

TEST REPORT

Application No.: SZEM2010010393CR(SGS SZ No.:T52010300040EM)
Applicant: NEW BRIGHT INDUSTRIAL CO., LTD
Address of Applicant: 9/F., NEW BRIGHT BUILDING, SHEUNG YUET ROAD, KOWLOON BAY, KOWLOON, HONG KONG

Equipment Under Test (EUT):
EUT Name: TOY Transmitter & Receiver
Model No.: TX-G31HB40, RX-704A(SMD)-40
 Additional model number: 741 ♣

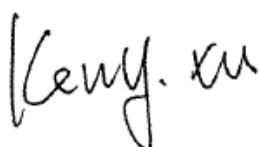
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Country of Origin: China
Standard(s) : EN 301 489-1 V2.2.3
 EN 301 489-3 V2.1.1
Date of Receipt: 2020-10-19
Date of Test: 2020-10-19 to 2020-10-23
Date of Issue: 2020-10-27

Test Result:	Pass*
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* 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		2020-10-27		Original

Authorized for issue by:			
		Gebin Sun	

		Gebin Sun /Project Engineer	
		Eric Fu	

		Eric Fu /Reviewer	



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2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Radiated Emissions (30MHz-1GHz)	EN 301 489-1 V2.2.3 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 V2.2.3	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-6GHz)	EN 301 489-3 V2.1.1	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass

Declaration of EUT Family Grouping:

Model No: TX-G31HB40, RX-704A(SMD)-40

Additional model number: 741

Only the model TX-G31HB40, RX-704A(SMD)-40 was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference on model number and appearance.

TX-G31HB40 is model No. for Transmitter, RX-704A(SMD)-40 is model No. for Receiver.



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3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	5
4.1 DETAILS OF E.U.T.	5
4.2 DESCRIPTION OF SUPPORT UNITS	5
4.3 MEASUREMENT UNCERTAINTY	5
4.4 TEST LOCATION	6
4.5 TEST FACILITY	6
4.6 DEVIATION FROM STANDARDS	6
4.7 ABNORMALITIES FROM STANDARD CONDITIONS	6
4.8 MONITORING OF EUT FOR ALL IMMUNITY TEST	6
5 EQUIPMENT LIST	7
6 EMISSION TEST RESULTS	9
6.1 RADIATED EMISSIONS (30MHZ-1GHZ)	9
6.1.1 <i>E.U.T. Operation</i>	9
6.1.2 <i>Test Setup Diagram</i>	9
6.1.3 <i>Measurement Data</i>	9
7 IMMUNITY TEST RESULTS	12
7.1 ELECTROSTATIC DISCHARGE	14
7.1.1 <i>Test Setup Diagram</i>	14
7.1.2 <i>E.U.T. Operation</i>	14
7.1.3 <i>Test Results:</i>	14
7.2 RADIATED IMMUNITY (80MHZ-6GHZ)	15
7.2.1 <i>Test Setup Diagram</i>	15
7.2.2 <i>E.U.T. Operation</i>	15
7.2.3 <i>Test Results:</i>	15
8 PHOTOGRAPHS	16
8.1 RADIATED EMISSIONS (30MHZ-1GHZ) TEST SETUP	16
8.2 ELECTROSTATIC DISCHARGE TEST SETUP	16
8.3 RADIATED IMMUNITY (80MHZ-6GHZ) TEST SETUP	17
8.4 EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)	17



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4 General Information

4.1 Details of E.U.T.

Power Supply:	3V DC(1.5V x 2 "AA" Size Batteries) for TX 4.5V DC(1.5V x 3 "AA" Size Batteries) for RX
Operation Frequency:	40.680MHz
Sample Type:	Portable production
Antenna Type:	Integral
The highest working frequency(except RF modulator):	Less than 108MHz

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)
		± 4.8dB (1GHz-6GHz)
2	Radiated Immunity	± 1.64dB
3	ESD	± 6 %
4	Temperature test	± 1°C
5	Humidity test	± 3%



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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 movement and connection status of the EUT

Audio: None



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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	2020-07-19	2023-07-18
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-15	2019-12-16	2020-12-15
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-02	2019-05-24	2022-05-23
Pre-amplifier	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31

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	2020-04-17	2021-04-16

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	2020-07-10	2021-07-09
Measurement Software	Rohde & Schwarz	EMC32 V9.25.00	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SMB100A	SEM006-11	2020-03-23	2021-03-22
Broadband Amplifier	Rohde & Schwarz	BBA150-BC250	SEM005-12	2020-09-23	2021-09-22
Broadband Amplifier	Rohde & Schwarz	BBA150-D110	SEM005-13	2020-04-01	2021-03-31
Broadband Amplifier	Rohde & Schwarz	BBA150-E60	SEM005-16	2020-05-21	2021-05-20
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	2020-03-23	2021-03-22
Power Sensor	Rohde & Schwarz	NRP-Z92	SEM009-17	2020-09-23	2021-09-22
Stacked Log.-Per.-Broadband Antenna	Schwarzbeck	STLP 9129	SEM003-25	N/A	N/A
Amplifier	Amplifier Research	75A250A	SEM005-11	2020-04-01	2021-03-31
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	SEM010-06	2020-09-23	2021-09-22
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2020-04-01	2021-03-31
Conditioning Amplifier	Brüel & Kjaer	2690-OS2	SEM005-10	2020-04-14	2021-04-13
Mouth Simulator	Brüel & Kjaer	4227	SEM017-01	2020-04-14	2021-04-13
Signal Source	Brüel & Kjaer	4231	SEM017-02	2020-03-25	2021-03-24



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Coupling/Decoupling Network	SCHLODER	CDN-M2+3	SEM007-10	2020-09-23	2021-09-22
Audio Analyzer	Rohde & Schwarz	UPV	SEM008-03	2020-09-23	2021-09-22

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2020-09-15	2021-09-14
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2020-09-15	2021-09-14
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06



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6 Emission Test Results

6.1 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN 301 489-1 V2.2.3
 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: 25.8 °C Humidity: 56.5 % RH Atmospheric Pressure: 1015 mbar

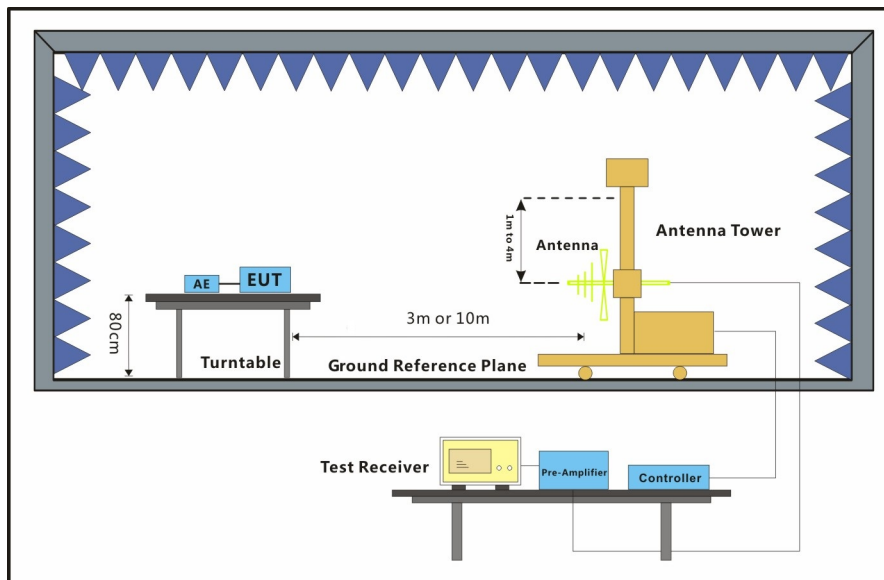
Pretest these modes to find the worst case:

- 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

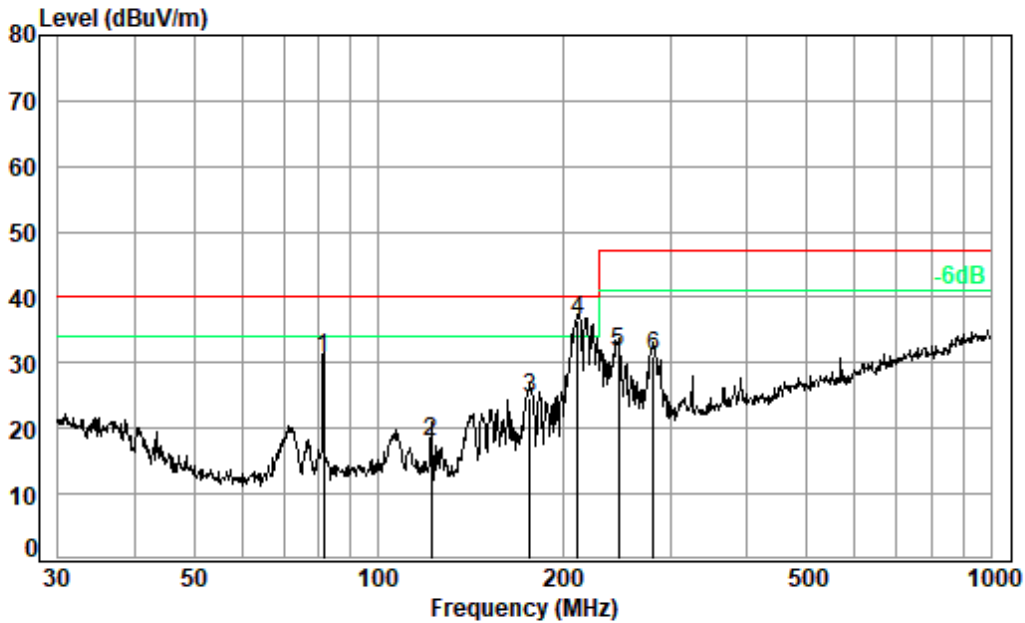


6.1.3 Measurement Data

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



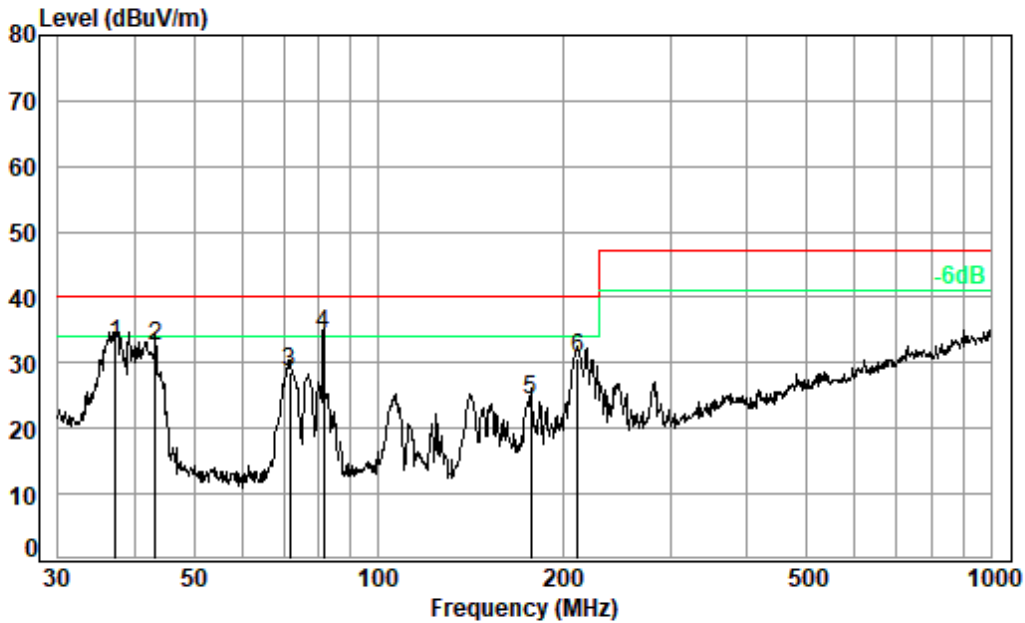
Condition: 3m HORIZONTAL
 Job No. : 10393CR
 Test Mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	81.50	1.22	12.05	27.63	45.05	30.69	40.00	-9.31 QP
2	121.98	1.13	12.90	27.48	31.38	17.93	40.00	-22.07 QP
3	176.89	1.18	15.46	27.23	35.25	24.66	40.00	-15.34 QP
4 pp	211.53	1.31	15.53	27.11	46.81	36.54	40.00	-3.46 QP
5	246.81	1.61	18.07	27.00	39.00	31.68	47.00	-15.32 QP
6	281.01	1.87	18.39	26.91	37.77	31.12	47.00	-15.88 QP



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Mode:a; Polarization:Vertical



Condition: 3m VERTICAL
Job No. : 10393CR
Test Mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	
1	37.29	0.68	19.38	27.71	40.36	32.71	40.00	-7.29 QP
2	43.20	0.70	16.67	27.70	42.75	32.42	40.00	-7.58 QP
3	71.83	0.88	12.52	27.64	42.69	28.45	40.00	-11.55 QP
4 pp	81.50	1.22	12.05	27.63	48.66	34.30	40.00	-5.70 QP
5	177.51	1.18	15.45	27.22	34.80	24.21	40.00	-15.79 QP
6	211.53	1.31	15.53	27.11	40.85	30.58	40.00	-9.42 QP



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7 Immunity Test Results

Performance Criteria Description in EN 301 489-1 V2.2.3

Performance criteria for continuous phenomena	<p>During the test, the equipment shall:</p> <ul style="list-style-type: none"> • continue to operate as intended; • not unintentionally transmit; • not unintentionally change its operating state; • not unintentionally change critical stored data.
Performance criteria for transient phenomena	<p>For all ports and transient phenomena with the exception described below, the following applies:</p> <ul style="list-style-type: none"> • The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data. • After application of the transient phenomena, the equipment shall operate as intended. <p>For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:</p> <ul style="list-style-type: none"> • 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 otherwise restored. 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. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.



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Performance Criteria Description in 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.

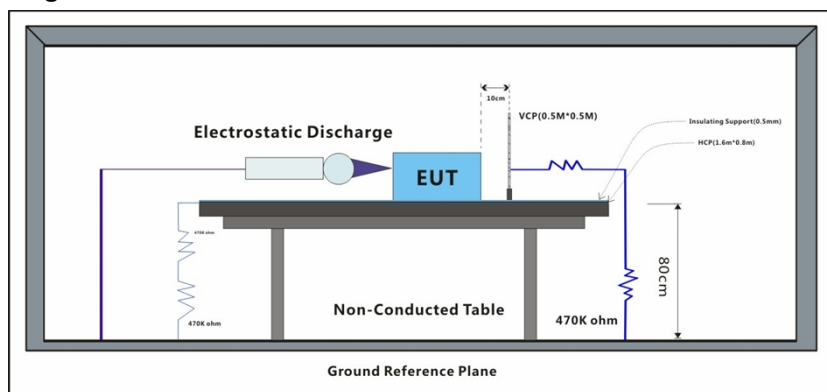


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7.1 Electrostatic Discharge

Test Requirement: EN 301 489-1 V2.2.3
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

7.1.1 Test Setup Diagram



7.1.2 E.U.T. Operation

Operating Environment:
Temperature: 22.5 °C Humidity: 41.8 % RH Atmospheric Pressure: 1015 mbar
Test mode:
a: Wireless mode, Keep the EUT pairing and motor running.
b: Idle mode, Keep the EUT standby.

7.1.3 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.

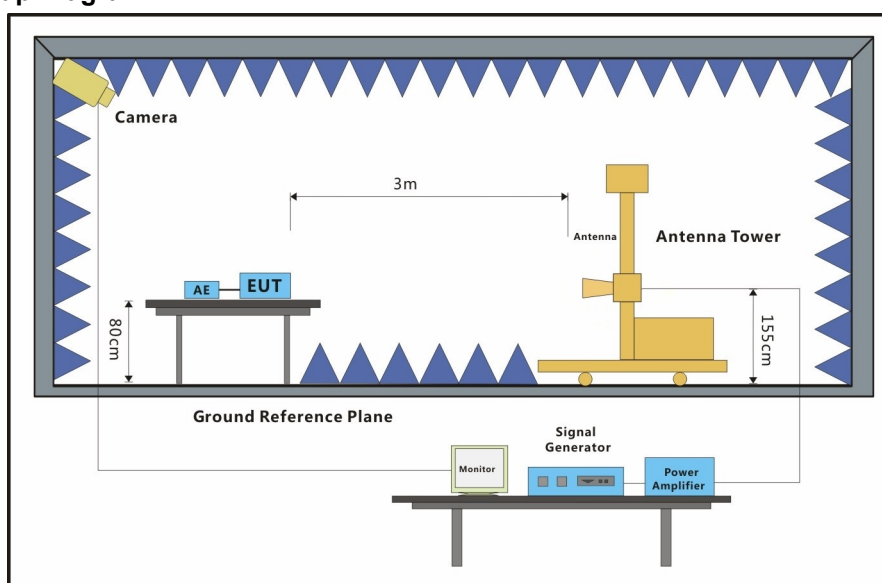


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7.2 Radiated Immunity (80MHz-6GHz)

Test Requirement: EN 301 489-1 V2.2.3
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

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:
Temperature: 25.3 °C Humidity: 51.9 % RH Atmospheric Pressure: 1015 mbar
Test mode: a:Wireless mode,Keep the EUT pairing and motor running.
b:Idle mode,Keep the EUT standby.

7.2.3 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.



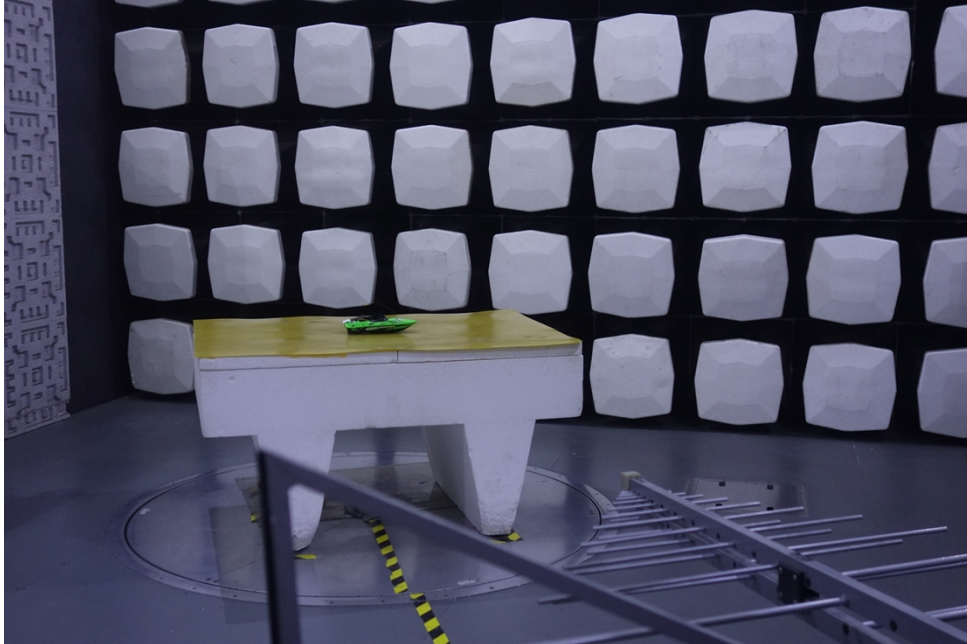
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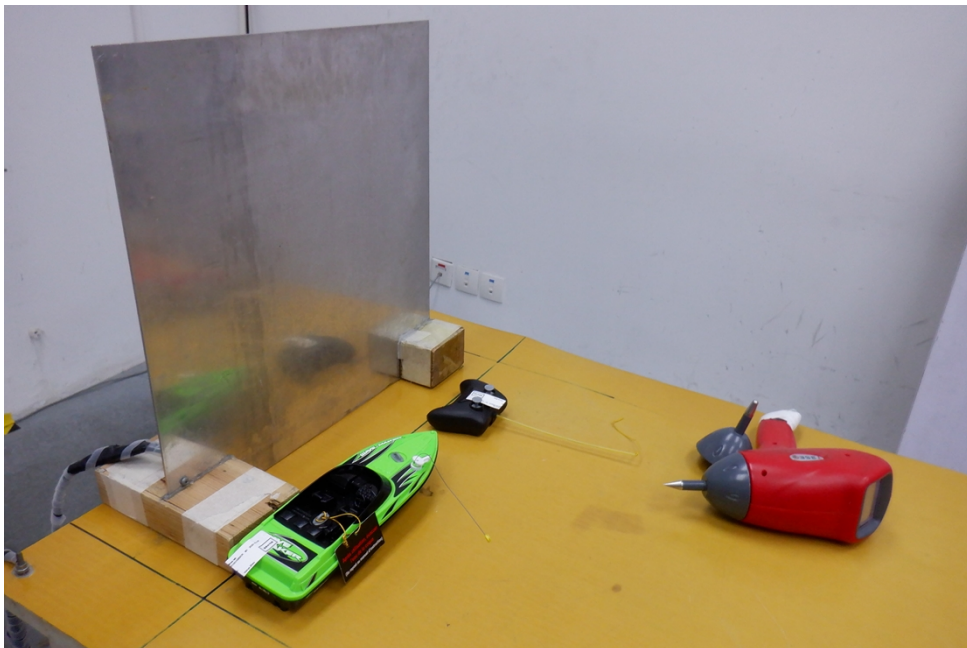
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8 Photographs

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 - Photographs of Constructional Details for SZEM2010010393CR

- End of the Report -



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