

TEST REPORT

Application No.: GZCR2604000668LM
Applicant: Nature's Mark, LLC
Address of Applicant: 5509 Stockdale Ct, Jurupa Valley, CA 92509, USA
Manufacturer: Nature's Mark, LLC
Address of Manufacturer: 5509 Stockdale Ct, Jurupa Valley, CA 92509, USA
Factory: TG-BROTHER ELECTRONIC LIGHTING CO., LTD.
Address of Factory: SvayRieng GIGA Resource SEZ, Daeum Pou, Kandieng Reay, Svay Teab, Svay Rieng Province, Cambodia
Product Name: 100CT Mickey String light
Model No.: HX25052805-SM, HX25052805-S, HX25052805-SW, HX25052805-SS, HX25052805-SSM, HX25052805-SSW ♣
 ♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Standard(s) : 47 CFR Part 15, Subpart C 15.231
Date of Receipt: 2026-04-10
Date of Test: 2026-04-27 to 2026-05-22
Date of Issue: 2026-05-27

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



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Revision Record			
Version	Report No.	Date	Remark
01	GZCR260400066802	2026-05-27	Original

Authorized for issue by:			
		Key Liang	
		Key Liang/Project Engineer	
Approved By		Vico Cui	
		Vico Cui/Reviewer	



2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.231	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
20dB Bandwidth	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2020) Section 6.9.2	47 CFR Part 15, Subpart C 15.231(c)	Pass
Dwell Time (15.231(a1))		ANSI C63.10 (2020) Section 7.4	47 CFR Part 15, Subpart C 15.231(a1)	Pass
Radiated Emissions below 1GHz		ANSI C63.10 (2020) Section 6.4&6.5	47 CFR Part 15C Section 15.231(b) and 15.209	Pass**
Field Strength of the Fundamental Signal (15.231(b))		ANSI C63.10 (2020) Section 6.5	47 CFR Part 15, Subpart C 15.231(b)	Pass**
Radiated Emissions above 1GHz		ANSI C63.10 (2020) Section 6.6	47 CFR Part 15C Section 15.231(b) and 15.209	Pass

** : The EUT passed Radiated Emissions below 1GHz and Field Strength of the Fundamental Signal (15.231(b)) tests after modification.

Note:

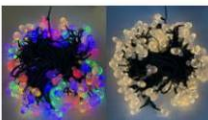
E.U.T./EUT means Equipment Under Test.

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



♣ Declaration of EUT Family Grouping:

Model No.: HX25052805-SM, HX25052805-S, HX25052805-SW, HX25052805-SS,
HX25052805-SSM, HX25052805-SSW

Models No.	Photo	Product name
HX25052805-SM	 HX25052805-SM	100CT Mickey String light – Multi Color
HX25052805-S	 HX25052805-S	100CT Mickey String light, 2 asst – (Multi Color & Warm White)
HX25052805-SW	 HX25052805-SW	100CT Mickey String light – Warm White
HX25052805-SS	 HX25052805-SS	100CT Mickey String light, 2 asst – (Multi Color & Warm White)
HX25052805-SSM	 HX25052805-SSM	100CT Mickey String light – Multi Color
HX25052805-SSW	 HX25052805-SSW	100CT Mickey String light – Warm White

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the model name and appearance color.

Therefore only one model **HX25052805-SM** was tested in this report.



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4 General Information

4.1 Details of E.U.T.

Power supply: DC 30 V for main unit powered by AC/DC adapter as below (Receiver):
Model: JT-DC300V0200-L3
Input: AC 120V, 60Hz, 0.30A
Output: DC 30V 0.20A
DC 3.0V = 1 x 3.0V CR2032 button cell for remote controller (Transmitter)

Test voltage: DC 3.0V

Cable(s): AC mains ports for main unit
None for remote controller.

Operation Frequency: 433.92MHz

Channel Numbers: 1

Modulation Type: ASK

Antenna Type: PCB Antenna

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

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
20dB Bandwidth	±0.274%
Dwell Time (15.231(a1))	±0.029%
Radiated Emissions below 1GHz	±5.14dB (30MHz-1GHz; 3m); ±4.90dB (30MHz-1GHz; 10m)
Field Strength of the Fundamental Signal (15.231(b))	±5.14dB (30MHz-1GHz; 3m); ±4.90dB (30MHz-1GHz; 10m)
Radiated Emissions above 1GHz	±4.88 dB (1GHz-6 GHz); ±5.06 dB (6GHz-18GHz); ±5.30dB(18GHz-40GHz)

Remark:

The U_{lab} (lab Uncertainty) is less than U_{CISPR} (CISPR Uncertainty) or U_{ETSI} (ETSI Uncertainty).

Emission decision rule:

- Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit, marked as Pass in the report.
- Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit, marked as Fail in the report.



4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou,
Guangdong, China 510663

Tel: +86 20 82155555

No tests were sub-contracted.

4.5 Test Facility

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

● 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.

● 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

20dB Bandwidth					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MI CABLE	SGS-EMC	0.8M	EMC2137	2025-11-02	2026-11-01
MXA Signal Analyzer (10Hz-8.4GHz)	Agilent Technologies	N9020A	SEM004-10	2025-11-25	2026-11-24

Dwell Time (15.231(a1))					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MI CABLE	SGS-EMC	0.8M	EMC2137	2025-11-02	2026-11-01
MXA Signal Analyzer (10Hz-8.4GHz)	Agilent Technologies	N9020A	SEM004-10	2025-11-25	2026-11-24

Radiated Emissions below 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2025-08-13	2028-08-12
Coaxial cable	Mirco-COAX UTIFLEX	311A	EMC0540	2024-08-19	2026-08-18
Amplifier (9kHz-1.3GHz)	HP	8447F	EMC2065	2025-11-25	2026-11-24
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2026-03-28	2028-03-27
EMI Test Receiver (9kHz-7GHz)	Rohde & Schwarz	ESR7	EMC2220	2025-11-18	2026-11-17
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Trilog Broadband Antenna (25MHz-2GHz)	Schwarzbeck Mess-Elektronik	VULB 9168	EMC2174	2025-04-21	2027-04-20

Field Strength of the Fundamental Signal (15.231(b))					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2025-08-13	2028-08-12
Coaxial cable	Mirco-COAX UTIFLEX	311A	EMC0540	2024-08-19	2026-08-18
Amplifier (9kHz-1.3GHz)	HP	8447F	EMC2065	2025-11-25	2026-11-24
EMI Test Receiver (9kHz-7GHz)	Rohde & Schwarz	ESR7	EMC2220	2025-11-18	2026-11-17
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Trilog Broadband Antenna (25MHz-2GHz)	Schwarzbeck Mess-Elektronik	VULB 9168	EMC2174	2025-04-21	2027-04-20



Radiated Emissions above 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
1-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2025-08-11	2026-08-10
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2025-08-11	2026-08-10
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2024-08-19	2026-08-18
Horn Antenna (1-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2025-05-13	2027-05-12
966 Anechoic Chamber	Shenzhen C.R.T	CRTSGSSAC966	EMC2230	2025-03-22	2028-03-21
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Preamplifier (1-18GHz)	Shenzhen TST	LNA010180G50	EMC6036	2026-04-14	2027-04-13
Intelligent Coaxial RF Switch (DC-18GHz)	Shenzhen TST	ICS01018	EMC6037	2026-04-14	2027-04-13

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2026-05-14	2027-05-13



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

15.203 requirement:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement.

Antenna location: Refer to Internal photos



7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.231(c)

Test Method: ANSI C63.10 (2020) Section 6.9.2

Test Engineer: Banna Ban

Limit:

Frequency range(MHz)	Limit
70-900	No wider than 0.25% of the center frequency
Above 900	No wider than 0.5% of the center frequency

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 21.5 °C

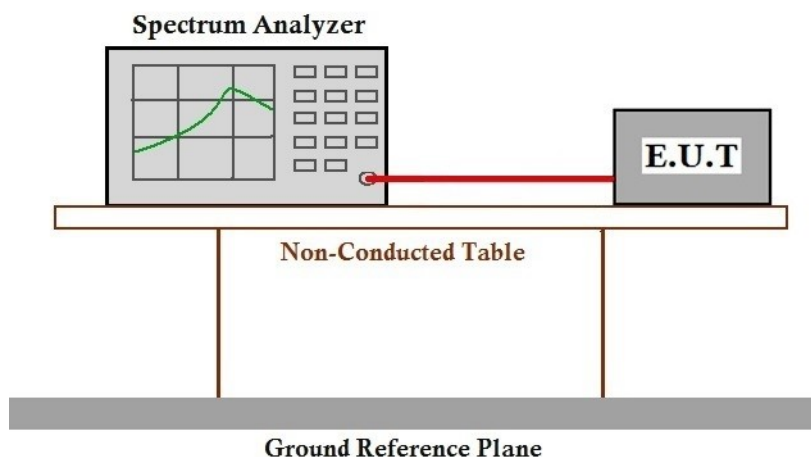
Humidity: 61.1 % RH

Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

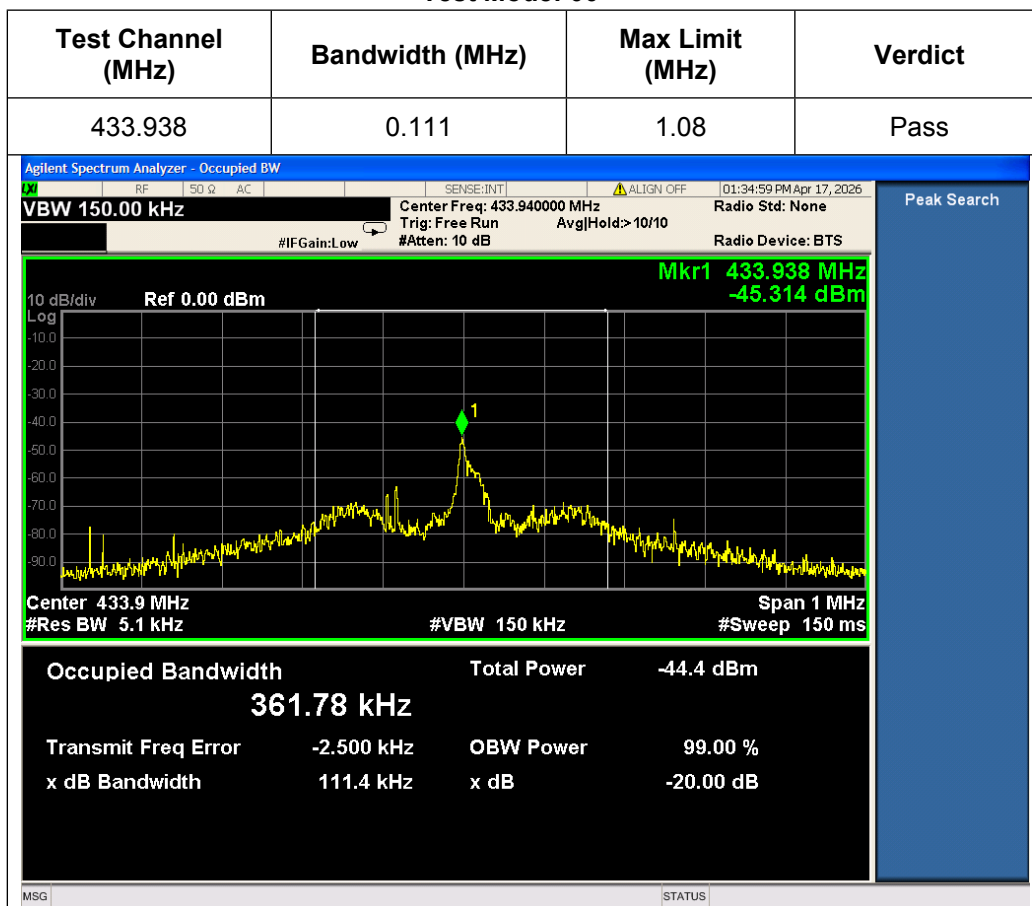
Pre-scan / Mode	Description
Final test Code	
Final test 00	Tx mode

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

Test Mode: 00



7.2 Dwell Time (15.231(a1))

Test Requirement 47 CFR Part 15, Subpart C 15.231(a1)

Test Method: ANSI C63.10 (2020) Section 7.4

Test Engineer: Banna Ban

Limit:

Device type	Limit
Manually operated transmitter	The switch automatically deactivate the transmitter within not more than 5 seconds of being released
Automatically activated transmitter	Cease transmission within 5 seconds after activation
Periodic transmissions to determine system integrity of transmitters used in security or safety applications	The total transmission time does not exceed 2 seconds per hour

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 21.5 °C

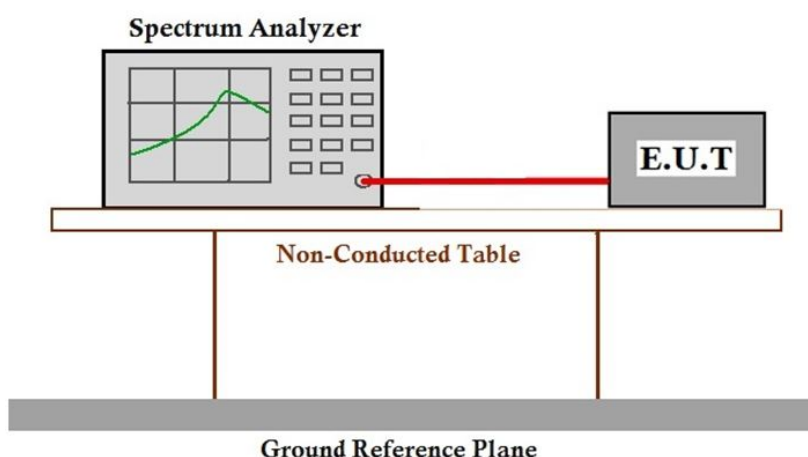
Humidity: 61.1 % RH

Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Mode	Description
Final test Code	
Final test 00	Tx mode

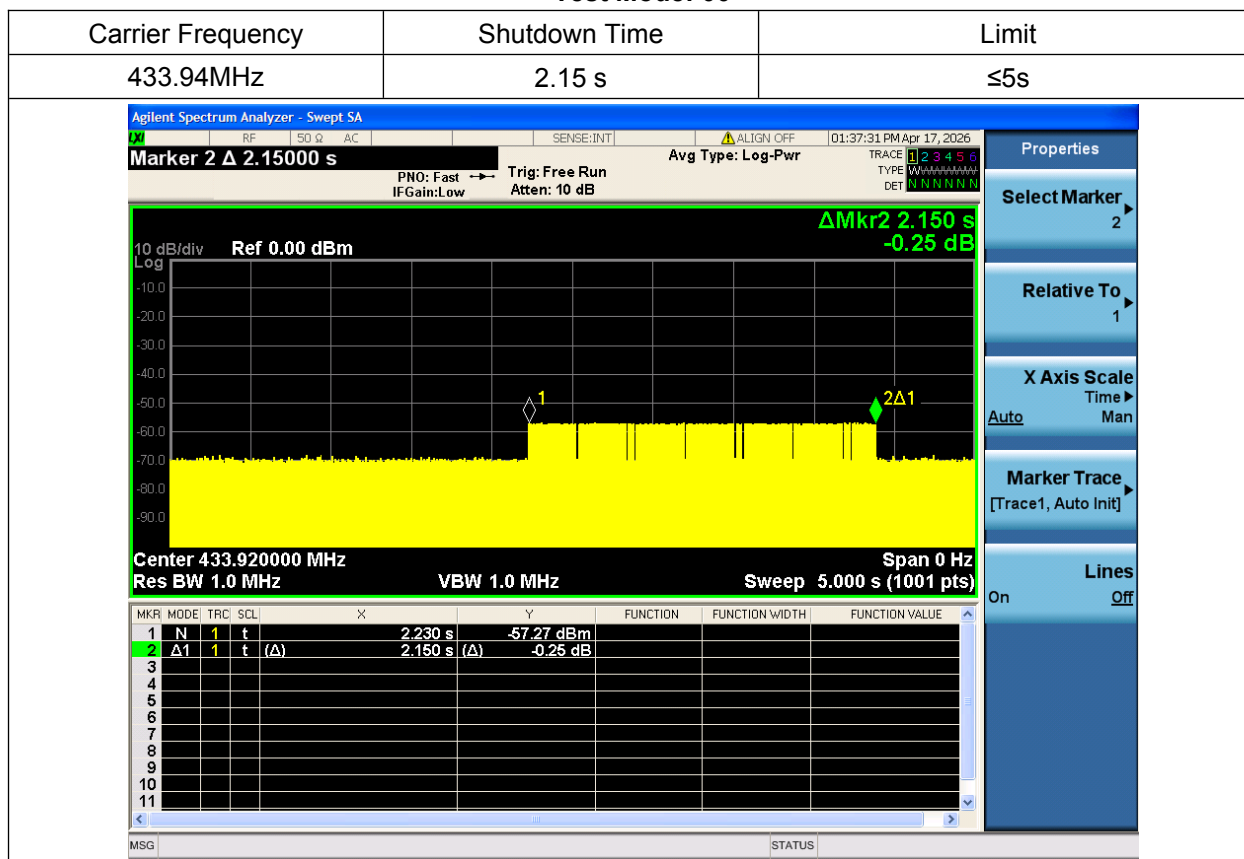
7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data



Test Mode: 00



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7.3 Radiated Emissions below 1GHz

Test Requirement 47 CFR Part 15C Section 15.231(b) and 15.209

Test Method: ANSI C63.10 (2020) Section 6.4&6.5

Test Engineer: Bob Qu

Test Distance: 10m above 30MHz; 3m below 30MHz

Limit:

For Restricted bands

Frequency(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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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 Other bands

Fundamental Frequency MHz	Field Strength of Fundamental (μV/m @ 3 m)	Field Strength of Harmonics and Spurious Emissions (μV/m @ 3 m)
40.66 to 40.70	2,250	225
70 to 130	1,250	125
130 to 174	**1,250 to 3,750	**125 to 375
174 to 260	3,750	375
260 to 470	**3,750 to 12,500	**375 to 1,250
Above 470	12,500	1,250
Detector:	Peak for pre-scan QP for 30MHz to 1000 MHz: 120 kHz resolution bandwidth Peak for Above 1 GHz: 1 MHz resolution bandwidth	



** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows:

for the band 130-174 MHz, $\mu\text{V/m}$ at 3 meters = $56.81818(F) - 6136.3636$;

for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3333$.

The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

The fundamental frequency of the EUT is 433.92 MHz

The limit for average or QP field strength dB $\mu\text{V/m}$ for the fundamental emission= 80.83 dB $\mu\text{V/m}$

No fundamental is allowed in the restricted bands.

The limit for average field strength dB $\mu\text{V/m}$ for the spurious emission=60.83 dB $\mu\text{V/m}$. Spurious in the restricted bands must be less than 60.83 dB $\mu\text{V/m}$ or 15.209, whichever limit permits a higher field strength.

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 21.8 °C

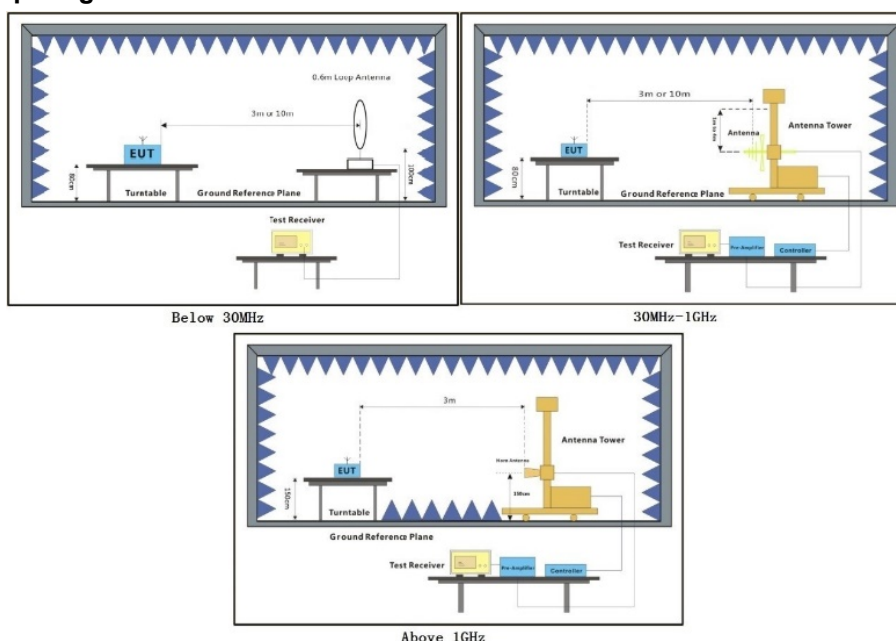
Humidity: 52.7 % RH

Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	00	Tx mode

7.3.3 Test Setup Diagram



7.3.4 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.

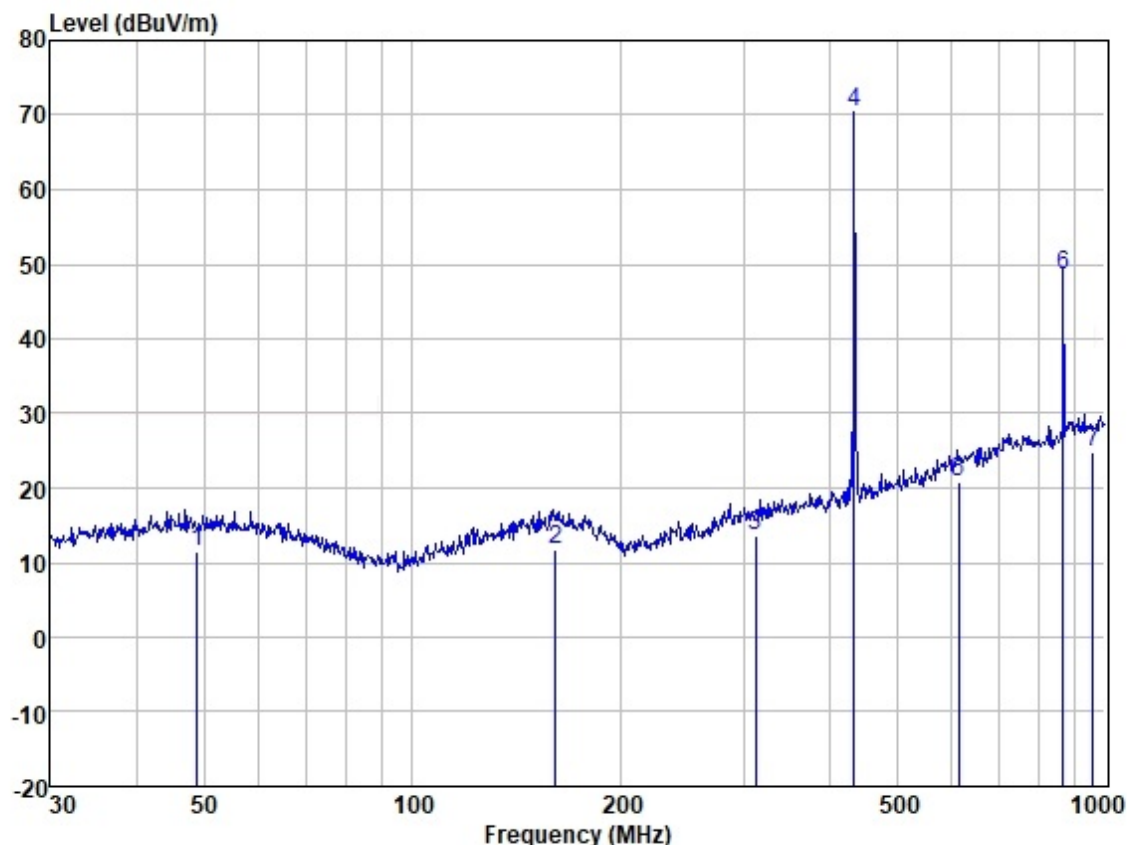
Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, 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.

Remark 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.



Test Mode: 00; Polarity: Horizontal



Site : SGS
Model :
Power :
Test Mode : TX

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	48.843	24.83	13.93	0.74	27.97	11.53			HORIZONTAL	QP
2	160.909	25.06	13.40	1.03	27.70	11.79			HORIZONTAL	QP
3	312.179	25.12	13.89	1.71	27.23	13.49			HORIZONTAL	QP
5	614.000	26.85	20.46	2.07	28.46	20.92			HORIZONTAL	QP
6	869.130	51.00	23.06	2.61	28.18	48.49			HORIZONTAL	QP
7	960.000	25.93	23.81	2.69	27.76	24.67			HORIZONTAL	QP

The 4th point in the plot was the fundamental frequency of the EUT, please refer to section 7.4 for details.



Frequency (MHz)	Level @10m (dBuV/m)	Convert Factor (dB)*	Level @ 3m (dBuV/m)	Limit @3m (dBuV/m)	Over limit (dB)	Remark
48.843	11.53	10.46	21.99	40.00	-18.01	QP
160.909	11.79	10.46	22.25	43.52	-21.27	QP
312.179	13.49	10.46	23.95	46.02	-22.07	QP
614.000	20.92	10.46	31.38	46.02	-14.64	QP
869.130	48.49	10.46	58.95	60.83	-1.88	QP
960.000	24.67	10.46	35.13	53.98	-18.85	QP

*Remark :

Level (dBuV/m) @3m = Level (dBuV/m) @10m + Convert Factor (dB)

Convert Factor (dB) = $20 \times \log(\text{Measurement Distance}/\text{Specified Distance}) = 20 \times \log(10/3) = 10.46 \text{ dB}$
according to 15.31 (f) (1)



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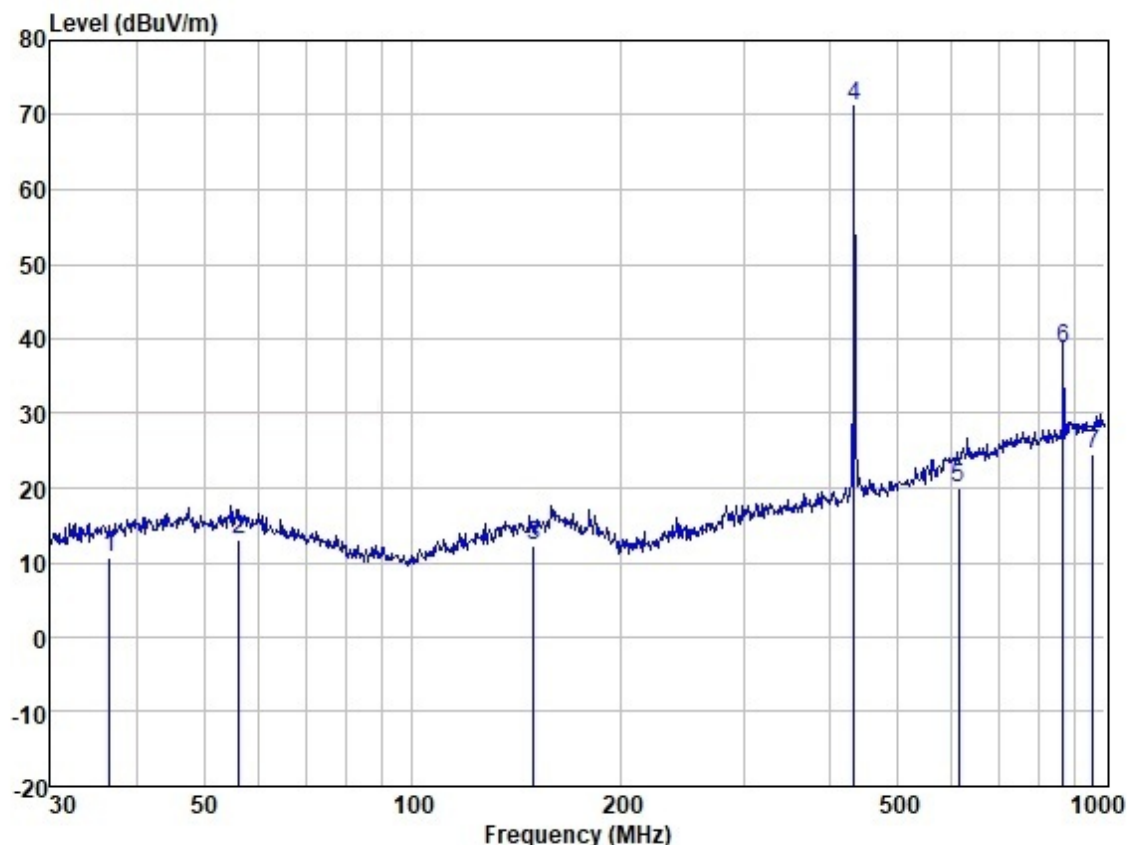
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Test Mode: 00; Polarity: Vertical



Site : SGS
Model :
Power :
Test Mode : TX

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	36.509	24.77	13.22	0.65	27.99	10.65			VERTICAL	QP
2	56.197	26.49	13.61	0.77	27.94	12.93			VERTICAL	QP
3	149.486	25.65	13.42	0.98	27.73	12.32			VERTICAL	QP
5	614.000	25.91	20.46	2.07	28.46	19.98			VERTICAL	QP
6	869.130	41.08	23.06	2.61	28.18	38.57			VERTICAL	QP
7	960.000	25.81	23.81	2.69	27.76	24.55			VERTICAL	QP

The 4th point in the plot was the fundamental frequency of the EUT, please refer to section 7.4 for details.



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Frequency (MHz)	Level @10m (dBuV/m)	Convert Factor (dB)*	Level @ 3m (dBuV/m)	Limit @3m (dBuV/m)	Over limit (dB)	Remark
36.509	10.65	10.46	21.11	40.00	-18.89	QP
56.197	12.93	10.46	23.39	40.00	-16.61	QP
149.486	12.32	10.46	22.78	43.52	-20.74	QP
614.000	19.98	10.46	30.44	46.02	-15.58	QP
869.130	38.57	10.46	49.03	60.83	-11.80	QP
960.000	24.55	10.46	35.01	53.98	-18.97	QP

*Remark :

Level (dBuV/m) @3m = Level (dBuV/m) @10m + Convert Factor (dB)

Convert Factor (dB) = $20 \times \log(\text{Measurement Distance/Specified Distance}) = 20 \times \log(10/3) = 10.46 \text{ dB}$
according to 15.31 (f) (1)



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7.4 Field Strength of the Fundamental Signal (15.231(b))

Test Requirement 47 CFR Part 15, Subpart C 15.231(b)
 Test Method: ANSI C63.10 (2020) Section 6.5
 Test Engineer: Bob Qu
 Test Distance: 10m

Limit:

Fundamental Frequency MHz	Field Strength of Fundamental (μV/m @ 3 m)	Field Strength of Harmonics and Spurious Emissions (μV/m @ 3 m)
40.66 to 40.70	2,250	225
70 to 130	1,250	125
130 to 174	**1,250 to 3,750	**125 to 375
174 to 260	3,750	375
260 to 470	**3,750 to 12,500	**375 to 1,250
Above 470	12,500	1,250
Detector:	Peak for pre-scan	
	QP for 30MHz to1000 MHz:120 kHz resolution bandwidth	
	Peak for Above 1 GHz: 1 MHz resolution bandwidth	

** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows:

for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636;

for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333.

The fundamental frequency of the EUT is 433.92 MHz

The limit for average or QP field strength dBuV/m for the fundamental emission= 80.83 dBuV/m

No fundamental is allowed in the restricted bands.

7.4.1 E.U.T. Operation

Operating Environment:

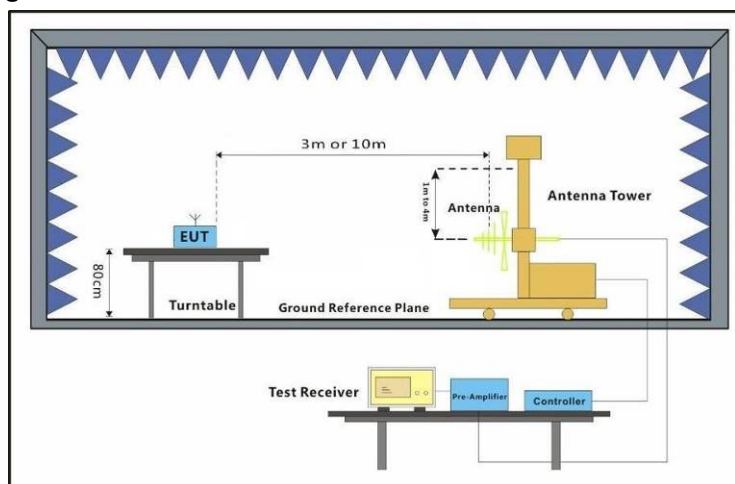
Temperature: 21.8 °C Humidity: 52.7 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Mode	Description
Final test Code	
Final test 00	Tx mode



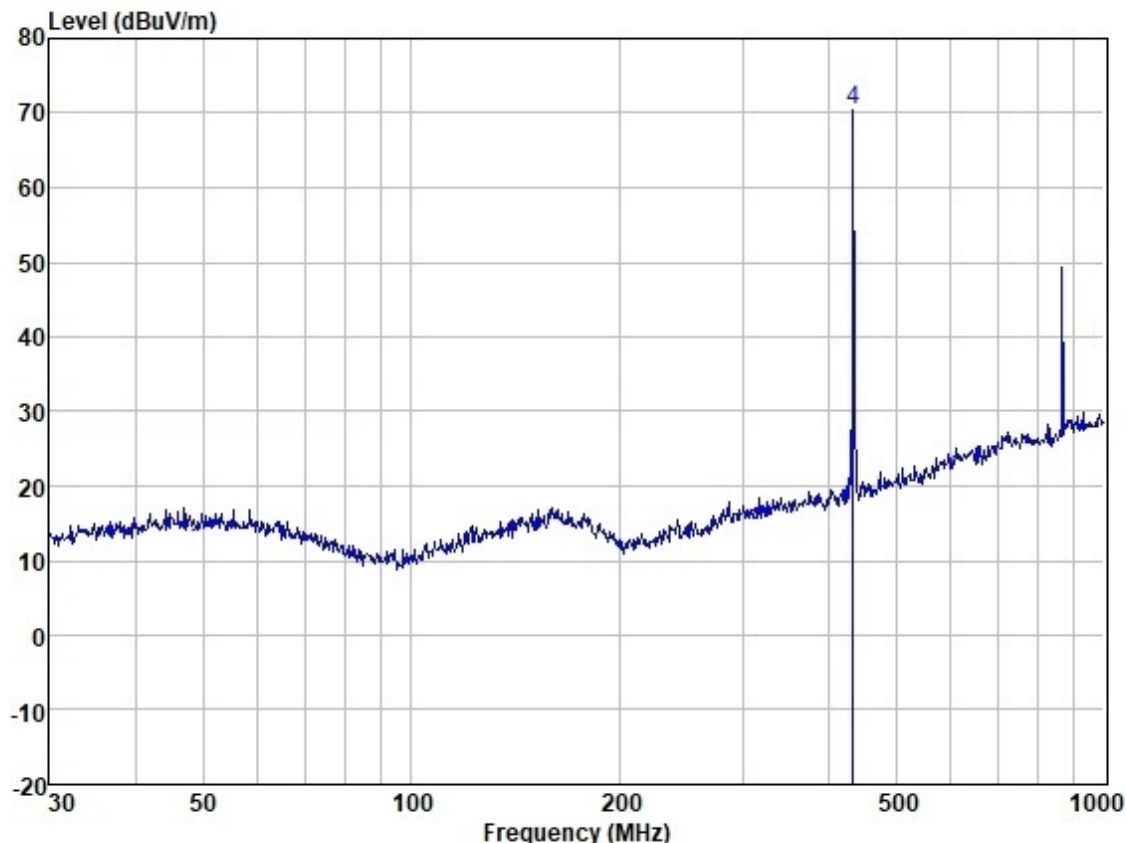
7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

- 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.
 - 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.
 - 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.
 - 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.
 - 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.
 - The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
 - 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.
 - The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
- Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Test Mode: 00; Polarity: Horizontal



Site : SGS
Model :
Power :
Test Mode : TX

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
4	434.065	79.90	16.82	1.85	28.25	70.32			HORIZONTAL	QP

Frequency (MHz)	Level @10m (dBuV/m)	Convert Factor (dB)*	Level @ 3m (dBuV/m)	Limit @3m (dBuV/m)	Over limit (dB)	Remark
434.065	70.32	10.46	80.78	80.83	-0.05	QP

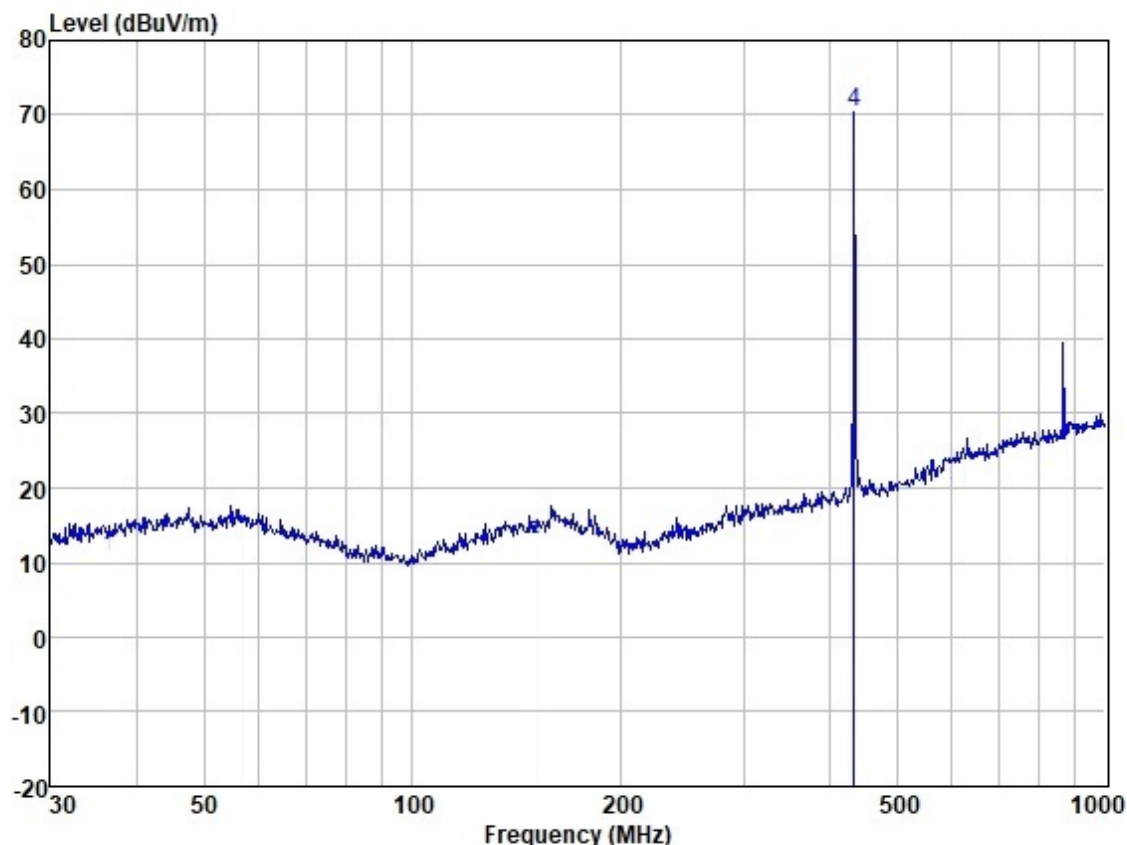
*Remark :

Level (dBuV/m) @3m = Level (dBuV/m) @10m + Convert Factor (dB)

Convert Factor (dB) = $20 \times \log(\text{Measurement Distance/Specified Distance}) = 20 \times \log(10/3) = 10.46 \text{ dB}$
according to 15.31 (f) (1)



Test Mode: 00; Polarity: Vertical



Site : SGS
Model :
Power :
Test Mode : TX

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
4	434.065	79.84	16.82	1.85	28.25	70.26		VERTICAL	QP

Frequency (MHz)	Level @10m (dBuV/m)	Convert Factor (dB)*	Level @ 3m (dBuV/m)	Limit @3m (dBuV/m)	Over limit (dB)	Remark
434.065	70.26	10.46	80.72	80.83	-0.11	QP

*Remark :

Level (dBuV/m) @3m = Level (dBuV/m) @10m + Convert Factor (dB)

Convert Factor (dB) = $20 \times \log(\text{Measurement Distance/Specified Distance}) = 20 \times \log(10/3) = 10.46 \text{ dB}$ according to 15.31 (f) (1)



7.5 Radiated Emissions above 1GHz

Test Requirement 47 CFR Part 15C Section 15.231(b) and 15.209

Test Method: ANSI C63.10 (2020) Section 6.6

Test Engineer: Lily Kuang

Limit:

For Restricted bands

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 960	500	3

Remark: Radiated emission limits in this band is based on measurements employing an average detector, 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 Other bands

Fundamental Frequency MHz	Field Strength of Fundamental (μV/m @ 3 m)	Field strength of spurious emissions (μV/m @ 3 m)
Above 470	12,500	1,250
Detector:	Peak for pre-scan	
	Peak for Above 1 GHz: 1 MHz resolution bandwidth	

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C

Humidity: 52.3 % RH

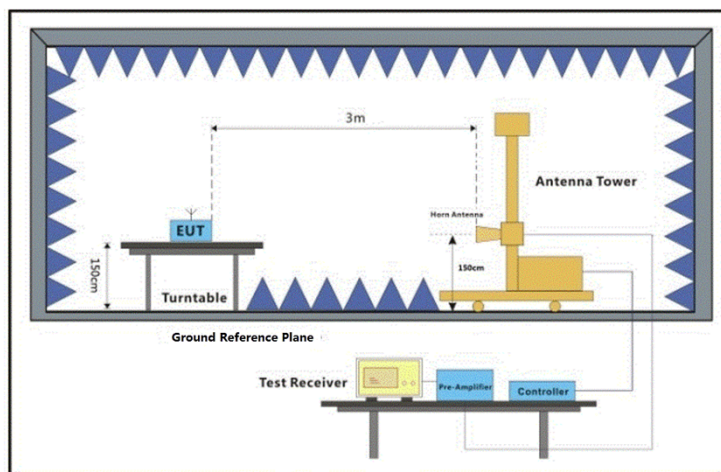
Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Mode	Description
Final test Code	
Final test 00	Tx mode



7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

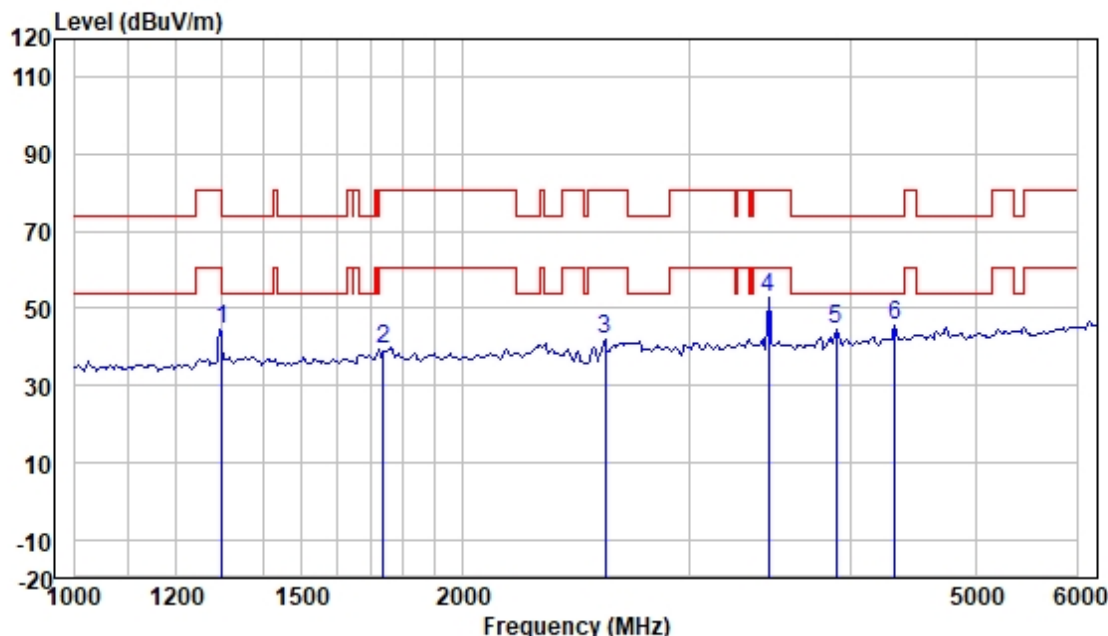
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Remark:

- 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
- For frequencies above 1GHz, 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.



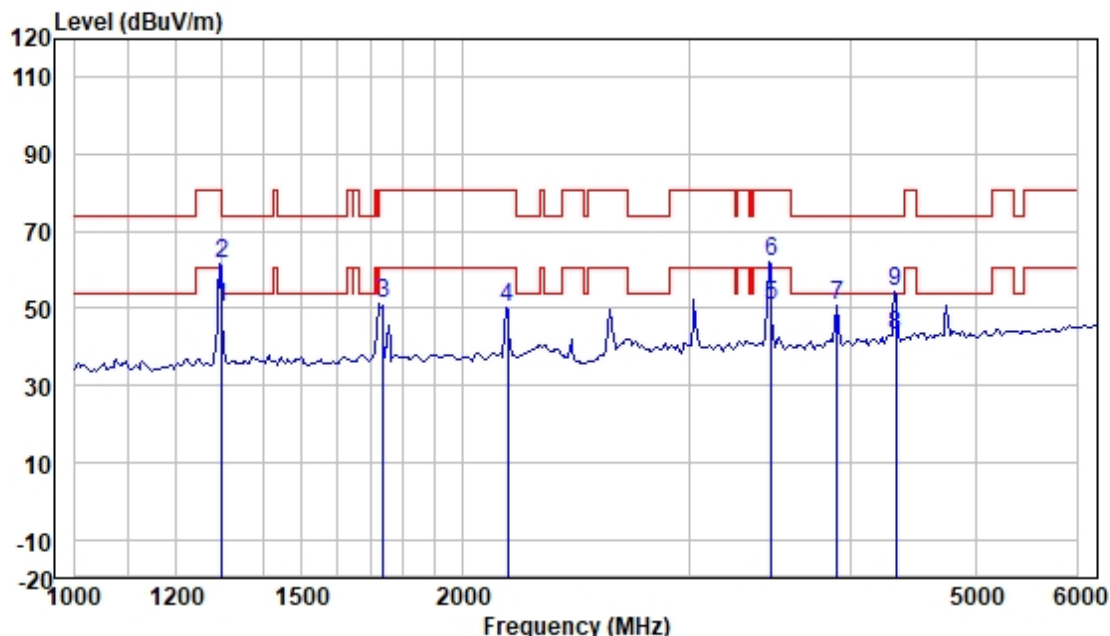
Test Mode: 00; Polarity: Vertical



	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1301.85	54.82	25.60	2.59	38.58	44.43	74.00	-29.57	VERTICAL	Peak
2	1735.80	48.00	26.30	2.92	37.99	39.23	80.83	-41.60	VERTICAL	Peak
3	2580.65	48.37	27.87	3.53	37.75	42.02	80.83	-38.81	VERTICAL	Peak
4	3455.51	57.22	28.96	4.08	37.55	52.71	80.83	-28.12	VERTICAL	Peak
5	3901.52	47.54	29.87	4.45	37.51	44.35	74.00	-29.65	VERTICAL	Peak
6	4329.35	47.78	30.67	4.59	37.46	45.58	74.00	-28.42	VERTICAL	Peak



Test Mode: 00; Polarity: Horizontal



	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	1301.50	60.49	25.60	2.59	38.58	50.10	54.00	-3.90	HORIZONTAL	Average
2	1301.50	71.86	25.60	2.59	38.58	61.47	74.00	-12.53	HORIZONTAL	Peak
3	1736.00	59.90	26.30	2.92	37.99	51.13	80.83	-29.70	HORIZONTAL	Peak
4	2169.70	57.67	26.96	3.22	37.79	50.06	80.83	-30.77	HORIZONTAL	Peak
5	3471.73	55.40	28.96	4.08	37.55	50.89	60.83	-9.94	HORIZONTAL	Average
6	3471.73	66.77	28.96	4.08	37.55	62.26	80.83	-18.57	HORIZONTAL	Peak
7	3905.56	54.08	29.87	4.45	37.51	50.89	74.00	-23.11	HORIZONTAL	Peak
8	4339.47	44.97	30.70	4.59	37.46	42.80	54.00	-11.20	HORIZONTAL	Average
9	4339.47	56.34	30.70	4.59	37.46	54.17	74.00	-19.83	HORIZONTAL	Peak



8 Test Setup Photo

Refer to Appendix - Test Setup Photo for GZCR260400066802



9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2604000668LM

- End of the Report -

