

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

MEASUREMENT 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: W10, W11, W12, W13, W15, W16, W17, W19

Brand Name: F&D, OMAKER

Report Number: NTC1605115E

Test Date(s): May 18, 2016 to June 24, 2016

Report Date(s): June 24, 2016

Prepared by

Dongguan Nore Testing Center Co., Ltd.

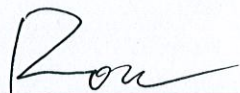
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Prepared By

Approved & Authorized Signer



Rose Hu / Engineer



Ion Fan / Authorized Signatory

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
NTC1605115E	Initial Issue	2016-06-24

1. GENERAL INFORMATION

PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST

- Manufacturer & Factory : Same as the applicant
- Model Name : W10, W11, W12, W13, W15, W16, W17, W19
(All tests were carried on model W12.)
- 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
Adapter : None
- Test Voltage : AC 230V 50Hz(Adapter input), DC 3.7V battery
- Operating Temperature Range : 0°C to 45°C (Declaration by manufacturer)
- Adaptive/Non-Adaptive Equipment : Adaptive equipment

Technical Specification:

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

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: 2011	Mains Terminal Disturbance Voltage Test	PASS	Uncertainty: 2.7dB
	Radiated Emission Test	PASS	Uncertainty: 3.4dB
IMMUNITY			
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

No.	Equipment	Model	Serial No.	Trade name	Data Cable	Power Cord
1	Mobile phone	X5SL	86704802393 0426	VIVO	1.5m unshielded	N/A
2.	iPod	A1446	DCYNV5EMF 0GQ	Apple	1.5m unshielded	N/A
3.	Adapter	BSYC050200 UW	N/A	N/A	N/A	N/A

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
B	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 function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be no degradation of performance(note 2)
<p>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.</p> <p>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 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.</p>		

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.

Performance Criteria For Transient 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 (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

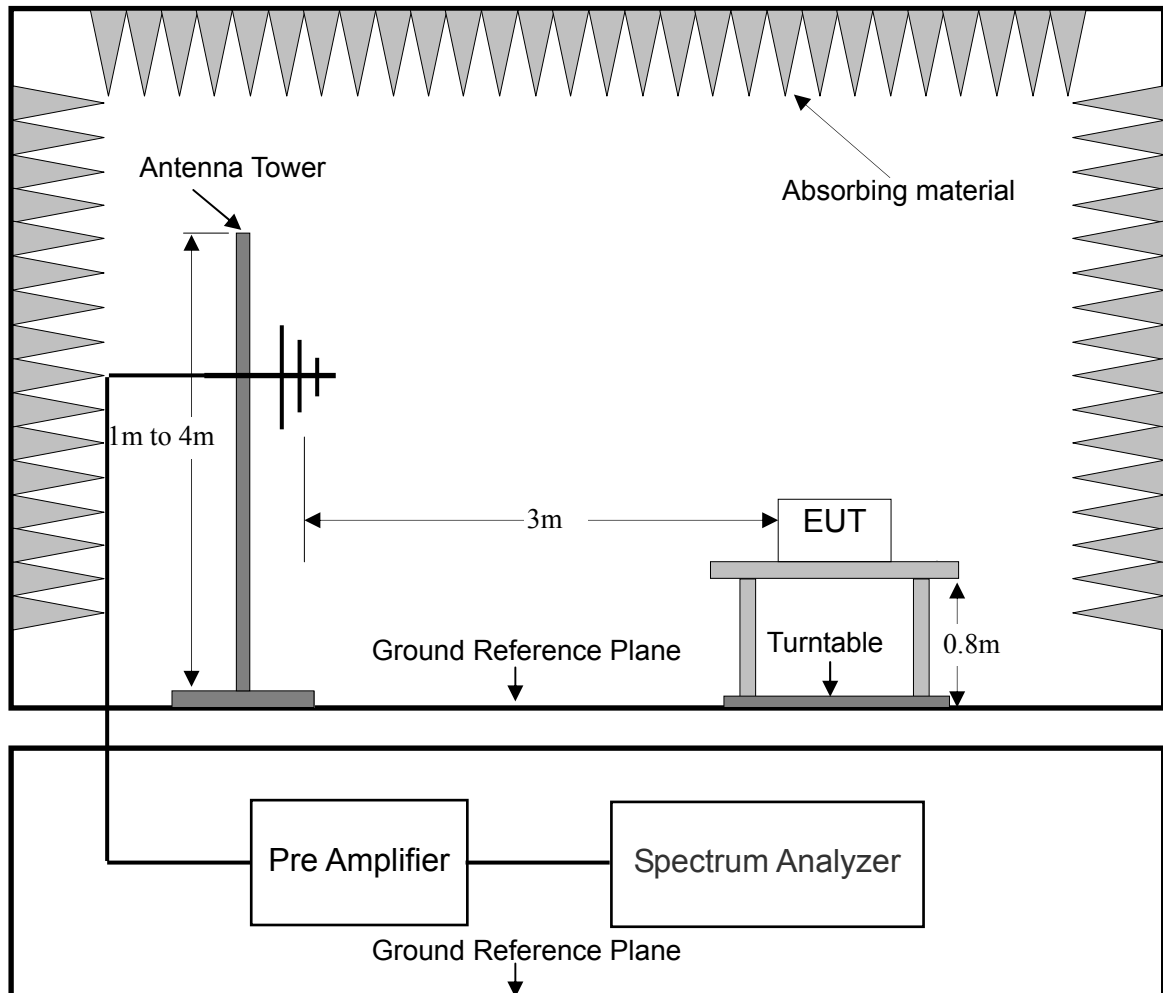
Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
 (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

Limits for radiated disturbance Above 1GHz

FREQUENCY (MHz)	DISTANCE (Meters)	Average Limit (dB μ V/m)	Peak Limit
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

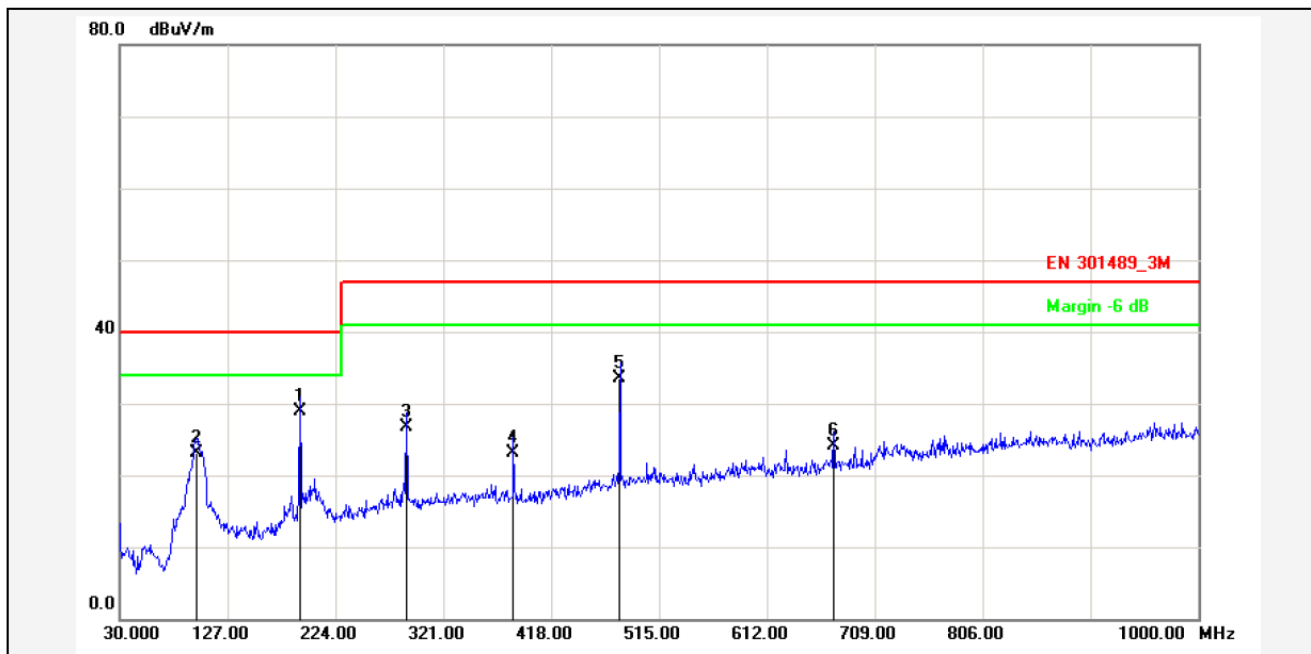
Please refer to following data tables.



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Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Radiation

Test Time: 2016-5-19 11:58:51



Report No.: W12	Test Standard: EN 301489_3M	Test Distance: 3m
Test item: Radiation Emission	Ant. Polarization: Horizontal	
Applicant: FENDA	Temp.(C)/Hum.(%): 22(C) / 54 %	
Product: BLUETOOTH SPEAKER	Power Rating: AC230V 50Hz	
Model No.: W12	Test Engineer: Anson	

Test Mode: Charging + TX+RX(BT Link)
Remark:

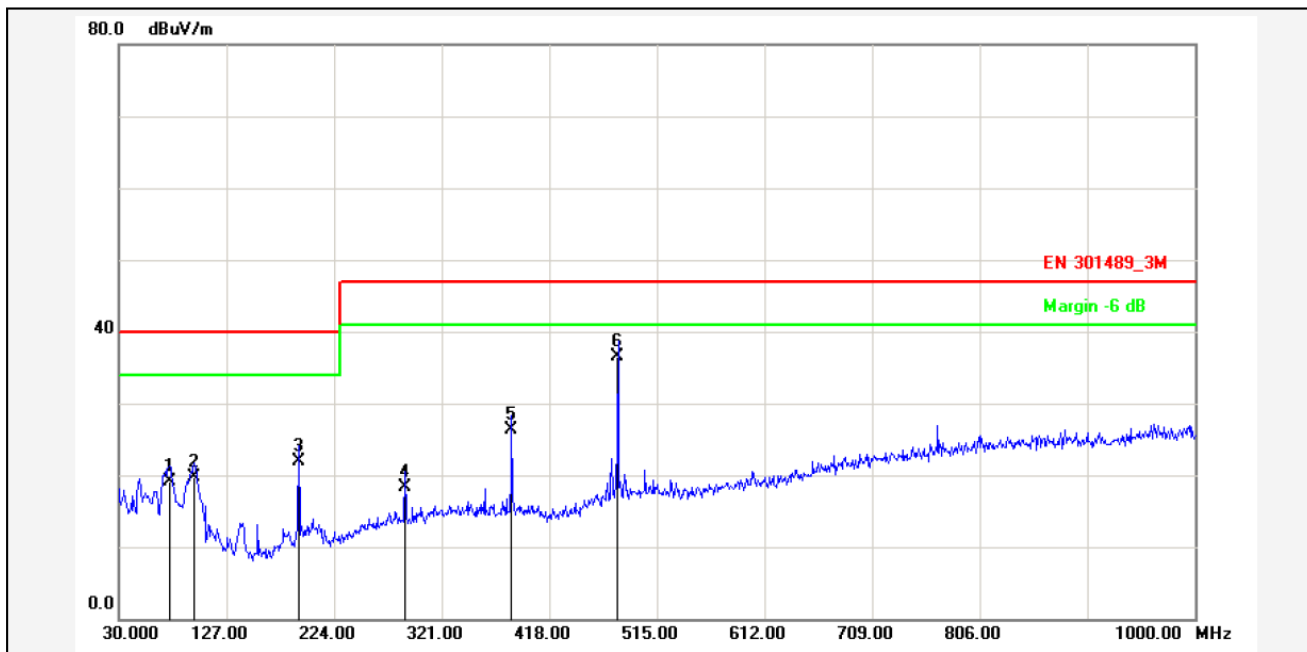
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	191.9900	-13.51	42.51	29.00	40.00	-11.00	QP			P	
2	98.8700	-12.28	35.38	23.10	40.00	-16.90	QP			P	
3	288.0199	-10.80	37.50	26.70	47.00	-20.30	QP			P	
4	384.0500	-9.19	32.39	23.20	47.00	-23.80	QP			P	
5	480.0799	-7.21	40.81	33.60	47.00	-13.40	QP			P	
6	672.1399	-4.57	28.67	24.10	47.00	-22.90	QP			P	



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Site: Radiation

Test Time: 2016-5-19 12:05:10



Report No.: W12

Test Standard: EN 301489_3M

Test item: Radiation Emission

Applicant: FENDA

Product: BLUETOOTH SPEAKER

Model No.: W12

Test Distance: 3m

Ant. Polarization: Vertical

Temp.(C)/Hum.(%): 22(C) / 54 %

Power Rating: AC230V 50Hz

Test Engineer: Anson

Test Mode: Charging + TX+RX(BT Link)

Remark:

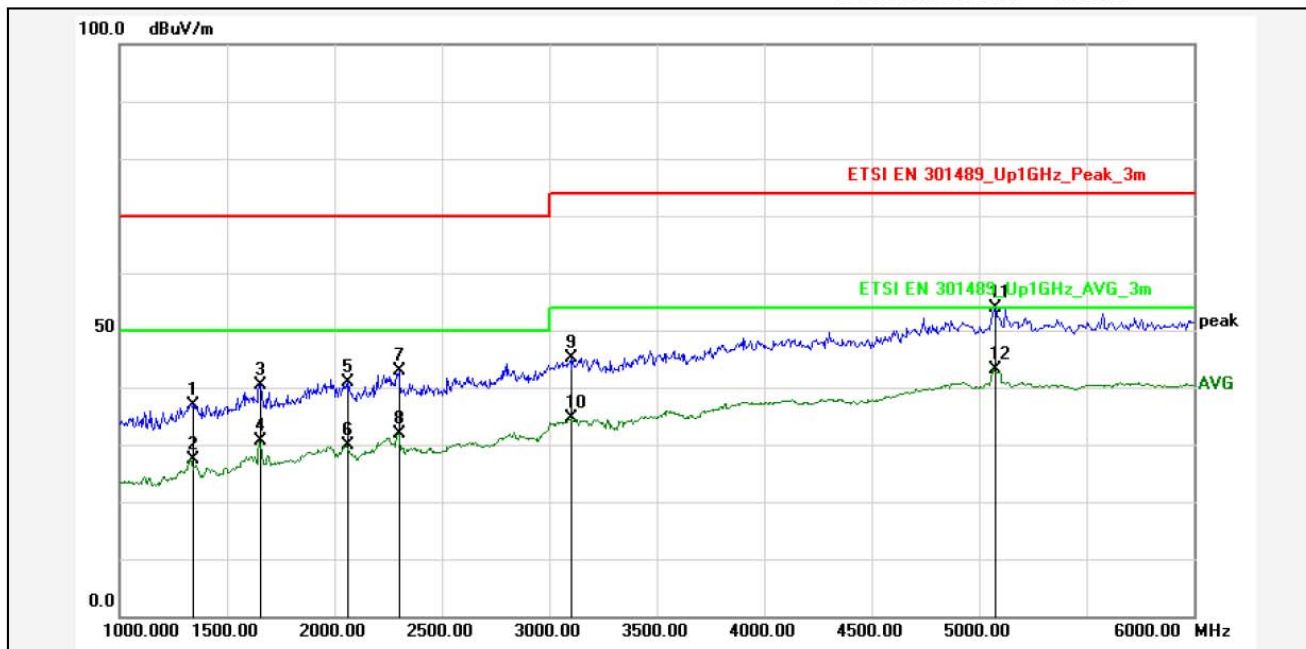
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	75.5899	-19.03	38.23	19.20	40.00	-20.80	QP			P	
2	97.9000	-15.98	35.68	19.70	40.00	-20.30	QP			P	
3	191.9900	-16.51	38.51	22.00	40.00	-18.00	QP			P	
4	288.0199	-12.80	31.20	18.40	47.00	-28.60	QP			P	
5	384.0500	-11.19	37.49	26.30	47.00	-20.70	QP			P	
6	480.0799	-9.21	45.81	36.60	47.00	-10.40	QP			P	



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Site: Radiation

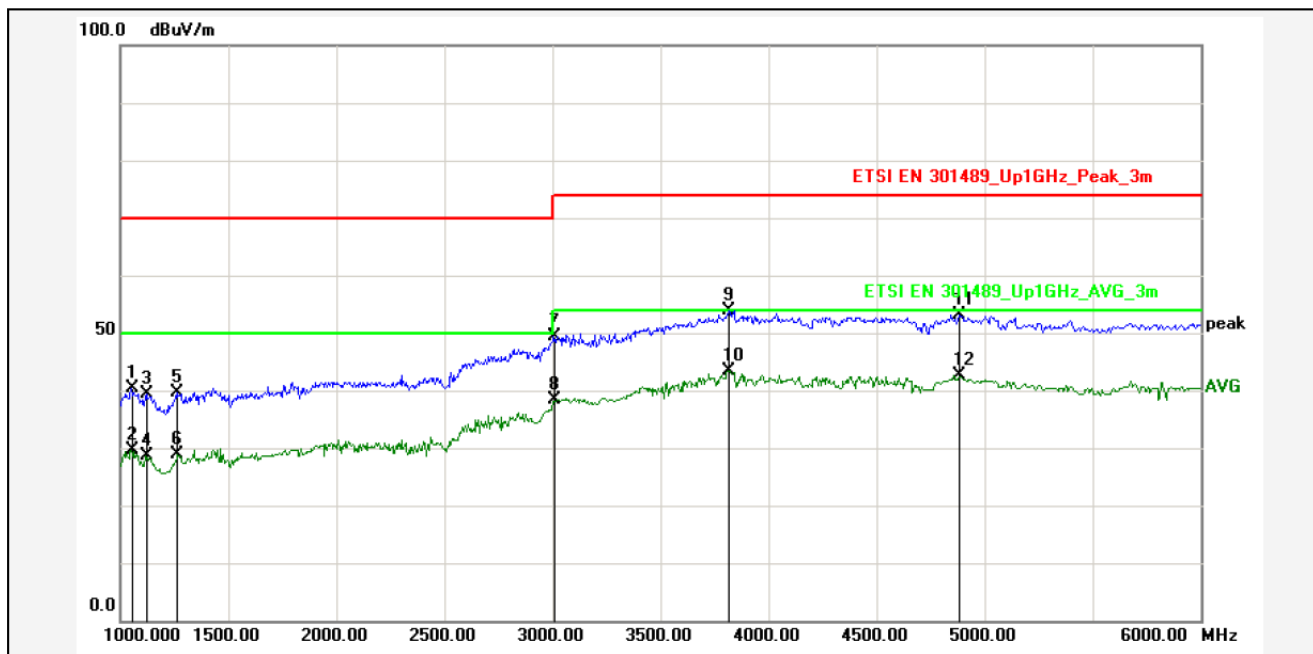
Test Time: 2016-5-19 14:09:43



Report No.: W12
 Test Standard: ETSI EN 301489_Up1GHz_Peak_3m
 Test item: Radiation Emission
 Applicant: FENDA
 Product: BLUETOOTH SPEAKER
 Model No.: W12
 Test Mode: Charging + TX+RX(BT Link)
 Remark:

Test Distance: 3m
 Ant. Polarization: Horizontal
 Temp.(C)/Hum.(%): 22(C) / 54 %
 Power Rating: AC230V 50Hz
 Test Engineer: Anson

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	1341.581	2.81	34.15	36.96	70.00	-33.04	peak			P	
2	1341.581	2.81	24.55	27.36	50.00	-22.64	AVG			P	
3	1654.476	4.80	35.70	40.50	70.00	-29.50	peak			P	
4	1654.476	4.80	25.77	30.57	50.00	-19.43	AVG			P	
5	2066.100	7.14	33.66	40.80	70.00	-29.20	peak			P	
6	2066.100	7.14	22.81	29.95	50.00	-20.05	AVG			P	
7	2304.722	7.77	35.09	42.86	70.00	-27.14	peak			P	
8	2304.722	7.77	24.08	31.85	50.00	-18.15	AVG			P	
9	3103.070	9.55	35.52	45.07	74.00	-28.93	peak			P	
10	3103.070	9.55	25.19	34.74	54.00	-19.26	AVG			P	
11	5079.058	15.65	38.14	53.79	74.00	-20.21	peak			P	
12	5079.058	15.65	27.50	43.15	54.00	-10.85	AVG			P	



Report No.: W12	Test Standard: ETSI EN 301489_Up1GHz_Peak_3m	Test Distance: 3m
Test item: Radiation Emission	Ant. Polarization: Vertical	Temp.(C)/Hum.(%): 22(C) / 54 %
Applicant: FENDA	Power Rating: AC230V 50Hz	Test Engineer: Anson
Product: BLUETOOTH SPEAKER		
Model No.: W12		
Test Mode: Charging + TX+RX(BT Link)		
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	1053.334	1.48	38.91	40.39	70.00	-29.61	peak			P	
2	1053.334	1.48	28.03	29.51	50.00	-20.49	AVG			P	
3	1123.517	1.78	37.71	39.49	70.00	-30.51	peak			P	
4	1123.517	1.78	26.78	28.56	50.00	-21.44	AVG			P	
5	1264.555	2.40	37.14	39.54	70.00	-30.46	peak			P	
6	1264.555	2.40	26.45	28.85	50.00	-21.15	AVG			P	
7	3009.976	9.29	40.12	49.41	74.00	-24.59	peak			P	
8	3009.976	9.29	29.20	38.49	54.00	-15.51	AVG			P	
9	3819.945	11.59	42.29	53.88	74.00	-20.12	peak			P	
10	3819.945	11.59	31.77	43.36	54.00	-10.64	AVG			P	
11	4882.743	14.98	38.11	53.09	74.00	-20.91	peak			P	
12	4882.743	14.98	27.60	42.58	54.00	-11.42	AVG			P	

8.2 AC POWER CONDUCTED EMISSION

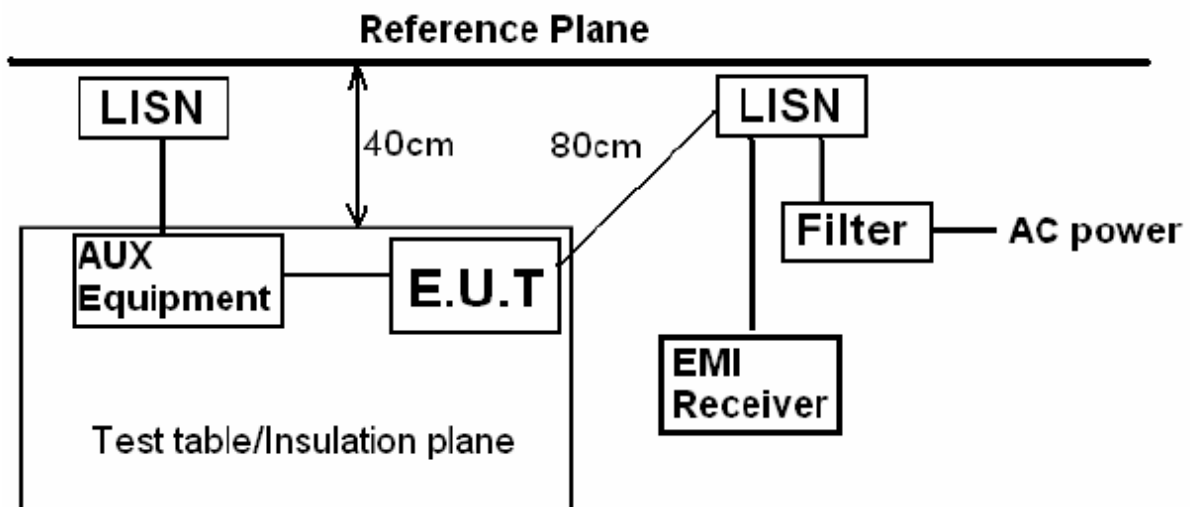
LIMIT

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 (MHz)	Limits (dB(uV))	
	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



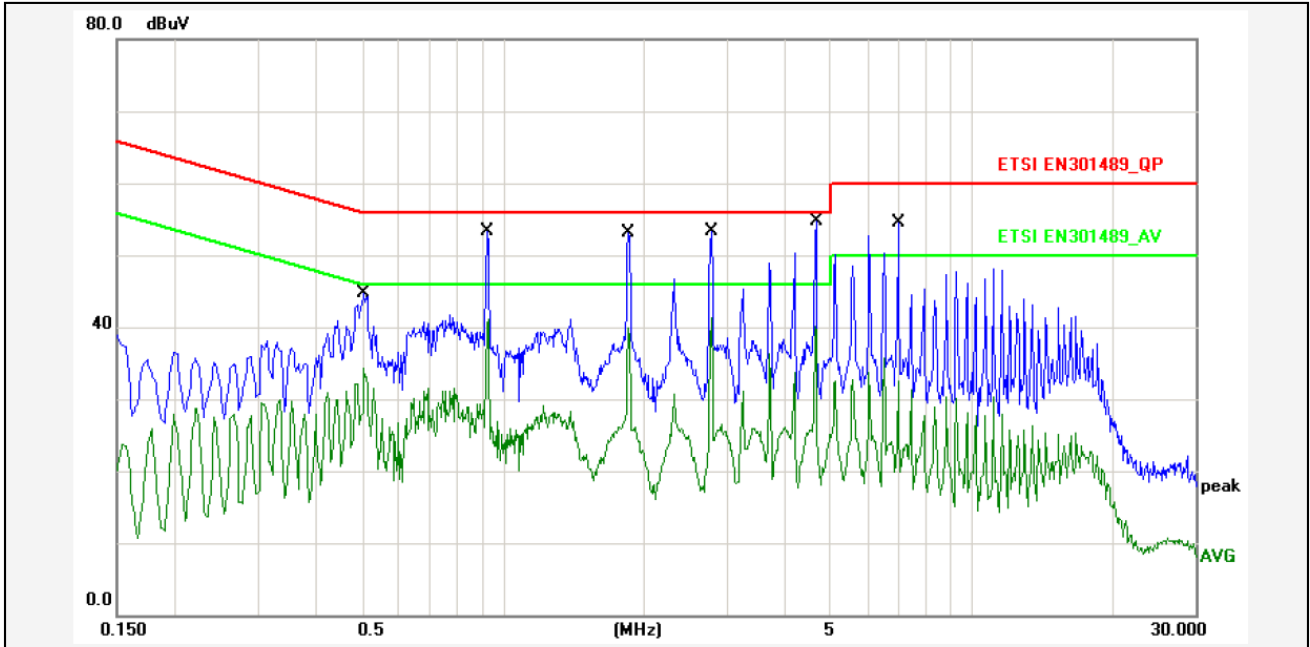
TEST PROCEDURE

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 tables.



Report No.: W12
 Test Standard: ETSI EN301489_QP
 Test item: Conducted Emission
 Applicant: FENDA
 Product: BULETOOTH SPEAKER
 Model No.: W12
 Phase: L1
 Temp.()/Hum.(%): 22(C) / 55 %
 Power Rating: AC230V 50Hz
 Test Engineer: chilaw

Test Mode: Charging + TX+RX(BT Link)
 Remark:

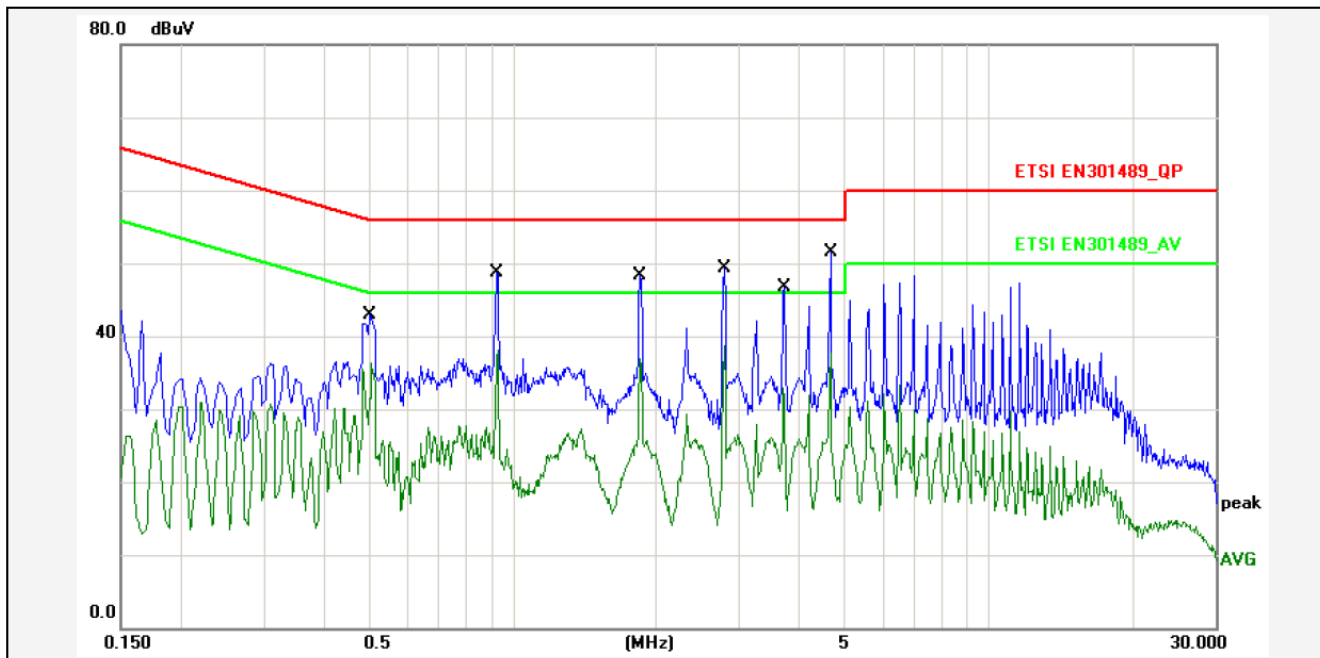
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.5045	10.80	31.00	41.80	56.00	-14.20	QP	P	
2	0.5045	10.80	21.50	32.30	46.00	-13.70	AVG	P	
3	0.9233	10.80	39.40	50.20	56.00	-5.80	QP	P	
4	0.9233	10.80	28.30	39.10	46.00	-6.90	AVG	P	
5	1.8483	10.80	39.30	50.10	56.00	-5.90	QP	P	
6	1.8483	10.80	27.10	37.90	46.00	-8.10	AVG	P	
7	2.7794	10.80	39.50	50.30	56.00	-5.70	QP	P	
8	2.7794	10.80	28.40	39.20	46.00	-6.80	AVG	P	
9	4.6467	10.80	40.80	51.60	56.00	-4.40	QP	P	
10	4.6467	10.80	27.40	38.20	46.00	-7.80	AVG	P	
11	6.9508	10.80	40.60	51.40	60.00	-8.60	QP	P	
12	6.9508	10.80	19.60	30.40	50.00	-19.60	AVG	P	



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Site: Conduction

Test Time: 2016-5-26 10:46:59

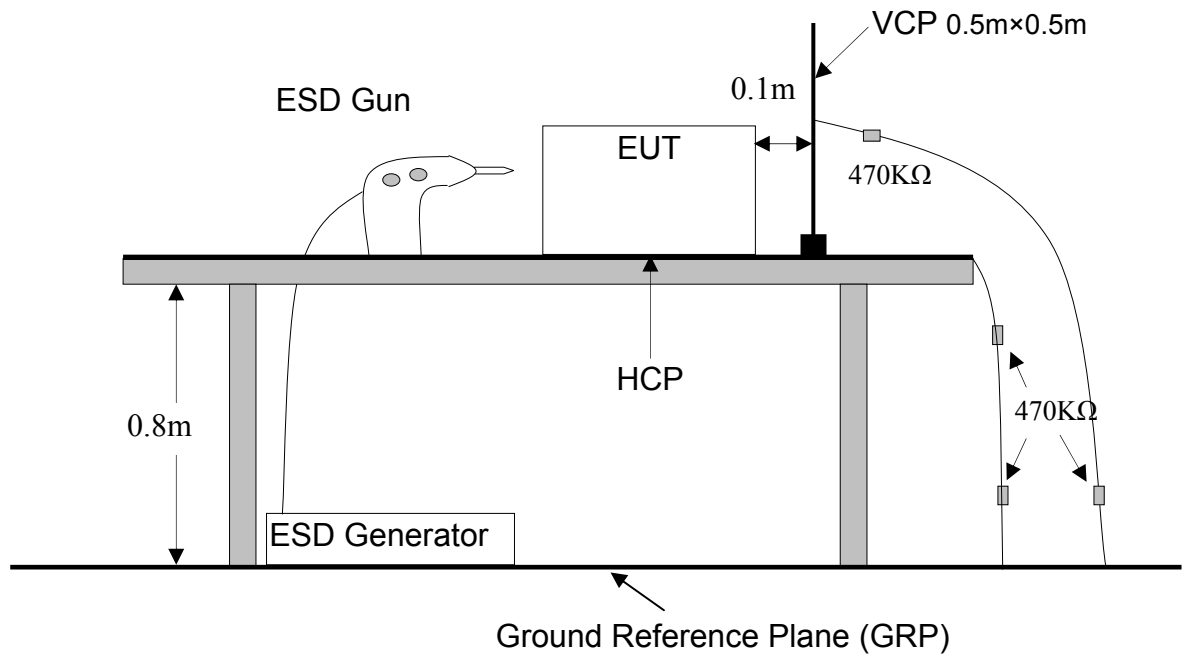


Report No.: W12
 Test Standard: ETSI EN301489_QP
 Test item: Conducted Emission
 Applicant: FENDA
 Product: BULETOOTH SPEAKER
 Model No.: W12
 Phase: N
 Temp.()/Hum.(%): 22(C) / 55 %
 Power Rating: AC230V 50Hz
 Test Engineer: chilaw
 Test Mode: Charging + TX+RX(BT Link)
 Remark:

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.4993	10.80	29.00	39.80	56.01	-16.21	QP	P	
2	0.4993	10.80	23.60	34.40	46.01	-11.61	AVG	P	
3	0.9233	10.80	34.90	45.70	56.00	-10.30	QP	P	
4	0.9233	10.80	25.40	36.20	46.00	-9.80	AVG	P	
5	1.8483	10.80	34.50	45.30	56.00	-10.70	QP	P	
6	1.8483	10.80	24.10	34.90	46.00	-11.10	AVG	P	
7	2.7794	10.80	35.60	46.40	56.00	-9.60	QP	P	
8	2.7794	10.80	25.80	36.60	46.00	-9.40	AVG	P	
9	3.7197	10.80	32.90	43.70	56.00	-12.30	QP	P	
10	3.7197	10.80	20.00	30.80	46.00	-15.20	AVG	P	
11	4.6467	10.80	37.60	48.40	56.00	-7.60	QP	P	
12	4.6467	10.80	24.90	35.70	46.00	-10.30	AVG	P	

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

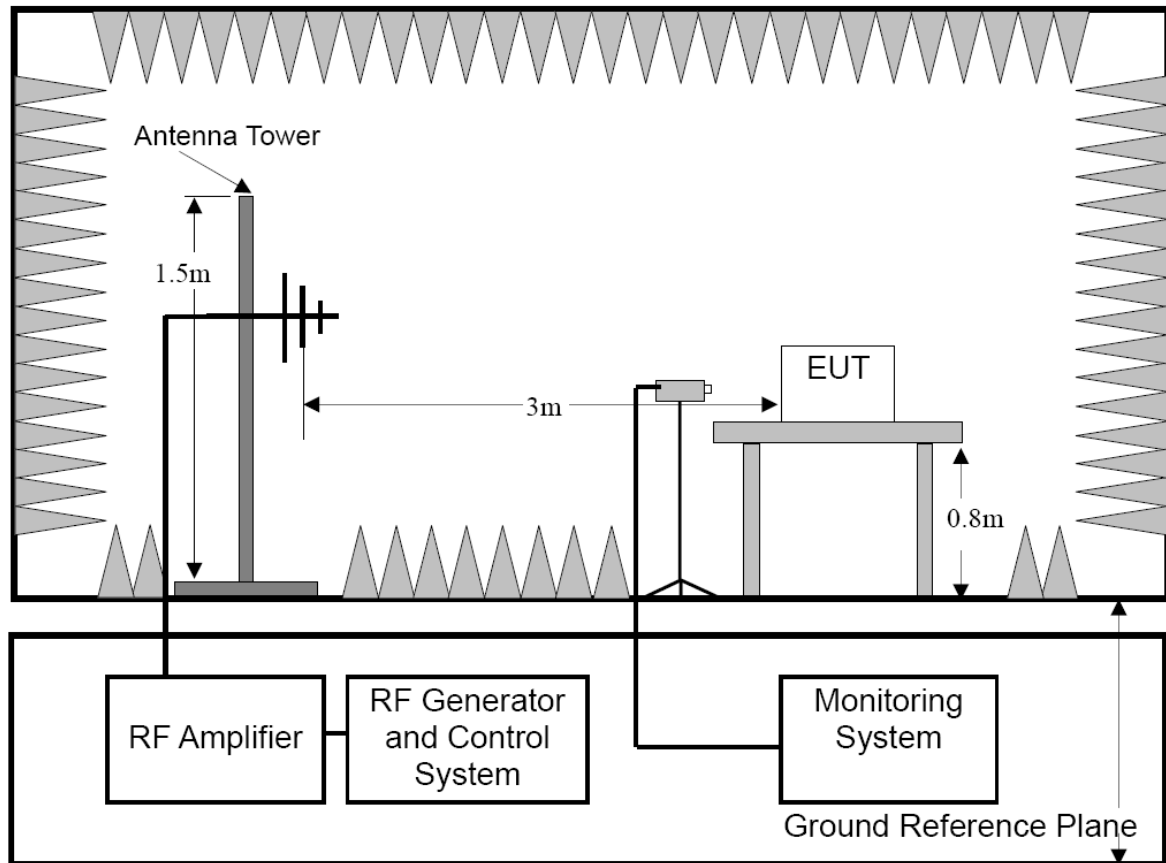
please refer to following data table.

Test Condition			
Temperature	26°C	Test Voltage	AC 230V/50Hz, DC 3.7V
Humidity	56%RH	Tested by	Steven
Pressure	1022mbar	Performance Criterion :	CR & CT & B
Ground Bond Resistance		0.2 Ω	
Time Between Each Discharge :		1 second	
Test Mode		TX+RX, Charging+TX+RX	
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 Type	Level		Result
Contact Discharge	± 2, ± 4kV		Pass
Air Discharge	± 2, ± 4, ± 8kV		Pass*
Indirect HCP Discharge	± 2, ± 4kV		Pass
Indirect VCP Discharge	± 2, ± 4kV		Pass

Note: During the test, the EUT stops working, but it can be recovered by users after test. This test results was performed based on the client's product specifications and user's manual

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	26°C	Test Voltage	AC 230V 50Hz, DC 3.7V
Humidity	56%RH	Tested by	Steven
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 Vertical	
Test Mode		TX+RX, Charging+TX+RX	
Test Level		3V/m	
Test Result			
Frequency (MHz)	Exposed Side		Result
80 to 1000 1400 to 2700	Front		Pass
80 to 1000 1400 to 2700	Left		Pass
80 to 1000 1400 to 2700	Rear		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. 25, 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 Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Nov. 08, 2015	1 Year
5.	Pulse Limiter	MTS-systemtechnik	MTS-IMP-136	26115-010-0007	Nov. 08, 2015	1 Year

FOR RADIATED EMISSION MEASUREMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Nov. 24, 2015	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Nov. 27, 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)

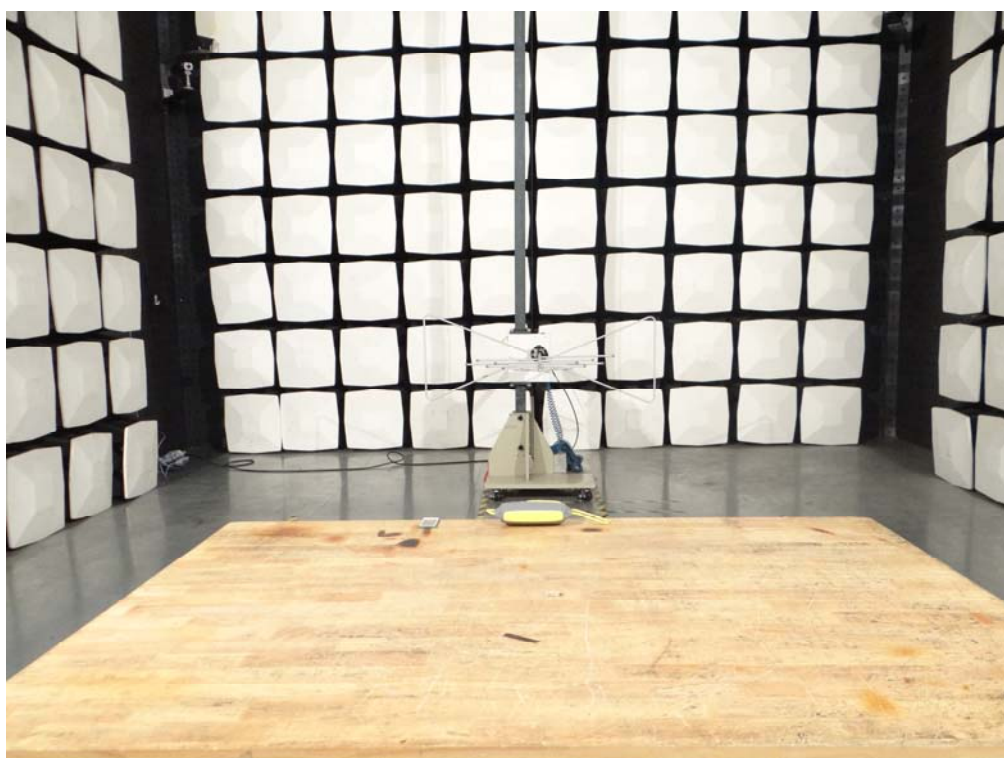
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5181A	MY50142530	Aug 31, 2015	1 Year
2.	Antenna Log-Periodic	CORAD	ATR80M6G	0337307	Aug 31, 2015	1 Year
3.	Switch Controller	CORAD	SC1000	0337343	Aug 31, 2015	1 Year
4.	RF Power Meter	ESE	4242	13984	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	TESEQ	C6187	95175	Aug 31, 2015	1 Year
12	Dual Directional Coupler	TESEQ	CPH-274F	M251304-01	Aug 31, 2015	1 Year

APPENDIX 1 PHOTOGRPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST



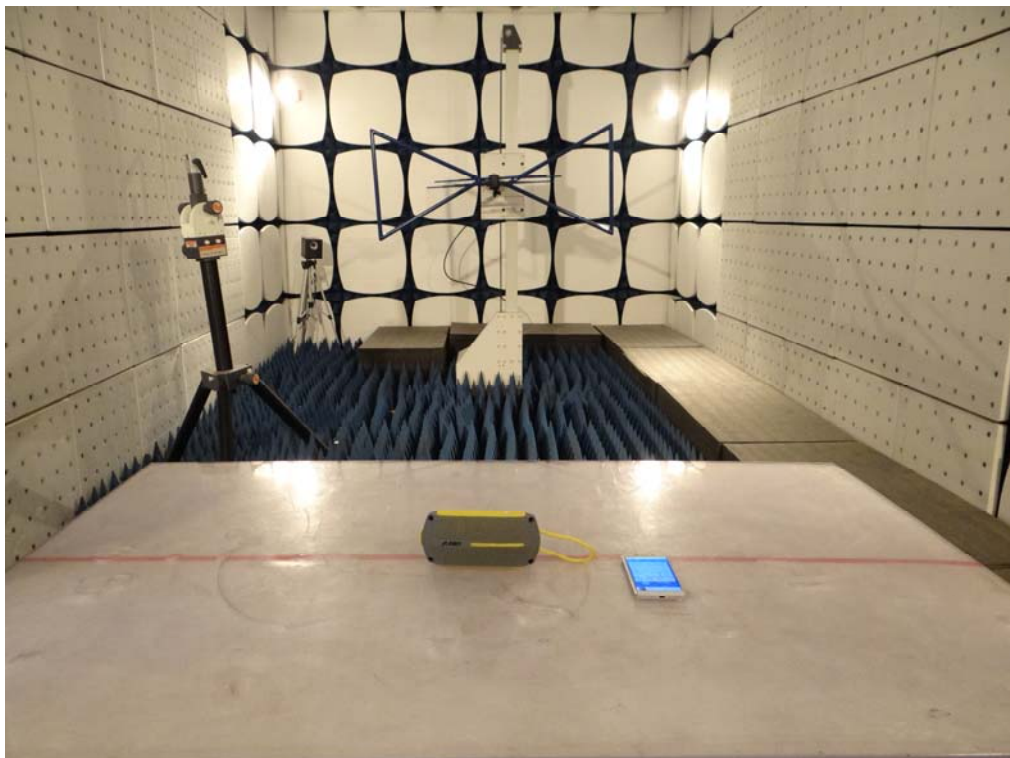
RADIATED EMISSION TEST



ELECTROSTATIC DISCHARGE TEST



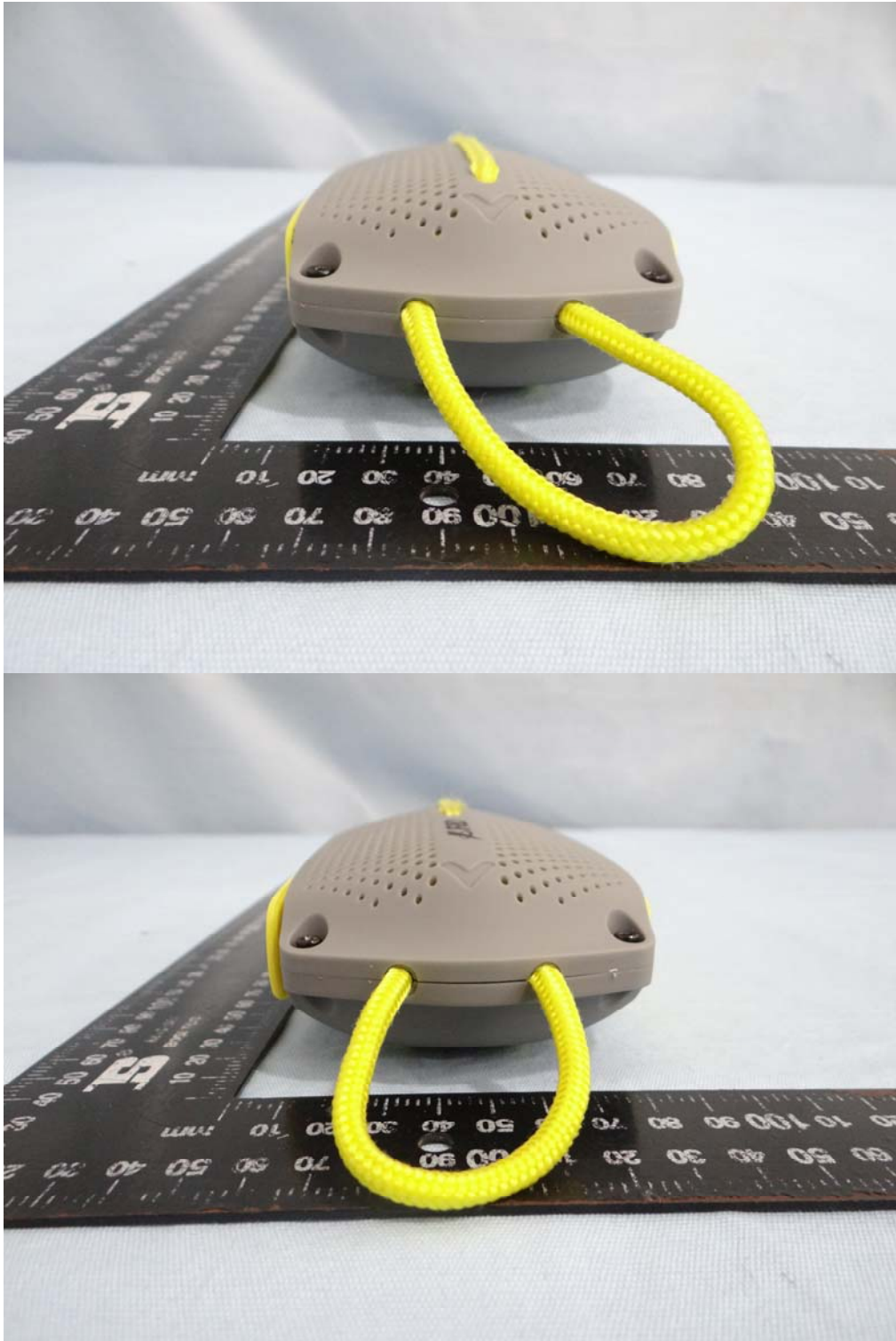
RADIATED ELECTROMAGNETIC FIELD TEST



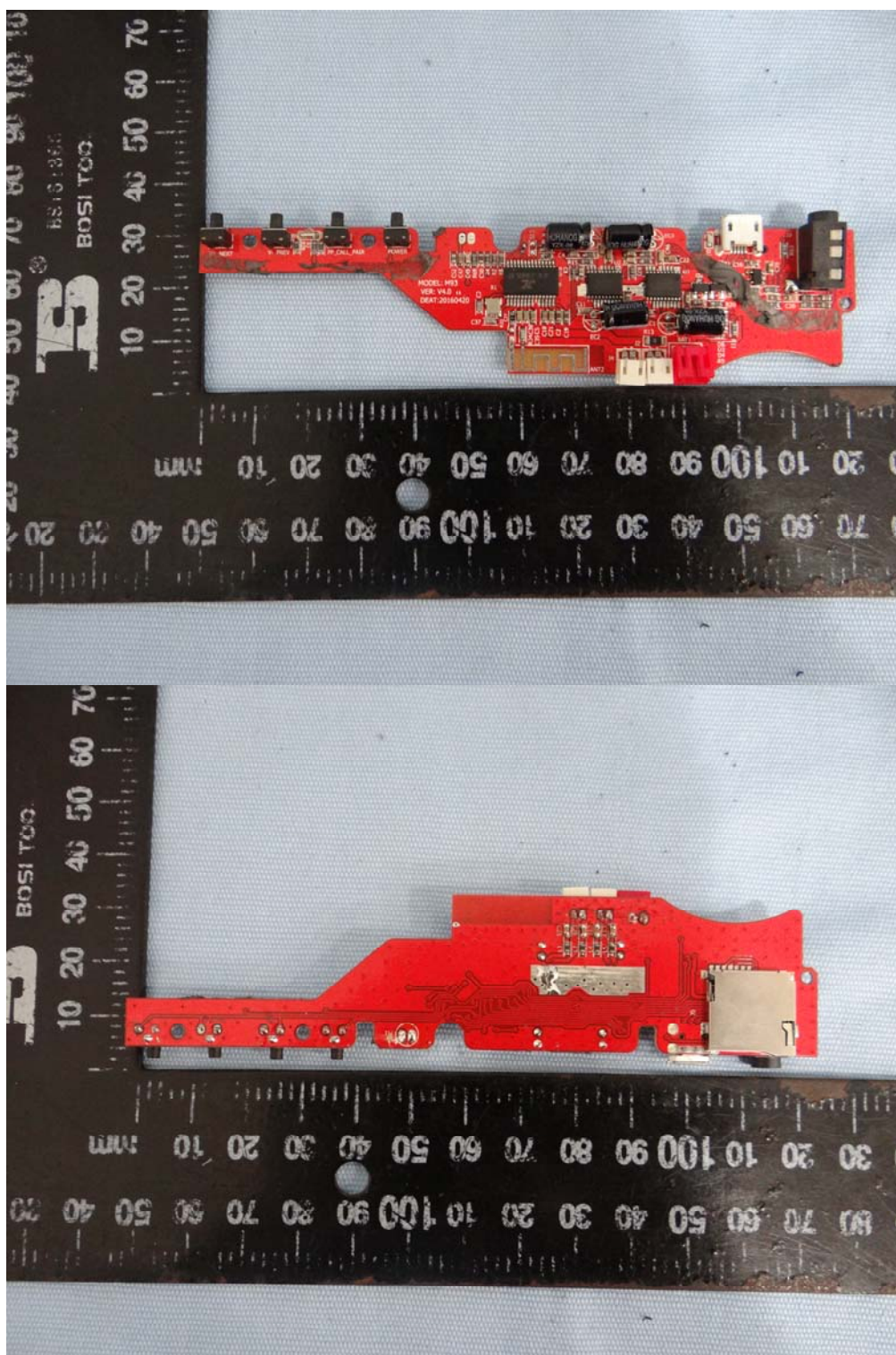
General Appearance of the EUT

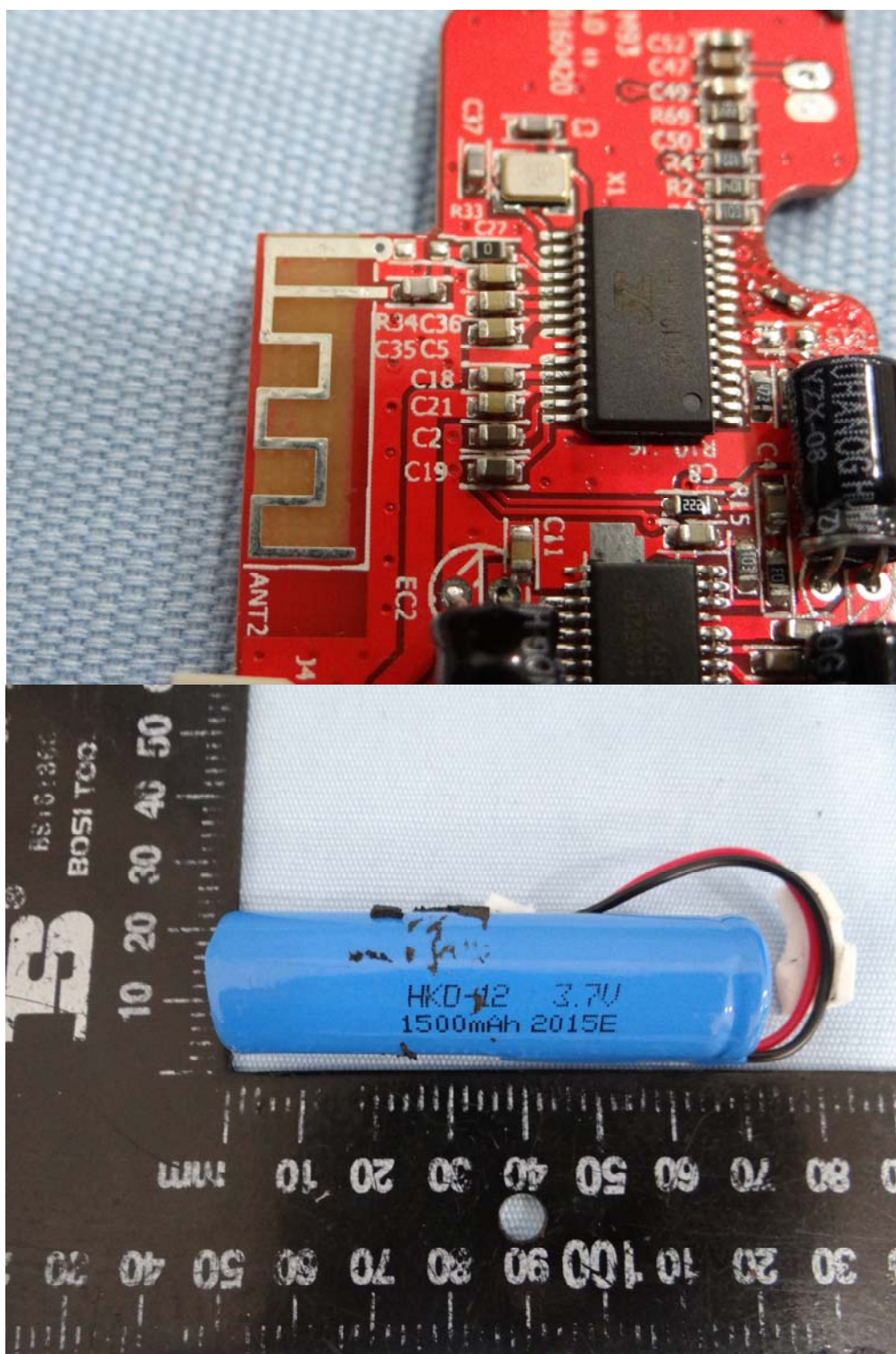












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