

FCC Test Report

Product Name	Automatic Upper Arm Blood Pressure Monitor
Model No.	HL858CB
FCC ID.	2ABTAHNL85CBA

Applicant	HEALTH & LIFE CO., LTD.
Address	9F No.186, Jian Yi Road, Zhonghe District, New Taipei City, Taiwan

Date of Receipt	Aug. 06, 2015
Issued Date	Aug. 21, 2015
Report No.	1580266R-RFUSP01V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Test Report

Issued Date: Aug. 21, 2015

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Applicant	HEALTH & LIFE CO., LTD.
Address	9F No.186, Jian Yi Road, Zhonghe District, New Taipei City, Taiwan
Manufacturer	HEALTH & LIFE CO., LTD.
Model No.	HL858CB
FCC ID.	2ABTAHNL85CBA
EUT Rated Voltage	DC 6V by Battery
EUT Test Voltage	AC 120V/60Hz
Trade Name	Health & Life
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2014 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v03r03
Test Result	Complied

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Attachment 1: EUT Test Photographs
Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Automatic Upper Arm Blood Pressure Monitor
Trade Name	Health & Life
Model No.	HL858CB
FCC ID.	2ABTAHNL85CBA
Frequency Range	2402 – 2480MHz
Channel Number	V4.0: 40CH
Type of Modulation	V4.0: GFSK (1Mbps)
Antenna Type	PCB Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Contain Module	AMICCOM/A8105

Antenna List

No.	Manufacturer	Model No.	Antenna Type	Peak Gain
1	SIGNAL	SMD8105-A0X	PCB Antenna	-2.39556dBi for 2.4 GHz

Note: The antenna of EUT is conforming to FCC 15.203.

Center Frequency of Each Channel: (For V4.0)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 01:	2404 MHz	Channel 02:	2406 MHz	Channel 03:	2408 MHz
Channel 04:	2410 MHz	Channel 05:	2412 MHz	Channel 06:	2414 MHz	Channel 07:	2416 MHz
Channel 08:	2418 MHz	Channel 09:	2420 MHz	Channel 10:	2422 MHz	Channel 11:	2424 MHz
Channel 12:	2426 MHz	Channel 13:	2428 MHz	Channel 14:	2430 MHz	Channel 15:	2432 MHz
Channel 16:	2434 MHz	Channel 17:	2436 MHz	Channel 18:	2438 MHz	Channel 19:	2440 MHz
Channel 20:	2442 MHz	Channel 21:	2444 MHz	Channel 22:	2446 MHz	Channel 23:	2448 MHz
Channel 24:	2450 MHz	Channel 25:	2452 MHz	Channel 26:	2454 MHz	Channel 27:	2456 MHz
Channel 28:	2458 MHz	Channel 29:	2460 MHz	Channel 30:	2462 MHz	Channel 31:	2464 MHz
Channel 32:	2466 MHz	Channel 33:	2468 MHz	Channel 34:	2470 MHz	Channel 35:	2472 MHz
Channel 36:	2474 MHz	Channel 37:	2476 MHz	Channel 38:	2478 MHz	Channel 39:	2480 MHz

Note:

1. The EUT is a Automatic Upper Arm Blood Pressure Monitor with a built-in Bluetooth V4.0 transceiver.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit - BLE (GFSK)
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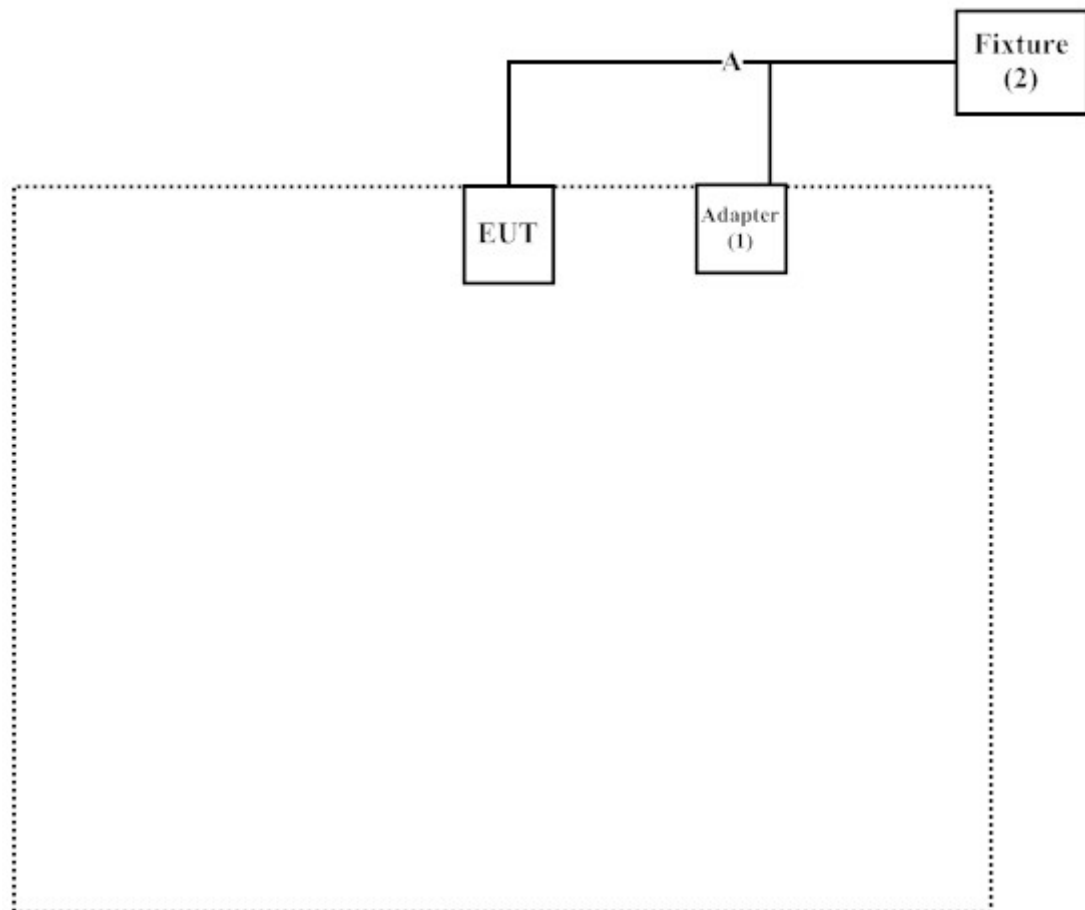
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Adapter	Mass Power	SDF0600100C1BA	N/A	N/A
2	Fixture	FLUKE	BP PUMP2	9170010	Non-Shielded, 1.8m

Signal Cable Type	Signal cable Description
A Air Cable (1 to 2)	Non-Shielded, 4.2m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute continue transmitter on the EUT
- (3) Check the test mode, the test channel, and the data rate.
- (4) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from
QuieTek Corporation's Web Site: <http://www.quietek.com/chinese/about/certificates.aspx?bval=5>
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site:
<http://www.quietek.com/>

Site Description: File on
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FCC Engineering Laboratory
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Registration Number: 92195

Site Name: Quietek Corporation
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Linkou Dist. New Taipei City 24451,
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TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

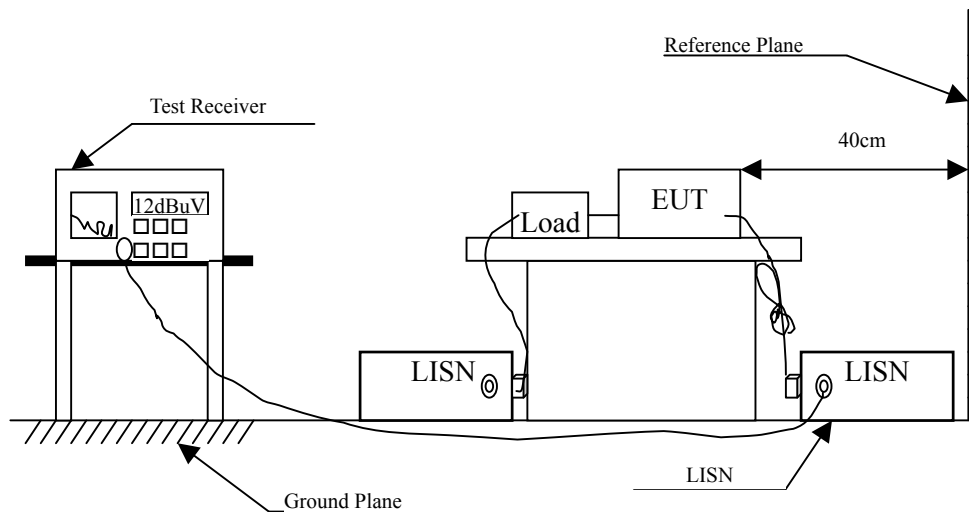
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Next Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2014	Sep., 2015	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2015	Feb., 2016	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2015	Feb., 2016	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2015	Mar, 2016	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2015	Feb., 2016	
	No.1 Shielded Room					

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 1: Transmit - BLE (GFSK) (2442MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 1					
Quasi-Peak					
0.150	9.764	23.670	33.434	-32.566	66.000
0.173	9.758	21.870	31.628	-33.715	65.343
0.193	9.754	20.060	29.814	-34.957	64.771
0.271	9.760	15.190	24.950	-37.593	62.543
0.447	9.774	22.460	32.234	-25.280	57.514
0.732	9.796	24.540	34.336	-21.664	56.000
Average					
0.150	9.764	9.190	18.954	-37.046	56.000
0.173	9.758	7.240	16.998	-38.345	55.343
0.193	9.754	3.300	13.054	-41.717	54.771
0.271	9.760	6.520	16.280	-36.263	52.543
0.447	9.774	11.470	21.244	-26.270	47.514
0.732	9.796	12.190	21.986	-24.014	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 1: Transmit - BLE (GFSK) (2442MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV
	dB	dBuV	dBuV		
LINE 2					
Quasi-Peak					
0.154	9.763	22.690	32.453	-33.433	65.886
0.166	9.760	21.740	31.500	-34.043	65.543
0.248	9.758	14.160	23.918	-39.291	63.210
0.295	9.762	13.330	23.092	-38.765	61.857
0.455	9.774	21.050	30.824	-26.462	57.286
0.603	9.786	10.780	20.566	-35.434	56.000
Average					
0.154	9.763	1.890	11.653	-44.233	55.886
0.166	9.760	11.310	21.070	-34.473	55.543
0.248	9.758	14.200	23.958	-29.251	53.210
0.295	9.762	5.000	14.762	-37.095	51.857
0.455	9.774	12.660	22.434	-24.852	47.286
0.603	9.786	2.920	12.706	-33.294	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

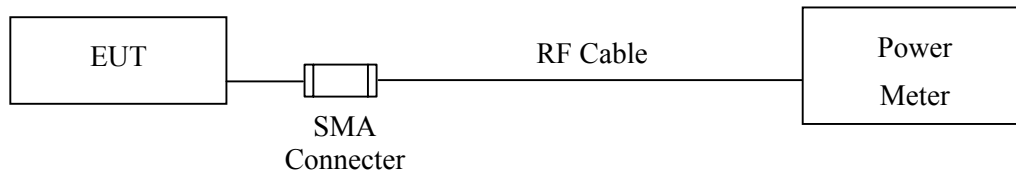
3. Peak Power Output

3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Next Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2015	May, 2016
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2015	Jun, 2016

Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

3.2. Test Setup



3.3. Limit

The maximum peak power shall be less 1Watt.

3.4. Test Procedure

Tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Power Output

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Peak Power Output
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	4.95	1 Watt= 30 dBm	Pass
Channel 19	2440.00	5.01	1 Watt= 30 dBm	Pass
Channel 39	2480.00	4.57	1 Watt= 30 dBm	Pass

4. Radiated Emission

4.1. Test Equipment

The following test equipments are used during the radiated emission test:

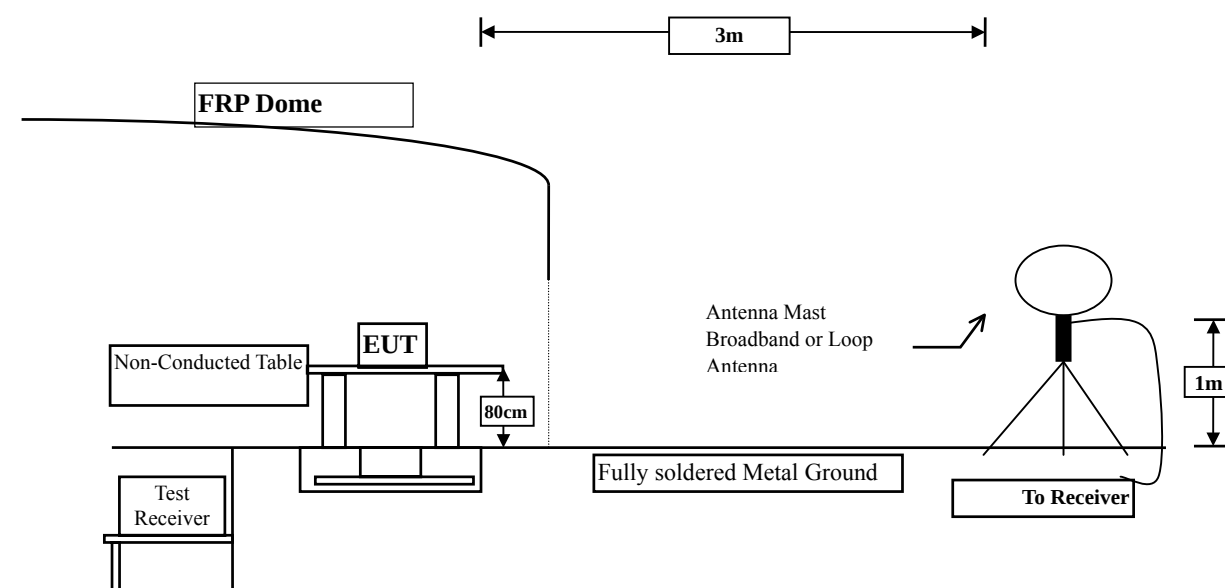
Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Next Cal.
☒ Site # 3	X Magnetic Loop Antenna	Teseq	HLA6121/ 37133	Sep, 2014	Sep, 2015
	X Bilog Antenna	Schaffner Chase	CBL6112B/ 2707	Jun, 2015	Jun, 2016
	X EMI Test Receiver	R&S	ESCS 30/838251/ 001	Jun, 2015	Jun, 2016
	X Coaxial Cable	QTK(Arnist)	RG 214/ LC003-RG	Jun, 2015	Jun, 2016
	X Coaxial signal switch	Arnist	MP59B/ 6200798682	Jun, 2015	Jun, 2016

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Next Cal.
☒ CB # 8	X Spectrum Analyzer	R&S	FSP40/ 100339	Oct, 2014	Oct, 2015
	X Horn Antenna	ETS-Lindgren	3117/ 35205	Mar, 2015	Mar, 2016
	X Horn Antenna	Schwarzbeck	BBHA9170/209	Jan, 2015	Jan, 2016
	X Horn Antenna	TRC	AH-0801/95051	Aug, 2015	Aug, 2016
	X Pre-Amplifier	EMCI	EMC012630SE/980210	Jan, 2015	Jan, 2016
	X Pre-Amplifier	MITEQ	JS41-001040000-58-5P /153945	Jul, 2015	Jul, 2016
	X Pre-Amplifier	NARDA	DBL-1840N506/013	Jul, 2015	Jul, 2016

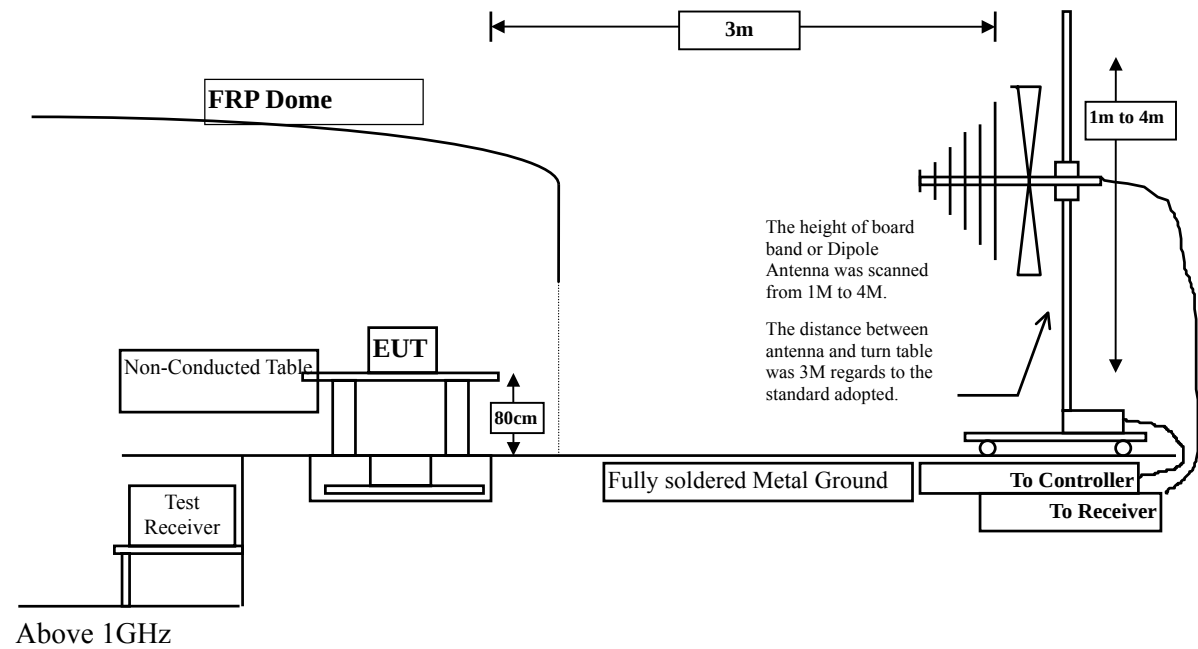
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with "X" are used to measure the final test results.

4.2. Test Setup

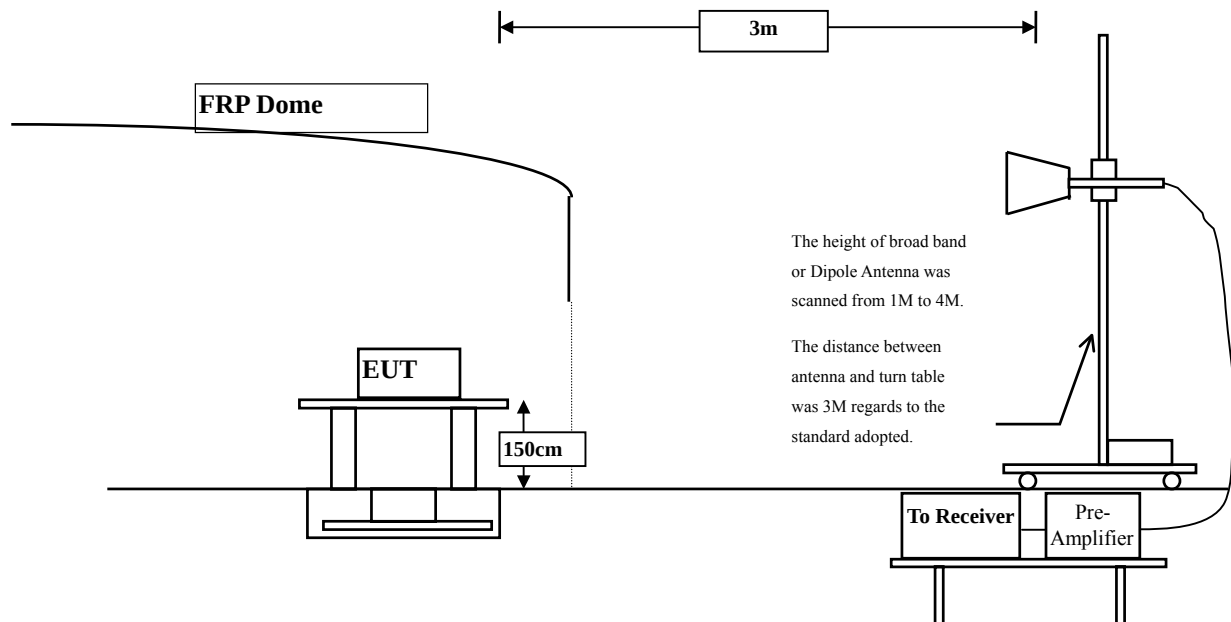
9kHz~30MHz



30MHz~1GHz



Above 1GHz



4.3. Limits

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

- Remarks:
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK)(2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4804.000	3.327	65.440	68.767	-5.233	74.000
7206.000	10.136	41.980	52.116	-21.884	74.000
9608.000	13.706	36.250	49.956	-24.044	74.000
Average Detector:					
4804.000	3.327	31.850	35.177	-18.823	54.000
Vertical					
Peak Detector:					
4804.000	6.638	65.860	72.497	-1.503	74.000
7206.000	11.005	45.980	56.985	-17.015	74.000
9608.000	14.103	33.680	47.783	-26.217	74.000
Average Detector:					
4804.000	6.638	30.250	36.887	-17.113	54.000
7206.000	11.005	28.520	39.525	-14.475	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4880.000	3.010	60.510	63.520	-10.480	74.000
7320.000	11.833	40.450	52.284	-21.716	74.000
9760.000	12.580	33.190	45.771	-28.229	74.000
Average Detector:					
4880.000	3.010	27.520	30.530	-23.470	54.000
Vertical					
Peak Detector:					
4880.000	5.738	66.310	72.048	-1.952	74.000
7320.000	12.703	44.930	57.633	-16.367	74.000
9760.000	13.052	35.250	48.302	-25.698	74.000
Average Detector:					
4880.000	5.738	28.520	34.258	-19.742	54.000
7320.000	12.703	25.230	37.933	-16.067	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.000	2.760	58.940	61.700	-12.300	74.000
7440.000	12.567	40.620	53.186	-20.814	74.000
9920.000	13.456	35.250	48.706	-25.294	74.000
Average Detector:					
4960.000	2.760	26.580	29.340	-24.660	54.000
Vertical					
Peak Detector:					
4960.000	5.557	64.030	69.587	-4.413	74.000
7440.000	13.426	43.300	56.725	-17.275	74.000
9920.000	13.958	35.250	49.208	-24.792	74.000
Average Detector:					
4960.000	5.557	28.250	33.807	-20.193	54.000
7440.000	13.426	25.950	39.375	-14.625	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
248.001	-6.122	23.550	17.428	-28.572	46.000
370.203	-1.080	17.416	16.337	-29.663	46.000
462.986	1.017	17.410	18.427	-27.573	46.000
541.710	2.900	16.986	19.886	-26.114	46.000
606.377	4.638	17.685	22.322	-23.678	46.000
713.217	3.567	18.726	22.292	-23.708	46.000
Vertical					
380.043	-1.440	17.131	15.691	-30.309	46.000
540.304	0.105	17.130	17.235	-28.765	46.000
685.101	2.239	18.115	20.354	-25.646	46.000
755.391	3.286	19.070	22.356	-23.644	46.000
842.551	3.059	18.807	21.866	-24.134	46.000
966.261	8.016	17.997	26.013	-27.987	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

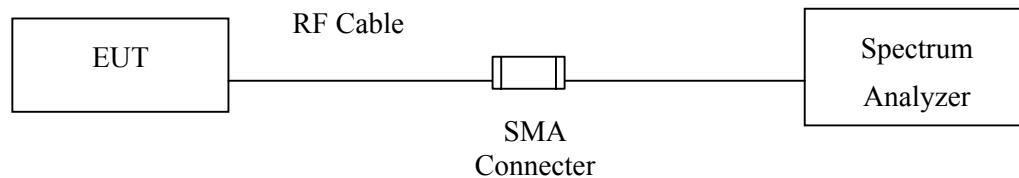
5. RF Antenna Conducted Test

5.1. Test Equipment

Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2015	Jun, 2016
Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2015	Jun, 2016
X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015	Apr., 2016

Note: 1. All equipments are calibrated every one year.
2. The test instruments Marked "X" are used to measure the final test results.

5.2. Test Setup



5.3. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.4. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

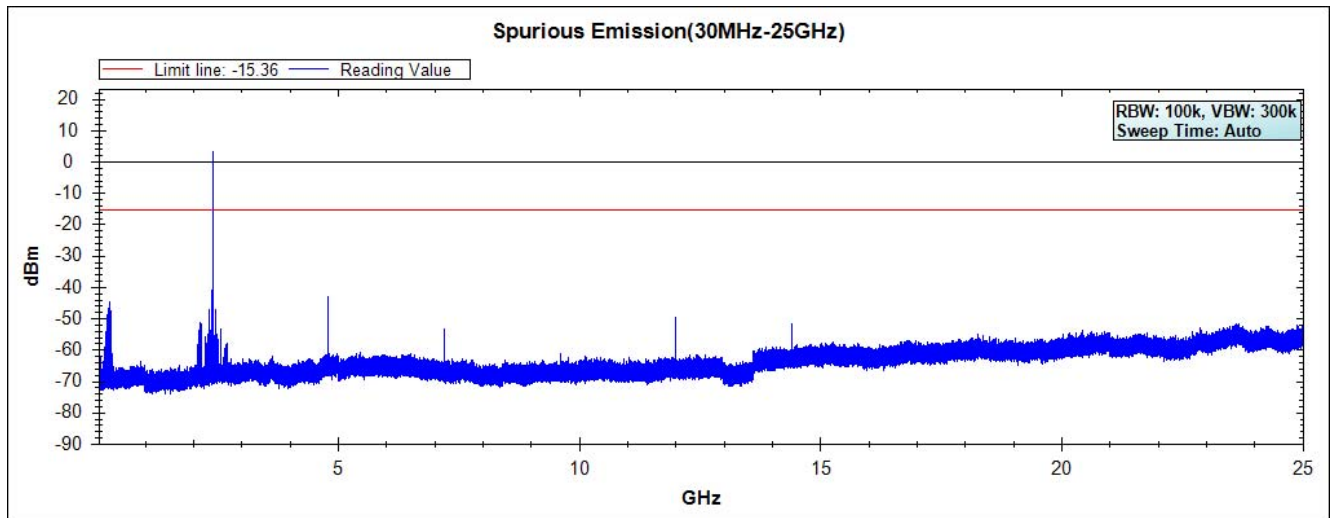
5.5. Uncertainty

± 150Hz

5.6. Test Result of RF Antenna Conducted Test

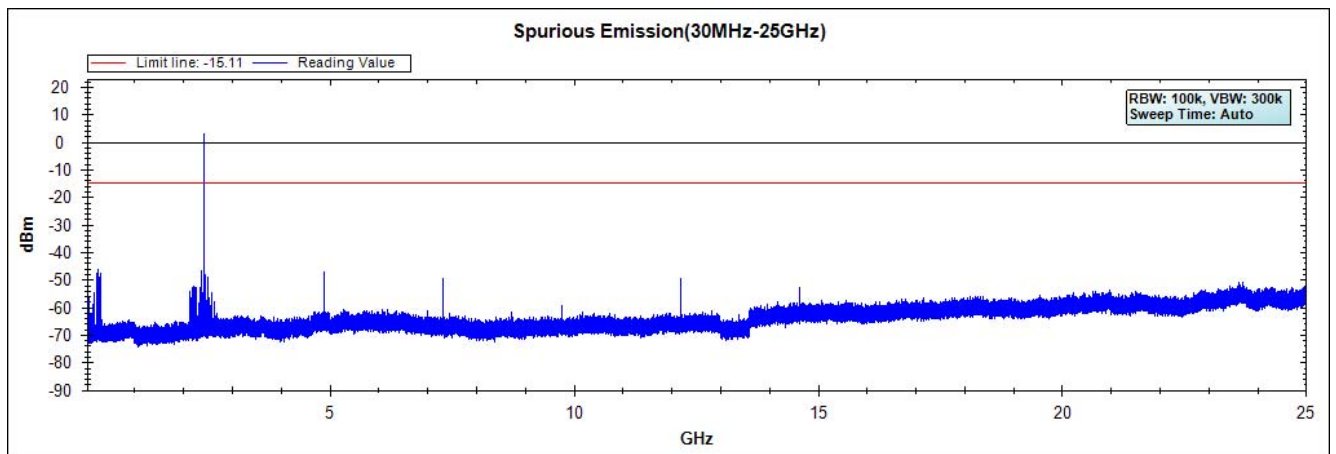
Product : Automatic Upper Arm Blood Pressure Monitor
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - BLE (GFSK)

Figure Channel 00:



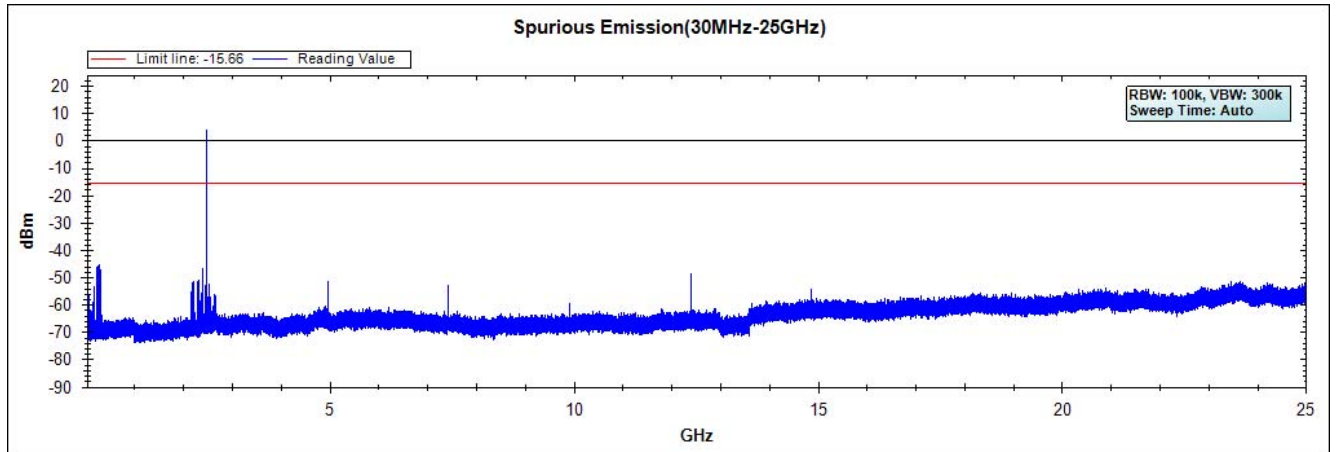
Product : Automatic Upper Arm Blood Pressure Monitor
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - BLE (GFSK)

Figure Channel 19:



Product : Automatic Upper Arm Blood Pressure Monitor
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - BLE (GFSK)

Figure Channel 39:



6. Band Edge

6.1. Test Equipment

RF Conducted Measurement

The following test equipments are used during the band edge tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2015	Jun, 2016
Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2015	Jun, 2016
X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015	Apr., 2016

RF Radiated Measurement:

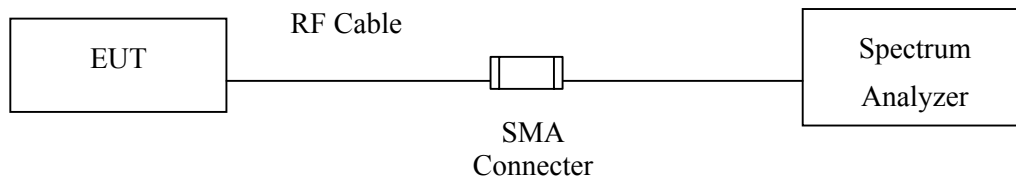
The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Next Cal.
☒ CB # 8	X Spectrum Analyzer	R&S	FSP40/ 100339	Oct, 2014	Oct, 2015
	X Horn Antenna	ETS-Lindgren	3117/ 35205	Mar, 2015	Mar, 2016
	X Horn Antenna	Schwarzbeck	BBHA9170/209	Jan, 2015	Jan, 2016
	X Horn Antenna	TRC	AH-0801/95051	Aug, 2015	Aug, 2016
	X Pre-Amplifier	EMCI	EMC012630SE/980210	Jan, 2015	Jan, 2016
	X Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul, 2015	Jul, 2016
	X Pre-Amplifier	NARDA	DBL-1840N506/013	Jul, 2015	Jul, 2016

Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

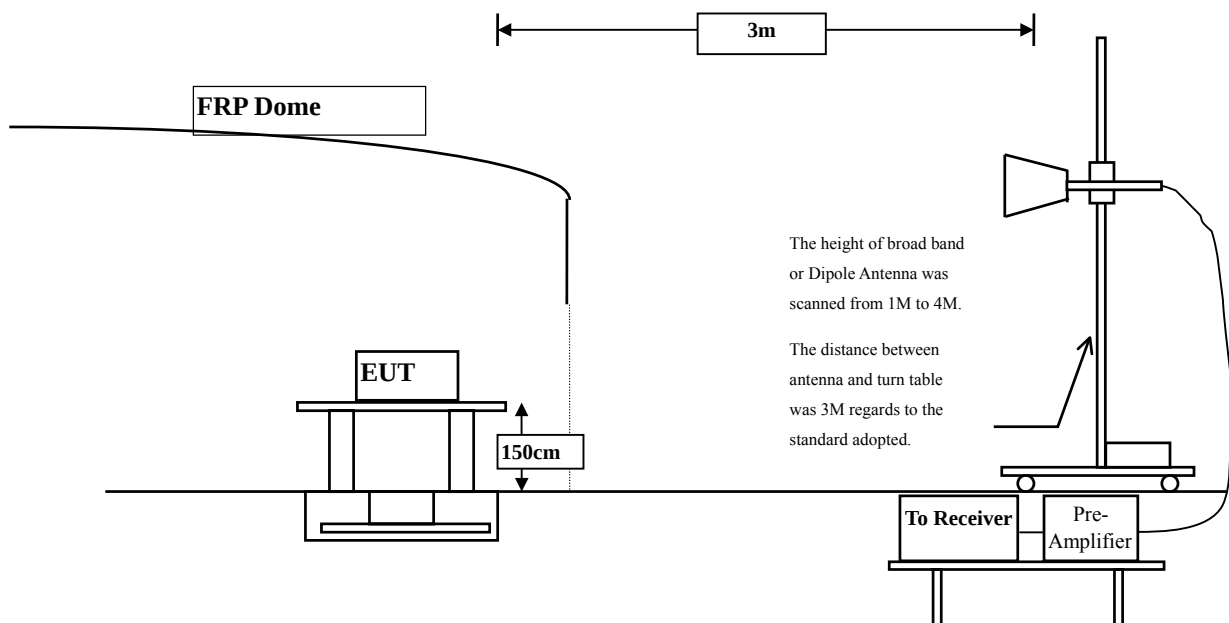
6.2. Test Setup

RF Conducted Measurement



RF Radiated Measurement:

Above 1GHz



6.3. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

6.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

6.6. Test Result of Band Edge

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2370.100	-2.775	49.591	46.816	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	46.470	43.783	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	66.607	63.947	--	--	--
00 (Peak)	2402.200	-2.657	97.736	95.079	--	--	--
00 (Average)	2369.900	-2.776	44.003	41.227	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	38.789	36.102	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	60.380	57.720	--	--	--
00 (Average)	2402.000	-2.657	97.706	95.049	--	--	--

Figure Channel 00:

Horizontal (Peak)

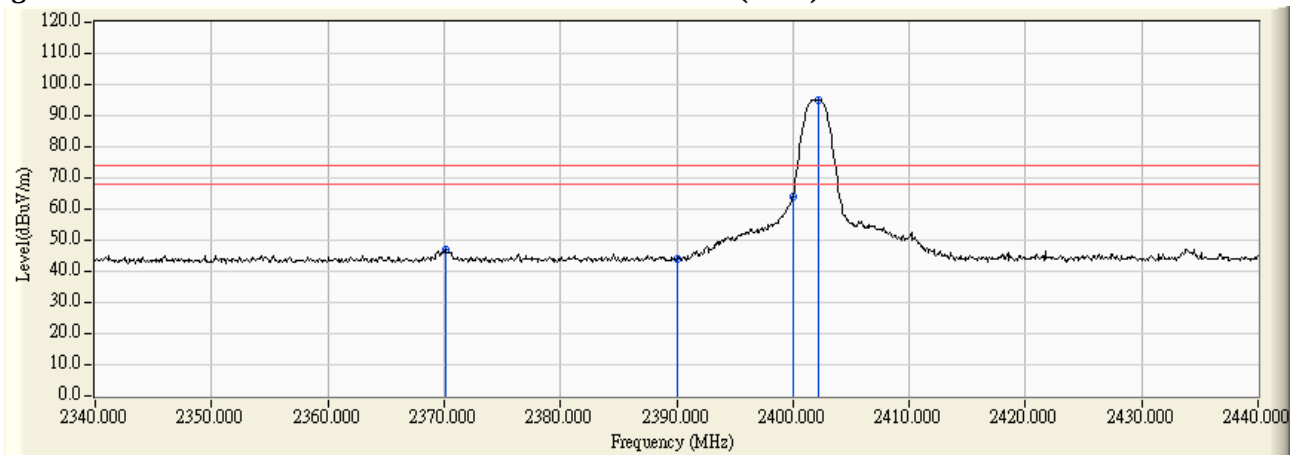
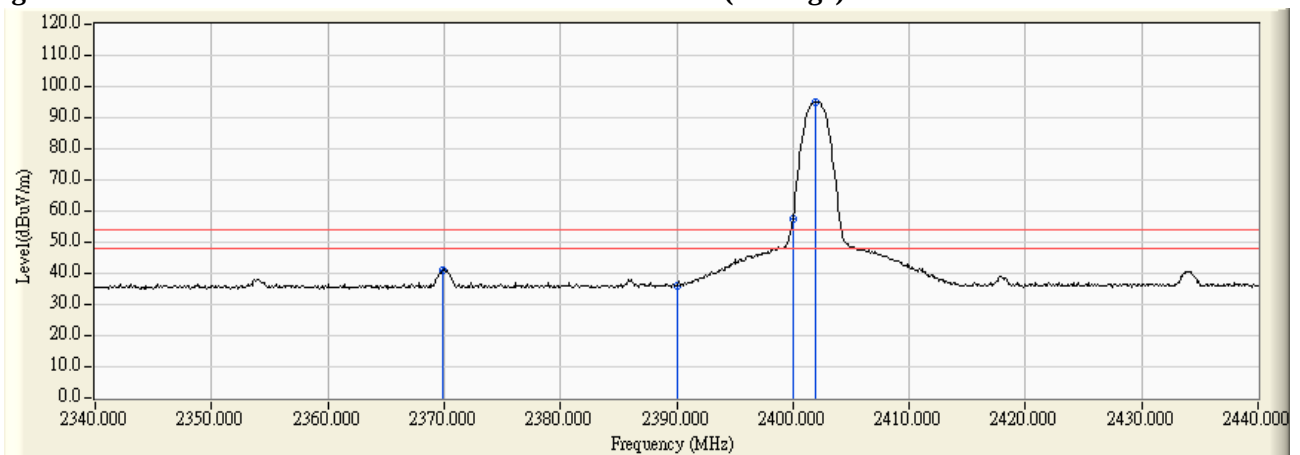


Figure Channel 00:

Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2370.000	-4.091	48.907	44.816	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	46.907	42.748	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	64.589	60.418	--	--	--
00 (Peak)	2402.200	-4.171	95.311	91.140	--	--	--
00 (Average)	2370.000	-4.091	42.536	38.445	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	39.004	34.845	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	58.099	53.928	--	--	--
00 (Average)	2402.000	-4.171	95.288	91.117	--	--	--

Figure Channel 00:

Vertical (Peak)

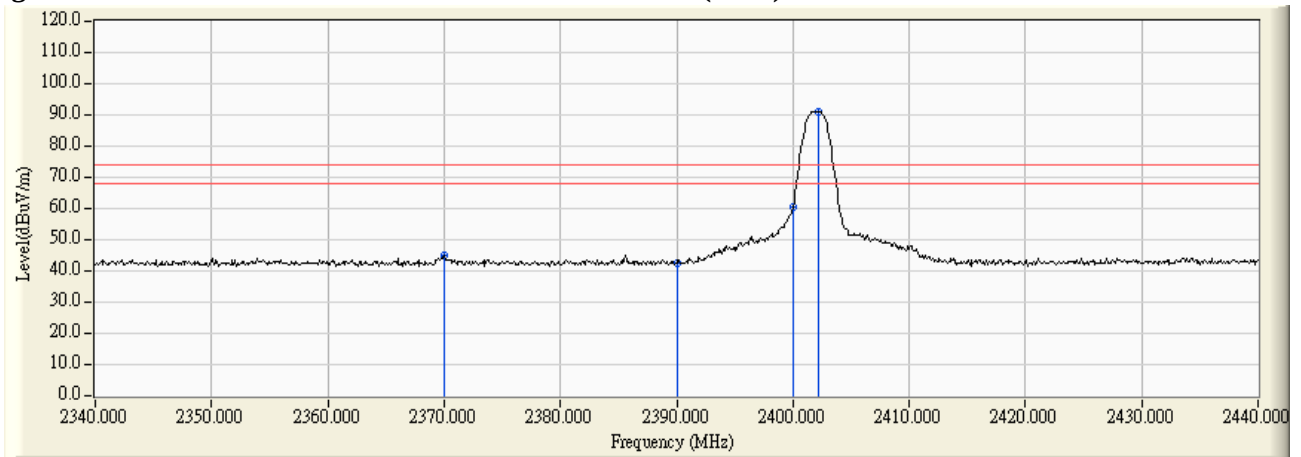
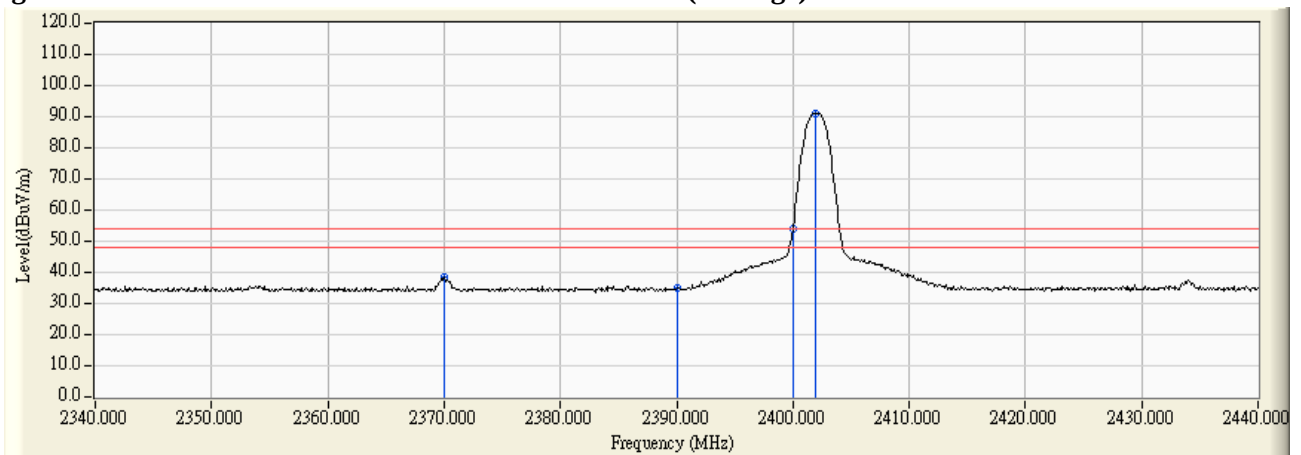


Figure Channel 00:

Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Automatic Upper Arm Blood Pressure Monitor
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - BLE (GFSK)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
39 (Peak)	2480.300	-2.605	98.938	96.333	--	--	--
39 (Peak)	2483.500	-2.601	59.152	56.550	74.00	54.00	Pass
39 (Average)	2480.000	-2.605	98.937	96.332	--	--	--
39 (Average)	2483.500	-2.601	51.412	48.810	74.00	54.00	Pass

Figure Channel 39: Horizontal (Peak)

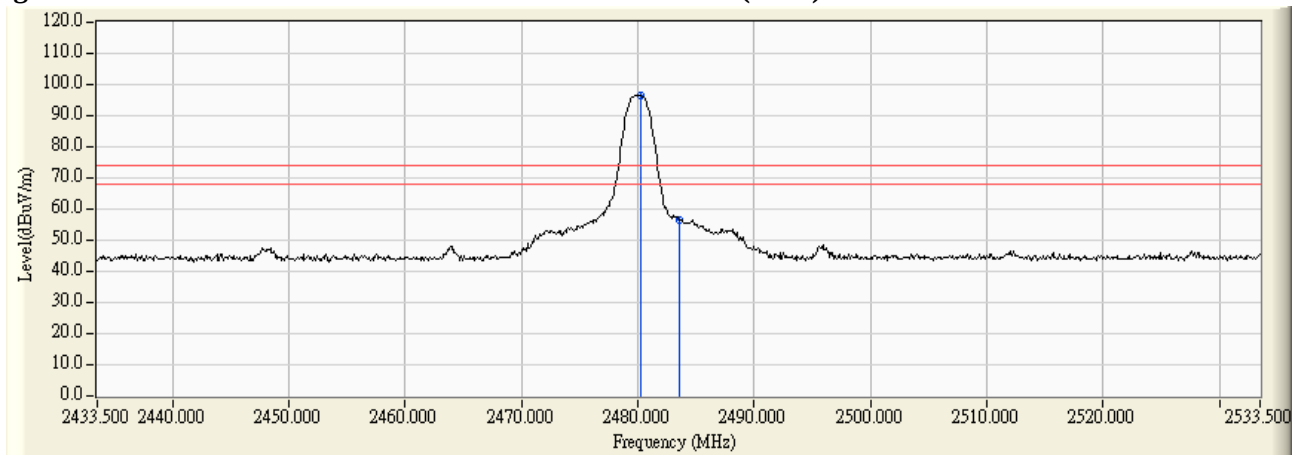
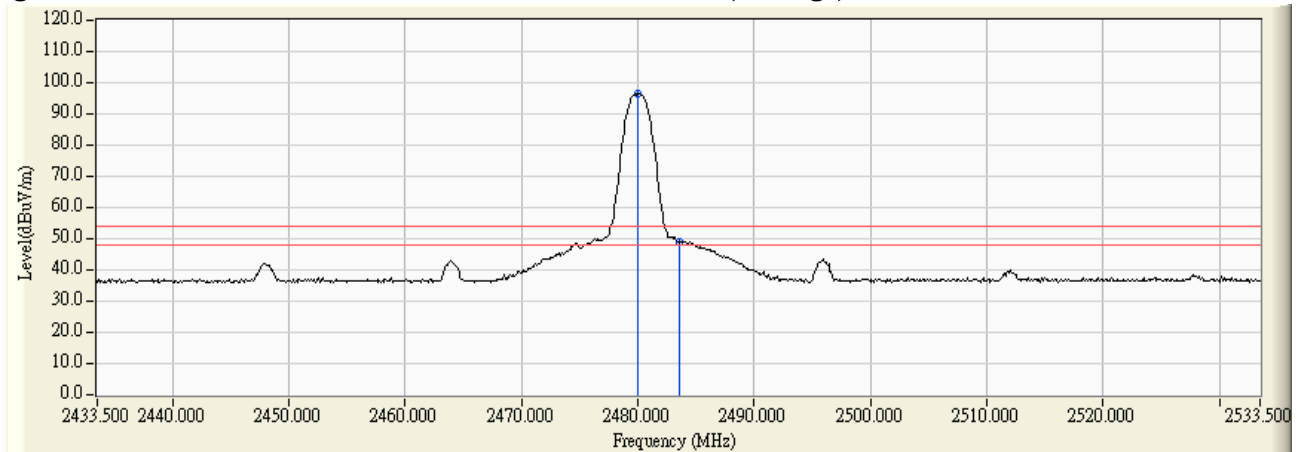


Figure Channel 39: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
39 (Peak)	2479.800	-3.978	97.317	93.339	--	--	--
39 (Peak)	2483.500	-3.966	57.937	53.970	74.00	54.00	Pass
39 (Average)	2480.300	-3.977	97.447	93.470	--	--	--
39 (Average)	2483.500	-3.966	50.148	46.181	74.00	54.00	Pass

Figure Channel 39: Vertical (Peak)

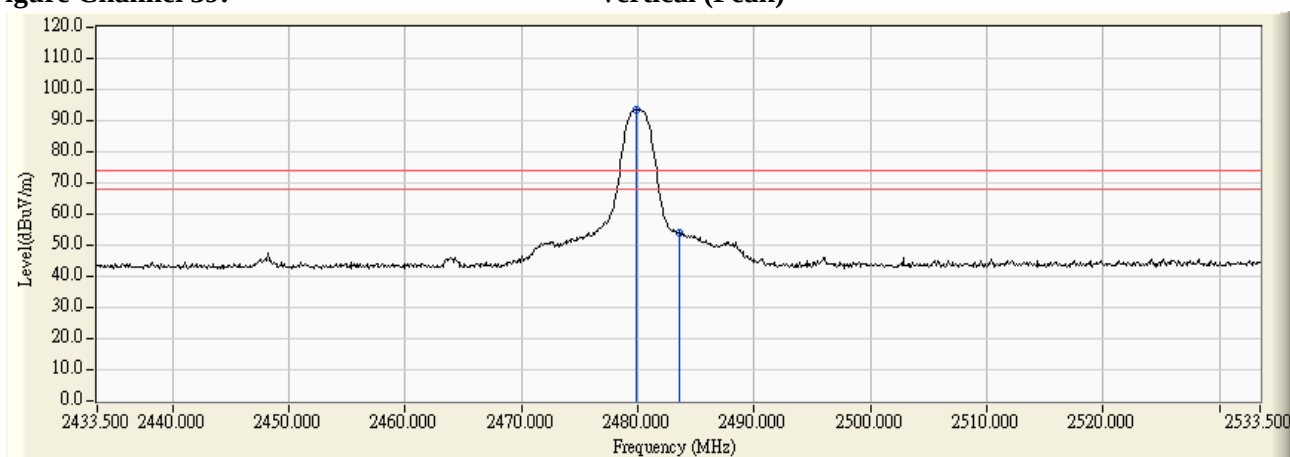
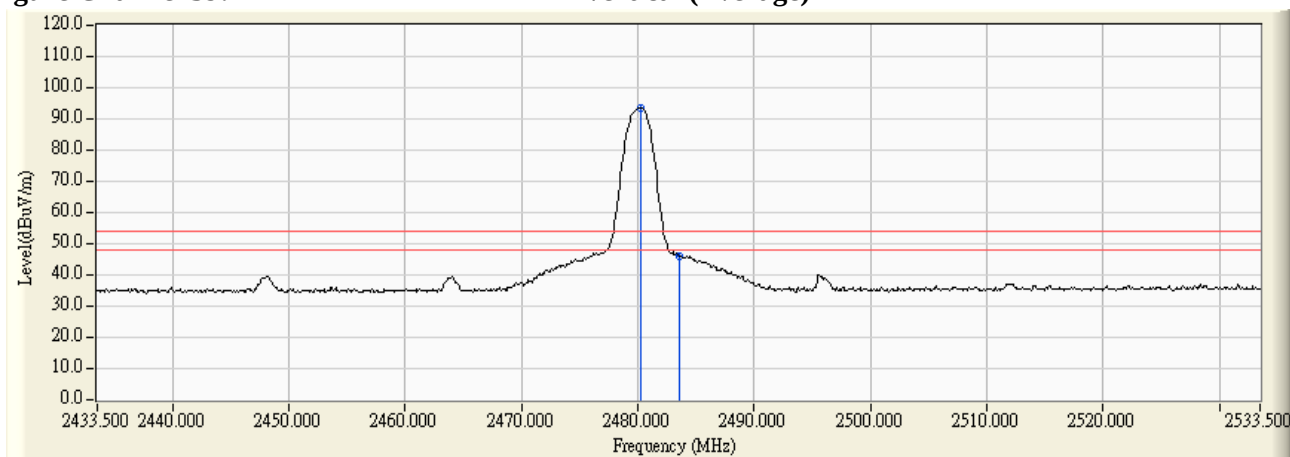


Figure Channel 39: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

7. Occupied Bandwidth (6dB BW)

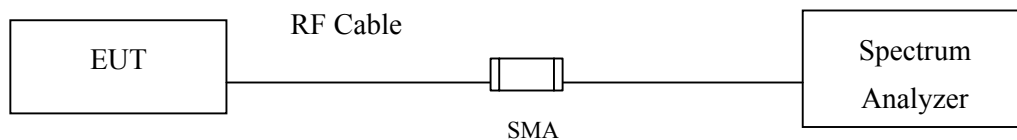
7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Next Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2015	Jun, 2016
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2015	Jun, 2016
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015	Apr., 2016

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

7.2. Test Setup



7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

7.4. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 1-5% of the emission bandwidth, VBW $\geq$ 3*RBW

7.5. Uncertainty

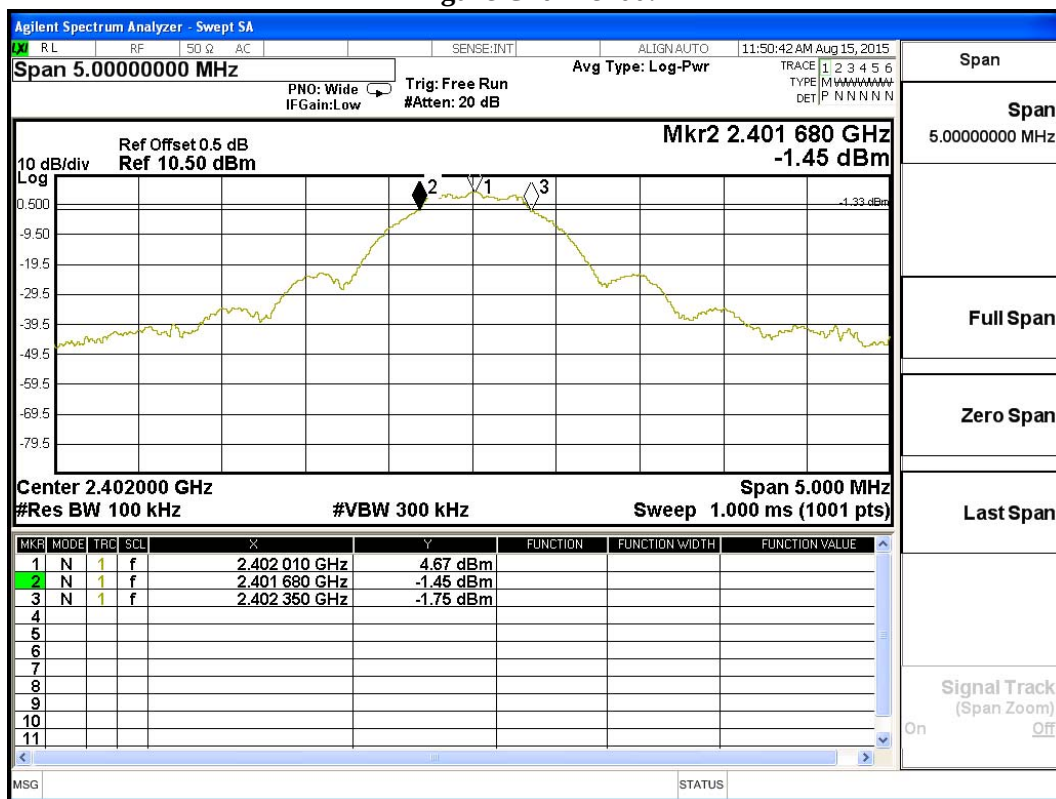
$\pm$ 150Hz

7.6. Test Result of Occupied Bandwidth

Product : Automatic Upper Arm Blood Pressure Monitor
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	670	>500	Pass

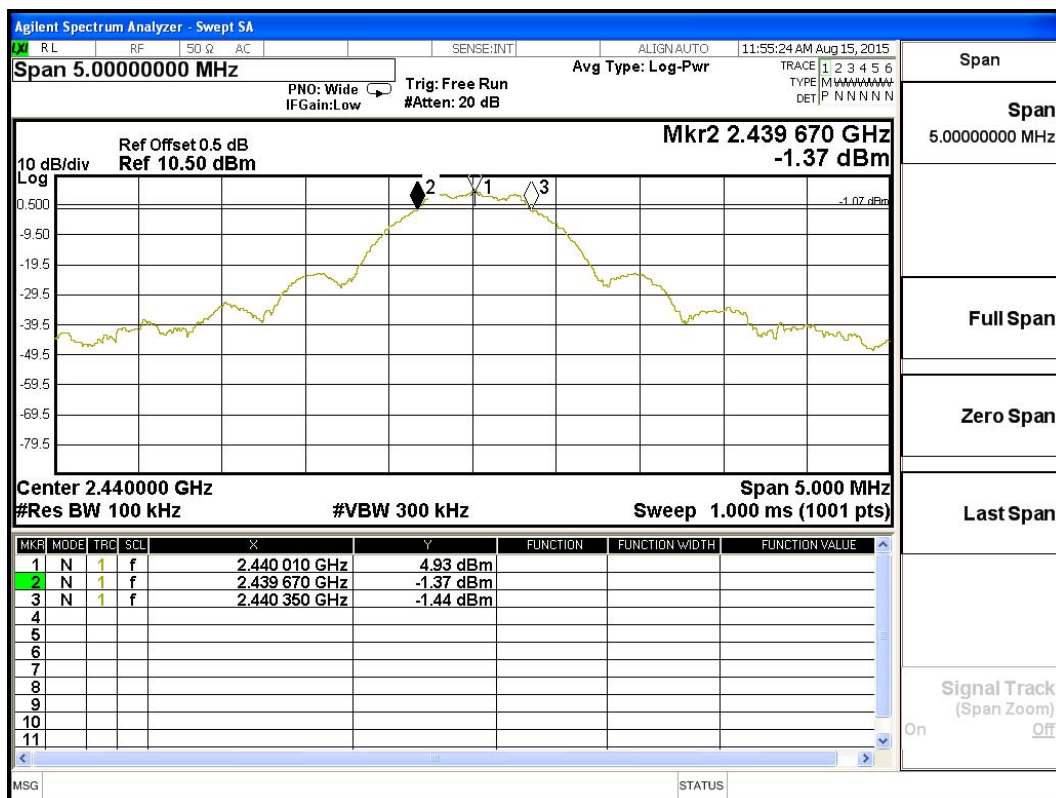
Figure Channel 00:



Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
19	2440	680	>500	Pass

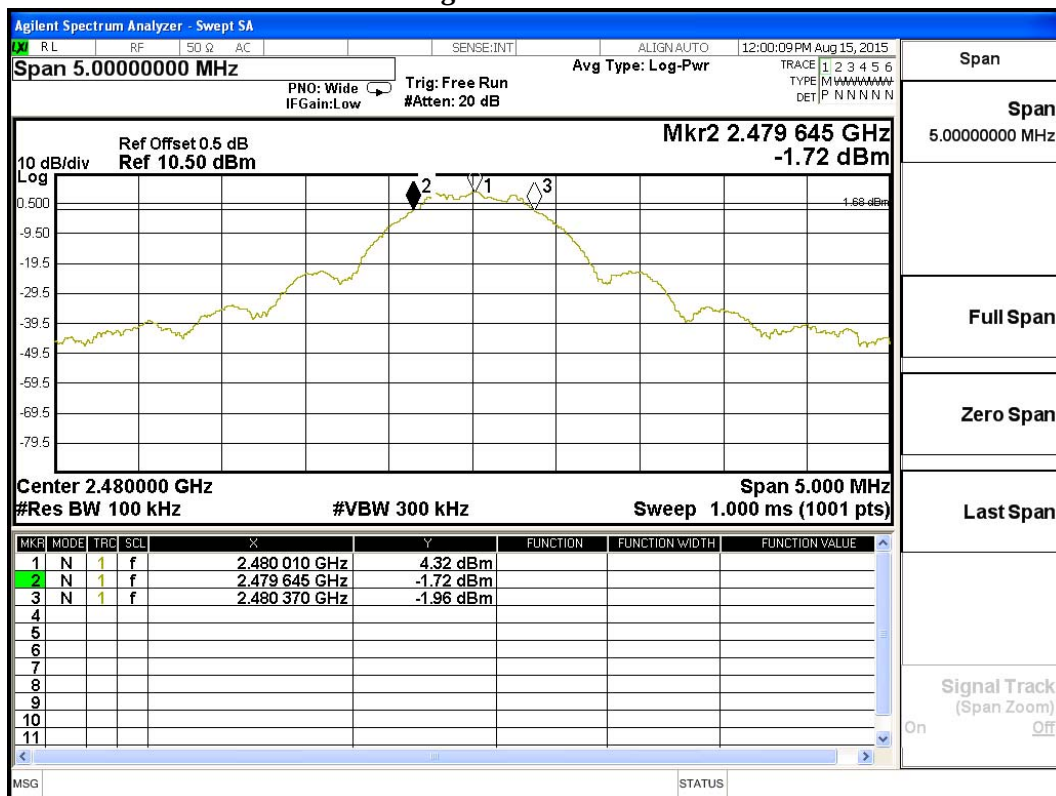
Figure Channel 19:



Product : Automatic Upper Arm Blood Pressure Monitor
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2480	725	>500	Pass

Figure Channel 39:



8. Power Density

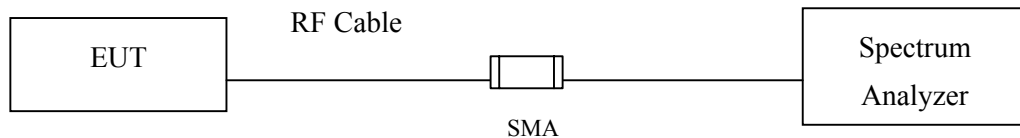
8.1. Test Equipment

	Equipment	Manufactu	Model No./Serial No.	Last Cal.	Next Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2015	Jun, 2016
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2015	Jun, 2016
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015	Apr., 2016

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

8.2. Test Setup



8.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2013, the maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

8.5. Uncertainty

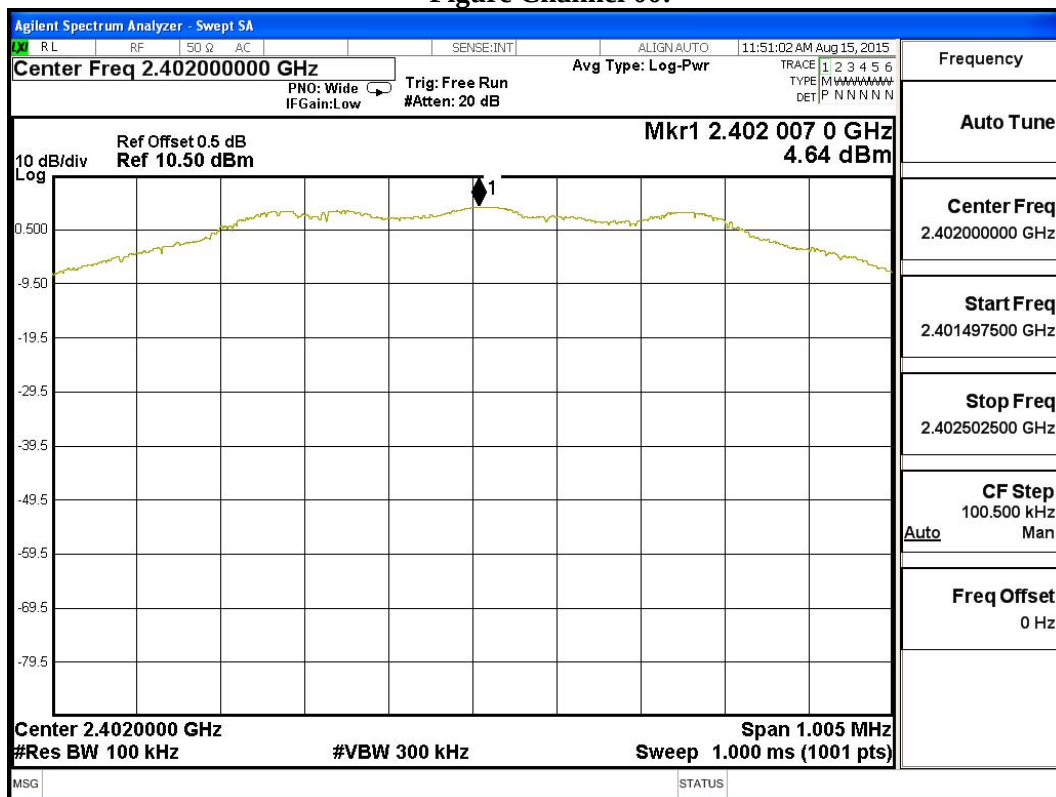
± 1.27 dB

8.6. Test Result of Power Density

Product : Automatic Upper Arm Blood Pressure Monitor
 Test Item : Power Density Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	4.64	< 8dBm	Pass

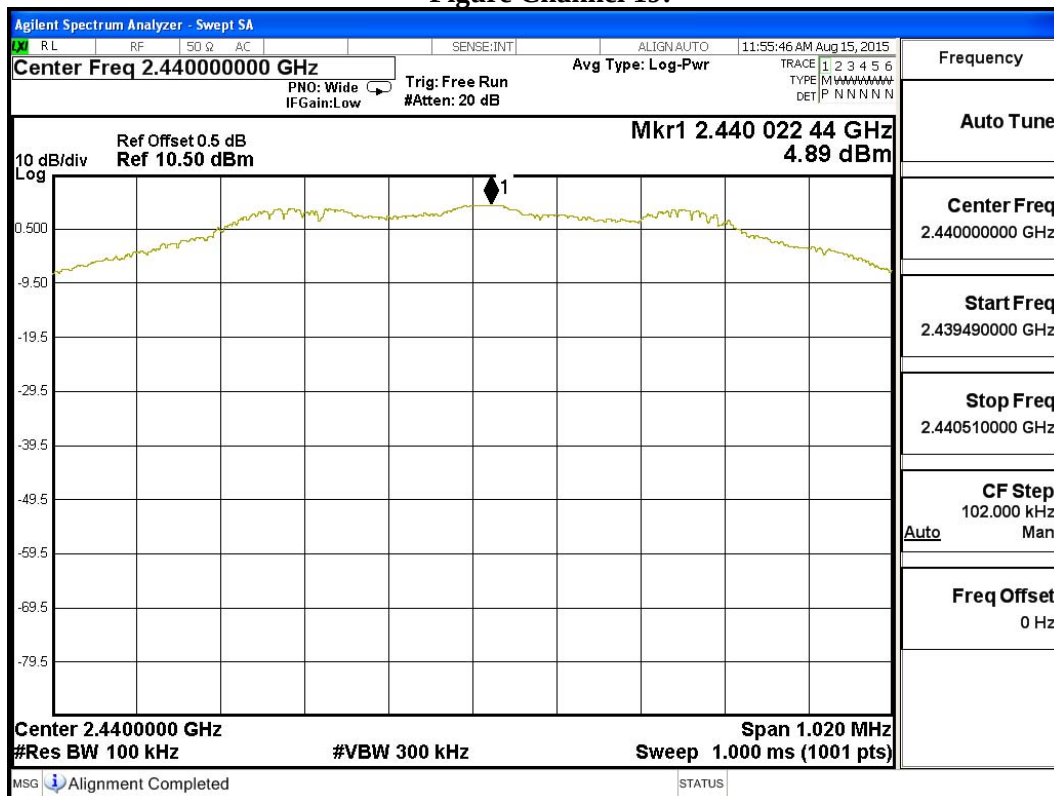
Figure Channel 00:



Product : Automatic Upper Arm Blood Pressure Monitor
 Test Item : Power Density Data
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
19	2440	4.89	< 8dBm	Pass

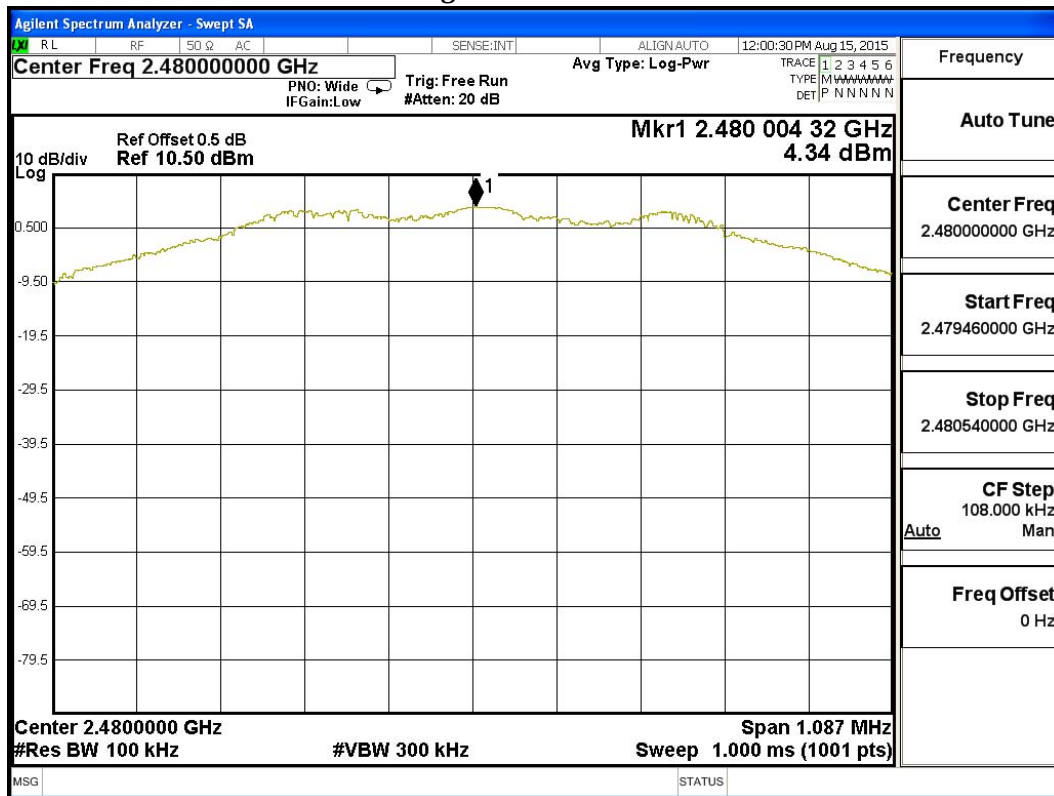
Figure Channel 19:



Product : Automatic Upper Arm Blood Pressure Monitor
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
39	2480	4.34	< 8dBm	Pass

Figure Channel 39:



9. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs