FCC Test Report

Product Name	Blood Pressure Monitor
Model No.	HL858CB
FCC ID.	2ABTAHNL85CB1

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

Date of Receipt	Dec. 10, 2015
Issued Date	Jan. 15, 2016
Report No.	1610278R-RFUSP01V00
Report Version	V1.0

Testing Laboratory
3023

Test Report

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Product Name	Blood Pressure Monitor
Applicant	HEALTH & LIFE CO.,LTD.
Address	9F., No.186, Jian Yi Road, Zhonghe District, New Taipei City, Taiwan
Manufacturer	HEALTH & LIFE CO.,LTD.
Address	9F., No.186, Jian Yi Road, Zhonghe District, New Taipei City, Taiwan
Name and address of factory (ies) :	#1 Health & Life (Suzhou) Co., Ltd. No.1428 Xiang Jiang Road, Suzhou New District, Suzhou City 215129, Jiangsu Province, China #2 LIVING SCIENCE CO., LTD. No.1428 Xiang Jiang Road, Suzhou New District Suzhou City 215129,Jiangsu Province, China
Model No.	HL858CB
FCC ID.	2ABTAHNL85CB1
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 v03r04
Test Result	Complied

Documented By : Jinn Chen

(Senior Adm. Specialist / Jinn Chen)

Tested By : Nick Chen

(Engineer / Nick Chen)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Blood Pressure Monitor
Trade Name	Health & Life
Model No.	HL858CB
FCC ID.	2ABTAHNL85CB1
Frequency Range	2402 – 2480MHz
Channel Number	V4.0: 40CH
Type of Modulation	V4.0: GFSK(1Mbps)
Antenna Type	PIFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Power Adapter	MFR: SINPRO, M/N: HPU15-102 Input: AC 100-240V, 47-63Hz, 0.4-0.2A Output: DC 5.99V, 2A max Cable Out: Non-shielded, 1.5m, with one ferrite core bonded.

Antenna List

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

Note:

1. The antenna of EUT is conform 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 Blood Pressure Monitorwith 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)

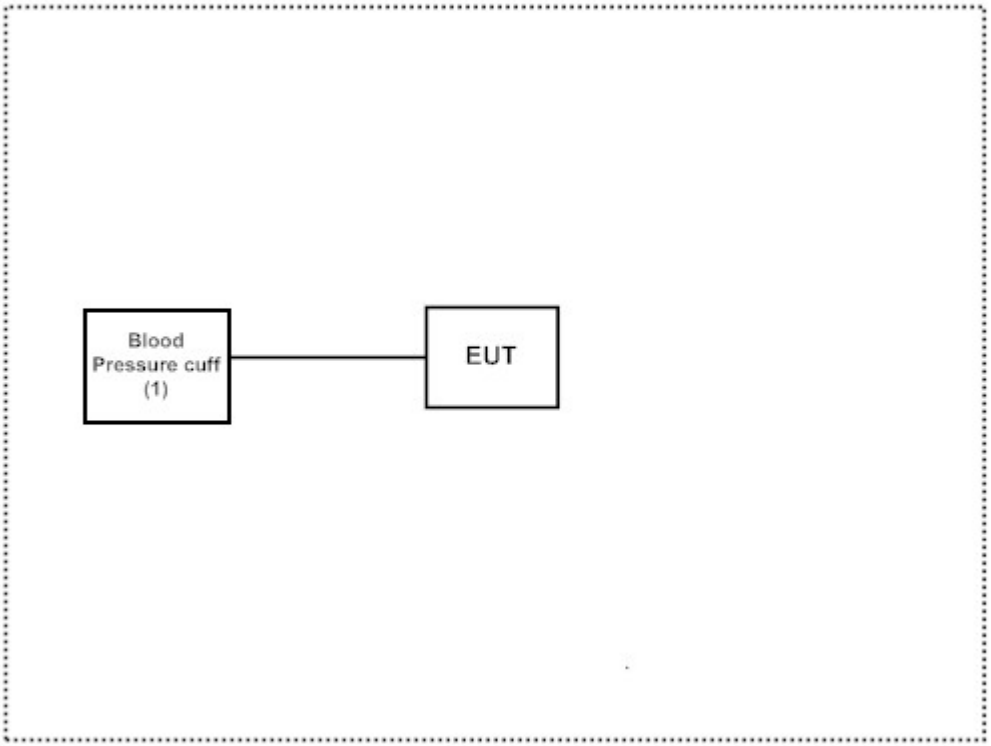
1.3. Tested System Details

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	Blood Pressure cuff	Health	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	Air Cable	Non-shielded, 0.6m

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
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

Site Name: Quietek Corporation
Site Address: No.5-22, Ruishukeng,
Linkou Dist. New Taipei City 24451,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

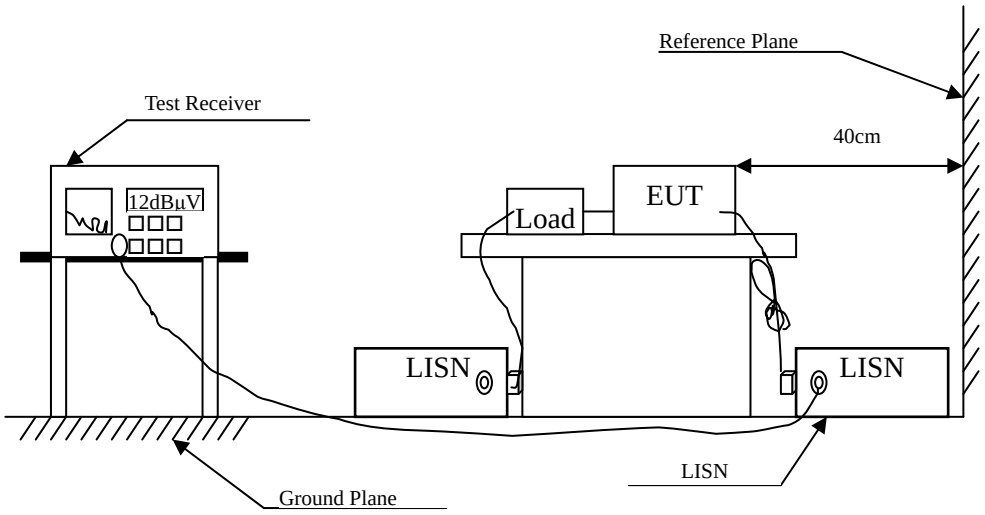
2.1. Test Equipment

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

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.
3. All equipments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBμV) 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 invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup according to ANSI C63.4, 2014 and tested according to DTS test procedure of FCC KDB-558074 for compliance to FCC 47CFR 15.247 requirements.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : Blood Pressure Monitor
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 1: Transmit - BLE (GFSK)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV	dB	dBμV
LINE 1					
Quasi-Peak					
0.170	9.743	34.220	43.964	-21.465	65.429
0.216	9.739	30.030	39.769	-24.345	64.114
0.334	9.745	27.380	37.125	-23.618	60.743
0.490	9.752	32.180	41.932	-14.354	56.286
0.779	9.765	28.600	38.365	-17.635	56.000
7.920	9.910	27.320	37.230	-22.770	60.000
Average					
0.170	9.743	18.800	28.544	-26.885	55.429
0.216	9.739	22.700	32.439	-21.675	54.114
0.334	9.745	24.340	34.085	-16.658	50.743
0.490	9.752	24.580	34.332	-11.954	46.286
0.779	9.765	20.320	30.085	-15.915	46.000
7.920	9.910	21.530	31.440	-18.560	50.000

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 : Blood Pressure Monitor
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 1: Transmit - BLE (GFSK)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 2					
Quasi-Peak					
0.173	9.747	31.650	41.397	-23.946	65.343
0.509	9.753	33.100	42.853	-13.147	56.000
0.771	9.775	28.660	38.435	-17.565	56.000
1.974	9.839	19.840	29.679	-26.321	56.000
6.685	9.900	23.990	33.890	-26.110	60.000
20.920	10.100	24.460	34.560	-25.440	60.000
Average					
0.173	9.747	12.100	21.847	-33.496	55.343
0.509	9.753	21.120	30.873	-15.127	46.000
0.771	9.775	18.660	28.435	-17.565	46.000
1.974	9.839	6.030	15.869	-30.131	46.000
6.685	9.900	16.290	26.190	-23.810	50.000
20.920	10.100	19.050	29.150	-20.850	50.000

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

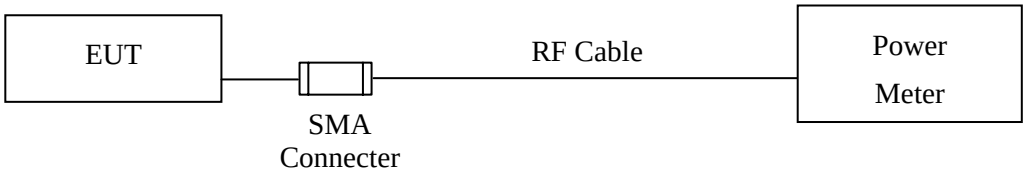
3.1. Test Equipment

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

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.
3. All equipments are calibrated every one year.

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 9.1.2 PKPM1 Peak power meter method.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Power Output

Product : 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	-3.47	1 Watt= 30 dBm	Pass
Channel 19	2440.00	-4.20	1 Watt= 30 dBm	Pass
Channel 39	2480.00	-5.43	1 Watt= 30 dBm	Pass

4. Radiated Emission

4.1. Test Equipment

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

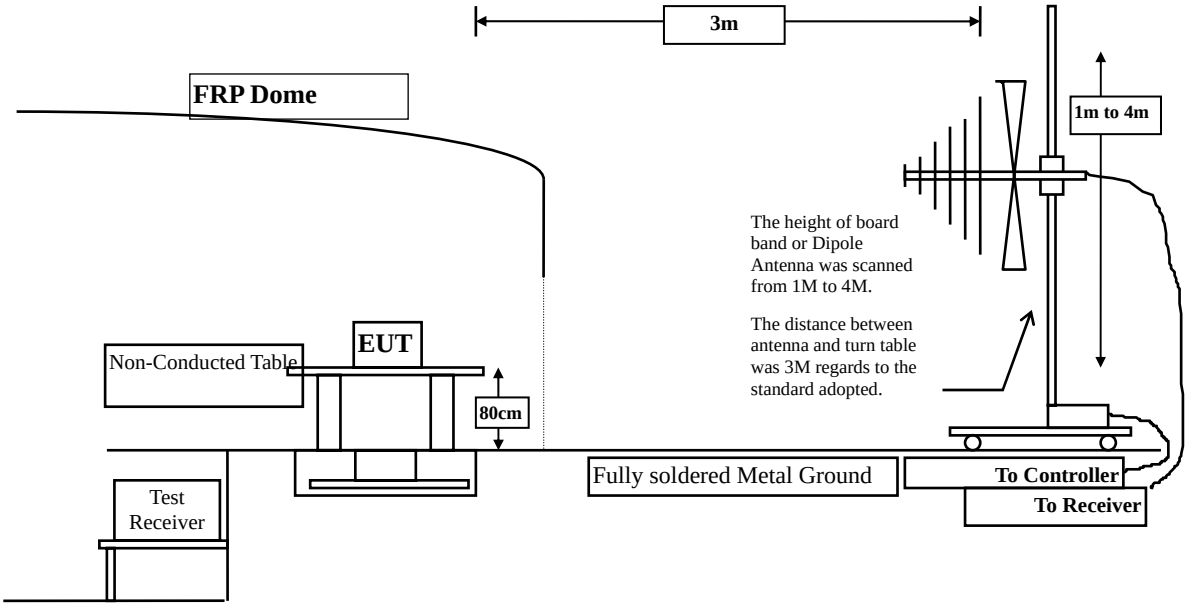
Test Site		Equipment	Manufacturer	Model No./Serial No.	Cal. Due	Cal. Date
☒Site # 3	X	Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2016	Jul., 2015
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2016	Sep., 2015
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2016	Sep., 2015
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2016	Jul., 2015
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2016	Sep., 2015
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2016	May, 2015
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2016	Sep., 2015
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2016	Feb., 2015
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A	N/A

Note:

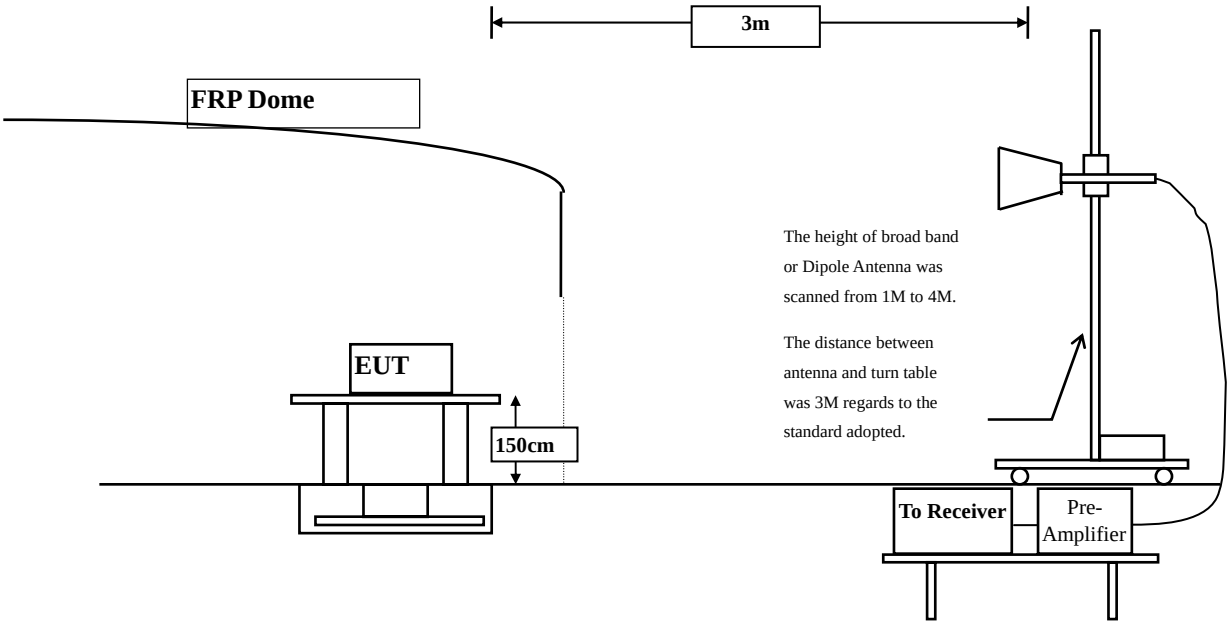
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.
3. All equipments are calibrated every one year.

4.2. Test Setup

Below 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 (dBμV) = 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 form 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 : Blood Pressure Monitor
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK)(2402MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4804.000	2.511	60.600	63.110	-10.890	74.000
7206.000	9.511	44.740	54.251	-19.749	74.000
9608.000	10.394	39.360	49.754	-24.246	74.000
Average					
Detector:					
4804.000	2.511	42.250	44.760	-9.240	54.000
7206.000	9.511	30.520	40.031	-13.969	54.000
Vertical					
Peak Detector:					
4804.000	2.923	63.170	66.092	-7.908	74.000
7206.000	9.988	48.110	58.099	-15.901	74.000
9608.000	10.847	43.440	54.287	-19.713	74.000
Average					
Detector:					
4804.000	2.923	43.750	46.672	-7.328	54.000
7206.000	9.988	32.880	42.869	-11.131	54.000
9608.000	10.847	27.880	38.727	-15.273	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 : Blood Pressure Monitor
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4880.000	2.038	57.240	59.278	-14.722	74.000
7320.000	9.699	43.290	52.989	-21.011	74.000
9760.000	9.665	39.810	49.475	-24.525	74.000
Average					
Detector:					
4880.000	2.038	39.930	41.968	-12.032	54.000
Vertical					
Peak Detector:					
4880.000	2.499	60.650	63.149	-10.851	74.000
7320.000	10.303	47.520	57.823	-16.177	74.000
9764.000	10.315	41.820	52.135	-21.865	74.000
Average					
Detector:					
4880.000	2.499	41.860	44.359	-9.641	54.000
7320.000	10.303	32.000	42.303	-11.697	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 : Blood Pressure Monitor
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4960.000	2.582	54.380	56.962	-17.038	74.000
7440.000	10.555	40.080	50.635	-23.365	74.000
9920.000	10.206	38.930	49.136	-24.864	74.000
Average Detector:					
4960.000	2.582	38.400	40.982	-13.018	54.000
Vertical					
Peak Detector:					
4960.000	3.398	58.570	61.969	-12.031	74.000
7440.000	11.214	41.890	53.104	-20.896	74.000
9920.000	11.245	39.510	50.755	-23.245	74.000
Average Detector:					
4960.000	3.398	40.950	44.349	-9.651	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 : Blood Pressure Monitor
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
97.900	-10.097	31.582	21.485	-22.015	43.500
352.040	-1.282	26.433	25.151	-20.849	46.000
468.440	3.544	23.039	26.583	-19.417	46.000
610.060	3.657	24.306	27.963	-18.037	46.000
854.500	7.380	23.651	31.031	-14.969	46.000
998.060	8.838	22.448	31.286	-22.714	54.000
Vertical					
30.000	-3.010	35.135	32.125	-7.875	40.000
128.940	-3.710	31.559	27.849	-15.651	43.500
365.620	0.282	23.978	24.260	-21.740	46.000
540.220	2.169	23.324	25.493	-20.507	46.000
687.660	2.292	24.057	26.349	-19.651	46.000
965.080	3.832	22.339	26.171	-27.829	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

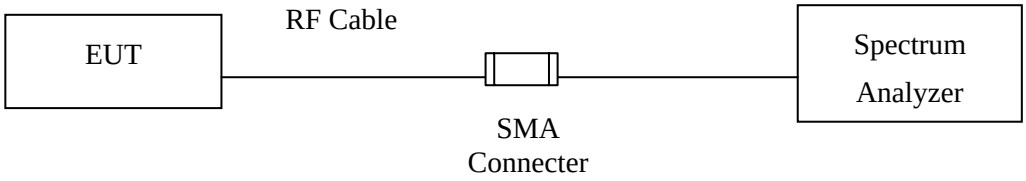
5.1. Test Equipment

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

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.
3. All equipments are calibrated every one year.

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

Figure Channel 00:

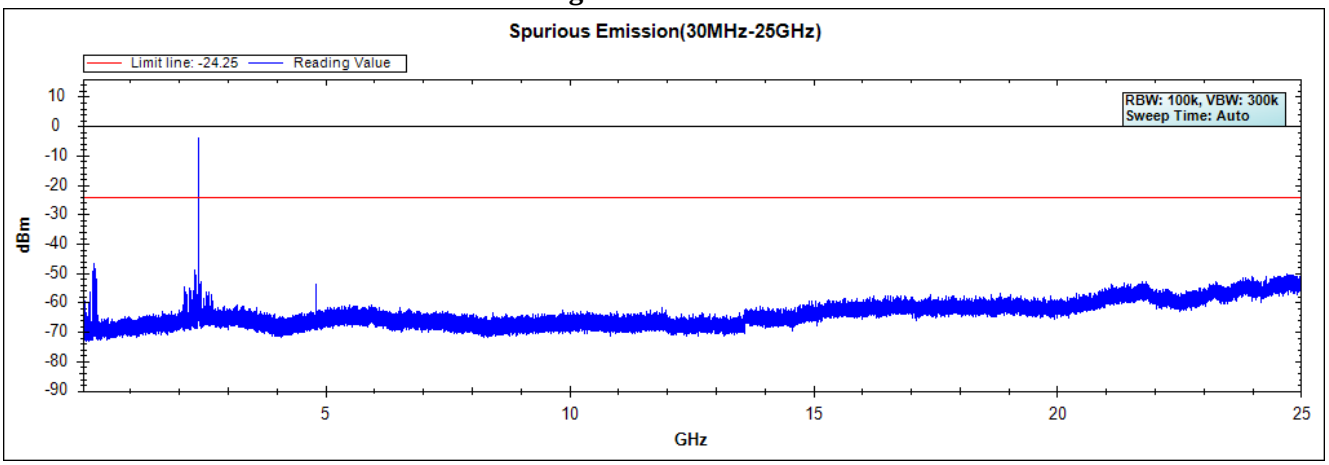


Figure Channel 19:

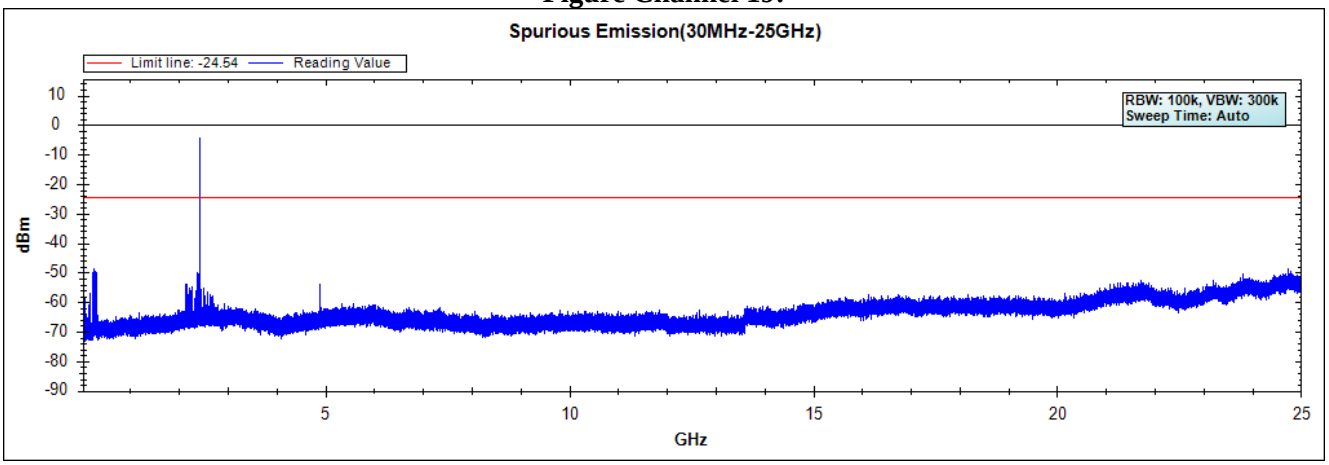
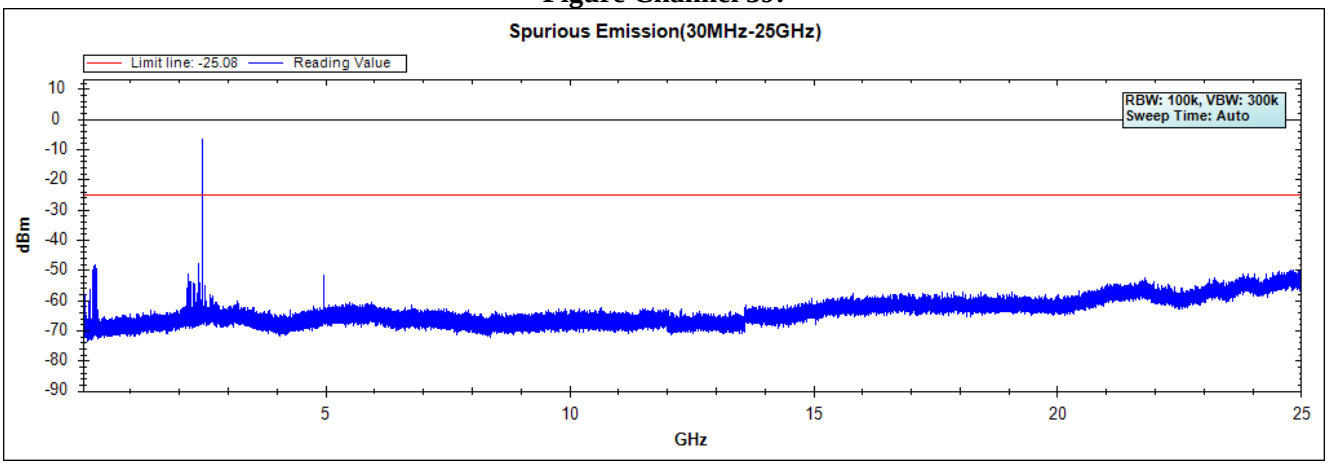


Figure Channel 39:



Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

6.1. Test Equipment

RF Radiated Measurement:

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

Test Site		Equipment	Manufacturer	Model No./Serial No.	Cal. Due	Cal. Date
☒Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2016	Sep., 2015
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2016	Sep., 2015
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2016	Jul., 2015
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2016	Sep., 2015
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2016	May, 2015
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2016	Sep., 2015
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2016	Feb., 2015
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A	N/A

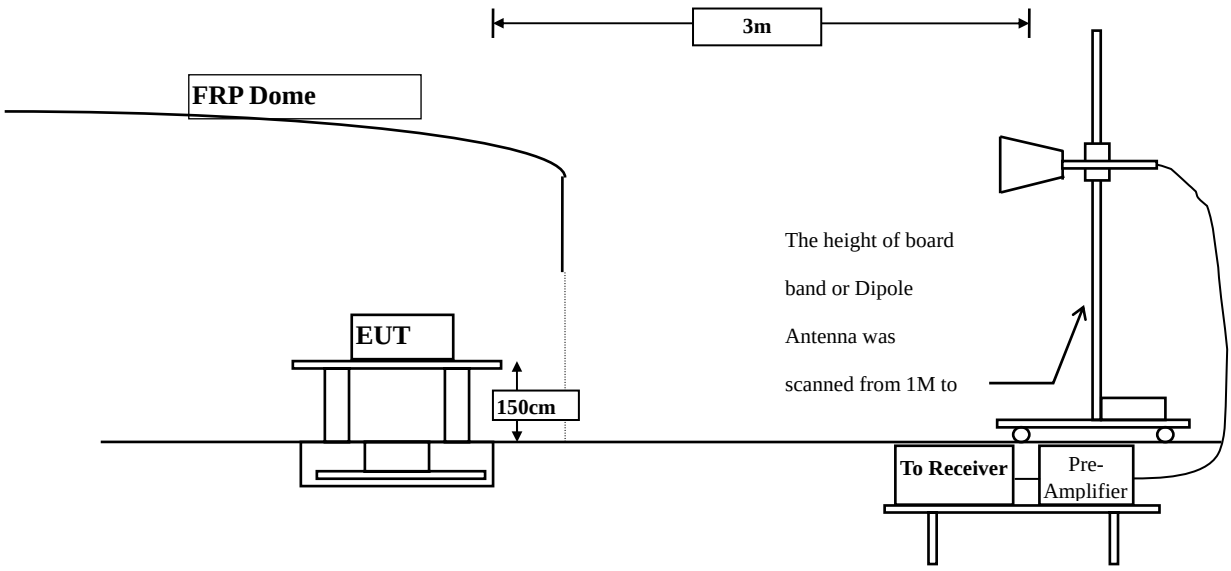
Note:

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.
3. All equipments are calibrated every one year.

6.2. Test Setup

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 : Blood Pressure Monitor
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
00 (Peak)	2369.800	-2.776	43.190	40.414	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	41.022	38.335	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	72.695	70.035	--	--	--
00 (Peak)	2402.000	-2.657	93.693	91.036	--	--	--
00 (Average)	2370.100	-2.775	35.352	32.577	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	30.963	28.276	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	48.735	46.075	--	--	--
00 (Average)	2402.000	-2.657	79.169	76.512	--	--	--

Figure Channel 00: Horizontal (Peak)

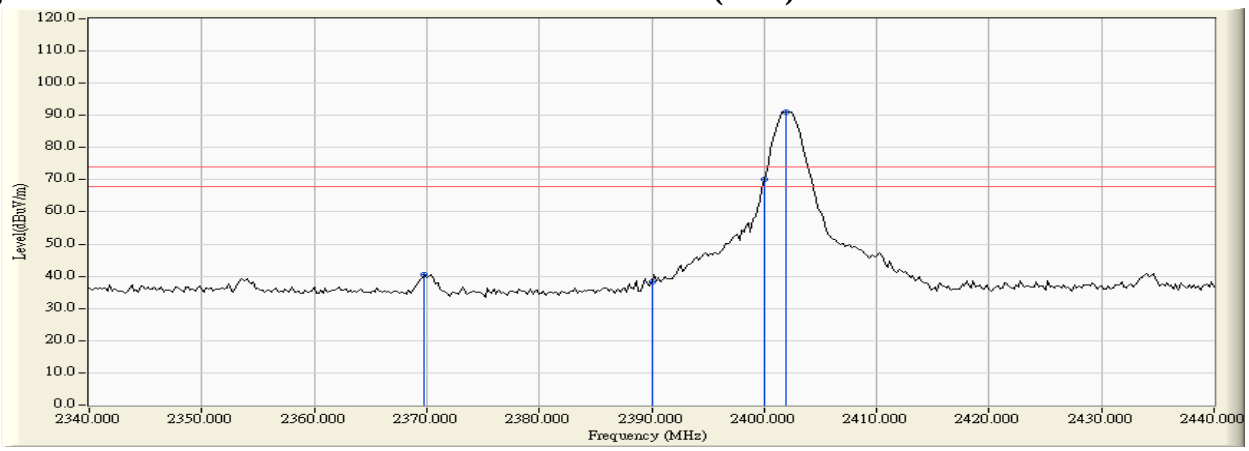
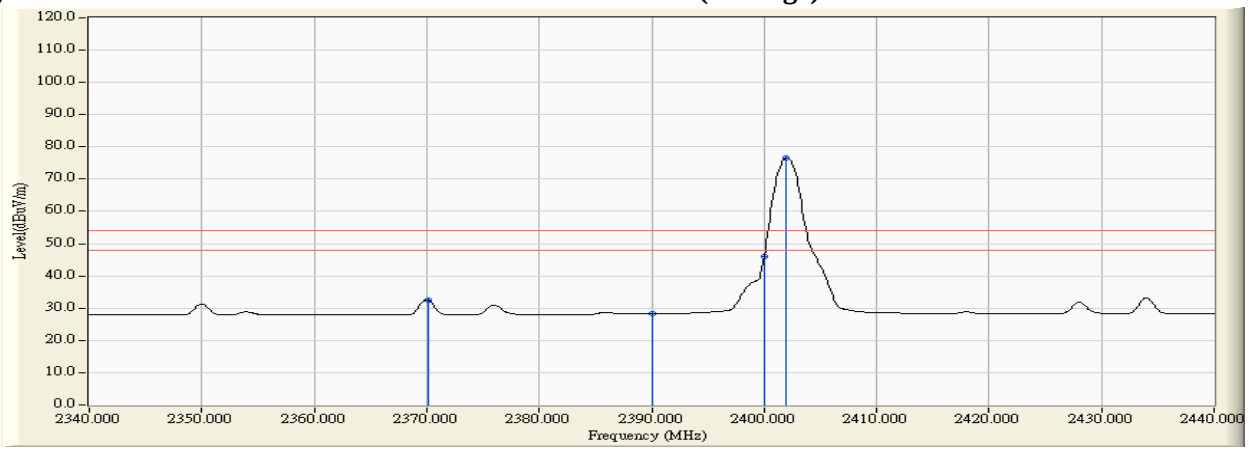


Figure Channel 00: Horizontal (Average)



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 : Blood Pressure Monitor
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
00 (Peak)	2370.400	-4.092	44.069	39.977	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	40.536	36.377	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	72.132	67.961	--	--	--
00 (Peak)	2401.800	-4.171	94.673	90.502	--	--	--
00 (Average)	2369.900	-4.091	35.301	31.210	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	30.939	26.780	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	48.475	44.304	--	--	--
00 (Average)	2402.000	-4.171	78.889	74.718	--	--	--

Figure Channel 00: Vertical (Peak)

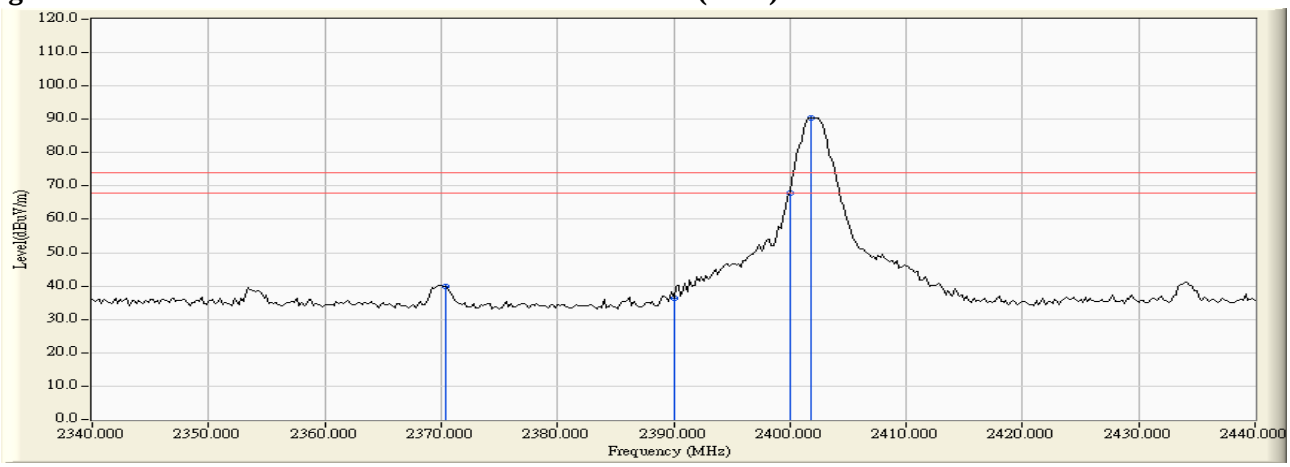
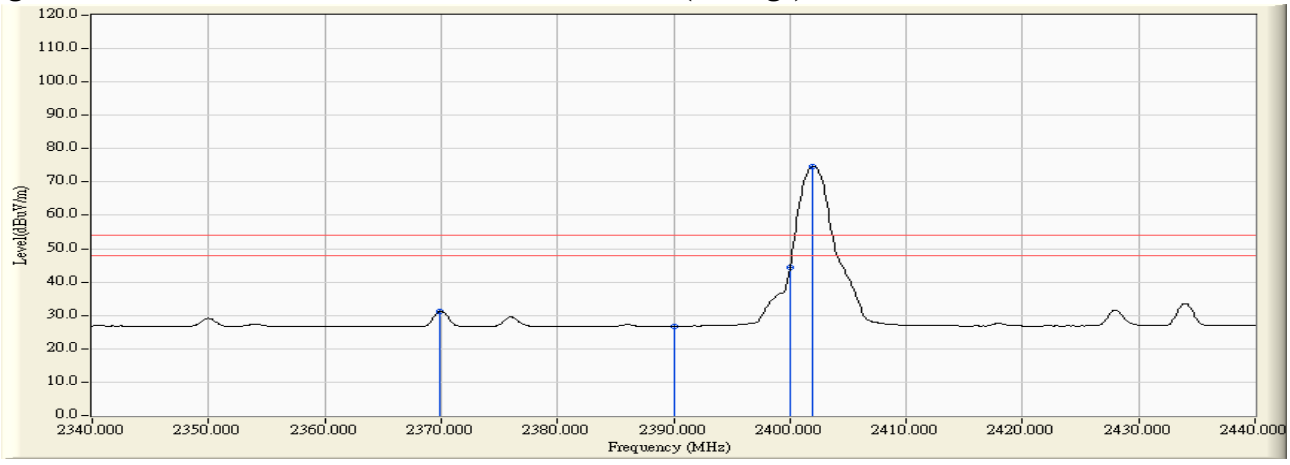


Figure Channel 00: Vertical (Average)



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 : Blood Pressure Monitor
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
39 (Peak)	2479.900	-2.605	93.145	90.540	--	--	--
39 (Peak)	2483.500	-2.601	58.411	55.809	74.00	54.00	Pass
39 (Average)	2480.000	-2.605	79.195	76.590	--	--	--
39 (Average)	2483.500	-2.601	35.700	33.098	74.00	54.00	Pass
39 (Average)	2531.900	-2.814	37.578	34.765	74.00	54.00	Pass

Figure Channel 39: Horizontal (Peak)

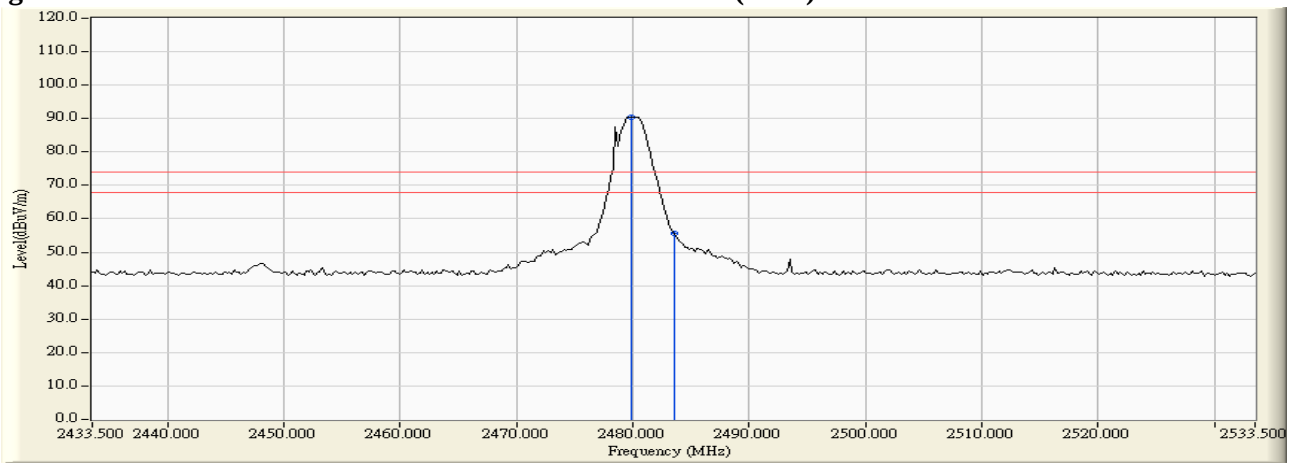
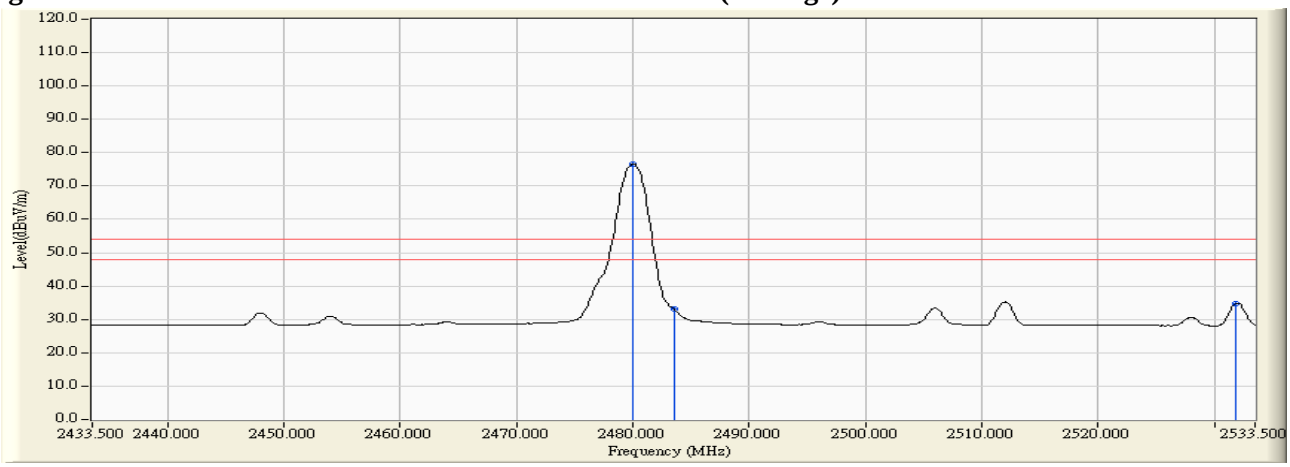


Figure Channel 39: Horizontal (Average)



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 : Blood Pressure Monitor
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
39 (Peak)	2479.700	-3.978	94.663	90.684	--	--	--
39 (Peak)	2483.500	-3.966	58.857	54.890	74.00	54.00	Pass
39 (Average)	2480.000	-3.978	78.088	74.110	--	--	--
39 (Average)	2483.500	-3.966	34.970	31.003	74.00	54.00	Pass
39 (Average)	2512.200	-3.854	37.183	33.330	74.00	54.00	Pass

Figure Channel 39: Vertical (Peak)

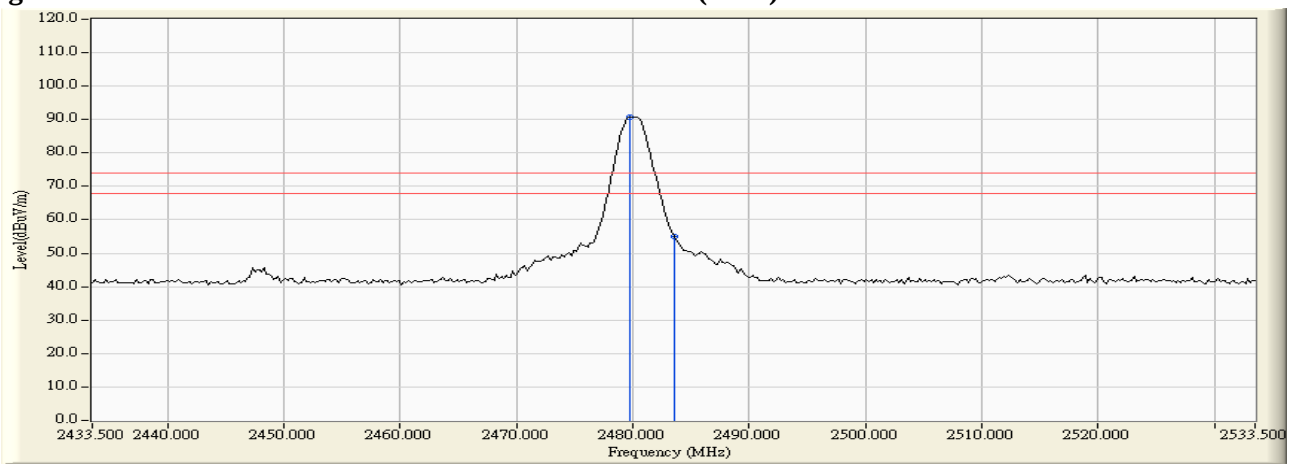
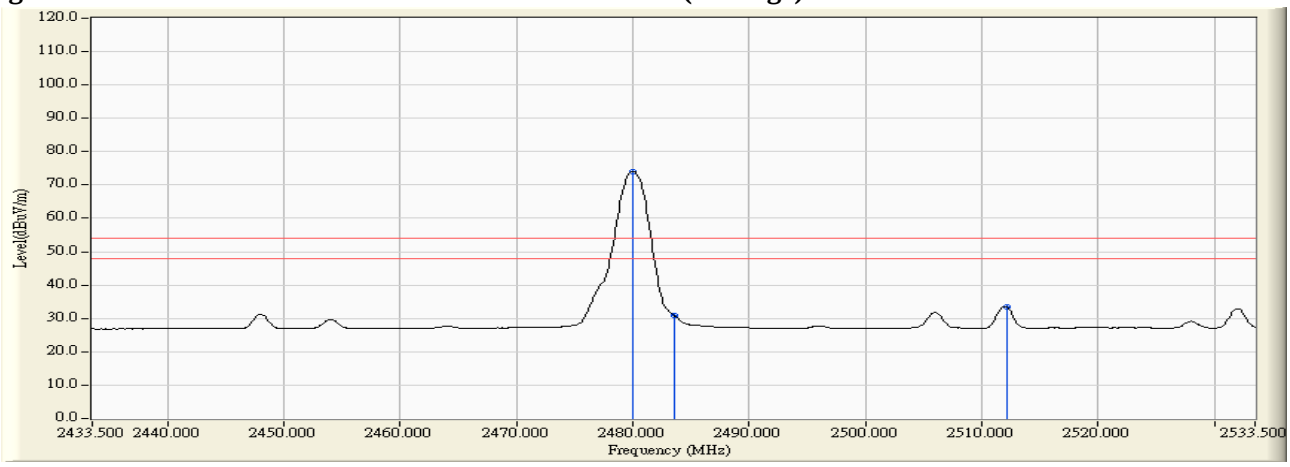


Figure Channel 39: Vertical (Average)



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)

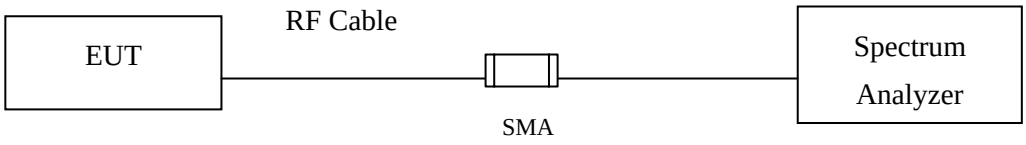
7.1. Test Equipment

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

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.
3. All equipments are calibrated every one year.

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≥3*RBW

7.5. Uncertainty

± 150Hz

7.6. Test Result of Occupied Bandwidth

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

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	740.0	>500	Pass
19	2440	750.0	>500	Pass
39	2480	720.0	>500	Pass

Figure Channel 00:

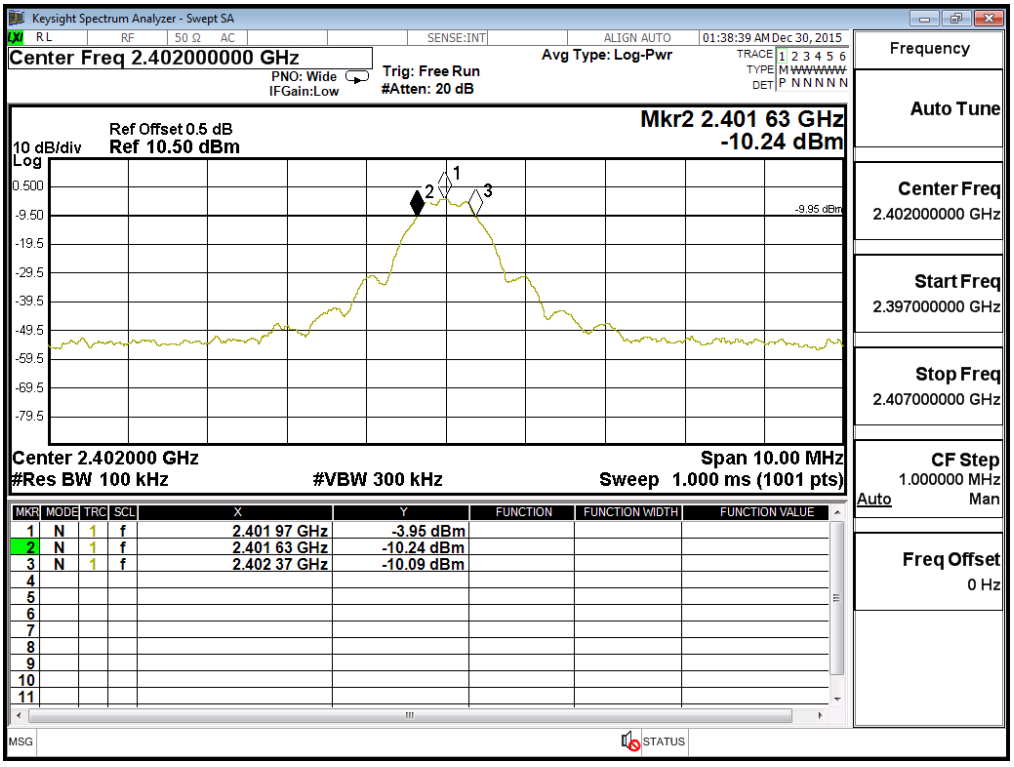


Figure Channel 19:

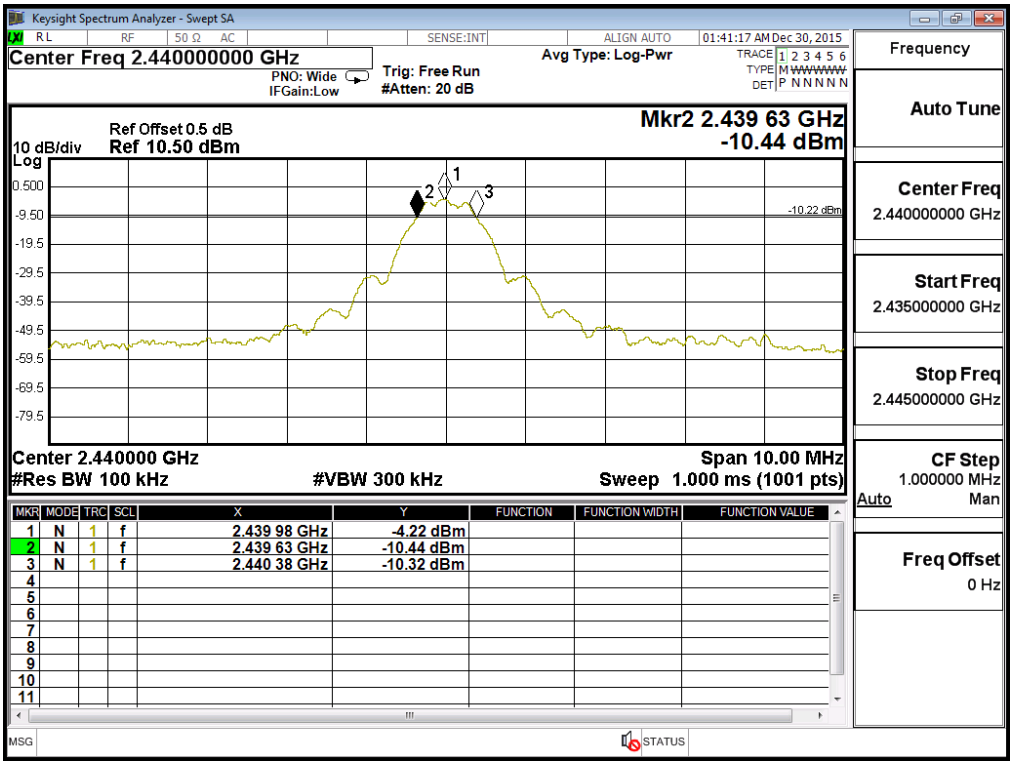
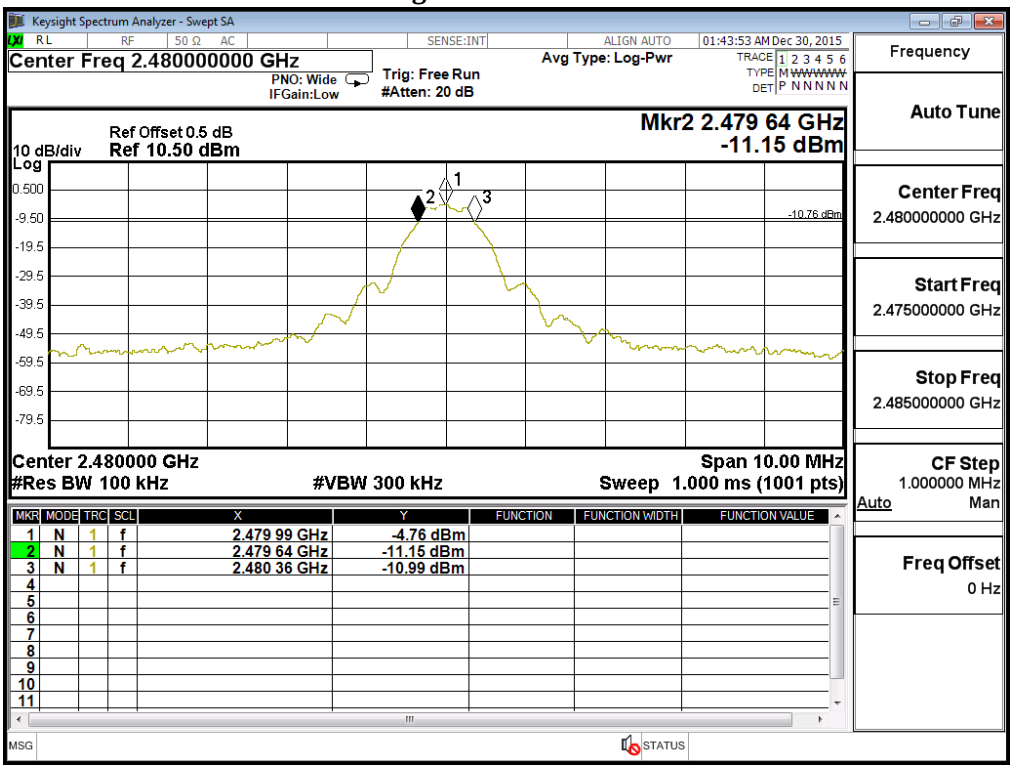


Figure Channel 39:



8. Power Density

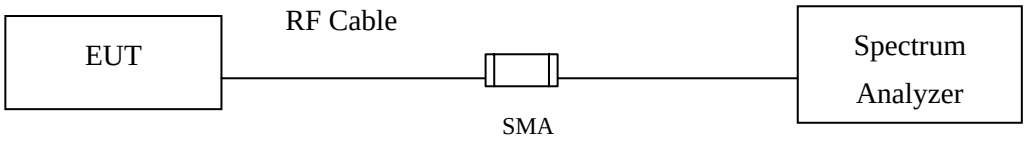
8.1. Test Equipment

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

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.
3. All equipments are calibrated every one year.

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 : Blood Pressure Monitor
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	-4.250	< 8dBm	Pass
19	2440	-4.540	< 8dBm	Pass
39	2480	-5.080	< 8dBm	Pass

Figure Channel 00:

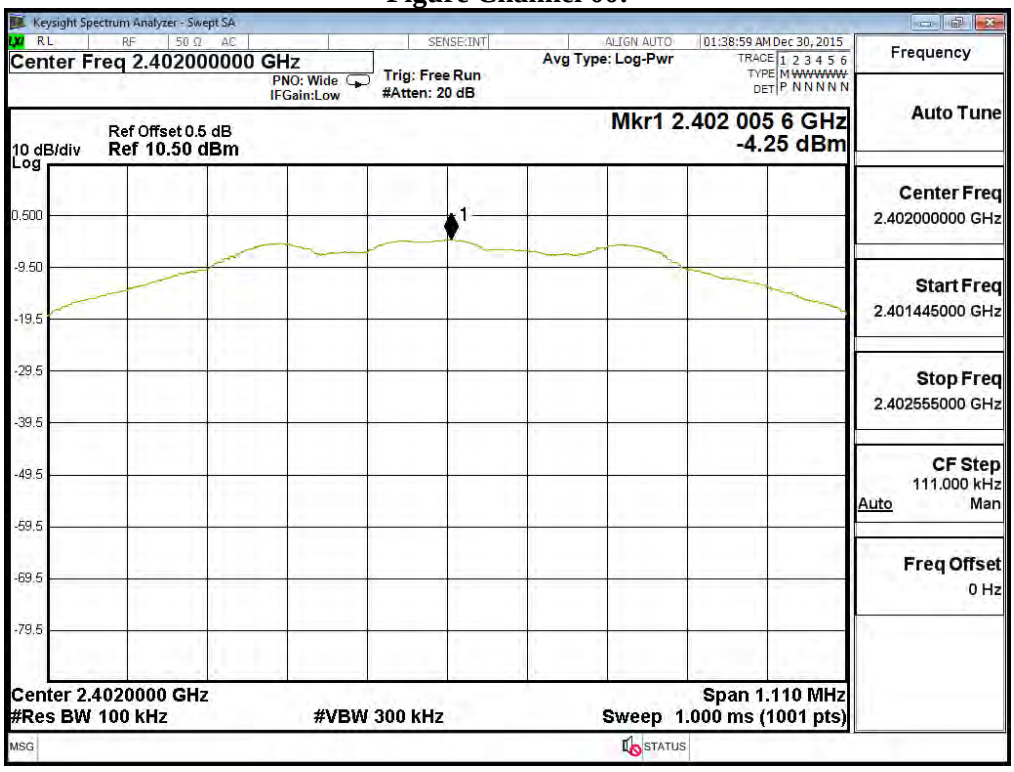


Figure Channel 19:

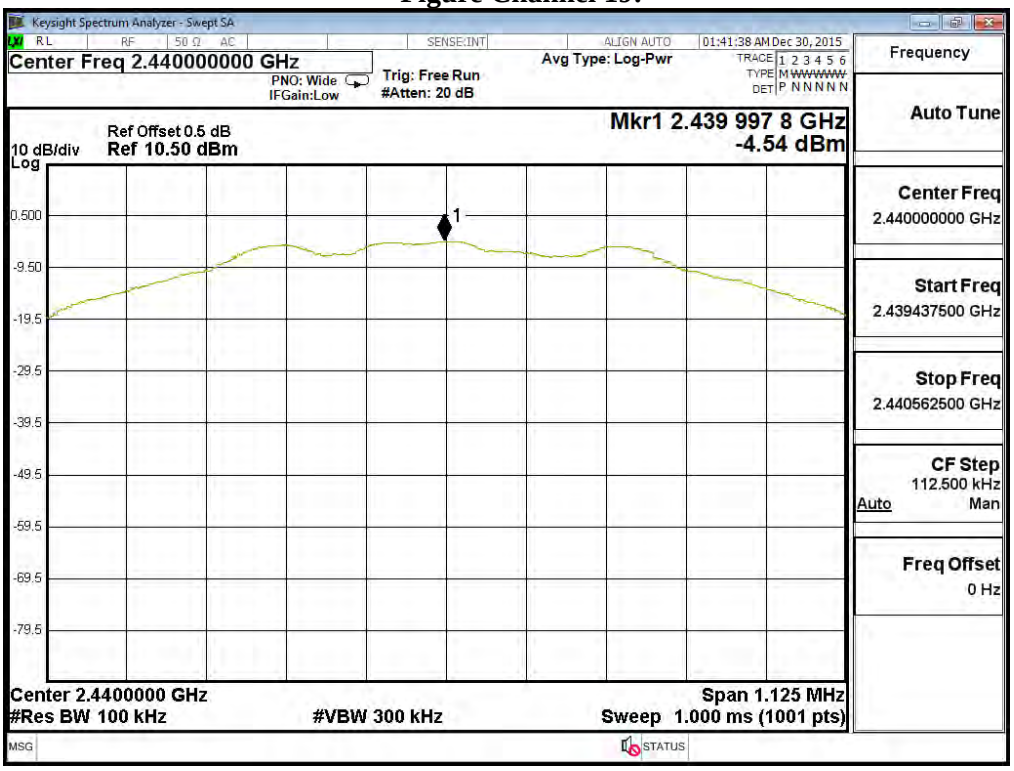
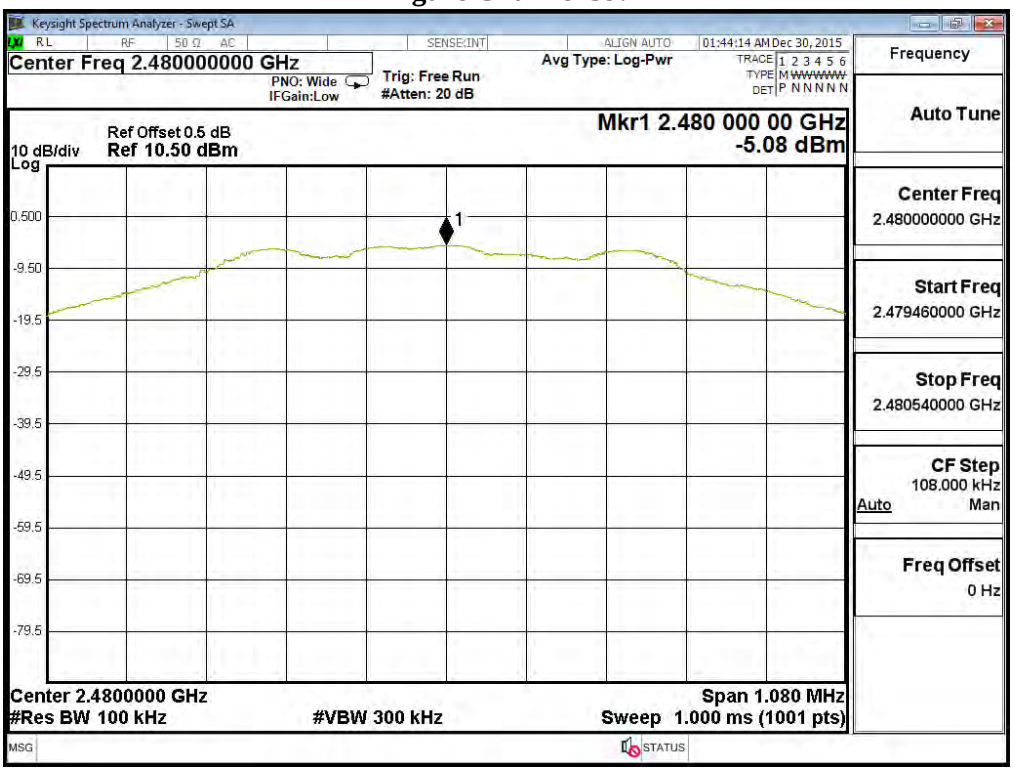


Figure Channel 39:



9. EMI Reduction Method During Compliance Testing

No modification was made during testing.