

#### ETSI EN 301 489-1 v 1.9.2: 2011/ ETSI EN 301 489-17 v 2.2.1: 2012

#### MEASURMENT AND TEST REPORT

For

Shenzhen Fenda Technology Co., Ltd.

Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China

E.U.T.: BLUETOOTH SPEAKER

Model Name: W5, W6, W8, W5 Mini, Square

Brand Name:

#### Report Number: NTC1604236E

Test Date(s): April 21, 2016 to May 13, 2016

Report Date(s): May 13, 2016

**Prepared by** 

Dongguan Nore Testing Center Co., Ltd.

Building D, Gaosheng Science & Technology Park, Zhouxi Longxi Road, Nancheng District, Dongguan City, Guangdong Province, China Tel: +86-769-22022444 Fax: +86-769-22022799

**Prepared By** 

Rose Hu / Engineer

Approved & Authorized Signer



Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Dongguan Nore Testing Center Co., Ltd. The test results referenced from this report are relevant only to the sample tested.



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# **Revision History of This Test Report**

Report Number	Description	Issued Date
NTC1604236E	Initial Issue	2016-05-13



# 1. GENERAL INFORMATION PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST

Manufacturer & Factory	:	Same as the applicant
Model Name	:	W5, W6, W8, W5 Mini, Square (All tests were carried on model W5.)
Model difference	:	These models have the same circuitry, electrical mechanical, PCB layout and physical construction. Their differences in model name for trading purpose.
Power Supply	:	DC 5V come from USB port, DC 3.7V Li-ion battery (Normal Voltage)
Adapter	:	None
Test Voltage	•	DC 3.7V, DC 5V (Adapter input AC 230V 50Hz)
Operating Temperature Range	:	0°C to 45°C (Declaration by manufacturer)
Remark:	:	None

Item	BT2.1+EDR					
Frequency	2402-2480MHz					
Modulation	GFSK, π/4-DQPSK					
Number of Channel	79					
Channel space	1MHz					
Antenna Type	PCB antenna					
Antenna Gain	0 dBi (declared by manufacturer)					

П



# 2. SUMMARY OF TEST RESULTS

The E.U.T. has been tested according to the following specifications:

ETSI EN 301 489-1 v 1.9.2: 2011/ETSI EN 301 489-17 v 2.2.1: 2012										
EMISSION										
Standard Test Type Result Remarks										
EN 55022: 2010+AC:	Mains Terminal Disturbance Voltage Test	PASS	Uncertainty: 2.7dB							
2011	Radiated Emission Test	PASS	Uncertainty: 3.4dB							
Standard	Test Type	Result	Remarks							
EN 61000-4-2: 2009	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion B							
EN 61000-4-3: 2006+A2: 2010	Radio-frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion A							



# **3. TEST METHODOLOGY**

As per table 2 of clause 7.1 of ETSI EN 301 489-1 V1.9.2, the measurement was performed under EUT combined condition during the tests. The ports on the ancillary left empty during the measurement in this report.

# 4. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

# 5. TEST FACILITY

Site Description EMC Lab	:	Listed by FCC, July 03, 2014 The Certificate Number is 665078.
		Listed by Industry Canada, June 18, 2014 The Certificate Registration Number. Is 46405-9743
Name of Firm 1	:	Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Site Location 1	:	Building D, Gaosheng Science & Technology Park, Zhouxi Longxi Road, Nancheng District, Dongguan City, Guangdong Province, China
Name of Firm 2	:	Bureau Veritas Shenzhen Co., Ltd., Dongguan Branch
Site Location 2	:	No. 34, Chenwulu Section, Guantai Rd., Houjie Town, Dongguan City, Guangdong 523942, China

# 6. SUPPORT EQUIPMENT

Adapter	:	Model: BSYC050200UW Input: AC100-240V 50/60Hz 0.5A Output: DC 5.0V 2000mA
iDhana		•
iPhone	•	Manufacturer: Apple
		M/N: iPhone 4
		S/N: 84133UUVA4S
iPod	:	Manufacturer: Apple
		M/N: A1446
		S/N: DCYNV5EMF0GQ



# 7. PERFORMANCE CRITERIA

	ETSI EN301489-17 v 2.2.1: 2012									
Criteria	During Test	After Test								
A	Shall operate as intended May show degradation of performance (note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance(note 2) Shall be no loss of function Shall be no loss of stored data or user programmable functions								
В	May show loss of function (one or more) May show degradation of performance (note 1) No unintentional transmissions	Functions shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance (note 2) Shall be no loss of stored data or user programmable functions								
c May be loss of functio (one or more)		Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be no degradation of performance(note 2)								
NOTE 1: 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.										
perf case perf	NOTE 2: 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									

(including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

# Performance Criteria For Continuous Phenomena (CT & CR)

At the conclusion of the test the EUT shall operated as intended with no loss of user control functions or stored data, the communication link shall have been maintained during the test.

manufacturer then either of these may be derived from the product description and documentation

# Performance Criteria For Transitent Phenomena (TT & TR)

At the conclusion of each exposure the EUT shall operated with no user noticeable loss of communication link.



# 8. ETSI EN 301 489-1/17 REQUIREMENTS

# **8.1 RADIATED EMISSION LIMIT**

According standard ETSI EN 301 489-1 v 1.9.2 Clause 8.2.3, Table 3 and EN 55022: 2010+AC: 2011 Clause 6, Table 6, Class B

## Limits for radiated disturbance Blow 1GHz

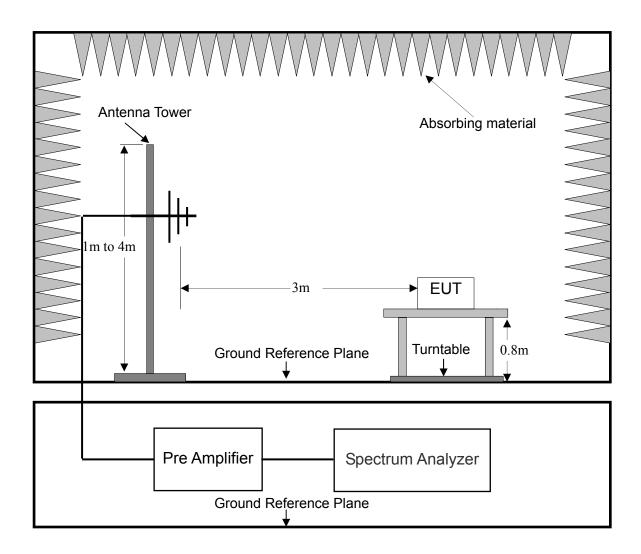
FREQUENCY	DISTANCE	FIELD STRENGTHS LIMIT					
(MHz)	(Meters)	(dBµV/m)					
30 ~ 230	3	40					
230 ~ 1000	3	47					
Note: (1) The smaller limit shall apply at the combination point between two frequency bands. (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.							

# Limits for radiated disturbance Above 1GHz

FREQUENCY	DISTANCE	Average Limit	Peak Limit					
(MHz)	(Meters)	V/m)						
1000 ~ 3000	3	50	70					
3000 ~ 6000	3	54	74					
Note: The lower limit applies at the transition frequency.								



## **TEST CONFIGURATION**



### **TEST PROCEDURE**

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 8.2.3 and EN 55022: 2010+AC: 2011 Clause 6 for the measurement methods.

### **TEST RESULT**

#### PASS

Please refer to following data tables of the worst case: Charging+BT Link.



Site: Radiation

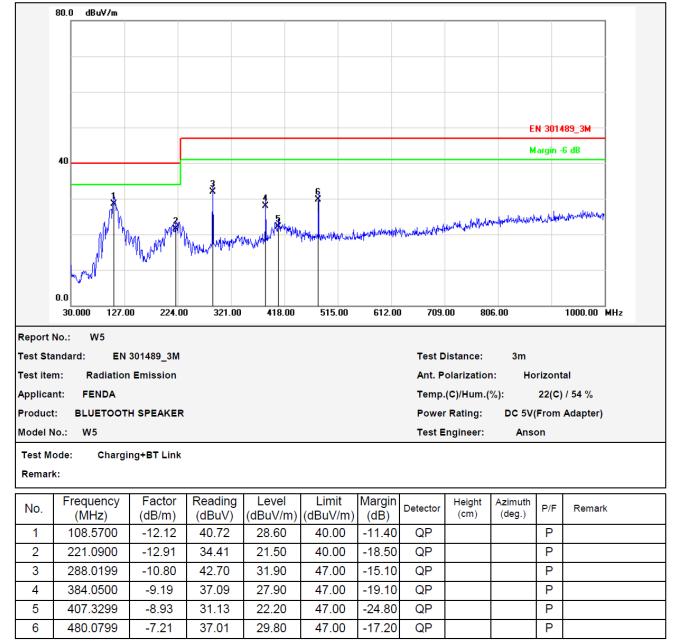


 Dongguan NTC Co., Ltd.

 Tel:+86-769-22022444
 Fax:+86-769-22022799

 Web:
 Http://www.ntc-c.com

Test Time: 2016-4-29 11:52:49





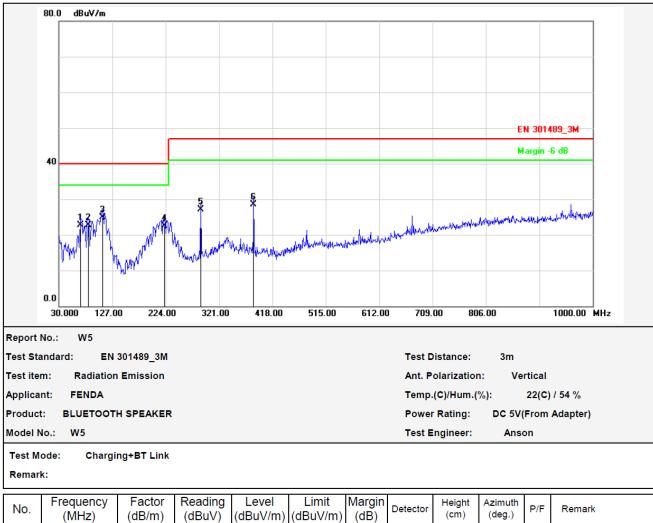


Dongguan NTC Co., Ltd. Tel:+86-769-22022444 Fax:+86-769-22022799 Note Testing Center Web: <u>Http://www.ntc-c.com</u>

Site: Radiation

11:51:07

Test Time: 2016-4-29



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	69.7699	-17.31	40.11	22.80	40.00	-17.20	QP			Ρ	
2	83.3499	-18.50	41.20	22.70	40.00	-17.30	QP			Ρ	
3	109.5400	-16.15	41.05	24.90	40.00	-15.10	QP			Ρ	
4	222.0600	-15.86	38.36	22.50	40.00	-17.50	QP			Ρ	
5	288.0199	-12.80	39.90	27.10	47.00	-19.90	QP			Ρ	
6	384.0500	-11.19	39.79	28.60	47.00	-18.40	QP			Ρ	





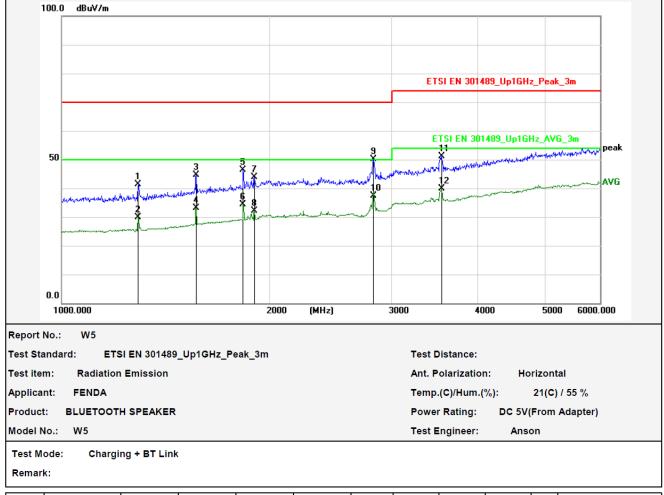
#### Dongguan NTC Co., Ltd. Tel:+86-769-22022444 Fax:+86-769-22022799

Site: Radiation

Tel:+86-769-22022444 Fax:+86-769-220

Test Times

Test Time: 2016-4-29 10:42:48



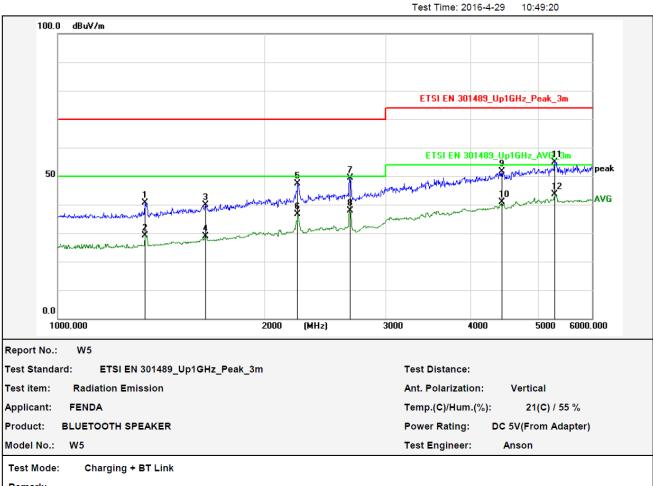
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	1289.726	2.54	38.77	41.31	70.00	-28.69	peak			Ρ	
2	1289.726	2.54	27.24	29.78	50.00	-20.22	AVG			Ρ	
3	1565.084	4.15	40.45	44.60	70.00	-25.40	peak			Ρ	
4	1565.084	4.15	29.04	33.19	50.00	-16.81	AVG			Ρ	
5	1829.098	5.95	40.43	46.38	70.00	-23.62	peak			Ρ	
6	1829.098	5.95	28.54	34.49	50.00	-15.51	AVG			Ρ	
7	1899.233	6.37	37.50	43.87	70.00	-26.13	peak			Ρ	
8	1899.233	6.37	25.76	32.13	50.00	-17.87	AVG			Ρ	
9	2821.952	8.88	41.24	50.12	70.00	-19.88	peak			Ρ	
10	2821.952	8.88	28.40	37.28	50.00	-12.72	AVG			Ρ	
11	3543.030	10.50	40.75	51.25	74.00	-22.75	peak			Ρ	
12	3543.030	10.50	29.41	39.91	54.00	-14.09	AVG			Ρ	





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Site: Radiation



Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	1339.179	2.81	37.77	40.58	70.00	-29.42	peak			Ρ	
2	1339.179	2.81	26.43	29.24	50.00	-20.76	AVG			Ρ	
3	1639.720	4.69	35.26	39.95	70.00	-30.05	peak			Ρ	
4	1639.720	4.69	24.18	28.87	50.00	-21.13	AVG			Ρ	
5	2235.578	7.55	39.88	47.43	70.00	-22.57	peak			Ρ	
6	2235.578	7.55	29.07	36.62	50.00	-13.38	AVG			Ρ	
7	2664.702	8.61	40.68	49.29	70.00	-20.71	peak			Ρ	
8	2664.702	8.61	29.36	37.97	50.00	-12.03	AVG			Ρ	
9	4432.448	13.35	38.27	51.62	74.00	-22.38	peak			Ρ	
10	4432.448	13.35	27.55	40.90	54.00	-13.10	AVG			Ρ	
11	5292.741	16.05	38.87	54.92	74.00	-19.08	peak			Ρ	
12	5292.741	16.05	27.60	43.65	54.00	-10.35	AVG			Ρ	



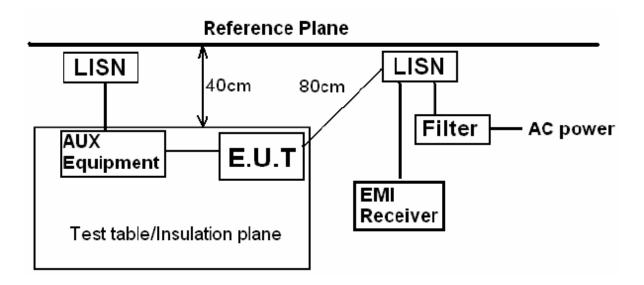
# **8.2 AC POWER CONDUCTED EMISSION**

### LIMIT

According to standard ETSI EN 301 489-1 v1.9.2 Clause 8.3.3, Table 8 and EN 55022: 2010+AC: 2011 Clause 5, Table 2, Class B

Limits for conducted disturbance at the mains ports of class B ITE.									
Frequency range	Frequency range Limits (dB(uV))								
(MHz)	Quasi-peak	Average							
0.15 to 0.5	66 to 56	56 to 46							
0.5 to 5	56	46							
5 to 30	60	50							

### **TEST CONFIGURATION**



### **TEST PROCEDURE**

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 8.3.3 and EN 55022: 2010+AC: 2011 Clause 5 for the measurement methods.



# **TEST RESULTS**

#### PASS

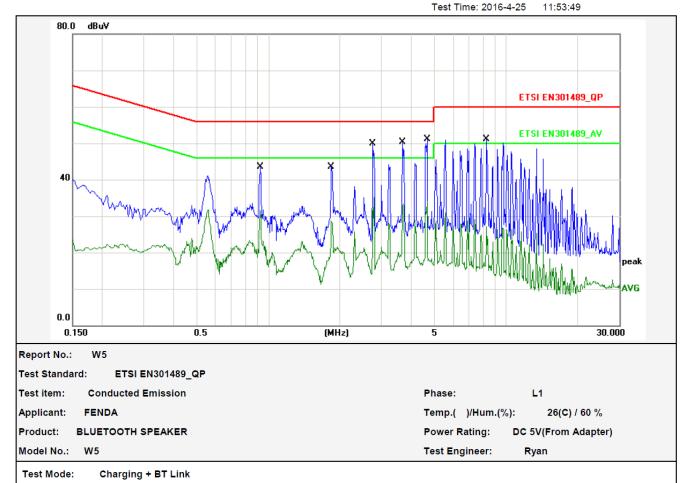
Please refer to following data.



Site: Conduction



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Remark:

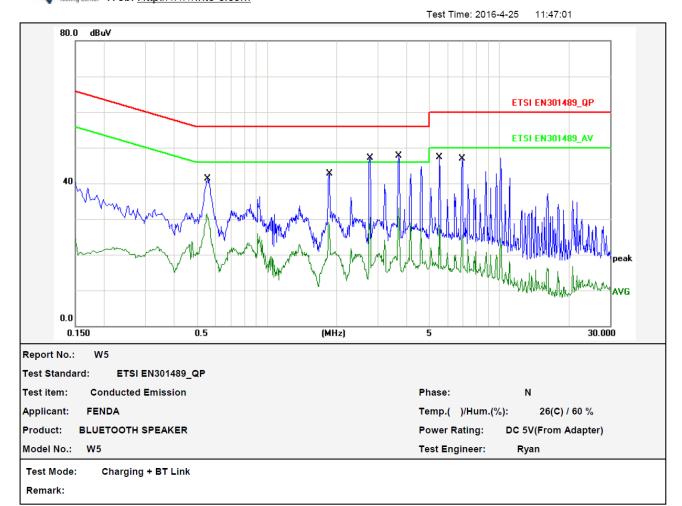
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.9260	10.80	30.60	41.40	56.00	-14.60	QP	Ρ	
2	0.9260	10.80	18.80	29.60	46.00	-16.40	AVG	Р	
3	1.8460	10.80	30.50	41.30	56.00	-14.70	QP	Ρ	
4	1.8460	10.80	15.90	26.70	46.00	-19.30	AVG	Ρ	
5	2.7540	10.80	37.00	47.80	56.00	-8.20	QP	Ρ	
6	2.7540	10.80	22.70	33.50	46.00	-12.50	AVG	Ρ	
7	3.6780	10.80	37.40	48.20	56.00	-7.80	QP	Ρ	
8	3.6780	10.80	20.80	31.60	46.00	-14.40	AVG	Ρ	
9	4.6499	10.80	38.70	49.50	56.00	-6.50	QP	Ρ	
10	4.6499	10.80	21.40	32.20	46.00	-13.80	AVG	Ρ	
11	8.3099	10.80	38.30	49.10	60.00	-10.90	QP	Ρ	
12	8.3099	10.80	14.50	25.30	50.00	-24.70	AVG	Ρ	



NTC

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Site: Conduction

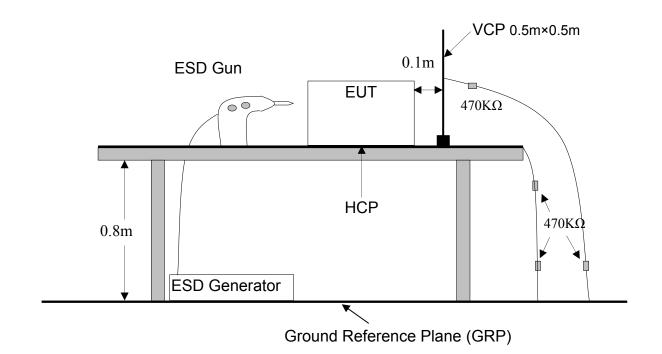


No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.5580	10.80	28.40	39.20	56.00	-16.80	QP	Ρ	
2	0.5580	10.80	18.70	29.50	46.00	-16.50	AVG	Ρ	
3	1.8620	10.80	29.90	40.70	56.00	-15.30	QP	Ρ	
4	1.8620	10.80	16.50	27.30	46.00	-18.70	AVG	Ρ	
5	2.7860	10.80	34.70	45.50	56.00	-10.50	QP	Ρ	
6	2.7860	10.80	17.80	28.60	46.00	-17.40	AVG	Ρ	
7	3.6820	10.80	34.50	45.30	56.00	-10.70	QP	Ρ	
8	3.6820	10.80	20.40	31.20	46.00	-14.80	AVG	Ρ	
9	5.5179	10.80	34.90	45.70	60.00	-14.30	QP	Ρ	
10	5.5179	10.80	15.70	26.50	50.00	-23.50	AVG	Ρ	
11	6.9298	10.80	34.10	44.90	60.00	-15.10	QP	Ρ	
12	6.9298	10.80	12.50	23.30	50.00	-26.70	AVG	Ρ	



# **8.3 ELECTROSTATIC DISCHARGE**

# **TEST CONFIGURATION**



### **TEST PROCEDURE:**

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

### **TEST RESULT**

#### PASS

please refer to following data table.

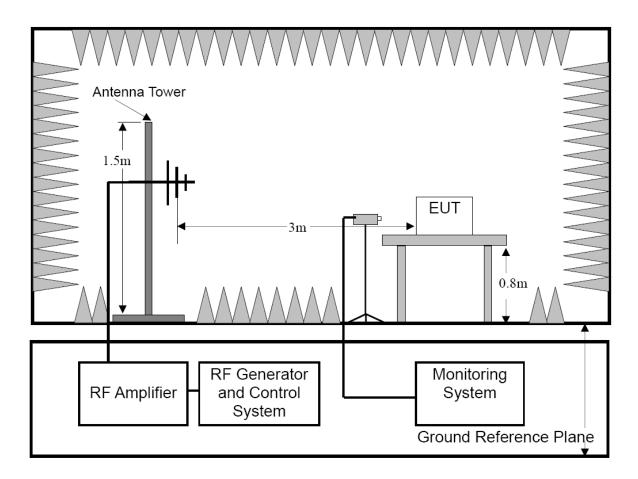


		Test Co	ondition				
Temperature	25°C		Test Voltage	AC 230V/50Hz, DC 3.7V			
Humidity	52%RH	1	Tested by	Chilaw			
Pressure	1022m	bar	Performance Criterion :	CR & CT & B			
Ground Bond Resist	ance		0.2 Ω				
Time Between Each	Dischar	ge :	1 second				
Test Mode			TX+RX(BT Link)				
Test Level			± 2.0, ± 4.0, ±8.0 kV (Air Discharge) ± 2.0, ±4.0 kV (Contact Discharge) ± 2.0, ±4.0 kV (Indirect Contact Discharge)				
		Test	Result				
Discharge Typ	De		Level	Result			
Contact Discha	rge	±	2, ± 4kV	Pass*			
Air Discharge ± 2			$\pm$ 4, $\pm$ 8kV	Pass			
Indirect HCP Discharge		±	2, ± 4kV	Pass			
Indirect VCP Discl	harge	±	2, ± 4kV	Pass			



# 8.4 RF ELECTROMAGNETIC FIELD

# **TEST CONFIGURATION**



### **TEST PROCEDURE**

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 9.2.2 and EN61000-4-3 for the measurement methods.

# **TEST RESULT**

#### PASS

please refer to following data table.



		Test Condition					
Temperature	25°C	Test Voltage	AC 230V 50Hz, DC 3.7V				
Humidity	52%RH	Tested by	Chilaw				
Pressure	1022mbar	Performance Criterion	CR & CT & A				
Frequency Range		80-1000MHz and	1400-2700 MHz				
Test Modulation		1kHz, 80% AM					
Dwell time		1 second					
Frequency Step		1%					
Antenna Polarization		Horizontal and V	Horizontal and Vertical				
Test Mode		TX+RX(BT Link)	TX+RX(BT Link)				
Test Level		3V/m	3V/m				
		Test Result					
Frequency (MHz)		Exposed Side	Result				
80 to 1000 1400 to 2700		Front	Pass				
80 to 1000 1400 to 2700		Left Pa					
80 to 1000 1400 to 2700			Pass				
80 to 1000 1400 to 2700		Right	Pass				

Note: The exclusion band for 2,45 GHZ equipment falling within the scope of the present document extends from 2 280 MHz to 2 607,675 MHz.

Note: This test was carry out on Bureau Veritas Shenzhen Co., Ltd., Dongguan Branch.



# 8.5 TEST EQUIPMENT LIST

# FOR MAINS TERMINALS DISTURBANCE VOLTAGE TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.
						Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101152	Nov. 24, 2015	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Nov. 08, 2015	1 Year
3.	L.I.S.N	Schwarzbeck	NNLK8129	8129-212	Nov. 08, 2015	1 Year
4.	RF Switching	Compliance Direction	RSU-M2	38311	Nov. 08, 2015	1 Year
	Unit	Systems Inc.				
5.	Pulse Limiter	MTS-systemtechnik	MTS-IMP-136	26115-010-	Nov. 08, 2015	1 Year
				0007		

### FOR RADIATED EMISSION MEASUREMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.
						Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Nov. 23, 2015	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Nov. 26, 2015	1 Year
3.	Cable	Huber+Suhner	CBL3-NN-9M	21490001	Nov. 08, 2015	1 Year
4.	Cable	Huber+Suhner	CIL02	N/A	Nov. 08, 2015	1 Year
5.	Power Amplifier	HP	HP 8447D	1145A00203	Nov. 07, 2015	1 Year
6	Horn Antenna	COM-Power	AH-118	071078	Nov. 05, 2015	1 Year
7	Pre-Amplifier	COM-Power	PAM-118	443007	Nov. 05, 2015	1 Year

### FOR ELECTROSTATIC DISCHARGE TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQ	NSG 437	432	Nov. 09, 2015	1 Year



## FOR RF ELECTROMAGNETIC FIELD IMMUNITY TEST

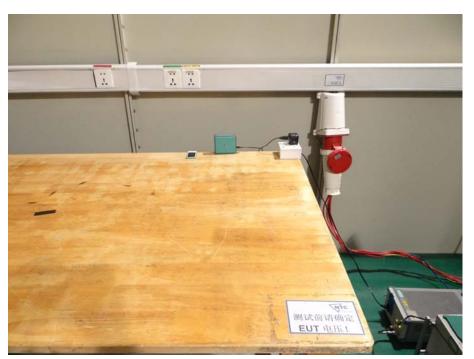
#### (Bureau Veritas Shenzhen Co., Ltd., Dongguan Branch)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5181A	MY501425 30	Aug 31, 2015	1 Year
2.	Antenna Log-Periodic	CORAD	ATR80M6G	0337307	Aug 31, 2015	1 Year
3.	Switch Controller	CORAD	SC1000	0337343	Aug 31, 2015	1 Year
4.	RF Power Meter	ESE	4242	13984	Aug 31, 2015	1 Year
5	Power Sensor	ESE	51011EMC	35716	Aug 31, 2015	1 Year
6	E-Field probe	Narda	NBM-520	2403/01B	Nov. 03, 2015	1 Year
7	Power Amplifier	TESEQ	CBA 1G-150	T44029	N/A	N/A
8	Power Amplifier	TESEQ	CBA 3G-100	T44030	N/A	N/A
9	Power Amplifier	TESEQ	CBA 6G-050	1041204	N/A	N/A
10	Dual Directional Coupler	TESEQ	C5982	95208	Aug 31, 2015	1 Year
11	Dual Directional Coupler		C6187		Aug 31, 2015	1 Year
12	Dual Directional Coupler	TESEQ	CPH-274F	M251304-0 1	Aug 31, 2015	1 Year

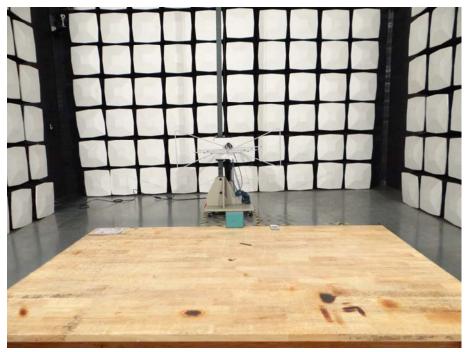


### APPENDIX 1 PHOTOGRPHS OF TEST SETUP

# LINE CONDUCTED EMISSION TEST



# **RADIATED EMISSION TEST**

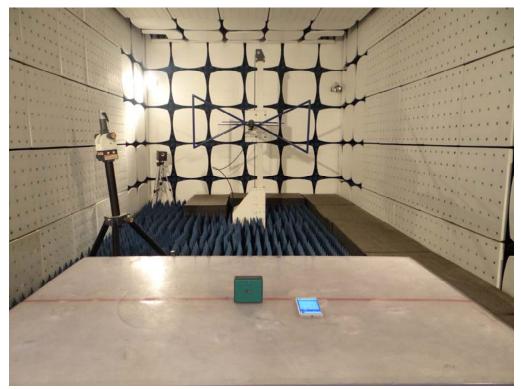




# **ELECTROSTATIC DISCHARGE TEST**



# RADIATED ELECTROMAGNETIC FIELD TEST





**General Appearance of the EUT** 













