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Data Sheet

UTS3000T+ Series Spectrum Analyzer

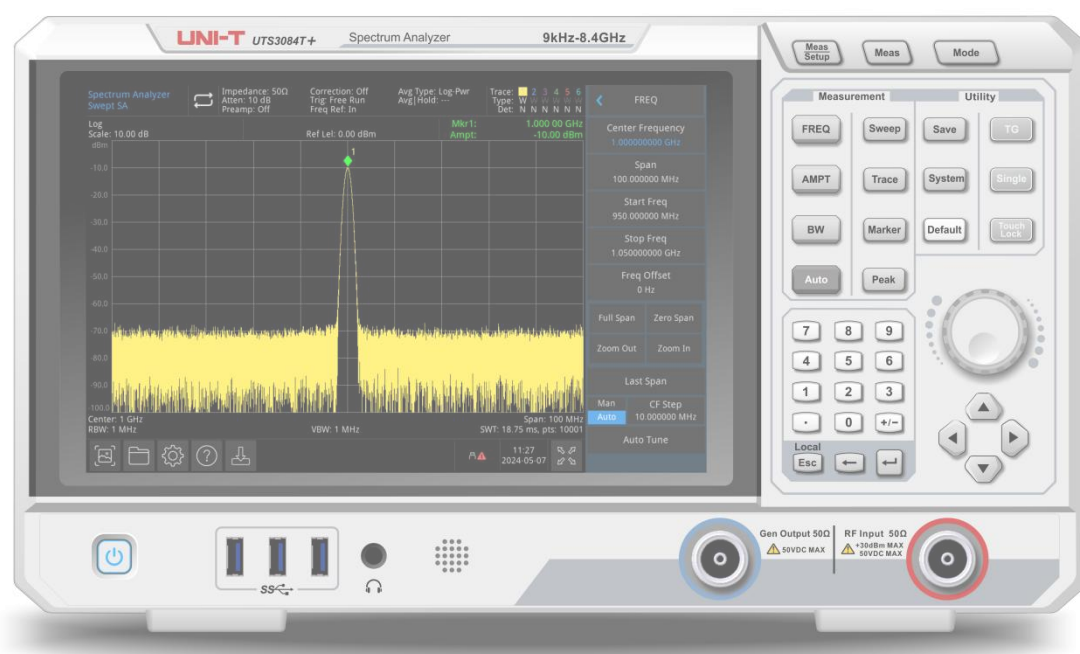
This document applies to the following models:
UTS3036T+, UTS3084T+

V1.0

August 2024

Product Features

- Frequency measurement range: 9 kHz to 3.6 GHz, 9 kHz to 8.4 GHz
- Display average noise level can be as low as -161 dBm (typical value)
- Phase noise < -98 dBc/Hz (Offset 10 kHz, typical value)
- Full amplitude accuracy < 0.7 dB
- Up to 40,001 scanning points
- Minimum resolution bandwidth (RBW) 1 Hz
- Advanced function one key measurement (optional)
- EMI Pre-compliance analysis function (optional)
- Support analog demodulation analysis (optional)
- Support tracking source output function
- 10.1-inch 1280 × 800 HD capacitive touch screen
- Provide USB/LAN interface, support SCPI protocol

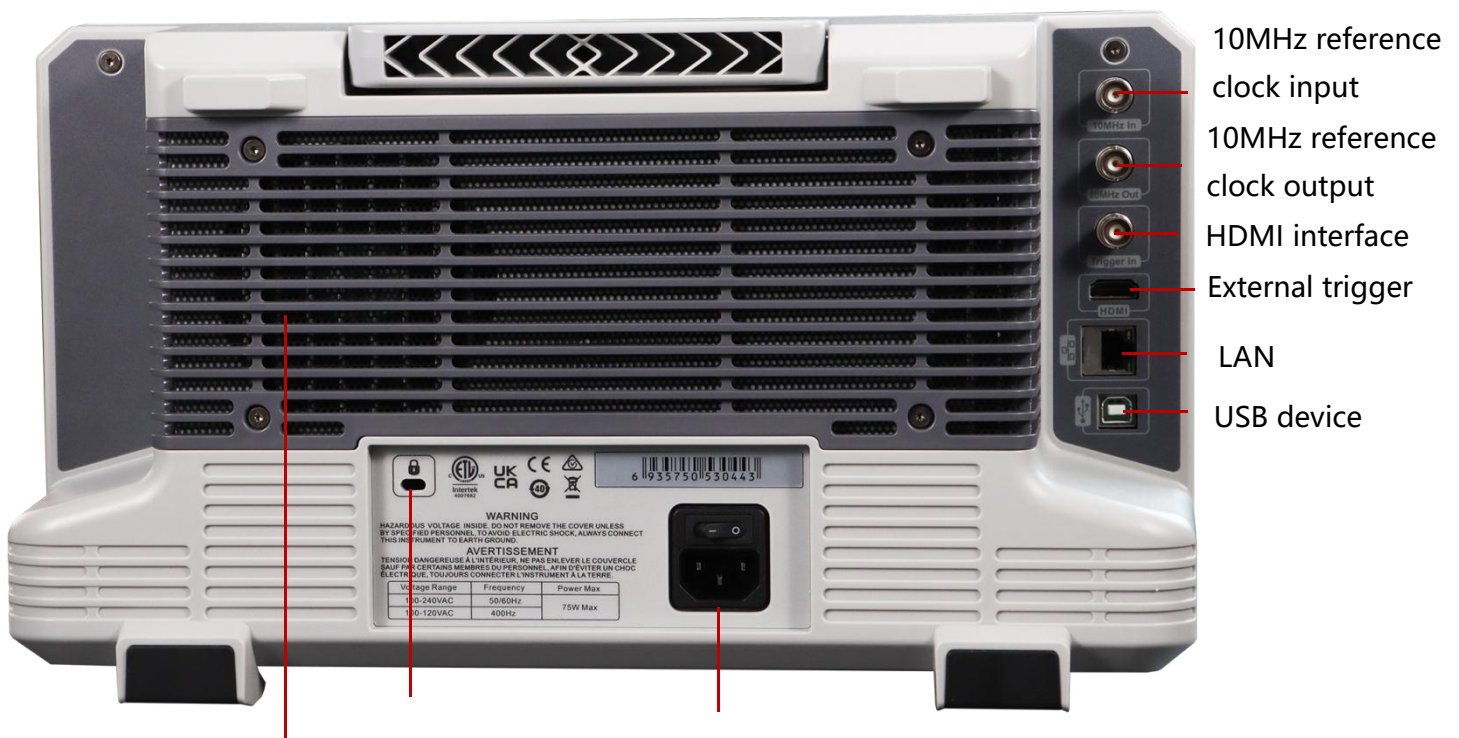
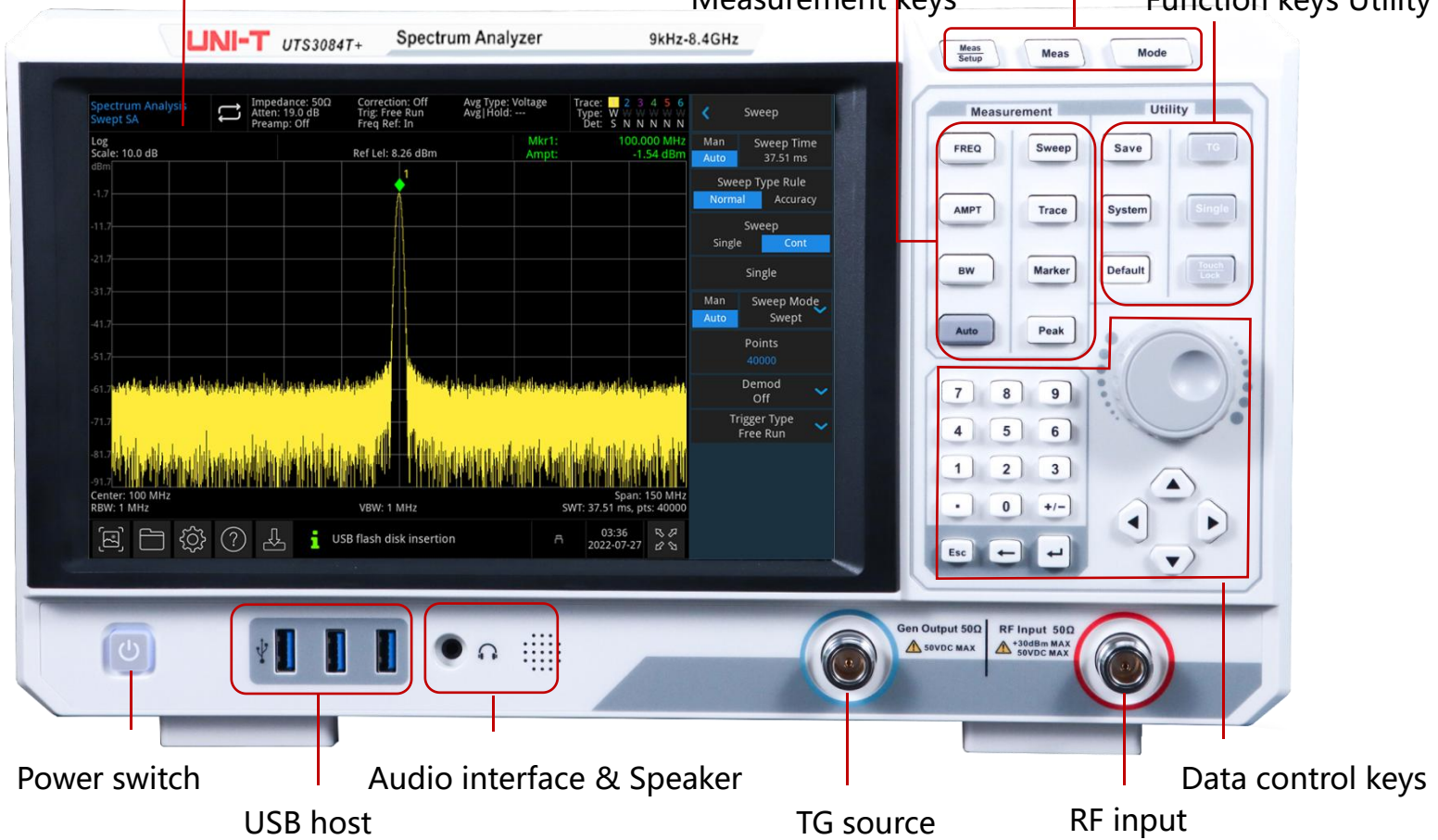


10.1 inch touch screen

Measurement keys

Advanced function keys

Function keys Utility



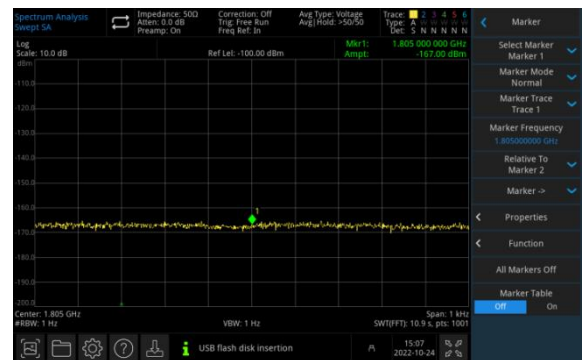


Multi touch HD screen for quick operation

10.1-inch multi-touch HD capacitive screen. 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. UTS3000T+ series DANL as low as -161dBm, excellent sensitivity can effectively test weak signals.

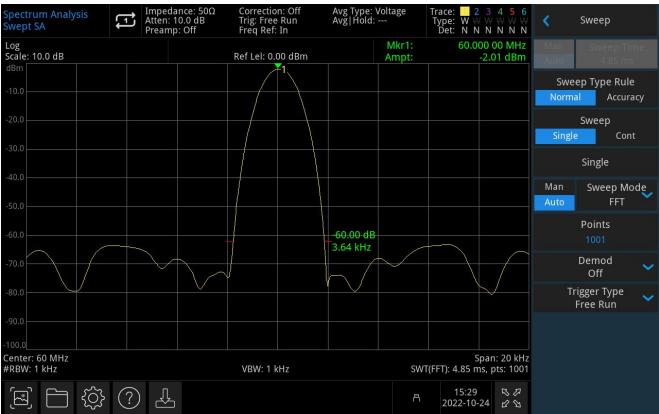
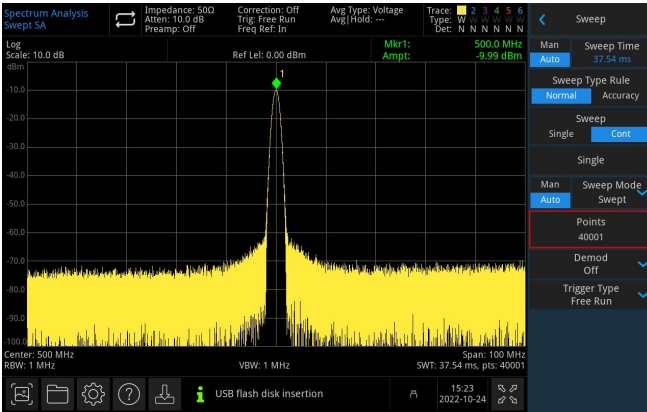
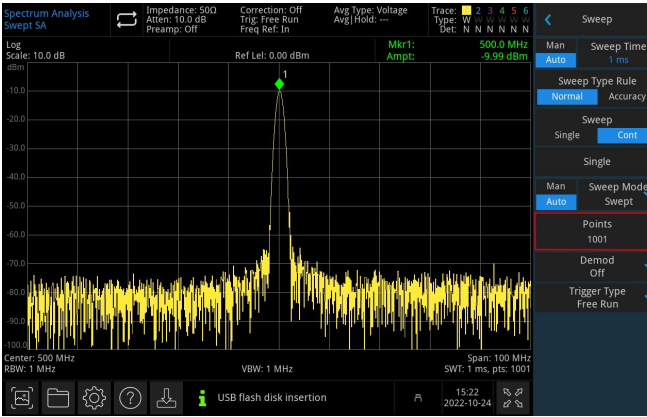


Removable dust mesh

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 40,001 points

The UTS3000T+ series provides up to 40,001 sweep points, providing higher frequency resolution, making it easier to capture signals that are difficult to detect.

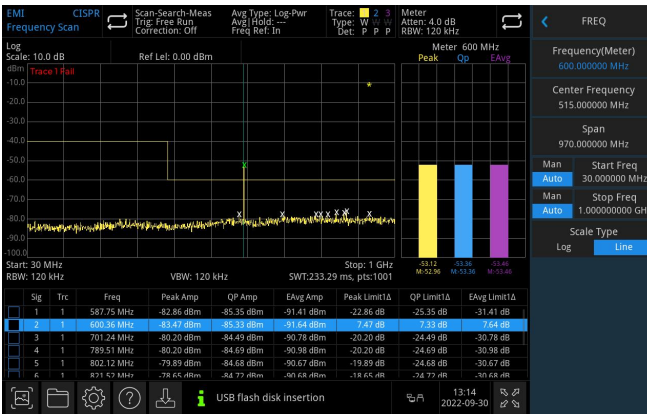


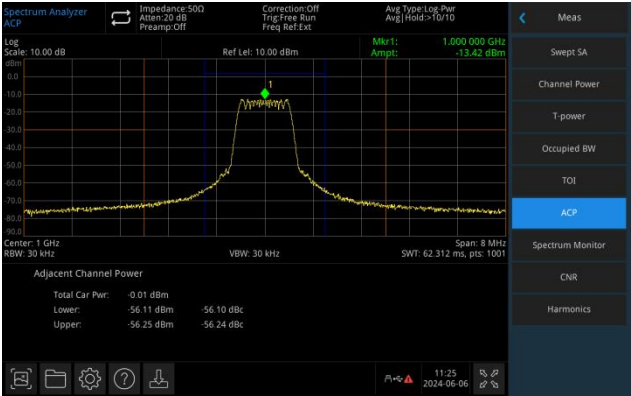
Excellent selectivity

It has stronger signal resolution capability of adjacent unequal amplitudes.

EMI pre-compliance (Optional)

UTS3000T+ series Optional components, together with near-field probes, help you find and improve EMI defects in advance. Thereby shortening the development cycle.



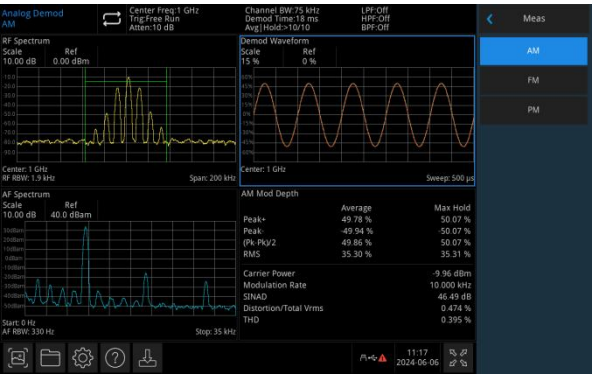


Advanced measurement (Optional):
Calculating ACPR(Adjacent Channel
Power Ratio)

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, Harmonics.

Analog demodulation analysis
(Optional)

Provides demodulation analysis of AM, FM, PM analog signals



Definitions and Conditions

"Specifications" describe 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 additional product performance information that is not covered by the product warranty. When performance exceeds specifications, 80% of units can be demonstrated with a 95% confidence level over a temperature range of 20 °C to 30 °C. 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:

The instrument should in a calibration cycle and has warmed up for at least 30 minutes. If the analyzer is stored within the allowable storage temperature range but exceed the allowable operating temperature range, it must be placed within the allowable operating temperature range for at least two hours before starting the analyzer.

Product function and model comparison table

	UTS3036T+	UTS3084T+
Spectrum analysis	●	●
EMI	○	○
Analog demodulation	○	○
Advanced measurement	○	○
Tracking generator	●	●

Note: ● Standard ○ Option × Not Available

Frequency and Time Specifications

Frequency			
model	UTS3036T+	UTS3084T+	
frequency range	9 kHz to 3.6 GHz	9 kHz to 8.4 GHz	
resolution bandwidth	1 Hz		
10 MHz internal frequency reference			
Frequency reference	10.000000 MHz		
Accuracy	±[(time since last adjustment x aging rate) + temperature stability +calibration accuracy]		
Achievable initial calibration accuracy	<1 ppm		
Temperature stability	<1 ppm	5 to +45 °C,Take 25 °C as reference	
Aging rate	0.5 ppm/ year, 3 ppm/20 years		
Frequency readout accuracy (start, stop, center, marker)			
Marker resolution	Span / (Sweep point - 1)		
Marker frequency uncertainty	± (marker frequency x frequency reference accuracy + 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 accuracy+Counter resolution]		
Frequency span (FFT and swept mode)			
Sweep range	0Hz, 100 Hz to 2.1 GHz	0Hz, 100 Hz to 3.6 GHz	0Hz, 100 Hz to 8.4 GHz
Sweep accuracy	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	Accuracy, Normal		
Sweep Mode	Swept, FFT		
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 3 MHz, 1-3-10 steps		
Selectivity (−60 dB/−3 dB)	<4.8: 1 (nominal)	−60 dB: −3 dB	

Bandwidth accuracy (–3 dB) < 5% (nominal)

Video bandwidth (VBW)

Range 1 Hz to 3 MHz, 1-3-10 steps

Uncertainty of video bandwidth < 5%

Amplitude Accuracy and Range

Amplitude range

Range 10 MHz to maximum frequency

Reference level –100 dBm to +30 dBm, steps 1 dB

Preamp 20 dB, Nominal, 9 kHz to 3.6 GHz and 8.4 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 $\leq +33$ 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, dB μ V, V, W

Sweep (trace) point range 40,001

Number of traces 6

Detector Sample, Peak, Negative, Normal, Average

Trace Type Clear/Write, Average, Max Hold, Min Hold

Frequency response

20°C to 30°C, 30% to 70% relative humidity, Input attenuation 20 dB, be relative to 50 MHz.

Preamp Off 9 kHz to 3.6 GHz ± 0.6 dB; ± 0.3 dB, Typical

3.6 GHz to 8.4 GHz ± 0.8 dB; ± 0.6 dB, Typical

Preamp On 100 kHz to 3.6 GHz ± 1.0 dB; ± 0.8 dB, Typical

3.6 GHz to 8.4 GHz ± 1.2 dB; ± 1.0 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 °C, $f_c=50$ MHz, Preamp Off, Relative to 20 dB attenuation, Input attenuation 1 to 51 dB ± 0.5 dB

Absolute amplitude accuracy	20 to 30 °C, $f_c=50$ MHz, RBW=1 kHz, VBW=1 kHz, Peak detectors, Input attenuation 20 dB
	± 0.4 dB, Input signal level -20 dBm, Preamp Off
Total absolute amplitude accuracy	± 0.5 dB, Input signal level -40 dBm, Preamp On
	20 to 30 °C, $f_c > 100$ 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
	$\pm (0.4 \text{ dB} + \text{Frequency response})$
Input voltage standing wave ratio (VSWR)	<1.8 (Nominal)

Dynamic Range Specifications

1 dB gain compression

20 to 30 °C, $f_c \geq 50$ MHz, Input attenuation 0 dB, Preamp off

>-5 dBm, Nominal

Displayed average noise level (DANL)

20 to 30 °C, 0dB RF attenuation, RBW=1Hz, VBW=1Hz, sample detector, average > 50

		UTS3036T+	UTS3084T+
Preamp off	100 kHz to 500 kHz	-108dBm (Nominal)	-108 dBm (Nominal)
	500 kHz to 1 MHz	-120 dBm, -124 dBm (Typical)	-114 dBm, -118 dBm (Typical)
	1 MHz to 10 MHz	-127 dBm, -130 dBm (Typical)	-124 dBm, -128 dBm (Typical)
	10 MHz to 200 MHz	-142 dBm, -145 dBm (Typical)	-144 dBm, -148 dBm (Typical)
	200 MHz to 1.5 GHz	-143 dBm, -146 dBm (Typical)	-143 dBm, -147 dBm (Typical)
	1.5 GHz to 3.2 GHz	-140 dBm, -143 dBm (Typical)	-142 dBm, -144 dBm (Typical)
	3.2 GHz to 4.5 GHz	-135 dBm, -140 dBm (Typical)	-139 dBm, -142 dBm (Typical)
	4.5 GHz to 6.2 GHz	---	-134 dBm, -138 dBm (Typical)
	6.2 GHz to 7.5 GHz	---	-138 dBm, -143 dBm (Typical)
	7.5 GHz to 8.4 GHz	---	-139 dBm, -141 dBm (Typical)
Preamp on	100 kHz to 500 kHz	-130 dBm (Nominal)	-130 dBm (Nominal)
	500 kHz to 1 MHz	-140 dBm, -146 dBm (Typical)	-135 dBm, -140 dBm (Typical)
	1 MHz to 10 MHz	-145 dBm, -153 dBm (Typical)	-146 dBm, -152 dBm (Typical)
	10 MHz to 200 MHz	-162 dBm, -164 dBm (Typical)	-162 dBm, -165 dBm (Typical))
	200 MHz to 1.5 GHz	-161 dBm, -164 dBm (Typical)	-162 dBm, -164 dBm (Typical)
	1.5 GHz to 3.2 GHz	-159 dBm, -161 dBm (Typical)	-160 dBm, -162 dBm (Typical)
	3.2 GHz to 4.5 GHz	-155 dBm, -158 dBm (Typical)	-157 dBm, -160 dBm (Typical))
	4.5 GHz to 6.2 GHz	---	-153 dBm, -156 dBm (Typical)

6.2 GHz to 7.5 GHz	---	-155 dBm, -157 dBm (Typical)
7.5 GHz to 8.4 GHz	---	-154 dBm, -156 dBm (Typical)

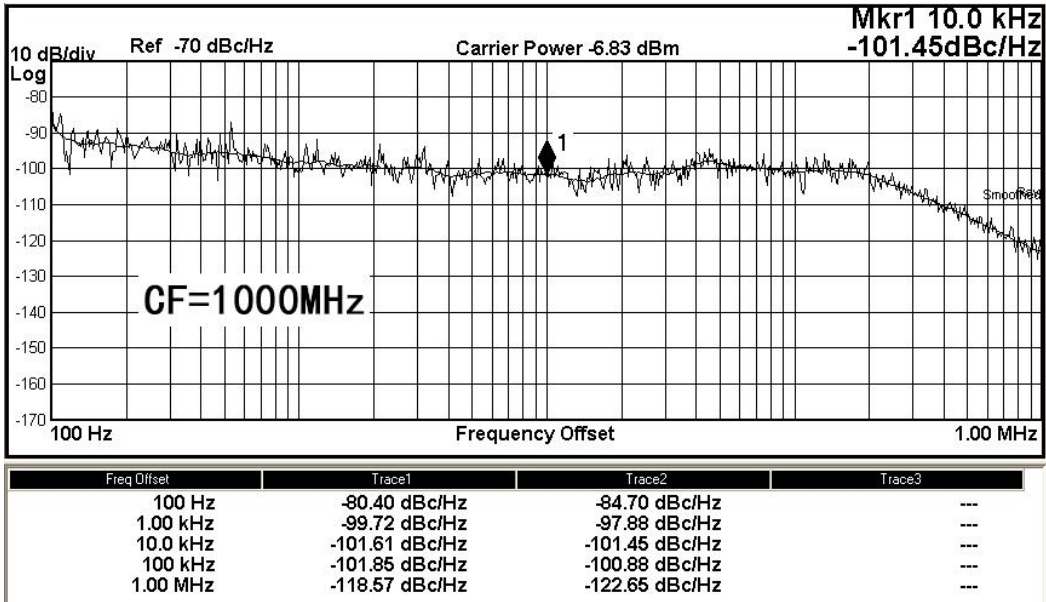
Spurious responses

Second harmonic distortion (SHI)	20 to 30 °C, Preamp off, Signal input -30 dBm, 0dB RF attenuation	
	fc≥50 MHz	-65 dBc/+35 dBm
Third-order intermodulation distortion (TOI)	20 to 30 °C, Preamp off, Signal input -20 dBm, 0 dB RF attenuation, fc ≥ 50 MHz	
	+10 dBm; +13 dBm Nominal	
Input related spurious	20 to 30 °C, Mixer level: -30 dBm	
	< -60 dBc	
Residual responses	20 to 30 °C, Input port 50 Ω, RF attenuation 0 dB	
	< -90 dBm	

Phase noise

20 to 30 °C, fc=1 GHz, RBW=1 kHz, VBW=10 Hz, Sampling detection, Log avg, avg > 50

Offset	UTS3036T+	UTS3084T+
10 kHz	-95 dBc/Hz, -98 dBc/Hz (Typical)	
100 kHz	-93 dBc/Hz, -98 dBc/Hz (Typical)	
1 MHz	-115 dBc/Hz, -116 dBc/Hz (Typical)	-110 dBc/Hz, -112 dBc/Hz (Typical)



Tracking Generator Specifications

Frequency		
Frequency range	100 kHz to 3.6 GHz	100 kHz to 6 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 V DC	

Analog Demodulation Analysis (Option)

Demodulation		
Frequency range	2 MHz to 3.6 GHz	2 MHz to 8.4 GHz
Carrier power accuracy	±2 dB	
Input power	-30 dBm to +20 dBm	Automatic attenuation
Carrier power display resolution	0.01 dBm	
AM measurement		
Modulation rate	20 Hz to 100 kHz	
Accuracy	1 Hz(Nominal)	Modulation rate < 1 kHz
	< 0.1%Modulation rate (Nominal)	Modulation rate ≥ 1 kHz
Depth	5 to 95%	
Accuracy	±4%(Nominal)	
FM measurement		
Modulation rate	20 Hz to 100 kHz	
Accuracy	1 Hz(Nominal)	Modulation rate < 1 kHz
	< 0.1%Modulation rate (Nominal)	Modulation rate ≥ 1 kHz
Frequency offset	1 kHz to 400 kHz	
Accuracy	±4% (Nominal)	
PM measurement		
Modulation rate	20 Hz to 100 kHz	

Accuracy	1 Hz (Nominal)	Modulation rate < 1 kHz
	< 0.1% Modulation rate (Nominal)	Modulation rate ≥ 1 kHz
Phase deviation	0.2 to 6.28 rad	
Accuracy	±4% (Nominal)	

EMI (Option)

EMI Resolution bandwidth

Resolution bandwidth (-6dB)	200 Hz, 9 kHz, 120 kHz, 1 MHz
Resolution bandwidth accuracy	<5%, (Nominal)

EMI detector

EMI detector	Peak, Negative Peak, Quasi Peak, EMI Average, Average
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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

Power Measurement

Channel Power	Channel power, Power spectral density
Adjacent Channel Power (ACP)	Main CH Power, Left channel power, Right channel power
Occupied Bandwidth	Occupied Bandwidth, Transmit Frequency Error
Time Domain Power	Zero Span Integrated Power
Carrier Noise Ratio (CNR)	C/N, Noise Power

Non-Linear Measurement

Third-Order Intercept(TOI)	Measure the third-order products from two tones
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Harmonic Measurement	Max Harmonic number 10
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Spectrum Monitor Measurement

Spectrogram

Interface and display

Common interface

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

Display Type	10.1-inch capacitive multi-touch panel
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Display resolution	1280×800, RGB Vertical pixel
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General technical specifications

Specifications

Supply voltage	100 to 240 VAC (Fluctuations $\pm$ 10%)	100 to 120 VAC (Fluctuations $\pm$ 10%)
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Frequency	50/60 Hz	400 Hz
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Environment

Temperature range	operation: 0 °C to +40 °C
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Non operational: -20 °C to +70 °C

Cooling method	Fan forced cooling
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Humidity range	operation: Below +35 °C $\leq$ 90%relative humidity;
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Non operational: +35 °C to +40 °C $\leq$ 60%relative humidity

Altitude	operation: Below 3,000 m; Non operational: Below 15,000 m
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Mechanical specifications		
Dimensions	378mm×218mm×120mm (Width x Height x Length)	
Net weight	4.55 kg	
Calibration cycle	The recommended calibration cycle 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, 150kHz-30MHz
Radiation disturbance	CISPR 11/EN 55011	CLASS B group 1, 30MHz-1GHz
(ESD)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)
(EFT)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	3 V, 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	

Ordering information

	Description	Ordering No.
	Spectrum analyzer, 9 kHz to 3.6 GHz	UTS3036T+
	Spectrum analyzer, 9 kHz to 8.4 GHz	UTS3084T+
Standard accessories	Power cord x1	
	USB cable x1	UT-D14
Recommended options & accessories		
Options	Advanced measurement kit	UTS3000-AMK
	EMI measurement option	UTS3000-EMI
	Analog demodulation analysis option	UTS3000-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-C02-4GHz
	Antenna 2400MHz-2500MHz x2	UTS-T01
	Antenna 824-960MHz/1710-1990MHz 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 30MHz-3GHz, Detection range 3 cm x1	NFP-3G-P2
	Near field probe, frequency range 30MHz-2GHz, resolving power 5 mm x1	NFP-2G-P3
	Near field probe, frequency range 30MHz-3GHz, 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



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