

APPLICATION FOR VERIFICATION
On Behalf of
SHENZHEN QIAOHUA INDUSTRIES LIMITED

Receiver

Model No.: QT-14R,QT-10R,QT-11R,QT-13R,QT-12R,QT-15R,QT-16R

FCC ID: 2AAV8QT-14R

Prepared for : SHENZHEN QIAOHUA INDUSTRIES LIMITED
Address : Qiaohua Industrial Zone, Luo Tian Forestry Center,Song Gang
Town, Bao An District,Shenzhen, Guangdong, China

Prepared by : Accurate Technology Co., Ltd.
Address : F1, Bldg. A&D, Changyuan New Material Port, Keyuan
Rd., Science & Industry Park, Nanshan District, Shenzhen
518057, P.R. China

Tel: +86-755-26503290
Fax: +86-755-26503396

Report No. : ATE20142301
Date of Test : Nov 20-28,2014
Date of Report : Dec 02,2014

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Test Report Declaration

Applicant : SHENZHEN QIAOHUA INDUSTRIES LIMITED
Manufacturer : SHENZHEN QIAOHUA INDUSTRIES LIMITED
EUT Description : Receiver
(A) MODEL NO.:
QT-14R,QT-10R,QT-11R,QT-13R,QT-12R,QT-15R,QT-16R
(B) SERIAL NO.: N/A
(C) POWER SUPPLY: AC 120V


Measurement Procedure Used:

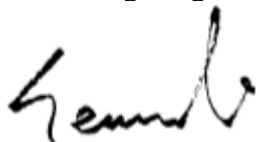
FCC Rules and Regulations Part 15 Subpart B ANSI C63.4: 2009

The device described above is tested by Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Accurate Technology Co., Ltd.

Date of Test : Nov 20-Dec 02,2014
Date of Report : Dec 02,2014

Prepared by : 
(Eric Zhang, Engineer)

Approved & Authorized Signer : 
(Sean Liu, Manager)

1. TEST RESULTS SUMMARY

Test Items	Test Standard	Test Results
Power Line Conducted Emission	FCC Part 15 Subpart B	Pass
Radiated Emission	FCC Part 15 Subpart B	Pass

2. GENERAL INFORMATION

2.1. Product of Device (EUT)

EUT	: Receiver
Model Number	: QT-14R,QT-10R,QT-11R,QT-13R,QT-12R,QT-15R,QT-16R Note: These samples are same except for the model number and colors are difference. So we prepare the QT-14R for test
Power Supply	: AC 120V
Modulation:	: ASK
Operation Frequency	: 433.92MHz Receiver
Applicant	: SHENZHEN QIAOHUA INDUSTRIES LIMITED
Address	: Qiaohua Industrial Zone, Luo Tian Forestry Center, Song Gang Town, Bao An District, Shenzhen, Guangdong, China
Manufacturer	: SHENZHEN QIAOHUA INDUSTRIES LIMITED
Address	: Qiaohua Industrial Zone, Luo Tian Forestry Center, Song Gang Town, Bao An District, Shenzhen, Guangdong, China
Date of sample received	: Nov 20, 2014
Date of Test	: Nov 20-28, 2014

2.2. Accessory and Auxiliary Equipment

NA

2.3. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen, May 10, 2004

Listed by FCC
The Registration Number is 253065

Listed by FCC
The Registration Number is 752051

Listed by Industry Canada
The Registration Number is 5077A-1

Listed by Industry Canada
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee for Laboratories
The Certificate Registration Number is L3193

Name of Firm : Accurate Technology Co., Ltd.
Site Location : F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P.R. China

2.4. Measurement Uncertainty

Conducted emission expanded uncertainty : U=2.23dB, k=2

Power disturbance expanded uncertainty : U=2.92dB, k=2

Radiated emission expanded uncertainty : U=3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty : U=4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty : U=4.06dB, k=2
(Above 1GHz)

3. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

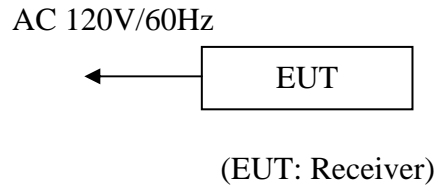
Kind of equipment	Manufacturer	Type	S/N	Calibrated date	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 11, 2014	Jan. 10, 2015
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 11, 2014	Jan. 10, 2015
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 11, 2014	Jan. 10, 2015
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 11, 2014	Jan. 10, 2015
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2014	Jan. 14, 2015
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 15, 2014	Jan. 14, 2015
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 11, 2014	Jan. 10, 2015
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 11, 2014	Jan. 10, 2015

4. POWER LINE CONDUCTED MEASUREMENT

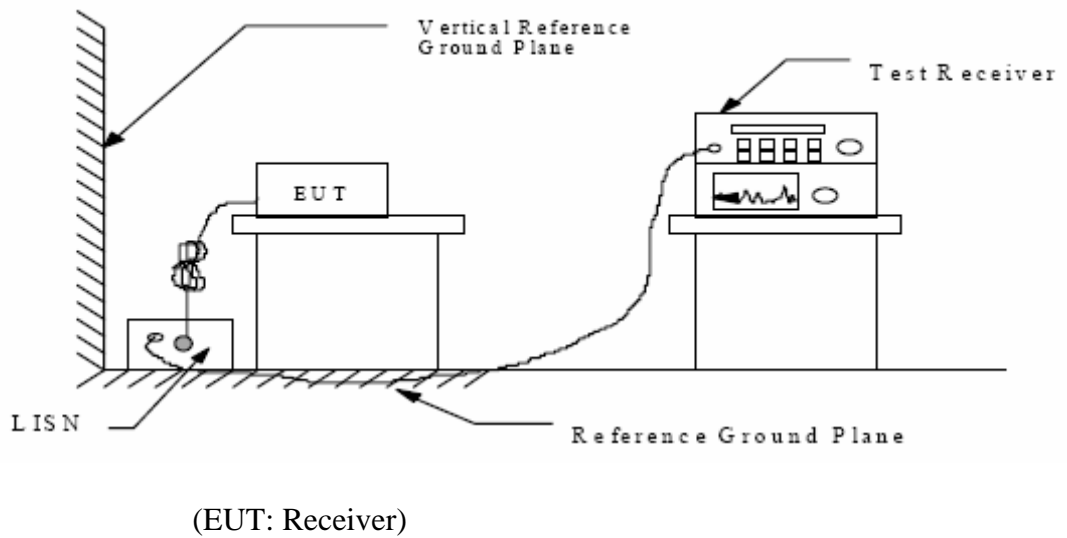
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators

4.1.1.1. For Transfer data



4.1.2. Shielding Room Test Setup Diagram



4.2. The Emission Limit

4.2.1. Conducted Emission Measurement Limits According to Section 15.107(a)

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 - 56.0 *	56.0 - 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

* Decreases with the logarithm of the frequency.

4.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

4.3.1. Receiver (EUT)

Model Number: QT-14R

Serial Number: N/A

Manufacturer: SHENZHEN QIAOHUA INDUSTRIES LIMITED

4.4. Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 3.2.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in test mode and measure it.

4.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

4.6. Power Line Conducted Emission Measurement Results

PASS.

Test Mode: RX								
MEASUREMENT RESULT: "2301-1_fin"								
2014-11-26 10:09								
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE	
0.150000	36.80	10.3	66	29.2	QP	L1	GND	
1.454000	13.40	11.6	56	42.6	QP	L1	GND	
29.751500	3.50	12.0	60	56.5	QP	L1	GND	
MEASUREMENT RESULT: "2301-1_fin2"								
2014-11-26 10:09								
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE	
0.150000	22.50	10.3	56	33.5	AV	L1	GND	
1.238000	9.60	11.6	46	36.4	AV	L1	GND	
29.333000	-1.70	12.0	50	51.7	AV	L1	GND	
MEASUREMENT RESULT: "2301-2_fin"								
2014-11-26 10:11								
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE	
0.150000	28.60	10.3	66	37.4	QP	N	GND	
1.088000	14.50	11.6	56	41.5	QP	N	GND	
28.235000	0.90	12.0	60	59.1	QP	N	GND	
MEASUREMENT RESULT: "2301-2_fin2"								
2014-11-26 10:11								
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE	
0.150000	22.70	10.3	56	33.3	AV	N	GND	
1.272000	9.70	11.6	46	36.3	AV	N	GND	
29.270000	1.90	12.0	50	48.1	AV	N	GND	

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are shown in the following pages.

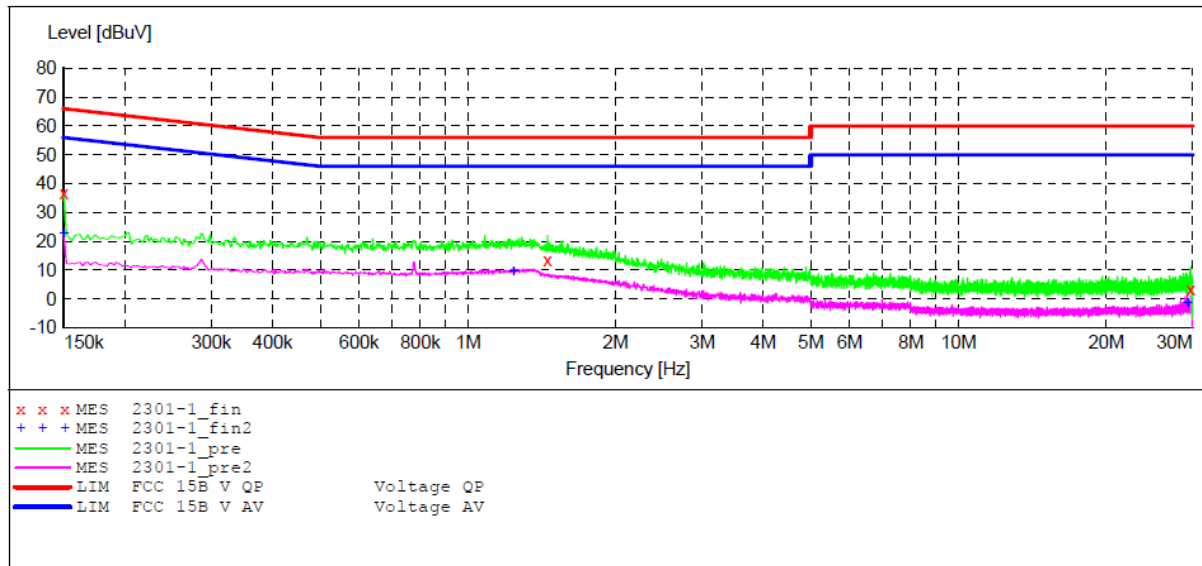
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Receiver M/N:QT-14R
 Manufacturer: QIAOHUA
 Operating Condition: RX
 Test Site: 2#Shielding Room
 Operator: Carry
 Test Specification: L 120V/60Hz
 Comment: Report NO.:ATE20142301
 Start of Test: 2014-11-26 / 10:07:33

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN (ESH3-Z5)
 Average



MEASUREMENT RESULT: "2301-1_fin"

2014-11-26 10:09

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	36.80	10.3	66	29.2	QP	L1	GND
1.454000	13.40	11.6	56	42.6	QP	L1	GND
29.751500	3.50	12.0	60	56.5	QP	L1	GND

MEASUREMENT RESULT: "2301-1_fin2"

2014-11-26 10:09

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	22.50	10.3	56	33.5	AV	L1	GND
1.238000	9.60	11.6	46	36.4	AV	L1	GND
29.333000	-1.70	12.0	50	51.7	AV	L1	GND

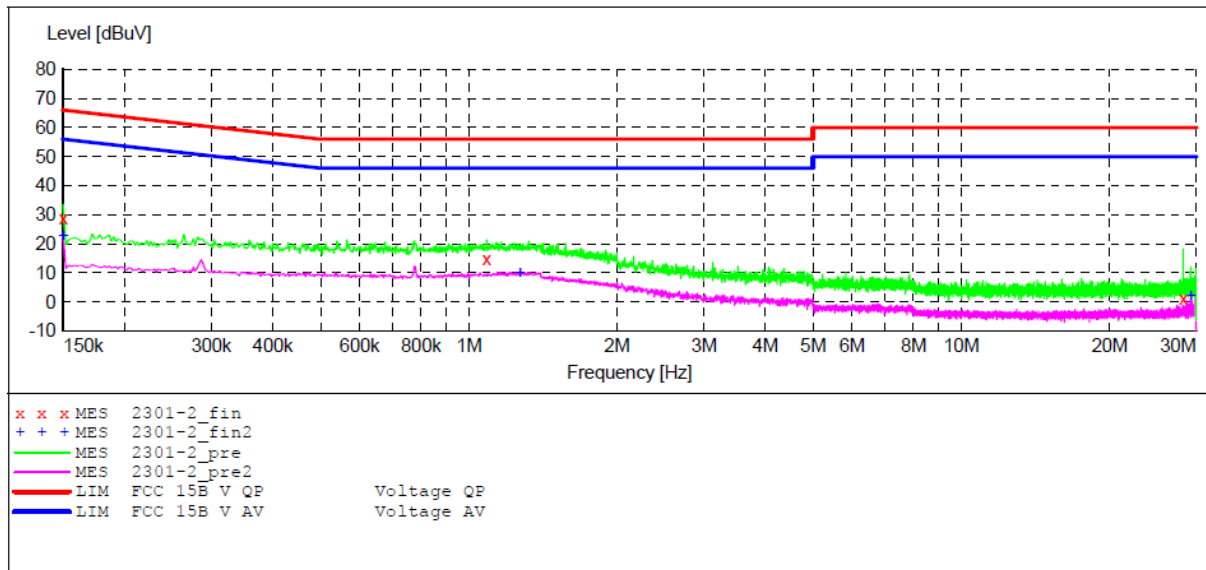
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Receiver M/N:QT-14R
 Manufacturer: QIAOHUA
 Operating Condition: RX
 Test Site: 2#Shielding Room
 Operator: Carry
 Test Specification: N 120V/60Hz
 Comment: Report NO.:ATE20142301
 Start of Test: 2014-11-26 / 10:10:08

SCAN TABLE: "V 150K-30MHZ fin"

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.5 kHz	QuasiPeak	1.0 s	9 kHz	LISN (ESH3-Z5)
			Average			



MEASUREMENT RESULT: "2301-2_fin"

2014-11-26 10:11

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	28.60	10.3	66	37.4	QP	N	GND
1.088000	14.50	11.6	56	41.5	QP	N	GND
28.235000	0.90	12.0	60	59.1	QP	N	GND

MEASUREMENT RESULT: "2301-2_fin2"

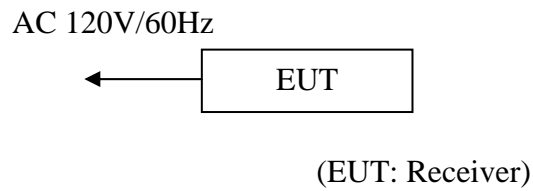
2014-11-26 10:11

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	22.70	10.3	56	33.3	AV	N	GND
1.272000	9.70	11.6	46	36.3	AV	N	GND
29.270000	1.90	12.0	50	48.1	AV	N	GND

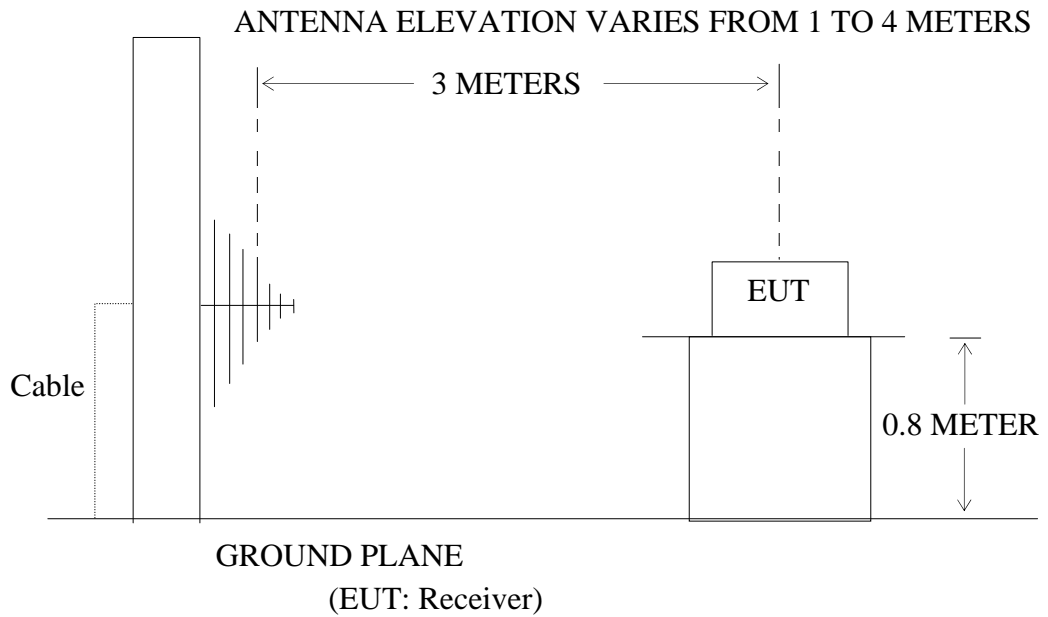
5. RADIATED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



5.1.2. Semi-Anechoic Chamber Test Setup Diagram



5.2.The Emission Limit For Section 15.109 (a)

5.2.1.Radiation Emission Measurement Limits According to Section 15.109 (a).

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V/m})$
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
960-1000	3	500	54.0

Remark: (1) Emission level $\text{dB}(\mu\text{V}) = 20 \log$ Emission level $\mu\text{V/m}$.
 (2)The smaller limit shall apply at the cross point between two frequency bands.
 (3)Distance is the distance in meters between the measuring instrument antenna and the closest point of any part of the device or system.

5.3.EUT Configuration on Measurement

The following equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3.1.Receiver

Model Number: QT-14R

Serial Number: N/A

Manufacturer: SHENZHEN QIAOHUA INDUSTRIES LIMITED

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 4.2.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in test mode (Rx) and measure it.

5.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2009 on radiated emission measurement.

The bandwidth of the EMI test receiver (R&S ESCS30) is set at 120kHz from

30MHz to 5000MHz.

The frequency range from 30MHz to 5000MHz is checked.

5.6.Radiated Emission Noise Measurement Result

PASS.

Model Number: QT-14R								
Test mode: RX								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	224.5192	34.81	-21.79	13.02	46.00	-32.98	QP
	2	361.7139	30.25	-18.15	12.10	46.00	-33.90	QP
	3	776.8777	26.71	-10.97	15.74	46.00	-30.26	QP
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	224.5192	35.42	-21.79	13.63	46.00	-32.37	QP
	2	364.2595	30.19	-18.13	12.06	46.00	-33.94	QP
	3	860.0352	27.32	-9.69	17.63	46.00	-28.37	QP
ABOVE1G								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	2130.048	41.41	-8.43	32.98	54.00	-21.02	peak
	2	2603.663	42.07	-6.76	35.31	54.00	-18.69	peak
	3	3717.803	39.75	-2.19	37.56	54.00	-16.44	peak
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	2140.419	41.98	-8.44	33.54	54.00	-20.46	peak
	2	2949.377	41.55	-5.57	35.98	54.00	-18.02	peak
	3	4077.258	41.77	-1.15	40.62	54.00	-13.38	peak



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg.A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

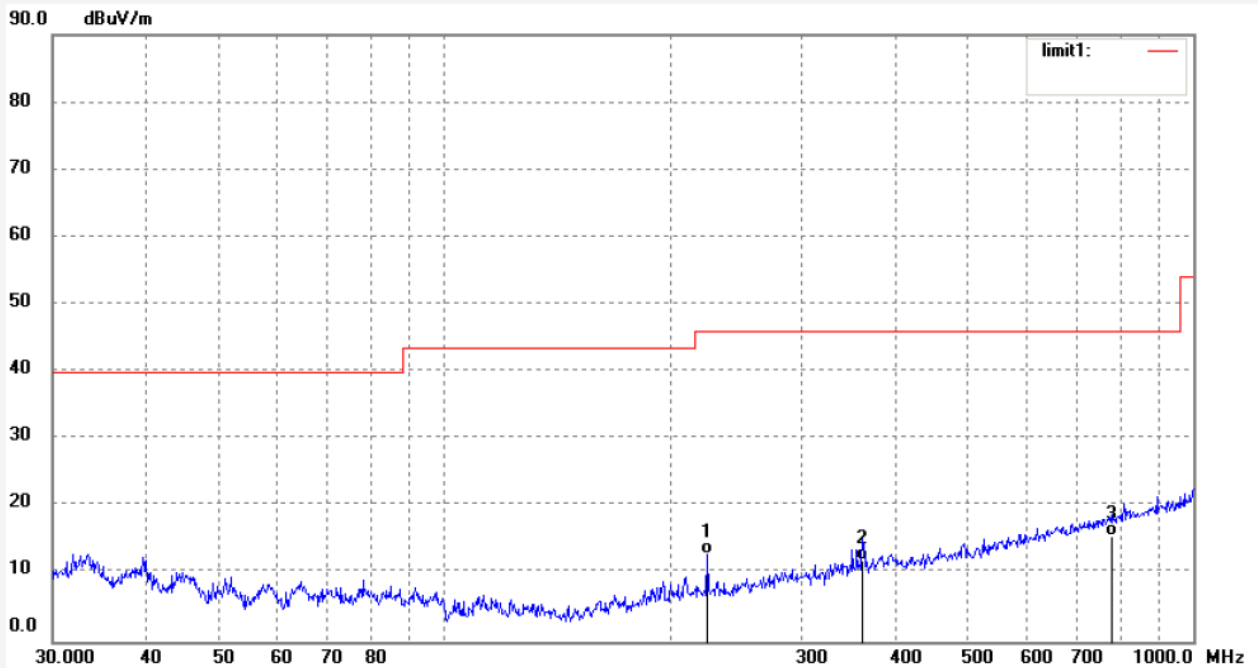
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: WCARRY #327
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Receiver
Mode: RX
Model: QT-14R
Manufacturer: QIAOHUA

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 14/11/21/
Time: 9/56/05
Engineer Signature: Carry
Distance: 3m

Note: Report NO.:ATE20142301



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	224.5192	34.81	-21.79	13.02	46.00	-32.98	QP			
2	361.7139	30.25	-18.15	12.10	46.00	-33.90	QP			
3	776.8777	26.71	-10.97	15.74	46.00	-30.26	QP			



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

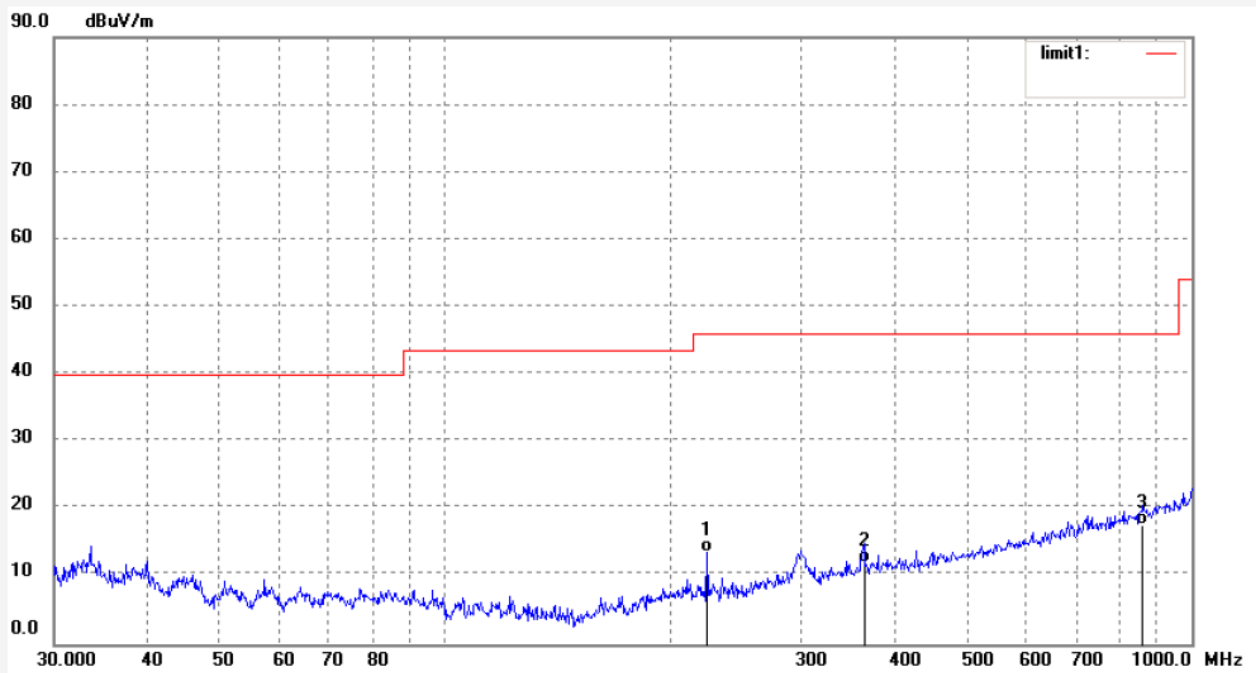
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: WCARRY #328
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Receiver
Mode: RX
Model: QT-14R
Manufacturer: QIAOHUA

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 14/11/21/
Time: 9/56/57
Engineer Signature: Carry
Distance: 3m

Note: Report NO.:ATE20142301



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	224.5192	35.42	-21.79	13.63	46.00	-32.37	QP			
2	364.2595	30.19	-18.13	12.06	46.00	-33.94	QP			
3	860.0352	27.32	-9.69	17.63	46.00	-28.37	QP			



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

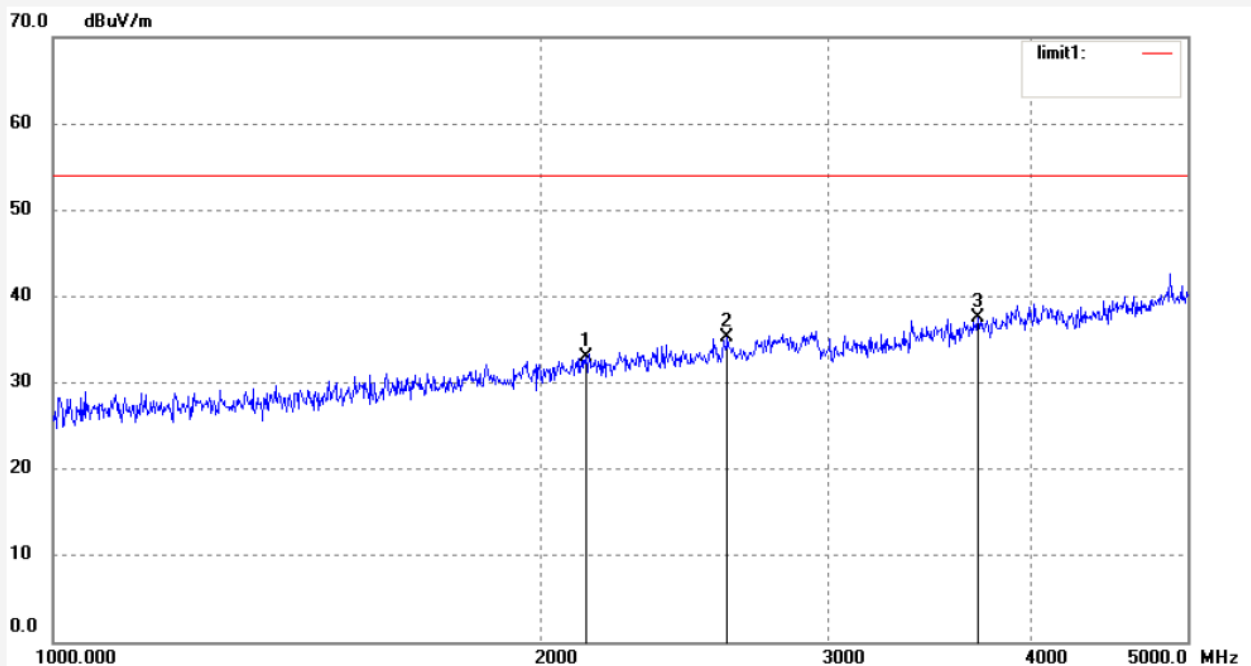
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: wcarry #343
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Receiver
Mode: RX
Model: QT-14R
Manufacturer: QIAOHUA

Polarization: Horizontal
Power Source: DC 12V
Date: 2014/11/27
Time: 11:47:32
Engineer Signature: Carry
Distance: 3m

Note: Report NO.:ATE20142301



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2130.048	41.41	-8.43	32.98	54.00	-21.02	peak			
2	2603.663	42.07	-6.76	35.31	54.00	-18.69	peak			
3	3717.803	39.75	-2.19	37.56	54.00	-16.44	peak			

Job No.: wcarry #344

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Receiver

Mode: RX

Model: QT-14R

Manufacturer: QIAOHUA

Polarization: Vertical

Power Source: DC 12V

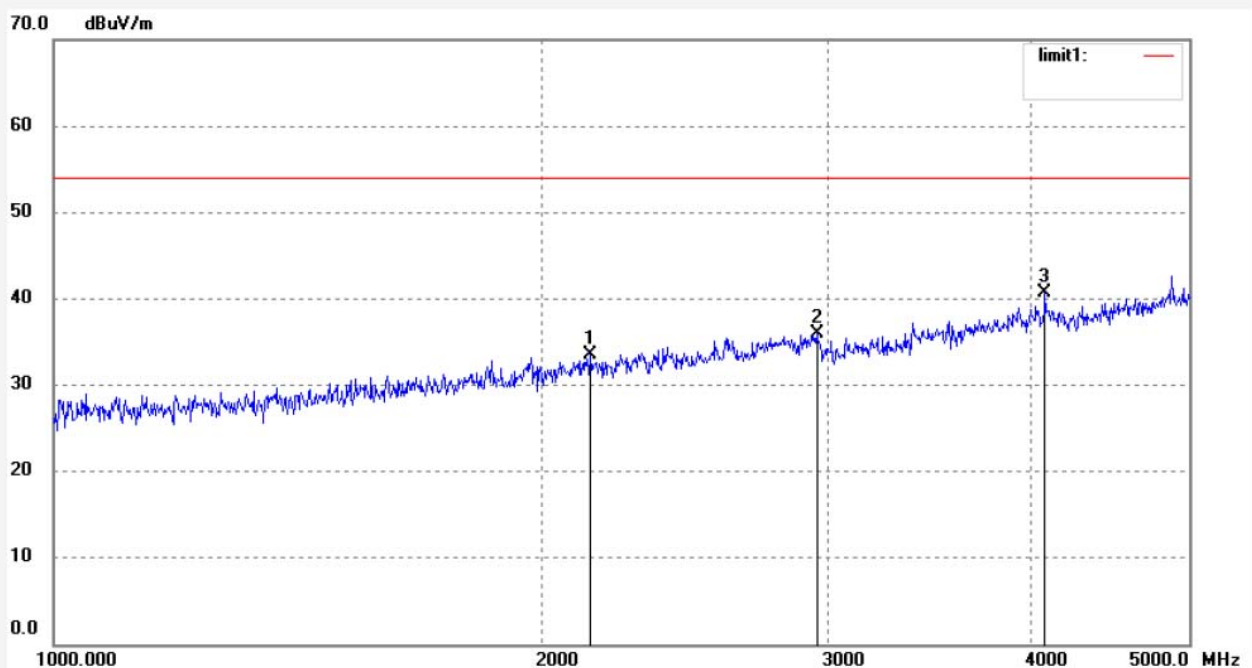
Date: 2014/11/27

Time: 11:47:42

Engineer Signature: Carry

Distance: 3m

Note: Report NO.:ATE20142301



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2140.419	41.98	-8.44	33.54	54.00	-20.46	peak			
2	2949.377	41.55	-5.57	35.98	54.00	-18.02	peak			
3	4077.258	41.77	-1.15	40.62	54.00	-13.38	peak			