

TEST REPORT

Application No.: SZCR2506002560AT
Applicant: Lockin Technology (Beijing) Co., Ltd.
Address of Applicant: 4F, BLDG.15, Yard.3, Jinghai 5th RD, Beiing Economic-Technological Development. Beijing, 101111 China
Manufacturer: Lockin Technology (Beijing) Co., Ltd.
Address of Manufacturer: 4F,BLDG.15,Yard.3,Jinghai 5th RD, Beiing Economic-Technological Development.
Factory: Chongqing Luxiangjia Technology Co., Ltd.
Address of Factory: No.50 Industrial Avenue, Pulu Street, Tongliang District, Chongqing, P.R.China
Equipment Under Test (EUT):
EUT Name: Lockin Smart Lock V5 Vision
Model No.: XFCL301
Trade Mark:  **LOCKIN**
FCC ID: 2BPG9-XFCL301
Standard(s) : 47 CFR Part 15, Subpart C 15.225
Date of Receipt: 2025-06-17
Date of Test: 2025-06-20 to 2025-06-24
Date of Issue: 2025-07-07

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

Keny Xu

Keny Xu
EMC Laboratory Manager






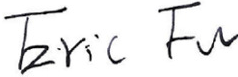
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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 2 of 26

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2025-07-07		Original

Authorized for issue by:				
				
		Bill Chen/Project Engineer		
				
		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 15.225	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 15.225	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass
Emission Mask		ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.225(a)&(b)&(C)	Pass
Frequency tolerance		ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart C 15.225(e)	Pass
Radiated Emissions (9kHz-30MHz)		ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.225(d) & 15.209	Pass
Radiated Emissions (30MHz-1GHz)		ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.225(d) & 15.209	Pass



3 Contents

	Page
1 Cover Page	1
2 Test Summary.....	3
3 Contents	4
4 General Information.....	6
4.1 Details of E.U.T.....	6
4.2 Description of Support Units.....	6
4.3 Measurement Uncertainty	6
4.4 Test Location	7
4.5 Test Facility.....	7
4.6 Deviation from Standards.....	7
4.7 Abnormalities from Standard Conditions.....	7
5 Equipment List	8
6 Radio Spectrum Technical Requirement.....	10
6.1 Antenna Requirement	10
6.1.1 Test Requirement:	10
6.1.2 Conclusion	10
7 Radio Spectrum Matter Test Results.....	11
7.1 20dB Bandwidth	11
7.1.1 E.U.T. Operation	11
7.1.2 Test Mode Description	11
7.1.3 Test Setup Diagram	11
7.1.4 Measurement Procedure and Data.....	11
7.2 Emission Mask.....	13
7.2.1 E.U.T. Operation	13
7.2.2 Test Mode Description	13
7.2.3 Test Setup Diagram	14
7.2.4 Measurement Procedure and Data.....	14
7.3 Frequency tolerance.....	16
7.3.1 E.U.T. Operation	16
7.3.2 Test Mode Description	16
7.3.3 Test Setup Diagram	16
7.3.4 Measurement Procedure and Data.....	16
7.4 Radiated Emissions (9kHz-30MHz)	18
7.4.1 E.U.T. Operation	18
7.4.2 Test Mode Description	18
7.4.3 Test Setup Diagram	19
7.4.4 Measurement Procedure and Data.....	19
7.5 Radiated Emissions (30MHz-1GHz)	22
7.5.1 E.U.T. Operation	22



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 5 of 26

7.5.2	Test Mode Description	22
7.5.3	Test Setup Diagram	23
7.5.4	Measurement Procedure and Data	23
8	Test Setup Photo	26
9	EUT Constructional Details (EUT Photos)	26



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4 General Information

4.1 Details of E.U.T.

Power supply:	Battery 1: Rechargeable Li-ion Battery Pack Model:ZNS-09G Nominal Voltage:DC 7.4V Rated Capacity:5000mAh Nominal Energy:37Wh Battery 2: Rechargeable Li-ion Battery Pack Model:ZNS-11G Nominal Voltage:DC 7.4V Rated Capacity:2250mAh Nominal Energy:16.65Wh
RF cable(Provided by the customer):	0.5dB
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	Loop 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	$\pm 3\%$
Emission Mask	$\pm 4.5\text{dB}$ (Below 1GHz)
Frequency tolerance	$\pm 3\%$
Radiated Emissions (9kHz-30MHz)	$\pm 3.6\text{dB}$
Radiated Emissions (30MHz-1GHz)	$\pm 6.0\text{dB}$ for 3m; $\pm 5.0\text{dB}$ for 10m

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (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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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 7 of 26

4.4 Test Location

All tests were performed at:

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No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

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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Report No.: SZCR250600256004

Page: 8 of 26

5 Equipment List

20dB Bandwidth					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
DC Power Supply	Zhao Xin	PS-305D	SEM011-13	2024-08-14	2025-08-13
Spectrum Analyzer	Rohde & Schwarz	FSP30	SEM004-06	2024-09-14	2025-09-13
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2024-07-06	2025-07-05
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2025-03-03	2026-03-02

Emission Mask					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2025-03-21	2026-03-20
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2024-08-14	2025-08-13
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2023-09-23	2025-09-22
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2025-03-04	2026-03-03
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2023-11-20	2025-11-19
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2024-07-06	2025-07-05

Frequency tolerance					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
DC Power Supply	Zhao Xin	PS-305D	SEM011-13	2024-08-14	2025-08-13
Spectrum Analyzer	Rohde & Schwarz	FSP30	SEM004-06	2024-09-14	2025-09-13
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2024-07-06	2025-07-05
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2025-03-03	2026-03-02
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2025-02-26	2026-02-25



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Report No.: SZCR250600256004

Page: 9 of 26

Radiated Emissions (9kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2025-03-21	2026-03-20
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2024-08-14	2025-08-13
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2023-09-23	2025-09-22
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2025-03-04	2026-03-03
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2023-11-20	2025-11-19
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2024-07-06	2025-07-05

Radiated Emissions (30MHz-1GHz)					
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	2024-08-14	2025-08-13
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2023-09-16	2025-09-15
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2025-03-04	2026-03-03
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2024-07-06	2025-07-05

General used equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2024-07-24	2025-07-23
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2024-07-24	2025-07-23
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2025-03-03	2026-03-02



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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 15.215

Test Method: ANSI C63.10 (2013) Section 6.9

7.1.1 E.U.T. Operation

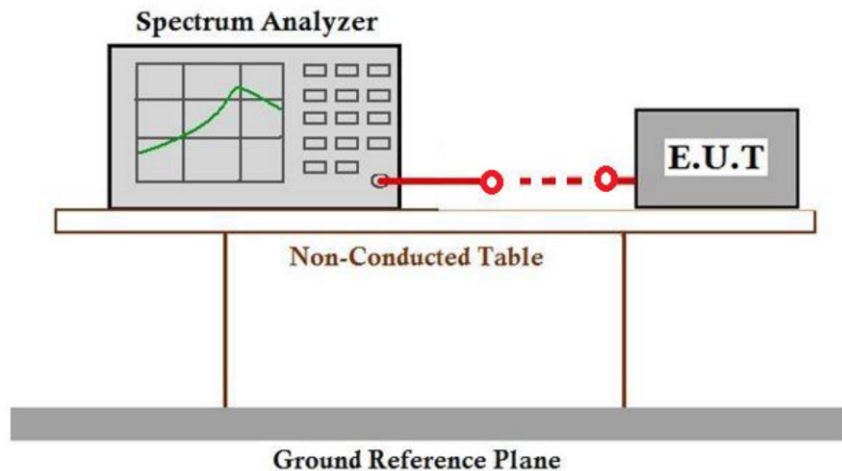
Operating Environment:

Temperature: 26.0 °C Humidity: 45.8 % RH Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode with modulation

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

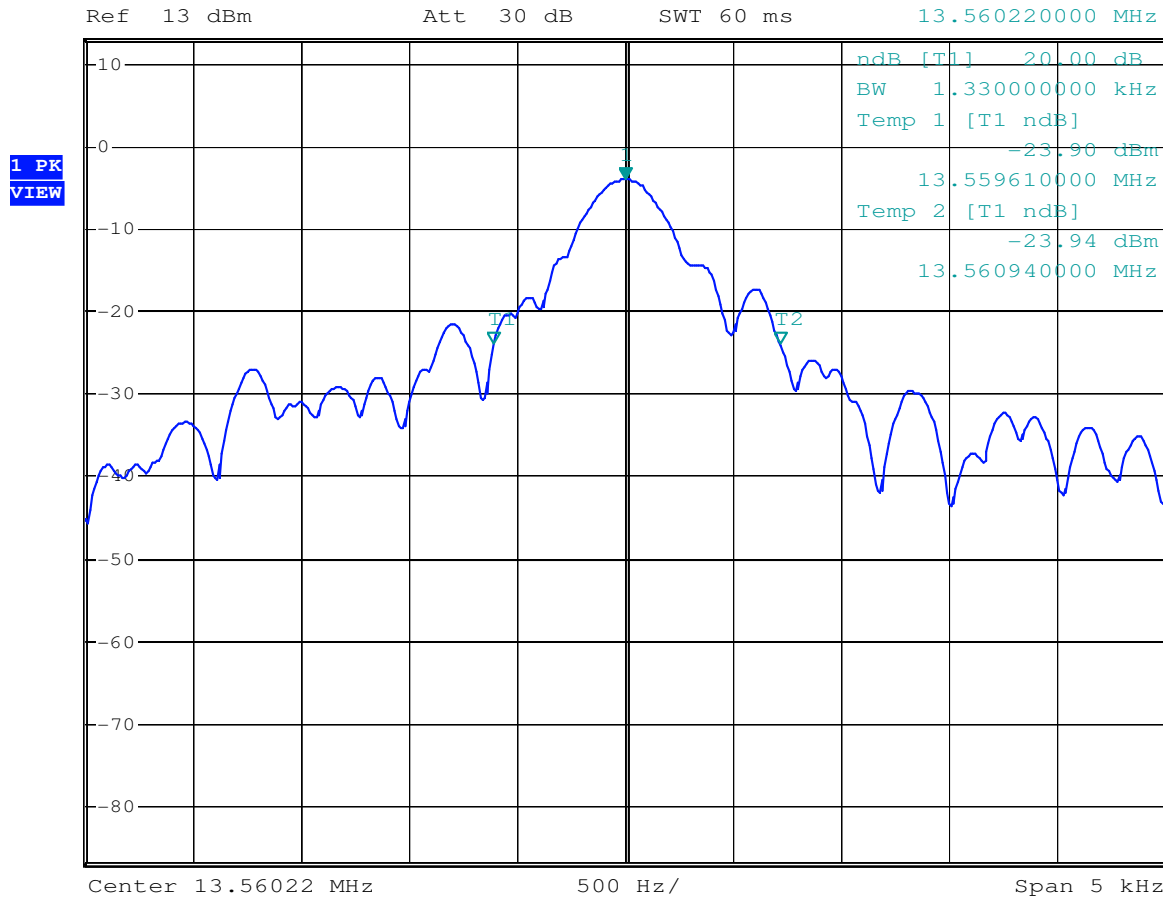
The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.



f_L (MHz)	f_H (MHz)	f_c (MHz)	Limit(MHz)	Result
13.559610	13.560940	13.560220	13.553 to 13.567	PASS



*RBW 300 Hz Marker 1 [T1]
 VBW 1 kHz -3.99 dBm
 SWT 60 ms 13.56022000 MHz



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7.2 Emission Mask

Test Requirement 47 CFR Part 15, Subpart C 15.225(a)&(b)&(C)
 Test Method: ANSI C63.10 (2013) Section 6.4
 Measurement Distance: 3m

Limit:

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Below 30MHz

The limit at 3m test distance is below:

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

where

FS_{limit} is the calculation of field strength at the limit distance, expressed in dBμV/m
 FS_{max} is the measured field strength, expressed in dBμV/m
 d_{measure} is the distance of the measurement point from the EUT
 d_{limit} is the reference distance or the distance of the $\lambda/2\pi$ point

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 124dBuV/m at 3 meters.

7.2.1 E.U.T. Operation

Operating Environment:

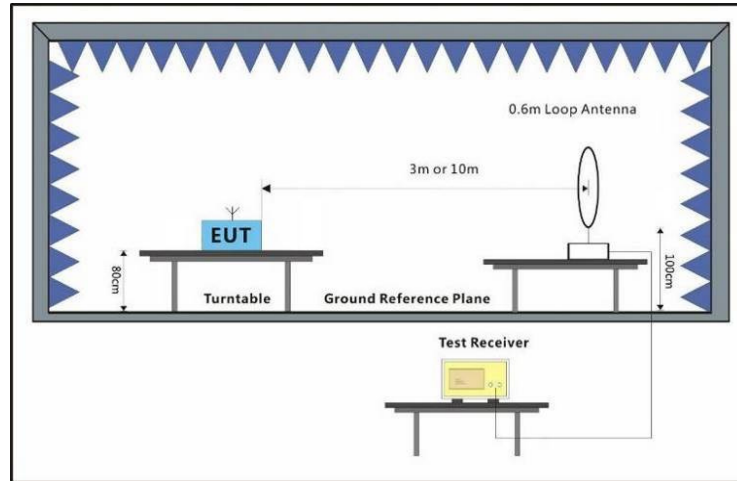
Temperature: 21.4 °C Humidity: 47.3 % RH Atmospheric Pressure: 1020 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode with modulation



7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

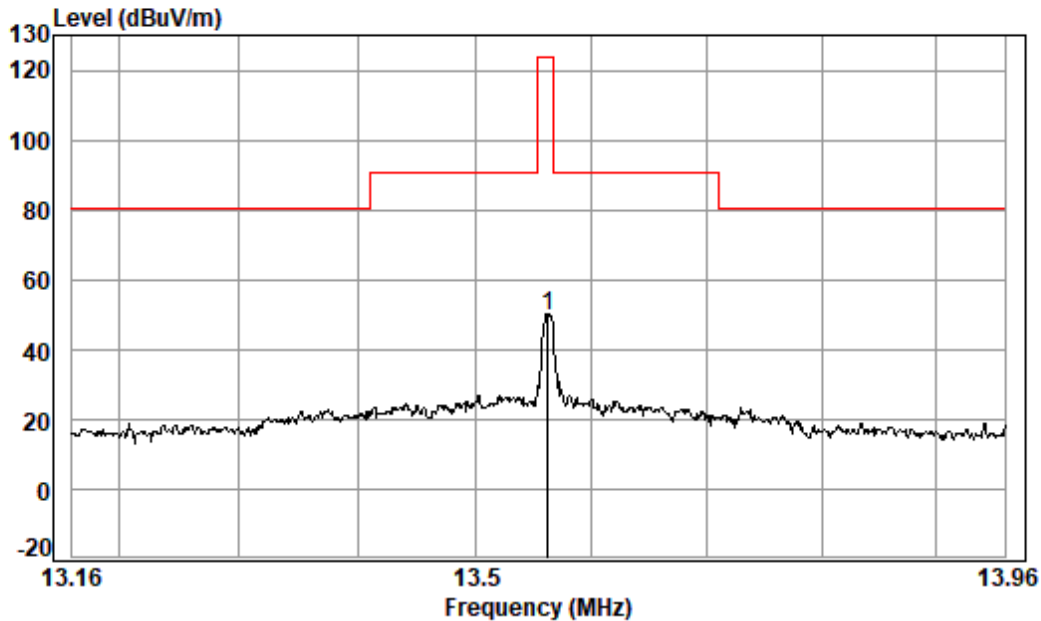


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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 15 of 26



Condition: 3m

Job No. : 02561AT

Test Mode: 03

		Read	Ant	Cable	Preamp		Limit	Over	
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	pp	13.562	72.46	8.55	1.16	32.50	49.67	124.00	-74.33 QP



7.3 Frequency tolerance

Test Requirement 47 CFR Part 15, Subpart C 15.225(e)

Test Method: ANSI C63.10 (2013) Section 6.8

Limit:

$\pm 0.01\%$

7.3.1 E.U.T. Operation

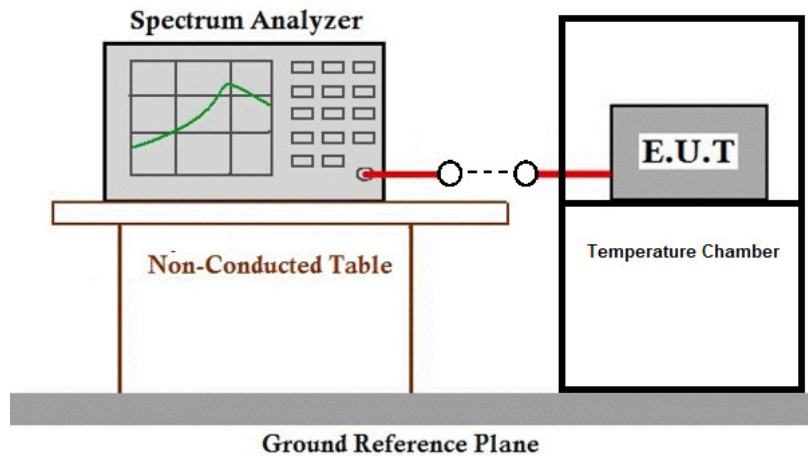
Operating Environment:

Temperature: 26.0 °C Humidity: 45.8 % RH Atmospheric Pressure: 1020 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode with modulation

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 17 of 26

Temperature (°C)	Voltage(Vdc)	Measurement Frequency(MHz)	Frequency Tolerance (%)	Limit (%)	Result
50	7.4	13.559941	-0.0004	±0.01	Pass
40		13.559953	-0.0003		Pass
30		13.56022	0.0016		Pass
20		13.559998	0.0000		Pass
10		13.559931	-0.0005		Pass
0		13.559969	-0.0002		Pass
-10		13.559921	-0.0006		Pass
-20		13.559984	-0.0001		Pass
20	6.30	13.559917	-0.0006		Pass
	8.52	13.559957	-0.0003		Pass



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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 18 of 26

7.4 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

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

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30

Note:

At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

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

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 21.6 °C

Humidity: 48.7 % RH

Atmospheric Pressure: 1020 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode with modulation



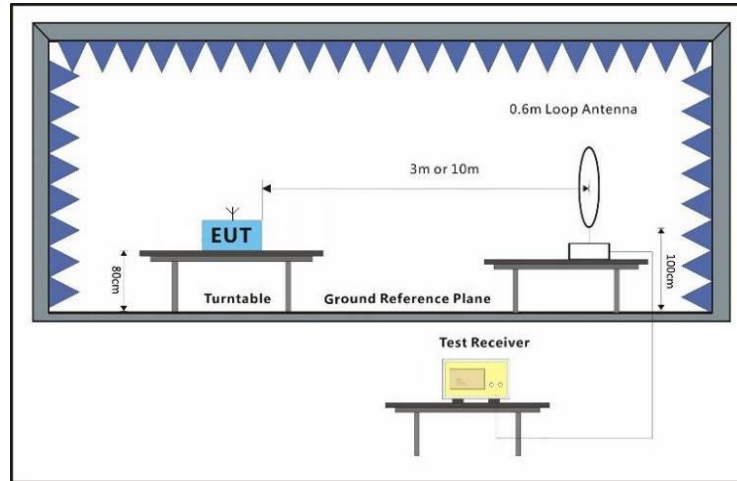
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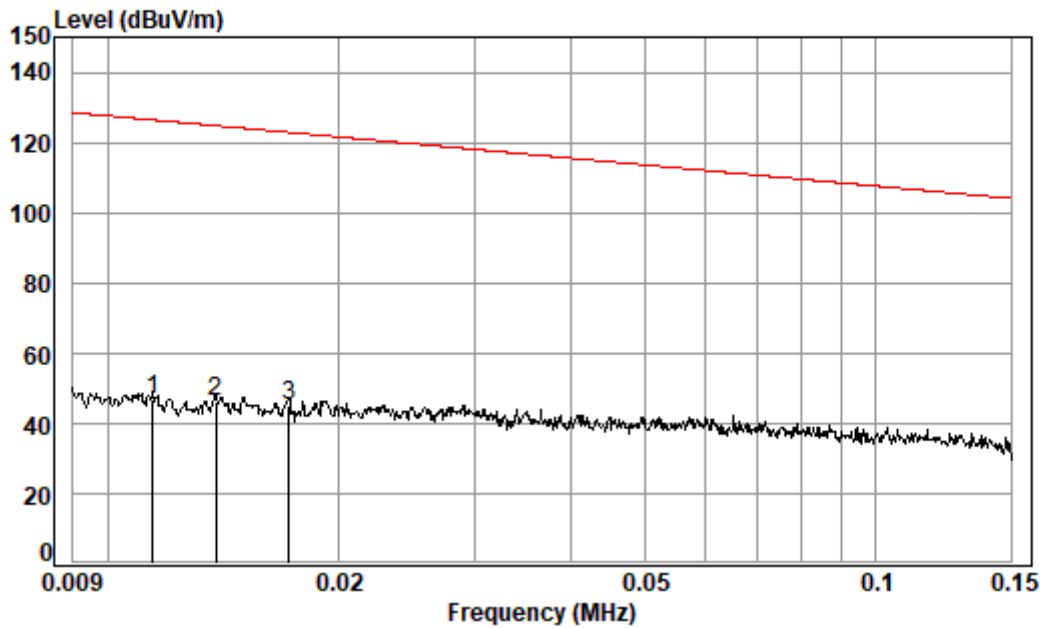
7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.





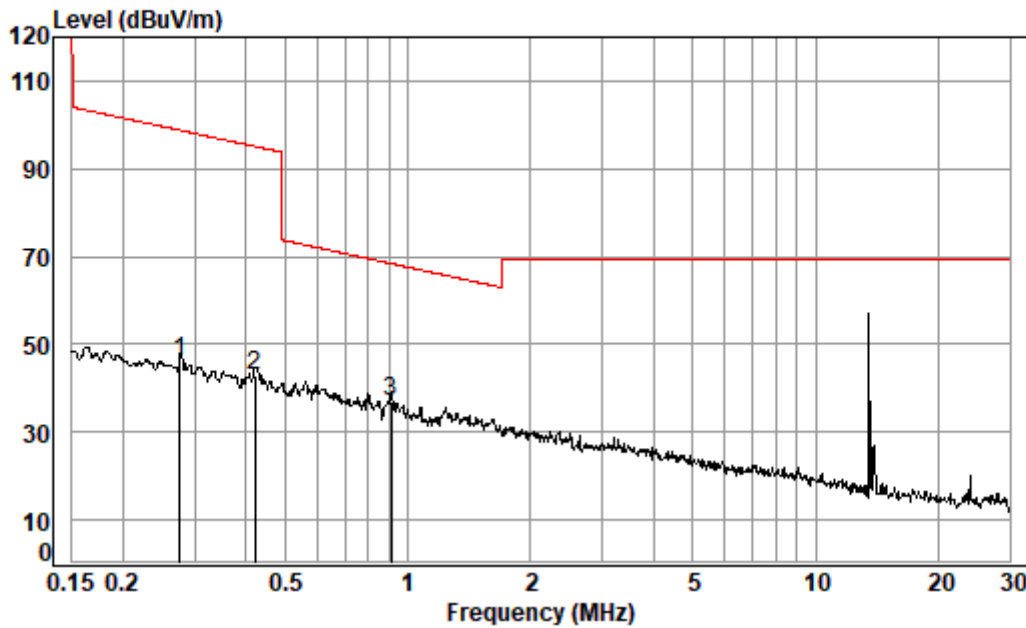
Condition: 3m

Job No. : 02560AT

Test Mode: 03

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.011	60.00	17.56	0.34	31.09	46.81	126.42	-79.61	Average
2	0.014	60.25	16.51	0.34	31.18	45.92	124.79	-78.87	Average
3 pp	0.017	60.98	15.00	0.34	31.30	45.02	122.88	-77.86	Average





Condition: 3m

Job No. : 02560AT

Test Mode: 03

		Read	Ant	Cable	Preamp		Limit	Over	
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.276	67.66	10.41	0.35	32.44	45.98	98.79	-52.81	Average
2 av	0.421	64.56	10.39	0.37	32.58	42.74	95.11	-52.37	Average
3 pp	0.909	58.77	10.35	0.44	32.54	37.02	68.40	-31.38	QP



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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 22 of 26

7.5 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

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

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
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 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.

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.2 °C

Humidity: 45.5 % RH

Atmospheric Pressure: 1020 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode with modulation

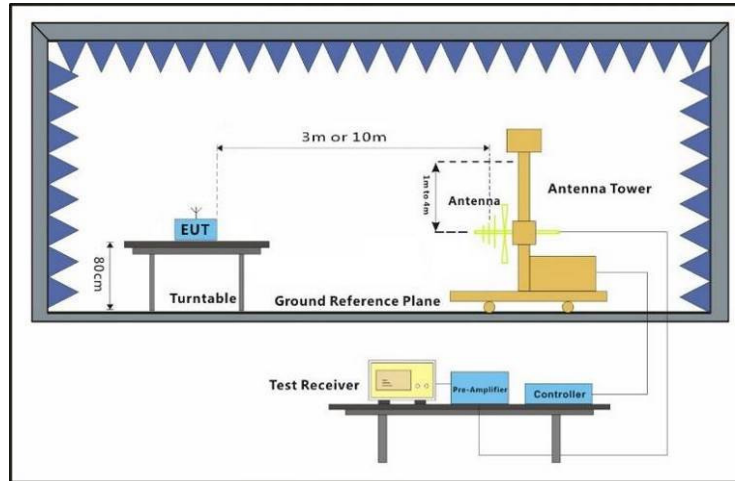


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7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 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 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: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



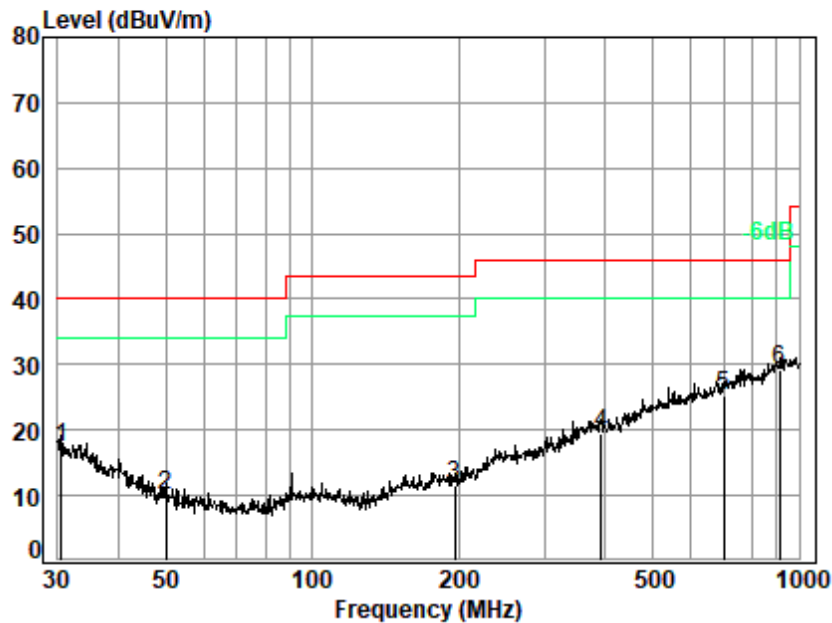
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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 24 of 26

Test Mode: 03; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 02560AT/02561AT
Test Mode: 03

	Ant	Cable	Preamp	Read	Limit	Over	
Freq	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.531	20.95	0.68	27.79	23.43	17.27	40.00 -22.73 QP
2	50.057	12.75	0.86	27.73	24.03	9.91	40.00 -30.09 QP
3	196.510	14.10	1.75	27.18	22.86	11.53	43.50 -31.97 QP
4	392.095	20.73	2.55	27.12	23.46	19.62	46.00 -26.38 QP
5	699.305	25.93	3.54	27.73	23.61	25.35	46.00 -20.65 QP
6 q	912.862	28.01	4.16	26.67	23.60	29.10	46.00 -16.90 QP



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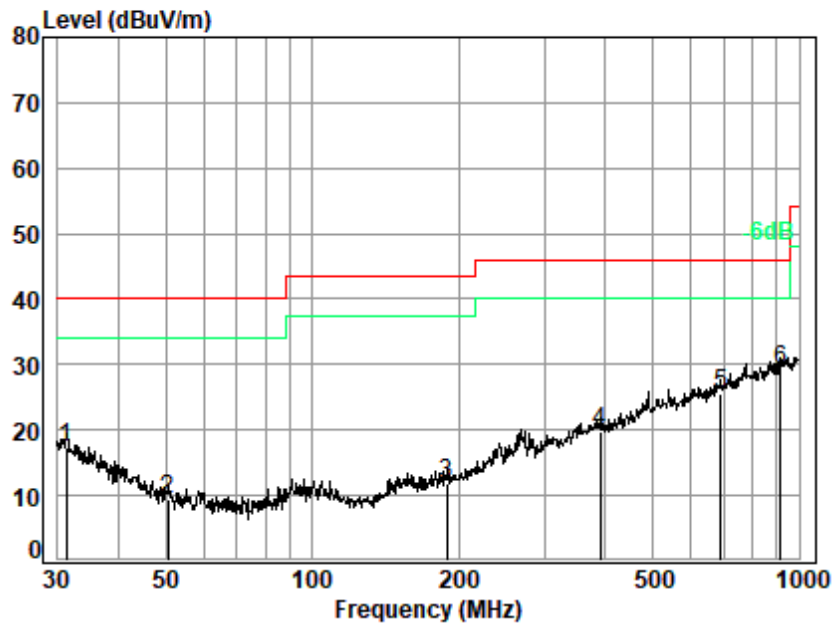
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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250600256004

Page: 25 of 26

Test Mode: 03; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 02560AT/02561AT
Test Mode: 03

	Ant	Cable	Preamp	Read		Limit	Over	
	Freq	Factor	Loss	Factor	Level	Level	Line	Limit Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	31.180	20.65	0.68	27.79	23.93	17.47	40.00	-22.53 QP
2	50.586	12.67	0.87	27.73	23.71	9.52	40.00	-30.48 QP
3	189.074	14.29	1.72	27.22	23.06	11.85	43.50	-31.65 QP
4	390.723	20.75	2.55	27.12	23.68	19.86	46.00	-26.14 QP
5	689.565	25.69	3.51	27.75	24.22	25.67	46.00	-20.33 QP
6 q	916.069	28.06	4.16	26.65	23.58	29.15	46.00	-16.85 QP



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8 Test Setup Photo

Refer to Appendix NFC— Test Setup Photos for SZCR2506002560AT

9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2506002560AT

- End of the Report -

