TEST REPORT

Application No.:	SZEM2001000200CR(SGS SZ No.:T52010210023EM)
Applicant:	GuangDong XinYu Technology Industrial Co., Ltd
Address of Applicant:	Laimei Industrial zone, Chenghai District, Shantou, Guangdong
Equipment Under Test (EUT):	
EUT Name:	1:14 big foot racer
Item / Style No.:	XQ-3930
Request Age Grading:	8+
Standard(s) :	EN 301 489-1 V2.1.1
	EN 301 489-3 V2.1.1
Date of Receipt:	2020-01-07
Date of Test:	2020-01-08 to 2020-03-05
Date of Issue:	2020-03-09
Test Result:	**Pass***

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

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.

Keny Xu
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2020-03-09		Original

Authorized for issue by:				
				
		Gebin Sun /Project Engineer		
				
		Eric Fu /Reviewer		

2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Radiated Emissions (30MHz-1GHz)	EN 301 489-1 V2.1.1 EN 301 489-3 V2.1.1	EN 55032:2015	Class B	Pass

Immunity Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Electrostatic Discharge	EN 301 489-1 V2.1.1 EN 301 489-3 V2.1.1	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-6GHz)		EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass

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4 General Information

4.1 Details of E.U.T.

Power Supply:	9V DC(9V x 1 "6F22" Size Batteries) for TX 7.5V DC(1.5V x 5 "AA" Size Batteries) for RX
The highest working frequency(except RF modulator):	Less than 108MHz
Frequency Range:	27.145MHz
Sample Type:	Portable production
Antenna Type:	Integral

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radiated emission	± 4.5dB (30MHz-1GHz)
2	Radiated Immunity	± 1.64dB
3	ESD	± 6 %
4	Temperature test	± 1℃
5	Humidity test	± 3%

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, 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**

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. 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: CN1178**

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

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **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

4.8 Monitoring of EUT for All Immunity Test

Visual: Monitored the light and connection status of the EUT

Audio: None

5 Equipment List

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	2017-08-05	2020-08-04
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2019-07-11	2020-07-10
MXE EMI receiver (3Hz-3.6GHz)	KEYSIGHT	N9038A	SEM004-15	2019-12-16	2020-12-15
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2019-04-01	2020-03-31

Electrostatic Discharge					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
ESD Ground Plane	SGS(3m*3m)	N/A	SEN006-01	N/A	N/A
ESD Generator	TESEQ AG	NSG 437	SEM019-02	2019-04-19	2020-04-18

Radiated Immunity (80MHz-6GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Fully-Anechoic Chamber 2	Chang Zhou Zhong Shuo	854	SEM001-05	2019-07-11	2020-07-10
Measurement Software	Rohde & Schwarz	EMC32 V9.25.00	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SMB100A	SEM006-11	2019-04-01	2020-03-31
Broadband Amplifier (80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	2019-09-24	2020-09-23
Broadband Amplifier (800MHz-3GHz)	Rohde & Schwarz	BBA150-D110	SEM005-13	2019-04-01	2020-03-31
Broadband Amplifier (2.5GHz-6GHz)	Rohde & Schwarz	BBA150-E60	SEM005-16	2019-04-12	2020-04-11
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	2019-04-01	2020-03-31
Power Sensor	Rohde & Schwarz	NRP-Z92	SEM009-17	2019-09-24	2020-09-23
Stacked Log.-Per.-Broadband Antenna (70MHz-10GHz)	Schwarzbeck	STLP 9129	SEM003-25	N/A	N/A
Amplifier (10kHz-250MHz)	Amplifier Research	75A250A	SEM005-11	2019-04-01	2020-03-31
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	SEM010-06	2019-09-24	2020-09-23

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Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2019-04-02	2020-04-01
Conditioning Amplifier	Brüel & Kjaer	2690-OS2	SEM005-10	2019-04-19	2020-04-18
Mouth Simulator	Brüel & Kjaer	4227	SEM017-01	2019-04-16	2020-04-15
Signal Source	Brüel & Kjaer	4231	SEM017-02	2019-04-19	2020-04-18
Coupling/Decoupling Network	SCHLODER	CDN-M2+3	SEM007-10	2019-09-24	2020-09-23
Audio Analyzer	Rohde & Schwarz	UPV	SEM008-03	2019-09-24	2020-09-23

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2019-09-26	2020-09-25
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2019-04-04	2020-04-03

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6 Emission Test Results

6.1 Radiated Emissions (30MHz-1GHz)

Test Requirement:	EN 301 489-1 V2.1.1
	EN 301 489-3 V2.1.1
Test Method:	EN 55032:2015
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Limit:	
30MHz-230MHz	40 dB(μV/m) quasi-peak
230MHz-1GHz	47 dB(μV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

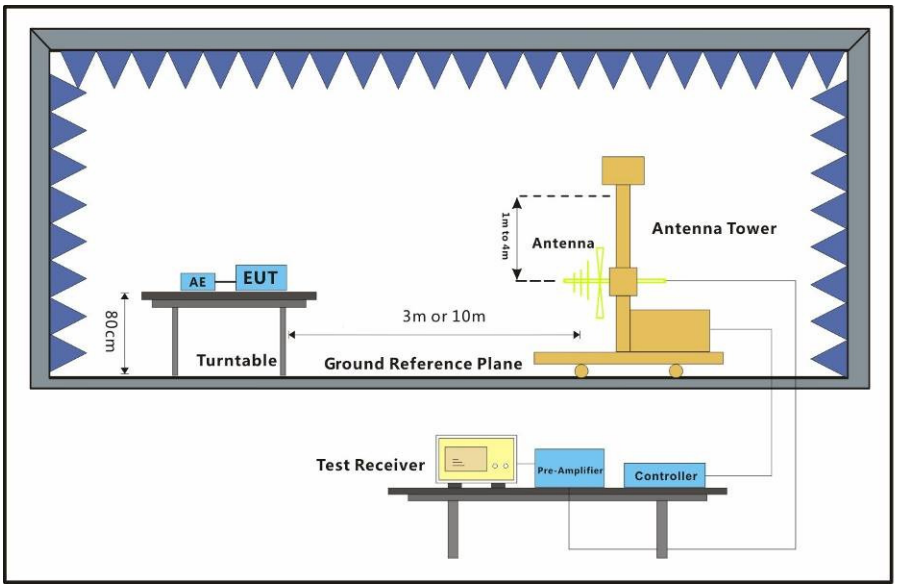
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case:	a:Wireless mode,Keep the EUT pairing and motor running. b:Idle mode,Keep the EUT standby.
The worst case for final test:	a:Wireless mode,Keep the EUT pairing and motor running.

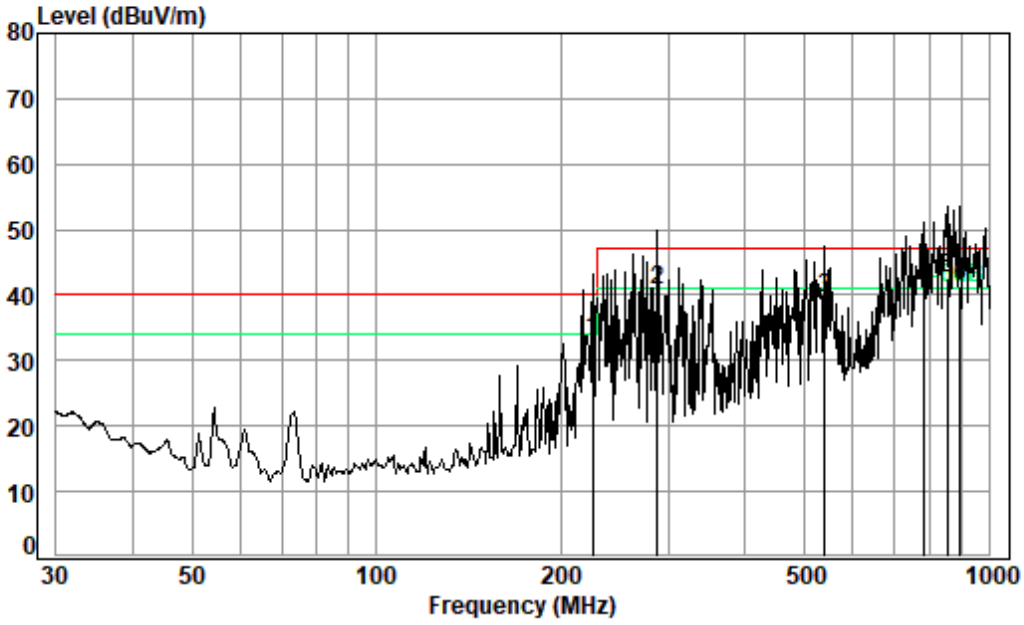
6.1.2 Test Setup Diagram



6.1.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Mode:a; Polarization:Horizontal



Condition: 3m HORIZONTAL
Job No. : 00200CR
Test Mode: a

	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	225.31	1.55	17.64	27.09	41.13	33.23	40.00	-6.77	QP
2	287.99	1.85	19.13	26.92	46.73	40.79	47.00	-6.21	QP
3	539.48	2.64	25.43	27.97	39.46	39.56	47.00	-7.44	QP
4	782.35	3.15	28.40	27.75	37.40	41.20	47.00	-5.80	QP
5 pp	854.02	3.42	29.22	27.48	37.45	42.61	47.00	-4.39	QP
6	897.00	3.59	29.76	27.30	35.44	41.49	47.00	-5.51	QP

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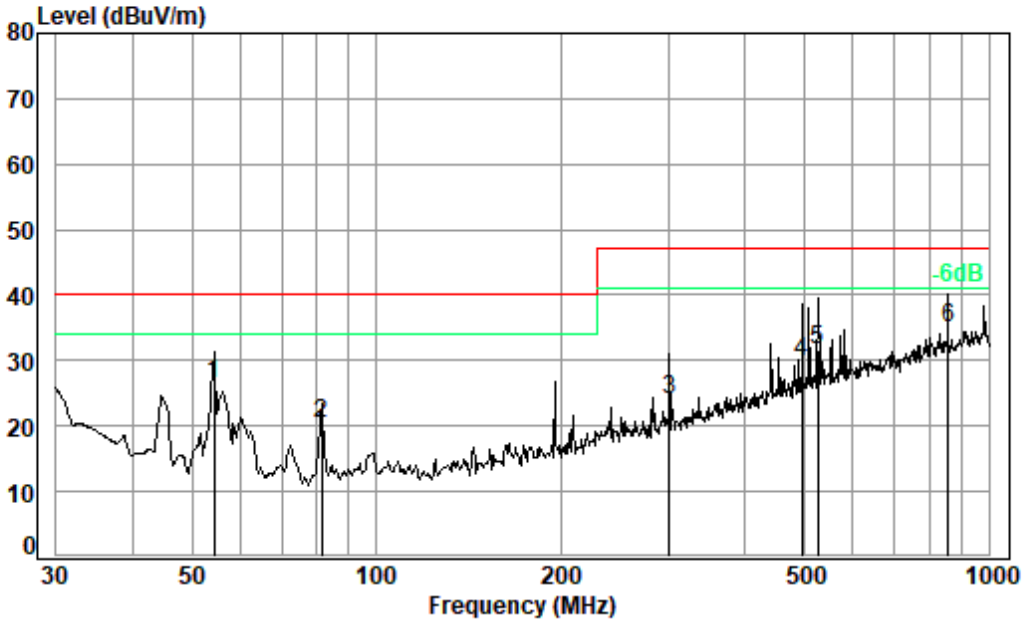
Mode:a; Polarization:Vertical



Condition: 3m VERTICAL
Job No. : 00200CR
Test Mode: a

	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	54.26	0.80	13.75	27.69	39.55	26.41	40.00	-13.59	QP
2	81.50	1.10	12.17	27.66	34.72	20.33	40.00	-19.67	QP
3	301.42	1.90	19.65	26.90	29.53	24.18	47.00	-22.82	QP
4	495.93	2.59	24.52	27.82	30.39	29.68	47.00	-17.32	QP
5	526.40	2.63	25.16	27.93	31.64	31.50	47.00	-15.50	QP
6 pp	857.02	3.44	29.26	27.47	29.87	35.10	47.00	-11.90	QP

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7 Immunity Test Results

7.1 Performance Criteria Description in ETSI EN 301 489-1 V2.1.1

Performance criteria for continuous phenomena applied to transmitters and receivers	During and after the test, the equipment shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the equipment is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. During the test, the EUT shall not unintentionally transmit or change its actual operating state and stored data. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
Performance criteria for transient phenomena applied to transmitters and receivers	For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies: • For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A SW reboot is not allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. • For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. A SW reboot is not allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. For all other ports the following applies: • After the test, the equipment shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the equipment is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. • During the EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed. • If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
Performance criteria for equipment which does not provide a continuous communication link	For radio equipment which does not provide a continuous communication link, the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation.

Performance criteria for ancillary equipment tested on a stand alone basis	If ancillary equipment is intended to be tested on a stand alone basis, the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation.

7.2 Performance Criteria Description in ETSI EN 301 489-3 V2.1.1

Criteria	During Test	After Test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions
Performance criterion A applies for immunity tests with phenomena of a continuous nature; Performance criterion B applies for immunity tests with phenomena of a transient nature.		
Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in EN 301 489-3 clause 5. Where the EUT has more than one mode of operation, an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in sufficient modes to confirm there are no such unintentional responses.		

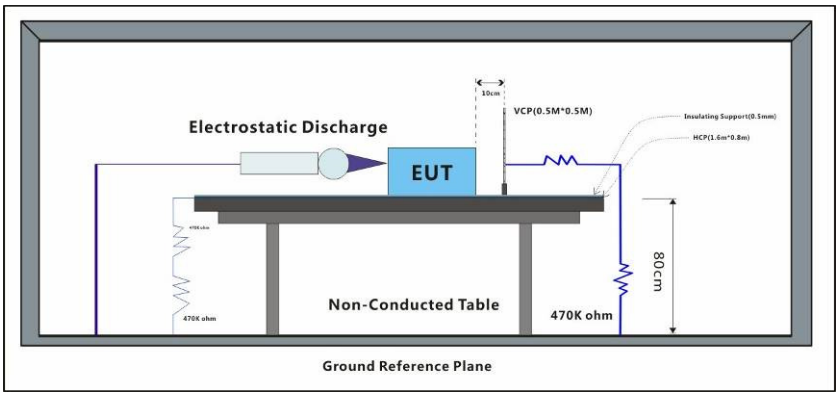
Special conditions for EMC immunity tests

Reference to clauses in ETSI EN 301 489-1	**Special product-related conditions, additional to or modifying the test conditions in ETSI EN 301 489-1, clause 9**
Test method; Radio frequency electromagnetic field	The test shall be performed over the range 80 MHz to 2 700 MHz with the exception of the exclusion bands defined in clause 4.6. Where the EUT is subject to EMC Immunity testing under a Harmonised Standard of a Directive other than the Directive 2014/53/EU [i.3] then the modulating signal frequency specified in that Harmonised Standard may be used. If this alternative modulating frequency is used, then the applicable Directive, Harmonised Standard & modulating frequency shall be noted in the test report.
Test method; Radio frequency, common mode	Where the EUT is subject to EMC Immunity testing under a Harmonised Standard of a Directive other than the Directive 2014/53/EU [i.3] then the modulating signal frequency specified in that Harmonised Standard may be used. If this alternative modulating frequency is used, then the applicable Directive, Harmonised Standard & modulating frequency shall be noted in the test report.

7.3 Electrostatic Discharge

Test Requirement: EN 301 489-1 V2.1.1
EN 301 489-3 V2.1.1
Test Method: EN 61000-4-2:2009
Performance Criterion: B
Discharge Impedance: 330Ω/150pF
Number of Discharge: Minimum 10 times at each test point
Discharge Mode: Single Discharge
Discharge Period: 1 second minimum

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:
Temperature: 22.7 °C Humidity: 43.6 % RH Atmospheric Pressure: 1020 mbar
Test mode: a:Wireless mode,Keep the EUT pairing and motor running.
b:Idle mode,Keep the EUT standby.

7.3.3 Test Results:

Observations: Test Point:
1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

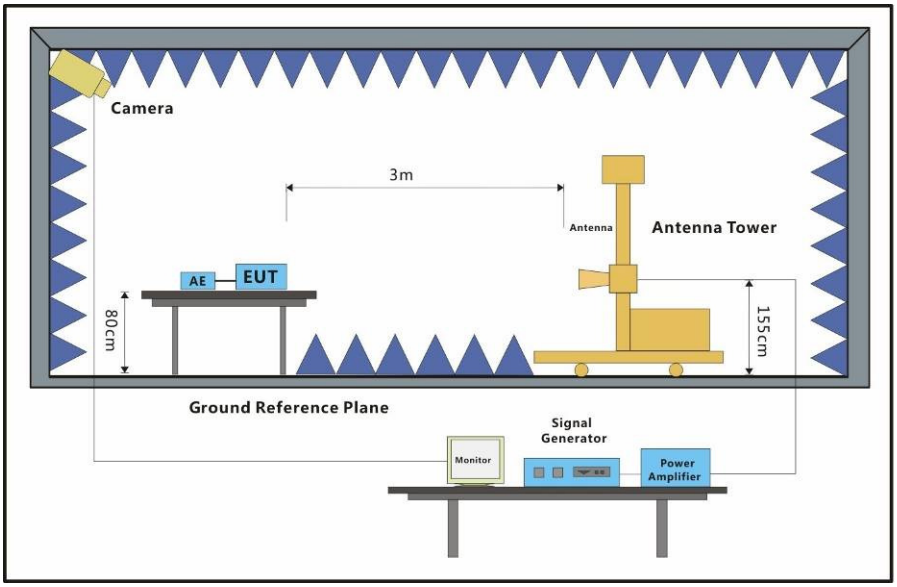
Results:

A: No degradation in the performance of the EUT was observed.

7.4 Radiated Immunity (80MHz-6GHz)

Test Requirement: EN 301 489-1 V2.1.1
EN 301 489-3 V2.1.1
Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010
Performance Criterion: A
Frequency Range: 80MHz to 6GHz
Antenna Polarisation: Vertical and Horizontal
Modulation: 1kHz,80% Amp. Mod,1% increment

7.4.1 Test Setup Diagram



7.4.2 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar
Test mode: a:Wireless mode,Keep the EUT pairing and motor running.
b:Idle mode,Keep the EUT standby.

7.4.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-6GHz	3	Front	2s	A
80MHz-6GHz	3	Back	2s	A
80MHz-6GHz	3	Left	2s	A
80MHz-6GHz	3	Right	2s	A
80MHz-6GHz	3	Top	2s	A
80MHz-6GHz	3	Underside	2s	A

Results:

A: No degradation in the performance of the EUT was observed.

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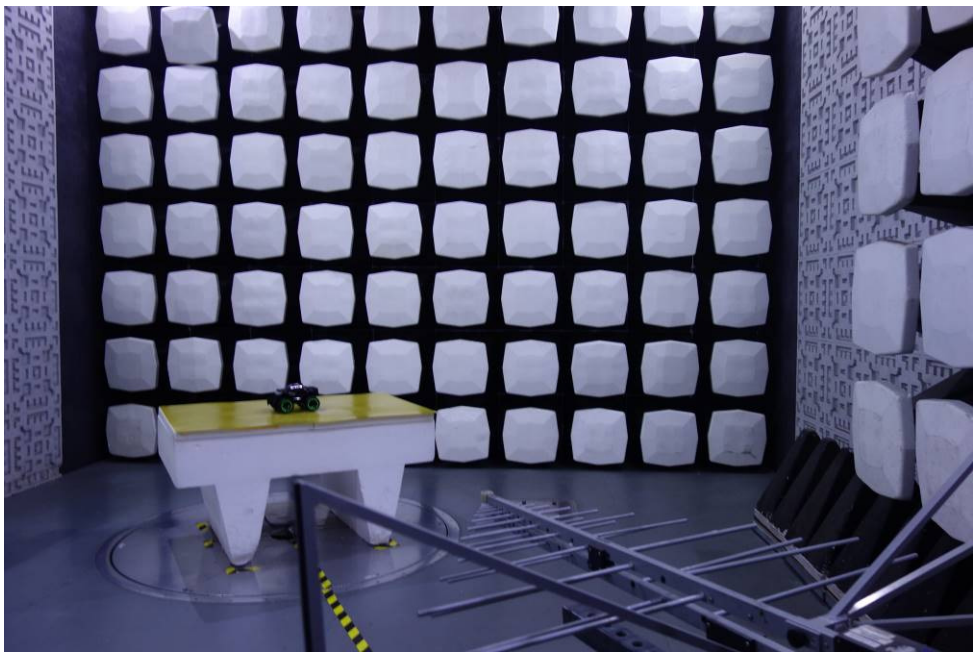
8 Photographs

8.1 Radiated Emissions (30MHz-1GHz) Test Setup



8.2 Electrostatic Discharge Test Setup

8.3 Radiated Immunity (80MHz-6GHz) Test Setup

8.4 EUT Constructional Details (EUT Photos)

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM2001000200CR.

- End of the Report -