FCC Test Report

Product Name	：	Heart-Rate Smartwatch
Trade Name	：	Holux
Model No.	：	Impulse8100
FCC ID.	：	RJI-IMPULSE8100

Applicant	：	HOLUX TECHNOLOGY, INC
Address	：	No. 1-1, Innovation Road 1, Science-Based Industrial Park, Hsinchu 30076, Taiwan, R.O.C.

Date of Receipt	：	Jul. 10, 2015
Issued Date	：	Oct. 01, 2015
Report No.	：	1570314R-RFUSP01V00
Report Version	：	V1.0

Testing Laboratory
3024

Test Report Certification

Issued Date : Oct. 01, 2015
Report No. : 1570314R-RFUSP01V00

Product Name	:	Heart-Rate Smartwatch
Applicant	:	HOLUX TECHNOLOGY, INC
Address	:	No. 1-1, Innovation Road 1, Science-Based Industrial Park, Hsinchu 30076, Taiwan, R.O.C.
Trade Name	:	Holux
Model No.	:	Impulse8100
FCC ID.	:	RJI-IMPULSE8100
EUT Voltage	:	Mode 1: DC 5V (Power by PC) Mode 2: DC 3.7V (Power by Battery)
Testing Voltage	:	Mode 1: DC 5V (Power by PC) Mode 2: DC 3.7V (Power by Battery)
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C Section 15.247:2014 ANSI C63.10: 2013
Test Lab	:	QuieTek HsinChu Testing Lab
Test Result	:	Complied

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Documented By : (Demi Chang / Senior Engineering Adm. Specialist)

Tested By : (Ken Huang / Engineer)

Approved By : (Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
1570314R-RFUSP01V00	Rev.1.0	Initial issue of report	Oct. 01, 2015

Laboratory Information

We, **QuieTek Corporation**, are an independent RF consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025 specified testing scopes:

Taiwan R.O.C.	**:**	**TAF, Accreditation Number: 3024**
USA	**:**	**FCC, Registration Number: 365520**
Canada	**:**	**IC, Submission No: 181665 / IC Registration Number: 4075C-4**

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/english/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/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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LinKou Testing Laboratory:
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

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1. General Information

1.1. EUT Description

Product Name	Heart-Rate Smartwatch
Trade Name	Holux
Model Name	Impulse8100
Frequency Range/Channel Number	2402~2480MHz / 40 Channels
Type of Modulation	BLE 4.0 (GFSK)

Antenna Information	
Antenna Type	Omni-directional Antenna
Antenna Gain	Ant 0: Peak 1dBi

Accessories Information	
USB Cable	Shielded, 1m

ANT-TX / RX

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

Note:

1. This device is a Heart-Rate Smartwatch including BT 4.0 transmitting and receiving function.
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.247.
3. Regards to the frequency band operation; the lowest、middle and highest frequency of channel were selected to perform the test, and then shown on this report.
4. This device is a composite device in accordance with Part 15 regulations. The function of the receiving was tested and its test report number is 1570314R-RFUSP01V00-A.

1.2. Test Mode

QuieTek has verified the construction and function in typical operation. The preliminary tests were performed in different data rate, and to find the worst condition, which was shown in this test report. The following table is the final test mode.

TX	Mode 1: Transmit-Power by PC Mode 2: Transmit-Power by Battery

Test Items	Modulation	Channel	Antenna	Result
Conducted Emission	GFSK	00/19/39	0	Complies
Peak Power Output	GFSK	00/19/39	0	Complies
Radiated Emission	GFSK	00/19/39	0	Complies
RF antenna conducted test	GFSK	00/19/39	0	Complies
Radiated Emission Band Edge	GFSK	00/19/39	0	Complies
Occupied Bandwidth	GFSK	00/19/39	0	Complies
Power Density	GFSK	00/19/39	0	Complies

1.3. Tested System Details

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

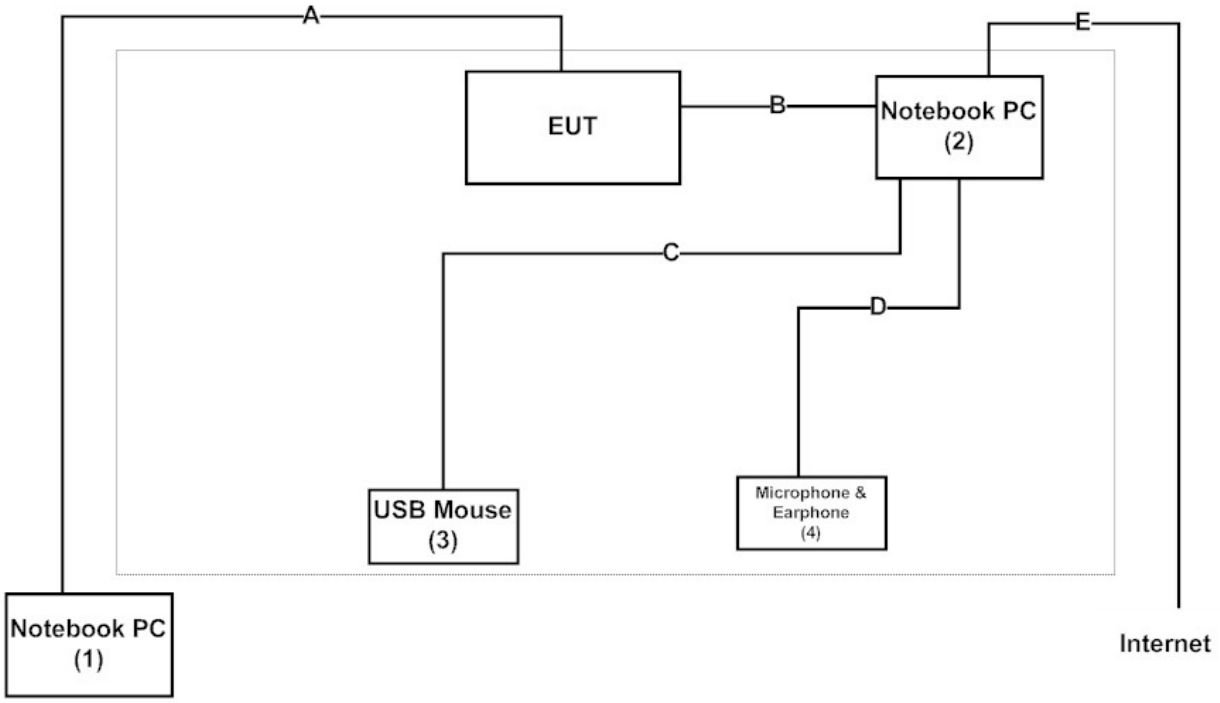
Test Mode		Mode 1: Transmit-Power by PC				
Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook PC	ASUS	X522EP	E5N0CV043264197	DoC	Non-Shielded, 1.8m, one ferrite core bonded
2	Notebook PC	HP	HSTNN-146C	CNU8253S1X	DoC	Non-Shielded, 1.8m
3	USB Mouse	Logitech	M-UV83	LZE35006065	DoC	--
4	Microphone & Earphone	Fujiei	SBZ-38	N/A	DoC	--

Test Mode		Mode 2: Transmit-Power by Battery				
Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook PC	ASUS	X522EP	E5N0CV043264197	DoC	Non-Shielded, 1.8m, one ferrite core bonded

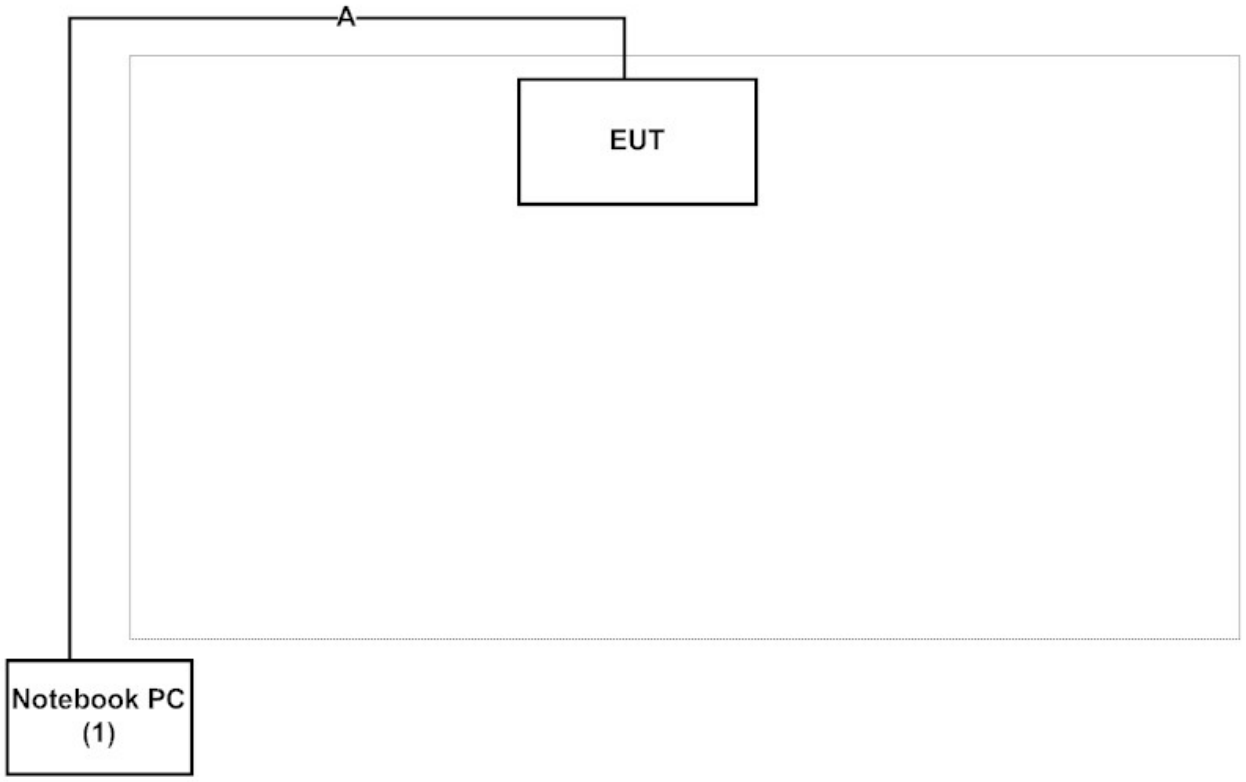
1.4. Configuration of tested System

Test Mode	Mode 1: Transmit-Power by PC

Connection Diagram



Signal Cable Type		Signal cable Description
A	Signal Cable	Non-Shielded, 3m
B	USB Cable	Shielded, 1m
C	USB Mouse Cable	Shielded, 1.8m
D	Microphone & Earphone Cable	Non-Shielded, 1.2m
E	LAN Cable	Non-Shielded, 3 m

Test Mode	Mode 2: Transmit-Power by Battery	
Connection Diagram		
		
Signal Cable Type		Signal cable Description
A	Signal Cable	Non-Shielded, 3m

1.5. EUT Exercise Software

1	Test system is in accord with EUT user manual (refer to 1.4 configuration of tested system).
2	Turn on the power of all equipment.
3	Execute the notebook PC's test program “nRFgo studio” and then link with the EUT.
4	Configure the test mode, the test channel, and the data rate.
5	Press “Start TX” to start the continuous transmitting.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 C 15.207 Conducted Emission	15 - 35	23 °C
Humidity (%RH)		25 - 75	50 %RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output	15 - 35	23 °C
Humidity (%RH)		25 - 75	50 %RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission	15 - 35	23 °C
Humidity (%RH)		25 - 75	50 %RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 RF antenna conducted test	15 - 35	23 °C
Humidity (%RH)		25 - 75	50 %RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Band Edge	15 - 35	23 °C
Humidity (%RH)		25 - 75	50 %RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth	15 - 35	23 °C
Humidity (%RH)		25 - 75	50 %RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Power Density	15 - 35	23 °C
Humidity (%RH)		25 - 75	50 %RH
Barometric pressure (mbar)		860 - 1060	950-1000

2. Conducted Emission

2.1. Test Equipment

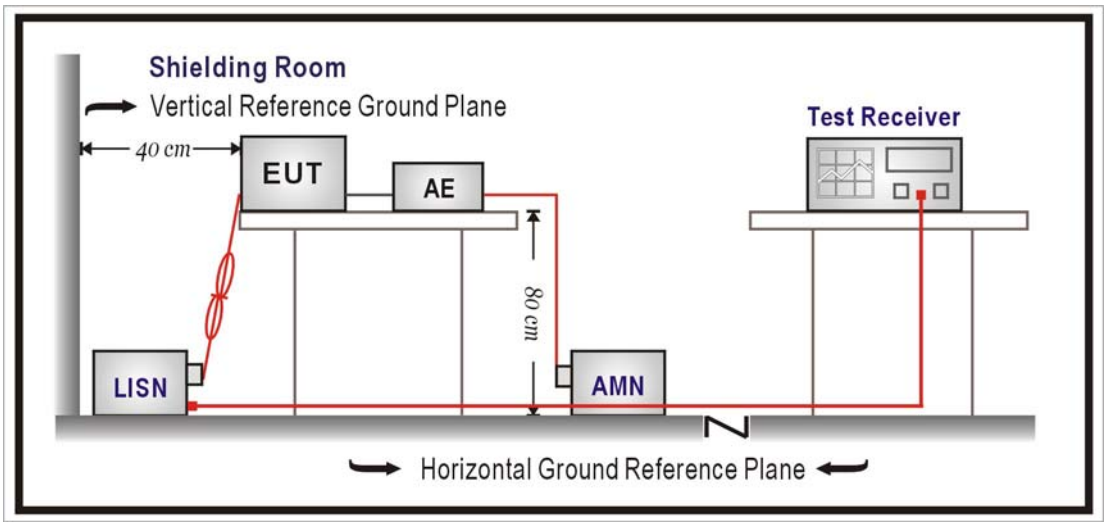
The following test equipments are used during the test:

Conducted Emission / SR2

Instrument	Manufacturer	Model No.	Serial No.	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2016/01/25
LISN	R&S	ENV216	100092	2016/08/17
Test Receiver	R&S	ESCS 30	825442/014	2016/07/16

Note: All equipments that need to calibrate are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	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 was setup according to ANSI C63.10: 2009 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs.)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

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

2.5. Test Specification

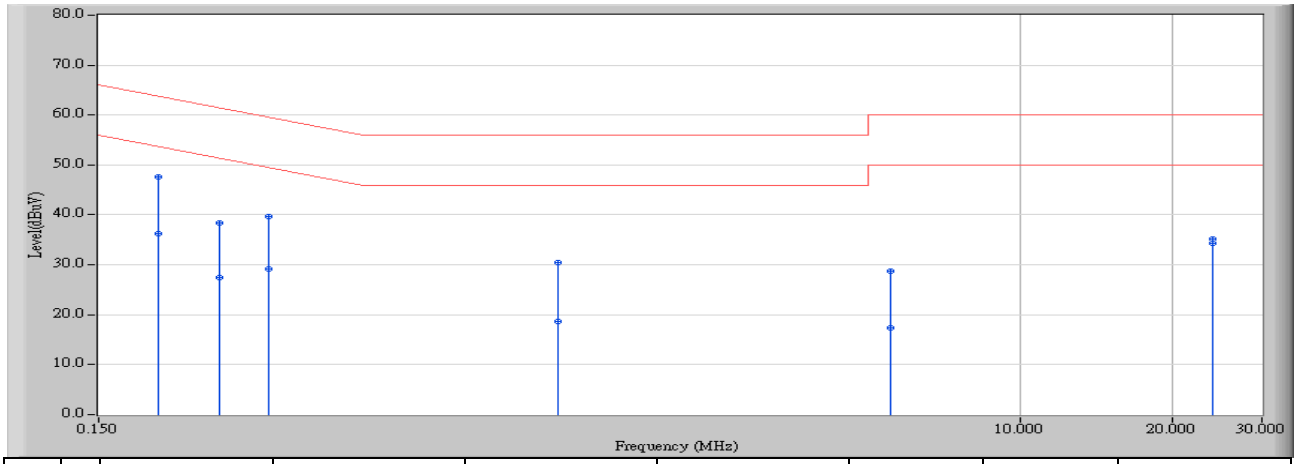
According to FCC Part 15 Subpart C Paragraph 15.207: 2014

2.6. Uncertainty

The measurement uncertainty is defined as ± 2.26 dB.

2.7. Test Result

Site : SR2	**Time : 2015/09/22 - 11:40**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-5_0818 - Line1	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2440MHz**

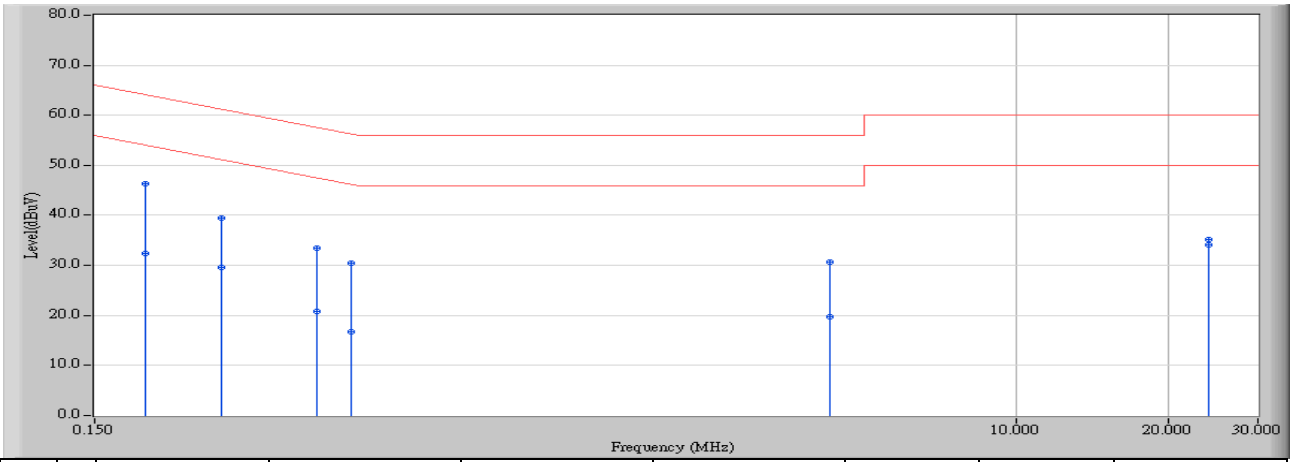


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.197	9.688	37.830	47.518	-16.223	63.741	QUASIPEAK
2		0.197	9.688	26.650	36.338	-17.403	53.741	AVERAGE
3		0.259	9.692	28.710	38.403	-23.049	61.451	QUASIPEAK
4		0.259	9.692	17.730	27.423	-24.029	51.451	AVERAGE
5		0.326	9.699	29.880	39.579	-19.979	59.558	QUASIPEAK
6		0.326	9.699	19.450	29.149	-20.409	49.558	AVERAGE
7		1.216	9.733	20.680	30.413	-25.587	56.000	QUASIPEAK
8		1.216	9.733	9.020	18.753	-27.247	46.000	AVERAGE
9		5.541	9.935	18.750	28.685	-31.315	60.000	QUASIPEAK
10		5.541	9.935	7.360	17.295	-32.705	50.000	AVERAGE
11		24.002	10.444	24.700	35.144	-24.856	60.000	QUASIPEAK
12	*	24.002	10.444	23.770	34.214	-15.786	50.000	AVERAGE

Note:

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

Site : SR2	**Time : 2015/09/22 - 11:43**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-5_0818 - Line2	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2440MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.189	9.765	36.530	46.295	-17.782	64.078	QUASIPEAK
2		0.189	9.765	22.700	32.465	-21.612	54.078	AVERAGE
3		0.267	9.774	29.700	39.473	-21.732	61.205	QUASIPEAK
4		0.267	9.774	19.740	29.513	-21.692	51.205	AVERAGE
5		0.412	9.787	23.770	33.558	-24.056	57.614	QUASIPEAK
6		0.412	9.787	11.100	20.888	-26.726	47.614	AVERAGE
7		0.482	9.798	20.590	30.389	-25.915	56.304	QUASIPEAK
8		0.482	9.798	6.940	16.739	-29.565	46.304	AVERAGE
9		4.263	9.956	20.710	30.667	-25.333	56.000	QUASIPEAK
10		4.263	9.956	9.750	19.707	-26.293	46.000	AVERAGE
11		24.002	10.250	24.890	35.140	-24.860	60.000	QUASIPEAK
12	*	24.002	10.250	23.910	34.160	-15.840	50.000	AVERAGE

Note:

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

3. Peak Power Output

3.1. Test Equipment

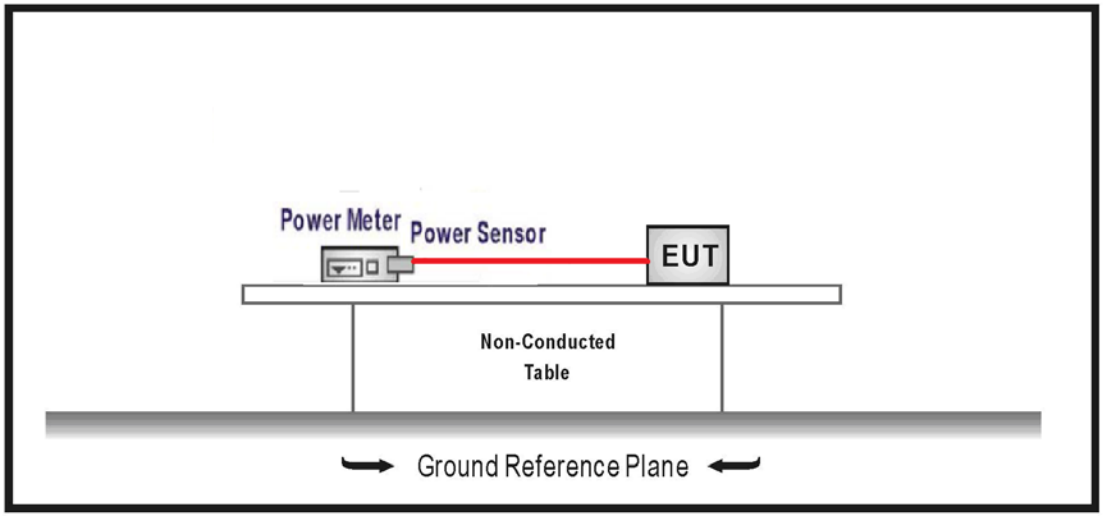
The following test equipments are used during the test:

Peak Power Output / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23
Signal & Spectrum Analyzer	R&S	FSV40	101049	2015/10/30
Signal Analyzer	R&S	FSV7	101650	2015/12/17

Note: All equipments that need to calibrate are with calibration period of 1 year.

3.2. Test Setup



3.3. Test procedures

The EUT was tested according to DTS test procedure section 9.1.2 of KDB558074 v03r02 measurement to FCC 47CFR 15.247 requirements.

3.4. Limits

The maximum peak power shall be less 1 Watt.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2014

3.6. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB.

3.7. Test Result

Product	Heart-Rate Smartwatch		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit-Power by PC		
Date of Test	2015/09/22	Test Site	SR7

BLE 4.0 (GFSK)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	-1.20	30	Pass
19	2440	-0.14	30	Pass
39	2480	0.71	30	Pass

4. Radiated Emission

4.1. Test Equipment

The following test equipments are used during the test:

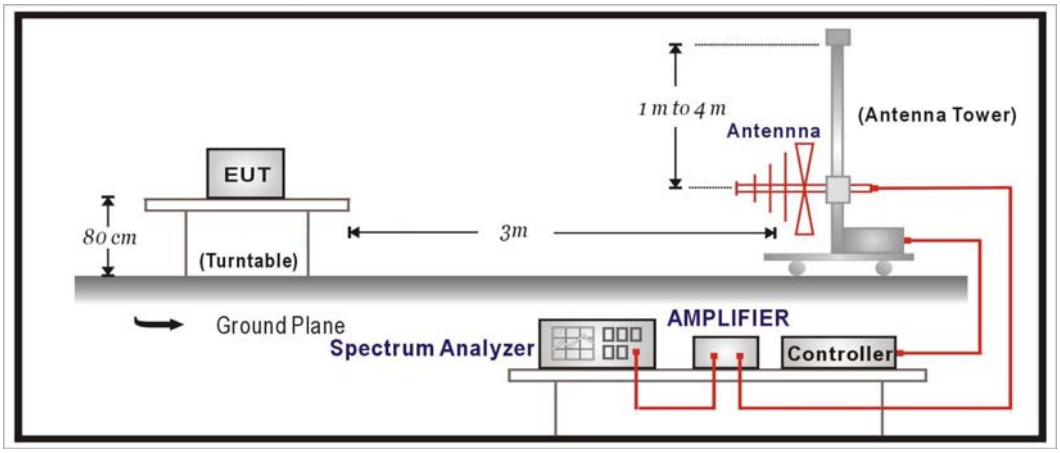
Radiated Emission / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Bilog Antenna	Schaffner	CBL6112B	2895	2016/08/14
Double Ridged Guide Horn Antenna	Schwarzbeck	BBHA 9120	D743	2016/01/26
Pre-Amplifier	EMCI	EMC0031835	980233	2016/01/18
Pre-Amplifier	QuieTek	AP-025C	CHM-0706049	2016/01/18
Spectrum Analyzer	Agilent	E4440A	MY46187335	2016/01/07
k Type Cable	Huber+Suhner	SF 102	25623/2	2016/01/26
Horn Antenna	Schwarzbeck	BBHA 9170	203	2016/09/07
Signal & Spectrum Analyzer	R&S	FSV40	101049	2015/10/30

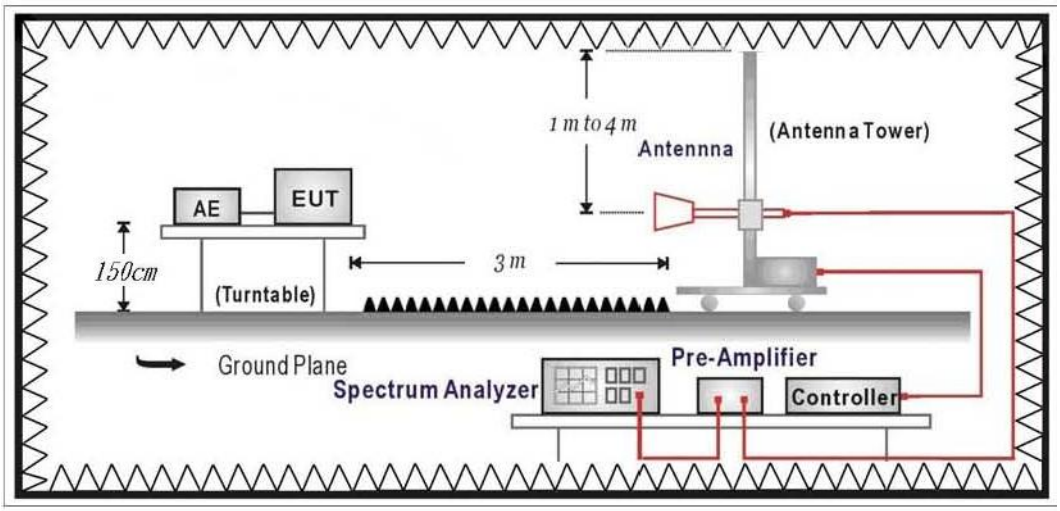
Note: All equipments that need to calibrate are with calibration period of 1 year.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. 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	dBuV/m	dBuV/m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remark: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

The EUT was setup according to ANSI C63.10: 213 and tested according to DTS test procedure of KDB558074 v03r02 for compliance to FCC 47CFR 15.247 requirements.
The EUT and its simulators are placed on a turn table which is 0.8 and 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 213 on radiated measurement.
On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2014

4.6. Uncertainty

The measurement uncertainty

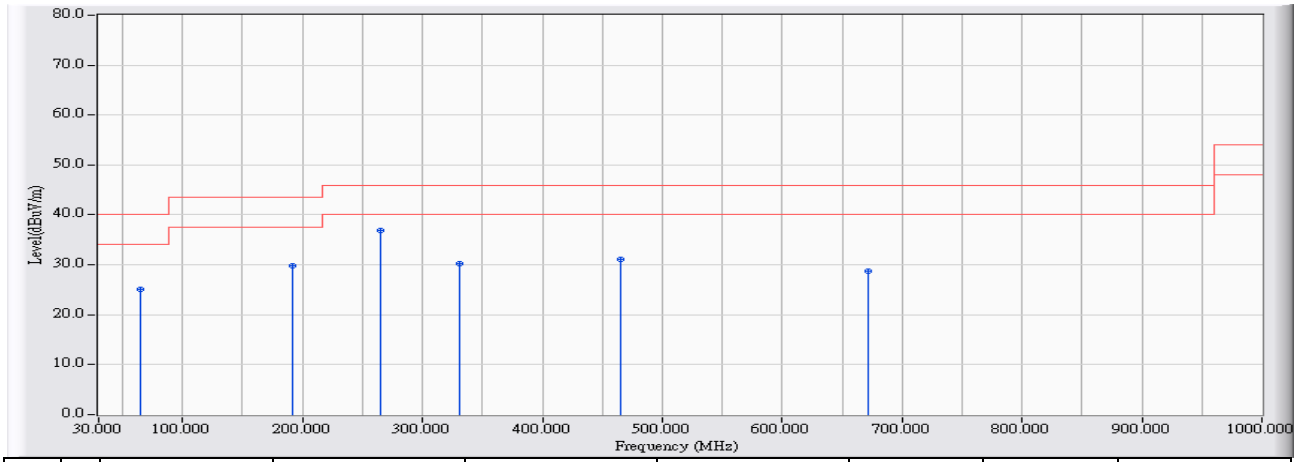
30MHz～1GHz as ±3.43dB

1GHz～26.5Ghz as ±3.65dB

4.7. Test Result

30MHz-1GHz Spurious

Site : CB1	**Time : 2015/09/21 - 13:23**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - HORIZONTAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2440MHz**

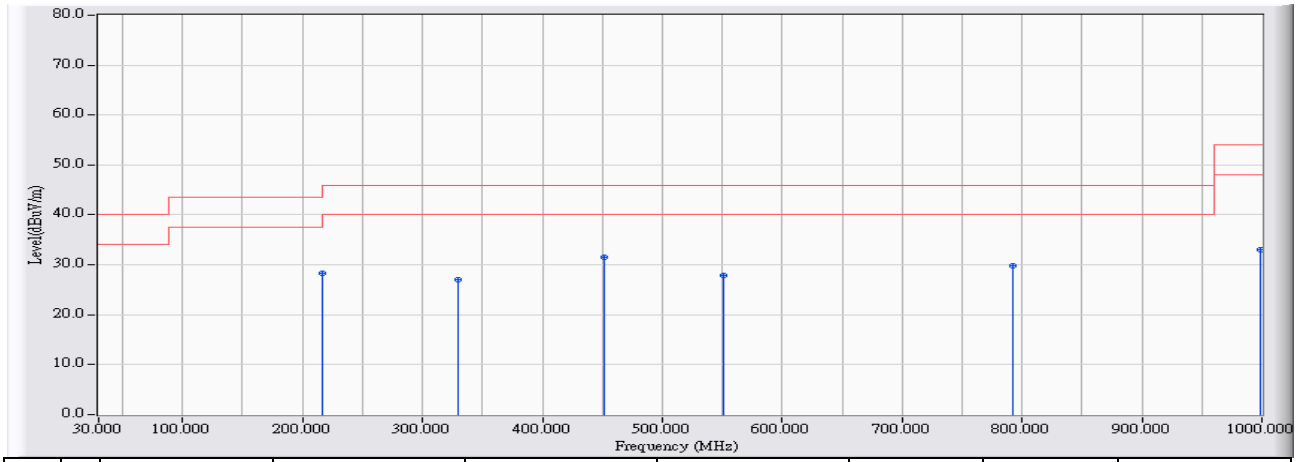


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		65.387	5.622	19.564	25.186	-14.814	40.000	QUASIPEAK
2		191.909	8.204	21.603	29.807	-13.693	43.500	QUASIPEAK
3	*	265.592	12.154	24.636	36.790	-9.210	46.000	QUASIPEAK
4		331.519	13.509	16.751	30.260	-15.740	46.000	QUASIPEAK
5		465.312	16.479	14.563	31.042	-14.958	46.000	QUASIPEAK
6		671.819	17.849	10.913	28.762	-17.238	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : CB1	**Time : 2015/09/21 - 13:27**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - VERTICAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2440MHz**

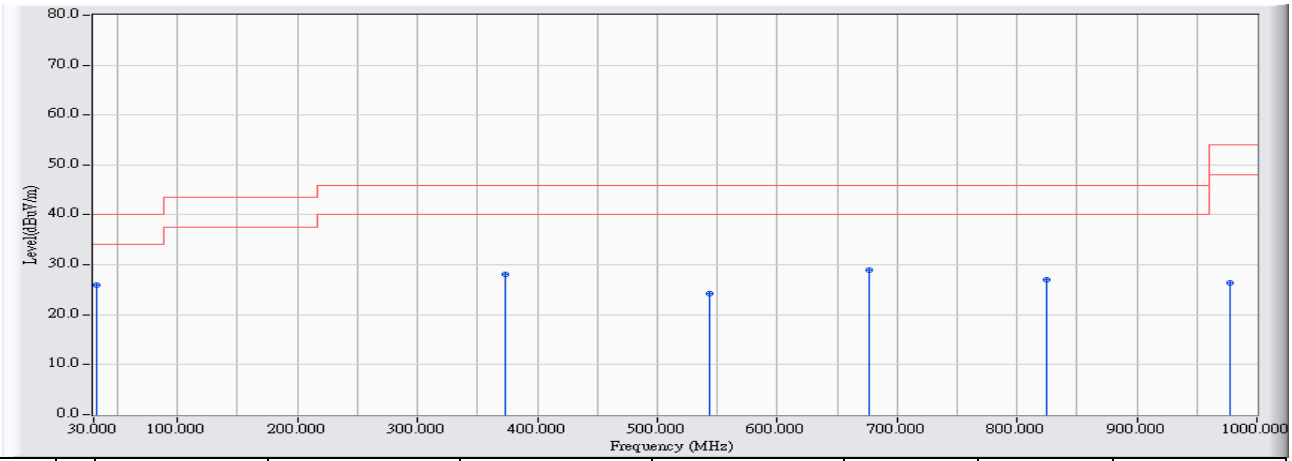


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		216.632	9.402	18.888	28.290	-17.710	46.000	QUASIPEAK
2		330.065	13.474	13.472	26.946	-19.054	46.000	QUASIPEAK
3	*	451.739	16.204	15.388	31.592	-14.408	46.000	QUASIPEAK
4		551.114	17.336	10.525	27.861	-18.139	46.000	QUASIPEAK
5		792.524	19.122	10.765	29.888	-16.112	46.000	QUASIPEAK
6		998.546	20.277	12.732	33.009	-20.991	54.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : CB1	**Time : 2015/09/21 - 13:31**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - HORIZONTAL	**Power : DC 3.7V**
EUT : Heart-Rate Smartwatch	**Note : Mode 2: Transmit-Power by Battery _ GFSK_2440MHz**

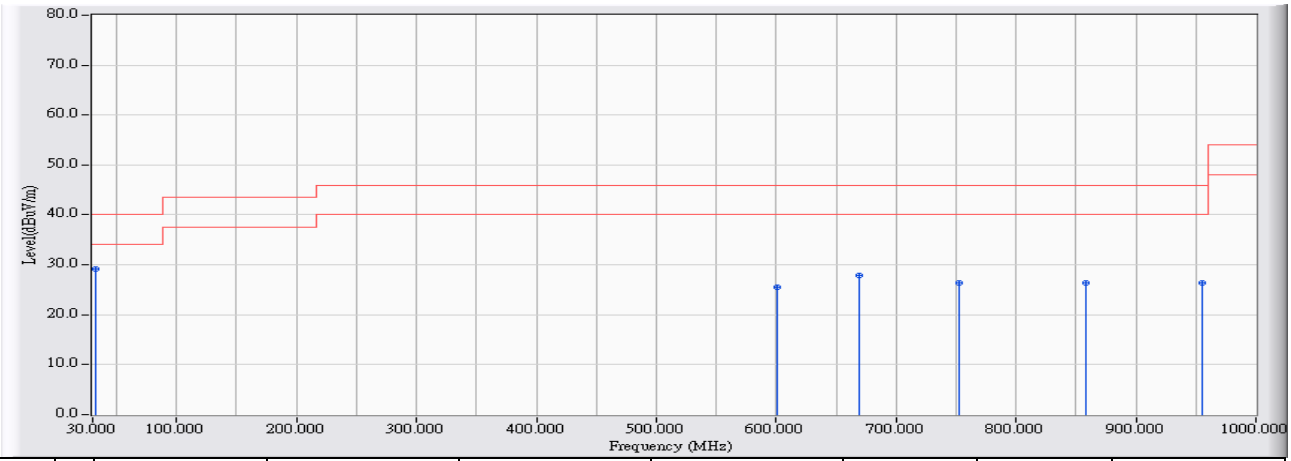


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	32.909	13.128	12.856	25.984	-14.016	40.000	QUASIPEAK
2		372.724	14.499	13.697	28.196	-17.804	46.000	QUASIPEAK
3		543.358	17.313	6.862	24.175	-21.825	46.000	QUASIPEAK
4		676.667	17.873	10.985	28.859	-17.141	46.000	QUASIPEAK
5		824.033	19.276	7.690	26.966	-19.034	46.000	QUASIPEAK
6		977.701	20.106	6.200	26.307	-27.693	54.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : CB1	**Time : 2015/09/21 - 13:35**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - VERTICAL	**Power : DC 3.7V**
EUT : Heart-Rate Smartwatch	**Note : Mode 2: Transmit-Power by Battery _ GFSK_2440MHz**



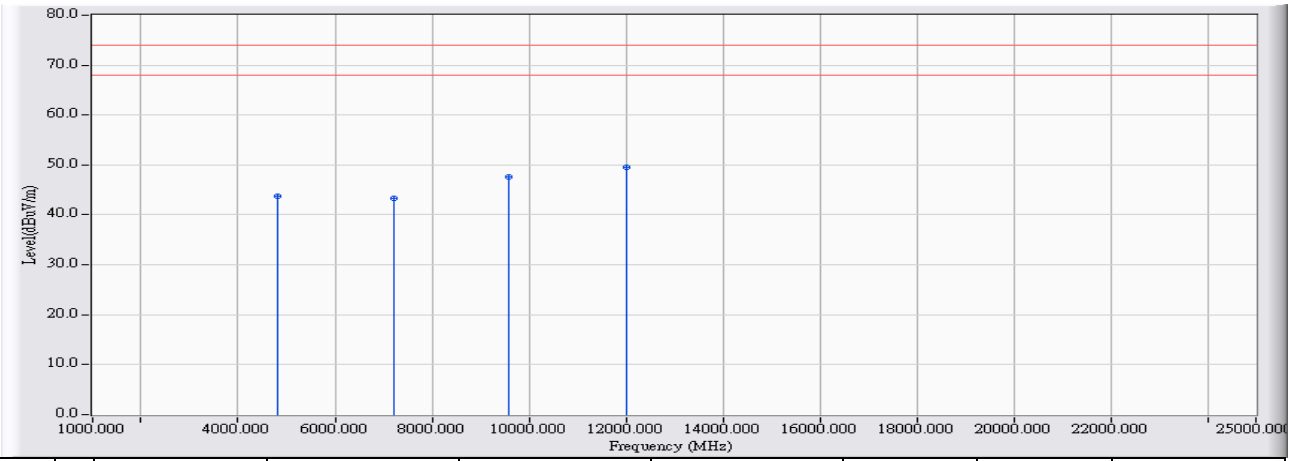
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	32.909	13.128	15.970	29.098	-10.902	40.000	QUASIPEAK
2		601.044	17.489	8.025	25.514	-20.486	46.000	QUASIPEAK
3		668.911	17.834	9.999	27.833	-18.167	46.000	QUASIPEAK
4		752.289	18.632	7.742	26.373	-19.627	46.000	QUASIPEAK
5		857.966	19.364	6.954	26.318	-19.682	46.000	QUASIPEAK
6		955.402	19.925	6.538	26.463	-19.537	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Above 1GHz Spurious

Site : CB1	**Time : 2015/09/21 - 19:00**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2402MHz**

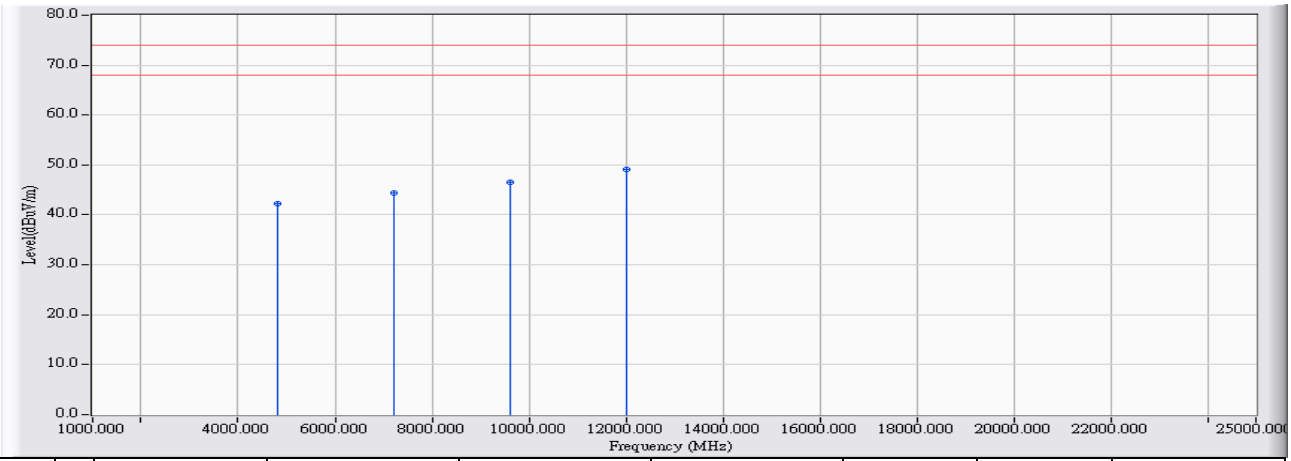


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-7.060	50.880	43.820	-30.180	74.000	PEAK
2		7207.060	-0.838	44.190	43.351	-30.649	74.000	PEAK
3		9598.000	4.817	42.890	47.708	-26.292	74.000	PEAK
4	*	12015.000	8.351	41.250	49.601	-24.399	74.000	PEAK

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. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	**Time : 2015/09/21 - 19:08**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2402MHz**

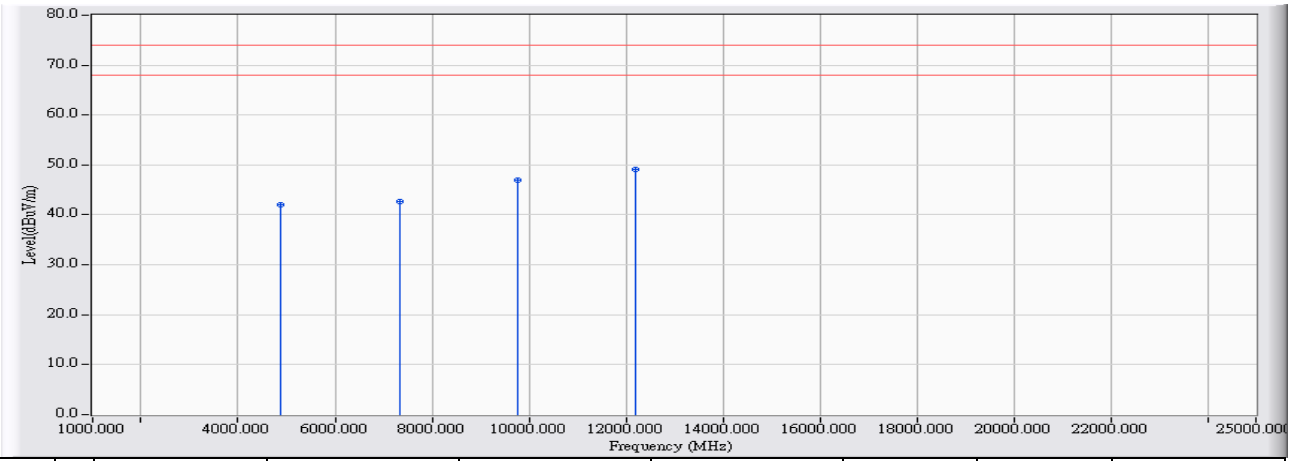


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4803.780	-9.443	51.720	42.277	-31.723	74.000	PEAK
2		7206.000	0.099	44.319	44.417	-29.583	74.000	PEAK
3		9613.587	4.036	42.450	46.486	-27.514	74.000	PEAK
4	*	12008.770	8.132	41.010	49.142	-24.858	74.000	PEAK

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. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	**Time : 2015/09/21 - 19:16**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2440MHz**

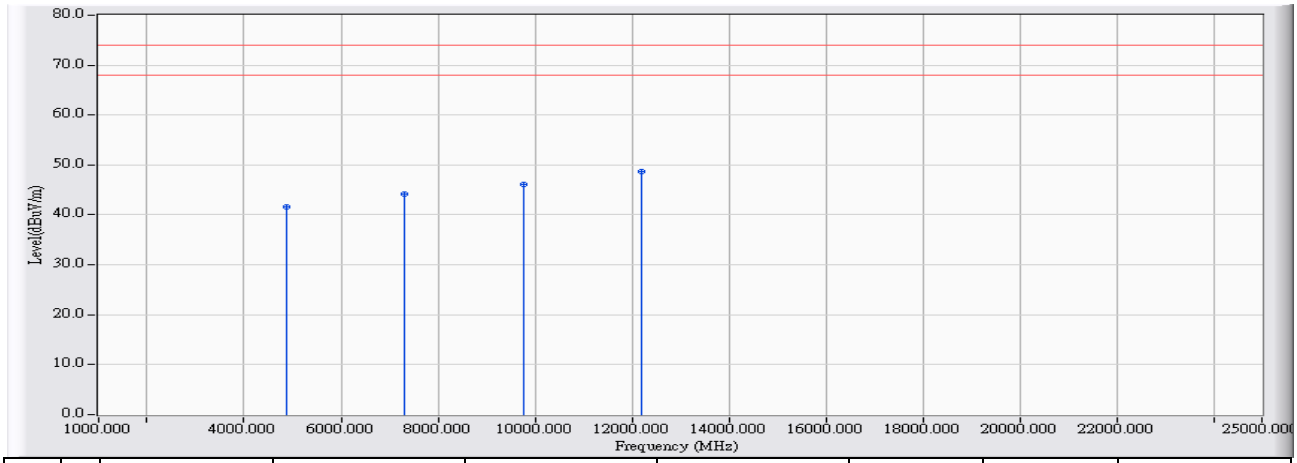


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4880.000	-6.968	49.040	42.073	-31.927	74.000	PEAK
2		7329.425	-0.562	43.320	42.758	-31.242	74.000	PEAK
3		9765.477	5.508	41.490	46.998	-27.002	74.000	PEAK
4	*	12201.540	8.364	40.720	49.084	-24.916	74.000	PEAK

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. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	**Time : 2015/09/21 - 19:24**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2440MHz**

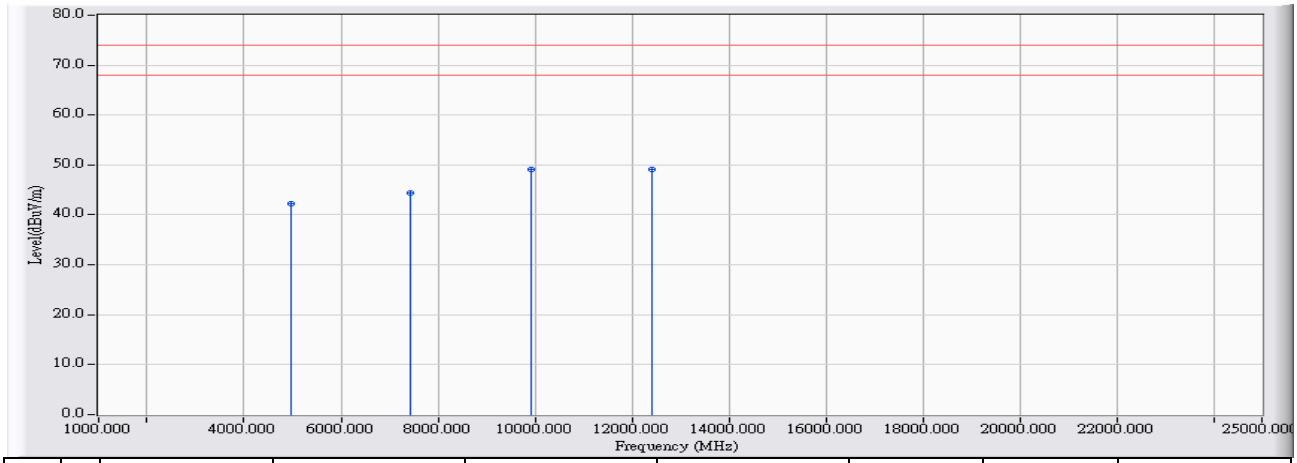


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4880.000	-9.039	50.710	41.671	-32.329	74.000	PEAK
2		7319.120	0.395	43.890	44.285	-29.715	74.000	PEAK
3		9764.298	4.723	41.370	46.093	-27.907	74.000	PEAK
4	*	12195.000	8.010	40.590	48.601	-25.399	74.000	PEAK

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. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	**Time : 2015/09/21 - 19:32**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2480MHz**

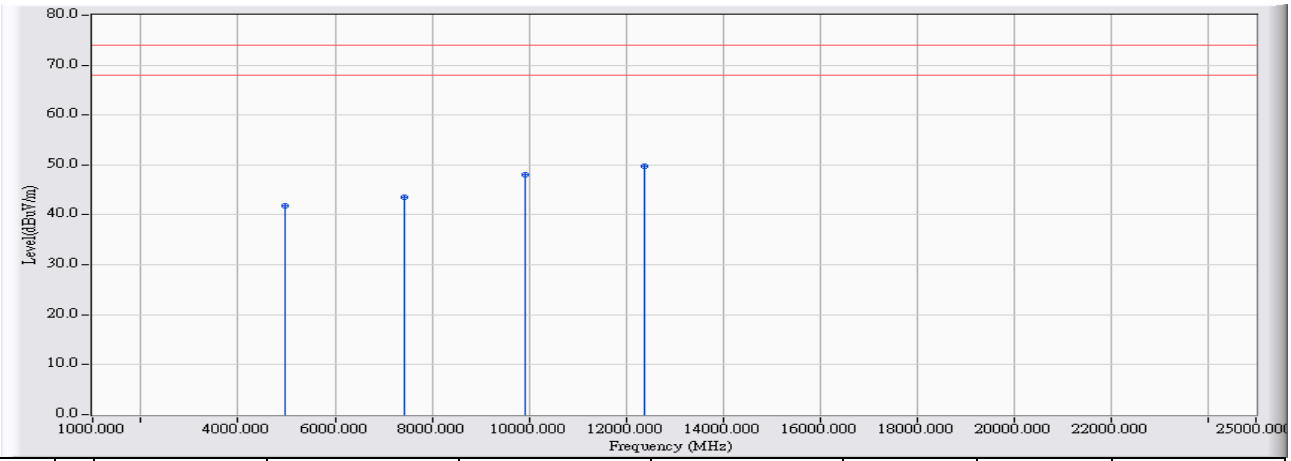


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4959.080	-6.869	49.140	42.270	-31.730	74.000	PEAK
2		7440.000	-0.296	44.660	44.364	-29.636	74.000	PEAK
3		9920.000	6.118	43.040	49.158	-24.842	74.000	PEAK
4	*	12403.280	8.320	40.860	49.179	-24.821	74.000	PEAK

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. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	**Time : 2015/09/21 - 19:40**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4959.220	-8.617	50.540	41.922	-32.078	74.000	PEAK
2		7438.800	-0.300	43.910	43.611	-30.389	74.000	PEAK
3		9910.265	6.079	41.960	48.039	-25.961	74.000	PEAK
4	*	12398.581	8.319	41.360	49.680	-24.320	74.000	PEAK

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. The Emission above 13GHz were not included is because their levels are too low.

5. RF antenna conducted test

5.1. Test Equipment

The following test equipments are used during the test:

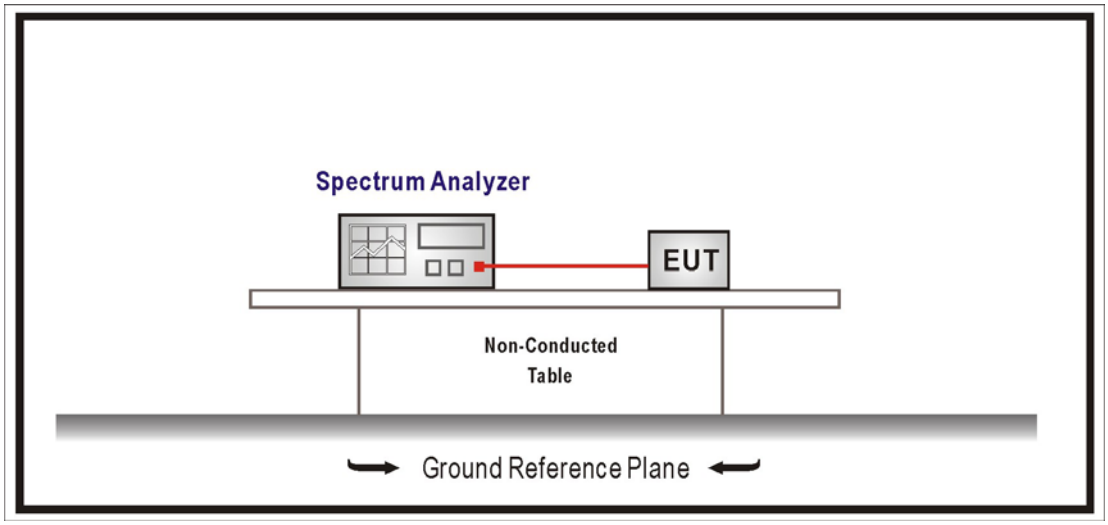
RF antenna conducted test / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23
Signal & Spectrum Analyzer	R&S	FSV40	101049	2015/10/30
Signal Analyzer	R&S	FSV7	101650	2015/12/17

Note: All equipments that need to calibrate are with calibration period of 1 year.

5.2. Test Setup

RF Antenna Conducted Measurement:



5.3. Limits

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 an RF conducted or 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)).

5.4. Test Procedure

The EUT was setup according to ANSI C63.10: 213 and tested according to DTS test procedure section 11.2 of KDB558074 v03r02 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

5.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2014

5.6. Uncertainty

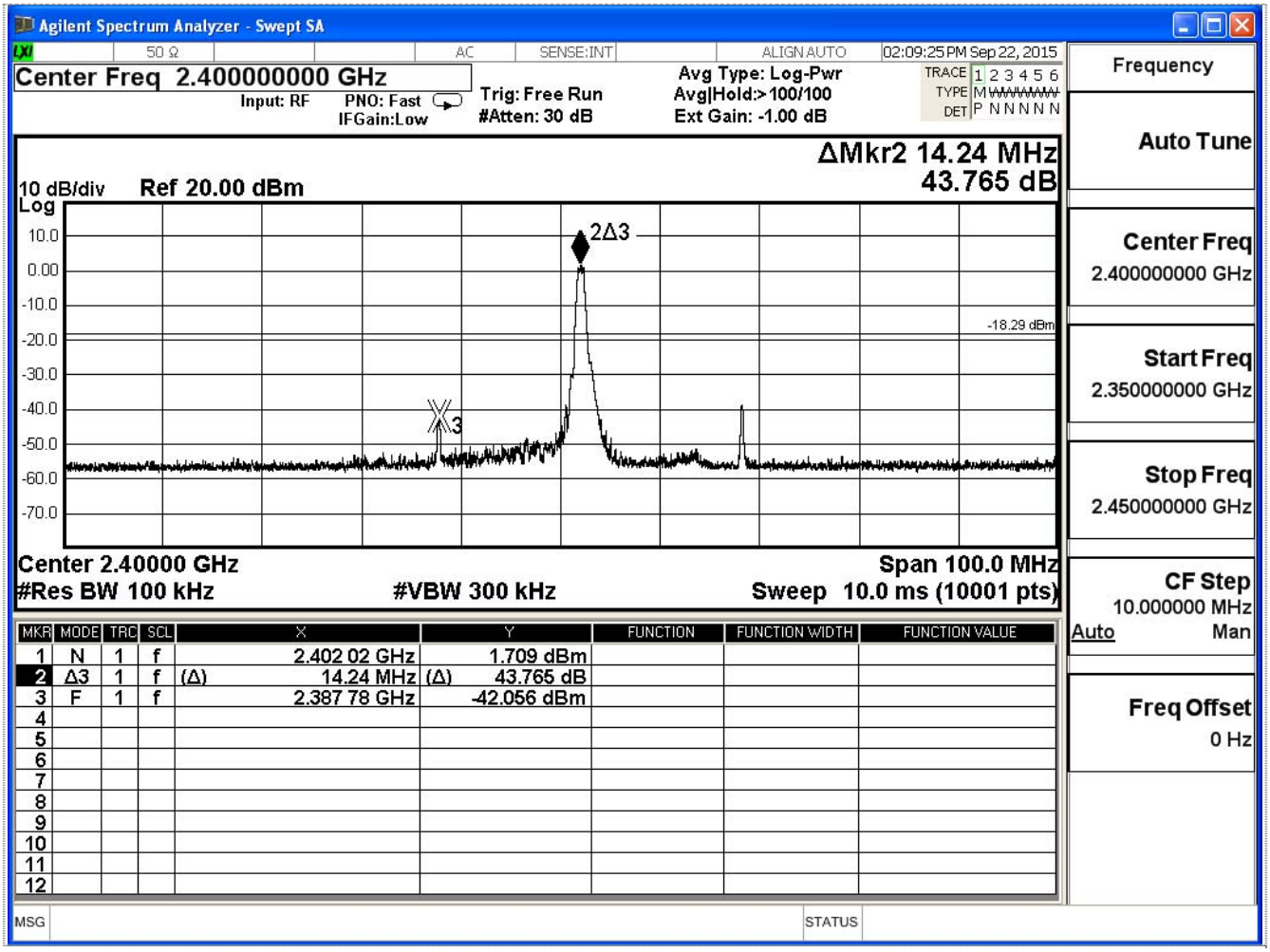
Conducted is defined as ± 1.27dB

5.7. Test Result

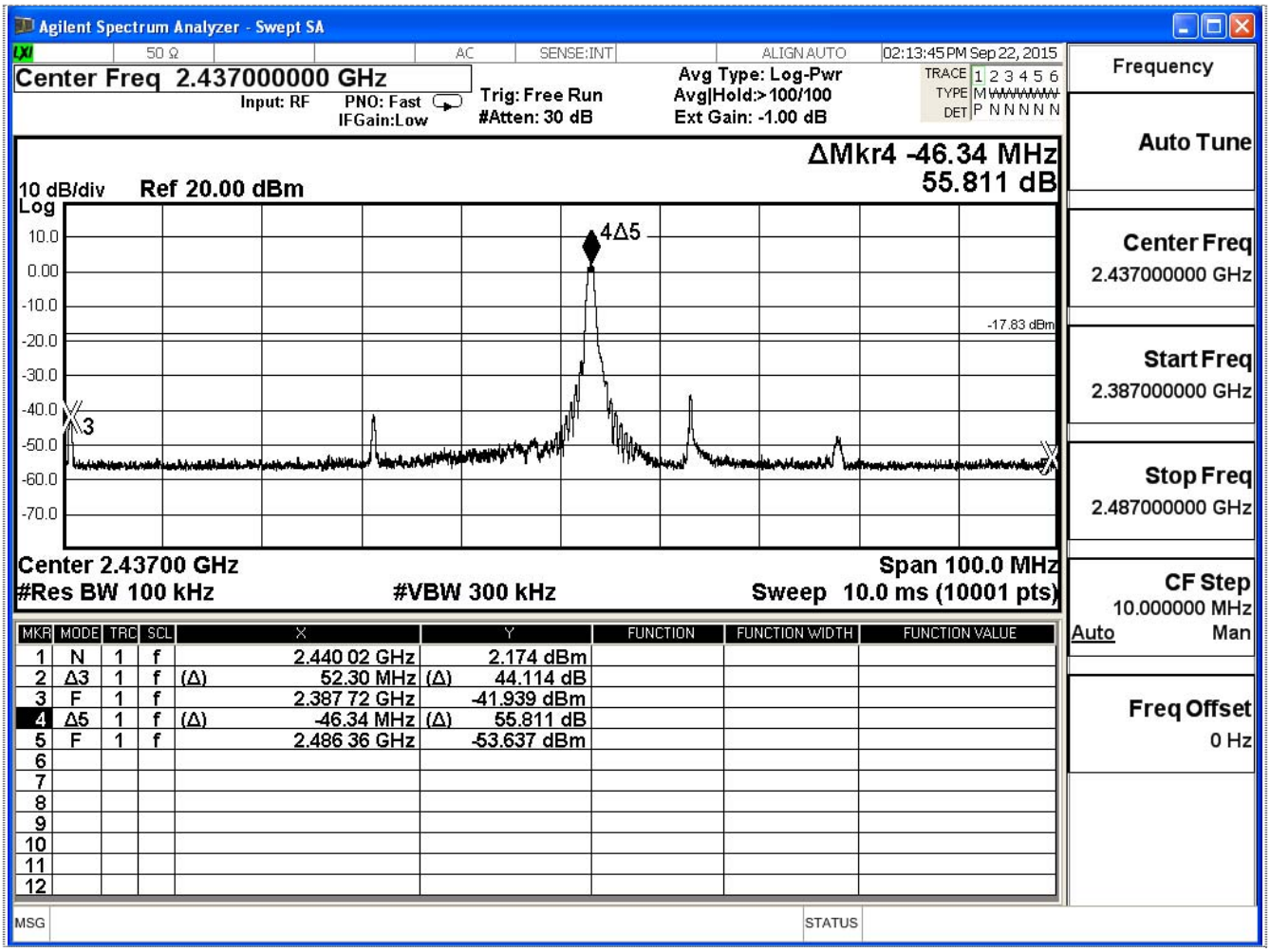
Product	Heart-Rate Smartwatch		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit-Power by PC		
Date of Test	2015/09/22	Test Site	SR7

BLE 4.0 (GFSK)				
Channel	Frequency (MHz)	Measure Level (dBc)	Limit (dBc)	Result
00	2402	43.765	≧20	Pass
19	2440	44.114	≧20	Pass
39	2480	42.263	≧20	Pass

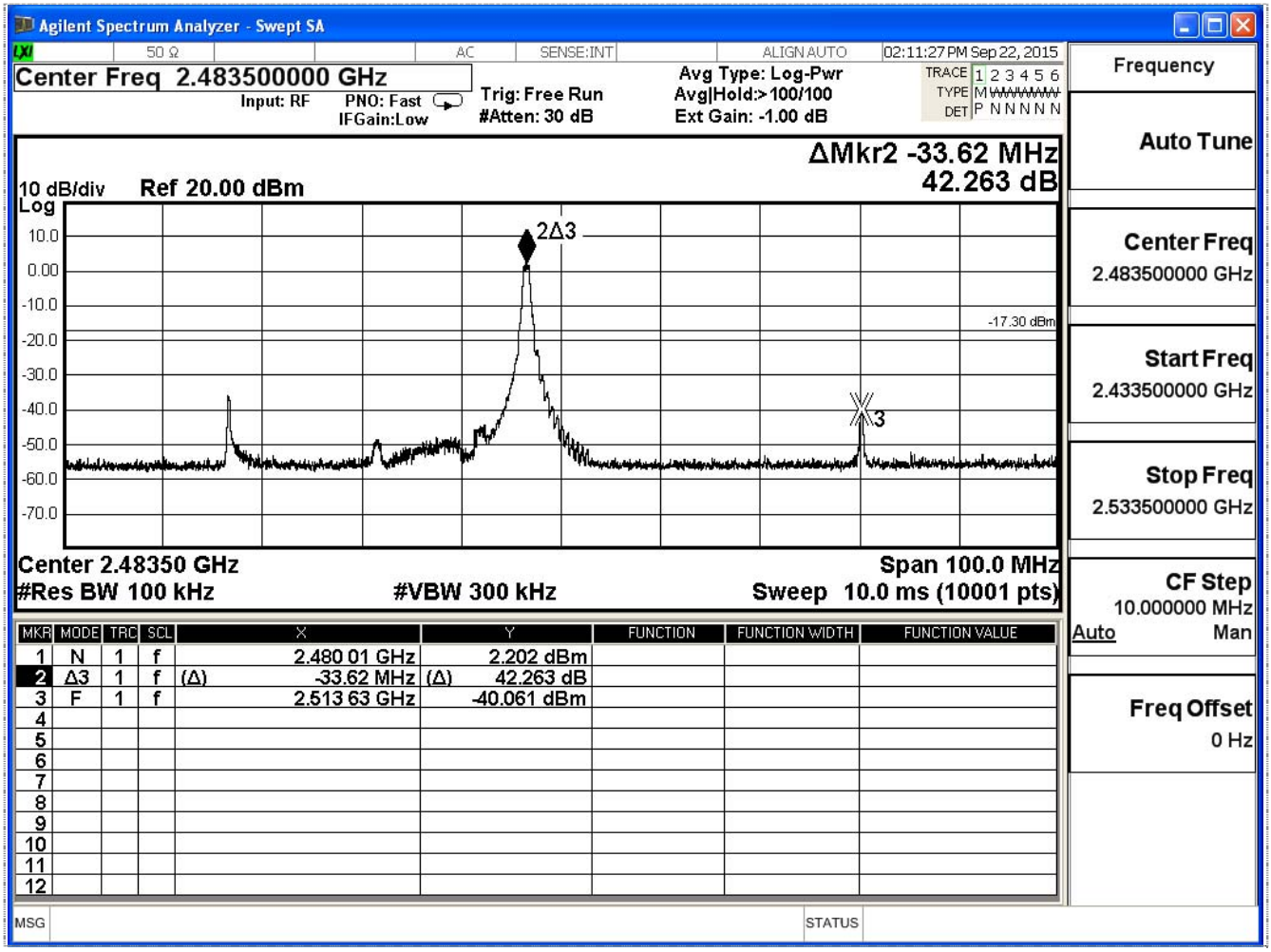
Channel 00



Channel 19

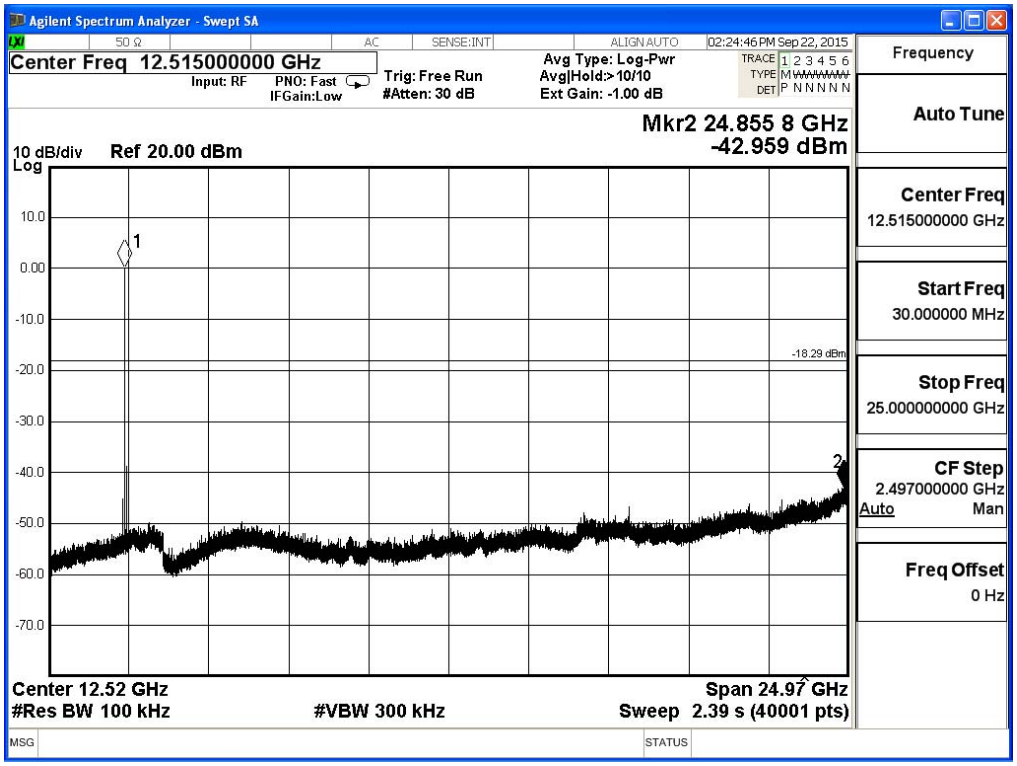

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
02:13:45 PM Sep 22, 2015
Center Freq 2.437000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -1.00 dB
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
ΔMkr4 -46.34 MHz
55.811 dB
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-17.83 dBm
Center 2.43700 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 100.0 MHz
Sweep 10.0 ms (10001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.440 02 GHz 2.174 dBm
2 Δ3 1 f (Δ) 52.30 MHz (Δ) 44.114 dB
3 F 1 f 2.387 72 GHz -41.939 dBm
4 Δ5 1 f (Δ) -46.34 MHz (Δ) 55.811 dB
5 F 1 f 2.486 36 GHz -53.637 dBm
Frequency
Auto Tune
Center Freq
2.437000000 GHz
Start Freq
2.387000000 GHz
Stop Freq
2.487000000 GHz
CF Step
10.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Channel 39

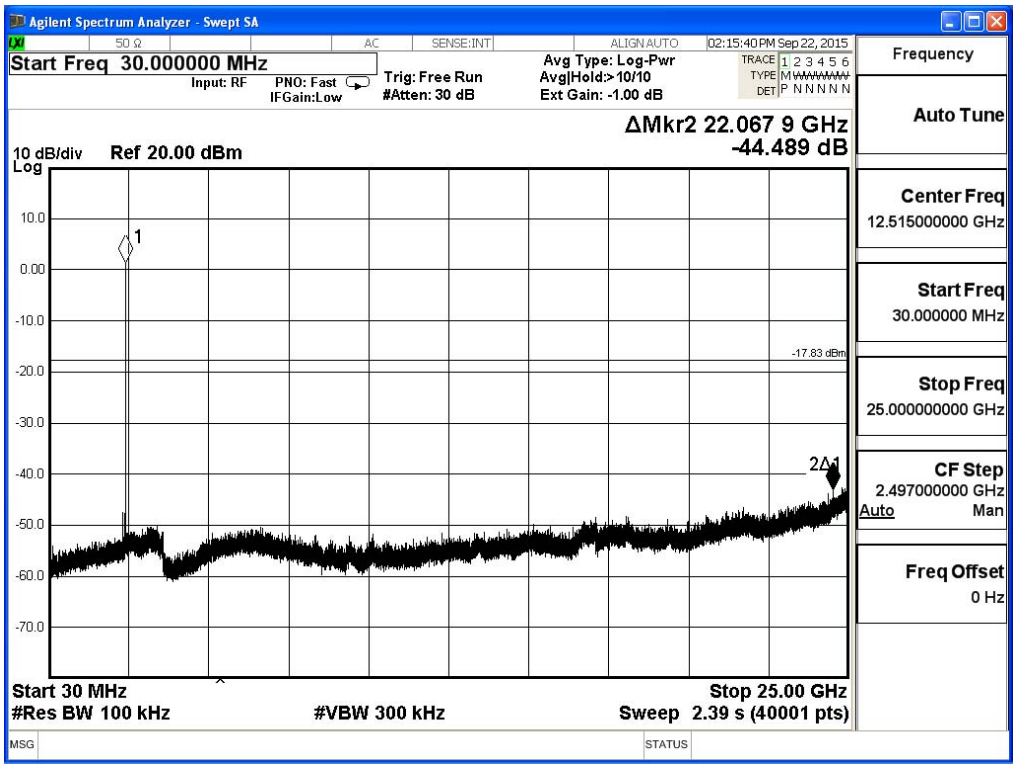

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
02:11:27 PM Sep 22, 2015
Center Freq 2.483500000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -1.00 dB
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
ΔMkr2 -33.62 MHz
42.263 dB
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
2Δ3
3
-17.30 dBm
Center 2.48350 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 100.0 MHz
Sweep 10.0 ms (10001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.480 01 GHz 2.202 dBm
2 Δ3 1 f (Δ) -33.62 MHz (Δ) 42.263 dB
3 F 1 f 2.513 63 GHz -40.061 dBm
Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.433500000 GHz
Stop Freq
2.533500000 GHz
CF Step
10.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Product	Heart-Rate Smartwatch		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit-Power by PC		
Date of Test	2015/09/22	Test Site	SR7

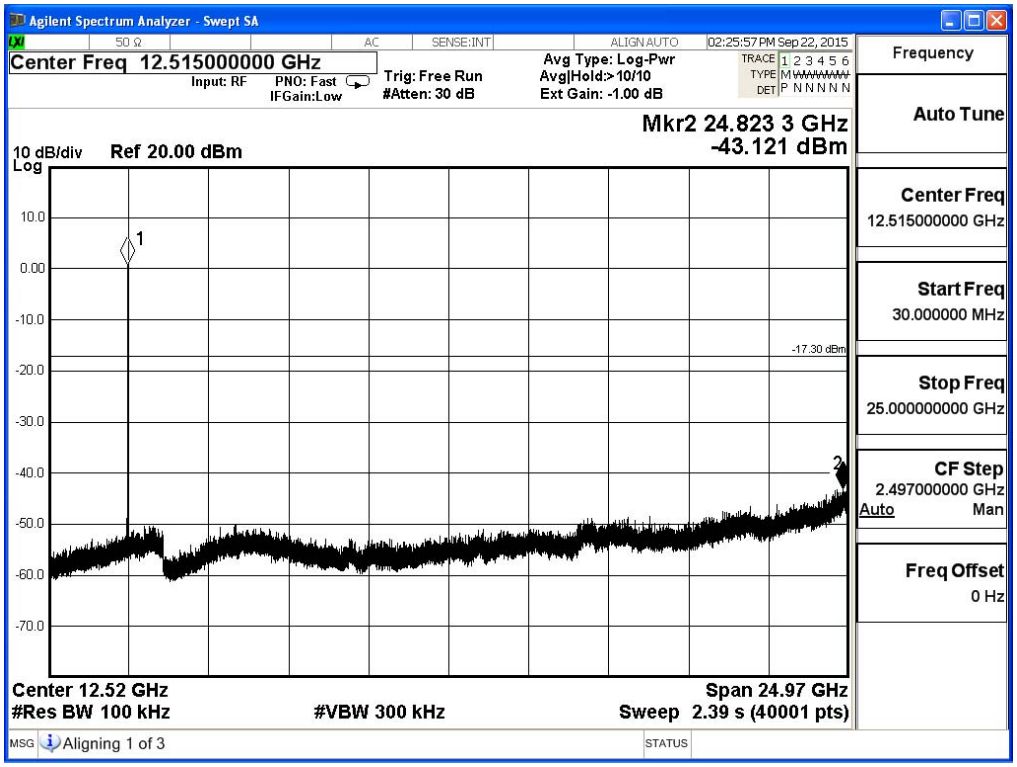
Channel 00 (30MHz-25GHz)- BLE 4.0 (GFSK)



Channel 19 (30MHz-25GHz)- BLE 4.0 (GFSK)



Channel 39 (30MHz-25GHz)- BLE 4.0 (GFSK)



6. Radiated Emission Band Edge

6.1. Test Equipment

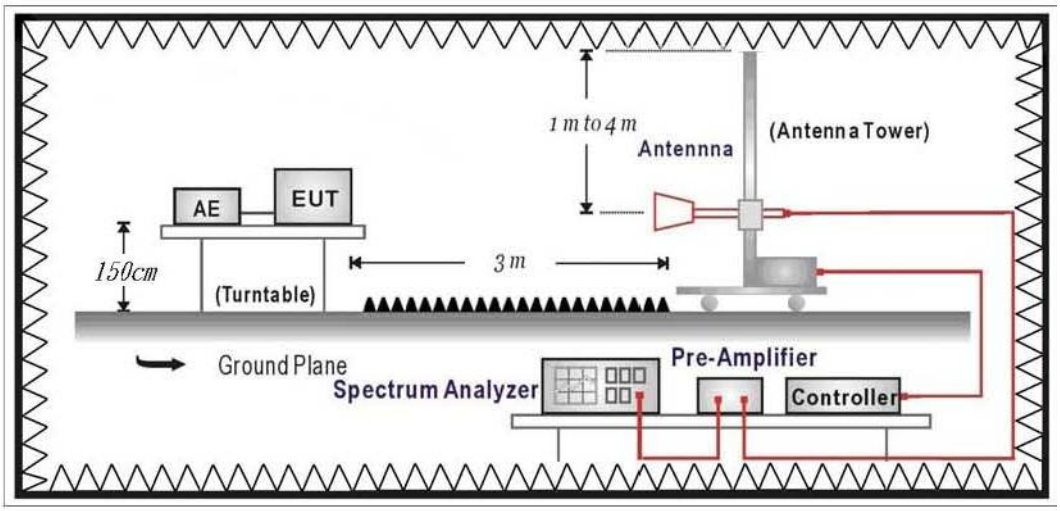
The following test equipments are used during the test:

Radiated Emission Band Edge / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Double Ridged Guide Horn Antenna	Schwarzbeck	BBHA 9120	D743	2016/01/26
Spectrum Analyzer	Agilent	E4440A	MY46187335	2016/01/07
k Type Cable	Huber+Suhner	SF 102	25623/2	2016/01/26
Signal & Spectrum Analyzer	R&S	FSV40	101049	2015/10/30

Note: All equipments that need to calibrate are with calibration period of 1 year.

6.2. Test Setup



6.3. 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.

6.4. Test Procedure

The EUT was setup according to ANSI C63.10: 213 and tested according to DTS test procedure of KDB558074 v03r02 for compliance to FCC 47CFR 15.247 requirements.

The EUT and its simulators are placed on a turn table which is 1.5 meter above ground.

The turn table can rotate 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 can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 213 on radiated measurement.

6.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2014

6.6. Uncertainty

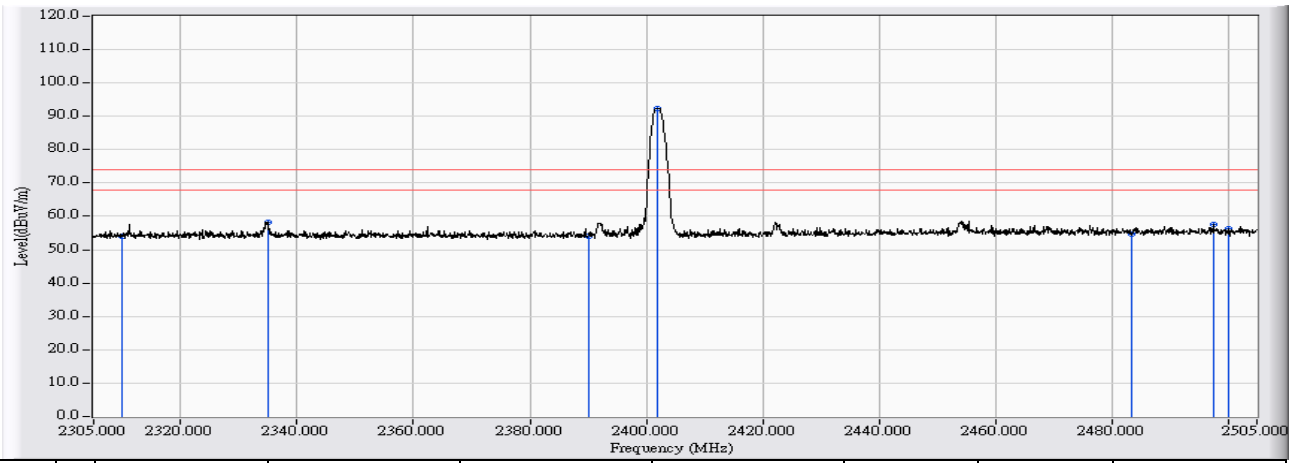
The measurement uncertainty

± 3.9 dB above 1GHz

6.7. Test Result

Radiated is defined as

Site : CB1	**Time : 2015/09/18 - 14:30**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2402MHz**

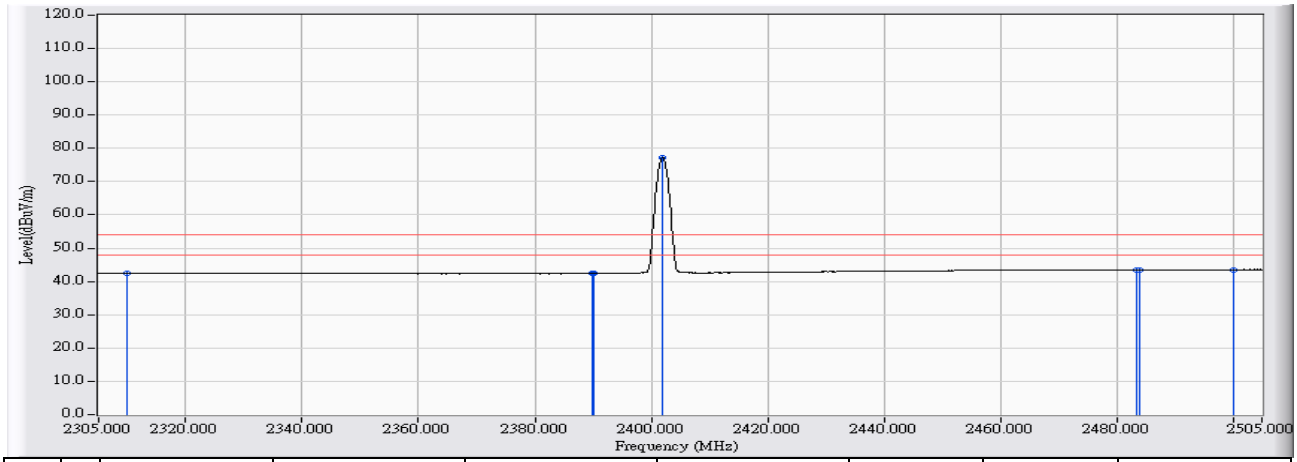


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.366	25.650	54.016	-19.984	74.000	PEAK
2		2334.885	28.472	29.780	58.253	-15.747	74.000	PEAK
3		2390.000	28.709	25.316	54.025	-19.975	74.000	PEAK
4	*	2401.951	28.760	63.585	92.345	18.345	74.000	PEAK
5		2483.500	29.110	25.555	54.665	-19.335	74.000	PEAK
6		2497.504	29.171	28.260	57.431	-16.569	74.000	PEAK
7		2500.000	29.183	27.059	56.241	-17.759	74.000	PEAK

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. If the readings given are average, peak measurement should also be supplied.

Site : CB1	**Time : 2015/09/18 – 14:32**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2402MHz**

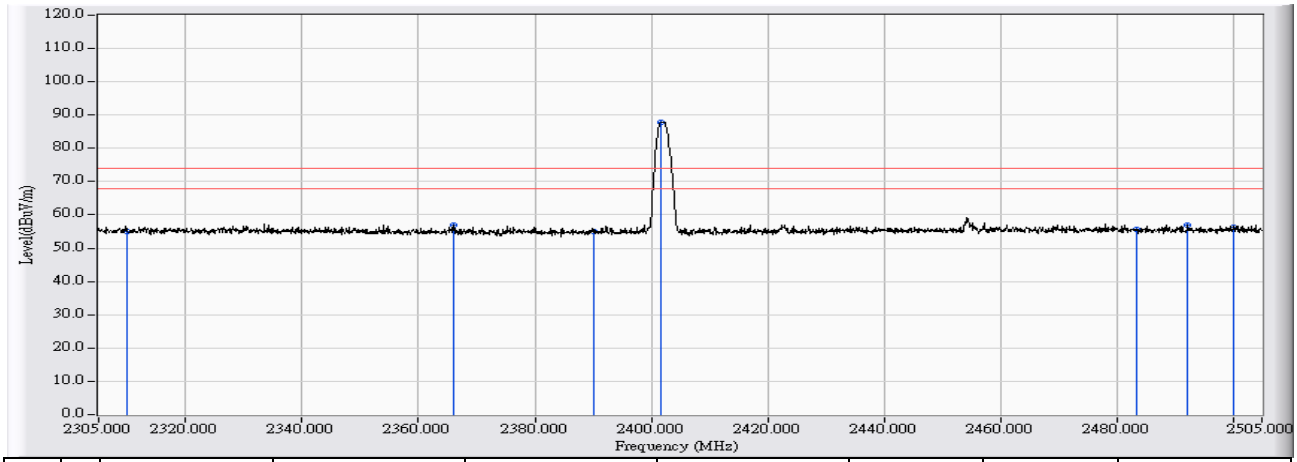


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.366	14.075	42.441	-11.559	54.000	AVERAGE
2		2389.758	28.709	13.686	42.394	-11.606	54.000	AVERAGE
3		2390.000	28.709	13.694	42.403	-11.597	54.000	AVERAGE
4	*	2401.951	28.760	48.429	77.189	23.189	54.000	AVERAGE
5		2483.500	29.110	14.354	43.464	-10.536	54.000	AVERAGE
6		2483.910	29.112	14.400	43.512	-10.488	54.000	AVERAGE
7		2500.000	29.183	14.374	43.556	-10.444	54.000	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. If the readings given are average, peak measurement should also be supplied.

Site : CB1	**Time : 2015/09/18 - 14:40**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2402MHz**

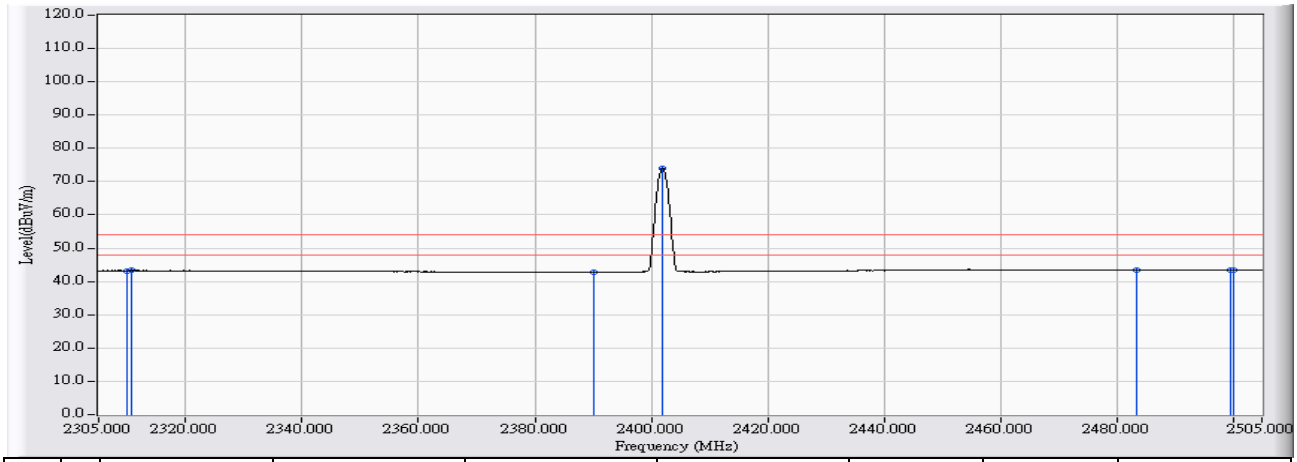


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	29.201	25.868	55.070	-18.930	74.000	PEAK
2		2365.969	29.169	27.791	56.960	-17.040	74.000	PEAK
3		2390.000	29.155	25.700	54.856	-19.144	74.000	PEAK
4	*	2401.751	29.149	58.810	87.959	13.959	74.000	PEAK
5		2483.500	29.102	26.511	55.613	-18.387	74.000	PEAK
6		2492.306	29.097	27.951	57.048	-16.952	74.000	PEAK
7		2500.000	29.094	27.066	56.160	-17.840	74.000	PEAK

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. If the readings given are average, peak measurement should also be supplied.

Site : CB1	**Time : 2015/09/18 - 14:42**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2402MHz**

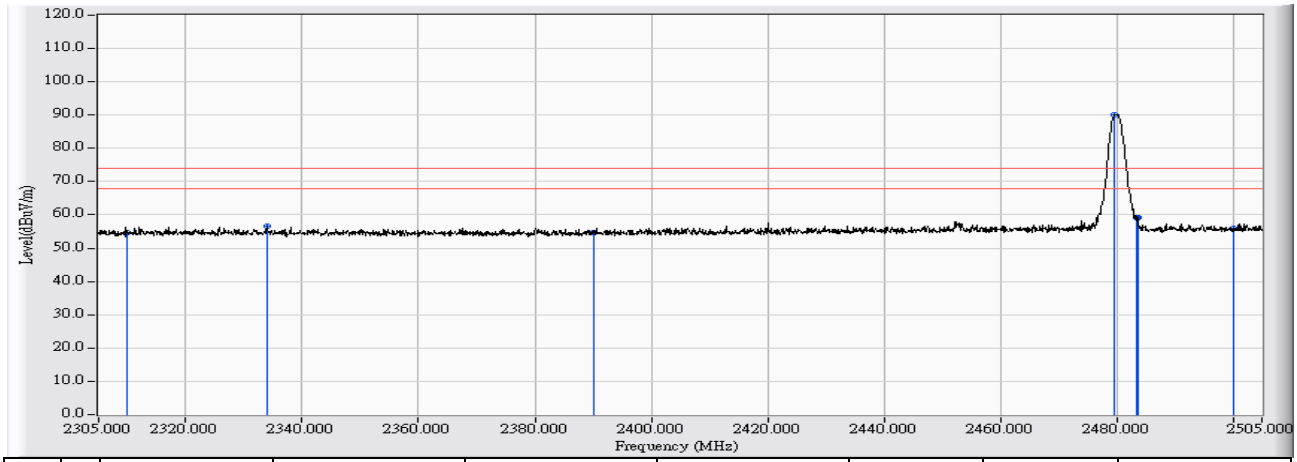


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	29.201	14.054	43.256	-10.744	54.000	AVERAGE
2		2310.597	29.201	14.087	43.288	-10.712	54.000	AVERAGE
3		2390.000	29.155	13.685	42.841	-11.159	54.000	AVERAGE
4	*	2401.951	29.149	44.759	73.908	19.908	54.000	AVERAGE
5		2483.500	29.102	14.399	43.501	-10.499	54.000	AVERAGE
6		2499.503	29.093	14.386	43.480	-10.520	54.000	AVERAGE
7		2500.000	29.094	14.352	43.446	-10.554	54.000	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. If the readings given are average, peak measurement should also be supplied.

Site : CB1	**Time : 2015/09/18 - 14:50**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2480MHz**

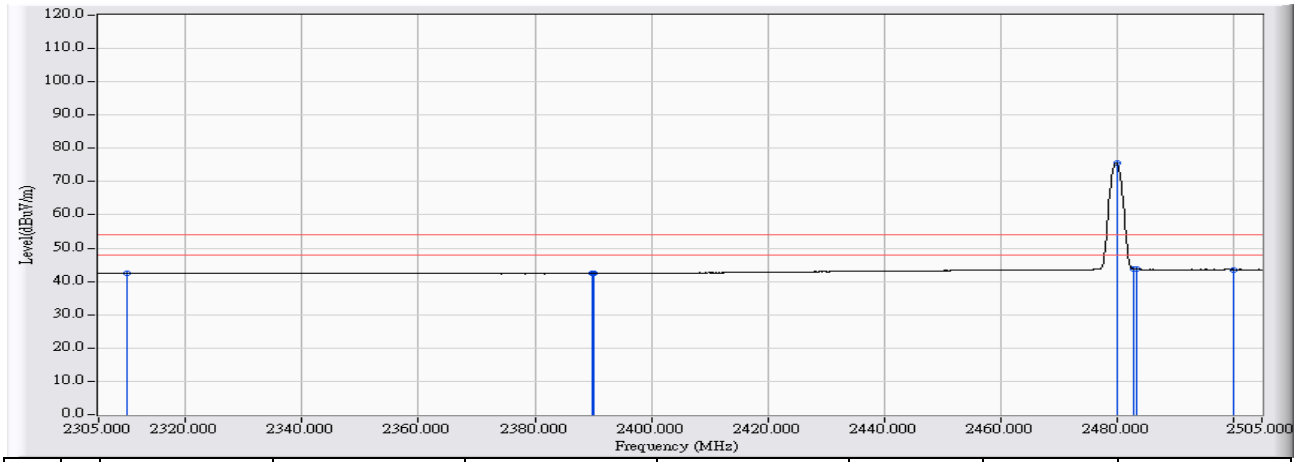


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.366	26.205	54.571	-19.429	74.000	PEAK
2		2333.885	28.469	28.027	56.495	-17.505	74.000	PEAK
3		2390.000	28.709	26.067	54.776	-19.224	74.000	PEAK
4	*	2479.713	29.094	61.061	90.155	16.155	74.000	PEAK
5		2483.500	29.110	30.233	59.343	-14.657	74.000	PEAK
6		2483.611	29.111	30.056	59.167	-14.833	74.000	PEAK
7		2500.000	29.183	26.876	56.058	-17.942	74.000	PEAK

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. If the readings given are average, peak measurement should also be supplied.

Site : CB1	**Time : 2015/09/18 - 14:55**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2480MHz**

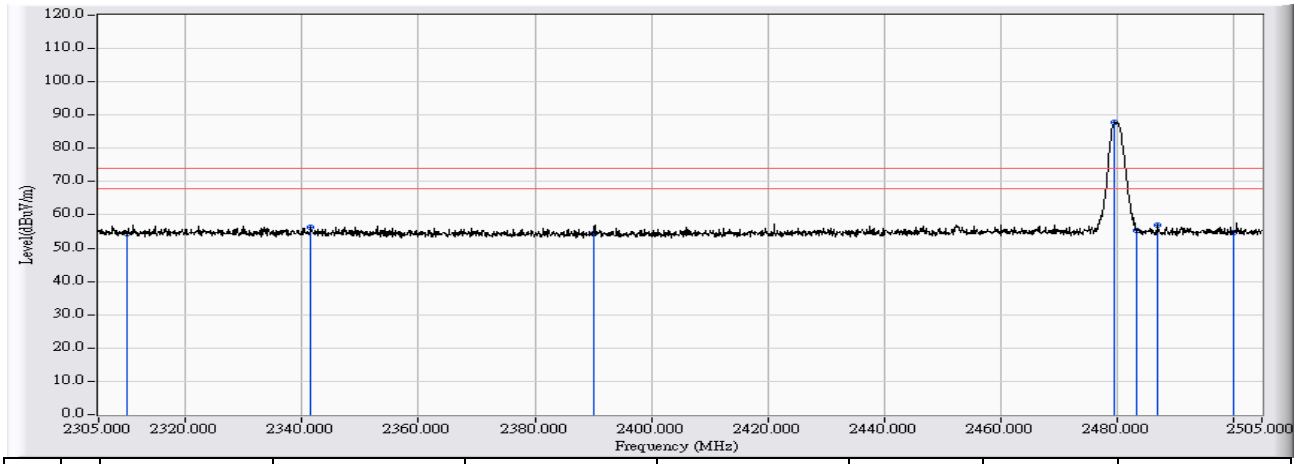


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.366	14.059	42.425	-11.575	54.000	AVERAGE
2		2389.758	28.709	13.654	42.362	-11.638	54.000	AVERAGE
3		2390.000	28.709	13.664	42.373	-11.627	54.000	AVERAGE
4	*	2480.012	29.095	46.564	75.659	21.659	54.000	AVERAGE
5		2482.911	29.108	14.688	43.796	-10.204	54.000	AVERAGE
6		2483.500	29.110	14.567	43.677	-10.323	54.000	AVERAGE
7		2500.000	29.183	14.401	43.583	-10.417	54.000	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. If the readings given are average, peak measurement should also be supplied.

Site : CB1	**Time : 2015/09/18 - 15:00**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2480MHz**

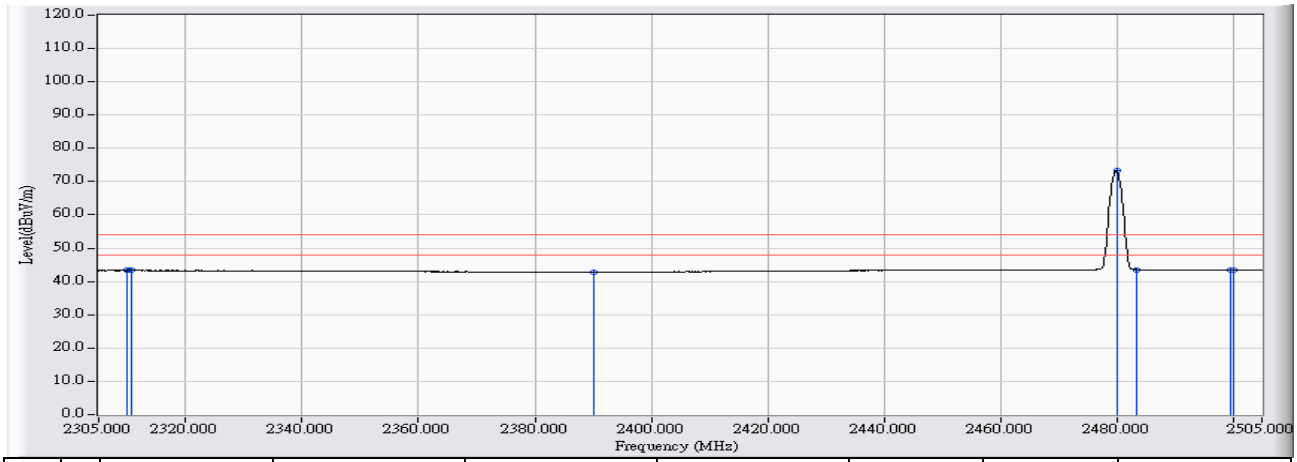


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	29.201	25.309	54.511	-19.489	74.000	PEAK
2		2341.482	29.184	27.262	56.446	-17.554	74.000	PEAK
3		2390.000	29.155	25.287	54.443	-19.557	74.000	PEAK
4	*	2479.713	29.104	58.611	87.715	13.715	74.000	PEAK
5		2483.500	29.102	26.383	55.485	-18.515	74.000	PEAK
6		2487.109	29.099	27.922	57.022	-16.978	74.000	PEAK
7		2500.000	29.094	25.629	54.723	-19.277	74.000	PEAK

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. If the readings given are average, peak measurement should also be supplied.

Site : CB1	**Time : 2015/09/18 - 15:05**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 5V**
EUT : Heart-Rate Smartwatch	**Note : Mode 1: Transmit-Power by PC_ GFSK_2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	29.201	14.105	43.307	-10.693	54.000	AVERAGE
2		2310.597	29.201	14.094	43.295	-10.705	54.000	AVERAGE
3		2390.000	29.155	13.663	42.819	-11.181	54.000	AVERAGE
4	*	2480.012	29.104	44.168	73.272	19.272	54.000	AVERAGE
5		2483.500	29.102	14.461	43.563	-10.437	54.000	AVERAGE
6		2499.503	29.093	14.408	43.502	-10.498	54.000	AVERAGE
7		2500.000	29.094	14.396	43.490	-10.510	54.000	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. If the readings given are average, peak measurement should also be supplied.

7. Occupied Bandwidth

7.1. Test Equipment

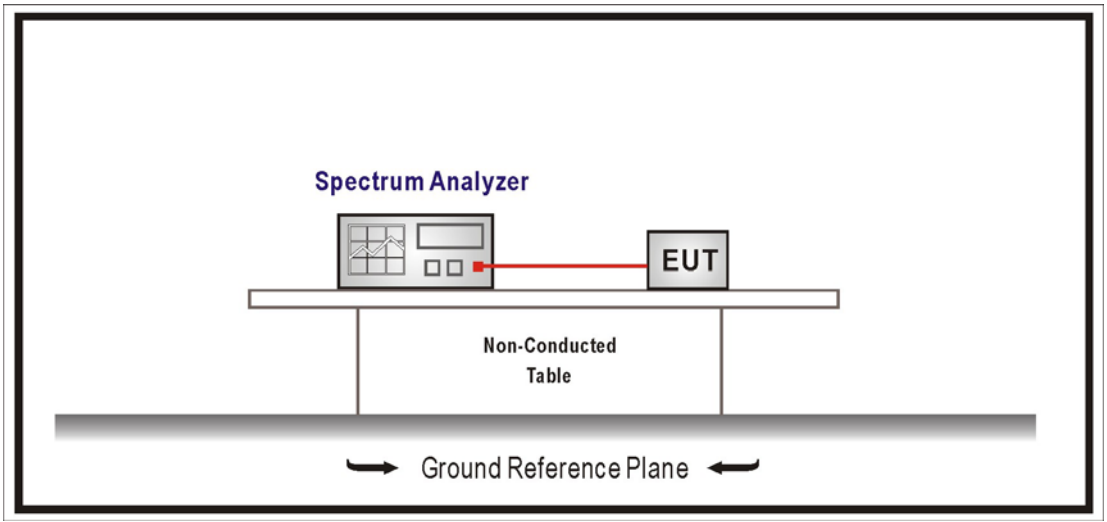
The following test equipments are used during the test:

Occupied Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23
Signal & Spectrum Analyzer	R&S	FSV40	101049	2015/10/30
Signal Analyzer	R&S	FSV7	101650	2015/12/17

Note: All equipments that need to calibrate are with calibration period of 1 year.

7.2. Test Setup



7.3. Test Procedures

The EUT was setup according to ANSI C63.10; tested according to DTS test procedure of KDB558074 v03r02 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 1-5% of the OBW, Set the VBW≧3xRBW, Sweep Time=Auto.

7.4. Limits

The 6 dB bandwidth must be greater than 500 kHz.

7.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2014

7.6. Uncertainty

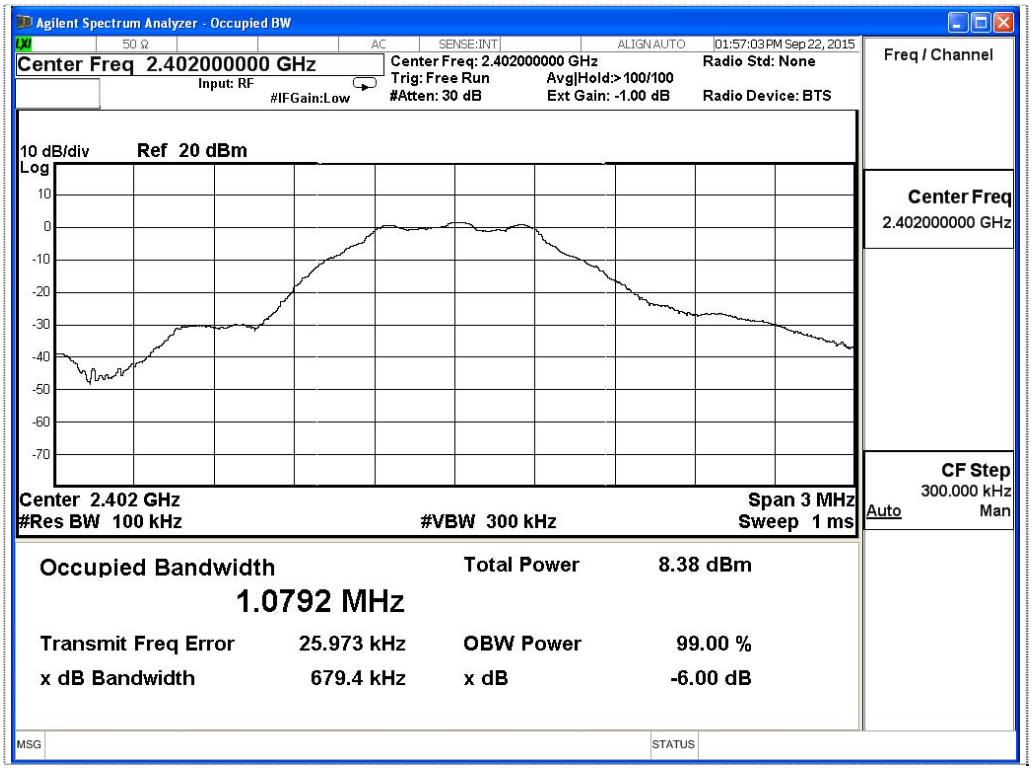
The measurement uncertainty is defined as ±150Hz

7.7. Test Result

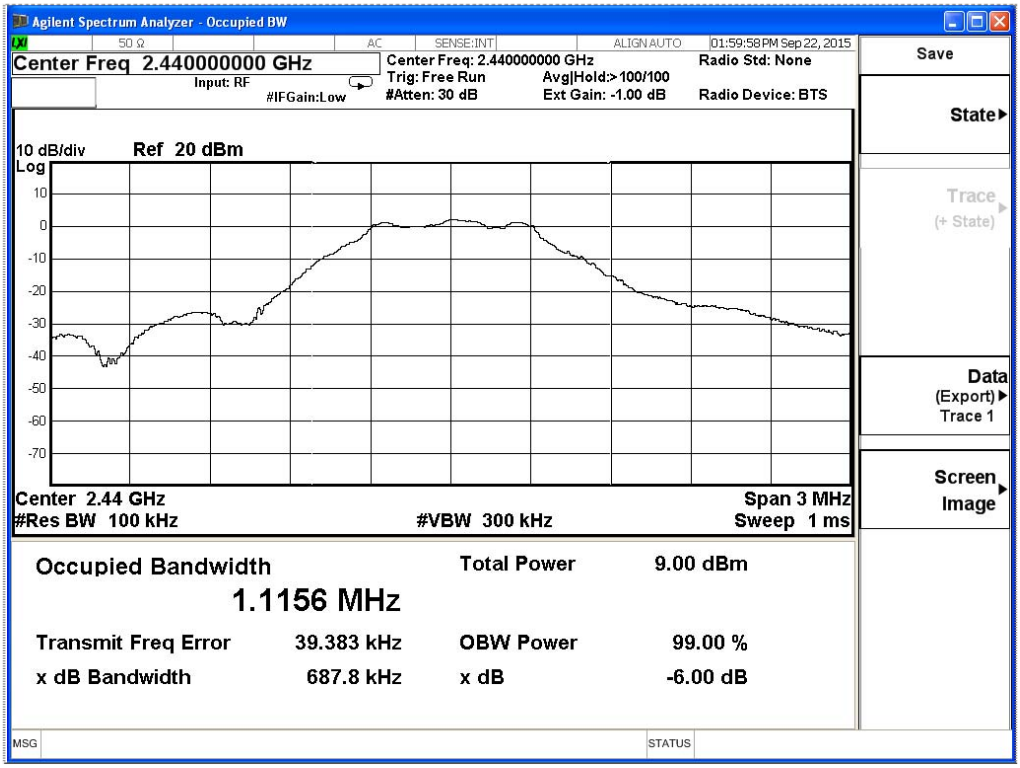
Product	Heart-Rate Smartwatch		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit-Power by PC		
Date of Test	2015/09/22	Test Site	SR7

BLE 4.0 (GFSK)				
Channel No.	Frequency (MHz)	Measure Level(MHz)	Limit (MHz)	Result
00	2402	0.679	≧0.5	Pass
19	2440	0.687	≧0.5	Pass
39	2480	0.683	≧0.5	Pass

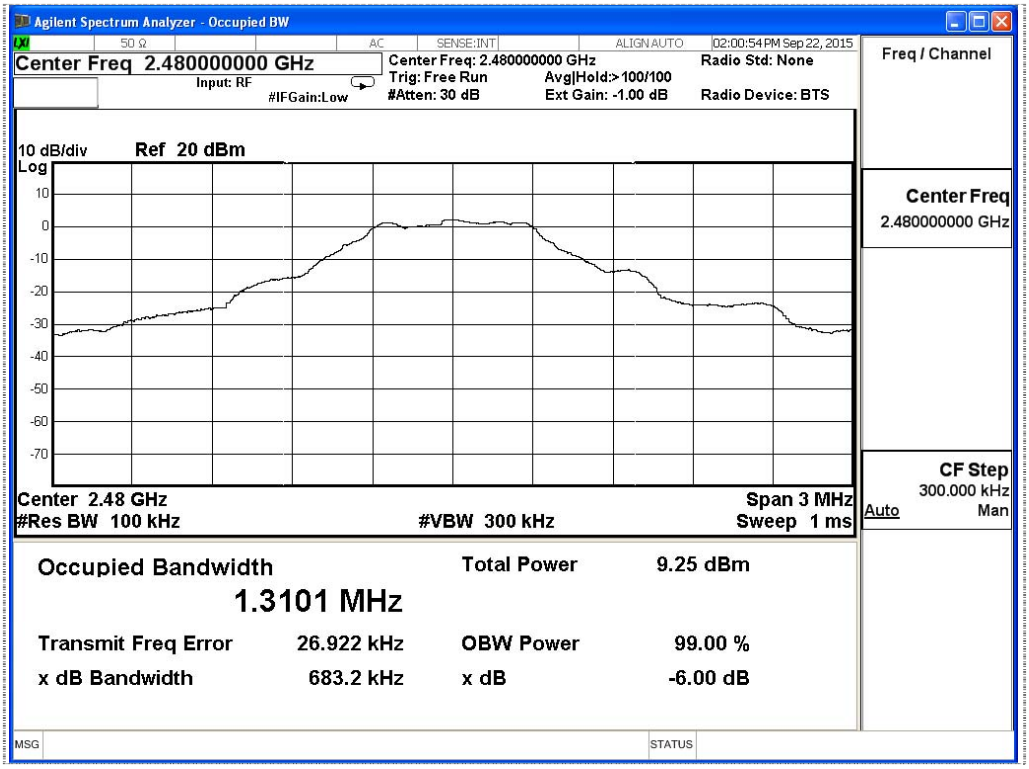
Channel 00



Channel 19



Channel 39



8. Power Density

8.1. Test Equipment

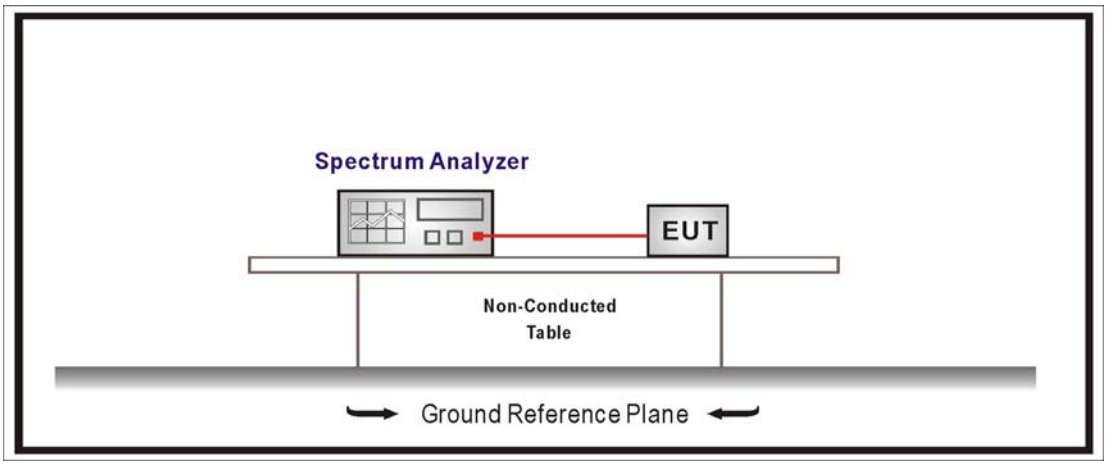
The following test equipment is used during the test:

Power Density / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23
Signal & Spectrum Analyzer	R&S	FSV40	101049	2015/10/30
Signal Analyzer	R&S	FSV7	101650	2015/12/17

Note: All equipments that need to calibrate are with calibration period of 1 year.

8.2. Test Setup



8.3. Limits

The peak power spectral density conducted from the intentional radiated to the antenna shall not be greater than +8dBm in any 3kHz band during any time interval of continuous transmission.

8.4. Test Procedures

The EUT was setup according to ANSI C63.10: 213; tested according to DTS test procedure section 10.2 of KDB558074 v03r02 for compliance to FCC 47CFR 15.247 requirements.
Set 3KHz ≦RBW≦100 kHz, Set VBW≧3xRBW, Sweep time=Auto, Set Peak detector;
The tested according to section E)c) of KDB662911 v02v01.

8.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2014

8.6. Uncertainty

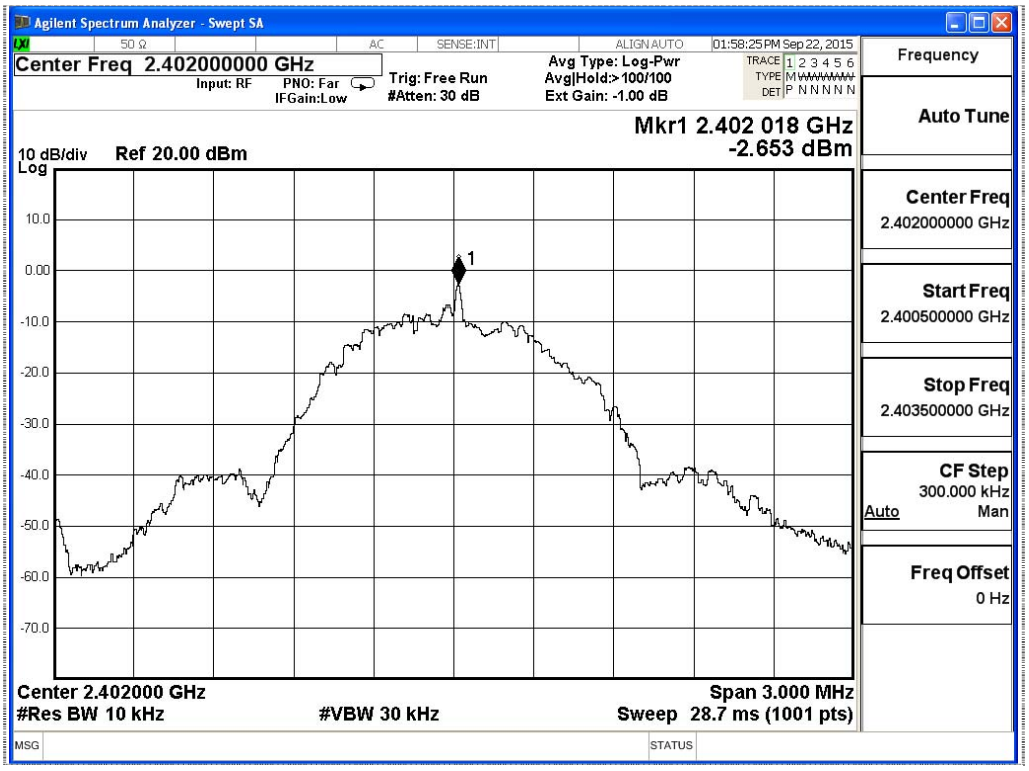
The measurement uncertainty is defined as ±1.27dB.

8.7. Test Result

Product	Heart-Rate Smartwatch		
Test Item	Power Density		
Test Mode	Mode 1: Transmit-Power by PC		
Date of Test	2015/09/22	Test Site	SR7

BLE 4.0 (GFSK)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	-2.653	≦8	Pass
19	2440	-3.908	≦8	Pass
39	2480	-5.102	≦8	Pass

Channel 00



Channel 19

Channel 39