APMS3003 Specification 1.0

A compact 9 kHz to 3.0 GHz phase coherent triple output signal generator

Introduction

The APMS3003 is a phase coherent triple-output RF signal generator with
a frequency range from 9 kHz to 3.0 GHz and is ideally suited for a wide range of application, where good signal quality accurate and wide output power range is required. Good phase noise is combined with spurious and harmonic rejection.
A high-stability OCXO reference provides excellent frequency accuracy and stability. THe OCXO can be phase locked to an external 10 MHz reference.

The APMS3003 comes in standard 19 inch 1U enclosure and offers various control interfaces like USB, LAN, or GPIB. Each interface allows easy and fast communication using SCPI 1999 command set. Remote control of the instrument can be quickly attained from any host system. A customer-supplied application programming interface (API) or programming examples for Matlab, Labview, C++, and other commercially available tools make implementation very straightforward.

Specifications

The specifications in the following pages describe the warranted performance of the signal generator for 25 ± 10 °C after a 30 minute warm-up period. Typical specifications describe expected, but not warranted performance. Min and Max specifications are warranted.

Parameter	Min.	Typ.	Max.	Note
Frequency range	9 KHz		3.0 GHz	Each channel
resolution		1 Hz		
Phase resolution				
Switching speed		5 ms		
SSB Phase noise at 1 GHz				
at 20 kHz from carrier at 1 MHz		-120 dBc/Hz -135 dBc/Hz		scales with frequency at 20 dB/dec
Power level				
Range	-30 dBm		+15 dBm	See max power plot
Resolution		0.01 dB		
Level uncertainty		0.25 dB	±1.0 dB	over specified power range
Output impedance		50 Ohms		
VSWR f < 200 MHz 200 MHz < f < 2 GHz		1.4	1.8	
Reverse Power Protection				
DC Voltage		15 V		
RF power			23 dBm	
Spectral purity Output harmonics			-30 dBc	at + 10 dBm output power , f> 100 MHz
Non-harmonic spurious		-60 dBc		
Internal reference frequency				
Temperature stability (10 to 45 degC)			±0.1 ppm	OCXO based
Reference IN/OUT		10 MHz / 100 MHz		
Frequency sweep Sweep type: linear, logarithmic, random				
Step time	2 ms			
Dwell time	1 ms		10 s	
Off-time (incl. transient time)	1 ms			

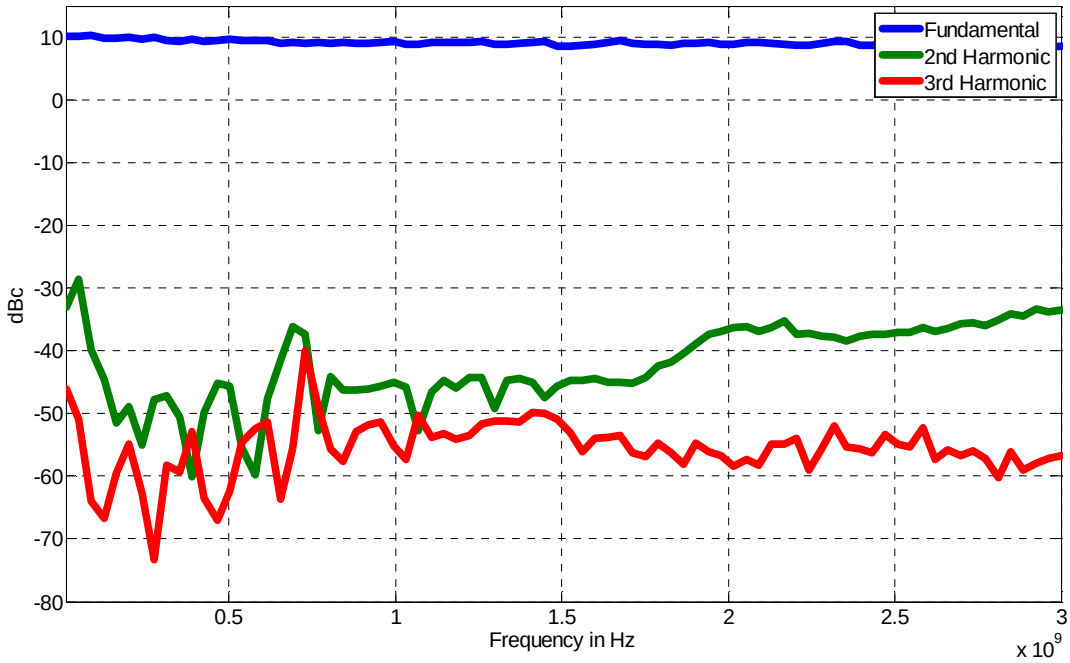
Modulation Capabilities (optional)

Any combination of sweeps and internal/external AM and pulse modulation is allowed

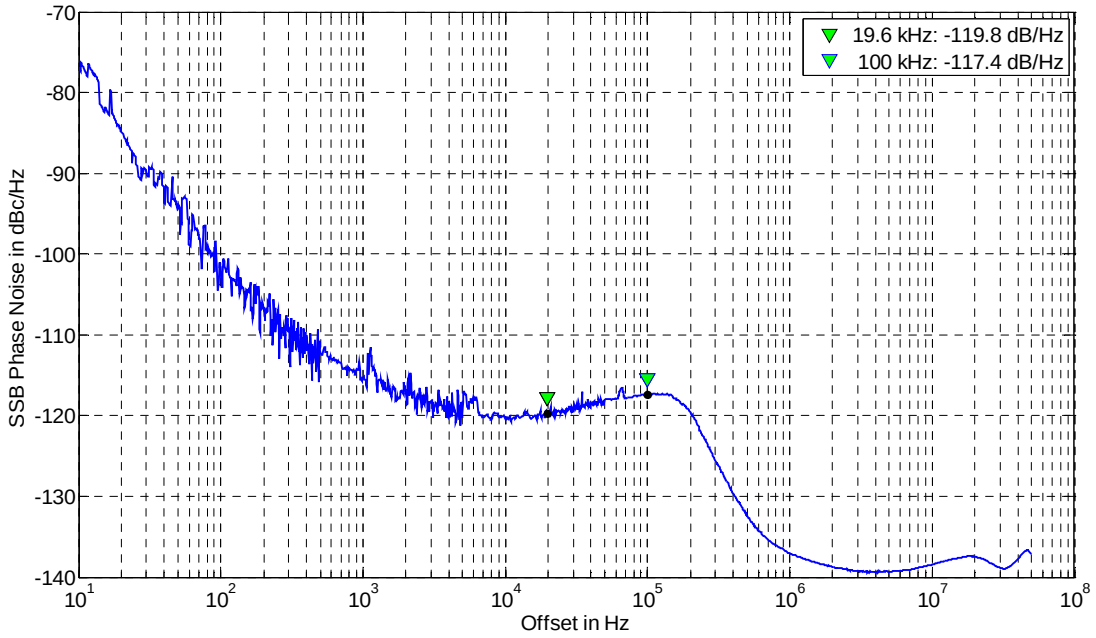
Parameter	Min.	Typ.	Max.	Note
Pulse Modulation On/off ratio		>70 dB		at +10 dBm
Repetition frequency	0.1 Hz 0.1 Hz		500 kHz 100 kHz	External Internal
Duty cycle	1 % to 99 % in 1% steps			within specified minimum pulse width
Minimum Pulse width	50 ns			
Pulse rise/fall time		10 ns		
External input amplitude	TTL			
AM Modulation Modulation rate resolution	0.1 Hz	 0.02 Hz	30 kHz	
Modulation depth Resolution	0 %	 1 %	90 %	
Distortion		1.5 % at 30% 2.5 % at 80%		
Accuracy		2 %	4 %	
Modulation waveforms	Sinusoidal, triangular, square			

Measurements

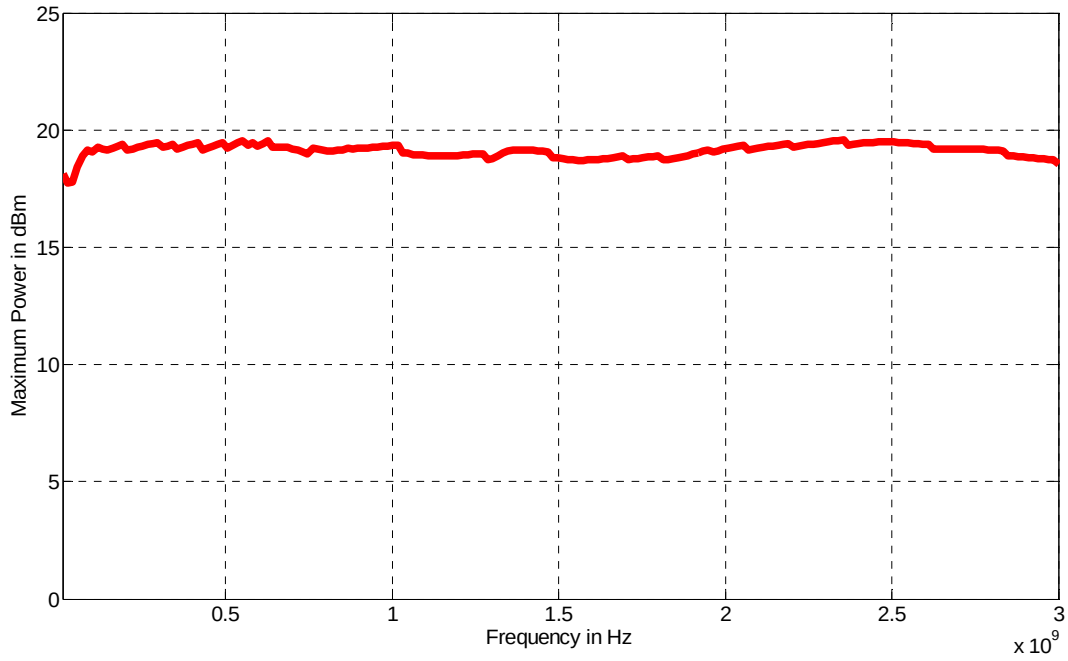
2nd (green) and 3rd (brown) Harmonics at +10 dBm Output Power



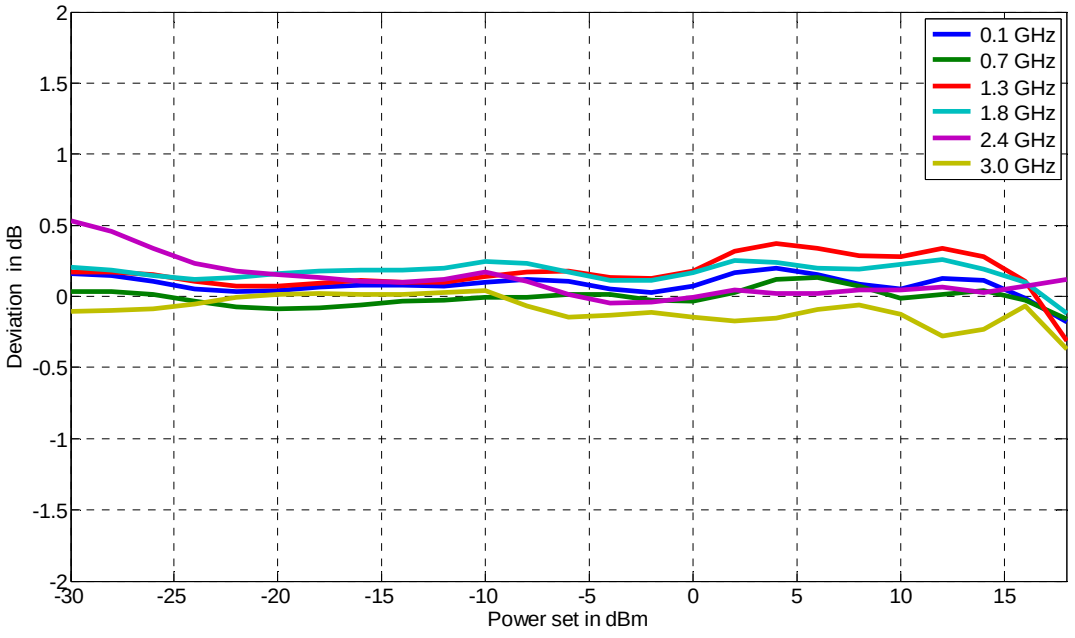
SSB phase noise (1 GHz)



Maximum Output Power



Output Power Linerity



Enclosure

Weight ≤ 5 kg (11 lb.) net, ≤ 8 kg (18 lb.) shipping

Dimensions 42 mm H x 426 mm W x 360 mm L [1.7 in H x 16.8 in W x 14.2 in L]

Connectors

Front panel:

1. RF OUT1,2,3: SMA female
2. RF on/off button

Rear panel:

1. 10 MHz REF IN: BNC female
2. 100 MHz REF OUT: BNC female
3. LAN connection: RJ-45
4. USB 2.0 host and device (optional)
5. AC Power plug

Options

MOD adds AM and PULSE modulation

General Characteristics

Remote programming interfaces

Ethernet 100BaseT LAN interface,
USB 2.0 , USBTMC
GPIB (IEEE-488.2,1987) with listen and talk (optional)

Control language SCPI Version 1999.0

Power requirements 100 or 240 VAC, 50 or 60 Hz, 30W maximum
Operating temperature range 0 to 45 °C
Storage temperature range –40 to 70 °C
Operating and storage altitude up to 15,000 feet

CE notice
Safety/EMC complies with applicable Safety and EMC regulations and directives.

Recommended calibration cycle 24 months
ISO compliant Instrument is manufactured in an ISO-9001 registered facility under high quality standards.

Document History

Version/Status	Date	Author		Notes
V19	2015-01-15	jk		first release