







ISO/IEC17025Accredited Lab.

Report No: FCC 1506125 File reference No: 2015-07-01

Applicant: GALAXYWIND Network System Co., Ltd.

Product: W Module

Model No: W Module, W0, W1, W2, W3, W4, W5, W6, W7, W8, W9

Trademark: N/A

Test Standards: FCC Part 15.247

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.4, FCC Part 15 Subpart C,

Paragraph 15.247 regulations for the evaluation of

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated: July 01, 2015

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timewaytech.com

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Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAL-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.

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Test Report Conclusion

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1.0 General Details

1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Room 512-519,5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen,

Guangdong China

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: GALAXYWIND Network System Co., Ltd.

Address: GalaxyWind building, No.5 Xinxi road, Shenzhen High-Tech Industry Park, Nanshan district,

China

Telephone: --Fax: --

1.3 Description of EUT

Product: W Module

Manufacturer: GALAXYWIND Network System Co., Ltd.

Address: GalaxyWind building, No.5 Xinxi road, Shenzhen High-Tech Industry Park,

Nanshan district, China

Brand Name: N/A

Model Number: W Module

Additional Model Number: W0, W1, W2, W3, W4, W5, W6, W7, W8, W9

Type of Modulation IEEE 802.11b : DSSS (CCK, QPSK, DBPSK)

IEEE 802.11g/n (HT20): OFDM(64QAM, 16QAM, QPSK, BPSK)

Frequency range IEEE 802.11b/g/n (HT20): 2412-2462MHz

Channel Spacing 5MHz for IEEE 802.11b/g/n(HT20) Air Data Rate IEEE 802.11b : 11, 5.5, 2, 1 Mbps

IEEE 802.11g: 54, 48,36, 24, 18, 12, 9, 6 Mbps

IEEE 802.11n HT20 : 6.5 Mbps-72.2MHz

Frequency Selection By software

Channel Number IEEE 802.11b/g/n (HT20): 11 Channels

Antenna: PCB Antenna and the maximum Gain of this antenna is 0dBi;

1.4 Submitted Sample: 2 Samples

The report refers only to the sample tested and does not apply to the bulk.

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Test Duration 2015-06-16 to 2015-06-30

1.6 Test Uncertainty Conducted Emissions Uncertainty = 3.6dB Radiated Emissions Uncertainty =4.7dB

Terry Tang Test Engineer The sample tested by

Print Name: Terry Tang

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2.0 Test Equipments							
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date		
ESPI Test Receiver	R&S	ESPI 3	100379	2014-08-21	2015-08-20		
TWO Line-V-NETW	R&S	EZH3-Z5	100294	2014-08-22	2015-08-21		
TWO Line-V-NETW	R&S	EZH3-Z5	100253	2014-08-22	2015-08-21		
Ultra Broadband ANT	R&S	HL562	100157	2014-08-23	2015-08-22		
ESDV Test Receiver	R&S	ESDV	100008	2014-08-22	2015-08-21		
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2014-08-21	2015-08-20		
System Controller	CT	SC100	-				
Printer	EPSON	РНОТО ЕХЗ	CFNH234850				
Computer	IBM	8434	1S8434KCE99BLXLO*	-	-		
Loop Antenna	EMCO	6502	00042960	2014-08-22	2015-08-21		
ESPI Test Receiver	R&S	ESI26	838786/013	2014-08-22	2015-08-21		
3m OATS			N/A	2014-08-21	2015-08-20		
Horn Antenna	R&S	BBHA 9170	BBHA9170265	2014-08-23	2015-08-22		
Horn Antenna	R&S	BBHA 9120D	9120D-631	2014-08-23	2015-08-22		
Power meter	Anritsu	ML2487A	6K00003613	2014-08-22	2015-08-21		
Power sensor	Anritsu	MA2491A	32263	2014-08-22	2015-08-21		
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2014-08-23	2015-08-22		
LISN	AFJ	LS16C	10010947251	2014-08-21	2015-08-20		
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2014-08-22	2015-08-21		
9*6*6 Anechoic			N/A	2014-08-21	2015-08-20		
EMI Test Receiver	RS	ESCS30	100139	2014-08-22	2015-08-21		

Auxiliary Equipment 2.1

Name	Model No.	Rating	Manufacturer	FCC ID/DOC
Ivallic	Model No.	Rating	Manufacturei	TCC ID/DOC
Passive				
Earphone				

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3. DESCRIPTION OF TEST MODES

IEEE 802.11b, 802.11g, 802.11n (HT20) mode

The EUT had been tested under operating condition. There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode: 11Mbps data rate (worst case) was chosen for full testing. IEEE 802.11g mode: 54Mbps data rate (worst case) was chosen for full testing. IEEE 802.11n (HT20) mode: 6.5Mbps data rate (worst case) were chosen for full testing

The worst-case data rates are determined according to the description above, based on the investigations by measuring the PSD and average power across all the data rates, bandwidths, modulations and spatial stream modes.

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3.0 **Technical Details**

3.1 **Summary of test results**

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107 & 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.247(a)(2) Limit	Spectrum bandwidth of a Orthogonal Frequency Division Multiplex System Limit: 6dB bandwidth>500kHz	PASS	Complies
FCC Part 15, Paragraph 15.247(b)	Maximum peak output power Limit: max. 30dBm	PASS	Complies
FCC Part 15, Paragraph 15.109,15.205 & 15.209	Transmitter Radiated Emission Limit: Table 15.209	PASS	Complies
FCC Part 15, Paragraph 15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Complies
FCC Part 15, Paragraph 15.247(d)	Out of Band Emission and Restricted Band Radiation Limit: 20dB less than peak value of fundamental frequency Restricted band limit: Table 15.209	PASS	Complies

3.2 **Test Standards**

FCC Part 15 Subpart & Subpart C, Paragraph 15.247, ANSI C63.4:2009 and ANSI C63.10:2009

4.0 **EUT Modification**

No modification by Shenzhen Timeway Technology Consulting Co., Ltd

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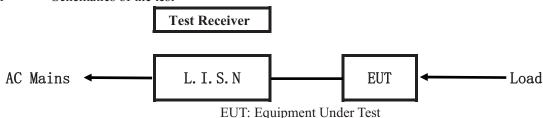
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5.0 Power Line Conducted Emission Test

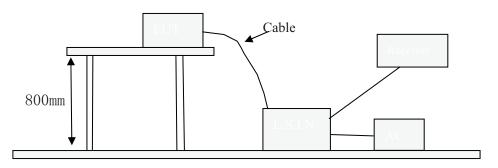
5.1 Schematics of the test



5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2009. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2009.

Test Voltage: 120V~, 60Hz Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2009. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model	FCC ID
W Module	GALAXYWIND Network	W Module, W0, W1, W2, W3,	2AES6WMODULE
	System Co., Ltd.	W4, W5, W6, W7, W8, W9	

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

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C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Raring
Test Fixture	GALAXYWIND			
	Network System			
	Co., Ltd.			
Power	Jingrichang	JT-H050150		Input:100-240V~, 50/60Hz,0.35A;
Supply				Output: DC5V, 1.5A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009.

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207 and 15.107

Frequency	Class A Lim	its (dB µ V)	Class B Limits (dB µ V)		
(MHz)	Quasi-peak Level Average Level		Quasi-peak Level	Average Level	
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*	
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0	
5.00 ~ 30.00	73.0	60.0	60.0	50.0	

Notes:

- 1. *Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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Conducted Emission on Live Terminal (150kHz to 30MHz) A:

EUT Operating Environment

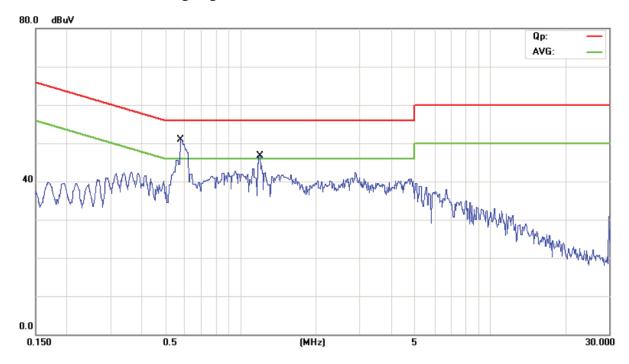
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep WIFI Transmitting

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBu∀	dBuV	dB	Detector	Comment
1	0.5741	27.00	11.45	38.45	56.00	-17.55	QP	
2 *	0.5741	17.50	11.45	28.95	46.00	-17.05	AVG	
3	1.1834	23.70	11.97	35.67	56.00	-20.33	QP	
4	1.1834	11.90	11.97	23.87	46.00	-22.13	AVG	

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

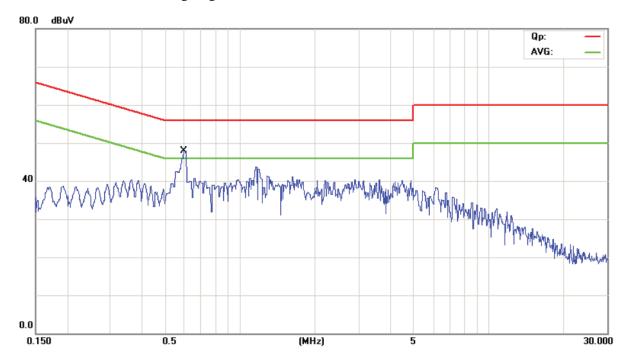
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep WIFI Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Mk.	Freq.			Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.5970	29.40	11.47	40.87	56.00	-15.13	QP	
2		0.5970	13.80	11.47	25.27	46.00	-20.73	AVG	

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6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.10-2009. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2009.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=1MHz VBW=3MHz and PK detector. AV value with RBW=1MHz, VBW=3MHz and RMS detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup Distance = 3m Computer Pre -Amplifier Furn-table Receiver

- 6.2 Configuration of The EUT
 Same as section 5.3 of this report
- 6.3 EUT Operating Condition
 Same as section 5.4 of this report.

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6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109

		<u> </u>
Frequency Range (MHz)	Distance (m)	Field strength (dB µ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

- 2. In the Above Table, the higher limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

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Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal/Vertical (30MHz----1000MHz)

EUT set Condition: Keep Transmitting

Results: Pass

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)	
240.000	36.85	36.85 H 46.0		
200.000	39.18	Н 43.50		
200.000	200.000 33.55		43.50	
280.000	41.21	V	46.00	

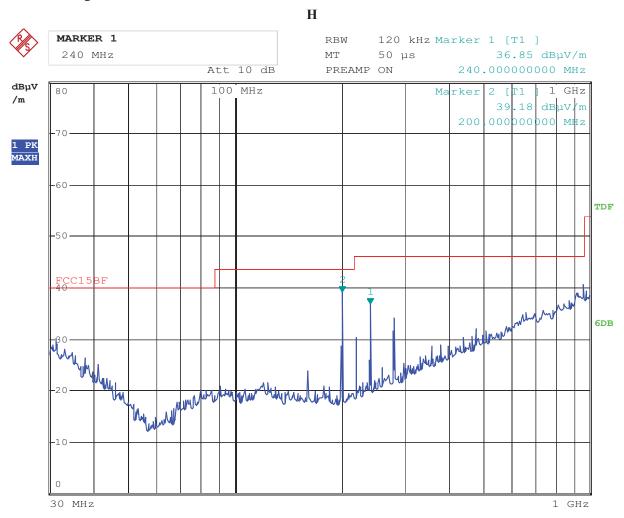
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Test Figure:



26.JUN.2015 15:20:27 Date:

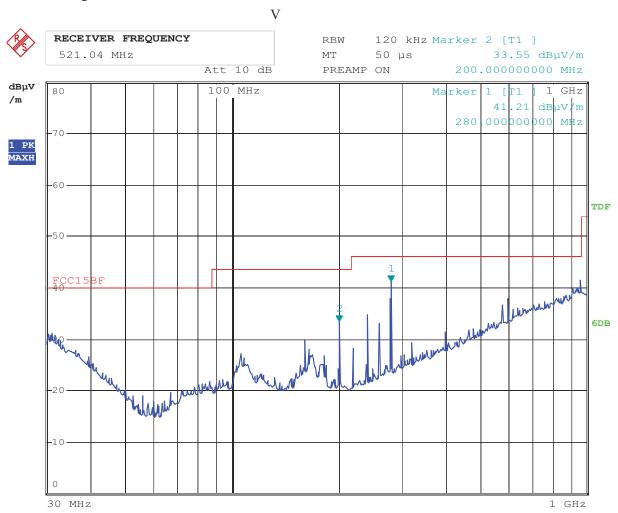
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Test Figure:



26.JUN.2015 11:08:20 Date:

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Operation Mode: Transmitting under CH01 for 11g at 54Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)
4824.00	49.78 (PK) H		74(Peak)/ 54(AV)
4824.00	49.82 (PK)	V	74(Peak)/ 54(AV)
7236.00		H/V	74(Peak)/ 54(AV)
9648.00		H/V	74(Peak)/ 54(AV)
12060		H/V	74(Peak)/ 54(AV)
14472		H/V	74(Peak)/ 54(AV)
16884		H/V	74(Peak)/ 54(AV)
19296		H/V	74(Peak)/ 54(AV)
21708	21708		74(Peak)/ 54(AV)
24120		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11g mode 54Mbps

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Operation Mode: Transmitting under CH06 for 11g at 54Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB µ V/m)
4874.00	48.97 (PK)	V	74(Peak)/ 54(AV)
4874.00	49.32 (PK)	Н	74(Peak)/ 54(AV)
7311.00		H/V	74(Peak)/ 54(AV)
9748.00		H/V	74(Peak)/ 54(AV)
12185		H/V	74(Peak)/ 54(AV)
14622		H/V	74(Peak)/ 54(AV)
17059		H/V	74(Peak)/ 54(AV)
19496	19496 H/V		74(Peak)/ 54(AV)
21933		H/V	74(Peak)/ 54(AV)
24370		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11g mode 54 Mbps

Operation Mode: Transmitting under CH11 for 11g at 54Mbps

Frequency (MHz)	Level@3m (dB \u03ba V/m)	Antenna Polarity	Limit@3m (dB \u03ba V/m)
4924	49.58 (PK)	Н	74(Peak)/ 54(AV)
4924	49.64 (PK)	V	74(Peak)/ 54(AV)
7368		H/V	74(Peak)/ 54(AV)
9848		H/V	74(Peak)/ 54(AV)
12310		H/V	74(Peak)/ 54(AV)
14772	-	H/V	74(Peak)/ 54(AV)
17234		H/V 74(P	
19696		H/V	74(Peak)/ 54(AV)
22158	-	H/V	74(Peak)/ 54(AV)
24620		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

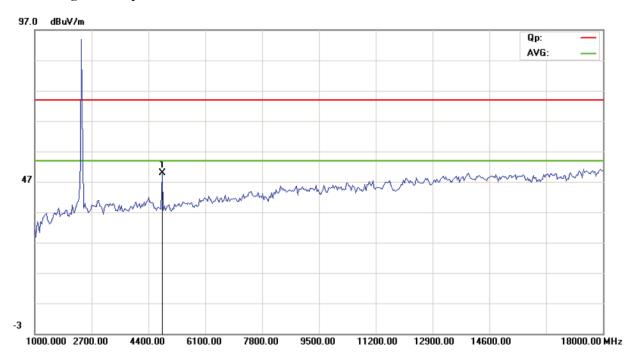
- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11g mode at 54 Mbps

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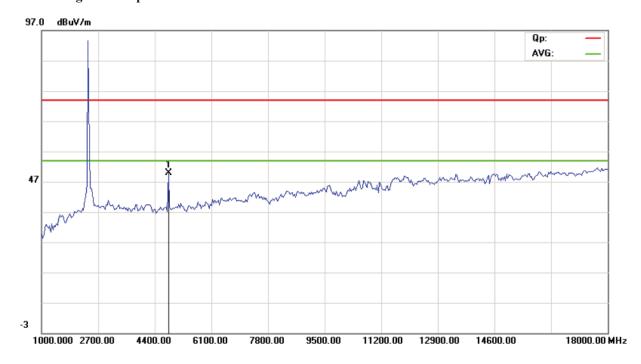


Please refer to the following test plots for details:

CH01 for 11g at 54Mbps: Horizontal



CH01 for 11g at 54Mbps: Vertical



The report refers only to the sample tested and does not apply to the bulk.

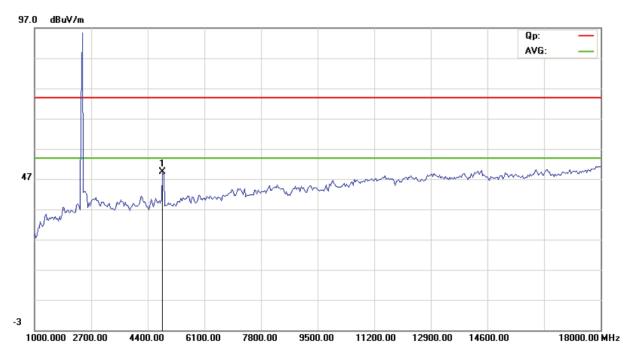
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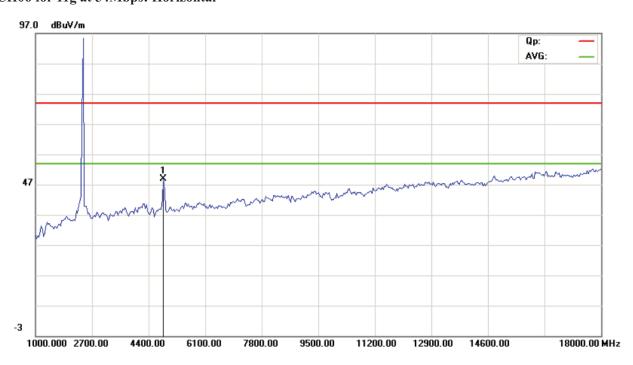
Date: 2015-07-01



CH06 for 11g at 54Mbps: Vertical



CH06 for 11g at 54Mbps: Horizontal



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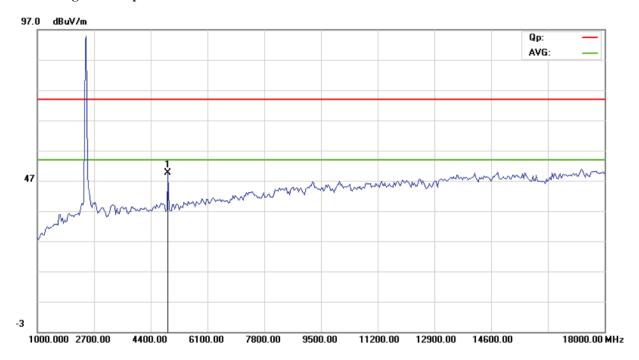
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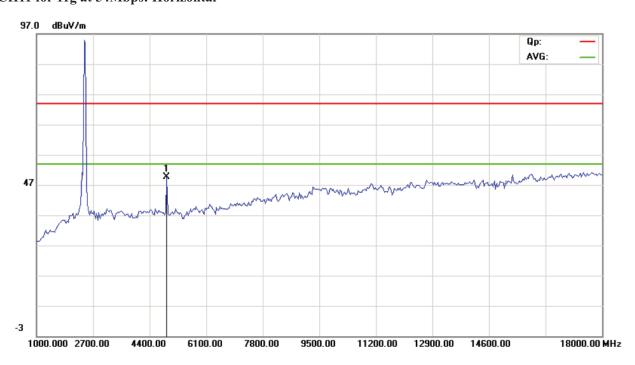
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CH11 for 11g at 54Mbps: Vertical



CH11 for 11g at 54Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

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Operation Mode: Transmitting under CH01 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB µ V/m)	
4824.00	50.82 (PK)	Н	74(Peak)/ 54(AV)	
4824.00	50.59 (PK)	V	74(Peak)/ 54(AV)	
7236.00		H/V	74(Peak)/ 54(AV)	
9648.00		H/V	74(Peak)/ 54(AV)	
12060		H/V	74(Peak)/ 54(AV)	
14472		H/V	74(Peak)/ 54(AV)	
16684	16684 H/V		74(Peak)/ 54(AV)	
19296	19296 H/V		74(Peak)/ 54(AV)	
21708		H/V	74(Peak)/ 54(AV)	
24120		H/V 74(Peak)/ 54(A)		

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11b mode 11Mbps

Operation Mode: Transmitting under CH06 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \u03b4 V/m)
4874.00	52.62 (PK)	Н	74(Peak)/ 54(AV)
4874.00	52.58 (PK)	V	74(Peak)/ 54(AV)
7311.00		H/V	74(Peak)/ 54(AV)
9748.00		H/V	74(Peak)/ 54(AV)
12185		H/V	74(Peak)/ 54(AV)
14622		H/V	74(Peak)/ 54(AV)
17059		H/V 74(Peak)/ 54	
19496		H/V	74(Peak)/ 54(AV)
21933		H/V	74(Peak)/ 54(AV)
24370		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11b mode 11Mbps

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Operation Mode: Transmitting under CH11 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB µ V/m)
4924	51.79 (PK)	Н	74(Peak)/ 54(AV)
4924	51.63 (PK)	V	74(Peak)/ 54(AV)
7368		H/V	74(Peak)/ 54(AV)
9848		H/V	74(Peak)/ 54(AV)
12310		H/V	74(Peak)/ 54(AV)
14772		H/V	74(Peak)/ 54(AV)
17234		H/V	74(Peak)/ 54(AV)
19696		H/V 74(Peak)/ 54	
22158		H/V	74(Peak)/ 54(AV)
24620		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

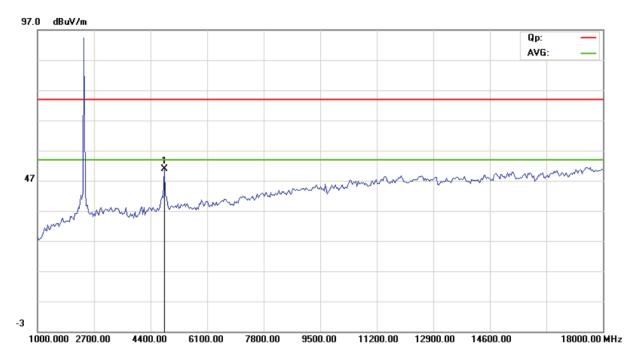
- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11b mode at 11Mbps

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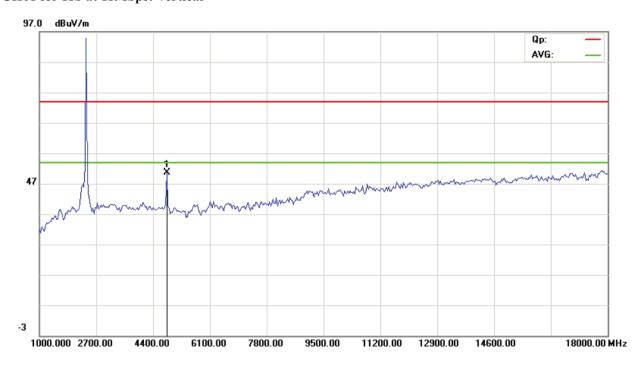


Please refer to the following test plots for details:

CH01 for 11b at 11Mbps: Horizontal



CH01 for 11b at 11Mbps: Vertical



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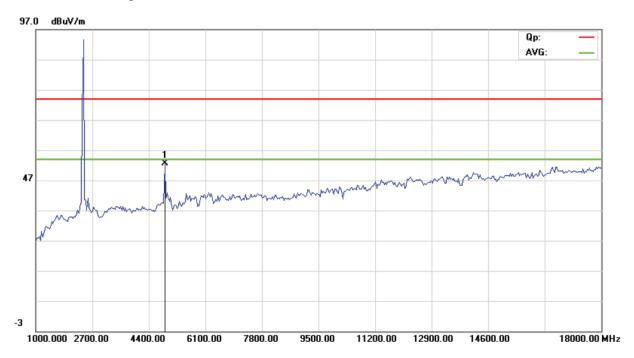
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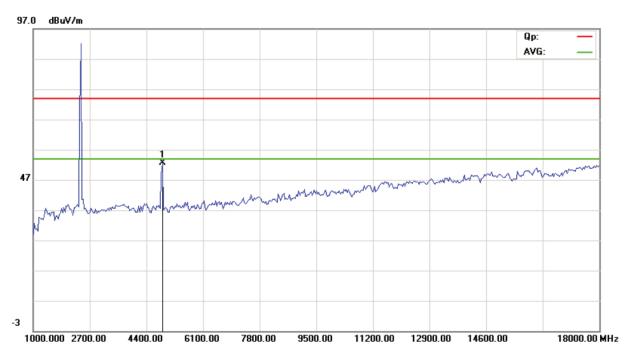
Date: 2015-07-01



CH06 for 11b at 11Mbps: Vertical



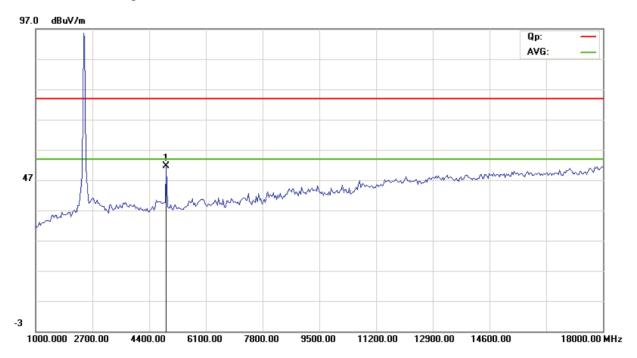
CH06 for 11b at 11Mbps: Horizontal



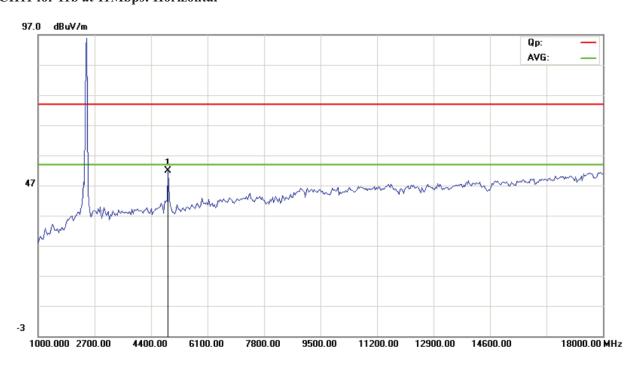
Date: 2015-07-01



CH11 for 11b at 11Mbps: Vertical



CH11 for 11b at 11Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

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Operation Mode: Transmitting under CH01 for 11n HT20 at 6.5Mbps

<u> </u>	1		
Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)	
50.85 (PK) H		74(Peak)/ 54(AV)	
51.09 (PK)	V	74(Peak)/ 54(AV)	
I		74(Peak)/ 54(AV)	
	H/V 74		
	H/V	74(Peak)/ 54(AV)	
	H/V	74(Peak)/ 54(AV)	
	H/V	74(Peak)/ 54(AV)	
19296		74(Peak)/ 54(AV)	
21708		74(Peak)/ 54(AV)	
24120		74(Peak)/ 54(AV)	
	50.85 (PK) 51.09 (PK)	50.85 (PK) H 51.09 (PK) V H/V H/V H/V H/V H/V H/V H/V	

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11n (HT20) mode 6.5Mbps

Operation Mode: Transmitting under CH06 for 11n HT20 at 6.5Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \u03b4 V/m)
4874.00	52.04 (PK)	Н	74(Peak)/ 54(AV)
4874.00	52.19 (PK)	V	74(Peak)/ 54(AV)
7311.00	-	H/V	74(Peak)/ 54(AV)
9748.00		H/V	74(Peak)/ 54(AV)
12185		H/V	74(Peak)/ 54(AV)
14622		H/V	74(Peak)/ 54(AV)
17059	7059 H/V		74(Peak)/ 54(AV)
19496		H/V	74(Peak)/ 54(AV)
21933		H/V	74(Peak)/ 54(AV)
24370		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11n (HT20) mode 6.5Mbps

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Operation Mode: Transmitting under CH11 for 11n HT20 at 6.5Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB µ V/m)
4924	50.69 (PK)	Н	74(Peak)/ 54(AV)
4924	50.14 (PK)	V	74(Peak)/ 54(AV)
7368		H/V	74(Peak)/ 54(AV)
9848		H/V	74(Peak)/ 54(AV)
12310		H/V	74(Peak)/ 54(AV)
14772		H/V	74(Peak)/ 54(AV)
17234		H/V	74(Peak)/ 54(AV)
19696		H/V 74(Peak)/ 54	
22158		H/V	74(Peak)/ 54(AV)
24620		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

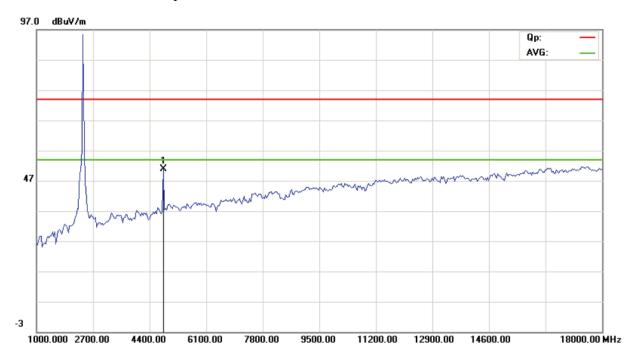
- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11n (HT20) mode 6.5Mbps

Date: 2015-07-01

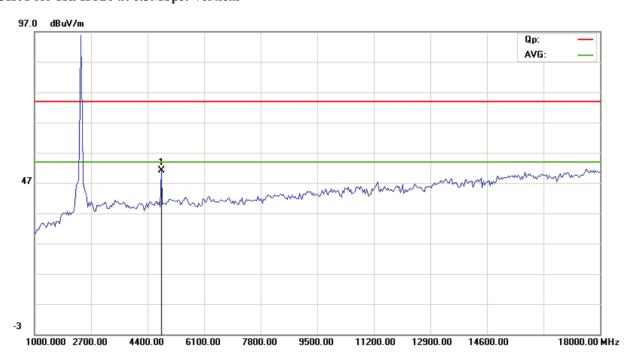


Please refer to the following test plots for details:

CH01 for 11n HT20 at 6.5Mbps: Horizontal



CH01 for 11n HT20 at 6.5Mbps: Vertical



The report refers only to the sample tested and does not apply to the bulk.

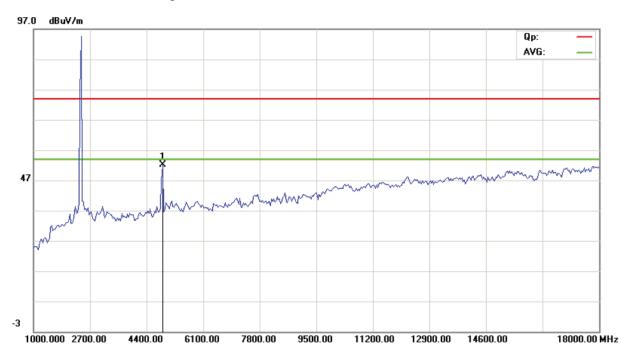
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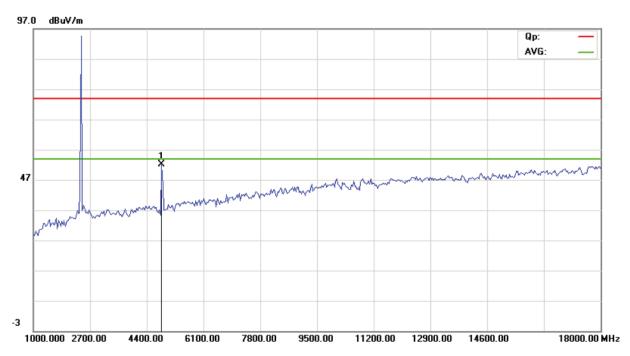
Date: 2015-07-01



CH06 for 11n HT20 at 6.5Mbps: Vertical



CH06 for 11n HT20 at 6.5Mbps: Horizontal



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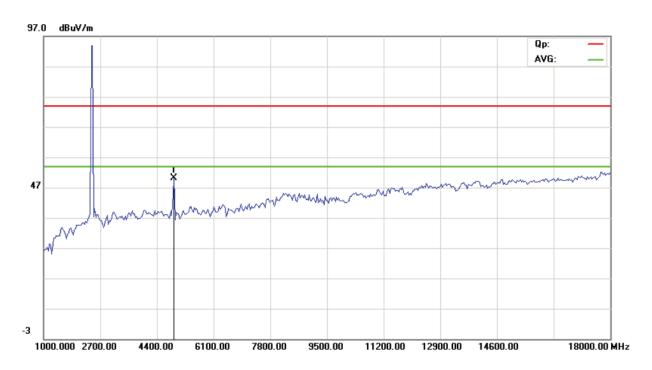
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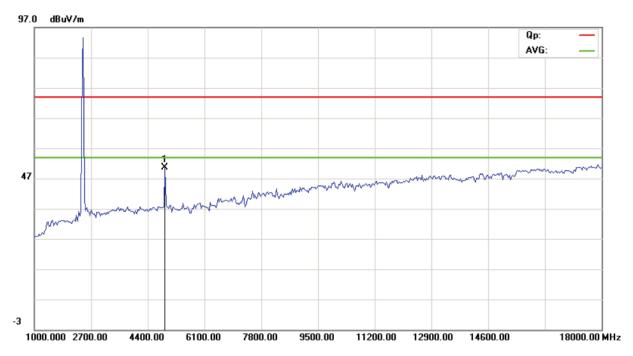
Date: 2015-07-01



CH11 for 11n HT20 at 6.5Mbps: Vertical



CH11 for 11n HT20 at 6.5Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

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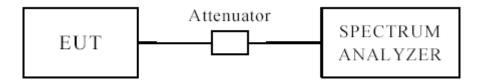
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7.0 6dB Bandwidth Measurement

7.1 Test Setup



7.2 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is >500 kHz

7.3 Test Procedure

- 1. Set resolution bandwidth (RBW) = 100 kHz
- 2. Set the video bandwidth (VBW) \geq 3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.4 Test Result

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6dB Occupied Bandwidth

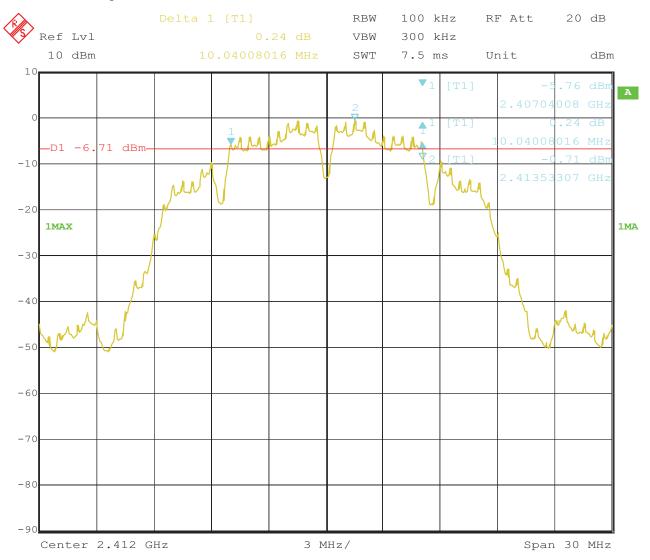
EUT	T W Module		Model		W Module			
Mode 802.118		302.11b	1b Input Volt		age AC		120V	
Temperat	ure	24	4 deg. C,		Humidity	nidity 56% RH		6 RH
Channel		el Frequency (MHz)	Data Transfer Rate (Mbps)	(MHz)				Pass/ Fail
1		2412	1	10.04		10.04 0.5		Pass
6		2437	1	10.04			0.5	Pass
11		2462	1	10.04			0.5	Pass
1		2412	11	10.04			0.5	Pass
6		2437	11	10.04			0.5	Pass
11		2462	11	10	.04		0.5	Pass

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1. 802.11b at 1Mbps of CH01



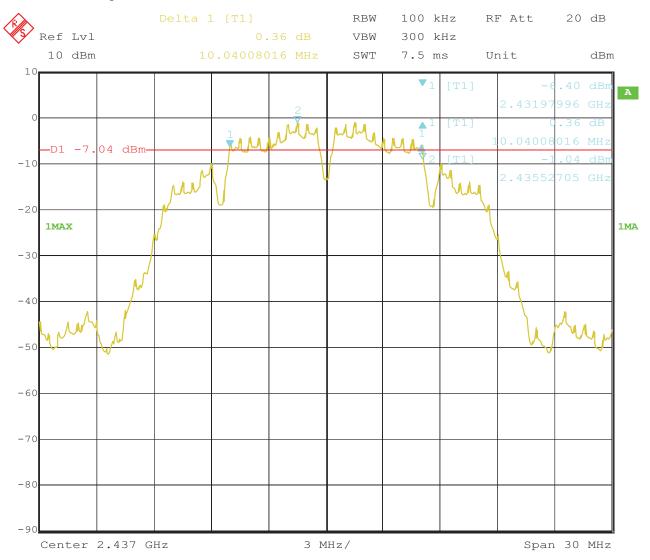
16.JUN.2015 12:50:03 Date:

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2. 802.11b at 1Mbps of CH06



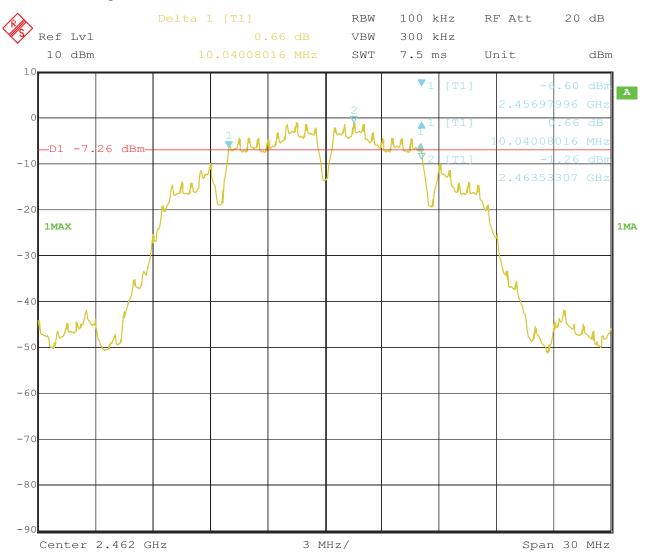
16.JUN.2015 13:00:52 Date:

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3. 802.11b at 1Mbps of CH11



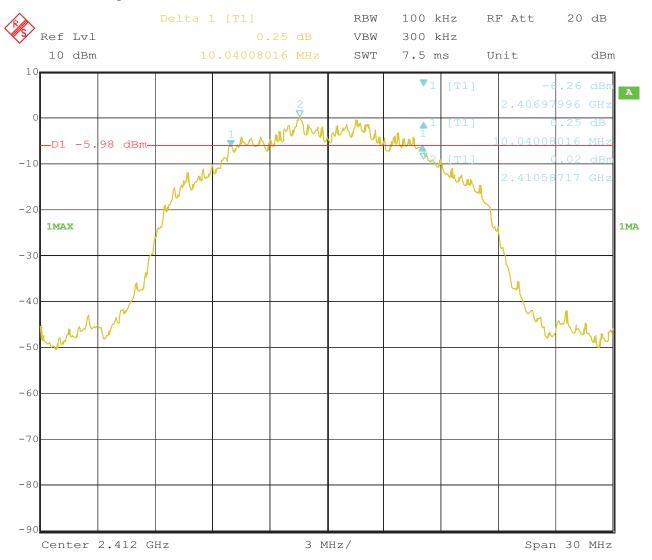
16.JUN.2015 15:16:31 Date:

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4. 802.11b at 11Mbps of CH01



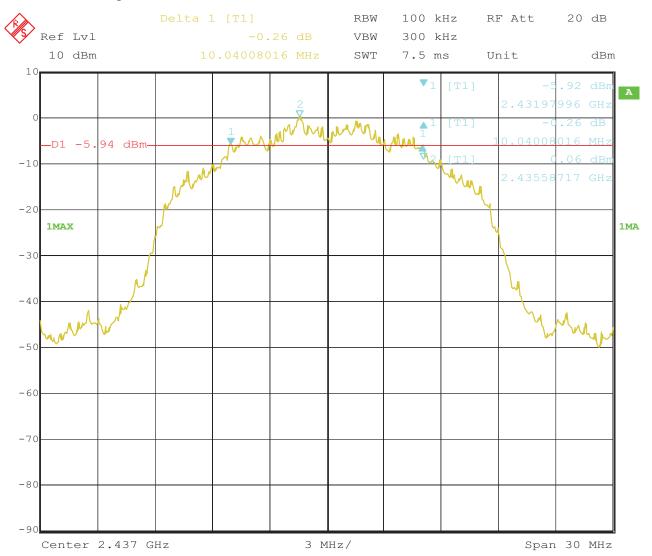
16.JUN.2015 12:52:40 Date:

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5. 802.11b at 11Mbps of CH06



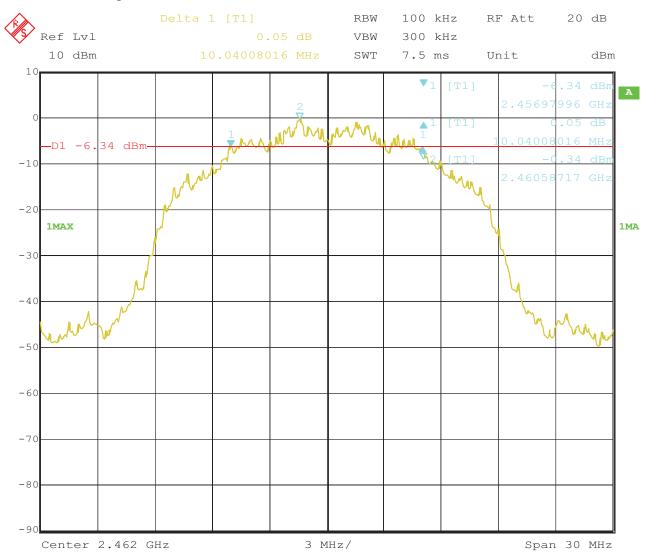
16.JUN.2015 15:11:52 Date:

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6. 802.11b at 11Mbps of CH11



16.JUN.2015 15:14:29 Date:

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6dB Occupied Bandwidth

EUT		W	Module		Model		W Module	
Mode		8	302.11g		Input Vol	tage	AC120V	
Temperat	Cemperature 24 deg. C, Humidity		,	56% RH				
Channel		el Frequency (MHz)	Data Transfer Rate (Mbps)		ndwidth Hz)	Minimum Limit (MHz)		Pass/ Fail
1		2412	54	16	.41		0.5	Pass
6		2437	54	16	16.41		0.5	Pass
11		2462	54	16	.41		0.5	Pass

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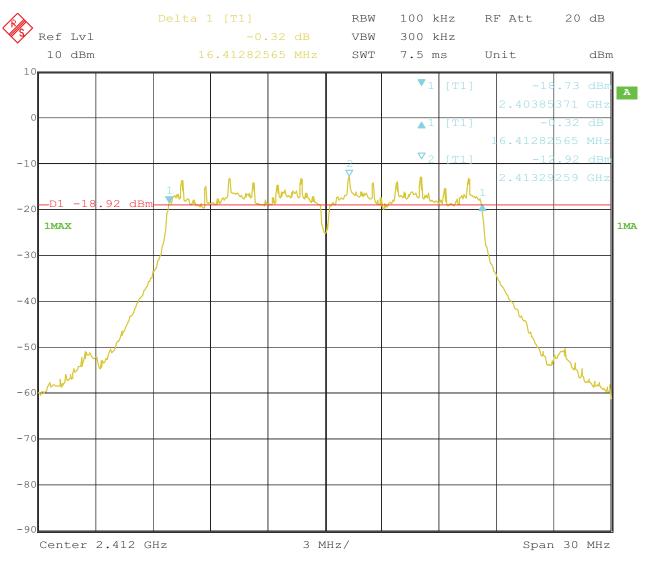
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Test Plots:

1. 802.11g at 54Mbps of CH01



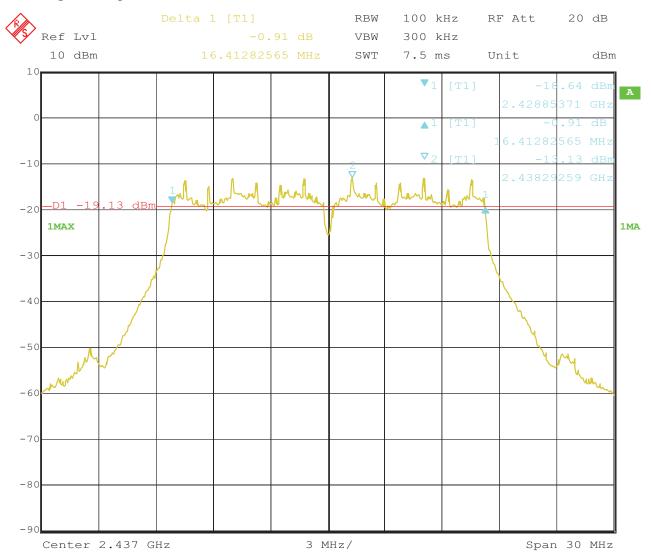
16.JUN.2015 12:56:21 Date:

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2. 802.11g at 54Mbps of CH06



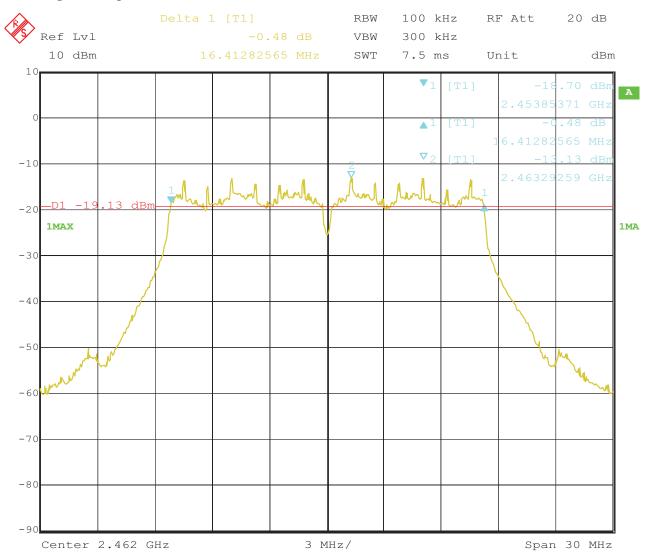
16.JUN.2015 12:59:18 Date:

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3. 802.11g at 54Mbps of CH11



16.JUN.2015 15:18:41 Date:

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6dB Occupied Bandwidth

EUT		W	Module		Model		W Module	
Mode		802	.11n HT20		Input Vol	tage	AC	120V
Temperat	ure	24	24 deg. C, Humidity 569		56%	% RH		
Channel		el Frequency (MHz)	Data Transfer Rate (Mbps)		undwidth Hz)		mum Limit MHz)	Pass/ Fail
1		2412	6.5M	17	.56		0.5	Pass
6		2437	6.5M	17	.56		0.5	Pass
11		2462	6.5M	17	.56		0.5	Pass

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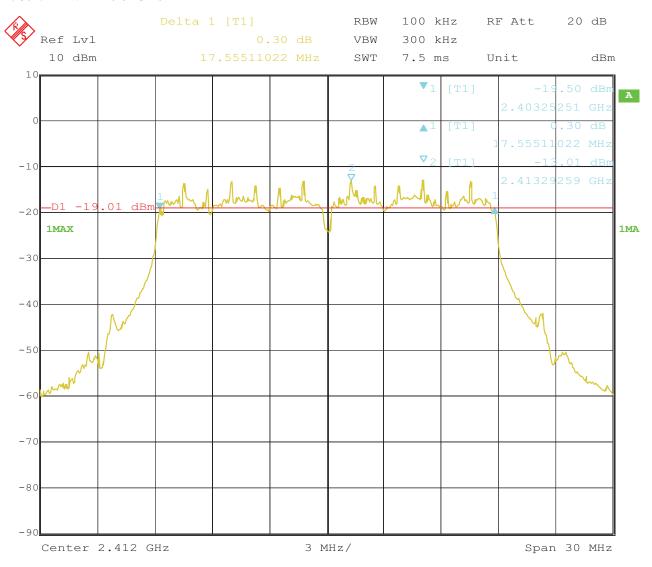
Report No: FCC1506125

Date: 2015-07-01



Test Plots:

1. 802.11n at HT20 of CH01



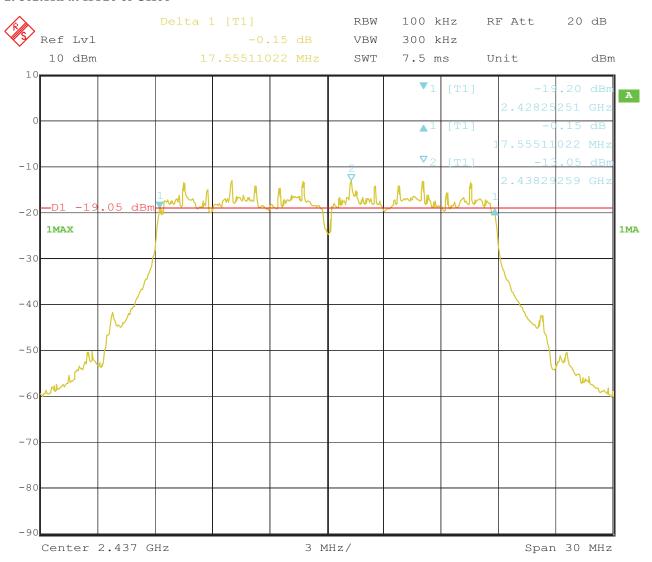
16.JUN.2015 15:27:07 Date:

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2. 802.11n at HT20 of CH06



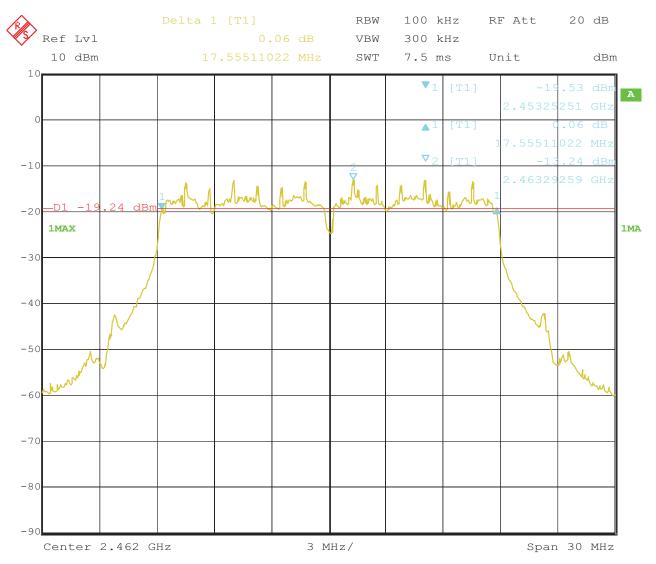
16.JUN.2015 15:23:01 Date:

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Date: 2015-07-01



3. 802.11n at HT20 of CH11



16.JUN.2015 15:20:47 Date:

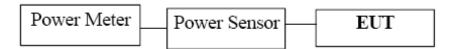
Date: 2015-07-01



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8. Maximum Output Power

8.1 Test Setup



8.2 Limits of Maximum Output Power

The Maximum Output Power Measurement is 30dBm.

8.3 Test Procedure

The RF power output was measured with a Power meter connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate centre frequency.

Note: the Peak power was measured

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8.4Test Results

EUT		W Module		Model		W Module	
Mode	ode 802.11b		Input Voltage		AC120V		
Temperati	ure	24 deg	g. C,	Hur	Humidity 56% RH		56% RH
Channel	Cha	annel Frequency (MHz)	1 "		Power Limit (dBm)		Pass/ Fail
1		2412	13.83		30		Pass
6		2437	13.73		30		Pass
11		2462	13.49		30		Pass

Note: 1. At finial test to get the worst-case emission at 11Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

3. The worse case was recorded

EUT		W Mo	dule Mo		odel		W Module	
Mode		802.11g		Input Voltage		AC120V		
Temperat	ure	24 deg	g. C,	Humidity			56% RH	
Channel	Channel Frequency		Max. Power Output		Power Limit		Pass/ Fail	
Chamilei		(MHz)	(dBm)		(dBm)			
1		2412	5.49		30		Pass	
6		2437	5.49		30		Pass	
11		2462	5.36		30		Pass	

Note: 1. At finial test to get the worst-case emission at 54Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

3. The worse case was recorded

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EUT	T W Module		dule	Model		W Module	
Mode	Mode 802.11n (HT20) Inp		Input	Input Voltage		AC120V	
Temperat	ure	24 deg	g. C,	Humidity		56% RH	
Channel	Channel Frequency		Max. Power Output		Power	Limit	Pass/ Fail
Chamie		(MHz)	(dBm)		(dBm)		
1		2412	5.67		30		Pass
6		2437			30		Pass
11		2462	5.39		30		Pass

Note: 1. At finial test to get the worst-case emission at 6.5Mbps of 11n HT20 for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

3. The worse case was recorded

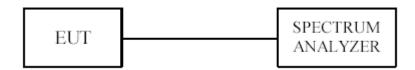
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9. Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density Measurement is 8dBm.

9.3 Test Procedure

- 1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
- 2. Set the RBW = 10 kHz.
- 3. Set the VBW \geq 30 kHz.
- 4. Set the span to 1.5 times the DTS channel bandwidth.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
- 11. The resulting peak PSD level must be ≤ 8 dBm.

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9.4Test Result

EUT	EUT W Mod		dule		odel		W Module
Mode 802.11b 11Mb		1Mbps	Input Voltage		AC120V		
Temperati	ure	24 deg	24 deg. C, Humidity			56% RH	
Channel	Cha	annel Frequency (MHz)	Final RF Power Level (dBm)		Maximum Limit (dBm)		Pass/ Fail
			11Mbps	S			
1		2412	-9.58		8		Pass
6		2437	-9.86	8			Pass
11		2462	-10.21		8		Pass

EUT	EUT W Module		dule	Model		W Module	
Mode	Mode 802.11b 1Mbps Input Voltag		Voltage	AC120V			
Temperat	ure	24 deg	g. C,	Humidity		56% RH	
Channel	Cha	annel Frequency (MHz)	uency Final RF Power Level in (dBm)		Maximum Limit (dBm)		Pass/ Fail
			1Mbps	}			
1		2412	-11.79		8		Pass
6		2437	-11.88		8		Pass
11		2462	-12.14	•	8		Pass

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EUT	UT W Modu		dule Mode		odel		W Module	
Mode	Mode 802.11g 54Mbps Input Volta		Voltage	AC120V				
Temperati	ure	24 deg	g. C,	Hur	Iumidity 50		56% RH	
Channel	Channel Frequency Final RF Pow		wer	Maximum Limit		Pass/ Fail		
		(MHz)	Level in (dBm)		(dBm)			
			54Mbps	S				
1		2412 -22.70			8		Pass	
6		2437	-22.85		8		Pass	
11		2462	-22.95		8		Pass	

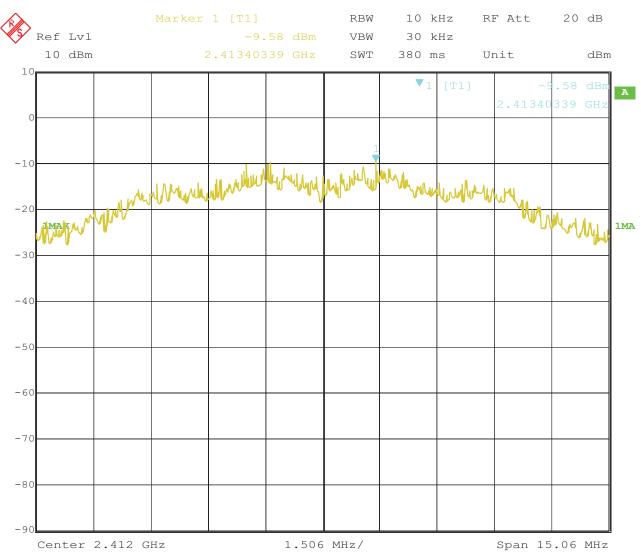
EUT		W Mo	dule M		odel		W Module	
Mode	Mode 802.11n HT20 6.5Mbps		Input Voltage		AC120V			
Temperat	ure	24 deg	g. C,	Humidity		56% RH		
Channel	Channel Frequency		Final RF Power		Maximum Limit		Pass/ Fail	
Chamie		(MHz)	Level (dBm)		(dBm)			
			HT20					
1		2412	-23.36		8		Pass	
6		2437 -23.56			8		Pass	
11		2462	-23.63		8		Pass	

Date: 2015-07-01



9.5 Photo of Power Spectral Density Measurement

1.802.11b at 11Mbps of CH01



16.JUN.2015 16:35:34 Date:

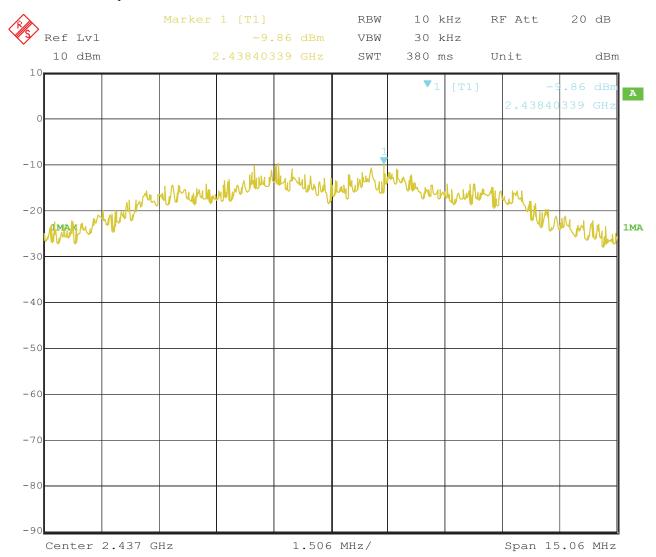
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2. 802.11b at 11Mbps at CH06



16.JUN.2015 16:36:14 Date:

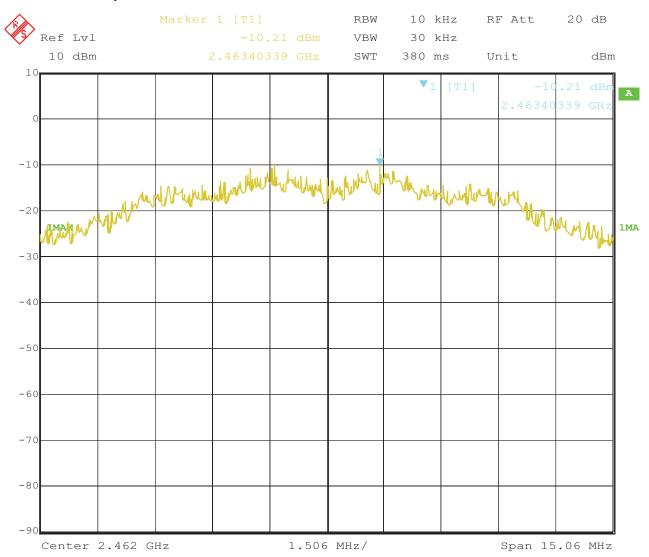
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3. 802.11b at 11Mbps of CH11



16.JUN.2015 16:38:21 Date:

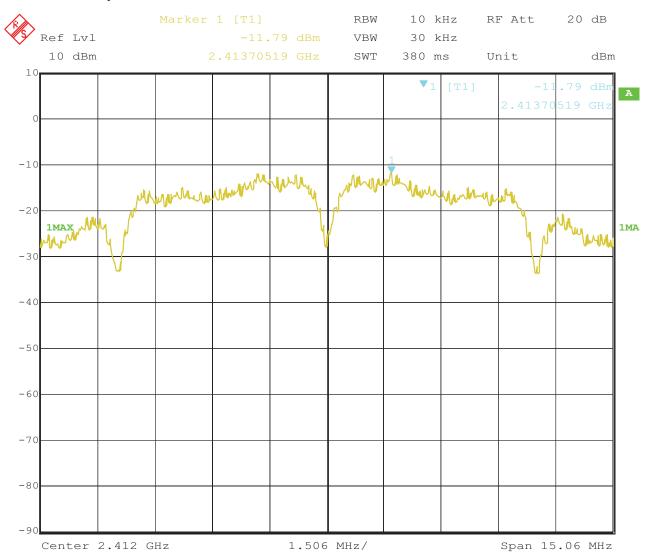
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4. 802.11b at 1Mbps of CH1



16.JUN.2015 16:34:37 Date:

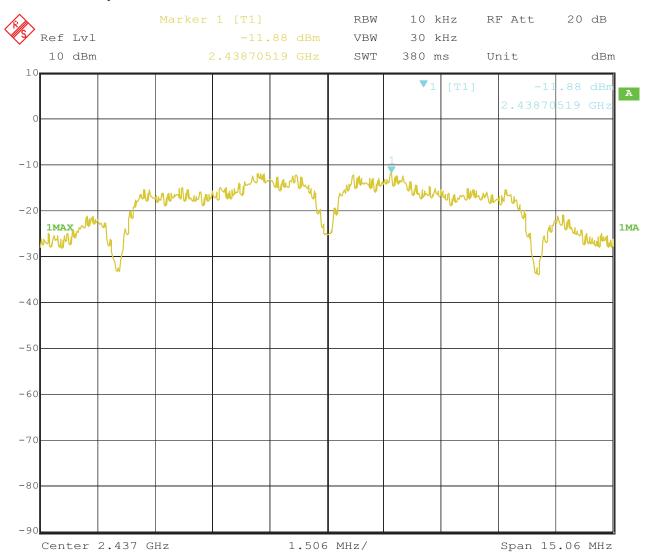
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5. 802.11b at 1Mbps of CH6



16.JUN.2015 16:36:45 Date:

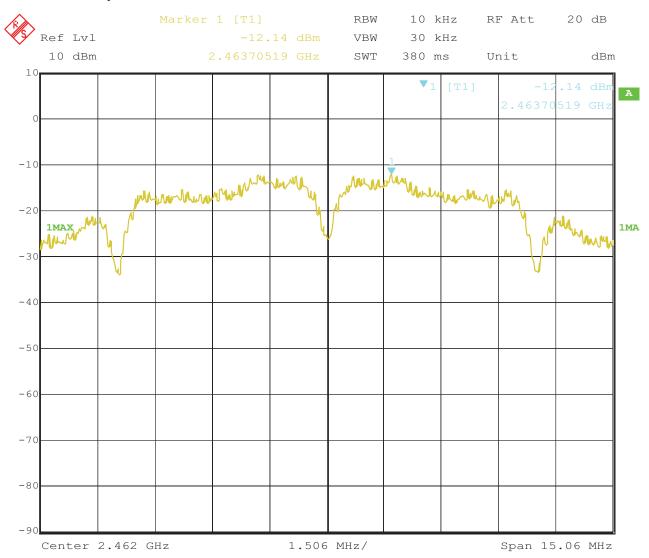
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6. 802.11b at 1Mbps of CH11



16.JUN.2015 16:37:25 Date:

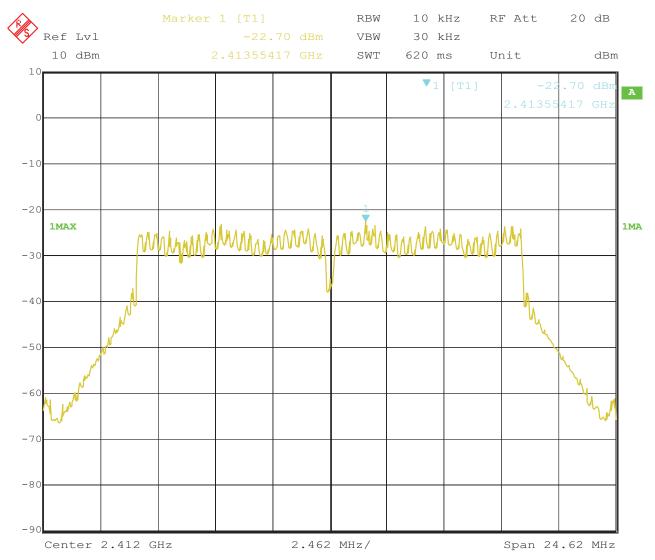
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7. 802.11g at 54Mbps of CH1



16.JUN.2015 16:49:41 Date:

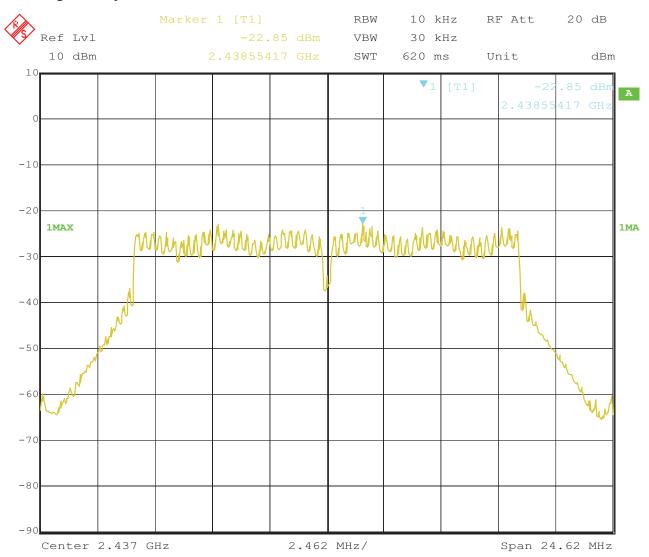
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8. 802.11g at 54Mbps of CH6



16.JUN.2015 16:42:39 Date:

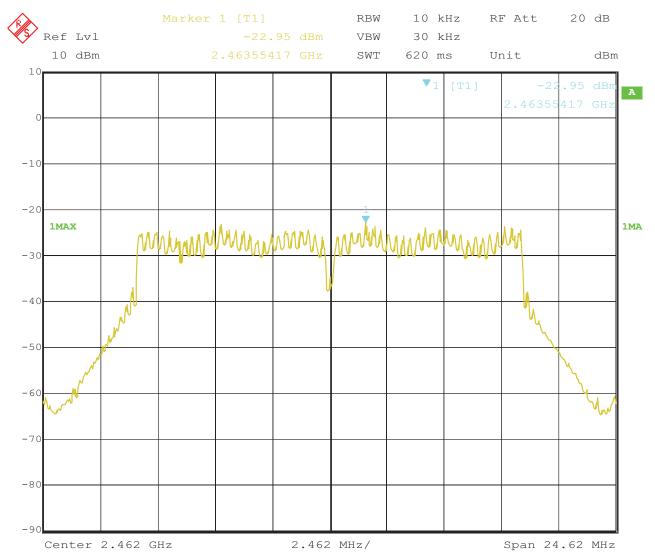
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9. 802.11g at 54Mbps of CH11



16.JUN.2015 16:41:05 Date:

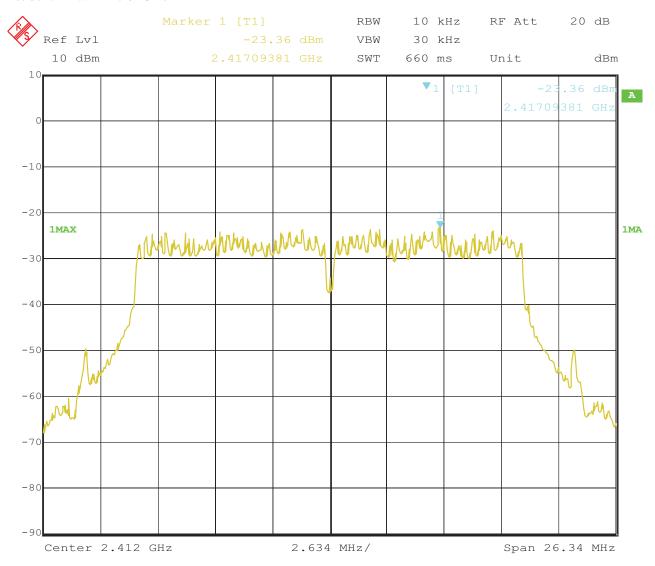
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10. 802.11n at HT20 of CH01



16.JUN.2015 16:51:06 Date:

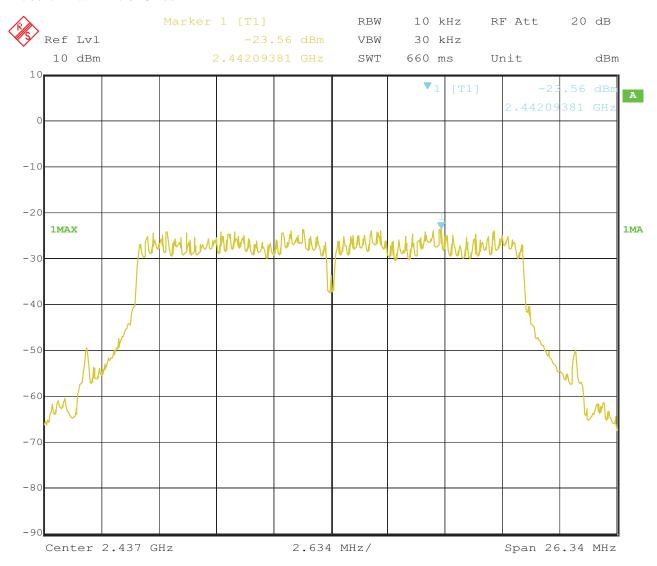
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11. 802.11n at HT20 of CH06



16.JUN.2015 16:52:11 Date:

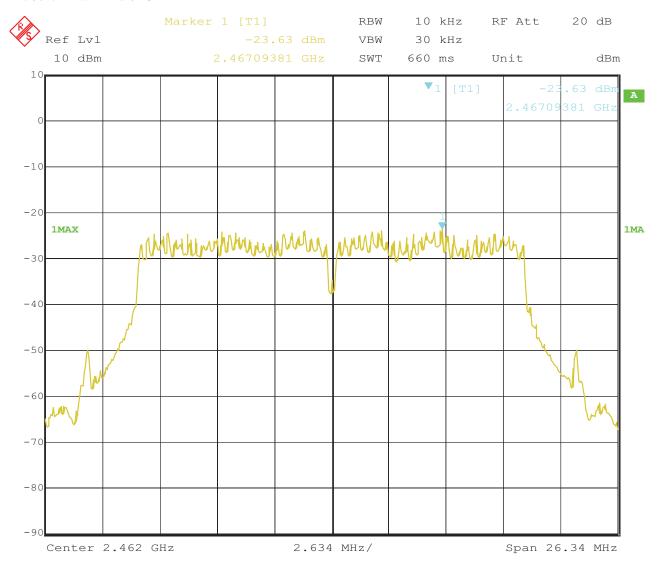
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12. 802.11n at HT20 of CH11



16.JUN.2015 16:52:57 Date:

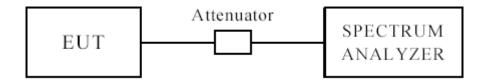
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10 Out of Band Measurement

10.1 Test Setup for band edge



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

10.2 Limits of Out of Band Emissions Measurement

- 1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

10.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test.(Peak values with RBW=1MHz,VBW=3MHz and PK detector. AV value with RBW=1MHz, VBW=3MHz and RMS detector)

For bandage test, the spectrum set as follows: RBW=100, VBW=300 kHz. A conducted measurement used

10.4 Test Result

Please see next pages

Note: For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

Date: 2015-07-01



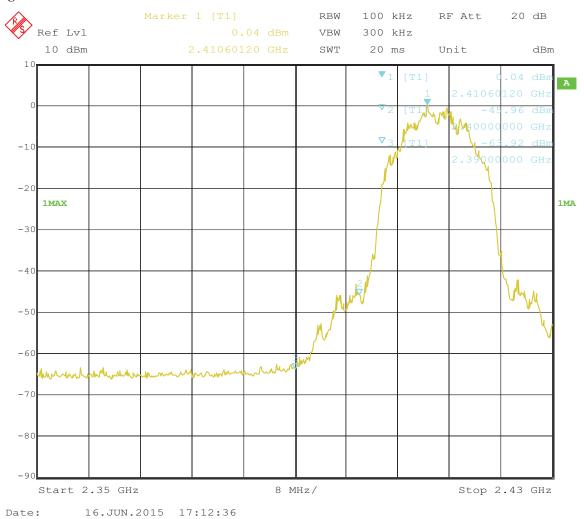
For 802.11b mode

CH01 at 11Mbps

10.4 Band-edge and Restricted band Measurement

	ě								
EUT	W	W Module		W Module					
Mode	Keeping Transmitting		Input Voltage	AC120V					
Temperature	24 deg. C,		Humidity	56% RH					
Test Result:	Pass		Detector	PK					
2400	PK (dBμV/m)	63.4	T :	$74(dB\mu V/m)$					
	AV (dBμV/m)	42.9	Limit	$54(dB\mu V/m)$					
2390	PK (dBμV/m)	44.7	Limit	$74(dB\mu V/m)$					
	AV (dBμV/m)		Liffilt	54(dBμV/m)					

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

The report refers only to the sample tested and does not apply to the bulk.

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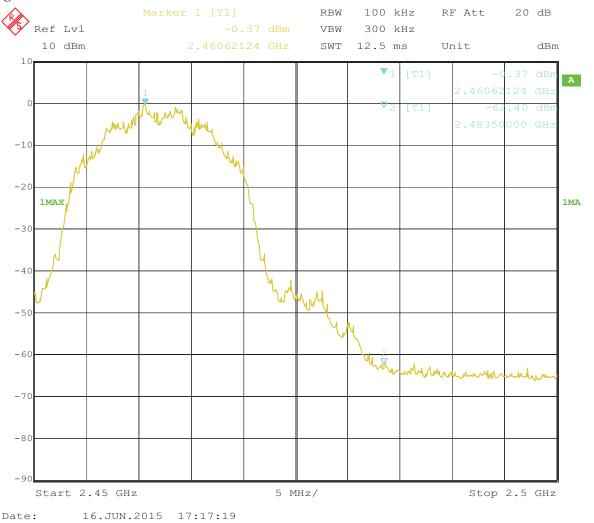


CH11 at 11Mbps

10.4 Band-edge and Restricted band Measurement

EUT	W Module		Model	W Module
Mode	Keeping	g Transmitting	Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:		Pass	Detector	PK
2483.5	PK (dBμV/m)	46.8	T,	74(dBμV/m)
	AV (dBμV/m)		Limit	54(dBμV/m)

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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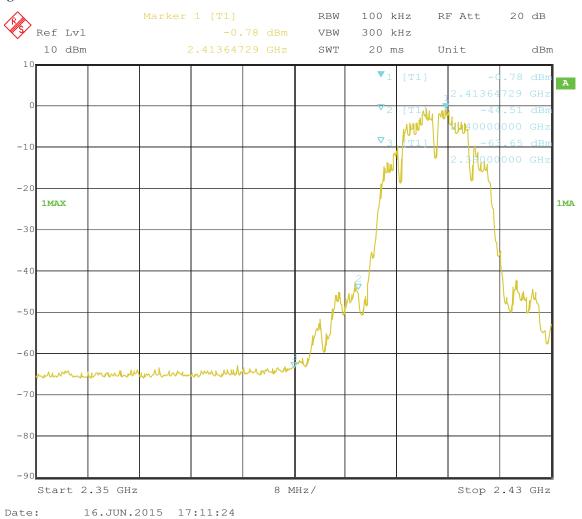
For 802.11b mode

CH01 at 1Mbps

10.4 Band-edge and Restricted band Measurement

EUT	W Module		Model	W Module
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2400	PK (dBµV/m)	62.7	Limit	$74(dB\mu V/m)$
	AV (dBμV/m)	41.8	Limit	$54(dB\mu V/m)$
2390	PK (dBµV/m)	43.9	Limit	$74(dB\mu V/m)$
	AV (dBμV/m)		Lillit	$54(dB\mu V/m)$

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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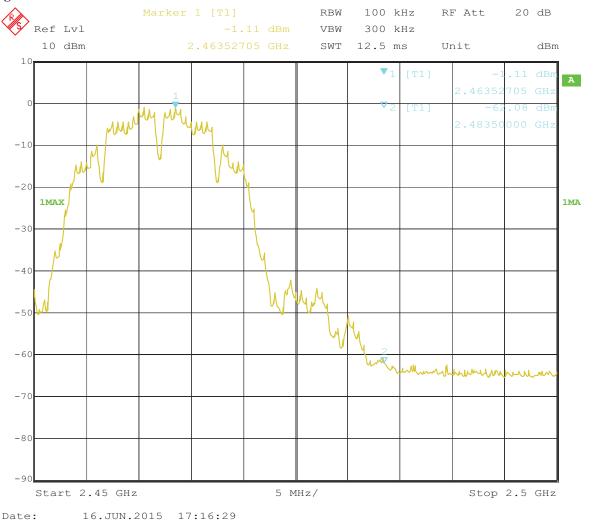


CH11 at 1Mbps

10.4 Band-edge and Restricted band Measurement

EUT	W Module		Model	W Module
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dBμV/m)	45.9	T,	74(dBμV/m)
	AV (dBμV/m)		Limit	54(dBμV/m)

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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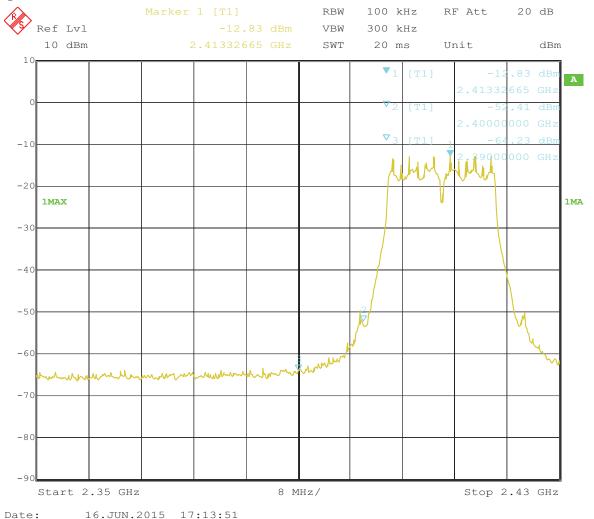
For 802.11g mode

CH01 at 54Mbps

10.4 Band-edge and Restricted band Measurement

0				
EUT	W Module		Model	W Module
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2400	PK (dBμV/m)	59.4	T ::4	$74(dB\mu V/m)$
	AV (dBμV/m)	40.2	Limit	$54(dB\mu V/m)$
2390	PK (dBμV/m)	43.8	Limit	$74(dB\mu V/m)$
	AV (dBμV/m)		Limit	54(dBμV/m)

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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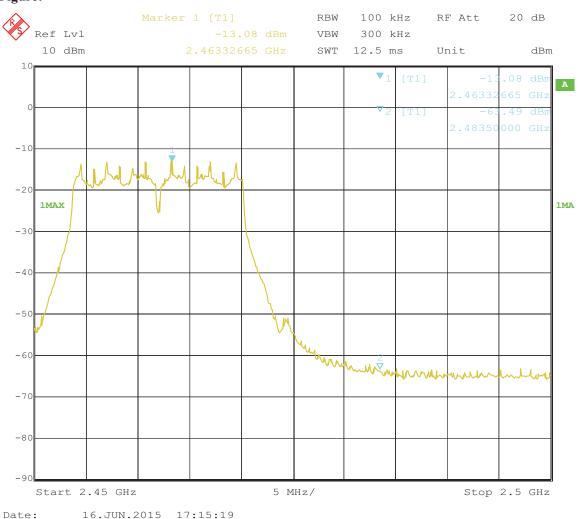


CH11 at 54Mbps

10.4 Band-edge and Restricted band Measurement

EUT	W Module		Model		W Module
Mode	Keeping Transmitting		Input Voltage		AC120V
Temperature	24 deg. C,		Humidity		56% RH
Test Result:	Pass		Detec	ctor	PK
2483.5	PK (dBµV/m)	44.1	T ::4	74(dBμV/m) 54(dBμV/m)	
	AV (dBμV/m)		Limit		

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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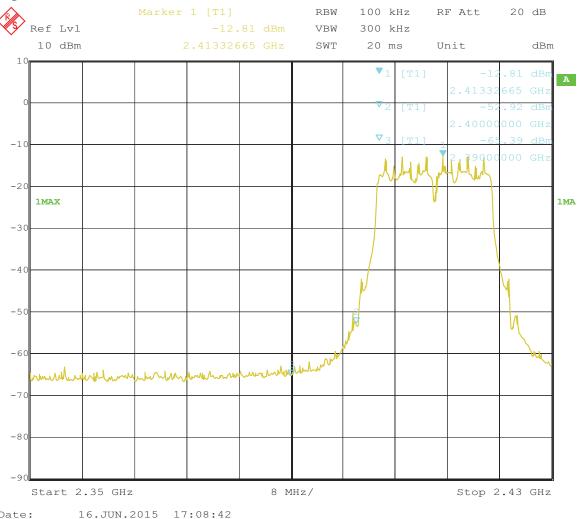
For 802.11n (HT20) mode

CH01 at 6.5Mbps

10.4 Band-edge and Restricted band Measurement

EUT	W Module		Model	W Module
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2400	PK (dBμV/m)	60.3	T ::4	74(dBμV/m)
	AV (dBμV/m)	41.1	Limit	54(dBμV/m)
2390	PK (dBμV/m)	45.2	Limit	74(dBμV/m)
	AV (dBμV/m)		Lillill	54(dBμV/m)

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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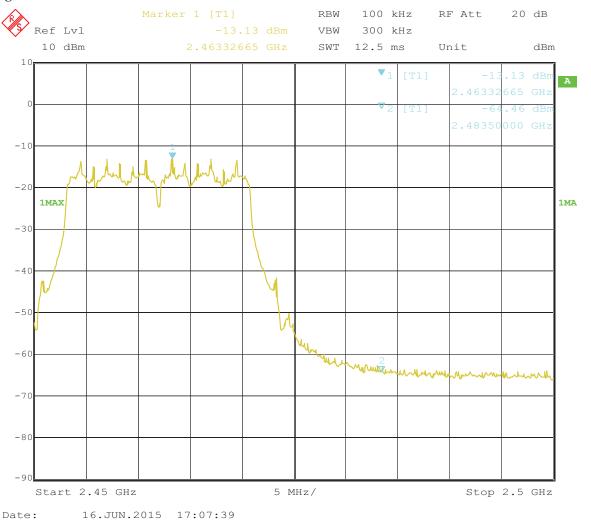


CH11 at 6.5Mbps

10.4 Band-edge and Restricted band Measurement

EUT	W Module		Model	W Module
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dBμV/m)	45.9	T : :/	$74(dB\mu V/m)$
	AV (dBμV/m)		Limit	$54(dB\mu V/m)$

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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11.0 Antenna Requirement

11.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

PCB antenna used. The maximum Gain of the antennas is 0dBi.

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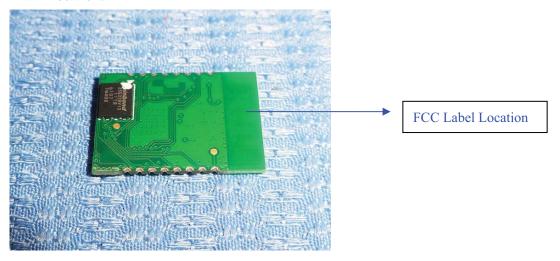


12.0 FCC ID Label

FCC ID: 2AES6WMODULE

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



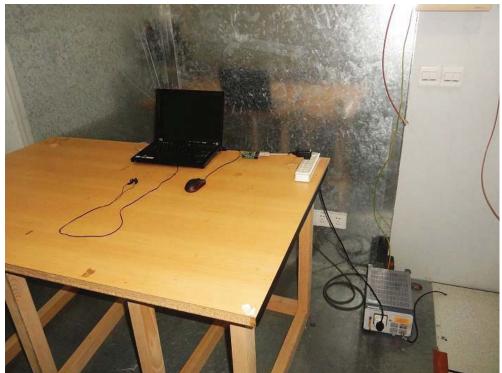
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13.0 **Photo of testing**

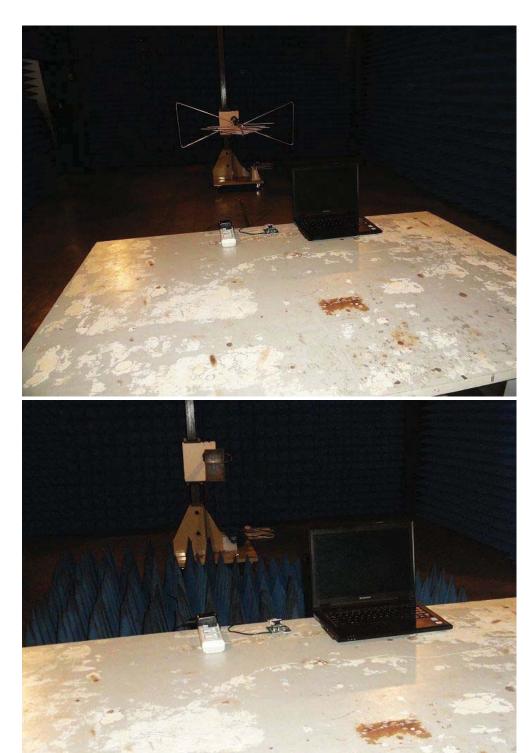
Conducted Emission Test Setup:



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Radiated Emission Test Setup:



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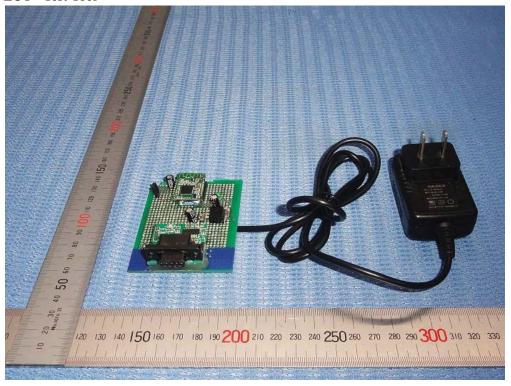
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Photos of EUT+ Test Tool





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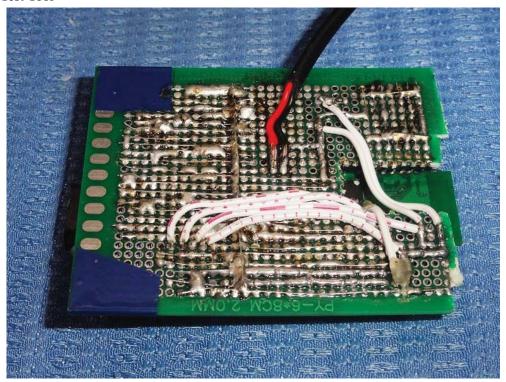
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Photos of Test Tool



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Photos of EUT





End of the report

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