

Report No.: SZEM121000574601

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FCC REPORT

Application No: SZEM1210005746RF **Applicant:** Liquid Image Co., LLC

Manufacturer:Foxda Technology Industrial(Shenzhen) co., Ltd.Factory:Foxda Technology Industrial(Shenzhen) co., Ltd.

Product Name: Torque+ Series Offroad Goggle 369

Model No.(EUT): 369

FCC ID: WGI-XSC-369

Standards: 47 CFR Part 15, Subpart C (2011)

Date of Receipt: 2012-10-22(For original report: SZEM121000572901)

Date of Test: 2012-10-28 to 2012-10-31

(For original report: SZEM121000572901)

Date of Issue: 2012-12-14(For original report: SZEM121000572901)

2013-01-07(For new report: SZEM121000574601)

Test Result: PASS *

. * In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.



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2 Test Summary

Test Item	Test Requirement	Test method	Result	
Antonno Poquiroment	47 CFR Part 15, Subpart C Section	ANCI C62 10 2000	DACC	
Antenna Requirement	15.203/15.247 (c)	ANSI C63.10 2009	PASS	
Conducted Peak Output	47 CFR Part 15, Subpart C Section	VDD550074 D04	DACC	
Power	15.247 (b)(3)	KDB558074 D01	PASS	
6dB Occupied	47 CFR Part 15, Subpart C Section	VDD550074 D04	DACC	
Bandwidth	15.247 (a)(2)	KDB558074 D01	PASS	
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	KDB558074 D01	PASS	
Band-edge for RF	47 CFR Part 15, Subpart C Section	VDD550074 D04	DACC	
Conducted Emissions	15.247(d)	KDB558074 D01	PASS	
RF Conducted Spurious	47 CFR Part 15, Subpart C Section	VDD550074 D01	PASS	
Emissions	15.247(d)	KDB558074 D01	PASS	
Radiated Spurious	47 CFR Part 15, Subpart C Section	ANSI C62 10 2000	DACC	
Emissions	15.205/15.209	ANSI C63.10 2009	PASS	
Band Edge (Radiated	47 CFR Part 15, Subpart C Section	ANCI C62 10 2000	DACC	
Emission)	15.205/15.209	ANSI C63.10 2009	PASS	

Original model No. in report SZEM121000572901: 339

New model No. in report SZEM121000574601: 369

Only the model 339 was tested in report SZEM121000572901.

This report was an additional report copied from the report SZEM121000572901, just changing the product name and model No..Since the electrical circuit design, layout, components used and internal wiring for the model "339" in the report SZEM121000572901 was exactly the same as the model "369" in this report, only the product name and color are difference.



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4 General Information

4.1 Client Information

Applicant:	Liquid Image Co., LLC
Address of Applicant:	7909 Walerga Road, Suite112-206 Antelope, California, 95843,
	United States
Manufacturer:	Foxda Technology Industrial(Shenzhen) co., Ltd.
Address of Manufacturer:	1F-3F of 2 nd Building, Foxda Industrial Zone, Pingshan New District,
	Shenzhen China
Factory:	Foxda Technology Industrial(Shenzhen) co., Ltd.
Address of Factory:	1F-3F of 2 nd Building, Foxda Industrial Zone, Pingshan New District,
	Shenzhen China

4.2 General Description of EUT

_	
Product Name:	Torque+ Series Offroad Goggle 369
Model No.:	369
Trade Mark:	Xtreme Sport Cams
Operation Frequency:	IEEE 802.11b/g: 2412MHz to 2462MHz
Channel Numbers:	IEEE 802.11b/g: 11 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK)
	IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK)
Sample Type:	Portable production
Test Power Grade:	Set wifi_pwr value 2 (manufacturer declare)
Test Software of EUT:	Provided by manufacturer
Antenna Type:	Integral
Antenna Gain:	0.34dBi
Power Supply:	Model 55
	Li-ion Battery
	3.7V 1150mAh 4.3Wh
USB Cable:	45 cm with one ferrite core
HDMI Cable:	55 cm with two ferrite core
Test Voltage:	DC 3.7 Li-ion Battery



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Operation F	Operation Frequency each of channel(802.11b/g)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency	
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz	
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz	
3	2422MHz	6	2437MHz	9	2452MHz			

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11b/g:

Channel	Frequency	
The Lowest channel	2412MHz	
The Middle channel	2437MHz	
The Highest channel	2462MHz	

4.3 Test Environment and Mode

Operating Environment:	Operating Environment:					
Temperature:	25.0 °C					
Humidity:	56 % RH					
Atmospheric Pressure: 1010 mbar						
Test mode:						
Transmitting mode:	The EUT transmitted the continuous modulation test signal at the specific channel(s)					

4.4 Description of Support Units

The EUT has been tested independent unit.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.



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4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

VCCI

The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, T-1153 and C-2383 respectively.

FCC – Registration No.: 556682

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

Industry Canada (IC)

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.



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4.10Test Instruments List

RE in Chamber								
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)			
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2013-06-10			
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2013-05-17			
3	EMI Test software	AUDIX	E3	SEL0050	N/A			
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2013-10-24			
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2013-10-24			
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2013-10-24			
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2013-05-17			
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2013-10-24			
9	Coaxial cable	SGS	N/A	SEL0027	2013-05-59			
10	Coaxial cable	SGS	N/A	SEL0189	2013-05-29			
11	Coaxial cable	SGS	N/A	SEL0121	2013-05-29			
12	Coaxial cable	SGS	N/A	SEL0178	2013-05-29			
13	Band filter	Amindeon	82346	SEL0094	2013-05-17			
14	Barometer	Chang Chun	DYM3	SEL0088	2013-05-24			
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24			
16	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2013-10-24			
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2013-05-17			
18	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2013-10-24			
19	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2013-06-04			



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RF c	RF connected test							
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd))			
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24			
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2013-10-24			
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2013-10-24			
4	Coaxial cable	SGS	N/A	SEL0178	2013-05-29			
5	Coaxial cable	SGS	N/A	SEL0179	2013-05-29			
6	Barometer	ChangChun	DYM3	SEL0088	2013-05-24			
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2013-05-17			
8	Band filter	amideon	82346	SEL0094	2013-05-17			
9	POWER METER	R&S	NRVS	SEL0144	2013-10-24			
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2013-05-17			
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2013-10-24			

Note: The calibration interval is one year, all the instruments are valid.



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5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(c)

15.203 requirement:

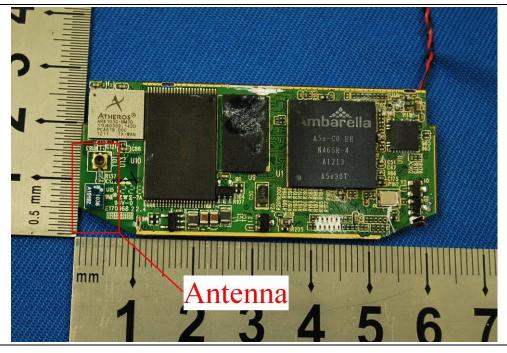
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

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

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.34dBi.

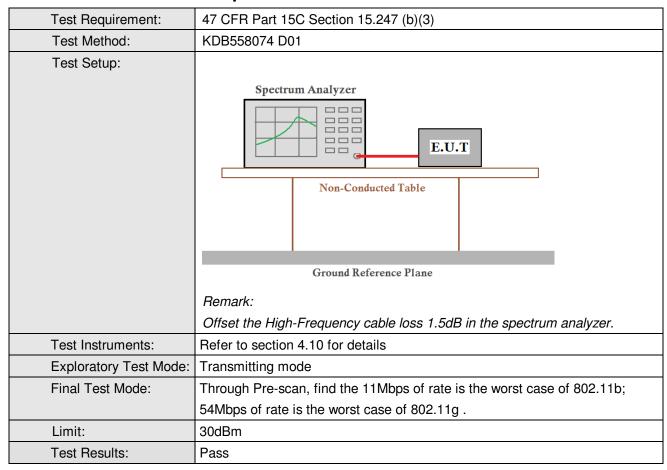




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5.2 Conducted Peak Output Power



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Pre-scan under all rate at lowest channel 1								
Mode		802	.11b			_		
Data Rate	1Mbps	2Mbps	5.5Mbps	11Mbps				
Power (dBm)	10.58	10.63	10.79	10.98				
Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power (dBm)	10.75	10.87	10.95	11.01	11.12	11.29	11.43	11.61

Through Pre-scan, 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g.

Measurement Data

802.11b mode							
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result				
Lowest	10.98	30.00	Pass				
Middle	10.75	30.00	Pass				
Highest	10.77	30.00	Pass				
	802.11g mo	de					
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result				
Lowest	11.61	30.00	Pass				
Middle	11.29	30.00	Pass				
Highest	10.78	30.00	Pass				



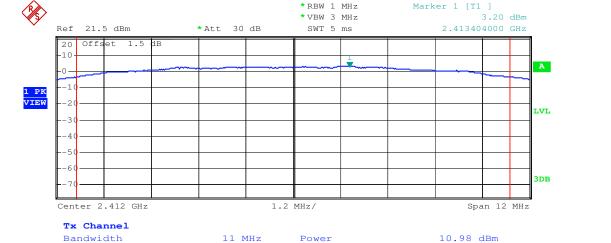


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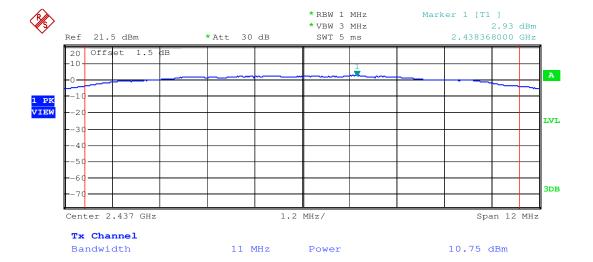
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Test plot as follows:

Test mode: 802.11b Test channel: Lowest



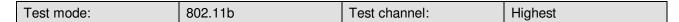
Test mode: 802.11b Test channel: Middle

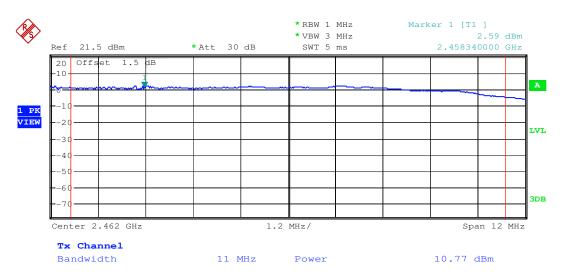




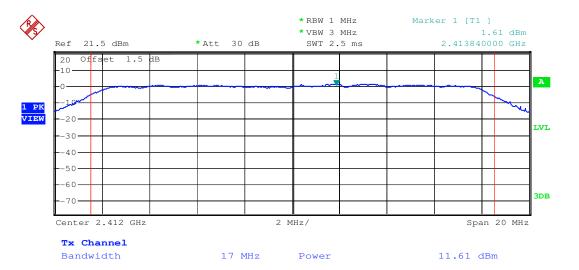
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Test mode:	802.11g	Test channel:	Lowest



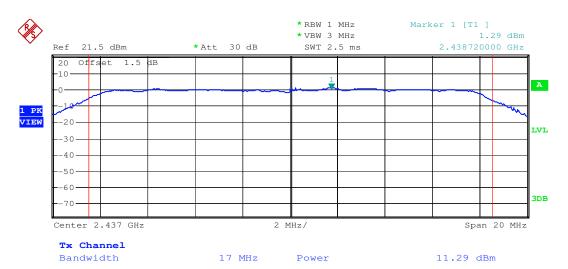
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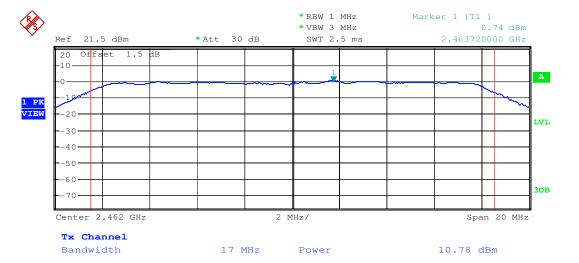
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Test mode: 802.11g Test channel: Middle



Test mode: 802.11g Test channel: Highest

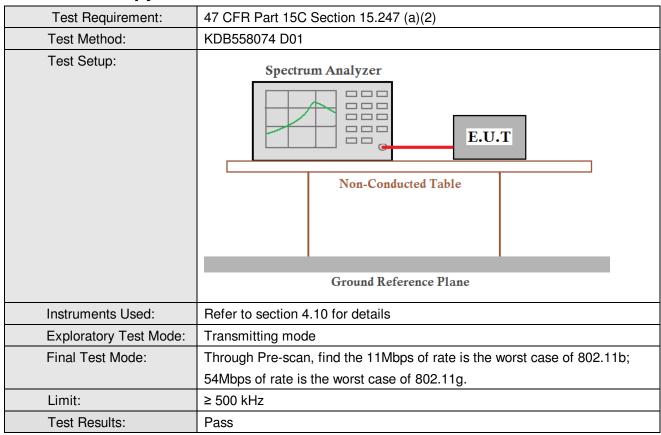




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5.3 6dB Occupy Bandwidth



Measurement Data

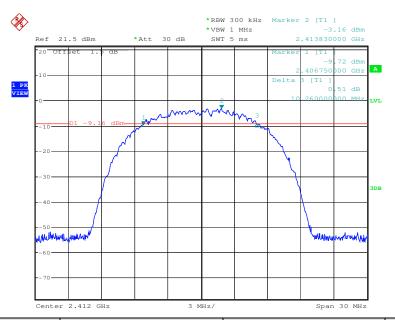
model of the control						
802.11b mode						
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result			
Lowest	10.26	≥500	Pass			
Middle	10.32	≥500	Pass			
Highest	10.32	≥500	Pass			
802.11g mode						
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result			
Lowest	Lowest 16.68 Middle 16.68		Pass			
Middle			Pass			
Highest	16.50	≥500	Pass			



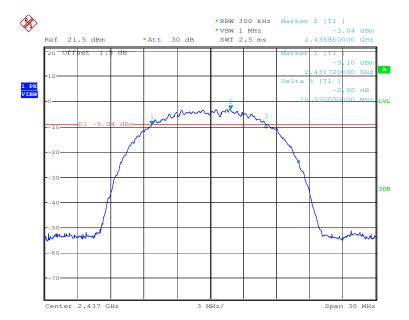
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Test plot as follows:



Test mode: 802.11b Test channel: Middle

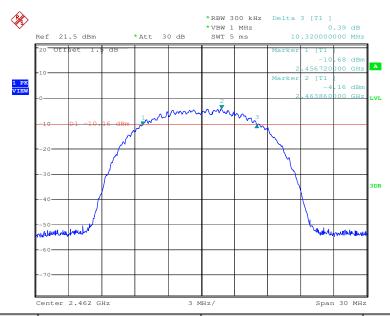




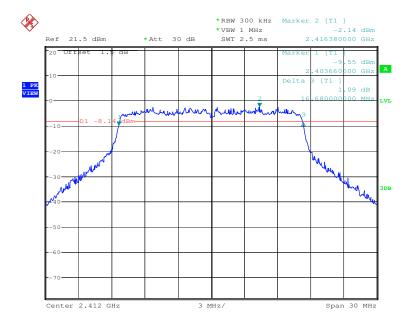
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Test mode: 802.11b Test channel: Highest



Test mode: 802.11g Test channel: Lowest



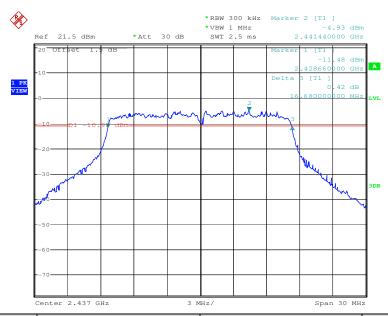
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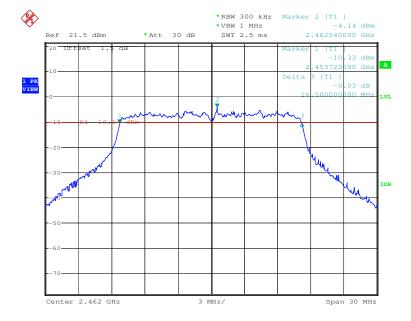
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Test mode: 802.11g Test channel: Middle



Test mode: 802.11g Test channel: Highest



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5.4 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)				
Test Method:	KDB558074 D01				
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.				
Test Instruments:	Refer to section 4.10 for details				
Exploratory Test Mode:	Transmitting mode				
Final Test Mode:	Through Pre-scan, find the 11Mbps of rate is the worst case of 802.11b;				
	54Mbps of rate is the worst case of 802.11g.				
Limit:	≤8.00dBm				
Test Results:	Pass				
Remark:	Scale the observed power level to an equivalent level in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where: BWCF = 10log (3kHz/100 kHz = -15.2 dB).				



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Measurement Data

802.11b mode						
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result			
Lowest	-21.29	≤8.00	Pass			
Middle	-21.26	≤8.00	Pass			
Highest	-21.91	≤8.00	Pass			
802.11g mode						
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result			
Lowest	Lowest -23.26		Pass			
Middle -23.43		≤8.00	Pass			
Highest	-23.97	≤8.00	Pass			

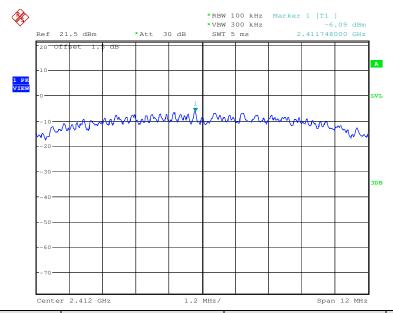


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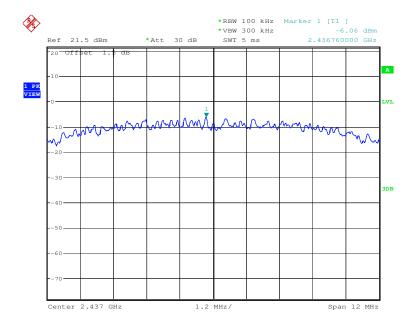
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Test plot as follows:

Test mode: 802.11b Test channel: Lowest



Test mode: 802.11b Test channel: Middle



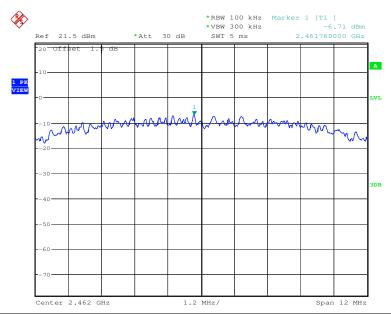




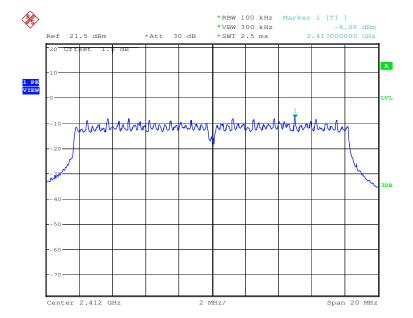
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Test mode: 802.11b Test channel: Highest



Test mode: 802.11g Test channel: Lowest



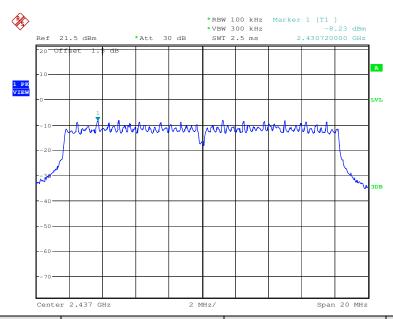
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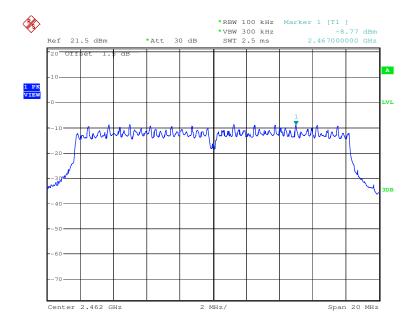
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Test mode: 802.11g Test channel: Middle



Test mode: 802.11g Test channel: Highest





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5.5 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	KDB558074 D01
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.
Exploratory Test Mode:	Transmitting mode
Final Test Mode:	Through Pre-scan, find the 11Mbps of rate is the worst case of 802.11b; 54Mbps of rate is the worst case of 802.11g.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

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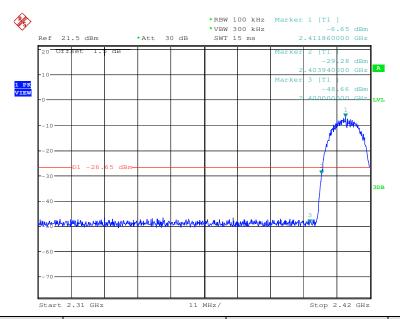


Report No.: SZEM121000574601

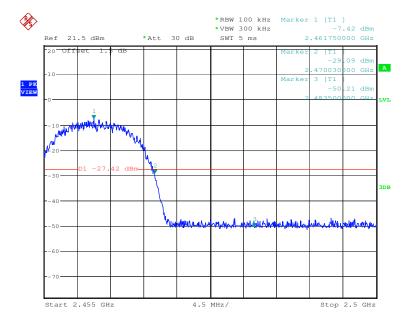
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Test plot as follows:

Test mode: 802.11b Test channel: Lowest



Test mode: 802.11b Test channel: Highest

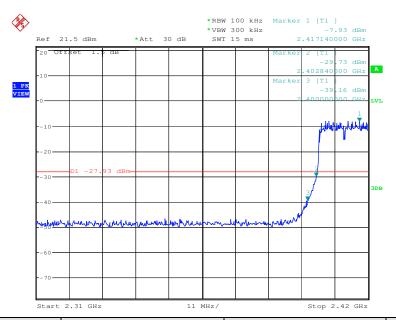




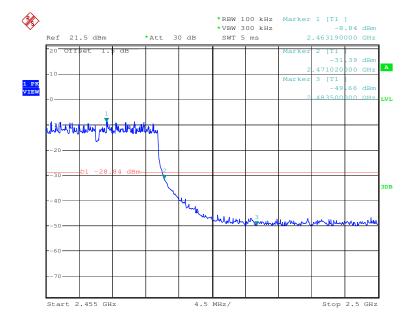
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Test mode: 802.11g Test channel: Lowest



Test mode: 802.11g Test channel: Highest





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5.6 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)					
Test Method:	KDB558074 D01					
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.					
Exploratory Test Mode:	Transmitting mode					
Final Test Mode:	Through Pre-scan, find the 11Mbps of rate is the worst case of 802.11b;					
	54Mbps of rate is the worst case of 802.11g.					
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.					
Instruments Used:	Refer to section 4.10 for details					
Test Results:	Pass					

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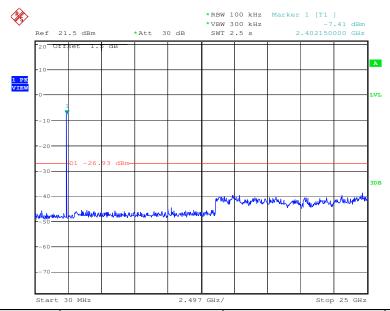


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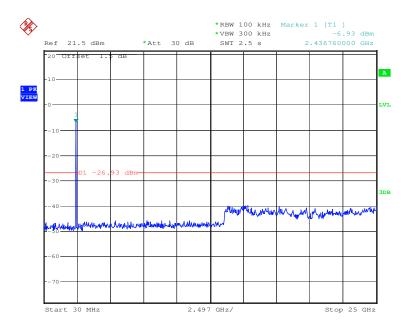
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Test plot as follows:

Test mode: 802.11b Test channel: Lowest



Test mode: 802.11b Test channel: Middle

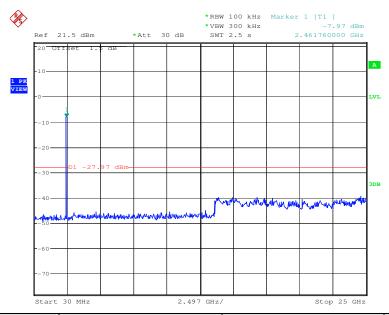




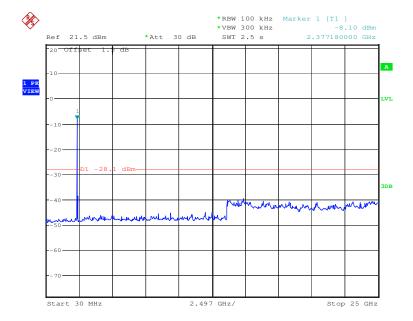
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Test mode: 802.11b Test channel: Highest



Test mode: 802.11g Test channel: Lowest



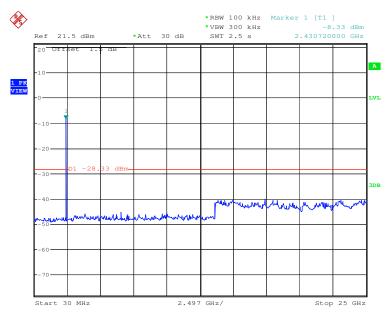
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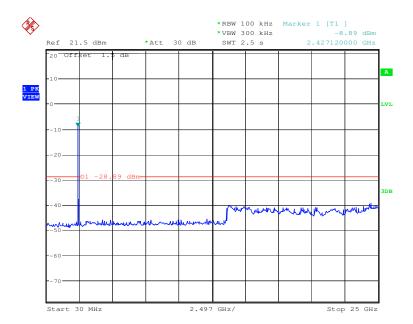
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Test mode: 802.11g Test channel: Middle



Test mode: 802.11g Test channel: Highest



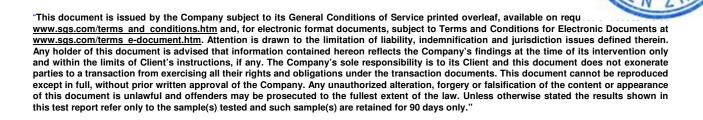


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5.7 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205						
Test Method:	ANSI C63.10 2009						
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)						
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark		
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak		
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average		
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak		
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak		
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average		
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak		
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak		
	Above 1GHz	Peak	1MHz	3MHz	Peak		
	Above IGHZ	Peak	1MHz	10Hz	Average		
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)		
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300		
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30		
	1.705MHz-30MHz	30	-	-	30		
	30MHz-88MHz	100	40.0	Quasi-peak	3		
	88MHz-216MHz	150	43.5	Quasi-peak	3		
	216MHz-960MHz	200	46.0	Quasi-peak	3		
	960MHz-1GHz	500	54.0	Quasi-peak	3		
	Above 1GHz	500	54.0	Average	3		
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency						
	emissions is 20dB above the maximum permitted average emission limit						
applicable to the equipment under test. This peak limit applies peak							
	emission level radiated by the device.						

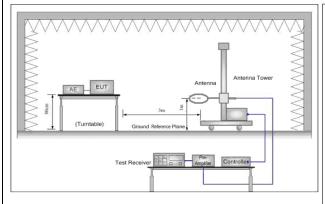




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Test Setup:



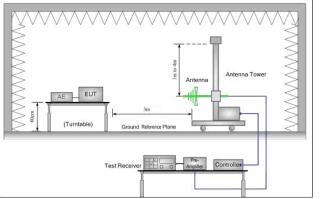


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

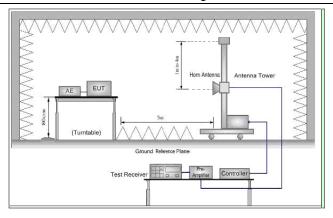


Figure 3. Above 1 GHz

Test Procedure:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB



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	margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.		
	g. Test the EUT in the lowest channel ,the middle channel ,the Highest channel		
	h. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.		
	i. Repeat above procedures until all frequencies measured was complete.		
Exploratory Test	Transmitting mode		
Mode:			
Final Test Mode:	Through Pre-scan, find the 11Mbps of rate is the worst case of 802.11b; 54Mbps of rate is the worst case of 802.11g.		
Instruments Used:	Refer to section 4.10 for details		
Test Results:	Pass		

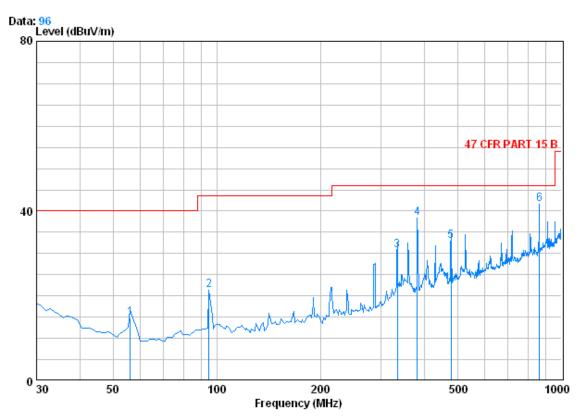


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5.7.1 Radiated emission below 1GHz

30MHz~1GHz (QP)				
Test mode:	Transmitting	Vertical		



Condition : 47 CFR PART 15 B 3m 3142C VERTICAL

Job No. : 5729RF Mode : Transmitting

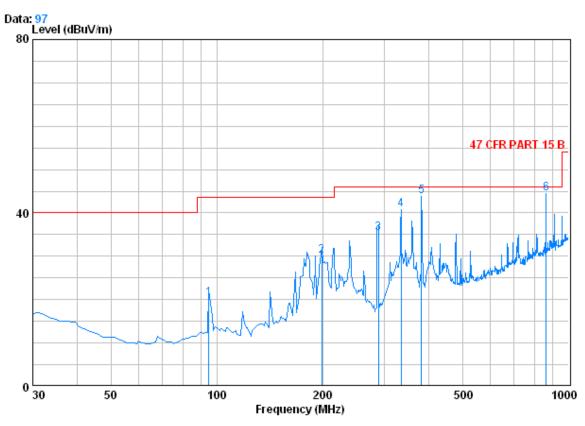
	CableA	ntenna	Preamp	Read		Limit	Over
Freq	Loss	Factor	Factor	Level	Level	Line	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
56.190	0.80	7.48	27.28	33.74	14.75	40.00	-25.25
94.990	1.15	8.91	27.21	38.56	21.41	43.50	-22.09
334.580	2.01	15.04	26.66	40.26	30.65	46.00	-15.35
382.110	2.15	16.08	27.01	47.07	38.29	46.00	-7.71
478.140	2.52	17.80	27.60	40.11	32.83	46.00	-13.17
862.260	3.46	22.70	26.96	42.36	41.57	46.00	-4.43
	MHz 56.190 94.990 334.580 382.110 478.140	Freq Loss MHz dB 56.190 0.80 94.990 1.15 334.580 2.01 382.110 2.15 478.140 2.52	Freq Loss Factor MHz dB dB/m 56.190 0.80 7.48 94.990 1.15 8.91 334.580 2.01 15.04 382.110 2.15 16.08 478.140 2.52 17.80	MHz dB dB/m dB 56.190 0.80 7.48 27.28 94.990 1.15 8.91 27.21 334.580 2.01 15.04 26.66 382.110 2.15 16.08 27.01 478.140 2.52 17.80 27.60	Freq Loss Factor Factor Level MHz dB dB/m dB dBuV 56.190 0.80 7.48 27.28 33.74 94.990 1.15 8.91 27.21 38.56 334.580 2.01 15.04 26.66 40.26 382.110 2.15 16.08 27.01 47.07 478.140 2.52 17.80 27.60 40.11	Freq Loss Factor Factor Level Level MHz dB dB/m dB dBuV dBuV/m 56.190 0.80 7.48 27.28 33.74 14.75 94.990 1.15 8.91 27.21 38.56 21.41 334.580 2.01 15.04 26.66 40.26 30.65 382.110 2.15 16.08 27.01 47.07 38.29 478.140 2.52 17.80 27.60 40.11 32.83	Freq Loss Factor Factor Level Level Line MHz dB dB/m dB dBuV dBuV/m dBuV/m 56.190 0.80 7.48 27.28 33.74 14.75 40.00 94.990 1.15 8.91 27.21 38.56 21.41 43.50 334.580 2.01 15.04 26.66 40.26 30.65 46.00 382.110 2.15 16.08 27.01 47.07 38.29 46.00 478.140 2.52 17.80 27.60 40.11 32.83 46.00



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Test mode:	Transmitting	Horizontal



Condition : 47 CFR PART 15 B 3m 3142C HORIZONTAL

Job No. : 5729RF Mode : Transmitting

		CableA	ıntenna	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	94.990	1.15	8.91	27.21	37.42	20.27	43.50	-23.23
2	198.780	1.40	10.19	26.70	45.26	30.14	43.50	-13.36
3	288.020	1.85	13.40	26.43	46.43	35.24	46.00	-10.76
4 0	334.580	2.01	15.04	26.66	50.35	40.74	46.00	-5.26
5 @	382.110	2.15	16.08	27.01	52.55	43.77	46.00	-2.23
6 0	862.260	3.46	22.70	26.96	45.36	44.57	46.00	-1.43



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5.7.2 Transmitter emission above 1GHz

Test mode: 802.1		.11b	Test channel:		Lowest	Remark	-	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarizatio n
3088.453	3.39	33.37	40.37	45.90	42.29	74	-31.71	Vertical
4128.280	4.24	34.17	41.14	46.00	43.27	74	-30.73	Vertical
5257.662	4.87	34.65	41.57	47.37	45.32	74	-28.68	Vertical
6678.987	5.30	36.13	40.33	46.30	47.40	74	-26.60	Vertical
8313.511	6.19	36.12	38.92	45.35	48.74	74	-25.26	Vertical
9960.375	5.98	37.67	37.48	44.43	50.60	74	-23.40	Vertical
2875.986	3.25	33.21	40.21	45.31	41.56	74	-32.44	Horizontal
3570.714	3.79	33.28	40.72	46.30	42.65	74	-31.35	Horizontal
4433.263	4.44	35.01	41.36	46.26	44.35	74	-29.65	Horizontal
5244.295	4.86	34.65	41.58	46.95	44.88	74	-29.12	Horizontal
6921.301	5.47	35.89	40.12	47.62	48.86	74	-25.14	Horizontal
9088.188	6.13	36.70	38.24	44.09	48.68	74	-25.32	Horizontal

Test mode: 8		.11b	Test channel:		Middle	Remark		Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarizatio n
3208.660	3.49	33.32	40.45	45.19	41.55	74	-32.45	Vertical
3953.443	4.13	33.76	41.00	45.89	42.78	74	-31.22	Vertical
5244.295	4.86	34.65	41.58	46.94	44.87	74	-29.13	Vertical
6561.030	5.27	36.25	40.43	46.85	47.94	74	-26.06	Vertical
8441.459	6.18	36.18	38.80	45.29	48.85	74	-25.15	Vertical
9636.161	5.99	37.34	37.76	46.35	51.92	74	-22.08	Vertical
3096.325	3.39	33.37	40.37	47.40	43.79	74	-30.21	Horizontal
3953.443	4.13	33.76	41.00	45.84	42.73	74	-31.27	Horizontal
4983.987	4.77	34.43	41.77	45.97	43.40	74	-30.60	Horizontal
6235.364	5.19	35.98	40.71	47.04	47.50	74	-26.50	Horizontal
8022.456	6.20	36.01	39.16	46.45	49.50	74	-24.50	Horizontal
9710.030	5.99	37.41	37.71	44.13	49.82	74	-24.18	Horizontal



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Test mode:	802	2.11b	Test ch	annel:	Highest	Remark	:	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarizatio n
3598.087	3.82	33.32	40.74	47.72	44.12	74	-29.88	Vertical
4797.271	4.69	34.73	41.63	47.28	45.07	74	-28.93	Vertical
5940.967	5.11	35.62	40.97	47.66	47.42	74	-26.58	Vertical
7800.936	6.22	36.00	39.36	46.00	48.86	74	-25.14	Vertical
9042.038	6.15	36.64	38.29	45.10	49.60	74	-24.40	Vertical
10916.260	6.20	38.47	37.83	44.87	51.71	74	-22.29	Vertical
3325.070	3.59	33.27	40.54	46.84	43.16	74	-30.84	Horizontal
3824.757	4.01	33.59	40.91	46.30	42.99	74	-31.01	Horizontal
5393.215	4.92	34.78	41.45	47.28	45.53	74	-28.47	Horizontal
7063.693	5.60	35.83	40.00	46.36	47.79	74	-26.21	Horizontal
8615.126	6.17	36.29	38.65	45.20	49.01	74	-24.99	Horizontal
10269.320	6.04	38.02	37.56	44.44	50.94	74	-23.06	Horizontal

Test mode:	802	.11g	Test ch	annel:	Lowest	Remark	-	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarizatio n
3241.498	3.52	33.30	40.48	47.58	43.92	74	-30.08	Vertical
4096.875	4.23	34.08	41.11	47.57	44.77	74	-29.23	Vertical
5230.963	4.86	34.63	41.58	47.87	45.78	74	-28.22	Vertical
6628.177	5.29	36.18	40.38	47.92	49.01	74	-24.99	Vertical
8022.456	6.20	36.01	39.16	47.07	50.12	74	-23.88	Vertical
9935.053	5.98	37.65	37.52	45.20	51.31	74	-22.69	Vertical
3018.502	3.33	33.39	40.31	47.82	44.23	74	-29.77	Horizontal
4278.055	4.35	34.59	41.25	46.63	44.32	74	-29.68	Horizontal
5674.896	5.01	35.18	41.20	48.42	47.41	74	-26.59	Horizontal
7394.878	6.00	35.96	39.71	47.13	49.38	74	-24.62	Horizontal
9088.188	6.13	36.70	38.24	45.91	50.50	74	-23.50	Horizontal
10036.730	5.98	37.76	37.47	44.85	51.12	74	-22.88	Horizontal

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Test mode:	802	2.11g	Test ch	annel:	Middle	Remark	:	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarizatio n
3057.166	3.36	33.38	40.34	47.46	43.86	74	-30.14	Vertical
4138.802	4.25	34.22	41.14	47.50	44.83	74	-29.17	Vertical
5732.974	5.03	35.26	41.15	48.30	47.44	74	-26.56	Vertical
6747.341	5.32	36.06	40.28	48.36	49.46	74	-24.54	Vertical
8462.975	6.18	36.19	38.78	46.61	50.20	74	-23.80	Vertical
10453.950	6.09	38.24	37.64	45.38	52.07	74	-21.93	Vertical
3184.250	3.47	33.33	40.44	47.65	44.01	74	-29.99	Horizontal
4278.055	4.35	34.59	41.25	47.41	45.10	74	-28.90	Horizontal
5504.170	4.95	34.90	41.35	47.58	46.08	74	-27.92	Horizontal
6886.154	5.43	35.92	40.15	48.00	49.20	74	-24.80	Horizontal
8104.559	6.20	36.04	39.10	47.33	50.47	74	-23.53	Horizontal
9935.053	5.98	37.65	37.52	44.71	50.82	74	-23.18	Horizontal

Test mode:	802	.11g	Test ch	annel:	Highest	Remark	-	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarizatio n
3634.910	3.85	33.37	40.77	47.33	43.78	74	-30.22	Vertical
4582.422	4.55	35.06	41.47	47.38	45.52	74	-28.48	Vertical
6047.776	5.14	35.76	40.87	47.85	47.88	74	-26.12	Vertical
7470.558	6.08	35.99	39.64	47.26	49.69	74	-24.31	Vertical
8703.294	6.17	36.36	38.59	46.12	50.06	74	-23.94	Vertical
10480.590	6.09	38.28	37.65	44.71	51.43	74	-22.57	Vertical
3184.250	3.47	33.33	40.44	47.23	43.59	74	-30.41	Horizontal
4223.950	4.31	34.45	41.21	47.92	45.47	74	-28.53	Horizontal
5034.994	4.79	34.43	41.76	48.42	45.88	74	-28.12	Horizontal
6764.538	5.33	36.04	40.27	47.45	48.55	74	-25.45	Horizontal
8527.851	6.18	36.23	38.73	46.91	50.59	74	-23.41	Horizontal
10400.860	6.07	38.18	37.62	43.46	50.09	74	-23.91	Horizontal

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

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2) The disturbance above 11GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

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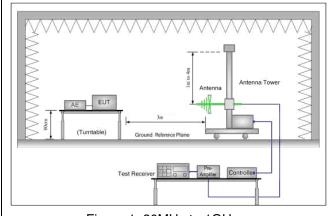


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5.8 Band Edge (Radiated Emission)

Test Requirement:	47 CFR Part 15C Section	7 CFR Part 15C Section 15.209 and 15.205								
Test Method:	ANSI C63.10 2009	NSI C63.10 2009								
Test Site:	Measurement Distance: 3r	leasurement Distance: 3m (Semi-Anechoic Chamber)								
Limit:	Frequency	Limit (dBuV/m @3m)	Remark							
	30MHz-88MHz	40.0	Quasi-peak Value							
	88MHz-216MHz 43.5 Quasi-peak									
	216MHz-960MHz	46.0	Quasi-peak Value							
	960MHz-1GHz	54.0	Quasi-peak Value							
	Above 10Uz	54.0 Average Value								
	Above 1GHz	74.0 Peak Value								
Test Setup:										



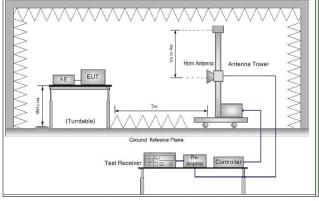


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz

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Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
	b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
	c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
	d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
	e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
	f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel
	g. Test the EUT in the lowest channel, the Highest channel
	h. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
	 i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting mode
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b;
	6Mbps of rate is the worst case of 802.11g.
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass



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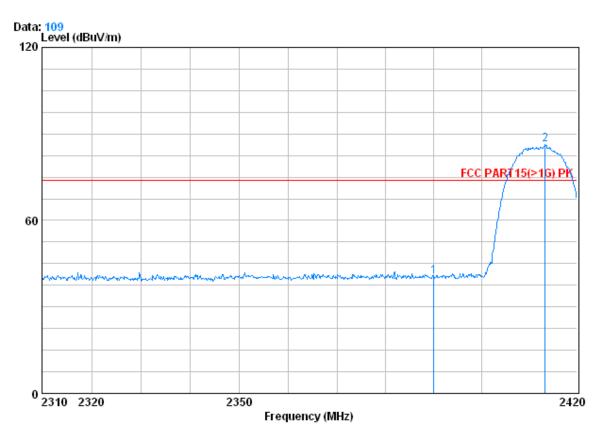


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Test plot as follows:

Worse case mode: 802.11b Test channel: Lowest Remark: Peak Vertical



Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 5729RF

Mode : B 2412 BANDEDGE

		Freq			Preamp Factor				
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 2	x	2390.080 2413.290			39.85 39.86				

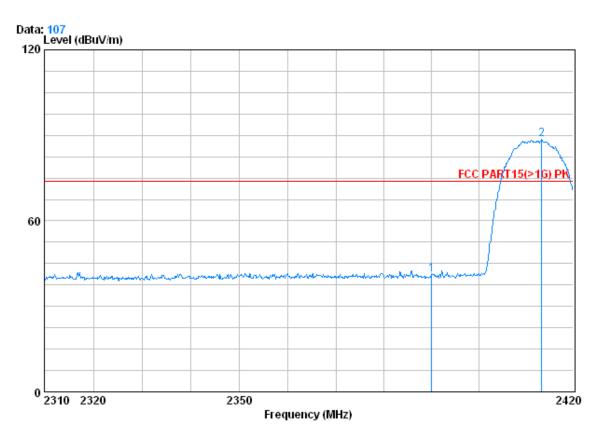
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Worse case mode: 802.11b Test channel: Lowest Remark: Peak Horizontal



Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 5729RF

Mode: B 2412 BANDEDGE

	Freq			Preamp Factor				Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 2 @	2390.080 2413.290			39.85 39.86				

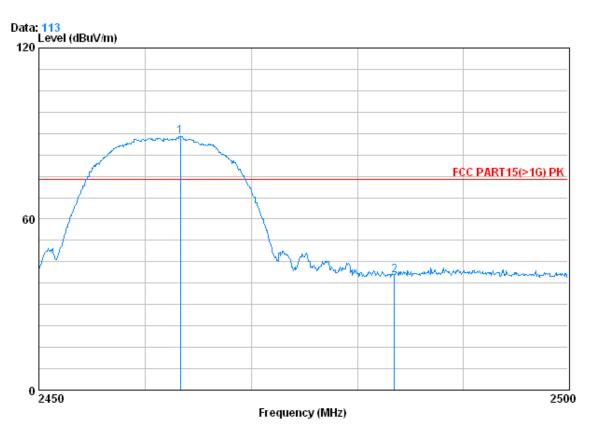
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Worse case mode: 802.11b Test channel: Highest Remark: Peak Vertical



Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 5729RF

Mode : B 2462 BANDEDGE

		Cablei	Antenna	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	-dB/m			dBuV/m	dBuV/m	dB
	HIIZ	uв	GD/III	ав	abav	abav/III	abav/m	ab
1 0	2463.300	3.02	32.64	39.91	93.22	88.98	74.00	14.98
2	2483.500	3.03	32.67	39.92	44.57	40.35	74.00	-33.65

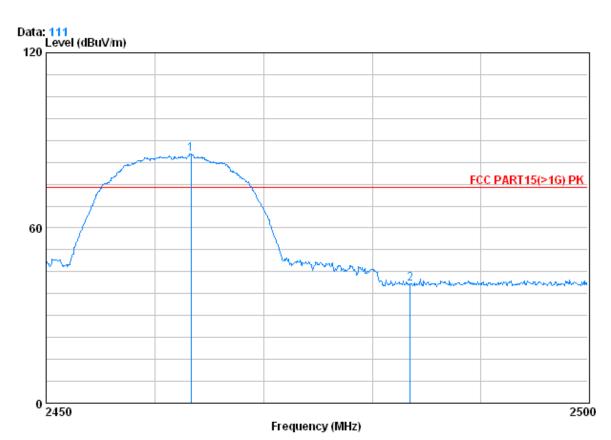
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Worse case mode: 802.11b Test channel: Highest Remark: Peak Horizontal



Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 5729RF

Mode : B 2462 BANDEDGE

		Cablei	Antenna	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 X	2463.300	3.02	32.64	39.91	89.59	85.34	74.00	11.34
2	2483.500	3.03	32.67	39.92	45.15	40.93	74.00	-33.07

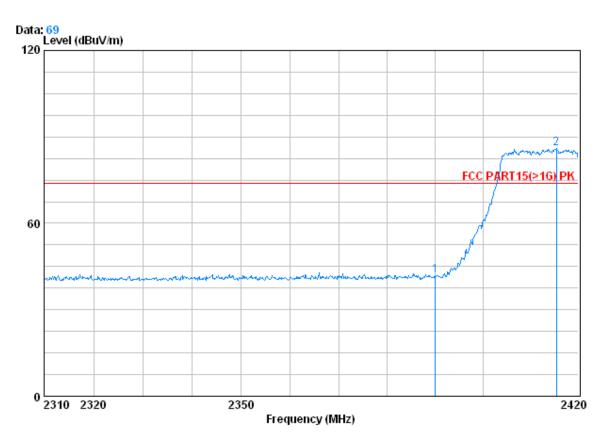
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Worse case mode: 802.11g Test channel: Lowest Remark: Peak Vertical



Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 5729RF

Mode : G 2412 BANDEDGE

			Cablei	Antenna	Preamp	Read		Limit	Over
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit
		MHz	dB	dB/m	dB	dBuV	dBuV/m	${\tt dBuV/m}$	dB
1		2390.080	2.98	32.51	39.85	46.08	41.73	74.00	-32.27
2	X	2415.380	2.99	32.54	39.86	90.22	85.89	74.00	11.89

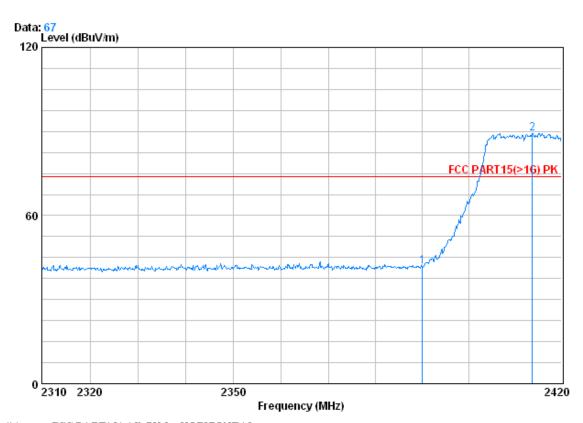
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Worse case mode: 802.11g Test channel: Lowest Remark: Peak Horizontal



Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 5729RF

Mode : G 2412 BANDEDGE

	Freq			Preamp Factor				Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 2 @	2390.080 2413.730			39.85 39.86				

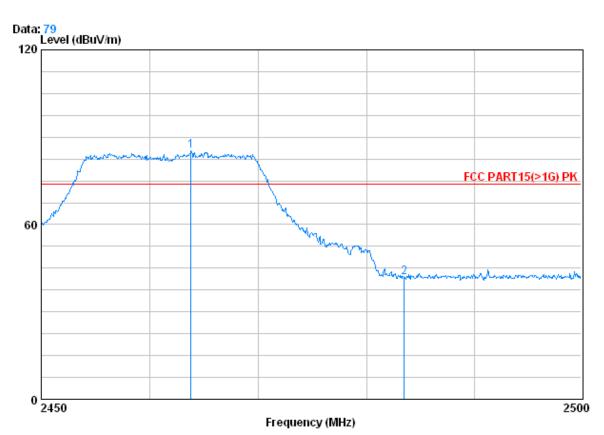
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Worse case mode: 802.11g Test channel: Highest Remark: Peak Vertical



Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 5729RF

Mode : G 2462 BANDEDGE

		CableAntenna		Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 X	2463.750	3.02	32.64	39.91	89.55	85.31	74.00	11.31
2	2483.500	3.03	32.67	39.92	46.02	41.80	74.00	-32.20

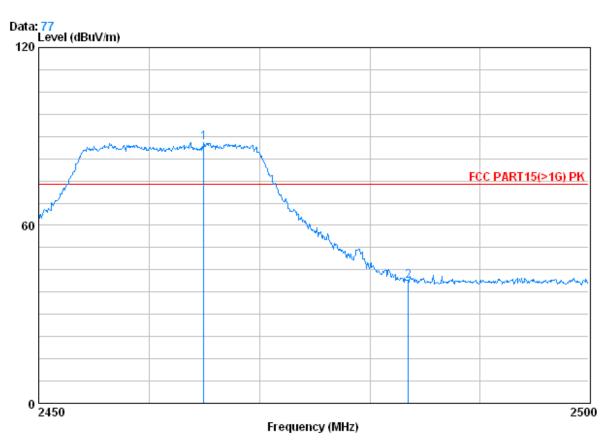
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Worse case mode: 802.11g Test channel: Highest Remark: Peak Horizontal



Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 5729RF

Mode : G 2462 BANDEDGE

	Freq	CableAntenna Loss Factor		•				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 @ 2	2464.900 2483.500			39.91 39.92				

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

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