

The 5009b Dual Frequency Synthesizer module provides two independent RF frequency synthesizers covering the frequency range 20MHz to 6.4 GHz. Each synthesizer is phase locked to the same internal TCXO reference or can be locked to a high stability external reference. Programming the non-volatile settings can be accomplished using the 5009 Configuration Manager or any terminal emulation program including the Valon 5000term.exe through the micro-USB interface. List Mode and Sweep Step mode is also provided as well as serial TTL control through the User Port.



Electrical Specifications

DC Input

<p>Input Voltage Range</p> <p>Absolute Max Operational Max Recommended Operation Voltage Reduced performance Min non-operational</p>	<p>+16V to -16V (reverse protected) +8v +6V +4.8 to 5.8V (output power reduced) +3.5V (synthesizer remains locked and serial port ok) >10V for >10sec resets the synthesizer to factory default settings</p>
<p>Input Current</p> <p>Source 1 and Source 2 on Only Source 1 or Source 2 on Source 1 and Source 2 off</p>	<p>400mA Output enabled 250mA Output disabled 300mA Output enabled 150mA Output disabled 70mA both disabled (standby)</p>
<p>DC Input Connector</p>	<p>Hirose DF3A-2P-2DS Mates with Hirose DF3-2S-2C plug and pre-crimped wire H2BXT-10112-R4 (red) and H2BXT-10112-B4 (black). Custom 20" dc cables supplied with synthesizer, additional cables available.</p>

Full performance is obtained when the dc input voltage is in the operational range. If the input voltage is increased above the operational range, the output will be disabled and the synthesizer will be in standby mode. The synthesizer may be operated with reduced RF output power in the reduced performance voltage range. If the dc voltage is in the Min non-operational range, the output will be disabled but all user settings will be retained. Input voltages below the minimum non-operational range will cause a reset condition.

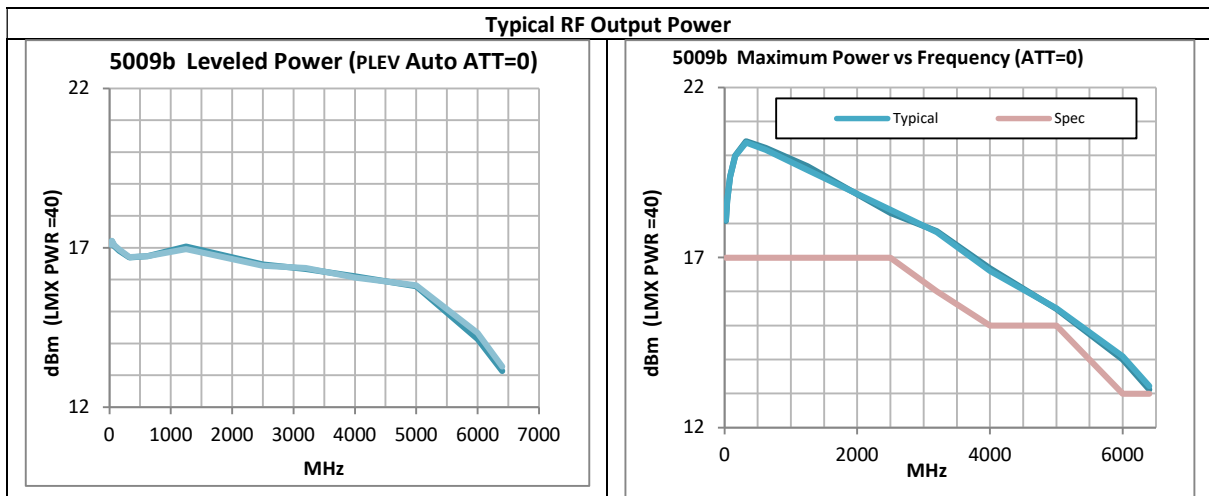
Note: The 5009b is **NOT** USB powered. You may purchase a Valon **PS6V-1** power supply kit.

RF Synthesizer Specifications (Unless otherwise noted, all specifications apply equally to both synthesizers.)

Frequency Range	20MHz to 6.4GHz						
Frequency Increment	1Hz (f <4294MHz), 10Hz (F> 4294MHz)						
Frequency Lock Time	<20uS						
Sweep rate	0.1ms to 1sec in 0.1ms steps						
Phase Noise	Typical phase noise						
		100Hz	1kHz	10kHz	100kHz	1MHz	
3GHz to 6GHz		-73	-88	-96	-96	-126	dBc/Hz
2GHz to 4GHz		-75	-93	-100	-100	-130	
1GHz to 2GHz		-90	-105	-110	-110	-136	
Harmonics	The 5009b output waveform is a clipped sine wave. Harmonics are typically 12dBc. Odd harmonics are most prominent.						
Spurious	Non-Harmonic <-60dBc except boundary spurs						
Output Return loss (dB)	ATT=0dB	ATT=3dB		ATT=15dB			
100MHz ~ 2GHz	>6	>12		>20			
2GHz ~ 4GHz	>12	>15		>10			
4GHz ~ 6GHz	>6	>10		>10			
Source to Source Isolation	>75dB						
RF Connectors	SMA Female						

AM Modulation (depth)	0.00dB to 31.75dB
AM Frequency	0.5Hz to 10kHz ±0.5Hz
AM Waveform	50% duty cycle square wave

Maximum Output Power (PLEV=40, ATT=0)	0~3000 MHz	Min dBm	Typ. dBm	Max. dBm
	3~4 GHz	>17	18	<20
	4~6 GHz	>15	16	<17
		>13	15	<16
Minimum Output Power		<-30dBm		(PLEV=0, ATT=0)
		<60dBm		(PLEV=0, ATT=31.5)
Attenuator Relative Attenuation Range	0.00dB to 31.75dB			
Attenuation Step Size	0.25dB			
RF output On/OFF	When off power is reduced by ~30dB			



Reference Frequency

Internal Reference	Frequency Initial Accuracy Temperature Stability Reference Trim Range Reference Trim Resolution	10.000MHz $\pm 0.5\text{ppm}$ (23°C) can be zeroed with reference trim command $\pm 0.3\text{ppm}$ -20°C to +70°C (case temp) $\pm 10\text{ppm}$ 0.02ppm
External Reference	Frequency Range Input power range	50Ω 10MHz to 100MHz 0dBm to +13dBm max.
External Reference Connector	SMA Female Note: Ext input is ac coupled to synthesizer but dc coupled to internal VCTCXO control circuit. External reference should be disconnected when using internal reference.	
EFC Electronic frequency Control at external reference input	Pulling range $>\pm 10\text{ppm}$ Voltage $\pm 3\text{V}$ Input resistance 20kΩ Frequency response 0Hz~>5kHz	

Interface

USB	Micro-B socket FTDI virtual com port 9600, 8, N,1,N default- Automatically shift to 115200 with GUI See FTDI for drivers for your computer. Note: The Configuration Manager GUI will automatically configure the USB port and switch to 115200 baud rate.
USER PORT	3.3V TTL TXD & RXD <i>(see section 5)</i> 115200,8,N,1,N default Hirose DF11-8DP-2DS Mates with Hirose DF11-8DS-2C plug and pre-crimped Wire H3BXT-10112-** (Digi-Key) LMS-1 LIST Mode switch and cable accessory is also available. External Trigger Input: 3.3V TTL Hi-Z input
Selectable Baud Rates	Either port: 9600, 19200, 38400, 57600,115200, 230400, 460800, 921600

Environmental

Operational full specifications:	-20°C~+70°C (case temperature)
No damage functional:	-40°C~+85°C (case temperature)
Humidity:	5%~95% minimal condensation allowed
IP rating:	50 No water protection.

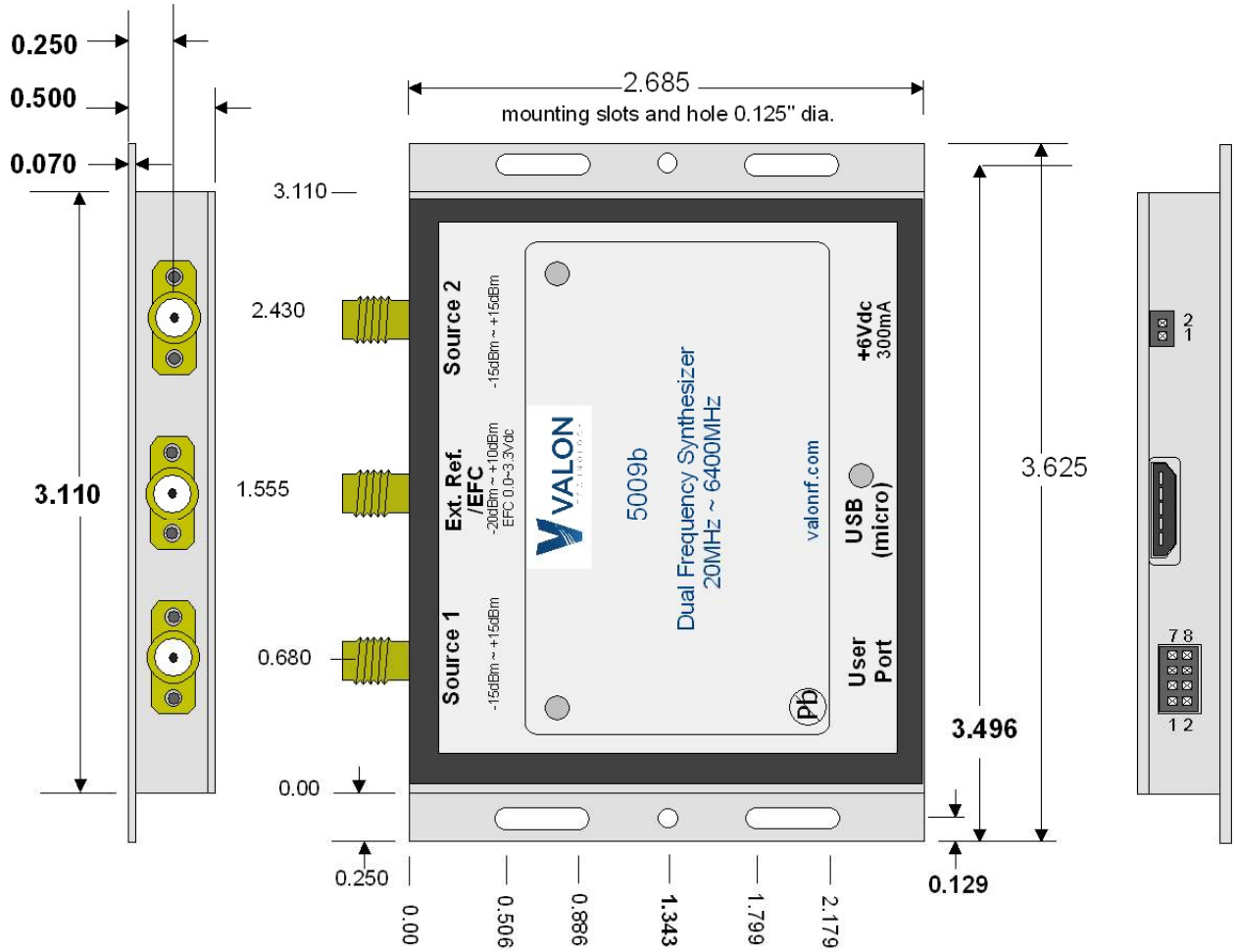
Mechanical Dimensions

3.625"W x 2.685"L x 0.50"H

Weight: 0.2lbs, 91g

Material: AL-6061-T6

Finish: Clear Alodine (conductive)



Dimensions are Inches