1433D/E/F/H

Signal Generator

(1MHz to 20GHz/26.5GHz/40GHz/50GHz)

F.E.S. Co., Ltd.

1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110

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Product Overview

1433 Series signal generator is a hand-held instrument specially designed for field testing by Ceyear Technology Co., Ltd. It has the functions of CW signal output, FM/AM/Pulse/PM modulation, large dynamic range amplitude adjustment, step/list sweep etc. The integrated design of 8.4-inch large capacitive touch screen is convenient for users' operation.

1433 series signal generator has the characteristics of small size, flexible power supply and good working environment adaptability, which is very suitable for on-site use. It can be applied to the field installation, debugging and daily maintenance of fault diagnosis of electronic integrated system, receiver performance test, communication, navigation and other equipment test.

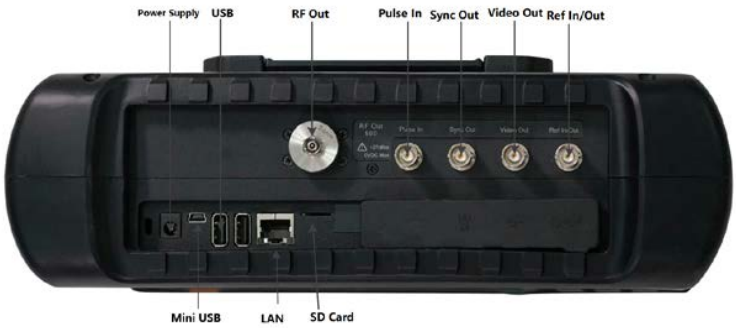
Product Features

- Wider frequency coverage: from 1MHz to 50GHz
- Higher frequency resolution: 0.1Hz
- Excellent phase noise performance: -110dBc/Hz@10kHz frequency offset @10GHz carrier(typical)
- Various auxiliary test interfaces: reference input/output, pulse input, monitoring output, synchronization output etc.
- Convenient and fast user operation experience: 8.4-inch large screen with bright LCD, convenient capacitive touch screen operation, integrated design of LCD and touch screen
- Strong environmental adaptability: the working temperature range is -10℃~50℃
- Flexible power supply mode: can be powered by battery or power adapter

Wider frequency coverage

The frequency range of 1433 series signal generator is 1MHz to 20GHz/26.5GHz/40GHz/50GHz, the serialization minimum frequency is as low as 1MHz, and the highest frequency is as high as 50GHz, which can meet the needs of wide-band testing.

Various auxiliary test interfaces



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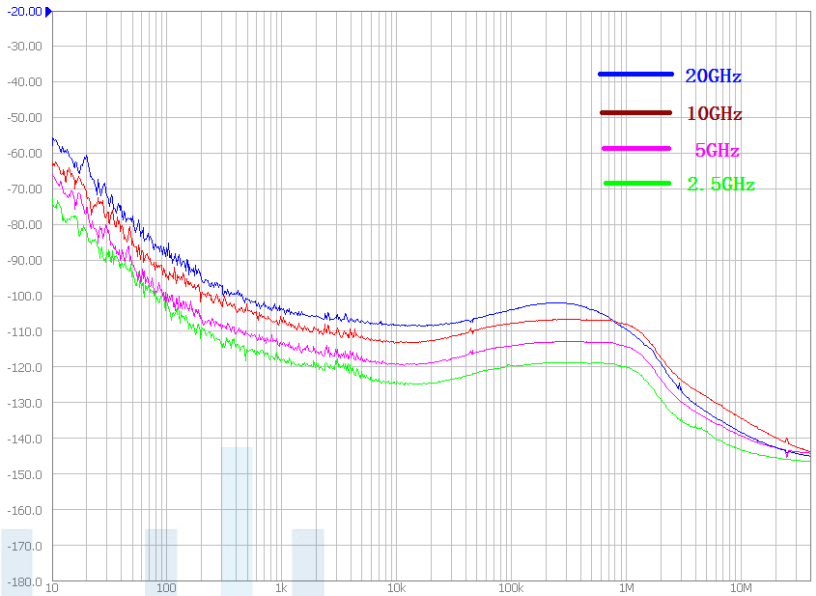
Excellent phase noise performance

1433 Series signal generator SSB phase noise is better than -110dBc/Hz@10kHz frequency offset @10GHz carrier(typical) , which can meet the test requirements of most application scenarios.



Note 1: The supplementary features given in the form of typical values are for users' reference.

Convenient and fast user operation experience

8.4-inch large screen with high-brightness LCD, 800×600 pixel resolution, convenient capacitive touch screen operation, multi-window display, clear display of instrument setting parameters and status information, providing convenient and fast user operation experience.

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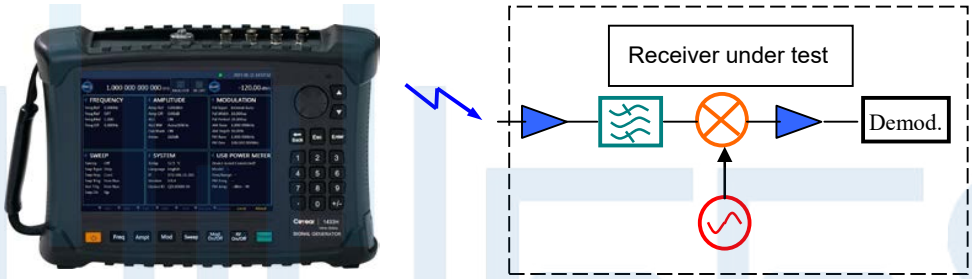
Typical Application

Electronic system anti- interference performance test

The 1433 series signal generator has a wide output frequency and power range, and has a variety of analog modulation functions. It can simulate and generate jamming signals in the actual combat environment during the test of the anti-jamming performance of the electronic system, which can be used for the test of the anti-jamming performance of the electronic system.

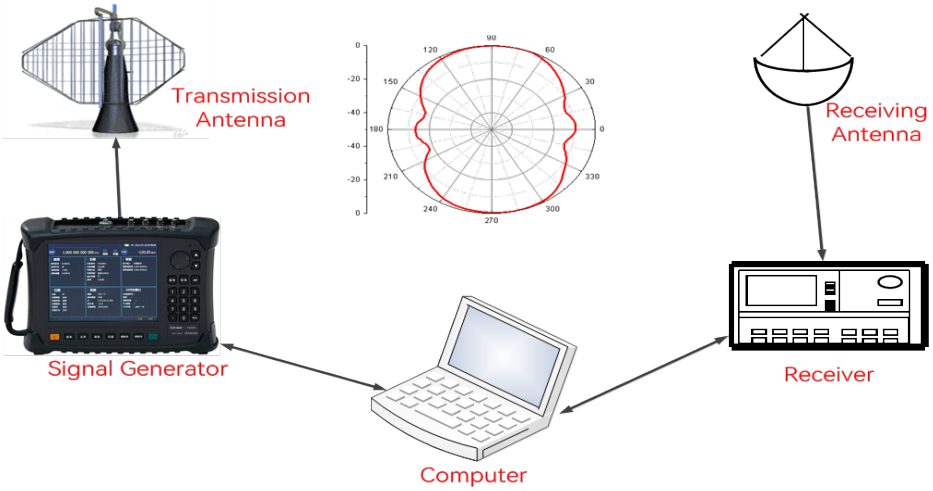
Receiver performance test and fault troubleshooting

For radar and other electronic equipment receiving performance testing and troubleshooting applications, 1433 series signal generators provide CW, analog modulated signal output, and can provide excitation signal simulation.



Antenna pattern field test

For the field test application of the antenna pattern, the 1433 series signal generator outputs a signal with known fixed amplitude, which is used to test the indicator of the transmitting antenna pattern.



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Technical Specification

1. Main Functions

- CW signal output function
- FM/AM/Pulse modulation function
- Step and List sweep function
- Unstable amplitude and Unlock alarm function
- Support LAN and USB interface program control function

2. Specifications

Frequency Characteristics			
Frequency Range	1433D:1MHz~20GHz 1433E:1MHz~26.5GHz 1433F:1MHz~40GHz 1433H:1MHz~50GHz	Frequency	N（internal YO harmonic number）
		1MHz≤f < 2.35GHz	1/2
		2.35GHz≤f < 2.5GHz	1/8
		2.5GHz≤f < 5GHz	1/4
		5GHz≤f≤10GHz	1/2
		10GHz < f≤20GHz	1
		20GHz < f≤40GHz	2
		40GHz < f≤50GHz	4
Frequency Resolution	0.1Hz		
Internal timebase	Aging rate	$\pm 0.5\times10^{-6}$/year	
	Temperature effects	$\pm 0.3\times10^{-6}$（-10℃~50℃，versus 25℃±5℃）	
Initial calibration accuracy	$\pm 0.5\times10^{-6}$		
Reference input	frequency	10MHz~100MHz，step 1MHz	
	Power	-5dBm~+10dBm，impedance: 50Ω	
Reference output	Frequency	10MHz	
	Power	> 0dBm，50Ω impedance	
Sweep characteristics			
Sweep features	Sweep mode	Step/List	
	Sweep points	2 to 1601	
	Dwell time	10ms to 100s	
	Trigger mode	Auto/manual	

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Level characteristics		
Stable output power range(25℃±10℃，CW mode)	1MHz≤f < 2.5GHz	-120dBm~+5dBm
	2.5GHz≤f≤10GHz	-120dBm~+10dBm
	10GHz < f≤20GHz	-120dBm~+5dBm
	20GHz < f≤40GHz	-120dBm~+5dBm
	40GHz < f≤50GHz	-120dBm~0dBm
Level accuracy (25℃±10℃)	-10dBm < P≤Maximum stable output power	±1.0dB
	-60dBm < P≤-10dBm	±1.5dB
	-90dBm≤P≤-60dBm	±1.8dB
Output impedance	50Ω（Rating）	
SWR	1MHz≤f≤20GHz	< 1.80
	20GHz < f≤40GHz	< 2.00
	40GHz < f≤50GHz	< 2.50
Maximum reverse power	+27dBm（0V DC）（Rating）	
Spectral purity（specification is point frequency without modulated mode)		
Harmonics (Measured at +5dBm or maximum specified power, whichever is lower)	1MHz≤f≤1.5GHz	≤-40dBc
	1.5GHz < f≤2.5GHz	≤-30dBc
	2.5GHz < f≤19GHz	≤-40dBc
	19GHz < f≤25GHz	≤-30dBc
	25GHz < f≤50GHz	≤-35dBc（typical）
Non-harmonics (0dBm，>10kHz offset)	1MHz≤f < 2.5GHz	≤-54dBc
	2.5GHz≤f < 5GHz	≤-60dBc
	5GHz≤f≤10GHz	≤-56dBc
	10GHz < f≤20GHz	≤-50dBc
	20GHz < f≤38GHz	≤-44dBc
	38GHz < f≤50GHz	≤-40dBc
SSB Phase noise（at maximum stable output power)	1MHz≤f < 2.35GHz	≤-82dBc/Hz@100Hz
		≤-98dBc/Hz@1kHz
		≤-108dBc/Hz@10kHz
		≤-106dBc/Hz@100kHz
	2.35GHz≤f < 2.5GHz	≤-94dBc/Hz@100Hz
		≤-110dBc/Hz@1kHz
		≤-120dBc/Hz@10kHz
		≤-118dBc/Hz@100kHz

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SSB Phase noise（at maximum stable output power）	2.5GHz≤f < 5GHz	≤-88dBc/Hz@100Hz
		≤-104dBc/Hz@1kHz
		≤-114dBc/Hz@10kHz
		≤-112dBc/Hz@100kHz
	5GHz≤f≤10GHz	≤-82dBc/Hz@100Hz
		≤-98dBc/Hz@1kHz
		≤-108dBc/Hz@10kHz
		≤-106dBc/Hz@100kHz
	10GHz < f≤20GHz	≤-76dBc/Hz@100Hz
		≤-92dBc/Hz@1kHz
		≤-102dBc/Hz@10kHz
		≤-100dBc/Hz@100kHz
	20GHz < f≤40GHz	≤-70dBc/Hz@100Hz
		≤-86dBc/Hz@1kHz
		≤-96dBc/Hz@10kHz
		≤-94dBc/Hz@100kHz
	40GHz < f≤50GHz	≤-68dBc/Hz@100Hz
		≤-84dBc/Hz@1kHz
		≤-94dBc/Hz@10kHz
		≤-92dBc/Hz@100kHz
Modulation Characteristics		
Pulse modulation（Frequency >10MHz）	On/off ratio	≥80dB
	Rise/fall times	≤30ns
	minimum pulse width ALC ON	1μs（Deviation±50ns）
	minimum pulse width ALC OFF	100ns（Deviation±20ns）
Amplitude modulation（Frequency >10MHz）	Modulation type	Linear modulation、exponent modulation
	Modulation rate（3dB bandwidth）	DC~20kHz
	Maximum depth	Linear closed loop：≥90.0%
		Exponent closed loop：≥20.0dB
	Linear AM accuracy	±（5%× setting depth + 1%）（at 1kHz modulation rate）
	Exponent AM accuracy	±（5%× setting depth + 1dB）（at 1kHz modulation rate）

Frequency modulation (Frequency >10MHz)	Modulation rate（3dB bandwidth）	DC~20kHz
	Maximum deviation	N×800kHz（N: YO harmonic number），accuracy: ±10%（at 1kHz modulation rate）
	FM deviation accuracy	±3%（at 1kHz，100kHz offset，300Hz~3kHz demodulation bandwidth）
Phase modulation (Frequency >10MHz)	Modulation rate（3dB bandwidth）	DC~20kHz
	Maximum deviation	N×20.0rad（N: YO harmonic number），accuracy± 10%（at 1kHz modulation rate）
	ϕM deviation accuracy	±(3%×setting deviation +0.01rad)(at 1kHz modulation rate，deviation N×10.0rad)
General characteristics		
RF output port	1433D	N（female），impedance: 50Ω
	1433E	2.4mm（male），impedance: 50Ω
	1433F	2.4mm（male），impedance: 50Ω
	1433H	2.4mm（male），impedance: 50Ω
Dimensions (W×H×D)	314mm×218mm×91mm (excluding handle, foot mat and footing)	
Weight	≤5.5kg（including battery）	
Power supply	Power adapter	Input：100~240V、50/60Hz AC
		Output: 15V_{DC}, 4A
	Lithium electronic battery	10.8V，≥8800mAh
Power consumption	≤45W（Battery charging is not included）	
Temperature range	Operating temperature	-10℃~+50℃（battery charging temperature: 0℃~+45℃）
	Storage temperature	-40℃~+70℃（battery storage temperature: -20℃ ~+60℃）
Other interface	Pulse input	BNC（female）
	Synchronization output	BNC（female）
	Monitoring output	BNC（female）
	Reference input/output	BNC（female）
Note: Ratings refer to expected performance, or describe product performance that is useful in the product but not covered by the product warranty.		

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Ordering Information

Main Models

1433D signal generator 1MHz~20GHz
1433E signal generator 1MHz~26.5GHz
1433F signal generator 1MHz~40GHz
1433H signal generator 1MHz~50GHz

Standard Configuration:

No	Description	Quantity	Remarks
1	Power cable	1	Standard three-core power cable
2	Power adapter	1	Power adapter: input 100~240V 50/60Hz output 15V/4A
3	9900mAh Rechargeable li-ion battery	1	Rechargeable li-ion battery
4	Quick start guide	1	
5	Communication cable assembly	1	USB remote control cable
6	Product Certificate conformity	1	

Options:

No	Option ID	Description	Function
1	1433-001	User Manual (Chinese)	
2	1433-002	User Manual (English)	
3	1433-003	Programming Manual (Chinese)	
4	1433-004	Programming Manual (English)	
5	1433-S01	USB Power Meter Option(software)	Provide USB Power Measurement Function (Requires USB Power sensor:H06~H13)
6	1433-H01	Optional Accessories of English Version	English Signs、Keys、Menu
7	1433-H02	Power Adapter	Power Adapter
8	1433-H03	Rechargeable Lithium Ion Battery	Standby Battery
9	1433-H04	Purple Cat5e Cable	Point to Point, 2 Meters
10	1433-H05	Micro SD Card	Class4, Capacity: 8G
11	1433-H06	87230 USB CW Power Sensor	9kHz~6GHz , for CW power measurement（S01 is optional）

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No	Option ID	Description	Function
12	1433-H07	87231 USB CW Power Sensor	10MHz~18GHz , for CW power measurement（S01 is optional）
13	1433-H08	87232 USB CW Power Sensor	50MHz~26.5GHz , for CW power measurement（S01 is optional）
14	1433-H09	87233 USB CW Power Sensor	50MHz~40GHz , for CW power measurement（S01 is optional）
15	1433-H10	87234D USB Peak Power Sensor	50MHz~18GHz , for Peak power measurement（S01 is optional）
16	1433-H11	87234E USB Peak Power Sensor	50MHz~26.5GHz , for Peak power measurement（S01 is optional）
17	1433-H12	87234F USB Peak Power Sensor	50MHz~40GHz , for Peak power measurement（S01 is optional）
18	1433-H13	87234L USB Peak Power Sensor	500MHz~67GHz , for Peak power measurement（S01 is optional）
19	1433-H14	Functional Bag	Protect the Instrument
20	1433-H15	Backpack	Easy to Carry
21	1433-H16	Safety Instrument Carrying Case	High strength light weight packing case with handle for transportation
22	1433D-JL	Calibration Service	Metrological calibration services, provides metrological reports
23	1433E-JL	Calibration Service	Metrological calibration services, provides metrological reports
24	1433F-JL	Calibration Service	Metrological calibration services, provides metrological reports
25	1433H-JL	Calibration Service	Metrological calibration services, provides metrological reports
26	1433D-EWT1	Extended Warranty-1 year	Extended 1-year out of standard warranty, 2 optional for 2-year extended warranties, and so on, service does not include calibration, one-way shipping only
27	1433E-EWT1	Extended Warranty-1 year	Extended 1-year out of standard warranty, 2 optional for 2-year extended warranties, and so on, service does not include calibration, one-way shipping only

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No	Option ID	Description	Function
28	1433F-EWT1	Extended Warranty-1 year	Extended 1-year out of standard warranty, 2 optional for 2-year extended warranties, and so on, service does not include calibration, one-way shipping only
29	1433H-EWT1	Extended Warranty-1 year	Extended 1-year out of standard warranty, 2 optional for 2-year extended warranties, and so on, service does not include calibration, one-way shipping only

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