Ceyear 1466-V Vector Signal Generator

F.E.S. Co., Ltd.

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

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

Line Official

Facebook

Product Overview

Ceyear 1466-V vector signal generator is created to meet the varied test requirements with top performance and functionality, especially in higher frequencies, wider bandwidths, higher signal spectral purity, higher output power, better EVM and high-precision synchronized multichannel applications. Also rich built-in functions such as analog modulation, digital modulation, fading simulation, and AWGN could bring more convenience to daily testing. Through integration with multi-scenario signal simulation software, complex style signals can be generated for general-purpose tests in different scenarios for wireless communication, radar and navigation. Friendly designed human-computer interaction, including graphics guided operation, web browser based remote control, power meter automatic connection and identification, SCPI command recording, as well as interface user customization could speed up the test operation. The Ceyear 1466-V vector signal generator is an ideal choice for high standard testing in components, modules, machines and systems.

Main Features

Excellent RF Performance

- Coaxial frequency coverage: 6kHz to 13GHz/20GHz/33GHz/45GHz/53GHz/67GHz;

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Line Official
Facebook

- Excellent spectral purity: SSB <-132dBc/Hz (typ.10GHz carrier at 10kHz offset),Spurious <-80 dBc (10GHz carrier);
- Extremely low wideband noise: SSB <-161dBc/Hz(typ.20GHz carrier at 30MHz offset);
- High output power: settable power range from -150dBm to +25dBm;
- Maximum 2GHz modulation bandwidth, optional 500MHz/1GHz/2GHz bandwidth;
- Outstanding vector modulation accuracy: EVM<0.8%(5GNR, FR2 28GHz);
- Double independent RF channels can be contained in one machine.

Various Built-in Functions

- Rich modulation functions, covering analog modulation, pulse modulation and more than 30 digital modulation formats
- Support playback function of user-defined arbitrary wave data sample rate
- Support CW multi-tone and complex multi-carrier modulation functions
- TestModel/FRC covers more than 600 mobile communication protocols such as 5G NR, LTE etc .
- Integrated WLAN standard wireless connection signal analog function
- Multi-type noise addition and real-time fading simulation function

Multi-scenario signal simulation

- Support flexible editing simulation of various communication protocol signals
- Mobile Communication Signal Simulation,WLAN Signal Simulation

Friendly interactive interface

- Touch screen display with graphics guided operation, support user-defined menus
- Cross-platform browser based remote control
- SCPI command real-time recording and operation project automatic builder

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Line Official
Facebook

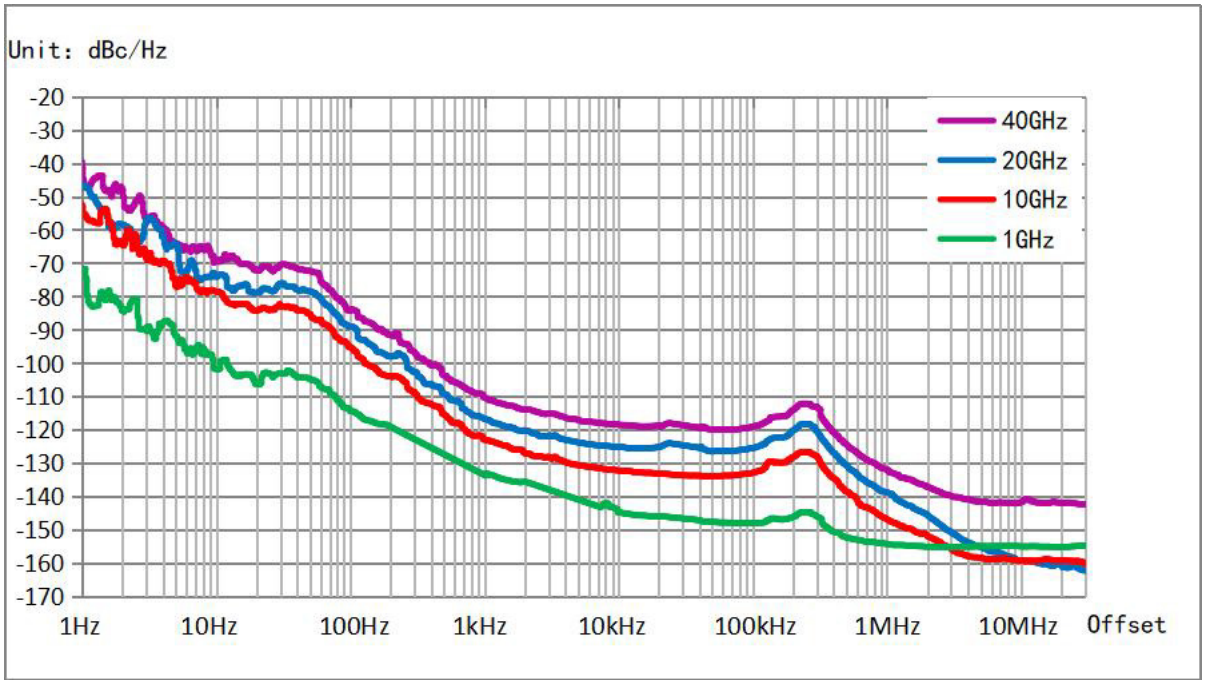
Excellent RF Performance

Excellent spectral purity, making cutting-edge testing easier

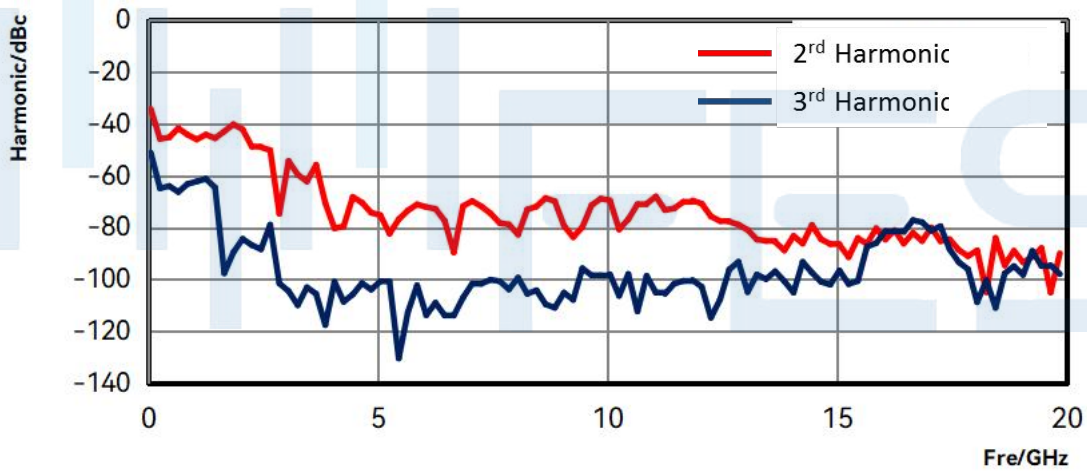
Ceyear 1466-V vector signal generator supports high spectral purity output signal, SSB phase noise: -145dBc/Hz @10kHz offset at 1GHz carrier, -132dBc/Hz @10kHz offset at 10GHz carrier, Wideband noise floor: -161dBc/Hz @30MHz offset at 20GHz carrier, spurious<-80dBc at 10GHz carrier, harmonics <-55dBc. The purer signal makes you no longer troubled by interfering signals when testing microwave and millimeter wave components, systems and OTA.

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Line Official
Facebook



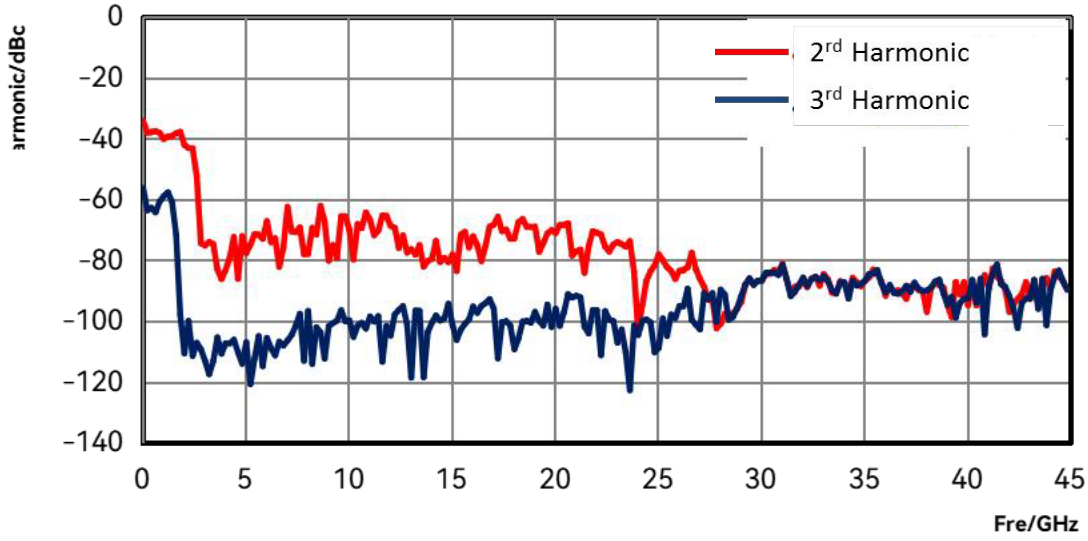
Option H04-2: measured SSB phase noise



1466D-V: measured harmonic

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

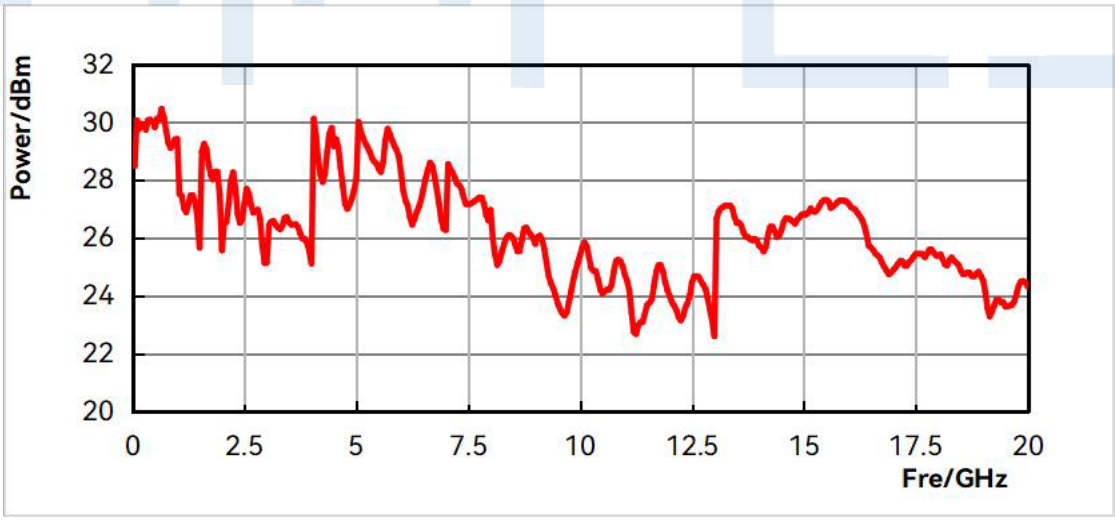
Line Official
Facebook



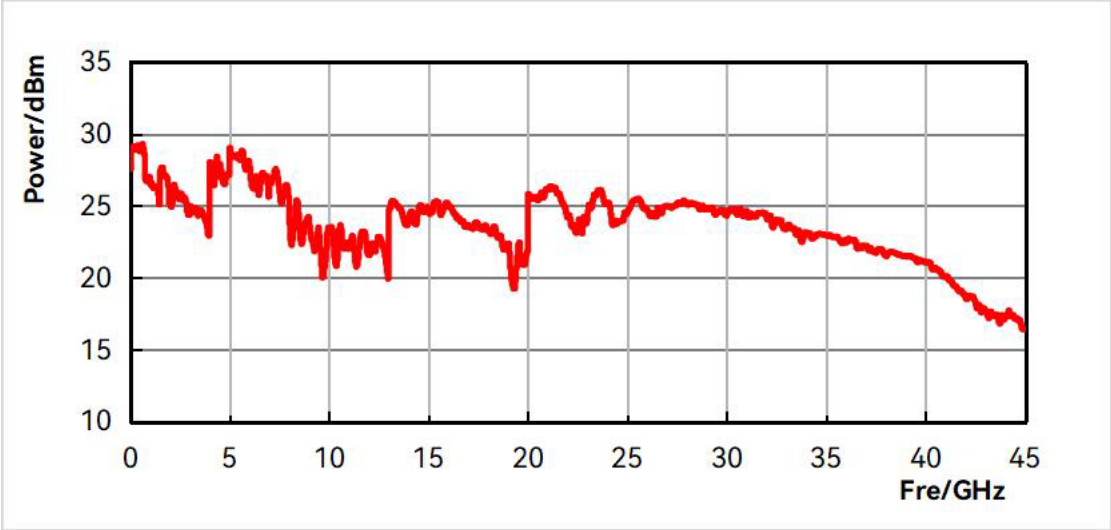
1466G-V: measured harmonic

Large dynamic range and high accuracy power output

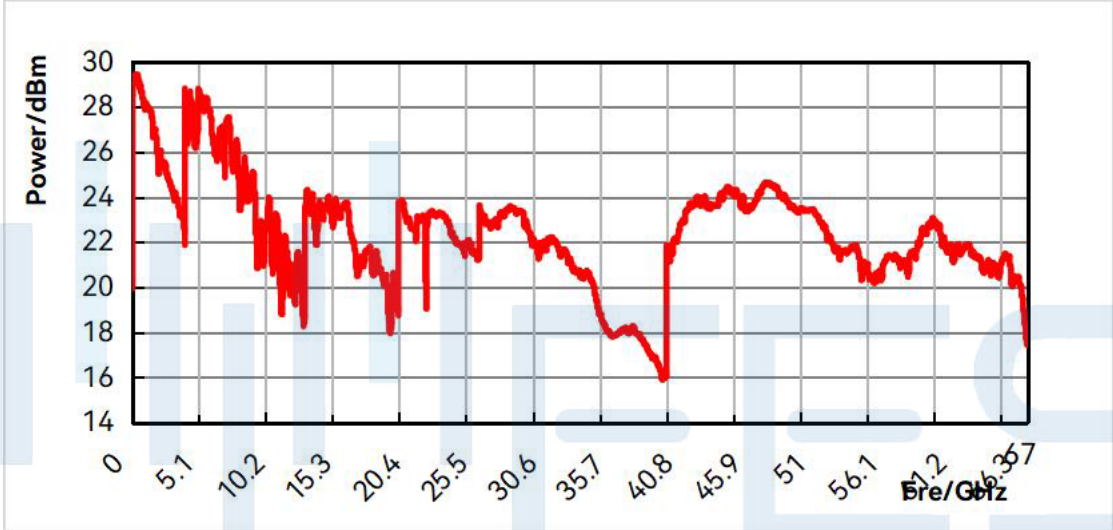
Ceyear 1466-V vector signal generator maximum output power(typ.): +27dBm @5GHz, +24dBm@ 20GHz, +25dBm @30GHz, +22dBm@ 60GHz. Minimum settable output power can up to -150dBm, dynamic range of output power can reach 170dB. It has excellent power accuracy specifications:<0.5dB below 20GHz(typ).



1466D-V: measured max. output power (option H05-20)



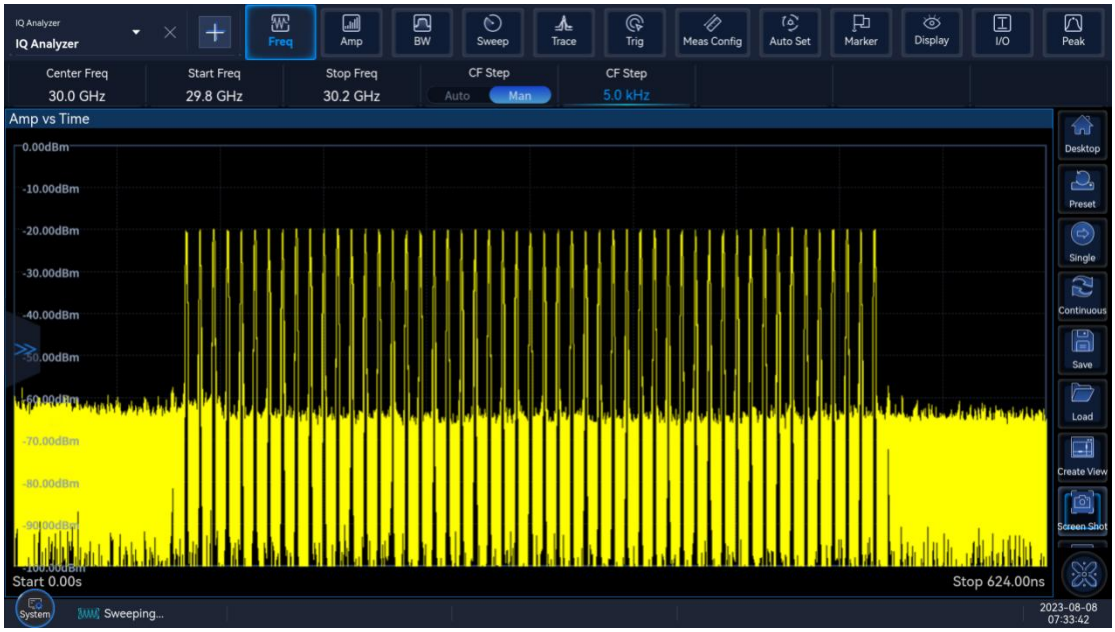
1466G-V: measured max. output power (option H05-45)



1466L-V Max. output power measured value (High power option H05-67)

2GHz RF modulation bandwidth

Ceyear 1466-V vector signal generator can provide a maximum 2GHz RF modulation bandwidth. According to different application scenarios, it supports flexible selection of 500MHz, 1GHz and 2GHz bandwidth. When using an external broadband baseband signal input, the RF modulation bandwidth is up to 5GHz. Regardless of the current 5G communication or the future 6G communication, the superior modulation bandwidth performance can easily meet the test challenges.



30GHz carrier 2GHz Modulation bandwidth multi-tone signal spectrum

F.E.S. Co., Ltd.

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

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

Line Official

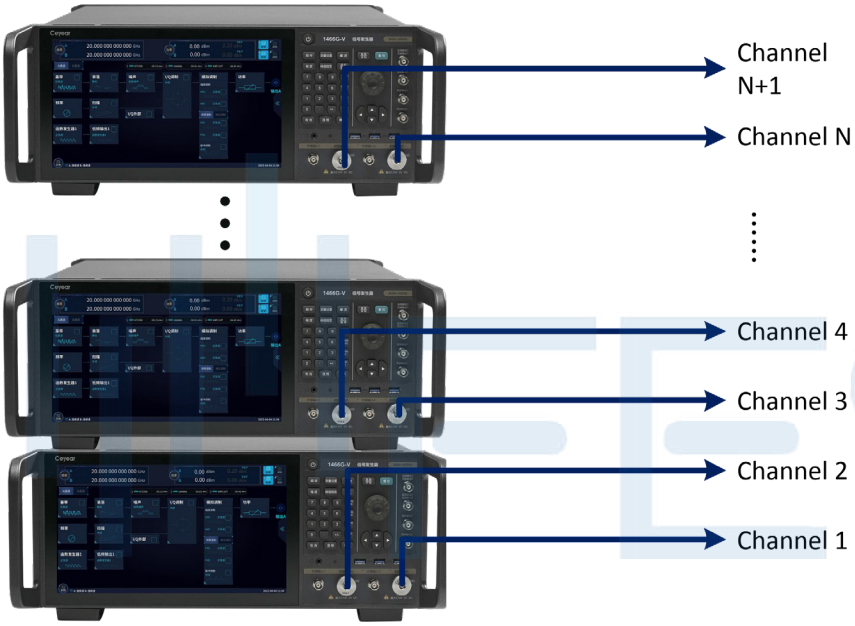
Facebook

Excellent vector modulation accuracy

Ceyear 1466-V vector signal generator has excellent vector modulation accuracy, QPSK modulation EVM measured value 0.4%(2GHz carrier) . 5GNR ACPR (typical value, <-55dBc@2GHz carrier, <-45dBc@42.5GHz carrier). The signal generator is capable of performing performance evaluation in communication equipment research and development and communication equipment performance testing in production lines.

Multi-machine cascade for multi-source phase reference excitation

Support multi-machine cascading, providing solutions for MIMO, beamforming, and signal diversity testing.



1466-V vector signal generator multi-machine cascade

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

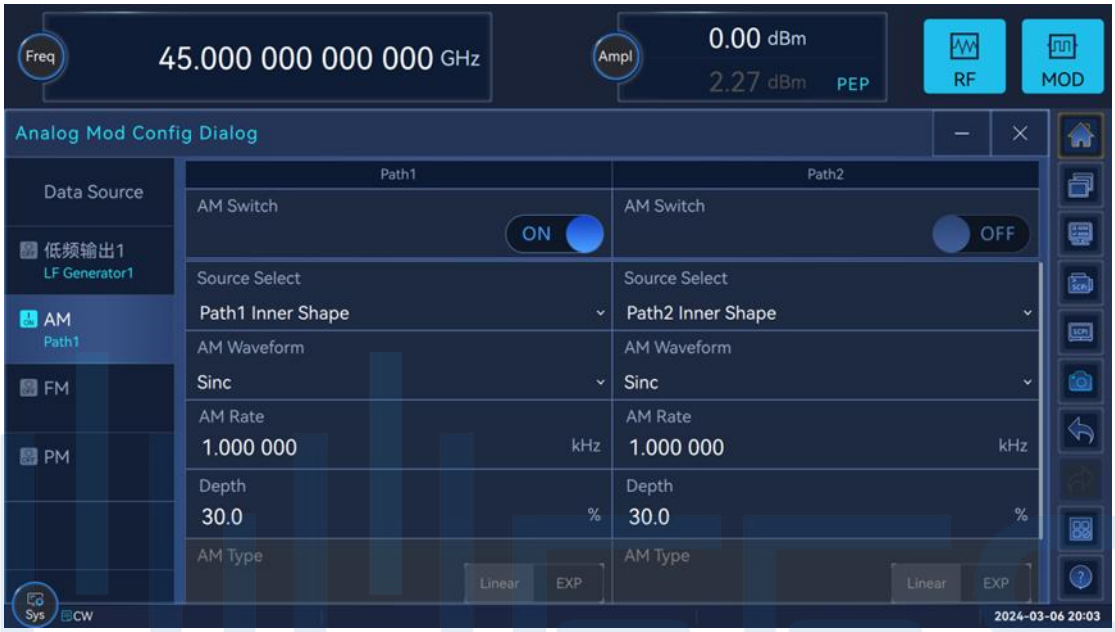
Line Official

Facebook

Various built-in functions

Full range of analog modulation

Amplitude modulation, frequency modulation, phase modulation and pulse modulation are supported. It has complex pulse modulation functions such as double pulse, pulse train, PRF jittering, PRF staggering, and PRF sliding.



Analog modulation interface

Comprehensive standard digital modulation styles

Generation of up to 30+ digital standard modulation signals (PSK, FSK, QAM, APSK), covering all important frequency bands and modulation styles for digital communications.

F.E.S. Co., Ltd.

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

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

Line Official

Facebook

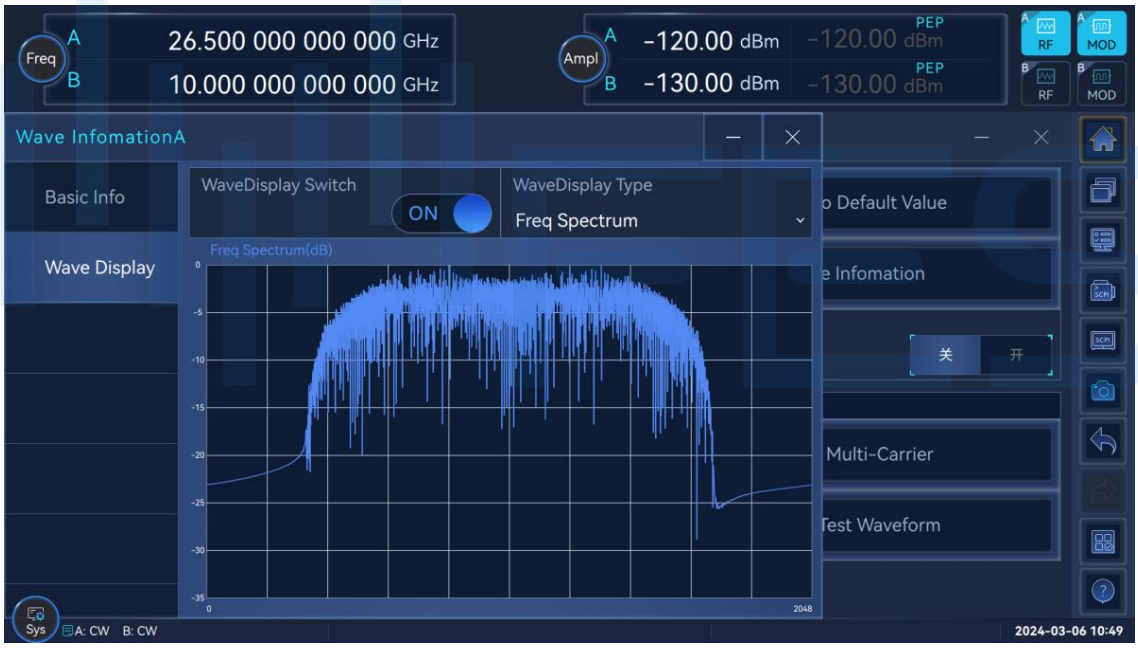
4096QAM modulation interface

16APSK modulation interface

Arbitrary wave playback

Support user-defined arbitrary waveform data variable sampling rate playback function. With the convenient baseband preview function, it is convenient for you to verify the correctness of the data in the time domain and frequency domain at the first time.

Arbitrary wave IQ data display interface



Arbitrary wave IQ data spectrum display interface

Multicarrier signal generation

Support continuous wave multi-tone and complex multi-carrier modulation functions to make complex signal scene construction easier.

Multi-tone modulation interface

Complex multi carrier modulation interface

F.E.S. Co., Ltd.

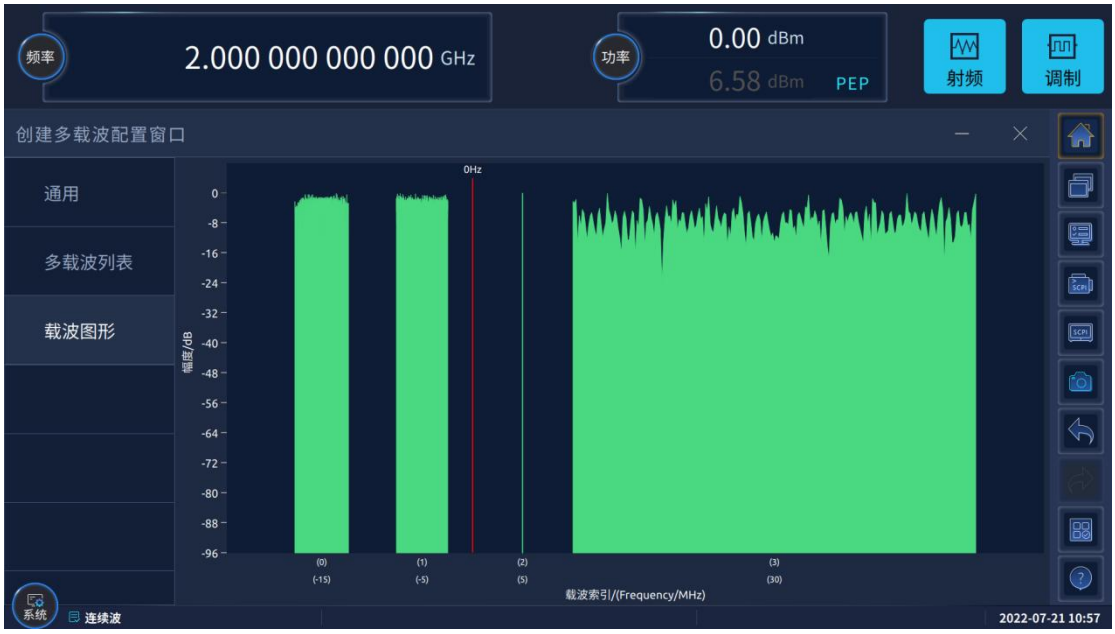
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

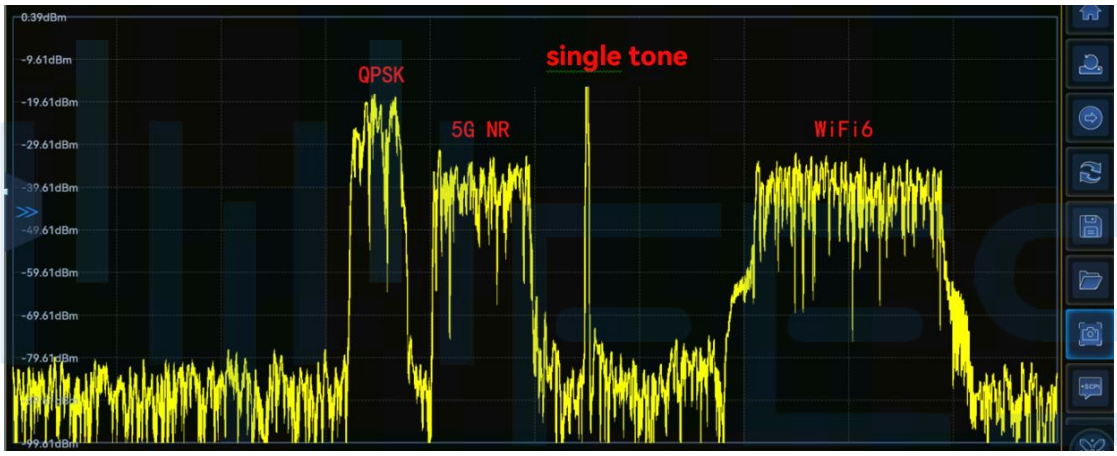
www.fesupply.com

Line Official

Facebook



Complex multi-carrier modulation graphical attribute interface



Different modulation types of multi-carrier test map

Multiple types of noise addition methods

Support pure noise, additive Gaussian noise, continuous wave interference and other noise adding functions.

F.E.S. Co., Ltd.

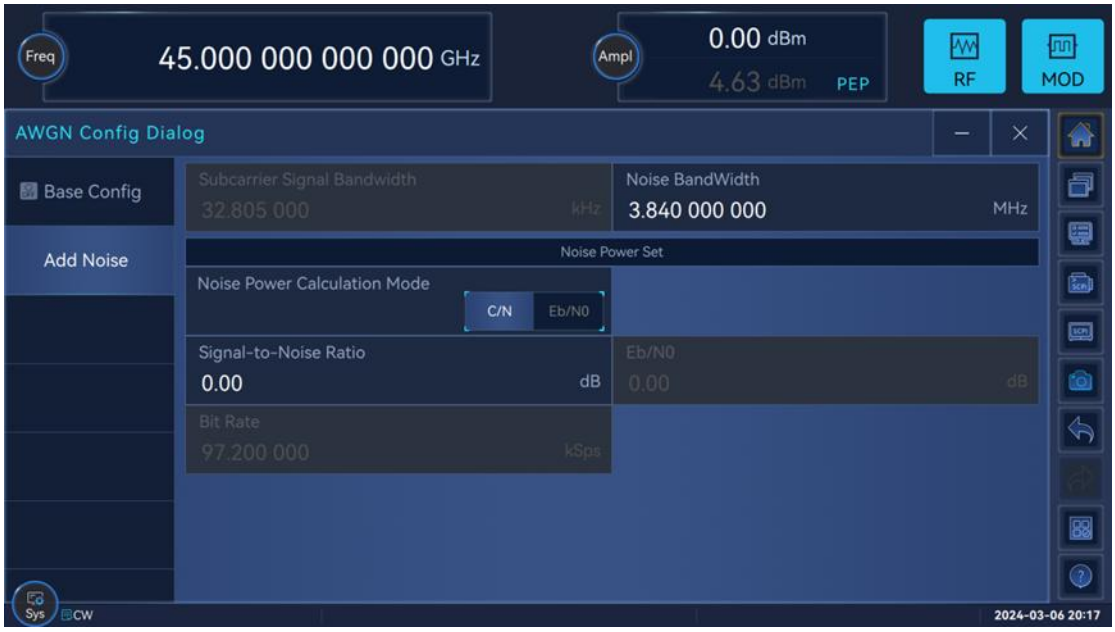
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

Line Official

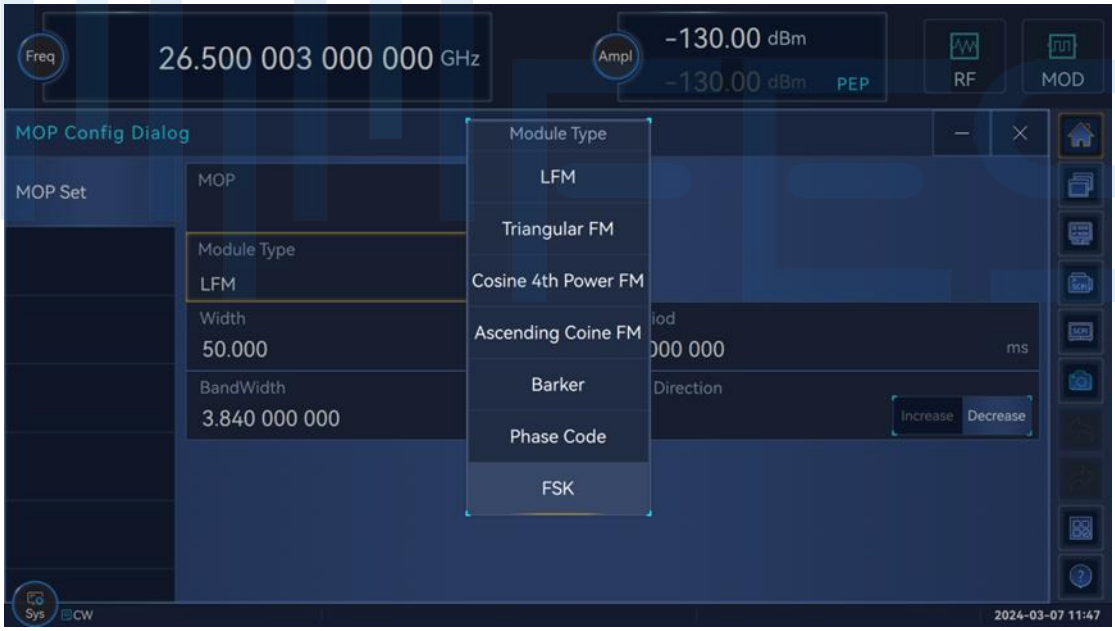
Facebook



Additive Gaussian noise interface

Intra-pulse modulation

Supports multiple types of intrapulse modulation including linear frequency modulation, Barker code, phase modulation code, etc.

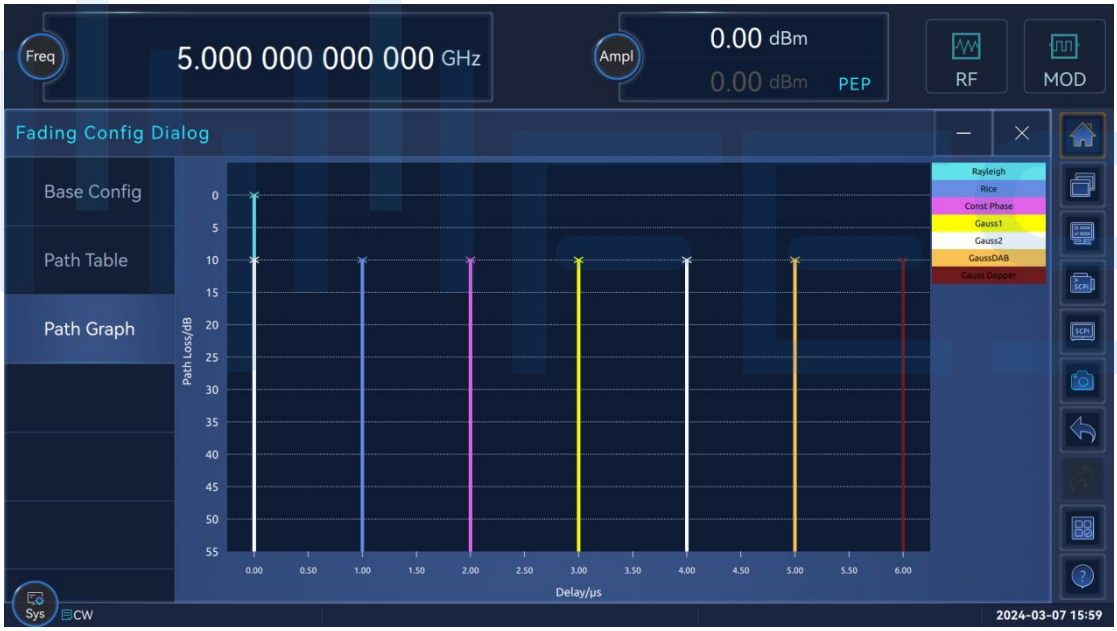


Intra-pulse modulation interface

Real-time fading simulation

Maximum 20 fading paths, supporting fading types such as pure Doppler, Rayleigh, Rice, Rayleigh + lognormal, etc., supporting preset fading scene modes, and simulating fading channel models defined by 3GPP.

Real-time fading simulation interface



Real-time fading multi-path

F.E.S. Co., Ltd.

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

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

Line Official

Facebook

Multi-scenario signal simulation

The 1466-V signal generator combines simulation software to support multi-type signal simulation and RF output.

Mobile Communication Signal Simulation

For the development and production of mobile communication base stations or terminals, as well as the radio frequency conformance test necessary for the verification and approval of mobile communication equipment network access, the Ceyear 1466-V signal generator supports standard protocol signals through embedded more than 600 TestModel/FRC including 5G NR one-click simulation. At the same time, with the mobile communication signal simulation software, it can realize flexible editing and simulation of various communication protocol signals.

5GNR TM sample interface

F.E.S. Co., Ltd.

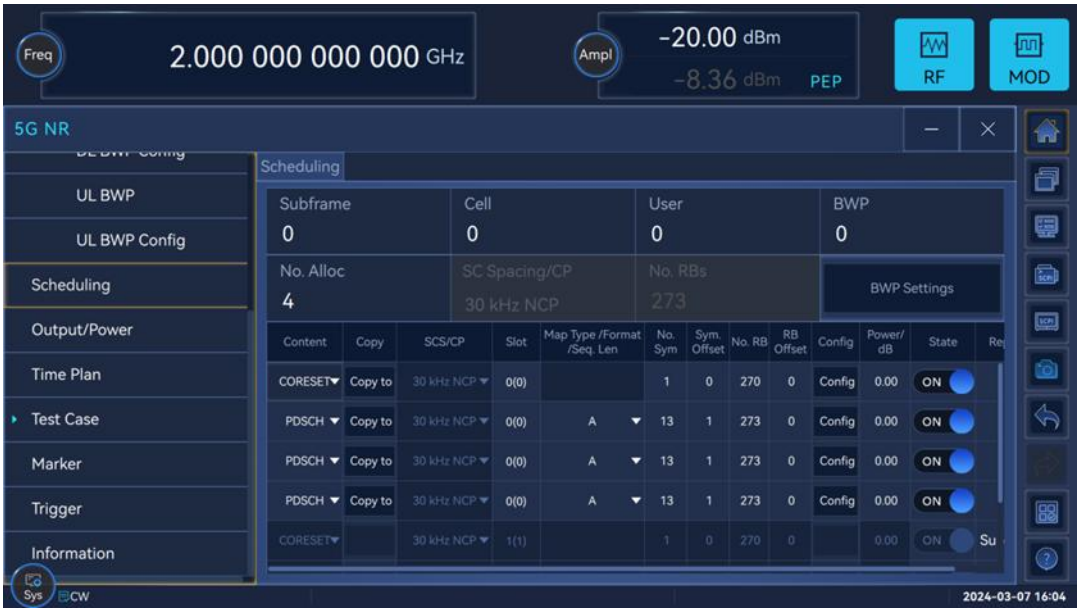
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

Line Official

Facebook



Downlink scheduling Settings

FR1-TM1_1_FDD_100MHz_30kHz measured value

F.E.S. Co., Ltd.

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

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

Line Official

Facebook

FR1-TM3_1_FDD_100MHz_60kHz measured value

WLAN Signal Simulation

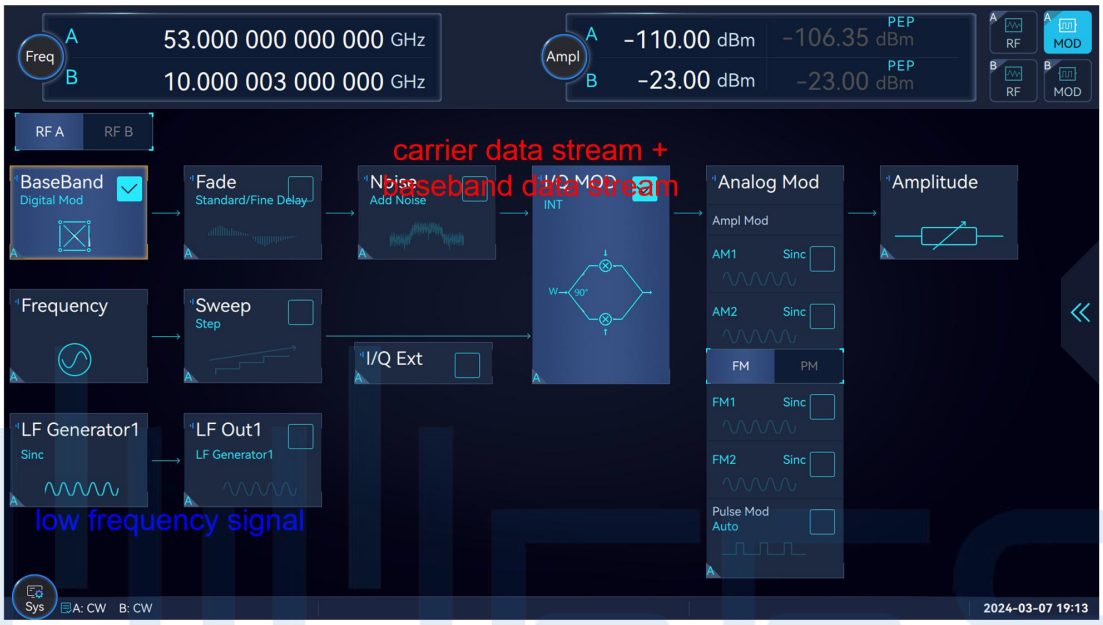
For the development, production and testing of wireless communication terminals, it has 802.11a/b/g/n/ac/ax wireless connection PPDU, MPDU, A-MPDU and other signal simulations, and supports physical frames composed of multiple PPDUs with different modulation and coding methods Block signal simulation.

WLAN Physical frame block interface

Newly upgraded human-machine interaction

Touchable graphic guide interaction

The 11.6-inch high-resolution touch screen is used to clearly display the main parameters and instrument status information, and with the signal flow diagram guidance interface, the display is more intuitive and the interaction is more friendly.



Signal flow diagram guidance interface

Flexible editable user control interface

Support user-defined menus, tailor-made personalized user control interface according to test habits, realize multi-functional operations in one window, and avoid the trouble of too deep menus and repeated searches.

F.E.S. Co., Ltd.

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

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

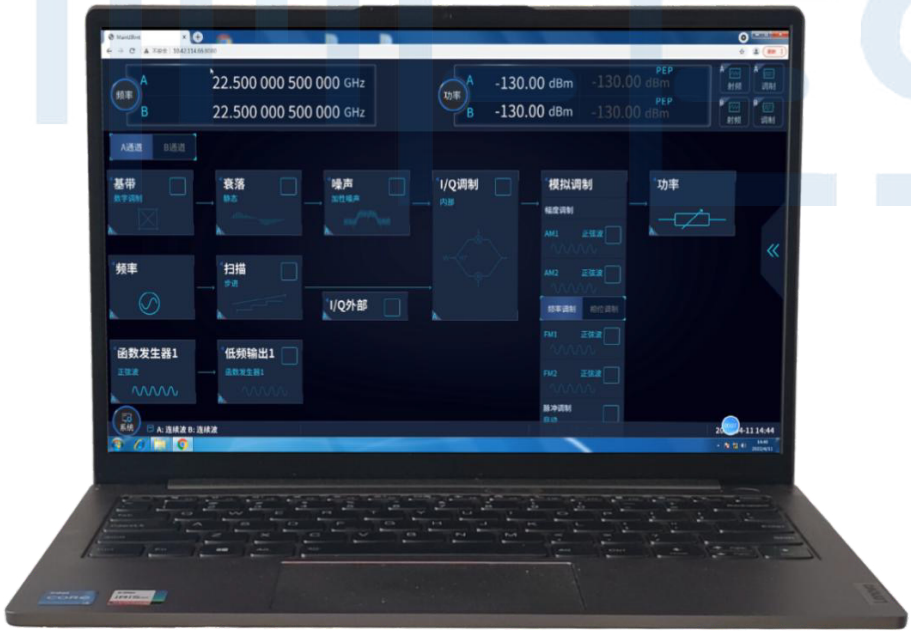
Line Official

Facebook

User defined menu

Support cross-platform client control

Cross-platform client and browser access control. Support multiple clients to connect at the same time, and the working status of the instrument is refreshed synchronously. Supports web browser access control for mobile devices.



Browser access

Simultaneous recording of SCPI commands and one-click script generation

Not only can you export recorded SCPI commands with one click, but also automatically generate VS (C++, C#), Qt, Matlab, LabView program control example projects, making program control easier.

F.E.S. Co., Ltd.

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

TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com

www.fesupply.com

Line Official

Facebook

SCPI command record

Technical Specifications

Frequency characteristics			
	1466C-V:6kHz to 13GHz 1466D-V: 6kHz to 20GHz	Frequency range	N1 (Internal YO harmonic number)
		6kHz≤f≤10MHz	-

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Line Official

Facebook

Frequency	1466E-V: 6kHz to 33GHz 1466G-V: 6kHz to 45GHz 1466H-V: 6kHz to 53GHz 1466L-V: 6kHz to 67GHz	10MHz<f≤50MHz	-
		50MHz<f≤62.5MHz	1/256
		62.5MHz<f≤125MHz	1/128
		125MHz<f≤250MHz	1/64
		250MHz<f≤500MHz	1/32
		500MHz<f≤1GHz	1/16
		1GHz<f≤2GHz	1/8
		2GHz<f≤4GHz	1/4
		4GHz<f≤8GHz	1/2
		8GHz<f≤20GHz	1
		20GHz<f≤40GHz	2
		40GHz<f≤67GHz	4
Resolution	0.001Hz		
Switching speed	<15ms		
Aging rate(typ)	$\pm 5\times10^{-10}$ /day after 30 days warm-up		
Reference output	Frequency	10MHz	
	Amplitude	>+4dBm into 50Ω load	
Reference input	Frequency	1 to 100MHz,step:1Hz	
	Amplitude	-5dBm to +10dBm,impedance: 50Ω	
Sweep characteristics			
Sweep mode	Step sweep List sweep Ramp(analog) sweep(option S15) Power sweep(option S16)		

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Line Official
Facebook

Ramp(analog) sweep (Option S15)	Maximum sweep rate	f>4GHz	400MHz/ms
	Frequency accuracy	±0.05% of span (at 100ms sweep time, for sweep spans less than maximum values given above)	

Output characteristics

	Model	standard	Option H01-90/120/130
Minimum output power	1466C/D/E/G(-V)	-10dBm(settable -20dBm)	Option H01-130: -120.0dBm(settable -150dBm)
	1466H/L(-V)	-10dBm(settable -20dBm)	Option H01-90:-90.0dBm(settable -110dBm) Option H01-120: -90.0dBm(csettable -140dBm)

Maximum output power (CW, 25±10°C)

1466C-V				
Configuration / Frequency range	Standard	Programmable step attenuator Option H01-130, H01-B130	High output power (option H05-13,H05-B13)	High output power and programmable step attenuator (option H01-130,H05-13,H01-B130,H05-B13)
6kHz≤f≤50MHz	≥+15.0	≥+15.0	≥+15.0	≥+15.0
50MHz<f≤13GHz	≥+15.0	≥+15.0	≥+20.0	≥+20.0
1466D-V				

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Configuration / Frequency range	Standard	Programmable step attenuator Option H01-130, H01-B130	High output power (option H05-20 ,H05-B20	High output power and programmable step attenuator (option H01-130,H05-20,H01-B130,H05-B20)
6kHz≤f≤50MHz	≥+15.0	≥+15.0	≥+15.0	≥+15.0
50MHz<f≤20GHz	≥+15.0	≥+15.0	≥+20.0	≥+20.0
1466E-V				
Configuration / Frequency range	**Standard**	**Programmable step attenuator Option H01-130, H01-B130**	**High output power (option H05-33 ,H05-B33**	**High output power and programmable step attenuator (option H01-130,H05-33,H01-B130, H05-B33)**
6kHz≤f≤50MHz	≥+8.0	≥+8.0	≥+15.0	≥+15.0
50MHz<f≤6GHz	≥+12.0	≥+12.0	≥+20.0	≥+20.0
6GHz<f≤18GHz	≥+12.0	≥+12.0	≥+18.0	≥+18.0
18GHz<f≤30GHz	≥+12.0	≥+12.0	≥+17.0	≥+17.0
30GHz<f≤33GHz	≥+12.0	≥+12.0	≥+18.0	≥+18.0
1466G-V				
Configuration	Standard	Programmable step	High output power	High output power and

	Frequency range		attenuator Option H01-130, H01-B130	(option H05-45 ,H05-B45	programmable step attenuator (option H01-130,H05-45,H01-B130,H05-B45)
	6kHz≤f≤50MHz	≥+8.0	≥+8.0	≥+15.0	≥+15.0
	50MHz<f≤6GHz	≥+12.0	≥+12.0	≥+20.0	≥+20.0
	6GHz<f≤18GHz	≥+12.0	≥+12.0	≥+18.0	≥+18.0
	18GHz<f≤30GHz	≥+12.0	≥+12.0	≥+17.0	≥+17.0
	30GHz<f≤40GHz	≥+12.0	≥+12.0	≥+18.0	≥+18.0
	40GHz<f≤45GHz	≥+12.0	≥+12.0	≥+14.0	≥+13.0
	1466H-V				
	Configuration / Frequency range	Standard	Programmable step attenuator Option H01-90/120, H01-B90/120	High output power (option H05-53 ,H05-B53	High output power and programmable step attenuator (option H01-90/120+H05-53,H01-B90/120+H05-B53
	6kHz≤f≤50MHz	≥+8.0	≥+8.0	≥+12.0	≥+12.0
	50MHz<f≤35GHz	≥+8.0	≥+8.0	≥+17.0	≥+16.0
	35GHz<f≤40GHz	≥+8.0	≥+8.0	≥+15.0	≥+13.0
	40GHz<f≤53GHz	≥+8.0	≥+8.0	≥+20.0	≥+18.0
	1466L-V				
	Configuration	Standard	Programmable step	High output power	High output power and

	Frequency range		attenuator Option H01-90/120,H01-B90/B120	(option H05-67,H05-B67	programmable step attenuator (option H01-90/120+H05-53, H01-B90/120+H05-B53)
	6kHz≤f≤50MHz	≥+8.0	≥+8.0	≥+12.0	≥+12.0
	50MHz<f≤35GHz	≥+8.0	≥+8.0	≥+17.0	≥+16.0
	35GHz<f≤40GHz	≥+8.0	≥+8.0	≥+15.0	≥+13.0
	40GHz<f≤53GHz	≥+8.0	≥+8.0	≥+20.0	≥+18.0
	53GHz<f≤65GHz	≥+8.0	≥+8.0	≥+18.0	≥+16.0
	65GHz<f≤67GHz	≥+8.0	≥+8.0	≥+15.0	≥+12.0

	Standard			
	Power(dBm) / Frequency	-10dBm<P≤+10dBm	+10dBm<P≤+25dBm	+25dBm<P
Level accuracy (25±10°C)	6kHz≤f≤50MHz	±1.0dB	±1.0dB	—
	50MHz<f≤3GHz	±0.5dB	±0.5dB	±1.0dB
	3GHz<f≤20GHz	±0.9dB	±0.9dB	±1.2dB
	20GHz<f≤40GHz	±1.0dB	±1.0dB	—
	40GHz<f≤50GHz	±1.3dB	±1.3dB	—
	50GHz<f≤67G	±1.8dB	±1.8dB	—

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Line Official
Facebook

	Hz					
	H01-130/120/90/50/B130 programmable step attenuator option					
	Power(dBm) / Frequency	+120dBm <P≤-90dBm	-90dBm< P≤-50dBm	-50dBm< P≤+10dBm	+10dBm< P≤+25dBm	+25dBm<P
	6kHz≤f≤50MHz	—	±1.5dB	±1.0Db	±1.0dB	—
	50MHz<f≤3GHz	±1.2dB	±0.7dB	±0.5dB	±0.5dB	±1.0dB
	3GHz<f≤20GHz	±1.8dB	±0.9dB	±0.9dB	±0.9dB	±1.2dB
	20GHz<f≤40GHz	—	±1.2dB	±1.0dB	±1.0dB	—
	40GHz<f≤50GHz	—	±1.5dB	±1.3dB	±1.3dB	—
	50GHz<f≤67GHz	—	±2.0dB	±1.8dB	±1.8dB	—
Power resolution	0.01dB					
Temperature stability	0.02dB/°C (typ)					
Output impedance	50Ω(nom)					
VSWR(internal leveled)(typ)	100kHz≤f≤20GHz	<1.6				
	20GHz<f≤40GHz	<1.8				
	40GHz<f≤67GHz	<2.0				
Maximum reverse power	0.5W(0V DC)(nom)					

Spectral purity characteristics		
Harmonics (dBc at +10dBm or maximum specified output power, whichever is lower)	Frequency	Standard
	6kHz≤f≤3GHz	<-30dBc
	3GHz<f≤67GHz	<-55dBc
Sub-harmonics(at +10dBm or maximum specified output power, whichever is lower)	100kHz≤f≤20GHz	<-80dBc
	20GHz<f≤40GHz	<-60dBc
	40GHz<f≤67GHz	<-50dBc

	Frequency	Standard /Option H04-1	Option H04-2
Non-harmonics(dBc at 0dBm, for offset >3kHz)	6kHz≤f≤250MHz	<-58dBc	<-68dBc
	250MHz<f≤4GHz	<-70dBc	<-80dBc
	4GHz<f≤10GHz	<-70dBc	<-80dBc
	10GHz<f≤20GHz	<-64dBc	<-74dBc
	20GHz<f≤40GHz	<-58dBc	<-68dBc
	40GHz<f≤67GHz	<-45dBc	<-45dBc

SSB phase noise (dBc/Hz, at +10dBm or	Offset from carrier	10Hz	100Hz	1kHz	10kHz	100kHz	1MHz	10MHz
	Standard phase noise							
	100MHz	—	<-11	<-12	<-13	<-13	—	—

maximum specified output power, whichever is lower)			0	8	4	8		
	250MHz<f≤500MHz	—	<-108	<-126	<-132	<-136	—	—
	0.5 GHz<f≤1GHz	—	<-103	<-121	<-130	<-130	—	—
	1 GHz<f≤2GHz	—	<-97	<-117	<-124	<-124	—	—
	2 GHz<f≤4GHz	—	<-92	<-111	<-118	<-118	—	—
	4GHz<f≤10GHz	—	<-85	<-105	<-110	<-110	—	—
	10GHz<f≤20GHz	—	<-79	<-98	<-104	<-104	—	—
	20GHz<f≤40GHz	—	<-73	<-91	<-98	<-98	—	—
	40GHz<f≤67GHz	—	<-68	<-85	<-92	<-92	—	—
	H04-1 low phase noise option							
	100MHz	—	<-118	<-141	<-148	<-148	—	—
	250MHz<f≤500MHz	—	<-111	<-130	<-145	<-143	—	—

	0.5 GHz<f≤1GHz	—	<-105	<-124	<-140	<-138	—	—
	1 GHz<f≤2GHz	—	<-100	<-118	<-134	<-132	—	—
	2 GHz<f≤4GHz	—	<-93	<-113	<-128	<-126	—	—
	4GHz<f≤10GHz	—	<-85	<-105	<-120	<-118	—	—
	10GHz<f≤20GHz	—	<-79	<-99	<-114	<-112	—	—
	20GHz<f≤40GHz	—	<-73	<-93	<-108	<-106	—	—
	40GHz<f≤67GHz	—	<-67	<-87	<-103	<-101	—	—
	H04-2 ultra low phase noise option							
	100MHz	<-102	<-118	<-141	<-148	<-148	<-148	<-148
	250MHz<f≤500MHz	<-92	<-112	<-135	<-146	<-148	<-150	<-150
	0.5GHz<f≤1GHz	<-90	<-110	<-134	<-144	<-147	<-150	<-150
	1GHz<f≤2GHz	<-88	<-10	<-12	<-13	<-14	<-14	<-14

			4	7	8	2	8	8
	2 GHz<f≤4GHz	<-82	<-99	<-122	<-135	<-136	<-146	<-148
	4GHz<f≤10GHz	<-77	<-91	<-115	<-128	<-128	<-140	<-154
	10GHz<f≤20GHz	<-71	<-85	<-109	<-122	<-122	<-134	<-152
	20GHz<f≤40GHz	<-63	<-79	<-99	<-116	<-116	<-128	<-142
	40GHz<f≤67GHz	<-57	<-73	<-94	<-110	<-110	<-122	<-136
Modulation characteristics								
Frequency modulation (50MHz<f≤50GHz, Option S11)	Maximum deviation:N×20MHz(N: YO harmonic number) Accuracy(at 1kHz, N×20kHz≤deviation<N×800kHz): <± (2.5%× set frequency offset +20Hz) Modulation rate(3dB bandwidth, N×500kHz frequency offset)):DC-10MHz Distortion(at 1kHz, N×20kHz≤deviations<N×800kHz):<1%							
Phase modulation (50MHz<f≤50GHz, Option S11)	Maximum deviation: Normal mode:N×20.0rad(N: YO harmonic number) Broadband mode:N×2rad Low noise mode:N×0.2rad							

	Accuracy(at 1kHz,N×0.2rad≤phase deviations<N×8rad,normal mode): <± (3% of setting deviation+0.01 rad) Modulation rate(3dB bandwidth, broadband mode):DC to 10MHz(typ) Distortion (at 1kHz, N×0.8rad≤deviations<N×8rad, THD)::<0.8%
Amplitude modulation (10MHz<f≤50GHz, Option S11)	Maximum depth:>90% Modution rate(3 dB bandwidth, 30% modulation depth):DC to 100kHz Accuracy(1kHz modulation rate,30% modulation depth):±(5% of setting+1%) Distortion(1kHz modulation rate,Linear mode,THD,30% modulation depth):<1.0%
Pulse modulation (f>50MHz, option S13 will cover option S12)	**Option S12: Pulse modulation**
	On/off ratio: >80dB
	Rise/fall times: <20ns
	Repetition frequency: 0Hz to 25MHz
	Minimum pulse width: 0.1μs
	Option S13: Narrow Pulse modulation
	On/off ratio: >80dB
	Rise/fall times: <10ns
	Repetition frequency: 0Hz to 25MHz
	Minimum pulse width: 20ns
LF out/Function generator(option	Support frequency/phase modulation, amplitude modulation output Waveform: sina, square, triangle, sawtooth, noise, double sine, sweep sine

S14)	Frequency range: DC to 10MHz for sine, double sine, sweep sine waveform; 0.1Hz to 1MHz for square, triangle, swatooth waveform. Frequency resolution:0.1Hz Low frequency output:amplitude: 0 to 5Vpp(nom), into 50Ω load
Vector accuracy(EVM,RMS %,after calibration,0dBm,25℃±10℃)	Basic modulation types(symbol rate 4 Msym/s,root Nyquist filter,α=0.3,QPSK format,f>100MHz): 100MHz<f≤4GHz <0.8% 4GHz<f≤20GHz <1.0% 20GHz<f≤40GHz <1.2% 40GHz<f≤67GHz <1.4% CDMA(symbol rate 3.84 Msym/s,root Nyquist filter,α=0.22,QPSK format): <0.7% (2GHz) 5GNR:(Test Model 3.1a,100MHz,256QAM,30kHz SCS,Option S01): <0.85% (100MHz,3.5GHz) <1.0% (100MHz,10GHz) <1.2% (100MHz,28GHz) <1.8% (100MHz,42.5GHz)
Adjacent Channel Power Ratio(ACPR,after calibration ,25℃±1	CDMA:(symbol rate 3.84 Msym/s,root Nyquist filter,α=0.22,QPSK format) >64dBc (2GHz) 5GNR:(Test Model 3.1a,100MHz,256QAM,30kHz SCS,option S01)

0℃)	1466C/D/E/F-V: >52dBc (100MHz,3.5GHz,0dBm) >51dBc (100MHz,10GHz,0dBm) >48dBc (100MHz,28GHz,0dBm) >42dBc (100MHz,42.5GHz,0dBm) 1466H/L-V: >52dBc (100MHz,3.5GHz,0dBm) >51dBc (100MHz,10GHz,0dBm) >46dBc (100MHz,28GHz,+5dBm) >41dBc (100MHz,42.5GHz,+5dBm)
Internal modulation bandwidth	(Carrier:900MHz, 2.6GHz, 3.5GHz, 10GHz, 28GHz, 42.5GHz, option S01/02) H31-500/H31-B500 option:500MHz(Multitone,number of tones:51,Frequency interval:10MHz,frequency response:<3.0dB); H31-1000/H31-B1000 option:1GHz(Multitone,number of tones:51, carrier:≥2.6GHz,frequency interval: 20MHz,frequency response: <4.0dB); H31-2000/H31-B2000 option:2GHz(Multitone,number of tones:51 carrier: ≥3.5GHz,frequency interval: 40MHz,frequency response: <5.0dB).

External modulation bandwidth	(carrier: 10GHz, 28GHz,42.5GHz) standard:2GHz(ALC off,input 500mVPP sine to channel I,frequency response: ±5.0dB); H33/H33-B:5GHz(f>20GHz,ALC off,input 500mVPP sine to channel I,frequency response: ±8.0dB).
Internal baseband signal generator	Channel: 2（I and Q） Max. symbol rate: Standard: 150Msps Option H31-1000: 300Msps Option H31-2000: 600Msps Baseband waveform memory: Standard: 1G sampling point Option H32: 4G sampling point Real-time baseband mode: Modulation format: PSK: BPSK, QPSK, AQPSK, OQPSK, π/4DQPSK, 8PSK QAM: 16, 32, 64, 128, 256, 512, 1024, 2048, 4096 FSK: 2, 4, 8, 16, 32, 64 ASK, MSK, APSK arbitrary wave modulation Maximum frequency interval in multitone mode（H31-2000）: 2GHz EVM: <0.5% （typ） （RMS%, symble rate 4Msps, Gennyquist filter, α=0.3, QPSK format）

	Arbitrary wave mode: Data format: waveform segment, sequence Maximum clock frequency（H31-2000）: 2.5GHz Trigger mode: continuous, single, gated Trigger source: key trigger, external Trigger type: Automatic, trigger, real-time, single ignore repeat trigger, single buffer repeat trigger, single real-time repeat trigger, high gating valid, low gating valid.
General characteristics	
RF output interface	1466C/D(-V):3.5mm(Male),Impedance 50Ω 1466E/G(-V):2.4mm(Male),Impedance 50Ω 1466H/L(-V):1.85mm(Male),Impedance 50Ω
Dimension (W×H×D)	475mm×193mm×620mm(Includes handle and protective bottom corner) 426mm×177mm×500mm(Excludes handle and protective bottom corner)
Weight	<35kg(weight depend on product model and option)
Power requirements	100 to 120VAC,50 to 60Hz or 200 to 240VAC,50 to 60Hz(adaptive power supply)
Power consumption	<700W
Temperature range	Operating temperature range:0°C to +50°C; Storage temperature range:-40°C to +70°C

Ording Information

- ***Mainframe:***

1466C-V Signal Generator: 6kHz to 13GHz

1466D-V Signal Generator: 6kHz to 20GHz

1466E-V Signal Generator: 6kHz to 33GHz

1466G-V Signal Generator: 6kHz to 45GHz

1466H-V Signal Generator: 6kHz to 53GHz

1466L-V Signal Generator: 6kHz to 67GHz

- ***Standard:***

No.	Description	Remarks
1	Power cable assembly	/
2	Quick User's Guide	/
3	The Product certificate of conformity	/

- **Option:**

Option No.	Description	Function and performance requirements
Programmable step attenuator option		
1466-H01-130	130dB programmable step attenuator	To expand output power dynamic range for 1466C/D/E/G-V
1466-H01-120	120dB programmable step attenuator	To expand output power dynamic range for 1466H/L-V
1466-H01-90	90dB programmable step attenuator	To expand output power dynamic range for 1466H/L-V
1466-H01-B130	Channel B 130dB programmable step attenuator	To expand Channel B output power dynamic range for 1466C/D-V, Requires option 1466-H11-B13/B20/BV13/BV20
Low phase noise option		
1466-H04-1	Low phase noise	Improved phase noise performance,10GHz@10kHz:-120dBc/Hz.
1466-H04-2	Ultra low phase noise	Improved phase noise performance,10GHz@10kHz:-128dBc

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Option No.	Description	Function and performance requirements
		/Hz.
1466-H04-B1	Channel B low phase noise	Improved Channel B phase noise performance,10GHz@10kHz:-120dBc/Hz, Regarding options 1466-H11-B13/B20/BV13/BV20.
1466-H04-B2	Channel B ultra low phase noise	Improved Channel B phase noise performance,10GHz@10kHz:-128dBc/Hz, Regarding options 1466-H11-B13/B20/BV13/BV20.
High output power option		
1466-H05-13	13GHz High output power	Improve maximum output power for 1466C-V
1466-H05-20	20GHz High output power	Improve maximum output power for 1466D-V
1466-H05-33	33GHz High output power	Improve maximum output power for 1466E-V
1466-H05-45	45GHz High output power	Improve maximum output power for 1466G-V

Option No.	Description	Function and performance requirements
1466-H05-53	53GHz High output power	Improve maximum output power for 1466H-V
1466-H05-67	67GHz High output power	Improve maximum output power for 1466L-V
1466-H05-B13	13GHz Channel B High output power	Improve Channel B maximum output power for 1466C-V,Option 1466-H11-B13/BV13 need to be configured
1466-H05-B20	20GHz Channel B High output power	Improve Channel B maximum output power for 1466D-V,Option 1466-H11-B20/BV20 need to be configured
Dual channel option		
1466-H11-BV13	13GHz Vector Channel B	Add Channel B,output 6kHz to 13GHz vector signal for 1466D-V
1466-H11-BV20	20GHz Vector Channel B	Add Channel B, Output 6kHz to 20GHz Vector signal for 1466D-V
Internal modulation bandwidth option		
1466-H31-500	500MHz modulation bandwidth	Internal modulation bandwidth:500MHz.

F.E.S. Co., Ltd.
1000/24, P.B. Tower, 8 floor, Sukhumvit 71 Rd., North Klongtan, Wattana, Bangkok 10110
TEL: 02-064-4050 or 02-064-4051 I FAX: 02-010-4262 I Email: info@fesupply.com
www.fesupply.com

Option No.	Description	Function and performance requirements
1466-H31-1000	1GHz modulation bandwidth	Internal modulation bandwidth:1GHz for 1466-V vector generator.
1466-H31-2000	2GHz modulation bandwidth	Internal modulation bandwidth:2GHz for 1466-V vector generator.
1466-H31-B500	Channel B 500MHz modulation bandwidth	Channel B Internal modulation bandwidth:500MHz Option 1466-H11-BV13 or 1466-H11-BV20 need to be configured.
1466-H31-B1000	Channel B 1GHz modulation bandwidth	Channel B Internal modulation bandwidth:1GHz Option 1466-H11-BV13 or 1466-H11-BV20 need to be configured.
1466-H31-B2000	Channel B 2GHz modulation bandwidth	Channel BInternal modulation bandwidth:2GHz Option 1466-H11-BV13 or 1466-H11-BV20 need to be configured.
Large memory option		

Option No.	Description	Function and performance requirements
1466-H32	Internal baseband large capacity memory	Expand internal baseband memory to 16GB
1466-H32-B	Channel B Internal baseband large capacity memory	Expand Channel B internal baseband memory to 16GB, Option 1466-H11-BV13 or option 1466-H11-BV20 need to be configured
Wideband external IQ input option		
1466-H33	Wideband external IQ input	Add wideband external IQ input function
1466-H33-B	Channel B Wideband external IQ input	Channel B Wideband external IQ input,Option 1466-H11-BV13 or option 1466-H11-BV20 need to be configured
Input and Output option		
1466-07	100MHz/1GHz Reference Input and Output	Support 100MHz or 1GHz reference signal input and output functions
1466-H36	Phase coherence	Realize phase coherent input-output

Option No.	Description	Function and performance requirements
	extension	interface connection
Other option		
1466-H94	Rack mount kit	Mount kit for rack
1466-H98	English Option	English panel and English operation interface
1466-H99	Aluminum alloy transport case	High-intensity portable aluminum alloy transport case, with carrying handle and omni-directional wheel, convenient for transportation
1466-H100	User Manual paper version	A detailed user manual in hard copy is provided.
1466-S01	Arbitrary waveform modulation function	Support arbitrary wave data download and playback, baseband signal generation or signal playback for 1466-V vector generator
1466-S02	Multitone modulation	Realize multitone modulation siganl generation function
1466-S03	Intrapulse modulation	Intrapulse Chirp, Barker Code, etc for 1466-V vector generator
1466-S04	AWGN generation	Support pure noise generation, additive

Option No.	Description	Function and performance requirements
		white Gaussian noise (AWGN) and continuous wave interference functions f
1466-S06	Segment waveform file generation	Realize the digital modulation signal generated waveform segment file
1466-S07	Sequencing file generation	To achieve multiple waveform segment files generated sequence files. Option S01 need to be configured
1466-S08	Multicarrier waveform generation	Realize multicarrier waveform siganl generation. Option S01 arbitrary waveform need to be configured.
1466-S09	Frequency hopping signal generation	Realize frequency hopping siganl generation
Analog modulation option		
1466-S11	Analog modulation	Add analog modulation function indluding AM,FM,ΦM
1466-S12	Pulse modulation	Add pulse modulation function, minimum pulse width 100ns
1466-S13	Narrow pulse modulation	Add pulse modulation function, minimum pulse width 20ns

Option No.	Description	Function and performance requirements
1466-S14	LF output/function waveform generator	Add low frequency output and function waveform signal generation
Sweep function option		
1466-S15	Ramp(analog)sweep	Add analog sweep function(Ramp sweep)
1466-S16	Power sweep	Add power sweep function
Internal signal simulation option		
1466-S21	Wireless connection signal simulation function	802.11a/b/g/n/ac/ax (Wi-Fi1~Wi-Fi6) Wireless connection PPDU, MPDU, A-MPDU and other signal simulation, with leading, data domain, MAC frame, PE, space mapping and other module parameter Settings. It supports physical frame block signal simulation consisting of multiple PPDUs with different modulation and coding modes. Applicable to all models of the 1466-V vector generator.
1466-S22	Wireless connection	802.11be (WIFI7) wireless connection

Option No.	Description	Function and performance requirements
	signal simulation function-WIFI 7	signal simulation. Supports the corresponding protocol standards, PPDU format, MAC frame type, transmission mode, PPDU and other parameters. Support for multiple RU (MRUs) options and enhanced OFDMA emulation.
1466-S23	Bluetooth signal simulation	Support basic rate (BR) and enhanced rate (EDR) Bluetooth signal simulation, providing three transmission Mode ACL+EDR, SCO, eSCO+EDR; Supports Bluetooth Low Energy (LE) signal simulation, Supports two channel types: Broadcast and Data.
1466-S31	Communication signal simulation GSM/EDGE	Support normal symbol rate full speed/half speed conventional, synchronous, frequency correction, access and null burst types, as well as high symbol rate burst types; Support normal symbol rate MSK/FSK, AQPSK,

Option No.	Description	Function and performance requirements
		8PSK, 16QAM, 32QAM and high symbol rate QPSK, 16QAM, 32QAM modulation; Support single frame, double frame and no frame 3 different types of frame structure configuration; Support independent power configuration for each time slot; Support channel coding for each time slot; Support wide pulse and narrow pulse filtering with high symbol rate; Supports up to 64 multi-carrier configurations.
1466-S33	Communication signal simulation LTE/ LTE-ADVANCED	Uplink: Support FDD/TDD duplex mode, PRACH, PUCCH, PUSCH and other uplink channels and DMRS uplink signal simulation of different bandwidth and modulation coding modes, with A1 to A8 a total of 44 categories of FRC signal simulation functions.

Option No.	Description	Function and performance requirements
		Downlink: Support FDD/TDD duplex mode, PBCH, PCFICH, PHICH, PDCCH, PDSCH and other downlink channels and CRS, PSS, SSS and other downlink signal simulation under Auto DCI/Manual scheduling PDSCH mode. It has the aggregation function of up to 5 carriers, the multi-antenna setting function of up to 4 antennas, and a total of 8 TestModel signal simulation functions of E-TM1~E-TM3.
1466-S34	Communication signal simulation 5G NR	Support 5G NR protocol R16 signal generation, including a variety of bandwidth and subcarrier interval Settings; It can generate more than 600 Testmodels and FRCS, support one-click simulation of standard protocol signals, and quickly establish test scenarios. Support uplink PUSCH, PUCCH, PRACH, downlink PDSCH,

Option No.	Description	Function and performance requirements
		CORESET multi-channel time-frequency resource detailed configuration, PDSCH/PUSCH channel coding, multi-antenna, multi-layer transmission simulation; Support CSI-RS, SRS, SS/PBCH, PRS, LTE-CRS and other signal configurations; Support a variety of upstream and downstream DCI formats in CORESET, DCI automatically calls PDSCH configuration; Support carrier aggregation and cross-carrier scheduling; Supports a variety of filters and user-defined filter configurations.
1466-S35	Communication signal simulation NB-Iot	Uplink: It supports Standalone, In_band, Guard_band and other deployment modes, and has uplink channel functions such as NPUSCH and NPRACH with different bandwidths and modulation and coding modes. The

Option No.	Description	Function and performance requirements
		NPUSCH format includes F1 and F2. The signal styles include Single-tone(15kHz/3.75kHz) and SC-FDMA(15kHz). Downlink: Support Standalone, In_band, Guard_band and other three deployment modes, with different bandwidth and modulation coding mode of NPBCH, NPDCCH, NPDSCH and other downlink signal simulation functions such as NPSS, NSSS, NRS, DCI format includes N0, N1, N2 three. NPDCCH search space includes UE specific, type1 common and type2 common.
1466-S61	Digital broadcast signal simulation DVB-H/T/T2/S2/S2X	Support DVB-H, DVB-T, DVB-T2, DVB-S2X protocol; Support for data channel coding according to protocol standards, including scrambling, interleaving, external code (BCH), and

Option No.	Description	Function and performance requirements
		internal code (LDPC) with rate from 1/4 to 31/45; Configurable baseband (BB) head, VL-SNR head, TS head, GSE head; Support DVB-S2 modulation scheme: QPSK, 8APSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK, 256APSK; Support QPSK, π/2BPSK in VL-SNR mode; Support pilot insertion and configuration; Supports superframe configuration, hop beam configuration, and configurable dwell time.
Calibration Service Option		
1466C-V-JL	Calibration Service	Provide metrology/calibration services and provide metrological reports
1466D-V-JL	Calibration Service	Provide metrology/calibration services and provide metrological reports
1466E-V-JL	Calibration Service	Provide metrology/calibration services and provide metrological reports
1466G-V-JL	Calibration Service	Provide metrology/calibration services

Option No.	Description	Function and performance requirements
		and provide metrological reports
1466H-V-JL	Calibration Service	Provide metrology/calibration services and provide metrological reports
1466L-V-JL	Calibration Service	Provide metrology/calibration services and provide metrological reports