



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

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Report No.: SHEM130300048102
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FCC REPORT

Application No. :	SHEM1303000481RF
Applicant:	Axesstel, Inc.
FCC ID:	PH7A1100
Equipment Under Test (EUT): NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	CDMA 1x Alert System (Sensor)
Brand Name:	Axesstel
Model:	AX54(Sensor)
Added Model:	N/A
Standards:	FCC PART 15 Subpart C: 2012
Date of Receipt:	Mar.29, 2013
Date of Test:	Apr. 1, 2013 to Apr. 23, 2013
Date of Issue:	Apr.23, 2013
Test Result :	PASS *

*In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Tony Wu

E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	Apr.23, 2013	/	Original

Authorized for issue by:				
Engineer		Zenger Zhang _____		<i>Zenger Zhang</i> _____
		Print Name		
Clerk		Amy Wang _____		<i>Amy Wang</i> _____
		Print Name		
Reviewer		Keny Xu _____		<i>Keny Xu</i> _____
		Print Name		



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3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10(2009)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10(2009)	N/A
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.231 (b)	ANSI C63.10(2009)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.231 (b)/15.209	ANSI C63.10(2009)	PASS
20dB Bandwidth	47 CFR Part 15, Subpart C Section 15.231 (c)	ANSI C63.10(2009)	PASS
Dwell Time	47 CFR Part 15, Subpart C Section 15.231 (a)	ANSI C63.10(2009)	PASS

Remark: This EUT is powered by battery only; therefore the AC Conducted Emission test is not applicable.

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5 General Information

5.1 Client Information

Applicant:	Axesstel, Inc
Address of Applicant:	6815 Flanders Drive, Ste 210, San Diego, CA92121, USA
Manufacturer:	Axesstel (Shanghai) Ltd.
Address of Manufacturer:	Room 1101, Building 19, No.1515 Gumei Road, Xuhui District, Shanghai
Factory:	Eastcom incorporated Co.,LTD

5.2 General Description of E.U.T.

Product Name	CDMA 1x Alert System (Sensor)
Brand Name:	Axesstel
Model No:	AX54(Sensor)
Added Model:	N/A
Product Description:	Fixed production

5.3 Technical Specifications:

Operation Frequency:	433.92MHz / 1Channel
Modulation Type:	ASK
Number of Channel:	1
Power Supply:	9V DC (The new battery is used for the EUT during the measurement)
Antenna Type	Integral

5.4 Support equipments for Testing

The EUT has been tested independently.



5.5 Details of Test Mode

Test Mode	Description of Test Mode
Transmitting mode	The EUT on continuously transmitting mode.

5.6 Test Location

All tests were performed at:

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

No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

5.7 Test Facility

● 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.



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6 Equipments Used during Test

Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-06-13	2013-06-12
2	Line impedance stabilization network (LISN)	SCHWARZBECK	NSLK8127	8127-490	2012-06-13	2013-06-12
3	Line impedance stabilization network (LISN)	ETS	3816/2	00034161	2012-06-13	2013-06-12

Radiated Spurious Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-02	2013-06-01
2	Antenna	SCHWARZBECK	VULB9168	9168-313	2012-08-15	2013-08-14
3	CONTROLLER	INNCO	CO200	474	/	/
4	Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-08-15	2013-08-14
5	Antenna	SCHWARZBECK	BBHA9170	9170-373	2012-08-15	2013-08-14
6	Low noise amplifier	LNA6900	TESEQ	71033	2012-08-15	2013-08-14

RF Conducted Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-03	2013-06-01
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-06-03	2013-06-01
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2012-06-03	2013-06-01
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-06-03	2013-06-01
5	Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA91703 73	2012-08-15	2013-08-14
6	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-10-09	2013-10-08
7	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2009P	--	2012-10-09	2013-10-08
8	CLAMP METER	FLUKE	316	86080010	2012-06-03	2013-06-01
9	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-10-09	2013-10-08

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11	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2012-06-03	2013-06-01
12	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT1800.0/2000.0-0.2/40-5SSK	11	2012-06-03	2013-06-01
13	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0-0.2/40-5SSK	9	2012-06-03	2013-06-01
14	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2012-06-03	2013-06-01
15	Low noise amplifier	TESEQ	LNA6900	70133	2012-06-03	2013-06-01
16	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-06-03	2013-06-01
17	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2012-06-03	2013-06-01
18	Active Loop Antenna	Beijing Daze	ZN30900A	0097	2012-10-28	2013-10-27

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7 Test results and Measurement Data

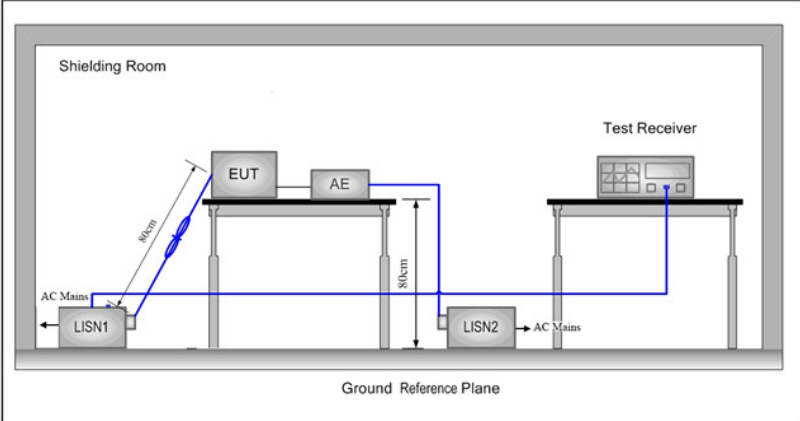
7.1 Antenna Requirement

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:	
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.	



7.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
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:	<ol style="list-style-type: none"> 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. 		

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

Measurement Data

This EUT is powered by battery only, therefore the AC Conducted Emission test is not applicable.

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7.3 Spurious Emissions

7.3.1 Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.231(b) and 15.209				
Test Method:	ANSI C63.10: 2009				
Test frequency range	9KHz – 6GHz				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.015MHz	Quasi-peak	200Hz	1KHz	Quasi-peak
	0.015MHz-30MHz	Quasi-peak	9kHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120 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)	-	Quasi-peak	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	Quasi-peak	30
	1.705MHz-30MHz	30	-	Quasi-peak	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
			74.0	Peak	3
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark	
	433.92MHz	80.8		Average Value	
		100.8		Peak Value	

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Test Procedure:	<ol style="list-style-type: none"> a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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. 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.
Test Setup:	

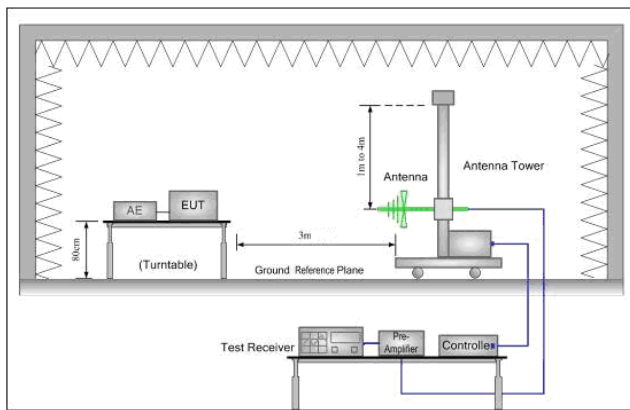


Figure 2. 30MHz to 1GHz

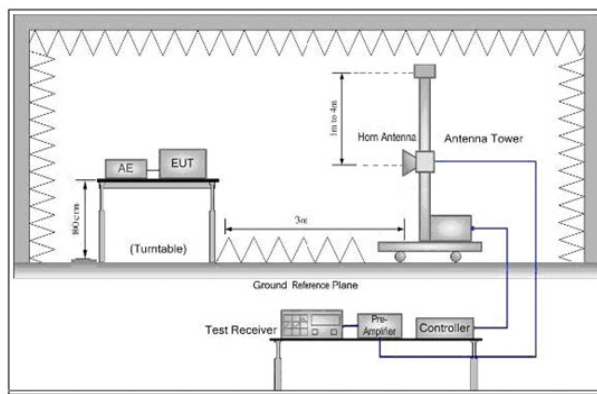


Figure 3. Above 1 GHz

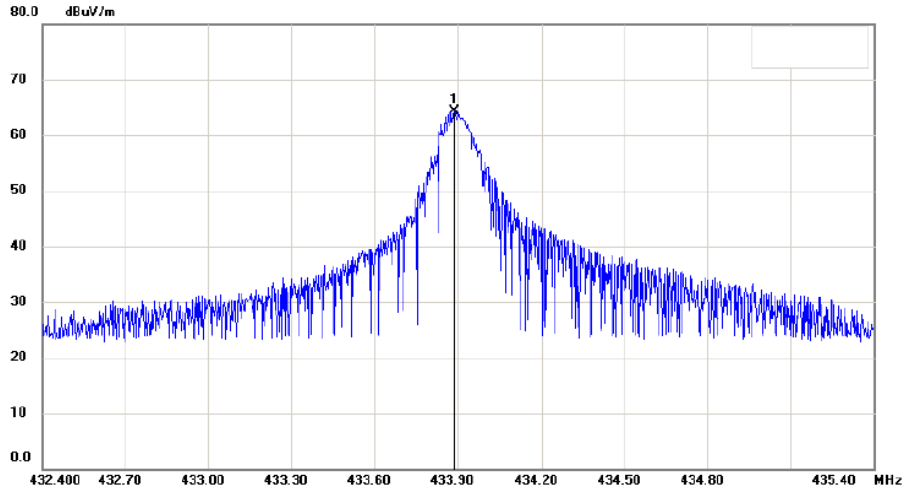
Test mode:	Transmitting mode
Instruments Used:	Refer to section 6 for details
Test Results:	Pass



Measurement Data

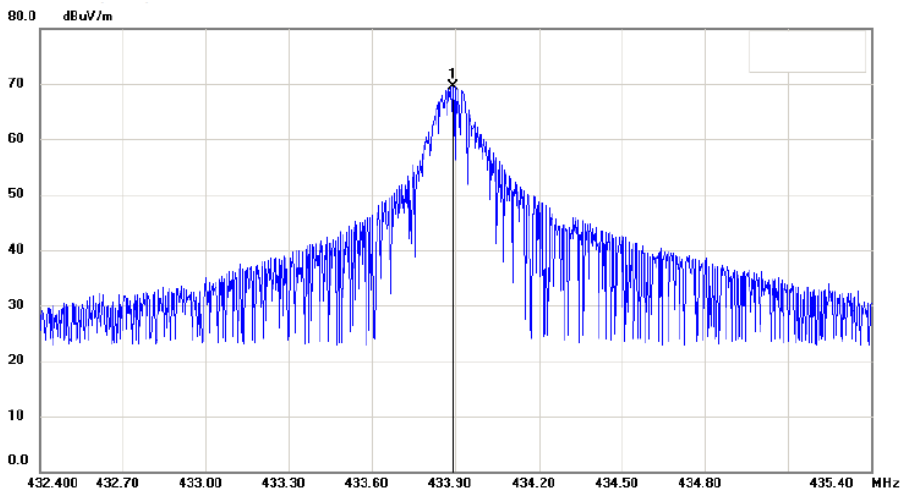
7.3.1.1 Field Strength Of The Fundamental Signal

Horizontal



Frequency (MHz)	Corrected Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Detector
433.92	-15.63	85.22	69.59	80.8	-11.21	Horizontal	Peak

Vertical



Frequency (MHz)	Corrected Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Detector
433.92	-15.63	79.86	64.23	80.8	-16.57	Vertical	Peak

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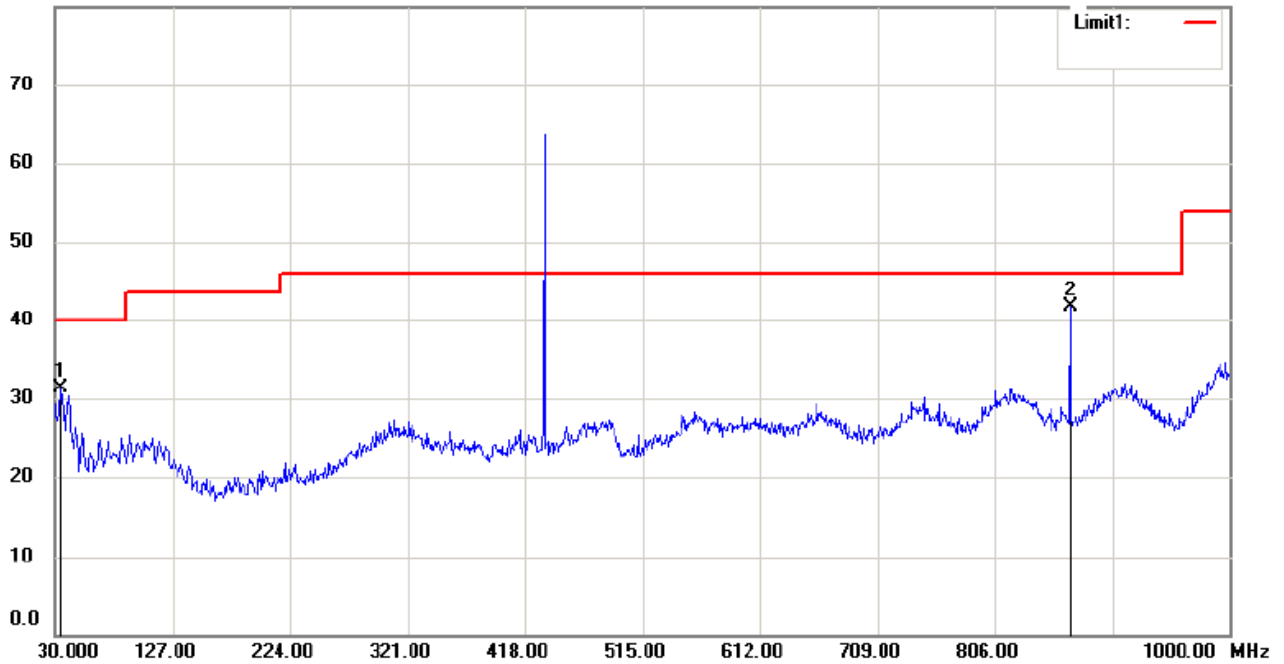


7.3.1.2 Spurious Emissions

Below 1GHz

Vertical:

80.0 dBuV/m



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	34.8500	53.96	peak	-22.65	31.31	40.00	-8.69
2	868.0800	52.15	peak	-10.40	41.75	46.00	-4.25

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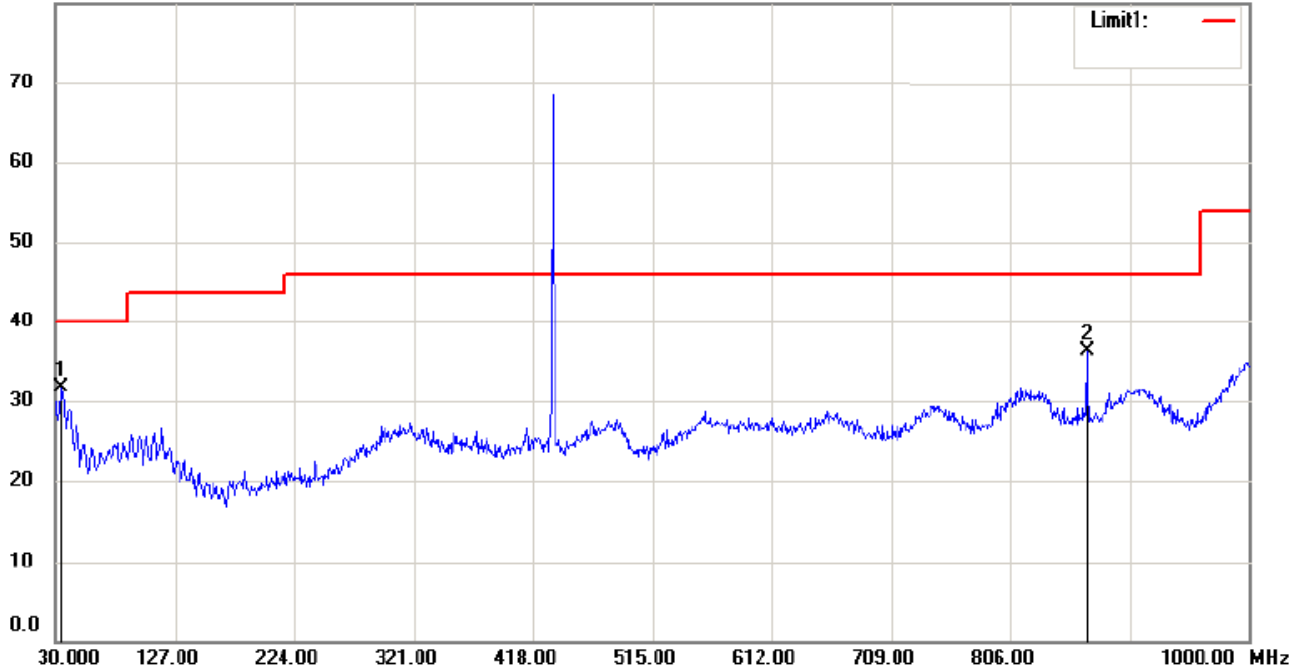
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Horizontal:

80.0 dBuV/m



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	34.8500	54.26	peak	-22.65	31.61	40.00	-8.39
2	868.0800	46.71	peak	-10.40	36.31	46.00	-9.69

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1GHz – 6GHz

Peak Value:

Frequency (MHz)	Factor (dB/m)	Read Level (dBUV)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	Polarization
1300	-12.04	45.76	33.72	54	-20.28	Horizontal
2170	-6.88	41.53	34.65	54	-19.35	Horizontal
3905	-2.54	44.42	41.88	54	-12.12	Horizontal
2170	-6.88	47.77	40.89	54	-13.11	Vertical
2600	-6.15	39.4	33.25	54	-20.75	Vertical
3905	-2.54	49.61	47.07	54	-6.93	Vertical
5645	1.37	43.95	45.32	54	-8.68	Vertical

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 found when testing, so only the above harmonics had been displayed.

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7.4 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.231 (c)
Test Method:	ANSI C63.10:2009
Test Setup:	
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test Mode:	Transmitting mode
Instruments Used:	Refer to section 6 for details
Test Results:	Pass

Measurement Data

20dB bandwidth (kHz)	Limit (kHz)	Results
46.00	108	Pass

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7.5 Dwell Time

Test Requirement:	47 CFR Part 15C Section 15.231 (a) (1)
Test Method:	ANSI C63.10:2009
Test Setup:	
Limit:	Not more than 5 seconds
Test Mode:	Transmitting mode
Instruments Used:	Refer to section 6 for details
Test Results:	Pass

Measurement Data

Test item	Limit (s)	Results
Transmitting time	≤5S	Pass

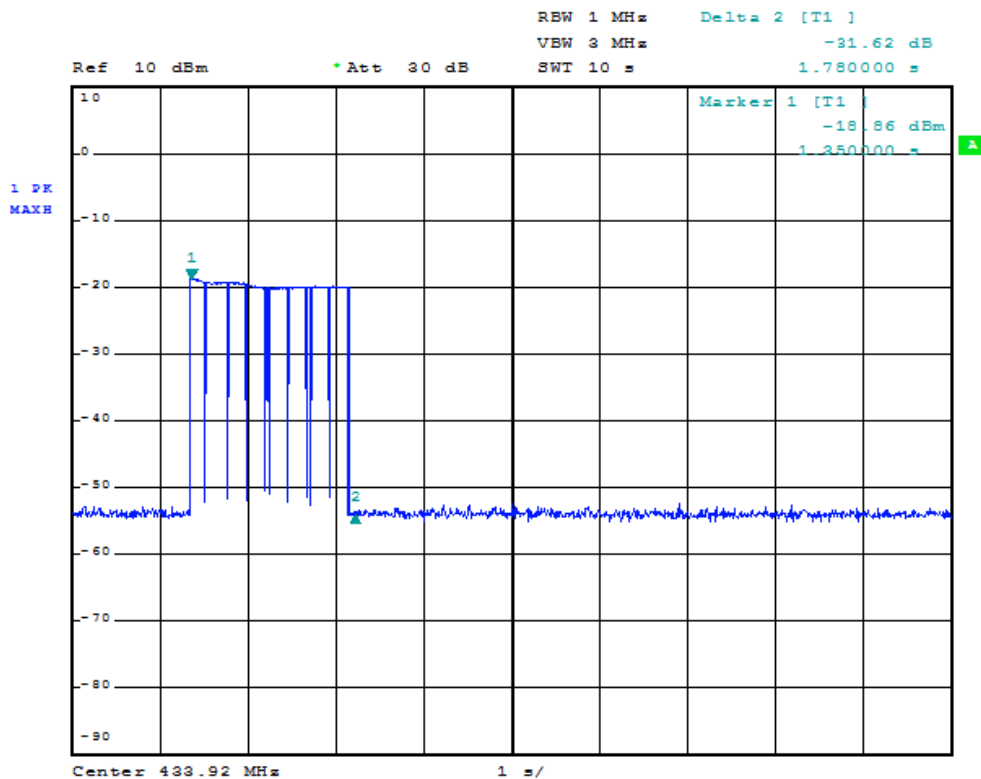


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Test plot as follows:



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8 Photographs - EUT Test Setup

Refer to the < AX54--Test Setup photos>.

9 Photographs - EUT Constructional Details

Refer to the < AX54--External Photos > & < AX54--Internal Photos >.