

# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

	OF
Product Name:	PDA Phone
Brand Name:	Sony
Type No.:	PM-0732-BV
Model Difference:	N/A
FCC ID:	PY7PM-0732
Report No.:	EH/2014/10052
Issue Date:	Apr. 11, 2014
FCC Rule Part:	§15.247, Cat: DTS
Prepared for:	Sony Mobile Communications AB Nya Vattentornet 22188 Lund/Sweden
Prepared by:	SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

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# **VERIFICATION OF COMPLIANCE**

Applicant:	Sony Mobile Communications AB Nya Vattentornet 22188 Lund/Sweden
Product Name:	PDA Phone
Brand Name:	Sony
Type No.:	PM-0732-BV
Model Difference:	N/A
FCC ID:	PY7PM-0732
File Number:	EH/2014/10052
Date of test:	Jan. 27, 2014 ~ Mar. 21, 2014
Date of EUT Received:	Jan. 27, 2014

# We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2009 & ANSI 63.10:2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

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

Test By:	Marcus Tseng	Date	Apr. 11, 2014
Prepared By:	Marcus Tseng / Engineer Uroletta Tang	Date	Apr. 11, 2014
Approved By:	Violetta Tang / Clerk	Date	Apr. 11, 2014

Jim Chang / Supervisor

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# **Revision History**

Report Number	Revision	Description	Issue Date
EH/2014/10052	Rev.00	Initial creation of document	Apr. 11, 2014

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# **FCC ID: PY7PM-0732**

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#### **GENERAL INFORMATION** 1

#### **Product description** 1.1

General:

Product Name:	PDA Phon	e	
Brand Name:	Sony		
Type No.:	PM-0732-	BV	
Model Difference:	N/A		
Data Cable (USB):	1.Model No.: EC450, Supplier: K-one Type No.: AI-0700, Length: 100 cm 2.Model No.: EC801, Supplier: Sony Type No.: AI-0401, Length: 100 cm		
Simple Hands-Free (SHF-White):	Model No. Type No.:	: MH410c, Supplier: Foster Electric AG-1100	
Simple Hands-Free (SHF-Black):	Model No.: MH410c, Supplier: Foster Electric Type No.: CCA-0004017		
Car Charger:	Model No.: AN400, Supplier: Salcomp Type No.: CAA-0003013		
Hi-Fi Wireless Headset:	Model No.: MW600, Supplier: BALDA Type No.: DDA-0002029.B coupling with Simple Hands Free (Model No.: MH755, Supplier: BALDA Type No.: AG-0502)		
Hardware Version:	A		
Software Version:	18.2.A.0.9		
	3.8Vdc		
	Battery:	Model No.: LIS1546ERPC, Supplier: Sony Type No.: N/A	
Power Supply:	Adapter:	1.Model No.: EP800, Supplier: Salcomp Type No.: CAA-0002016-US	
		2.Model No.: EP880, Supplier: Salcomp Type No.: AC-0400-US	

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Bluetooth BR+EDR:

Bluetooth Version:	V3.0+HS
Channel number:	79 channels
Modulation type:	Frequency Hopping Spread Spectrum
Transmit Power:	10.12dBm
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	<= 0.4s
Antenna Designation: PIFA Antenna, Gain: -1.34dBi	

Bluetooth Low Energy:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V4.0 Dual mode
Channel number:	40 channels
Modulation type:	GFSK
Transmit Power:	1.79dBm (Peak)
Antenna Designation:	PIFA Antenna, Gain: -1.34dBi

NFC:

Operating Frequency:	13.56MHz
Transmit Power:	< 123dBuV/m at 3m.
Number of Channels:	1
Antenna Type:	Loop Antenna
Modulation Type:	ASK, BPSK

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## ANT Plus:

Operating Frequency:	2402 – 2480MHz
Transmit Power:	102.10dBuV/m
Number of Channels:	79
Antenna Type:	PIFA Antenna, Gain: -1.34dBi
Modulation Type:	GFSK

## GSM / WCDMA:

	Operating Frequency		Rated Power
	GSM/GPRS 850, Class 33	824.2 MHz- 848.8 MHz	33dBm
	EDGE 850, Class 33	824.2 MHz- 848.8 MHz	27dBm
Cellular Phone Standards Frequency	GSM/GPRS 1900, Class 33	1850.2MHz – 1909.8MHz	30dBm
Range and Power.	EDGE 1900, Class 33	1850.2MHz - 1909.8MHz	26dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band II	1852.4MHz – 1907.6MHz	24dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band V	820.4 VI HZ - 840.0 VI HZ	
Type of Emission:	GSM 850: 249KGXW, GSM 19 GPRS 850: 243KGXW, GPRS 1 EDGE 850: 248KG7W, EDGE WCDMA Band II: 4M19F9W, W HSDPA Band II: 4M18F9W, HS HSUPA Band II: 4M18F9W, HS	,	
IMEI:	004402146985134		

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## WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg)	Modulation Technology	
	5150~5250	4	13.98dBm		
11a	5250~5350	4	13.99dBm	OFDM	
	5470~5725	8	13.99dBm		
	HT20 5150~5250	4	HT20: 11.49dBm		
11n	HT20 5250~5350	4	HT20: 11.49dBm	OFDM	
	HT20 5470~5725	8	HT20: 11.48dBm		
	HT40 5150~5250	2	HT40: 10.48dBm		
11n	HT40 5250~5350	2	HT40: 10.46dBm	OFDM	
	HT40 5470~5725	3	HT40: 10.49dBm		
Antenna I	Antenna Designation		ina, : -0.38dBi (5150) : 0.10dBi (5250) : 3.98dBi (5470)	(Hz-5350MHz)	
Modulation type		64QAM, 16QAM, QPSK, BPSK for OFDM			
Transition	n Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 65.0Mbps 802.11 n_40MHz: 13.5 – 135.0Mbps			

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# WLAN 2.4GHz+5.7GHz:

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology		
11b/g	2412-2462	11	b: 20.40dBm g: 21.93dBm	DSSS, OFDM		
11n	HT20 2412-2462	11	HT20: 20.89dBm	OFDM		
11a	5725-5850	5	a: 20.66dBm			
11n (5GHz)	HT20 5725-5850	5	HT20: 19.89dBm	OFDM		
11n (5GHz)	HT40 5725-5850	2	HT40: 19.07dBm			
Antenna	Antenna Designation:		PIFA Antenna, 2.4GHz Gain: -1.34dBi 5GHz Gain: 4.51dBi (5725MHz-5850MHz)			
Modulation type:		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM				
Transition	n Rate:	802.11 a: 802.11 b: 802.11 g: 802.11 n	6/9/12/18/24/36/48/5 1/2/5.5/11 Mbps 6/9/12/18/24/36/48/5 20MHz: 6.5 – 65.0N 40MHz: 13.5 – 135.1	54 Mbps 54 Mbps 1bps		

The 2.4G max antenna gain is -1.34dBi which was choosing for Radiated Spurious Emission test.

The 5G max antenna gain is 4.51dBi which was choosing for Radiated Spurious Emission test.

The EUT is in compliance with FCC \$15.247 at which the frequency band of 2400~2483.5, and 5725~5850MHz has been tested.

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## IEEE 802.11n Spec:

MCS		NORDO		nna		Datarate(Mbps)						
Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		800nsGI		400nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.200	15
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.400	30
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.700	45
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.900	60
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.300	90
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.800	120
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.000	135
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.200	150

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bite per single carrier
NCBPS	Number of coded bite per symbol
NDBPS	Number of data bite per symbol
GI	Guard interval

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## **1.2** Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID:** <u>**PY7PM-0732**</u> filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under the certification procedure.

## **1.3 Test Methodology**

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4:2009 and ANSI 63.10:2009. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with Apr 2013 KDB558074 D01 V03 for compliance to FCC 47CFR 15.247 requirements.

## **1.4 Test Facility**

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009. & ANSI C63.10:2009. FCC Registration Number: 990257. Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

## 1.5 Special Accessories

There are no special accessories used while test was conducted.

## **1.6 Equipment Modifications**

There was no modification incorporated into the EUT.

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#### 2 SYSTEM TEST CONFIGURATION

#### 2.1 **EUT Configuration**

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

#### 2.2 **EUT Exercise**

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

#### 2.3 **Test Procedure**

## 2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the general criterion in Section 7.1 of ANSI C63.4:2009 & 6.2 ANSI 63.10:2009.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz, and the measurement procedure 7.3 in ANSI 63.4:2009 & 6.2.2, and 6.2.3 in ANSI 63.10:2009 is followed to carry out the test. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107

## 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna. according to the requirements in Section 8 and 13 and of ANSI C63.4:2009, & Section 6.3, 6.4, 6.5, and 6.6 of ANSI 63.10:2009.

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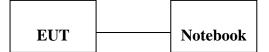
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#### 2.4 **Configuration of Tested System**

## Fig. 2-1 Radiated Emission



# Fig. 2-2 Conducted (Antenna Port) Configuration

EUT	Notebook

## **Table 2-1 Equipment Used in Tested System**

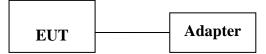
Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	QRCT	2.4.83.0	N/A	N/A	N/A
2.	Notebook	DELL	E5400	3704625136	shielding	Un-shielding

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# Fig. 2-3 AC Power Line Conducted Emission



## **Table 2-2 Equipment Used in Tested System**

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	QRCT	2.4.83.0	N/A	N/A	N/A

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#### SUMMARY OF TEST RESULTS 3

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	Peak Output Power	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.247(d)	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(d)	Spurious Emission	Compliant
§15.247(e)	Peak Power Density	Compliant
§15.203	Antenna Requirement	Compliant

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# **4 DESCRIPTION OF TEST MODES**

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

802.11 b mode: Channel low (2412MHz), mid (2437MHz) and high (2462MHz) with 1Mbps lowest data rate are chosen for full testing.

802.11 g mode: Channel low (2412MHz), mid (2437MHz) and high (2462MHz) with 6Mbps lowest data rate are chosen for full testing.

802.11 n\_20MHz mode: Channel low (2412MHz), mid (2437MHz) and high (2462MHz) with 6.5Mbps lowest data rate are chosen for full testing.

802.11 a mode: Channel low (5745MHz), mid (5785MHz) and high (5825MHz) with 6Mbps lowest data rate are chosen for full testing.

802.11 n (5GHz) \_20MHz: Lowest (5745MHz), Mid (5785MHz) and high (5825MHz) with 6.5 Mbps lowest data rate are chosen for full testing.

802.11 n (5GHz) \_40MHz: Lowest (5755MHz) and high (5795MHz) with 13.5 Mbps lowest data rate are chosen for full testing.

The worst case is determined by the output power that generates the highest emission. As examined in the section of output power measurement, the section 7.5, the lowest data rate at a/b/g/n\_HT20/n\_HT40 resulted the highest level of fundamental emission, and therefore, the lowest data rate is chosen as the worst-case to conduct the remaining of other mandatory test cases.

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

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# **5 MEASUREMENT UNCERTAINTY**

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 1.55dB (for Spectrum) +/- 1.42 dB (for Power Meter)
6dB Bandwidth	+/- 123.36 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 1.55 dB
Peak Power Density	+/- 1.55 dB
Temperature	+/- 0.8 °C
Humidity	+/- 4.7 %
DC / AC Power Source	DC=+/-1%, AC=+/-0.2%

Radiated Spurious Emission:

	30MHz - 180MHz: +/- 3.37dB
Management	180MHz -417MHz: +/- 3.19dB
Measurement uncertainty (Polarization : <b>Vertical</b> )	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

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

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

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# **6 CONDUCTED EMISSION TEST**

# 6.1 Standard Applicable:

According to §15.207, frequency range within 150 kHz to 30MHz shall not exceed the Limit table as below.

Frequency range	Limits dB(uV)						
MHz	Quasi-peak	Average					
0.15 to 0.50	66 to 56	56 to 46					
0.50 to 5	56	46					
5 to 30	60	50					
Note							
1. The lower limit shall apply at the transition frequencies							

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

## 6.2 Measurement Equipment Used:

Conducted Emission Test Site								
EQUIPMENT	MFR	SERIAL	LAST	CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCI7	100760	05/27/2013	05/26/2014			
LISN	Rolf-Heine	NNB-2/16Z	99012	03/23/2013	03/22/2014			
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/23/2013	03/22/2014			
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2013	11/25/2014			

# 6.3 EUT Setup:

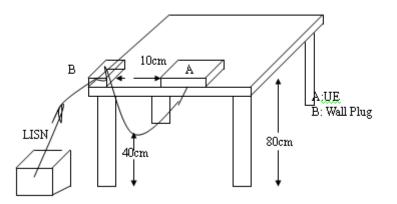
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4:2009 & ANSI 63.10:2009.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

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# 6.4 Test SET-UP (Block Diagram of Configuration)



## 6.5 Measurement Procedure:

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

## 6.6 Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots. Note2: The \* reveals the worst-case results that closet to the limit

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# AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode	:			Test Date:	Feb. 01, 2014
Temperature:	26	Humidit	ty:	50 %	Test By:	Marcus
Model No.:	EP800	I	-			
Site Conduction	s B Conduction(QP) Mode		Phase: Power: AC	<b>L1</b> 120V/60Hz	Temperatu Humidity:	re: 26 ℃ 60%
		Condu	ctedEmiss	ion		
File:10051		Data:#1	Da	ate: 2014/2/1	Time: 上行 10:05	27
80.0 dBuV						
<u> </u>				FC	CC Class B Conduction	(OP)
				FC	C Class B Conduction(/	NVG)
40 MMM	MWW WW	¥#####################################	Y waaanaa	124 million w	month	m lung
0.0	0.5 Reading Correct	Measure-	MHz)	5		30.000
No. Mk. Freq	Level Factor	in one	Limit Over			
MHz 1 0.477	dBuV dB 73 38.90 0.16		dBul∕ dB 6.39 -17.33		Comment	
2 0.477			6.39 -17.33			
3 0.644			6.00 -20.34			
4 0.644			6.00 -20.64			
5 0.874			6.00 -19.83			
6 0.874			6.00 -21.63			
7 * 1.442			6.00 -15.02			
8 1.442			6.00 -15.52			
9 1.702			6.00 -17.41			
10 1.702			6.00 -18.51			
11 4.026			6.00 -21.86			
12 4.026			6.00 -22.36			

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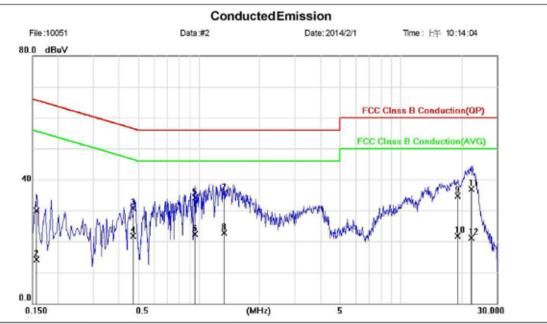
### **FCC ID: PY7PM-0732**



Site ConductionRoom Limit: FCC Class B Conduction(QP) Mode: Operation Mode Note: PDA Phone

Phase: Ν AC 120V/60Hz Power:

Temperature: 26 °C Humidity: 60%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1580	29.80	0.18	29.98	65.57	-35.59	QP	
2		0.1580	14.00	0.18	14.18	55.57	-41.39	AVG	
3		0.4740	30.50	0.19	30.69	56.44	-25.75	QP	
4		0.4740	21.50	0.19	21.69	46.44	-24.75	AVG	
5		0.9620	33.90	0.21	34.11	56.00	-21.89	QP	
6		0.9620	22.00	0.21	22.21	46.00	-23.79	AVG	
7	•	1.3380	35.20	0.21	35.41	56.00	-20.59	QP	
8		1.3380	22.50	0.21	22.71	46.00	-23.29	AVG	
9		19.1940	34.20	0.52	34.72	60.00	-25.28	QP	
10		19.1940	21.20	0.52	21.72	50.00	-28.28	AVG	
11		22.3940	36.40	0.54	36.94	60.00	-23.06	QP	
12		22.3940	20.50	0.54	21.04	50.00	-28.96	AVG	

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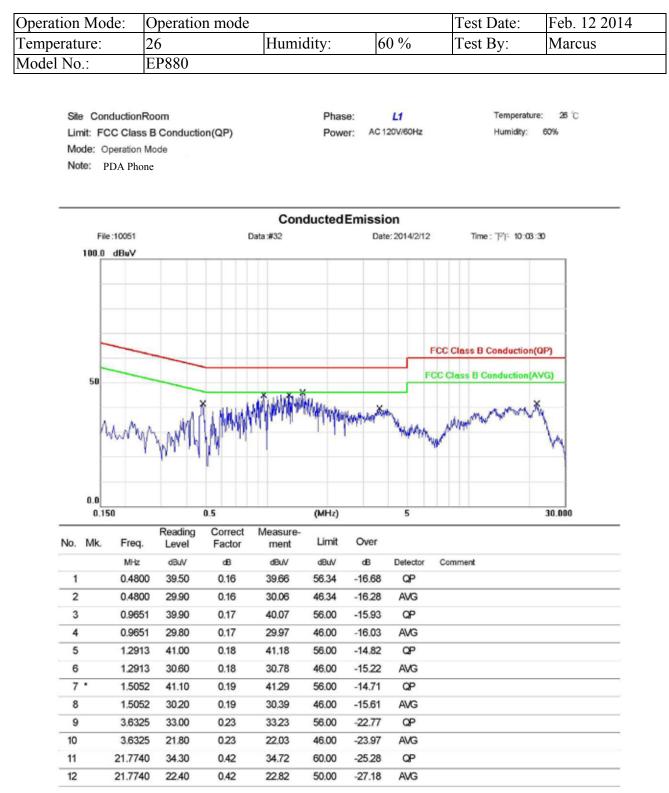
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# AC POWER LINE CONDUCTED EMISSION TEST DATA



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## **FCC ID: PY7PM-0732**

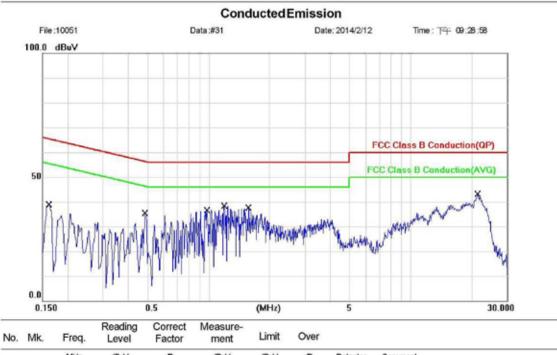
N

Temperature: 26 °C

60%

Humidity:

Site ConductionRoom Phase: Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Mode: Operation Mode Note: PDA Phone



					10.11			a
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1623	35.20	0.18	35.38	65.35	-29.97	QP	
2	0.1623	20.60	0.18	20.78	55.35	-34.57	AVG	
3	0.4862	33.40	0.19	33.59	56.23	-22.64	QP	
4	0.4862	24.50	0.19	24.69	46.23	-21.54	AVG	
5	0.9723	35.10	0.21	35.31	56.00	-20.69	QP	
6	0.9723	22.50	0.21	22.71	46.00	-23.29	AVG	
7 *	1.1873	35.30	0.21	35.51	56.00	-20.49	QP	
8	1.1873	23.40	0.21	23.61	46.00	-22.39	AVG	
9	1.5636	34.30	0.23	34.53	56.00	-21.47	QP	
10	1.5636	21.90	0.23	22.13	46.00	-23.87	AVG	
11	21.4940	36.40	0.54	36.94	60.00	-23.06	QP	
12	21.4940	20.60	0.54	21.14	50.00	-28.86	AVG	

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#### 7 PEAK OUTPUT POWER MEASUREMENT

#### 7.1 **Standard Applicable:**

According to §15.247 (b)

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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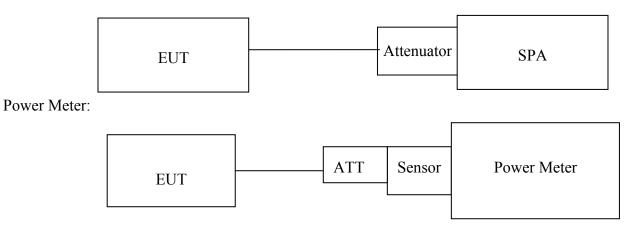


#### 7.2 **Measurement Equipment Used:**

	Conduct	ted Emission T	est Site		
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Power Meter	Anritsu	ML2495A	1005007	01/13/2014	01/12/2015
Power Sensor	Anritsu	MA2411B	917032	01/13/2014	01/12/2015
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/30/2013	05/29/2014
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/15/2013	03/14/2014
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2013	02/27/2014
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA			01/02/2015
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2013	02/27/2014
Splitter	Agilent	11636B	N/A	02/28/2013	02/27/2014

# 7.3 Test Set-up:

Spectrum:



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# 7.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.

2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (**Peak power setting on Spectrum:** Channel power function, RBW = 1MHz, VBW = 3MHz, Span: 30/60MHz, Detector =peak, Sweep = Auto. Setting on spectrum is adjusted based on the mandatory procedure in 9.1.2 of the KDB558074). Power Meter is used as the auxiliary test equipment to conduct the output power measurement. 9.1.3 in KDB558074 is followed.

(Avg. power setting on Spectrum: Channel power function, RBW = 1MHz, VBW = 3MHz, Span: 30/60MHz, Detector =Avg., Trace avg =100, Sweep = Auto, Setting on spectrum is adjusted based on the mandatory procedure in 9.2.2.4 of the KDB558074). Power Meter is used as the auxiliary test equipment to conduct the output power measurement. 9.2.3, option 3 in KDB558074 is followed.

- 3. Record the max. Reading as observed from Spectrum or Power Meter.
- 4. Repeat above procedures until all frequency of interest measured was complete.

Pre-anaysis Check: While conducting average power measurement, duty cycle of each mode  $(a/n_ht20/n_ht40)$  shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones b = 100%, g = 99%, and  $n_ht_20 = 99\%$ , a = 99%,  $n_20(5G) = 99\%$ , and  $n_40(5G) = 99\%$ , where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

# Formula:

*Duty Cycle* = *Ton* / (*Ton*+*Toff*)

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## Test Procedure:

Set span = 0, RBW = 1MHz, VBW = 3MHz, Detector = Peak Duty Cycle:

	Duty Cycle
802.11b	1.000
802.11g	0.990
802.11n_20 (2.4G)	0.990
802.11a	0.990
802.11n_20 (5G)	0.990
802.11n_40 (5G)	0.990

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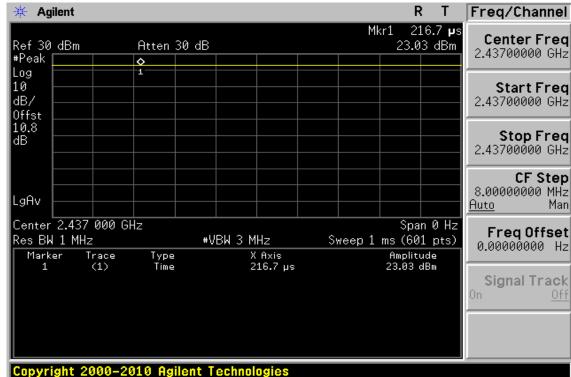
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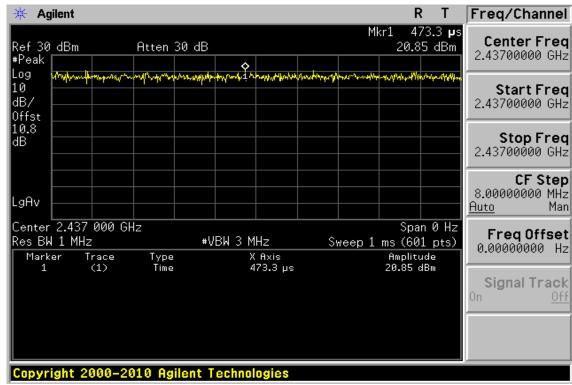


# **Duty Factor:**





#### 802.11 g



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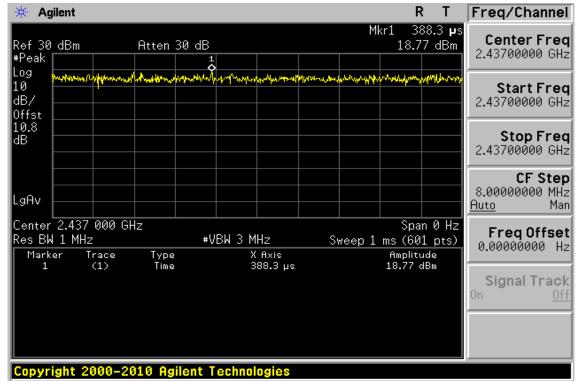
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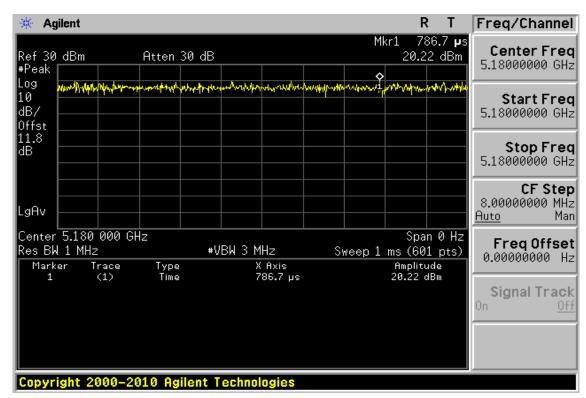
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## 802.11 n\_20 MHz



#### 802.11a



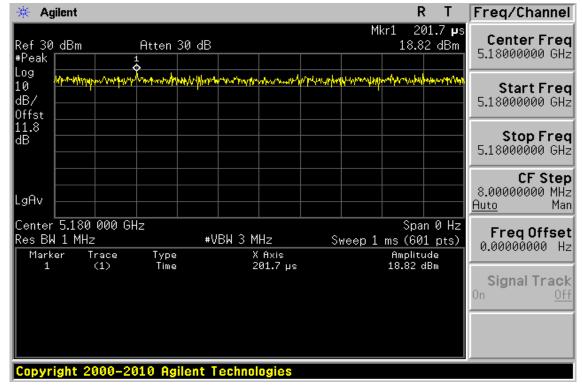
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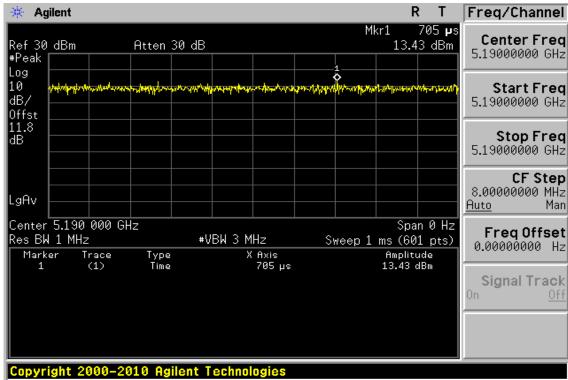
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#### 802.11 n (5GHz)\_20M



### 802.11 n (5GHz)\_40M



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#### 7.5 **Measurement Result:**

### 802.11b

			Peak Power Output (dBm)										
CII	Frequency			Deguined Limit									
СН	(MHz)	1	Required Limit										
1	2412	19.66	19.54	19.47	19.42	1 Watt = 30 dBm							
6	2437	20.40	20.33	20.28	20.22	1 Watt = 30 dBm							
11	2462	19.85	19.76	19.64	19.58	1 Watt = 30 dBm							

			Average Power Output (dBm)										
СП	Frequency		Deguined Limit										
СН	(MHz)	1	2	Required Limit									
1	2412	17.88	17.73	17.66	17.61	1 Watt = 30 dBm							
6	2437	17.96	17.93	17.83	17.80	1 Watt = 30 dBm							
11	2462	17.93	17.85	17.77	17.59	1 Watt = 30 dBm							

#### 802.11g

			Peak Power Output(dBm)										
СН	Frequency			Dequined Limit									
Сп	(MHz)	6	9	12	18	24	36	48	54	<b>Required Limit</b>			
1	2412	20.20	20.18	20.06	19.98	19.89	19.83	19.73	19.65	1 Watt = 30 dBm			
6	2437	21.93	21.88	21.81	21.75	21.66	21.63	21.54	21.44	1 Watt = 30 dBm			
11	2462	20.90	20.87	20.81	20.75	20.65	20.52	20.39	20.32	1 Watt = 30 dBm			

			Average Power Output(dBm)										
СП	Frequency				Deguined Lineit								
СН	(MHz)	6	9	12	18	24	36	48	54	<b>Required Limit</b>			
1	2412	11.93	11.89	11.83	11.72	11.59	11.47	11.39	11.36	1 Watt = 30 dBm			
6	2437	14.97	14.89	14.85	14.77	14.71	14.63	14.54	14.45	1 Watt = 30 dBm			
11	2462	12.97	12.88	12.81	12.69	12.59	12.53	12.49	12.38	1 Watt = 30 dBm			

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802.11n 20M

			Peak Power Output(dBm)										
СН	Frequency		Data Rate										
Сп	(MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	Limit			
1	2412	20.21	20.10	19.97	19.87	19.76	19.64	19.53	19.51	1 Watt = 30 dBm			
6	2437	20.89	20.87	20.78	20.67	20.63	20.53	20.45	20.31	1 Watt = 30 dBm			
11	2462	20.33	20.24	20.17	20.06	20.00	19.95	19.89	19.83	1 Watt = 30 dBm			

			Average Power Output(dBm)										
СН	Frequency		Data Rate										
Сп	(MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	Limit			
1	2412	11.99	11.95	11.87	11.80	11.75	11.67	11.54	11.45	1 Watt = 30 dBm			
6	2437	12.99	12.94	12.89	12.83	12.79	12.71	12.64	12.56	1 Watt = 30 dBm			
11	2462	10.99	10.93	10.81	10.72	10.59	10.49	10.36	10.33	1 Watt = 30 dBm			

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802.11a

			Peak Power Output (dBm)											
CII	Frequency		D . 11. 4											
СН	(MHz)	6	9	12	18	24	36	48	54	<b>Required Limit</b>				
149	5745	20.66	20.56	20.54	20.50	20.41	20.36	20.34	20.29	1 Watt = 30 dBm				
157	5785	20.56	20.47	20.37	20.30	20.24	20.12	20.06	19.96	1 Watt = 30 dBm				
165	5825	20.56	20.49	20.43	20.40	20.37	20.33	20.23	20.21	1 Watt = 30 dBm				

			Average Power Output(dBm)									
OII	Frequency	Data Rate								D		
СН	(MHz)	6	9	12	18	24	36	48	54	<b>Required Limit</b>		
149	5745	13.99	13.91	13.87	13.74	13.71	13.62	13.58	13.53	1 Watt = 30 dBm		
157	5785	13.93	13.91	13.88	13.84	13.79	13.74	13.69	13.66	1 Watt = 30 dBm		
165	5825	13.90	13.77	13.71	13.60	13.56	13.43	13.32	13.22	1 Watt = 30 dBm		

802.11n (5GHz) 20M

	Frequency			<b>D 1 1 1 1</b>						
СН	(MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	<b>Required Limit</b>
149	5745	19.56	19.47	19.37	19.35	19.33	19.22	19.21	19.09	1 Watt = 30 dBm
157	5785	19.70	19.66	19.63	19.54	19.40	19.35	19.27	19.22	1 Watt = 30 dBm
165	5825	19.89	19.78	19.71	19.59	19.53	19.46	19.36	19.26	1 Watt = 30 dBm

			Average Power Output(dBm)									
CII	Frequency				Data	Rate				<b>D 1 1 1 1</b>		
СН	(MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	<b>Required Limit</b>		
149	5745	11.44	11.38	11.26	11.21	11.14	11.04	11.00	10.94	1 Watt = 30 dBm		
157	5785	11.31	11.19	11.10	11.06	11.00	10.98	10.90	10.83	1 Watt = 30 dBm		
165	5825	11.34	11.29	11.22	11.17	11.12	11.07	11.01	10.96	1 Watt = 30 dBm		

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802.11n (5GHz)\_40M

			Peak Power Output(dBm)										
OII	Frequency		<b>D</b> • 11• 4										
СН	(MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	<b>Required Limit</b>			
151	5755	18.77	18.68	18.58	18.51	18.48	18.41	18.33	18.31	1 Watt = 30 dBm			
159	5795	19.07	19.01	18.99	18.97	18.92	18.83	18.74	18.70	1 Watt = 30 dBm			

			Average Power Output(dBm)								
OII	Frequency		<b>D</b>								
СН	(MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	Required Limit	
151	5755	10.37	10.29	10.19	10.14	10.07	9.98	9.91	9.87	1 Watt = 30 dBm	
159	5795	10.48	10.35	10.27	10.24	10.19	10.11	10.06	9.98	1 Watt = 30 dBm	

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

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# 8 6dB BANDWIDTH

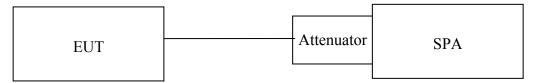
# 8.1 Standard Applicable:

According to §15.247(a)(2), Systems using digital modulation techniques may operate in the 902 - 928 MHz,2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

# 8.2 Measurement Equipment Used:

	Conducted Emission Test Site										
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.						
ТҮРЕ		NUMBER	NUMBER	CAL.							
Power Meter	Anritsu	ML2495A	1005007	01/13/2014	01/12/2015						
Power Sensor	Anritsu	MA2411B	917032	01/13/2014	01/12/2015						
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/30/2013	05/29/2014						
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/15/2013	03/14/2014						
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2013	02/27/2014						
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/03/2014	01/02/2015						
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2013	02/27/2014						
Splitter	Agilent	11636B	N/A	02/28/2013	02/27/2014						

# 8.3 Test Set-up:



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## 8.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3\*RBW, Span = 30M/50MHz, Detector=Peak, Sweep=auto, the setting on spectrum is adjusted based on the procedure as guide in 8.1 option 1 of KDB558074.
- 4. Mark the peak frequency and –6dB (upper and lower) frequency.
- 5. Repeat above procedures until all frequency of interest measured was complete.

## 8.5 Measurement Result:

Frequency	Bandwidth	Limit	Result
(MHz)	(kHz)	(kHz)	
2412	8136	> 500	PASS
2437	8134	> 500	PASS
2462	8620	> 500	PASS

802.11b

#### 802.11g

Frequency	Bandwidth	Limit	Result
(MHz)	(kHz)	(kHz)	
2412	16392	> 500	PASS
2437	16415	> 500	PASS
2462	16445	> 500	PASS

#### 802.11n\_20M

Frequency (MHz)	Bandwidth Limit (kHz) (kHz)		Result
2412	17657	> 500	PASS
2437	17659	> 500	PASS
2462	17618	> 500	PASS

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802.	11a
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Frequency	equency Bandwidth Limit		Result
(MHz)	(kHz)	(kHz)	
5745	16598	> 500	PASS
5785	16417	> 500	PASS
5825	16397	> 500	PASS

## 802.11n (5GHz)\_20M

Frequency	Bandwidth	Limit	Result
(MHz)	(kHz)	(kHz)	
5745	17638	> 500	PASS
5785	17636	> 500	PASS
5825	17586	> 500	PASS

#### 802.11n (5GHz)\_40M

Frequency	Bandwidth	Limit	Result
(MHz)	(kHz)	(kHz)	
5755	35441	> 500	PASS
5795	35269	> 500	PASS

\* Note: Offset 10.8dB for 2.4G 802.11b/g/n\_20;

Offset 11.8dB for 5G 802.11a/n\_20/n\_40.

\* Note: The arrow "->" reveals X decibel level

\*Refer to next page for plots

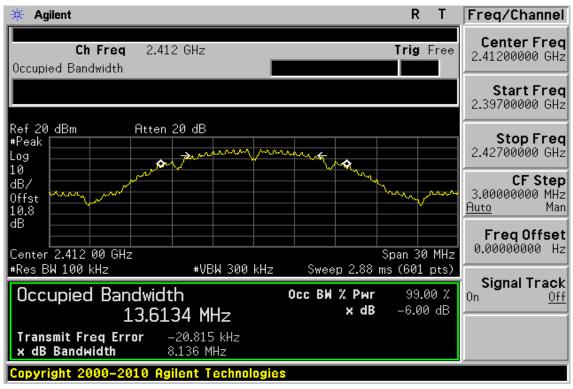
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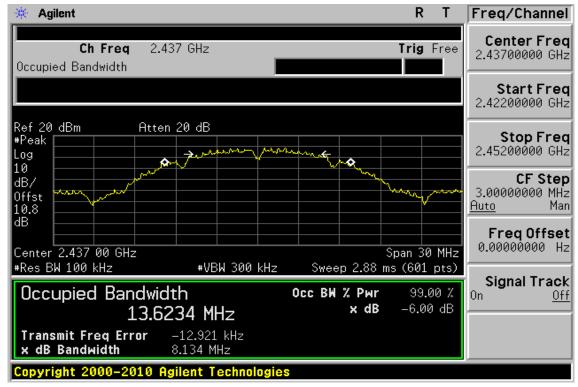
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# 802.11b 6dB Band Width Test Data CH-Low



# 6dB Band Width Test Data CH-Mid



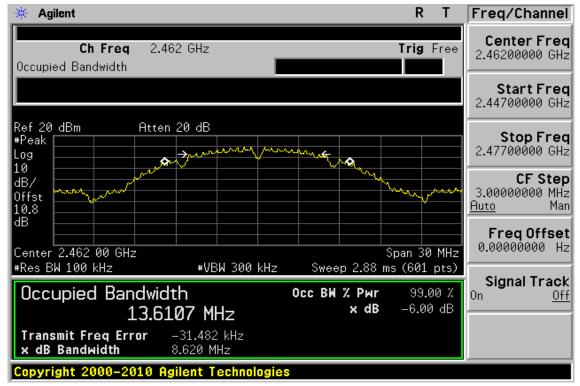
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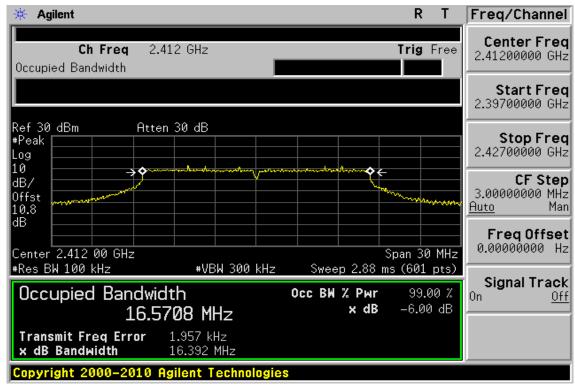


# 6dB Band Width Test Data CH-High



## 802.11g

# 6dB Band Width Test Data CH-Low



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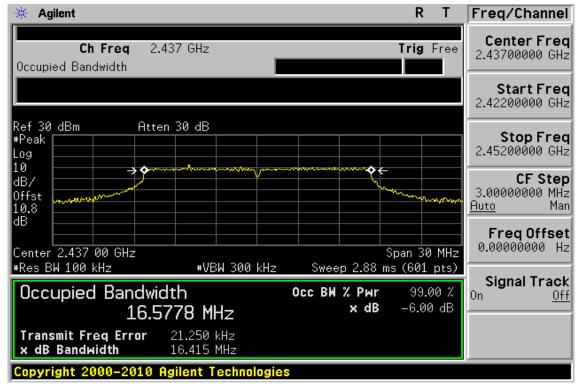
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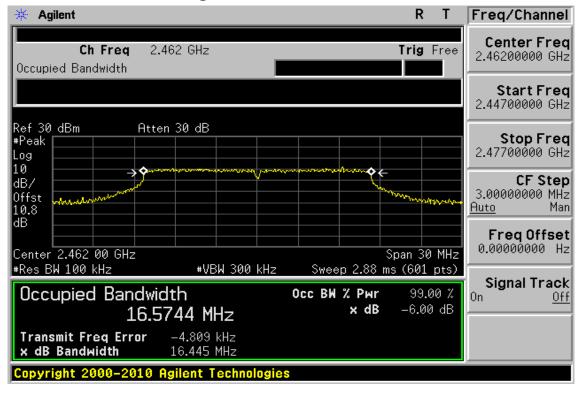
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# 6dB Band Width Test Data CH-Mid



## 6dB Band Width Test Data CH-High



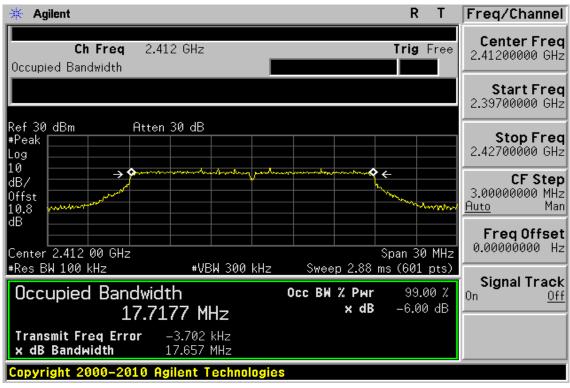
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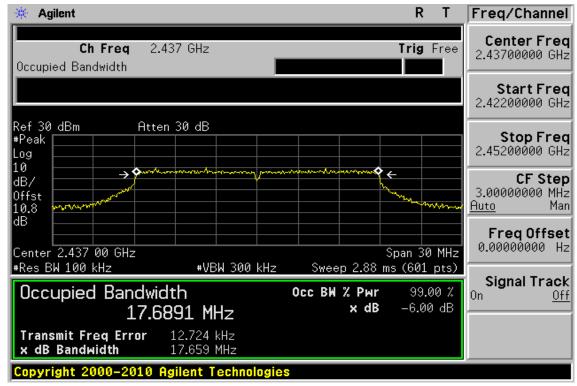
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# 802.11n\_20M 6dB Band Width Test Data CH-Low



# 6dB Band Width Test Data CH-Mid



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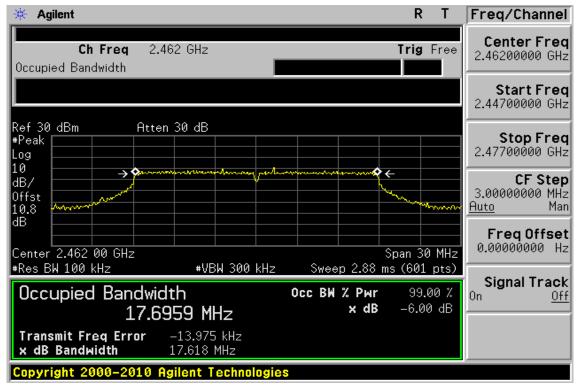
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# 6dB Band Width Test Data CH-High



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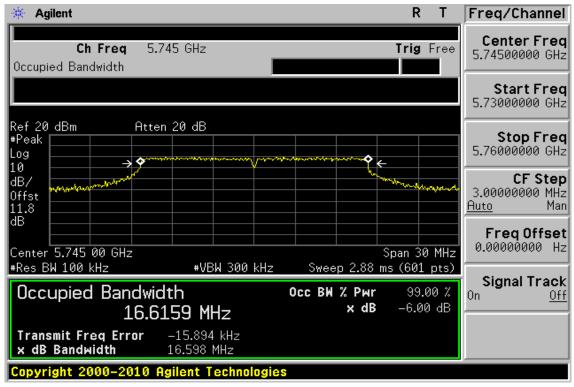
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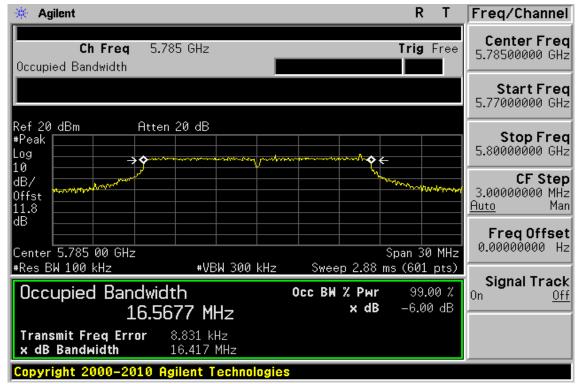
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# 802.11a 6dB Band Width Test Data CH-Low



# 6dB Band Width Test Data CH-Mid



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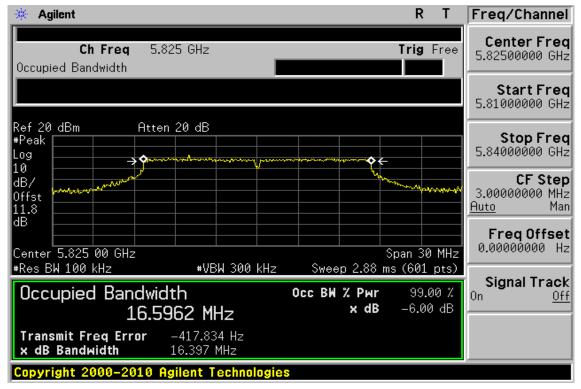
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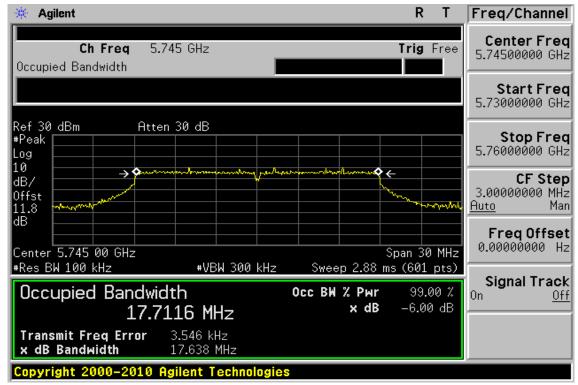


# 6dB Band Width Test Data CH-High



# 802.11n (5GHz)\_20M

# 6dB Band Width Test Data CH-Low



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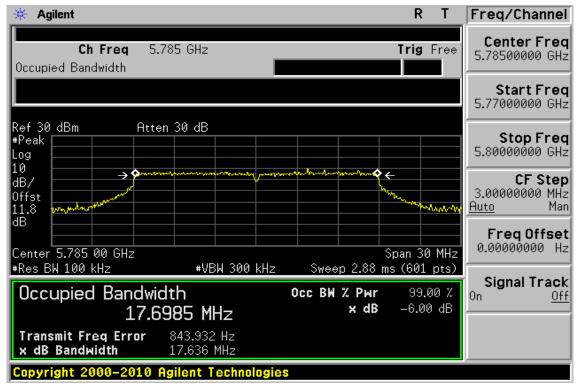
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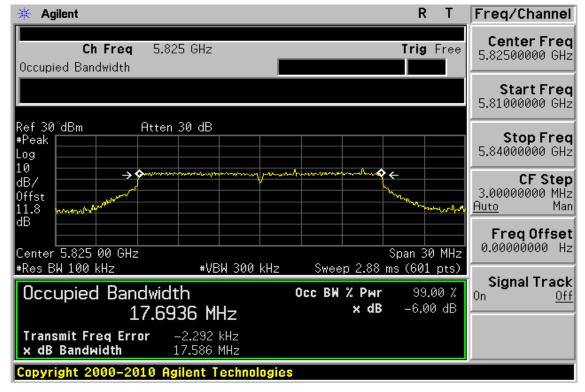
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# 6dB Band Width Test Data CH-Mid



# 6dB Band Width Test Data CH-High



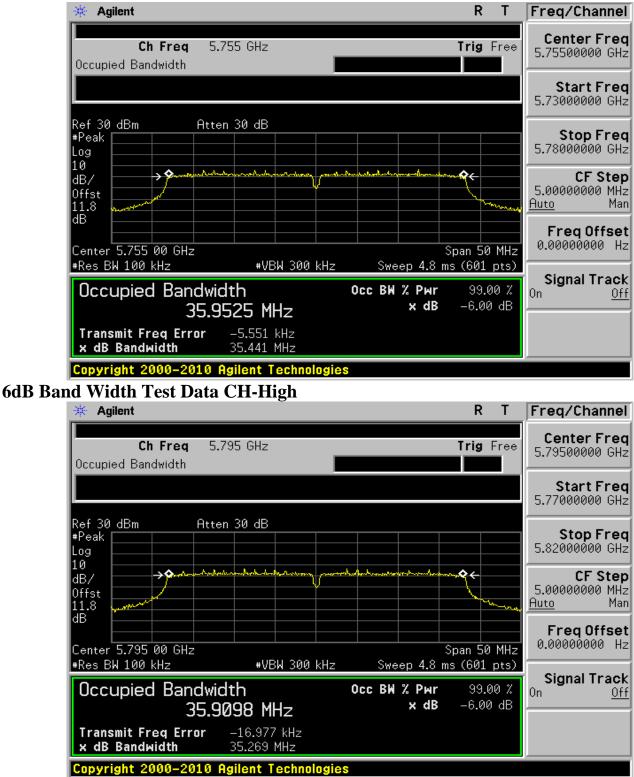
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# 802.11n (5GHz)\_40M 6dB Band Width Test Data CH-Low



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# 9 BAND EDGES MEASUREMENT

## 9.1 Standard Applicable:

According to \$15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in \$15.205(a), must also comply with the radiated emission limits specified in15.209(a).

## 9.2 Measurement Equipment Used:

#### 9.2.1 Conducted Emission at antenna port:

Refer to section 7.2 for details.

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#### 9.2.2 Radiated emission:

966 Chamber						
EQUIPMENT	LAST	CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.		
EMI Test Receiver	R&S	ESCI7	100760	05/27/2013	05/26/2014	
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/30/2013	05/29/2014	
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	01/20/2014	01/19/2015	
Spectrum Analyzer	R&S	FSV-30	101398	10/22/2013	10/21/2014	
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/02/2014	01/02/2015	
Horn antenna	ETS.LINDGREN	3117	123995	05/31/2013	05/30/2014	
Horn Antenna	Schwarzbeck	BBHA9170	184	01/23/2014	01/22/2015	
Pre-Amplifier	Agilent	8447D	2944A07676	01/03/2014	01/02/2015	
Pre-Amplifier	Agilent	8449B	3008A00578	01/03/2014	01/02/2015	
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/24/2014	01/23/2015	
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M2	02/28/2013	02/28/2014	
Attenuator	Mini-Circuit	BW-S10W2+	004	02/28/2013	02/27/2014	
Turn Table	HD	DT420	N/A	N.C.R	N.C.R	
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R	
Controller	HD	HD100	N/A	N.C.R	N.C.R	
Low Loss Cable	Huber Suhner	966_Rx	9	01/03/2014	01/02/2015	
3m Site NSA	SGS	966 chamber	N/A	07/15/2013	07/14/2014	

966 Chamber					
EQUIPMENT MFR MODEL SERIAL LAST CA					CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M2	02/27/2014	02/26/2015
Attenuator	Mini-Circuit	BW-S10W2+	004	02/27/2014	02/26/2015

Note: The measurement was taken place with the long duration of the time, and additional equipment list as shown above indicate those equipment of which has been subject to undertake the calibration in intermediate period of time of the measurement.

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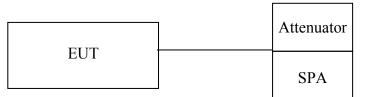
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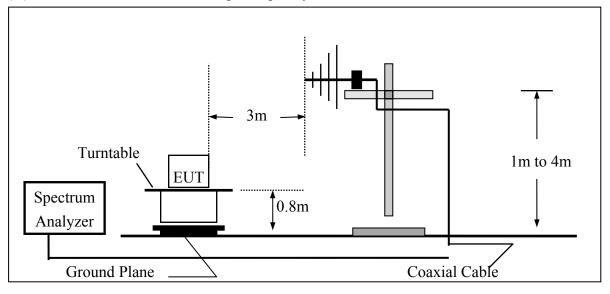
## 9.3 Test SET-UP:

## 9.3.1 Conducted Emission at antenna port:

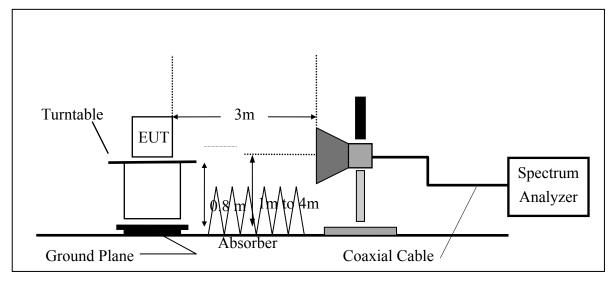


#### 9.3.2 Radiated emission:

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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



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# 9.4 Measurement Procedure:

Unwanted Emissions into Non-Restricted Frequency Bands, Measurement Procedure followed by 11.1 of KDB558074 D01

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
- 4. Set the spectrum analyzer as RBW, VBW=300KHz, Detector = Peak, Sweep = auto
- 5. Mark the highest reading of the emission as the reference level measurement.
- 6. Set DL as the limit = reading on marker 1 20dBm
- 7. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 KHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
- 8. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Unwanted Emission falling into Restricted Frequency Bands, Measurement Procedure followed by 12.1 of KDB558074:

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3.EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7.On spectrum, following 8.1.2, and RBW = 1MHz, VBW = 3MHz, & Marker 2390MHz, and 2483.5MHz (Peak Measurement). Average Measurement: following 8.2 with the modification span to 1MHz, &RBW = 1MHz, VBW = 3MHz and peak marker function to obtain the highest reading on 2390, and 2483.5MHz.
- 8. Repeat above procedures until all default test channel (low, middle, and high) was complete

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## 9.5 Field Strength Calculation:

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

# $\mathbf{FS} = \mathbf{RA} + \mathbf{AF} + \mathbf{CL} - \mathbf{AG}$

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

#### 9.6 Measurement Result:

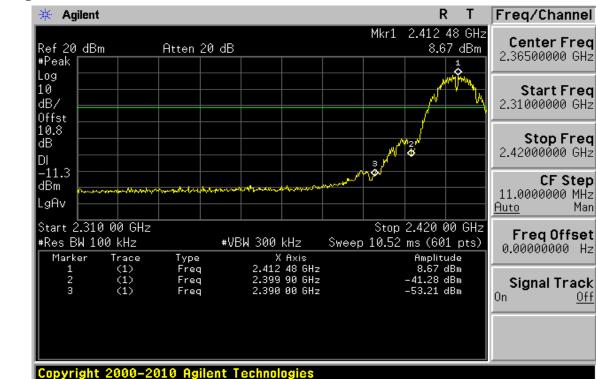
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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#### **Tabular Results:**

#### 802.11b

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
2.3999	-41.28	8.67	-11.30	Pass
2.4835	-49.92	9.29	-10.70	Pass

Note: Limit = Ref (The highest level of emission) dBm - 20dBm

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#### FCC ID: PY7PM-0732

#### **Radiated Emission:**

For measurement plot of radiation revealing the compliance of 15.209, please refer to Appendix I. (Unwanted Emissions into Restricted Frequency Bands): 802.11 b mode **Operation Band** :802.11 b Test Date :2014-03-18 **Fundamental Frequency** :2412 MHz Temp./Humi. :23.3deg C /52 RH **Operation Mode** :Band Edge LOW Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Average	33.83	2.42	36.25	54.00	-17.75
2390.00	E	Peak	46.91	2.42	49.33	74.00	-24.67

Operation Band	:802.11 b	Test Date	:2014-03-18
Fundamental Frequency	:2412 MHz	Temp./Humi.	:23.3deg_C /52 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2386.68	S	Average	41.45	2.40	43.85	54.00	-10.15
2386.68	S	Peak	50.31	2.40	52.71	74.00	-21.29
2390.00	E	Average	36.49	2.42	38.91	54.00	-15.09
2390.00	Е	Peak	48.13	2.42	50.55	74.00	-23.45

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#### FCC ID: PY7PM-0732

Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 55 of 247

Operation Band	:802.11 b	Test Date	:2014-03-18
Fundamental Frequency	:2462 MHz	Temp./Humi.	:23.3deg_C /52 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	36.22	2.74	38.96	54.00	-15.04
2483.50	Е	Peak	47.76	2.74	50.50	74.00	-23.50
2488.10	S	Average	39.18	2.76	41.94	54.00	-12.06
2488.10	S	Peak	48.59	2.76	51.35	74.00	-22.65

Operation Band	:802.11 b	Test Date	:2014-03-18
Fundamental Frequency	:2462 MHz	Temp./Humi.	:23.3deg_C /52 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	42.11	2.74	44.85	54.00	-9.15
2483.50	Е	Peak	51.40	2.74	54.14	74.00	-19.86
2487.10	S	Average	45.33	2.76	48.09	54.00	-5.91
2487.10	S	Peak	53.21	2.76	55.97	74.00	-18.03

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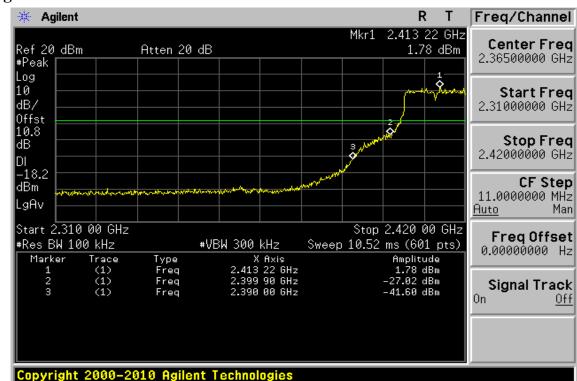
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#### **Tabular Results:**

#### 802.11g

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
2.3999	-27.02	1.78	-18.20	Pass
2.4836	-38.15	3.51	-16.50	Pass

Note: Limit = Ref (The highest level of emission) dBm - 20dBm

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## FCC ID: PY7PM-0732

:Curry

:HORIZONTAL

#### **Radiated Emission:**

Operation Mode

EUT Pol.

For measurement plot of radiation revealing the compliance of 15.209, please refer to Appendix I. (Unwanted Emissions into Restricted Frequency Bands): 802.11 g mode

Operation Band	:802.11 g	Test Date	:2014-03-18
Fundamental Frequency	:2412 MHz	Temp./Humi.	:23.3deg_C /52 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Average	36.76	2.42	39.18	54.00	-14.82
2390.00	Е	Peak	58.12	2.42	60.54	74.00	-13.46
Operation Ban Fundamental F		:802.11 g :2412 MHz		Date p./Humi.		:2014-03-18 :23.3deg_C /5	2 RH

Engineer

Measurement Antenna Pol.

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

:H Plane

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

:Band Edge LOW

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Е	Average	39.12	2.42	41.54	54.00	-12.46
2390.00	Е	Peak	61.45	2.42	63.87	74.00	-10.13

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#### FCC ID: PY7PM-0732

Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 59 of 247

Operation Band	:802.11 g	Test Date	:2014-03-18
Fundamental Frequency	:2462 MHz	Temp./Humi.	:23.3deg_C /52 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	41.59	2.74	44.33	54.00	-9.67
2483.50	Е	Peak	62.52	2.74	65.26	74.00	-8.74
Operation Band Fundamental F Operation Mod EUT Pol.	requency	:802.11 g :2462 MHz :Band Edge F :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2014-03-18 :23.3deg_C /5 :Curry :HORIZONTA	

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	44.19	2.74	46.93	54.00	-7.07
2483.50	Е	Peak	64.82	2.74	67.56	74.00	-6.44

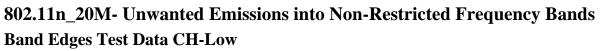
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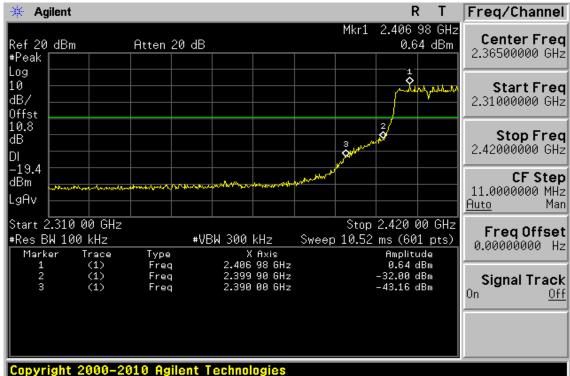
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#### 802.11n\_20MHz

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
2.3999	-32.00	0.64	-19.40	Pass
2.4835	-40.73	1.25	-18.80	Pass

Note: Limit = Ref (The highest level of emission) dBm - 20dBm

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## FCC ID: PY7PM-0732

#### Radiated Emission: 802.11 n\_20M mode

For measurement plot of radiation revealing the compliance of 15.209, please refer to Appendix I (Unwanted Emissions into Restricted Frequency Bands): 802.11 n 20M mode

Operation Band	:802.11 n20M	Test Date	:2014-03-18
Fundamental Frequency	:2412 MHz	Temp./Humi.	:23.3deg_C /52 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	E	Average	37.59	2.42	40.01	54.00	-13.99
2390.00	Е	Peak	59.40	2.42	61.82	74.00	-12.18

Operation Band	:802.11 n20M	Test Date	:2014-03-18
Fundamental Frequency	:2412 MHz	Temp./Humi.	:23.3deg_C /52 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	E	Average	41.60	2.42	44.02	54.00	-9.98
2390.00	Е	Peak	62.84	2.42	65.26	74.00	-8.74

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#### FCC ID: PY7PM-0732

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Operation Band	:802.11 n20M	Test Date	:2014-03-18
Fundamental Frequency	:2462 MHz	Temp./Humi.	:23.3deg_C /52 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	40.04	2.74	42.78	54.00	-11.22
2483.50	Е	Peak	60.00	2.74	62.74	74.00	-11.26
Operation Band Fundamental F Operation Mod EUT Pol.	requency	:802.11 n20N :2462 MHz :Band Edge F :H Plane	łIGH	Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2014-03-18 :23.3deg_C /5 :Curry :HORIZONTA	

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Е	Average	42.90	2.74	45.64	54.00	-8.36
2483.50	E	Peak	62.03	2.74	64.77	74.00	-9.23

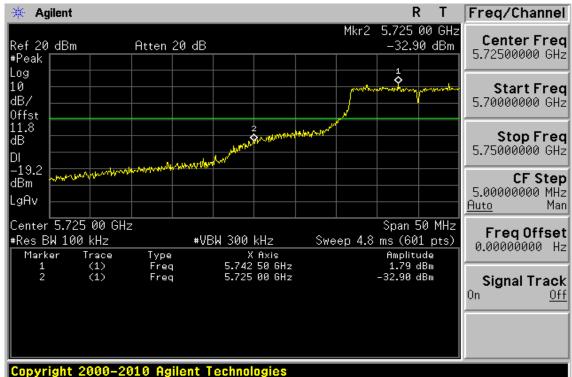
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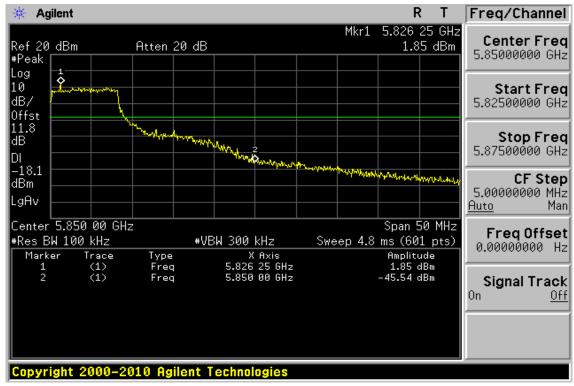
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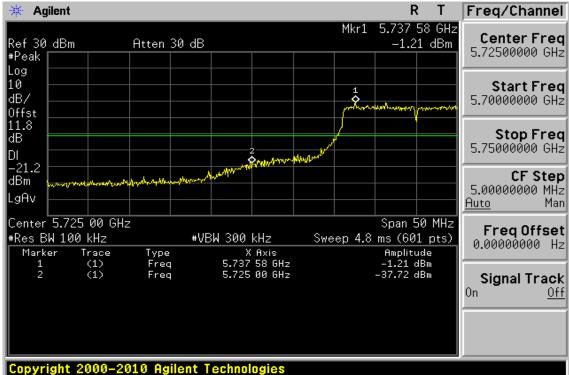


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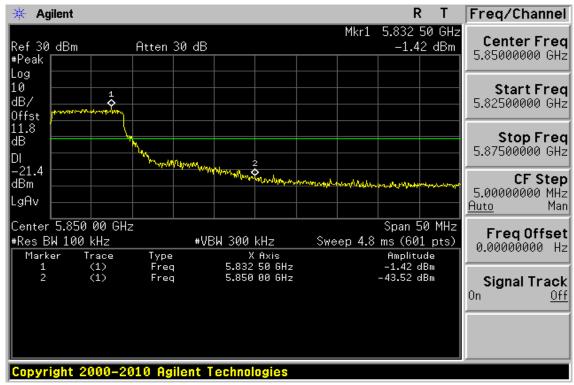
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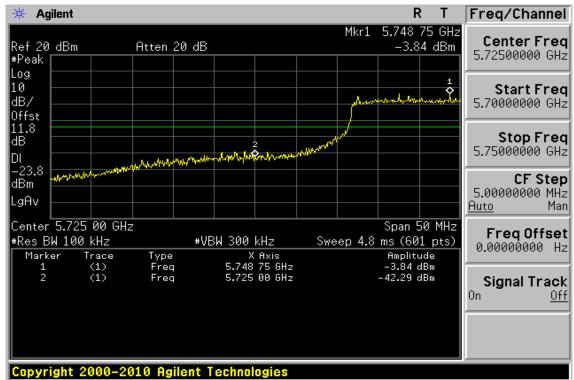
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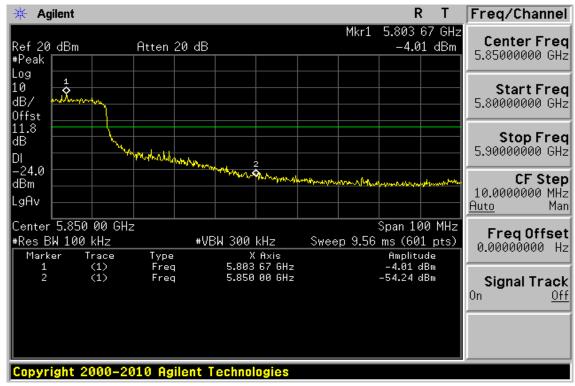
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# 802.11n (5GHz)\_40M - Unwanted Emissions into Non-Restricted Frequency Bands Band Edges Test Data CH-Low







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#### **Tabular Results:**

#### 802.11a

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
5.7250	-32.90	1.79	-19.20	Pass
5.8500	-45.54	1.85	-18.10	Pass

#### 802.11n\_20M

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
5.7250	-37.72	-1.21	-21.20	Pass
5.8500	-43.52	-1.42	-21.40	Pass

#### 802.11n\_40M

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
5.7250	-42.29	-3.84	-23.80	Pass
5.8500	-54.24	-4.01	-24.00	Pass

Note: Limit = Ref (The highest level of emission) dBm - 20dBm

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# **10 SPURIOUS EMISSION TEST 10.1 Standard Applicable**

According to §15.247(d),

Emission at antenna port:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

## Radiated Spurious Emission

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

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

## **10.2 Measurement Equipment Used:**

## **10.2.1** Conducted Emission at antenna port:

Refer to section 7.2 for details.

## 10.2.2 Radiated emission:

Refer to section 9.2.2 for details.

## 10.3 Test SET-UP:

#### **10.3.1** Conducted Emission at antenna port:

Refer to section 7.3 for details.

#### 10.3.2 Radiated emission:

Refer to section 9.3.2 for details.

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## **10.4 Measurement Procedure:**

## **Radiated Emission:**

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
- 7. Repeat above procedures until all default test channel measured were complete.

## **Conducted Emission:**

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. Set RBW = 100K & VBW = 300K on Spectrum.
- Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 3G, 3G to 8G, 8G to 13G, 13G to 18G and 18G to 26.5GHz, 18G to 40GHz (applicable if operation mode is 5GHz)
- 4. Via Software, combine 5 spans of frequency range into one plot
- 5. Repeat above procedures until all default test channel measured were complete.

## 10.5 Field Strength Calculation

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

## FS = RA + AF + CL - AG

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

## 10.6 Measurement Result:

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

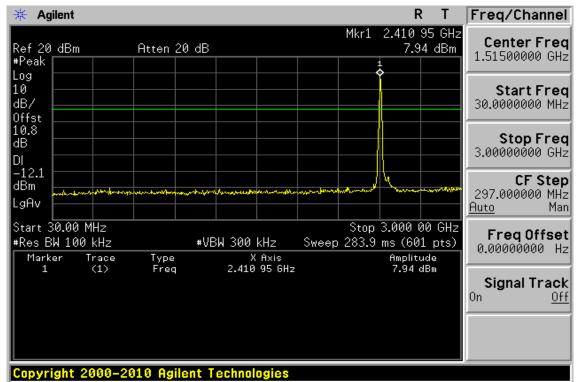
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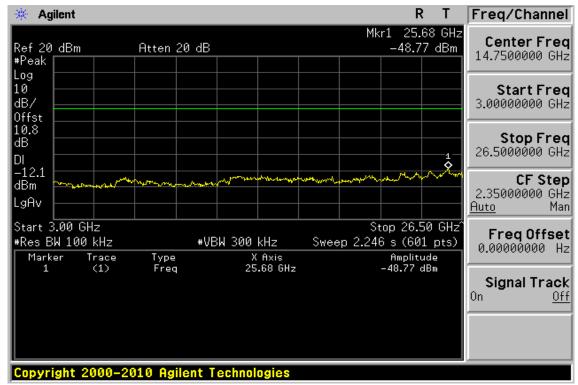
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# Conducted Spurious Emission Measurement Result (802.11b) Ch Low 30MHz – 3GHz



# Ch Low 3GHz - 26.5GHz



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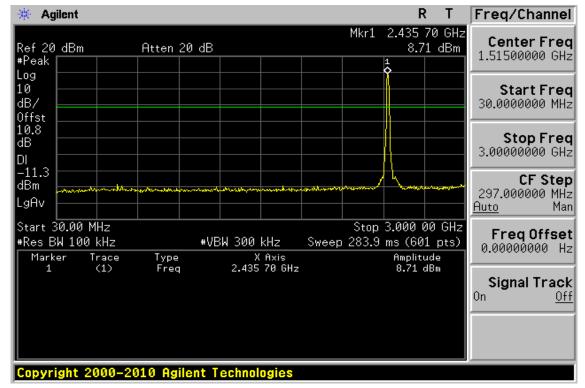
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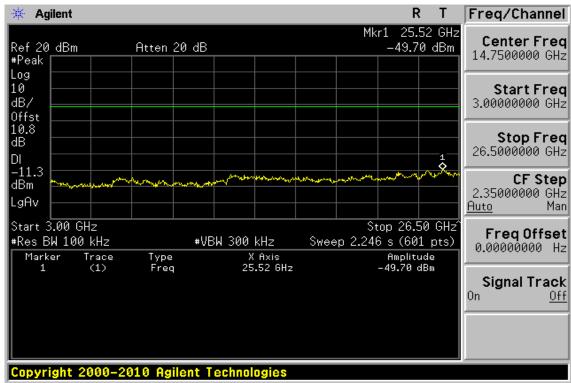
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#### Ch Mid 30MHz - 3GHz



## Ch Mid 3GHz – 26.5GHz



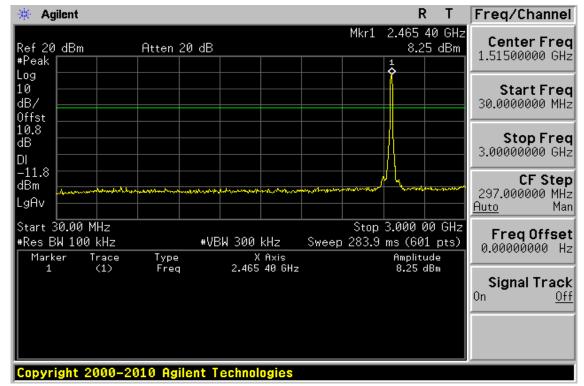
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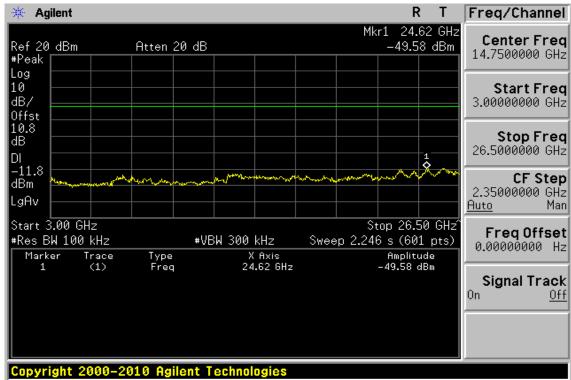
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## Ch High 30MHz - 3GHz



## Ch High 3GHz – 26.5GHz



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### **Tabular Results:**

Fundamental Frequency Operation Mode	2412 MHz :TX Low	Engineer	:Nick

Safe argin dB
6.67

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note :

"---" : denotes Noise Floor. Ref: Reference Signal

Note2: Limit = Ref (the highest emission of the fundamental) - 20dBm

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



#### **FCC ID: PY7PM-0732**

Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 74 of 247

Fundamental Frequency Operation Mode		2437 MHz :TX Mid	Engineer		:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
-	2435.70	Ref	8.71		
	<30	S		-11.30	
	30-1000	S		-11.30	
	4874.00	Н		-11.30	
	7311.00	Н		-11.30	
	9748.00	Н		-11.30	
	12185.00	Н		-11.30	
	14622.00	Н		-11.30	
	17059.00	Н		-11.30	
	19496.00	Н		-11.30	
	21933.00	Н		-11.30	
	24370.00	Н		-11.30	
	25520.00	S	-49.7	-11.30	38.40

#### "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

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#### **FCC ID: PY7PM-0732**

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Fundamental Frequency Operation Mode		2462 MHz :TX High	Engine	eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
-	2465.40	Ref	8.25		
	<30	S		-11.80	
	30-1000	S		-11.80	
	4924.00	Н		-11.80	
	7386.00	Н		-11.80	
	9848.00	Н		-11.80	
	12310.00	Н		-11.80	
	14772.00	Н		-11.80	
	17234.00	Н		-11.80	
	19696.00	Н		-11.80	
	22158.00	Н		-11.80	
	24620.00	S	-49.58	-11.80	37.78

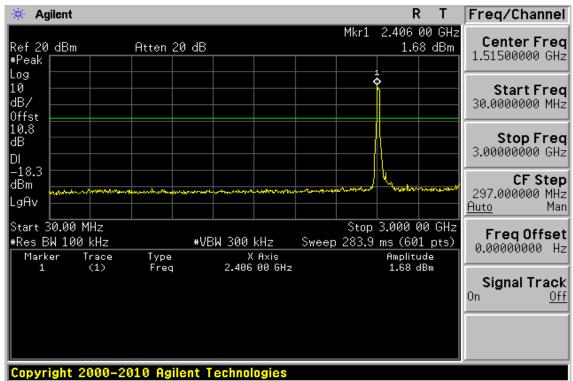
"H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

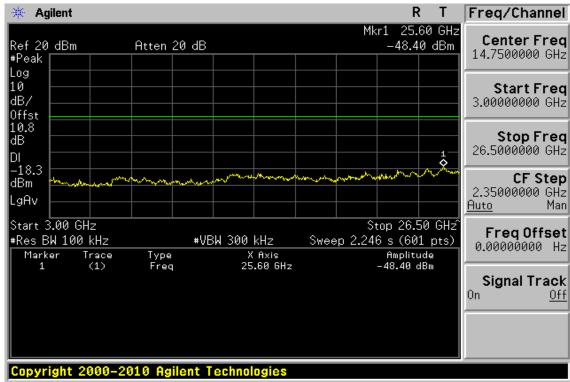
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# Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz – 3GHz







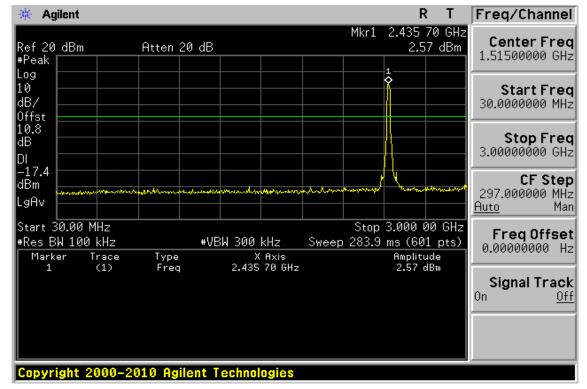
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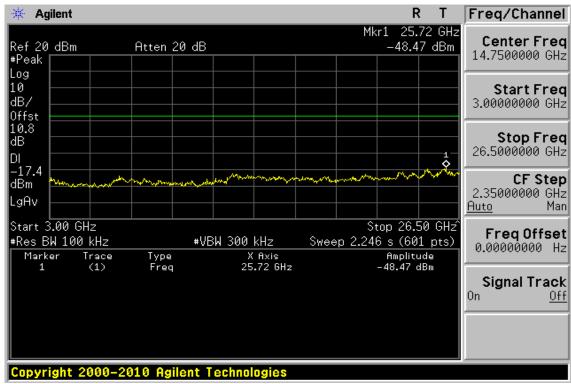
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#### Ch Mid 30MHz - 3GHz



# Ch Mid 3GHz – 26.5GHz

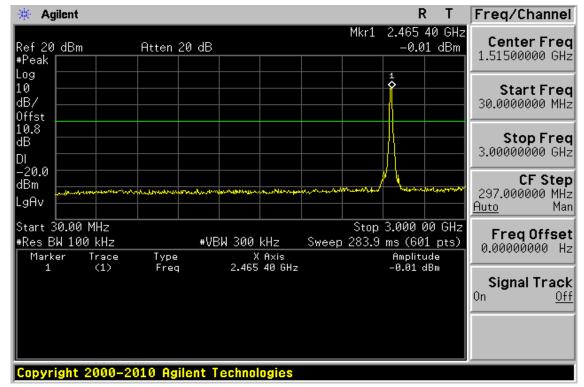


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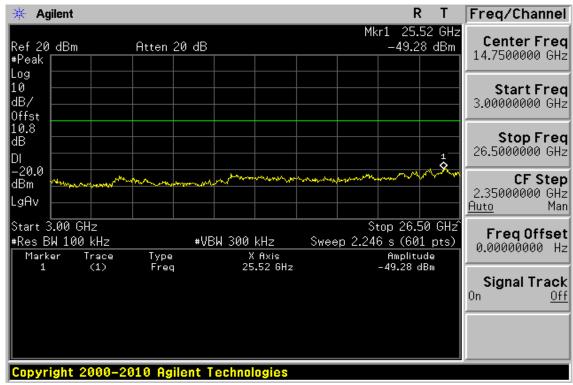
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# Ch High 30MHz - 3GHz



# Ch High 3GHz – 26.5GHz



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#### **Tabular Results:**

Out of Band emission at antenna terminals – 802.11g							
Fundamental Frequency Operation Mode	2412 MHz :TX Low	Engineer	:Nick				

	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
-	2406.00	Ref	1.68		
	<30	S		-18.30	
	30-1000	S		-18.30	
	4824.00	Н		-18.30	
	7236.00	Н		-18.30	
	9648.00	Н		-18.30	
	12060.00	Н		-18.30	
	14472.00	Н		-18.30	
	16884.00	Н		-18.30	
	19296.00	Н		-18.30	
	24120.00	Н		-18.30	
	25600.00	S	-48.40	-18.30	30.10

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note :

"---" : denotes Noise Floor. Ref: Reference Signal

Note2: Limit = Ref (the highest emission of the fundamental) - 20dBm

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#### **FCC ID: PY7PM-0732**

Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 80 of 247

Fundamental Frequency Operation Mode		2437 MHz :TX Mid	Engineer		:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
-	2435.70	Ref	2.57		
	<30	S		-17.40	
	30-1000	S		-17.40	
	4874.00	Н		-17.40	
	7311.00	Н		-17.40	
	9748.00	Н		-17.40	
	12185.00	Н		-17.40	
	14622.00	Н		-17.40	
	17059.00	Н		-17.40	
	19496.00	Н		-17.40	
	21933.00	Н		-17.40	
	24370.00	Н		-17.40	
	25720.00	S	-48.47	-17.40	31.07

#### "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

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#### **FCC ID: PY7PM-0732**

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Fundamental Frequency Operation Mode		2462 MHz :TX High	Engine	eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
-	2465.40	Ref	-0.01		
	<30	S		-20.00	
	30-1000	S		-20.00	
	4924.00	Н		-20.00	
	7386.00	Н		-20.00	
	9848.00	Н		-20.00	
	12310.00	Н		-20.00	
	14772.00	Н		-20.00	
	17234.00	Н		-20.00	
	19696.00	Н		-20.00	
	22158.00	Н		-20.00	
	24620.00	Н		-20.00	
	25520.00	S	-49.28	-20.00	29.28

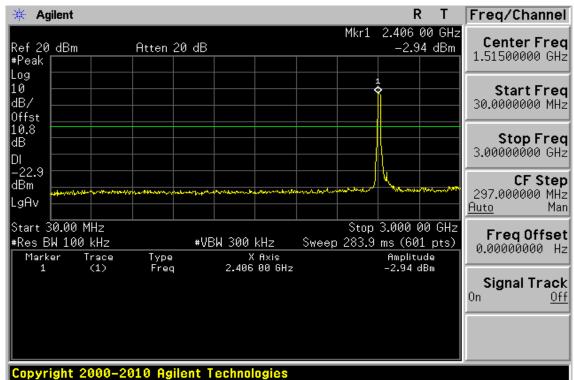
"H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

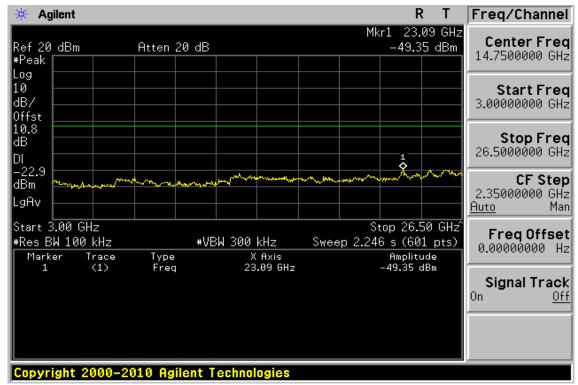
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# Conducted Spurious Emission Measurement Result (802.11n\_20M) Ch Low 30MHz – 3GHz



# Ch Low 3GHz - 26.5GHz



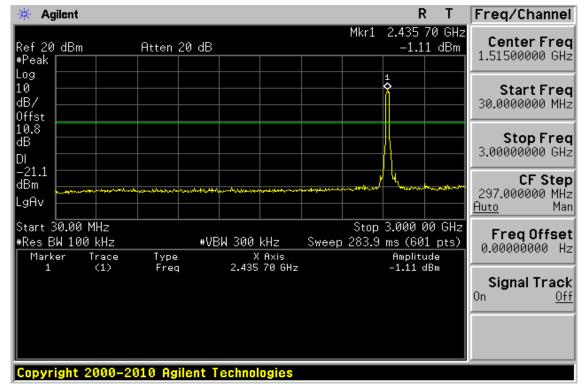
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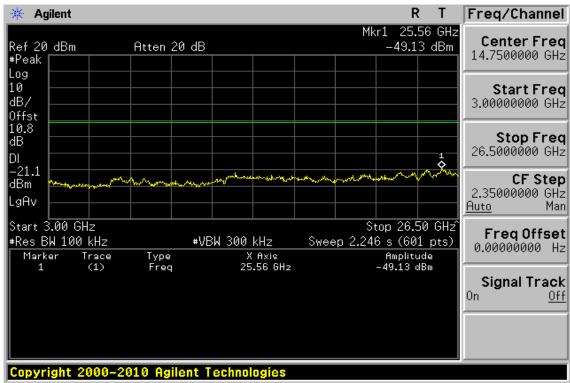
SGS Taiwan Ltd.	No.134,WuKungRoad,NewTaipe	iIndustrialPark,WukuDistrict,NewTaipeiCity	7,1aiwan24803/新北市五股區新北產業園區五工品	路 134 號
台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com	



#### Ch Mid 30MHz - 3GHz



# Ch Mid 3GHz – 26.5GHz

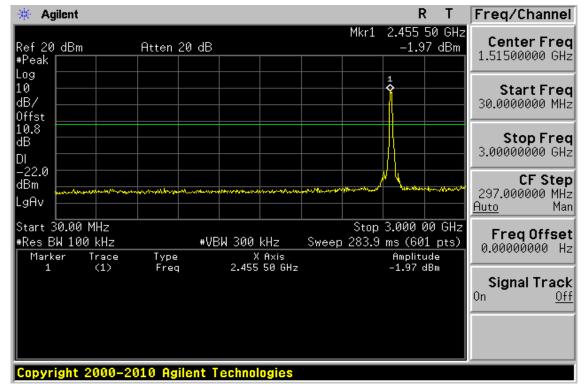


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

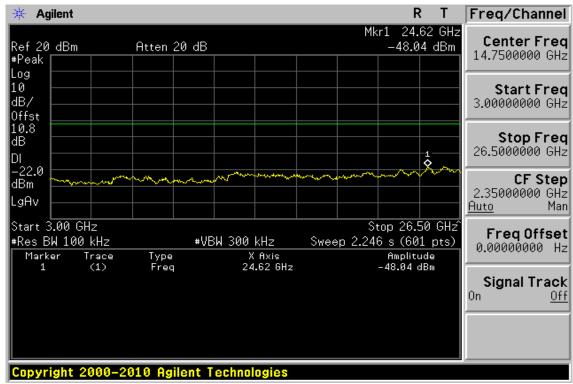
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# Ch High 30MHz - 3GHz



# Ch High 3GHz – 26.5GHz



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#### **Tabular Results:**

Out of Band emission at antenna terminals – 802.11n_20M					
Fundamental Frequency Operation Mode	2412 MHz :TX Low	Engineer	:Nick		
operation into ac					

	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
_	2406.00	Ref	-2.94		
	<30	S		-22.90	
	30-1000	S		-22.90	
	4824.00	Н		-22.90	
	7236.00	Н		-22.90	
	9648.00	Н		-22.90	
	12060.00	Н		-22.90	
	14472.00	Н		-22.90	
	16884.00	Н		-22.90	
	19296.00	Н		-22.90	
	23090.00	S	-49.35	-22.90	26.45
	24120.00	Н		-22.90	

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note :

"---" : denotes Noise Floor. Ref: Reference Signal

Note2: Limit = Ref (the highest emission of the fundamental) - 20dBm

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



#### **FCC ID: PY7PM-0732**

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Fundamental Frequency Operation Mode		2437 MHz :TX Mid	8		:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
-	2435.70	Ref	-1.11		
	<30	S		-21.10	
	30-1000	S		-21.10	
	4874.00	Н		-21.10	
	7311.00	Н		-21.10	
	9748.00	Н		-21.10	
	12185.00	Н		-21.10	
	14622.00	Н		-21.10	
	17059.00	Н		-21.10	
	19496.00	Н		-21.10	
	21933.00	Н		-21.10	
	24370.00	Н		-21.10	
	25560.00	S	-49.13	-21.10	28.03

#### "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

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

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#### **FCC ID: PY7PM-0732**

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Fundamental Frequency Operation Mode		2462 MHz Engin :TX High		eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	2455.50	Ref	-1.97		
	<30	S		-22.00	
	30-1000	S		-22.00	
	4924.00	Н		-22.00	
	7386.00	Н		-22.00	
	9848.00	Н		-22.00	
	12310.00	Н		-22.00	
	14772.00	Н		-22.00	
	17234.00	Н		-22.00	
	19696.00	Н		-22.00	
	22158.00	Н		-22.00	
	24620.00	S	-48.04	-22.00	26.04

#### "H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

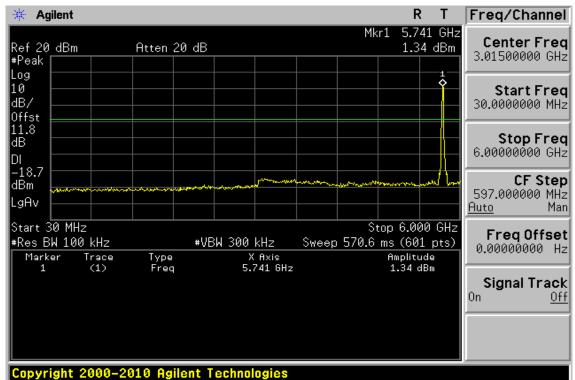
Note2: Limit = Ref (the highest emission of the fundamental) - 20dBm

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

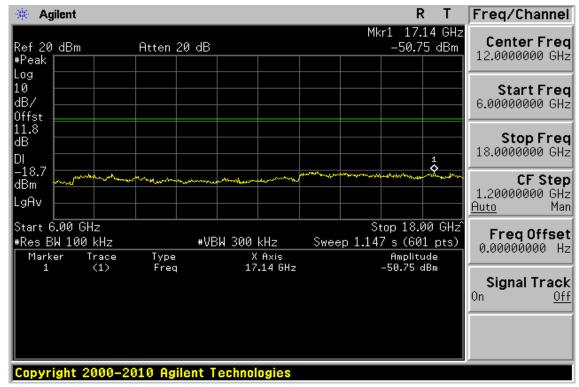
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# Conducted Spurious Emission Measurement Result (802.11a) Ch Low 30MHz – 6GHz



# Ch Low 6GHz - 18GHz



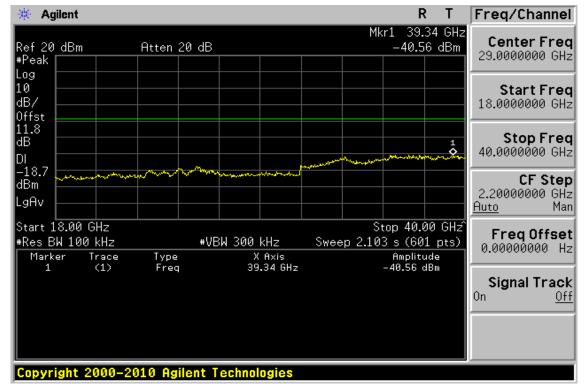
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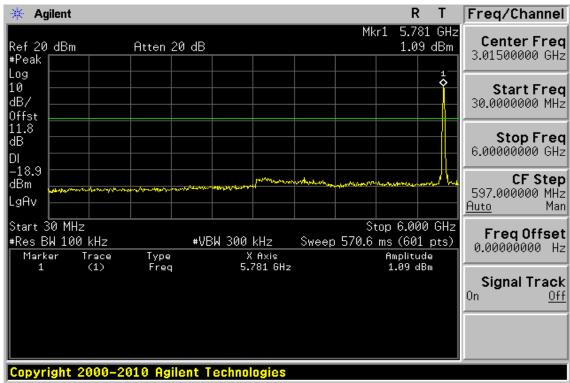
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台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com	



#### Ch Low 18GHz - 40GHz



### Ch Mid 30MHz – 6GHz

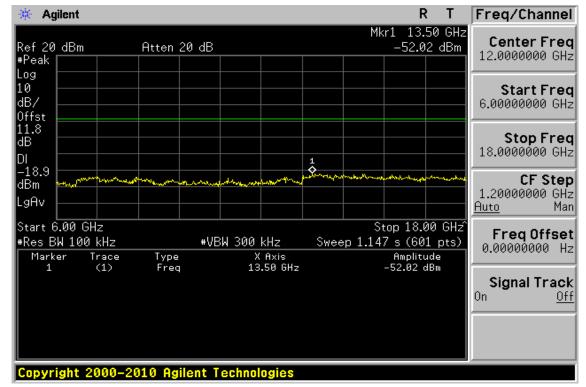


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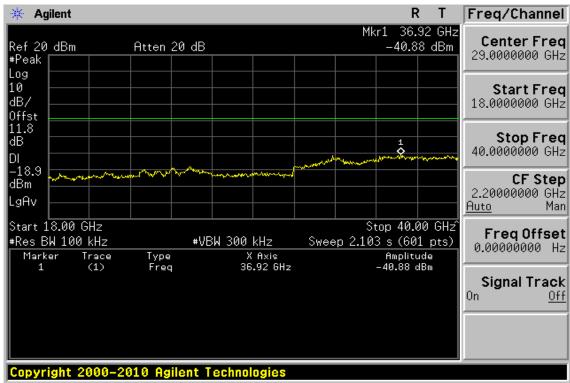
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#### Ch Mid 6GHz – 18GHz



### Ch Mid 18GHz – 40GHz

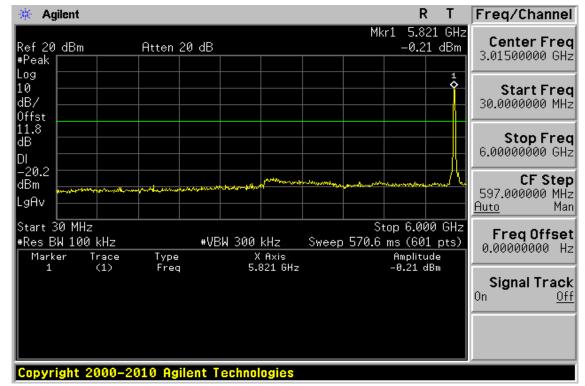


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

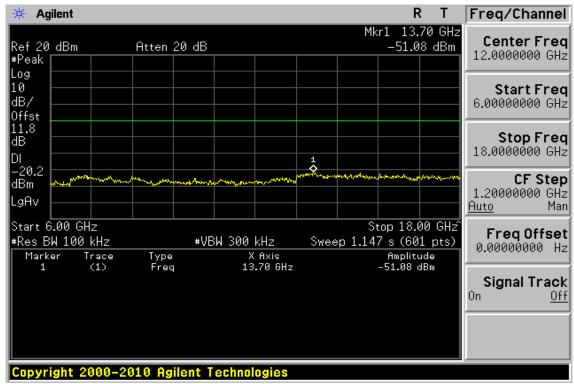
除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



# Ch High 30MHz - 6GHz



# Ch High 6GHz – 18GHz

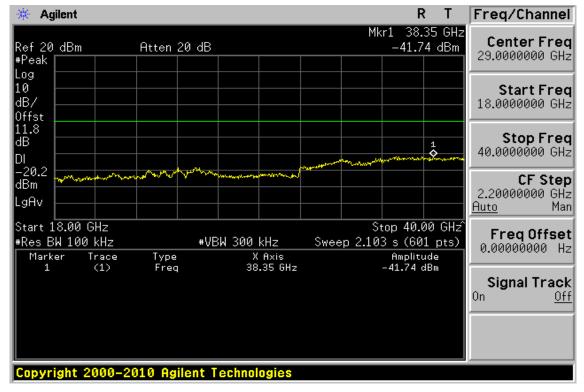


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#### Ch High 18GHz – 40GHz



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### **Tabular Results:**

<b>Out of Band</b>	emission at	antenna	terminals -	802.11a
Out of Dunu	chillion at	anconna	ter minung	002.114

Fundamental Frequency	5745 MHz	Engineer	:Nick
Operation Mode	:TX Low		

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
5741.00	Ref	1.34		
<30	S		-18.70	
30-1000	S		-18.70	
11490.00	Н		-18.70	
17140.00	S	-50.75	-18.70	32.05
17235.00	Н		-18.70	
22980.00	Н		-18.70	
28725.00	Н		-18.70	
34470.00	Н		-18.70	
39340.00	S	-40.56	-18.70	21.86

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note :

"---" : denotes Noise Floor. Ref: Reference Signal

Note2: Limit = Ref (the highest emission of the fundamental) - 20dBm

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



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Fundamental Frequency Operation Mode		5785 MHz Engineer :TX Mid		eer	:Nick	
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB	
	5781.00	Ref	1.09			
	<30	S		-18.90		
	30-1000	S		-18.90		
	11490.00	Н		-18.90		
	13500.00	S	-52.02	-18.90	33.12	
	17235.00	Н		-18.90		
	22980.00	Н		-18.90		
	28725.00	Н		-18.90		
	34470.00	Н		-18.90		
	36920.00	S	-40.88	-18.90	21.98	

"H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

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Fundamental Frequency Operation Mode		5825 MHz Engineer :TX High		eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	5821.00	Ref	-0.21		
	<30	S		-20.20	
	30-1000	S		-20.20	
1	1650.00	Н		-20.20	
1	3700.00	S	-51.08	-20.20	30.88
1	7475.00	Н		-20.20	
2	23300.00	Н		-20.20	
2	29125.00	Н		-20.20	
3	34950.00	Н		-20.20	
3	88350.00	S	-41.74	-20.20	21.54

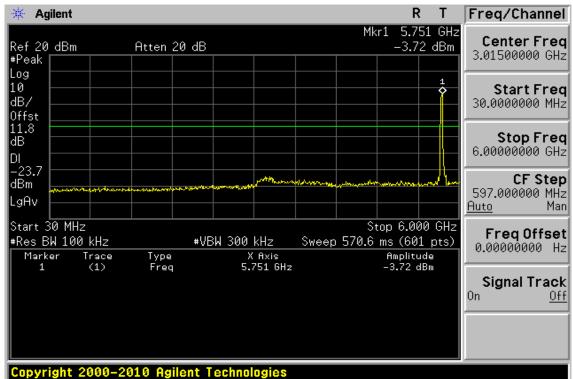
Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

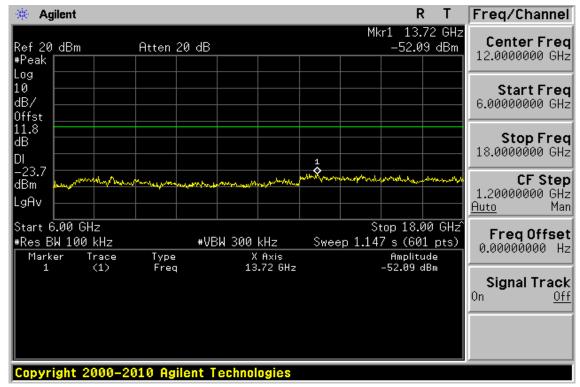
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



# Conducted Spurious Emission Measurement Result (802.11n (5GHz)\_20M) Ch Low 30MHz – 6GHz



# Ch Low 6GHz - 18GHz



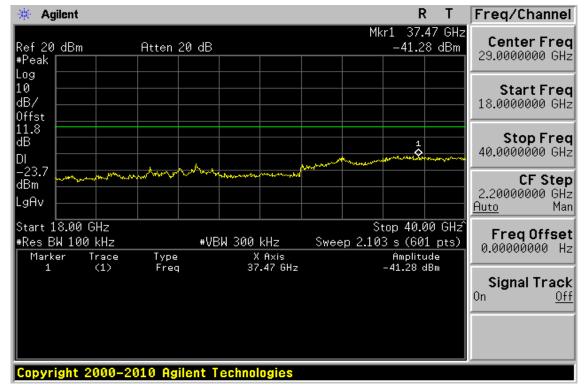
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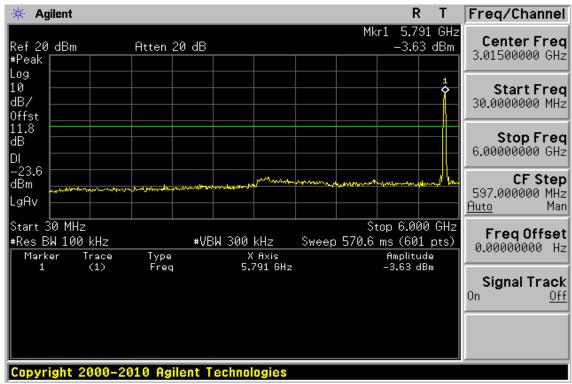
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台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com	



#### Ch Low 18GHz - 40GHz



# Ch Mid 30MHz – 6GHz

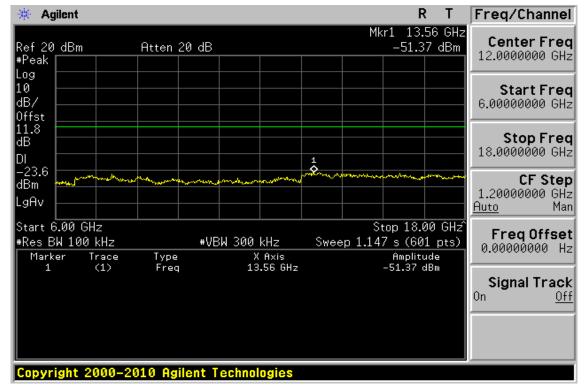


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

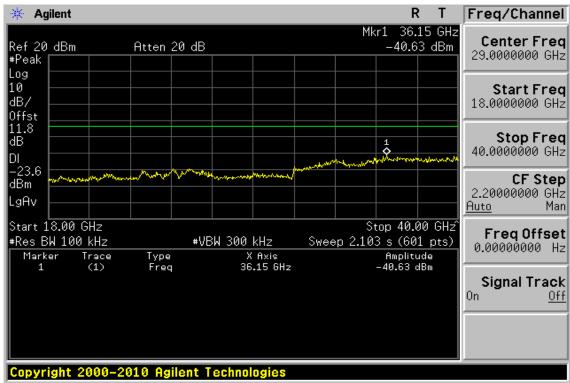
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#### Ch Mid 6GHz – 18GHz



### Ch Mid 18GHz – 40GHz

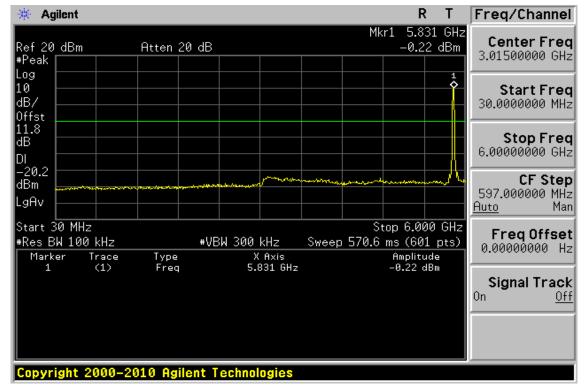


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

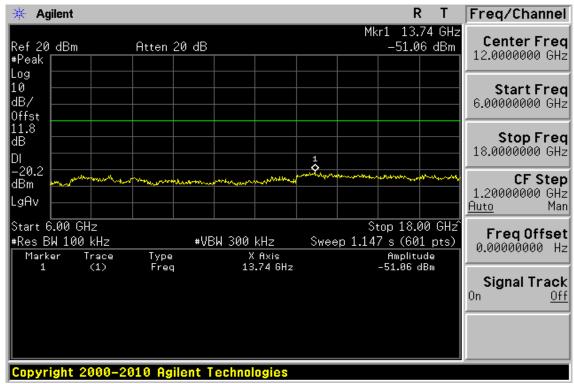
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# Ch High 30MHz - 6GHz



# Ch High 6GHz – 18GHz

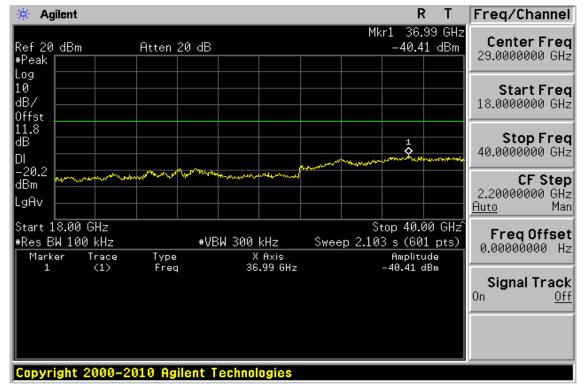


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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#### Ch High 18GHz – 40GHz



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### Out of Band emission at antenna terminals - 802.11n\_20M

Fundamental Frequency Operation Mode	5745 MHz :TX Low	Engineer		:Nick
F		D ľ	<b>T</b> · ·/	Safe

	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Sate Margin dB
-	5751.00	Ref	-3.72		
	<30	S		-23.70	
	30-1000	S		-23.70	
	11490.00	Н		-23.70	
	13720.00	S	-52.09	-23.70	28.39
	17235.00	Н		-23.70	
	22980.00	Н		-23.70	
	34470.00	Н		-23.70	
	37470.00	S	-41.28	-23.70	17.58

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor. Ref: Reference Signal

Note2: Limit = Ref (the highest emission of the fundamental) - 20dBm

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



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Fundamental Frequency Operation Mode		5785 MHz :TX Mid	Engineer		:Nick
_	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	5791.00	Ref	-3.63		
	<30	S		-23.60	
	30-1000	S		-23.60	
	11570.00	Н		-23.60	
	13560.00	S	-51.37	-23.60	27.77
	17355.00	Н		-23.60	
	23140.00	Н		-23.60	
	28925.00	Н		-23.60	
	34710.00	Н		-23.60	
	36150.00	S	-40.63	-23.60	17.03

"H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) - 20dBm

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



#### **FCC ID: PY7PM-0732**

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Fundamental Frequency Operation Mode		5825 MHz :TX High	Engineer		:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
_	5831.00	Ref	-0.22		
	<30	S		-20.20	
	30-1000	S		-20.20	
	11650.00	Н		-20.20	
	13740.00	S	-51.06	-20.20	30.86
	17475.00	Н		-20.20	
	23300.00	Н		-20.20	
	29125.00	Н		-20.20	
	34950.00	Н		-20.20	
	36990.00	S	-40.41	-20.20	20.21

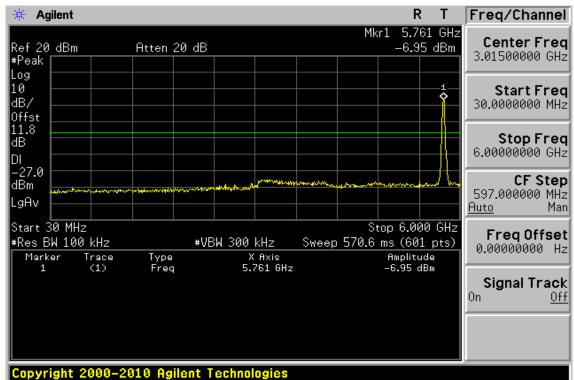
Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

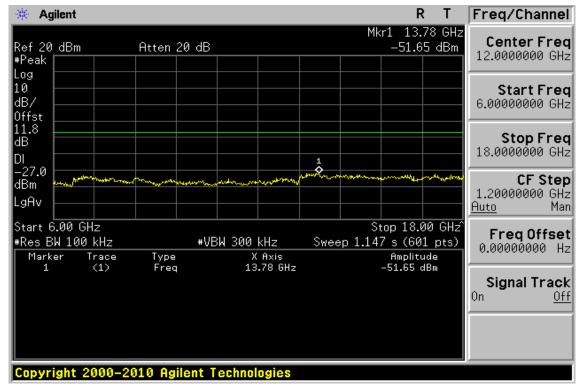
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



# Conducted Spurious Emission Measurement Result (802.11n (5GHz)\_40M) Ch Low 30MHz – 6GHz



# Ch Low 6GHz - 18GHz



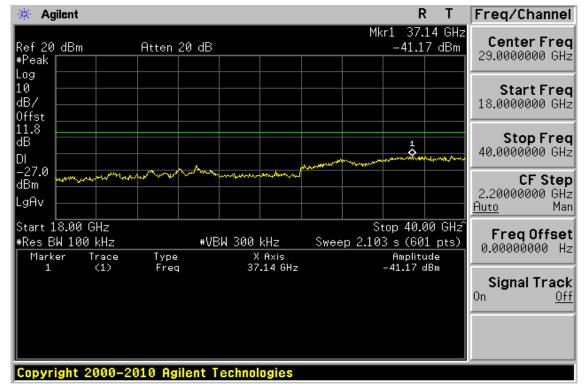
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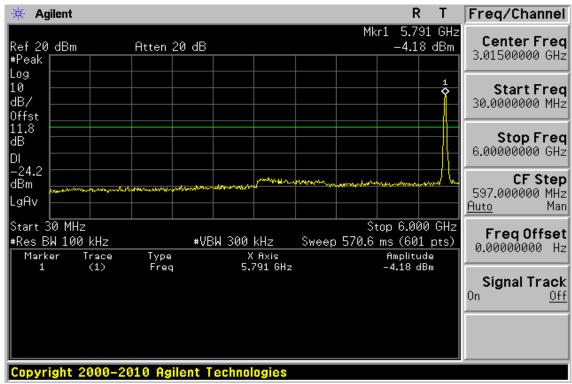
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台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com	



#### Ch Low 18GHz - 40GHz



# Ch High 30MHz – 6GHz

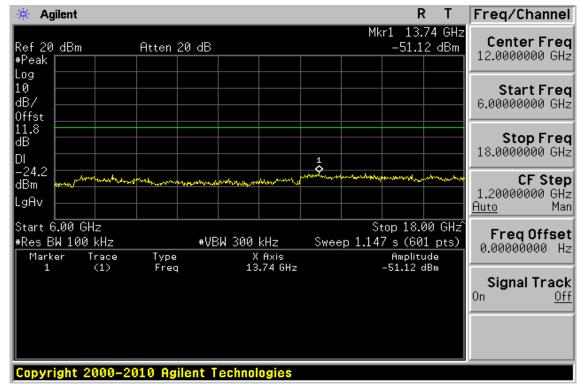


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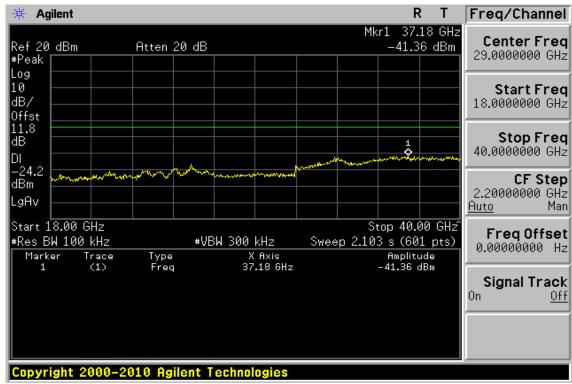
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# Ch High 6GHz – 18GHz



# Ch High 18GHz – 40GHz



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#### Out of Band emission at antenna terminals - 802.11n 40M

Fundamental Frequency Operation Mode	5755 MHz :TX Low	Engineer	:Nick

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
5761.00	Ref	-6.95		
<30	S		-27.00	
30-1000	S		-27.00	
11510.00	Н		-27.00	
13780.00	S	-51.65	-27.00	24.65
17265.00	Н		-27.00	
23020.00	Н		-27.00	
28775.00	Н		-27.00	
37140.00	S	-41.17	-27.00	14.17
30-1000 11510.00 13780.00 17265.00 23020.00 28775.00	S H S H H H		-27.00 -27.00 -27.00 -27.00 -27.00 -27.00	 

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor. Ref: Reference Signal

Note2: Limit = Ref (the highest emission of the fundamental) - 20dBm

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Fundamental Frequency Operation Mode		5795 MHz :TX High	Engineer		:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
-	5791.00	Ref	-4.18		
	<30	S		-24.20	
	30-1000	S		-24.20	
	11590.00	Н		-24.20	
	13740.00	S	-51.12	-24.20	26.92
	17385.00	Н		-24.20	
	23180.00	Н		-24.20	
	28975.00	Н		-24.20	
	34770.00	Н		-24.20	
	37180.00	S	-41.36	-24.20	17.16

"H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency. Note : "---" : denotes Noise Floor.

Note2: Limit = Ref (the highest emission of the fundamental) – 20dBm

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



#### **Radiated Spurious Emission Measurement Result (802.11b)**

For measurement plot of radiation, please refer to Appendix I.							
Operation Band	:802.11 b	Test Date	:2014-03-19				
Fundamental Frequency	:2412 MHz	Temp./Humi.	:22.1 deg_C / 68 RH				
Operation Mode	:TX LOW	Engineer	:Allen				
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL				

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	32.22	-17.86	14.36	43.50	-29.14
161.92	S	Peak	27.60	-12.69	14.91	43.50	-28.59
408.30	S	Peak	27.61	-8.95	18.66	46.00	-27.34
550.89	S	Peak	28.42	-7.32	21.10	46.00	-24.90
691.54	S	Peak	27.35	-3.76	23.59	46.00	-22.41
949.56	S	Peak	27.52	0.18	27.70	46.00	-18.30
4824.00	Н	Average	26.26	6.89	33.15	54.00	-20.85
4824.00	Н	Peak	37.33	6.89	44.22	74.00	-29.78
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						

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Operation Band	:802.11 b	Test Date	:2014-03-19
Fundamental Frequency	:2412 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV∕m	dBµV/m	dB
40.67	S	Peak	27.09	-13.39	13.70	40.00	-26.30
154.16	S	Peak	28.22	-12.73	15.49	43.50	-28.01
435.46	S	Peak	27.30	-8.90	18.40	46.00	-27.60
556.71	S	Peak	27.93	-6.91	21.02	46.00	-24.98
693.48	S	Peak	28.42	-3.83	24.59	46.00	-21.41
950.53	S	Peak	27.40	0.17	27.57	46.00	-18.43
4824.00	Н	Average	25.35	6.89	32.24	54.00	-21.76
4824.00	Н	Peak	37.16	6.89	44.05	74.00	-29.95
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						

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Operation Band	:802.11 b	Test Date	:2014-03-19
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	32.75	-17.86	14.89	43.50	-28.61
278.32	S	Peak	26.65	-11.60	15.05	46.00	-30.95
415.09	S	Peak	28.66	-8.91	19.75	46.00	-26.25
527.61	S	Peak	28.22	-7.51	20.71	46.00	-25.29
700.27	S	Peak	27.77	-4.08	23.69	46.00	-22.31
904.94	S	Peak	28.80	-0.67	28.13	46.00	-17.87
4874.00	Н	Average	25.84	6.96	32.80	54.00	-21.20
4874.00	Н	Peak	37.67	6.96	44.63	74.00	-29.37
7311.00	Н						
9748.00	Н						
12185.00	Н						
14622.00	Н						
17059.00	Н						
19496.00	Н						
21933.00	Н						

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Operation Band	:802.11 b	Test Date	:2014-03-19
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
49.40	S	Peak	26.90	-12.95	13.95	40.00	-26.05
280.26	S	Peak	26.16	-11.52	14.64	46.00	-31.36
427.70	S	Peak	27.25	-8.98	18.27	46.00	-27.73
557.68	S	Peak	27.63	-6.84	20.79	46.00	-25.21
676.99	S	Peak	27.87	-3.78	24.09	46.00	-21.91
964.11	S	Peak	27.26	0.20	27.46	54.00	-26.54
4874.00	Н	Average	26.15	6.96	33.11	54.00	-20.89
4874.00	Н	Peak	37.24	6.96	44.20	74.00	-29.80
7311.00	Н						
9748.00	Н						
12185.00	Н						
14622.00	Н						
17059.00	Н						
19496.00	Н						
21933.00	Н						
• • • • • • • •							

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Operation Band	:802.11 b	Test Date	:2014-03-19
Fundamental Frequency	:2462 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	31.94	-17.86	14.08	43.50	-29.42
162.89	S	Peak	27.18	-12.72	14.46	43.50	-29.04
397.63	S	Peak	27.48	-9.22	18.26	46.00	-27.74
510.15	S	Peak	28.99	-7.44	21.55	46.00	-24.45
685.72	S	Peak	27.28	-3.69	23.59	46.00	-22.41
951.50	S	Peak	26.85	0.18	27.03	46.00	-18.97
4924.00	Н	Average	24.84	7.01	31.85	54.00	-22.15
4924.00	Н	Peak	36.45	7.01	43.46	74.00	-30.54
7386.00	Н						
9848.00	Н						
12310.00	Н						
14772.00	Н						
17234.00	Н						
19696.00	Н						
22158.00	Н						

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Operation Band	:802.11 b	Test Date	:2014-03-19
Fundamental Frequency	:2462 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	1/11/12/5		αDμν	цD	ασμν/ Π		ųD
59.10	S	Peak	27.79	-13.52	14.27	40.00	-25.73
272.50	S	Peak	25.97	-11.85	14.12	46.00	-31.88
438.37	S	Peak	27.44	-8.84	18.60	46.00	-27.40
559.62	S	Peak	27.90	-6.72	21.18	46.00	-24.82
685.72	S	Peak	28.11	-3.69	24.42	46.00	-21.58
952.47	S	Peak	27.63	0.18	27.81	46.00	-18.19
4924.00	Н	Average	24.44	7.01	31.45	54.00	-22.55
4924.00	Н	Peak	37.18	7.01	44.19	74.00	-29.81
7386.00	Н						
9848.00	Н						
12310.00	Н						
14772.00	Н						
17234.00	Н						
19696.00	Н						
22158.00	Н						
24620.00	Н						

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# **Radiated Spurious Emission Measurement Result (802.11g)**

Operation Band	:802.11 g	Test Date	:2014-03-19
Fundamental Frequency	:2412 MHz	Temp./Humi.	:22.1 deg C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
			e	٦ŀ		0	П
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
53.28	S	Peak	28.20	-13.16	15.04	40.00	-24.96
278.32	S	Peak	26.50	-11.60	14.90	46.00	-31.10
439.34	S	Peak	27.57	-8.83	18.74	46.00	-27.26
559.62	S	Peak	27.77	-6.72	21.05	46.00	-24.95
678.93	S	Peak	28.01	-3.70	24.31	46.00	-21.69
969.93	S	Peak	27.70	0.17	27.87	54.00	-26.13
4824.00	Н	Average	25.11	6.89	32.00	54.00	-22.00
4824.00	Н	Peak	36.67	6.89	43.56	74.00	-30.44
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						

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Operation Band	:802.11 g	Test Date	:2014-03-19
Fundamental Frequency	:2412 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
48.43	S	Peak	27.11	-12.97	14.14	40.00	-25.86
158.04	S	Peak	27.11	-12.66	14.45	43.50	-29.05
440.31	S	Peak	27.04	-8.80	18.24	46.00	-27.76
548.95	S	Peak	28.03	-7.40	20.63	46.00	-25.37
684.75	S	Peak	27.49	-3.67	23.82	46.00	-22.18
951.50	S	Peak	27.53	0.18	27.71	46.00	-18.29
4824.00	Н	Average	24.62	6.89	31.51	54.00	-22.49
4824.00	Н	Peak	36.91	6.89	43.80	74.00	-30.20
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						

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Operation Band	:802.11 g	Test Date	:2014-03-19
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

			<b>a</b>			<b>.</b>	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	33.96	-17.86	16.10	43.50	-27.40
243.40	S	Peak	28.23	-13.15	15.08	46.00	-30.92
440.31	S	Peak	28.04	-8.80	19.24	46.00	-26.76
557.68	S	Peak	27.67	-6.84	20.83	46.00	-25.17
681.84	S	Peak	27.86	-3.66	24.20	46.00	-21.80
961.20	S	Peak	27.35	0.21	27.56	54.00	-26.44
4874.00	Н	Average	25.84	6.96	32.80	54.00	-21.20
4874.00	Н	Peak	37.49	6.96	44.45	74.00	-29.55
7311.00	Н						
9748.00	Н						
12185.00	Н						
14622.00	Н						
17059.00	Н						
19496.00	Н						
21933.00	Н						
24370.00	Н						

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Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 118 of 247

Operation Band	:802.11 g	Test Date	:2014-03-19
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
			-	15		0	15
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
50.37	S	Peak	26.97	-12.96	14.01	40.00	-25.99
170.65	S	Peak	27.78	-12.99	14.79	43.50	-28.71
421.88	S	Peak	27.60	-8.93	18.67	46.00	-27.33
522.76	S	Peak	28.04	-7.46	20.58	46.00	-25.42
680.87	S	Peak	28.50	-3.66	24.84	46.00	-21.16
990.30	S	Peak	27.49	0.09	27.58	54.00	-26.42
4874.00	Н	Average	24.35	6.96	31.31	54.00	-22.69
4874.00	Н	Peak	37.60	6.96	44.56	74.00	-29.44
7311.00	Н						
9748.00	Н						
12185.00	Н						
14622.00	Н						
17059.00	Н						
19496.00	Н						
21933.00	Н						
24370.00	Н						

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Operation Band	:802.11 g	Test Date	:2014-03-19
Fundamental Frequency	:2462 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
57.16	S	Peak	27.99	-13.41	14.58	40.00	-25.42
274.44	S	Peak	26.41	-11.76	14.65	46.00	-31.35
430.61	S	Peak	28.39	-8.99	19.40	46.00	-26.60
519.85	S	Peak	27.98	-7.42	20.56	46.00	-25.44
684.75	S	Peak	28.04	-3.67	24.37	46.00	-21.63
936.95	S	Peak	27.95	0.00	27.95	46.00	-18.05
4924.00	Н	Average	25.47	7.01	32.48	54.00	-21.52
4924.00	Н	Peak	36.47	7.01	43.48	74.00	-30.52
7386.00	Н						
9848.00	Н						
12310.00	Н						
14772.00	Н						
17234.00	Н						
19696.00	Н						
22158.00	Н						

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Operation Band	:802.11 g	Test Date	:2014-03-19
Fundamental Frequency	:2462 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
48.43	S	Peak	27.18	-12.97	14.21	40.00	-25.79
160.95	S	Peak	27.31	-12.66	14.65	43.50	-28.85
423.82	S	Peak	27.88	-8.96	18.92	46.00	-27.08
514.03	S	Peak	28.12	-7.44	20.68	46.00	-25.32
678.93	S	Peak	28.32	-3.70	24.62	46.00	-21.38
906.88	S	Peak	27.83	-0.60	27.23	46.00	-18.77
4924.00	Н	Average	24.82	7.01	31.83	54.00	-22.17
4924.00	Н	Peak	37.50	7.01	44.51	74.00	-29.49
7386.00	Н						
9848.00	Н						
12310.00	Н						
14772.00	Н						
17234.00	Н						
19696.00	Н						
22158.00	Н						

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#### Radiated Spurious Emission Measurement Result (802.11n\_20M)

Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:2412 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	32.84	-17.86	14.98	43.50	-28.52
272.50	S	Peak	26.78	-11.85	14.93	46.00	-31.07
435.46	S	Peak	27.58	-8.90	18.68	46.00	-27.32
548.95	S	Peak	27.89	-7.40	20.49	46.00	-25.51
683.78	S	Peak	27.39	-3.67	23.72	46.00	-22.28
957.32	S	Peak	27.74	0.20	27.94	46.00	-18.06
4824.00	Н	Average	25.42	6.89	32.31	54.00	-21.69
4824.00	Н	Peak	37.26	6.89	44.15	74.00	-29.85
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:2412 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
51.34	S	Peak	27.43	-13.03	14.40	40.00	-25.60
276.38	S	Peak	26.84	-11.68	15.16	46.00	-30.84
409.27	S	Peak	27.25	-8.93	18.32	46.00	-27.68
558.65	S	Peak	28.45	-6.78	21.67	46.00	-24.33
676.02	S	Peak	27.16	-3.81	23.35	46.00	-22.65
952.47	S	Peak	27.50	0.18	27.68	46.00	-18.32
4824.00	Н	Average	24.36	6.89	31.25	54.00	-22.75
4824.00	Н	Peak	36.61	6.89	43.50	74.00	-30.50
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Note	Detector	Spectrum Reading Level	Factor	Actual ES	Limit	Margin
F/H/F/S		-	dB		0	dB
1/11/L/5		αDμν	цD	ασμν/ Π		<u>u</u> D
S	Peak	27.87	-13.32	14.55	40.00	-25.45
S	Peak	26.81	-11.89	14.92	46.00	-31.08
S	Peak	27.53	-8.96	18.57	46.00	-27.43
S	Peak	28.02	-7.12	20.90	46.00	-25.10
S	Peak	27.95	-3.76	24.19	46.00	-21.81
S	Peak	27.48	0.10	27.58	46.00	-18.42
Н	Average	25.62	6.96	32.58	54.00	-21.42
Н	Peak	37.40	6.96	44.36	74.00	-29.64
Н						
Н						
Н						
Н						
Н						
Н						
Н						
	F/H/E/S S S S S S H H H H H H H H H H H H H	Mode           F/H/E/S         Mode           F/H/E/S         PK/QP/AV           S         Peak           P         Peak           P         Peak           P         P           P         P           P         P           P         P <tr tbb<="" tr=""></tr>	Mode         Reading Level           F/H/E/S         PK/QP/AV         dBµV           S         Peak         27.87           S         Peak         26.81           S         Peak         27.53           S         Peak         27.95           S         Peak         27.48           S         Peak         27.48           S         Peak         25.62           H         Average         25.62           H         Peak         37.40           H             H             H             H             H             H             H             H             H             H	Mode         Reading Level           F/H/E/S         PK/QP/AV         dBµV         dB           S         Peak         27.87         -13.32           S         Peak         26.81         -11.89           S         Peak         27.53         -8.96           S         Peak         27.95         -3.76           S         Peak         27.48         0.10           H         Average         25.62         6.96           H         Peak         37.40         6.96           H          H            H              H             H             H             H             H             H             H             H             H             H             H	Mode         Reading Level         FS           F/H/E/S         PK/QP/AV         dBµV         dB         dBµV/m           S         Peak         27.87         -13.32         14.55           S         Peak         26.81         -11.89         14.92           S         Peak         26.81         -11.89         14.92           S         Peak         26.81         -11.89         14.92           S         Peak         27.53         -8.96         18.57           S         Peak         27.95         -3.76         24.19           S         Peak         27.48         0.10         27.58           H         Average         25.62         6.96         32.58           H         Peak         37.40         6.96         44.36           H	Mode         Reading Level         FS         @3m           F/H/E/S         PK/QP/AV         dBµV         dB         dBµV/m         dBµV/m           S         Peak         27.87         -13.32         14.55         40.00           S         Peak         26.81         -11.89         14.92         46.00           S         Peak         26.81         -11.89         14.92         46.00           S         Peak         27.53         -8.96         18.57         46.00           S         Peak         27.95         -3.76         24.19         46.00           S         Peak         27.48         0.10         27.58         46.00           S         Peak         27.48         0.10         27.58         46.00           S         Peak         27.48         0.10         27.58         46.00           H         Average         25.62         6.96         32.58         54.00           H          H          H          H            H          H          H             H

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
52.31	S	Peak	26.77	-13.09	13.68	40.00	-26.32
264.74	S	Peak	27.21	-12.27	14.94	46.00	-31.06
448.07	S	Peak	27.16	-8.50	18.66	46.00	-27.34
536.34	S	Peak	29.04	-7.59	21.45	46.00	-24.55
685.72	S	Peak	27.06	-3.69	23.37	46.00	-22.63
912.70	S	Peak	27.97	-0.44	27.53	46.00	-18.47
4874.00	Н	Average	24.64	6.96	31.60	54.00	-22.40
4874.00	Н	Peak	36.49	6.96	43.45	74.00	-30.55
7311.00	Н						
9748.00	Н						
12185.00	Н						
14622.00	Н						
17059.00	Н						
19496.00	Н						
21933.00	Н						

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Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 125 of 247

Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:2462 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

MHz         F/H/E/S         PK/QP/AV         dBµV         dB         dBµV/m         dBµV/m         dB           99.84         S         Peak         33.51         -17.86         15.65         43.50         -27.85           276.38         S         Peak         26.83         -11.68         15.15         46.00         -30.85           414.12         S         Peak         27.41         -8.91         18.50         46.00         -27.50           516.94         S         Peak         28.48         -7.43         21.05         46.00         -24.95           682.81         S         Peak         27.48         -3.67         23.81         46.00         -22.19           913.67         S         Peak         28.22         -0.42         27.80         46.00         -18.20	Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
99.84       S       Peak       33.51       -17.86       15.65       43.50       -27.85         276.38       S       Peak       26.83       -11.68       15.15       46.00       -30.85         414.12       S       Peak       27.41       -8.91       18.50       46.00       -27.50         516.94       S       Peak       28.48       -7.43       21.05       46.00       -24.95         682.81       S       Peak       27.48       -3.67       23.81       46.00       -22.19         913.67       S       Peak       28.22       -0.42       27.80       46.00       -18.20	MHz	F/H/E/S		-	dB		0	dB
276.38SPeak26.83-11.6815.1546.00-30.85414.12SPeak27.41-8.9118.5046.00-27.50516.94SPeak28.48-7.4321.0546.00-24.95682.81SPeak27.48-3.6723.8146.00-22.19913.67SPeak28.22-0.4227.8046.00-18.20				·			•	
414.12SPeak27.41-8.9118.5046.00-27.50516.94SPeak28.48-7.4321.0546.00-24.95682.81SPeak27.48-3.6723.8146.00-22.19913.67SPeak28.22-0.4227.8046.00-18.20	99.84	S	Peak	33.51	-17.86	15.65	43.50	-27.85
516.94SPeak28.48-7.4321.0546.00-24.95682.81SPeak27.48-3.6723.8146.00-22.19913.67SPeak28.22-0.4227.8046.00-18.20	276.38	S	Peak	26.83	-11.68	15.15	46.00	-30.85
682.81SPeak27.48-3.6723.8146.00-22.19913.67SPeak28.22-0.4227.8046.00-18.20	414.12	S	Peak	27.41	-8.91	18.50	46.00	-27.50
913.67 S Peak 28.22 -0.42 27.80 46.00 -18.20	516.94	S	Peak	28.48	-7.43	21.05	46.00	-24.95
	682.81	S	Peak	27.48	-3.67	23.81	46.00	-22.19
	913.67	S	Peak	28.22	-0.42	27.80	46.00	-18.20
4924.00 H Average 25.50 7.01 32.51 54.00 -21.49	4924.00	Н	Average	25.50	7.01	32.51	54.00	-21.49
4924.00 H Peak 36.77 7.01 43.78 74.00 -30.22	4924.00	Н	Peak	36.77	7.01	43.78	74.00	-30.22
7386.00 Н	7386.00	Н						
9848.00 H	9848.00	Н						
12310.00 Н	12310.00	Н						
14772.00 Н	14772.00	Н						
17234.00 H	17234.00	Н						
19696.00 H	19696.00	Н						
22158.00 H	22158.00	Н						

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:2462 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MI			•	ID		0	ID
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
61.04	S	Peak	28.47	-13.77	14.70	40.00	-25.30
153.19	S	Peak	27.24	-12.74	14.50	43.50	-29.00
447.10	S	Peak	27.32	-8.53	18.79	46.00	-27.21
556.71	S	Peak	28.04	-6.91	21.13	46.00	-24.87
680.87	S	Peak	27.58	-3.66	23.92	46.00	-22.08
951.50	S	Peak	27.25	0.18	27.43	46.00	-18.57
4924.00	Н	Average	24.61	7.01	31.62	54.00	-22.38
4924.00	Н	Peak	35.95	7.01	42.96	74.00	-31.04
7386.00	Н						
9848.00	Н						
12310.00	Н						
14772.00	Н						
17234.00	Н						
19696.00	Н						
22158.00	Н						

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#### **Radiated Spurious Emission Measurement Result (802.11a)**

Operation Band	:802.11 a	Test Date	:2014-03-19
Fundamental Frequency	:5745 MHz	Temp./Humi.	:22.1 deg C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
44.55	S	Peak	28.09	-13.11	14.98	40.00	-25.02
270.56	S	Peak	27.63	-11.93	15.70	46.00	-30.30
418.00	S	Peak	27.94	-8.92	19.02	46.00	-26.98
559.62	S	Peak	28.75	-6.72	22.03	46.00	-23.97
677.96	S	Peak	28.83	-3.73	25.10	46.00	-20.90
956.35	S	Peak	28.25	0.20	28.45	46.00	-17.55
11490.00	Н	Average	23.12	17.78	40.90	54.00	-13.10
11490.00	Н	Peak	25.55	17.78	43.33	74.00	-30.67
17235.00	Н						
22980.00	Н						
28725.00	Н						

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Operation Band	:802.11 a	Test Date	:2014-03-19
Fundamental Frequency	:5745 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
41.64	S	Peak	28.57	-13.32	15.25	40.00	-24.75
169.68	S	Peak	28.96	-12.92	16.04	43.50	-27.46
420.91	S	Peak	28.41	-8.93	19.48	46.00	-26.52
511.12	S	Peak	29.91	-7.44	22.47	46.00	-23.53
680.87	S	Peak	29.10	-3.66	25.44	46.00	-20.56
916.58	S	Peak	27.68	-0.36	27.32	46.00	-18.68
11490.00	Н	Average	22.56	17.78	40.34	54.00	-13.66
11490.00	Н	Peak	26.42	17.78	44.20	74.00	-29.80
17235.00	Н						
22980.00	Н						
28725.00	Н						
34470.00	Н						

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Operation Band	:802.11 a	Test Date	:2014-03-19
Fundamental Frequency	:5785 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	33.23	-17.86	15.37	43.50	-28.13
271.53	S	Peak	28.57	-11.89	16.68	46.00	-29.32
399.57	S	Peak	28.53	-9.18	19.35	46.00	-26.65
559.62	S	Peak	28.12	-6.72	21.40	46.00	-24.60
678.93	S	Peak	28.10	-3.70	24.40	46.00	-21.60
950.53	S	Peak	28.37	0.17	28.54	46.00	-17.46
11570.00	Н	Average	23.18	17.66	40.84	54.00	-13.16
11570.00	Н	Peak	25.37	17.66	43.03	74.00	-30.97
17355.00	Н						
23140.00	Н						
28925.00	Н						
34710.00	Н						

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Operation Band	:802.11 a	Test Date	:2014-03-19
Fundamental Frequency	:5785 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
42.61	S	Peak	28.35	-13.25	15.10	40.00	-24.90
266.68	S	Peak	27.79	-12.14	15.65	46.00	-30.35
432.55	S	Peak	29.56	-8.96	20.60	46.00	-25.40
517.91	S	Peak	29.24	-7.43	21.81	46.00	-24.19
681.84	S	Peak	28.64	-3.66	24.98	46.00	-21.02
972.84	S	Peak	27.71	0.13	27.84	54.00	-26.16
11570.00	Н	Average	22.42	17.66	40.08	54.00	-13.92
11570.00	Н	Peak	25.87	17.66	43.53	74.00	-30.47
17355.00	Н						
23140.00	Н						
28925.00	Н						
34710.00	Н						

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Operation Band	:802.11 a	Test Date	:2014-03-19
Fundamental Frequency	:5825 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	34.23	-17.86	16.37	43.50	-27.13
150.28	S	Peak	28.47	-12.79	15.68	43.50	-27.82
418.97	S	Peak	28.77	-8.93	19.84	46.00	-26.16
559.62	S	Peak	27.94	-6.72	21.22	46.00	-24.78
677.96	S	Peak	28.11	-3.73	24.38	46.00	-21.62
989.33	S	Peak	27.53	0.09	27.62	54.00	-26.38
11650.00	Н	Average	23.16	17.87	41.03	54.00	-12.97
11650.00	Н	Peak	25.31	17.87	43.18	74.00	-30.82
17475.00	Н						
23300.00	Н						
29125.00	Н						
34950.00	Н						

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Operation Band	:802.11 a	Test Date	:2014-03-19
Fundamental Frequency	:5825 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
51.34	S	Peak	28.77	-13.03	15.74	40.00	-24.26
152.22	S	Peak	28.29	-12.76	15.53	43.50	-27.97
425.76	S	Peak	29.01	-8.97	20.04	46.00	-25.96
471.35	S	Peak	29.78	-7.85	21.93	46.00	-24.07
682.81	S	Peak	28.28	-3.67	24.61	46.00	-21.39
943.74	S	Peak	28.46	0.10	28.56	46.00	-17.44
11650.00	Н	Average	22.37	17.87	40.24	54.00	-13.76
11650.00	Н	Peak	25.46	17.87	43.33	74.00	-30.67
17475.00	Н						
23300.00	Н						
29125.00	Н						
34950.00	Н						

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# **FCC ID: PY7PM-0732**

#### Radiated Spurious Emission Measurement Result (802.11n (5GHz) 20M) **Operation Band** :802.11 n20M Test Date :2014-03-19 **Fundamental Frequency** :5745 MHz Temp./Humi. :22.1 deg C / 68 RH **Operation Mode** :TX LOW Engineer :Allen EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB) Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB) Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency. "---": denotes Noise Floor. Freq. Note Detector Spectrum Factor Actual Limit Margin FS Mode Reading Level @3m dBµV/m PK/QP/AV dBµV dB dBµV/m dB MHz F/H/E/S 49.40 S Peak 28.07 -12.9515.12 40.00 -24.88161.92 S -12.69 15.59 43.50 -27.91 Peak 28.28 426.73 S Peak 28.67 -8.98 19.69 46.00 -26.31 S 519.85 Peak 28.81 -7.42 21.39 46.00 -24.61 S 675.05 Peak 28.52 -3.84 24.68 46.00 -21.32960.23 S Peak 27.68 0.21 27.89 54.00 -26.11 11490.00 Η 23.15 17.78 40.93 54.00 -13.07 Average 11490.00 Η Peak 25.64 17.78 43.42 74.00 -30.58 17235.00 Η \_\_\_ 22980.00 Η 28725.00 Η

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:5745 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
48.43	S	Peak	28.27	-12.97	15.30	40.00	-24.70
271.53	S	Peak	27.56	-11.89	15.67	46.00	-30.33
415.09	S	Peak	28.16	-8.91	19.25	46.00	-26.75
559.62	S	Peak	28.44	-6.72	21.72	46.00	-24.28
679.90	S	Peak	28.73	-3.67	25.06	46.00	-20.94
937.92	S	Peak	28.11	0.01	28.12	46.00	-17.88
11490.00	Н	Average	22.38	17.78	40.16	54.00	-13.84
11490.00	Н	Peak	26.20	17.78	43.98	74.00	-30.02
17235.00	Н						
22980.00	Н						
28725.00	Н						

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:5785 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	33.78	-17.86	15.92	43.50	-27.58
163.86	S	Peak	29.80	-12.75	17.05	43.50	-26.45
417.03	S	Peak	28.38	-8.92	19.46	46.00	-26.54
484.93	S	Peak	29.30	-7.72	21.58	46.00	-24.42
674.08	S	Peak	27.86	-3.87	23.99	46.00	-22.01
962.17	S	Peak	27.70	0.20	27.90	54.00	-26.10
11570.00	Н	Average	23.23	17.66	40.89	54.00	-13.11
11570.00	Н	Peak	25.75	17.66	43.41	74.00	-30.59
17355.00	Н						
23140.00	Н						
28925.00	Н						
34710.00	Н						

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:5785 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX MID	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
48.43	S	Peak	28.04	-12.97	15.07	40.00	-24.93
154.16	S	Peak	28.17	-12.73	15.44	43.50	-28.06
415.09	S	Peak	28.76	-8.91	19.85	46.00	-26.15
518.88	S	Peak	28.55	-7.44	21.11	46.00	-24.89
667.29	S	Peak	29.19	-4.10	25.09	46.00	-20.91
946.65	S	Peak	27.37	0.14	27.51	46.00	-18.49
11570.00	Н	Average	22.45	17.66	40.11	54.00	-13.89
11570.00	Н	Peak	25.55	17.66	43.21	74.00	-30.79
17355.00	Н						
23140.00	Н						
28925.00	Н						
34710.00	Н						

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:5825 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
99.84	S	Peak	34.85	-17.86	16.99	43.50	-26.51
272.50	S	Peak	28.27	-11.85	16.42	46.00	-29.58
439.34	S	Peak	28.90	-8.83	20.07	46.00	-25.93
556.71	S	Peak	28.79	-6.91	21.88	46.00	-24.12
683.78	S	Peak	27.76	-3.67	24.09	46.00	-21.91
980.60	S	Peak	27.52	0.01	27.53	54.00	-26.47
11650.00	Н	Average	23.24	17.87	41.11	54.00	-12.89
11650.00	Н	Peak	25.68	17.87	43.55	74.00	-30.45
17475.00	Н						
23300.00	Н						
29125.00	Н						
34950.00	Н						

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Operation Band	:802.11 n20M	Test Date	:2014-03-19
Fundamental Frequency	:5825 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
41.64	S	Peak	28.81	-13.32	15.49	40.00	-24.51
247.28	S	Peak	29.31	-13.04	16.27	46.00	-29.73
444.19	S	Peak	28.24	-8.64	19.60	46.00	-26.40
549.92	S	Peak	28.56	-7.38	21.18	46.00	-24.82
677.96	S	Peak	28.49	-3.73	24.76	46.00	-21.24
938.89	S	Peak	27.88	0.03	27.91	46.00	-18.09
11650.00	Н	Average	22.36	17.87	40.23	54.00	-13.77
11650.00	Н	Peak	25.53	17.87	43.40	74.00	-30.60
17475.00	Н						
23300.00	Н						
29125.00	Н						
34950.00	Н						

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#### Radiated Spurious Emission Measurement Result (802.11n (5GHz) 40M) **Operation Band** :802.11 n40M Test Date :2014-03-19 **Fundamental Frequency** :5755 MHz Temp./Humi. :22.1 deg C / 68 RH **Operation Mode** :TX LOW Engineer :Allen EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB) Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB) Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency. "---": denotes Noise Floor. Freq. Note Detector Spectrum Factor Actual Limit Margin FS Mode Reading Level @3m dBµV/m PK/QP/AV dBµV dB dBµV/m dB MHz F/H/E/S 99.84 S Peak 33.32 -17.8615.46 43.50 -28.04S 27.97 -11.85 46.00 -29.88 272.50 Peak 16.12 424.79 S Peak 28.67 -8.96 19.71 46.00 -26.29 S 22.11 511.12 Peak 29.55 -7.44 46.00 -23.89S 676.99 Peak 27.92 -3.7824.14 46.00 -21.86 949.56 S Peak 28.40 0.18 28.58 46.00 -17.42 11510.00 Η 23.25 41.03 54.00 -12.97 Average 17.78 11510.00 Η Peak 26.52 17.78 44.30 74.00 -29.7017265.00 Η \_\_\_ 23020.00 Η 28775.00 Η 34530.00 Η

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Operation Band	:802.11 n40M	Test Date	:2014-03-19
Fundamental Frequency	:5755 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX LOW	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
52.31	S	Peak	28.19	-13.09	15.10	40.00	-24.90
272.50	S	Peak	27.82	-11.85	15.97	46.00	-30.03
450.01	S	Peak	28.03	-8.42	19.61	46.00	-26.39
557.68	S	Peak	28.81	-6.84	21.97	46.00	-24.03
662.44	S	Peak	28.55	-4.25	24.30	46.00	-21.70
964.11	S	Peak	28.16	0.20	28.36	54.00	-25.64
11510.00	Н	Average	22.29	17.78	40.07	54.00	-13.93
11510.00	Н	Peak	26.18	17.78	43.96	74.00	-30.04
17265.00	Н						
23020.00	Н						
28775.00	Н						
34530.00	Н						

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**Report No.: EH/2014/10052** Issue Date: Apr. 11, 2014 Page: 141 of 247

Operation Band	:802.11 n40M	Test Date	:2014-03-19
Fundamental Frequency	:5795 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
41.64	S	Peak	29.43	-13.32	16.11	40.00	-23.89
172.59	S	Peak	28.93	-13.17	15.76	43.50	-27.74
429.64	S	Peak	29.28	-8.99	20.29	46.00	-25.71
515.00	S	Peak	29.41	-7.43	21.98	46.00	-24.02
668.26	S	Peak	28.91	-4.08	24.83	46.00	-21.17
959.26	S	Peak	28.11	0.21	28.32	46.00	-17.68
11590.00	Н	Average	23.30	17.74	41.04	54.00	-12.96
11590.00	Н	Peak	25.70	17.74	43.44	74.00	-30.56
17385.00	Н						
23180.00	Н						
28975.00	Н						
34770.00	Н						

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Operation Band	:802.11 n40M	Test Date	:2014-03-19
Fundamental Frequency	:5795 MHz	Temp./Humi.	:22.1 deg_C / 68 RH
Operation Mode	:TX HIGH	Engineer	:Allen
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

34770.00

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Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
51.34	S	Peak	28.01	-13.03	14.98	40.00	-25.02
280.26	S	Peak	27.24	-11.52	15.72	46.00	-30.28
422.85	S	Peak	28.35	-8.94	19.41	46.00	-26.59
489.78	S	Peak	29.47	-7.70	21.77	46.00	-24.23
686.69	S	Peak	28.63	-3.69	24.94	46.00	-21.06
937.92	S	Peak	27.43	0.01	27.44	46.00	-18.56
11590.00	Н	Average	22.36	17.74	40.10	54.00	-13.90
11590.00	Н	Peak	25.37	17.74	43.11	74.00	-30.89
17385.00	Н						
23180.00	Н						
28975.00	Н						

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# **11 PEAK POWER SPECTRAL DENSITY**

# **11.1 Standard Applicable:**

According to §15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

# **11.2 Measurement Equipment Used:**

Refer to section 7.2 for details.

# 11.3 Test Set-up:

Refer to section 7.3 for details. (Spectrum Option)

# 11.4 Measurement Procedure (following the measurement procedure 10.2 of KDB558074):

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS channel bandwidth.
- 3. Set the RBW  $\geq$  3 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 amplitude level.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

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# **11.5 Measurement Result:**

### 802.11b

Frequency	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dBm)
2412	-5.57	8
2437	-4.89	8
2462	-3.80	8

#### 802.11g

Frequency	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dBm)
2412	-11.52	8
2437	-11.38	8
2462	-9.56	8

#### 802.11n 20M

Frequency	<b>RF</b> Power Density	Maximum Limit
MHz	Reading (dBm)	(dBm)
2412	-13.49	8
2437	-13.30	8
2462	-13.65	8

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#### 802.11a

Frequency	<b>RF</b> Power Density	Maximum Limit	
MHz	Reading (dBm)	(dBm)	
5745	-11.75	8	
5785	-11.11	8	
5825	-10.36	8	

#### 802.11n (5GHz)\_20M

Frequency	<b>RF</b> Power Density	Maximum Limit	
MHz	Reading (dBm)	(dBm)	
5745	-13.80	8	
5785	-13.82	8	
5825	-13.94	8	

#### 802.11n (5GHz)\_40M

Frequency	<b>RF Power Density</b>	Maximum Limit
MHz	Reading (dBm)	(dBm)
5755	-17.39	8
5795	-16.30	8

\* Note: Offset 10.8dB for 2.4G 802.11b/g/n 20; Offset 11.8dB for 5G 802.11a/n\_20/n\_40.

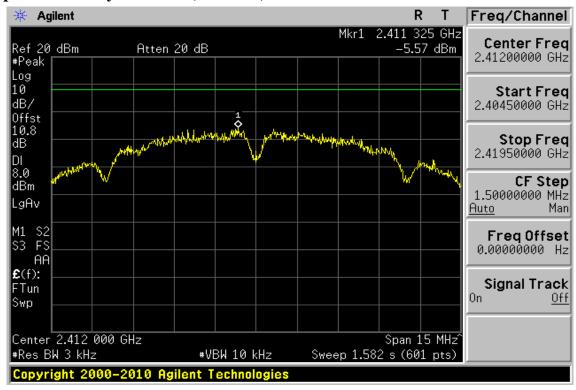
\*Refer to next page for plots

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# 802.11b Power Spectral Density Test Plot (CH-Low)



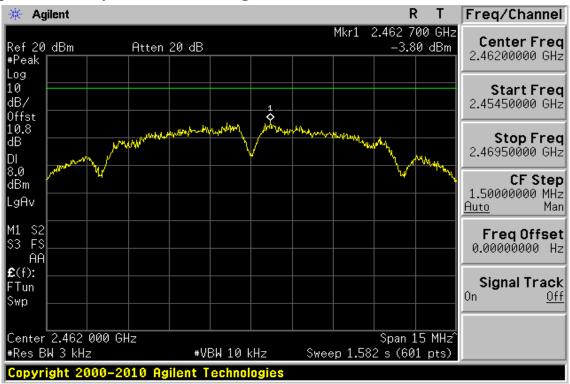
**Power Spectral Density Test Plot (CH-Mid)** 



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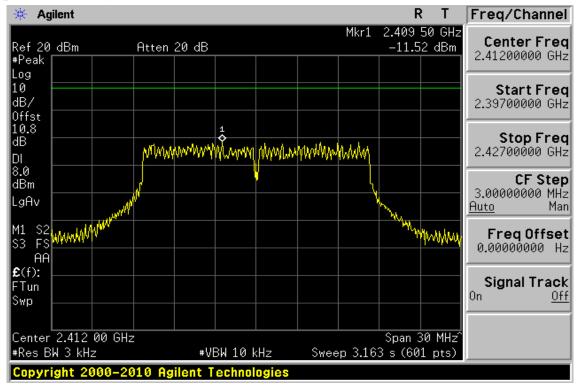




## **Power Spectral Density Test Plot (CH-High)**

#### 802.11g

#### **Power Spectral Density Test Plot (CH-Low)**



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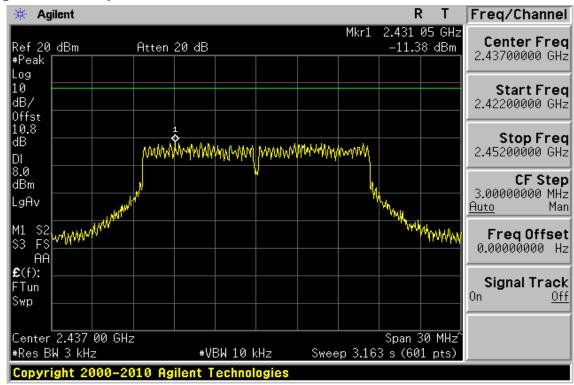
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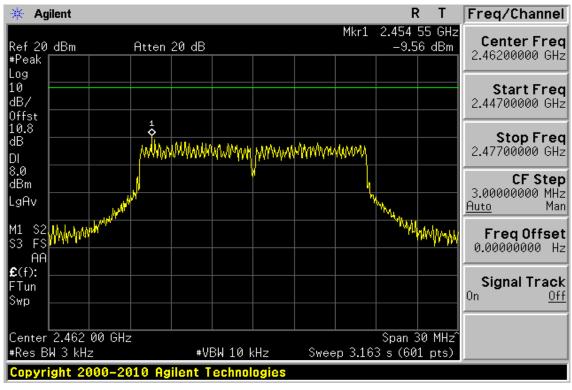
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# Power Spectral Density Test Plot (CH-Mid)

## **Power Spectral Density Test Plot (CH-High)**



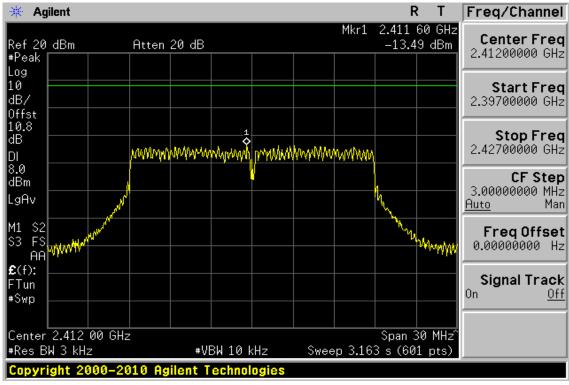
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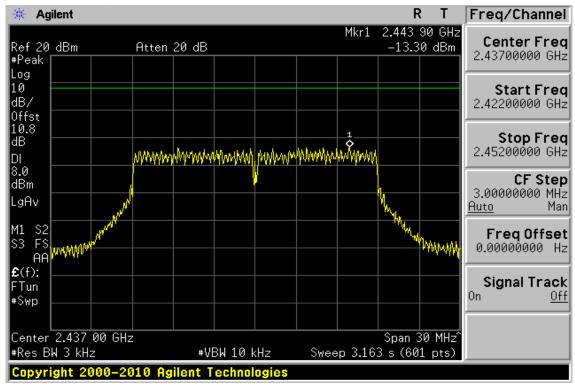


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# 802.11n\_20M Power Spectral Density Test Plot (CH-Low)



**Power Spectral Density Test Plot (CH-Mid)** 

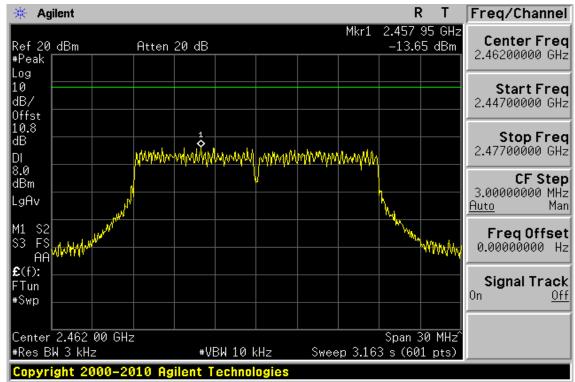


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#### Power Spectral Density Test Plot (CH-High)

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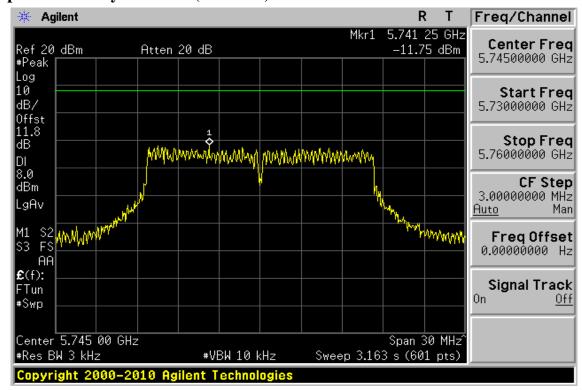
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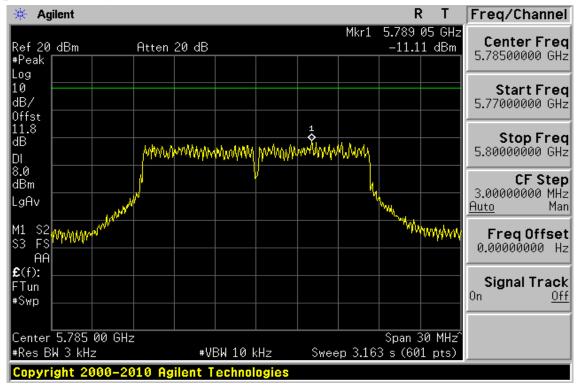
802.11a

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# Power Spectral Density Test Plot (CH-Low)

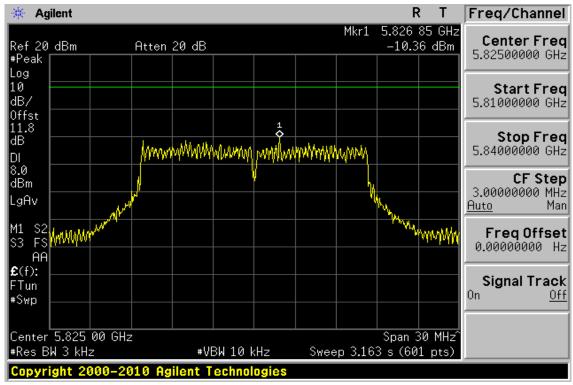
**Power Spectral Density Test Plot (CH-Mid)** 



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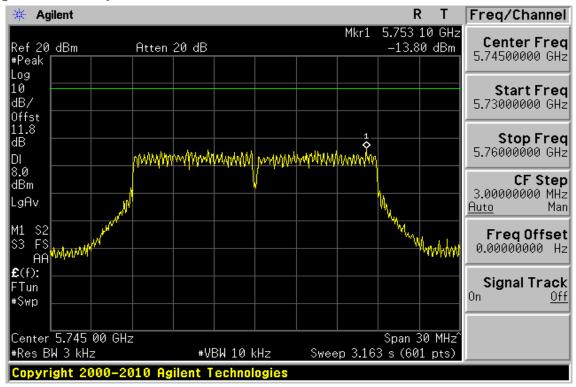
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# Power Spectral Density Test Plot (CH-High)

#### 802.11n (5GHz)\_20M

#### **Power Spectral Density Test Plot (CH-Low)**



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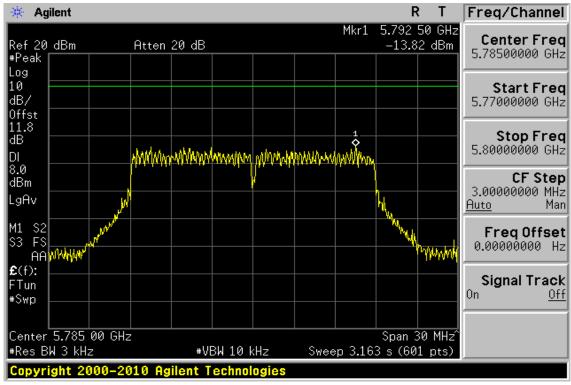
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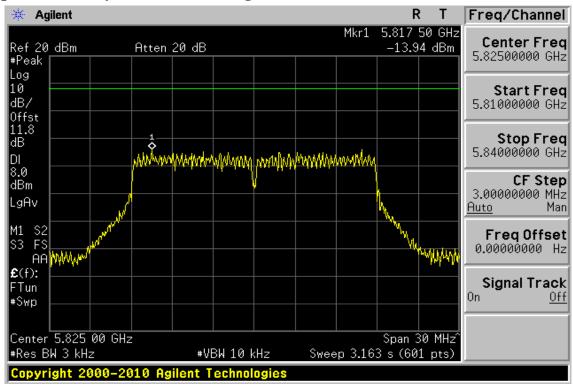
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#### Power Spectral Density Test Plot (CH-Mid)

#### **Power Spectral Density Test Plot (CH-High)**



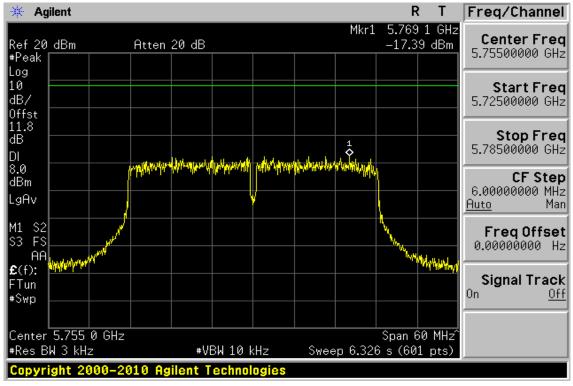
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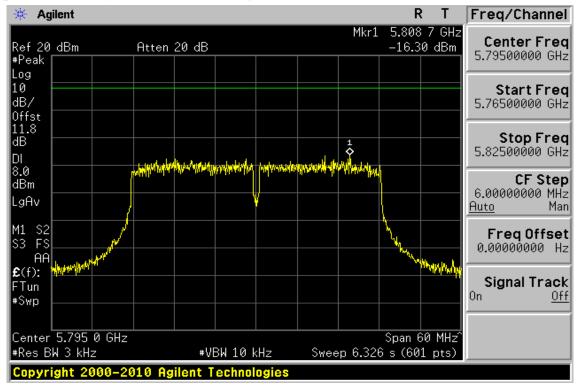


#### 802.11n (5GHz)\_40M

# Power Spectral Density Test Plot (CH-Low)



**Power Spectral Density Test Plot (CH-High)** 



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# **12 ANTENNA REQUIREMENT**

#### **12.1 Standard Applicable:**

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

#### 12.2 Antenna Connected Construction:

The directional gains of antenna used for transmitting is -1.34dBi for 2.4GHz, 4.51dBi for 5725-5850 MHz and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

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# **APPENDIX 1 MEASUREMENT PLOT OF RADIATED SPURIOUS EMISSION**

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#### **Band Edges Radiated Emission:**

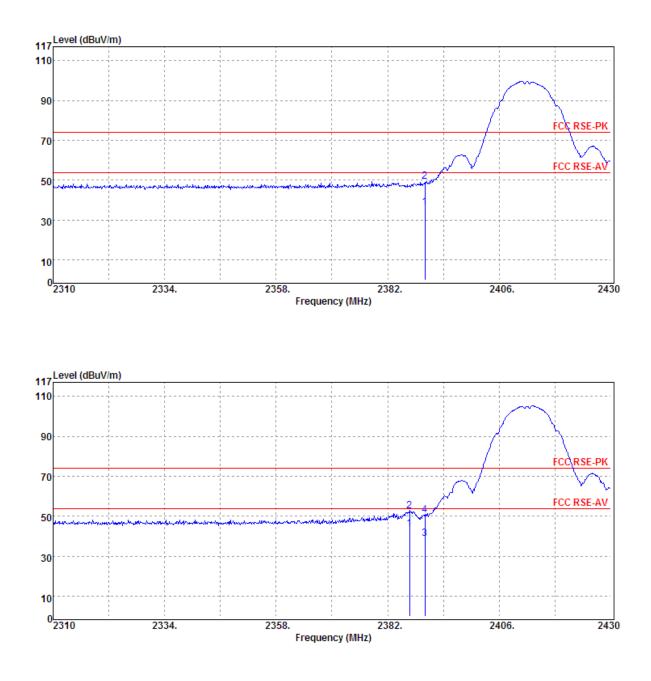
#### Note: The emission that surpasses the limit of peak represents the fundamental emission of the operation that does not account to be conformed to the limit of the interest.

#### 802.11b

Operation Band	
Fundamental Frequency	
Operation Mode	
EUT Pol.	

:802.11 b :2412 MHz :Band Edge LOW :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-18 :23.3deg\_C /52 RH :Curry :Ver. / Hor.



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			Member of SGS Group	

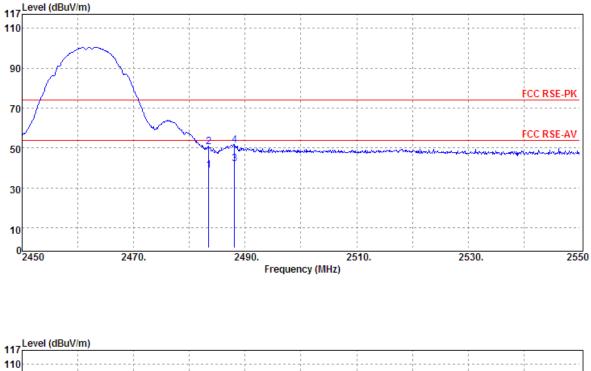


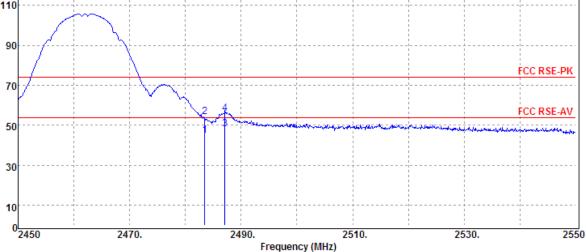
Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 158 of 247

**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 b :2462 MHz :Band Edge HIGH :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-18 :23.3deg\_C /52 RH :Curry :Ver. / Hor.





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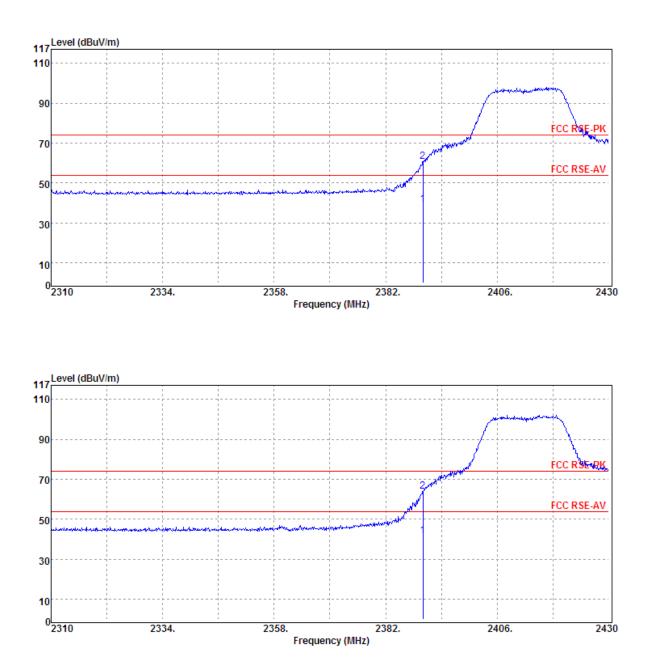
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#### 802.11g

**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 g :2412 MHz :Band Edge LOW :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-18 :23.3deg\_C /52 RH :Curry :Ver. / Hor.



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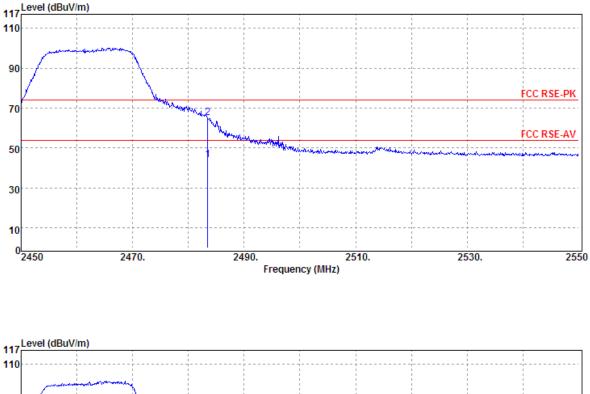
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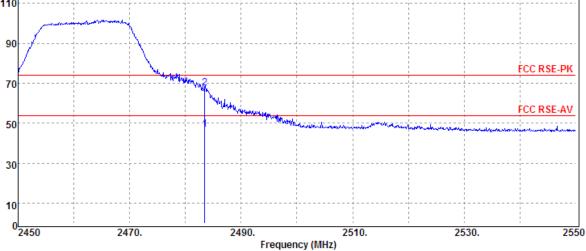
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台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com



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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 g :2462 MHz :Band Edge HIGH :H Plan Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-18 :23.3deg\_C /52 RH :Curry :Ver. / Hor.





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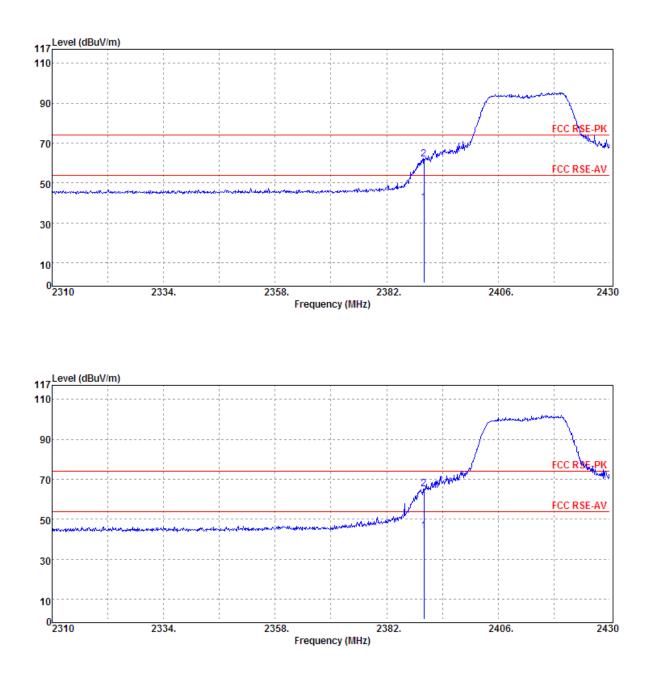
**Report No.: EH/2014/10052** Issue Date: Apr. 11, 2014 Page: 161 of 247

# 11n\_20 (2.4GHz)

**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 n20M :2412 MHz :Band Edge LOW :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-18 :23.3deg\_C /52 RH :Curry :Ver. / Hor.



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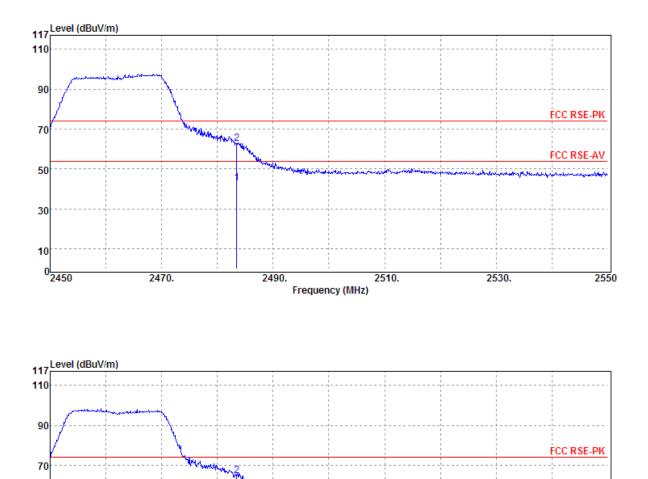
Operation Band Fundamental Frequency Operation Mode EUT Pol.

50

30

10

0 2450 :802.11 n20M :2462 MHz :Band Edge HIGH :H Plan Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-18 :23.3deg\_C /52 RH :Curry :Ver. / Hor.



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Frequency (MHz)

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2530.

FCC RSE

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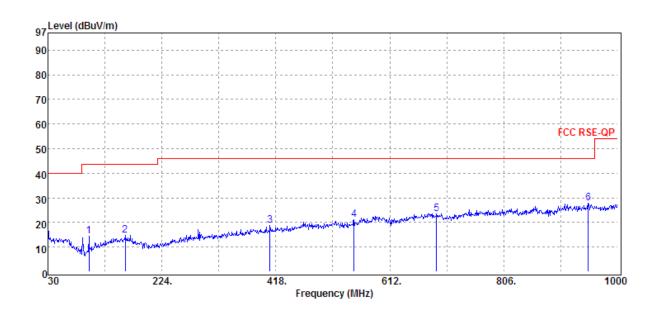


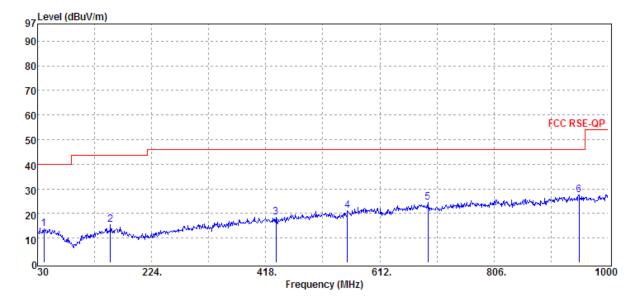
Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 163 of 247

#### Radiated Spurious Emission Measurement photos Result (below 1GHz)

Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 b :2412 MHz :TX LOW :H Plan Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.





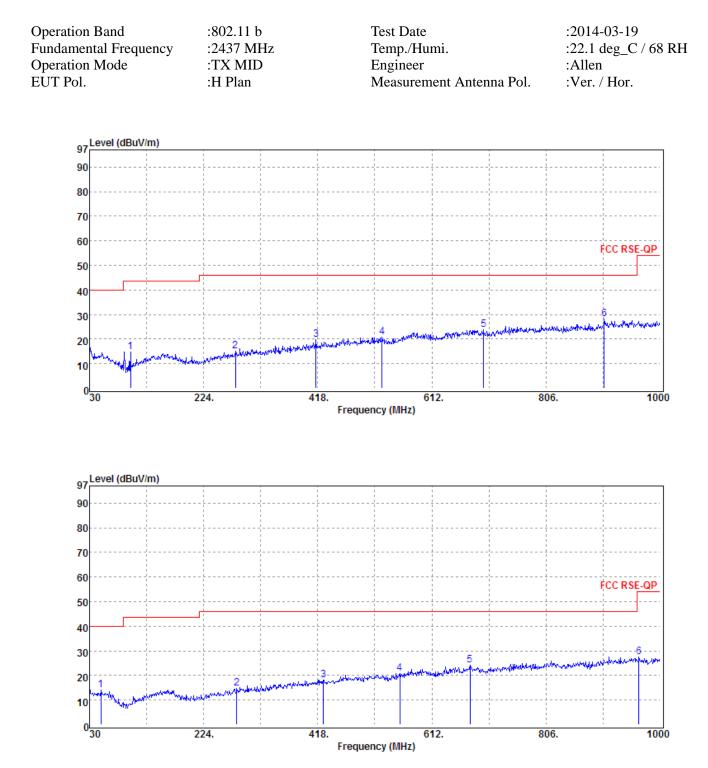
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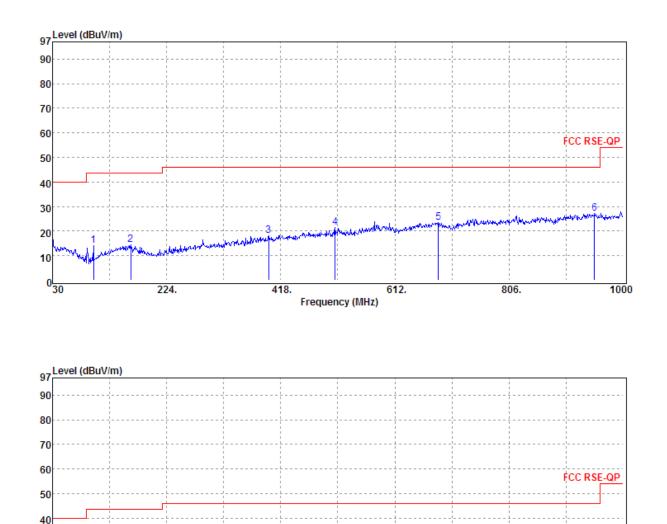
Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 165 of 247

Operation Band:802.Fundamental Frequency:2462Operation Mode:TX HEUT Pol.:H Pla

30 20 10

> 0<u>\_\_\_</u> 30

:802.11 b :2462 MHz :TX HIGH :H Plan Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.



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Frequency (MHz)

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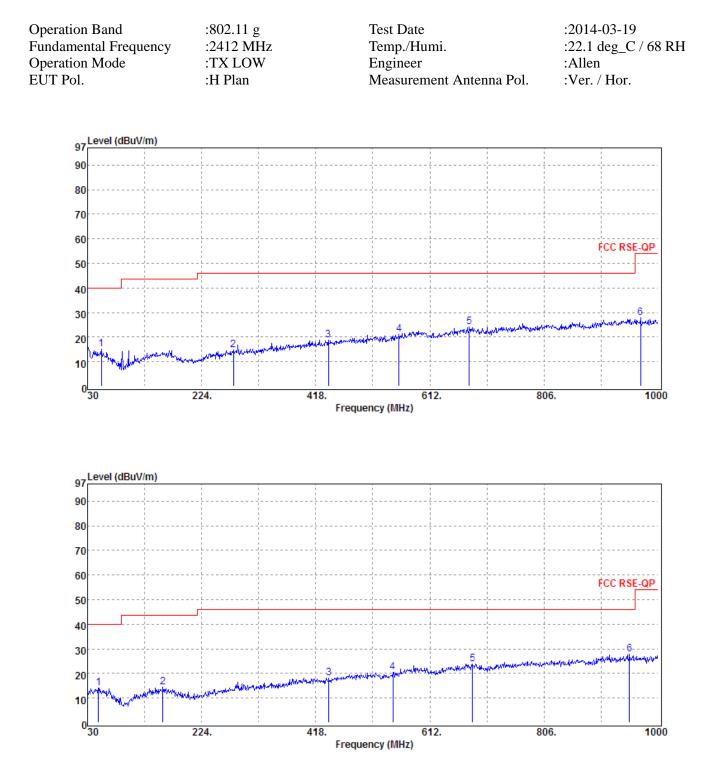
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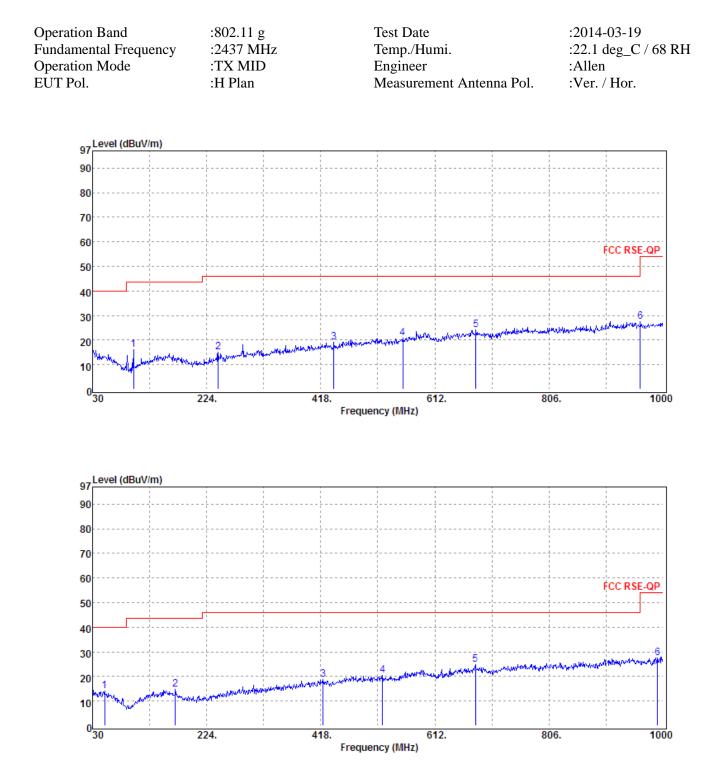
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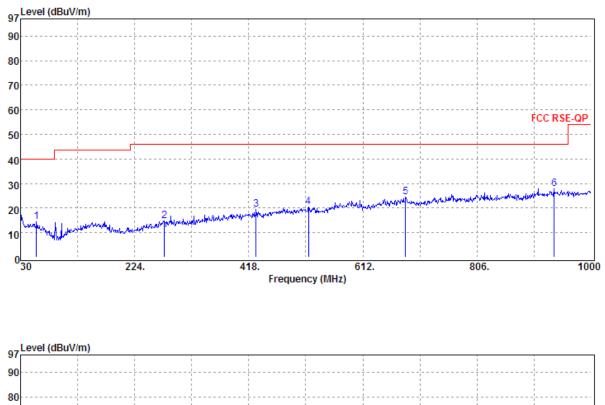
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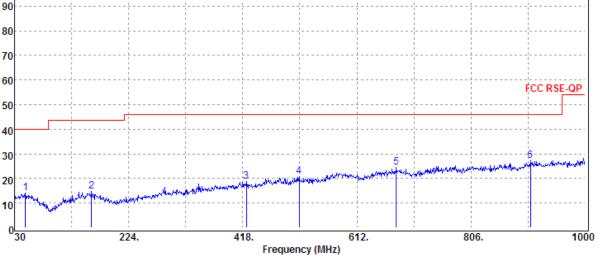


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**Operation Band** :802.11 g **Fundamental Frequency** :2462 MHz **Operation Mode** :TX HIGH EUT Pol. :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.





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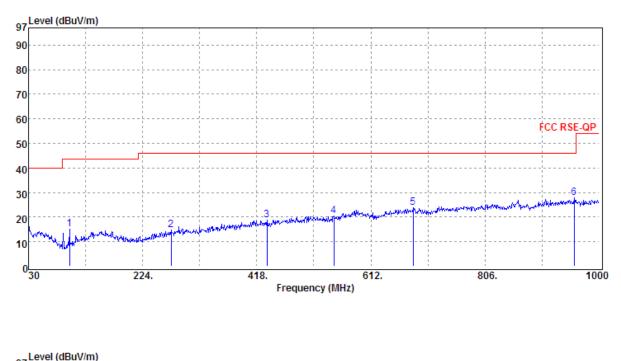


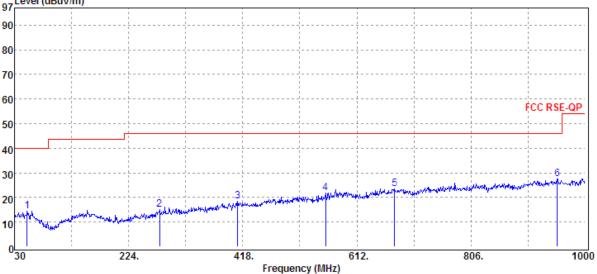
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**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 n20M :2412 MHz :TX LOW :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.





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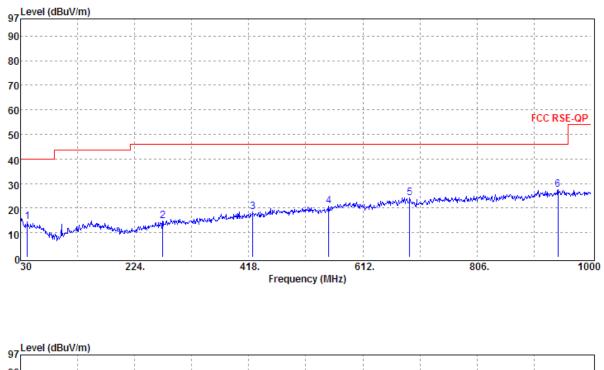
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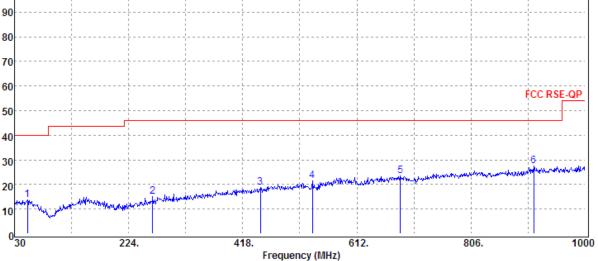
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n20M :2437 MHz :TX MID :H Plan Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.





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Operation Band Fundamental Frequency Operation Mode EUT Pol.

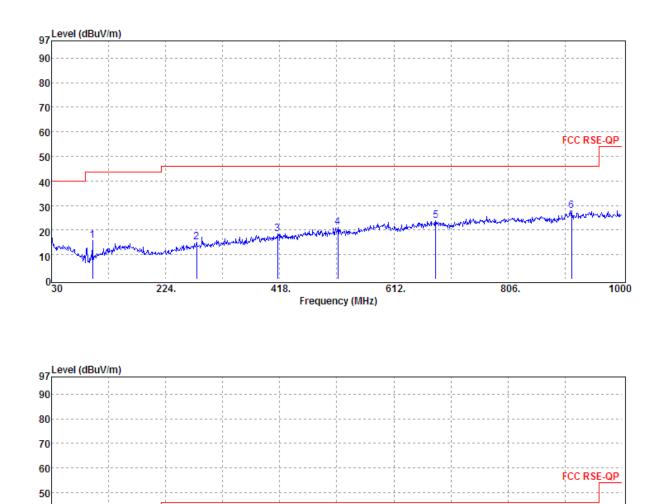
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224

:802.11 n20M :2462 MHz :TX HIGH :H Plan Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.



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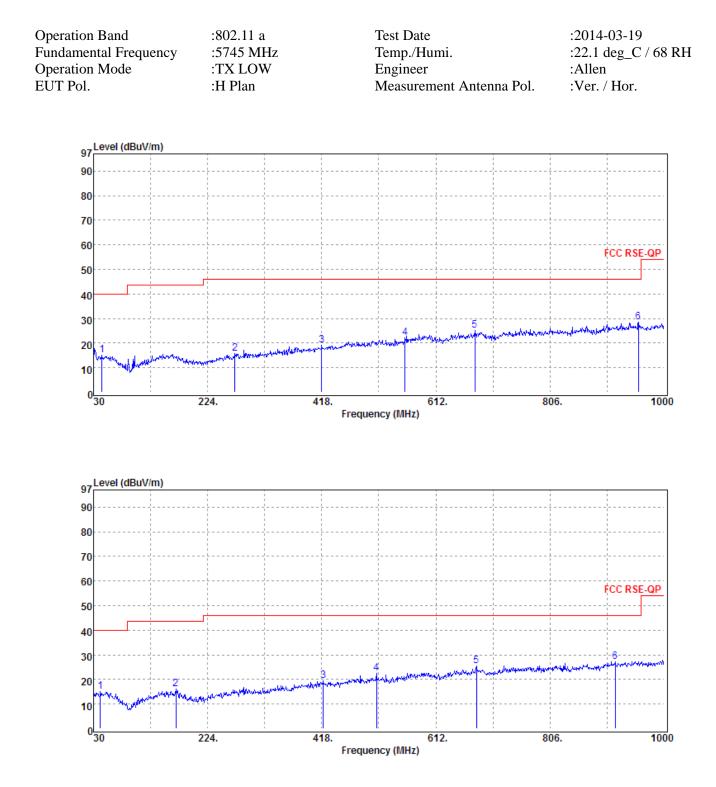
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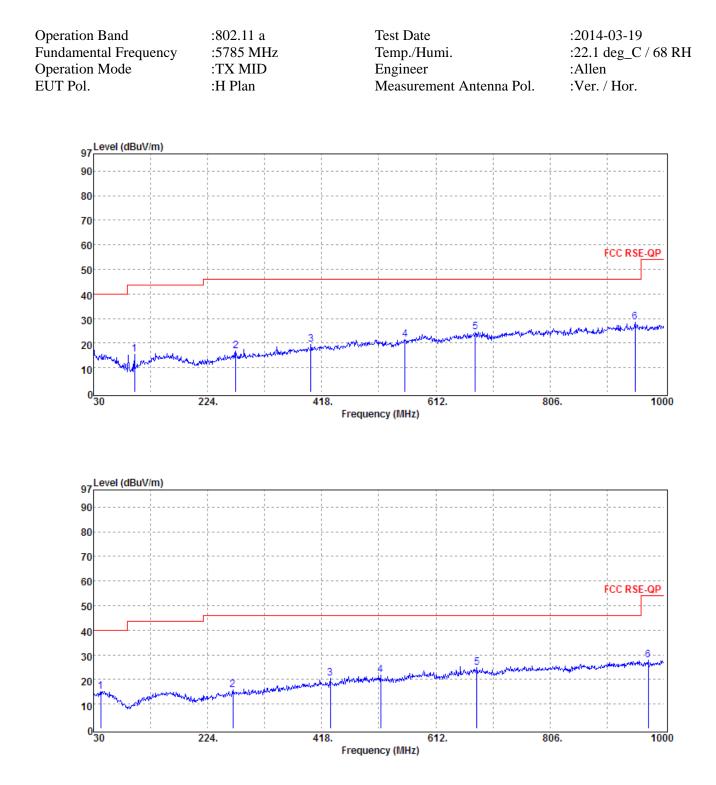
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:802.11 a

**Operation Band** 

30 20 10

0<u>\_\_\_</u> 30

#### **FCC ID: PY7PM-0732**

Test Date

Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 174 of 247

1000

1000

:2014-03-19

**Fundamental Frequency** :5825 MHz Temp./Humi. :22.1 deg\_C / 68 RH **Operation Mode** :TX HIGH Engineer :Allen EUT Pol. :H Plan Measurement Antenna Pol. :Ver. / Hor. Level (dBuV/m) 97 90 80 70 60 FCC RSE-QP 50 40 30 20 10 0<u>\_\_\_</u> 30 224 418. 612. 806. Frequency (MHz) Level (dBuV/m) 97 90 80 70 60 FCC RSE-QP 50 40

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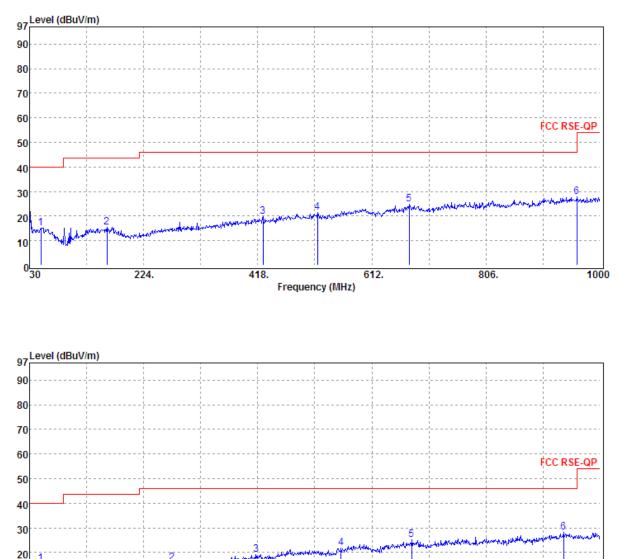


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**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 n20M :5745 MHz :TX LOW :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.



10 0 418 1000 30 224 612. 806. Frequency (MHz)

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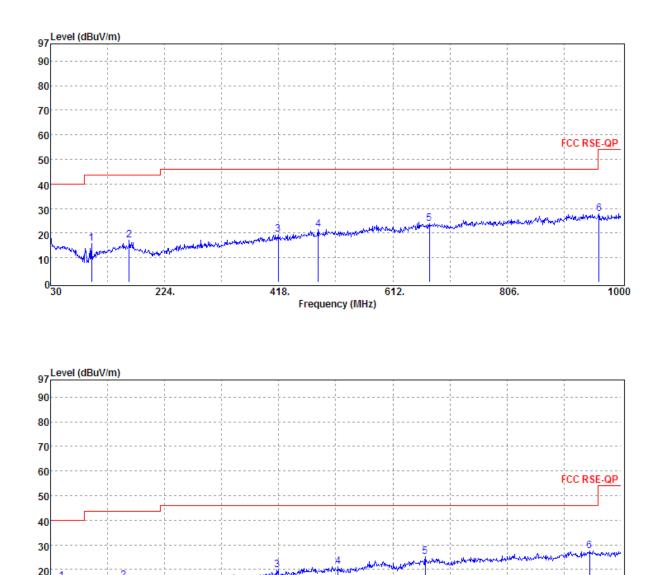
Report No.: EH/2014/10052 Issue Date: Apr. 11, 2014 Page: 176 of 247

Operation Band Fundamental Frequency Operation Mode EUT Pol.

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:802.11 n20M :5785 MHz :TX MID :H Plan Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver, /Hor.



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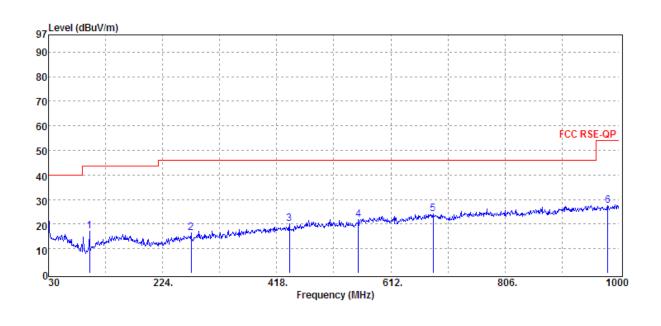


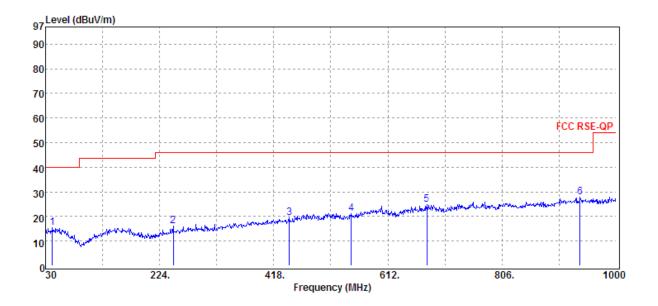
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**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 n20M :5825 MHz :TX HIGH :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.





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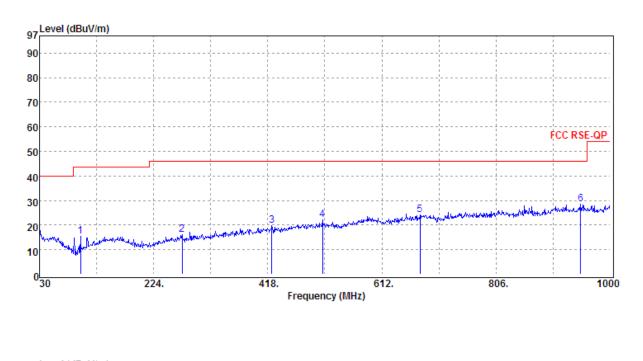


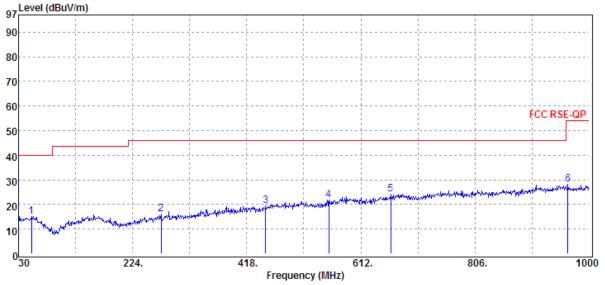
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**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 n40M :5755 MHz :TX LOW :H Plan

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver. / Hor.





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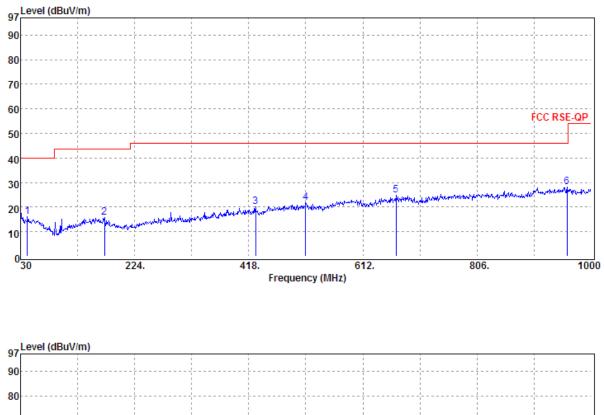
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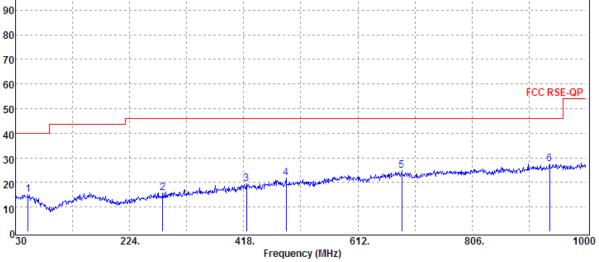
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n40M :5795 MHz :TX HIGH :H Plan Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :Ver, / Hor.





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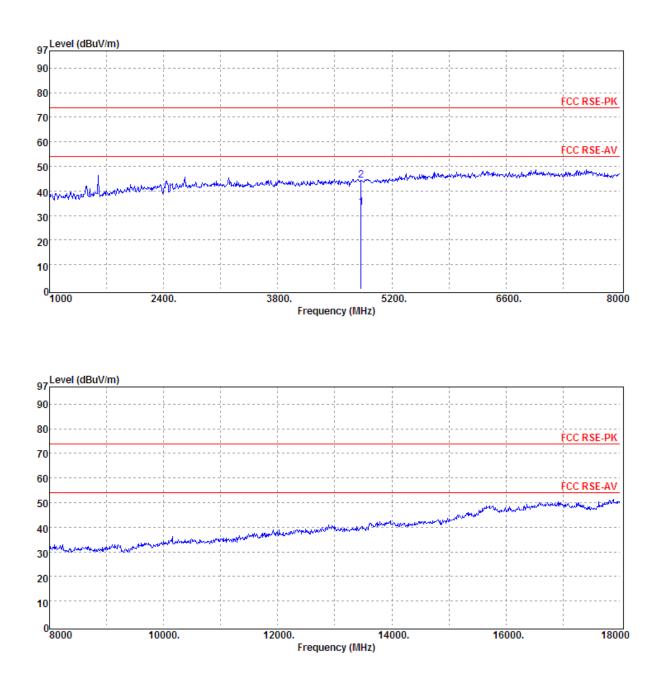


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#### Radiated Spurious Emission Measurement photos Result (above 1GHz)

Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 b :2412 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



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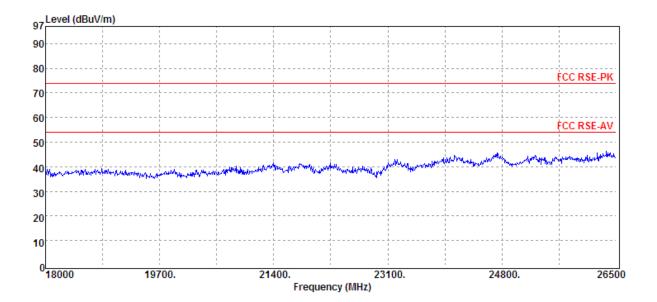
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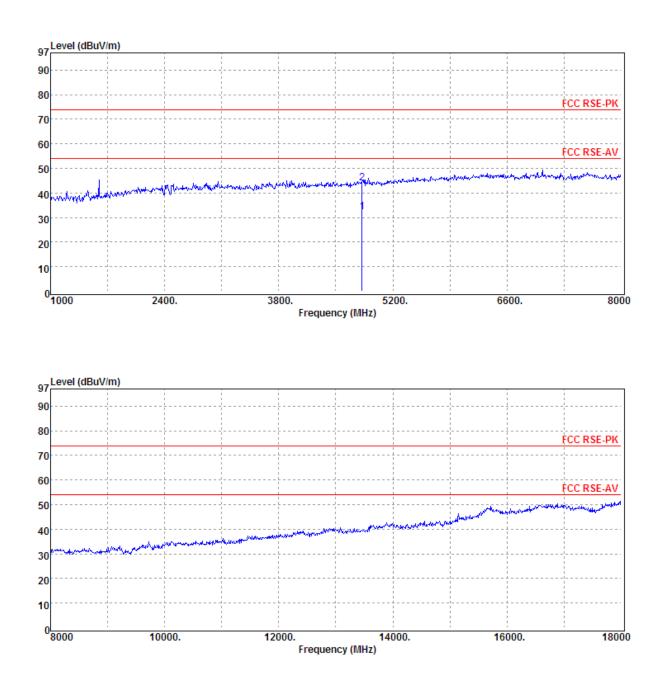
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Operation Band : Fundamental Frequency : Operation Mode : EUT Pol. :

:802.11 b :2412 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



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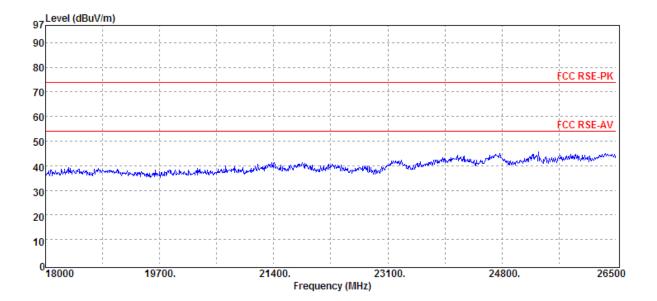
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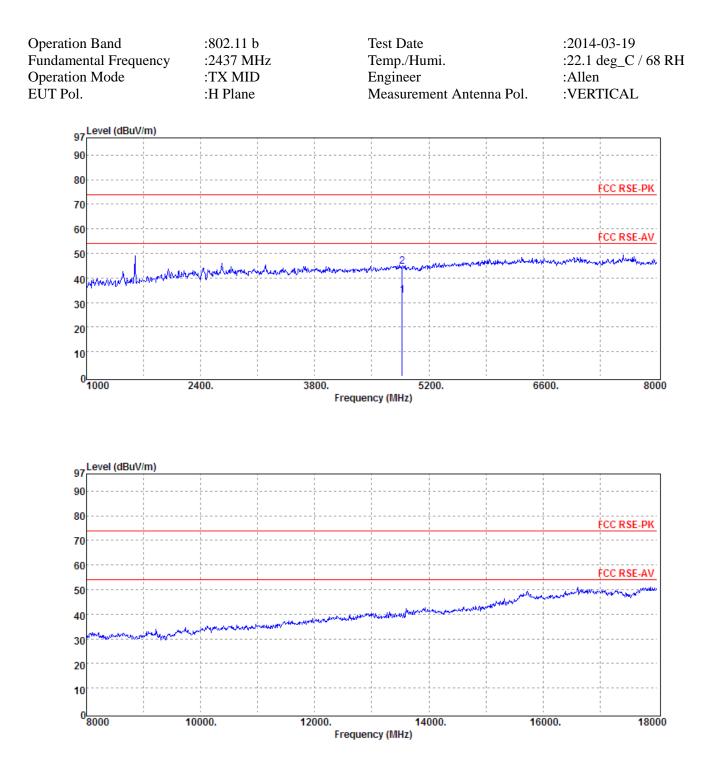
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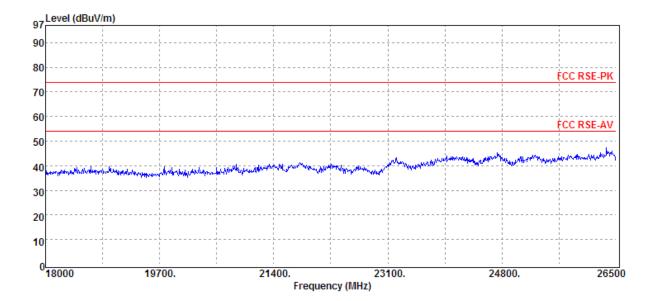
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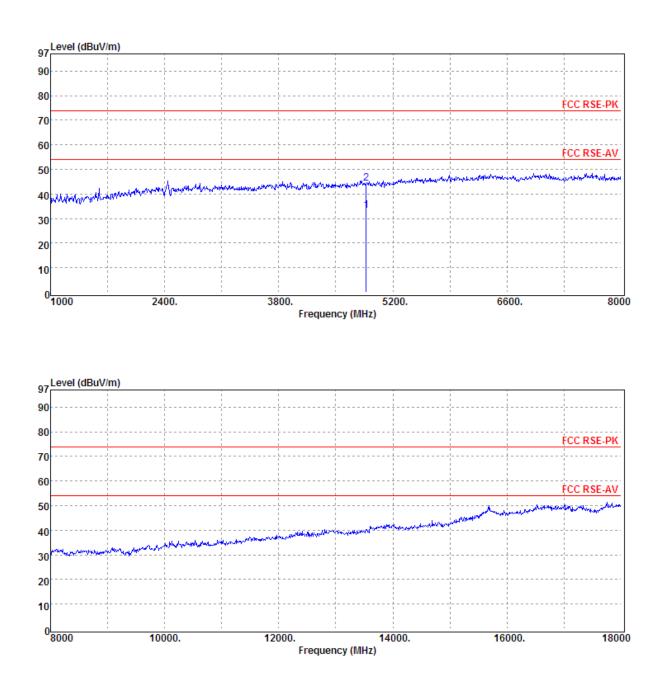
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Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 b :2437 MHz :TX MID :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



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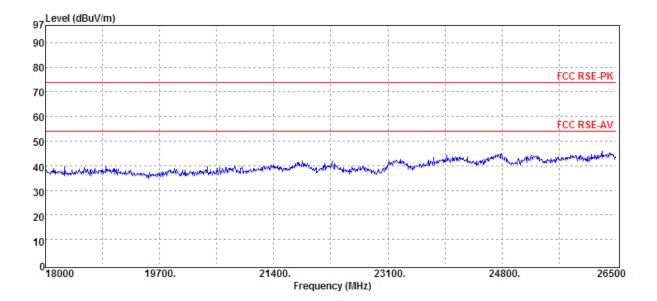
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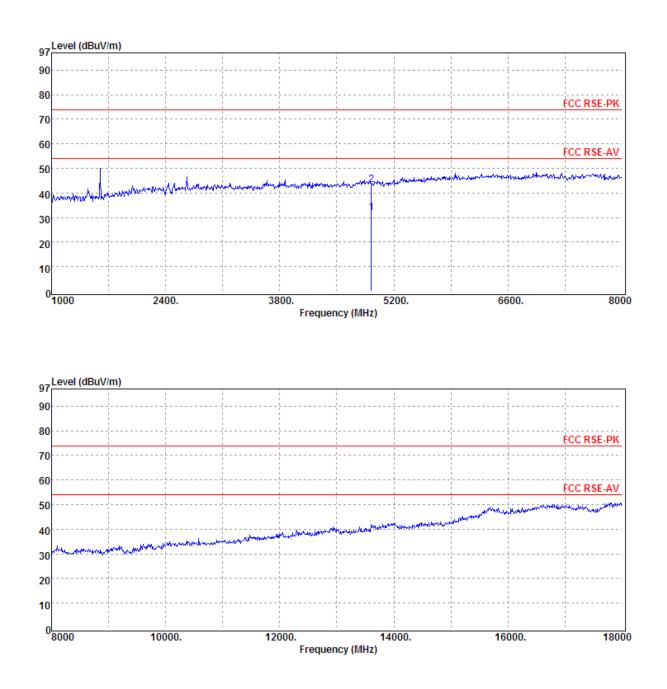
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Operation Band:Fundamental Frequency:Operation Mode:EUT Pol.:

:802.11 b :2462 MHz :TX HIGH :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



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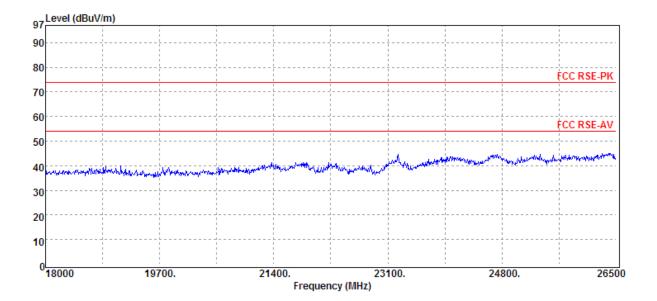
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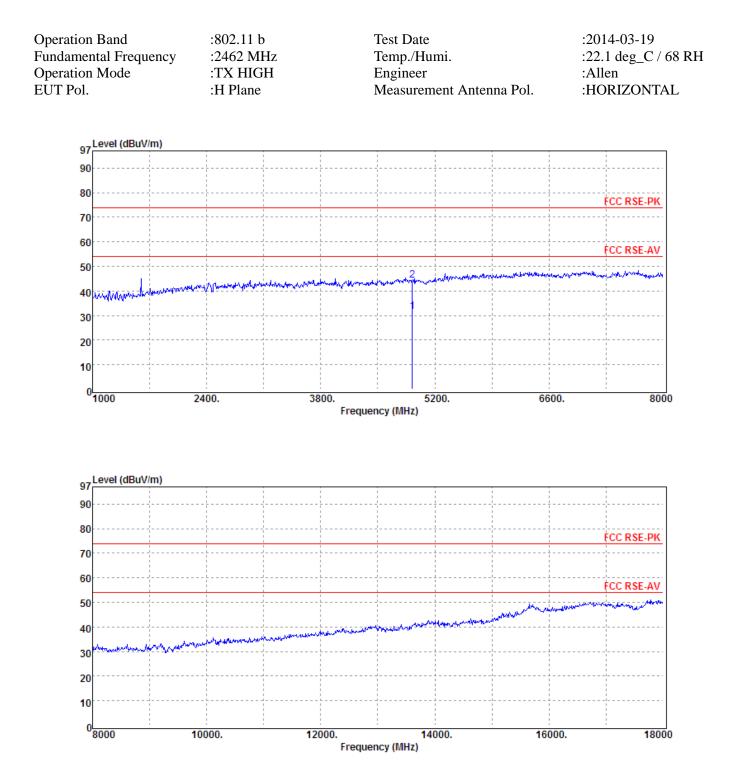
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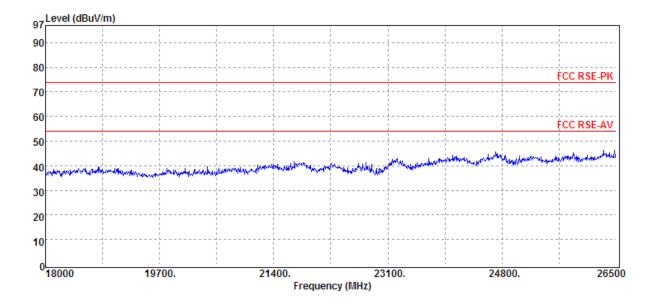
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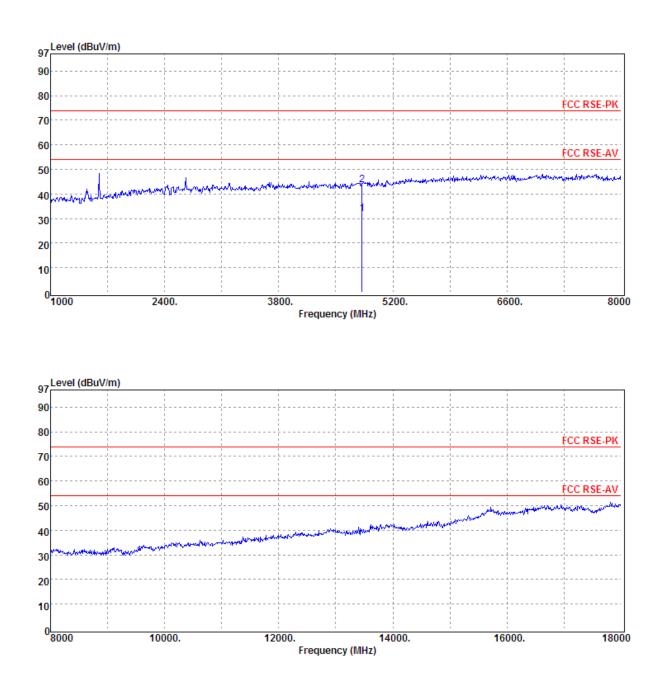
**Report No.: EH/2014/10052** Issue Date: Apr. 11, 2014 Page: 192 of 247

**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 g :2412 MHz :TX LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



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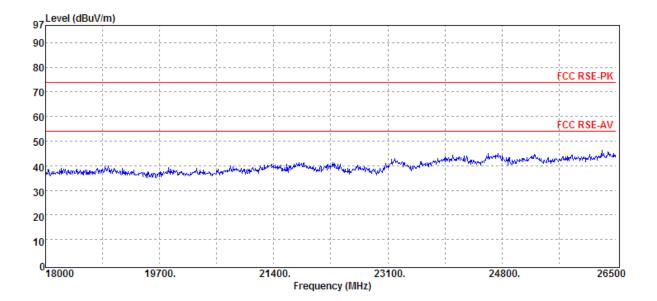
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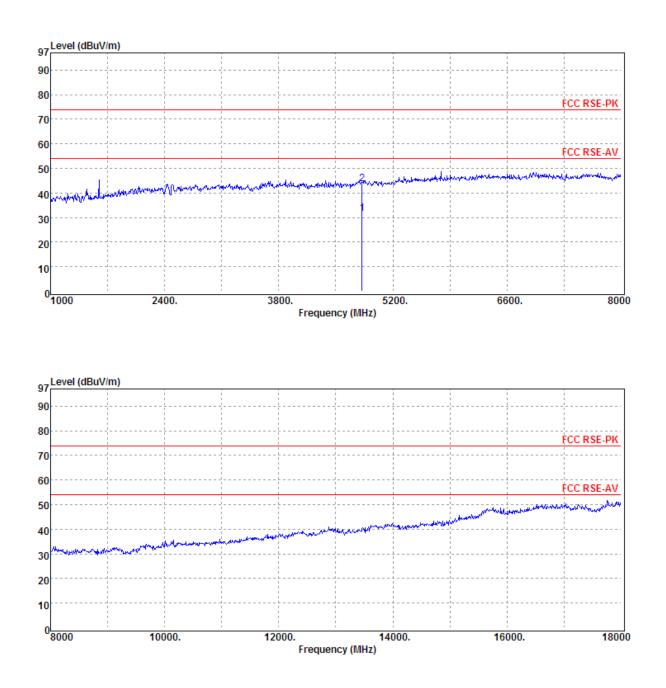
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Operation Band:Fundamental Frequency:Operation Mode:EUT Pol.:

:802.11 g :2412 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



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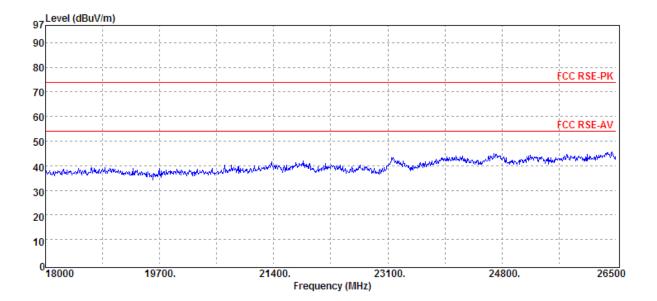
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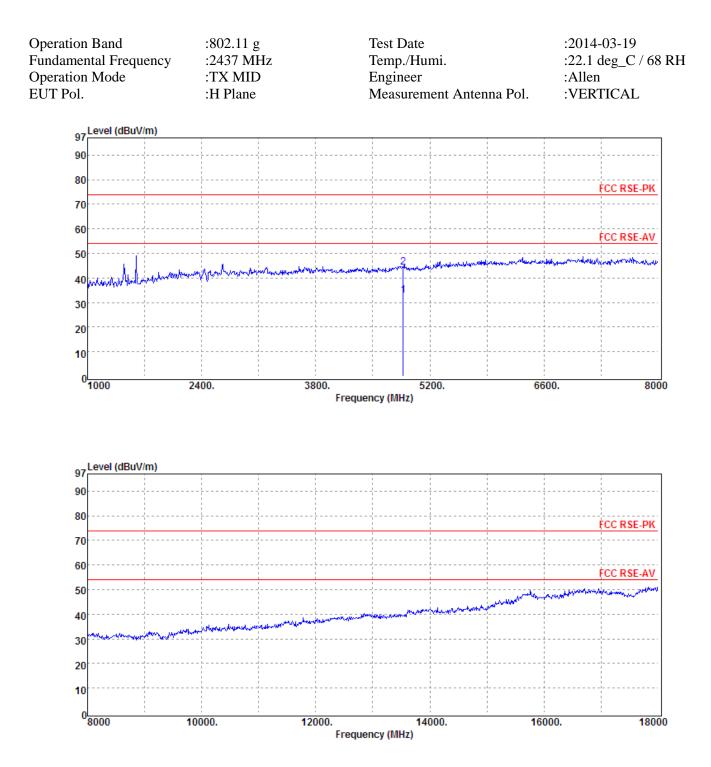
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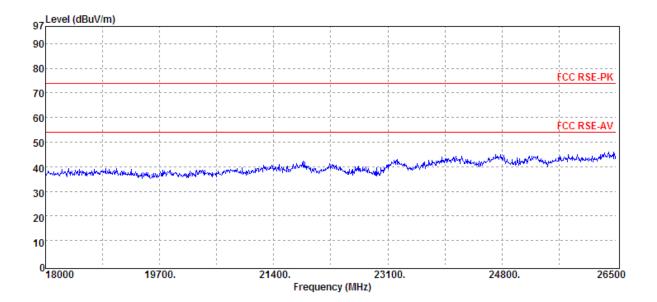
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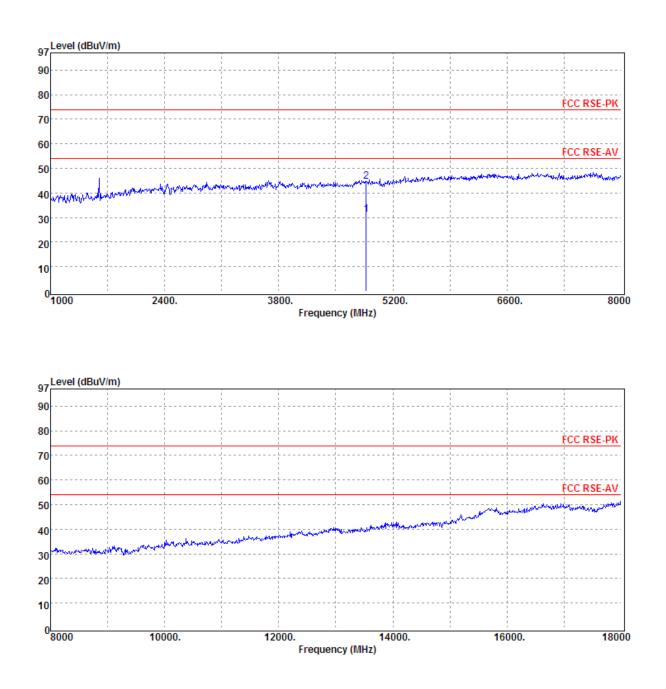
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Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 g :2437 MHz :TX MID :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



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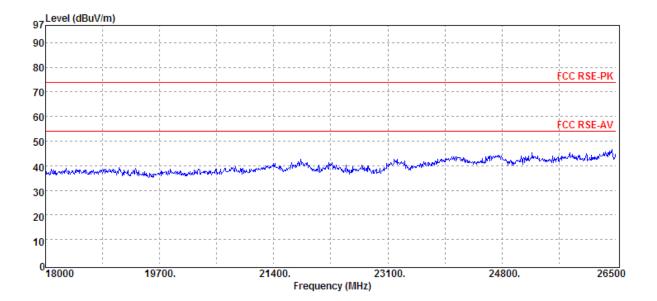
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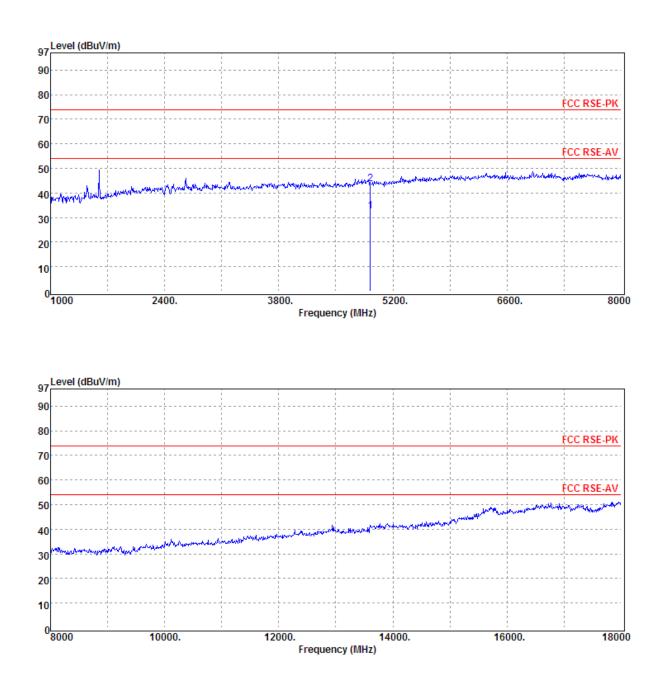
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Operation Band:8Fundamental Frequency:2Operation Mode:3EUT Pol.:1

:802.11 g :2462 MHz :TX HIGH :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



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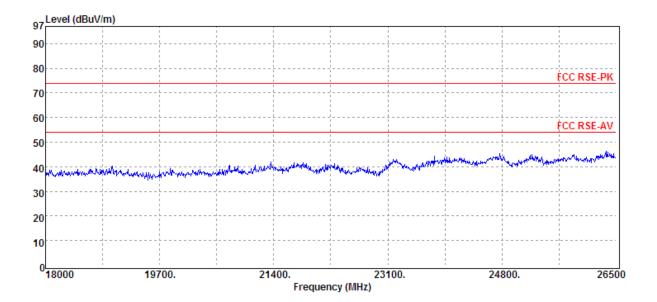
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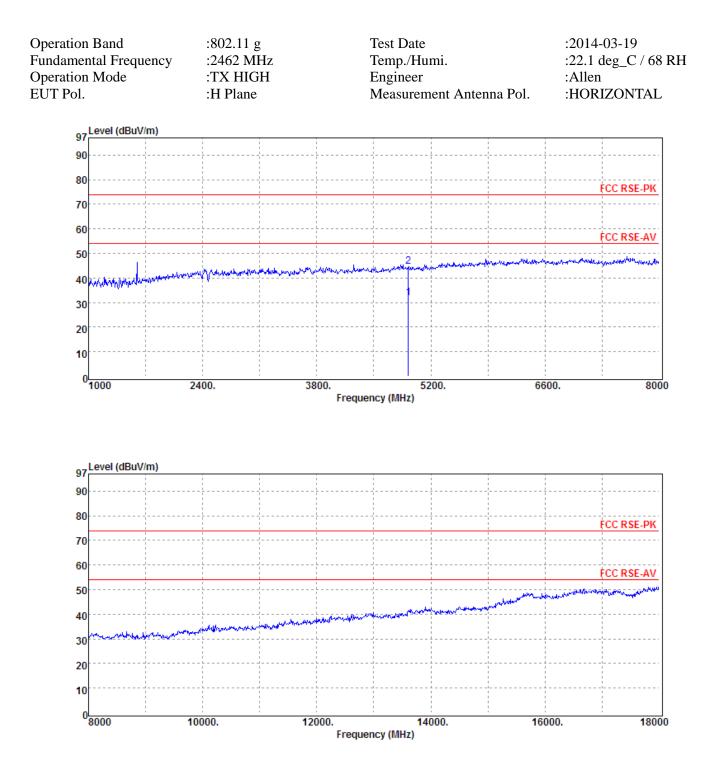
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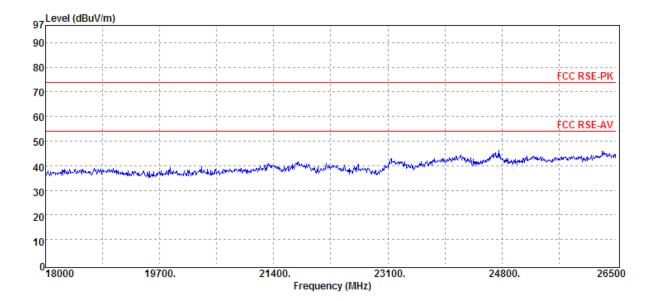
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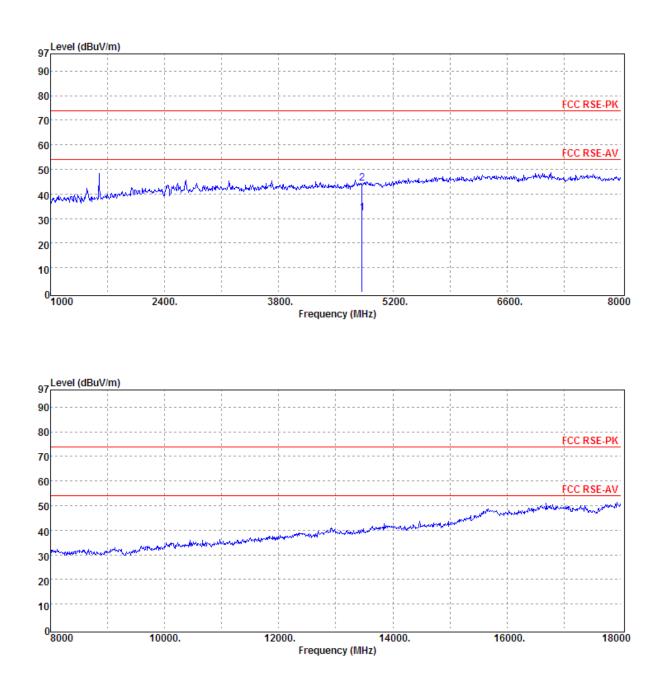
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n20M :2412 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



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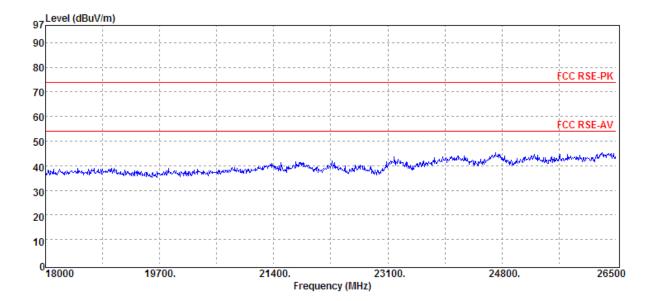
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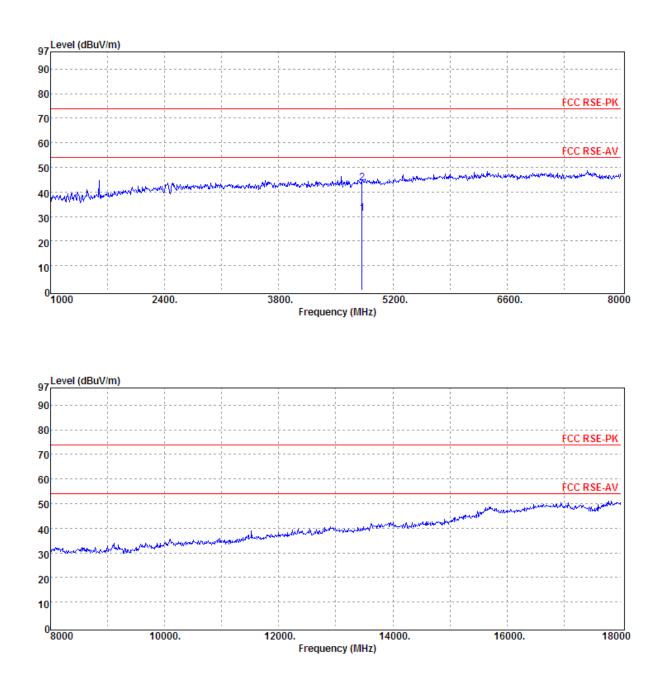
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n20M :2412 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



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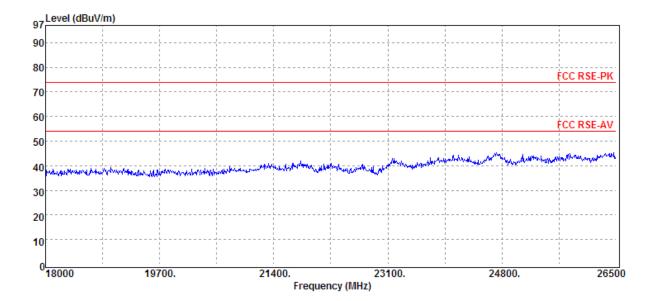
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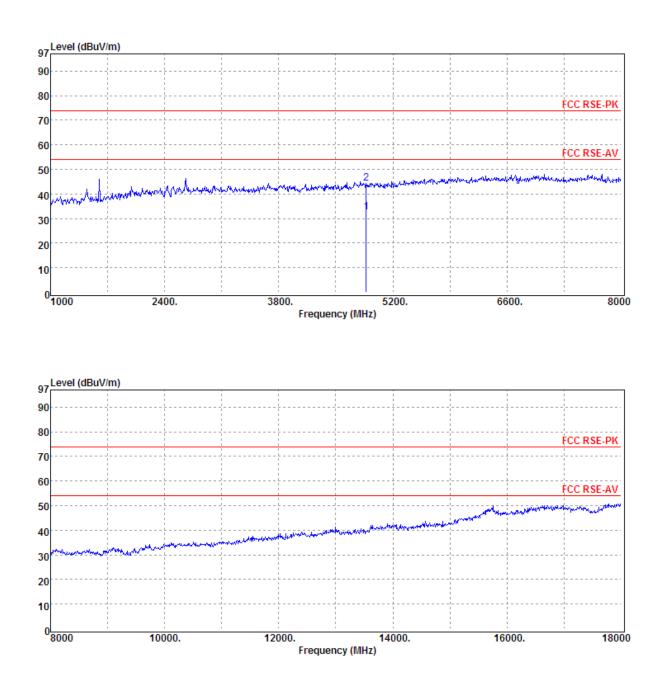
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n20M :2437 MHz :TX MID :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



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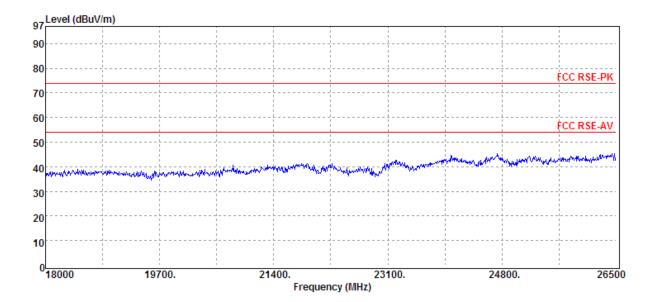
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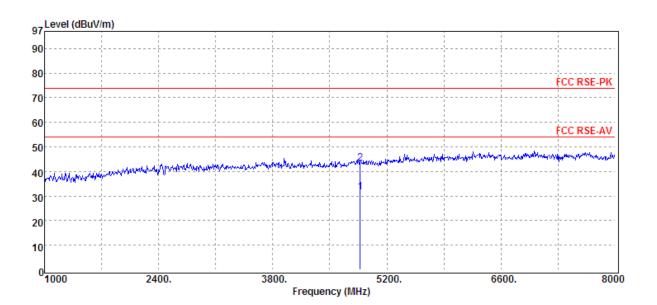
**Report No.: EH/2014/10052** Issue Date: Apr. 11, 2014 Page: 210 of 247

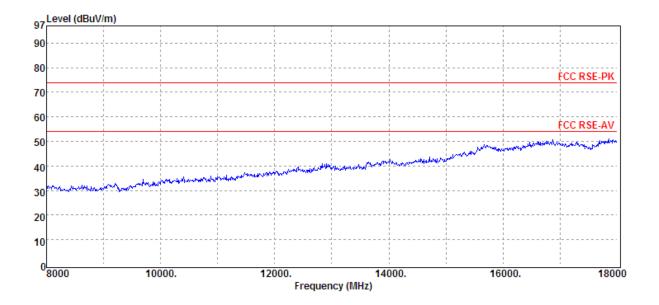
**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 n20M :2437 MHz :TX MID :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL





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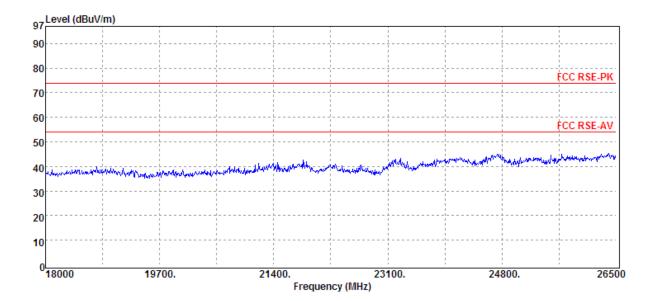
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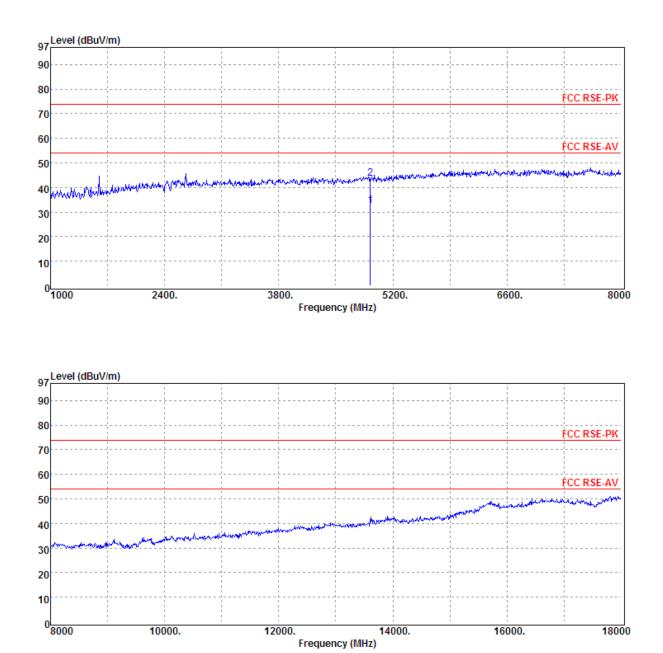
**Report No.: EH/2014/10052** Issue Date: Apr. 11, 2014 Page: 212 of 247

**Operation Band** Fundamental Frequency **Operation Mode** EUT Pol.

:802.11 n20M :2462 MHz :TX HIGH :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



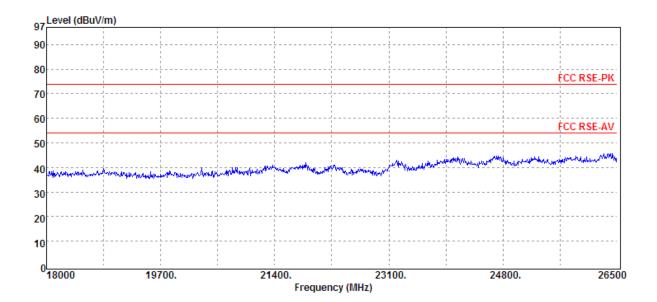
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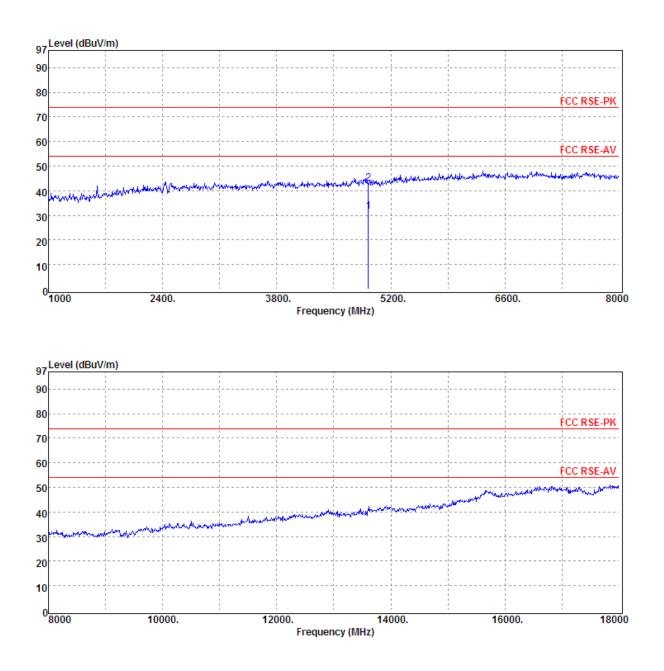
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n20M :2462 MHz :TX HIGH :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



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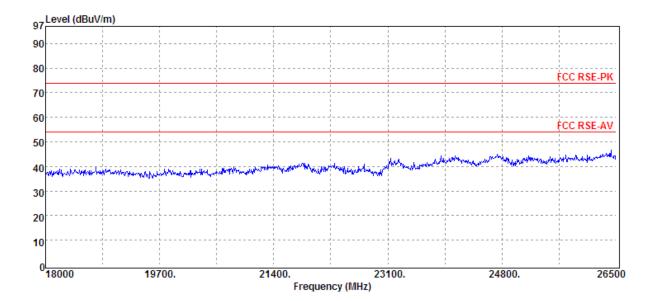
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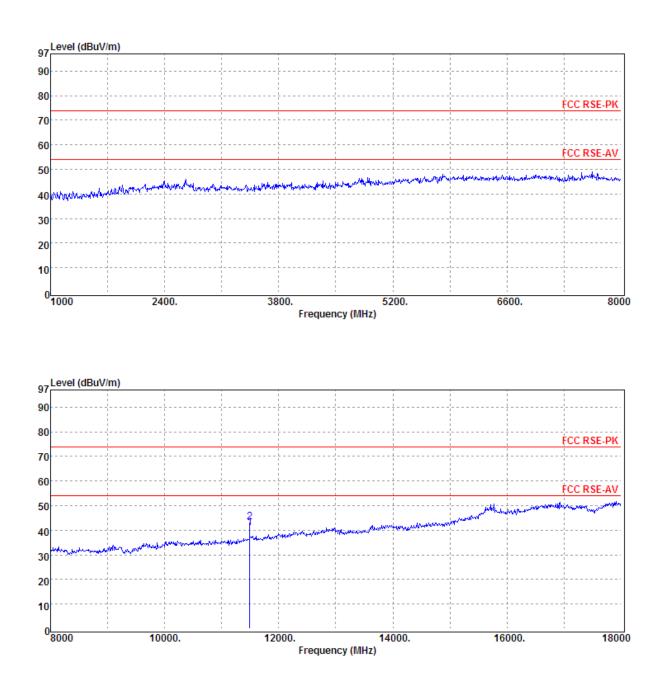


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Operation Band:802.11 aFundamental Frequency:5745 MHzOperation Mode:TX LOWEUT Pol.:H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL

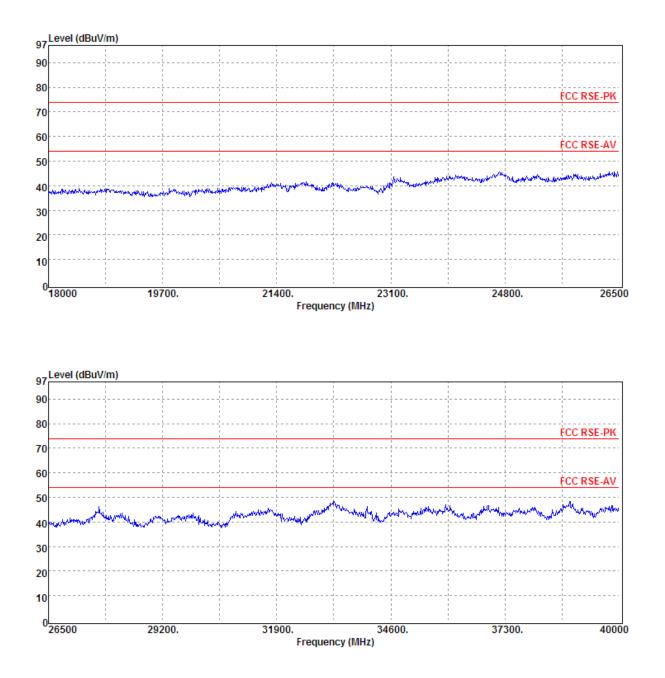


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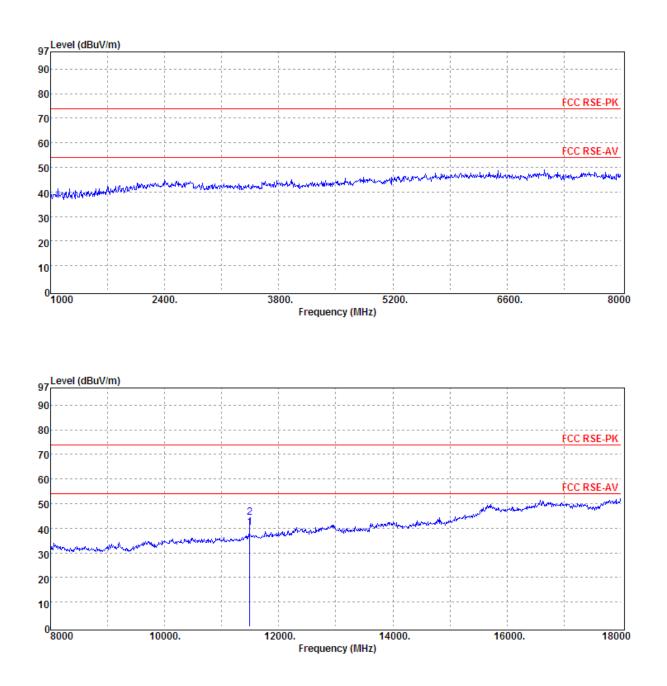
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Operation Band:Fundamental Frequency:Operation Mode:EUT Pol.:

:802.11 a :5745 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



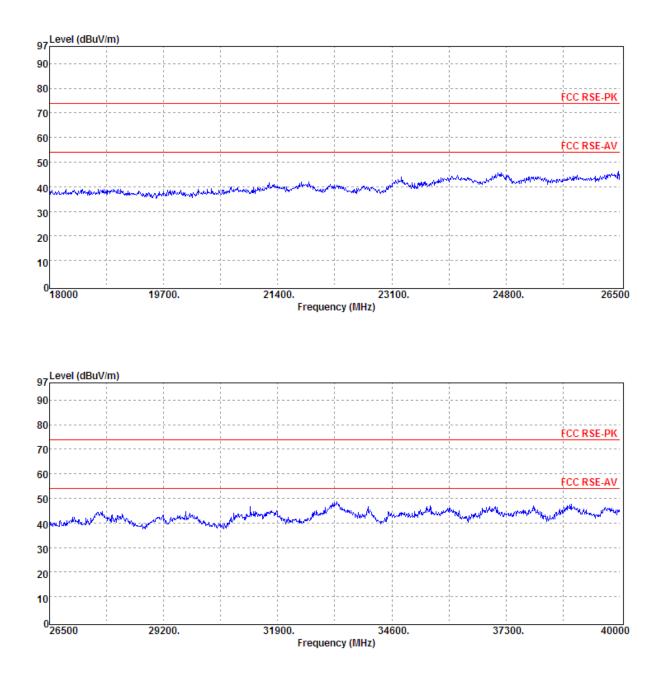
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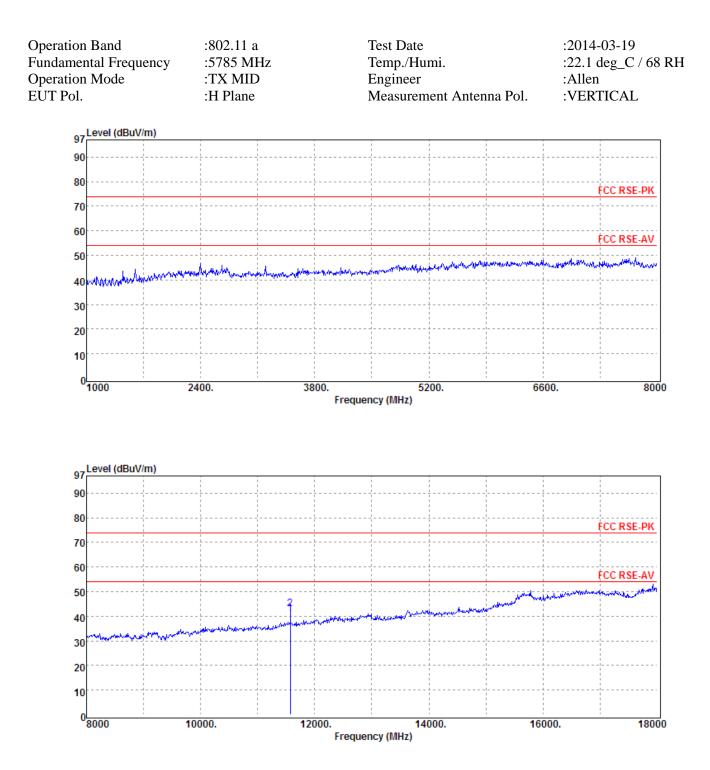
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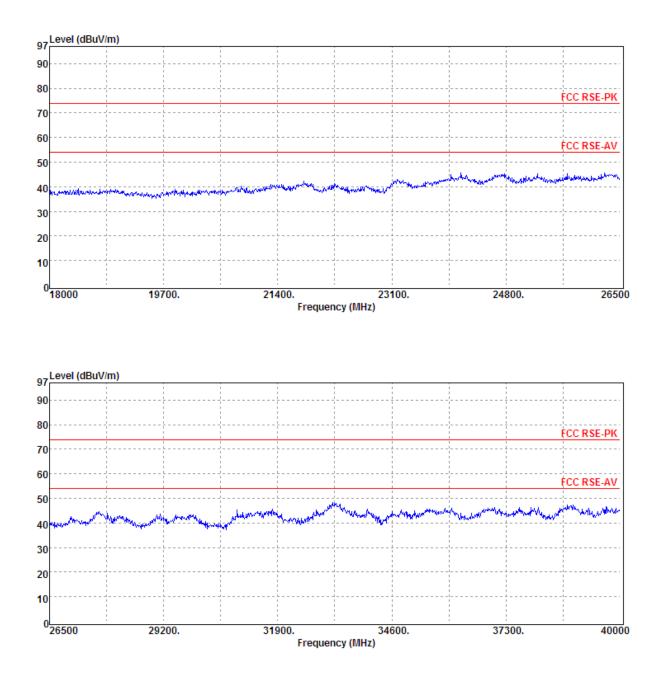
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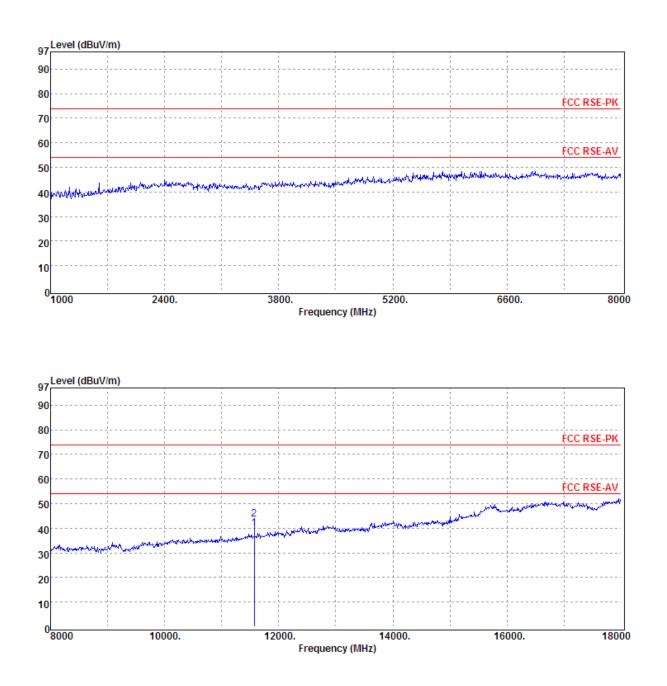
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Operation Band::Fundamental Frequency::Operation Mode:'EUT Pol.:'

:802.11 a :5785 MHz :TX MID :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



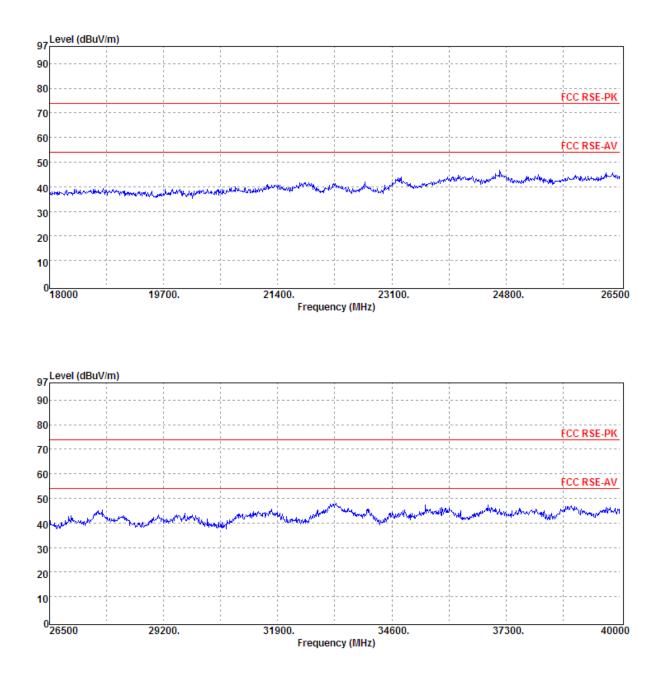
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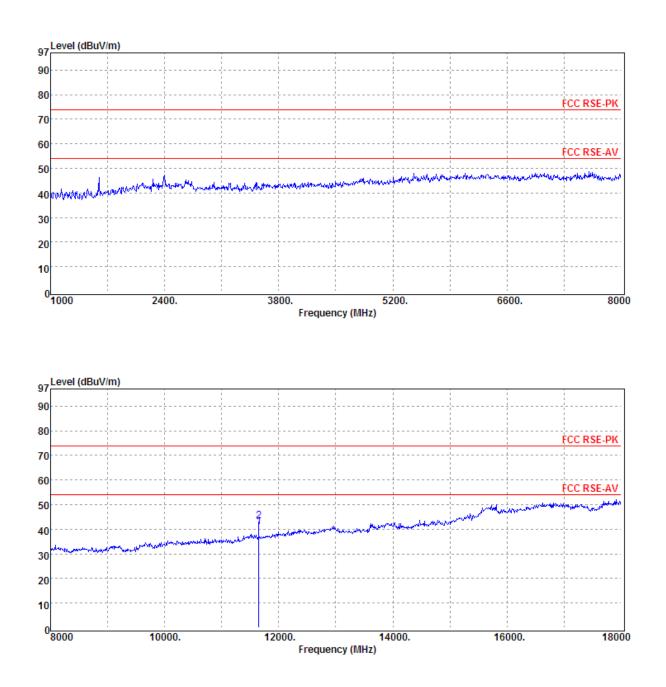
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Operation Band:8Fundamental Frequency:5Operation Mode:7EUT Pol.:H

:802.11 a :5825 MHz :TX HIGH :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL

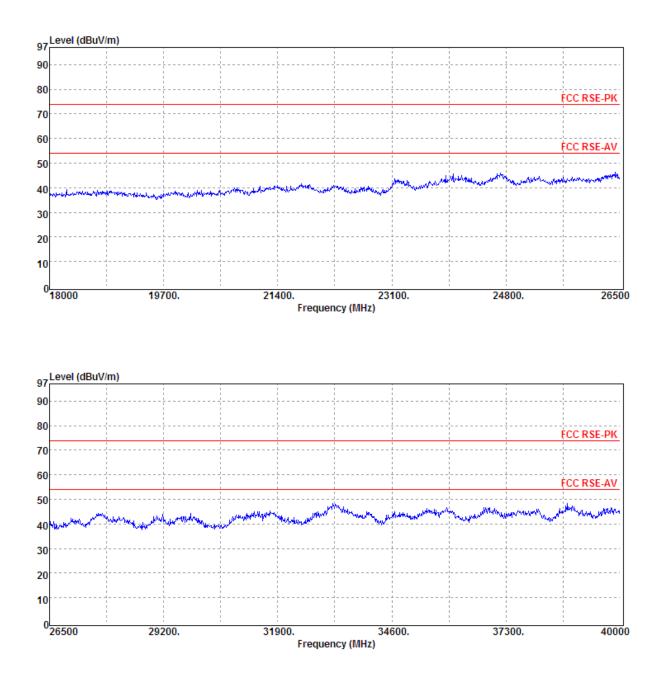


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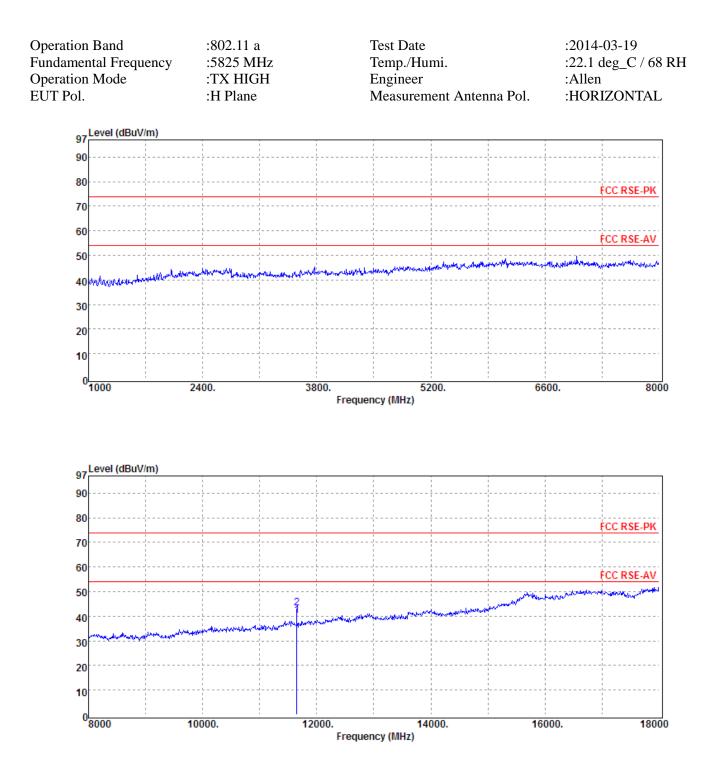
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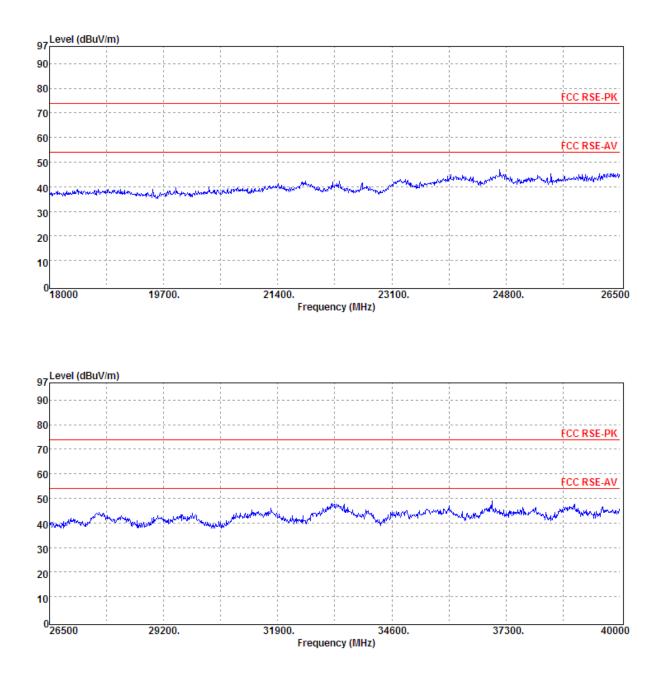


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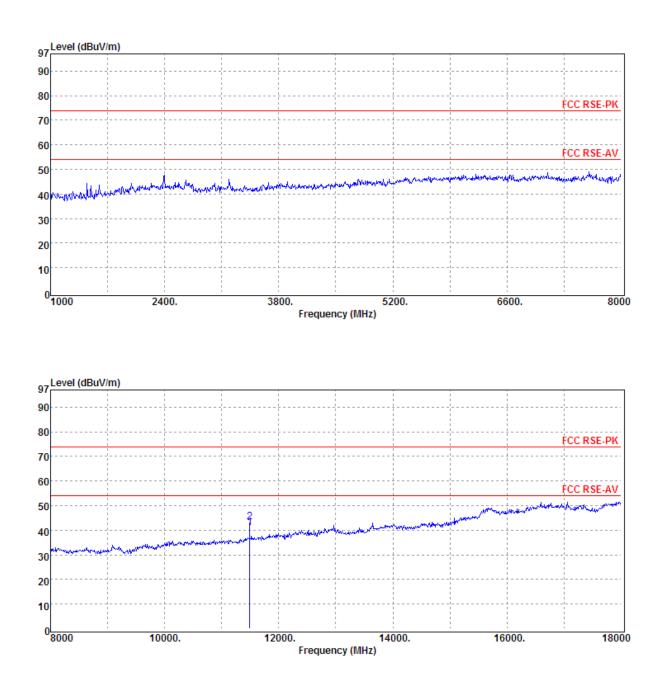
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n20M :5745 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



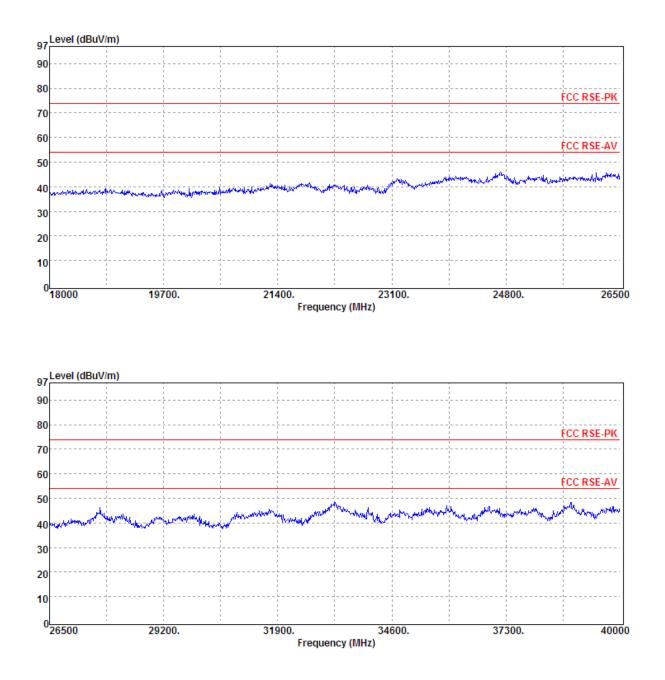
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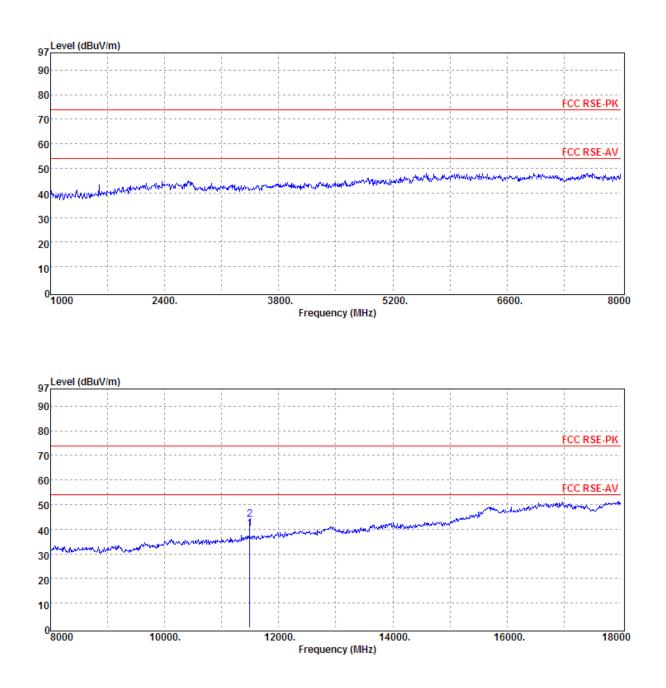
**Report No.: EH/2014/10052** Issue Date: Apr. 11, 2014 Page: 230 of 247

**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 n20M :5745 MHz :TX LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



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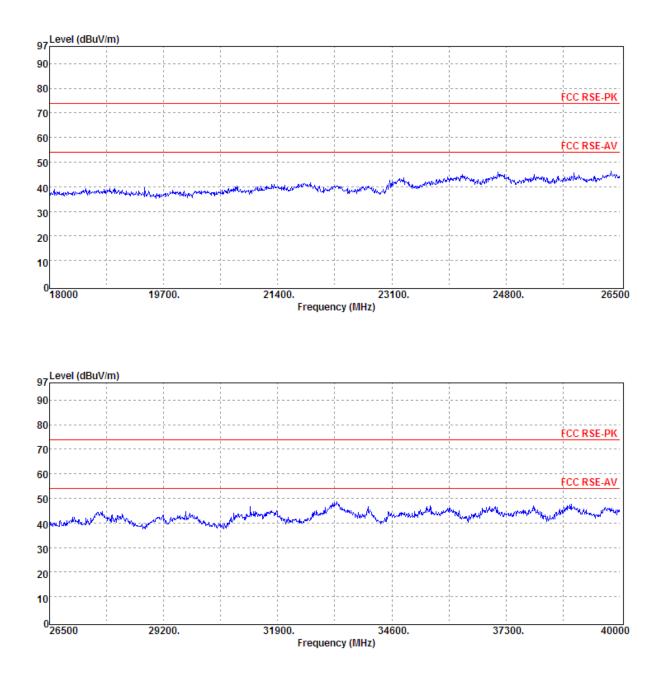
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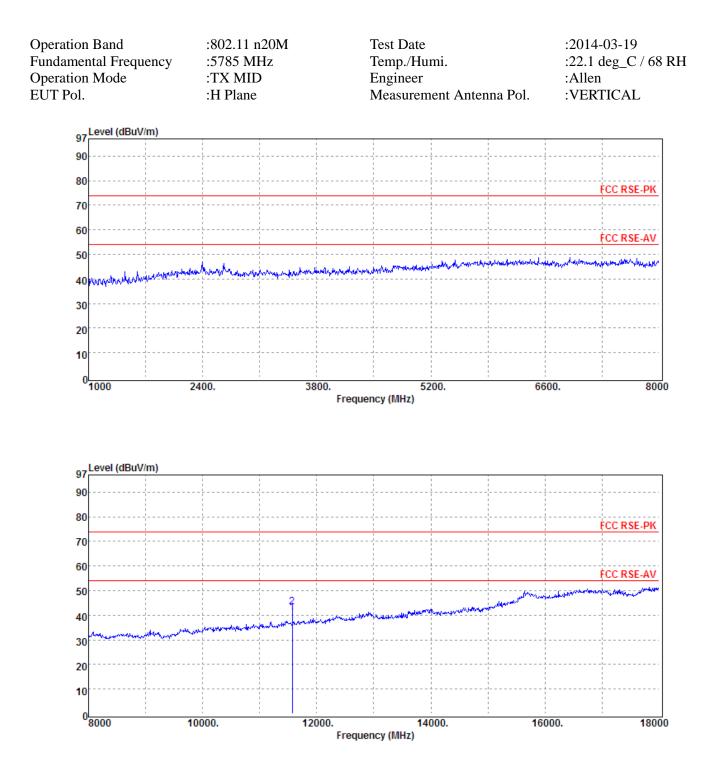
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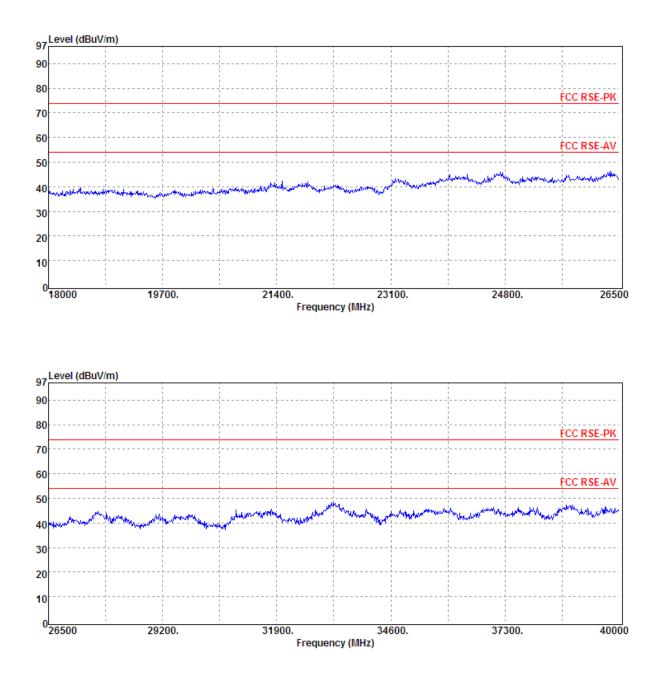
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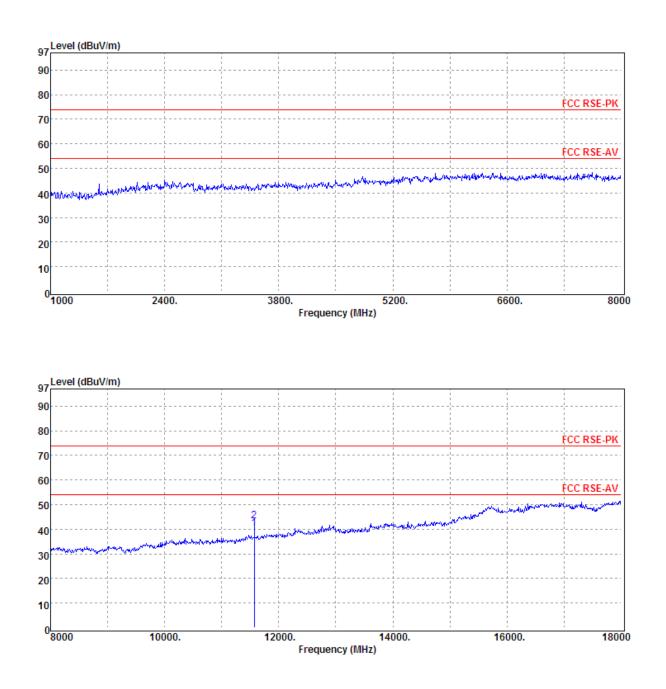
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n20M :5785 MHz :TX MID :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



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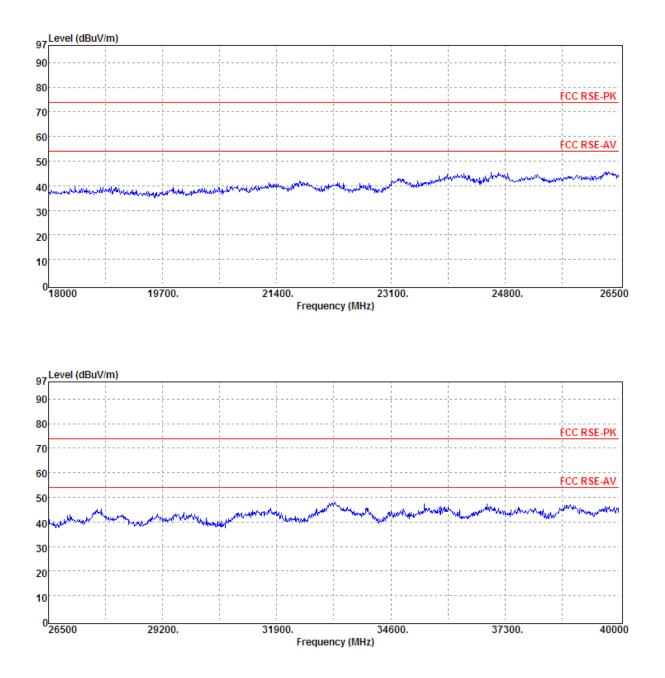
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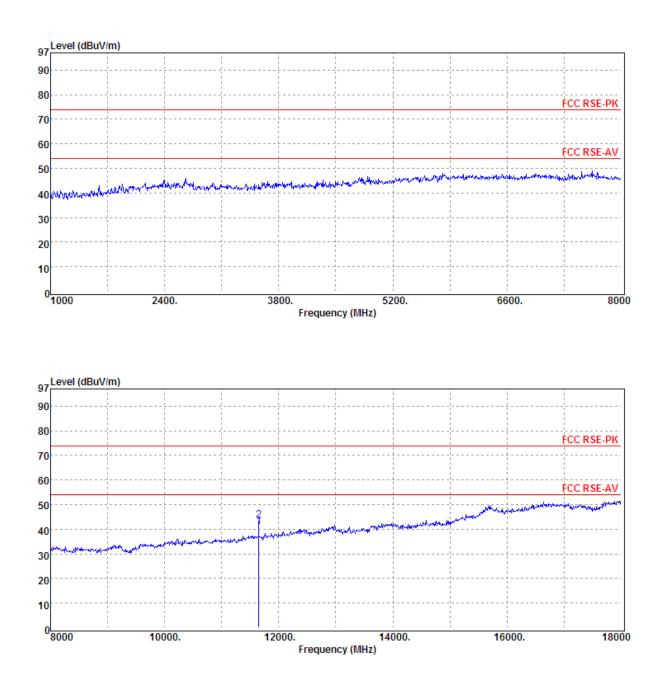
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n20M :5825 MHz :TX HIGH :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



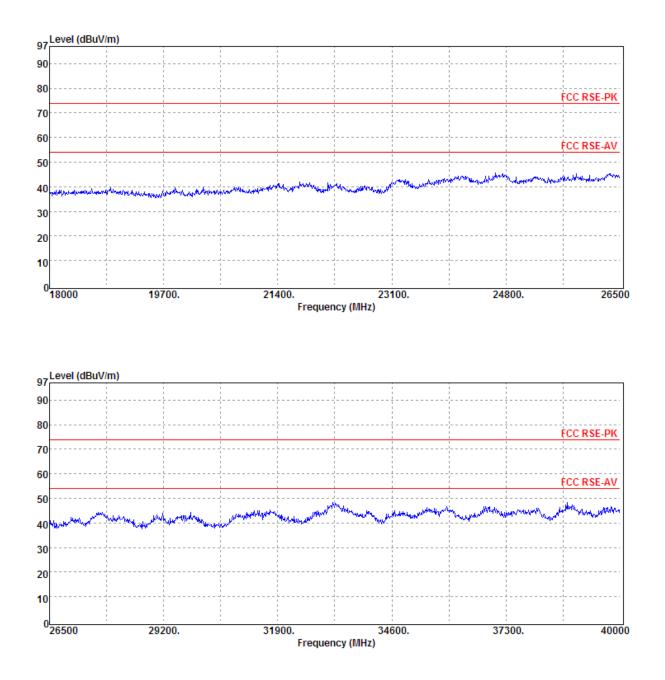
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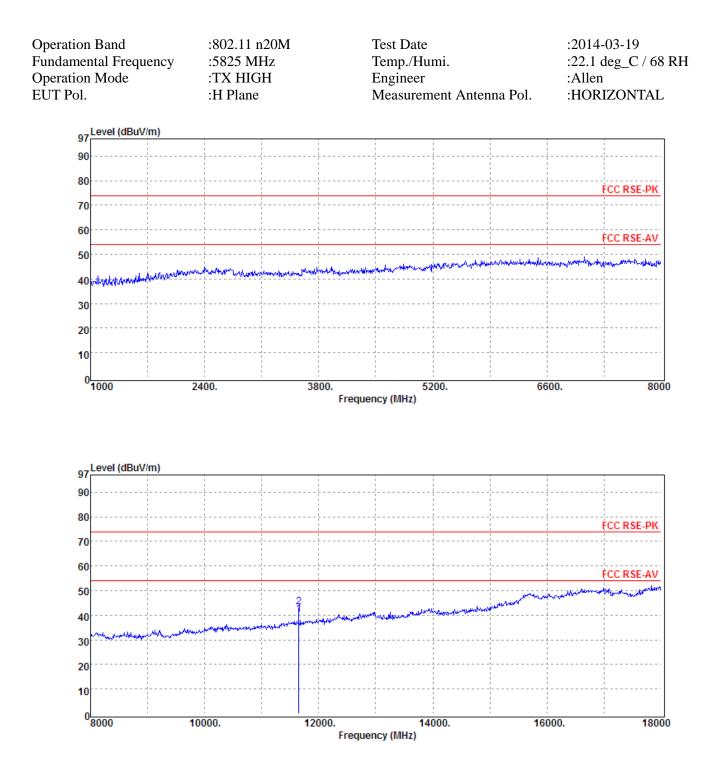
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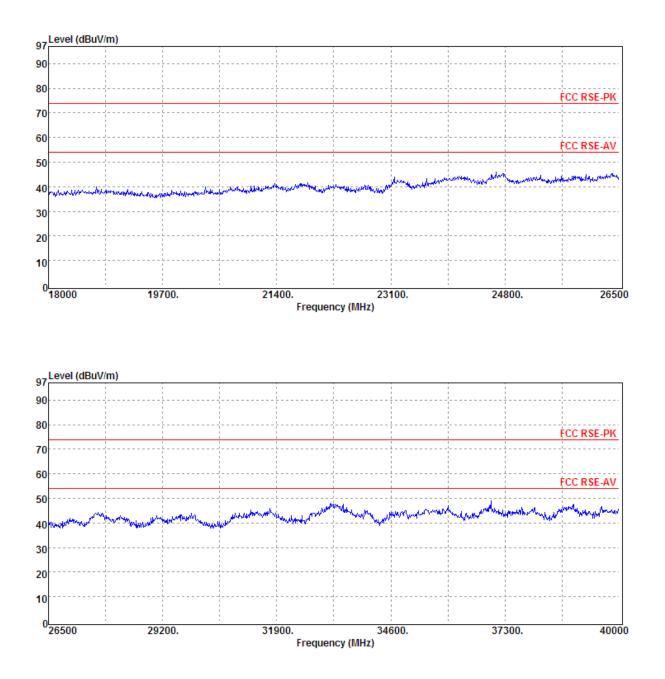
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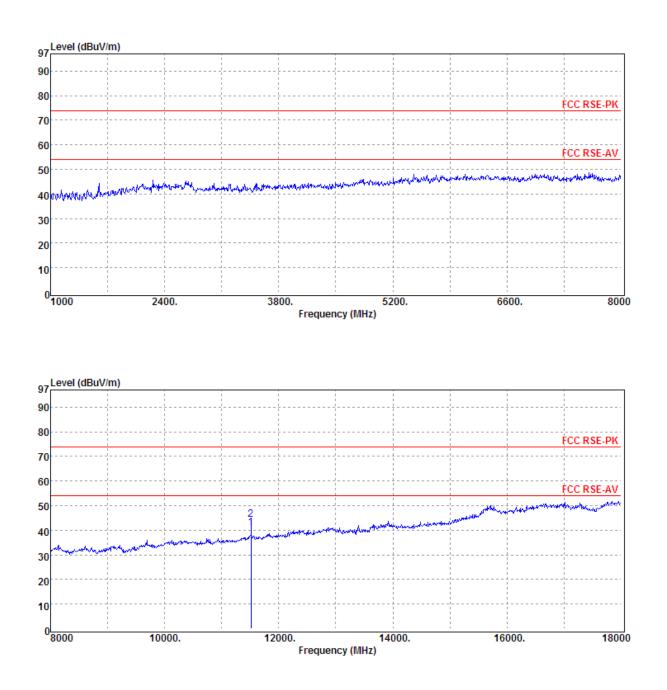
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n40M :5755 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL



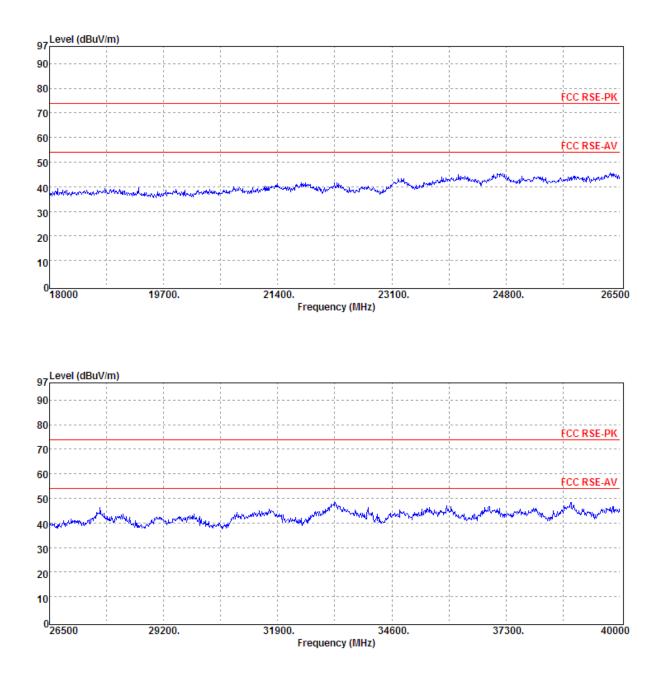
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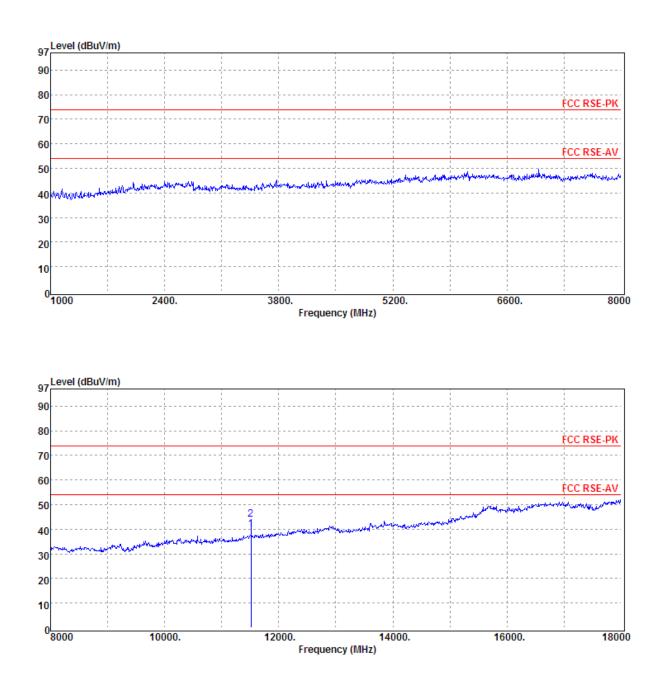
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n40M :5755 MHz :TX LOW :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL



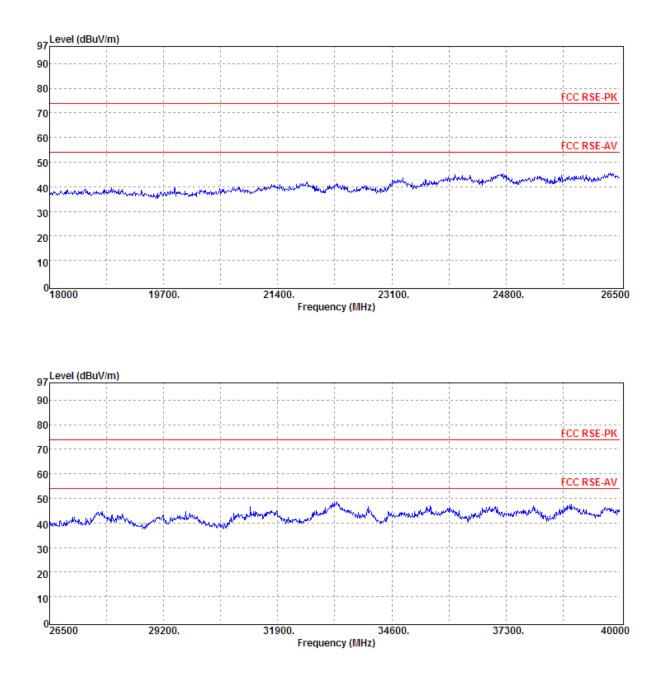
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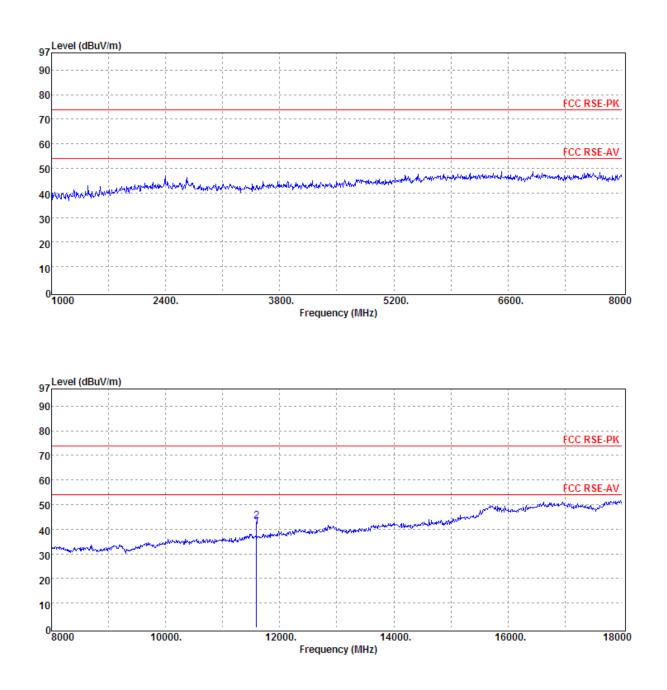
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Operation Band Fundamental Frequency Operation Mode EUT Pol. :802.11 n40M :5795 MHz :TX HIGH :H Plane Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2014-03-19 :22.1 deg\_C / 68 RH :Allen :VERTICAL

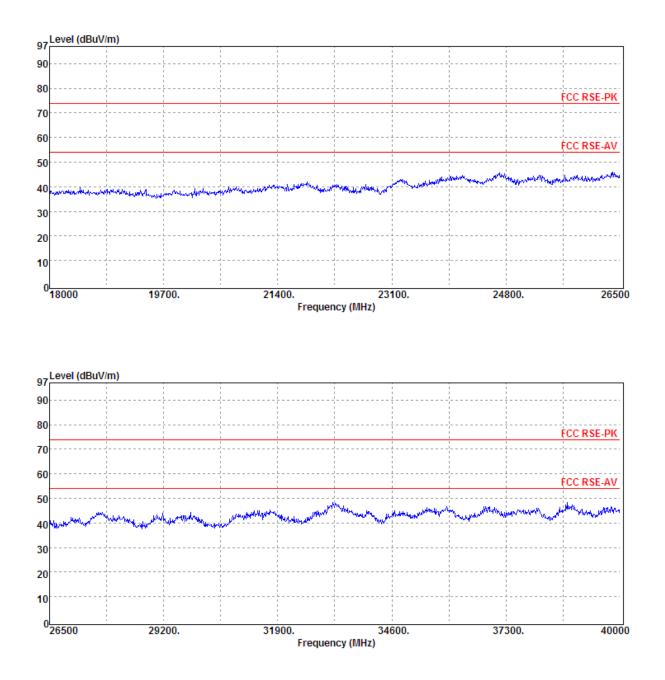


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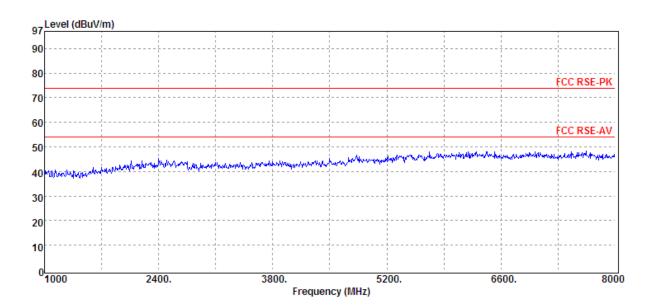
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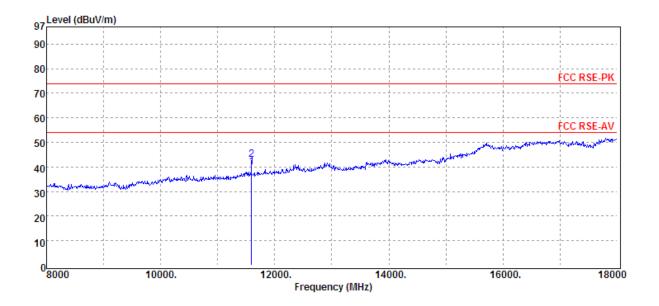
**Operation Band Fundamental Frequency Operation Mode** EUT Pol.

:802.11 n40M :5795 MHz :TX HIGH :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol.

:2014-03-19 :22.1 deg\_C / 68 RH :Allen :HORIZONTAL





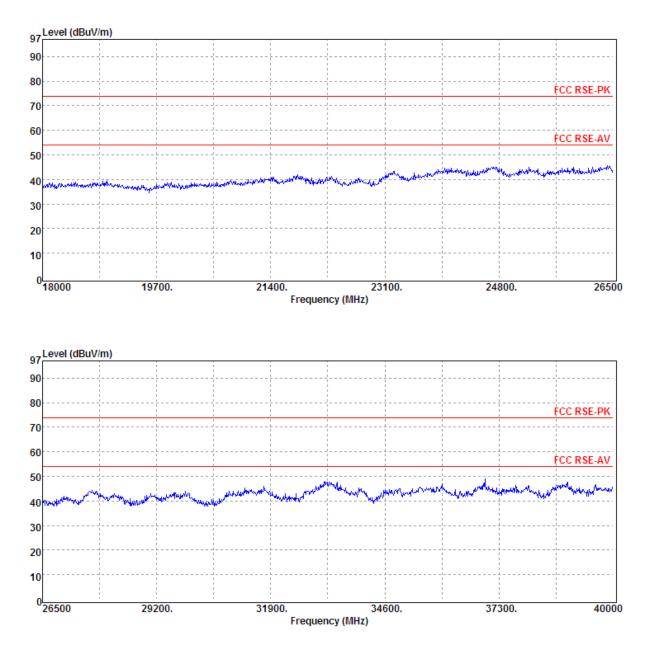
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