

TEST REPORT

Application No.: SZEM2005003685CR
Applicant: Zhengzhou F-wheel Industrial Co., Ltd
Address of Applicant: Zhengzhou City Liyun Road 27 District No.123 Huanghe Science and Technology College Science and Technology Park (South) B
Manufacturer: Shenzhen Counterbalance Technology Co., Ltd
Address of Manufacturer: Room1503, Jia'anda Building, No.110, Huafan Road, Tongsheng Community, Dalang Street, Longhua District, Shenzhen, Guangdong Province, China
Factory: 1.Komda Industrial(Dongguan)., LTD
 2.HUIZHOU XIDESHENG BICYCLE CO., LTD
Address of Factory: 1.Room101, No. 105 Pingshan Industrial Ave., Tangxia Dongguan, Guangdong, P.R.China
 2.NO.3 QIUCHANG NORTH ROAD, LINGHU VILLA HUIZHOU, GUANGDONG 516000 CHINA

Equipment Under Test (EUT):
EUT Name: Smart E Scooter, Smart E Bike
Model No.: BOLT, JBolt, JBolt-BLK, D1F, D1, B1, B2 ♣
 ♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Trade Mark: Jetson, DYU
Standard(s) : EN 301 489-1 V2.2.3
 Draft EN 301 489-17 V3.2.2

Date of Receipt: 2017-09-16(for original report SZEM170900964504)
Date of Test: 2017-09-19 to 2017-10-13(for original report SZEM170900964504)
Date of Issue: 2017-10-25(for original report SZEM170900964504)
 2019-07-19(for report SZEM190701586306)
 2020-05-13(for new report SZEM200500368502)

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

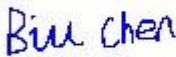



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-05-13		Original

Authorized for issue by:			
			
		<hr/> Bill Chen /Project Engineer	
			
		<hr/> 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 Draft EN 301 489-17 V3.2.2	EN 55032:2015	Class B	Pass

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 301 489-1 V2.2.3 Draft EN 301 489-17 V3.2.2	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

Remark for the report SZEM190701586306:

Original model No. in report SZEM170900964504: D1

The model D1 was only tested in report SZEM170900964504

New model No. in report SZEM190701586306: BOLT, JBolt, JBolt-BLK, D1F, D1

This report was an additional report copied from the report SZEM170900964504, just added the trade mark and the factory, changed the address of applicant and manufacturer, changed the product name and model No.. Since the electrical circuit design, layout, components used and internal wiring for the models in this report were exactly the same as the model in the original report SZEM170900964504, with only difference on frame material.

Therefore original data were kept in this report.



Remark for the report SZEM200500368502:

New model No. in report SZEM200500368502: BOLT, JBolt, JBolt-BLK, D1F, D1, B1, B2

This report was an additional report copied from the report SZEM190701586306, just changed the information of applicant, factory and model No.. Since the electrical circuit design, layout, components used and internal wiring for the models in this report were exactly the same as the models in the original report SZEM190701586306, with only difference on trade mark and model No..

Additionally, just updated the below standards.

Original report standard	The newest report standard
EN 301 489-1 V2.1.1	EN 301 489-1 V2.2.3
EN 301 489-17 V3.1.1	Draft EN 301 489-17 V3.2.2

Reviewed the updated standards, all the technical requirements for the EUT are identical between the original and the newest standards' version.

Therefore original data were kept in this report SZEM200500368502.



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4 General Information

4.1 Details of E.U.T.

Power supply:	Li-ion power battery pack: Model: HA103 Voltage: 36V Capacity: 10.4Ah Power: 374.4Wh Limited charging voltage: 42V
The highest working frequency (except RF modulator):	32MHz

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
iPhone 4	Apple	A1349	C37HL4GXDP0N

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°C
5	Humidity test	± 3%



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4.4 Test Location

All tests were performed at:

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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 movement and Receiver and transmitter 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	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	2017-07-13	2018-07-12
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2017-09-27	2018-09-26
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	2017-04-14	2018-04-13

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	2017-06-08	2018-06-07

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	2015-05-13	2018-05-12
Measurement Software	Rohde & Schwarz	EMC32 V9.25.00	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SMB100A	SEM006-11	2017-04-14	2018-04-13
Broadband Amplifier (80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	2017-09-27	2018-09-26
Broadband Amplifier (800MHz-3GHz)	Rohde & Schwarz	BBA150	EMC2092	2017-01-20	2018-01-19
Broadband Amplifier (2.5GHz-6GHz)	Rohde & Schwarz	BBA150-E60	SEM005-16	2017-07-17	2018-07-16
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	2017-04-14	2018-04-13
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-08	2017-04-14	2018-04-13
Stacked Log.-Per.-Broadband Antenna (70MHz-10GHz)	Schwarzbeck	STLP 9129	SEM003-25	N/A	N/A
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	SEM010-01	2017-09-27	2018-09-26



Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2017-04-14	2018-04-13
Conditioning Amplifier	Brüel & Kjaer	2690-OS2	SEM005-10	2017-06-19	2018-06-18
Mouth Simulator	Brüel & Kjaer	4227	SEM017-01	2017-04-21	2018-04-20
Signal Source	Brüel & Kjaer	4231	SEM017-02	2017-06-19	2018-06-18
Audio Analyzer	Rohde & Schwarz	UPV	SEM008-03	2017-09-27	2018-09-26

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	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-17



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6 Emission Test Results

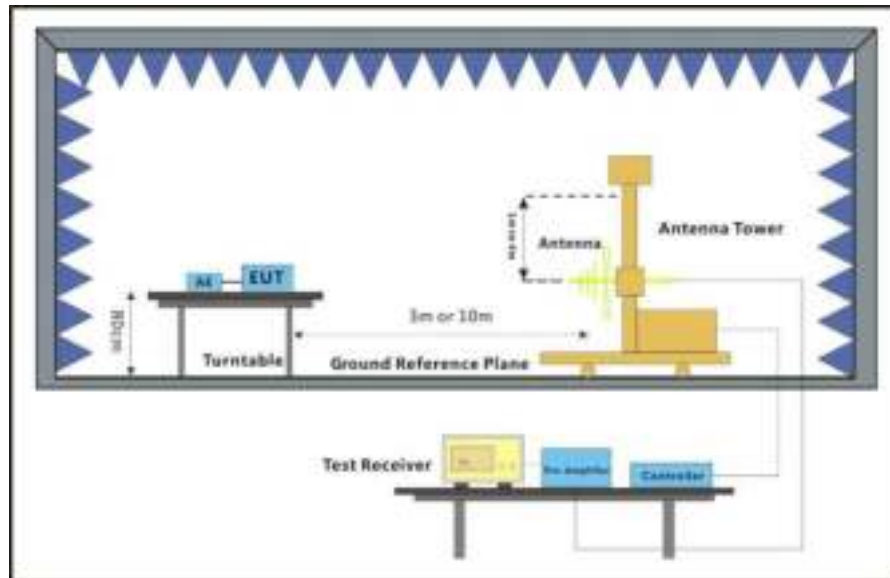
6.1 Radiated Emissions (30MHz-1GHz)

Test Requirement:	EN 301 489-1 V2.2.3 Draft EN 301 489-17 V3.2.2
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: 55 % RH Atmospheric Pressure: 1010 mbar
Pretest these mode to find the worst case:	c:Idle_Keep the EUT standby. d:Operation(BT)_Pair the device with Smartphone via Bluetooth and keep the music playing.
The worst case for final test:	d:Operation(BT)_Pair the device with Smartphone via Bluetooth and keep the music playing.

6.1.2 Test Setup Diagram



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6.1.3 Measurement Data

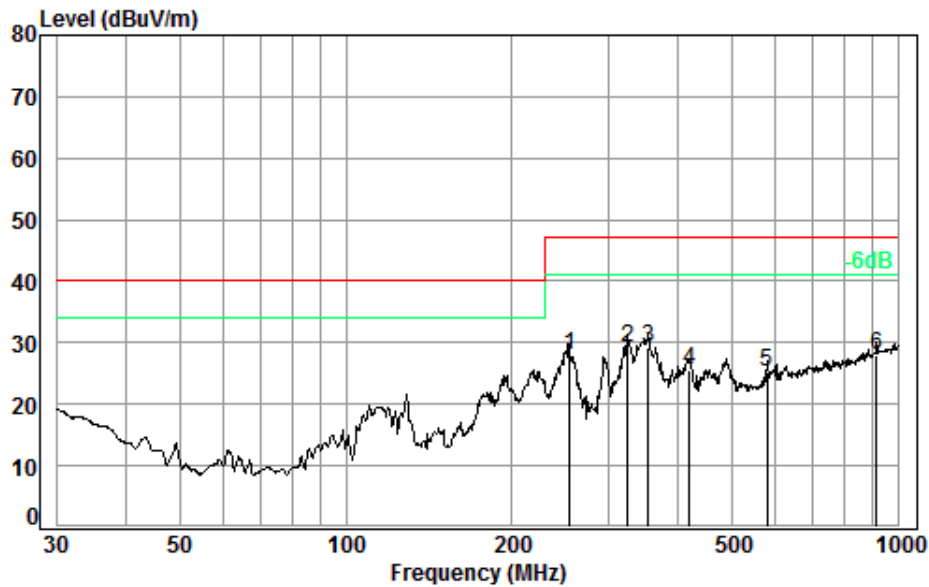
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



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Mode:d; Polarization:Horizontal



Condition: 3m HORIZONTAL
 Job No. : 09645MD
 Test Mode: b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	253.84	1.69	12.38	26.53	40.31	27.85	-19.15
2 pp	323.32	1.98	14.74	26.58	39.21	29.35	-17.65
3	352.94	2.07	14.15	26.81	39.93	29.34	-17.66
4	419.11	2.28	16.38	27.25	34.06	25.47	-21.53
5	578.67	2.68	19.20	27.57	30.83	25.14	-21.86
6	912.86	3.61	23.25	26.71	27.98	28.13	-18.87

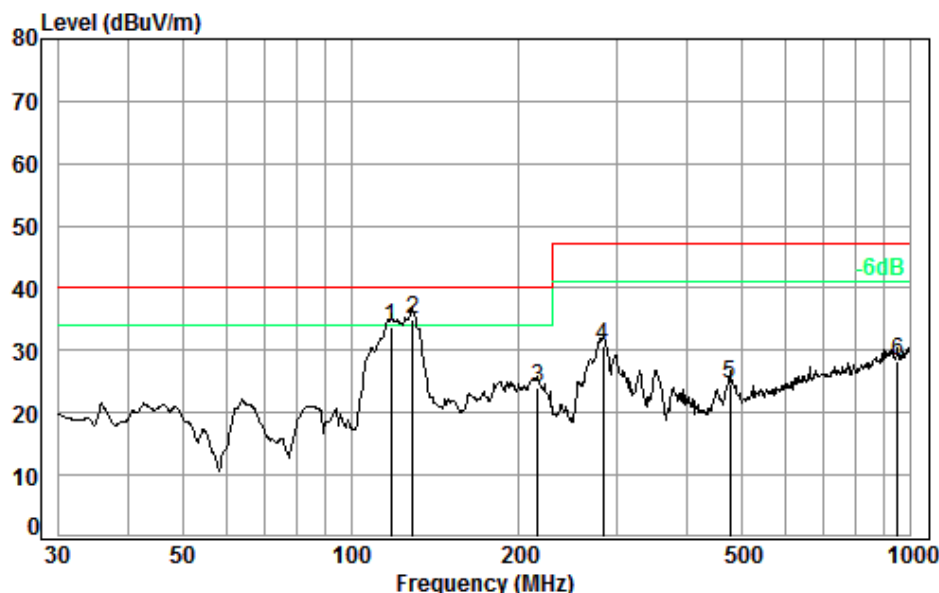


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Mode:d; Polarization:Vertical



Condition: 3m VERTICAL
 Job No. : 09645MD
 Test Mode: d

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	118.19	1.25	8.03	27.08	51.55	33.75	40.00	-6.25
2 pp	129.01	1.27	7.72	27.02	52.90	34.87	40.00	-5.13
3	216.02	1.49	11.03	26.64	38.11	23.99	40.00	-16.01
4	282.99	1.83	13.15	26.45	42.17	30.70	47.00	-16.30
5	475.50	2.51	17.80	27.58	31.95	24.68	47.00	-22.32
6	948.76	3.65	23.30	26.54	28.00	28.41	47.00	-18.59



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7 Immunity Test Results

7.1 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.



7.2 Performance Criteria Description in Draft EN 301 489-17 V3.2.2

Class 1 SRD Equipment		
Criteria	During Test	After Test
A	Shall operate as intended. (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 3). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3).
Note 1:	Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.	
Note 2:	Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.	
Note 3:	No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.	
Performance criteria A for immunity tests with phenomena of a continuous nature; Performance criteria B for immunity tests with phenomena of a transient nature; Performance criteria C for immunity tests with power interruptions exceeding a certain time.		



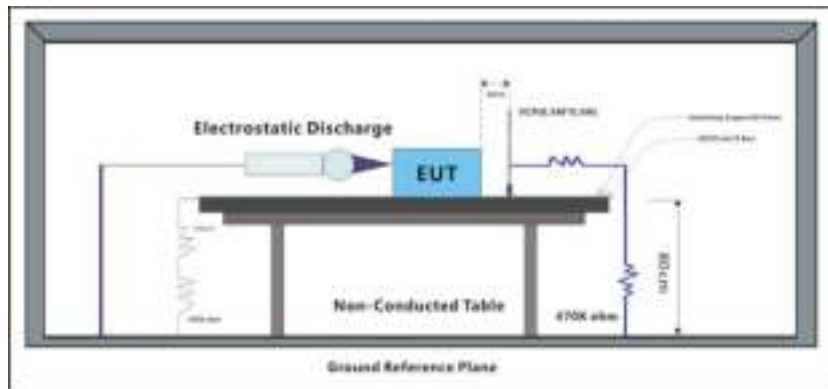
<p>Performance criteria for Continuous phenomena applied to Transmitters (CT)</p> <p>The performance criteria A shall apply.</p> <p>Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
<p>Performance criteria for Transient phenomena applied to Transmitters (TT)</p> <p>The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5000 ms duration, for which performance criteria C shall apply.</p> <p>Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
<p>Performance criteria for Continuous phenomena applied to Receivers (CR)</p> <p>The performance criteria A shall apply.</p> <p>Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
<p>Performance criteria for Transient phenomena applied to Receivers (TR)</p> <p>The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5000 ms duration for which performance criteria C shall apply.</p> <p>Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>



7.3 Electrostatic Discharge

Test Requirement: EN 301 489-1 V2.2.3
 Draft EN 301 489-17 V3.2.2
 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: 23 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar
 Test mode: c:Idle_Keep the EUT standby.
 d:Operation(BT)_Pair the device with Smartphone via Bluetooth and keep the music playing.

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
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

Results:

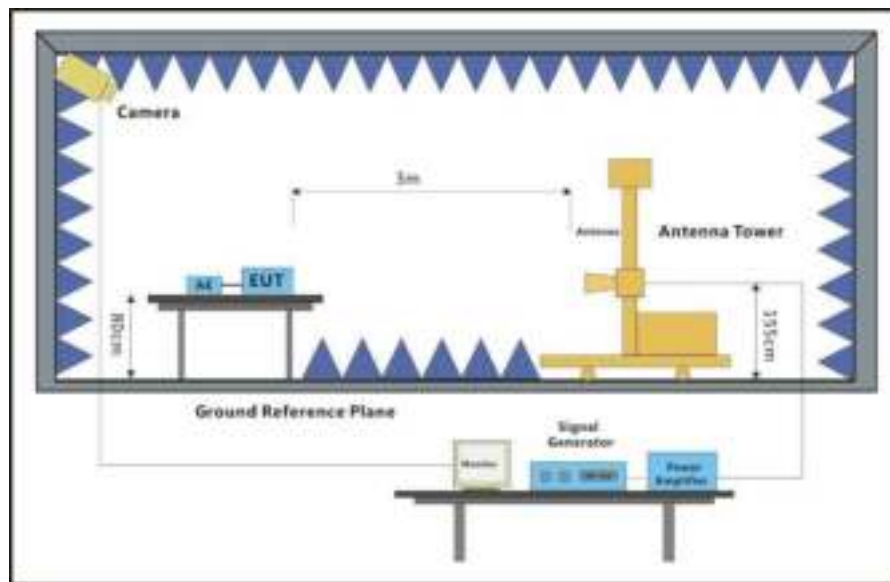
A: No degradation in the performance of the EUT was observed.



7.4 Radiated Immunity (80MHz-6GHz)

Test Requirement: EN 301 489-1 V2.2.3
 Draft EN 301 489-17 V3.2.2
 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: 24 °C Humidity: 54 % RH Atmospheric Pressure: 1010 mbar
 Test mode: c:Idle_Keep the EUT standby.
 d:Operation(BT)_Pair the device with Smartphone via Bluetooth and keep the music playing.

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:

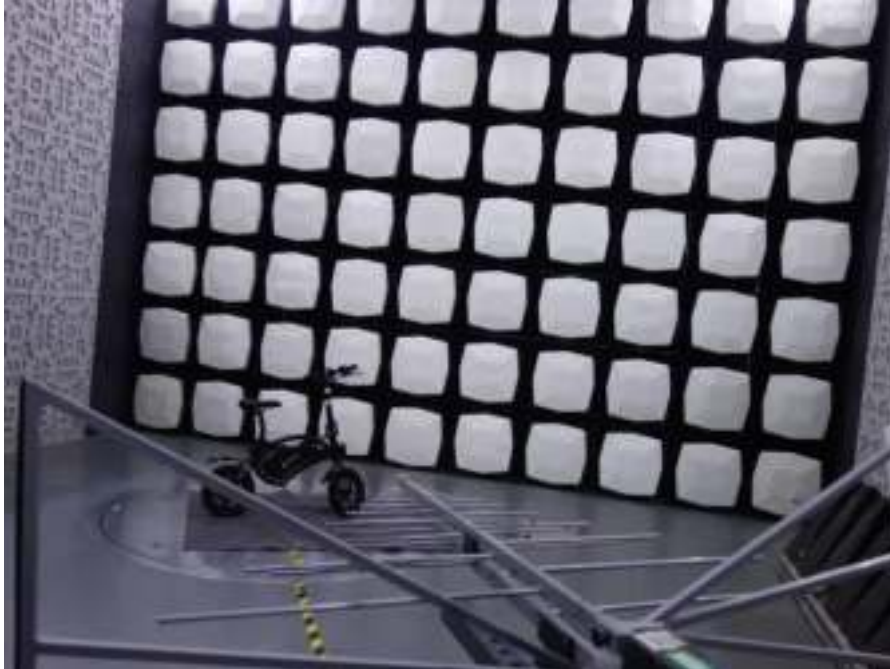
A: No degradation in the performance of the EUT was observed.



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8 Photographs

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



8.2 Electrostatic Discharge Test Setup



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



8.4 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM2005003685CR.

- End of the Report -



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