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Report No.: SHEM130700142801

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1 Cover Page

FCC REPORT

Application No. :	SHEM1307001428RF	
Applicant:	MEDTRUM TECHNOLOGIES Inc.	
FCC ID:	2AARUFM006	
Equipment Under Test (E	EUT):	
NOTE: The following samp	ble(s) submitted was/were identified on behalf of the client as	
Product Name:	Insulin management system (Personal Diabetes Managers)	
Brand Name:	N/A	
Model:	MD-SY-007 (MD-FM-006P)	
Added Model:	N/A	
Standards:	FCC PART 15 Subpart C: 2012	
Date of Receipt:	July 30, 2013	
Date of Test:	August 07, 2013 to September 29, 2013	
Date of Issue: September 29, 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 manufacture, 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	/	Sep 30, 2013	/	Original		

Authorized for issue by:		
Engineer	Eddy Zong	Eddy Zong
	Print Name	
Clerk	Susie Liu Print Name	Suire Liu
Reviewer	Keny Xu Print Name	Kony. Ku



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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 (e)	ANSI C63.10(2009)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.231 (e)/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 (e)	ANSI C63.10(2009)	PASS

Remark: 1. This EUT is powered by battery only; therefore the AC Conducted Emission test is not applicable.

2. It is a Repetitive transmission when PDM working in the channel 1 to 11, It is a active activation when PDM working in the channel 12



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5 General Information

5.1 Client Information

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

5.2 General Description of E.U.T.

Product Name	Insulin management system (Personal Diabetes Managers)
Brand Name:	N/A
Model No:	MD-SY-007 (MD-FM-006P)
Added Model:	N/A
Product Description:	Portable production

5.3 Technical Specifications:

Operation Frequency:	433.09MHz—	433.09MHz—434.61 MHz				
Modulation Technique:	OOK					
	Channel	Frequency(MHz)	Channel	Frequency(MHz)		
	1	433.09	7	433.92		
	2	433.23	8	434.05		
Number of Channel:	3	433.36	9	434.19		
	4	433.50	10	434.33		
	5	433.64	11	434.47		
	6	433.78	12	434.61		
Power Supply:	1.5V DC (The new alkaline battery is used for the EUT during the measurement)					
Antenna Type	Integral					

5.4 Support equipments for Testing

The EUT has been tested independently.

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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

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	SCHWARZBEC K	BBHA9120D	9120D-679	2014-03-06
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2014-06-01
4	ANTENNA	SCHWARZBEC K	VULB9168	9168-313	2014-03-06
5	Horn Antenna	SCHWARZBEC K	BBHA 9170	BBHA91703 73	2014-03-06
6	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2014-10-08
7	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2009P		2014-10-08
8	CLAMP METER	FLUKE	316	86080010	2014-06-01
9	Thermo- Hygrometer	ZHICHEN	ZC1-2	01050033	2014-10-08
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 nosie amplifier	TESEQ	LNA6900	70133	2014-02-22
16	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2014-02-22
17	Line impedance stabilization network	SCHWARZBEC K	NSLK8127	8127-490	2014-02-22

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7 Test results and Measurement Data

7.1 Antenna Requirement

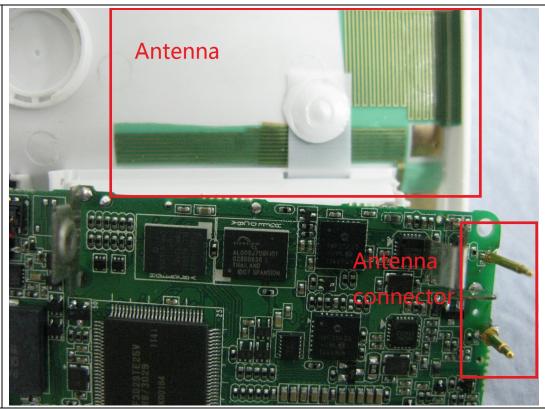
Standard requirement:

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 FPC antenna is integrated and no consideration of replacement. The best case gain of the antenna is 0dBi.

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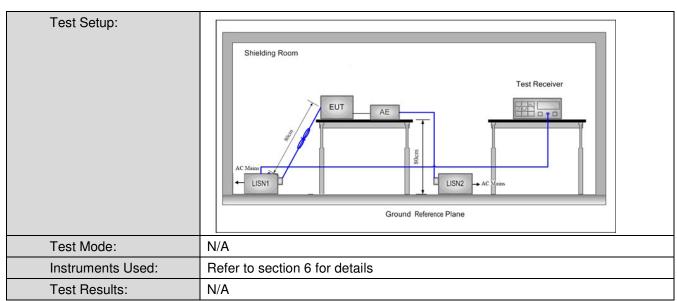
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7.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207			
Test Method:	ANSI C63.10: 2009			
Test Frequency Range:	150kHz to 30MHz			
Limit:	Fraguera (MIII-)	Limit (dBuV)		
	Frequency range (MHz)	Quasi-peak	Quasi-peak	
	0.15-0.5	66 to 56*	66 to 56*	
	0.5-5	56	56	
	5-30	60	60	
	* Decreases with the loga	rithm of the frequency.		
Test Procedure:	1) The mains terminal discroom. 2) The EUT was connected lampedance. The power connected to a second plane in the same was multiple socket outlet a single LISN provided to the single LISN provided to the tabletop EUT was ground reference pland placed on the horizont. 4) The test was performed the EUT shall be 0.4 movertical ground reference reference plane. The Lunit under test and bor mounted on top of the the closest points of the and associated equipmed. 5) In order to find the maxed the stability of the closest points of the and associated equipmed.	sturbance voltage test was content to AC power source on Network) which provide wer cables of all other of LISN 2, which was bonde ay as the LISN 1 for the strip was used to connect in the rating of the LISN was not placed upon a non-metale. And for floor-standing are all ground reference plane, if with a vertical ground reference plane was bonded to the LISN 1 was placed 0.8 m from the vertical ground reference ground reference plane. The LISN 1 and the EUT. All the nent were at least 0.8 m from the vertical ground reference plane. The LISN 1 and the EUT. All the content were at least 0.8 m from the vertical ground reference plane. The LISN 1 and the EUT. All the content were at least 0.8 m from the vertical ground reference plane. The content were at least 0.8 m from the cont	through a LISN 1 (Line is 50Ω/50μH + 5Ω linear units of the EUT were d to the ground reference unit being measured. A multiple power cables to a not exceeded. Ilic table 0.8m above the trangement, the EUT was between plane. The rear of eference plane. The e horizontal ground om the boundary of the e plane for LISNs his distance was between other units of the EUT om the LISN 2.	



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Measurement Data

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



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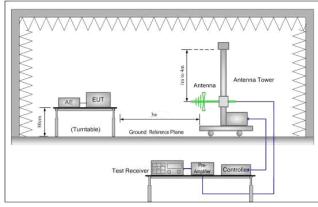
7.3 Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.231(b)&(e) and 15.209					
Test Method:	ANSI C63.10: 2009					
Test frequency range	9KHz – 6GHz					
Test Site:	Measurement Distance	e: 3m (Semi-Anech	noic Chambe	r)		
Receiver Setup:	Frequency Detector RBW VBW					
	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 1011z	Peak	1MHz	3MHz	Peak	
	Above 1GHz	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	
	Above IGHZ	500	74.0	Peak	3	
Limit:	Frequency	Limit (dBuV/m @3m)		Remark		
(Field strength of the	433.09 - 434.61MHz		72.9		Average Value	
fundamental signal)	700.00 - 707.011VII IZ	92.9		Peak Value		



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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		
	Test Procedure:	 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. 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
Test Setup:	Test Setup:	



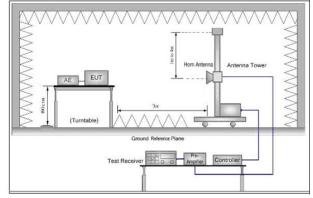


Figure 2. 30MHz to 1GHz

Figure 3. Above 1 GHz

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

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Measurement Data

7.3.1 Field Strength of the Fundamental Signal

Test channel	Freq. (MHz)	Result Level (dBμV/m)	Limit Line (dBµV/m)	Margin (dB)	Detector	Polarization
Channel 1	433.09	64.23	72.9	-8.67	Peak	VERTICAL
Channel	433.09	64.78	72.9	-8.12	Peak	HORIZONTAL
		76.38	92.9	-16.52	Peak	VERTICAL
Channel 11	404.47	51.41	72.9	-21.49	Average	VERTICAL
Channel 11	434.47	75.49	92.9	-17.41	Peak	HORIZONTAL
		50.52	72.9	-22.38	Average	HORIZONTAL
Channel 10	404.01	68.86	72.9	-4.04	Peak	VERTICAL
Channel 12	434.61	69.08	72.9	-3.82	Peak	HORIZONTAL

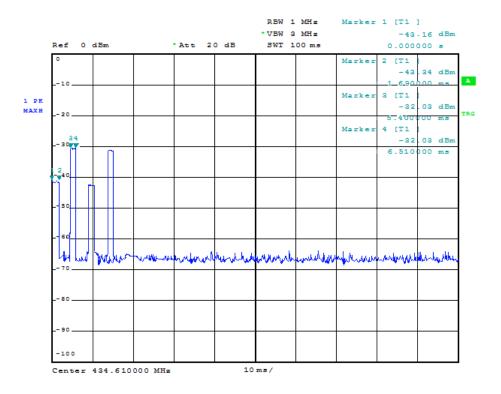
Average value:							
	Average value=Peak value + PDCF						
Calculate Formula:	PDCF=20 log(Duty cycle)						
	Duty cycle= T on time / T period						
	Ton time = 5.64ms						
Test data:	T period =100ms						
	PDCF= - 24.97						

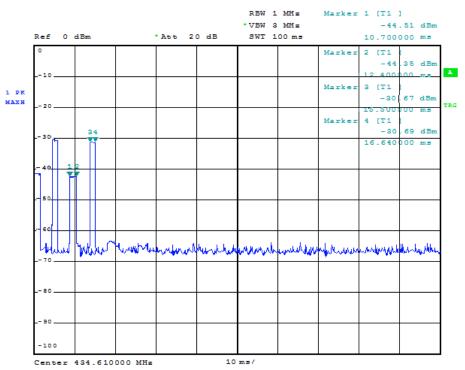
Remark: If the Peak value below the AV Limit, the AV test doesn't perform for this submission.



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Time slot:





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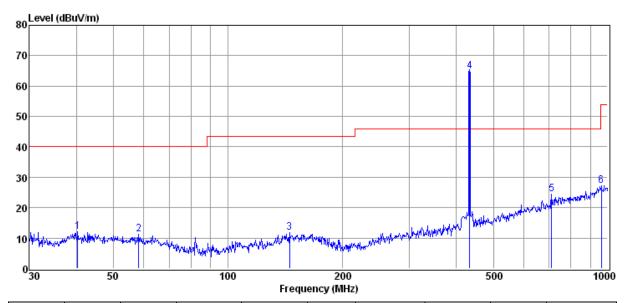
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rage. 13

7.3.2 Spurious Emissions

Below 1GHz

Channel 1 Vertical:

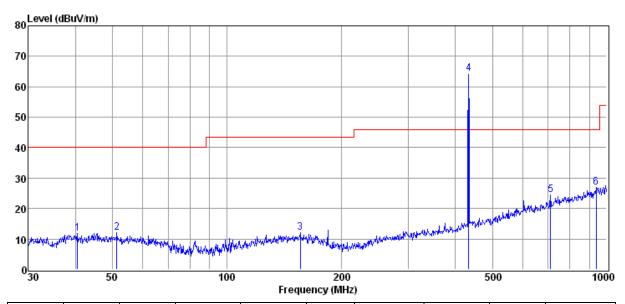


Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	40.28	23.08	13.29	24.70	0.56	12.23	40.00	-27.77	QP
2	58.20	23.02	12.31	24.70	0.72	11.35	40.00	-28.65	QP
3	145.35	22.91	12.42	24.70	1.25	11.88	43.50	-31.62	QP
4	433.09	N/A	N/A	N/A	N/A	N/A	N/A	Fundam	ental signal
5	711.67	24.63	20.73	24.10	3.19	24.45	46.00	-21.55	QP
6	962.16	23.18	24.00	23.75	3.82	27.25	54.00	-26.75	QP



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Horizontal:

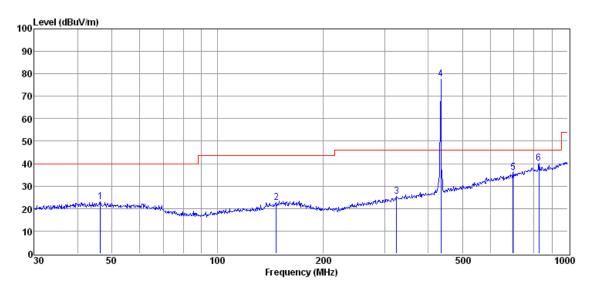


Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	40.42	22.79	13.28	24.70	0.56	11.93	40.00	-28.07	QP
2	51.30	23.30	12.72	24.70	0.66	11.98	40.00	-28.02	QP
3	155.91	22.74	12.64	24.70	1.30	11.98	43.50	-31.52	QP
4	433.09	N/A	N/A	N/A	N/A	N/A	N/A	Fundam	ental signal
5	711.67	24.71	20.73	24.10	3.19	24.53	46.00	-21.47	QP
6	938.83	23.26	23.68	23.80	3.76	26.90	46.00	-19.10	QP



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Channel 11 Vertical:



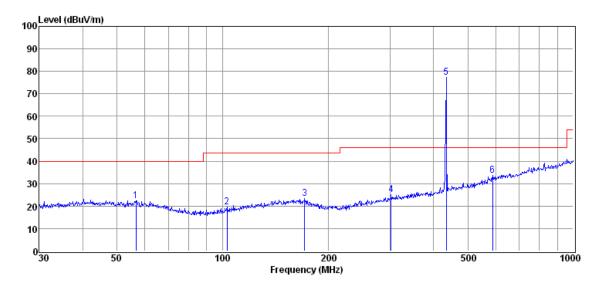
Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	46.34	34.01	13.02	24.70	0.61	22.94	40.00	-17.06	QP
2	147.40	33.68	12.54	24.70	1.26	22.78	43.50	-20.72	QP
3	324.46	34.64	13.08	24.50	2.04	25.26	46.00	-20.74	QP
4	434.47	N/A	N/A	N/A	N/A	N/A	N/A	Fundam	ental signal
5	696.86	36.68	20.36	24.10	3.13	36.07	46.00	-9.93	QP
6	827.49	38.23	22.42	23.90	3.51	40.26	46.00	-5.74	QP



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Horizontal:

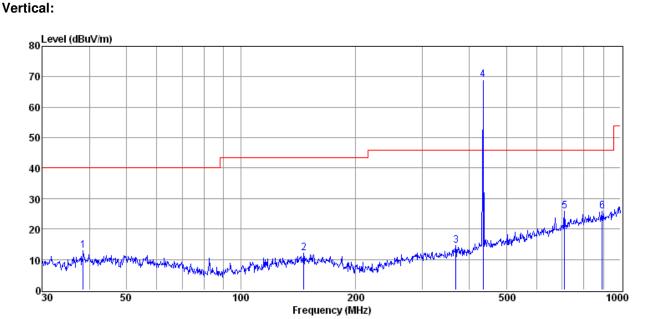


Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	56.59	33.90	12.40	24.70	0.70	22.30	40.00	-17.70	QP
2	103.08	33.87	9.48	24.70	1.06	19.71	43.50	-23.79	QP
3	171.39	34.48	12.13	24.60	1.37	23.38	43.50	-20.12	QP
4	302.48	35.12	12.47	24.50	1.96	25.05	46.00	-20.95	QP
5	434.47	N/A	N/A	N/A	N/A	N/A	N/A	Fundam	ental signal
6	588.91	36.00	18.93	24.20	2.87	33.60	46.00	-12.40	QP



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Channel 12:



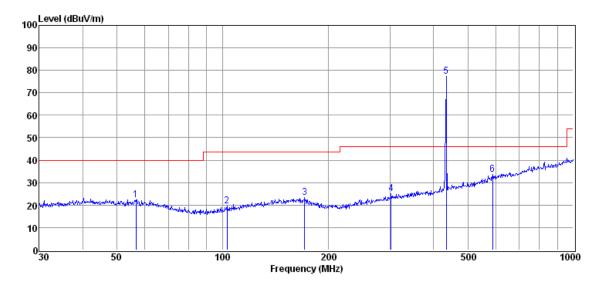
Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	38.48	23.94	13.03	24.70	0.54	12.81	40.00	-27.19	QP
2	146.37	22.99	12.48	24.70	1.26	12.03	43.50	-31.47	QP
3	368.11	22.59	14.11	24.43	2.19	14.46	46.00	-31.54	QP
4	434.61	N/A	N/A	N/A	N/A	N/A	N/A	Fundam	ental signal
5	711.67	25.97	20.73	24.10	3.19	25.79	46.00	-20.21	QP
6	893.86	23.04	22.85	23.82	3.64	25.71	46.00	-20.29	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)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	39.85	22.71	13.27	24.70	0.56	11.84	40.00	-28.16	QP
2	159.23	23.34	12.61	24.70	1.32	12.57	43.50	-30.93	QP
3	318.82	22.90	12.93	24.50	2.02	13.35	46.00	-32.65	QP
4	434.61	N/A	N/A	N/A	N/A	N/A	N/A	Fundam	ental signal
5	672.84	24.91	20.08	24.10	3.06	23.95	46.00	-22.05	QP
6	942.13	23.50	23.74	23.80	3.77	27.21	46.00	-18.79	QP



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1GHz - 6GHz

Peak Value:

Channel 1:

Frequency (MHz)	Factor (dB/m)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1380.60	8.13	41.47	49.60	74.00	-24.40	Horizontal
2712.88	8.74	40.65	49.39	74.00	-24.61	Horizontal
5198.75	9.04	42.78	51.82	74.00	-22.18	Horizontal
1639.72	8.23	40.54	48.77	74.00	-25.23	Vertical
2489.31	8.07	39.26	47.33	74.00	-26.67	Vertical
5302.23	9.43	41.33	50.76	74.00	-23.24	Vertical

Channel 11:

Frequency (MHz)	Factor (dB/m)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1777.41	8.23	41.33	49.56	74.00	-24.44	Horizontal
2080.96	8.14	40.29	48.43	74.00	-25.57	Horizontal
5466.22	9.89	42.26	52.15	74.00	-21.85	Horizontal
2047.67	8.04	39.78	47.82	74.00	-26.18	Vertical
3600.63	8.12	41.14	49.26	74.00	-24.74	Vertical
4338.16	8.26	41.54	49.80	74.00	-24.20	Vertical

Channel 12:

Frequency (MHz)	Factor (dB/m)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1320.28	8.12	41.95	50.07	74.00	-23.93	Horizontal
2972.58	8.77	39.17	47.94	74.00	-26.06	Horizontal
4340.70	9.35	40.46	49.81	74.00	-24.19	Horizontal
1759.65	8.52	40.82	49.34	74.00	-24.66	Vertical
2589.54	8.69	41.49	50.18	74.00	-23.82	Vertical
5202.18	9.49	42.92	52.41	74.00	-21.59	Vertical

Remark:

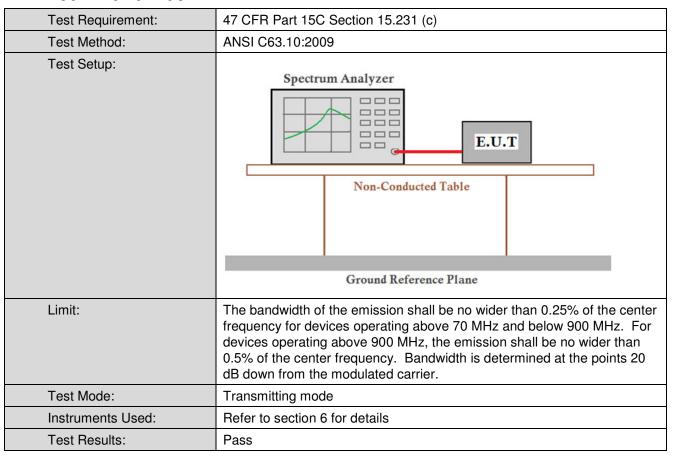
- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 - Final Test Level = Receiver Reading Level + Factor (Antenna Factor + Cable Factor Preamplifier Factor)
- 2) If Peak Result comply with AV limit, AV Result is deemed to comply with QP limit
- 3) 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



Measurement Data

Channel	Frequency(MHz)	20dB bandwidth (kHz)	Limit (kHz)	Results
1	433.09	139.2	1082.7	Pass
11	434.47	153.6	1086.1	Pass
12	434.61	157.2	1086.5	Pass

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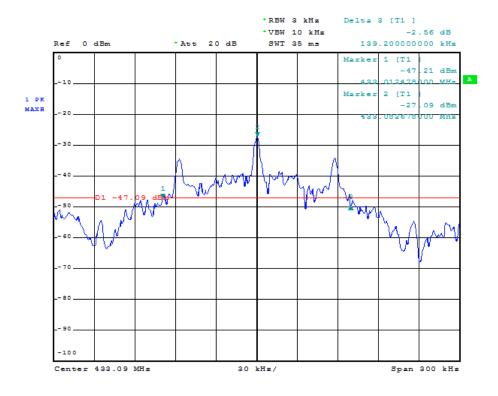


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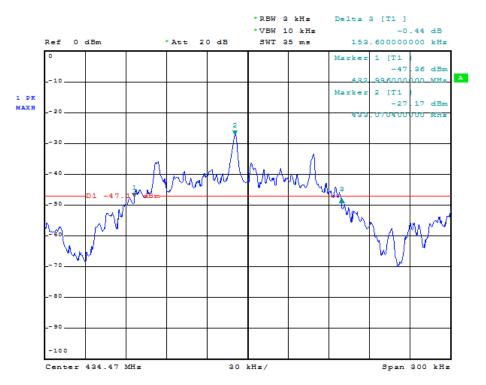
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Test plot as follows:

Channel 1:



Channel 11:

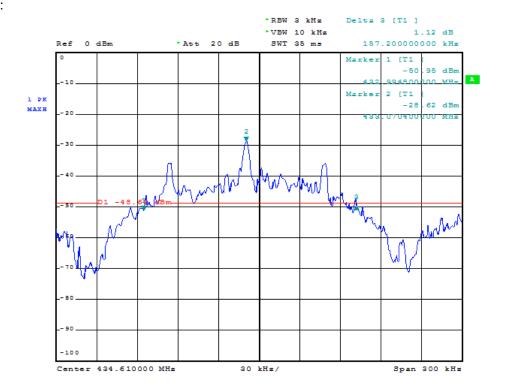


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Channel 12:

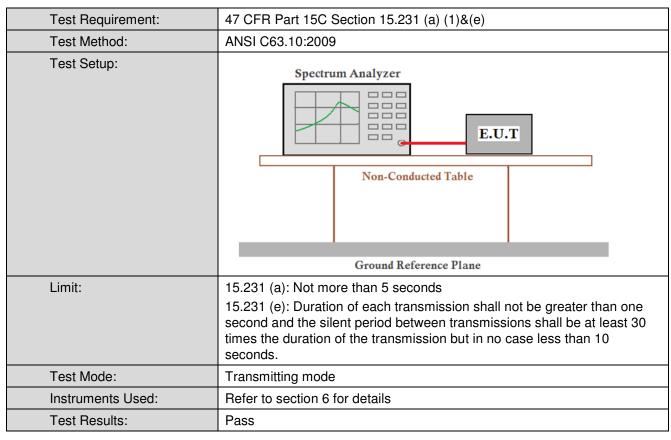




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7.5 Dwell Time



Measurement Data

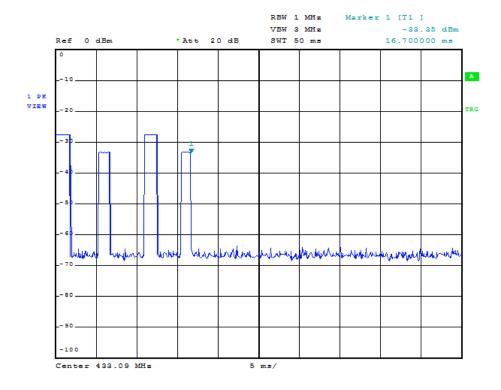
Test item	Limit (s)	Results	
Transmission Duration	≤1s	Pass	
Transmission Period	>30 times the transmit time and	Pass	
	≥10 seconds.		

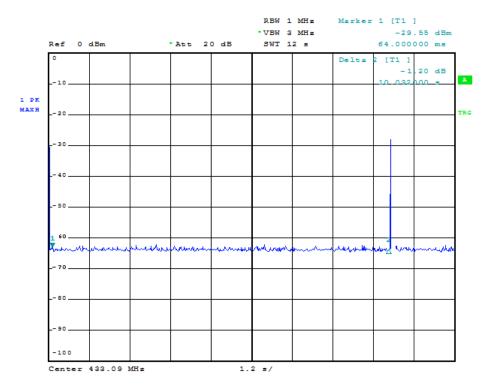


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Test plot as follows:

Channel 1:



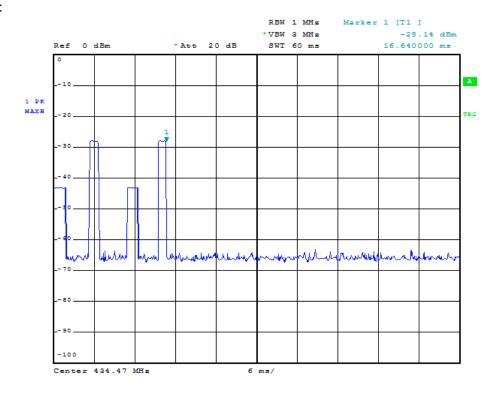


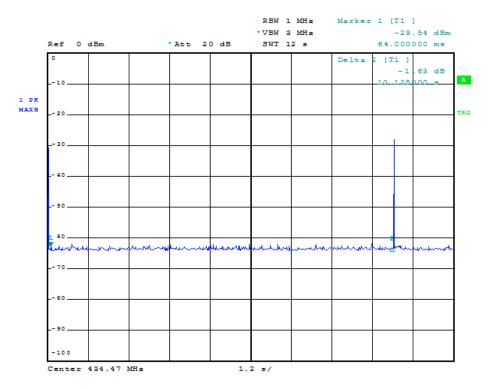
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Channel 11:



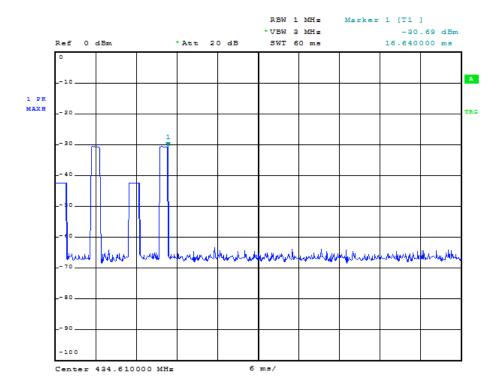


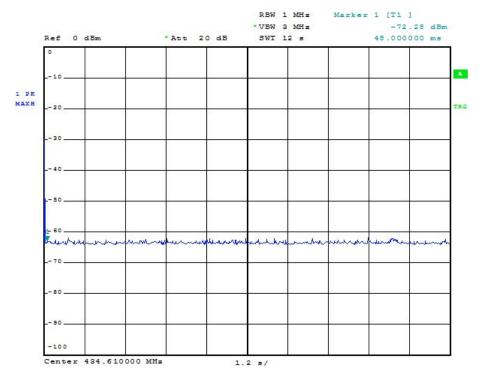
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Channel 12:





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8 Photographs - EUT Test Setup

Refer to the < MD-SY-007 (MD-JN-001) _Test Setup photos>.

9 Photographs - EUT Constructional Details

Refer to the < MD-SY-007 (MD-JN-001) External Photos > & < MD-SY-007 (MD-JN-001) Internal Photos >.

-- End of the Report--