

# TEST REPORT

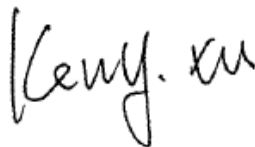
**Application No.:** SZCR2406002189AU  
**Applicant:** SAIC GM Wuling Automobile Co., Ltd.  
**Address of Applicant:** No.18 Hexi Road, Liuzhou City, Guangxi Zhuang Autonomous Region, 545007, China  
**Manufacturer:** United Automotive Electronic Systems Co., Ltd  
**Address of Manufacturer:** No. 555 Rong Qiao Road, Pudong New Area, Shanghai 201206, P.R. China.  
**Factory:** United Automotive Electronic Systems Co., Ltd. Liuzhou Plant  
**Address of Factory:** No. 8 Cheyuan Hengwu Road, Luorong Town, Yufeng District, Liuzhou City, Guangxi

### Equipment Under Test (EUT):

**EUT Name:** Intelligent Body Controller  
**Model No.:** IBC-00-01  
**Trade Mark:** SGMW  
**FCC ID:** 2AVYXIBC-68E70  
**Standard(s) :** 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2024-06-06  
**Date of Test:** 2024-06-17 to 2024-06-28  
**Date of Issue:** 2024-07-09

<b>Test Result:</b>	<b>Pass*</b>
---------------------	--------------

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



Keny Xu  
EMC Laboratory Manager



Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2024-07-09		Original

<b>Authorized for issue by:</b>			
		<i>Vincent Chen</i>	
		<b>Vincent Chen/Project Engineer</b>	
		<i>Eric Fu</i>	
		<b>Eric Fu/Reviewer</b>	



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## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C	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	ANSI C63.10 (2013) Section 6.9.2	47 CFR Part 15, Subpart C 15.215	Pass
Field Strength of the Fundamental Signal (15.209(c))		ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.209(c)	Pass
Radiated Emissions (9kHz-30MHz)		ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Emissions (30MHz-1GHz)		ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass



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### 3 Contents

	Page
<b>1 Cover Page</b> .....	<b>1</b>
<b>2 Test Summary</b> .....	<b>3</b>
<b>3 Contents</b> .....	<b>4</b>
<b>4 General Information</b> .....	<b>6</b>
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
<b>5 Equipment List</b> .....	<b>8</b>
<b>6 Radio Spectrum Technical Requirement</b> .....	<b>10</b>
6.1 Antenna Requirement .....	10
6.1.1 Test Requirement: .....	10
6.1.2 Conclusion.....	10
<b>7 Radio Spectrum Matter Test Results</b> .....	<b>11</b>
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 Field Strength of the Fundamental Signal (15.209(c)) .....	13
7.2.1 E.U.T. Operation .....	13
7.2.2 Test Mode Description .....	13
7.2.3 Test Setup Diagram .....	13
7.2.4 Measurement Procedure and Data.....	14
7.3 Radiated Emissions (9kHz-30MHz) .....	15
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 (30MHz-1GHz) .....	19
7.4.1 E.U.T. Operation .....	19
7.4.2 Test Mode Description .....	19
7.4.3 Test Setup Diagram .....	19
7.4.4 Measurement Procedure and Data.....	20
<b>8 Test Setup Photo</b> .....	<b>23</b>



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

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR240600218901

Page: 5 of 23

9 EUT Constructional Details (EUT Photos).....23



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	DC 3V via cell battery"CR2032"*1 DC 12V from battery for receiver
Cable Loss (for RF conducted test):	0.5dB
Operation frequency:	125kHz
Modulation type:	AM modulation
Antenna type:	External 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.
Remote controls	Provided by client	--	--

### 4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
20dB Bandwidth	± 0.3%
Field Strength of the Fundamental Signal (15.209(c))	± 3.6dB
Radiated Emissions (9kHz-30MHz)	± 3.6dB
Radiated Emissions (30MHz-1GHz)	± 6.0dB for 3m; ± 5.0dB for 10m

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.



### 4.4 Test Location

All tests were performed at:

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

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



## 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	2023-09-20	2024-09-19
Spectrum Analyzer	Rohde & Schwarz	FSP30	SEM004-06	2023-09-19	2024-09-18
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023-07-07	2024-07-06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2024-03-27	2025-03-26

Field Strength of the Fundamental Signal					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2024-03-26	2025-03-25
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2023-10-19	2024-10-18
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2023-09-23	2025-09-22
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2024-03-27	2025-03-26
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	2023-07-07	2024-07-06

Radiated Emissions (9kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2024-03-26	2025-03-25
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2023-10-19	2024-10-18
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2023-09-23	2025-09-22
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2024-03-27	2025-03-26
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	2023-07-07	2024-07-06



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<b>Radiated Emissions (30MHz-1GHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Inventory No.</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2024-03-26	2025-03-25
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2023-10-19	2024-10-18
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2023-09-23	2025-09-22
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2024-03-27	2025-03-26
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	2023-07-07	2024-07-06

<b>General used equipment</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Inventory No.</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
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	2024-03-18	2025-03-17



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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.

EUT Antenna:

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

Antenna location: Refer to External 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 6.9.2

Limit:

For report reference only

#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C

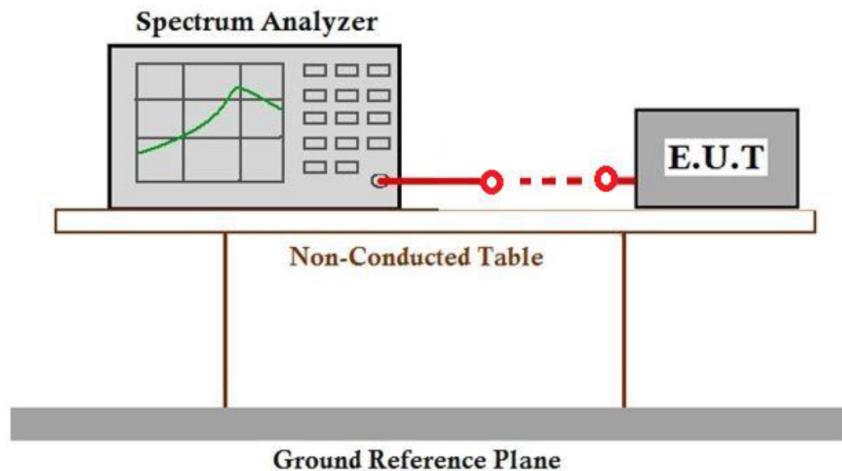
Humidity: 46.8 % RH

Atmospheric Pressure: 1020 mbar

#### 7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting mode

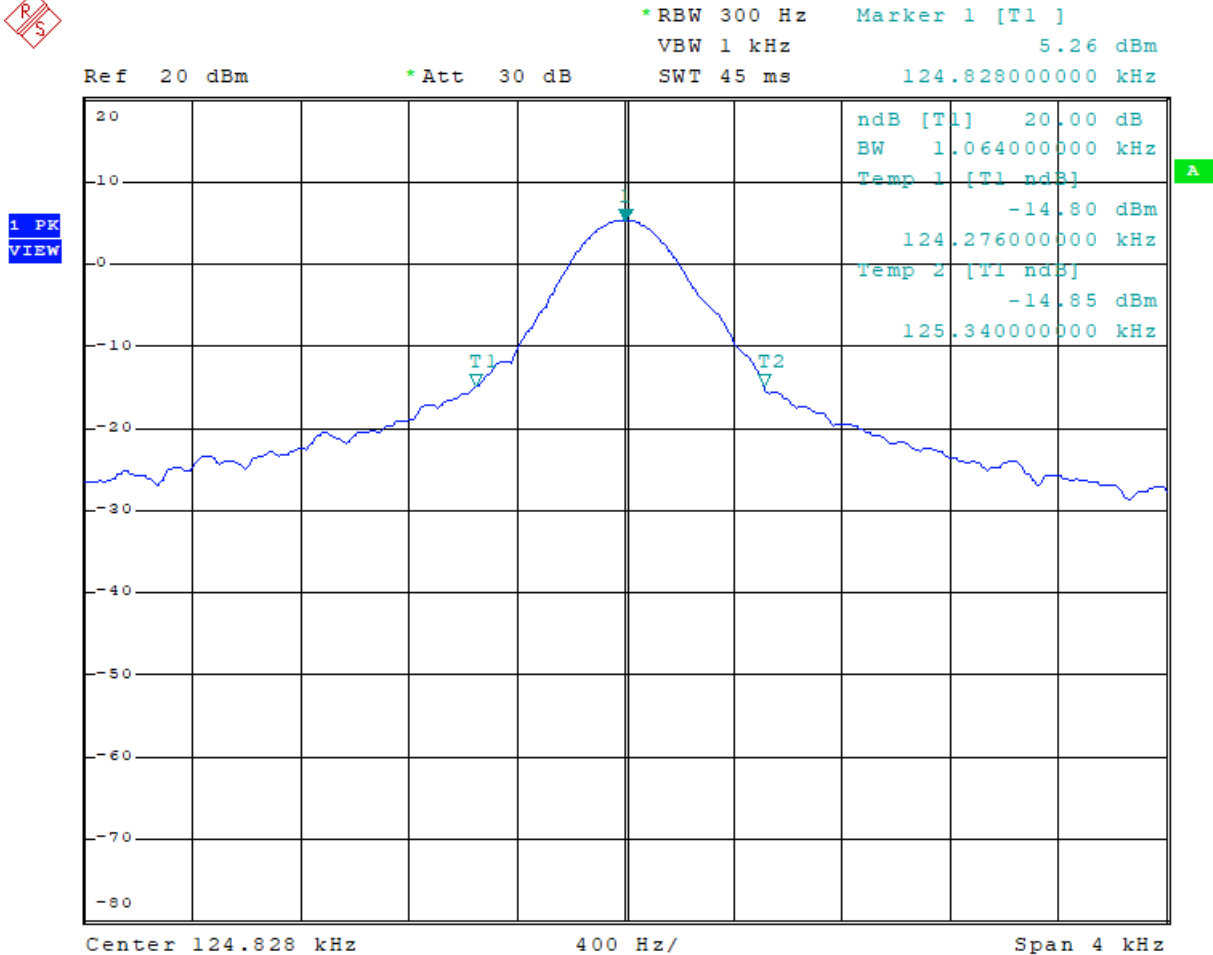
#### 7.1.3 Test Setup Diagram



#### 7.1.4 Measurement Procedure and Data



Test Frequency(kHz)	20dB bandwidth(kHz)	Limit(kHz)	Results
124.276	125.34	N/A	Pass



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### 7.2 Field Strength of the Fundamental Signal (15.209(c))

Test Requirement 47 CFR Part 15, Subpart C 15.209(c)

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

Measurement Distance: 3m

#### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C

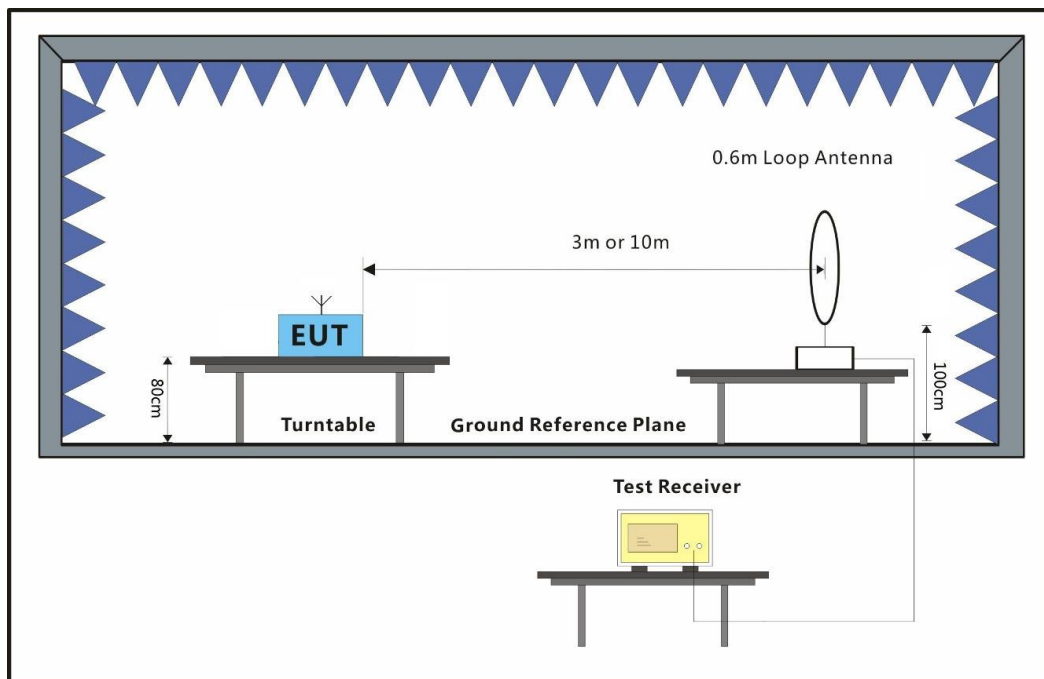
Humidity: 51.5 % RH

Atmospheric Pressure: 1020 mbar

#### 7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting mode

#### 7.2.3 Test Setup Diagram

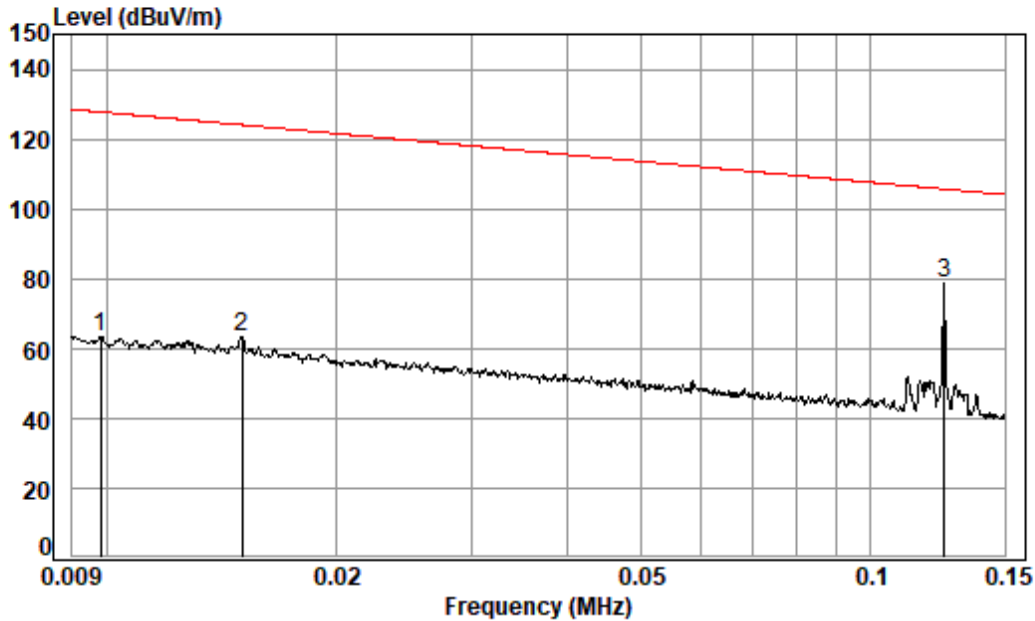


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### 7.2.4 Measurement Procedure and Data



Condition: 3m

Job No. : 02189AU

Test Mode: 01

	Read Freq	Ant Level	Ant Factor	Cable Loss	Preamp Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.010	76.02	18.42	0.31	31.39	63.36	127.74	-64.38	
2	0.015	78.99	15.96	0.31	31.85	63.41	124.05	-60.64	
3 pp	0.125	100.34	10.45	0.29	32.50	78.58	105.66	-27.08	



**7.3 Radiated Emissions (9kHz-30MHz)**

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

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

Measurement Distance: 10m

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

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. 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.

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than  $\lambda/2\pi$  and the limit distance is greater than  $\lambda/2\pi$ , the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the  $\lambda/2\pi$  distance, and at a 20 dB/decade of distance rate beyond  $\lambda/2\pi$ . This shall be accomplished using Equation (2):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(near\ field)}/d_{(10m)}\} + 20\log\{d_{(30/300m)}/d_{(near\ field)}\} \quad (2)$$

If the single point measured is at a distance greater than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20\log\{d_{(30/300m)}/d_{(10m)}\} \quad (3)$$

If both the single point and the limit distance are equal to or closer to the EUT than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(30/300m)}/d_{(10m)}\} \quad (4)$$

Remark:

$$d_{near\ field} = 47.77 / f_{MHz}$$

where  $f_{MHz}$  is the frequency of the emission being measured in MHz.



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### 7.3.1 E.U.T. Operation

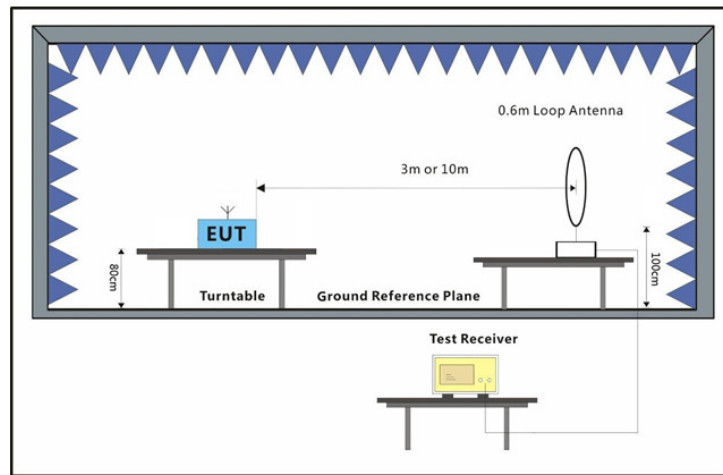
Operating Environment:

Temperature: 23.6 °C      Humidity: 51.5 % RH      Atmospheric Pressure: 1020 mbar

### 7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting mode

### 7.3.3 Test Setup Diagram

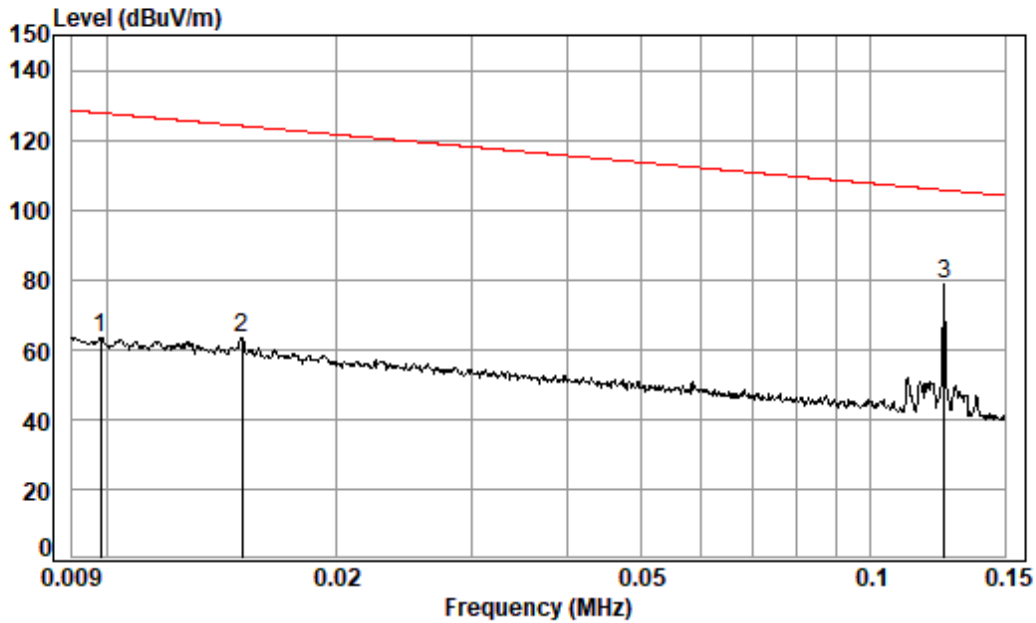


### 7.3.4 Measurement Procedure and Data

- a. All radiated emission measurements in terms of magnetic field strength shall be performed with a shielded loop antenna.
- b. For all radiated emission measurements in terms of magnetic field strength, the loop antenna were placed such that:
  - i. its centre shall be at 1.3 m height above the ground plane;
  - ii. the projection of its centre onto the ground plane shall be at the specified measurement distance from the projection on the ground plane of the closest point on the boundary of the equipment under test (EUT); and
  - iii. measurements shall be performed with the loop antenna placed vertically, in turn, in two polarizations (the measurement axis specified below is the line segment connecting the projections on the ground plane of the centre of the loop antenna and the centre of the EUT arrangement):
    - coaxial (loop plane perpendicular to the ground plane and to the measurement axis); and
    - coplanar (loop plane perpendicular to the ground plane and coplanar with the measurement axis).



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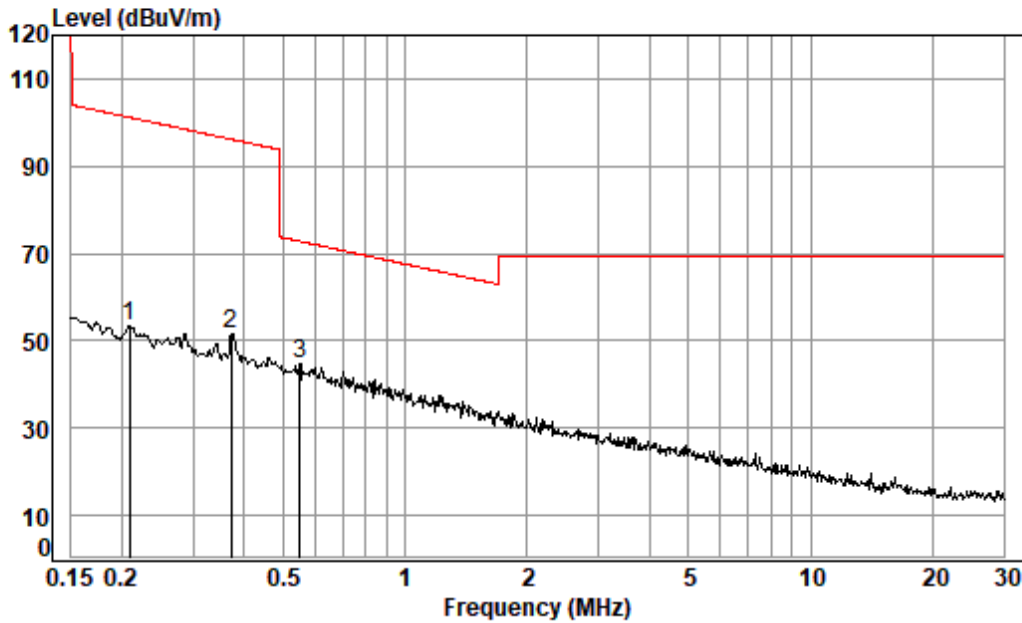
Condition: 3m

Job No. : 02189AU

Test Mode: 01

	Read Freq	Ant Level	Ant Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.010	76.02	18.42	0.31	31.39	63.36	127.74	-64.38	
2	0.015	78.99	15.96	0.31	31.85	63.41	124.05	-60.64	
3 pp	0.125	100.34	10.45	0.29	32.50	78.58	105.66	-27.08	





Condition: 3m

Job No. : 02189AU

Test Mode: 01

	Read Freq	Ant 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	0.209	75.36	10.38	0.31	32.50	53.55	101.18	-47.63	
2	0.373	73.34	10.33	0.33	32.50	51.50	96.17	-44.67	
3 pp	0.549	66.58	10.31	0.35	32.50	44.74	72.80	-28.06	





### 7.4 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 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.

#### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 21.3 °C

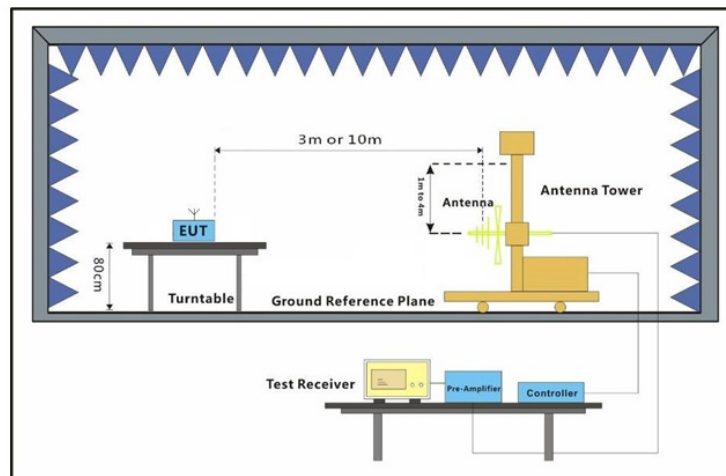
Humidity: 52.6 % RH

Atmospheric Pressure: 1020 mbar

#### 7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting mode

#### 7.4.3 Test Setup Diagram



### 7.4.4 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 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel,the middle channel,the Highest channel
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.
- i. Repeat above procedures until all frequencies measured was complete.

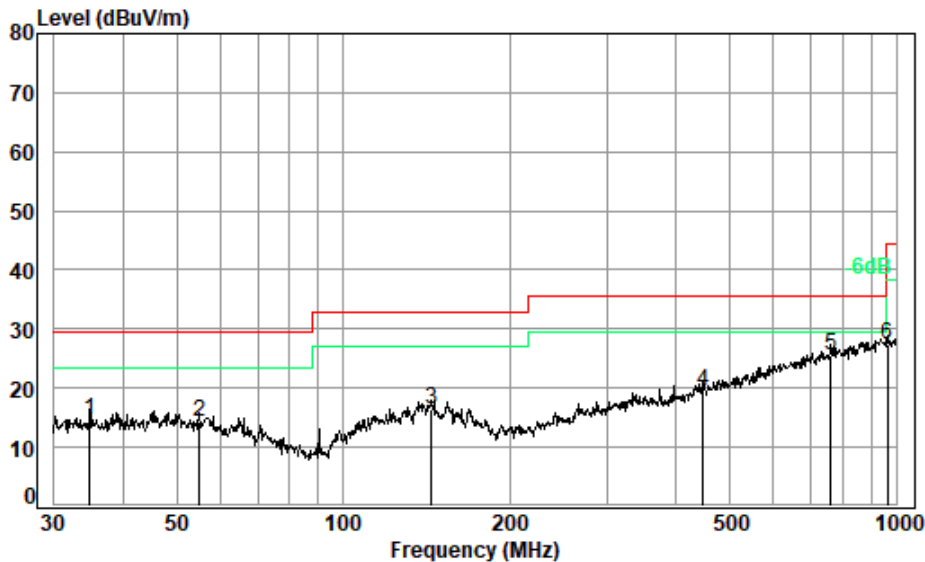
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



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Test Mode: 01; Polarity: Horizontal



Condition: 10m HORIZONTAL

Job No. : 02189AU

Test Mode: 01

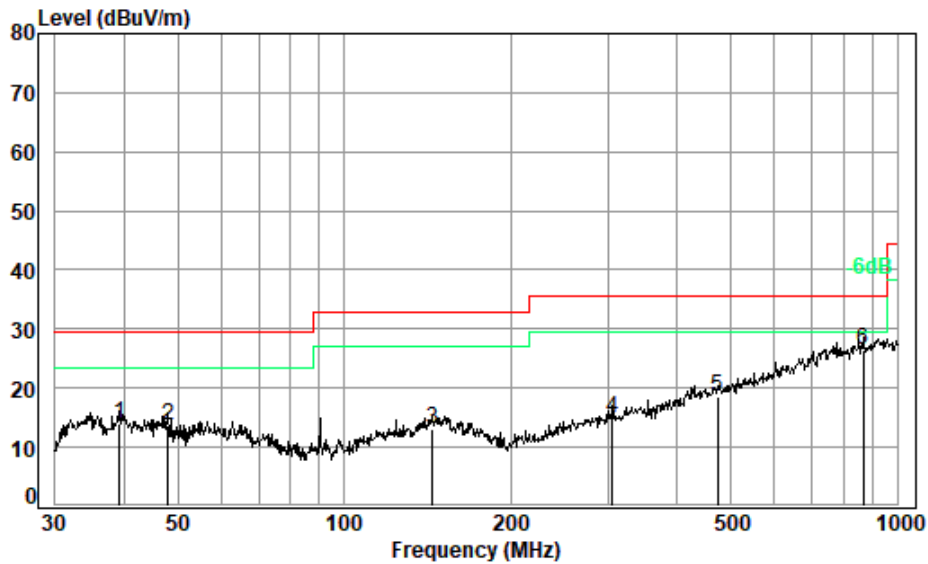
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	Limit Level	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	34.760	30.24	16.50	0.45	32.50	14.69	29.50	-14.81 QP
2	55.027	28.23	17.91	0.56	32.49	14.21	29.50	-15.29 QP
3	144.335	30.37	17.47	0.93	32.40	16.37	33.00	-16.63 QP
4	447.982	28.87	21.11	1.75	32.30	19.43	35.60	-16.17 QP
5 pp	760.704	28.99	26.39	2.40	32.11	25.67	35.60	-9.93 QP
6	965.542	27.93	27.90	2.69	31.27	27.25	44.40	-17.15 QP



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Test Mode: 01; Polarity: Vertical



Condition: 10m VERTICAL

Job No. : 02189AU

Test Mode: 01

	Read Freq	Ant Level	Ant Factor	Cable Loss	Preamp Factor	Limit Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	39.299	29.33	16.69	0.48	32.50	14.00	29.50	-15.50	QP
2	47.994	27.75	17.95	0.53	32.50	13.73	29.50	-15.77	QP
3	144.335	27.09	17.47	0.93	32.40	13.09	33.00	-19.91	QP
4	305.680	28.04	17.68	1.45	32.30	14.87	35.60	-20.73	QP
5	473.835	27.41	21.51	1.80	32.30	18.42	35.60	-17.18	QP
6 pp	869.130	28.23	27.28	2.59	31.58	26.52	35.60	-9.08	QP



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### 8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SZCR2406002189AU

### 9 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for SZCR2406002189AU

- End of the Report -

