

Radio Intentional EMC Test Report: EDCS -705497 For CP-7925G-A-K9 2.4GHz Radio Against the following Specifications : 47 CFR 15.247 RSS-210 RSS-102

> **Cisco Systems** EMC Laboratory 170 West Tasman Drive San Jose, CA 95134

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This report replaces any previously entered test report under EDCS -705497

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Section 1: Overview

Test Summary

The samples were assessed against the tests detailed in section 3 under the requirements of the following standards:

Emissions:

CFR47 Part 15.247 RSS-210 RSS102

Notes:

 Measurements were made in accordance with FCC docket #:DA 02-2138, ET docket 96-8, KDB Publication No. 558074& measurement method of spurious emission tolerance to the International Telecommunication Union (ITU) Recommendation SM329.

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Section 2: Assessment Information

2.1 General

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal Government.

With regard to this assessment, the following points should be noted:

- a) The results contained in this report relate only to the items tested and were obtained in the period between the date of the initial assessment and the date of issue of the report. Manufactured products will not necessarily give identical results, due to production tolerances and measurement uncertainties.
- b) The apparatus was set up and exercised using the configuration and modes of operation defined in this report only.
- c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report and the Test Assessment Plan (TAP).
- d) All testing was performed under the following environmental conditions:

 Temperature
 15°C to 35°C (54°F to 95°F)

 Atmospheric Pressure
 860mbar to 1060mbar (25.4" to 31.3")

 Humidity
 10% to 75*%

- e) All AC testing was performed at one or more of the following supply voltages: 110V (+/-10%) 60Hz
 - 220V (+/-10%) 50 or 60Hz
- f) Cisco Systems, Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). The scope of accreditation, certificate number 1178-01 is referenced in appendix C, along with further details.

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2.2 Start Date of Testing

10-Sep-2008

2.3 Report Issue Date

Cisco Systems, Inc. uses an electronic system to issue, store and control the revision of test reports. This system is called the Engineering Document Control System (EDCS). The actual report issue date is embedded into the original file on EDCS. Any copies of this report, either electronic or paper, that are not on EDCS must be considered uncontrolled

2.4 Testing facilities

This assessment was performed by:

Testing Laboratory

Cisco Systems, Inc., 170 West Tasman Drive San Jose, CA 95134, USA

Registration Numbers for Industry Canada

Cisco System Site	Site Identifier
Building P, 10m Chamber	Company #: 4624-2
Building P, 5m Chamber	Company #: 4624-1
Building N, 5m Chamber	Company #: 6111
Building I, 5m Chamber	Company #: 6112

Test Engineers

Phillip Carranco

2.5 Equipment Assessed (EUT)

CP-7925G-A-K9



2.6 EUT Description

. The CP-7925G- is the next generation Wireless IP Phone that will be more rugged and more resistant to dust, alcohol-based wipes, and liquid splashes, repeated drops and shocks therefore targeting the following markets: Retail, Warehouse, Distribution Centers, Manufacturing, Healthcare. It will also support Bluetooth as an optional interface for wireless headset.

The CP-7925G- will comprise of the MuRata LBEE1W9GVC module with support for TNET1253 for wlan and BRF6300 for Bluetooth support. The MuRata module will interface to the TNETV1700 host processor via SDIO interface, and it has 2 antenna interfaces, one for 2.4 GHz for both Bluetooth and 802.11b/g support, and an additional antenna for 5 GHz for 802.11a support.

2.7 Scope of Assessment

Tests have been performed in accordance with the relevant Test and Assessment Plan (TAP), a copy of which is contained in Appendix F of this report, and the relevant Cisco Systems, Inc. radio test procedures (EDCS-420238). This test report may not cover all of the tests highlighted in the test plan.

2.8 Units of Measurement

The units of measurements defined in the appendices are reported in specific terms, which are test dependent. Where radiated measurements are concerned these are defined at a particular distance. Basic voltage measurements are defined in units of [dBuV]

As an example, the basic calculation for all measurements is as follows:

Emission level [dBuV] = Indicated voltage level [dBuV] + Cable Loss [dB] + Other correction factors [dB]

The combinations of correction factors are dependent upon the exact test configurations [see test equipment lists for further details] and may include:-

Antenna Factors, Pre Amplifier Gain, LISN Loss, Pulse Limiter Loss and Filter Insertion Loss.

Note: to convert the results from dBuV/m to uV/m use the following formula:-

Level in uV/m = Common Antilogarithm [(X dBuV/m)/20] = Y uV/m

2.9 Report Template Control No.

EDCS#: 703456

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Section 3: Result Summary

3.1 Results Summary Table

Conducted emissions

Basic Standard	Test Details / Comments	Result
Power Spectral Density	15.247: For digitally modulated systems, the peak 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. (<i>RSS-210 A8.2</i>)	Pass
Peak Output Power	15.247: The maximum conducted output power of the intentional radiator for systems using digital modulation in the 2400-2483.5MHz band shall not exceed 1 Watt (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (<i>RSS-210 A8.4</i>)	Pass
6dB Bandwidth	15.247: Systems using digital modulation techniques may operate in the 5725-5850MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz. (RSS-210 A8.2)	Pass
Conducted Spurious Emissions	15.247: In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.(<i>RSS-210 A8.5</i>)	Pass

Radiated emissions

Basic Standard	Test Details / Comments		
Radiated Spurious and Harmonic Emissions	Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). (<i>RSS-210 Sec2.7</i>)	Pass	
Restricted Bandedge Measurements	Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). (<i>RSS-210 Sec2.7</i>)	Pass	

* SAR measurements to reported in separate report

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Section 4: Sample Details

Note: Each sample was evaluated to ensure that its condition was suitable to be used as a test sample prior to the commencement of testing. During preliminary testing all three planes (X,Y & Z) were evaluated to determine "Worst Case". The data collected determine that the orientation used for this report was demined "Worst Case".

4.1 Sample Details

Sample Number	Equipment Details	Serial Number	Part Number
S01	CP-7925G-A-K9	IAC1232A00M	74-5464-01

The following antennas were evaluated as part of this testing process. The antennas listed reflect the maximum gain allowed for each family type of antenna:

Fixed internal Antenna, Gain = 1.97dBi (no external antenna can be used.)

4.2 System Details

System #	Description	Samples
1	Radio Test Sample	S01

4.3 Mode of Operation Details

Mode#	Description	Comments
1	802.11B/G Test Mode	System is placed in a continuous Tx State at a Low, Middle, High Channel per Test Requirements. 802.11B running at 1Mbps while 802.11G running at 6Mbps

Section 5: Modifications

5.1 Sample Modifications Performed During Assessment

No modifications were performed during assessment.

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Appendix A: Formal Test Results

6 dB Bandwidth

15.247 & RSS-210 A8.2:

Systems using digital modulation techniques may operate in the 2400-2483.5MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz

Frequency (MHz)	Data Rate	6dB Bandwidth	Limit (kHz)	Margin (kHz)
, <i>,</i>	(Mbps)	(kHz)	· · ·	· · /
2412	1	10067	500	-9567
2437	1	10122	500	-9622
2462	1	10111	500	-9611
2412	6	16341	500	-15841
2437	6	16342	500	-15842
2462	6	16348	500	-15848

Frequency	Data	99%
(MHz)	Rate	Bandwidth
	(Mbps)	(kHz)
2412	1	145039
2437	1	144871
2462	1	144701
2412	6	164119
2437	6	164546
2462	6	164148

Graphical Test Results

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Peak Output Power

15.247 & RSS-210 A8.4:

The maximum conducted output power of the intentional radiator for systems using digital modulation in the 2400-2483.5MHz band shall not exceed 1 Watt (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Frequency (MHz)	Data Rate (Mbps)	Peak Output Power (dBm)	Limit (dBm)	Margin (dB)
2412	1	12.51	30	-17.49
2437	1	14.82	30	-15.18
2462	1	12.60	30	-17.40
2412	6	13.59	30	-16.41
2437	6	15.82	30	-14.18
2462	6	13.80	30	-16.20

Measurement procedure as per KDB Publication No. 558074 power output option 1, peak power meter.



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Power Spectral Density

15.247 & RSS-210 A8.2:

For digitally modulated systems, the peak 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

Frequency (MHz)	Data Rate (Mbps)	Peak Power Spectral Density (dBm/3kHz)	Limit (dBm)	Margin (dB)
2412	1	-16.53	8	-24.53
2437	1	-11.97	8	-19.97
2462	1	-15.04	8	-23.04
2412	6	-15.12	8	-23.12
2437	6	-10.48	8	-18.48
2462	6	-13.97	8	-21.97

Graphical Test Results



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Title: Power Spectral Density, 2412 MHz at 6Mbps





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Conducted Spurious emissions

15.247 & RSS-210 A8.5:

In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

Test Results



Comments: No Signals seen within 6dB of the Limit.



Comments: No Signals seen within 6dB of the Limit.

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Comments: No Signals seen within 6dB of the Limit.



Comments: No Signals seen within 6dB of the Limit.

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Comments: No Signals seen within 6dB of the Limit.



Comments: No Signals seen within 6dB of the Limit.

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Physical Test arrangement Photograph:



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Comments on the above Photograph:

No further comments

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Radiated Spurious and Harmonics Emissions

15.205 & RSS-210 sec2.7:

Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a).

Test Number: 33377 Spec ID: 647				
Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
Radiated Spurious Emissions	Enclosure	В	30MHz - 26.5GHz	CFR47 Part 15.109CFR47 Part 15.247, RSS-210, LP0002 HKTA1039
Operating Mode	Mode: 1, 802.11B/G Test Mode			
Power Input	110, 60Hz (+/-20%)			
Overall Result	Pass			
Comments	No further comments			
Deviation	There were no deviations from the specification			

System Number	Description	Samples	System under test	Support equipment
1	Radio Test Sample	S01	N	

Subtest Number: 33377	' - 1	Subtest Date: 24-Sep-2008						
Engineer	Phillip Carranco							
Lab Information	Building I, 5m And	Building I, 5m Anechoic						
Subtest Results	·							
Subtest Title	802.11B Radiated	d Spurious Emissions Results						
Subtest Result	Pass							
Highest Frequency	1000.0							
Lowest Frequency	30.0							
Comments on the above Test Results	No further comme	ents						
Environmental Condition	ons:							
Temperature: within rang	e of 54 to 95 F:	Yes						
Humidity: between 10 an	d 75%:	Yes						
Comments:		No Further Comments						

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Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF d	В	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
30.014	-3.1	0.5		21.3	18.6	Qp	V	113	168	40	-21.4	Pass	
920.687	-3.2	2.8		22.4	21.9	Qp	V	112	214	46	-24.1	Pass	
36.23	-3.2	0.5		16.5	13.8	Qp	V	106	141	40	-26.2	Pass	
168.396	2.9	1.2		11.6	15.6	Qp	V	111	191	43.5	-27.8	Pass	
215.563	-4.1	1.3		10.6	7.9	Qp	V	103	217	43.5	-35.6	Pass	

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Subtest Number: 33377	7 - 2 Subtest Date: 24-Sep-2008							
Engineer	Phillip Carranco							
Lab Information	Building I, 5m Anechoic							
Subtest Results								
Subtest Title 802.11B Radiated Spurious Emissions Results								
Subtest Result	Pass							
Highest Frequency	1000.0							
Lowest Frequency	30.0							

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Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
IVIHZ	abuv	LOSS		aBuv/m	пі туре		CIII	Deg	aBuv/m	aв		
30.026	-4	0.5	21.3	17.8	Qp	V	377	326	40	-22.2	Pass	
36.057	-3.8	0.5	16.6	13.3	Qp	Н	133	143	40	-26.7	Pass	
143.416	3	1.1	12.6	16.7	Qp	V	137	346	43.5	-26.8	Pass	
973.171	-3.4	2.8	22.9	22.3	Qp	Н	268	32	54	-31.7	Pass	

Subtest Number: 33377	7 - 3 Subtest Date: 24-Sep-2008							
Engineer	Phillip Carranco							
Lab Information	Building I, 5m Anechoic							
Subtest Results								
Subtest Title 802.11B Radiated Spurious Emissions Results								
Subtest Result	Pass							
Highest Frequency	1000.0							
Lowest Frequency	30.0							

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Dea	Limit dBuV/m	Margin dB	Pass /Fail	Comments
30.134	-3.2	0.5	21.2	18.4	Qp	V	118	162	40	-21.6	Pass	
164.369	8.1	1.2	11.8	21.1	Qp	V	118	288	43.5	-22.4	Pass	
892.609	-3	2.7	22.2	21.9	Qp	Н	130	135	46	-24.1	Pass	
37.342	-2.2	0.5	15.6	13.9	Qp	V	135	229	40	-26.1	Pass	
199.866	-3.2	1.3	12.2	10.3	Qp	V	109	265	43.5	-33.2	Pass	

Subtest Number: 33377	7 - 4 Subtest Date: 24-Sep-2008							
Engineer	Phillip Carranco							
Lab Information	Building I, 5m Anechoic							
Subtest Results								
Subtest Title 802.11B Radiated Spurious Emissions Test Results								
Subtest Result	Pass							
Highest Frequency	18000.0							
Lowest Frequency	1000.0							

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Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
17830.318	32.8	15	11.4	59.2	NA	H	125	0	74	-14.8	Pass	Noise Floor
14282.907	35	12.7	7.1	54.8	NA	V	125	0	74	-19.2	Pass	Noise Floor
2415.039	49	7.3	-5.3	50.9		V	99	361	74	-23.1	Pass	Tx Signal - EUT
					Peak(Scan)							

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Subtest Number: 33377	7 - 5 Subtest Date: 24-Sep-2008							
Engineer	Phillip Carranco							
Lab Information	Building I, 5m Anechoic							
Subtest Results								
Subtest Title 802.11B Radiated Spurious Emissions Test Results								
Subtest Result	Pass							
Highest Frequency	18000.0							
Lowest Frequency	1000.0							

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
17925.764	23.3	15.2	11.4	49.9	Av	V	100	0	54	-4.1	Pass	Noise Floor
2410.48	45.6	7.3	-5.3	47.6	Av	V	100	0	54	-6.4	Pass	Tx Signal - EUT
14330.63	25.4	12.6	7	45.1	Av	V	100	0	54	-8.9	Pass	Noise Floor
1874.921	30.2	5	-6	29.2	Av	V	99	361	54	-24.8	Pass	
1376.481	33	3.9	-7.8	29.1	Av	V	99	361	54	-24.9	Pass	
1625.735	31.6	4.3	-7.3	28.5	Av	Н	99	361	54	-25.5	Pass	

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Subtest Number: 33377	7 - 6 Subtest Date: 24-Sep-2008							
Engineer	Phillip Carranco							
Lab Information	Building I, 5m Anechoic							
Subtest Results								
Subtest Title 802.11B Radiated Spurious Emissions Results								
Subtest Result	Pass							
Highest Frequency	18000.0							
Lowest Frequency	1000.0							

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
17878.041	32.5	15	11.4	58.9	NA	H	100	0	74	-15.1	Pass	Noise Floor
2436.993	54	7.2	-5.4	55.9	NA	V	125	0	74	-18.1	Pass	Tx Signal - EUT
14235.184	35.3	12.6	7	55	NA	Н	125	0	74	-19	Pass	Noise Floor
1910.683	41.1	5.1	-6	40.1		V	99	361	74	-33.9	Pass	
					Peak(Scan)							

Subtest Number: 33377	- 7 Subtest Date: 24-Sep-2008					
Engineer	Phillip Carranco					
Lab Information	Building I, 5m Anechoic					
Subtest Results						
Subtest Title 802.11B Radiated Spurious Emissions Results						
Subtest Result	Pass					
Highest Frequency	18000.0					
Lowest Frequency	1000.0					

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Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
2436.993	51.4	7.2	-5.4	53.2	NA	V	125	0	54	-0.8	Pass	Tx Signal - EUT
17899.251	23.2	15.1	11.6	49.9	NA	V	125	0	54	-4.1	Pass	Noise Floor
14235.184	25.2	12.6	7	44.8	NA	H	100	0	54	-9.2	Pass	Noise Floor
1875.04	32.7	5	-6	31.8	Peak(Scan)	Н	100	361	54	-22.3	Pass	
1376.684	32.8	3.9	-7.8	28.9	Peak(Scan)	V	100	361	54	-25.1	Pass	
1625.665	30.4	4.3	-7.3	27.4	Peak(Scan)	Н	100	361	54	-26.7	Pass	

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Subtest Number: 33377	7 - 8 Subtest Date: 24-Sep-2008						
Engineer	Phillip Carranco						
Lab Information	Building I, 5m Anechoic						
Subtest Results							
Subtest Title 802.11B Radiated Spurious Emissions Results							
Subtest Result	Pass						
Highest Frequency	18000.0						
Lowest Frequency	1000.0						

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
17909.857	32.3	15.1	11.4	58.9	NA	Н	100	0	74	-15.1	Pass	Noise Floor
14346.538	36.3	12.6	7	55.9	NA	V	100	0	74	-18.1	Pass	Noise Floor
2463.506	54	7.2	-5.4	55.8	NA	V	100	0	74	-18.2	Pass	Tx Signal - EUT

Subtest Number: 3337	7 - 9 Subtest Date: 24-Sep-2008						
Engineer	Phillip Carranco						
Lab Information	Building I, 5m Anechoic						
Subtest Results							
Subtest Title 802.11B Radiated Spurious Emissions Results							
Subtest Result	Pass						
Highest Frequency	18000.0						
Lowest Frequency	1000.0						

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw dBuV	Cable	AF dB	Level dBu\//m	Measureme	Pol	Hgt cm	Azt Deg	Limit dBu\//m	Margin dB	Pass /Fail	Comments
2463.506	49.4	7.2	-5.4	51.3	Av	V	125	000	54	-2.7	Pass	Tx Signal - EUT
17851.528	23.7	15	11.3	50	Av	Н	125	0	54	-4	Pass	Noise Floor
14325.328	25.2	12.6	7.1	44.9	Av	Н	125	0	54	-9.1	Pass	Noise Floor
1874.94	31.4	5	-6	30.4	Av	Н	99	361	54	-23.6	Pass	
1625.983	32.2	4.3	-7.3	29.2	Av	Н	99	361	54	-24.8	Pass	
1376.516	31.9	3.9	-7.8	28	Av	V	99	361	54	-26	Pass	

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Subtest Number: 33377	7 - 10 Subtest Date: 24-Sep-2008					
Engineer	Phillip Carranco					
Lab Information	Building I, 5m Anechoic					
Subtest Results						
Subtest Title 802.11B Radiated Spurious Emissions Test Results						
Subtest Result	Pass					
Highest Frequency	26499.999					
Lowest Frequency	18000.0					

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fa	il Comments	
21770.354	37.3	0	1	7.5 54.8	B Peak(Scan)	V	100	361	83.5	-28.7	Pa	s N	loise Floor

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Subtest Number: 33377	7 - 11 Subtest Date: 24-Sep-2008								
Engineer	Phillip Carranco								
Lab Information Building I, 5m Anechoic									
Subtest Results									
Subtest Title	802.11B Radiated Spurious Emissions Test Results								
Subtest Result	Pass								
Highest Frequency	26499.999								
Lowest Frequency	18000.0								

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		ст	Deg	dBuV/m	dB		
21773.046	28	0	17.5	45.6	NA	V	100	0	63.5	-17.9	Pass	Noise Floor

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Test Number: 3344	Test Number: 33444 Spec ID: 647										
Basic Standard	Applied to	Class	Freq Range	Test Details / Comments							
Radiated Spurious Emissions	Enclosure B 30MHz - 26.5GHz CFR47 Part 15.109CFR47 Part 15.247, RSS-210, LP0002 HKTA1039										
Operating Mode	Mode: 1, 802.11B/G Test Mode										
Power Input	110, 60Hz (+/-	110, 60Hz (+/-20%)									
Overall Result	Pass										
Comments	No further con	No further comments									
Deviation	There were no	There were no deviations from the specification									

System Number	Description	Samples	System under test	Support equipment
1	Radio Test Sample	S01	V	

Subtest Number: 33444	- 1	Subtest Date: 24-Sep-2008						
Engineer	Phillip Carranco	Phillip Carranco						
Lab Information	Building I, 5m An	Building I, 5m Anechoic						
Subtest Results								
Subtest Title	802.11G Radiate	d Spurious Emissions Test Results						
Subtest Result	Pass							
Highest Frequency	1000.0							
Lowest Frequency	30.0							
Comments on the above Test Results	No further commo	ents						
Environmental Condition	ons:							
Temperature: within rang	e of 54 to 95 F:	Yes						
Humidity: between 10 an	d 75%:	Yes						
Comments:								

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Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass	/Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		ст	Deg	dBuV/m	dB			
30.77	9 -2.89	0.5	20.7	18.25	Qp	V	120	122	40	-21.8		Pass	
172.9	2 8.38	1.2	11.3	20.9	Qp	V	102	308	43.5	-22.6)	Pass	
36.2	2 -3.25	0.5	16.5	13.8	Qp	V	108	273	40	-26.2		Pass	,

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Subtest Number: 33444	- 2 Subtest Date: 24-Sep-2008						
Engineer	Phillip Carranco						
Lab Information	Building I, 5m Anechoic						
Subtest Results							
Subtest Title	802.11G Radiated Spurious Emissions Test Results						
Subtest Result	Pass						
Highest Frequency	1000.0						
Lowest Frequency	30.0						

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
IVIHZ	abuv	LOSS		aBuv/m	пі туре		cm	Deg	aBuv/m	ав		
30.14	-3.18	0.5	21.2	18.5	Qp	V	127	132	40	-21.5	Pass	
158.88	5.75	1.2	12.0	18.9	Qp	V	117	256	43.5	-24.6	Pass	
829.31	-3.11	2.6	21.8	21.3	Qp	V	116	197	46	-24.7	Pass	

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Subtest Number: 33444	- 3 Subtest Date: 24-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	802.11G Radiated Spurious Emissions Test Results
Subtest Result	Pass
Highest Frequency	1000.0
Lowest Frequency	30.0

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fai	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
30.059	-3.2	0.5	21.2	18.5	Qp	V	131	180	40	-21.5	Pass	
164.796	6.1	1.2	11.8	19.1	Qp	V	107	270	43.5	-24.4	Pass	
829.4	-3.2	2.6	21.8	21.2	Qp	V	107	355	46	-24.8	Pass	

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Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fai	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
36.99	-3.2	0.5	15.9	13.2	Qp	Η	121	150	40	-26.8	Pas	ò
998.72	-3.3	2.9	23.3	3 22.8	Qp	V	121	89	54	-31.2	Pass	5

Subtest Number: 33444	- 4 Subtest Date: 24-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	802.11G Radiated Spurious Emissions Test Results
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
17936.369	33.2	15.2	11.5	59.8	NA	Η	100	0	74	-14.2	Pass	Noise Floor

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Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fa	I Comments	
MHz	dBuV	Loss		dBuV/m	nt Type		ст	Deg	dBuV/m	dB			
2415.783	56.2	7.3	-5.	3 58.2	NA	V	100	0	74	-15.8	Pas	8	Tx Signal - EUT
14341.235	35.9	12.6		7 55.5	NA	Н	125	0	74	-18.5	Pas	8	Noise Floor

Subtest Number: 33444	- 5 Subtest Date: 24-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	802.11G Radiated Spurious Emissions Test Results
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
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Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHZ	aBuv	LOSS		dBuV/m	nt Type		ст	Deg	dBuV/m	αB		
17936.369	23.2	15.2	11.5	49.8	Av	H	100	0	54	-4.2	Pass	Noise Floor
2415.783	46.8	7.3	-5.3	48.7	Av	V	100	0	54	-5.3	Pass	Tx Signal - EUT
14176.856	25.3	12.6	7	44.8	Av	H	125	0	54	-9.2	Pass	Noise Floor
1376.494	32	3.9	-7.8	28.1	Av	V	99	361	54	-25.9	Pass	
1625.675	31.3	4.3	-7.3	28.2	Av	H	99	361	54	-25.8	Pass	
1875.088	30.5	5	-6	29.5	Av	Н	99	361	54	-24.5	Pass	

Subtest Number: 33444	- 6 Subtest Date: 24-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	802.11G Radiated Spurious Emissions Test Results
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

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Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
2442.296	59.6	7.2	-5.4	61.4	NA	V	100	0	74	-12.6	Pass	Tx Signal - EUT
17968.185	32.6	15	11.5	59.1	NA	Н	100	0	74	-14.9	Pass	Noise Floor
14282.907	35.6	12.7	7.1	55.4	NA	Н	100	0	74	-18.6	Pass	Noise Floor

Subtest Number: 33444	- 7 Subtest Date: 24-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	802.11G Radiated Spurious Emissions Test Results
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

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Frequency	Raw dBuV	Cable	AF dB	Level dBu\//m	Measureme	Pol	Hgt	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2436.993	51.5	7.2	-5.4	53.3	Av	V	100	Deg 0	54	-0.7	Pass	Tx Signal - E
17899.251	23.2	15.1	11.6	49.8	Av	Н	125	0	54	-4.2	Pass	Noise Floor
14314.722	25.2	12.6	7	44.8	Av	Н	125	0	54	-9.2	Pass	Noise Floor
1874.921	30.3	5	-6	29.4	Av	V	100	361	54	-24.6	Pass	
1376.533	32.8	3.9	-7.8	28.9	Av	V	100	361	54	-25.1	Pass	
1625.761	30.8	4.3	-7.3	27.7	Av	Н	100	361	54	-26.3	Pass	

Subtest Number: 33444	- 8 Subtest Date: 24-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	802.11G Radiated Spurious Emissions Test Results
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

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Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
17888.646	32.5	15	11.6	59.1	NA	Н	125	0	74	-14.9	Pass	Noise Floor
2468.808	55.8	7.2	-5.4	57.6	NA	V	125	0	74	-16.4	Pass	Tx Signal - EUT
14373.051	35.7	12.7	6.9	55.4	NA	Н	125	0	74	-18.6	Pass	Noise Floor

Subtest Number: 33444	- 9 Subtest Date: 24-Sep-2008					
Engineer	Phillip Carranco					
Lab Information	Building I, 5m Anechoic					
Subtest Results						
Subtest Title 802.11G Radiated Spurious Emissions Test Results						
Subtest Result	Pass					
Highest Frequency	18000.0					
Lowest Frequency	1000.0					

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

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Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
2468.808	50.9	7.2	-5.4	52.8	Av	V	100	0	54	-1.2	Pass	Tx Signal - EUT
17925.764	23.4	15.2	11.4	49.9	Av	V	100	0	54	-4.1	Pass	Noise Floor
14304.117	25.5	12.7	6.9	45	Av	H	100	0	54	-9	Pass	Noise Floor
1625.641	31.7	4.3	-7.3	28.6	Av	Н	99	361	54	-25.4	Pass	
1875.312	31.8	5	-6	30.8	Av	V	99	361	54	-23.2	Pass	
1376.423	31.3	3.9	-7.8	27.4	Av	V	99	361	54	-26.6	Pass	

Subtest Number: 33444	- 10 Subtest Date: 24-Sep-2008						
Engineer	Phillip Carranco						
Lab Information	Building I, 5m Anechoic						
Subtest Results							
Subtest Title	802.11G Radiated Spurious Emissions Test Results						
Subtest Result	Pass						
Highest Frequency	26499.999						
Lowest Frequency	18000.0						

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

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Frequency	Raw	Cable	AF	dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass	/Fail	Comments
MHz	dBuV	Loss			dBuV/m	nt Type		cm	Deg	dBuV/m	dB			
21766.835	37.6	0		17.6	55.1		V	100	361	83.5	-28.4	F	Pass	Noise Floor
						Peak(Scan)								

Subtest Number: 33444	- 11 Subtest Date: 24-Sep-2008					
Engineer	Phillip Carranco					
Lab Information	Building I, 5m Anechoic					
Subtest Results						
Subtest Title 802.11G Radiated Spurious Emissions Test Results						
Subtest Result	Pass					
Highest Frequency	26499.999					
Lowest Frequency	18000.0					

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /FailComments
MHz	dBuV	Loss		dBuV/m	nt Type		ст	Deg	dBuV/m	dB	
Page No: 48 of 76											



Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHZ	dBuV	LOSS		dBuV/m	nt Type		cm	Deg	dBuV/m	aв		
21773.046	28.3	0	17.5	45.9	NA	Η	100	0	63.5	-17.6	Pass	Noise Floor

Radiated Band Edge Measurements

15.205 & RSS-210 sec2.7:

Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a).

Test Number: 33247 Spec ID: 648									
Basic Standard	Applied to	Class	Freq Range	Test Details / Comments					
Restricted Bandedge Measurements	Enclosure	Enclosure B 2.4GHz - CFR47 Part 15.205,CFR47 Part 5.825GHz 15.209,LP002, RSS210HKTA1039							
Operating Mode	Mode: 1, 802.11B	Mode: 1, 802.11B/G Test Mode							
Power Input	3.7, DC (+/-20%)								
Overall Result	Pass								
Comments	No further commer	No further comments							
Deviation	There were no dev	iations from th	e specification						

System Number	Description	Samples	System under test	Support equipment
1	Radio Test Sample	S01	\checkmark	

Subtest Number: 33247	Subtest Date: 10-Sep-2008					
Engineer	Phillip Carranco					
Lab Information	Building I, 5m Anechoic					
Subtest Results						
Subtest Title	Radiated Bandedge for 802.11B Peak Reading					
Subtest Result	Pass					
Highest Frequency	2412.0					
Lowest Frequency	2310.0					
Comments on the above Test Results	No further comments					

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Environmental Conditions:					
Temperature: within range of 54 to 95 F:	Yes				
Humidity: between 10 and 75%:	Yes				
Comments:					

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /F	ailComments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
2390	55.4	4.6	-6.9	53		V	109	106	74	-21	Pa	ss
					Peak(Scan)							
2390	53.6	4.6	-6.9	51.2		Н	158	54	74	-22.8	Pa	ss
					Peak(Scan)							

Subtest Number: 33247	7 - 2 Subtest Date: 10-Sep-2008				
Engineer	Phillip Carranco				
Lab Information	Building I, 5m Anechoic				
Subtest Results					
Subtest Title Average Radiated Bandedge for 802.11B 2412MHz					
Subtest Result	Pass				
Highest Frequency 2412.0					
Lowest Frequency	2310.0				
Comments on the above Test Results	No further comments				

Page No: 50 of 76

Environmental Conditions:						
Temperature: within range of 54 to 95 F:	Yes					
Humidity: between 10 and 75%:	Yes					
Comments:						

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fa	I Comments
MHz	dBuV	Loss		dBuV/m	nt Type		ст	Deg	dBuV/m	dB		
2390	44.3	4.5	-6.9	9 42	Av	V	109	106	54	-12	Pas	6
2390	43.3	4.5	-6.9	9 41	Av	Н	158	54	54	-13	Pas	δ

Subtest Number: 33247	7 - 3 Subtest Date: 10-Sep-2008						
Engineer	Phillip Carranco						
Lab Information	Building I, 5m Anechoic						
Subtest Results							
Subtest Title Peak Bandedge Measurements for 802.11B							
Subtest Result	Pass						
Highest Frequency	2500.0						
Lowest Frequency	2462.0						
Comments on the above Test Results	No further comments						
Environmental Conditions:							

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Temperature: within range of 54 to 95 F:	Yes
Humidity: between 10 and 75%:	Yes
Comments:	

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fa	il Comments
2483.5	51.2	4.6	-6.8	49	Peak(Scan)	Н	151	99	74	-25	Pa	s
2483.5	52	4.6	-6.8	49.8	Peak(Scan)	V	104	152	74	-24.2	Pa	s

Subtest Number: 33247	7 - 4 Subtest Date: 10-Sep-2008					
Engineer	Phillip Carranco					
Lab Information Building I, 5m Anechoic						
Subtest Results						
Subtest Title Average Bandedge Results for 802.11B						
Subtest Result	Pass					
Highest Frequency	2500.0					
Lowest Frequency	2462.0					
Comments on the	No further comments					
above Test Results						
Environmental Conditions:						

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Temperature: within range of 54 to 95 F:	Yes
Humidity: between 10 and 75%:	Yes
Comments:	

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /I	ailComments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
2483.5	41.8	4.6	-6.8	39.6	Av	V	104	152	54	-14.4	Pa	ass
2483.5	40.9	4.6	-6.8	38.7	Av	Н	151	99	54	-15.3	Pa	ass

Subtest Number: 33247	7 - 5 Subtest Date: 10-Sep-2008					
Engineer	Phillip Carranco					
Lab Information	Building I, 5m Anechoic					
Subtest Results						
Subtest Title	ubtest Title Peak Bandedge Results for 802.11G					
Subtest Result	Pass					
Highest Frequency	2500.0					
Lowest Frequency	2462.0					
Comments on the No further comments						
above rest Results						

Temperature: within range of 54 to 95 F:	Yes
Humidity: between 10 and 75%:	Yes
Comments:	

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fa	il Comments
2483.5	70.8	4.6	-6	8 68.7	Peak(Scan)	V	105	210	74	-5.3	Pa	s
2483.5	64.2	4.6	-6	8 62	Peak(Scan)	Н	105	157	74	-12	Pa	s

Subtest Number: 33247	7 - 6 Subtest Date: 10-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	Average Bandedge Results for 802.11G (2462MHz)
Subtest Result	Pass
Highest Frequency	2500.0
Lowest Frequency	2462.0
Comments on the above Test Results	No further comments
Environmental Condition	ons:

Page No: 54 of 76

Temperature: within range of 54 to 95 F:	Yes
Humidity: between 10 and 75%:	Yes
Comments:	

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fa	I Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
2483.5	53.4	4.6	-6.8	51.2	Av	V	105	210	54	-2.8	Pas	6
2483.5	51.5	4.6	-6.8	49.3	Av	Н	105	157	54	-4.7	Pas	δ

Subtest Number: 3324	7 - 7 Subtest Date: 10-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	·
Subtest Title	Average Bandedge for 802.11G (2412MHz)
Subtest Result	Pass
Highest Frequency	2412.0
Lowest Frequency	2310.0
Comments on the	No further comments
above Test Results	
Environmental Conditi	ons:

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Temperature: within range of 54 to 95 F:	Yes
Humidity: between 10 and 75%:	Yes
Comments:	

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		ст	Deg	dBuV/m	dB		
2390	51.6	4.5	-6.	9 49.3	Av	V	109	108	54	-4.7	Pass	
2390	49.6	4.5	-6.	9 47.3	Av	Н	161	12	54	-6.7	Pass	

Subtest Number: 33247	7 - 8 Subtest Date: 10-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	Peak Bandedge Resutls for 802.11G (2412MHz)
Subtest Result	Pass
Highest Frequency	2412.0
Lowest Frequency	2310.0
Comments on the	No further comments
above Test Results	
Environmental Condition	DNS:

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Temperature: within range of 54 to 95 F:	Yes
Humidity: between 10 and 75%:	Yes
Comments:	

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fai	Comments
2390	69.2	4.6	-6.9	66.8		Н	161	12	74	-7.2	Pass	
					Peak(Scan)							
2390	67.7	4.6	-6.9	65.4		V	109	108	74	-8.6	Pass	
					Peak(Scan)							

Co-Locator Radiated Spurious Emissions

15.205 & RSS-210 sec2.7:

Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a).

Test Number:	Test Number: 33375 Spec ID: 441											
Basic Standard	Applied to	Class	Freq Range	Test Details / Comments								
Co-Located Transmitters	Enclosure	N/A	1GHz-1.0GHz	Compliance based upon meeting the emission levels for radiated spurious emissions as stated in RSS-210, FCC part 15.209 and HKTA1039. CISPR limits are not applicable for this test								
Operating Mode	Mode: 1, 802.11E	/G Test Mode										
Power Input	110, 60Hz (+/-20%)										
Overall Result	Pass	Pass										
Comments	No further comme	No further comments										
Deviation	There were no dev	riations from th	e specification									

System Number	Description	Samples	System under test	Support equipment	
1	Radio Test Sample	S01	N		

Subtest Number: 33375	5 - 1 Subtest Date: 17-Sep-2008									
Engineer	Phillip Carranco									
Lab Information	Building I, 5m Anechoic									
Subtest Results										
Subtest Title	tle Bluetooth & 802.11B Radiated Spurious Emissions									
Subtest Result	Pass									
Highest Frequency	1000.0									
Lowest Frequency	30.0									
Comments on the above Test Results	No further comments									
Environmental Conditions:										
Temperature: within rang F:	e of 54 to 95 Yes									

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Humidity: between 10 and 75%:	Yes
Comments:	

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
139.852	25.6	1	12.9	39.5	NA	V	100	0	43.5	-4	Pass	Support Equip
49.885	21	0.6	7.8	29.4	NA	V	125	0	40	-10.6	Pass	Support Equip
499.965	15	1.9	17.8	34.7	NA	V	100	0	46	-11.3	Pass	Support Equip
113.42	17.8	0.9	13	31.7	NA	V	125	0	43.5	-11.8	Pass	Support Equip
119.968	16.4	0.9	13.9	31.2	NA	V	125	0	43.5	-12.3	Pass	Support Equip
53.28	19.1	0.6	7.3	27	NA	V	100	0	40	-13	Pass	Support Equip

Subtest Number: 33375	- 2 Subtest Date: 17-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	

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Subtest Title	Bluetooth & 802.11B 1-18GHz Radiated Spurious Emissions
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Comments on the above Test Results	No further comments

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
17968.185	32.6	15	11.5	59.2	NA	V	125	0	74	-14.8	Pass	Noise Floor
14320.025	34.8	12.6	7	54.5	NA	Н	125	0	74	-19.5	Pass	Noise Floor
7813.933	40.7	9.4	1.9	52	Peak(Scan)	V	100	360	74	-22.1	Pass	
2463.474	45.4	7.2	-5.4	47.2	Peak(Scan)	Η	100	360	74	-26.8	Pass	

Subtest Number: 33375	- 3 Subtest Date: 17-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	Bluetooth & 802.11B Radiated Spurious Emissions
Subtest Result	Pass

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Highest Frequency	18000.0
Lowest Frequency	1000.0
Comments on the above Test Results	No further comments

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
7812.068	39.8	9.4	1.9	51	Av	V	102	146	54	-3	Pass	
17994.697	23.9	15.1	11.7	50.8	NA	Η	125	0	54	-3.2	Pass	Noise Floor
14373.051	25.3	12.7	6.9	45	NA	V	125	0	54	-9	Pass	Noise Floor
2463.506	41.2	7.2	-5.4	43.1	NA	Η	100	0	54	-10.9	Pass	Tx Signal - EUT

Subtest Number: 33375	- 4 Subtest Date: 17-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	

Page No: 61 of 76

Subtest Title	Bluetooth & 802.11B Peak Radiated Spurious Emissions
Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	18000.0
Comments on the	No Signal within 10dB of the Limit were observed.
above Test Results	

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Dea	Limit dBuV/m	Margin dB	Pass /Fail	Comments
C) (0	0	0 0	NA	U	0	0	0	0	Pass	

Subtest Number: 33375	- 5 Subtest Date: 17-Sep-2008					
Engineer	Phillip Carranco					
Lab Information	Building I, 5m Anechoic					
Subtest Results						
Subtest Title	Bluetooth & 802.11B Average Radiated Spurious Emissions					
Subtest Result Pass						
Highest Frequency	26499.999					

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Lowest Frequency	18000.0
Comments on the above Test Results	No Signal within 10dB of the Limit were observed.

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

 				-	-				-		-	
Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
21773.046	2	8 C	17.5	45.5	NA	V	100	0	63.5	-18	Pass	Noise Floor

Subtest Number: 3337	5 - 6 Subtest Date: 17-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	·
Subtest Title	Bluetooth & 802.11G Radiated Spurious Emissions
Subtest Result	Pass
Highest Frequency	1000.0
Lowest Frequency	30.0
-	

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Comments on the	No further comments
above Test Results	

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Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
140.095	26.8	1	12.9	40.6	NA	V	100	C	43.5	-2.9	Pass	Support Equip
832.19	16.1	2.4	21.8	40.3	NA	Н	125	C	46	-5.7	Pass	Support Equip
829.522	14.7	2.4	21.8	39	NA	Н	125	C	46	-7	Pass	Support Equip
49.885	21.2	0.6	7.8	29.6	NA	V	125	C	40	-10.4	Pass	Support Equip
499.965	15	1.9	17.8	34.6	NA	V	100	C	46	-11.4	Pass	Support Equip
113.42	18	0.9	13	31.9	NA	V	100	C	43.5	-11.6	Pass	Support Equip

Subtest Number: 33375	- 7 Subtest Date: 17-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic

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Subtest Results								
Subtest Title Bluetooth & 802.11G Peak Radiated Spurious Emissions								
Subtest Result	Pass							
Highest Frequency	18000.0							
Lowest Frequency	1000.0							
Comments on the above Test Results	No further comments							

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
17904.554	32.6	15.1	11	5 59.2	NA	V	100	0	74	-14.8	Pass	Noise Floor
14288.21	34.7	12.7		7 54.4	NA	V	125	0	74	-19.6	Pass	Noise Floor
8794.717	35.2	9.8	3	8 48.8	Peak(Scan)	V	100	0	74	-25.2	Pass	
2463.36	46.1	7.2	-5	4 48	Peak(Scan)	V	100	0	74	-26.1	Pass	

Subtest Number: 33375	- 8 Subtest Date: 17-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	

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Subtest Title	Bluetooth & 802.11G Average Radiated Spurious Emissions
Subtest Result	Pass
Highest Frequency	18000.0
Lowest Frequency	1000.0
Comments on the	No further comments
above Test Results	

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Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fail	Comments
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB		
7811.943	40.4	9.4	1.9	51.7	Av	V	105	144	54	-2.3	Pass	
18000	23.6	15.2	11.8	50.6	NA	V	100	0	54	-3.4	Pass	Noise Floor
14139.738	25.4	12.5	7	45	NA	V	100	0	54	-9	Pass	Noise Floor

Subtest Number: 33375	- 9 Subtest Date: 17-Sep-2008
Engineer	Phillip Carranco
Lab Information	Building I, 5m Anechoic
Subtest Results	
Subtest Title	Bluetooth & 802.11G Peak Radiated Spurious Emissions

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Subtest Result	Pass
Highest Frequency	26499.999
Lowest Frequency	18000.0
Comments on the above Test Results	No Signal within 10dB of the Limit were observed.

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Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF d	dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass	/Fail	Comments	
21747.411	38	0		17.5	55.6	Peak(Scan)	V	100	361	83.5	-27.9		Pass		Noise Floor

Subtest Number: 33375	- 10 Subtest Date: 17-Sep-2008					
Engineer	Phillip Carranco					
Lab Information	Building I, 5m Anechoic					
Subtest Results						
Subtest Title Bluetooth & 802.11G Average Radiated Spurious Emissions						
Subtest Result	Pass					
Highest Frequency	26499.999					

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Lowest Frequency	18000.0
Comments on the above Test Results	No Signal within 10dB of the Limit were observed.

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency	Raw	Cable	AF dB	Level	Measureme	Pol	Hgt	Azt	Limit	Margin	Pass /Fai	Comments	
MHz	dBuV	Loss		dBuV/m	nt Type		cm	Deg	dBuV/m	dB			
21790.08	28.1	0	17.	5 45.6	NA	Н	100	0	63.5	-17.9	Pas	s Noise	Floor

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Physical Test arrangement Photograph:



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Title: Radiated Spurious Emissions 18G – 26.5GHz Test Setup **Comments on the above Photograph:** No further comments



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cisco

Comments on the above Photograph:

No further comments

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Comments on the above Photograph:

No further comments


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Comments on the above Photograph:

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Appendix B: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description	Abbreviation	Description	
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit	
EMI	Electro Magnetic Interference	°C	Degrees Celsius	
EUT	Equipment Under Test	Temp	Temperature	
ITE	Information Technology Equipment	S/N	Serial Number	
ТАР	Test Assessment Schedule	Qty	Quantity	
ESD	Electro Static Discharge	emf	Electromotive force	
EFT	Electric Fast Transient	RMS	Root mean square	
EDCS	Engineering Document Control System	Qp	Quasi Peak	
Config	Configuration	Av	Average	
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak	
Cal	Calibration	kHz	Kilohertz (1x10 ³)	
EN	European Norm	MHz	MegaHertz (1x10 ⁶)	
IEC	International Electro technical Commission	GHz	Gigahertz (1x10 ⁹)	
CISPR	International Special Committee on Radio Interference	Н	Horizontal	
CDN	Coupling/Decoupling Network	V	Vertical	
LISN	Line Impedance Stabilization Network	dB	decibel	
PE	Protective Earth	V	Volt	
GND	Ground	kV	Kilovolt (1x10 ³)	
L1	Line 1	μV	Microvolt (1x10 ⁻⁶)	
L2	Line2	А	Amp	
L3	Line 3	μA	Micro Amp (1x10 ⁻⁶)	
DC	Direct Current	mS	Milli Second (1x10 ⁻³)	
RAW	Uncorrected measurement value, as indicated by the measuring device	μS	Micro Second (1x10 ⁻⁶)	
RF	Radio Frequency	μS	Micro Second (1x10 ⁻⁶)	
SLCE	Signal Line Conducted Emissions	m	Meter	
Meas dist	Measurement distance	Spec dist	Specification distance	
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)	
P	Power Line	L	Live Line	
N	Neutral Line	R	Return	
S	Supply	AC	Alternating Current	



Appendix C: Test Equipment Used to perform the test

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due
041987	Murata Electronics MXGS83RK3000	Special Radio Test Adaptor Cable	10-MAY-08	10-MAY-09
034974	Midwest Microwave ATT-0640-20-29M-02	Attenuator, 20dB, DC-40GHz	15-MAY-08	15-MAY-09
036716	Cisco RF Coaxial Cable-SMA	Radio Test Cable, SMA-SMA	14-Dec-08	14-Dec-09
040514	Agilent E4440A	Precision Spectrum Analyzer	16-Apr-08	16-Apr-09
008024	Huber + Suhner SF106A	3 meter Sucoflex cable	13-Nov-08	13-Nov-09
030443	Micro-Coax UFB311A-0-1560-520520	RF Coaxial Cable, to 18GHz, 156 In.	13-Nov-08	13-Nov-09
033602	Midwest Microwave CSY-NMNM-80-273001	RF Coaxial Cable, 27ft. to 18GHz	13-Nov-08	13-Nov-09
039114	Sunol Sciences JB1	Combination Antenna	19-Dec-08	19-Dec-09
040523	Rohde & Schwarz ESCI	EMI Test Receiver	26-Jun-08	26-Jun-09
002119	EMC Test Systems 3115	Double Ridged Guide Horn Antenna	03-Jun-08	03-Jun-09
008081	Huber + Suhner SF106A	1m Sucoflex cable	13-Nov-08	13-Nov-09
005691	Miteq NSP1800-25-S1	Broadband Preamplifier (1-18GHz)	09-Oct-08	09-Oct-09
035613	Micro-Tronics BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz	12-Jun-08	12-Jun-09
042000	Agilent E4440A	Spectrum Analyzer	04-Jun-08	04-Jun-09
024201	Rohde & Schwarz FSEK30	EMI Test Receiver	20-Nov-07	20-Nov-08
028072	CISCO 1840	18-40GHz EMI Test Fixture	03-Oct-07	03-Oct-08
021608	Micro-Coax UFB142A-1-1572-200-200	RF Coax Cable to 40GHz, 157.2in	03-Oct-07	03-Oct-08
043023	Anritsu MT8852B	Bluetooth Test Set	04-Aug-08	04-Aug-09

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Appendix D: Test Procedures

Measurements were made in accordance with

- FCC docket #:DA 00-0705,
- ET docket 96-8, KDB Publication No. 558074
- measurement method of spurious emission tolerance to the International Telecommunication Union (ITU) Recommendation SM329.
- ANSI PC63.10
- ANSI C63.4

Test procedures are summarized below

6dB Bandwidth	EDCS # - 422115		
26dB Bandwidth	EDCS # - 422115		
Co-Located Transmitter	EDCS # - 422118		
Conducted Spurious Test	EDCS # - 422119		
Peak Transmit Power Measurement	EDCS # - 422123		
Power Spectral Density	EDCS # - 422113		
Radiated Band Edge	EDCS # - 422124		
Radiated Spurious Test	EDCS # - 422125		

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