FCC Test Report

Report No: FCS202104034W01

Issued for

Applicant:	SHANTOU CHENGHAI CHUNYUANLONG TOYS FACTORY
Address:	No.3 Dongguahu Road, Huaidong, Lianxia Town, Chenghai District, Shantou City, Guangdong, China
Product Name:	REMOTE CONTROL CAR SERIES
Brand Name:	N/A
Model Name:	666-803,666-191,666-192,666-645,666-647,666-666, 666-667,666-668,666-669,666-671,666-672,666-673, 666-715,666-718,666-764,666-801,666-676,666-691, 666-768,666-806,666-805,666-804,666-771,666-694, 666-695,666-696,666-698,666-699,666-692,666-765, 666-766,666-767,666-769,666-770,666-762,666-763, 666-670,666-761,666-684,666-653,666-654,666-674, 666-745,666-746,666-747,666-748,666-749,666-750, 666-754,666-755,666-756,666-710,666-641,666-644, 666-646,666-648,666-649,666-719,666-724,666-725, 666-726,666-727,666-728,666-731,666-732,666-733, 666-734,666-735,666-736,666-737,666-738,666-739, 666-740,666-741,666-742,666-743,666-744,666-780, 666-781,666-782,666-783,666-784,666-785,666-786, 666-787,666-788,666-789,666-790,666-800,666-807, 666-808,666-809,666-810,666-811,666-812,666-813, 666-814,666-815,666-816,666-772,666-763,666-670, 666-761,666-684,666-653,666-654,666-674,666-802
Series Model:	N/A
FCC ID:	2AZUF-CYL666

Issued By: Flux Compliance Service Laboratory
Add: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
Tel: 769-27280901 Fax:769-27280901 http://www.fcs-lab.com

TEST RESULT CERTIFICATION

Applicant's Name..... :	SHANTOU CHENGHAI CHUNYUANLONG TOYS FACTORY
Address..... :	No.3 Dongguahu Road, Huaidong, Lianxia Town, Chenghai District, Shantou City, Guangdong, China
Manufacture's Name..... :	SHANTOU CHENGHAI CHUNYUANLONG TOYS FACTORY
Address..... :	No.3 Dongguahu Road, Huaidong, Lianxia Town, Chenghai District, Shantou City, Guangdong, China

Product Description

Product Name..... :	REMOTE CONTROL CAR SERIES
Brand Name .....:	N/A
Model Name..... :	666-803,666-191,666-192,666-645,666-647,666-666,666-667,666-668, 666-669,666-671,666-672,666-673,666-715,666-718,666-764,666-801, 666-676,666-691,666-768,666-806,666-805,666-804,666-771,666-694, 666-695,666-696,666-698,666-699,666-692,666-765,666-766,666-767, 666-769,666-770,666-762,666-763,666-670,666-761,666-684,666-653, 666-654,666-674,666-745,666-746,666-747,666-748,666-749,666-750, 666-754,666-755,666-756,666-710,666-641,666-644,666-646,666-648, 666-649,666-719,666-724,666-725,666-726,666-727,666-728,666-731, 666-732,666-733,666-734,666-735,666-736,666-737,666-738,666-739, 666-740,666-741,666-742,666-743,666-744,666-780,666-781,666-782, 666-783,666-784,666-785,666-786,666-787,666-788,666-789,666-790, 666-800,666-807,666-808,666-809,666-810,666-811,666-812,666-813, 666-814,666-815,666-816,666-772,666-763,666-670,666-761,666-684, 666-653,666-654,666-674,666-802
Test Standards..... :	FCC Rules and Regulations Part 15 Subpart C, Section 249
Test Procedure..... :	ANSI C63.10:2013

This device described above has been tested FCS, 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.
This report shall not be reproduced except in full, without the written approval of FCS, this document may be altered or revised by FCS, personal only, and shall be noted in the revision of the document..

Date of Test..... :

Date (s) of performance of tests. :	15 Apr, 2021 ~ 27 Apr, 2021
Date of Issue.....:	27 Apr, 2021
Test Result.....:	Pass

Tested by : Chris chen

(Chris Chen)

Reviewed by : Jack chen

(Jack Chen)

Approved by : Andy yue

(Andy yue)

Table of Contents **Page**

1. SUMMARY OF TEST RESULTS 5
1.1 TEST FACTORY 6
1.2 MEASUREMENT UNCERTAINTY 6
2. GENERAL INFORMATION 7
2.1 GENERAL DESCRIPTION OF THE EUT 7
2.2 DESCRIPTION OF THE TEST MODES 9
2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS 10
2.4 EQUIPMENTS LIST 11
3. RADIATED EMISSION MEASUREMENT 12
3.1 LIMIT 12
3.2 TEST PROCEDURE 13
3.3 TEST SETUP 14
3.4 TEST RESULTS 15
4. BAND EDGE TEST 19
4.1 LIMIT 19
4.2 TEST PROCEDURE 19
4.3 TEST SETUP 20
4.4 TEST RESULTS 21
5. 20 DB BANDWIDTH TEST 23
5.1 LIMIT 23
5.2 TEST PROCEDURE 23
5.3 TEST SETUP 23
5.4 TEST RESULTS 24
6. ANTENNA REQUIREMENT 26
6.1 STANDARD REQUIREMENT 26
6.2 EUT ANTENNA 26

Revision History

Rev.	Issue Date	Effect Page	Contents
00	27 Apr, 2021	All	Initial Issue

1. SUMMARY OF TEST RESULTS

FCC Part 15.249,Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	--
15.205(a), 15.209(a), 15.249(a), 15.249(c)	Radiated Spurious Emission	PASS	--
15.209	Field strength of fundamental	PASS	
15.249(d)	Band Edge Emission	PASS	--
15.215(c)	20dB Bandwidth	PASS	--
15.203	Antenna Requirement	PASS	--

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) All tests are according to ANSI C63.10-2013

1.1 TEST FACTORY

Company Name:	Flux Compliance Service Laboratory
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
Telephone:	+86-769-27280901
Fax:	+86-769-27280901
FCC Test Firm Registration Number: 514908 Designation number: CN0127 A2LA accreditation number：5545.01	

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ±U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	RF output power, conducted	±0.71dB
2	Unwanted Emissions, conducted	±2.98 dB
3	Conducted Emission (9KHz-150KHz)	±4.13 dB
4	Conducted Emission (150KHz-30MHz)	±4.74 dB
5	All emissions,radiated(<1G) 30MHz-1000MHz	±3.2 dB
6	All emissions,radiated (1GHz -18GHz)	±3.66 dB
7	All emissions,radiated (18GHz -40GHz)	±4.31 dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	REMOTE CONTROL CAR SERIES
Trade Name	N/A
Model Name	666-803,666-191,666-192,666-645,666-647,666-666, 666-667,666-668,666-669,666-671,666-672,666-673, 666-715,666-718,666-764,666-801,666-676,666-691, 666-768,666-806,666-805,666-804,666-771,666-694, 666-695,666-696,666-698,666-699,666-692,666-765, 666-766,666-767,666-769,666-770,666-762,666-763, 666-670,666-761,666-684,666-653,666-654,666-674, 666-745,666-746,666-747,666-748,666-749,666-750, 666-754,666-755,666-756,666-710,666-641,666-644, 666-646,666-648,666-649,666-719,666-724,666-725, 666-726,666-727,666-728,666-731,666-732,666-733, 666-734,666-735,666-736,666-737,666-738,666-739, 666-740,666-741,666-742,666-743,666-744,666-780, 666-781,666-782,666-783,666-784,666-785,666-786, 666-787,666-788,666-789,666-790,666-800,666-807, 666-808,666-809,666-810,666-811,666-812,666-813, 666-814,666-815,666-816,666-772,666-763,666-670, 666-761,666-684,666-653,666-654,666-674,666-802
Series Model	N/A
Model Difference	The above product with same circuit, PCB layout, electrical parts, materials and wiring structures, Appearance shape, the materials of decorative accessories is same, only different color.
Channel List	Please refer to the Note 2.
Descrption	Frequency:2402-2482MHz Modulation: GFSK Channel number: 16CH
Power Supply	DC 3V by 2*1.5V(AAA)
Hardware version number	V1.0
Software version number	V1.0
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. **Channel List**

Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	09	2442	17	2482
02	2407	10	2447		
03	2412	11	2452		
04	2417	12	2457		
05	2422	13	2462		
06	2427	14	2467		
07	2432	15	2472		
08	2437	16	2477		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	FGDG	PCB antenna	N/A	1.00dBi	Antenna

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

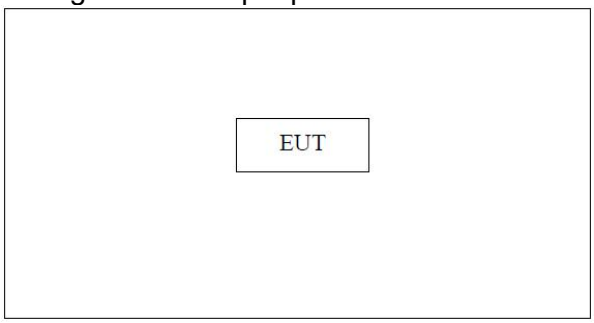
Test software: FCC tool
The test softeware was used to control EUT work in continuous TX mode, and select test channel, Wireless mode as below table

No.	Test model descrption
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK

Note:

1. For radiated emission, 3 axis were chosen for testing for each applicable mode.
2. The EUT used new battery when tested.
3. During the test, the dutycycle>98%, the test voltage was tuned from 85% to 115% of the Nominal rate supply votage, and found that the worst case was the nominal rated supply condition, So the report just shows that condition's data
4. We finally chose to test the right earphone of the sample, because the circuit of the left earphone and the right earphone are the same

Configuration and peripherals



2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.4 EQUIPMENTS LIST

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP 3	FCS-E001	2020. 06.26	2021. 06.25
Signal Analyzer	R&S	FSV40-N	FCS-E012	2020.06.05	2021.06.04
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2020.08.09	2021.08.10
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2020.08.26	2021.08.25
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2020.08.26	2021.08.25
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2020.06.26	2021.06.25
Pre-Amplifier(0.1M-3G Hz)	EMCI	EM330N	FCS-E004	2020.06.26	2021.06.25
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2020.06.03	2021.06.02
Pre-Amplifier (18G-40GHz)	TERA-MW	TRLA-0400	FCS-E019	2020.08.08	2021.08.07
Temperature & Humidity	HTC-1	victor	FCS-E005	2020.08.26	2021.08.25

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	FCS-E020	2020.06.03	2021.06.02
LISN	R&S	ENV216	FCS-E007	2020.08.08	2021.08.07
LISN	ETS	3810/2NM	FCS-E009	2020.06.03	2021.06.02
Temperature & Humidity	HTC-1	victor	FCS-E008	2020.08.08	2021.08.07

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
Spectrum Analyzer	Keysight	N9020A	FCS-E015	2020.06.03	2021.06.02
Spectrum Analyzer	Agilent	E4447A	MY50180039	2020.08.08	2021.08.07
Spectrum Analyzer	R&S	FSV-40	101499	2020.08.26	2021.08.25

3. RADIATED EMISSION MEASUREMENT

3.1 LIMIT

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009mhz - 1000mhz)

Frequencies (MHz)	Field Strength (micorvolts/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

LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

LIMITS OF FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
2400-2483.5	114	94

Notes:
(1) The limit for radiated test was performed according to FCC PART 15C.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2 TEST PROCEDURE

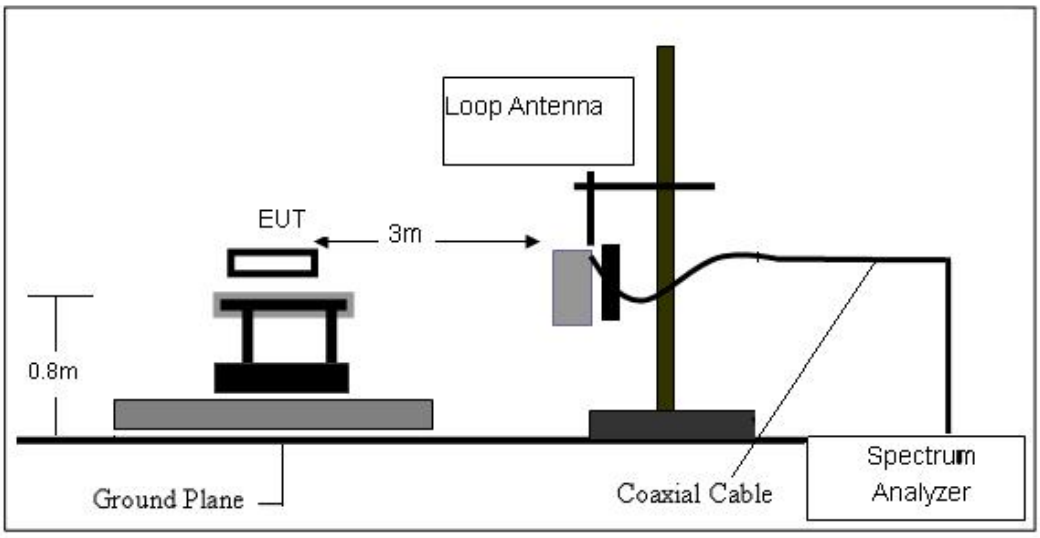
Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted band)	PK=1MHz / 1MHz, AV=1 MHz /10 Hz

a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz,and above 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then QuasiPeak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

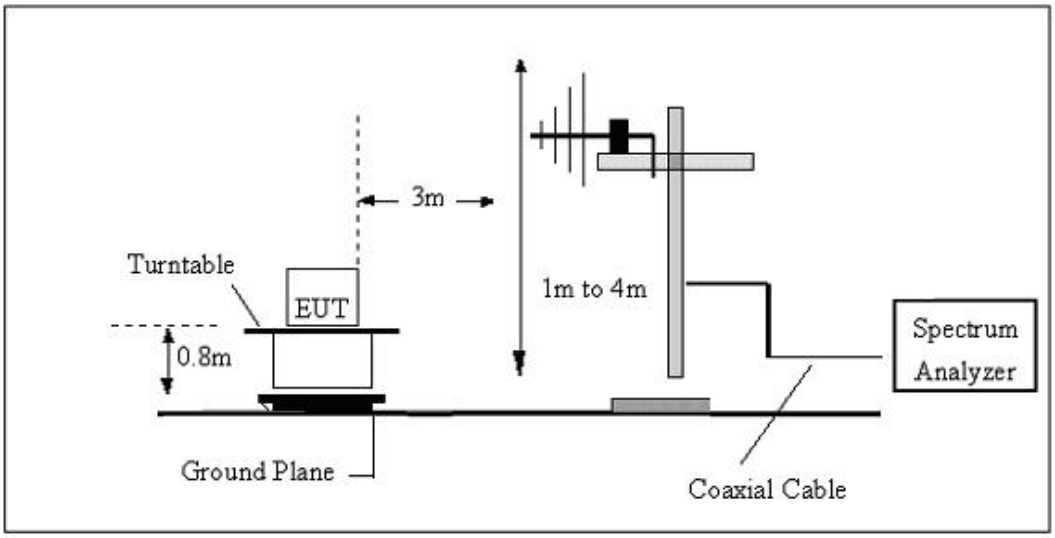
Note:
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.3 TEST SETUP

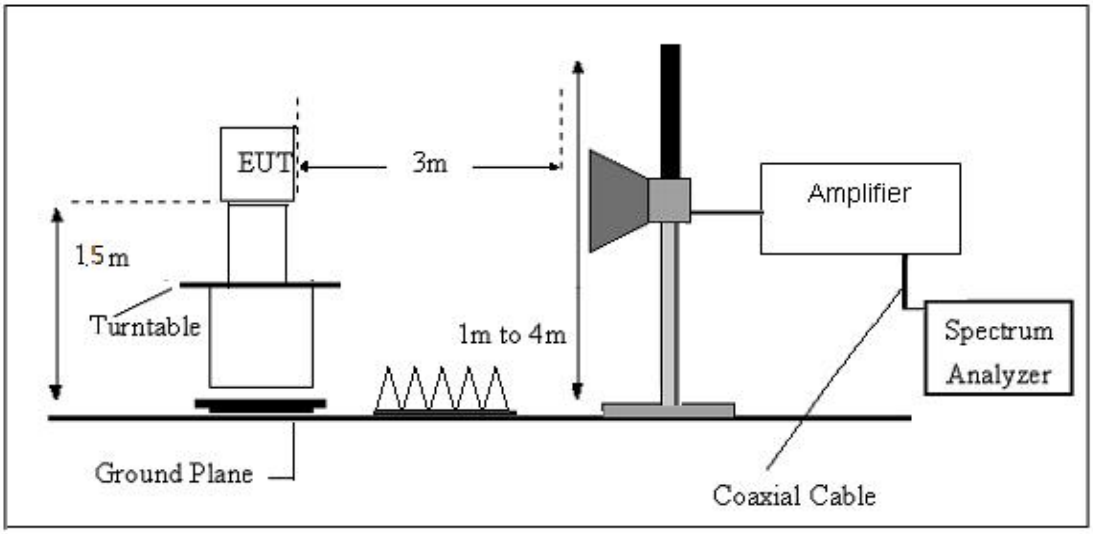
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.4 TEST RESULTS

Temperature:	25℃	Relative Humidity:	60%
Test Mode:	GFSK Mode	Test Voltage:	DC 3V

For field strength of the fundamental signal

Peak /Average value

Frequency (MHz)	Peak (dBμV/m)	Average (dBμV/m)	Pol.	Corr. (dB/m)	Peak Margin (dB)	Average Margin (dB)	Peak Limit (dBμV/m)	Avergae Limit (dBμV/m)	Result
2402.000000	80.7	54.7	H	32.2	33.4	39.3	114.0	94.0	Pass
2442.000000	81.2	55.3	H	32.4	32.8	38.7	114.0	94.0	Pass
2482.000000	79.4	54.9	H	32.6	34.7	39.1	114.0	94.0	Pass
2402.000000	85.4	58.7	V	32.2	28.6	35.3	114.0	94.0	Pass
2442.000000	85.8	59.1	V	32.4	28.2	34.9	114.0	94.0	Pass
2482.000000	83.0	58.1	V	32.6	31.0	35.9	114.0	94.0	Pass

For spurious emission

(9KHz-30MHz)

Freq.	Reading	Limit	Margin	State	Test Result
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F	
--	--	--	--	--	PASS
--	--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

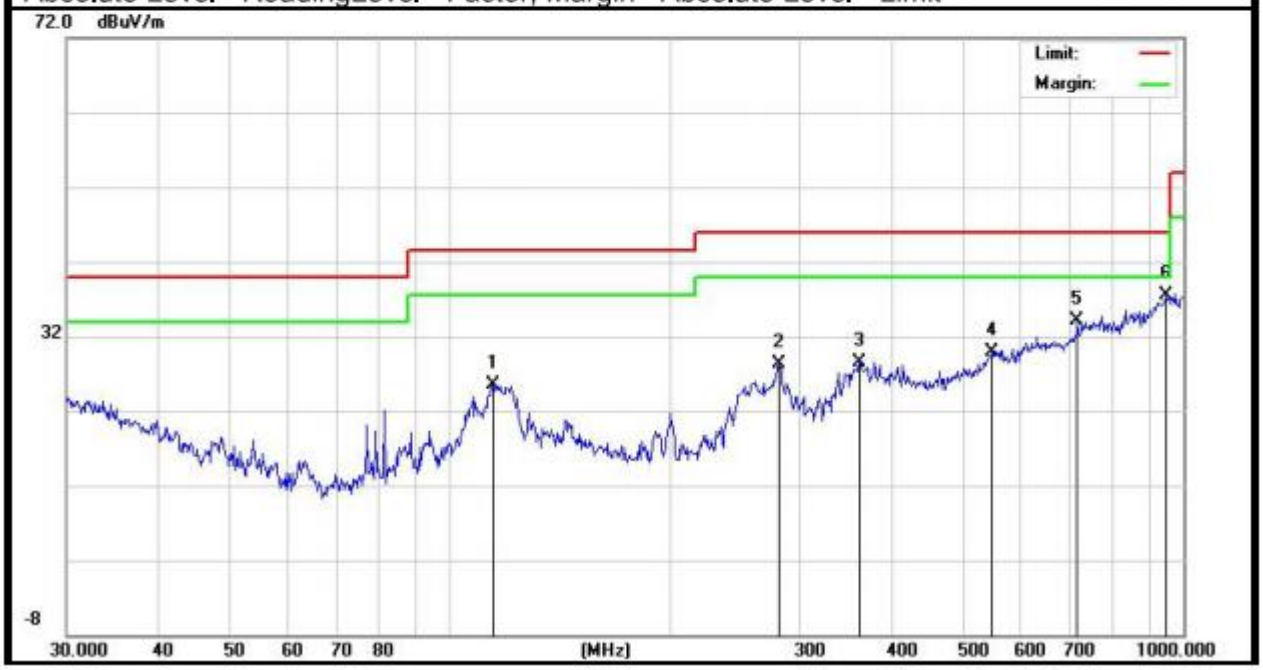
Limit line = specific limits (dBuv) + distance extrapolation factor.

(30MHZ-1000MHZ)

Temperature:	23.7℃	Relative Humidity:	61%
Test Voltage:	DC 3V	Phase:	Horizontal
Test Mode:	GFSK		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	114.5146	12.46	13.14	25.60	43.50	-17.90	QP
H	281.0075	11.35	17.00	28.35	46.00	-17.65	QP
H	361.7139	10.66	17.89	28.55	46.00	-17.45	QP
H	549.0195	5.45	24.49	29.94	46.00	-16.06	QP
H	716.6820	7.74	26.32	34.06	46.00	-11.94	QP
H	948.7608	6.43	31.09	37.52	46.00	-8.48	QP

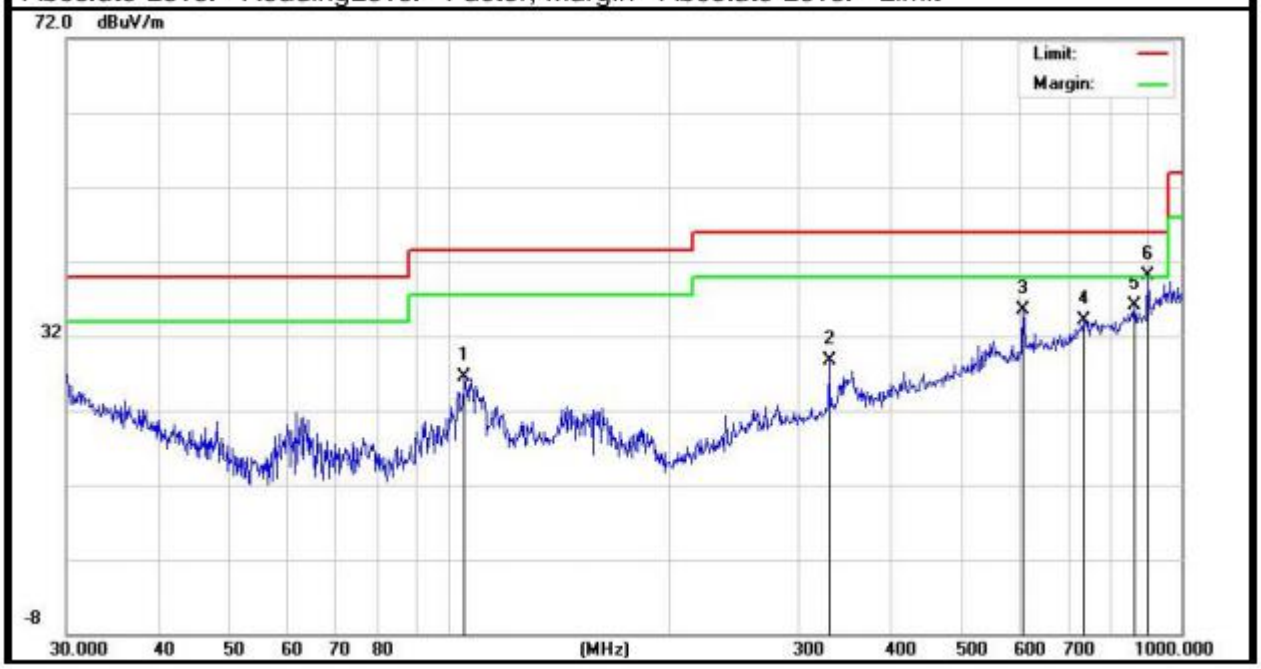
Remark:
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Temperature:	22.7℃	Relative Humidity:	61%
Test Voltage:	DC 3V	Phase:	Vertical
Test Mode:	GFSK		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	104.9033	14.42	12.12	26.54	43.50	-16.96	QP
V	330.1949	11.95	16.79	28.74	46.00	-17.26	QP
V	607.7866	11.19	24.36	35.55	46.00	-10.45	QP
V	734.4913	6.60	27.43	34.03	46.00	-11.97	QP
V	863.0561	7.35	28.67	36.02	46.00	-9.98	QP
V	900.1473	11.27	28.92	40.19	46.00	-5.81	QP

Remark:
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



(1GHZ~25GHZ)

LOW CH(GFSK)
Peak/ AV value

Frequency (MHz)	Antenna Polarization	Emission Level (dBμV/m)		Limit (dBμV/m)		Remark
		Peak	Average	Peak	Average	
4804.000	H	47.0	/	74.0	54.0	Pass
4972.000	H	45.6	/	74.0	54.0	Pass
7207.000	H	39.0	/	74.0	54.0	Pass
4787.000	V	51.2	/	74.0	54.0	Pass
4972.500	V	45.7	/	74.0	54.0	Pass
7205.000	V	46.1	/	74.0	54.0	Pass

MIDDLE CH(GFSK)
Peak/ AV value

Frequency (MHz)	Antenna Polarization	Emission Level (dBμV/m)		Limit (dBμV/m)		Remark
		Peak	Average	Peak	Average	
3158.500	H	39.1	/	74.0	54.0	Pass
4864.500	H	48.9	/	74.0	54.0	Pass
7326.000	H	42.9	/	74.0	54.0	Pass
4884.000	V	49.7	/	74.0	54.0	Pass
4973.000	V	46.0	/	74.0	54.0	Pass
7325.000	V	46.4	/	74.0	54.0	Pass

HIGH CH(GFSK)
Peak/ AV value

Frequency (MHz)	Antenna Polarization	Emission Level (dBμV/m)		Limit (dBμV/m)		Remark
		Peak	Average	Peak	Average	
4865.000	H	34.7	/	74.0	54.0	Pass
4964.500	H	49.2	/	74.0	54.0	Pass
7445.000	H	44.8	/	74.0	54.0	Pass
4965.000	V	52.0	/	74.0	54.0	Pass
7445.000	V	45.7	/	74.0	54.0	Pass
7445.000	V	45.7	/	74.0	54.0	Pass

4. BAND EDGE TEST

4.1 LIMIT

According to §15.249(d), Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

4.2 TEST PROCEDURE

a. The EUT is placed on a turntable, which is 1.5m above ground plane.

b. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

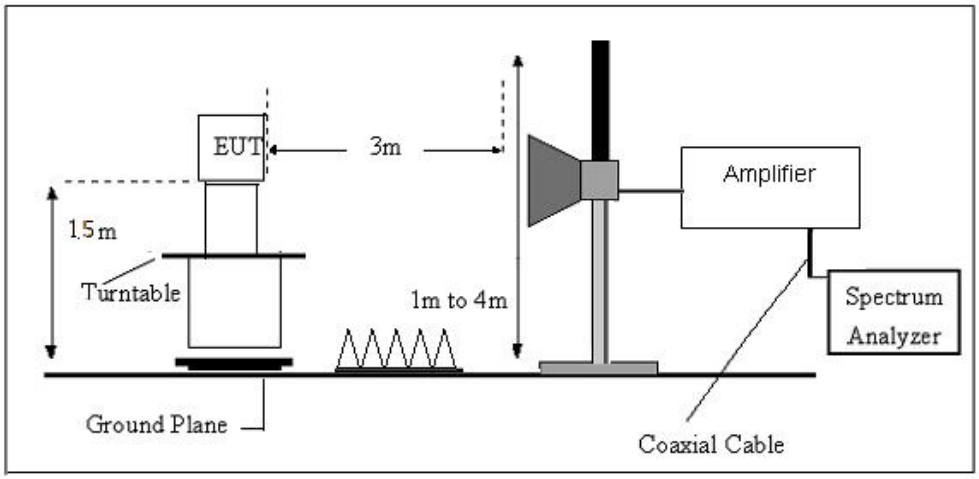
c. Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured, RBW = 1 MHz, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold
Follow the guidelines in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc.

d. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

e. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the duty cycle per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(duty cycle/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

4.3 TEST SETUP

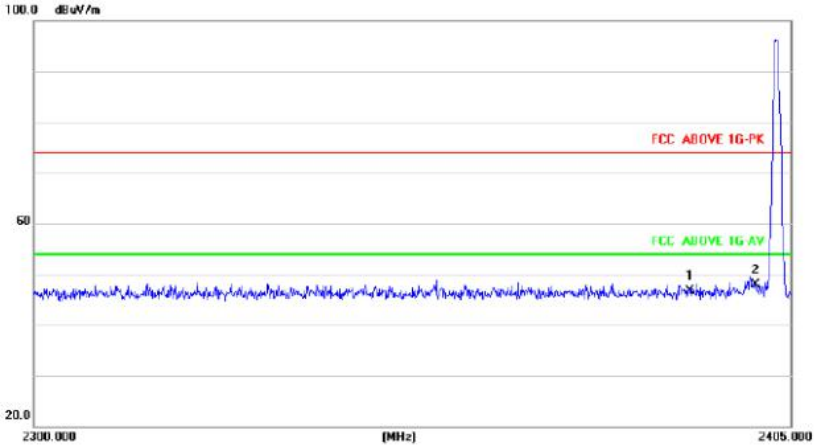
Radiated Emission Test-Up Frequency Above 1GHz

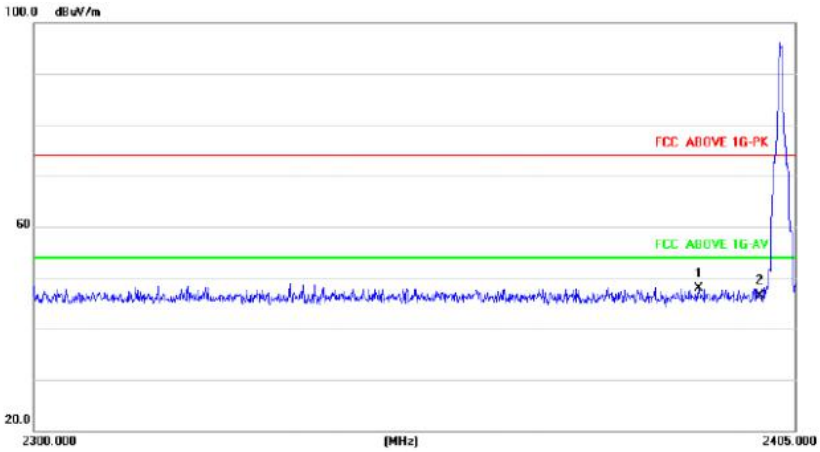


4.4 TEST RESULTS

All of the modulations were tested, and only the data of worst case exhibited. gfsk is worst case。

Low CH (GFSK)



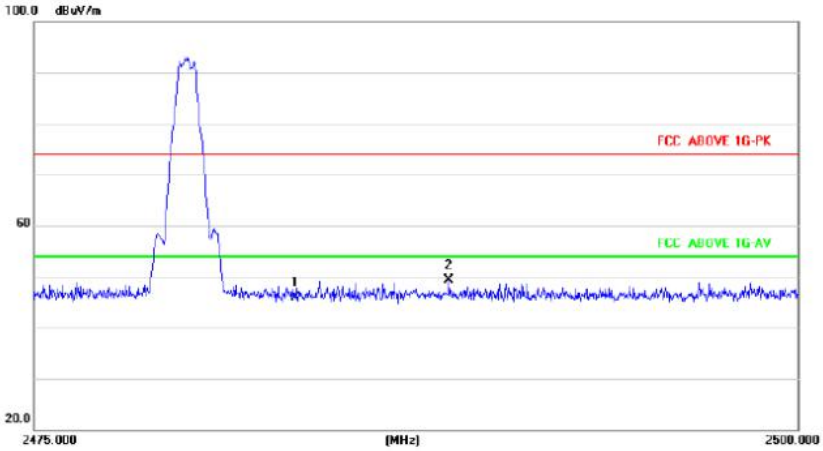


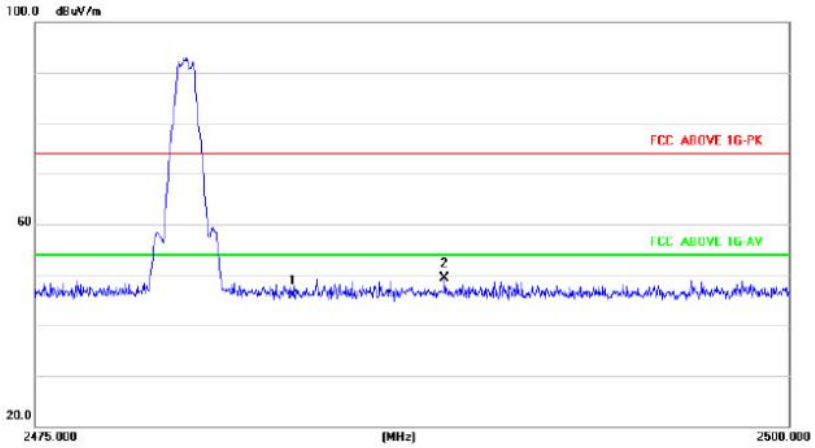
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	40.20	27.59	5.38	30.18	42.99	74.00	-31.01	Horizontal
2400.00	53.86	27.58	5.39	30.18	56.65	74.00	-17.35	Horizontal
2390.00	39.93	27.59	5.38	30.18	42.72	74.00	-31.28	Vertical
2400.00	53.04	27.58	5.39	30.18	55.83	74.00	-18.17	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	32.68	27.59	5.38	30.18	35.47	54.00	-18.53	Horizontal
2400.00	39.85	27.58	5.39	30.18	42.64	54.00	-11.36	Horizontal
2390.00	32.51	27.59	5.38	30.18	35.30	54.00	-18.70	Vertical
2400.00	41.79	27.58	5.39	30.18	44.58	54.00	-9.42	Vertical

High CH(GFSK)





Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	46.36	27.53	5.47	24.80	54.56	74.00	-19.44	Horizontal
2500.00	45.61	27.55	5.49	24.86	53.79	74.00	-20.21	Horizontal
2483.50	47.36	27.53	5.47	24.80	55.56	74.00	-18.44	Vertical
2500.00	46.76	27.55	5.49	24.86	54.94	74.00	-19.06	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	35.49	27.53	5.47	24.80	43.69	54.00	-10.31	Horizontal
2500.00	35.47	27.55	5.49	24.86	43.65	54.00	-10.35	Horizontal
2483.50	36.18	27.53	5.47	24.80	44.38	54.00	-9.62	Vertical
2500.00	35.32	27.55	5.49	24.86	43.50	54.00	-10.50	Vertical

5. 20 DB BANDWIDTH TEST

5.1 LIMIT

According to 15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, 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. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation

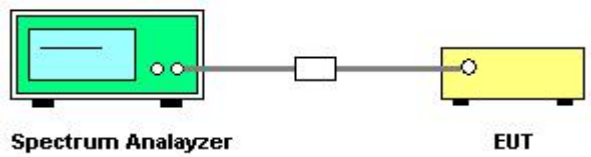
5.2 TEST PROCEDURE

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator

b. Position the EUT without connection to measurement instrument. 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 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

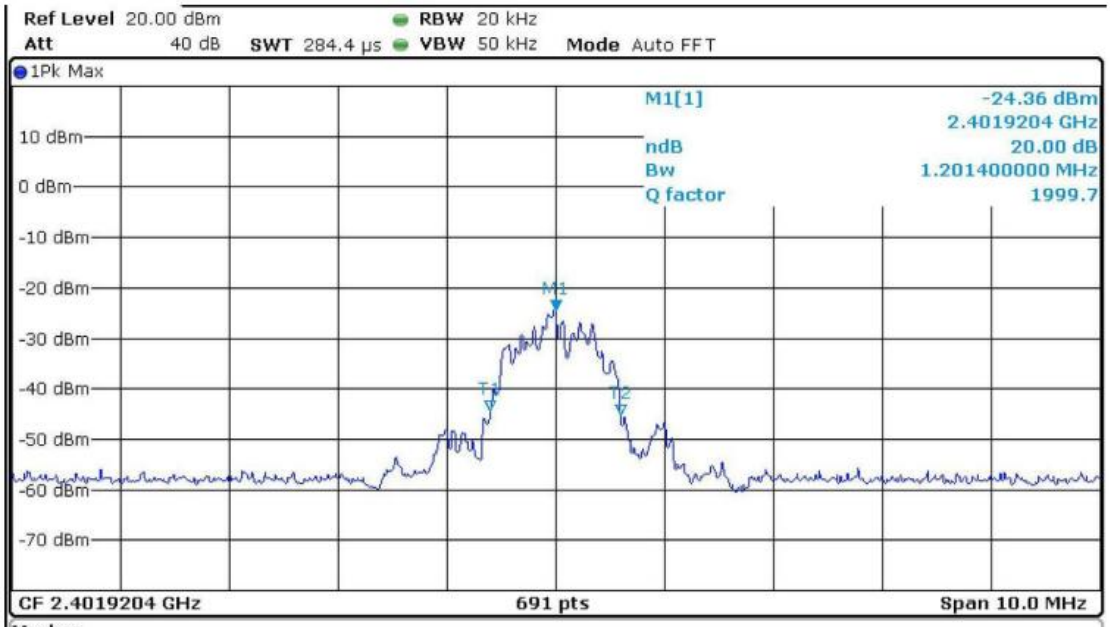
5.3 TEST SETUP



5.4 TEST RESULTS

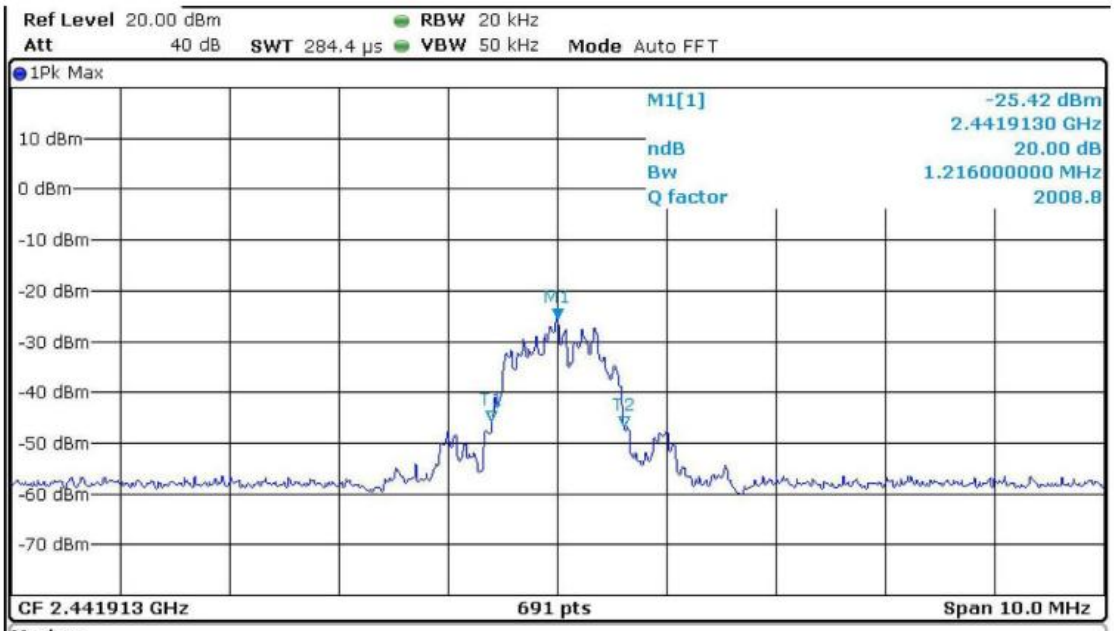
Temperature:	25℃	Relative Humidity:	50%
Test Mode:	GFSK	Test Voltage:	DC 3V

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.2014	PASS
2442 MHz	1.2160	PASS
2482 MHz	1.2160	PASS



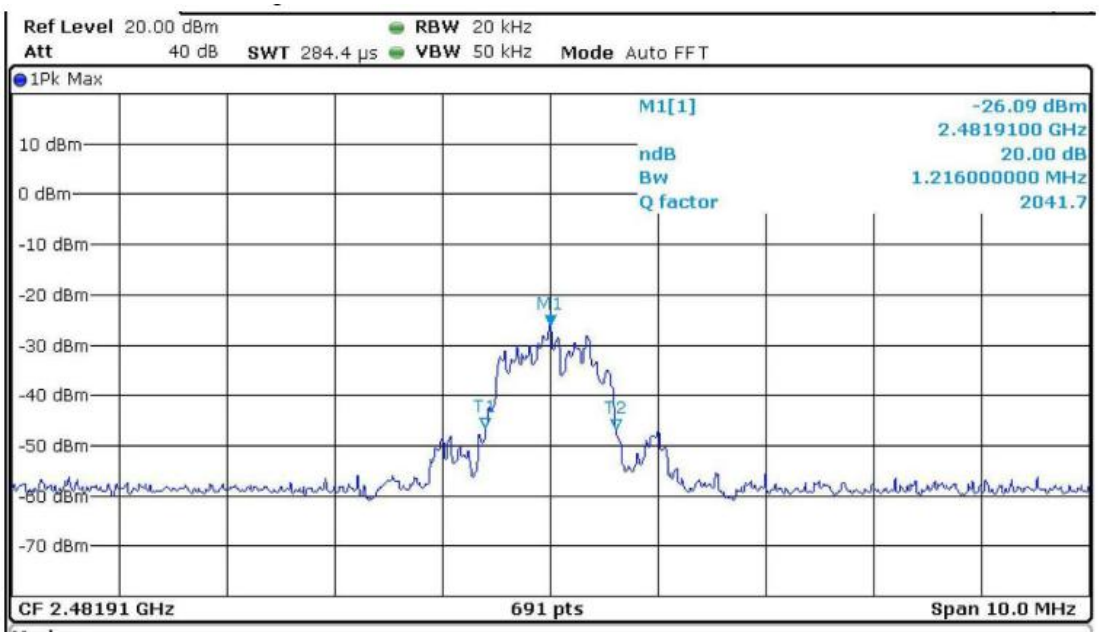
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4019204 GHz	-24.36 dBm	ndB down	1.2014 MHz
T1		1	2.4013124 GHz	-44.21 dBm	ndB	20.00 dB
T2		1	2.4025134 GHz	-45.09 dBm	Q factor	1999.7



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.441913 GHz	-25.42 dBm	ndB down	1.216 MHz
T1		1	2.441305 GHz	-45.74 dBm	ndB	20.00 dB
T2		1	2.442521 GHz	-46.78 dBm	Q factor	2008.8



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48191 GHz	-26.09 dBm	ndB down	1.216 MHz
T1		1	2.481302 GHz	-46.37 dBm	ndB	20.00 dB
T2		1	2.482518 GHz	-46.70 dBm	Q factor	2041.7

6. ANTENNA REQUIREMENT

6.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

6.2 EUT ANTENNA

The antennas used for this product are PCB antenna and other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 1.0dBi.

※※※※※END OF THE REPORT※※※※※