



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

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Report No.: SHEM130700142701  
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**1 Cover Page**

**FCC REPORT**

<b>Application No. :</b>	SHEM1307001427RF
<b>Applicant:</b>	MEDTRUM TECHNOLOGIES Inc.
<b>FCC ID:</b>	2AARUFM007
<b>Equipment Under Test (EUT):</b>	
<b>NOTE:</b> The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Insulin management system (Wireless USB stick)
Brand Name:	N/A
Model:	MD-SY-007 (MD-FM-007)
Added Model:	N/A
<b>Standards:</b>	FCC PART 15 Subpart C: 2012
<b>Date of Receipt:</b>	July 30, 2013
<b>Date of Test:</b>	August 07, 2013
<b>Date of Issue:</b>	August 08, 2013
<b>Test Result :</b>	<b>PASS *</b>

\*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	/	August 08, 2013	/	Original

Authorized for issue by:			
<b>Engineer</b>	Zenger Zhang _____ Print Name		<i>Zenger Zhang</i> _____
<b>Clerk</b>	Susie Liu _____ Print Name		<i>Susie Liu</i> _____
<b>Reviewer</b>	Keny Xu _____ Print Name		<i>Keny Xu</i> _____

### 3 Test Summary

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

<b>Applicant:</b>	MEDTRUM TECHNOLOGIES Inc.
<b>Address of Applicant:</b>	7F, Building 8, No.200 Niudun Rd, Shanghai, China
<b>Manufacturer:</b>	MEDTRUM TECHNOLOGIES Inc.
<b>Address of Manufacturer:</b>	7F, Building 8, No.200 Niudun Rd, Shanghai, China
<b>Factory:</b>	MEDTRUM TECHNOLOGIES Inc.

### 5.2 General Description of E.U.T.

<b>Product Name</b>	Insulin management system (Wireless USB stick)
<b>Brand Name:</b>	N/A
<b>Model No:</b>	MD-SY-007 (MD-FM-007)
<b>Added Model:</b>	N/A
<b>Product Description:</b>	Portable production, Manual transmission

### 5.3 Technical Specifications:

<b>Operation Frequency:</b>	434.61 MHz
<b>Modulation Technique:</b>	OOK
<b>Number of Channel:</b>	1
<b>Power Supply:</b>	5V DC(USB power)
<b>Antenna Type</b>	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.

## 6 Equipments Used during Test

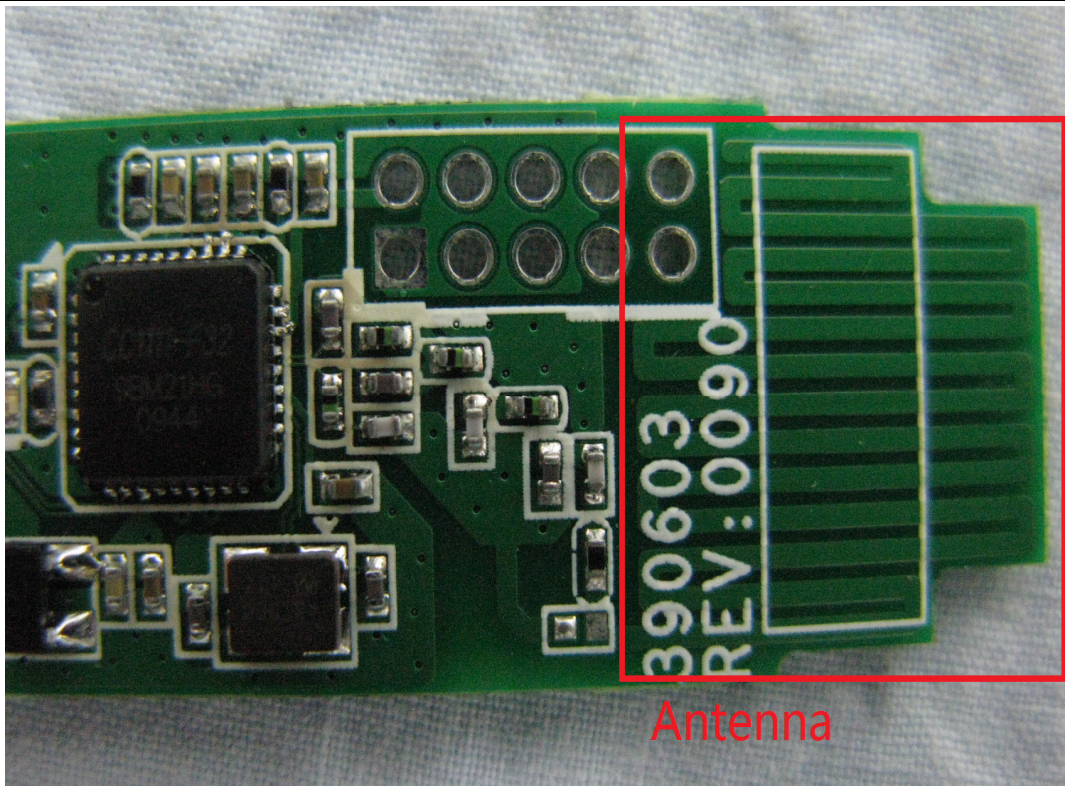
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2014-02-22
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2014-03-06
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2014-06-01
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2014-03-06
5	Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170373	2014-03-06
6	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2013-10-08
7	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2009P	--	2013-10-08
8	CLAMP METER	FLUKE	316	86080010	2014-06-01
9	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2013-10-08
11	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2014-06-01
12	Tunable Notch Filter	Wainwright instruments GmbH	WRCT1800.0 / 2000.0-0.2/40-5SSK	11	2014-06-01
13	Tunable Notch Filter	Wainwright instruments GmbH	WRCT800.0/880.0-0.2/40-5SSK	9	2014-06-01
14	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2014-06-01
15	Low noise amplifier	TESEQ	LNA6900	70133	2014-02-22
16	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2014-02-22
17	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2014-02-22

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## 7 Test results and Measurement Data

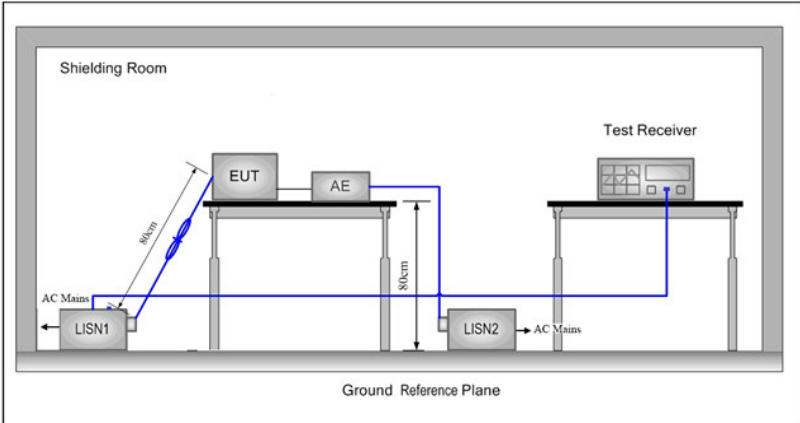
### 7.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203
<p>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.</p>	
<b>EUT Antenna:</b>	 <p style="text-align: center; color: red;">Antenna</p>
<p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.</p>	



## 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"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides 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.</li> <li>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,</li> <li>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 were at least 0.8 m from the LISN 2.</li> <li>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.</li> </ol>		

<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	
	433MHz	80.8		Average Value	
		100.8		Peak Value	

Test Procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> <li>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.</li> </ol>
Test Setup:	

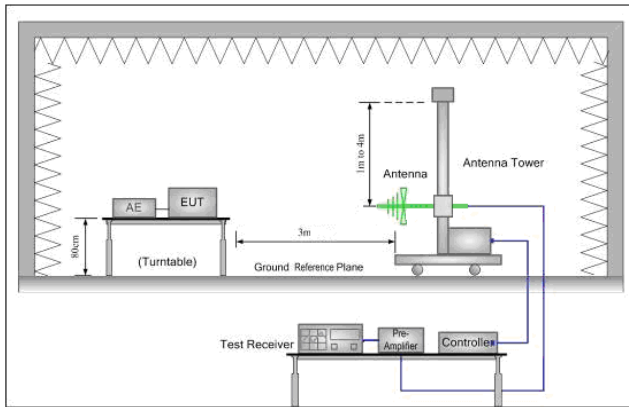


Figure 2. 30MHz to 1GHz

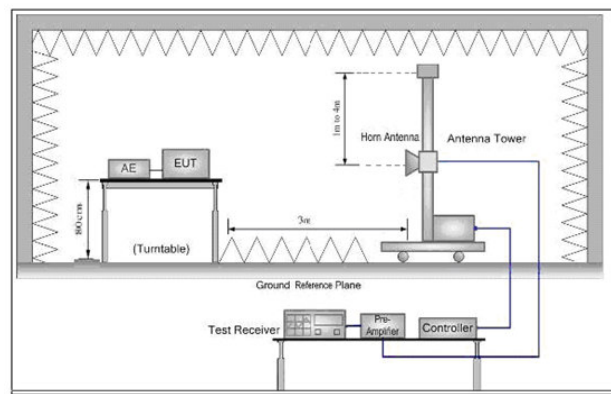


Figure 3. Above 1 GHz

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**

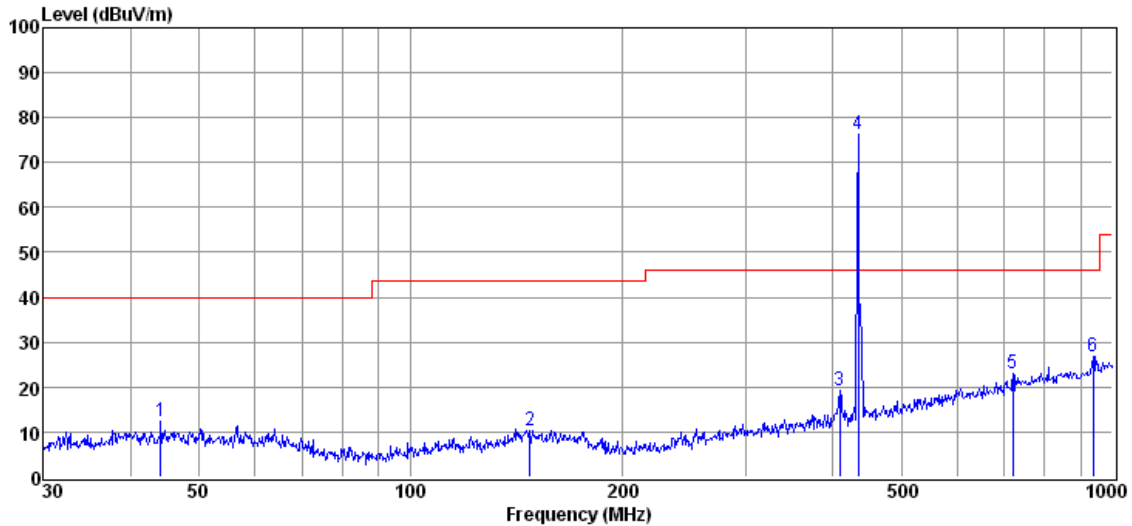
Freq. (MHz)	Read Level (dB $\mu$ V)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Result Level (dB $\mu$ V/m)	Limit Line (dB $\mu$ V/m)	Over Limit (dB)	Detector	Polarization
434.61	82.43	15.69	24.40	2.40	76.12	80.80	-4.68	Peak	VERTICAL
434.61	81.35	15.74	24.40	2.40	75.09	80.80	-5.71	Peak	HORIZONTAL

Remark: Because of the Peak value below the AV Limit, so the AV test doesn't perform for this submission.

**7.3.1.2 Spurious Emissions**

**Below 1GHz**

Vertical:

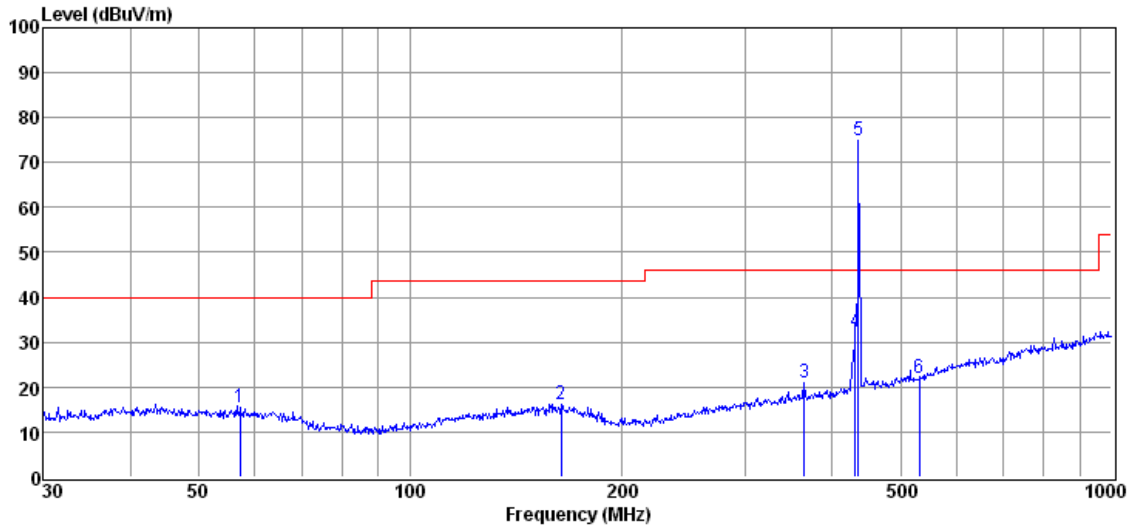


Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dB $\mu$ V)	(dB/m)	(dB)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
1	44.12	23.37	13.14	24.70	0.59	12.40	40.00	-27.60	QP
2	147.92	21.19	12.58	24.70	1.26	10.33	43.50	-33.17	QP
3	408.95	26.35	15.01	24.40	2.33	19.29	46.00	-26.71	QP
4	434.61	N/A	N/A	N/A	N/A	N/A	N/A	Fundamental signal	
5	721.73	22.89	21.01	24.10	3.23	23.03	46.00	-22.97	QP
6	938.83	23.25	23.68	23.80	3.76	26.89	46.00	-19.11	QP

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**Horizontal:**



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dB $\mu$ V)	(dB/m)	(dB)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
1	57.19	27.06	12.37	24.70	0.71	15.44	40.00	-24.56	Peak
2	164.33	26.96	12.47	24.66	1.34	16.11	43.50	-27.39	Peak
3	364.26	29.20	14.00	24.44	2.17	20.93	46.00	-25.07	Peak
4	431.03	38.62	15.59	24.40	2.39	32.20	46.00	-13.80	Peak
5	434.61	N/A	N/A	N/A	N/A	N/A	N/A		Fundamental signal
6	531.96	26.31	17.32	24.30	2.71	22.04	46.00	-23.96	Peak

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**1GHz – 6GHz**

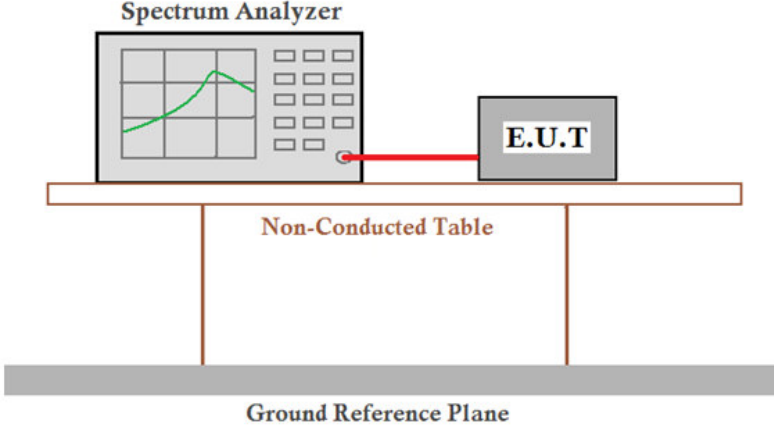
Peak Value:

Frequency (MHz)	Factor (dB/m)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1127.55	24.78	43.93	30.82	74.00	-43.18	Horizontal
1441.26	25.22	42.69	30.77	74.00	-43.23	Horizontal
1799.84	25.66	42.39	32.30	74.00	-41.70	Horizontal
2317.14	26.85	40.24	32.00	74.00	-42.00	Horizontal
2796.78	27.87	39.16	31.53	74.00	-42.47	Horizontal
5485.85	32.95	36.62	37.94	74.00	-36.06	Horizontal
1141.78	24.78	43.45	30.37	74.00	-43.63	Vertical
1736.48	25.56	41.72	31.26	74.00	-42.74	Vertical
2160.75	26.38	40.19	31.57	74.00	-42.43	Vertical
2786.78	27.86	38.63	31.00	74.00	-43.00	Vertical
4200.48	29.82	37.95	33.99	74.00	-40.01	Vertical
5555.09	33.21	35.18	36.50	74.00	-37.50	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.

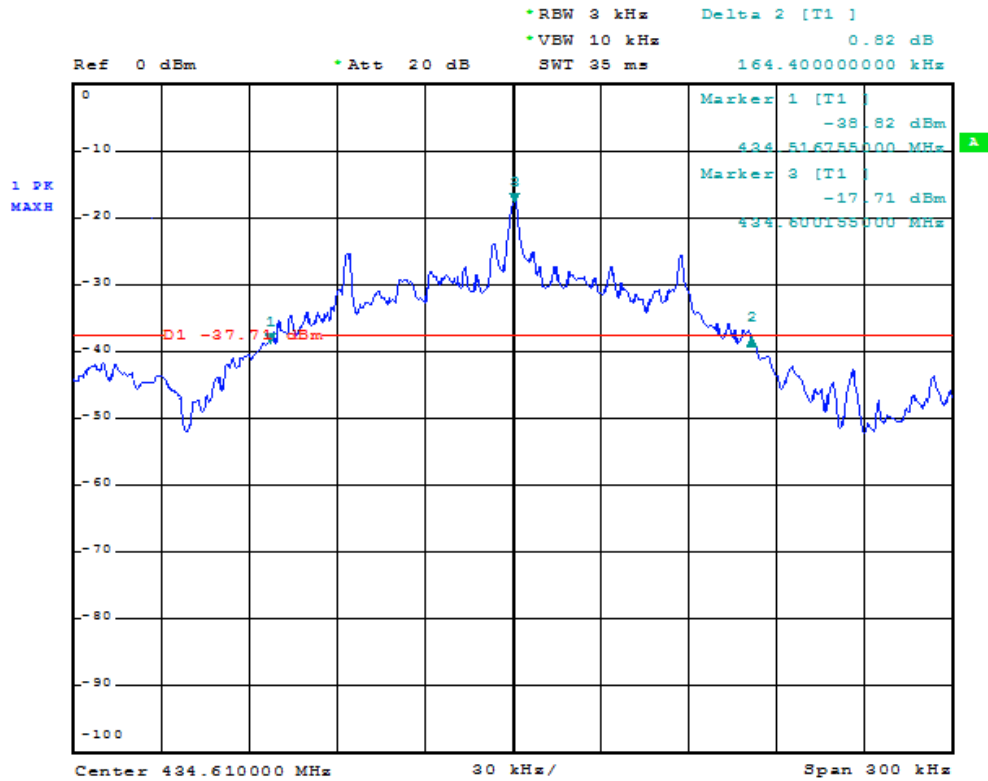
## 7.4 20dB Bandwidth

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

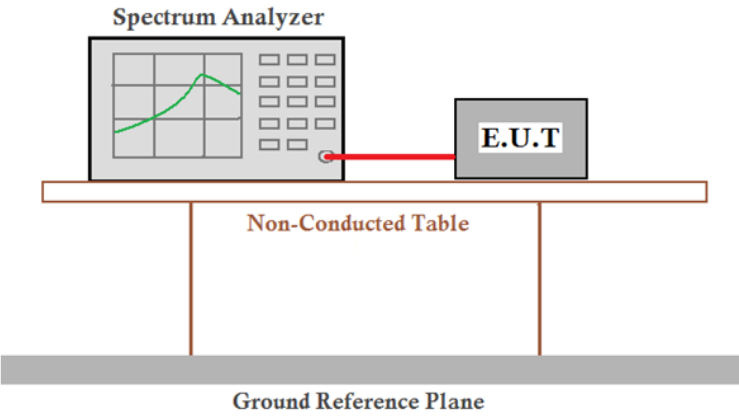
20dB bandwidth (kHz)	Limit (kHz)	Results
160	108	Pass

Test plot as follows:



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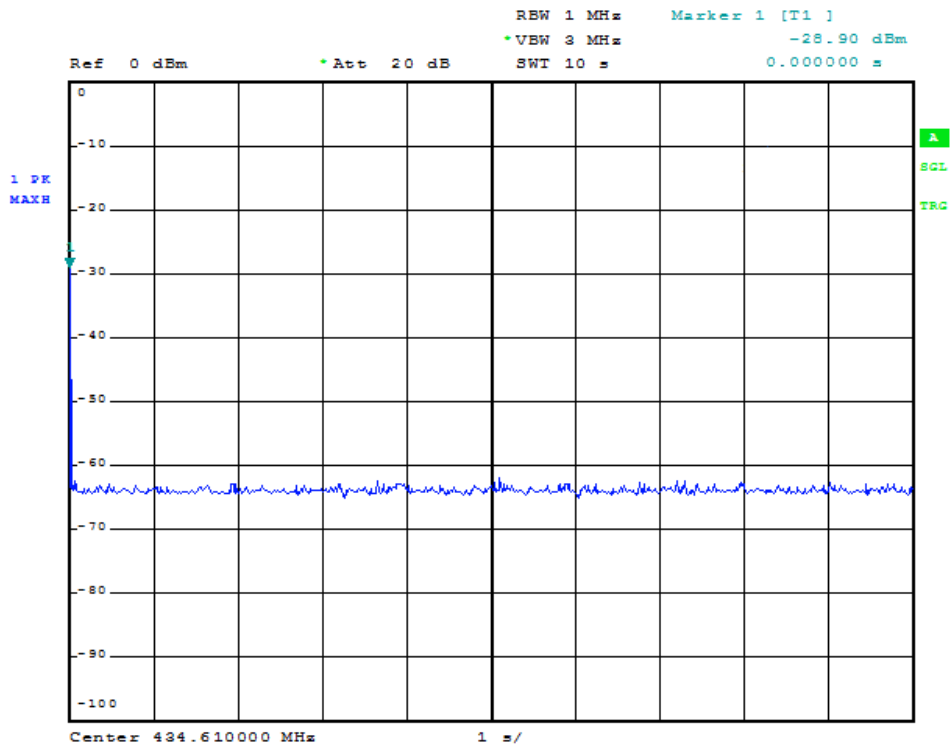
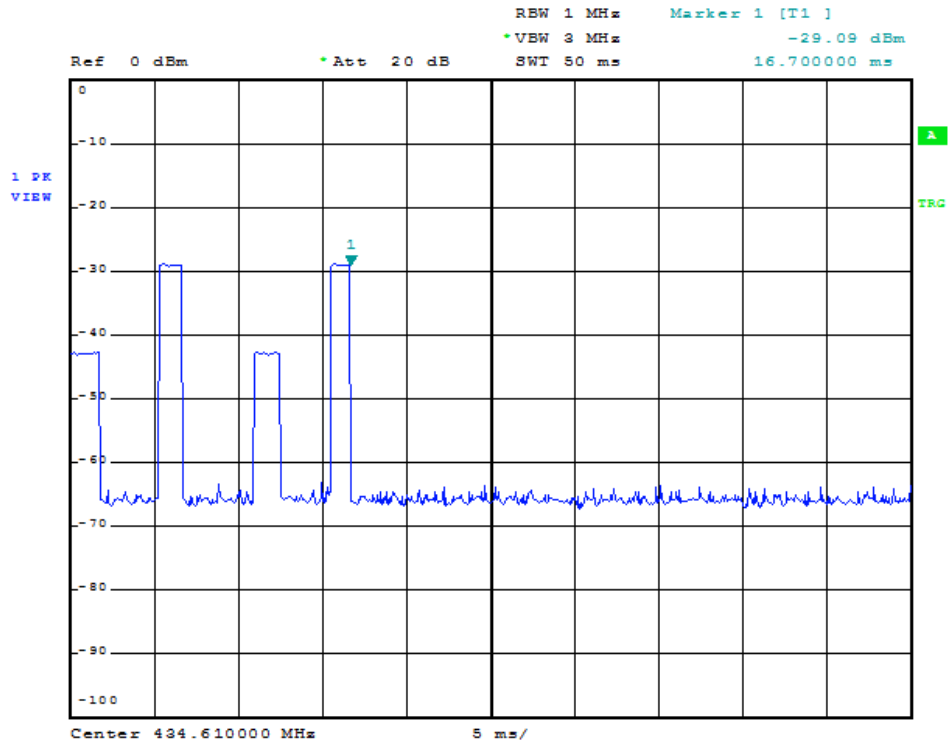
## 7.5 Dwell Time

Test Requirement:	47 CFR Part 15C Section 15.231 (a) (1)
Test Method:	ANSI C63.10:2009
Test Setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
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

Test plot as follows:



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## **8 Photographs - EUT Test Setup\**

Refer to the < MD-SY-007 (MD-FM-007)\_Test Setup photos>.

## **9 Photographs - EUT Constructional Details**

Refer to the < MD-SY-007 (MD-FM-007)\_External Photos > & < MD-SY-007 (MD-FM-007)\_Internal Photos >.

**--End of the Report--**