TEST REPORT

Application No.:	SZCR2309003182AT
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:	FLAT/RM 10 BLK A 16/F HI TECH INDUSTRIAL CENTRE 5-21 PAK TIN PAR STREET TSUEN WAN Hong Kong China
Factory:	RUI CHUANG KE DIGITAL CO., LTD
Address of Factory:	3F, A building, C Area, Shiwei Datianyang Industry Zone, Shiwei Community, Matian Street, Guangming District, 518000 Shenzhen, China
Equipment Under Test (EUT):	
EUT Name:	SS security panel
Model No.:	XP02US-SS-1433-00
FCC ID:	2AVDCXP02US-SS-1433
Standard(s) :	47 CFR Part 15, Subpart C 15.231
	(only for Field Strength of the Fundamental Signal (15.231(b)), Radiated Emissions below 1GHz, Radiated Emissions above 1GHz and Conducted Emissions at AC Mains Power Port (150kHz-30MHz))
Date of Receipt:	2023-09-27
Date of Test:	2023-10-07 to 2023-10-12
Date of Issue:	2023-10-16
Test Result:	**Pass***

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

Keny. xu

Keny Xu
EMC Laboratory Manager

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2023-10-16		Original

Authorized for issue by:				
		Leo Li **Leo Li/Project Engineer**		
		Eric Fu **Eric Fu/Reviewer**		

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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**
Field Strength of the Fundamental Signal (15.231(b))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.231(b)	Pass
Radiated Emissions below 1GHz		ANSI C63.10 (2013) Section 6.4&6.5	47 CFR Part 15C Section 15.231(b) and 15.209	Pass
Radiated Emissions above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15C Section 15.231(b) and 15.209	Pass

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at AC Mains Power Port (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass

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Remark:

This test report (Ref. No.: SZCR230900318202) is only valid with the original test report (Ref. No.: SZCR210502114703).

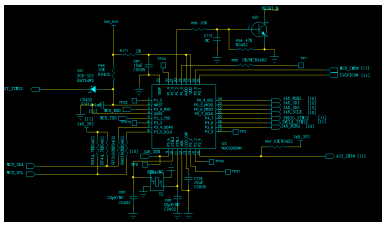
According to the declaration from the applicant, the models in this report and models in original report were identical, only difference on the board, and changed the information of manufacturer and product name, deleted trade mark.

According to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the RF part of the 433.92MHz except the MCU model name, antenna model, antenna type and antenna gain.

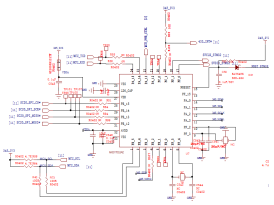
Other differences are detailed in the table below:

Differences:		
Description	**Before**	**After**
1. PCBA Version	V01	V03
2. 2. Add encryption chip	NO	ALPU-C (NEOWINE)
3. 433 MCU model name	NUC029ZAN (NUVOTON)	M031TD2AE (NUVOTON)
4. Remove Fuel gauge IC	MAX17260	DNP
5. 4G diversity antenna	XP05U-4G-DIV-V2.0	XP05U-4G-DIV-V2.0 AV
6. 433 antenna model	XP05-433-V2.0	XP05-433-V3.0
7. Antenna type	Inverted-F Antenna	FPC Antenna
8. Antenna gain	-2.5dBi	-2.61dBi

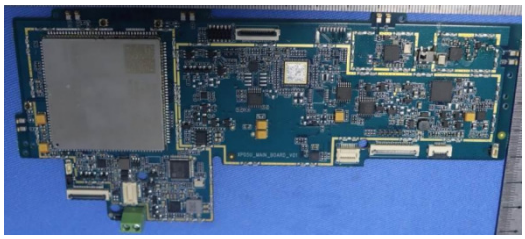
Remark: The 433 MCU just used for exchanging digital signals, the layout, pin position and packaging form are the same as the original.



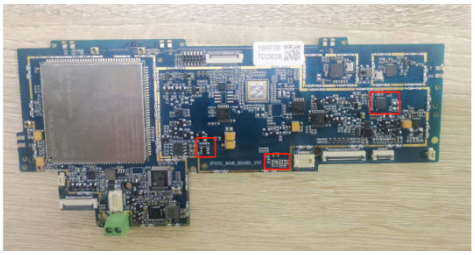
Before(MCU)



After(MCU)



Before



After

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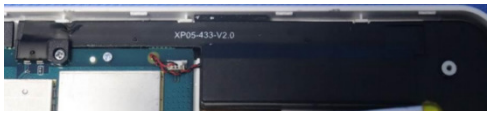
LTE diversity antenna(old) (receive function)

LTE diversity antenna(New) (receive function)



433.95MHz antenna(old)

433.95MHz antenna(New)

Considering to the difference, pre-scans were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report of section 2 were fully retested on model and shown the data in this report, other tests please refer to original report SZCR210502114703.

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3 Contents

Page

1 Cover Page 1

2 Test Summary 3

3 Contents 6

4 General Information 8

4.1 Details of E.U.T. 8
4.2 Description of Support Units 8
4.3 Measurement Uncertainty 8
4.4 Test Location 9
4.5 Test Facility 9
4.6 Deviation from Standards 9
4.7 Abnormalities from Standard Conditions 9

5 Equipment List 10

6 Radio Spectrum Technical Requirement 12

6.1 Antenna Requirement 12
6.1.1 Test Requirement: 12
6.1.2 Conclusion 12

7 Radio Spectrum Matter Test Results 13

7.1 Field Strength of the Fundamental Signal (15.231(b)) 13
7.1.1 E.U.T. Operation 13
7.1.2 Test Mode Description 13
7.1.3 Test Setup Diagram 14
7.1.4 Measurement Procedure and Data 14
7.2 Radiated Emissions below 1GHz 19
7.2.1 E.U.T. Operation 19
7.2.2 Test Mode Description 19
7.2.3 Test Setup Diagram 20
7.2.4 Measurement Procedure and Data 20
7.3 Radiated Emissions above 1GHz 23
7.3.1 E.U.T. Operation 23
7.3.2 Test Mode Description 23
7.3.3 Test Setup Diagram 23
7.3.4 Measurement Procedure and Data 24

8 Emission Test Results 27

8.1 Conducted Emissions at AC Mains Power Port (150kHz-30MHz) 27
8.1.1 E.U.T. Operation 27
8.1.2 Test Mode Description 27
8.1.3 Test Setup Diagram 28
8.1.4 Measurement Procedure and Data 28

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9 Test Setup Photo 31

10 EUT Constructional Details (EUT Photos) 31

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 12V from adapter input AC 120V/60Hz Adapter Model: SW-120250 Input: 100-240V~50/60Hz 0.68A Max Output: DC 12V 2500mA Lithium Ion Battery: 3.7V 3600mAh rechargeable battery which charged by adapter
Cable(s):	DC cable: 185cm unshielded Type-C to RJ45 cable: 17cm unshielded
Operation Frequency	433.95Mhz
Channel Numbers:	1
Modulation Type:	OOK
Antenna Gain:	-2.61dBi
Antenna Type:	FPC 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
Conducted Emissions at AC Mains Power Port (150kHz-30MHz)	± 3.1dB
Field Strength of the Fundamental Signal (15.231(b))	± 6.0dB
Radiated Emissions below 1GHz	± 6.0dB
Radiated Emissions above 1GHz	± 4.6dB (1-18GHz);± 4.8dB (18-40GHz)

Remark:
The U_{lab} (lab Uncertainty) is less than $U_{cispr/ETSI}$ (CISPR/ETSI 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.

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4.4 Test Location

All tests were performed at:

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Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

Conducted Emissions at AC Mains Power Port (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2022-05-14	2025-05-13
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2023-03-20	2024-03-19
Measurement Software	AUDIX	e3 V8.2014-6-27a	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2023-07-07	2024-07-06
LISN	Rohde&Schwarz	ENV216	SEM007-01	2023-09-19	2024-09-18
LISN	ETS-LINDGREN	3816/2	SEM007-02	2023-03-20	2024-03-19

Field Strength of the Fundamental Signal (15.231(b))					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2023-06-19	2026-06-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2022-10-20	2023-10-19
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2023-09-16	2025-09-15
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2023-03-20	2024-03-19
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2023-07-07	2024-07-06

Radiated Emissions below 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2021-11-30	2023-11-29
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2023-06-19	2026-06-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2022-10-20	2023-10-19
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2023-09-16	2025-09-15
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2023-03-20	2024-03-19
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2023-07-07	2024-07-06

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Radiated Emissions above 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2023-04-01	2026-03-31
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2023-03-20	2024-03-19
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2023-07-23	2025-07-22
Microwave system amplifier	Agilent	83017A	SEM005-25	2023-09-19	2024-09-18
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2023-07-07	2024-07-06

General used equipment					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2023-07-28	2024-07-27
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2023-07-28	2024-07-27
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2023-03-23	2024-03-22

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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

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.
15.247(b) (4) requirement:
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
EUT Antenna:
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -2.61dBi
Antenna location: Refer to internal photo.

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7 Radio Spectrum Matter Test Results

7.1 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(microvolts/meter)	Field strength of spurious emissions(microvolts/meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750	125 to 375
174-260	3750	375
260-470	3750 to 12500	375 to 1250
Above 470	12500	1250
Remark: the emission limit is based on measurement instrumentation employing an average detector at a distance of 3 meters. The frequencies above 1000MHz 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.		

7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 22.5 °C Humidity: 59.6 % RH Atmospheric Pressure: 1000 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with OOK modulation.
Pre-scan	01	TX mode_Keep the EUT in charging and continuously transmitting mode with OOK modulation.

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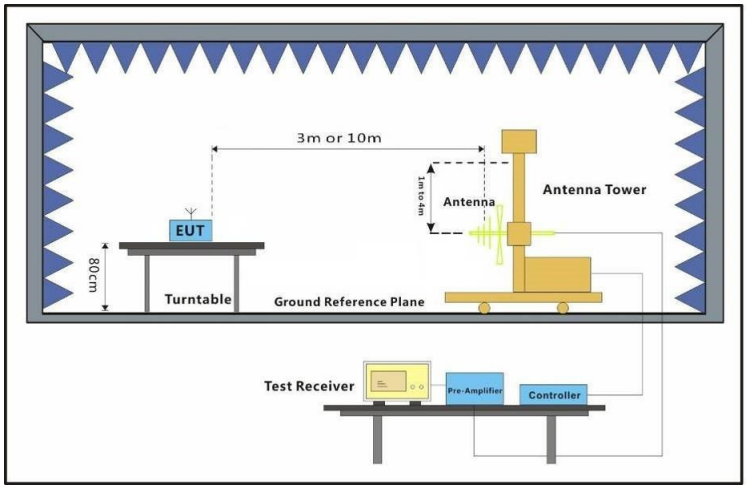
7.1.3 Test Setup Diagram



7.1.4 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. 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

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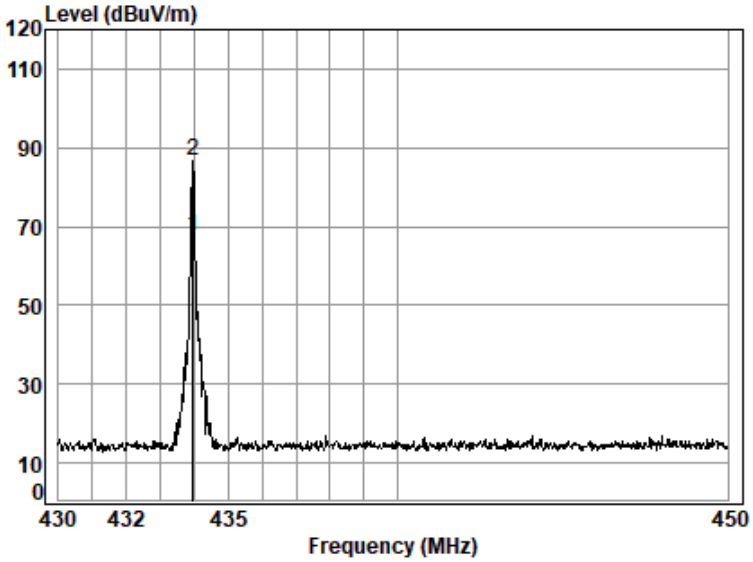
Refer to the original report SZCR2105021147AT, the PCDF=-18.76dB



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 03182AT
Test mode: 01

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	433.950	21.02	2.35	27.49	71.88	67.76	80.83	-13.07	Average
2 p	433.950	21.02	2.35	27.49	90.64	86.52	100.83	-14.31	Peak

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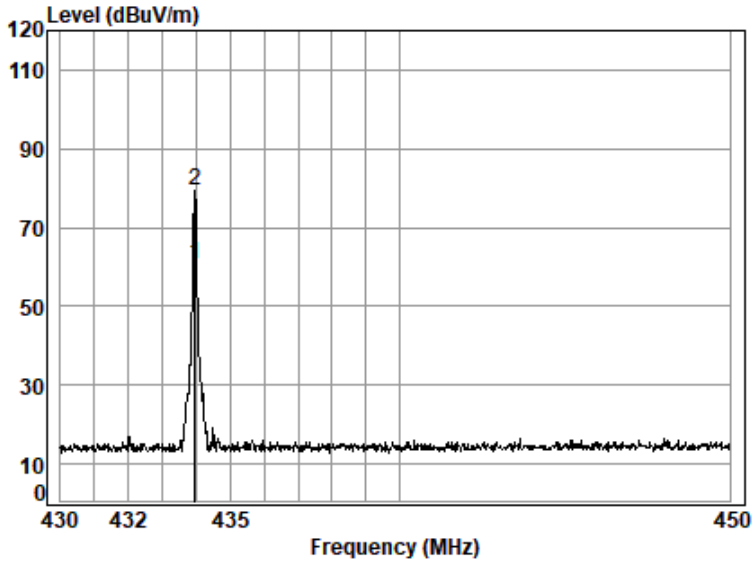

Site : chamber
Condition: 3m VERTICAL
Job No. : 03182AT
Test mode: 01

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	433.950	21.02	2.35	27.49	64.68	60.56	80.83	-20.27	Average
2 p	433.950	21.02	2.35	27.49	83.44	79.32	100.83	-21.51	Peak

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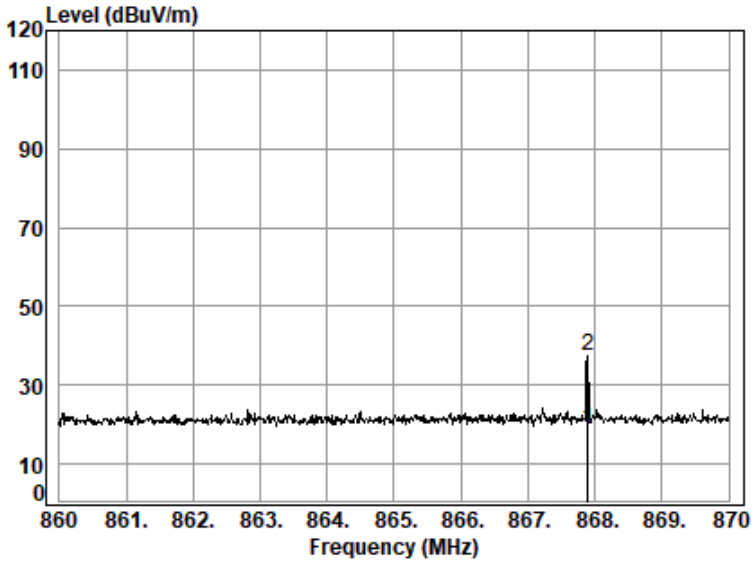

Site : chamber
Condition: 3m HORIZONTAL
Job No. : 03182AT
Test mode: 01

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	867.900	27.64	3.48	27.28	14.93	18.77	60.83	-42.06	Average
2 p	867.900	27.64	3.48	27.28	33.69	37.53	80.83	-43.30	Peak

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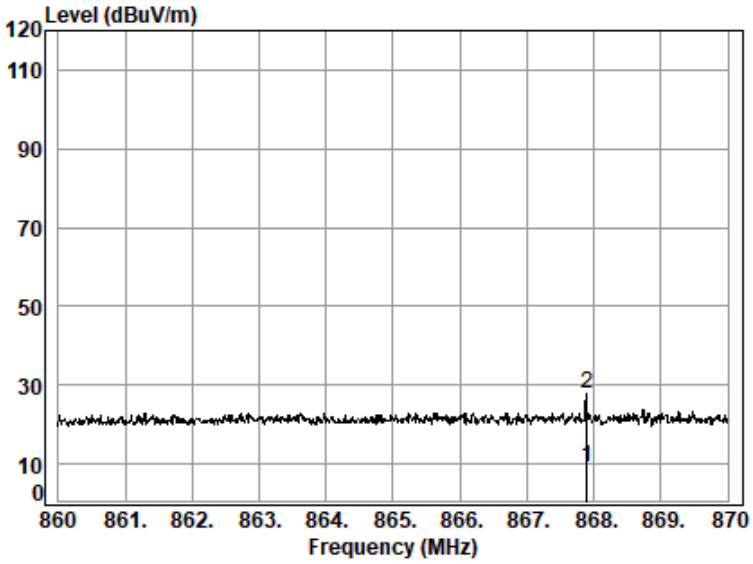

Site : chamber
Condition: 3m VERTICAL
Job No. : 03182AT
Test mode: 01

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	867.900	27.64	3.48	27.28	5.13	8.97	60.83	-51.86	Average
2 p	867.900	27.64	3.48	27.28	23.89	27.73	80.83	-53.10	Peak

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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
Measurement Distance: 3m

Limit:

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.		

7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 23.2 °C Humidity: 45.8 % RH Atmospheric Pressure: 1000 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with OOK modulation.
Pre-scan	01	TX mode_Keep the EUT in charging and continuously transmitting mode with OOK modulation.

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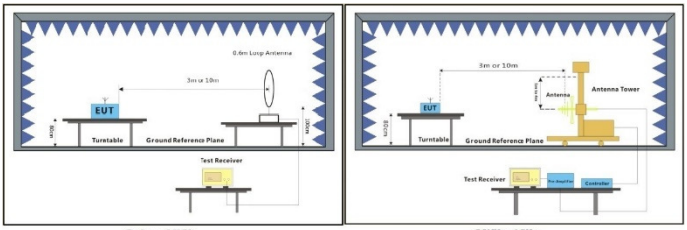
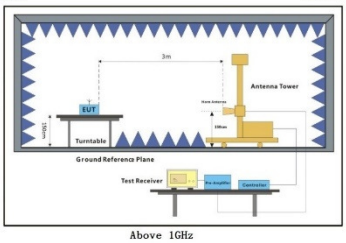
7.2.3 Test Setup Diagram



Below 30MHz

30MHz-1GHz



Above 1GHz

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 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. 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:

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 9kHz to 1GHz, 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.

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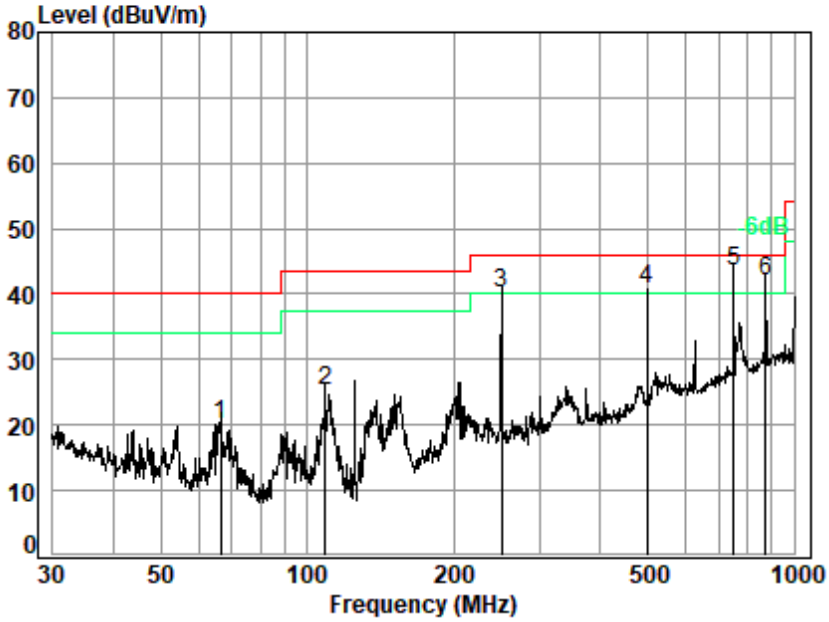
Test Mode: 00; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 03182AT
Test Mode: 00

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	66.27	10.90	0.96	27.70	35.87	20.03	40.00	-19.97	QP
2	108.65	12.03	1.24	27.58	39.42	25.11	43.50	-18.39	QP
3	250.30	17.24	1.95	27.07	47.94	40.06	46.00	-5.94	QP
4	499.42	22.90	2.89	27.78	42.64	40.65	46.00	-5.35	QP
5 q	750.11	26.52	3.67	27.76	41.05	43.48	46.00	-2.52	QP
6	875.25	27.66	4.03	27.25	37.64	42.08	46.00	-3.92	QP

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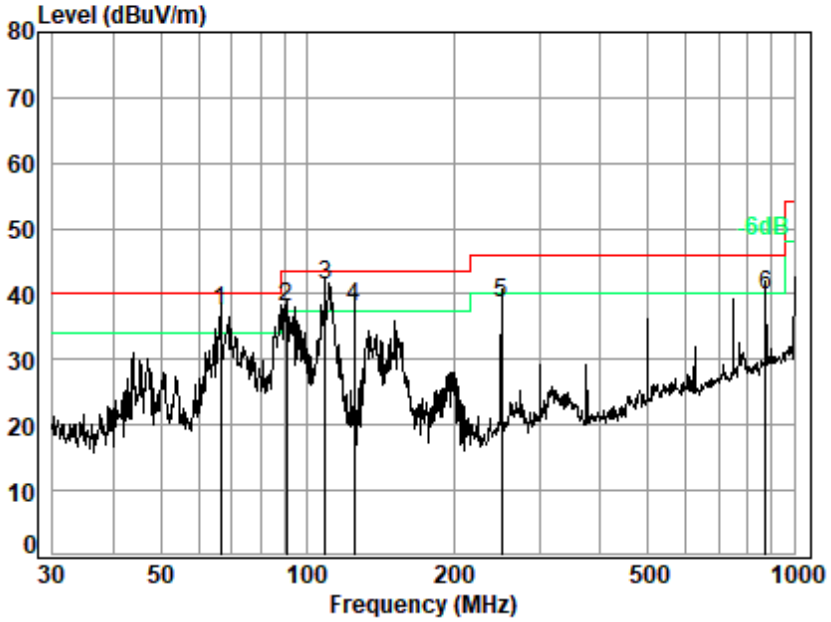
Test Mode: 00; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 03182AT
Test Mode: 00

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	66.27	10.90	0.96	27.70	53.40	37.56	40.00	-2.44	QP
2	90.54	11.78	1.13	27.64	52.76	38.03	43.50	-5.47	QP
3 q	108.65	12.03	1.24	27.58	55.67	41.36	43.50	-2.14	QP
4	125.01	10.98	1.33	27.52	53.37	38.16	43.50	-5.34	QP
5	250.30	17.24	1.95	27.07	46.66	38.78	46.00	-7.22	QP
6	875.25	27.66	4.03	27.25	35.50	39.94	46.00	-6.06	QP

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7.3 Radiated Emissions above 1GHz

Test Requirement 47 CFR Part 15C Section 15.231(b) and 15.209
Test Method: ANSI C63.10 (2013) Section 6.6
Measurement Distance: 3m

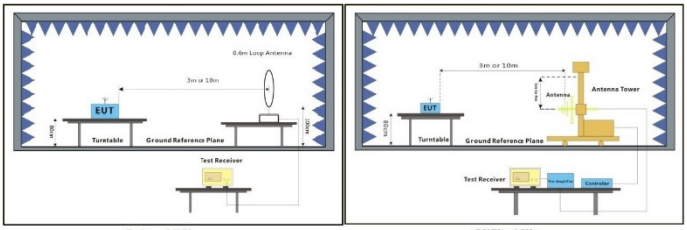
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 24.2 °C Humidity: 48.3 % RH Atmospheric Pressure: 1000 mbar

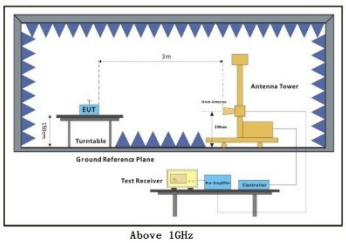
7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with OOK modulation.
Pre-scan	01	TX mode_Keep the EUT in charging and continuously transmitting mode with OOK modulation.

7.3.3 Test Setup Diagram



Below 30MHz 30MHz-1GHz



Above 1GHz

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7.3.4 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 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. 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:

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) 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.

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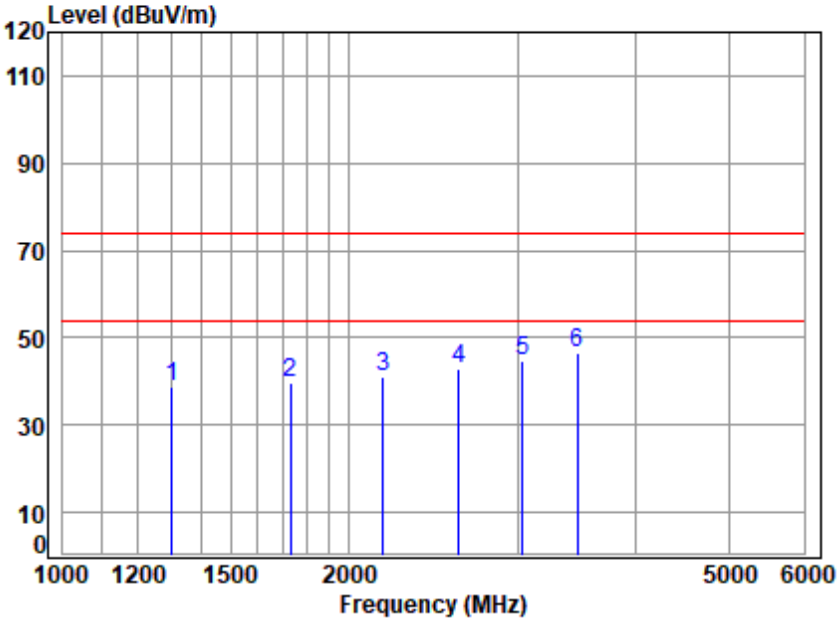
Test Mode: 01; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03182AT
Mode : 433 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1301.700	3.76	26.63	38.36	46.61	38.64	74.00	-35.36	Peak
2	1735.600	4.38	27.81	38.42	45.76	39.53	74.00	-34.47	Peak
3	2169.500	4.86	28.84	37.99	45.47	41.18	74.00	-32.82	Peak
4	2603.400	5.27	29.19	36.95	45.34	42.85	74.00	-31.15	Peak
5	3037.300	5.63	30.31	36.14	44.89	44.69	74.00	-29.31	Peak
6 q	3471.200	6.19	31.52	36.12	45.11	46.70	74.00	-27.30	Peak

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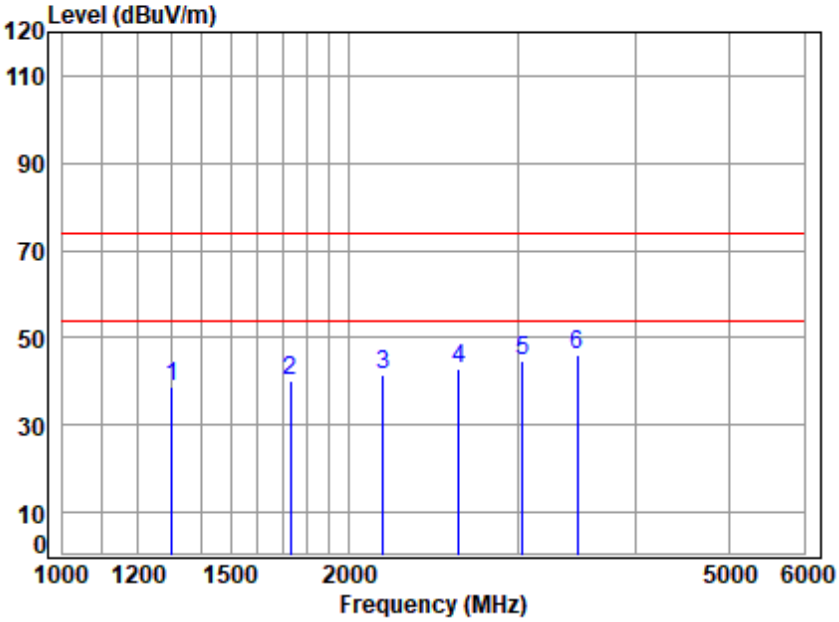
Test Mode: 01; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 03182AT
Mode : 433 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1301.700	3.76	26.63	38.36	46.92	38.95	74.00	-35.05	Peak
2	1735.600	4.38	27.81	38.42	46.45	40.22	74.00	-33.78	Peak
3	2169.500	4.86	28.84	37.99	45.61	41.32	74.00	-32.68	Peak
4	2603.400	5.27	29.19	36.95	45.29	42.80	74.00	-31.20	Peak
5	3037.300	5.63	30.31	36.14	44.73	44.53	74.00	-29.47	Peak
6 q	3471.200	6.19	31.52	36.12	44.50	46.09	74.00	-27.91	Peak

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8 Emission Test Results

8.1 Conducted Emissions at AC Mains Power Port (150kHz-30MHz)

Test Requirement: 47 CFR Part 15, Subpart C 15.231
Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		
Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15MHz to 30MHz		

8.1.1 E.U.T. Operation

Operating Environment:
Temperature: 23.4 °C Humidity: 47.3 % RH Atmospheric Pressure: 1000 mbar

8.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with OOK modulation.
Pre-scan	01	TX mode_Keep the EUT in charging and continuously transmitting mode with OOK modulation.

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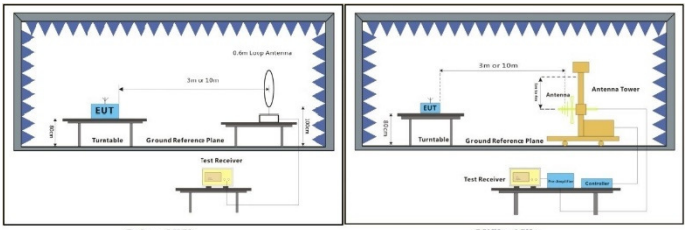
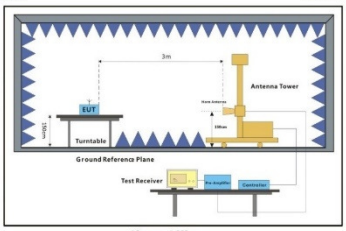
8.1.3 Test Setup Diagram



Below 30MHz

30MHz-1GHz



Above 1GHz

8.1.4 Measurement Procedure and Data

Frequency range: 150kHz-30MHz

An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

The red line show in graphic is the limit in standard used in this section.

Remark: Measured Level= Read Level+ Cable Loss+ LISN Factor

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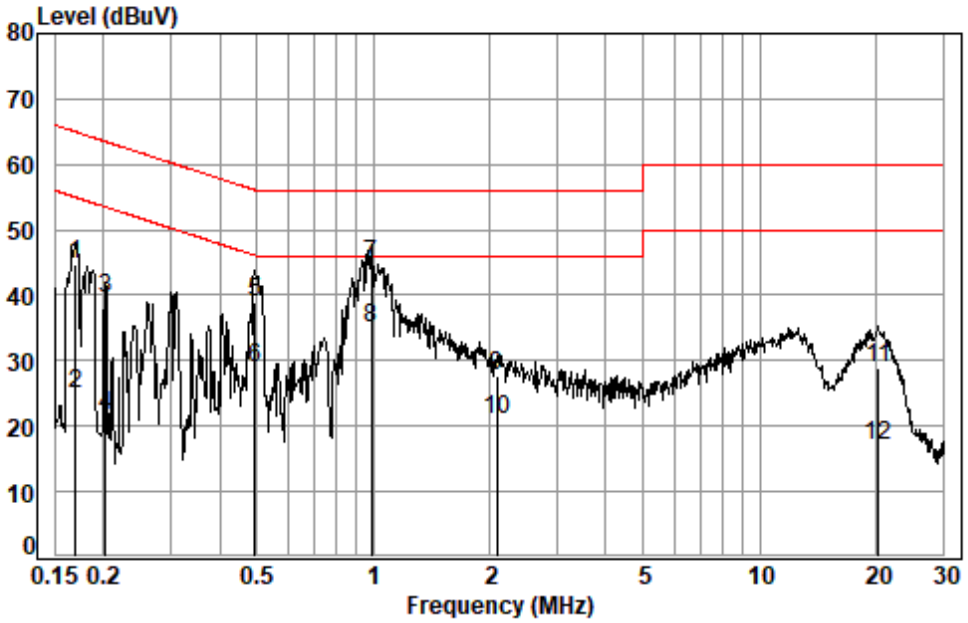
Test Mode: 00; Line: Live line



Site : Shielding Room
Condition: Line
Job No. : 03182AT
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1694	0.02	10.99	33.72	44.73	64.99	-20.26	QP
2	0.1694	0.02	10.99	13.96	24.97	54.99	-30.02	Average
3	0.2029	0.02	10.74	28.66	39.42	63.49	-24.07	QP
4	0.2029	0.02	10.74	10.74	21.50	53.49	-31.99	Average
5	0.4941	0.04	10.77	28.05	38.86	56.10	-17.24	QP
6	0.4941	0.04	10.77	18.09	28.90	46.10	-17.20	Average
7 *	0.9891	0.06	11.15	33.61	44.82	56.00	-11.18	QP
8 *	0.9891	0.06	11.15	23.82	35.03	46.00	-10.97	Average
9	2.0879	0.07	10.56	17.14	27.77	56.00	-28.23	QP
10	2.0879	0.07	10.56	10.51	21.14	46.00	-24.86	Average
11	20.2696	0.27	11.08	17.45	28.80	60.00	-31.20	QP
12	20.2696	0.27	11.08	5.59	16.94	50.00	-33.06	Average

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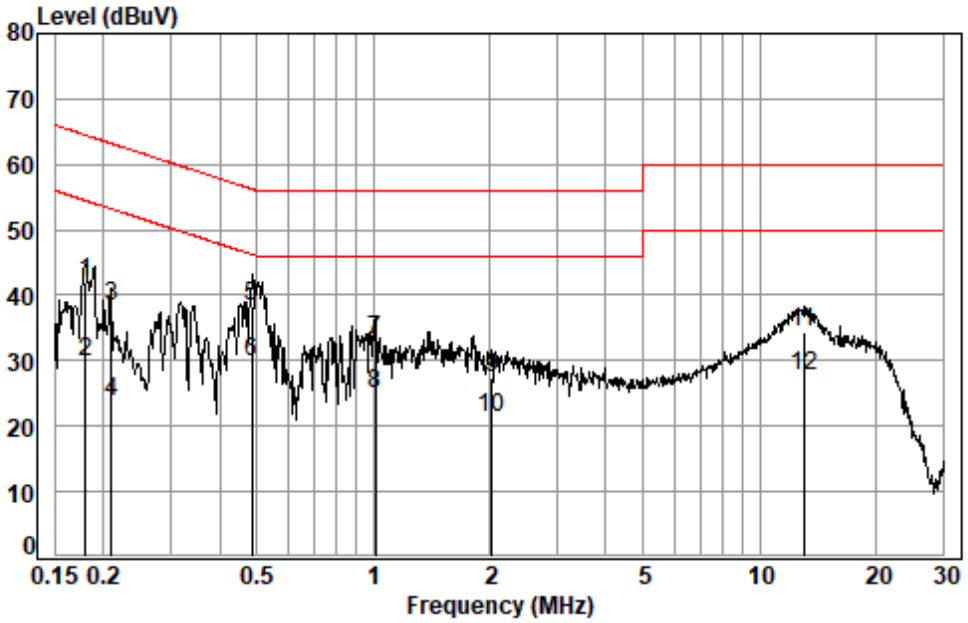
Test Mode: 00; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 03182AT
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1796	0.02	10.83	31.27	42.12	64.50	-22.38	QP
2	0.1796	0.02	10.83	19.02	29.87	54.50	-24.63	Average
3	0.2094	0.02	10.81	27.58	38.41	63.23	-24.82	QP
4	0.2094	0.02	10.81	12.88	23.71	53.23	-29.52	Average
5 *	0.4863	0.04	10.34	28.08	38.46	56.23	-17.77	QP
6 *	0.4863	0.04	10.34	19.44	29.82	46.23	-16.41	Average
7	1.0103	0.06	10.88	22.09	33.03	56.00	-22.97	QP
8	1.0103	0.06	10.88	14.08	25.02	46.00	-20.98	Average
9	2.0333	0.07	10.98	16.40	27.45	56.00	-28.55	QP
10	2.0333	0.07	10.98	10.24	21.29	46.00	-24.71	Average
11	12.9885	0.21	10.48	23.74	34.43	60.00	-25.57	QP
12	12.9885	0.21	10.48	17.12	27.81	50.00	-22.19	Average

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9 Test Setup Photo

Refer to Setup Photo for SZCR2309003182AT

10 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2309003182AT

- End of the Report -

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