SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

588 West Jindu Road,Songjiang District,Shanghai,China

Telephone: +86 (0) 21 6191 5666
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TEST REPORT

Application No. :	SHEM1302000245ME
Applicant:	iSmart Alarm, Inc
FCC ID:	SENDWS3
IC:	10970A-DWS3
Equipment Under Test (EUT): **NOTE:** The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Contact Sensor
Brand Name:	iSmart Alarm
Model:	DWS3
Added Model:	N/A
Standards:	FCC PART 15 Subpart C Section 15.249: 2012 RSS-210 Issue 8 Dec 2010 RSS-Gen Issue 3 Dec 2010 ANSI C63.10 (2009)
Date of Receipt:	Feb. 28, 2013
Date of Test:	Feb. 28, 2013 to Mar.03, 2013
Date of Issue:	Mar. 12, 2013
Test Result :	**PASS ***

. * In the configuration tested, the EUT complied with the standards specified above.

Mar. 2013

Tony Wu

E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00	/	Mar. 12, 2013	/	Original

Authorized for issue by:				
Engineer		Zenger Zhang **Print Name**		Zenger Zhang
Clerk		Amy Wang **Print Name**		Amy Wang
Reviewer		Keny Xu **Print Name**		Keny.xu

3 Test Summary

Test Item	FCC Requirement	IC Requirement	Test method	Result
Antenna Requirement	Section 15.203	RSS-Gen 7.1.2	ANSI C63.10 (2009)	PASS
AC Power Line Conducted Emission	Section 15.207	RSS-Gen Section 7.2.4	ANSI C63.10 (2009)	N/A
Field Strength of the Fundamental Signal	Section 15.249 (a)	RSS 210 A 2.9（a）	ANSI C63.10 (2009)	PASS
Spurious Emissions	Section 15.249 (a)/15.209	RSS 210 A 2.9（a）	ANSI C63.10 (2009)	PASS
20dB Occupied Bandwidth	Section 15.215 (c)	-----	ANSI C63.10 (2009)	PASS
99% Occupied Bandwidth	-----	RSS-Gen section 4.6.1	RSS-Gen section 4.6.1	PASS

Remark: N/A : Not applicable.

4 Contents

5 General Information

5.1 Client Information

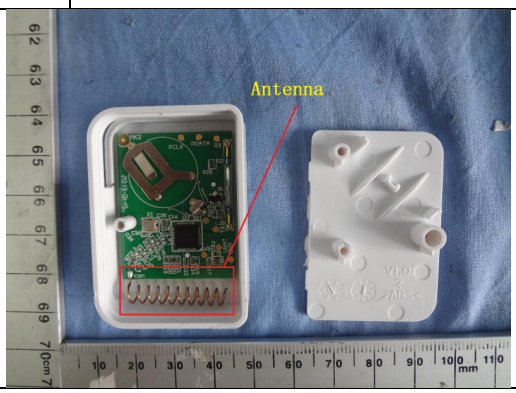
Applicant:	iSmart Alarm, Inc
Address of Applicant:	723 N. Shoreline Blvd Mountain View, CA 94043
Manufacturer:	iSmart Alarm, Inc
Address of Manufacturer:	723 N. Shoreline Blvd Mountain View, CA 94043
Factory:	iSmart Alarm, Inc
Address of Factory:	723 N. Shoreline Blvd Mountain View, CA 94043

5.2 General Description of EUT

Product Name	Contact Sensor
Brand Name:	iSmart Alarm
Model No:	DWS3
Added Model:	N/A
Power Supply:	3V DC
Product Description:	Fixed production

5.3 Technical Specifications:

Operation Frequency:	908MHz/1Channel
Modulation Technique:	GFSK
Antenna Type	Integral
Antenna Gain	0.5dBi



Support Units / Associated Equipments:

The EUT has been tested independently.

5.4 Test Environment and Mode

Operating Environment:	
Temperature:	22.0 °C
Humidity:	55% RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Transmitting mode:	Keep the EUT on continuous transmitting mode
Test battery:	4.5V DC(During test use three new alkaline batteries)

5.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

  CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

  SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

  The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

6 Test Instruments List

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-03	2013-06-02
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-06-03	2013-06-02
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2012-03-12	2013-03-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-06-03	2013-06-02
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-10-07	2013-10-05
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2009P	--	20121-10-13	2013-10-11
7	CLAMP METER	FLUKE	316	86080010	2012-04-22	2013-04-20
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-10-13	2013-10-11
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2012-06-17	2013-06-16
11	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT1800.0/ 2000.0-0.2/40-5SSK	11	2013-01-24	2014-01-22
12	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0-0.2/40-5SSK	9	2013-01-24	2014-01-22
13	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2012-04-08	2013-04-07
14	Low nosie amplifier	TESEQ	LNA6900	70133	2012-07-05	2013-07-04
15	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-06-04	2013-06-03
16	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2012-05-07	2013-05-06
18	AVG Power Sensor	Rohde & Schwarz	NRP-Z22	1137	2012-05-07	2013-05-06
20	Power meter	Rohde & Schwarz	NRP	101641	2012-05-05	2013-05-04
21	Active Loop Antenna	Beijing Daze	ZN30900A	0097	2012-10-28	2013-10-27

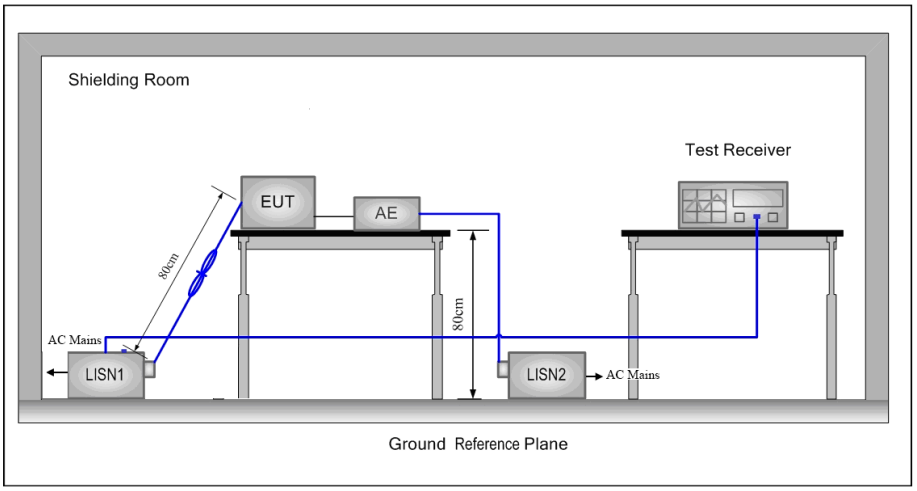
7 Test results and Measurement Data

7.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	Integral antenna
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.5dBi.	

7.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207 RSS-Gen Section 7.2.4
Test Method:	ANSI C63.10: 2009
Test Frequency Range:	150KHz to 30MHz
Limit:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.

Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	N/A
Test Results:	N/A

Measurement Data

N/A

Remark : For the device is powerd by battery so there is no need to test the Conducted Emission.

7.3 Field Strength of the Fundamental Signal

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209 RSS 210 A 2.9（a）
Test Method:	ANSI C63.10: 2009
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
902MHz~928MHz	94.0	Quasi-peak Value
	114.0	Peak Value

Test Setup:

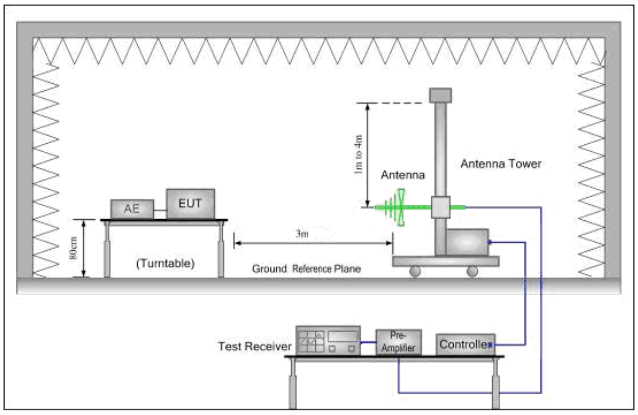


Figure 1. 30MHz to 1GHz

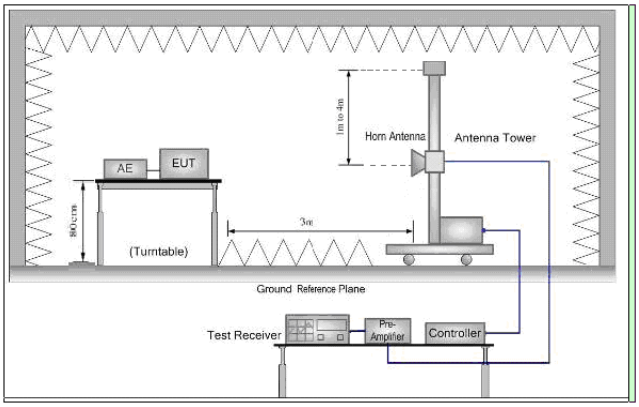


Figure 2. Above 1 GHz

Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground

	to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning. And found the Z axis positioning which it is worse case, Only the test worst case mode is recorded in the report. i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting mode
Test Results:	Pass

7.3.1 Measurement Data

Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
908.00	80.47	23.06	23.80	3.67	83.40	94.00	-10.60	QP	Horizontal
908.00	87.39	23.06	23.80	3.67	90.32	94.00	-3.68	QP	Vertical

7.4 Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209 RSS 210 A 2.9（a）
Test Method:	ANSI C63.10: 2009
Frequency Range	9KHz-10GHz
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:
(Spurious Emissions)

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Test Setup:	

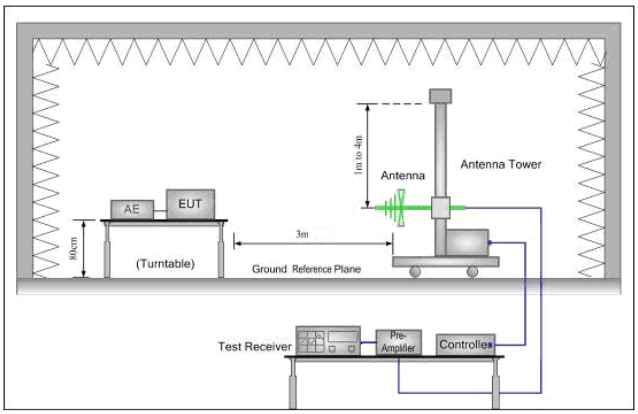


Figure 1. 30MHz to 1GHz

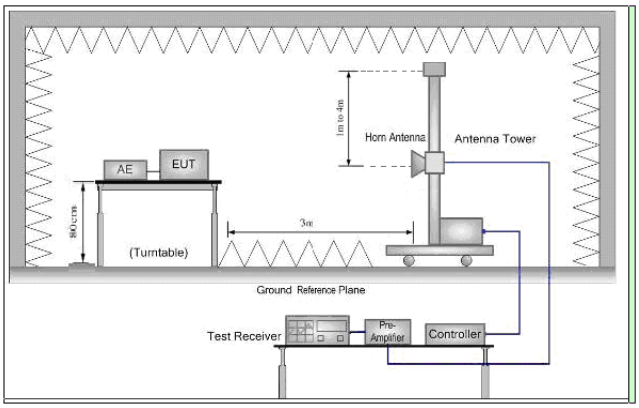


Figure 2. Above 1 GHz

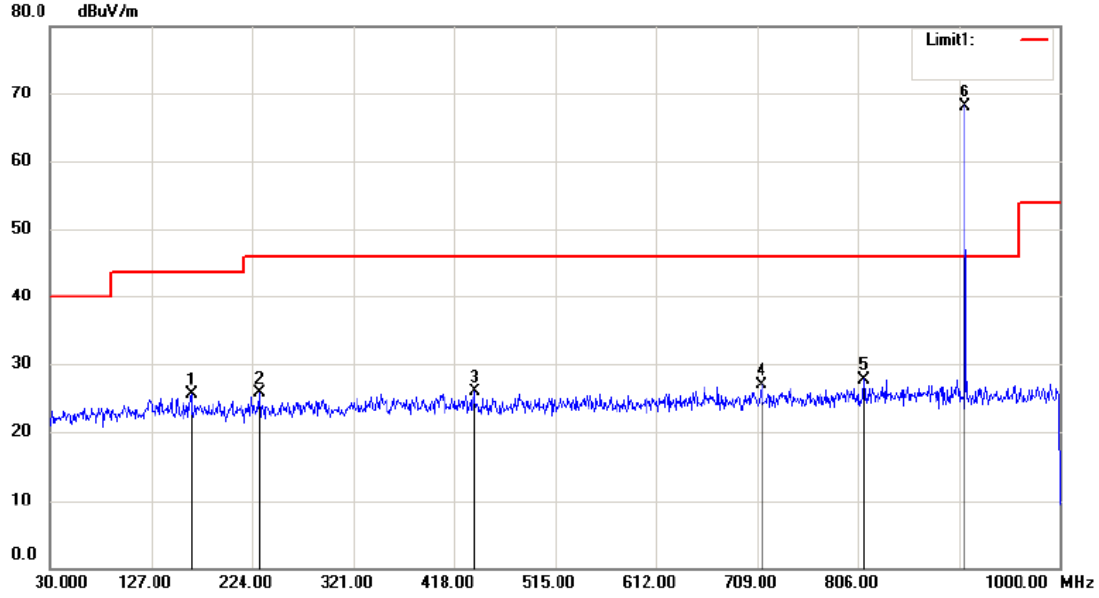
Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report. i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting mode
Test Results:	Pass

7.4.1 Measurement Data

30MHz~1GHz	
Test mode:	Transmitting mode

QP value:

Vertical:



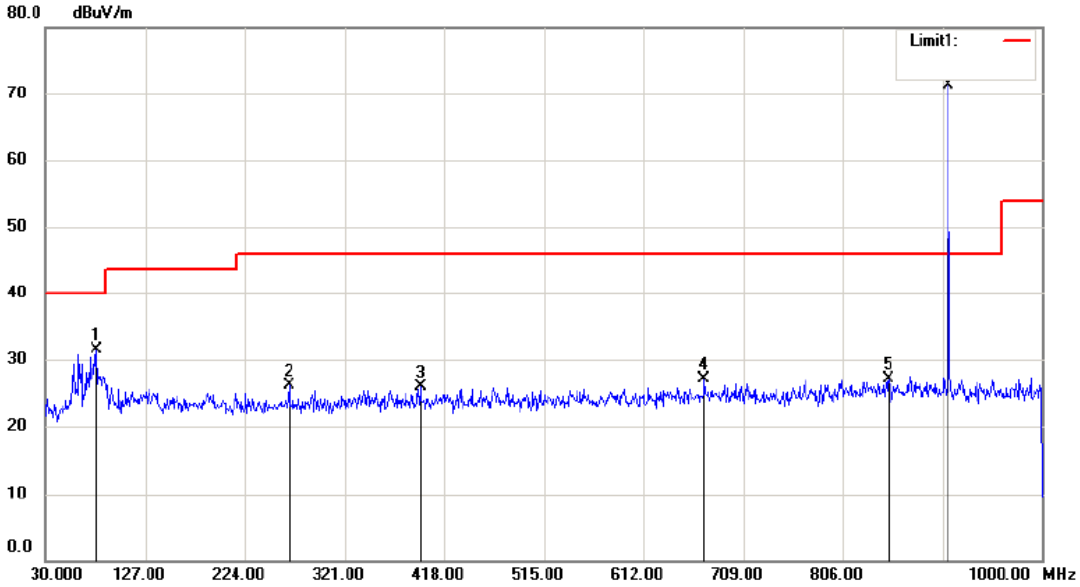
Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	165.8000	24.40	peak	1.14	25.54	43.50	-17.96
2	230.7900	24.30	peak	1.32	25.62	46.00	-20.38
3	437.4000	24.00	peak	1.88	25.88	46.00	-20.12
4	712.8800	24.28	peak	2.66	26.94	46.00	-19.06
5	811.8200	25.20	peak	2.60	27.80	46.00	-18.20
6	908.8200	65.25	peak	2.95	68.20	46.00	22.20

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

2. If Peak Result comply with QP limit,QP Result is deemed to comply with QP limit

3. Mark 6 is the fundamental signal

Horizontal:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	79.4700	30.82	peak	0.73	31.55	40.00	-8.45
2	266.6800	24.62	peak	1.42	26.04	46.00	-19.96
3	394.7200	24.12	peak	1.72	25.84	46.00	-20.16
4	671.1700	24.52	peak	2.53	27.05	46.00	-18.95
5	850.6200	24.43	peak	2.75	27.18	46.00	-18.82
6	908.8200	68.29	peak	2.95	71.24	46.00	25.24

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

2. If Peak Result comply with QP limit,QP Result is deemed to comply with QP limit

3. Mark 6 is the fundamental signal

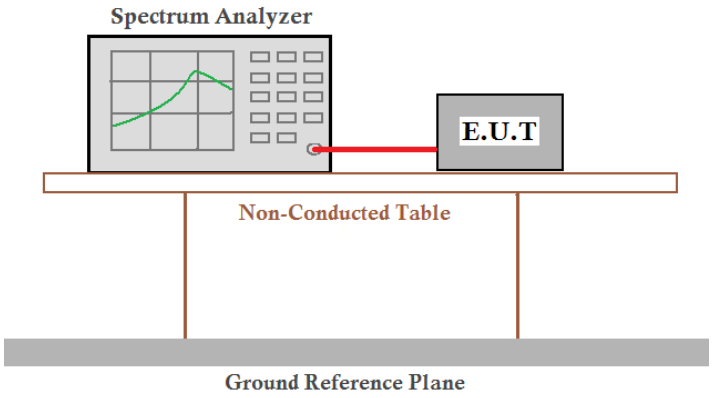
1GHz - 10GHz					
Test mode:	Transmitting mode	Test channel:	908MHz	Remark:	

Frequency (MHz)	Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Detector	Over Limit (dB)	Polarization
1810.75	-8.63	78.32	69.69	74	peak	-4.31	Vertical
1811.39	-8.61	35.50	26.89	54	AVG	-27.11	Vertical
2715.50	-5.87	55.02	49.15	74	peak	-24.85	Vertical
5441.50	1.00	55.79	56.79	74	peak	-17.21	Vertical
5441.74	1.00	31.39	32.39	54	AVG	-21.61	Vertical
6359.70	3.10	49.62	52.72	74	peak	-21.28	Vertical
7261.33	6.52	28.63	35.15	54	AVG	-18.85	Vertical
7262.75	6.53	51.04	57.57	74	peak	-16.43	Vertical
1810.75	-8.63	80.36	71.73	74	peak	-2.27	Horizontal
1811.44	-8.59	38.97	30.38	54	AVG	-23.62	Horizontal
2713.50	-5.87	76.98	71.11	74	peak	-2.89	Horizontal
2714.44	-5.86	36.33	30.47	54	AVG	-23.53	Horizontal
3632.00	-3.40	50.97	47.57	54	peak	-6.43	Horizontal
5446.51	1.00	30.35	31.35	54	AVG	-22.65	Horizontal
5453.25	1.01	55.79	56.80	74	peak	-17.20	Horizontal
6358.00	3.10	47.17	50.27	54	AVG	-3.73	Horizontal
7262.75	6.53	46.08	52.61	54	AVG	-1.39	Horizontal

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
2) The disturbance below 30MHz was very low, and the above harmonics were the highest point could be
2) found when testing, so only the above harmonics had been displayed.

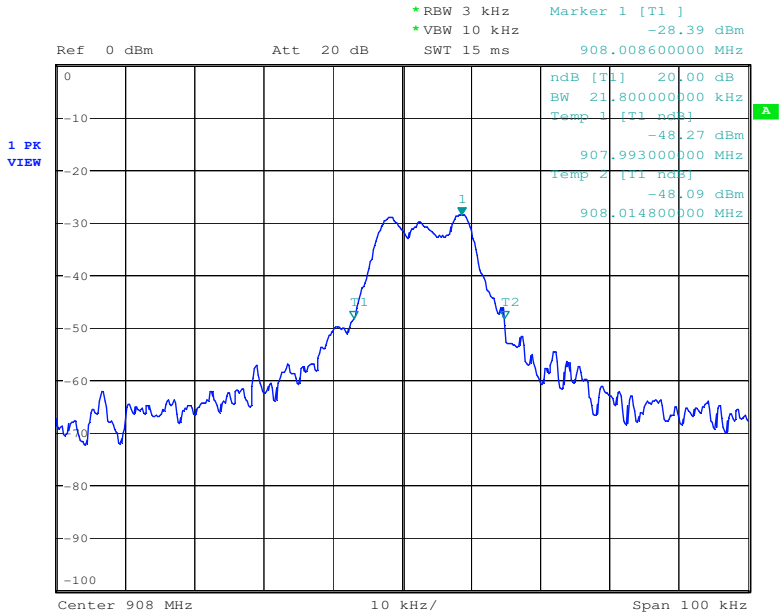
7.5 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2009
Test Setup:	
Instruments Used:	Refer to section 5.12 for details
Test mode:	Transmitting mode
Limit:	N/A
Test Results:	Pass

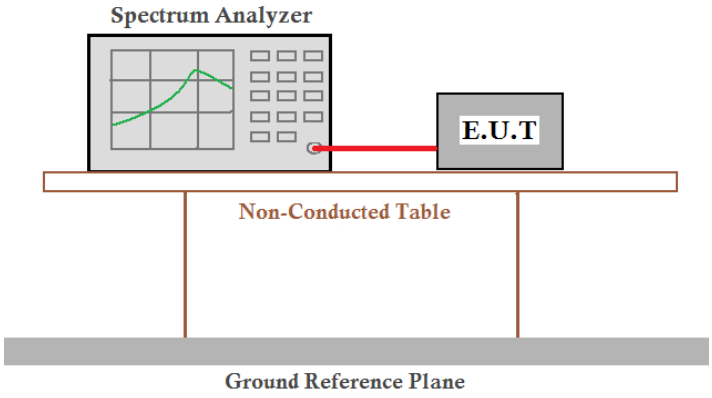
Measurement Data

Test channel	20dB bandwidth	Results
908MHz	21.80KHz	Pass

Test plot as follows:



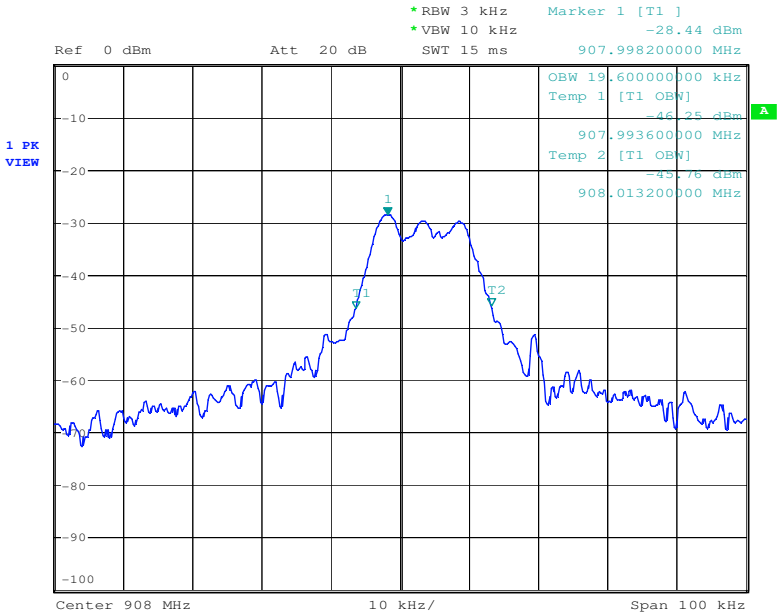
7.6 99% Occupied Bandwidth

Test Requirement:	RSS-Gen section 4.6.1
Test Method:	RSS-Gen section 4.6.1
Test Setup:	
Instruments Used:	Refer to section 5.12 for details
Test mode:	Transmitting mode
Limit:	N/A
Test Results:	Pass

Measurement Data

Test channel	99% bandwidth	Results
908MHz	19.6KHz	Pass

Test plot as follows:



4 Test Setup Photographs

Refer to the < DWS3 Test Setup photos>.

5 EUT Constructional Details

Refer to the < DWS3 External Photos > & < DWS3 Internal Photos >.