TEST REPORT

Application No.:	GZCR2108020916AT
Applicant:	dormakaba Canada Inc.
Address of Applicant:	65 Struck Court, Cambridge, Ontario, N1R 8L2, Canada
Manufacturer:	Shenzhen Winfor Canbo Technology Co., Ltd.
Address of Manufacturer:	7F, Building D, 7#, East Area, Shangxue Industrial Zone, Xuexiang community, Bantian street, Longgang district, Shenzhen City
Factory:	Shenzhen Winfor Canbo Technology Co., Ltd.
Address of Factory:	7F, Building D, 7#, East Area, Shangxue Industrial Zone, Xuexiang community, Bantian street, Longgang district, Shenzhen City
Equipment Under Test (EUT):	
EUT Name:	Wireless Battery Powered Touchless Switch
Model No.:	912-WBT, 912N-WBT, 912-WBT-HC, 912N-WBT-HC, 912GL-WBT, 912GL-WBT-HC ♣
♣	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:	dormakaba
Standard(s) :	47 CFR Part 15, Subpart C 15.249
Date of Receipt:	2021-09-17
Date of Test:	2021-09-17 to 2021-09-17
Date of Issue:	2021-09-18
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		*2021-09-18*		*Original*

Authorized for issue by:				
		Curry Wu/Project Engineer		
		Ricky Liu/Reviewer		

2 Test Summary

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Restricted Band Around Fundamental Frequency		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass
Radiated Emissions (below 1GHz)		ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass
Radiated Emissions (above 1GHz)		ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

Remark:

Model No.: 912-WBT, 912N-WBT, 912-WBT-HC, 912N-WBT-HC, 912GL-WBT, 912GL-WBT-HC

Only the model 912-WBT tested. According to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on appearance, color, Icon, power input, model number, shell material, dimensions and labeling.

This test report (Ref. No.: GZCR210802091601) is only valid with the original test report (Ref. No.: PTC20110403001E-FC01).

Compared with the original report, this report just reduced the transmitter power, channel frequency increased to 2465MHz by software without any hardware changes and added the information of factory.

Considering to the difference, Radiated Emissions(30MHz-1GHz), Field Strength of the Fundamental, Radiated Emissions(Above 1GHz) and Restricted Band Around Fundamental Frequency were performed on the sample in this report to find the items which can be influential to the result in the original test report, and shown the data in this report, other tests please refer to original report (Report No.: PTC20110403001E-FC01).

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4 General Information

4.1 Details of E.U.T.

Power supply: Powered by DC6V(4 * DC1.5V *AA*batteries)
Operation Frequency: 2412-2465MHz
Modulation Type: GFSK
Number of Channels: 54
Antenna Type: Integral Antenna
Antenna Gain: 0dBi

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	19	2430	37	2448
02	2413	20	2431	38	2449
03	2414	21	2432	39	2450
04	2415	22	2433	40	2451
05	2416	23	2434	41	2452
06	2417	24	2435	42	2453
07	2418	25	2436	43	2454
08	2419	26	2437	44	2455
09	2420	27	2438	45	2456
10	2421	28	2439	46	2457
11	2422	29	2440	47	2458
12	2423	30	2441	48	2459
13	2424	31	2442	49	2460
14	2425	32	2443	50	2461
15	2426	33	2444	51	2462
16	2427	34	2445	52	2463
17	2428	35	2446	53	2464
18	2429	36	2447	54	2465

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
--	--	--	--
The EUT has been tested as an independent unit.			

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Field Strength of the Fundamental Signal (15.249(a))	± 4.5dB (Below 1GHz); ± 4.8dB (Above 1GHz)
Restricted Band Around Fundamental Frequency	± 4.5dB (Below 1GHz); ± 4.8dB (Above 1GHz)
Radiated Emissions (below 1GHz)	5.06dB （30MHz-1GHz；3m） 4.46dB （30MHz-1GHz；10m）
Radiated Emissions (above 1GHz)	5.08dB (1GHz-6GHz); 5.14dB (above 6GHz)
Remark: The U_{lab} (lab Uncertainty) is less than U_{cispr} (CISPR Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.	

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Field Strength of the Fundamental Signal (15.249(a))					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020/9/9	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Signal Analyzer (20Hz-26.5GHz)	Rohde & Schwarz	FISQ 26	EMC0069	2020/11/13	2021-11-12

Restricted Band Around Fundamental Frequency					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI Test Receiver(20Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-01-08	2022-01-07
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Radiated Emissions (below 1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)-Lab	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2019-12-27	2021-12-26

10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25

Radiated Emissions (above 1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2020-11-13	2021-11-12
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05

6 Radio Spectrum Matter Test Results

6.1 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)
Test Method: ANSI C63.10 (2013) Section 6.5&6.6

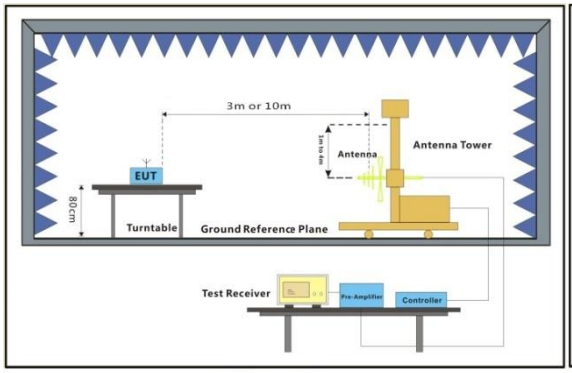
6.1.1 E.U.T. Operation

Operating Environment:
Temperature: 24.3 °C Humidity: 50.3 % RH Atmospheric Pressure: 1010 mbar

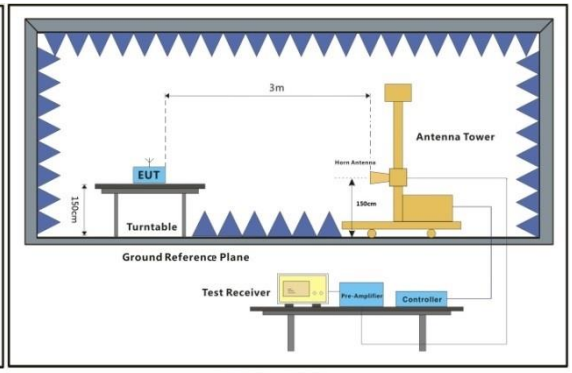
6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

6.1.3 Test Setup Diagram



30MHz-1GHz



Above 1GHz

6.1.4 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c.The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna 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.

e.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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f.The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g.If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h.Test the EUT in the lowest channel, the middle channel, the Highest channel.

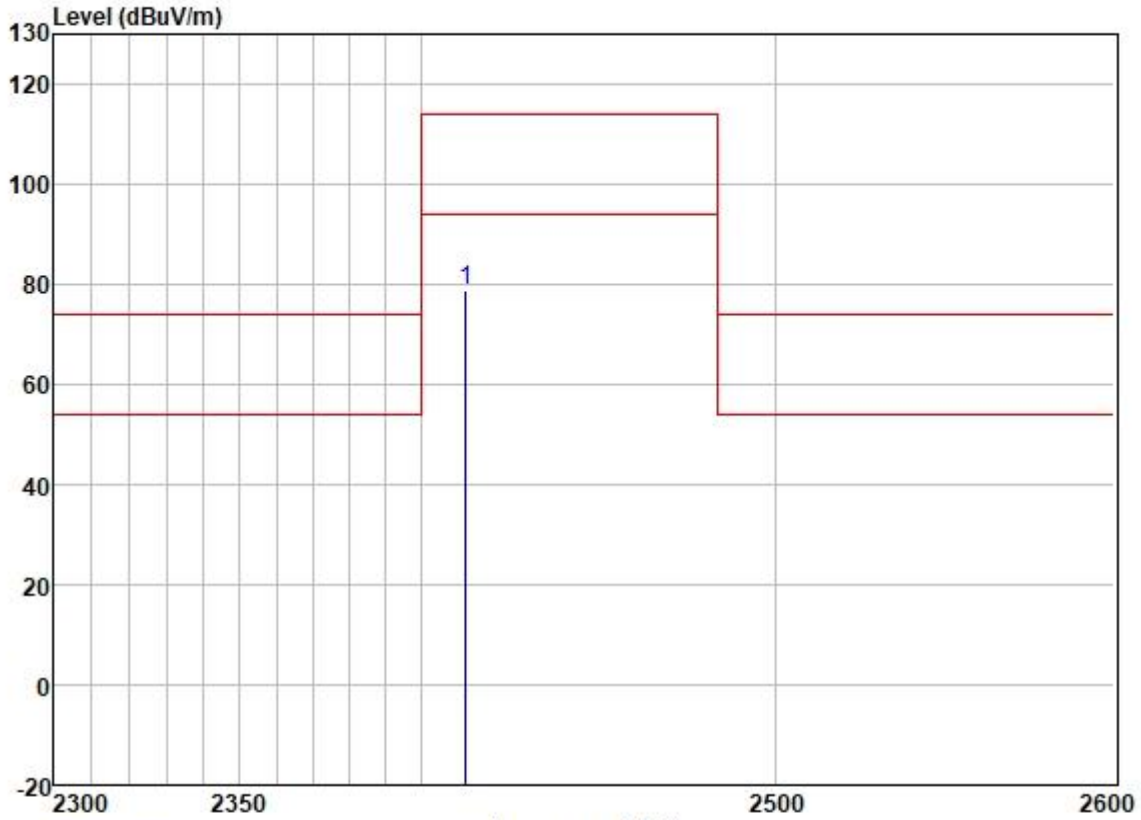
i.The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j.Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: Antenna: 3 denotes the type of antenna for above 1000MHz.

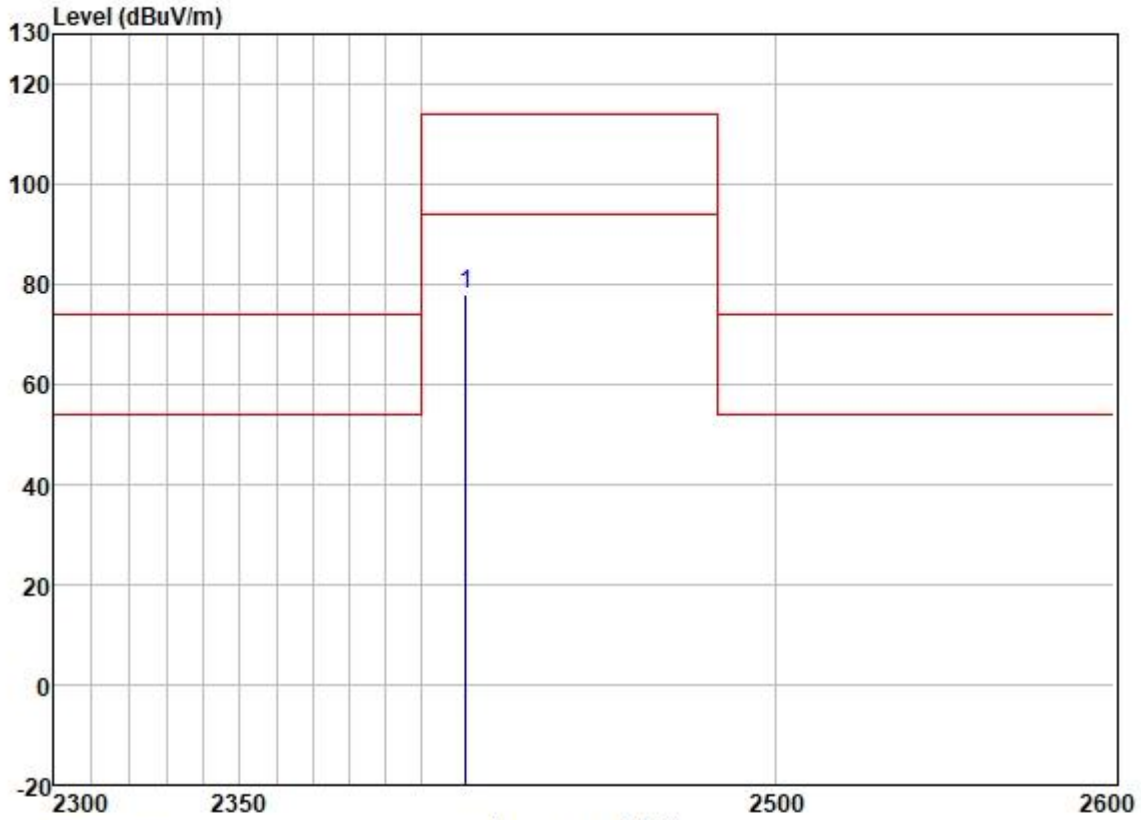
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:Low



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2412.000	85.63	27.38	3.47	37.59	78.89	114.00	-35.11	HORIZONTAL	Peak

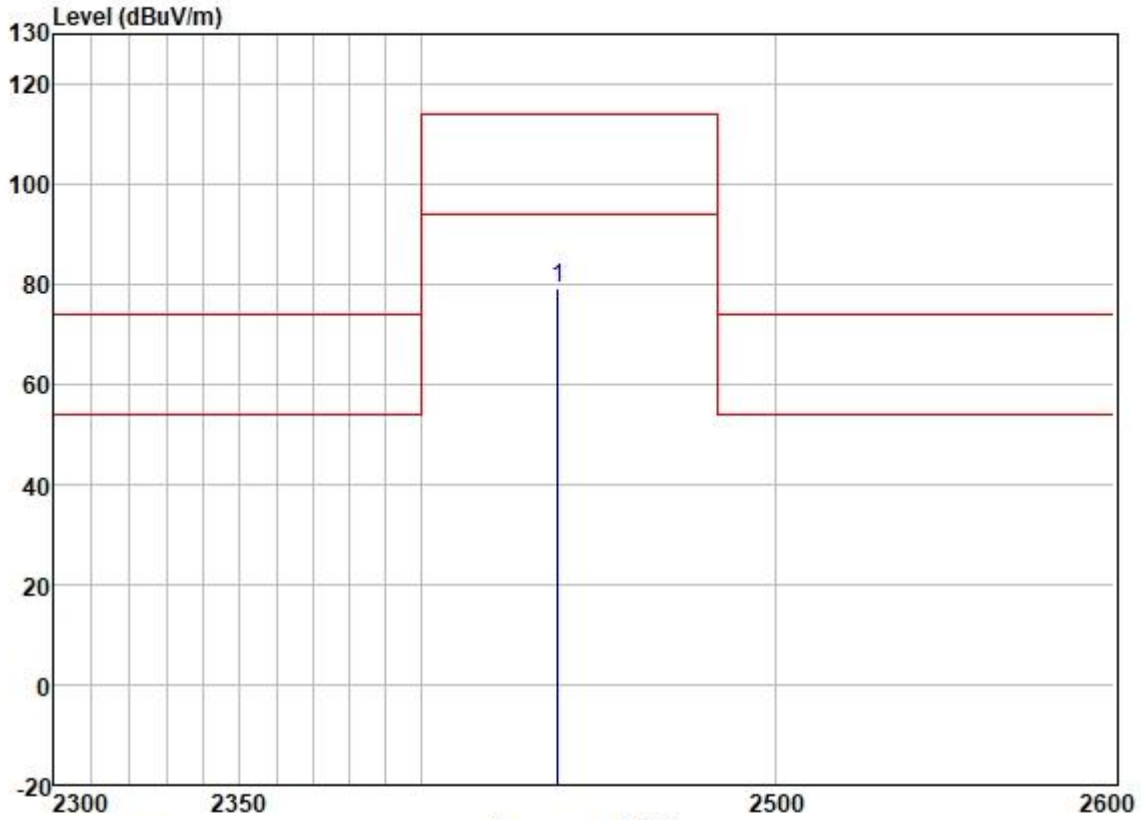
Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:Low



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2412.000	84.69	27.38	3.47	37.59	77.95	114.00	-36.05	VERTICAL	Peak

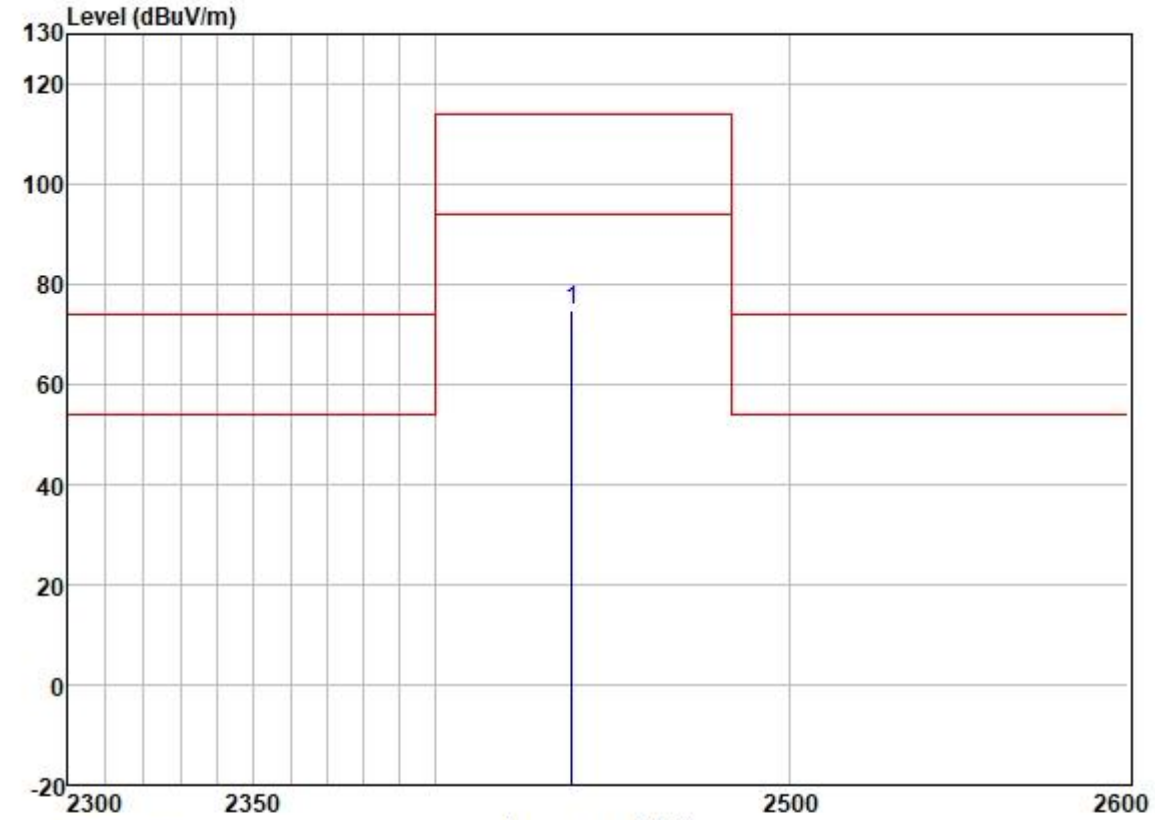
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:middle



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2438.000	85.83	27.41	3.42	37.58	79.08	114.00	-34.92	HORIZONTAL	Peak

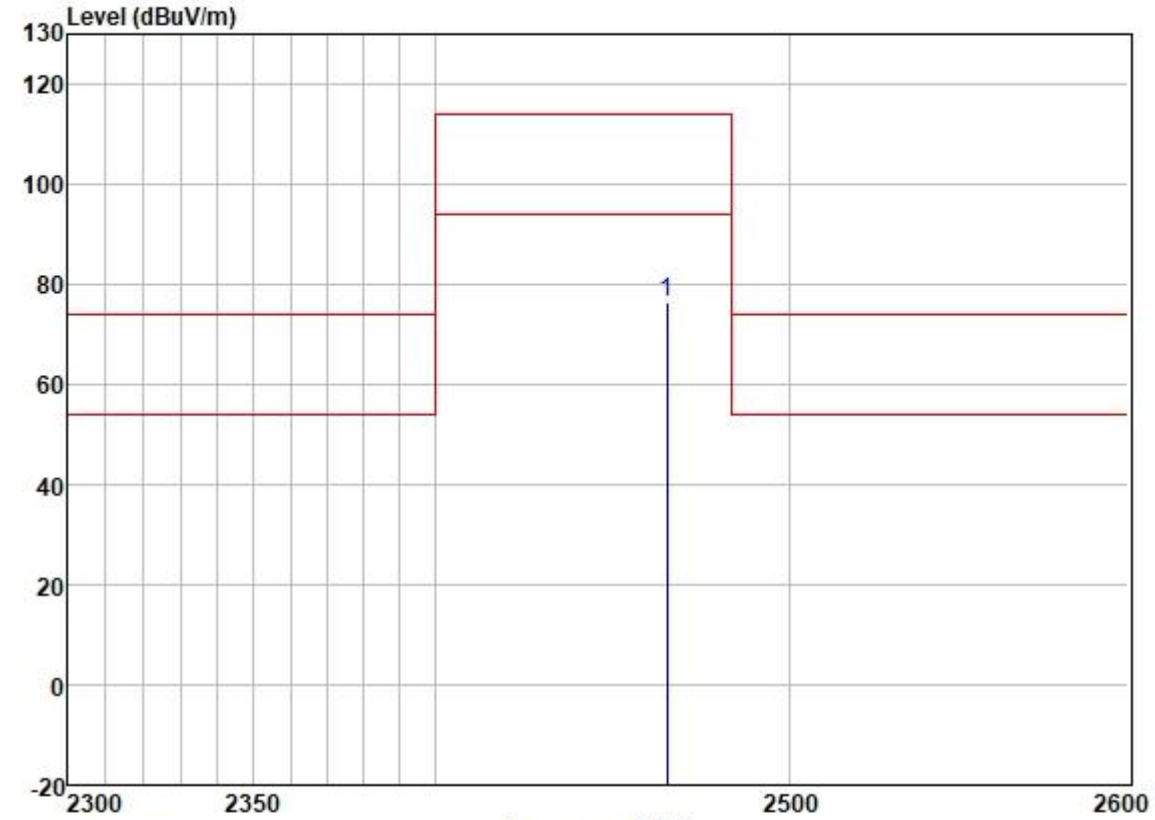
Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:middle



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2438.000	81.36	27.41	3.42	37.58	74.61	114.00	-39.39	VERTICAL	Peak

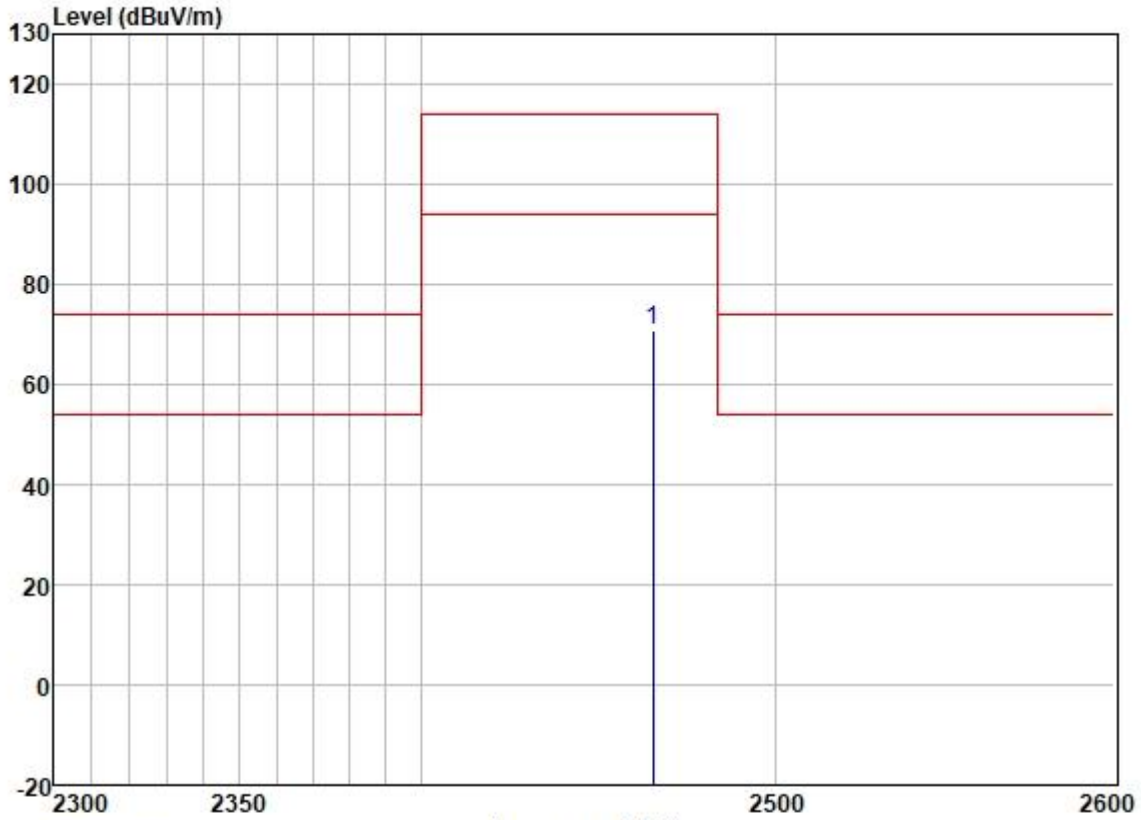
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:High



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2465.000	82.89	27.45	3.50	37.57	76.27	114.00	-37.73	HORIZONTAL	Peak

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:High



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2465.000	77.34	27.45	3.50	37.57	70.72	114.00	-43.28	VERTICAL	Peak

6.2 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209
Test Method: ANSI C63.10 (2013) Section 6.10.5

6.2.1 E.U.T. Operation

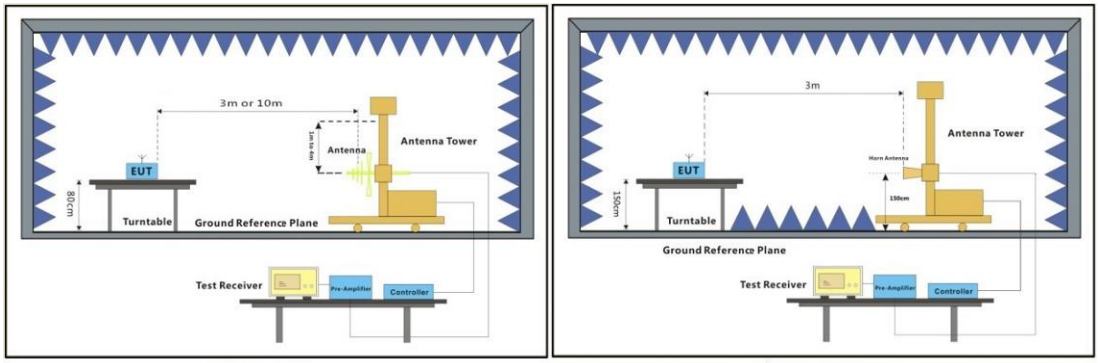
Operating Environment:

Temperature: 24.4 °C Humidity: 50.2 % RH Atmospheric Pressure: 1010 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

6.2.3 Test Setup Diagram



30MHz-1GHz Above 1GHz

6.2.4 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna 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.

e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the Highest channel.

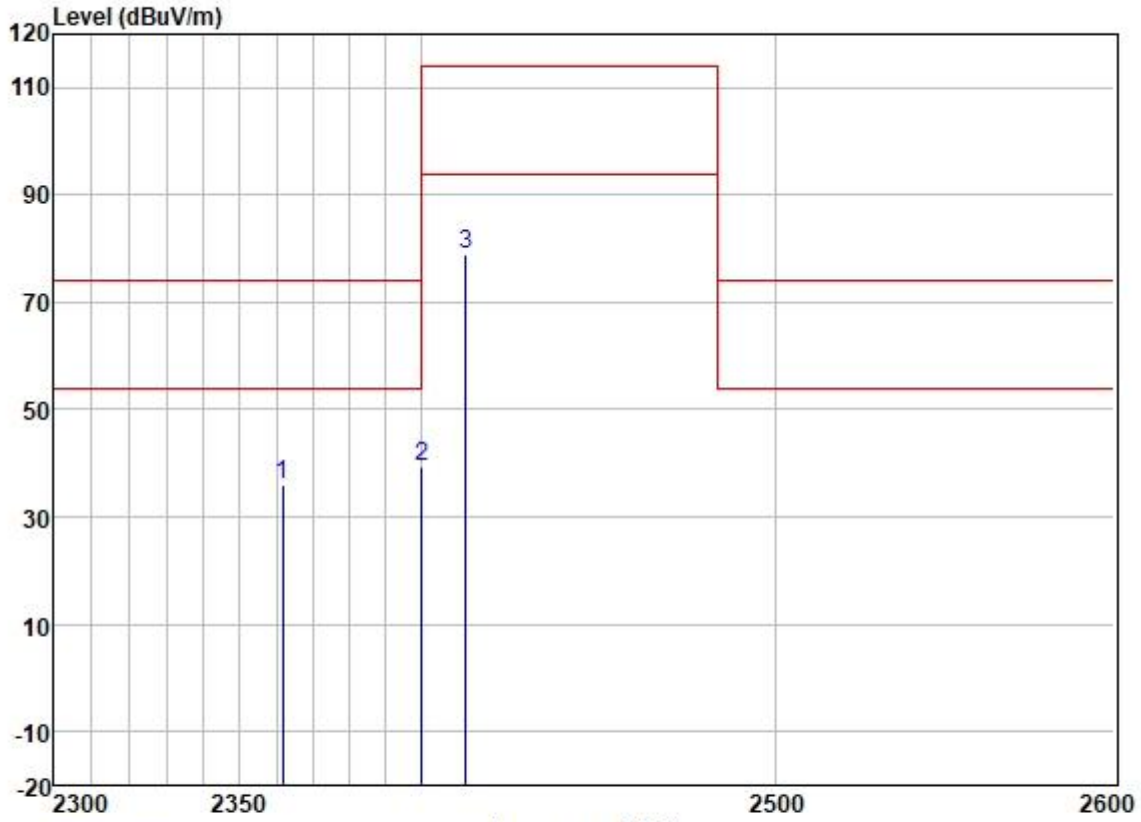
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: Antenna: 3 denotes the type of antenna for above 1000MHz.

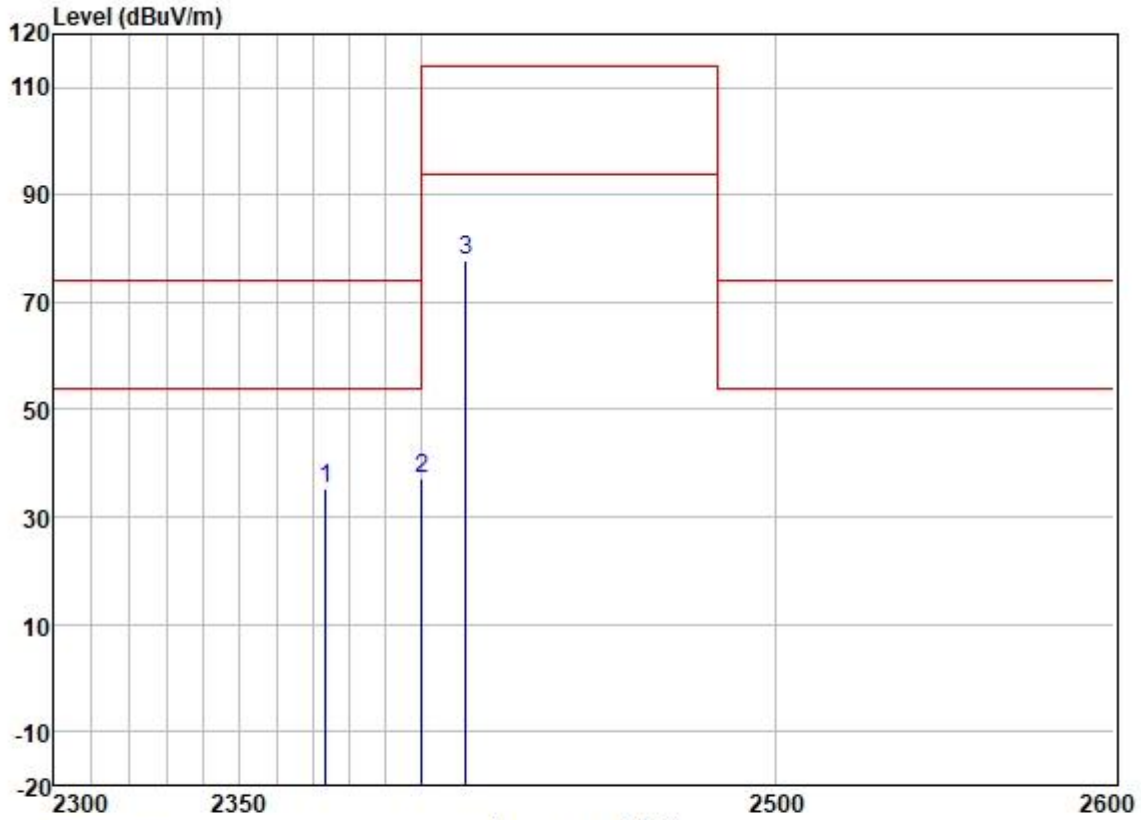
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2361.502	43.08	27.27	3.42	37.61	36.16	74.00	-37.84	HORIZONTAL	Peak
2	2400.000	45.94	27.35	3.50	37.59	39.20	74.00	-34.80	HORIZONTAL	Peak
3	2412.000	85.63	27.38	3.47	37.59	78.89	114.00	-35.11	HORIZONTAL	Peak

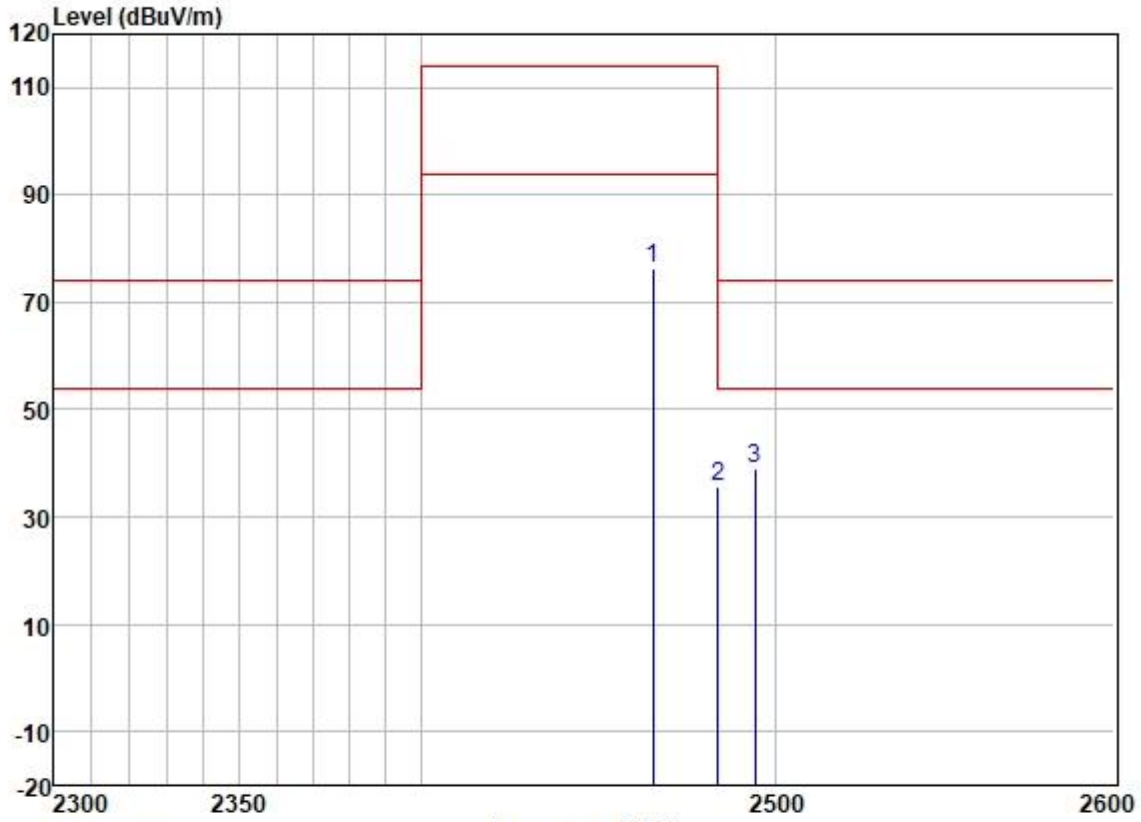
Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2373.397	41.95	27.30	3.45	37.60	35.10	74.00	-38.90	VERTICAL	Peak
2	2400.000	44.01	27.35	3.50	37.59	37.27	74.00	-36.73	VERTICAL	Peak
3	2412.000	84.69	27.38	3.47	37.59	77.95	114.00	-36.05	VERTICAL	Peak

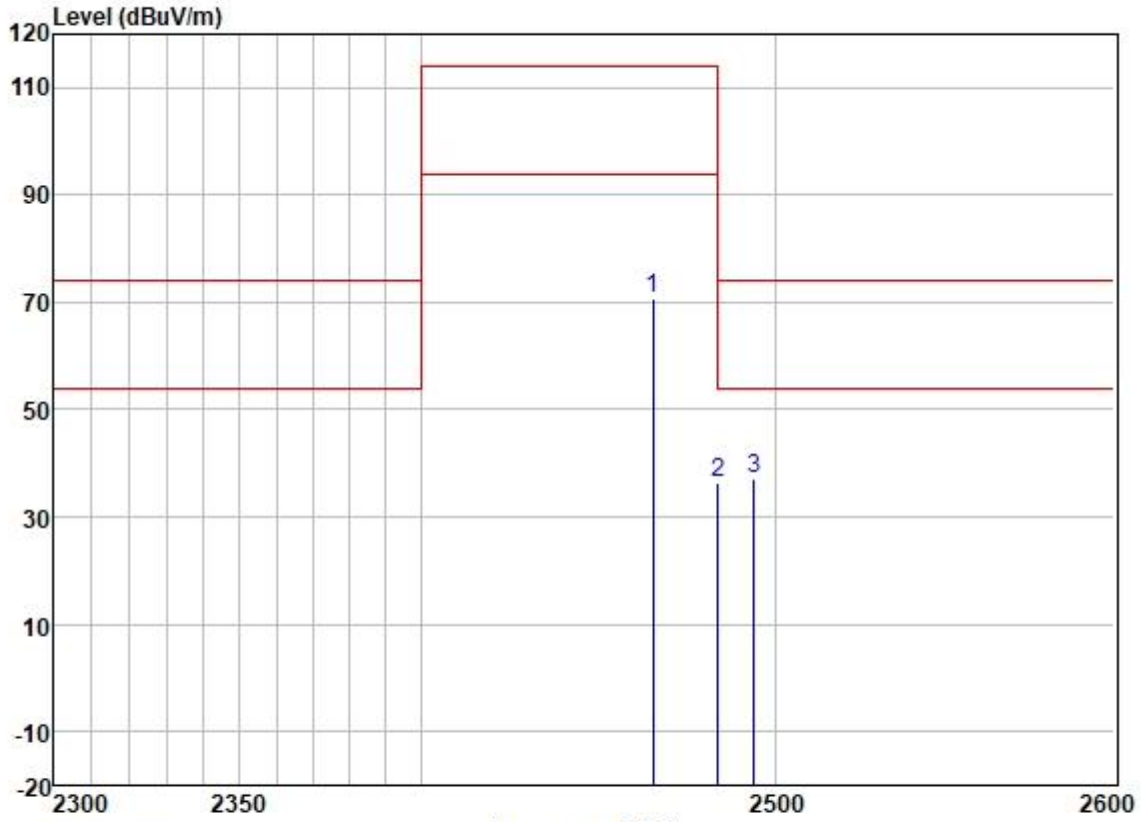
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2465.000	82.89	27.45	3.50	37.57	76.27	114.00	-37.73	HORIZONTAL	Peak
2	2483.500	42.26	27.48	3.53	37.57	35.70	74.00	-38.30	HORIZONTAL	Peak
3	2494.160	45.46	27.49	3.47	37.56	38.86	74.00	-35.14	HORIZONTAL	Peak

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2465.000	77.34	27.45	3.50	37.57	70.72	114.00	-43.28	VERTICAL	Peak
2	2483.500	42.99	27.48	3.53	37.57	36.43	74.00	-37.57	VERTICAL	Peak
3	2493.798	43.57	27.49	3.47	37.56	36.97	74.00	-37.03	VERTICAL	Peak

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
2) The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the above measurement data were shown in the report

6.3 Radiated Emissions (below 1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3

6.3.1 E.U.T. Operation

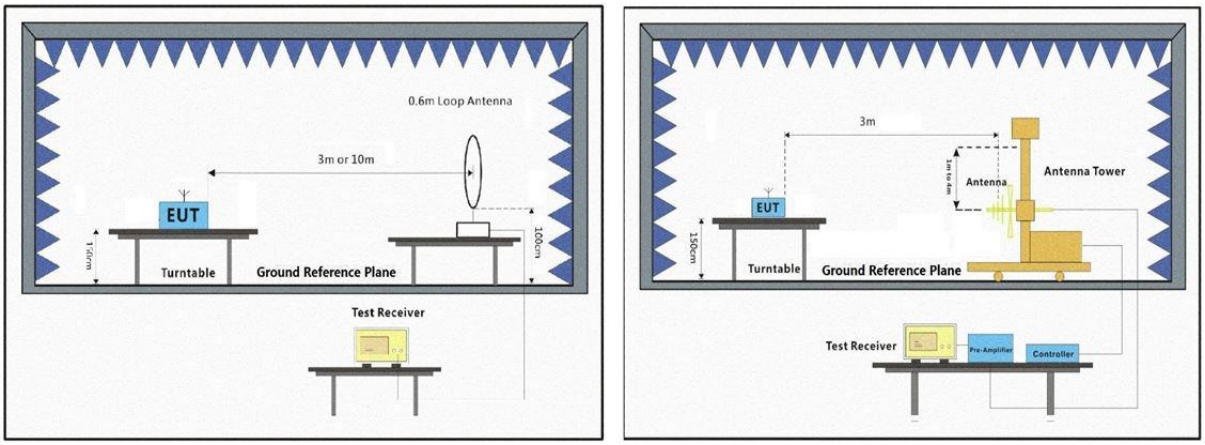
Operating Environment:

Temperature: 24.2 °C Humidity: 50.3 % RH Atmospheric Pressure: 1010 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

6.3.3 Test Setup Diagram



6.3.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) 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 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel.

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

i. Repeat above procedures until all frequencies measured was complete.

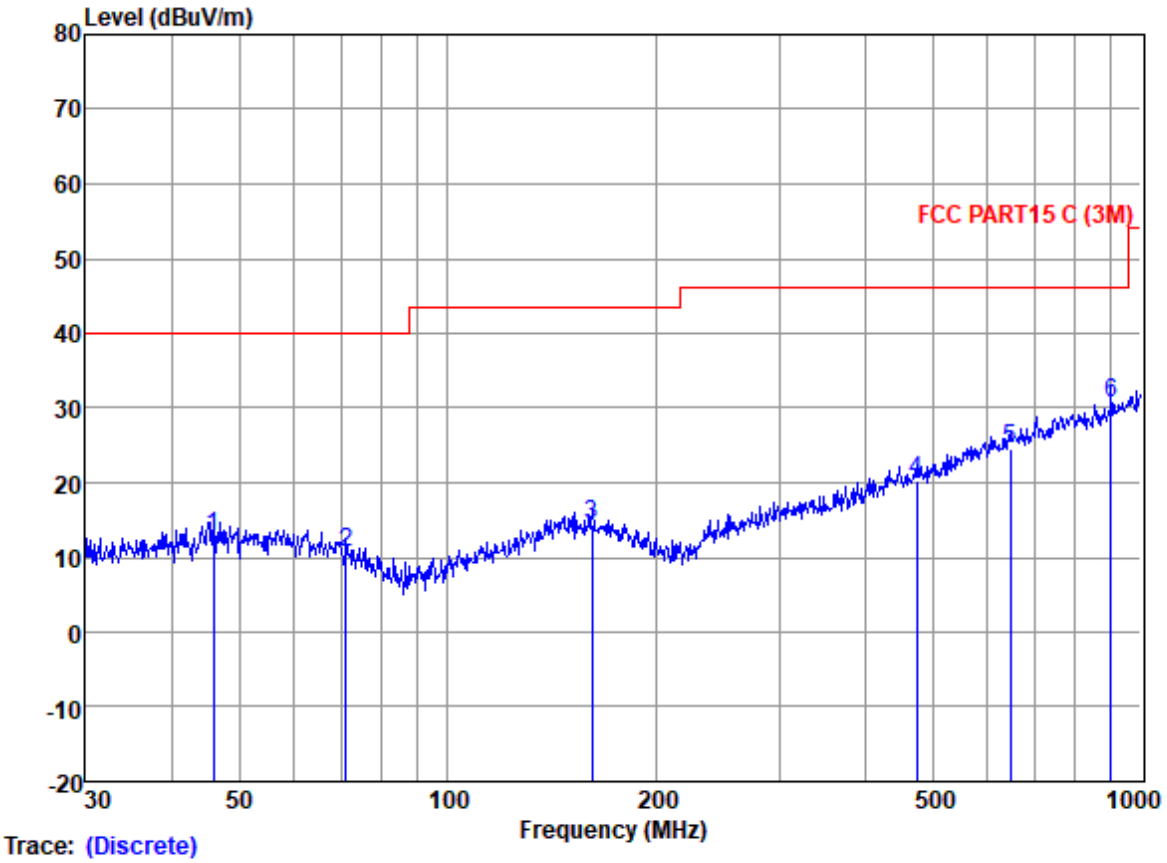
Remark:

1) Through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

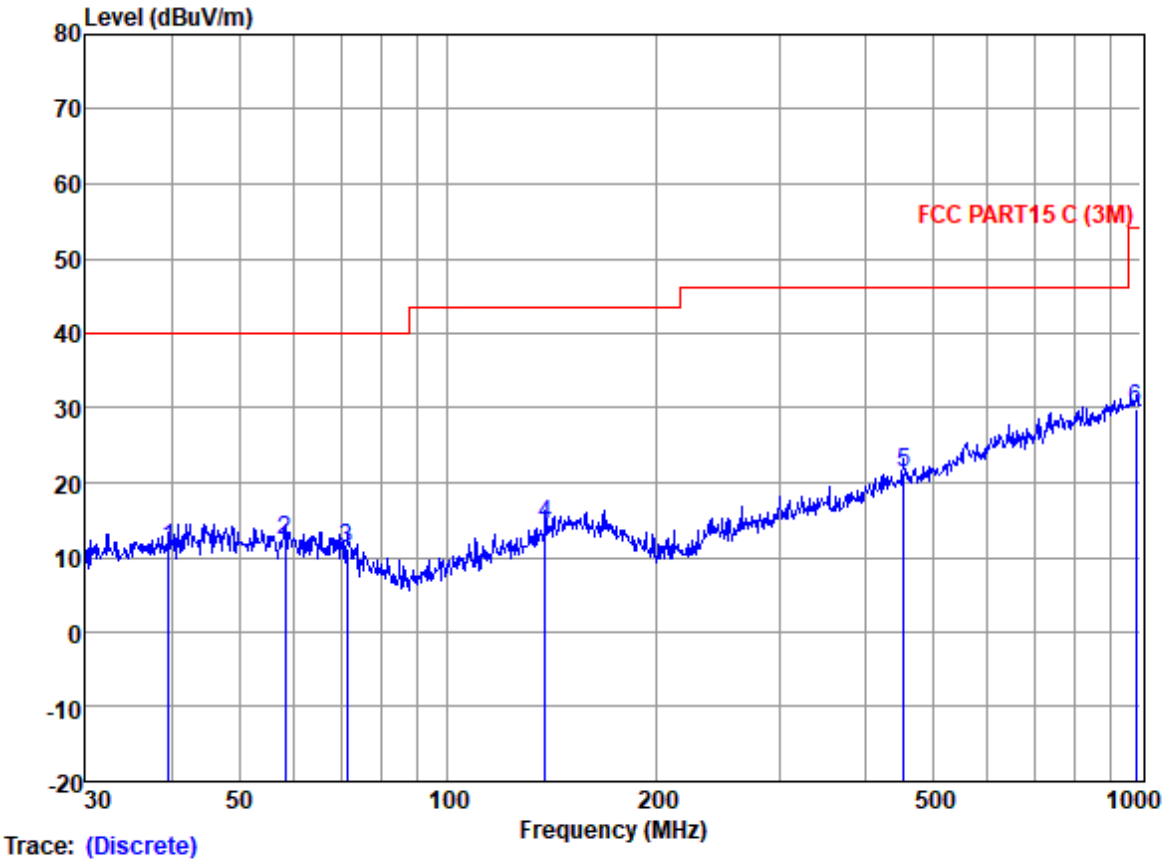
3) Scan from 9kHz to 1 GHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



Trace: (Discrete)

Site : SGS
Condition : FCC PART15 C (3M)
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1	45.86	24.99	13.89	1.13	27.17	12.84	40.00	-27.16	VERTICAL	QP
2	71.33	24.66	11.64	1.42	27.12	10.60	40.00	-29.40	VERTICAL	QP
3	161.47	25.29	13.60	2.34	26.79	14.44	43.50	-29.06	VERTICAL	QP
4	473.83	26.35	17.50	4.32	27.87	20.30	46.00	-25.70	VERTICAL	QP
5	647.39	26.76	20.48	5.51	28.18	24.57	46.00	-21.43	VERTICAL	QP
6	903.31	28.29	23.33	6.92	27.84	30.70	46.00	-15.30	VERTICAL	QP



Trace: (Discrete)

Site : SGS
Condition : FCC PART15 C (3M)
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1	39.58	23.92	13.47	1.10	27.18	11.31	40.00	-28.69	HORIZONTAL	QP
2	58.20	24.68	13.58	1.23	27.16	12.33	40.00	-27.67	HORIZONTAL	QP
3	71.58	25.32	11.59	1.42	27.12	11.21	40.00	-28.79	HORIZONTAL	QP
4	137.90	26.20	13.00	2.05	26.94	14.31	43.50	-29.19	HORIZONTAL	QP
5	454.31	27.33	17.40	4.22	27.74	21.21	46.00	-24.79	HORIZONTAL	QP
6	982.62	26.03	24.13	7.31	27.68	29.79	54.00	-24.21	HORIZONTAL	QP

6.4 Radiated Emissions (above 1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3

6.4.1 E.U.T. Operation

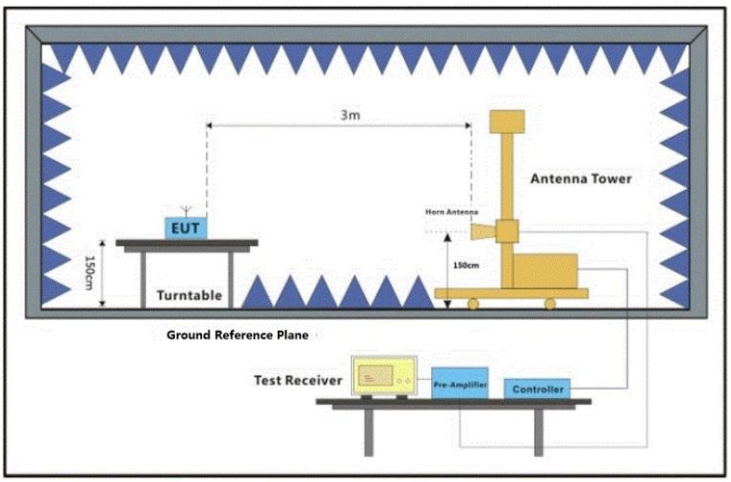
Operating Environment:

Temperature: 24.3 °C Humidity: 50.3 % RH Atmospheric Pressure: 1010 mbar

6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

6.4.3 Test Setup Diagram



6.4.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna 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 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel.

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

i. Repeat above procedures until all frequencies measured was complete.

Remark:

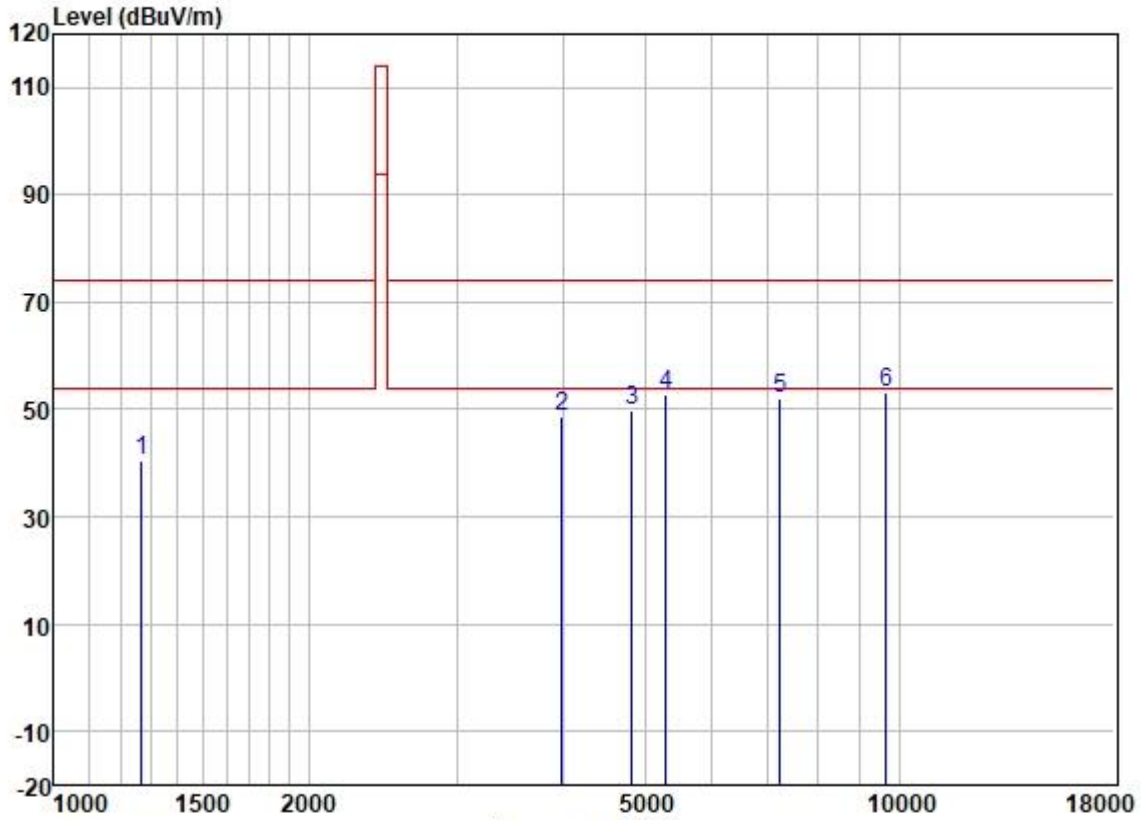
1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

2) Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) The field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

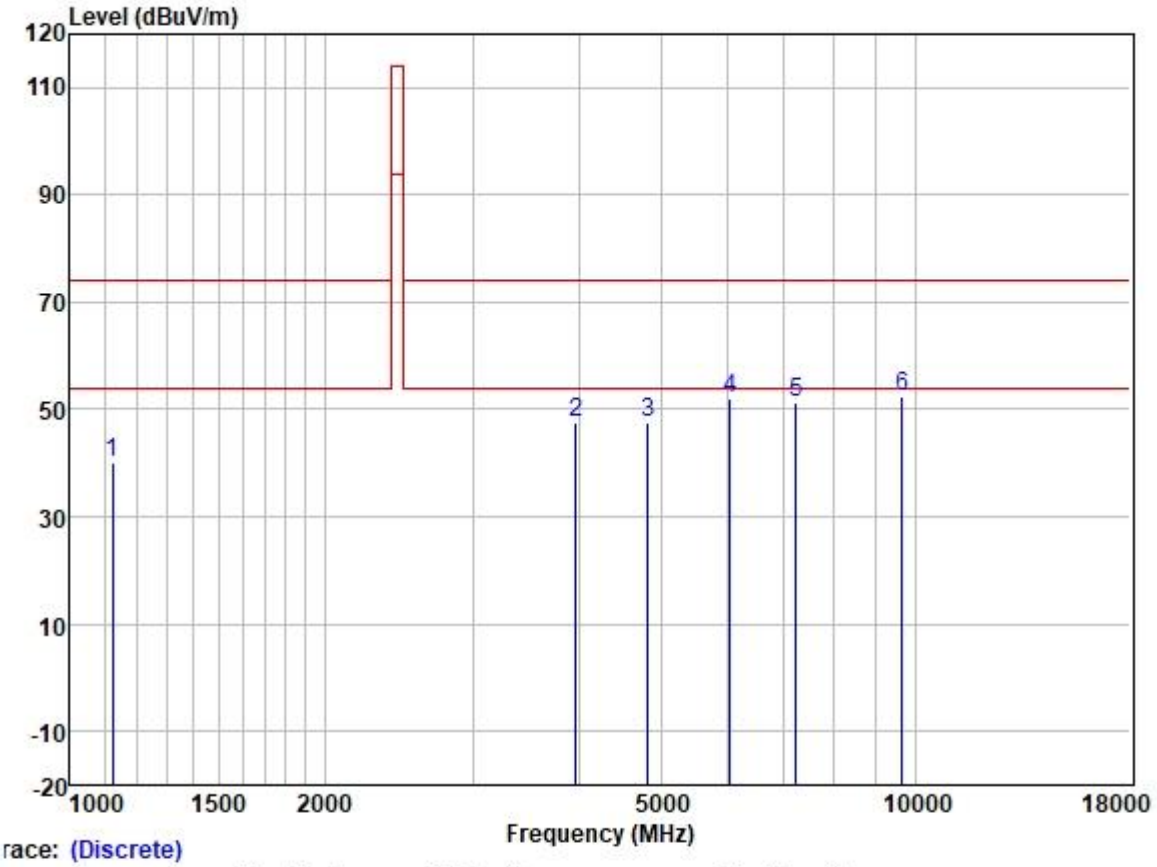
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:Low



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1269.856	51.13	25.11	2.46	38.33	40.37	74.00	-33.63	HORIZONTAL	Peak
2	3990.537	50.97	29.79	4.60	36.80	48.56	74.00	-25.44	HORIZONTAL	Peak
3	4824.000	49.89	31.45	5.42	36.83	49.93	74.00	-24.07	HORIZONTAL	Peak
4	5300.318	51.86	31.76	6.10	36.87	52.85	74.00	-21.15	HORIZONTAL	Peak
5	7236.000	47.74	35.70	6.03	37.39	52.08	74.00	-21.92	HORIZONTAL	Peak
6	9648.000	45.13	38.40	7.06	37.42	53.17	74.00	-20.83	HORIZONTAL	Peak

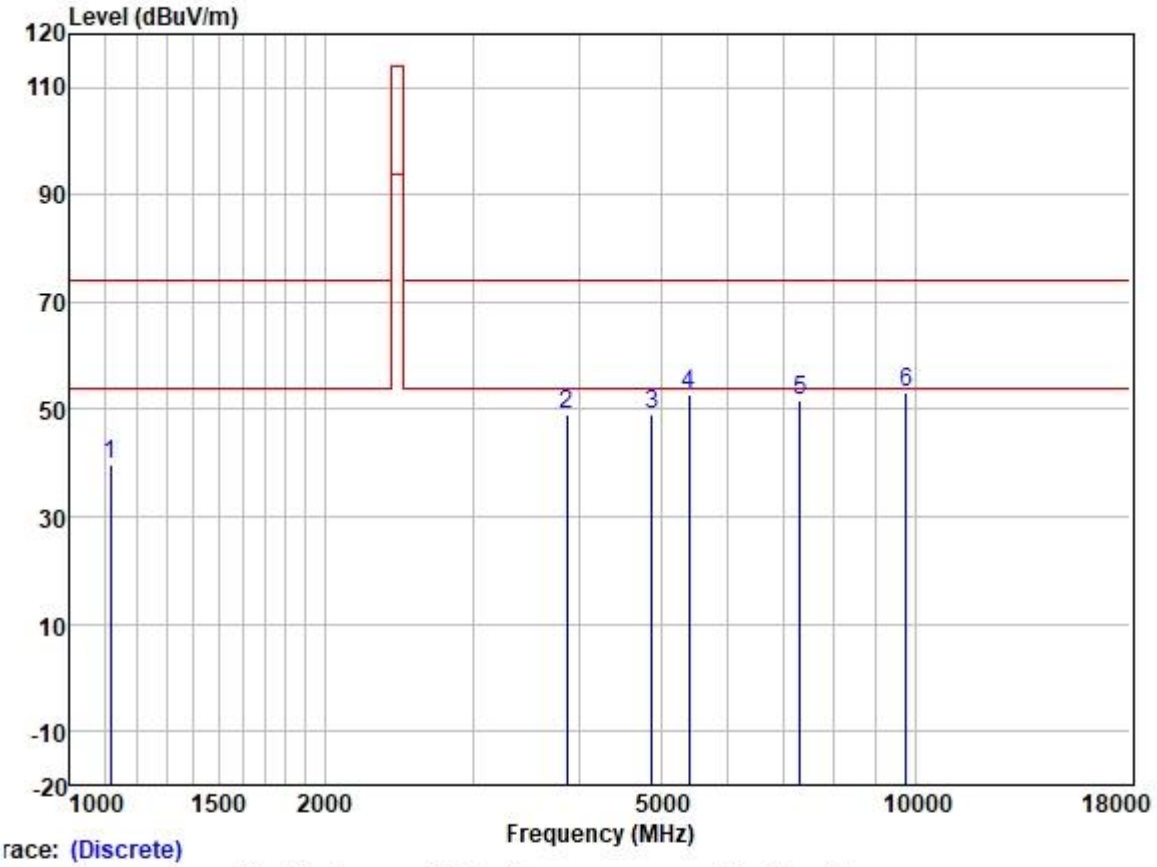
Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:Low



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1123.699	52.07	24.42	2.22	38.43	40.28	74.00	-33.72	VERTICAL	Peak
2	3968.149	50.16	29.77	4.60	36.81	47.72	74.00	-26.28	VERTICAL	Peak
3	4824.000	47.65	31.45	5.42	36.83	47.69	74.00	-26.31	VERTICAL	Peak
4	6040.807	50.34	32.48	6.18	36.91	52.09	74.00	-21.91	VERTICAL	Peak
5	7236.000	46.82	35.70	6.03	37.39	51.16	74.00	-22.84	VERTICAL	Peak
6	9648.000	44.38	38.40	7.06	37.42	52.42	74.00	-21.58	VERTICAL	Peak

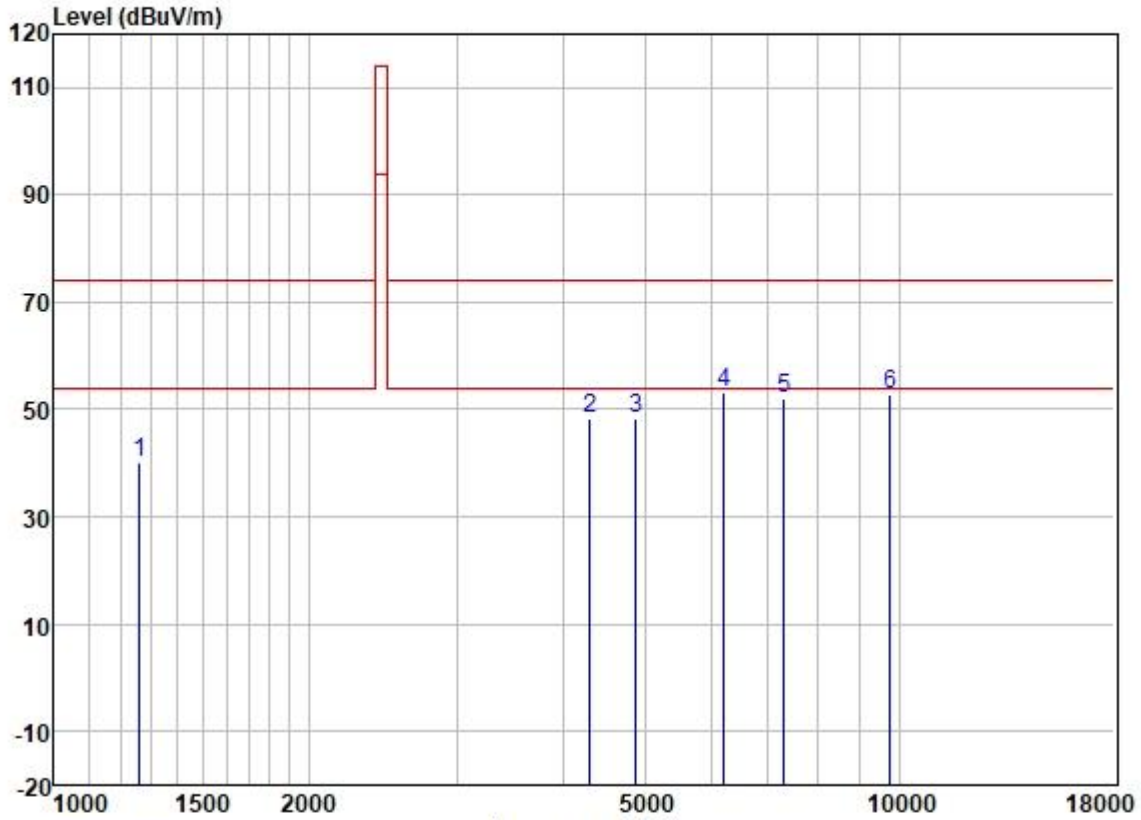
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:middle



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1117.609	51.57	24.40	2.25	38.43	39.79	74.00	-34.21	HORIZONTAL	Peak
2	3875.561	51.59	29.66	4.60	36.83	49.02	74.00	-24.98	HORIZONTAL	Peak
3	4876.000	48.99	31.54	5.50	36.84	49.19	74.00	-24.81	HORIZONTAL	Peak
4	5396.037	51.83	31.78	6.00	36.88	52.73	74.00	-21.27	HORIZONTAL	Peak
5	7314.000	47.06	35.93	6.11	37.43	51.67	74.00	-22.33	HORIZONTAL	Peak
6	9752.000	44.96	38.50	7.02	37.41	53.07	74.00	-20.93	HORIZONTAL	Peak

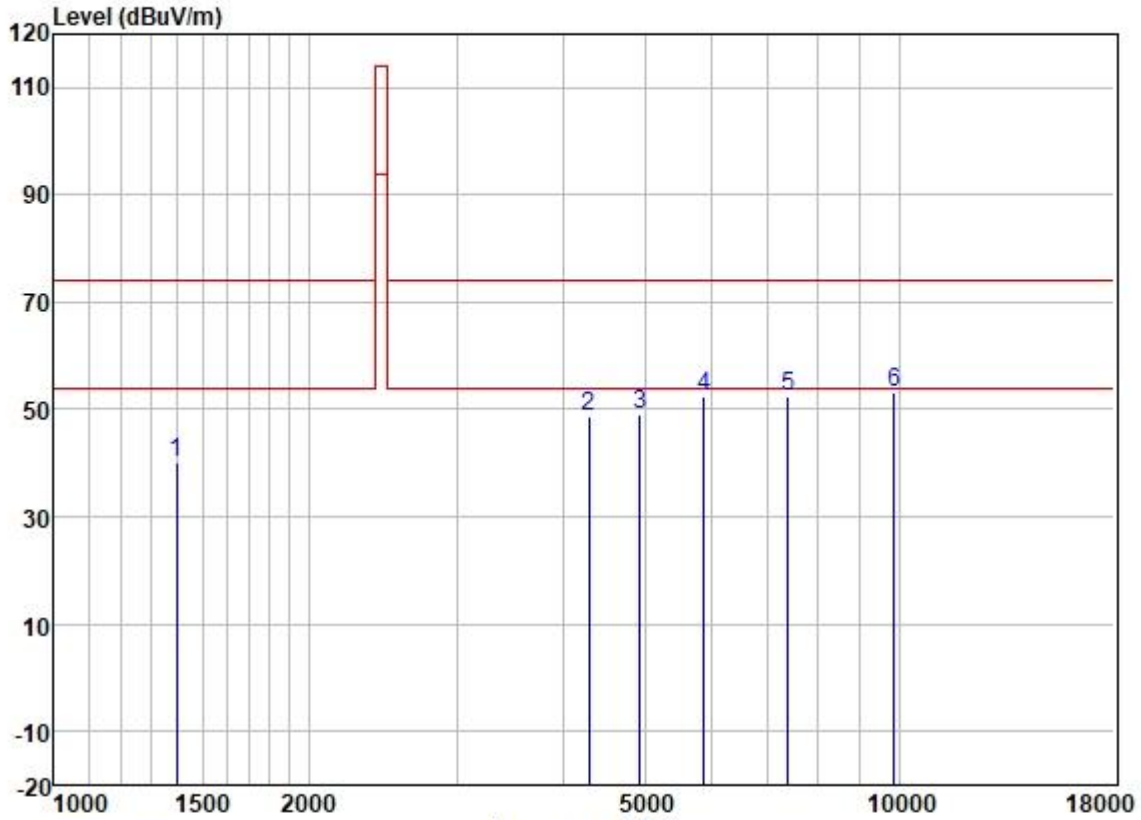
Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:middle



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1261.228	51.03	25.07	2.40	38.35	40.15	74.00	-33.85	VERTICAL	Peak
2	4306.915	49.96	30.48	4.65	36.81	48.28	74.00	-25.72	VERTICAL	Peak
3	4876.000	47.99	31.54	5.50	36.84	48.19	74.00	-25.81	VERTICAL	Peak
4	6214.814	50.92	33.03	6.06	36.94	53.07	74.00	-20.93	VERTICAL	Peak
5	7314.000	47.32	35.93	6.11	37.43	51.93	74.00	-22.07	VERTICAL	Peak
6	9752.000	44.84	38.50	7.02	37.41	52.95	74.00	-21.05	VERTICAL	Peak

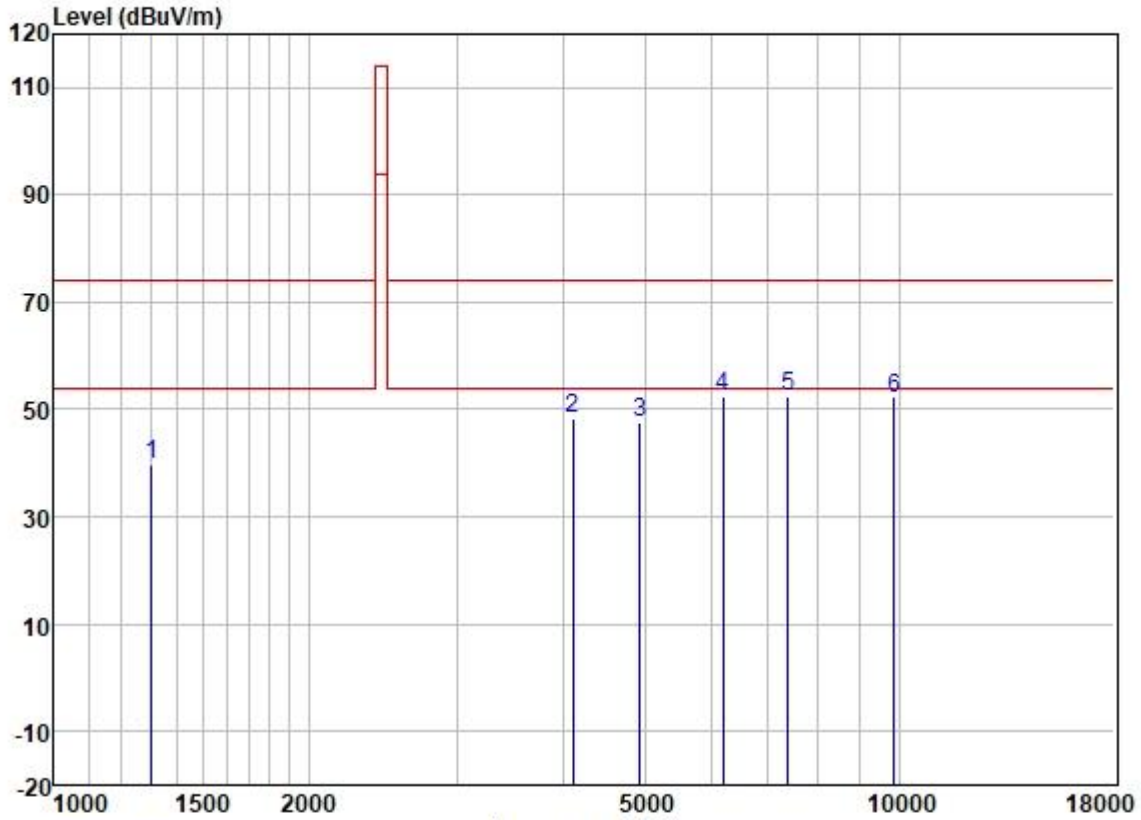
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:High



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1396.165	50.46	25.38	2.60	38.22	40.22	74.00	-33.78	HORIZONTAL	Peak
2	4292.229	50.26	30.45	4.64	36.81	48.54	74.00	-25.46	HORIZONTAL	Peak
3	4930.000	48.82	31.62	5.60	36.84	49.20	74.00	-24.80	HORIZONTAL	Peak
4	5883.739	51.07	32.29	5.93	36.90	52.39	74.00	-21.61	HORIZONTAL	Peak
5	7395.000	47.46	36.17	6.19	37.46	52.36	74.00	-21.64	HORIZONTAL	Peak
6	9860.000	45.18	38.60	6.98	37.41	53.35	74.00	-20.65	HORIZONTAL	Peak

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:High

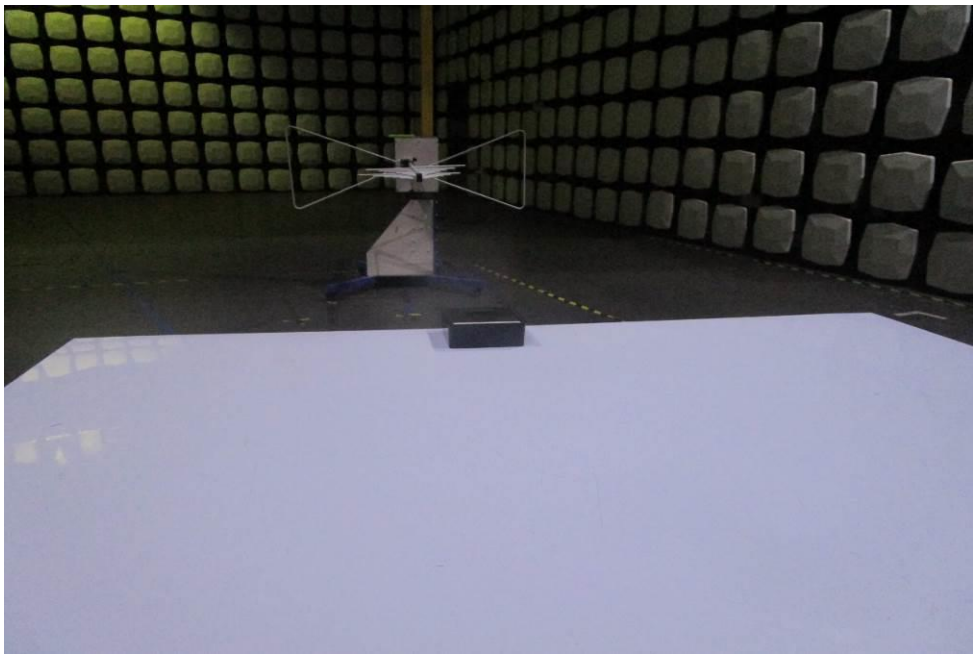


race: (Discrete)

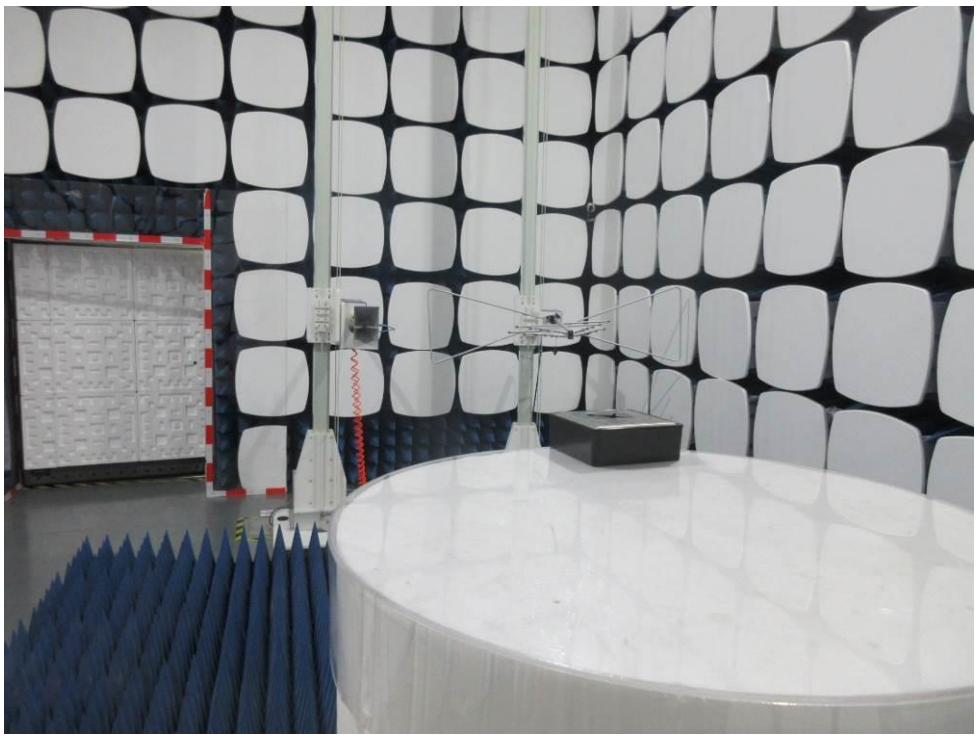
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1303.096	50.32	25.21	2.60	38.31	39.82	74.00	-34.18	VERTICAL	Peak
2	4109.822	50.68	29.96	4.60	36.80	48.44	74.00	-25.56	VERTICAL	Peak
3	4930.000	47.23	31.62	5.60	36.84	47.61	74.00	-26.39	VERTICAL	Peak
4	6187.373	50.43	32.96	6.07	36.93	52.53	74.00	-21.47	VERTICAL	Peak
5	7395.000	47.34	36.17	6.19	37.46	52.24	74.00	-21.76	VERTICAL	Peak
6	9860.000	44.07	38.60	6.98	37.41	52.24	74.00	-21.76	VERTICAL	Peak

7 Test Setup Photo

Radiated Emissions (below 1GHz)



Radiated Emissions (above 1GHz)



8 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for GZCR2108020916AT

- End of the Report -