gobandit GmbH

Sport Camera

Main Model: gobandit LIVE GBZ0500
Serial Model: N/A

15th June, 2012

Report No.: 12070058-FCC/IC-R1

(This report supersedes NONE)

Modifications made to the product : None

This Test Report is Issued Under the Authority of:		
Back Huang	Alex Liu	
Back Huang **Compliance Engineer**	**Alex Liu** **Technical Manager**	

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Test result presented in this test report is applicable to the representative sample only.

RF Test Report

FCC Part 15.247: 2012;IC RSS-210

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Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety

Accreditations for Product Certifications

Country/Region	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC, (RCB 208)	RF , Telecom
Hong Kong	OFTA (US002)	RF , Telecom

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CONTENTS

1 Executive Summary & EUT information

The purpose of this test programme was to demonstrate compliance of the gobandit GmbH, Sport Camera and model: gobandit LIVE GBZ0500 against the current Stipulated Standards. The Sport Camera has demonstrated compliance with the FCC Part 15.247: 2012 (KDB 558074);IC RSS-210**.**

EUT Information

EUT Description	:	**Sport Camera**
Main Model	:	**gobandit LIVE GBZ0500**
Serial Model	:	**N/A**
Antenna Gain	:	**WIFI: 2 dBi** **ANT+: 2 dBi** **GPS: 2 dBi**
Input Power	:	**LITHIUM ION BATTERY PACK** **MODEL NO.:CB-PB(NP60)** **3.7V 1200mAh 4.44Wh**
Classification Per Stipulated Test Standard	:	**FCC Part 15.247: 2012 (KDB 558074);IC RSS-210**

2 TECHNICAL DETAILS

Purpose	**Compliance testing of Sport Camera with stipulated standard**
Applicant / Client	**gobandit GmbH Max-Planck-Strasse 4, D-85609 Aschheim/Dornach, Germany**
Manufacturer	**AIPTEK Technology (Wu Jiang) Co., Ltd. NO.518 Yun Li Road, TongLi Town , WuJiang City , China**
Laboratory performing the tests	**SIEMIC Nanjing (China) Laboratories NO.2-1,Longcang Dadao, Yuhua Economic Development Zone, Nanjing, China Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email:info@siemic.com**
Test report reference number	**12070058-FCC/IC-R1**
Date EUT received	**6th April, 2012**
Standard applied	**FCC Part 15.247: 2012 (KDB 558074);IC RSS-210**
Dates of test (from – to)	**5th June, 2012 to 7th June, 2012**
No of Units :	**#1**
Equipment Category :	**Spread Spectrum System/Device**
Trade Name :	**gobandit**
RF Operating Frequency (ies)	**WIFI: 802.11b/g : 2412-2462 MHz ANT+: 2401.048-2482.048MHz GPS:1575.42MHz(Rx)**
Number of Channels	**WIFI: 11CH ANT+: 82CH**
Modulation	**WIFI: DSSS/OFDM ANT+: GFSK**
FCC ID	**YJTGBZ005**
IC ID	**10297A-GBZ005**

3 MODIFICATION

NONE

4 TEST SUMMARY

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

Spread Spectrum System/Device

Test Results Summary

FCC/IC Rules		Description of Test	Result
§15.247 (i), §2.1093	RSS-102 [2.5.1]	RF Exposure	Compliance
§15.247 (a)(2)	RSS-210 [A8.2]	6 dB Bandwidth&99% Occupied Bandwidth	Compliance
§15.247(b) (3)	RSS-210 [A8.4]	Conducted Maximum Output Power	Compliance
§15.247(e)	RSS-210 [A8.2]	Power Spectral Density	Compliance
§15.247(d)	RSS-210 [A8.5]	Band Edge & Conducted Spurious Emissions	Compliance
§15.205, §15.209, §15.247(d)	RSS-210 [A8.5]	Radiated Spurious Emissions & Restricted Bands(Tx)	Compliance
/	RSS-Gen [6.1]	Radiated Spurious Emissions & Restricted Bands(Rx)	Compliance

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 RF Exposure

Applicable Standard

According to §15.247 (i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Table 2 – Summary of SAR Evaluation Requirements for a Cell Phone with Multiple Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	Routine evaluation required	SAR not required: Unlicensed only o when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed o when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas o when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – o output ≤ 60/f: SAR not required o output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when o output ≤ 2·P_{Ref} and antenna is ≥ 5.0 cm from other antennas o output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas o output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required o test SAR on highest output channel for each wireless mode and exposure condition o if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	
Jaw, Mouth and Nose	Flat phantom SAR required o when measurement is required in tight regions of SAM and it is not feasible or the results can be questionable due to probe tilt, calibration, positioning and orientation issues o position rectangular and clam-shell phones according to flat phantom procedures and conduct SAR measurements for these specific locations	When simultaneous transmission SAR testing is required, contact the FCC Laboratory for interim guidance.

Routine SAR evaluation refers to that specifically required by §2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

Three antennas are available for the EUT, (WIFI antenna, ANT+ antenna, GPS antenna), The GPS antenna is only used to receive,the Max output power of WIFI is 7.40 mW <2*Pref (24 mW), Max output power of ANT+ is 0.98mW <2*Pref (24 mW).So no stand-alone SAR is required for WLAN and ANT+ antenna. According to KDB 648474, no simultaneous SAR measurement is required too.

According to 2.5.1 Exemption from Routine Evaluation Limits – SAR Evaluation in RSS-102

SAR evaluation is required if the separation distance between the user and the radiating element of the device is less than or equal to 20 cm, except when the device operates as follows:

- from 3 kHz up to 1 GHz inclusively, and with output power (i.e. the higher of the conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 200 mW for general public use and 1000 mW for controlled use;
- above 1 GHz and up to 2.2 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 100 mW for general public use and 500 mW for controlled use;
- above 2.2 GHz and up to 3 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 20 mW for general public use and 100 mW for controlled use;
- above 3 GHz and up to 6 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 10 mW for general public use and 50 mW for controlled use.

Above 2.2 GHz and up to 3 GHz inclusively, three antennas are available for the EUT, (WIFI antenna, ANT+ antenna, GPS antenna), The GPS antenna is only used to receive,The Max output power of WIFI is 7.40 mW <100 mW, Max output power of ANT+ is 0.98mW <100 mW.So, no SAR measurement is required.

Result:

The SAR measurement is exempt.

5.2 6 dB BANDWIDTH TESTING&99% Occupied Bandwidth

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Environmental Conditions

Temperature	22°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
4. Test date : 5th June, 2012
   Tested By : Back Huang

Requirement(s): §15.247(a)(2) specifies that the minimum 6 dB bandwidth shall be at least 500 kHz. In addition, the EBW is required information for subsequent band power measurements. The following procedures can be used to determine the EBW:

Procedures:
1. Set resolution bandwidth (RBW) = 1-5 % of the emission bandwidth (EBW).
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1-5 %.

Test Result: Pass.

6 dB BANDWIDTH

Please refer to the following tables and plots.

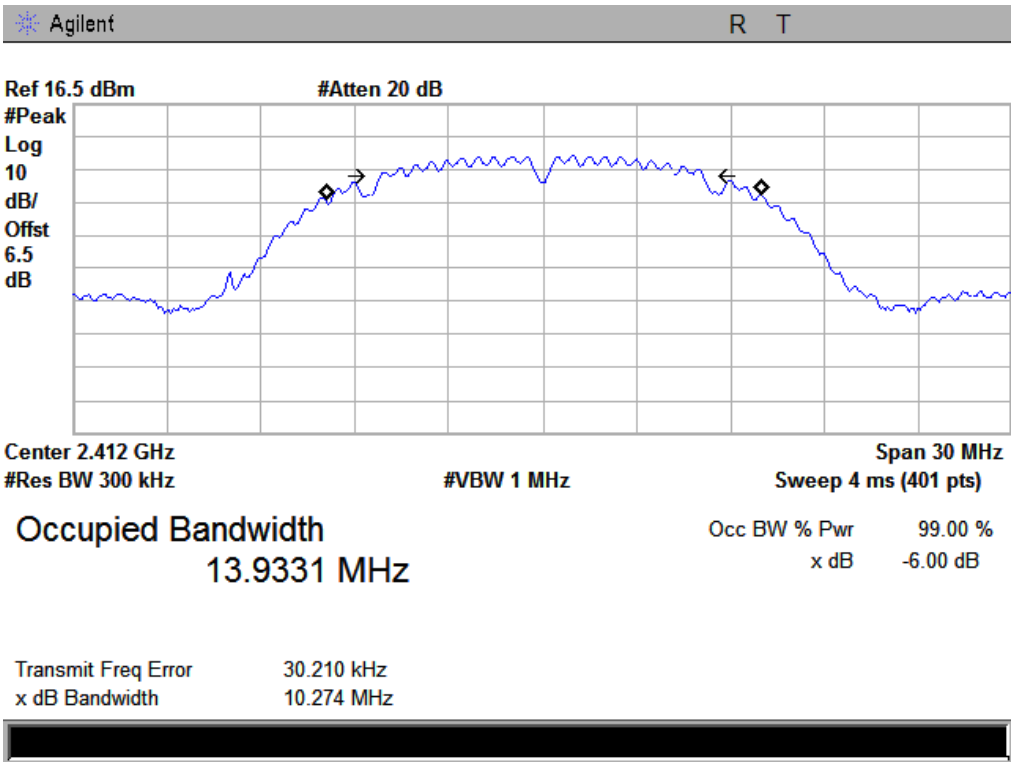
Channel	Channel Frequency (MHz)	Measured 6dB Bandwidth (MHz)	FCC Part 15.247 Limit (kHz)
802.11b mode			
Low	2412	10.274	＞500
Middle	2437	10.269	＞500
High	2462	10.269	＞500
802.11g mode			
Low	2412	16.736	＞500
Middle	2437	16.581	＞500
High	2462	16.577	＞500

99% Occupied Bandwidth

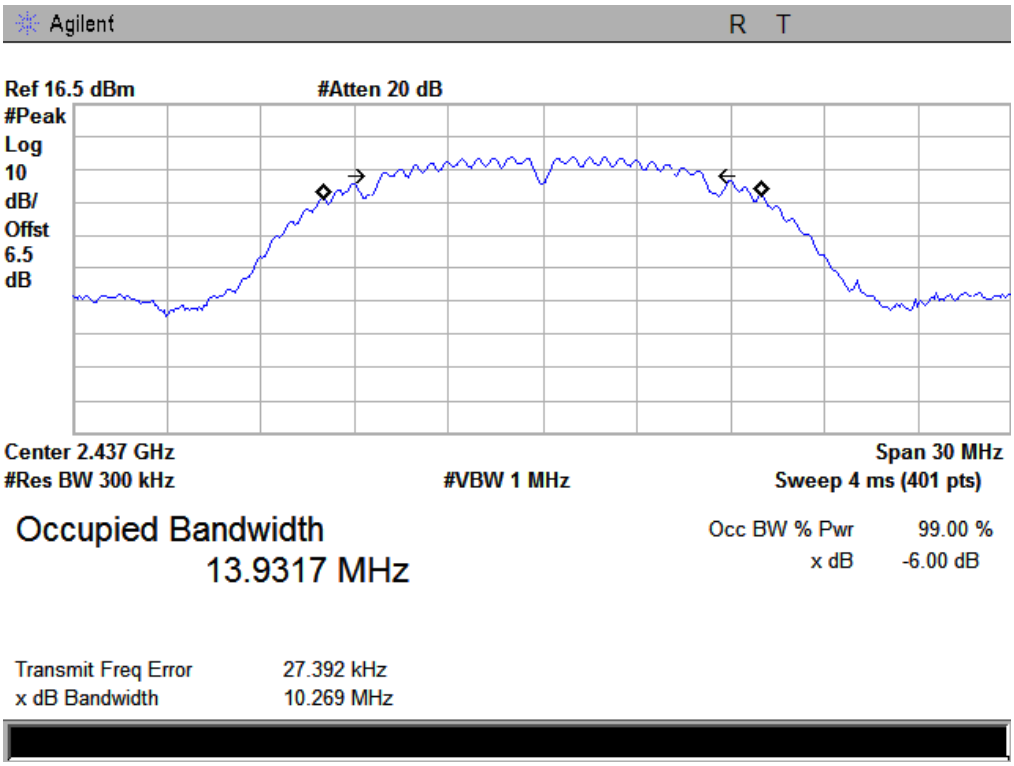
Please refer to the following tables and plots.

Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)
802.11b mode		
Low	2412	13.9331
Middle	2437	13.9317
High	2462	13.9203
802.11g mode		
Low	2412	17.7908
Middle	2437	17.0013
High	2462	16.9906

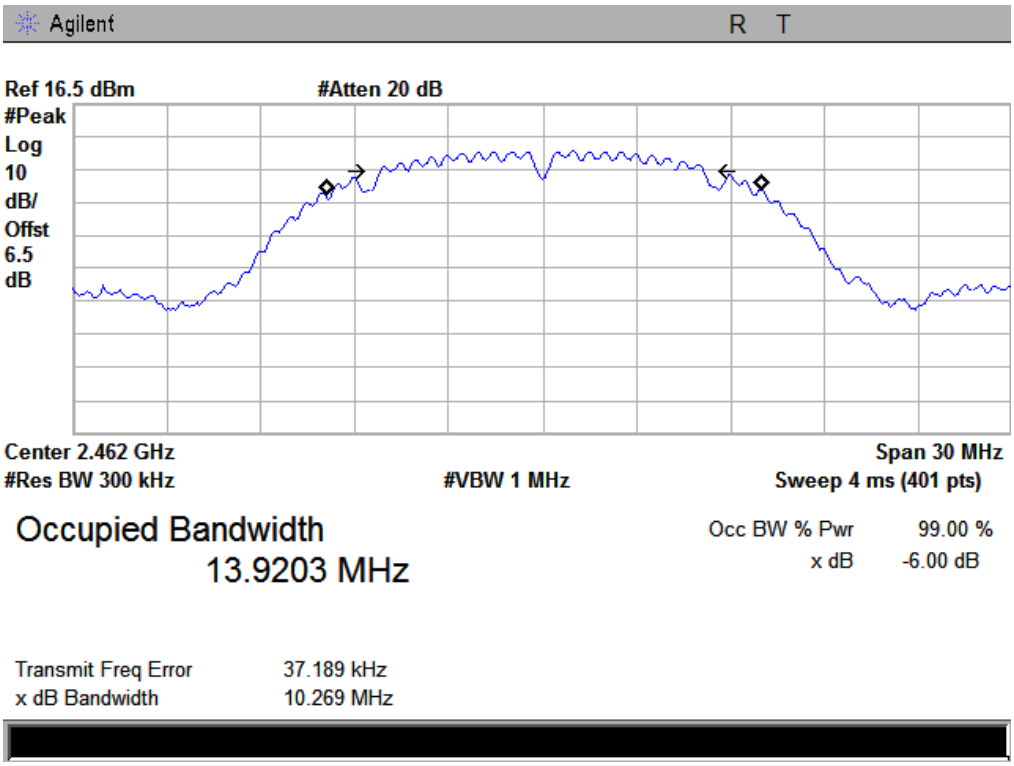
802.11b Low Channel



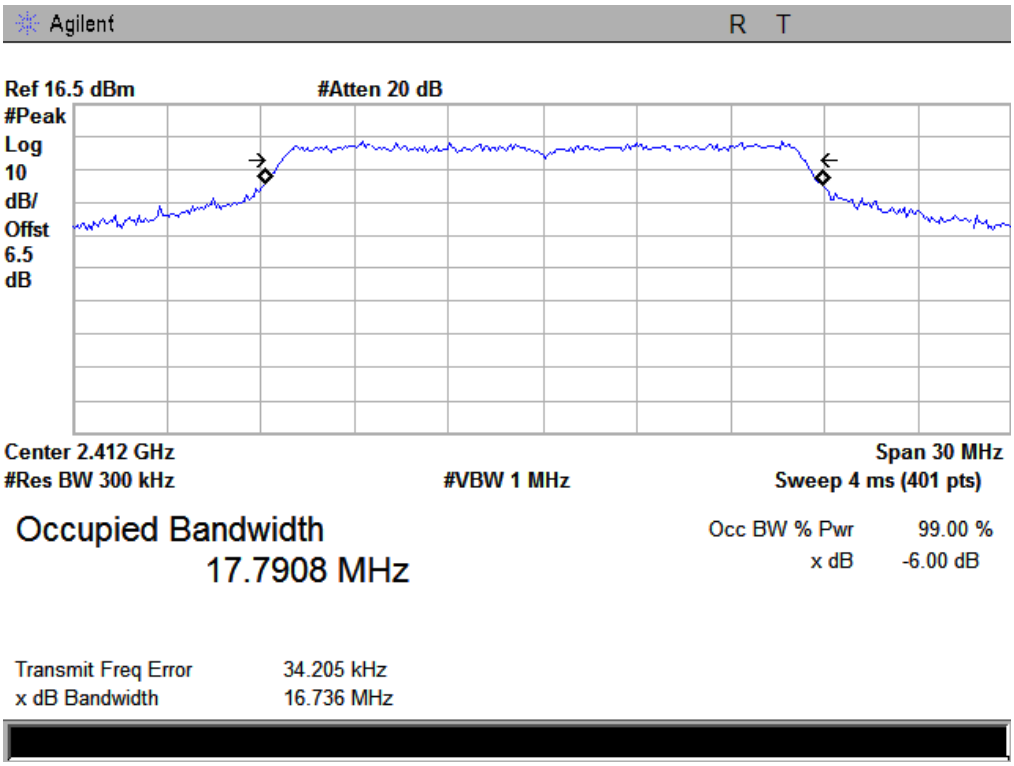
802.11b Middle Channel



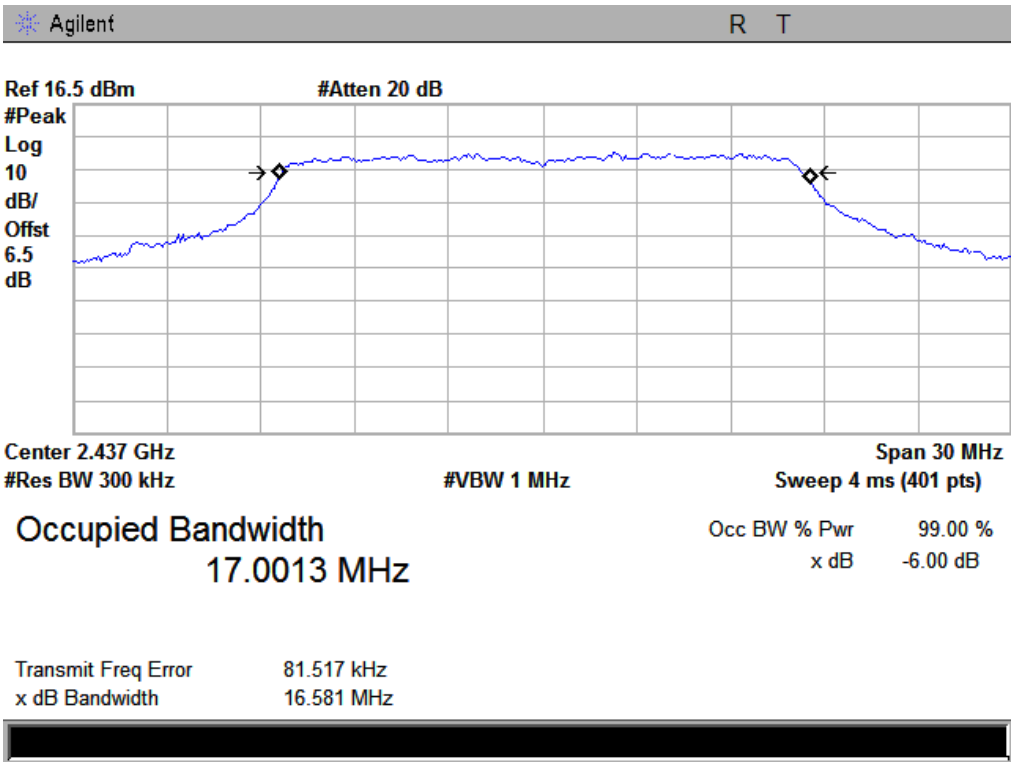
802.11b High Channel



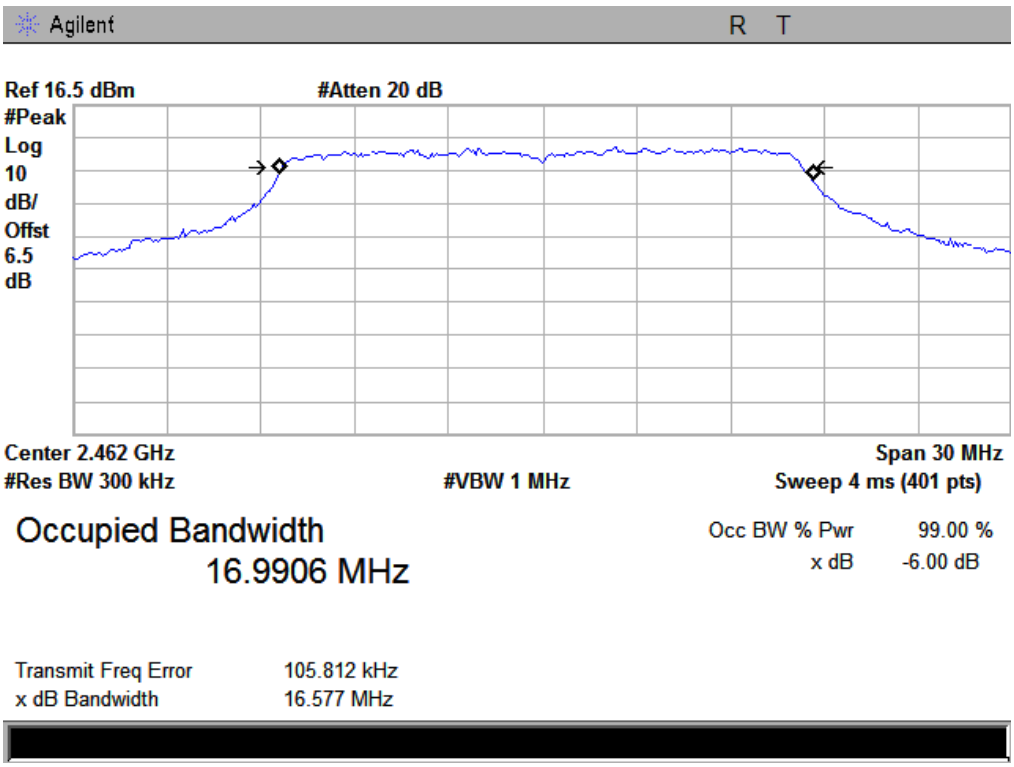
802.11g Low Channel



802.11g Middle Channel



802.11g High Channel



5.3 Conducted Maximum Output Power

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	16°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4. Test date : 5th June, 2012
   Tested By : Back Huang

Standard Requirement:

Maximum Peak Conducted Output Power Level:

§15.247(b)(3) specifies that the maximum peak conducted output power for DTS transmitters in any of the three authorized frequency bands is 1 watt (30 dBm). The following procedures can be used to determine the maximum peak conducted output power from a DTS EUT using a spectrum analyzer.

Maximum Conducted (Average) Output Power Level:

§15.247(b)(3) permits the maximum conducted output power to be measured as an alternative to a peak power measurement to demonstrate compliance to the one watt (30 dBm) output power limit. The maximum conducted output power is the highest total transmit power occurring in any mode when averaged over the EUT EBW. This measurement requires that the EUT be configured to transmit continuously (at a minimum duty cycle of 98%) at full power over the measurement duration. Time intervals during which the transmitter is off or transmitting at reduced power levels shall not be included.

Procedures:

Measurement Procedure PK2:

1. This procedure provides an integrated measurement alternative when the maximum available RBW < EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Set the span to a value that is 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

Measurement Procedure AVG2 (trace averaging over the EBW):

1. Set the analyzer span to 5-30% greater than the EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW ≥ 3 MHz.
4. Ensure that the number of measurement points in the sweep ≥ 2 x (span/RBW).
5. Sweep time = auto couple.
6. Detector = power averaging (RMS) or sample.
7. Employ trace averaging in power averaging (RMS) mode over a minimum of 100 traces.
8. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges to determine the maximum conducted output power of the EUT over the EBW. If the analyzer does not have a band power function, sum the spectral levels (in linear power units) at 1 MHz intervals extending across the entire EBW.

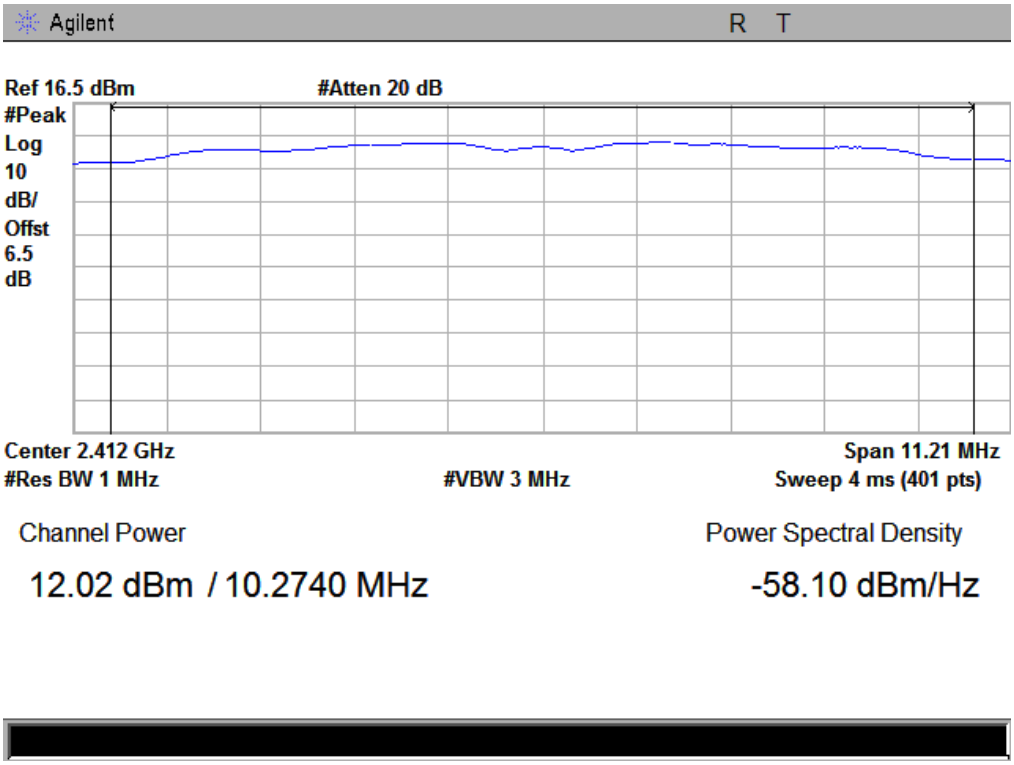
Test Result: Pass.

Please refer to the following tables and plots.

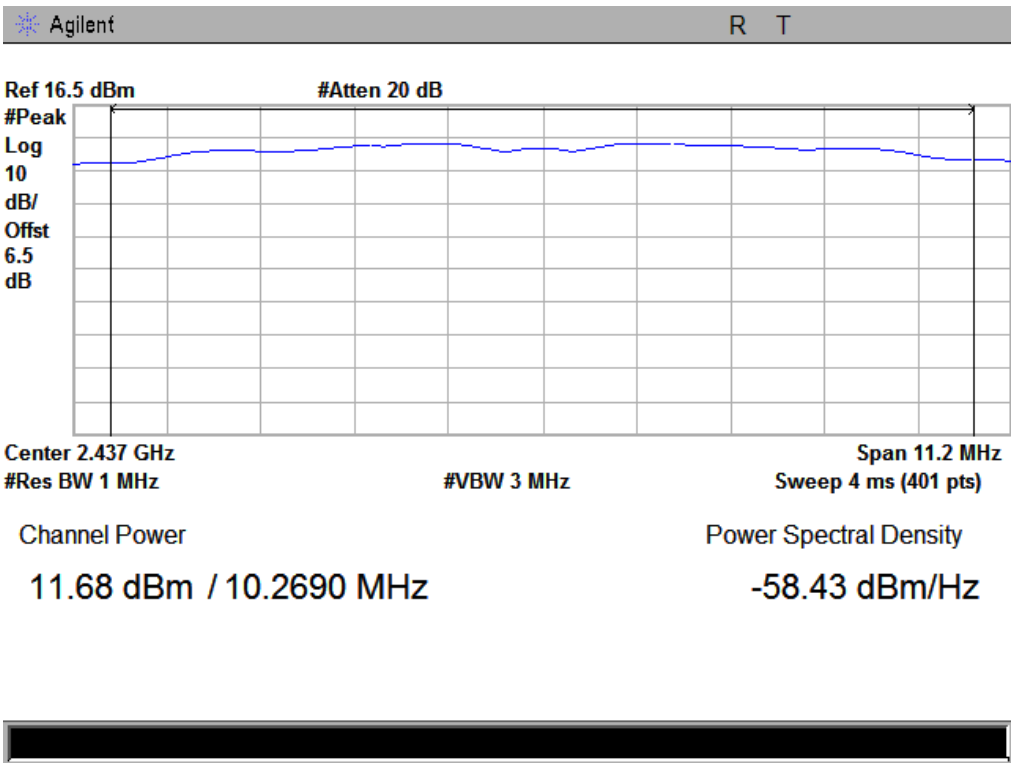
Channel	Channel Frequency (MHz)	Data Rate (Mbps)	PK Output Power (dBm)	AVG Output Power (dBm)	Limit (dBm)
802.11b mode					
Low	2412	1	12.02	8.00	30
Middle	2437	1	11.68	7.89	30
High	2462	1	12.73	8.69	30
802.11g mode					
Low	2412	6	11.59	6.65	30
Middle	2437	6	11.21	6.13	30
High	2462	6	12.10	7.06	30

802.11b Mode:

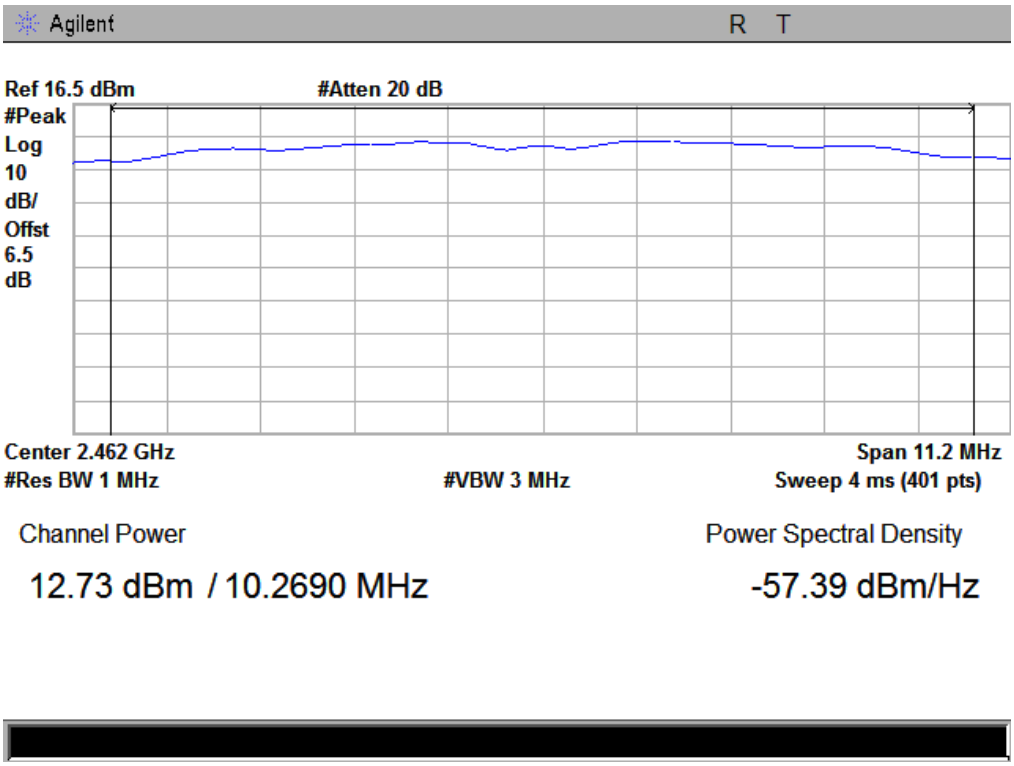
802.11b PK Output Power, Low Channel



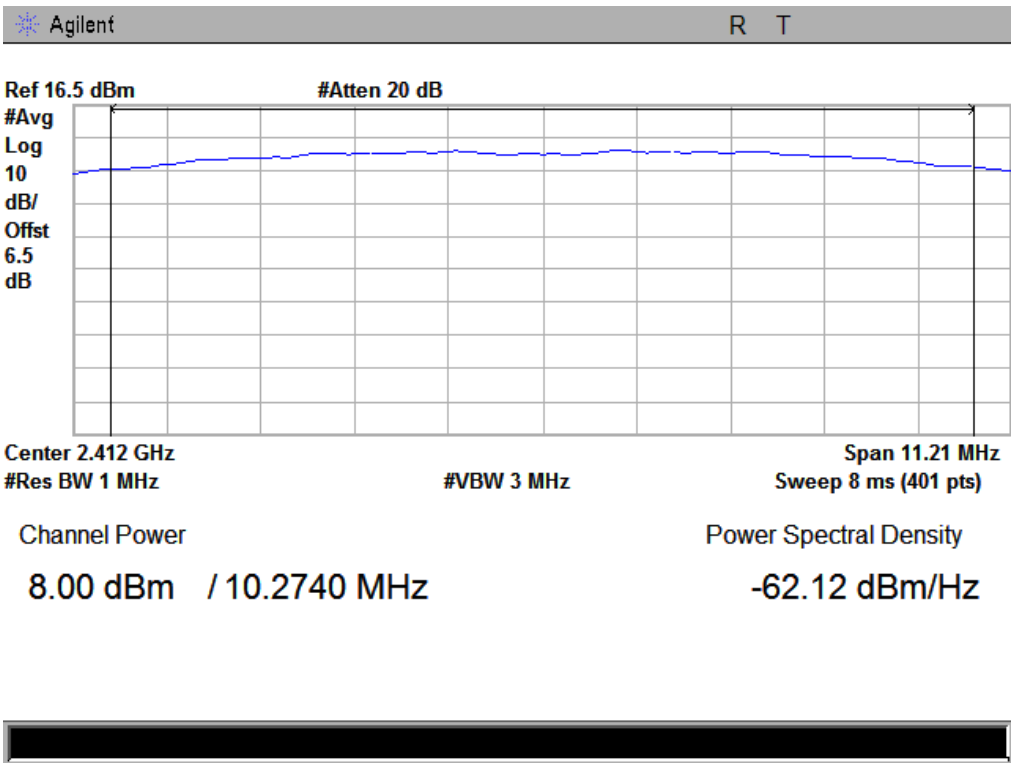
802.11b PK Output Power, Middle Channel



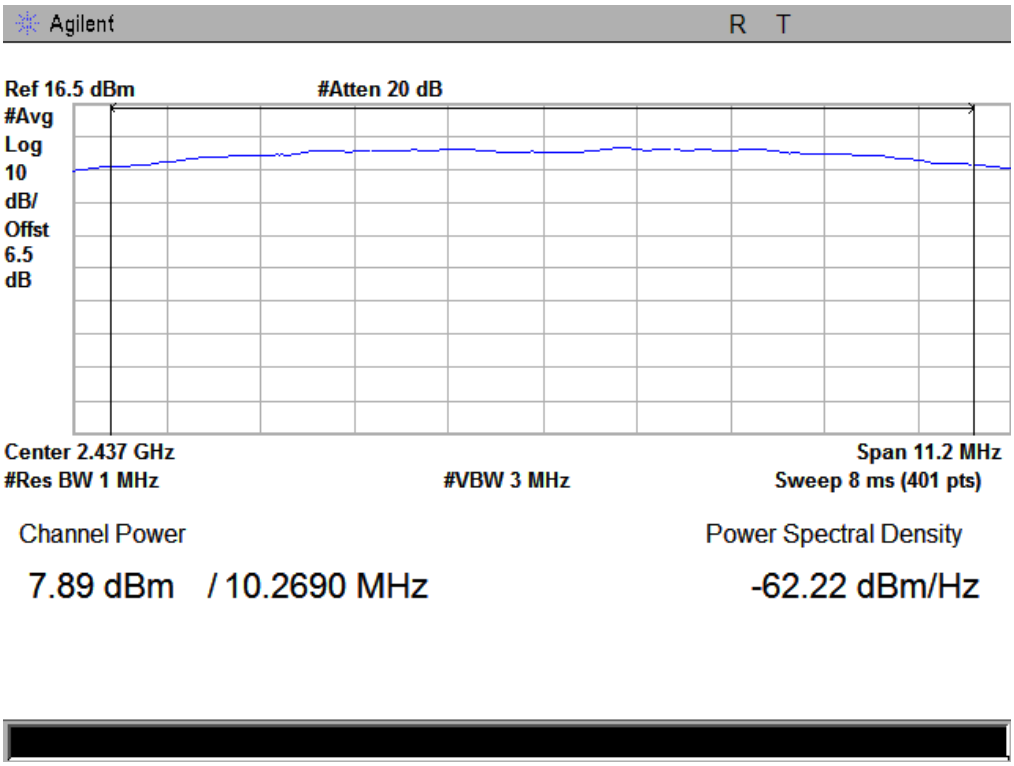
802.11b PK Output Power, High Channel



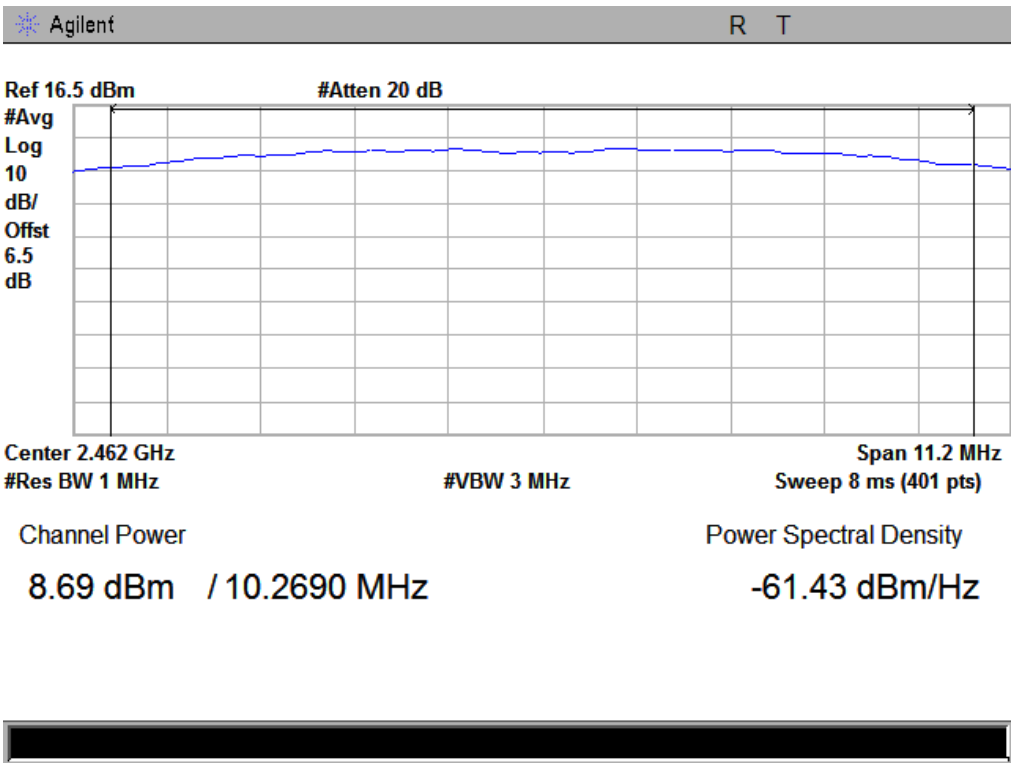
802.11b AVG Output Power, Low Channel



802.11b AVG Output Power, Middle Channel

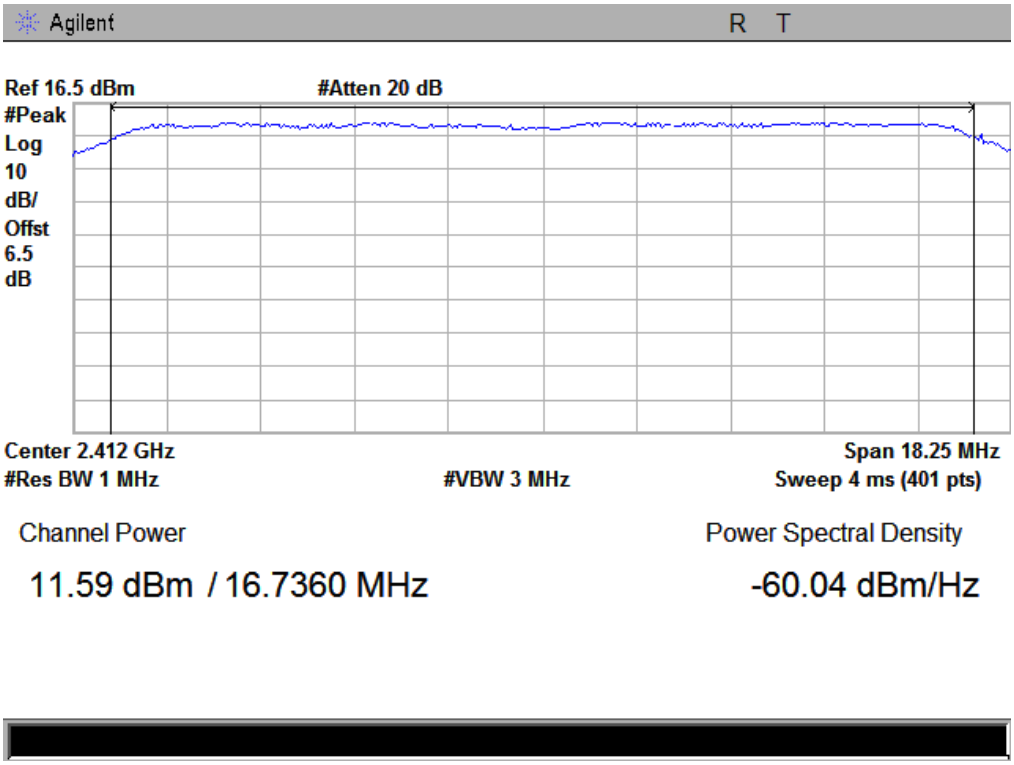


802.11b AVG Output Power, High Channel

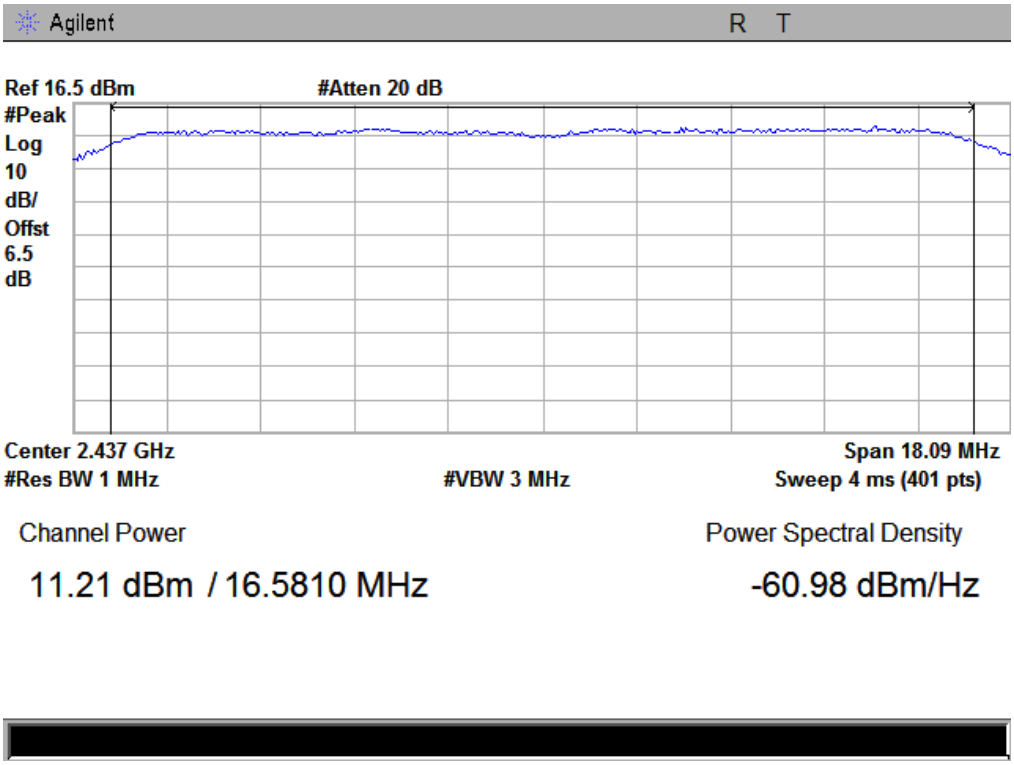


802.11g Mode:

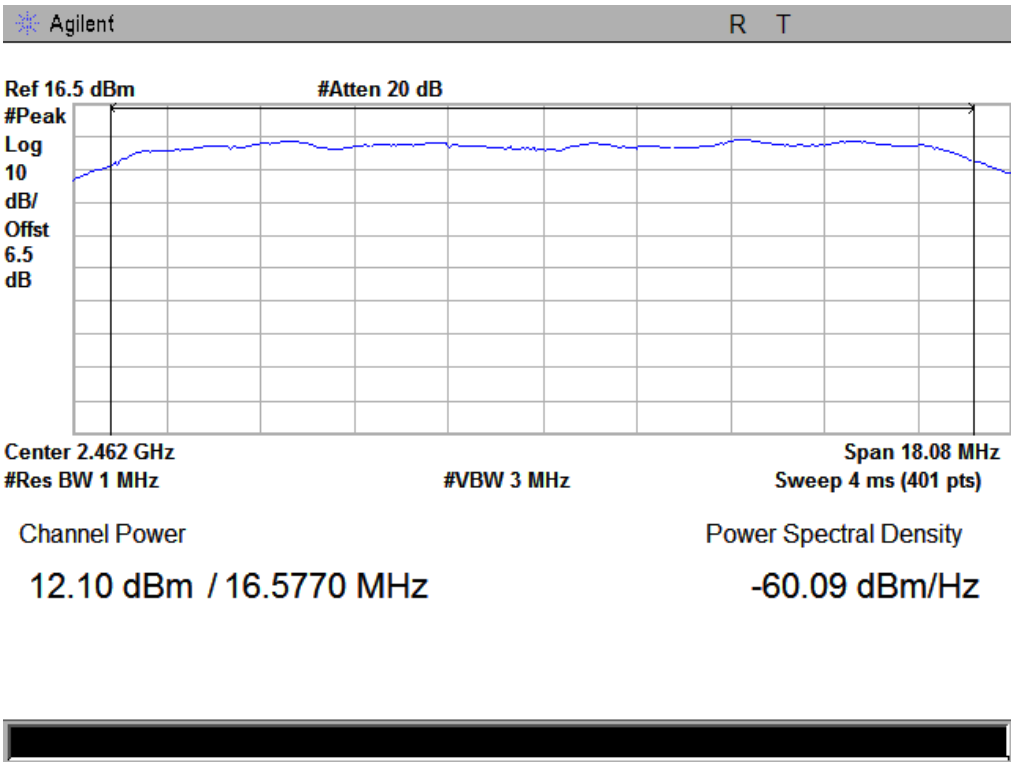
802.11g PK Output Power, Low Channel



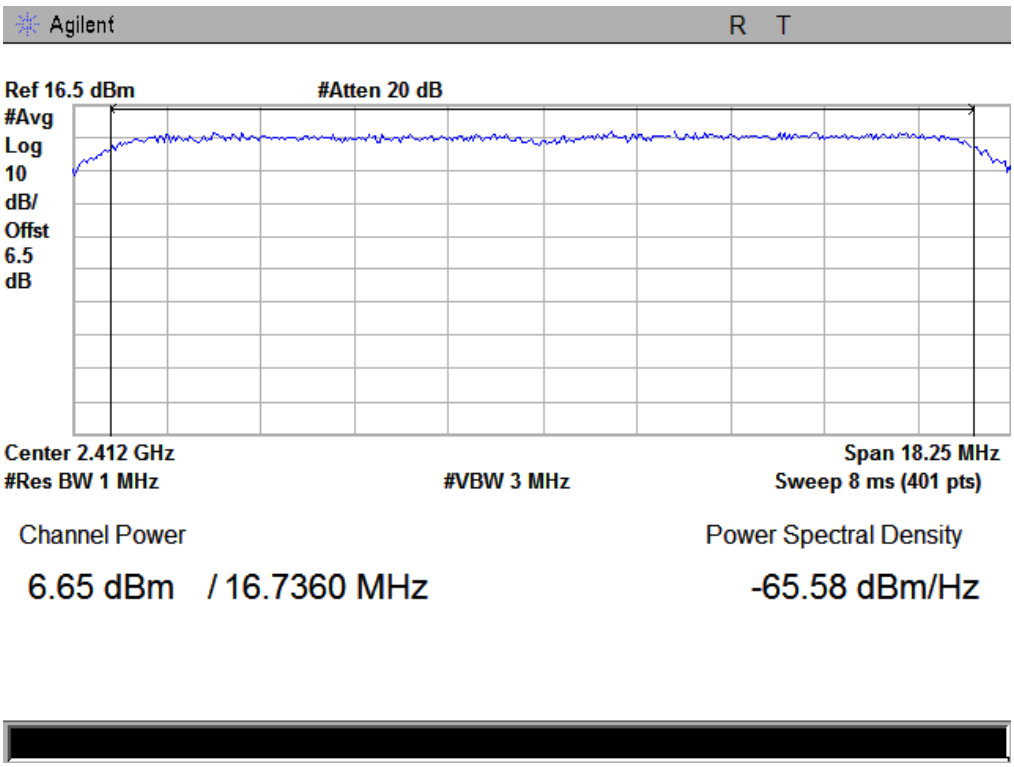
802.11g PK Output Power, Middle Channel



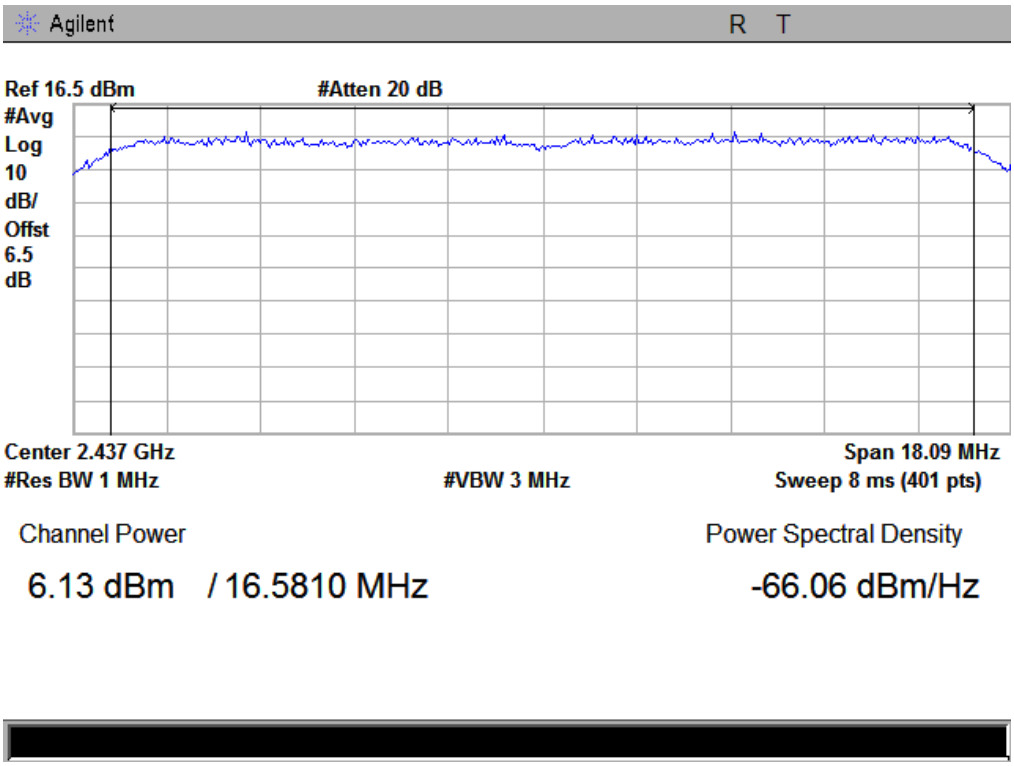
802.11g PK Output Power, High Channel



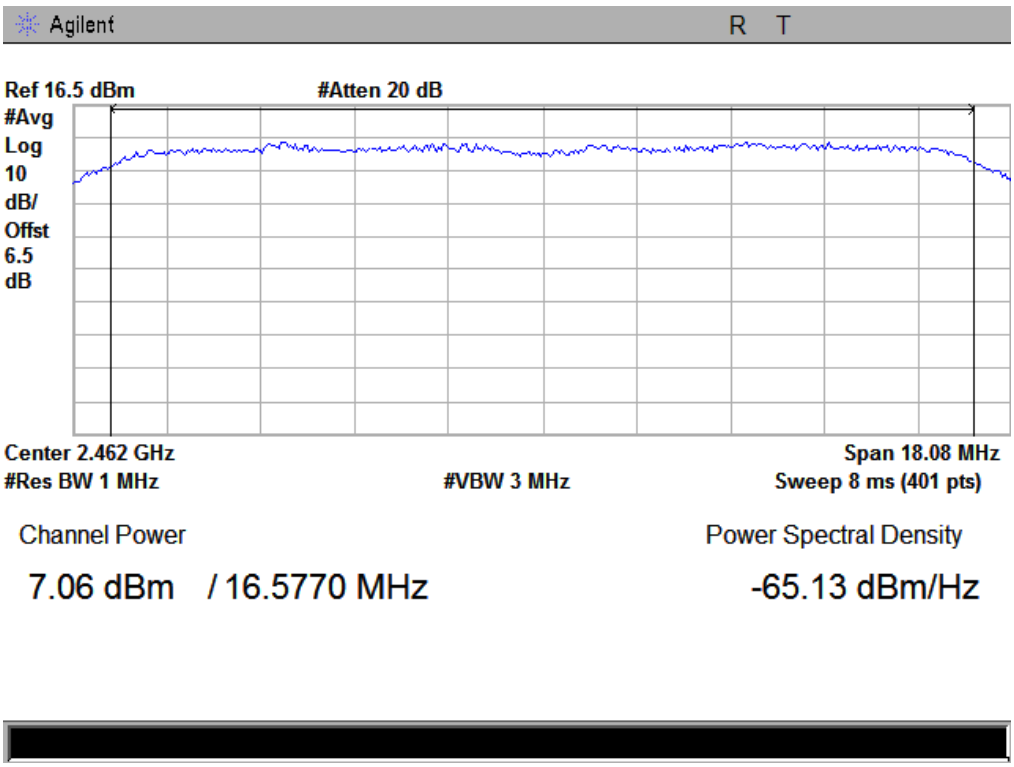
802.11g AVG Output Power, Low Channel



802.11g AVG Output Power, Middle Channel



802.11g AVG Output Power, High Channel



5.4 §15.247(e)/RSS-210(A8.2) - Power Spectral Density

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Environmental Conditions

Temperature	22°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
4. Test date : 5th June, 2012
   Tested By : Back Huang

Requirement(s): §15.247(e) specifies a conducted power spectral density (PSD) limit of 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission. The same method as used to determine the conducted output power shall be used to determine the power spectral density (i.e., if peak-detected fundamental power was measured then use the peak PSD procedure and if average fundamental power was measured then use the average PSD procedure).

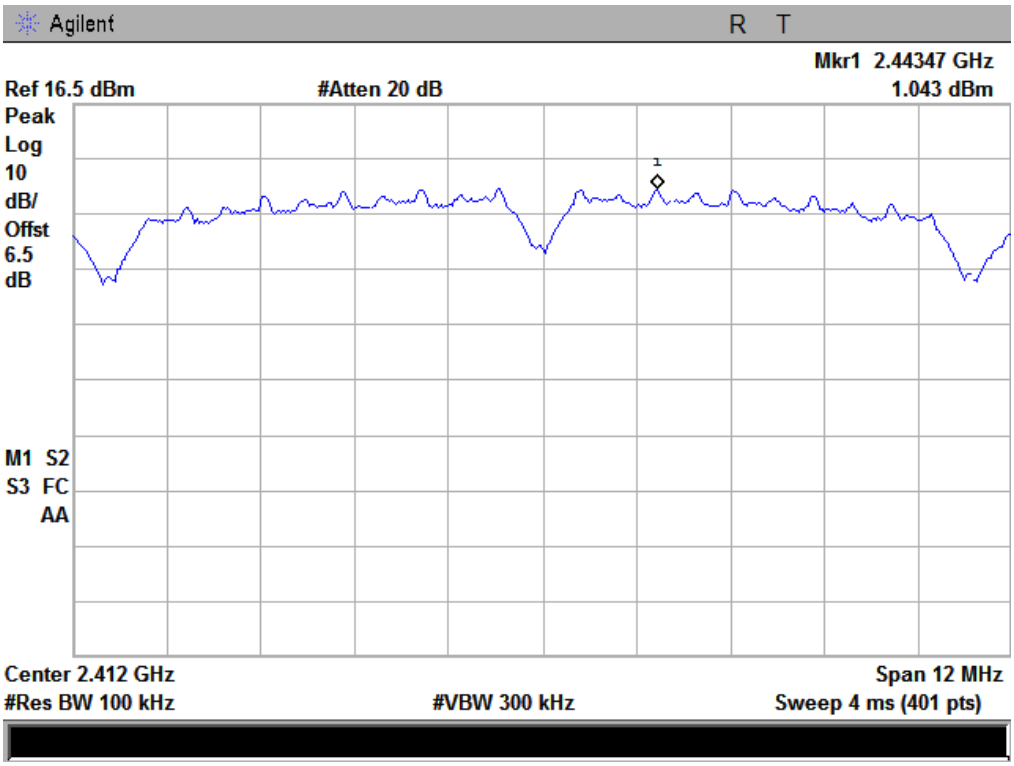
Procedures:
Measurement Procedure PKPSD:
1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 100 kHz.
3. Set the VBW ≥ 300 kHz.
4. Set the span to 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
10. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (3 kHz/100 kHz = -15.2 dB).
11. The resulting peak PSD level must be ≤ 8 dBm.

Test Result: Pass.

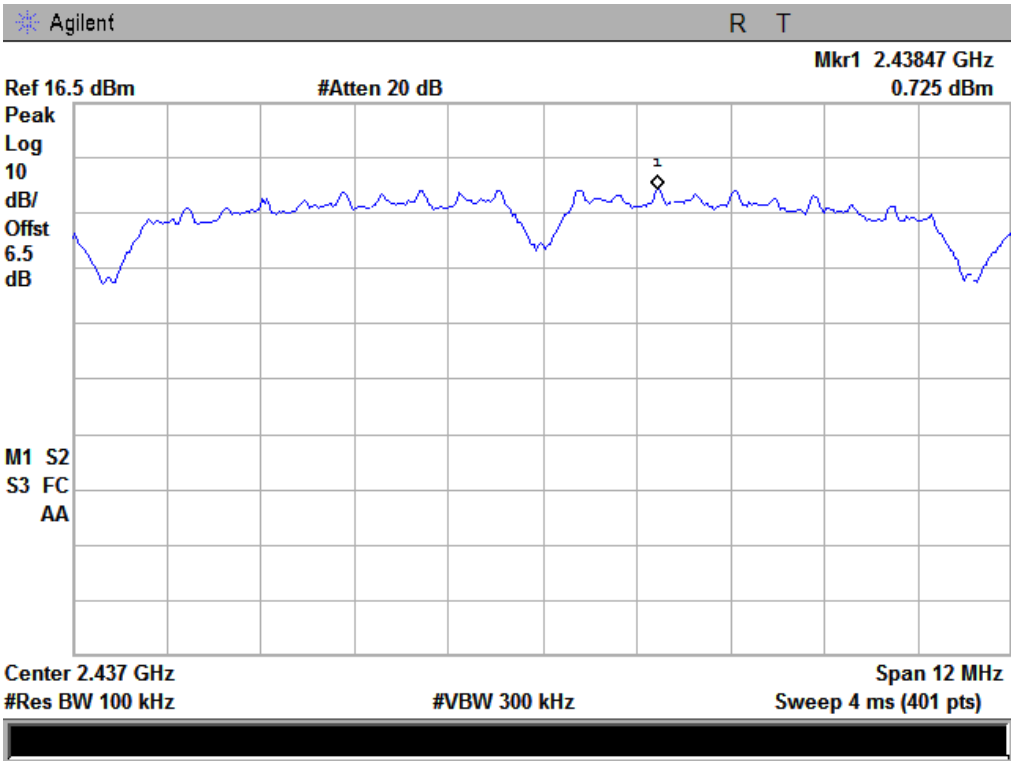
Please refer to the following tables and plots.

Channel	Frequency (MHz)	Data Rate	S.A. Reading (dBm)	BWCF (dB)	PSD (dBm)	Limit (dBm)
802.11b mode						
Low	2412	1	1.043	-15.2	-14.157	8
Middle	2437	1	0.725	-15.2	-14.475	8
High	2462	1	1.825	-15.2	-13.375	8
802.11g mode						
Low	2412	6	1.851	-15.2	-13.349	8
Middle	2437	6	1.101	-15.2	-14.099	8
High	2462	6	2.324	-15.2	-12.876	8

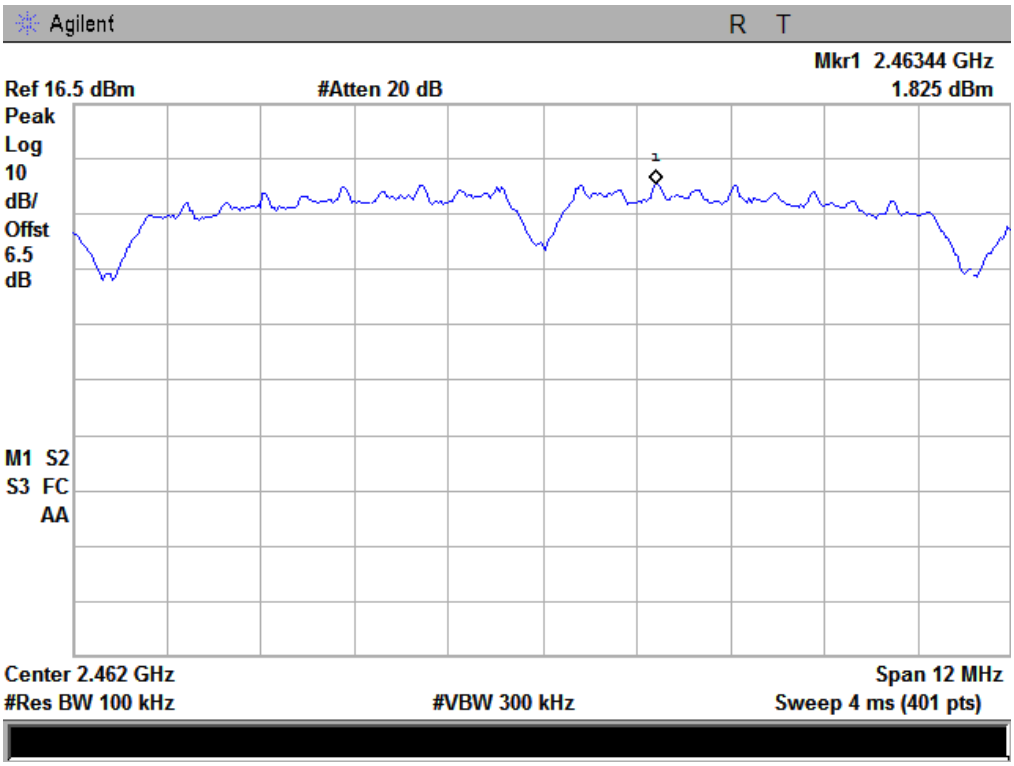
Power Spectral Density, 802.11b Low Channel



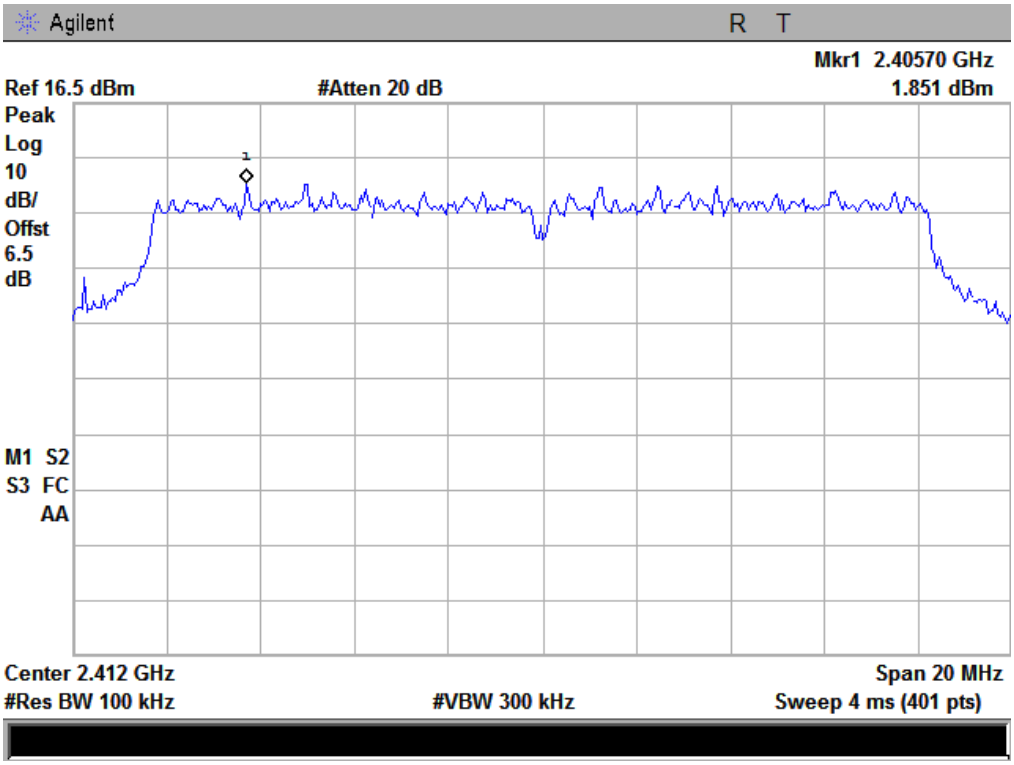
Power Spectral Density, 802.11b Middle Channel



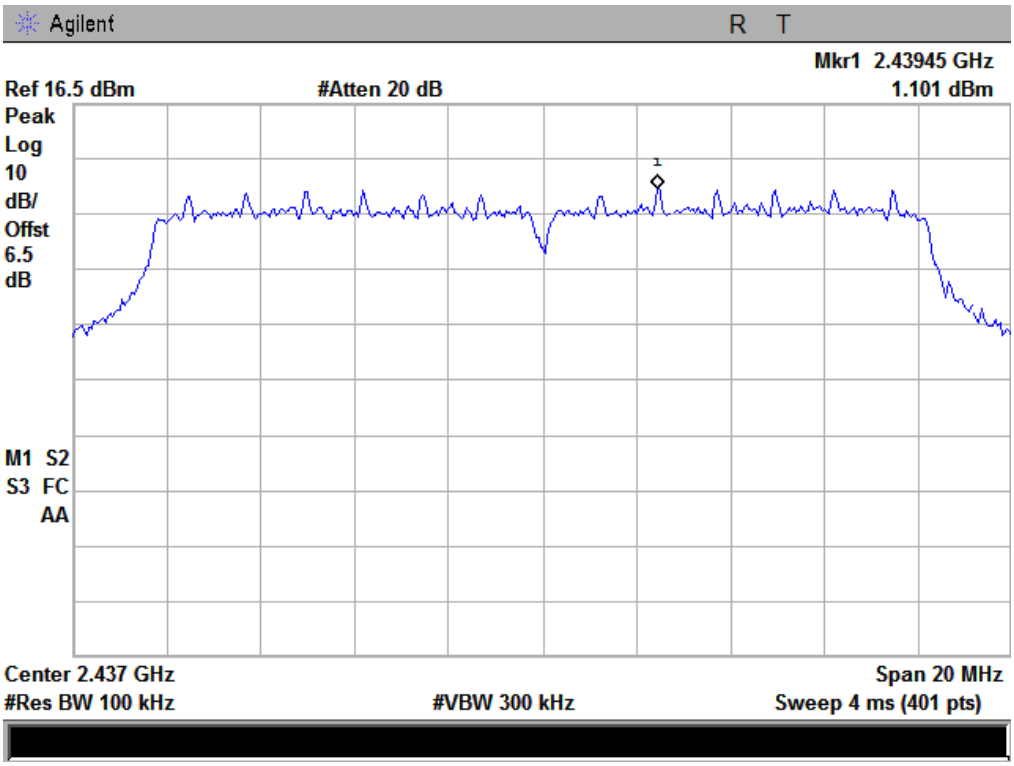
Power Spectral Density, 802.11b High Channel



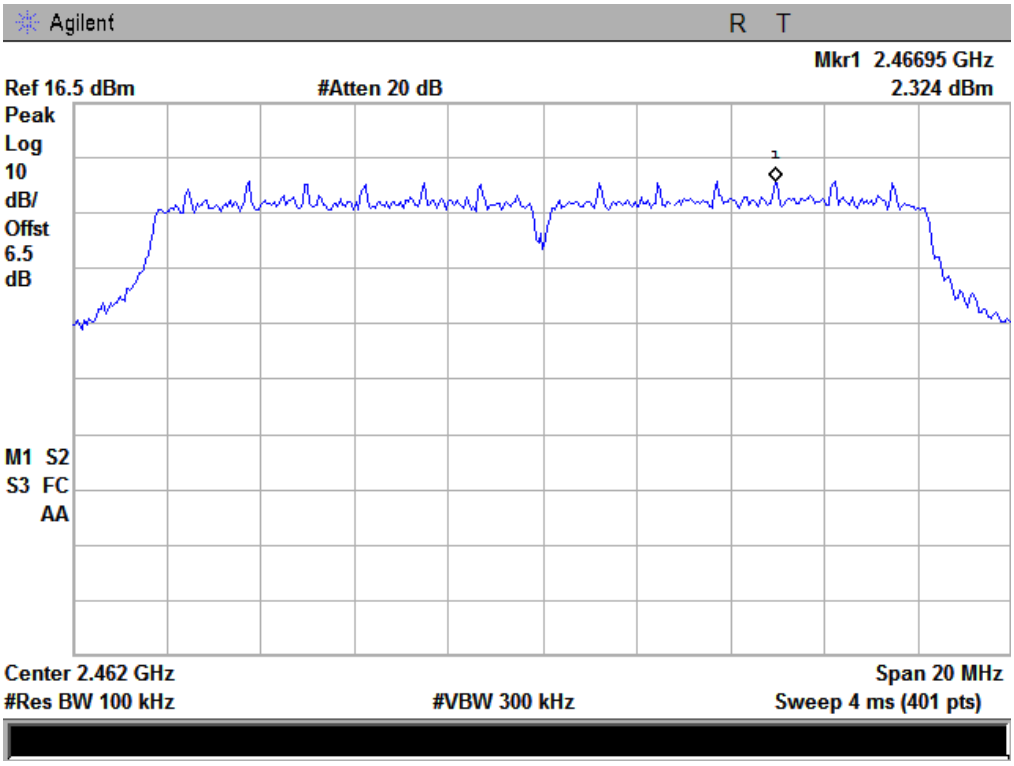
Power Spectral Density, 802.11g Low Channel



Power Spectral Density, 802.11g Middle Channel



Power Spectral Density, 802.11g High Channel



5.5 Band Edge & Conducted Spurious Emissions

1. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))

2. Environmental Conditions

Temperature	16oC
Relative Humidity	50%
Atmospheric Pressure	1019mbar

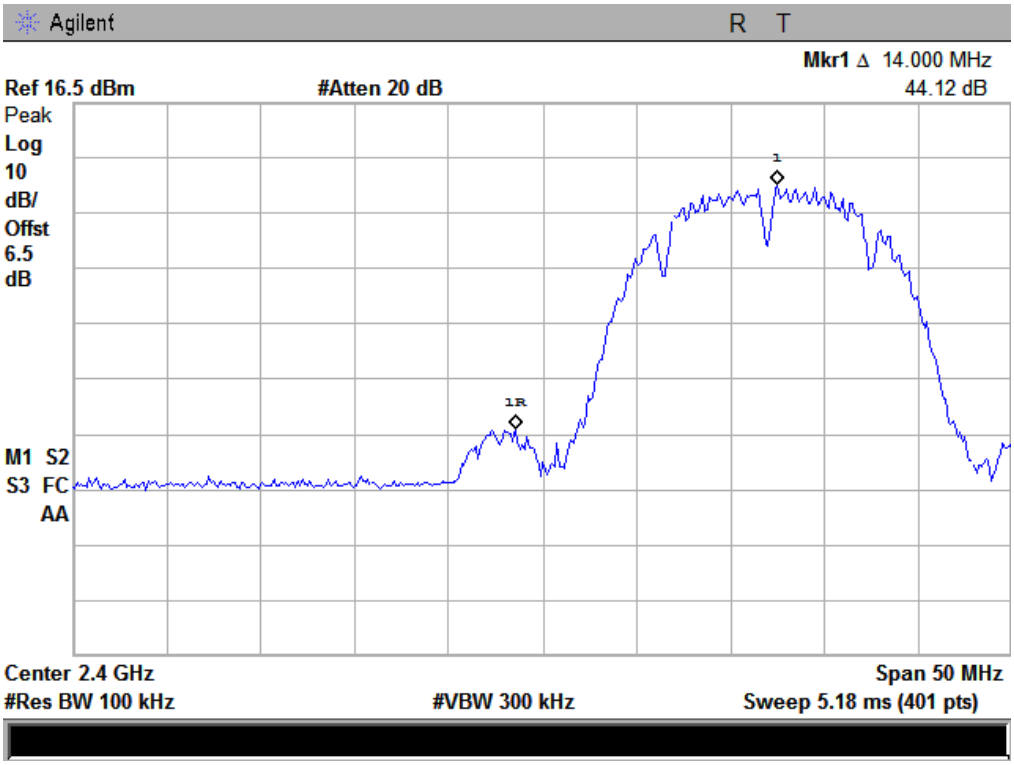
3. Test date : 6th June, 2012
Tested By : Back Huang

Test Result: Pass.

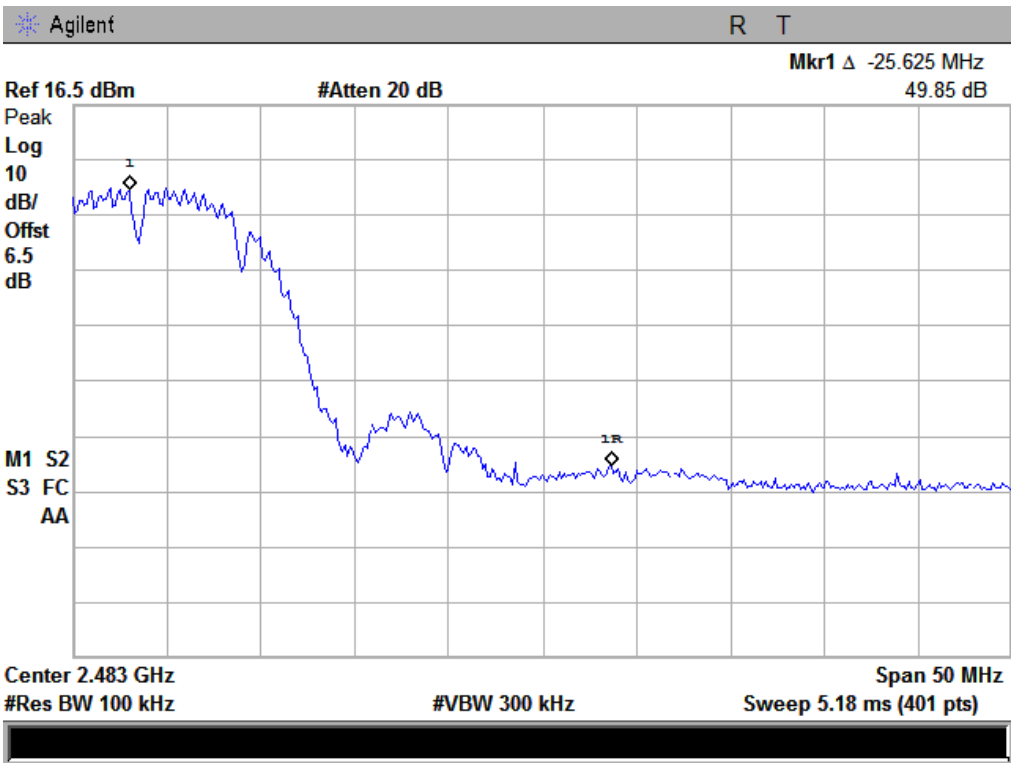
Please refer to the following tables and plots.

Band Edge	Delta Peak to band emission (dB)	Limit (dB)
802.11b mode		
Left Side	44.12	20
Right Side	49.85	20
802.11g mode		
Left Side	23.77	20
Right Side	42.53	20

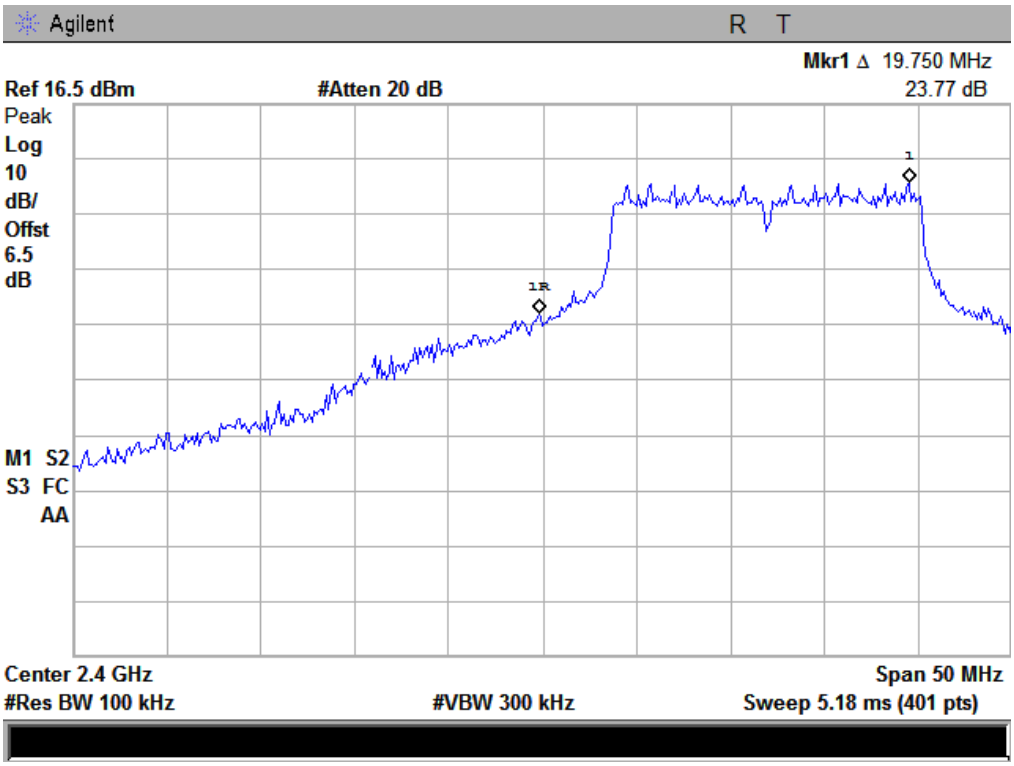
802.11b: Band Edge, Left Side



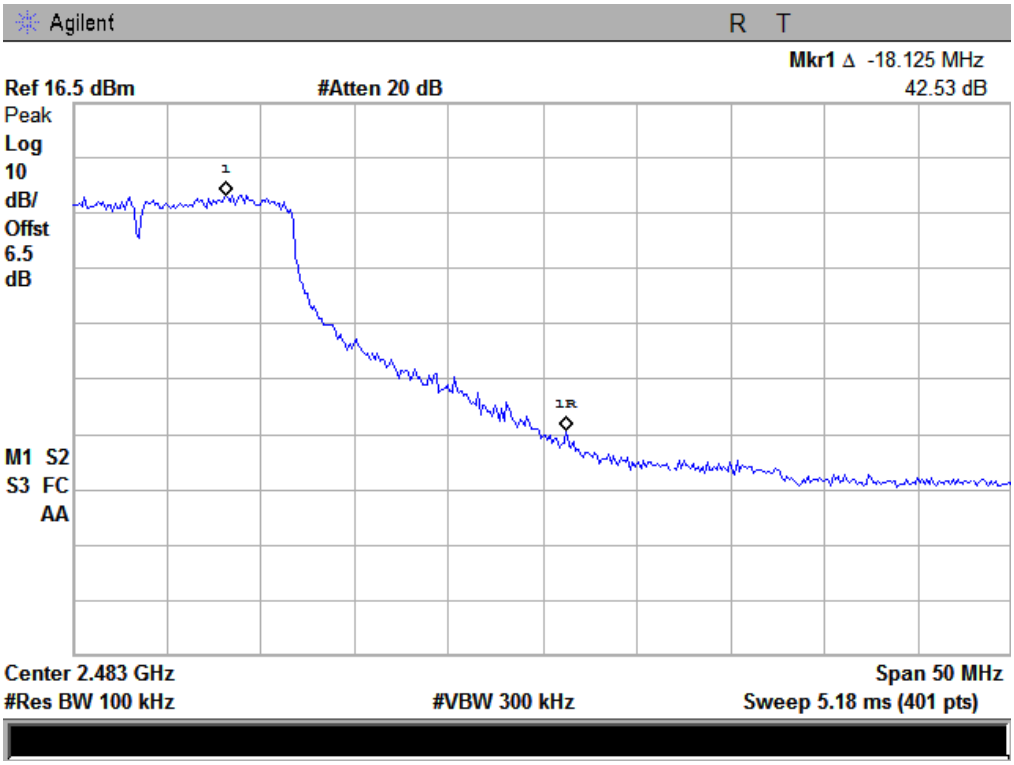
802.11b: Band Edge, Right Side



802.11g: Band Edge, Left Side



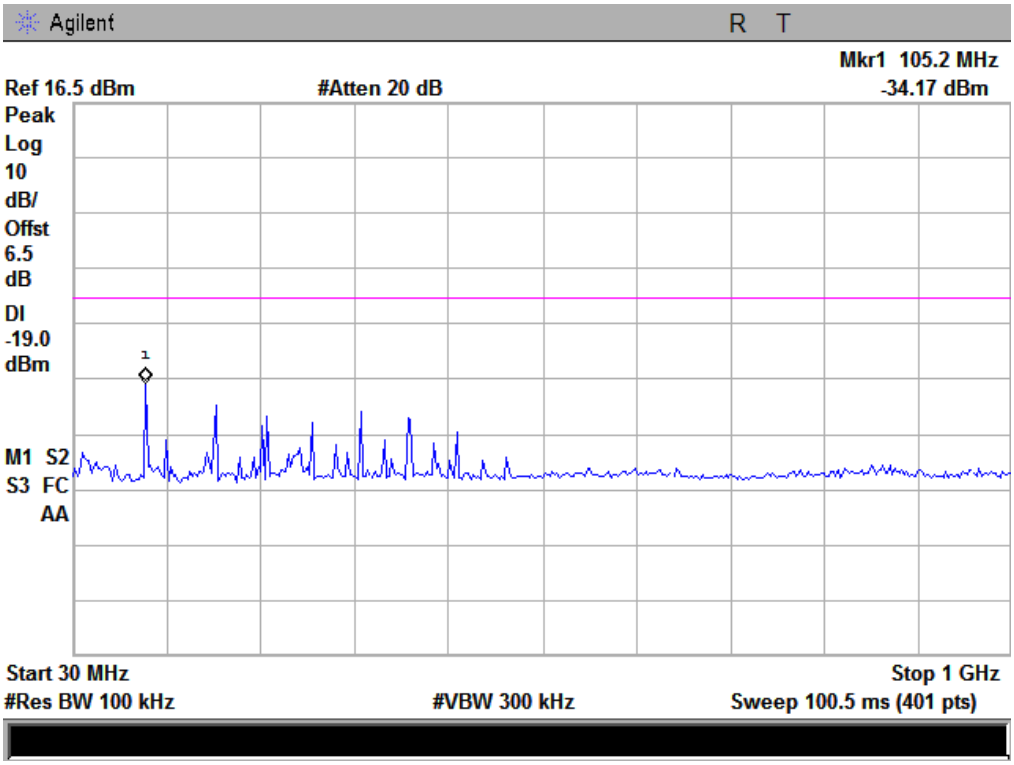
802.11g: Band Edge, Right Side



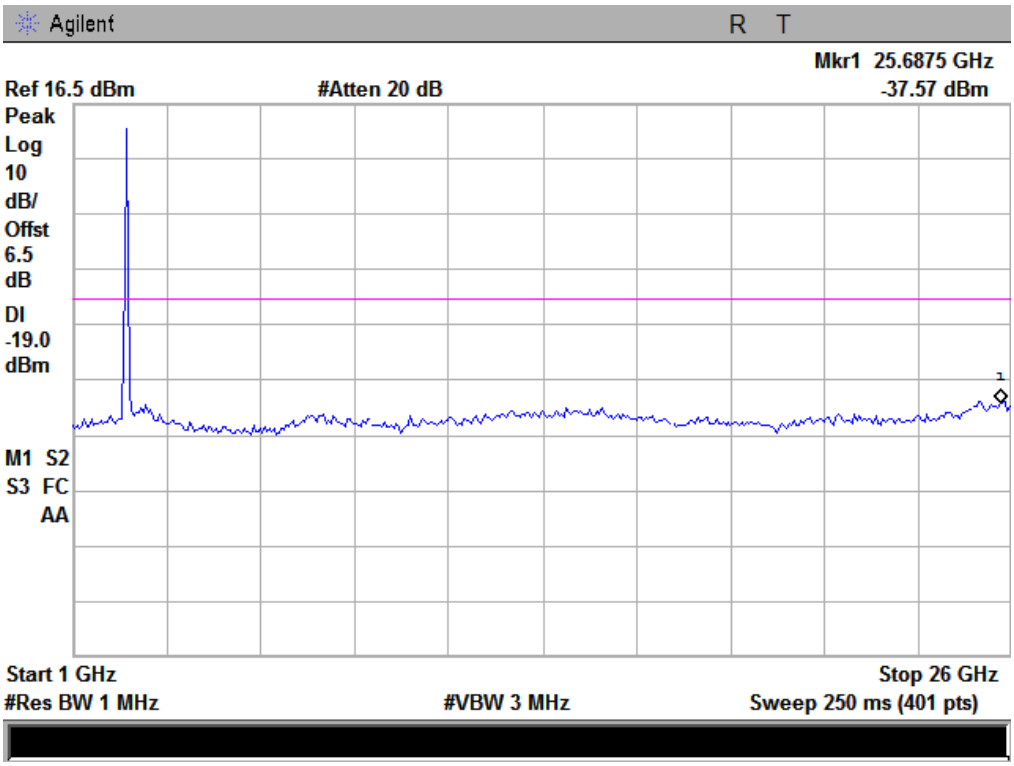
Antenna Port Conducted Spurious Emissions

Please refer to the following plots.

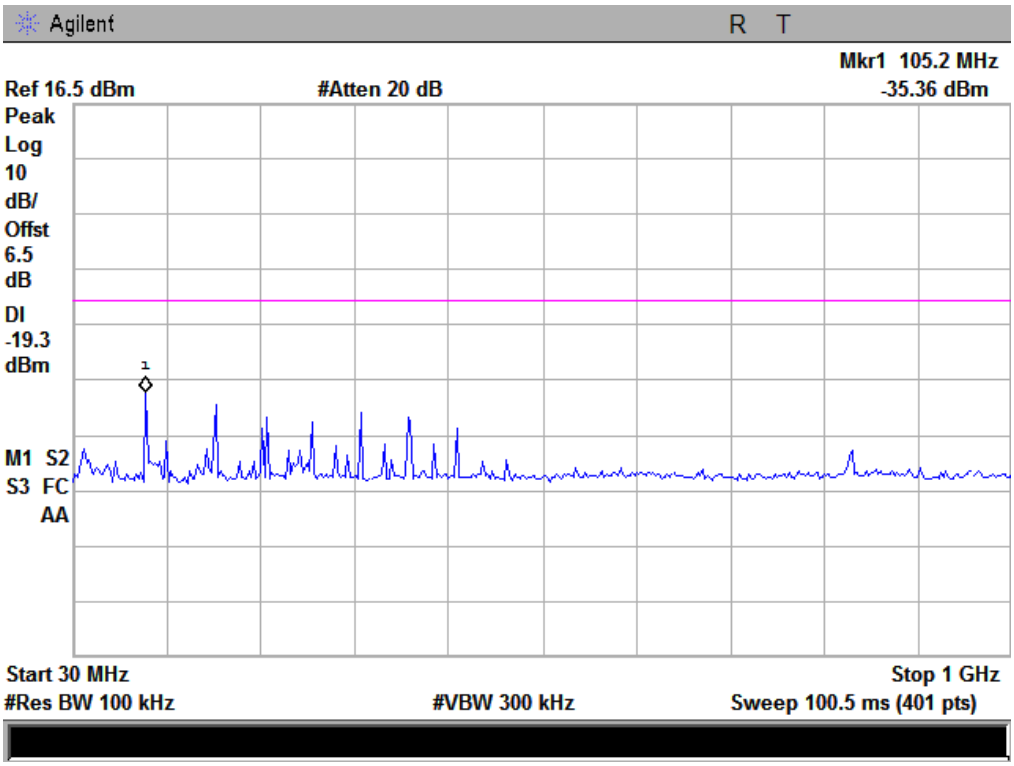
802.11b Low Channel Below 1G



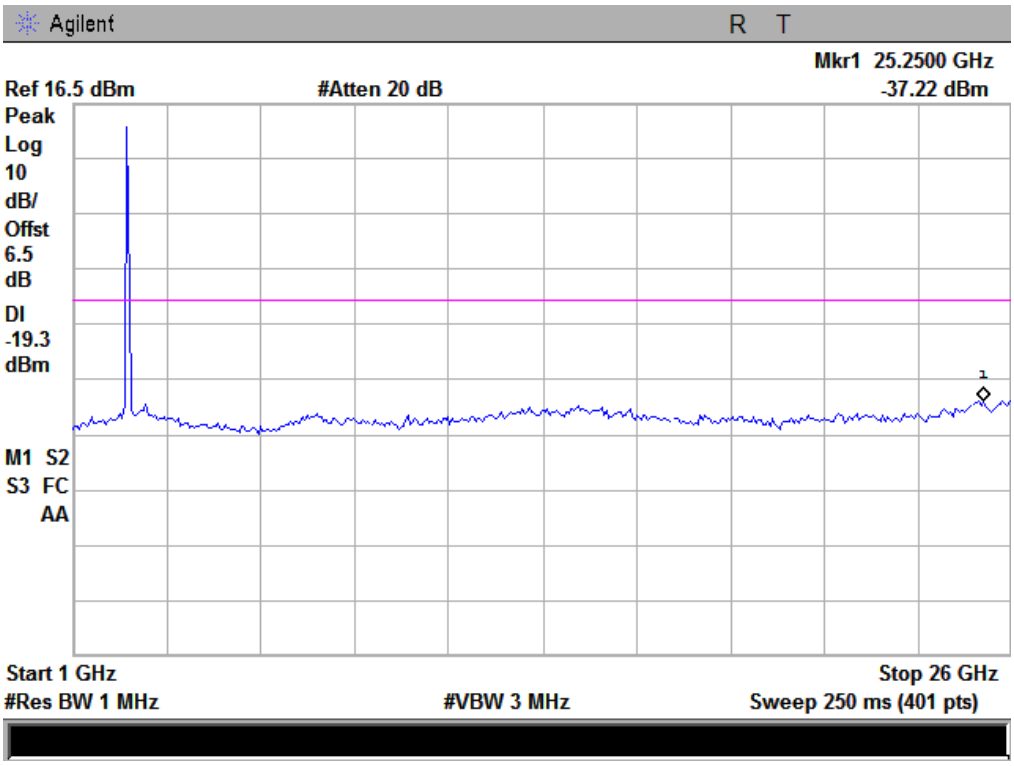
802.11b Low Channel Above 1G



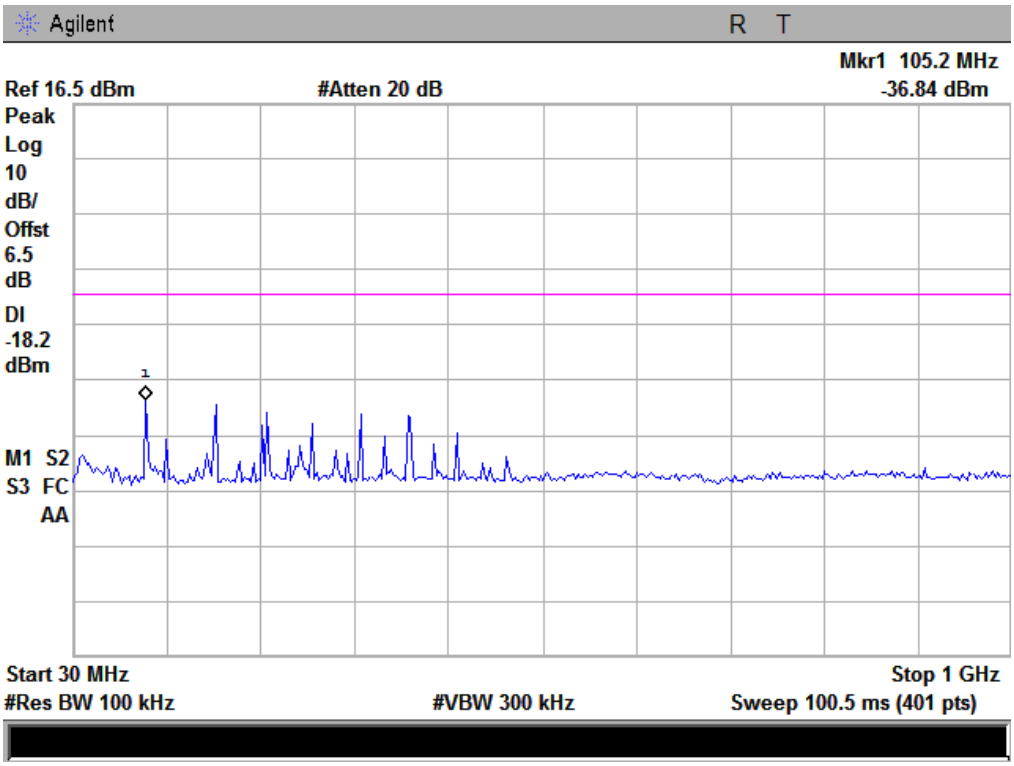
802.11b Middle Channel Below 1G



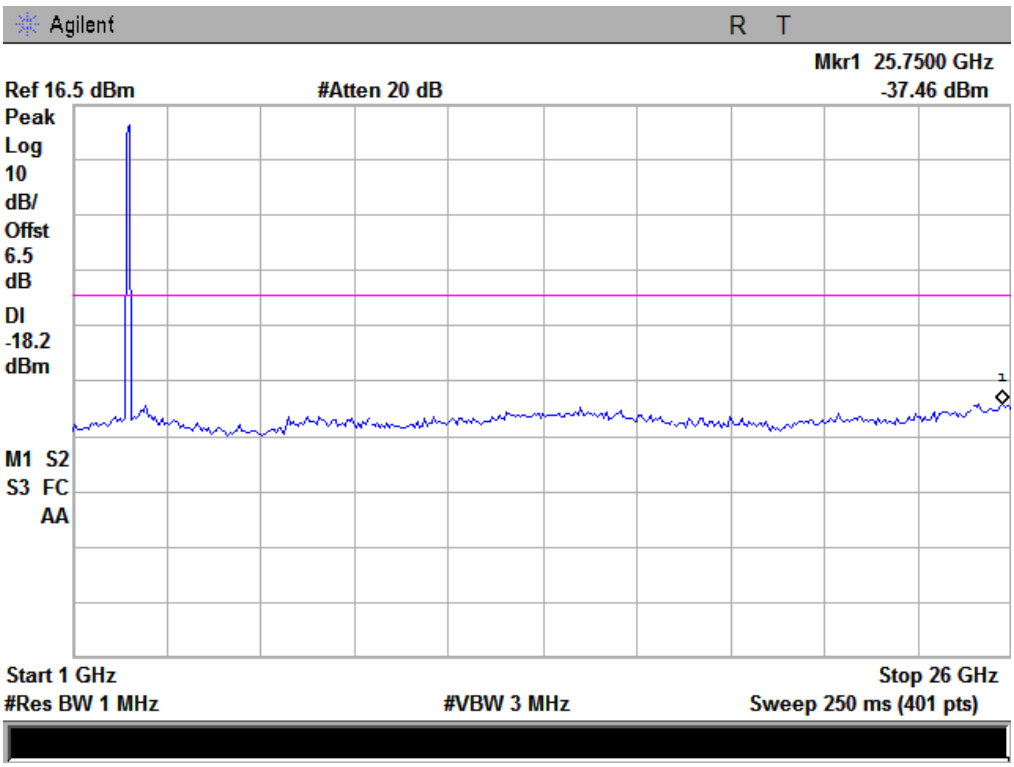
802.11b Middle Channel Above 1G



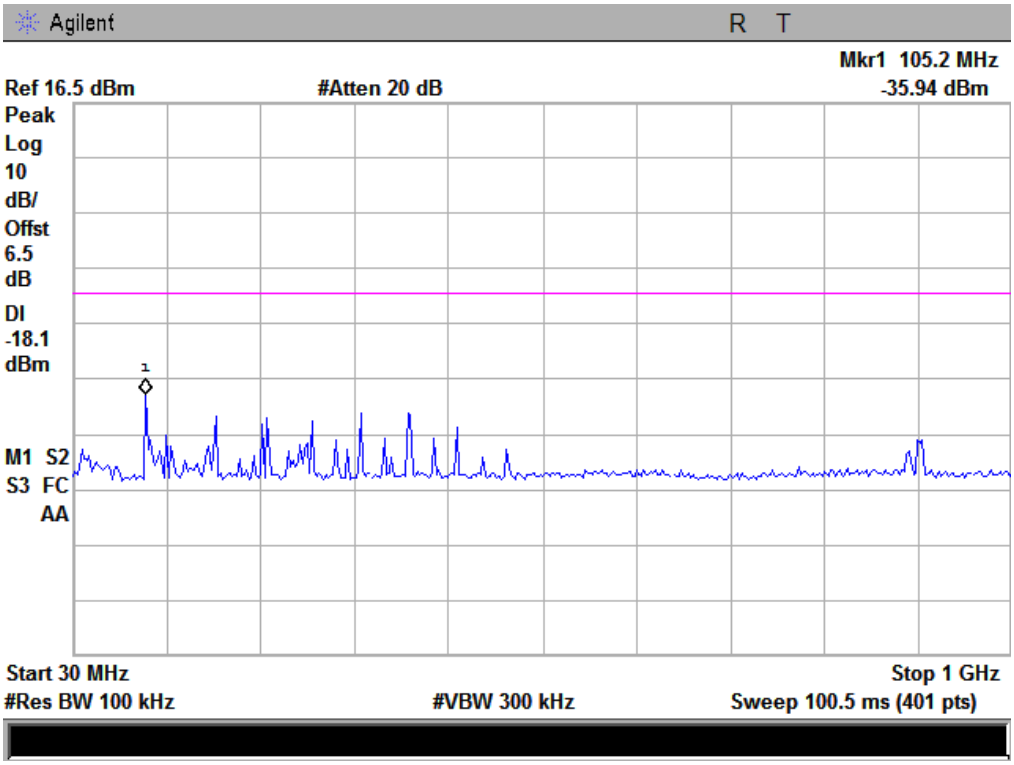
802.11b High Channel Below 1G



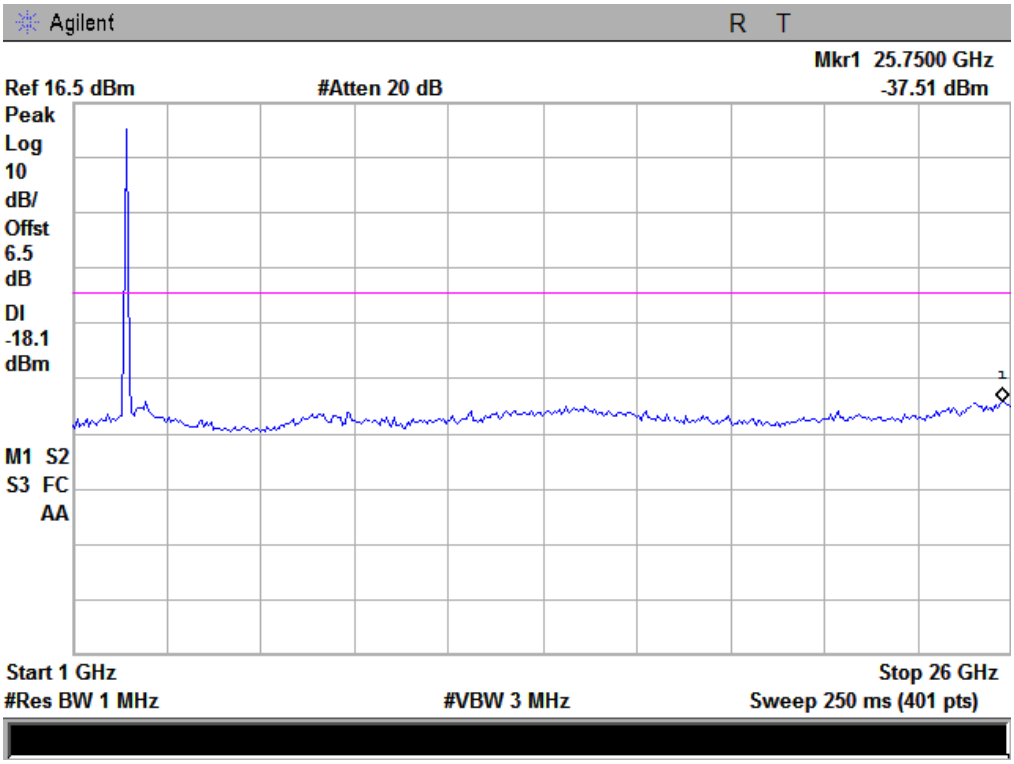
802.11b High Channel Above 1G



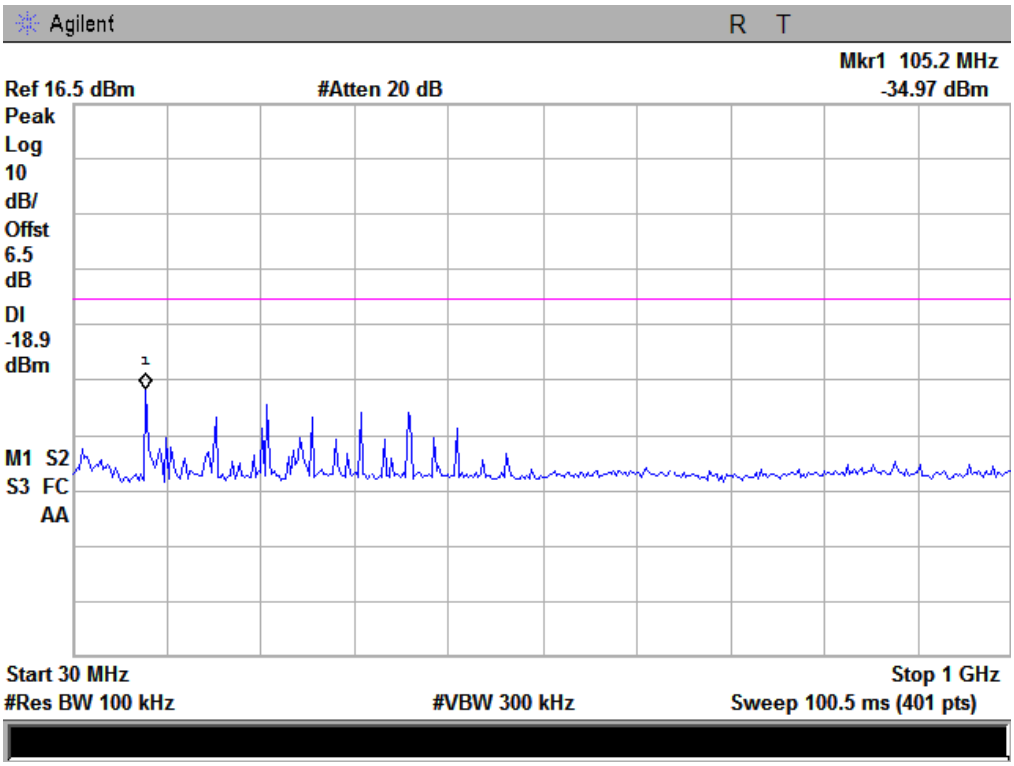
802.11g Low Channel Below 1G



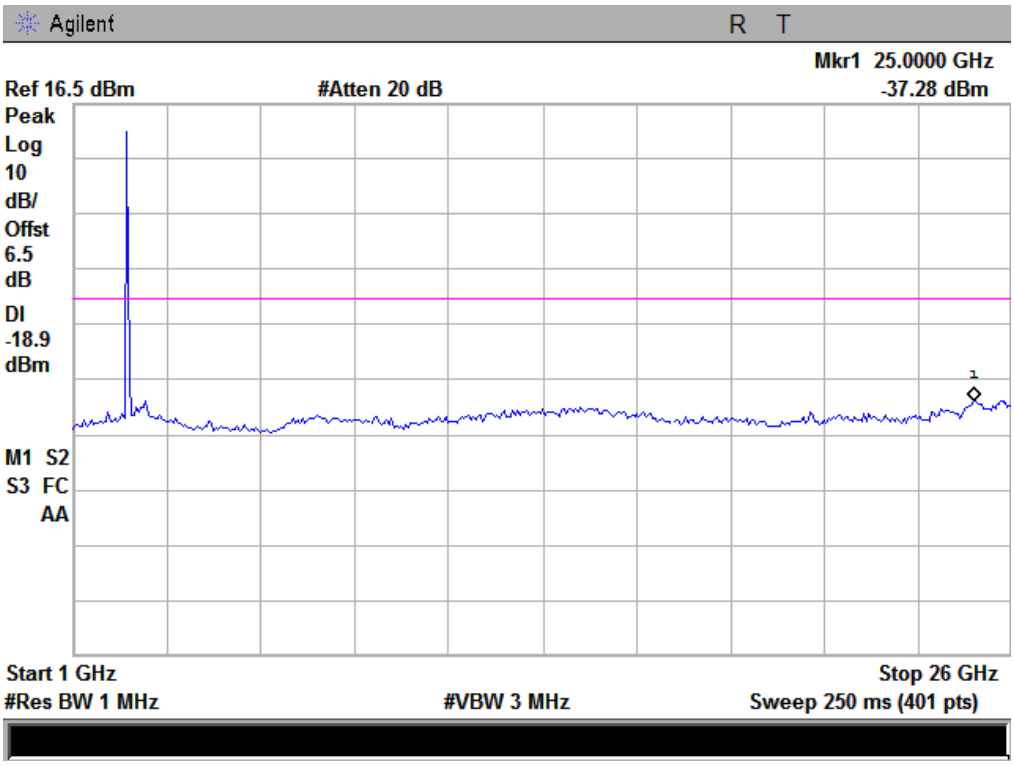
802.11g Low Channel Above 1G



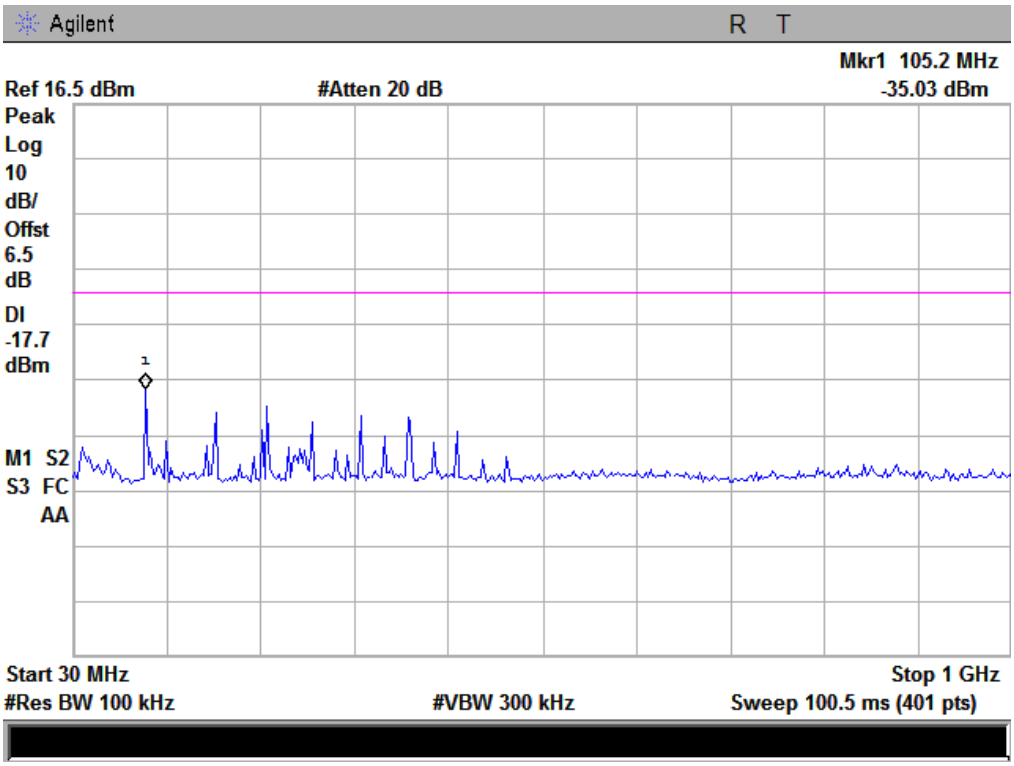
802.11g Middle Channel Below 1G



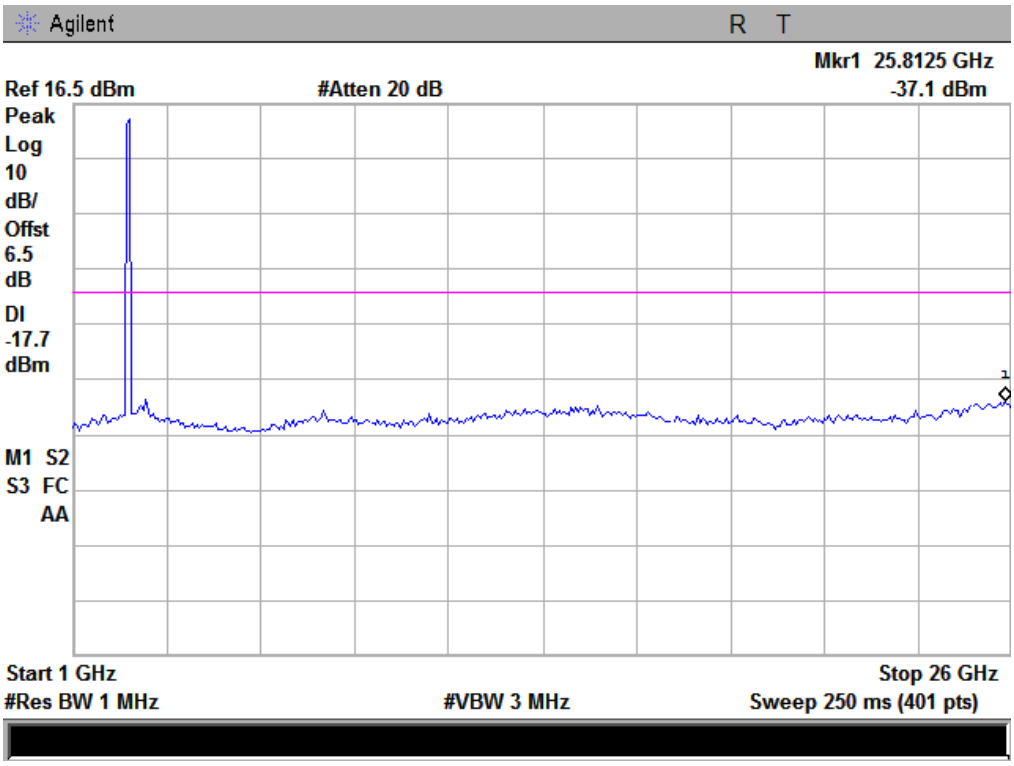
802.11g Middle Channel Above 1G



802.11g High Channel Below 1G



802.11g High Channel Above 1G



5.6 Radiated Spurious Emissions & Restricted Bands

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 1GHz & 1GHz above (3m & 10m) is +/-6dB.
4. Environmental Conditions

Temperature	22°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

5. Test date : 7th June, 2012
   Tested By : Back Huang

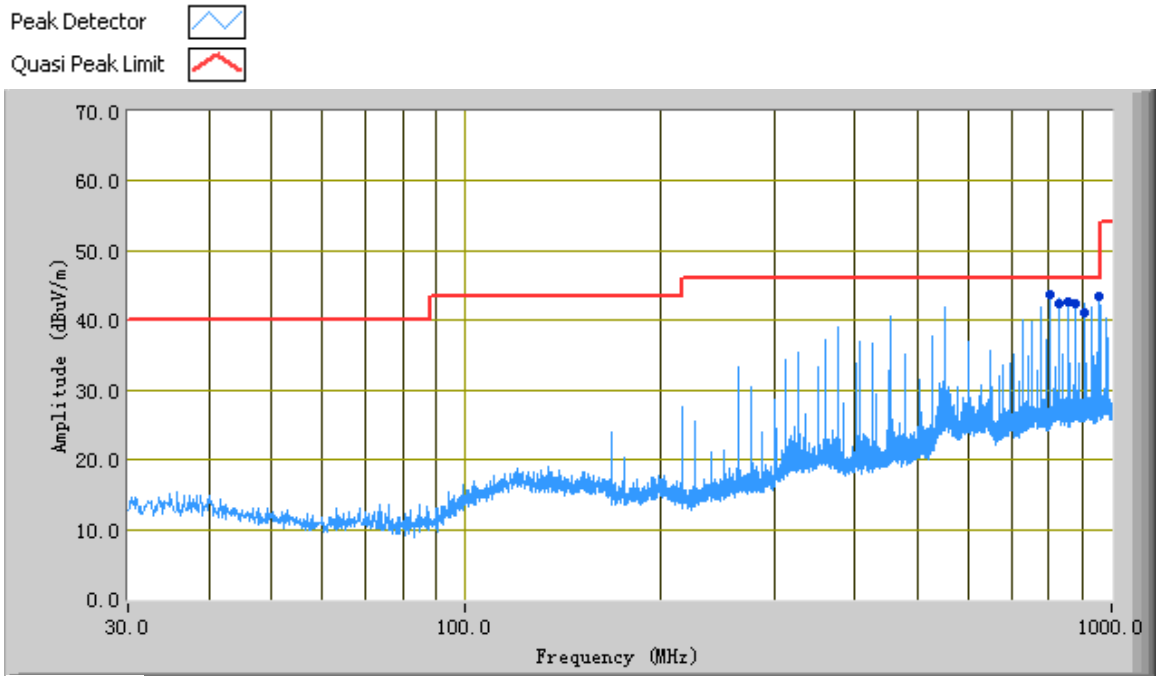
Standard Requirement: The emissions from the Low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges.

Test Result: Pass

30-1000 MHz:

Test Mode: Transmitting

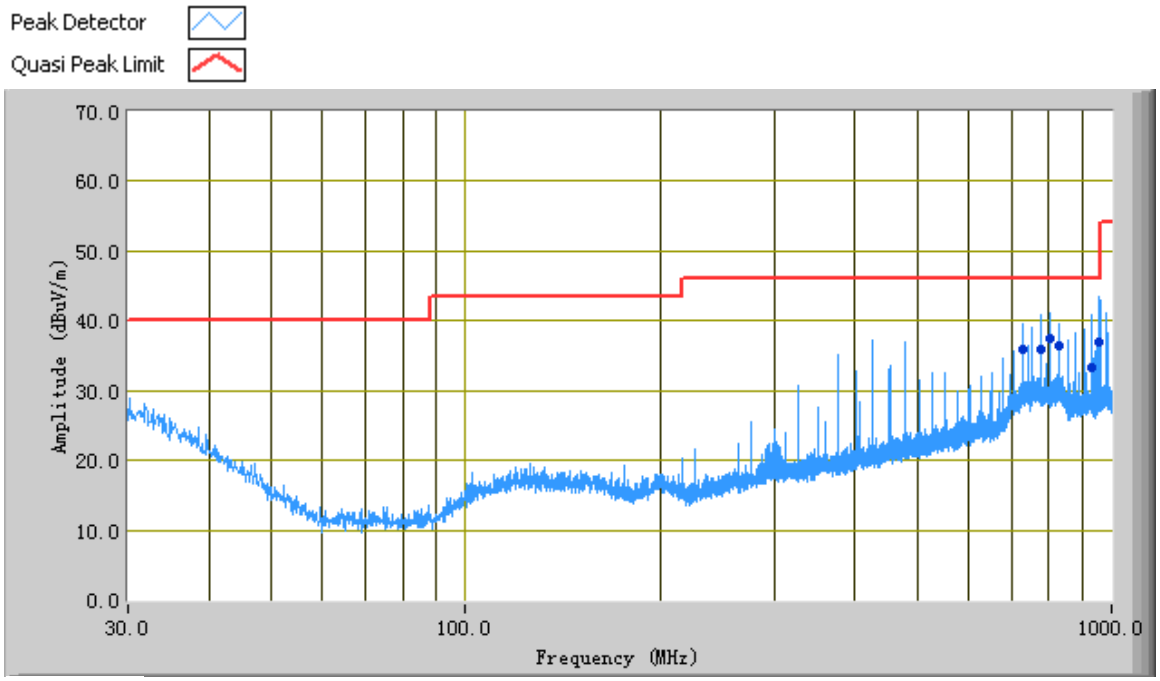
Mode: 802.11b



Test Data

Polarity Horizontal

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
804.61	43.60	174.00	H	101.00	-22.79	46.00	-2.40
955.47	43.41	119.00	H	104.00	-20.85	46.00	-2.59
829.75	42.55	177.00	H	100.00	-20.73	46.00	-3.45
854.88	42.61	132.00	H	110.00	-21.38	46.00	-3.39
880.04	42.41	124.00	H	112.00	-21.06	46.00	-3.59
905.18	41.21	127.00	H	101.00	-20.82	46.00	-4.79

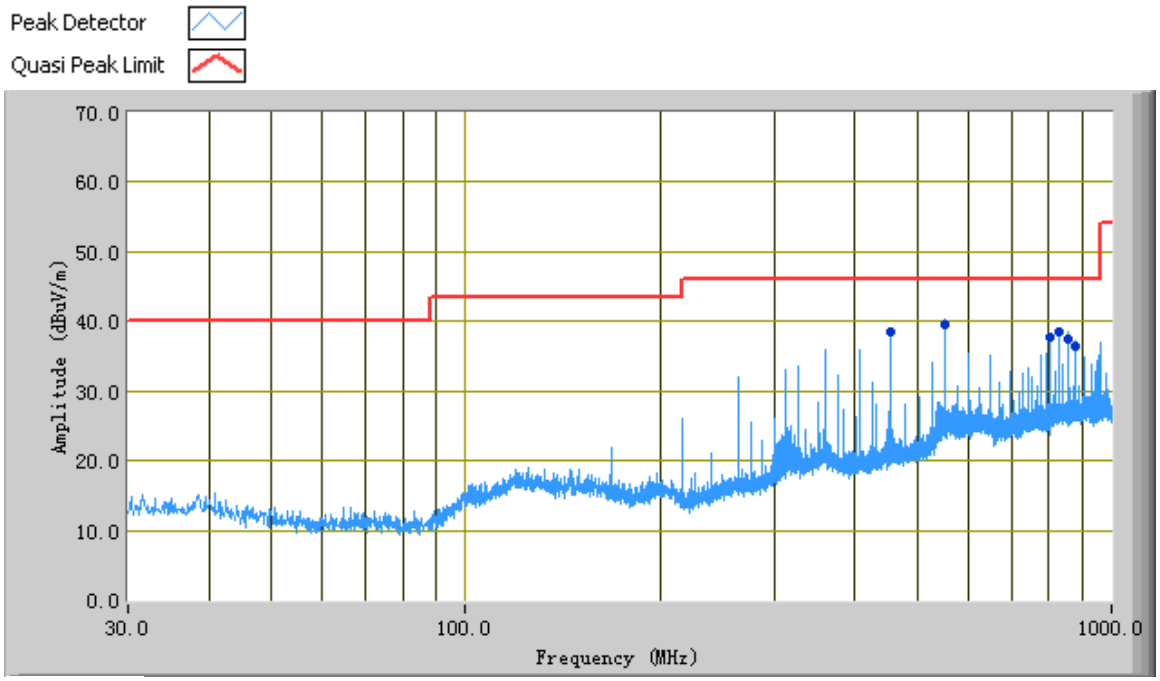


Test Data

Polarity Vertical

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
955.45	36.91	233.00	V	119.00	-20.12	46.00	-9.09
804.59	37.35	238.00	V	177.00	-19.32	46.00	-8.65
930.34	33.31	231.00	V	118.00	-20.19	46.00	-12.69
779.46	36.00	73.00	V	156.00	-18.42	46.00	-10.00
729.17	35.81	70.00	V	100.00	-20.15	46.00	-10.19
829.73	36.33	312.00	V	175.00	-18.08	46.00	-9.67

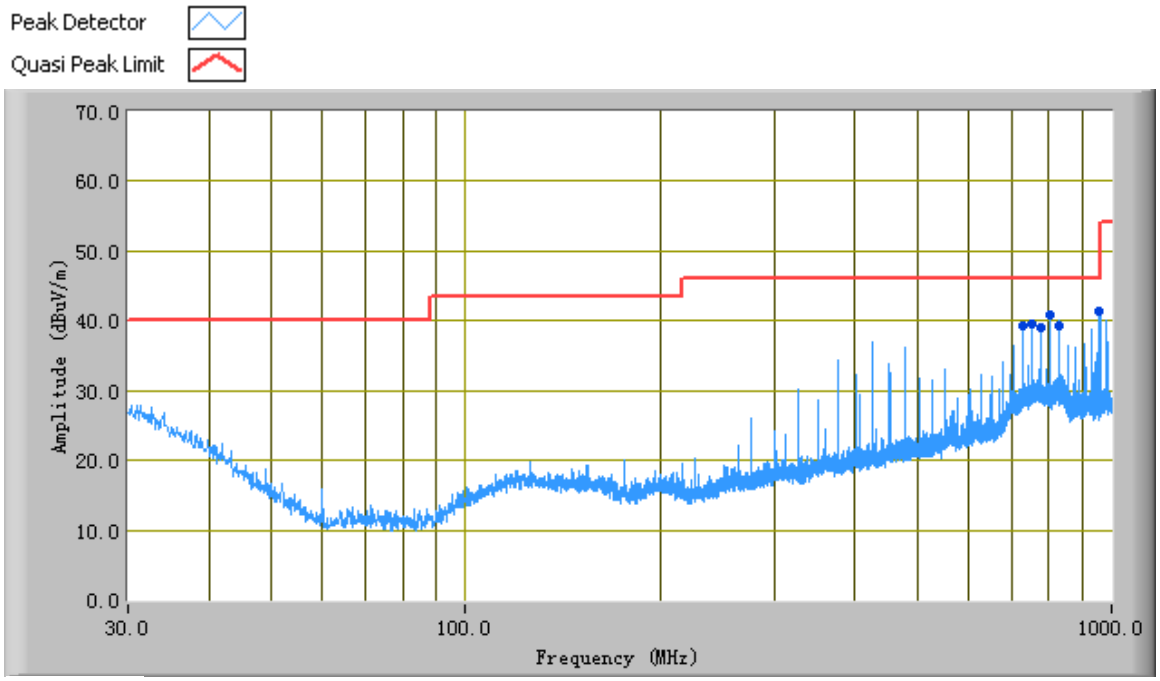
Mode: 802.11g



Test Data

Polarity Horizontal

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
552.00	39.48	92.00	H	141.00	-24.91	46.00	-6.52
455.92	38.38	99.00	H	192.00	-28.81	46.00	-7.62
829.76	38.40	74.00	H	102.00	-20.73	46.00	-7.60
854.89	37.48	240.00	H	100.00	-21.38	46.00	-8.52
804.60	37.75	77.00	H	102.00	-22.79	46.00	-8.25
880.02	36.41	242.00	H	101.00	-21.06	46.00	-9.59



Test Data

Polarity Vertical

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
955.46	41.45	234.00	V	110.00	-20.12	46.00	-4.55
804.60	41.25	222.00	V	131.00	-19.32	46.00	-4.75
829.76	39.31	133.00	V	131.00	-18.08	46.00	-6.69
729.16	39.50	188.00	V	158.00	-20.15	46.00	-6.50
779.45	38.43	114.00	V	137.00	-18.42	46.00	-7.57
754.32	39.57	156.00	V	144.00	-18.06	46.00	-6.43

Above 1 GHz:

Test Mode: Transmitting

Mode: 802.11b

Low Channel (2412 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4824	51.42	PK	148	1.2	V	34	2.6	26.79	61.23	74	-12.77
4824	52.53	PK	145	1.2	H	33.8	2.6	26.79	62.14	74	-11.86
4824	40.43	AV	148	1.2	V	34	2.6	26.79	50.24	54	-3.76
4824	41.65	AV	145	1.2	H	33.8	2.6	26.79	51.26	54	-2.74
1271.15	42.18	PK	285	1.1	V	25.3	1.5	26.65	42.33	74	-31.67
1271.15	42.08	PK	225	1.1	H	23.8	1.5	26.65	40.73	74	-33.27
1271.15	33.46	AV	285	1.1	V	25.3	1.5	26.65	33.61	54	-20.39
1271.15	33.62	AV	225	1.1	H	23.8	1.5	26.65	32.27	54	-21.73

Middle Channel (2437 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4874	51.02	PK	125	1.2	V	33.6	2.6	26.78	60.44	74	-13.56
4874	51.69	PK	256	1.1	H	33.8	2.6	26.78	61.31	74	-12.69
4874	39.26	AV	125	1.2	V	33.6	2.6	26.78	48.68	54	-5.32
4874	39.47	AV	256	1.1	H	33.8	2.6	26.78	49.09	54	-4.91
1263.13	41.83	PK	140	1	V	25.3	1.5	26.65	41.98	74	-32.02
1263.13	42.18	PK	178	1.1	H	23.8	1.5	26.65	40.83	74	-33.17
1263.13	32.96	AV	140	1	V	25.3	1.5	26.65	33.11	54	-20.89
1263.13	33.12	AV	178	1.1	H	23.8	1.5	26.65	31.77	54	-22.23

High Channel (2462 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4924	51.73	PK	158	1.2	V	34.6	2.7	26.75	62.28	74	-11.72
4924	52.97	PK	250	1.1	H	34.7	2.7	26.75	63.62	74	-10.38
4924	40.84	AV	158	1.2	V	34.6	2.7	26.75	51.39	54	-2.61
4924	42.07	AV	250	1.1	H	34.7	2.7	26.75	52.72	54	-1.28
1283.41	41.65	PK	257	1.1	V	25.3	1.5	26.65	41.8	74	-32.2
1283.41	41.83	PK	243	1.2	H	23.8	1.5	26.65	40.48	74	-33.52
1283.41	33.13	AV	257	1.1	V	25.3	1.5	26.65	33.28	54	-20.72
1283.41	33.04	AV	243	1.2	H	23.8	1.5	26.65	31.69	54	-22.31

Spurious emission in restricted band for FCC:

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2389.32	40.31	AV	110	1.1	V	30.2	1.6	26.83	45.28	54	-8.72
2484.06	35.19	AV	185	1.1	V	30.5	1.8	26.83	40.66	54	-13.34
2389.32	40.66	AV	155	1.1	H	30.4	1.6	26.83	45.83	54	-8.17
2484.06	35.28	AV	180	1.2	H	30.6	1.8	26.83	40.85	54	-13.15
2389.32	47.13	PK	110	1.1	V	30.2	1.6	26.83	52.10	74	-21.90
2484.06	42.98	PK	185	1.1	V	30.5	1.8	26.83	48.45	74	-25.55
2389.32	47.36	PK	155	1.1	H	30.4	1.6	26.83	52.53	74	-21.47
2484.06	43.17	PK	180	1.2	H	30.6	1.8	26.83	48.74	74	-25.26

Spurious emission in restricted band for IC:

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2389.32	40.31	AV	110	1.1	V	30.2	1.6	26.83	45.28	54	-8.72
2389.32	40.66	AV	155	1.1	H	30.4	1.6	26.83	45.83	54	-8.17
2389.32	47.13	PK	110	1.1	V	30.2	1.6	26.83	52.10	74	-21.90
2389.32	47.36	PK	155	1.1	H	30.4	1.6	26.83	52.53	74	-21.47

Mode: 802.11g

Low Channel (2412 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4824	50.15	PK	133	1.1	V	34	2.6	26.79	59.96	74	-14.04
4824	50.42	PK	320	1.1	H	33.8	2.6	26.79	60.03	74	-13.97
4824	39.43	AV	133	1.1	V	34	2.6	26.79	49.24	54	-4.76
4824	39.53	AV	320	1.1	H	33.8	2.6	26.79	49.14	54	-4.86
1268.52	41.12	PK	120	1.2	V	25.3	1.5	26.65	41.27	74	-32.73
1268.52	40.86	PK	133	1.1	H	23.8	1.5	26.65	39.51	74	-34.49
1268.52	33.04	AV	120	1.2	V	25.3	1.5	26.65	33.19	54	-20.81
1268.52	33.17	AV	133	1.1	H	23.8	1.5	26.65	31.82	54	-22.18

Middle Channel (2437 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4874	49.15	PK	189	1.1	V	33.6	2.6	26.78	58.57	74	-15.43
4874	49.09	PK	156	1.1	H	33.8	2.6	26.78	58.71	74	-15.29
4874	39.06	AV	189	1.1	V	33.6	2.6	26.78	48.48	54	-5.52
4874	39.13	AV	156	1.1	H	33.8	2.6	26.78	48.75	54	-5.25
1263.87	41.17	PK	242	1.1	V	25.3	1.5	26.65	41.32	74	-32.68
1263.87	41.34	PK	134	1	H	23.8	1.5	26.65	39.99	74	-34.01
1263.87	33.38	AV	242	1.1	V	25.3	1.5	26.65	33.53	54	-20.47
1263.87	33.51	AV	134	1	H	23.8	1.5	26.65	32.16	54	-21.84

High Channel (2462 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4924	50.74	PK	253	1.1	V	34.6	2.7	26.75	61.29	74	-12.71
4924	50.71	PK	135	1.3	H	34.7	2.7	26.75	61.36	74	-12.64
4924	40.34	AV	253	1.1	V	34.6	2.7	26.75	50.89	54	-3.11
4924	39.97	AV	135	1.3	H	34.7	2.7	26.75	50.62	54	-3.38
1264.73	41.54	PK	168	1.1	V	25.3	1.5	26.65	41.69	74	-32.31
1264.73	40.98	PK	287	1.1	H	23.8	1.5	26.65	39.63	74	-34.37
1264.73	33.61	AV	168	1.1	V	25.3	1.5	26.65	33.76	54	-20.24
1264.73	33.06	AV	287	1.1	H	23.8	1.5	26.65	31.71	54	-22.29

Spurious emission in restricted band for FCC:

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2381.74	40.34	AV	110	1.1	V	30.2	1.8	26.83	45.51	54	-8.49
2485.63	41.83	AV	185	1.1	V	30.5	1.8	26.83	47.30	54	-6.70
2381.74	33.87	AV	155	1.1	H	30.4	1.8	26.83	39.24	74	-34.76
2485.63	33.92	AV	180	1.2	H	30.6	1.8	26.83	39.49	74	-34.51
2381.74	43.13	PK	110	1.1	V	30.2	1.8	26.83	48.30	54	-5.70
2485.63	42.94	PK	185	1.1	V	30.5	1.8	26.83	48.41	54	-5.59
2381.74	36.04	PK	155	1.1	H	30.4	1.8	26.83	41.41	74	-32.59
2485.63	36.85	PK	180	1.2	H	30.6	1.8	26.83	42.42	74	-31.58

Spurious emission in restricted band for IC:

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2381.74	40.34	AV	110	1.1	V	30.2	1.8	26.83	45.51	54	-8.49
2381.74	33.87	AV	155	1.1	H	30.4	1.8	26.83	39.24	74	-34.76
2381.74	43.13	PK	110	1.1	V	30.2	1.8	26.83	48.30	54	-5.70
2381.74	36.04	PK	155	1.1	H	30.4	1.8	26.83	41.41	74	-32.59

5.7 Radiated Emissions(Rx)

1. The receiver shall be operated in the normal receive mode near the mid-point of the band in which the receiver is designed to operate.
2. Radiated emission measurements are to be performed on a test site registered with Industry Canada. As an alternative, the conducted measurement method may be used when the antenna is detachable. In such a case, the receiver spurious signal may be measured at the antenna port.
4. Environmental Conditions — Temperature 22°C; Relative Humidity 50%; Atmospheric Pressure 1019mbar
5. Test date : 7th June, 2012
   Tested By : Back Huang

Standard Requirement: For emissions below 1000 MHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth. Above 1000 MHz, measurements shall be performed using an average detector with a minimum resolution bandwidth of 1 MHz.

Test Result: Pass

Mode: 802.11b

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
963.53	33.42	AV	211	1.2	V	25.3	1.5	26.65	33.57	54	-20.43
1292.31	32.57	AV	106	1.1	V	28.7	1.7	26.73	36.24	54	-17.76
963.53	33.19	AV	156	1.1	H	25.3	1.5	26.65	33.34	54	-20.66
1292.31	32.53	AV	359	1.1	H	28.7	1.7	26.73	36.20	54	-17.80
963.53	41.61	PK	211	1.2	V	25.3	1.5	26.65	41.76	74	-32.24
1292.31	41.13	PK	106	1.1	V	28.7	1.7	26.73	44.80	74	-29.20
963.53	41.52	PK	156	1.1	H	25.3	1.5	26.65	41.67	74	-32.33
1292.31	40.97	PK	359	1.1	H	28.7	1.7	26.73	44.64	74	-29.36

Mode: 802.11g

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (cm)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
964.57	33.52	AV	211	1.1	V	25.3	1.5	26.65	33.67	54	-20.33
1292.44	32.64	AV	106	1.1	V	28.7	1.7	26.73	36.31	54	-17.69
964.57	33.12	AV	320	1.1	H	25.3	1.5	26.65	33.27	54	-20.73
1292.44	33.24	AV	359	1.1	H	28.7	1.7	26.73	36.91	54	-17.09
964.57	41.72	PK	214	1.1	V	25.3	1.5	26.65	41.87	74	-32.13
1292.44	41.59	PK	106	1.1	V	28.7	1.7	26.73	45.26	74	-28.74
964.57	41.62	PK	154	1.1	H	25.3	1.5	26.65	41.77	74	-32.23
1292.44	41.23	PK	359	1.1	H	28.7	1.7	26.73	44.90	74	-29.10

Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Calibration Date	Calibration Due Date
AC Conducted Emissions			
R&S EMI Test Receiver	ESPI3	05/25/2012	05/25/2013
R&S LISN	LI-115	05/25/2012	05/25/2013
Radiated Emissions			
Spectrum Analyzer	8563E	01/10/2012	01/10/2013
EMI Receiver	ESPI3	05/18/2012	05/18/2013
Antenna(1 ~18GHz)	3115	6/2/2012	6/2/2013
Antenna (30MHz~2GHz)	JB1	05/24/2012	05/24/2013
Chamber	3m	4/13/2012	4/13/2013
Pre-Amplifier(1 ~ 18GHz)	AMF-7D-00101800-30-10P	5/24/2012	5/24/2013
Horn Antenna (18~40GHz)	AH-840	7/23/2011	7/23/2012
Microwave Pre-Amp (18~40GHz)	PA-840	Every 2000 Hours	
Signal Analyzer	8665B	1/21/2012	1/21/2013
Temperature/Humidity Chamber	1007H	06/02/2012	06/02/2013

Annex A. ii RADIATED EMISSIONS TEST DESCRIPTION

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 10th Harmonic , was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

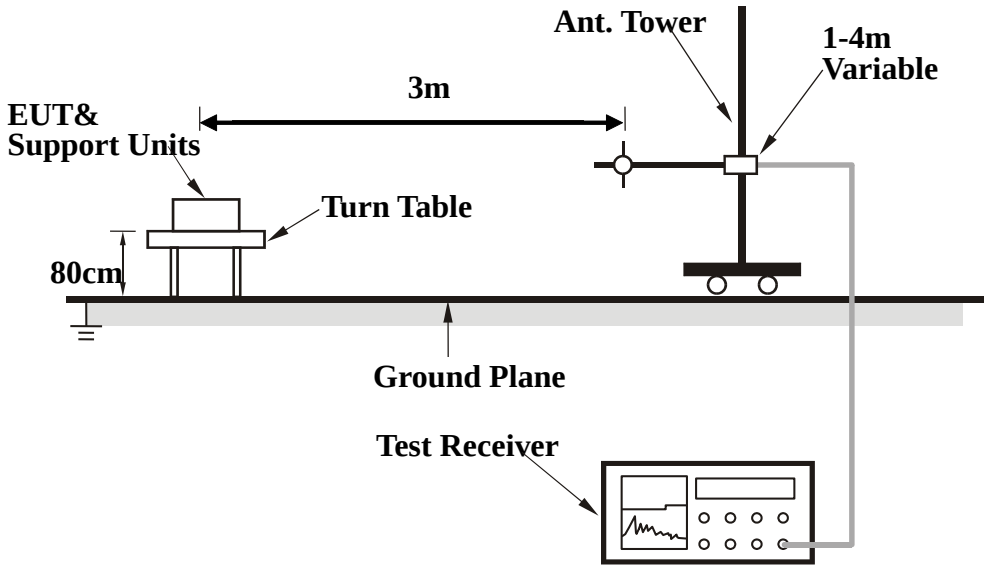
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred, clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS).

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:
1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement
1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.

2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ◦ to 360 ◦ with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.

5. Repeat step 4 until all frequencies need to be measured were complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

where
Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)
And the average value is

Average = Peak Value + Duty Factor or
Set RBW = 1MHz, VBW = 10Hz.

Note :
If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

Annex B. EUT AND TEST SETUP PHOTOGRAPHS

Please see attachment

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

EUT TEST CONDITIONS

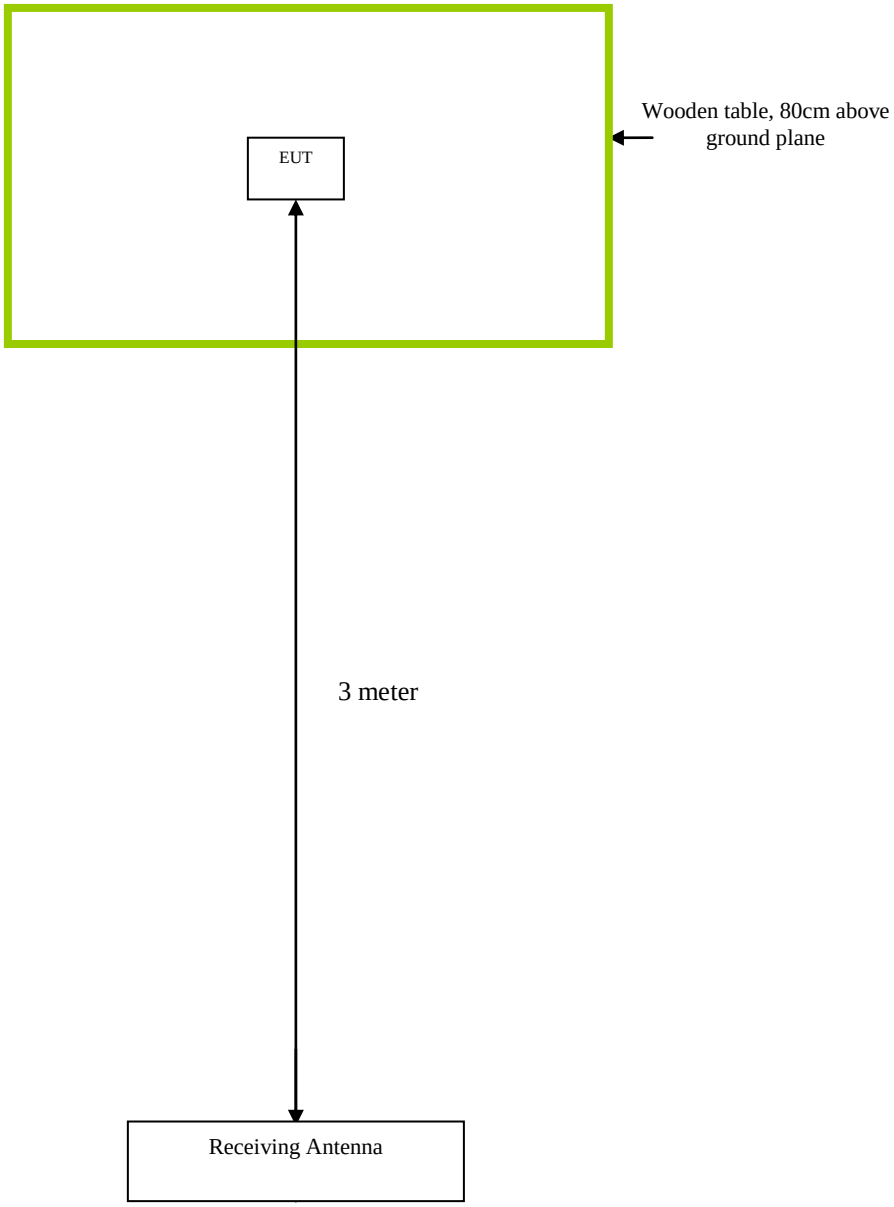
Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
Gateway Laptop	MS2288 & LXWHF02013951C3CA92200	N/A

Block Configuration Diagram for Radiated Emissions

Note:Before Testing, the EUT must be set up for transmitting by laptop.



Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was continuously transmitting to stimulate the worst case.

Annex D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment

Annex E. DECLARATION OF SIMILARITY

NONE