RADIO TEST REPORT

Report No.: STS2012165W06

Issued for

Shenzhen YQT Electronic Technology Co.,Ltd

F5, Bldg4, Hua Feng No.1 Science & Technology Zone,
Xixiang, Bao'an, Shenzhen, China

Product Name:	Smart Watch
Brand Name:	YQT
Model Name:	T5
Series Model:	Q1, Q2, Q5, Q6, Q6S, Q7S, Q9, Q11, Q11S, Q11CW, Q12, Q12G, Q12B, Q12CW, Q12W, Q12T, Q13, Q13W, Q15, Q15F, Q16, Q17, Q18, Q18F, Q19, Q19F, Q19CW, Q19-XZ6, Q19-360, Q20, Q21, Q22, Q23, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q50, Q523, Q523-1.22, Q528, Q529, Q750, Q610S, Q60, Q60S, Q49, Q68, Q72, Q86, T3, T5S, T6, T8, T8W, T8L, T10, T10S, T10-360, T11, T12, T13, T15, T16, T17, T18, T19, T20, T27,T28, T29, T30, T31, T32, T33, T35, T36, W02S, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, Q13Z, Z1, S20
FCC ID:	2AKM6-T5
Test Standard:	FCC Part 22H and 24E

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TEST RESULT CERTIFICATION

Applicant's Name ..... :	Shenzhen YQT Electronic Technology Co.,Ltd
Address ..... :	F5, Bldg4, Hua Feng No.1 Science & Technology Zone, Xixiang, Bao'an, Shenzhen, China
Manufacturer's Name ..... :	Shenzhen YQT Electronic Technology Co.,Ltd
Address ..... :	F5, Bldg4, Hua Feng No.1 Science & Technology Zone, Xixiang, Bao'an Shenzhen, China

Product Description

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Test Standards ..... :	FCC Part 22H and 24E
Test Procedure ..... :	KDB 971168 D01 v03r01,ANSI C63.26(2015)

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test.....:

Date of receipt of test item.....:	23 Dec. 2020
Date (s) of performance of tests.:	23 Dec. 2020 ~ 31 Dec. 2020
Date of Issue .....:	31 Dec. 2020
Test Result .....:	Pass

Testing Engineer : Chris Chen
(Chris Chen)

Technical Manager : Sean She
(Sean she)

Authorized Signatory : Vita Li
(Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	31 Dec. 2020	STS2012165W06	ALL	Initial Issue

SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

The radiated emission testing was performed according to the procedures of KDB 971168 D01 v03r01 and ANSI C63.26(2015)

FCC Rules	Test Description	Test Limit	Test Result	Reference
2.1046	Conducted Output Power	Reporting Only	PASS	
22.913d 24.232d	Peak-to-Average Ratio	< 13 dB	PASS	
2.1046 22.913 24.232	Effective Radiated Power/Equivalent Isotropic Radiated Power	< 7 Watts max. ERP(Part 22) < 2 Watts max. EIRP(Part 24)	PASS	
2.1049 22.917 24.238	Occupied Bandwidth	Reporting Only	PASS	
2.1055 22.355 24.235	Frequency Stability	< 2.5 ppm (Part 22) Emission must remain in band (Part 24)	PASS	
2.1051 22.917 24.238	Spurious Emission at Antenna Terminals	< 43+10log10(P[Watts])	PASS	
2.1053 22.917 24.238	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	
2.1051 22.917 24.238	Band Edge	< 43+10log10(P[Watts])	PASS	

1 INTRODUCTION

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD
Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China
FCC test Firm Registration Number: 625569
IC test Firm Registration Number: 12108A
A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements ofANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 toindicate a 95% level of confidence. The measurement data shown herein meets or exceeds the UCISPRmeasurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly tospecified limits to determine compliance.

No.	Item	Uncertainty
1	RF output power, conducted	±0.68dB
2	Unwanted Emissions, conducted	±2.988dB
3	All emissions, radiated 30-1GHz	±4.39dB
4	All emissions, radiated 1G-6GHz	±5.10dB
5	All emissions, radiated>6G	±5.48dB
6	Conducted Emission (9KHz-150KHz)	±2.79dB
7	Conducted Emission (150KHz-30MHz)	±2.80dB

2 PRODUCT INFORMATION

Product Name	Smart Watch
Trade Name	YQT
Model Name	T5
Series Model	Q1, Q2, Q5, Q6, Q6S, Q7S, Q9, Q11, Q11S, Q11CW, Q12, Q12G, Q12B, Q12CW, Q12W, Q12T, Q13, Q13W, Q15, Q15F, Q16, Q17, Q18, Q18F, Q19, Q19F, Q19CW, Q19-XZ6, Q19-360, Q20, Q21, Q22, Q23, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q50, Q523, Q523-1.22, Q528, Q529, Q750, Q610S, Q60, Q60S, Q49, Q68, Q72, Q86, T3, T5S, T6, T8, T8W, T8L, T10, T10S, T10-360, T11, T12, T13, T15, T16, T17, T18, T19, T20, T27,T28, T29, T30, T31, T32, T33, T35, T36, W02S, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, Q13Z, Z1, S20
Model Difference	Only difference in model names and appearance.
Tx Frequency:	GSM/GPRS/EDGE: 850: 824 MHz ~ 849MHz 1900: 1850 MHz ~ 1910MHz WCDMA: Band V: 824 MHz ~ 849 MHz Band II: 1850 MHz ~ 1910 MHz
Rx Frequency:	GSM/GPRS/EDGE: 850: 869 MHz ~ 894 MHz 1900: 1930 MHz ~ 1990MHz WCDMA: Band V: 869 MHz ~ 894 MHz Band II: 1930 MHz ~ 1990 MHz
Max RF Output Power:	GSM850:30.72dBm, PCS1900:27.85dBm GPRS850(1-Slot):30.33dBm, GPRS1900(1-Slot):27.55dBm GPRS850(2-Slot):29.85dBm, GPRS1900(2-Slot):27.11dBm GPRS850(3-Slot):29.36dBm, GPRS1900(3-Slot):26.68dBm GPRS850(4-Slot):28.92dBm, GPRS1900(4-Slot):26.19dBm EDGE 850(1-Slot):30.15dBm, EDGE 1900(1-Slot):27.22dBm EDGE 850(2-Slot):29.39dBm, EDGE 1900(2-Slot):26.45dBm EDGE 850(3-Slot):28.67dBm, EDGE 1900(3-Slot):25.71dBm EDGE 850(4-Slot):27.93dBm, EDGE 1900(4-Slot):24.94dBm WCDMA Band V:21.17dBm, WCDMA Band II:21.65dBm
Type of Emission:	GSM(850): 305KGXW; PCS(1900): 307KGXW GPRS(850): 325KGXW; GPRS(1900): 318KGXW EDGE(850): 315KG7W; EDGE(1900): 313KG7W WCDMA850: 4M65F9W WCDMA1900: 4M65F9W
Modulation Characteristics:	GMSK for GSM/GPRS; GMSK and 8PSK for EDGE WCDMA: QPSK; HSDPA:QPSK/16QAM; HSUPA:BPSK
SIM Card:	Only support single SIM Card.
Antenna:	PIFA
Antenna gain:	0 dBi

Battery:	Rated Voltage:3.7V Charge Limit Voltage:4.2V Capacity: 680mAh
Power Rating:	Input: DC 5V 1A
GPRS/EDGE Class:	Multi-Class12
Extreme Vol. Limits:	DC 3.5V~ DC 4.2V(Normal: DC 3.7V)
Extreme Temp. Tolerance:	-30℃ to +50℃
Hardware version number:	G4H-MB-V1.0
Software version number:	G4P_EMMC_240_5M_COMMON_OVERSEA_20190919_17.19.00
Note: 1. The High Voltage 3.5V and Low Voltage 4.2V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage. 2. The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.	

3 TEST CONFIGURATION OF EQUIPMENT UNDER TEST

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 and ANSI C63.26 2015 Power Meas. License Digital Systems with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 10th harmonic for GSM850 and WCDMA Band V.

2. 30 MHz to 10th harmonic for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

	TEST MODES	
BAND	RADIATED TCS	CONDUCTED TCS
GSM 850	GSM LINK GPRS/EDGE CLASS 12 LINK	GSM LINK GPRS/EDGE CLASS 12 LINK
GSM 1900	GSM LINK GPRS/EDGE CLASS 12 LINK	GSM LINK GPRS/EDGE CLASS 12 LINK
WCDMA BAND V	RMC 12.2KBPS LINK	RMC 12.2KBPS LINK
WCDMA BAND II	RMC 12.2KBPS LINK	RMC 12.2KBPS LINK

RF Function	Band	Mode	Modulation	Power Class	Ant Gain(dBi)	Ant Type	SIM Card
GSM	850	GSM	GMSK	4(power control level 5)	0	PIFA	2 SIM 1 is used to tested.
		GPRS (Class12)	GMSK	4			
		EDGE(Class12)	GMSK, 8PSK	E2			
	1900	GSM	GMSK	1(power control level 0)			
		GPRS (Class12)	GMSK	1			
		EDGE(Class12)	GMSK, 8PSK	E2			
RF Function	Band	Mode	Modulation	Power Class	Ant Gain(dBi)	Ant Type	SIM Card
WCDMA	2/5	WCDMA	QPSK	3	0	PIFA	2 SIM 1 is used to tested.
		HSDPA	QPSK, 16QAM				
		HSUPA	BPSK				

4 MEASUREMENT INSTRUMENTS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2020.10.12	2021.10.11
Signal Analyzer	R&S	FSV 40-N	101823	2020.10.10	2021.10.09
Signal Generator	Agilent	83752A	3610A02740	2020.10.10	2021.10.09
Wireless Communications Test Set	R&S	CMW 500	133884	2020.03.05	2021.03.04
Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2019.10.15	2021.10.14
Bilog Antenna	TESEQ	CBL6111D	45873	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1343	2020.10.12	2022.10.11
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2020.10.12	2022.10.11
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2020.10.12	2021.10.11
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2020.10.12	2021.10.11
Pre-Amplifier (18G-40GHz)	SKET	LNPA-1840-50	SK2018101801	2020.10.10	2021.10.09
Turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
Test SW	BALUN	BL410-E/18.905			

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Universal Radio communication tester	R&S	CMU200	119907	2020.10.12	2021.10.11
Wireless Communications Test Set	R&S	CMW 500	133884	2020.03.05	2021.03.04
Signal Analyzer	Agilent	N9020A	MY52440124	2020.03.05	2021.03.04
Temperature& Humidity test chamber	Safety test	AG80L	171200018	2020.03.05	2021.03.04
Programmable power supply	Agilent	E3642A	MY40002025	2020.10.12	2021.10.11
Temperature & Humidity	SW-108	SuWei	N/A	2020.03.07	2021.03.06
Temperature & Humidity	HH660	Mieo	N/A	2019.10.17	2020.10.16
Test SW	FARAD	LZ-RF /LzRf-3A3			

Equipment with a calibration date of “NCR” shown in this list was not used to make direct calibrated measurements.

5 TEST ITEMS

5.1 CONDUCTED OUTPUT POWER

TEST OVERVIEW

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

TEST PROCEDURES

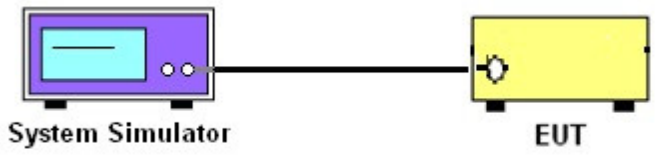
1. The transmitter output port was connected to the system simulator.

2. Set eut at maximum power through the system simulator.

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Measure and record the power level from the system simulator.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 1.

5.2 PEAK TO AVERAGE RATIO

TEST OVERVIEW

According to §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 db.

TEST PROCEDURES

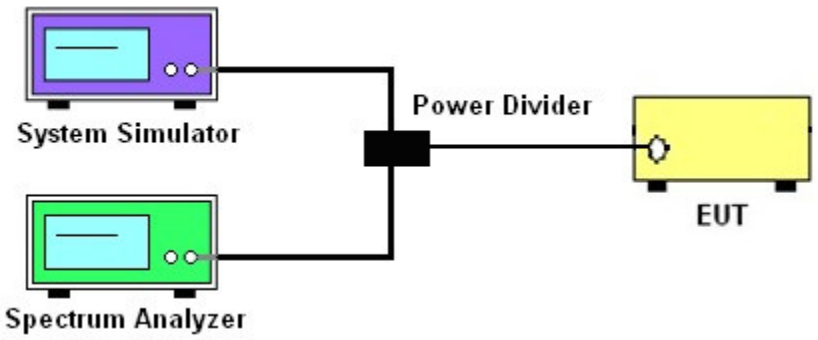
1. The testing follows FCCKDB 971168 v03r01 section.

2. The eut was connected to the spectrum analyzer and peak and av system simulator& spectrum analysis reads.

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Set the test probe and measure average power of the spectrum analysis.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 2.

5.3 TRANSMITTER RADIATED POWER (EIRP/ERP)

TEST OVERVIEW

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI C63.26 2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

TEST PROCEDURE

1. The testing follows FCC KDB 971168 Section 5.8 and ANSI C63.26-2015 Section 5.2.
2. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.
3. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
4. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
5. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a nonradiating cable. The absolute levels of the spurious emissions were measured by the substitution.
6. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to ANSI C63.26-2015. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.

EIRP=S.G Level+ Gain-Cable loss; ERP=S.G Level+ Gain-Cable loss-2.15.

TEST RESULT

Note: Test data See Appendix 3.

5.4 OCCUPIED BANDWIDTH

TEST OVERVIEW

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

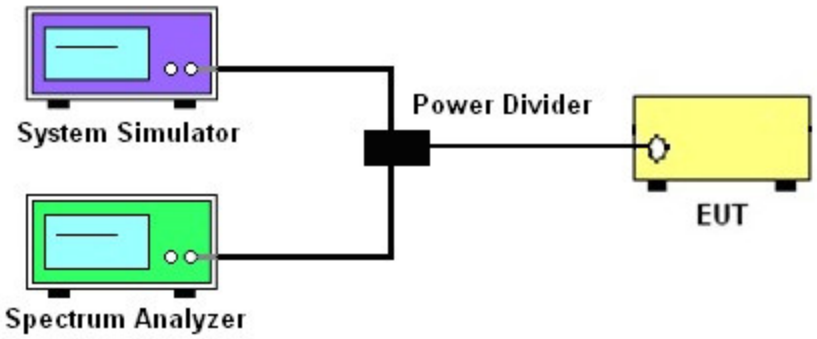
The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 Db below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

All modes of operation were investigated and the worst case configuration results are reported in this section.

TEST PROCEDURE

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7.The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

TEST SETUP



TEST RESULT

Note: Test data See Appendix 4.

5.5 FREQUENCY STABILITY

TEST OVERVIEW

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26 2015. The frequency stability of the transmitter is measured by:

a.) Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

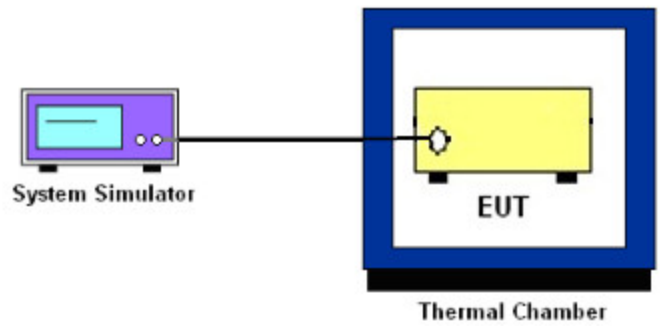
Temperature Variation

1. The testing follows FCC KDB 971168 D01 section 9.0
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

Voltage Variation

1. The testing follows FCC KDB 971168 D01 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 5.