KEYSIGHT TECHNOLOGIES (AGILENT HP)

83712A

The Keysight / Agilent HP 83712A is a synthesized CW signal generator operating over the frequency range of 10 MHz to 20 GHz. Known for its high spectral purity and reliable performance, it is widely used for local oscillator substitution, RF component testing, and general-purpose microwave signal generation. It features standard 1 kHz frequency resolution, upgradable to 1 Hz, and versatile leveling options.

SPECIFICATIONS

General

Interfaces	GPIB (HP-IB)
Display	Front panel liquid crystal display (LCD)
Warm-up Time	30 minutes

Physical

Power Supply	90 to 132 VAC (48 to 440 Hz), 198 to 264 VAC (48 to 66 Hz); < 400 VA
Operating Temperature	0 to +55 °C °C
Dimensions (W×H×D)	425 mm x 133 mm x 498 mm mm
Weight	< 16 kg kg

Frequency

Frequency Range	10 MHz to 20 GHz (0.01 to 20.0 GHz)
Frequency Resolution (Standard)	1 kHz
Frequency Resolution (with Option 1E8)	1 Hz
Frequency Aging Rate (Standard)	< 1.0 x 10^-6 / year
Frequency Aging Rate (with Option 1E5)	< 5 x 10^-10 / day after 24-hour warm-up
Frequency Switching Time	< 50 ms to within 1 kHz

Amplitude and RF Output

Maximum Leveled Output Power (0.01 - 1 GHz)	+13 dBm
Minimum Leveled Output Power (Standard)	0 dBm
Minimum Leveled Output Power (with Option 1E1)	-110 dBm
Amplitude Display Resolution	0.01 dB
Level Flatness (Power >= -90 dBm)	±0.7 dB
Level Flatness Degradation (Type-N RF connectors above 18 GHz)	Typically 0.2 dB
Output Source SWR	< 2.0:1 nominal
Nominal Source Impedance	50 Ω

Spectral Purity

Harmonics (0.01 to 1 GHz)	<-30 dBc
Non-harmonic Spurious (Offsets >= 3 kHz)	<-50 dBc
Residual FM (at 1 GHz)	< 15 Hz (in 50 Hz to 15 kHz bandwidth)
Residual FM Scaling	Decreases 6 dB per octave below 1 GHz
AM Noise Floor (1-20 GHz)	<-150 dBc/Hz (at 0 dBm and offsets > 5 MHz from carrier)
AM Noise Floor (0.01-1 GHz)	<-140 dBc/Hz (at 0 dBm and offsets > 5 MHz from carrier)
SSB Phase Noise (at 10 GHz, 10 kHz offset)	<-78 dBc/Hz

Ports and Connectivity

RF Output Connector (Standard)	Type-N precision
RF Output Connector (with Option 1E9)	3.5 mm precision (male APC-3.5)
ALC Input Connector	Front panel BNC
ALC Input Nominal Impedance	100 kΩ
10 MHz External Reference Input Connector	Rear panel BNC
External Reference Input Requirements	10 MHz ± 100 Hz, 0 to +10 dBm
External Reference Nominal Input Impedance	50 Ω
10 MHz Reference Output Connector	Rear panel BNC
10 MHz Reference Output Level	Nominally +3 dBm
10 MHz Reference Output Nominal Impedance	50 Ω
0.5 V/GHz Output	Rear panel connector, supplies voltage proportional to output frequency

Configurations and Options

Option 1E1	Output Step Attenuator
Option 1E5	High stability timebase
Option 1E8	1 Hz frequency resolution

Environmental

Storage Temperature	-40 to +75 °C
Operating Altitude	Up to 4,570 m
Non-operating Altitude	Up to 15,240 m

Output Power

Amplitude Resolution	0.01 dB
Power Sweep Range	> 15 dB

Inputs & Outputs

External Reference Input Frequency	10 MHz
Rear Panel Connector Types	BNC (Ref In, Ref Out, ALC In, 0.5 V/GHz Out), GPIB

Power

Maximum Power Consumption	400 VA

Connectivity & Control

Programming Language	SCPI

TECHNOLOGY

Synthesized CW Signal Generator

APPLICATIONS

RF/Microwave Testing, Local Oscillator Substitution, Component Characterization