



# Data Sheet

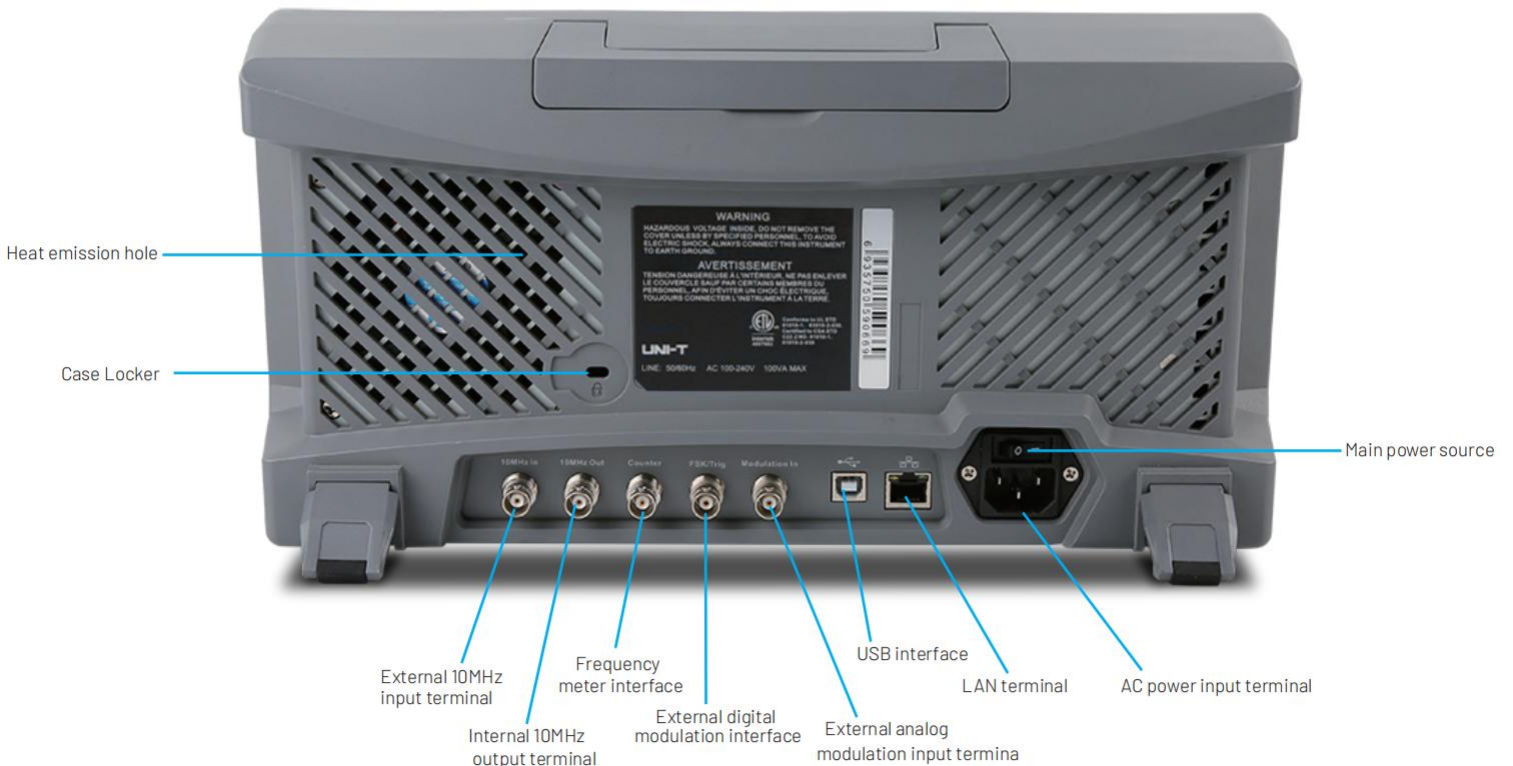
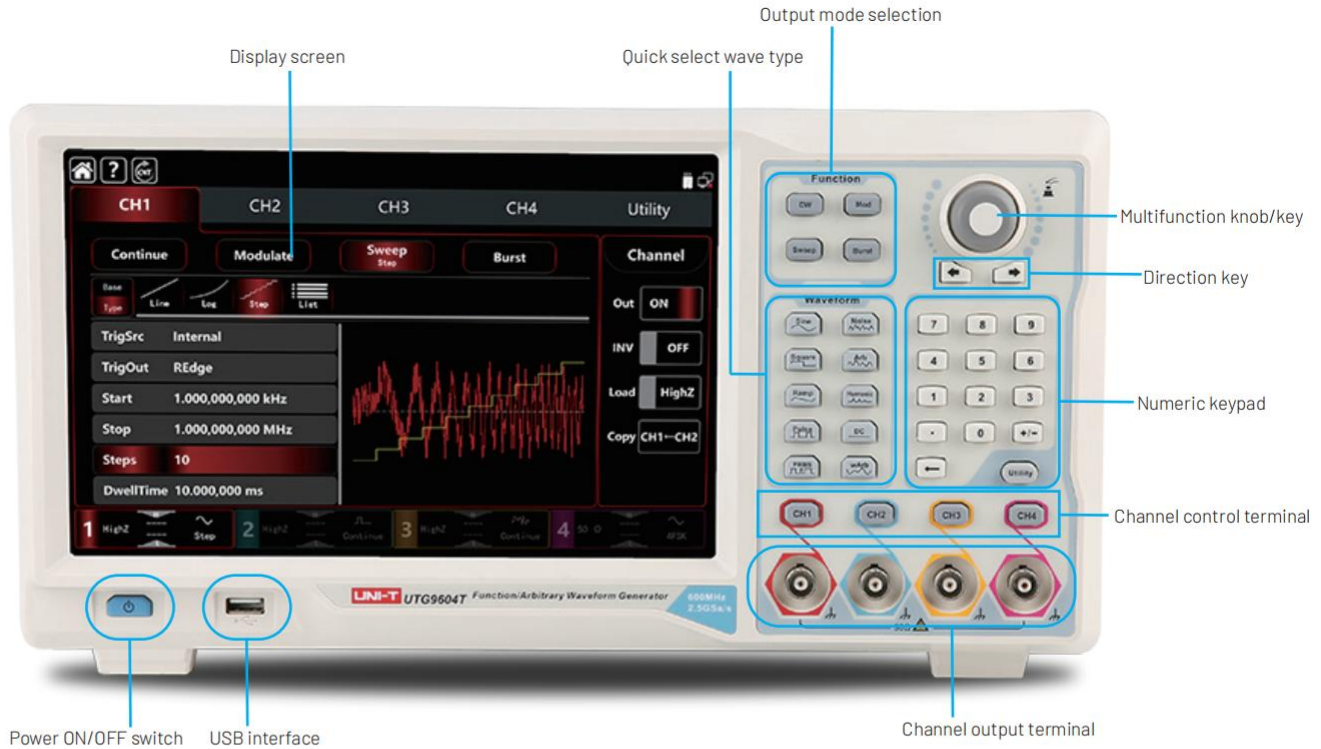
## UTG9000T Series Function/Arbitrary Waveform Generator



## Main Features

- Standard four channel with separate output channel mode
- Nine basic waves: sine wave, square wave, ramp wave, pulse wave, harmonic wave, noise, PRBS (pseudo random binary sequence), DC, arbitrary wave
- The maximum sampling rate 2.5GSa/s, the vertical resolution 16bits/14bits
- Adjustable noise bandwidth
- Sine wave output: 600MHz/500MHz/350MHz, full band: 1 $\mu$ Hz resolution
- Square wave output: 200MHz/160MHz/120MHz, the minimum edge time: within 1.5ns, adjustable duty ratio
- Pulse wave output: 200MHz/160MHz/120MHz, wide dynamic range high precise adjustable rising/falling edge time, adjustable duty ratio
- It can output phase and amplitude, independent and adjustable 2~16 harmonic wave
- The maximum output swing: 20Vpp
- It can output arbitrary wave 8pts~64Mpts, support point-by-point. More than 200 types of nonvolatile digital arbitrary wave storage
- It can store 16GB (optional) or 20MB arbitrary file (.bsv or.csv) , the instrument status file
- It can read arbitrary wave file (.bsv or.csv) and the instrument file storage in USB
- Abundant modulation types: AM, FM, PM, DSB-AM, QAM, ASK, FSK, 3FSK, 4FSK, PSK, BPSK, QPSK, OSK, PWM, SUM
- Linear, logarithmic, list frequency, stepping sweep
- Support frequency sweep and burst (pulse string) output
- Digital protocol output: SPI、IIC、UART
- SNR (signal to noise ratio) one-click output
- Four channels can be internal/external modulating, internal/external/manual respectively or at the same time
- Hardware frequency counter: 800MHz, AC/DC coupling
- Powerful upper-computer software and arbitrary editor
- 10.1-inch capacitive touch screen, 1280\*800 resolution
- Standard configuration interface: USB Host, USB Device, LAN, independent input and output of 10MHz clock source
- Usability multifunction knob and numeric keypad

# Oscilloscope Panel



# Product Introduction

This product has DDS (direct digital frequency synthesis) function, it can present high precision, stable, pure and low distortion signal. Plus, it can also offer wave in high frequency with quick rising edge and falling edge. It is a

high-performance, multifunction four channel arbitrary function generator.

Usability touch screen, superior technical index and humanity graph display design for your better work performance. This product is a multi-purpose generator to meet your current and future testing needs.

## Digital Protocol Output

UTG9000T series has three serial standard protocol output SPI, IIC, UART, compile the corresponding parameter can make serial signal waveform of protocol. This function is to test the protocol interface, to provide input signal for interface. Interface measurement operating more specific and effectively.



## Frequency Meter

UTG9000T series has built-in frequency meter, to be tested frequency signal only needs to connect with "counter" on the back panel, then will get the result.



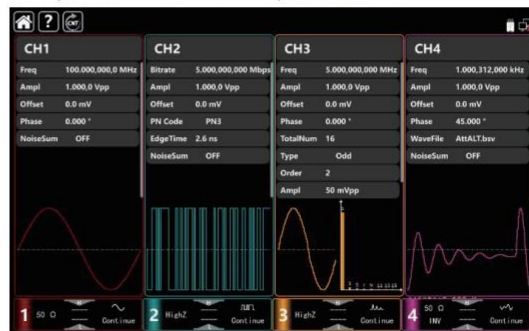
## Channel Merging

UTG9000T series can merge CH1 with CH2, CH3 merge with CH4, great real-time and true superposition features to presents complicated waveform.



## Four-channel Sync Display

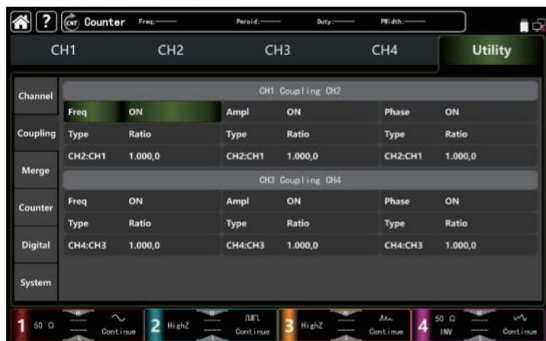
UTG9000T series has four channels, Ch1 and CH2 are the main channels, CH3 and CH4 is belong to secondary channel. User can switch to display signal parameters of four channel on the same screen, it's easy to operate and record parameters.



### Channel Coupling

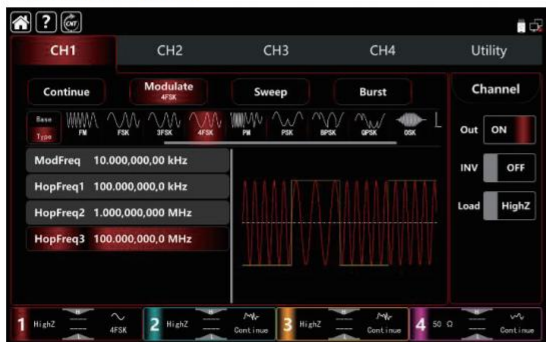
CH1 and CH2, CH3 and CH4 has channel coupling function. Turn on the function when another channel needs the same or relative signal waveform.

UTG9000T series has three coupling mode to meet different requirements. Channel coupling is quickly to send parameter to the other channel, it meets sync switch waveform demand.



### Multiple modulation mode

Support multiple analog and digital modulation, which is AM, FM, PM, DSBAM, QAM, ASK, FSK, 3FSK, 4FSK, PSK, BPSK, QPSK, OSK, PWM, SUM, it has internal and external modulating signal source. A variety of modulation signals to meet waveform generation needs from radio to TV to mobile network.



### Sweep frequency

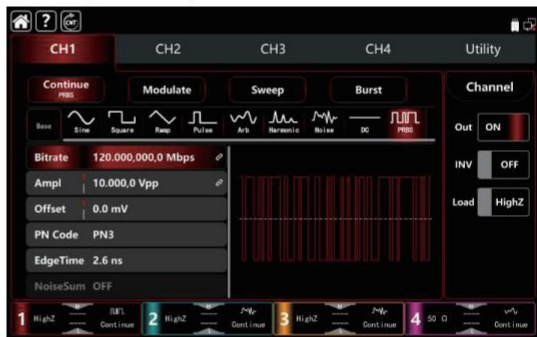
Except linear and logarithm frequency, it adds two modes stepping and list. Set frequency step and time interval between

each frequency point, follow stepping frequency to get waveform of stepping sweep; preset a list, output time interval by frequency point in list to get frequency waveform. User can freely compile frequency waveform as own needs.



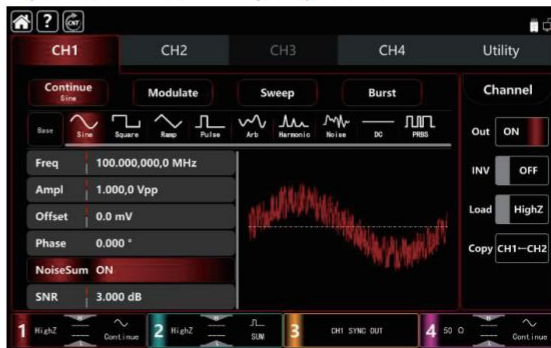
### PRBS

UTG9000T series has PRBS wave, which is PN3, PN5, PN7, PN9, PN11, PN13, PN15, PN17, PN21, PN23, PN25, PN27, PN29, PN31, PN33. It's for product performance measurement.



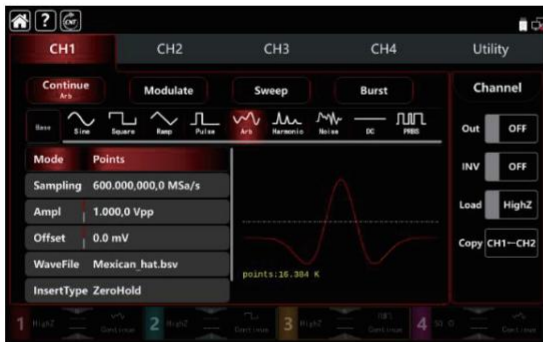
### One-button SNR

One-button SNR on continuous waveform. User can set SNR parameter according to your own needs. It's convenient to test input tolerance ability of product.



## Arbitrary Wave

UTG9000T series stores over 200 types of standard waveforms in nonvolatile memory. Upper-computer software can create and compile arbitrary wave, use USB interface on the front panel to read arbitrary wave data file in USB. It provides a lot of flexible arbitrary wave for testing standard waveform of medical, biological, mathematical and other fields.



# Quick Model Selection

Parameter	Model	UTG9604T		UTG9504T		UTG9354T	
		CH1/CH2	CH3/CH4	CH1/CH2	CH3/CH4	CH1/CH2	CH3/CH4
Channel		CH1/CH2	CH3/CH4	CH1/CH2	CH3/CH4	CH1/CH2	CH3/CH4
Maximum frequency		600MHz	200MHz	500MHz	200MHz	350MHz	160MHz
Sampling rate		2.5GSa/s	625MSa/s	2.5GSa/s	625MSa/s	2.5GSa/s	625MSa/s
Vertical resolution		16bits	16bits	14bits	16bits	14bits	16bits
Arbitrary wave depth		8pts-64Mpts	8kpts	8pts-64Mpts	8kpts	8pts-64Mpts	8kpts
Waveform		Sine, square, ramp, pulse, harmonic, noise, PRBS, DC, arbitrary wave					
Operating mode		Continue, Modulate, Sweep, Burst, Frequency counter, Protocol					
Modulation type		AM, FM, PM, DSBAM, QAM, ASK, FSK, 3FSK, 4FSK, PSK, BPSK, QPSK, OSK, PWM, SUM					

# Technical Parameter

Except as otherwise noted and marked "typical value",

all the technical index is normal when in two terms as follows,

1. Signal generator execute calibration and within calibration period.
2. Signal generator continuous operating in specified operating temperature over 30min.

Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Maximum frequency	600MHz	500MHz	350MHz	200MHz		160MHz
Sampling rate	2.5GSa/s			625MSa/s		
Vertical resolution	16bit	14bit		16bit		
Arbitrary wave length	8pts-64Mpts			8kpts		
Mode	Continue, Modulate, Sweep, Burst, Frequency counter, Protocol					
Waveform	Sine, Square, Ramp, Pulse, Harmonic, Noise, PRBS, DC, Arbitrary wave					
Modulation type	AM, FM, PM, DSB-AM, QAM, ASK, FSK, 3FSK, 4FSK, PSK, BPSK, QPSK, OSK, PWM, SUM					
Frequency sweep type	Linear, logarithm, stepping, list sweep					
Burst type	N cycle, infinite, gated					
Digital protocol	SPI, I2C, UART					
Frequency counter	100mHz-800MHz, AC, DC					
Frequency Characteristics						
Resolution	1μHz					
Reference frequency	frequency	10.0000MHz				
	Initial accuracy	±0.5ppm, 25°C				
	Temperature stability	±0.5ppm, 0°C~+40°C				
	Aging rate	±1ppm within one year				
Output Characteristics						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Output impedance	50Ω (Typical value)					
Amplitude range (Load: High Z)	≤40MHz		2mVpp~20Vpp	≤20MHz		2mVpp~20Vpp
	≤120MHz		2mVpp~10Vpp	≤80MHz		2mVpp~10Vpp
	≤160MHz		2mVpp~5Vpp	≤20MHz		2mVpp~5Vpp
	≤300MHz		2mVpp~4Vpp	≤80MHz		2mVpp~3Vpp
	≤400MHz		2mVpp~2.5Vpp	-		-
	≤500MHz		2mVpp~1.5Vpp	-		-
≤600MHz		2mVpp~1Vpp	-		-	

Amplitude range (Load: 50Ω)	≤40MHz	1mVpp~10Vpp		≤20MHz	1mVpp~10Vpp	
	≤120MHz	1mVpp~5Vpp		≤80MHz	1mVpp~5Vpp	
	≤160MHz	1mVpp~2.5Vpp		≤120MHz	1mVpp~2.5Vpp	
	≤300MHz	1mVpp~2Vpp		≤200MHz	1mVpp~2Vpp	
	≤400MHz	1mVpp~1.25Vpp		-	1mVpp~1.25Vpp	
	≤500MHz	1mVpp~0.75Vpp		-	1mVpp~0.75Vpp	
	≤600MHz	1mVpp~0.5Vpp		-	1mVpp~0.5Vpp	
Accuracy	(1kHz sine wave, 0V deviation, >10mVpp)					
	± (amplitude value 1%+1mVpp)					
DC offset range	range: (Peak value AC+DC)					
	-5Vpp~5Vpp(50Ω); -10Vpp~10Vpp(High Z)					
Accuracy of deviation	±1% of deviation value ±0.5%±2mV of amplitude value					
<b>Sine Wave Characteristics</b>						
Channel	CH3/CH4			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz		1μHz-160MHz
Resolution	1μHz					
Harmonic distortion (Typical value)	≤10MHz (0dBm), ≤-65dBc			≤10MHz (0dBm), ≤-65dBc		
	≤60MHz (0dBm), ≤-60dBc			≤60MHz (0dBm), ≤-60dBc		
	≤150MHz (0dBm), ≤-50dBc			≤100MHz (0dBm), ≤-55dBc		
	≤200MHz (0dBm), ≤-40dBc			≤200MHz (0dBm), ≤-40dBc		
	≤600MHz (0dBm), ≤-28dBc			-		
Spurious signal (nonharmonic, typical value)	≤10MHz <-70 dBc, Typical value(0dBm)					
	> 10MHz <-70dBc+6dB/ octave, Typical value(0dBm)					
Total harmonic distortion (Typical value)	0.075 % (0 dBm, 10 Hz ~ 20 kHz)					
Nonharmonic spurious	-60dBc (0dBm, ≤350MHz)			-60dBc (0dBm, ≤200MHz)		
	-55dBc (0dBm, >350MHz)					
Amplitude flatness (versus to 1kHz sine wave, 1Vpp/50Ω)	≤10MHz, 0.1dB					
	≤160MHz, 0.2dB					
	≤350MHz, 0.4dB					
	≤600MHz, 0.8dB					
Overlay amplitude of noise	noise voltage≤1Vrms					
Phase characteristics	-360.000°- 360.000°					
Phase noise(typical value)	10 MHz: ≤-125 dBc /Hz (typical value, 0dBm, 10kHz deviation)					
<b>Square Wave Characteristics</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Frequency	1μHz-200MHz	1μHz-160MHz	1μHz-120MHz	1μHz-60MHz		1μHz-50MHz
Rising/falling time	1μHz					
Rising/falling time	1MHz, 1 Vpp, 50Ω load					
	<1ns	<2ns		<5ns		<6ns
Overshoot (typical value)	<2% , (1MHz, 1 Vpp, 50Ω load)					
Duty ratio	0.000001%-99.999999%			0.000001%-99.999999%		
Pulse width	2.4ns (typical value)			8.0ns (typical value)		
Jitter (typical value)	100 ps (1Vpp, 50Ω load)					
Phase characteristics	-360.000°- 360.000°					
Overlay amplitude of noise	noise voltage≤1Vrms					
<b>Pulse Wave Characteristics</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Frequency	1μHz-200MHz	1μHz-160MHz	1μHz-120MHz	1μHz-60MHz		1μHz-50MHz



Resolution	1μHz					
Symmetry	1MHz, 1Vpp, 50Ω load					
Linearity	1ns-10ks	1.5ns-10ks	2ns-10ks	5ns-2ks	6ns-2ks	
Overshoot (typical value)	<2% , (1MHz, edge≥2ns , 1Vpp, 50Ω load)					
Duty ratio	0.000001%-99.999999%			0.000001%-99.999999%		
Pulse width	2.4ns (typical value)			8.0ns (typical value)		
Jitter (typical value)	100 ps (1Vpp, 50Ω load)					
Phase characteristics	-360.000°- 360.000°					
Overlay amplitude of noise	noise voltage≤1Vrms					
<b>Ramp Wave Characteristics</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9604T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Frequency	1μHz-30MHz		1μHz-20MHz	1μHz-10MHz		1μHz-8MHz
Resolution	1μHz					
Symmetry	0.00%-100.00%					
Linearity	<1% , (1kHz, 1Vpp, 50% Symmetry)					
Phase characteristics	-360.000°- 360.000°					
Overlay amplitude of noise	noise voltage≤1Vrms					
<b>Gaussian Noise Characteristics</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9504T	UTG9604T	UTG9504T	UTG9354T
Frequency	1mHz-600MHz	1mHz-500MHz	1mHz-350MHz	1mHz-200MHz	1mHz-200MHz	1mHz-160MHz
<b>Arbitrary Wave Characteristics</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model		UTG9604T	UTG9504T	UTG9354T	UTG9354T	UTG9504T
Sampling rate	DDS	2.5GSa/s			625MSa/s	
	Point by point	1μSa/s-600MSa/s	1μSa/s-500MSa/s	1μSa/s-350MSa/s	-	
Frequency range(DDS)	1μHz-100MHz		1μHz-80MHz	1μHz-60MHz		1μHz-50MHz
Length	8pts-64Mpts			8kpts (fixed)		
Vertical resolution	16bit	14bit		16bit		
Nonvolatile storage	more than 200 waveforms					
Minimum rising/falling time	<4ns, (50Ω, 1Vpp)					
Phase characteristics(DDS)	-360.000°- 360.000° (DDS model)					
Jitter	<150ps					
Overlay amplitude of noise	noise voltage≤1Vrms					
<b>PRBS Characteristics</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Bitrate	1μbps-120Mbps		1μbps-80Mbps	1μbps-60Mbps		1μbps-40Mbps
Edge time	2.6ns-1000s			4.2ns-1000s		
PN code	PN3、PN5、PN7、PN9、PN11、PN13、PN15、PN17、PN21、PN23、PN25、PN27、PN29、PN31、PN33					
Overlay amplitude of noise	noise voltage≤1Vrms					
<b>Harmonic Wave Characteristics</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Frequency range	1μHz-300MHz	1μHz-250MHz	1μHz-175MHz	1μHz-100MHz		1μHz-80MHz
Harmonic time	1-16					
Harmonic type	even harmonic, odd harmonic, all harmonics, customize					
Harmonic amplitude	1mV-10Vpp(50Ω load)					
	set the amplitude according to the selected harmonic serial number					
Harmonic phase	0.00°-360.00°					
	set the phase according to the selected harmonic serial number					
<b>AM Modulation</b>						

Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	Sine, square, pulse, ramp, arbitrary wave					
Source	Internal/external					
Modulation wave	Sine, square, rising ramp, falling ramp, noise, arbitrary wave					
Modulation depth	0.00%-120.00%					
Modulation frequency	1µHz-2MHz (Internal)					
<b>DSB-AM Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	Sine, square, pulse, ramp, arbitrary wave					
Source	internal/external					
Modulation wave	Sine, square, rising ramp, falling ramp, noise, arbitrary wave					
Modulation depth	0.00%-100.00%					
Modulation frequency	1µHz-2MHz (Internal)					
<b>FM Modulation</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Trigger source	Internal, external rising edge, external falling edge, manual					
Trigger output	Close, rising edge, falling edge					
Start frequency	1µHz-600MHz	1µHz-500MHz	1µHz-350MHz	1µHz-200MHz	1µHz-160MHz	
Stop frequency	1µHz-600MHz	1µHz-500MHz	1µHz-350MHz	1µHz-200MHz	1µHz-160MHz	
Dwell time	1ms-500s					
Step	2-2048 steps					
<b>List Frequency Sweep</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Modulation wave	Sine, square, rising ramp, falling ramp, noise, arbitrary wave					
Phase deviation	0.00°- 360.00°					
Modulation frequency	1µHz-2MHz (Internal)					
<b>ASK Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	Sine, square, pulse, ramp, arbitrary wave					
Source	Internal (50% Duty ratio square) / external (TTL level)					
Modulation frequency	1µHz-2MHz (Internal)					
<b>FSK Modulation</b>						
Channel	CH1/CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Carrier wave	Sine, square, pulse, ramp, arbitrary wave					
Source	Internal (50% Duty ratio square) / external (TTL LEVEL)					
Modulation frequency	1µHz-2MHz (Internal)					
Hopping frequency 1	1µHz-600MHz	1µHz-500MHz	1µHz-350MHz	1µHz-200MHz	1µHz-160MHz	
<b>3FSK Modulation</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Carrier wave	Sine, square, pulse, ramp, arbitrary wave					
Source	Internal (50% Duty ratio square)					
Modulation frequency	1µHz-2MHz (Internal)					
Hopping frequency 1	1µHz-600MHz	1µHz-500MHz	1µHz-350MHz	1µHz-200MHz	1µHz-160MHz	
Hopping frequency 2	1µHz-600MHz	1µHz-500MHz	1µHz-350MHz	1µHz-200MHz	1µHz-160MHz	
<b>4FSK Modulation</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Carrier wave	Sine, square, pulse, ramp, arbitrary wave					
Source	Internal (50% Duty ratio square)					
Modulation frequency	1µHz-2MHz (Internal)					

Hopping frequency 1	1µHz-600MHz	1µHz-500MHz	1µHz-350MHz	1µHz-200MHz	1µHz-160MHz	
Hopping frequency 2	1µHz-600MHz	1µHz-500MHz	1µHz-350MHz	1µHz-200MHz	1µHz-160MHz	
Hopping frequency 3	1µHz-600MHz	1µHz-500MHz	1µHz-350MHz	1µHz-200MHz	1µHz-160MHz	
<b>PSK Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	Sine, square, ramp, arbitrary wave					
Source	Internal (50% Duty ratio square) /external (TTL LEVEL)					
Modulation frequency	1µHz-2MHz (Internal)					
Hopping phase	0.00°- 360.00°					
<b>BPSK Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	Sine, square, ramp, arbitrary wave					
PN code	PN3, PN5, PN7, PN9, PN11, PN13, PN15, PN17, PN21, PN23, PN25, PN27, PN29, PN31, PN33					
Bitrate	1µbps-2Mbps					
Phase 1	0.00°- 360.00°					
Phase 2	0.00°- 360.00°					
<b>QPSK Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	Sine, square, ramp, arbitrary wave					
PN code	PN3, PN5, PN7, PN9, PN11, PN13, PN15, PN17, PN21, PN23, PN25, PN27, PN29, PN31, PN33					
Bitrate	1µbps-2Mbps					
Phase 1	0.00°- 360.00°					
Phase 2	0.00°- 360.00°					
Phase 3	0.00°- 360.00°					
Phase 4	0.00°- 360.00°					
<b>OSK Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	Sine					
Trigger source	Internal/external					
Modulation frequency	1µHz-2MHz (Internal)					
Oscillation time	1ns-500ks					
<b>QAM Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
IQ map	QAM4, QAM8, QAM16, QAM32, QAM64, QAM128, QAM256					
PN Code	PN3, PN5, PN7, PN9, PN11, PN13, PN15, PN17, PN21, PN23, PN25, PN27, PN29, PN31, PN33					
Bitrate	1µbps-2Mbps					
<b>PWM Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	pulse					
Source	Internal/external					
Modulation wave	Sine, square, rising ramp, falling ramp, noise, arbitrary wave					
Modulation frequency	1µHz-2MHz (Internal)					
Width deviation	0.000000%-49.999999% of pulse width					
<b>SUM Modulation</b>						
Model	UTG9604T, UTG9504T, UTG9354T					
Carrier wave	Sine, square, pulse, ramp, arbitrary wave, harmonic, noise					
Source	Internal/external					
Modulation wave	Sine, square, rising ramp, falling ramp, noise, arbitrary wave					
Modulation frequency	1µHz-2MHz (Internal)					
Modulation depth	0.00%-100.00%					
<b>Linear Frequency Sweep</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Trigger source	Internal, external rising edge, external falling edge, manual					
Trigger output	Close, rising edge, falling edge					

Start frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz	1μHz-160MHz	
Stop frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz	1μHz-160MHz	
Frequency sweep time	1ms-500s					
<b>Logarithm Frequency Sweep</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Trigger source	Internal, external rising edge, external falling edge, manual					
Trigger output	Close, rising edge, falling edge					
Start frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz	1μHz-160MHz	
Stop frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz	1μHz-160MHz	
Frequency sweep time	1ms-500s					
<b>Stepping Frequency Sweep</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Gating source	external trigger					
Trigger source	internal, external rise edge, external fall edge, manual					
Trigger output	Close, rising edge, falling edge					
Start frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz	1μHz-160MHz	
Stop frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz	1μHz-160MHz	
Dwell time	1ms-500s					
Step	2-2048 steps					
<b>List Frequency Sweep</b>						
Channel	CH1 & CH2			CH3 & CH4		
Model	UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Trigger source	Internal, external rising edge, external falling edge, manual					
Trigger output	Close, rising edge, falling edge					
Start frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz	1μHz-160MHz	
Stop frequency	1μHz-600MHz	1μHz-500MHz	1μHz-350MHz	1μHz-200MHz	1μHz-160MHz	
Dwell time	1ms-500s					
List file	Maximum 2048 frequency points for a single file Frequency range is accordance with fundamental wave range					
<b>N cycle</b>						
Waveform	Sine, square, pulse, ramp, arbitrary wave					
Trigger source	Internal, external rising edge, external falling edge, manual					
Trigger output	Close, rising edge, falling edge					
Trigger cycle	1us-500s					
Cycle number	1-50000					
<b>Gate</b>						
Waveform	Sine, square, pulse, ramp, arbitrary wave, noise					
Polarity	positive, negative(TTL LEVEL)					
Phase	0.00°-360.00°					
<b>Infinite</b>						
Waveform	Sine, square, pulse, ramp, arbitrary wave					
Trigger source	Internal, external rising edge, external falling edge, manual					
Trigger output	Close, rising edge, falling edge					
phase	0.00°-360.00°					
<b>Frequency Counter</b>						
Measurement parameter	Frequency, period, duty ratio, positive pulse width, negative pulse width					
Accuracy	±5ppm					
Frequency resolution	8bit					
Frequency range	100mHz-800MHz	100mHz-60MHz		≥100mVrms		
		60MHz-300MHz		≥200mVrms		
		300MHz-500MHz		≥500mVrms		
		500MHz-800MHz		≥1Vrms		

Coupling mode	AC, DC, HF reject						
Trigger level	-2.5V-2.5V						
Sensitivity	0%-100%						
Digital Protocol	SPI Characteristics						
Interface	CH2 - SCLK, CH3 - nCS, CH4 - MOSI						
Amplitude	1mV-10V						
Send way	Auto, manual						
Interval time	20ns-1000s in auto mode of send way						
Data format	Hexadecimal, character						
Data length	Maximum 2048 bytes						
Digital Protocol	I <sup>2</sup> C Characteristics						
Interface	CH3 - SCL, CH4 - SDA						
Amplitude	1mV-10V						
Clock frequency	1Hz-50MH						
Address	7bit, 10bit						
Send way	Auto, manual						
Interval time	20ns-1000s in auto mode of send way						
Data format	Hexadecimal, character						
Data length	Maximum 2048 bytes						
Digital Protocol	UART Characteristics						
Interface	CH4 - TX						
Amplitude	1mV-10V						
Baud rate	1-1000000 (customized)						
Date bit	4, 5, 6, 7, 8						
Stop bit	1bit, 2bit						
Verify bit	None, even, odd						
Send way	Auto, manual						
Interval time	20ns-1000s in auto mode of send way						
Data format	Hexadecimal, character						
Data length	Maximum 2048 bytes						
<b>Coupling &amp; Merge</b>							
Channel	CH1 & CH2				CH3 & CH4		
Input frequency		UTG9604T	UTG9504T	UTG9354T	UTG9604T	UTG9504T	UTG9354T
Frequency coupling	Ratio	0.0001-10000					
	Deviation	-600MHz ~ 600MHz	-500MHz ~ 500MHz	-350MHz ~ 350MHz	-200MHz ~ 200MHz		-160MHz ~ 160MHz
Phase coupling	Ratio	0.0001-10000					
	Deviation	-720°- 720°					
Amplitude coupling	Ratio	0.0001-10000					
	Deviation	-9.999Vpp-9.999Vpp (50Ω)					
Channel Merge	CH1 merge with CH2, CH3 merge with CH4						
<b>External Modulation Input</b>							
Input frequency	<50kHz						
Modulation depth	± 5Vpk = 100%						
Input impedance	5kΩ (typical value)						
<b>External Reference Input</b>							
Input frequency	10MHz±50Hz (clock frequency adjustable)						
Level range	Compatible with TTL						
Input impedance	10kΩ (typical value, DC coupling)						
Lock time	<1s						
<b>Internal Reference Output</b>							
Input frequency	10MHz±50Hz						

Level range	Compatible with TTL
Level range	50Ω(typical value, DC coupling)
<b>Trigger input</b>	
Slop	Rising or falling, optional
Input level	Compatible with TTL
Pulse width	>100ns
Input impedance	>10kΩ, DC coupling
Response time	<1μs, typical value
<b>Trigger output</b>	
Maximum frequency	1MHz
Input level	Compatible with TTL
Pulse width	>400ns, typical value
Output impedance	50Ω, typical value
<b>Sync output</b>	
Frequency range	≤60MHz (CH3 is synchronized with CH1, CH4 is synchronized with CH2, CH3 can't synchronize with CH4)
Level	Compatible with TTL
Output impedance	50Ω, typical value
<b>General Technical Specification</b>	
Communication interface	USB Host, USB Device, LAN
Display mode	10.1" TFT capacitive touch, 1280*800 resolution
Blacklight	30%、40%、50%、60%、70%、80%、90%、100%
Supply voltage	100-240VACrms, 50Hz/60Hz; 100-120Vrms(±10%), 400 Hz
Power dissipation	Less than 50W
Fuse wire	2A, T-class, 250V
Temperature range	operating: +10C ~ +40C Non-operating: -20C ~ +60C
Cooling method	Forced cooling by fan
Humidity range	<+35C: ≤90%relative humidity
	+35C~+40C: ≤60%relative humidity
Altitude	Operating: below 2000 meters
	Non-operating: below 15000 meters
Size (reference)	370mm×115mm×185mm
Net weight	4.04kg
Gross weight	6.06kg



\*The UTG9600T series have been certified by CE, cETLus

## Accessories selection

Accessory	Quantity	Remark
National power cable	1	standard
USB line	1	standard
BNC cable (1 meter)	4	standard
Product warranty	1	standard

## Warranty

Three-years warranty, excluding probes and accessories.

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