

AV1464 /A/B/C Synthesized Signal Generator

(250kHz~20GHz/40GHz/50GHz/67GHz)



Product Overview

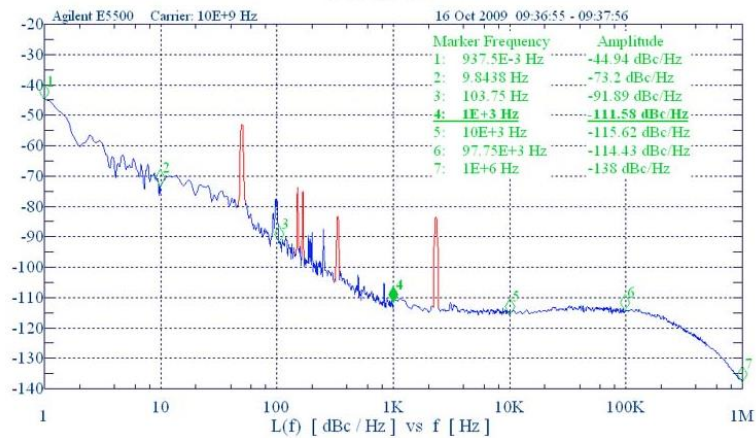
AV1464 series enjoy world-class sideband phase noise within the frequency range of 250kHz~67GHz. Any strict test requirements on signal generators can be satisfied by the excellent spectrum purity, extra-wide frequency coverage, high-precision analog sweep, and high-precision power output in a large dynamic range. The standard dual-channel internal modulation signal generators and complex pulse generators provide wonderful AM, FM, \varnothing M modulation and pulse modulation capabilities, and free you from the annoyance of selecting from numerous options. AV1464 series have four models to meet various demands from customers, they are AV1464A 250kHz ~ 20GHz, AV1464B 250kHz ~ 40GHz, AV1464C 250kHz ~ 50GHz and AV1464 250kHz~67GHz. Simplified Chinese and English operation menus and large TFT LCD can better fulfill customers' demands. These products are ideal LO sources, clock sources and high-performance synthesized sweep sources, and also generate high quality analog signals. They are mainly used in the comprehensive assessment of electronic system performances, testing on high-performance receiver and parameters of components and parts, can be applied to many fields, such as aviation, spaceflight, radar, and communication and navigation equipment.

Main Characteristics

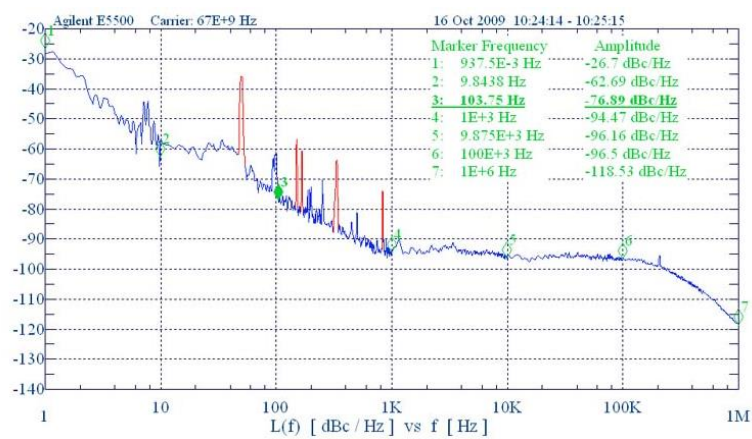
- Extra-wide frequency coverage
- Super pure signals
- Large dynamic range high-precision power output within the bandwidth of 67GHz
- High-precision analog sweep frequency output
- Standard package contains an inter-modulation signal generator and a pulse generator
- Excellent wideband DCFM, DC \varnothing M
- High-precision linearity AM and exponential AM
- High-performance pulse modulation
- 170GHz frequency-multiplication source module frequency extension
- Chinese/English operation menus, large TFT LCD display
- Analog, Step, List, and Power Sweep
- Automatic software update with U Disk

Super pure signals

AV1464 series can provide Hi-Q test signal in bandwidth of 67GHz, good sideband phase noise, harmonic and spurious performance to meet test requirements of radar system development and satellite communications for clean drive signal.



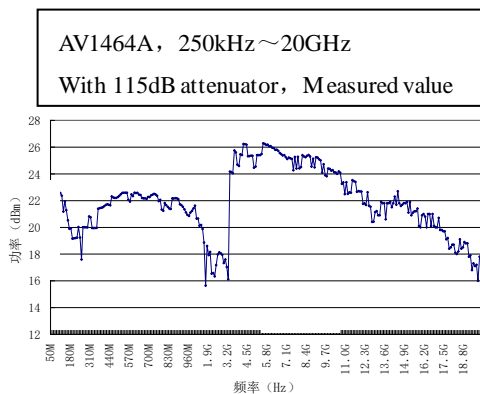
Single-sideband phase noise (10GHz carrier)



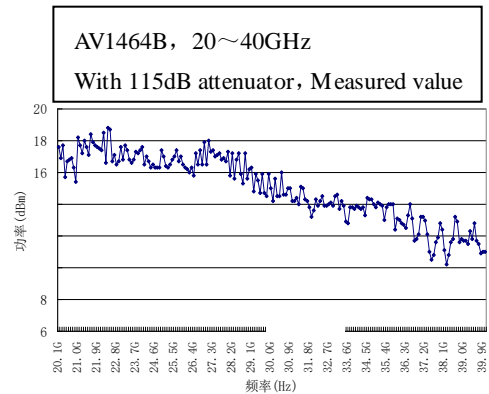
Single-sideband phase noise (67GHz carrier)

High-precision power output within a large dynamic range

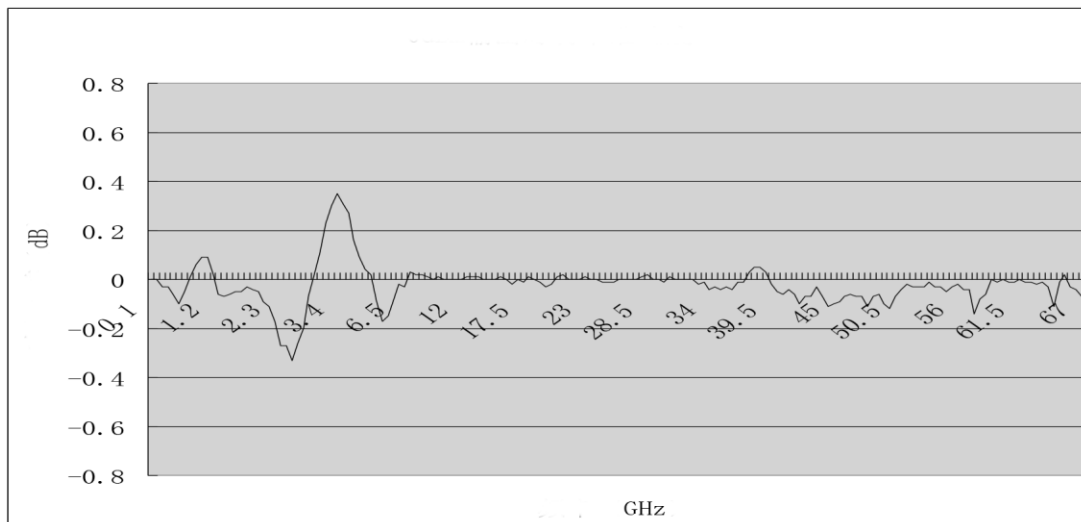
AV1464 series can output high-precision signals in a large dynamic range within the frequency of 67GHz to meet your testing requirements.



Max. Output power



Max. Output power



AV1464 power accuracy of 0dBm output

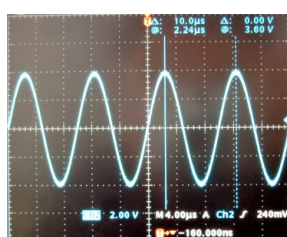
High-precision analog sweep frequency

Whole frequency high-precision analog frequency sweep can satisfy your demands on fast sweep during wideband test.

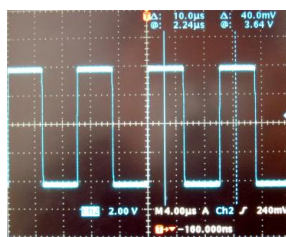
Internal modulation signal generator and pulse generator (standard)

Configuring standard dual-channel internal modulation signal generators, AV1464 series generate high-quality modulation signals by the synthesis technology of direct digital waveform. The frequency range is DC-1MHz and resolution is 0.1Hz. Modulated waveforms can have as many as 7 kinds to provide comprehensive signal analog.

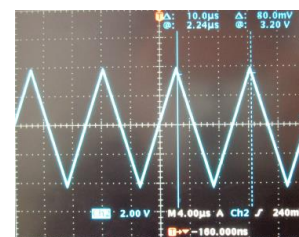
The standard configuration of internal pulse generator supplies 6 pulse modes totally for your choice. The pulse width can be set randomly between 40ns and 42s at steps of 10ns and pulse ON/OFF ratio is larger than 80dB, to meet your test for high-performance pulse source.



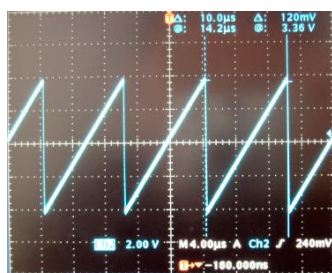
Sine



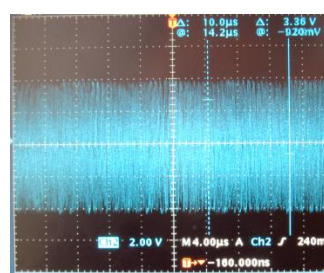
Square



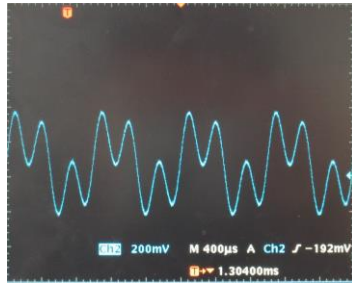
Triangular



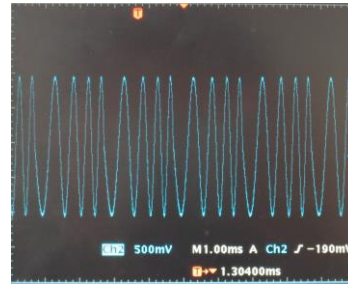
Saw-tooth wave



Noise



Dual-sine

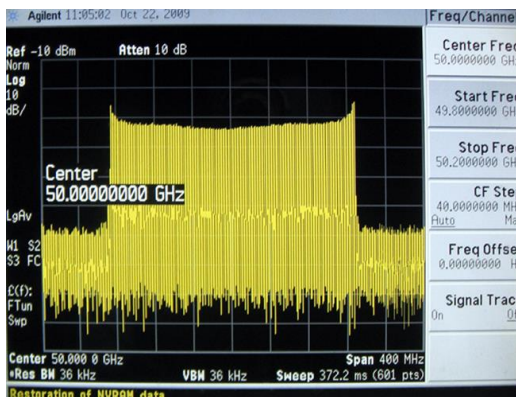


Swept-sine

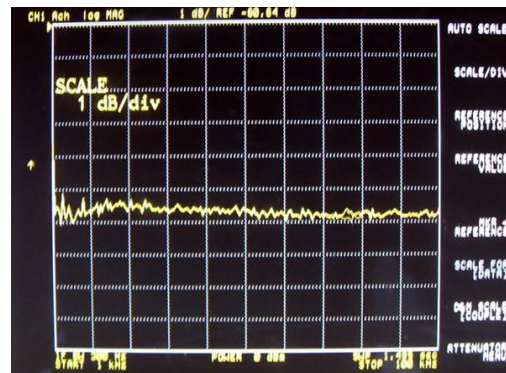
Excellent analog modulation (standard)

The AV1464 series come standard with excellent analog modulation capability as well as AM, FM, ØM functions and support the inputs of internal and external modulation sources. They have wonderful DCFM capability with modulation rate up to DC~10MHz. They have two kinds of work modes: linear AM and index AM. The depth of the linear AM is greater than 90%. They offer you comprehensive solutions to generate high quality analog signals.

Carrier 50GHz, frequency offset 128MHz
frequency modulation spectrum

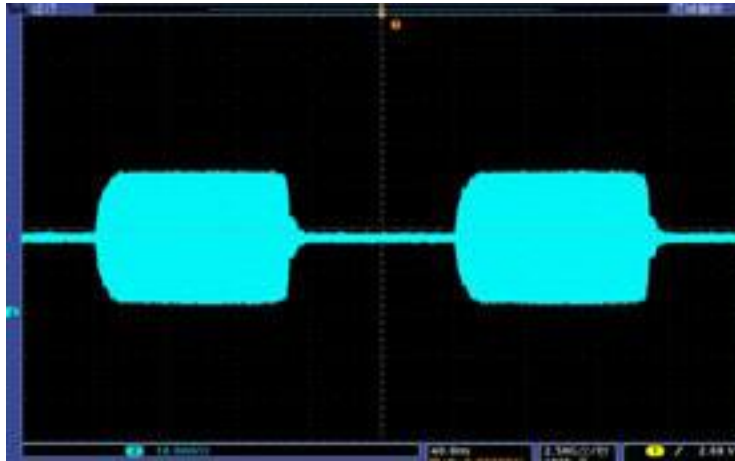


Carrier 50GHz amplitude modulation
bandwidth



High-performance pulse modulation (standard)

The AV1464 series come standard with high-performance pulse modulation function. When the output frequency is greater than 500MHz, its modulation depth is greater than 80dB, its modulation rate is smaller than 20ns and its minimum pulse width is 100ns. They support many trigger modes like gate, external, etc.. Double-pulse output is available and provides flexible and convenient solutions for radar pulse signal analog.



Pulse modulation waveform when Carrier is 60GHz and pulse width is 100ns

Spectrum extension of source module (standard)

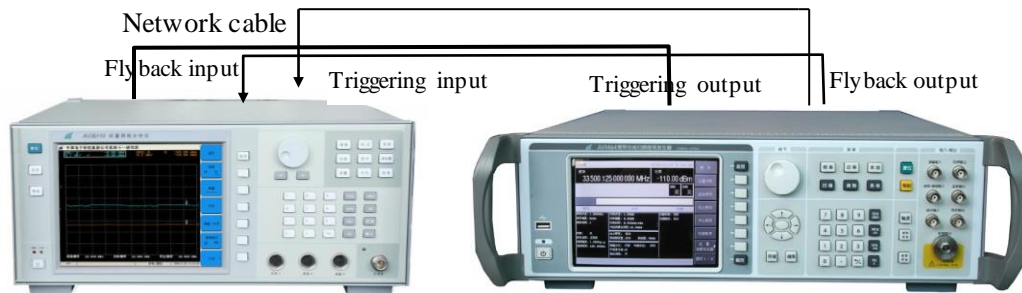
The AV1464 series come standard with a source module interface to which the waveguide series source modules of CETI can be connected to extend frequency to millimeter-wave, which provide a simple, quick, low-cost solution for high quality millimeter-wave signal generation.

Millimeter-wave output

Support:	Frequency Range
AV82406	50~75GHz
AV82406A	75~110GHz
AV82406B	110~170GHz

Establishment of automatic scalar network testing system

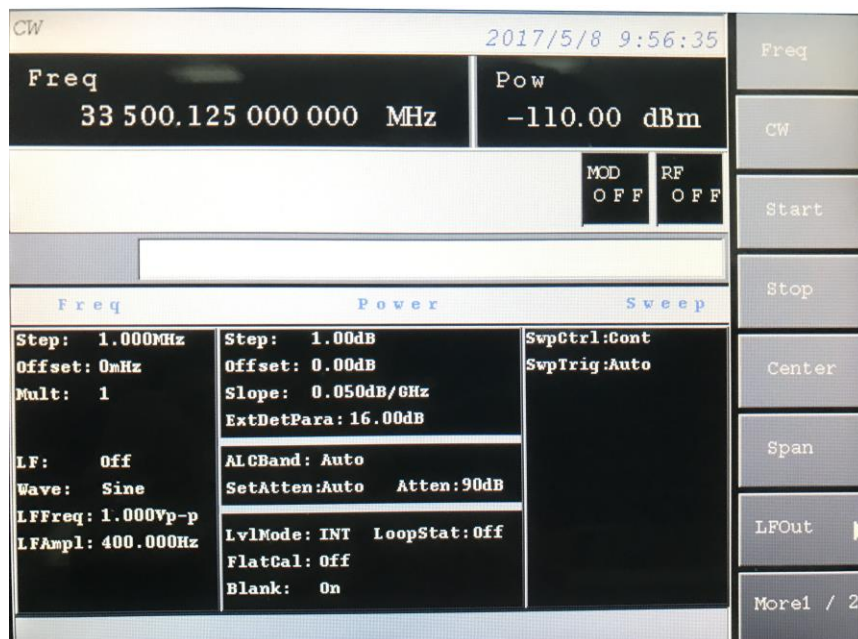
AV1464 series can build up an auto scalar network testing system together with AV36110 Scalar Network Analyzer to bring you fast and convenient wideband network test.



AV36110 Scalar Network analyze

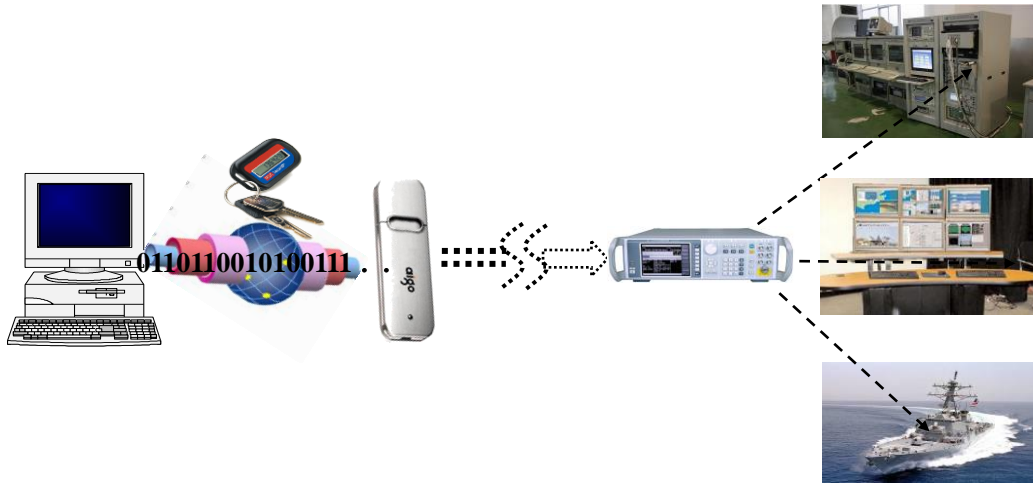
Chinese/English operation menu, Large TFT LCD

The AV1464 series with independently designed software use large screens and Simplified Chinese/English operation menus and have a panoramic view of the current state. The operation menus can be set in English according to the different uses and occasions for your convenience.



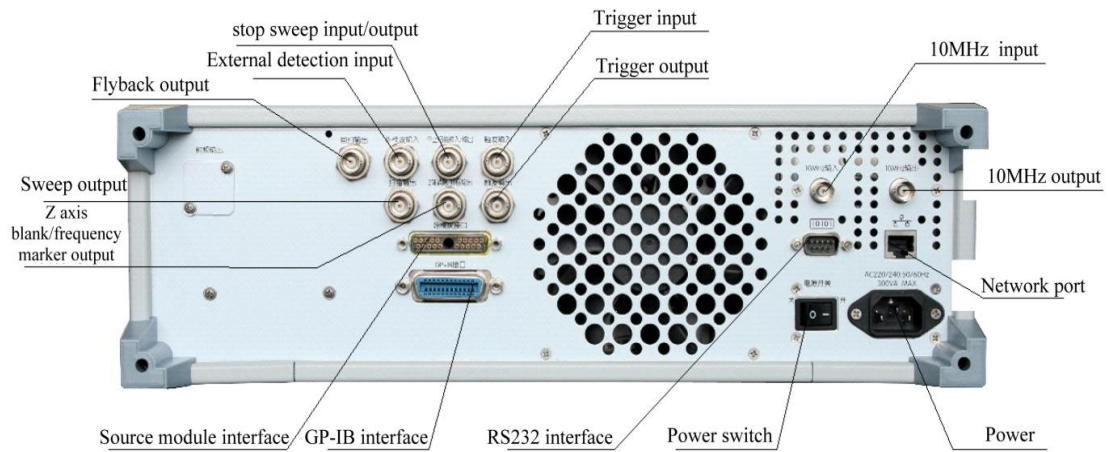
Auto software update with a U disk

The AV1464 series provide USB interfaces available for smart software update and data backup. You can easily use a U disk for simple and quick software update and maintenance.



Multiple programming interfaces

The AV1464 series offer additional extended interfaces like RS232 interface, GPIB interface, network interface, etc., for your choice to enable remote control and network update.



Typical Applications

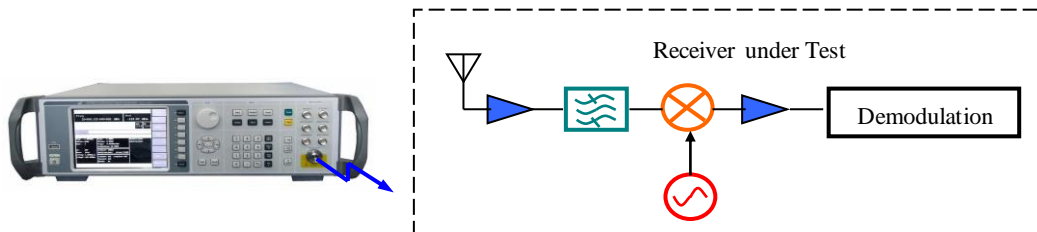
Comprehensive performance evaluation on electronic system

As synthesized signal generators with top-level performance in such field, AV1464 series can generate high quality analog signals in a large dynamic range within the frequency range of 250kHz~67GHz. They are used in the comprehensive performance evaluation of electronic systems on radar, electronic warfare and communication equipment, etc., to address the problems in system specification test on bandwidth, sensitivity, dynamic range, intermodulation distortion and so on.



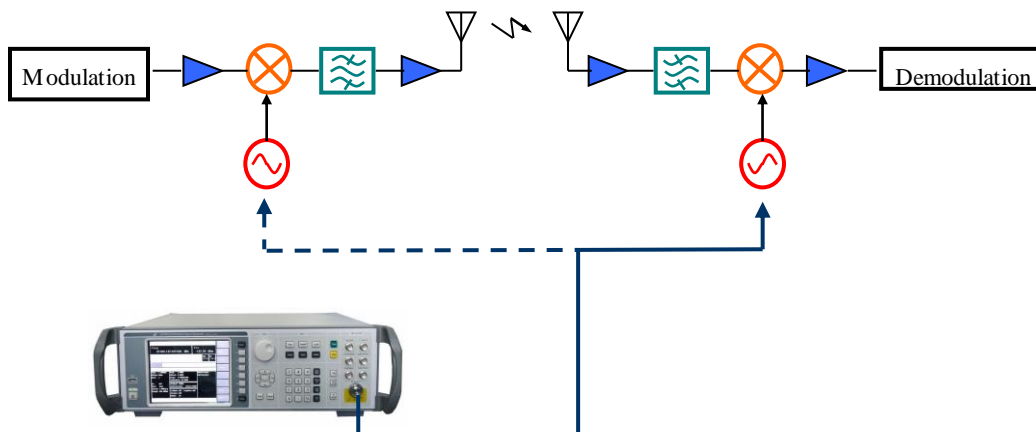
Testing on High-performance Receiver

AV1464 series possess large output dynamic ranges and extremely high frequency stability and frequency resolution is 0.001Hz. They can output high-precision standard test signals in performance test on the high-performance receivers of radar, electronic warfare and communication equipment to address the problems in specification test on sensitivity, dynamic range, and channel selectivity and so on.



Local oscillator (LO) substitution

With high pure signal quality, the AV1464 series can be used as ideal local oscillators to substitute those in the equipment under test, such as transmitters and receivers. They will effectively avoid negative effect on test due to bad quality of LO so as to ensure the accuracy and creditability of your test.



Technical Specifications

Frequency Range	AV1464A: 250kHz~ 20GHz AV1464B: 250kHz~ 40GHz AV1464C: 250kHz~ 50GHz AV1464 : 250kHz~ 67GHz	Frequency	N (internal YO harmonic number)
		$250\text{kHz} \leq f \leq 250\text{MHz}$	1/8
		$250\text{MHz} < f \leq 500\text{MHz}$	1/16
		$500\text{MHz} < f \leq 1\text{GHz}$	1/8
		$1\text{GHz} < f \leq 2\text{GHz}$	1/4
		$2\text{GHz} < f \leq 3.2\text{GHz}$	1/2
		$3.2\text{GHz} < f \leq 10\text{GHz}$	1
		$10\text{GHz} < f \leq 20\text{GHz}$	2
		$20\text{GHz} < f \leq 40\text{GHz}$	4
		$40\text{GHz} < f \leq 67\text{GHz}$	8
Frequency Resolution	0.001Hz		
Time-base Aging Rate (typical)	5×10^{-10} /day (power on after 30 days)		
Sweep Mode	Step Sweep List Sweep Power Sweep Analog Sweep		
Analog sweep (typical)	Max. Sweep speed rate	$250\text{kHz} \leq f \leq 500\text{MHz}$	25MHz/ms
		$500\text{MHz} < f \leq 1\text{GHz}$	50MHz/ms
		$1\text{GHz} < f \leq 2\text{GHz}$	100MHz/ms
		$2\text{GHz} < f \leq 3.2\text{GHz}$	200MHz/ms
		$3.2\text{GHz} < f$	400MHz/ms
	Sweep accuracy	0.05% Sweep width (sweep time 100ms, within the regulated max. sweep width of 100ms)	
Harmonic ²	$250\text{kHz} \leq f \leq 10\text{MHz}$	-28dBc (typical)	
	$10\text{MHz} < f \leq 2\text{GHz}$	-28dBc	
	$2\text{GHz} < f \leq 20\text{GHz}$	-55dBc	
	$20\text{GHz} < f \leq 40\text{GHz}$	-50dBc	
Sub-harmonic ²	$250\text{kHz} \leq f \leq 10\text{GHz}$	N/A	
	$10\text{GHz} < f \leq 20\text{GHz}$	-55dBc	
	$20\text{GHz} < f \leq 67\text{GHz}$	-50dBc	
Non-harmonic ³	$250\text{kHz} \leq f \leq 2\text{GHz}$	-65dBc	
	$2\text{GHz} < f \leq 20\text{GHz}$	-56dBc	
	$20\text{GHz} < f \leq 40\text{GHz}$	-50dBc	

	40 GHz < f ≤ 67GHz	-44dBc			
Single Sideband Phase Noise (dBc/Hz) ⁴	Frequency \ Freq. offset	100Hz	1kHz	10kHz	100kHz
	250kHz ≤ f ≤ 250MHz	-101	-121	-130	-130
	250MHz < f ≤ 500MHz	-108	-126	-132	-132
	500MHz < f ≤ 1GHz	-101	-121	-130	-130
	1GHz < f ≤ 2 GHz	-96	-115	-124	-124
	2GHz < f ≤ 3.2GHz	-92	-111	-120	-120
	3.2GHz < f ≤ 10GHz	-81	-101	-110	-110
	10GHz < f ≤ 20GHz	-75	-95	-104	-104
	20GHz < f ≤ 40GHz	-69	-89	-98	-98
	40GHz < f ≤ 67GHz	-64	-83	-92	-92
Output power range (25±10°C)	AV1464A: +13dBm ~ -20dBm With option: programmable step attenuator: +11dBm ~ -120dBm (-135dBm is settable)				
	AV1464B: +10dBm ~ -20dBm With option: programmable step attenuator: +8dBm ~ -120dBm (-135dBm is settable)				
	AV1464C/AV1464: +6dBm ~ -20dBm With option: programmable step attenuator: +3dBm ~ -90dBm (-110dBm is settable)				
Power accuracy (25±10°C)	No programmable step attenuator				
	Freq. \ Power	> +10 dBm	+10~-10 dBm	-10~-20dBm	
	250kHz ≤ f ≤ 2GHz	±1.0dB	±1.0dB	±2.0dB (typical)	
	2GHz < f ≤ 20GHz	±1.2dB	±1.0dB	±2.0dB (typical)	
	20GHz < f ≤ 40GHz	/	±1.2dB	±2.2dB (typical)	
	40GHz < f ≤ 50GHz	/	±1.5dB	±2.2dB (typical)	
	50GHz < f ≤ 67GHz	/	±1.8dB	±2.5dB (typical)	
	With programmable step attenuator				
	Freq. \ Power	> +10 dBm	+10~-10dBm	-10~-60dBm	-60~-90dBm
	250kHz ≤ f ≤ 2GHz	±1.0dB	±1.0dB	±1.5dB	±1.8dB (typical)
2GHz < f ≤ 20GHz	±1.2dB	±1.0dB	±1.5dB	±2.2dB (typical)	

		20GHz < f ≤ 40GHz	/	±1.2dB	±1.8dB	±2.5dB (typical)	
		40GHz < f ≤ 50GHz	/	±1.5dB	±2.0dB	±2.5dB (typical)	
		50GHz < f ≤ 67GHz	/	±1.8dB	±2.5dB	±3.0dB (typical)	
Modulation	Pulse modulation	500MHz ≤ f ≤ 67GHz	Pulse modulation ON/OFF ratio		>80dB		
			Rise and fall time of pulse modulation		<20ns		
			Min. pulse width(ALC ON)		1μs		
			Min. pulse width(ALC OFF)		0.1μs		
	AM	10MHz < f ≤ 50GHz	Modulation depth: >90% Modulation bandwidth (3dB, 30% modulation depth, frequency point for test:1G/5G/20G/40G/50G): DC~100kHz AM accuracy (1kHz modulation rate, 30% modulation depth): <±3% AM distortion (1kHz modulation rate, 30% modulation depth): <2%				
	FM	10MHz < f ≤ 50GHz	Max. Freq. offset: N×16MHz (N is harmonic number of YO) Accuracy (1kHz rate, 300Hz~3kHz demodulation bandwidth, 1kHz < frequency offset < N×800kHz, exclude remaining FM): < ± (5% × setting frequency offset + 20Hz) Modulation rate (3dB bandwidth): Internal DC: DC~100kHz; internal AC: 100kHz~1MHz External DC: DC~100kHz; external AC: 100 kHz ~10MHz Distortion (1kHz rate, frequency offset :N×800kHz, total harmonic distortion): <2%				
Phase modulation	10MHz < f ≤ 50GHz	Max. phase offset: when modulation bandwidth is 100kHz N×160rad Accuracy (1kHz rate, 300Hz~3kHz demodulation bandwidth, 1rad < phase offset < N×80rad, exclude remaining phase modulation, when modulation bandwidth is 100kHz): <± (5% × setting phase offset + 0.01 rad) Modulation rate (3dB bandwidth): Modulation bandwidth 100kHz: DC-100kHz; modulation bandwidth 1MHz: 100kHz ~1MHz (typical) Distortion (1kHz rate, 1rad < phase offset < N×80rad, total harmonic distortion, when modulation bandwidth is 100kHz): <2%					

Internal modulation signal generator	Function generator provides: signals of AM and freq./phase modulation			
	Waveform: Sine wave, square wave, triangle wave, ramp wave, noise, double sine and sweep sine.			
Internal modulation signal generator	Frequency range: Sine wave, double sine, sweep sine 1Hz~1MHz			
	Square wave, triangle wave and ramp wave 1Hz-100kHz			
Internal modulation signal generator	Frequency resolution: 1Hz			
	Pulse modulation signal: Pulse width: 20ns~(42s-10ns) Pulse cycle: 100ns~42s Resolution: 10ns			
RF output port	AV1464A	AV1464B	AV1464C	AV1464
	3.5mm(M)	2.4mm(M)	2.4mm(M)	1.85mm(M)
Display	TFT-LCD			
Operation menu	Simplified Chinese/English			
Size (W×H×D)	Standard: 426mm × 133mm × 510 mm (no handles, rear feet and support) Max.: 482mm × 152mm × 582 mm			
Max. Weight	Approx. 20kg			
Working temp.	0°C ~+40°C			
Max. Power consumption	300W			
Power	220V AC			

Note:

1. When AV1464 Synthesized Signal Generator stays in the ambient temperature for 2 hours and are pre heated for 30 min, the attenuators will couple automatically (or ALC power is larger than -5dBm) . All specifications can be fulfilled within the given working temperature range. The supplementary characteristics by typical value are only for user reference but not for verification.
2. When the output power is at maximum, output freq. range of the generators stays within the specs.
3. When the output power is 0dBm, deviate from carrier by 1kHz.
4. The output power is set at +10dBm in test or the max. output power (the max. output power is lower than +10dBm) .

Ordering Information

Main Unit:	AV1464	Synthesized signal generator	250kHz~67GHz
	AV1464A	Synthesized signal generator	250kHz~20GHz
	AV1464B	Synthesized signal generator	250kHz~40GHz
	AV1464C	Synthesized signal generator	250kHz~50GHz

Standard Package

No.	Description	Remarks
1	Power cord	Standard tri-prong power cord
2	User Manual	2 copies
3	Programming Manual	2 copies
4	Certificate of Conformity	1 copy

Options

No.	Description	Remarks
AV1464-001	115dB programmable step attenuator	Only available for AV1464A and AV1464B. To extend dynamic range of output power.
AV1464-002	90dB programmable step attenuator	Only available for AV1464C and AV1464. To extend dynamic range of output power.
AV1464-003	Options in English	English menus and panel etc., for export.
AV1464-004	Aluminum alloy transit case	High strength, light aluminum alloy transit case with handle. Easy for transportation
AV1464-005	Rackmount kit	The required kit for mounting the instrument in a rack.