# **TEST REPORT**

$\mathbf{T}$	Dt&C

# DT&C Co., Ltd.

42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042 Tel : 031-321-2664, Fax : 031-321-1664

- 1. Report No: DRTFCC1709-0184
- 2. Customer
  - Name (FCC) : POINTMOBILE CO., LTD. / Name (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)
- 3. Use of Report : FCC & IC Original Grant
- Product Name / Model Name : Mobile Computer / FCC: PM70, IC: PM70G
   FCC ID: V2X-PM70G / IC: 10664A-PM70G
- 5. Test Method Used : KDB 558074, ANSI C63.10-2013 Test Specification : FCC Part 15 Subpart C.247

RSS-247 Issue 2 (2017-02), RSS-GEN Issue 4 (2014-11)

- 6. Date of Test : 2017.06.12 ~ 2017.06.30
- 7. Testing Environment : See appended test report.
- 8. Test Result : Refer to the attached test result.

Affirmation	Tested by		Technical Manager	Na-60
	Name : JaeHyeok Bang	Sh	Name : GeunKi Son	(Signature)
		200		

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DT&C Co., Ltd.

2017.09.12.

# DT&C Co., Ltd.

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

# **Test Report Version**

Test Report No.	Date	Description
DRTFCC1709-0184	Sep. 12, 2017	Initial issue

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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 sit	e No. :	5740A-3
www.dtnc.net		
Telephone	:	+ 82-31-321-2664
FAX	:	+ 82-31-321-1664

## **1.2 Test Environment**

Ambient Condition	
Temperature	+23 ~ +24 °C
<ul> <li>Relative Humidity</li> </ul>	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: PM70G
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

# 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.
- (RBW : 100 kHz / VBW : 300 kHz) 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

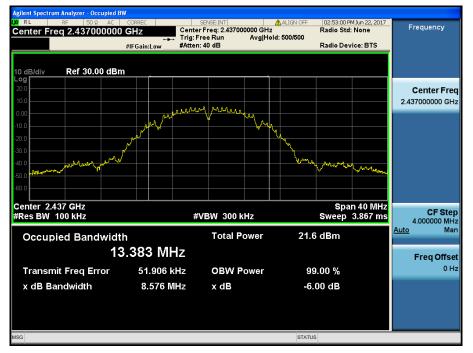
Test Mode	Data Rate	Frequency [MHz]	Test Results [MHz]
		2412	9.098
802.11b	1 Mbps	2437	8.576
		2462	8.569
	6 Mbps	2412	16.410
802.11g		2437	16.430
		2462	16.350
		2412	17.620
802.11n (HT20)	MCS 0	2437	17.650
( · · )		2462	17.300

## RESULT PLOTS

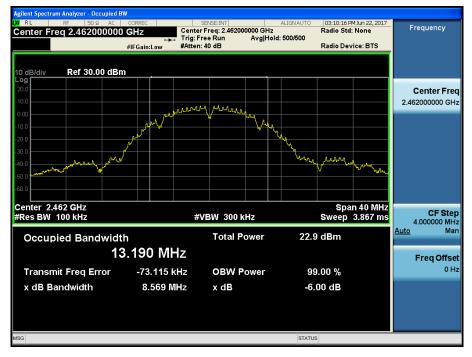
#### 6 dB Bandwidth Test Mode: 802.11b & 1 Mbps & 2412 MHz nt Spectrum Analyzer - Occupied BV 02:50:50 PM Jun 22, 201 Radio Std: None Frequency Center Freq: 2.412000000 GHz Trig: Free Run Avg|Ho #Atten: 30 dB Center Freq 2.412000000 GHz Avg|Hold: 500/500 #IFGain:Low Radio Device: BTS Ref 30.00 dBm **Center 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



#### Test Mode: 802.11b & 1 Mbps & 2462 MHz



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#### Test Mode: 802.11g & 6 Mbps & 2412 MHz

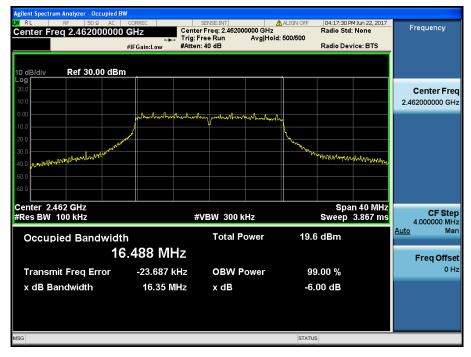


#### 6 dB Bandwidth

Test Mode: 802.11g & 6 Mbps & 2437 MHz

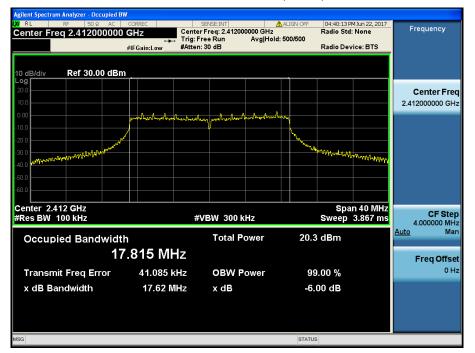


## Test Mode: 802.11g & 6 Mbps & 2462 MHz



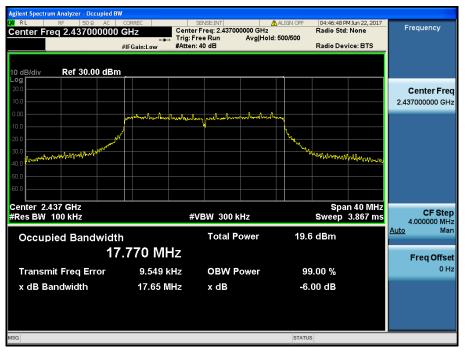
**Dt&C** 

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



#### 6 dB Bandwidth

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



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

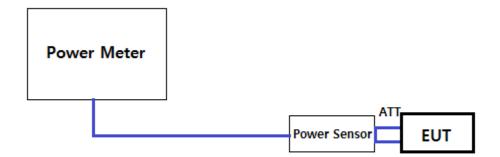


## 6.2 Maximum Peak Conducted Output Power

## 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

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

Mode Channe				Test Result [dBm]							
	Channel	Frequency [MHz]	Detector			0	DATA RA	TE [Mbps	5]		
		[]		6	9	12	18	24	36	48	54
	4	2412	PK	21.91	21.84	21.86	21.94	21.85	21.84	21.82	21.78
	1 241	2412	AV	14.70	14.69	14.70	14.62	14.60	14.65	14.56	14.57
002.44 m	6	0407	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
		2462	РК	21.65	21.64	21.60	21.61	21.48	21.60	21.57	21.63
	11	2462	AV	13.30	13.25	13.19	13.16	13.19	13.23	13.31	13.25

Mode Channel				Test Result [dBm]							
	Channel	Frequency [MHz]	Detector			Ι	DATA RA	TE [MCS	]		
				0	1	2	3	4	5	6	7
	4	2442	PK	21.38	21.33	21.37	21.33	21.26	21.25	21.32	21.31
	1 2412	2412	AV	13.84	13.72	13.72	13.73	13.67	13.64	13.75	13.75
802.11n	6	2427	PK	21.49	21.39	21.40	21.38	21.39	21.45	21.33	21.45
(HT20)	D	2437	AV	13.23	13.12	13.16	13.13	13.12	13.25	13.16	13.13
	11 2462	2462	PK	20.53	20.51	20.48	20.43	20.34	20.35	20.45	20.45
		2462	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

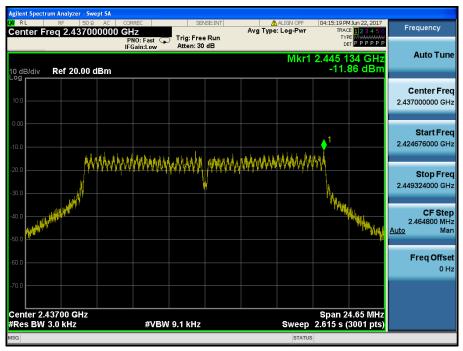


#### Test Mode: 802.11g & 6 Mbps & 2412 MHz

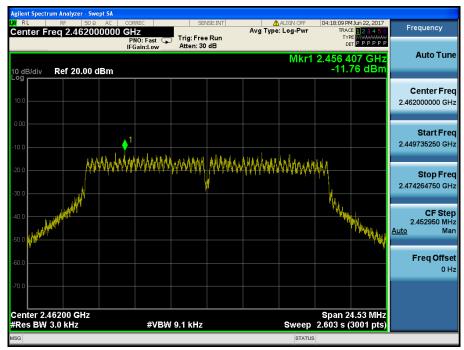


#### Maximum PKPSD

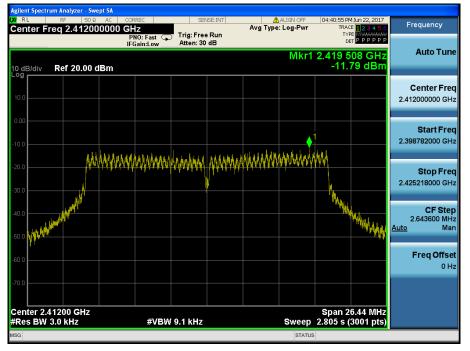
Test Mode: 802.11g & 6 Mbps & 2437 MHz



#### Test Mode: 802.11g & 6 Mbps & 2462 MHz

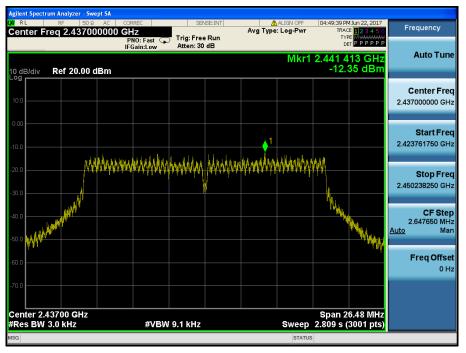


#### Test Mode: 802.11n(HT20) & MCS 0 & 2412 MHz



#### 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

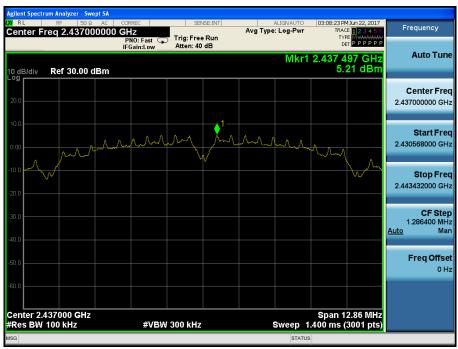




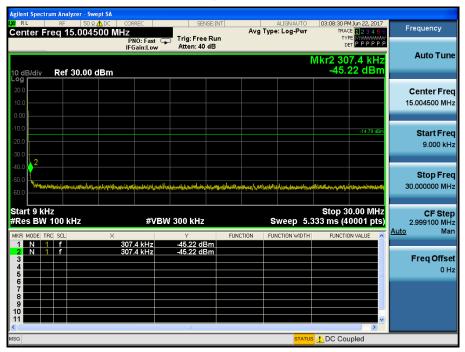
LX/RL RF 50Ω AC		SENSE:INT	🛕 ALIGN OFF	02:52:12 PM Jun 22, 2017	Frequency
Center Freq 5.01500000		Trig: Free Run	Avg Type: Log-Pwr	TRACE 123456 TYPE MWANANAN	Frequency
	PNO: Fast 😱 IFGain:Low	Atten: 40 dB		DETPPPPP	
	II Galil.20W		<b>B</b> 41		Auto Tune
			MKR	5 3.043 68 GHz	
10 dB/div Ref 30.00 dBm				-35.60 dBm	
Log					
20.0	1				Center Freq
10.0					5.015000000 GHz
0.00					
-10.0				-13.67 dBm	Start Freq
-20.0		1			30.000000 MHz
-30.0	5		<u>∆4 ∆3</u>		
(9.9)	Sites and the second second	And the second	a state was a state of the		
-40.0	and have been been been been	the second s		and the second	Stop Freq
-50.0 and the shall be a set of the set of t					10.000000000 GHz
-60.0					10.00000000 GH2
Start 30 MHz				Stop 10.000 GHz	CF Step
#Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 18	.67 ms (40001 pts)	997.000000 MHz
MKR MODE TRC SCL X	1	Y ELIN	CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
	113 33 GHz	9.40 dBm	CHON FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 4.8	324 32 GHz	-33.20 dBm			
3 N 1 f 7.	710 64 GHz	-35.50 dBm			Freq Offset
4 N 1 f 7.	114 43 GHz 043 68 GHz	-35.58 dBm -35.60 dBm			0 Hz
6		00.00 dB11			
7					
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MSG			STATUS		

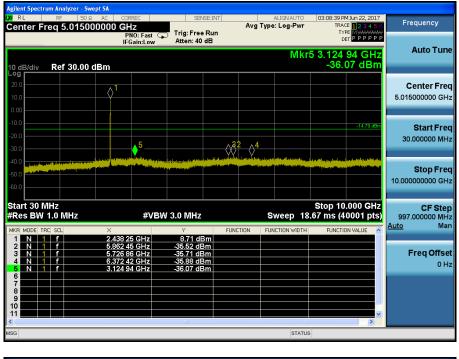
Agilent Spectrun W RL Center Fre	RF 50 \$	2 AC COR		Trig: Free		Avg	ALIGN OFF	TRAC	M Jun 22, 2017 E 1 2 3 4 5 6 E MWWWWWW	Frequency
	Ref 30.00	IFG	iain:Low	Atten: 40	dB		Mkr3 2	4.746 1	25 GHz 21 dBm	Auto Tune
20.0 10.0										Center Freq 17.500000000 GHz
-10.0 -20.0 -30.0							Statement Shuffeli (State 2 , 1 , 2 , 2 , 2 , 2 , 2 , 2 , 2 , 2 ,	on Station and Address Product Pro-	-13.67 dBm	Start Freq 10.000000000 GHz
-40.0 444444444 -50.0			and the life life life							<b>Stop Fred</b> 25.000000000 GH;
Start 10.00 #Res BW 1	.0 MHz	×	#VBV	N 3.0 MHz		NCTION	Sweep 40	.00 ms (4	.000 GHz 0001 pts)	CF Step 1.500000000 GH: Auto Mar
1 N 1 2 N 1 3 N 1 4 5	f f f	24.147 250 24.323 500 24.746 125	) GHz	-26.68 dE -27.14 dE -27.21 dE	lm Im	NETION	FONCTION WIDTH	FONCTIO		Freq Offse 0 H
6 7 8 9 10 11										
< ISG							STATUS			

## 802.11b & 1 Mbps & 2437 MHz



## Reference





	ım Analyzer - Sv								
Center Fr		Ω AC CORREC	7	SENSE: INT	Avg	ALIGNAUTO Type: Log-Pwr	TRAC	4 Jun 22, 2017 E <b>1 2 3 4 5 6</b>	Frequency
		PNO: IEGair	Fast 😱 Trig	g:FreeRun en:40 dB			TYF	E MWWWWW PPPPP	
		1 0 81	1.20			Mkr3	24.338 8	75 GHz	Auto Tune
10 dB/div	Ref 30.00	dBm				initio /		98 dBm	
20.0									
10.0									Center Freq 17.50000000 GHz
0.00									17.50000000 GHZ
-10.0									
								-14.79 dBm	Start Freq
-20.0								$\gamma \gamma \gamma$	10.00000000 GHz
-30.0	and the second	and group and being still and		or constant of the		and here a second s	a contra participation de la contra de la cont		
-40.0	control of the local diversion of the local d	and a same of the static balling in the							Stop Freq
-50.0									25.00000000 GHz
-60.0									
Start 10.0								.000 GHz	CF Step
#Res BW	1.0 MHz		#VBW 3.0	MHz		Sweep 40	0.00 ms (4	0001 pts)	1.50000000 GHz Auto Man
MKR MODE TR	C SCL	× 24.912 250 G	۲ ۲۰۰۲ ک	73 dBm	FUNCTION	FUNCTION WIDTH	FUNCTIO	IN VALUE	Auto
2 N 1	f	23.997 250 G	Hz -26	.86 dBm					<b>FO</b> <i>f</i>
3 N 1 4		24.338 875 G	Hz -26	.98 dBm					Freq Offset 0 Hz
5								=	0 H2
7									
8									
10								~	
<								> >	
MSG						STATU	s		

## 802.11b & 1 Mbps & 2462 MHz



#### Reference

#### **High Band-edge**



Agilent Spectrum Analyzer - Swept SA					
₩ RL RF 50 Ω ▲ DC Center Freg 15.004500 M		SENSE:INT Avg	ALIGNAUTO 03 Type: Log-Pwr	11:29 PM Jun 22, 2017 TRACE 1 2 3 4 5 6	Frequency
501101 1104 15.004500 W	PNO: East ( Trig	g:FreeRun en:40 dB			
	IFGain:Low Au	en. 40 db	MikeQ	1.568 5 MHz	Auto Tune
10 dB/div Ref 30.00 dBm				-51.31 dBm	
Log					
20.0					Center Freq
10.0					15.004500 MHz
0.00					
-10.0				-13.23 dBm	Start Freq
-20.0					9.000 kHz
-30.0					
-40.0					Stop Freq
-50.0	unine and a second s	muluerupetersprachebolowing		والمتراجع المحاجم والمحاجم والمحاجم	30.000000 MHz
-60.0					
Start 9 kHz			S	top 30.00 MHz	CF Step
#Res BW 100 kHz	#VBW 300	kHz	Sweep 5.333	ms (40001 pts)	2.999100 MHz
MKR MODE TRC SCL X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 2 N 1 f 13	281.9 kHz -46 568 5 MHz -51	.16 dBm 31 dBm			
3					Freq Offset
5				=	0 Hz
6 7 7					
8					
10				~	
<		ш		<u> </u>	
MSG			STATUS 🥂	DC Coupled	
Antipat Caratavan Analysis Course CA					

Agilent Spectrum Analyzer - Swept SA							
IXI RL RF 50Ω AC	CORREC	SENSE:INT		ALIGNAUTO : Log-Pwr	03:11:38 PM		Frequency
Center Freq 5.015000000	GHZ PN0: Fast	Trig: Free Run	Avg type	: Log-Pwr	TYP	123456 M <del>MMMMM</del> PPPPPP	
	IFGain:Low	Atten: 40 dB			DE	PPPPP	
				Mkr	5 3.288	94 GHz	Auto Tune
10 dB/div Ref 30.00 dBm						6 dBm	
Log							
20.0	1						Center Freq
10.0							5.015000000 GHz
0.00							
-10.0							
						-13.23 dBm	Start Freq
-20.0	<u>^4 <u>*</u>5</u>		2				30.000000 MHz
-30.0	\$ <del>⁴</del> ┼ <b>∮</b> °─┼		>───				
-40.0	All strends of the second strends of the second	and the part of the statement of	and a second	and any later of		(house the grant of the second	
-50.0		and the second					Stop Freq
-60.0							10.00000000 GHz
Start 30 MHz					Stop 10.	000 GHz	CF Step
#Res BW 1.0 MHz	#VBW 3	3.0 MHz	S	weep 18	.67 ms (40	0001 pts)	997.000000 MHz
MKRI MODEL TRCI SCL X		Y FU	NCTION FUN	ICTION WIDTH	FUNCTIO	N VALUE	<u>Auto</u> Man
1 N 1 f 2.4	60 94 GHz	10.45 dBm					
2 N 1 f 3.2 3 N 1 f 5.8		-35.20 dBm -35.41 dBm					Freq Offset
4 N 1 f 2.6	61 08 GHz	-35.50 dBm					0 Hz
	88 94 GHz	-35.66 dBm				=	0 H2
6							
8							
9							
11						~	
<		ш					
MSG				STATUS			

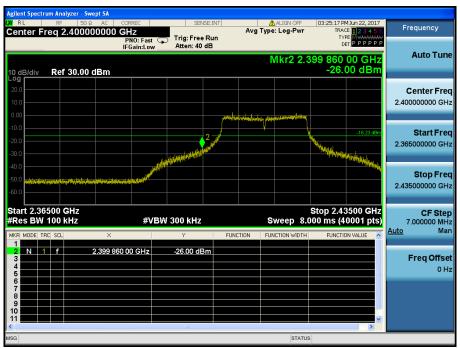
Agilent Spectrum	Analyzer - Swept S					
	RF 50Ω AC q 17.500000	000 GHz	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	03:11:46 PM Jun 22, 2017 TRACE 123456	Frequency
		PNO: Fast 🕞 IFGain:Low	Trig: Free Run Atten: 40 dB		DET PPPPP	
				Mkr3	24.076 375 GHz	Auto Tun
10 dB/div	Ref 30.00 dBr	n			-27.21 dBm	
20.0						Center Fre
10.0						17.500000000 GH
0.00						
10.0					-13.23 dBm	Start Fre
20.0					<u>→</u> 3-&	10.00000000 GH
-30.0		and the state of the				
40.0		a and a second				Stop Fre
-50.0 -60.0						25.00000000 GH
-00.0						
tart 10.000 Res BW 1.		#\/B\/	V 3.0 MHz	Swoon 4	Stop 25.000 GHz 0.00 ms (40001 pts)	CF Ste
IKES DW T		#060 ×	v 3.0 WH2	FUNCTION FUNCTION WIDTH		1.50000000 GF Auto Ma
1 N 1	f 24	.738 625 GHz	-26.61 dBm	FONCTION FONCTION WIDTH	PONCTION VALUE	
2 N 1 3 N 1		.694 375 GHz .076 375 GHz	-26.83 dBm -27.21 dBm			Freq Offs
4 5					=	0 H
6 7						
8						
10						
					>	
G				STATL	s	

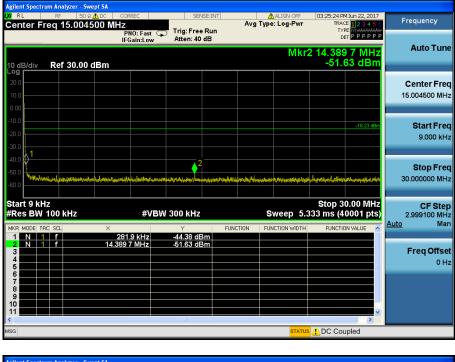
## 802.11g & 6 Mbps & 2412 MHz



#### Reference

#### Low Band-edge

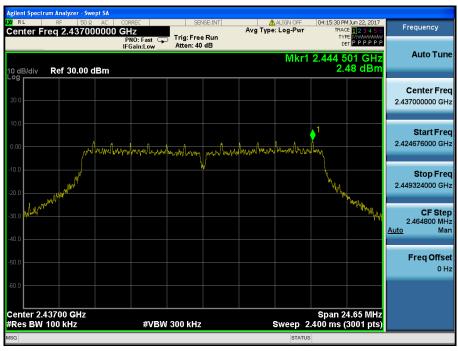




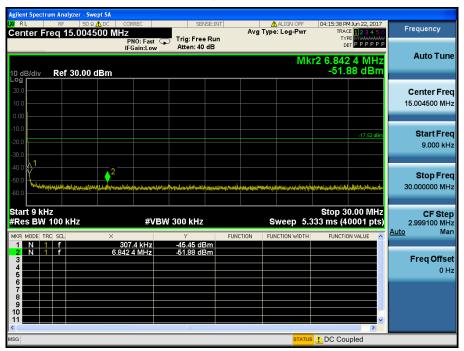
Agilent Spectrum Analyzer - Swept SA						
RL RF 50 Ω AC     Center Freq 5.015000000	GHz	SENSE:INT		ALIGN OFF e: Log-Pwr	03:25:33 PM Jun 22, 201 TRACE 1 2 3 4 5	Frequency
10 dB/div Ref 30.00 dBm	PNO: Fast 🖵 IFGain:Low	) Trig: Free Run Atten: 40 dB		Mkr	түре Миллин Det P P P P P 5 2.555 15 GH -35.98 dBr	Auto Tune
20.0 01 10.0 0.00 01						Center Freq 5.015000000 GHz
-10.0 -20.0 -30.0					-16.23 dB	Start Freq 30.000000 MHz
-40.0 -50.0 -60.0						<b>Stop Freq</b> 10.000000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VBW	3.0 MHz			Stop 10.000 GH .67 ms (40001 pts	997.000000 MHz
2 N 1 f 2.42 3 N 1 f 6.20 4 N 1 f 2.44	18 56 GHz 26 54 GHz 55 74 GHz 17 23 GHz 55 15 GHz	Y F 10.71 dBm -13.83 dBm -35.37 dBm -35.74 dBm -35.74 dBm -35.99 dBm	JNCTION FUI	NCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
MSG				STATUS		

Agilent Spectrum Analyzer - Swep					
X RL RF 50 Ω Center Freq 17.50000	AC CORREC 000000 GHz PNO: Fast	SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	03:25:41 PM Jun 22, 2017 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
10 dB/div Ref 30.00 d	IFGain:Low	Atten: 40 dB	Mkr3 2	4.624 625 GHz -27.14 dBm	Auto Tune
20.0 10.0 0.00					Center Freq 17.500000000 GHz
-10.0		the standard		-16.23 dFm	Start Fred 10.000000000 GH2
-40.0 -50.0 -60.0					Stop Free 25.000000000 GH:
Start 10.000 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz		Stop 25.000 GHz .00 ms (40001 pts)	CF Step 1.500000000 GH: Auto Mar
1 N 1 f 2 N 1 f	24.382 750 GHz 24.694 000 GHz 24.624 625 GHz	-26.48 dBm -27.04 dBm -27.14 dBm	CTION FUNCTION WIDTH		Freq Offse 0 Ha
6 7 8 9 10					
< And		THI CONTRACTOR OF CONTRACTOR O	STATUS		

## 802.11g & 6 Mbps & 2437 MHz



## Reference





STATUS

## 802.11g & 6 Mbps & 2462 MHz



#### Reference

### **High Band-edge**



Agiler		ectru																						
X/R Cen		Fre	RF Pq			<u> </u>	MHz				Trig: Fi	SENSE:I		Avg		LIGN OF			TRACE	un 22, 20 1 2 3 4	5.6	F	requen	су
10 d	B/div	v	Ref	í 30.	.00 (	dBn	11	PNO: I Gain:	Fast ( Low	•	Atten:						Ν	1kr2 : -4	298	.4 kl 7 dB	IZ		Auto	Tune
Log 20.0 10.0 0.00																							Centei 5.00450	
-10.0 -20.0 -30.0	2																			-18.20 c	:IBm		<b>Start</b> 9.00	t <b>Freq</b> 00 kHz
-40.0 -50.0 -60.0		ين المراجعة والمراجعة	<b>, and a</b> t a	htered		As aprile	enter en	9 <b>1</b> 111	matritity		et sy there of	detane	the set of the set	content (marile)	silman	dandriser	pet an	م <del>ور</del> ياويلونو		نىرغۇر <b>ل</b> ۇرىي	Vhil	3	<b>Stop</b> 0.00000	0 <b>Freq</b> 0 MHz
Stai #Re	s B	W 1	00	kHz					#VB	W 3	00 kH	łz				weep		33 ms	(40	.00 MI 001 pi VALUE	ts)	Auto	<b>CF</b> 2.99910	<sup>°</sup> <b>Step</b> 0 MHz Man
MKR 1 2 3	N N N	1 1	f					8.4 kl 8.4 kl			Y -45.97 -45.97	dBm dBm	FUN	CTION	FUN	ICTION WIE	ЛН	FUN	ICTION	VALUE			Freq	Offset
3 4 5 6 7 8 9 10 11																				>			Treq	0 Hz
MSG	_	_	_	_	_	_		_		_					_	ST/	ATUS	LDC (	Coup					

Agilent Spectrum Analyzer -										
Center Freq 5.015		SENSE:INT		ALIGN OFF	04:19:05 PM Jun 22, 2017 TRACE 1 2 3 4 5 6	Frequency				
	PNO: Fast ⊂ IFGain:Low	Trig: Free Run Atten: 40 dB	•							
	IFGain:Low	Attell: 40 dB		Micel	2 006 02 CH-	Auto Tune				
10 dB/div Ref 30.0	Mkr5 3.096 02 GHz dB/div Ref 30.00 dBm35.93 dBm									
20.0						Center Freq				
10.0						5.015000000 GHz				
0.00						0.01000000000112				
-10.0										
-20.0					-18.20 dBm	Start Freq				
-30.0	¢ <sup>2</sup> _5		∧,34			30.000000 MHz				
(2.2)		وانتقيبه بريانية المررب		وروا فالمتعاور ومالأ فلوا والمروا	والمتعادية والمعالية والمعالية والمعادية					
-40.0	and the second second second second	the design of the paper of the local distance of the local distanc	والمحافظة المترين المطالبات	and the state of the		Stop Freq				
						10.00000000 GHz				
-60.0										
Start 30 MHz					Stop 10.000 GHz					
#Res BW 1.0 MHz	#VB	A/ 3.0 MHz		Sweep 18.	67 ms (40001 pts)					
MKR MODE TRC SCL	×	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man				
1 N 1 f 2 N 1 f	2.460 19 GHz 2.442 24 GHz	8.97 dBm -29.29 dBm								
3 N 1 f 4 N 1 f	5.766 74 GHz 5.881 89 GHz	-35.17 dBm -35.89 dBm				Freq Offset				
5 N 1 f	3.096 02 GHz	-35.89 dBm			=	0 Hz				
6										
8										
9										
11					~					
MSG				STATUS	, <u>·</u>					

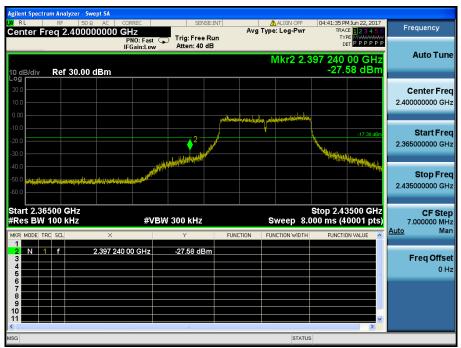


# 802.11n(HT20) & MCS 0 & 2412 MHz



### Reference

#### Low Band-edge



Agilent Spectrum Analyzer - Swept SA					
02 RL RF 50ΩΔΩC Center Freq 15.004500 MI	Hz	Avg Typ	ALIGN OFF e: Log-Pwr	04:41:42 PM Jun 22, 2017 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P	Frequency
10 dB/div Ref 30.00 dBm	PN0: Fast 🖵 Trig: Free IFGain:Low Atten: 40		Μ	ьет РРРРРР kr2 306.7 kHz -46.77 dBm	Auto Tune
20.0 10.0 0.00					Center Freq 15.004500 MHz
-10.0				-17.38 dBm	Start Freq 9.000 kHz
-40.0 2	ennelisenfrantialeisenetenetenatuuterren.stelle	ŧ <sup>ġ</sup> ţŗ <u>ĸ</u> ŧŶŦ₩₽ŢŶijĬħġġġŢ <mark>Ŋ</mark> ĬŶĬŔĬŶĬŢĸġĬŶĬŔĦŦŴĸĸ <u>Ŗ</u> Ĭ	gladialaray sawal shi alabada	Hamildoner and the state of the	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz	#VBW 300 kHz		· ·	Stop 30.00 MHz 33 ms (40001 pts)	CF Step 2.999100 MHz Auto Man
MKR MODE TRC SCL X 1 N 1 F 2 N 1 F 3	306.7 kHz -46.77 dB 306.7 kHz -46.77 dB	Sm 🛛 👘	NCTION WIDTH	FUNCTION VALUE	Freq Offset
4 5 6				=	0 Hz
7 8 9 10					
MSG			STATUS	DC Coupled	

Agilent Spectrum Analyzer - Swept SA										
X         RL         RF         50 Ω         AC           Center Freq 5.015000000		BE:INT ALIGN C Avg Type: Log-F	Wr TRACE 123456	Frequency						
	PNO: Fast Trig: Free IFGain:Low Atten: 40			Auto Tune						
10 dB/div Ref 30.00 dBm	Mkr5 9.969 59 GHz -36.05 dBm -36.05 dBm									
20.0 10.0 0.00	1			Center Freq 5.015000000 GHz						
-20.0	2 8		-17.38 dBm 5	Start Freq 30.000000 MHz						
-40.0 -50.0 -60.0				<b>Stop Freq</b> 10.000000000 GHz						
Start 30 MHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep	Stop 10.000 GHz 18.67 ms (40001 pts)	CF Step 997.000000 MHz						
MKR MODE TRC SCL X	419 06 GHz 9.97 dE	FUNCTION FUNCTION W	IDTH FUNCTION VALUE	<u>Auto</u> Man						
2 N 1 f 2.4 3 N 1 f 2.4 4 N 1 f 2.3	428 28 GHz -17.31 dB 434 76 GHz -23.32 dB 391 15 GHz -25.33 dB 969 59 GHz -36.05 dB	m m		Freq Offset 0 Hz						
7 8 9 9 9 9 10 10 11 11 11 11 11 11 11 11 11 11 11										
MSG		s	TATUS							

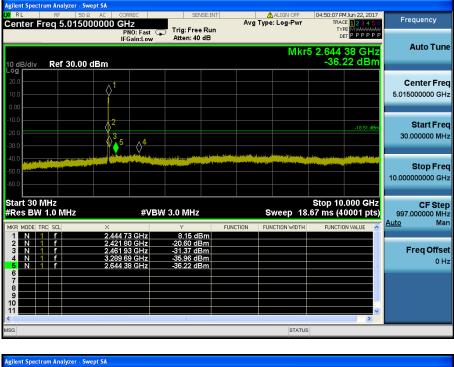
LXI RL		Ω AC CORF			e:int	Avg Ty	ALIGN OFF	TRAG	M Jun 22, 2017 CE 1 2 3 4 5 6 PE M <del>V W M M V</del>	Frequency
10 dB/div	Ref 30.00	IFG	o: Fast 🕒 ain:Low	Atten: 40 o			Mkr3 2	₀ 4.939 2	50 GHz	Auto Tune
20.0 10.0										Center Freq 17.500000000 GHz
-10.0 -20.0 -30.0			and the state of the state		an civil da su que ci a la com			a <mark>No. 1. and Marthaly</mark> (a. 11	-17.38/5 3.	Start Freq 10.000000000 GHz
-40.0					Interference and the Res					<b>Stop Fred</b> 25.000000000 GHz
Start 10.0 #Res BW	1.0 MHz	×	#VBW	/ 3.0 MHz	FLIN		Sweep 40	.00 ms (4	.000 GHz 0001 pts)	CF Step 1.500000000 GH: <u>Auto</u> Mar
1 N 1 2 N 1 3 N 1 4 5	f f	24.293 875 24.695 125 24.939 250	GHz	-26.72 dB -27.06 dB -27.08 dB	m m					Freq Offse 0 H:
6 7 8 9 10 11										
< ISG							STATUS		>	

# 802.11n(HT20) & MCS 0 & 2437 MHz



### Reference

Agilent Spectrum Analyzer - Swept SA XI RL RF 50 Ω 🛕 DC	CORREC	SENSE:INT	ALIGN OFF	04:49:58 PM Jun 22, 2017	
Center Freq 15.004500 M	PNO: East	rig: Free Run Atten: 40 dB	Avg Type: Log-Pwr	TRACE 123456 TYPE M M M M M M M M M M M M M M M M M M M	Frequency
10 dB/div Ref 30.00 dBm			Γ	/lkr2 281.9 kHz -44.53 dBm	Auto Tune
Log 20.0 10.0 0.00					Center Fred 15.004500 MHz
-10.0				-18.51 dBm	Start Fred 9.000 kHz
-40.0 2 -50.0	าราสาราสาราสาราสาราสาราสาราสาราส	ianation (ประการสาราชการการ	energian salah di perintahan sana sana	าป <sub>า</sub> ปีแนวกระบบใหญาและสุดที่สารหล่างและรู้ได้รังแก่ เ <sub>สต</sub>	Stop Free 30.000000 MH:
Start 9 kHz #Res BW 100 kHz	#VBW 30		Sweep 5.3	Stop 30.00 MHz 33 ms (40001 pts)	<b>CF Stej</b> 2.999100 MH <u>Auto</u> Ma
1 N 1 F 2 N 1 F 3 4 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	281.9 kHz - 281.9 kHz -	44.53 dBm 44.53 dBm			Freq Offse 0 H
6 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9					
< lisg			STATUS	DC Coupled	



Agilent Spectrum Analyzer - Swept SA				
KE RE 50 Ω AC     Center Freq 17.50000000	CORREC SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	04:50:15 PM Jun 22, 2017 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast Trig: Free Run IFGain:Low Atten: 40 dB	Mkr3 2	түре Милини Det P P P P P P 24.172 375 GHz	Auto Tune
10 dB/div Ref 30.00 dBm 20.0			-27.31 dBm	Center Freq
-10.0			3	Start Freq
-30.0 -40.0 distribution of the last of the second sector of the -50.0		in a family and the province of the second se Second second s		<b>Stop Freq</b> 25.00000000 GHz
-60.0 Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz		Stop 25.000 GHz .00 ms (40001 pts)	CF Step 1.50000000 GHz Auto Man
2 N 1 f 24.637 3 N 1 f 24.172	1 375 GHz -27.17 dBm 7 375 GHz -27.28 dBm 2 375 GHz -27.31 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset
4 5 6 7 7 8			======================================	0 Hz
9 10 11 11			×	
MSG		STATU	3	

# 802.11n(HT20) & MCS 0 & 2462 MHz



### Reference

## **High Band-edge**



Agilent Spectrum Analyzer - Swept SA				
KE RE 50Ω ALDC     Center Freq 15.004500 Ν		Avg Type: L	IGN OFF 04:55:49 PM Jun 22, 2017 og-Pwr TRACE 2 3 4 5 TYPE MINIMUM	Frequency
10 dB/div Ref 30.00 dBm	PNO: Fast 🖵 Trig: Free R IFGain:Low Atten: 40 dl		түре Миг2 297.7 kHz -46.65 dBm	Auto Tune
20.0 10.0 0.00				Center Freq 15.004500 MHz
-10.0			-19.19.dBr	Start Freq 9.000 kHz
-40.0	An and a party and an an an an an and a start and a	gang gantaka futfatikan atan pertekan	orisidentlehtelsstrelstegenenstrumprommetelstere	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz	#VBW 300 kHz	Swe	Stop 30.00 MHz eep 5.333 ms (40001 pts	2.999100 MHz
MKR MODE TRC SCL X	297.7 kHz -46.65 dBn 297.7 kHz -46.65 dBn		ON WIDTH FUNCTION VALUE	Auto Man
2 N 1 f 3 4 5 6 6	297.7 kHz -46.65 dBm			Freq Offset 0 Hz
7 8 9 9 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10				
K MSG	illi illi		STATUS ! DC Coupled	
			and a be coupled	

Agilent Spectrum Analyzer - Swe											
RL RF 50 Ω     Center Freq 5.01500		SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	04:55:58 PM Jun 22, 2017 TRACE 1 2 3 4 5 6	Frequency						
	PNO: Fast G	Trig: Free Run Atten: 40 dB		TYPE MWWWWWW DET PPPPP							
	IFGall.cow		Mkr	5 6 271 72 CHz	Auto Tune						
10 dB/div Ref 30.00 d	Mkr5 6.271 72 GHz dB/div Ref 30.00 dBm										
20.0					Center Freq						
10.0					5.015000000 GHz						
0.00											
-10.0											
-20.0	3			-19.19 dBm	Start Freq 30.000000 MHz						
-30.0	ļ ľ		L _5		30.000000 MH2						
-40.0	and the second	destance to describe a dist	a sala halfallaga da sala sala sala sala sala sa	Robert and the second sector and							
-50.0					Stop Freq						
-60.0					10.00000000 GHz						
Start 30 MHz #Res BW 1.0 MHz	#VBV	/ 3.0 MHz	Sweep 18	Stop 10.000 GHz 67 ms (40001 pts)	CF Step 997.000000 MHz						
MKR MODE TRC SCL	×		ICTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man						
1 N 1 f 2 N 1 f	2.456 70 GHz 2.479 88 GHz	8.04 dBm -24.65 dBm									
3 N 1 f 4 N 1 f	2.481 87 GHz 5.738 82 GHz	-25.22 dBm -35.39 dBm			Freq Offset						
5 N 1 f	6.271 72 GHz	-35.60 dBm		=	0 Hz						
6											
8											
10											
11				~							
MSG			STATUS	3							

Agilent Spectrum Analyzer - Swept SA					
M RL RF 50Ω AC Center Freq 17.50000000		SENSE:INT Avg Free Run	ALIGN OFF	04:56:06 PM Jun 22, 2017 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
10 dB/div Ref 30.00 dBm		n: 40 dB	Mkr3 2	4.185 500 GHz -27.35 dBm	Auto Tune
					Center Freq 17.500000000 GHz
-10.0				19.3 (2h)	<b>Start Freq</b> 10.000000000 GHz
-40.0		in the second			<b>Stop Freq</b> 25.000000000 GHz
Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 N			Stop 25.000 GHz .00 ms (40001 pts)	CF Step 1.50000000 GHz Auto Man
2 N 1 f 23.94	3 250 GHz -26.3	FUNCTION 7 dBm 1 dBm 5 dBm	FUNCTION WIDTH	FUNCTION VALUE	Freq Offset
6 8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10				*	
<				>	



# 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 <sub>on</sub> (ms)	T <sub>on</sub> + T <sub>off</sub> (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)
2389.77	Н	Y	PK	49.02	0.70	N/A	N/A	49.72	74.00	24.28
2389.96	Н	Y	AV	38.92	0.70	0.10	N/A	39.72	54.00	14.28
4824.03	V	Z	PK	45.26	4.86	N/A	N/A	50.12	74.00	23.88
4823.95	V	Z	AV	36.89	4.86	0.10	N/A	41.85	54.00	12.15

#### • 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)
4873.76	V	Z	PK	44.87	5.07	N/A	N/A	49.94	74.00	24.06
4873.97	V	Z	AV	34.86	5.07	0.10	N/A	40.03	54.00	13.97

#### • 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)
2483.55	Н	Y	PK	52.71	1.07	N/A	N/A	53.78	74.00	20.22
2483.52	Н	Y	AV	40.97	1.07	0.10	N/A	42.14	54.00	11.86
4924.17	V	Z	PK	45.26	5.23	N/A	N/A	50.49	74.00	23.51
4924.04	V	Z	AV	35.96	5.23	0.10	N/A	41.29	54.00	12.71

#### Note.

- 1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.
- 2. This device was tested under MIMO Multiple transmitting (Ant 1, 2) and the worst case data are reported in the table above.
- Sample Calculation.
   Margin = Limit Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
- 4. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20\*log(1m/3m)

# 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)
2389.61	V	Z	PK	65.66	0.70	N/A	N/A	66.36	74.00	7.64
2389.96	V	Z	AV	46.41	0.70	0.59	N/A	47.70	54.00	6.30
4823.07	V	Z	PK	44.32	4.86	N/A	N/A	49.18	74.00	24.82
4822.59	V	Z	AV	33.94	4.86	0.59	N/A	39.39	54.00	14.61

#### • 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)
4874.76	V	Z	PK	44.21	5.07	N/A	N/A	49.28	74.00	24.72
4874.94	V	Z	AV	33.79	5.07	0.59	N/A	39.45	54.00	14.55

#### • 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)
2483.67	V	Z	PK	65.24	1.07	N/A	N/A	66.31	74.00	7.69
2483.53	V	Z	AV	48.53	1.07	0.59	N/A	50.19	54.00	3.81
4923.33	V	Z	PK	44.41	5.23	N/A	N/A	49.64	74.00	24.36
4924.06	V	Z	AV	33.86	5.23	0.59	N/A	39.68	54.00	14.32

#### Note.

- 1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.
- 2. This device was tested under MIMO Multiple transmitting (Ant 1, 2) and the worst case data are reported in the table above.
- Sample Calculation.
   Margin = Limit Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
- Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20\*log(1m/3m)



# 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)
2389.69	V	Z	PK	61.95	0.70	N/A	N/A	62.65	74.00	11.35
2389.80	V	Z	AV	46.88	0.70	0.63	N/A	48.21	54.00	5.79
4822.88	V	Z	PK	44.23	4.86	N/A	N/A	49.09	74.00	24.91
4823.80	V	Z	AV	33.74	4.86	0.63	N/A	39.23	54.00	14.77

#### • 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)
4873.34	V	Z	PK	44.49	5.07	N/A	N/A	49.56	74.00	24.44
4872.64	V	Z	AV	33.75	5.07	0.63	N/A	39.45	54.00	14.55

#### • 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)
2483.65	V	Z	PK	64.51	1.07	N/A	N/A	65.58	74.00	8.42
2483.77	V	Z	AV	48.07	1.07	0.63	N/A	49.77	54.00	4.23
4923.04	V	Z	PK	44.22	5.23	N/A	N/A	49.45	74.00	24.55
4923.80	V	Z	AV	33.74	5.23	0.63	N/A	39.60	54.00	14.40

#### Note.

- 1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.
- 2. This device was tested under MIMO Multiple transmitting (Ant 1, 2) and the worst case data are reported in the table above.
- Sample Calculation.
   Margin = Limit Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
- Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz. Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20\*log(1m/3m)



# 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.)

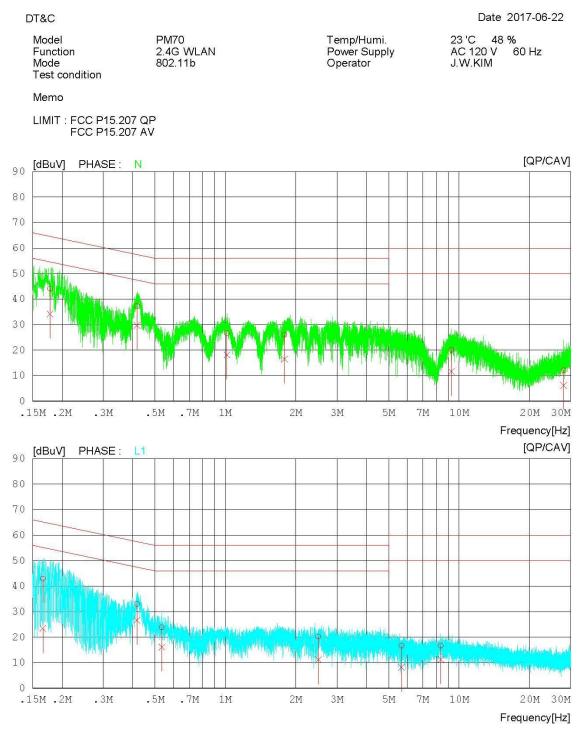
The worst data was reported.

## 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
Function
Mode
Test condition

lition

PM70 2.4G WLAN 802.11b

Memo

DT&C

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

NC	FREQ	READING QP CAV	C.FACTOR	RESULT QP CAV	LIMIT QP CAV	MARGIN QP CAV	PHASE
	[MHz]	[dBuV] [dBuV]	[dB]	[dBuV] [dBuV	] [dBuV][dBu\	/] [dBuV][dBuV	7]
1	0.17808	43.94 33.97	0.21	44.1534.18	64.57 54.57	20.42 20.39	Ν
2	0.41890	37.03 29.53	0.21	37.24 29.74	57.47 47.47	20.23 17.73	Ν
3	1.01440	26.4517.87	0.26	26.7118.13	56.00 46.00	29.29 27.87	Ν
4	1.79120	25.73 16.19	0.29	26.0216.48	56.00 46.00	29.98 29.52	Ν
5	9.26920	19.47 11.00	0.67	20.14 11.67	60.00 50.00	39.8638.33	Ν
6	27.99220	10.14 4.30	1.94	12.08 6.24	60.00 50.00	47.9243.76	Ν
7	0.16578	42.7223.21	0.18	42.9023.39	65.17 55.17	22.27 31.78	L1
8	0.41840	32.8626.39	0.20	33.0626.59	57.48 47.48	24.4220.89	L1
9	0.53500	23.59 15.97	0.20	23.7916.17	56.00 46.00	32.21 29.83	L1
10	2.50340	19.88 10.84	0.32	20.2011.16	56.00 46.00	35.80 34.84	L1
11	5.66900	16.15 7.65	0.50	16.65 8.15	60.00 50.00	43.35 41.85	L1
12	8.34860	15.9310.57	0.68	16.6111.25	60.00 50.00	43.3938.75	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.

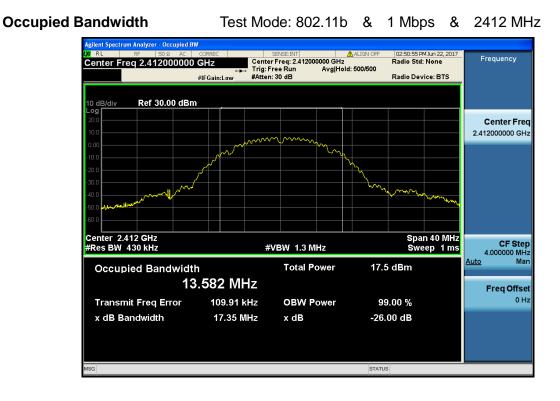
### TEST PROCEDURE

- 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]
		2412	13.582
802.11b	1 Mbps	2437	13.397
		2462	13.184
	6 Mbps	2412	17.844
802.11g		2437	17.661
		2462	17.247
		2412	18.571
802.11n (HT20)	MCS 0	2437	18.513
		2462	18.201

### RESULT PLOTS



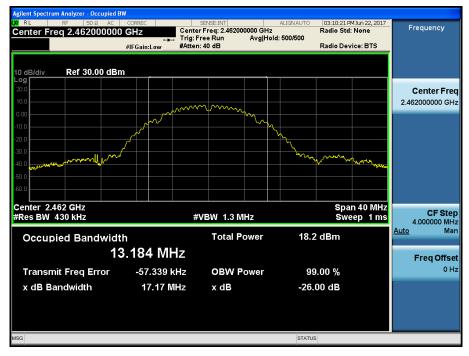
#### **Occupied Bandwidth**

### Test Mode: 802.11b & 1 Mbps & 2437 MHz

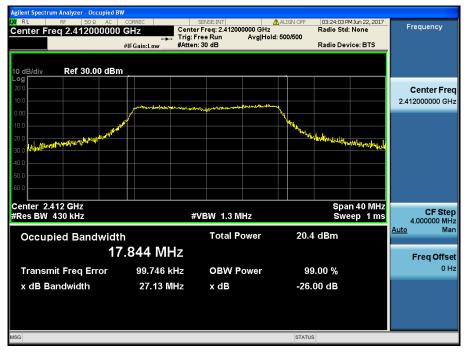




#### Test Mode: 802.11b & 1 Mbps & 2462 MHz



### Test Mode: 802.11g & 6 Mbps & 2412 MHz



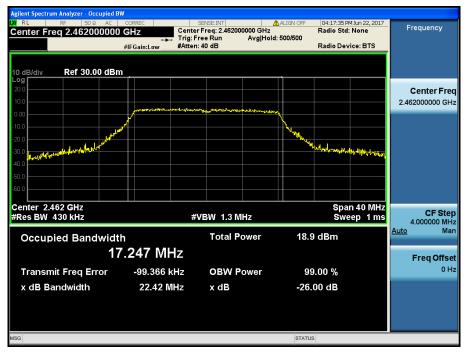
#### **Occupied Bandwidth**

### Test Mode: 802.11g & 6 Mbps & 2437 MHz

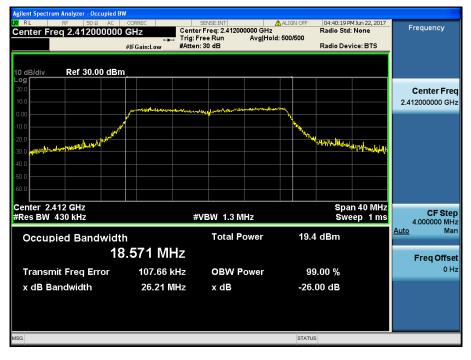




#### Test Mode: 802.11g & 6 Mbps & 2462 MHz



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



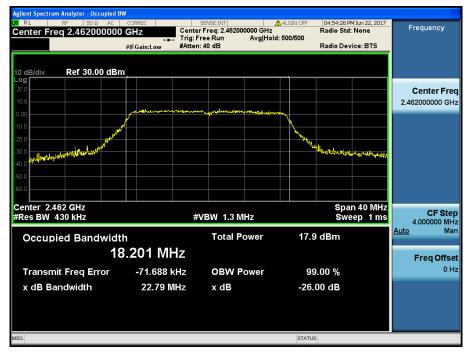
#### **Occupied Bandwidth**

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





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



# 7. LIST OF TEST EQUIPMENT

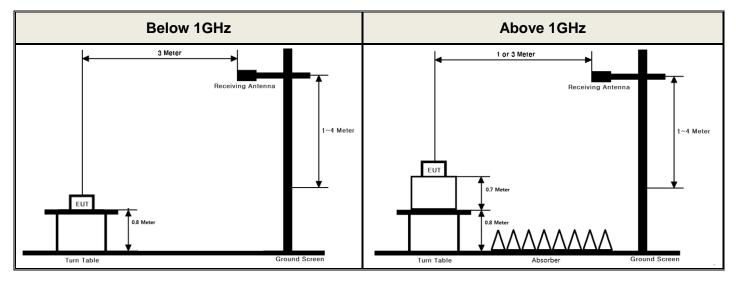
Туре	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	16/09/09	17/09/09	MY50200834
Digital Multimeter	Agilent Technologies	34401A	17/01/04	18/01/04	US36099541
DC Power Supply	Agilent Technologies	66332A	16/09/08	17/09/08	US37473305
Vector 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
PreAmplifier	Agilent Technologies	8449B	16/10/19	17/10/19	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 Instruments	WHKX12-2580- 3000-18000-80SS	16/09/09	17/09/09	3
Highpass Filter	Wainwright Instruments	WHNX6-6320- 8000-26500-40CC	16/09/13	17/09/13	1
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
ARTIFICIAL MAINS NETWORK	ROHDE&SCHWARZ	ESH2-Z5	16/09/08	17/09/08	828739/006
SINGLE-PHASE MASTER	NF	4420	16/09/08	17/09/08	3049354420023

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

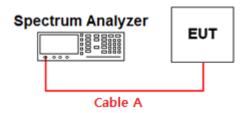
# **APPENDIX I**

## 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

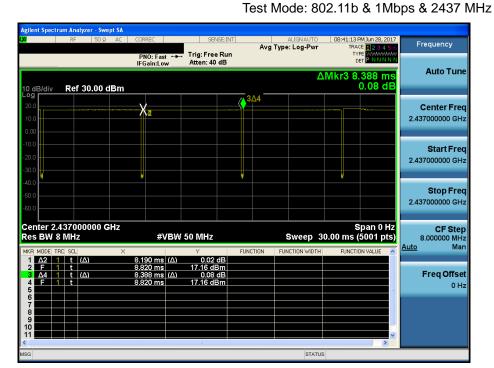
# Duty Cycle measured using section 6.0 b) of KDB558074

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 :

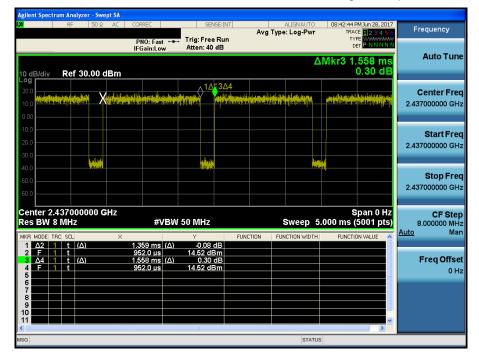


## **Duty Cycle**

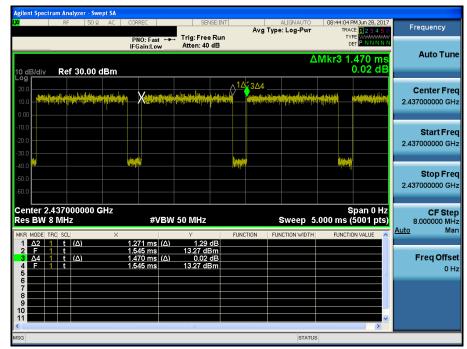


**Duty Cycle** 

#### Test Mode: 802.11g & 6Mbps & 2437 MHz



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

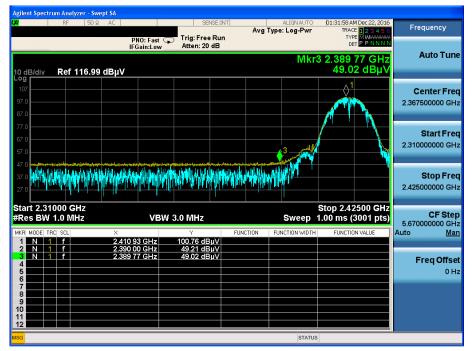


#### **Duty Cycle**

# **APPENDIX III**

# **Unwanted Emissions (Radiated) Test Plot**

#### 802.11b & Lowest & Y & Hor



### 802.11b & Lowest & Y & Hor

#### ctrum Ana Frequency Avg Type: Pwr(RMS) Avg[Hold: 200/200 Trig: Free Run Atten: 20 dB PNO: Fast IFGain:Low Auto Tune Mkr3 2.389 96 GH 38.918 dBµ Ref 116.99 dBµV Center Freq 2.367500000 GHz Start Freq 2.31000000 GHz 3 talieten india andra india andra india india india andro a statistical data india india and a statistical data 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) Luto Man 39.145 dBµ\ 38.918 dBµ\ Freq Offset 0 H; STATUS

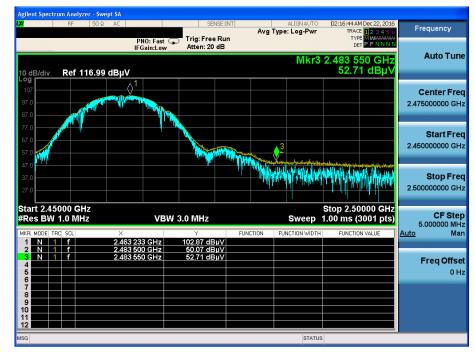
### **Detector Mode : PK**

**Detector Mode : AV** 

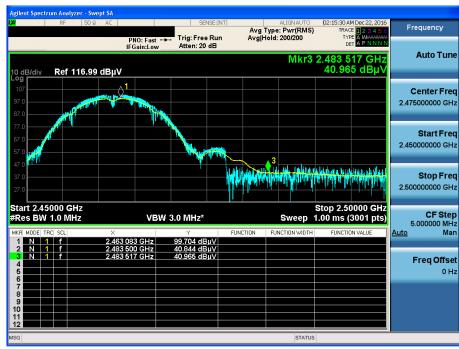


## 802.11b & Highest & Y & Hor

# **Detector Mode : PK**



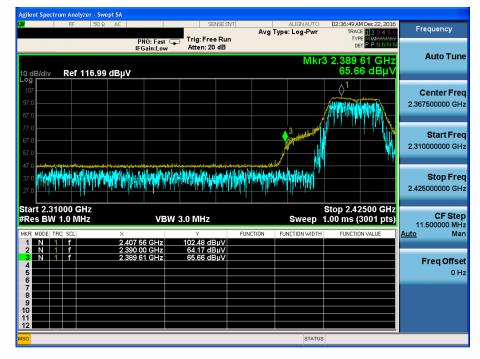
## 802.11b & Highest & Y & Hor



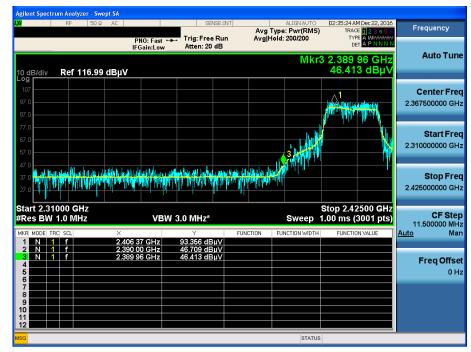


## 802.11g & Lowest & Z & Ver

#### **Detector Mode : PK**



#### 802.11g & Lowest & Z & Ver





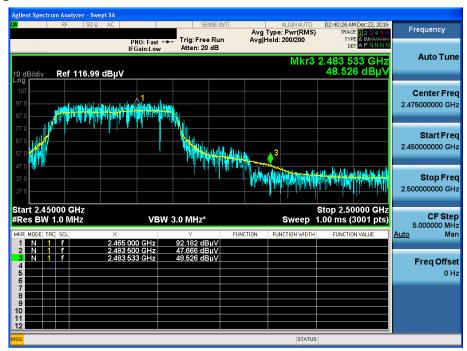
# **Detector Mode : PK**

## 802.11g & Highest & Z & Ver



### Detector Mode : AV

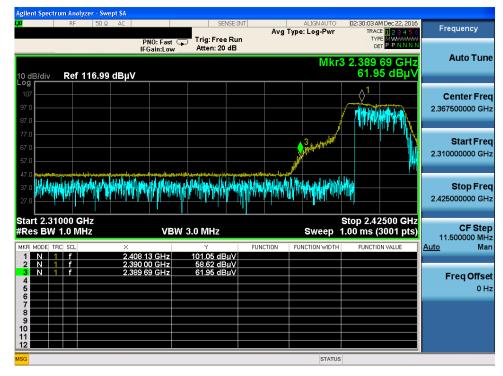
#### 802.11g & Highest & Z & Ver



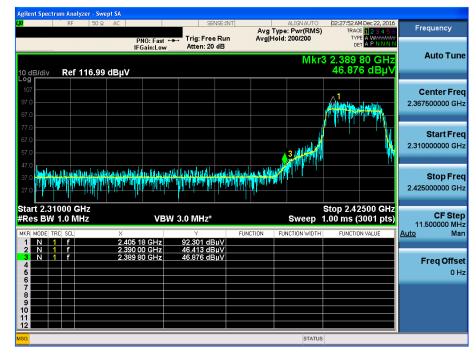


## 802.11n(HT20) & Lowest & Z & Ver

### **Detector Mode : PK**



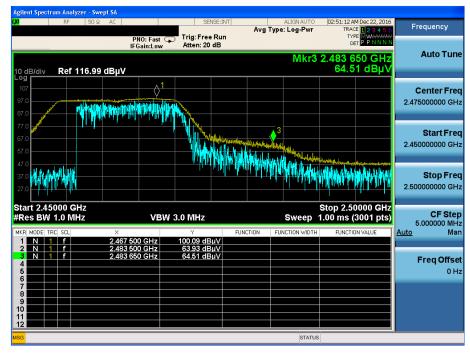
# 802.11n(HT20) & Lowest & Z & Ver



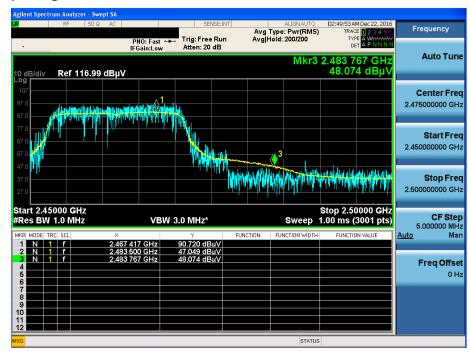


# Detector Mode : PK

## 802.11n(HT20) & Highest & Z & Ver



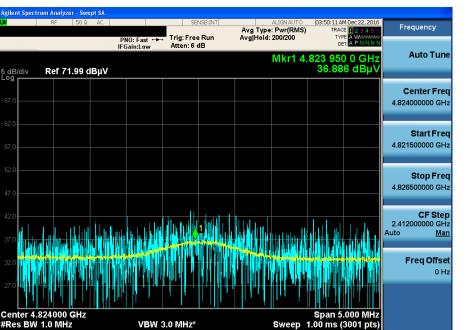
802.11n(HT20) & Highest & Z & Ver



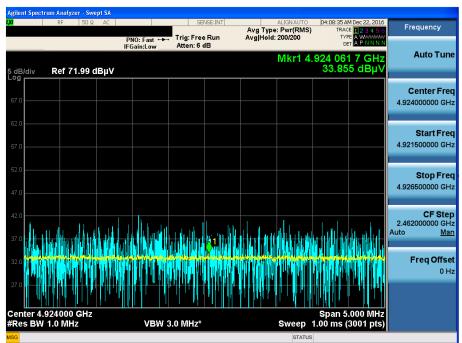
**Detector Mode : AV** 



### 802.11b & Lowest & Z & Ver



### 802.11g & Highest & Z & Ver





## 802.11n(HT20) & Highest & Z & Ver

