

FCC Test Report

Product Name : GPS Sport Watch
Model No. : TW-100
FCC ID. : 2ADUC100S1218201401

Applicant : TSKY CO., LTD
Address : 15F.-1, No.8, Ziqiang S. Rd., Zhubei
City, Hsinchu County 302, Taiwan

Date of Receipt : 2014/11/19
Issued Date : 2014/12/16
Report No. : 14B0457R-RFUSP73V00
Report Version : V1.0



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.

Test Report Certification

Issued Date : 2014/12/16

Report No. : 14B0457R-RFUSP73V00



Product Name : GPS Sport Watch
 Applicant : TSKY CO., LTD
 Address : 15F.-1, No.8, Ziqiang S. Rd., Zhubei City, Hsinchu County 302,
 Taiwan
 Model No. : TW-100
 FCC ID. : 2ADUC100S1218201401
 EUT Voltage : DC 3.7V (Power by Battery)
 Trade Name : TSKY
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2013
 Test Result : Complied

The test results relate only to the samples tested.

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Documented By :

(Carol Tsai / Engineering Adm. Assistant)

Reviewed By :

(Ken Huang / Assistant Engineer)

Approved By :

(Roy Wang / Director)

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: 150981

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/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :

<http://www.quietek.com/>

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

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1. General Information

1.1. EUT Description

Product Name	GPS Sport Watch
Trade Name	TSKY
Model No.	TW-100
Frequency Range/Channel Number	2402~2480MHz / 40 Channels
Type of Modulation	Bluetooth 4.0(GFSK)
Antenna Type	Soldered on PCB
Antenna Gain	0dBi

Component	
USB Cable	Shielded, 0.8m

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 GPS Sport Watch including a 2.4GHz Bluetooth 4.0 function.
2. 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.
3. This device is a Bluetooth 4.0 in accordance with Part 15 regulations. The function receiving was measured and made a test report that the report number is 14B0457R-RFUSP01V00 under Declaration of Conformity.

1.2. Test Mode

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-Test Mode	
EMI	Mode 1: Transmit
Final Test Mode	
EMI	Mode 1: Transmit

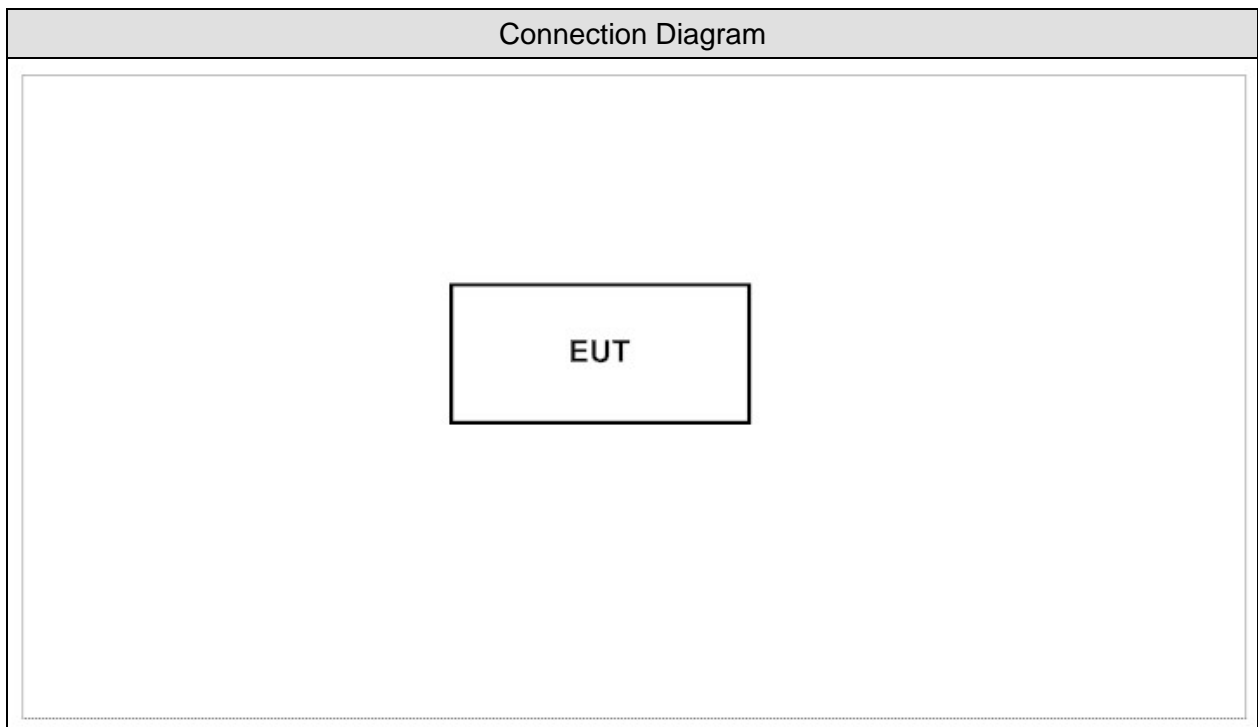
Test Items	Mode	Modulation	Channel	Antenna	Result
Conducted Emission	1	GFSK	19	0	NA
Peak Power Output	1	GFSK	0/19/39	0	Complies
Radiated Emission	1	GFSK	0/19/39	0	Complies
RF antenna conducted test	1	GFSK	0/19/39	0	Complies
Radiated Emission Band Edge	1	GFSK	0/39	0	Complies
Occupied Bandwidth	1	GFSK	0/19/39	0	Complies
Power Density	1	GFSK	0/19/39	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:

Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
N/A					

1.4. Configuration of tested System



1.5. EUT Exercise Software

1	Setup the EUT as shown in Section 1.4.
2	Turn on the EUT power.
3	Configure the test mode, the test channel to start the continuous transmit.
4	Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output	15 - 35	26
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission	15 - 35	25
Humidity (%RH)		25 - 75	54
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Band Edge	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth	15 - 35	26
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 RF antenna conducted test	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Power Density	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000

2. Peak Power Output

2.1. Test Equipment

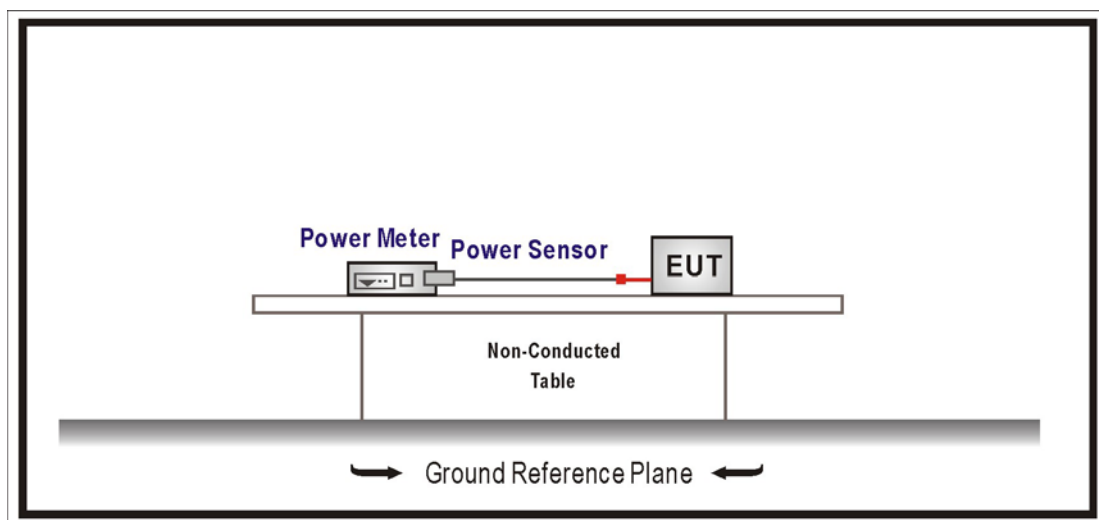
The following test equipment is used during the test:

Peak Power Output / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Power Meter	Agilent	N1911A	MY45101353	2015/10/31
Power Sensor	Agilent	N1921A	MY45241670	2015/10/31

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. 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.

2.4. Limits

The maximum peak power shall be less 1 Watt.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

2.6. Test Result

Product	GPS Sport Watch		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2014/12/10	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	-2.290	30	Pass
19	2440	-2.140	30	Pass
39	2480	-2.780	30	Pass

3. Radiated Emission

3.1. Test Equipment

The following test equipments are used during the test:

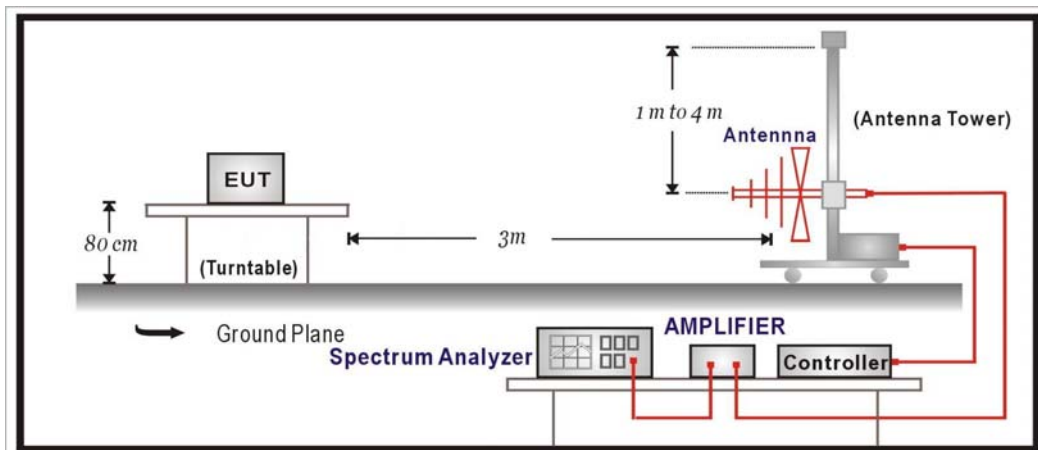
Radiated Emission / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Bilog Antenna	SCHAFFNER	CBL6112B	2895(CB1)	2015/08/14
Double Ridged Guide Horn Antenna	Schwarzback	BBHA 9120	D743	2015/02/12
Pre-Amplifier	Quietek	AMF-4D.	888003	2015/06/02
Pre-Amplifier	Quietek	AP-025C	CHM-0706049	2015/02/06
Spectrum Analyzer	Agilent	E4440A	MY46187335	2015/01/12
k Type Cable	Huber Suhner	Sucoflex 102	25623/2	2015/02/10
Bilog Antenna	SCHAFFNER	CBL6112B	2895(CB1)	2015/08/14

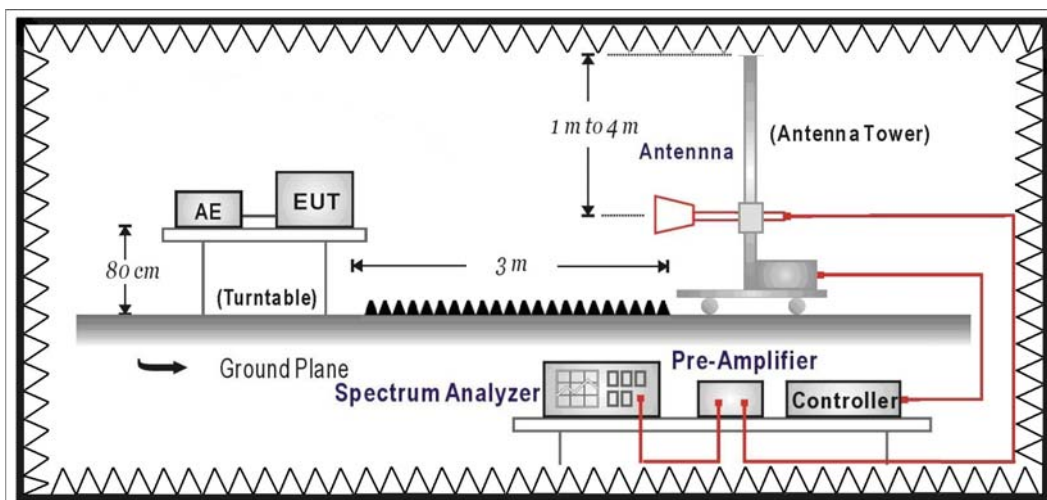
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

3.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



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

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

3.4. Test Procedure

The EUT was setup according to ANSI C63.10 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 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 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.

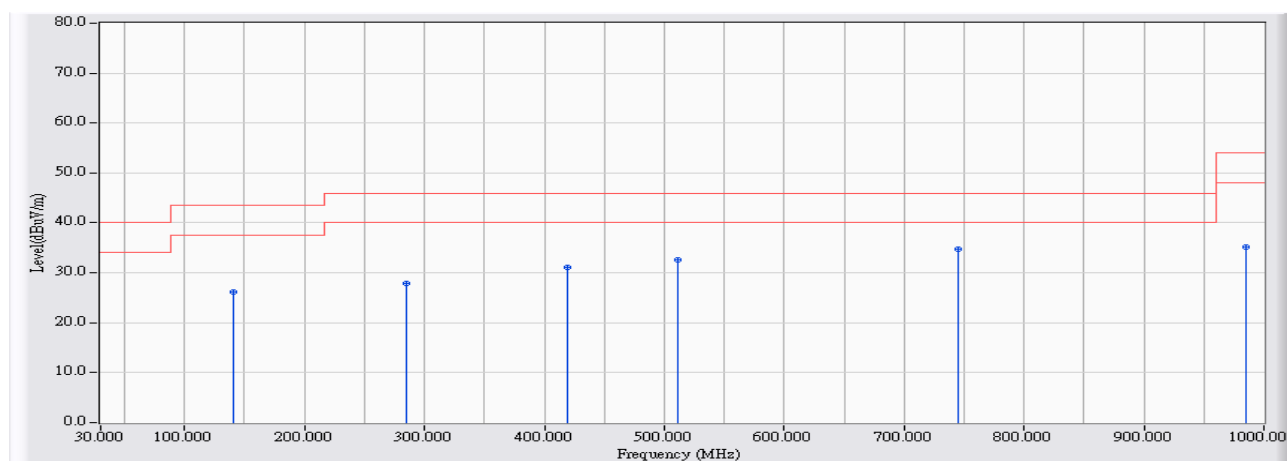
3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

3.6. Test Result

30MHz-1GHz Spurious

Site : CB1	Time : 2014/12/04 - 19:39
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB1_FCC_EFS_30-1G-2_1011 - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2440MHz

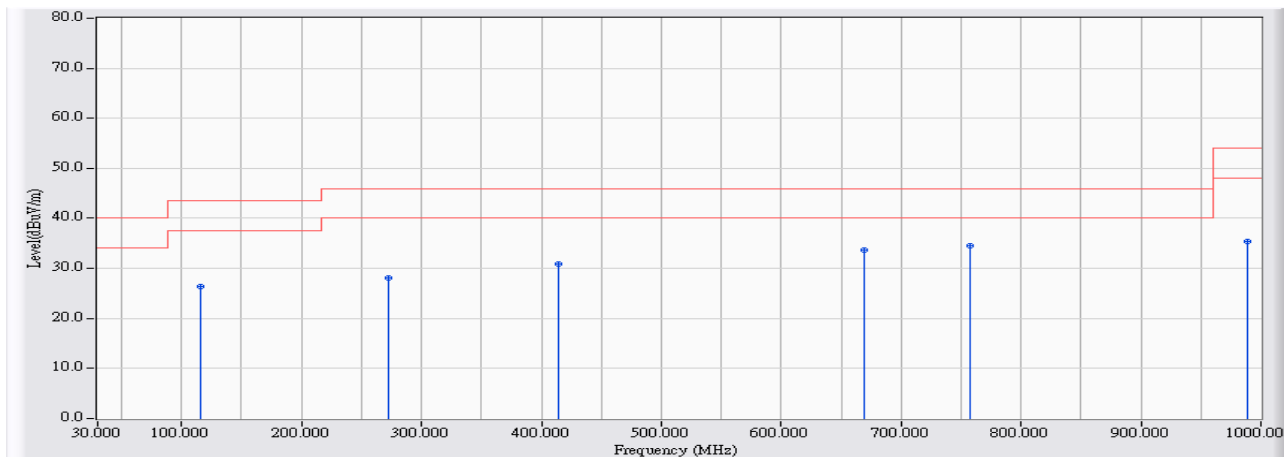


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	141.009	10.082	16.188	26.270	-17.230	43.500	QUASPEAK
2	284.983	12.492	15.458	27.949	-18.051	46.000	QUASPEAK
3	419.260	15.545	15.581	31.126	-14.874	46.000	QUASPEAK
4	510.880	17.216	15.477	32.692	-13.308	46.000	QUASPEAK
5	* 745.502	18.549	16.146	34.694	-11.306	46.000	QUASPEAK
6	984.973	20.166	15.088	35.254	-18.746	54.000	QUASPEAK

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 : 2014/12/04 - 19:44
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB1_FCC_EFS_30-1G-2_1011 - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2440MHz



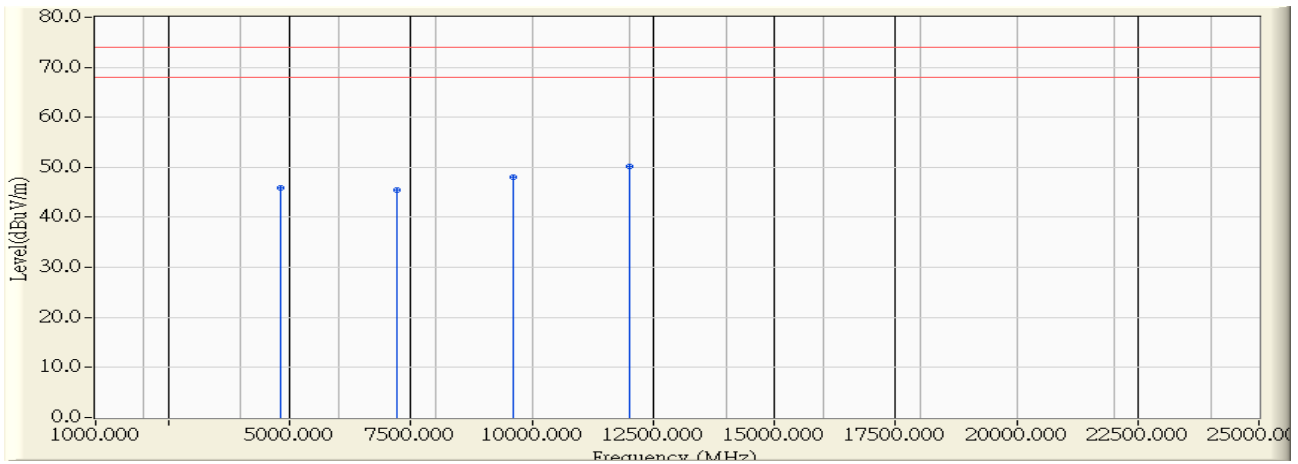
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	115.802	10.613	15.868	26.481	-17.019	43.500	QUASPEAK
2	271.894	12.264	15.729	27.993	-18.007	46.000	QUASPEAK
3	413.928	15.437	15.348	30.785	-15.215	46.000	QUASPEAK
4	668.911	17.834	15.791	33.625	-12.375	46.000	QUASPEAK
5	* 757.136	18.690	15.921	34.611	-11.389	46.000	QUASPEAK
6	988.366	20.194	15.124	35.318	-18.682	54.000	QUASPEAK

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

Harmonic & Spurious:

Site : CB1	Time : 2014/12/14 - 07:19
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2402MHz

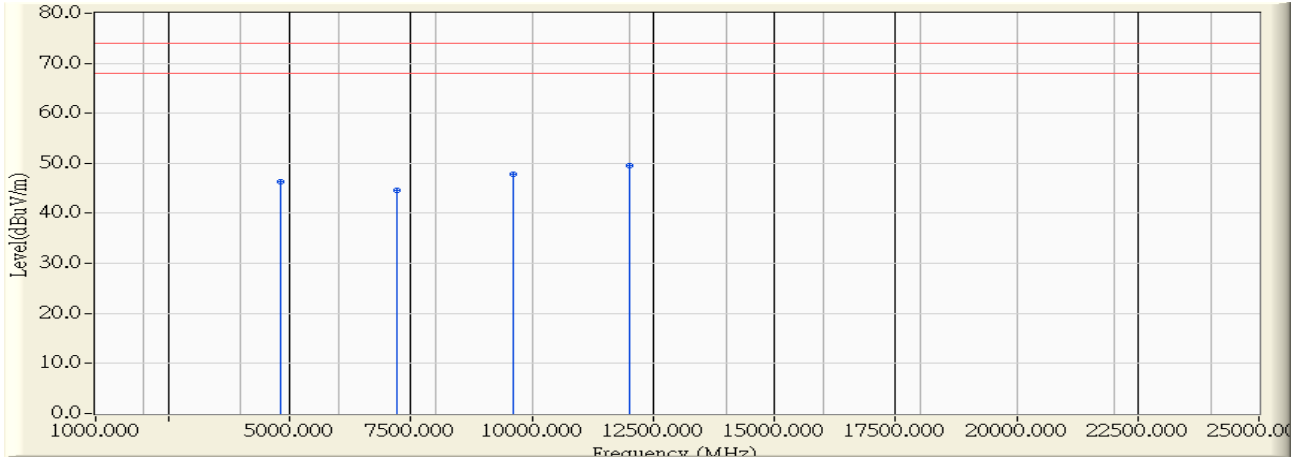


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4804.470	-0.581	46.420	45.839	-28.161	74.000	PEAK
2	7212.310	5.468	40.000	45.468	-28.532	74.000	PEAK
3	9607.390	9.183	38.900	48.083	-25.917	74.000	PEAK
4	* 12005.860	11.125	38.980	50.105	-23.895	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 : 2014/12/14 - 07:28
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2402MHz

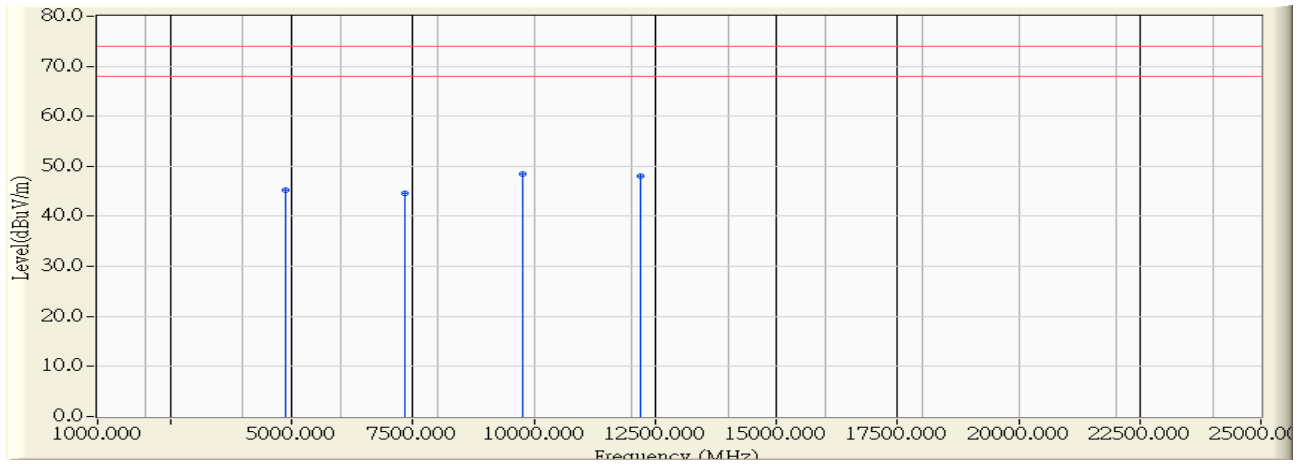


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4804.500	-0.581	46.900	46.319	-27.681	74.000	PEAK
2	7202.930	5.448	39.270	44.717	-29.283	74.000	PEAK
3	9617.560	9.249	38.580	47.829	-26.171	74.000	PEAK
4	* 12015.700	11.120	38.350	49.470	-24.530	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 : 2014/12/14 - 08:04
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2440MHz

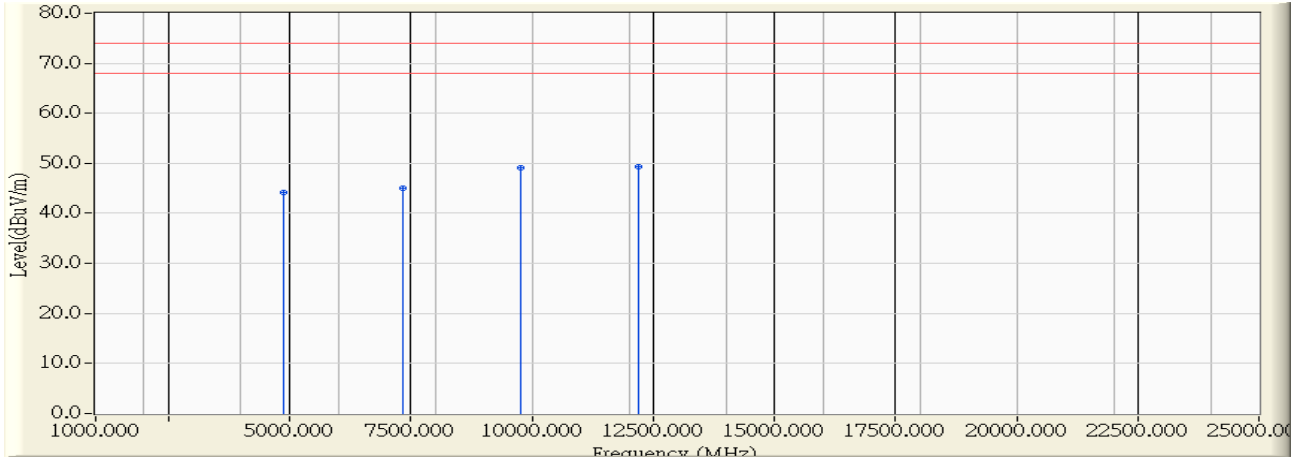


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4880.620	-0.396	45.576	45.180	-28.820	74.000	PEAK
2	7325.750	5.713	38.820	44.533	-29.467	74.000	PEAK
3	* 9765.980	10.210	38.320	48.530	-25.470	74.000	PEAK
4	12195.210	11.038	37.090	48.128	-25.872	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 : 2014/12/14 - 07:42
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2440MHz

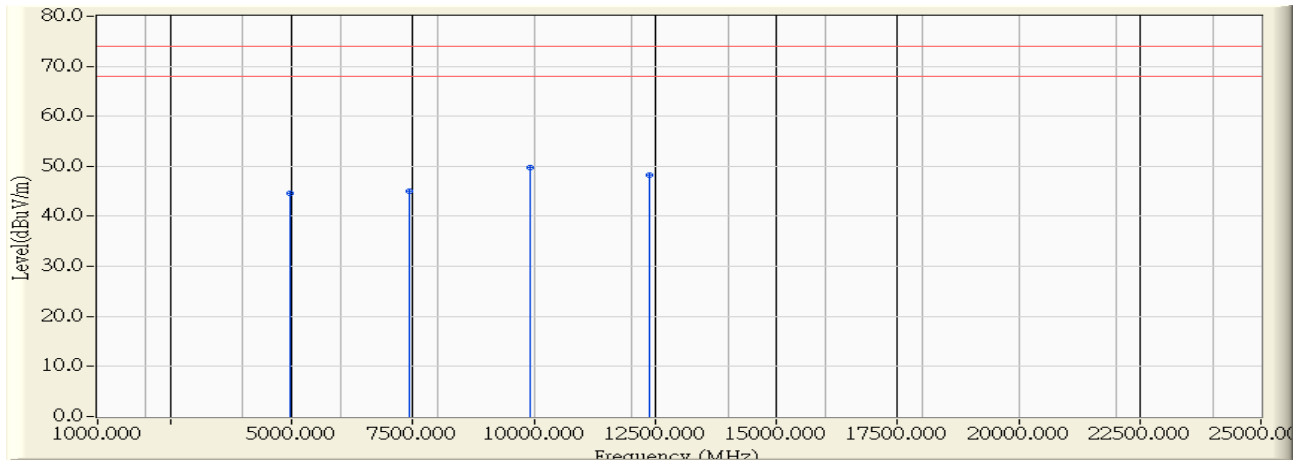


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4880.450	-0.396	44.590	44.194	-29.806	74.000	PEAK
2	7323.360	5.709	39.400	45.108	-28.892	74.000	PEAK
3	9759.280	10.166	38.950	49.116	-24.884	74.000	PEAK
4	* 12192.020	11.040	38.280	49.320	-24.680	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 : 2014/12/14 - 07:49
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2480MHz

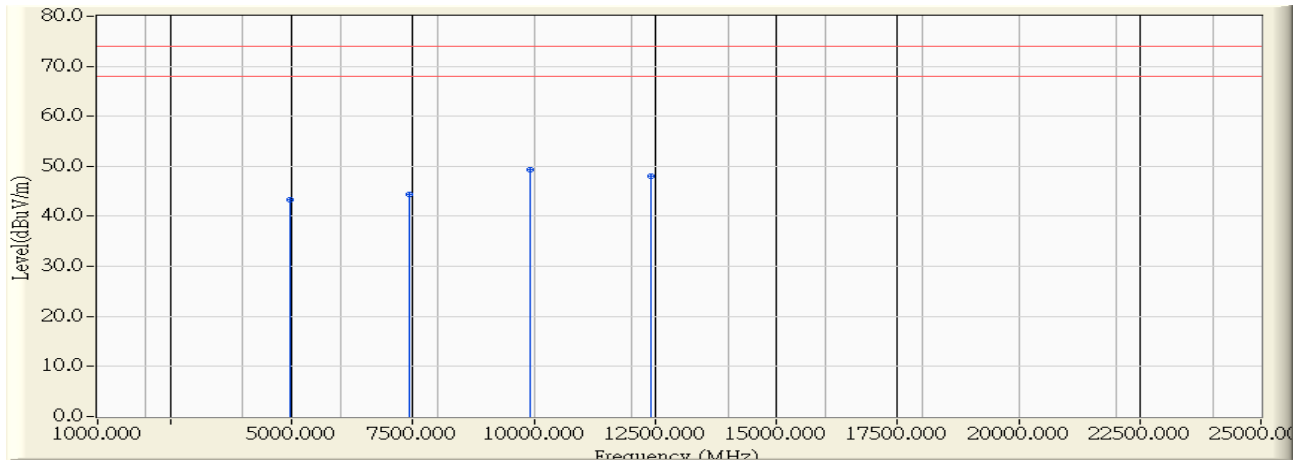


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4960.010	-0.202	44.760	44.558	-29.442	74.000	PEAK
2	7434.140	5.947	39.200	45.147	-28.853	74.000	PEAK
3	* 9918.480	11.197	38.460	49.657	-24.343	74.000	PEAK
4	12398.630	10.945	37.390	48.335	-25.665	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 : 2014/12/14 - 07:52
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2480MHz



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4960.120	-0.202	43.550	43.348	-30.652	74.000	PEAK
2	7444.430	5.970	38.340	44.310	-29.690	74.000	PEAK
3	* 9926.680	11.250	38.010	49.260	-24.740	74.000	PEAK
4	12404.920	10.943	37.140	48.082	-25.918	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.

4. RF antenna conducted test

4.1. Test Equipment

The following test equipment is used during the test:

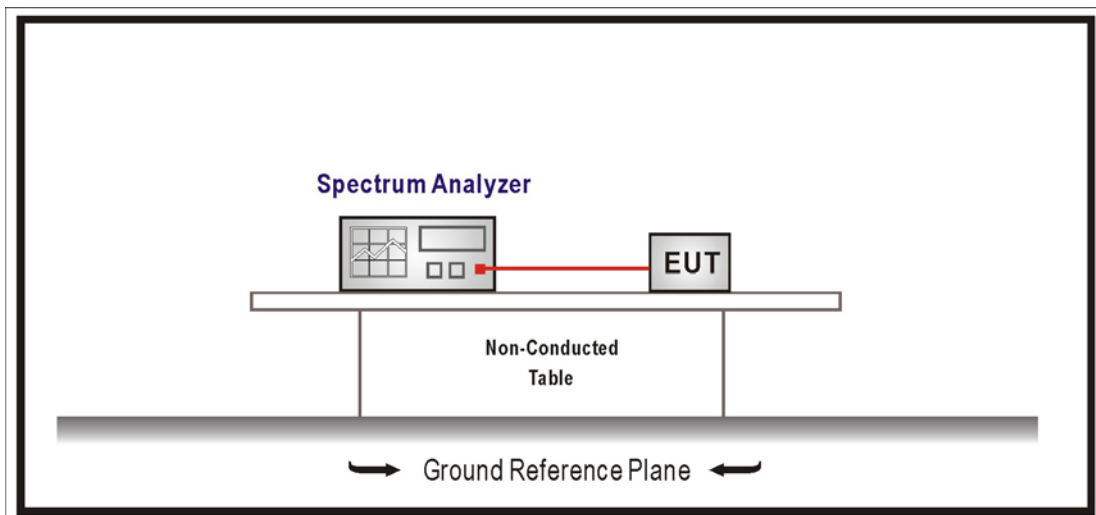
RF antenna conducted test / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2015/07/14

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

4.2. Test Setup

RF Conducted Measurement:



4.3. 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)).

4.4. Test Procedure

The EUT was setup according to ANSI C63.10 and tested according to DTS test procedure of KDB558074 V03R02 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

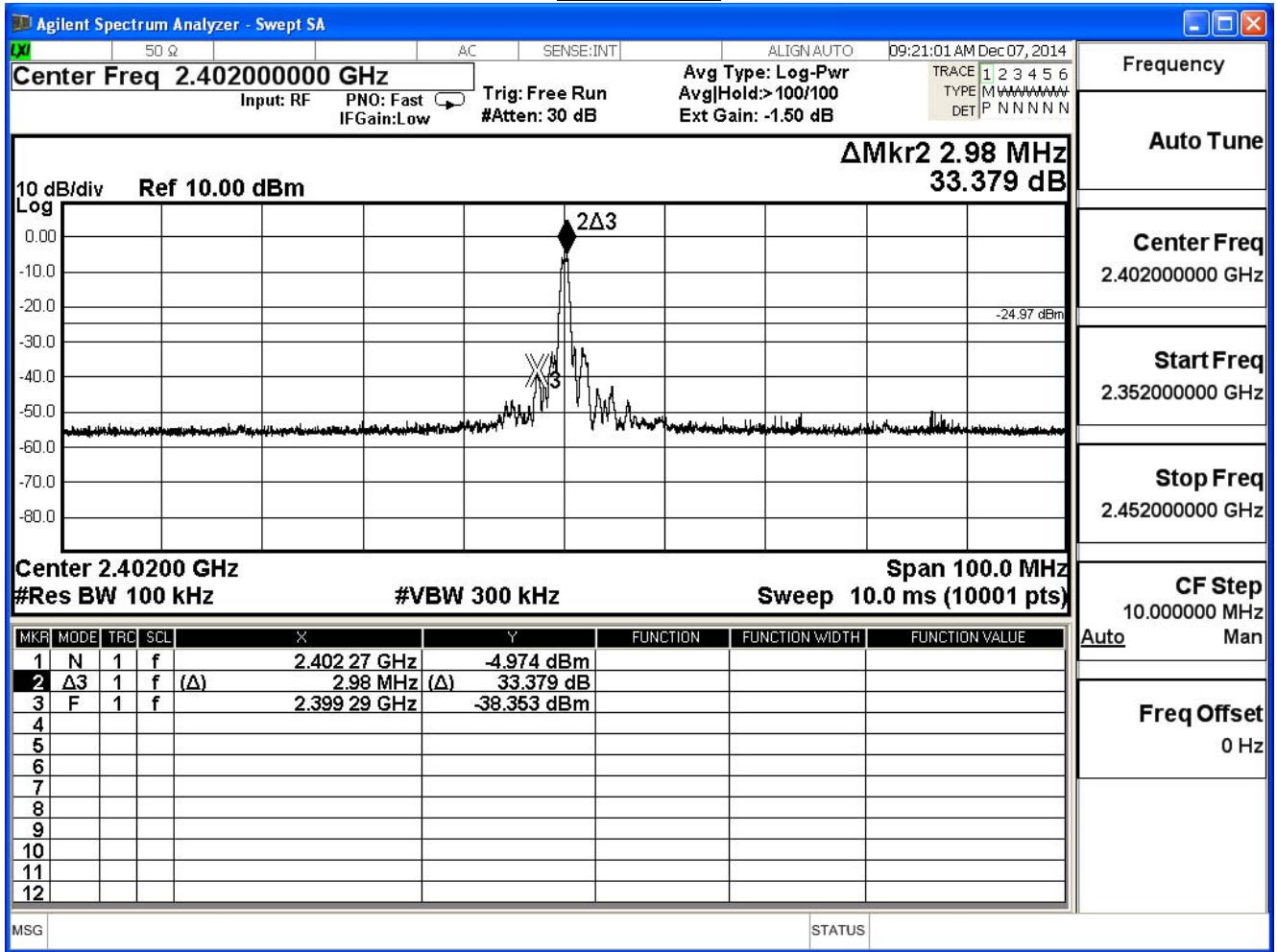
4.6. Test Result

Product	GPS Sport Watch		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2014/12/07	Test Site	SR7

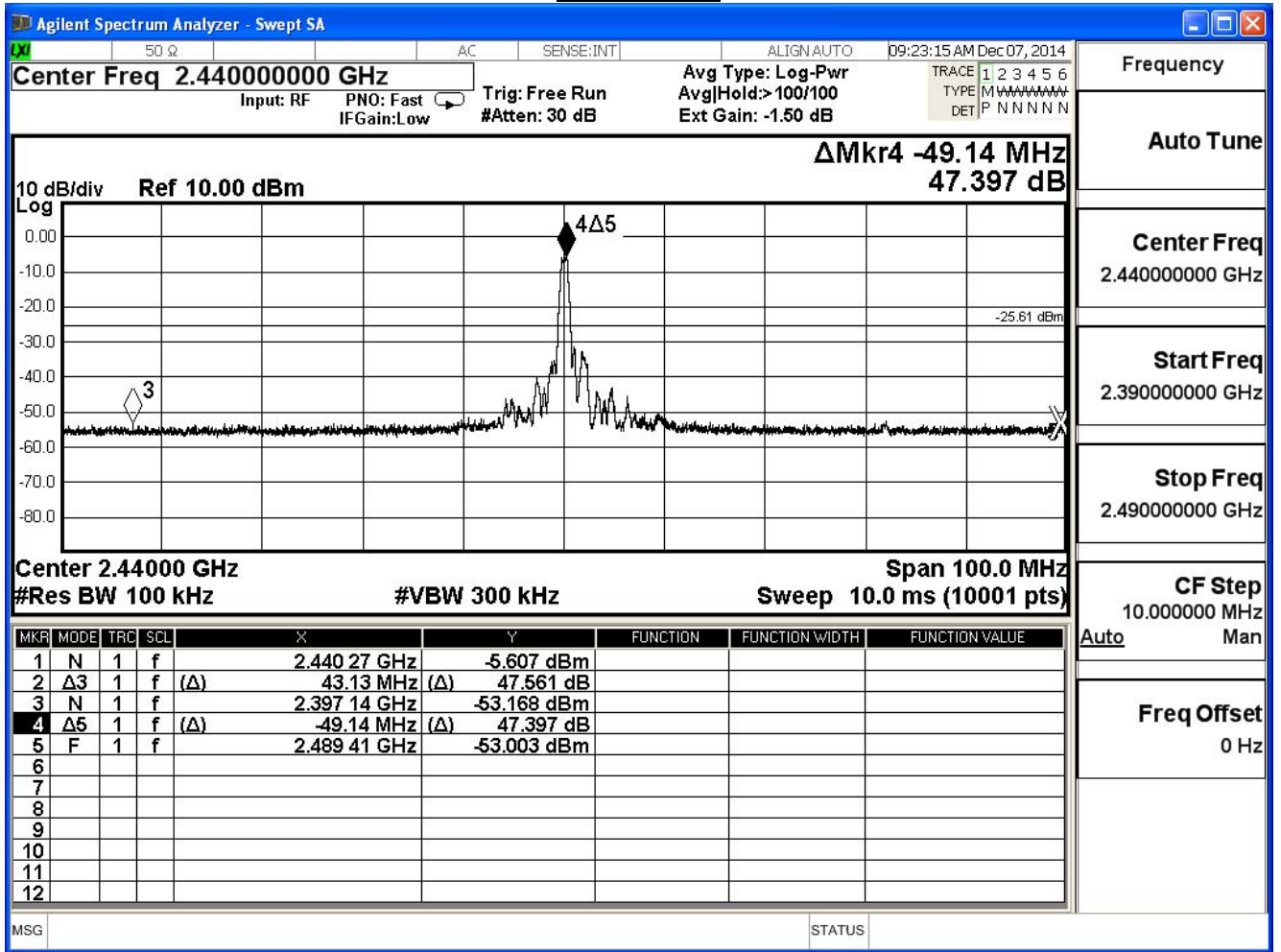
GFSK

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dBc)	Result
00	2402	33.379	≥ 20	Pass
19	2440	47.397	≥ 20	Pass
39	2480	43.602	≥ 20	Pass

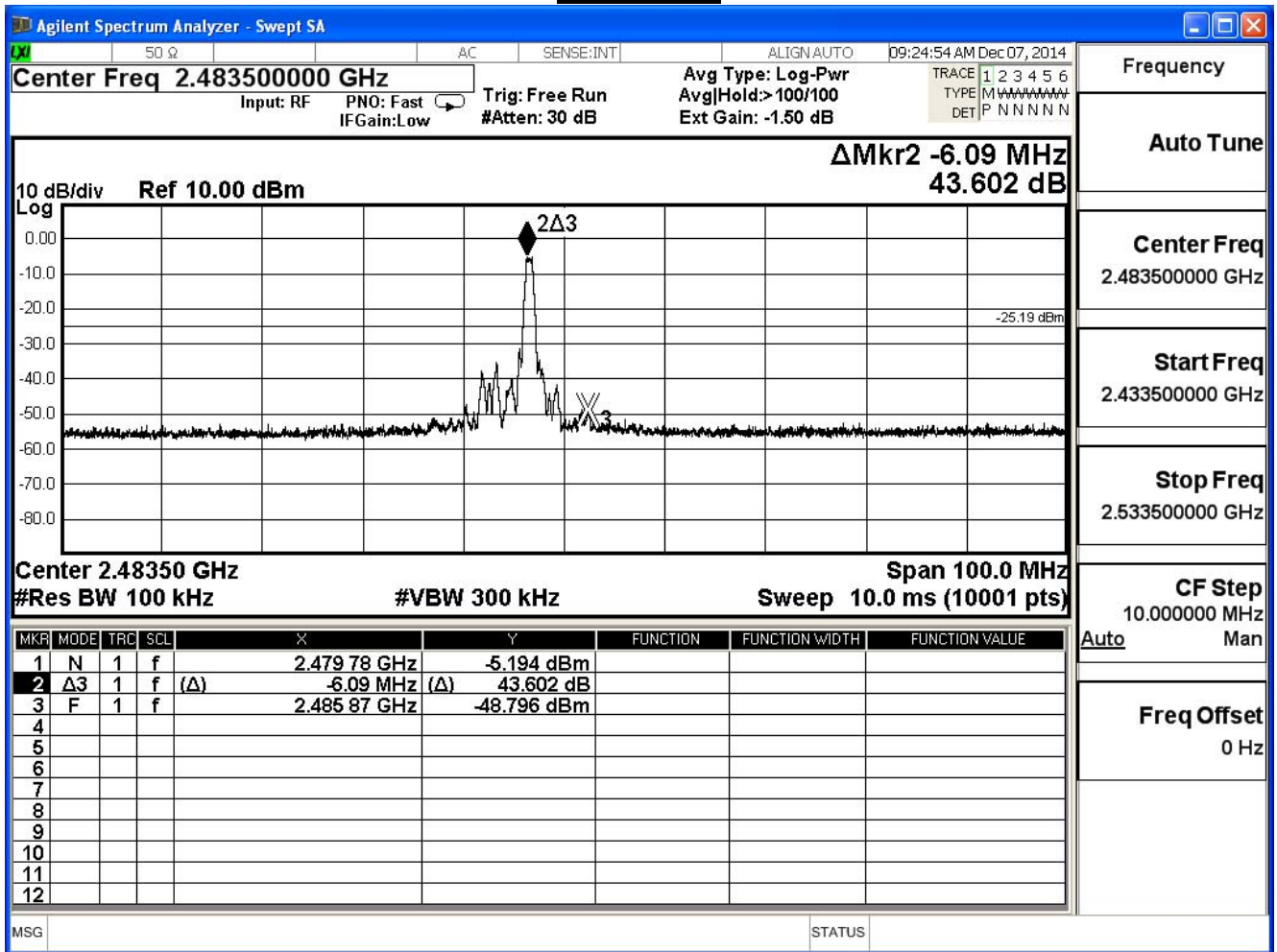
Channel 00



Channel 19

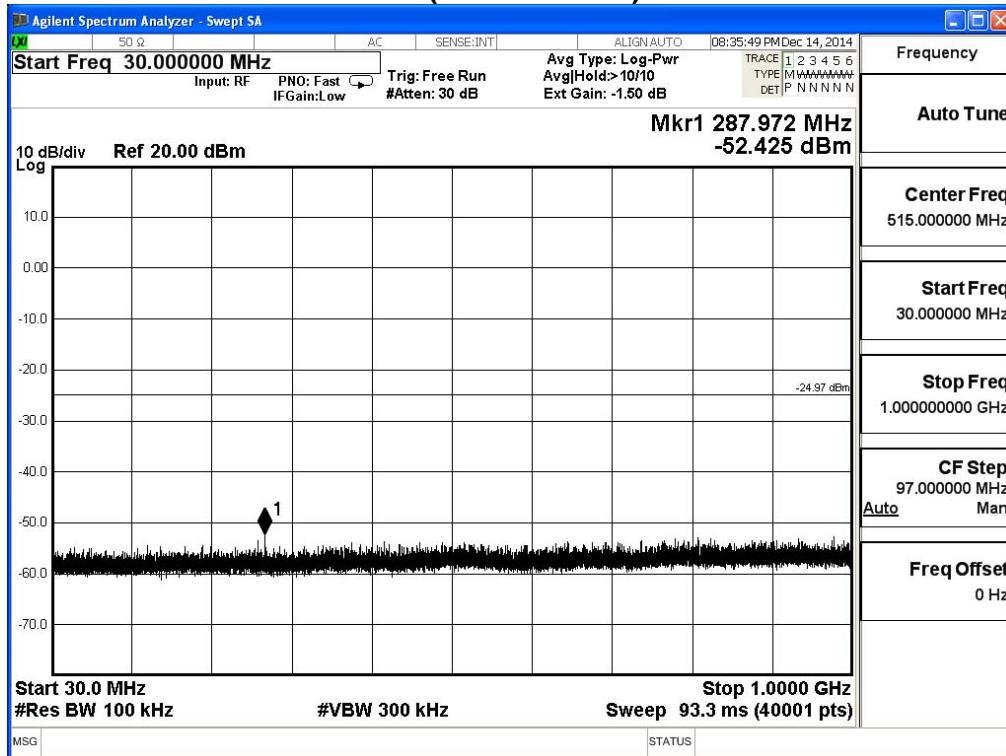


Channel 39

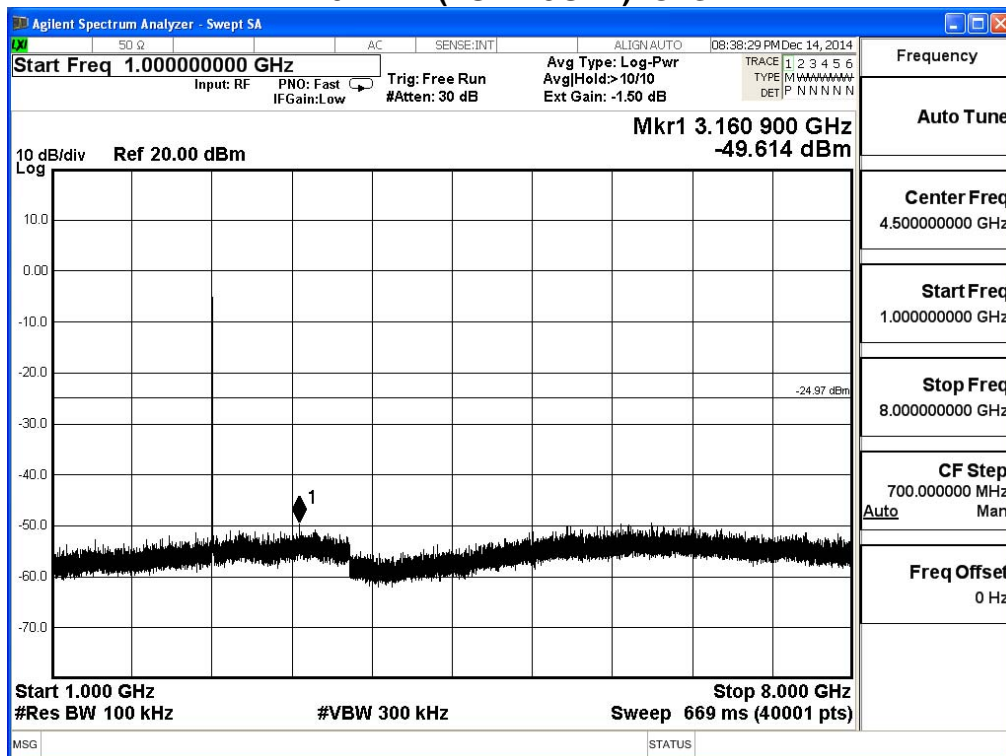


Product	GPS Sport Watch		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2014/12/07	Test Site	SR7

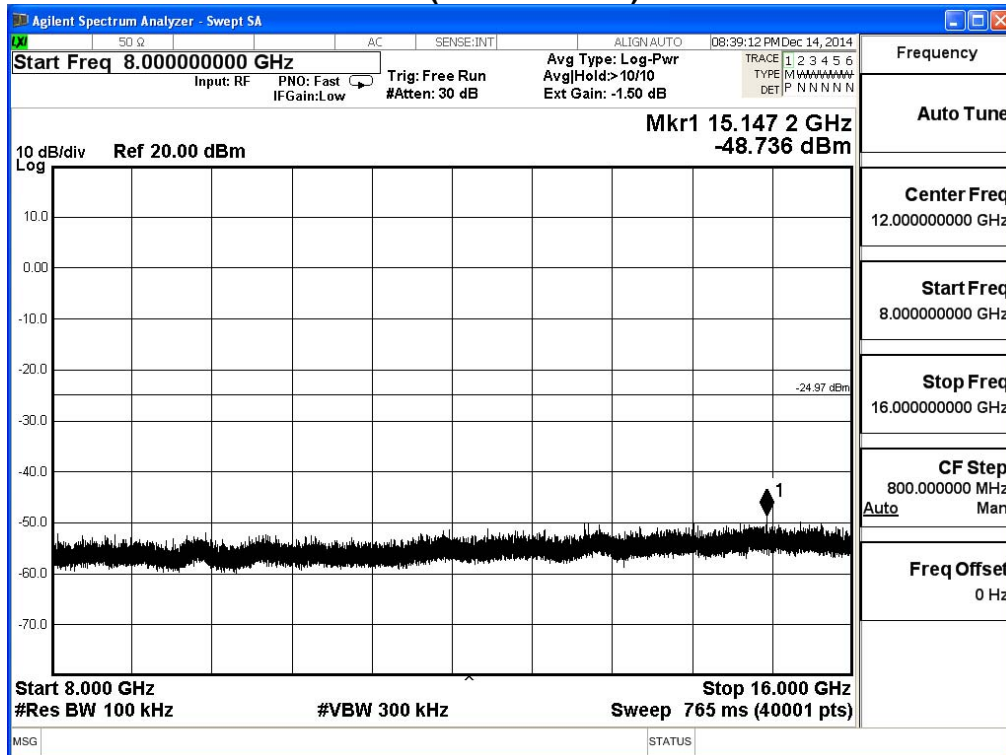
2402MHz (30MHz-1GHz)- GFSK



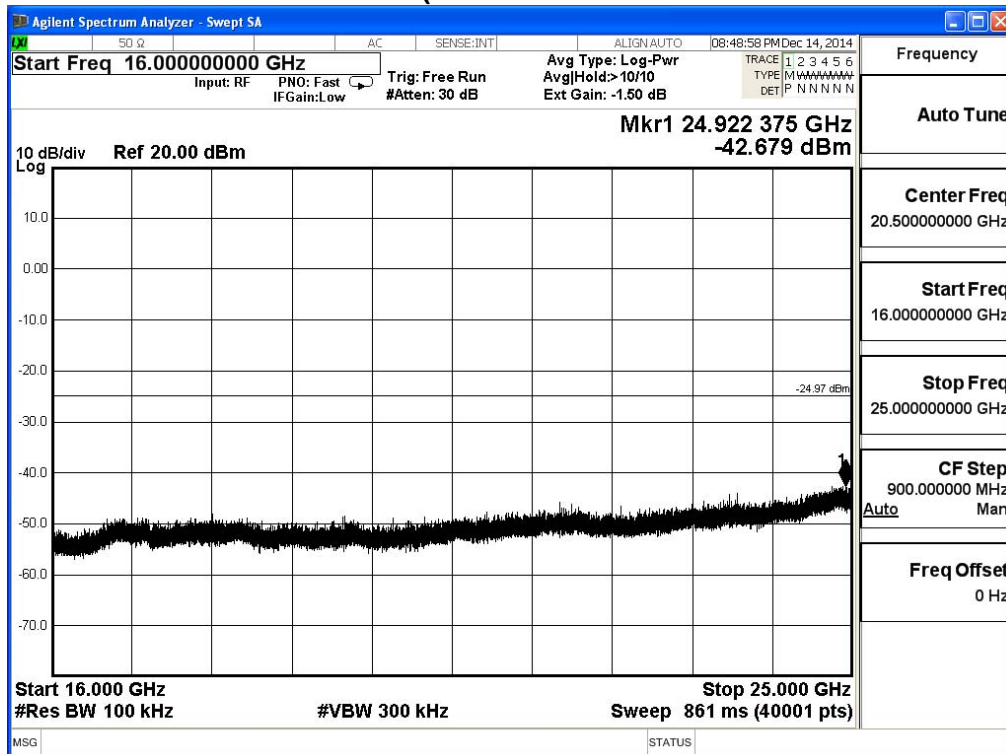
2402MHz (1GHz-8GHz)- GFSK



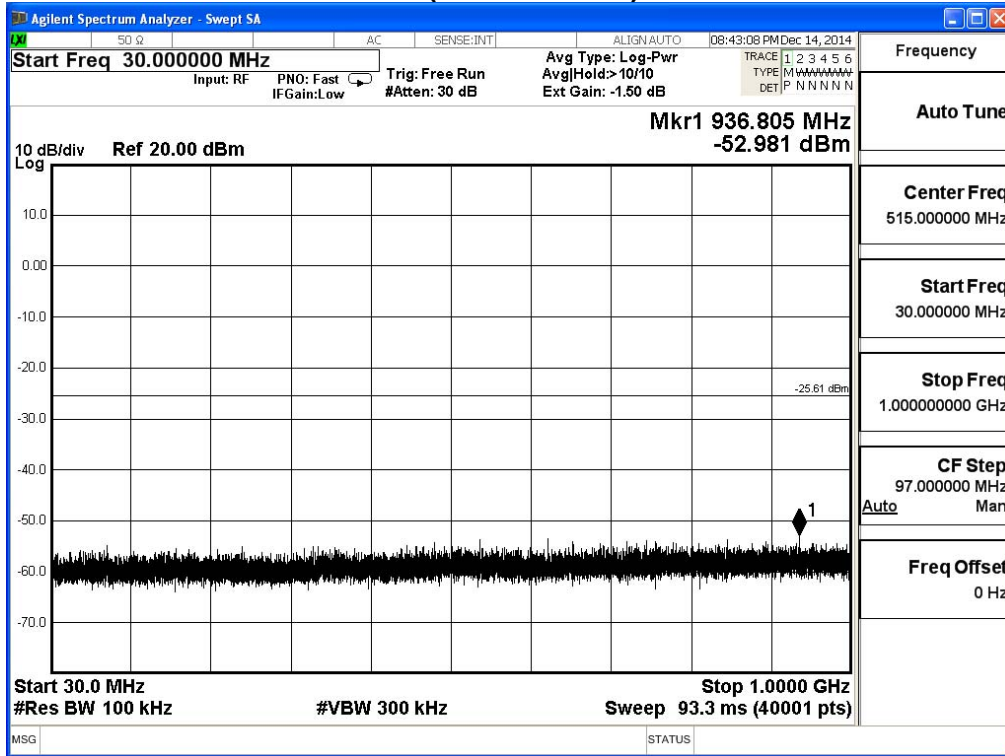
2402MHz (8GHz-16GHz)- GFSK



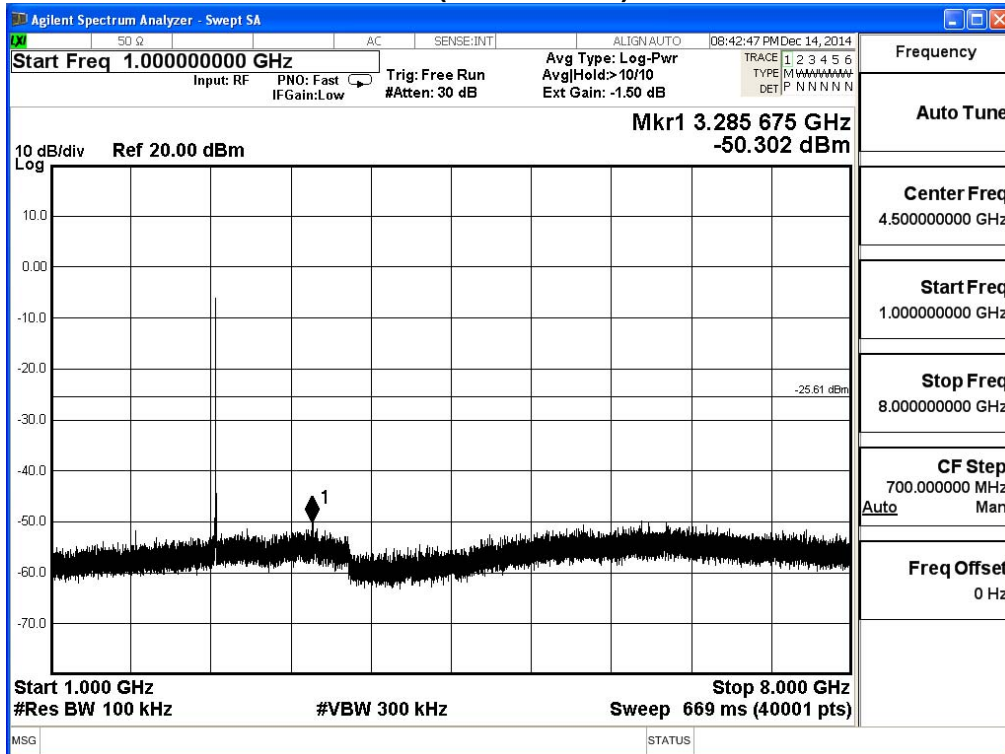
2402MHz (16GHz-25GHz) - GFSK



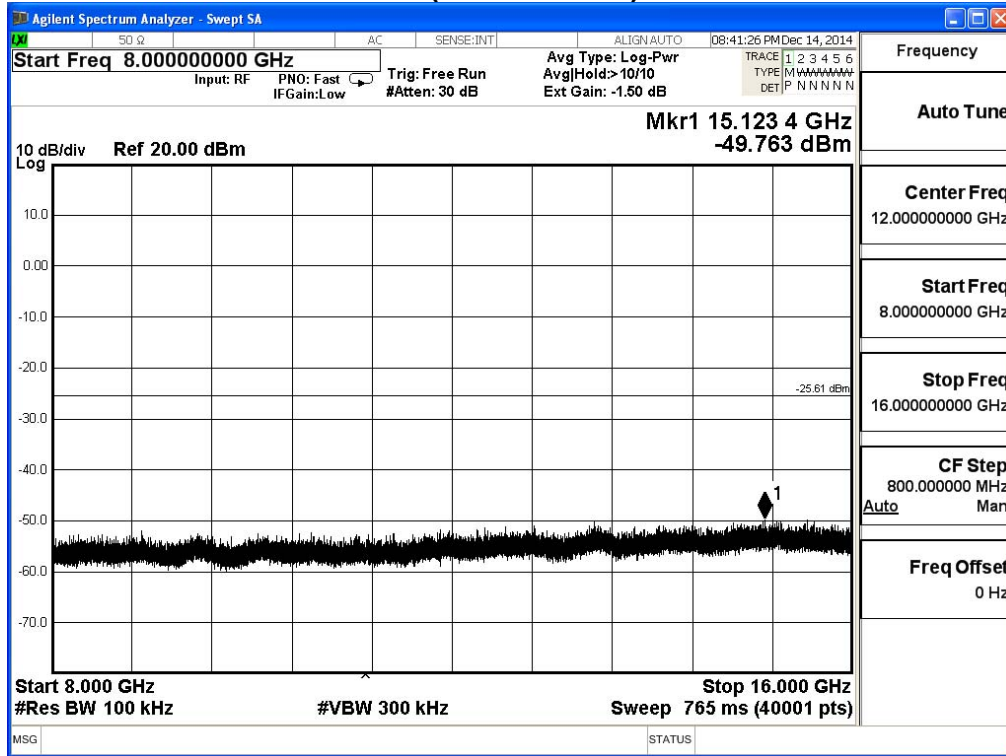
2440MHz (30MHz-1GHz)- GFSK



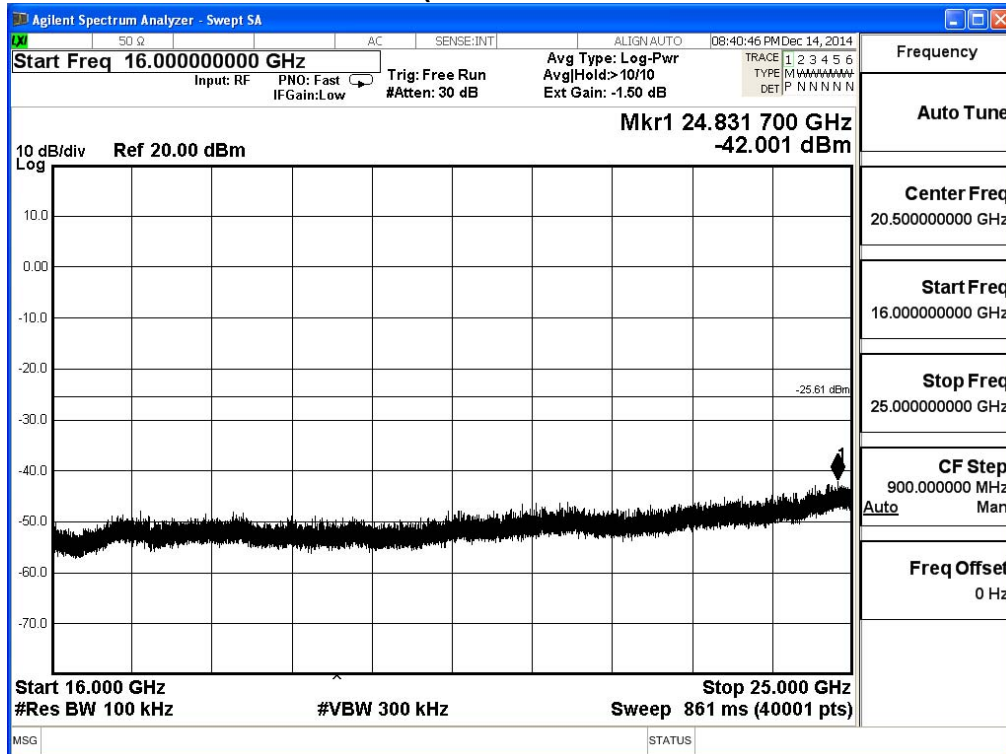
2440MHz (1GHz-8GHz)- GFSK



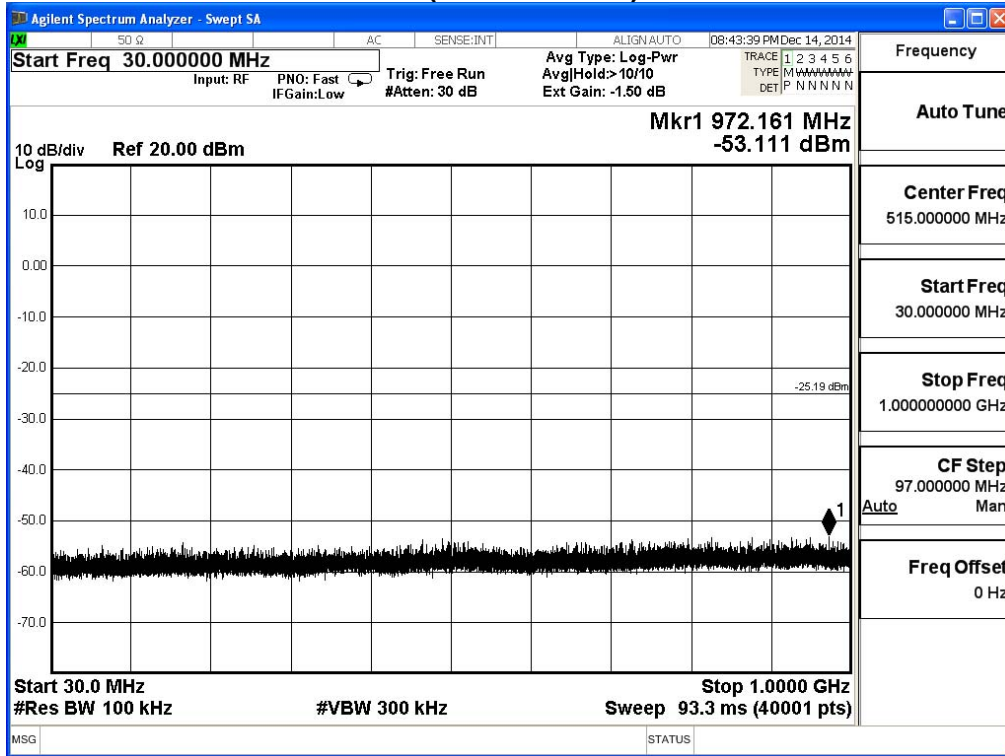
2440MHz (8GHz-16GHz)- GFSK



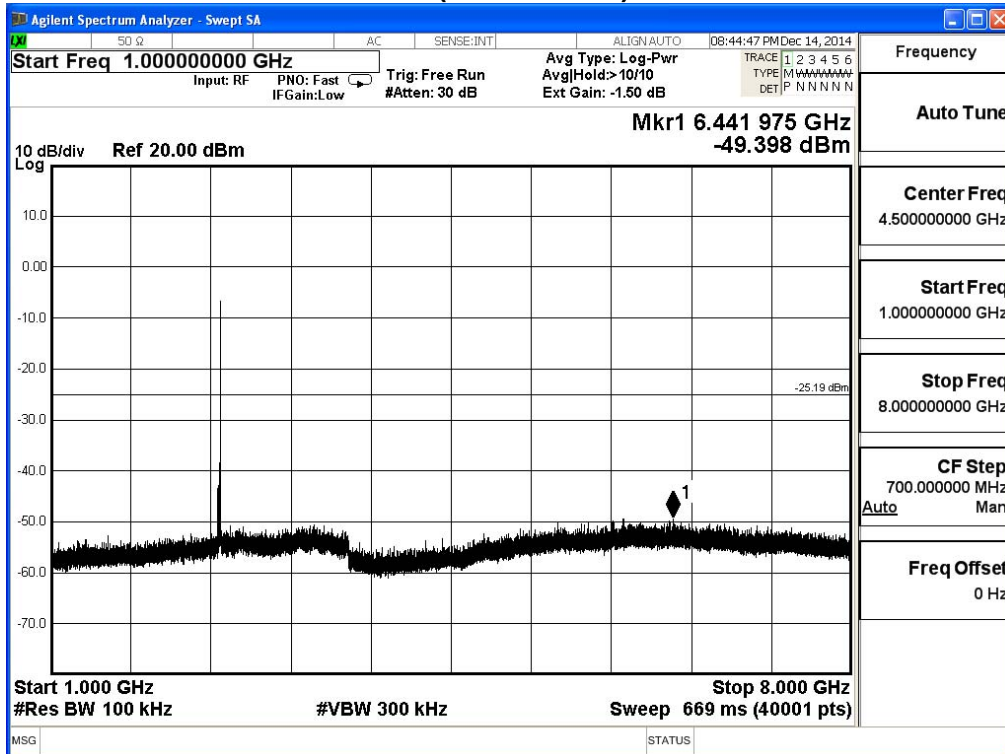
2440MHz (16GHz-25GHz) - GFSK



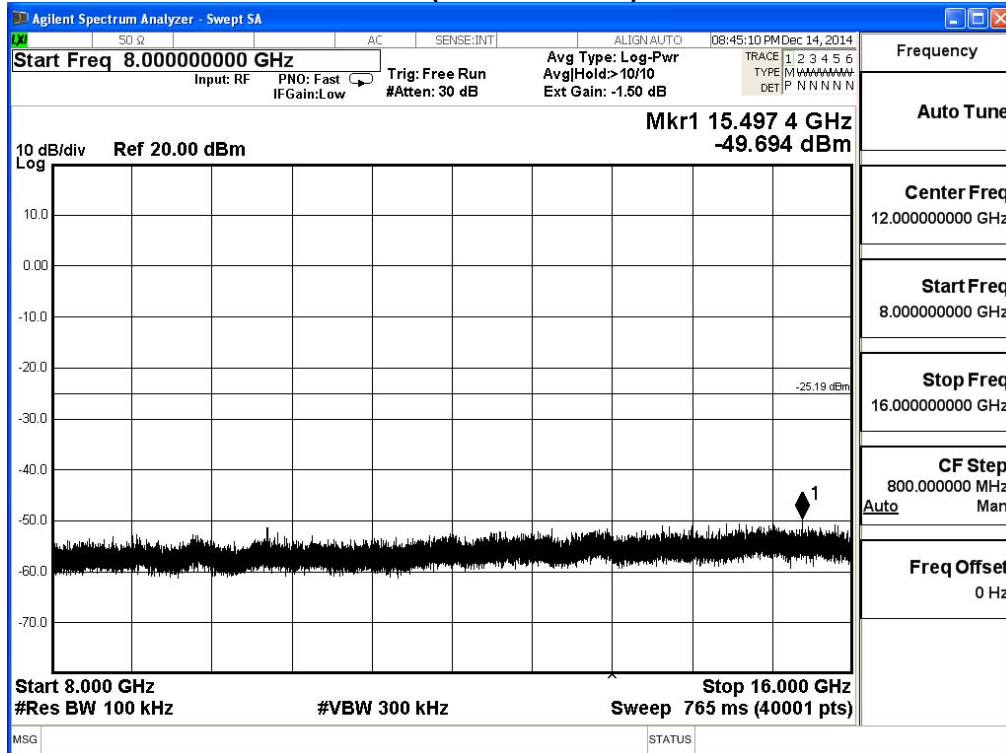
2480MHz (30MHz-1GHz)- GFSK



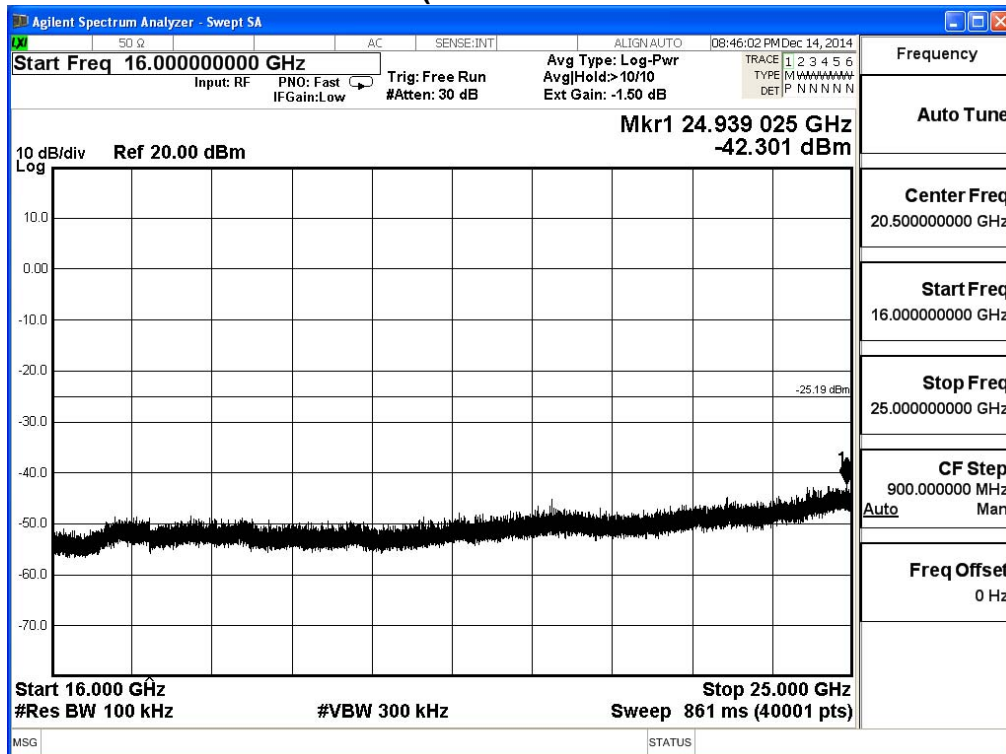
2480MHz (1GHz-8GHz)- GFSK



2480MHz (8GHz-16GHz)- GFSK



2480MHz (16GHz-25GHz) - GFSK



5. Band Edge

5.1. Test Equipment

The following test equipments are used during the test:

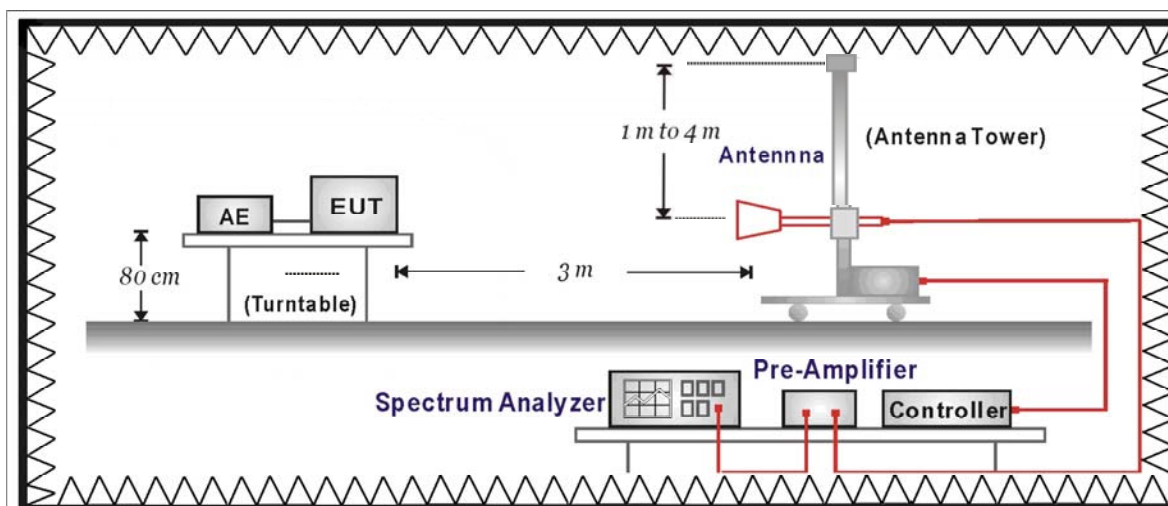
Band Edge / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Double Ridged Guide Horn Antenna	Schwarzback	BBHA 9120	D743	2015/02/12
Spectrum Analyzer	Agilent	E4440A	MY46187335	2015/01/12
k Type Cable	Huber Suhner	Sucoflex 102	25623/2	2015/02/10

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

5.2. Test Setup

RF Radiated Measurement:



5.3. 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.

5.4. Test Procedure

The EUT was setup according to ANSI C63.10 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 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.

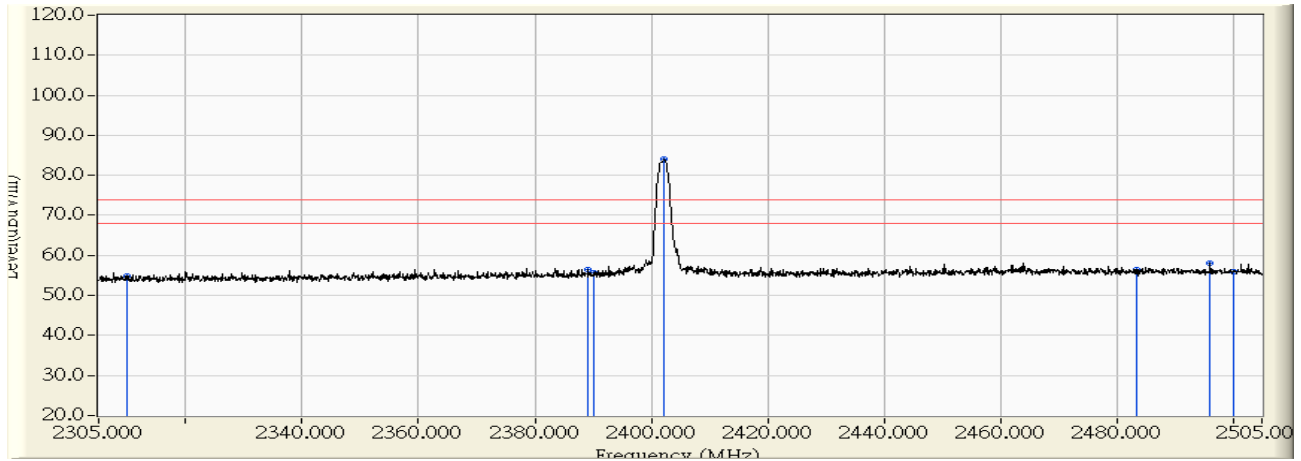
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10 on radiated measurement.

5.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

5.6. Test Result

Site : CB1	Time : 2014/12/14 - 10:04
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2402MHz

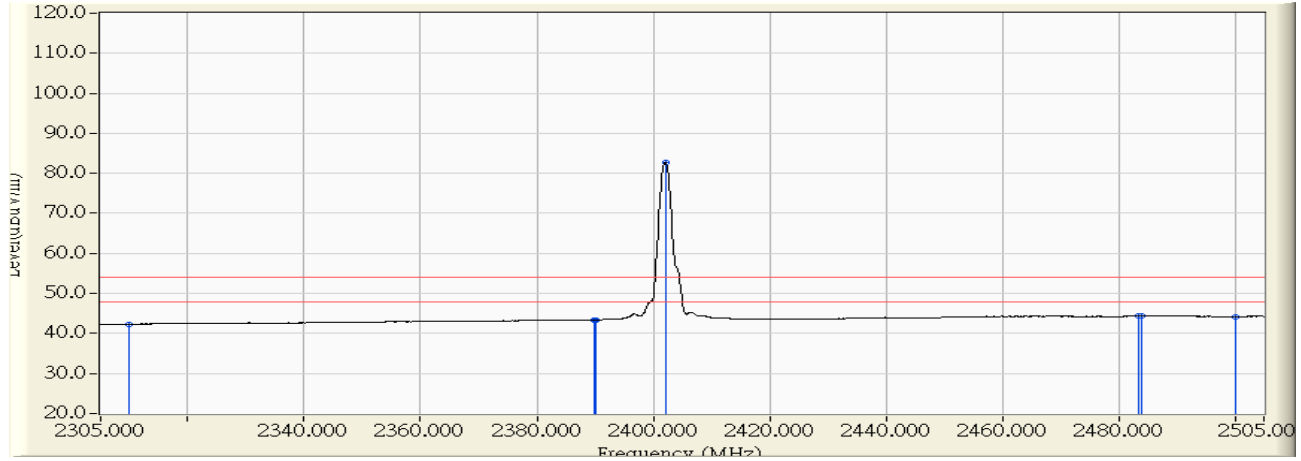


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	30.411	24.468	54.879	-19.121	74.000	PEAK
2	2389.200	31.232	25.254	56.487	-17.513	74.000	PEAK
3	2390.000	31.241	24.480	55.721	-18.279	74.000	PEAK
4	* 2402.300	31.369	52.651	84.019	10.019	74.000	PEAK
5	2483.500	31.980	24.486	56.465	-17.535	74.000	PEAK
6	2496.100	31.946	26.086	58.031	-15.969	74.000	PEAK
7	2500.000	31.934	23.901	55.836	-18.164	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 : 2014/12/14 - 10:05
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2402MHz

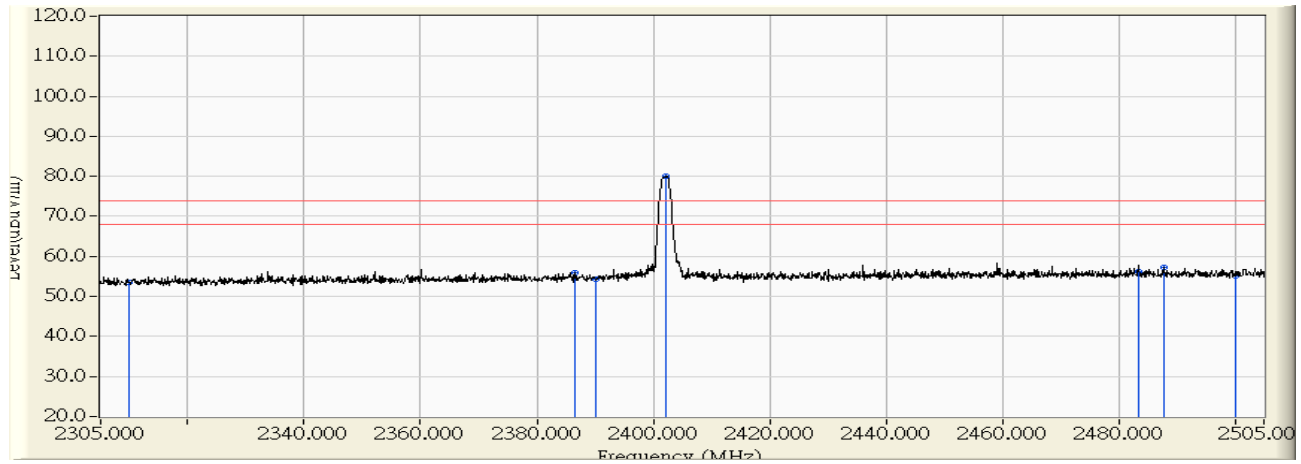


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	30.411	11.945	42.356	-11.644	54.000	AVERAGE
2	2389.800	31.239	12.201	43.440	-10.560	54.000	AVERAGE
3	2390.000	31.241	12.181	43.422	-10.578	54.000	AVERAGE
4	* 2402.100	31.366	51.437	82.803	28.803	54.000	AVERAGE
5	2483.500	31.980	12.325	44.304	-9.696	54.000	AVERAGE
6	2483.900	31.978	12.316	44.294	-9.706	54.000	AVERAGE
7	2500.000	31.934	12.268	44.203	-9.797	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 : 2014/12/14 - 10:11
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2402MHz

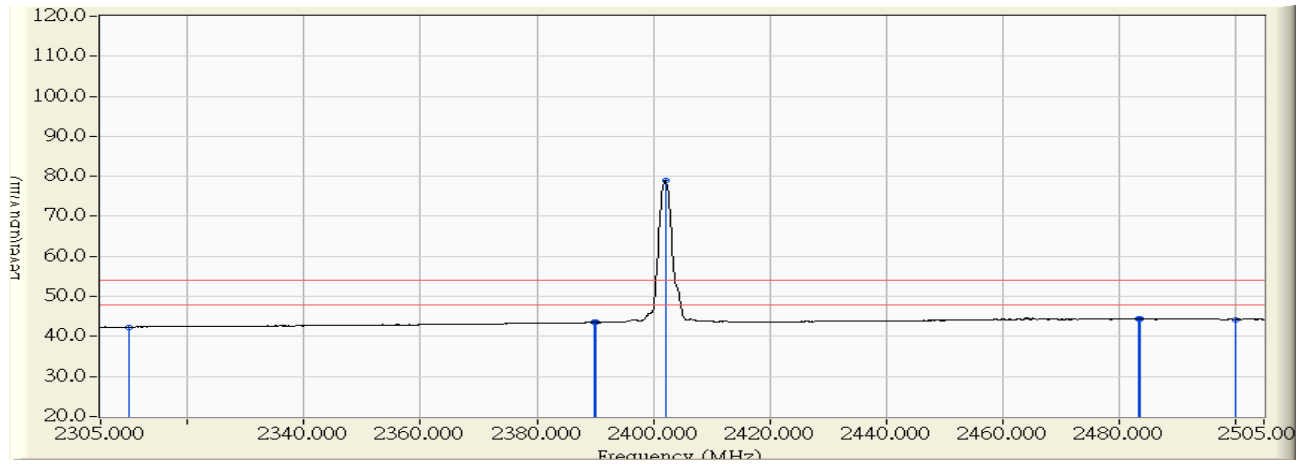


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	30.411	23.167	53.578	-20.422	74.000	PEAK
2	2386.600	31.206	24.695	55.901	-18.099	74.000	PEAK
3	2390.000	31.241	23.028	54.269	-19.731	74.000	PEAK
4	* 2402.300	31.369	48.736	80.104	6.104	74.000	PEAK
5	2483.500	31.980	24.089	56.068	-17.932	74.000	PEAK
6	2487.900	31.968	25.272	57.240	-16.760	74.000	PEAK
7	2500.000	31.934	23.123	55.058	-18.942	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 : 2014/12/14 - 10:12
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2402MHz

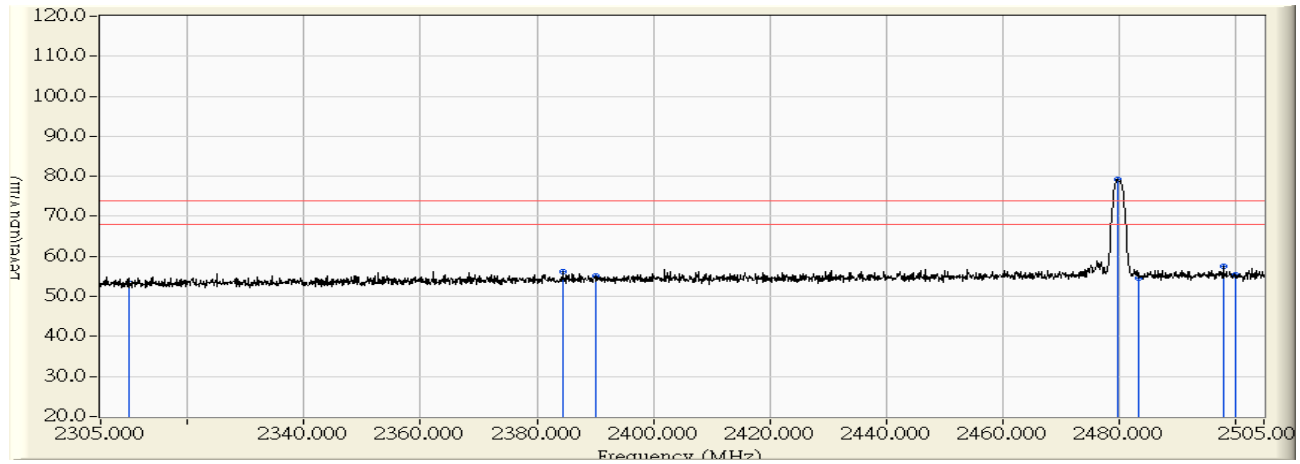


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	30.411	11.927	42.338	-11.662	54.000	AVERAGE
2	2389.800	31.239	12.239	43.478	-10.522	54.000	AVERAGE
3	2390.000	31.241	12.227	43.468	-10.532	54.000	AVERAGE
4	* 2402.100	31.366	47.607	78.973	24.973	54.000	AVERAGE
5	2483.500	31.980	12.327	44.306	-9.694	54.000	AVERAGE
6	2483.600	31.979	12.330	44.309	-9.691	54.000	AVERAGE
7	2500.000	31.934	12.311	44.246	-9.754	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 : 2014/12/14 - 10:17
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2480MHz

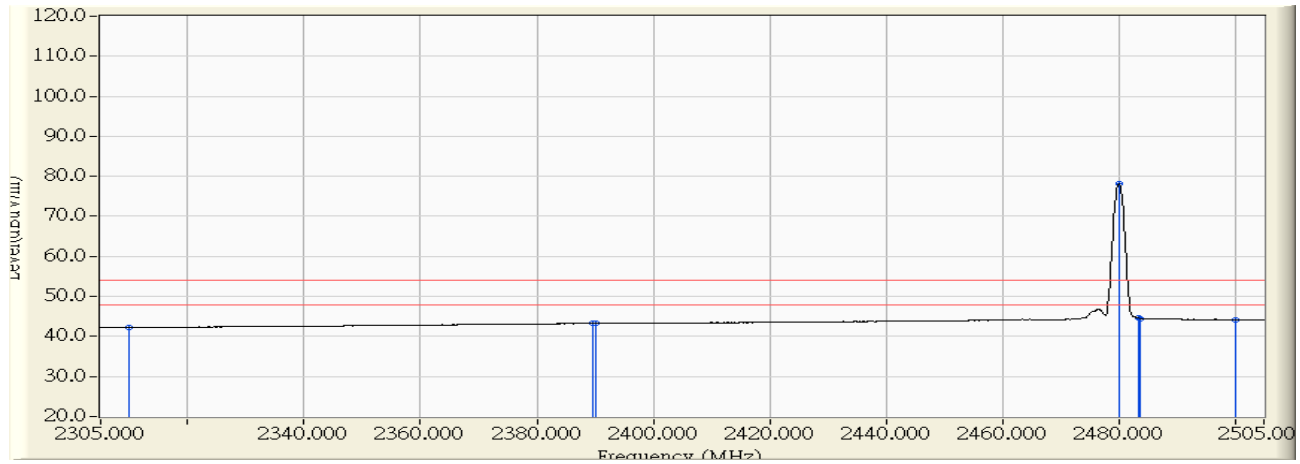


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	30.411	22.935	53.346	-20.654	74.000	PEAK
2	2384.500	31.184	25.045	56.229	-17.771	74.000	PEAK
3	2390.000	31.241	23.755	54.996	-19.004	74.000	PEAK
4	* 2479.800	31.989	47.176	79.166	5.166	74.000	PEAK
5	2483.500	31.980	22.703	54.682	-19.318	74.000	PEAK
6	2498.000	31.940	25.549	57.489	-16.511	74.000	PEAK
7	2500.000	31.934	23.504	55.439	-18.561	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 : 2014/12/14 - 10:18
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2480MHz

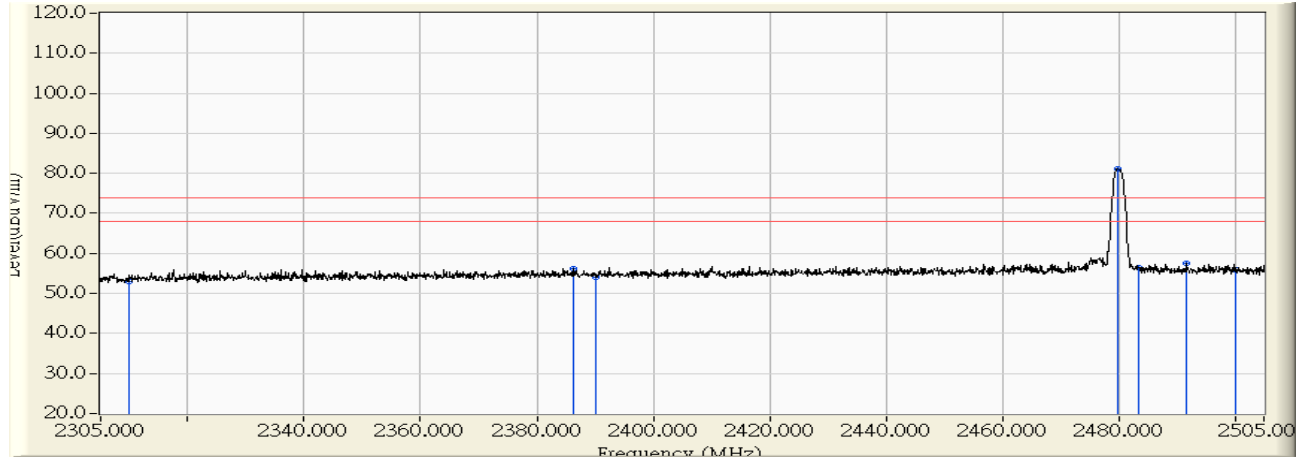


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	30.411	11.803	42.214	-11.786	54.000	AVERAGE
2	2389.500	31.236	12.061	43.297	-10.703	54.000	AVERAGE
3	2390.000	31.241	12.061	43.302	-10.698	54.000	AVERAGE
4	* 2480.100	31.989	46.054	78.043	24.043	54.000	AVERAGE
5	2483.500	31.980	12.567	44.546	-9.454	54.000	AVERAGE
6	2483.600	31.979	12.505	44.484	-9.516	54.000	AVERAGE
7	2500.000	31.934	12.263	44.198	-9.802	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 : 2014/12/14 - 10:25
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2480MHz

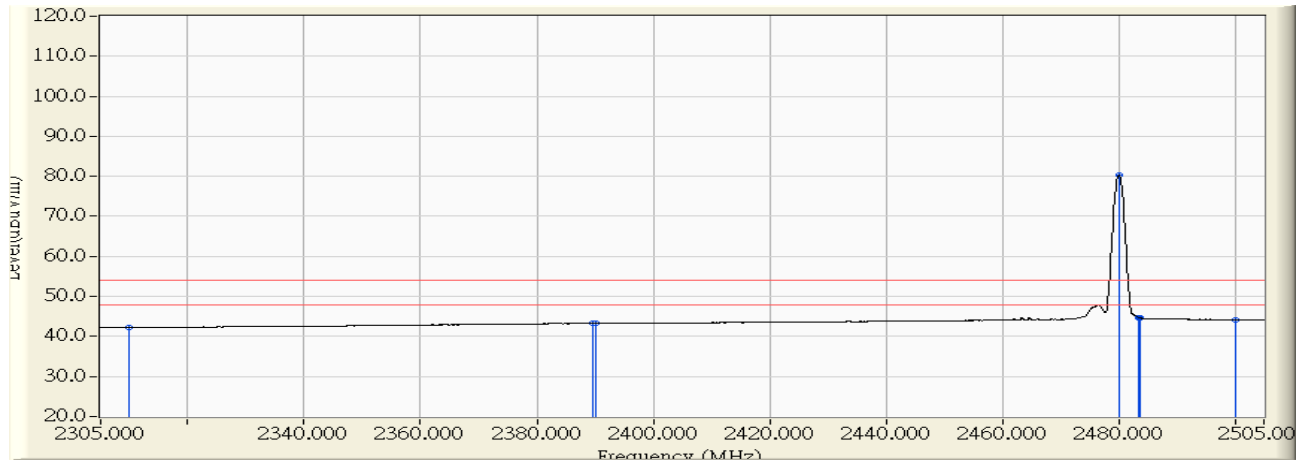


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	30.411	22.661	53.072	-20.928	74.000	PEAK
2	2386.200	31.202	24.922	56.124	-17.876	74.000	PEAK
3	2390.000	31.241	22.926	54.167	-19.833	74.000	PEAK
4	* 2479.800	31.989	49.249	81.239	7.239	74.000	PEAK
5	2483.500	31.980	24.615	56.594	-17.406	74.000	PEAK
6	2491.700	31.958	25.554	57.511	-16.489	74.000	PEAK
7	2500.000	31.934	24.068	56.003	-17.997	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 : 2014/12/14 - 10:26
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : GPS Sport Watch	Note : 2480MHz



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	30.411	11.857	42.268	-11.732	54.000	AVERAGE
2	2389.500	31.236	12.049	43.285	-10.715	54.000	AVERAGE
3	2390.000	31.241	12.029	43.270	-10.730	54.000	AVERAGE
4	* 2480.100	31.989	48.251	80.240	26.240	54.000	AVERAGE
5	2483.500	31.980	12.726	44.705	-9.295	54.000	AVERAGE
6	2483.600	31.979	12.676	44.655	-9.345	54.000	AVERAGE
7	2500.000	31.934	12.268	44.203	-9.797	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.

6. Occupied Bandwidth

6.1. Test Equipment

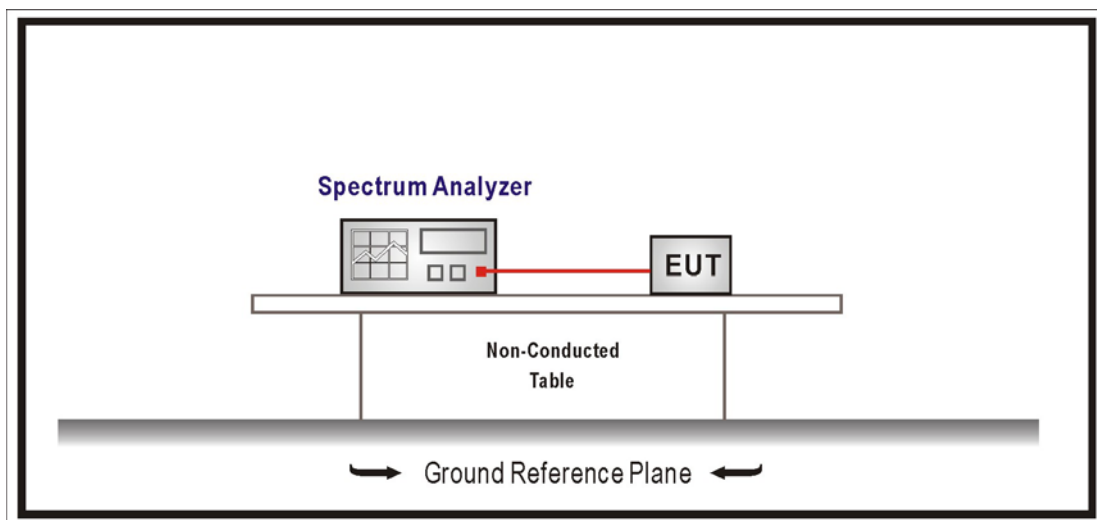
The following test equipment is used during the test:

Occupied Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2015/07/14

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

6.2. Test Setup



6.3. Limits

The 6 dB bandwidth must be greater than 500 kHz.

6.4. 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% of EBW, Span greater than RBW.

6.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

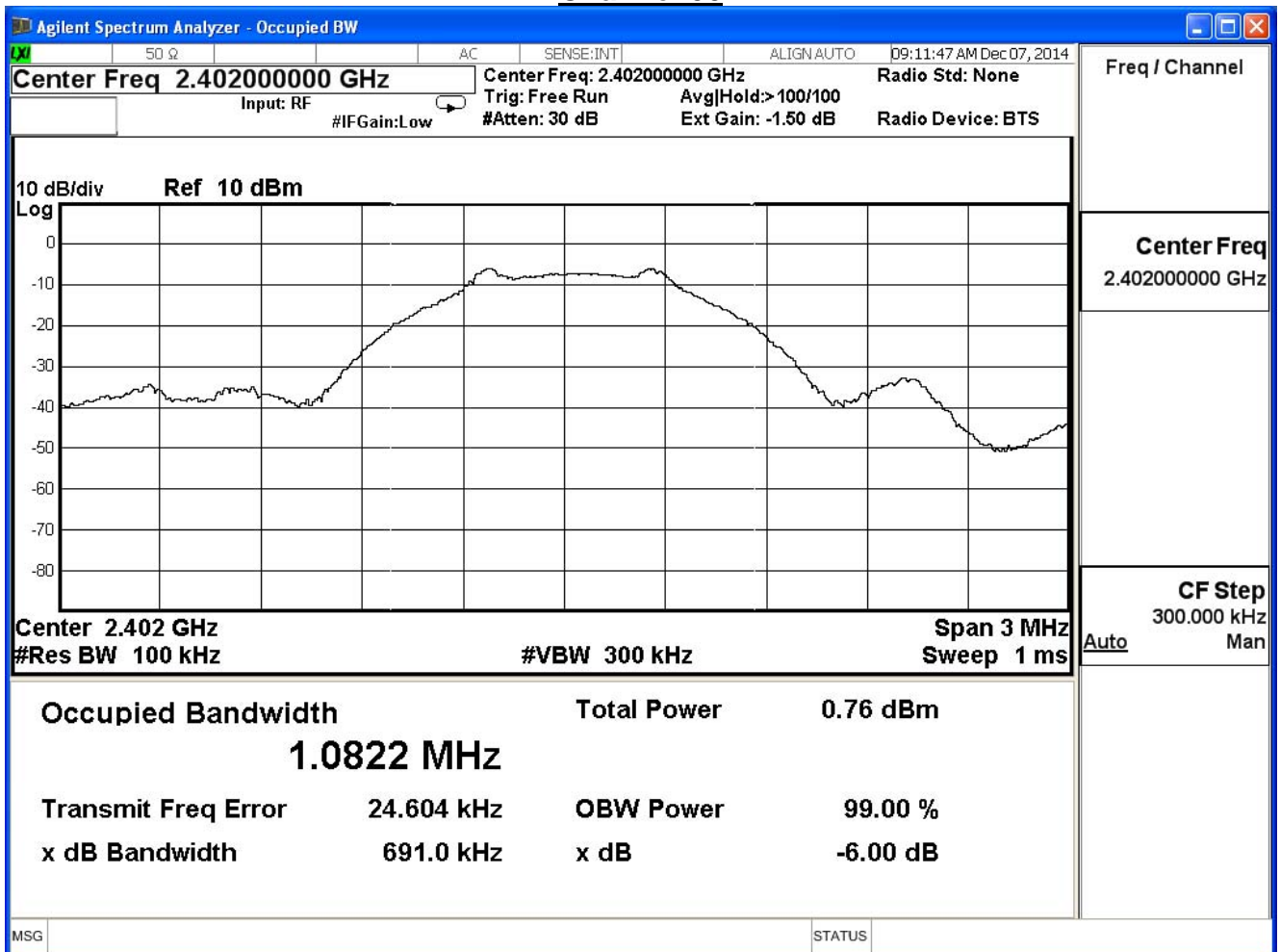
6.6. Test Result

Product	GPS Sport Watch		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2014/12/07	Test Site	SR7

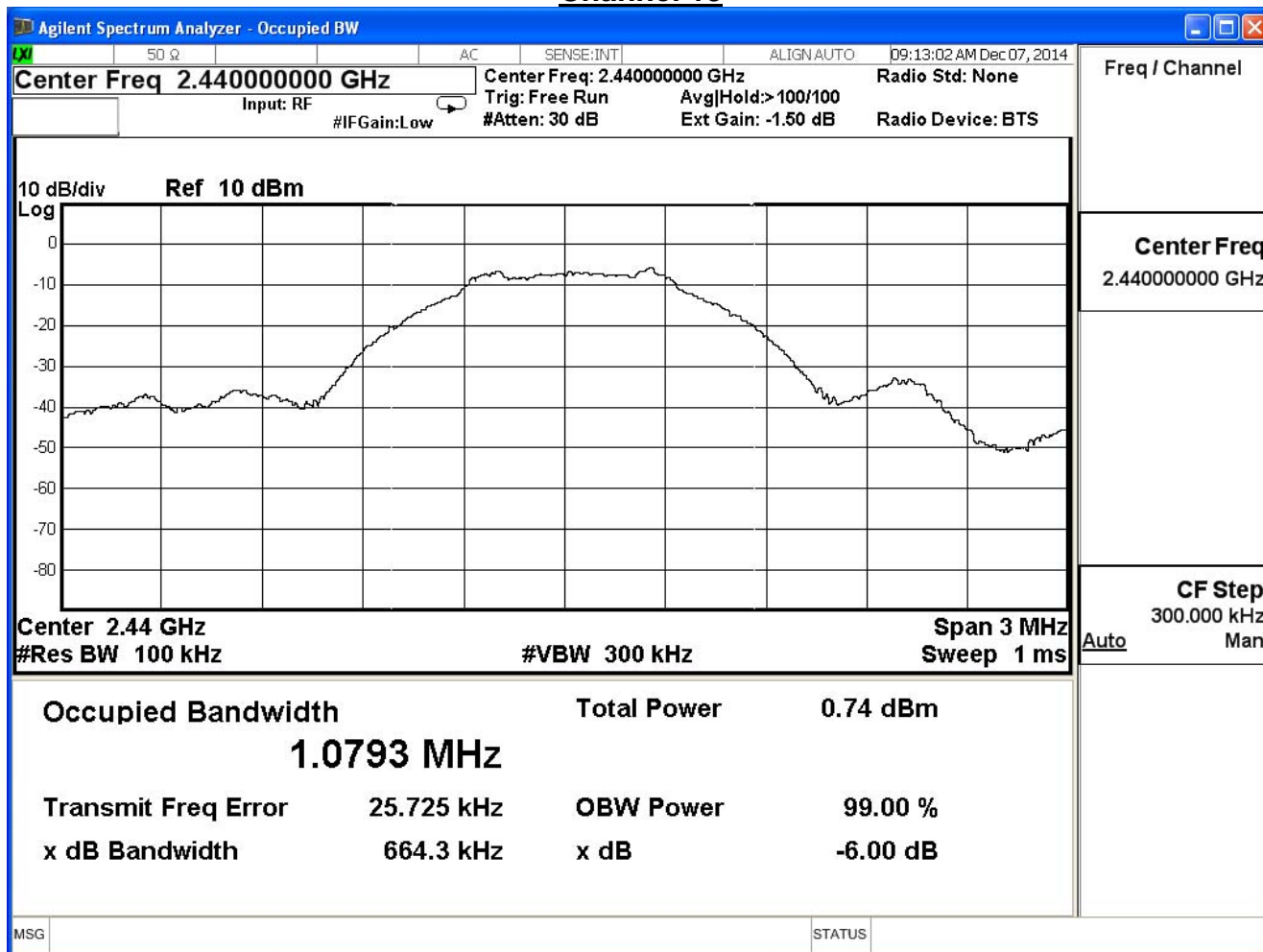
GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	0.691	≥ 0.5	Pass
19	2440	0.664	≥ 0.5	Pass
39	2480	0.663	≥ 0.5	Pass

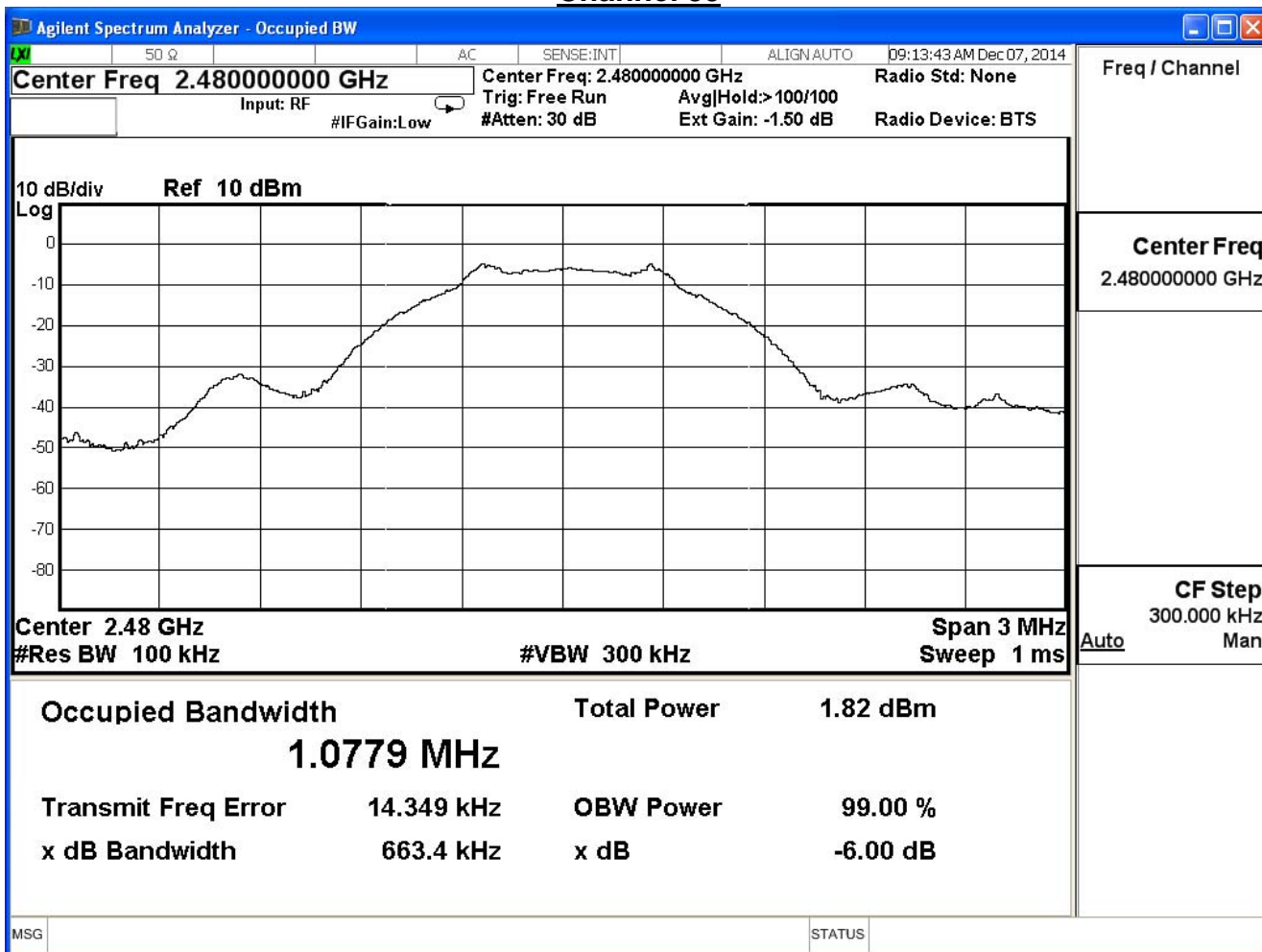
Channel 00



Channel 19



Channel 39



7. Power Density

7.1. Test Equipment

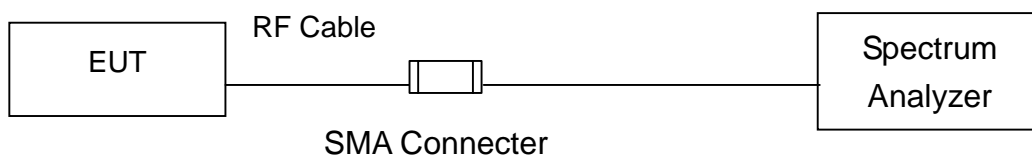
The following test equipment is used during the test:

Power Density / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2015/07/14

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

7.2. Test Setup



7.3. 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.

7.4. 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.

7.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

7.6. Uncertainty

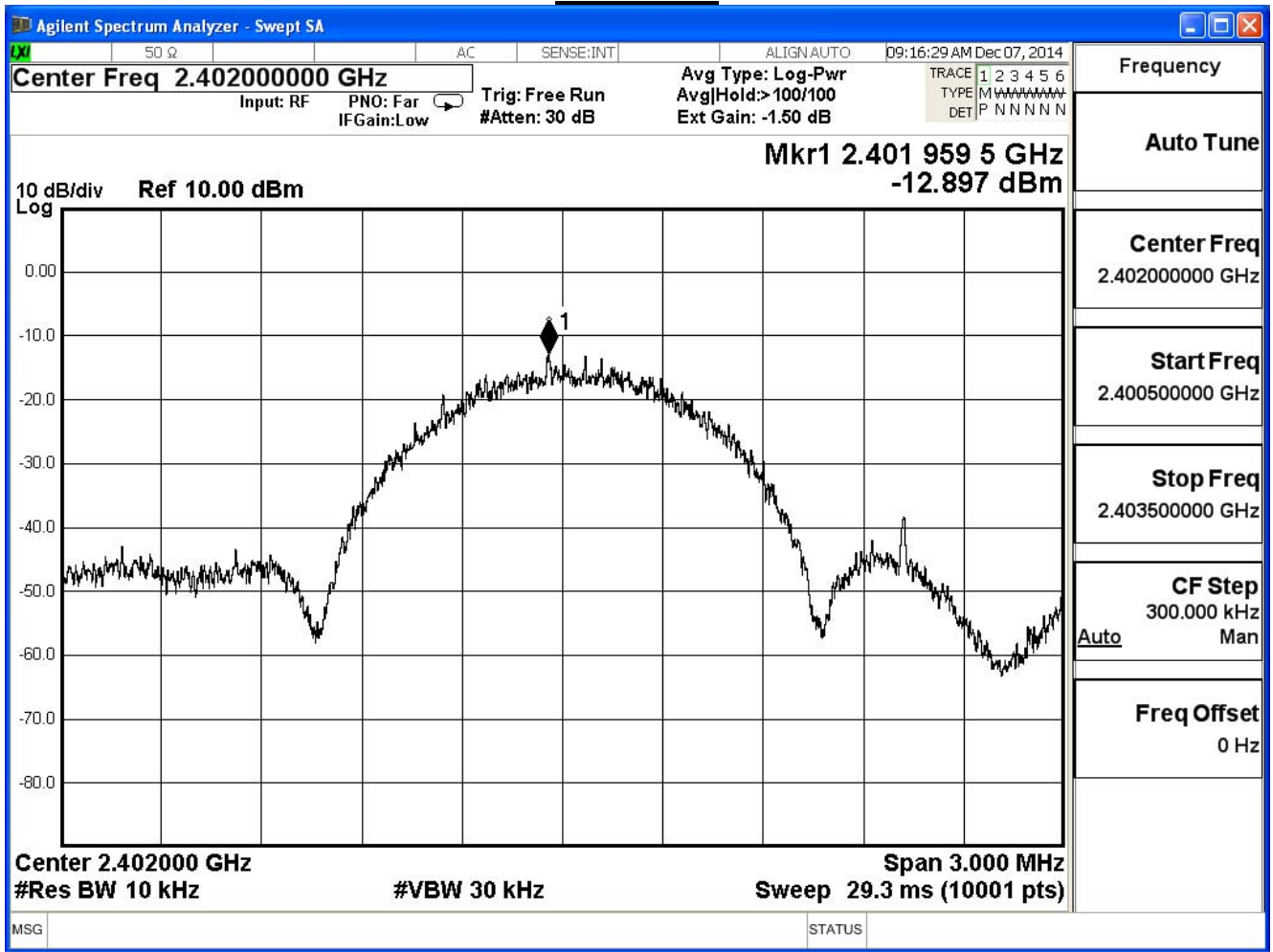
The measurement uncertainty is defined as ± 1.27 dB.

7.7. Test Result

Product	GPS Sport Watch		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2014/12/07	Test Site	SR7

Channel No.	Frequency (MHz)	Measurement (dBm)	Limit (dBm)	Result
0	2402	-12.897	≤ 8	Pass
19	2440	-13.197	≤ 8	Pass
39	2480	-11.564	≤ 8	Pass

Channel 00



Channel 19

