

Report No.: EH/2009/30023-02 Issue Date: Jan. 05, 2012 Page: 1 of 83

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

OF

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT AND INDUSTRY CANADA RSS 210 CLASS II PC REPORT

Product Name:	POS terminal
Brand Name:	INGENICO
Model No.:	iPA280; IPA280-01P1714
Model Differences:	IPA280-01P1714: TPO3.5"LCD (LCM) SWI Q2687G (Edge module)
FCC ID:	XKBIPA280
IC:	2586D-IPA280
Report No.:	EH/2009/30023-02
Issue Date:	Jan. 05, 2012
FCC Rule Part:	§15.247, Cat: DTS
IC Rule Part:	RSS-210 issue 8 :2010, Annex 8
Prepared for:	INGENICO 192, avenue Charles de Gaulle, 92200 Neuil- ly-sur-Seine, FRANCE
Prepared by:	SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.



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VERIFICATION OF COMPLIANCE

Applicant:	INGENICO 192, avenue Charles de Gaulle, 92200 Neuilly-sur-Seine, FRANCE
Product Name:	POS terminal
Brand Name:	INGENICO
FCC ID:	XKBIPA280
IC:	2586D-IPA280
Model No.:	iPA280; IPA280-01P1714
Model Difference:	IPA280-01P1714: TPO3.5"LCD (LCM) SWI Q2687G (Edge module)
File Number:	EH/2009/30023-02
Date of test:	Nov. 08, 2011 ~ Jan. 04, 2012
Date of EUT Received:	Nov. 08, 2011

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 (2003) and RSS-Gen. issue 3 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 and IC RSS 210 issue 8: 2010 Annex 8. The test results of this report relate only to the tested sample identified in this report.

Test By:	Marcus Tseng	Date	Jan. 05, 2012	
Prepared By:	Marcus Tseng / Engineer Celine Chou	Date	Jan. 05, 2012	
Approved By:	Celine Chou / Clerk Jim Chang Jim Chang / Supervisor	Date	Jan. 05, 2012	

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Version

Version No.	Date	Description
00	Jan. 05, 2012	Initial creation of document

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1 **GENERAL INFORMATION**

Product Description 1.1

General:

General.		
Product Name:	POS terminal	
Brand Name:	INGENICO)
Model No.:	iPA280; IP	A280-01P1714
Model Difference:	IPA280-01	P1714: TPO3.5"LCD (LCM) SWI Q2687G (Edge module)
Data Cable:	Model No.: N/A, Supplier: Ingenico	
Hardware Version:	PRE-DVT	
Software Version:	0.60.00.G	
	3.6Vdc Lithium Ion battery or 5Vdc by AC/DC power adapter	
Power Supply:	Battery:Model No.: IPA200-BAT, Supplier: IngenicoAdapter:Model No.: DSA-10CU-05, Supplier: DVE	

WLAN: 802.11 b/g

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology	Type of Emission
11b/g	2412 - 2462	11	b: 13.97 dBm g: 15.31 dBm	DSSS, OFDM	b: 13M8G1D g: 16M5G1D
Antenna	Designation	PIFA Ante	nna / Gain: -0.85dBi		
Modulat	Modulation typeCCK, 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					
Class II Permissive change 1. BT & WIFI Antenna location exchange 2. BT & WIFI matching impedance adjustment – Nominal Gain with Higher Value			Iominal Gain with		

This report applies for WLAN

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1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID:** <u>XKBIPA280</u> filing to comply with Section 15.247 of the FCC Part 15C, Subpart C Rules. And **IC:** <u>2586D-IPA280</u> filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 8. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and RSS-Gen: 2010. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-4.

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

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

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 requirements in Section 7 and 13 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

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 of ANSI C63.4-2003.

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Configuration of Tested System 2.4

Fig. 2-1 Conducted Emission Configuration



Fig. 2-2 Radiated Emission Configuration



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.
1.	N/A			

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result	
§15.207(a)/	AC Power Line Conducted Emission	Compliant	
RSS-Gen §7.2.4 §15.247(b)/		r	
RSS-210 §A8.4(4)	Peak Output Power	Compliant	
§15.247(b)/	6dB Bandwidth	Compliant	
RSS-210 §A8.4(4)		Compliant	
§15.247(c)/	100 KHz Bandwidth Of	Compliant	
RSS-210 §A8.4(4)	Frequency Band Edges		
§15.247(c)/	Spurious Emission	Compliant	
RSS-210 §A8.4(4)	1	I	
§15.247/	Peak Power Density	Compliant	
RSS-210 §A8.2(b)		I	
§15.203/	Antenna Requirement	Compliant	
RSS-GEN §7.1.2,		F	
RSS-Gen §4.6.1	99% Power Bandwidth	Compliant	

4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

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

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

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

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CONDUCTED EMISSION TEST 5

5.1. **Standard Applicable:**

According to §15.207 and RSS-Gen §7.2.4, frequency range within 150KHz to 30MHz shall not exceed the Limit table as below.

Frequency range		.imits B(uV)			
MHz	Quasi-peak	Average			
0.15 to 0.50	66 to 56	56 to 46			
0.50 to 5	56	46			
5 to 30	60	50			
Note					
1. The lower limit shall apply at the transition frequencies					
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.					

5.2. Measurement Equipment Used:

AC Power Line Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
EMI Test Receiver	R&S	ESCS30	828985/004	09/23/2010	09/22/2012		
LISN	Rolf-Heine	NNB-2/16Z	99012	03/31/2011	03/30/2012		
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/31/2011	03/30/2012		
Coaxial Cables	N/A	WK CE Cable	N/A	01/04/2011	01/05/2013		

5.3. EUT Setup:

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
- 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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5.4. 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 frequency measured were complete.

5.5. Measurement Result:

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

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

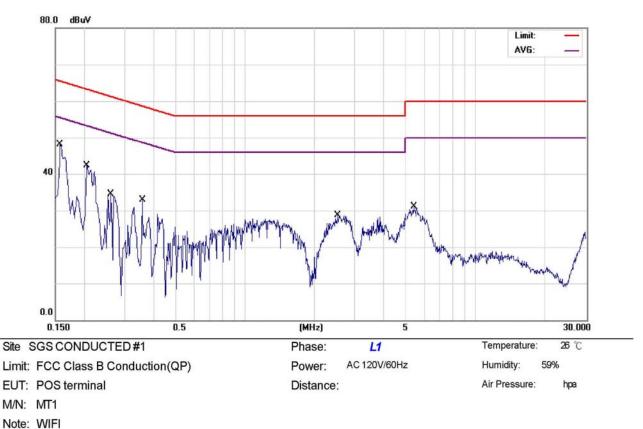
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	WLAN			Test Date:	Dec. 14, 2011
Temperature:	26 °C	Humidity:	59 %	Test By:	Marcus



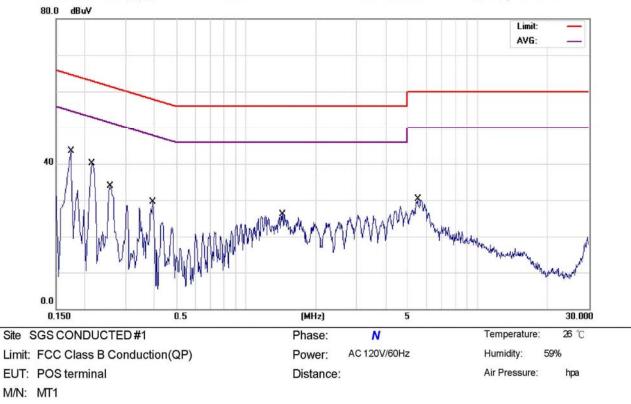
No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1	*	0.1580	48.06	0.13	48.19	65.57	-17.38	QP		
2		0.2060	42.15	0.12	42.27	63.37	-21.10	QP		
3		0.2620	34.45	0.12	34.57	61.37	-26.80	QP		
4		0.3580	32.78	0.12	32.90	58.77	-25.87	QP		
5		2.5380	28.51	0.16	28.67	56.00	-27.33	QP		
6		5.4140	30.98	0.20	31.18	60.00	-28.82	QP		

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Note: WIFI

No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1 *	0.1740	43.43	0.17	43.60	64.77	-21.17	QP		
2	0.2140	39.98	0.16	40.14	63.05	-22.91	QP		
3	0.2580	33.71	0.16	33.87	61.50	-27.63	QP		
4	0.3940	29.37	0.16	29.53	57.98	-28.45	QP		
5	1.4380	26.02	0.16	26.18	56.00	-29.82	QP		
6	5.5220	30.10	0.24	30.34	60.00	-29.66	QP		

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6 PEAK OUTPUT POWER MEASUREMENT

6.1 Standard Applicable:

According to §15.247(a)(2), (b)

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

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for

fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for

fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

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According to RSS-210 issue 8,§A8.4(4), for systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W. Except as provided in Section A8.4 (5), the e.i.r.p. shall not exceed 4 W.

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 signalling 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.

	Conducted Emission Test Site								
EQUIPMENT	MFR	MFR MODEL		LAST	CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.					
Power Sensor	Anritsu	MA2411B	917032	01/21/2010	01/20/2012				
Power Meter	Anritsu	ML2495A	1005007	02/17/2010	02/16/2012				
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012				
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/25/2011	01/24/2012				
DC Block	Agilent	BLK-18	155452	07/05/2011	07/04/2012				
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2011	01/04/2012				
Attenuator	Mini-Circuit	BW-S6W5	001	01/05/2011	01/04/2012				
Attenuator	Mini-Circuit	BW-S10W5	001	01/05/2011	01/04/2012				
Attenuator	Mini-Circuit	BW-S20W5	001	01/05/2011	01/04/2012				
Splitter	Agilent	11636B	N/A	01/05/2011	01/04/2012				

6.2 Measurement Equipment Used:

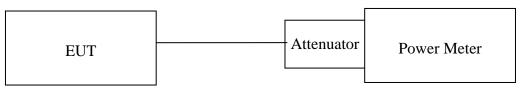
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6.3 .Test Set-up:



6.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.
- 3. Record the max. reading.
- 4. Repeat above procedures until all frequency measured were complete.

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6.5 Measurement Result:

802.11b mode:

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	13.43	13.43	0.02203	1
2442.00	13.74	13.74	0.02366	1
2462.00	13.97	13.97	0.02495	1

802.11g mode:

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
2412.00	14.65	14.65	0.02917	1
2442.00	15.28	15.28	0.03373	1
2462.00	15.31	15.31	0.03396	1

Note: Offset 11.0 dB

Note: Refer to next page for plots.

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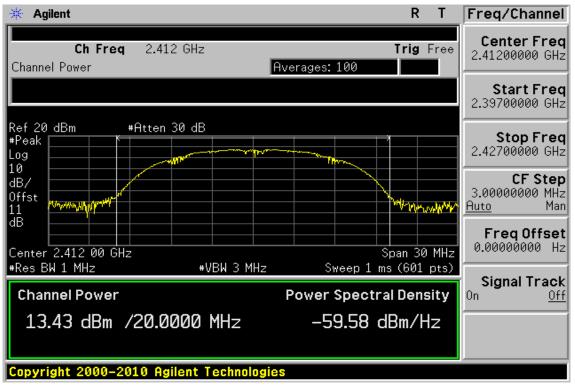
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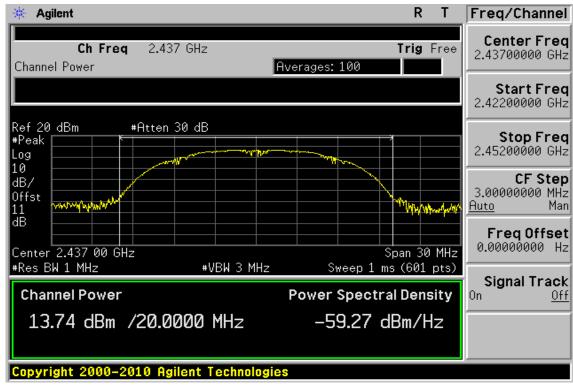
Report No.: EH/2009/30023-02 Issue Date: Jan. 05, 2012 Page: 19 of 83

802.11b, 1Mbps

Peak Power Output Plot (CH Low)



Peak Power Output Plot (CH Mid)



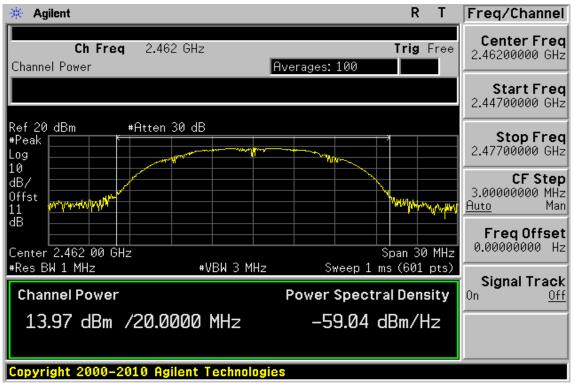
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Peak Power Output Plot (CH High)



Average Power Output Plot (CH Low)



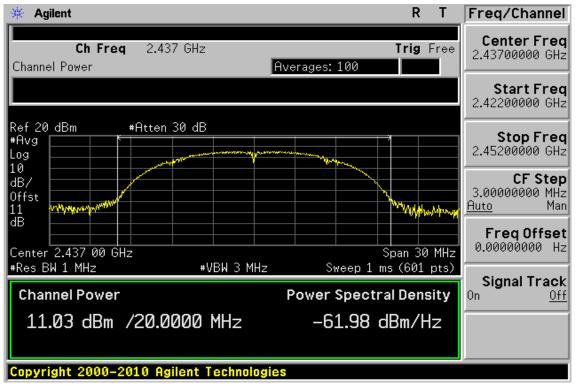
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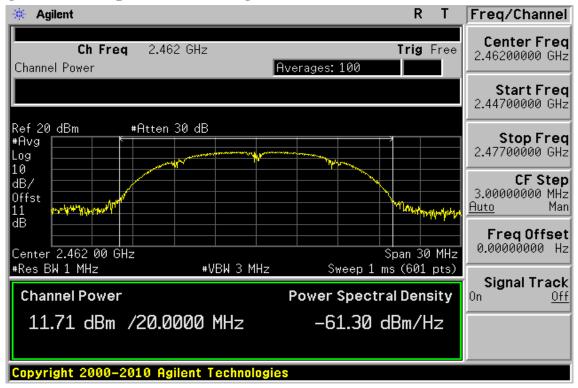
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Average Power Output Plot (CH Mid)



Average Power Output Plot (CH High)



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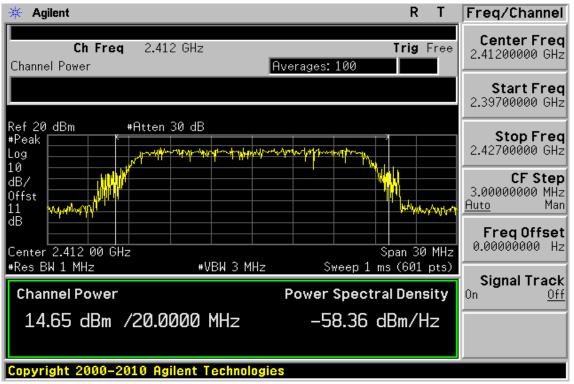
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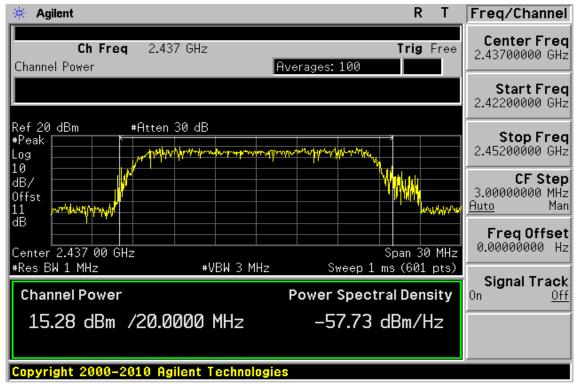
Report No.: EH/2009/30023-02 Issue Date: Jan. 05, 2012 Page: 22 of 83

802.11g, 6Mbps

Peak Power Output Plot (CH Low)



Peak Power Output Plot (CH Mid)



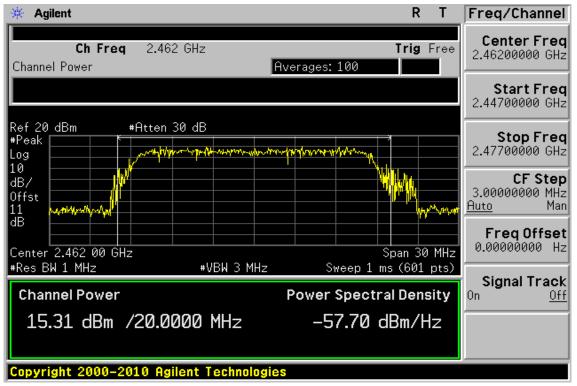
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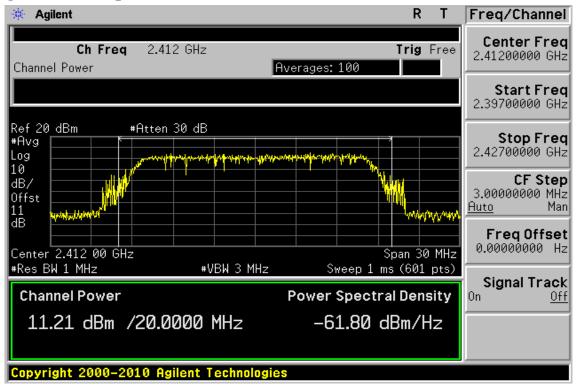
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Peak Power Output Plot (CH High)



Average Power Output Plot (CH Low)

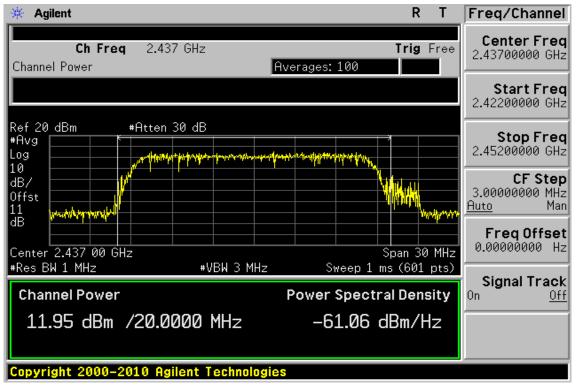


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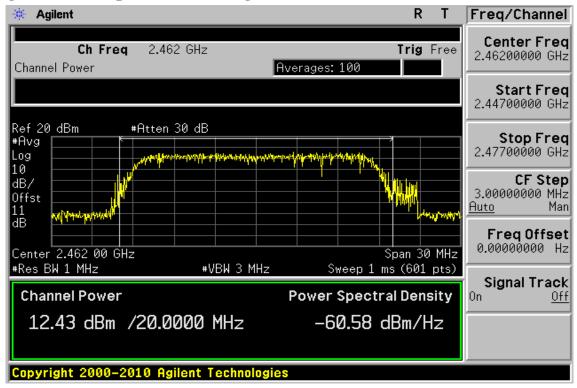
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Average Power Output Plot (CH Mid)



Average Power Output Plot (CH High)



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7 6dB Bandwidth

7.1 Standard Applicable:

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

According to RSS 210 issue 8: 2010Annex 8.2. Systems employing digital modulation techniques (which includes direct sequence) can now be certified under RSS-210 provided they comply with the following requirements: The minimum 6 dB bandwidth shall be at least 500 kHz.

7.2 Measurement Equipment Used:

Refer to section 6.2 for details.

7.3 Test Set-up:

Refer to section 6.3 for details.

7.4 Measurement Procedure:

- 1.Place the EUT on the table and set it in transmitting mode.
- 2.Remove the antenna from the EUT and then connect a low loss RF cable from the 3.antenna port to the spectrum analyzer.
- 3.Set the spectrum analyzer as RBW=100KHz, VBW = 3*RBW, Span= 30M/60MHz, Sweep=auto
- 4. Mark the peak frequency and -6dB (upper and lower) frequency.
- 5. Repeat above procedures until all frequency measured were complete.

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7.5 Measurement Result:

802.11b

Frequency	Bandwidth	Bandwidth	Result
(MHz)	(MHz)	(KHz)	Kesuit
2412	10.147	> 500	PASS
2437	10.145	> 500	PASS
2462	10.146	> 500	PASS

802.11g

Frequency	Bandwidth	Bandwidth	Result	
(MHz)	(MHz)	(KHz)	Result	
2412	16.444	> 500	PASS	
2437	16.448	> 500	PASS	
2462	16.446	> 500	PASS	

offset: 11.0dB

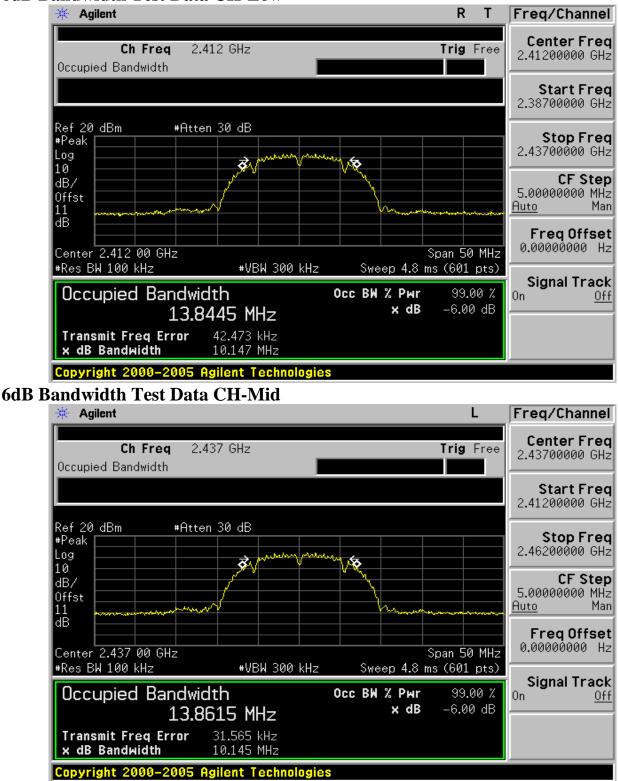
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802.11b 6dB Bandwidth Test Data CH-Low



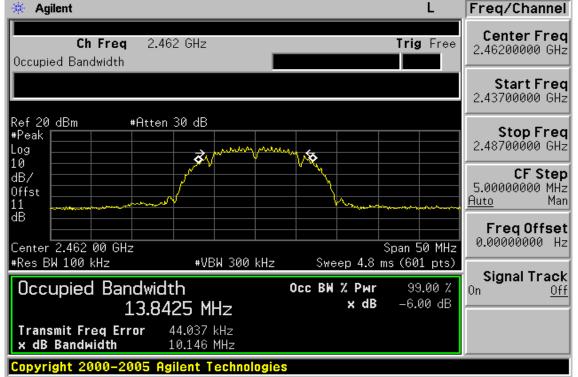
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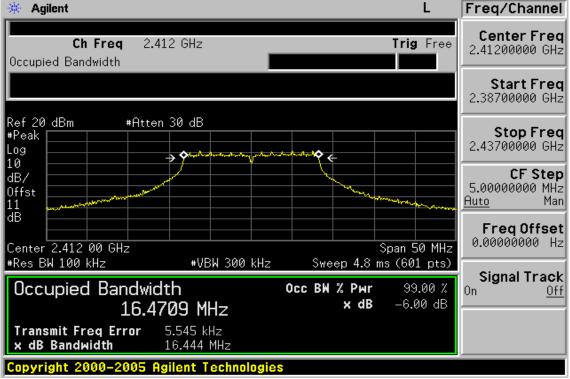


6dB Bandwidth Test Data CH-High



802.11g

6dB Bandwidth Test Data CH-Low



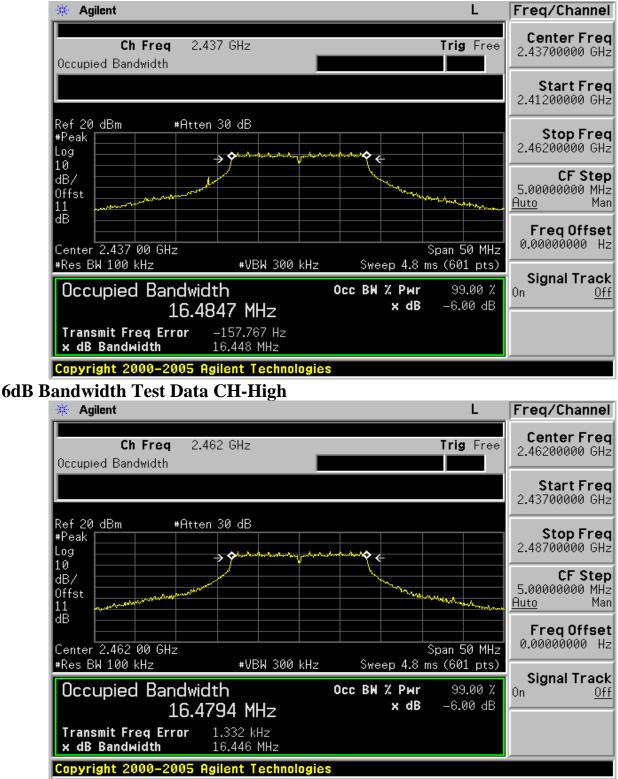
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6dB Bandwidth Test Data CH-Mid



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8 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

8.1 Standard Applicable:

According to §15.247(c), 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 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

According to RSS-210 issue 8,§A8.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced 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 section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

8.2 Measurement Equipment Used:

8.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

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8.2.2. Radiated emission:

966 Chamber							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	R&S	FSP 40	100034	03/30/2011	03/29/2012		
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2011	11/18/2013		
Horn antenna	ETS.LINDGREN	3117	123995	03/19/2011	03/18/2013		
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2011	11/27/2013		
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2011	01/04/2012		
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012		
DC Block	Agilent	BLK-18	155452	01/05/2011	01/04/2012		
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	SUCOFLEX 104PEA-10M	10m	01/05/2011	01/04/2012		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2011	01/04/2012		
3m Site	SGS	966 chamber	N/A	07/15/2011	07/14/2012		

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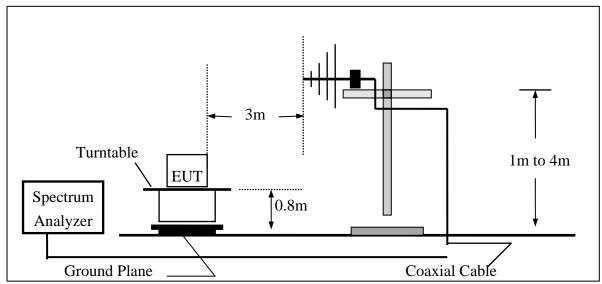
8.3 Test SET-UP:

8.3.1 Conducted Emission at antenna port:

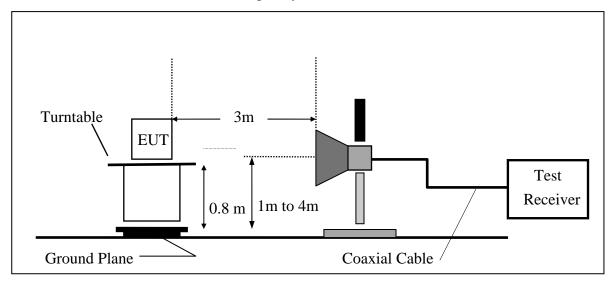
Refer to section 6.3 for details.

8.3.2 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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8.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
- 5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
- 6. Repeat above procedures until all frequency measured were complete.

8.5 Field Strength Calculation:

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

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

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

8.6 Measurement Result:

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

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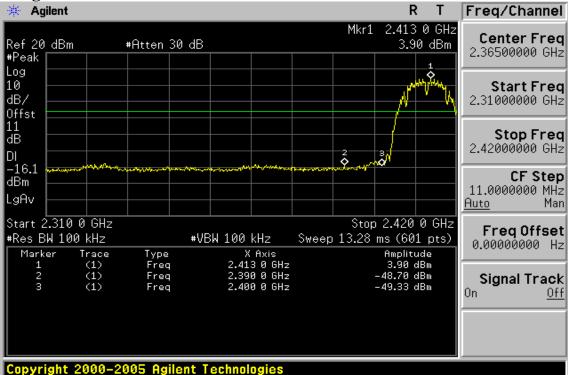
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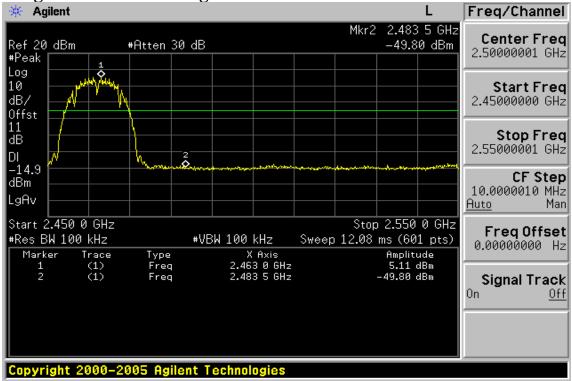


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802.11b Band Edges Test Data CH-Low







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Radiated Emission: 802.11 b mode							
Operation B	and	:802.11b	:802.11b			:2011-11	-14
Fundamenta	l Frequency	:2412 MHz		Temp./Hum	ii.	:27 deg_	C / 66 RH
Operation M	Iode	:CH LOW I	BANDEDGE	Engineer		:Marcus	
EUT Pol.		:H PLAN		Measureme	nt Antenna P	ol. :VERTIC	CAL
Actual FS(d	$B\mu V/m) = S$	SPA. Reading	$level(dB\mu V) +$	- Factor(dB)			
Factor(dB) =	= Antenna F	actor(dBµV/n	n) + Cable Los	$s(dB) - Pre_{-}$	Amplifier Ga	in(dB)	
Note : "F	": denotes l	Fundamental	Frequency. ; "I	H" : denotes H	larmonic Freq	uency.	
"E	E" : denotes I	Band Edge Fre	quency. ; "S" :	denotes Spur	ious Frequen	cy.	
"_	" : denotes	Noise Floor.					
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level	1	FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
2390.00	Е	Average	39.52	5.17	44.69	54.00	-9.31
2390.00	Е	Peak	53.61	5.17	58.78	74.00	-15.22

Operation Band	:802.11b	Test Date	:2011-11-14			
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH			
Operation Mode	:CH LOW BANDEDGE	Engineer	:Marcus			
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL			
Actual $FS(dB\mu V/m) = SPA$. Reading level($dB\mu V$) + Factor(dB)						

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

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

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
2390.00	E	Average	39.29	5.79	45.08	54.00	-8.92
2390.00	E	Peak	52.78	5.79	58.57	74.00	-15.43

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Operation Band		:802.11b	:802.11b Test Date		:2011-11-14		-14
Fundamenta	l Frequency	:2462 MHz		Temp./Hum	ii.	:27 deg_	C / 66 RH
Operation M	Iode	:CH HIGH	BANDEDGE	Engineer		:Marcus	
EUT Pol.		:H PLAN		Measureme	nt Antenna Po	ol. :VERTIC	CAL
Actual FS(d	$B\mu V/m) = S$	PA. 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 F	Fundamental I	Frequency. ; "H	I" : denotes H	larmonic Freq	uency.	
"Е	E" : denotes E	Band Edge Free	quency. ; "S" : a	denotes Spur	ious Frequen	cy.	
··	" : denotes	Noise Floor.					
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
2483.50	E	Average	40.39	5.69	46.08	54.00	-7.92
2483.50	E	Peak	52.14	5.69	57.83	74.00	-16.17

Operation Band	:802.11b	Test Date	:2011-11-14			
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH			
Operation Mode	:CH HIGH BANDEDGE	Engineer	:Marcus			
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL			
Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)						

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

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

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

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
2483.50	E	Average	39.27	6.72	45.99	54.00	-8.01
2483.50	E	Peak	49.95	6.72	56.67	74.00	-17.33

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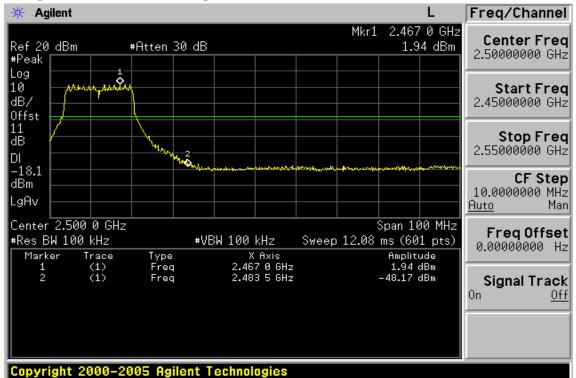
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802.11g

Band Edges Test Data CH-Low

🔆 Agilent Freg/Channel L Mkr1 2.417 1 GHz Center Frea Ref 20 dBm 0.75 dBm #Atten 30 dB 2.36500000 GHz #Peak Log M 10 Start Freq e k e dB/ 2.31000000 GHz Offst 3 11 Stop Freq dB 2.42000000 GHz DI 2 -19.2 **CF** Step dBm 11.0000000 MHz LaAv Man Auto Stop 2.420 0 GHz Start 2.310 0 GHz Freq Offset #Res BW 100 kHz #VBW 100 kHz Sweep 13.28 ms (601 pts) 0.00000000 Hz Amplitude Trace (1) (1) (1) Marker X Axis 2.417 1 GHz 2.390 0 GHz Type Freq Freq 0.75 dBm -49.19 dBm -32.38 dBm 1 Signal Track 2.400 0 GHz 3 Frea 0n Off Copyright 2000-2005 Agilent Technologies

Band Edges Test Data CH-High



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Radiated Emission: 802.11 g mode							
Operation Ba	and	:802.11g		Test Date		:2011-11	-14
Fundamenta	l Frequency	:2412 MHz		Temp./Hum	i.	:27 deg_	C / 66 RH
Operation M	lode	:CH LOW	BANDEDGE	Engineer		:Marcus	
EUT Pol.		:H PLAN		Measureme	nt Antenna Po	ol. :VERTIC	CAL
Actual FS(d)	$B\mu V/m) = S$	PA. Reading	$level(dB\mu V) +$	- Factor(dB)			
Factor(dB) =	Antenna F	actor(dBµV/r	n) + Cable Los	s(dB) – Pre_	Amplifier Ga	in(dB)	
Note : "F	": denotes l	Fundamental	Frequency. ; "H	H": denotes H	larmonic Freq	uency.	
"Е	": denotes I	Band Edge Fre	equency.; "S" :	denotes Spur	ious Frequen	cy.	
"	": denotes	Noise Floor.					
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level	l	FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
2390.00	E	Average	41.89	5.17	47.06	54.00	-6.94
2390.00	E	Peak	59.74	5.17	64.91	74.00	-9.09

Operation Band	:802.11g	Test Date	:2011-11-14			
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH			
Operation Mode	:CH LOW BANDEDGE	Engineer	:Marcus			
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL			
Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)						

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

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

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

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V\!/m$	dB
2390.00	Е	Average	40.27	5.79	46.06	54.00	-7.94
2390.00	E	Peak	58.27	5.79	64.06	74.00	-9.94

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Operation Band		:802.11g		Test Date		:2011-11	:2011-11-14	
Fundamenta	l Frequency	:2462 MHz		Temp./Hum	ıi.	:27 deg_	C / 66 RH	
Operation M	Iode	:CH HIGH	BANDEDGE	Engineer		:Marcus		
EUT Pol.		:H PLAN		Measureme	nt Antenna Po	ol. :VERTIC	CAL	
Actual FS(d	$B\mu V/m) = S$	PA. 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 I	Fundamental	Frequency. ; "H	I" : denotes H	larmonic Freq	uency.		
"Е	": denotes E	Band Edge Fre	equency. ; "S" : a	denotes Spur	ious Frequen	cy.		
··	" : denotes	Noise Floor.						
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB	
2483.50	E	Average	42.21	5.69	47.90	54.00	-6.10	
2483.50	E	Peak	61.54	5.69	67.23	74.00	-6.77	

Operation Band	:802.11g	Test Date	:2011-11-14		
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH		
Operation Mode	:CH HIGH BANDEDGE	Engineer	:Marcus		
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL		
Actual $FS(dB\mu V/m) = SPA$. Reading level($dB\mu V$) + Factor(dB)					

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

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

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
2483.50	E	Average	39.77	6.72	46.49	54.00	-7.51
2483.50	E	Peak	55.75	6.72	62.47	74.00	-11.53

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9 SPURIOUS RADIATED EMISSION TEST

9.1 Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). 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.

According to RSS-210 issue 8,§A8.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced 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 section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

9.2 Measurement Equipment Used:

9.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

9.2.2. Radiated emission:

Refer to section 7.2 for details.

9.3 Test SET-UP:

9.3.1. Conducted Emission at antenna port:

Refer to section 6.3 for details.

9.3.2. Radiated emission:

Refer to section 7.3 for details.

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9.4 Measurement Procedure:

Radiated Emission:

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

Conducted Emission:

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. Set RBW = 100K & VBW = 100K on Spectrum.
- 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
- 4. Via Software, combine 5 spans of frequency range into one plot

9.5 Field Strength Calculation

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

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

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

9.6 Measurement Result:

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

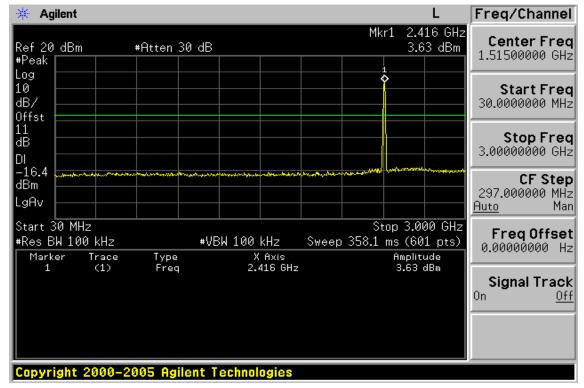
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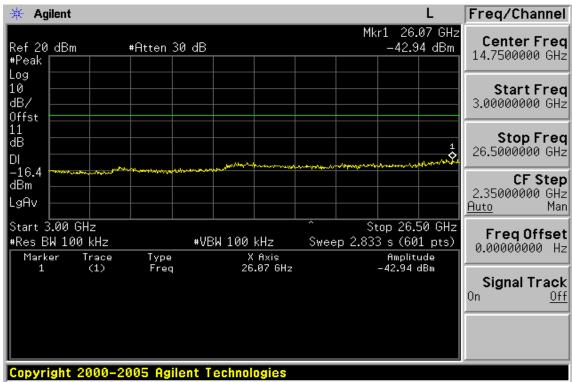
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Conducted Spurious Emission Measurement Result (802.11b) Ch Low 30MHz – 3GHz



Ch Low 3GHz – 26.5GHz



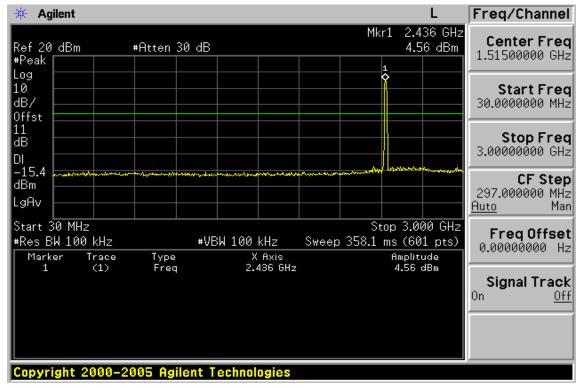
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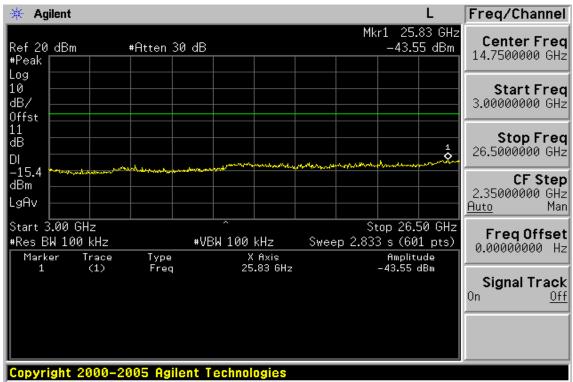


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Ch Mid 30MHz – 3GHz



Ch Mid 3GHz – 26.5GHz

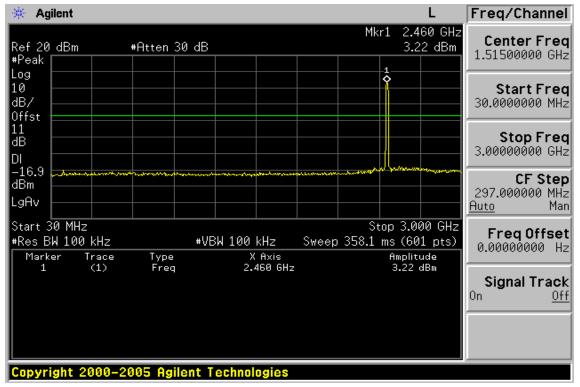


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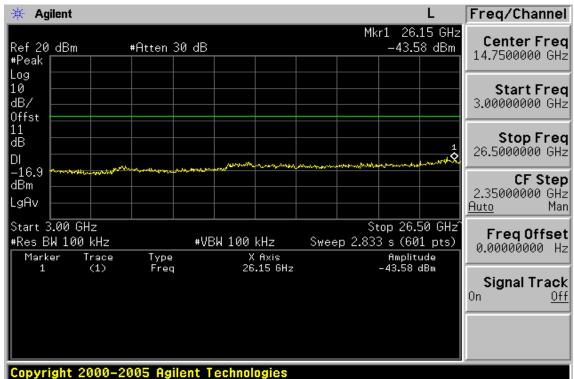
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Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



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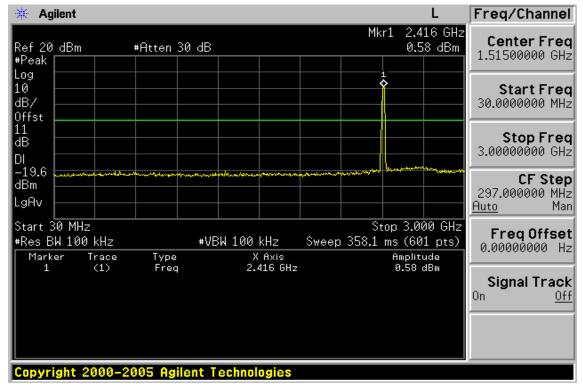
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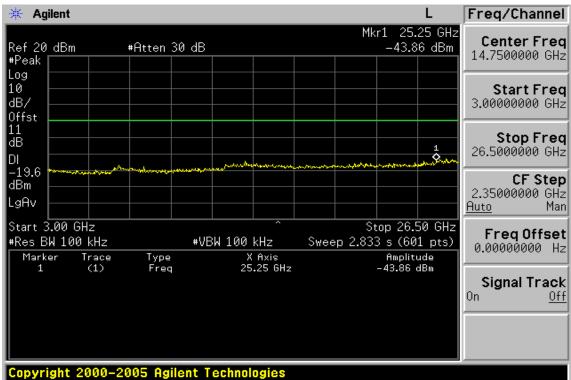
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Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz – 3GHz



Ch Low 3GHz – 26.5GHz



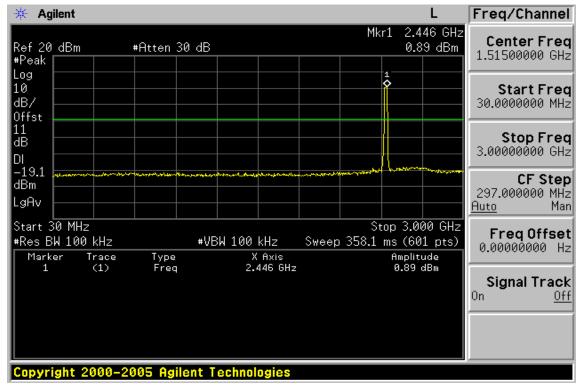
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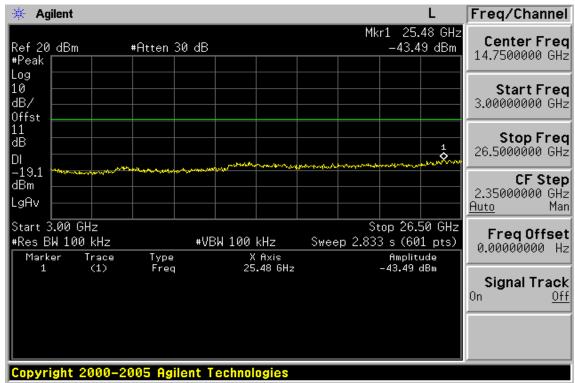


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Ch Mid 30MHz – 3GHz



Ch Mid 3GHz – 26.5GHz

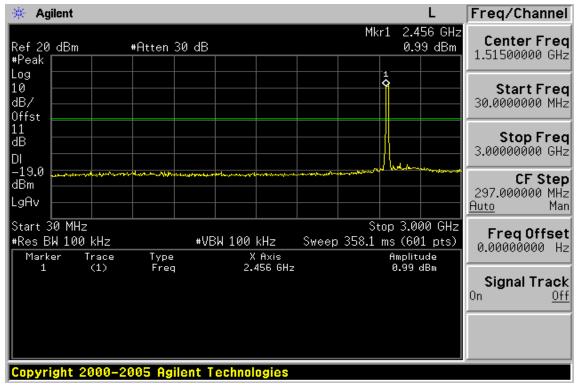


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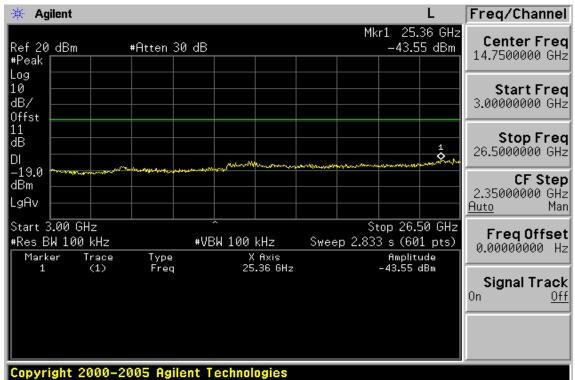
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Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



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Radiated Spurious Emission Measurement Result (802.11b)

Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
54.25	S	Peak	28.28	-14.21	14.07	40.00	-25.93
143.49	S	Peak	30.58	-12.17	18.41	43.50	-25.09
274.44	S	Peak	27.57	-12.45	15.12	46.00	-30.88
416.06	S	Peak	26.76	-9.98	16.78	46.00	-29.22
588.72	S	Peak	27.63	-7.11	20.52	46.00	-25.48
846.74	S	Peak	27.98	-2.89	25.09	46.00	-20.91
4824.00	Н	Peak	34.74	9.89	44.63	74.00	-29.37
7236.00							
9648.00							
12060.00							
14472.00							
16884.00							
19296.00							
21708.00							
24120.00							

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
46.49	S	Peak	28.23	-14.09	14.14	40.00	-25.86
163.86	S	Peak	26.88	-11.96	14.92	43.50	-28.58
232.73	S	Peak	29.45	-13.66	15.79	46.00	-30.21
286.08	S	Peak	30.08	-12.09	17.99	46.00	-28.01
416.06	S	Peak	30.70	-9.98	20.72	46.00	-25.28
748.77	S	Peak	28.71	-4.82	23.89	46.00	-22.11
4824.00	Н	Peak	34.60	9.90	44.50	74.00	-29.50
7236.00							
9648.00							
12060.00							
14472.00							
16884.00							
19296.00							
21708.00							
24120.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2437 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
143.49	S	Peak	30.34	-12.17	18.17	43.50	-25.33
250.19	S	Peak	27.05	-13.23	13.82	46.00	-32.18
425.76	S	Peak	27.87	-9.73	18.14	46.00	-27.86
515.00	S	Peak	27.95	-8.53	19.42	46.00	-26.58
703.18	S	Peak	27.73	-5.04	22.69	46.00	-23.31
802.12	S	Peak	26.96	-3.50	23.46	46.00	-22.54
4874.00	Н	Peak	33.88	10.22	44.10	74.00	-29.90
7311.00							
9748.00							
12185.00							
14622.00							
17059.00							
19496.00							
21933.00							
24370.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2437 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
39.70	S	Peak	27.04	-13.06	13.98	40.00	-26.02
148.34	S	Peak	26.78	-11.87	14.91	43.50	-28.59
335.55	S	Peak	30.05	-11.13	18.92	46.00	-27.08
416.06	S	Peak	29.99	-9.98	20.01	46.00	-25.99
551.86	S	Peak	27.57	-7.85	19.72	46.00	-26.28
715.79	S	Peak	28.04	-4.79	23.25	46.00	-22.75
4874.00	Н	Peak	34.65	10.17	44.82	74.00	-29.18
7311.00							
9748.00							
12185.00							
14622.00							
17059.00							
19496.00							
21933.00							
24370.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
49.40	S	Peak	28.51	-13.95	14.56	40.00	-25.44
143.49	S	Peak	30.11	-12.17	17.94	43.50	-25.56
275.41	S	Peak	27.25	-12.47	14.78	46.00	-31.22
369.50	S	Peak	27.52	-10.59	16.93	46.00	-29.07
578.05	S	Peak	28.92	-7.38	21.54	46.00	-24.46
793.39	S	Peak	27.28	-3.61	23.67	46.00	-22.33
4924.00	Н	Peak	35.00	10.02	45.02	74.00	-28.98
7386.00							
9848.00							
12310.00							
14772.00							
17234.00							
19696.00							
22158.00							
24620.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
158.04	S	Peak	27.01	-11.77	15.24	43.50	-28.26
232.73	S	Peak	30.29	-13.66	16.63	46.00	-29.37
348.16	S	Peak	28.68	-10.94	17.74	46.00	-28.26
416.06	S	Peak	29.50	-9.98	19.52	46.00	-26.48
622.67	S	Peak	28.64	-6.19	22.45	46.00	-23.55
850.62	S	Peak	27.40	-2.85	24.55	46.00	-21.45
4924.00	Н	Peak	34.71	9.91	44.62	74.00	-29.38
7386.00							
9848.00							
12310.00							
14772.00							
17234.00							
19696.00							
22158.00							
24620.00							

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Radiated Spurious Emission Measurement Result (802.11g)

Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
143.49	S	Peak	30.72	-12.17	18.55	43.50	-24.95
298.69	S	Peak	26.68	-11.89	14.79	46.00	-31.21
382.11	S	Peak	26.96	-10.43	16.53	46.00	-29.47
507.24	S	Peak	28.41	-8.65	19.76	46.00	-26.24
633.34	S	Peak	27.97	-6.05	21.92	46.00	-24.08
798.24	S	Peak	28.50	-3.57	24.93	46.00	-21.07
1994.50	S	Peak	39.55	4.64	44.19	74.00	-29.81
4824.00	Н	Peak	35.98	9.71	45.69	74.00	-28.31
7236.00							
9648.00							
12060.00							
14472.00							
16884.00							
19296.00							
21708.00							
24120.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
159.01	S	Peak	27.53	-11.67	15.86	43.50	-27.64
354.95	S	Peak	29.45	-10.88	18.57	46.00	-27.43
474.26	S	Peak	28.03	-9.11	18.92	46.00	-27.08
586.78	S	Peak	28.33	-7.19	21.14	46.00	-24.86
741.01	S	Peak	27.71	-4.94	22.77	46.00	-23.23
842.86	S	Peak	27.66	-2.94	24.72	46.00	-21.28
4824.00	Н	Peak	34.27	9.75	44.02	74.00	-29.98
7236.00							
9648.00							
12060.00							
14472.00							
16884.00							
19296.00							
21708.00							
24120.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2437 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
143.49	S	Peak	29.92	-12.17	17.75	43.50	-25.75
371.44	S	Peak	26.57	-10.60	15.97	46.00	-30.03
484.93	S	Peak	27.90	-8.98	18.92	46.00	-27.08
647.89	S	Peak	27.53	-5.91	21.62	46.00	-24.38
802.12	S	Peak	28.92	-3.50	25.42	46.00	-20.58
931.13	S	Peak	26.49	-1.51	24.98	46.00	-21.02
4874.00	Н	Peak	35.35	10.22	45.57	74.00	-28.43
7311.00							
9748.00							
12185.00							
14622.00							
17059.00							
19496.00							
21933.00							
24370.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2437 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
37.76	S	Peak	26.96	-13.32	13.64	40.00	-26.36
159.98	S	Peak	26.68	-11.57	15.11	43.50	-28.39
286.08	S	Peak	29.45	-12.09	17.36	46.00	-28.64
373.38	S	Peak	28.67	-10.56	18.11	46.00	-27.89
550.89	S	Peak	27.43	-7.83	19.60	46.00	-26.40
846.74	S	Peak	28.50	-2.89	25.61	46.00	-20.39
4874.00	Н	Peak	33.72	10.17	43.89	74.00	-30.11
7311.00							
9748.00							
12185.00							
14622.00							
17059.00							
19496.00							
21933.00							
24370.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
143.49	S	Peak	31.19	-12.17	19.02	43.50	-24.48
231.76	S	Peak	27.80	-13.70	14.10	46.00	-31.90
496.57	S	Peak	29.03	-8.83	20.20	46.00	-25.80
667.29	S	Peak	28.23	-5.61	22.62	46.00	-23.38
893.30	S	Peak	28.09	-2.21	25.88	46.00	-20.12
953.44	S	Peak	27.40	-1.24	26.16	46.00	-19.84
4924.00	Н	Peak	33.88	10.02	43.90	74.00	-30.10
7386.00							
9848.00							
12310.00							
14772.00							
17234.00							
19696.00							
22158.00							
24620.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
156.10	S	Peak	27.18	-11.64	15.54	43.50	-27.96
286.08	S	Peak	28.78	-12.09	16.69	46.00	-29.31
416.06	S	Peak	29.35	-9.98	19.37	46.00	-26.63
634.31	S	Peak	28.25	-6.04	22.21	46.00	-23.79
802.12	S	Peak	27.83	-3.50	24.33	46.00	-21.67
974.78	S	Peak	27.92	-1.15	26.77	54.00	-27.23
4924.00	Н	Peak	34.00	9.91	43.91	74.00	-30.09
7386.00							
9848.00							
12310.00							
14772.00							
17234.00							
19696.00							
22158.00							
24620.00							

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Radiated Spurious Emission Measurement Result(802.11b)

Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX LOW	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
143.49	S	Peak	31.15	-12.17	18.98	43.50	-24.52
358.83	S	Peak	27.79	-10.82	16.97	46.00	-29.03
460.68	S	Peak	28.91	-9.21	19.70	46.00	-26.30
593.57	S	Peak	28.70	-6.97	21.73	46.00	-24.27
744.89	S	Peak	28.53	-4.90	23.63	46.00	-22.37
904.94	S	Peak	27.54	-1.97	25.57	46.00	-20.43
4824.00	Н	Peak	30.53	9.89	40.42	74.00	-33.58
7236.00							
9648.00							
12060.00							
14472.00							
16884.00							
19296.00							
21708.00							
24120.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX LOW	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
40.67	S	Peak	26.88	-13.24	13.64	40.00	-26.36
151.25	S	Peak	28.89	-11.74	17.15	43.50	-26.35
225.94	S	Peak	30.07	-14.06	16.01	46.00	-29.99
349.13	S	Peak	30.59	-10.94	19.65	46.00	-26.35
528.58	S	Peak	28.68	-8.29	20.39	46.00	-25.61
755.56	S	Peak	29.24	-4.75	24.49	46.00	-21.51
4824.00	Н	Peak	31.17	9.90	41.07	74.00	-32.93
7236.00							
9648.00							
12060.00							
14472.00							
16884.00							
19296.00							
21708.00							
24120.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2437 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX MID	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
53.28	S	Peak	27.90	-14.24	13.66	40.00	-26.34
143.49	S	Peak	31.32	-12.17	19.15	43.50	-24.35
357.86	S	Peak	27.39	-10.86	16.53	46.00	-29.47
451.95	S	Peak	28.06	-9.27	18.79	46.00	-27.21
571.26	S	Peak	28.49	-7.52	20.97	46.00	-25.03
725.49	S	Peak	27.31	-4.52	22.79	46.00	-23.21
4874.00	Н	Peak	30.53	10.22	40.75	74.00	-33.25
7311.00							
9748.00							
12185.00							
14622.00							
17059.00							
19496.00							
21933.00							
24370.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2437 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX MID	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
56.19	S	Peak	27.64	-14.56	13.08	40.00	-26.92
152.22	S	Peak	26.88	-11.62	15.26	43.50	-28.24
374.35	S	Peak	29.46	-10.55	18.91	46.00	-27.09
539.25	S	Peak	28.01	-8.15	19.86	46.00	-26.14
637.22	S	Peak	27.95	-6.01	21.94	46.00	-24.06
811.82	S	Peak	27.78	-3.37	24.41	46.00	-21.59
4874.00	Н	Peak	31.04	10.17	41.21	74.00	-32.79
7311.00							
9748.00							
12185.00							
14622.00							
17059.00							
19496.00							
21933.00							
24370.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX HIGH	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
61.04	S	Peak	27.85	-14.85	13.00	40.00	-27.00
143.49	S	Peak	30.81	-12.17	18.64	43.50	-24.86
300.63	S	Peak	27.09	-11.75	15.34	46.00	-30.66
365.62	S	Peak	28.09	-10.68	17.41	46.00	-28.59
624.61	S	Peak	28.60	-6.15	22.45	46.00	-23.55
796.30	S	Peak	28.14	-3.59	24.55	46.00	-21.45
4924.00	Н	Peak	30.65	10.02	40.67	74.00	-33.33
7386.00							
9848.00							
12310.00							
14772.00							
17234.00							
19696.00							
22158.00							
24620.00							

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Operation Band	:802.11b	Test Date	:2011-11-14
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX HIGH	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
168.71	S	Peak	27.79	-12.38	15.41	43.50	-28.09
335.55	S	Peak	30.72	-11.13	19.59	46.00	-26.41
416.06	S	Peak	29.23	-9.98	19.25	46.00	-26.75
579.02	S	Peak	28.11	-7.37	20.74	46.00	-25.26
711.91	S	Peak	28.02	-4.86	23.16	46.00	-22.84
876.81	S	Peak	28.10	-2.50	25.60	46.00	-20.40
4924.00	Н	Peak	31.75	9.91	41.66	74.00	-32.34
7386.00							
9848.00							
12310.00							
14772.00							
17234.00							
19696.00							
22158.00							
24620.00							

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Radiated Spurious Emission Measurement Result (802.11g)

Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX LOW	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
99.84	S	Peak	30.11	-16.37	13.74	43.50	-29.76
143.49	S	Peak	30.21	-12.17	18.04	43.50	-25.46
288.99	S	Peak	26.77	-12.06	14.71	46.00	-31.29
437.40	S	Peak	27.68	-9.53	18.15	46.00	-27.85
627.52	S	Peak	27.72	-6.12	21.60	46.00	-24.40
803.09	S	Peak	27.31	-3.47	23.84	46.00	-22.16
4824.00	Н	Peak	30.77	9.89	40.66	74.00	-33.34
7236.00							
9648.00							
12060.00							
14472.00							
16884.00							
19296.00							
21708.00							
24120.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2412 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX LOW	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
61.04	S	Peak	28.03	-14.85	13.18	40.00	-26.82
150.28	S	Peak	27.57	-11.81	15.76	43.50	-27.74
286.08	S	Peak	29.34	-12.09	17.25	46.00	-28.75
416.06	S	Peak	30.08	-9.98	20.10	46.00	-25.90
658.56	S	Peak	28.05	-5.76	22.29	46.00	-23.71
832.19	S	Peak	27.78	-3.08	24.70	46.00	-21.30
4824.00	Н	Peak	30.82	9.90	40.72	74.00	-33.28
7236.00							
9648.00							
12060.00							
14472.00							
16884.00							
19296.00							
21708.00							
24120.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2437 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX MID	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
143.49	S	Peak	31.15	-12.17	18.98	43.50	-24.52
292.87	S	Peak	27.03	-12.01	15.02	46.00	-30.98
447.10	S	Peak	27.67	-9.36	18.31	46.00	-27.69
583.87	S	Peak	28.32	-7.22	21.10	46.00	-24.90
665.35	S	Peak	28.12	-5.65	22.47	46.00	-23.53
881.66	S	Peak	28.31	-2.39	25.92	46.00	-20.08
4874.00	Н	Peak	30.45	10.22	40.67	74.00	-33.33
7311.00							
9748.00							
12185.00							
14622.00							
17059.00							
19496.00							
21933.00							
24370.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2437 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX MID	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
152.22	S	Peak	26.92	-11.62	15.30	43.50	-28.20
286.08	S	Peak	29.88	-12.09	17.79	46.00	-28.21
416.06	S	Peak	28.81	-9.98	18.83	46.00	-27.17
595.51	S	Peak	27.09	-6.91	20.18	46.00	-25.82
624.61	S	Peak	28.77	-6.15	22.62	46.00	-23.38
885.54	S	Peak	28.68	-2.32	26.36	46.00	-19.64
4874.00	Н	Peak	30.64	10.17	40.81	74.00	-33.19
7311.00							
9748.00							
12185.00							
14622.00							
17059.00							
19496.00							
21933.00							
24370.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX HIGH	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V\!/\!m$	dB
143.49	S	Peak	30.31	-12.17	18.14	43.50	-25.36
268.62	S	Peak	27.18	-12.57	14.61	46.00	-31.39
435.46	S	Peak	28.48	-9.56	18.92	46.00	-27.08
577.08	S	Peak	28.13	-7.43	20.70	46.00	-25.30
725.49	S	Peak	27.57	-4.52	23.05	46.00	-22.95
935.98	S	Peak	27.74	-1.45	26.29	46.00	-19.71
4924.00	Н	Peak	31.33	10.02	41.35	74.00	-32.65
7386.00							
9848.00							
12310.00							
14772.00							
17234.00							
19696.00							
22158.00							
24620.00							

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Operation Band	:802.11g	Test Date	:2011-11-14
Fundamental Frequency	:2462 MHz	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:RX HIGH	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	$dB\mu V/m$	$dB\mu V/m$	dB
149.31	S	Peak	27.04	-11.81	15.23	43.50	-28.27
228.85	S	Peak	29.51	-13.86	15.65	46.00	-30.35
416.06	S	Peak	30.09	-9.98	20.11	46.00	-25.89
551.86	S	Peak	27.73	-7.85	19.88	46.00	-26.12
713.85	S	Peak	28.01	-4.81	23.20	46.00	-22.80
867.11	S	Peak	27.21	-2.62	24.59	46.00	-21.41
4924.00	Н	Peak	30.21	9.91	40.12	74.00	-33.88
7386.00							
9848.00							
12310.00							
14772.00							
17234.00							
19696.00							
22158.00							
24620.00							

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10 PEAK POWER SPECTRAL DENSITY

10.1 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 8 dBm 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.

According to RSS-210 issue 8, §A8.2(b) The transmitter power spectral density (into the antenna) shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0 second duration.

10.2 Measurement Equipment Used:

Refer to section 6.2 for details.

10.3 Test Set-up:

Refer to section 6.3 for details.

10.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW = 3KHz, VBW = 10KHz, Span = 1.5MHz, Sweep=100s
- 4. Record the max. reading.
- 5. Repeat above procedures until all frequency measured were complete.

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10.5 **Measurement Result:**

802.11b

Frequency MHz	RF Power Density Reading (dBm)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-11.35	-11.35	8
2437	-11.78	-11.78	8
2462	-11.45	-11.45	8

802.11g

Frequency MHz	RF Power Density Reading (dBm)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-14.30	-14.30	8
2437	-12.90	-12.90	8
2462	-12.17	-12.17	8

*Offset 11.0 dB

Note: Refer to next page for plots.

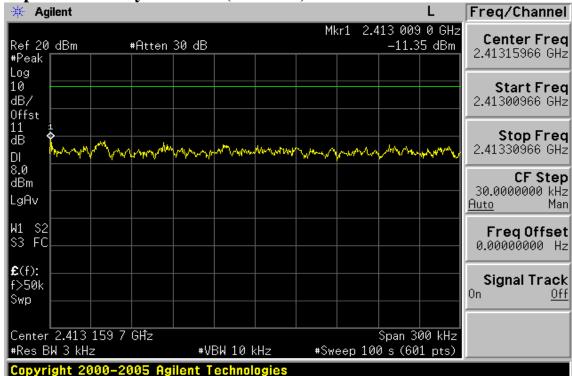
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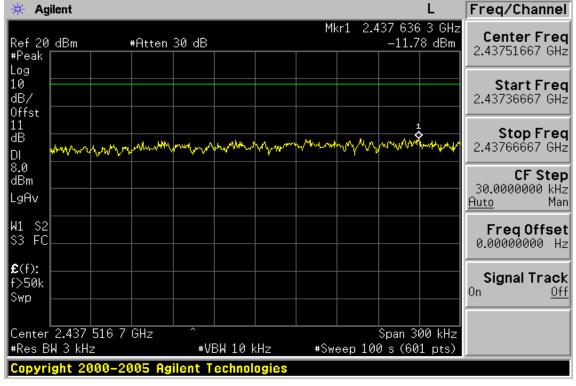


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802.11b Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

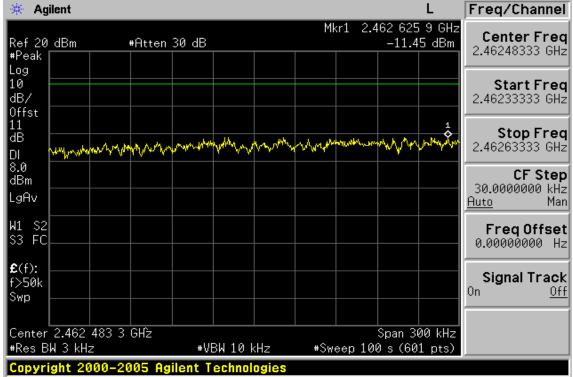


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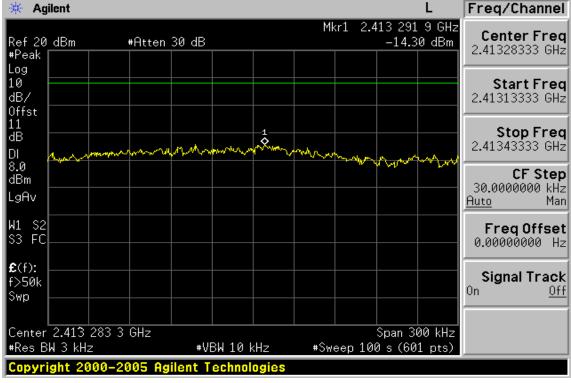


Power Spectral Density Test Plot (CH-High)



802.11g

Power Spectral Density Test Plot (CH-Low)

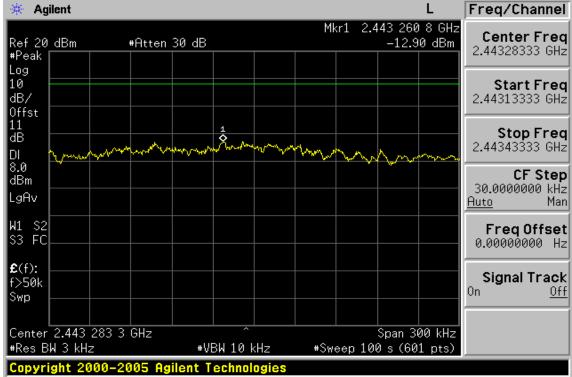


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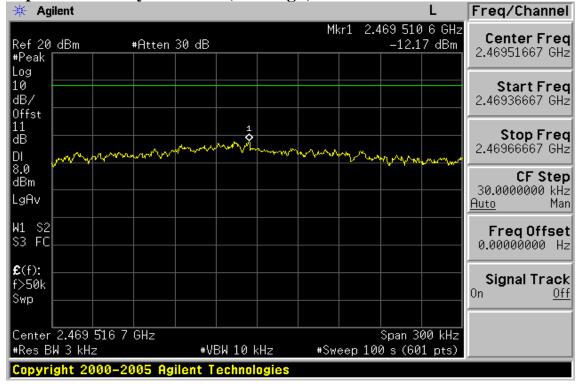
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Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



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11 ANTENNA REQUIREMENT

11.1. Standard Applicable:

According to §15.203, Antenna requirement.

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

replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some

field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the

proper antenna is employed so that the limits in this Part are not exceeded.

According to RSS-GEN 7.1.2, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

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When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

11.2. Antenna Connected Construction:

The directional gains of antenna used for transmitting is -0.85 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

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12 99% Bandwidth Measurement

12.1. Standard Applicable:

RSS-Gen §4.6.1, the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

The span between the two recorded frequencies is the occupied bandwidth.

12.2. Measurement Equipment Used:

Refer to section 6.2 for details.

12.3. Test Set-up:

Refer to section 6.3 for details.

12.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW=1% of the approximate emission bandwidth, VBW = 3 times RBW, Span= 30/60
- 4. Turn on the 99% bandwidth function, max reading..
- 5. Repeat above procedures until all frequency measured were complete.

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12.5. Measurement Result:

802.11b

Frequency	99%Bandwidth		
MHz	(MHz)		
2412	13.8355		
2437	13.7699		
2462	13.8412		

802.11g

Frequency	99%Bandwidth		
MHz	(MHz)		
2412	16.4879		
2437	16.4737		
2462	16.4843		

*Offset 11.0 dB

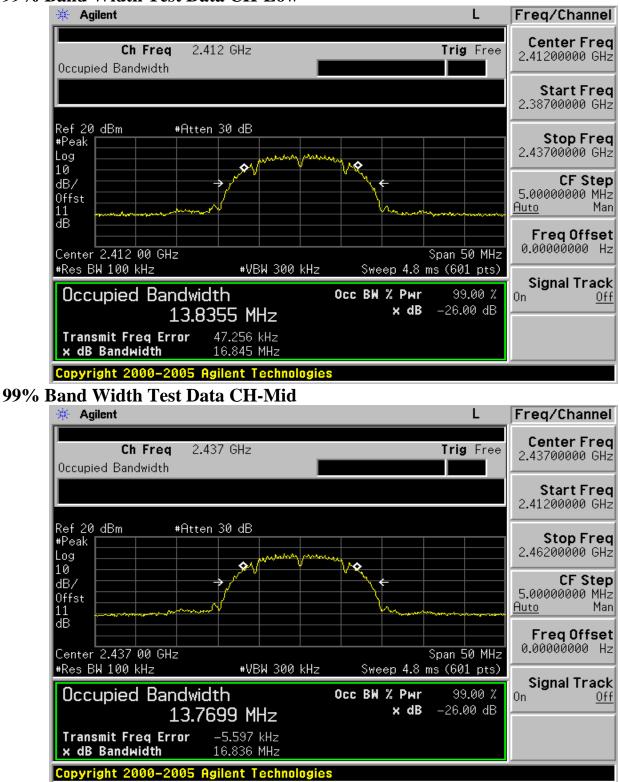
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802.11b 99% Band Width Test Data CH-Low

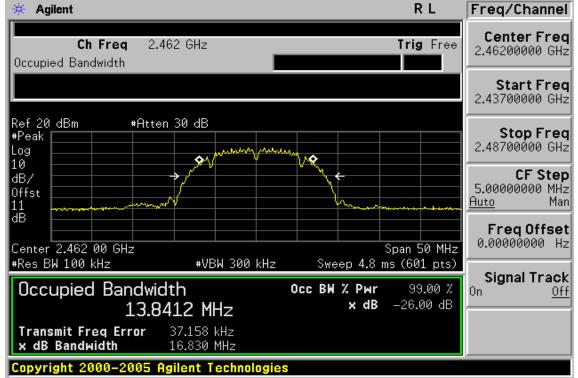


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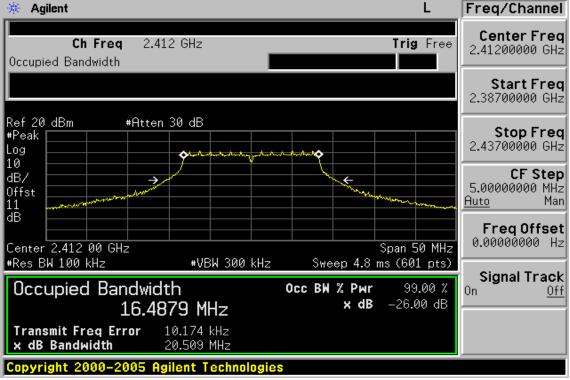


99% Band Width Test Data CH-High



802.11g

99% Band Width Test Data CH-Low

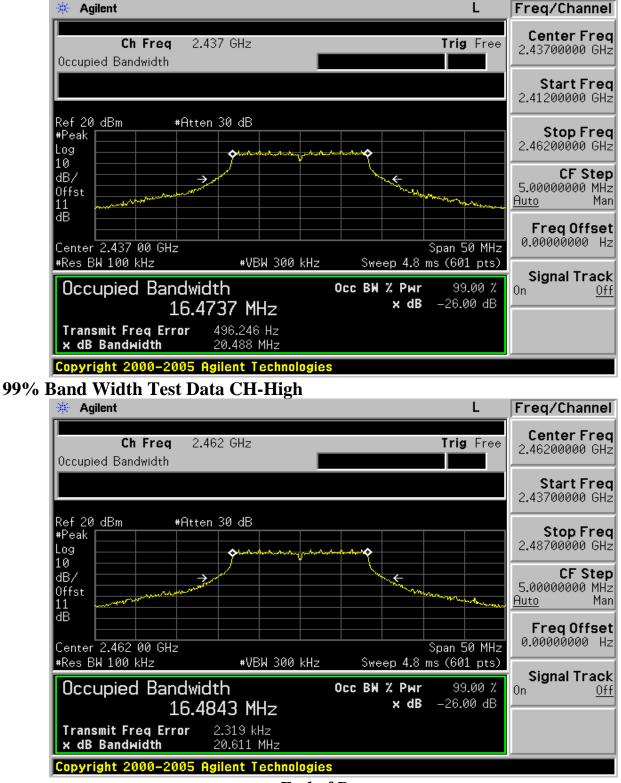


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99% Band Width Test Data CH-Mid



~ End of Report ~

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