# FCC Test Report

Product Name : Band

Model No. : JL01

FCC ID. : V3J-JL01

Applicant : Aliphcom

Address : 99 Rhode Island Street 3rd Floor, San Francisco, CA 94103 United States

Date of Receipt : 2013/09/24

Issued Date : 2013/10/17

Report No. : 139500R-RFUSP43V01

Report Version : V1.0


# Test Report Certification

Issued Date : 2013/10/17
Report No. : 139500R-RFUSP43V01

QuieTek

| | | |
|---|---|---|
| Product Name | : | Band |
| Applicant | : | Aliphcom |
| Address | : | 99 Rhode Island Street 3rd Floor, San Francisco, CA 94103 United States |
| Manufacturer | : | Fugang Electric (Kunshan) Co., Ltd |
| Model No. | : | JL01 |
| FCC ID. | : | V3J-JL01 |
| EUT Voltage | : | DC 3.7V |
| Trade Name | : | JAWBONE |
| Applicable Standard | : | FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2012 |
| 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 : Fonbo Fang

( Fonbo Fang / Engineering Adm. Assistant )

Reviewed By : JuBo Shen

( JuBo Shen / Engineer )

Approved By : Roy Wang

( Roy Wang / Manager )

**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: 1313**<br>**NCC, Certificate No: NCC-RCB-07** |
| **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:

**HsinChu Testing Laboratory:**
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TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

**LinKou Testing Laboratory:**
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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 | Band |
| Trade Name | JAWBONE |
| Model No. | JL01 |
| Frequency Range/Channel Number | 2402~2480MHz / 40 Channels |
| Type of Modulation | GFSK |
| Antenna Type | Printed Antenna |
| Antenna Gain | -3dBi |

| Component | |
|---|---|
| USB Cable | Shielded, 0.05m |

| 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 Band including a 2.4GHz receiving function, and transmitting function.
2. These test results on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
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 RF radio in accordance with Part 15 regulations. The function receiving was measured and made a test report that the report number is 139500R-RFUSP37V02 under Declaration of Conformity.
5. Product's Serial Number: DV1, 8DB50A4719000500(Conducted sample);
   DV1, 0103380000B1B522(Radiated sample)

## 1.2. Operational Description

The JL01 is a wrist strap with Bluetooth 4.0 function. The baseband Bluetooth signal is generated digitally and modulated in accordance with GFSK modulation scheme employed in Bluetooth. The Bluetooth technology operates in the unlicensed industrial, scientific and medical (ISM) band at 2402MHz to 2480MHz.

The Nordic nRF8001 is a single-chip Bluetooth processor with a high performance integrated 2.4GHz RF transceiver. The crystal oscillator is 16MHz. It is fully compliant with Bluetooth 4.0 and all prior standard features. The nRF8001 has an architecture that has been designed to take advantage of the Bluetooth low energy (BLE) standard, enabling both modes in PCs and consumer electronics devices. This device is using a spread spectrum and the signal using a digital modulation among 40 frequencies at 2 MHz intervals in Bluetooth low energy function.
The working voltage of this device is 3.7Vdc. The antenna gain is -3dBi. The type of antenna is Printed antenna without antenna connector.

## 1.3. 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 |

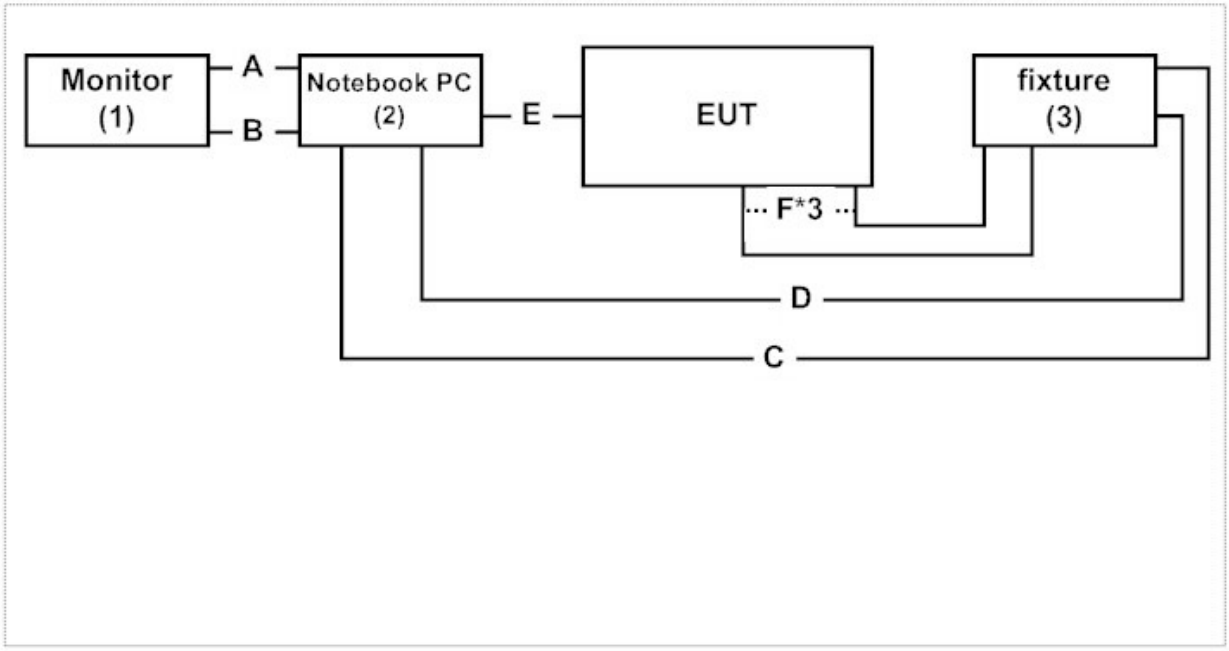
| Emission | Mode 1 |
|---|---|
| Conducted Emission | Yes |
| Peak Power Output | Yes |
| Radiated Emission | Yes |
| RF antenna conducted test | Yes |
| Band Edge | Yes |
| Number of hopping Frequency | No |
| Carrier Frequency Separation | No |
| Occupied Bandwidth | Yes |
| Dwell Time | No |
| Power Density | Yes |

## 1.4. 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 |
|---|---|---|---|---|---|---|
| 1 | Monitor | BenQ | Q24W5 | ETD6701578SLD | DoC | Non-Shielded, 1.8m |
| 2 | Notebook PC | ACER | MS2296 | LUSCV021391150 332C2000 | DoC | Non-Shielded, 2.5m one ferrite core bonded |
| 3 | fixture | Jawbone | MBT9113-AV2 | N/A | DoC | Non-Shielded |

## 1.5. Configuration of tested System

| Connection Diagram |
|---|
|  |



| Signal Cable Type | | Signal cable Description |
|---|---|---|
| A | HDMI Cable | Shielded, 1.6m |
| B | VGA Cable | Shielded, 1m |
| C | USB Cable | Shielded, 1.8m |
| D | USB to RS232 Cable | Shielded, 1m |
| E | USB Cable | Shielded, 0.05m |
| F | Signal Cable | Non-Shielded, 0.1m, 3PCS |

## 1.6. EUT Exercise Software

| Test Mode | Mode 1: Transmit |
|---|---|
| 1 | Setup the EUT as shown in Section 1.5 |
| 2 | Execute the “Band-Monitor-Client-2.4.9.exe” which is installed on the Notebook. |
| 3 | Configure the test mode, the test channel to start the continuous Receiver |
| 4 | Verify that the EUT works properly. |

## 1.7. 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 |
| Humidity (%RH) | | 25 - 75 | 50 |
| Barometric pressure (mbar) | | 860 - 1060 | 950-1000 |
| Temperature (°C) | FCC PART 15 C 15.247 Peak Power Output | 15 - 35 | 23 |
| Humidity (%RH) | | 25 - 75 | 50 |
| 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 | 24 |
| Humidity (%RH) | | 25 - 75 | 48 |
| Barometric pressure (mbar) | | 860 - 1060 | 950-1000 |
| Temperature (°C) | FCC PART 15 C 15.247 RF antenna conducted test | 15 - 35 | 24 |
| Humidity (%RH) | | 25 - 75 | 48 |
| Barometric pressure (mbar) | | 860 - 1060 | 950-1000 |
| Temperature (°C) | FCC PART 15 C 15.247 Power Density | 15 - 35 | 24 |
| Humidity (%RH) | | 25 - 75 | 48 |
| Barometric pressure (mbar) | | 860 - 1060 | 950-1000 |

## 2. Conducted Emission

### 2.1. Test Equipment

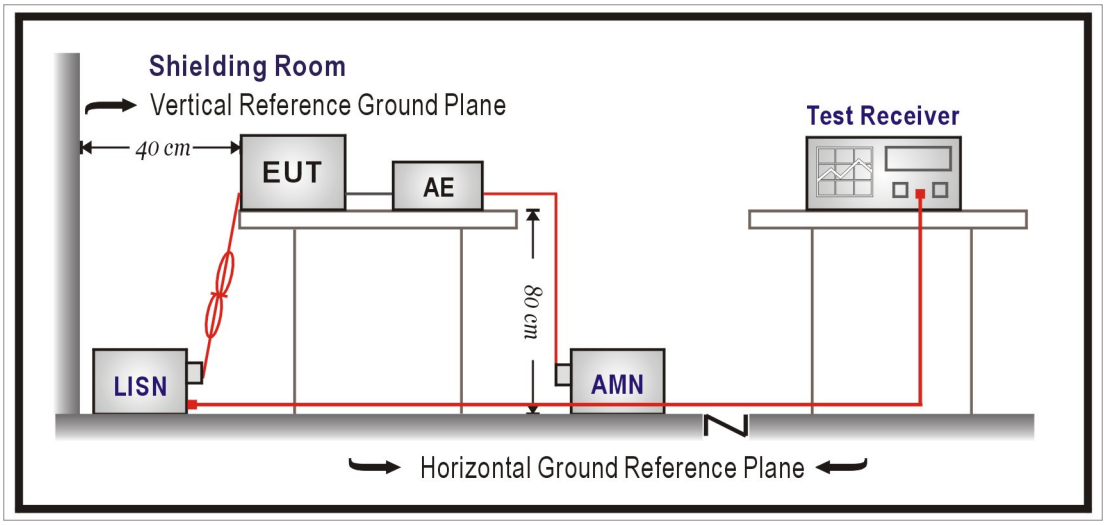
The following test equipments are used during the test:

Conducted Emission / SR2

| Instrument | Manufacturer | Model No. | Serial No | Next Cal. Date |
|---|---|---|---|---|
| Artificial Mains Network | R&S | ENV4200 | 848411/010 | 2014/01/24 |
| LISN | R&S | ENV216 | 100092 | 2014/08/08 |
| Test Receiver | R&S | ESCS 30 | 825442/014 | 2014/07/30 |

Note: 1. 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<br>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 and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2009 on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

## 2.5. Test Specification

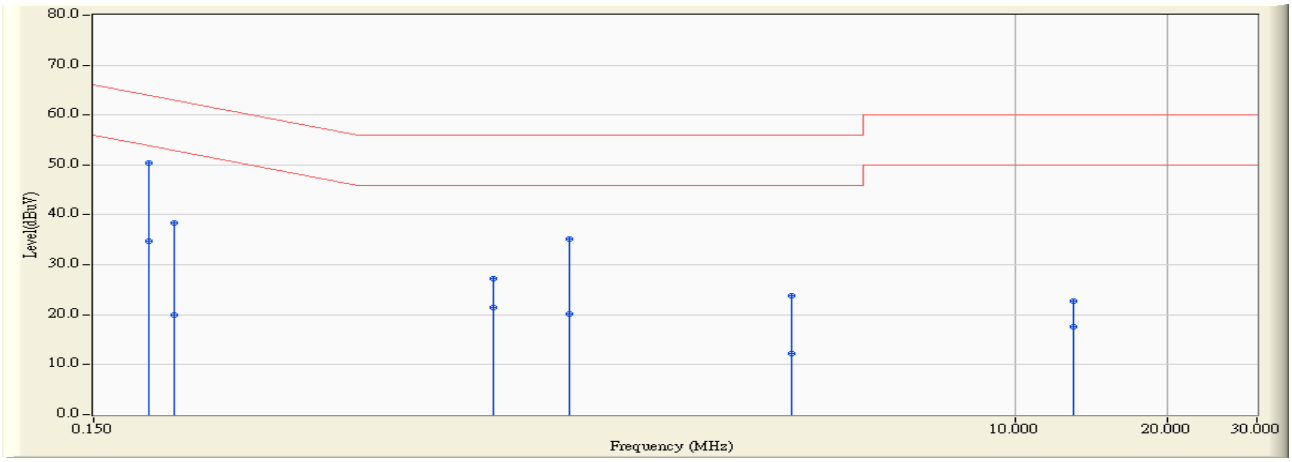
According to FCC Part 15 Subpart C Paragraph 15.207: 2012

## 2.6. Uncertainty

The measurement uncertainty is defined as ± 2.26 dB.

## 2.7. Test Result

| | |
|---|---|
| **Site : SR2** | **Time : 2013/10/04 - 15:56** |
| **Limit : CISPR_B_00M_QP** | **Margin : 10** |
| **Probe : SR2_LISN(16A)-3_0822 - Line1** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2440MHz** |

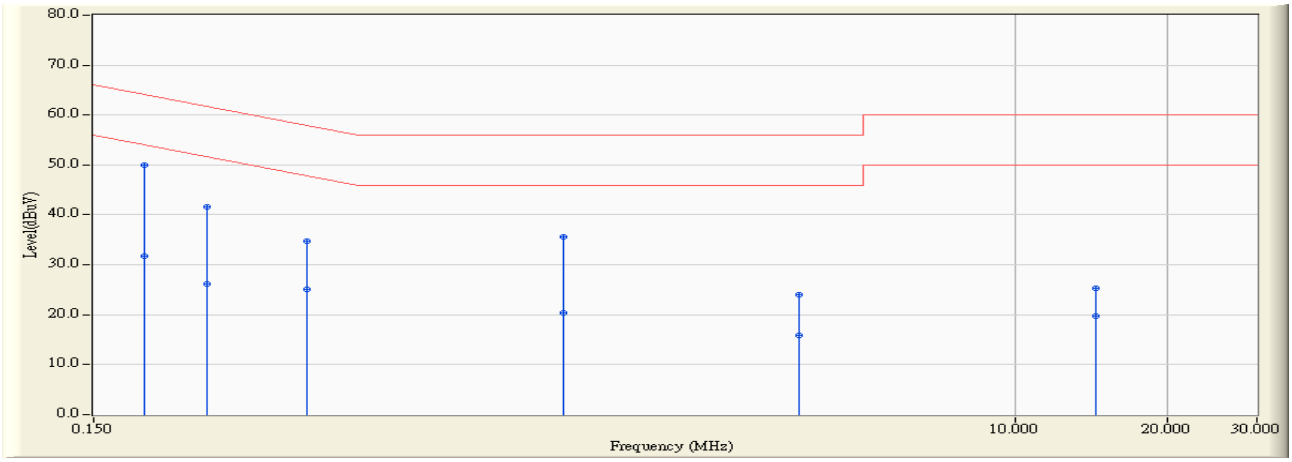



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV) | Margin (dB) | Limit (dBuV) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 0.193 | 9.643 | 40.820 | 50.463 | -13.445 | 63.908 | QUASIPEAK |
| 2 | | 0.193 | 9.643 | 25.050 | 34.693 | -19.215 | 53.908 | AVERAGE |
| 3 | | 0.216 | 9.649 | 28.760 | 38.409 | -24.547 | 62.956 | QUASIPEAK |
| 4 | | 0.216 | 9.649 | 10.240 | 19.889 | -33.067 | 52.956 | AVERAGE |
| 5 | | 0.927 | 9.739 | 17.410 | 27.149 | -28.851 | 56.000 | QUASIPEAK |
| 6 | | 0.927 | 9.739 | 11.710 | 21.449 | -24.551 | 46.000 | AVERAGE |
| 7 | | 1.314 | 9.774 | 25.310 | 35.084 | -20.916 | 56.000 | QUASIPEAK |
| 8 | | 1.314 | 9.774 | 10.410 | 20.184 | -25.816 | 46.000 | AVERAGE |
| 9 | | 3.591 | 9.911 | 13.910 | 23.821 | -32.179 | 56.000 | QUASIPEAK |
| 10 | | 3.591 | 9.911 | 2.260 | 12.171 | -33.829 | 46.000 | AVERAGE |
| 11 | | 13.029 | 10.189 | 12.600 | 22.789 | -37.211 | 60.000 | QUASIPEAK |
| 12 | | 13.029 | 10.189 | 7.320 | 17.509 | -32.491 | 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 : 2013/10/04 - 16:03** |
| **Limit : CISPR_B_00M_QP** | **Margin : 10** |
| **Probe : SR2_LISN(16A)-3_0822 - Line2** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2440MHz** |




| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV) | Margin (dB) | Limit (dBuV) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 0.189 | 9.631 | 40.390 | 50.021 | -14.057 | 64.078 | QUASIPEAK |
| 2 | | 0.189 | 9.631 | 22.130 | 31.761 | -22.317 | 54.078 | AVERAGE |
| 3 | | 0.252 | 9.647 | 31.910 | 41.556 | -20.149 | 61.705 | QUASIPEAK |
| 4 | | 0.252 | 9.647 | 16.530 | 26.176 | -25.529 | 51.705 | AVERAGE |
| 5 | | 0.396 | 9.680 | 25.130 | 34.810 | -23.125 | 57.935 | QUASIPEAK |
| 6 | | 0.396 | 9.680 | 15.370 | 25.050 | -22.885 | 47.935 | AVERAGE |
| 7 | | 1.275 | 9.750 | 25.890 | 35.640 | -20.360 | 56.000 | QUASIPEAK |
| 8 | | 1.275 | 9.750 | 10.680 | 20.430 | -25.570 | 46.000 | AVERAGE |
| 9 | | 3.732 | 9.905 | 14.050 | 23.955 | -32.045 | 56.000 | QUASIPEAK |
| 10 | | 3.732 | 9.905 | 5.960 | 15.865 | -30.135 | 46.000 | AVERAGE |
| 11 | | 14.435 | 10.272 | 14.930 | 25.202 | -34.798 | 60.000 | QUASIPEAK |
| 12 | | 14.435 | 10.272 | 9.510 | 19.782 | -30.218 | 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

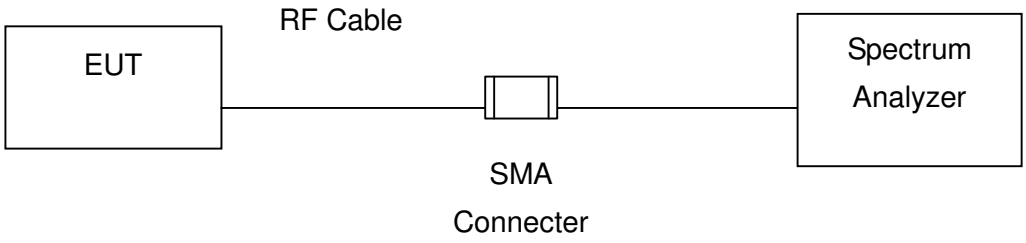
The following test equipment is used during the test:

Peak Power Output / SR7

| Instrument | Manufacturer | Model No. | Serial No | Next Cal. Date |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | N9010A-EXA | US47140172 | 2014/08/05 |

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

## 3.2. Test Setup




## 3.3. Test procedures

The EUT was setup according to ANSI C63.4: 2009; tested according to DTS test procedure of KDB558074 D01V03R01 for compliance 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

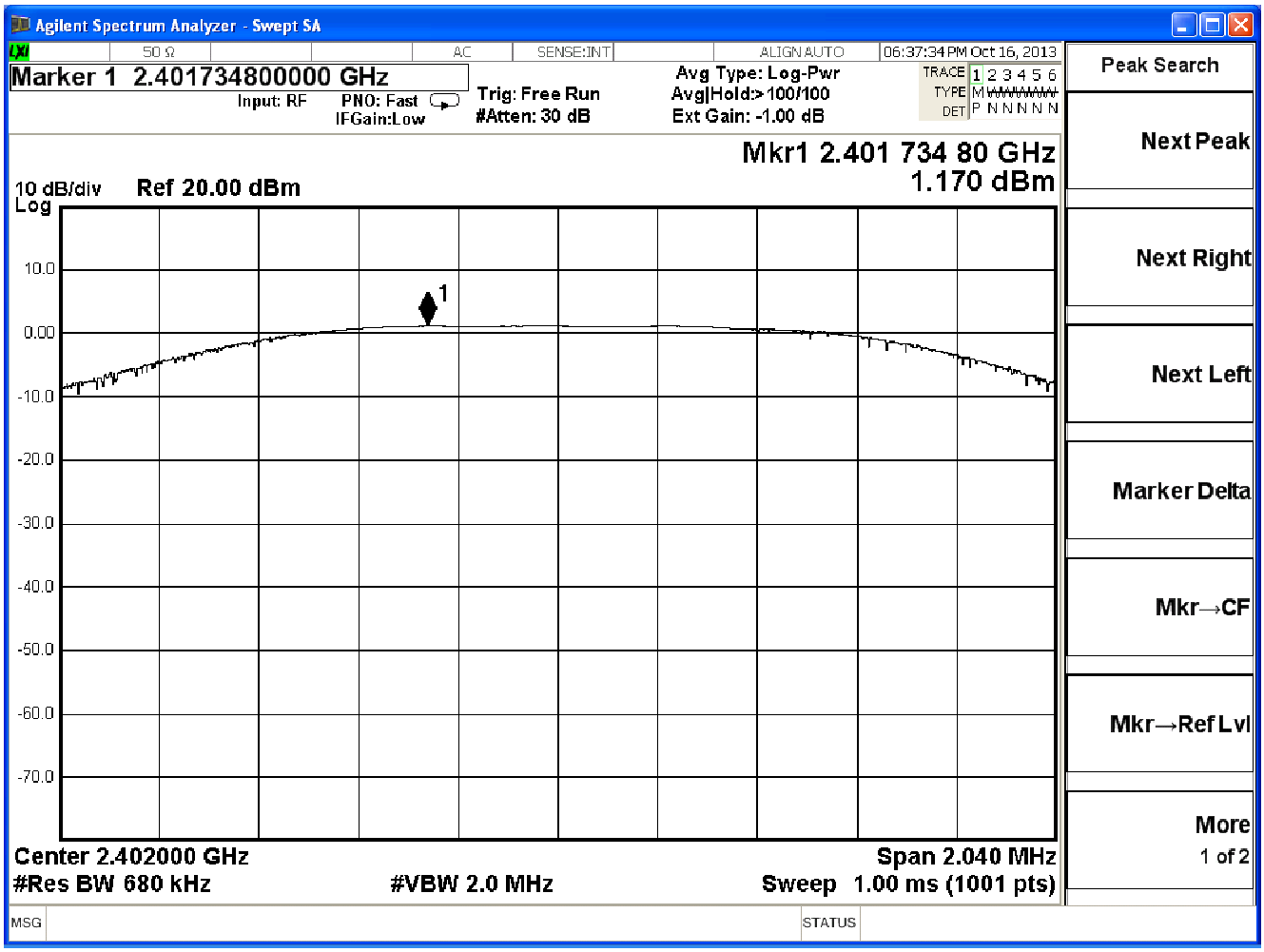
## 3.6. Test Result

| Product | Band | | |
|---|---|---|---|
| Test Item | Peak Power Output | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/16 | Test Site | SR7 |

**GFSK**

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 0 | 2402 | 1.170 | ≦30 | Pass |

**Channel 0**

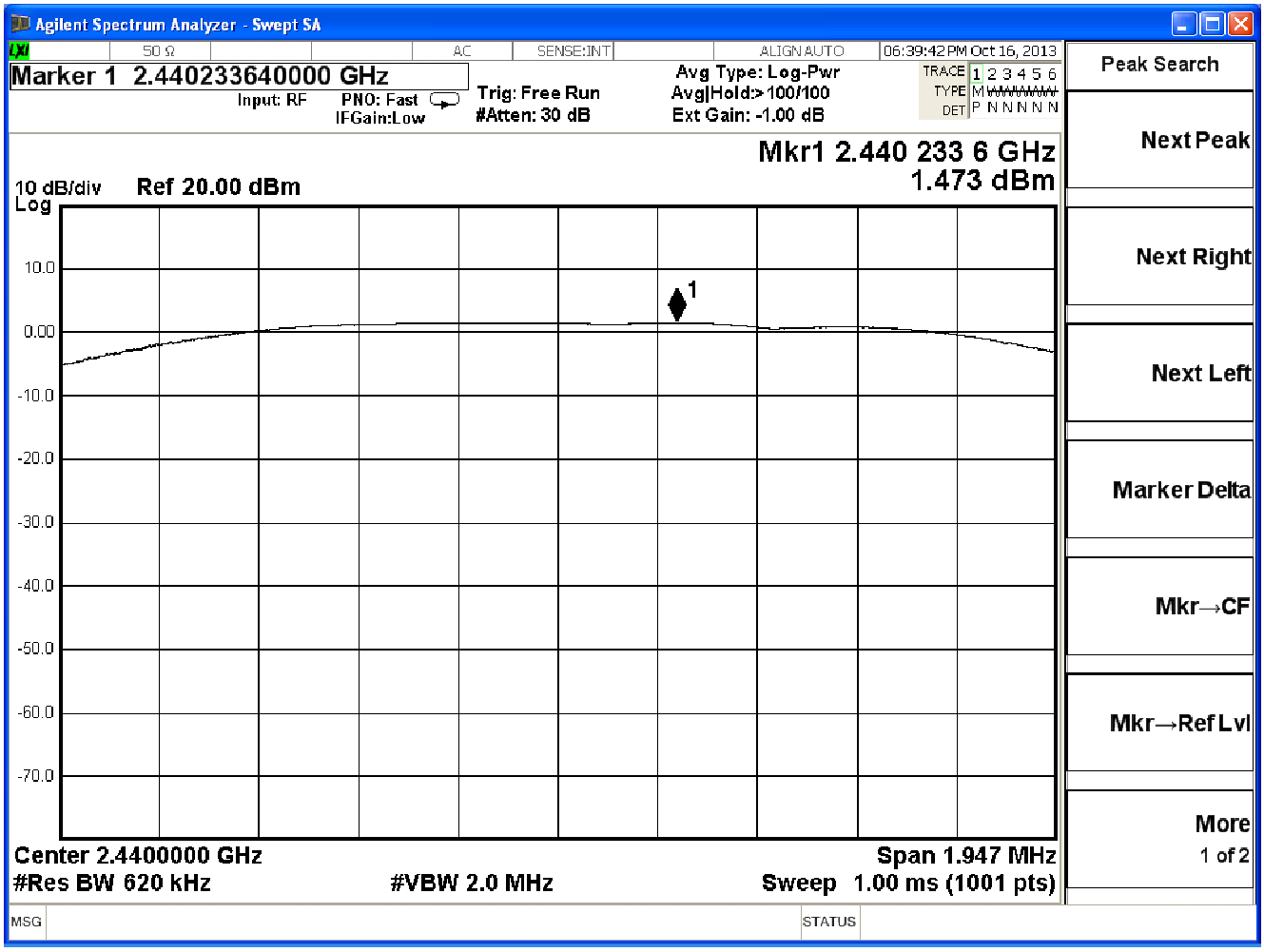


| Product | Band | | |
|---|---|---|---|
| Test Item | Peak Power Output | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/16 | Test Site | SR7 |

**GFSK**

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 19 | 2440 | 1.473 | ≦30 | Pass |

**Channel 19**

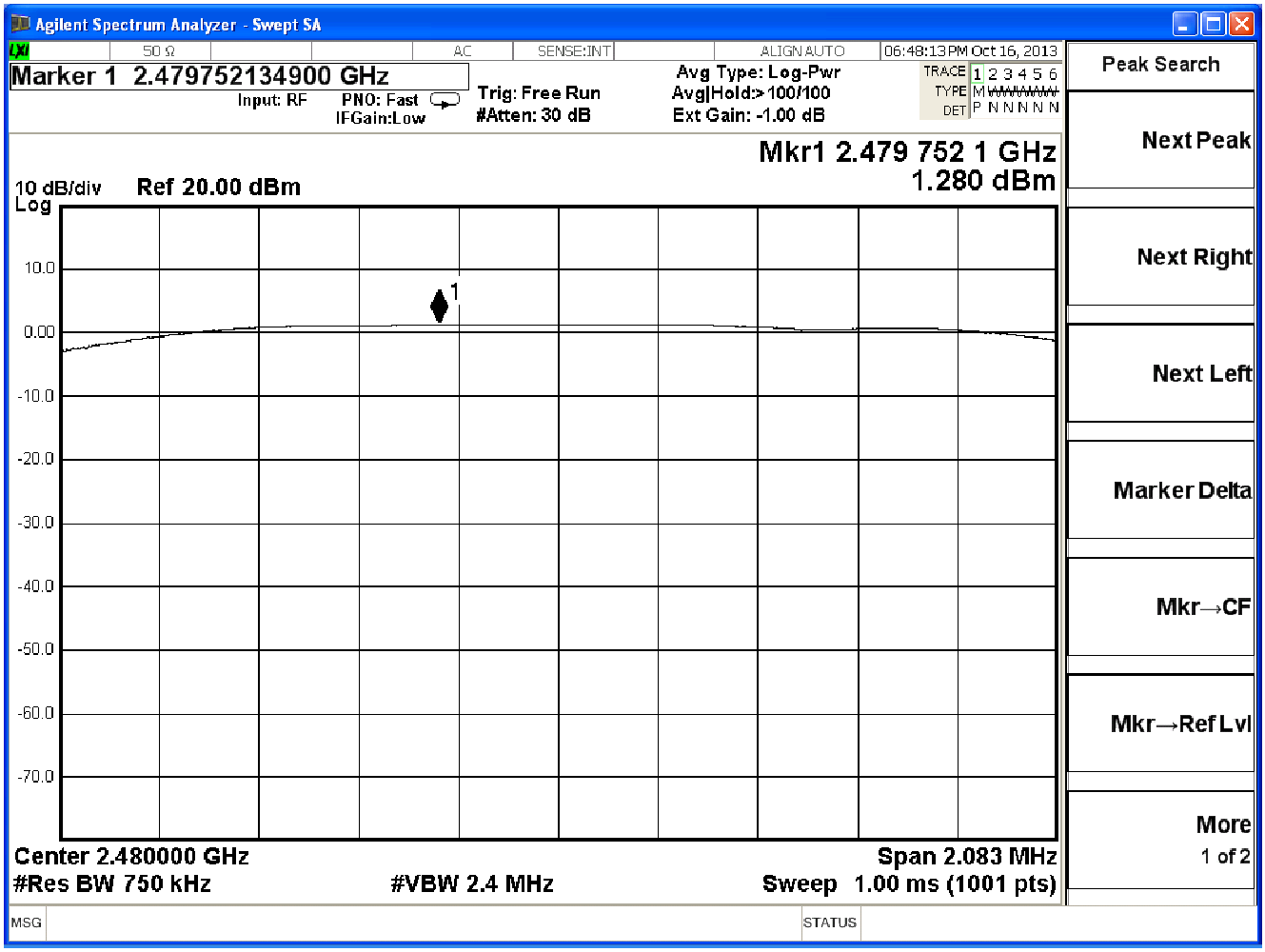


| Product | Band | | |
|---|---|---|---|
| Test Item | Peak Power Output | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/16 | Test Site | SR7 |

**GFSK**

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 39 | 2480 | 1.280 | ≦30 | Pass |

**Channel 39**



# 4. Radiated Emission

## 4.1. Test Equipment

The following test equipments are used during the test:

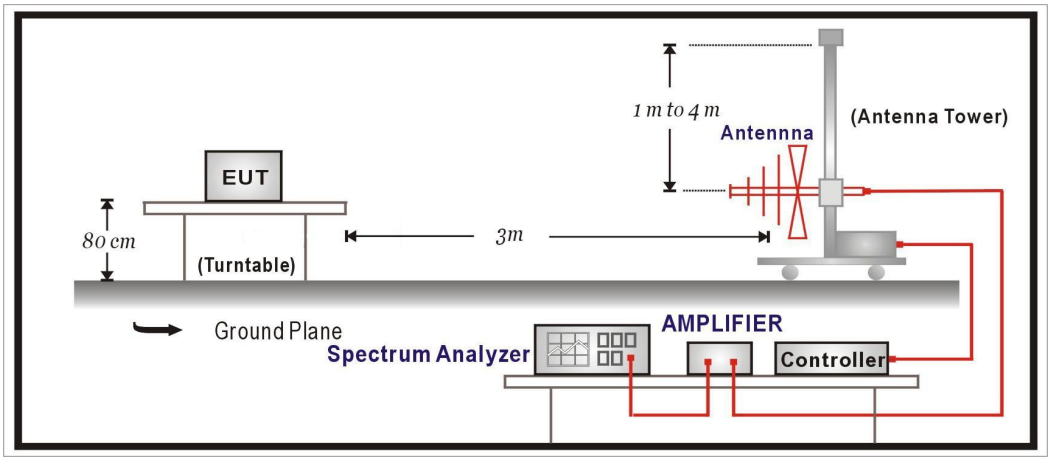
Radiated Emission / CB1

| Instrument | Manufacturer | Model No. | Serial No | Next Cal. Date |
|---|---|---|---|---|
| Bilog Antenna | SCHAFFNER | CBL6112B | 2895(CB1) | 2014/08/14 |
| Double Ridged Guide Horn Antenna | Schwarzback | BBHA 9120 | D743 | 2014/02/17 |
| Horn Antenna | Schwarzback | BBHA 9170 | 203 | 2014/10/24 |
| Pre-Amplifier | MITEQ | AMF-4D-005180-24 -10P | 888003 | 2014/06/09 |
| Pre-Amplifier | QuieTek | AP-025C | CHM-0706049 | 2014/02/19 |
| Spectrum Analyzer | Agilent | E4440A | MY46187335 | 2014/01/27 |
| k Type Cable | Huber Suhner | Sucoflex 102 | 25623/2 | 2014/02/21 |

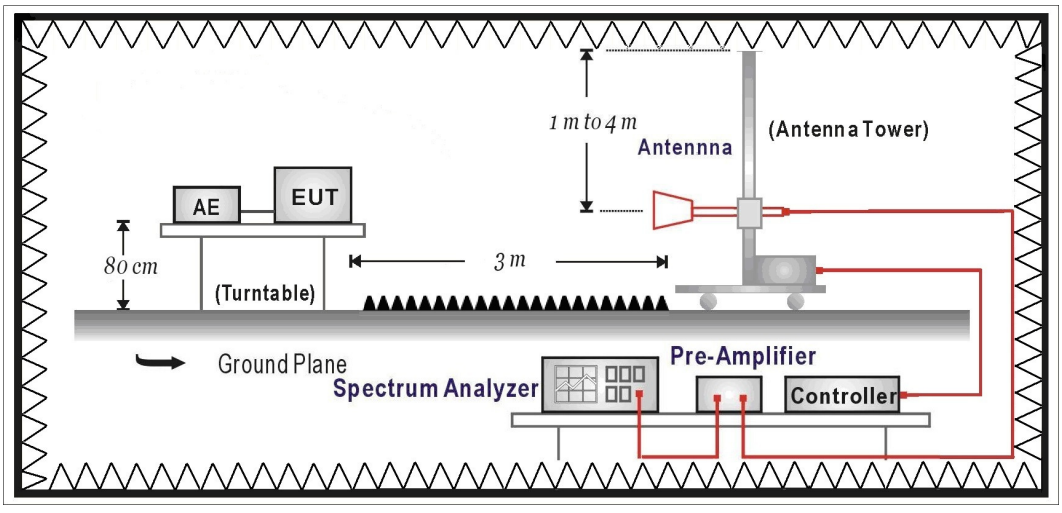
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

## 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 | 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.

## 4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to DTS test procedure of KDB558074 D01V03R01 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 C63.4:2009 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.

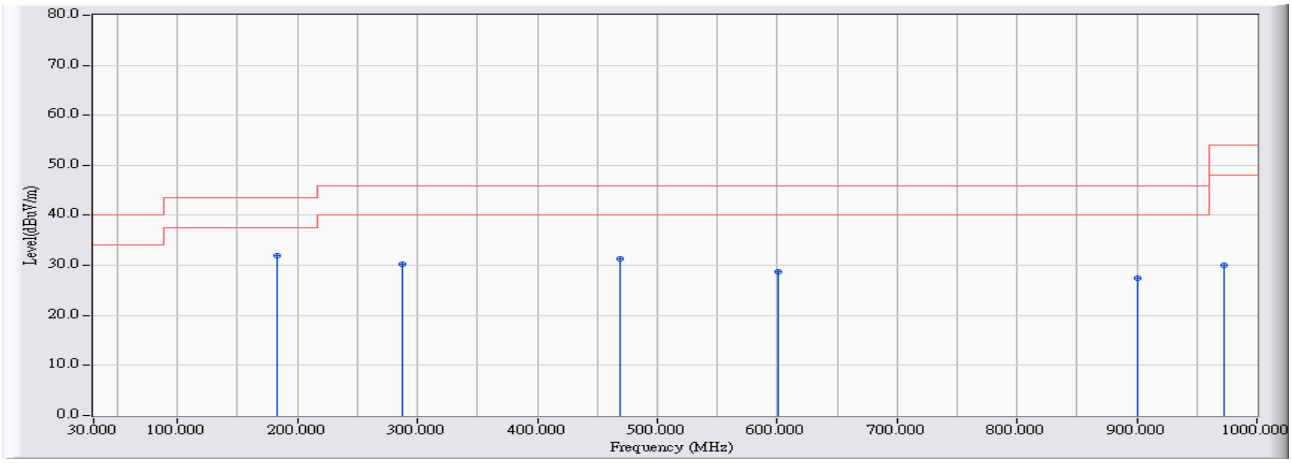
## 4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

## 4.6. Test Result

### 30MHz-1GHz Spurious

| | |
|---|---|
| Site : CB1 | Time : 2013/10/04 - 14:45 |
| Limit : FCC_CLASS_B_03M_QP | Margin : 6 |
| Probe : CB1_FCC_EFS_30-1G-2_1011 - HORIZONTAL | Power : DC 3.7V |
| EUT : Band | Note : Mode 1: Transmit_2440MHz |

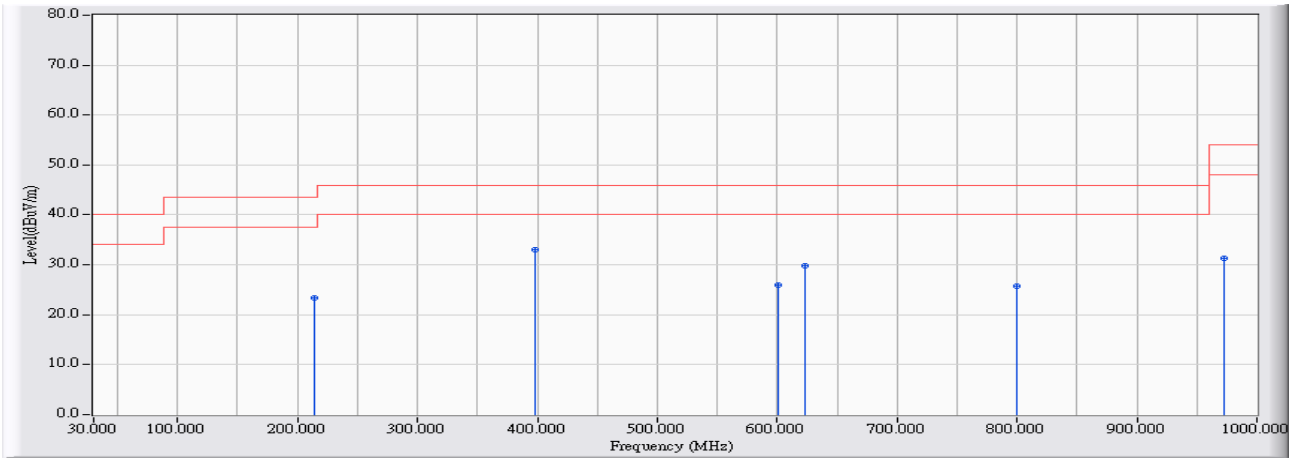



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 183.260 | -24.698 | 56.692 | 31.994 | -11.506 | 43.500 | QUASIPEAK |
| 2 | | 288.020 | -20.087 | 50.233 | 30.146 | -15.854 | 46.000 | QUASIPEAK |
| 3 | | 468.440 | -16.078 | 47.449 | 31.371 | -14.629 | 46.000 | QUASIPEAK |
| 4 | | 600.360 | -15.316 | 43.960 | 28.644 | -17.356 | 46.000 | QUASIPEAK |
| 5 | | 901.060 | -12.980 | 40.356 | 27.376 | -18.624 | 46.000 | QUASIPEAK |
| 6 | | 972.840 | -12.378 | 42.341 | 29.963 | -24.037 | 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 : 2013/10/04 - 14:46** |
| **Limit : FCC_CLASS_B_03M_QP** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_30-1G-2_1011 - VERTICAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2440MHz** |



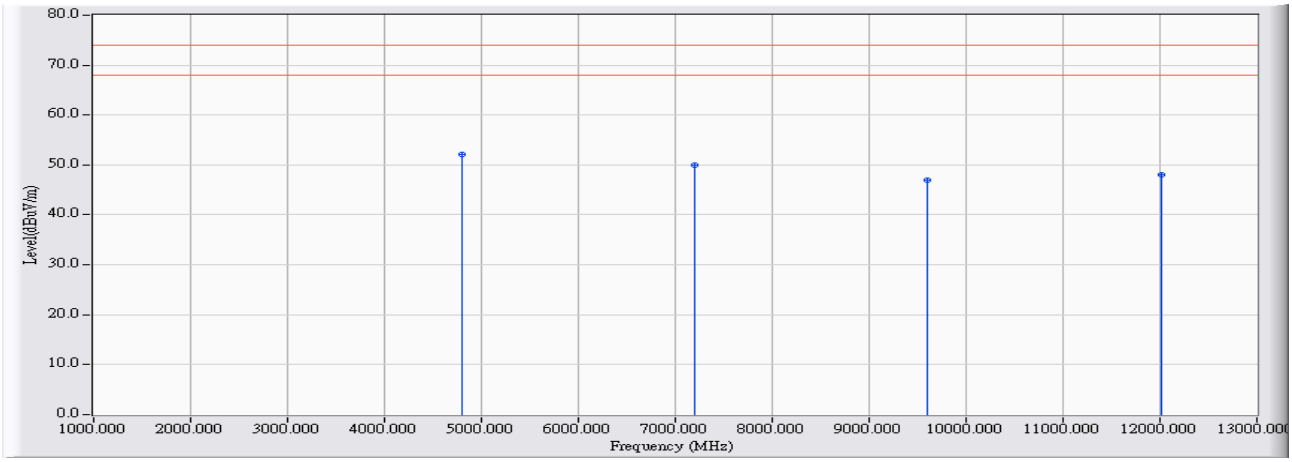

| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 214.300 | -23.568 | 46.961 | 23.393 | -20.107 | 43.500 | QUASIPEAK |
| 2 | * | 398.600 | -17.448 | 50.489 | 33.041 | -12.959 | 46.000 | QUASIPEAK |
| 3 | | 600.360 | -15.316 | 41.227 | 25.911 | -20.089 | 46.000 | QUASIPEAK |
| 4 | | 623.640 | -15.167 | 45.042 | 29.875 | -16.125 | 46.000 | QUASIPEAK |
| 5 | | 800.180 | -13.302 | 38.952 | 25.650 | -20.350 | 46.000 | QUASIPEAK |
| 6 | | 972.840 | -12.378 | 43.727 | 31.349 | -22.651 | 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

## Harmonic & Spurious:

| | |
|---|---|
| **Site : CB1** | **Time : 2013/10/04 - 11:51** |
| **Limit : FCC_SpartC_15.247_H_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2402MHz** |

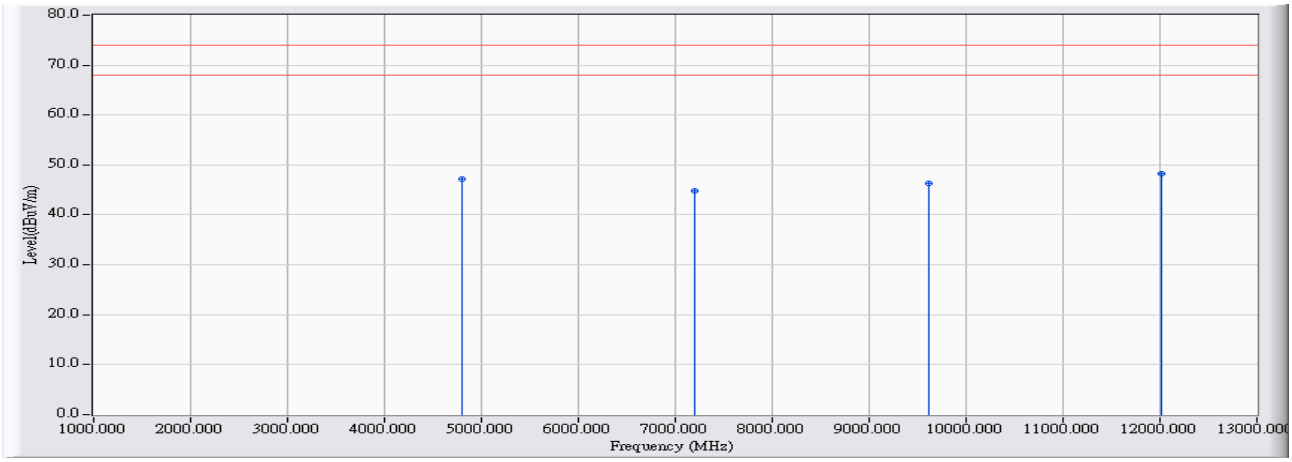



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 4803.570 | 0.147 | 51.988 | 52.135 | -21.865 | 74.000 | PEAK |
| 2 | | 7205.520 | 7.096 | 42.913 | 50.009 | -23.991 | 74.000 | PEAK |
| 3 | | 9606.650 | 10.925 | 36.055 | 46.980 | -27.020 | 74.000 | PEAK |
| 4 | | 12014.450 | 13.153 | 34.857 | 48.011 | -25.989 | 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 : 2013/10/04 - 12:02** |
| **Limit : FCC_SpartC_15.247_H_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2402MHz** |

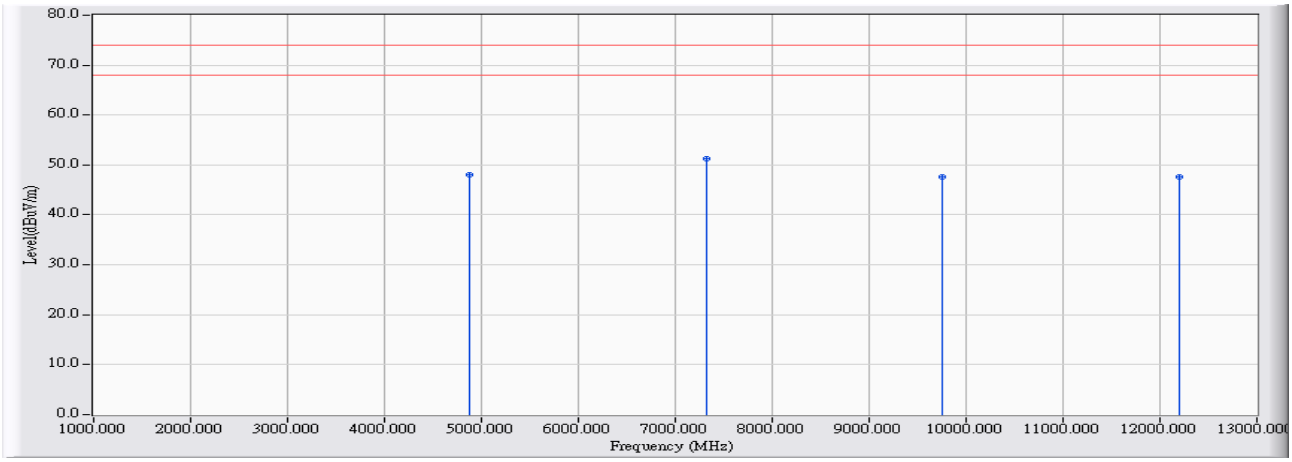



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4803.410 | 0.147 | 47.113 | 47.260 | -26.740 | 74.000 | PEAK |
| 2 | | 7205.545 | 7.096 | 37.694 | 44.790 | -29.210 | 74.000 | PEAK |
| 3 | | 9607.910 | 10.929 | 35.413 | 46.342 | -27.658 | 74.000 | PEAK |
| 4 | * | 12008.500 | 13.148 | 35.020 | 48.168 | -25.832 | 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 : 2013/10/04 - 13:10** |
| **Limit : FCC_SpartC_15.247_H_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2440MHz** |

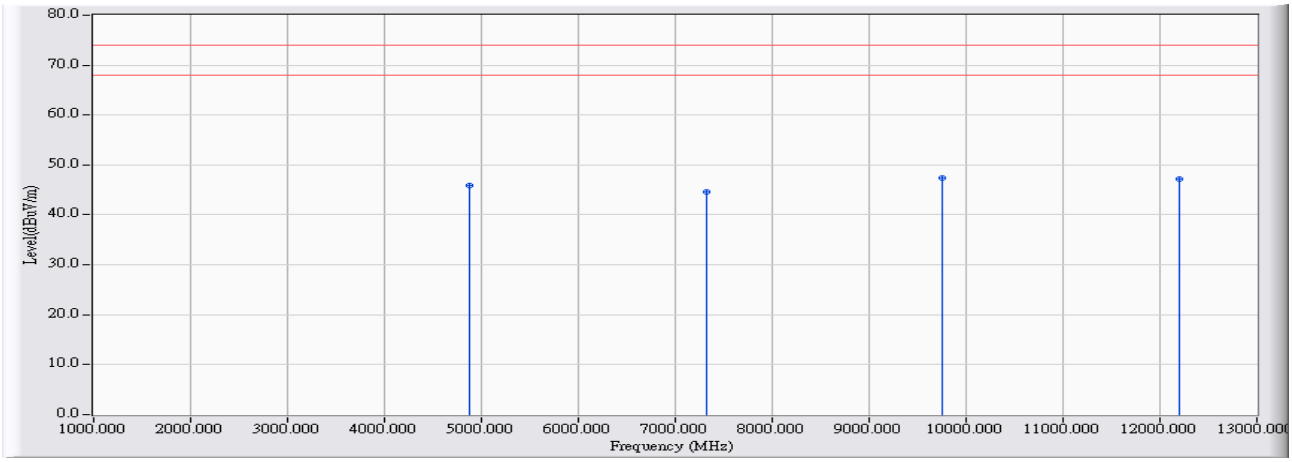



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4879.490 | 0.378 | 47.572 | 47.950 | -26.050 | 74.000 | PEAK |
| 2 | * | 7319.860 | 7.375 | 43.783 | 51.157 | -22.843 | 74.000 | PEAK |
| 3 | | 9760.690 | 11.477 | 36.191 | 47.669 | -26.331 | 74.000 | PEAK |
| 4 | | 12201.375 | 13.378 | 34.212 | 47.590 | -26.410 | 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 : 2013/10/04 - 13:15** |
| **Limit : FCC_SpartC_15.247_H_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2440MHz** |

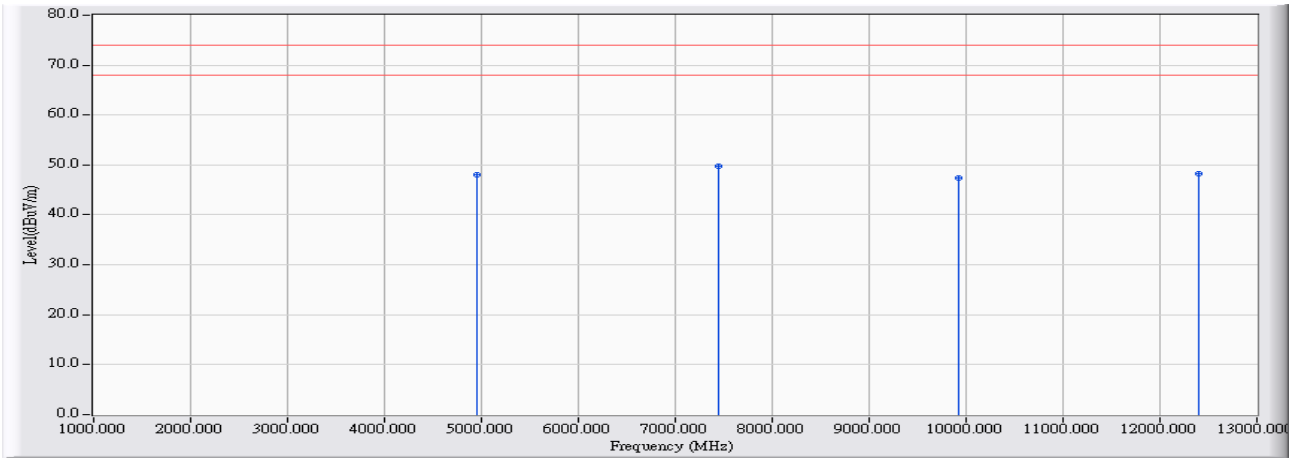



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4879.415 | 0.378 | 45.479 | 45.857 | -28.143 | 74.000 | PEAK |
| 2 | | 7319.115 | 7.373 | 37.333 | 44.706 | -29.294 | 74.000 | PEAK |
| 3 | * | 9759.740 | 11.474 | 35.954 | 47.428 | -26.572 | 74.000 | PEAK |
| 4 | | 12199.830 | 13.376 | 33.776 | 47.152 | -26.848 | 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 : 2013/10/04 - 13:20** |
| **Limit : FCC_SpartC_15.247_H_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2480MHz** |

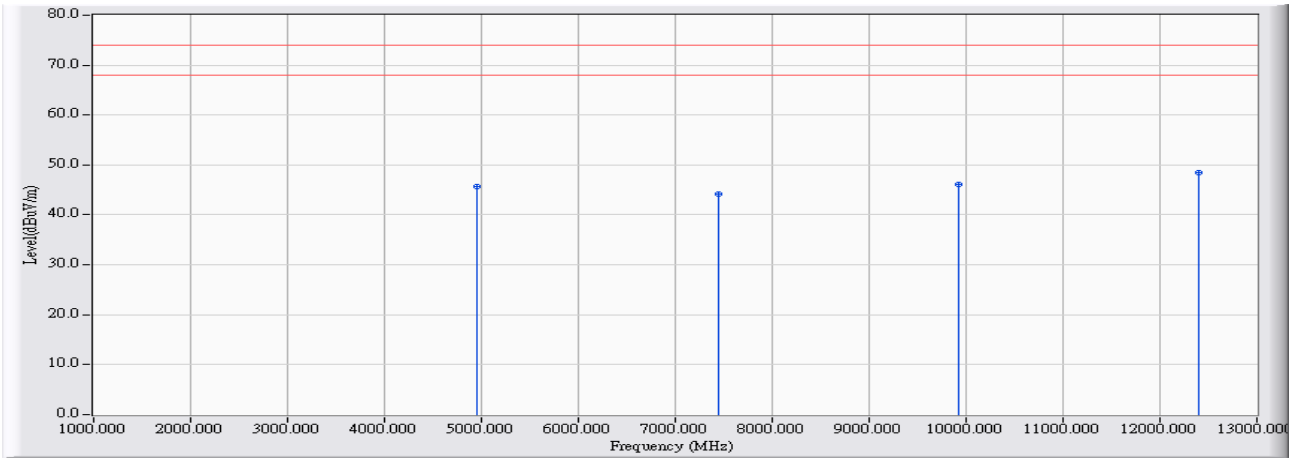



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4960.435 | 0.624 | 47.346 | 47.970 | -26.030 | 74.000 | PEAK |
| 2 | * | 7439.260 | 7.665 | 42.147 | 49.812 | -24.188 | 74.000 | PEAK |
| 3 | | 9920.020 | 12.049 | 35.343 | 47.392 | -26.608 | 74.000 | PEAK |
| 4 | | 12399.875 | 13.617 | 34.734 | 48.351 | -25.649 | 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 : 2013/10/04 - 13:23** |
| **Limit : FCC_SpartC_15.247_H_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2480MHz** |




| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4960.350 | 0.624 | 44.963 | 45.586 | -28.414 | 74.000 | PEAK |
| 2 | | 7439.435 | 7.666 | 36.608 | 44.274 | -29.726 | 74.000 | PEAK |
| 3 | | 9919.005 | 12.046 | 34.038 | 46.084 | -27.916 | 74.000 | PEAK |
| 4 | * | 12401.915 | 13.619 | 34.795 | 48.414 | -25.586 | 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 equipment is used during the test:

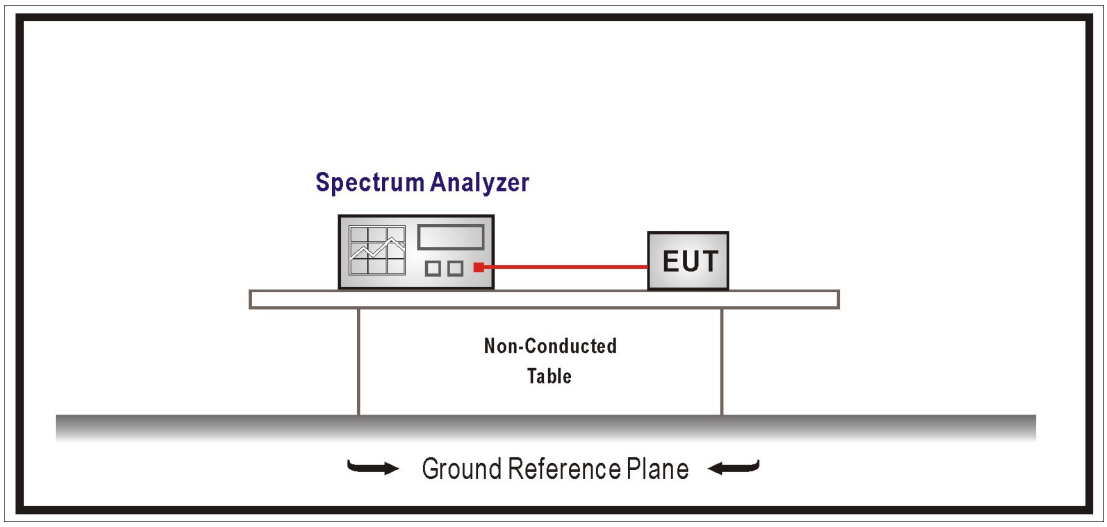
RF antenna conducted test / SR7

| Instrument | Manufacturer | Model No. | Serial No | Next Cal. Date |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | N9010A-EXA | US47140172 | 2014/08/05 |

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

## 5.2. Test Setup

RF 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 C63.4, 2009 and tested according to DTS test procedure of KDB558074 D01V03R01 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

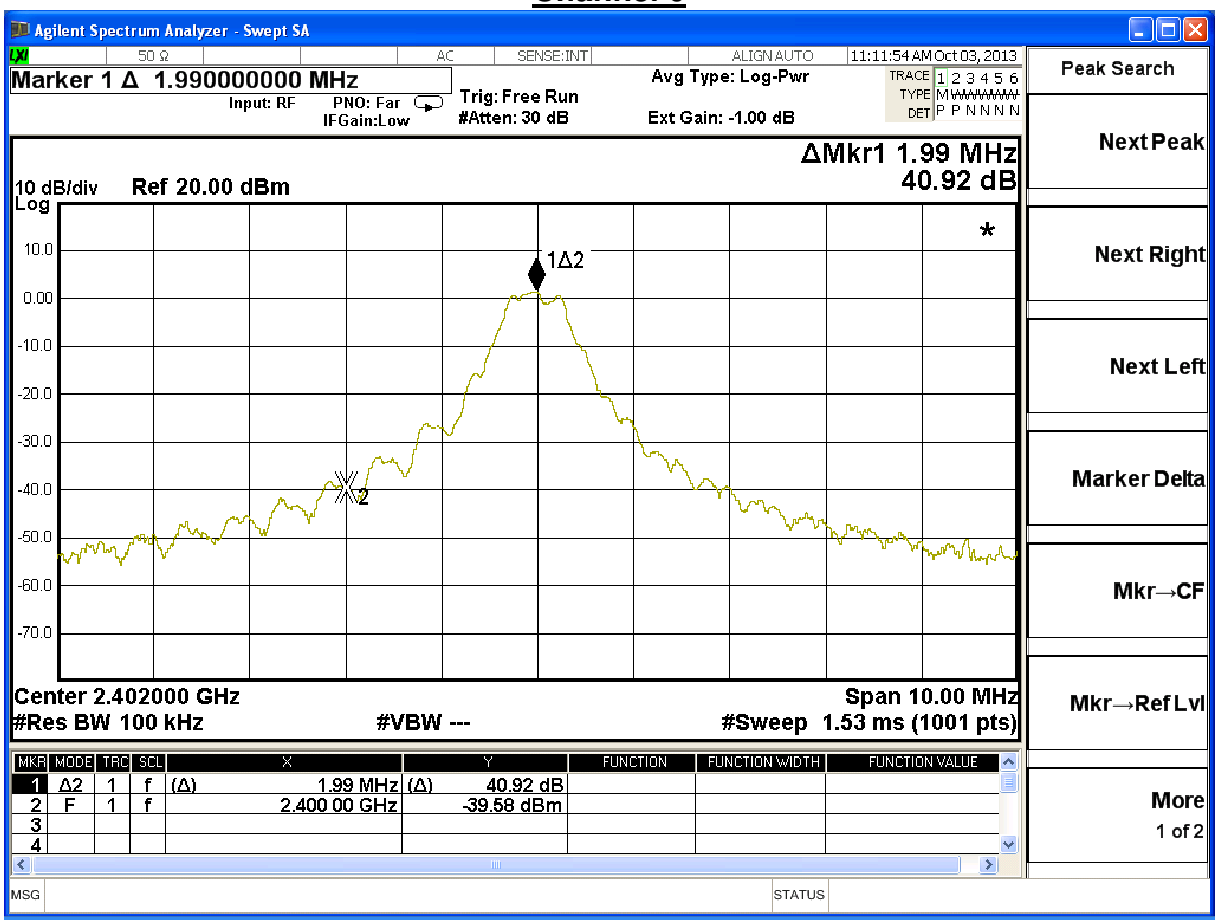
## 5.6. Test Result

| Product | Band | | |
|---|---|---|---|
| Test Item | RF antenna conducted test | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/03 | Test Site | SR7 |

**GFSK**

| Channel No. | Frequency (MHz) | Measurement Level (dB) | Required Limit (dBc) | Result |
|---|---|---|---|---|
| 0 | 2402 | 40.92 | ≧30 | Pass |

**Channel 0**

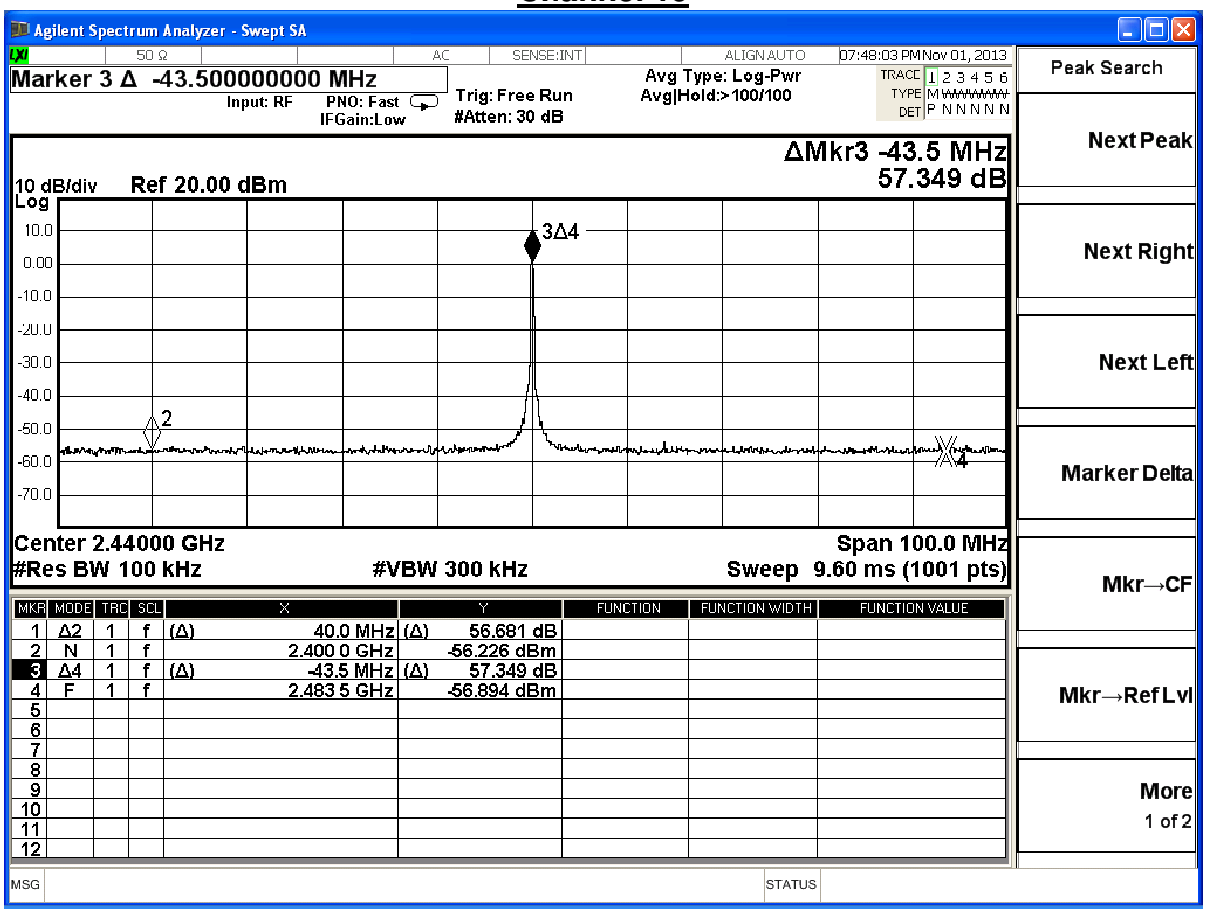


| Product | Band | | |
|---|---|---|---|
| Test Item | RF antenna conducted test | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/11/1 | Test Site | SR7 |

**GFSK**

| Channel No. | Frequency (MHz) | Measurement Level (dB) | Required Limit (dBc) | Result |
|---|---|---|---|---|
| 19 | 2440 | 56.68 | ≧30 | Pass |
| 19 | 2440 | 57.35 | ≧30 | Pass |

**Channel 19**

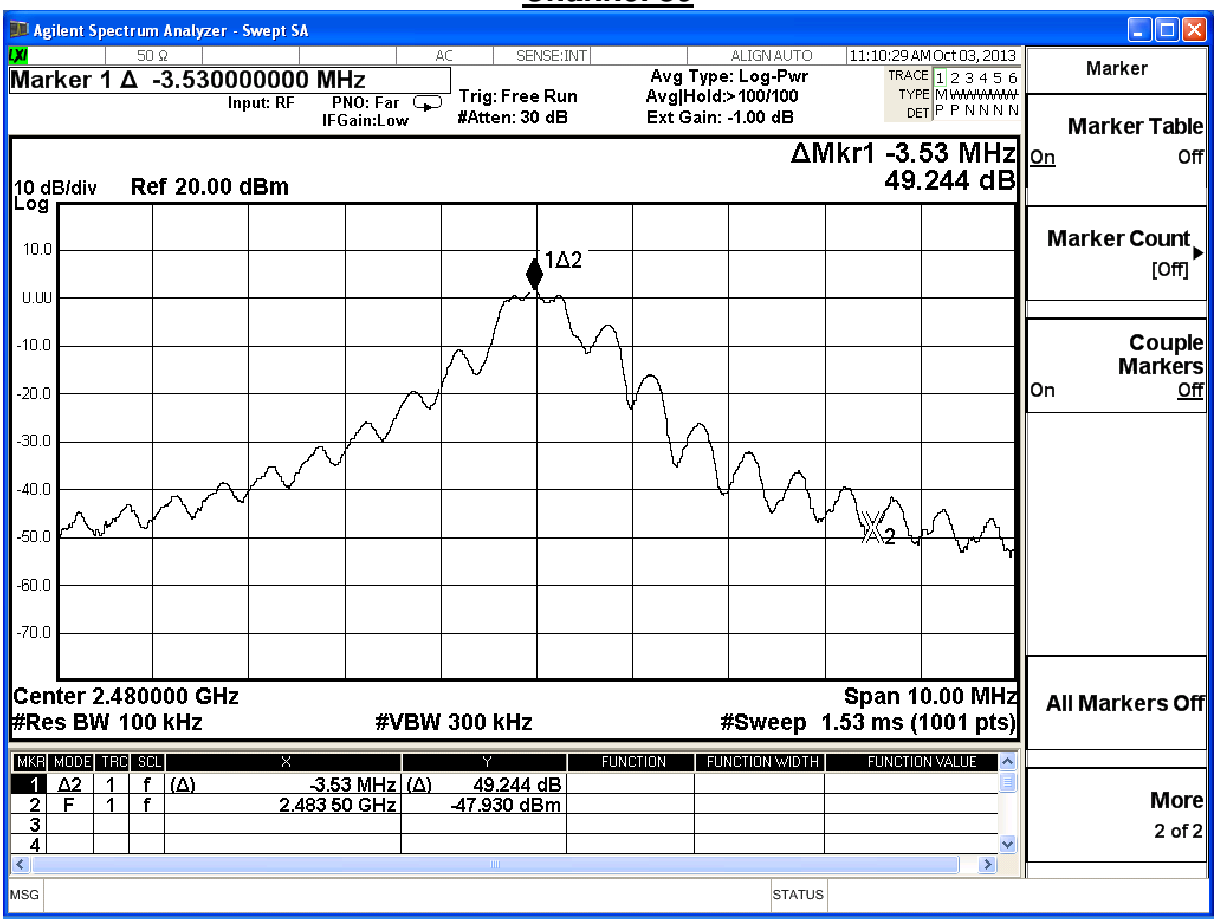


| Product | Band | | |
|---|---|---|---|
| Test Item | RF antenna conducted test | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/03 | Test Site | SR7 |

**GFSK**

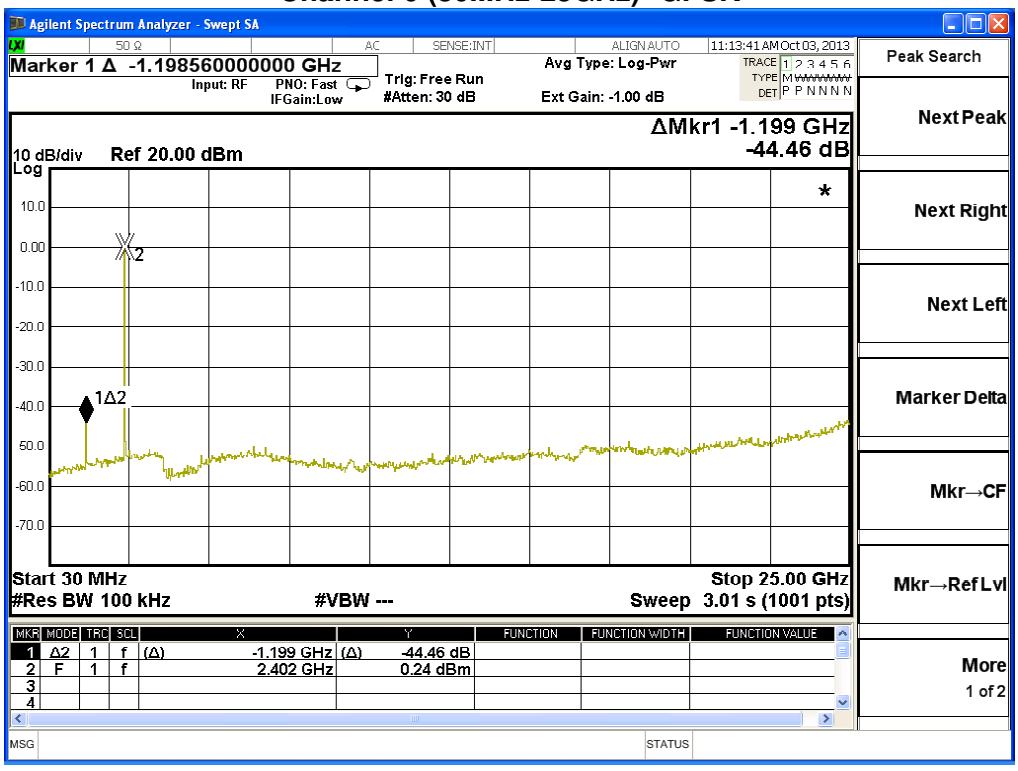
| Channel No. | Frequency (MHz) | Measurement Level (dB) | Required Limit (dBc) | Result |
|---|---|---|---|---|
| 39 | 2480 | 49.24 | ≧30 | Pass |

**Channel 39**

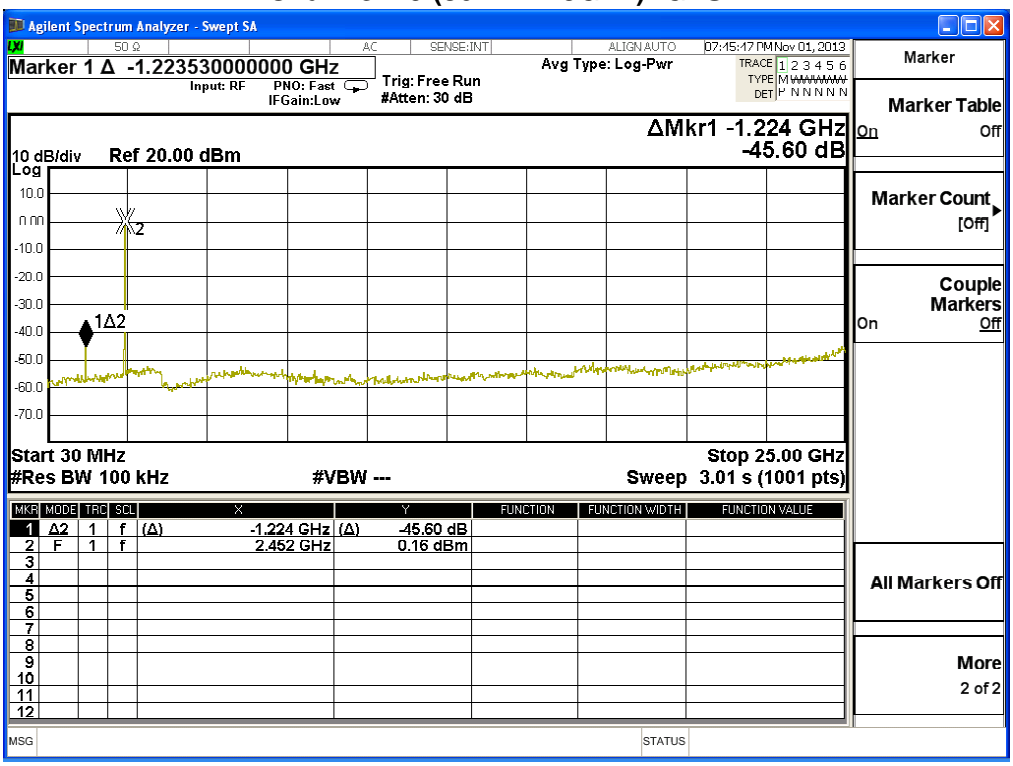


| Product | Band | | |
|---|---|---|---|
| Test Item | RF antenna conducted test | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/11/1 | Test Site | SR7 |

**Channel 0 (30MHz-25GHz)- GFSK**

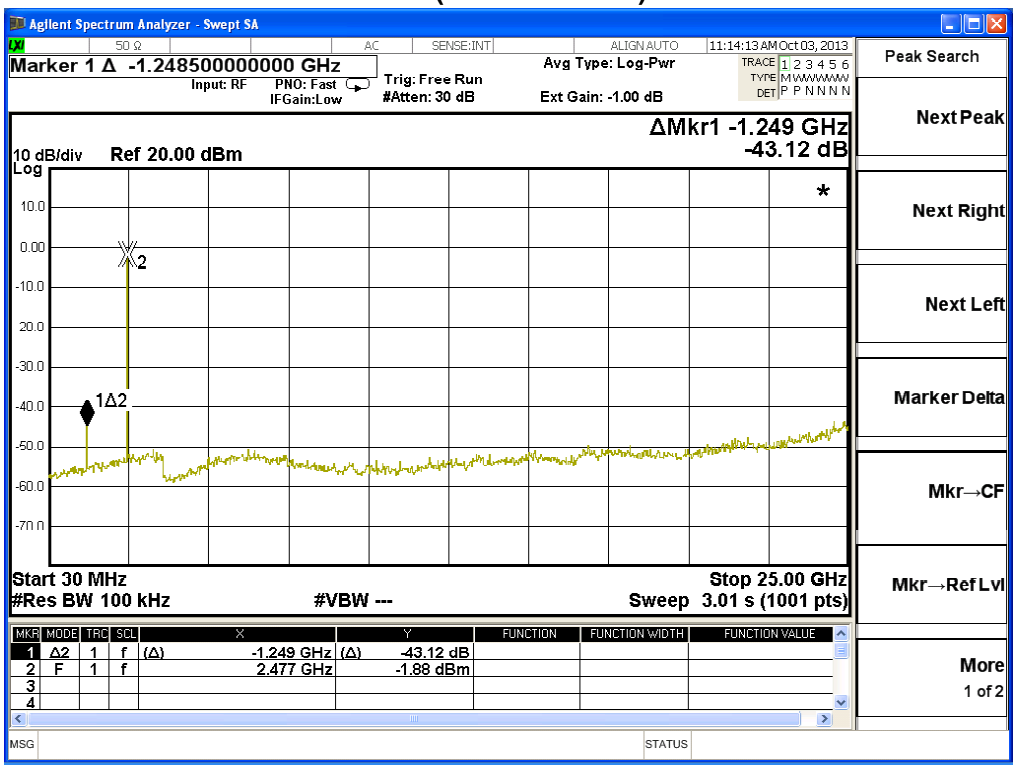



**Channel 19 (30MHz-25GHz)- GFSK**



| Product | Band | | |
|---|---|---|---|
| Test Item | RF antenna conducted test | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/03 | Test Site | SR7 |

**Channel 39 (30MHz-25GHz)- GFSK**



# 6. Band Edge

## 6.1. Test Equipment

The following test equipments are used during the test:

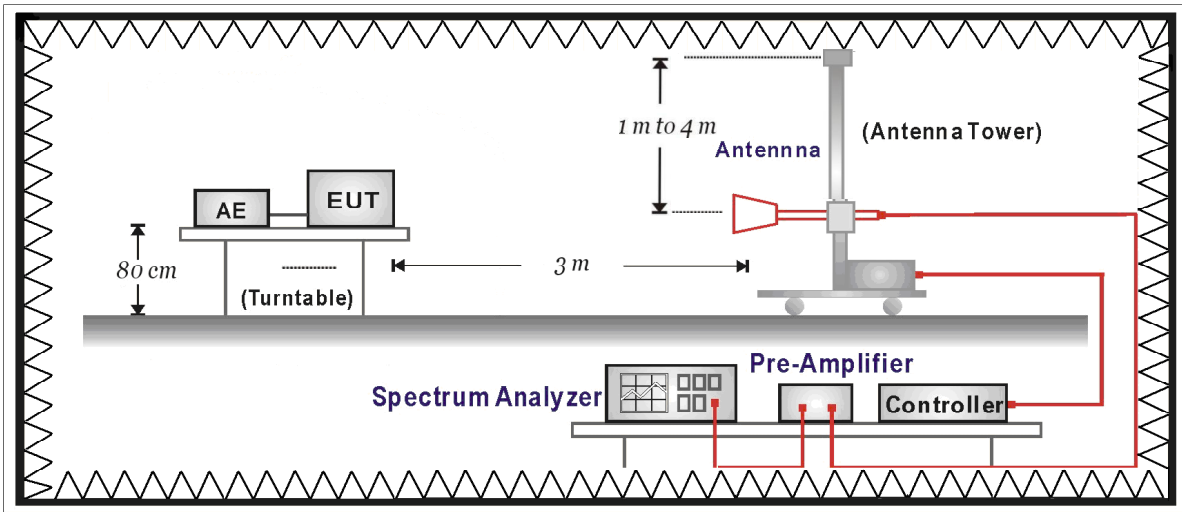
Band Edge / CB1

| Instrument | Manufacturer | Model No. | Serial No | Next Cal. Date |
|---|---|---|---|---|
| Double Ridged Guide Horn Antenna | Schwarzback | BBHA 9120 | D743 | 2014/02/17 |
| Spectrum Analyzer | Agilent | E4440A | MY46187335 | 2014/01/27 |
| k Type Cable | Huber Suhner | Sucoflex 102 | 25623/2 | 2014/02/21 |

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

## 6.2. Test Setup

RF Radiated Measurement:



## 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 C63.4, 2009 and tested according to DTS test procedure of KDB558074 D01V03R01 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.

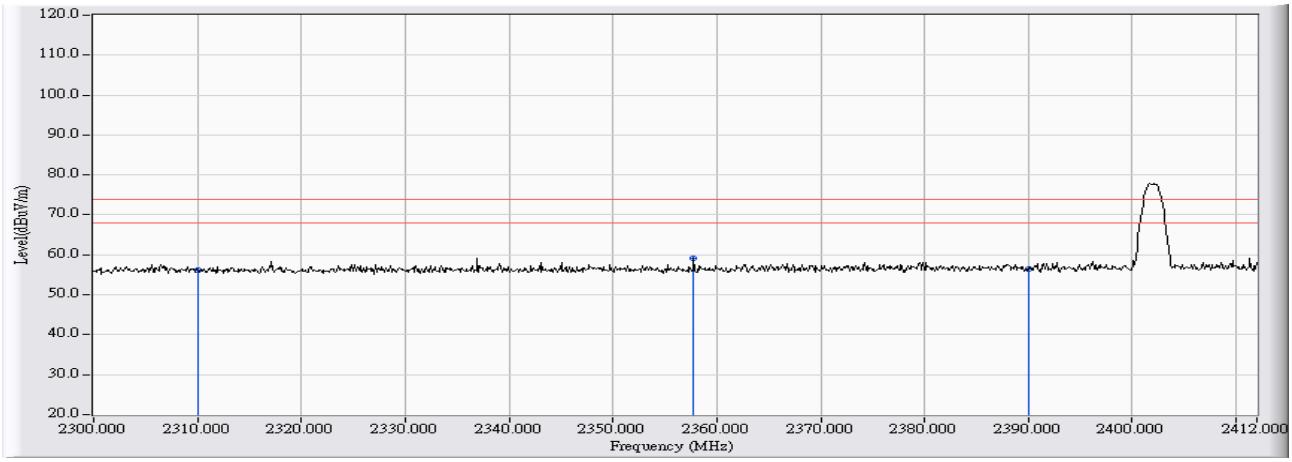
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2009 on radiated measurement.

## 6.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

## 6.6. Test Result

| | |
|---|---|
| **Site : CB1** | **Time : 2013/10/04 - 11:19** |
| **Limit : FCC_SpartC_15.209_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2402MHz** |

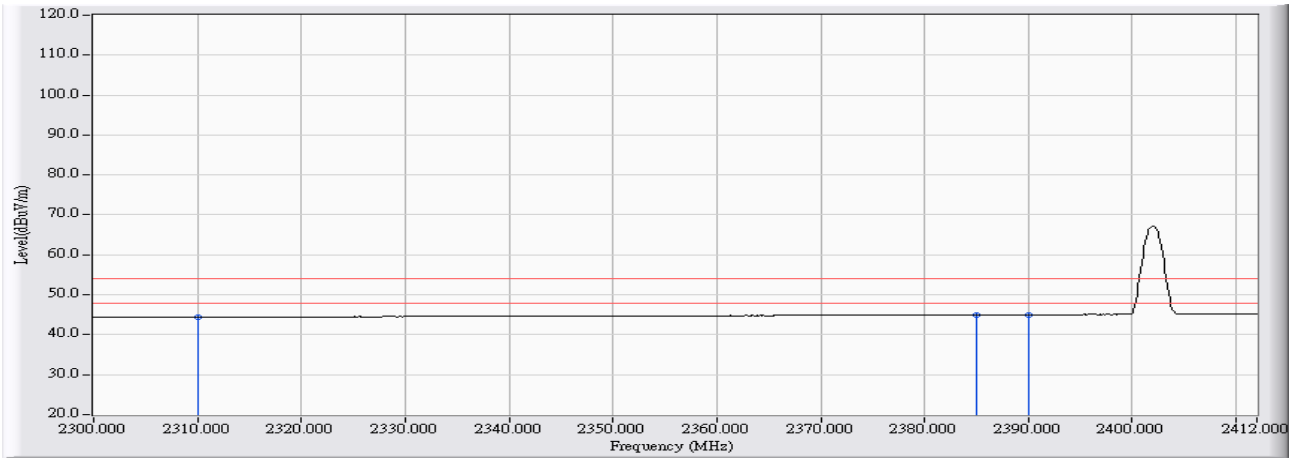



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2310.000 | 27.862 | 28.255 | 56.117 | -17.883 | 74.000 | PEAK |
| 2 | * | 2357.792 | 27.986 | 31.131 | 59.117 | -14.883 | 74.000 | PEAK |
| 3 | | 2390.000 | 28.069 | 28.447 | 56.516 | -17.484 | 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 : 2013/10/04 - 11:20** |
| **Limit : FCC_SpartC_15.209_03M_AV** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2402MHz** |

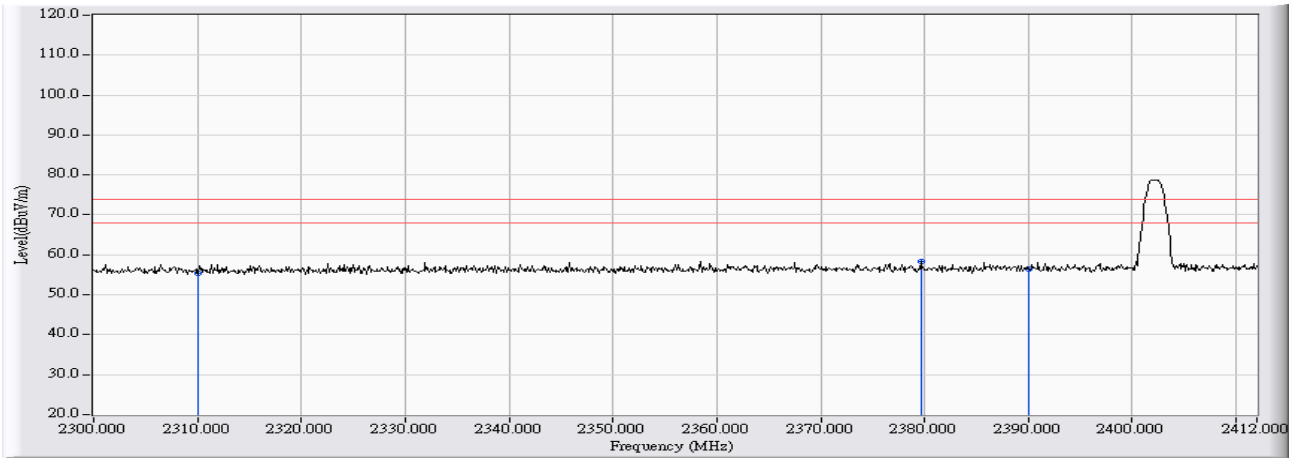



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2310.000 | 27.862 | 16.590 | 44.452 | -9.548 | 54.000 | AVERAGE |
| 2 | | 2385.008 | 28.056 | 16.909 | 44.965 | -9.035 | 54.000 | AVERAGE |
| 3 | * | 2390.000 | 28.069 | 16.956 | 45.025 | -8.975 | 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 : 2013/10/04 - 11:23** |
| **Limit : FCC_SpartC_15.209_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2402MHz** |

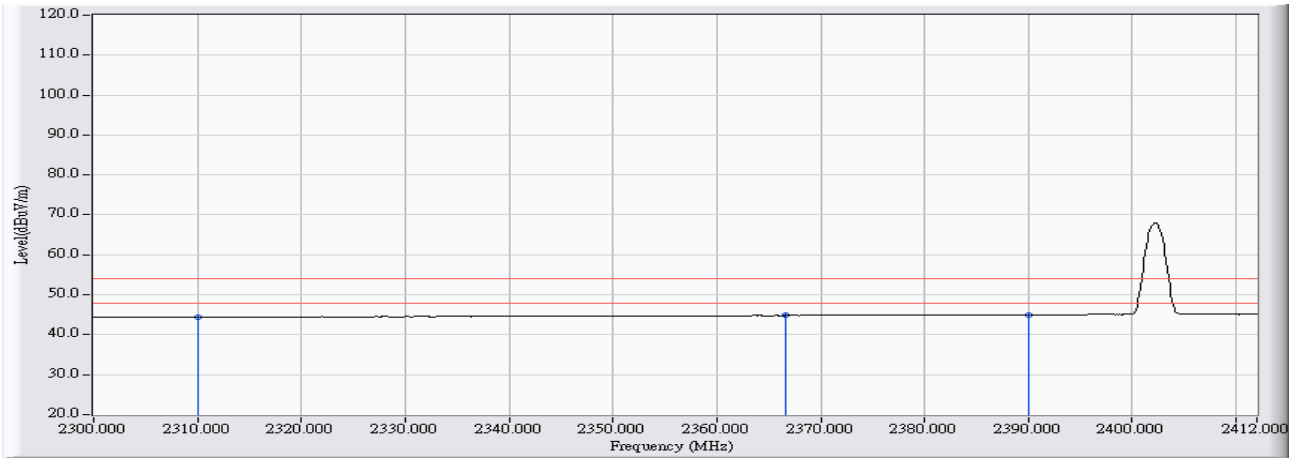



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2310.000 | 27.862 | 27.618 | 55.480 | -18.520 | 74.000 | PEAK |
| 2 | * | 2379.632 | 28.042 | 30.379 | 58.421 | -15.579 | 74.000 | PEAK |
| 3 | | 2390.000 | 28.069 | 28.423 | 56.492 | -17.508 | 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 : 2013/10/04 - 11:23** |
| **Limit : FCC_SpartC_15.209_03M_AV** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2402MHz** |

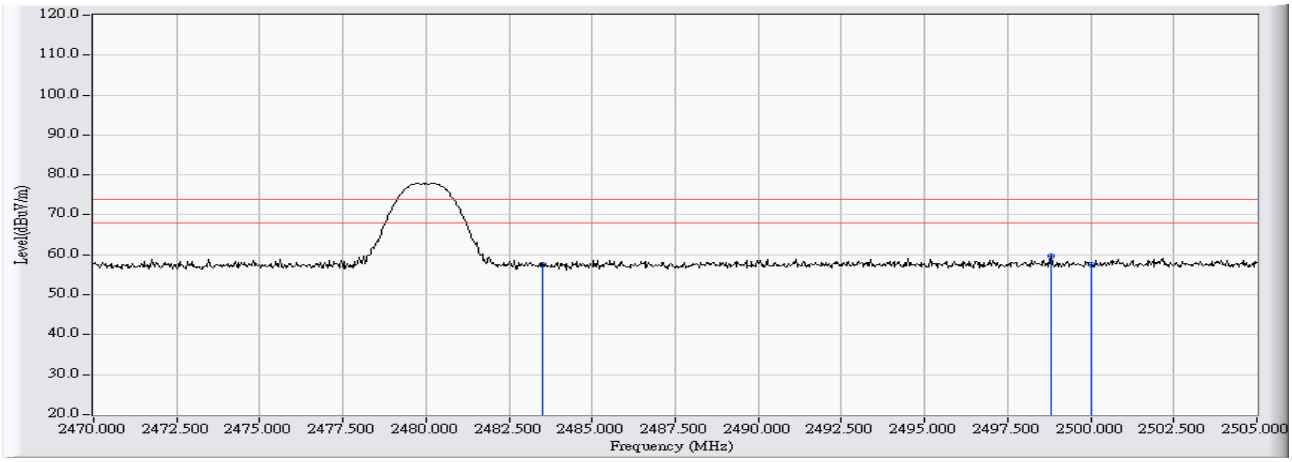



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2310.000 | 27.862 | 16.611 | 44.473 | -9.527 | 54.000 | AVERAGE |
| 2 | | 2366.640 | 28.008 | 16.797 | 44.805 | -9.195 | 54.000 | AVERAGE |
| 3 | * | 2390.000 | 28.069 | 16.926 | 44.995 | -9.005 | 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 : 2013/10/04 - 11:36** |
| **Limit : FCC_SpartC_15.209_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2480MHz** |

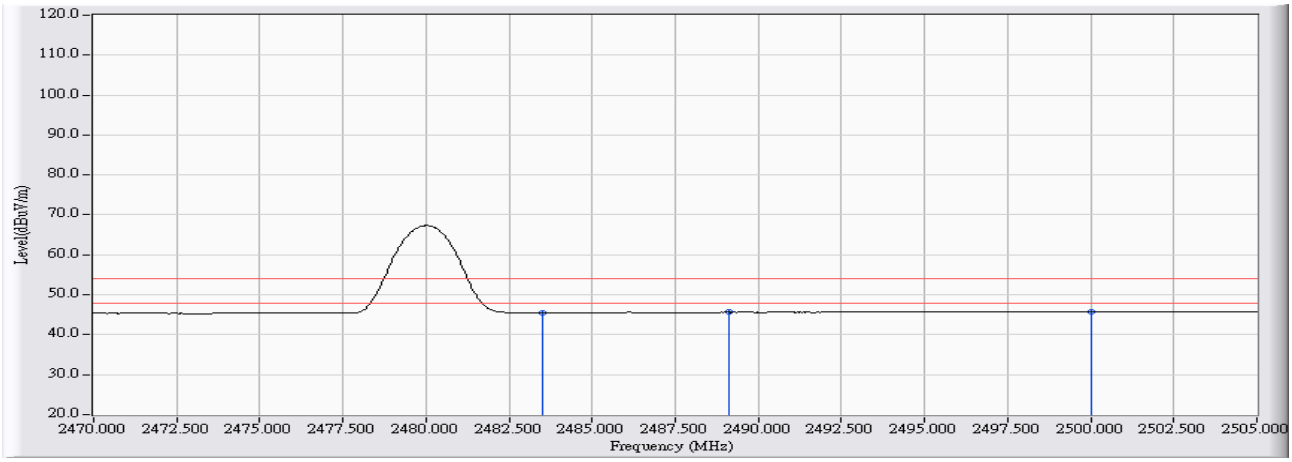



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2483.500 | 28.311 | 29.218 | 57.529 | -16.471 | 74.000 | PEAK |
| 2 | * | 2498.805 | 28.352 | 31.215 | 59.567 | -14.433 | 74.000 | PEAK |
| 3 | | 2500.000 | 28.357 | 29.091 | 57.447 | -16.553 | 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 : 2013/10/04 - 11:36** |
| **Limit : FCC_SpartC_15.209_03M_AV** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2480MHz** |

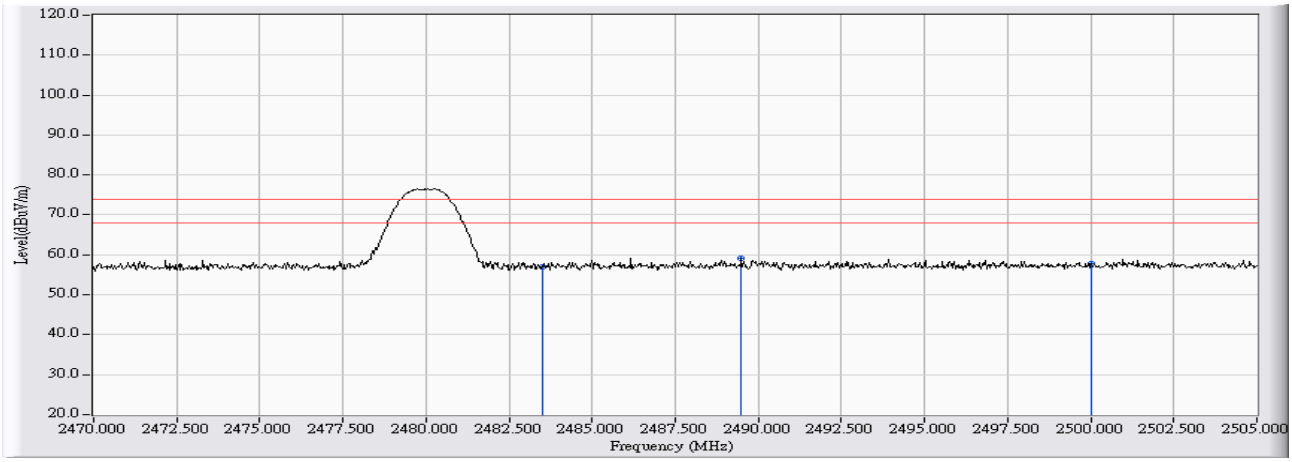



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2483.500 | 28.311 | 17.197 | 45.508 | -8.492 | 54.000 | AVERAGE |
| 2 | | 2489.110 | 28.325 | 17.302 | 45.627 | -8.373 | 54.000 | AVERAGE |
| 3 | * | 2500.000 | 28.357 | 17.366 | 45.722 | -8.278 | 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 : 2013/10/04 - 11:39** |
| **Limit : FCC_SpartC_15.209_03M_PK** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2480MHz** |

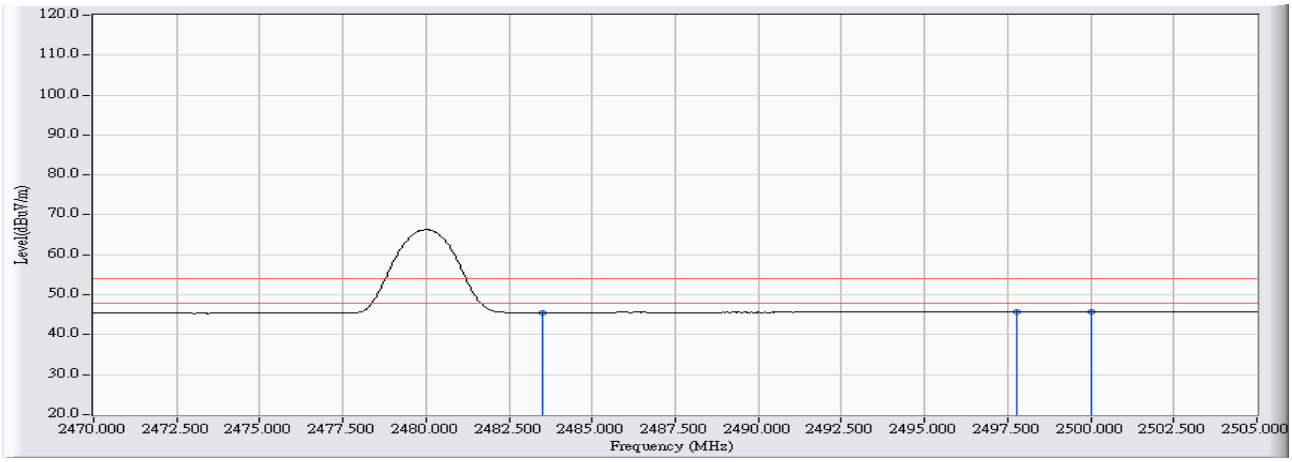



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2483.500 | 28.311 | 28.632 | 56.943 | -17.057 | 74.000 | PEAK |
| 2 | * | 2489.495 | 28.326 | 30.837 | 59.163 | -14.837 | 74.000 | PEAK |
| 3 | | 2500.000 | 28.357 | 29.544 | 57.900 | -16.100 | 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 : 2013/10/04 - 11:40** |
| **Limit : FCC_SpartC_15.209_03M_AV** | **Margin : 6** |
| **Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL** | **Power : DC 3.7V** |
| **EUT : Band** | **Note : Mode 1: Transmit_2480MHz** |




| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2483.500 | 28.311 | 17.196 | 45.507 | -8.493 | 54.000 | AVERAGE |
| 2 | | 2497.755 | 28.349 | 17.335 | 45.684 | -8.316 | 54.000 | AVERAGE |
| 3 | * | 2500.000 | 28.357 | 17.398 | 45.754 | -8.246 | 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

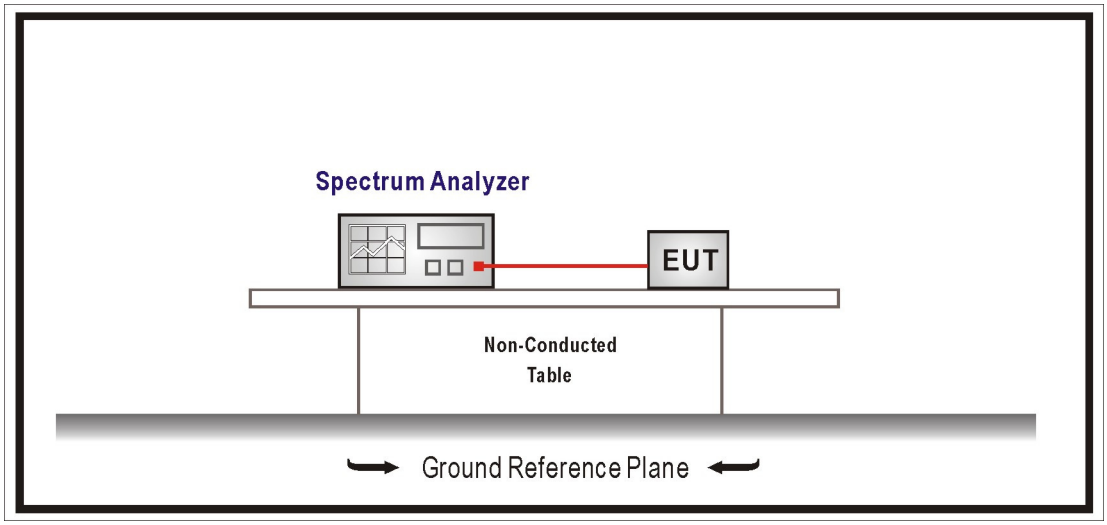
The following test equipment is used during the test:

Occupied Bandwidth / SR7

| Instrument | Manufacturer | Model No. | Serial No | Next Cal. Date |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | N9010A-EXA | US47140172 | 2014/08/05 |

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

## 7.2. Test Setup




## 7.3. Limits

The 6 dB bandwidth must be greater than 500 kHz.

## 7.4. Test Procedures

The EUT was setup according to ANSI C63.4: 2009; tested according to DTS test procedure of KDB558074 D01V03R01 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 1% of EBW, Span greater than RBW.

## 7.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

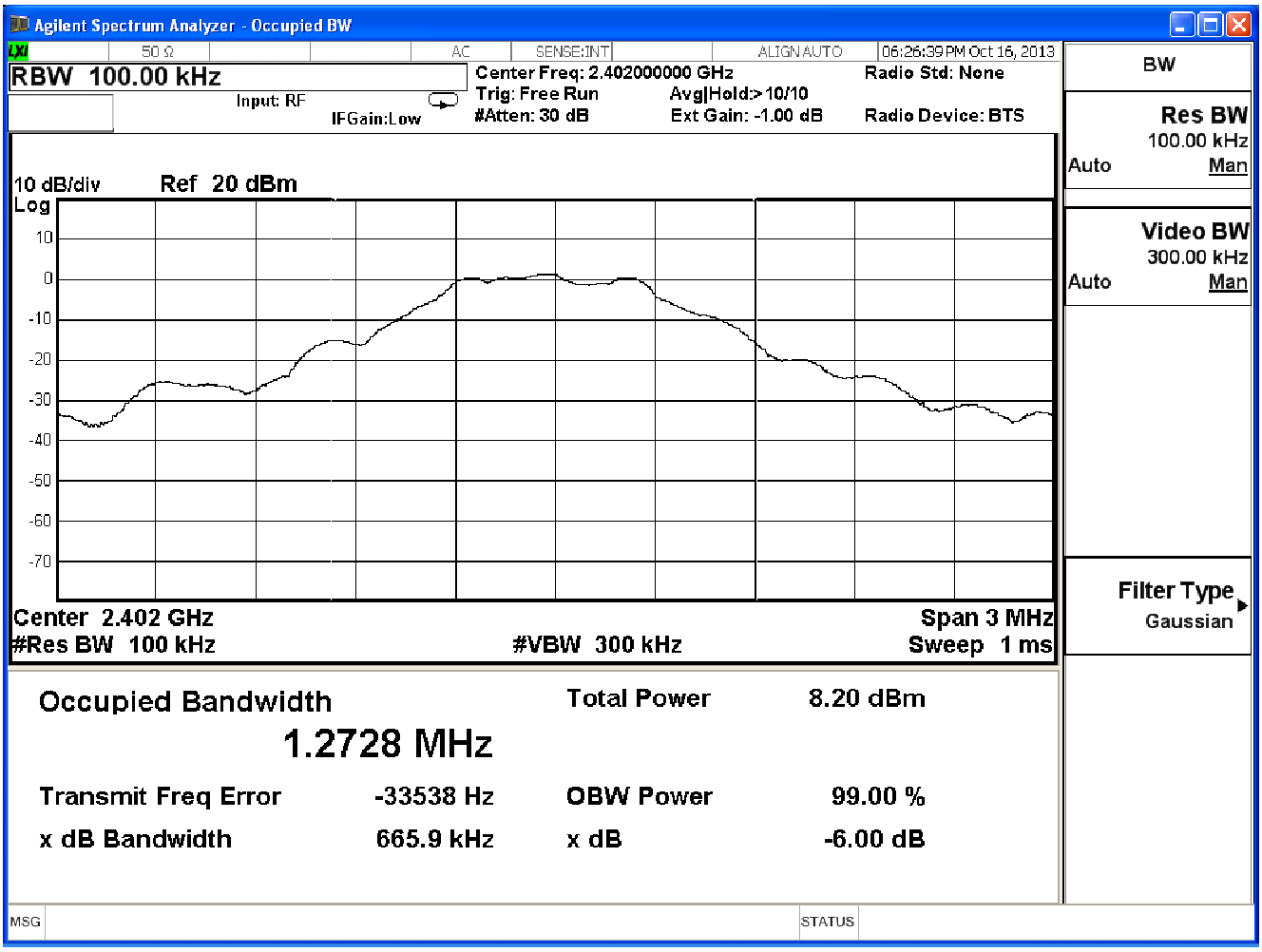
## 7.6. Test Result

| Product | Band | | |
|---|---|---|---|
| Test Item | Occupied Bandwidth | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/16 | Test Site | SR7 |

**GFSK**

| Channel No. | Frequency (MHz) | Measure Level (KHz) | Limit (KHz) | Result |
|---|---|---|---|---|
| 0 | 2402 | 665.9 | ≧500 | Pass |

**Channel 0**

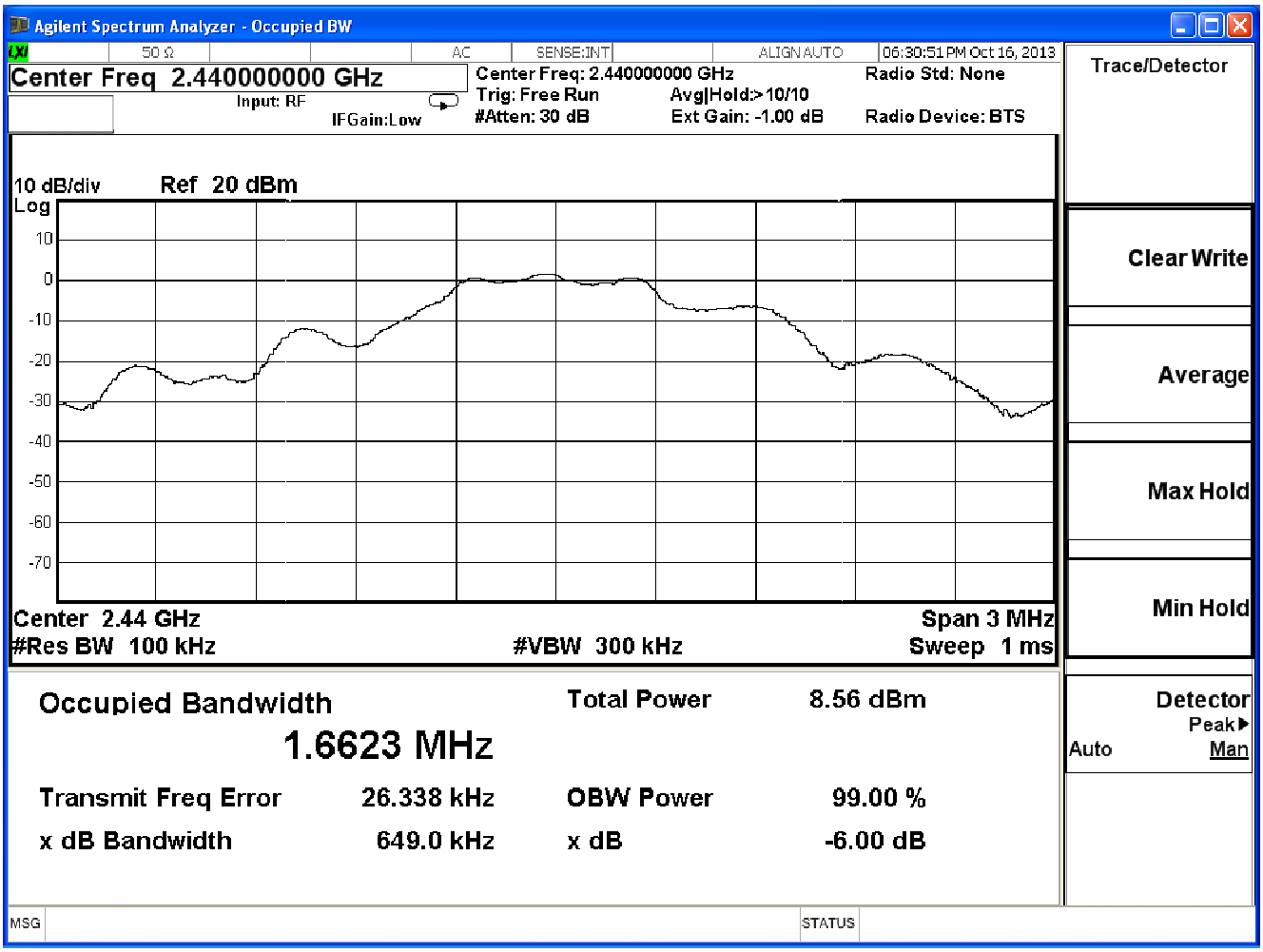


| Product | Band | | |
|---|---|---|---|
| Test Item | Occupied Bandwidth | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/16 | Test Site | SR7 |

**GFSK**

| Channel No. | Frequency (MHz) | Measure Level (KHz) | Limit (KHz) | Result |
|---|---|---|---|---|
| 19 | 2440 | 649.0 | ≧500 | Pass |

**Channel 19**

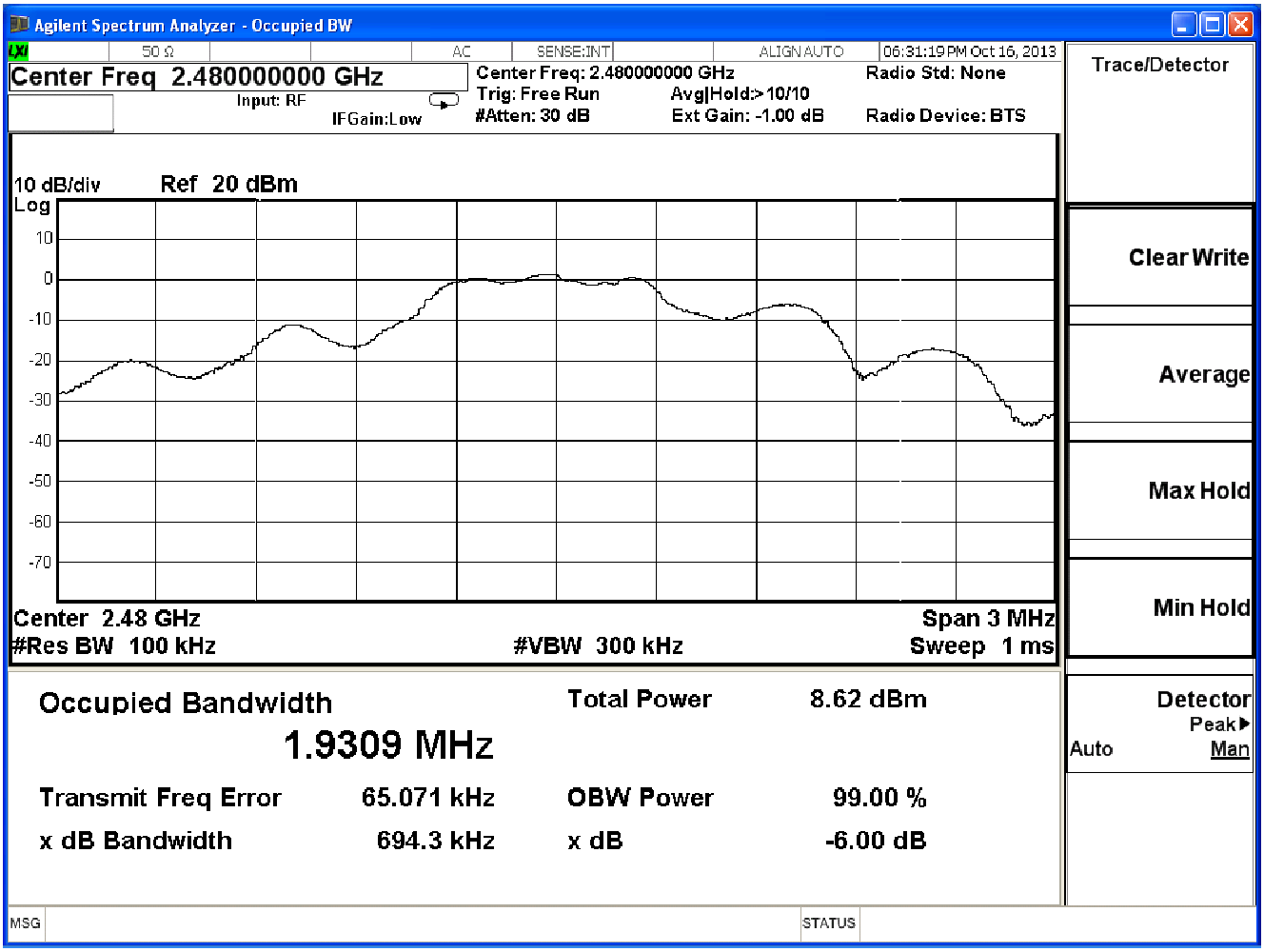


| Product | Band | | |
|---|---|---|---|
| Test Item | Occupied Bandwidth | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/16 | Test Site | SR7 |

**GFSK**

| Channel No. | Frequency (MHz) | Measure Level (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|
| 39 | 2480 | 694.3 | ≧500 | Pass |

**Channel 39**



# 8. Power Density

## 8.1. Test Equipment

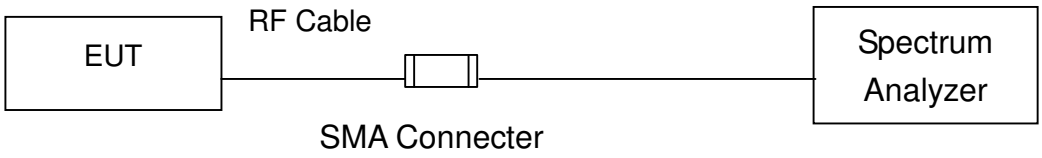
The following test equipment is used during the test:

Power Density / SR7

| Instrument | Manufacturer | Model No. | Serial No | Next Cal. Date |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | N9010A-EXA | US47140172 | 2014/08/05 |

Note: 1. 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 C63.4: 2009; tested according to DTS test procedure of KDB558074 D01V03R01 for compliance to FCC 47CFR 15.247 requirements.

## 8.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

## 8.6. Uncertainty

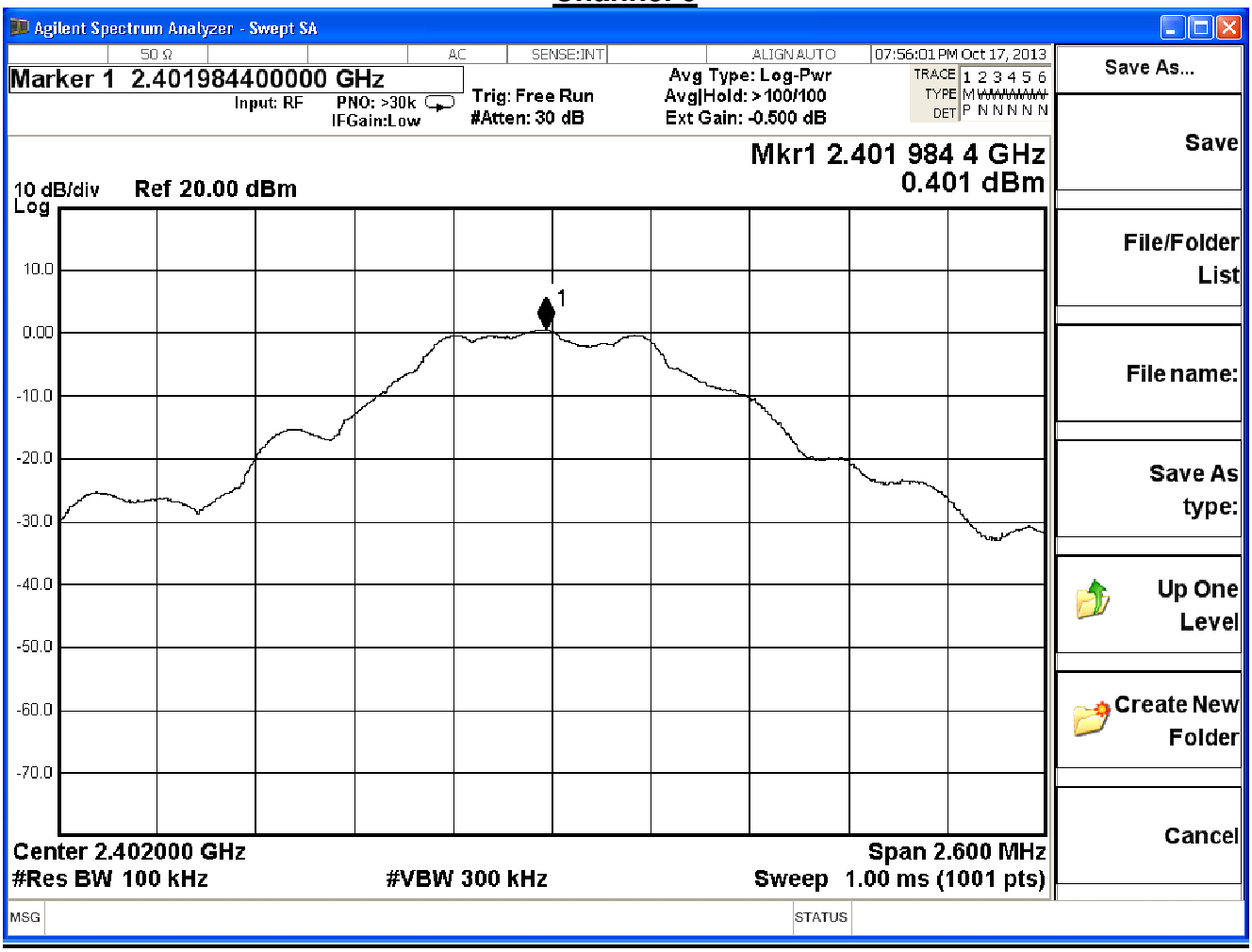
The measurement uncertainty is defined as ±1.27dB.

## 8.7. Test Result

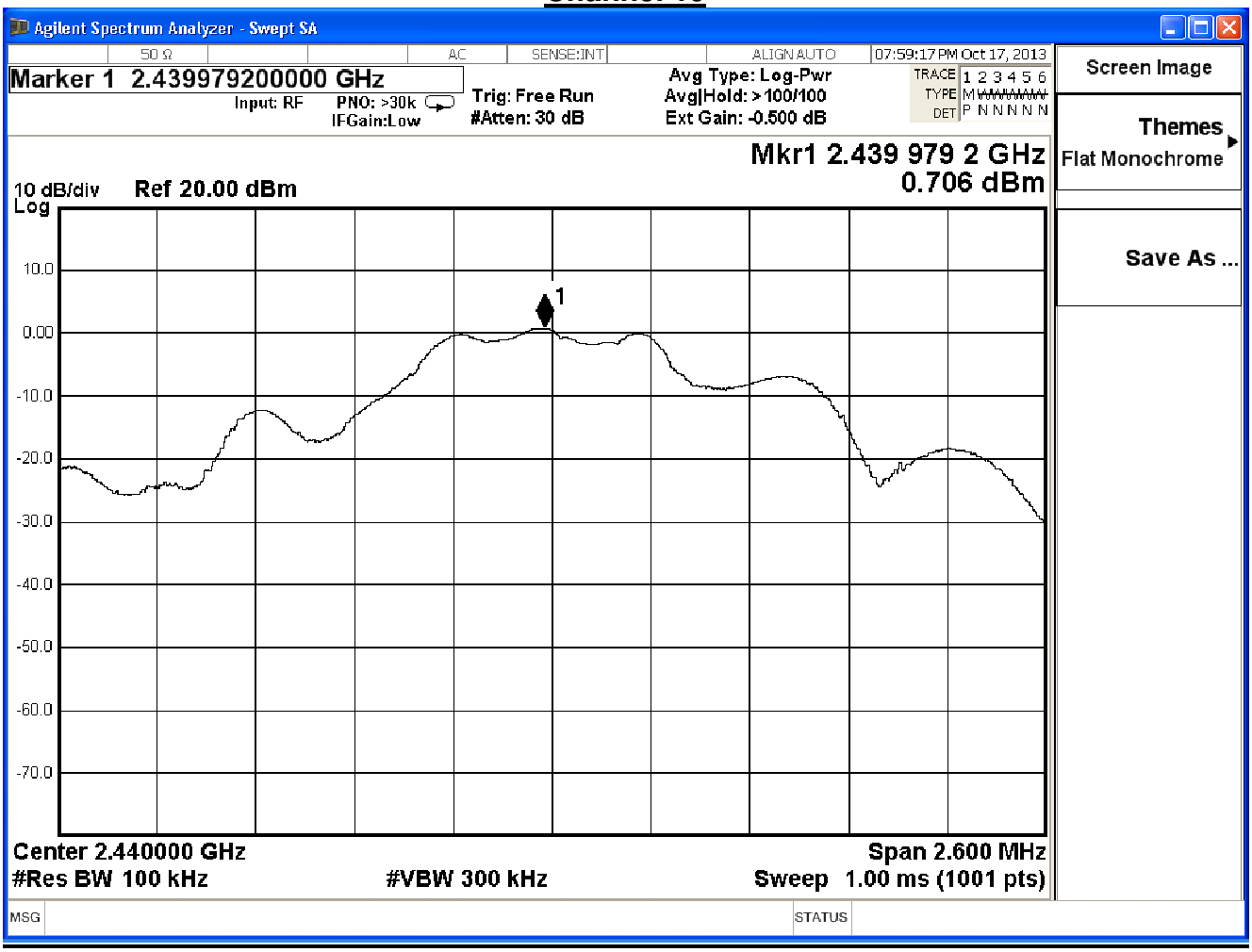
| Product | Band | | |
|---|---|---|---|
| Test Item | Power Density | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/10/17 | Test Site | SR7 |

| Channel No. | Frequency (MHz) | Measurement (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 0 | 2402 | 0.40 | ≦8 | Pass |
| 19 | 2440 | 0.71 | ≦8 | Pass |
| 39 | 2480 | 0.51 | ≦8 | Pass |

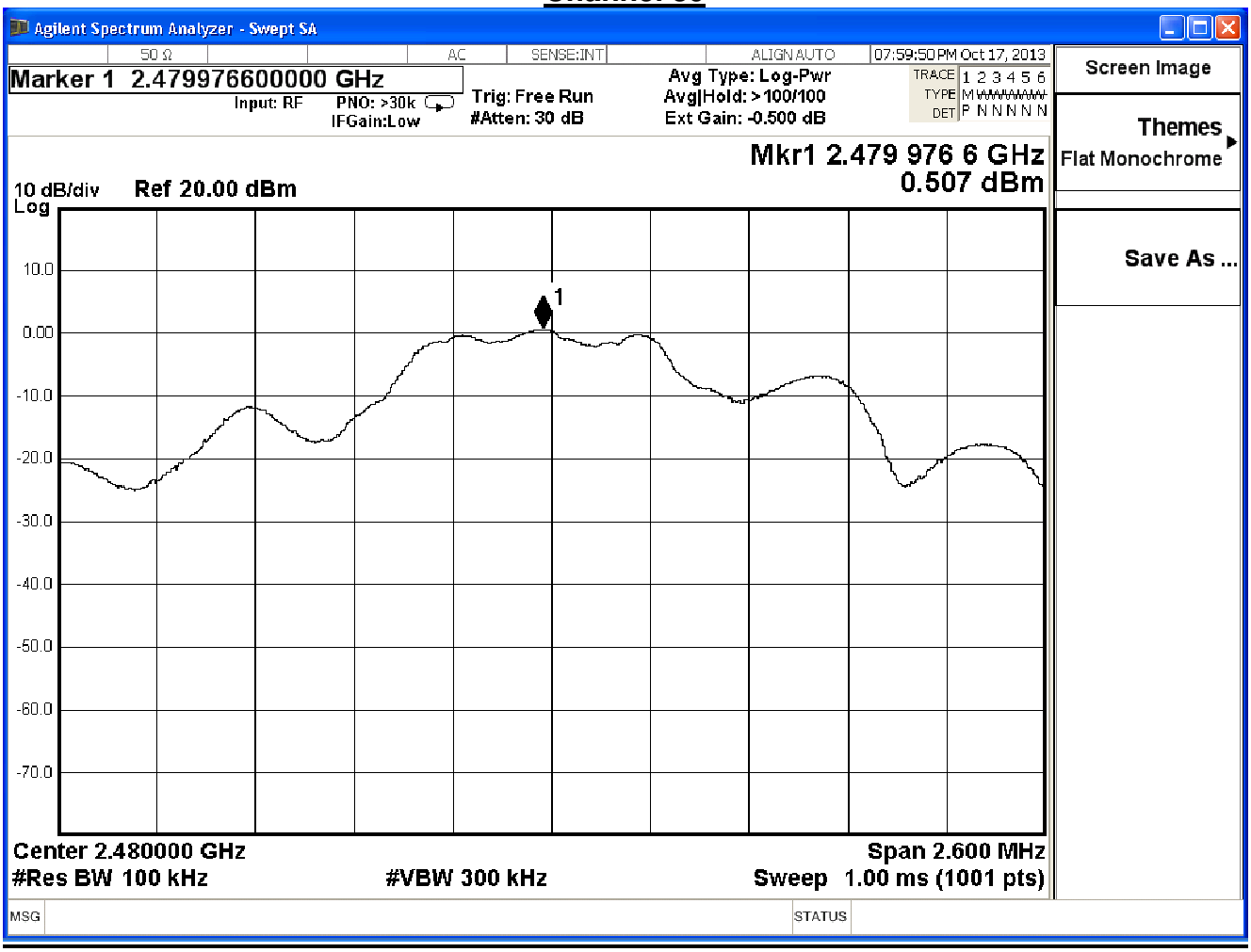
**Channel 0**



## Channel 19


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
07:59:17 PM Oct 17, 2013
Marker 1 2.439979200000 GHz
Input: RF
PNO: >30k
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: >100/100
Ext Gain: -0.500 dB
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.439 979 2 GHz
0.706 dBm
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
1
Center 2.440000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 2.600 MHz
Sweep 1.00 ms (1001 pts)
MSG
STATUS
Screen Image
Themes
Flat Monochrome
Save As ...

## Channel 39


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
07:59:50 PM Oct 17, 2013
Marker 1 2.479976600000 GHz
Input: RF
PNO: >30k
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: >100/100
Ext Gain: -0.500 dB
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.479 976 6 GHz
0.507 dBm
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
1
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 2.600 MHz
Sweep 1.00 ms (1001 pts)
MSG
STATUS
Screen Image
Themes
Flat Monochrome
Save As ...

# 9. Duty Cycle

## 9.1. Test Equipment

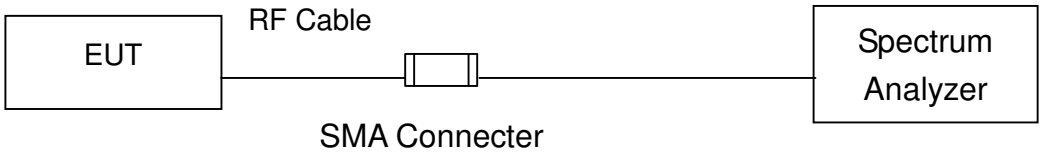
The following test equipment is used during the test:

Power Density / SR7

| Instrument | Manufacturer | Model No. | Serial No | Next Cal. Date |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | N9010A-EXA | US47140172 | 2014/08/05 |

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

## 9.2. Test Setup




## 9.3. Limits

The duty cycle of greater than or equal to 98%.

## 9.4. Test Procedures

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal.

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

## 9.5. Test Specification

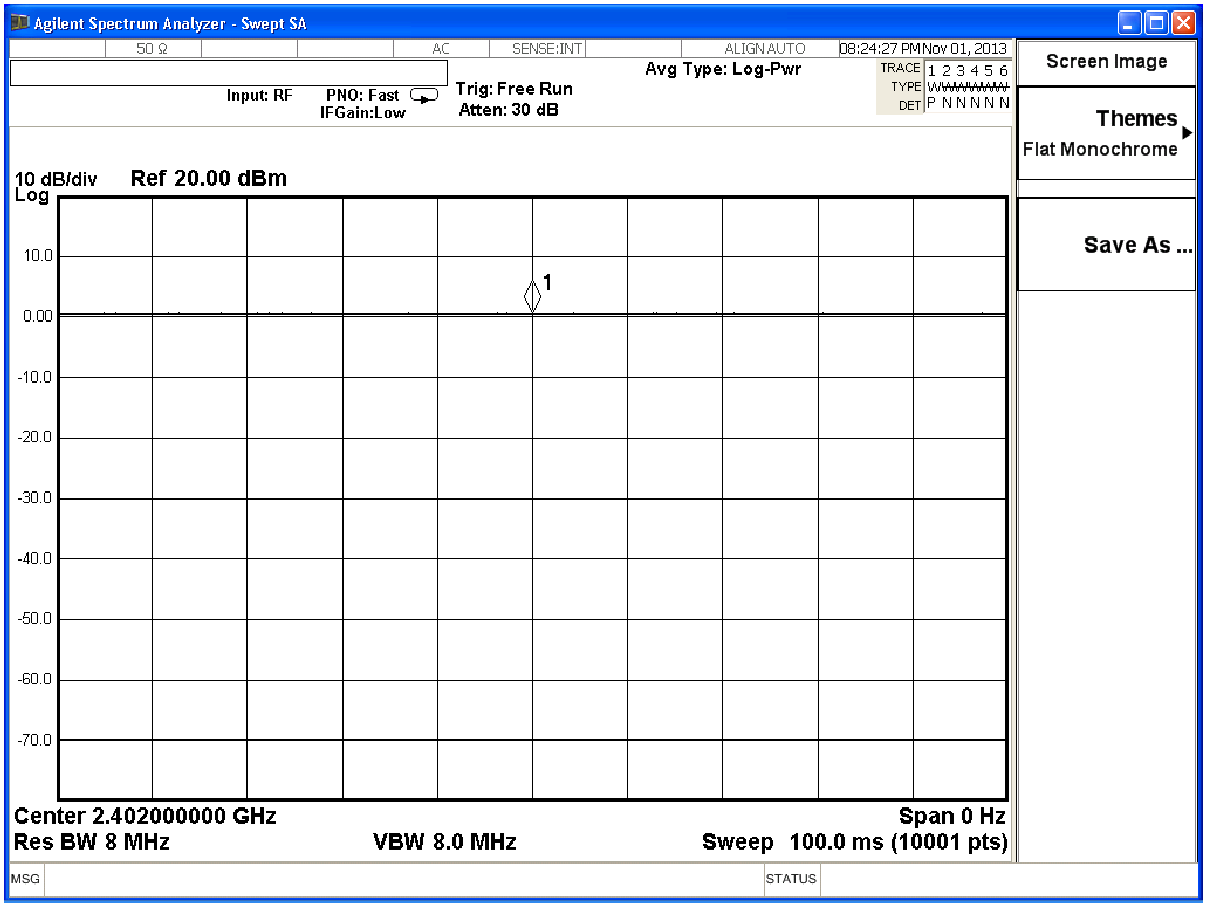
According to FCC Part 15 Subpart C Paragraph 15.247

## 9.6. Test Result

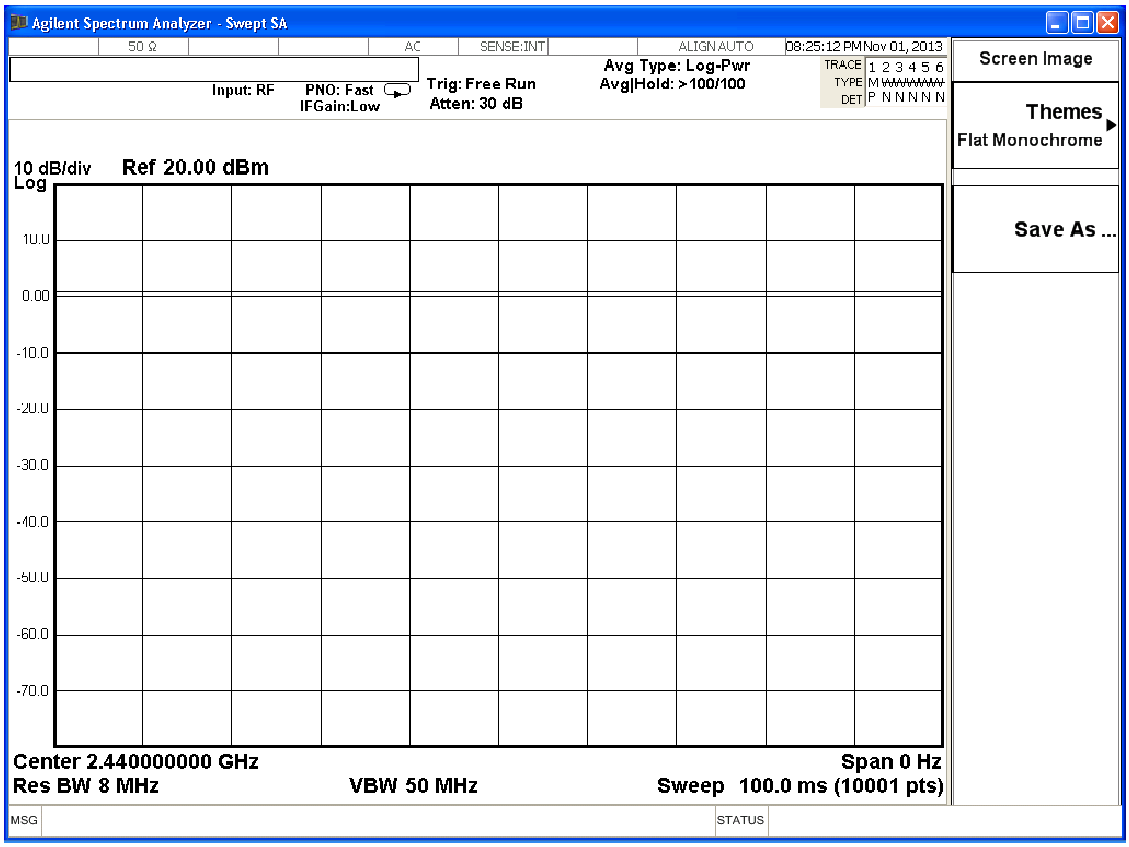
| Product | Band | | |
|---|---|---|---|
| Test Item | Duty Cycle | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2013/11/1 | Test Site | SR7 |

| Channel No. | Frequency (MHz) | Measurement (%) | Limit (%) | Result |
|---|---|---|---|---|
| 0 | 2402 | 100 | ≧98% | Pass |
| 19 | 2440 | 100 | ≧98% | Pass |
| 39 | 2480 | 100 | ≧98% | Pass |

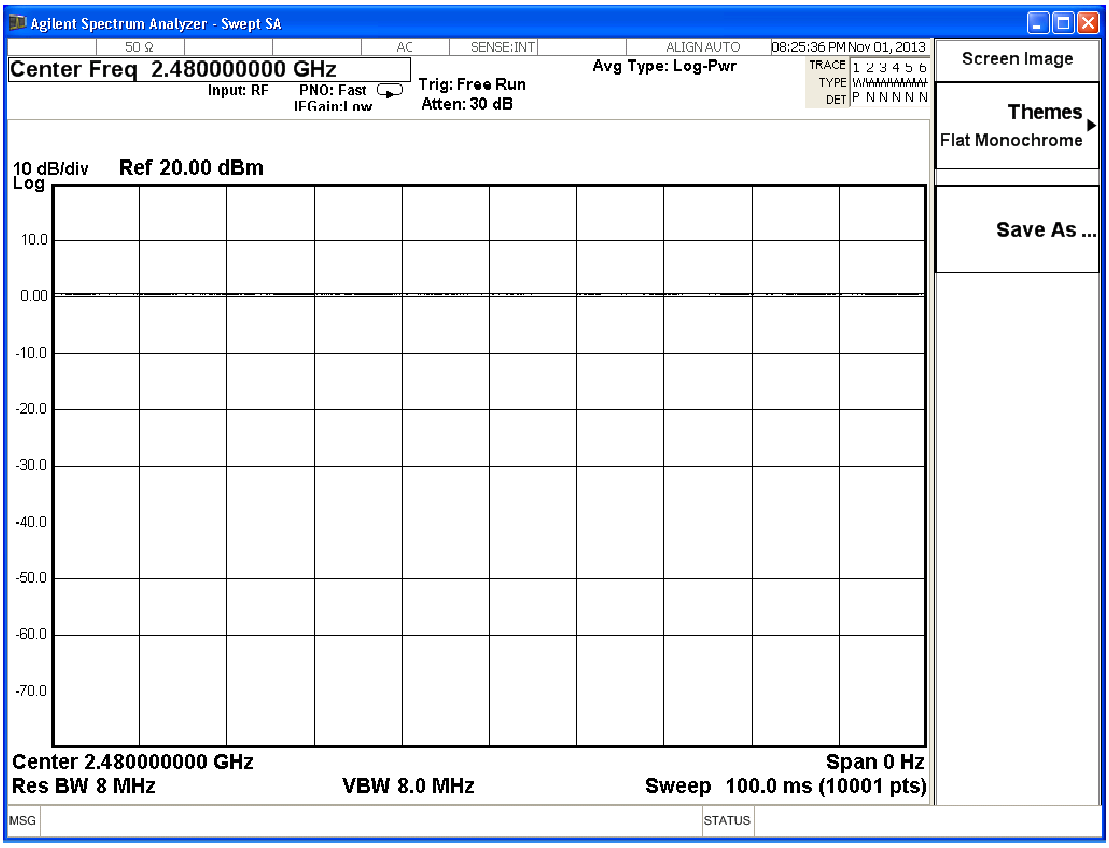
**Channel 0**



## Channel 19


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
08:25:12 PM Nov 01, 2013
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: >100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Screen Image
Themes
Flat Monochrome
Save As ...
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
Center 2.440000000 GHz
Res BW 8 MHz
VBW 50 MHz
Span 0 Hz
Sweep 100.0 ms (10001 pts)
MSG
STATUS

## Channel 39


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
08:25:36 PM Nov 01, 2013
Center Freq 2.480000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Screen Image
Themes
Flat Monochrome
Save As ...
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
Center 2.480000000 GHz
Res BW 8 MHz
VBW 8.0 MHz
Span 0 Hz
Sweep 100.0 ms (10001 pts)
MSG
STATUS