

FCC Test Report

Product Name	Afterglow Anka/AG7 wireless Dongle for XB1
Model No	048-032T
FCC ID.	X5B-048-032T

Applicant	Performance Designed Products, LLC
Address	14144 Ventura Blvd., Suite 200 Sherman Oaks, CA91423 USA

Date of Receipt	Apr. 17, 2015
Issue Date	June 01, 2015
Report No.	1540398R-RFUSP25V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Product Name	Afterglow Anka/AG7 wireless Dongle for XB1
Applicant	Performance Designed Products, LLC
Address	14144 Ventura Blvd., Suite 200 Sherman Oaks, CA91423 USA
Manufacturer	Performance Designed Products, LLC
Model No.	048-032T
EUT Rated Voltage	DC 5V (Power by USB)
EUT Test Voltage	AC 120V/60Hz
Trade Name	pdp, Afterglow
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2014 ANSI C63.4: 2009, ANSI C63.10: 2009 KDB 558074 D01 DTS Meas Guidance v03r02
Test Result	Complied

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Afterglow Anka/AG7 wireless Dongle for XB1
Trade Name	pdp, Afterglow
Model No.	048-032T
FCC ID.	X5B-048-032T
Frequency Range	2403.35 – 2479.35MHz
Channel Control	Auto
Channel Separation	2MHz
Channel Number	39
Type of Modulation	Pi/4 DQPSK
Antenna Type	MULTILAYER CERAMIC
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Walsin	RFANT3216120A5T	MULTILAYER CERAMIC	2.12dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	2403.35 MHz	Channel 11:	2423.35 MHz	Channel 21:	2443.35 MHz	Channel 31:	2463.35 MHz
Channel 2:	2405.35 MHz	Channel 12:	2425.35 MHz	Channel 22:	2445.35 MHz	Channel 32:	2465.35 MHz
Channel 3:	2407.35 MHz	Channel 13:	2427.35 MHz	Channel 23:	2447.35 MHz	Channel 33:	2467.35 MHz
Channel 4:	2409.35 MHz	Channel 14:	2429.35 MHz	Channel 24:	2449.35 MHz	Channel 34:	2469.35 MHz
Channel 5:	2411.35 MHz	Channel 15:	2431.35 MHz	Channel 25:	2451.35 MHz	Channel 35:	2471.35 MHz
Channel 6:	2413.35 MHz	Channel 16:	2433.35 MHz	Channel 26:	2453.35 MHz	Channel 36:	2473.35 MHz
Channel 7:	2415.35 MHz	Channel 17:	2435.35 MHz	Channel 27:	2455.35 MHz	Channel 37:	2475.35 MHz
Channel 8:	2417.35 MHz	Channel 18:	2437.35 MHz	Channel 28:	2457.35 MHz	Channel 38:	2477.35 MHz
Channel 9:	2419.35 MHz	Channel 19:	2439.35 MHz	Channel 29:	2459.35 MHz	Channel 39:	2479.35 MHz
Channel 10:	2421.35 MHz	Channel 20:	2441.35 MHz	Channel 30:	2461.35 MHz		

Note:

1. The EUT is an Afterglow Anka/AG7 wireless Dongle for XB1 with a built-in 2.4GHz transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample for the purpose of demonstrating compliance of 2.4GHz transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
5. The EUT is using two the same SISO antennas(Ant1&Ant2) and only the worst case(Ant1) is shown in the report.

Test Mode:	Mode 1: Transmit
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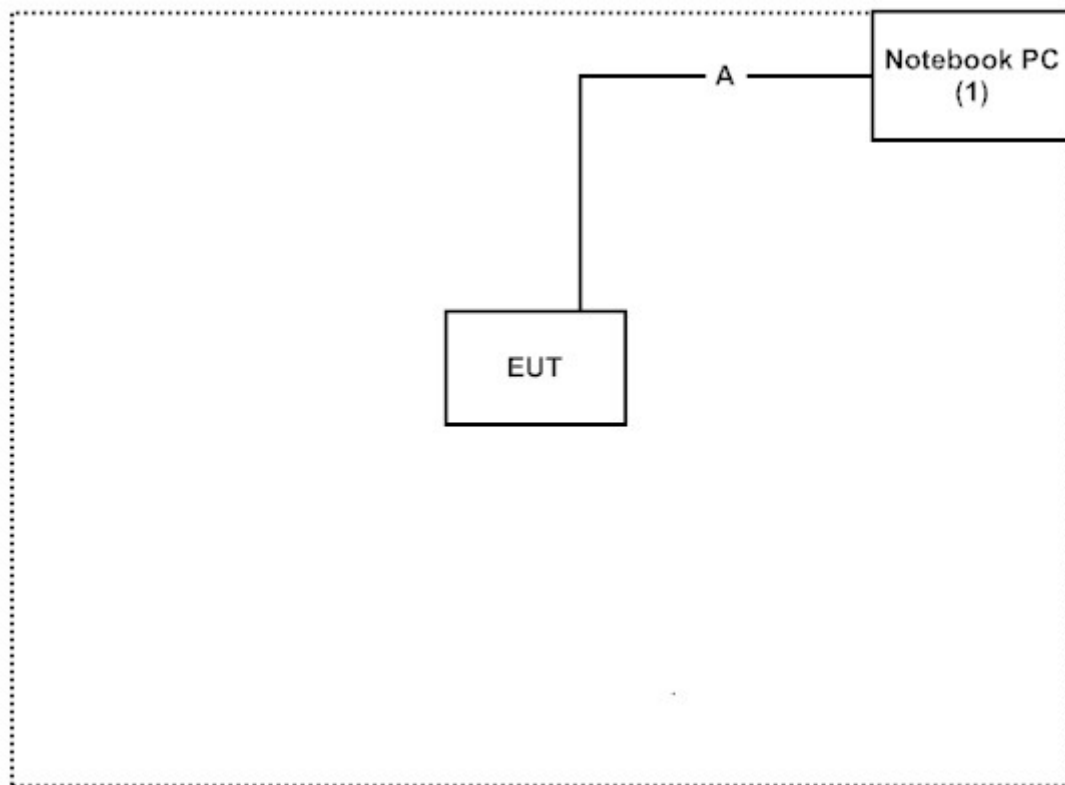
1.3. Tested System Details

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

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m

Signal Cable Type	Signal cable Description
A USB Cable	Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute “VMI dedbug.exe (v1.1.6.47)” on the Notebook PC.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmit.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : <http://www.quietek.com/chinese/about/certificates.aspx?bval=5>

The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

Site Description: File on
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FCC Accreditation Number: TW1014

2. Conducted Emission

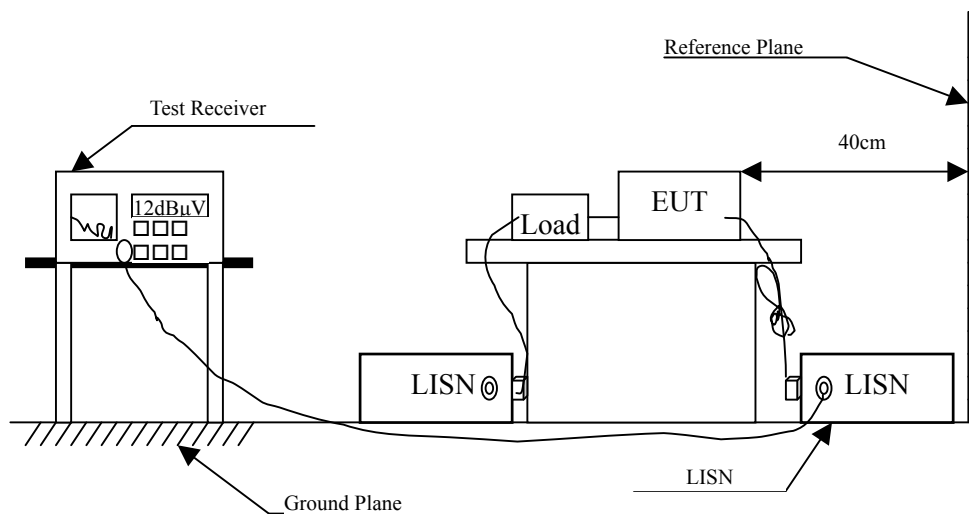
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2014	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2015	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2015	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar., 2015	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2015	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

2.2. Test Setup



2.3. Limits

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

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

2.4. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2009 on conducted measurement.

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

The EUT was setup to ANSI C63.4: 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : Afterglow Anka/AG7 wireless Dongle for XB1
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
Line 1					
Quasi-Peak					
0.197	9.699	34.150	43.849	-20.808	64.657
0.373	9.707	31.680	41.387	-18.242	59.629
0.459	9.710	28.460	38.170	-19.001	57.171
0.830	9.727	16.880	26.607	-29.393	56.000
7.654	9.860	19.980	29.840	-30.160	60.000
24.037	9.987	20.490	30.477	-29.523	60.000
Average					
0.197	9.699	25.740	35.439	-19.218	54.657
0.373	9.707	19.390	29.097	-20.532	49.629
0.459	9.710	10.970	20.680	-26.491	47.171
0.830	9.727	5.420	15.147	-30.853	46.000
7.654	9.860	10.940	20.800	-29.200	50.000
24.037	9.987	14.710	24.697	-25.303	50.000

Note:

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

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.197	9.679	35.300	44.979	-19.678	64.657
0.295	9.683	36.960	46.643	-15.214	61.857
0.357	9.686	7.490	17.176	-42.910	60.086
0.494	9.692	23.900	33.592	-22.579	56.171
10.595	9.900	15.000	24.900	-35.100	60.000
24.888	10.145	20.580	30.725	-29.275	60.000
Average					
0.197	9.679	31.600	41.279	-13.378	54.657
0.295	9.683	26.250	35.933	-15.924	51.857
0.357	9.686	7.480	17.166	-32.920	50.086
0.494	9.692	13.160	22.852	-23.319	46.171
10.595	9.900	14.990	24.890	-25.110	50.000
24.888	10.145	15.090	25.235	-24.765	50.000

Note:

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

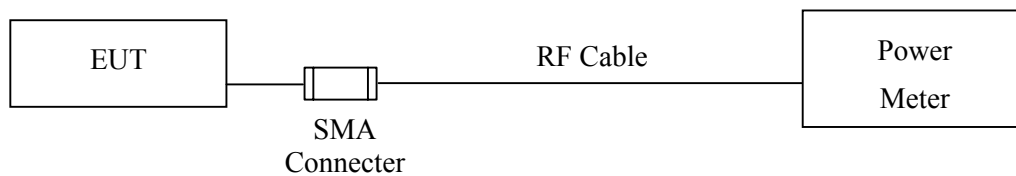
3. Peak Power Output

3.1. Test Equipment

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

Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

3.2. Test Setup



3.3. Limit

The maximum peak power shall be less 1Watt.

3.4. Test Procedure

Tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.2 PKPM1 Peak power meter method.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Power Output

Product : Afterglow Anka/AG7 wireless Dongle for XB1
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
01	2403.35	2.12	1 Watt= 30 dBm	Pass
20	2441.35	2.15	1 Watt= 30 dBm	Pass
39	2479.35	2.06	1 Watt= 30 dBm	Pass

4. Radiated Emission

4.1. Test Equipment

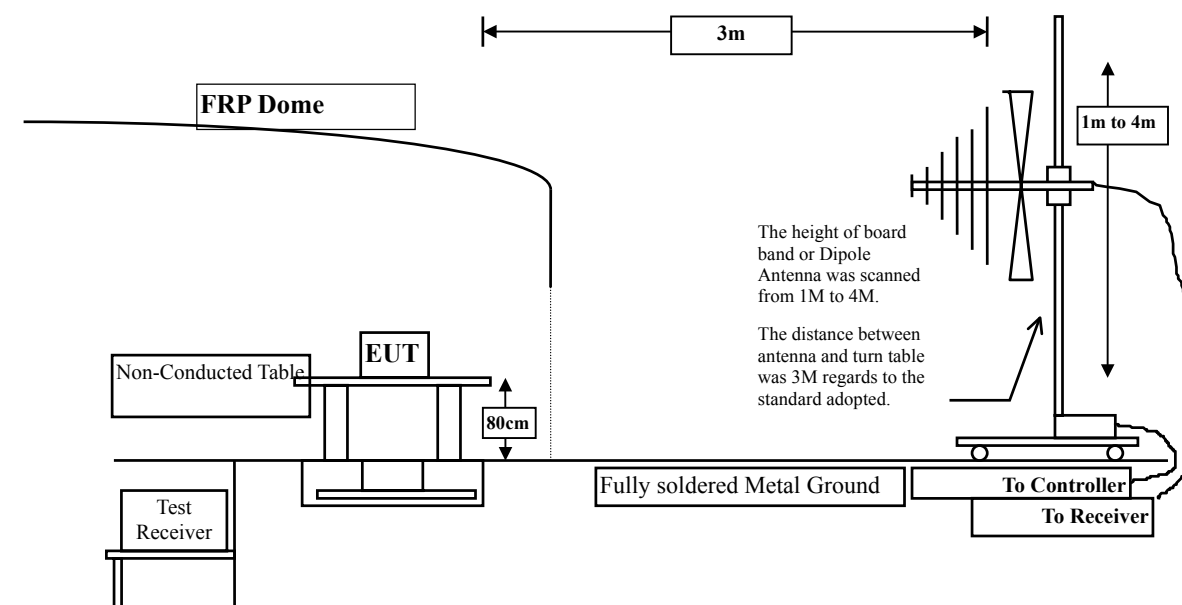
The following test equipments are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	X	Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2014
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2014
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2014
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2014
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2014
		Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2015
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2014
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2015
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

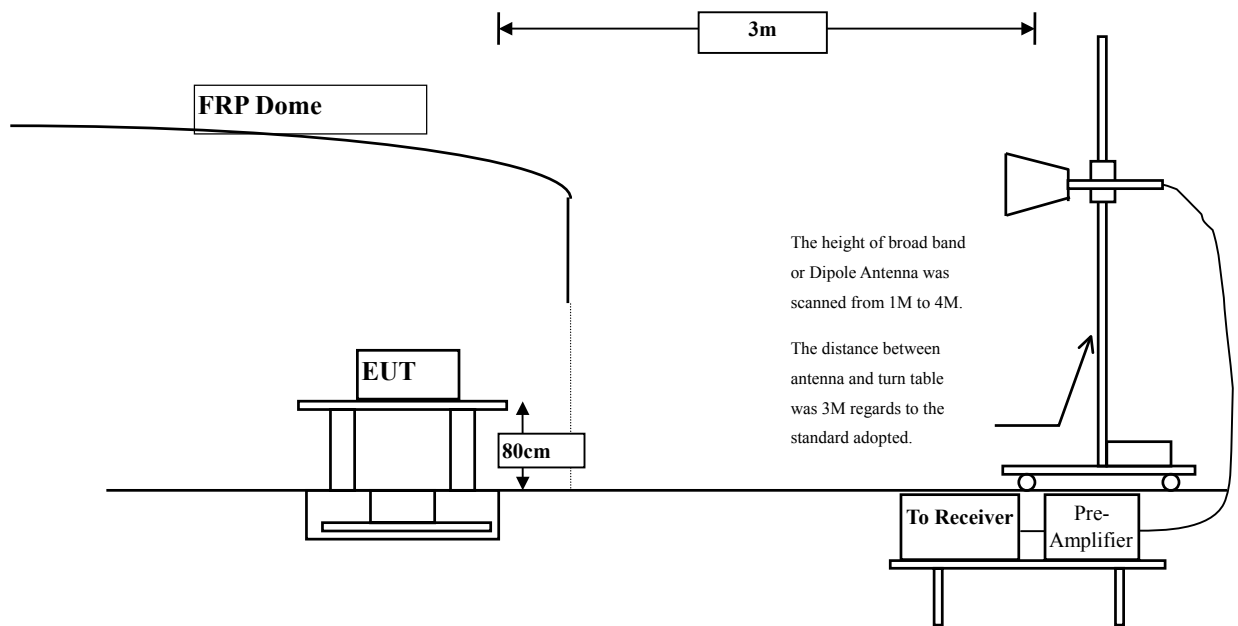
- Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

4.2. Test Setup

Below 1GHz



Above 1GHz



4.3. Limits

➤ General Radiated Emission Limits

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

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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

4.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2009 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2009 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2403.35MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4806.700	2.534	47.974	50.508	-23.492	74.000
7210.050	9.466	41.544	51.010	-22.990	74.000
9613.400	10.343	38.246	48.590	-25.410	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4806.700	2.934	44.603	47.537	-26.463	74.000
7210.050	9.946	43.096	53.043	-20.957	74.000
9613.400	10.808	37.900	48.708	-25.292	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.700	2.021	45.686	47.707	-26.293	74.000
7324.050	9.783	40.178	49.961	-24.039	74.000
9765.400	9.687	38.785	48.472	-25.528	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4882.700	2.484	44.917	47.401	-26.599	74.000
7324.050	10.399	42.967	53.366	-20.634	74.000
9765.400	10.320	38.790	49.110	-24.890	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2479.35MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4958.700	2.569	45.482	48.051	-25.949	74.000
7438.050	10.548	40.610	51.158	-22.842	74.000
9917.400	10.202	38.039	48.241	-25.759	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4958.700	2.569	45.482	48.051	-25.949	74.000
7438.050	10.548	40.610	51.158	-22.842	74.000
9917.400	10.202	38.039	48.241	-25.759	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
259.890	-5.455	41.175	35.720	-10.280	46.000
292.870	-5.076	44.321	39.245	-6.755	46.000
397.630	0.826	35.839	36.665	-9.335	46.000
711.910	3.788	36.121	39.909	-6.091	46.000
794.360	6.387	30.979	37.366	-8.634	46.000
900.090	5.818	33.076	38.894	-7.106	46.000
Vertical					
177.440	-1.248	30.620	29.372	-14.128	43.500
227.880	-6.169	33.846	27.678	-18.322	46.000
324.880	-3.120	33.277	30.157	-15.843	46.000
711.910	-1.132	36.121	34.989	-11.011	46.000
783.690	2.742	32.193	34.935	-11.065	46.000
843.830	2.420	26.097	28.517	-17.483	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

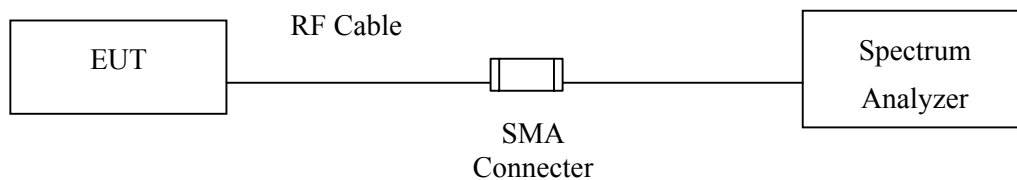
5. RF Antenna Conducted Test

5.1. Test Equipment

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

Note: 1. All equipments are calibrated every one year.
2. The test instruments Marked "X" are used to measure the final test results.

5.2. Test Setup



5.3. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.4. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

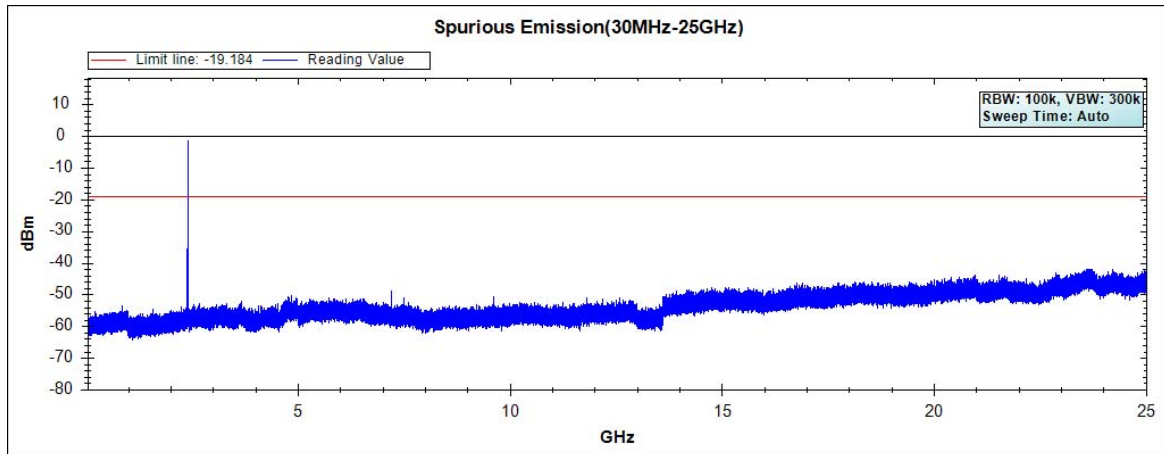
5.5. Uncertainty

$\pm 150\text{Hz}$

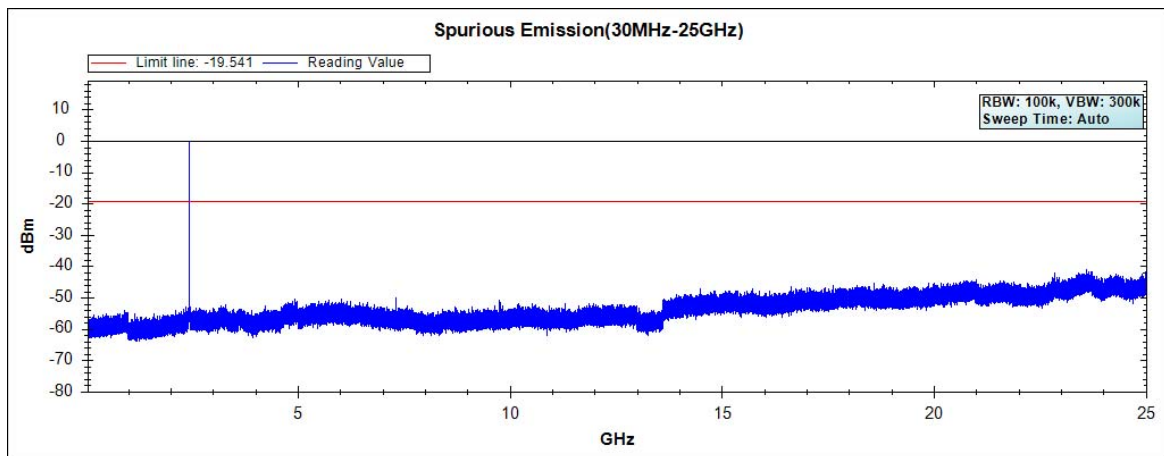
5.6. Test Result of RF antenna conducted test

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : RF antenna conducted test
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit

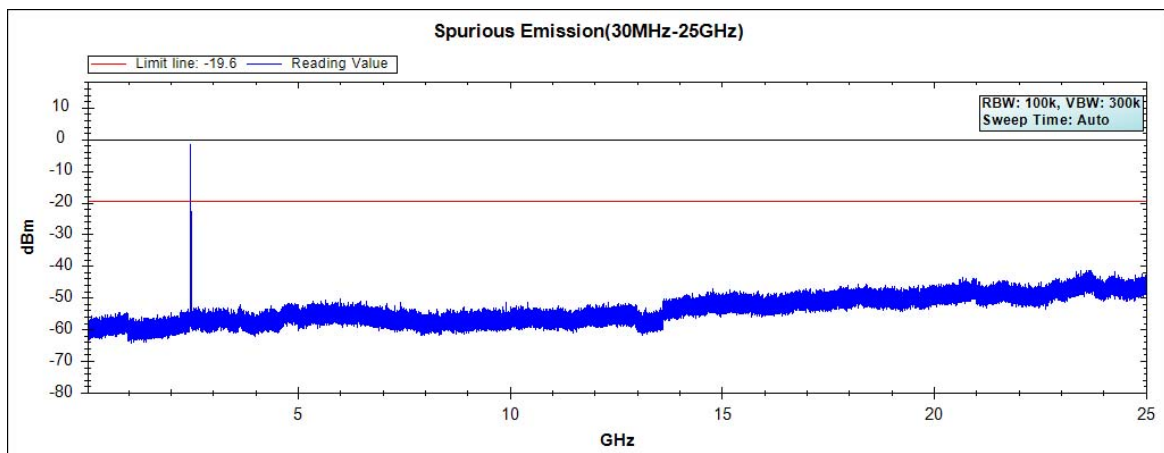
Channel 01 (2403.35MHz) 30M-25GHz



Channel 20 (2441.35MHz) 30M-25GHz



Channel 39 (2479.35MHz) 30M-25GHz



6. Band Edge

6.1. Test Equipment

RF Conducted Measurement

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

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

RF Radiated Measurement:

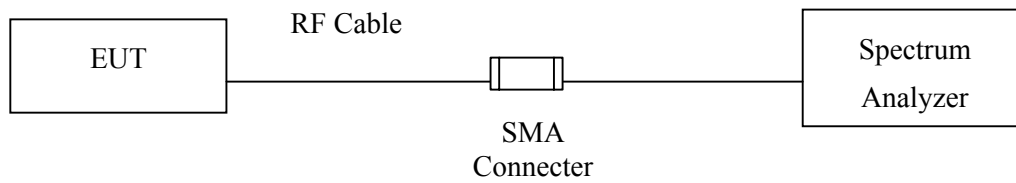
The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2014
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2014
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2014
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2014
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2015
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2014
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2015
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

- Note:
1. All equipments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

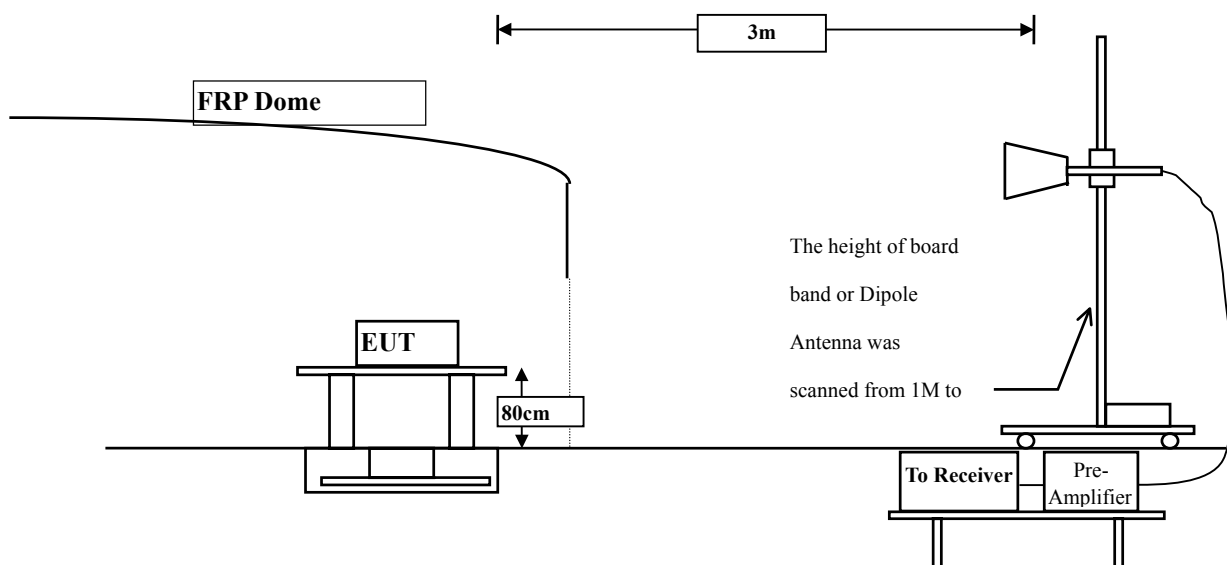
6.2. Test Setup

RF Conducted Measurement



RF Radiated Measurement:

Above 1GHz



6.3. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2009 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2009 on radiated measurement.

6.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

6.6. Test Result of Band Edge

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit(2403.35MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	-2.687	60.495	57.808	74.00	54.00	Pass
01 (Peak)	2400.000	-2.660	76.204	73.544	74.00	54.00	Pass
01 (Peak)	2403.500	-2.655	104.416	101.761	--	--	--
01 (Average)	2390.000	-2.687	43.793	41.106	74.00	54.00	Pass
01 (Average)	2398.000	-2.663	65.742	63.079	--	--	--
01 (Average)	2400.000	-2.660	63.693	61.033	--	--	--
01 (Average)	2403.400	-2.655	101.445	98.790	--	--	--

Figure Channel 01: Horizontal (Peak)

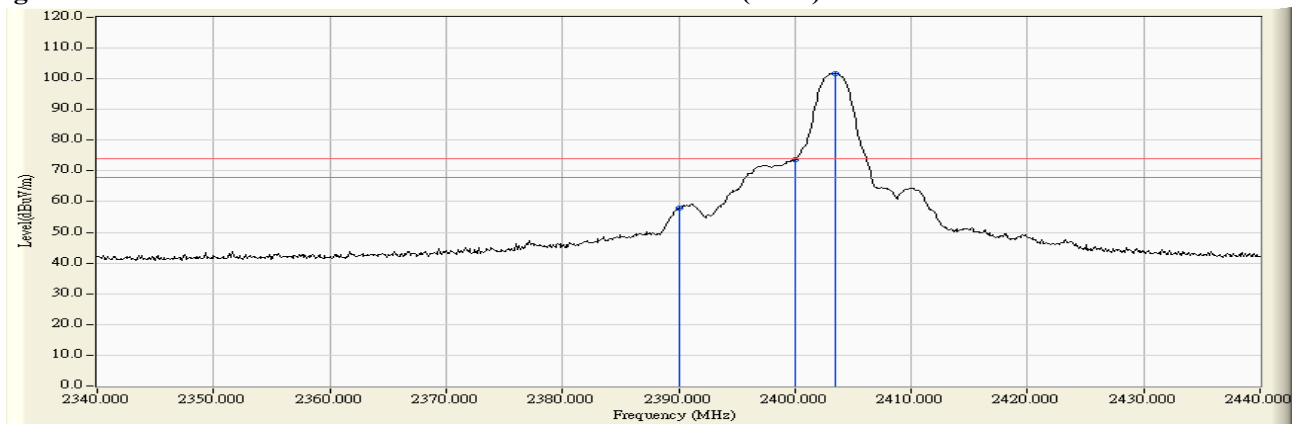
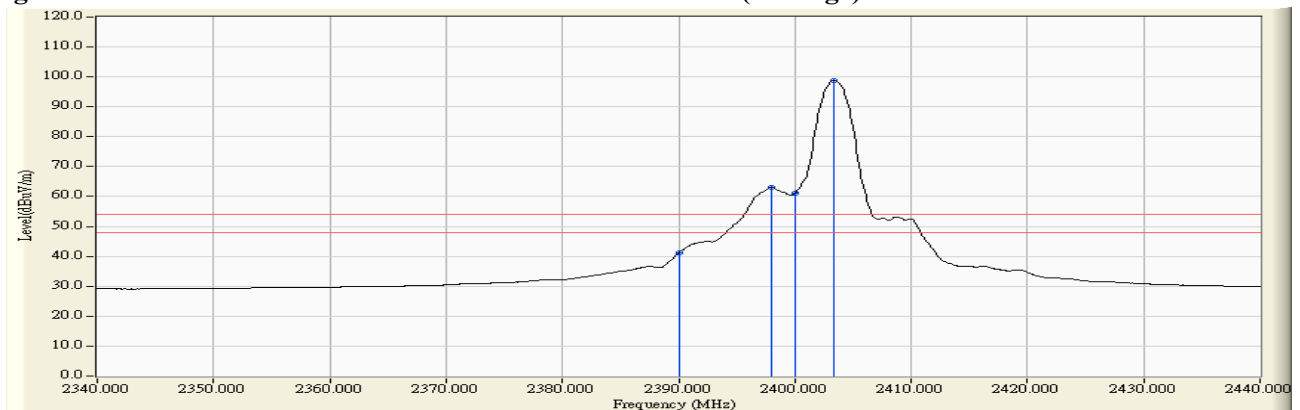


Figure Channel 01: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit(2403.35MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	-4.159	54.559	50.400	74.00	54.00	Pass
01 (Peak)	2400.000	-4.171	68.854	64.683	74.00	54.00	Pass
01 (Peak)	2403.600	-4.170	97.156	92.986	--	--	--
01 (Average)	2390.000	-4.159	38.845	34.686	74.00	54.00	Pass
01 (Average)	2397.900	-4.171	58.838	54.667	74.00	54.00	Pass
01 (Average)	2400.000	-4.171	56.654	52.483	74.00	54.00	Pass
01 (Average)	2403.400	-4.170	94.211	90.041	--	--	--

Figure Channel 01:

Vertical (Peak)

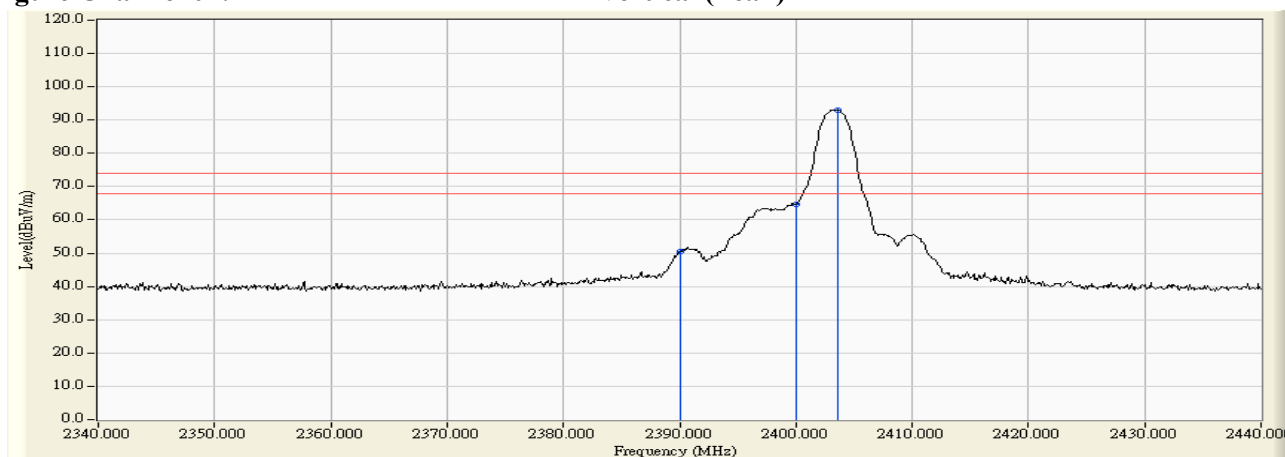
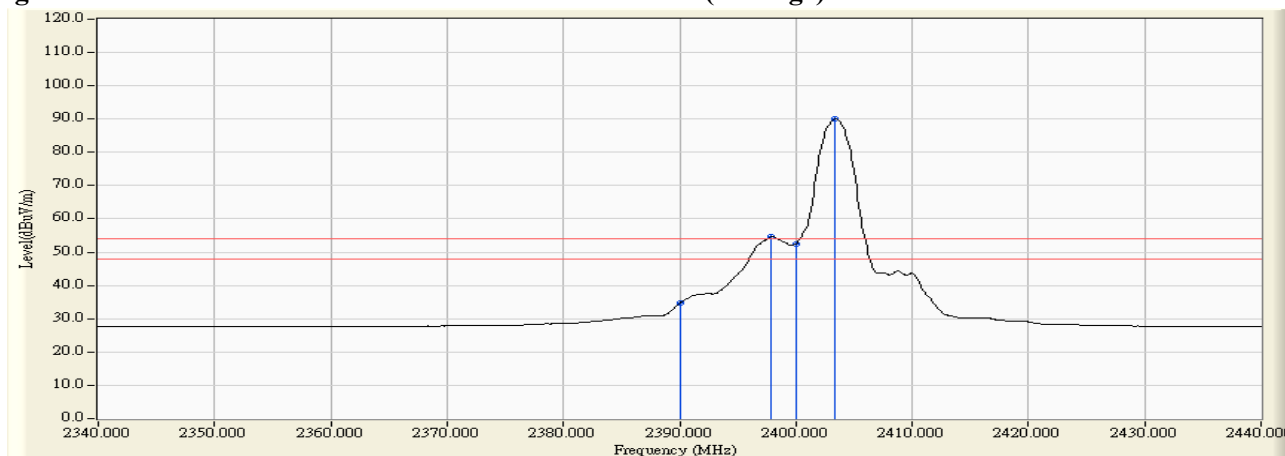


Figure Channel 01:

Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit(2479.35MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
39 (Peak)	2479.100	-2.606	101.546	98.940	--	--	--
39 (Peak)	2483.500	-2.601	67.031	64.429	74.00	54.00	Pass
39 (Average)	2479.400	-2.606	98.715	96.109	--	--	--
39 (Average)	2483.500	-2.601	54.523	51.921	74.00	54.00	Pass

Figure Channel 39: Horizontal (Peak)

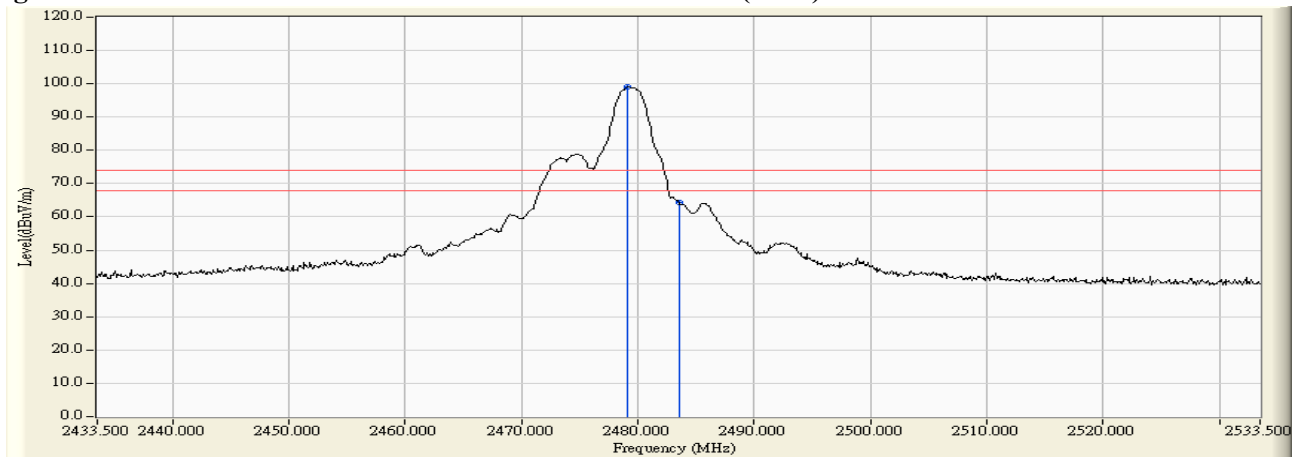
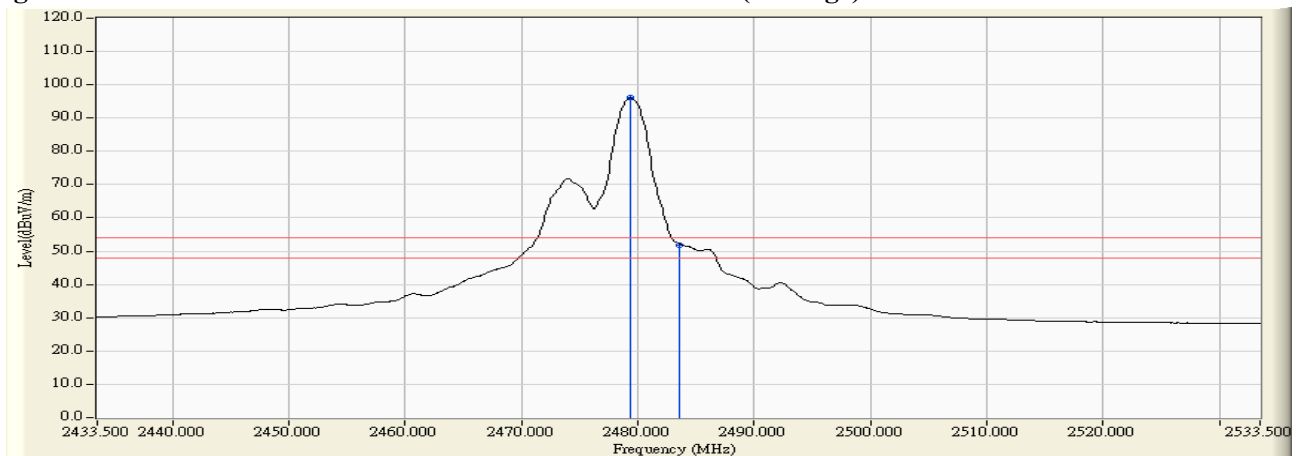


Figure Channel 39: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit(2479.35MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
39 (Peak)	2479.200	-3.980	95.602	91.622	--	--	--
39 (Peak)	2483.500	-3.966	61.639	57.672	74.00	54.00	Pass
39 (Average)	2479.400	-3.980	92.753	88.773	--	--	--
39 (Average)	2483.500	-3.966	49.205	45.238	74.00	54.00	Pass

Figure Channel 39: Vertical (Peak)

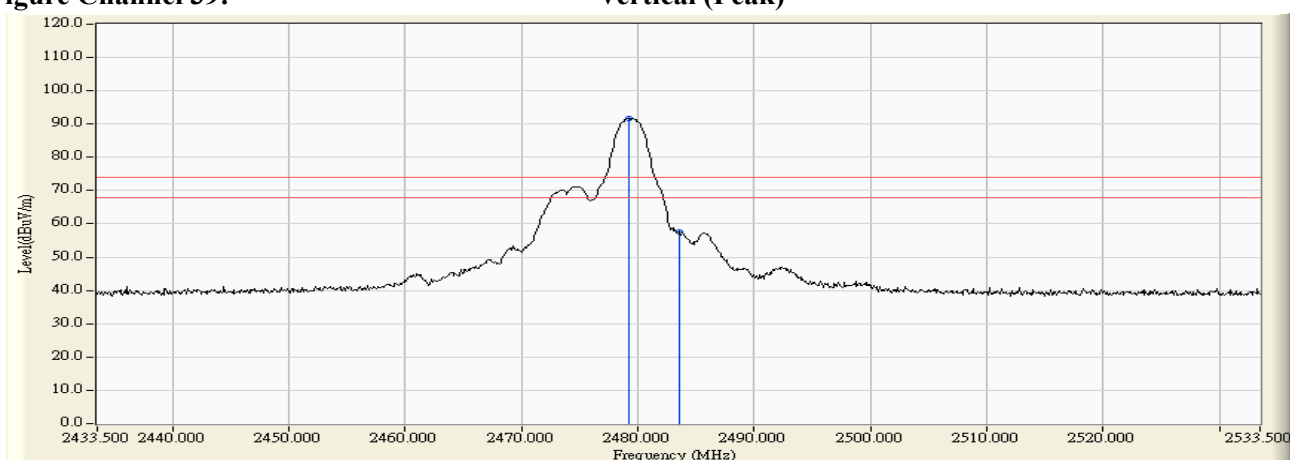
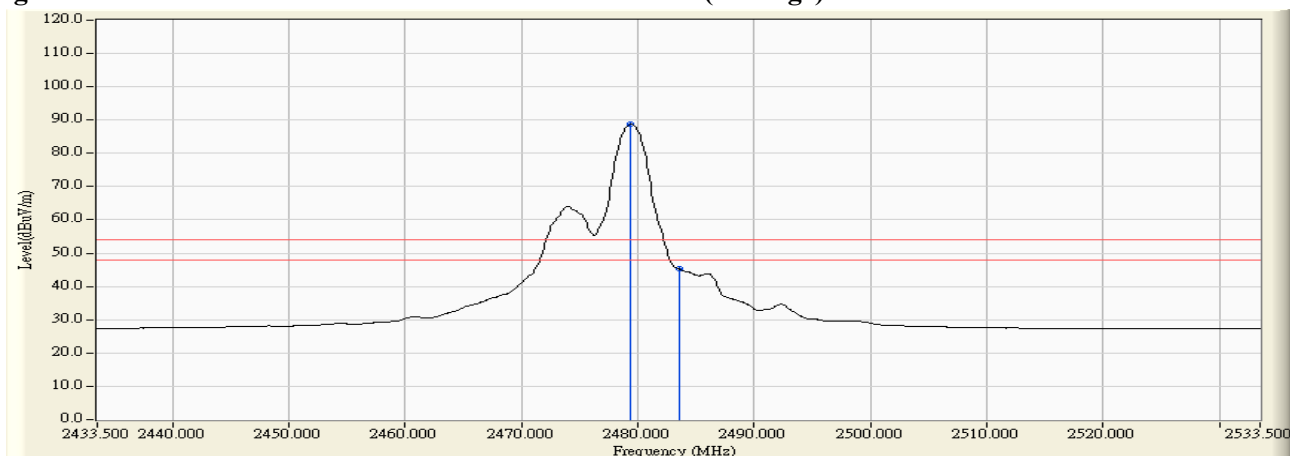


Figure Channel 39: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

7. Occupied Bandwidth (6dB BW)

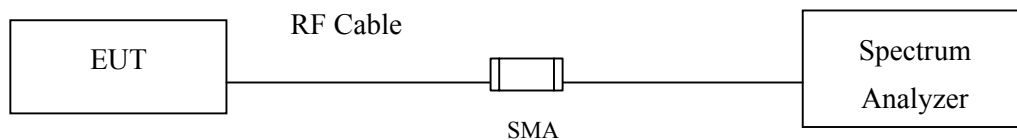
7.1. Test Equipment

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

Note:

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

7.2. Test Setup



7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

7.4. Test Procedure

The EUT was setup according to ANSI C63.10 2009; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 1-5% of the emission bandwidth, VBW \geq 3*RBW

7.5. Uncertainty

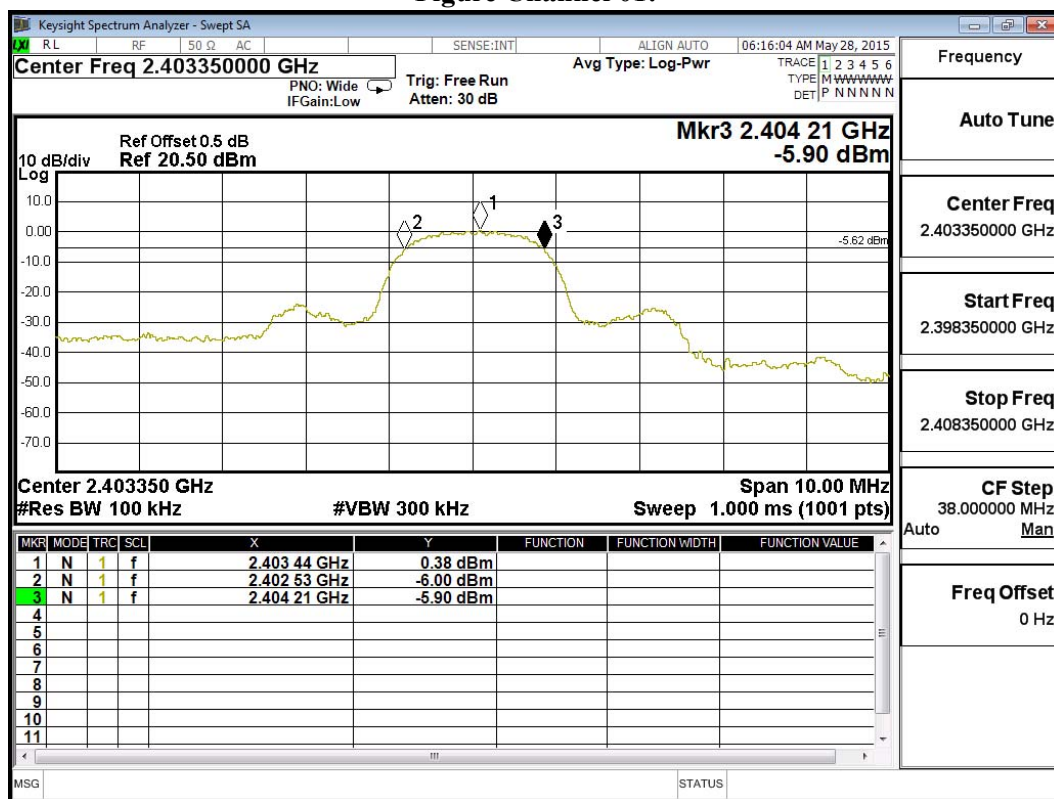
$\pm 150\text{Hz}$

7.6. Test Result of Occupied Bandwidth

Product : Afterglow Anka/AG7 wireless Dongle for XB1
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2403.35MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2403.35	1680	>500	Pass

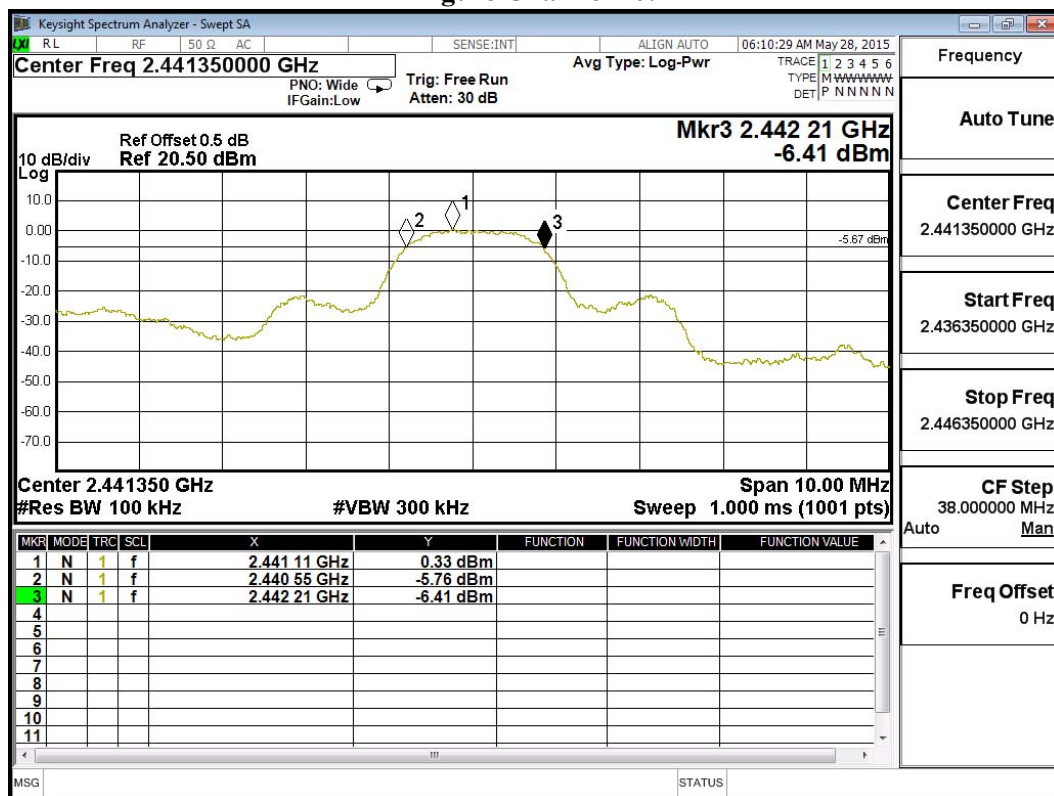
Figure Channel 01:



Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2441.35MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
20	2441.35	1660	>500	Pass

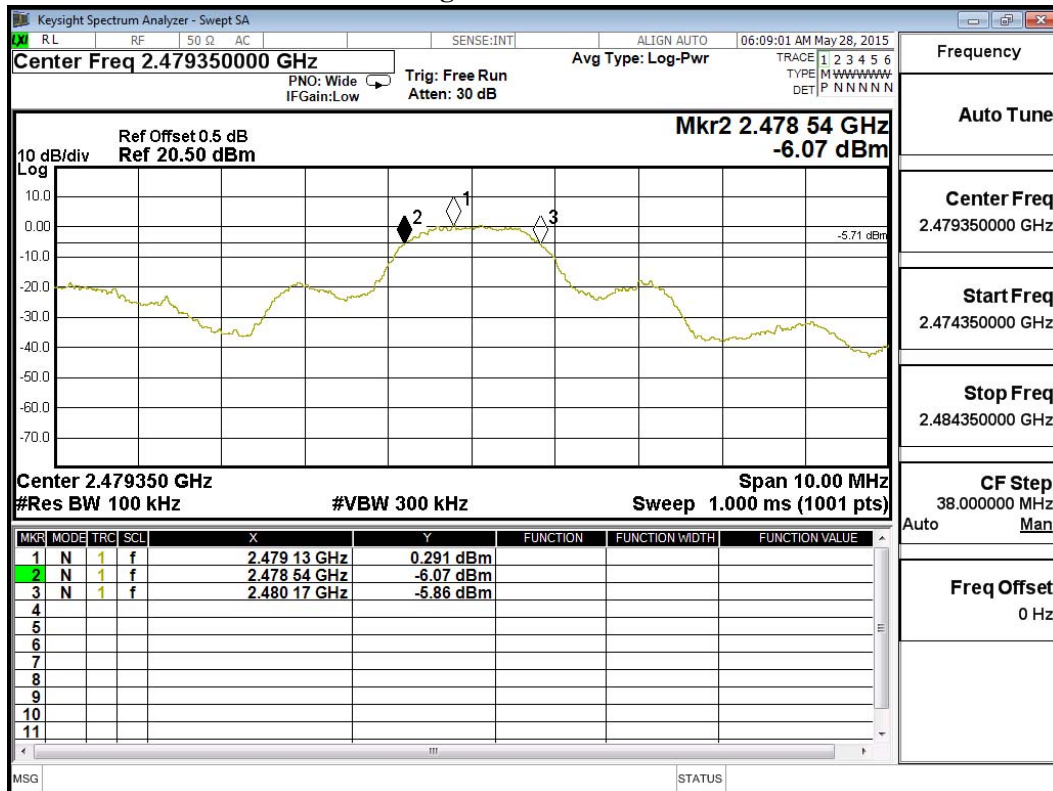
Figure Channel 20:



Product : Afterglow Anka/AG7 wireless Dongle for XB1
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2479.35MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2479.35	1630	>500	Pass

Figure Channel 39:



8. Power Density

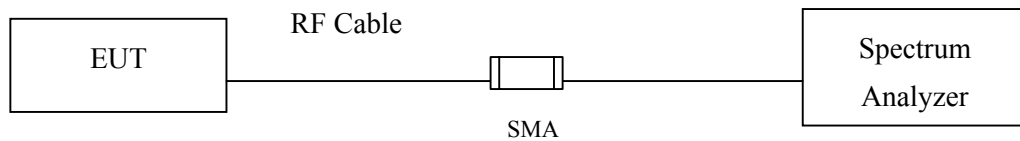
8.1. Test Equipment

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

Note:

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

8.2. Test Setup



8.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2009, the maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

8.5. Uncertainty

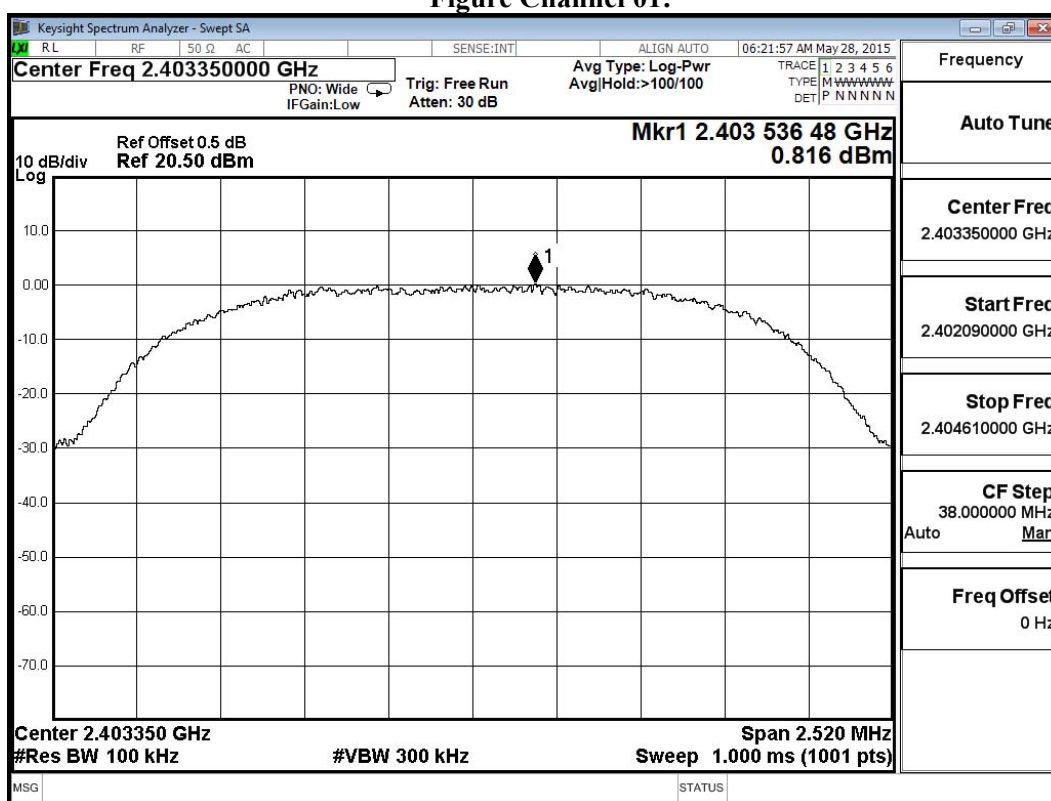
± 1.27 dB

8.6. Test Result of Power Density

Product : Afterglow Anka/AG7 wireless Dongle for XB1
 Test Item : Power Density Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit(2403.35MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2403.35	0.816	< 8dBm	Pass

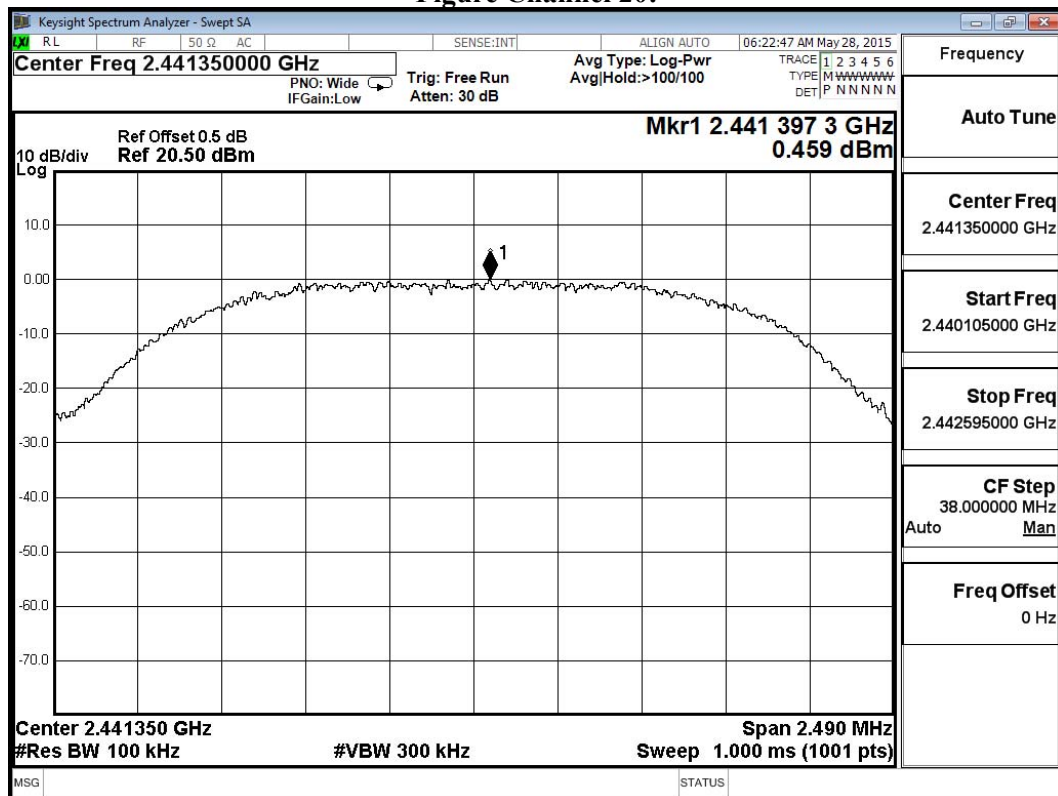
Figure Channel 01:



Product : Afterglow Anka/AG7 wireless Dongle for XB1
 Test Item : Power Density Data
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit (2441.35MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
20	2441.35	0.459	< 8dBm	Pass

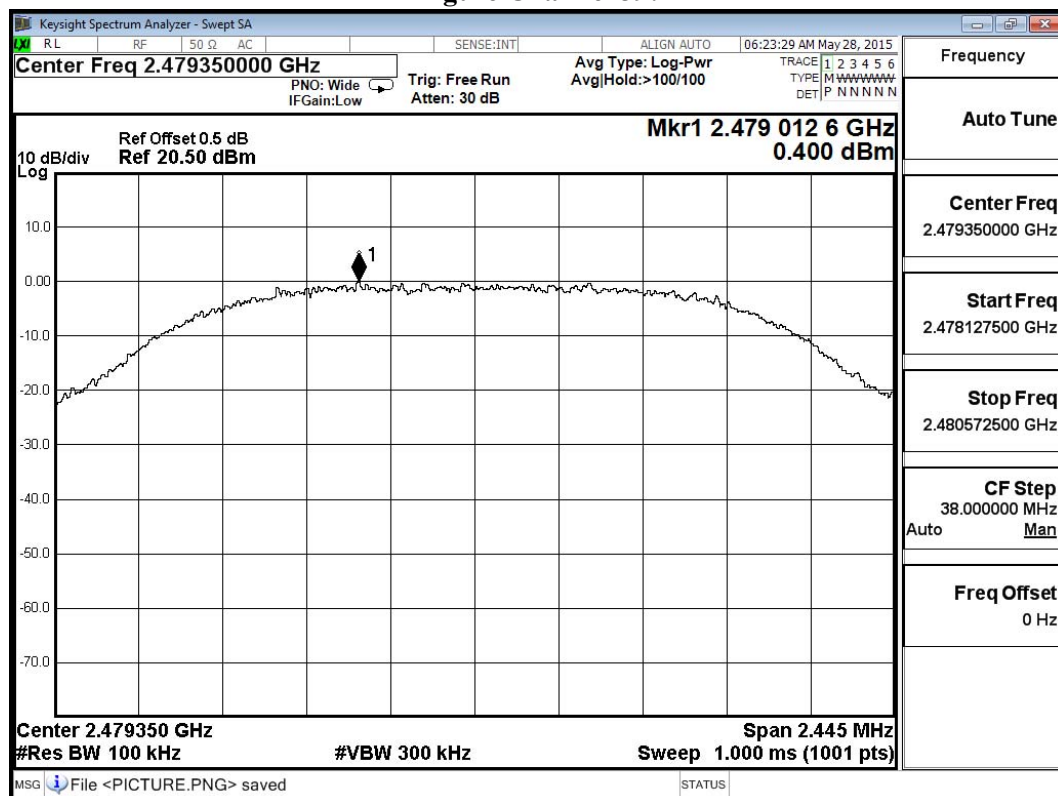
Figure Channel 20:



Product : Afterglow Anka/AG7 wireless Dongle for XB1
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2479.35MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
39	2479.35	0.400	< 8dBm	Pass

Figure Channel 39:



9. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs