



# **TEST REPORT**

Applicant:	FEIYUE TOYS FACTORY
Address:	CHENGHUA STREET, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, China.

Manufacturer or Supplier	FEIYUE TOYS FACTORY
Address	CHENGHUA STREET, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, China
Product:	HIGH SPEED MODEL CAR
Brand Name:	N/A
Model:	FYGS0001TX
Additional Model & Model Difference	FYGS0001RX; See items 2.1
Date of tests:	Nov. 05, 2015 ~ Nov. 24, 2015

the tests have been carried out according to the requirements of the following standard:

□ FCC Part 15, Subpart C, Section 15.249(2014-10)

Herse

CONCLUSION: The submitted sample was found to **COMPLY** with the test requirement

Tested by Heise Chen	Approved by Chris Chen
Project Engineer / EMC Department	Assistant Manager / EMC Department

Date: Nov. 24, 2015

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# **RELEASE CONTROL RECORD**

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF150914N082	Original release	Nov. 24, 2015

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# **SUMMARY OF TEST RESULTS**

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)					
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK		
§15.203	Antenna Requirement	PASS	No antenna connector is used		
§15.207 (a)	Conducted Emission	N/A	EUT is powered by battery		
§15.205	Restricted Band of Operation	PASS	Compliant		
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant		
§15.215(c)	20dB Bandwidth Test	PASS	Compliant		

# **MEASUREMENT UNCERTAINTY**

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
	9KHz ~ 30MHz	2.74dB
Radiated emissions	30MHz ~ 1GHz	3.55dB
Radiated efflissions	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	4.84dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

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# 3 GENERAL INFORMATION

### 3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	HIGH SPEED MODEL CAR
MODEL NO.	FYGS0001TX
ADDITIONAL MODELS	FYGS0001RX
FCC ID	2AGOA-FY20151130
NOMINAL VOLTAGE	DC 6V(1.5V*AA*4) From Battery
MODULATION TECHNOLOGY	GFSK
OPERATING FREQUENCY	2412MHz-2475MHz
ANTENNA TYPE	Wire Antenna, 0dBi Gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

#### NOTE:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- 2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
- 3. Please refer to the EUT photo document (Reference No.: 150914N082) for detailed product photo.
- 4. Additional model FYGS0001RX is identical with the test model FYGS0001TX except the model no. for trading purpose.

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# 3.2 DESCRIPTION OF TEST MODES

EUT CONFIGURE	APPLICABLE TO				DESCRIPTION
MODE	RE<1G	RE≥1G	PLC	BW	DESCRIPTION
-	√	$\checkmark$	-	√	Powered by DC 6V from battery

Where RE<1G: Radiated Emission below 1GHz RE≥1G: Radiated Emission above 1GHz

PLC: Power Line Conducted Emission BW: 20db bandwidth

Following channel(s) was (were) selected for the test as listed below.

TESTED CHANNEL	TESTED FREQUENCY
Low	2412 MHz
Middle	2445 MHz
High	2475 MHz

Note: The more detailed channel, please refer to the product specifications

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### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.249(2014-10) ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

**NOTE:** It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B Verification. The test report has been issued separately.

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together without any other necessary accessories or support units

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# **TEST TYPES AND RESULTS**

#### RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

### NOTE:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

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# 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 27,15	Apr. 26,16
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Apr. 23,15	Apr. 22,16
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 16, 15	Jul. 15, 16
Horn Antenna	ETS-Lindgren	3117	00062558	May 30,14	May 29,16
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,15	Mar. 03, 16
Pre-Amplifier (0.5~18GHz)	SCHWARZBECK	BBV 9718	9718-266	Mar 26,14	Mar 25,16
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 15	Aug. 07, 16
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	April. 19,14	April. 18,16
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 21,14	Jan. 20,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Jan. 21,14	Jan. 20,17

# NOTE:

- 1. The test was performed in 966 Chamber.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
- 3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
- 4. The FCC Site Registration No. is 494399.

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#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

#### NOTE:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported.
- 5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file Test Setup Photo.

### 4.1.4 DEVIATION FROM TEST STANDARD

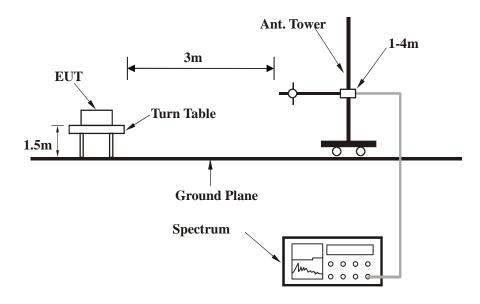
No deviation.

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# 4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

# 4.1.6 EUT OPERATING CONDITIONS

- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

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# 4.1.7 TEST RESULTS

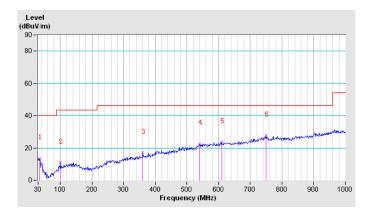
#### **BELOW 1GHz WORST-CASE DATA**

CHANNEL	TX Middle Channel	DETECTOR	Ougsi Poek (OD)
FREQUENCY RANGE	30MHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)			
1	34.22	13.50	40.00	-26.50	100	0	27.87	-14.37			
2	100.29	10.99	43.50	-32.51	100	0	31.07	-20.08			
3	360.36	17.04	46.00	-28.96	100	0	30.12	-13.08			
4	540.30	22.65	46.00	-23.35	100	0	28.96	-6.31			
5	609.19	23.51	46.00	-22.49	100	0	29.24	-5.73			
6	749.77	27.73	46.00	-18.27	100	0	30.17	-2.44			

### **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



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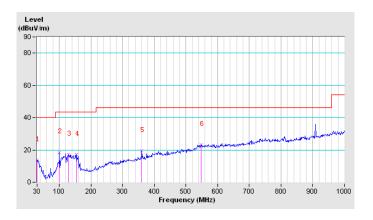


CHANNEL	TX Middle Channel	DETECTOR	Ougoi Book (OD)
FREQUENCY RANGE	30MHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)			
1	30.00	13.62	40.00	-26.38	100	0	25.97	-12.35			
2	100.29	18.48	43.50	-25.02	100	0	38.56	-20.08			
3	129.81	17.30	43.50	-26.20	100	0	35.52	-18.22			
4	153.71	17.28	43.50	-26.22	100	0	36.02	-18.74			
5	360.36	19.35	46.00	-26.65	100	0	32.43	-13.08			
6	547.33	23.22	46.00	-22.78	100	0	29.41	-6.19			

# **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



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# **ABOVE 1GHz WORST-CASE DATA:**

CHANNEL	TX Low Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

		ANTENNA	POLARITY &	& TEST DIS	TANCE: HO	RIZONTAL	AT 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	50.6 PK	74.0	-23.4	1.04 H	267	50.16	0.41
2	2400.00	30.9 AV	54.0	-23.1	1.04 H	267	30.46	0.41
3	2412.00	93.2 PK	114.0	-20.8	1.04 H	267	92.73	0.44
4	2412.00	62.5 AV	94.0	-31.5	1.04 H	267	62.06	0.44
5	4824.00	63.6 PK	74.0	-10.4	1.00 H	186	57.03	6.59
6	4824.00	48.3 AV	54.0	-5.7	1.00 H	186	41.73	6.59
7	7236.00	56.8 PK	74.0	-17.2	1.45 H	215	46.04	10.80
8	7236.00	43.2 AV	54.0	-10.8	1.45 H	215	32.35	10.80
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	50.4 PK	74.0	-23.6	1.41 V	95	49.97	0.41
2	2400.00	32.0 AV	54.0	-22.0	1.41 V	95	31.58	0.41
3	2412.00	91.5 PK	114.0	-22.5	1.41 V	95	91.05	0.44
4	2412.00	62.0 AV	94.0	-32.0	1.41 V	95	61.53	0.44
5	4824.00	67.2 PK	74.0	-6.8	1.78 V	140	60.64	6.59
6	4824.00	50.6 AV	54.0	-3.4	1.78 V	140	44.05	6.59
7	7236.00	57.8 PK	74.0	-16.2	1.03 V	25	47.03	10.80
8	7236.00	43.5 AV	54.0	-10.5	1.03 V	25	32.73	10.80

#### **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.

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CHANNEL	TX Middle Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	2445.00	94.4 PK	114.0	-19.6	1.01 H	275	93.83	0.52		
2	2445.00	63.2 AV	94.0	-30.8	1.01 H	275	62.69	0.52		
3	4890.00	64.1 PK	74.0	-9.9	1.21 H	221	57.34	6.78		
4	4890.00	48.7 AV	54.0	-5.3	1.21 H	221	41.87	6.78		
5	7335.00	57.2 PK	74.0	-16.8	1.41 H	108	46.36	10.80		
6	7335.00	45.3 AV	54.0	-8.7	1.41 H	108	34.48	10.80		
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M			
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	2445.00	95.8 PK	114.0	-18.2	1.19 V	333	95.26	0.52		
2	2445.00	64.1 AV	94.0	-29.9	1.19 V	333	63.57	0.52		
3	4890.00	67.2 PK	74.0	-6.8	1.06 V	149	60.40	6.78		
4	4890.00	50.6 AV	54.0	-3.4	1.06 V	149	43.77	6.78		
5	7335.00	57.8 PK	74.0	-16.2	1.12 V	351	46.96	10.80		
6	7335.00	44.3 AV	54.0	-9.7	1.12 V	351	33.51	10.80		

### **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.

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CHANNEL	TX High Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

		ANTENNA	POLARITY &	& TEST DIS	TANCE: HO	RIZONTAL	AT 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2475.00	95.3 PK	114.0	-18.7	1.92 H	232	94.66	0.59
2	2475.00	63.9 AV	94.0	-30.1	1.92 H	232	63.31	0.59
3	2483.50	56.1 PK	74.0	-17.9	1.92 H	232	55.50	0.61
4	2483.50	42.6 AV	54.0	-11.4	1.92 H	232	41.97	0.61
5	4950.00	64.0 PK	74.0	-10.0	1.05 H	71	57.08	6.96
6	4950.00	49.1 AV	54.0	-4.9	1.05 H	71	42.16	6.96
7	7425.00	56.3 PK	74.0	-17.7	1.39 H	203	45.47	10.80
8	7425.00	43.6 AV	54.0	-10.4	1.39 H	203	32.78	10.80
		ANTENNA	POLARITY	/ & TEST D	STANCE: V	ERTICAL A	T 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2475.00	94.3 PK	114.0	-19.7	1.02 V	347	93.71	0.59
2	2475.00	63.8 AV	94.0	-30.2	1.02 V	347	63.21	0.59
3	2483.50	56.2 PK	74.0	-17.8	1.02 V	347	55.63	0.61
4	2483.50	42.8 AV	54.0	-11.3	1.02 V	347	42.14	0.61
5	4950.00	64.6 PK	74.0	-9.4	1.18 V	274	57.66	6.96
6	4950.00	50.0 AV	54.0	-4.0	1.18 V	274	43.02	6.96
7	7425.00	56.9 PK	74.0	-17.1	1.52 V	30	46.12	10.80
8	7425.00	45.3 AV	54.0	-8.7	1.52 V	30	34.51	10.80

# **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.

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# 4.2 20dB BANDWIDTH MEASUREMENT

### 4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

#### 4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	Feb. 18,15	Feb. 17,16
Power Sensor	Keysight	U2021XA	MY55060018	Feb. 18,15	Feb. 17,16
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16
Oscilloscope	Agilent	DSO9254A	MY51260160	Sep.07,15	Sep. 06,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Sep.07,15	Sep. 06,16
Signal Generator	Agilent	N5183A	MY50140980	Sep.07,15	Sep. 06,16
ESG Vector Signal	Agilopt	E4438C	MY49072505	Apr 22 15	Apr 21 16
Generator	Agilent	E4430C	W149072505	Apr. 22, 15	Apr. 21, 16
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16

#### NOTE:

- 1. The test was performed in RF Oven room.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

#### 4.2.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

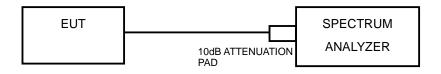
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080



### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

# 4.2.5 TEST SETUP



# 4.2.6 EUT OPERATING CONDITIONS

- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

# 4.2.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2412	1.281
Middle	2445	1.295
High	2475	1.375

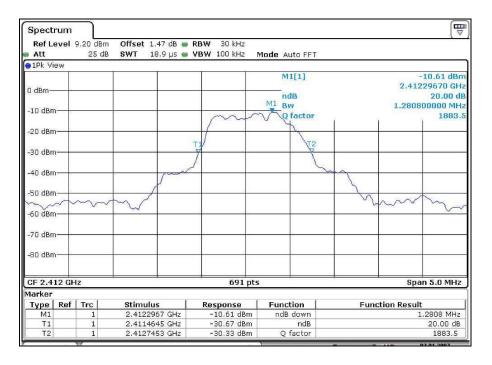
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Email: <a href="mailto:customerservice.dg@cn.bureauveritas.com">customerservice.dg@cn.bureauveritas.com</a>

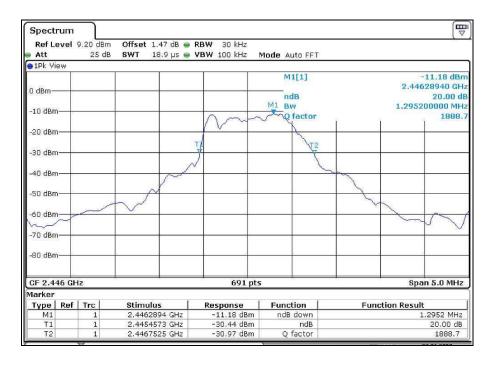
Report Version 1



#### **Test Data: Low channel**



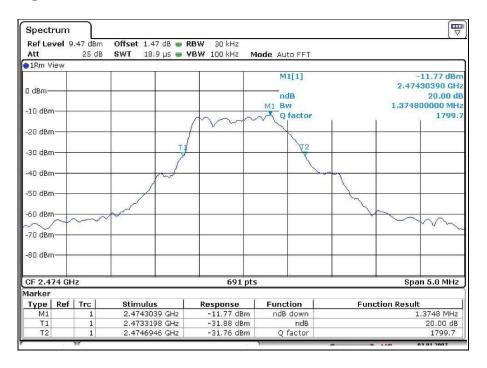
#### **Test Data: Middle channel**



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# **Test Data: High channel**



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# 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

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# 6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---

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