EMC TEST REPORT

Report No.: 18070636-FCC-E

Supersede Report No: N/A

Applicant	Medtrum Technologies Inc.
Product Name	Personal Diabetes Manager
Model No.	MD-FM-008
Serial No.	N/A
Test Standard	FCC Part 15 Subpart B Class B, ANSI C63.4: 2014
Test Date	August 03 to September 05, 2018
Issue Date	September 07, 2018
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Evans He	David Huang	
Test Engineer	Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
18070636-FCC-E	NONE	Original	September 07, 2018

2. Customer information

Applicant Name	Medtrum Technologies Inc.
Applicant Add	7F， Building 8, No.200 Niudun Road, Shanghai 201203, China
Manufacturer	Medtrum Technologies Inc.
Manufacturer Add	7F， Building 8, No.200 Niudun Road, Shanghai 201203, China

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao’ an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software of Radiated Emission	Radiated Emission Program-To Shenzhen v2.0
Test Software of Conducted Emission	EZ-EMC(ver.Icp-03A1)

4. Equipment under Test (EUT) Information

Description of EUT:	Personal Diabetes Manager
Main Model:	MD-FM-008
Serial Model:	N/A
Antenna Gain:	BLE: 1.6dBi
Antenna Type:	Chip antenna
Input Power:	**Adapter:** Model: UES06WNCPU-050100SPA Input: AC 100-240V~50/60Hz, 0.2A Output: DC 5.0V, 1.0A **Battery:** Model: RC2 Voltage: 3.8V Capacity: 490mAh(1.9Wh) Maximum Charge Voltage: 4.35V
Equipment Category：	JAB
Type of Modulation:	BLE: GFSK
RF Operating Frequency (ies):	BLE: 2402-2480 MHz
Number of Channels:	BLE: 40CH
Port:	Pls refer to the user’ s manual
Trade Name :	Medtrum
FCC ID:	2AARU-FM008
Date EUT received:	August 02, 2018

Test Date(s): August 03 to September 05, 2018

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

Measurement Uncertainty

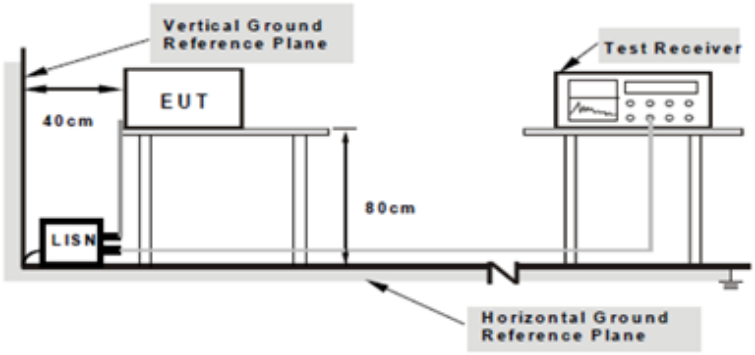
Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±3.11dB
Radiated Emission(30MHz~1GHz)	±5.12dB
Radiated Emission(1GHz~6GHz)	±5.34dB

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1019mbar
Test date :	August 30, 2018
Tested By :	Evans He

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.107</td><td>a)</td><td>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.
<table>
<tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>QP</th><th>Average</th></tr>
<tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 46</td></tr>
<tr><td>0.5 ~ 5</td><td>56</td><td>46</td></tr>
<tr><td>5 ~ 30</td><td>60</td><td>50</td></tr>
</table></td><td>☑</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 

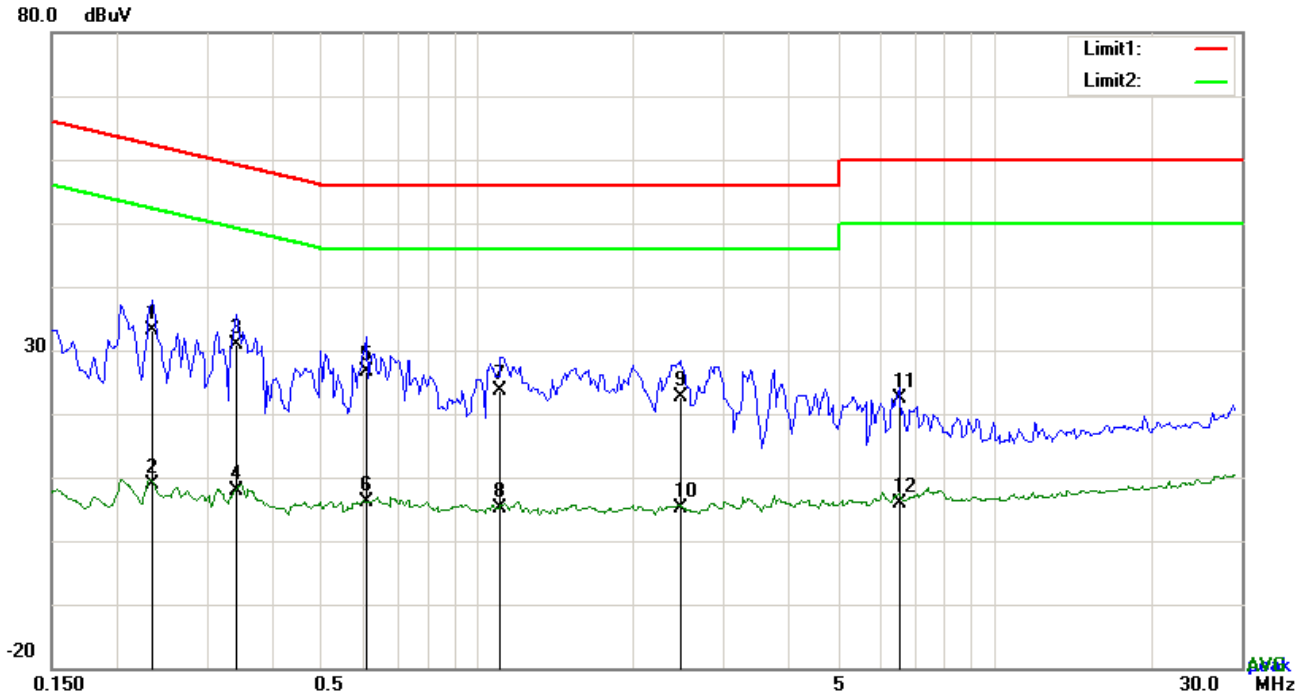
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains.</td></tr>
</table>

	3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver. 7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode :	Charging Mode

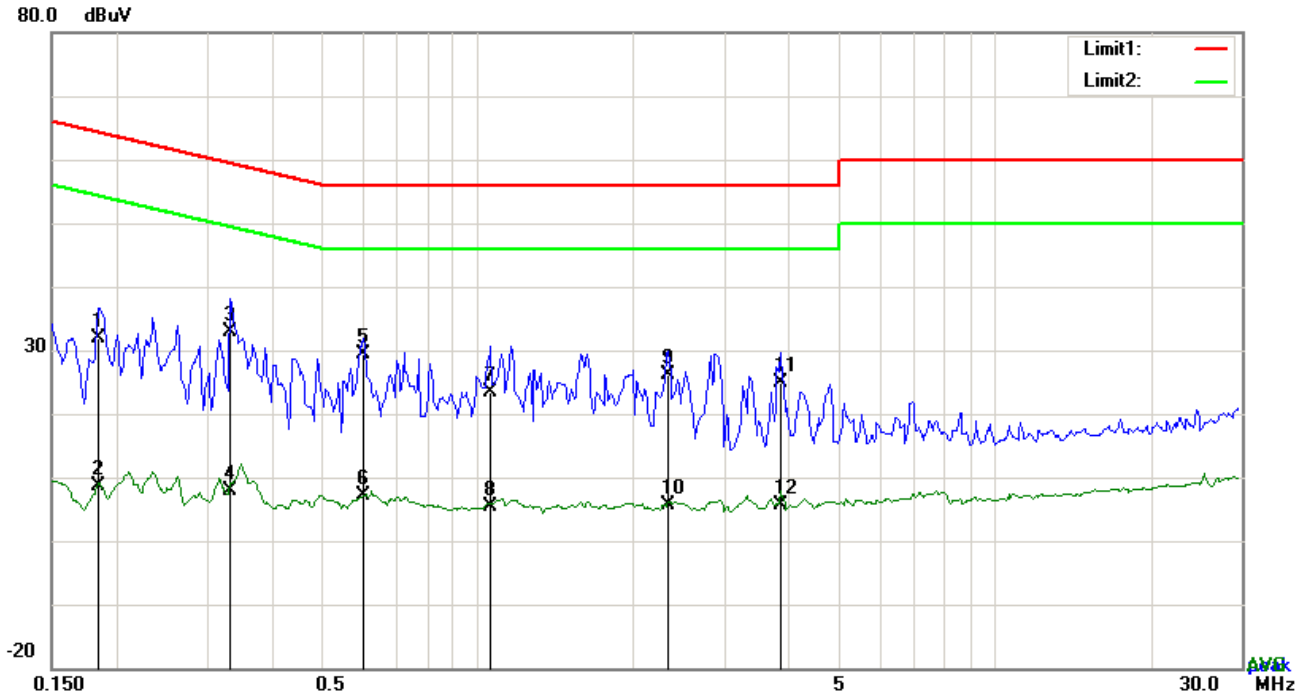


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.2358	23.16	QP	10.03	33.19	62.24	-29.05
2	L1	0.2358	-1.06	AVG	10.03	8.97	52.24	-43.27
3	L1	0.3411	20.97	QP	10.03	31.00	59.18	-28.18
4	L1	0.3411	-2.26	AVG	10.03	7.77	49.18	-41.41
5	L1	0.6102	16.51	QP	10.03	26.54	56.00	-29.46
6	L1	0.6102	-3.86	AVG	10.03	6.17	46.00	-39.83
7	L1	1.1094	13.62	QP	10.03	23.65	56.00	-32.35
8	L1	1.1094	-4.93	AVG	10.03	5.10	46.00	-40.90
9	L1	2.4666	12.66	QP	10.05	22.71	56.00	-33.29
10	L1	2.4666	-4.91	AVG	10.05	5.14	46.00	-40.86
11	L1	6.5256	12.27	QP	10.10	22.37	60.00	-37.63
12	L1	6.5256	-4.33	AVG	10.10	5.77	50.00	-44.23

Test Mode :	Charging Mode

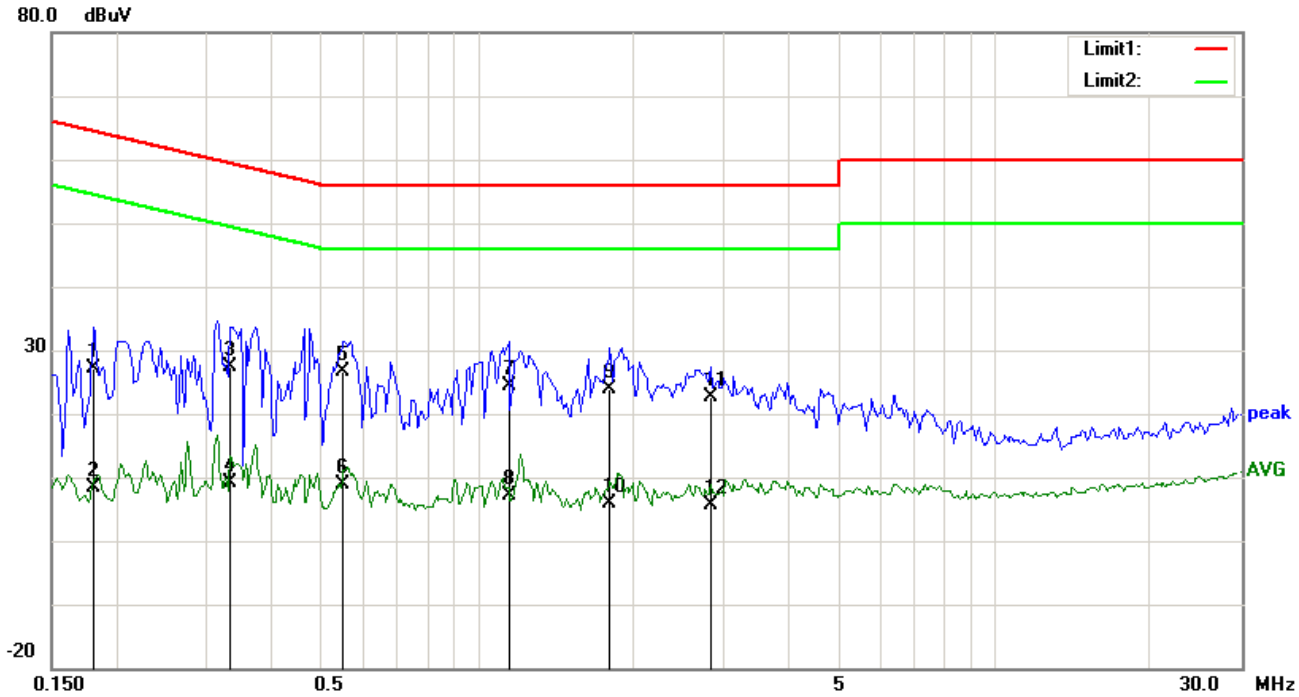


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1851	21.92	QP	10.02	31.94	64.25	-32.31
2	N	0.1851	-1.30	AVG	10.02	8.72	54.25	-45.53
3	N	0.3333	22.80	QP	10.02	32.82	59.37	-26.55
4	N	0.3333	-2.14	AVG	10.02	7.88	49.37	-41.49
5	N	0.6024	19.37	QP	10.02	29.39	56.00	-26.61
6	N	0.6024	-2.91	AVG	10.02	7.11	46.00	-38.89
7	N	1.0626	13.41	QP	10.03	23.44	56.00	-32.56
8	N	1.0626	-4.56	AVG	10.03	5.47	46.00	-40.53
9	N	2.3379	16.10	QP	10.04	26.14	56.00	-29.86
10	N	2.3379	-4.34	AVG	10.04	5.70	46.00	-40.30
11	N	3.8502	14.94	QP	10.06	25.00	56.00	-31.00
12	N	3.8502	-4.46	AVG	10.06	5.60	46.00	-40.40

Test Mode :	Charging Mode

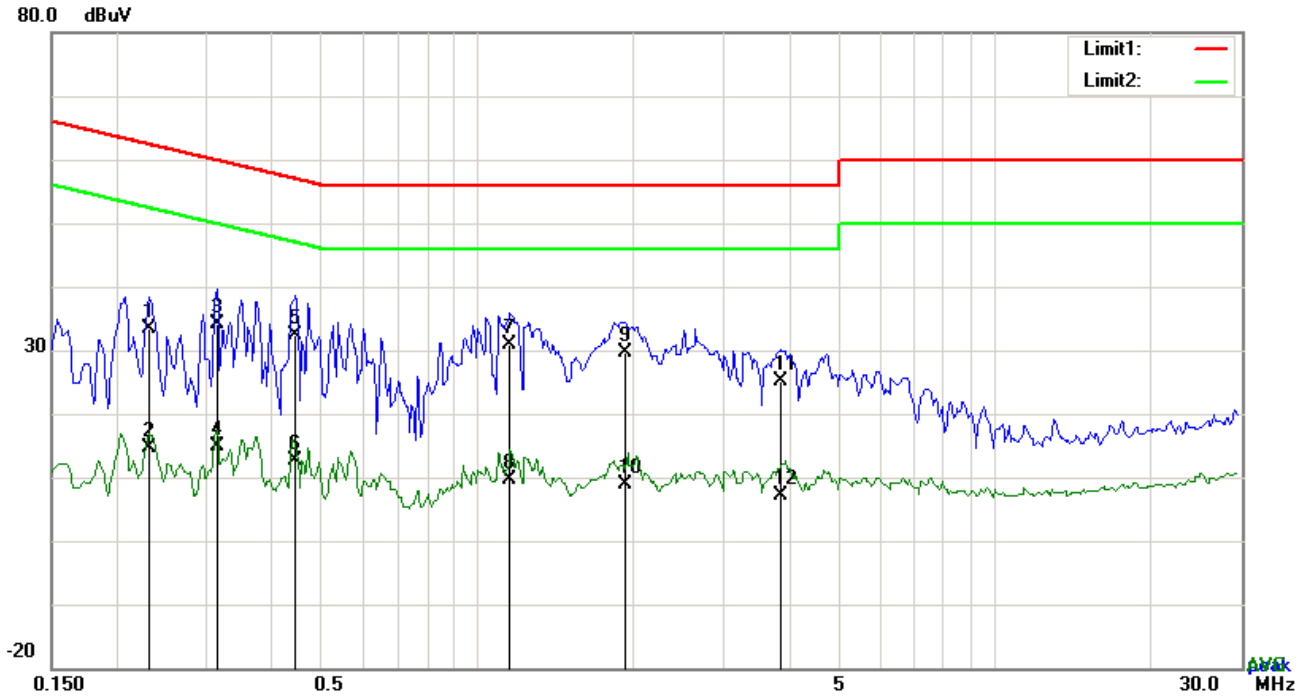


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1812	17.06	QP	10.03	27.09	64.43	-37.34
2	L1	0.1812	-1.71	AVG	10.03	8.32	54.43	-46.11
3	L1	0.3333	17.35	QP	10.03	27.38	59.37	-31.99
4	L1	0.3333	-0.94	AVG	10.03	9.09	49.37	-40.28
5	L1	0.5517	16.59	QP	10.03	26.62	56.00	-29.38
6	L1	0.5517	-1.27	AVG	10.03	8.76	46.00	-37.24
7	L1	1.1523	14.29	QP	10.03	24.32	56.00	-31.68
8	L1	1.1523	-2.84	AVG	10.03	7.19	46.00	-38.81
9	L1	1.8036	13.77	QP	10.04	23.81	56.00	-32.19
10	L1	1.8036	-4.15	AVG	10.04	5.89	46.00	-40.11
11	L1	2.8293	12.54	QP	10.05	22.59	56.00	-33.41
12	L1	2.8293	-4.50	AVG	10.05	5.55	46.00	-40.45

Test Mode :	Charging Mode



Test Data

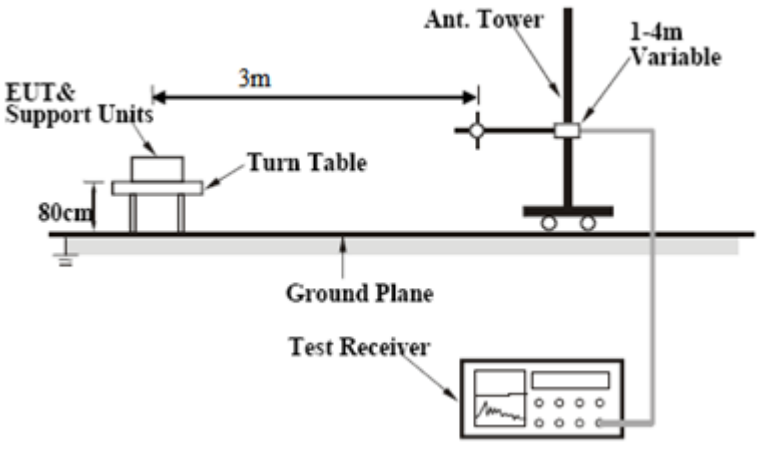
Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.2319	23.29	QP	10.02	33.31	62.38	-29.07
2	N	0.2319	4.65	AVG	10.02	14.67	52.38	-37.71
3	N	0.3138	24.09	QP	10.02	34.11	59.87	-25.76
4	N	0.3138	4.83	AVG	10.02	14.85	49.87	-35.02
5	N	0.4464	22.32	QP	10.02	32.34	56.94	-24.60
6	N	0.4464	2.68	AVG	10.02	12.70	46.94	-34.24
7	N	1.1562	20.86	QP	10.03	30.89	56.00	-25.11
8	N	1.1562	-0.33	AVG	10.03	9.70	46.00	-36.30
9	N	1.9284	19.63	QP	10.04	29.67	56.00	-26.33
10	N	1.9284	-1.17	AVG	10.04	8.87	46.00	-37.13
11	N	3.8619	14.95	QP	10.06	25.01	56.00	-30.99
12	N	3.8619	-2.95	AVG	10.06	7.11	46.00	-38.89

6.2 Radiated Emissions

Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1019mbar
Test date :	August 30, 2018
Tested By :	Evans He

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.109(d)</td><td>a)</td><td>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (μV/m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 - 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☑</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
a. Vertical or horizontal polarization (whichever gave the higher emission level</td></tr>
</table>

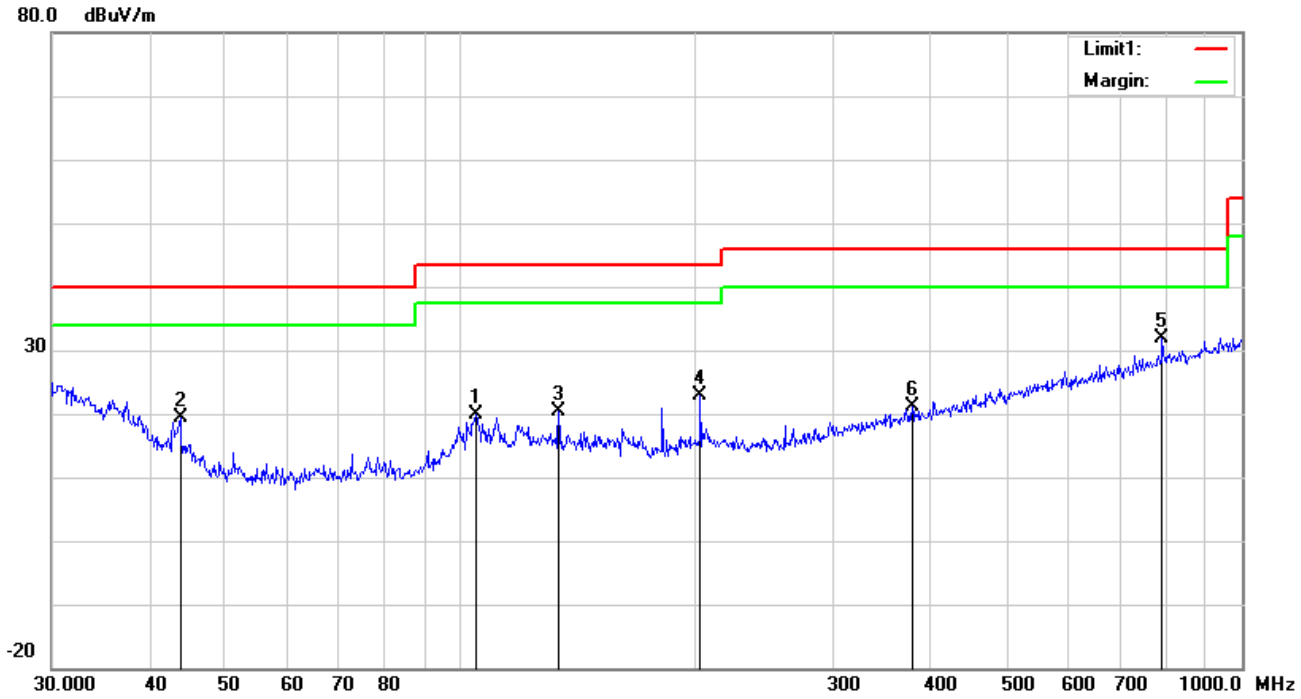
	over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. 4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth with Peak detection for Average Measurement as below at frequency above 1GHz. ■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%) 5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode :	Charging Mode

Below 1GHz

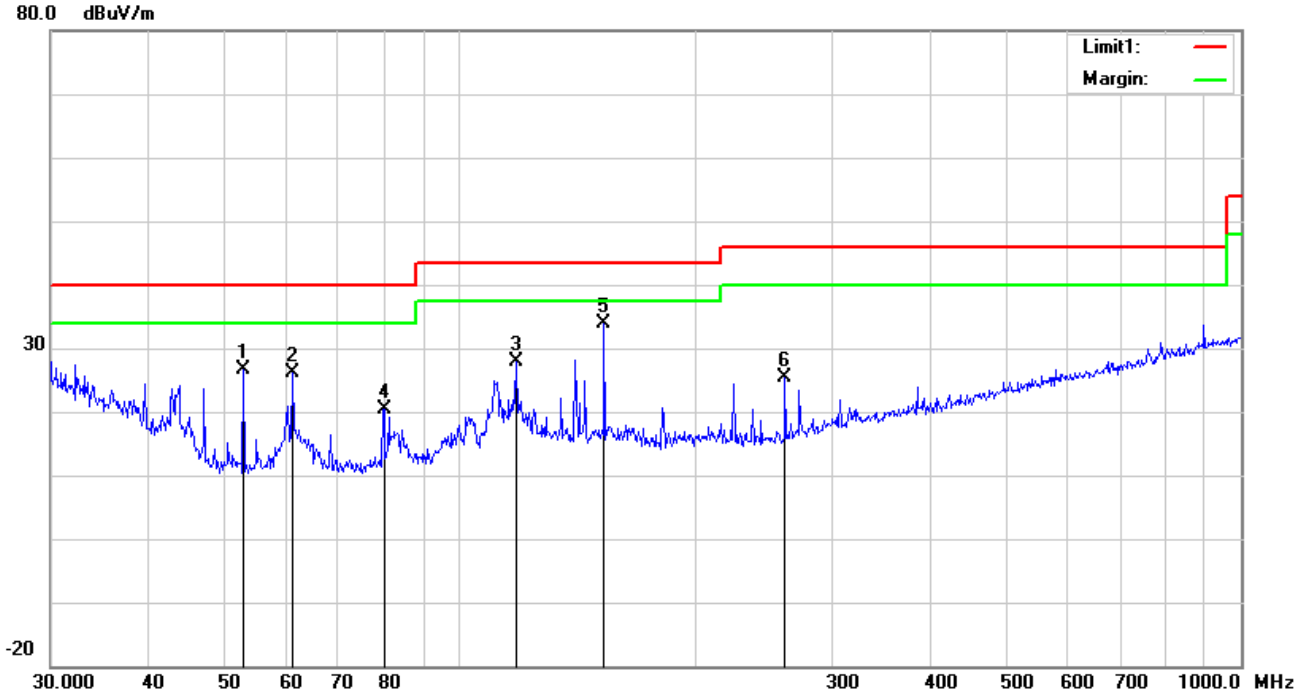


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	( )
1	H	104.5361	29.87	11.19	22.33	1.14	19.87	43.50	-23.63	100	126
2	H	43.8119	29.46	11.38	22.29	0.76	19.31	40.00	-20.69	100	174
3	H	133.6188	28.48	13.01	22.39	1.23	20.33	43.50	-23.17	100	353
4	H	202.8104	31.71	12.06	22.37	1.55	22.95	43.50	-20.55	100	346
5	H	790.6188	28.88	21.29	21.17	2.94	31.94	46.00	-14.06	100	213
6	H	378.5843	25.89	15.25	22.07	2.02	21.09	46.00	-24.91	100	74

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	( )
1	V	52.9453	40.20	8.08	22.39	0.79	26.68	40.00	-13.32	100	78
2	V	61.1316	40.29	7.36	22.41	0.78	26.02	40.00	-13.98	100	292
3	V	118.1862	35.54	13.58	22.36	1.16	27.92	43.50	-15.58	100	320
4	V	80.0806	34.21	7.60	22.42	1.05	20.44	40.00	-19.56	100	68
5	V	153.2004	42.31	12.60	22.32	1.36	33.95	43.50	-9.55	100	346
6	V	261.0583	34.09	11.89	22.29	1.72	25.41	46.00	-20.59	100	204

Above 1GHz

Frequency (MHz)	Read_level (dBμV/m)	Azimuth	Height (cm)	Polarity (H/V)	Level (dBμV/m)	Factors (dB)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
1376.95	67.22	175	100	V	-18.73	48.01	74	-25.99	PK
3374.34	69.97	3	100	V	-12.98	47.22	74	-26.78	PK
1261.62	65.54	294	100	V	-20.15	47.03	74	-26.97	PK
1868.58	64.49	317	100	H	-15.55	43.21	74	-30.79	PK
1908.64	63.13	192	100	H	-14.87	47.73	74	-26.27	PK
3504.61	61.44	105	100	H	-13.29	46.01	74	-27.99	PK

*Note1: The highest frequency of the EUT is 2480 MHz, so the testing has been conformed to 5*2480MHz =12,400MHz.*

Note2: The frequency that above 3GHz is mainly from the environment noise.

Note3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

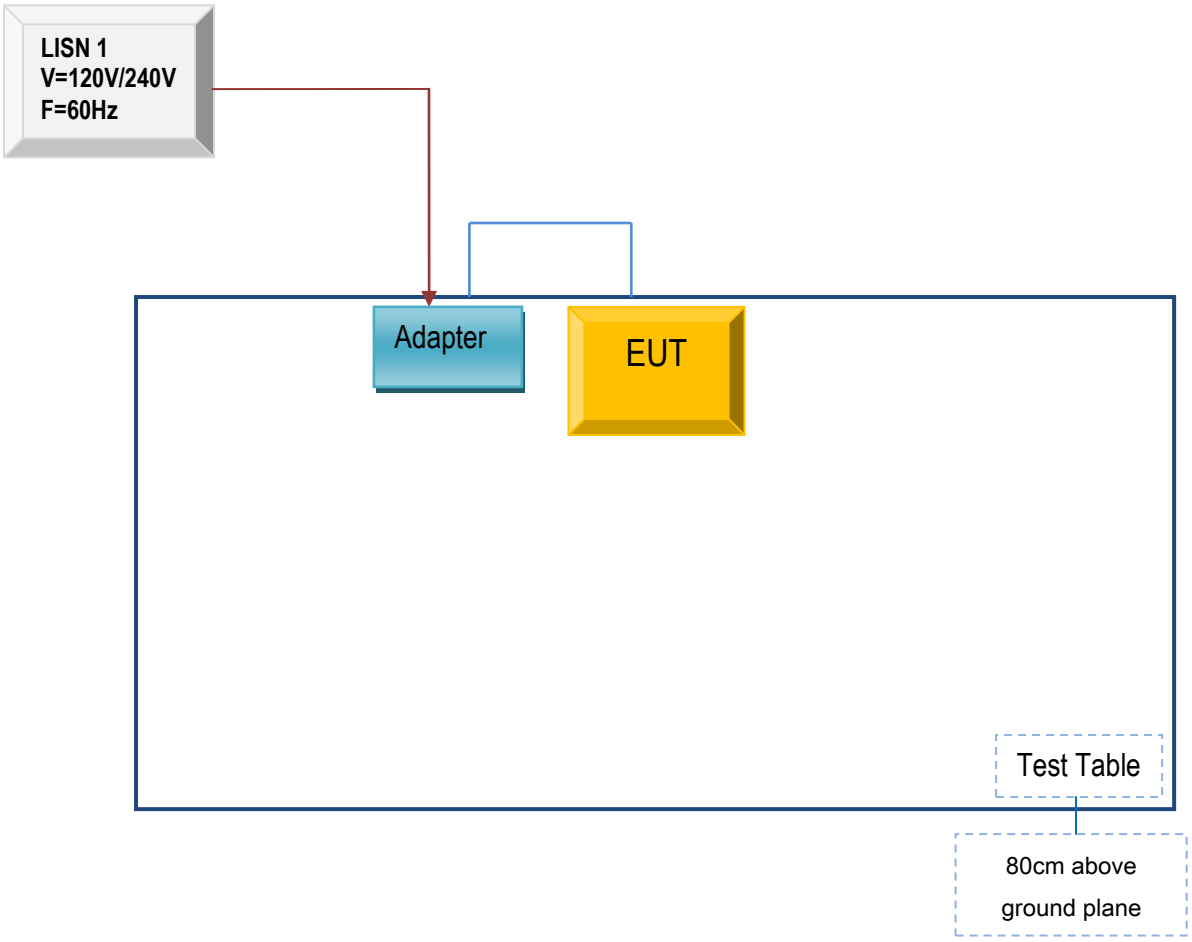
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/15/2017	09/14/2018	☑
Line Impedance Stabilization Network	LI-125A	191106	09/23/2017	09/22/2018	☑
Line Impedance Stabilization Network	LI-125A	191107	09/23/2017	09/22/2018	☑
LISN	ISN T800	34373	09/23/2017	09/22/2018	☑
Transient Limiter	LIT-153	531118	08/29/2018	08/28/2019	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/15/2017	09/14/2018	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/29/2018	08/28/2019	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/22/2018	03/21/2019	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/19/2017	09/18/2018	☑
Double Ridge Horn Antenna	AH-118	71259	09/22/2017	09/21/2018	☑

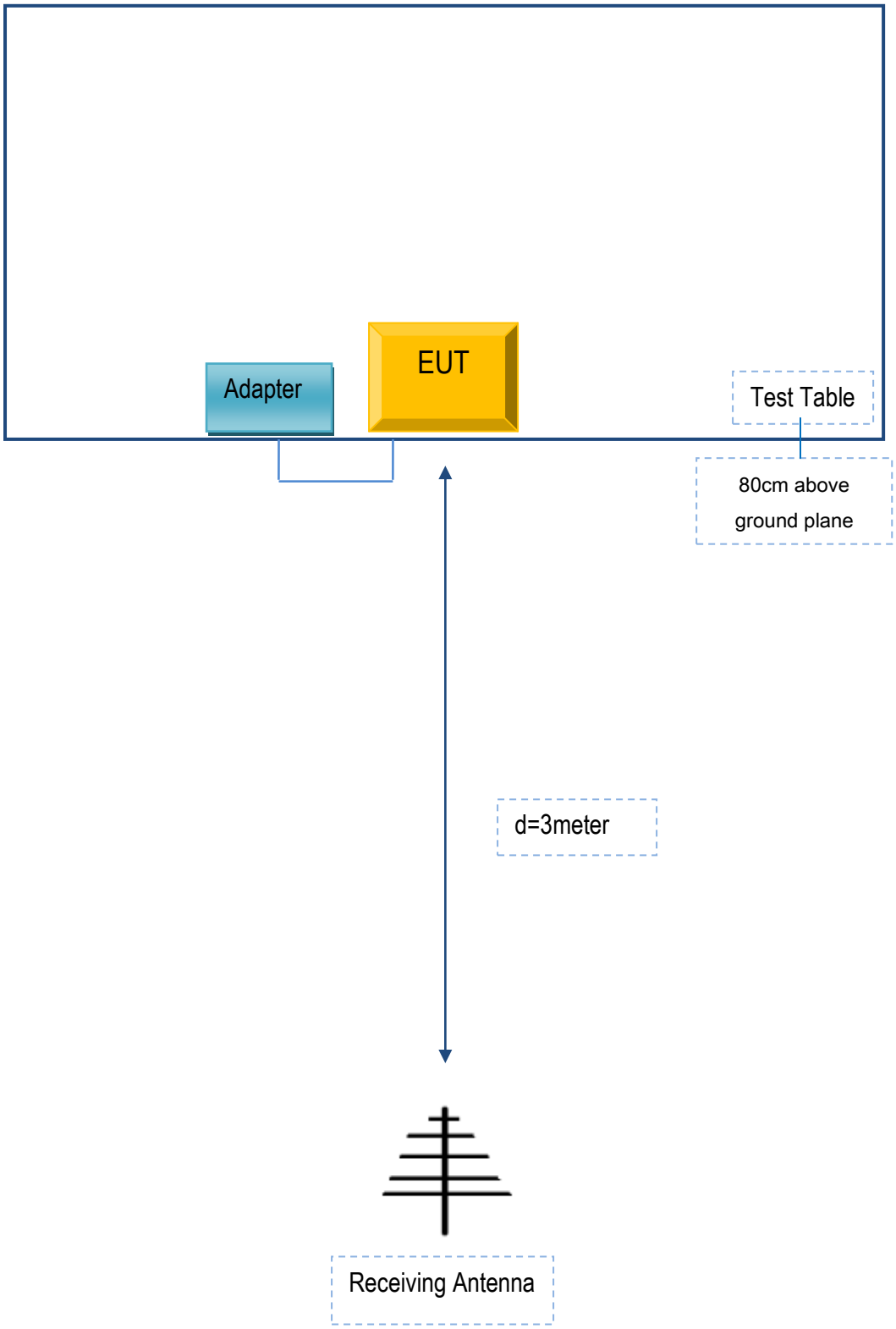
Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

Annex B.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex B. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Medtrum Technologies Inc.	Adaptor	UES06WNCPU-050100SPA	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	N/A

Annex C. User Manual / Block Diagram / Schematics / Partlist/ DECLARATION OF SIMILARITY

Please see the attachment