

WT-328

无线网络测试仪器

Wireless Connectivity Tester

Technical Specifications



深圳市极致汇仪科技有限公司
Shenzhen iTest Technology Co., Ltd.
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General Technical Specifications

Analyzer			
Input frequency range	RF A1 to B4	400MHz to 6000 MHz ^(*)	
IF bandwidth	RF A1 to B4	180 MHz	
Input power range	RF A1 to B4	+30 dBm peak(+25 dBm average)	
Input power accuracy	RF A1 to B4	Specification:	±0.5 dB (+25 to -40 dBm)
		Typical:	±0.3 dB (+25 to -40 dBm)
Input return loss	RF A1 to B4	>13 dB	
Spurious (signal applied)	RF A1 to B4	<-70 dBc (CW, for signal levels greater than -10 dBm)	
Spectral flatness	RF A1 to B4	Specification:	≤±0.75 dB (±80 MHz)
		Typical:	±0.5 dB (±80 MHz)
Inherent spurious floor (no signal)	RF A1 to B4	≤-95 dBm	
Quantization		14 bits	
Noise figure		≤26 dB at minimum input attenuation	
Integrated phase noise		≤0.3 degrees (100 Hz to 1 MHz) 0.2 degrees (100 Hz to 1 MHz) typical	
Signal to noise ratio		≥55 dB 100 KHz RBW	
Sampling data rate		240/120/60/30 Msps	
Waveform capture duration		at 30 Msps sampling data rate	160 ms
		at 60 Msps sampling data rate	80 ms
		at 120 Msps sampling data rate	40 ms
		at 240 Msps sampling data rate	20 ms
RF Analyzer – Signal Trigger			
Absolute minimum value	Wideband RF	-40 dBm	
Absolute maximum value	Limited by the maximum input power		
Trigger relative threshold	-10 to -40 dBmax		
Level accuracy	<±1 dB		
Port – Isolation			
Port to Port Isolation	>110 dB		
VSA channel switching time	≤100 ms		
VSG channel switching time	≤100 ms		
Timebase			
Oscillator type	OCXO		
Frequency	10 MHz		
Initial accuracy (25°C, after 60 minute warm-up)	<±0.05 ppm		
Maximum aging	<±0.1 ppm per year		
Temperature stability	<±0.01 ppm, referenced to 25°C		
Warm-up time (to within ±0.1 ppm at 25°C)	<5 minutes		
MIMO System Performance			
VSA capture trigger accuracy	≤±50 ns		
VSG start trigger accuracy	≤±50 ns		

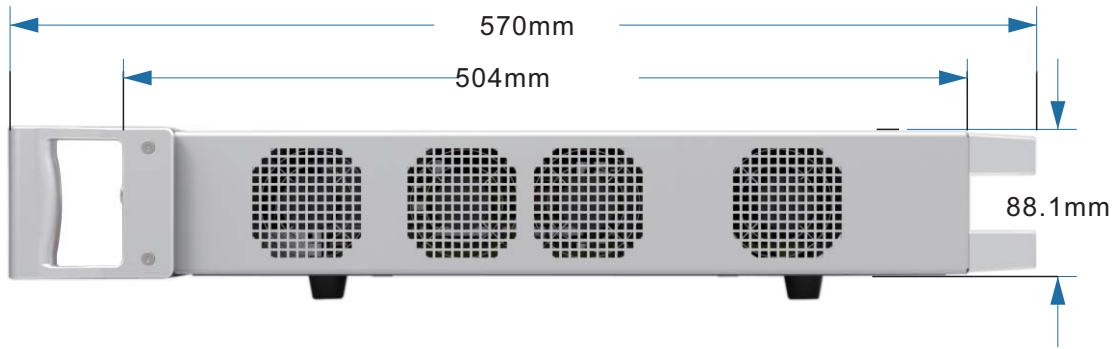
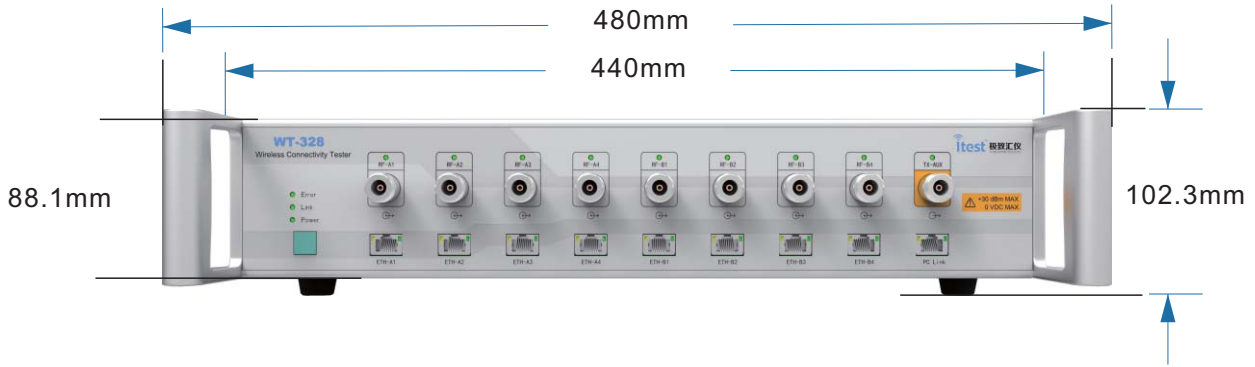
*1:Firmware lower than 2.0 only support:2400 MHz to 2500 MHz;4900 MHz to 6000 MHz

RF Generator			
Output frequency range	RF A1 to B4; TX-AUX	400 MHz to 6000 MHz ^(*)	
IF bandwidth	RF A1 to B4; TX-AUX	180 MHz	
Output power range(CW)	RF A1 to B4	0 to -100 dBm	
	TX-AUX	+10 to -90 dBm	
Output power accuracy	RF A1 to B4	Specification:	±0.75 dB(0 to -90 dBm)
			±1.50 dB(-90 to -100 dBm)
		Typical:	±0.50 dB(0 to -90 dBm)
	±1.00 dB(-90 to -100 dBm)		
	TX-AUX	Specification:	±0.75 dB(+10 to -80 dBm)
			±1.50 dB(-80 to -90 dBm)
Typical:		±0.50 dB(+10 to -80 dBm)	
	±1.00 dB(-80 to -90 dBm)		
Output return loss	RF A1 to B4; TX-AUX	>13 dB	
Spurious (in channel)	RF A1 to B4; TX-AUX	Specification:	≤-40 dBc(160 MHz, >-55 dBm)(CW)
		Typical:	≤-50 dBc(160 MHz, >-55 dBm)(CW)
Spectral flatness	RF A1 to B4; TX-AUX	Specification:	≤±0.75 dB (±80 MHz)
		Typical:	±0.5 dB (±80 MHz)
Quantization		16 bits	
Integrated phase noise		≤0.3 degrees (100 Hz to 1 MHz) 0.2 degrees (100 Hz to 1 MHz) typical	
Signal to noise ratio		Specification:	≥60 dB (100 KHz signal RBW), power level -10 dBm
		Typical:	≥70 dB (100 KHz signal RBW), power level -10 dBm
Carrier leakage		≤-40 dBc	
Gap power		≤-90 dBm/100 kHz	
Sampling date rate		240/120/60/30 Msps	
General and Environmental			
Dimensions	Unit with Handle:480 mm W x 570 mm D x 102.3 mm H Unit without Handle:440 mm W x 504 mm D x 88.1 mm H		
Net weight	14kg		
Power requirements	110 to 240 VAC, 50 to 60Hz		
Power consumption	<150 W (maximum), <15W (standby)		
Operating temperature	+10°C to +55°C		
Storage temperature	-20°C to +70°C		
Specification validity temperature	+20°C to +30°C		
Operating humidity	15% to 95% relative humidity, non-condensing		
EMC	EN 61326, FCC PART 15B		
Safety	EN 61010-1, IEC 61010-1		
Mechanical vibration	IEC 60068, IEC 61010		
Mechanical shock	ASTM D3332-99, Method B		
Recommended calibration cycle	24 months		
Warranty	12 months hardware 12 months software updates		
Recommended PC	Intel Core i5 2.5 GHz with 4 GB of RAM or better		

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WLAN (802.11a/b/g/n/p/ac/ax)		
EVM	Residual VSA EVM (full packet channel estimation, measured at -10 dBm)	≤-47 dB for 20 M(Typical: -50 dB)
		≤-47 dB for 40 M(Typical: -50 dB)
		≤-46 dB for 80 M(Typical: -48 dB)
		≤-45 dB for 160 M(Typical: -47 dB)
	Residual VSG EVM (full packet channel estimation, measured at -10 dBm)	≤-47 dB for 20 M(Typical: -50 dB)
		≤-47 dB for 40 M(Typical: -50 dB)
		≤-46 dB for 80 M(Typical: -48 dB)
		≤-45 dB for 160 M(Typical: -47 dB)
Peak power	Peak power over all symbols (dBm)	VSA power accuracy: ±0.5 dB (+20 to -45 dBm)
RMS power	All: average power of complete datacapture (dBm)	
	No gap: average power over all symbols after removal of any gap between packets (dBm)	
I/Q amplitude error	Residual VSA I/Q imbalance:	≤1% (+20 to -30 dBm)
	Residual VS GI/Q imbalance:	≤1% (-5 to -95 dBm)
I/Q phase error	Residual VSA I/Q imbalance:	≤0.5 degree (+20 to -30 dBm)
	Residual VS GI/Q imbalance:	≤0.5 degree (-5 to -95 dBm)
Frequency error	VSA measurement error:	≤±0.2 ppm calibrated
RMS phase noise	VSA integrated phase noise:	<0.3 degrees (100 Hz to 1 MHz)
Spectral mask	Transmit spectrum mask	Spectral mask view: ±90 MHz
Spectral flatness	VSA flatness over 160 MHz BW: ±0.75 dB	
CCDF (complementary cumulative distribution function)	Probability of peak signal power being greater than a given power level versus peak-to-average power ratio (dB)	
Power on ramp	Power-on time from 10% to 90%	
Power down ramp	Power-off time from 90% to 10%	
Eye diagram	I and Q channels versus time(802.11b/g DSSS signals only)	
Raw capture data	I and Q signals versus time	
General waveform analysis	DC offset, RMS level, minimum/maximum amplitude, peak-to-peak amplitude, RMS I- and Q-channel levels	
CW frequency analysis	Frequency of CW tone	

Bluetooth® (1.0, 2.0, 2.1, 3.0)		
TX output power	Transmit DUT output power (dBm)	VSA power accuracy: ±0.5 dB (+20 to -45 dBm)
TX output spectrum	Transmit DUT power spectral density	
20 dB bandwidth	VSA frequency accuracy:	≤±0.2 ppm calibrated
In-band emissions (Adjacent channel)	VSA spurious:	<-70 dBc (100 KHz RBW) (CW)
Modulation characteristics	Average and peak frequency deviation (Hz)	(For EVM better than -25 dB) VSA measurement error: ≤±0.2 ppm calibrated
Carrier frequency tolerance	Carrier frequency offset (Hz)	
Carrier frequency drift	Carrier frequency change over the Bluetooth burst (Hz)	
Relative transmit power(EDR)	VSA power accuracy:	±0.5 dB (+20 to -45 dBm)
Carrier frequency stability(EDR)	Frequency drift over the Bluetooth EDR burst duration (Hz)	
Receive sensitivity	Receive sensitivity test. Includes Dirty Packets.	VSG power accuracy: ±0.75 dB (0 to -90 dBm)
Maximum input signal level	Assuming single-ended BER measurement	
RMS EVM (EDR)	RMS EVM for Bluetooth EDR	Residual VSA EVM: ≤-35 dB (+20 to -30 dBm) Residual VSG EVM: ≤-35 dB (-10 to -70 dBm)
Peak EVM (EDR)	Peak EVM for Bluetooth EDR	
Bluetooth® (4.0, 4.1, 4.2)/BLE		
Output power at NOC		VSA power accuracy: ±0.5 dB (+20 to -45 dBm)
Output power at EOC		
In-band emissions at NOC	Spurious emission measured at ±5 MHz of DUT TX frequency only	VSA spurious: <-70 dBc (100 KHz RBW) (CW)
In-band emissions at EOC		
Modulation characteristics	Average and peak frequency deviation (Hz)	
Carrier frequency offset and drift at NOC	Carrier frequency offset (Hz) and change over the Bluetooth burst (Hz)	VSA frequency accuracy: ≤±0.2 ppm calibrated
Carrier frequency offset and drift at EOC		
Receiver sensitivity at NOC	Receive sensitivity test using user-generated waveforms	VSG power accuracy: ±0.75 dB (0 to -90 dBm)
Receiver sensitivity at EOC		
C/I and receiver selectivity performance		VSG spurious(in channel):≤-40 dBc (160 MHz,>-55 dBm)(CW)
Blocking performance		
Intermodulation performance		
Maximum input signal level	VSG maximum output power:	0 to -100 dBm CW
Bluetooth® (5.0)		
In-band emissions	VSA spurious: < -70 dBc (100 KHz RBW) (CW)	
Modulation characteristics	VSA frequency accuracy: ≤ ± 0.2 ppm calibrated	
Carrier frequency offset and drift		
Stable modulation characteristics		
Receiver sensitivity	VSG power accuracy:±0.75 dB (0 to -90 dBm)	
Receiver sensitivity – stable modulation index		
Maximum input signal level	VSG maximum output power:0 to -100 dBm CW	
Maximum input signal level – stable modulation index	VSG maximum output power:0 to -100 dBm CW	
C/I and receiver selectivity performance	VSG spurious (in channel):≤-40 dBc (160 MHz,>-55 dBm)(CW)	
Blocking performance		
Intermodulation performance		





深圳市极致汇仪科技有限公司
SHENZHEN ITEST TECHNOLOGY CO., LTD.

地址：深圳市宝安区新安街道兴东社区67区留芳路6号庭威产业园1号楼5C
电话：+86-755-2153 5646
传真：+86-755-2640 5551
销售部邮箱：wtsales@itest.cn
技术服务邮箱：support@itest.cn
www.itest.cn

台湾办事处

地址：新北市土城区中央路三段87号7楼
电话：+886-2-2269 2007
传真：+886-2-2269 2036
E-mail：michaelwang@itest.cn

西南办事处

地址：成都市高新区锦悦西路26号孵化园
9号F座310室（地铁孵化园B口出）
电话：+86 139 8059 4915
E-mail：yangmingjie@itest.cn



华东办事处

地址：上海市闵行区莲花路2080弄50号金茂科技园D座302室
电话：+86 180 6193 4935
E-mail：fanyong@itest.cn