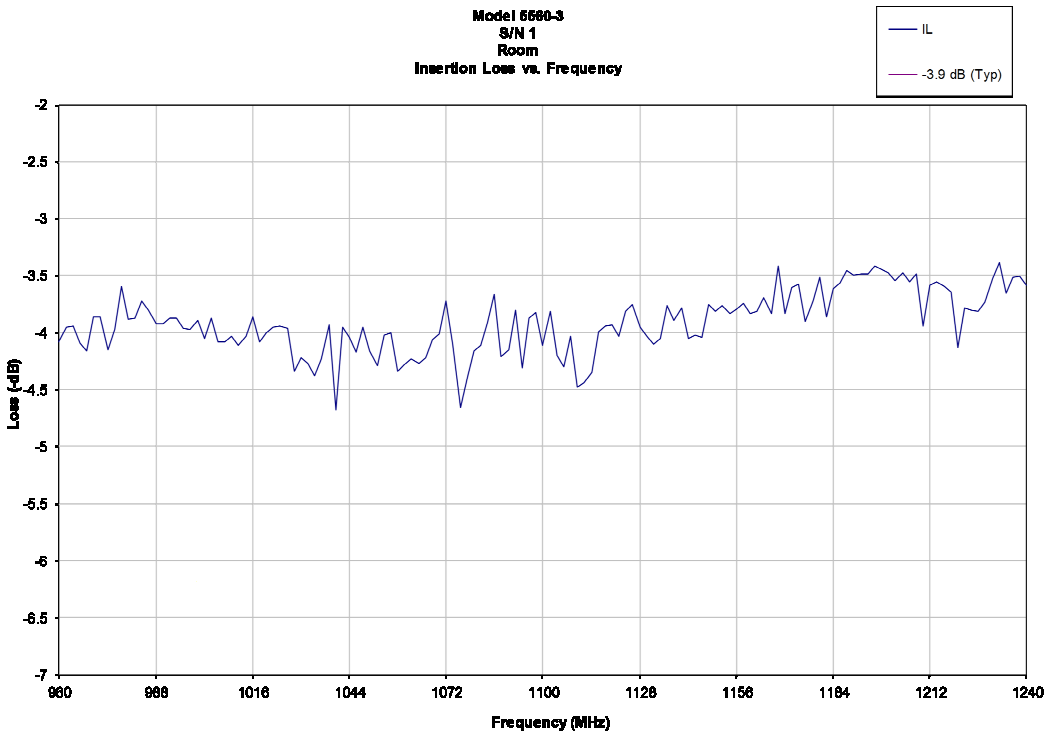
The 5560 filter is offered in a small integrated SMT package to support applications where compact design, power requirements, and board layout flexibility are important. It meets the vibration and shock requirements of systems used in ground-mobile and airborne environments.

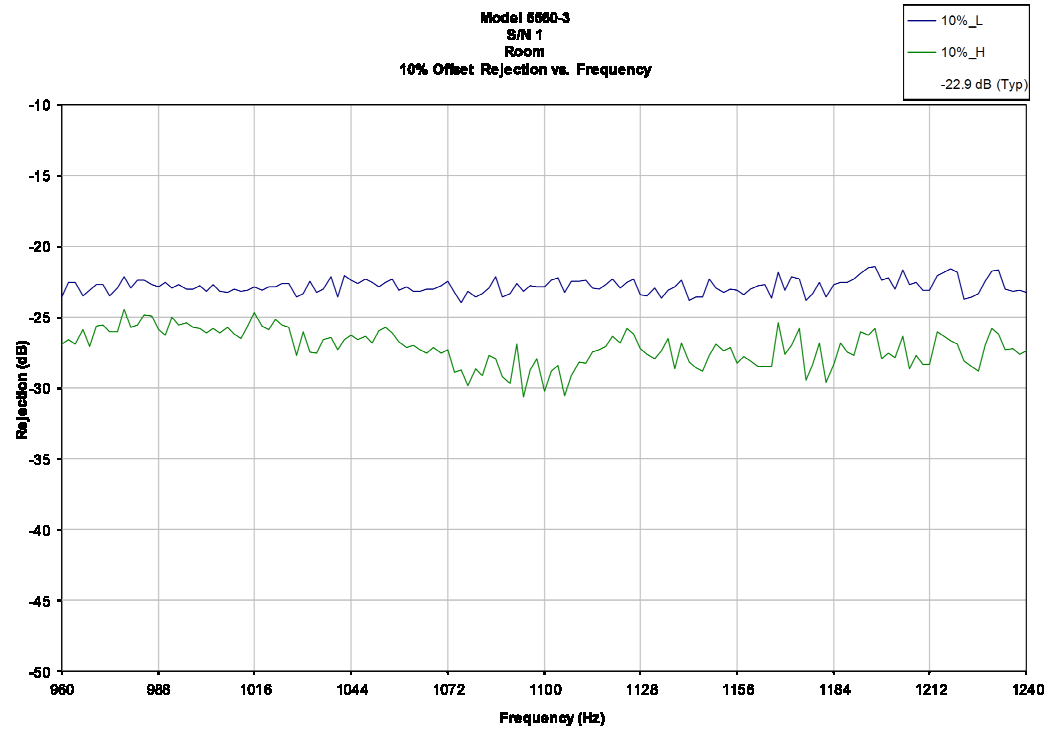
The following table shows the typical performance of the filter at a bandwidth of 5.5%.
Options are available upon request for different bandwidths.

Frequency Range	960 to 1240 MHz
Available BW (Typical)	5.5%
*Ftune +/- 10% Rejection (Typical)	-20.0 dB
*Ftune +/- 15% Rejection (Typical)	-27.0 dB
*Ftune +/- 20% Rejection (Typical)	-31.0 dB
Insertion Loss (Typical)	-4.1 dB
Impedance (Input /Output)	50 Ω
Tuning Speed	6µs max
Tuning Resolution	2 MHz
P1dB	+30 dBm
IIP3 (+24dBm input)	+45 dBm
Noise Figure (Typical)	< 0.5 dB above Insertion Loss
DC Power	
DC Voltage	3.3 VDC +/- 0.3 VDC
DC Current Max	260 mA
Operating Temperature Range	-40 to +85°C
Control Interface	SPI or Parallel
Dimensions [L x W x H]	1.50 X 1.50 X 0.25 inches 38.10 X 38.10 X 6.40 mm

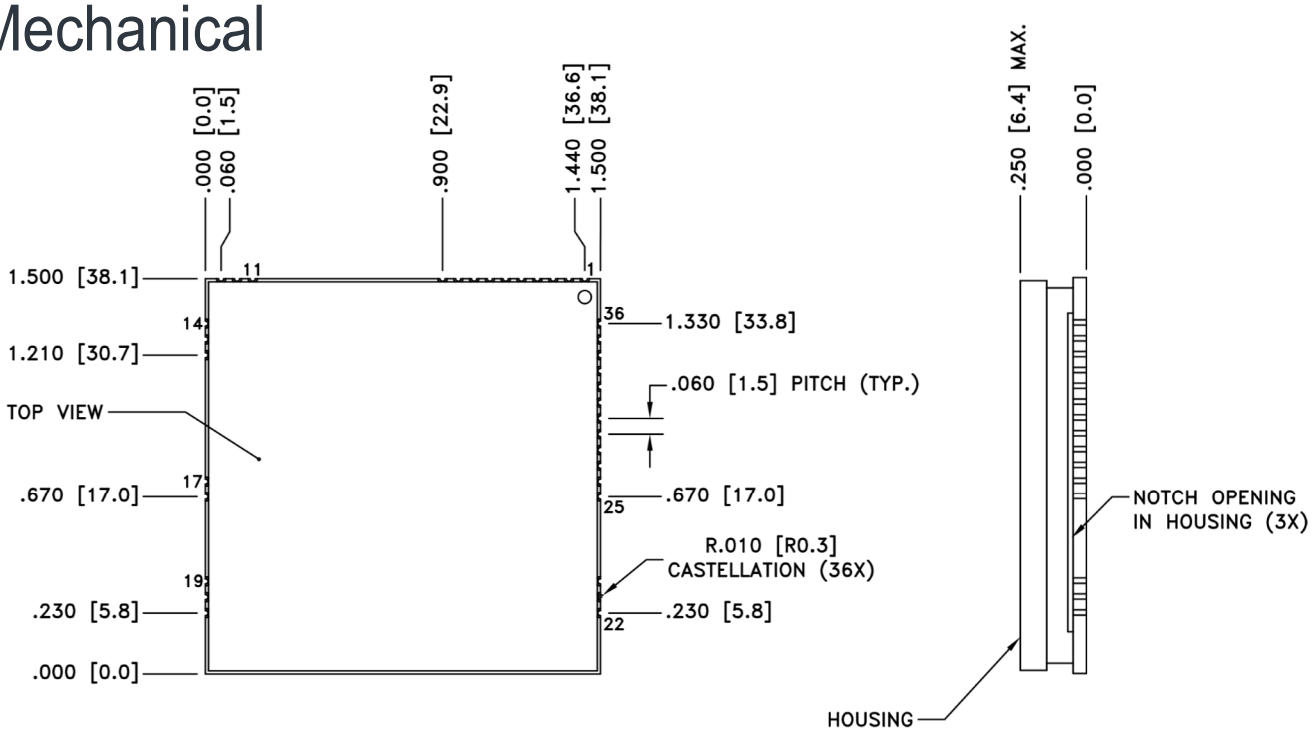
*Referenced at 0dB

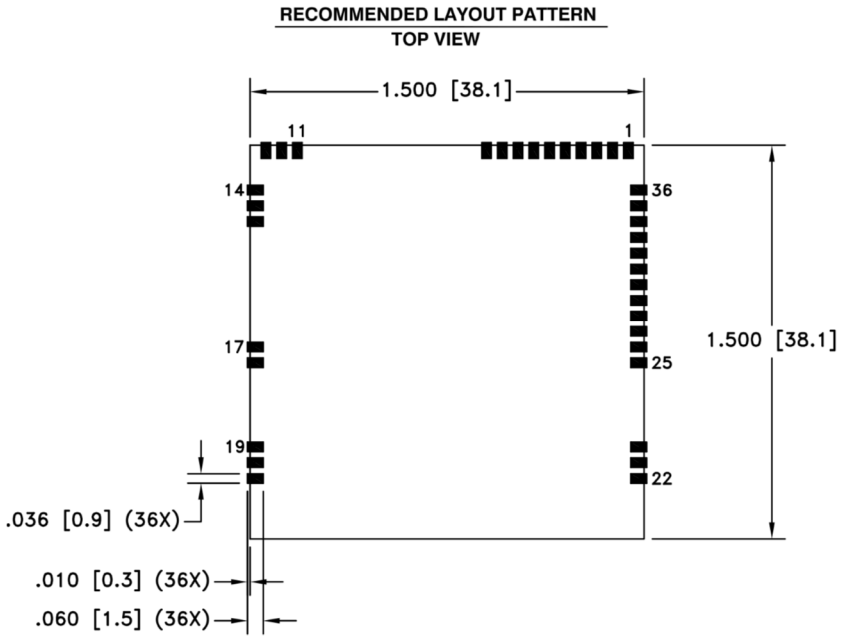
Sweep Response





Mechanical





NOTES:
1. TOLERANCES ±.010 [0.25] UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE INCHES [mm].

PIN DESIGNATORS				
PIN NUMBER	DESCRIPTION		PIN NUMBER	DESCRIPTION
1	N/C		19	GND
2	N/C		20	RF_IN
3	MOSI		21	GND
4	MISO		22	GND
5	SCK		23	RF_OUT
6	$\overline{CS}$ / STB		24	GND
7	N/C		25	Vcc
8	N/C		26	GND
9	SER / $\overline{PAR}$		27	N/C
10	$\overline{TUNE\ READY}$		28	A7
11	GND		29	A6
12	GND		30	A5
13	GND		31	A4
14	GND		32	A3
15	GND		33	A2
16	GND		34	A1
17	N/C		35	A0
18	GND		36	GND

N/C = NO CONNECT

Ordering Information

Model Number	(-)	Bandwidth	(-)	Options	Add “-EB” for Unit Mounted on Evaluation Board	
5560	(-)	5.5	(-)		(-)	EB

Options:

A:
B:
C:

Available Bandwidths

*Options available upon request

Frequency Range	960 to 1240 MHz		
Available BW	3%	5.5%	7%
*Ftune +/- 10% Rejection (Typical)	TBD	-20 dB	TBD
*Ftune +/- 15% Rejection (Typical)	TBD	-27 dB	TBD
*Ftune +/- 20% Rejection (Typical)	TBD	-31 dB	TBD
Insertion Loss (Typical)	TBD	4.1 dB	TBD

Corresponding Evaluation Board

Model 5560 series filters are tunable bandpass filters that can be tuned over the frequency range of 960 to 1240MHz.

The EB5560 Evaluation Board is designed to test and evaluate Netcom's Model 5560 frequency agile filter. The evaluation board will also work for future frequency agile filters within the 5560 family. The evaluation board is used to supply power to the filter, provide tuning control, facilitate measurement of the filter's RF parameters, switching speed, and power consumption.

Tuning control of the filter is provided by the EB5560 Evaluation Board in the form of frequency tune words. The EB5560 uses a USB input and user interface program to provide frequency tuning control for the 5560 frequency agile filter.

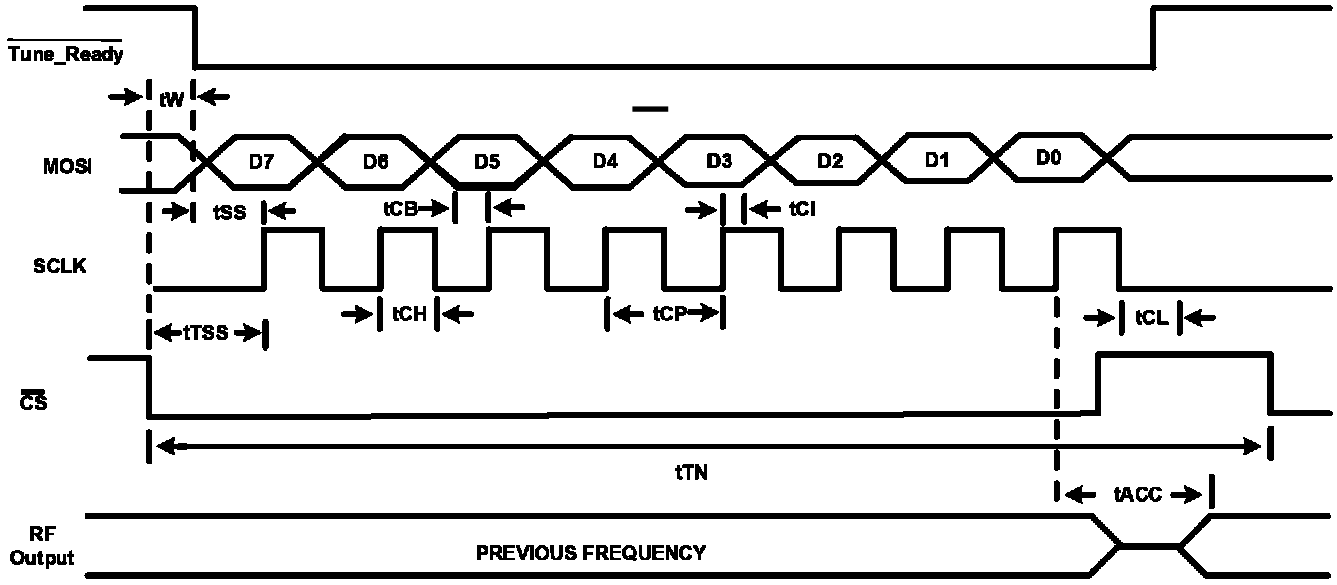
Address Input Timing Diagram Serial

Tuning resolution is 2MHz from address 0 decimal (960MHz) to 140 decimal (1240MHz).
Tuning of the filter starts when the last data clock (8th) pulse of the address is sent to the unit while the $\overline{CS}$ (Chip select) is low.

The filter will move to the correct tune channel which allows the tuned address frequency to pass while meeting all of the tuning parameters.

Symbol	Parameter	Min	Max	Units
tW	Time from Chip Select Low to $\overline{Tune\_Ready}$ Low	0	3000	ns
tSS	Setup time $\overline{Tune\_Ready}$ to SCLK*	500		ns
tTSS	Setup time Chip Select to SCLK*	2000		ns
tW	Time from Chip Select Low to $\overline{Tune\_Ready}$ Low	0	2000	ns
tCB	MOSI data to Clock High Setup	10		ns
tCH	Clock High Time	$\frac{tCP}{2}$		ns
tCP	Clock Period	125		ns
tCI	MOSI Hold Clock High	10		ns
tACC	Access time from Last (8th) SCLK edge to Fo**		6	us
tTN	Access time from Chip Select to new Chip Select	120		us

5560 SERIAL ADDRESS PROTOCOL



Address Input Timing Diagram Parallel

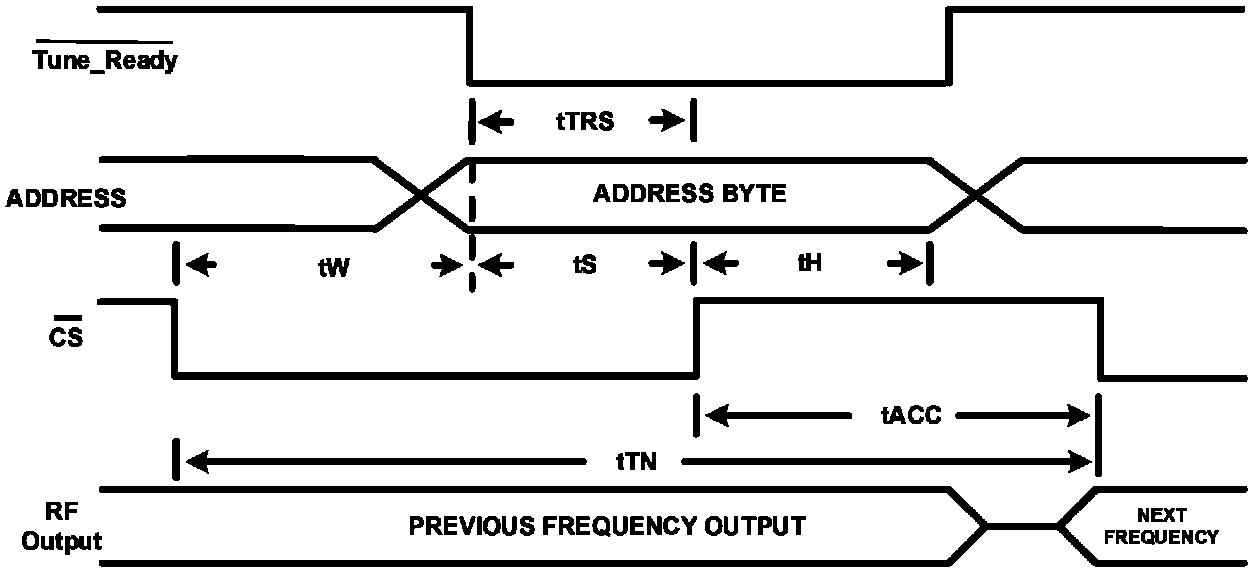
Tuning resolution is 2MHz from address 0 decimal (960MHz) to 140 decimal (1240MHz).

The tuning steps are below:

- The $\overline{\text{Tune\_Ready}}$ line starts at logic high to indicate the unit is ready to process a new tune address.
- When the filter $\overline{\text{CS}}$ line is set to logic low, the $\overline{\text{Tune\_Ready}}$ line will go low to indicate the unit is ready for the new tuning address.
- The new tuning address should be held for 300ns, then take the $\overline{\text{CS}}$ line high.
- The tuning address should be held for 300ns minimum for processing.
- The $\overline{\text{Tune\_Ready}}$ line will go high to indicate the new tuning address processing is complete.
- The new tuning channel will be ready in 6us max from the time the $\overline{\text{CS}}$ line goes high.
- Hold the $\overline{\text{CS}}$ line high for at least 120us minimum before sending a new tuning address.

Symbol	Parameter	Min	Max	Units
tW	Time CS/Strobe Low to $\overline{\text{Tune\_Ready}}$ Low	0	3000	ns
tTRS	Time $\overline{\text{Tune\_Ready}}$ Low to $\overline{\text{CS}}$/Strobe High	600		ns
tS	Address Setup Time	300		ns
tH	Address Hold Time	300		ns
tACC	Access time from $\overline{\text{CS}}$/Strobe High to Fo		6	us
tTN	Access time from $\overline{\text{CS}}$/Strobe to new $\overline{\text{CS}}$/Strobe	120		us

5560 PARALLEL ADDRESS PROTOCOL



Environmental Specification Standards

Temperature:

- High temperature shall meet MIL-STD-810E, Method 501.3, Procedure I to 125°C storage, and procedure II to 85°C operating.
- Low temperature shall meet MIL-STD-810E Method 502.3, Procedure I to -57°C storage, and Procedure II to -40°C operating.

Vibration:

- MIL-STD-810E Method 514.4

Shock:

- MIL-STD-810E Procedure VI, Method 516.4

RoHS Compliance:

- Unit is RoHS compliant

Lead Plating:

- ELECTROLESS NICKEL, TYPE 1, CLASS 1, Cu/Ni P7, 100 MICRO INCHES (0.0001 INCHES) MINIMUM, IMMERSION GOLD PLATE 2 TO 6 MICRO INCHES (0.000002 TO 0.000006 INCHES) ON OUTER LAYERS.

Solder Reflow:

- TBD

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