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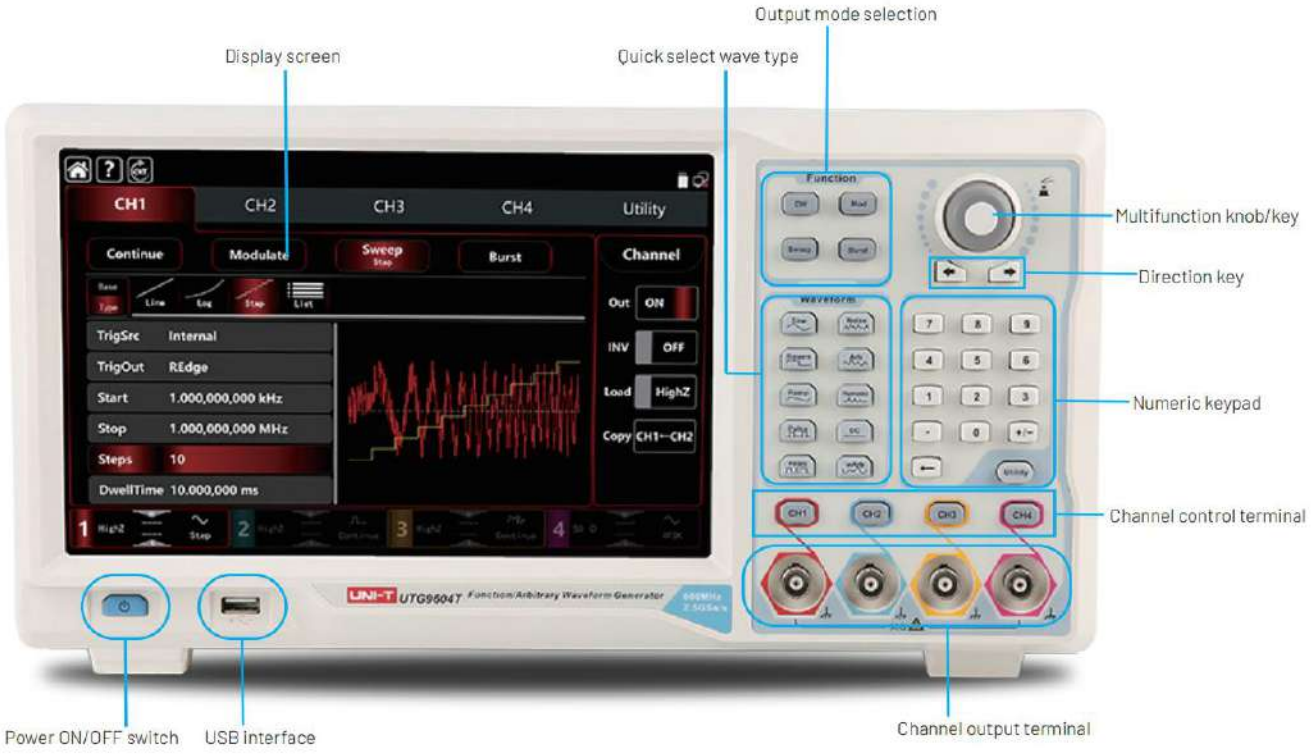
Data Sheet

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: 1μHz 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

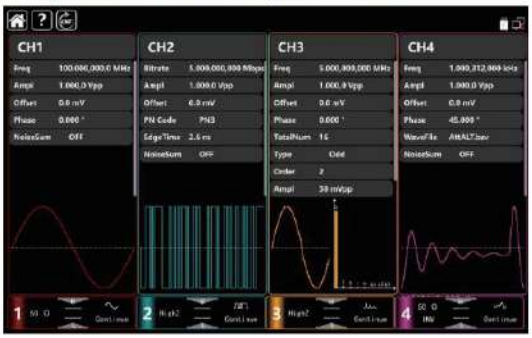
UTG9000T series has built-in frequency meter, to be tested frequency signal only needs to connect with "counter" on the back panel, then will get the result.

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.



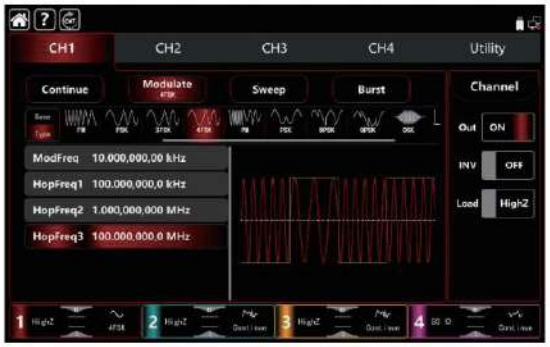
Channel Coupling

CH1and 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.

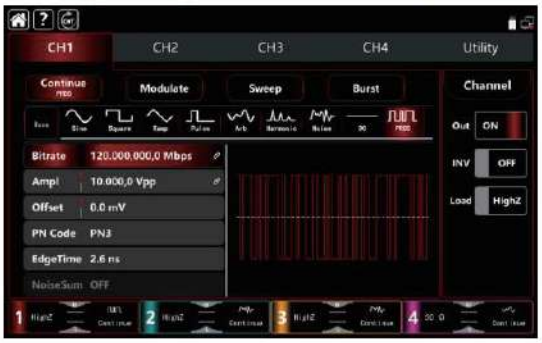


Sweep frequency

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.

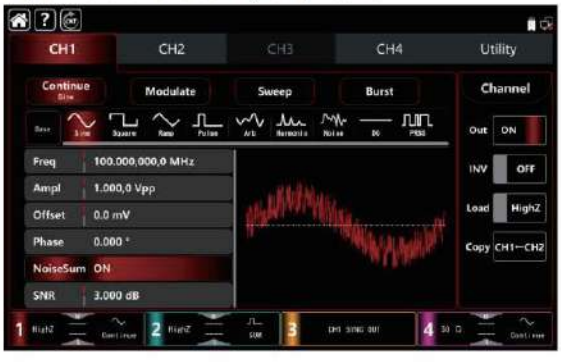
PRBS

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.



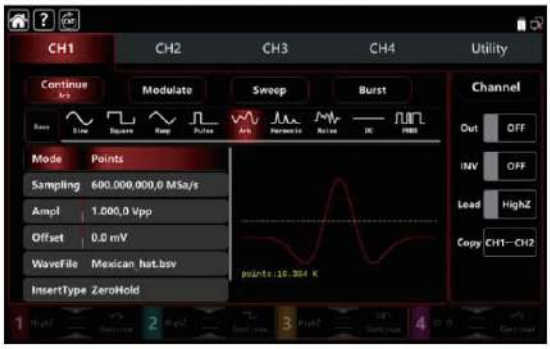
One-button SNR

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	
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℃				
	Temperature stability	±0.5ppm, 0℃~+40℃				
	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					
Sine Wave Characteristics						
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)					
Square Wave Characteristics						
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					
Pulse Wave Characteristics						
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)	100ps (1Vpp, 50Ω load)					
Phase characteristics	-360.000°-360.000°					
Overlay amplitude of noise	noise voltage≤1Vrms					
Ramp Wave Characteristics						
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					
Gaussian Noise Characteristics						
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
Arbitrary Wave Characteristics						
Channel	CH1&CH2			CH3&CH4		
Model		UTG9604T	UTG9504T	UTG9354T	UTG9354T	UTG9504T	UTG9354T
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						
PRBS Characteristics						
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					
Harmonic Wave Characteristics						
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					
AM Modulation						

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)					
DSB-AM Modulation						
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)					
FM Modulation						
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					
List Frequency Sweep						
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)					
ASK Modulation						
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)					
FSK Modulation						
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
3FSK Modulation						
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
4FSK Modulation						
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
PSK Modulation					
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°				
BPSK Modulation					
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°				
QPSK Modulation					
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°				
OSK Modulation					
Model	UTG9604T、UTG9504T、UTG9354T				
Carrier wave	Sine				
Trigger source	Internal/external				
Modulation frequency	1μHz-2MHz (Internal)				
Oscillation time	1ns-500ks				
QAM Modulation					
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				
PWM Modulation					
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				
SUM Modulation					
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%				
Linear Frequency Sweep					
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					
Logarithm Frequency Sweep						
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					
Stepping Frequency Sweep						
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					
List Frequency Sweep						
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					
N cycle						
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					
Gate						
Waveform	Sine、square、pulse、ramp、arbitrary wave、noise					
Polarity	positive、negative(TTL LEVEL)					
Phase	0.00°-360.00°					
Infinite						
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°					
Frequency Counter						
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	**I²C Characteristics 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

Coupling & Merge							
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						

External Modulation Input	
Input frequency	<50kHz
Modulation depth	±5Vpk = 100%
Input impedance	5kΩ (typical value)
External Reference Input	
Input frequency	10MHz±50Hz (clock frequency adjustable
Level range	Compatible with TTL
Input impedance	10kΩ (typical value, DC coupling)
Lock time	<1s
Internal Reference Output	
Input frequency	10MHz±50Hz

Level range	Compatible with TTL
Level range	50Ω(typical value, DC coupling)
Trigger input	
Slop	Rising or falling, optional
Input level	Compatible with TTL
Pulse width	>100ns
Input impedance	>10kΩ, DC coupling
Response time	<1μs, typical value
Trigger output	
Maximum frequency	1MHz
Input level	Compatible with TTL
Pulse width	>400ns, typical value
Output impedance	50Ω, typical value
Sync output	
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
General Technical Specification	
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: +10℃ ~ +40℃ Non-operating: -20℃ ~+60℃
Cooling method	Forced cooling by fan
Humidity range	<+35℃: ≤90%relative humidity
	+35℃~+40℃: ≤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.

Please visit https://instruments.uni-trend.com/list_190/65.html to learn more information.

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