FCC Test Report

Product Name ： PAJ2801UA-40 Wireless BLE 4.0 Module

Trade Name ： PixArt

Model No. ： PAJ2801UA-40

FCC ID. ： 2AIPB-PAJ2801UA-40

Applicant ： PixArt Imaging Inc.

Address ： No.5 Innovation Rd. I, Hsinchu Science Park, Hsinchu 300, Taiwan, R.O.C.

Date of Receipt ： Jun. 21, 2016

Issued Date ： Jul. 19, 2016

Report No. ： 1660453R-RFUSP01V00

Report Version ： V1.0

Testing Laboratory
3024

Test Report Certification

Issued Date : Jul. 19, 2016
Report No. : 1660453R-RFUSP01V00

Product Name	:	PAJ2801UA-40 Wireless BLE 4.0 Module
Applicant	:	PixArt Imaging Inc.
Address	:	No.5 Innovation Rd. I, Hsinchu Science Park, Hsinchu 300, Taiwan, R.O.C.
Model No.	:	PAJ2801UA-40
FCC ID.	:	2AIPB-PAJ2801UA-40
EUT Voltage	:	DC 1.9V~3.6V
Testing Voltage	:	DC 3.3V
Trade Name	:	PixArt
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2015
Test Lab	:	QuieTek Hsin Chu Laboratory
Test Result	:	Complied

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

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

Tested By : (JuBo Shen / Senior Engineer)

Approved By : (Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
1660453R-RFUSP01V00	V1.0	Initial issue of report	Jul. 19, 2016

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: 834100**
Canada	**:**	**IC, Submission No: 181665 / IC Registration Number: 4075C-4**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site:
http://www.quietek.com/english/about/certificates.aspx?bval=5
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site :
http://www.quietek.com/index_en.aspx
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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:

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.

TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

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1. General Information

1.1. EUT Description

Product Name	PAJ2801UA-40 Wireless BLE 4.0 Module
Trade Name	PixArt
Model No.	PAJ2801UA-40

Frequency Range/Channel Number	2402~2480MHz / 40 Channels
Type of Modulation	GFSK
Antenna Type	Printed
Antenna Gain	0dBi

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	2416 MHz	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 PAJ2801UA-40 Wireless BLE 4.0 Module is a Wireless BLE Module including 2.4G 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.

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	
Test Mode	Mode 1: Transmit Mode
Final Test Mode	
Test Mode	Mode 1: Transmit Mode

Test Items	Mode	Modulation	Channel	Antenna	Result
Conducted Emission	N/A	GFSK	19	0	N/A
Peak Power Output	1	GFSK	00/19/39	0	Complies
Radiated Emission	1	GFSK	00/19/39	0	Complies
RF antenna conducted test	1	GFSK	00/19/39	0	Complies
Radiated Emission Band Edge	1	GFSK	00/39	0	Complies
Occupied Bandwidth	1	GFSK	00/19/39	0	Complies
Power Density	1	GFSK	00/19/39	0	Complies

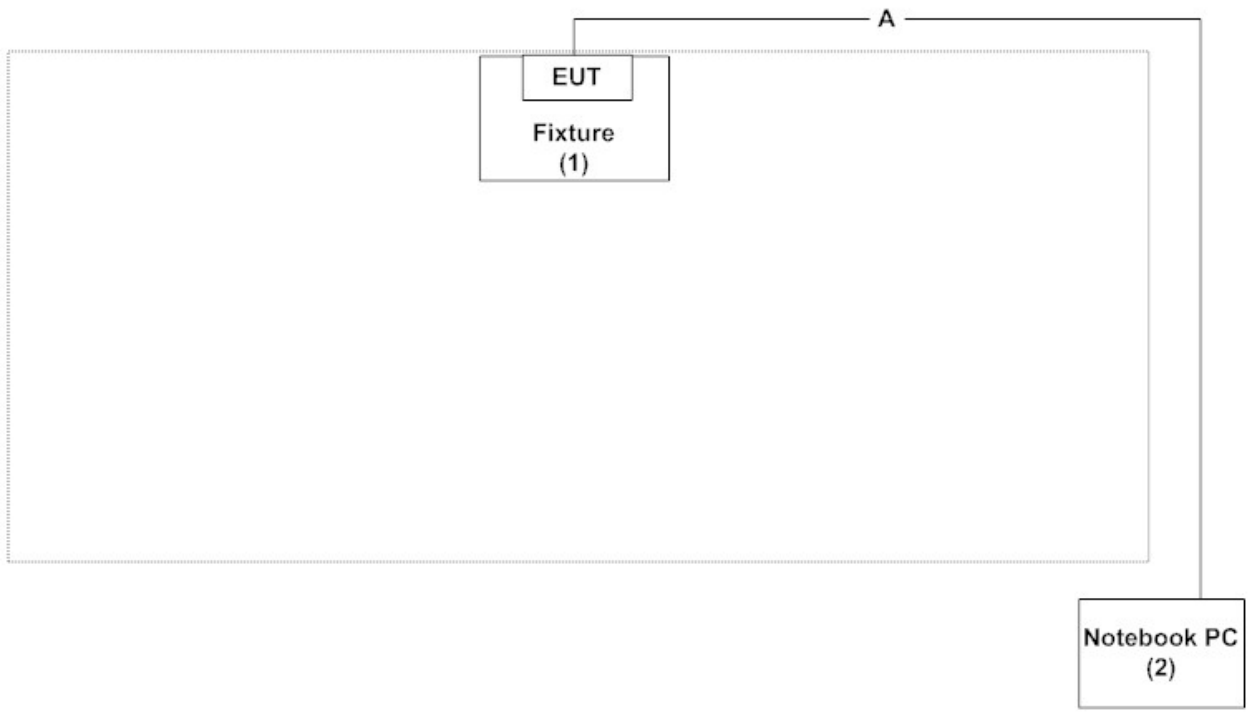
1.3. Tested System Details

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

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Fixture	PixArt	PST-MD-2801-EVB	N/A	DoC	--
2	Notebook PC	ACER	MS2296	LUSCV021391150332C2000	DoC	Non-Shielded, 2.5m one ferrite core bonded

1.4. Configuration of tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 3m

1.5. EUT Exercise Software

1	Setup the EUT as shown in Section 1.4.
2	Execute the Pixart BLE Utillity V1.0.0 on the EUT.
3	Configure the test mode, the test channel, and the data rate.
4	Press “Start TX” to start the continuous transmitting.
5	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 15.207 Conducted Emission	15 - 35	20
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	24
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	24
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	24
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Power Density	15 - 35	24
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000

2. Conducted Emission

2.1. Test Equipment

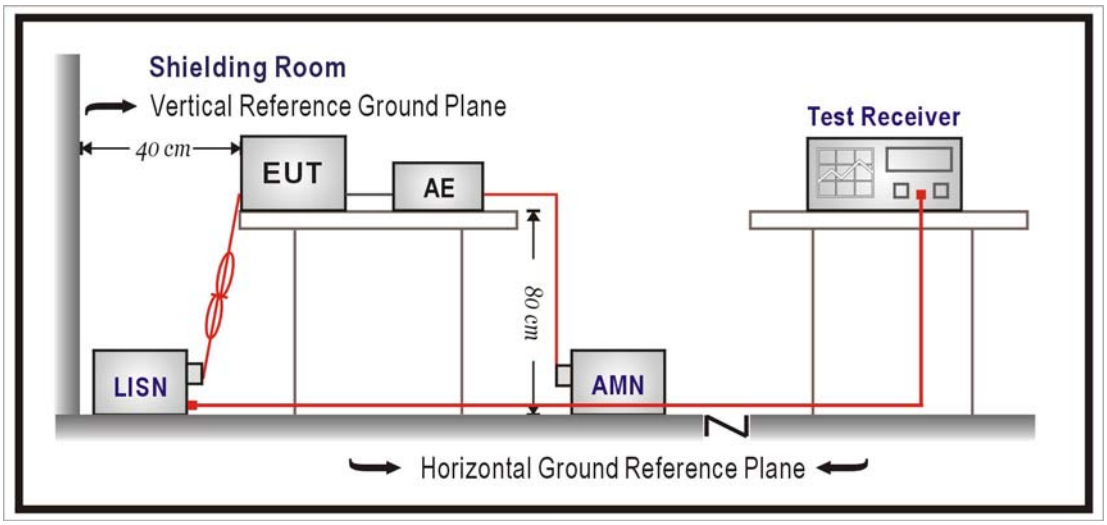
The following test equipments are used during the test:

Conducted Emission / SR2

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2017/01/20
LISN	R&S	ENV216	100092	2016/08/17
Test Receiver	R&S	ESCS 30	825442/014	2016/07/16

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

2.2. Test Setup



2.3. Limits

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

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

2.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs.)
Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207: 2015

2.6. Uncertainty

The measurement uncertainty is defined as ± 2.26 dB.

2.7. Test Result

Owing to the DC operation of EUT, this test item is not performed.

3. Peak Power Output

3.1. Test Equipment

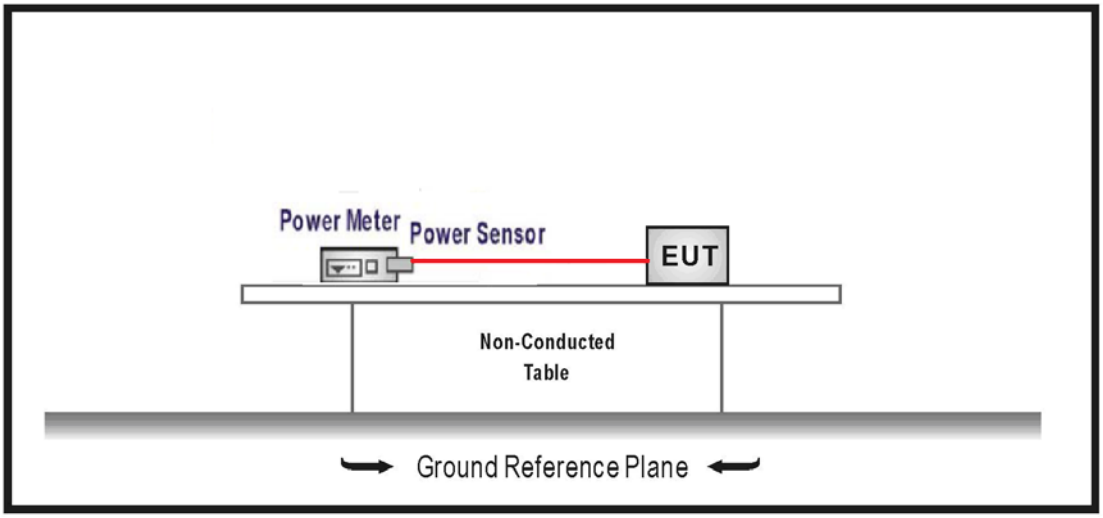
The following test equipment is used during the test:

Peak Power Output / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Power Meter	Agilent	N1911A	MY45101353	2016/10/11
Power Sensor	Agilent	N1921A	MY45241670	2016/10/11

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 C63.10: 2013; tested according to DTS test procedure of KDB558074 v03r05 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	PAJ2801UA-40 Wireless BLE 4.0 Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2016/06/30	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	1.47	≦30	Pass
19	2440	2.37	≦30	Pass
39	2480	1.97	≦30	Pass

4. Radiated Emission

4.1. Test Equipment

The following test equipments are used during the test:

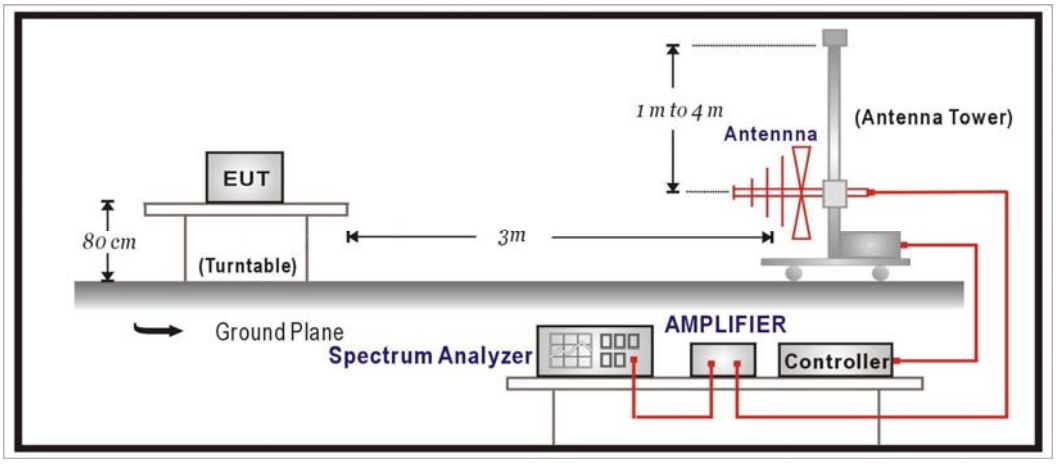
Radiated Emission / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Bilog Antenna	Schaffner	CBL6112B	2895	2016/08/14
Double Ridged Guide Horn Antenna	Schwarzbeck	BBHA 9120	D743	2017/01/14
Pre-Amplifier	EMCI	EMC0031835	4583/10/13	2017/01/26
Pre-Amplifier	QuieTek	AP-025C	CHM-0706049	2017/01/03
Spectrum Analyzer	Agilent	E4440A	MY46187335	2016/12/24
k Type Cable	Huber+Suhner	SF 102	25623/2	2017/01/11
Horn Antenna	Schwarzbeck	BBHA 9170	203	2016/09/07
Signal & Spectrum Analyzer	R&S	FSV40	101049	2017/01/05

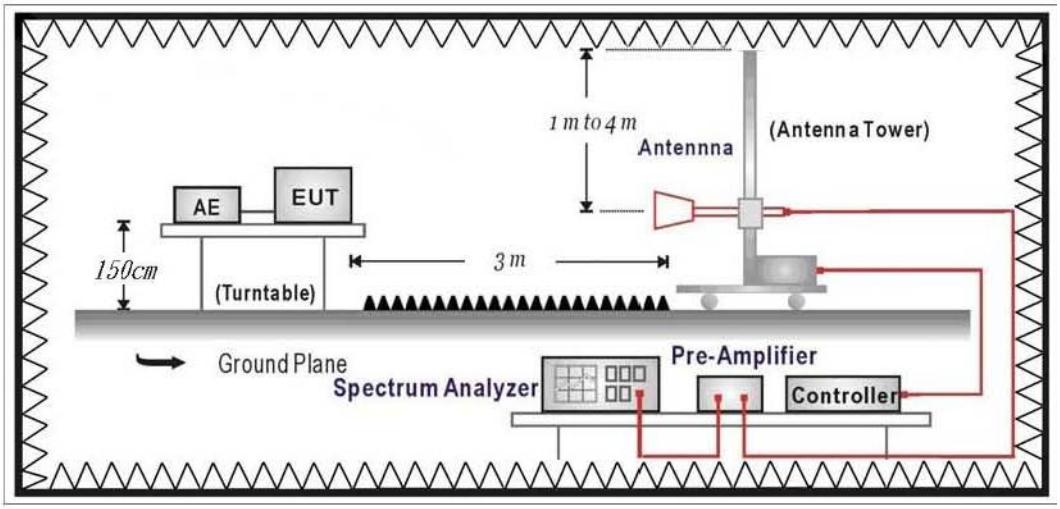
Note: All equipments that need to calibrate are with calibration period of 1 year.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limits

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

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	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 C63.10: 2013 and tested according to DTS test procedure of KDB558074 v03r05 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(under 1GHz) or 1.5 meter above ground (above 1GHz). 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: 2013 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.

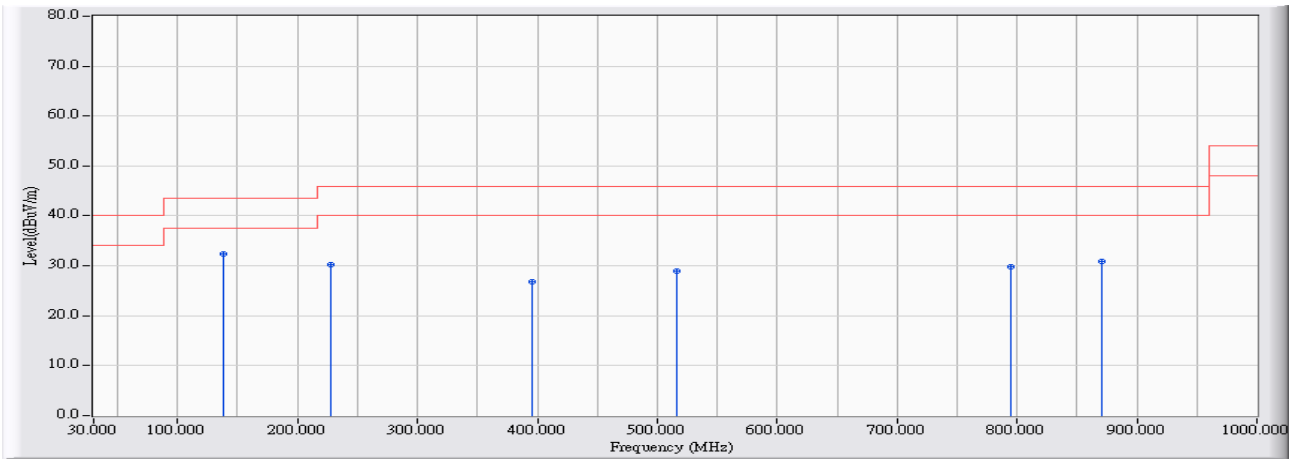
4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

4.6. Test Result

30MHz-1GHz Spurious

Site : CB1	**Time : 2016/06/30 - 06:25**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30M-1G-4_9161 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2402MHz**

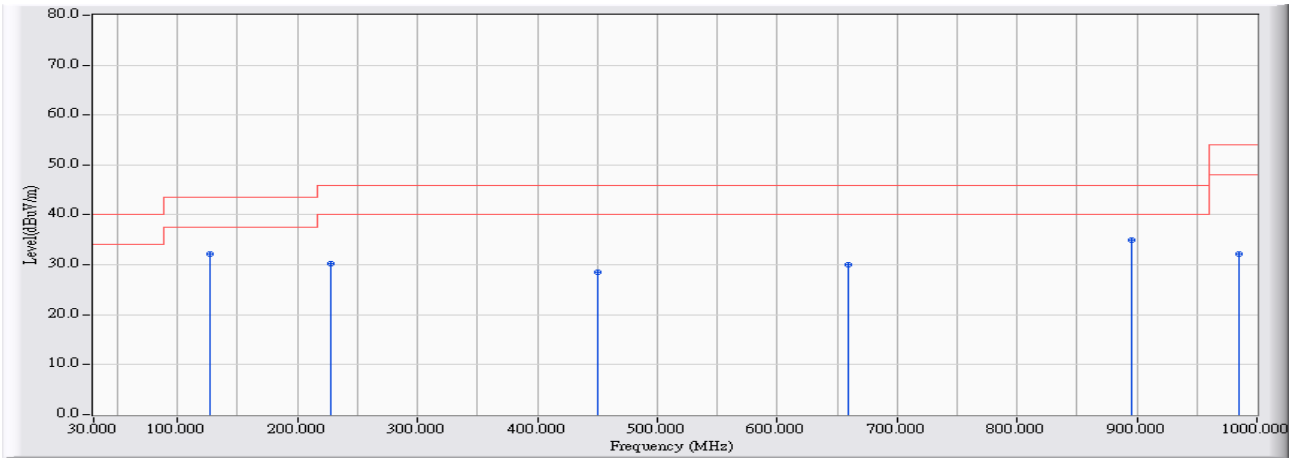


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	138.629	16.668	15.824	32.492	-11.008	43.500	QUASIPEAK
2		227.472	12.875	17.323	30.198	-15.802	46.000	QUASIPEAK
3		395.459	16.330	10.514	26.844	-19.156	46.000	QUASIPEAK
4		515.630	18.387	10.585	28.972	-17.028	46.000	QUASIPEAK
5		794.284	22.332	7.571	29.903	-16.097	46.000	QUASIPEAK
6		870.421	23.130	7.712	30.842	-15.158	46.000	QUASIPEAK

Note:

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

Site : CB1	**Time : 2016/06/30 - 06:29**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30M-1G-4_9161 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2402MHz**

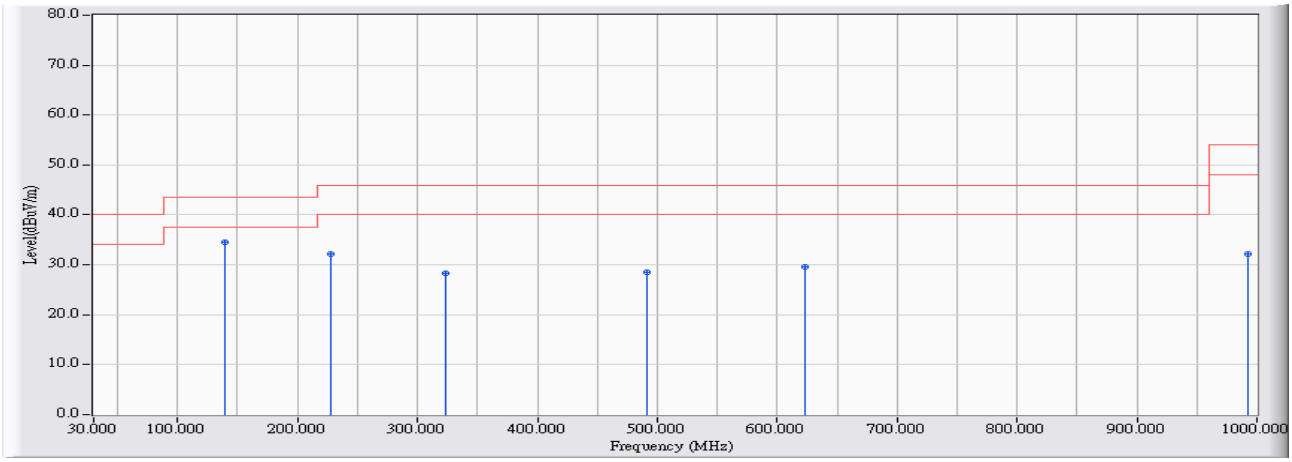


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		126.699	14.738	17.384	32.122	-11.378	43.500	QUASIPEAK
2		227.472	12.875	17.323	30.198	-15.802	46.000	QUASIPEAK
3		450.453	17.563	10.957	28.520	-17.480	46.000	QUASIPEAK
4		659.661	20.718	9.312	30.030	-15.970	46.000	QUASIPEAK
5	*	895.541	23.392	11.661	35.053	-10.947	46.000	QUASIPEAK
6		984.579	24.199	8.012	32.211	-21.789	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 : 2016/06/30 - 06:33**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30M-1G-4_9161 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2440MHz**

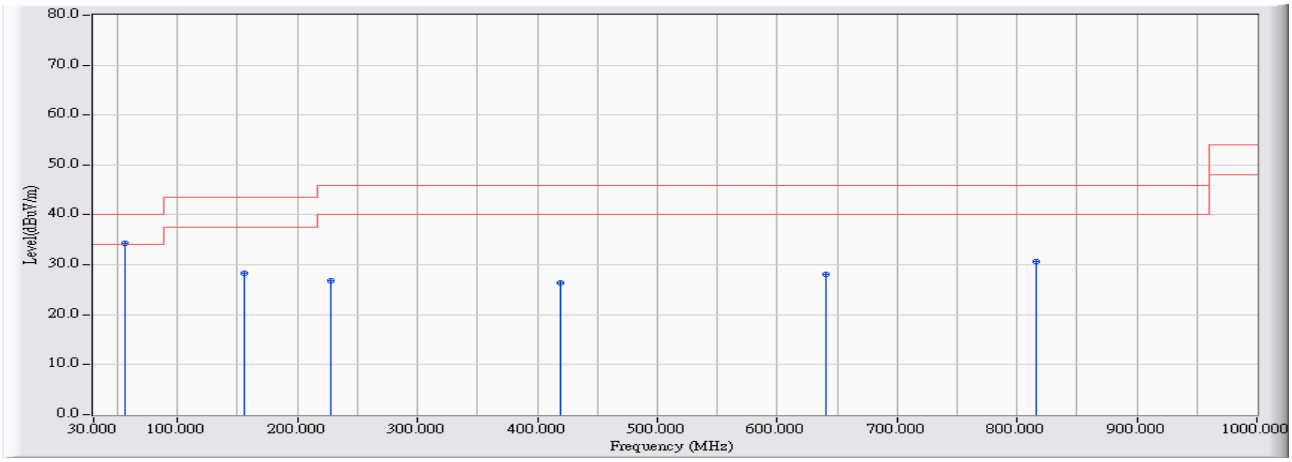


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	139.308	16.792	17.645	34.437	-9.063	43.500	QUASIPEAK
2		227.569	12.873	19.201	32.074	-13.926	46.000	QUASIPEAK
3		323.396	14.779	13.584	28.363	-17.637	46.000	QUASIPEAK
4		491.868	18.010	10.585	28.595	-17.405	46.000	QUASIPEAK
5		623.581	20.252	9.396	29.648	-16.352	46.000	QUASIPEAK
6		993.017	24.275	7.934	32.209	-21.791	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 : 2016/06/30 - 06:35**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30M-1G-4_9161 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2440MHz**

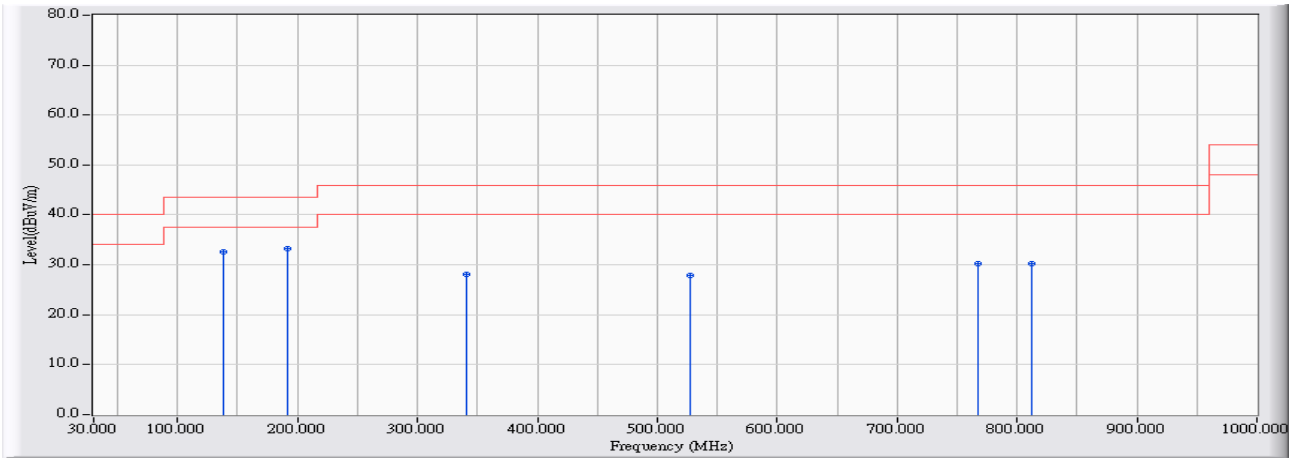


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	56.284	12.346	21.968	34.314	-5.686	40.000	QUASIPEAK
2		156.184	18.729	9.505	28.234	-15.266	43.500	QUASIPEAK
3		227.472	12.875	13.861	26.736	-19.264	46.000	QUASIPEAK
4		419.319	16.865	9.588	26.453	-19.547	46.000	QUASIPEAK
5		640.360	20.469	7.725	28.194	-17.806	46.000	QUASIPEAK
6		815.330	22.557	8.062	30.619	-15.381	46.000	QUASIPEAK

Note:

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

Site : CB1	**Time : 2016/06/30 - 06:38**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30M-1G-4_9161 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2480MHz**

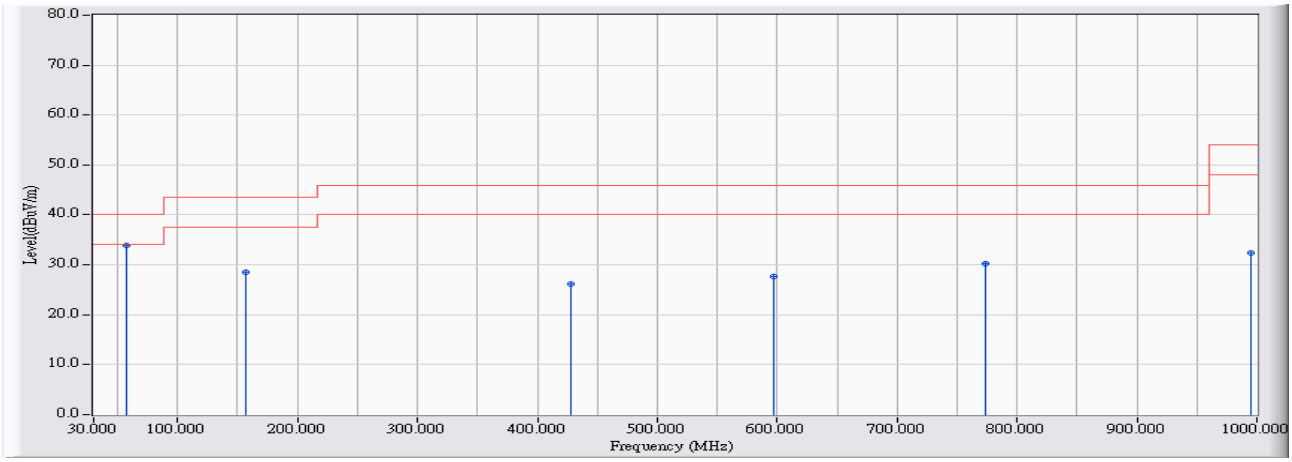


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		138.532	16.651	15.929	32.580	-10.920	43.500	QUASIPEAK
2	*	192.168	13.519	19.796	33.315	-10.185	43.500	QUASIPEAK
3		341.145	15.158	12.974	28.132	-17.868	46.000	QUASIPEAK
4		527.657	18.610	9.302	27.912	-18.088	46.000	QUASIPEAK
5		767.999	22.027	8.168	30.195	-15.805	46.000	QUASIPEAK
6		812.033	22.523	7.697	30.220	-15.780	46.000	QUASIPEAK

Note:

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

Site : CB1	**Time : 2016/06/30 - 06:40**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30M-1G-4_9161 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2480MHz**



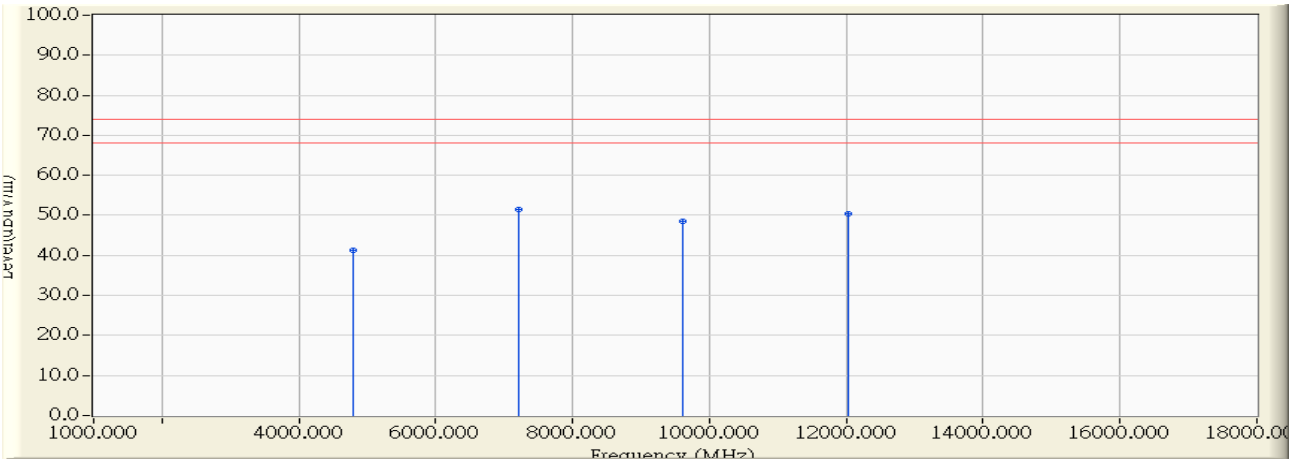
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	56.866	12.313	21.623	33.936	-6.064	40.000	QUASIPEAK
2		156.281	18.731	9.844	28.575	-14.925	43.500	QUASIPEAK
3		428.242	17.066	9.181	26.247	-19.753	46.000	QUASIPEAK
4		597.005	19.893	7.685	27.578	-18.422	46.000	QUASIPEAK
5		774.110	22.098	8.213	30.311	-15.689	46.000	QUASIPEAK
6		995.053	24.294	8.174	32.468	-21.532	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 : 2016/07/12 - 13:25**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2402MHz**

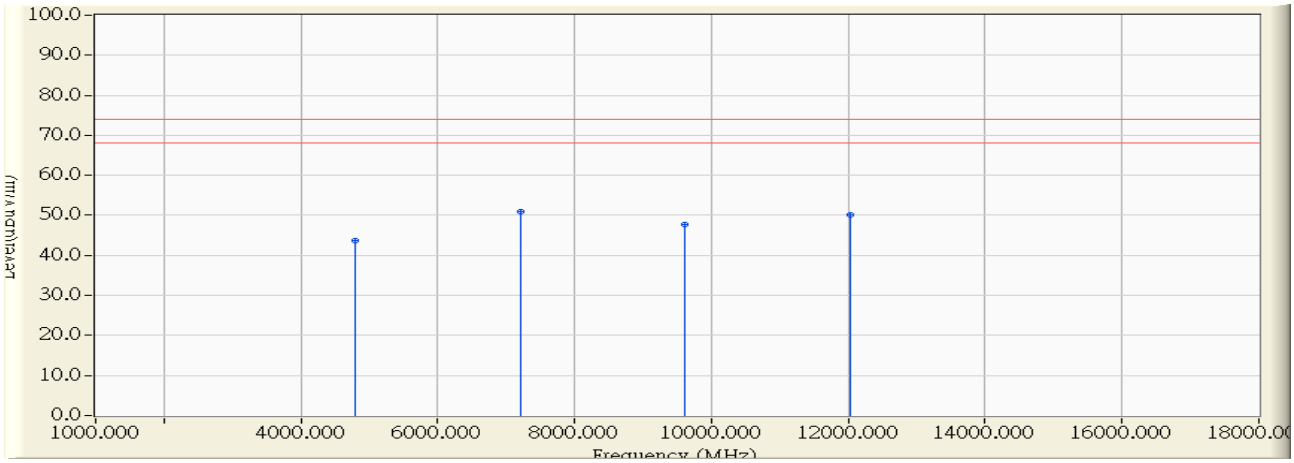


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4803.000	-2.616	43.840	41.224	-32.776	74.000	PEAK
2	*	7206.000	5.866	45.680	51.547	-22.453	74.000	PEAK
3		9617.000	7.491	40.990	48.481	-25.519	74.000	PEAK
4		12018.000	10.388	40.110	50.497	-23.503	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 : 2016/07/12 - 13:35**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2402MHz**

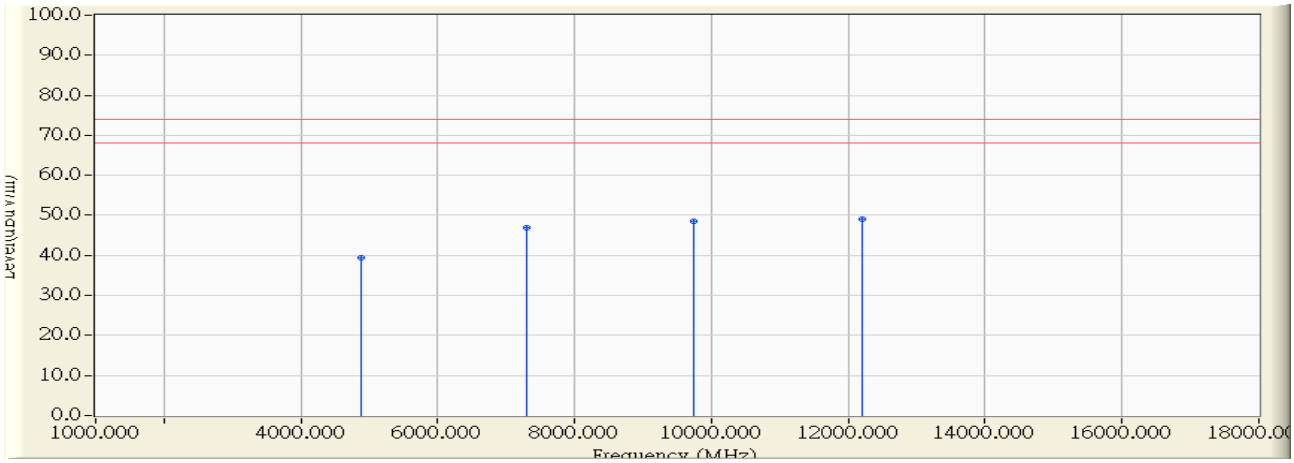


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4803.000	-1.666	45.450	43.784	-30.216	74.000	PEAK
2	*	7205.000	5.365	45.510	50.875	-23.125	74.000	PEAK
3		9618.000	7.044	40.640	47.684	-26.316	74.000	PEAK
4		12026.000	9.920	40.160	50.081	-23.919	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 : 2016/07/12 - 13:46**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2440MHz**

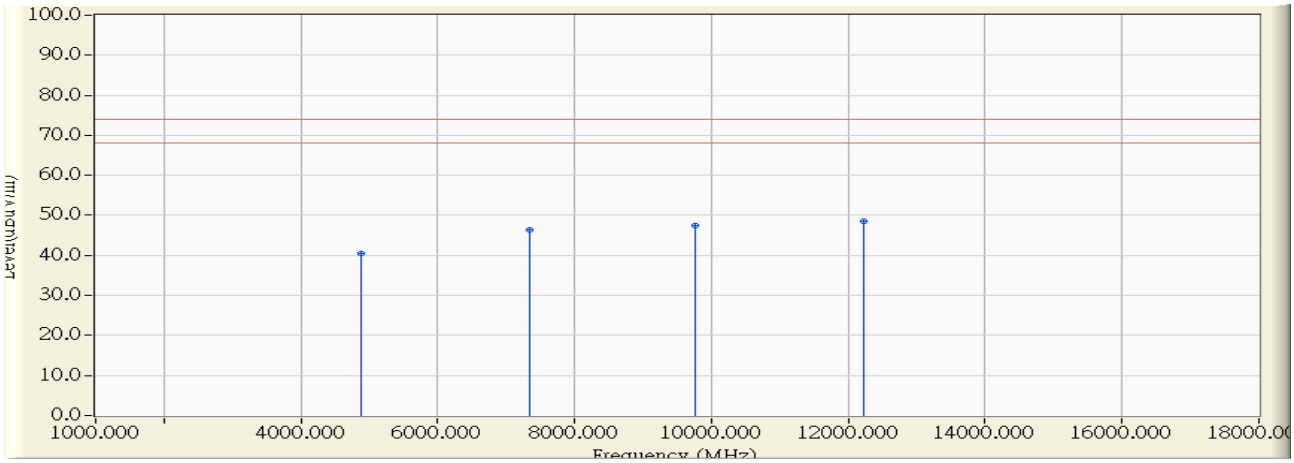


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4870.000	-2.436	41.920	39.484	-34.516	74.000	PEAK
2		7302.000	6.056	40.820	46.876	-27.124	74.000	PEAK
3		9748.000	8.200	40.270	48.470	-25.530	74.000	PEAK
4	*	12201.000	10.169	38.940	49.109	-24.891	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 : 2016/07/12 - 13:57**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2440MHz**

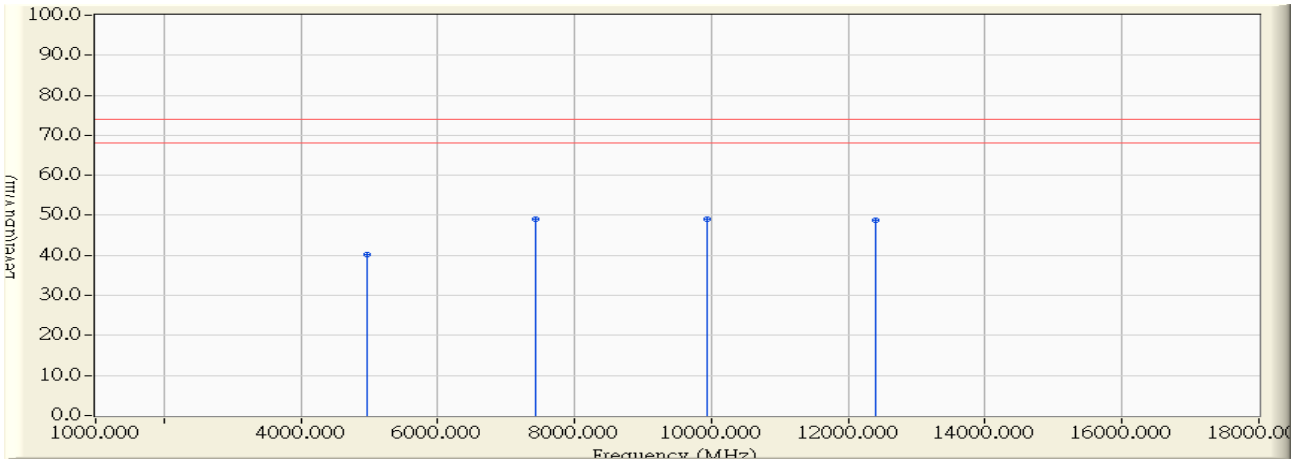


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4879.000	-1.652	42.240	40.588	-33.412	74.000	PEAK
2		7333.000	5.617	40.710	46.327	-27.673	74.000	PEAK
3		9766.000	7.623	39.950	47.573	-26.427	74.000	PEAK
4	*	12215.000	9.885	38.750	48.634	-25.366	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 : 2016/07/12 - 14:12**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2480MHz**

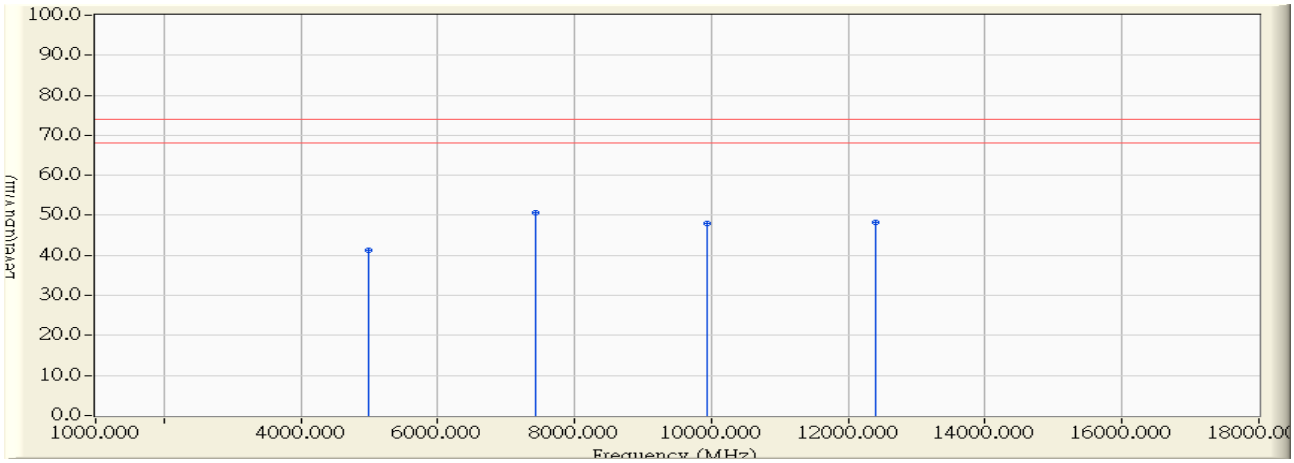


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4970.000	-2.168	42.270	40.102	-33.898	74.000	PEAK
2	*	7440.000	6.328	42.860	49.187	-24.813	74.000	PEAK
3		9939.000	9.234	39.900	49.135	-24.865	74.000	PEAK
4		12404.000	9.927	38.760	48.687	-25.313	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 : 2016/07/12 - 14:15**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4978.000	-1.634	42.920	41.286	-32.714	74.000	PEAK
2	*	7439.000	5.826	44.750	50.575	-23.425	74.000	PEAK
3		9937.000	8.293	39.640	47.933	-26.067	74.000	PEAK
4		12400.000	9.850	38.530	48.379	-25.621	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:

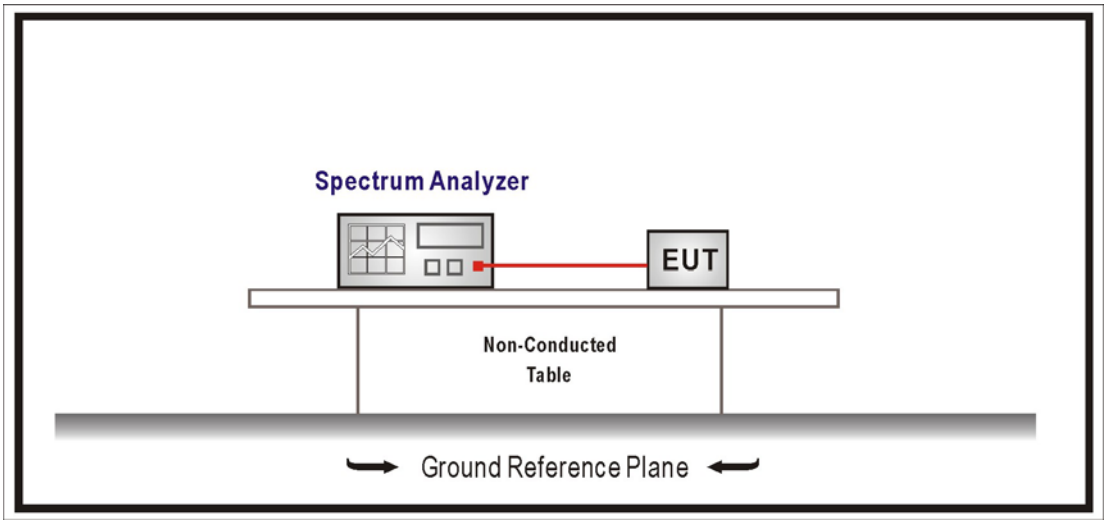
RF antenna conducted test / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23
Signal & Spectrum Analyzer	R&S	FSV40	101049	2017/01/05

Note: 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 C63.10: 2013 and tested according to DTS test procedure of KDB558074 v03r05 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

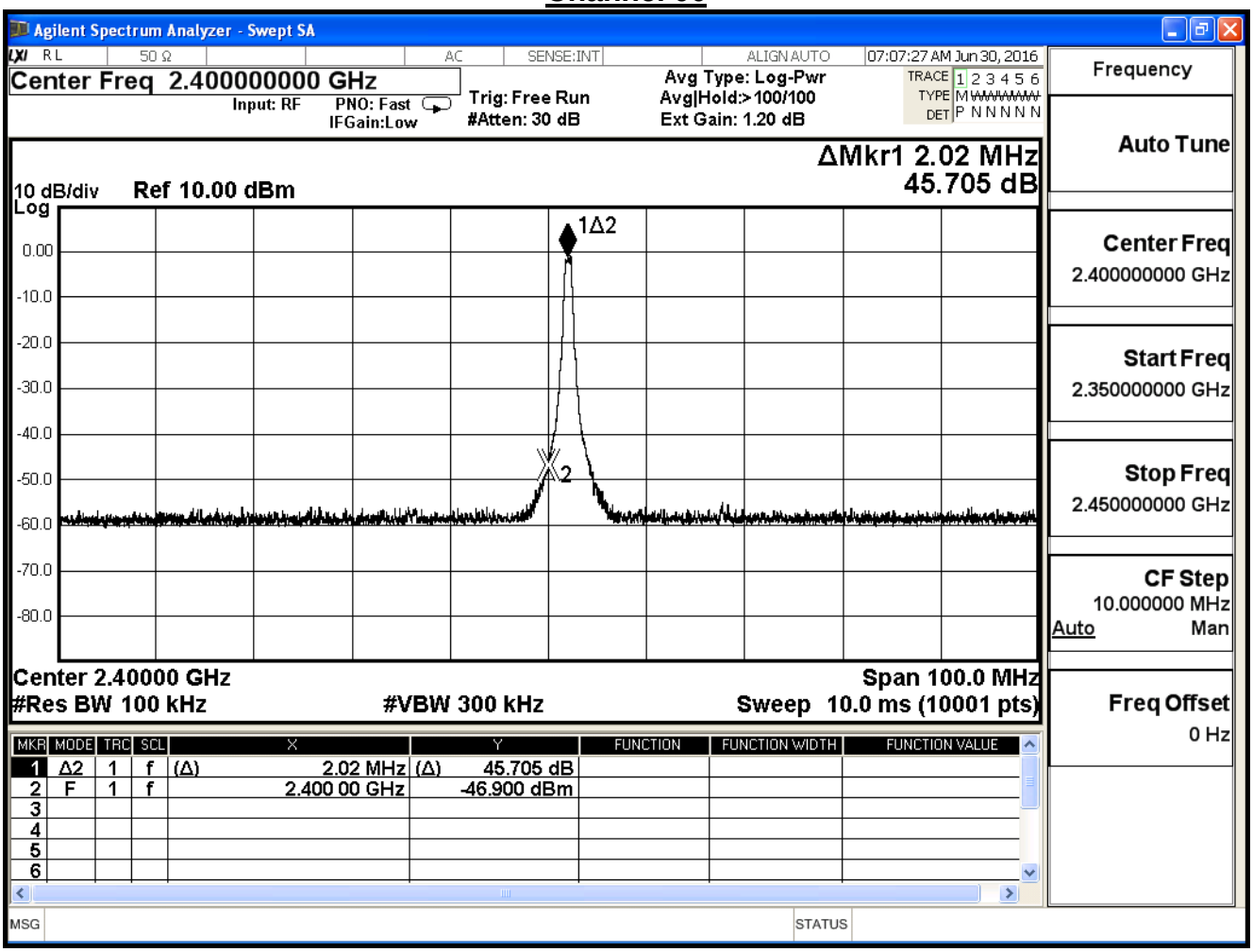
5.6. Test Result

Product	PAJ2801UA-40 Wireless BLE 4.0 Module		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2016/06/30	Test Site	SR7

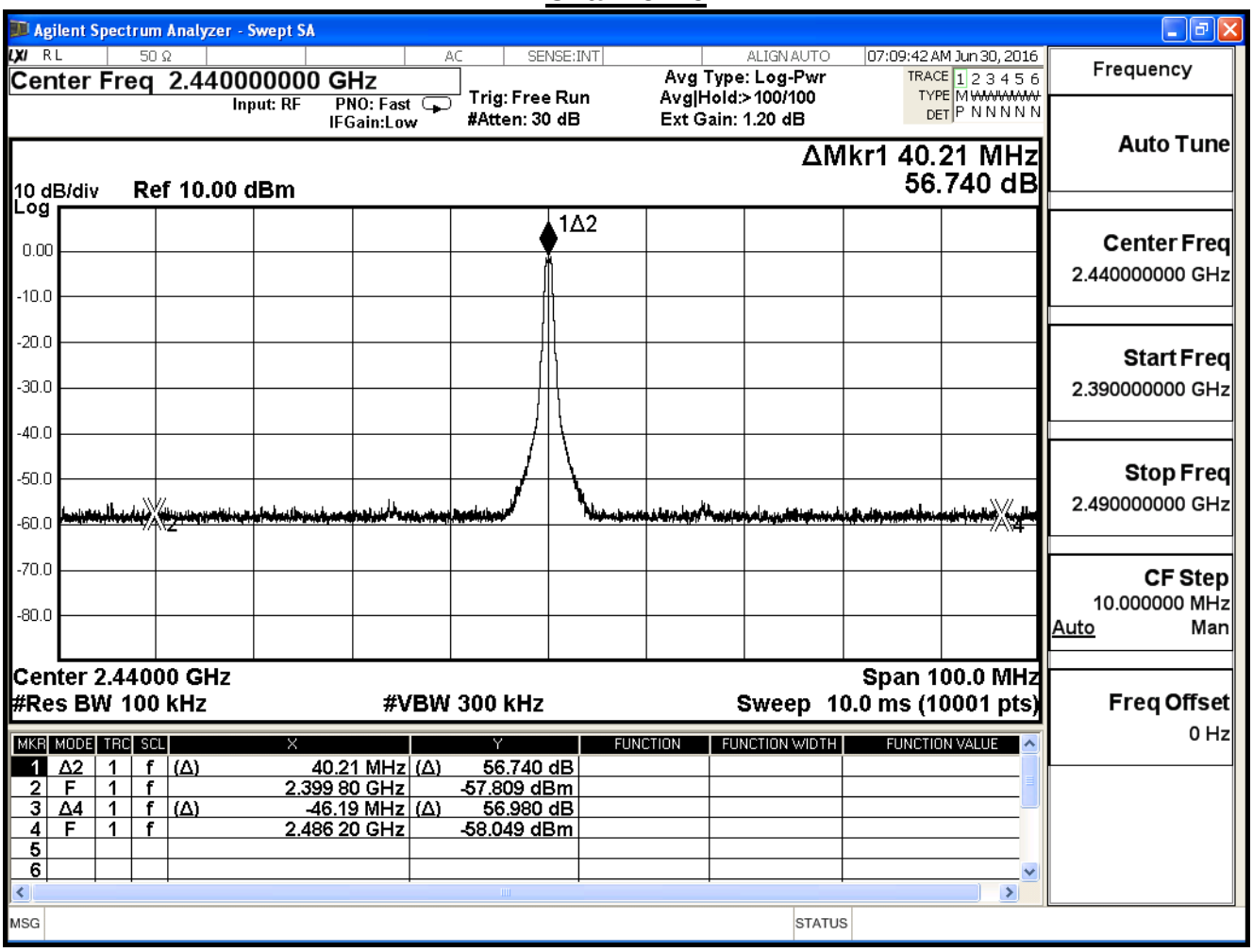
GFSK

Channel	Frequency (MHz)	Measure Level (dBc)	Limit (dBc)	Result
00	2402	45.705	≧30	Pass
19	2440	56.740	≧30	Pass
39	2480	52.707	≧30	Pass

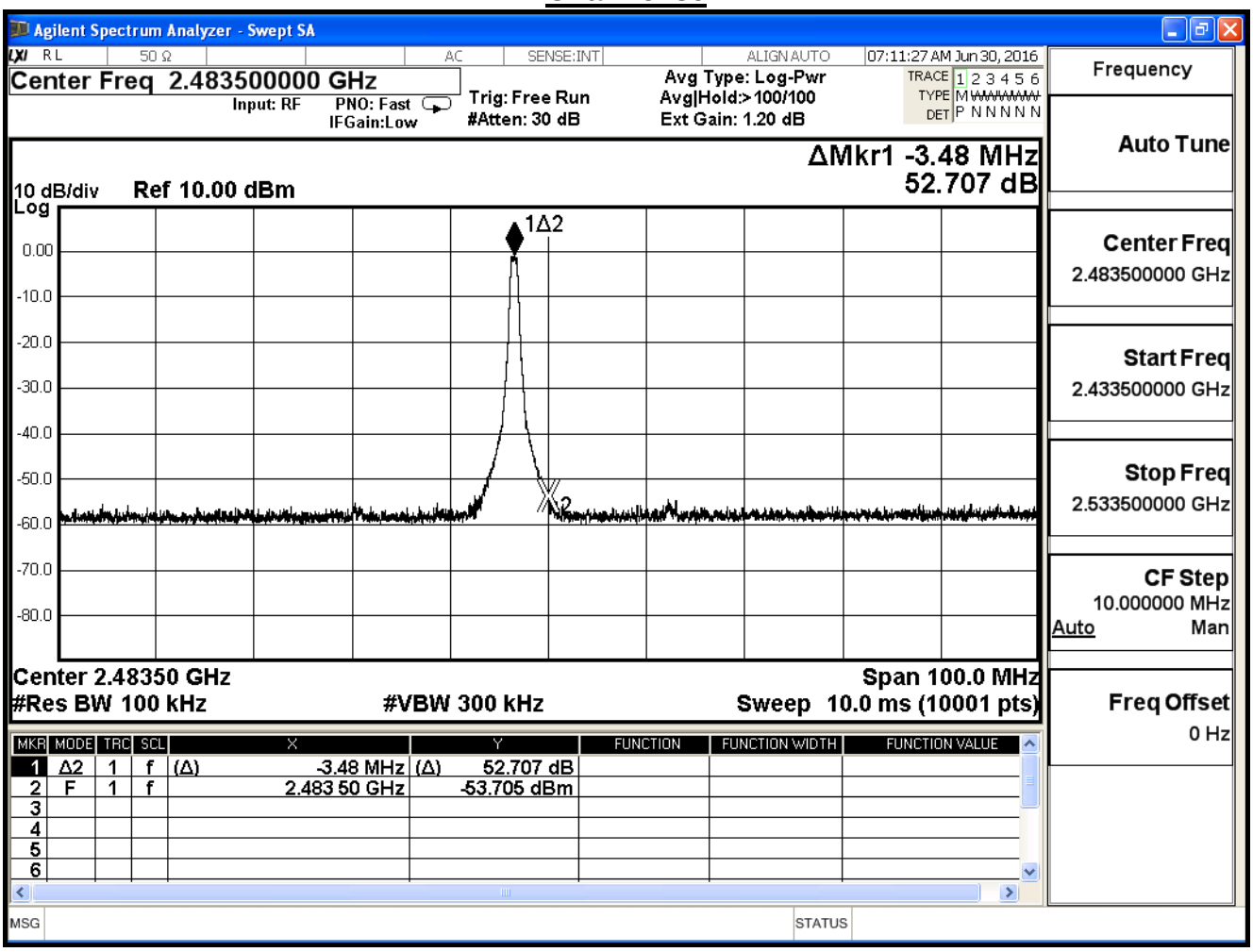
Channel 00



Channel 19

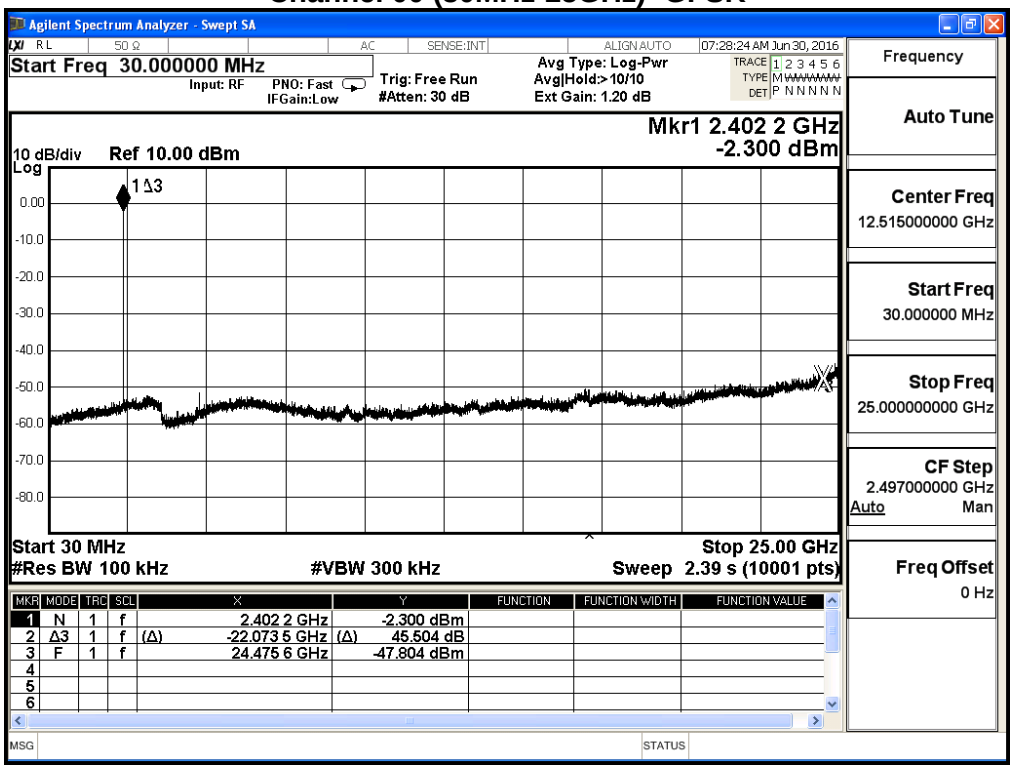

Agilent Spectrum Analyzer - Swept SA
RL
50 Ω
AC
SENSE:INT
ALIGN AUTO
07:09:42 AM Jun 30, 2016
Center Freq 2.440000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: 1.20 dB
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
ΔMkr1 40.21 MHz
56.740 dB
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1Δ2
Center 2.44000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 100.0 MHz
Sweep 10.0 ms (10001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 Δ2 1 f (Δ) 40.21 MHz (Δ) 56.740 dB
2 F 1 f 2.399 80 GHz -57.809 dBm
3 Δ4 1 f (Δ) -46.19 MHz (Δ) 56.980 dB
4 F 1 f 2.486 20 GHz -58.049 dBm
5
6
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.440000000 GHz
Start Freq
2.390000000 GHz
Stop Freq
2.490000000 GHz
CF Step
10.000000 MHz
Auto
Man
Freq Offset
0 Hz

Channel 39

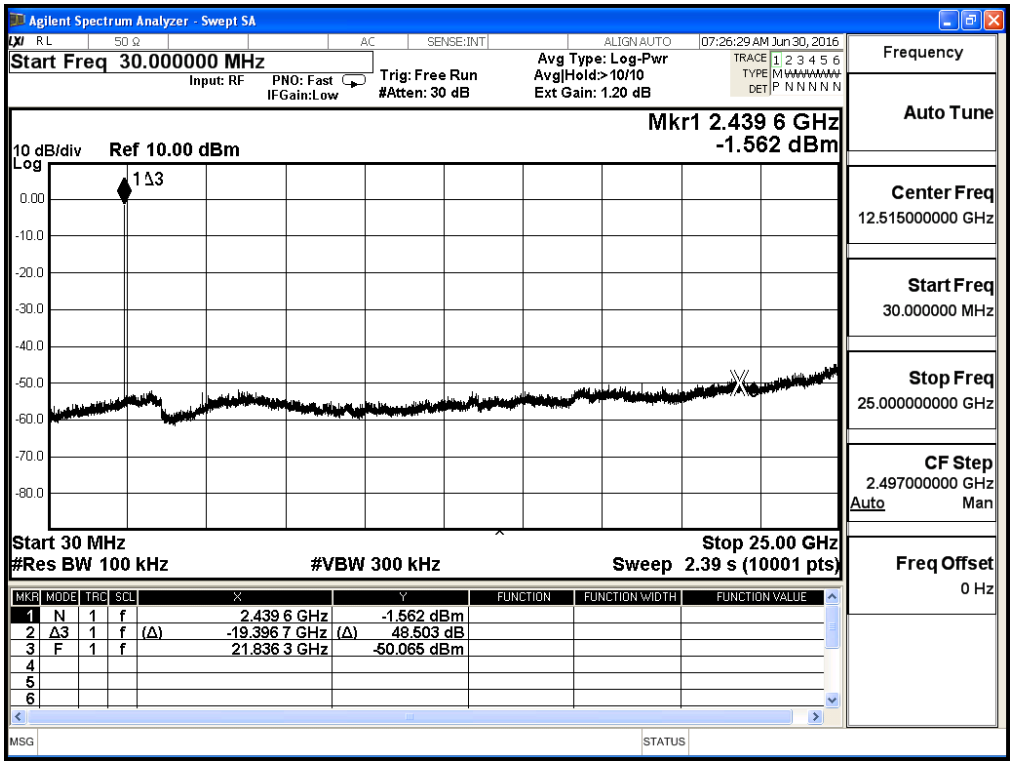

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.483500000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: 1.20 dB
07:11:27 AM Jun 30, 2016
ΔMkr1 -3.48 MHz
52.707 dB
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.48350 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 100.0 MHz
Sweep 10.0 ms (10001 pts)
1 Δ2 1 f (Δ) -3.48 MHz (Δ) 52.707 dB
2 F 1 f 2.483 50 GHz -53.705 dBm
Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.433500000 GHz
Stop Freq
2.533500000 GHz
CF Step
10.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	PAJ2801UA-40 Wireless BLE 4.0 Module		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2016/06/30	Test Site	SR7

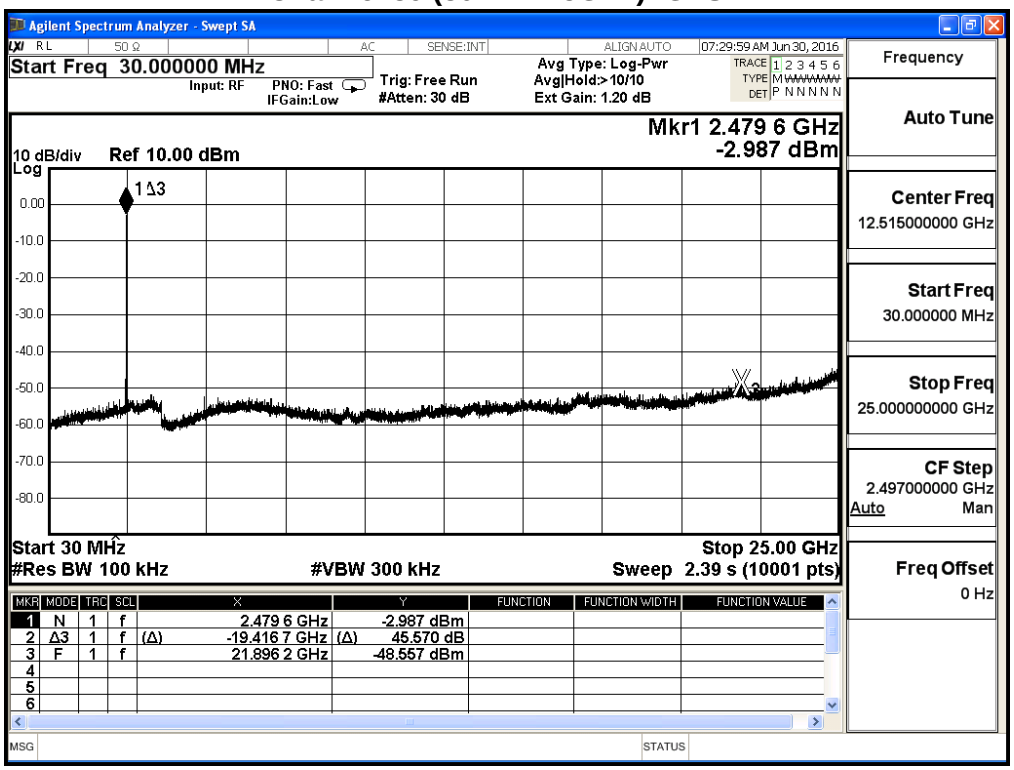
Channel 00 (30MHz-25GHz)- GFSK



Channel 19 (30MHz-25GHz)- GFSK



Channel 39 (30MHz-25GHz)- GFSK



6. Band Edge

6.1. Test Equipment

The following test equipments are used during the test:

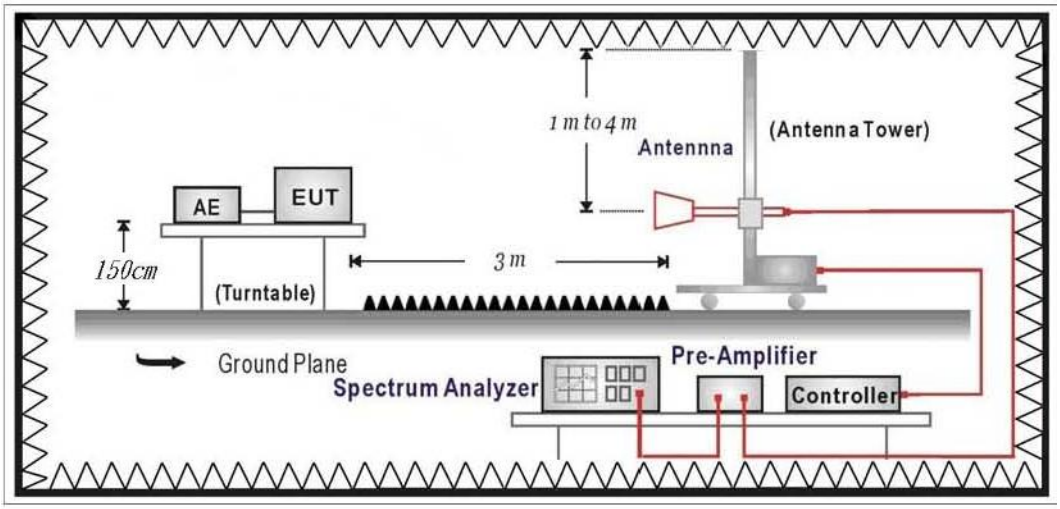
Band Edge / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Double Ridged Guide Horn Antenna	Schwarzbeck	BBHA 9120	D743	2017/01/14
Spectrum Analyzer	Agilent	E4440A	MY46187335	2016/12/24
k Type Cable	Huber+Suhner	SF 102	25623/2	2017/01/11
Signal & Spectrum Analyzer	R&S	FSV40	101049	2017/01/05

Note: 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 C63.10: 2013 and tested according to DTS test procedure of KDB558074 v03r05 for compliance to FCC 47CFR 15.247 requirements.

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

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

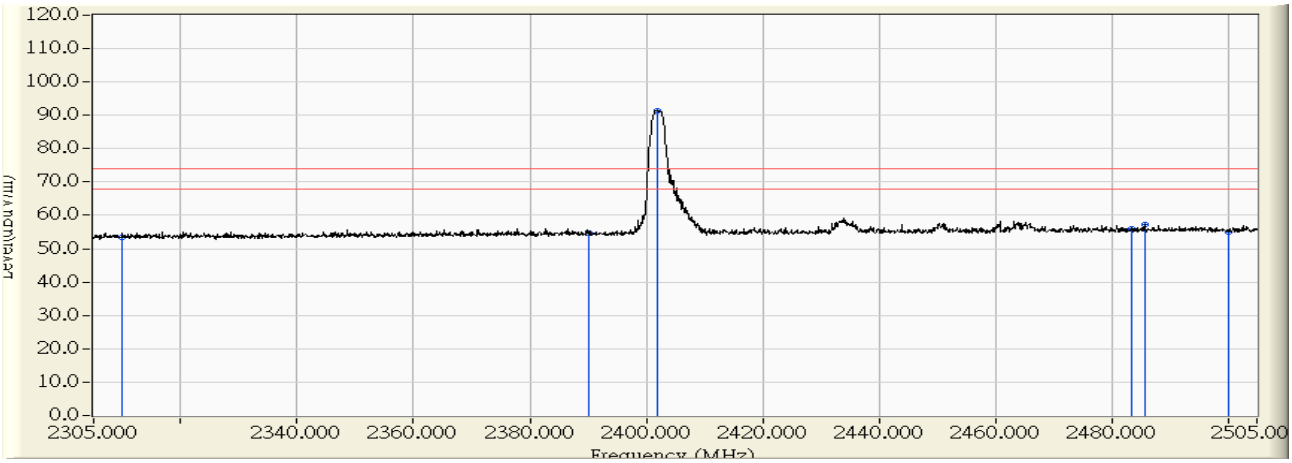
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

6.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

6.6. Test Result

Site : CB1	**Time : 2016/07/12 - 14:55**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2402MHz**

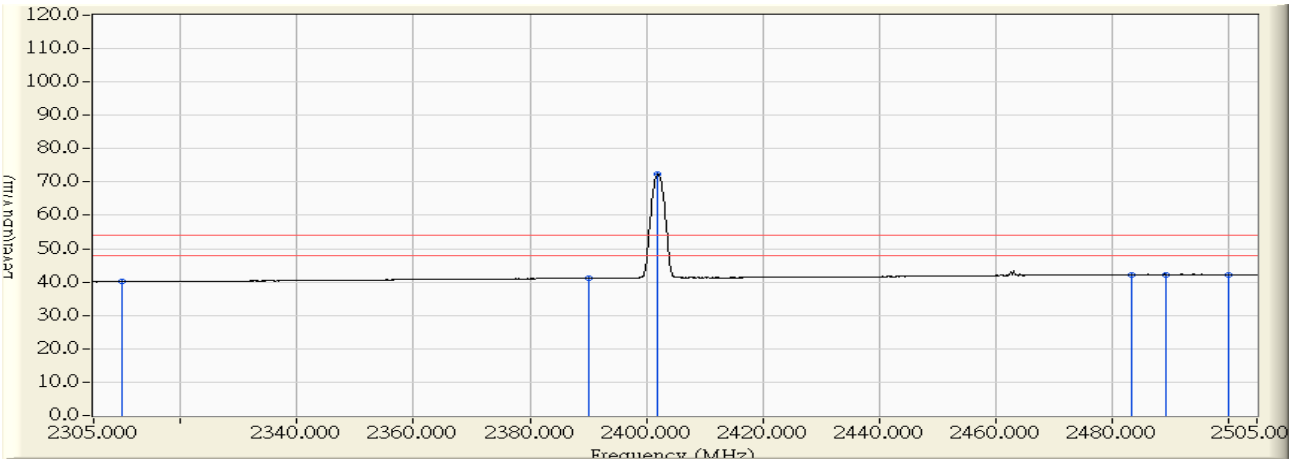


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.130	25.405	53.535	-20.465	74.000	PEAK
2		2390.000	28.933	25.730	54.663	-19.337	74.000	PEAK
3	*	2401.900	29.052	62.344	91.397	17.397	74.000	PEAK
4		2483.500	29.829	26.140	55.969	-18.031	74.000	PEAK
5		2485.700	29.830	27.445	57.275	-16.725	74.000	PEAK
6		2500.000	29.826	25.098	54.923	-19.077	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 : 2016/07/12 - 14:58**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2402MHz**

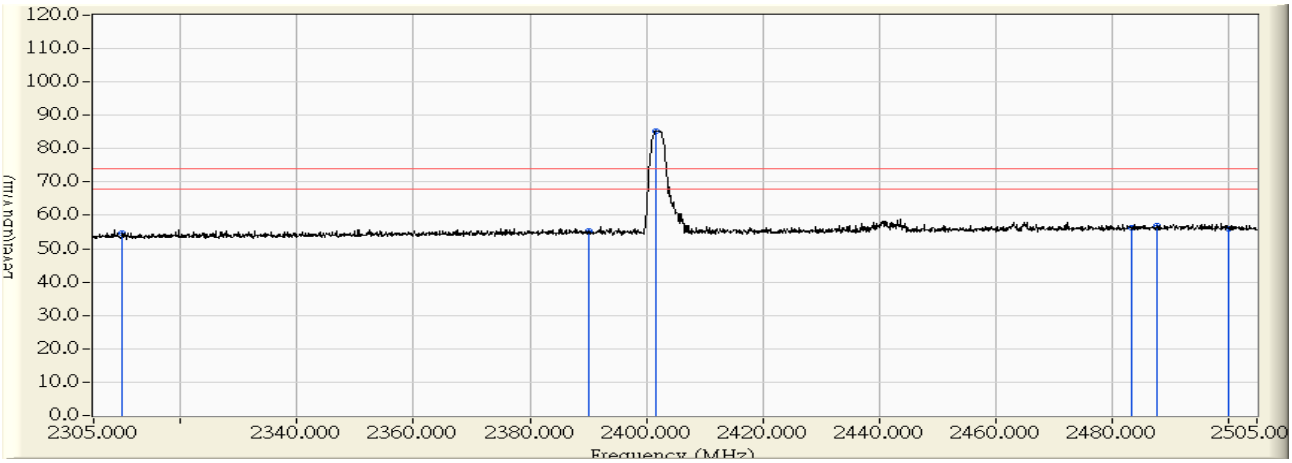


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.130	12.016	40.146	-13.854	54.000	AVERAGE
2		2390.000	28.933	12.227	41.160	-12.840	54.000	AVERAGE
3	*	2402.000	29.053	43.249	72.303	18.303	54.000	AVERAGE
4		2483.500	29.829	12.424	42.253	-11.747	54.000	AVERAGE
5		2489.300	29.832	12.453	42.285	-11.715	54.000	AVERAGE
6		2500.000	29.826	12.437	42.262	-11.738	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 : 2016/07/12 - 15:00**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2402MHz**

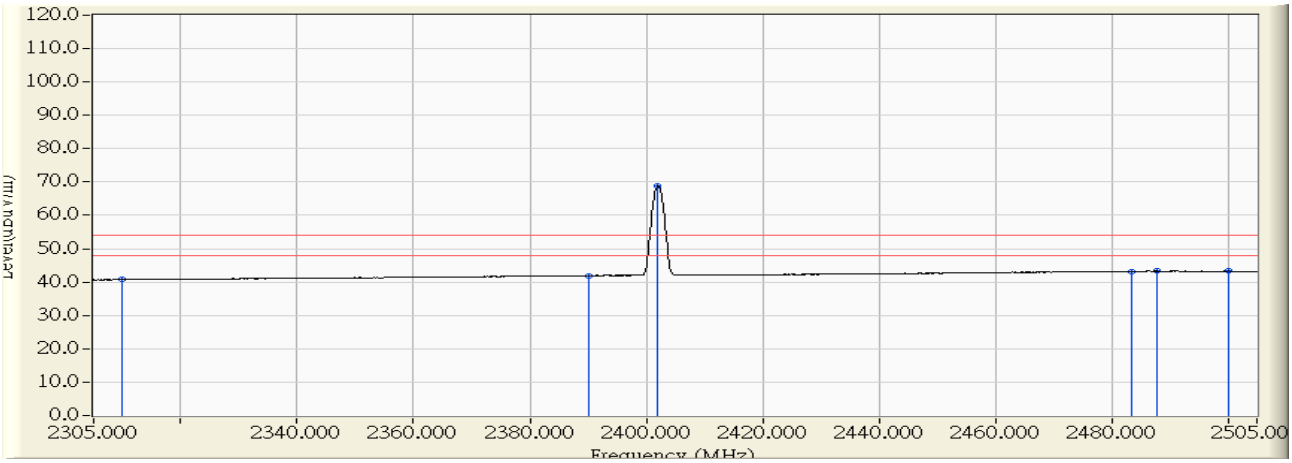


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.784	25.797	54.581	-19.419	74.000	PEAK
2		2390.000	29.747	25.673	55.420	-18.580	74.000	PEAK
3	*	2401.700	29.888	55.447	85.335	11.335	74.000	PEAK
4		2483.500	30.830	25.591	56.421	-17.579	74.000	PEAK
5		2487.900	30.841	25.964	56.805	-17.195	74.000	PEAK
6		2500.000	30.860	25.099	55.958	-18.042	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 : 2016/07/12 - 15:02**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2402MHz**

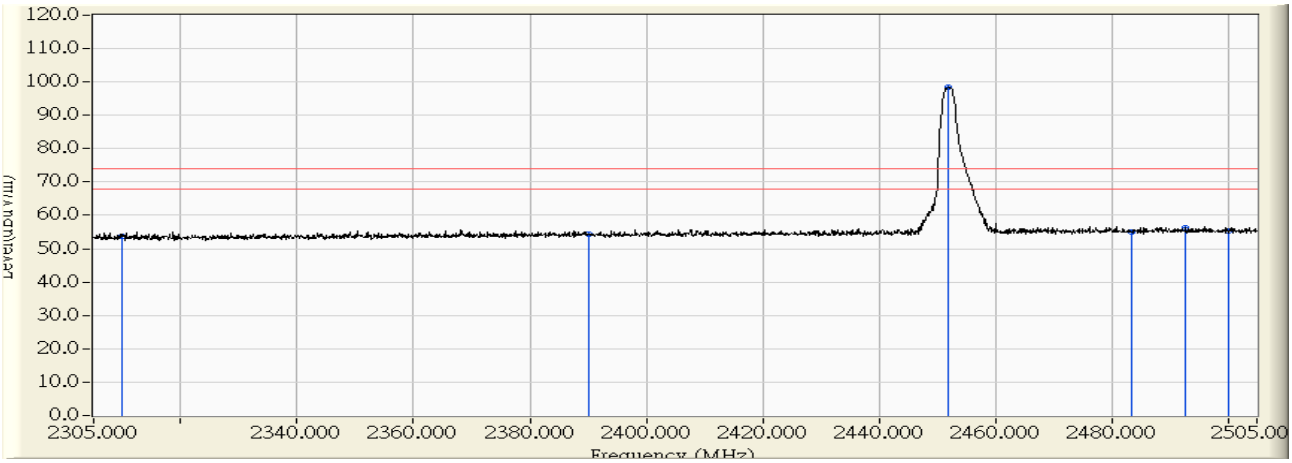


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.784	11.948	40.732	-13.268	54.000	AVERAGE
2		2390.000	29.747	12.164	41.911	-12.089	54.000	AVERAGE
3	*	2402.000	29.891	39.006	68.898	14.898	54.000	AVERAGE
4		2483.500	30.830	12.291	43.121	-10.879	54.000	AVERAGE
5		2487.700	30.840	12.437	43.277	-10.723	54.000	AVERAGE
6		2500.000	30.860	12.446	43.305	-10.695	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 : 2016/07/12 - 15:07**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2440MHz**

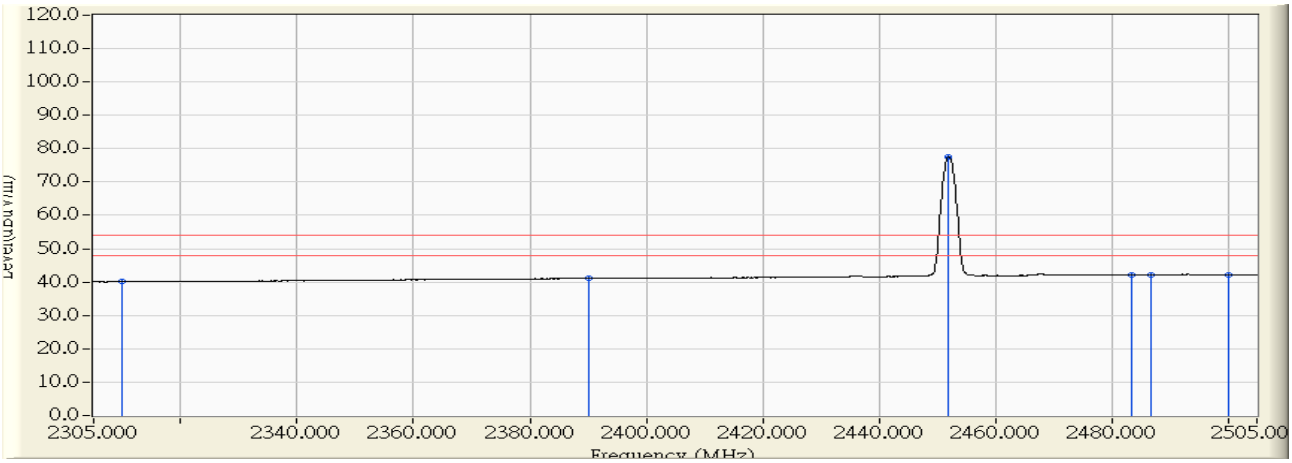


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.130	25.571	53.701	-20.299	74.000	PEAK
2		2390.000	28.933	25.369	54.302	-19.698	74.000	PEAK
3	*	2451.800	29.553	68.836	98.390	24.390	74.000	PEAK
4		2483.500	29.829	25.307	55.136	-18.864	74.000	PEAK
5		2492.800	29.834	26.424	56.258	-17.742	74.000	PEAK
6		2500.000	29.826	25.594	55.419	-18.581	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 : 2016/07/12 - 15:07**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2440MHz**

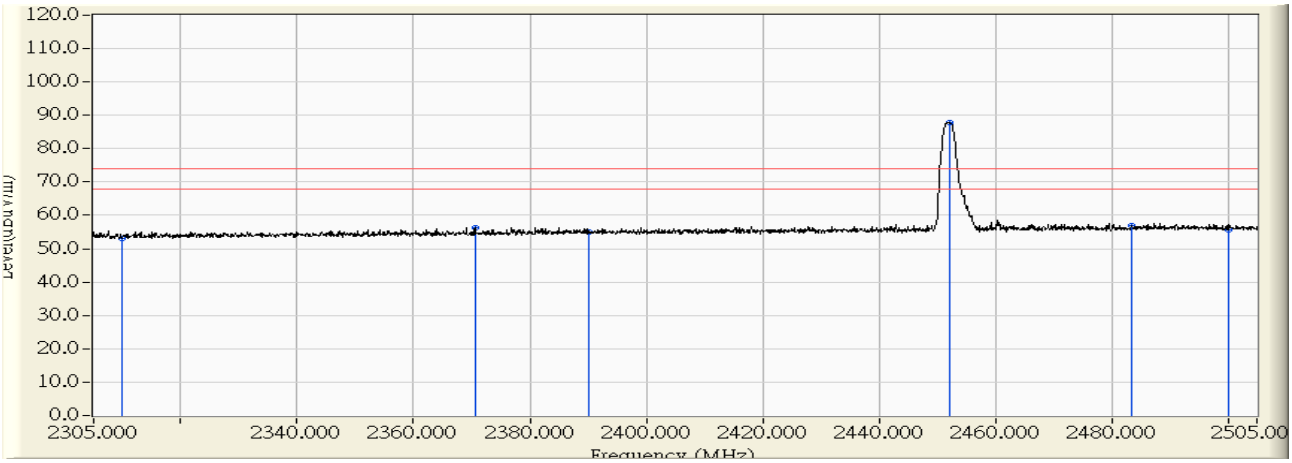


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.130	11.984	40.114	-13.886	54.000	AVERAGE
2		2390.000	28.933	12.190	41.123	-12.877	54.000	AVERAGE
3	*	2452.000	29.555	48.105	77.661	23.661	54.000	AVERAGE
4		2483.500	29.829	12.428	42.257	-11.743	54.000	AVERAGE
5		2486.700	29.831	12.420	42.251	-11.749	54.000	AVERAGE
6		2500.000	29.826	12.384	42.209	-11.791	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 : 2016/07/12 - 15:10**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2440MHz**

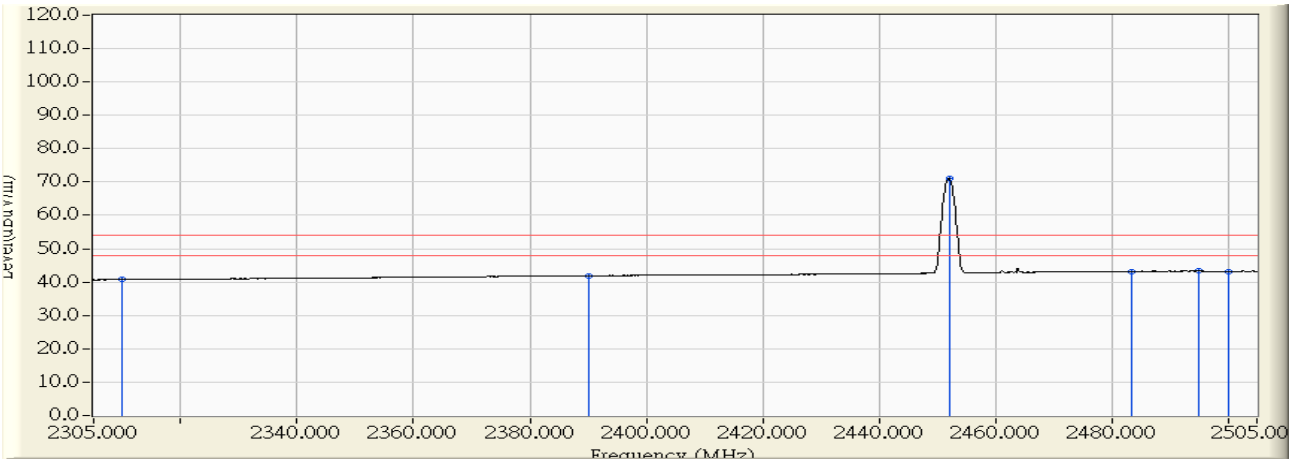


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.784	24.352	53.136	-20.864	74.000	PEAK
2		2370.600	29.514	26.840	56.353	-17.647	74.000	PEAK
3		2390.000	29.747	25.237	54.984	-19.016	74.000	PEAK
4	*	2452.200	30.496	57.232	87.728	13.728	74.000	PEAK
5		2483.500	30.830	26.263	57.093	-16.907	74.000	PEAK
6		2500.000	30.860	24.766	55.625	-18.375	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 : 2016/07/12 - 15:12**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2440MHz**

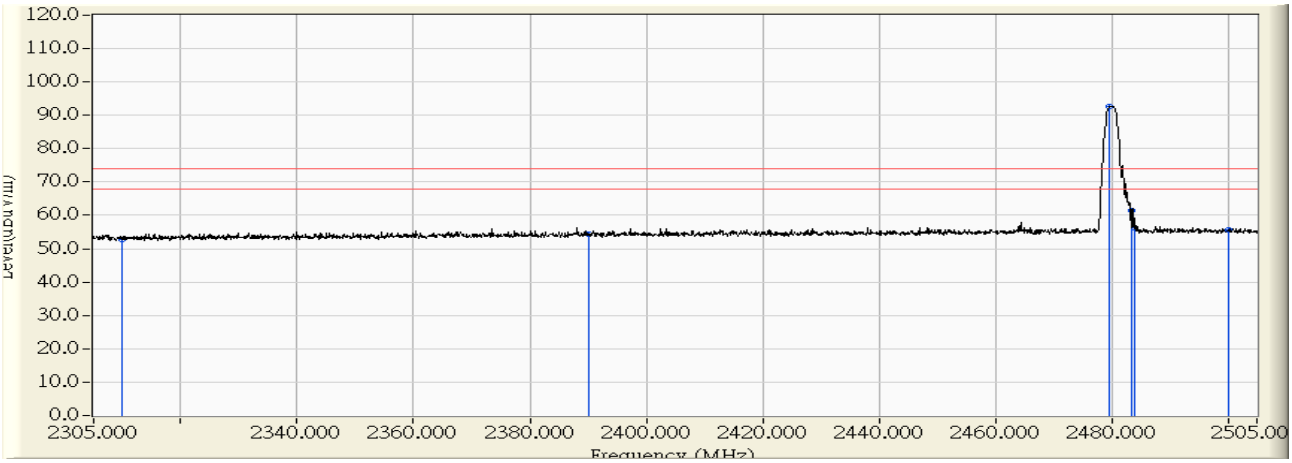


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.784	11.946	40.730	-13.270	54.000	AVERAGE
2		2390.000	29.747	12.186	41.933	-12.067	54.000	AVERAGE
3	*	2452.100	30.494	40.560	71.055	17.055	54.000	AVERAGE
4		2483.500	30.830	12.387	43.217	-10.783	54.000	AVERAGE
5		2494.900	30.858	12.427	43.285	-10.715	54.000	AVERAGE
6		2500.000	30.860	12.390	43.249	-10.751	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 : 2016/07/12 - 15:16**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2480MHz**

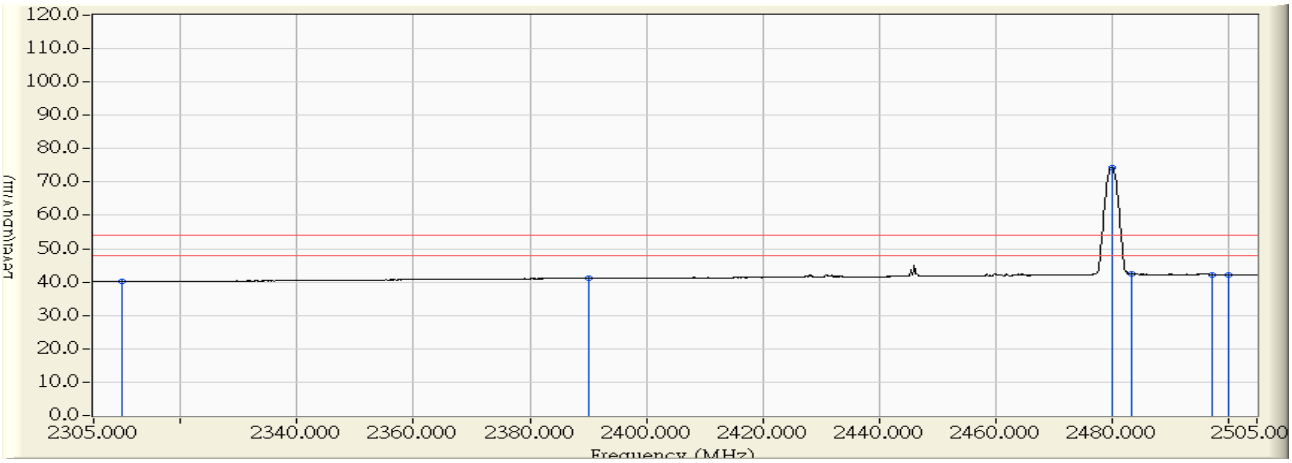


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.130	24.656	52.786	-21.214	74.000	PEAK
2		2390.000	28.933	25.540	54.473	-19.527	74.000	PEAK
3	*	2479.700	29.827	62.896	92.723	18.723	74.000	PEAK
4		2483.500	29.829	31.687	61.516	-12.484	74.000	PEAK
5		2483.900	29.830	26.490	56.319	-17.681	74.000	PEAK
6		2500.000	29.826	25.961	55.786	-18.214	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 : 2016/07/12 - 15:18**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - HORIZONTAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2480MHz**

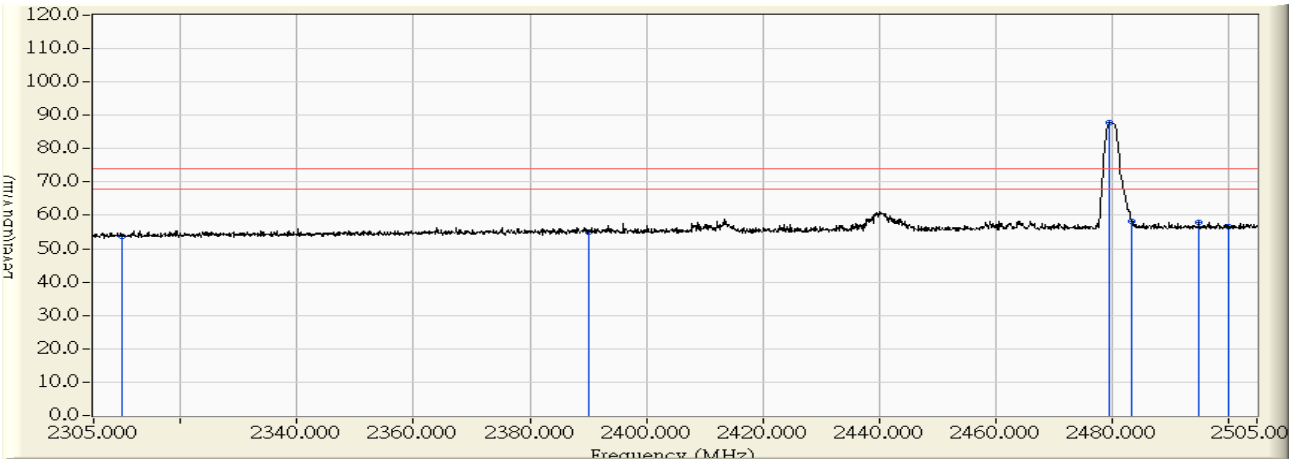


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.130	12.001	40.131	-13.869	54.000	AVERAGE
2		2390.000	28.933	12.208	41.141	-12.859	54.000	AVERAGE
3	*	2480.000	29.827	44.632	74.459	20.459	54.000	AVERAGE
4		2483.500	29.829	12.503	42.332	-11.668	54.000	AVERAGE
5		2497.200	29.832	12.425	42.257	-11.743	54.000	AVERAGE
6		2500.000	29.826	12.408	42.233	-11.767	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 : 2016/07/12 - 15:24**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2480MHz**

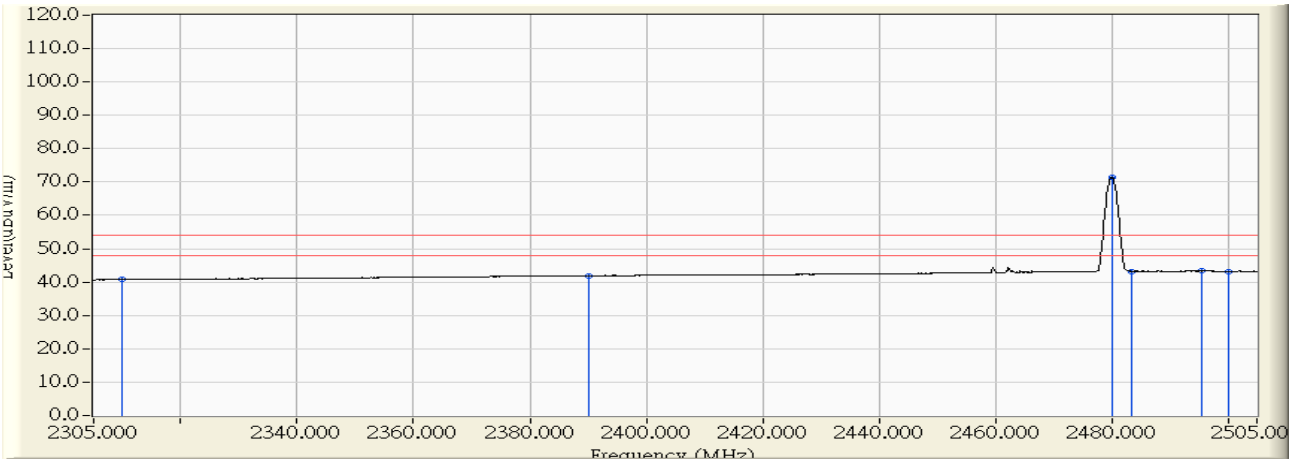


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.784	24.849	53.633	-20.367	74.000	PEAK
2		2390.000	29.747	25.172	54.919	-19.081	74.000	PEAK
3	*	2479.700	30.821	56.944	87.765	13.765	74.000	PEAK
4		2483.500	30.830	27.523	58.353	-15.647	74.000	PEAK
5		2495.000	30.858	26.928	57.787	-16.213	74.000	PEAK
6		2500.000	30.860	25.669	56.528	-17.472	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 : 2016/07/12 - 15:24**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G_H2 - VERTICAL	**Power : DC 3.3V**
EUT : PAJ2801UA-40 Wireless BLE 4.0 Module	**Note : 802.15.1_2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	28.784	12.000	40.784	-13.216	54.000	AVERAGE
2		2390.000	29.747	12.181	41.928	-12.072	54.000	AVERAGE
3	*	2480.100	30.821	40.534	71.356	17.356	54.000	AVERAGE
4		2483.500	30.830	12.396	43.226	-10.774	54.000	AVERAGE
5		2495.400	30.860	12.430	43.290	-10.710	54.000	AVERAGE
6		2500.000	30.860	12.400	43.259	-10.741	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. DTS Occupied Bandwidth

7.1. Test Equipment

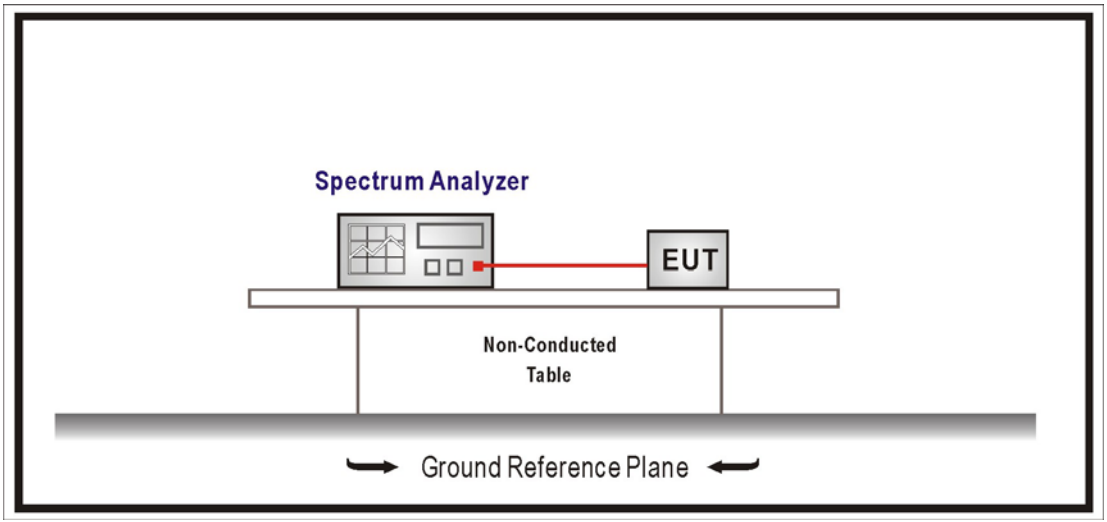
The following test equipments are used during the test:

DTS Occupied Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23

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

7.2. Test Setup



7.3. Test Procedures

The EUT was setup according to ANSI C63.10:2013; tested procedure section 8.1 of KDB558074 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 100KHz, Set the VBW≧3xRBW, Sweep Time=Auto, Set Peak Detector.

7.4. Limits

The 6 dB bandwidth must be greater than 500 kHz.

7.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2014

7.6. Uncertainty

The measurement uncertainty is defined as ±150Hz

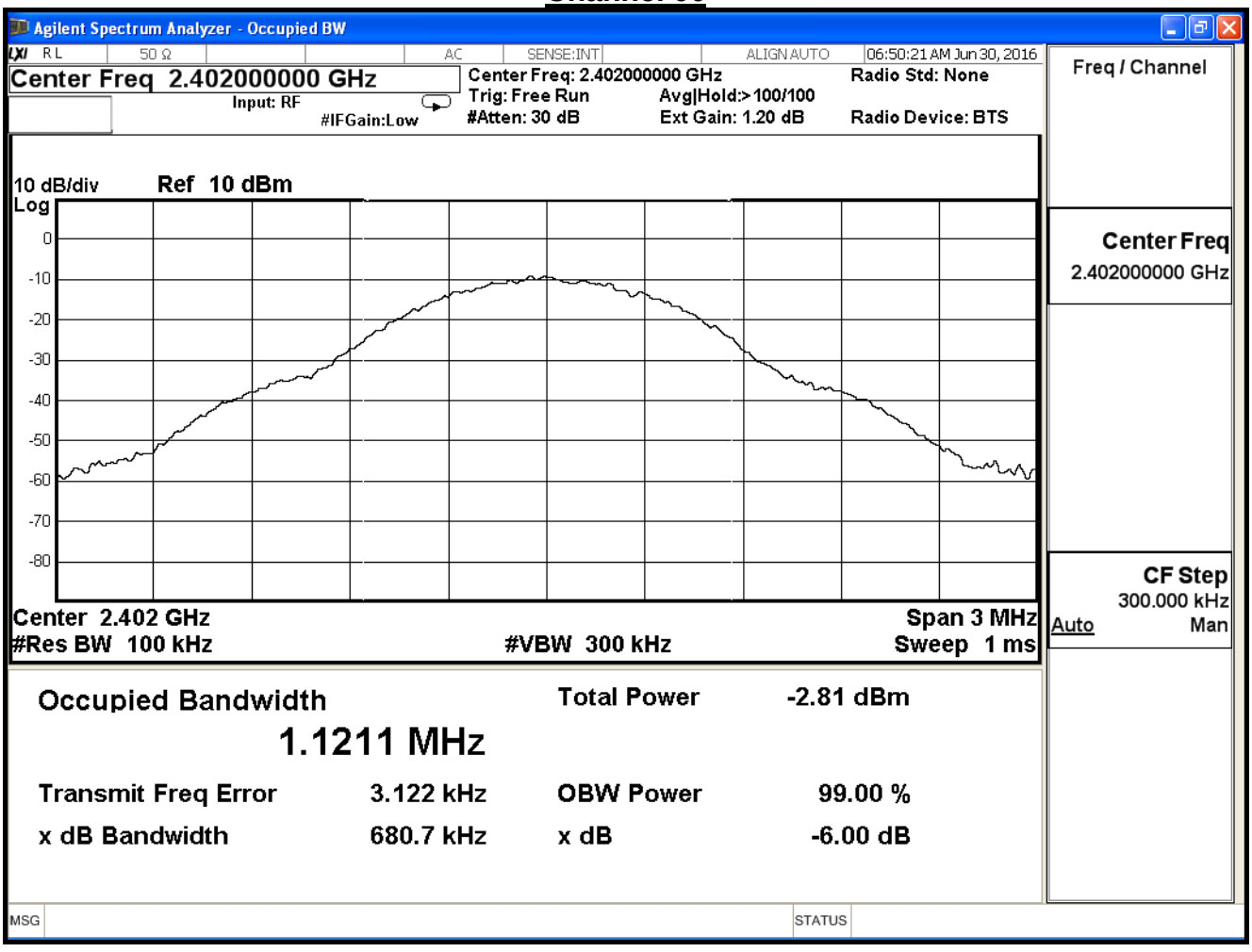
7.7. Test Result

Product	PAJ2801UA-40 Wireless BLE 4.0 Module		
Test Item	DTS Occupied Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2016/06/30	Test Site	SR7

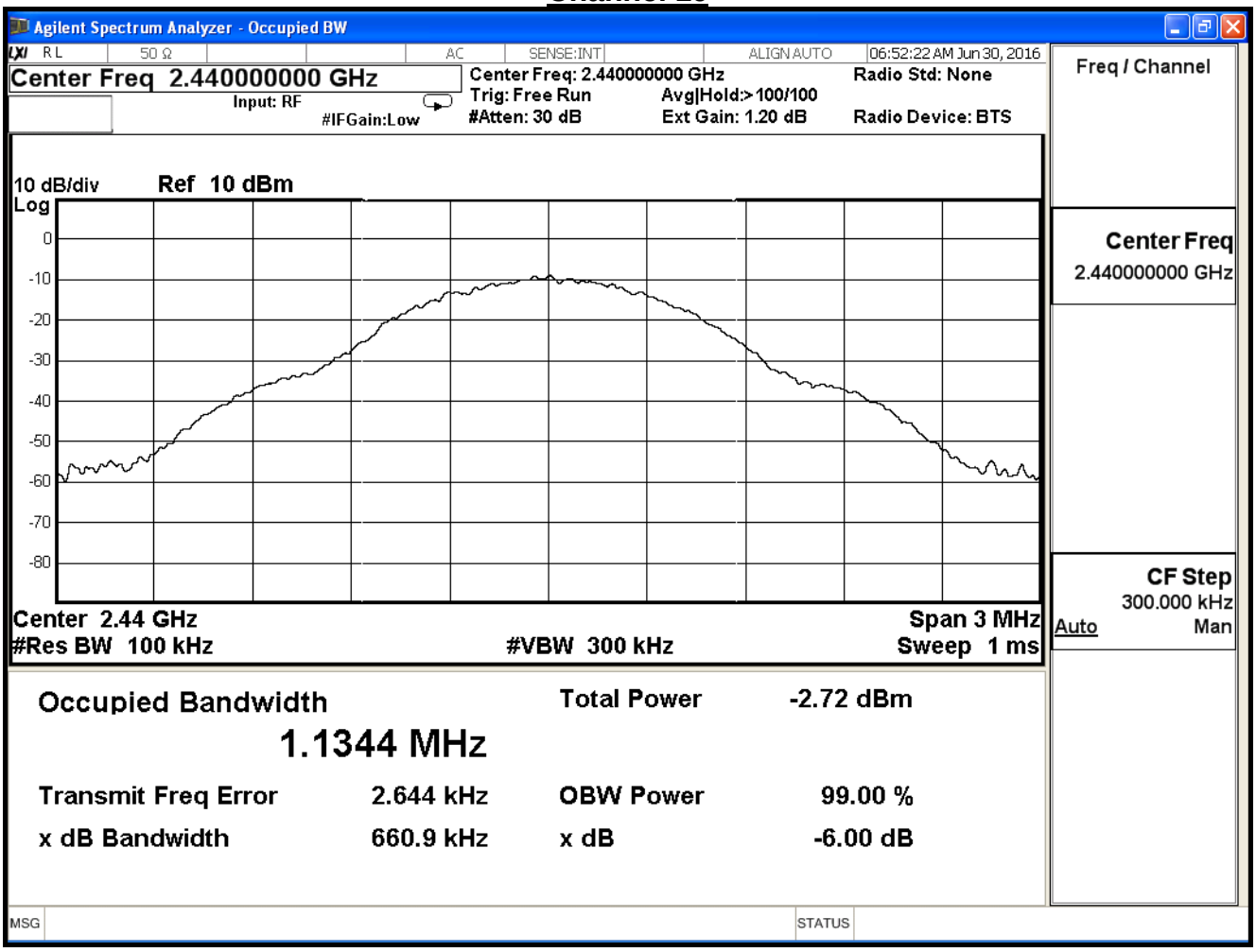
GFSK

Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
00	2402	0.680	--	Pass
19	2440	0.660	--	Pass
39	2480	0.700	--	Pass

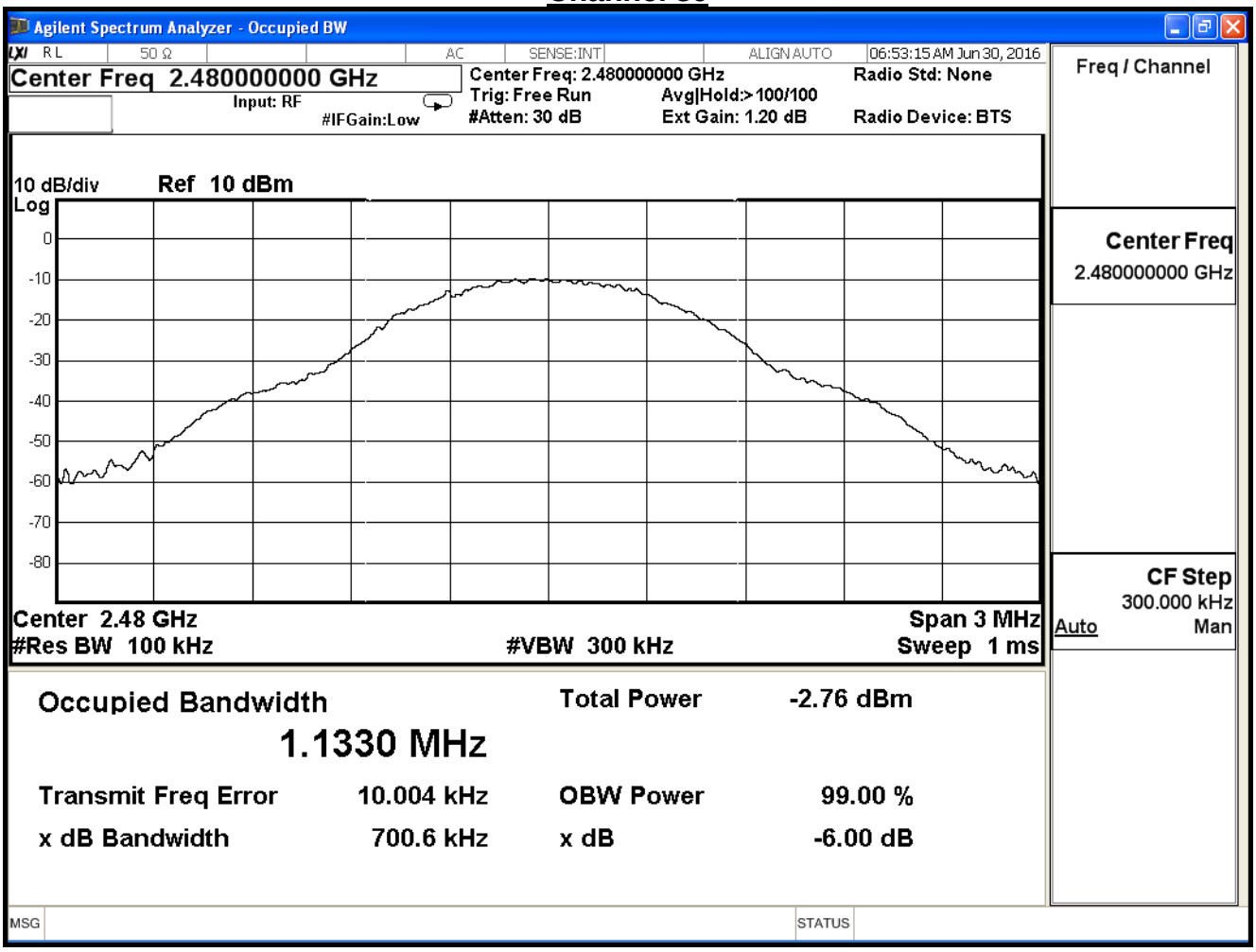
Channel 00



Channel 19


Agilent Spectrum Analyzer - Occupied BW
RL
50 Ω
AC
SENSE:INT
ALIGN AUTO
06:52:22 AM Jun 30, 2016
Center Freq 2.440000000 GHz
Input: RF
#IFGain:Low
Center Freq: 2.440000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 30 dB
Ext Gain: 1.20 dB
Radio Std: None
Radio Device: BTS
Freq / Channel
10 dB/div
Ref 10 dBm
Log
0
-10
-20
-30
-40
-50
-60
-70
-80
Center Freq
2.440000000 GHz
CF Step
300.000 kHz
Auto
Man
Center 2.44 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1 ms
Occupied Bandwidth
1.1344 MHz
Total Power
-2.72 dBm
Transmit Freq Error
2.644 kHz
OBW Power
99.00 %
x dB Bandwidth
660.9 kHz
x dB
-6.00 dB
MSG
STATUS

Channel 39


Agilent Spectrum Analyzer - Occupied BW
RL
50 Ω
AC
SENSE:INT
ALIGN AUTO
06:53:15 AM Jun 30, 2016
Center Freq 2.480000000 GHz
Input: RF
#IFGain:Low
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 30 dB
Ext Gain: 1.20 dB
Radio Std: None
Radio Device: BTS
Freq / Channel
10 dB/div
Ref 10 dBm
Log
0
-10
-20
-30
-40
-50
-60
-70
-80
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.1330 MHz
Total Power
-2.76 dBm
Transmit Freq Error
10.004 kHz
OBW Power
99.00 %
x dB Bandwidth
700.6 kHz
x dB
-6.00 dB
MSG
STATUS

8. Power Density

8.1. Test Equipment

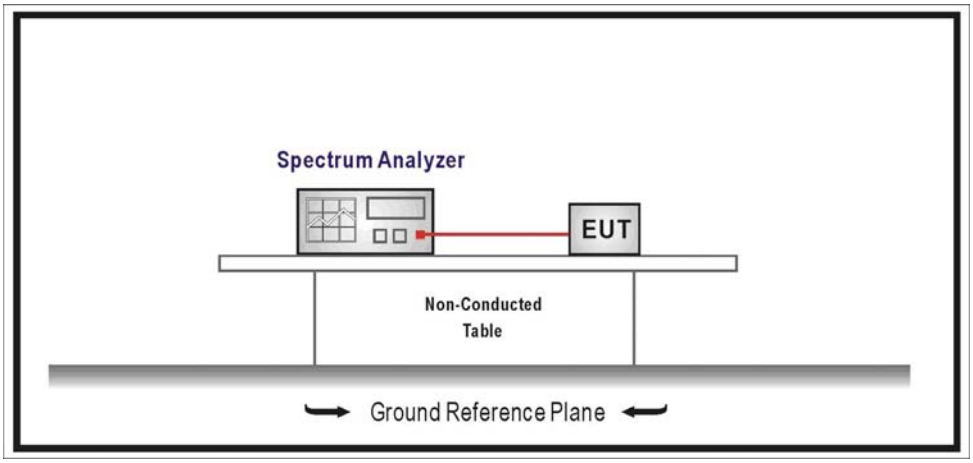
The following test equipment is used during the test:

Power Density / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23
Signal & Spectrum Analyzer	R&S	FSV40	101049	2017/01/05
Signal Analyzer	R&S	FSV7	101650	2016/11/30

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

8.2. Test Setup



8.3. Limits

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

8.4. Test Procedures

The EUT was setup according to ANSI C63.10: 2013; tested according to DTS test procedure of KDB558074 v03r05 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

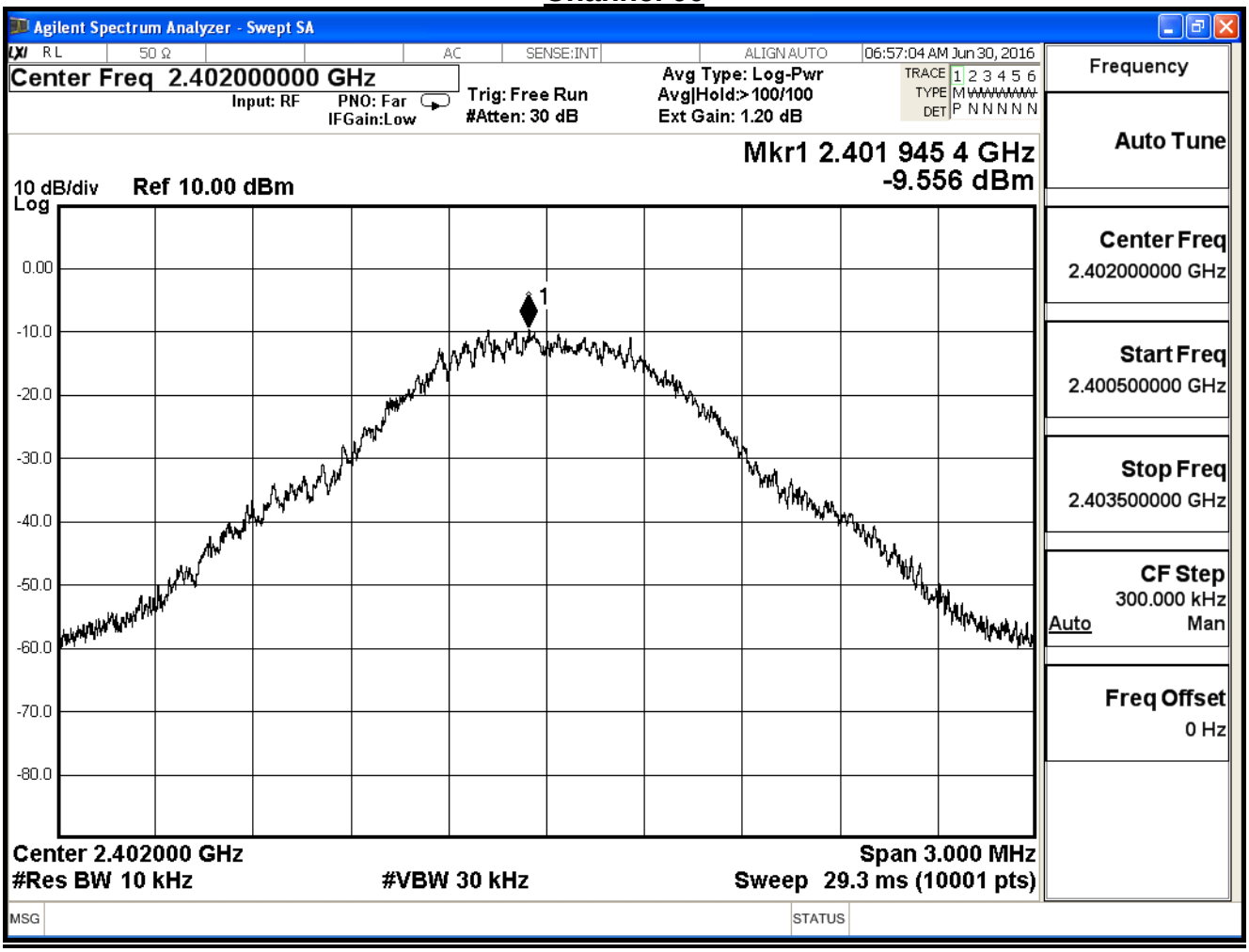
The measurement uncertainty is defined as ±1.27dB.

8.7. Test Result

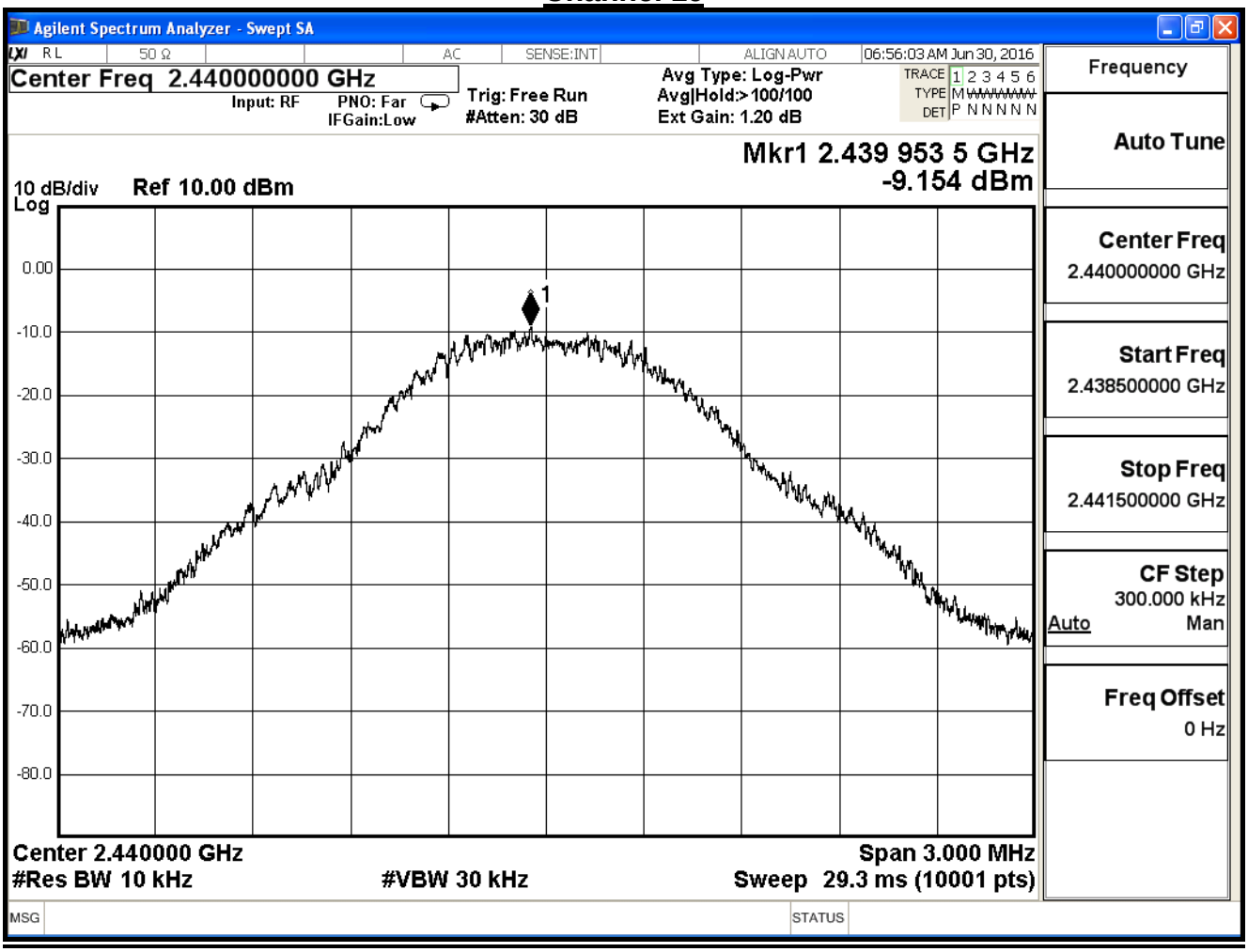
Product	PAJ2801UA-40 Wireless BLE 4.0 Module		
Test Item	Power Density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2016/06/30	Test Site	SR7

Channel No.	Frequency (MHz)	Measure Level(dBm)	Limit (dBm)	Result
00	2402	-9.556	≦8	Pass
19	2440	-9.154	≦8	Pass
39	2480	-9.698	≦8	Pass

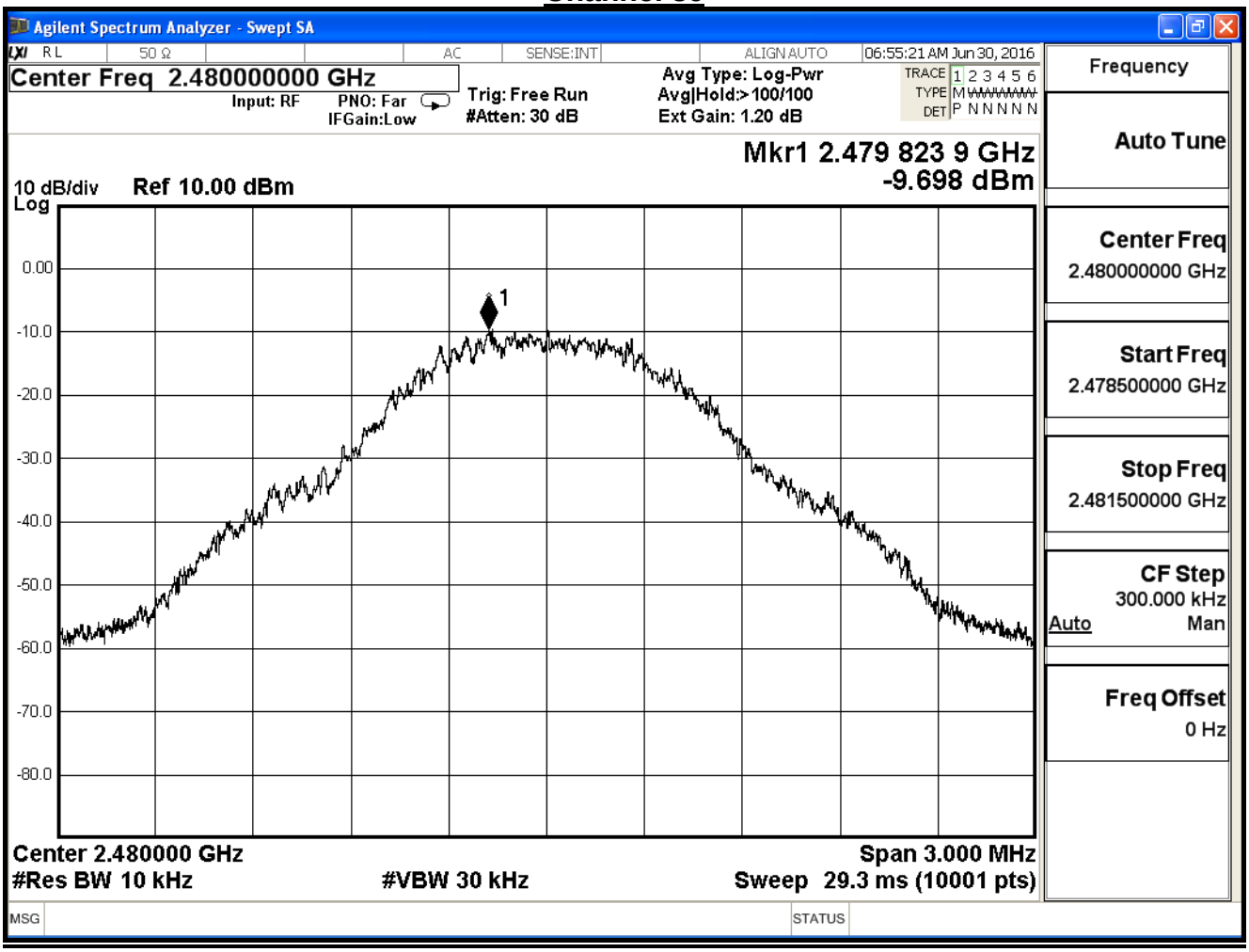
Channel 00



Channel 19


Agilent Spectrum Analyzer - Swept SA
RL
50 Ω
AC
SENSE:INT
ALIGN AUTO
06:56:03 AM Jun 30, 2016
Center Freq 2.440000000 GHz
Input: RF
PNO: Far
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: 1.20 dB
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.439 953 5 GHz
-9.154 dBm
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.440000 GHz
#Res BW 10 kHz
#VBW 30 kHz
Span 3.000 MHz
Sweep 29.3 ms (10001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.440000000 GHz
Start Freq
2.438500000 GHz
Stop Freq
2.441500000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz

Channel 39


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
Input: RF
PNO: Far
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: 1.20 dB
06:55:21 AM Jun 30, 2016
Mkr1 2.479 823 9 GHz
-9.698 dBm
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.480000 GHz
#Res BW 10 kHz
#VBW 30 kHz
Span 3.000 MHz
Sweep 29.3 ms (10001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.481500000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS