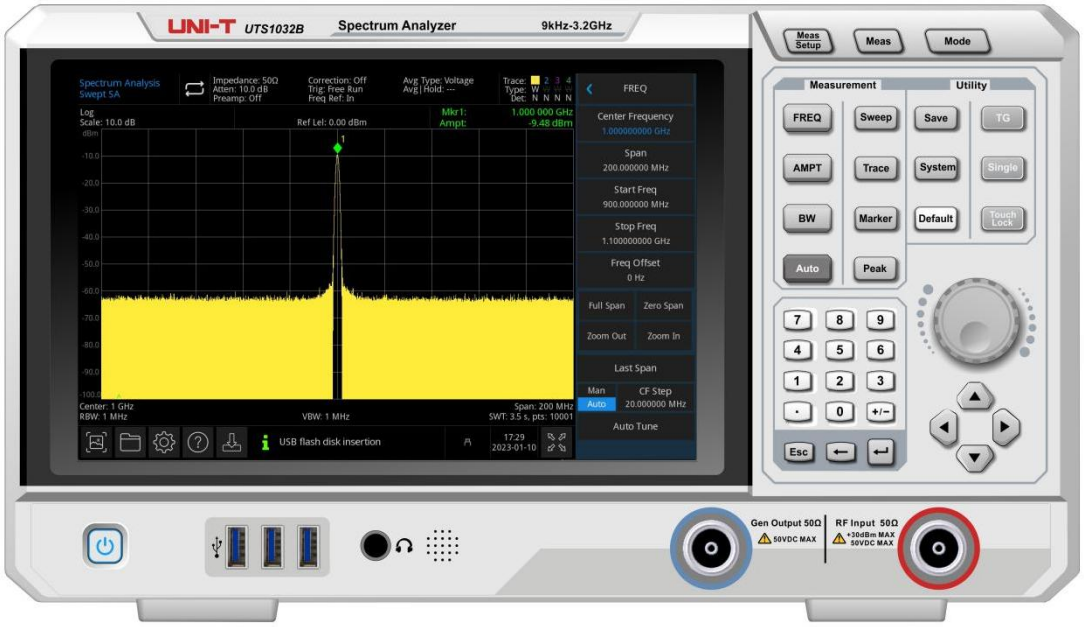
Instruments.uni-trend.com



Datasheet

UTS1000B/T Series Spectrum Analyzer

V1.2

2024.06

Product Features

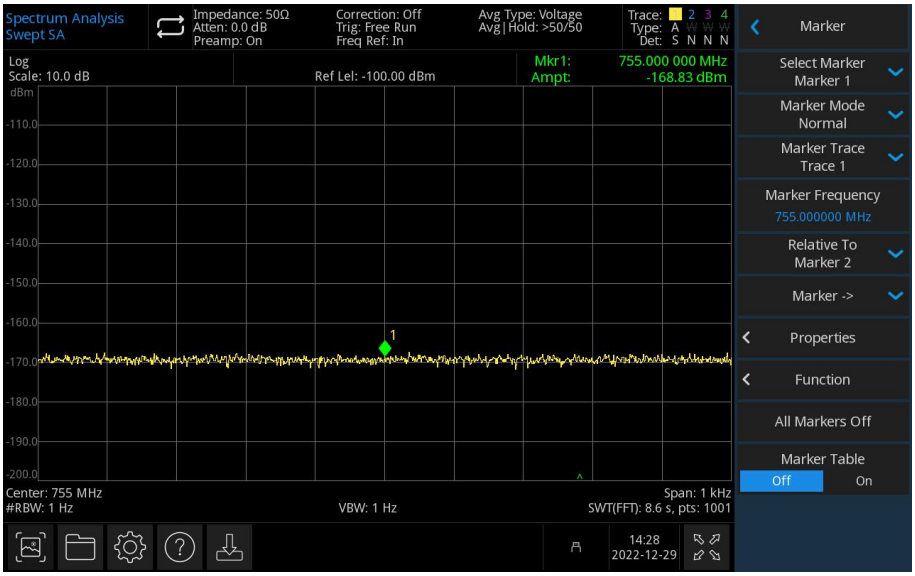
- Frequency measurement range: 9 kHz to 1.5 GHz, 9 kHz to 3.2 GHz
- Display average noise level (DANL) can be as low as -161 dBm (Typical value)
- Phase noise < -98 dBc/Hz (Offset 10 kHz, typical value)
- Full amplitude Precision < 0.7 dB
- Up to 10,001 scanning points
- Minimum resolution bandwidth (RBW) 1 Hz
- Advanced function one key measurement (Option)
- EMI Pre-compliance analysis function (Option)
- Supports analog demodulation analysis (Option)
- Supports tracking generator output function (UTS1000T Only)
- 10.1-inch 1280 × 800 HD capacitive touch screen
- Provides USB/LAN interface, supports SCPI protocol

Multi-touch HD Screen for Quick Operation

10.1-inch multi-touch HD capacitive screen with quick menu settings. Supports multiple gesture operations such as dragging, expanding, and zooming on the trace. Convenient human-computer interaction operation solves the problem of cumbersome and difficult operation to the greatest extent.

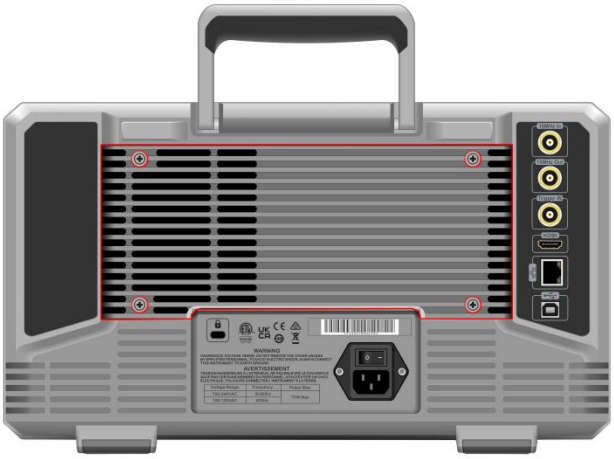
Excellent Sensitivity to Test Weaker Signals

The weak signal test is easily affected by the noise floor of the spectrum analyzer itself. UTS1000B/T series has a DANL as low as -161 dBm, providing excellent sensitivity to effectively test weak signals.



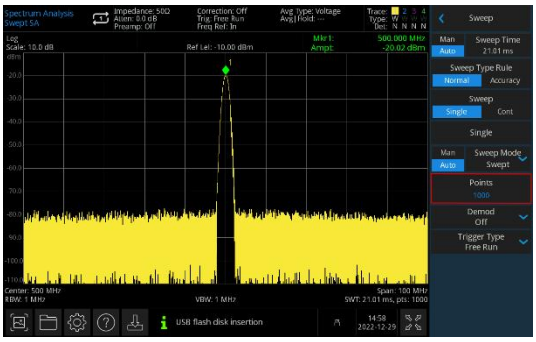
Removable Dust Mesh

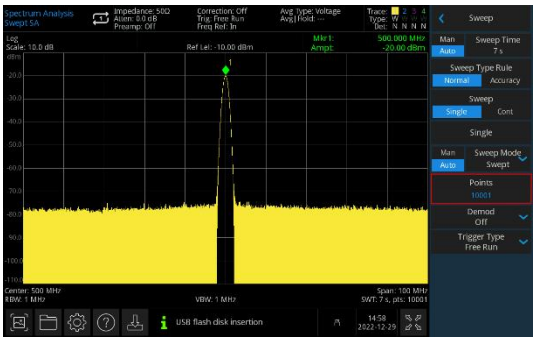
With a detachable dust filter, after the instrument is used for a period of time, the user can remove the dust from the air inlet. To ensure the reliability of the whole machine, it can avoid short-circuit, burn or fire caused by dust.



Scan 10,001 points

UTS1000B/T series provides up to 10,001 sweep points, offering higher frequency resolution and making it easier to capture signals that are difficult to detect.



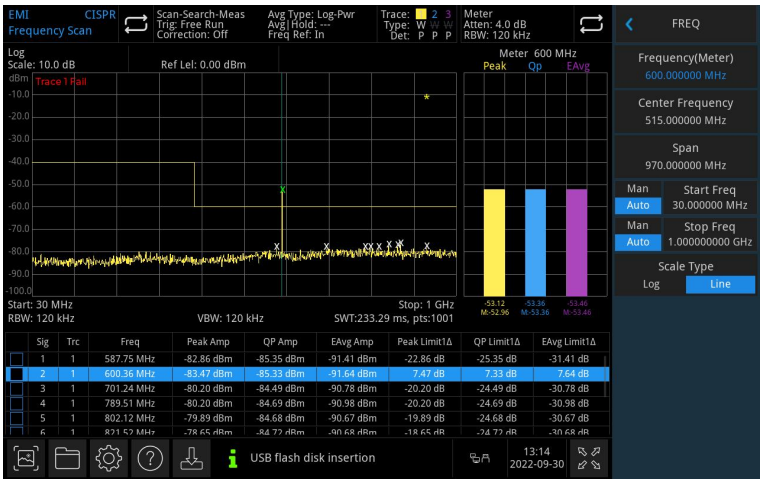


Excellent Selectivity

It has a stronger capability to resolve signals of adjacent unequal amplitudes.

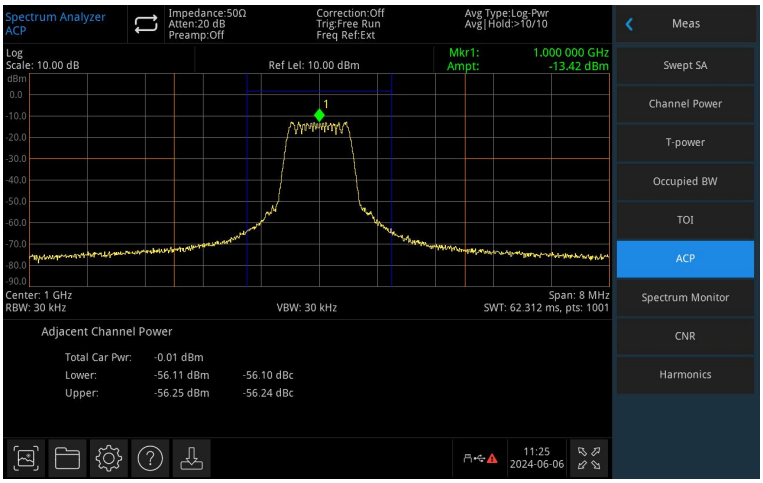
EMI pre-compliance (Option)

UTS1000B/T series includes optional components that, when used with near-field probes, assist in locating and resolving EMI defects in advance, thereby shortening the development cycle.



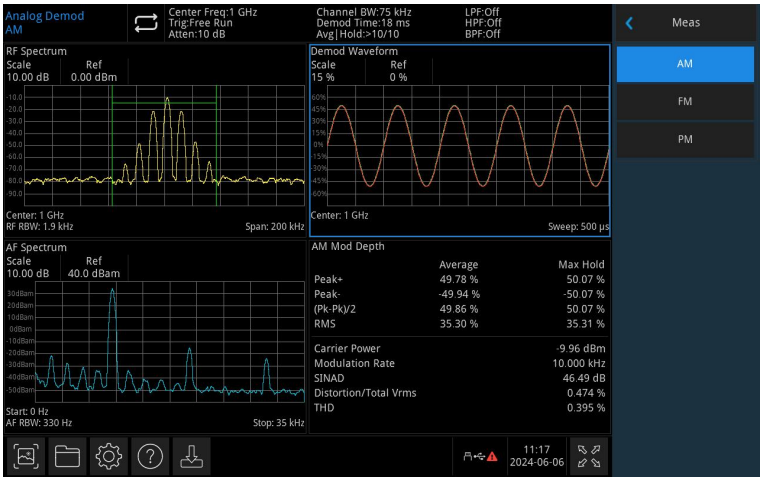
Advanced measurement (Option)

The advanced measurement mode provides the test items required by the transmitter test specification: Channel Power, T-power, Occupied BW, TOI, ACP, Spectrum Monitor, CNR, and Harmonics.



Analog demodulation analysis (Option)

Provides AM, FM analog signal for demodulation analysis



Definitions and Conditions

"Specifications" describes the performance of the parameters covered by the product warranty in detail, unless otherwise noted, these specifications apply to the temperature range of 20°C to 30°C.

"Typical" refers to other product performance information not covered by the product warranty. 80% of the units can exhibit 95% confidence over the temperature range of 20 °C to 30 °C when performance is out of specification. Typical performance does not include measurement uncertainty.

"Nominal Value" means expected performance, or describes product performance that is useful in product applications but not covered by the product warranty.

The analyzer can meet its specifications under the following conditions:
It is within its calibration cycle and has warmed up for at least 30 minutes.
If the analyzer has been stored within the allowable storage temperature range but outside the allowable operating temperature range, it must be placed within the allowable operating temperature range for at least two hours before starting.

Product Function and Model Comparison Table

	UTS1015B	UTS1032B	UTS1015T	UTS1032T
Spectrum analysis	●	●	●	●
EMI	○	○	○	○
Analog demodulation	○	○	○	○
Advanced measurement	○	○	○	○
Tracking generator	×	×	●	●

Note: ● Standard ○ Option × Not supported

Frequency and Time Specifications

Frequency		
Model	UTS1015B/T	UTS1032B/T
Frequency range	9 kHz to 1.5 GHz	9 kHz to 3.2 GHz
Resolution bandwidth	1 Hz	
10 MHz internal frequency reference		
Frequency reference	10.000000 MHz	
Precision	± [(time since last adjustment x aging rate) + temperature stability +calibration Precision]	
Achievable initial calibration Precision	< 1 ppm	
Temperature stability	< 1 ppm	5 to +45 ℃, take 25 ℃ as reference
Aging rate	≤ ±1.0 ppm/ year	
Frequency readout Precision (start, stop, center, marker)		
Marker resolution	Span / (Sweep point-1)	
Marker frequency uncertainty	± (Marker frequency x Frequency reference Precision + 1 % x Span + 10 % x RBW+ Marker resolution)	
Marker Mode	Normal, DeltaΔ, Fixed	
Marker function	Marker Noise, Band Power, Band Density, N dB, Counter	
Counter resolution	1 Hz	
Uncertainty of frequency counter	± [Marker frequency x Frequency reference precision + Counter resolution]	
Frequency span (FFT and swept mode)		
Sweep range	0 Hz, 100 Hz to 1.5 GHz	0 Hz, 100 Hz to 3.2 GHz
Sweep Precision	Swept	±[0.25%*Span+Span / (Points-1)]
	FFT	±[0.10%*Span+Span / (Points-1)]
Sweep time and triggering		
Sweep time	1 ms to 4,000 s (span ≠ 0)	
	1 µs to 4,000 s (span = 0)	
Sweep Type Rule	Precision, Normal	
Sweep Mode	Swept (1 kHz to 1 MHz), FFT (1 Hz to 30 kHz)	
Sweep Rules	Single, Continuous	
Trigger Type	Free Run, External, Video	
External trigger input	TTL, Rising/Falling	
Resolution bandwidth (RBW)		
Range (-3dB bandwidth)	1 Hz to 1 MHz, 1-3-10 steps	
Selectivity (-60 dB/-3 dB)	< 4.8: 1 (Nominal)	-60 dB: -3 dB
Bandwidth Precision (-3dB)	< 5 % (Nominal)	

Video bandwidth (VBW)	
Range	1 Hz to 1 MHz,1-3-10 steps
Uncertainty of video bandwidth	< 5%

Amplitude Precision and Range Specifications

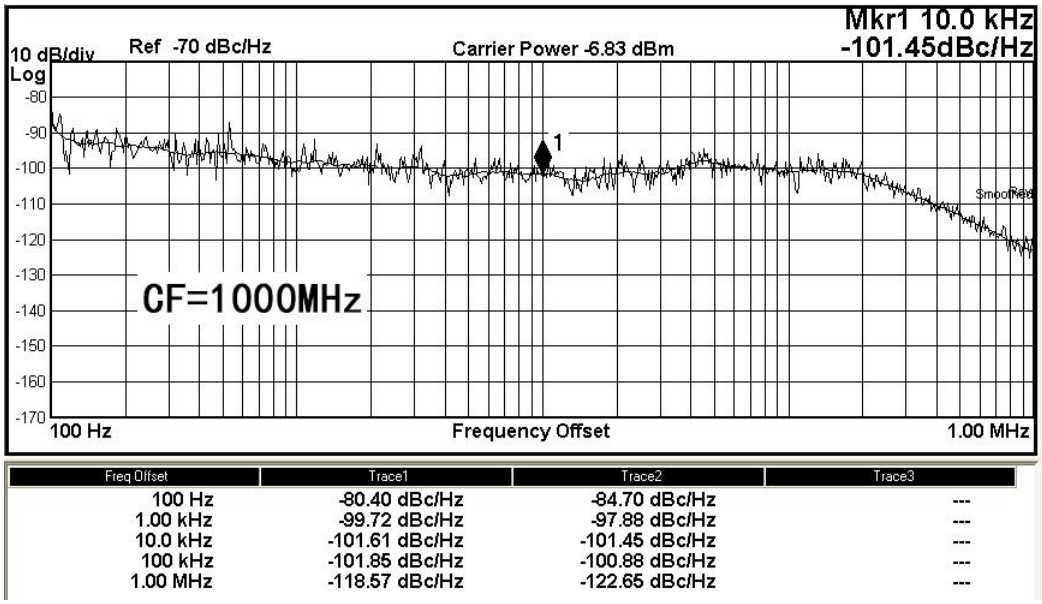
Amplitude range		
range	10 MHz to maximum frequency: (DANL) to +30 dBm	
Reference level	-100 dBm to+30 dBm, steps 1 dB	
Preamp	20 dB, Nominal, 9 kHz to 1.5 GHz (3.2 GHz)	
Input attenuator range	0 to 51 dB, 1 dB Step	
Maximum safe input level		
DC volts	50 V DC	max
Maximum continuous wave RF power	≤ +33 dBm	3 minutes, Input attenuation > 20 dB
Display range		
Log scale	1 dB to 200 dB	
Linear scale	0 to Reference level	
Scale units	dBm, dBmV, dBμV, V, W	
Sweep (trace) point range	10,001	
Number of traces	4	
Detector	Sample, Peak, Negative, Normal, Average	
Trace Type	Clear/Write, Average, Max Hold, Min Hold	
Frequency response		
20℃ to 30℃, 30% to 70% relative humidity, Input attenuation 20 dB, be relative to 50 MHz.		
Preamp Off	9 kHz to 3.2 GHz	±0.6 dB; ± 0.3 dB, Typical
Preamp On	100 kHz to 3.2 GHz	±1.0 dB; ± 0.8 dB, Typical
Error and precision		
Resolution bandwidth switching uncertainty	Relative to 10 kHz RBW logarithmic resolution ± 0.2 dB, linear resolution ± 0.01, Nominal	
Input attenuation switching uncertainty	20 to 30 ℃, fc=50 MHz, Preamp Off, Relative to 20 dB attenuation, Input attenuation 1 to 51 dB	
	± 0.5 dB	
Absolute amplitude Precision	20 to 30 ℃, fc=50 MHz, RBW=1 kHz, VBW=1 kHz, Peak detectors, Input attenuation20 dB	
	± 0.4 dB, Input signal level -20 dBm, Preamp Off	
	± 0.5 dB, Input signal level -40 dBm, Preamp On	
Total absolute amplitude Precision	20 to 30 ℃, fc > 100 kHz, Input signal level -50 dBm to 0 dBm, RBW = 1 kHz, VBW = 1 kHz, Peak detectors, Input attenuation 20 dB, Preamp Off, 95% confidence	

	±(0.4 dB+ Frequency response)	
Input voltage standing wave ratio (VSWR)	1 MHz to 1.5 GHz ≤ 1.8 (Nominal)	1 MHz to 3.2 GHz ≤ .8 (Nominal)

Dynamic Range Specifications

1 dB gain compression			
	20 to 30 ℃, fc ≥ 50 MHz, Input attenuation 0 dB, Preamp off		
	> -5 dBm, Nominal		
Displayed average noise level (DANL)			
20 to 30 ℃, 0dB RF attenuation, RBW=1 Hz, VBW=1 Hz, sample detector, average > 50			
		UTS1015B/T	UTS1032B/T
Preamp off	9 kHz to 500 kHz	-130 dBm (Nominal)	-105 dBm (Nominal)
	500 kHz to 1 MHz	-143 dBm, -145 dBm (Typical)	-115 dBm, -120 dBm (Typical)
	1 MHz to 10 MHz	-142 dBm, -144 dBm (Typical)	-127 dBm, -130 dBm (Typical)
	10 MHz to 200 MHz	-142 dBm, -143 dBm (Typical)	-142 dBm, -145 dBm (Typical)
	200 MHz to 1.5 GHz	-140 dBm, -142 dBm (Typical)	-143 dBm, -146 dBm (Typical)
	1.5 GHz to 3.2 GHz	---	-140dBm, -143dBm (Typical)
Preamp on	9 kHz to 500 kHz	-145 dBm (Nominal)	-125 dBm (Nominal)
	500 kHz to 1 MHz	-155 dBm, -157 dBm (Typical)	-130 dBm, -135 dBm (Typical)
	1 MHz to 10 MHz	-155 dBm, -158 dBm (Typical)	-145 dBm, -147 dBm (Typical)
	10 MHz to 200 MHz	-158 dBm, -160 dBm (Typical)	-158 dBm, -160 dBm (Typical)
	200 MHz to 1.5 GHz	-159 dBm, -161 dBm (Typical)	-161 dBm, -164 dBm (Typical)
	1.5 GHz to 3.2 GHz	---	-159 dBm, -161 dBm (Typical)
Spurious responses			
Second harmonic distortion (SHI)	20 to 30 ℃, Preamp off, Signal input-30 dBm, 0dB RF attenuation		
	fc ≥ 50 MHz	-65 dBc/+35 dBm	
Third-order intermodulation distortion (TOI)	20 to 30 ℃, Preamp off, Signal input-20 dBm, 0 dB RF attenuation, fc ≥ 50 MHz		
	+10 dBm; +13 dBm Nominal		
Input related spurious	20 to 30 ℃, Mixer level: -30 dBm		
	< -60 dBc		
Residual responses	20 to 30 ℃, Input port 50 Ω, RF attenuation 0 dB		
	< -90 dBm		
Phase noise			
20 to 30 ℃, fc = 1 GHz, RBW=1 kHz, VBW=10 Hz, Sampling detection, Log avg, avg> 50			
Offset		UTS1015B/T	UTS1032B/T

10 kHz	-95 dBc/Hz, -98 dBc/Hz (Typical)	-95 dBc/Hz, -98 dBc/Hz (Typical)
100 kHz	-96 dBc/Hz, -98 dBc/Hz (Typical)	-93 dBc/Hz, -98 dBc/Hz (Typical)
1 MHz	-115 dBc/Hz, -120 dBc/Hz (Typical)	-115 dBc/Hz, -120 dBc/Hz (Typical)



Tracking Generator Specifications (UTS1000T Only)

Frequency		
Frequency range	100 kHz to 1.5 GHz	10 MHz to 3.2 GHz
Counter resolution	10 Hz	
Output power level		
Range	-40 dBm to 0 dBm	
Resolution	0.5 dB	
Flatness output	be relative to 50 MHz	
	± 3 dB	
Maximum safe reverse input level		
Average total power	30 dBm	
AC coupling	±50 VDC	

Analog Demodulation Analysis (Option)

Demodulation		
Frequency range	2 MHz to 1.5 GHz	2 MHz to 3.2 GHz
Carrier power Precision	± 2 dB	

Input power	-30 dB to +20 dBm	Automatic attenuation
Carrier power display resolution	0.01 dBm	
AM measurement		
Modulation rate	20 Hz to 100 kHz	
Precision	1 Hz (Nominal)	Modulation rate <1 kHz
	< 0.1% Modulation rate (Nominal)	Modulation rate ≥1 kHz
Depth	5 to 95%	
Precision	± 4% (Nominal)	
FM measurement		
Modulation rate	20 Hz to 100 kHz	
Precision	1 Hz (Nominal)	Modulation rate < 1 kHz
	< 0.1% Modulation rate (Nominal)	Modulation rate ≥ 1 kHz
Frequency offset	1 kHz to 400 kHz	
Precision	± 4% (Nominal)	

EMI (Option)

EMI Resolution bandwidth	
Resolution bandwidth (-6dB)	200 Hz, 9 kHz, 120 kHz, 1 MHz
Resolution bandwidth Precision	< 5%, (Nominal)
EMI detector	
EMI detector	Peak, Negative Peak, Quasi Peak, EMI Average, Average
EMI Main function	
Main function	EMI Standard: CISPR
	View: Scan table, Meter, Signal table
	Meter control
	Avg settings
	Limit: AS-NZS, BellCore, DEF-STAN, DO-160, EN, FCC, GB9254, MIL-461, VCCI and Custom
	Signal table settings
	Scan table settings
	Scan Sequence: Scan, Search, Scan-Search-Meas, Scan-Search, Search-Meas, Measure
	Sig Detector
	Output report

Advanced measurement kit (Option)

Power Measurement	
Channel power	Channel power, Power spectral density
ACP (Adjacent Channel Power)	Main CH Power, Left channel power, Right channel power
Occupied bandwidth	Occupied Bandwidth, Transmit Frequency Error
Time domain power	Zero Span Integrated Power
CNR (Carrier Noise Ratio)	C/N, Noise Power
Non-Linear Measurement	
TOI, Third-order intercept	Measure the third-order products from two tones
Harmonic measurement	Max Harmonic number 10
Spectrum Monitor Measurement	
Spectrogram	

Interface and display

Common interface	
RF input	Type-N female, 50 Ω, nominal
Front panel trace source output	Type-N female, 50 Ω, nominal
10 MHz Ext Ref In	10 MHz, > 0 dBm, BNC female, 50 Ω, nominal
10 MHz out	10 MHz, -5 dBm to +10 dBm, BNC female, 50 Ω, nominal
External trigger input	TTL, BNC female
HDMI display	HDMI 1.4 display interface
USB-Host	USB-A
USB-Device	USB-B
LAN	LAN (VXI11), 10/100/1,000 Base, RJ-45
Headphone Jack	3.5 mm (1/8 inch) miniature stereo audio jack
Display screen	
Display type	10.1-inch capacitive multi-touch panel
Display resolution	1280×800, RGB Vertical pixel

General Technical Specifications

Specifications		
Supply voltage	100 to 240 VAC (Fluctuations ± 10%)	100 to 120 VAC (Fluctuations ± 10%)
Frequency	50/60 Hz	400 Hz
Environment		

Temperature range	operation: 0℃ to +40℃	
	Non-operating: -20℃ to +70℃	
Cooling method	Fan forced cooling	
Humidity range	Operation: Below + 35 ℃ ≤ 90% relative humidity; Non-operating: + 35 ℃ to +40 ℃ ≤ 60% relative humidity	
Altitude	Operation: Below 3,000 m; Non-operating: Below 15,000 m	
Pollution degree	2	
Operating environment	Indoor use	
Mechanical specifications		
Dimensions	378mm×218mm×120mm (Width x Height x Length)	
Net weight	4.55 kg	
Calibration period	The recommended calibration period is one year	
Regulatory standards		
EMC	Compliance with EMC directives (2014/30/EU), conform to or better than IEC 61326-1:2021/EN61326-1:2021, IEC 61326-2-1:2021/EN61326-2-1:2021	
Conductive disturbance	CISPR 11/EN 55011	CLASS B group 1, 150 kHz-30 MHz
Radiation disturbance	CISPR 11/EN 55011	CLASS B group 1, 30 MHz-1 GHz
Electrostatic discharge (ESD)	IEC 61000-4-2/EN 61000-4-2	4.0 kV (Contact), 8.0 kV (air)
Radio frequency electromagnetic field immunity	IEC 61000-4-3/EN 61000-4-3	0 V/m (80 MHz to 1 GHz); 3 V/m (1.4 GHz to 2 GHz); 1 V/m (2.0 GHz to 2.7GHz)
Electrical fast transient burst (EFT)	IEC 61000-4-4/EN 61000-4-4	2 kV (AC input port)
Surge	IEC 61000-4-5/EN 61000-4-5	1 kV (Live line to zero line) 2 kV (Fire/zero line to ground)
Immunity to RF continuous conduction	IEC 61000-4-6/EN 61000-4-6	3V, 0.15-80 MHz
Voltage dips and short interruptions	IEC 61000-4-11/EN 61000-4-11	Voltage dip: 0% UT during 1 cycle; 40% UT during 10/12 cycles; 70% UT during 25/30 cycles Short Interruption: 0% UT during 250/300 cycles
Safety regulations		
	EN 61010-1:2010+A1:2019 EN IEC61010-2-030:2021+A11:2021 BS EN61010-1:2010+A1:2019 BS EN IEC61010-2-030:2021+A11:2021 UL 61010-1:2012 Ed.3+ R:19 Jul2019 UL 61010-2-030:2018 Ed.2 CSA C22.2#61010-1:2012 Ed.3+U1;U2;A1 CSA C22.2#61010-2-030:2018 Ed.2	

Order Information

	Description	Order No.
Model	Spectrum analyzer, 9 kHz to 1.5 GHz	UTS1015B
	Spectrum analyzer, 9 kHz to 3.2 GHz	UTS1032B
	Spectrum analyzer, 9 kHz to 1.5 GHz, TG	UTS1015T
	Spectrum analyzer, 9 kHz to 3.2 GHz, TG	UTS1032T
Standard accessories	Power cord ×1	
	USB cable x1	UT-D14
Recommended options & accessories		
Options	Advanced measurement kit	UTS1000-AMK
	EMI measurement option	UTS1000-EMI
	Analog demodulation analysis option	UTS1000-AMA
UT-CK01 accessories kit	SMAJ-NJ-0.7M DC-6G cable x1	UT-W02-6GHz
	NJ-NJ-0.7M DC-6G cable x1	UT-W01-6GHz
	Adapter SMA-N-KJ-T DC-6GHz x2	UT-C01-6GHz
	Adapter N-BNC-JK DC-4GHz x2	UT-C02-6GHz
	Antenna 2400 MHz-2500 MHz x2	UTS-T01
	Antenna 824-960 MHz/1710-1990 MHz x2	UTS-T02
UTS-EMI01 Near-field probes kit	50Ω-SMA-SMB cable x1	UT-W03
	Adapter SMA-N-KJ-T DC-6 GHz x1	UT-C01
	Near field probe, frequency range 30 MHz-3 GHz, Detection range 10 cm x1	NFP-3G-P1
	Near field probe, frequency range 30 MHz-3 GHz, Detection range 3 cm x1	NFP-3G-P2
	Near field probe, frequency range 30 MHz-2 GHz, resolving power 5 mm x1	NFP-2G-P3
	Near field probe, frequency range 30 MHz-3 GHz, resolving power 2 mm x1	NFP-3G-P4

Options ordering and installation

1. **Purchase options:** Based on your requirements, please purchase the specified function options from Uni-t Sales Personnel and provide the serial number of the instrument that needs the option installed.
2. **Receive certificate:** You will receive the license certificate based on the address provided in the order.
3. **Register and obtain license:** Visit the Uni-t official website license activation session for registration. Use the license key and instrument serial number provided in the certificate to obtain the option license code and license file.
4. **Install the option:** Download the option license file to the root directory of a USB storage device, and connect the USB storage device to the instrument. Once the USB storage device is recognized, the Option Install menu will be activated. Press this menu key to begin installing the option.

Limited Warranty and Liability

Uni-T guarantees that the Instrument product is free from any defect in material and workmanship within three years from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination or improper handling. If you need warranty service within the warranty period, please contact your seller directly. Uni-T will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device. For the probes and accessories, the warranty period is one year. Visit instrument.uni-trend.com for full warranty information.

Learn more at: www.uni-trend.com

Register your product to confirm your ownership. You will also get product notifications, update alerts, exclusive offers and all the latest information you need to know.

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