Quality&**Precise**

MAXWELLON 1435V

9kHz~3GHz/6GHz

Vector Signal Generator

2023

Maxwellon

Based on innovative technologies, the 1435-V series signal generator achieves balance in terms of performance, economy and volumetric weight. It supports arbitrary modulation of wave data downloaded in 5 formats, and enables users to edit, download, and configure the waveforms as required to complete various signal simulations and meet the testing requirements of various complex signals. Its baseband signal generator is easy to set up and has excellent performance. It supports real-time occurrence of general digital modulation signals in more than 20 formats such as PSK, QAM, FSK and MSK. It also has excellent spectral purity, with a single side band (SSB) phase noise of -136dBc/Hz (when the carrier is 1GHz and the frequency offset is 10kHz) or -120dBc/Hz (when the carrier is 6GHz and the frequency offset is 10kHz).

It provides a high power output and a large dynamic range, with the maximum output power up to 22dBm@3GHz and an output power dynamic range greater than 150dB. Besides, it is equipped with a 7-inch high-sensitivity LED touch screen, and supports operation by touch screen, panel buttons, rotary knobs, external mouse and keyboard, etc.

Key Feature

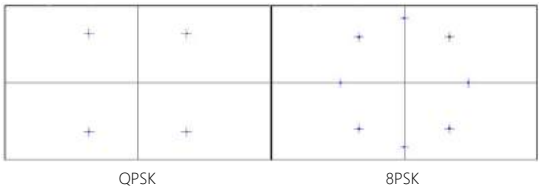
- Wide frequency coverage
- High output power
- Excellent SSB phase noise
- Extremely short frequency switching time
- High performance pulse modulation
- Built-in multi-function function generator
- Small size and light weight
- High-sensitivity LED touch screen

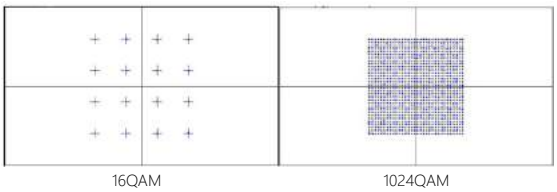
High Compatibility, Downloading Of Wave Data In Arbitrary Format

The 1435-V series signal generator supports direct downloading and playing of arbitrary wave data in five formats: Mat-File 5, ASCII, Binary, cap and csv, and provides a storage depth of 2G sampling points.

Complete Universal Digital Modulation Modes

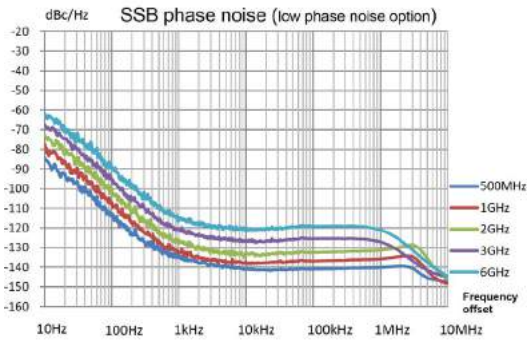
The 1435-V series signal generator supports real-time occurrence of universal digital modulation signals in more than 20 formats, including PSK, QAM, FSK and MSK.





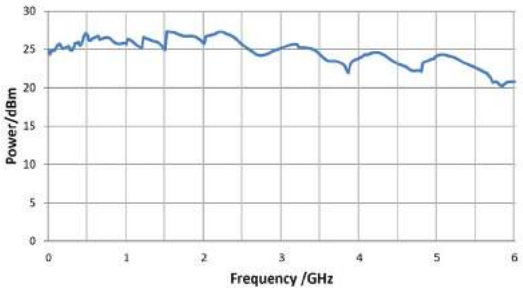
Excellent SSB Phase Noise

The 1435-V series signal generator provides two st ep s of SSB phase noise for users. The standard SSB phase noise is measured at -104dBc/Hz (6GHz@10kHz) and the SSB phase noise can be as low as -120dBc/Hz (6GHz@10kHz) when the low phase noise option is selected . Users can select the phase noise as required to achieve the optimal cost performance.
It covers a frequency range of 9kHz to 6GHz.



High Output Power

When the H08 high-power output option is selected, the measured value of the full-band output power of the 1435-V series signal generator can be above 20dBm. In the test where high-power excitation signals are required, the 1435-V series signal generator can be used to obtain the required test signal without an external amplifier.



Maximum output power of 1435B-V (option H08)

Small Size And Light Weight

By adopting the portable 3U-high chassis design, the 1435-V series signal generator has its weight and volume greatly reduced (compared to bench instruments). The heaviest model of this series is 9.4kg, and the lightest model is 7.8kg.

High-Sensitivity Led Touch Screen

The 7-inch wide LED display which supports a resolution of 800 × 480 pixels clearly shows the instrument status information. The combination of the capacitive screen and the tailored window interface enables the 1435-V series signal generator to respond sensitively and accurately to users' touch operations. In addition to the touch screen, the user can also operate the instrument by the panel buttons, the rotary knobs (with the Enter function), and the external keyboard and mouse conveniently and quickly.

Typical Applications

General Test

The 1435-V series signal generator has complete functions, and supports both digital modulation and AM, FM, ΦM and PM analog modulation functions, which can be widely used in the field of RF testing.

Test Of Communication Systems

The 1435-V series signal generator provides excellent digital modulation performance, complete digital modulation modes, and supports real-time occurrence of universal digital modulation signals and user-defined modulation signals in more than 20 formats such as PSK, QAM, FSK, MSK, etc., which is suitable for various indicator tests, for example, the bit error rate of a communication system.

Test Of Navigation Systems

The 1435-V series signal generator is highly compatible and supports arbitrary wave data in various formats, which enables it to conveniently play user-defined navigation data files. In addition, it has a power dynamic range up to 150dB. Thus, it is suitable for such indicator tests as the sensitivity and signal-to-noise ratio of a navigation receiving devices.

Specification[1]

Frequency Properties			
Frequency Range	1435A-V:9kHz~3GHz 1435B-V:9kHz~6GHz	Frequency	N (Internal YO harmonic number)
		9kHz≤f≤250MHz	1/8
		250MHz≤f≤375MHz	1/16
		375MHz<f≤750MHz	1/8
		750MHz<f≤1.5GHz	1/4
		1.5GHz<f≤3GHz	1/2
		3GHz<f≤6GHz	1
Frequency Resolution	0.001Hz		
Frequency Switching Time	<1ms(typical value[2])		
Timebase Aging Rate (typical value)	Standard: $\pm 5\times10^{-7}$/year (after continuous switch-on for 30 days)		
	High Stability Time Base option H10: $\pm 5\times10^{-10}$ /day (after 30-day continuous power-on)		
Reference Output	Frequency	10MHz	
	Power	>+4dBm to 50 Ω load	
Reference Input	Frequency	1-50MHz, 1Hz step	
	Power	0dBm~+7dBm, 50Ω impedance	
Sweep Properties			
Sweep Mode	Step Sweep, List Sweep		
Scan Dwell Time	100μs~100s		
Power Features			
Min. Power	Standard:-15dBm (can be set -20dBm)		
	Option H01:-110dBm (can be set -135dBm)		
Max. Power (25±10°C)	Frequency Range	Standard	High Power Output Option H08
	9kHz≤f≤3GHz	18dBm	22dBm
	3GHz<f≤5GHz	16dBm	20dBm
	5GHz<f≤6GHz	15dBm	18dBm

Power Accuracy (25±10°C)	Standard				
	Power (dBm) / Frequency	10~Max. Power	-10 ~ 10		-15 ~ 10
	9kHz≤f≤2GHz	±0.8dB	±0.6dB		±1.5dB
	2GHz<f≤6GHz	±0.9dB	±0.7dB		±1.5dB
	H01 programmable step attenuator option				
	Power (dBm) / Frequency	10~Max. Power	-10~10	-70~-10	-90~-70
	9kHz≤f≤2GHz	±0.8dB	±0.6dB	±0.7dB	±1.4dB
	2GHz<f≤6GHz	±0.9dB	±0.7dB	±0.7dB	±1.6dB
Power Resolution	0.01dB				
Output Impedance	50Ω (rated value[3])				
Source Standing Wave Ratio, VSWR (Internal Fixed Amplitude) (Typical Value)	9kHz≤f≤3GHz	<1.7			
	3GHz<f≤6GHz	<1.6			
Max. Reverse Power	0.5W (0V DC) (rated value[3])				

Spectral Purity[4]

Harmonic Wave (at +10dBm)	Frequency	Standard			
	9kHz≤f≤10MHz	<-23dBc			
	10MHz<f≤2GHz	<-30dBc			
	2GHz<f≤3GHz (1435A-V)	<-55dBc			
	2GHz<f≤6GHz (1435B-V)	<-30dBc			
Subharmonic Wave (at +10dBm)	9kHz≤f≤6GHz	None			
Non-harmonic Wave (at 0dBm, 10kHz Frequency Offset)	Frequency	Standard	Low phase noise option		
	9kHz≤f≤250MHz	<-54dBc	<-60dBc		
	250MHz<f≤3GHz	<-62dBc	<-77dBc		
	3GHz<f≤6GHz	<-56dBc	<-71dBc		
SSB Phase Noise (dBc/Hz at +10dBm)	Standard				
	Frequency	100Hz	10kHz		
	100MHz	-83	-115		
	250 MHz	-93	-127		
	500MHz	-89	-121		
	1 GHz	-83	-115		
	2 GHz	-77	-109		
	3GHz	-74	-105		
	4 GHz	-71	-103		
	6 GHz	-68	-99		
	Low phase noise option H06				
	Frequency	100Hz	1kHz	10kHz	100kHz
	100MHz	-83	-112	-131	-131
	250MHz	-93	-123	-139	-139
	500MHz	-89	-119	-135	-135
	1GHz	-83	-113	-132	-132
	2GHz	-77	-107	-126	-126
	3GHz	-74	-104	-121	-121
	4GHz	-71	-101	-120	-120
	6GHz	-68	-98	-115	-115

Modulation Features			
Frequency Modulation[5] (Option H02)	Maximum frequency offset: N × 16MHz (N is the number of fundamental harmonic wave) Accuracy (1kHz modulation rate, frequency offset: N × 500kHz): ± (2% × set frequency offset + 20Hz) Modulation rate (3dB bandwidth, frequency offset: N × 500kHz): DC-7MHz Distortion (1kHz rate, frequency offset: N × 500kHz): <0.4%		
Phase Modulation[5] (Option H02)	Maximum phase offset: N × 16rad (N is the number of fundamental harmonic wave) Accuracy (1kHz modulation rate, frequency offset: N × 500kHz): ± (2% × set phase offset + 0.01rad) Modulation rate (3dB bandwidth, phase offset: N × 8rad): DC-1MHz Distortion (1kHz modulation rate, phase offset: N × 8rad): <0.4%		
Amplitude Modulation[5] (Option H02)	Maximum depth: >90% Amplitude modulation accuracy(1 kHz modulation rate, 30% modulation depth): ± (4% × set depth +1%) Amplitude modulation distortion(1kHz modulation rate, linear mode, total harmonic distortion, 30% modulation depth): <2%; Amplitude modulation bandwidth (3dB bandwidth, 30% modulation depth, frequency test point: 1GHz, 5GHz): DC~100kHz.		
Pulse Modulation[6] (Option H03)	Switching ratio		>80dB
	Rise and fall time		<10ns
	Minimum pulse of internal fixed amplitude		1μs
	Minimum pulse of non-fixed amplitude		100ns
Narrow Pulse Modulation[6] (Option H04)	Switching ratio		>80dB
	Rise and fall time		<10ns
	Minimum pulse of internal fixed amplitude		1μs
	Minimum pulse of non-fixed amplitude		20ns
Internal Analog Modulation Signal Generator (Option H02)	It provides three independent signals for frequency/phase modulation, amplitude modulation and low frequency output signals Waveform: sine wave, square wave, triangle wave, sawtooth wave Frequency range: sine wave 0.1Hz~10MHz Square wave, triangle wave, sawtooth wave 0.1Hz~1MHz Frequency resolution: 0.1Hz Low frequency output: amplitude 0~5V peak (rated value), to 50Ω load		
Internal Pulse Generator (Option H03)	Pulse width: 20ns~(42s-10ns) (rated value) Pulse period: 40ns~42s Resolution: 10ns		
Multi-function Function Generator (Option H05)	The Multi-function generator consists of 7 waveform generators. The generator can be set separately or five generators can be set simultaneously by using the AM, FM/ΦM and the composite modulation characteristics in the low-frequency output. Waveform: Function generator 1: sine wave, triangle wave, square wave, sawtooth wave, pulse Function generator 2: sine wave, triangle wave, square wave, sawtooth wave, pulse Dual function generator: sine wave, triangle wave, square wave, sawtooth wave, pulse, phase offset and amplitude ratio of audio 2 relative to audio 1; Scan function generator: sine wave, triangle wave, square wave, sawtooth wave; Noise generator 1: uniform, Gaussian; Noise generator 2: uniform, Gaussian; DC: LF output only; Frequency parameters: Sine wave: 0.1Hz to 10MHz; Triangle wave, square wave, sawtooth wave, pulse: 0.1Hz to 1MHz; Resolution: 0.1Hz;		
Vector Modulation Accuracy (25°C ± 10°C After Calibration) (Symbol Rate: 4Msps, Root Nyquist Filter, A=0.3, QPSK Format, 0dBm)	50MHz~3GHz		EVM (RMS%) <1.4%
	3GHz~6GHz	Standard	EVM (RMS%) <1.8%
		Low phase noise option	EVM (RMS%) <1.4%
Internal Modulation Bandwidth	(Carrier 900MHz, 1.8GHz, 2.4GHz, 6GHz) Standard: 120MHz (multi-tone, number of tones: 51, frequency interval: 2.4MHz, ±3dB bandwidth); H09 large modulation bandwidth option: 200MHz (multi-tone, number of tones: 51, frequency interval: 4MHz, ±3dB bandwidth).		

External Modulation Bandwidth	(Carrier 900MHz, 1.8GHz, 2.4GHz, 6GHz) 200MHz (open loop of fixed amplitude, input 100mVrms sine wave through I channel,±4dB bandwidth)
Internal Baseband Signal Generator	**Number of channels**: 2 (I and Q) **Maximum symbol rate:** Standard: 75Msps Option 09: 125Msps **Baseband waveform memory:** Standard: 1G sampling point Option H32: 2G sampling point **Real-time baseband mode:** Modulation format: PSK: BPSK, QPSK, OQPSK, π/4DQPSK, D8PSK, 16PSK QAM: 4, 16, 32, 64, 128, 256, 512, 1024 FSK: 2, 4, 8, 6 ASK, MSK, arbitrary wave modulation EVM: <1.0% (typical value) (RMS%, symbol rate: 4Msps, root Nyquist filter, α=0.3, QPSK format) Maximum frequency interval in dual tone mode: 200MHz **Arbitrary wave mode:** Data format: Mat-File 5, ASCII, Binary, cap, csv. Trigger: Trigger type: continuous, single, gating, advanced waveform segments; Trigger source: trigger key, external, remote (GPIB, LAN); Trigger mode: auto play, trigger play, trigger reset, single auto, single trigger buffer, single reset, gated (high, low), waveform segment-single, waveform segment-continuous;
AWGN (option S03)	Types: Pure noise, Continuous wave jamming, Additive noise Noise bandwidth: 120/200MHz Setting range: 0 to 40dB
General Features	
RF Output Port	N type (negative), impedance 50Ω
Maximum Dimensions (width × height × depth)	330mm × 147mm × 397mm (excluding the handle)
	420mm × 147mm × 445mm (including the handle)
Weight	<12kg (the weight varies with the model and option configuration)
Power Supply	100~120VAC, 50~60Hz; or 200~240VAC, 50~60Hz (self-adaptive)
Power Consumption	Less than 300W
Temperature Range	Operating temperature: 0°C~+50°C; storage temperature: -40°C~+70°C

Notes:

1. The 1435-V series signal generator can be stored at ambient temperature for 2 hours. After preheating for 30 minutes, the attenuator is automatically coupled (or ALC power is greater than -5dBm) to meet the performance of each indicator within a given working range.

2.The typical value is a supplementary feature given based on the stereotype value, which is only for user reference, and will not be assessed.

3.The rated value refers to the expected performance, or describes the product performance that is useful in the product but is not included in the product warranty.

4.The spectral purity indicates that the point frequency has no modulation mode.

5.The technical specifications of frequency modulation, phase modulation and amplitude modulation are applicable to frequencies above 10MHz.

6.The technical specifications of pulse modulation and narrow pulse modulation are applicable to frequencies above 50MHz.

Ordering Information

Model

Model	Name	Description
1435A-V	Vector Signal Generator	9kHz~3GHz
1435B-V	Vector Signal Generator	9kHz~6GHz

Standard

No.	Name	Description
1	Power Cord	Standard three core power cord
2	Product certificate	

Options

Option Model	Name	Description
1435V-H01-A	115dB programmable step attenuator	Expand the output power dynamic range.
1435V-H02	Analog modulation	Increase analog modulation functions, including AM, FM, ΦM and low frequency output.
1435V-H03	Pulse modulation	Increase the pulse modulation function with a minimum pulse width of 100ns.
1435V-H04	Narrow pulse modulation	Increase the pulse modulation function with a minimum pulse width of 20ns.
1435V-H05	Multi-function function generator	Add a richer analog modulation signal format. (Note: The H05 option is available after the H02 analog modulation option is selected.)
1435V-H06	Low phase noise	Optimize SSB phase noise, 6GHz@10kHz: -115dBc/Hz.
1435V-H08	High power output	Increase the maximum output power.
1435V-H09	Large modulation bandwidth	The internal modulation bandwidth is extended to 200MHz, suitable for the -V series.
1435V-H10	High stability time base option	Internal time base aging rate.
1435V-H32	Large-capacity memory of built-in baseband	Built in baseband memory is expanded to 8GB, suitable for the -V series.
1435V-H50	Calibration certificate	Instrument calibration.
1435V-H92	RF output moved to the rear panel	RF output on rear panel.
1435V-H93	Portable handle	3U handle.
1435V-H94	Rack mount kit	Mounting kit for the upper cabinet.
1435V-H95	Aluminum alloy transport case	High-strength lightweight aluminum alloy transport case with handle and universal roller for easy transportation.
1435V-H98	English kit	English panel, English manual, English operation interface and English operating system.
1435V-S01	Arbitrary	Support arbitrary wave data download and playback, generation of baseband signal or signal playback
1435V-S02	Linear	Supported intra-pulse linear frequency modulation function
1435V-S03	Gaussian White Noise	Supported pure noise generation, additive noise generation and continuous wave jamming generation

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