

TEST REPORT For FCC

FCC Standards : FCC 47CFR part 15 subpart C
Industry Canada Standards :RSS-210 Issue 8 & RSS-GEN Issue 4

Test Report No. : CTK-2015-00569
Date of Issue : 2015-06-08
FCC ID : A3LWEA403E
Certification Number IC : 649E-WEA403E
Model/Type No. : WEA403e
Kind of Product : WLAN Access Point
Applicant : Samsung Electronics Co., Ltd.
Applicant Address : 129, Samsung-ro Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea, 443-742
Manufacturer : Samsung Electronics Co., Ltd.
Manufacturer Address : 129, Samsung-ro Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea, 443-742
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Telephone : +82-31-279-5687
Received Date : 2015-03-10
Test period : Start : 2015-05-27 End : 2015-06-08

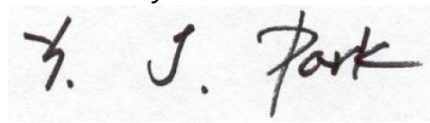
The test results presented in this report relate only to the object tested.

Tested by



Won-Jae, Hwang
Test Engineer
Date: 2015-06-08

Reviewed by



Young-Joon, Park
Technical Manager
Date: 2015-06-08

REPORT REVISION HISTORY

Date	Revision	Page No
2015-06-08	Issued (CTK-2015-00569)	All

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1.0 General Product Description

Equipment model name	WEA403e						
Serial number	Prototype						
EUT condition	Pre-production, not damaged						
Frequency Range	802.11b/g/n_HT20 : 2412 MHz - 2462 MHz						
RF output power :							
Mode	Channel Bandwidth (MHz)	Frequency Range (MHz)	ANT1 (SISO)	ANT2 (SISO)	ANT3 (SISO)	ANT1+2 (MIMO)	ANT1+2+3 (MIMO)
			RF output power (dBm)				
802.11b	20	2412 - 2462	15.38	-	-	-	-
802.11g	20		12.14	11.21	11.70	14.71	16.47
802.11n	20		12.20	11.18	11.61	14.73	16.45
Number of channels		11					
Transfer Rate	802.11b : 11 / 5.5 / 2 / 1 Mbps 802.11g : 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps 802.11n : up to 300 Mbps						
Type of Modulation	802.11b : DSSS 802.11g/n : OFDM						
Power Source	DC 48 V(Adaptor,PoE)						
Duty Cycle	802.11b : 99.1 % 802.11g : 98.3 % 802.11n_HT20 : 98.3 %						
Antenna Type	- Dipole antenna - Patch antenna						
Antenna Gain *	1. WDS-ANTD2D : 2 dBi @2.4GHz, 4 dBi @5GHz (Dipole) 2. WDS-ANTD4D : 4 dBi @2.4GHz, 5.5 dBi @5GHz (Dipole) 3. WDS-ANTP63 : 6.5 dBi @2.4GHz, 7 dBi @5GHz (Patch)						

* This EUT is supported the two Dipole antenna. Worst case is WDS-ANTD4D. So the worst data of WDS-ANTD4D and Patch antenna are shown.

* Test mode

The worst-case data rates are determined to be as follows for each mode.

802.11b mode, 1 Mb/s, CCK Modulation

802.11g mode, 6 Mb/s, OFDM Modulation

802.11n HT20 mode, MCS 0, OFDM Modulation

1.1 Tested Frequency

802.11b, 802.11g, 802.11n_HT20

	LOW	MID	HIGH
Frequency (MHz)	2412	2437	2462

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Note Computer	DELL INC.	Inspiron 6400	-
Switching Adapter	DDongguang Lite Power 2nd Plant	LA65NS0-00	-
PoE Switch	NETGEAR INC	GS110TP	200CC8412556
AC/DC ADAPTER	BAO HUI SCIENCE & TECHNOLOGY CO., LTD.	AD8190LF	-

1.4 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.5 Test Facility

The measurement facility is located at (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.6 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements	 805871
JAPAN	VCCI	3 m & 10 m SAC and Conducted Test Site	 R-948, C-986, T-1843
KOREA	MSIP	EMI (Electromagnetic Interference / Emission) EMS (Electromagnetic Susceptibility / Immunity)	 No. 51, KR0025
International	KOLAS	EMC	

2 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	> 500 kHz	Conducted	C
15.247(b)	Maximum Output Power	< 1 Watt		C
15.247(d)	Conducted Spurious emission	> 20 dBc		C
15.247(d)	Band Edge	> 20 dBc		C
15.247(e)	Transmitter Power Spectral Density	< 8 dBm @ 3 kHz		C
				C
15.209	Field Strength of Harmonics	15.209(a)	Radiated	C
15.207	AC Conducted Emissions	15.207(a)	Line Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

- FCC Part 15.247, ANSI C63.10-2013

The tests were performed according to the method of measurements prescribed in

KDB No.558074

2.1 Technical Characteristic Test

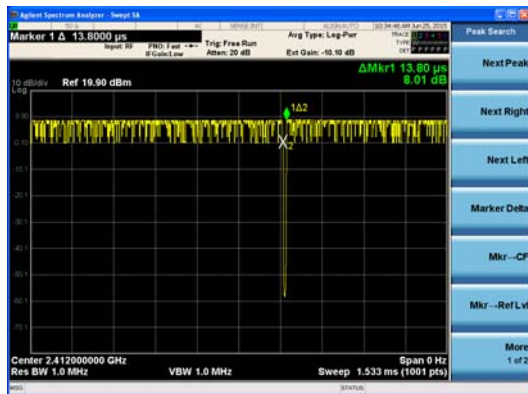
2.1.1 ON Time, Duty Cycle

Procedure:

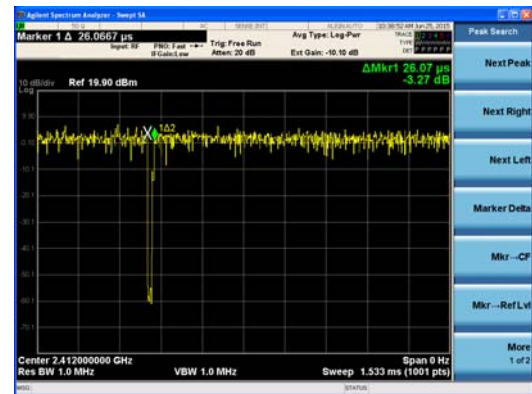
KDB 558074 Zero-Span Spectrum Analyzer Method.

Measurement Data:

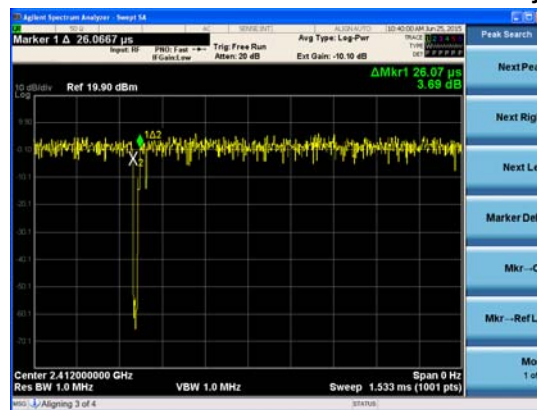
	ON Time (ms)	Period (ms)	TX OFF (ms)	Duty Cycle (linear)	Duty Cycle (%)
802.11b	1.519	1.533	0.014	0.991	99.1
802.11g	1.507	1.533	0.026	0.983	98.3
802.11n_HT20	1.507	1.533	0.026	0.983	98.3



Duty Cycle_802.11b



Duty Cycle_802.11g



Duty Cycle_802.11n_HT20

2.1.2 6dB Bandwidth and 99 % Bandwidth

Procedure:

The bandwidth at 6dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 50 MHz

VBW = 300 kHz (3 x RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data:

Ant : A1

	6 dB Bandwidth and 99% Bandwidth (MHz)					
Frequency	2412 MHz		2437 MHz		2462 MHz	
Mode	6dB	99%	6dB	99%	6dB	99%
802.11b	9.04	11.91	9.06	11.96	9.04	11.86
802.11g	16.33	16.48	16.39	16.51	16.28	16.44
802.11n HT20	17.61	17.67	17.61	17.73	17.32	17.65
Measurement uncertainty	± 3 dB					

Ant : A2

	6 dB Bandwidth and 99% Bandwidth (MHz)					
Frequency	2412 MHz		2437 MHz		2462 MHz	
Mode	6dB	99%	6dB	99%	6dB	99%
802.11g	16.31	16.45	16.36	16.51	15.81	16.47
802.11n HT20	17.31	17.63	17.65	17.73	16.43	17.66
Measurement uncertainty	± 3 dB					

Ant : A3

	6 dB Bandwidth and 99% Bandwidth (MHz)					
Frequency	2412 MHz		2437 MHz		2462 MHz	
Mode	6dB	99%	6dB	99%	6dB	99%
802.11g	16.38	16.50	16.41	16.52	16.12	16.45
802.11n HT20	17.62	17.70	17.64	17.75	16.98	17.65
Measurement uncertainty	± 3 dB					

Ant : M1

	6 dB Bandwidth and 99% Bandwidth (MHz)					
Frequency	2412 MHz		2437 MHz		2462 MHz	
Mode	6dB	99%	6dB	99%	6dB	99%
802.11g	16.36	16.49	16.39	16.51	16.09	16.42
Measurement uncertainty	± 3 dB					

Ant : M2

	6 dB Bandwidth and 99% Bandwidth (MHz)					
Frequency	2412 MHz		2437 MHz		2462 MHz	
Mode	6dB	99%	6dB	99%	6dB	99%
802.11g	15.86	16.42	16.40	16.53	15.80	16.44
Measurement uncertainty	± 3 dB					

Ant : M3

	6 dB Bandwidth and 99% Bandwidth (MHz)					
Frequency	2412 MHz		2437 MHz		2462 MHz	
Mode	6dB	99%	6dB	99%	6dB	99%
802.11g	16.35	16.47	16.40	16.51	15.78	16.42
Measurement uncertainty	± 3 dB					

Minimum Standard:

6 dB Bandwidth > 500kHz

See next pages for actual measured spectrum plots.



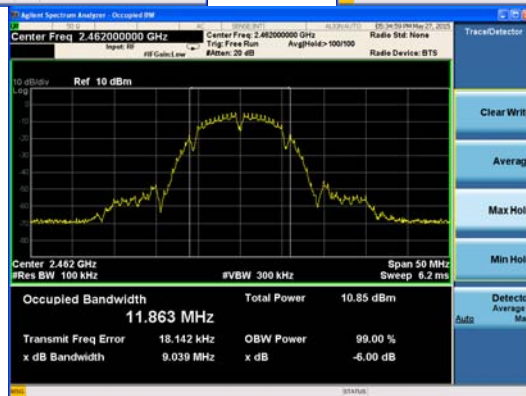
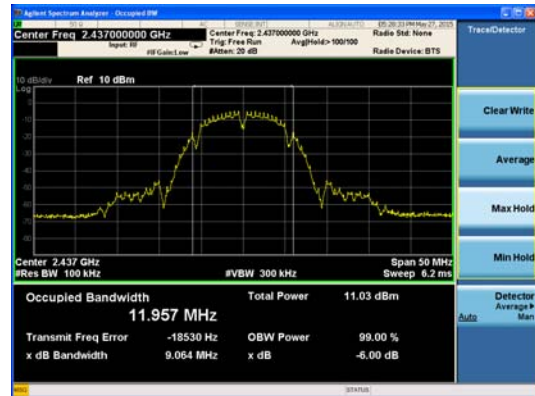
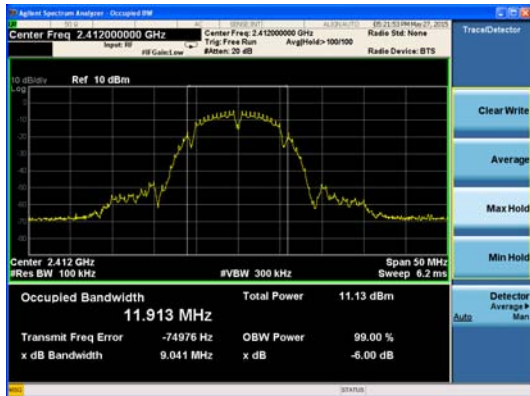
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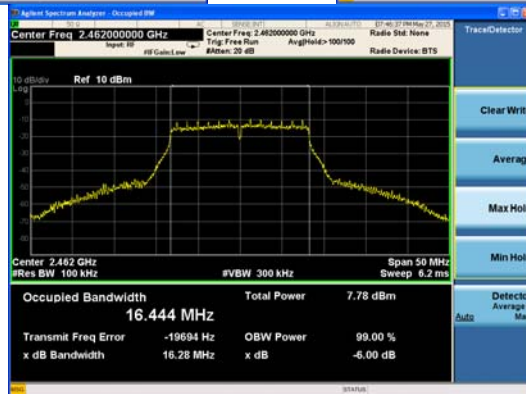
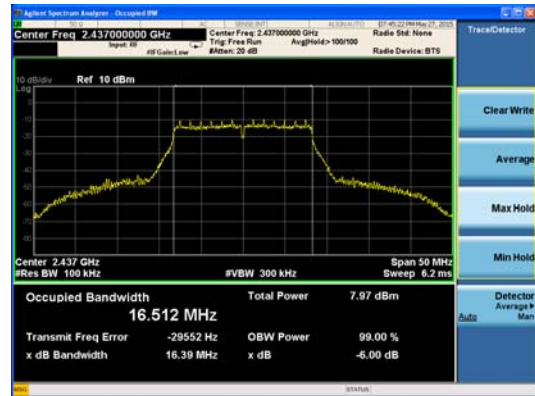
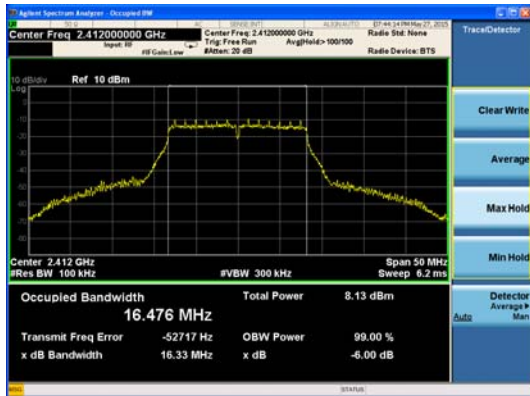
(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea

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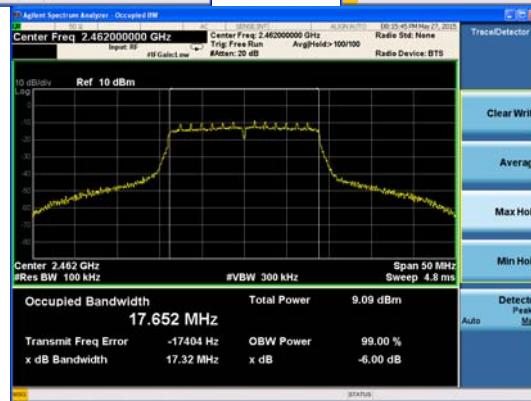
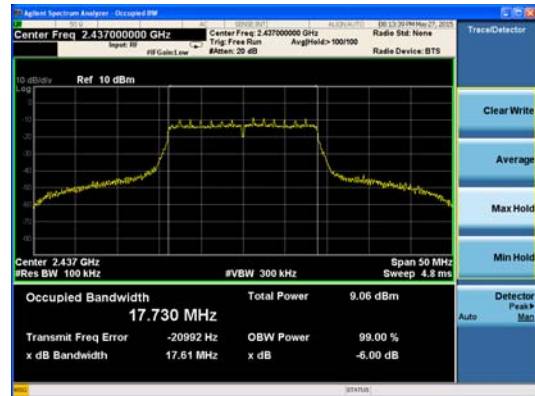
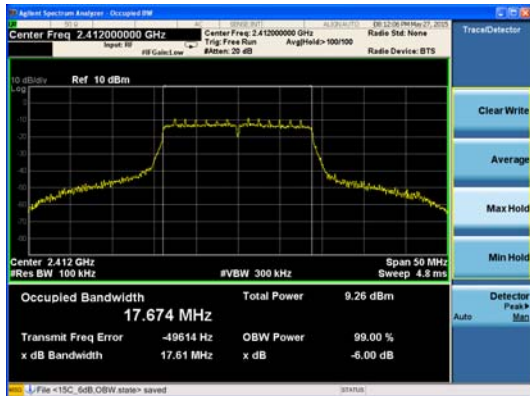
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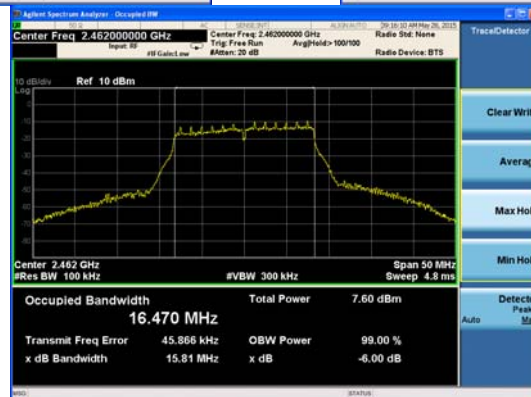
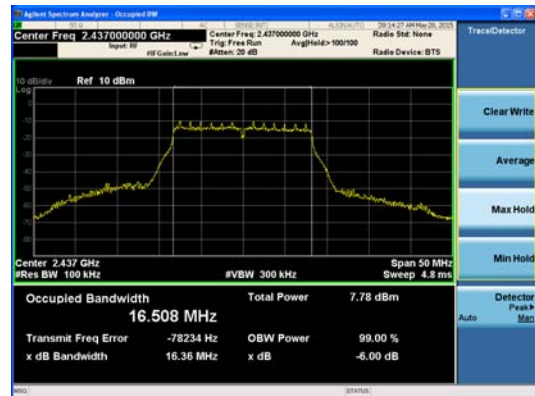
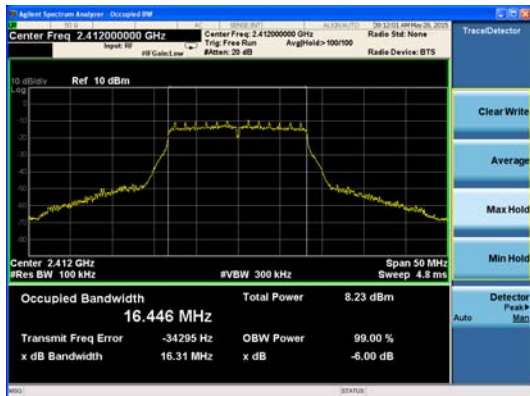
Ant : A1_802.11b



Ant : A1_802.11g



Ant : A1_802.11n



Ant : A2_802.11g



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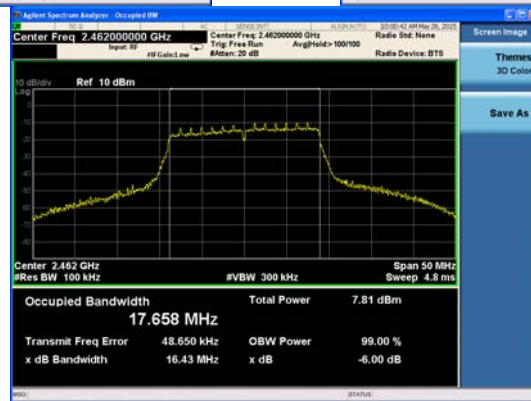
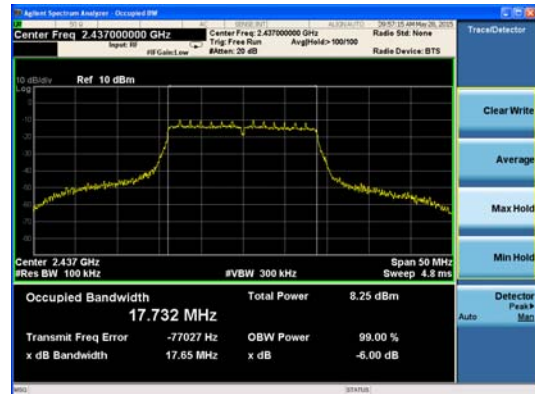
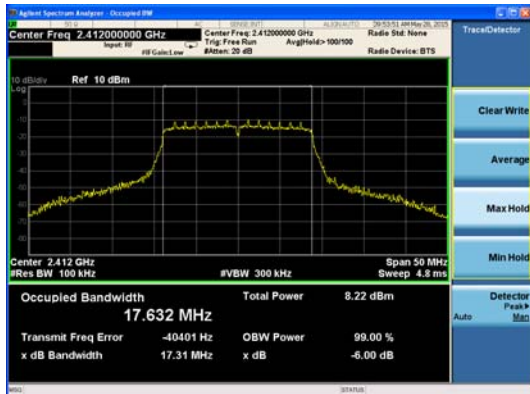
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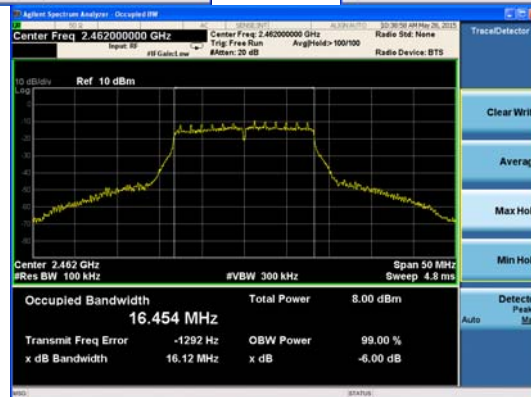
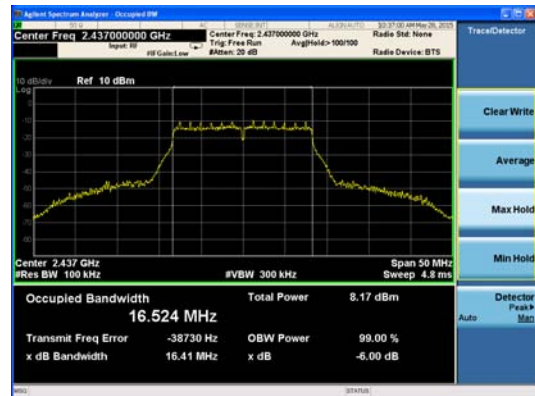
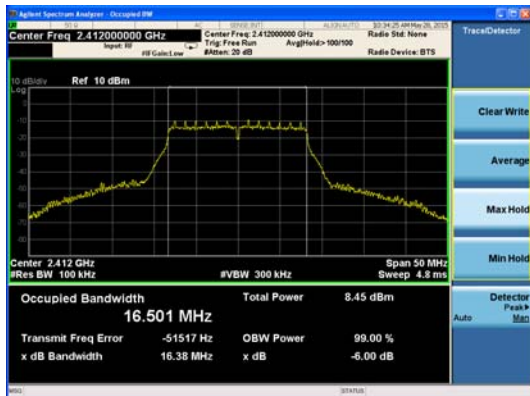
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Ant : A2_802.11n



Ant : A3_802.11g



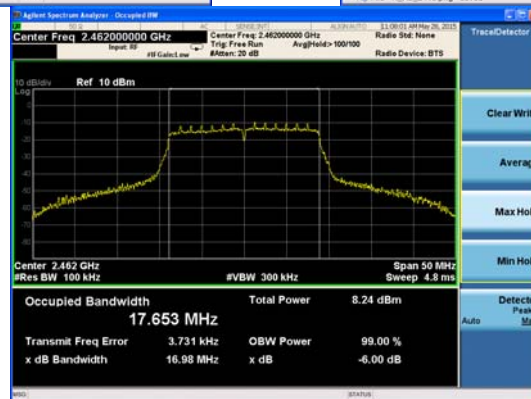
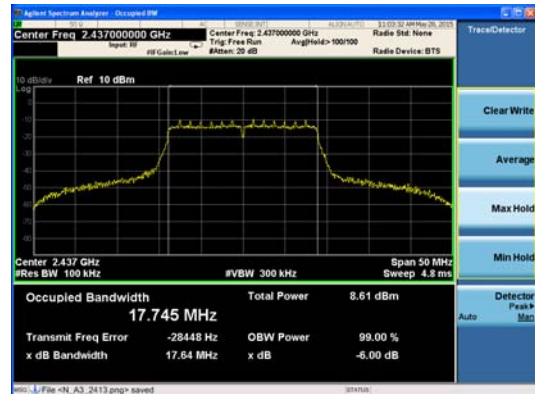
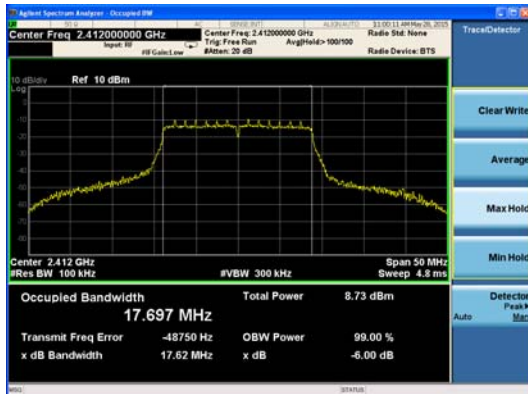
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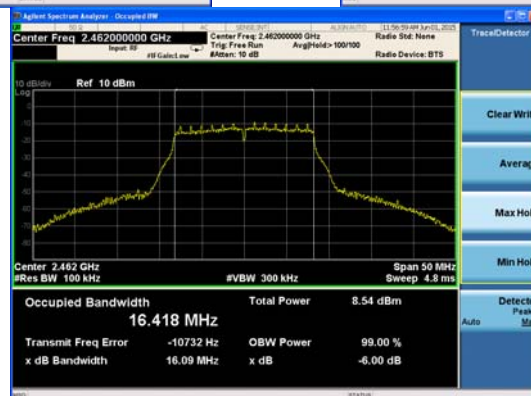
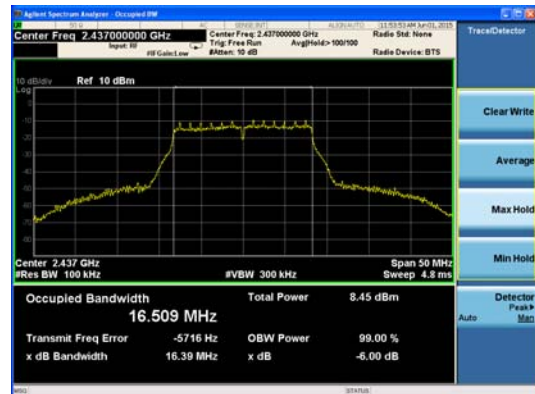
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Ant : A3_802.11n



Ant : M1_802.11g



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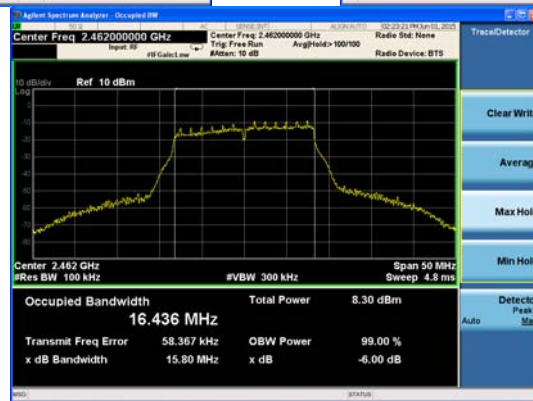
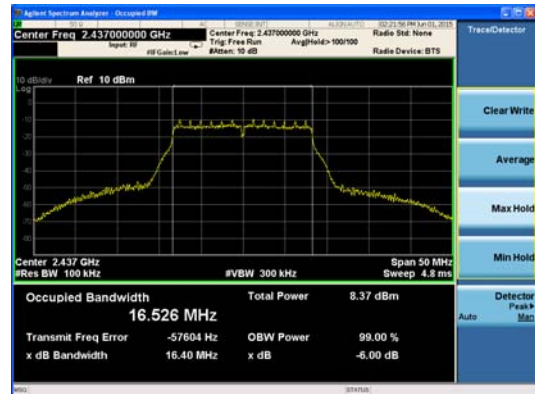
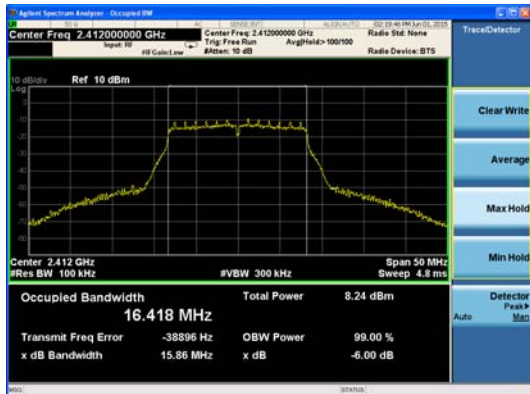
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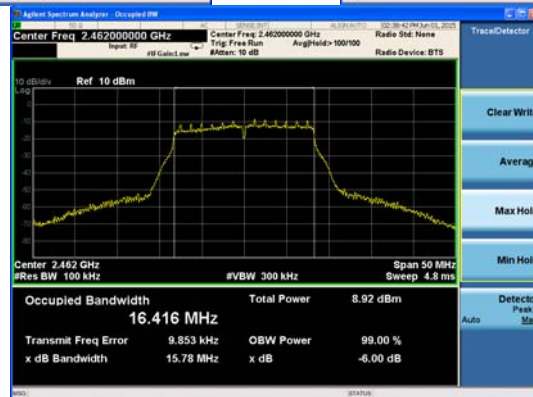
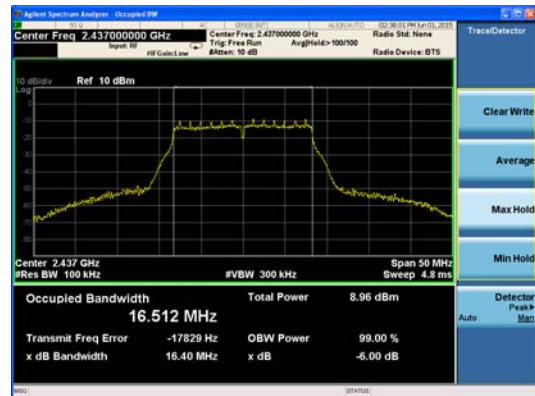
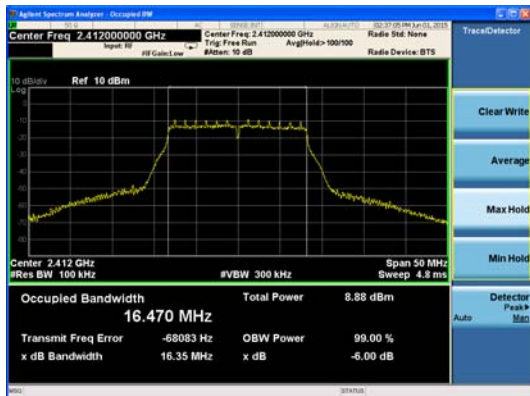
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Ant : M2_802.11g



Ant : M3_802.11g

2.1.3 OUTPUT POWER

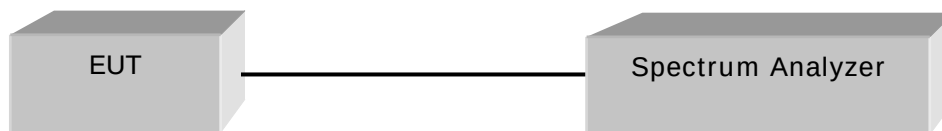
Test Location

RF Test Room

Test Procedures

Average Power(Procedure 9.2.2.2 in KDB 558074, Method AVGSA-1)

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 1 MHz

Span = about 36 MHz, 50 MHz

VBW = 3 MHz (3 x RBW)

Sweep = auto

Trace = average at least 100

Detector function = RMS

Limit

[Dipole ANT]

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Limit (dBm)	
				FCC	IC
SISO	802.11b/g/n	ANT1	4.0	30	36
SISO	802.11b/g/n	ANT2	4.0	30	36
SISO	802.11b/g/n	ANT3	4.0	30	36
MIMO (2Tx)	802.11g/n	ANT1 + ANT2	7.01	28.99	34.99
MIMO (3Tx)	802.11g/n	ANT1 + ANT2+ ANT3	8.77	27.23	33.23

[Patch ANT]

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Limit (dBm)	
				FCC	IC
SISO	802.11b/g/n	ANT1	6.5	29.95	35.5
SISO	802.11b/g/n	ANT2	6.5	29.95	35.5
SISO	802.11b/g/n	ANT3	6.5	29.95	35.5
MIMO (2Tx)	802.11g/n	ANT1 + ANT2	9.51	26.49	32.49
MIMO (3Tx)	802.11g/n	ANT1 + ANT2+ ANT3	11.27	24.73	30.73

Test Results

Ant : A1

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11b	15.38	15.13	15.13
802.11g	12.14	12.04	11.88
802.11n HT20	12.20	12.05	11.95
Measurement uncertainty	± 3 dB		

Ant : A2

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	11.21	10.88	10.74
802.11n HT20	11.18	11.03	10.71
Measurement uncertainty	± 3 dB		

Ant : A3

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	11.70	11.26	11.02
802.11n HT20	11.61	11.43	10.94
Measurement uncertainty	± 3 dB		

Ant : A1 + A2

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	14.71	14.51	14.36
802.11n HT20	14.73	14.58	14.38
Measurement uncertainty	± 3 Db		

Ant : A1 + A2 + A3

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	16.47	16.19	16.01
802.11n HT20	16.45	16.29	16.01
Measurement uncertainty	± 3 dB		

Ant : M1

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	11.63	11.68	11.64
Measurement uncertainty	± 3 dB		

Ant : M2

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	11.35	11.54	11.56
Measurement uncertainty	± 3 dB		

Ant : M3

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	12.22	11.99	12.15
Measurement uncertainty	± 3 dB		

Ant : M1 + M2

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	14.50	14.62	14.61
Measurement uncertainty	± 3 dB		

Ant : M1 + M2 + M3

	Measured Output Power (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	16.52	16.51	16.56
Measurement uncertainty	± 3 dB		



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Ant : A1_802.11b



Ant : A1_802.11g



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Ant : A2_802.11g



Ant : A3_802.11g



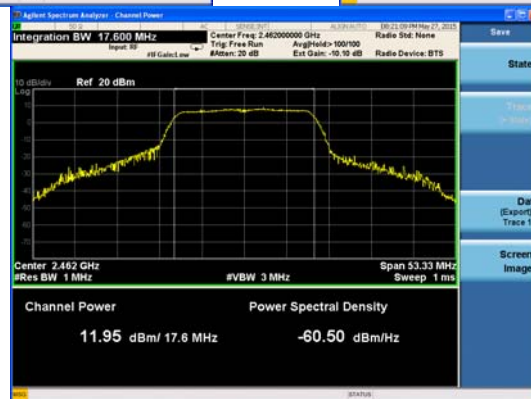
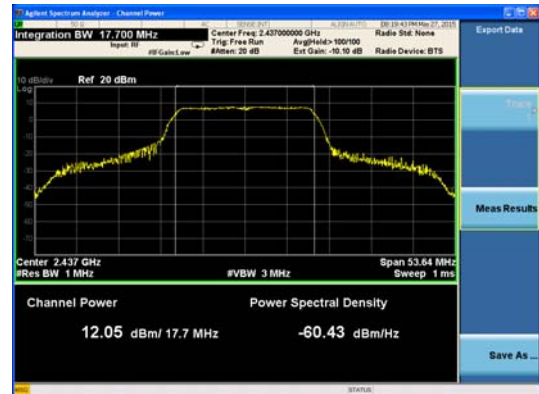
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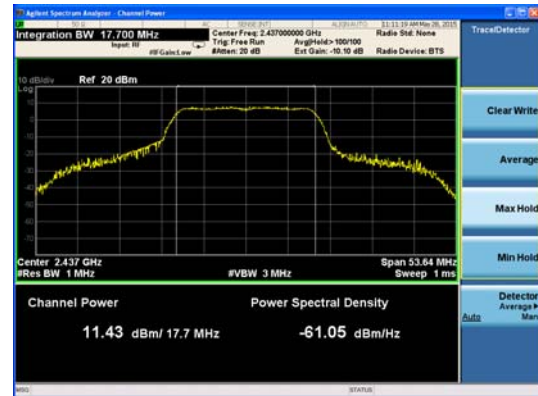
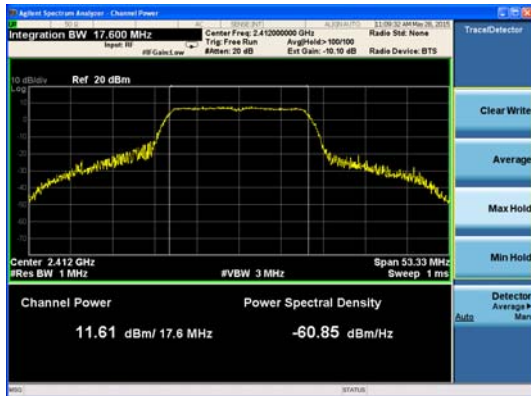
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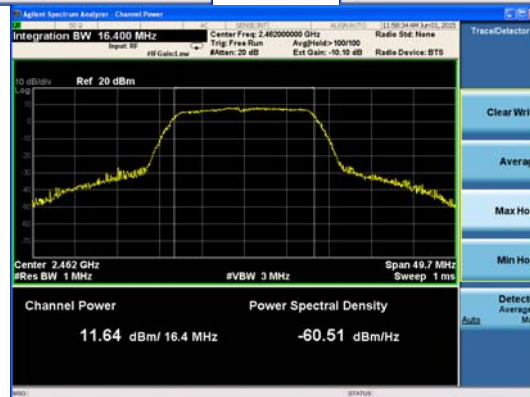
Ant : A1_802.11n



Ant : A2_802.11n



Ant : A3_802.11n



Ant : M1_802.11g



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Ant : M2_802.11g



Ant : M3_802.11g

2.1.4 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 3 kHz

VBW = 10 kHz

Sweep = Auto

Span = 20 MHz

Detector function = peak

Trace = max hold

Limit

[Dipole ANT]

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Limit (dBm)
				FCC, IC
SISO	802.11b/g/n	ANT1	4.0	8
SISO	802.11b/g/n	ANT2	4.0	8
SISO	802.11b/g/n	ANT3	4.0	8
MIMO (2Tx)	802.11g/n	ANT1 + ANT2	7.01	6.99
MIMO (3Tx)	802.11g/n	ANT1 + ANT2 + ANT3	8.77	5.23

[Patch ANT]

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Limit (dBm)
				FCC, IC
SISO	802.11b/g/n	ANT1	6.5	7.5
SISO	802.11b/g/n	ANT2	6.5	7.5
SISO	802.11b/g/n	ANT3	6.5	7.5
MIMO (2Tx)	802.11g/n	ANT1 + ANT2	9.51	4.49
MIMO (3Tx)	802.11g/n	ANT1 + ANT2 + ANT3	11.27	2.73

Test Results

Ant : A1

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11b	-8.07	-8.35	-8.32
802.11g	-12.67	-12.95	-12.76
802.11n HT20	-13.49	-13.13	-13.49
Measurement uncertainty	± 3 dB		

Ant : A2

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-13.86	-13.60	-14.07
802.11n HT20	-14.01	-13.65	-13.99
Measurement uncertainty	± 3 dB		

Ant : A3

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-13.21	-13.59	-13.44
802.11n HT20	-13.86	-14.50	-14.40
Measurement uncertainty	± 3 dB		

Ant : A1 + A2

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-10.21	-10.25	-10.36
802.11n HT20	-10.73	-10.37	-10.72
Measurement uncertainty	± 3 dB		

Ant : A1 + A2 + A3

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-8.45	-8.60	-8.62
802.11n HT20	-9.01	-8.95	-9.17
Measurement uncertainty	± 3 dB		

Ant : M1

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-13.04	-13.10	-12.83
Measurement uncertainty	± 3 dB		

Ant : M2

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-13.00	-13.73	-12.69
Measurement uncertainty	± 3 dB		

Ant : M3

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-12.25	-12.66	-12.06
Measurement uncertainty	± 3 dB		

Ant : M1 + M2

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-10.01	-10.39	-9.75
Measurement uncertainty	± 3 dB		

Ant : M1 + M2 + M3

	Measured Power Density (dBm)		
Mode	2412 MHz	2437 MHz	2462 MHz
802.11g	-7.98	-8.37	-7.74
Measurement uncertainty	± 3 dB		

See next pages for actual measured spectrum plots.



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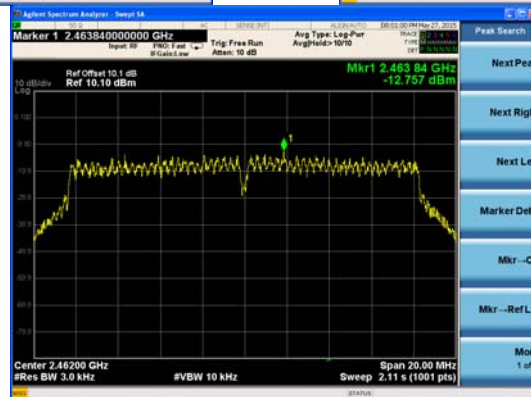
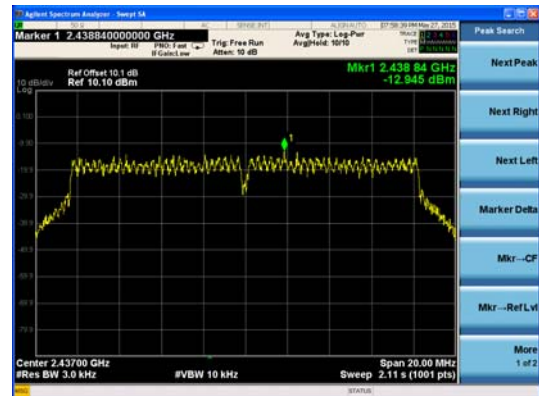
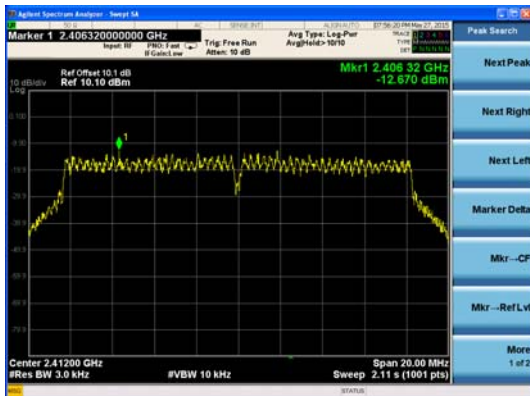
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Ant : A1_802.11b



Ant : A1_802.11g



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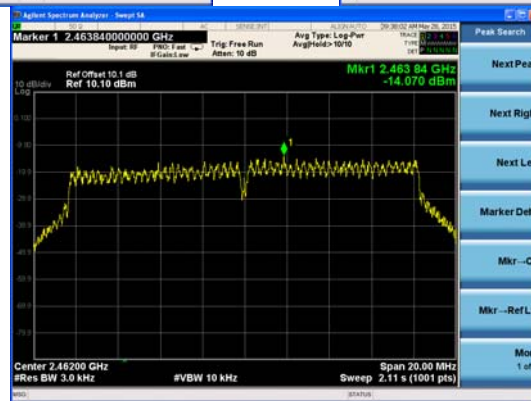
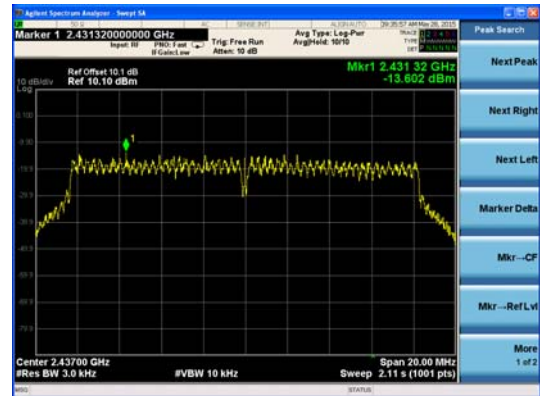
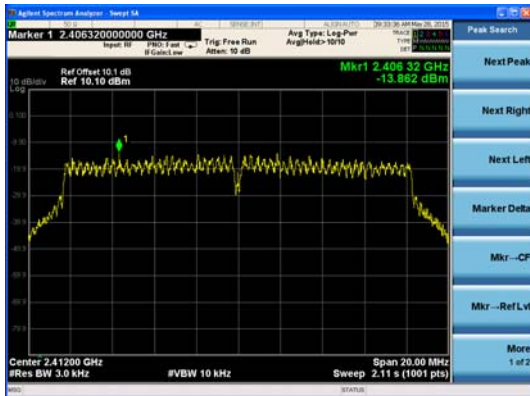
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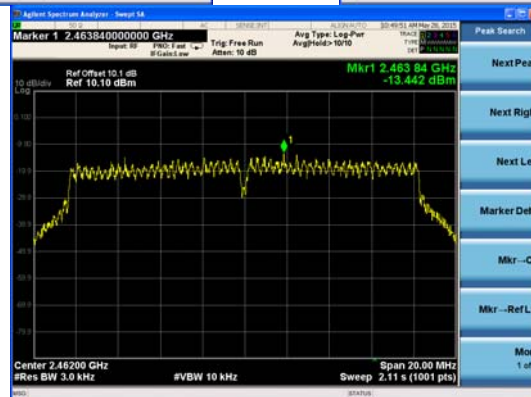
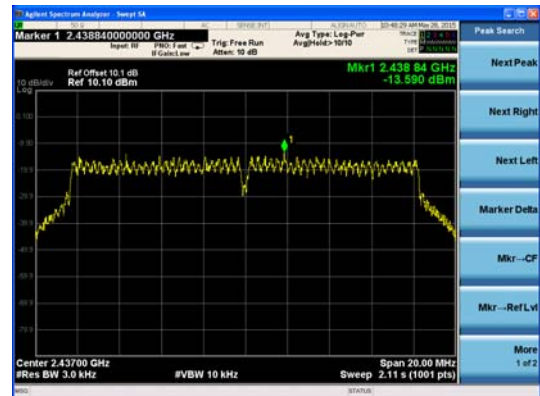
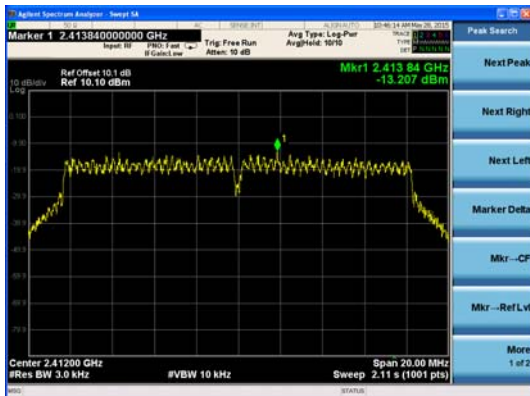
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Ant : A2_802.11g



Ant : A3_802.11g



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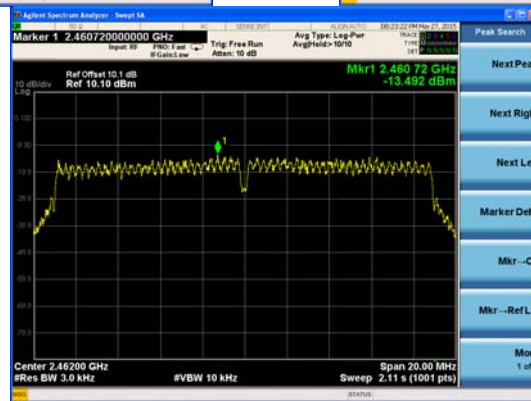
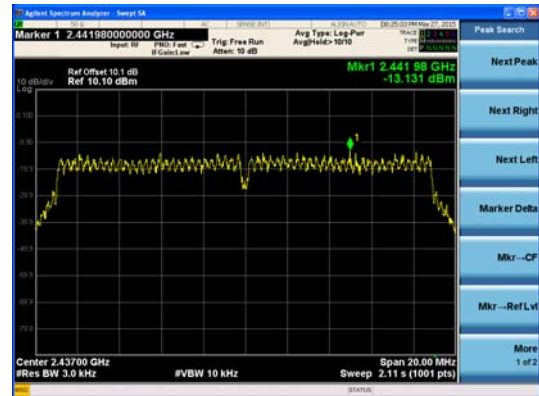
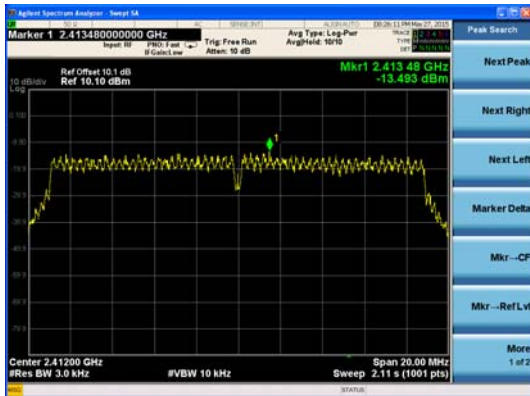
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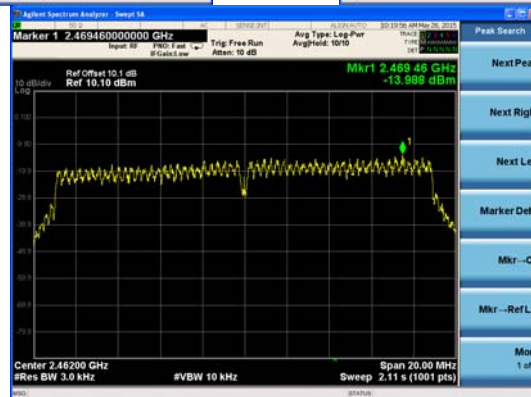
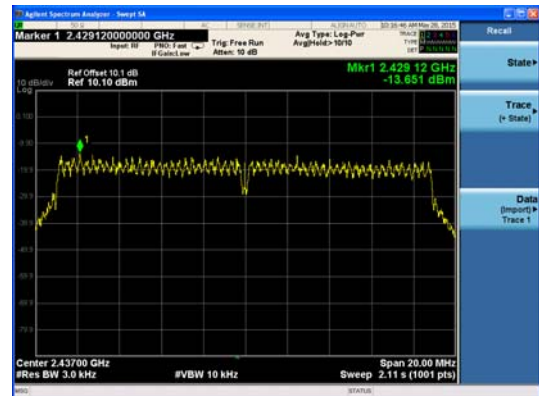
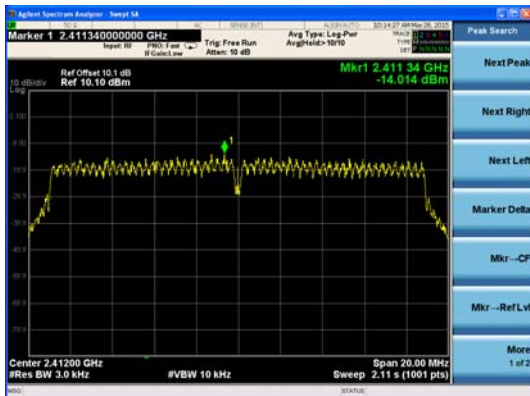
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Ant : A1_802.11n



Ant : A2_802.11n



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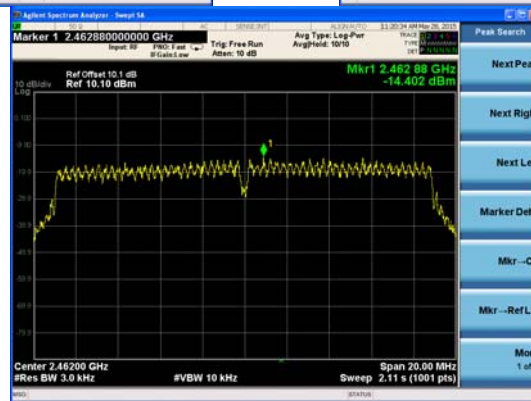
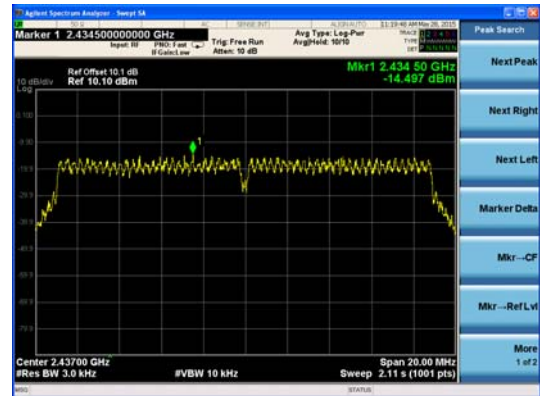
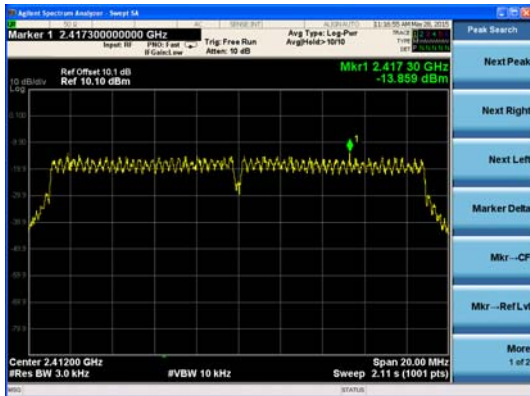
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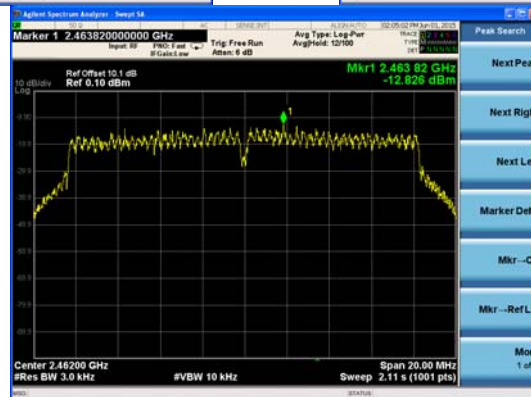
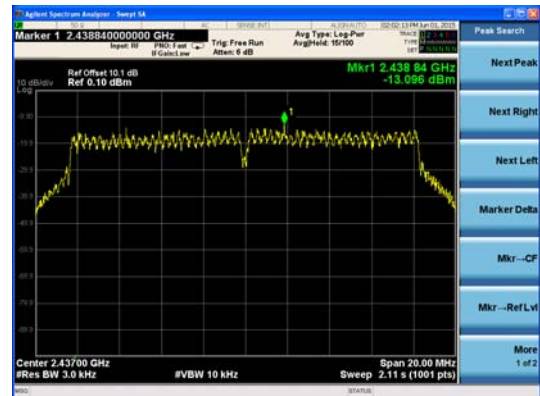
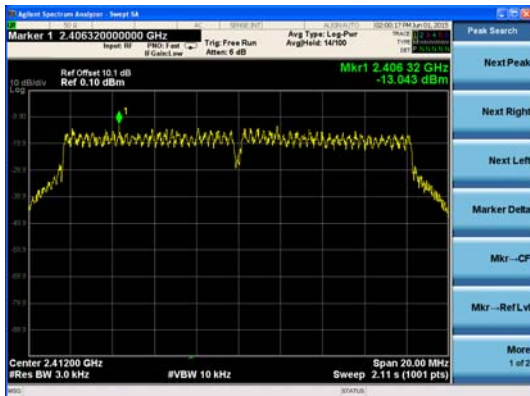
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Ant : A3_802.11n



Ant : M1_802.11g



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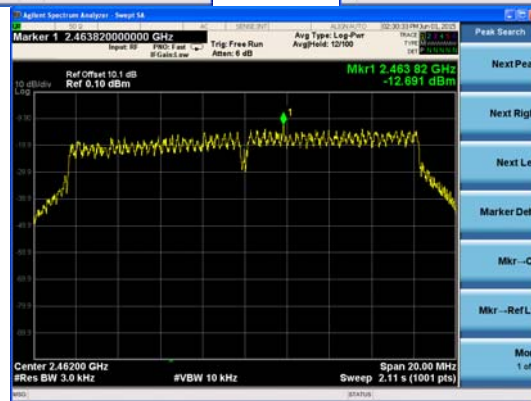
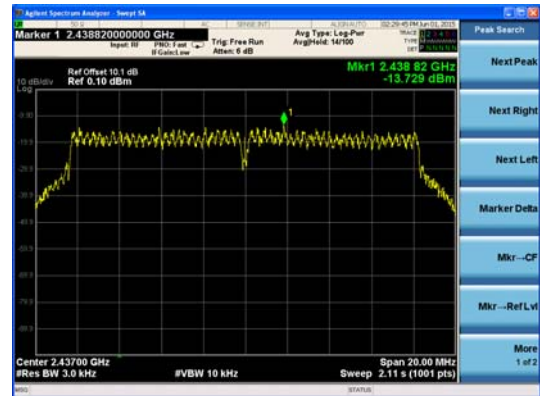
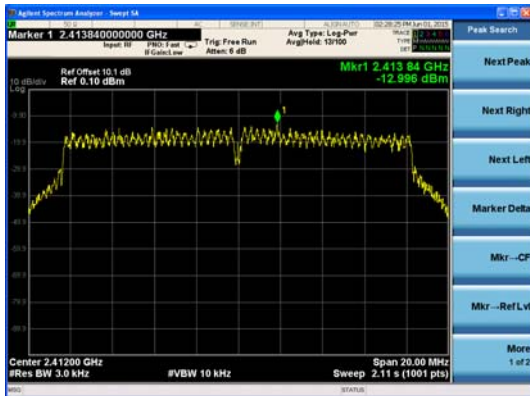
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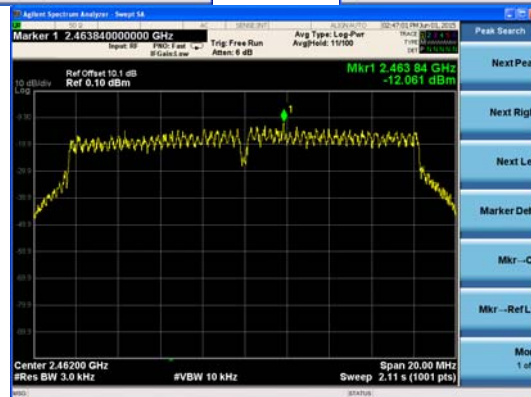
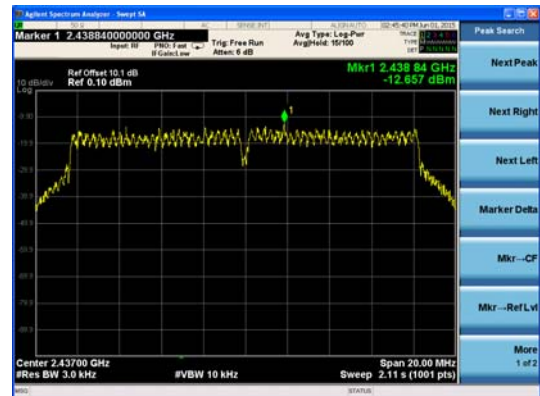
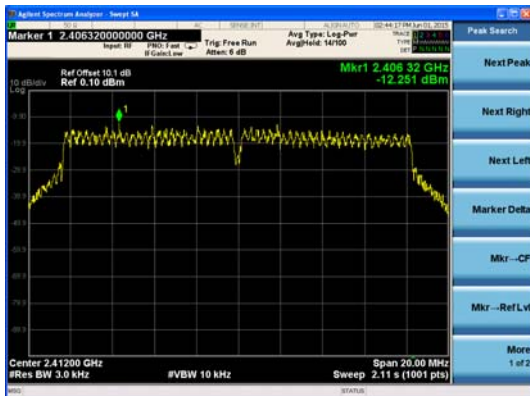
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Ant : M2_802.11g



Ant : M3_802.11g

2.1.5 Band - edge

Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

VBW = 300 kHz

Span = 50 MHz

Detector function = peak

Trace = max hold

Sweep = auto

Measurement Data: Complies

- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

Minimum Standard:	> 20 dBc
--------------------------	----------

See next pages for actual measured spectrum plots.



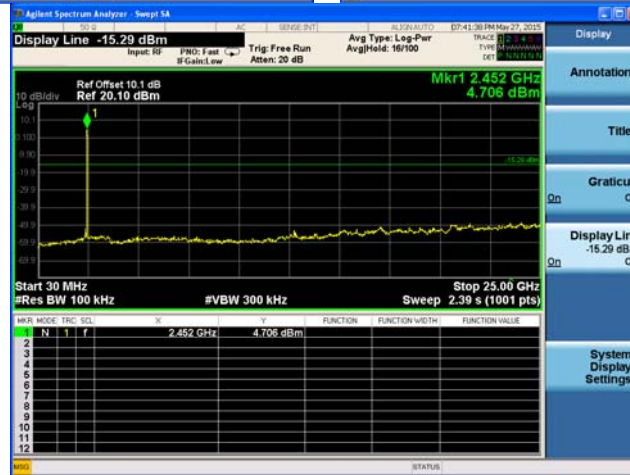
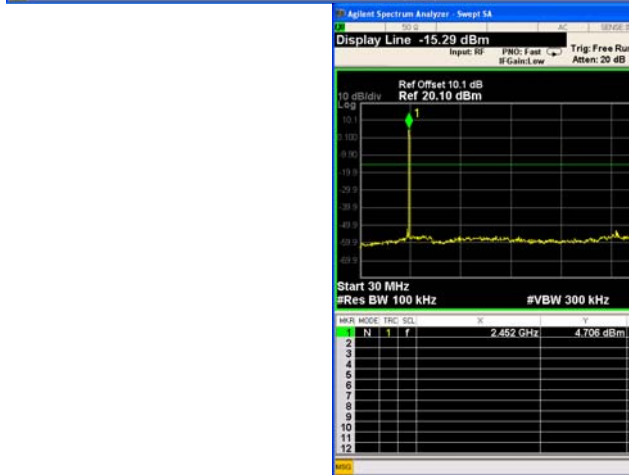
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Ant : A1_802.11b



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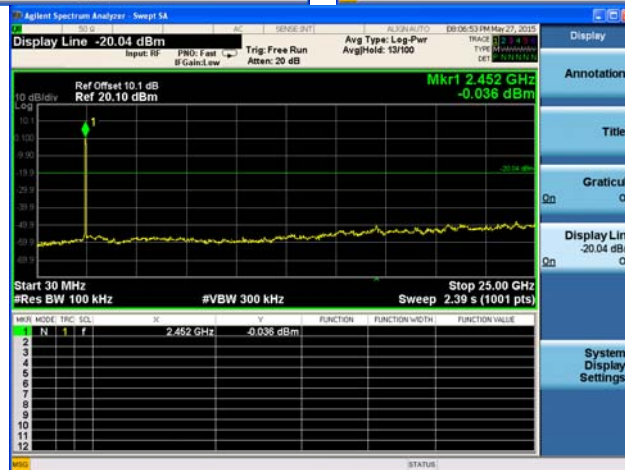
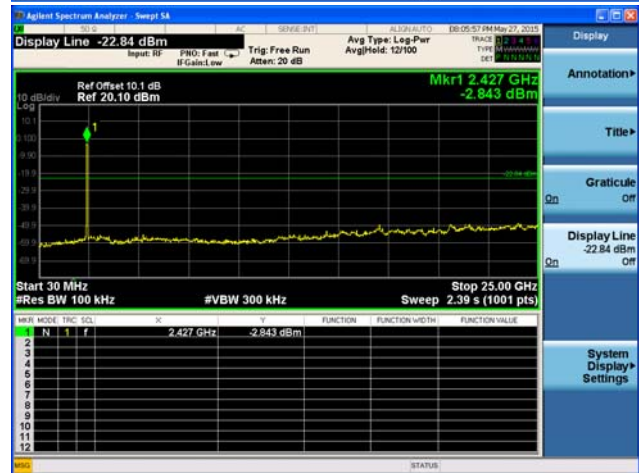
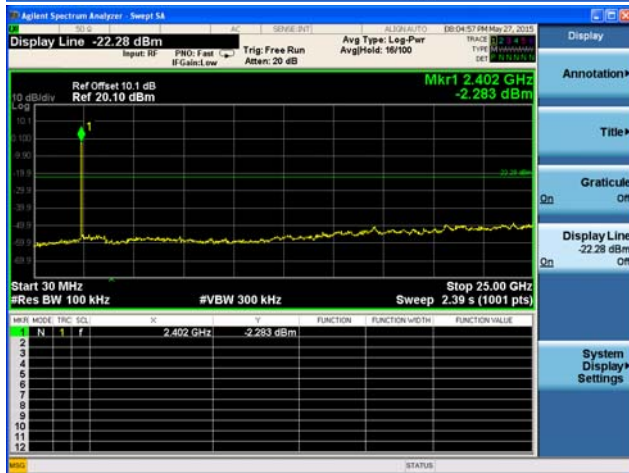
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Ant : A1_802.11g



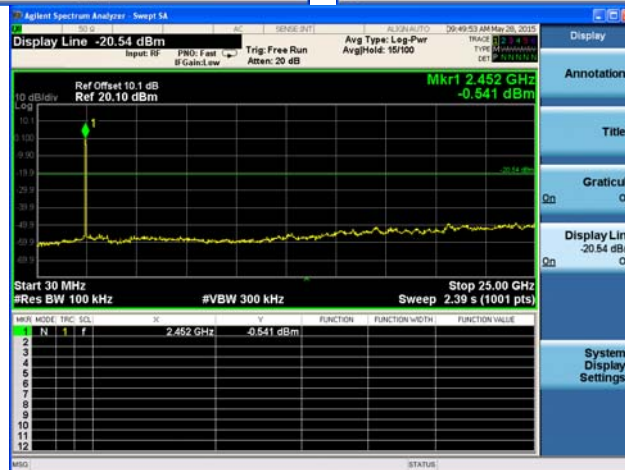
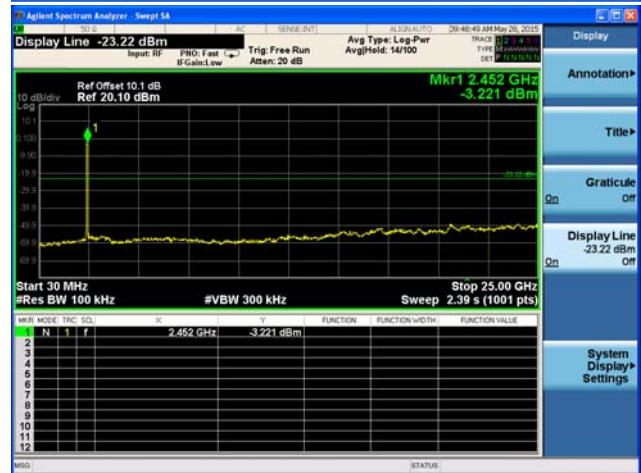
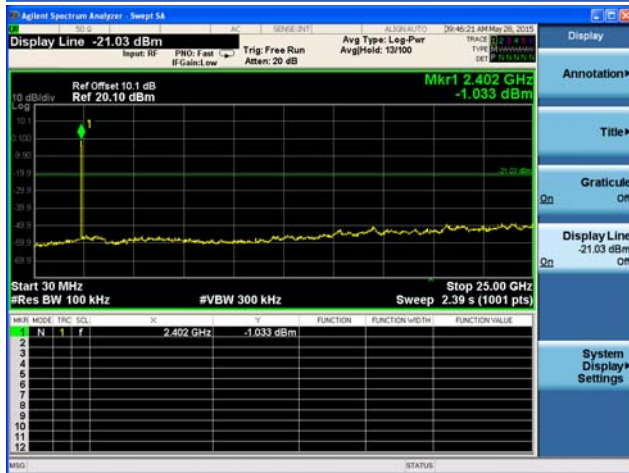
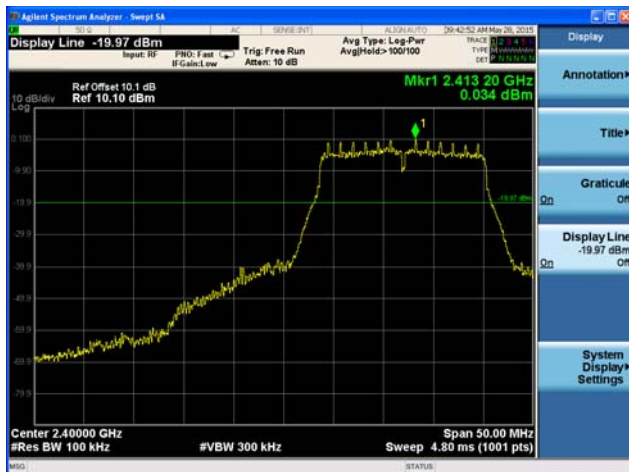
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Ant : A2_802.11g



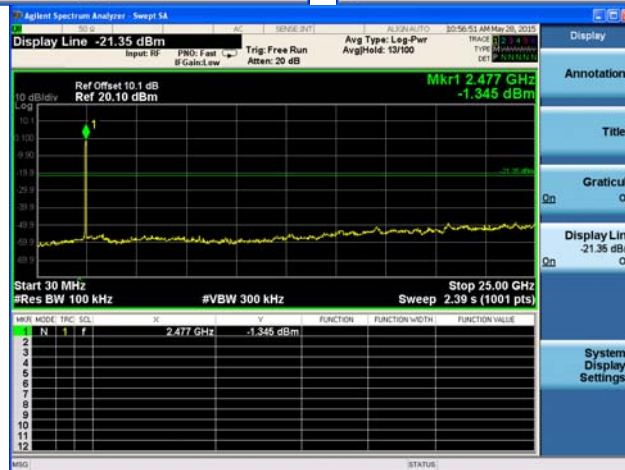
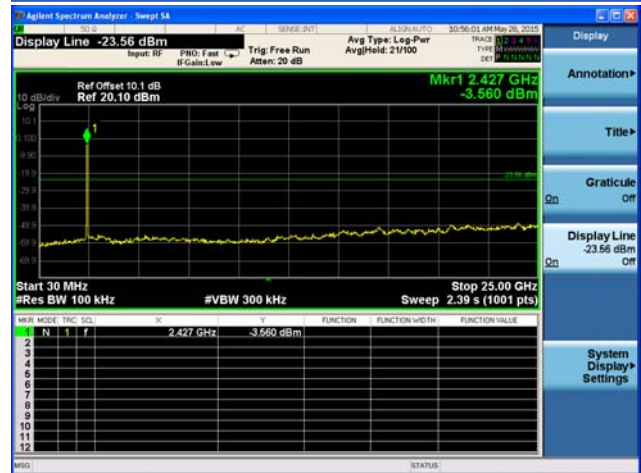
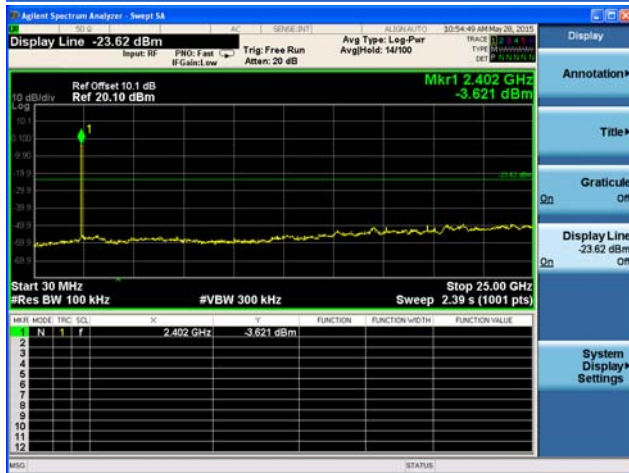
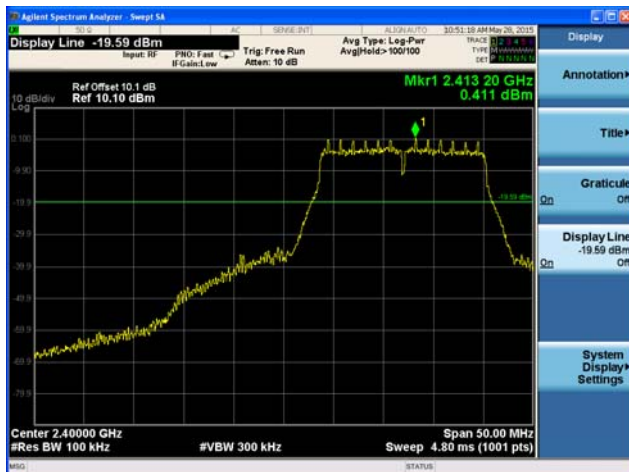
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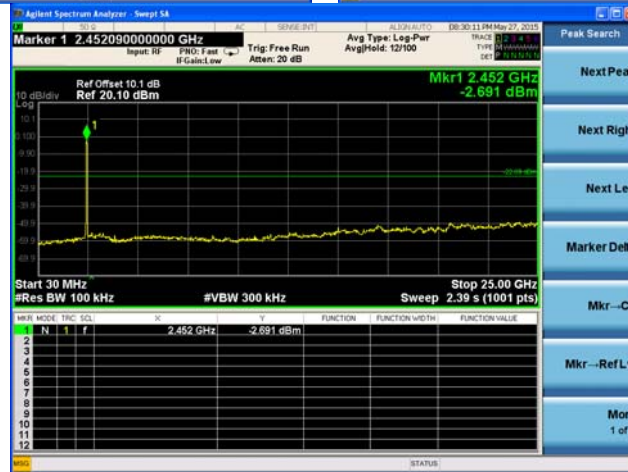
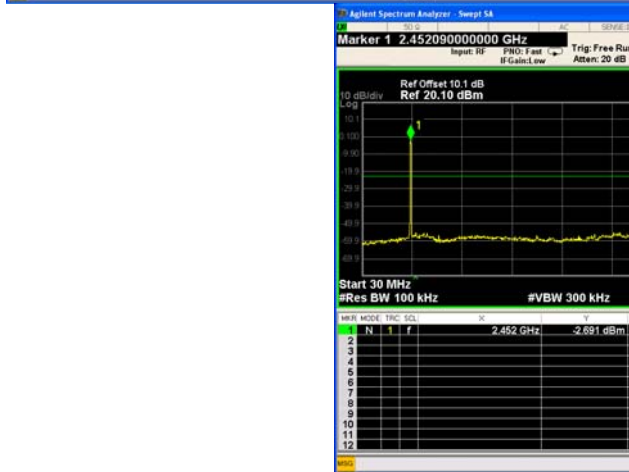
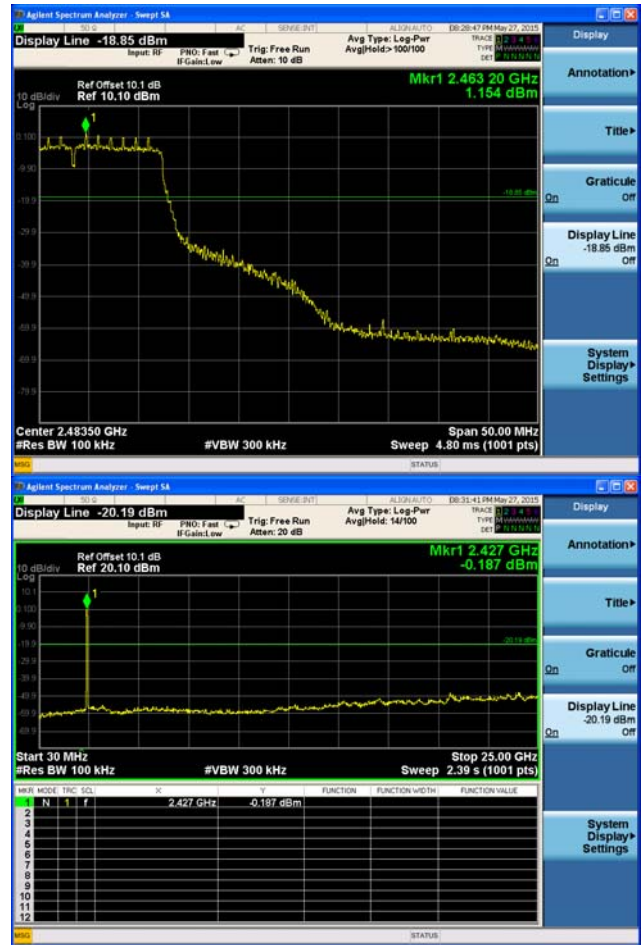
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Ant : A3_802.11g



Ant : A1_802.11n



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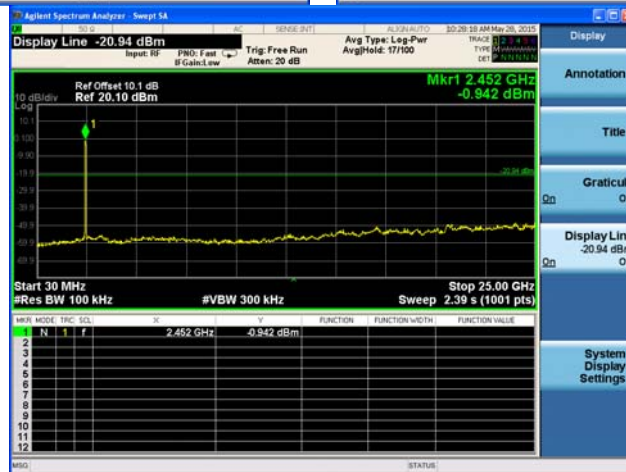
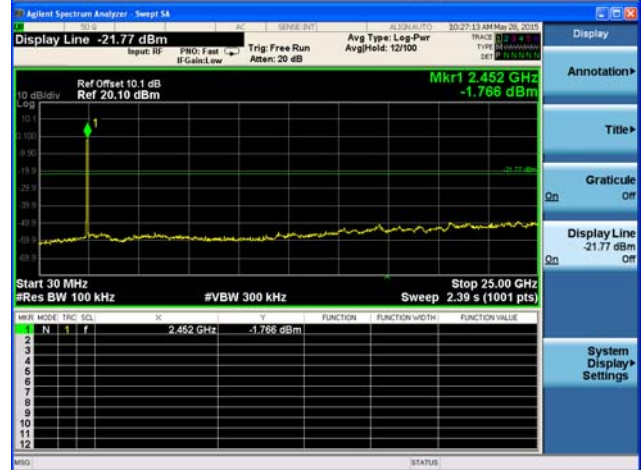
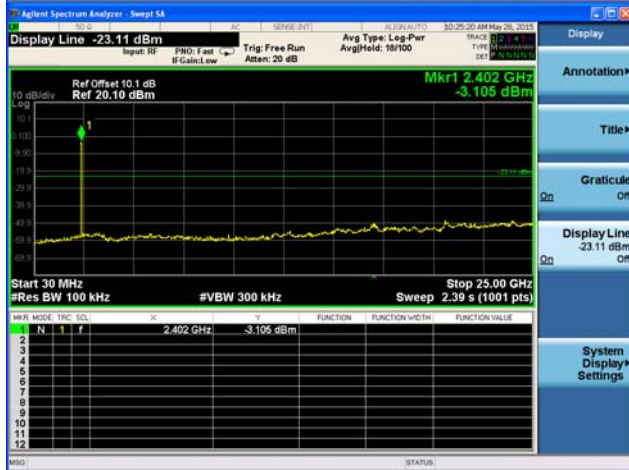
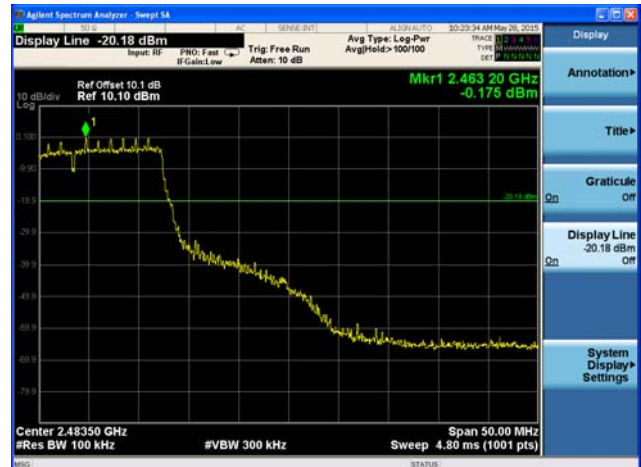
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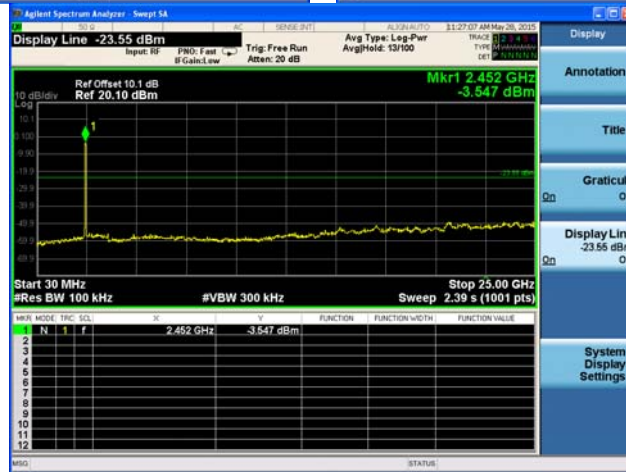
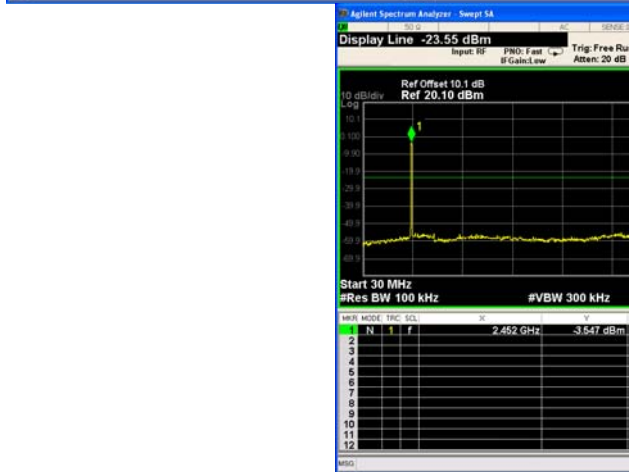
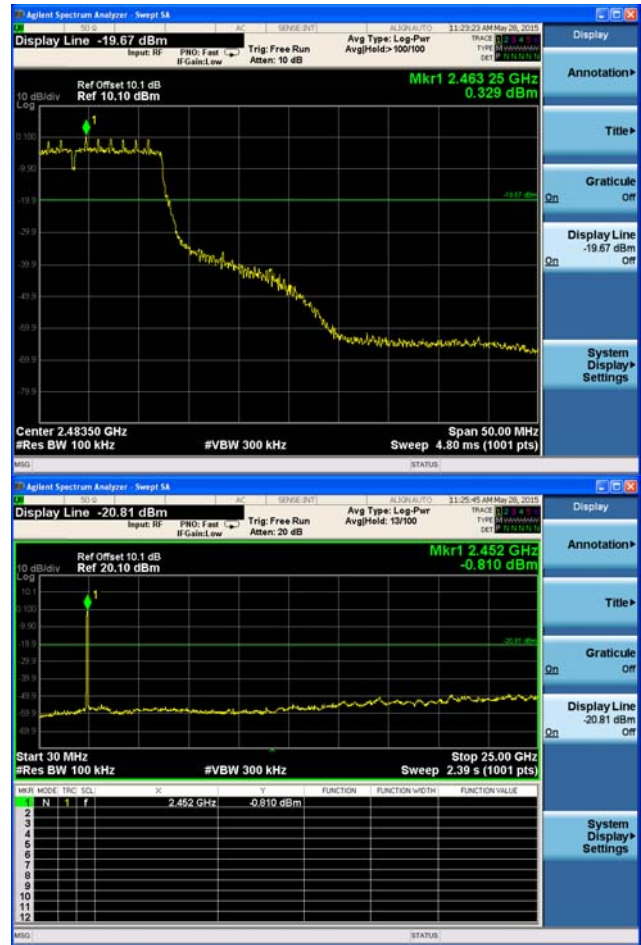
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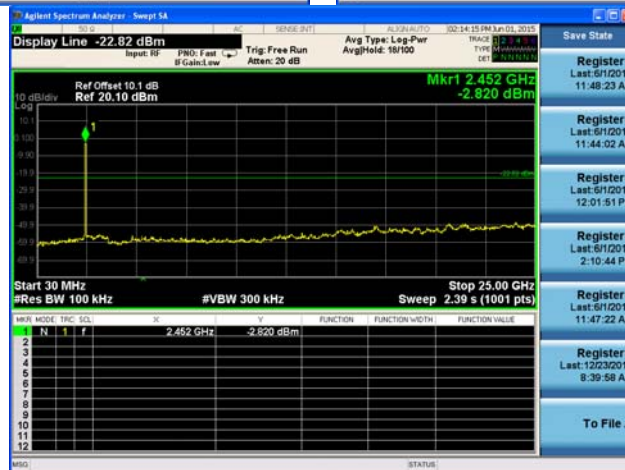
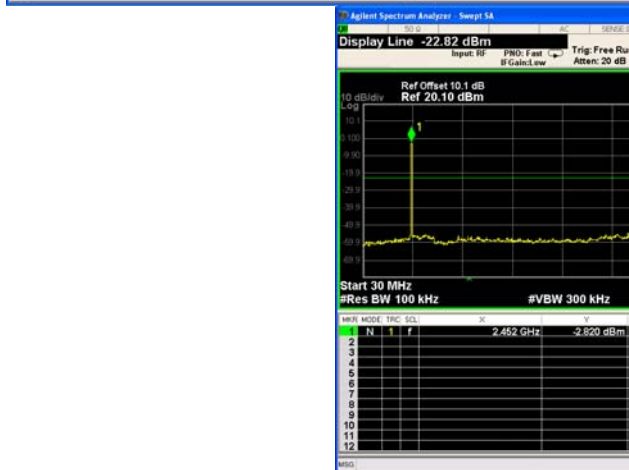
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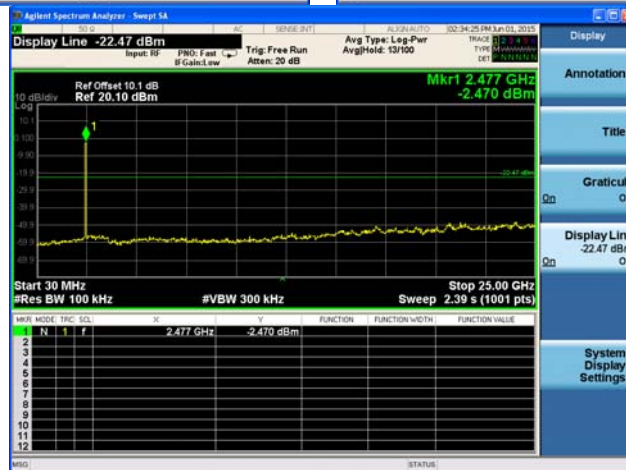
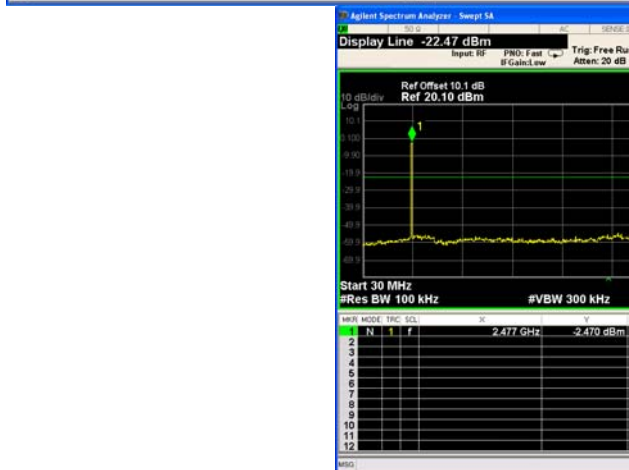
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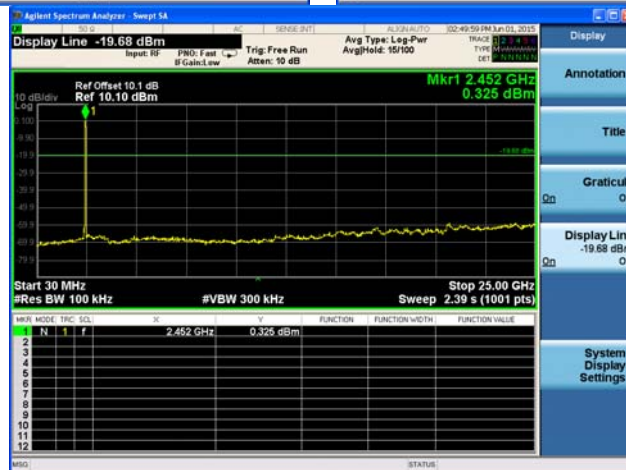
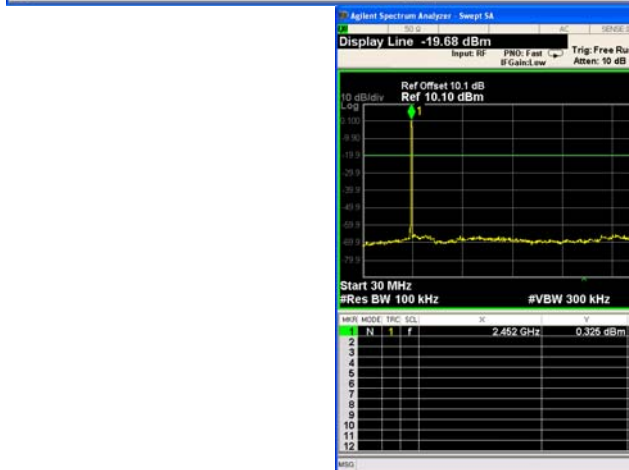
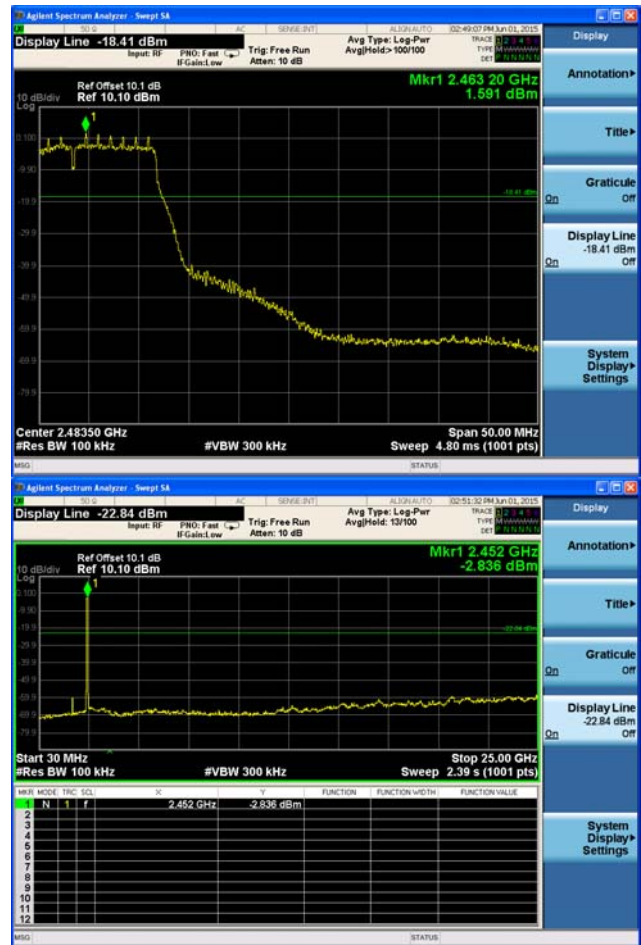
Ant : A3_802.11n



Ant : M1_802.11g



Ant : M2_802.11g



Ant : M3_802.11g

2.1.6 Field Strength of Emissions

Test Location

- ☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)
☒ 3 m SAC (test distance : 3 m)

Test Procedures

- 1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- 2) In the frequency range above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

The spectrum analyzer is set to:

Frequency Range = 9 kHz ~ 25 GHz (2.4 GHz 10th harmonic)

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz, 9 kHz for $f < 30$ MHz

VBW $\geq$ RBW

Sweep = auto

Limit

- 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	-	30
30-88	100**	40	3
88-216	150**	43.5	3
216-960	200**	46	3
Above 960	500	54	3

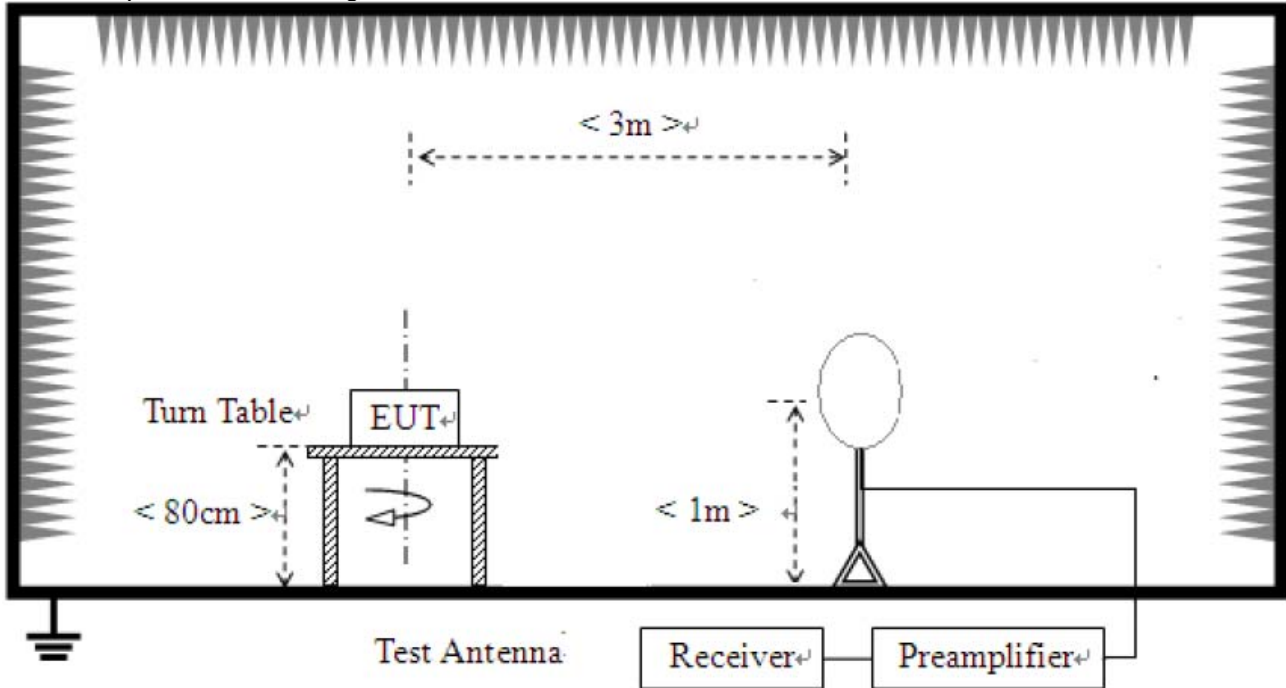
** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :

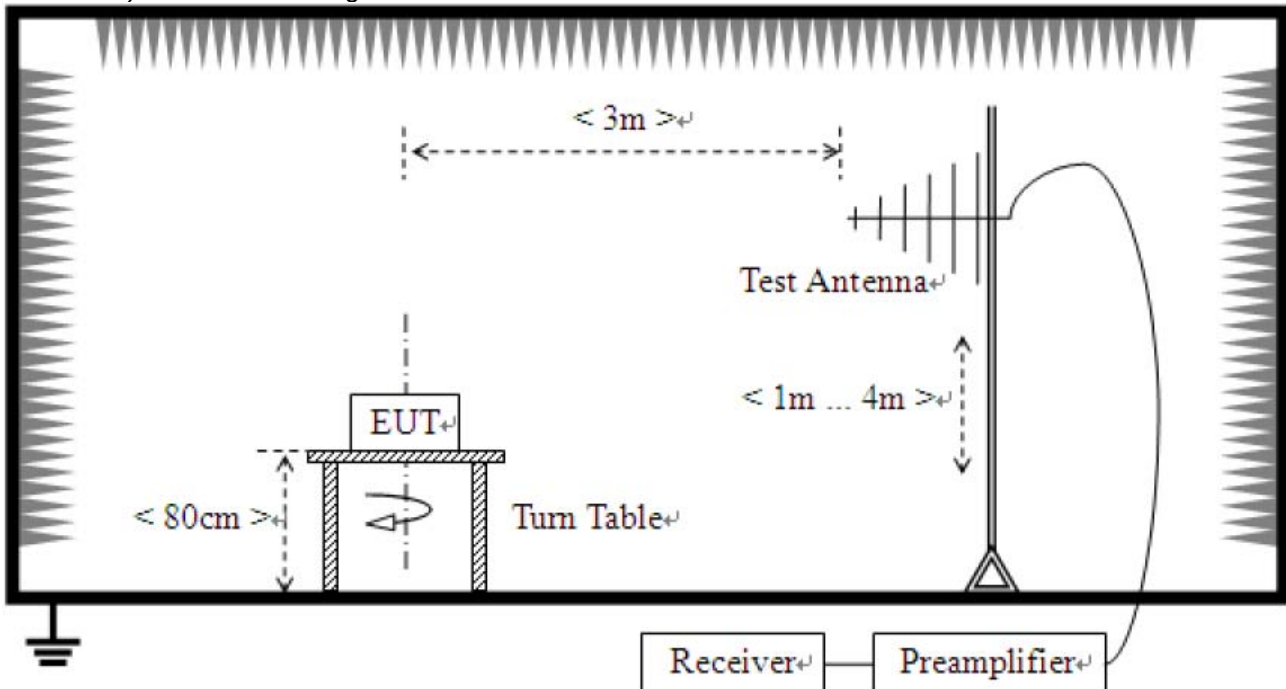
- 1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
- 2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

Test Setup:

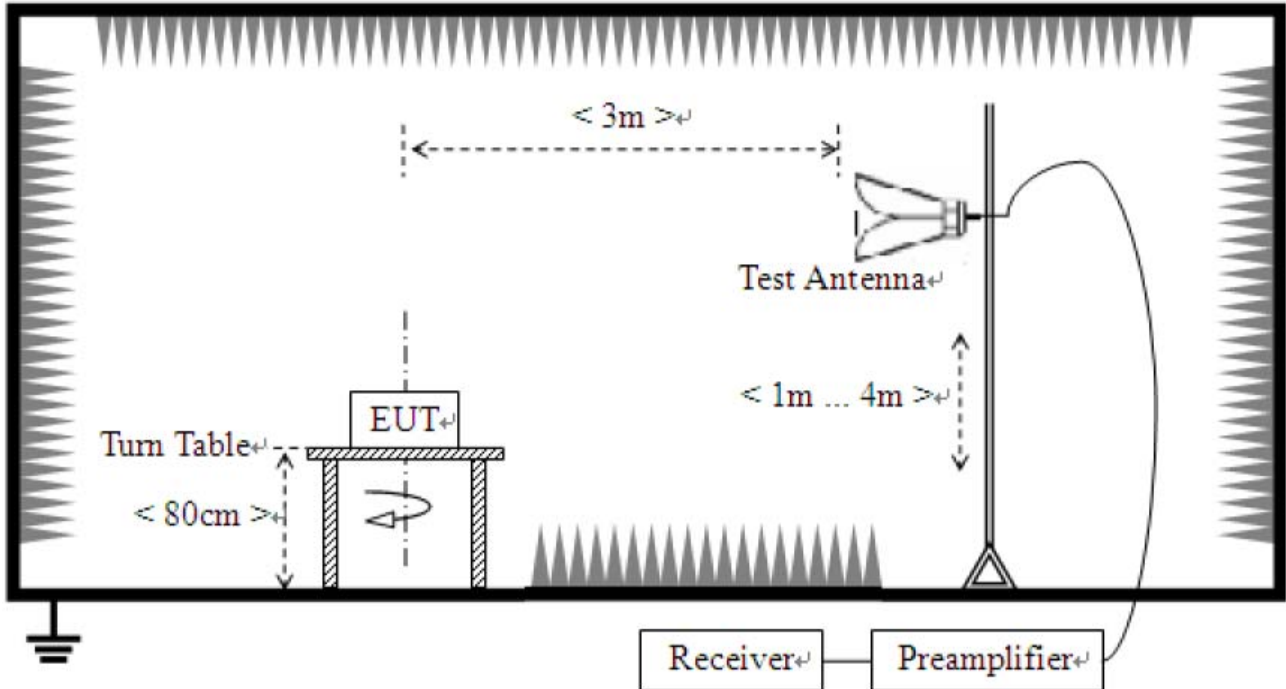
- 1) For field strength of emissions from 9 kHz to 30 MHz



- 2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz



Test Mode

The worst-case antenna configuration are determined to be as follows for each mode.

802.11b mode : ANT1 (SISO)

802.11g mode : ANT1 + ANT2 + ANT3

802.11n HT20 mode : ANT1 + ANT2 + ANT3

Test Results

1) 9 kHz to 30 MHz

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	9 kHz – 30 MHz
Test mode	802.11b, 802.11g, 802.11n	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	See note

Note :

The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB)

2) 30 MHz to 1 GHz

Test mode : 802.11n

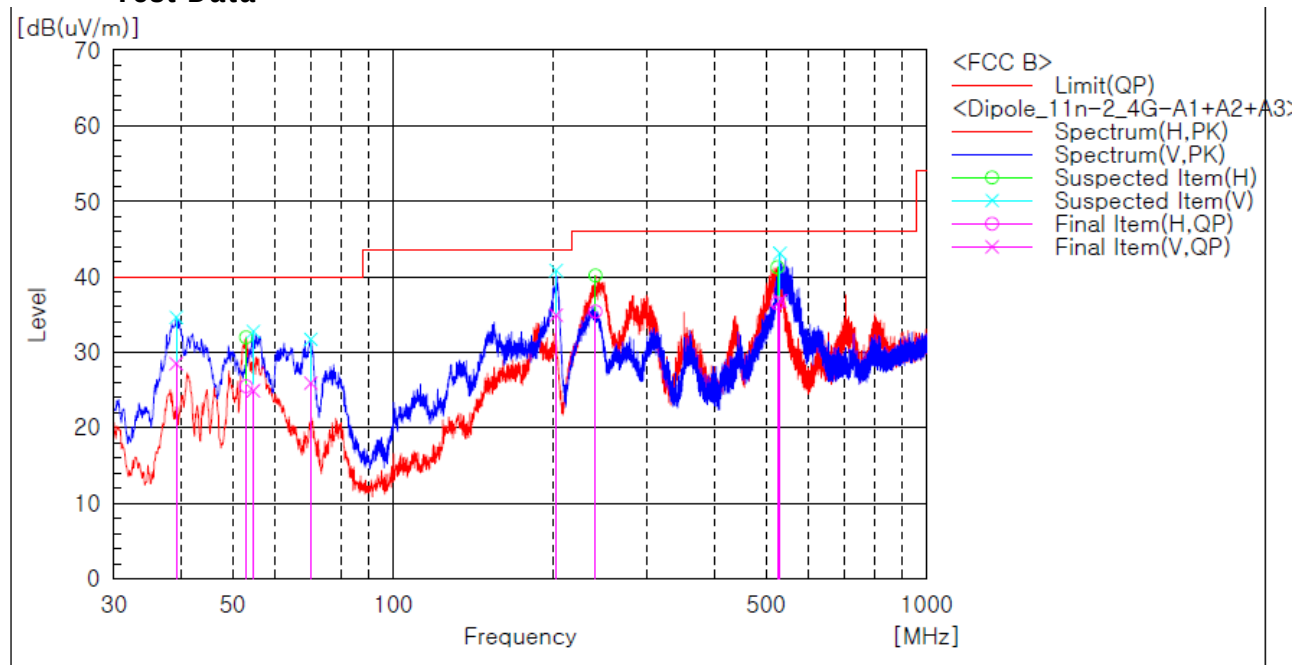
EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	Below 1000MHz
Configuration	Dipole ANT A1+A2+A3	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
202.175	34.9	8.6	Quasi-peak

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	39.215	V	41.2	-12.7	28.5	40.0	11.5	100.0	272.0	
2	53.038	H	38.4	-12.9	25.5	40.0	14.5	205.0	309.0	
3	54.735	V	37.9	-13.0	24.9	40.0	15.1	100.0	309.0	
4	70.134	V	40.5	-14.6	25.9	40.0	14.1	195.0	51.0	
5	202.175	V	48.4	-13.5	34.9	43.5	8.6	100.0	11.0	
6	239.641	H	46.5	-11.1	35.4	46.0	10.6	100.0	89.0	
7	525.428	H	38.2	-1.7	36.5	46.0	9.5	205.0	48.0	
8	530.884	V	38.4	-1.6	36.8	46.0	9.2	100.0	86.0	

Remark :

1. The field strength of spurious emission was measured in the following position: EUT and antenna stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.

Test mode : 802.11g

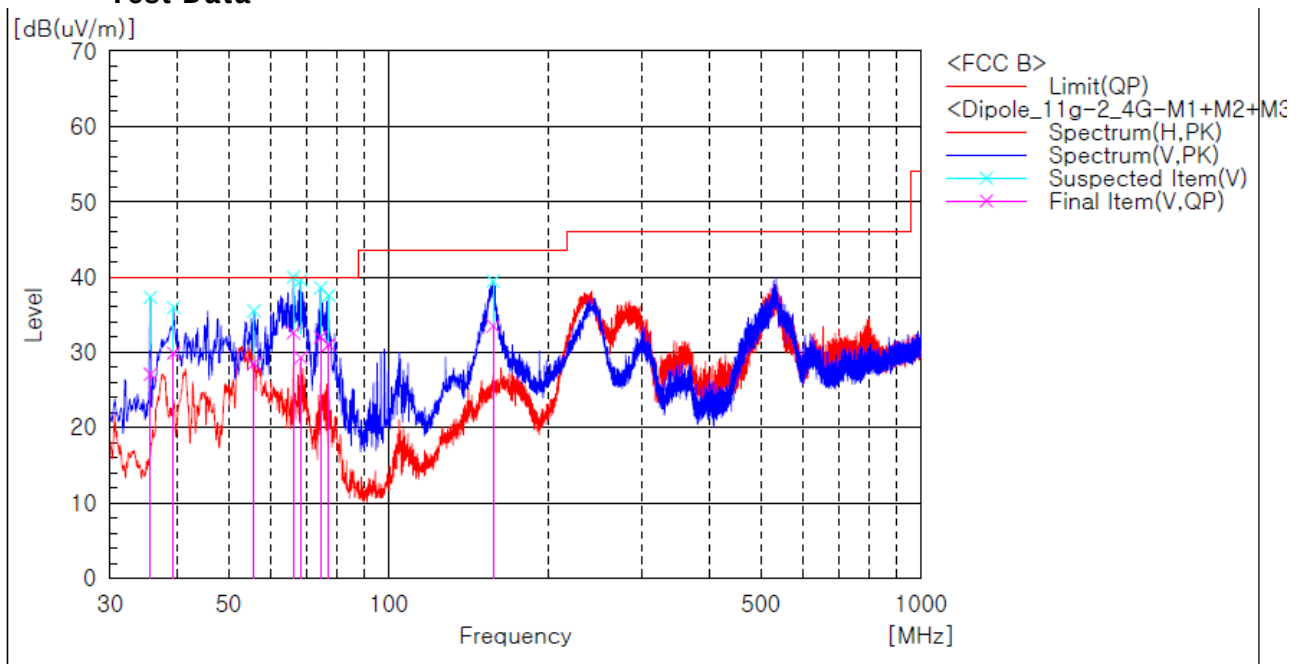
EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	Below 1000MHz
Configuration	Dipole ANT M1+M2+M3	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
66.254	32.6	7.4	Quasi-peak

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	35.699	V	40.6	-13.5	27.1	40.0	12.9	100.0	271.0	
2	39.458	V	42.6	-12.7	29.9	40.0	10.1	100.0	11.0	
3	55.826	V	41.6	-13.1	28.5	40.0	11.5	100.0	11.0	
4	66.254	V	46.7	-14.1	32.6	40.0	7.4	100.0	160.0	
5	68.436	V	43.6	-14.3	29.3	40.0	10.7	100.0	122.0	
6	74.499	V	47.2	-15.2	32.0	40.0	8.0	100.0	122.0	
7	77.166	V	46.6	-15.6	31.0	40.0	9.0	195.0	51.0	
8	157.191	V	43.9	-10.4	33.5	43.5	10.0	100.0	234.0	

Remark :

1. The field strength of spurious emission was measured in the following position: EUT and antenna stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.

Test mode : 802.11n

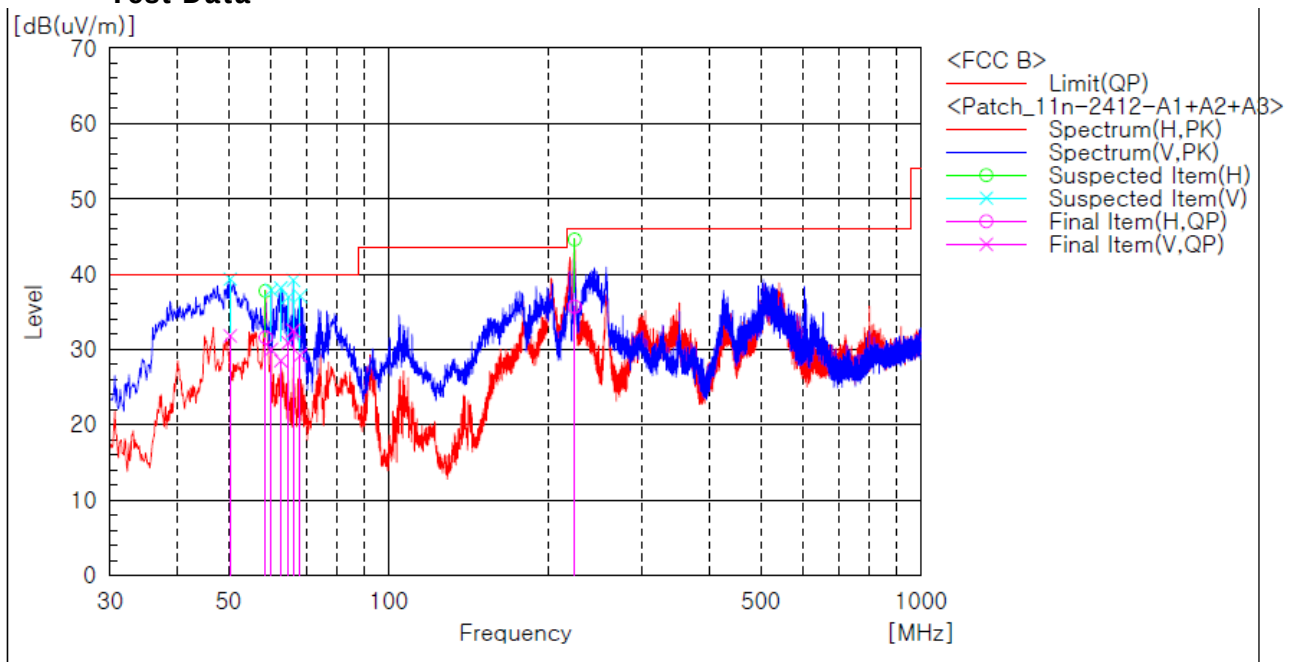
EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	Below 1000MHz
Configuration	Patch ANT A1+A2+A3	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
66.254	32.5	7.5	Quasi-peak

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	50.370	V	44.6	-12.8	31.8	40.0	8.2	100.0	235.0	
2	58.736	H	45.1	-13.5	31.6	40.0	8.4	400.0	308.0	
3	60.191	V	43.6	-13.6	30.0	40.0	10.0	100.0	86.0	
4	62.738	V	42.3	-13.8	28.5	40.0	11.5	100.0	11.0	
5	64.799	V	44.9	-14.0	30.9	40.0	9.1	100.0	86.0	
6	66.254	V	46.6	-14.1	32.5	40.0	7.5	100.0	123.0	
7	68.194	V	43.5	-14.3	29.2	40.0	10.8	100.0	86.0	
8	223.636	H	48.1	-12.4	35.7	46.0	10.3	100.0	202.0	

Remark :

1. The field strength of spurious emission was measured in the following position: EUT and antenna stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.

Test mode : 802.11g

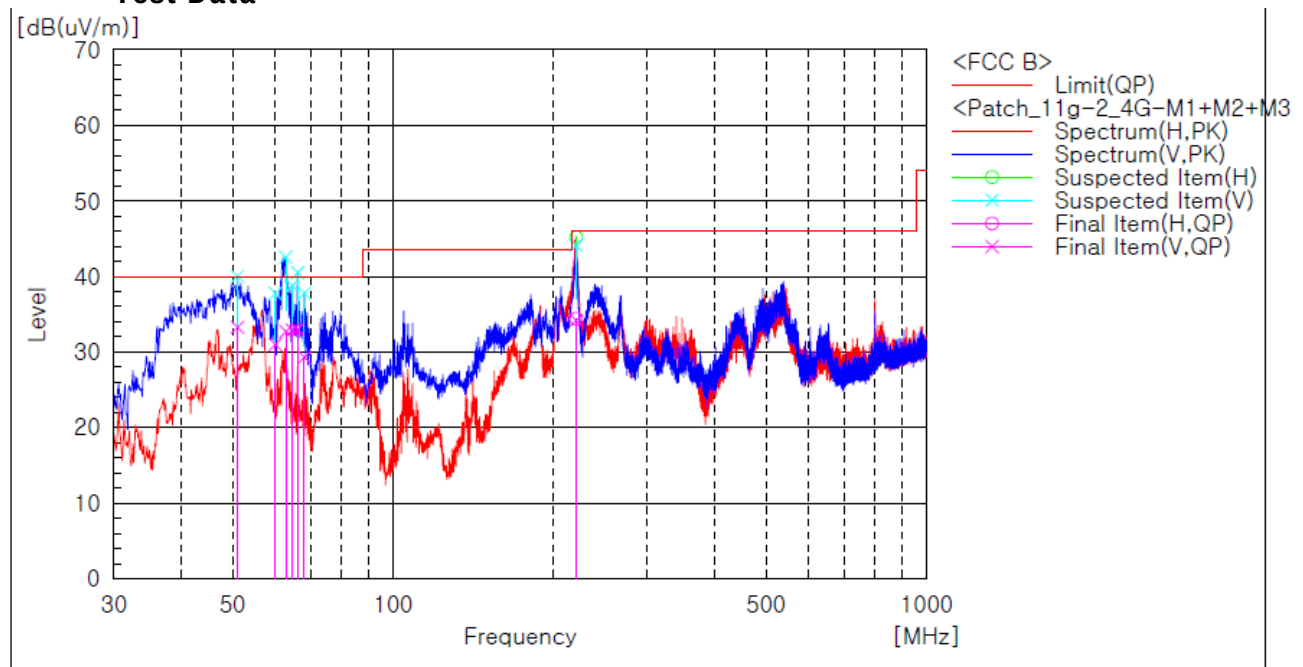
EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	Below 1000MHz
Configuration	Patch ANT M1+M2+M3	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
51.098	33.3	6.7	Quasi-peak

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	51.098	V	46.1	-12.8	33.3	40.0	6.7	100.0	235.0	
2	60.191	V	44.6	-13.6	31.0	40.0	9.0	100.0	86.0	
3	62.980	V	46.5	-13.8	32.7	40.0	7.3	100.0	10.0	
4	64.799	V	46.9	-14.0	32.9	40.0	7.1	100.0	10.0	
5	66.254	V	47.1	-14.1	33.0	40.0	7.0	100.0	10.0	
6	68.194	V	43.6	-14.3	29.3	40.0	10.7	100.0	272.0	
7	220.241	V	46.9	-12.7	34.2	46.0	11.8	195.0	237.0	
8	220.484	H	47.0	-12.6	34.4	46.0	11.6	100.0	165.0	

Remark :

1. The field strength of spurious emission was measured in the following position: EUT and antenna stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.

3) above 1 GHz

Test mode : 802.11b

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Dipole ANT A1	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4824.0	52.2	1.8	Average

Ch.1(2412 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4824.0	V	38.6	45.9	13.6	52.2	59.5	54.0	74.0	1.8	14.5

Ch.6(2437 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4874.0	V	37.1	45.1	13.7	50.8	58.8	54.0	74.0	3.2	15.2

Ch.11(2462 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4924.0	V	37.2	46.0	13.7	50.9	59.7	54.0	74.0	3.1	14.3

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
2388.2	V	29.3	43.4	8.1	37.4	51.5	54.0	74.0	16.6	22.5
2489.3	V	27.0	42.5	8.4	35.4	50.9	54.0	74.0	18.6	23.1

Test mode : 802.11g

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Dipole ANT A1+A2+A3	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2483.5	69.7	4.3	Peak

Ch.1(2412 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4824.0	V	31.7	48.4	13.6	45.3	62.0	54.0	74.0	8.7	12.0

Ch.6(2437 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4874.0	V	32.2	47.6	13.7	45.9	61.3	54.0	74.0	8.1	12.7

Ch.11(2462 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4924.0	V	32.4	46.7	13.7	46.1	60.4	54.0	74.0	7.9	13.6

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
2390.0	V	37.7	58.0	8.1	45.8	66.1	54.0	74.0	8.2	7.9
2483.5	V	37.5	61.4	8.3	45.8	69.7	54.0	74.0	8.2	4.3

Test mode : 802.11n

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Dipole ANT A1+A2+A3	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2390.0	71.4	2.6	Peak

Ch.1(2412 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4824.0	V	32.2	47.0	13.6	45.8	60.6	54.0	74.0	8.2	13.4

Ch.6(2437 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4874.0	V	31.3	45.8	13.7	45.0	59.5	54.0	74.0	9.0	14.5

Ch.11(2462 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4924.0	V	31.9	46.7	13.7	45.6	60.4	54.0	74.0	8.4	13.6
7386.0	V	29.8	45.6	17.8	47.6	63.4	54.0	74.0	6.4	10.6

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
2390.0	V	39.3	63.3	8.1	47.4	71.4	54.0	74.0	6.6	2.6
2483.5	V	39.3	61.9	8.3	47.6	70.2	54.0	74.0	6.4	3.8

Test mode : 802.11g

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Dipole ANT M1+M2+M3	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
7386.0	71.5	2.5	Peak

Ch.1(2412 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4824.0	V	33.0	49.3	13.6	46.6	62.9	54.0	74.0	7.4	11.1
7232.0	V	31.2	50.4	17.7	48.9	68.1	54.0	74.0	5.1	5.9

Ch.6(2437 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4874.0	V	34.1	50.9	13.7	47.8	64.6	54.0	74.0	6.2	9.4
7311.0	V	32.2	49.7	17.9	50.1	67.6	54.0	74.0	3.9	6.4

Ch.11(2462 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4924.0	V	35.2	49.9	13.7	48.9	63.6	54.0	74.0	5.1	10.4
7386.0	V	33.4	53.7	17.8	51.2	71.5	54.0	74.0	2.8	2.5

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
2390.0	V	37.7	57.6	8.1	45.8	65.7	54.0	74.0	8.2	8.3
2483.5	V	35.2	57.6	8.3	43.5	65.9	54.0	74.0	10.5	8.1

Test mode : 802.11b

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Patch ANT A1	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4824.0	51.9	2.1	Average

Ch.1(2412 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4824.0	V	38.3	45.0	13.6	51.9	58.6	54.0	74.0	2.1	15.4

Ch.6(2437 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4874.0	V	37.7	44.7	13.7	51.4	58.4	54.0	74.0	2.6	15.6

Ch.11(2462 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4924.0	V	37.9	46.9	13.7	51.6	60.6	54.0	74.0	2.4	13.4

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
2390.0	V	31.6	44.7	8.1	39.7	52.8	54.0	74.0	14.3	21.2
2492.9	V	29.9	43.5	8.4	38.3	51.9	54.0	74.0	15.7	22.1

Test mode : 802.11g

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Dipole ANT A1+A2+A3	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2483.5	69.9	4.1	Peak

Ch.1(2412 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4826.0	V	33.0	48.5	13.6	46.6	62.1	54.0	74.0	7.4	11.9

Ch.6(2437 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4876.0	V	33.3	47.9	13.7	47.0	61.6	54.0	74.0	7.0	12.4

Ch.11(2462 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4926.0	V	33.2	48.6	13.7	46.9	62.3	54.0	74.0	7.1	11.7
7388.0	V	30.2	46.5	17.8	48.0	64.3	54.0	74.0	6.0	9.7

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
2390.0	V	34.7	58.3	8.1	42.8	66.4	54.0	74.0	11.2	7.6
2483.5	V	38.8	61.6	8.3	47.1	69.9	54.0	74.0	6.9	4.1

Test mode : 802.11n

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Dipole ANT A1+A2+A3	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2483.5	69.2	4.8	Peak

Ch.1(2412 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4825.0	V	33.7	49.3	13.6	47.3	62.9	54.0	74.0	6.7	11.1
7233.0	V	30.2	47.8	17.7	47.9	65.5	54.0	74.0	6.1	8.5

Ch.6(2437 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4875.0	V	34.0	49.7	13.7	47.7	63.4	54.0	74.0	6.3	10.6
7313.0	V	30.4	47.8	17.9	48.3	65.7	54.0	74.0	5.7	8.3

Ch.11(2462 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4925.0	V	33.6	48.2	13.7	47.3	61.9	54.0	74.0	6.7	12.1
7388.0	V	30.3	47.7	17.8	48.1	65.5	54.0	74.0	5.9	8.5

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
2390.0	V	37.5	59.7	8.1	45.6	67.8	54.0	74.0	8.4	6.2
2483.5	V	39.6	60.9	8.3	47.9	69.2	54.0	74.0	6.1	4.8

Test mode : 802.11g

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Patch ANT M1+M2+M3	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4877.0	51.5	2.5	Average

Ch.1(2412 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4827.0	V	36.1	51.4	13.6	49.7	65.0	54.0	74.0	4.3	9.0
7235.0	V	32.4	53.4	17.7	50.1	71.1	54.0	74.0	3.9	2.9

Ch.6(2437 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4877.0	V	37.8	52.8	13.7	51.5	66.5	54.0	74.0	2.5	7.5
7310.0	V	32.9	53.3	17.9	50.8	71.2	54.0	74.0	3.2	2.8

Ch.11(2462 MHz)

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
4927.0	V	36.7	51.5	13.7	50.4	65.2	54.0	74.0	3.6	8.8
7394.0	V	32.6	52.2	17.8	50.4	70.0	54.0	74.0	3.6	4.0

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
2390.0	V	36.0	54.8	8.1	44.1	62.9	54.0	74.0	9.9	11.1
2483.5	V	34.3	54.7	8.3	42.6	63.0	54.0	74.0	11.4	11.0

Test Results

1) 9 kHz to 30 MHz

Test mode : Receiver

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	9 kHz – 30 MHz
Mode	Receiver	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	See note

Note :

The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB)

2) 30 MHz to 1 GHz

Test mode : Receiver

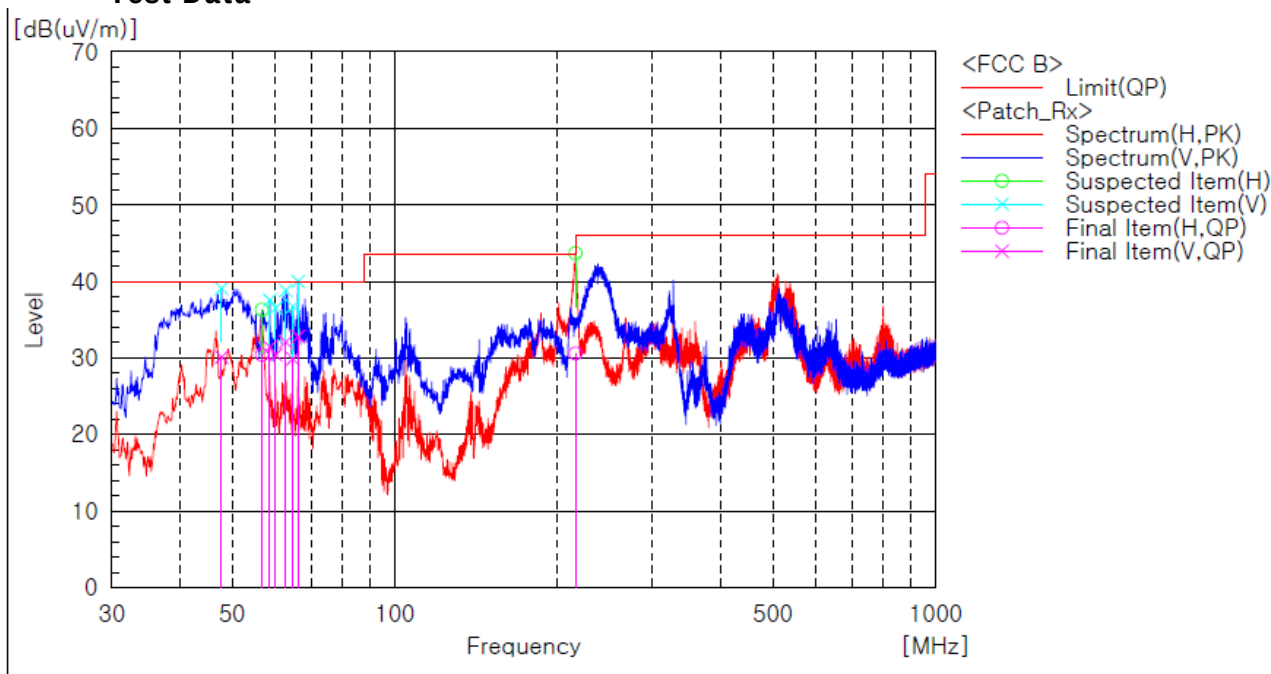
EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	Below 1000MHz
Mode	Receiver	Detector function	Quasi-Peak / Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
66.254	32.8	7.2	Quasi-Peak

Test Data



Final Result

No.	Frequency (P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]	QP [dB(uV)]	[dB(1/m)]	QP [dB(uV/m)]	QP [dB(uV/m)]	QP [dB]	[cm]	[deg]	
1	47.824	V 42.8	-12.7	30.1	40.0	9.9	100.0	234.0	
2	56.796	H 43.6	-13.2	30.4	40.0	9.6	308.0	52.0	
3	58.736	V 44.9	-13.5	31.4	40.0	8.6	100.0	85.0	
4	60.191	V 44.0	-13.6	30.4	40.0	9.6	100.0	47.0	
5	62.859	V 45.9	-13.8	32.1	40.0	7.9	100.0	47.0	
6	64.799	V 43.9	-14.0	29.9	40.0	10.1	100.0	47.0	
7	66.254	V 46.9	-14.1	32.8	40.0	7.2	100.0	122.0	
8	215.876	H 43.6	-13.0	30.6	43.5	12.9	100.0	164.0	

Remark :

1. The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(Z axis) and the worst case was recorded.

Test mode : Receiver

EUT	WLAN Access Point	Measurement Detail	
Model	WEA403e	Frequency Range	1-25GHz
Mode	Receiver	Detector function	Average / Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
No emissions were detected at a level greater than 20dB below limit.			

Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]
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No emissions were detected at a level greater than 20dB below limit.

2.1.7 AC Conducted Emissions

Test Location

Shielded Room

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

- 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency.

Test Results

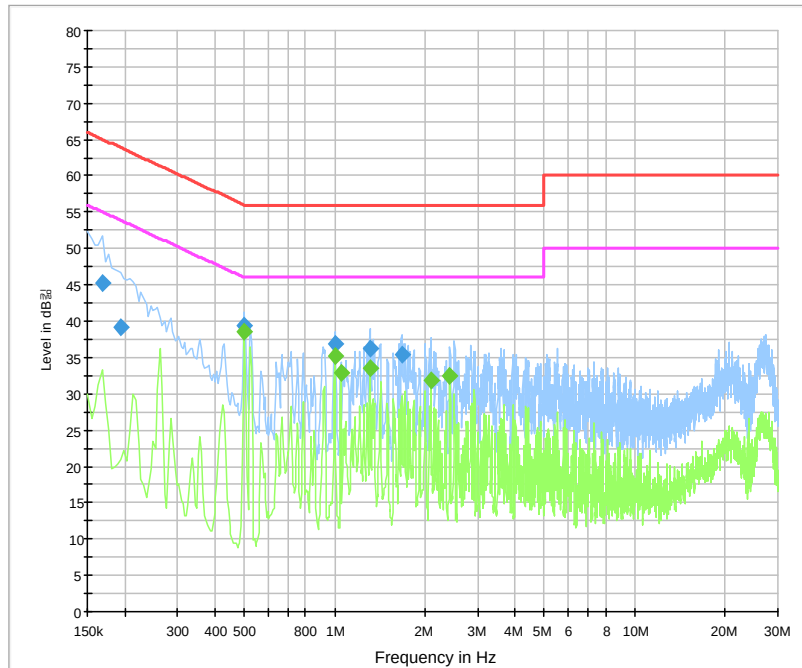
The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
0.501	40.0	6.0	Average

Test Data

[HOT]
CISPR 22 Class B_L1



Final Result 1

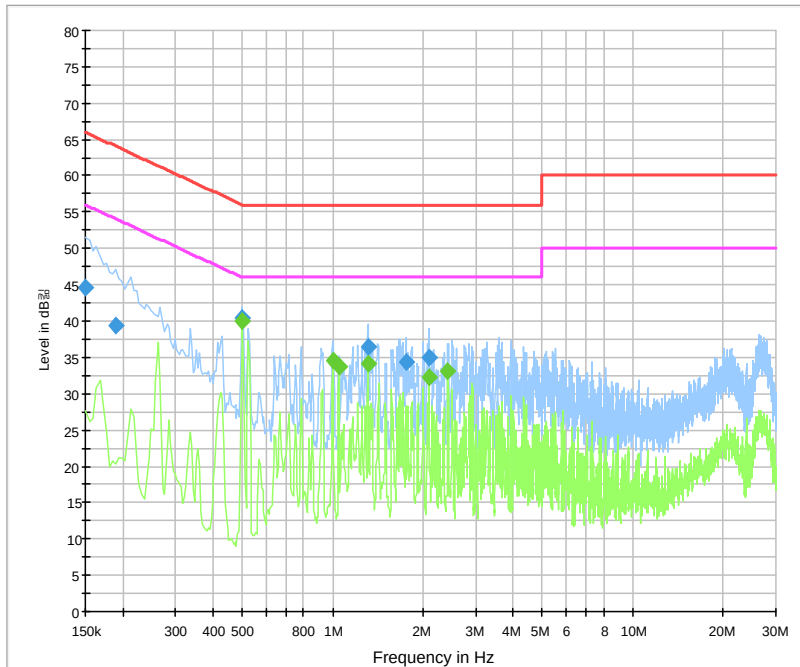
Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.168000	45.2	1000.0	9.000	On	L1	9.8	19.8	65.1
0.195000	39.1	1000.0	9.000	On	L1	9.8	24.7	63.8
0.501000	39.5	1000.0	9.000	On	L1	9.9	16.5	56.0
1.000500	36.8	1000.0	9.000	On	L1	9.7	19.2	56.0
1.311000	36.1	1000.0	9.000	On	L1	9.7	19.9	56.0
1.671000	35.5	1000.0	9.000	On	L1	9.7	20.5	56.0

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.501000	38.6	1000.0	9.000	On	L1	9.9	7.4	46.0
1.000500	35.2	1000.0	9.000	On	L1	9.7	10.8	46.0
1.050000	32.9	1000.0	9.000	On	L1	9.7	13.1	46.0
1.311000	33.4	1000.0	9.000	On	L1	9.7	12.6	46.0
2.098500	31.8	1000.0	9.000	On	L1	9.8	14.2	46.0
2.422500	32.5	1000.0	9.000	On	L1	9.8	13.5	46.0

[NEUTRAL]

CISPR 22 Class B_N



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	44.7	1000.0	9.000	On	N	9.7	21.3	66.0
0.190500	39.4	1000.0	9.000	On	N	9.8	24.6	64.0
0.501000	40.4	1000.0	9.000	On	N	9.9	15.6	56.0
1.311000	36.3	1000.0	9.000	On	N	9.7	19.7	56.0
1.756500	34.2	1000.0	9.000	On	N	9.7	21.8	56.0
2.094000	35.1	1000.0	9.000	On	N	9.8	20.9	56.0

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.501000	40.0	1000.0	9.000	On	N	9.9	6.0	46.0
1.000500	34.5	1000.0	9.000	On	N	9.7	11.5	46.0
1.050000	33.6	1000.0	9.000	On	N	9.7	12.4	46.0
1.311000	34.2	1000.0	9.000	On	N	9.7	11.8	46.0
2.098500	32.3	1000.0	9.000	On	N	9.8	13.7	46.0
2.422500	33.0	1000.0	9.000	On	N	9.8	13.0	46.0

APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2014-11-07	2015-11-07
2	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2014-11-07	2015-11-07
3	EMI Test Receiver	Rohde & Schwarz	ESC17	100814	2014-12-05	2015-12-05
4	EMI Test Receiver	Rohde & Schwarz	ESC17	100816	2014-12-05	2015-12-05
5	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-126	2014-05-19	2016-05-19
6	Attenuator	HP	8498A	1801A06913	2014-11-11	2015-11-11
7	EPM Series Power Meter	HP	E4418A	GB38272734	2014-11-17	2015-11-17
8	Power Sensor	HP	8487A	3318A03524	2015-02-06	2016-02-06
9	Audio Analyzer	HP	8903B	2747A03432	2014-11-10	2015-11-10
10	ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2014-11-12	2015-11-12
11	SYNTHESIZED SWEEPER	HP	8341B	2819A01563	2014-11-14	2015-11-14
12	Attenuator	HP	8494A	3308A33351	2014-11-07	2015-11-07
13	Temp&Humi Chamber	Kunpoong	JT-TH-556-1	9QE5-002	2015-01-16	2016-01-16
14	Temp&Humi Chamber	Kunpoong	JT-TH-556-2	9QE5-003	2015-01-16	2016-01-16
15	Temp&Humi Chamber	ESPEC CORP.	SH-241	92000872	2015-05-13	2016-05-13
16	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2014-11-07	2015-11-07
17	Horn Antenna	ETS-Lindgren	3115	00078895	2015-05-07	2017-05-07
18	Horn Antenna	ETS-Lindgren	3116	00062916	2015-04-30	2017-04-30
19	Horn Antenna	ETS-Lindgren	3117	00154525	2013-07-03	2015-07-03
20	OPT H64 AMPLIFIER	HP	8447F	3113A06814	2015-02-06	2016-02-06
21	PREAMPLIFIER	Agilent	8449B	3008A02307	2014-10-24	2015-10-24
22	Radio Communication Tester	Rohde & Schwarz	CMU200	106765	2015-02-02	2016-02-02
23	LISN	Rohde & Schwarz	ENV216	101235	2015-05-14	2016-05-14
24	LISN	Rohde & Schwarz	ENV216	101236	2015-05-14	2016-05-14
25	LISN	Rohde & Schwarz	ENV216	101151	2014-11-07	2015-11-07
26	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2014-11-07	2015-11-07
27	EMI Test Receiver	Rohde & Schwarz	ESC13	100032	2015-02-02	2016-02-02
28	6dB Attenuator	R&S	DNF	272.4110.50	2014-11-07	2015-11-07
29	AMPLIFIER	Sonoma Instrument Co.	310	291721	2015-02-02	2016-02-02
30	EMI Test Receiver	Rohde & Schwarz	ESU40	100336	2015-05-15	2016-05-15
31	Signal Generator	Rohde & Schwarz	SMBV100A	258008	2015-05-13	2016-05-13
32	Bilog Antenna	Schaffner	CBL6111C	2551	2014-05-08	2016-05-08