APGEN3000 Specification 1.21

A compact 9 kHz to 3.0 GHz RF Signal Generator

The APGEN3000 is a fast-switching RF Signal Generator with dedicated modulation and trigger capabilities. The APGEN3000 covers a frequency range from 9 kHz to 3.0 GHz and is ideally suited for a wide range of application, where good signal quality, fast switching, and accurate and wide output power range is required.

The APGEN3000 offers various control interfaces like USB, LAN, or (optionally and in different enclosure) 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	
resolution		0.1 Hz		
Phase resolution				
Switching speed		5 ms		
SSB Phase noise at 1 GHz				
at 20 kHz from carrier at 1 MHz		-102 dBc/Hz -130 dBc/Hz		scales with frequency at 20 dB/dec
Power level				
Range 9 kHz to 10 MHz >10 Mhz	 -65 dBm -65 dBm		 +5 dBm +10 dBm	
Resolution		0.1 dB		
Level uncertainty			±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			20 dBm	
Spectral purity Output harmonics (> 10 MHz)			-30 dBc	at + 5 dBm output power
Non-harmonic spurious		-50 dBc		f < 137 MHz
		-60 dBc		f > 137 MHz
Internal reference frequency				
Temperature stability (10 to 45 degC)			±5 ppm	
Frequency sweep Sweep type: linear, logarithmic, random				
Step time	2 ms			
Dwell time	1 ms		10 s	
Off-time (incl. transient time)	1 ms			

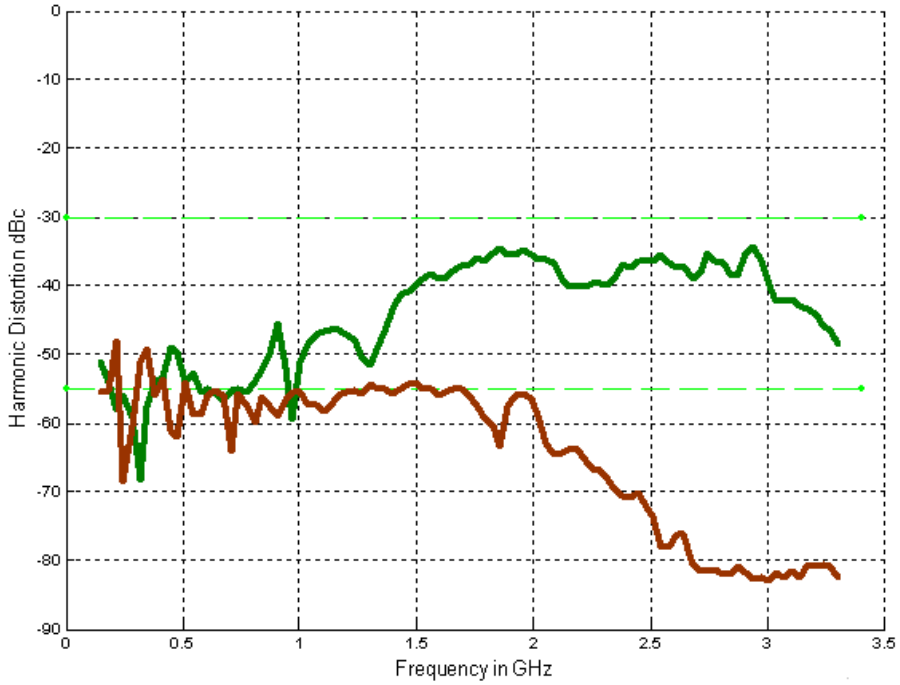
Modulation Capabilities

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

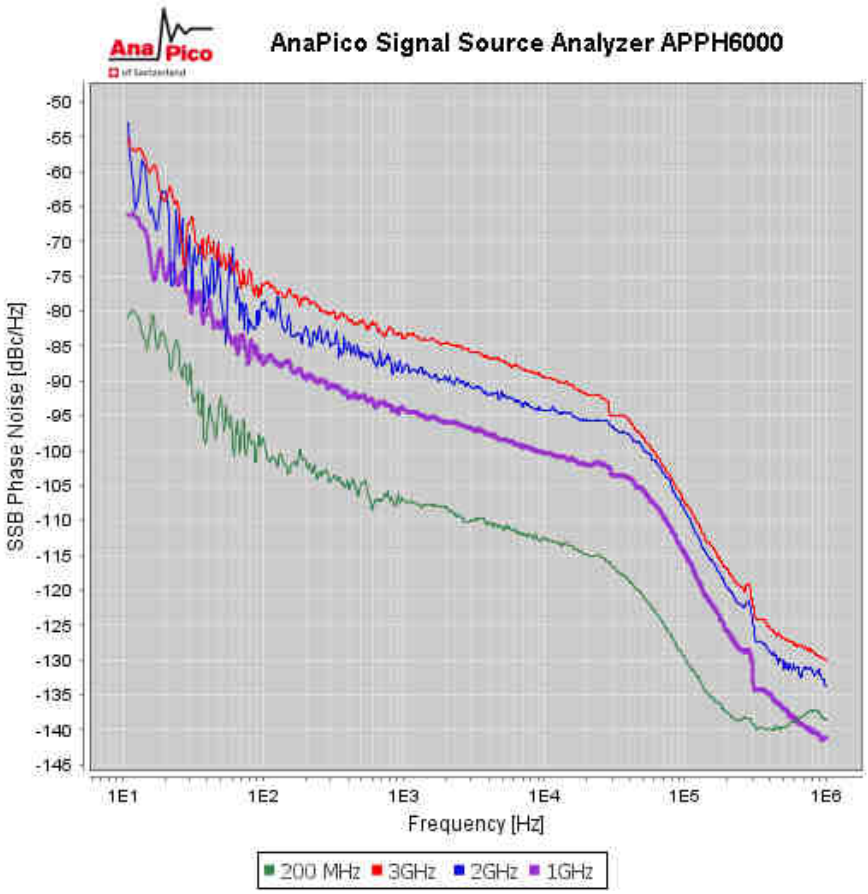
Parameter	Min.	Typ.	Max.	Note
Pulse Modulation On/off ratio		>50 dB		at +10 dBm
Repetition frequency	0.1 Hz 0.1 Hz		500 kHz 100 kHz	External Internal
Duty cycle	1 % to 99 % in 1% steps *			within specified minimum pulse width
Minimum Pulse width	50 ns			
Pulse rise/fall time		10 ns		
External input amplitude		TTL		
AM Modulation Modulation rate resolution	0.1 Hz 1 Hz	 0.02 Hz	10 kHz 30 kHz	 for RF>1 MHz for RF< 1 MHz; ALC hold
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



Enclosure

Rear

Weight ≤ 1 kg (2 lbs) net, ≤ 1.5 kg (3 lb.) shipping

Dimensions 60 mm H x 106 mm W x 220 mm L

Connectors

Front panel:

1. **RF output: N female**
2. **RF on/off button**
3. **Power on/off switch**
4. **AM modulation input: BNC female**
5. **Pulse modulation: BNC female**
6. **Function output: BNC female**
7. **Trigger input: BNC female**

Rear panel:

1. **LAN connection: RJ-45**
2. **USB 2.0 host and device**
3. **DC Power plug (6V, 2.5A)**

General Characteristics

Remote programming interfaces
Ethernet 100BaseT LAN interface,
USB 2.0 host & device
GPIB (IEEE-488.2,1987) with listen and talk (optional)
Control language SCPI Version 1999.0

Power requirements 6 VDC; 20 W maximum
Mains adapter supplied: 100-240 VAC in/ 6V 2.5A DC out
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.

Document History

Version/Status	Date	Author		Notes
V09	2010-08-01	jk		first release
V10	2011-10-10	jk		Updated specs (spurious, harmonics, enclosure)
V11	2011-11-10	jk		Enclosure
V12	2012-10-1	jk		Reverse power specs added
V12	2012-10-1	jk		Reverse power specs added
V121	2012-10-30	jk		Refined spurious specs