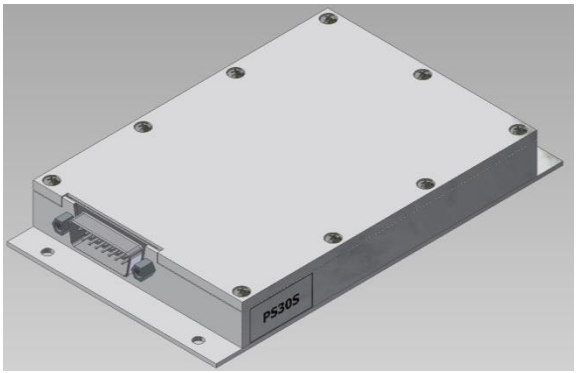


The preselector PS1.5-30S is digitally tunable filter operating from 1.5 MHz to 30 MHz. This module consists of two (2) internal tunable bandpass filters (the frequency range divided between them in the following way: 1.5-6.7 MHz and 6.7-30 MHz) and the internal amplifier (it compensates filter's insertion losses). PS1.5-30S uses serial interface for tuning.

PS30S
Specification:

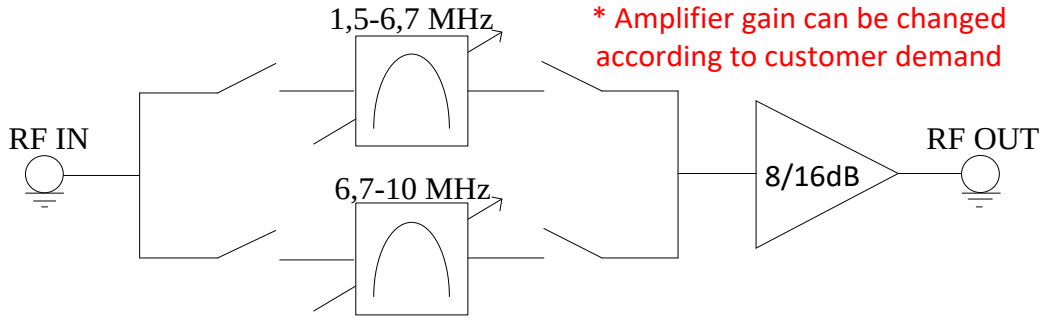
Frequency Coverage (3 bands)	1.5 to 30 MHz
Input/Output Impedance:	50 Ω
In-band Input/Output VSWR	2:1
In-band RF Power Handling	5 Watt (input)
Out-band RF Power Handling	Up to 20 Watt
In-band Second Order Intercept Point	+100 dBm(input)
In-band Third Order Intercept Point	+40 dBm (input)
Center Frequency Drift:	±80 PPM/ºC
Tuning Control	Serial
Tuning Speed	10 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:	146x88x18.2 mm
Weight:	280 g
RF Connection	MCX

PS30S filters' specification

FrequencyRange	#	Bandwidth (3 dB), %	Insertion Loss, dB	Shape factor (30 dB)		
				Overall	Low Side	High Side
1.5-6.7 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
6.7-30 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

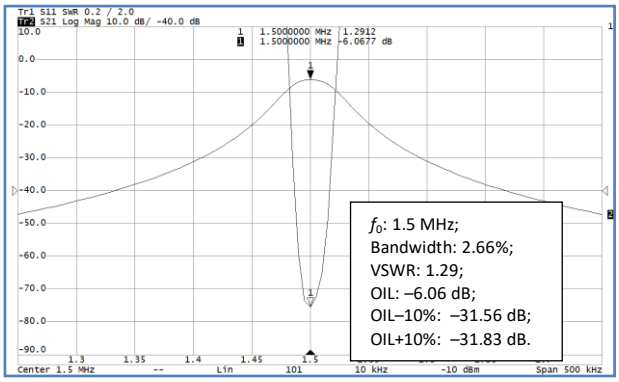
Note: table values are shown as average/maximum.

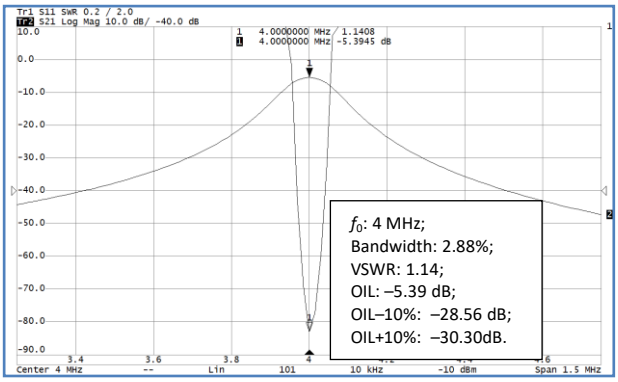
PS30S block diagram

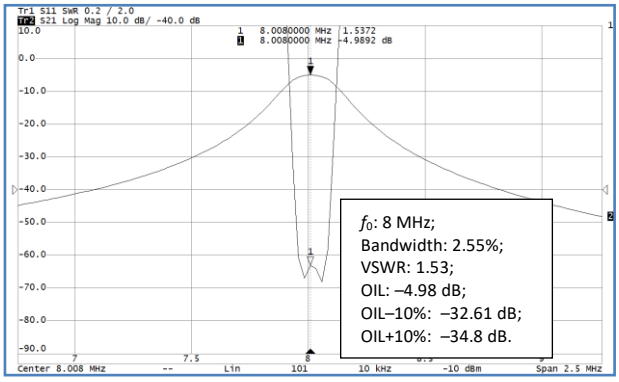


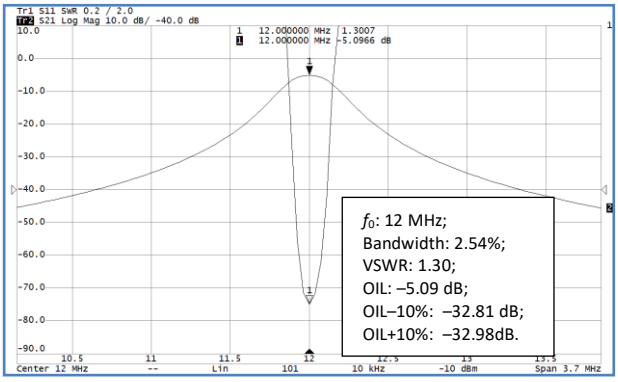
Frequency response functions and VSWR functions

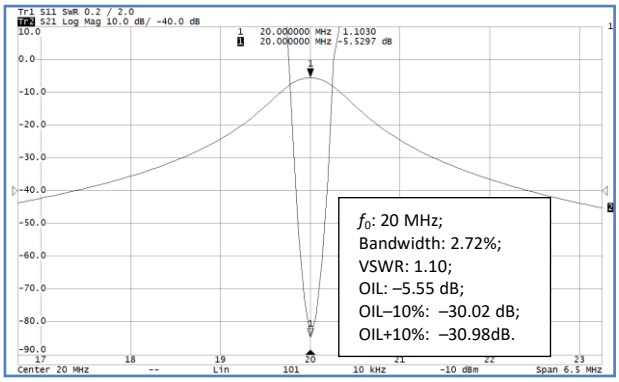
The first frequency range (1.5-6.7MHz) has 364 tuning frequencies and the second frequency range (6.7-30MHz) has 389 tuning frequencies. Some frequency response functions and VSWR functions are shown below:

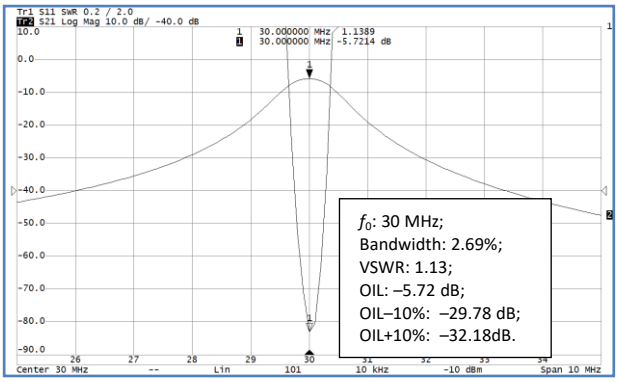








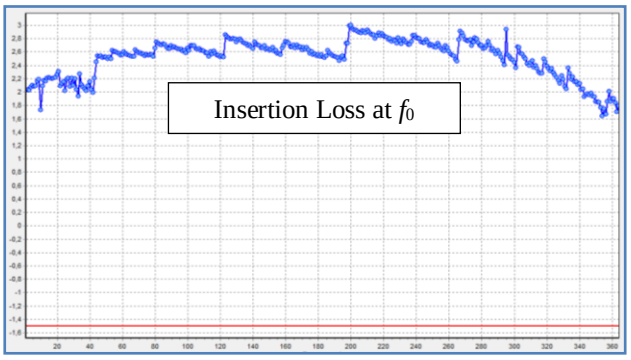


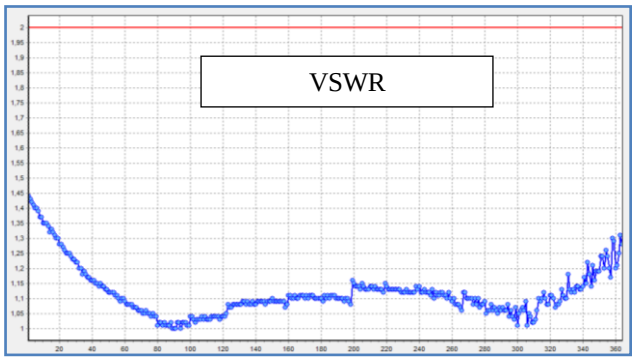


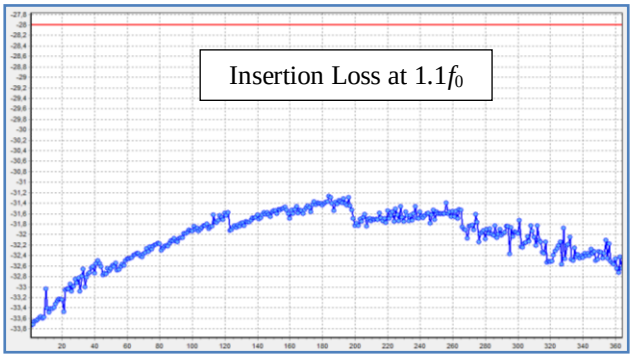
Note: f_0— tuning frequency;VSWR — VSWR at $f_0$frequency;OIL — insertion loss at f_0; OIL–10% — insertion loss at0,9f_0;OIL+10% — insertion loss at 1,1f_0.

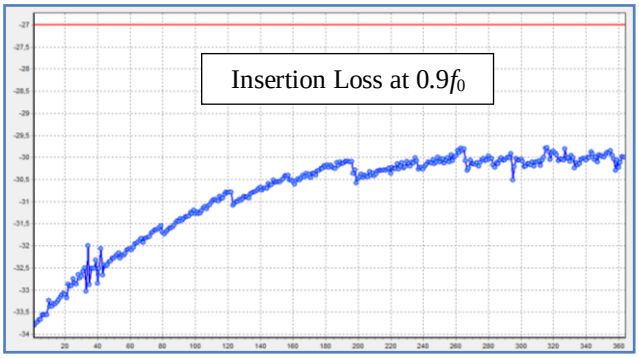
1.5-6.7 MHz filter performance

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 1.5-6.7 MHz filter.



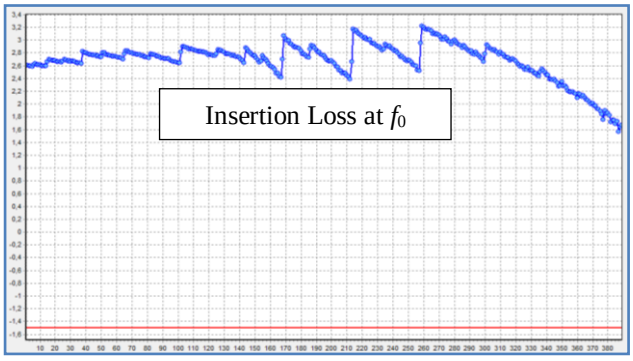


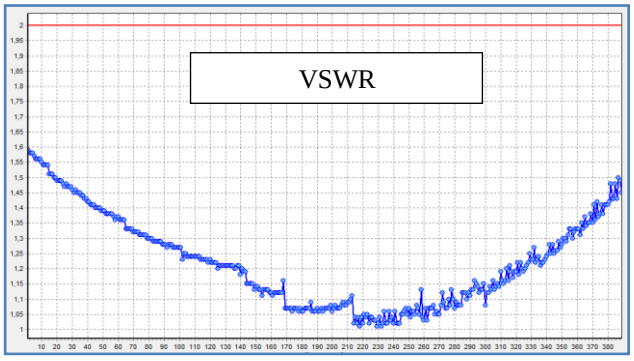


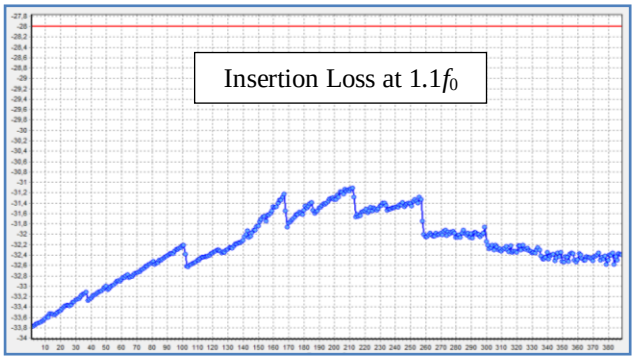


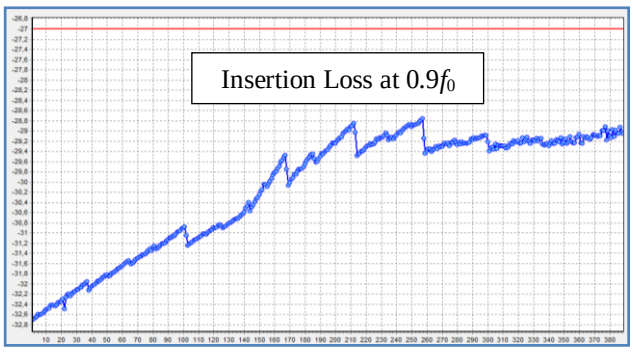
6.7-30 MHz filter performance

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 6.7-30 MHz filter.









Pinout & Ratings

PIN #	Reference designator	Description	Notes
1-6, 10	N/C	No Connect	—
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: 5V; Inactive: 0V
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:

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

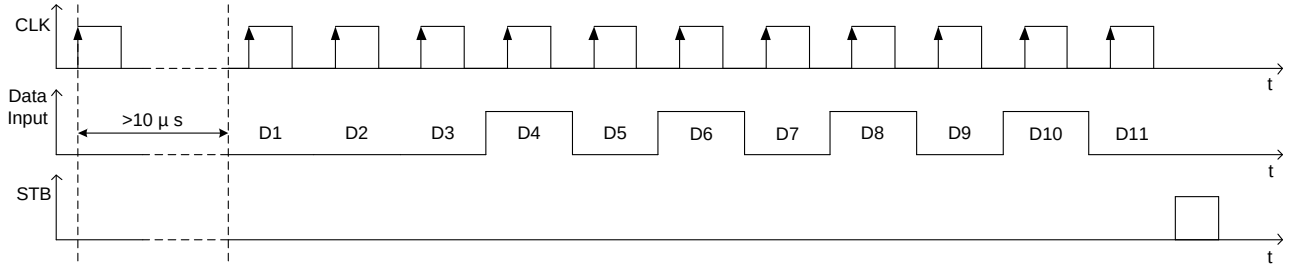
f_0 — tuning frequency; f_l — low frequency of the band;f_h — high frequency of the band.

Example

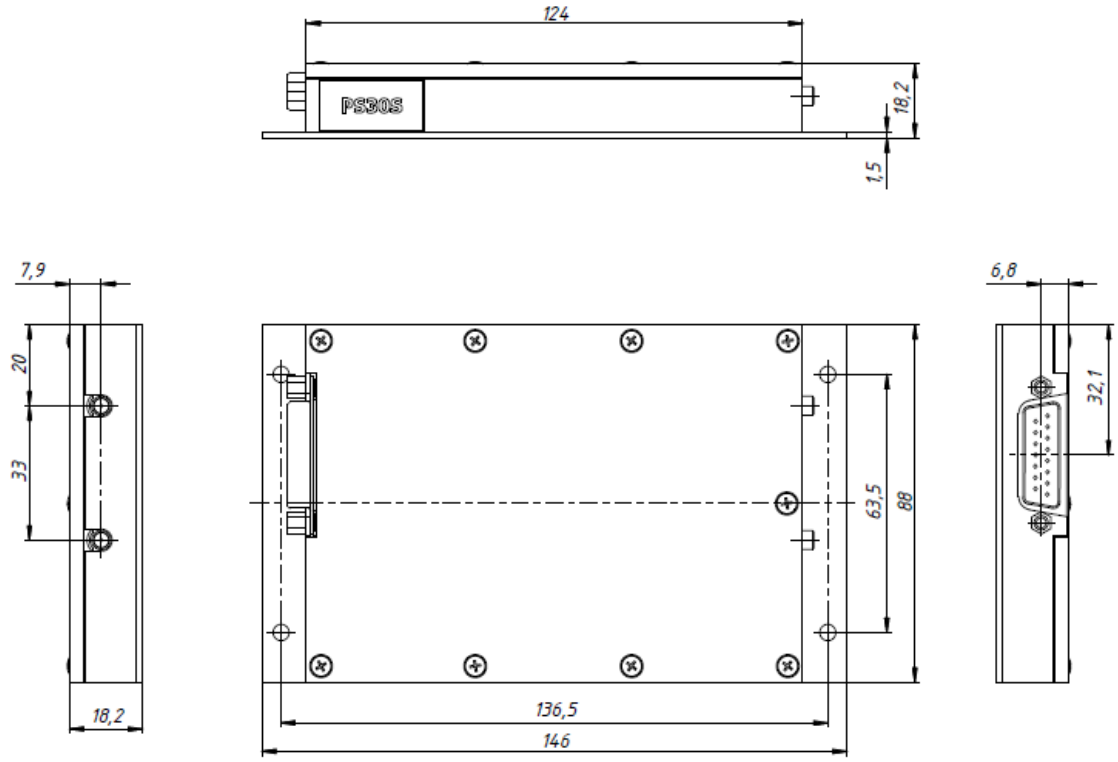
If you wish to tune to 8.02 MHz, the tune word is:

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

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



Mechanical Outline



Note:sizes are shown in millimeters.