

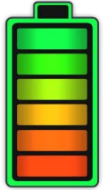


DS INSTRUMENTS
WWW.DSINSTRUMENTS.COM



RHO *The Leader in DF*
International Inc **THETA**

RT-14400WP – PORTABLE HIGH-DYNAMIC RANGE USB RF SIGNAL GENERATOR



Welcome to the industry standard for compact and affordable automated signal generation!

Simple to control in stand-alone mode, easy to program in automated setups via serial commands over the driverless USB connection, or our included software.

Signal Generator Features!

- Wide power output range (90dB)
- Compact & rugged enclosure
- Battery-powered with internal charging
- Front settings control buttons
- Wide frequency coverage of 4+ GHz
- Simple PC control software
- industry standard SCPI command support
- Front-mounted bright OLED display
- Reference source auto-detection
- American made for high reliability

RT-14400WP Specifications:

- Frequency Range: 35-4400 MHz
- Power output: -80 to +10dBm
- Power control: 0.5dB steps & variable
- Phase Noise: 4.4GHz: -82dBc @ 10KHz
- Harmonics: < -12dBc typical
- **Dimensions: 29mm x 70mm x 105mm**
- **Weight: ~250g**
- Min frequency step size: 40Hz – 3KHz
- Input Voltage: 5V Standard USB Type-C
- Input current: ~1.0A
- RF Connector: SMA
- Reference input: 10MHz MCX
- Internal reference: 10MHz ± 2.5 PPM TCXO
- Internal Battery: 2.5Ah Lithium-Ion

MADE IN

U. S. A.

Distributed by:
RHOTHETA International Inc

8201 Peters Rd Ste 1000
Ft Lauderdale FL USA
+1 (954) 495-8700

info@rhothetaint.com

Thanks for your business!



-Key Features-

- Wide Frequency Coverage
- Calibrated RF Power Output
- 90dB RF Output Step Attenuator
- 15dB Vernier Range
- USB COM Interface
- Industry Standard SCPI Commands
- OLED Display and Control Buttons
- Battery Powered
- Internal Charging
- Very Cost Effective
- Incredibly Compact
- Conveniently USB Powered

RT-14400WP

PORTABLE WIDEBAND SIGNAL GENERATOR



RT-14400WP - A wideband RF Signal Generator

The RT-14400WP signal generator from DS Instruments enables users to generate high quality RF/ Microwave signals quickly and easily. An OLED display and interface buttons allow frequency selection, attenuator control, and RF output ON/Off without need for a host PC. The RF output covers 7 octaves from 35 to 4400MHz. The produced waveform is fully synthesized using modern fractional N synthesis. The final step size of the RF output varies from a maximum of ~3KHz to less than 40Hz depending on band of operation. This synthesized source has its own internal precision 10MHz TCXO oscillator, and can accept an external reference signal if needed.

Power output level can be controlled via internal step attenuator over a range of 90dB in 0.5dB steps, and also has a separate 15dB power vernier setting. RF output power is calibrated to a maximum output level of +10dBm. Higher output is possible when in un-calibrated mode.

Ease of Use

The RT-14400WP signal generator can be controlled from the front panel interface or by the USB port and a host PC. The user simply connects a PC to the RT-14400WP, and with provided software all settings and functions can be remotely operated in real time.

Signal Generator USB Operation

With the RT-14400WP connected to the PC via USB port, industry standard SCPI commands are used to fully control the instrument. The USB port is configured on the host PC as a virtual COM port. This feature allows users to control the signal generator for automated test applications from many different operating systems and scripting languages and environments.



RHO
International Inc

The Leader in DF
THETA



RT-14400WP

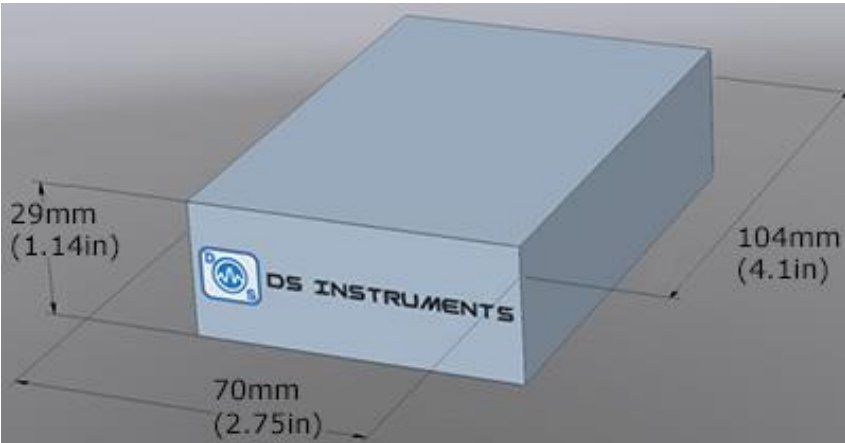
SPECIFICATIONS

Conditions: 25° C, Internal 10MHz Oscillator, USB supplied power

Parameter	Min	Max	Typ	Units
Output Frequency Range	35	4400		MHz
Output Power Range (calibrated)	-80	+10		dBm
Output Power Range (Uncalibrated mode)	-85	+12		dBm
Calibration Accuracy (output flatness) @ -40dBm to +10dBm		±3.0	±1.0	dB
@ -80dBm to -40dBm		±5.0	±1.5	dB
Phase Noise @ 4400MHz, 10KHz Offset			-82	dBc
@ 2000MHz, 10KHz Offset			-88	dBc
@ 900MHz, 10KHz Offset			-94	dBc
@ 433MHz, 10KHz Offset			-100	dBc
Step Size (decreases by 2 as RF band reduces)		2.44		KHz
Internal RF Attenuator Step Size	0.3	0.8	0.5	dB
Step Attenuator Range	0	90		dB
Power Vernier Range	0	15		dB
Typical Vernier Minimum Increment			0.05	dB
Device Temperature Rating	-30	50	25	Deg. C
Harmonic Levels – 2 nd , 3 rd		-10	-12	dBc
Reference 10MHz Input Level	-10	-25	0	dBm
Frequency Lock and Settle Time		5	2	mS
Internal Reference TCXO Stability			± 2.50	PPM
USB port Input Voltage	4.7	5.4	5.0	VDC
USB Current Requirement (Full battery)		0.6	0.5	A
USB Current Requirement (Charging active)		1.2	1.0	A
Case Dimensions			1.2x2.8x4	In
Internal Battery Capacity			2.5	Ah
Device Weight			250	g

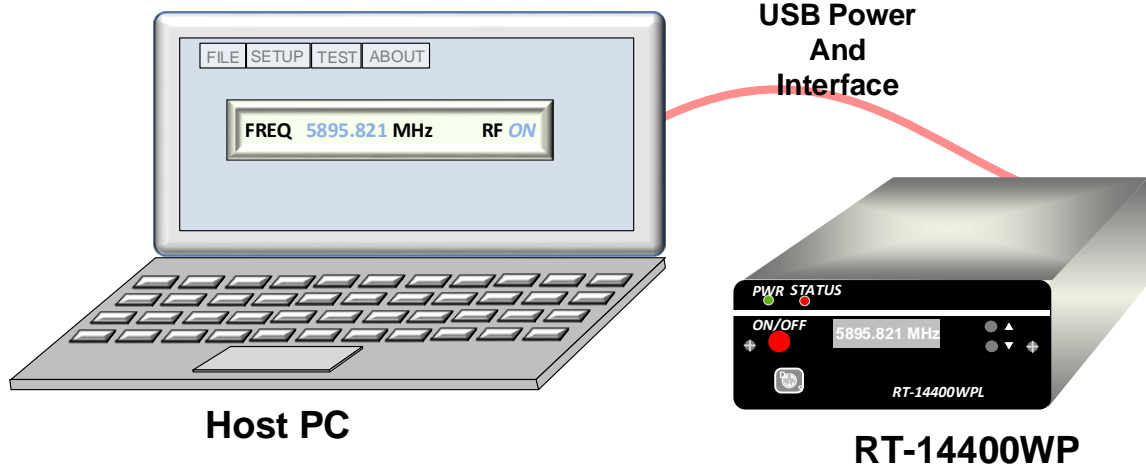
RT-14400WP

Case Dimensions & Front / Rear Panel Features



RT-14400WP

Windows GUI for remote Operation



DS Instruments RF Control

Signal Generator Control
Rev 10+
[DS Instruments](#)
[Help!](#)

COM41

SG6000L - SER:1011 - FW:10.02

Cal-101

Internal 10MHz

5500.0000 Freq MHz

9.0 Power dBm

X1

USBVolts: 5.03

Sweep Controls

Mode	Direction
Single	UP
Points	Dwell (mS)
100	5
Start (MHz)	Stop (MHz)
1000	2000
Step Size	Run Time
10.1010 MHz	~.500 Sec

Power Vernier

0 [BADCOMMAND] 5.03 OFF ON +9.0DBM ON 2000.00000MHZ

RT-14400WP

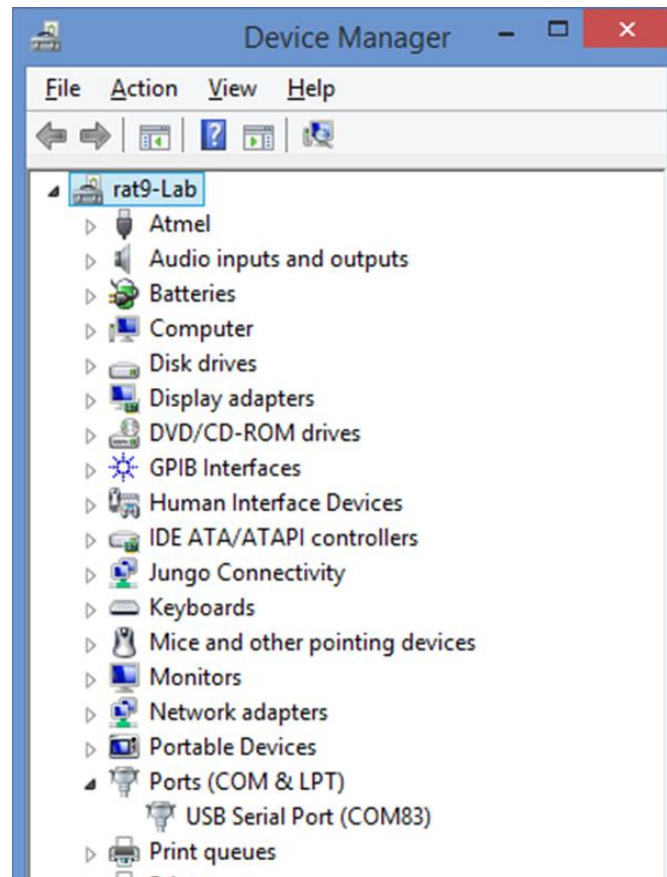
SCPI Serial Command List

Command	Example 1	Example 2	Description
FREQ: CW	FREQ: CW 400MHZ	FREQ: CW 3.33GHZ	Set output Frequency
FREQ: CW?			Return current Frequency
OUTP: STAT	OUTP: STAT ON	OUTP: STAT OFF	Turn on or off the RF output
OUTP: STAT?			Return if output is enabled
POWER	9	-12.5	Set output power in dBm
POWER?			Return current output power
VERNIER	VERNIER 3	VERNIER -22	Fine tune the output power (no units)
VERNIER?			Return vernier setting
*IDN?			Return the SCPI identification string
*PING?			returns "PONG!" if device is responding
SYST: ERR?			Returns any pending error codes
*CLS			Clears any error codes
SYST: DBG?			Returns last debug status message
*RST			Reset unit now
*INTREF?			Is the internal reference enabled?
*EXTREF?			Is an external reference signal detected?
*INTERNALREF 1			Set reference to internal
*INTERNALREF 0			Set reference to external
*INTERNALREF A			Autodetect 10MHz reference at power up
*DISPLAY	*DISPLAY OFF	*DISPLAY ON	Power on or off the display
*BUZZER	*BUZZER ON	*BUZZER OFF	Mute the buzzer
*SAVESTATE			Save frequency & attenuation as boot defaults
*SYSVOLTS?			Return internal USB voltage
*UNITNAME	*UNITNAME Bob	*UNITNAME DEV-34	Set a unique name in flash memory
*UNITNAME?			Return this device's name
SWE: MODE	SWE: MODE SCAN		Enters sweep mode & arms external sweep trigger
FREQ: START	FREQ: START 1GHZ	FREQ: START 99MHZ	Sweep start frequency
FREQ: STOP	FREQ: STOP 2GHZ	FREQ: STOP 999MHZ	Sweep stop frequency
LIST: DIR	LIST: DIR UP	LIST: DIR DOWN	Sweep direction
SWE: POINTS	SWE: POINTS 10	SWE: POINTS 900	Sweep point count
SWE: DWELL	SWE: DWELL 25	SWE: DWELL 1000	Sweep dwell time in milliseconds
INIT: CONT	INIT: CONT 0	INIT: CONT 1	Sweep continuous mode or single
INIT: IMM			Trigger the sweep now
ABORT			Stop the sweep now
SWE: ACTIVE?			Is the device sweeping now
TRIG: STEP			Mode where trigger command only advances 1 step
TRIG: SWEEP			Trigger command will execute entire sweep (default)

RT-14400WP

Remote Control Example Code

All of our products can be controlled from any serial-capable programming language or environment. MATLAB, .NET, Linux, python are all popular. We use Visual Studio 2015 and C# for our standard GUI. First determine the port number that your device has installed itself as:



Example Code (C# .NET Framework):

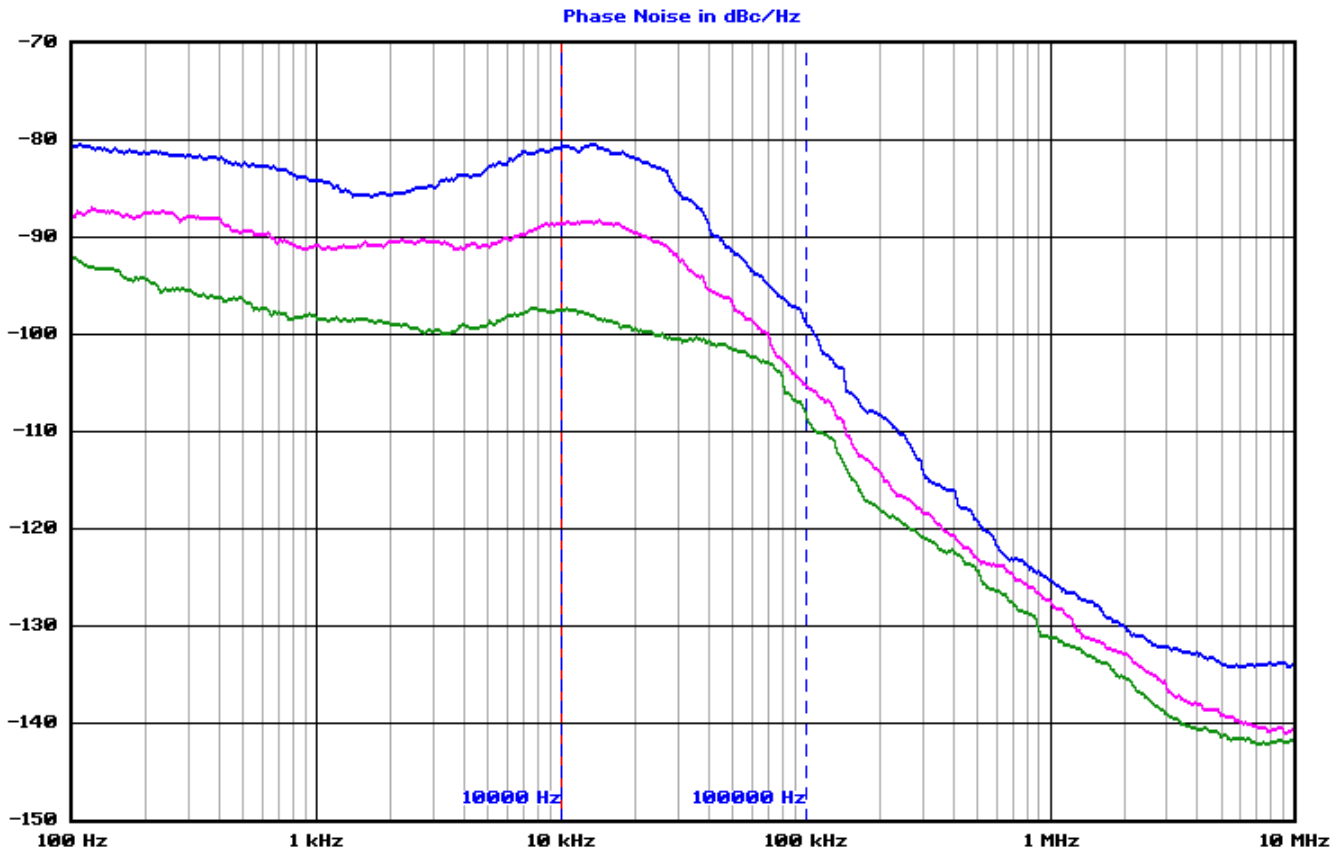
```
using System;
using System.IO.Ports;    // include serial port library

SerialPort myPort = new SerialPort("COM83", 115200, System.IO.Ports.Parity.None, 8, System.IO.Ports.StopBits.One);
myPort.Open();           // open the port we just made
myPort.WriteLine("*IDN?"); // send any command here
myPort.ReadTimeout = 250;

string myResponse = myPort.ReadLine(); // read back the response
System.Threading.Thread.Sleep(30);     // delay before sending the next command
```

RT-14400WP

Typical Phase Noise

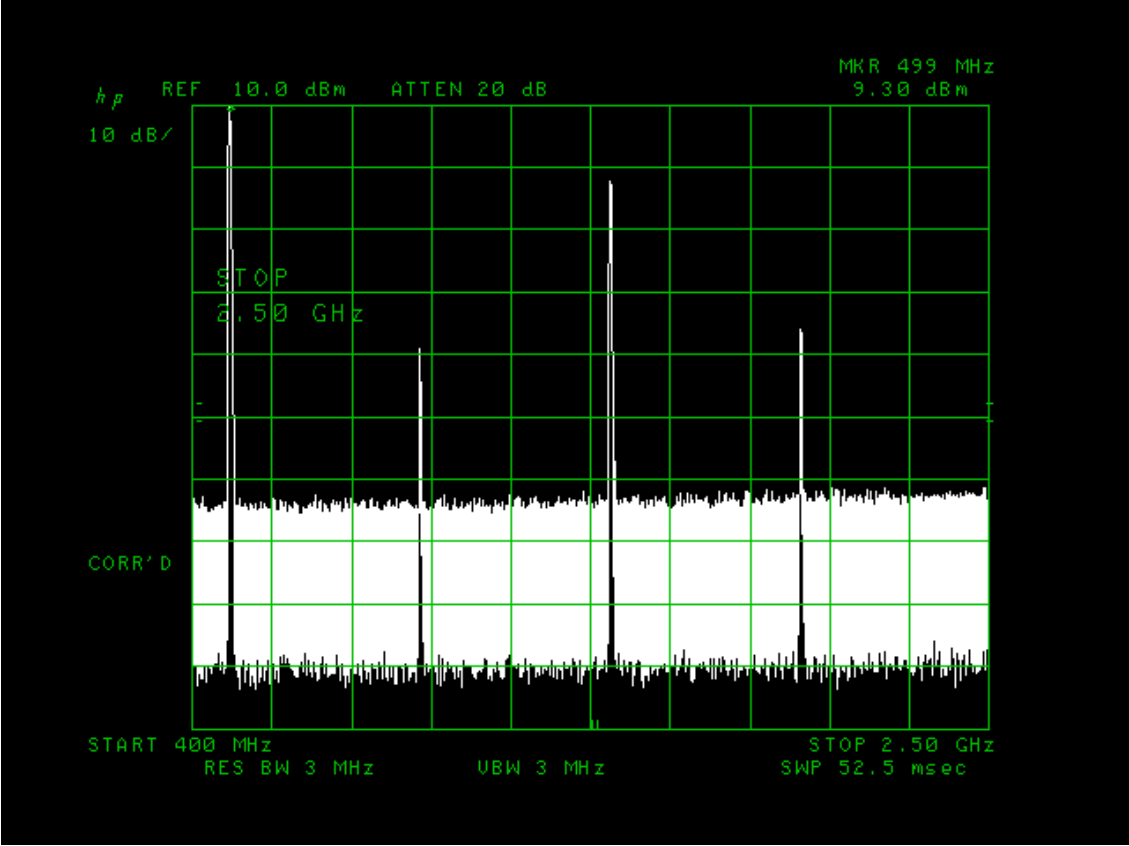


Trace	Carrier Hz	Carrier dBm	dBc/Hz at 10000 Hz	RMS Jitter
SG4400	4 400 000 000	10.50	-80.7	6.7E-013 s
SG4400	2 000 000 000	9.50	-88.6	6.5E-013 s
SG4400	500 000 000	10.00	-97.4	1.1E-012 s

RT-14400WP

Harmonics

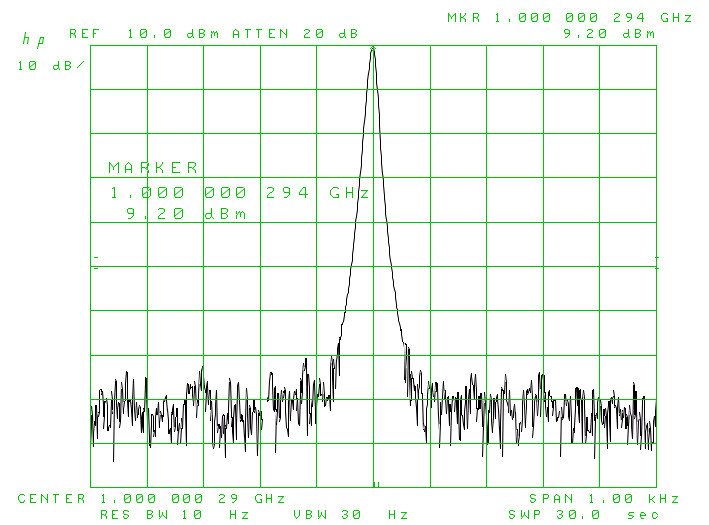
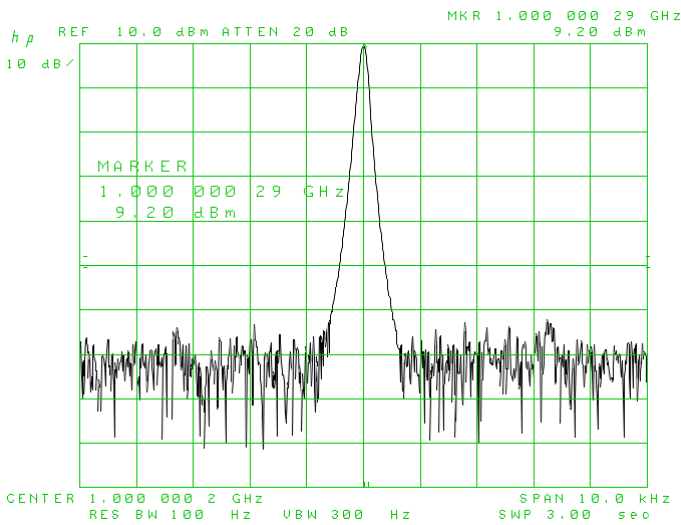
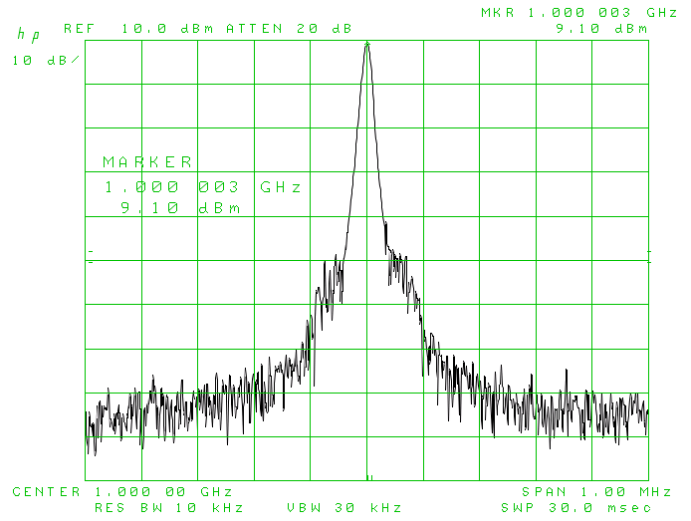
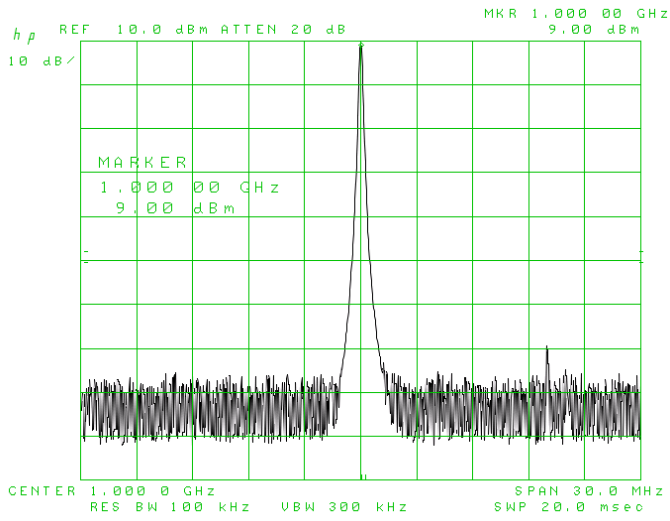
Harmonics are more plentiful at low frequencies (<500MHz) in wideband systems, causing more pronounced distortion. Unfiltered synthesizers can have harmonics as high as -10dBc extending well beyond the 9th.



RT-14400WP

Typical Output Power Spectrums

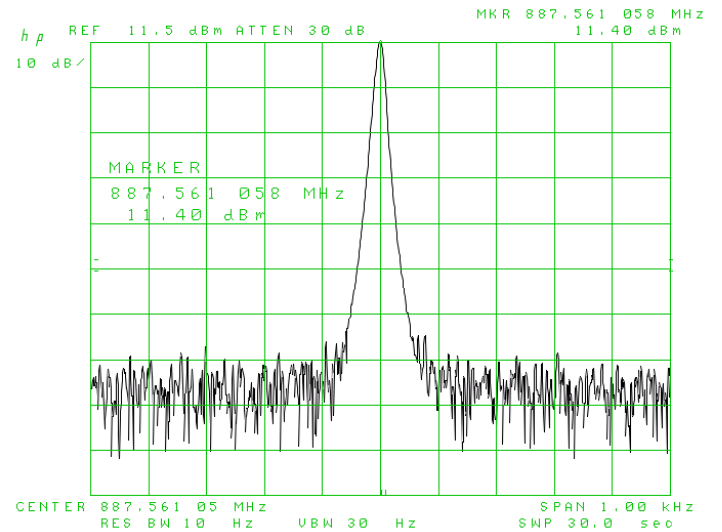
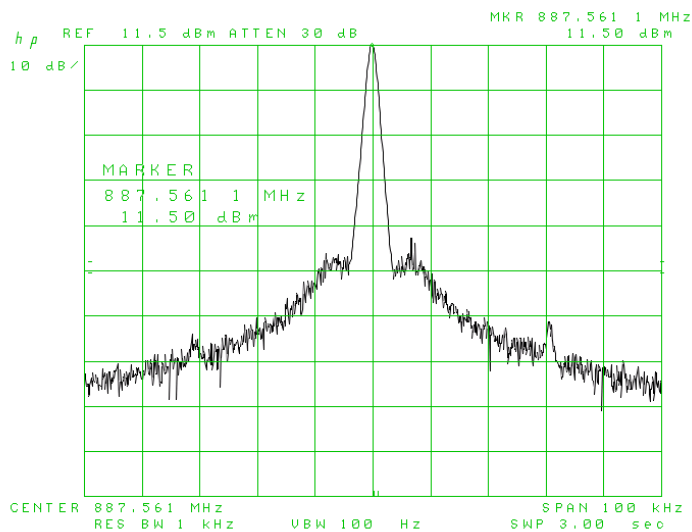
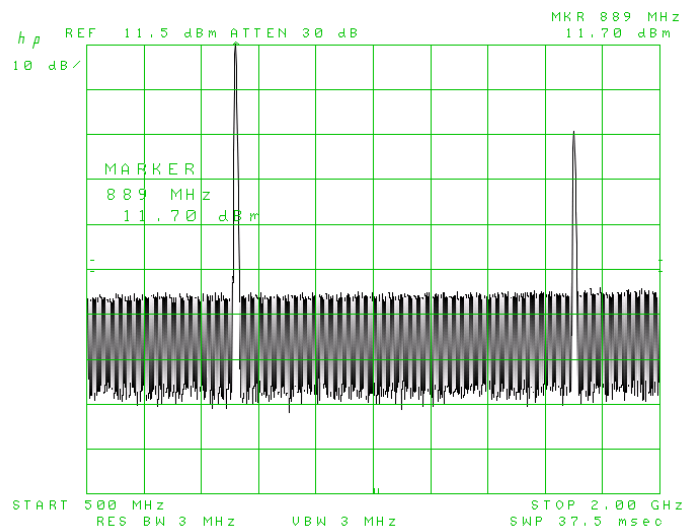
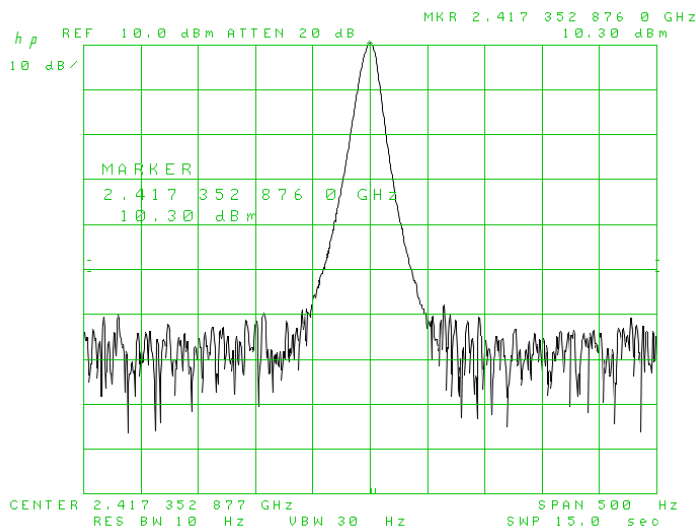
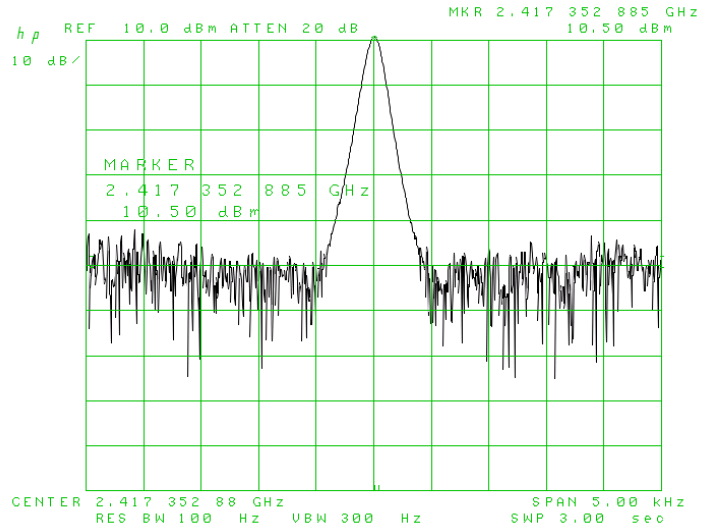
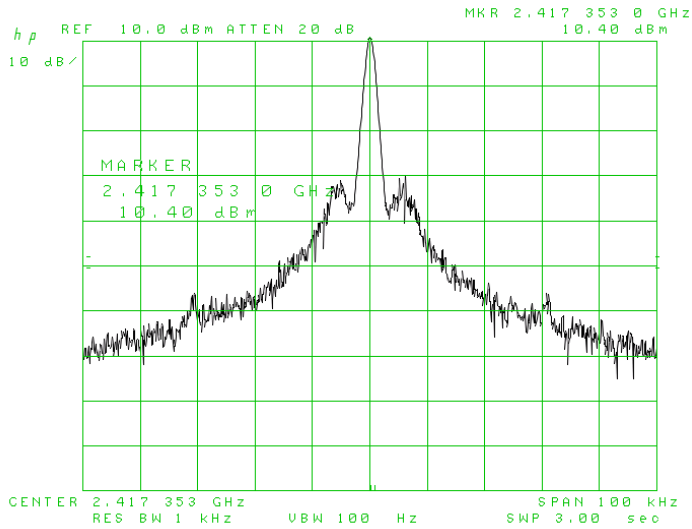
[25 Deg. C, USB Power , internal 10MHz]



RT-14400WP

Typical Output Power Spectrums, Cont.

[25 Deg. C, USB Power, internal 10MHz]



RT-14400WP Pricing

Ordering Information

RT-14400WP – Battery Powered – Wide Power Range – 35 to 4400MHz

Contact Information

	<p>RHO <i>The Leader in DF</i> International Inc THETA</p>	<p>RHOTHETA International Inc 8201 Peters Rd Ste 1000 Ft Lauderdale FL USA +1 954 495 8700 info@rhothetaint.com service@rhothetaint.com</p>
-------------------------------------------------------------------------------------	------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

