

G7M-06 vector signal generator

Features

- Frequency range from 10 MHz to 6 GHz
- Wide output power control range from -90 dBm to +12 dBm
- Low phase noise -130 dBc/Hz at 20 kHz offset from 1 GHz carrier
- Analog modulation types: amplitude, frequency, phase and pulse modulations
- Custom digital modulation
- Built-in modulation signal generator
- Modulated signal band at 100 MHz

Description

G7M-06 signal generator is designed to generate continuous harmonic, analog-modulated and digital-modulated signals. Such devices are used for analyzing, tuning, testing and monitoring during manufacturing of RF & MW devices and equipment used in communications, radars, instrument engineering and measurement equipment. The G7M-06 signal generator is controlled via universal SCPI commands by external PC with VEGA software installed, integrating G7M-06 into automated instrumentation systems.

Main capabilities

Available operating modes:

- continuous generation of frequency- and power-stabilized harmonic signals;
- frequency sweep, power sweep and arbitrary frequency/power list sweep;
- continuous generation of modulated signal;
- continuous generation of modulation signals (I and Q).



Features and options

Output microwave connector type

Output microwave connector type is determined by G7M-06 generator options:

- 01R option — type III connector (female);
- 11R option — type N connector (female).

Analog modulation

The G7M-06 generates amplitude, frequency and phase modulated signals using an internal modulation signal generator with typical waveforms (sinus, sawtooth, triangle, square, noise).

Pulse modulation

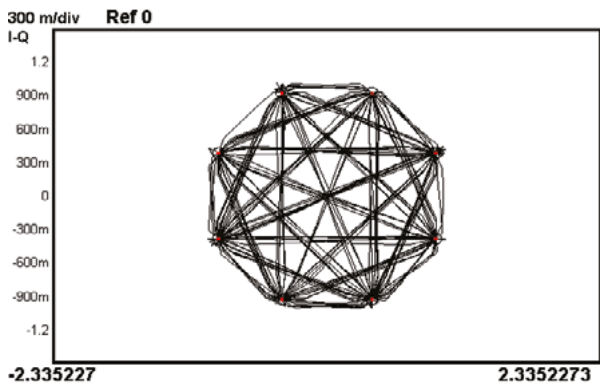
Pulse modulated signal can be generated using an internal or external pulse modulator. Internal or external pulse modulator can be controlled with the use of internal pulse oscillators that generates periodic pulse sequence and 2 to 255 pulses bursts.

Digital modulation

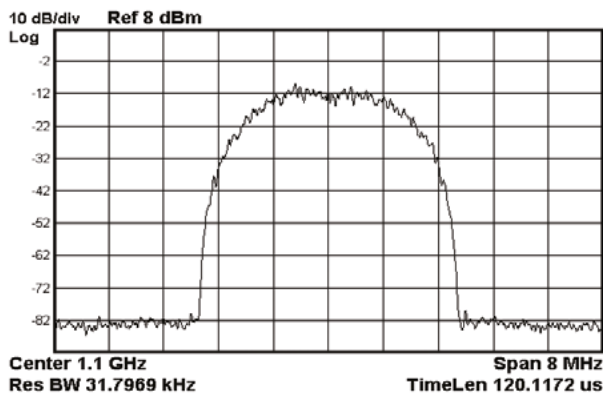
G7M-06 signal generator allows using both internal and external quadrature modulators to generate modulated signals. The internal or external oscillator can be used as a modulation signal source of the internal quadrature modulator. For this purpose, the front of the devices provides I and Q modulation signal inputs. The G7M-06 signal generator can be used as a modulation signal source of the external quadrature modulator as well, using I and O outputs at the back of the device.

Star pattern and signal spectrum at 1.1 GHz with 8PSK modulation, 16 Mbps data transmission rate and Nyquist filter with β equal to 0.9.

Star pattern diagram



Spectrum



Built-in generator of modulation signals (I and Q)

The two-channel generator is used as internal source of modulation signals that allows to:

- play pre-calculated and saved signal records of the device memory with sampling rate up to 125 MHz;
- play signal sequence records of the device memory (a few associated signal segments with predetermined

number of repetitions);

- correct and distort modulation signals;
- create event markers (markers are defined by user during signal generation).

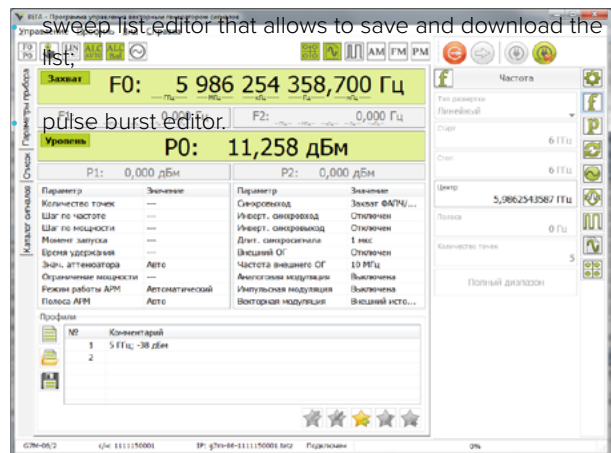
Synchronization system

The G7M-06 signal generator can stabilize output signal frequencies of 10, 50 or 100 MHz of external reference oscillator, and stabilize frequencies of external devices 10 MHz internal reference oscillator signals. Flexible digital synchronization system provides joint operation of signal generator and external devices, which allows using G7M-06 in various measuring systems without developing additional software.

Software

G7M-06 signal generator is controlled by VEGA software providing following advantages:

- user-friendly interface;
- wide capabilities for signal parameter setting;
- saving and downloading profiles;
- signal waveform library that allows creating waveform sequences;



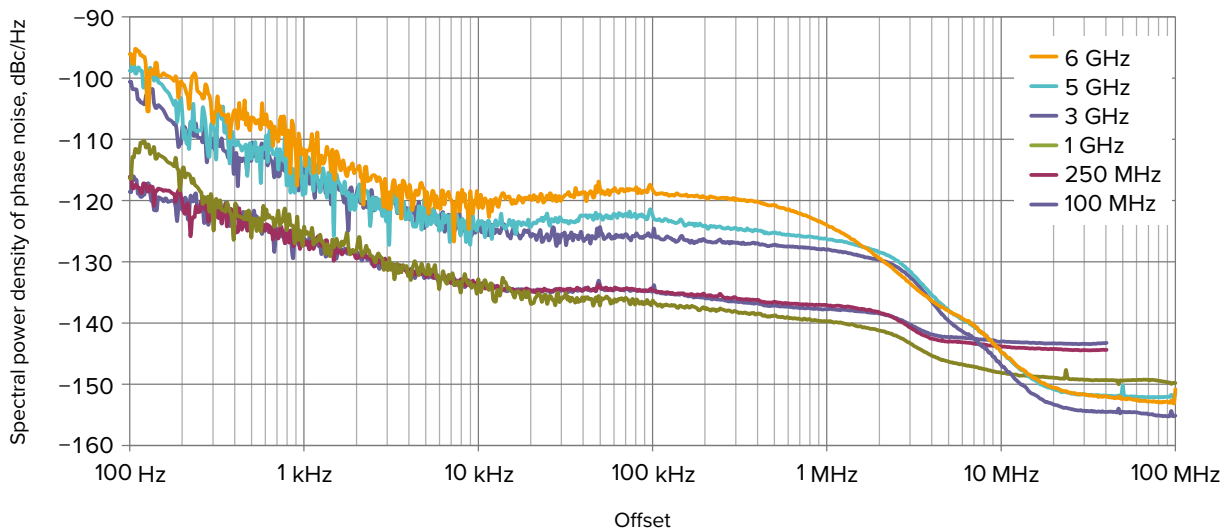
Specifications

Operating frequency range	10 MHz ... 6 GHz
Output frequency step	0.1 Hz
Relative frequency setting error for operation with built-in reference oscillator	$\pm 1 \times 10^{-6}$
Time required to set a new frequency	< 2 ms
Output signal power setting range	-90 ... +12 dBm
Output signal power setting increment	0.1 dB
Relative spectral power density level of phase noise at 20 kHz offset	
250 MHz	< -130 dBc/Hz
500 MHz	< -130 dBc/Hz
1 GHz	< -130 dBc/Hz
2 GHz	< -125 dBc/Hz
3 GHz	< -120 dBc/Hz
4 GHz	< -120 dBc/Hz
6 GHz	< -115 dBc/Hz
Relative level of harmonic components at 12 dBm output signal power	< -30 dBc
Relative level of nonharmonic components	< -50 dBc
Microwave signal modulation	
Frequency modulation	
FM deviation	0 ... 10 MHz
FM deviation setting increment	1 Hz
Phase modulation	
PM index	0 ... 3.14 radian
PM index setting increment	0.01 radian
Amplitude modulation	
AM depth	0 ... 100 %
AM depth setting increment	0.1%
Internal analog modulation source (amplitude modulation, frequency modulation, phase modulation)	
Modulation waveform	sinus, sawtooth, triangle, square, noise
Modulation signal frequency	0.1 Hz ... 10 MHz*
Modulation signal frequency setting increment	0.1 Hz
Pulse modulation	
Pulse envelope front/tail time	< 10 ns
Minimum pulse duration	20 ns
Pulse modulator	> 50 dB
Pulse modulation source	internal or external
Internal pulse oscillator	
Pulse duration	20 ns ... 3.99999998 sec
Pulse repetition period	40 ns ... 4 sec
Pulse duration and pulse repetition period setting increment	10 ns
Number of pulses per pulse burst	up to 255
Digital modulation specifications	
Modulation signal source (I and Q).	internal, external, sum
External modulation signal source	
Signal band at high-frequency (I + Q)	up to 200 MHz
Input resistance	50 Ohm
Allowable signal level	0.5 V
Fixed bias correction	± 100 mV with 0.1 mV step
Internal modulation signal source	
Number of channels	2 (I and Q)
DAC resolution	16 bit
Sampling rate	100 Hz ... 125 MHz
Sampling rate setting increment	0.1 Hz
Signal band at high-frequency (I + Q)	100 MHz
Maximum memory capacity per channel	32×10^6 samples
Waveform sequence	
Maximum number of segments per sequence	1024

* 10 MHz for sine waveform of modulation signal, 1 MHz for other waveforms.

Maximum number of a segment repetitions	65 535
Digital modulation settings of internal modulation signal generator	
Amplification balance	± 1 dB with 0.001 dB step
Phase balance	$\pm 10^\circ$ with 0.01° step
Permanent offset in I channel	$\pm 20\%$ with 0.01 % step
Permanent offset in Q channel	$\pm 20\%$ with 0.01 % step
Relative delay between I and Q channels	± 400 ns with 1 ns step
Modulation signal output (I and Q).	
Peak-to-peak signal output for 50 Ohm load	up to 1 V
Band	50 MHz
Fixed bias	± 1 V
Output signal type	symmetrical and asymmetrical

Phase noise



Ordering information

Basic supply set

1) G7M-06 vector signal generator. 2) Ethernet cable. 3) Power cable. 4) VEGA software for vector generator signal control. 5) Carrying case.

Versions

G7M-06/1 Vector signal generator, 0.01 ... 6 GHz with 01R option

G7M-06/2 Vector signal generator, 0.01 ... 6 GHz with 11R option

Additional accessories

On your request, the device may be supplied with additional coaxial adapters and cable assemblies.

Ordering example

- Vector signal generator G7M-06/1 — 1 pcs.
- Control and data display device PKU-11 — 1 pcs.