



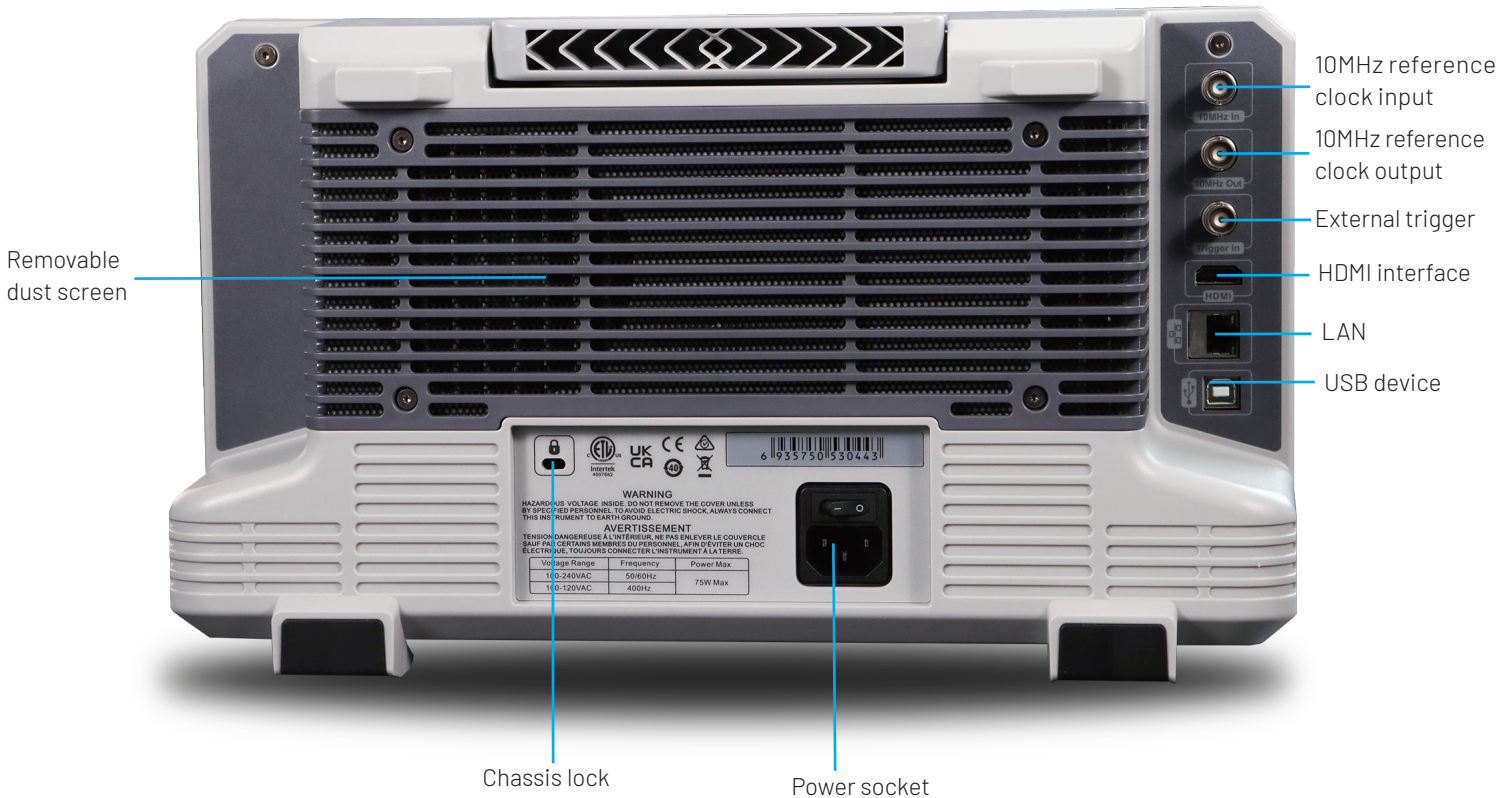
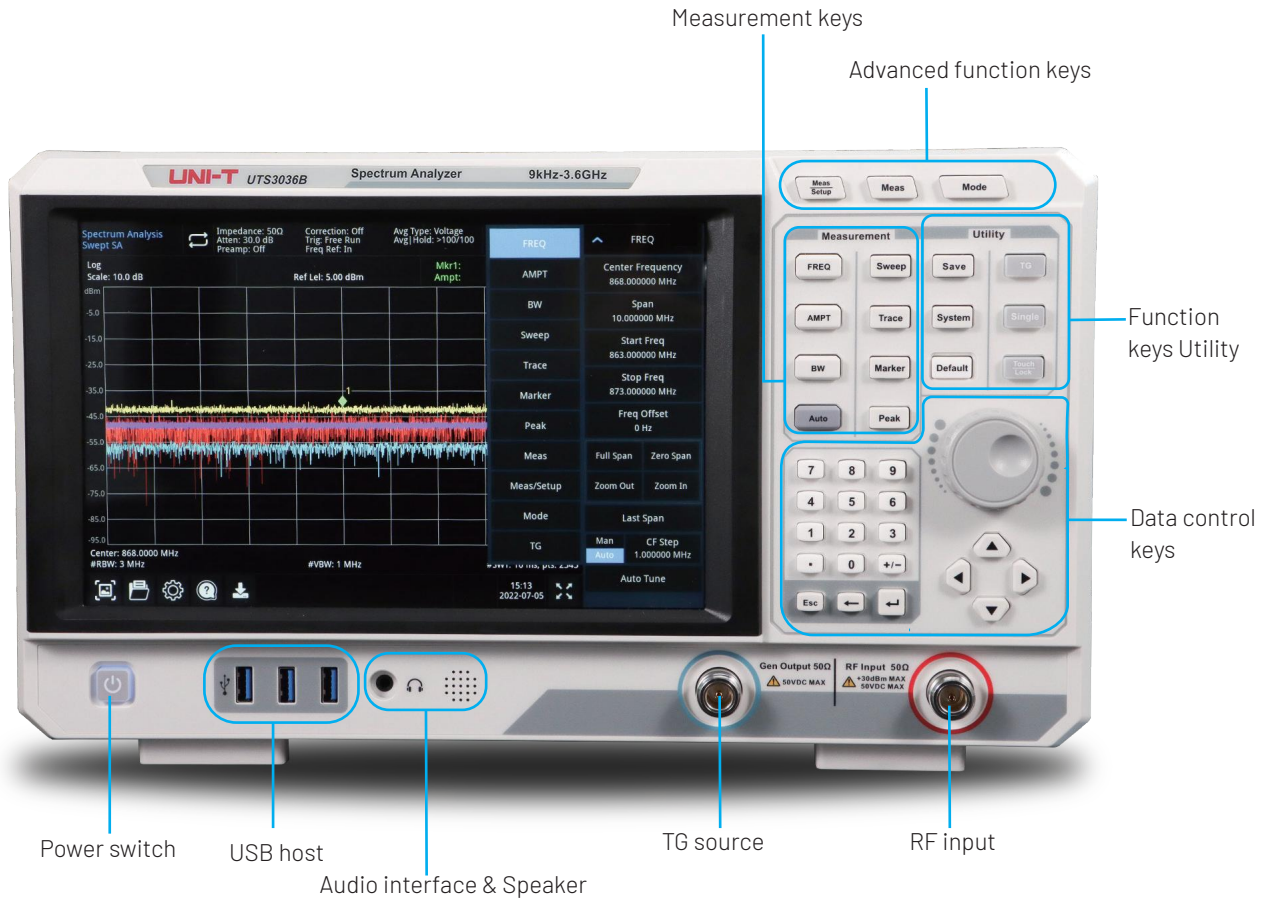
# Data Sheet

## UTS3000B Series Spectrum Analyzer

# Product Features

- Frequency measurement range: 9 kHz~2.1 GHz,9 kHz~3.6 GHz,9 kHz~8.4 GHz
- Display average noise level can be as low as -161 dBm/Hz (typical value)
- Phase noise <-98 dBc/Hz (Offset 10 kHz, typical value)
- Full amplitude accuracy <0.7 dB
- Up to 40001 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 digital demodulation analysis (optional)
- Support tracking source output function (optional)
- 10.1 inch 1280 × 800 HD capacitive touch screen
- Provide USB/LAN interface, support SCPI protocol

# Panel introduction



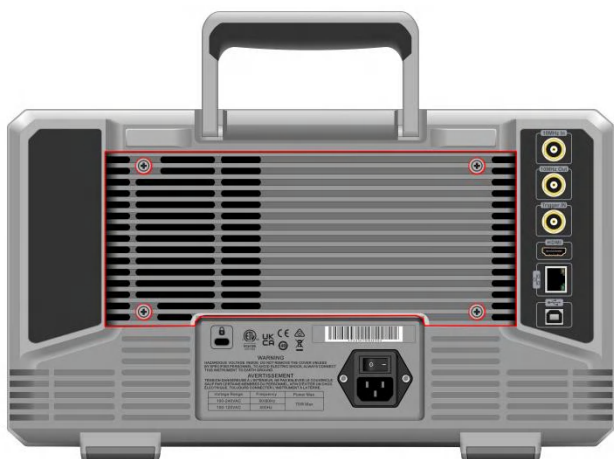
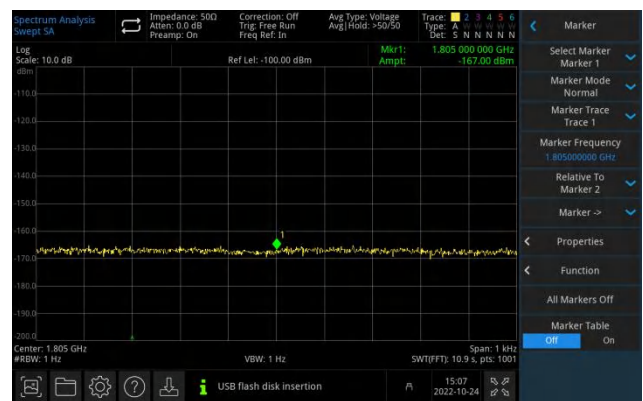


## Multi touch HD screen for quick operation

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. UTS3000B series DANL as low as  $-161\text{dBm}$ , excellent sensitivity can effectively test weak signals.



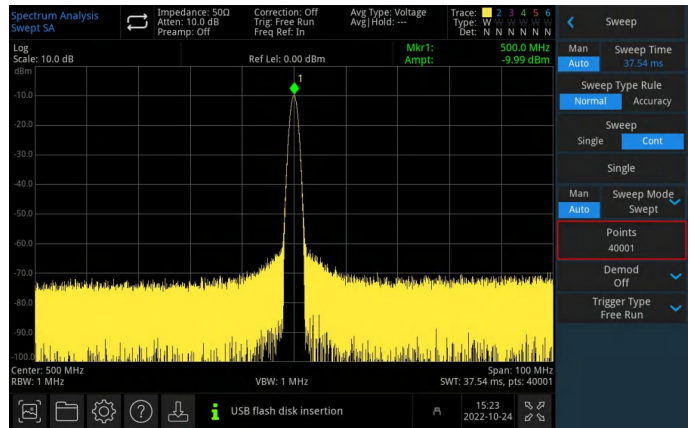
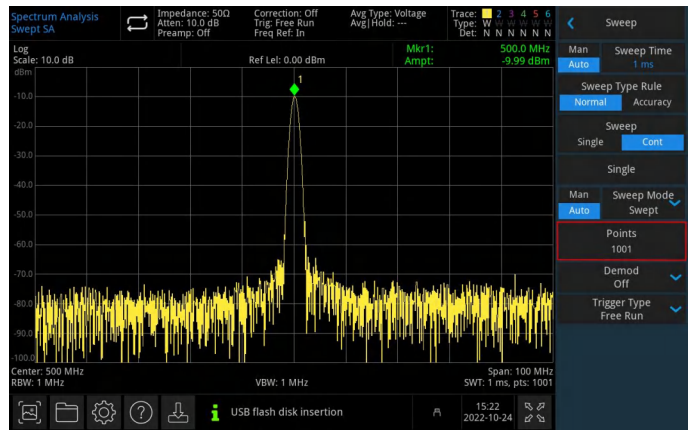
## Removable dust mesh

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 40001 points

The UTS3000B series provides up to 40,001 sweep points, providing higher frequency resolution, making it easier to capture signals that are difficult to detect.

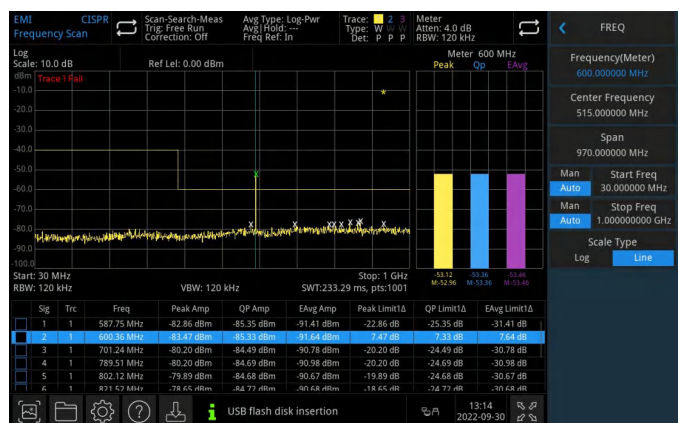


## Excellent selectivity

It has stronger signal resolution capability of adjacent unequal amplitudes.

## EMI pre-compliance

UTS3000B series Optional components, together with near-field probes, help you find and improve EMI defects in advance. Thereby shortening the development cycle.



# 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 18°C to 28°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:

Is 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 outside 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**

	UTS3021B	UTS3036B	UTS3084B	UTS3084T
Spectrum analysis	●	●	●	●
Vector Signal Analysis	○	○	○	○
EMI	○	○	○	○
Analog demodulation	○	○	○	○
Advanced measurement	○	○	○	○
Tracking generator	○	○		●

Note: ● standard ○ option

# Frequency and Time Specifications

## Frequency

model	UTS3021B	UTS3036B	UTS3084B/T
frequency range	9 kHz to 2.1 GHz	9 kHz to 3.6 GHz	9 kHz to 8.4 GHz
resolution bandwidth	1 Hz		

## 10MHz 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 year		

## Frequency readout accuracy (start, stop, center, marker)

Marker resolution	Span/Sweep point-1		
Marker frequency uncertainty	$\pm$ (marker frequency x frequency reference accuracy + 1 % x span + 10 % x RBW+marker resolution)		
Marker Mode	Normal、Delta $\Delta$ 、Fixed		
Marker function	Marker Noise、Band Power、Band Density、N dB、Counter		
Counter resolution	1 Hz		
Uncertainty of frequency counter	$\pm$ [marker frequency x frequency reference accuracy+Counter resolution]		
<b>Frequency span (FFT and swept mode)</b>			
Sweep range	0Hz, 100Hz to 2.1GHz	0Hz, 100Hz to 3.6GHz	0Hz, 100Hz to 8.4GHz
Sweep accuracy	$\pm$ Span/Sweep point-1		
<b>Sweep time and triggering</b>			
Sweep time	1 ms to 4000 s		
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		
<b>Resolution bandwidth (RBW)</b>			
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 (-3dB)	< 5% (nominal)		
<b>Video bandwidth (VBW)</b>			
Range	1 Hz to 3 MHz, 1-3-10 steps		
Uncertainty of video bandwidth	< 5%		

## Amplitude Accuracy and Range Specifications

<b>Amplitude range</b>			
range	10 MHz to maximum frequency		
Reference level	-100 dBm to +30 dBm, steps 1 dB		
Preamp	20 dB, Nominal, 9 kHz to 2.1 GHz (3.6 GHz、8.4 GHz)		
Input attenuator range	0~51 dB, 1 dB Steps		
<b>Maximum safe input level</b>			
DC volts	50 V DC	max	
Maximum continuous wave RF power	$\leq$ +33 dBm	3 minute, Input attenuation >20 dB	
<b>Display range</b>			
Log scale	10 dB to 100 dB		
Linear scale	0 to Reference level		

Scale units	dBm, dBmV, dBμV, V, W		
Sweep(trace) point range	40001		
Number of traces	6		
Detector	Sample、Peak、Negative、Normal、Average		
Trace Type	Clear/Write、Average、Max Hold、Min Hold		

### Frequency response

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

Preamp Off	10 MHz to 3.6 GHz	±0.4 dB; ±0.3 dB, Typical	
	3.6 GHz to 8.4 GHz	±1.3 dB; ±0.8 dB, Typical	
Preamp On	10 MHz to 3.6 GHz	±1.0 dB; ±0.8 dB, Typical	
	3.6 GHz to 8.4 GHz	±1.5 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 ~30 °C, fc=50 MHz, Preamp Off, Relative to 20 dB attenuation, Input attenuation 1~51 dB  
±0.5 dB

Absolute amplitude accuracy  
20 ~30 °C, fc=50 MHz, RBW=1 kHz, VBW=1 kHz, Peak detectors, Input attenuation 20 dB  
±0.4 dB, Input signal level -20 dBm, Preamp Off  
±0.5 dB, Input signal level -40 dBm, Preamp On

Total absolute amplitude accuracy  
20~30 °C, Fc>100 kHz, Input signal level -50 dBm~0 dBm, RBW=1 kHz, VBW=1 kHz, Peak detectors, Input attenuation 20dB, Preamp Off, 95% confidence  
±(0.4 dB+ Frequency response)

Input voltage standing wave ratio (VSWR)	1MHz to 2.1GHz	1 MHz to 3.6GHz	1 MHz to 8.4GHz
	<1.7, (Nominal)	<1.5, (Nominal)	<1.5, (Nominal)

## Dynamic Range Specifications

### 1 dB gain compression

Fc ≥ 50 MHz, Input attenuation 0 dB, preamp off, 20 °C to 30 °C  
>-5 dBm, Nominal

### Displayed average noise level (DANL)

Input load termination, 0dB RF attenuation, RBW=10Hz, VBW=1Hz, sample detector, average > 50

Preamp off	9 kHz to 500 kHz	-108 dBm (Nominal)
RBW=10 Hz	500 kHz to 1 MHz	-120 dBm, -124 dBm (Typical)
	1 MHz to 10 MHz	-127 dBm, -130 dBm (Typical)
	10 MHz to 200 MHz	-142 dBm, -145 dBm (Typical)



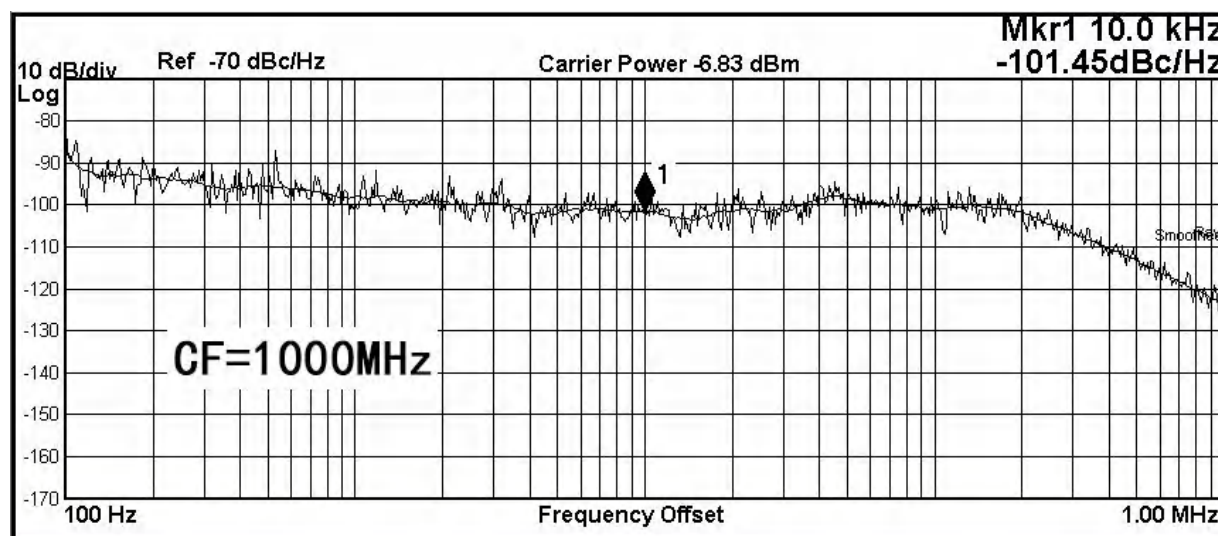
	200 MHz to 1.5 GHz	-143 dBm,-146 dBm (Typical)
	1.5 GHz to 3.2 GHz	-140 dBm,-143 dBm (Typical)
	3.2 GHz to 8.4 GHz	-135 dBm,-140 dBm (Typical)
Preamp on	9 kHz to 500 kHz	-130 dBm (Nominal)
RBW=10 Hz	500 kHz to 1 MHz	-145 dBm,-150 dBm (Typical)
	1 MHz to 10 MHz	-155 dBm,-158 dBm (Typical)
	10 MHz to 200 MHz	-162 dBm,-164 dBm (Typical)
	200 MHz to 1.5 GHz	-161 dBm,-164 dBm (Typical)
	1.5 GHz to 3.2 GHz	-159 dBm,-161 dBm (Typical)
	3.2 GHz to 8.4 GHz	-155 dBm,-158 dBm (Typical)

### Spurious responses

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

### Phase noise

		index	Typical
Offset relative to continuous wave signal Fc=1 GHz, RBW=1 kHz, VBW=10 Hz, Sampling detection, Log avg, avg>50	10 kHz	<-95 dBc/Hz	<-98 dBc/Hz
	100 kHz	<-95 dBc/Hz	<-98 dBc/Hz
	1 MHz	<-115 dBc/Hz	<-116 dBc/Hz



Freq Offset	Trace1	Trace2	Trace3
100 Hz	-80.40 dBc/Hz	-84.70 dBc/Hz	---
1.00 kHz	-99.72 dBc/Hz	-97.88 dBc/Hz	---
10.0 kHz	-101.61 dBc/Hz	-101.45 dBc/Hz	---
100 kHz	-101.85 dBc/Hz	-100.88 dBc/Hz	---
1.00 MHz	-118.57 dBc/Hz	-122.65 dBc/Hz	---

# TG Specifications

Frequency			
Frequency range	100 kHz to 2.1 GHz	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		

## Modulation analysis technical indicators

Demodulation			
Frequency range	2 MHz to 2.1 GHz	2 MHz to 3.6 GHz	2 MHz to 8.4 GHz
Carrier power accuracy	±2 dB		
Input power	-30 dB to +20 dBm	Automatic attenuation	
Carrier power display resolution	0.01 dBm		
AM measurement (option)			
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 (option)			
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)		
Digital demodulation (option)			
modulation type	ASK(2ASK);		
	FSK: 2, 4, 8, 16 level;		
	MSK(GMSK);		
	PSK: BPSK, QPSK, OQPSK, 8PSK;		
	DPSK: DBPSK, DQPSK, D8PSK, $\pi/4$ -DQPSK, $\pi/8$ -D8PSK;		
	QAM: 16, 32, 64, 128, 256		

Measure symbol length	16 to 4096
Number of sign points/oversampling rate	4, 6, 8, 10, 12, 14, 16
Symbol rate	1 ksps to 2.5 Msps, Number of symbol points * symbol rate ≤ 10 Msps

## Interface and display

Common interface	
Front panel trace source output	Type-N female, 50 Ω, nominal
10MHz Ext Ref In	10 MHz, >0 dBm, 50 Ω, BNC female, 50 Ω, nominal
10 MHz out	10 MHz, -5 dBm~+10 dBm, 50 Ω, BNC female, 50 Ω, nominal
External trigger input	TTL , BNC female
HDMI display	HDMI 1.4 Display interface
USB-Host	USB-A 3.0
USB-Device	USB-B 2.0
LAN	LAN(VXI11), 10/100/1000 Base, RJ-45
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 100 to 120 VAC
Frequency	50/60 Hz 400 Hz
Environment	
Temperature range	operation: 0°C~+40 °C Non operational: -20 °C~+70 °C
Cooling method	Fan forced cooling
Humidity range	operation: Below +35 °C ≤90%relative humidity; Non operational: +35 °C~+40 °C ≤60%relative humidity
Altitude	operation: Below 3000 m; Non operational: Below 15000 m
Mechanical specifications	
Dimensions	378mm×218mm×120mm (Width x Height x Length)
Net weight	4.55 kg
Calibration cycle	The recommended calibration circle 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.
Models	Spectrum analyzer, 9 kHz to 2.1 GHz	UTS3021B
	Spectrum analyzer, 9 kHz to 3.6 GHz	UTS3036B
	Spectrum analyzer, 9 kHz to 8.4 GHz	UTS3084B
	Spectrum analyzer, 9 kHz to 8.4 GHz with built-in Tracking generator	UTS3084T
Standard accessories	Power cord x1	
	USB cable x1	UT-D04
<b>Recommended options &amp; accessories</b>		
Options	Advanced measurement kit	UTS3000B-AMK
	EMI measurement option	UTS3000B-EMI
	Analog demodulation measurement option	UTS3000B-AMA

	Digital demodulation analysis option	UTS3000B-VSA
	Tracking generator options	UTS3021B-TG
		UTS3036B-TG
UT-CK01	SMAJ-NJ-0.7M DC-6G Cable x1	UT-W02-6GHz
accessories kit	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 2400MHz-2500MHz x2	UTS-T01
	antenna 824-960MHz/1710-1990MHz x2	UTS-T02
UTS-EMI01 Near-field	50Ω-SMA-SMB Cable x1	UT-W03
probes kit	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



## Warranty and Service

If the spectrum analyzer is under warranty or is covered by a maintenance contract, it will be repaired under the terms of warranty as below. If the analyzer is no longer under warranty, UNI-T will notify you of the cost of repair after examining the analyzer.

UNI-T UTS3000B series spectrum analyzers provide 3-year warranty for mainframes and 1-year warranty for accessories as standard.

The above warranty applies to all UNI-TREND test measurement instrument products procured through the UNI-TREND authorized distributors. Product purchased from outside the UNI-TREND instruments network will be serviced by the selling agents and not UNI-TREND TECHNOLOGY. Please Go to UNI-T official website ->instruments->support->Where to buy to find the authorized test and measurement instrument distributors.

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