TEST REPORT

DT&C Co., Ltd.

			DT&C Co.	, Ltd.		
U	Dt&C		42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 1704 Tel : 031-321-2664, Fax : 031-321-1664			
1. Report	No: DRTFCC1709-0192	2(2)				
2. Custom	er					
• Name	(FCC) : POINTMOBILE	CO., LTD. / Name	(IC) : POINTMOBIL	.E CO.,LTD		
				a Seoul South Korea 153-709 Seoul Korea (Republic Of)		
3. Use of F	Report : FCC & IC Origina	al Grant				
	Name / Model Name : M V2X-PM70W / IC: 10664	70 III.	FCC: PM70, IC: PM	70W		
	thod Used : KDB 558074	 International control of the state of the st	013			
Test Sp	ecification : FCC Part 15 RSS-247 Iss		SS-GEN Issue 4 (20	14-11)		
6. Date of	Test : 2017.06.12 ~ 2017	7.06.30, 2017.10.2	25			
7. Testing	Environment : See apper	nded test report.				
8. Test Re	sult : Refer to the attache	ed test result.				
	Tested by		Technical Manager			
Affirmation	Name : JaeHyeok Bang	12th/	Name : GeunKi Son	(Signature)		
The tes	t results presented in this t	est report are limite	d only to the sample su	upplied by applicant and		
the use of the	nis test report is inhibited ot	her than its purpose	e. This test report shall	not be reproduced except in		

2017.10.30.

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If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description
DRTFCC1709-0192	Sep. 12, 2017	Initial issue
DRTFCC1709-0192(1)	Oct. 26, 2017	Add the section 1.6
DRTFCC1709-0192(2)	Oct. 30, 2017	Revised the section 1.6

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1. GENERAL INFORMATION

1.1 Testing Laboratory

DT&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The site is constructed in conformance with the requirements.

- FCC MRA Accredited Test Firm No. : KR0034

- IC Test site	Telephone : + 82-31-321-2664					
www.dtnc.net	www.dtnc.net					
Telephone	:	+ 82-31-321-2664				
FAX	:	+ 82-31-321-1664				

1.2 Test Environment

Ambient Condition	
Temperature	+23 ~ +24 °C
 Relative Humidity 	42 % ~ 48 %

1.3 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014 and ANSI C 63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

Test items	Measurement uncertainty
Transmitter Output Power	0.70 dB (The confidence level is about 95 %, $k = 2$)
Conducted spurious emission	0.94 dB (The confidence level is about 95 %, $k = 2$)
AC conducted emission	2.4 dB (The confidence level is about 95 %, k = 2)
Radiated spurious emission (1 GHz Below)	5.1 dB (The confidence level is about 95 %, k = 2)
Radiated spurious emission (1 GHz ~ 18 GHz)	5.4 dB (The confidence level is about 95 %, k = 2)
Radiated spurious emission (18 GHz Above)	5.3 dB (The confidence level is about 95 %, $k = 2$)

1.4 Details of Applicant

Applicant (FCC)	:	POINTMOBILE CO., LTD.
Applicant (IC)		POINTMOBILE CO.,LTD
Address (FCC)	:	B-9F, Kabul Great Valley 32 Digital-ro 9-gil, Geumcheon-gu Seoul South Korea 153-709
Address (IC)		B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu Seoul Korea (Republic Of)
Contact person (FCC)	:	Wilson Park
Contact person (IC)	:	Edgar Cho

1.5 Description of EUT

EUT	Mobile Computer
Model Name	FCC: PM70 IC: PM70W
Add Model Name	NA
Power Supply	DC 3.8 V
Hardware version	MP
Software version	70.00
Frequency Range	2.4GHz Band • 802.11b/g/n(HT20) : 2412 MHz ~ 2462 MHz
Max. RF Output Power	2.4GHz Band • 802.11b : 18.75 dBm • 802.11g : 21.94 dBm • 802.11n (HT20) : 21.49 dBm
Modulation Type	802.11b : DSSS/CCK 802.11g/n : OFDM
Antenna Specification	Internal Antenna • 2.4GHz Band Max. peak gain : -2.577 dBi



1.6 Reference test data explanations

• Introduction

This report includes the WLAN(2.4GHz) conducted test data of FCC ID: V2X-PM70G / IC: 10664A-PM70G with reference to KDB 484596 D01 Referencing Test Data DR01-42712. And the applicant takes full responsibility that the test data as reference section below represents compliance for FCC ID: V2X-PM70W / IC: 10664A-PM70W.

• Explain the difference

The difference between FCC ID: V2X-PM70W / IC: 10664A-PM70W and FCC ID: V2X-PM70G / IC: 10664A-PM70G are as follows.

FCC ID	V2X-PM70G	V2X-PM70W	
IC	10664A-PM70G	10664A-PM70W	
	WCDMA, LTE	NA	
DE Conchilition	WLAN	WLAN	
RF Capabilities	Bluetooth	Bluetooth	
	NFC	NFC	

Note: The two products are same enclosure and printed circuit board.

FCC ID: V2X-PM70W / IC: 10664A-PM70W has been removed the part of WCDMA/LTE transmitter. And the other transmitter portion has not changed.

• Spot check verification data

	Channel	Frequency [MHz]		Test Res		
Mode			Detector	DATA RATE [MCS 0]		Deviation of the two
				Reference data (FCC ID: V2X-PM70G IC: 10664A-PM70G)	Spot check data (FCC ID: V2X-PM70W IC: 10664A-PM70W)	products [dB]
	4	2412	РК	21.38	20.10	-1.28
	I	2412	AV	13.84	12.72	-1.12
802.11n	6	2437	РК	21.49	20.24	-1.25
(HT20)			AV	13.23	12.88	-0.35
		2462	РК	20.53	20.51	-0.02
			AV	12.46	12.98	0.52

Note: The deviation of the two products shows a good correlation.(less than 1.5dB) Also, the spot check data is within the tune-up range and comply with the limit.

• Reference section

Equipment Class	Reference FCC ID	Reference IC	Type Grant/Permissive change	Folder Test/RF Exposure	Report title	Sections
DSS	V2X-PM70G	10664A-PM70G	Grant	Test	Test Rpt (DSS)	Sections 2, 3, 4, 5, 6, 7, 10
DTS	V2X-PM70G	10664A-PM70G	Grant	Test	Test Rpt (DTS-LE)	Sections 3.1, 3.2, 3.3, 3.4, 3.7
DTS	V2X-PM70G	10664A-PM70G	Grant	Test	Test Rpt (DTS-WLAN)	Sections 6.1, 6.2, 6.3, 6.4, 6.7
NII	V2X-PM70G	10664A-PM70G	Grant	Test	Test Rpt (NII-WLAN)	Sections 7.1, 7.2, 7.3, 7.4, 7.5, 7.8
INII	V2A-FINI70G	100047-110100	Grant	1031	Test Rpt (DFS)	All sections

2. SUMMARY OF TESTS

FCC Part	RSS Std.	Parameter	Limit	Test Condition	Status Note 1			
15.247(a)	RSS-247 [5.2]	6 dB Bandwidth	> 500 kHz		С			
15.247(b)	RSS-247 [5.4]	Transmitter Output Power	< 1 Watt		С			
15.247(d)	RSS-247 [5.5]	Out of Band Emissions / Band Edge	20 dBc in any 100 kHz BW	Conducted	с			
15.247(e)	RSS-247 [5.2]	Transmitter Power Spectral Density	< 8 dBm/3 kHz		С			
-	RSS-Gen [6.6]	Occupied Bandwidth (99 %)	RSS-Gen(6.6)		С			
15.247(d) 15.205 15.209	RSS-247 [5.5] RSS-GEN [8.9] RSS-GEN [8.10]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	FCC 15.209 limits	Radiated	C Note 2			
15.207	RSS-Gen [8.8]	AC Line Conducted Emissions	FCC 15.207 limits	AC Line Conducted	С			
15.203	RSS-Gen [8.3]	Antenna Requirements	FCC 15.203	-	С			
	Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable Note 2: This test item was performed in each axis and the worst case data was reported.							



3. TEST METHODOLOGY

Generally the tests were performed according to the KDB558074 D01 v04. And ANSI C63.10-2013 was used to reference appropriate EUT setup and maximizing procedures of radiated spurious emission and AC line conducted emission testing.

3.1 EUT CONFIGURATION

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

3.2 EUT EXERCISE

The EUT was operated in the test mode to fix the TX frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The power-line conducted emission test procedure is not described on the KDB 558074. So this test was fulfilled with the requirements in Section 6.2 of ANSI C63.10.

The EUT is placed on the wooden table, which is 0.8 m above ground plane and the conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and Average detector.

Radiated Emissions

Basically the radiated tests were performed with KDB 558074. But some requirements and procedures like test site requirements, EUT setup and maximizing procedure were fulfilled with the requirements in Section 5 and 6 of the ANSI C63.10 as stated on section 12.1 of the KDB 558074.

The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m 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 highest emission, the relative positions of the EUT were rotated through three orthogonal axes.

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested with all modes of operating conditions to determine the worst case emission characteristics. A test program is used to control the EUT for staying in continuous transmitting mode.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. ANTENNA REQUIREMENTS

5.1 According to FCC 47 CFR §15. 203 & RSS-Gen [8.3]

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The internal antenna is attached on the main PCB using the special spring tension. (Refer to Internal Photo file.) Therefore this E.U.T Complies with the requirement of §15.203.

6. TEST RESULT

6.1 6 dB Bandwidth

Test Requirements and limit, §15.247(a)

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

The minimum permissible 6 dB bandwidth is 500 kHz.

TEST CONFIGURATION

Refer to the APPENDIX I.

TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of KDB558074

- 1. Set resolution bandwidth (RBW) = 100 kHz.
- 2. Set the video bandwidth (VBW) \ge 3 x RBW.
- (<u>RBW : 100 kHz / VBW : 300 kHz</u>) 3. Detector = **Peak**.
- 4. Trace mode = Max hold.
- 5. Sweep = Auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

TEST RESULTS: Comply

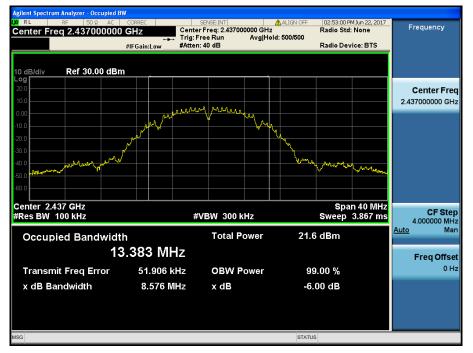
Test Mode	Data Rate	Frequency [MHz]	Test Results [MHz]
		2412	9.098
802.11b	1 Mbps	2437	8.576
		2462	8.569
		2412	16.410
802.11g	6 Mbps	2437	16.430
		2462	16.350
		2412	17.620
802.11n (HT20)	MCS 0	2437	17.650
		2462	17.300

RESULT PLOTS

6 dB Bandwidth Test Mode: 802.11b & 1 Mbps & 2412 MHz nt Spectrum Analyzer - Occupied BV 02:50:50 PM Jun 22, 201 Radio Std: None Frequency Center Freq: 2.412000000 GHz Trig: Free Run Avg|Hol #Atten: 30 dB Center Freq 2.412000000 GHz Avg|Hold: 500/500 #IFGain:Low Radio Device: BTS Ref 30.00 dBm **Center Freq** 2.412000000 GHz A A AJ LA D.A.I Center 2.412 GHz #Res BW 100 kHz Span 40 MHz Sweep 3.867 ms CF Step 4.000000 MHz Man #VBW 300 kHz <u>Auto</u> 22.1 dBm Total Power **Occupied Bandwidth** 13.525 MHz **Freq Offset** Transmit Freq Error 85.767 kHz **OBW Power** 99.00 % 0 Hz x dB Bandwidth 9.098 MHz -6.00 dB x dB STATUS

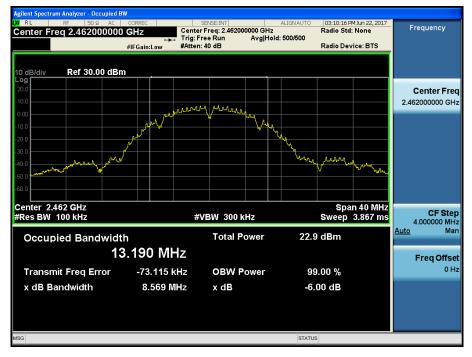
6 dB Bandwidth

Test Mode: 802.11b & 1 Mbps & 2437 MHz



6 dB Bandwidth

Test Mode: 802.11b & 1 Mbps & 2462 MHz



6 dB Bandwidth

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Test Mode: 802.11g & 6 Mbps & 2412 MHz



6 dB Bandwidth

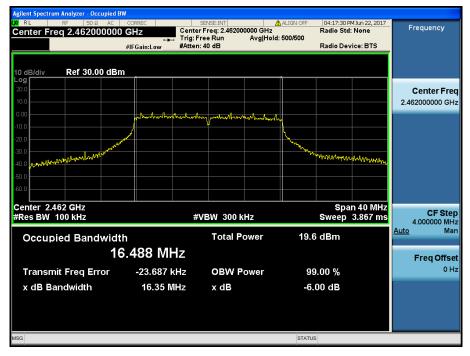
Test Mode: 802.11g & 6 Mbps & 2437 MHz



Dt&C

6 dB Bandwidth

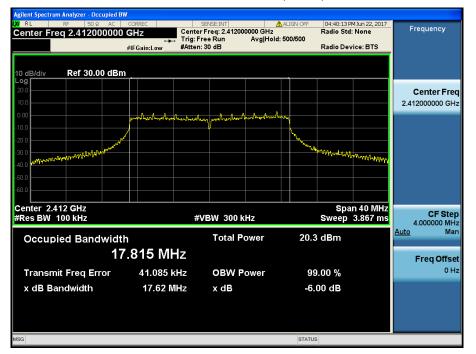
Test Mode: 802.11g & 6 Mbps & 2462 MHz



6 dB Bandwidth

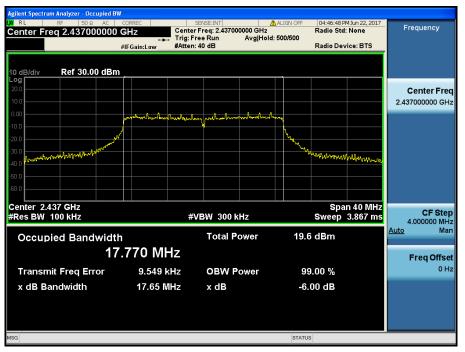
Dt&C

Test Mode: 802.11n(HT20) & MCS 0 & 2412 MHz



6 dB Bandwidth

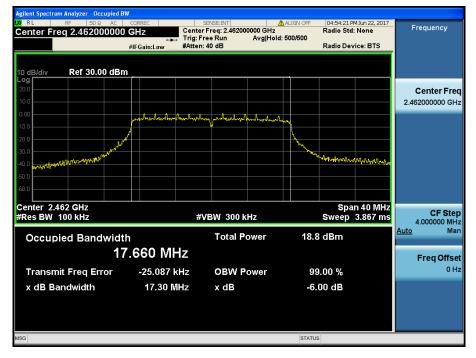
Test Mode: 802.11n(HT20) & MCS 0 & 2437 MHz



🛈 Dt&C

6 dB Bandwidth

Test Mode: 802.11n(HT20) & MCS 0 & 2462 MHz

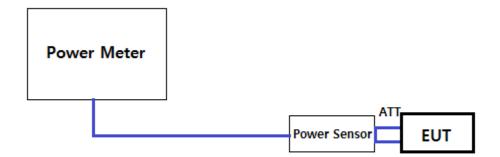


6.2 Maximum Peak Conducted Output Power

Test Requirements and limit, §15.247(b)

The maximum permissible conducted output power is 1 Watt.

TEST CONFIGURATION



TEST PROCEDURE

1. PKPM1 Peak power meter method of KDB558074

The maximum conducted output powers were measured using a broadband peak RF power meter which has greater video bandwidth than DUT's DTS bandwidth and utilize a fast-responding diode detector.

2. Method AVGPM-G (Measurement using a gated RF average power meter) of KDB558074

The average conducted output powers were measured using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

TEST RESULTS: Comply

- Measurement Data:

- Test Results

					Test Result [dBm]							
Mode	Channel	Frequency [MHz]	Detector			D	ATA RAT	E [Mbps]			
		[·····]		1	2	5.5	11	NA	NA	NA	NA	
	1	2412	PK	17.84	17.82	17.81	17.82	-	-	-	-	
	1		AV	15.29	15.18	15.22	15.17	-	-	-	-	
002 445	C	0407	PK	17.54	17.48	17.59	17.44	-	-	-	-	
802.11b	6	2437	AV	14.87	14.82	14.80	14.84	-	-	-	-	
	44	2462	PK	18.75	18.68	18.74	18.66	-	-	-	-	
	11		AV	16.10	16.08	15.95	16.07	-	-	-	-	

				Test Result [dBm]							
Mode	Channel	Frequency [MHz]	Detector			C	OATA RA	TE [Mbps	5]		
				6	9	12	18	24	36	48	54
	1	2412	PK	21.91	21.84	21.86	21.94	21.85	21.84	21.82	21.78
	I		AV	14.70	14.69	14.70	14.62	14.60	14.65	14.56	14.57
002.11.*	6	2437	PK	21.54	21.54	21.54	21.47	21.43	21.50	21.47	21.48
802.11g	6	2437	AV	14.15	14.16	14.06	14.05	14.15	14.09	14.14	14.10
	44	2462	PK	21.65	21.64	21.60	21.61	21.48	21.60	21.57	21.63
	11		AV	13.30	13.25	13.19	13.16	13.19	13.23	13.31	13.25

Mode Channe					Test Result [dBm]							
	Channel	Frequency [MHz]	Detector			I	DATA RA	TE [MCS]			
				0	1	2	3	4	5	6	7	
	1	2412	PK	21.38	21.33	21.37	21.33	21.26	21.25	21.32	21.31	
	I		AV	13.84	13.72	13.72	13.73	13.67	13.64	13.75	13.75	
802.11n	G	2427	PK	21.49	21.39	21.40	21.38	21.39	21.45	21.33	21.45	
(HT20)	6	2437	AV	13.23	13.12	13.16	13.13	13.12	13.25	13.16	13.13	
	44	2462	PK	20.53	20.51	20.48	20.43	20.34	20.35	20.45	20.45	
	11		AV	12.46	12.40	12.35	12.33	12.28	12.35	12.31	12.41	



6.3 Maximum Power Spectral Density

Test requirements and limit, §15.247(e)

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

TEST CONFIGURATION

Refer to the APPENDIX I.

Test Procedure

Method PKPSD of KDB558074 is used.

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS bandwidth.
- 3. Set the RBW to : **3 kHz** ≤ RBW ≤ **100 kHz**
- 4. Set the VBW \ge 3 x RBW
- 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 within the RBW.

10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Mode	Data Rate	Frequency [MHz]	RBW	PKPSD [dBm]
		2412	3 kHz	-7.73
802.11b	1 Mbps	2437	3 kHz	-9.04
		2462	3 kHz	-5.92
		2412	3 kHz	-9.57
802.11g	6 Mbps	2437	3 kHz	-11.86
		2462	3 kHz	-11.76
		2412	3 kHz	-11.79
802.11n HT20	MCS 0	2437	3 kHz	-12.35
		2462	3 kHz	-13.77

TEST RESULTS: Comply

Test Mode: 802.11b & 1 Mbps & 2412 MHz

RESULT PLOTS

Maximum PKPSD



Maximum PKPSD

Test Mode: 802.11b & 1 Mbps & 2437 MHz



Test Mode: 802.11b & 1 Mbps & 2462 MHz

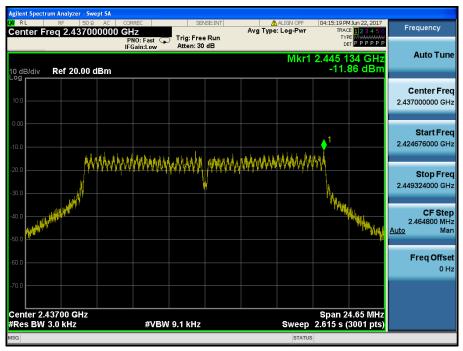


Test Mode: 802.11g & 6 Mbps & 2412 MHz

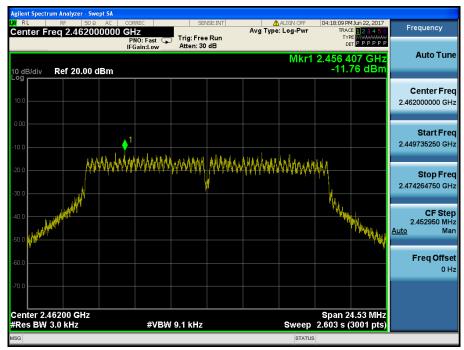


Maximum PKPSD

Test Mode: 802.11g & 6 Mbps & 2437 MHz



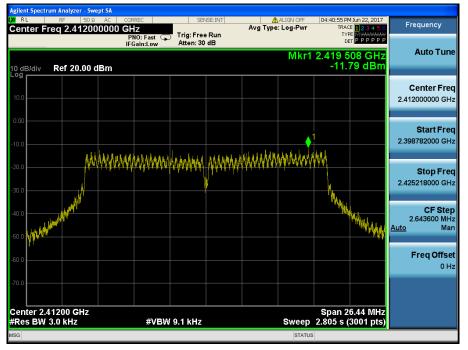
Test Mode: 802.11g & 6 Mbps & 2462 MHz



Dt&C

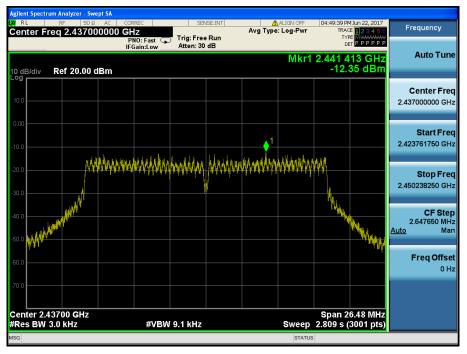
Maximum PKPSD

Test Mode: 802.11n(HT20) & MCS 0 & 2412 MHz



Maximum PKPSD

Test Mode: 802.11n(HT20) & MCS 0 & 2437 MHz



Test Mode: 802.11n(HT20) & MCS 0 & 2462 MHz



6.4 Out of Band Emissions at the Band Edge / Conducted Spurious Emissions

Test requirements and limit, §15.247(d)

§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions :

If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured inband average PSD level.

In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

TEST CONFIGURATION

Refer to the APPENDIX I.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer.

- Measurement Procedure 1 – Reference Level

- 1. Set instrument center frequency to DTS channel center frequency.
- 2. Set the span to \geq 1.5 times the DTS bandwidth.
- 3. Set the RBW = **100 kHz.**
- 4. Set the VBW \geq 3 x RBW.
- 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 PSD level.

- Measurement Procedure 2 - Unwanted Emissions

- 1. Set the center frequency and span to encompass frequency range to be measured.
- 2. Set the RBW = 100 kHz. (Actual 1 MHz , See below note)
- 3. Set the VBW \geq 3 x RBW. (Actual 3 MHz, See below note)
- 4. Detector = Peak.
- 5. Ensure that the number of measurement points \geq Span / RBW.
- 6. Sweep time = Auto couple.
- 7. Trace mode = **Max hold.**
- 8. Allow the trace to stabilize. (this may take some time, depending on the extent of the span)
- 9. Use the peak marker function to determine the maximum amplitude level.

Note: The conducted spurious emission was tested with below settings.

Frequency range: 9 kHz ~ 30 MHz

RBW = 100 kHz, VBW = 300 kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 40001

Frequency range: 30 MHz ~ 10 GHz, 10 GHz ~25 GHz RBW = 1 MHz, VBW = 3 MHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 40001

LIMIT LINE = 20 dB below of the reference level of above measurement procedure Step 2. (RBW = 100 kHz, VBW = 300 kHz)

If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 kHz, VBW = 300 kHz, SPAN = 100 MHz and BINS = 2001 to get accurate emission level within 100 kHz BW.

Also the path loss for conducted measurement setup was used as described on the Appendix I of this test report.



RESULT PLOTS

802.11b & 1 Mbps & 2412 MHz

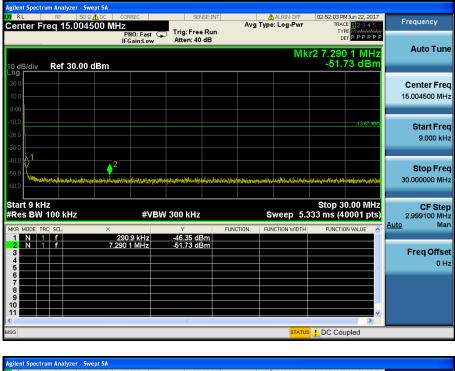


Reference

Low Band-edge







WiKFS 3.043 68 GHZ -35.60 dBm 0 dB/div Ref 30.00 dBm -35.60 dBm 200 1 </th <th>Agilent Spectrum Analyzer - Swept SA</th> <th></th> <th></th> <th></th> <th></th>	Agilent Spectrum Analyzer - Swept SA				
PR0: Fast Trig: Free Run Atten: 40 dB Mkr5 3.043 68 GHz -35.60 dBm Auto Tune 10 dE/div Ref 30.00 dBm -35.60 dBm -35.60 dBm Center Freq 5.01500000 GHz 200 -		GH ₇	Avg Type: Log	-Pwr TRACE 123456	Frequency
Control Control Center Freq 200 100		PNO: Fast 😱 Trig: Free	dB	Mkr5 3.043 68 GHz	Auto Tune
Start So MHz Y Bunction Function width Function value Start Freq 30.000000 MHz 400 400 5 4 4 3 3 3 5 5 4 4 3 3 3 3 3 5 5 4 4 4 3 3 3 3 5 5 4 4 3 3 3 5 5 4 4 3 3 3 5 5 4 4 3 3 3 5 5 5 4 4 3 3 3 5	20.0 10.0				Center Freq 5.015000000 GHz
600 Stop Freq 10.00000000 GHz 801 Start 30 MHz 802 Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) 1 f 2 N 1 f 4 N 1 f 3 N 1 f 3 N 1 f 4 N 1 f 3 N 1 f 3 N 1 f 3 N 1 f 3 N 1 f 3 N 1 f 3 N 1 f 3 N 1 f 3 N 1 f 3 N 1 f 3 N 1 f 3 N <td>-20.0</td> <td>52²</td> <td></td> <td></td> <td>Start Freq 30.000000 MHz</td>	-20.0	52 ²			Start Freq 30.000000 MHz
#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.67 ms (40001 pts) 997.00000 MHz MKR MODE TRCI SCL X Y FUNCTION FUNCTION WDTH FUNCTION VALUE Auto Man 1 N 1 f 2.413 33 GHz 9.40 GBm State State Auto Man 1 N 1 f 7.710 64 GHz S5.80 GBm Function watch Function watch Freq Offset 6 N 1 f 3.043 68 GHz -35.50 dBm Freq Offset 0 Hz 8 9 9 9 - - - - - 10 0 - - - - - - - - 11 -	-50.0				Stop Freq 10.000000000 GHz
MRR MODE TRC SCL X Y FUNCTION FUNCTION VIDTH FUNCTION VALUE 1 N 1 f 2413 33 GHz 940 dBm 2 N 1 f 4824 32 GHz 33 20 dBm 3 N 1 f 7.710 64 GHz 33 50 dBm 4 N 1 f 7.7110 43 GHz 35.60 dBm 6 7 8 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Start 30 MHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Swee		CF Step 997.000000 MHz
3 N 1 f 7.710 64 GHz 35.50 dBm 35.50 dBm	1 N 1 f 2.4'	13 33 GHz 9.40 dE	Bm	WIDTH FUNCTION VALUE	Auto Mari
7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	3 N 1 f 7.7' 4 N 1 f 7.1' 5 N 1 f 3.04	10 64 GHz -35.50 dB 14 43 GHz -35.58 dB	lm		Freq Offset 0 Hz
	7 8 8 9 10 10 10 10 10 10 10 10 10 10 10 10 10 1				
	K MSG			STATUS	

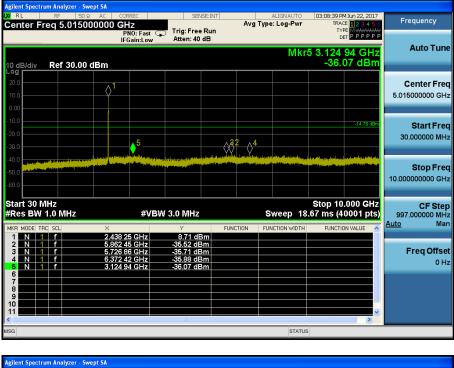


802.11b & 1 Mbps & 2437 MHz



Reference

Agilent Spectr									
Center Fi		50 Ω <u>1∆</u> DC D4500 Mi		SENSE	Av	ALIGNAUTO Type: Log-Pwr	03:08:30 PM Ju TRACE	23456	Frequency
			PNO: Fast IFGain:Low	Trig: Free R Atten: 40 dl			TYPE DET	PPPPP	Auto Tune
10 dB/div	Ref 30.0	00 dBm					/Wkr2 307. -45.22		AutoTune
20.0 10.0									Center Fred 15.004500 MH:
-10.0								-14.79 dBm	Start Free 9.000 kH:
-40.0 2 -50.0	hatherica, action, and the	diaininining milinan	terfattanistatunis	ilasoppi unteksenteksisesteis	Manjahaistinatinan	erhansbefisterkssenkelensberedere betreise	History, gargebries	in a stand of the	Stop Free 30.000000 MH
Start 9 kH #Res BW			#VB	W 300 kHz		Sweep 5.3	Stop 30.0 333 ms (400	01 pts)	CF Ste 2.999100 MH Auto Ma
MKR MODE TR		Х	307.4 kHz	-45.22 dBr	FUNCTION	FUNCTION WIDTH	FUNCTION V	ALUE 🔼	<u>Auto</u> Ma
2 N 1 3 4 5 5	f		307.4 kHz	-45.22 dBn					Freq Offse 0 H
6 7 8 9									
10								~	
ISG						STATUS	DC Couple	ed	



Agilent Spectrum Analyzer - Swept SA					
RL RF 50 Ω AC Center Freq 17.500000000) GHz		ALIGNAUTO ype: Log-Pwr	03:08:47 PM Jun 22, 2017 TRACE 2 3 4 5 6 TYPE MANAGEM	Frequency
10 dB/div Ref 30.00 dBm	PNO: Fast Trig: Fro IFGain:Low Atten: 4		Mkr3 24	.338 875 GHz -26.98 dBm	Auto Tune
20.0 10.0					Center Freq 17.50000000 GHz
-10.0 -20.0 -30.0			Intelessor in Excision data para pada para pada	-14.79 dBm	Start Freq 10.000000000 GHz
-40.0 dip left a land of the set					Stop Freq 25.000000000 GHz
Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MH		Sweep 40.0	Stop 25.000 GHz 0 ms (40001 pts)	CF Step 1.50000000 GHz Auto Man
2 N 1 f 23.997	Y 250 GHz 2650 GHz 2650 GHz 875 GHz 875 GHz 26.98 c	dBm	FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
MSG			STATUS		

802.11b & 1 Mbps & 2462 MHz



Reference

High Band-edge



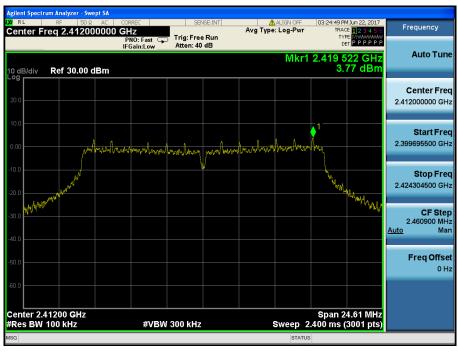


Agilent Spectrum Analyzer - Swept S					
₩ RL RF 50ΩΛΩ Center Freq 15.004500		SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	03:11:29 PM Jun 22, 2017 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
10 dB/div Ref 30.00 dBr	IFGain:Low	Atten: 40 dB	MI	оет РРРРРР (r2 1.568 5 MHz -51.31 dBm	Auto Tune
20.0 10.0 0.00					Center Freq 15.004500 MHz
-10.0				-13:23 tdBm	Start Freq 9.000 kHz
-40.0	ĸĹĸŢĹĹſŦŔĊĹĸĸŢĊŢŎŔĸĬĬŦĸĬ	npednijeđersulovarnitestajsta	a ciju (kada at ku ngati neta nji izi 1991 tet kan binga	าร์อากรีสู่ข้อสูงไปเป็นอาการในอุปัตรุปัตรูปกรุปกรรมที่สาม	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz	#VBV	/ 300 kHz	Sweep 5.	Stop 30.00 MHz 333 ms (40001 pts)	CF Step 2.999100 MHz
MKR MODE TRC SCL 1 N 1 f 2 N 1 f 3 - - 4 - - 5 - - 6 - -	× 281.9 kHz 1.568 5 MHz	-46.16 dBm -51.31 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man Freq Offset 0 Hz
7 9 10 11				×	
MSG			STATL	s 1. DC Coupled	

Agilent Spectrum An											
Center Freq	50 Ω AC COF 5.015000000 GH	REC	SENSE			ALIGNAUTO : Log-Pwr	TRAG	M Jun 22, 2017 E <mark>1 2 3 4 5</mark> 6	Frequency		
	Р	NO: Fast 🕞 Gain:Low	Trig: Free F Atten: 40 d				TY D	PE MWWWWW ET P P P P P P			
	Mkr5 3.288 94 GHz										
10 dB/div Re	dB/div Ref 30.00 dBm -35.66 dBm										
20.0	. 1								Center Freq		
10.0	\^'								5.015000000 GHz		
0.00											
-10.0								-13.23 dBm	Otort Error		
-20.0									Start Freq 30.000000 MHz		
-30.0		⁵		∂					00.000000 Mil 12		
-40.0			designed to a section of	and a second	and a state of the s	and the second second					
-50.0	a stands do nel sederal de la seconda de		المحالية والتقار						Stop Freq 10.00000000 GHz		
-60.0									10.00000000 GH2		
Start 30 MHz							Stop 10	.000 GHz	CF Step		
#Res BW 1.0	MHz	#VBW	3.0 MHz		s	weep 18			997.000000 MHz		
MKR MODE TRC SCL			Y	FUNC	TION FUN	ICTION WIDTH	FUNCTIO	ON VALUE	<u>Auto</u> Man		
1 N 1 f 2 N 1 f	2.460 9		10.45 dBn -35.20 dBn								
3 N 1 f	5.815 5 2.661 0	9 GHz	-35.41 dBn -35.50 dBn	n					Freq Offset		
5 N 1 f	3.288 9		-35.66 dBn					=	0 Hz		
6 7											
8											
10											
<			Ш					<u>></u>			
MSG						STATUS					

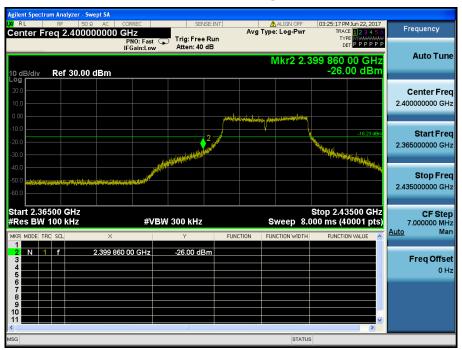


802.11g & 6 Mbps & 2412 MHz

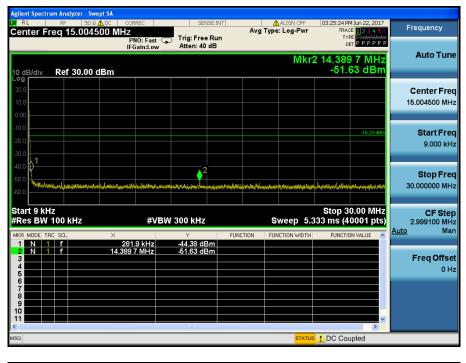


Reference

Low Band-edge







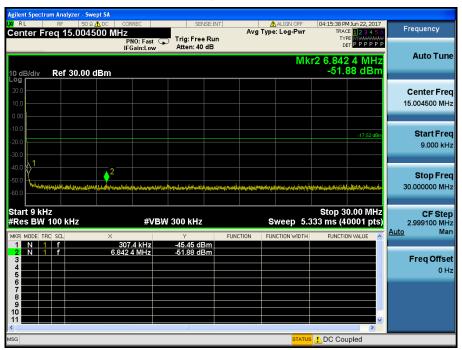
	um Analyzer -					_				
Center F		000000 GH		SENS			ALIGN OFF	TRAC	4 Jun 22, 2017)E <mark>1 2 3 4 5 6</mark>	Frequency
		P	NO: Fast G Gain:Low	Trig: Free F Atten: 40 d				DI	Е Милинии ТРРРРРР	
40.151.15	Ref 30.0						Mkr		15 GHz 98 dBm	Auto Tune
10 dB/div Log 20.0	Rei 30.0									Center Freq
10.0										5.015000000 GHz
-10.0		\$ ²							-16.23 dBm	Start Freq
-30.0						3	and the second second			30.000000 MHz
-40.0 -50.0	an in the second se									Stop Freq 10.000000000 GHz
-60.0										10.000000000 6112
Start 30 M #Res BW			#VBV	V 3.0 MHz		s	weep 18	Stop 10 .67 ms (4	.000 GHz 0001 pts)	CF Step 997.000000 MHz
MKR MODE TH	RC SCL	× 2.418 5	6 CH7	۲ 10.71 dBr	FUNCTIO	N FUI	NCTION WIDTH	FUNCTIO	IN VALUE	<u>Auto</u> Man
2 N 1 3 N 1 4 N 1	f f	2.425 5 2.425 5 6.265 7 2.447 2	4 GHz 4 GHz	-13.83 dBn -35.37 dBn -35.74 dBn	n n					Freq Offset
5 N 1 6	f	2.555 1		-35.98 dBn					=	0 Hz
7 8 9										
10 11									~	
MSG							STATUS			

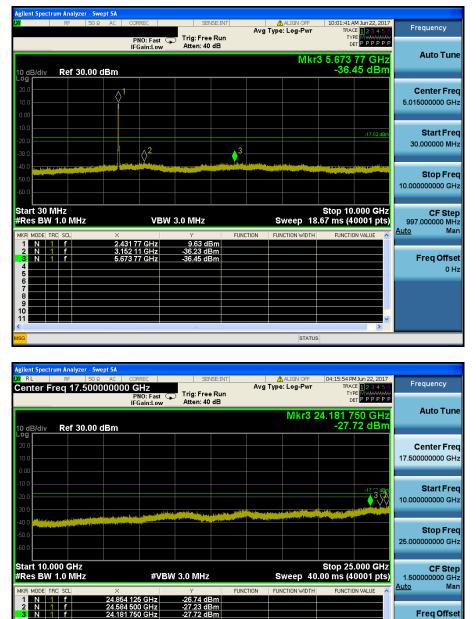
XI RL	um Analyzer - S RF 50 req 17.500	Ω AC CO 0000000 C P	RREC CHZ NO: Fast G Gain:Low	SENSE Trig: Free F Atten: 40 d	lun		ALIGN OFF : Log-Pwr	TRAC	4 Jun 22, 2017 12 1 2 3 4 5 6 12 M WWWWW 15 P P P P P P	Frequency
10 dB/div	Ref 30.00		Gam.cow	Theorem and a			Mkr3 2	4.624 6 -27.1	25 GHz 14 dBm	Auto Tune
20.0 10.0 0.00										Center Fred 17.500000000 GHz
-10.0 -20.0 -30.0					Naporal and State and State and State	A CONTRACT OF A	North Income and Array		-16.23 dBm	Start Fred 10.000000000 GHz
-40.0										Stop Free 25.000000000 GH:
Start 10.0 Res BW	1.0 MHz	×	#VB\	N 3.0 MHz	FUNC		weep 40	.00 ms (4	.000 GHz 0001 pts)	CF Step 1.50000000 GH Auto Mar
1 N 1 2 N 1 3 N 1 4 5	f f	24.382 75 24.694 00 24.624 62	0 GHz	-26.48 dBn -27.04 dBn -27.14 dBn	1			FONCTIO		Freq Offse 0 H
6 7 8 9 10 11										
sg							STATUS		>	

802.11g & 6 Mbps & 2437 MHz



Reference





0 Hz

STATUS

802.11g & 6 Mbps & 2462 MHz



Reference

High Band-edge



Agilen		ctrur																					
Cen		Fre	RF Pq 1		50 Ω / 045		ЙНz	RREC		Tria: F	SENSE:		Avg		ALIGN OF		04:18:5 T	RACE	n 22, 201 2 3 4 5 9 P P P P	6	F	requen	су
10 dl	B/div	/	Rei	30.	00 c	IBm	IF	Gain:L			: 40 dB					N	lkr2 2	298.				Auto	Tune
Log 20.0 10.0 0.00																						Cente 5.00450	•
-10.0 -20.0 -30.0	2																		-18.20 dB	17			t Freq 00 kHz
-40.0 -50.0 -60.0	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	<u>ليديرا</u> م	,anlai ni	htereside	episio A	u nga intera	₩₩₩₩₩₩₩	feret informe	ulp ⁴ til _k ully	hjadot, synthesed	rikitione	rifilmant for the state	ant mary is	vilment	denduise	per an	oprafalaskanke,	ang ng n	on, bridgen, h	-	3	Stop 0.00000	Freq 10 MHz
Star #Re	sВ	W 1	00	kHz				#	VBN	/ 300 k	Hz				weep		33 ms	(400		5)	Auto	CF 2.99910	Step 0 MHz Man
MKR 1	MODE N	TRC 1	SCL			×		.4 kH	-	Y 45.05	dBm		CTION	FUN	ICTION WIE	TH	FUN	CTION \	ALUE		Auto		Wall
2 3 4 5	Ň	1	f				298	.4 kH:	z	-45.97	dBm									=		Freq	Offset 0 Hz
6 7 8 9 10																							
11 <														-					>				
MSG															ST/	ATUS	🚹 DC (Coupl	ed				

Agilent Spectrum Analyzer - Swept SA					
RL RF 50 Ω AC Center Freq 5.015000000	CORREC GH7	SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	04:19:05 PM Jun 22, 2017 TRACE 1 2 3 4 5 6	Frequency
	PNO: East	rig: Free Run Atten: 40 dB			
	II Gam.cow .		Mkr	5 3.096 02 GHz	Auto Tune
10 dB/div Ref 30.00 dBm			IVIKI	-35.93 dBm	
20.0					Contor From
10.0					Center Freq 5.015000000 GHz
0.00					3.013000000 0112
-10.0					
-20.0				-18.20 dBm	Start Freq
-30.0	5		\$4		30.000000 MHz
-40.0			ووالانحام والانتقاء ويعالوه والتواوي	a house and the state of the st	
-50.0				أنطنا التشاقلية متصليب مخالا	Stop Freq
-60.0					10.00000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VBW 3.	0 MHz	Sweep 18	Stop 10.000 GHz .67 ms (40001 pts)	CF Step 997.000000 MHz
MKR MODE TRC SCL X		Y FUN	CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 2.46	0 19 GHz 2 24 GHz -2	8.97 dBm 29.29 dBm			
3 N 1 f 5.76	6 74 GHz 🚽 式	35.17 dBm			Freq Offset
5 N 1 f 3.09		35.89 dBm 35.93 dBm		=	0 Hz
6 7					
8					
10					
		ш		~	
MSG			STATUS	3	

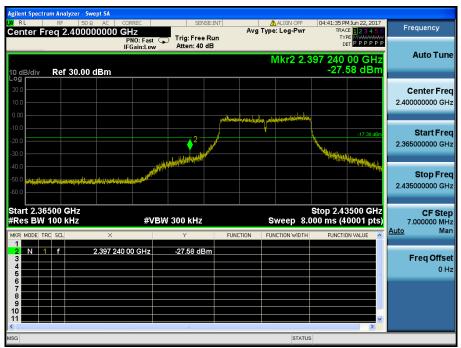


802.11n(HT20) & MCS 0 & 2412 MHz



Reference

Low Band-edge



Agiler		trum	Anal																											
w∥ Cen	L Iter		RF 1			<u>1</u> dc 00				∣ nst ⊂		Tria	SEI	NSE:I			Av			lign of .og-P		04:	TE	RACE	Jun 22, 1 2 3 M WW P P P	456	F	reque	ncy	
10 d Log	B/div	R	lef	30.0)0 c	IBm		IFGa					en: 40								ſ		23	06	ррр .7 k 7 dl	Hz		Aut	o Tu	ne
20.0 10.0 0.00																													er Fr 500 M	
-10.0 -20.0 -30.0																									-17.3	8 dBm			ort Fr 000 k	
-40.0 -50.0 -60.0	2_	tan ay t		www.tw	nding file	larme	deg til før	a il an	hainta	<u>ht</u> here the	mana	dawth	moani	inter and	Have	utere ta	nyat hawa	tiensheet	i de la como	derret fin inter	ist-qia	ulutter (id,	ri y iit	ree.L	wine)d	he Hand for	3		ор Fr 000 М	
#Re	nt9k sBV	V 10		Hz			×		#	VB	W 3	i00 Y	kHz			FUNC	TION			eep TION WI		33 1	ns	(40	.00 N 001 VALUE	pts)	uto		F Ste 100 M M	
1 2 3 4 5 6	Ν	1	f				30	06.7 06.7	'kH 'kH	z z		-46.	77 di 77 di	3m 3m		FUNC	TION		JNUT				FUNC	TUN	VALUE			Frec	Offs 0	set Hz
7 8 9 10 11 <												1														>				
MSG	_			_	_	_	_													ST	ATUS	<u>1</u> 0	C C	oup	led			_		_

Agilent Spectrum Analyzer - Swep					
RL RF 50 Ω Center Freq 5.015000	AC CORREC	SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	04:41:51 PM Jun 22, 2017 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast G	Trig: Free Run Atten: 40 dB		TYPE MWWWWWW DET P P P P P P	
	II GUILLOW		Mkr	5 9.969 59 GHz	Auto Tune
10 dB/div Ref 30.00 d	Bm			-36.05 dBm	
20.0					Center Freq
10.0	`				5.015000000 GHz
0.00					
-10.0	2				Start Freq
-20.0				-17.38 dBm	30.000000 MHz
-30.0	_			5	
-40.0		المراجعة عن المراجعة المراجعة محمد المراجعة المراجع	a Miller (na an Articles II) a principal de la dera production de la pro- California de la companya de la comp		04 E
-50.0					Stop Freq 10.00000000 GHz
-60.0					10.0000000000000
Start 30 MHz				Stop 10.000 GHz	CF Step
#Res BW 1.0 MHz	#VBI	V 3.0 MHz	Sweep 18	.67 ms (40001 pts)	997.000000 MHz
MKR MODE TRC SCL	×		FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 2 N 1 f	2.419 06 GHz 2.428 28 GHz	9.97 dBm -17.31 dBm			
3 N 1 F 4 N 1 F	2.434 76 GHz 2.391 15 GHz	-23.32 dBm -25.33 dBm			Freq Offset
5 N 1 f	9.969 59 GHz	-36.05 dBm		=	0 Hz
7					
8 9 9					
10				~	
<		Ш		>	
MSG			STATUS	3	

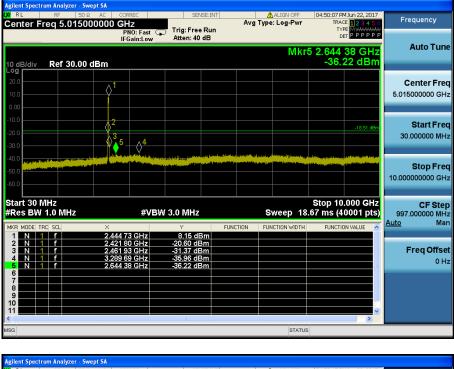


802.11n(HT20) & MCS 0 & 2437 MHz



Reference

RL RF 50Ω <u>A</u> DC enter Freq 15.004500 Ν		SENSE:INT	ALIGN OFF Avg Type: Log-Pwi	TYPE M MARABARARA	Frequency
	PNO: Fast (IFGain:Low	Atten: 40 dB		DET PPPPPP Mkr2 281.9 kHz	Auto Tun
0 dB/div Ref 30.00 dBm 99 0.0 0.0				-44.53 dBm	Center Fre 15.004500 MH
0.0				-18.51 dBm	Start Fre 9.000 k⊦
0.0					
0.0		ntil for stationeras i fjerdens fation	สาร์สาราราชการสมัยไประกัญหายได้ไประกัญหาย	สุขาร่างให้สารแรงการในการเหลือที่เหล่ารูกสรุโปรีการในส	•
0.0 And a standard and a	#VB	W 300 kHz		Stop 30.00 MHz j.333 ms (40001 pts)	Stop Fre 30.000000 Mi CF Ste 2.999100 Mi Auto Mi
ant 9 KHz Res BW 100 KHz	#VB	W 300 kHz	Sweep 5	Stop 30.00 MHz j.333 ms (40001 pts)	30.000000 Mi CF Ste 2.999100 Mi



Agilent Spectrum Analyzer - Swept SA				
RL RF 50 Ω AC Center Freg 17.50000000	CORREC SENSE	Avg Type: Log-Pwr	04:50:15 PM Jun 22, 2017 TRACE 123456	Frequency
	PNO: Fast Trig: Free R IFGain:Low Atten: 40 dE			
10 dB/div Ref 30.00 dBm		Mkr3	24.172 375 GHz -27.31 dBm	Auto Tune
20.0 10.0 0.00				Center Freq 17.500000000 GHz
-10.0 -20.0 -30.0		Alexand an entering for the second second		Start Freq 10.000000000 GHz
-40.0				Stop Freq 25.00000000 GHz
Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 4	Stop 25.000 GHz 0.00 ms (40001 pts)	CF Step 1.50000000 GHz Auto Man
MKR MODE TRC SCL X	1 375 GHz -27.17 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Man
	7 375 GHz -27.28 dBm 2 375 GHz -27.31 dBm			Freq Offset 0 Hz
7 8 9 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10			~	
MSG	uu .	STATU	JS	

802.11n(HT20) & MCS 0 & 2462 MHz



Reference

High Band-edge





MR MR Sols Apric Connect Sense INT Auton Ver Machine Ver Frequency Center Freq 15.004500 MHz IPG init.ew Trig: Free Run Atten: 40 dB Avg Type: Log-Pwr Trace 19 a go of the PP PP PP PP PP PP PP PP PP PP PP PP PP Tree Ver Auto Tune 10 dE/div Ref 30.00 dBm -46.65 dBm -46.65 dBm Center Freq 15.004500 MHz 20 0	Agilent Spectrum Analyzer - Swept SA					
PHOF Past Atten: 40 dB OPT P P P P P Mkr2 297.7 kHz Atten: 40 dB Mkr2 297.7 kHz 10 dB/div Ref 30.00 dBm -46.65 dBm 200 -46.65 dBm -46.65 dBm 100 -46.65 dBm -919 dm 200 -46.65 dBm -46.65 dBm 200 -46.65 dBm -919 dm 200 -46.65 dBm -46.65 dBm 200 -46	RL RF 50 Ω ▲ DC Center Freq 15.004500 M	Hz	Avg Ty		TRACE 1 2 3 4 5 6	Frequency
Composition Note that it is consistent with the second	10 JD/Jin Dof 20.00 dBm			Mki	DET PPPPP	Auto Tune
200 2 2 3 3 3 3 3 3 4 5 6 5 6 7 46.65 dBm 5 7 4 6 <td< td=""><td>20.0 10.0</td><td></td><td></td><td></td><td></td><td>•</td></td<>	20.0 10.0					•
Start 9 kHz Stop Freq Start 9 kHz Stop 30.00 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 5.333 ms (40001 pts) MKR MODE TRC SCL X 1 N 1 1 2 N 1 1 2 N 1 1 2 N 1 1 2 N 1 1 2 N 1 1 2 1 3 4 4 297.7 kHz 46.65 dBm 3 3 4 4 3 5 3 6 3 7 48.65 dBm 3 4 4 48.65 dBm 5 5 6 3 7 48.65 dBm 8 4 4 48.65 dBm 4 48.65 dBm 4 48.65 dBm 5	-20.0				-19.19 dBm	
#Res BW 100 kHz #VBW 300 kHz Sweep 5.333 ms (40001 pts) 2.999100 MHz MKR MODE TRC SCL X Y FUNCTION FUNCTION VALUE Auto Man 1 N 1 f 297.7 kHz -46.65 dBm FUNCTION FUNCTION VALUE Auto Man 2 N 1 f 297.7 kHz -46.65 dBm Freq Offset O Hz 3 4 5 5 5 5 5 6	-50.0	he har have be and a second and a second a second a second as	irfadabashagalariyindirdirdiyinlarayin	ertpinesnielendlebeleind	selpen and from the selfer to the selfer	
MRR MODE TRC SLL X Y FUNCTION FUNCTION <t< td=""><td>#Res BW 100 kHz</td><td>#VBW 300 kF</td><td></td><td>Sweep 5.333</td><td>ms (40001 pts)</td><td>2.999100 MHz</td></t<>	#Res BW 100 kHz	#VBW 300 kF		Sweep 5.333	ms (40001 pts)	2.999100 MHz
MSG STATUS L DC Coupled	1 N 1 f 2 N 1 f 3 - - - 4 - - - 5 - - - 6 - - - 7 - - - 8 - - - 9 - - - 10 - - -	297.7 kHz -46.65	dBm			Freq Offset
	MSG			STATUS 🦺	DC Coupled	

Agilent Spect	trum Ar	nalyzer - Swe									
		50 Ω 5.01500	0000 GH			SE:INT		ALIGN OFF	TRA	M Jun 22, 2017 CE <mark>1 2 3 4 5 6</mark>	Frequency
	_		PI IFC	NO: Fast G Gain:Low	Atten: 40				D	PE MWWWWWW ET PPPPP	
10 dB/div	Re	f 30.00 d	Bm					Mkr		72 GHz 60 dBm	Auto Tune
20.0 10.0 0.00			^1								Center Freq 5.015000000 GHz
-10.0 -20.0 -30.0			3			\$ ⁴	_ ∮ ⁵			-19.19 dBm	Start Freq 30.000000 MHz
		nggi karang karap kanan di									Stop Freq 10.000000000 GHz
Start 30 #Res BW		MHz		#VB۱	№ 3.0 MHz			Sweep 18	Stop 10 .67 ms (4	.000 GHz 0001 pts)	CF Step 997.000000 MHz
MKR MODE	TRC SC	L	× 2.456 7	0 647	∀ 8.04 dE		TION FI	UNCTION WIDTH	FUNCTI	DN VALUE	<u>Auto</u> Man
2 N 3 N 4 N 5 N	1 f 1 f 1 f 1 f		2.400 7 2.479 8 2.481 8 5.738 8 6.271 7	8 GHz 7 GHz 2 GHz	-24.65 dE -25.22 dE -35.39 dE -35.60 dE	sm sm sm					Freq Offset 0 Hz
6 7 8 9 10 11											
< MSG					Ш			STATUS		>	
mou								STATUS			

Agilent Spectrum Analyzer - Swept SA				
RE RE 50 Ω AC Center Freg 17.50000000	CORREC SENSE:	Avg Type: Log-Pwr	04:56:06 PM Jun 22, 2017 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast Trig: Free Ru IFGain:Low Atten: 40 dB		түре Милини Det Р Р Р Р Р Р 4.185 500 GHz	Auto Tune
10 dB/div Ref 30.00 dBm			-27.35 dBm	Center Freq
0.00				17.500000000 GHz
-10.0			3 ¥¶□	Start Freq 10.000000000 GHz
-40.0 and the product of the second of the s				Stop Freq
-60.0			Stop 25.000 GHz	25.00000000 GHz
#Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 40.	00 ms (40001 pts)	CF Step 1.50000000 GHz <u>Auto</u> Man
1 N 1 f 24.64	3 750 GHz -26.17 dBm	FONCTION FONCTION WIDTH	PONCTION VALUE	
	3 250 GHz -26.31 dBm 5 500 GHz -27.35 dBm			Freq Offset 0 Hz
7				
10 11 <			~	
MSG		STATUS		



6.5 Radiated Spurious Emissions

Test Requirements and limit,

§15.247(d), §15.205, §15.209

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) and (b), then the 15.209(a) limit in the table below has to be followed

- FCC Part 15.209(a) and (b)

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
0.009 - 0.490	2400/F (KHz)	300
0.490 – 1.705	24000/F (KHz)	30
1.705 – 30.0	30	30
30 ~ 88	100 **	3
88 ~ 216	150 **	3
216 ~ 960	200 **	3
Above 960	500	3

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

• FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900		
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240	3600 ~ 4400		
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

• FCC Part 15.205(b): The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.



TEST CONFIGURATION

Refer to the APPENDIX I.

TEST PROCEDURE

- 1. The EUT is placed on a non-conductive table, emission measurements at below 1 GHz, the table height is 80 cm and above 1 GHz, the table height is 1.5 m.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until the measurements for all frequencies are complete.

Measurement Instrument Setting for Radiated Emission Measurements.

The radiated emission was tested according to the section 6.3, 6.4, 6.5 and 6.6 of the ANSI C63.10-2013 with following settings.

Peak Measurement:

RBW = As specified in below table , VBW ≥ 3 x RBW, Sweep = Auto, Detector = Peak, Trace mode = Max Hold until the trace stabilizes.

Frequency	RBW
9 - 150 kHz	200 - 300 Hz
0.15 - 30 MHz	9 - 10 kHz
30 - 1000 MHz	100 - 120 kHz
> 1000 MHz	1 MHz

Average Measurement:

- 1. RBW = 1 MHz (unless otherwise specified).
- 2. VBW ≥ 3 x RBW.
- 3. Detector = RMS (Number of points \ge 2 x Span / RBW)
- 4. Averaging type = power. (i.e., RMS)
- 5. Sweep time = auto.
- 6. Perform a trace average of at least 100 traces.
- 7. A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
- 1) If power averaging (RMS) mode was used in step 4, then the applicable correction factor is 10 log(1/x), where x is the duty cycle.
- 2) If linear voltage averaging mode was used in step 4, then the applicable correction factor is 20 log(1/x), where x is the duty cycle.
- If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

Duty Cycle Corrections (Refer to appendix II for duty cycle measurement procedure and plots)

Band	Duty Cycle (%)	T _{on} (ms)	T _{on} + T _{off} (ms)	DCF = 10log(1 / Duty) (dB)
802.11b	97.64	8.190	8.388	0.10
802.11g	87.23	1.359	1.558	0.59
802.11n(HT20)	86.46	1.271	1.470	0.63
-	-	-	-	-



9 kHz~ 25 GHz Data (802.11b & 1 Mbps)

• 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.69	Н	Y	PK	48.75	0.70	N/A	N/A	49.45	74.00	24.55
2389.96	Н	Y	AV	39.05	0.70	0.10	N/A	39.85	54.00	14.15
4823.79	V	Z	PK	45.48	4.86	N/A	N/A	50.34	74.00	23.66
4823.88	V	Z	AV	37.10	4.86	0.10	N/A	42.06	54.00	11.94

• 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4873.89	V	Z	PK	45.36	5.07	N/A	N/A	50.43	74.00	23.57
4873.89	V	Z	AV	35.01	5.07	0.10	N/A	40.18	54.00	13.82

• 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.82	Н	Y	PK	50.74	1.07	N/A	N/A	51.81	74.00	22.19
2483.57	Н	Y	AV	41.22	1.07	0.10	N/A	42.39	54.00	11.61
4923.76	V	Z	PK	46.23	5.23	N/A	N/A	51.46	74.00	22.54
4924.02	V	Z	AV	35.92	5.23	0.10	N/A	41.25	54.00	12.75

Note.

1. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. So Distance Correction Factor : - $9.54 \text{ dB} = 20^{*}\log(1 \text{ m} / 3 \text{ m})$

2. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.

3. The band edge test has performed between 2310-2390 MHz and 2483.5-2500 MHz. The worst results were reported in the table.

4. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F+ DCF + Distance Factor / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCF = Duty Cycle Correction Factor.



9 kHz~ 25 GHz Data (802.11g & 6 Mbps)

• 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.88	V	Z	PK	64.08	0.70	N/A	N/A	64.78	74.00	9.22
2389.80	V	Z	AV	46.94	0.70	0.59	N/A	48.23	54.00	5.77
4822.69	V	Z	PK	44.77	4.86	N/A	N/A	49.63	74.00	24.37
4822.48	V	Z	AV	33.89	4.86	0.59	N/A	39.34	54.00	14.66

• 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.45	V	Z	PK	45.07	5.07	N/A	N/A	50.14	74.00	23.86
4875.13	V	Z	AV	33.81	5.07	0.59	N/A	39.47	54.00	14.53

• 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.77	V	Z	PK	64.62	1.07	N/A	N/A	65.69	74.00	8.31
2483.72	V	Z	AV	47.49	1.07	0.59	N/A	49.15	54.00	4.85
4925.90	V	Z	PK	44.31	5.23	N/A	N/A	49.54	74.00	24.46
4925.05	V	Z	AV	33.79	5.23	0.59	N/A	39.61	54.00	14.39

Note.

1. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. So Distance Correction Factor : - 9.54 dB = 20*log(1 m / 3 m)

2. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.

3. The band edge test has performed between 2310-2390 MHz and 2483.5-2500 MHz. The worst results were reported in the table.

4. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F+ DCF + Distance Factor / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCF = Duty Cycle Correction Factor.

9 kHz~ 25 GHz Data (802.11n HT20 & MCS 0)

• 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.92	V	Z	PK	63.08	0.70	N/A	N/A	63.78	74.00	10.22
2389.88	V	Z	AV	46.80	0.70	0.63	N/A	48.13	54.00	5.87
4824.55	V	Z	PK	44.40	4.86	N/A	N/A	49.26	74.00	24.74
4824.38	V	Z	AV	33.95	4.86	0.63	N/A	39.44	54.00	14.56

• 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.24	V	Z	PK	45.23	5.07	N/A	N/A	50.30	74.00	23.70
4874.67	V	Z	AV	33.81	5.07	0.63	N/A	39.51	54.00	14.49

• 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.73	V	Z	PK	63.84	1.07	N/A	N/A	64.91	74.00	9.09
2483.53	V	Z	AV	47.53	1.07	0.63	N/A	49.23	54.00	4.77
4922.95	V	Z	PK	44.20	5.23	N/A	N/A	49.43	74.00	24.57
4922.63	V	Z	AV	33.79	5.23	0.63	N/A	39.65	54.00	14.35

Note.

1. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. So Distance Correction Factor : - 9.54 dB = 20*log(1 m / 3 m)

2. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.

3. The band edge test has performed between 2310-2390 MHz and 2483.5-2500 MHz. The worst results were reported in the table.

4. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F + DCF + Distance Factor / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCF = Duty Cycle Correction Factor.

5. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.



6.6 Power-line conducted emissions

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

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

* Decreases with the logarithm of the frequency

TEST CONFIGURATION

See test photographs for the actual connections between EUT and support equipment.

TEST PROCEDURE

- 1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
- 2. The EUT is connected via LISN to the test power supply.
- 3. The measurement results are obtained as described below:
- 4. Detectors Quasi Peak and Average Detector.

Test Results: Comply(Refer to next page.)

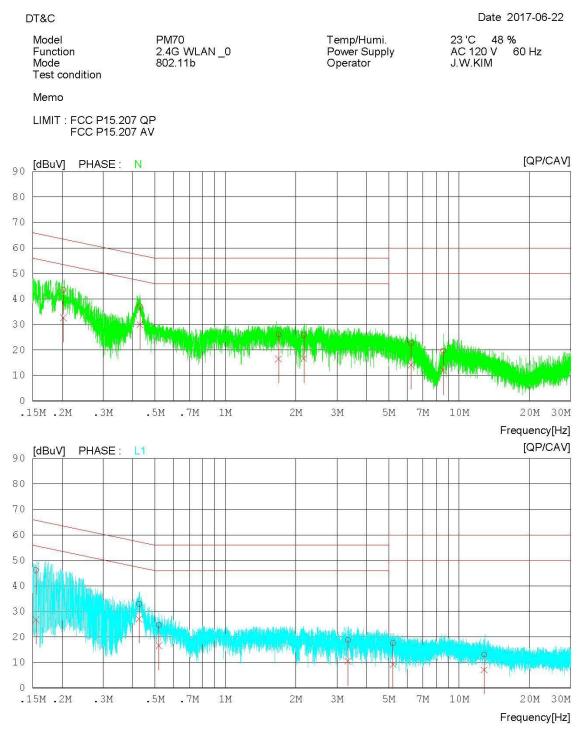
The worst data was reported.

RESULT PLOTS

AC Line Conducted Emissions (Graph)

Test Mode: 802.11g & 6Mbps & 2462 MHz

Results of Conducted Emission



AC Line Conducted Emissions (List)

Test Mode: 802.11g & 6Mbps & 2462 MHz

Results of Conducted Emission

Temp/Humi. Power Supply

Operator

Date 2017-06-22

60 Hz

23 'C 48 % AC 120 V 6 J.W.KIM

Model	
Functi	on
Mode	
Test c	ondition

lition

PM70 2.4G WLAN_0 802.11b

conditi

Memo

DT&C

LIMIT : FCC P15.207 QP FCC P15.207 AV

NC) FREQ	READING QP CAV	C.FACTOR	RESULT QP CAV	LIMIT QP (MARGIN CAV QP CA	
	[MHz]	[dBuV] [dBuV]	[dB]	[dBuV] [dBuV] [dBuV][c	lBuV] [dBuV][dE	3uV]
1	0.20301	43.35 32.43	0.20	43.5532.63	63.49 53	.49 19.94 20.86	5 N
2	0.43136	36.9329.71	0.21	37.14 29.92	57.23 47	.23 20.0917.31	L N
3	1.68780	25.69 16.27	0.29	25.9816.56	56.00 46	.00 30.0229.44	l N
4	2.16780	25.47 16.37	0.31	25.7816.68	56.00 46	.00 30.22 29.32	2 N
5	6.23980	22.22 13.65	0.51	22.7314.16	60.00 50	.00 37.27 35.84	l N
6	8.56280	19.17 11.34	0.64	19.8111.98	60.00 50	.00 40.19 38.02	2 N
7	0.15491	46.00 26.53	0.18	46.1826.71	65.73 55	.73 19.55 29.02	2 L1
8	0.42783	32.7626.82	0.20	32.9627.02	57.29 47	.29 24.33 20.27	7 L1
9	0.51964	24.3616.43	0.20	24.5616.63	56.00 46	.00 31.44 29.37	7 L1
10	3.34460	18.4510.14	0.36	18.8110.50	56.00 46	.00 37.19 35.50) L1
11	5.21120	17.06 8.76	0.46	17.52 9.22	60.00 50	.00 42.4840.78	3 L1
12	12.80140	12.04 6.15	0.96	13.00 7.11	60.00 50	.00 47.00 42.89	9 L1



Test Requirements, RSS-Gen [6.6]

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 % emission bandwidth, as calculated or measured.

TEST CONFIGURATION

Refer to the APPENDIX I.

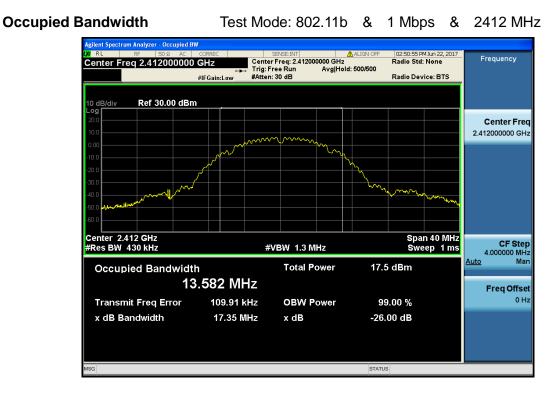
TEST PROCEDURE

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

TEST RESULTS: Comply

Test Mode	Data Rate	Frequency [MHz]	Test Results [MHz]
			13.582
802.11b	1 Mbps	2437	13.397
		2462	13.184
	g 6 Mbps	2412	17.844
802.11g		2437	17.661
		2462	17.247
802.11n (HT20)	MCS 0	2412	18.571
		2437	18.513
		2462	18.201

RESULT PLOTS



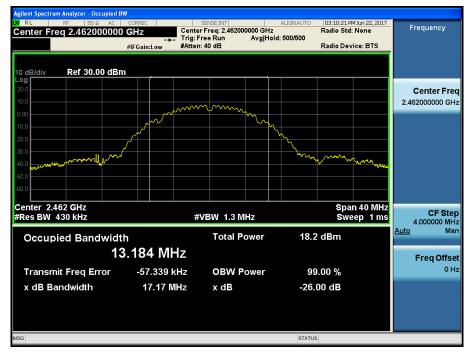
Occupied Bandwidth

Test Mode: 802.11b & 1 Mbps & 2437 MHz

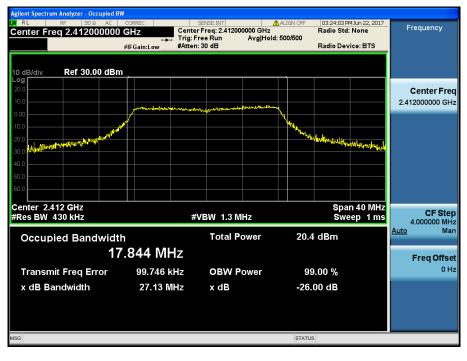




Test Mode: 802.11b & 1 Mbps & 2462 MHz



Test Mode: 802.11g & 6 Mbps & 2412 MHz

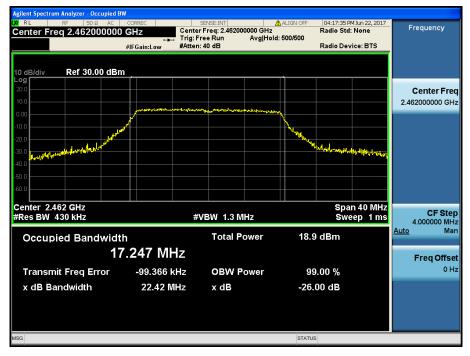


Occupied Bandwidth

Test Mode: 802.11g & 6 Mbps & 2437 MHz

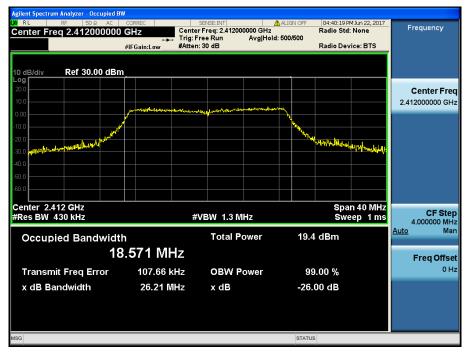


Test Mode: 802.11g & 6 Mbps & 2462 MHz



Dt&C

Test Mode: 802.11n(HT20) & MCS 0 & 2412 MHz

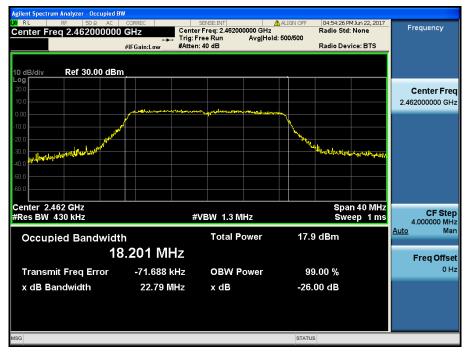


Occupied Bandwidth

Test Mode: 802.11n(HT20) & MCS 0 & 2437 MHz



Test Mode: 802.11n(HT20) & MCS 0 & 2462 MHz



7. LIST OF TEST EQUIPMENT

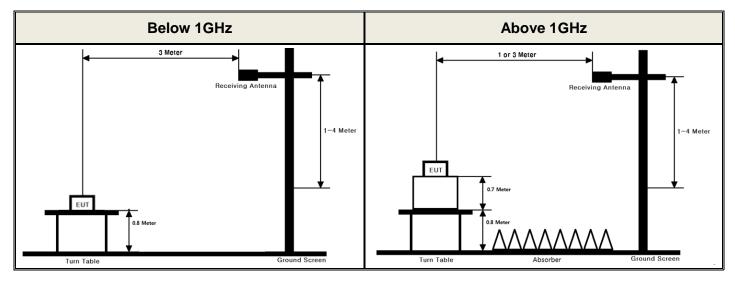
Туре	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N	
Spectrum Analyzer	Agilent Technologies	N9020A	16/09/09	17/09/09	MY50200834	
Spectrum Analyzer Agilent Technologie		119020A	17/09/06	18/09/06	WT 30200034	
Digital Multimeter	Agilent Technologies	34401A	17/01/04	18/01/04	US36099541	
DC Power Supply	Agilent Technologies	66332A	16/09/08	17/09/08	US37473305	
	Aglient Technologies		17/09/05	18/09/05		
Vector Signal Generator	Rohde Schwarz	SMBV100A	17/01/04	18/01/04	255571	
Signal Generator	Rohde Schwarz	SMF100A	17/04/21	18/04/21	102341	
Attenuator(10dB)	Hefei Shunze	SS5T2.92-10-40	17/01/11	18/01/11	16012202	
Thermohygrometer	BODYCOM	BJ5478	17/04/11	18/04/11	120612-2	
Loop Antenna	Schwarzbeck	FMZB1513	16/04/22	18/04/22	1513-128	
BILOG Antenna	SCHWARZBECK	VULB9160	16/11/11	18/11/11	3151	
Horn Antenna	ETS-LINDGREN	3117	16/05/03	18/05/03	00140394	
Horn Antenna	A.H.Systems Inc.	SAS-574	17/04/25	19/04/25	154	
Dre Area lifier		0.4.40D	16/10/19	17/10/19	2000 4 02 4 00	
PreAmplifier	Agilent Technologies	8449B	17/09/05	18/09/05	3008A02108	
Low Noise Pre Amplifier	tsj	MLA-010K01-B01- 27	17/03/06	18/03/06	1844539	
EMI TEST RECEIVER	Rohde Schwarz	ESR7	17/02/16	18/02/16	101061	
EMI TEST RECEIVER	Rohde Schwarz	ESCI	17/02/18	18/02/18	100364	
Highpass Filter	Wainwright	WHKX12-2580- 3000-18000-80SS	16/09/09	17/09/09	3	
Highpass Fliter	Instruments		17/09/05	18/09/05		
Highnass Filter	Wainwright	WHNX6-6320-	16/09/13	17/09/13	1	
Highpass Filter	Instruments	8000-26500-40CC	17/09/05	18/09/05		
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2495A	17/04/11	18/04/11	1306007	
Power Meter & Wide Bandwidth Sensor	Anritsu	MA2490A	17/04/11	18/04/11	1249001	
	ROHDE&SCHWARZ	ESH2-Z5	16/09/08	17/09/08	828739/006	
ARTIFICIAL MAINS NETWORK			17/09/06	18/09/06		
SINGLE-PHASE MASTER	NF	4420	16/09/08	17/09/08	3049354420023	
UNGLE-I HAGE WAGTER		7720	17/09/01	18/09/01	0040004420020	

Note: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2006.

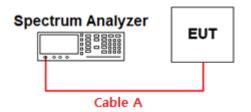
APPENDIX I

Test set up diagrams

Radiated Measurement



Conducted Measurement



Path loss information

Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)
0.03	0.19	15	3.19
1	0.81	20	4.44
2.402 & 2.440 & 2.480	1.24	25	5.70
5	1.85	-	-
10	2.92	-	-

Note 1: The path loss from EUT to Spectrum analyzer was measured and used for test. Path loss (S/A's correction factor) = Cable A (Attenuator, Applied only when it was used externally)



APPENDIX II

Duty cycle plots

TEST PROCEDURE

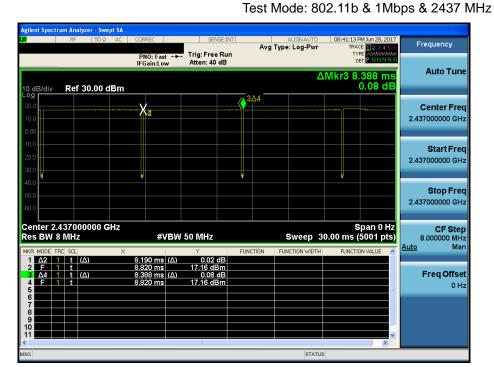
Duty Cycle measured using section 6.0 b) of KDB558074

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission. Set RBW \geq OBW if possible; otherwise, set RBW to the largest available value. Set VBW \geq RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T \leq 16.7 microseconds.)

Test Plots :

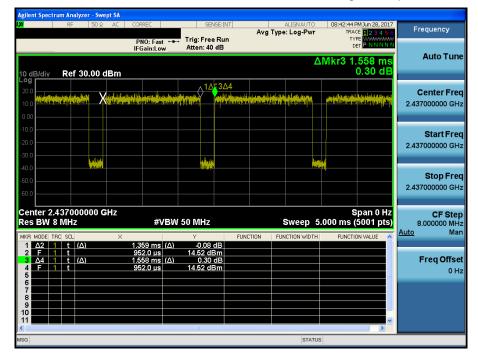


Duty Cycle



Duty Cycle

Test Mode: 802.11g & 6Mbps & 2437 MHz



Test Mode: 802.11n(HT20) & MCS 0 & 2437 MHz

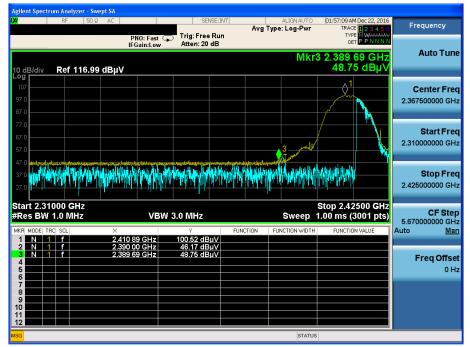
1 Jun 28, 2017 Frequency Avg Type: Log-Pwr PNO: Fast +++ Trig: Free Run IFGain:Low Atten: 40 dB TYPE DET Auto Tune ΔMkr3 1.470 m 0.02 dl Ref 30.00 dBm $\Delta^{1\Delta}$ 3/14 **Center Freq** 2.437000000 GHz Start Freq 2.437000000 GHz Stop Freq 2.437000000 GHz Center 2.437000000 GHz Res BW 8 MHz Span 0 Hz Sweep 5.000 ms (5001 pts) CF Step 8.000000 MHz Man #VBW 50 MHz <u>Auto</u> t (Δ) (A) 13.27 dBm 0.02 dB ⊢ ∆4 Freq Offset t (Δ) (Δ) 13.27 dBr 0 Hz

Duty Cycle

APPENDIX III

Unwanted Emissions (Radiated) Test Plot

802.11b & Lowest & Y & Hor



802.11b & Lowest & Y & Hor

trum An Avg Type: Pwr(RMS) Avg|Hold: 200/200 Frequency Trig: Free Run Atten: 20 dB PNO: Fast IFGain:Low Auto Tune Mkr3 2.389 96 GH 39.050 dBµ Ref 116.99 dBµV Center Freq 2.367500000 GHz Start Freq 2.310000000 GHz 3, Stop Freq 2.425000000 GHz Start 2.31000 GHz #Res BW 1.0 MHz Stop 2.42500 GHz CF Step 5.67000000 GHz VBW 3.0 MHz* Sweep 1.00 ms (3001 pts) Auto Mar 39.123 dBµ∖ 39.050 dBu∖ Freq Offset 0 Hz STATUS

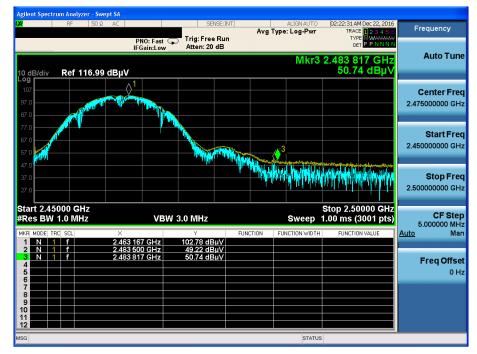
Detector Mode : PK

Detector Mode : AV

Detector Mode : PK



802.11b & Highest & Y & Hor



802.11b & Highest & Y & Hor

Detector Mode : AV





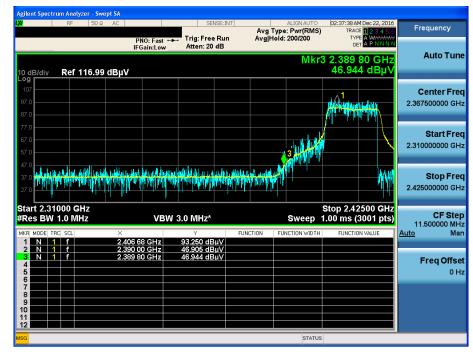
802.11g & Lowest & Z & Ver

Detector Mode : PK



802.11g & Lowest & Z & Ver

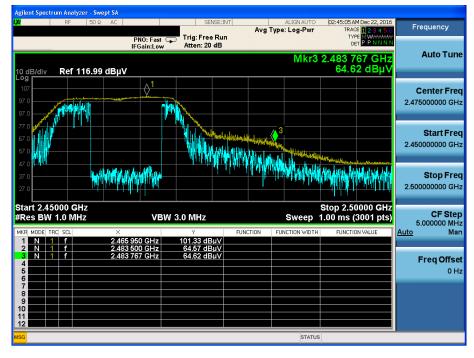
Detector Mode : AV





Detector Mode : PK

802.11g & Highest & Z & Ver



Detector Mode : AV

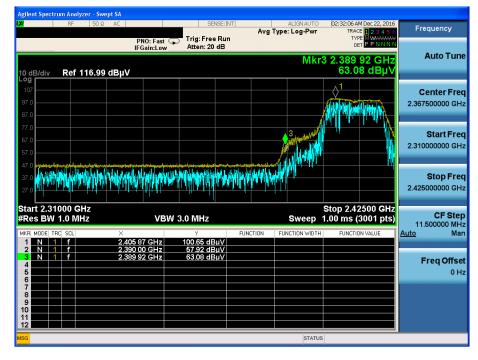
802.11g & Highest & Z & Ver





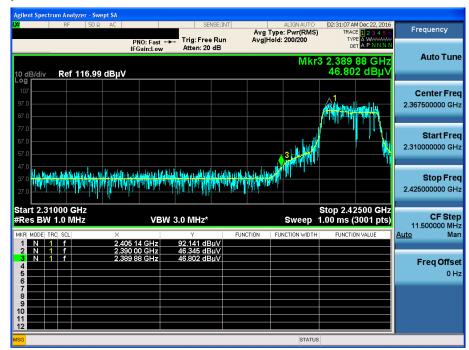
802.11n(HT20) & Lowest & Z & Ver

Detector Mode : PK



802.11n(HT20) & Lowest & Z & Ver

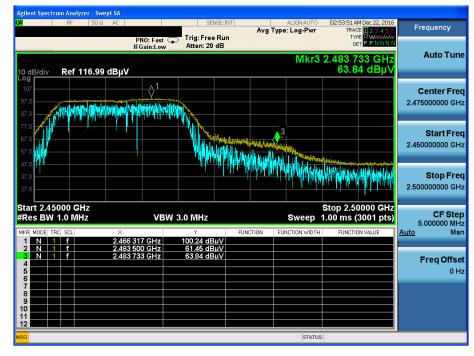
Detector Mode : AV





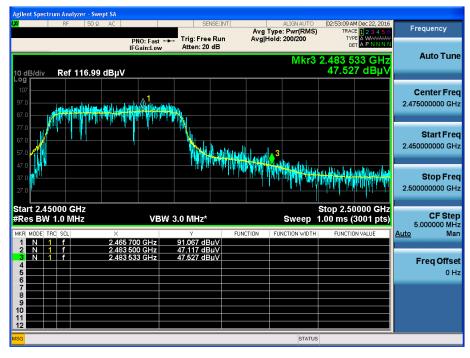
802.11n(HT20) & Highest & Z & Ver

Detector Mode : PK



802.11n(HT20) & Highest & Z & Ver

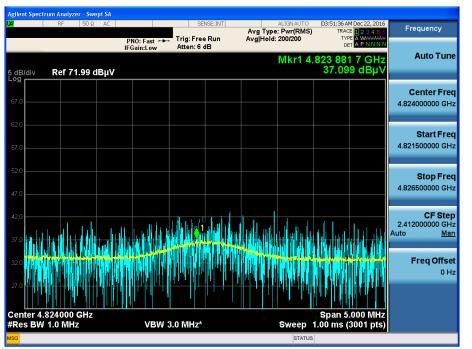




Detector Mode : AV

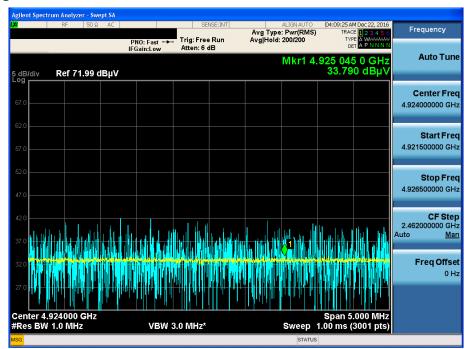


802.11b & Lowest & Z & Ver



802.11g & Highest & Z & Ver

Detector Mode : AV



802.11n(HT20) & Highest & Z & Ver

Detector Mode : AV

