

Report No.: ER/2014/B0045 Issue Date: Jan. 19, 2015

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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name: Mobile Phone

Sony **Brand Name:**

PM-0854-BV **Type No.:**

Model Difference: N/A

FCC ID: PY7-PM0854

ER/2014/B0045 **Report No.:**

Issue Date: Jan. 19, 2015

FCC Rule Part: §15.247, Cat: DTS

Sony Mobile Communications AB Prepared for:

Nya Vattentornet 22188 Lund/Sweden

SGS Taiwan Ltd.

Electronics & Communication Laboratory

No.134, Wu Kung Road, New Taipei Industrial Prepared by:

Park, Wuku District, New Taipei City, Taiwan

24803





Test ing Laborators 0513

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VERIFICATION OF COMPLIANCE

Sony Mobile Communications AB **Applicant:**

Nya Vattentornet 22188 Lund/Sweden

Product Name: Mobile Phone

Brand Name: Sony

PM-0854-BV Type No.:

Model Difference: N/A

FCC ID: PY7-PM0854

File Number: ER/2014/B0045

Date of test: Nov. 06, 2014 ~ Nov. 21, 2014

Date of EUT Received: Nov. 06, 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 Iseng	Date	Jan. 19, 2015
_	Marcus Tseng / Engineer		
Prepared By:	Tiffany Kao	Date	Jan. 19, 2015
Approved By:	Tiffany Kao / Clerk Laug Jim Chang / Supervisor	Date	Jan. 19, 2015

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Revision History

Report Number	Revision	Description	Issue Date
ER/2014/B0045	Rev.00	Initial creation of document	Dec. 08, 2014
ER/2014/B0045	Rev.01	Updated HW, SW, and internal photo	Jan. 09, 2015
ER/2014/B0045	Rev.02	Revised Measurement Procedure of Peak Output Power Measurement	Jan. 19, 2015

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GENERAL INFORMATION

Product description

General:

Product Name:	Mobile Phone		
Brand Name:	Sony		
Type No.:	PM-0854-	BV	
Model Difference:	N/A		
Data Cable (USB):		: EC450, Supplier: K-one AI-0700, Length: 100 cm	
Simple Hands-Free (SHF-White):	Model No. Type No.:	: MH410c, Supplier: Foster Electric AG-1100	
Car Charger:	Model No.: AN400, Supplier: Salcomp Type No.: CAA-0003013		
BT PHF:	Model No.: SBH20, Supplier: Sony Type No.: RD-0010 coupling with Simple Hands Free (Model No.: MH755, Supplier: BALDA, Type No.: AG-0503)		
Hardware Version:	A		
Software Version:	25.0.A.0.33		
	3.8Vdc		
Power Supply:	Battery:	Model No.: LIS1574ERPC, Supplier: Sony Type No.: N/A	
	Adapter:	Model No.: EP800, Supplier: Salcomp Type No.: CAA-0002016-US	

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Bluetooth BR+EDR:

Bluetooth Version:	V4.1 dual mode + HS
Channel number:	79 channels
Modulation type:	Frequency Hopping Spread Spectrum
Transmit Power:	5.38dBm
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	<= 0.4s
Antenna Designation:	PIFA Antenna, Gain: 2.52dBi

Bluetooth Low Energy:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V4.1 dual mode + HS
Channel number:	40 channels
Modulation type:	GFSK
Transmit Power:	-1.49dBm (Peak)
Antenna Designation:	PIFA Antenna, Gain: 2.52dBi

WLAN 2.4GHz:

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology	
11b/g	2412-2462	11	b: 18.87dBm g: 22.66dBm	DSSS, OFDM	
11n	HT20 2412-2462	11	HT20: 21.09dBm	OFDM	
11n	HT40 2422-2452	7	HT40: 22.22dBm	OFDM	
Antenna Designation:		PIFA Antenna, Gain: 2.52dBi			
Modulation type:		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM			
Transition Rate:		802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 72.2Mbps 802.11 n_40MHz: 13.5 –135Mbps			

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WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Avg. Power	Modulation Technology	
	5150~5250	4	13.96dBm		
11a	5250~5350	4	13.99dBm	OFDM	
i i a	5470~5725	8	13.96dBm	OFDIVI	
	5725-5850	5	13.79dBm		
	HT20 5150~5250	4	HT20: 12.99dBm		
11	HT20 5250~5350	4	HT20: 12.95dBm	OFDM	
11n	HT20 5470~5725	8	HT20: 12.99dBm	OFDM	
	HT20 5725-5850	5	HT20: 12.79dBm		
	HT40 5150~5250	2	HT40: 11.95dBm		
11n	HT40 5250~5350	2	HT40: 11.93dBm	OFDM	
11n	HT40 5470~5725	3	HT40: 11.96dBm	Ordivi	
	HT40 5725-5850	2	HT40: 11.98dBm		
PIFA Antenna, 5GHz Gain: -0.54dBi (5150MHz-5250MHz) 5GHz Gain: -0.89dBi (5250MHz-5350MHz) 5GHz Gain: -0.34dBi (5470MHz-5725MHz) 5GHz Gain: -0.19dBi (5725MHz-5850MHz)					
Modulation type	64QAM, 16QAM, QPSK, BPSK for OFDM				
Transition 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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GSM / WCDMA/ LTE:

	Operating Frequency	Rated Power	
	GSM/GPRS 850, Class 12	824.2 MHz- 848.8 MHz	33dBm
	EDGE 850, Class 12	824.2 MHz- 848.8 MHz	27dBm
	GSM/GPRS 1900, Class 12	1850.2MHz – 1909.8MHz	30dBm
	EDGE 1900, Class 12	1850.2MHz – 1909.8MHz	26dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band II	1852.4MHz – 1907.6MHz	24dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band IV	1712.4MHz - 1752.6MHz	24dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band V	826.4MHz - 846.6MHz	24dBm
	1.4MHz BW LTE-Band 2	1850MHz- 1909.3MHz	23dBm
	3MHz BW LTE-Band 2	1851.5MHz – 1908.5MHz	23dBm
Cellular Phone	5MHz BW LTE-Band 2	1852.5MHz – 1907.5MHz	23dBm
Standards Frequency	10MHz BW LTE-Band 2	1855MHz – 1905MHz	23dBm
Range and Power	15MHz BW LTE-Band 2	1857.5MHz – 1902.5MHz	23dBm
	20MHz BW LTE-Band 2	1860MHz – 1900MHz	23dBm
	1.4MHz BW LTE-Band 4	1710.7MHz- 1754.3MHz	23dBm
	3MHz BW LTE-Band 4	1711.5MHz – 1753.5MHz	23dBm
	5MHz BW LTE-Band 4	1712.5MHz – 1752.5MHz	23dBm
	10MHz BW LTE-Band 4	1715MHz – 1750MHz	23dBm
	15MHz BW LTE-Band 4	1717.5MHz – 1747.5MHz	23dBm
	20MHz BW LTE-Band 4	1720MHz – 1745MHz	23dBm
	5MHz BW LTE-Band 5	2502.5MHz – 2567.5MHz	23dBm
	10MHz BW LTE-Band 5	2505.0MHz – 2565.0MHz	23dBm
	15MHz BW LTE-Band 5	2507.5MHz – 2562.5MHz	23dBm
	20MHz BW LTE-Band 5	2510.0MHz – 2560MHz	23dBm

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	Operating Frequency	Rated Power	
Cellular Phone Standards Frequency	5MHz BW LTE-Band 7	2502.5MHz – 2567.5MHz	23dBm
	10MHz BW LTE-Band 7	2505.0MHz – 2565.0MHz	23dBm
Range and Power	15MHz BW LTE-Band 7	2507.5MHz – 2562.5MHz	23dBm
	20MHz BW LTE-Band 7	2510.0MHz – 2560MHz	23dBm
Type of Emission:	GSM 850: 252KGXW, GSM 19 GPRS 850: 248KGXW, GPRS EDGE 850: 259KG7W, EDGE WCDMA Band II: 4M21F9W, WCDMA Band V: 4M21F9W HSDPA Band II: 4M21F9W, HSDPA Band V: 4M21F9W HSUPA Band II: 4M21F9W, HSUPA Band V: 4M22F9W 1.4MHz BW LTE-Band 2 QPSK 1.4MHz BW LTE-Band 2 16QA 3MHz BW LTE-Band 2 16QA 5MHz BW LTE-Band 2 16QA 5MHz BW LTE-Band 2 QPSK 5MHz BW LTE-Band 2 QPSK 10MHz BW LTE-Band 2 QPSK 15MHz BW LTE-Band 2 QPSK 15MHz BW LTE-Band 2 QPSK 15MHz BW LTE-Band 2 QPSK 20MHz BW LTE-Band 2 QPSK 3MHz BW LTE-Band 2 QPSK 15MHz BW LTE-Band 2 QPSK 15MHz BW LTE-Band 2 QPSK 3MHz BW LTE-Band 4 QPSK 3MHz BW LTE-Band 4 QPSK 3MHz BW LTE-Band 4 QPSK 5MHz BW LTE-Band 4 QPSK 10MHz BW LTE-Band 4 QPSK 10MHz BW LTE-Band 4 QPSK 15MHz BW LTE-Band 4 QPSK	1900: 253KGXW 1900: 253KG7W WCDMA Band IV: 4M22F9W, SDPA Band IV: 4M21F9W, SUPA Band IV: 4M22F9W, SUPA Band IV: 4M21F9W, SUPA Band IV: 4M22F9W, SUPA Band IV: 4M21F9W, SUPA Band IV: 4M22F9W, SUPA Band IV: 4M2EFBW, SUPA Band IV: 4M2EFBW, SUPA Band IV: 4M2EFBW, SUPA Band IV: 4M2EFBW, SUP	

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The EUT is in compliance with FCC \$15.247 at which the frequency band of 2400~2483.5.

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IEEE 802.11n Spec:

MCS					NG	n n c	NID.	nna		Datarat	e(Mbps)	
Index	Nss	Modulation	R	NBPSC	NCE	BPS	NDBPS		800nsGI		400nsGI	
-					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz	20MHz 40	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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Related Submittal(s) / Grant (s) 1.2

This submittal(s) (test report) is intended for FCC ID: PY7-PM0854 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.

Test Methodology 1.3

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 Jun 2014 KDB558074 V03r02 for compliance to FCC 47CFR 15.247 requirements.

Test Facility 1.4

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, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2009 & ANSI C63.10:2009. FCC Registration Numbers are: 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.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 455997.

1.5 **Special Accessories**

There are no special accessories used while test was conducted.

Equipment Modifications 1.6

There was no modification incorporated into the EUT.

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SYSTEM TEST CONFIGURATION

2.1 **EUT Configuration**

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

2.2 **EUT Exercise**

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

2.3 **Test Procedure**

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. 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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Configuration of Tested System

Fig. 2-1 Radiated Emission



Fig. 2-2 Conducted (Antenna Port) Configuration

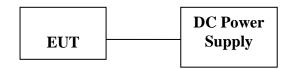


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	DC Power Supply	HP	E3640A	KR93300208	N/A	N/A

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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	N/A	N/A	N/A	N/A	N/A

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SUMMARY OF TEST RESULTS

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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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 n HT40 mode: Channel low (2422MHz), mid (2437MHz) and high (2452MHz) with 13.5Mbps 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 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 802.11b/g/n WLAN Transmitter for channel Low, Mid and High, the worst case E1 position was reported.

Type no, PM-0854-BV, and Type no PM-0850-BV share the equivalently identical enclosure, material of coating, I/O function, PCB board, display, and power source. In addition, PM-0854-BV, and Type no PM-0850-BV implement the same Bluetooth/WLAN chipset/module with the same antenna that operates with the same transmitted power level. Hence, this given test report contains the identical test results that inherent from PM-0850-BV.

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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					
Magazinemant vingantaintiv	180MHz -417MHz: +/- 3.19dB					
Measurement uncertainty (Polarization : Vertical)	0.417GHz-1GHz: +/- 3.19dB					
(1 olditzation : Vertical)	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					
	10HZ - 18GHZ. +/- 4.08dB					

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

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CONDUCTED EMISSION TEST

6.1 Standard Applicable:

According to §15.207, frequency range within 150kHz 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

6.2 **Measurement Equipment Used:**

Conducted Emission Test Site									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
EMI Test Receiver	R&S	ESCI7	100760	05/26/2014	05/25/2015				
LISN	Rolf-Heine	NNB-2/16Z	99012	03/26/2014	03/25/2015				
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/19/2014	03/18/2015				
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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^{1.} The lower limit shall apply at the transition frequencies

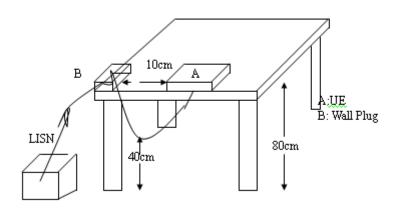
^{2.} The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.



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6.4 Test SET-UP (Block Diagram of Configuration)



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

Measurement Result:

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

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

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AC POWER LINE CONDUCTED EMISSION TEST DATA

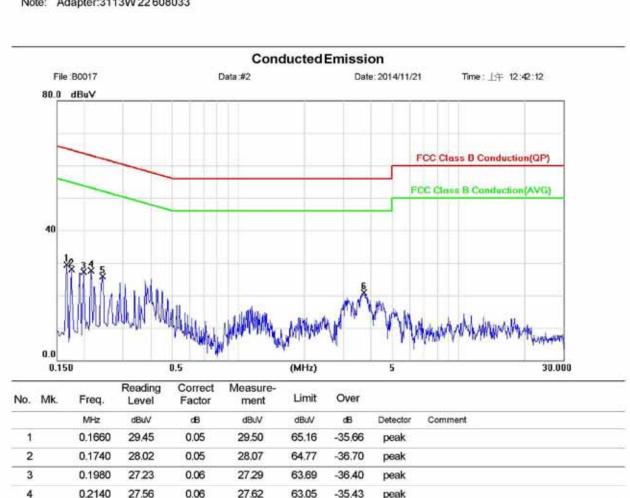
Operation Mode:	Operation mode			Test Date:	Nov. 21, 2014
Temperature:	26	Humidity:	60 %	Test By:	Tin
Model No.:	EP800	•	•		

Site ConductionRoom Temperature: Phase: L1 AC 120V/60Hz Humidity: 66% Power:

Limit: FCC Class B Conduction(QP)

Mode: Operation

Note: Adapter:3113W 22 608033



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dВ	dBuV	dBulV	dΒ	Detector	Comment	
1	0.1660	29.45	0.05	29.50	65.16	-35.66	peak		
2	0.1740	28.02	0.05	28.07	64.77	-36.70	peak		
3	0.1980	27.23	0.06	27.29	63.69	-36.40	peak		
4	0.2140	27.56	0.06	27.62	63.05	-35,43	peak		
5	0.2420	25.82	0.06	25.88	62.03	-36.15	peak		
6 *	3.7260	20.68	0.17	20.85	56.00	-35.15	peak		

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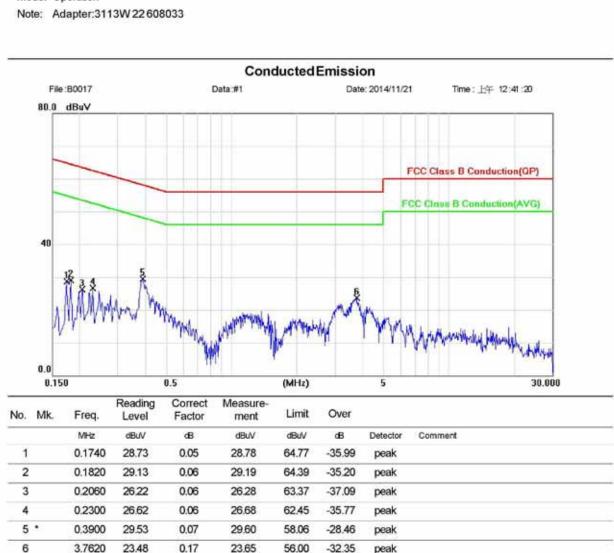


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Site ConductionRoom Phase: Temperature: 24 T N Limit: FCC Class B Conduction(QP) AC 120V/60Hz Humidity: Power:

Mode: Operation



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peak



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PEAK OUTPUT POWER MEASUREMENT

Standard Applicable:

According to §15.247 (b)

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz 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.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is 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 transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

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Measurement Equipment Used:

Conducted Emission Test Site										
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.					
TYPE		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	05/19/2014	05/18/2015					
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/08/2014	03/07/2015					
DC Block	Mini-Circuits	BLK-18-S+	1	02/27/2014	02/26/2015					
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/03/2014	01/02/2015					
Attenuator	Mini-Circuit	BW-S10W2+	002	02/27/2014	02/26/2015					
Splitter	Agilent	11636B	N/A	02/27/2014	02/26/2015					

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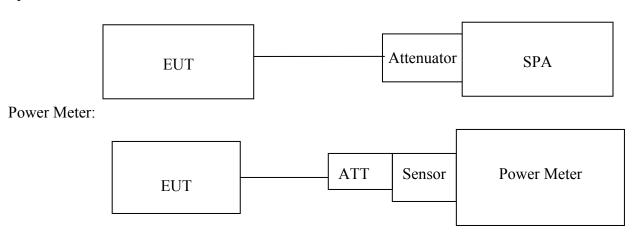


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7.3 **Test Set-up:**

Spectrum:



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).

(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.

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Pre-analysis Check: While conducting average power measurement, duty cycle of each mode (b/g/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 = 99%, g = 99%, $n_ht_20 = 99\%$, and $n_ht_40 = 99\%$ where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

 $Duty\ Cycle = Ton/(Ton+Toff)$

Test Procedure:

Set span = 0, RBW = 8MHz, VBW = 8MHz, Detector = PeakDuty Cycle:

	Duty Cycle	Duty Fator (dB)
802.11b	1	0.04
802.11g	1	0.04
802.11n_20	1	0.04
802.11n_40	1	0.04

Duty Cycle Factor: $10 * \log (1/0.99) = 0.04$

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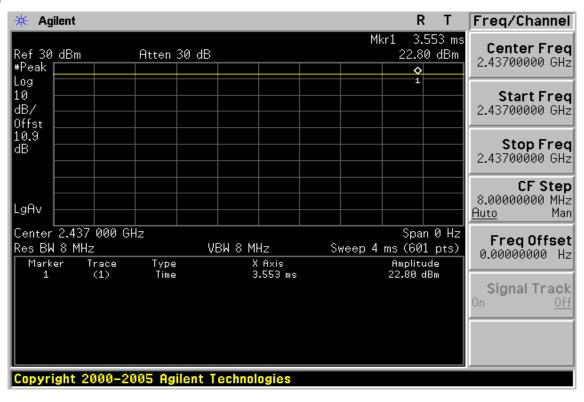


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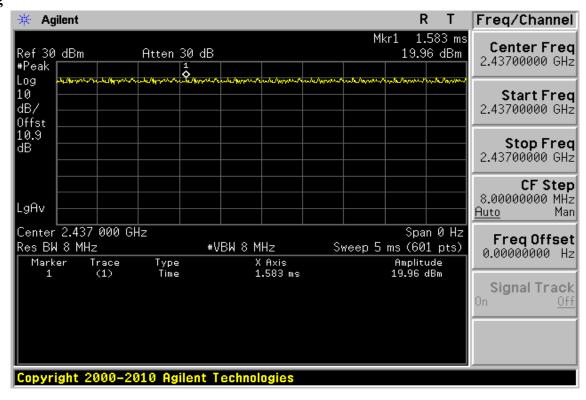
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Duty Factor:

802.11 b



802.11 g



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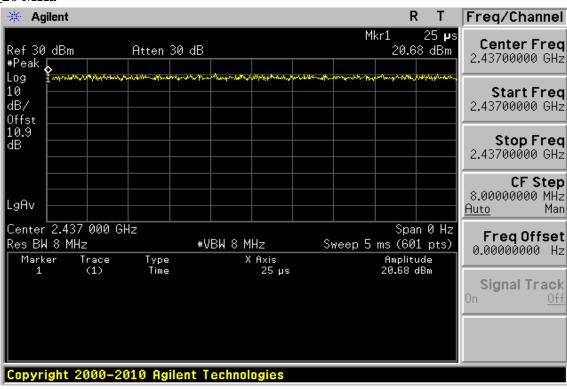
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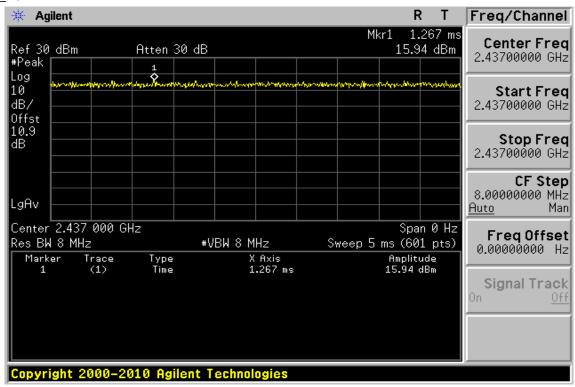
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802.11 n 20 MHz



802.11 n 40 MHz



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7.5 **Measurement Result:**

802.11b

V Z •111	~										
			Peak Power Output (dBm)								
CII	Frequency		Data Rate								
СН	(MHz)	1	2	11	Required Limit						
1	2412	18.87	18.85	18.71	18.64	1 Watt = 30 dBm					
6	2437	18.71	18.66	18.56	18.48	1 Watt = 30 dBm					
11	2462	18.61	18.51	18.50	18.46	1 Watt = 30 dBm					

			Average Power Output (dBm)							
CII	Frequency		Data Rate							
СН	(MHz)	1	2	Required Limit						
1	2412	15.98	15.89	15.87	15.84	1 Watt = 30 dBm				
6	2437	15.95	15.85	15.78	15.72	1 Watt = 30 dBm				
11	2462	15.99	15.86	15.84	15.82	1 Watt = 30 dBm				

802.11g

, , , , ,			Peak Power Output(dBm)									
CII	Frequency				Data	Rate				Dogginal Limit		
СН	(MHz)	6	9	12	18	24	36	48	54	Required Limit		
1	2412	22.49	22.40	22.35	22.29	22.25	22.19	22.18	22.01	1 Watt = 30 dBm		
6	2437	22.66	22.63	22.60	22.57	22.45	22.37	22.18	21.99	1 Watt = 30 dBm		
11	2462	21.92	21.82	21.70	21.51	21.35	21.26	21.19	21.14	1 Watt = 30 dBm		

			Average Power Output(dBm)								
CII	Frequency	ency Data Rate								Dogwined Limit	
СН	(MHz)	6	9	12	18	24	36	48	54	Required Limit	
1	2412	14.96	14.79	14.72	14.67	14.63	14.45	14.32	14.17	1 Watt = 30 dBm	
6	2437	14.72	14.68	14.64	14.52	14.38	14.31	14.15	14.10	1 Watt = 30 dBm	
11	2462	14.80	14.61	14.52	14.46	14.40	14.26	14.10	13.92	1 Watt = 30 dBm	

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802.11n 20M

			Peak Power Output(dBm)								
CII	Frequency				Data	Rate				Required	
CH (MHz)		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	Limit		
1	2412	21.01	20.90	20.86	20.67	20.58	20.55	20.55	20.40	1 Watt = 30 dBm	
6	2437	21.09	21.02	20.98	20.87	20.78	20.63	20.47	20.33	1 Watt = 30 dBm	
11	2462	20.81	20.69	20.54	20.36	20.24	20.12	19.97	19.81	1 Watt = 30 dBm	

CII	Frequency			_	Data	Rate				Required
CH (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	Limit	
1	2412	11.44	11.33	11.26	11.17	11.05	10.92	10.83	10.64	1 Watt = 30 dBm
6	2437	11.47	11.35	11.19	11.04	11.02	10.87	10.71	10.66	1 Watt = 30 dBm
11	2462	11.49	11.36	11.33	11.26	11.24	11.11	10.99	10.88	1 Watt = 30 dBm

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802.11n_40M

			Peak Power Output(dBm)								
СН	Frequency				Data	Rate				Required	
Сп	(MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	Limit	
1	2422	22.01	21.85	21.76	21.65	21.59	21.40	21.28	21.22	1 Watt = 30 dBm	
6	2437	22.22	22.17	22.08	22.07	22.04	21.90	21.73	21.62	1 Watt = 30 dBm	
11	2452	21.44	21.32	21.15	21.07	20.94	20.75	20.73	20.57	1 Watt = 30 dBm	

			Average Power Output(dBm)								
CII	Frequency				Data	Rate				Required	
Сн	CH (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	Limit	
1	2422	11.44	11.30	11.30	11.15	11.01	10.87	10.79	10.75	1 Watt = 30 dBm	
6	2437	11.29	11.18	11.08	10.90	10.86	10.77	10.62	10.48	1 Watt = 30 dBm	
11	2452	11.45	11.41	11.35	11.29	11.22	11.19	11.01	10.84	1 Watt = 30 dBm	

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

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6dB BANDWIDTH

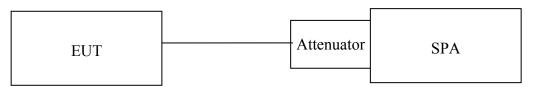
8.1 **Standard Applicable:**

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

Measurement Equipment Used:

	Conducted Emission Test Site									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.					
TYPE		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	05/19/2014	05/18/2015					
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/08/2014	03/07/2015					
DC Block	Mini-Circuits	BLK-18-S+	1	02/27/2014	02/26/2015					
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/03/2014	01/02/2015					
Attenuator	Mini-Circuit	BW-S10W2+	002	02/27/2014	02/26/2015					
Splitter	Agilent	11636B	N/A	02/27/2014	02/26/2015					

8.3 **Test Set-up:**



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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:**

802.11b

Frequency	Bandwidth	Limit	Result
(MHz)	(kHz)	(kHz)	
2412	9612	> 500	PASS
2437	10028	> 500	PASS
2462	9633	> 500	PASS

802.11g

Frequency	Bandwidth	Limit	Result
(MHz)	(kHz)	(kHz)	
2412	15537	> 500	PASS
2437	15439	> 500	PASS
2462	15760	> 500	PASS

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802.11n_20M

Frequency	Bandwidth	Limit	Result
(MHz)	(kHz)	(kHz)	
2412	15166	> 500	PASS
2437	16092	> 500	PASS
2462	16378	> 500	PASS

802.11n 40M

Frequency	Bandwidth	Limit	Result
(MHz)	(kHz)	(kHz)	
2422	35219	> 500	PASS
2437	34005	> 500	PASS
2452	27591	> 500	PASS

^{*} Note: Offset 10.9dB for 2.4G 802.11b/g/n_20/n_40;

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^{*} Note: The arrow "->" reveals X decibel level

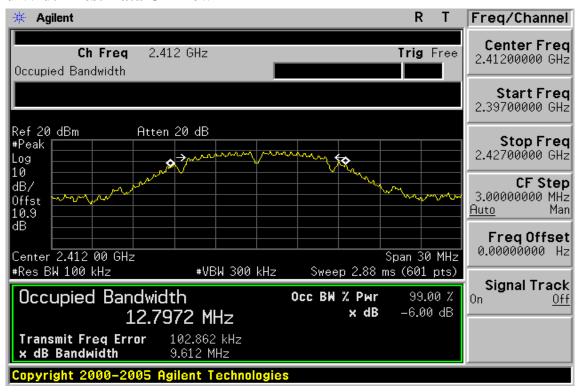
^{*}Refer to next page for plots

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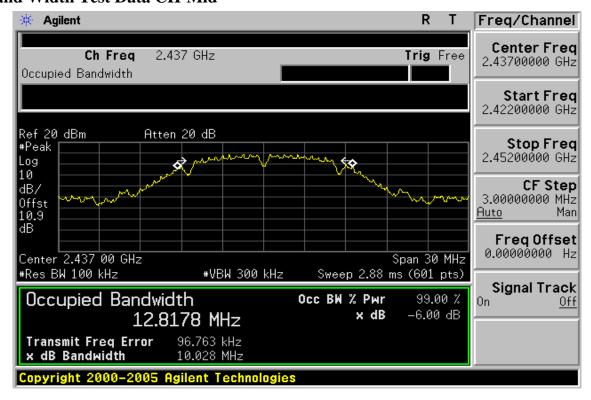
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802.11b

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



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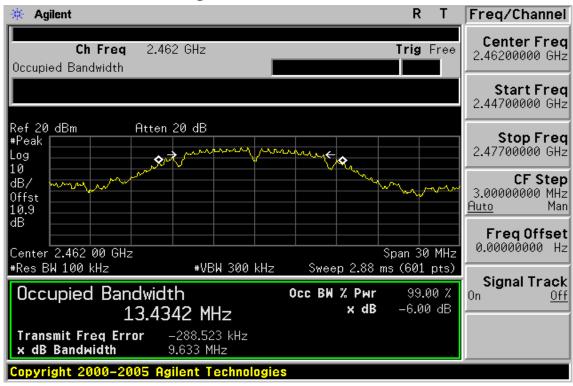
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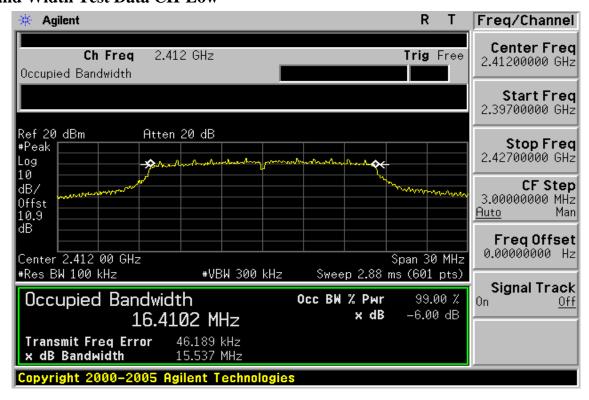
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6dB Band Width Test Data CH-High



802.11g

6dB Band Width Test Data CH-Low



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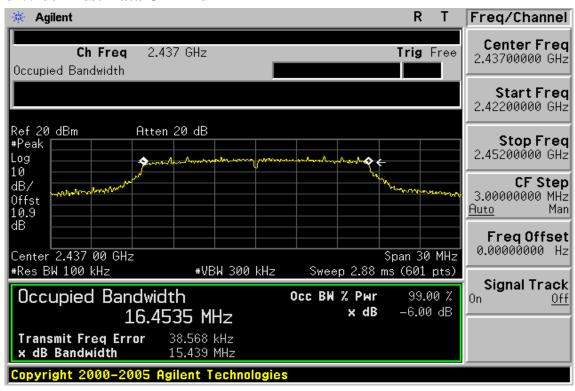
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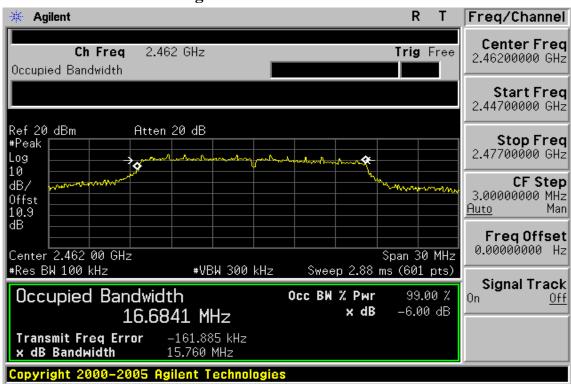
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6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



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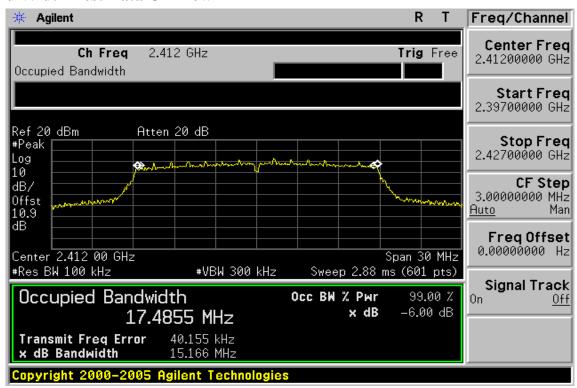
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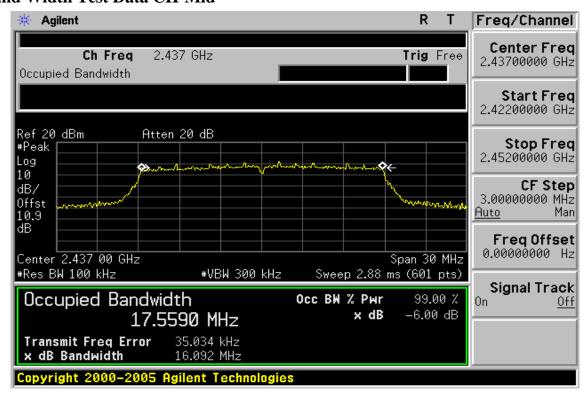
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802.11n 20M

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



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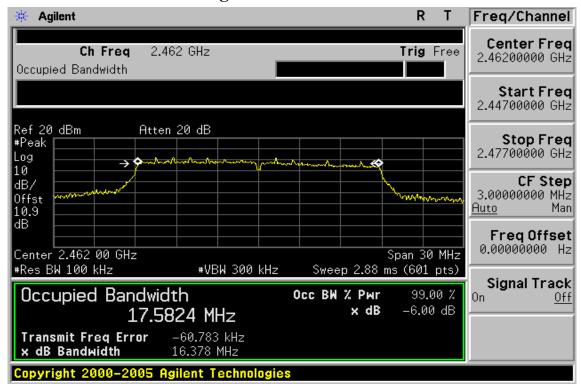
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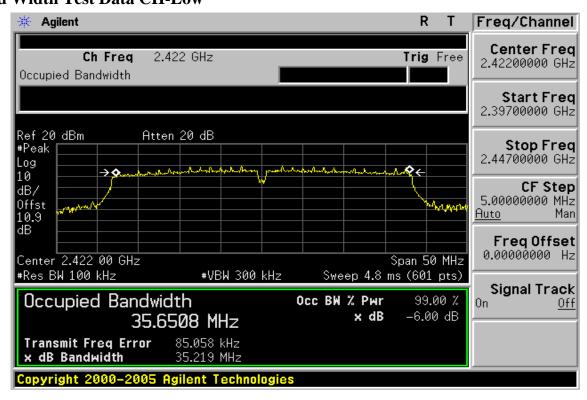
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6dB Band Width Test Data CH-High



802.11 n 40M

6dB Band Width Test Data CH-Low



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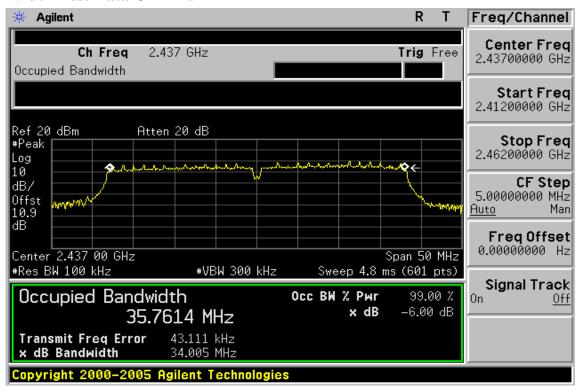
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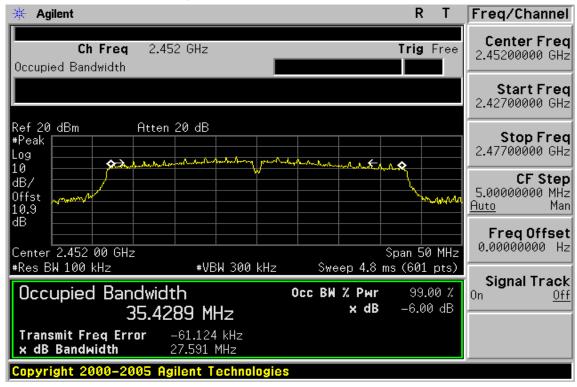
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6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



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BAND EDGES MEASUREMENT

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 in 15.209(a).

9.2 **Measurement Equipment Used:**

9.2.1 Conducted Emission at antenna port:

Refer to section 7.2 for details.

Radiated emission: 9.2.2

966 Chamber									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
EMI Test Receiver	R&S	ESCI7	100760	05/26/2014	05/25/2015				
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/19/2014	05/18/2015				
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	01/20/2014	01/19/2015				
Spectrum Analyzer	R&S	FSV-30	101398	10/07/2014	10/06/2015				
Loop Antenna	ETS.LINDGREN	6502	00148045	07/03/2014	07/02/2015				
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/02/2014	01/01/2015				
Horn antenna			123995	05/19/2014	05/18/2015				
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	02/27/2014	02/26/2015				
Attenuator	Mini-Circuit	BW-S10W2+	004	02/27/2014	02/26/2015				
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	07/15/2014	07/14/2015				

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

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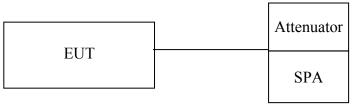
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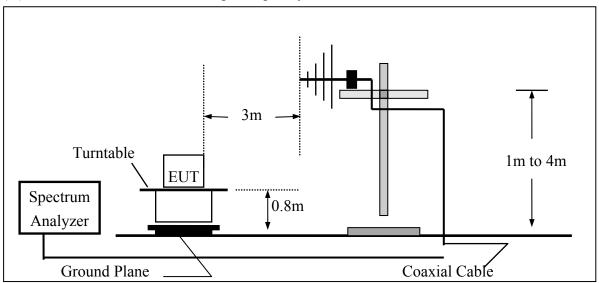
9.3 **Test SET-UP:**

9.3.1 **Conducted Emission at antenna port:**

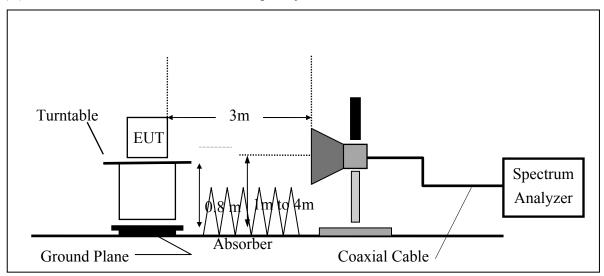


9.3.2 Radiated emission:

(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:

$$FS = RA + AF + CL - AG$$

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

Measurement Result:

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

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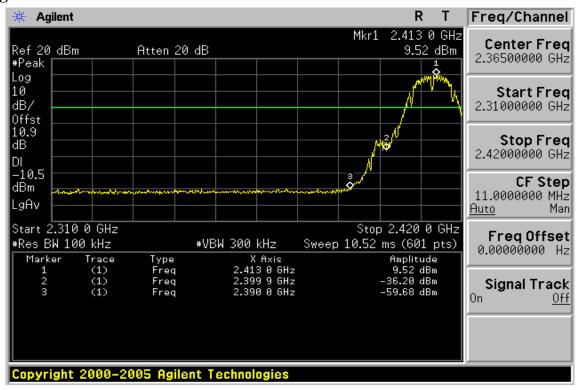
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802.11b - Unwanted Emissions into Non-Restricted Frequency Bands **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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Tabular Results:

802.11b

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
2.3999	-36.20	9.52	-10.50	Pass
2.4835	-54.23	8.68	-11.30	Pass

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

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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 :2014-11-10 Fundamental Frequency :2412 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge LOW Engineer ·Tin

EUT Pol. Measurement Antenna Pol. :VERTICAL :E1 Plane

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBμV/m	dBμV/m	dB
2390.00	E	Average	30.32	2.48	32.80	54.00	-21.20
2390.00	E	Peak	41.94	2.48	44.42	74.00	-29.58

Operation Band :802.11 b Test Date :2014-11-10 Fundamental Frequency :2412 MHz Temp./Humi. :23 deg C / 58 RH Operation Mode :Band Edge LOW Engineer :Tin

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBµV/m	dBµV/m	dB
2390.00	E	Average	34.14	2.48	36.62	54.00	-17.38
2390.00	E	Peak	44.14	2.48	46.62	74.00	-27.38

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Operation Band :802.11 b **Test Date** :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge HIGH Engineer

EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	E	Average	35.53	2.84	38.37	54.00	-15.63
2483.50	E	Peak	46.69	2.84	49.53	74.00	-24.47
2484.20	S	Average	35.26	2.85	38.11	54.00	-15.89
2484.20	S	Peak	48.44	2.85	51.29	74.00	-22.71

Operation Band :802.11 b Test Date :2014-11-10 Fundamental Frequency :2462 MHz Temp./Humi. :23 deg C / 58 RH Operation Mode :Band Edge HIGH Engineer :Tin

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	E	Average	35.82	2.84	38.66	54.00	-15.34
2483.50	E	Peak	48.31	2.84	51.15	74.00	-22.85

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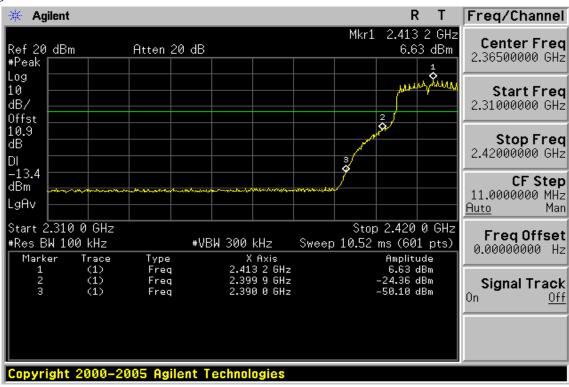
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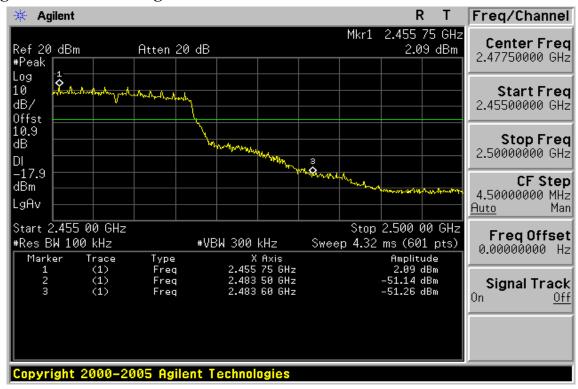
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802.11g - Unwanted Emissions into Non-Restricted Frequency Bands **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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Tabular Results:

802.11g

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
2.3999	-24.36	6.63	-13.40	Pass
2.4836	-51.26	2.09	-17.90	Pass

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

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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 g mode

Operation Band :802.11 g Test Date :2014-11-10 Fundamental Frequency :2412 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge LOW Engineer :Tin

EUT Pol. Measurement Antenna Pol. :VERTICAL :E1 Plane

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

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

"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 Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2390.00	E	Average	33.64	2.48	36.12	54.00	-17.88
2390.00	E	Peak	50.21	2.48	52.69	74.00	-21.31
Fundamental Frequency :2412 M		:802.11 g :2412 MHz		Test Date Temp./Humi.		:2014-11-10 :23 deg_C / 5	8 RH
Operation Mod EUT Pol.	de	:Band Edge I :E1 Plane		Engineer Measurement An	tenna Pol.	:Tin :HORIZONTA	AL

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

Factor(dB) = Antenna Factor(dB μ 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	${ m d} B \mu V$	dB	dBµV/m	dBμV/m	dB
2390.00	E	Average	34.30	2.48	36.78	54.00	-17.22
2390.00	E	Peak	54.02	2.48	56.50	74.00	-17.50

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Operation Band :802.11 g Test Date :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge HIGH Engineer EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

Factor(dB) = Antenna Factor(dB μ 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	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	E	Average	41.66	2.84	44.50	54.00	-9.50
2483.50	E	Peak	61.88	2.84	64.72	74.00	-9.28
2483.90	S	Average	40.87	2.84	43.71	54.00	-10.29
2483.90	S	Peak	63.25	2.84	66.09	74.00	-7.91
Operation Band Fundamental Frequency Operation Mode		:802.11 g :2462 MHz :Band Edge I	:2462 MHz			:2014-11-10 :23 deg_C / 58 RH :Tin	
EUT Pol.		:E1 Plane		Engineer Measurement Ant	tenna Pol.	:HORIZONTA	A L

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	E	Average	42.07	2.84	44.91	54.00	-9.09
2483.50	E	Peak	62.97	2.84	65.81	74.00	-8.19
2484.00	S	Average	41.12	2.84	43.96	54.00	-10.04
2484.00	S	Peak	64.69	2.84	67.53	74.00	-6.47

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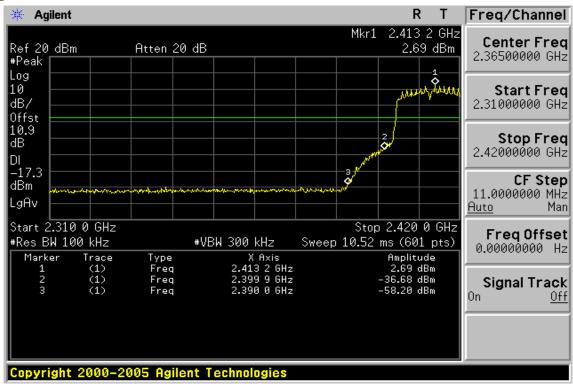
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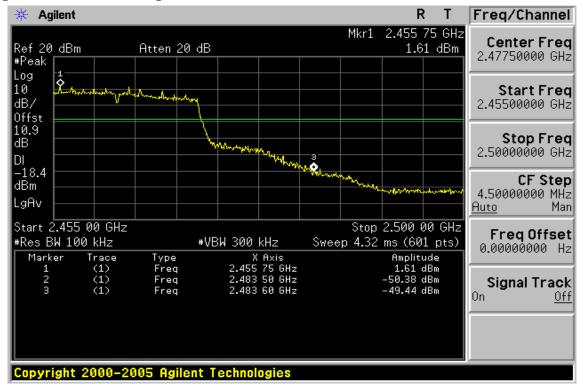
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802.11n_20M- Unwanted Emissions into Non-Restricted Frequency Bands **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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802.11n_20MHz

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
2.3999	-36.68	2.69	-17.30	Pass
2.4836	-49.44	1.61	-18.40	Pass

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

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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 :2014-11-10 :2412 MHz Fundamental Frequency Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge LOW Engineer :Tin

EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
2390.00	E	Average	31.01	2.48	33.49	54.00	-20.51
2390.00	E	Peak	43.82	2.48	46.30	74.00	-27.70

Operation Band :802.11 n20M Test Date :2014-11-10 Fundamental Frequency :2412 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge LOW Engineer ·Tin

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	E	Average	30.98	2.48	33.46	54.00	-20.54
2390.00	Е	Peak	43.43	2.48	45.91	74.00	-28.09

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Test Date **Operation Band** :802.11 n20M :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge HIGH Engineer EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
2483.50	E	Average	36.65	2.84	39.49	54.00	-14.51
2483.50	E	Peak	56.75	2.84	59.59	74.00	-14.41
Operation Ban Fundamental F		:802.11 n20M :2462 MHz		st Date mp./Humi.		:2014-11-10 :23 deg_C / 5	8 RH

Operation Mode :Band Edge HIGH Engineer :Tin

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	E	Average	36.87	2.84	39.71	54.00	-14.29
2483.50	E	Peak	58.83	2.84	61.67	74.00	-12.33

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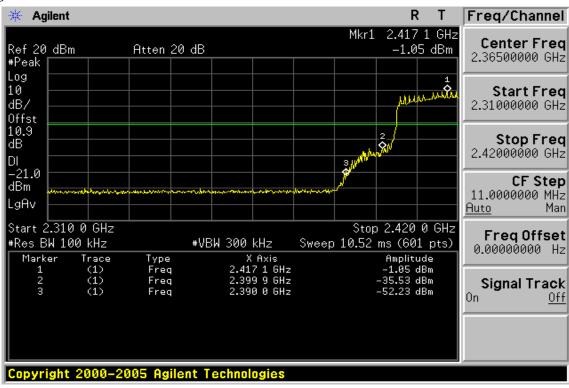
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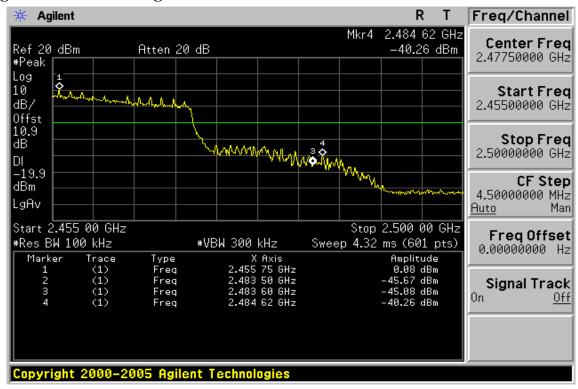
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802.11n_40M- Unwanted Emissions into Non-Restricted Frequency Bands **Band Edges Test Data CH-Low**



Band Edges Test Data CH-High



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802.11n_20MHz

Frequency (GHz)	Results (dBm)	Ref (dBm)	Limit (dBm)	Verdict
2.3999	-35.53	-1.05	-21.00	Pass
2.4846	-40.26	0.00	-19.90	Pass

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

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Radiated Emission:

(Unwanted Emissions into Restricted Frequency Bands): 802.11 n 20M mode

:802.11 n40M Test Date **Operation Band** :2014-11-10 Fundamental Frequency :2422 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge LOW Engineer :Tin

EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBμV/m	dBμV/m	dB
2390.00	E	Average	32.96	2.48	35.44	54.00	-18.56
2390.00	E	Peak	53.81	2.48	56.29	74.00	-17.71
Operation Ban Fundamental F		:802.11 n40M :2422 MHz		t Date np./Humi.		:2014-11-10 :23 deg_C / 5	8 RH

Operation Mode :Band Edge LOW Engineer :Tin

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBμV/m	dBµV/m	dB
2390.00	E	Average	32.49	2.48	34.97	54.00	-19.03
2390.00	Е	Peak	53.83	2.48	56.31	74.00	-17.69

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Operation Band :802.11 n40M **Test Date** :2014-11-10

Fundamental Frequency :2452 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge HIGH Engineer

EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	E	Average	37.95	2.84	40.79	54.00	-13.21
2483.50	E	Peak	60.14	2.84	62.98	74.00	-11.02
Operation Band	i	:802.11 n40M	1 Tes	st Date		:2014-11-10	

Fundamental Frequency Temp./Humi. :23 deg C / 58 RH :2452 MHz

Operation Mode :Band Edge HIGH Engineer :Tin

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	E	Average	38.78	2.84	41.62	54.00	-12.38
2483.50	E	Peak	61.43	2.84	64.27	74.00	-9.73

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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 emis-
- 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:

- To connect Antenna Port of EUT to Spectrum. 1.
- Set RBW = 100K & VBW = 300K on Spectrum. 2.
- 3. 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)
- Via Software, combine 5 spans of frequency range into one plot 4.
- Repeat above procedures until all default test channel measured were complete. 5.

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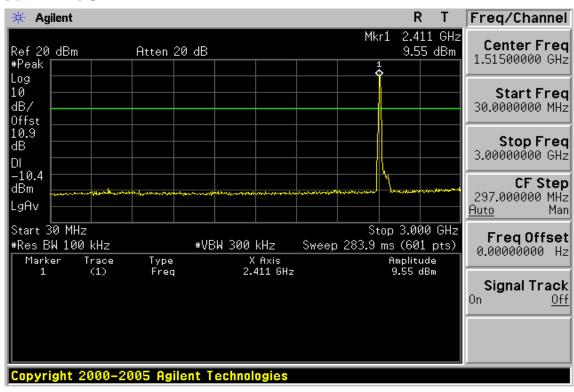
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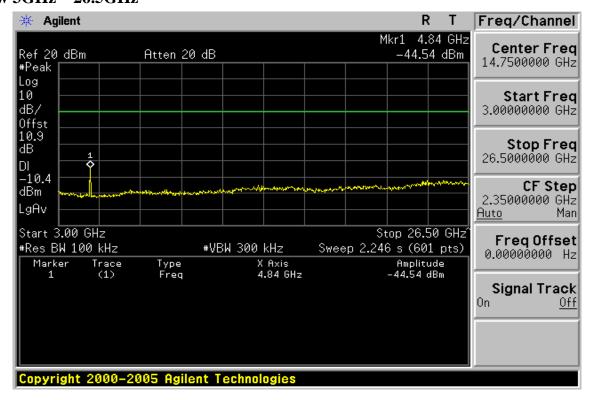
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Conducted Spurious Emission Measurement Result (802.11b) Ch Low 30MHz - 3GHz



Ch Low 3GHz - 26.5GHz



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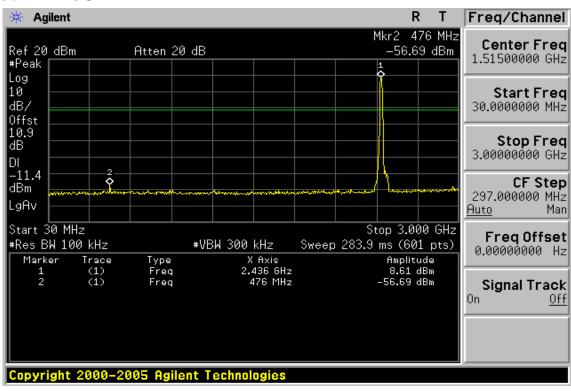
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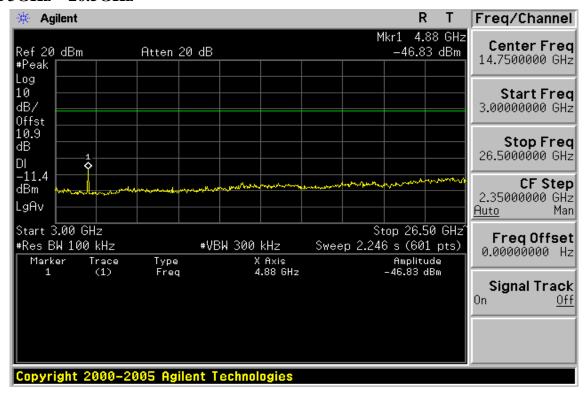
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Ch Mid 30MHz - 3GHz



Ch Mid 3GHz – 26.5GHz



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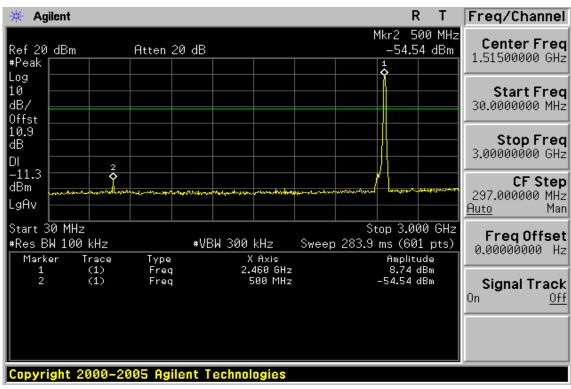
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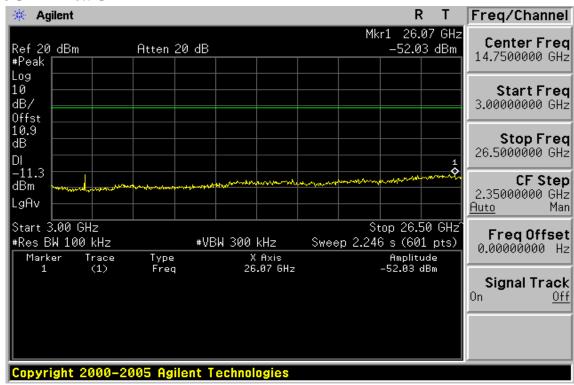
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Ch High 30MHz - 3GHz



Ch High 3GHz – 26.5GHz



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Tabular Results:

Out of Band emission at antenna terminals – 802.11b

Engineer :Tin Fundamental Frequency 2412 MHz

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
2412.00	Ref	9.55		
< 30	S		-10.40	
30-1000	S		-10.40	
4824.00	Н		-10.40	
7236.00	Н		-10.40	
9648.00	Н		-10.40	
12060.00	Н		-10.40	
14472.00	Н		-10.40	
16884.00	Н		-10.40	
19296.00	Н		-10.40	
21708.00	Н		-10.40	
24120.00	Н		-10.40	
48400.00	S	-44.54	-10.40	34.14

"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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Cofo

Fundamental Frequency Engineer :Tin 2437 MHz Operation Mode :TX Mid

Freq. (MHz)	Note F/H/E/S	Reading dBm	Li mit dBm	Safe Margin dB
2437.00	Ref	8.61		
< 30	S		-11.40	
30-1000	S		-11.40	
4874.00	Н		-11.40	
7311.00	Н		-11.40	
9748.00	Н		-11.40	
12185.00	Н		-11.40	
14622.00	Н		-11.40	
17059.00	Н		-11.40	
19496.00	Н		-11.40	
21933.00	Н		-11.40	
24370.00	Н		-11.40	
48800.00	S	-46.83	-11.40	35.43

"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 2462 MHz Engineer :Tin Operation Mode :TX High

Freq. (MHz)	Note F/H/E/S	Reading dBm	Li mit dBm	Safe Margin dB
2462.00	Ref	8.74		
< 30	S		-11.30	
30-1000	S		-11.30	
4924.00	Н		-11.30	
7386.00	Н		-11.30	
9848.00	Н		-11.30	
12310.00	Н		-11.30	
14772.00	Н		-11.30	
17234.00	Н		-11.30	
19696.00	Н		-11.30	
22158.00	Н		-11.30	
24620.00	Н		-11.30	
26070.00	S	-52.03	-11.30	40.73

"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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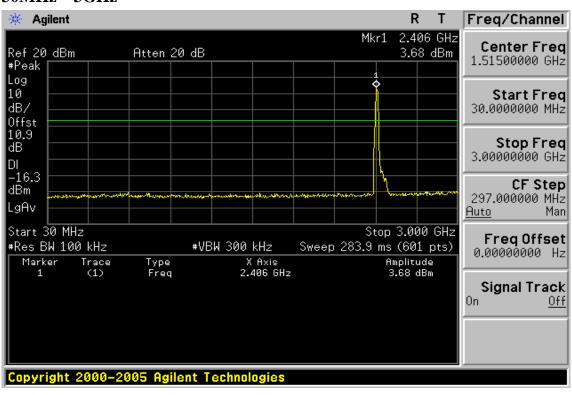
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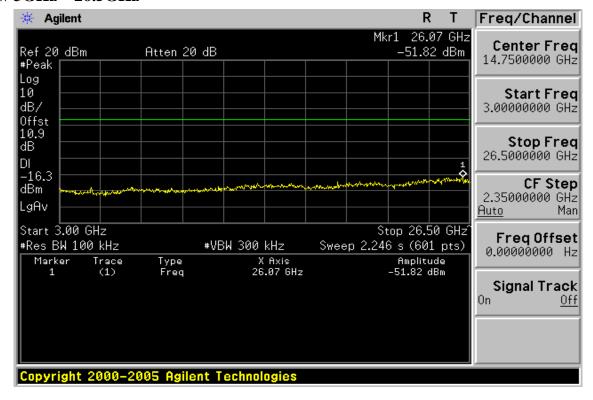
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Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz - 3GHz



Ch Low 3GHz – 26.5GHz



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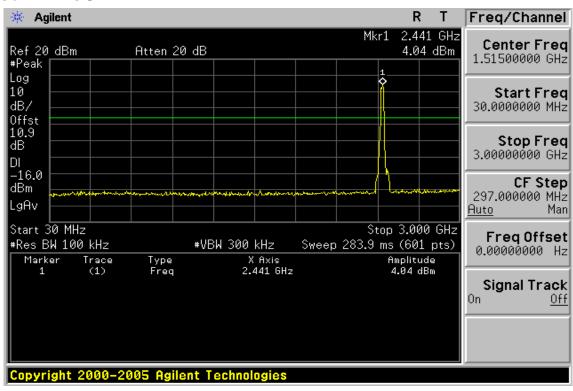
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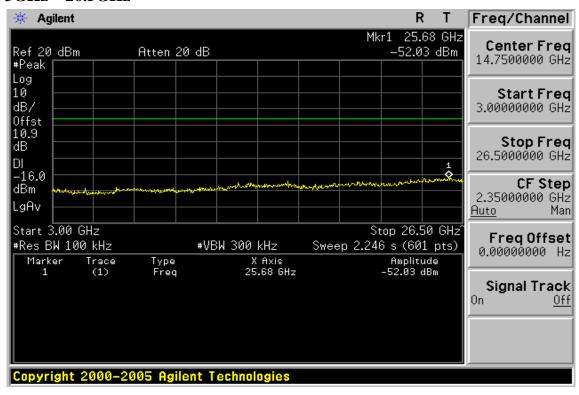
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Ch Mid 30MHz - 3GHz



Ch Mid 3GHz - 26.5GHz



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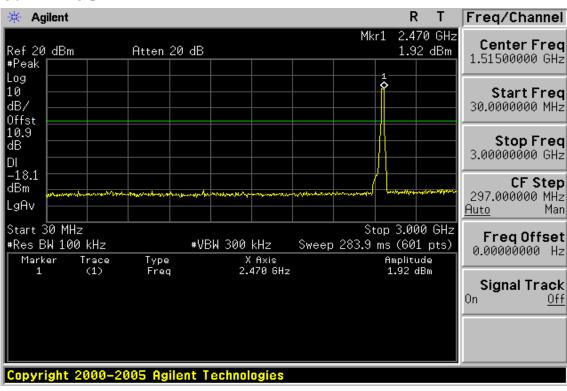
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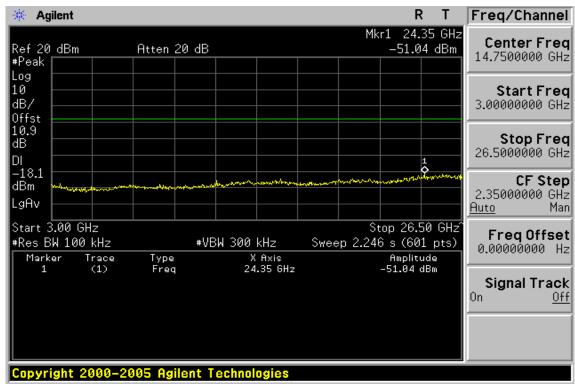
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Ch High 30MHz - 3GHz



Ch High 3GHz – 26.5GHz



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Tabular Results:

Out of Band emission at antenna terminals – 802.11g

Fundamental Frequency 2412 MHz Engineer :Tin

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
2412.00	Ref	3.68		
< 30	S		-16.30	
30-1000	S		-16.30	
4824.00	Н		-16.30	
7236.00	Н		-16.30	
9648.00	Н		-16.30	
12060.00	Н		-16.30	
14472.00	Н		-16.30	
16884.00	Н		-16.30	
19296.00	Н		-16.30	
21708.00	Н		-16.30	
24120.00	Н		-16.30	
26070.00	S	-51.82	-16.30	35.52

"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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Fundamental Frequency Engineer :Tin 2437 MHz Operation Mode :TX Mid

Freq. (MHz)	Note F/H/E/S	Reading dBm	Li mit dBm	Safe Margin dB
2437.00	Ref	4.04		
< 30	S		-16.00	
30-1000	S		-16.00	
4874.00	Н		-16.00	
7311.00	Н		-16.00	
9748.00	Н		-16.00	
12185.00	Н		-16.00	
14622.00	Н		-16.00	
17059.00	Н		-16.00	
19496.00	Н		-16.00	
21933.00	Н		-16.00	
24370.00	Н		-16.00	
25680.00	S	-52.03	-16.00	36.03

"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 2462 MHz Engineer :Tin Operation Mode :TX High

Freq. (MHz)	Note F/H/E/S	Reading dBm	Li mit dBm	Safe Margin dB
2462.00	Ref	1.92		
< 30	S		-18.10	
30-1000	S		-18.10	
4924.00	Н		-18.10	
7386.00	Н		-18.10	
9848.00	Н		-18.10	
12310.00	Н		-18.10	
14772.00	Н		-18.10	
17234.00	Н		-18.10	
19696.00	Н		-18.10	
22158.00	Н		-18.10	
24350.00	S	-51.04	-18.10	32.94
24620.00	Н		-18.10	

"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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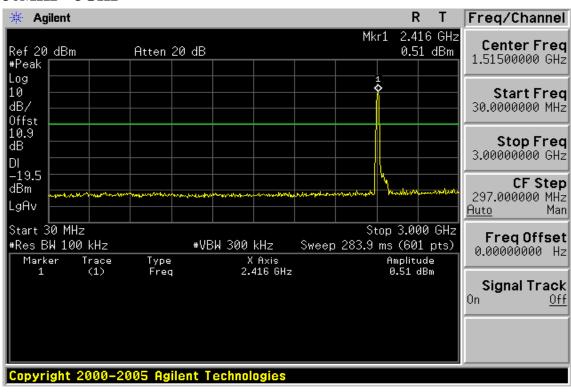
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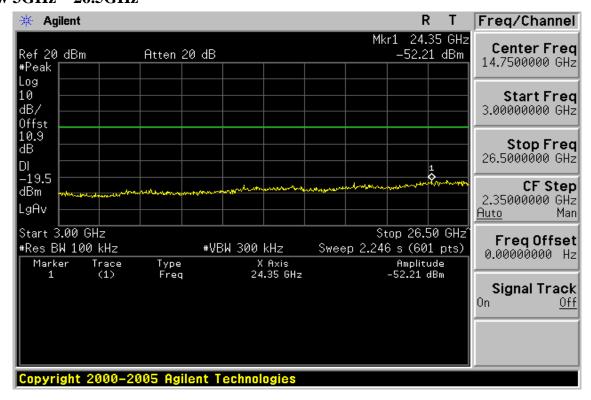
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Conducted Spurious Emission Measurement Result (802.11n_20M) Ch Low 30MHz - 3GHz



Ch Low 3GHz - 26.5GHz



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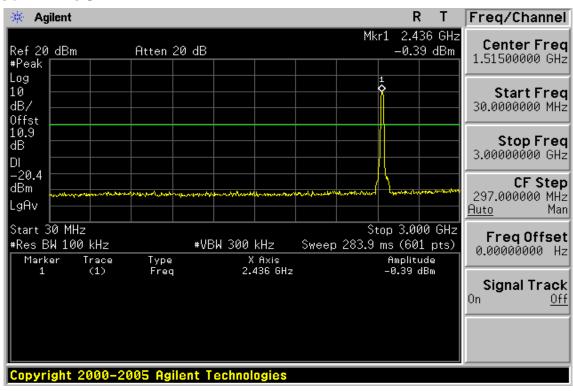
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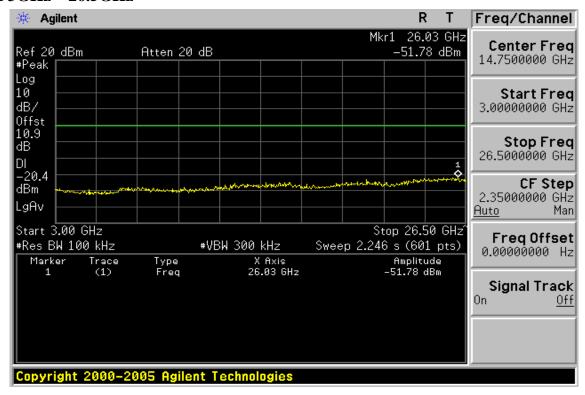
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Ch Mid 30MHz - 3GHz



Ch Mid 3GHz – 26.5GHz



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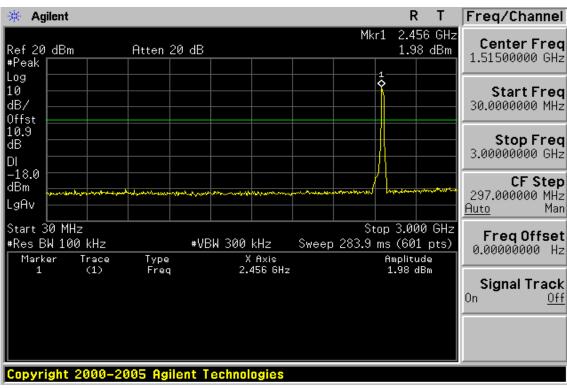
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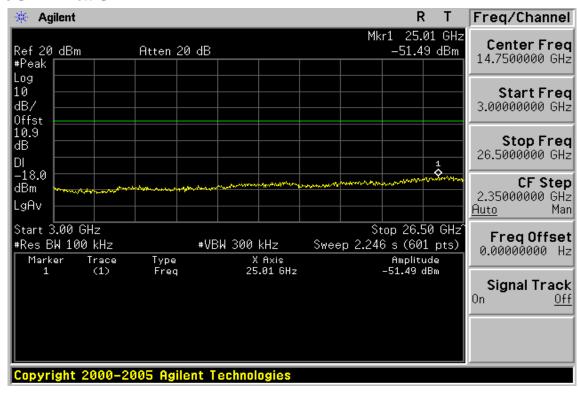
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Ch High 30MHz - 3GHz



Ch High 3GHz – 26.5GHz



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Tabular Results:

Out of Band emission at antenna terminals - 802.11n_20M

:Tin Fundamental Frequency 2412 MHz Engineer

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
2412.00	Ref	0.51		
<30	S		-19.50	
30-1000	S		-19.50	
4824.00	Н		-19.50	
7236.00	Н		-19.50	
9648.00	Н		-19.50	
12060.00	Н		-19.50	
14472.00	Н		-19.50	
16884.00	Н		-19.50	
19296.00	Н		-19.50	
21708.00	Н		-19.50	
24120.00	Н		-19.50	
24350.00	S	-52.21	-19.50	32.71

"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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Fundamental Frequency Engineer :Tin 2437 MHz Operation Mode :TX Mid

Freq. (MHz)	Note F/H/E/S	Reading Limit dBm dBm		Safe Margin dB
2437.00	Ref	-0.39		
< 30	S		-20.40	
30-1000	S		-20.40	
4874.00	Н		-20.40	
7311.00	Н		-20.40	
9748.00	Н		-20.40	
12185.00	Н		-20.40	
14622.00	Н		-20.40	
17059.00	Н		-20.40	
19496.00	Н		-20.40	
21933.00	Н		-20.40	
24370.00	Н		-20.40	
26030.00	S	-51.78	-20.40	31.38

"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 2462 MHz Engineer :Tin Operation Mode :TX High

Freq. (MHz)	Note F/H/E/S	Reading Limit dBm dBm		Safe Margin dB
2462.00	Ref	1.98		
< 30	S		-18.00	
30-1000	S		-18.00	
4924.00	Н		-18.00	
7386.00	Н		-18.00	
9848.00	Н		-18.00	
12310.00	Н		-18.00	
14772.00	Н		-18.00	
17234.00	Н		-18.00	
19696.00	Н		-18.00	
22158.00	Н		-18.00	
24620.00	Н		-18.00	
25010.00	S	-51.49	-18.00	33.49

"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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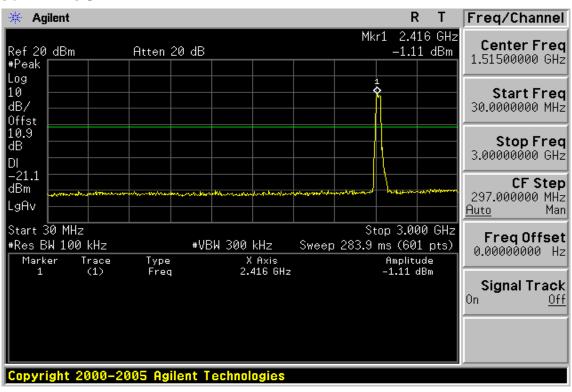
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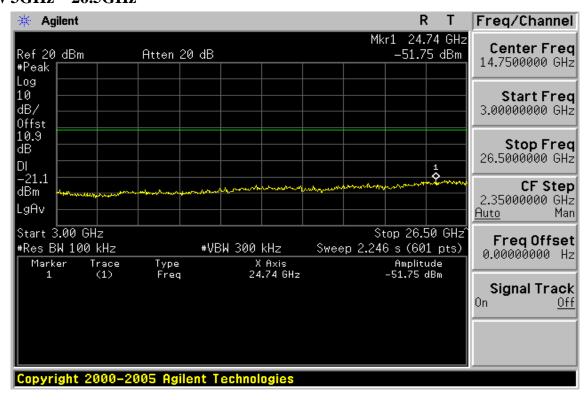
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Conducted Spurious Emission Measurement Result (802.11n_40M) Ch Low 30MHz - 3GHz



Ch Low 3GHz - 26.5GHz



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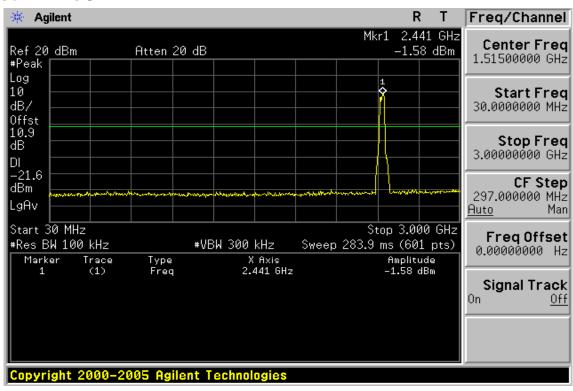
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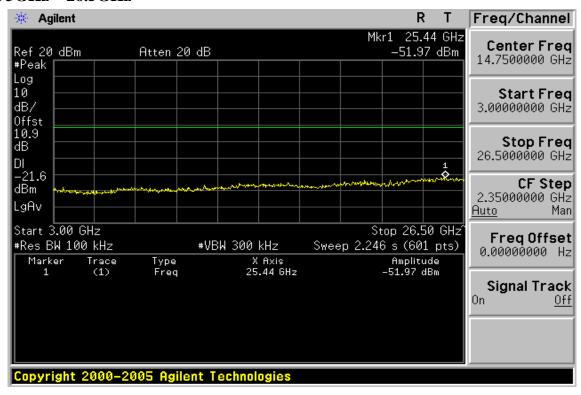
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Ch Mid 30MHz - 3GHz



Ch Mid 3GHz - 26.5GHz



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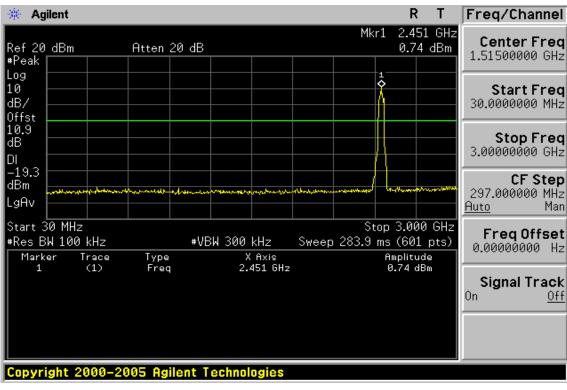
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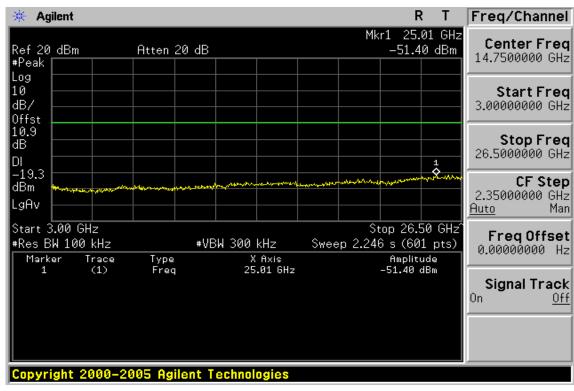
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Ch High 30MHz - 3GHz



Ch High 3GHz – 26.5GHz



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Tabular Results:

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

Fundamental Frequency 2422 MHz Engineer :Tin

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
2422.00	Ref	-1.11		
<30	S		-21.10	
30-1000	S		-21.10	
4844.00	Н		-21.10	
7266.00	Н		-21.10	
9688.00	Н		-21.10	
12110.00	Н		-21.10	
14532.00	Н		-21.10	
16954.00	Н		-21.10	
19376.00	Н		-21.10	
21798.00	Н		-21.10	
24220.00	Н		-21.10	
24740.00	S	-51.75	-21.10	30.65

"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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Fundamental Frequency Engineer :Tin 2437 MHz Operation Mode :TX Mid

Freq. (MHz)	Note F/H/E/S	Reading Limit dBm dBm		Safe Margin dB
2437.00	Ref	-1.58		
< 30	S		-21.60	
30-1000	S		-21.60	
4874.00	Н		-21.60	
7311.00	Н		-21.60	
9748.00	Н		-21.60	
12185.00	Н		-21.60	
14622.00	Н		-21.60	
17059.00	Н		-21.60	
19496.00	Н		-21.60	
21933.00	Н		-21.60	
24370.00	Н		-21.60	
25440.00	S	-51.97	-21.60	30.37

"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 2452 MHz Engineer :Tin Operation Mode :TX High

Freq. (MHz)	Note F/H/E/S	Reading Limit dBm dBm		Safe Margin dB
2452.00	Ref	0.74		
< 30	S		-19.30	
30-1000	S		-19.30	
4904.00	Н		-19.30	
7356.00	Н		-19.30	
9808.00	Н		-19.30	
12260.00	Н		-19.30	
14712.00	Н		-19.30	
17164.00	Н		-19.30	
19616.00	Н		-19.30	
22068.00	Н		-19.30	
24520.00	Н		-19.30	
25010.00	S	-51.4	-19.30	32.10

"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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Radiated Spurious Emission Measurement Result (802.11b)

For measurement plot of radiation, please refer to Appendix I.

:2014-11-10 **Operation Band** :802.11 b Test Date

Fundamental Frequency :2412 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :TX LOW Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

Factor(dB) = Antenna Factor(dB μ 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	dΒμV	dB	dBμV/m	dBμV/m	dB
30.97	S	Peak	46.93	-13.89	33.04	40.00	-6.96
108.57	S	Peak	40.47	-16.28	24.19	43.50	-19.31
222.06	S	Peak	37.21	-14.27	22.94	46.00	-23.06
455.83	S	Peak	28.56	-8.05	20.51	46.00	-25.49
752.65	S	Peak	26.91	-2.49	24.42	46.00	-21.58
928.22	S	Peak	27.39	-0.10	27.29	46.00	-18.71
4824.00	Н	Average	34.07	6.85	40.92	54.00	-13.08
4824.00	Н	Peak	39.27	6.85	46.12	74.00	-27.88
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						
24120.00	Н						

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Operation Band :802.11 b **Test Date** :2014-11-10

Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	${ m d} B \mu V$	dB	$dB\mu V/m$	dBμV/m	dB
30.97	S	Peak	32.34	-13.89	18.45	40.00	-21.55
107.60	S	Peak	32.88	-16.47	16.41	43.50	-27.09
286.08	S	Peak	28.41	-11.51	16.90	46.00	-29.10
461.65	S	Peak	27.92	-7.89	20.03	46.00	-25.97
591.63	S	Peak	27.71	-5.05	22.66	46.00	-23.34
820.55	S	Peak	28.15	-2.00	26.15	46.00	-19.85
4824.00	Н	Average	41.49	6.85	48.34	54.00	-5.66
4824.00	Н	Peak	44.37	6.85	51.22	74.00	-22.78
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						
24120.00	Н						

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Operation Band :802.11 b **Test Date** :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB
30.97	S	Peak	46.13	-13.89	32.24	40.00	-7.76
108.57	S	Peak	40.56	-16.28	24.28	43.50	-19.22
224.00	S	Peak	36.76	-14.20	22.56	46.00	-23.44
343.31	S	Peak	28.18	-10.33	17.85	46.00	-28.15
575.14	S	Peak	28.11	-5.40	22.71	46.00	-23.29
858.38	S	Peak	27.73	-1.47	26.26	46.00	-19.74
4874.00	Н	Average	36.27	6.93	43.20	54.00	-10.80
4874.00	Н	Peak	41.22	6.93	48.15	74.00	-25.85
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 b **Test Date** :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	$\mathrm{d} B \mu \mathrm{V}$	dB	dBμV/m	dBμV/m	dB
30.00	S	Peak	34.11	-13.90	20.21	40.00	-19.79
106.63	S	Peak	33.48	-16.64	16.84	43.50	-26.66
286.08	S	Peak	29.02	-11.51	17.51	46.00	-28.49
457.77	S	Peak	27.66	-7.99	19.67	46.00	-26.33
588.72	S	Peak	28.24	-5.00	23.24	46.00	-22.76
868.08	S	Peak	28.00	-1.49	26.51	46.00	-19.49
4874.00	Н	Average	41.41	6.93	48.34	54.00	-5.66
4874.00	Н	Peak	45.19	6.93	52.12	74.00	-21.88
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 b **Test Date** :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB
33.88	S	Peak	47.16	-13.87	33.29	40.00	-6.71
107.60	S	Peak	40.19	-16.47	23.72	43.50	-19.78
223.03	S	Peak	35.31	-14.24	21.07	46.00	-24.93
388.90	S	Peak	29.03	-9.31	19.72	46.00	-26.28
644.01	S	Peak	28.51	-4.93	23.58	46.00	-22.42
862.26	S	Peak	27.48	-1.44	26.04	46.00	-19.96
4924.00	Н	Average	36.71	6.99	43.70	54.00	-10.30
4924.00	Н	Peak	41.48	6.99	48.47	74.00	-25.53
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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Operation Band :802.11 b **Test Date** :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	dΒμV	dB	dBμV/m	dBµV/m	dB
105.66	S	Peak	32.61	-16.83	15.78	43.50	-27.72
241.46	S	Peak	27.63	-13.22	14.41	46.00	-31.59
286.08	S	Peak	29.20	-11.51	17.69	46.00	-28.31
481.05	S	Peak	28.53	-7.61	20.92	46.00	-25.08
639.16	S	Peak	27.91	-5.13	22.78	46.00	-23.22
897.18	S	Peak	27.89	-0.97	26.92	46.00	-19.08
4924.00	Н	Average	39.66	6.99	46.65	54.00	-7.35
4924.00	Н	Peak	43.41	6.99	50.40	74.00	-23.60
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** :2014-11-10

Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB
33.88	S	Peak	46.16	-13.87	32.29	40.00	-7.71
87.23	S	Peak	44.12	-18.50	25.62	40.00	-14.38
162.89	S	Peak	34.36	-12.51	21.85	43.50	-21.65
396.66	S	Peak	28.83	-9.14	19.69	46.00	-26.31
584.84	S	Peak	28.42	-5.04	23.38	46.00	-22.62
858.38	S	Peak	28.92	-1.47	27.45	46.00	-18.55
4824.00	Н	Average	25.17	6.85	32.02	54.00	-21.98
4824.00	Н	Peak	37.40	6.85	44.25	74.00	-29.75
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						
24120.00	Н						

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Operation Band :802.11 g **Test Date** :2014-11-10

Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
30.00	S	Peak	32.74	-13.90	18.84	40.00	-21.16
105.66	S	Peak	33.31	-16.83	16.48	43.50	-27.02
266.68	S	Peak	26.75	-12.24	14.51	46.00	-31.49
420.91	S	Peak	28.27	-8.79	19.48	46.00	-26.52
668.26	S	Peak	28.29	-4.11	24.18	46.00	-21.82
915.61	S	Peak	27.90	-0.35	27.55	46.00	-18.45
4824.00	Н	Average	27.19	6.85	34.04	54.00	-19.96
4824.00	Н	Peak	38.05	6.85	44.90	74.00	-29.10
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						
24120.00	Н						

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Operation Band :802.11 g **Test Date** :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
33.88	S	Peak	46.47	-13.87	32.60	40.00	-7.40
107.60	S	Peak	40.18	-16.47	23.71	43.50	-19.79
225.94	S	Peak	35.81	-14.14	21.67	46.00	-24.33
385.99	S	Peak	28.25	-9.36	18.89	46.00	-27.11
595.51	S	Peak	28.25	-5.21	23.04	46.00	-22.96
855.47	S	Peak	27.74	-1.55	26.19	46.00	-19.81
4874.00	Н	Average	25.78	6.93	32.71	54.00	-21.29
4874.00	Н	Peak	38.15	6.93	45.08	74.00	-28.92
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** :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB
108.57	S	Peak	32.40	-16.28	16.12	43.50	-27.38
149.31	S	Peak	29.39	-12.73	16.66	43.50	-26.84
286.08	S	Peak	28.89	-11.51	17.38	46.00	-28.62
480.08	S	Peak	28.10	-7.61	20.49	46.00	-25.51
759.44	S	Peak	27.66	-2.52	25.14	46.00	-20.86
940.83	S	Peak	28.12	0.14	28.26	46.00	-17.74
4874.00	Н	Average	25.88	6.93	32.81	54.00	-21.19
4874.00	Н	Peak	39.30	6.93	46.23	74.00	-27.77
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** :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB
33.88	S	Peak	45.91	-13.87	32.04	40.00	-7.96
88.20	S	Peak	43.16	-18.68	24.48	43.50	-19.02
159.98	S	Peak	34.97	-12.33	22.64	43.50	-20.86
224.00	S	Peak	35.65	-14.20	21.45	46.00	-24.55
462.62	S	Peak	28.55	-7.86	20.69	46.00	-25.31
948.59	S	Peak	27.48	0.25	27.73	46.00	-18.27
4924.00	Н	Average	25.92	6.99	32.91	54.00	-21.09
4924.00	Н	Peak	37.95	6.99	44.94	74.00	-29.06
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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Operation Band :802.11 g **Test Date** :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	${ m d} B \mu V$	dB	$dB\mu V/m$	dBμV/m	dB
107.60	S	Peak	32.33	-16.47	15.86	43.50	-27.64
240.49	S	Peak	27.94	-13.24	14.70	46.00	-31.30
330.70	S	Peak	26.62	-10.74	15.88	46.00	-30.12
562.53	S	Peak	27.81	-6.32	21.49	46.00	-24.51
659.53	S	Peak	29.05	-4.39	24.66	46.00	-21.34
906.88	S	Peak	27.34	-0.59	26.75	46.00	-19.25
4924.00	Н	Average	24.98	6.99	31.97	54.00	-22.03
4924.00	Н	Peak	37.48	6.99	44.47	74.00	-29.53
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 (802.11n_20M)

Operation Band :802.11 n20M Test Date :2014-11-10

Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

Factor(dB) = Antenna Factor(dB μ 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	dΒμV	dB	dBμV/m	dBμV/m	dB
31.94	S	Peak	49.69	-13.88	35.81	40.00	-4.19
99.84	S	Peak	33.37	-17.96	15.41	43.50	-28.09
286.08	S	Peak	28.04	-11.51	16.53	46.00	-29.47
484.93	S	Peak	28.37	-7.59	20.78	46.00	-25.22
762.35	S	Peak	28.00	-2.56	25.44	46.00	-20.56
944.71	S	Peak	27.23	0.21	27.44	46.00	-18.56
4824.00	Н	Average	25.56	6.85	32.41	54.00	-21.59
4824.00	Н	Peak	38.22	6.85	45.07	74.00	-28.93
7236.00	Н						
9648.00	Н						
12060.00	Н						
14472.00	Н						
16884.00	Н						
19296.00	Н						
21708.00	Н						
24120.00	Н						

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Operation Band :802.11 n20M Test Date :2014-11-10

Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB	
42.61	S	Peak	32.18	-13.35	18.83	40.00	-21.17	
159.98	S	Peak	27.30	-12.33	14.97	43.50	-28.53	
341.37	S	Peak	27.21	-10.38	16.83	46.00	-29.17	
446.13	S	Peak	30.30	-8.38	21.92	46.00	-24.08	
671.17	S	Peak	27.13	-4.00	23.13	46.00	-22.87	
925.31	S	Peak	27.53	-0.15	27.38	46.00	-18.62	
4824.00	Н	Average	26.93	6.85	33.78	54.00	-20.22	
4824.00	Н	Peak	39.22	6.85	46.07	74.00	-27.93	
7236.00	Н							
9648.00	Н							
12060.00	Н							
14472.00	Н							
16884.00	Н							
19296.00	Н							
21708.00	Н							
24120.00	Н							

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Operation Band :802.11 n20M Test Date :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	${ m d} B \mu V$	dB	$dB\mu V/m$	dBμV/m	dB
31.94	S	Peak	49.36	-13.88	35.48	40.00	-4.52
99.84	S	Peak	33.80	-17.96	15.84	43.50	-27.66
394.72	S	Peak	27.18	-9.19	17.99	46.00	-28.01
601.33	S	Peak	28.35	-5.46	22.89	46.00	-23.11
773.02	S	Peak	28.39	-2.68	25.71	46.00	-20.29
937.92	S	Peak	27.29	0.09	27.38	46.00	-18.62
4874.00	Н	Average	25.98	6.93	32.91	54.00	-21.09
4874.00	Н	Peak	37.99	6.93	44.92	74.00	-29.08
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 n20M Test Date :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB
41.64	S	Peak	31.72	-13.42	18.30	40.00	-21.70
151.25	S	Peak	27.24	-12.65	14.59	43.50	-28.91
286.08	S	Peak	28.44	-11.51	16.93	46.00	-29.07
482.02	S	Peak	28.21	-7.61	20.60	46.00	-25.40
686.69	S	Peak	27.90	-3.64	24.26	46.00	-21.74
911.73	S	Peak	28.75	-0.44	28.31	46.00	-17.69
4874.00	Н	Average	26.27	6.93	33.20	54.00	-20.80
4874.00	Н	Peak	38.85	6.93	45.78	74.00	-28.22
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 n20M Test Date :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB
31.94	S	Peak	49.07	-13.88	35.19	40.00	-4.81
99.84	S	Peak	34.41	-17.96	16.45	43.50	-27.05
286.08	S	Peak	28.32	-11.51	16.81	46.00	-29.19
483.96	S	Peak	28.59	-7.60	20.99	46.00	-25.01
767.20	S	Peak	28.03	-2.64	25.39	46.00	-20.61
934.04	S	Peak	27.64	0.01	27.65	46.00	-18.35
4924.00	Н	Average	25.90	6.99	32.89	54.00	-21.11
4924.00	Н	Peak	38.29	6.99	45.28	74.00	-28.72
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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Operation Band :802.11 n20M Test Date :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
41.64	S	Peak	33.06	-13.42	19.64	40.00	-20.36
145.43	S	Peak	27.12	-12.90	14.22	43.50	-29.28
286.08	S	Peak	28.22	-11.51	16.71	46.00	-29.29
476.20	S	Peak	27.90	-7.66	20.24	46.00	-25.76
676.99	S	Peak	27.73	-3.77	23.96	46.00	-22.04
946.65	S	Peak	27.49	0.23	27.72	46.00	-18.28
4924.00	Н	Average	25.78	6.99	32.77	54.00	-21.23
4924.00	Н	Peak	38.32	6.99	45.31	74.00	-28.69
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 (802.11n_40M)

Operation Band :802.11 n40M Test Date :2014-11-10

Fundamental Frequency :2422 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

Factor(dB) = Antenna Factor(dB μ 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	dB _µ V	dB	dBμV/m	dBμV/m	dB
IVITIZ	1/11/L/3	TR/QT/AV	αδμν	цD	ασμν/ π	ασμνητι	<u>ub</u>
30.97	S	Peak	48.50	-13.89	34.61	40.00	-5.39
99.84	S	Peak	33.50	-17.96	15.54	43.50	-27.96
343.31	S	Peak	27.83	-10.33	17.50	46.00	-28.50
581.93	S	Peak	28.29	-5.08	23.21	46.00	-22.79
763.32	S	Peak	28.64	-2.57	26.07	46.00	-19.93
950.53	S	Peak	27.64	0.28	27.92	46.00	-18.08
4844.00	Н	Average	26.15	6.92	33.07	54.00	-20.93
4844.00	Н	Peak	37.95	6.92	44.87	74.00	-29.13
7266.00	Н						
9688.00	Н						
12110.00	Н						
14532.00	Н						
16954.00	Н						
19376.00	Н						
21798.00	Н						
24220.00	Н						

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Operation Band Test Date :2014-11-10 :802.11 n40M

Fundamental Frequency :2422 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	dΒμV	dB	dBμV/m	dBμV/m	dB
42.61	S	Peak	32.66	-13.35	19.31	40.00	-20.69
120.21	S	Peak	29.41	-14.99	14.42	43.50	-29.08
338.46	S	Peak	27.39	-10.48	16.91	46.00	-29.09
446.13	S	Peak	30.42	-8.38	22.04	46.00	-23.96
680.87	S	Peak	27.52	-3.63	23.89	46.00	-22.11
945.68	S	Peak	27.30	0.21	27.51	46.00	-18.49
4844.00	Н	Average	26.41	6.92	33.33	54.00	-20.67
4844.00	Н	Peak	37.72	6.92	44.64	74.00	-29.36
7266.00	Н						
9688.00	Н						
12110.00	Н						
14532.00	Н						
16954.00	Н						
19376.00	Н						
21798.00	Н						
24220.00	Н						

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Operation Band Test Date :2014-11-10 :802.11 n40M

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode Engineer :TX MID :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

Factor(dB) = Antenna Factor(dB μ 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	dΒμV	dB	dBμV/m	dBμV/m	dB
31.94	S	Peak	48.48	-13.88	34.60	40.00	-5.40
99.84	S	Peak	33.91	-17.96	15.95	43.50	-27.55
286.08	S	Peak	29.32	-11.51	17.81	46.00	-28.19
408.30	S	Peak	27.49	-8.83	18.66	46.00	-27.34
581.93	S	Peak	28.50	-5.08	23.42	46.00	-22.58
935.98	S	Peak	27.24	0.06	27.30	46.00	-18.70
4874.00	Н	Average	25.97	6.93	32.90	54.00	-21.10
4874.00	Н	Peak	37.64	6.93	44.57	74.00	-29.43
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 n40M Test Date :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry

EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
42.61	S	Peak	31.64	-13.35	18.29	40.00	-21.71
141.55	S	Peak	28.40	-13.09	15.31	43.50	-28.19
286.08	S	Peak	28.12	-11.51	16.61	46.00	-29.39
584.84	S	Peak	29.04	-5.04	24.00	46.00	-22.00
750.71	S	Peak	28.17	-2.48	25.69	46.00	-20.31
941.80	S	Peak	27.62	0.16	27.78	46.00	-18.22
4874.00	Н	Average	26.26	6.93	33.19	54.00	-20.81
4874.00	Н	Peak	38.21	6.93	45.14	74.00	-28.86
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 Test Date :2014-11-10 :802.11 n40M

Fundamental Frequency :2452 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :VERTICAL

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

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

"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	${ m d} B \mu V$	dB	$dB\mu V/m$	$dB\mu V/m$	dB
31.94	S	Peak	48.83	-13.88	34.95	40.00	-5.05
99.84	S	Peak	34.74	-17.96	16.78	43.50	-26.72
286.08	S	Peak	28.23	-11.51	16.72	46.00	-29.28
529.55	S	Peak	28.06	-7.37	20.69	46.00	-25.31
798.24	S	Peak	28.11	-2.22	25.89	46.00	-20.11
953.44	S	Peak	27.23	0.30	27.53	46.00	-18.47
4904.00	Н	Average	25.21	6.94	32.15	54.00	-21.85
4904.00	Н	Peak	37.31	6.94	44.25	74.00	-29.75
7356.00	Н						
9808.00	Н						
12260.00	Н						
14712.00	Н						
17164.00	Н						
19616.00	Н						
22068.00	Н						
24520.00	Н						

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Operation Band Test Date :2014-11-10 :802.11 n40M

Fundamental Frequency :2452 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :HORIZONTAL

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

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

"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	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	$dB\mu V/m$	dB
41.64	S	Peak	32.92	-13.42	19.50	40.00	-20.50
161.92	S	Peak	26.43	-12.45	13.98	43.50	-29.52
343.31	S	Peak	27.95	-10.33	17.62	46.00	-28.38
504.33	S	Peak	27.90	-7.38	20.52	46.00	-25.48
677.96	S	Peak	27.51	-3.71	23.80	46.00	-22.20
951.50	S	Peak	27.50	0.29	27.79	46.00	-18.21
4904.00	Н	Average	25.29	6.94	32.23	54.00	-21.77
4904.00	Н	Peak	36.92	6.94	43.86	74.00	-30.14
7356.00	Н						
9808.00	Н						
12260.00	Н						
14712.00	Н						
17164.00	Н						
19616.00	Н						
22068.00	Н						
24520.00	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 $VBW > 3 \times RBW$.
- 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	RF Power Density	Maximum Limit	
MHz	Reading (dBm)	(dBm)	
2412	-5.37	8	
2437	-4.54	8	
2462	-3.27	8	

802.11g

Frequency	RF Power Density	Maximum Limit	
MHz	Reading (dBm)	(dBm)	
2412	-9.25	8	
2437	-9.61	8	
2462	-9.62	8	

802.11n 20M

Frequency	RF Power Density	Maximum Limit
MHz	Reading (dBm)	(dBm)
2412	-12.12	8
2437	-12.39	8
2462	-11.31	8

802.11n 40M

Frequency	RF Power Density	Maximum Limit
MHz	Reading (dBm)	(dBm)
2422	-15.12	8
2437	-15.69	8
2452	-14.20	8

^{*} Note: Offset 10.9dB for 2.4G 802.11b/g/n_20; /n_40

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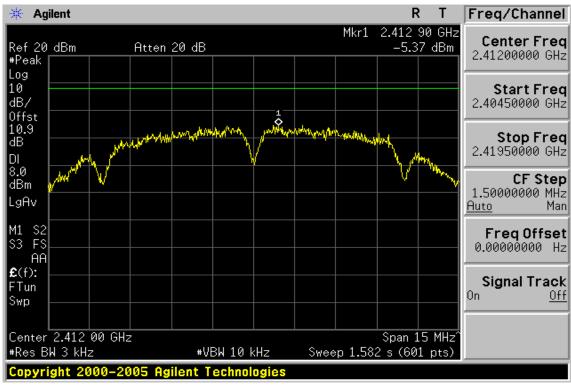
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^{*}Refer to next page for plots

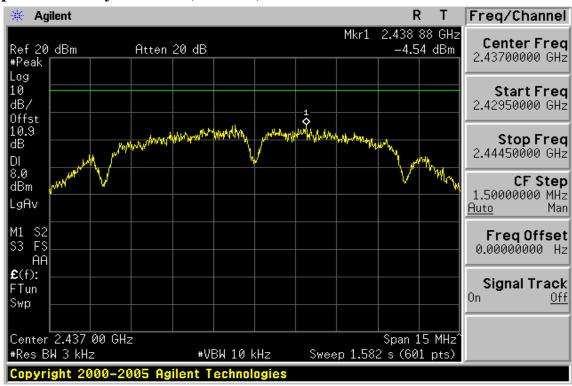
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802.11b **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)



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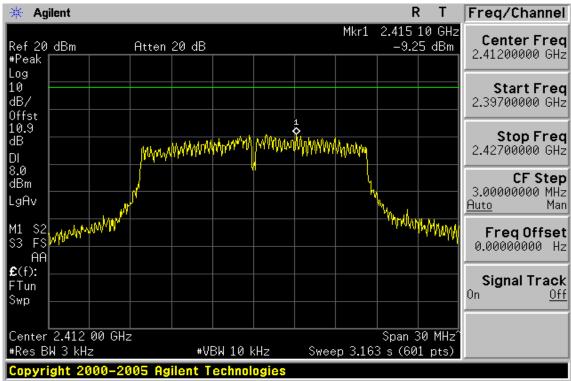
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Power Spectral Density Test Plot (CH-High)



802.11g **Power Spectral Density Test Plot (CH-Low)**



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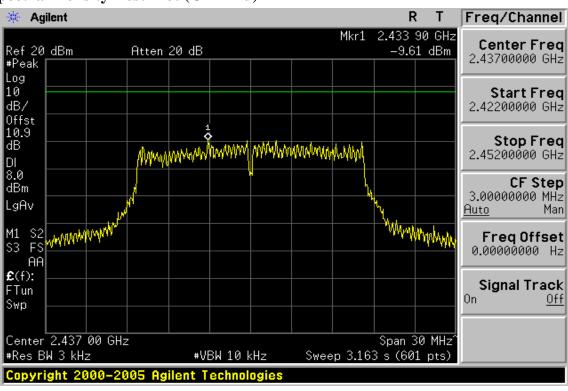
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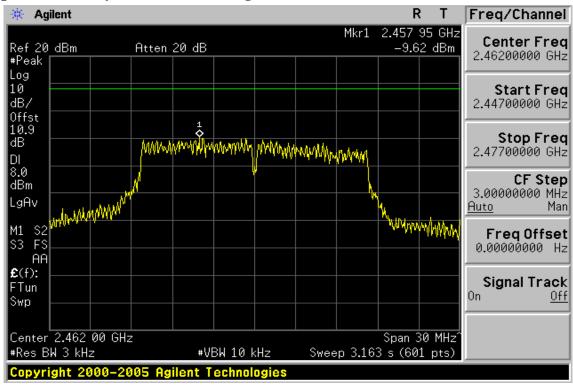
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Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



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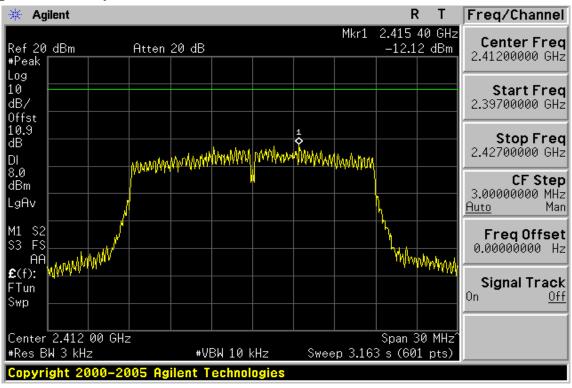
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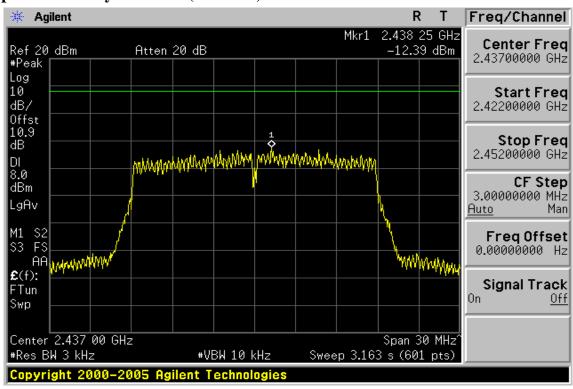
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802.11n 20M

Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



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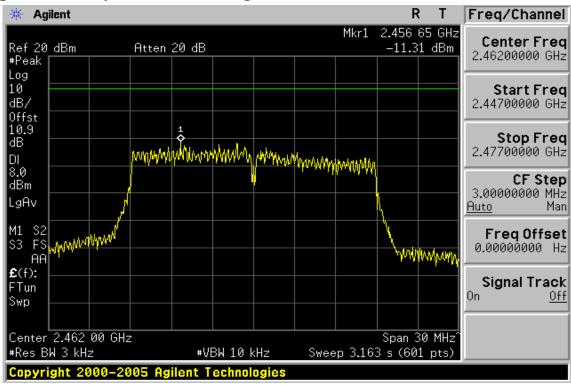
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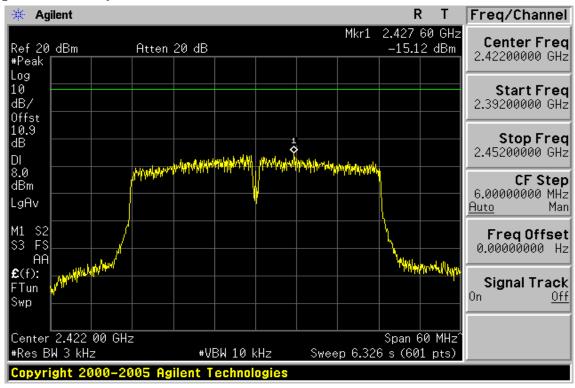
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Power Spectral Density Test Plot (CH-High)



802.11n 40M

Power Spectral Density Test Plot (CH-Low)



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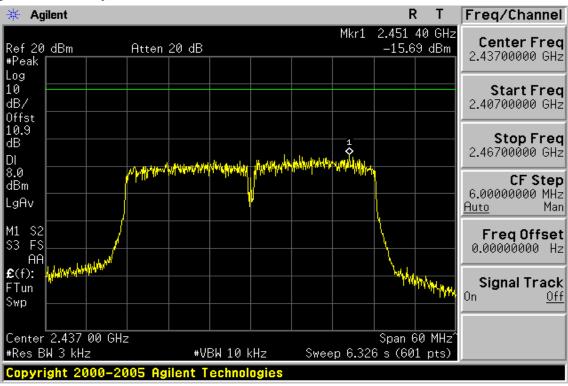
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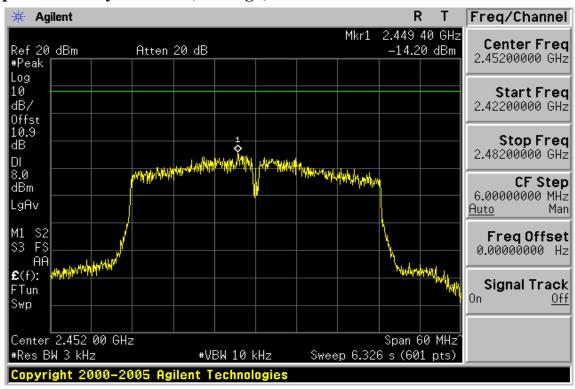
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Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



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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 2.52dBi 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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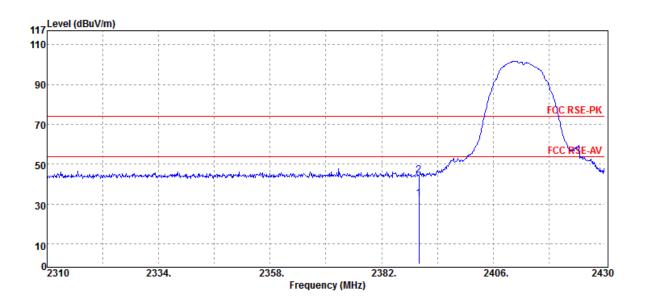
Band Edges Radiated Emission:

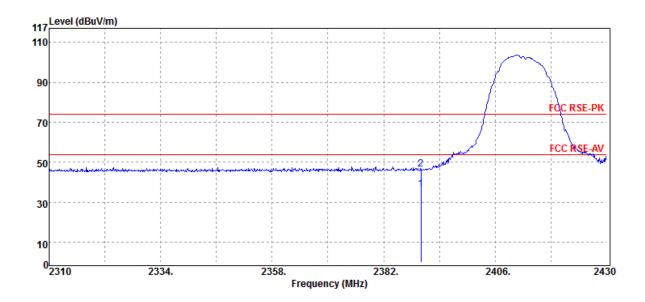
Note: The emission that surpasses the limit of peak represents the fundamental emission of the operation that does not account to be conformed to the limit of the interest.

802.11b

Operation Band :802.11 b **Test Date** :2014-11-10 Fundamental Frequency :2412 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge LOW Engineer :Tin EUT Pol. :E1 Plane Measurement Antenna Pol. :Ver. / Hor.





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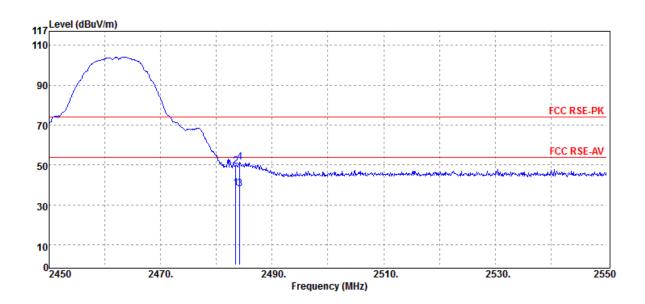
Operation Band Fundamental Frequency Operation Mode EUT Pol.

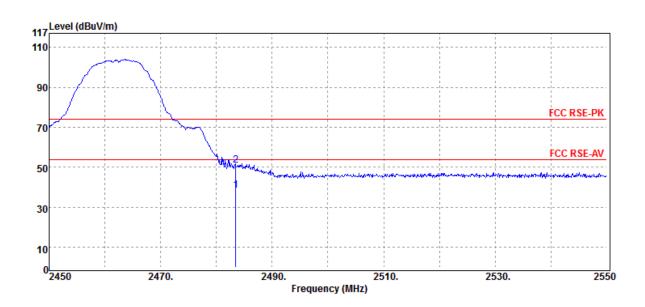
:802.11 b :2462 MHz :Band Edge HIGH :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Ver. / Hor. Measurement Antenna Pol.





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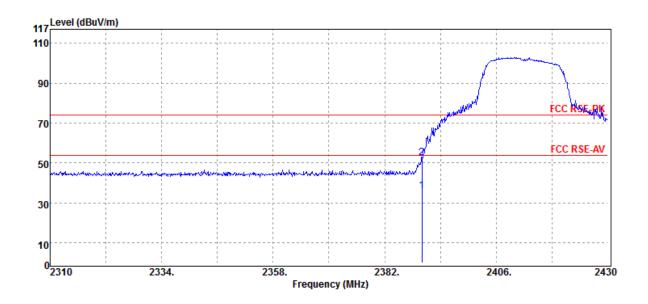
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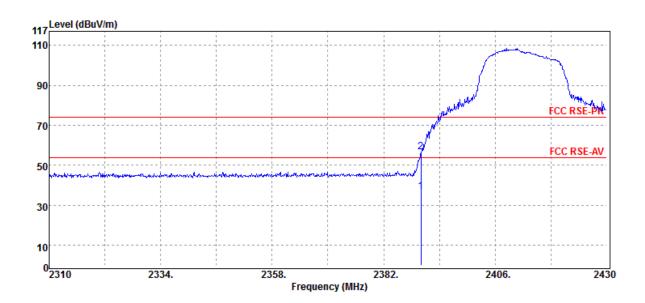
802.11g

Operation Band :802.11 g Test Date :2014-11-10 Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer

EUT Pol. :E1 Plane :Ver. / Hor. Measurement Antenna Pol.





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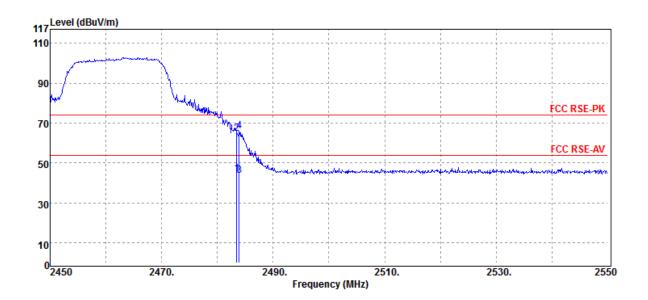
Operation Band Fundamental Frequency Operation Mode EUT Pol.

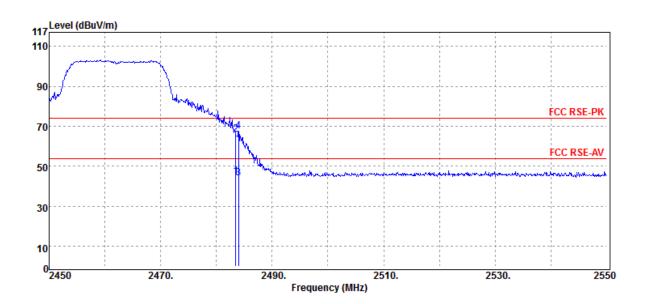
:802.11 g :2462 MHz :Band Edge HIGH :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Ver. / Hor. Measurement Antenna Pol.





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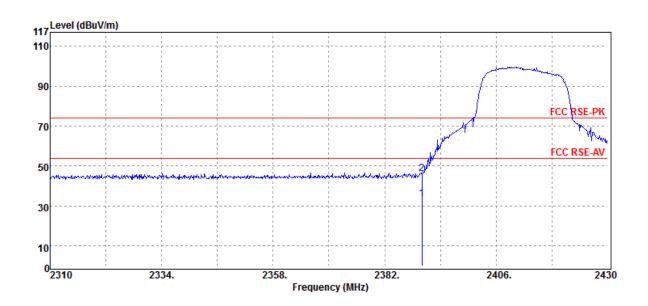
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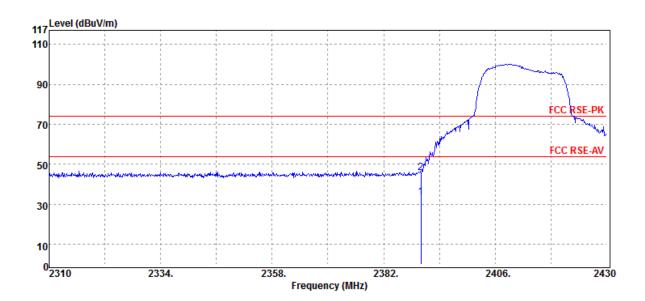
802.11n 20M

Operation Band :802.11 n20M Test Date :2014-11-10 Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer

EUT Pol. :E1 Plane :Ver. / Hor. Measurement Antenna Pol.





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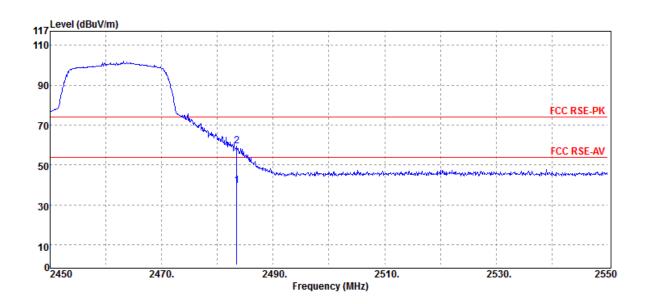
Operation Band Fundamental Frequency Operation Mode EUT Pol.

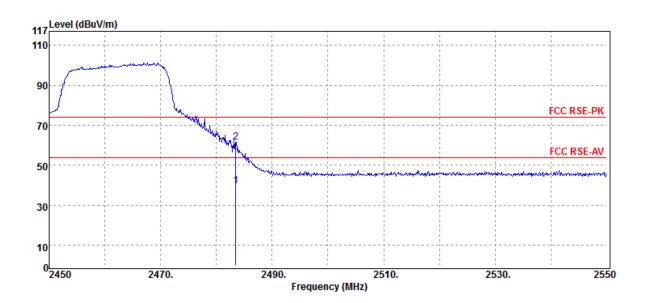
:802.11 n20M :2462 MHz :Band Edge HIGH :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Ver. / Hor. Measurement Antenna Pol.





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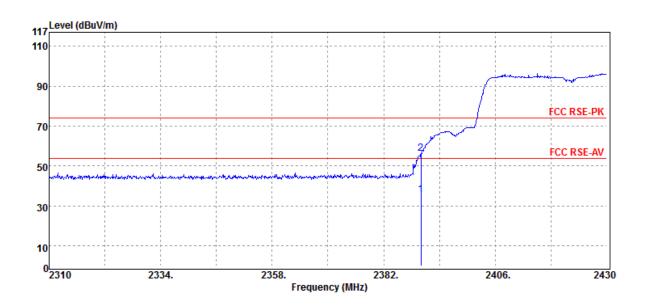
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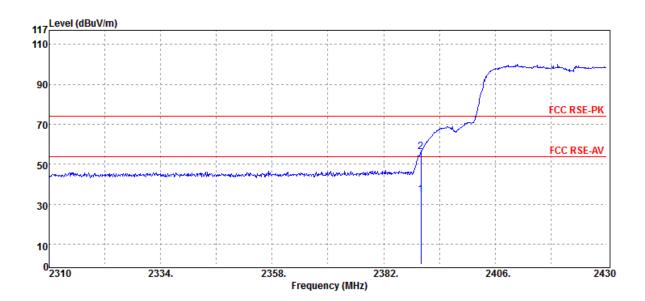
802.11n_40M

Operation Band :802.11 n40M Test Date :2014-11-10 Fundamental Frequency :2422 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer

EUT Pol. :E1 Plane :Ver. / Hor. Measurement Antenna Pol.





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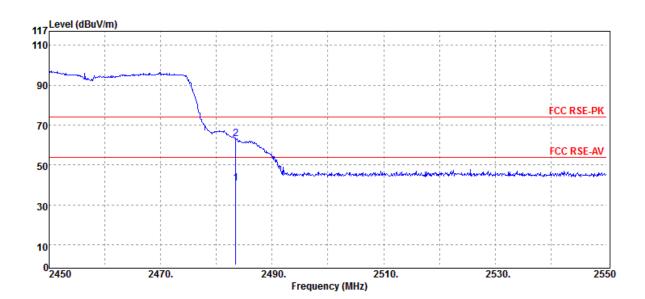
Operation Band Fundamental Frequency Operation Mode EUT Pol.

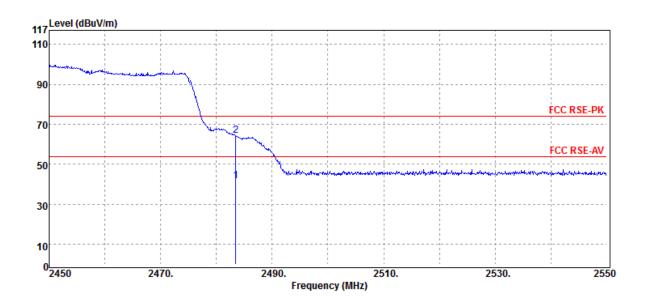
:802.11 n40M :2452 MHz :Band Edge HIGH :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Ver. / Hor. Measurement Antenna Pol.





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EUT Pol.

FCC ID: PY7-PM0854

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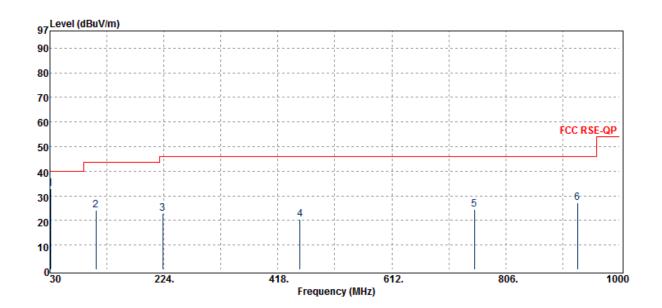
:Ver. / Hor.

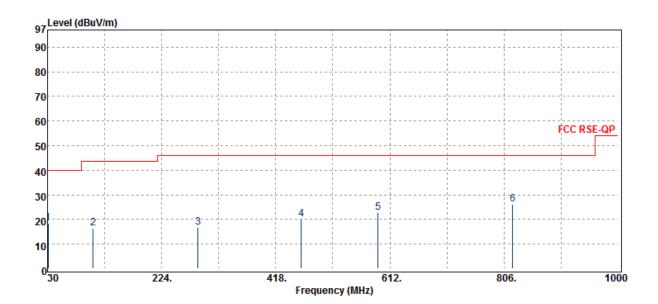
Radiated Spurious Emission Measurement photos Result (below 1GHz)

:E1 Plane

Operation Band :802.11 b Test Date :2014-11-10 Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH Operation Mode :TX LOW Engineer :Curry

Measurement Antenna Pol.





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台灣檢驗科技股份有限公司

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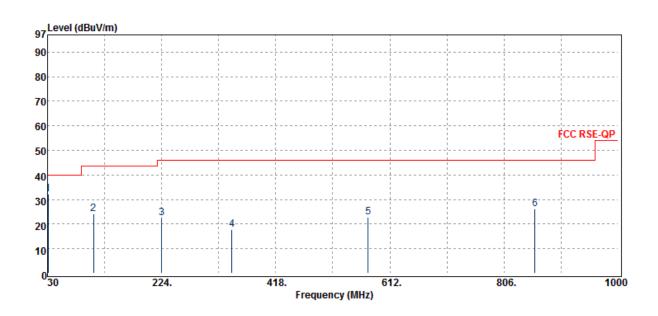
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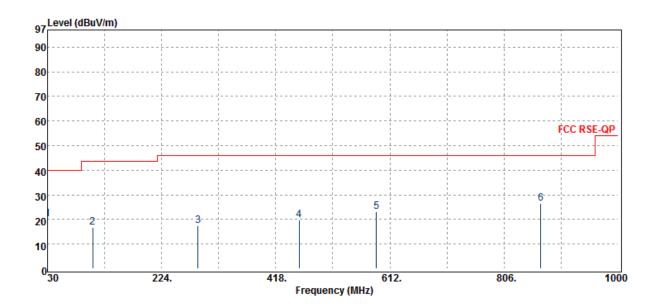
Operation Band :802.11 b

Fundamental Frequency :2437 MHz Operation Mode :TX MID

EUT Pol. :E1 Plan Test Date :2014-11-10 Temp./Humi. :23 deg_C / 58 RH

Engineer :Curry Measurement Antenna Pol. :Ver. / Hor.





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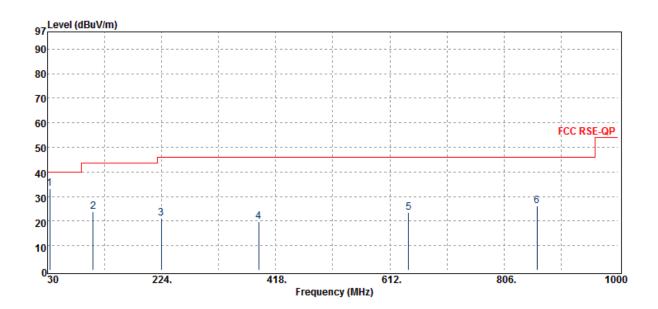
Operation Band Fundamental Frequency

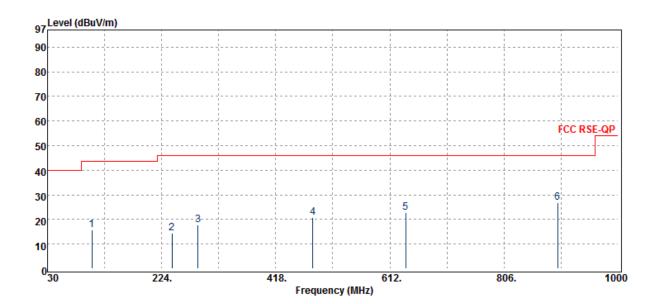
Operation Mode EUT Pol.

:802.11 b :2462 MHz :TX HIGH :E1 Plane

Test Date Temp./Humi. :2014-11-10 :23 deg_C / 58 RH

Engineer :Curry Measurement Antenna Pol. :Ver. / Hor.





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Operation Band Fundamental Frequency Operation Mode

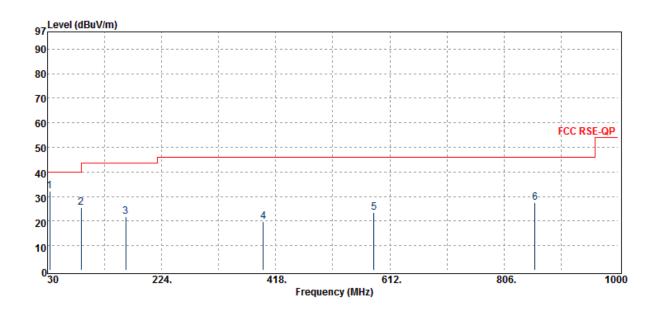
EUT Pol.

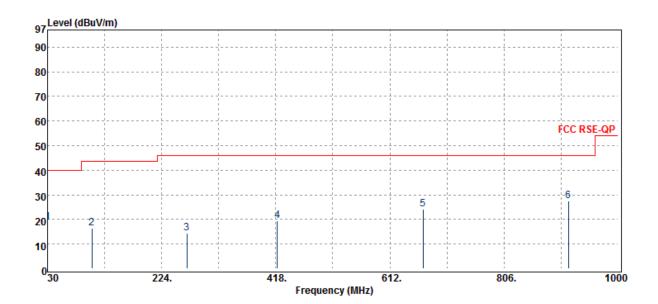
:802.11 g :2412 MHz :TX LOW :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry Measurement Antenna Pol. :Ver. / Hor.





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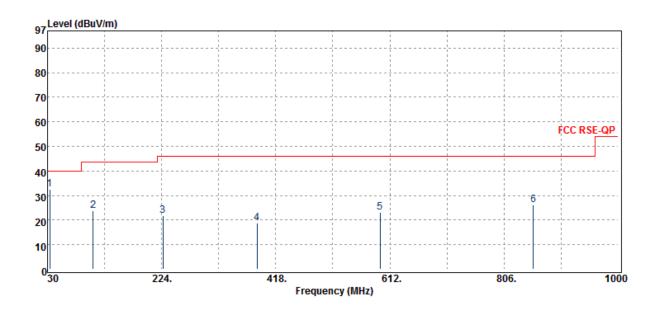
Operation Band Fundamental Frequency

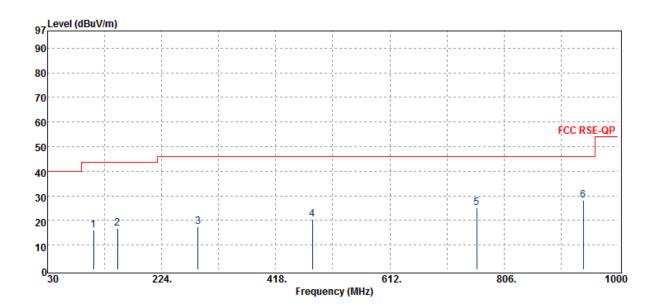
Operation Mode EUT Pol.

:802.11 g :2437 MHz :TX MID :E1 Plan

Test Date Temp./Humi. :2014-11-10 :23 deg_C / 58 RH

Engineer :Curry Measurement Antenna Pol. :Ver. / Hor.





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Operation Band Fundamental Frequency Operation Mode

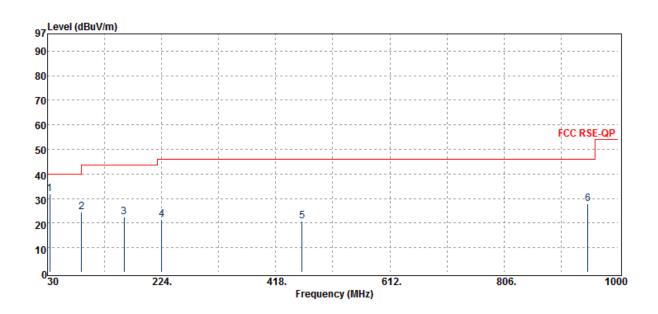
EUT Pol.

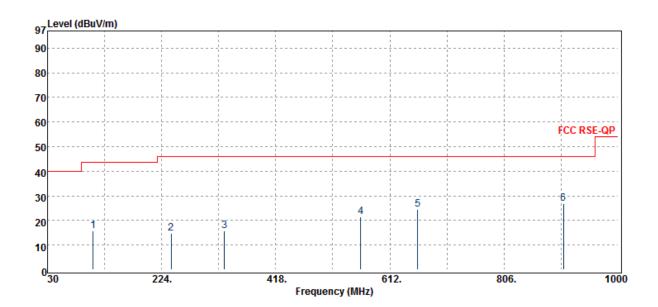
:802.11 g :2462 MHz :TX HIGH :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry Measurement Antenna Pol. :Ver. / Hor.





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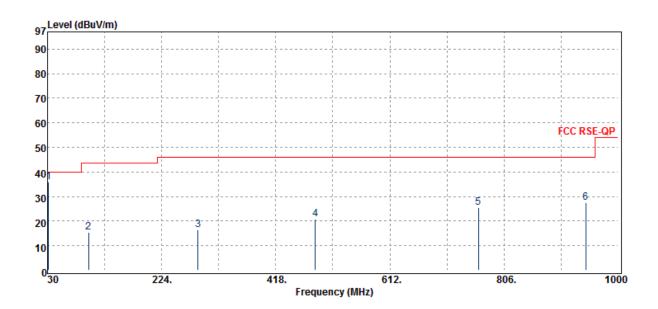
Operation Band Fundamental Frequency Operation Mode EUT Pol.

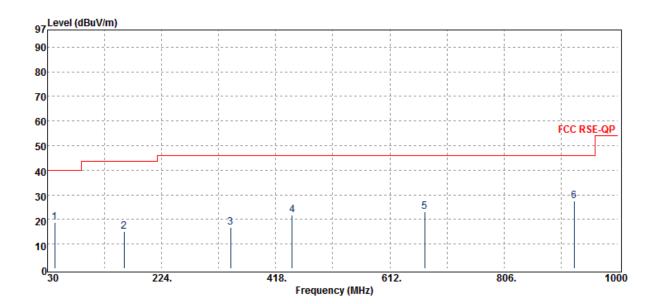
:802.11 n20M :2412 MHz :TX LOW :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry Measurement Antenna Pol. :Ver. / Hor.





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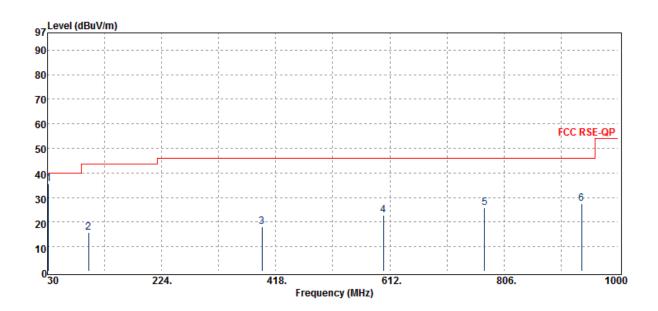
Operation Band Fundamental Frequency Operation Mode

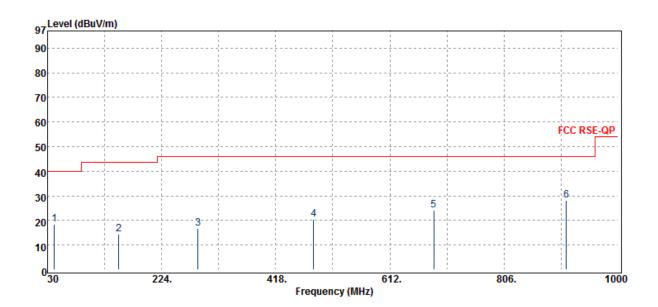
EUT Pol.

:802.11 n20M :2437 MHz :TX MID :E1 Plane

Test Date Temp./Humi. :2014-11-10 :23 deg_C / 58 RH

Engineer :Curry Measurement Antenna Pol. :Ver. / Hor.





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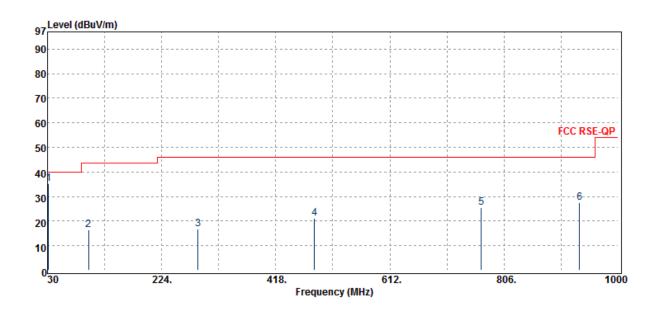
Operation Band Fundamental Frequency Operation Mode EUT Pol.

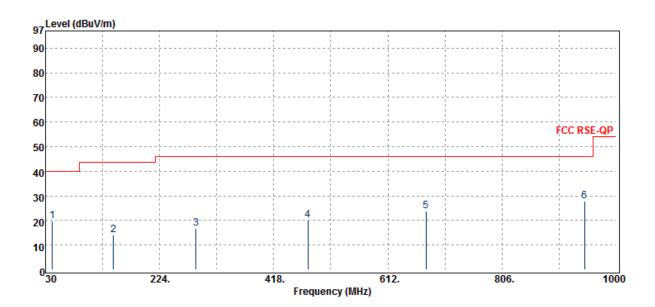
:802.11 n20M :2462 MHz :TX HIGH :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry Measurement Antenna Pol. :Ver. / Hor.





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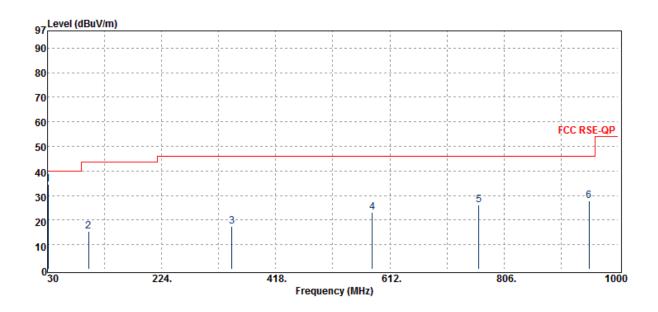
Operation Band Fundamental Frequency Operation Mode EUT Pol.

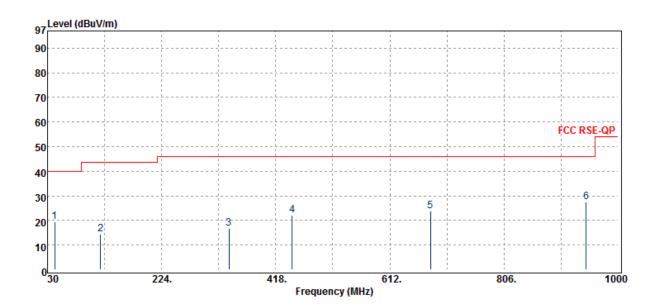
:802.11 n40M :2422 MHz :TX LOW :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry Measurement Antenna Pol. :Ver. / Hor.





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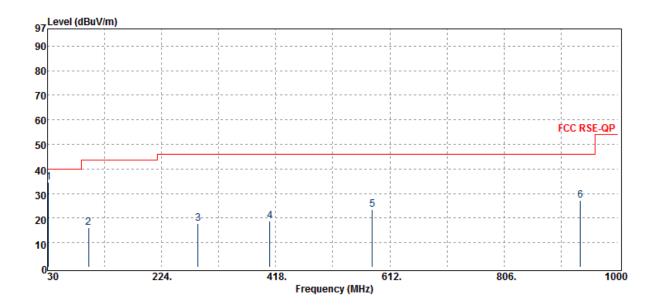
Operation Band Fundamental Frequency Operation Mode EUT Pol.

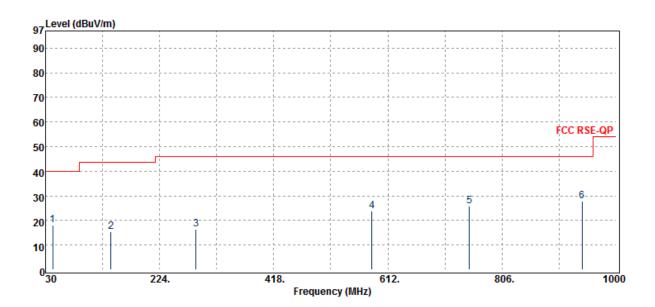
:802.11 n40M :2437 MHz :TX MID :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry Measurement Antenna Pol. :Ver. /Hor.





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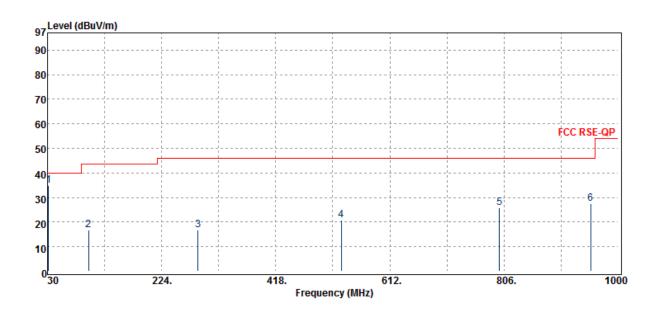
Operation Band Fundamental Frequency Operation Mode EUT Pol.

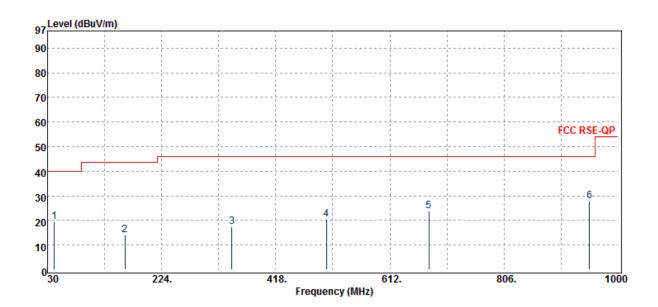
:802.11 n40M :2452 MHz :TX HIGH :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry Measurement Antenna Pol. :Ver. / Hor.





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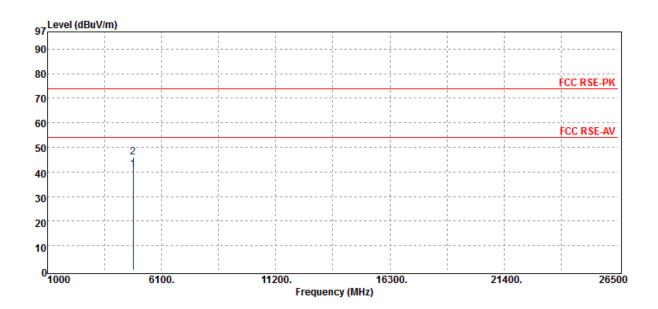
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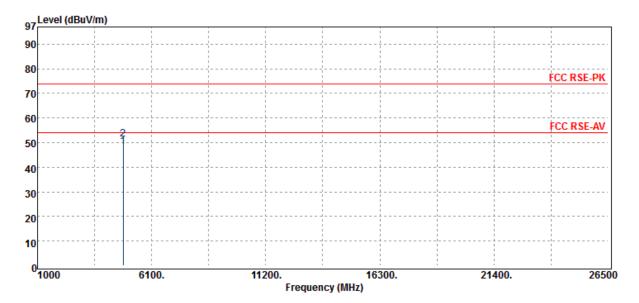
Radiated Spurious Emission Measurement photos Result (above 1GHz)

Operation Band :802.11 b Test Date :2014-11-10

Fundamental Frequency :2412 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry EUT Pol. :E1 Plane :Ver. / Hor. Measurement Antenna Pol.





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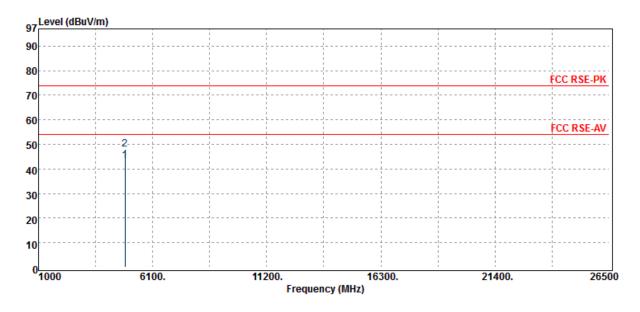
Report No.: ER/2014/B0045 Issue Date: Jan. 19, 2015

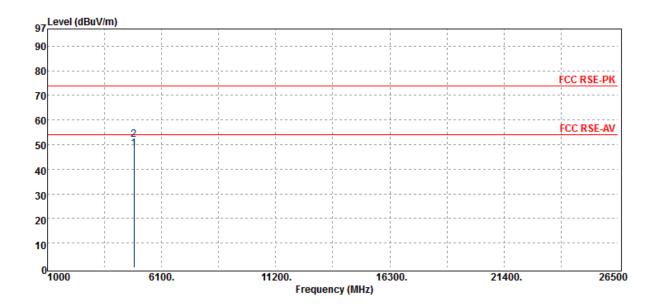
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Operation Band :802.11 b Test Date :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :Ver. / Hor.





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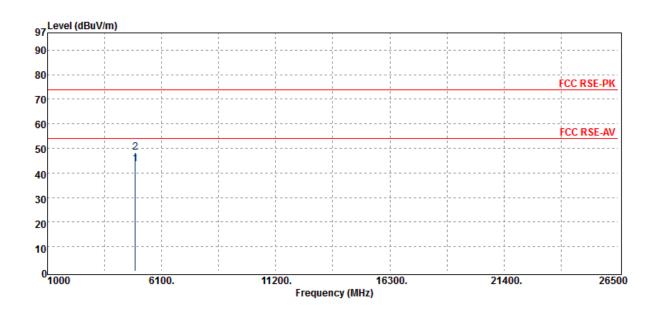
Report No.: ER/2014/B0045 Issue Date: Jan. 19, 2015

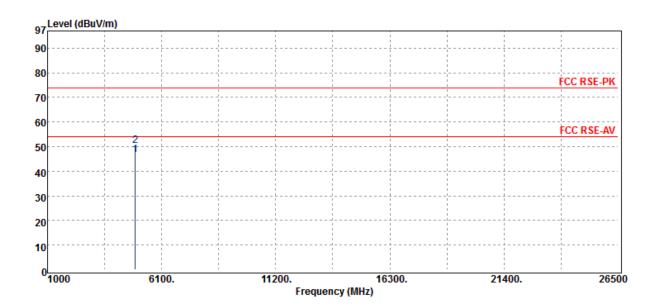
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Operation Band :802.11 b Test Date :2014-11-10

Fundamental Frequency :2462 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX HIGH Engineer :Curry EUT Pol. :E1 Plane :Ver. / Hor. Measurement Antenna Pol.





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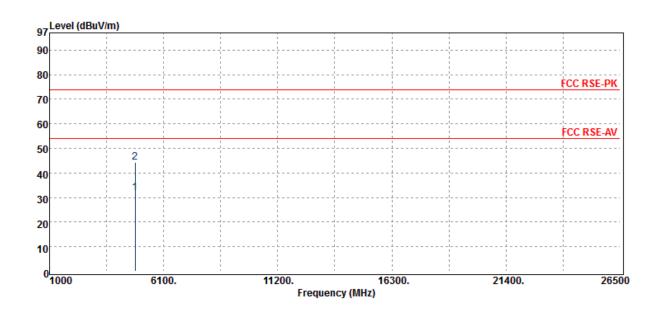
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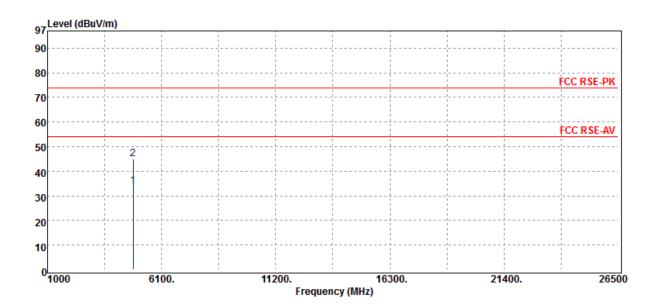
Operation Band Fundamental Frequency

:802.11 g :2412 MHz Operation Mode :TX LOW EUT Pol. :E1 Plane

Test Date Temp./Humi. :2014-11-10 :23 deg_C / 58 RH

Engineer :Curry :Ver. / Hor. Measurement Antenna Pol.





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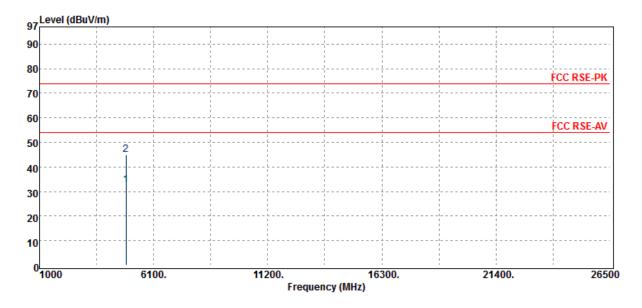
Report No.: ER/2014/B0045 Issue Date: Jan. 19, 2015

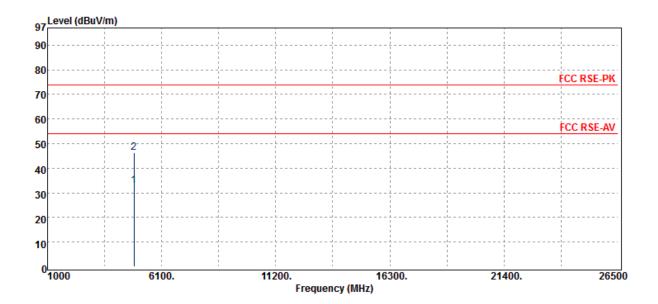
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Operation Band :802.11 g Test Date :2014-11-10

Fundamental Frequency :2437 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :Ver. / Hor.





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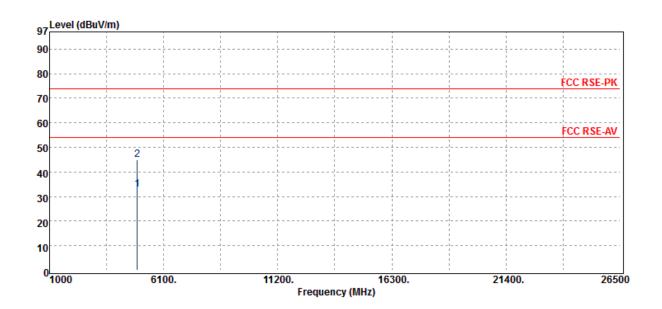
Operation Band Fundamental Frequency Operation Mode

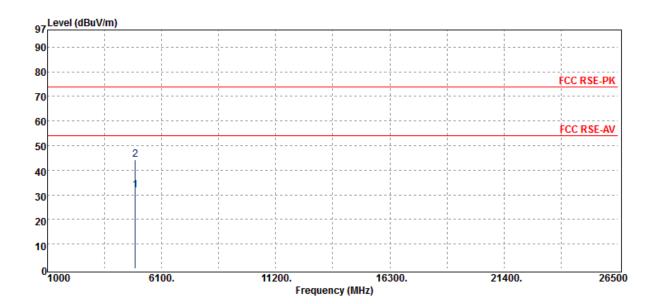
EUT Pol.

:802.11 g :2462 MHz :TX HIGH :E1 Plane

Test Date Temp./Humi. :2014-11-10 :23 deg_C / 58 RH

Engineer :Curry :Ver. / Hor. Measurement Antenna Pol.





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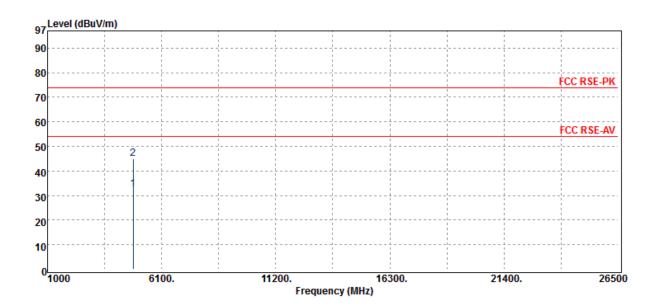
Operation Band Fundamental Frequency Operation Mode EUT Pol.

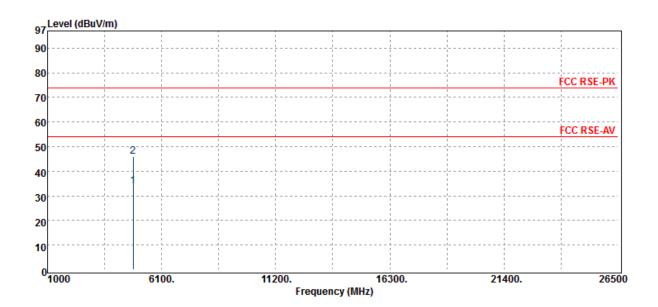
:802.11 n20M :2412 MHz :TX LOW :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry :Ver. / Hor. Measurement Antenna Pol.





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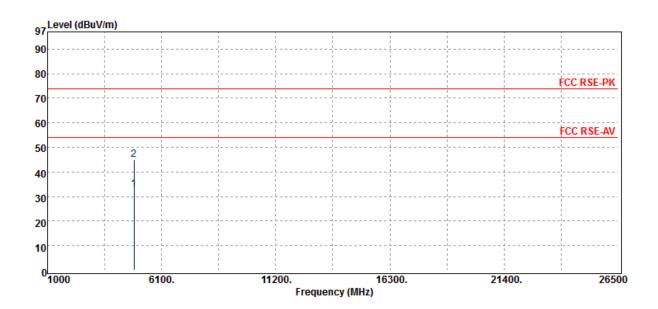
Operation Band Fundamental Frequency

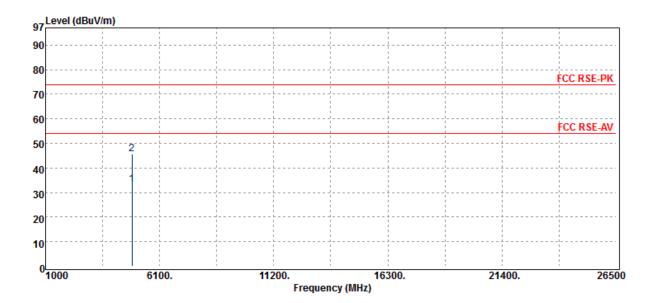
Operation Mode EUT Pol.

:802.11 n20M :2437 MHz :TX MID :E1 Plane

Test Date Temp./Humi. :2014-11-10 :23 deg_C / 58 RH

Engineer :Curry :Ver. / Hor. Measurement Antenna Pol.





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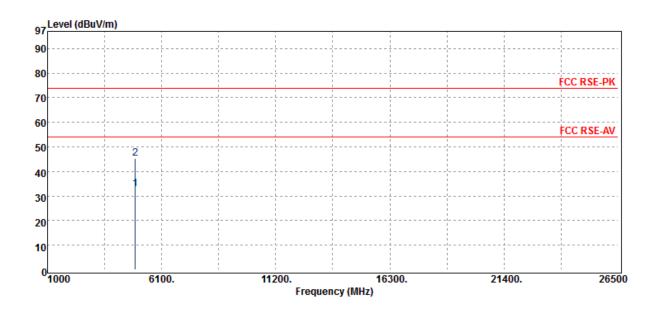


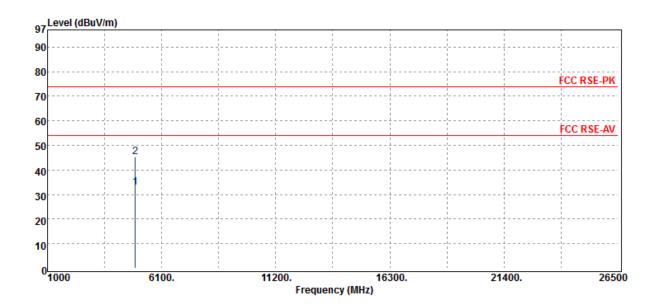
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Operation Band :802.11 n20M Test Date :2014-11-10 Fundamental Frequency :2462 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :TX HIGH Engineer :Curry EUT Pol. :E1 Plane Measurement Antenna Pol. :Ver. / Hor.





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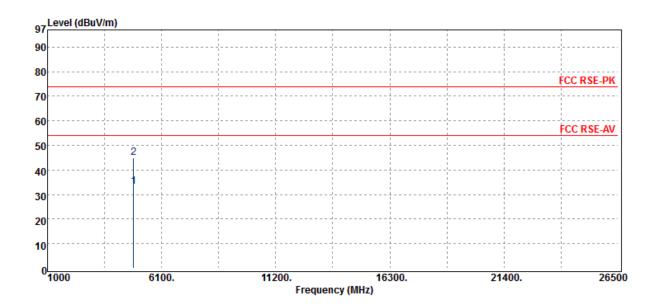
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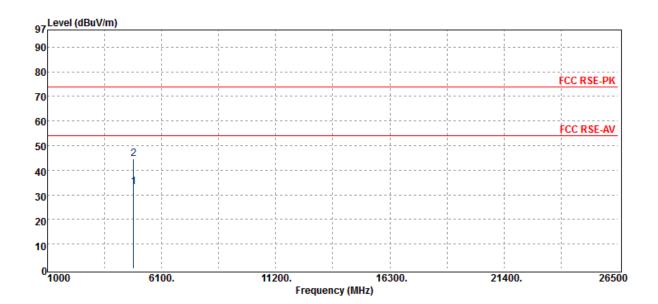
Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 n40M :2422 MHz :TX LOW :E1 Plane

Test Date Temp./Humi. :2014-11-10 :23 deg_C / 58 RH

Engineer :Curry :Ver. / Hor. Measurement Antenna Pol.





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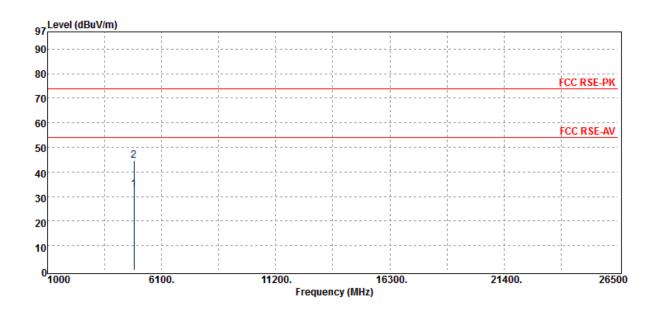
Operation Band Fundamental Frequency Operation Mode

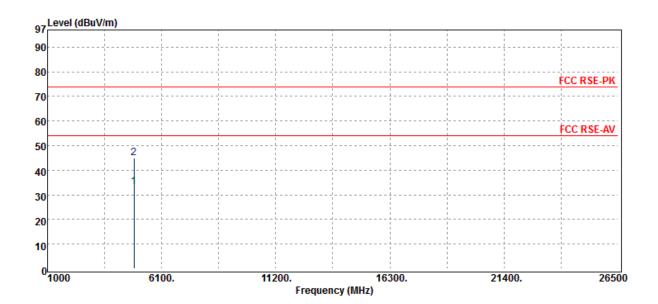
EUT Pol.

:802.11 n40M :2437 MHz :TX MID :E1 Plane

Test Date Temp./Humi. :2014-11-10 :23 deg_C / 58 RH

Engineer :Curry :Ver. /Hor. Measurement Antenna Pol.





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Operation Band Fundamental Frequency Operation Mode

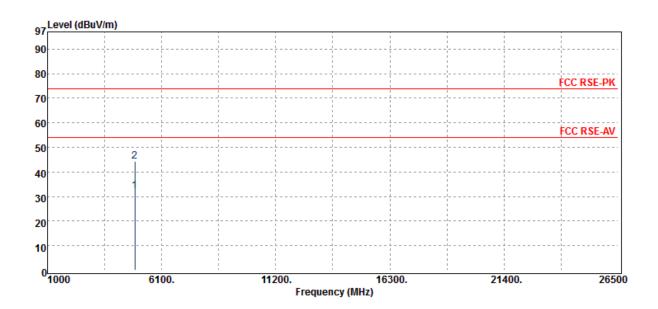
EUT Pol.

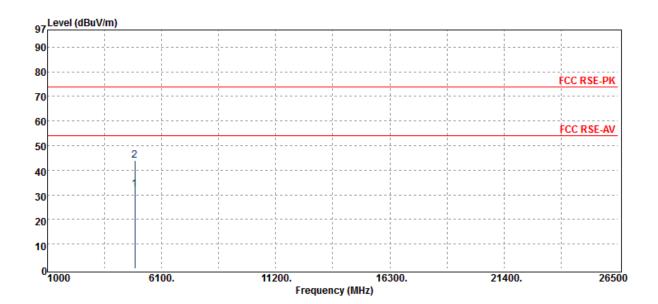
:802.11 n40M :2452 MHz :TX HIGH :E1 Plane

Test Date Temp./Humi. Engineer

:2014-11-10 :23 deg_C / 58 RH

:Curry :Ver. / Hor. Measurement Antenna Pol.





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