TEST REPORT

Application No.:	GZCR2108020888AT
Applicant:	SYBER SENSE IOT COMPANY LIMITED
Address of Applicant:	FLAT/RM 10 BLK A 16/F HI TECH INDUSTRIAL CENTRE 5-21 PAK TIN PAR STREET TSUEN WAN Hong Kong China
Manufacturer:	SYBER SENSE IOT COMPANY LIMITED
Address of Manufacturer:	5/F, Xiagu Building, Meishenghuigu Hi-tech Innovation Park, 83 Dabao Road, Baoan, Shenzhen, China.
Factory:	SYBER SENSE IOT COMPANY LIMITED
Address of Factory:	3/F, Building A, Hanhaida High-tech Park,DatianYang C District, Shiwei Community,Matian Street, Guangming New District,Shenzhen, China.
Equipment Under Test (EUT):	
EUT Name:	SS Panic button(XPP01)
Model No.:	XPP01-E-1433-00
Trade Mark:	Syber Sense
Standard(s) :	47 CFR Part 15, Subpart C 15.231
Date of Receipt:	2021-08-03
Date of Test:	2021-08-04 to 2021-08-13
Date of Issue:	2021-09-02
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		2021-09-02		*Original*

Authorized for issue by				
		Curry Wu/Project Engineer		
		Ricky Liu/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 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.231(c)	Pass
Radiated Emissions (below 1GHz)		ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15C Section 15.231(b) and 15.209	Pass
Dwell Time (15.231(a))		N/A	47 CFR Part 15, Subpart C 15.231(a)	Pass
Field Strength of the Fundamental Signal (15.231(b))		ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.231(b)	Pass
Radiated Emissions (above 1GHz)		ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15C Section 15.231(b) and 15.209	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.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	3V DC(3V x 1 "CR2032" Button Cell)
Operation Frequency	433.95MHz
Channel Numbers:	1
Modulation Type:	ASK
Antenna Gain:	0.6dBi
Antenna Type:	LDS Antenna

4.2 Description of Support Units

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

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
20dB Bandwidth	±3%
Radiated Emissions (below 1GHz)	±5.06dB （30MHz-1GHz；3m） ±4.46dB （30MHz-1GHz；10m）
Dwell Time (15.231(a))	±3%
Field Strength of the Fundamental Signal (15.231(b))	±5.06dB （30MHz-1GHz；3m）
Radiated Emissions (above 1GHz)	±5.08 dB (1GHz-6 GHz); ±5.14 dB (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

20dB Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

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

Dwell Time (15.231(a))					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Field Strength of the Fundamental Signal (15.231(b))					
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
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
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	2020-09-17	2021-09-16
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 Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

Standard 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. The best case gain of the antenna is 0.6 dBi.

Antenna location: Refer to internal photo.

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 (2013) Section 6.9

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

Remark: For this device, the limit is 433.95MHz*0.25%=1.084875MHz

7.1.1 E.U.T. Operation

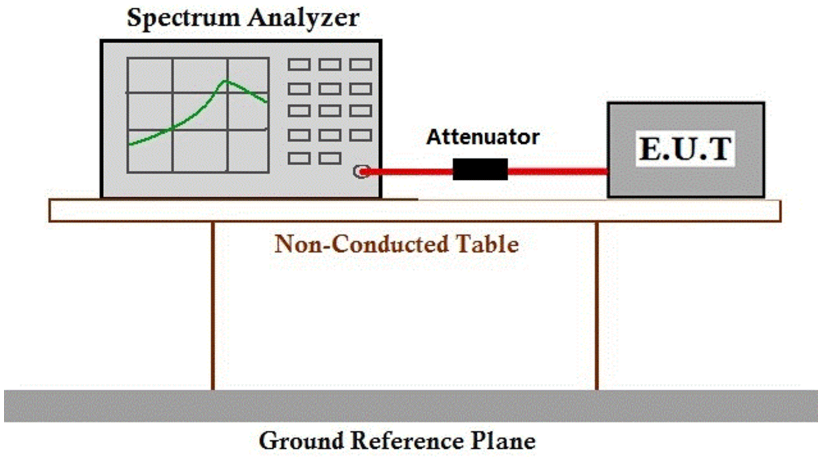
Operating Environment:

Temperature: 22.8 °C Humidity: 54.3 % RH Atmospheric Pressure: 995 mbar

7.1.2 Test Mode Description

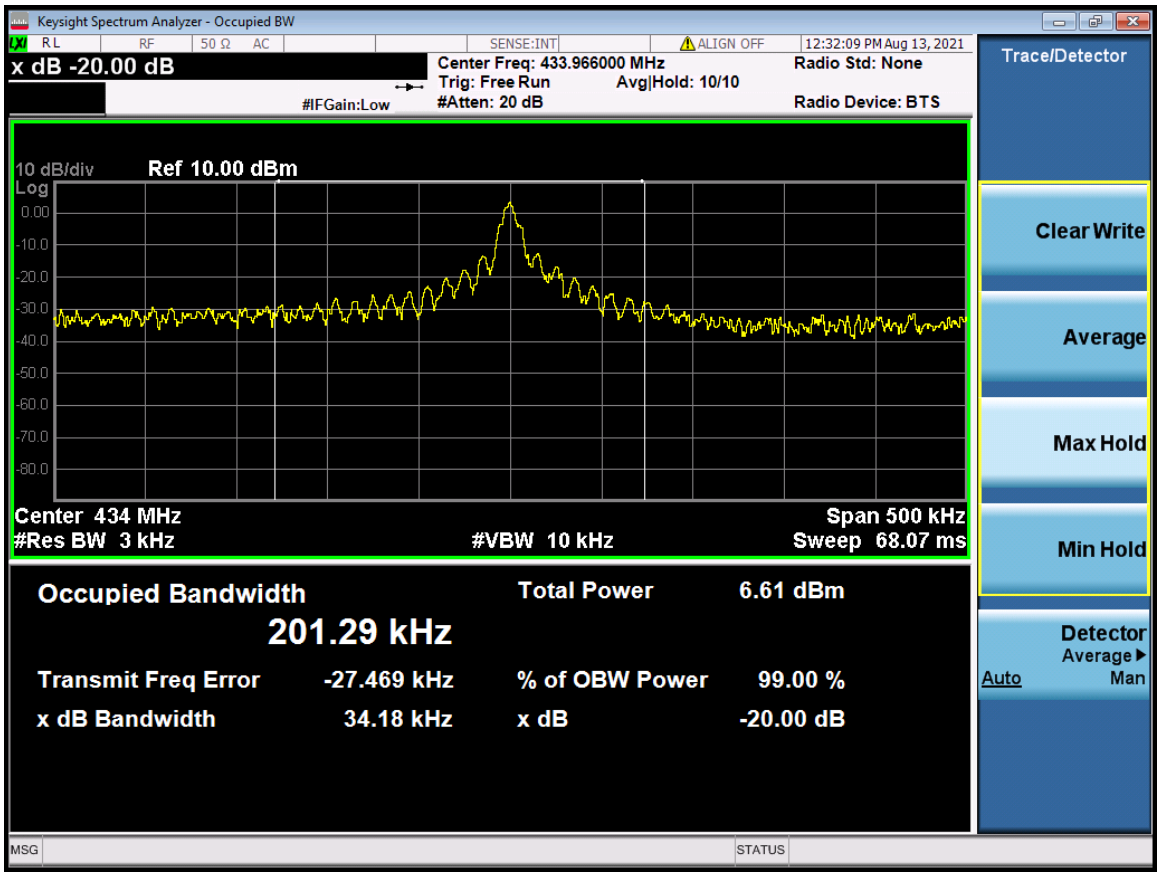
Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode.

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

Test Channel	Bandwidth	Limit	Verdict
433.95MHz	34.18kHz	1.084875MHz	PASS



7.2 Radiated Emissions (below 1GHz)

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

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

Measurement Distance: 3m

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 (dBµV/m @ 3 m)	Field Strength of Hasrmonics and Spurious Emissions (dBµV/m @ 3 m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	**61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	**71.48 to 81.94	51.48 to 61.94
Above 470	81.94	61.94
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 maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The fundamental frequency of the EUT is 433.95 MHz

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

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuv/m for the spurious emission=60.83 dBuV/m. Spurious in the restricted bands must be less than 60.83 dBuV/m or 15.209, whichever limit permits a higher field strength.

7.2.1 E.U.T. Operation

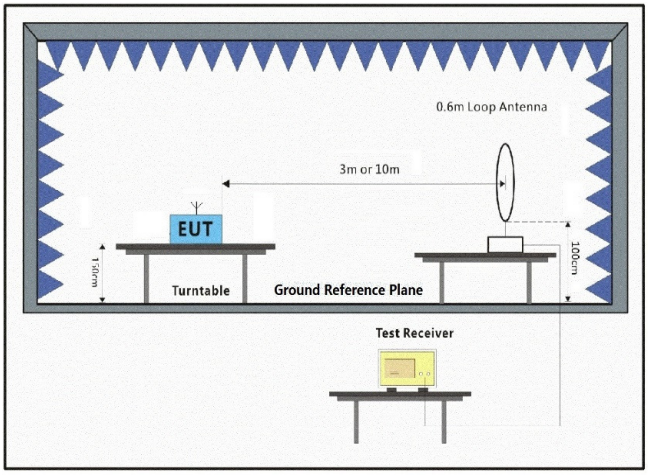
Operating Environment:

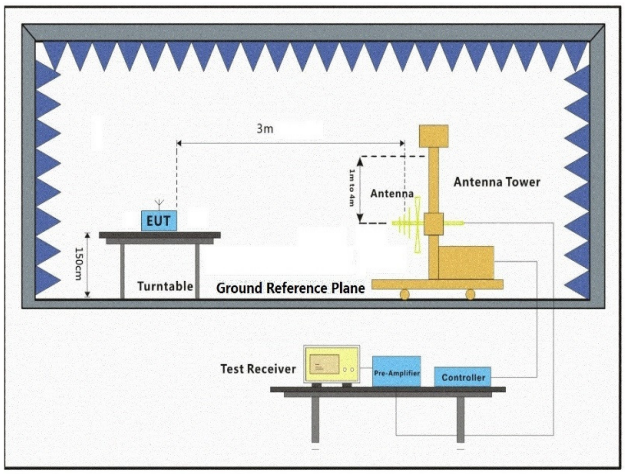
Temperature: 23.7 °C Humidity: 54.3 % RH Atmospheric Pressure: 995 mbar

7.2.2 Test Mode Description

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

7.2.3 Test Setup Diagram





7.2.4 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 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 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 quasi-peak 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: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

The average correction factor is computed by analyzing the on time in 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average = Peak value + 20log (Duty cycle), where the duty factor is calculated from following formula:

20log (Duty cycle) =20log(9.7%)= -20.26 dB

Here:

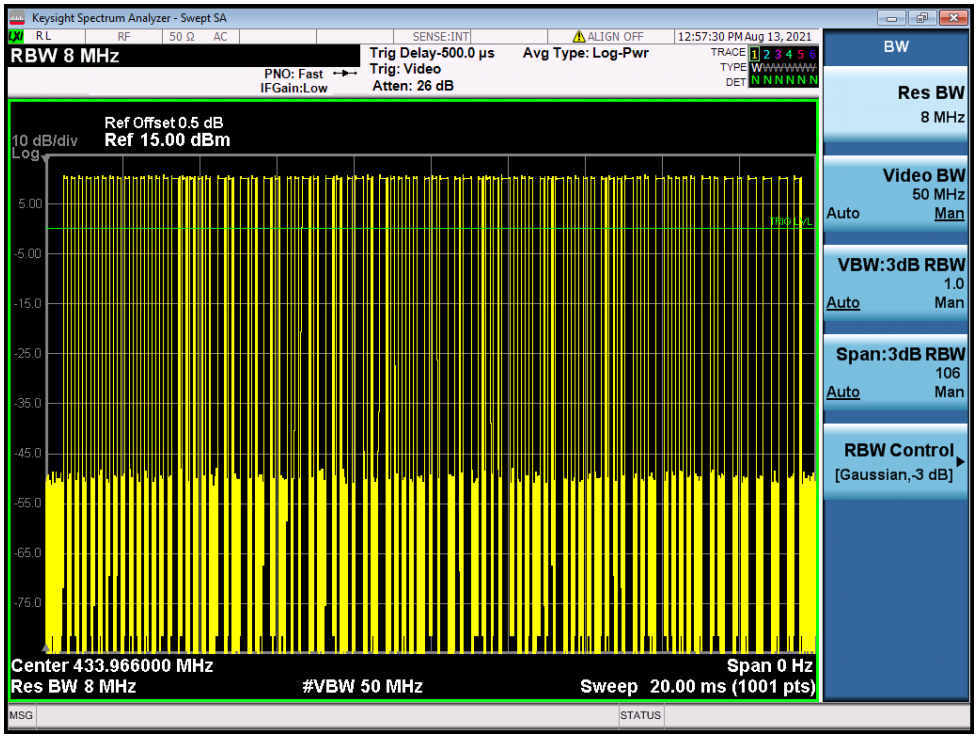
Duty cycle = Ton_cum / Ton+off

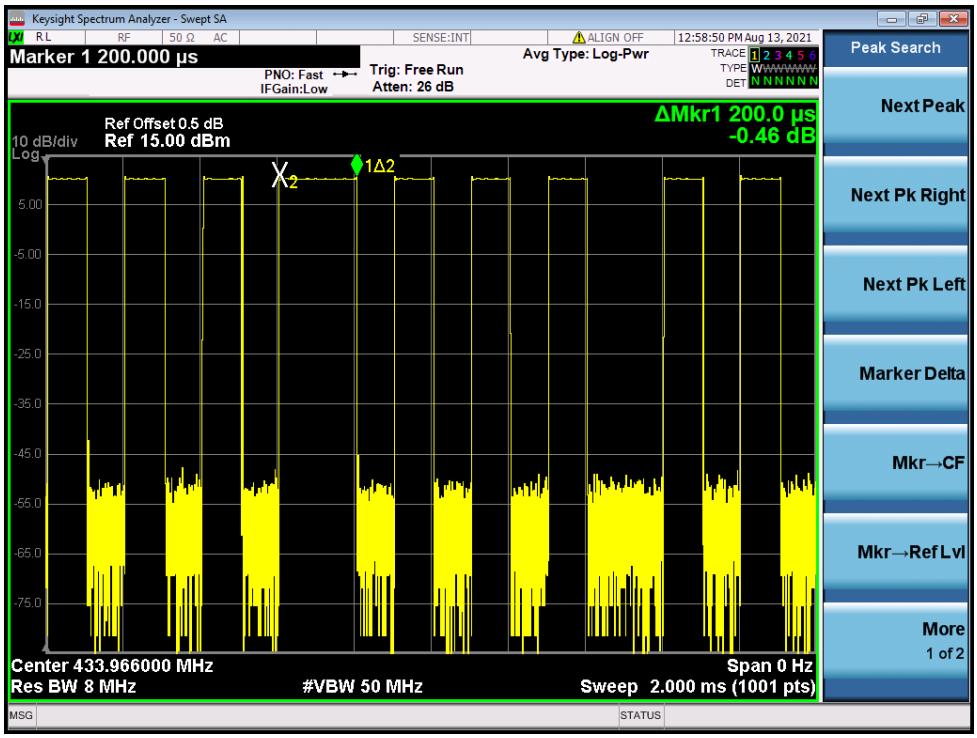
Ton_cum =(57*0.1+20*0.2)=9.7ms

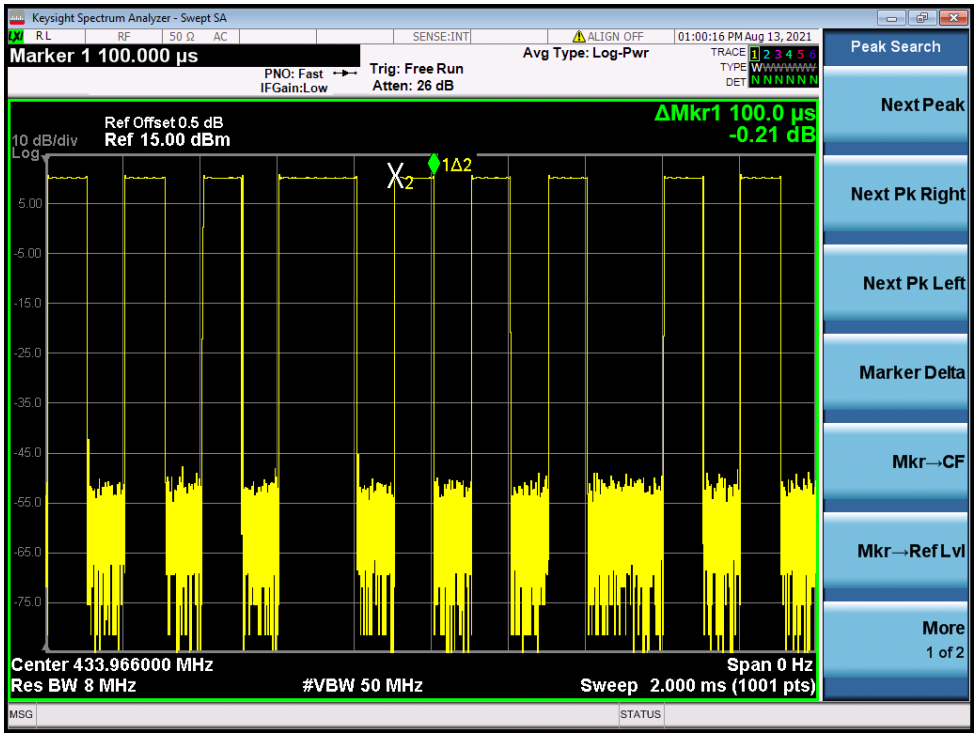
Ton+off = 100 (ms)

Duty cycle = 9.7/ 100 = 9.7%

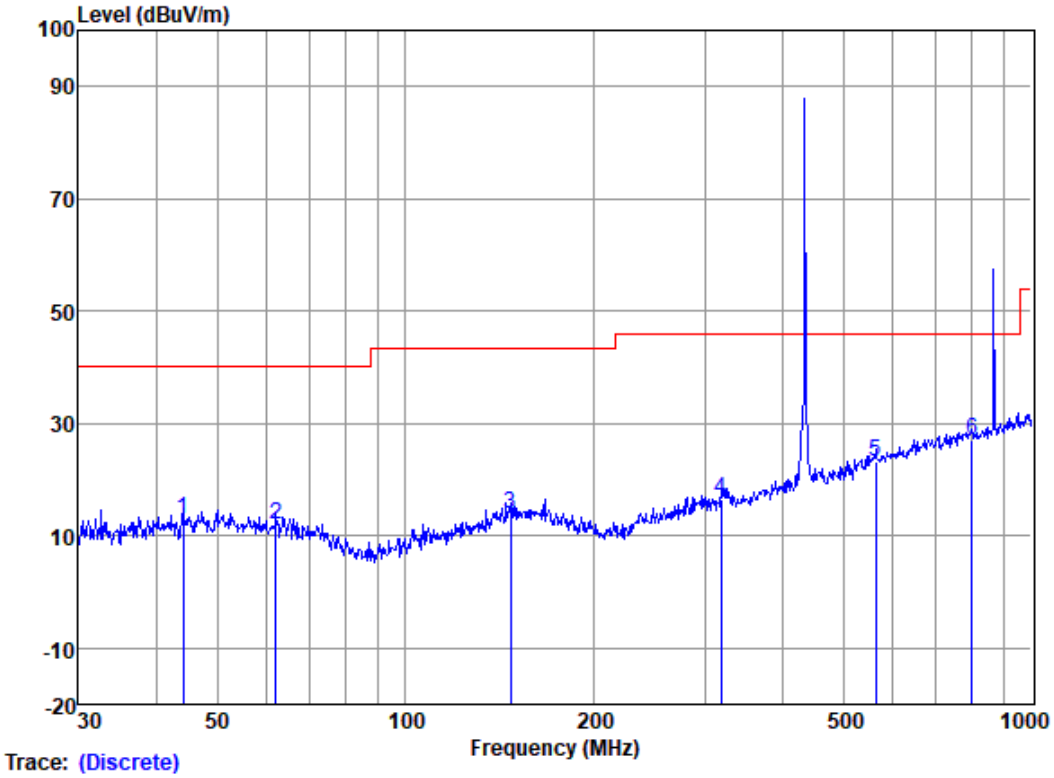
Please refer to below plot for more details.







Test Mode: 00; Polarity: Horizontal

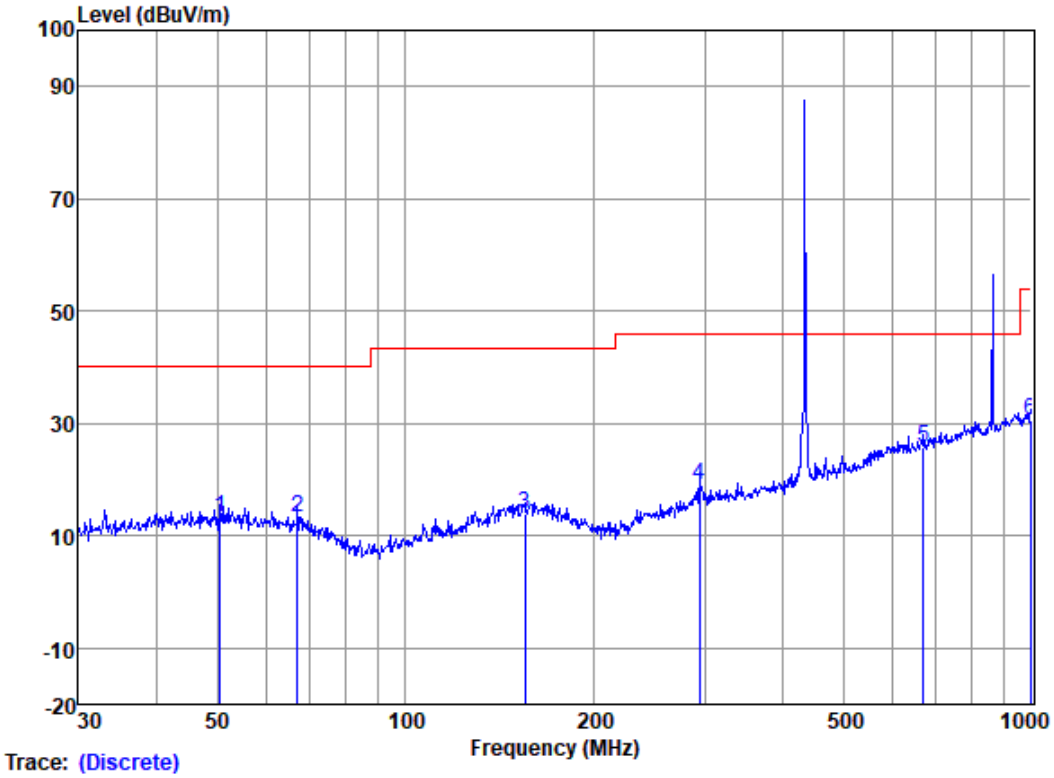


Trace: (Discrete)

Site : SGS
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	44.12	25.07	13.81	1.12	27.17	12.83	40.00	-27.17	HORIZONTAL	QP
2	62.00	24.69	13.10	1.30	27.15	11.94	40.00	-28.06	HORIZONTAL	QP
3	146.89	24.94	13.70	2.20	26.85	13.99	43.50	-29.51	HORIZONTAL	QP
4	318.82	25.61	14.25	3.32	26.65	16.53	46.00	-29.47	HORIZONTAL	QP
5	562.66	27.75	18.82	4.93	28.15	23.35	46.00	-22.65	HORIZONTAL	QP
6	801.79	26.21	22.62	6.17	28.03	26.97	46.00	-19.03	HORIZONTAL	QP

Test Mode: 00; Polarity: Vertical



Trace: (Discrete)

Site : SGS
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	50.59	25.50	13.92	1.15	27.17	13.40	40.00	-26.60	VERTICAL	QP
2	67.20	26.72	12.34	1.38	27.14	13.30	40.00	-26.70	VERTICAL	QP
3	154.82	24.55	13.75	2.28	26.81	13.77	43.50	-29.73	VERTICAL	QP
4	294.11	29.11	13.48	3.15	26.55	19.19	46.00	-26.81	VERTICAL	QP
5	670.49	27.67	20.70	5.65	28.17	25.85	46.00	-20.15	VERTICAL	QP
6	996.50	26.54	24.27	7.43	27.66	30.58	54.00	-23.42	VERTICAL	QP

7.3 Dwell Time (15.231(a))

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

Test Method: N/A

Limit:

Device type	Limit
Manually operated transmitter	The switch automatically deactivate the transmitter within not more than 5 seconds of being released
Automatically actived 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

7.3.1 E.U.T. Operation

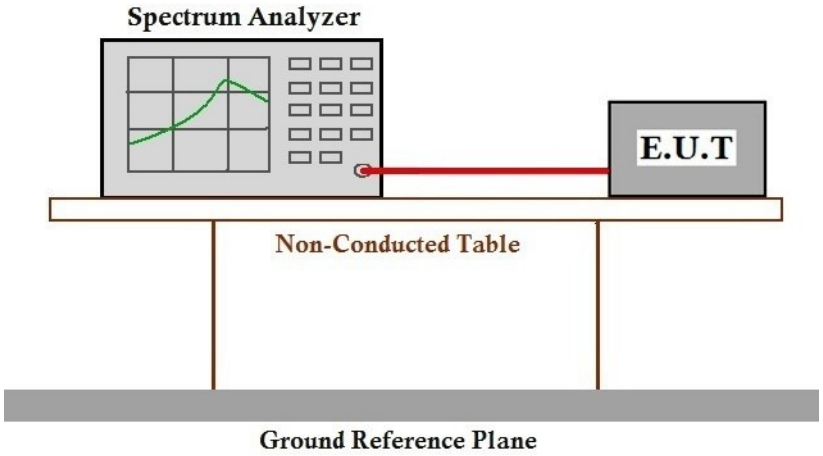
Operating Environment:

Temperature: 22.8 °C Humidity: 54.3 % RH Atmospheric Pressure: 995 mbar

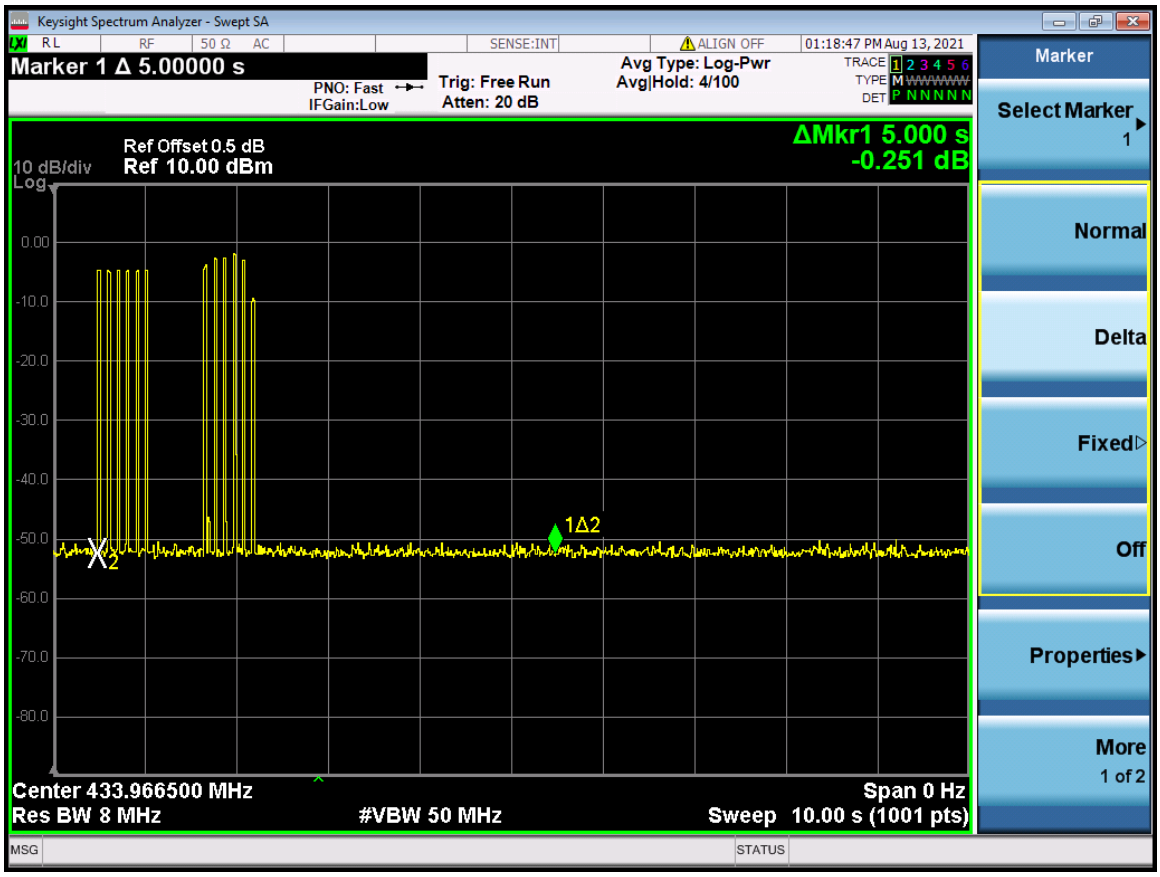
7.3.2 Test Mode Description

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

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data



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 (2013) Section 6.5

Measurement Distance: 3m

Limit:

Fundamental Frequency MHz	Field Strength of Fundamental (dBµV/m @ 3 m)	Field Strength of Harmonics and Spurious Emissions (dBµV/m @ 3 m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	**61.94 to 71.48	**41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	**71.48 to 81.94	**51.48 to 61.94
Above 470	81.94	61.94
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 maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The fundamental frequency of the EUT is 433.95 MHz

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

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuv/m for the spurious emission=60.83 dBuV/m. Spurious in the restricted bands must be less than 60.83 dBuV/m or 15.209, whichever limit permits a higher field strength.

7.4.1 E.U.T. Operation

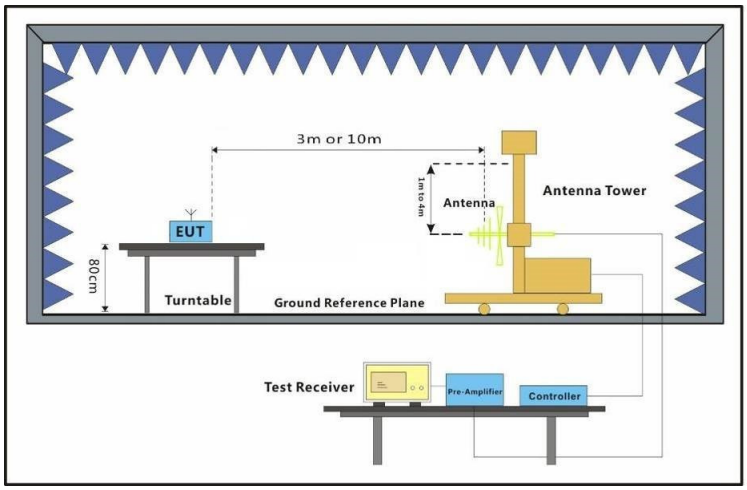
Operating Environment:

Temperature: 23.7 °C Humidity: 54.3 % RH Atmospheric Pressure: 995 mbar

7.4.2 Test Mode Description

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

7.4.3 Test Setup Diagram



7.4.4 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 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 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.

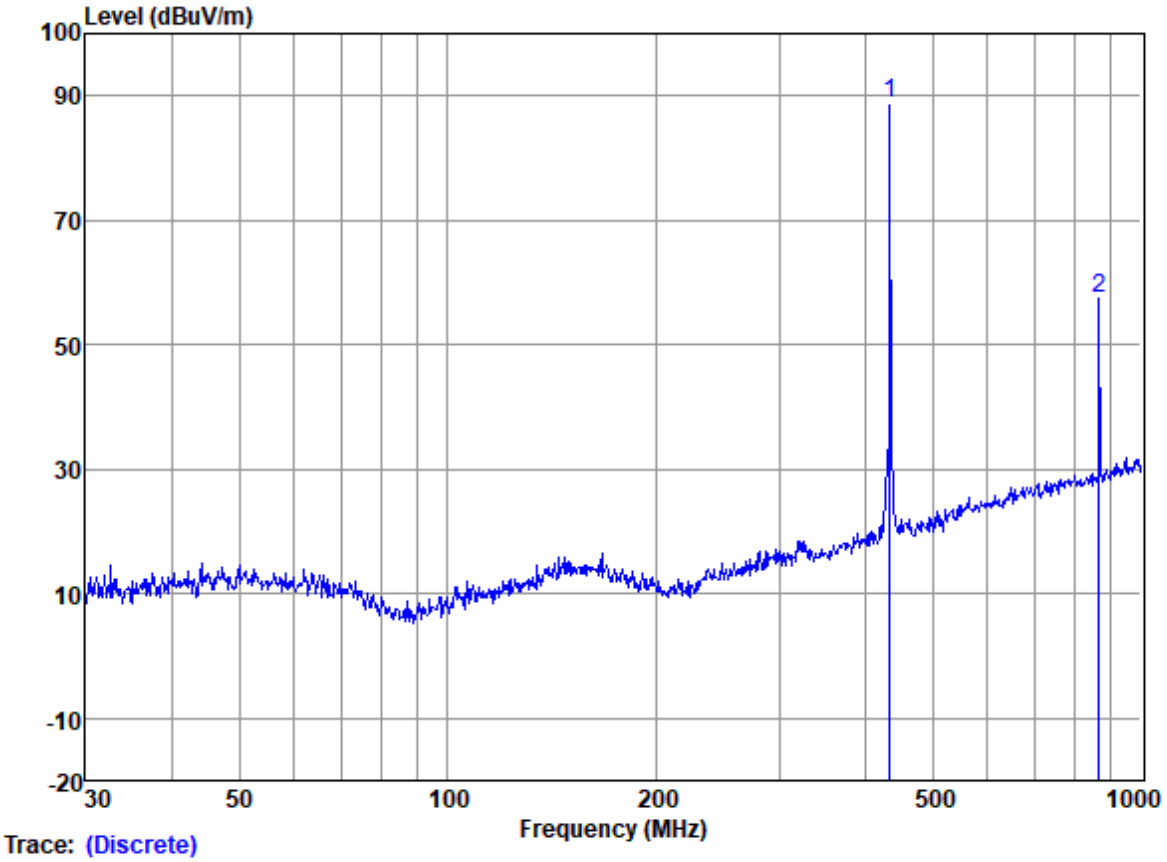
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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. 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

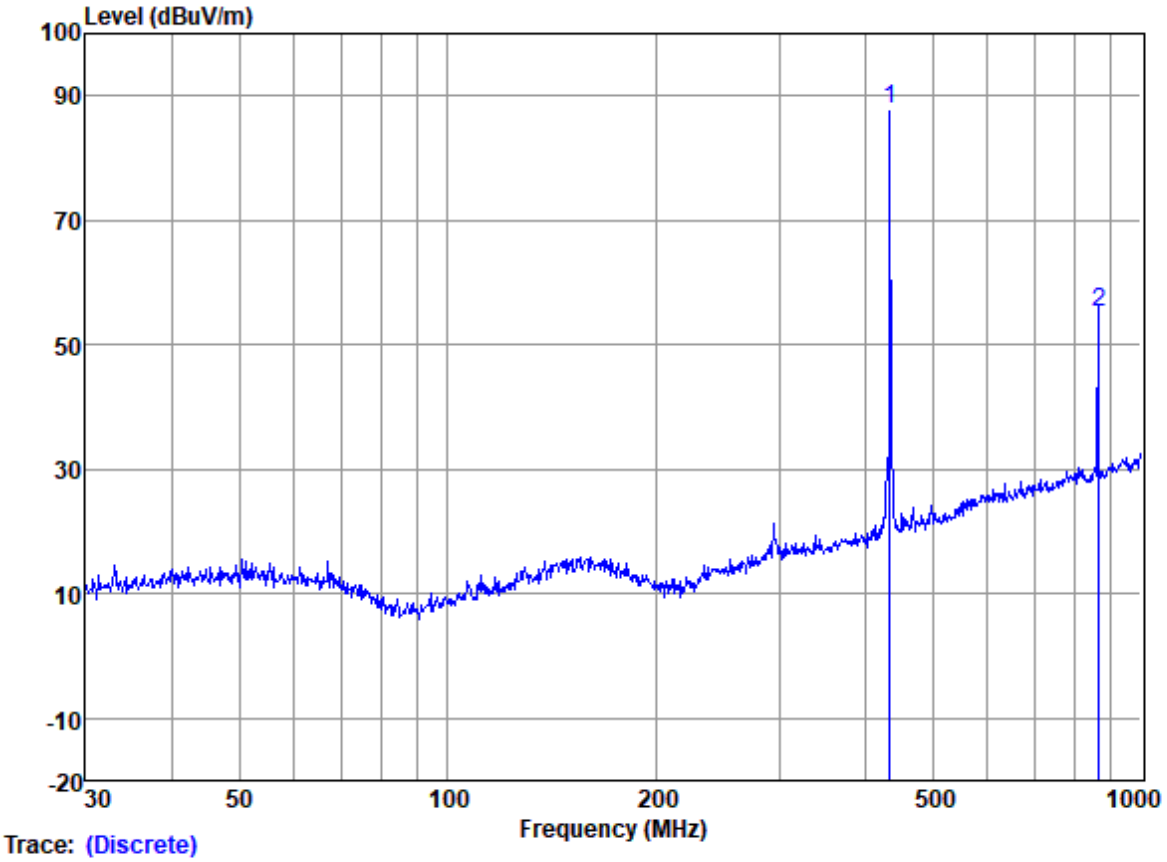


Trace: (Discrete)

Site : SGS
Condition :
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	434.07	95.27	16.85	4.09	27.53	88.68			HORIZONTAL	Peak
2	869.13	55.81	22.90	6.71	27.89	57.53			HORIZONTAL	Peak

Test Mode: 00; Polarity: Vertical



Trace: (Discrete)

Site : SGS
Condition :
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	434.07	94.55	16.85	4.09	27.53	87.96			VERTICAL	Peak
2	869.13	53.38	22.90	6.71	27.89	55.10			VERTICAL	Peak

Peak value:								
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.95	4.09	16.85	27.53	95.27	88.68	100.83	-12.15	Horizontal
433.95	4.09	16.85	27.53	94.55	87.96	100.83	-12.87	Vertical
867.90	6.71	22.93	27.89	55.81	57.53	80.83	-23.3	Horizontal
867.90	6.71	22.93	27.89	53.38	55.10	80.83	-25.73	Vertical

Average value:						
Frequency (MHz)	Average correction factor	Peak Level (dBuV/m)	Average Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.95	-20.26	88.68	68.42	80.83	-12.41	Horizontal
433.95	-20.26	87.96	67.7	80.83	-13.13	Vertical
867.90	-20.26	57.53	37.27	60.83	-23.56	Horizontal
867.90	-20.26	55.10	34.84	60.83	-25.99	Vertical

Note: The Average correction factor calculation please refer to Clause 7.2.4

7.5 Radiated Emissions (above 1GHz)

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

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

Measurement Distance: 3m

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 (dBµV/m @ 3 m)	Field Strength of Hasrmonics and Spurious Emissions (dBµV/m @ 3 m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	**61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	**71.48 to 81.94	51.48 to 61.94
Above 470	81.94	61.94
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 maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The fundamental frequency of the EUT is 433.95 MHz

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

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuv/m for the spurious emission=60.83 dBuV/m. Spurious in the restricted bands must be less than 60.83 dBuV/m or 15.209, whichever limit permits a higher field strength.

7.5.1 E.U.T. Operation

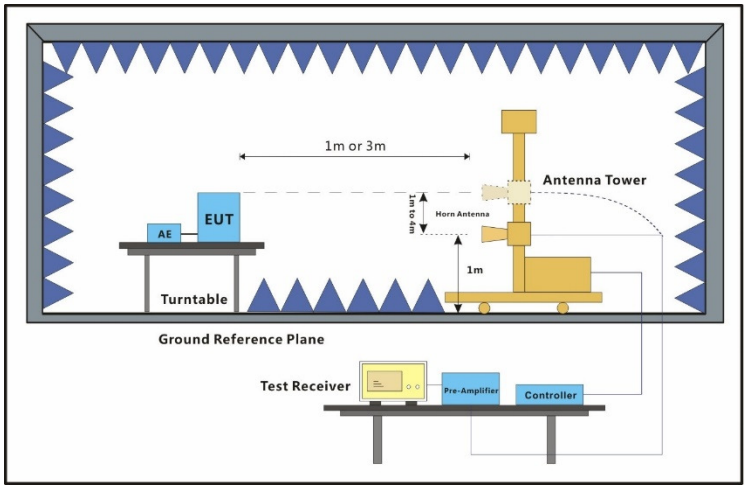
Operating Environment:

Temperature: 22.6 °C Humidity: 53.3 % RH Atmospheric Pressure: 995 mbar

7.5.2 Test Mode Description

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

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

a. 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.

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

c. The antenna 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 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.

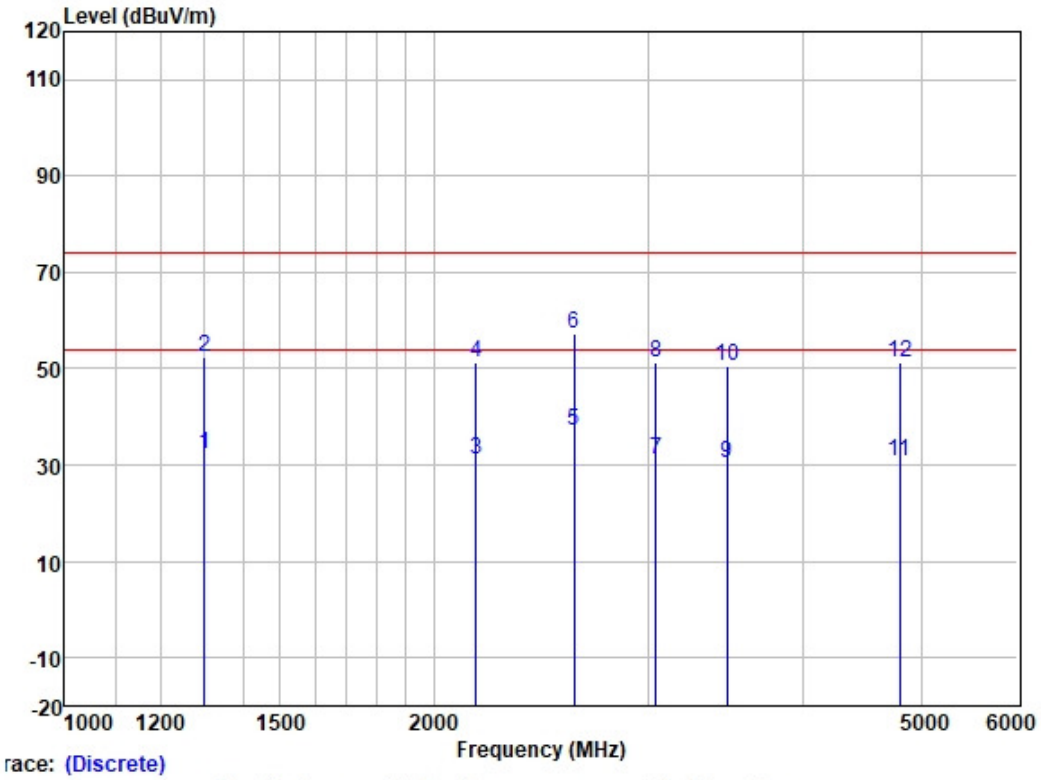
h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

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

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

The average correction factor is computed by analyzing the on time in 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average = Peak value + 20log (Duty cycle), where the duty factor is -20.39dB, please refer to Section 7.2.4 for more details.

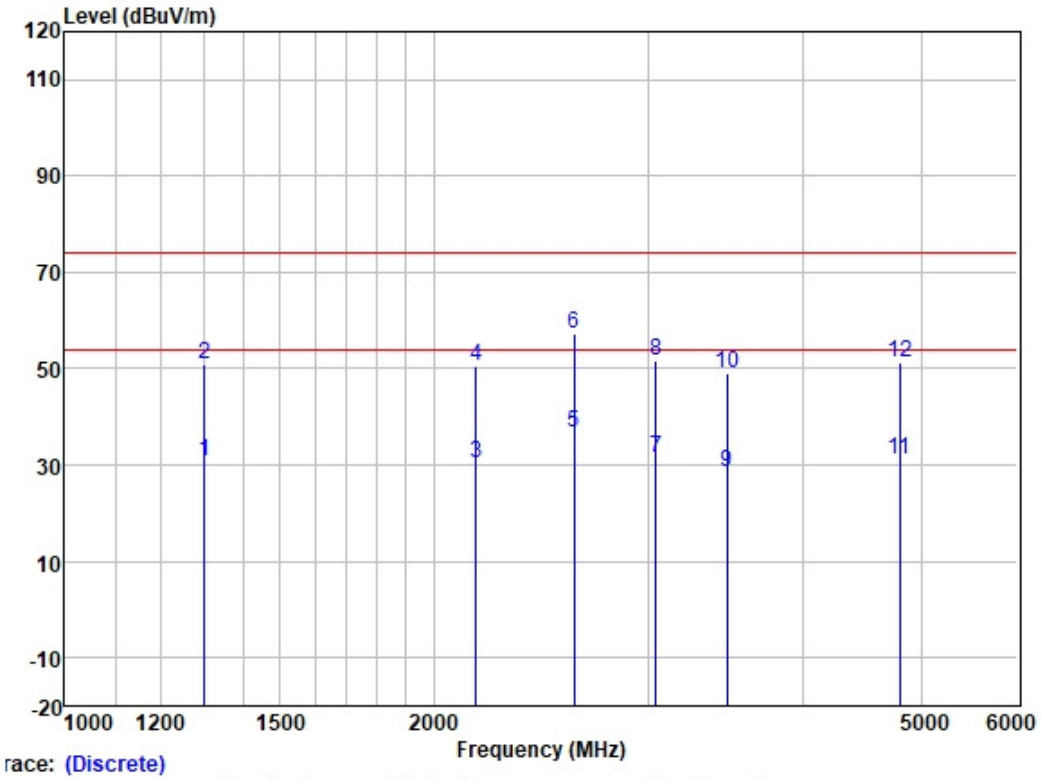
Test Mode: 00; Polarity: Horizontal



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	1301.332	42.65	25.20	2.60	38.31	32.14	54.00	-21.86	HORIZONTAL	Average
2	1301.332	62.91	25.20	2.60	38.31	52.40	74.00	-21.60	HORIZONTAL	Peak
3	2168.510	39.18	26.49	3.19	37.66	31.20	54.00	-22.80	HORIZONTAL	Average
4	2168.510	59.44	26.49	3.19	37.66	51.46	74.00	-22.54	HORIZONTAL	Peak
5	2603.351	43.58	27.63	3.50	37.52	37.19	54.00	-16.81	HORIZONTAL	Average
6	2603.351	63.84	27.63	3.50	37.52	57.45	74.00	-16.55	HORIZONTAL	Peak
7	3037.063	36.08	28.42	3.83	37.22	31.11	54.00	-22.89	HORIZONTAL	Average
8	3037.063	56.34	28.42	3.83	37.22	51.37	74.00	-22.63	HORIZONTAL	Peak
9	3473.883	34.07	28.89	4.25	36.95	30.26	54.00	-23.74	HORIZONTAL	Average
10	3473.883	54.33	28.89	4.25	36.95	50.52	74.00	-23.48	HORIZONTAL	Peak
11	4804.636	30.88	31.42	5.40	36.83	30.87	54.00	-23.13	HORIZONTAL	Average
12	4804.636	51.14	31.42	5.40	36.83	51.13	74.00	-22.87	HORIZONTAL	Peak

Test Mode: 00; Polarity: Vertical

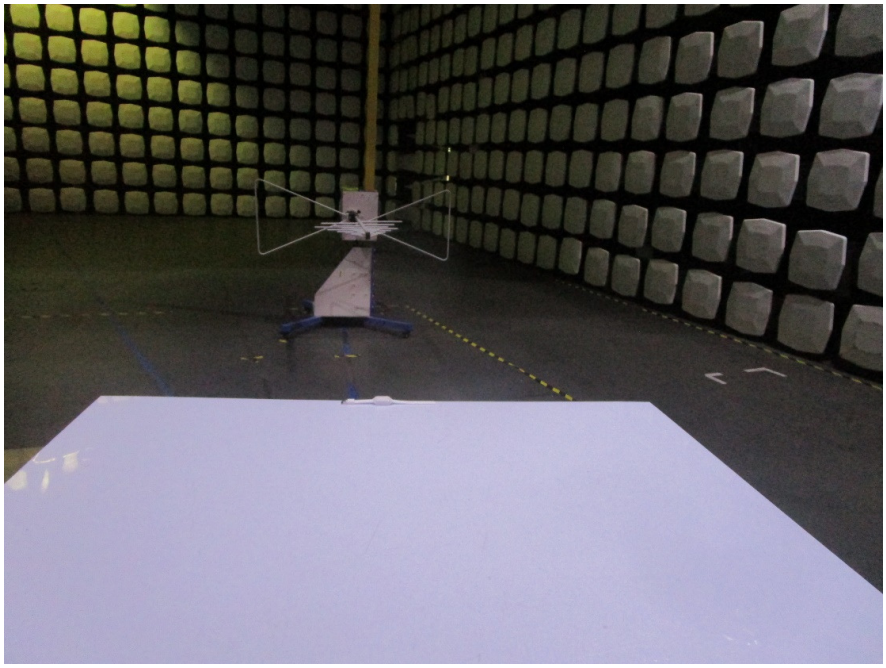


race: (Discrete)

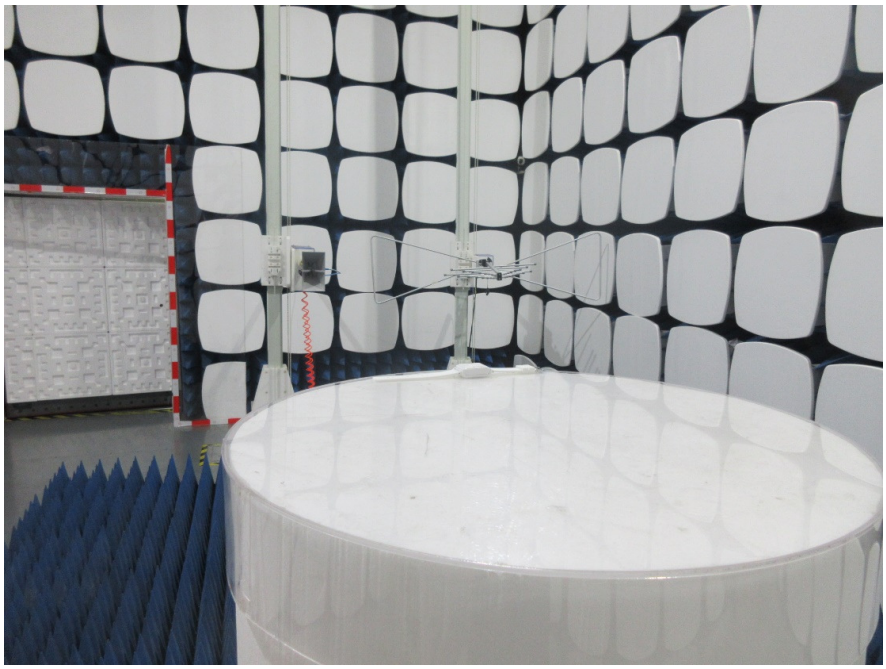
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1301.332	41.24	25.20	2.60	38.31	30.73	54.00	-23.27	VERTICAL	Average
2	1301.332	61.50	25.20	2.60	38.31	50.99	74.00	-23.01	VERTICAL	Peak
3	2168.510	38.26	26.49	3.19	37.66	30.28	54.00	-23.72	VERTICAL	Average
4	2168.510	58.52	26.49	3.19	37.66	50.54	74.00	-23.46	VERTICAL	Peak
5	2603.351	43.23	27.63	3.50	37.52	36.84	54.00	-17.16	VERTICAL	Average
6	2603.351	63.49	27.63	3.50	37.52	57.10	74.00	-16.90	VERTICAL	Peak
7	3037.063	36.32	28.42	3.83	37.22	31.35	54.00	-22.65	VERTICAL	Average
8	3037.063	56.58	28.42	3.83	37.22	51.61	74.00	-22.39	VERTICAL	Peak
9	3473.883	32.50	28.89	4.25	36.95	28.69	54.00	-25.31	VERTICAL	Average
10	3473.883	52.76	28.89	4.25	36.95	48.95	74.00	-25.05	VERTICAL	Peak
11	4804.636	30.98	31.42	5.40	36.83	30.97	54.00	-23.03	VERTICAL	Average
12	4804.636	51.24	31.42	5.40	36.83	51.23	74.00	-22.77	VERTICAL	Peak

8 Test Setup Photo

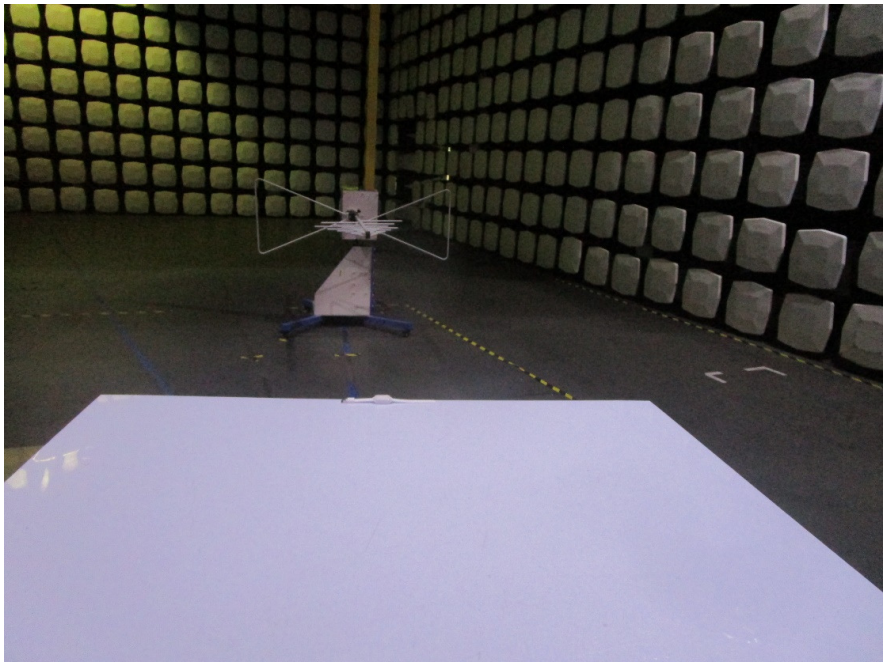
Radiated Emissions (below 1GHz)



Radiated Emissions (above 1GHz)



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



9 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for GZCR2108020888AT

- End of the Report -

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