

# S5105 Microwave Multifunctional Analyzer

(Frequency Range: 30kHz – 18GHz/ 26.5GHz, 50MHz - 40GHz)

## Key Features

- Spectrum Analysis
- Power Monitoring
- Vector Network Analysis
- Field Strength Measurement
- Vector Voltage Measurement
- USB Power Measurement
- Cable and Antenna Feeder Test
- With data storage, playback and comparison functions
- With USB, LAN and other interfaces for program control and data transmission
- With six-independent cursor display function, and the cursor position can slide with the finger.
- 8.4 inch LCD touch screen, easy to operate, friendly man-machine interface, visual display.
- Small size, light weight, secondary environmental adaptability, easy to carry and test in special occasions.
- Test data can be stored and called, and three kinds of storage media are available: 1.5G or more high-capacity internal storage, USB external storage, SD external storage.
- Battery powered, suitable for field use, intelligent power management, with remaining battery capacity indication and low battery alarm function, and sleep energy-saving function.



With frequency range of 18GHz/26.5GHz/40GHz, S5105D/E/F microwave multifunctional analyzers integrate multiple functions such as dual-port vector network analysis, cable and antenna feeder test, vector voltage measurement, spectrum analysis (channel power, adjacent channel power, occupied bandwidth, interference analysis and frequency counting), field strength measurement and power measurement, providing you with powerful comprehensive test capabilities.

**Dual-port vector network analysis** can make comprehensive RF network parameters measurement quickly and accurately, providing logarithmic, linear, phase, group delay, impedance chart, polar coordinate, SWR and other display formats, and providing time domain measurement options.

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**Cable and antenna feeder test** can measure the SWR, return loss, impedance, cable loss and other parameters of microwave networks such as antenna feeders, transmission lines and cables, and can conveniently measure impedance discontinuity points in feeders and cables, with DTF function.

**Vector voltage measurement** adopts an integrated solution instead of the traditional vector voltmeter to accurately test the electrical length of cables and some other devices under test.

**Spectrum analysis** is a spectrum analyzer with standard functions, which can measure the spectrum characteristics comprehensively in an electromagnetic environment.

**Field strength measurement** has a friendly user interface and high test sensitivity. With the corresponding test antenna, it can effectively monitor the electromagnetic spectrum and is widely used in space electromagnetic environment monitoring and radio management.

**USB power sensor** is configured to achieve large dynamic range and high-precision power measurement, and can also carry out power monitoring through the spectrum input port.

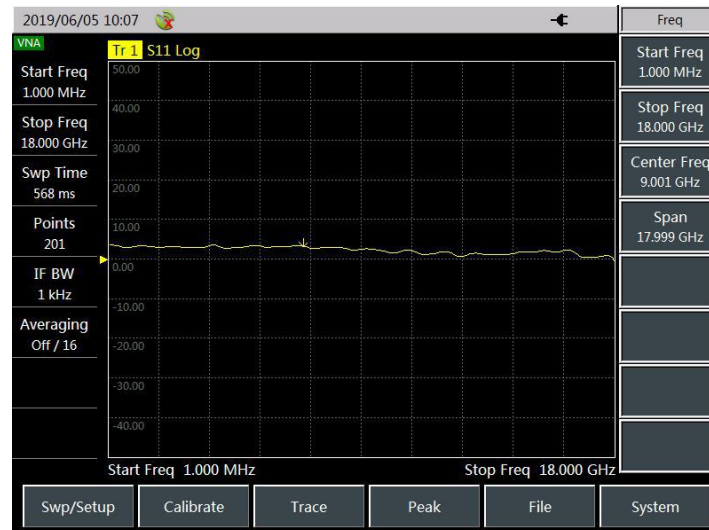
## Main Functions Features To Boost Your Efficiency

### 1. Network Parameter Measurement

With the frequency range of network analysis of 30kHz - 18GHz/ 26.5GHz and 50MHz- 40GHz, S5105D/E/F microwave analyzers can realize standard vector network analysis and measurement of full 4S parameters, and can test full S parameters of amplifier, filter, attenuator, duplexer and other devices, providing logarithmic, linear, phase, group delay, impedance, polar coordinate, SWR and other display formats.

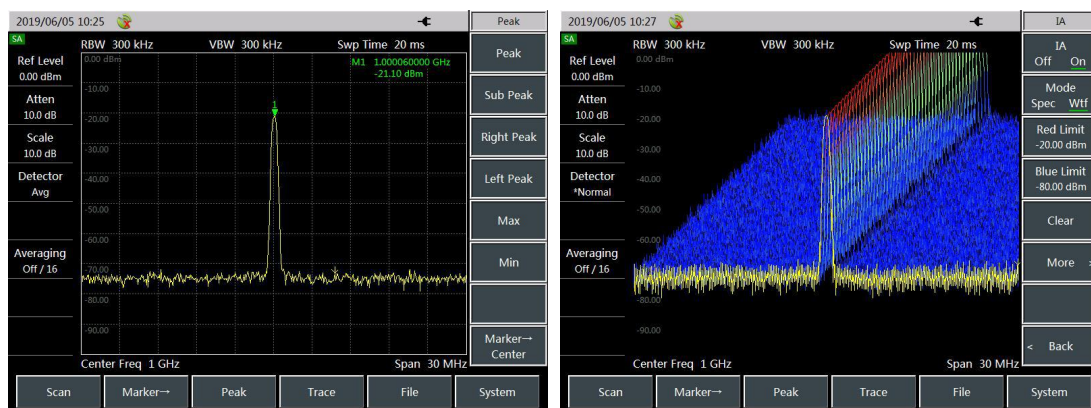
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## 2. Spectrum Analysis

With the frequency range of the spectrum analysis function (spectrum analysis, field strength, channel power, occupied bandwidth, adjacent channel power ratio, interference analysis, frequency counting) of 100kHz - 18GHz/26.5GHz/40GHz, S5105D/E/F microwave analyzers have such features as wide frequency band, high sensitivity, wide dynamic range and good phase noise, can realize fast and efficient signal detection and measurement, can display three traces at the same time, have different optional detector modes such as standard, sample, positive peak, negative peak and mean, and have interference analysis, spectrogram, waterfall plot, data recording and playback functions.



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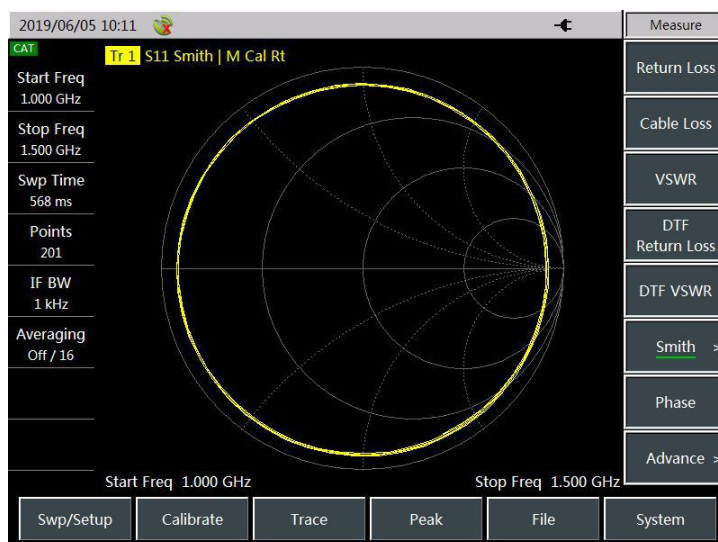


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## 3. Cable and Antenna Test

As cable and antenna feeder testers, S5105D/E/F microwave analyzers can be used to measure the return loss, VSWR, impedance, cable loss and distance to fault of cables, feeders and other devices under test. The measurement of return loss and distance to fault will help you determine the specific cause of performance degradation of the overall system in the cable and antenna feeder system. In addition, some common cable and feeder parameters are built in for convenient use.

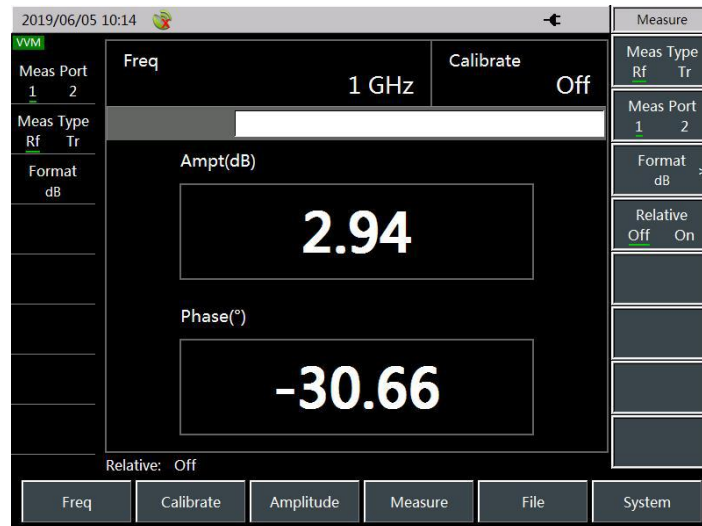


## 4. Vector Voltage Measurement (Option)

With the frequency range of vector voltage measurement of 30kHz - 18GHz/26.5GHz and 50MHz - 26.5GHz, S5105D/E/F microwave analyzers can accurately measure the electrical length and phase shift of devices under test, and can perform reflection and transmission test.

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## 5. Power Measurement Based on USB Power Sensor (Option)

S5105D/E/F microwave analyzers can use S 8723X series USB Continuous Wave Power Sensors of Saluki to measure power, and can test RF/microwave power up to 40GHz.

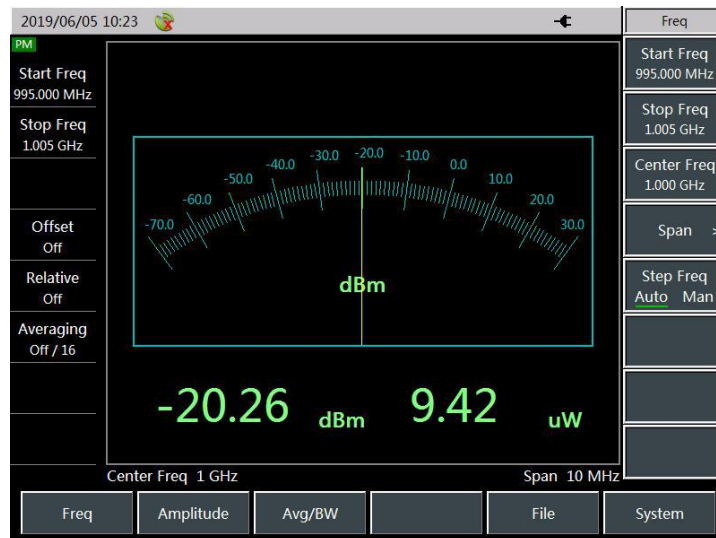


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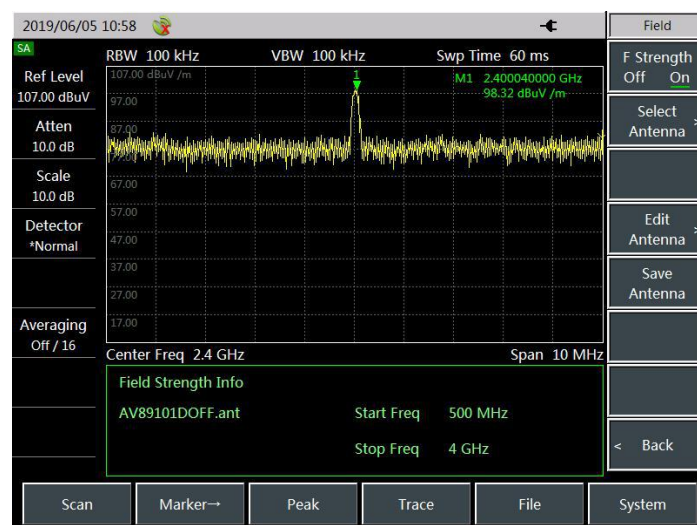
## 6. Power Monitoring (Option)

S5105D/E/F microwave analyzers can also carry out power monitoring and measurement through the spectrum input port, with frequency range of 100kHz - 18GHz/26.5GHz/40GHz.



## 7. Field Strength Measurement (Option)

S5105D/E/F microwave analyzers can also be used for field strength measurement together with the corresponding test antennas, and are widely used in space electromagnetic environment monitoring and radio management. The testers support user antennas, allowing users to define their own antennas.



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## 8. Supporting List Sweep

In addition to frequency sweeping, spectrum analysis, antenna feeder test and network analysis also support list sweep. Parameters in each band are independent.

## 9. Supporting Upper and Lower Limit Lines

Spectrum analysis, antenna feeder test and network analysis support the limit line test. The limit line can be used as a visual reference, and can also be used as the basis for PASS/FAIL judgment. If the test data exceed the upper limit line or fall below the lower limit line, the loudspeaker will sound "dripping" to remind the user that the data have exceeded the limit line.

## 10. Sleep Energy-saving Function

The analyzer has a sleep energy-saving function, and the sleep time can be set. When the sleep function is activated, the testers will automatically turn off the display or shut down if they are not operated for a certain period of time, thus saving electric energy and effectively extending the working time and service life of battery.

## 11. More Cursors

Six independent cursors are provided, which can display the parameters of the cursor position and can also search for maximum, minimum or peak values. All cursors have the  $\Delta$  mode, making the test reading easier. In addition, the scale on the left side of the display can facilitate the judgment of the test results.

## 12. Automatic Software Upgrade of USB Disk

S5105D/E/F analyzers have USB interfaces that can be used for intelligent software upgrade and data backup. You can easily use the USB disk to perform software upgrade and maintenance on the instrument. It takes only a few steps and is simple and quick. You can restart the instrument after the upgrade.

## Typical Applications

S5105D/E/F microwave analyzers are compact and portable. With many test parameters and comprehensive test functions, they are very suitable for multi-parameter test occasions, and can be battery-powered. As a powerful tool for field engineering installation, debugging, daily



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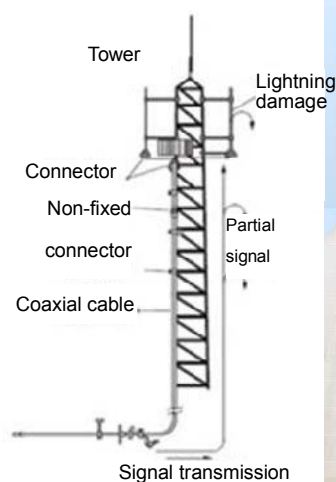
maintenance and repair of various microwave electronics, the testers can be widely used in various fields such as radar, communication, radio & television and radio management, and are also a good choice for teaching in colleges and universities.

## 1. Test of Main Performance Parameters of Radar

With full functions, S5105D/E/F analyzers can test the main performance parameters of radar antenna feeder, transmitting/receiving subsystem and other subsystems up to 18GHz/26.5GHz/40GHz, including the SWR, reflectance, insertion loss, return loss and impedance characteristics of antenna feeder subsystem, the transmitting signal frequency and spectrum characteristics of transmitting subsystem, and the center frequency, gain, differential loss, bandwidth and dynamic range of receiving subsystem.

## 2. Multi-parameter Test in Such Fields as Cable TV and Wireless Communication

Cable TV, cellular telephone system, digital mobile communication operators and equipment manufacturers use S5105D/E/F testers to perform integrated test on spectrum distribution, antenna feeder contact performance, S parameters of components and parts and feedthrough power in the field.





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## Technical Specifications

Parameter	S5105D	S5105E	S5105F
<b>Cable &amp; Antenna Feeder Test (Optional)</b>			
Frequency Range	30kHz - 18GHz	30kHz - 26.5GHz	50MHz - 40GHz
Frequency Accuracy	$\pm 1 \times 10^{-6}$		
Power Level	Big, small		
Data Points	11 - 10001		
Effective Directivity	≥40dB 2MHz-500MHz ≥36dB 500MHz-9GHz ≥32dB 9GHz-18GHz	≥40dB 2MHz-500MHz ≥36dB 500MHz-9GHz ≥32dB 9GHz-18GHz ≥30dB 18GHz-26.5GHz	≥35dB 50MHz-500MHz ≥32dB 500MHz-18GHz ≥30dB 18GHz-26.5GHz ≥28dB 26.5GHz-40GHz
<b>Vector Network Analysis (Standard Configuration)</b>			
Frequency Range	30kHz - 18GHz	30kHz - 26.5GHz	50MHz - 40GHz
Frequency Accuracy	$\pm 1 \times 10^{-6}$		
Power Range	Big, small, manual		
Power Level Accuracy (-15dBm output)	±2.5dB 10MHz-18GHz	±2.5dB 10MHz-26.5GHz	±2.5dB 10MHz-26.5GHz ±3.0dB 26.5GHz-40GHz
Effective Directivity	≥40dB 2MHz-500MHz ≥36dB 500MHz-9GHz ≥32dB 9GHz-18GHz	≥40dB 2MHz-500MHz ≥36dB 500MHz-9GHz ≥32dB 9GHz-18GHz ≥30dB 18GHz-26.5GHz	≥35dB 50MHz-500MHz ≥32dB 500MHz-18GHz ≥30dB 18GHz-26.5GHz ≥28dB 26.5GHz-40GHz
Effective Source Match	≥37dB 2MHz-500MHz ≥30dB 500MHz-9GHz ≥28dB 9GHz-18GHz	≥37dB 2MHz-500MHz ≥30dB 500MHz-9GHz ≥28dB 9GHz-18GHz ≥25dB 18GHz-26.5GHz	≥30dB 50MHz-500MHz ≥25dB 500MHz-18GHz ≥22dB 18GHz-26.5GHz ≥18dB 26.5GHz-40GHz
Transmission Tracking	±0.25dB 2MHz-500MHz ±0.29dB 500MHz-9GHz ±0.33dB 9GHz-18GHz	±0.25dB 2MHz-500MHz ±0.29dB 500MHz-9GHz ±0.33dB 9GHz-18GHz ±0.35dB 18GHz-26.5GHz	±0.25dB 2MHz-500MHz ±0.29dB 500MHz-9GHz ±0.33dB 9GHz-18GHz ±0.35dB 18GHz-26.5GHz ±0.40dB 26.5GHz-33GHz ±0.50dB 33GHz-40GHz

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Parameter	S5105D	S5105E	S5105F
<b>Reflective Tracking</b>	±0.10dB 2MHz-500MHz ±0.13dB 500MHz-9GHz ±0.14dB 9GHz-18GHz	±0.10dB 2MHz-500MHz ±0.13dB 500MHz-9GHz ±0.14dB 9GHz-18GHz ±0.21dB 18GHz-26.5GHz	±0.10dB 2MHz-500MHz ±0.13dB 500MHz-9GHz ±0.14dB 9GHz-18GHz ±0.21dB 18GHz-26.5GHz ±0.25dB 26.5GHz-33GHz ±0.30dB 33GHz-40GHz
<b>Dynamic Range</b>	≥85dB 2MHz-18GHz	≥85dB 2MHz-18GHz ≥80dB 18GHz-26.5GHz	≥85dB 50MHz-18GHz ≥80dB 18GHz-26.5GHz ≥75dB 26.5GHz-33GHz ≥65dB 33GHz-40GHz
<b>Power Monitoring (Optional)</b>			
<b>Frequency Range</b>	100kHz - 18GHz	100kHz - 26.5GHz	100kHz - 40GHz
<b>Power Range</b>	-60dBm to +20dBm	-60dBm to +20dBm	-50dBm to +20dBm
<b>Spectrum Analysis (Standard Configuration)</b>			
<b>Frequency Range</b>	100kHz - 18GHz	100kHz - 26.5GHz	100kHz - 40GHz
<b>Resolution</b>	Range: 1Hz - 5MHz (step by 1,3,10)		
<b>Bandwidth</b>	Accuracy: ±10% 3kHz-3MHz, ±15% 5MHz		
<b>Video Bandwidth</b>	1Hz - 5MHz (step by 1,3,10)		
<b>Display Average</b> <b>Noise Level</b>	Pre-amplifier on: 2MHz-4.5GHz ≤-151dBm 4.5GHz-7GHz ≤-147dBm 7GHz-13GHz ≤-145dBm 13GHz-18GHz ≤-140dBm	Pre-amplifier on: 2MHz-4.5GHz ≤-151dBm 4.5GHz-7GHz ≤-147dBm 7GHz-13GHz ≤-145dBm 13GHz-18GHz ≤-140dBm 18GHz-26.5GHz ≤-138dBm	Pre-amplifier on: 2MHz-4.5GHz ≤-151dBm 4.5GHz-7GHz ≤-147dBm 7GHz-13GHz ≤-145dBm 13GHz-18GHz ≤-140dBm 18GHz-26.5GHz ≤-138dBm 26.5GHz-40GHz ≤-135dBm
	Pre-amplifier off: 2MHz-4.5GHz ≤-135dBm 4.5GHz-7GHz ≤-131dBm 7GHz-13GHz ≤-127dBm 13GHz-18GHz ≤-120dBm	Pre-amplifier off: 2MHz-4.5GHz ≤-135dBm 4.5GHz-7GHz ≤-131dBm 7GHz-13GHz ≤-127dBm 13GHz-18GHz ≤-120dBm 18GHz-26.5GHz ≤-116dBm	Pre-amplifier off: 2MHz-4.5GHz ≤-135dBm 4.5GHz-7GHz ≤-131dBm 7GHz-13GHz ≤-127dBm 13GHz-18GHz ≤-120dBm 18GHz-26.5GHz ≤-116dBm 26.5GHz-40GHz ≤-113dBm
<b>Noise Sideband</b> <b>(CF=1GHz)</b>	≤ -99dBc/Hz@100kHz		
	≤ -110dBc/Hz@1MHz		

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Parameter	S5105D	S5105E	S5105F
Residual Response	≤ -80dBm		≤ -70dBm
Max. Safety Input Level	+27dBm		
<b>General Information</b>			
Type of Test Port	N (f)	3.5mm (m)	2.4mm (m)
Power Supply	Rechargeable lithium-ion battery or power adapter		
Power Consumption	≤ 45W (excluding battery charging)		
Operating Temp.	-10°C to +50°C		
Storage Temp.	-40°C to +70°C		
Max. Weight	5.3kg (excluding battery)		
Max. Dimensions	315mm×220mm×102mm (excluding handle and bracket)		

## Standard Package

Item	Name	Qty
1	S5105D/E/F Main Machine	1 UNIT
2	Standard Three-core Power Cord	1 PC
3	Power Adapter	1 PC
4	Rechargeable Lithium-ion Battery	1 PC
5	CD (including user manual, programming manual, USB driver, program-controlled function library, program-controlled example, and installation file required for program-controlled function library)	1 PC
6	Certificate of Conformity	1 PC

## Optional Accessories

Part No.	Name	Description
S5105-S02	Antenna Test (Software)	For testing RL, VSWR, Break point of Cable and Antenna.

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S5105-S03	Vector Voltmeter (Software)	For testing cable phase shift and electrical length.
S5105-S04	USB Power Measurements (Software)	External USB Power probe can conduct precise measurement of continuous wave signal. (Need to reprovision USB power sensors)
S5105-S05	Power Detection (Software)	Receiving external signal at spectrum input port in order to measure signal power.
S5105-S06	Field Strength Measurements (Software)	For field strength measurements. (Need to reprovision antenna)
S5105-S07	GPS Positioning (Software)	Provide geographical information such as longitude, latitude and altitude. (Including GPS antenna)
S5105-S08	Electronic Calibration	Software, should buy e-cal module separately (For VNA, C&A, Vector Voltmeter function)
S5105-H01	Rechargeable Lithium-ion Battery	Backup battery
S5105-H02	AC-DC Adapter	Backup
S5105-H04	S31101A N-type male Calibration Kit, DC - 18GHz	Calibrate for Vector Network Analysis, Antenna Test and Vector
S5105-H05	S31101B N-type Female Calibration Kit, DC - 18GHz	
S5105-H06	S31121 3.5mm Calibration Kit, DC - 26.5GHz	
S5105-H07	S31123 2.4mm Calibration Kit, DC - 40GHz	
S5105-H08	N (M-M) Calibration Cable	Calibration or Cable Test
S5105-H09	N (F-M) Calibration Cable	
S5105-H10	3.5mm (F-F) Calibration Cable	
S5105-H11	3.5mm (F-M) Calibration Cable	
S5105-H12	2.4mm (F-F) Calibration Cable	
S5105-H13	2.4mm (F-M) Calibration Cable	
S5105-H14	S87230 USB Power Sensor, 9kHz-6GHz	For High-precision Power Measurement

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S5105-H15	S87231 USB Power Sensor, 10MHz-18GHz	For High-precision Power Measurement
S5105-H16	S87232 USB Power Sensor, 50MHz-26.5GHz	
S5105-H17	S87233 USB Power Sensor, 50MHz-40GHz	
S5105-H18	S89101A Antenna, 10kHz-20MHz	For Field Strength Measurement
S5105-H19	S89101B Antenna, 20MHz-200MHz	
S5105-H20	S89101C Antenna, 200MHz-500MHz	For Field Strength Measurement
S5105-H21	S89101D Antenna, 500MHz-4000MHz	
S5105-H22	S89901 Antenna, 1GHz-18GHz	
S5105-H23	S89401 Antenna Amplifier, 10kHz-4GHz	
S5105-H24	S71522D Attenuator (40dB, 25W)	For High Power Measurement
S5105-H25	S71523C Attenuator (40dB, 50W)	
S5105-H26	S71524C Attenuator (40dB, 100W)	
S5105-H27	S71101 Adapter, N(F)-N(F)	For Switching Between Connectors
S5105-H28	S71115 Adapter, 3.5mm(M)-N(F)	
S5105-H29	S71116 Adapter, 3.5mm(M)-N(M)	
S5105-H30	S71117 Adapter, 3.5mm(F)-N(M)	
S5105-H31	S81101 Adapter, N(M)-N(F)	
S5105-H32	Soft Backpack	For Carrying
S5105-H33	Aluminum Carrying Case	For Transportation
S5105-H34	Waterproof Safety Box	For Transportation
S5105-H35	S89901 Antenna Handle	Used with option H22 antenna
S5105-H36	S20402 Electrical Calibration Kit	Frequency: 300kHz - 18GHz
S5105-H37	S20403 Electrical Calibration Kit	Frequency: 10MHz - 26.5GHz
S5105-H38	S20404 Electrical Calibration Kit	Frequency: 10MHz - 50GHz
S5105-H39	S87302FZ Test Cable	3.5/3.5-female to female, 60cm

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S5105-H40	S87302FE Test Cable	3.5/3.5-female to male, 60cm
S5105-H41	S87302AZ Test Cable	N/N-male to male, 60cm
S5105-H42	S87302BA Test Cable	N/N-female to male, 60cm
S5105-H43	S87234D USB Peak/Average Power Sensor	50MHz-18GHz, for peak power measurement
S5105-H44	S87234E USB Peak/Average Power Sensor	50MHz-26.5GHz, for peak power measurement
S5105-H45	S87234F USB Peak/Average Power Sensor	50MHz-40GHz, for peak power measurement

*Note: Information will conduct the necessary updates , the contents of this document are subject to change without notice*