



ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C AND RSS 247 REQUIREMENT

Product Name: Digital Signage Media Appliance

Brand Name: IAdea

Model No.: IAD-16004

Marketing Name MBR-1100 Rev 1.1

Model Difference: N/A

FCC ID: Y9E-IAD16004

IC: 20491-IAD16004

E2/2017/60079 Report No.:

Issue Date: Sep. 08, 2017

FCC Rule Part: §15.247, Cat: DTS

RSS-247 issue 2 Feb. 2017 IC Rule:

FCC Prepared for: **IAdea Corporation**

3F., No. 21, Lane 168, Xingshan Road., Neihu Dist.,

Taipei City 11469 Taiwan

Prepared by: SGS Taiwan Ltd.

Electronics & Communication Laboratory

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Taiwan 333





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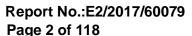
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VERIFICATION OF COMPLIANCE

FCC Applicant: IAdea Corporation

3F., No. 21, Lane 168, Xingshan Road., Neihu Dist., Taipei City

11469 Taiwan

Product Name: Digital Signage Media Appliance

Brand Name: IAdea

Model No.: IAD-16004

Marketing Name MBR-1100 Rev 1.1

Model Difference: N/A

FCC ID: Y9E-IAD16004 IC: 20491-IAD16004 **Report Number:** E2/2017/60079

Date of test: Jun. 21, 2017 ~ Sep. 01, 2017

Date of EUT Received: Jun. 21, 2017

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

11

Test By:	Vit	Date:	Sep. 08, 2017	
_	Vito Pei/ Engineer			
Prepared By:	Stefanle Yu	Date:	Sep. 08, 2017	
Approved By:	Stefanie Yu/ Clerk Lang Jim Chang / Asst. Manager	Date:	Sep. 08, 2017	

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Revision History

Report Number	Revision	Description	Issue Date
E2/2017/60079	Rev.00	Initial creation of document	Sep. 08, 2017

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Table of Contents

1	GENERAL INFORMATION	5
2	SYSTEM TEST CONFIGURATION	7
3	SUMMARY OF TEST RESULTS	9
4	DESCRIPTION OF TEST MODES	10
5	MEASUREMENT UNCERTAINTY	12
6	CONDUCTED EMISSION TEST	13
7	DUTY CYCLE OF TEST SIGNAL	17
8	PEAK OUTPUT POWER MEASUREMENT	20
9	6dB & 99% BANDWIDTH MEASUREMENT	24
10	CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT	30
11	RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT	63
12	PEAK POWER SPECTRAL DENSITY	114
13	ANTENNA REQUIREMENT	118

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GENERAL INFORMATION

1.1 Product description

General:

Jeneral.				
Product Name:	Digital S	Digital Signage Media Appliance		
Brand Name:	IAdea	IAdea		
Model No.:	IAD-160	04		
Model Difference:	N/A			
Product SW/HW version:	1.2.79.425 / ID702AD-1702A-2B			
Radio SW/HW version:	N/A / ID702AD-1702A-2B			
Data Cable (USB):	Model N	Model No.:N/A; Supplier: N/A		
	3Vdc from button cell lithium battery or 5Vdc from AC/DC Adapter			
Power Supply:	Battery:	Model No.: CR1220; Supplier: Hitachi Maxell Ltd.		
	Adapter:	Model No.: WB-10E05R; Supplier: Asian Power Devices Inc.		

WLAN 2.4GHz:

Wi-Fi	Frequency Range	Channels	Rated Power	Type of Emission 99%	Modulation Technology		
11b/g	2412-2462	11	b: 9.90dBm g: 13.63dBm	b:15M3G1D g:16M5D1D	DSSS, OFDM		
11n	HT20 2412-2462	11	HT20:12.85dBm	HT20:17M7D1D	OFDM		
11n	HT40 2422-2452	9	HT40:12.23dBm	HT40:36M2D1D	OFDM		
Antenna Designation:		Dipole Antenna, Antenna Gain: 4.79dBi					
Modulati	on type:	,	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM				
802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbp 802.11 n_20MHz: 6.5 – 72.2Mbps 802.11 n_40MHz: 13.5 - 150.0Mbps			s				

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 DTS Meas. Guidance

Canada RSS-247 issue 2 Feb. 2017

Canada RSS-Gen issue 4 Nov. 2014

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333 (TAF code 0513)

FCC Registration Numbers are: 735305

Canada Registration Number: 4620A-5

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 **Conducted Emissions**

The EUT is a placed on as turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 **Radiated Emissions**

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max, emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example with cable loss and attenuator. offset = RF cable loss (0.4dB)+ attenuation factor(10dB)=10.4dB)

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2.5 Configuration of Tested System Fig. 2-1 Radiated Emission Conducted (Antenna Port) Configuration

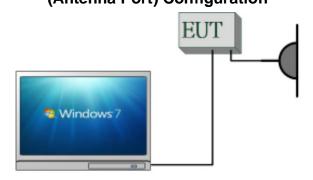


Fig 2-2 Conducted (AC power line) Configuration

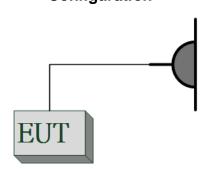


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2	Notebook	Lenovo	L430	R9-YYG88	Shielded	Unshielded

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SUMMARY OF TEST RESULTS

FCC Rules	IC Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b)(3)	RSS-247 §5.4(4)	Peak Output Power	Compliant
§15.247(a)(2)	RSS-247 §5.2 (1) RSS-Gen §6.6	6dB & 99% Emission Bandwidth	Compliant
§15.247(d)	RSS-247 §5.5	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	RSS-247 §5.5	Radiated Band Edge and Spurious Emission	Compliant
§15.247(e)	RSS-247 §5.2(2)	Power Spectral Density	Compliant
§15.203 §15.247(b)	RSS- Gen §8.3	Antenna Requirement	Compliant

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DESCRIPTION OF TEST MODES

4.1 Operated in 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b, 802.11g and 802.11n HT20

a. c p. c a. c a c.	and promote for comments, comments and comments.						
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY				
1	2412 MHz	7	2442 MHz				
2	2417 MHz	8	2447 MHz				
3	2422 MHz	9	2452 MHz				
4	2427 MHz	10	2457 MHz				
5	2432 MHz	11	2462 MHz				
6	2437 MHz						

7 channels are provided for 802.11n_HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422 MHz	7	2442 MHz
4	2427 MHz	8	2447 MHz
5	2432 MHz	9	2452 MHz
6	2437 MHz		

4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE AVAILABLE TESTED MODULATION DATA RATE (Mbps)						
802.11g	1 to 11	1,6,11	OFDM	6		

RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)		
802.11b	1 to 11	1, 6, 11	DSSS	1		
802.11g	1 to 11	1, 6, 11	OFDM	6		
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 0		
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 0		

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Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11b/g/n WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

ANTENNA PORT CONDUCTED MEASUREMENT:

	CONDUCTED TEST					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)		
802.11b	1 to 11	1, 6, 11	DSSS	1		
802.11g	1 to 11	1, 6, 11	OFDM	6		
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 0		

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MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 0.84 dB
6dB Bandwidth	+/- 51.33 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB
Peak Power Density	+/- 1.3 dB
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
Measurement uncertainty	180MHz -417MHz: +/- 3.19dB
(Polarization : Vertical)	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : Horizontal)	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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CONDUCTED EMISSION TEST

6.1 Standard Applicable

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range	Lin dB(nits (uV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

6.2 Measurement Equipment Used

	Con	ducted Emission	Test Site		
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
EMI Test Receiver	R&S	ESCI 7	100950	12/12/2016	12/11/2017
Coaxial Cables	N/A	N30N30-1042-150c m	N/A	08/30/2016	08/29/2017
LISN	Schwarzbeck	NSLK 8127	8127-648	06/18/2017	06/17/2018
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

6.3 EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

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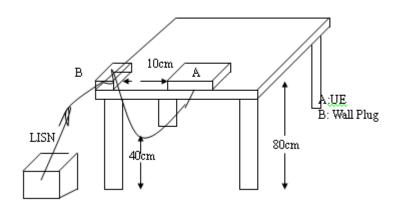
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^{1.} The lower limit shall apply at the transition frequencies

^{2.}The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.



6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed

6.6 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closet to the limit

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode	Test By:	Tin
Temperature:	20 ℃	Humidity:	58 %

Site: Conduction Room

L1

Temperature:

24 °C

Limit: FCC Class B Conduction(QP)

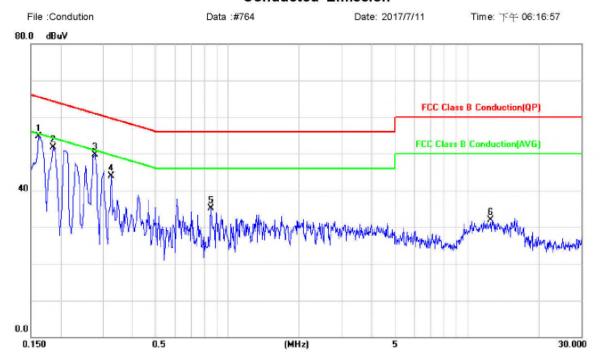
Phase: Power:

AC 120V/60Hz

Humidity: 65 %

Mode: Note:

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1615	35.30	19.50	54.80	65.39	-10.59	peak	
2		0.1860	32.18	19.49	51.67	64.21	-12.54	peak	
3		0.2780	30.10	19.62	49.72	60.88	-11.16	peak	
4		0.3260	24.15	19.70	43.85	59.55	-15.70	peak	
5		0.8500	15.32	19.79	35.11	56.00	-20.89	peak	
6		12.6020	11.90	19.97	31.87	60.00	-28.13	peak	

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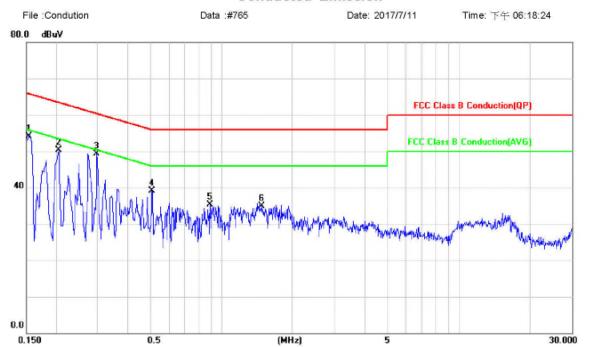


Temperature: 24 °C Site: Conduction Room Phase:

Power: AC 120V/60Hz Humidity: Limit: FCC Class B Conduction(QP) 65 %

Mode: Note:

Conducted Emission



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1540	34.64	19.50	54.14	65.78	-11.64	peak	
2	0.2060	30.82	19.50	50.32	63.37	-13.05	peak	
3 *	0.2980	29.71	19.65	49.36	60.30	-10.94	peak	
4	0.5100	19.13	19.98	39.11	56.00	-16.89	peak	
5	0.8900	15.58	19.78	35.36	56.00	-20.64	peak	
6	1.4780	14.96	20.04	35.00	56.00	-21.00	peak	

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DUTY CYCLE OF TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

- 1. Set span = Zero
- 2. RBW = 8MHz
- 3. VBW = 8MHz.
- 4. Detector = Peak

Duty Cycle:

	Duty Cycle (%)	Duty Factor (dB)
802.11b	100.00	0.00
802.11g	100.00	0.00
802.11n_20	100.00	0.00
802.11n_40	100.00	0.00

Duty Cycle Factor: $10 * \log(1/1) = 0$

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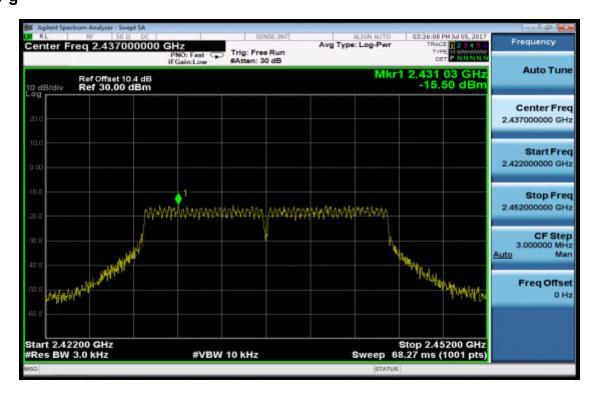
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7.1 DUTY CYCLE TEST SIGNAL Measurement Result



802.11 g



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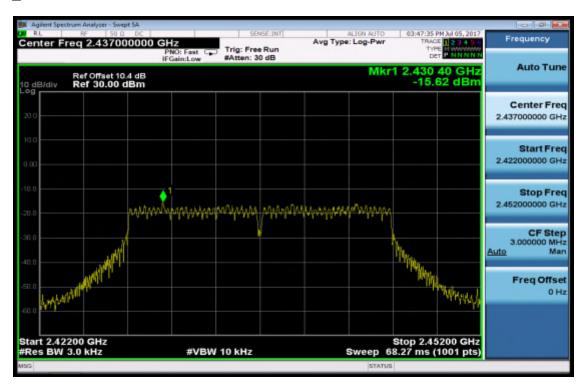
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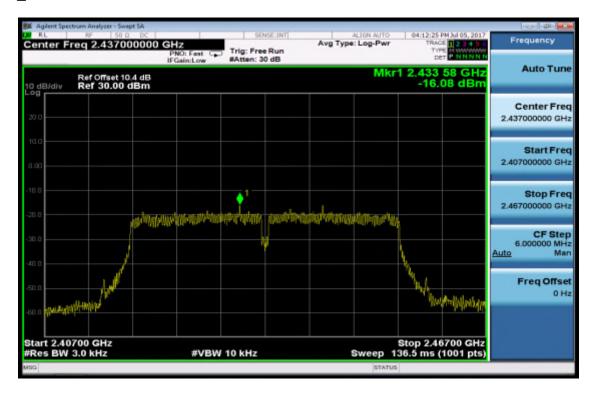
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802.11 n_20 MHz



802.11 n 40 MHz



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PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

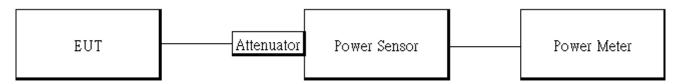
In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

8.2 Measurement Equipment Used

	Conducte	ed Emission	Test Site		
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018
Power Meter	Anritsu	ML2496A	1326001	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315048	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315049	06/23/2017	06/22/2018
Coaxial Cable 30cm	WOKEN	00100A1F1A 195C	RF01	12/12/2016	12/11/2017
DC Block	PASTERNACK	PE8210	RF29	12/12/2016	12/11/2017
Splitter	RF-LAMBAD	RFLT2W1G1 8G	RF35	12/12/2016	12/11/2017
Attenuator	WOKEN	218FS-10	RF23	12/12/2016	12/11/2017
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2017	05/01/2018

8.3 Test Set-up

Power Meter:



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8.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.

8.5 Measurement Result

802.1	1b Main					
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit	RESULT
1	2412	1	7.88	6.14	1 Watt = 30.00 dBm	PASS
6	2437	1	8.34	6.82	1 Watt = 30.00 dBm	PASS
11	2462	1	9.90	9.77	1 Watt = 30.00 dBm	PASS
802.1	1b Main					
СН	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up to lerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit	RESULT
1	2412	1	5.78	3.78	1 Watt = 30.00 dBm	PASS
6	2437	1	6.23	4.20	1 Watt = 30.00 dBm	PASS
11	2462	1	7.82	6.05	1 Watt = 30.00 dBm	PASS

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802.1	1g Main					
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit	RESULT
1	2412	6	13.63	23.07	1 Watt = 30.00 dBm	PASS
6	2437	6	13.38	21.78	1 Watt = 30.00 dBm	PASS
11	2462	6	11.38	13.74	1 Watt = 30.00 dBm	PASS
802.1	1g Main				•	·
СН	Freq. (MHz)	Data Rate	Max. Avg. Output in clude tun e up to lerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit	RESULT
CH	•		in clude tune up to lerance Power	in clude tune up tolerance Power	Limit 1 Watt = 30.00 dBm	RESULT PASS
	(MHz)	Rate	in clude tune up to lerance Power (dBm)	include tune up tolerance Power (mW)		

802.1	802.11n_HT20M Main								
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit	RESULT			
1	2412	MCS0	10.01	10.02	1 Watt = 30.00 dBm	PASS			
6	2437	MCS0	12.85	19.28	1 Watt = 30.00 dBm	PASS			
11	2462	MCS0	10.82	12.08	1 Watt = 30.00 dBm	PASS			
802.1	1n_HT20	M Main							
СН	Freq. (MHz)	Data Rate	Max. Avg. Output in clude tune up to lerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit	RESULT			
1	2412	MCS0	1.02	1.26	1 Watt = 30.00 dBm	PASS			
6	2437	MCS0	4.31	2.70	1 Watt = 30.00 dBm	PASS			
11	2462	MCS0	1.84	1.53	1 Watt = 30.00 dBm	PASS			

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802.11n_HT40M Main							
СН	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit	RESULT	
3	2422	MCS0	12.23	16.71	1 Watt = 30.00 dBm	PASS	
6	2437	MCS0	11.91	15.52	1 Watt = 30.00 dBm	PASS	
9	2452	MCS0	12.11	16.26	1 Watt = 30.00 dBm	PASS	
802.1	1n_HT40	M Main			-		
СН	Freq. (MHz)	Data Rate	Max. Avg. Output in clude tune up to lerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit	RESULT	
3	2422	MCS0	3.53	2.25	1 Watt = 30.00 dBm	PASS	
6	2437	MCS0	3.18	2.08	1 Watt = 30.00 dBm	PASS	
9	2452	MCS0	3.34	2.16	1 Watt = 30.00 dBm	PASS	

Note:

offset 10.40 dB for SISO mode

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^{*} Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.



6dB & 99% BANDWIDTH MEASUREMENT

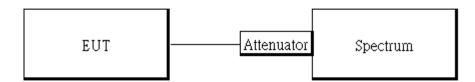
9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Measurement Equipment Used

Conducted Emission Test Site								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.			
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018			
DC Block	PASTERNACK	PE8210	RF29	12/12/2016	12/11/2017			
Coaxial Cable	WOKEN	00100A1F1A 195C	RF01	12/12/2016	12/11/2017			
Attenuator	WOKEN	218FS-10	RF23	12/12/2016	12/11/2017			

9.3 Test Set-up



9.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. For 6dB Bandwidth:
 - Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=peak, Sweep=auto.
- 5. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. For 99% Bandwidth:
 - Set the spectrum analyzer as RBW=1%, VBW = 3*RBW, Span = 30M/50MHz, Detector=Sample, Sweep=auto.
- 7. Turn on the 99% bandwidth function, max reading.
- 8. Repeat above procedures until all frequency of interest measured was complete.

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9.5 Measurement Result

802.11b Main

802.11 a Main

<u> </u>			
Fre q.	6dB BW	Limit	Result
(MHz)	(kHz)	(kHz)	1100a it
2412	10092	> 500	PASS
2437	10091	> 500	PASS
2462	10092	> 500	PASS

Fre q.	6dB BW	Limit	Result
(MHz)	(kHz)	(kHz)	ixe su it
2412	16600	> 500	PASS
2437	16610	> 500	PASS
2462	16600	> 500	PASS

802.11 n HT20 Main

~ ~~	44		 - 4 ^	
UIFI	77	-	 7 11	Main

Fre q. (MHz)	6dB BW (kHz)	Limit (kHz)	Result	Fre q. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	17840	> 500	PASS	2422	36460	> 500	PASS
2437	17840	> 500	PASS	2437	36480	> 500	PASS
2462	17840	> 500	PASS	2452	36470	> 500	PASS

802.11b Ma	in	802.11g Main		
Freq. 99% BW (MHz) (MHz)		Freq. (MHz)	99% BW (MHz)	
(IVITZ)	(IVI⊓Z)	(IVITZ)	(IVITZ)	
2412	15.181	2412	16.433	
2437	15.285	2437	16.506	
2462	15.074	2462	16.506	

802.11n_H	Γ20M Main	802.11n_HT40M Main		
Freq. (MHz)	99% BW (MHz)	Freq. (MHz)	99% BW (MHz)	
2412	17.693	2422	36.041	
2437	17.728	2437	36.203	
2462	17.703	2452	36.171	

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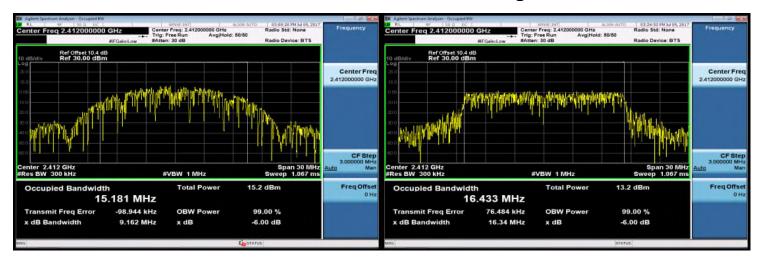
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^{*}Refer to next page for plots



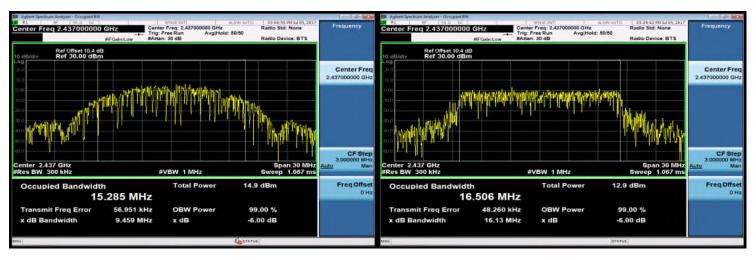
6dB BW 802.11b CH-Low

6dB BW 802.11g CH-Low



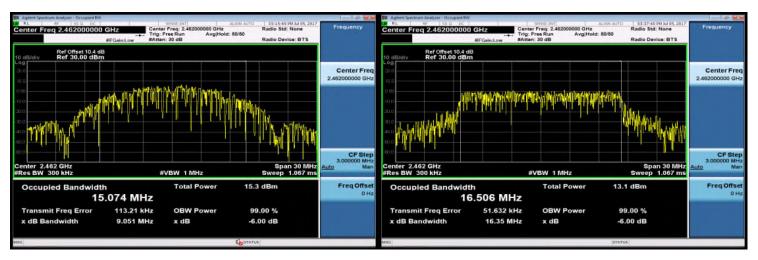
6dB BW 802.11b CH-Mid

6dB BW 802.11g CH-Mid



6dB BW 802.11b CH-High

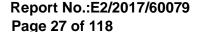
6dB BW 802.11g CH-High



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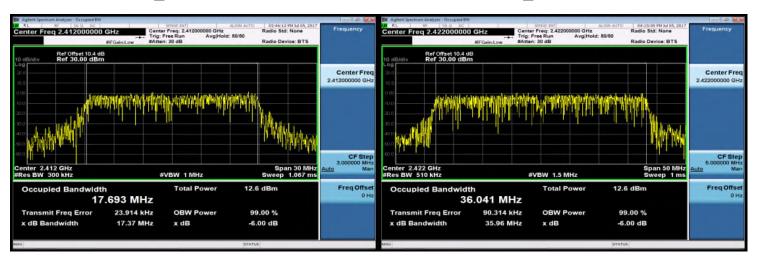
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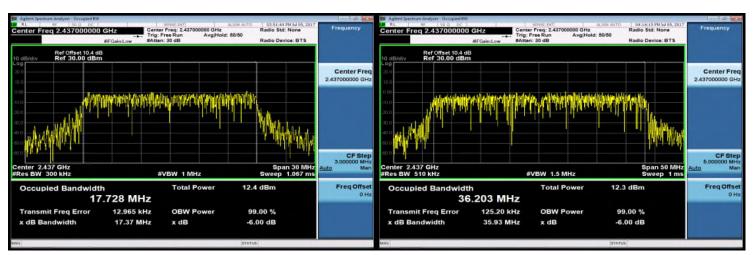
6dB BW 802.11n_HT20M CH-Low

6dB BW 802.11n HT40M CH-Low



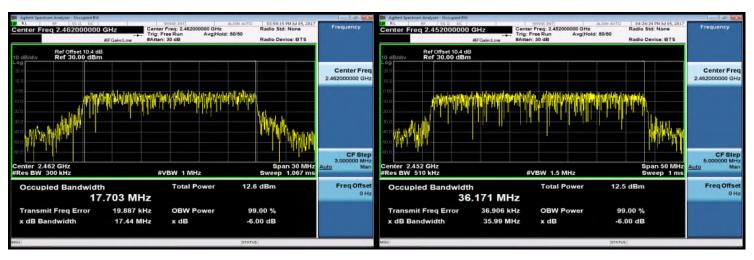
6dB BW 802.11n HT20M CH-Mid

6dB BW 802.11n_HT40M CH-Mid



6dB BW 802.11n_HT20M CH-High

6dB BW 802.11n_HT40M CH-High



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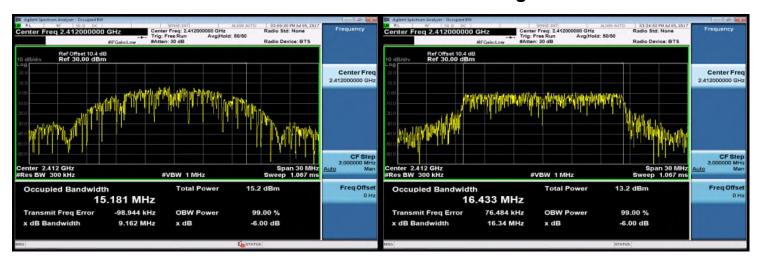
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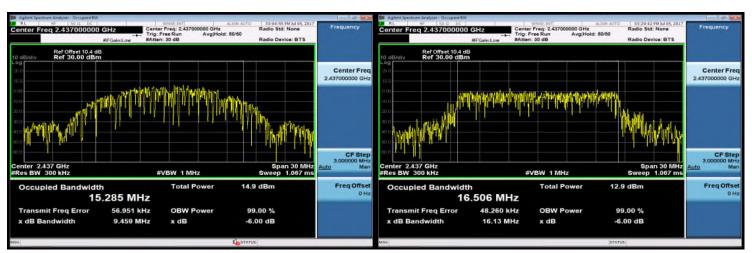
99% BW 802.11b CH-Low

99% BW 802.11g CH-Low



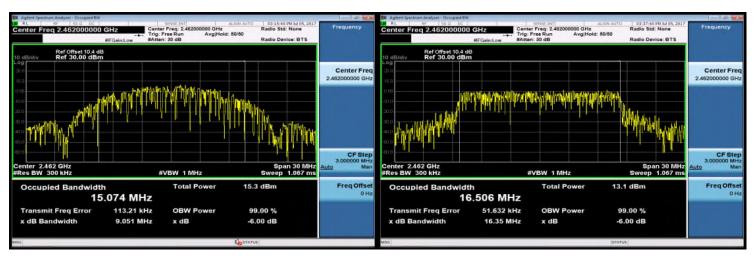
99% BW 802.11b CH-Mid

99% BW 802.11g CH-Mid



99% BW 802.11b CH-High

99% BW 802.11g CH-High

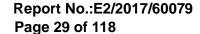


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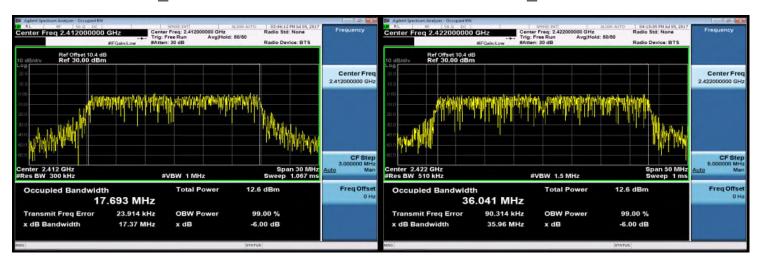
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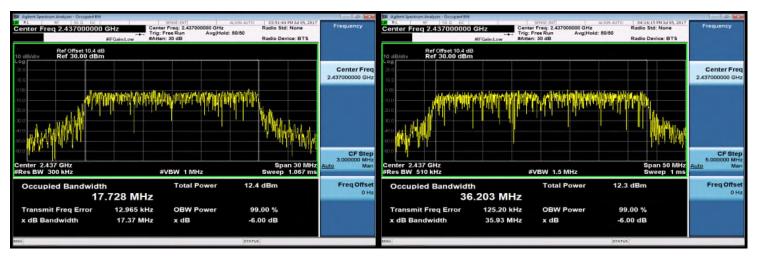
99% BW 802.11n HT20M CH-Low

99% BW 802.11n HT40M CH-Low



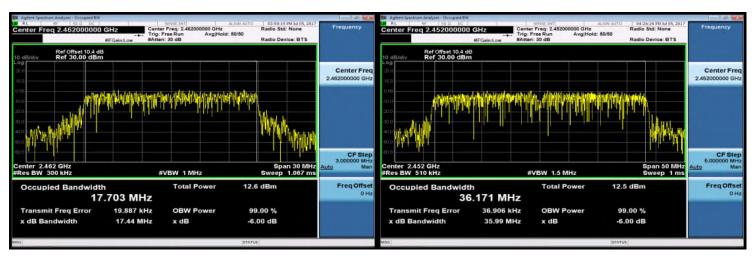
99% BW 802.11n_HT20M CH-Mid

99% BW 802.11n_HT40M CH-Mid



99% BW 802.11n_HT20M CH-High

99% BW 802.11n_HT40M CH-High



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CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

As per KDB 558074 D01 11.1 a)

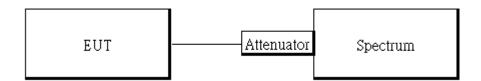
If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10 Table 6, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.9 Table4 &5.

Measurement Equipment Used

Conducted Emission Test Site								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.			
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018			
DC Block	PASTERNACK	PE8210	RF29	12/12/2016	12/11/2017			
Coaxial Cable	WOKEN	00100A1F1A 195C	RF01	12/12/2016	12/11/2017			
Attenuator	WOKEN	218FS-10	RF23	12/12/2016	12/11/2017			

10.3 **Test SET-UP**



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10.4 Measurement Procedure

Band Edge Limit Calculation:

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 100kHz & VBW = 300 kHz.
- 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.

Conducted Band Edge:

- To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
- 5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
- 6. Mark the highest reading of the emission as the reference level measurement.
- 7. Set DL as the limit = reading on marker 1 20dBm
- 8. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 kHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
- 9. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Conducted Spurious Emission:

- 1. To connect Antenna Port of EUT to Spectrum
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set RBW = 100 kHz & VBW = 300 kHz, Detector = Peak, Sweep = Auto.
- 4. Allow trace to fully stabilize.
- 5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- 6. Repeat above procedures until all default test channel measured were complete.

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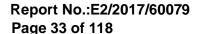
10.5 **Measurement Result**

Bande	edge Limi	it 802.11b MODE	Bandedge Limit 802.11g MODE		
Freq.	PSD	Bandedge Limit	Freq.	PSD	Bandedge Limit
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)
2412	5.41	-14.59	2412	-1.09	-21.09
2462	5.52	-14.48	2462	-0.99	-20.99

Banded	lge Limit	8 02.11 n 20 M O D E	Bandedge Limit 8 02.11 n40 MODE		
Freq.	PSD	Bandedge Limit	Freq.	PSD	Bandedge Limit
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)
2412	-1.85	-21.85	2422	-4.65	-24.65
2462	-1.72	-21.72	2452	-4.77	-24.77

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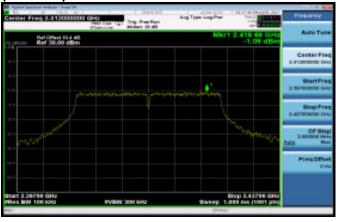
802.11b PSD for BANDEDGE limit(CH-Low)



802.11b PSD FOR BANDEDGE LIMIT (CH-High)



802.11g PSD FOR BANDEDGE LIMIT (CH-Low)



802.11g PSD FOR BANDEDGE LIMIT (CH-High)



802.11n HT20 PSD FOR BANDEDGE LIMIT (CH-Low)



802.11n HT20 PSD FOR BANDEDGE LIMIT (CH-High)

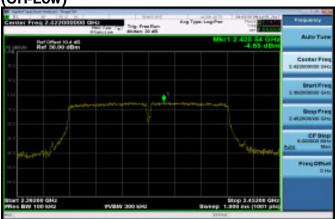


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802.11n HT40 PSD FOR BANDEDGE LIMIT (CH-Low)



802.11n HT40 PSD FOR BANDEDGE LIMIT (CH-High)



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802.11b **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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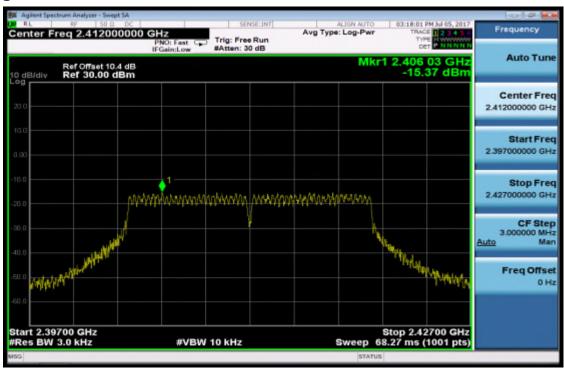
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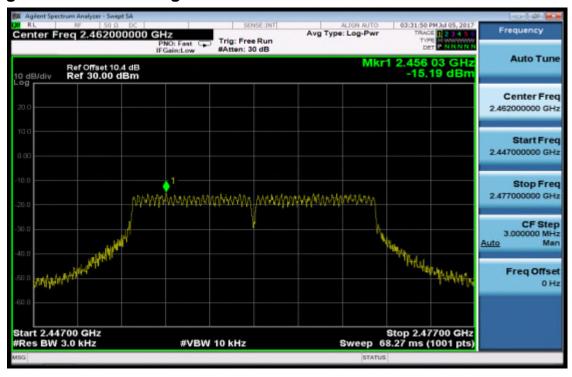
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802.11g **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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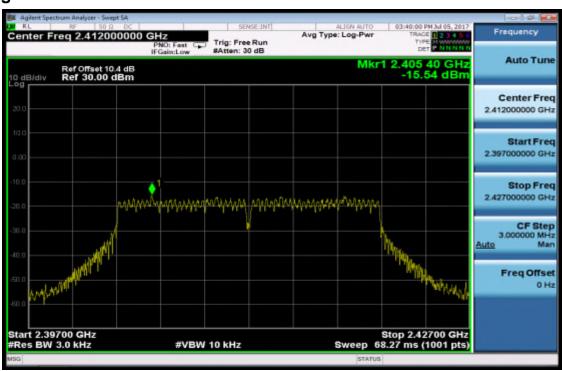
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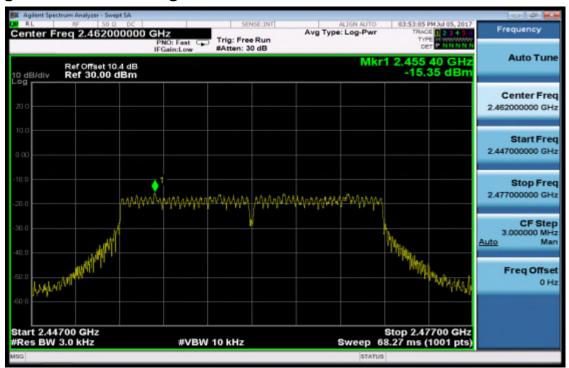
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802.11n HT20 **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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802.11n HT40 **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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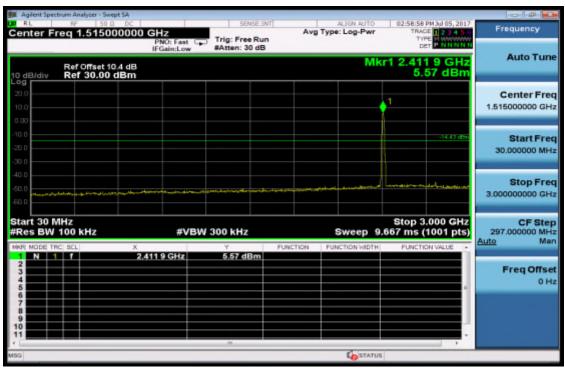
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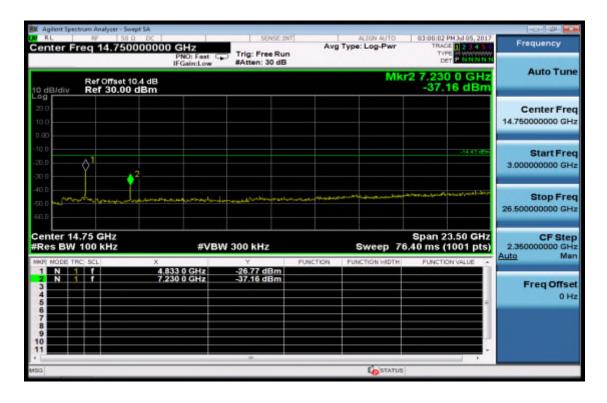
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802.11b **Spurious Emission Test Data CH-Low**





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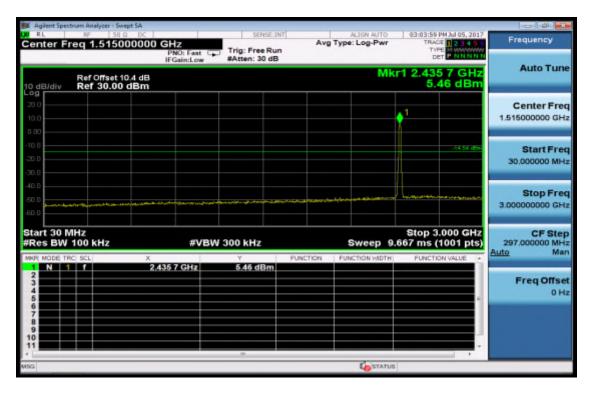
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Spurious Emission Test Data CH-Mid





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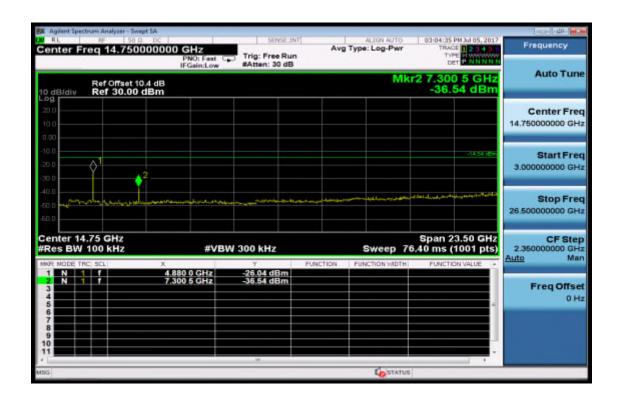
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Spurious Emission Test Data CH-High

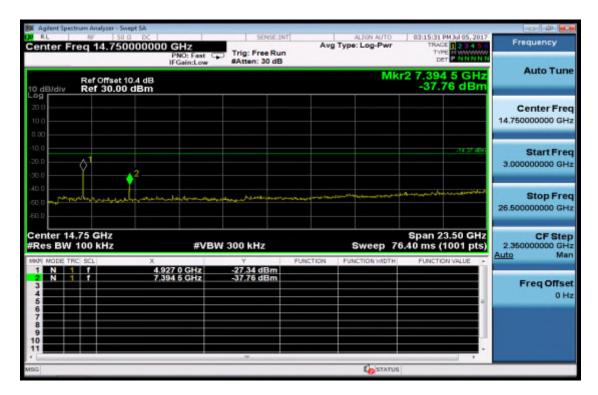


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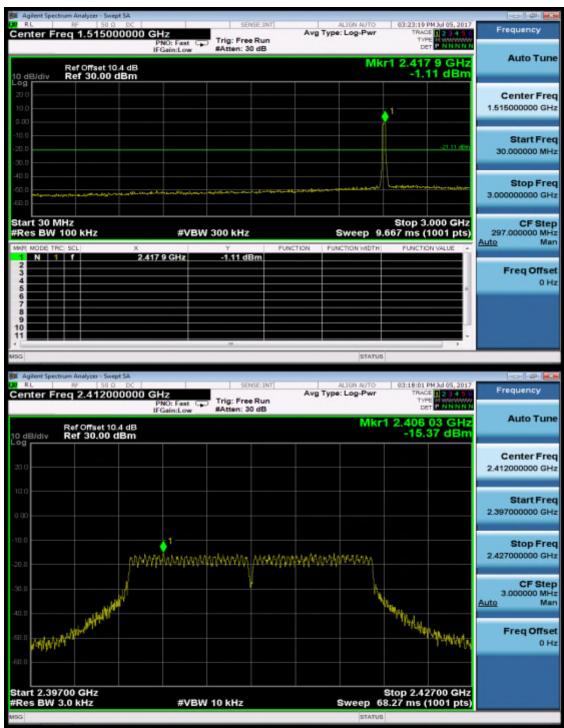
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802.11g **Spurious Emission Test Data CH-Low**



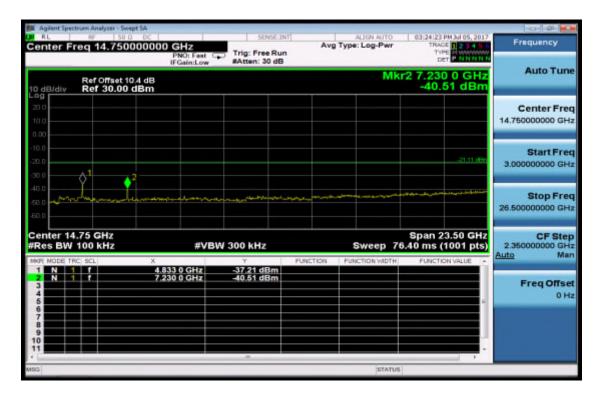
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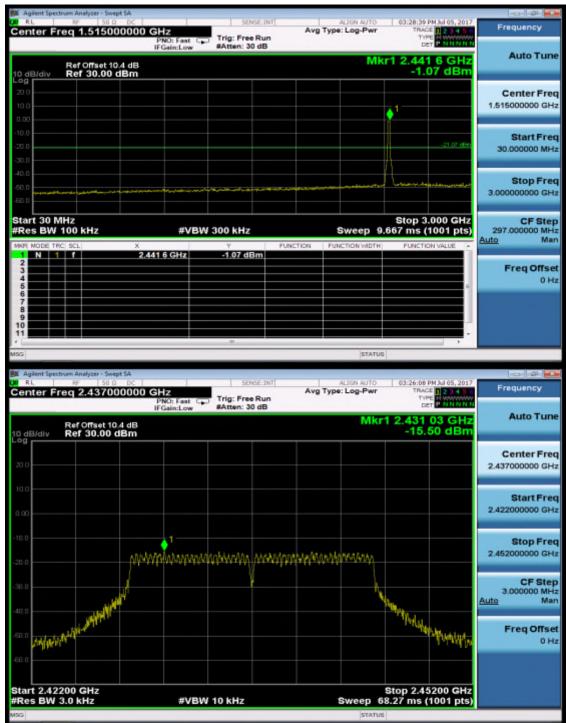
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Spurious Emission Test Data CH-Mid

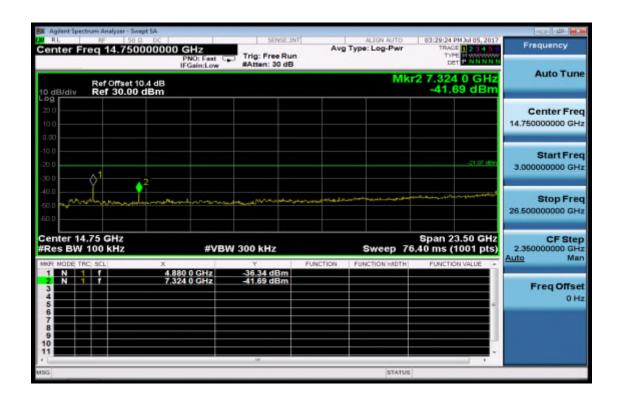


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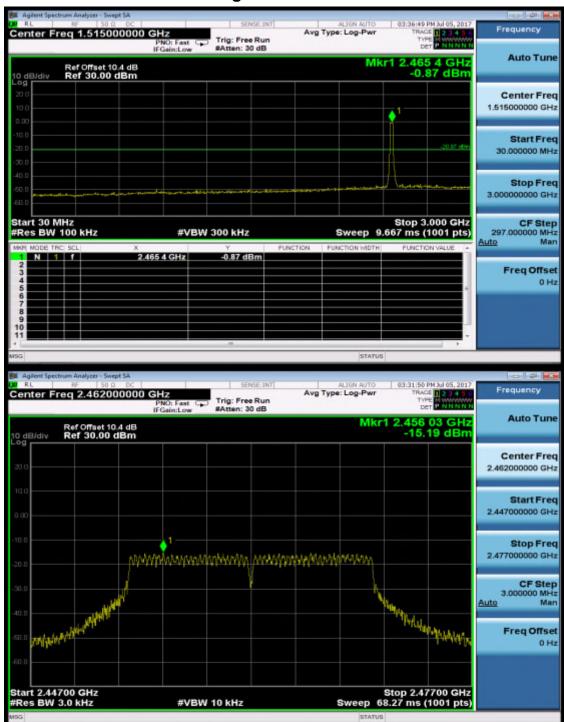
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Spurious Emission Test Data CH-High

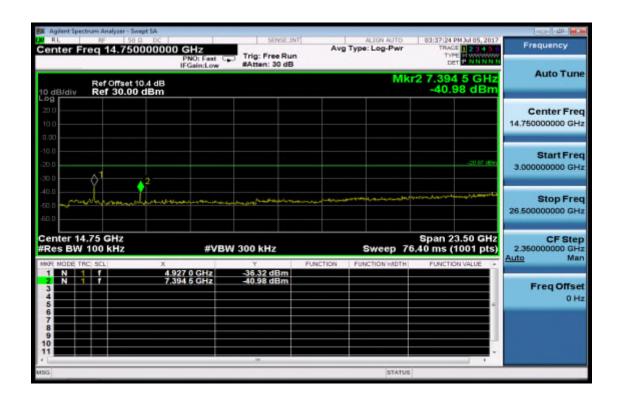


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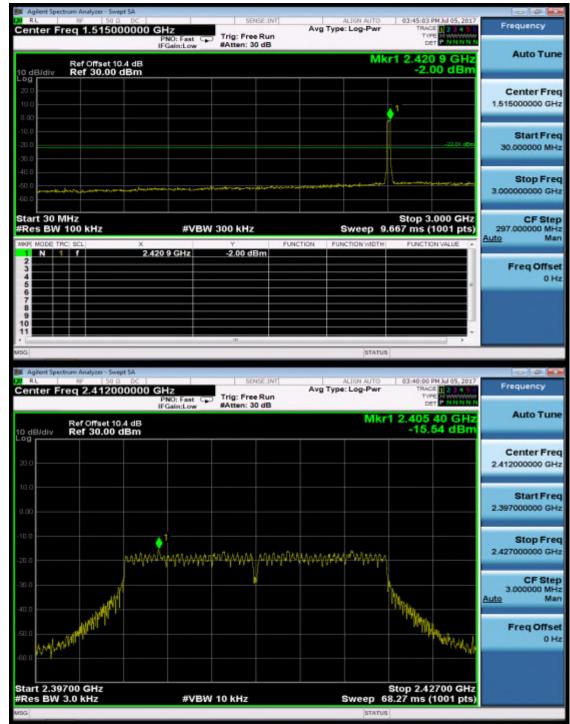
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802.11n HT20 **Spurious Emission Test Data CH-Low**

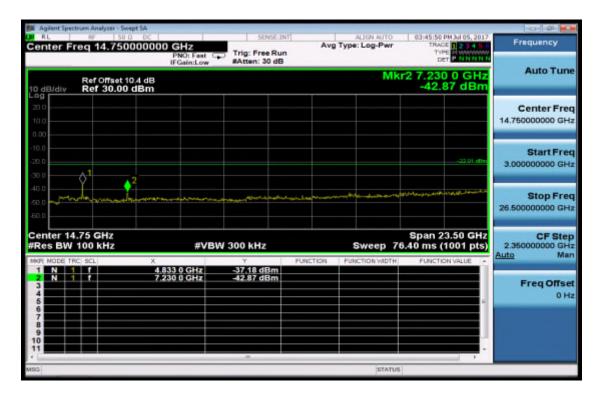


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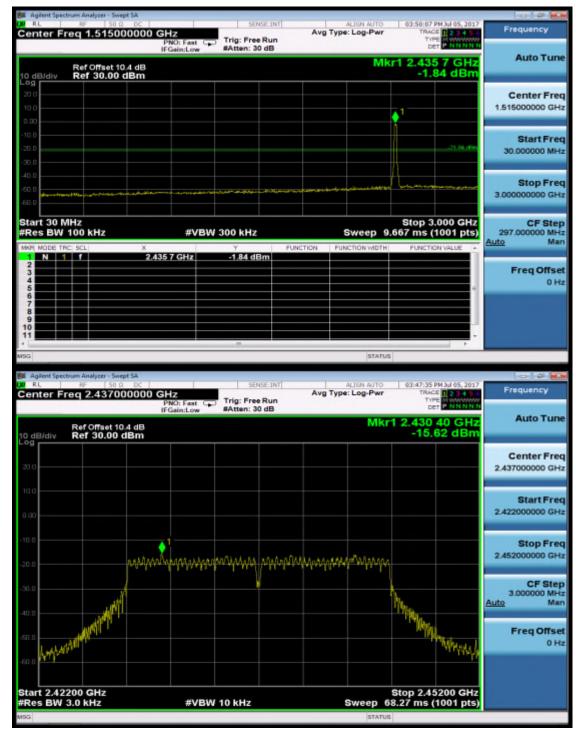
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Spurious Emission Test Data CH-Mid

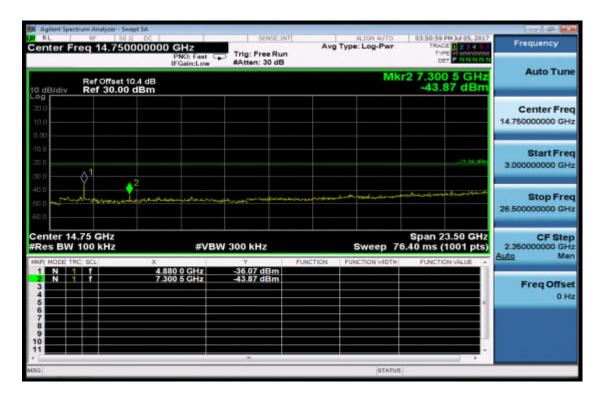


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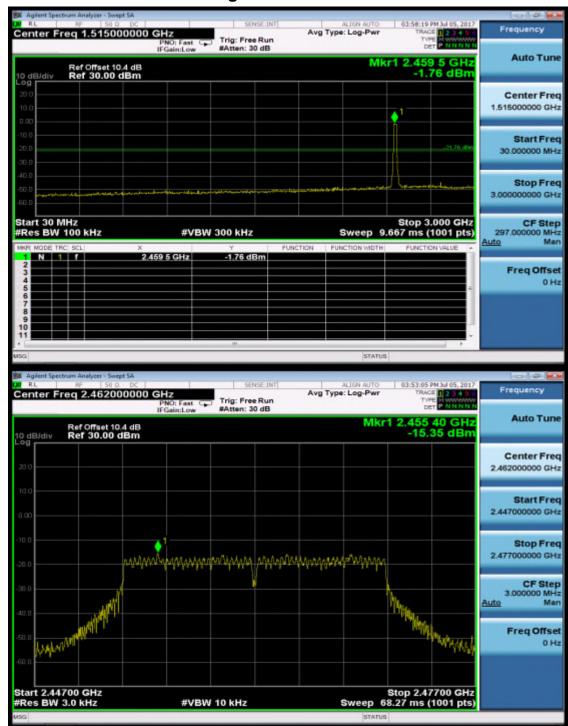
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Spurious Emission Test Data CH-High



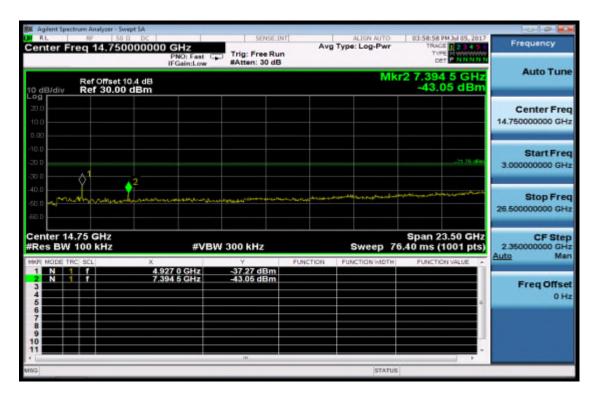
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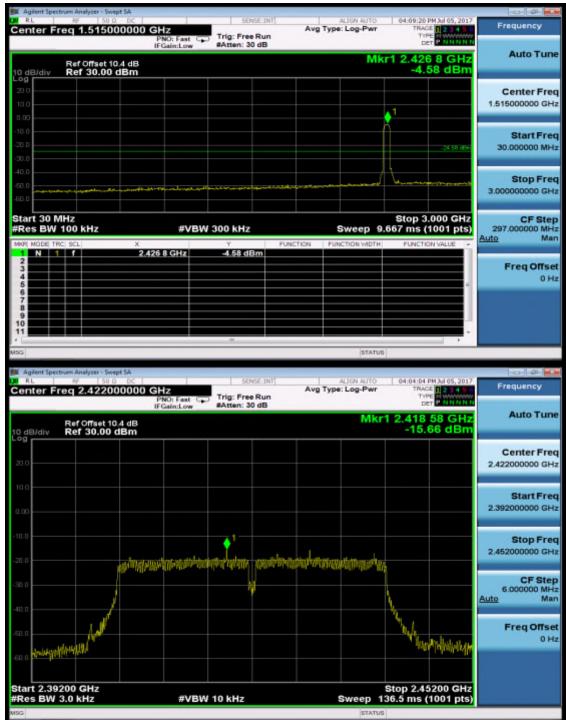
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802.11n HT40 **Spurious Emission Test Data CH-Low**



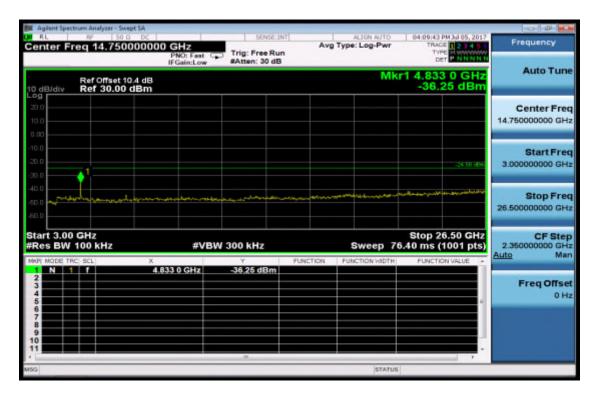
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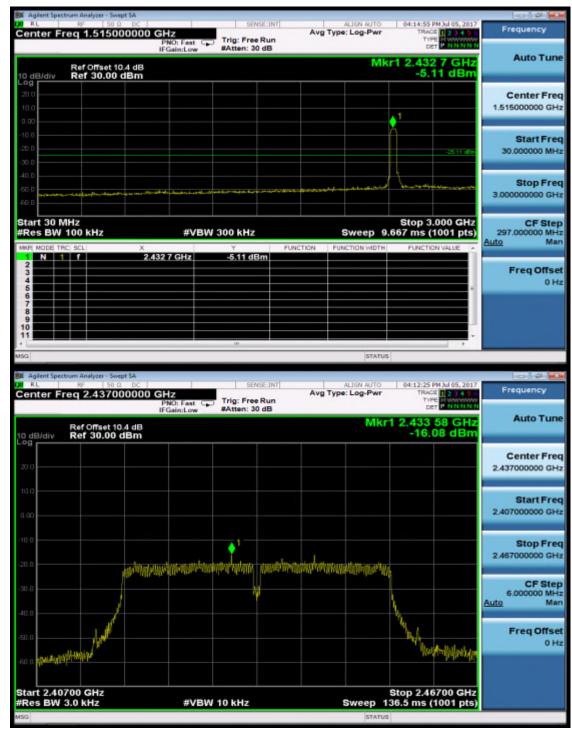
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Spurious Emission Test Data CH-Mid



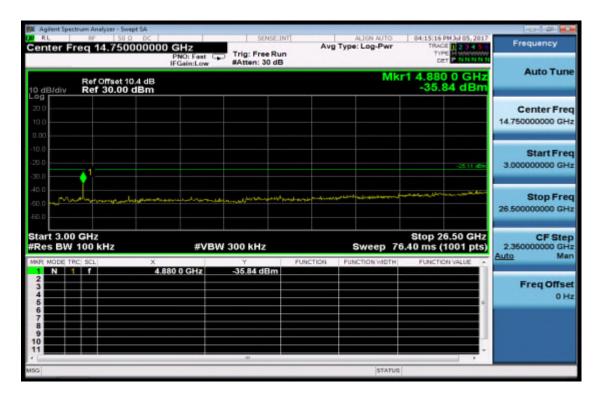
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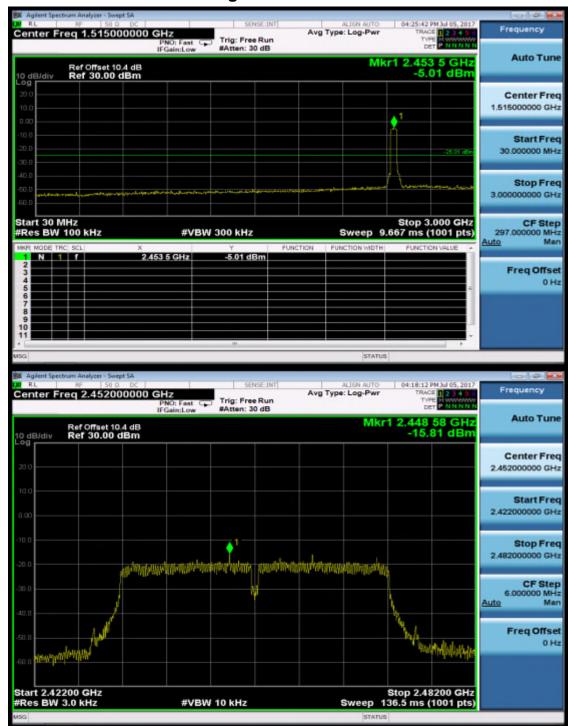
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Spurious Emission Test Data CH-High



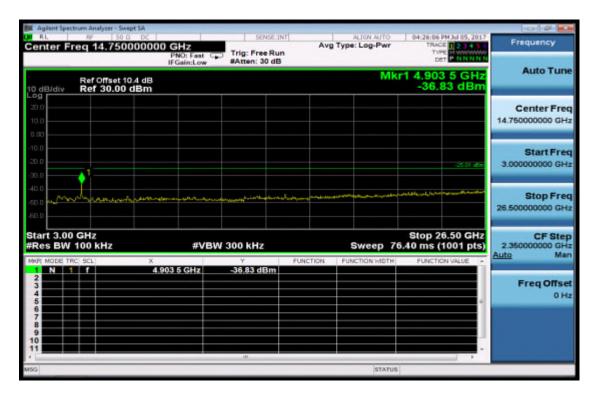
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11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

Standard Applicable 11.1

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 & RSS-Gen §8.10 Table 6 limit as below.

And according to §15.33(a) (1) & RSS-Gen §8.9 Table 4 & 5, for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	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	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level $(dB\mu V/m) = 20 \log Emission level (dB\mu V/m)$

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11.2 Measurement Equipment Used:

966 Chamber							
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.		
EMI Test Receiver	R&S	ESU 40	100363	04/18/2017	04/17/2018		
Loop Antenna	ETS-Lindgren	6502	00143303	12/23/2016	12/22/2017		
Broadband An- tenna	TESEQ	CBL 6112D	35240	11/03/2016	11/02/2017		
Horn Antenna	ETS-Lindgren	3117	00143272	12/15/2016	12/16/2017		
Horn Antenna	Schwarzbeck	BBHA9170	185	08/01/2017	07/31/2018		
Pre Amplifier	EMC Instru- ments	EMC330	980096	12/12/2016	12/11/2017		
Pre Amplifier	EMC Instru- ments	EMC0011830	980199	12/12/2016	12/11/2017		
Pre Amplifier	R&S	SCU-18	10204	12/12/2016	12/11/2017		
Pre Amplifier	R&S	SCU-26	100780	12/12/2016	12/11/2017		
Coaxial Cable	Huber+Suhner	RG 214/U	966Rx 9K-30M	12/12/2016	12/11/2017		
Coaxial Cable	Huber+Suhner	RG 214/U SUCOFLEX 104	966Rx 30M-3G	12/12/2016	12/11/2017		
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Rx 1G-18G	12/12/2016	12/11/2017		
Coaxial Cable	Huber+Suhner	mini 141-12 SUCOFLEX 104	966Rx 18G-40G	12/12/2016	12/11/2017		
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Tx 30M-18G	12/12/2016	12/11/2017		
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	966Tx 18G-40G	12/12/2016	12/11/2017		
Attenuator	WOKEN	218FS-10	RF27	12/12/2016	12/11/2017		
Site NSA	SGS	966 Chamber C	SAC-C	03/02/2017	03/01/2018		
Site VSWR	SGS	966 Chamber C	SAC-C	03/02/2017	03/01/2018		
DC Power Supply	HOLA	DP-3003	D7070035	05/04/2017	05/03/2018		
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.		
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.		
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.		
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.		

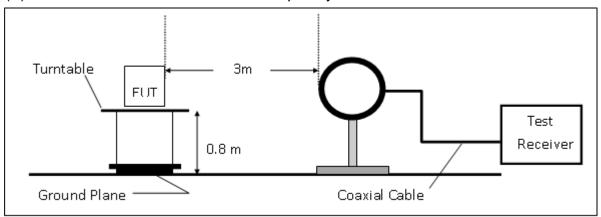
NOTE: N.C.R refers to Not Calibrated Required.

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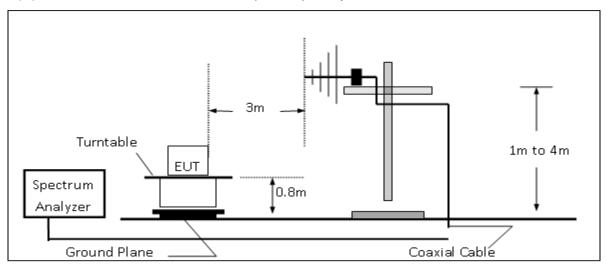


11.3 Test SET-UP

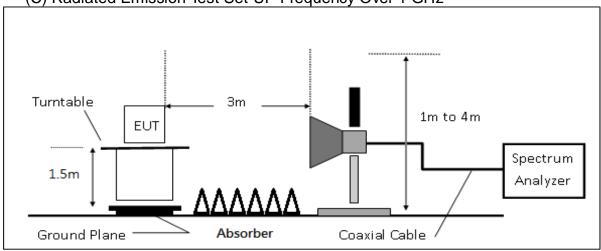
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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11.4 Measurement Procedure

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- 8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- 10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
- 12. Repeat above procedures until all default test channel measured were complete.

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11.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note:

"F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency. "E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

Test Results of Radiated Spurious Emissions form 9 kHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

11.7 **Measurement Result**

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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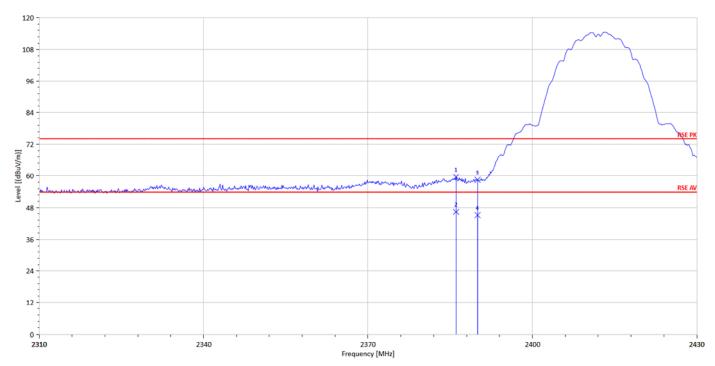


Radiated Band Edge Measurement Result (802.11b)

Operation Mode: Test Date: 802.11b 2017/8/23

Fundamental Frequency: 2412 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2386.08	S	Peak	54.72	4.82	59.54	74	-14.46
2386.08	S	Average	41.64	4.82	46.46	54	-7.54
2390.00	Е	Peak	53.65	4.84	58.49	74	-15.51
2390.00	Ε	Average	40.32	4.84	45.16	54	-8.84

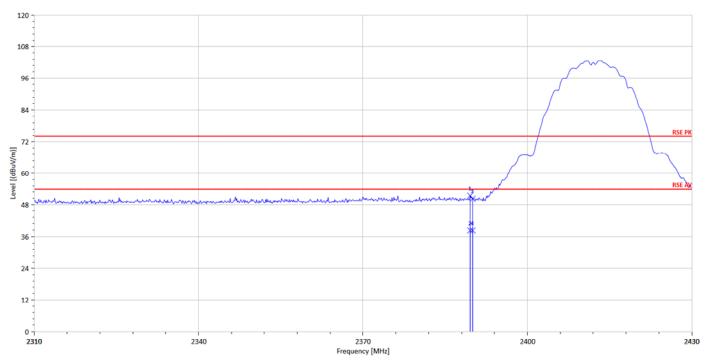
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Operation Mode: 802.11b Test Date: 2017/8/23

Fundamental Frequency: 22.7deg_C/57RH 2412 MHz Temp. / Humi.:

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2389.56	S	Peak	46.58	4.84	51.42	74	-22.58
2389.56	S	Average	33.40	4.84	38.24	54	-15.76
2390.00	Е	Peak	45.45	4.84	50.29	74	-23.71
2390.00	Е	Average	33.38	4.84	38.22	54	-15.78

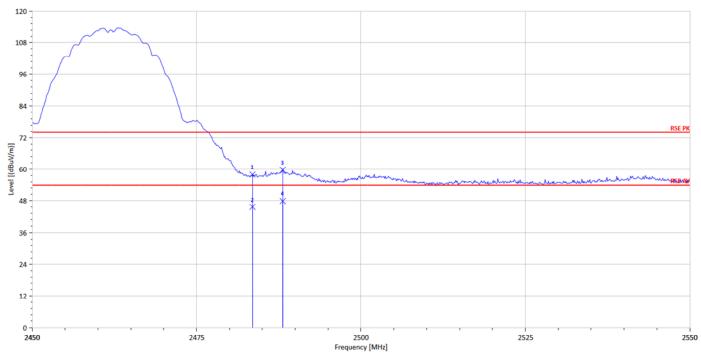
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Operation Mode: 802.11b Test Date: 2017/8/23

Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
	2483.50	Е	Peak	52.63	5.38	58.01	74	-15.99
	2483.50	E	Average	40.27	5.38	45.65	54	-8.35
	2488.10	S	Peak	54.38	5.41	59.79	74	-14.21
	2488.10	S	Average	42.50	5.41	47.91	54	-6.09

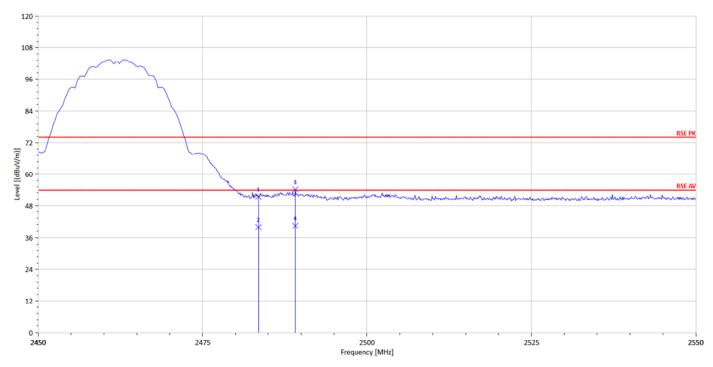
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Operation Mode: 802.11b Test Date: 2017/8/23

Fundamental Frequency: 22.7deg_C/57RH 2462 MHz Temp. / Humi. :

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dΒμV/m	dBµV/m	dB
2483.50	Е	Peak	46.08	5.38	51.46	74	-22.54
2483.50	Е	Average	34.49	5.38	39.87	54	-14.13
2489.10	S	Peak	48.81	5.42	54.23	74	-19.77
2489.10	S	Average	35.02	5.42	40.44	54	-13.56

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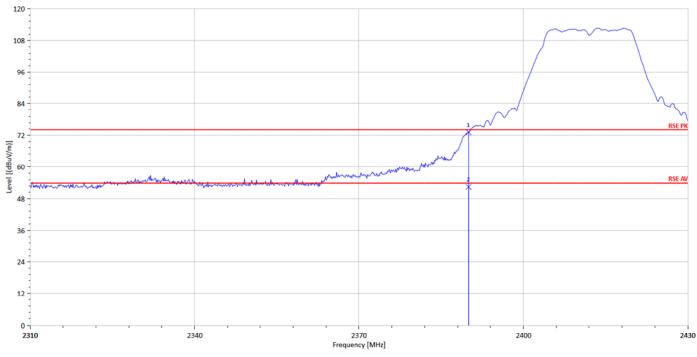


Radiated Band Edge Measurement Result (802.11g)

Operation Mode: Test Date: 802.11g 2017/8/23

Fundamental Frequency: 2412 MHz Temp. / Humi. : 22.7deg C/57RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



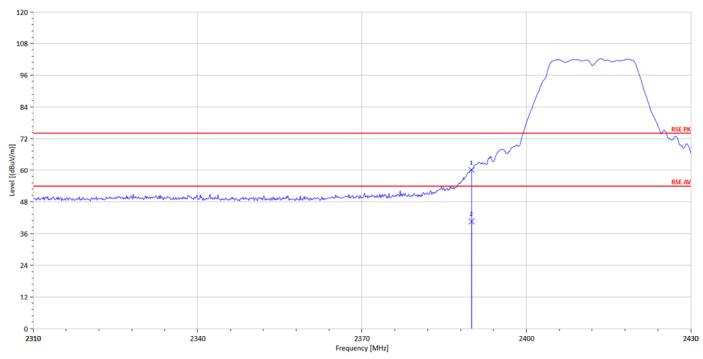
	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin	
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	_
•	2390.00	Е	Peak	68.23	4.84	73.07	74	-0.93	•
	2390.00	Е	Average	47.65	4.84	52.49	54	-1.51	

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Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Peak	55.27	4.84	60.11	74	-13.89
2390.00	Е	Average	35.75	4.84	40.59	54	-13.41

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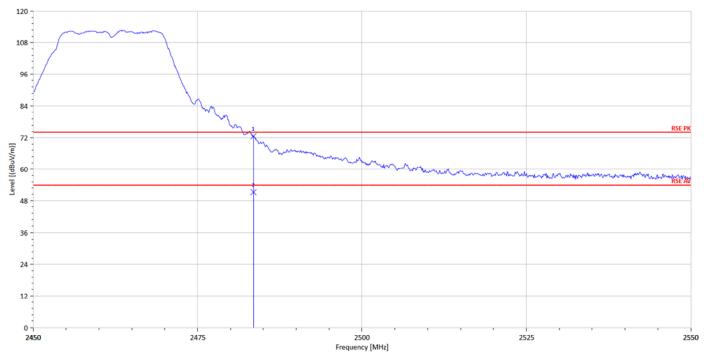
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



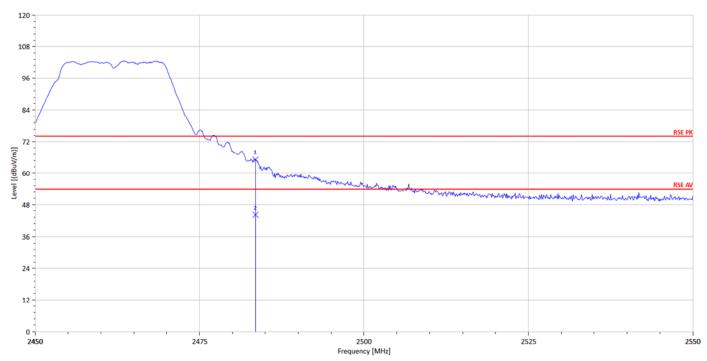
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Peak	67.11	5.38	72.50	74	-1.50
2483.50	Е	Average	45.85	5.38	51.23	54	-2.77

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
•	2483.50	Е	Peak	59.80	5.38	65.18	74	-8.82
	2483.50	E	Average	38.80	5.38	44.18	54	-9.82

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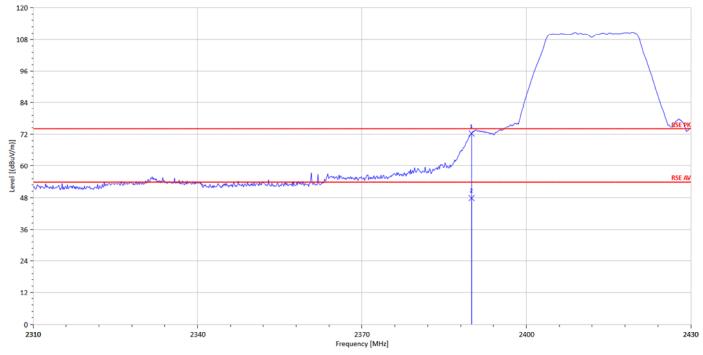


Radiated Band Edge Measurement Result (802.11_HT20)

Operation Mode: Test Date: 802.11n20 2017/8/23

Fundamental Frequency: 2412 MHz Temp. / Humi. : 22.7deg C/57RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2390.00	E	Peak	67.37	4.84	72.21	74	-1.79
2390.00	Е	Average	43.09	4.84	47.93	54	-6.07

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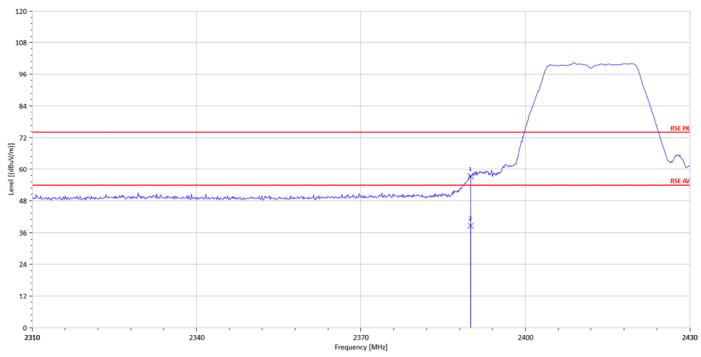
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Fundamental Frequency: 22.7deg_C/57RH 2412 MHz Temp. / Humi.:

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Peak	52.51	4.84	57.35	74	-16.65
2390.00	E	Average	33.66	4.84	38.50	54	-15.50

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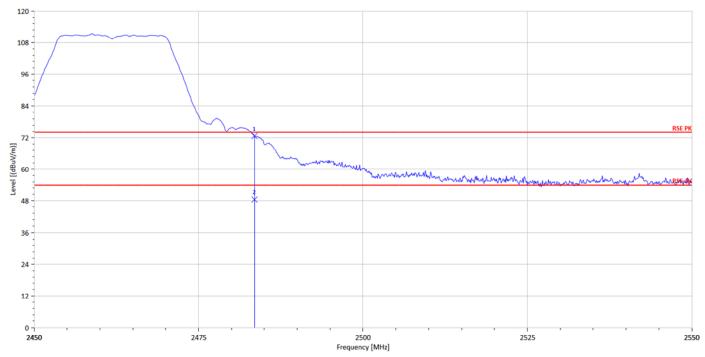
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



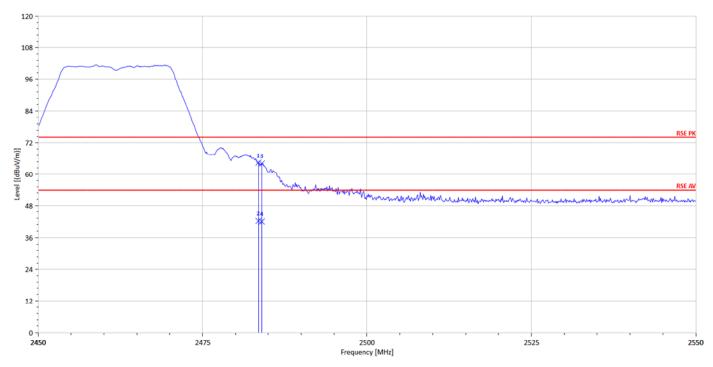
	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
•	2483.50	Е	Peak	67.20	5.38	72.58	74	-1.42
	2483.50	E	Average	43.12	5.38	48.50	54	-5.50

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	E	Peak	59.02	5.38	64.40	74	-9.60
2483.50	Е	Average	36.88	5.38	42.26	54	-11.74
2484.00	S	Peak	58.68	5.39	64.06	74	-9.94
2484.00	S	Average	36.65	5.39	42.04	54	-11.96

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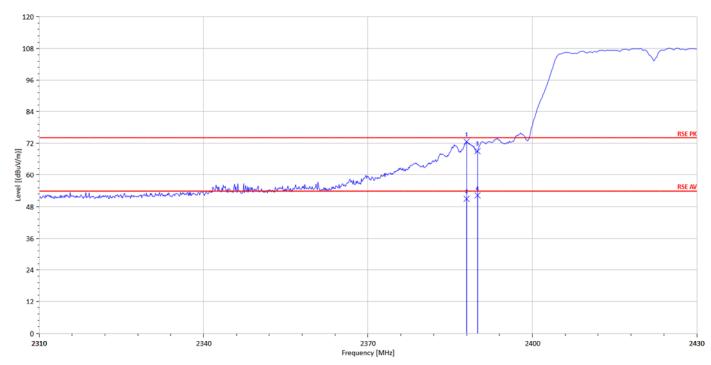


Radiated Band Edge Measurement Result (802.11_HT40)

Operation Mode: Test Date: 802.11n40 2017/8/23

Fundamental Frequency: 2422 MHz Temp. / Humi. : 22.7deg C/57RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical



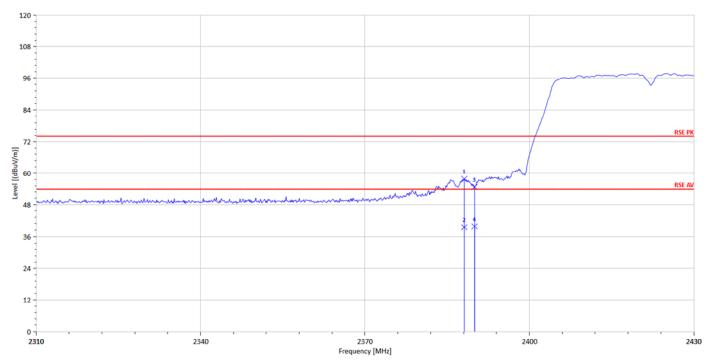
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2388.00	S	Peak	67.67	4.83	72.50	74	-1.50
2388.00	S	Average	46.17	4.83	51.00	54	-3.00
2390.00	E	Peak	64.17	4.84	69.01	74	-4.99
2390.00	Ε	Average	47.42	4.84	52.26	54	-1.74

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 22.7deg_C/57RH 2422 MHz Temp. / Humi.:

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal



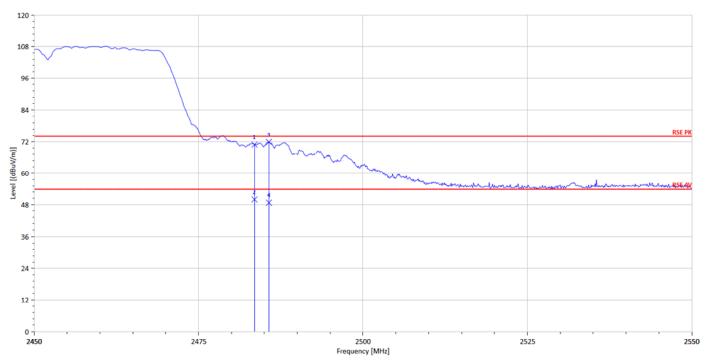
	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
	2388.12	S	Peak	52.99	4.83	57.82	74	-16.18
	2388.12	S	Average	34.64	4.83	39.47	54	-14.53
	2390.00	Е	Peak	50.00	4.84	54.85	74	-19.15
	2390.00	Е	Average	34.94	4.84	39.78	54	-14.22

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 2452 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
	2483.50	Е	Peak	65.49	5.38	70.88	74	-3.12
	2483.50	E	Average	44.63	5.38	50.01	54	-3.99
	2485.70	S	Peak	66.48	5.40	71.87	74	-2.13
	2485.70	S	Average	43.43	5.40	48.83	54	-5.17

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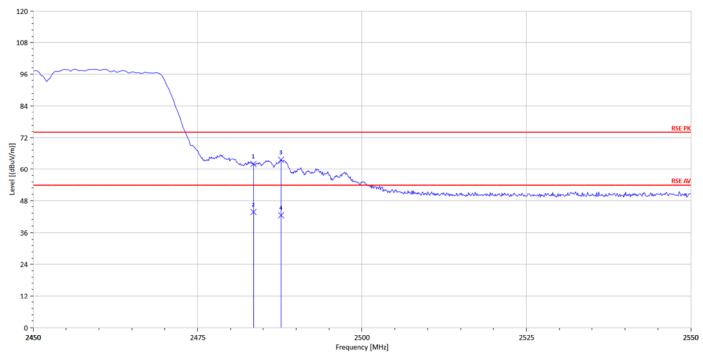
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Fundamental Frequency: 2452 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
	2483.50	Е	Peak	56.67	5.38	62.05	74	-11.95
	2483.50	E	Average	38.31	5.38	43.69	54	-10.31
	2487.70	S	Peak	58.19	5.41	63.60	74	-10.40
	2487.70	S	Average	37.08	5.41	42.49	54	-11.51

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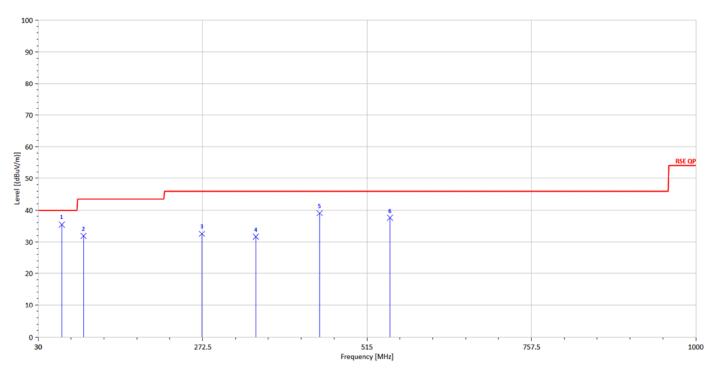
Below 1GHz Worst-Case Data:

Radiated Spurious Emission Measurement Result (802.11 g)

Test Date: Operation Mode: 802.11g 2017/8/23

22.7deg_C/57RH Fundamental Frequency: 2412 MHz Temp. / Humi.:

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBμV/m	dB
64.92	S	Peak	54.84	-19.38	35.46	40	-4.54
96.93	S	Peak	47.36	-15.52	31.84	43.5	-11.66
271.53	S	Peak	43.28	-10.73	32.55	46	-13.45
351.07	S	Peak	39.78	-8.18	31.59	46	-14.41
445.16	S	Peak	44.67	-5.58	39.09	46	-6.91
548.95	S	Peak	41.04	-3.45	37.59	46	-8.41

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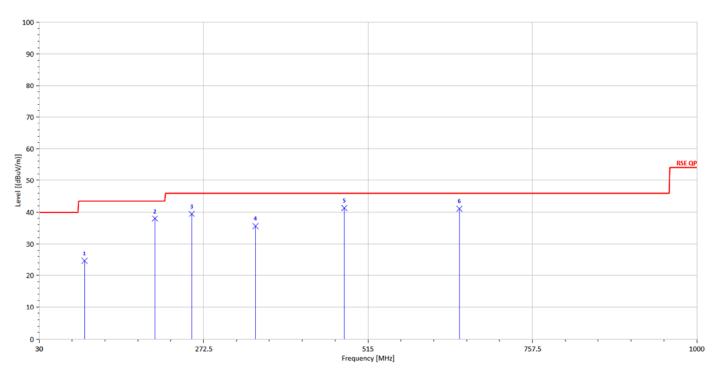
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Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: Η Measurement Antenna Pol. : Horizontal



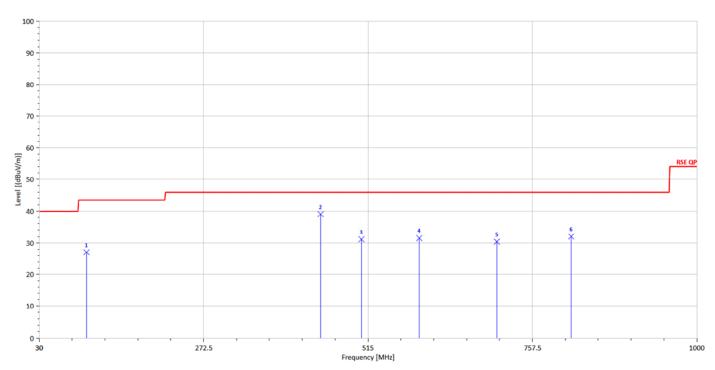
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
96.93	S	Peak	40.14	-15.52	24.61	43.5	-18.89
200.72	S	Peak	52.28	-14.27	38.01	43.5	-5.49
255.04	S	Peak	50.24	-10.74	39.50	46	-6.50
349.13	S	Peak	43.86	-8.24	35.61	46	-10.39
480.08	S	Peak	46.46	-5.10	41.36	46	-4.64
649.83	S	Peak	42.81	-1.69	41.13	46	-4.87

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Η Measurement Antenna Pol. : Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	42.05	-15.03	27.03	43.5	-16.47
445.16	S	Peak	44.68	-5.58	39.09	46	-6.91
505.30	S	Peak	35.83	-4.72	31.11	46	-14.89
590.66	S	Peak	34.38	-2.91	31.47	46	-14.53
705.12	S	Peak	32.34	-1.95	30.38	46	-15.62
814.73	S	Peak	31.83	0.17	32.01	46	-13.99

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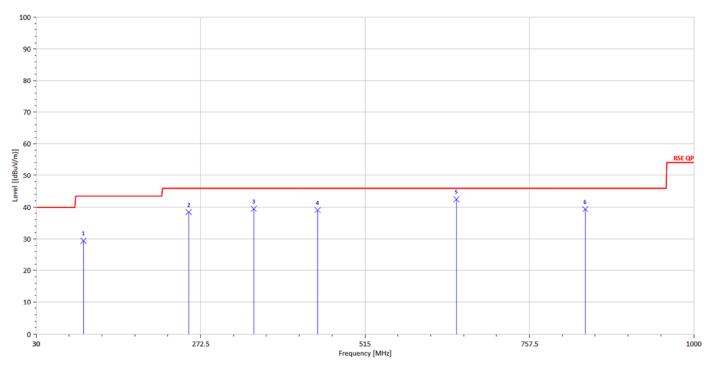
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Η Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	44.41	-15.03	29.38	43.5	-14.12
255.04	S	Peak	49.22	-10.74	38.48	46	-7.52
351.07	S	Peak	47.76	-8.18	39.57	46	-6.43
445.16	S	Peak	44.70	-5.58	39.12	46	-6.88
649.83	S	Peak	44.19	-1.69	42.50	46	-3.50
839.95	S	Peak	38.38	1.05	39.43	46	-6.57

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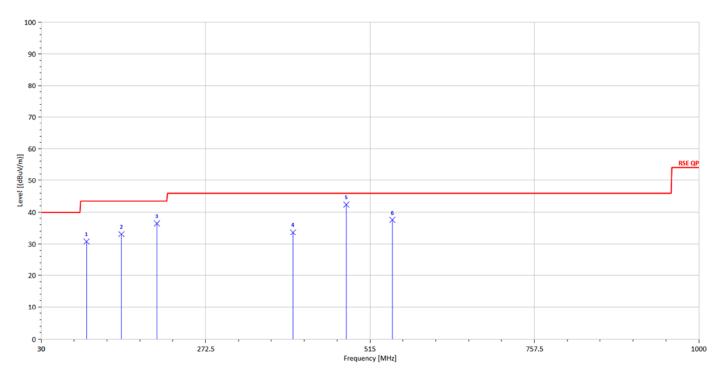
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical Н



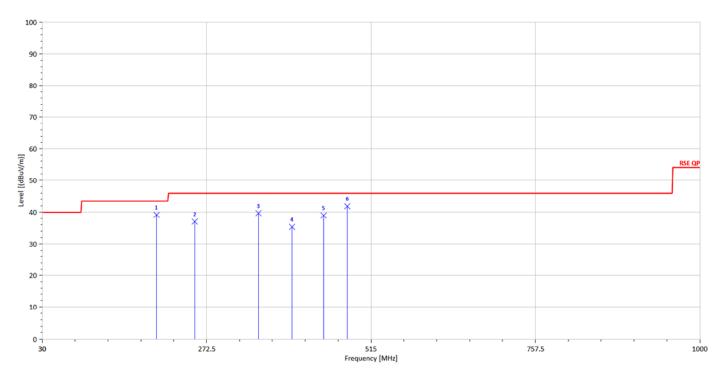
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
96.93	S	Peak	46.23	-15.52	30.71	43.5	-12.79
148.34	S	Peak	46.44	-13.36	33.08	43.5	-10.42
200.72	S	Peak	50.72	-14.27	36.45	43.5	-7.05
401.51	S	Peak	40.28	-6.63	33.64	46	-12.36
480.08	S	Peak	47.53	-5.10	42.43	46	-3.57
547.98	S	Peak	41.03	-3.47	37.56	46	-8.44

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Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal Н



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBμV/m	dBµV/m	dB
198.78	S	Peak	53.60	-14.42	39.18	43.5	-4.32
255.04	S	Peak	47.81	-10.74	37.06	46	-8.94
349.13	S	Peak	47.96	-8.24	39.72	46	-6.28
398.60	S	Peak	42.13	-6.73	35.39	46	-10.61
445.16	S	Peak	44.60	-5.58	39.01	46	-6.99
480.08	S	Peak	46.99	-5.10	41.90	46	-4.10

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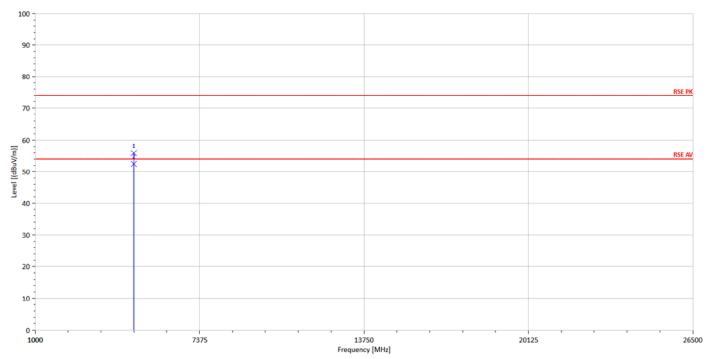
Above 1GHz Data:

Radiated Spurious Emission Measurement Result (802.11 b)

Operation Mode: 802.11b Test Date: 2017/8/23

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4824.00	Н	Peak	42.15	13.76	55.91	74	-18.09
4824.00	Н	Average	38.73	13.76	52.49	54	-1.51

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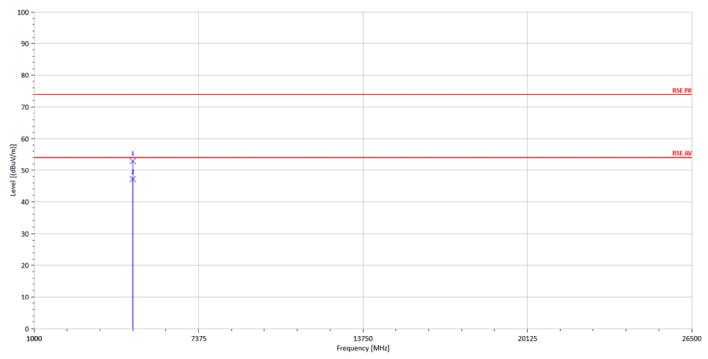
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Fundamental Frequency: 22.7deg_C/57RH 2412 MHz Temp. / Humi. :

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal



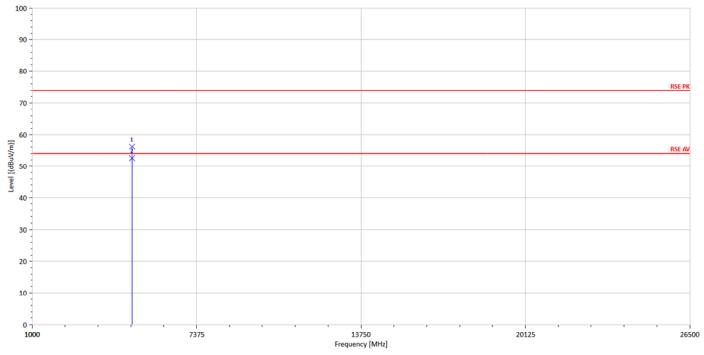
	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
•	4824.00	Н	Peak	39.15	13.76	52.91	74	-21.09
	4824.00	Н	Average	33.44	13.76	47.20	54	-6.80

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 22.7deg_C/57RH 2437 MHz Temp. / Humi. :

Ashton Operation Band: Tx CH Mid Test Engineer: EUT Pol.: Measurement Antenna Pol. : Vertical



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
•	4874.00	Н	Peak	42.31	13.89	56.20	74	-17.81
	4874.00	Н	Average	38.68	13.89	52.57	54	-1.44

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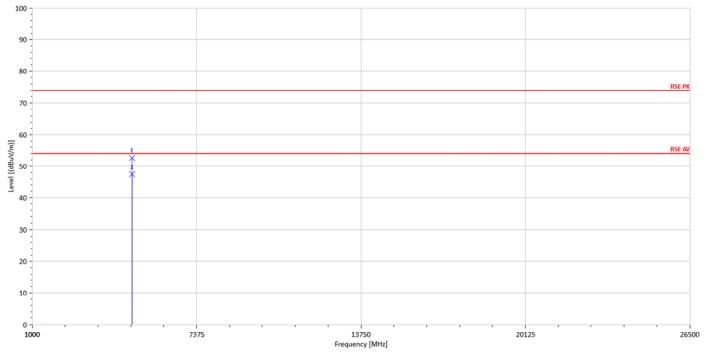
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Fundamental Frequency: 22.7deg_C/57RH 2437 MHz Temp. / Humi. :

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	4874.00	Н	Peak	38.73	13.89	52.62	74	-21.39
	4874.00	Н	Average	33.62	13.89	47.51	54	-6.49

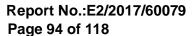
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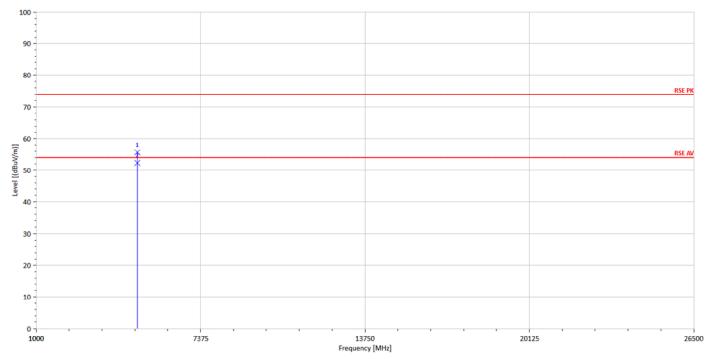
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Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical



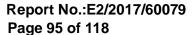
Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Н	Peak	41.66	14.01	55.67	74	-18.33
4924.00	Н	Average	38.31	14.01	52.32	54	-1.68

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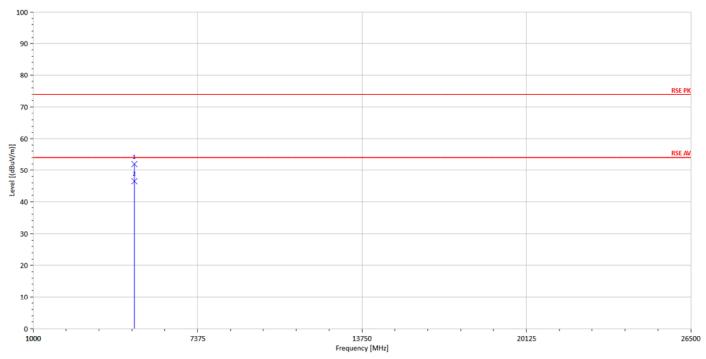
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Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	4924.00	Н	Peak	37.97	14.01	51.98	74	-22.02
	4924.00	Н	Average	32.54	14.01	46.55	54	-7.45

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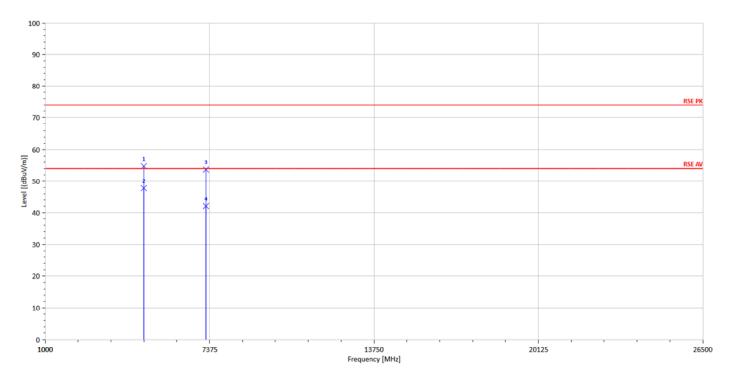


Radiated Spurious Emission Measurement Result (802.11 g)

Operation Mode: 802.11g Test Date: 2017/8/23

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Tx CH Low Operation Band: Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4824.00	Н	Peak	40.99	13.76	54.75	74	-19.25
4824.00	Н	Average	34.05	13.76	47.81	54	-6.19
7236.00	Н	Peak	34.01	19.67	53.68	74	-20.32
7236.00	Н	Average	22.44	19.67	42.11	54	-11.89

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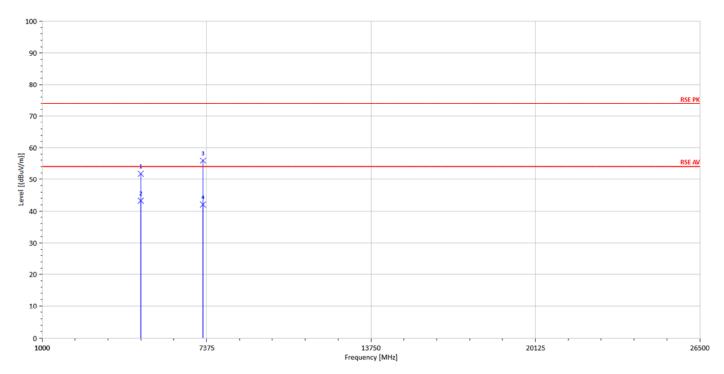
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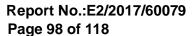
Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: Η Measurement Antenna Pol.: Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dΒμV/m	dBµV/m	dB
4824.00	Н	Peak	38.02	13.76	51.78	74	-22.22
4824.00	Н	Average	29.55	13.76	43.31	54	-10.69
7236.00	Н	Peak	36.23	19.67	55.90	74	-18.10
7236.00	Н	Average	22.46	19.67	42.13	54	-11.87

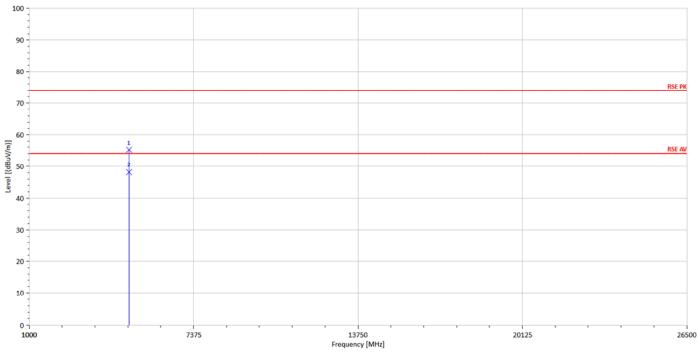
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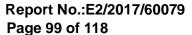
Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Η Measurement Antenna Pol.: Vertical



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4874.00	Н	Peak	41.29	13.89	55.18	74	-18.83
4874.00	Н	Average	34.29	13.89	48.18	54	-5.83

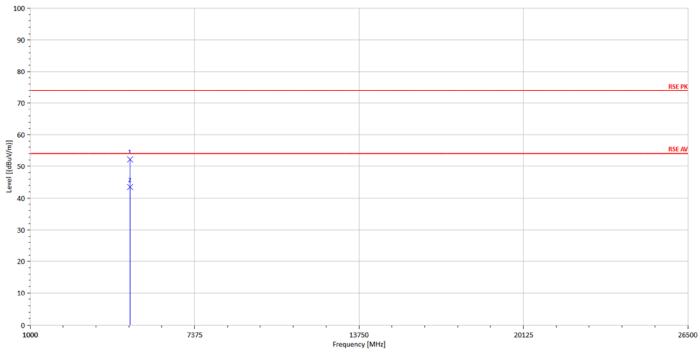
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.





Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Η Measurement Antenna Pol.: Horizontal



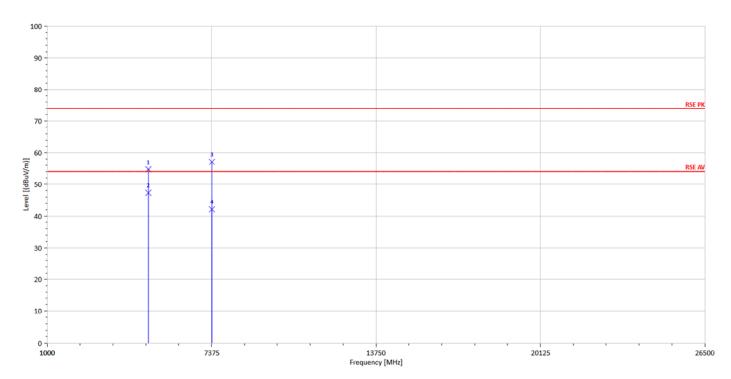
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4874.00	Н	Peak	38.30	13.89	52.19	74	-21.82
4874.00	Н	Average	29.63	13.89	43.52	54	-10.49

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: Vertical Н



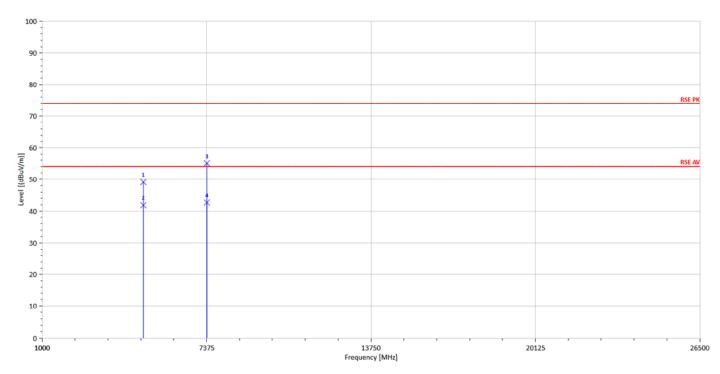
Freq.	Note	Detector Mode	Spectum	Factor	Actual FS	Limit @3m	Margin
N 41 1	E/L/E/O		Reading Level	ID	_		ID.
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dΒμV/m	dBμV/m	dB
4924.00	Н	Peak	40.70	14.01	54.71	74	-19.29
4924.00	Н	Average	33.36	14.01	47.37	54	-6.63
7386.00	Н	Peak	37.03	20.07	57.10	74	-16.90
7386.00	Н	Average	22.14	20.07	42.21	54	-11.79

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal Н



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.00	Н	Peak	35.11	14.01	49.12	74	-24.88
4924.00	Н	Average	27.90	14.01	41.91	54	-12.09
7386.00	Н	Peak	34.95	20.07	55.02	74	-18.98
7386.00	Н	Average	22.68	20.07	42.75	54	-11.25

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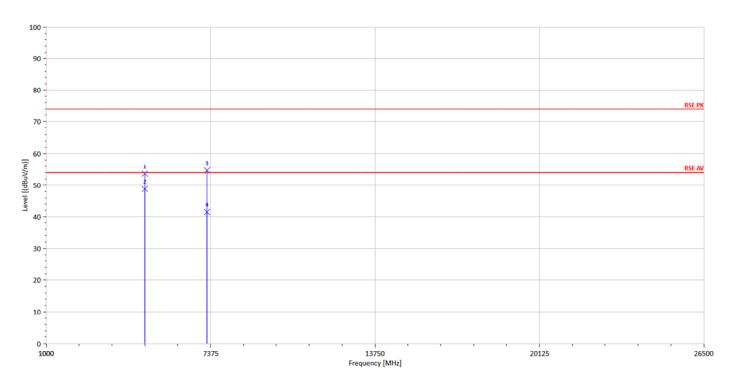


Radiated Spurious Emission Measurement Result (802.11_HT20)

Test Date: Operation Mode: 802.11n20 2017/8/23

Fundamental Frequency: 2412 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4824.00	Н	Peak	39.91	13.76	53.67	74	-20.33
4824.00	Н	Average	35.05	13.76	48.81	54	-5.19
7236.00	Н	Peak	35.01	19.67	54.68	74	-19.32
7236.00	Н	Average	21.81	19.67	41.48	54	-12.52

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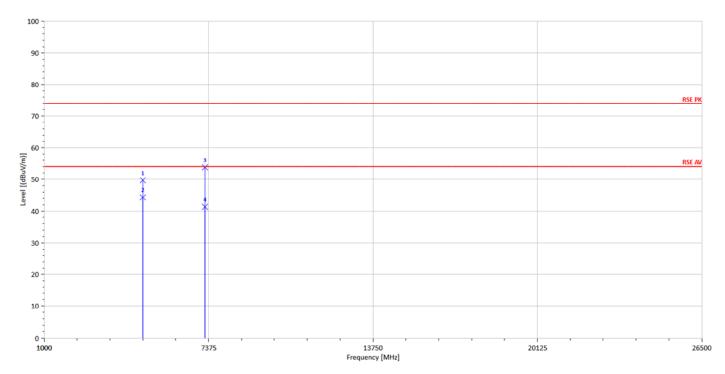
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Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: Н Measurement Antenna Pol. : Horizontal



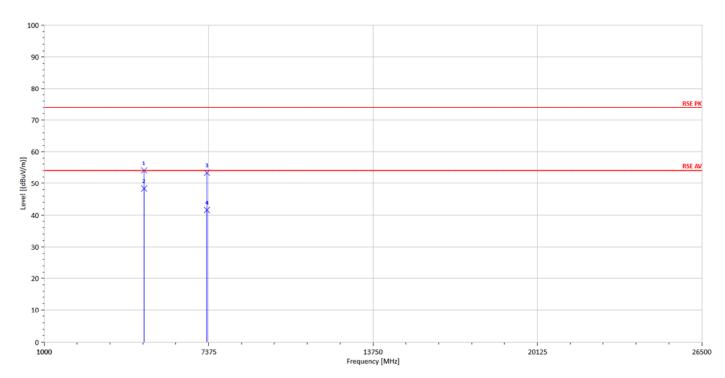
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4824.00	Н	Peak	35.91	13.76	49.67	74	-24.33
4824.00	Н	Average	30.65	13.76	44.41	54	-9.59
7236.00	Н	Peak	34.10	19.67	53.77	74	-20.23
7236.00	Н	Average	21.75	19.67	41.42	54	-12.58

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Н Measurement Antenna Pol. : Vertical



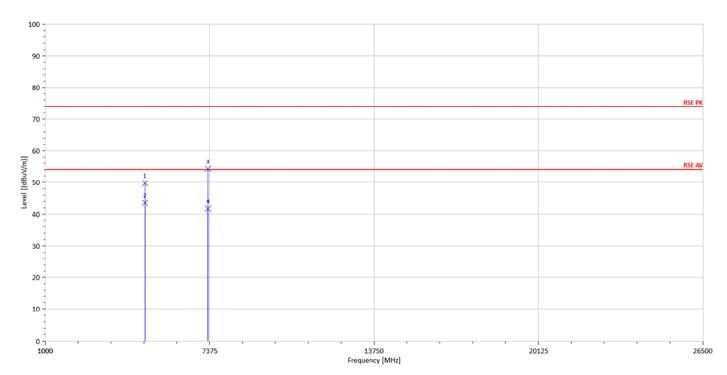
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dΒμV/m	dBµV/m	dB
4874.00	Н	Peak	40.15	13.89	54.04	74	-19.97
4874.00	Н	Average	34.47	13.89	48.36	54	-5.65
7311.00	Н	Peak	33.46	19.83	53.29	74	-20.71
7311.00	Н	Average	21.84	19.83	41.67	54	-12.33

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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Н Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dΒμV/m	dBµV/m	dB
4874.00	Н	Peak	35.82	13.89	49.70	74	-24.30
4874.00	Н	Average	29.73	13.89	43.62	54	-10.39
7311.00	Н	Peak	34.41	19.83	54.24	74	-19.76
7311.00	Н	Average	21.94	19.83	41.77	54	-12.23

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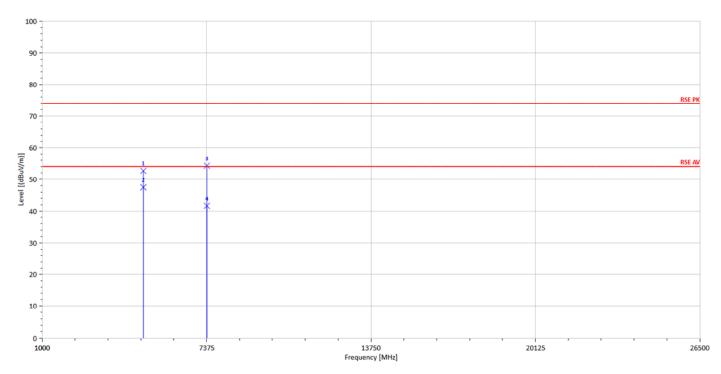
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Н Measurement Antenna Pol. : Vertical



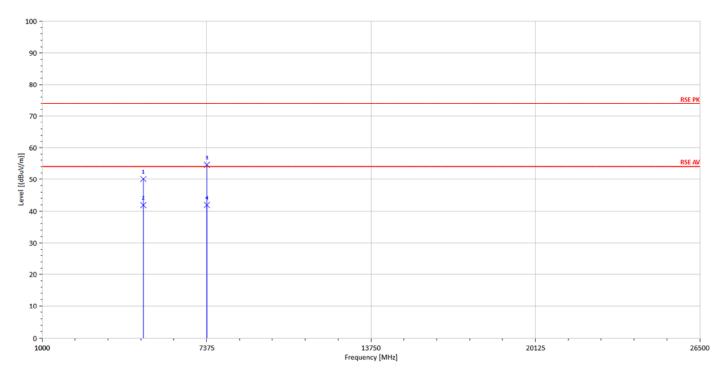
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4924.00	Н	Peak	38.64	14.01	52.65	74	-21.35
4924.00	Н	Average	33.52	14.01	47.53	54	-6.47
7386.00	Н	Peak	34.19	20.07	54.26	74	-19.74
7386.00	Н	Average	21.66	20.07	41.73	54	-12.27

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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: Н Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dΒμV/m	dBµV/m	dB
4924.00	Н	Peak	36.06	14.01	50.07	74	-23.93
4924.00	Н	Average	27.93	14.01	41.94	54	-12.06
7386.00	Н	Peak	34.47	20.07	54.54	74	-19.46
7386.00	Н	Average	21.93	20.07	42.00	54	-12.00

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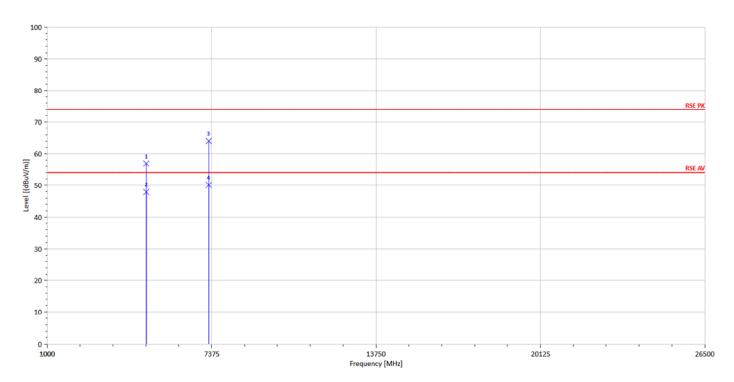


Radiated Spurious Emission Measurement Result (802.11_HT40)

Operation Mode: 802.11n40 Test Date: 2017/8/23

22.7deg_C/57RH Fundamental Frequency: 2422 MHz Temp. / Humi. :

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical



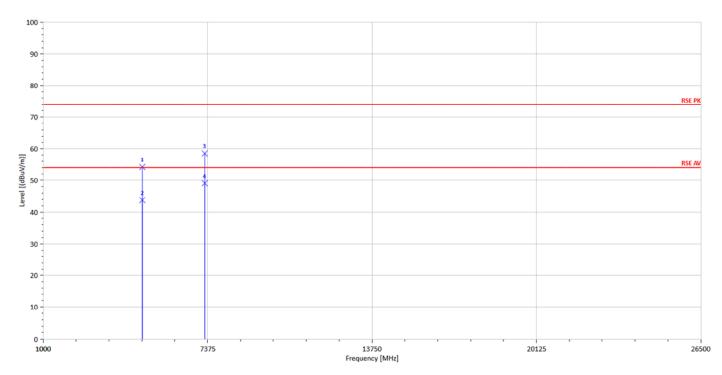
Note	Detector	Spectum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
Н	Peak	43.08	13.81	56.89	74	-17.11
Н	Average	34.12	13.81	47.93	54	-6.07
Н	Peak	44.30	19.73	64.03	74	-9.97
Н	Average	30.38	19.73	50.11	54	-3.89
	F/H/E/S H H H	Mode F/H/E/S PK/QP/AV H Peak H Average H Peak	Mode Reading Level F/H/E/S PK/QP/AV dBμV H Peak 43.08 H Average 34.12 H Peak 44.30	Mode Reading Level F/H/E/S PK/QP/AV dBμV dB H Peak 43.08 13.81 H Average 34.12 13.81 H Peak 44.30 19.73	F/H/E/SMode PK/QP/AVReading Level dB μVFS dB μV/mHPeak43.0813.8156.89HAverage34.1213.8147.93HPeak44.3019.7364.03	Mode F/H/E/SReading Level PK/QP/AVFS dBμV@3m dBμV/mHPeak43.0813.8156.8974HAverage34.1213.8147.9354HPeak44.3019.7364.0374

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Fundamental Frequency: 2422 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: Н Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dΒμV/m	dBµV/m	dB
4844.00	Н	Peak	40.37	13.81	54.18	74	-19.82
4844.00	Н	Average	30.03	13.81	43.84	54	-10.16
7266.00	Н	Peak	38.76	19.73	58.49	74	-15.51
7266.00	Н	Average	29.32	19.73	49.05	54	-4.95

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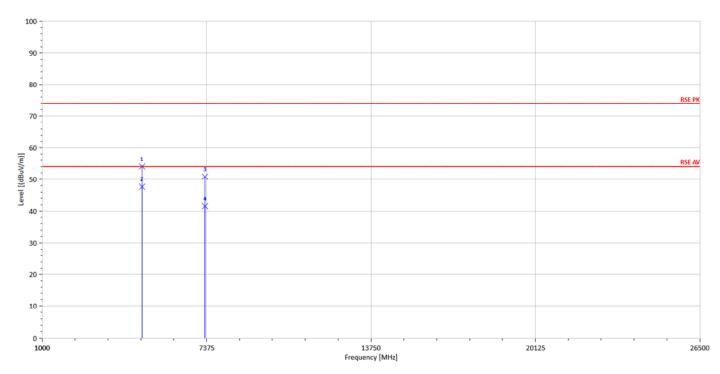
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Н Measurement Antenna Pol. : Vertical



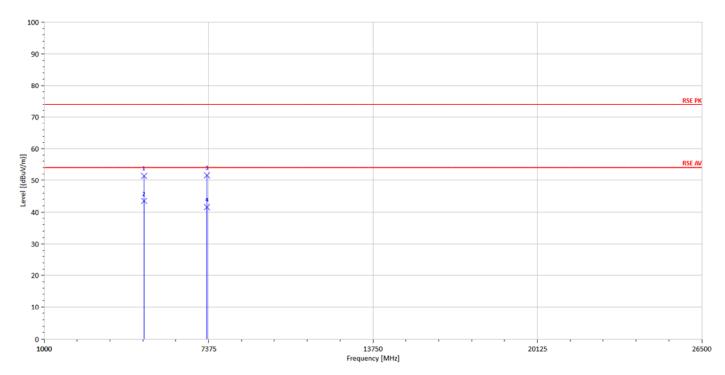
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4874.00	Н	Peak	40.14	13.89	54.03	74	-19.98
4874.00	Н	Average	33.83	13.89	47.72	54	-6.29
7311.00	Н	Peak	30.98	19.83	50.81	74	-23.19
7311.00	Н	Average	21.79	19.83	41.62	54	-12.38

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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Н Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dΒμV/m	dBµV/m	dB
4874.00	Н	Peak	37.53	13.89	51.42	74	-22.59
4874.00	Н	Average	29.67	13.89	43.56	54	-10.45
7311.00	Н	Peak	31.77	19.83	51.60	74	-22.40
7311.00	Н	Average	21.79	19.83	41.62	54	-12.38

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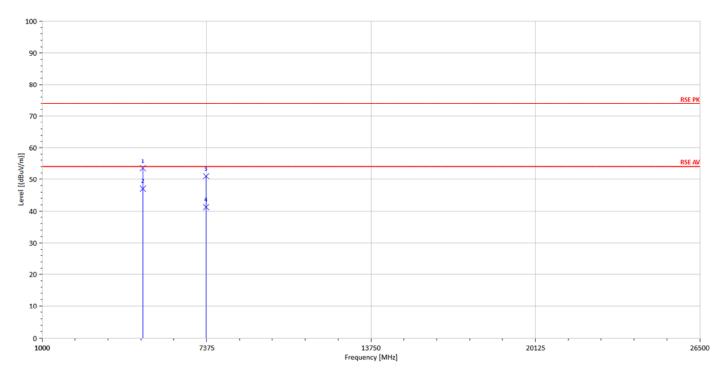
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Fundamental Frequency: Temp. / Humi. : 22.7deg_C/57RH 2452 MHz

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Н Measurement Antenna Pol. : Vertical



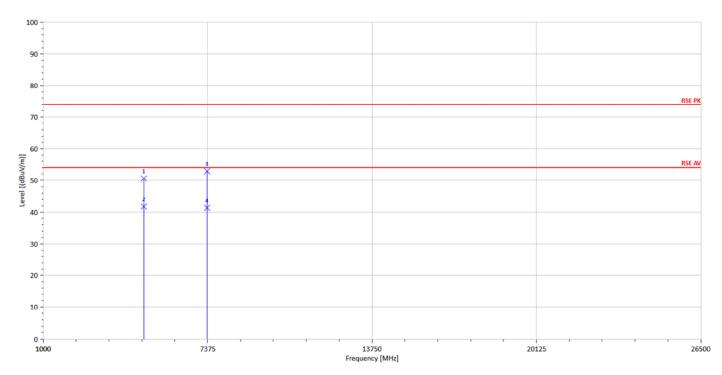
Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4904.00	Н	Peak	39.54	13.96	53.50	74	-20.50
4904.00	Н	Average	33.14	13.96	47.10	54	-6.90
7356.00	Н	Peak	31.03	19.97	51.00	74	-23.00
7356.00	Н	Average	21.35	19.97	41.32	54	-12.68

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Fundamental Frequency: Temp. / Humi. : 2452 MHz 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Н Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4904.00	Н	Peak	36.62	13.96	50.58	74	-23.42
4904.00	Н	Average	27.85	13.96	41.81	54	-12.19
7356.00	Н	Peak	32.89	19.97	52.86	74	-21.14
7356.00	Н	Average	21.45	19.97	41.42	54	-12.58

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12 PEAK POWER SPECTRAL DENSITY

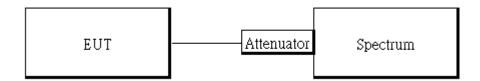
Standard Applicable 12.1

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

12.2 **Measurement Equipment Used**

Conducted Emission Test Site									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018				
DC Block	PASTERNACK	PE8210	RF29	12/12/2016	12/11/2017				
Coaxial Cable	WOKEN	00100A1F1A 195C	RF01	12/12/2016	12/11/2017				
Attenuator	WOKEN	218FS-10	RF23	12/12/2016	12/11/2017				

12.3 Test Set-up



12.4 **Measurement Procedure**

- 10. Set analyzer center frequency to DTS channel center frequency.
- 11. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 12. Set the span to 1.5 times the DTS channel bandwidth.
- 13. Set the RBW = 3 kHz & VBW = 10 kHz.
- 14. For defining Restricted Band Edge Limit: Set the RBW = 100kHz & VBW = 300 kHz
- 15. Detector = peak.
- 16. Sweep time = auto couple.
- 17. Trace mode = max hold.
- 18. Allow trace to fully stabilize.
- 19. Use the peak marker function to determine the maximum amplitude level.

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12.5 **Measurement Result**

POWER DENSITY 802.11b			PC	WER DEN	SITY 802.1	l1g	
Freq. (MHz)	PSD (dBm)	Limit (dBm)	Result	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Result
2412	-14.66	8.00	PASS	2412	-15.37	8.00	PASS
2437	-14.80	8.00	PASS	2437	-15.50	8.00	PASS
2462	-14.58	8.00	PASS	2462	-15.19	8.00	PASS

POWER DENSITY 802.11n HT20							
Freq. (MHz)	PSD (dBm)	Limit (dBm)	Result				
2412	-15.54	8.00	PASS				
2437	-15.62	8.00	PASS				
2462	-15.35	8.00	PASS				

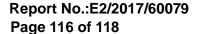
POWER DENSITY 802.11n HT40						
Freq. (MHz)	PSD (dBm)	Limit (dBm)	Result			
2422	-15.66	8.00	PASS			
2437	-16.08	8.00	PASS			
2452	-15.81	8.00	PASS			

^{*}Refer to next page for plots

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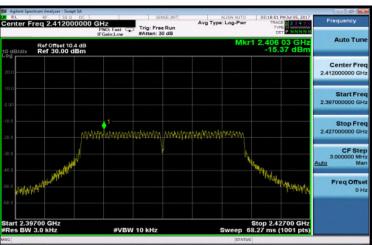




802.11b CH-Low



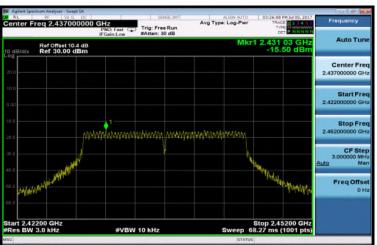
802.11g CH-Low



802.11b CH-Mid



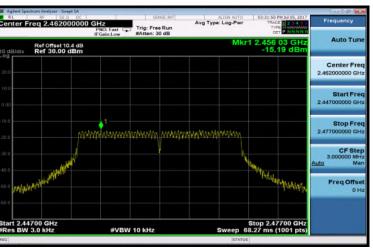
802.11g CH-Mid



802.11b CH-High



802.11g CH-High

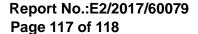


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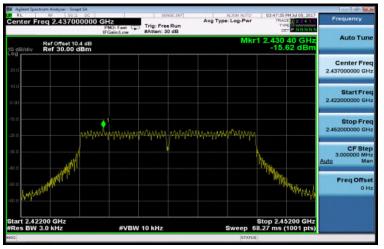
802.11n 20 CH-Low

ter Freq 2.412000000 GHz PN0: Fast PN0: Fast Atten: 20 dB Ref Offset 10.4 dB Ref 30.00 dBm

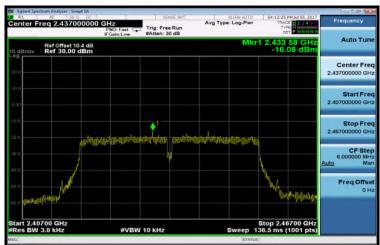
802.11n 40 CH-Low



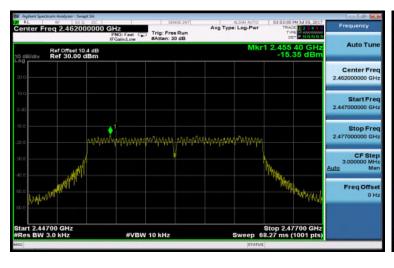
802.11n_20 CH-Mid



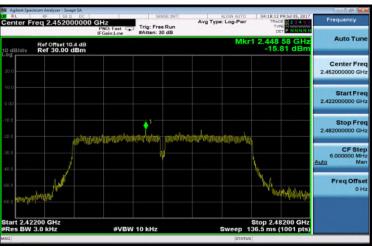
802.11n_40 CH-Mid



802.11n_20 CH-High



802.11n_40 CH-High



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13 ANTENNA REQUIREMENT

Standard Applicable 13.1

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

If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

13.2 **Antenna Connected Construction**

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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