The pre-postselector PPS1.5-30 is digitally tunable filter operating from 1.5 MHz to 30 MHz.PPS1.5-30 can be included either in receiving or transmitting tract by input/output commutation. This module consists of three (3) internal tunable bandpass filters (the frequency range divided between them in the following way: 1.5-4 MHz, 4-10 MHz and 10-30 MHz) and two internal amplifiers which compensate filter's insertion losses (one of amplifiers works in receiving tract while another one works in the transmitting tract). PPS1.5-30 uses serial interface for tuning.

PPS1.5-30
Specification:

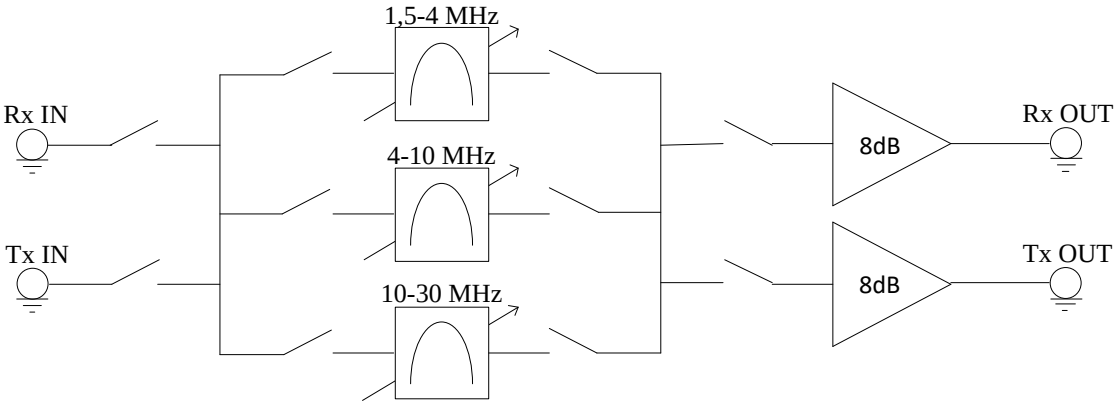
Frequency Coverage (3 bands)	1.5 to 30 MHz
Input/Output Impedance:	50 Ω
In-band Input/Output VSWR	2:1
In-band RF Power Handling	5 Watt (input)
Out-band RF Power Handling	Up to 20 Watt
In-band Second Order Intercept Point	+100 dBm (input)
In-band Third Order Intercept Point	+40 dBm (input)
Center Frequency Drift:	±80 PPM/ºC
Tuning Control	Serial
Tuning Speed	150 µS
DC Power Consumption (Static)	5V @ 800mA 12V @ 300mA
Shape Factor (30 dB/ 3 dB)	7 typical
Operating TemperatureRange	-40°C to +85°C
Size:	162x92x48 mm
Weight:	420 g
RF Connection	MCX

PPS1.5-30 filters' specification

FrequencyRange	#	Bandwidth (3 dB), %	Insertion Loss, dB	Shape factor (30 dB)		
				Overall	Low Side	High Side
1.5-4 MHz	5	4.6/5.5	5.0/5.9	5.8/6.1	6.8/7.3	4.8/4.9
	4	3.6/4.5	5.2/6.2	5.9/6.2	6.9/7.2	4.9/5.0
	3	2.5/3.5	5.6/6.5	5.8/6.2	6.8/7.1	4.8/5.0
	2	1.7/2.4	6.1/6.9	5.9/6.1	6.7/7.2	5.1/6.1
4-10 MHz	5	4.6/5.5	4.9/6.3	6.0/6.2	7.0/7.2	5.0/5.1
	4	3.6/4.5	5.3/6.7	5.9/6.2	7.1/7.6	4.8/5.0
	3	2.5/3.5	5.8/7.0	6.0/6.2	6.9/7.2	4.9/5.2
	2	1.7/2.4	6.2/7.3	6.1/6.2	6.9/7.0	5.3/5.4
10-30 MHz	5	4.6/5.5	4.3/5.2	6.1/6.3	7.0/7.4	5.1/5.2
	4	3.6/4.5	4.7/5.8	6.1/6.5	7.3/8.0	4.9/5.2
	3	2.5/3.5	5.1/6.2	5.9/6.0	6.6/6.7	5.2/5.4
	2	1.7/2.4	5.4/6.6	5.8/6.1	6.6/7.2	5.0/6.1

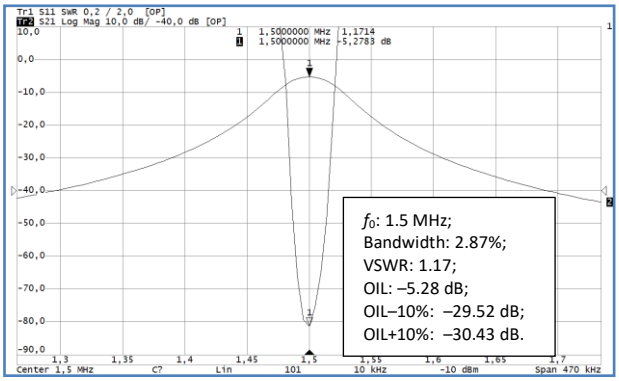
Note: table values are shown as average/maximum.

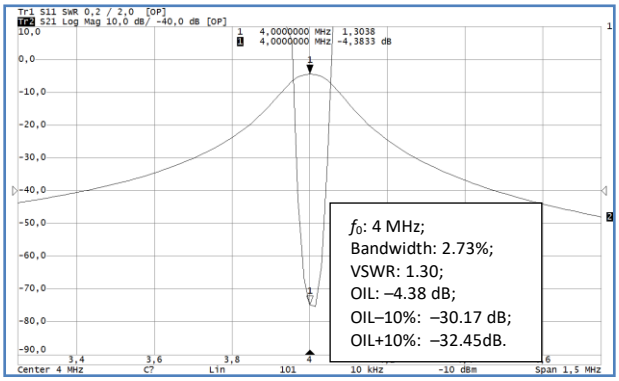
PPS1.5-30 block diagram

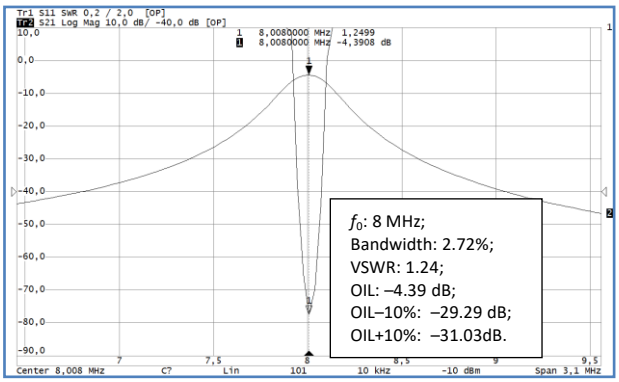


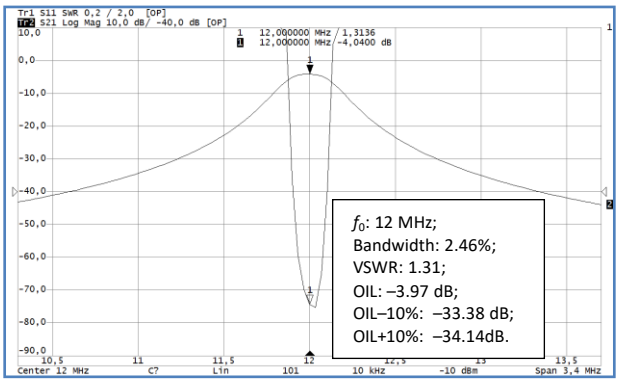
Frequency response functions and VSWR functions

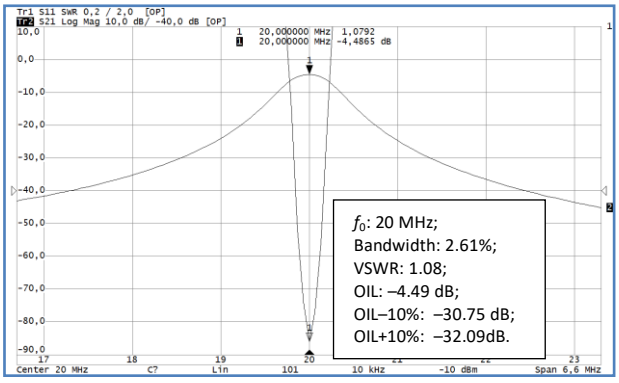
Each frequency range has 251 tuning frequencies. Some frequency response functions and VSWR functions are shown below:

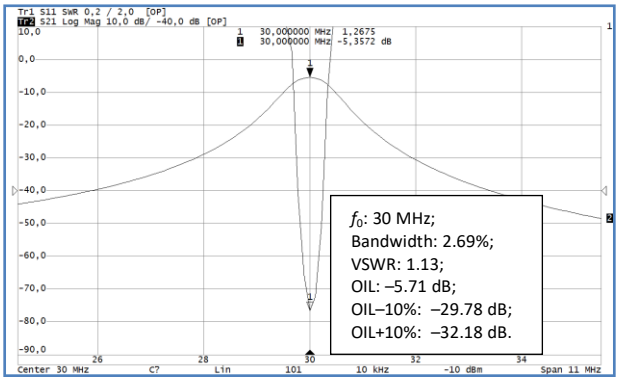








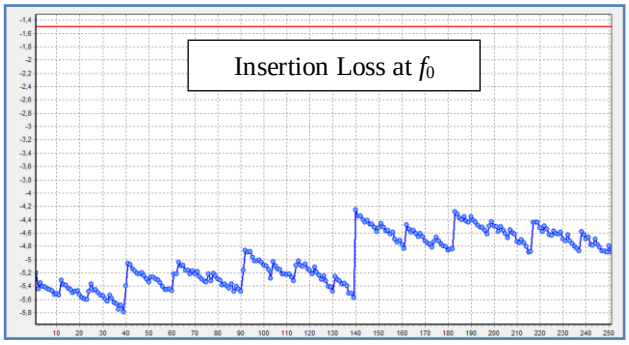


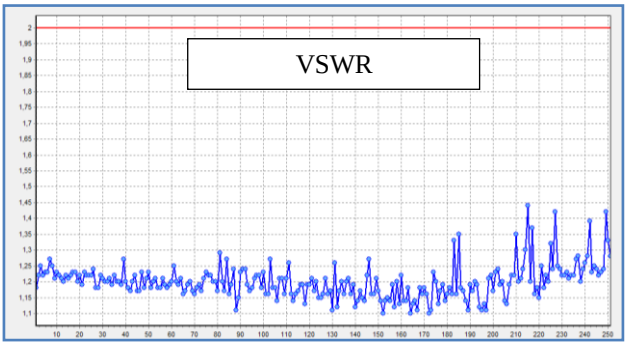


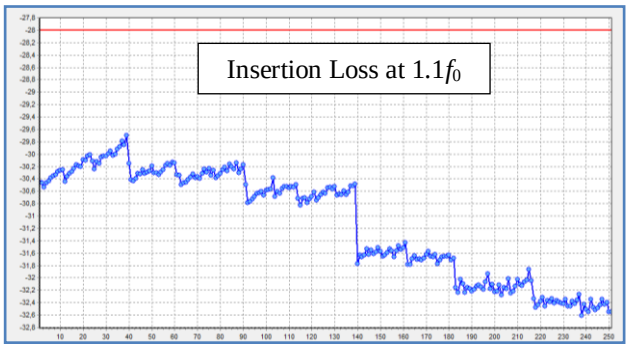
Note: f_0 — tuning frequency;VSWR — VSWR at f_0 frequency;OIL — insertion loss at f_0; OIL–10% — insertion loss at 0,9f_0;OIL+10% — insertion loss at 1,1f_0.

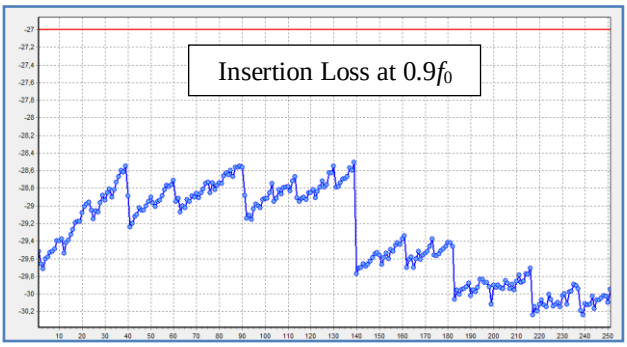
1.5-4 MHz filter performance

The following diagrams show value of Insertion Loss at f_0, Insertion Loss at $0.9f_0$, Insertion Loss at $1.1f_0$ and VSWR at each tuning frequency for 1.5-4 MHz filter.



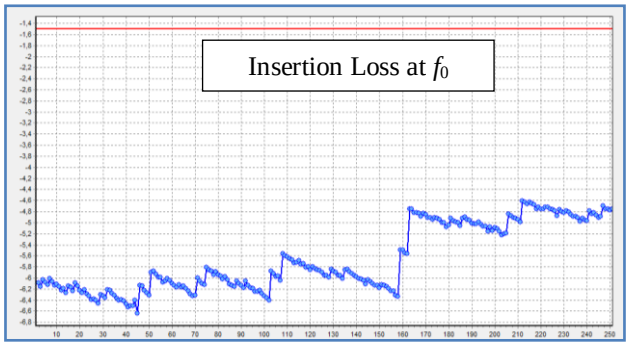


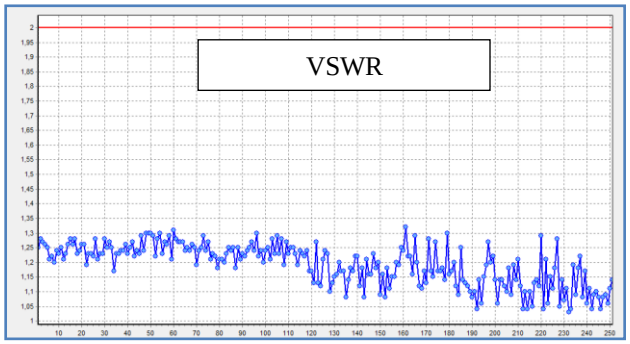


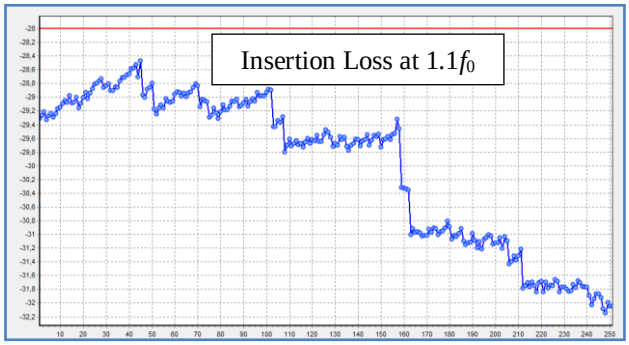


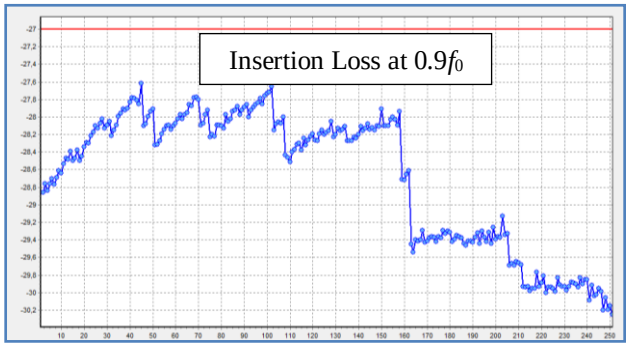
4-10 MHz filter performance

The following diagrams show value of Insertion Loss at f_0, Insertion Loss at $0.9f_0$, Insertion Loss at $1.1f_0$ and VSWR at each tuning frequency for 4-10 MHz filter.



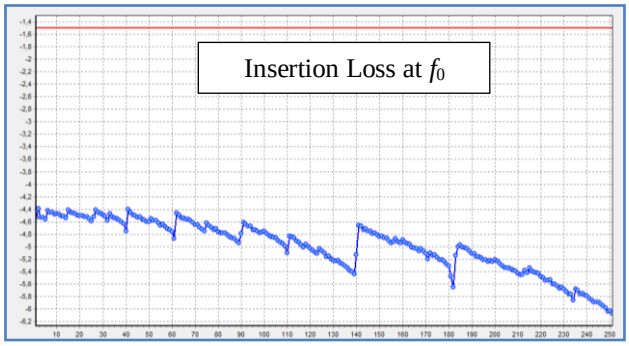


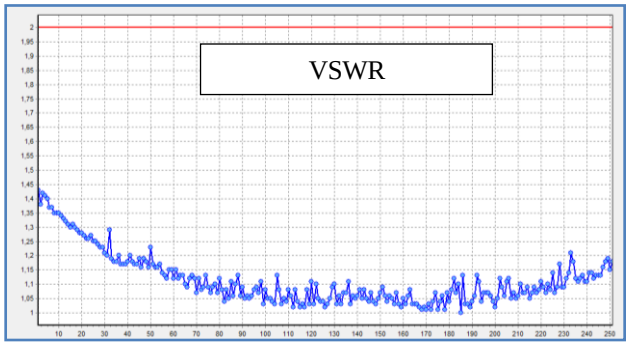


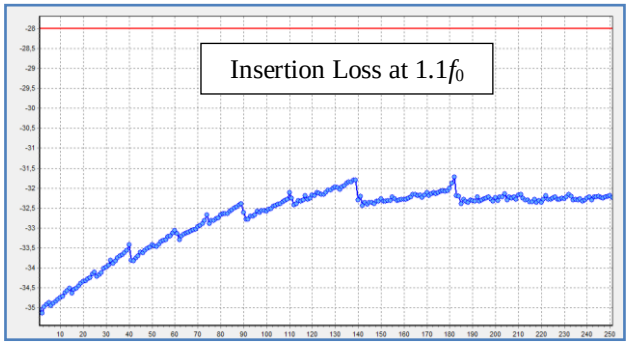


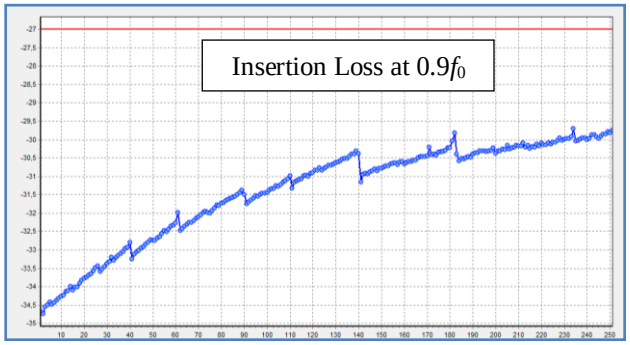
10-30 MHz filter performance

The following diagrams show value of Insertion Loss at f_0, Insertion Loss at $0.9f_0$, Insertion Loss at $1.1f_0$ and VSWR at each tuning frequency for 10-30 MHz filter.









Pinout& Ratings

PIN #	Reference designator	Description	Notes
1-5, 10	N/C	No Connect	—
6	PTT	SWRX/TX	Rx mode: 5V; Tx mode: 0V
7, 9, 11	GND	Digital/RF Ground	—
8	VCC	+5V Power Supply Input	4.75 to 5.25V @ 800mA
12	VDD	+12V Power Supply Input	11.5 to 12.5V @ 300mA
13	STB	Strobe	Active: 0V; Inactive: +5V
14	CLK	Serial Clock	Active: 5V; Inactive: 0V
15	DI	Serial Data Input	Active: 5V; Inactive: 0V

Serial interface description

Serial interface consists of 3 signals: CLK (clock), DI (data input), STB (strobe). Data input is 11 bits code. First 8 bits determine the tuning frequency and the last 3 bits determine the frequency band.

Frequencybandcode

Frequency band	D9	D10	D11
1,5–4 MHz	1	0	0
4–10 MHz	0	1	0
10–30 MHz	0	0	1

Tuning frequencycode

Tuning frequency code is calculated by X_{10} conversion into binary code. X_{10} is calculated by the formula:

$$X_{10} = \left(\frac{f_0 - f_l}{f_h - f_l}\right) \times 250\,,$$

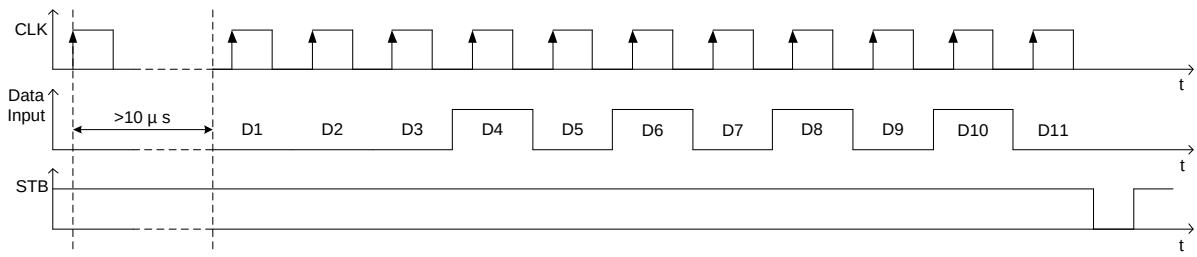
f_0 — tuning frequency; f_l — low frequency of the band; f_h — high frequency of the band.

Example

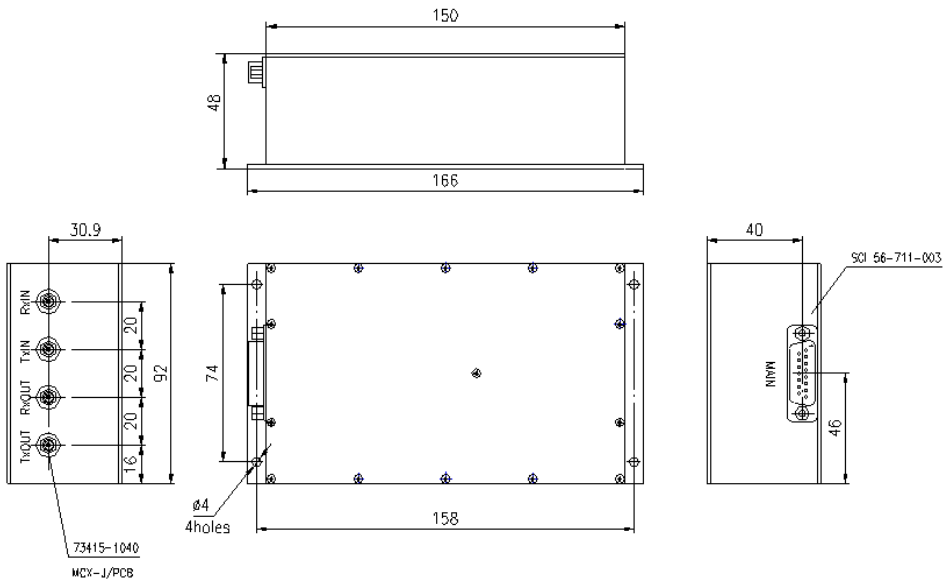
If you wish to tune to 8.02 MHz, the tune word is:

$$X_{10} = \left(\frac{8{,}02 - 4{,}00}{10{,}00 - 4{,}00}\right) \times 250 \approx 168;$$

$$168_2 = 10\ 10\ 10\ 00.$$



Mechanical Outline



Note:sizes are shown in millimeters.