



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

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Report No.: SZEM161101010301

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# FCC Test Report

**Application No.:** SZEM1611010103CR  
**Applicant:** Zmodo Technology Shenzhen Corp., Ltd.  
**Manufacturer:** Zmodo Technology Shenzhen Corp., Ltd.  
**Factory:** Zmodo Technology Shenzhen Corp., Ltd.  
**Equipment Under Test (EUT):**  
**EUT Name:** Charging pad  
**Model No.:** SA-H0001  
**Add Model No.:** SA-HXXXX(The X is variables, X=0 TO 9)  
**FCC ID:** ZK8-H0001  
**Standards:** 47 CFR PART 18: 2015  
**Date of Receipt:** 2016-11-28  
**Date of Test:** 2016-12-09 to 2016-12-10  
**Date of Issue:** 2016-12-13

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

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:



Jack Zhang  
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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. All test results in this report can be traceable to National or International Standards.

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## 2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission (150 kHz to 30 MHz)	47 CFR PART 18: 2015	FCC OST/ MP-5:1986	18.307(a)	Pass
Radiated Emission (9 kHz to 30MHz)	47 CFR PART 18: 2015	FCC OST/ MP-5:1986	18.305(b)	Pass



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### 4 General Information

#### 4.1 Client Information

Applicant:	Zmodo Technology Shenzhen Corp., Ltd.
Address of Applicant:	25/F, Office Tower A, Financial Technology Building, 11 Keyuan Road, Nanshan District, Shenzhen, China
Manufacturer:	Zmodo Technology Shenzhen Corp., Ltd.
Address of Manufacturer:	25/F, Office Tower A, Financial Technology Building, 11 Keyuan Road, Nanshan District, Shenzhen, China
Factory:	Zmodo Technology Shenzhen Corp., Ltd.
Address of Factory:	25/F, Office Tower A, Financial Technology Building, 11 Keyuan Road, Nanshan District, Shenzhen, China

#### 4.2 General Description of EUT

Product Name:	Charging pad
Model No.:	SA-H0001
Sample Type:	wireless charging transmitter
Operation Frequency:	110-205kHz
Antenna Type	Loop antenna
Power Supply:	DC 5V from USB port
Adapter:	Model: G0926U-050-200 Input: 100-240V, 50/60Hz, 0.5A Output: DC 5V, 2A
DC cable:	148cm unshielded

Remark:

Model No.: SA-H0001, SA-HXXXX(The X is variables, X=0 TO 9)

Only the model SA-H0001 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for all above models, only different on model name and color.



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#### 4.3 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Serial No.
DC Electronic load	Provided by Client	N/A	N/A

#### 4.4 Details of Test Mode

Mode 1	Wireless charge mode(Full Load)
Mode 2	Wireless charge mode(Half Load)
Mode 3	Wireless charge mode(No-Load)

#### 4.5 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, Shenzhen, Guangdong, China.  
518057.

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

No tests were sub-contracted.



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### 4.6 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **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**

The 10m Semi-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.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

### 4.7 Deviation from Standards

None.

### 4.8 Abnormalities from Standard Conditions

None.



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## 5 Equipment List

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2016-05-13	2017-05-13
2	LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
3	LISN	ETS-LINDGREN	3816/2	SEM007-02	2016-04-25	2017-04-25
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2016-04-25	2017-04-25

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2016-05-13	2017-05-13
2	EMI Test Receiver (9k-3GHz)	Rohde & Schwarz	ESCI	SEM004-01	2016-04-25	2017-04-25
3	Trilog-Broadband Antenna(30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-29
4	Pre-amplifier	Sonoma Instrument Co	310N	SEM005-03	2016-07-06	2017-07-06
5	Loop Antenna	ETS-Lindgren	6502	SEM003-08	2015-08-14	2018-08-14



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General used equipment						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
2	Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
3	Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
4	Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2016-05-18	2017-05-18

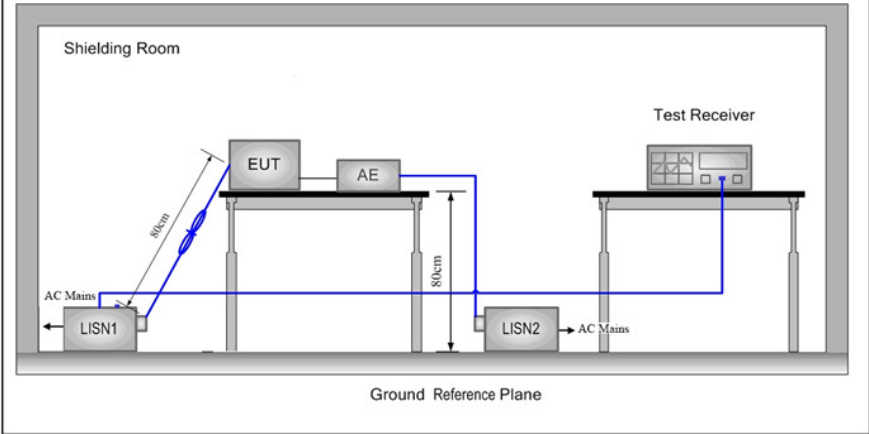




## 6 Test Results

### 6.1 Conducted Emissions

Test Requirement:	47 CFR PART 18.307(a)		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		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.			
Test Procedure:	<ol style="list-style-type: none"><li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li><li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li><li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</li><li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</li><li>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.</li></ol>		

Test Setup:	
Test Mode:	Wireless charge mode (Mode 1, 2, 3). The worst case (Mode 1) is reported only.
Instruments Used:	Refer to section 5 for details
Test Results:	Pass

#### Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

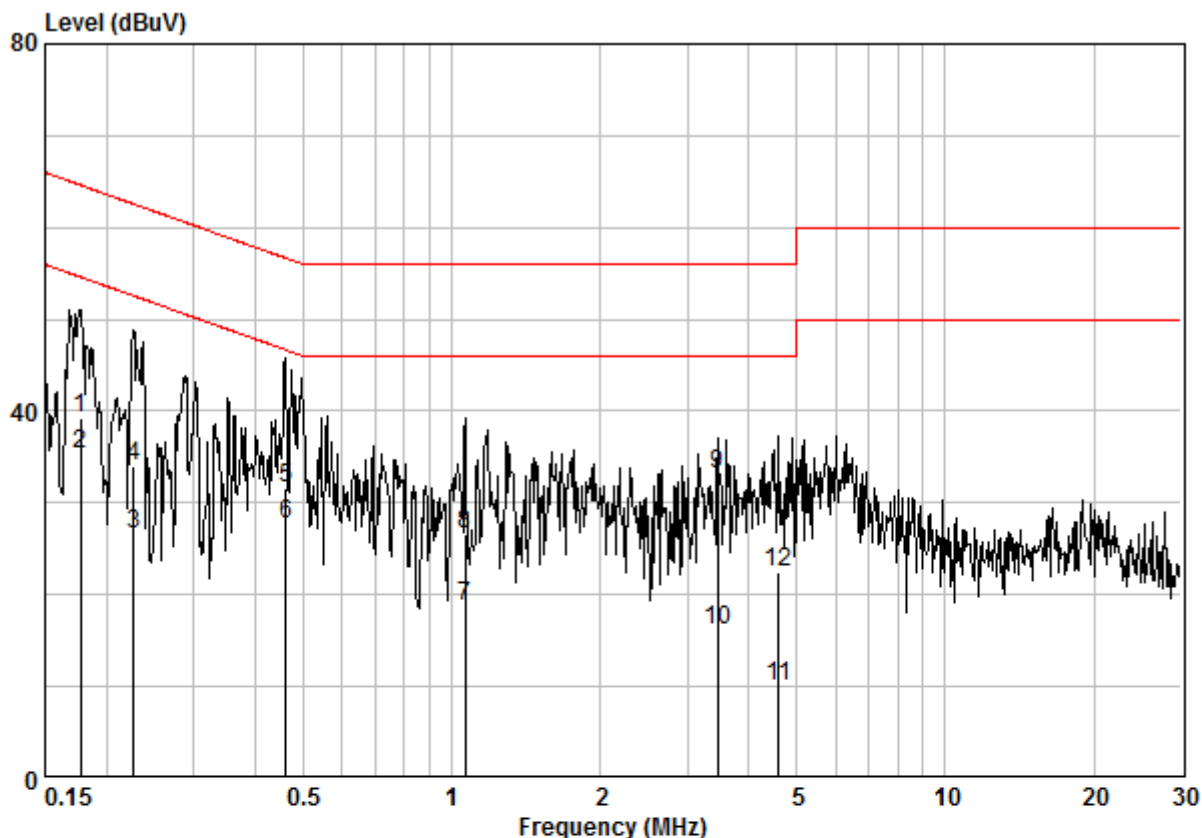
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



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Mode 1  
Live Line:



Site : Shielding Room  
Condition : CE LINE  
Job No. : 10103CR  
Test Mode : 1

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.17678	0.02	9.60	29.71	39.33	64.64	-25.30	QP
2	0.17678	0.02	9.60	25.69	35.31	54.64	-19.33	AVERAGE
3	0.22676	0.02	9.60	16.90	26.52	52.57	-26.05	AVERAGE
4	0.22676	0.02	9.60	24.47	34.09	62.57	-28.48	QP
5	0.46122	0.02	9.59	22.04	31.66	56.67	-25.02	QP
6 @	0.46122	0.02	9.59	18.05	27.67	46.67	-19.00	AVERAGE
7	1.065	0.03	9.62	9.07	18.73	46.00	-27.27	AVERAGE
8	1.065	0.03	9.62	17.00	26.66	56.00	-29.34	QP
9	3.454	0.02	9.63	23.47	33.12	56.00	-22.88	QP
10	3.454	0.02	9.63	6.39	16.04	46.00	-29.96	AVERAGE
11	4.598	0.02	9.64	0.33	9.99	46.00	-36.01	AVERAGE
12	4.598	0.02	9.64	12.81	22.48	56.00	-33.52	QP





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## 6.2 Radiated Emissions

Test Requirement:	47 CFR PART 18.305(b)				
Test Site:	Measurement Distance: 10m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	
	9kHz~150kHz	Quasi-peak	200Hz	≥RBW	
	150kHz~30MHz	Quasi-peak	9kHz	≥RBW	
	30MHz~1GHz	Quasi-peak	100kHz	≥RBW	
Limit:	<b>Equipment</b>	<b>Operating frequency</b>	<b>RF Power generated by equipment (watts)</b>	<b>Field strength limit (uV/m)</b>	<b>Distance (meters)</b>
	Any type unless otherwise specified (miscellaneous)	Any ISM frequency	Below 500 500 or more	25 25×SQRT (power/500)	300 1300
		Any non-ISM frequency	Below 500 500 or more	15 15×SQRT (power/500)	300 1300
	Industrial heaters and RF stabilized arc welders	On or below 5,725 MHz Above 5,725 MHz	Any Any	10 ( <sup>2</sup> )	1,600 ( <sup>2</sup> )
	Medical diathermy	Any ISM frequency Any non-ISM frequency	Any Any	25 15	300 300
	Ultrasonic	Below 490 kHz	Below 500 500 or more	2,400/F(kHz) 2,400/F(kHz)×SQRT(power/500)	300 3300
		490 to 1,600 kHz Above 1,600 kHz	Any Any	24,000/F(kHz) 15	30 30
	Induction cooking ranges	Below 90 kHz On or above 90 kHz	Any Any	1,500 300	430 430
	<p>1 Field strength may not exceed 10 μV/m at 1600 meters. Consumer equipment operating below 1000 MHz is not permitted the increase in field strength otherwise permitted here for power over 500watts.</p> <p>2 Reduced to the greatest extent possible.</p> <p>3 Field strength may not exceed 10 μV/m at 1600 meters. Consumer equipment is not permitted the increase in field strength otherwise permitted here for over 500 watts.</p> <p>4 Induction cooking ranges manufactured prior to February 1, 1980, shall be subject to the field strength limits for miscellaneous ISM equipment.</p> <p>Remark:According to the article 18.305(b), The operating frequency is non-ISM frequency;the RF Power generated by equipment is below 500(watts); According to the clause 18.305(c), the EUT belongs to Consumer equipment.</p>				
Test Setup:					

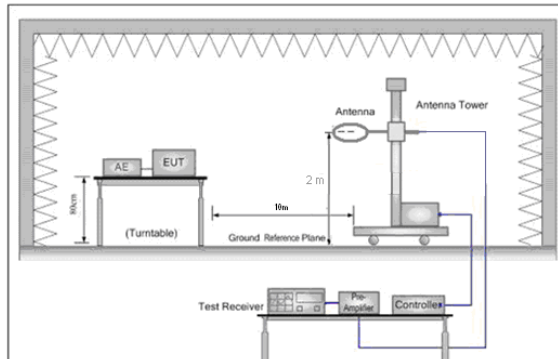


Figure 1. Below 30MHz

**Test Procedure:**

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber(30MHz-1000MHz) and 10 meter semi-anechoic chamber(9kHz-30MHz). The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 10 meters(30MHz-1000MHz) and 10 meter(9kHz-30MHz) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Above 30MHz:The Analyzer/Receiver scanned from 30MHz to 1000MHz.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.
- Below 30MHz: The Analyzer/Receiver scanned from 9kHz to 30MHz.The antenna height is 2 meters above the ground to determine the maximum value of the field strength.
- 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 2 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- Repeat above procedures until all frequencies measured was complete.
- Measurement Requirement:  
According to the clause 18.305(c)notes 2.  
At frequencies at or above 30MHz:  

$$\text{Limit3m(dBuV)} = \text{Limitxm(dBuV)} + 20\log(\text{xm}/3\text{m})$$
At frequencies below 30MHz:  

$$\text{Limit10m(dBuV)} = \text{Limitxm(dBuV)} + 40\log(\text{xm}/10\text{m})$$



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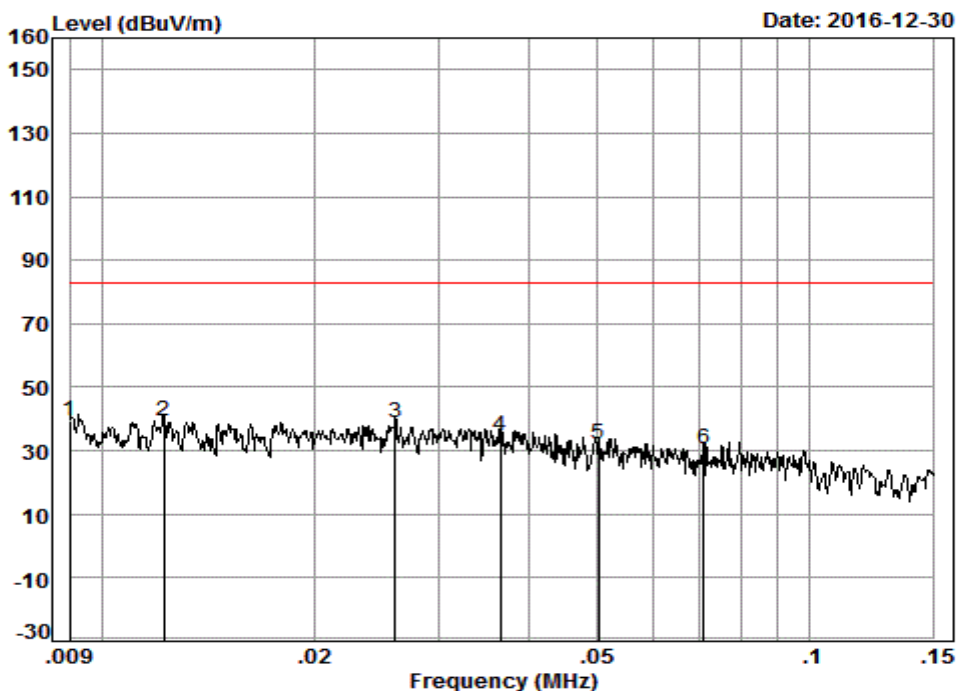
	Remark: x replace the number 10,30,300.
Test Mode:	Wireless charge mode(Mode 1,2,3). The worst case (Mode 3) is reported only.
Instruments Used:	Refer to section 5 for details
Test Results:	Pass



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0.009MHz-30MHz  
Test mode: 3



Condition: 10m  
Job No. : 10103CR  
Test Mode: 3  
: X

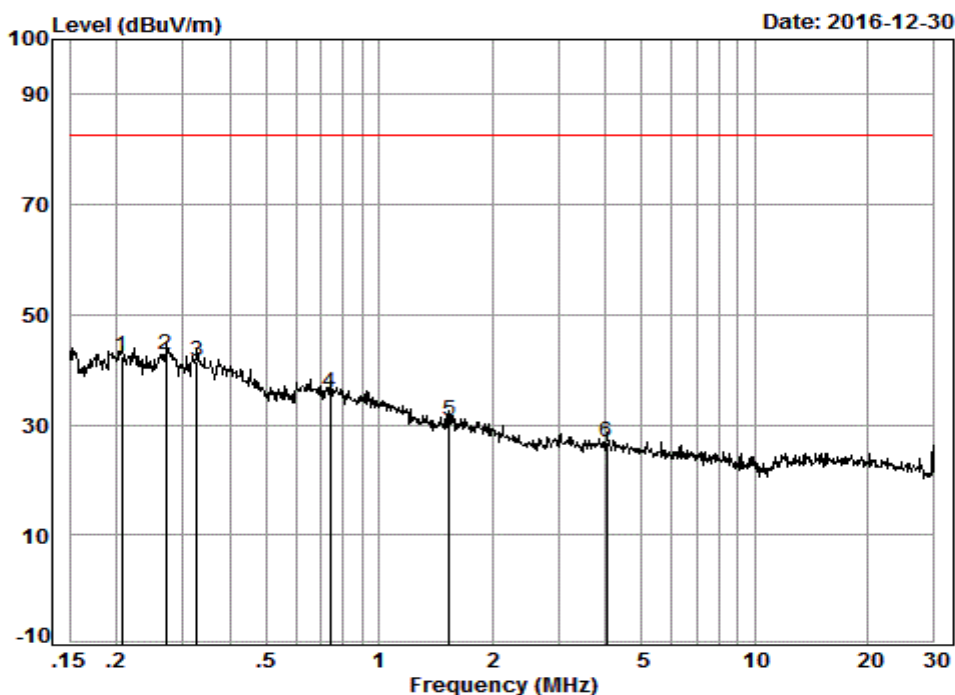
		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp	0.01	0.30	20.00	32.80	52.03	39.53	82.61 -43.08
2		0.01	0.27	18.05	32.80	53.97	39.49	82.61 -43.12
3		0.03	0.19	14.26	32.80	57.27	38.92	82.61 -43.69
4		0.04	0.15	13.29	32.80	54.26	34.90	82.61 -47.71
5		0.05	0.12	12.39	32.80	52.67	32.38	82.61 -50.23
6		0.07	0.09	12.14	32.80	50.97	30.40	82.61 -52.21





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Condition: 10m  
Job No. : 10103CR  
Test Mode: 3  
: X

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	0.21	0.08	11.89	32.82	63.18	42.33	82.61	-40.28
2	0.27	0.09	11.96	32.82	63.47	42.70	82.61	-39.91
3	0.33	0.09	11.88	32.83	62.49	41.63	82.61	-40.98
4	0.74	0.18	11.99	32.84	56.52	35.85	82.61	-46.76
5	1.54	0.30	12.06	32.86	51.13	30.63	82.61	-51.98
6	4.03	0.41	12.09	32.88	47.10	26.72	82.61	-55.89



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**Test Result:**

Frequency (MHz)	Level @ 10m (dBuV/m)	Level @ 300m (dBuV/m)	Limit @ 300m (dBuV/m)	Margin (dB)	Ant. Polarization
0.0090	39.53	-19.55	23.52	-43.07	X
0.0122	39.49	-19.59	23.52	-43.11	X
0.0260	38.92	-20.16	23.52	-43.68	X
0.0365	34.9	-24.18	23.52	-47.70	X
0.0504	32.38	-26.70	23.52	-50.22	X
0.0708	30.4	-28.68	23.52	-52.20	X
0.2061	42.33	-16.75	23.52	-40.27	X
0.2715	42.7	-16.38	23.52	-39.90	X
0.3269	41.63	-17.45	23.52	-40.97	X
0.7391	35.85	-23.23	23.52	-46.75	X
1.5350	30.63	-28.45	23.52	-51.97	X
4.0270	26.72	-32.36	23.52	-55.88	X

**Remark:**

- 1:The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement X, Y, and Z plane. The X plane results were found as the worst case and were shown in this report.
- 2:According to the clause 2.3 of MP-5:1986, the highest frequency is 205kHz, So the Range of frequency measurements is 9kHz to 30MHz.

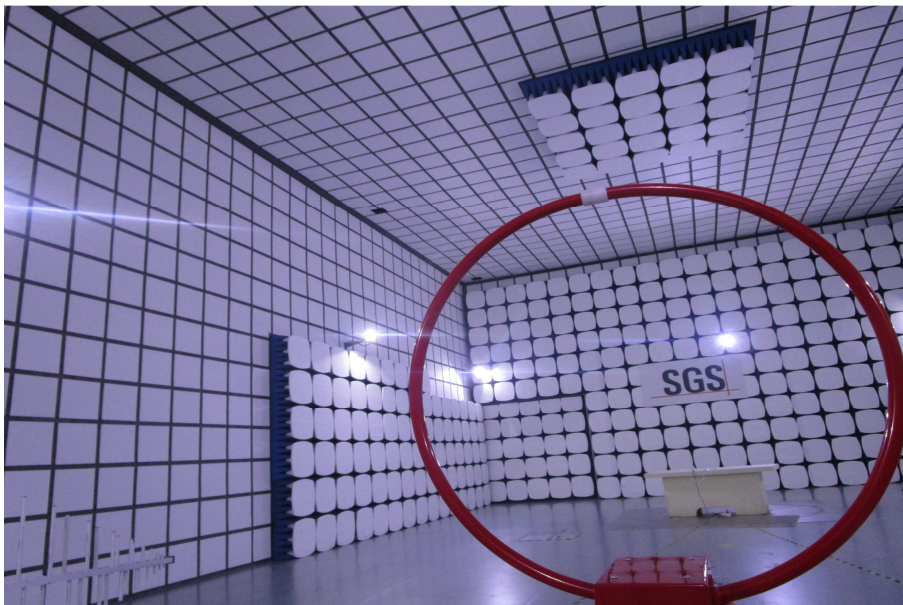
## 7 Photographs

Test Model No.: SA-H0001

### 7.1 Conducted Emission Test Setup



### 7.2 Radiated Emission Test Setup



### 7.3 EUT Constructional Details

