RF1453 CW and Analog High Power (+24dBm) Signal Generator 2-13GHz

General Specification

Frequency range 2-13GHz
Output power: +24dBm max.
Reverse power protection.
Dynamitic power range: 28dB
Sweeping step: 1MHz~99MHz
Stability: 5x10E-7 / hour
Switching time 5~30ms
Low phase noise -75dBc/Hz (100KHz offset)
Control interface: RS232 (GPIB optional)
Modulation available upon request: FM, AM, QPSK, BPSK, OFDM, DSSS spread signal.

Summary

RF1453 is a low cost version CW and Analog signal generator. The equipment uses the temperature compensated crystal oscillator (TCXO) as reference which is locked with 10MHz GPS signal. The TCXO works with the frequency multipliable matrix, so that the signal generator can achieve the frequency stability up to 5x10E-7 per hour. RF1453 can generate signal 2-13GHz with 1MHz~99MHz sweeping step. Higher output power up to 24dBm CW . The GPIB and RS-232 interfaces are also available for automatic control and operation.

General Specification.				
Specification	**unit**	**min**	**typ.**	**max.**
Frequency output	GHz	2		13
Frequency step	MHz	1		99
Output Power (P1dB)	dBm	9		24
Output Power Accuracy	dB		±1.2	±2.5
Power adjustment range	dB		28	
Frequency Accuracy (relative)			5x10E-7	
Frequency Stability	dBc/Hz/Hour	-75	-70	-60
Sweeping locking Time (refer 10MHz)	ms	5	20	30
Inband harmonics	dBc		-18	
Frequency Display	bit	5 bit (MHz)		
Power Display	bit / dBm	3 bit (0.1dBm)		
Power Supply	AC V	110 / 220		
Power consumption	Watt	100		
RF connector	SMA-Female			
Dimension and Weight	19" x 16" x 3.5" / (13.2lb.)			
Communication Protocol	RS232 (DB9) /GPIB (optional)			

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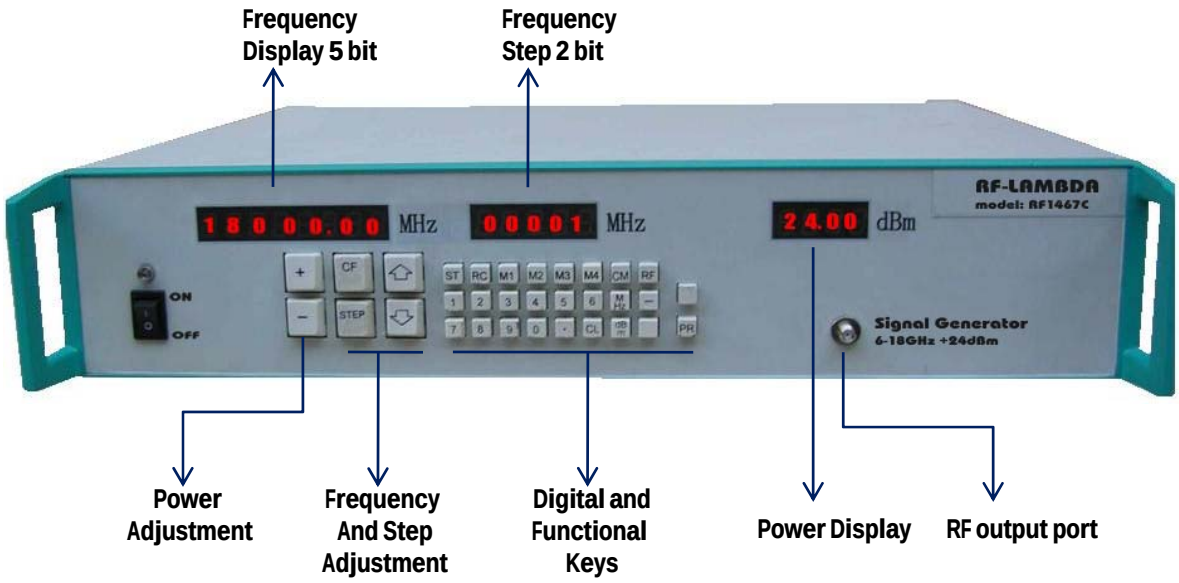
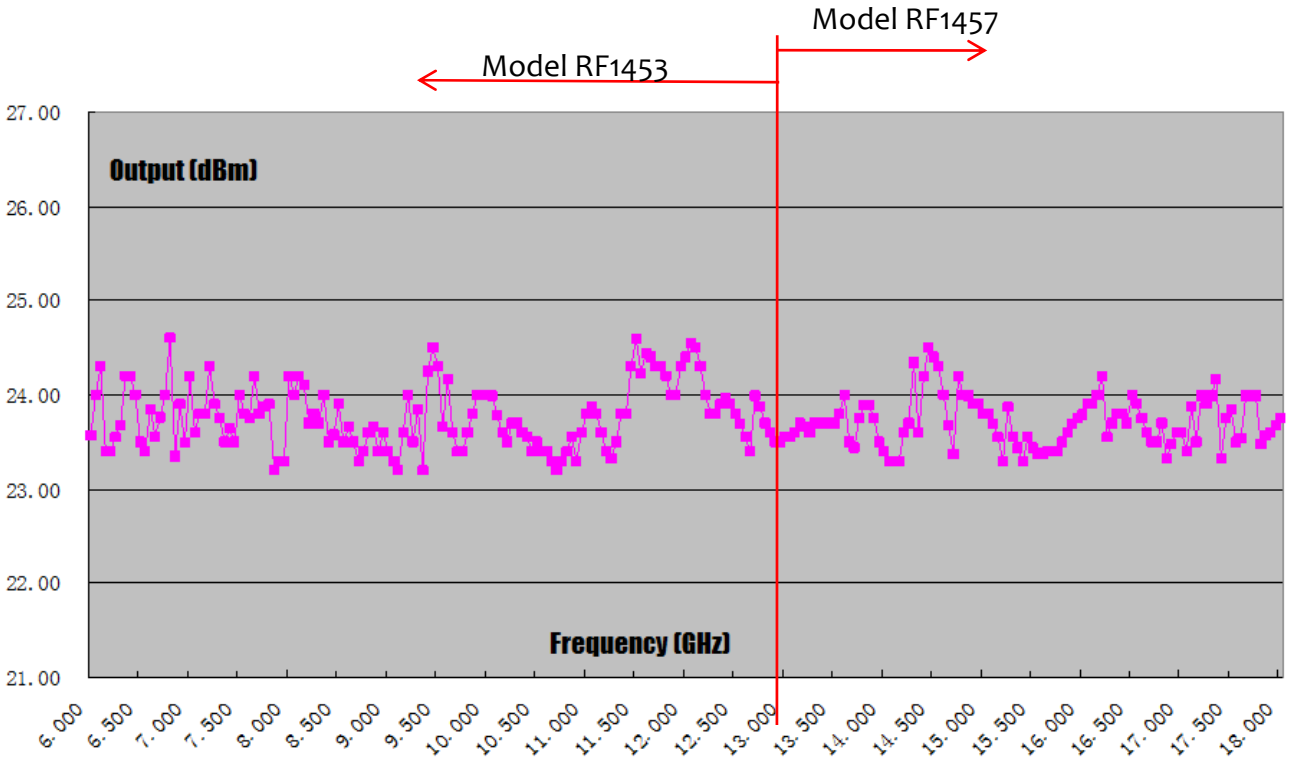


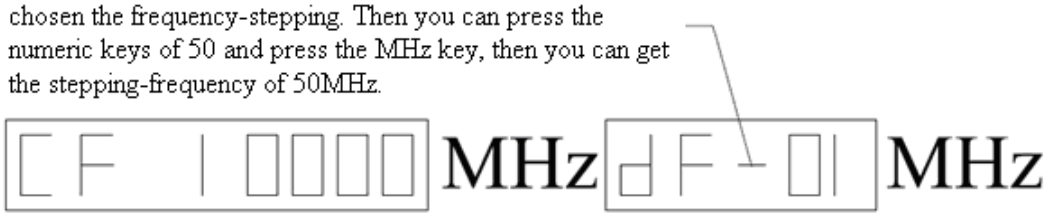


• **Frequency display** **default frequency 10000MHz，Step：1MHz**

When the horizontal line appear, it means that you have chosen the frequency. Then you can change the frequency by pressing the increasing and decreasing key, or you can press the numeric keys of 03000 and press the MHz key, then you can get the frequency of 3GHz.

• **Step Display**

When the horizontal line appear, it means that you have chosen the frequency-stepping. Then you can press the numeric keys of 50 and press the MHz key, then you can get the stepping-frequency of 50MHz.



• **Power Display** **Default: +9dBm**

The display of -10dBm: 

Signal Generator Default Setting (Power ON)

• Center Frequency	10GHz
• Output power	0dBm
• Frequency step	1MHz
• User-defined values	

M1 CF—6000MHz **0** dF—50MHz **0** Maximum power 5dBm
M2 CF—8000MHz **0** dF—50MHz **0** Maximum power 5dBm
M3 CF—15000MHz **0** dF—50MHz **0** Maximum power 5dBm
M4 CF—13000MHz **0** dF—50MHz **0** Maximum power 5dBm

KEYS	use
＋ －Power keys	Once pressed, the power will be increased or decreased by 1dB.
CF Frequency Key	After pressing this key, the horizontal line will appear in the frequency screen. Then you can set the frequency. (Range: 02000~13000MHz) Notice: You should set the 5 digital frequency numbers within the range.
STEP key	After pressing this key, the horizontal line will appear in the step screen. Then you can set the step. Range: 01~99MHz, Notice: You should set the step number of double-digit within the range.
Increase key and decrease key ⇧ ⇩	Increase or decrease the frequency by the pre-set step.
0~9 numeric key	Set the frequency value: 02000~13000, the step value: 01~99, or the power value: －
CL Clear key	Clear the number.
MHz Confirmation key	When pressing this key, it means the frequency you set is valid.
dBm Confirmation key	When pressing this key, it means the power you set is valid.
－ Minus key	When pressed, the power value is changed to a negative value, and when pressed again, it will be changed to a positive value.
PR Reset key	When pressed, it will come back to the initial frequency value of 10000, initial step value of 01, and the initial value of 00.
ST Storage key	After pressing this key and the key of M1/M2/M3/M4 you can save current frequency and step.
RC Load key	After pressing this key and the key of M1/M2/M3/M4, you can load the current frequency and step which were saved.
M1~M4 Storage bit	There are 4 different status you can save (Frequency and Step)
CM Communication key	It is used to for the serial port communication . When pressed, you can turn on the communication, then you will see the letters of “con” in the step screen, and you can turn it off by just pressing this key again.
RF Radio frequency switch	When pressed, Power screen shows: OFF , which means radio frequency is turned off. When pressed again, it will be turned on.

1. Modify frequency

Method No. 1

Keyboard operation	Frequency display and instruction
Press the "CF" key	There is a "-" between the letter of "CF" and the frequency value.
Press the numeric keys in the frequency range from of 02000 to 13000.	Each time you press a numeric key, the frequency value will move right by one digit in the frequency screen. If the value is out of range, the screen will show the maximum frequency value.
If the input is wrong, just press the "CL" key.	The frequency screen will resume the value which was shown last time.
Press "MHz" key to confirm	The frequency value you set will be valid.

Method No. 2

Keyboard operation	Frequency display and instruction
Press " " key 	Increase or decrease the frequency by the step value which you set.

2. Modify Power

Keyboard operation	Frequency display and instruction
Press the increase or decrease key	Increase or decrease the power value by 1dBm
Press the numeric keys in the power value range from -9~+11dBm	Each time you press a numeric key, the Power value will move left by one digit in the power screen.
Press the "—" key	The value switch between positive and negative.
Press the "dBm" to confirm	When the output power value is wrong or is out of range of local device, the power value will turn to its maximum value.

3. Modify Step

Keyboard operation	Frequency display and instruction
Press the "STEP" key	There is a "-" between the letter of "dF" and the step value.
Press the numeric keys to input the step value	Set the value in the range from 01 to 99.
If the input is wrong, just press the "CL" key.	The step screen will resume the value which was shown last time.
Press the "M/Hz" to confirm	The frequency value you set will be valid.

4. save user-defined frequency and power value setting

Keyboard operation	Frequency display and instruction
Press the "ST" key	Load
Press a key among M1, M2, M3 or M4 to choose the storage address.	The screen will display those saved status.

A. Load pre-settings of frequency and power value

Keyboard operation	Frequency display and instruction
Press the "RC" key	CALL
Press a key among M1, M2, M3 or M4 to choose the status form the storage address.	The screen will display the saved status.

B. Communication function

Keyboard operation	Frequency display and instruction
Press the "CM" key	It will display "Con", and the system is in the serial port communication mode. Meanwhile, other keys don't work anymore. When pressing this key again, the device will exit the serial port communication mode.

C. Radio frequency switch

Keyboard operation	Frequency display and instruction
Press the "RF" key	It will display "OFF", and the output of radio frequency will be turned off.
Press the "RF" key again	The frequency screen will resume the value which was shown last time, and the output of radio frequency will be turned on.

D. Reset

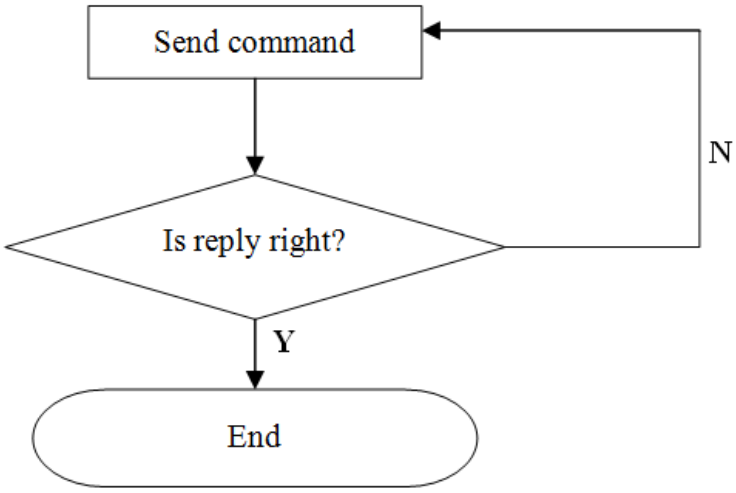
If the system doesn't work in its normal status or the screen doesn't display in its normal value, press the "PR" key to reset the system to its default value.

5. RS232 Serial Port communication Protocol

communication frame： BBH (“H” is stand for hex) + Data（4Bytes）
Baud rate：9600bps
the data is made up of one start bit, eight data bits , one stop bit , and there is no stop bit for checkout.

We use cross line for serial port pin layout.

The flow chart of the controller to send command



Set frequency and power

the controller sends: **BBH + 4bytes data**
4bytes data = 3byte frequency (The same order as the screen shows)
1byte power (MSB bit is stand for positive or negative.)

Sample:

If you want to set the frequency value at 6GHz and the power value at 10dBm, the command is :
BBH + 00H + 60H + 00H + 0AH
If you want to set the frequency value at 8GHz and the power value at 24dBm, the command is :
BBH + 00H + 80H + 00H + 18H
If you want to set the frequency value at 12GHz and the power value at 9dBm, the command is :
BBH + 01H + 20H + 00H +09H

If the signal generator return value is equal to **1DH**, it means the command was sent and received correctly.

f the signal resource’s return value is equal to **0EH**, it means the command was NOT send or receive correctly, then the controller should send command again.