30GHZ STANDARD SIGNAL GENERATOR

Description

Introducing the **SG30000L, our latest economical wideband Signal Generator!**

DS Instrument's new wideband microwave signal generator has been announced! This new standard version offers the same low-noise performance of the **SG30000PRO**, but without the **costly** high-band attenuation and switching . Like our SG6000 product line, this RF generator is fully programmable via SCPI commands, or the front panel interface, making it more flexible than any competing

product. High output power, wide bandwidth, and ultra-compact size make this the best value 30GHz source on the market.

Now shipping REV 3 (2021) with level control!

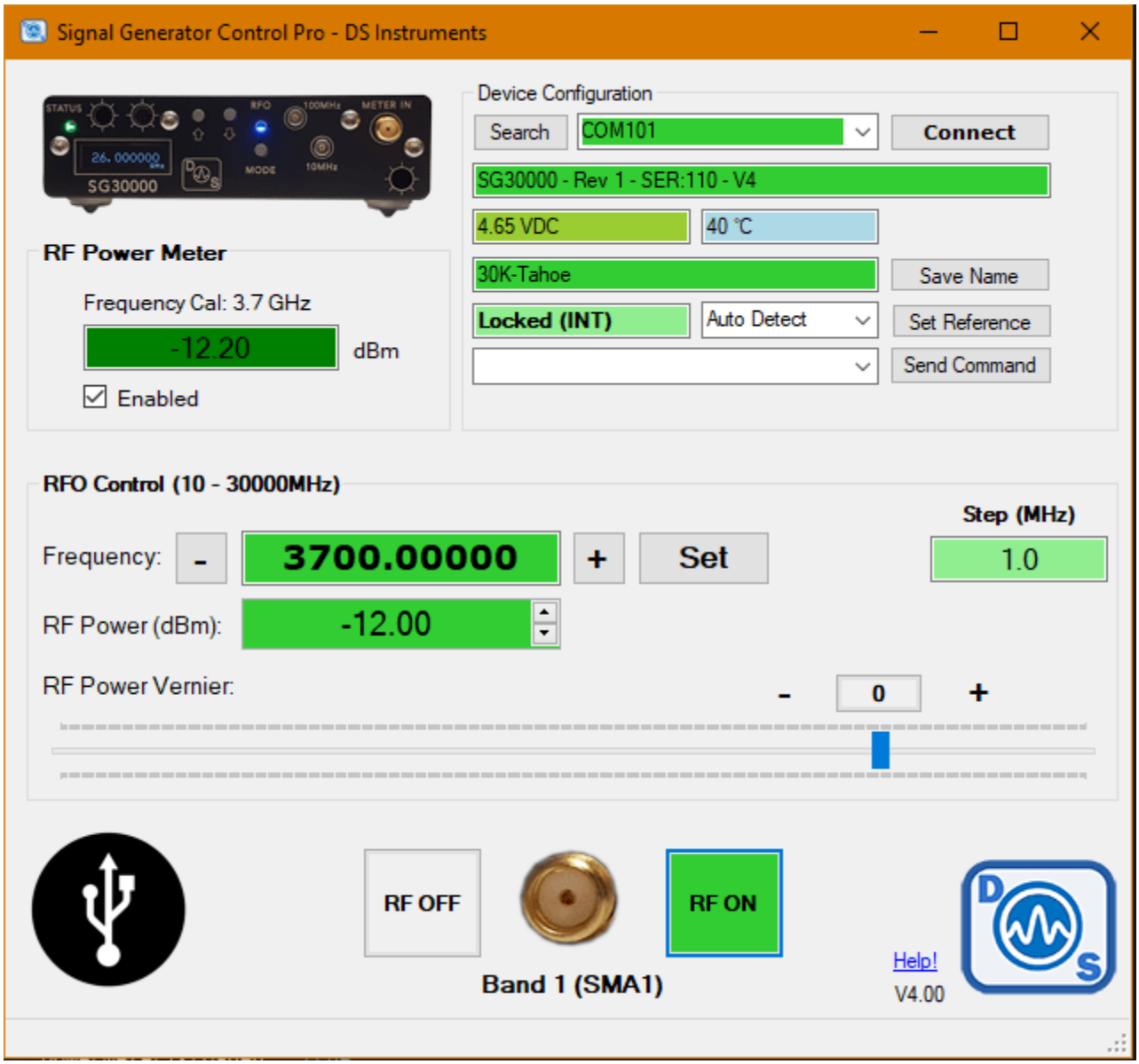
SG30000L Standard 30GHz Device Features:

- Output frequency range covering **0.05 – 30GHz**
- Low band SMA port: LF-13GHz
- High band 2.92mm port: 13-30GHz
- Power control (0.1 – 13Ghz): -10dBm to +10dBm (vernier only – no steps)
- Power control (13 – 30GHz **calibrated**): -20dBm to +10dBm (0.5dB **steps & vernier**)
- Max output power in un-calibrated mode: +13dBm typical
- Excellent phase noise: -90dBc @ 22GHz @ 10KHz offset
- Harmonic levels: < -12dBc typical
- Extremely small frequency step size (2Hz)
- Ultra-low-noise 100MHz VCXO locked to internal TCXO or external 10MHz reference
- Internal precision high-frequency reference source (±280PPB 10MHz)
- External 10MHz reference input (MCX jack)
- Compact powder-coated laser-etched enclosure
- Stand-alone frequency sweeping support
- **Precision 2.92mm** (40GHz rated) output port (3.5mm compatible)
- Ethernet remote operation (DHCP)
- Windows control software included (USB & Network enabled)
- SCPI command aware via USB-C virtual COM port for remote control
- Front controls and bright OLED display for stand-alone usage
- Completely powered from USB-C, no DC adapter required!

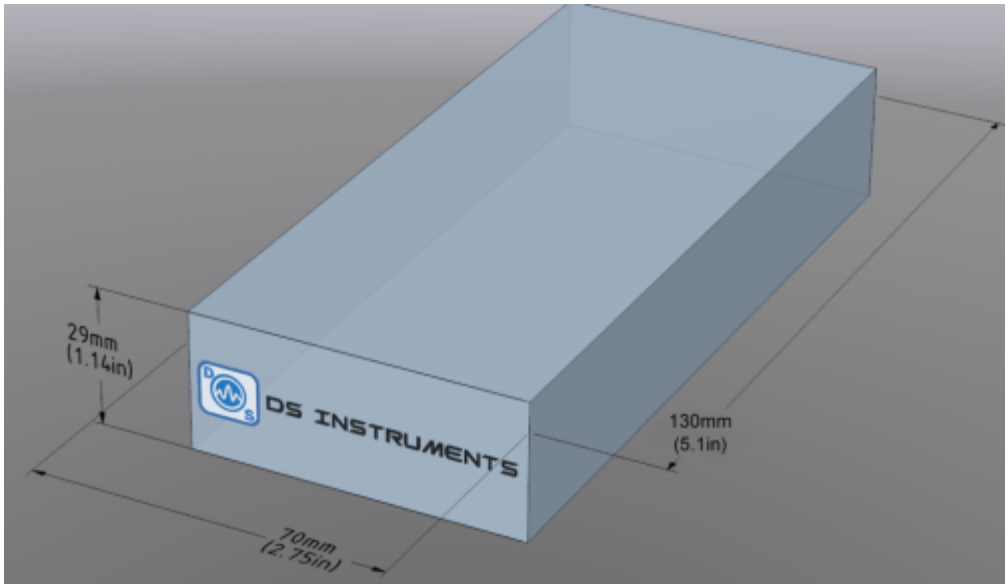
Common RF Applications:

- Automated testing environments
- General RF lab use
- Flexible LO sourcing
- Antenna design
- EMC testing
- Production verification and test setups
- Educational / university lab use
- Aerospace / Defense Research
- 802.11n development / Testing
- Ku-band satellite link testing
- X-band radar applications
- Ka-band development
- Up-converting and down-converting
- Line of sight link testing
- Wireless infrastructure design
- Transponder verification
- 5G testing
- mm wave technology

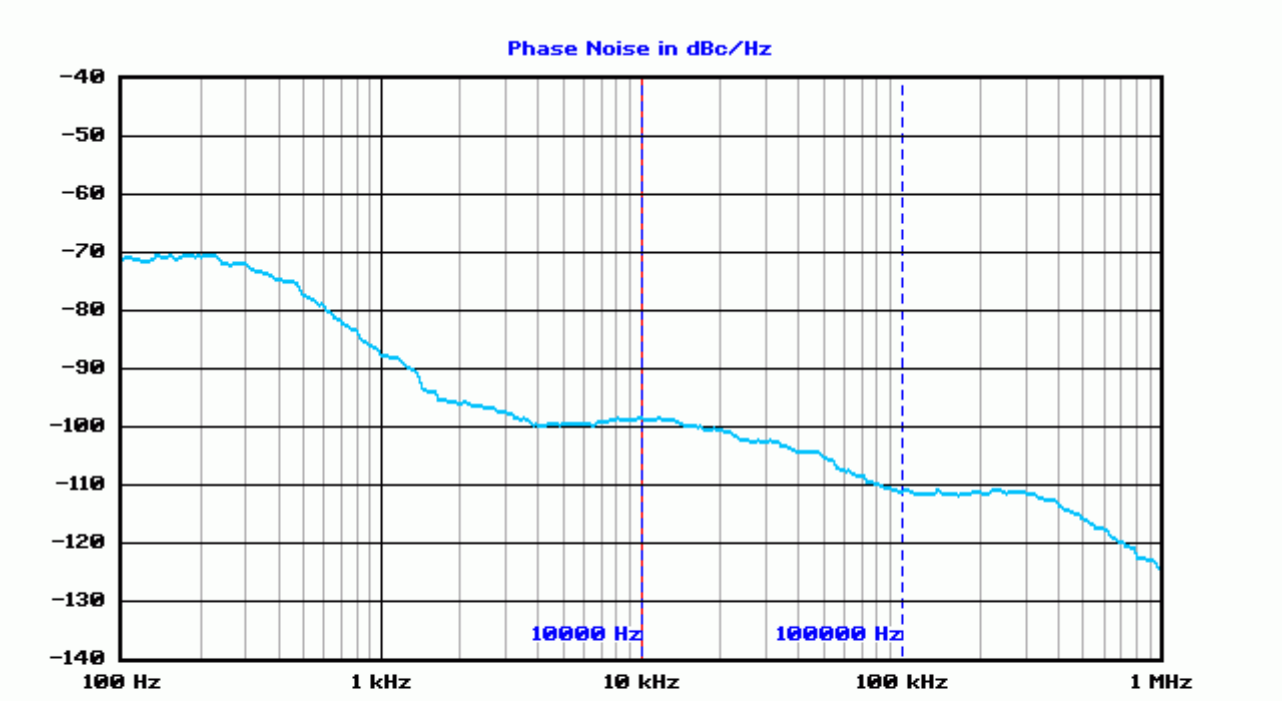
PC Control Application:



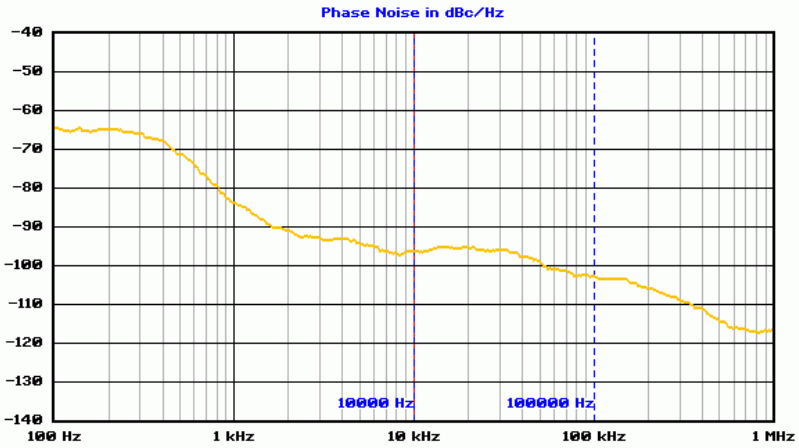
Mechanical Specifications (5-inch narrow case):



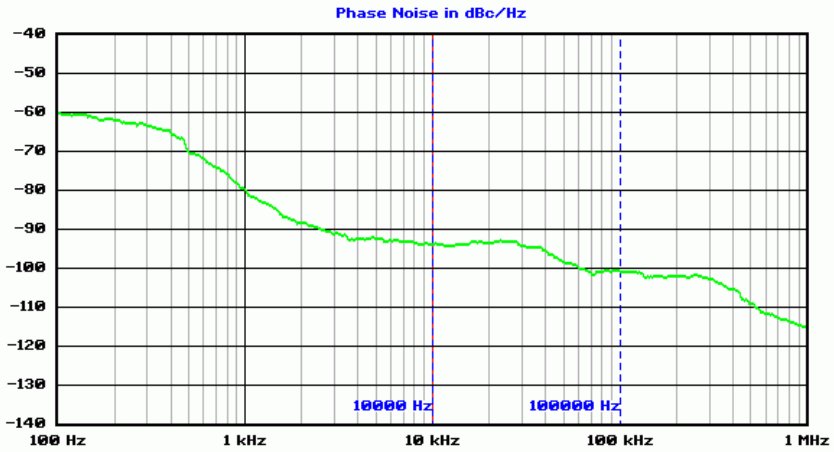
RF Performance Plots (Phase Noise):



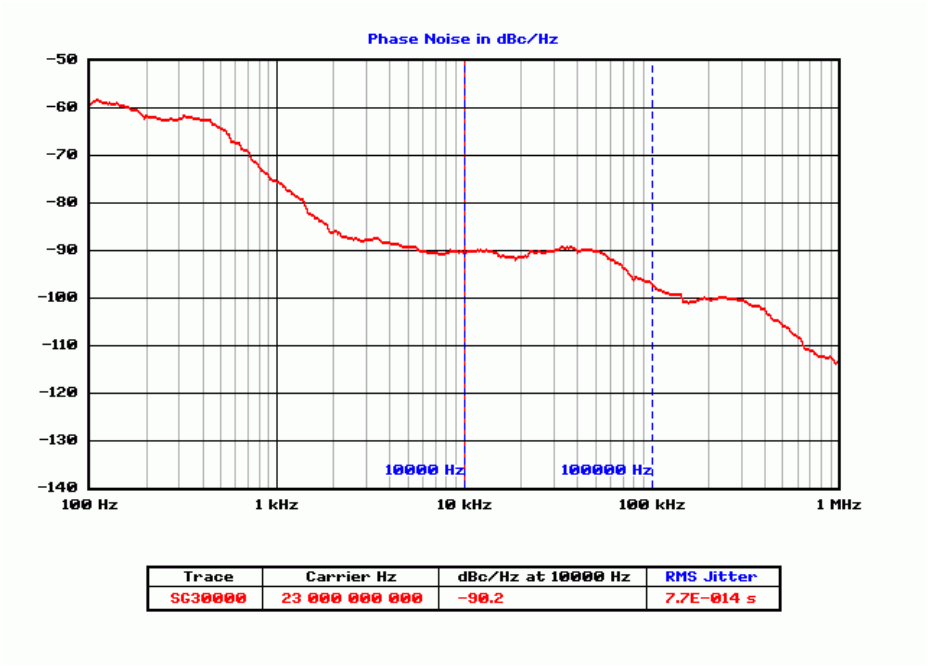
Trace	Carrier Hz	dBc/Hz at 10000 Hz	RMS Jitter
SC30000	6 000 000 000	-98.7	6.9E-014 s



Trace	Carrier Hz	dBc/Hz at 10000 Hz	RMS Jitter
SC30000	12 000 000 000	-96.1	6.8E-014 s

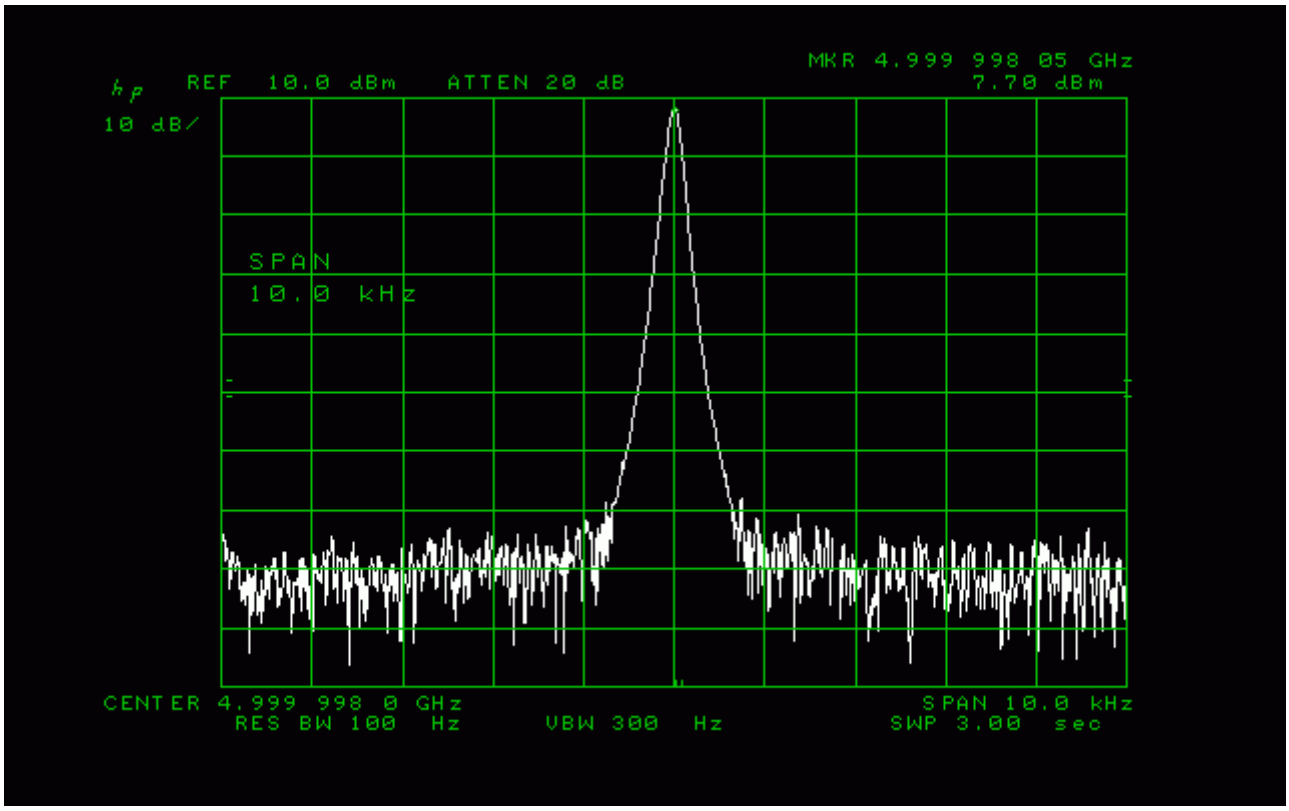


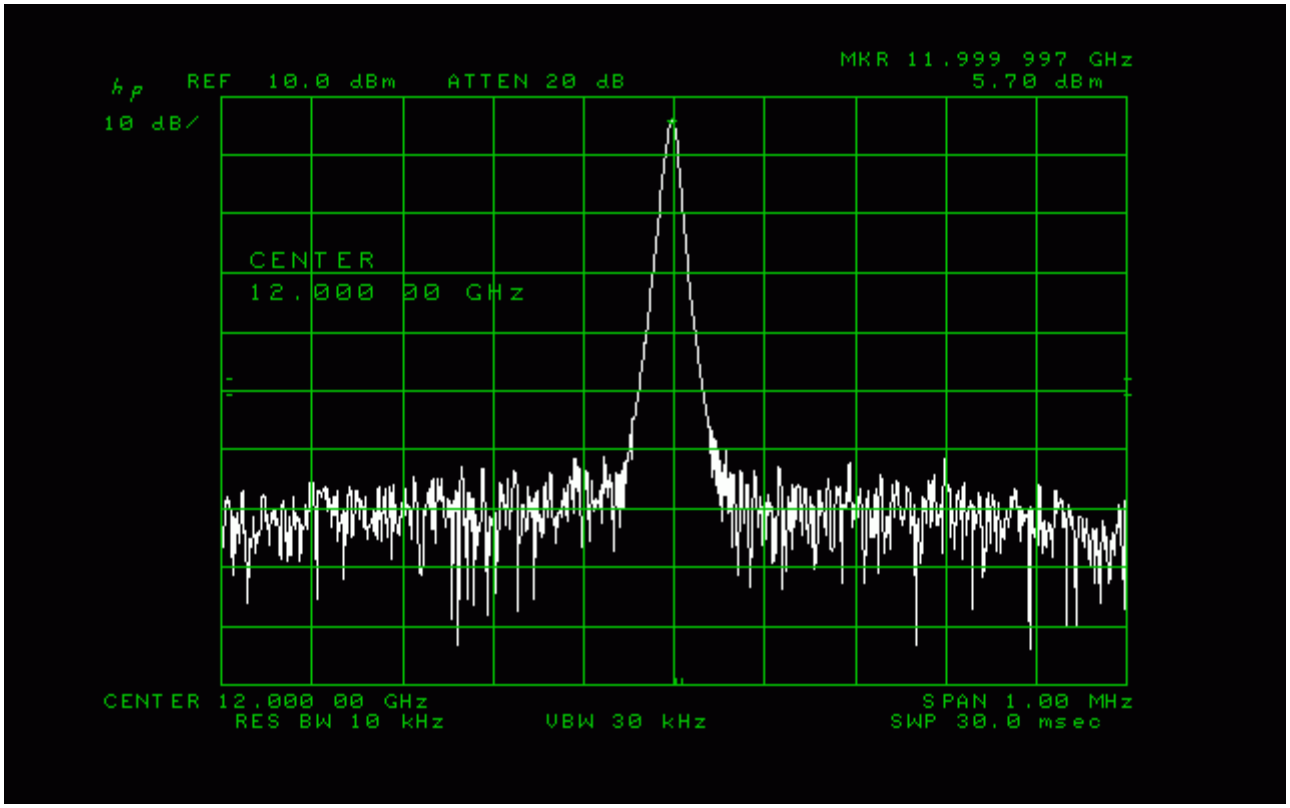
Trace	Carrier Hz	dBc/Hz at 10000 Hz	RMS Jitter
SC30000	18 000 000 000	-93.6	5.5E-014 s

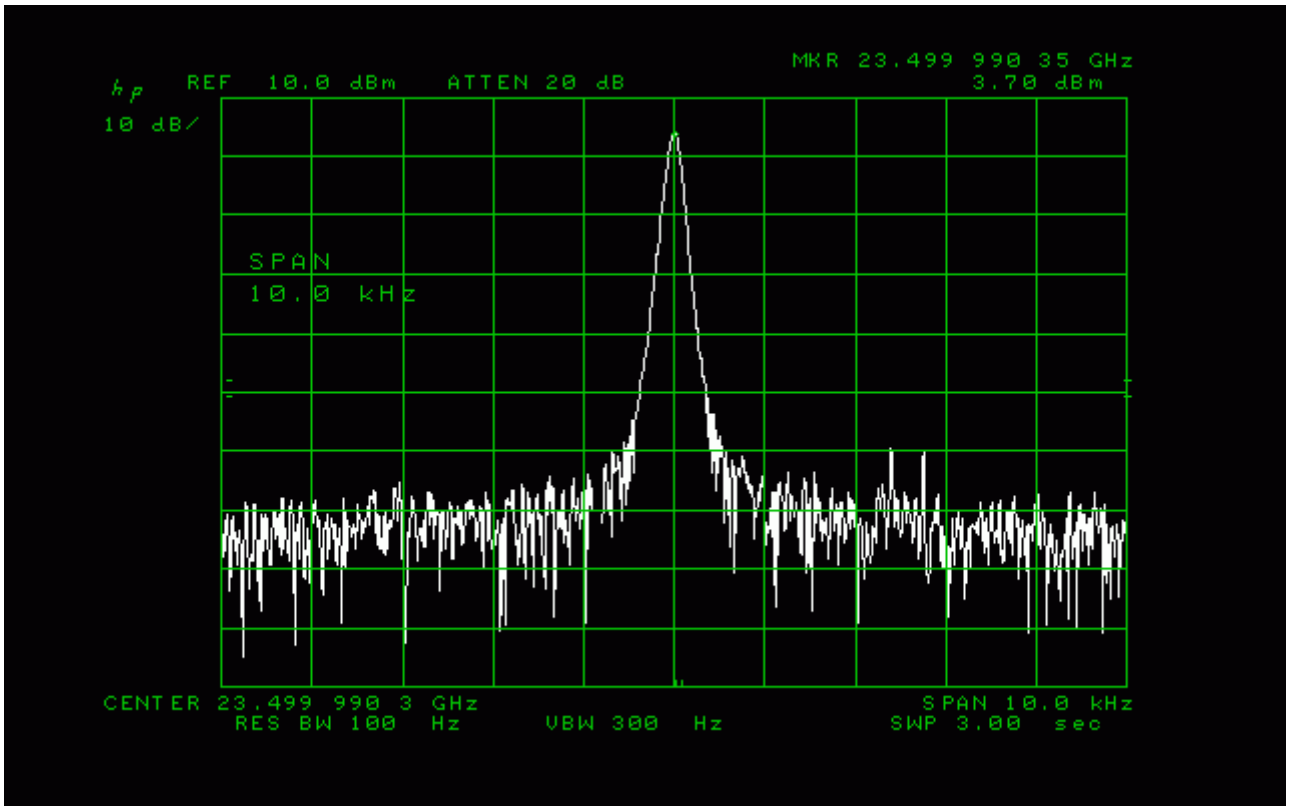


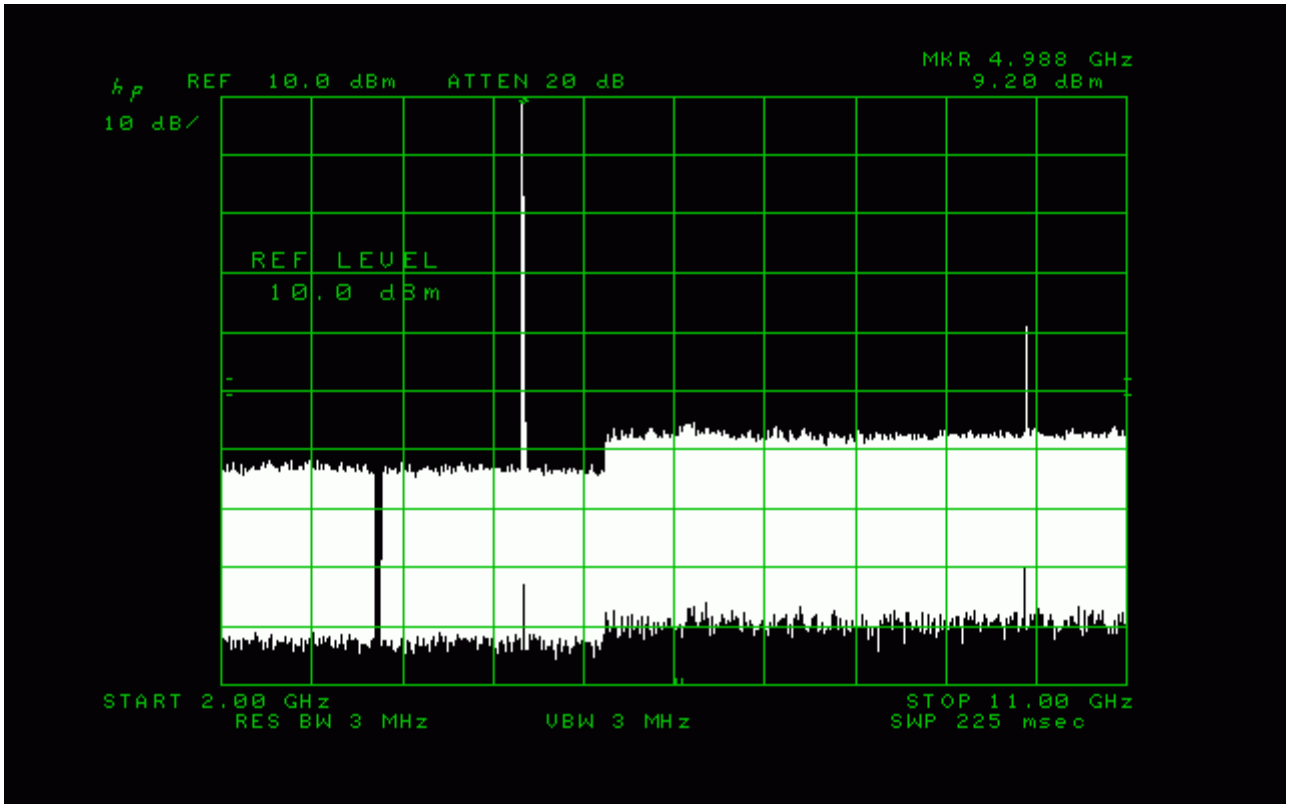
Trace	Carrier Hz	dBc/Hz at 10000 Hz	RMS Jitter
SG30000	23 000 000 000	-90.2	7.7E-014 s

Performance Plots (CW Output):




MKR 11.999 997 GHz
5.70 dBm
REF 10.0 dBm ATTEN 20 dB
10 dB/
CENTER
12.000 00 GHz
CENTER 12.000 00 GHz
RES BW 10 kHz
VBW 30 kHz
SPAN 1.00 MHz
SWP 30.0 msec


MKR 23.499 990 35 GHz
3.70 dBm
REF 10.0 dBm ATTEN 20 dB
10 dB/
SPAN
10.0 kHz
CENTER 23.499 990 3 GHz
RES BW 100 Hz
VBW 300 Hz
SPAN 10.0 kHz
SWP 3.00 sec



Command List (USB & Ethernet):

Command	Example 1	Example 2	Description
*IDN?			Return the SCPI identification string
*PING?			returns “PONG!” if device is responding
SYST:ERR?			Returns any pending error codes
SYST:DBG?			Returns last debug status message
*REV?			Return the hardware revision number
*CLS			Clears any error codes
*RST			Reset unit now

*DISPLAY	*DISPLAY OFF	*DISPLAY ON	Power on of off the display
*BUZZER	*BUZZER ON	*BUZZER OFF	Mute the buzzer
*SLEEP	*SLEEP ON	*SLEEP OFF	Save power by putting device into sleep mode
*LAN	*LAN ON	*LAN OFF	Enable or disable the network subsystem
*SAVESTATE			Save frequency & attenuation as boot defaults
*CLEANSTATE			Clear all settings back to factory defaults
*UNITNAME	*UNITNAME Bob	*UNITNAME DEV-34	Set a unique name in flash memory
*UNITNAME?			Return this device’s name
*SYSVOLTS?			Return USB voltage input reading
*TEMPC?			Return system temperature
POWER:READ?			Get power meter reading if hardware is available
*POWER:FCAL	*POWER:FCAL 3000MHZ		Calibrate the power meter for a different frequency
FREQ:CW	FREQ:CW 400MHZ	FREQ:CW 3.33GHZ	Set output Frequency
FREQ:CW?			Return current Frequency

FREQ:MIN?			Return minimum supported freq in Hz
FREQ:MAX?			Return max supported frequency in HZ
OUTP:STAT	OUTP:STAT ON	OUTP:STAT OFF	Turn on or off the RF output
OUTP:STAT?			Return if output is enabled
POWER	POWER 9	POWER -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
SYSREF INT			VCXO locked to internal 10MHz TCXO
SYSREF EXT			VCXO locked to an external 10MHz
SYSREF FREE			VCXO not locked to 10MHZ – lowest noise
SYSREF AUTO			Automatic choice between internal and external
SYSREF?			Return the current source of the reference signal
SYSREF LOCK?			Is the reference PLL locked?
SYSREF STATUS?			Returns the detected status of current reference

SYSREF UPDATE			after a reference change this will relock the source
SYSREF OFF			disable internal 100MHz vcxo – requires external source
SWE:MODE SCAN			Enters sweep mode & arms external sweep trigger
SWE:MODE LIST			Enters list mode & arms external trigger
SWE:MODE?			Returns the current sweeping mode
SWE:POINTS	SWE:POINTS 10	SWE:POINTS 900	Sets sweep point count
SWE:POINTS?			Returns the current point count
SWE:DWELL	SWE:DWELL 25	SWE:DWELL 1000	Sweep dwell time in milliseconds
SWE:DWELL?			Returns the current dwell time
SWE:RESET			Return to start of list, does not clear memory
SWE:ACTIVE?			Is the device sweeping now
FREQ:START	FREQ:START 1GHZ	FREQ:START 99MHZ	Save the sweep start frequency
FREQ:START?			Returns the start frequency
FREQ:STOP	FREQ:STOP 2GHZ	FREQ:STOP 999MHZ	Save the sweep stop frequency

FREQ:STOP?			Returns the stop frequency
LIST:DIR	LIST:DIR UP	LIST:DIR DOWN	Sweep direction
LIST:DIR?			Returns UP or DOWN
LIST:SIZE?			Returns the current size of the sweeping list
LIST:CLEAR			
LIST:ADD	LIST:ADD 2GHz	LIST:ADD 450MHz	Add a single point to the end of the sweeping list
LIST:MAX?			Returns the MAX frequency list length
LIST?			Prints the entire frequency list
INIT:CONT	INIT:CONT 0	INIT:CONT 1	Sweep continuous mode or single
INIT:IMM			Trigger the sweep now
ABORT			Stop the sweep now
TRIG:STEP			Mode where trigger command only advances 1 step
TRIG:SWEEP			Trigger command will execute entire sweep (default)
COM Settings: 115200bps, 8bits, 1 stop, no parity, no flow control – Command terminator = linefeed			