Commission TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Waterproof Parolee GPS Tracker

ISSUED TO
Megastek Technologies Limited

UNIT 6, BLK A, 12/F, PROFIT IND BLDG, 1-15 KWAI FUNG CRESCENT, KWAI CHUNG, NT, HONGKONG



Tested by: Jingjia Li
Jingjia Li
(Engineer)
Date May. 10, 2018

Approved by: Hao Qi
Hao Qi
(Vice Chief Engineer)
Date May. 10, 2018

Report No.:	BL-SZ1850057-201
EUT Type:	Waterproof Parolee GPS Tracker
Model Name:	MT200X, MT200
Brand Name:	/
Test Standard:	See section 3.1
Test conclusion:	See section 5
Test Date:	Dec. 19, 2016~ Dec. 30, 2016
Date of Issue:	May. 10, 2018

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Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055
TEL: +86-755-66850100
FAX: +86-755-61824271
www.baluntek.com

Revision History

Version	Issue Date	Revisions
Rev. 01	May. 10, 2018	Initial Issue

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co.,Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province,P. R. China
Phone Number	+86 755 6685 0100

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co.,Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province,P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation (A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20 to 30℃
Ambient Relative Humidity	45% - 65%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

(1) The test report reference to the report template version V1.1.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Megastek Technologies Limited
Address	UNIT 6, BLK A, 12/F, PROFIT IND BLDG, 1-15 KWAI FUNG CRESCENT, KWAI CHUNG, NT, HONGKONG

2.2 Manufacturer Information

Manufacturer	Megastek Technologies Limited
Address	Building C, Zhongda Industrial Park, Dongshan Industrial Street, Zhangmutou, Dongguan, China

2.3 Factory Information

Factory	Megastek Technologies Limited
Address	Building C, Zhongda Industrial Park, Dongshan Industrial Street, Zhangmutou, Dongguan, China

2.4 General Description for Equipment under Test (EUT)

EUT Type	Megastek Technologies Limited
Brand Name	/
Model Name	MT200X, MT200
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only differ in model name. Details please refer to the difference declaration file.

2.5 Ancillary Equipment

N/A

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	IEC 60068-2-1 :2007	Environmental testing – Part 2-1: Tests -Test A: Cold
2	IEC 60068-2-2:2007	Environmental testing – Part 2-2: Tests -Test B: Dry heat
3	IEC 60068-2-78:2012	Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state
4	IEC 60068-2-11:1981	Environmental testing for electric and electronic products – Part 2: Test methods - Test Ka: Salt mist
5	IEC 60068-2-6:2007	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)
6	IEC 60068-2-31:2008	Environmental testing - Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens
7	IEC 60529:1989+A1:1999 +A2:2013	Degrees of protection provided by enclosures (IP Code)
8	Commissioned Requirements	/

3.2 Result verdict

Result-Remark
According to IEC 60068-2-1 :2007, EUT performs the following tests: - Cold operating According to IEC 60068-2-2:2007, EUT performs the following tests: - Heat operating - Aging test According to IEC 60068-2-78:2012, EUT performs the following tests: - Damp heat operating According to IEC 60068-2-11:1981, EUT performs the following tests: - Salt mist test According to IEC 60068-2-6:2007, EUT performs the following tests: - Vibration test According to IEC 60068-2-31:2008, EUT performs the following tests: - Free fall test According to IEC 60529:1989+A1:1999+A2:2013, EUT performs the following tests: - Level 6 for Dust proof (IP6X) - Level 7 for water proof (IPX7) According to Commissioned Requirements, EUT performs the following tests: - Thermal Shock - Tensile tests of Foot ring - Shear test - Bending test - Extrusion test - Charging contact test - Keypad Test - No signal environment - Standby test See TEST RESULT.
Possible test case verdicts:
-test case does not apply to the test object...: N/A -test object does meet the requirement.....: P(Pass) -test object does not meet the requirement...: F(Fail)
Test result remark
Because the EUT (test sample in this report) is the same as test sample in test report No. BL-SZ16C0093-202, which is issued by Shenzhen BALUN Technology Co., Ltd. on Jul. 31, 2017. And the model name, applicant information, manufacturer address and factory address are updated in this report. So all test items are referenced report No.BL-SZ16C0093-202 issued by Shenzhen BALUN Technology Co., Ltd. on Jul. 31, 2017.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

Temperature	25~26°C
Relative Humidity	50~62% RH
Air Pressure	100.8 kPa

4.2 Test Equipment List

No.	Description	Model	Equipment No	Cal. Date	Cal. Due
1	Vibration table	ES-20-320	BZ-KKX-L001	2016.11.11	2017.11.10
2	Temperature – humidity Test chamber	HUT410P	BZ-KKX-L003	2016.12.05	2017.12.04
3	Temperature – humidity Test chamber	HUT405P	BZ-KKX-L004	2016.12.05	2017.12.04
4	IPX7 / 8 test device	X8	BZ-KKX-L009	2016.11.11	2017.11.10
5	sand dust test chamber	SC-500	BZ-KKX-L010	2016.07.13	2017.07.12
6	Click and underline test machine	DZ-207	BZ-KKX-L011	2016.11.11	2017.11.10
7	Salt spray test chamber	OK-SH-90	BZ-KKX-L019	2016.12.29	2017.12.28
8	Extrusion machine	BE-6045W	BZ-CHN-L012	2016.10.14	2017.10.13
9	Drop tester	XH-320	BZ-CHN-L014	/	/
10	tape measure	5m	BZ-SFT-L071	2016.11.14	2017.11.13

4.3 Test Configurations

N/A

5 TEST RESULT

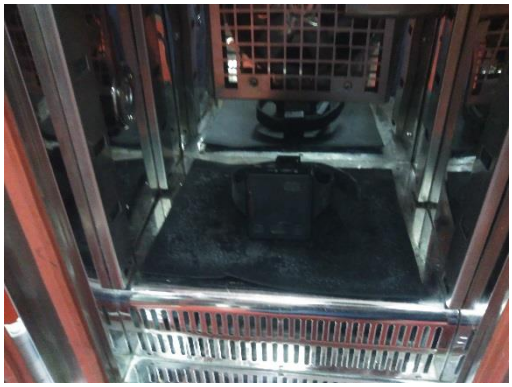
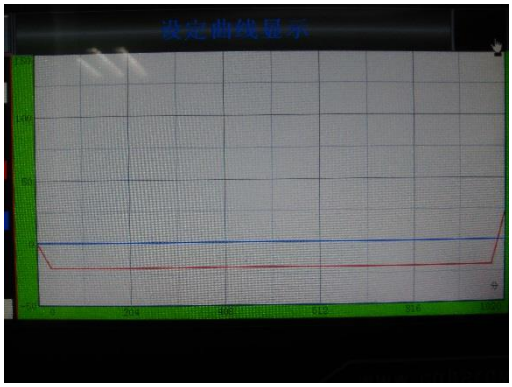
Table 1	**Cold operating**	F
Test Procedure	1. Sample under test are operating conditions. 2. Test temperature: -20°C. 3. Test duration: 26 h. 4. Recovery: After the test, the ambient temperature was returned to the standard atmospheric environment within 30 min, in the standard atmospheric environment for 1 h.	
Acceptance criteria	During the test, the sample remains in operation. After testing, the appearance of the sample should be no damage.	
Test Results	During the test, Sample tips low battery, and then shut down. After the test, the product is not any damage and normally working. The remaining capacity of 40%.	
Test photos	 Photo during test  Test temperature graph	

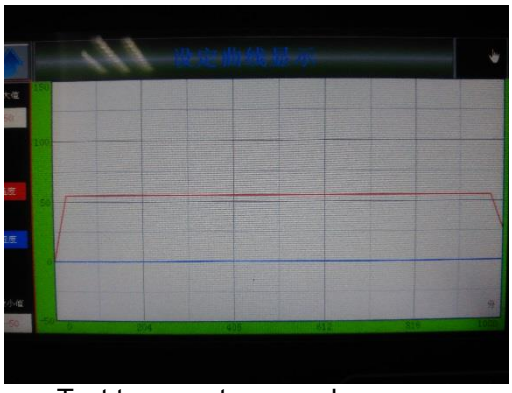
Table 2	**Heat operating**	F
Test Procedure	1. Sample under test are operating conditions. 2. Test temperature: 55°C; 3. Test duration: 16 h; 4. Recovery: After the test, the ambient temperature was returned to the standard atmospheric environment within 30 min, in the standard atmospheric environment for 1 h.	
Acceptance criteria	During the test, the sample remains in operation. After testing, the appearance of the sample should be no damage.	
Test Results	During the test, Sample tips low battery, and then shut down. After the test, the product is not any damage and normally working. The remaining capacity of 50%.	
Test photos	 Photo during test  Test temperature graph	

Table 3	**Aging test**	P
Test Procedure	1. Sample under test are operating conditions. 2. During the test, the sample is connected to the power cord and remains charged. 3. Test temperature: 40°C; 4. Test duration: 168 h; 5. Recovery: After the test, the ambient temperature was returned to the standard atmospheric environment within 30 min, in the standard atmospheric environment for 1 h.	
Acceptance criteria	During the test, the sample remains in operation. After testing, the appearance of the sample should be no damage.	
Test Results	During the test, the sample keep operation. After testing, the appearance of the sample no damage.	
Test photos	 Photo during test  Test temperature graph	

Table 4	**Damp heat operating**	P
Test Procedure	1. Sample under test are operating conditions. 2. Test temperature: (40±2)°C. 3. Test humidity: (93±3)% RH. 4. Test duration: 24 h. 5. Recovery: After the test, the ambient temperature was returned to the standard atmospheric environment within 30 min, in the standard atmospheric environment for 1 h.	
Acceptance criteria	After the test, the product should be not any damage and normally working.	
Test Results	After the test, the product is not any damage and normally working.	
Test photos	 Photo during test  Test temperature graph	

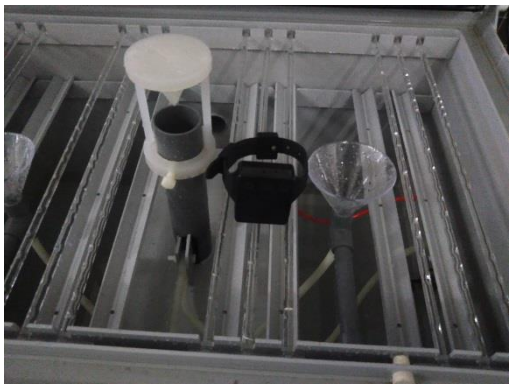
Table 5	**Salt mist test**	P
Test Procedure	1. The specimen is introduced in the unpacked, switched-off, ready-for-use state; 2. Salt solution: the salt solution concentration (5±1)% by weight; 3. pH value: the pH value of the solution is between 6.5 and 7.2, at a temperature of (35 ± 2)°C; 4. Test temperature: (35 ± 2)°C; 5. Test duration: 24 h; 6. Recovery: at the completion of the test, unless otherwise specified by the relevant specification, washed in running tap water for 5 min, rinsed in subjected to air blast to remove droplets of water.	
Acceptance criteria	After the test, the product should be not any damage and normally working.	
Test Results	After the test, the product not any damage and normally working.	
Test photos	 Photo during test  Test temperature graph	

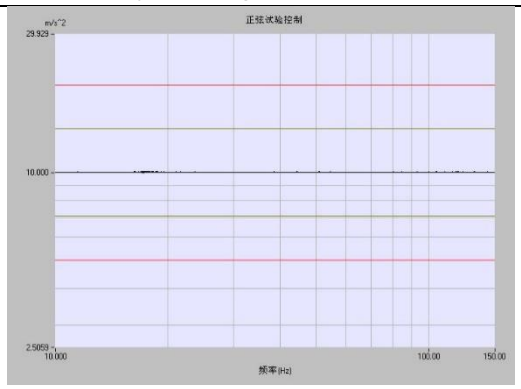
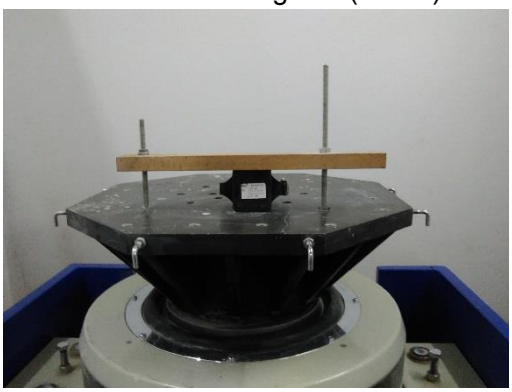
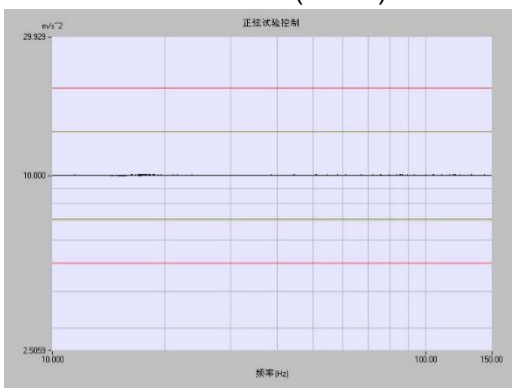
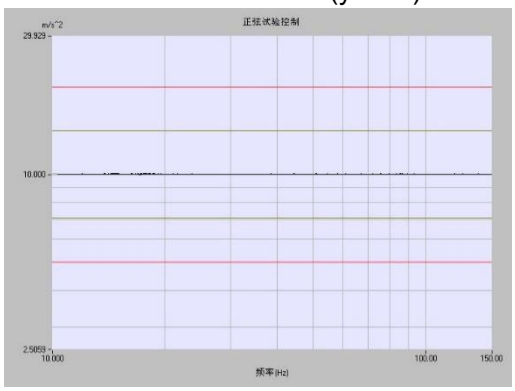
Table 6	**Vibration Test**	P
Test Procedure	1. Vibration frequency: 10H-150Hz. 2. The acceleration: 10 m/s^2. 3. Direction: x, y, z. Sweep frequency cycle 20 times/ axial. A total of 3 h.	
Acceptance criteria	After the test, the product should be not any damage and normally working.	
Test Results	After the test, the product not any damage and normally working.	
Test photos	 Photo during test (x-axis)  The vibration curve (x-axis)  Photo during test (y-axis)  The vibration curve (y-axis)  Photo during test (z-axis)  The vibration curve (z-axis)	

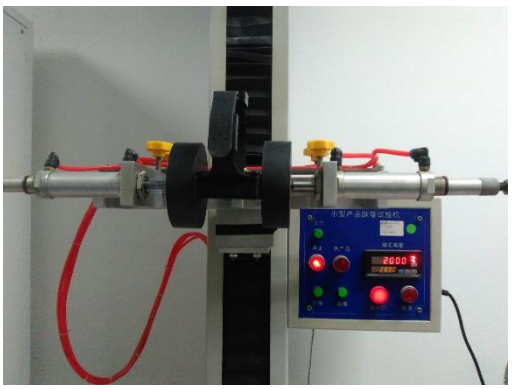
Table 7	**Free fall test**	P
Test Procedure	Fall from 2 meters high and down to the most vulnerable parts	
Acceptance criteria	After the test, the appearance of the sample should be free of damage. Good electrical and mechanical properties.	
Test Results	After the test, the sample appearance is not damaged, the components are not loose. Good electrical and mechanical properties.	
Test photos	 Photo 1 during test  Photo 2 during test	

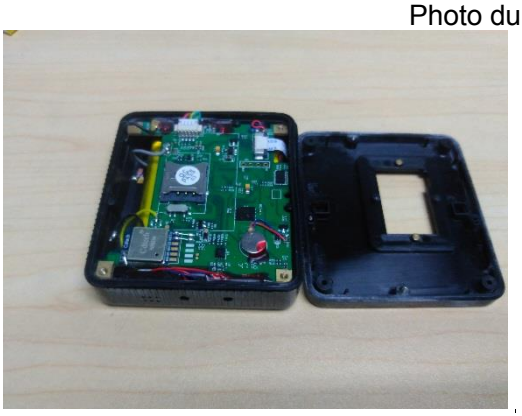
Table 8	**Level 6 for Dust proof (IP6X)**	P
Test Procedure	Test is under testing sample's situation and IEC 60529:1989+A1:1999 +A2:2013 clause 13.4, 13.6.	
Acceptance criteria	The protection is satisfactory if no deposit of dust is observed inside of the enclosure at the end of the test.	
Test Results	After the test, no dust has entered.	
Test photos	 Photo during test  Verifying photo 1 after test  Verifying photo 2 after test	

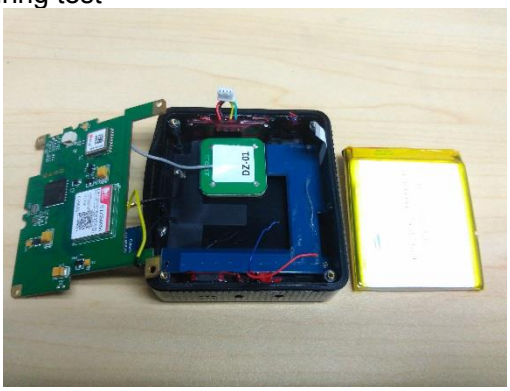
Table 9	**Level 7 for water proof (IPX7)**	P
Test Procedure	Test is under testing sample's situation and IEC 60529:1989+A1:1999 +A2:2013 clause 14.2.7.	
Acceptance criteria	The protection is satisfactory if no deposit of water is observable inside the enclosure at the end of the test. In general, if any water has entered, it shall not: a) Be insufficient to interfere with the correct operation of the equipment or impair safety. b) Deposit on insulation parts where it could lead to tracking along the creepage distances. c) Reach live parts or windings not designed to operate when wet. d) Accumulate near the cable end or enter the cable if any.	
Test Results	After the test, no water has entered.	
Test photos	 Photo during test  Verifying photo 1 after test  Verifying photo 2 after test	

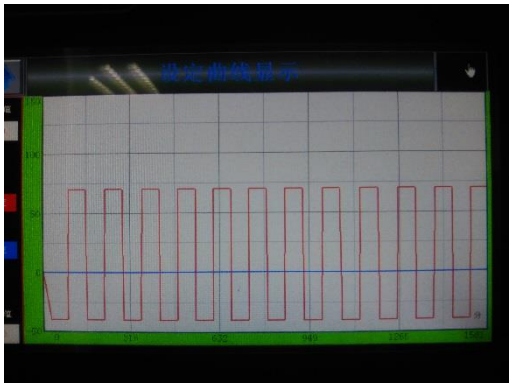
Table 10	**Thermal Shock**	P
Test Procedure	1. Sample under test are operating conditions. 2. Low temperature: -40°C, lasts 1 h. 3. High temperature: 70°C, lasts 1h. 4. Temperature conversion time: 3 min. 5. Number of cycles: 12 times. 6. Recovery: After the test, the ambient temperature was returned to the standard atmospheric environment within 30 min, in the standard atmospheric environment for 1 h.	
Acceptance criteria	During the test, the sample remains in operation. After testing, the appearance of the sample should be no damage.	
Test Results	During the test, the sample is turned off. After the test, at room temperature to restore 1h, return to normal work, the appearance of the sample without damage.	
Test photos	 Photo during test  Test temperature graph	

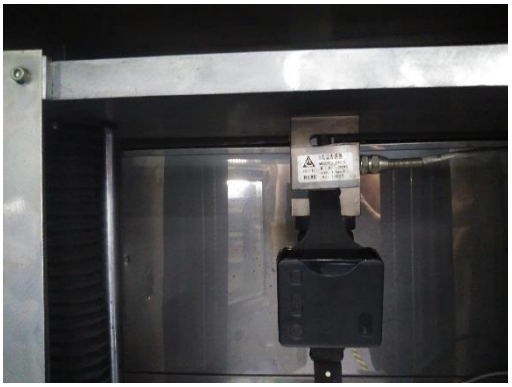
Table 11	**Tensile tests of Foot ring**	P
Test Procedure	Use tension tester to pull the Foot ring to see if it can be damaged.	
Acceptance criteria	The sample should be able to withstand 2000N tension.	
Test Results	The sample can withstand 2000N tension.	
Test photos	 Photo during test	

Table 12	**Shear test**	P
Test Procedure	Using pressure testing machine, screwdriver and other equipment to simulate the damage to the system to observe the buckle and the transmitter from the power of the size.	
Acceptance criteria	The force at the time of shearing should be greater than 250N.	
Test Results	The force of the shear is greater than 250N.	
Test photos	 Photo during test	

Table 13	**Bending test**	P
Test Procedure	Using pressure testing machine, screwdriver and other equipment to simulate the damage to the system to observe the buckle and the transmitter from the power of the size.	
Acceptance criteria	Test results should be greater than 10000N	
Test Results	Test results greater than 10000N.	
Test photos	 Photo during test  Test pressure graph	

Table 14	**Extrusion test**	P
Test Procedure	The sample shell gap and the top of the extrusion test to observe the shell deformation and damage when the size of the power	
Acceptance criteria	Test results should be greater than 8000N	
Test Results	Test results greater than 8000N.	
Test photos	 Photo during test  Test pressure graph	

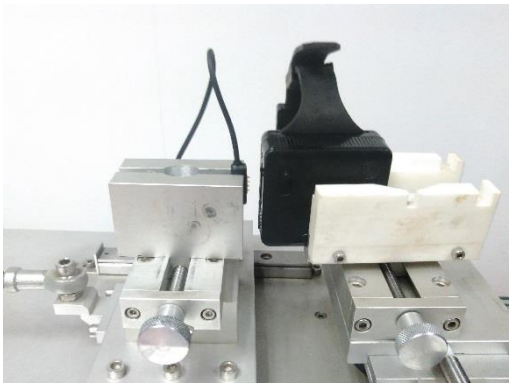
Table 15	**Charging contact test**	P
Test Procedure	1000 times, charging interface test, still can continuously charge.	
Acceptance criteria	Interface wear degree, can not have contact bad or loose condition	
Test Results	After the test, the interface is slightly worn, no contact is bad or loose, and the charging function is normal.	
Test photos	 Photo during test	

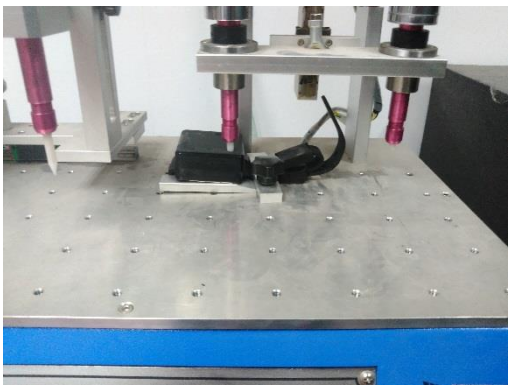
Table 16	**Keypad Test**	P
Test Procedure	5000 times after the durability test, the button can work properly.	
Acceptance criteria	Button function is complete (including press / rebound, key function)	
Test Results	The power button, SOS key and dial key are all key functions, and the button is normal.	
Test photos	 Photo during test	

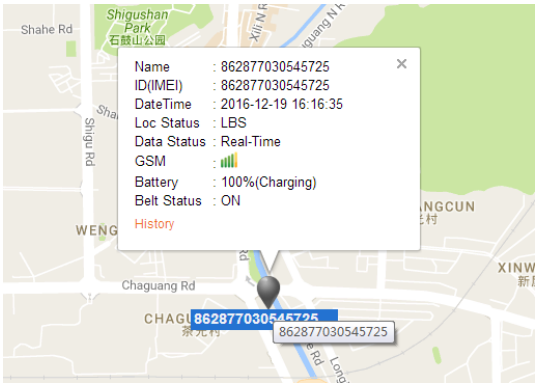
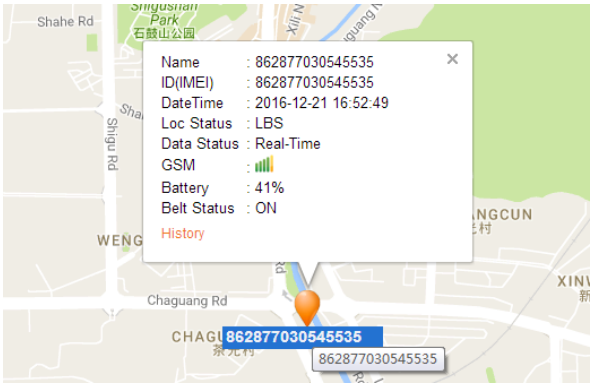
Table 17	**No signal environment**	P
Test Procedure	Full of electricity, the sample is in standby state, placed in a closed metal box, each 2H observation product is normal to standby, until shutdown, recording test time.	
Acceptance criteria	During the test, the sample should be keep standby.	
Test Results	During the test, the sample can be keep standby. The test time is 5.5 days.	
Test photos	 Photo during test	

Table 18	**Standby test**	P
Test Procedure	Full of electricity to keep the feet in standby mode, each 2H observation sample is normal standby until shutdown, recording test time.	
Acceptance criteria	During the test, the sample should be keep standby.	
Test Results	During the test, the sample can be keep standby. The test time is 5.5 days.	
Test photos	 Photo during test	

6 EUT PHOTO

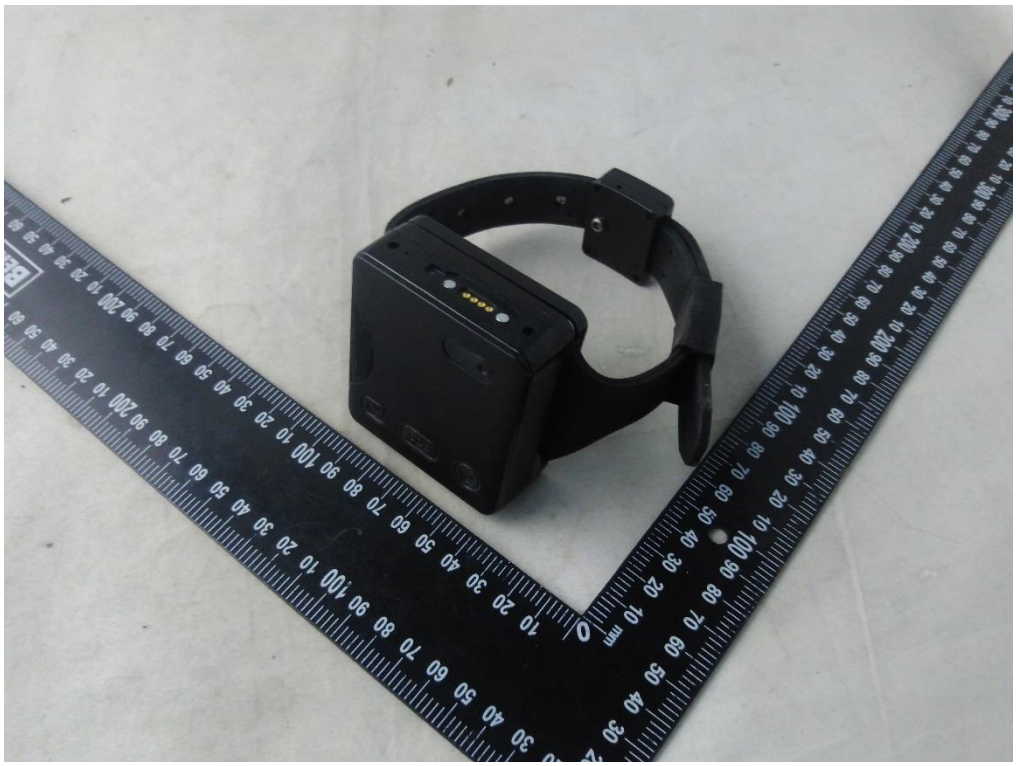


Photo 1 Appearance of EUT

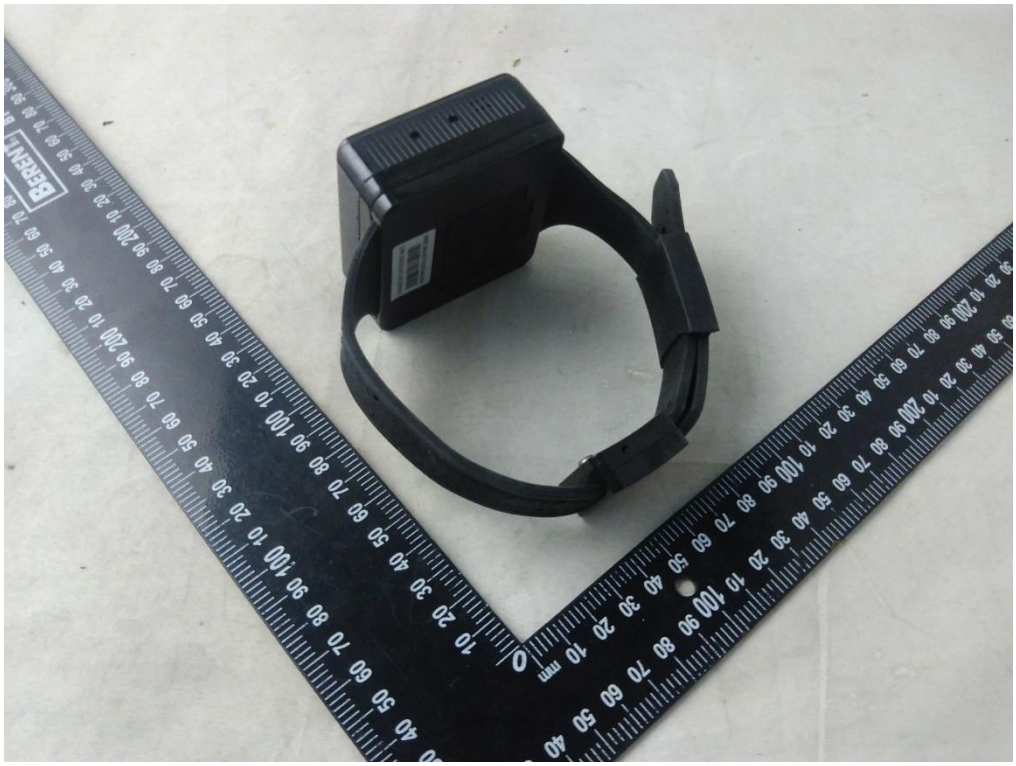


Photo 2 Appearance of EUT

---End of Report---