



# **TEST REPORT**

Applicant:	Shantou Dreamhouse Toys Industrial Co., Ltd.
Address:	2nd Floor of Zhaofeng Plastic Toy Factory, Chenghua Street, Chenghai
Audress.	District, Shantou City

Manufacturer or Supplier	Shantou Dreamhouse Toys Industrial Co., Ltd.			
Address	2nd Floor of Zhaofeng Plastic Toy Factory,Chenghua Street, Chenghai District,Shantou City			
Product:	Toy RC LED Lightning Thrasher			
Brand Name:	Sharper Image			
Model:	1012782			
Additional Model & Model Difference				
Date of tests: Jun. 30, 2022 ~ Jul. 05, 2022				

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

#### FCC Part 15, Subpart C, Section 15.249

CONCLUSION: The submitted sample was found to <u>COMPLY</u> with the test requirement

Tested by Loren Luo Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
Lorien	Date: Jul. 13, 2022
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	t sample was taken or any similar or identical product unless specifically

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# RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2205WDG0091	Original release	Jul. 13, 2022



# **1 SUMMARY OF TEST RESULTS**

The EUT has been tested according to the following specifications:

A	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	Power by Battery						
§15.205	Restricted Band of Operation	PASS	Compliant						
§15.209 §15.249(a)			Compliant						
§15.215(c)	20dB Bandwidth Test	PASS	Compliant						

## 2 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	2.66dB
Radiated emissions	30MHz ~ 1GMHz	4.76dB
naulaleu emissions	1GHz ~ 18GHz	4.92dB
	18GHz ~ 40GHz	4.58dB

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



## **3 GENERAL INFORMATION**

## 3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Toy RC LED Lightning Thrasher		
MODEL NO.	1012782		
ADDITIONAL MODEL	101XXXX (where XXXX can be digits 0000-9999 which		
	represent different customers)		
FCC ID	2AO8XMXW2022F		
NOMINAL VOLTAGE	Remote control: DC 9V(9V 6F22*1) from battery;		
	CAR: DC 9V(1.5V*AA*6) from battery		
MODULATION TECHNOLOGY	GFSK		
OPERATING FREQUENCY	2402-2478MHz		
ANTENNA TYPE	Wire Antenna, with 0dBi gain		
I/O PORTS	Refer to user's manual		
CABLE SUPPLIED	N/A		

#### NOTES:

- 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.: 2205WDG0091) for detailed product photo.
- 4. Additional models (see above table) are identical with the test model 1012782 except the color of the appearance, trade name and model number for trading purpose.



## 3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type. The worst case was found when the EUT was positioned on Y axis for radiated emission. The EUT was tested under the following mode.

EUT CONFIGUR	RE	APPLIC	ABLE TO		DECODIDION
MODE	RE<1G	RE≥1G	PLC	BW	DESCRIPTION
А	Α √ √ - √		$\checkmark$	DC 9V from battery	
Where I	DE .1C. Dadi	atad Emior	alon holow	100-	<b>DEN1C:</b> Dedicted Emission shows 10Hz

Where **RE<1G:** Radiated Emission below 1GHz **PLC:** Power Line Conducted Emission **RE≥1G:** Radiated Emission above 1GHz **BW:** 20db bandwidth

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

TESTED CHANNEL	TESTED FREQUENCY
Low	2402 MHz
Middle	2440 MHz
High	2478 MHz



#### **Channel List**

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2402	11	2422	21	2442	31	2462
2	2404	12	2424	22	2444	32	2464
3	2406	13	2426	23	2446	33	2468
4	2408	14	2428	24	2448	34	2470
5	2410	15	2430	25	2450	35	2472
6	2412	16	2432	26	2452	36	2474
7	2414	17	2434	27	2454	37	2476
8	2416	18	2436	28	2456	38	2478
9	2418	19	2438	29	2458		
10	2420	20	2440	30	2460		

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

## **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE	25deg. C, 55%RH	DC 9V from battery	Jelly
BW	25deg. C, 56%RH	DC 9V from battery	Jelly



## 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

### ANSI C63.10-2013

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

## 3.4 DESCRIPTION OF SUPPORT UNITS

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



# 4. TEST TYPES AND RESULTS

## 4.1 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.

#### NOTES:

- 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.



## 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Spectrum Analyzer	Rohde&Schwarz	FSV40-N	101817	Jun 19, 23
Bilog Antenna	SCHWARZBECK	VULB 9168	01281	July 30, 22
Pre-Amplifier	Agilent	8447D	2944A10488	Aug.08, 22
3m Semi-anechoic Chamber	ETS-Lindgren	9m*6m*6m	D3040003DG-1	July 30, 24
Coaxial RF Cable	Joinfront	JFAA6-NMNM-8000	2100033742	Aug.08, 22
Coaxial RF Cable	Joinfront	JFAR-NMBNCM-2000	2100033742	Aug.08, 22
Coaxial RF Cable	Joinfront	JFAR-BNCMSMM-500	2100033742	Aug.08, 22
Test software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A
Horn Antenna	ETS-Lindgren	3117	00240041	July 22, 22
Horn Antenna	SCHWARZBECK	BBHA 9170	01024	Dec. 25, 22
Pre-Amplifier (1GHz-18GHz)	SCHWARZBECK	BBV 9718C	00142	Jun. 14, 23
Pre-Amplifier (18GHz-40GHz)	Rohde&Schwarz	SCU40	100437	Nov. 16, 22
Coaxial RF Cable	Joinfront	JFAA6-NMNM-8000	2100033742	Aug.08, 22
Coaxial RF Cable	Joinfront	JFAA6-NMSMM-2000	2100033742	Aug.08, 22
Coaxial RF Cable	Joinfront	JFAA6-NMSMM-800	2100033742	Aug.08, 22

#### NOTES:

1. The test was performed in 966 Chamber-3 (Baodun).

2. The calibration interval of the above test instruments are 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 above1GHz if tested.

4. The FCC Site Registration No. is 749762.



#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) 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. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. 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.

#### NOTES:

- 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.

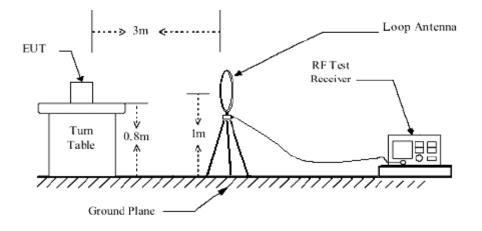
## 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

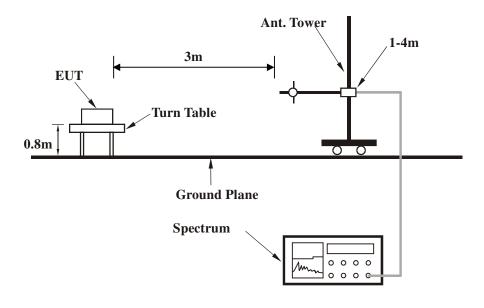


### 4.1.5 TEST SETUP

#### **Below 30MHz test setup**

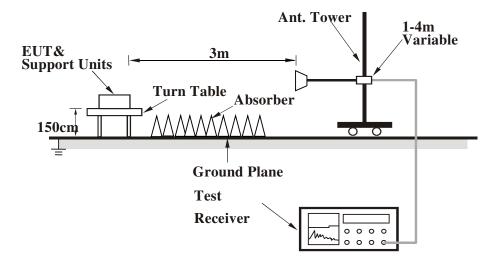


## **Below 1GHz test setup**





#### Above 1GHz test setup



**Note:** 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.



## 4.1.7 TEST RESULTS

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

CHANNEL	TX Middle Channel	DETECTOR	Quesi Besk (QD)
FREQUENCY RANGE	9KHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

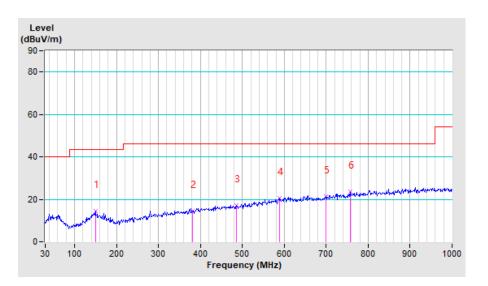
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	149.49	14.58 QP	43.50	-28.92	1.84 H	167	28.27	-13.69	
2	381.45	14.60 QP	46.00	-31.40	2.74 H	194	25.59	-10.99	
3	485.48	17.29 QP	46.00	-28.71	1.09 H	111	26.64	-9.35	
4	588.10	20.66 QP	46.00	-25.34	2.43 H	312	27.53	-6.87	
5	699.16	21.23 QP	46.00	-24.77	2.89 H	330	26.62	-5.39	
6	756.80	23.46 QP	46.00	-22.54	2.27 H	224	27.63	-4.17	

#### **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 emission levels of other frequencies were greater than 20dB margin.

- 4. 9KHz~30MHz have been test and test data more than 20dB margin.
- 5. Margin value = Emission level Limit value.



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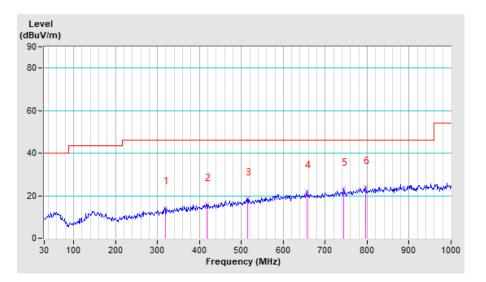


CHANNEL	TX Middle Channel	DETECTOR	Quasi Bask (QB)
FREQUENCY RANGE	9KHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	318.19	14.29 QP	46.00	-31.71	1.14 V	345	26.44	-12.15	
2	418.00	16.03 QP	46.00	-29.97	2.96 V	121	26.44	-10.41	
3	515.00	18.58 QP	46.00	-27.42	1.58 V	244	27.37	-8.79	
4	656.99	22.20 QP	46.00	-23.80	2.77 V	45	28.08	-5.88	
5	744.14	23.11 QP	46.00	-22.89	2.17 V	269	27.54	-4.43	
6	796.16	23.99 QP	46.00	-22.01	2.10 V	300	27.37	-3.38	

#### **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 emission levels of other frequencies were greater than 20dB margin.
- 4. 9KHz~30MHz have been test and test data more than 20dB margin.
- 5. Margin value = Emission level Limit value.





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

CHANNEL	TX Low 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	#2400.00	56.24 PK	74.00	-17.76	1.02 H	156	55.40	0.84
2	#2400.00	27.44 AV	54.00	-26.56	1.02 H	156	26.60	0.84
3	*2402.00	76.99 PK	114.00	-37.01	1.02 H	156	76.14	0.85
4	*2402.00	48.19 AV	94.00	-45.81	1.02 H	156	47.34	0.85
5	4804.00	50.27 PK	74.00	-23.73	1.02 H	136	45.00	5.27
6	4804.00	21.47 AV	54.00	-32.53	1.02 H	136	16.20	5.27
7	#7206.00	51.68 PK	74.00	-22.32	1.07 H	169	41.77	9.91
8	#7206.00	22.88 AV	54.00	-31.12	1.07 H	169	12.97	9.91
		ANTENNA		/ & TEST DI	STANCE: V	ERTICAL A	Т 3 М	
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	56.78 PK	74.00	-17.22	1.06 V	321	55.94	0.84
2	#2400.00	27.98 AV	54.00	-26.02	1.06 V	321	27.14	0.84
3	*2402.00	76.45 PK	114.00	-37.55	1.06 V	321	75.60	0.85
4	*2402.00	47.65 AV	94.00	-46.35	1.06 V	321	46.80	0.85
5	4804.00	48.26 PK	74.00	-25.74	1.50 V	216	42.99	5.27
6	4804.00	19.46 AV	54.00	-34.54	1.50 V	216	14.19	5.27
7	#7206.00	50.36 PK	74.00	-23.64	1.02 V	219	40.45	9.91
8	#7206.00	21.56 AV	54.00	-32.44	1.02 V	219	11.65	9.91

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 emission levels of other frequencies were greater than 20dB margin.

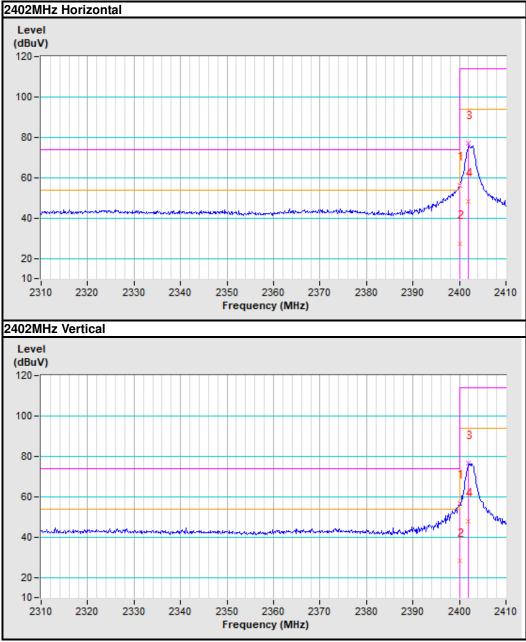
4. Margin value = Emission level – Limit value.

5. " \* ": Fundamental frequency.

6. " # ": The radiated frequency is out of the restricted band.







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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	*2440.00	77.85 PK	114.00	-36.15	1.15 H	265	76.86	0.99
2	*2440.00	49.05 AV	94.00	-44.95	1.15 H	265	48.06	0.99
3	4880.00	52.36 PK	74.00	-21.64	1.05 H	57	46.98	5.38
4	4880.00	23.56 AV	54.00	-30.44	1.05 H	57	18.18	5.38
5	7320.00	53.41 PK	74.00	-20.59	1.02 H	174	43.40	10.01
6	7320.00	24.61 AV	54.00	-29.39	1.02 H	174	14.60	10.01
-		ANTENNA	POLARIT	/ & TEST DI	STANCE: V	ERTICAL A	Т 3 М	-
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	*2440.00	77.46 PK	114.00	-36.54	1.00 V	215	76.47	0.99
2	*2440.00	48.66 AV	94.00	-45.34	1.00 V	215	47.67	0.99
3	4880.00	50.36 PK	74.00	-23.64	1.05 V	57	44.98	5.38
4	4880.00	21.56 AV	54.00	-32.44	1.05 V	57	16.18	5.38
5	7320.00	53.14 PK	74.00	-20.86	1.06 V	68	43.13	10.01
6	7320.00	24.34 AV	54.00	-29.66	1.06 V	68	14.33	10.01

**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 emission levels of other frequencies were greater than 20dB margin.

4. Margin value = Emission level – Limit value.

5. " \* ": Fundamental frequency.



CHANNEL	TX High 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	*2478.00	92.00 PK	114.00	-22.00	1.45 H	220	91.13	0.87	
2	*2478.00	63.20 AV	94.00	-30.80	1.45 H	220	62.33	0.87	
3	2483.50	63.63 PK	74.00	-10.37	1.45 H	220	62.74	0.89	
4	2483.50	34.83 AV	54.00	-19.17	1.45 H	220	33.94	0.89	
5	4956.00	53.17 PK	74.00	-20.83	2.15 H	321	47.69	5.48	
6	4956.00	24.37 AV	54.00	-29.63	2.15 H	321	18.89	5.48	
7	7434.00	56.00 PK	74.00	-18.00	1.22 H	158	46.15	9.85	
8	7434.00	27.20 AV	54.00	-26.80	1.22 H	158	17.35	9.85	
		ANTENNA		/ & TEST DI	STANCE: V	ERTICAL A	Т 3 М		
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	*2478.00	96.58 PK	114.00	-17.42	1.00 V	338	95.71	0.87	
2	*2478.00	67.78 AV	94.00	-26.22	1.00 V	338	66.91	0.87	
3	2483.50	68.82 PK	74.00	-5.18	1.00 V	338	67.93	0.89	
4	2483.50	40.02 AV	54.00	-13.98	1.00 V	338	39.13	0.89	
5	4956.00	53.68 PK	74.00	-20.32	1.28 V	155	48.20	5.48	
6	4956.00	24.88 AV	54.00	-29.12	1.28 V	155	19.40	5.48	
7	7434.00	57.35 PK	74.00	-16.65	2.00 V	147	47.50	9.85	
8	7434.00	28.55 AV	54.00	-25.45	2.00 V	147	18.70	9.85	

#### **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 emission levels of other frequencies were greater than 20dB margin.

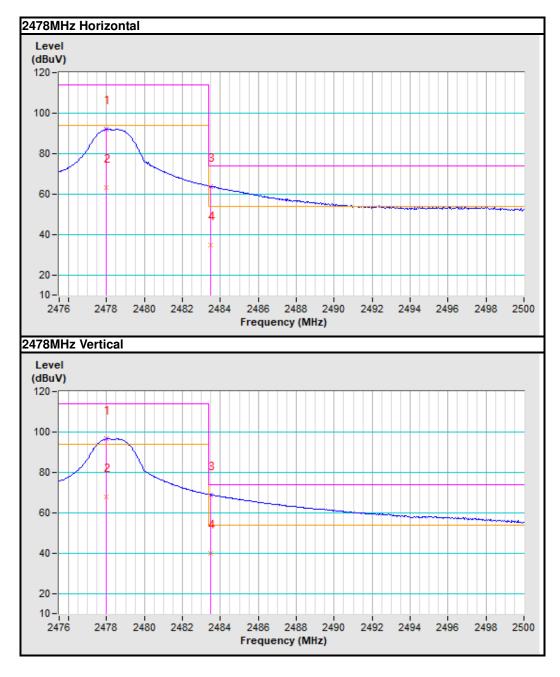
4. Margin value = Emission level – Limit value.

5. " \* ": Fundamental frequency.

6. " # ": The radiated frequency is out of the restricted band.



#### Band edge Plot





## 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

		Model No.	Serial No.	Next Cal.
Wireless Connectivity Tester	Rohde&Schwarz	CMW270	101601	Nov. 21, 22
MXA signal analyzer	Agilent	N9020A	MY49100060	Apr. 18, 23
Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Jan. 16, 23
Frequency Analyzer	Keysight	N9010B	MY60240432	Nov. 25, 22
Progammble Temperature&Humidi ty Chamber	Hongjin	HYC-TH-225DH	DG-180746	Feb. 16, 23
DC Source	Agilent	E3640A	MY40004013	Feb. 23, 23
Test software	ADT	ADT_RF Test Software V6.6.5.3	N/A	N/A
Test software	ADT	ADT_RF Test Software V6.6.5.4	N/A	N/A

#### NOTES:

- 1. The test was performed in RF Shielded room (Baodun).
- 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.

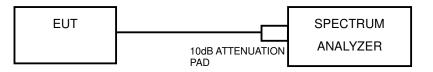
#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 TEST SETUP

Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province. 523942. People's Republic of China.





## 4.2.6 EUT OPERATING CONDITIONS

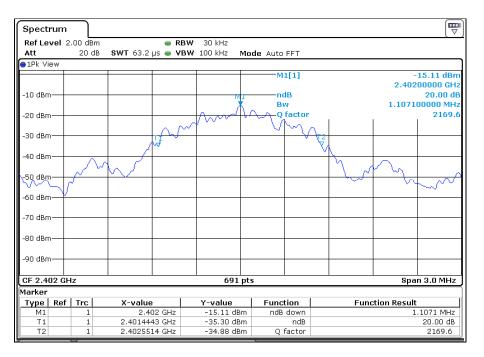
- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

#### 4.2.7 TEST RESULTS

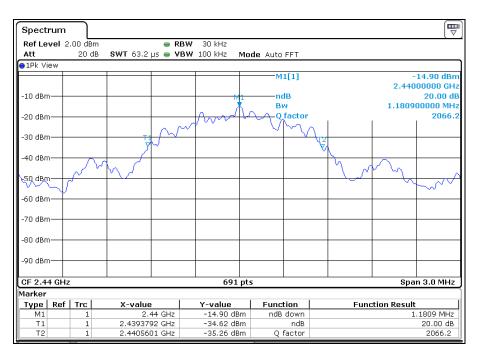
CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)		
Low	2402	1.1071		
Middle	2440	1.1809		
High	2478	1.1896		



#### Test Data: Low channel



#### Test Data: Middle channel



No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province. 523942. People's Republic of China.



#### Test Data: High channel

Spectrum 🕎											
Ref Level 2.00 dBm    RBW 30 kHz											
Att		20 dB	SWT 63.2	µs 👄 VB	W 100 kHz	Mod	e Auto FFT				
😑 1Pk Vi	PPk View										
							M1[1]			-	14.72 dBm
										2.478	00000 GHz
-10 dBm							20.00 dB				
					۸ ۵	Bw			1.1896	00000 MHz	
-20 dBm	1 <u></u> -				$-1/\sqrt{-1}$	442					2083.1
				$\sim$	~1			$\gamma \mid$			
-30 dBm	۱ <u> </u>		- T3	J Ť			· · · ·	12			
			y					- 14	<		
-40 dBm	ı—	$-\Delta$							$\mathcal{V}$		
		N	$M_{J}$							r m	~
-50 dBr	1					-					
	~										$\sim$
-60 dBm	)———					-					
-70 dBm	1										
-80 dBm											
-80 aBri	1										
-90 dBm											
-90 UBI	1										
CF 2.478 GHz         691 pts         Span 3.0 MHz											
<u> </u>	/o GH	2			09	rpts				sha	11 3.0 MHZ
Marker											
Type M1	Ref	Trc 1	X-value	78 GHz	<u>Y-value</u> -14.72 c	iBm	Function ndB down		Function Result 1.1896 MHz		
T1		1	2.477374		-14.72 0		nub uown ndB		1.1896 MH2 20.00 dB		
T2		1	2.47856		-34.75 c		O factor	20.00 dB			
		-	2.11050	11 012	51,150		2 100101	1			2000.1



# 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



# 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.

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