

FCC 47 CFR PART 15 SUBPART C/Oct. 2012 AND ANSI 63.4:2003 TEST REPORT

For

IP CAM

Model : F3005

Trade Name : ZAVIO

Issued for

ZAVIO Inc.

2F, No.13, R&D Rd.II, Science Based Industrial Park, Hsinchu, Taiwan

Issued by

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Issued Date: September 06, 2013



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	11/16/2012	Initial Issue	All Page 91	Rubeca yu
01	08/16/2013	Revised	P.1 & P.4 & P.7	Gloria Chang
02	09/06/2013	Revised POWER SPECTRAL DENSITY Data	P.27 ~ P.37	Gloria Chang



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1. TEST REPORT CERTIFICATION

Applicant	:	ZAVIO Inc
Address	:	2F, No.13, R&D Rd.II, Science Based Industrial Park,
		Hsinchu, Taiwan
Equipment Under Test :		IP CAM
Model	:	F3005
Trade Name	:	ZAVIO
Tested Date	:	October 22 ~ November 15, 2012 ; September 05, 2013

APPLICABLE STANDARD		
Standard	Test Result	
FCC Part 15 Subpart C/Oct. 2012 AND ANSI C63.4:2003	PASS	

WE HEREBY CERTIFY THAT: The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

fr

Sb. Lu Sr. Engineer

Reviewed by:

Gundam Lin Sr. Engineer



2. EUT DESCRIPTION

Product Name	IP CAM	
Model Number	F3005	
Identify Number	T121022S02	
Received Date	October 22 , 2012	
	IEEE 802.11b/g, 802.11n HT20 : 2412MHz~2462MHz	
Frequency Range	IEEE 802.11n HT40 : 2422MHz~2452MHz	
	IEEE 802.11b : 15.55 dBm (0.0359W)	
Transmit Power	IEEE 802.11g : 22.92 dBm (0.1959W)	
	IEEE 802.11n HT20 : 22.65 dBm (0.1841W)	
	IEEE 802.11n HT40 : 22.63 dBm (0.1832W)	
Channel Spacing	IEEE 802.11b/g, 802.11n HT20/HT40 : 5MHz	
Channel Number	IEEE 802.11b/g, 802.11n HT20 : 11 Channels	
	IEEE 802.11n HT40 : 7 Channels	
	IEEE 802.11b : 11, 5.5, 2, 1 Mbps	
	IEEE 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps	
Transmit Data Rate	IEEE 802.11n HT20 : 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps	
	IEEE 802.11n HT40 : 135, 121.5, 108, 81, 54, 40.5, 27,	
	13.5Mbps	
	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK)	
Type of Modulation	IEEE 802.11g : OFDM (64QAM, 16QAM, QPSK, BPSK)	
	IEEE 802.11n HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)	
Antenna Type Dipole Antenna, Antenna Gain 2dBi		
Power Rating 5Vdc		
Test Voltage	120Vac, 60Hz	
DC Power Cable Type	Non-shielded cable 1.5m × 2 (Non-detachable)	
I/O Port RJ-45 Port × 1, Power Port × 1, Micro SD Port × 1		



FCC ID: WOR-5003F

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	AMIGO	AMS47-0501000FU	100-240Vac, 50/60Hz, 0.2A	5Vdc, 1.0A
2	DVE	DSA-12CA-05 050150	100-240Vac, 50/60Hz, 0.3A	5Vdc, 1.5A

Remark :

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.

2. For more details, please refer to the User's manual of the EUT.

3. This submittal(s) (test report) is intended for FCC ID: WOR-5003F filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

4. The model F3005 was considered the main model for testing.



3. DESCRIPTION OF TEST MODES

The EUT is an 802.11n transceiver in IP CAM form factor. WiFi : Chain 1 (MAIN) transmits.

Conducted Emission / Radiated Emission Test (Below 1 GHz)

1. The following test modes were scanned during the preliminary test:

No.	Pre-Test Mode
1	Normal Operating / Power Adapter AMIGO
2	Normal Operating / Power Adapter DVE
3	TX Mode

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode				
	Radiated Emission	Normal Operating / Power Adapter AMIGO		
Emission		Normal Operating / Power Adapter DVE		
LIIISSION	Conducted Emission	Normal Operating / Power Adapter AMIGO		
		Normal Operating / Power Adapter DVE		

Remark : Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

Conducted / Radiated Emission Test (Above 1 GHz) IEEE 802.11b, 802.11g, 802.11n HT20 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode : 1Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11g mode : 6Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT20 mode : 6.5 Mbps data rate (worst case) were chosen for full testing.

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The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2422
Middle	2437
High	2452

IEEE 802.11n HT40 mode : 13.5Mbps data rate (worst case) were chosen for full testing.



4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2003 and FCC CFR 47, 15.207, 15.209, 15.247 and KDB558074.

5. FACILITIES AND ACCREDITATION

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

NO. 989-1 Wen Shan Rd., Shang Shan Village, Qionglin Shiang Hsinchu County 30741, Taiwan, R.O.C

The sites are constructed in conformance with the requirements of ANSI C63.4:2003 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

5.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

Taiwan TAF

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	INDUSTRY CANADA
Japan	VCCI
Taiwan	BSMI
USA	FCC MRA

Copies of granted accreditation certificates are available for downloading from our web site, http:///www.ccsrf.com

Remark: 1.FCC filing number is TW1027. 2.IC filing number is 2324 K-1/-2/-3.

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5.3 MEASUREMENT UNCERTAINTY

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2.

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 0.009 to 30 MHz	+/- 3.1252
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48

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

Consistent with industry standard (e.g. CISPR 22, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.



6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook PC	DELL	Latitude D610 CN-0C4708-48643-62 5-5565		DoC
2	Notebook PC	HP	ProBook 4421s	CNF03242PJ	DoC
3	Wireless Gigabit Router	SMC	SMCWGBR14 S-N	U193600496	
4	Micro SD Card	SanDisk	2G		

No.	Signal cable description
1	Non-shielded RJ-45 cable, 12m × 1

SETUP DIAGRAM FOR TESTS

EUT & peripherals setup diagram is shown in appendix setup photos.



EUT OPERATING CONDITION

RF Mode:

- 1. EUT & peripherals setup diagram is shown in appendix setup photos.
- 2. Pc a fixed ip, into the Network Neighborhood to confirm EUT obtained ip
- 3. On internet website key in: http://192.168.1.10/cgi-bin/admin/param?action=update&telnetd=23
- 4. Run Putty software →IP address 192.168.1.10
- 5. Account: root
 - . key in : mp8192c

->emi

- 6. Run the test command
- 7. Set up all computers like the setup diagram
 - (1) TX Mode:
 - \Rightarrow cttx 1 ; start tx
 - \Rightarrow cttx 0 ; stop tx
 - ⇒ chan 1 ; (Channel 1~14)
 - \Rightarrow bw ; bandwith (0=20M , 1=40M)
 - \Rightarrow txpower 30 ; (00~3f)
 - ⇒ rate 0 ; 0~3: CCK 1M~11M 4~11: OFDM 6M~54M
 - 12~19: MCS0~MCS7
 - 20~27: MCS8~MCS15
 - ⇒ cttx 1 ; Continuous TX
 - \Rightarrow Power control

IEEE 802.11b Channel Low (2412MHz) TX Power=21 IEEE 802.11b Channel Mid (2437MHz) TX Power=25 IEEE 802.11b Channel High (2462MHz) TX Power=27 IEEE 802.11g Channel Low (2412MHz) TX Power=30 IEEE 802.11g Channel Mid (2437MHz) TX Power=30 IEEE 802.11g Channel High (2462MHz) TX Power=30 IEEE 802.11n HT20 Channel Low (2412MHz) TX Power=30 IEEE 802.11n HT20 Channel Mid (2437MHz) TX Power=30 IEEE 802.11n HT20 Channel Mid (2437MHz) TX Power=30 IEEE 802.11n HT20 Channel Mid (2422MHz) TX Power=30 IEEE 802.11n HT40 Channel Low (2422MHz) TX Power=30 IEEE 802.11n HT40 Channel Mid (2437MHz) TX Power=30 IEEE 802.11n HT40 Channel Mid (2437MHz) TX Power=30

- 8. All of the functions are under run.
- 9. Start test.



Normal Mode:

- 1. EUT & peripherals setup diagram is shown in appendix setup photos.
- 2. Wireless Router to provide IP to the EUT.
- 3. Notebook PC (1) ping to EUT.
- 4. Notebook PC (2) ping to EUT.
- 5. All of the functions are under run.(web dispalay video)
- 6. Start test.



7. FCC PART 15.247 REQUIREMENTS

7.1 6dB BANDWIDTH

LIMITS

§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4407B	US41443108	09/12/2013

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST SETUP



TEST PROCEDURE

- 1. The transmitter output was connected to a spectrum analyzer.
- 2. Set resolution bandwidth (RBW) = 1-5% or DTS BW, not to exceed 100 kHz.
- 3. Set the video bandwidth (VBW) \ge 3 x RBW.
- 4. Detector = Peak.
- 5. Trace mode = max hold.
- 6. Sweep = auto couple.
- 7. Allow the trace to stabilize.
- 8. 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.

TEST RESULTS

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail	
Low	2412	10.17	500	PASS	
Middle	2437	10.17	500	PASS	
High	2462	10.17	500	PASS	

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.50	500	PASS
Middle	2437	16.50	500	PASS
High	2462	16.50	500	PASS

IEEE 802.11n HT20 mode

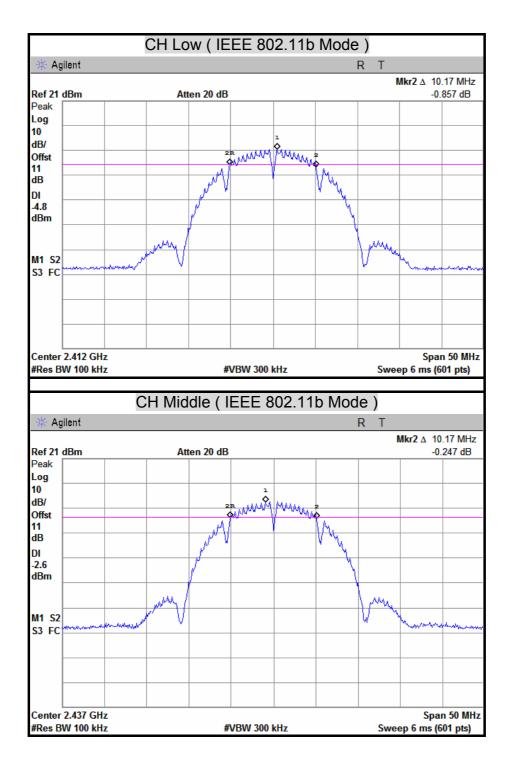
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	17.84	500	PASS
Middle	2437	17.83	500	PASS
High	2462	17.84	500	PASS

IEEE 802.11n HT40 mode

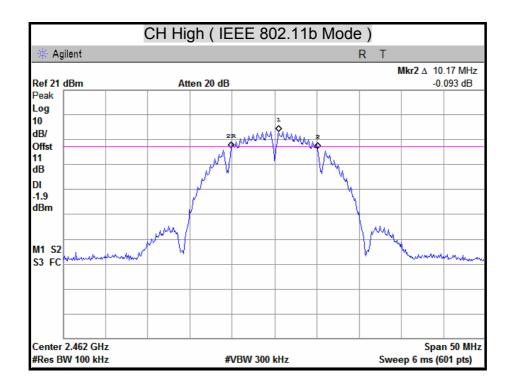
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2422	36.42	500	PASS
Middle	2437	36.50	500	PASS
High	2452	36.50	500	PASS



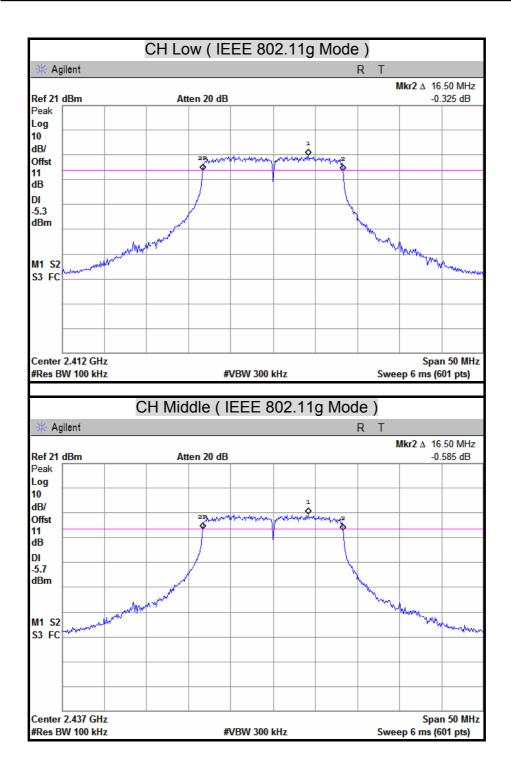
6dB BANDWIDTH





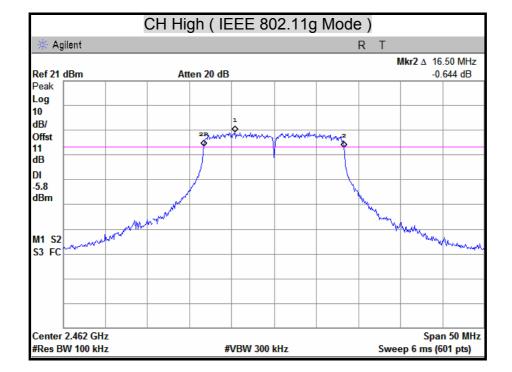




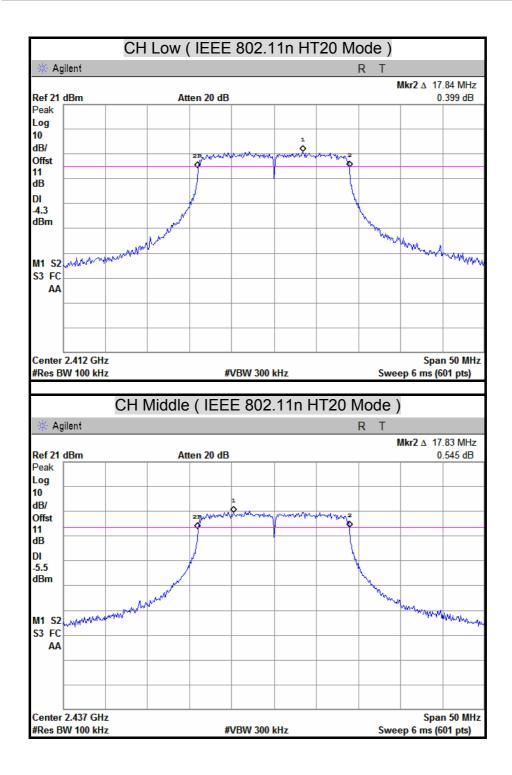


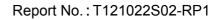


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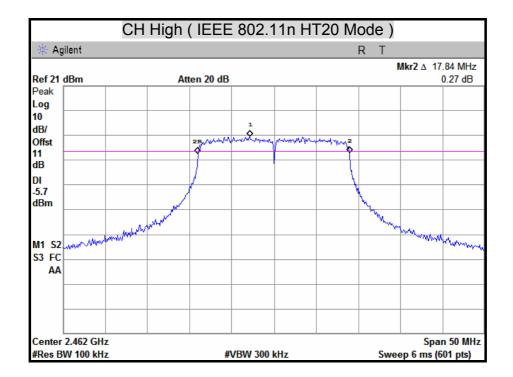




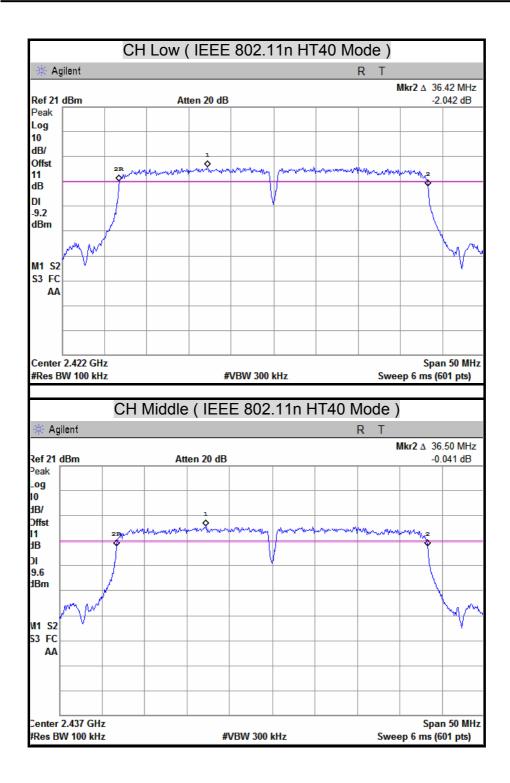




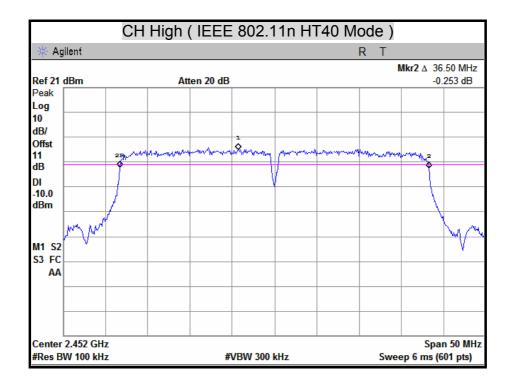














7.2 MAXIMUM PEAK OUTPUT POWER

<u>LIMITS</u>

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands : 1 watt.

§ 15.247(b) (4) Except as shown in paragraphs (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (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.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	ANRITSU	ML2495A	1149001	12/07/2012
Power Sensor	ANRITSU	MA2411B	1126148	12/14/2012

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

IEEE 802.11b Mode

Channel	Channel Frequency	Peak	Peak Power		Peak Power Limit		
Channel	(MHz)	(dBm)	(W)	(dBm)	(W)	Pass / Fail	
Low	2412	12.36	0.0172	30	1	PASS	
Middle	2437	14.62	0.0290	30	1	PASS	
High	2462	15.55	0.0359	30	1	PASS	

Remark:

1. At finial test to get the worst-case emission at 1Mbps.

2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the Power Meter to allow for direct reading of power.

IEEE 802.11g Mode

Channel	Channel Frequency	Peak Power		Peak Pov	Pass / Fail	
Channel	(MHz)	(dBm)	(W)	(dBm)	(W)	rass/raii
Low	2412	22.88	0.1941	30	1	PASS
Middle	2437	22.92	0.1959	30	1	PASS
High	2462	22.68	0.1854	30	1	PASS

Remark:

1. At finial test to get the worst-case emission at 6Mbps.

2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the Power Meter to allow for direct reading of power.

IEEE 802.11n HT20 mode

Channel	Channel Frequency	Peak Power		Peak Pov	Pass / Fail	
Channel	(MHz)	(dBm)	(W)	(dBm)	(W)	Fa557 Faii
Low	2412	22.65	0.1841	30	1	PASS
Middle	2437	22.60	0.1820	30	1	PASS
High	2462	22.35	0.1718	30	1	PASS

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.

2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the Power Meter to allow for direct reading of power.

Channel	Channel	Peak Power		Peak Pov	Pass / Fail	
Channel Frequenc (MHz)		(dBm)	(W)	(dBm)	(W)	Fa55/Faii
Low	2422	22.63	0.1832	30	1	PASS
Middle	2437	22.62	0.1828	30	1	PASS
High	2452	22.60	0.1820	30	1	PASS

IEEE 802.11n HT40 mode

Remark:

1. At finial test to get the worst-case emission at 13.5Mbps.

2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the Power Meter to allow for direct reading of power.



7.3 POWER SPECTRAL DENSITY

<u>LIMITS</u>

§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY46180323	04/15/2014

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST SETUP



TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer.
- 2. Set analyzer center frequency to DTS channel center frequency.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- 5. Set the VBW \geq 3 x RBW.
- 6. Detector = peak.
- 7. Sweep time = auto couple.
- 8. Trace mode = max hold.
- 9. Allow trace to fully stabilize.
- 10. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



TEST RESULTS

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-20.04	8	PASS
Middle	2437	-17.75	8	PASS
High	2462	-16.99	8	PASS

Remark:

1. At finial test to get the worst-case emission at 1Mbps.

2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the Spectrum Analyzer to allow for direct reading of power.

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-15.39	8	PASS
Middle	2437	-15.45	8	PASS
High	2462	-15.28	8	PASS

Remark:

1. At finial test to get the worst-case emission at 6Mbps.

2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the Spectrum Analyzer to allow for direct reading of power.



IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-14.85	8	PASS
Middle	2437	-14.42	8	PASS
High	2462	-14.66	8	PASS

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.

2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the Spectrum Analyzer to allow for direct reading of power.

IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2422	-15.15	8	PASS
Middle	2437	-15.45	8	PASS
High	2452	-15.62	8	PASS

Remark:

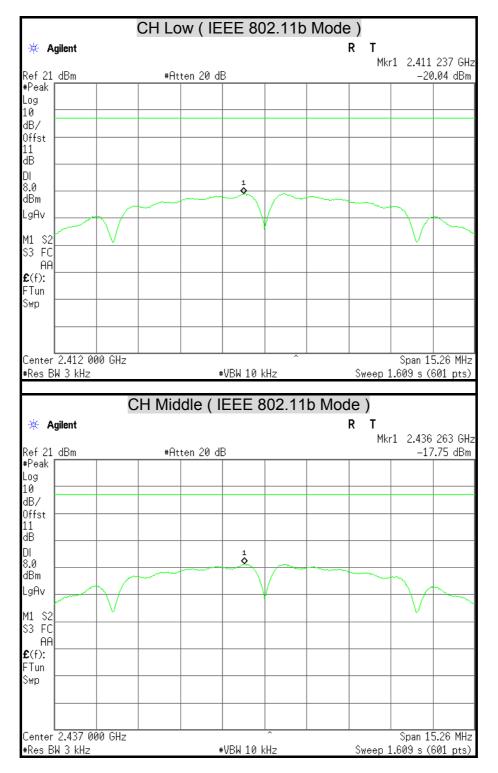
1. At finial test to get the worst-case emission at 13.5Mbps.

2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the Spectrum Analyzer to allow for direct reading of power.

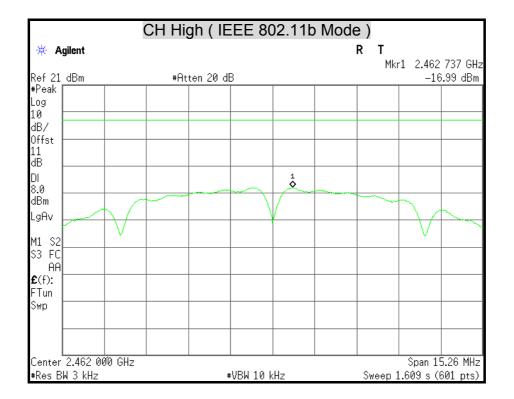


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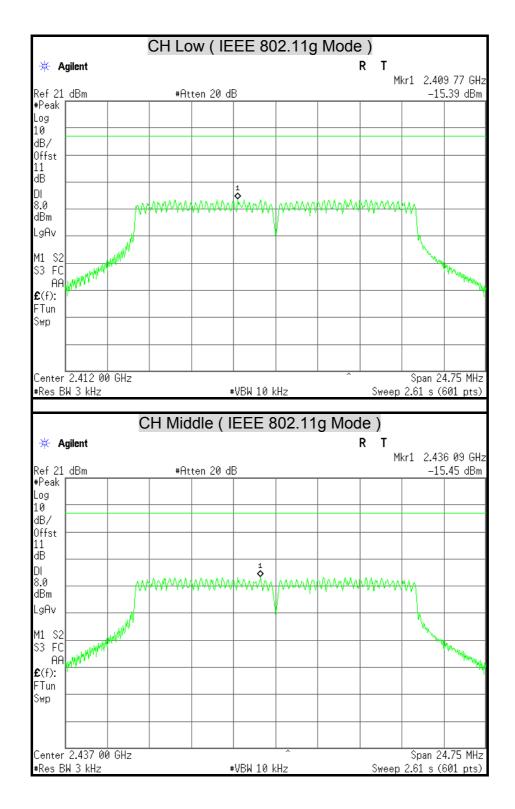
POWER SPECTRAL DENSITY



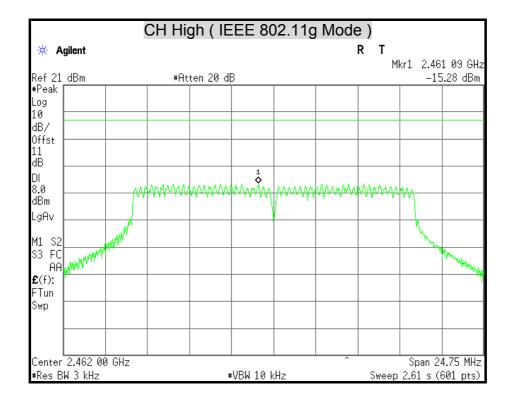






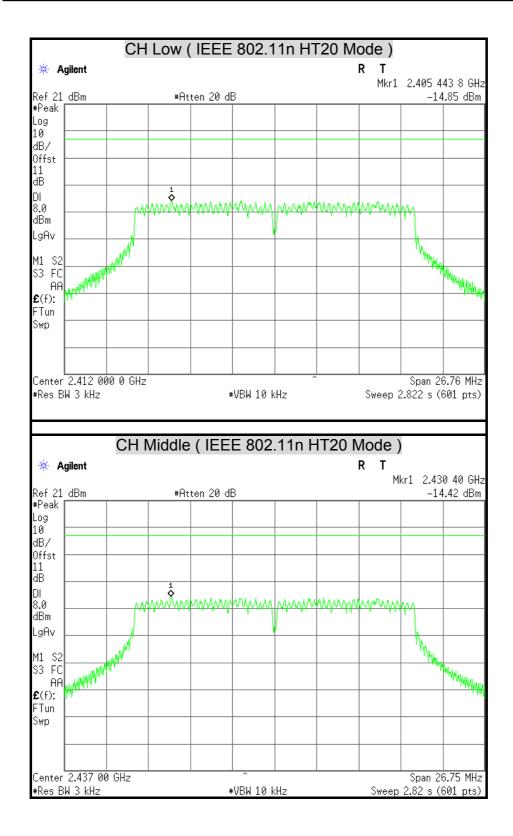






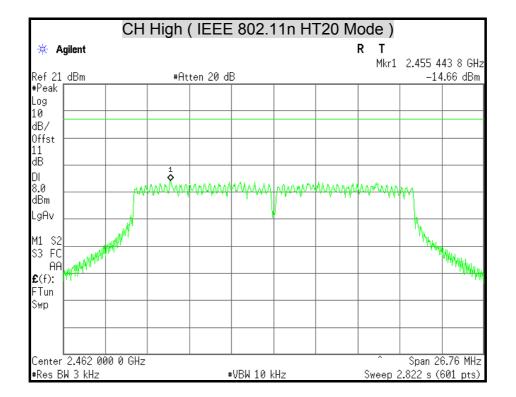


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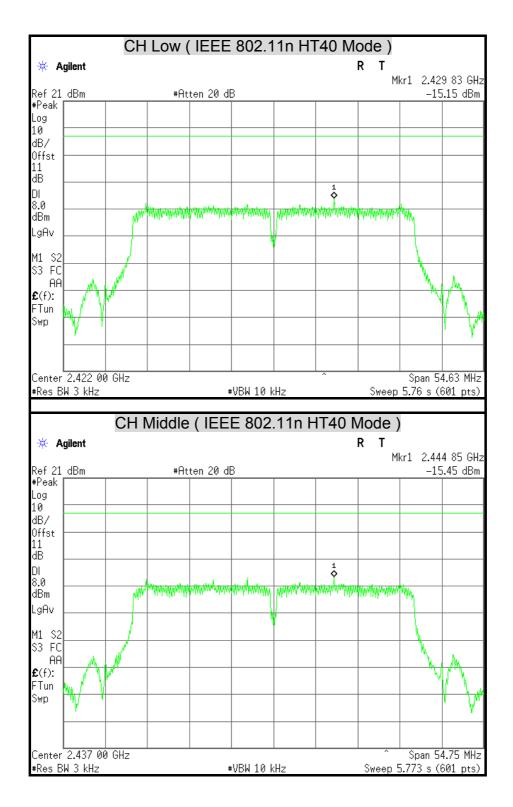


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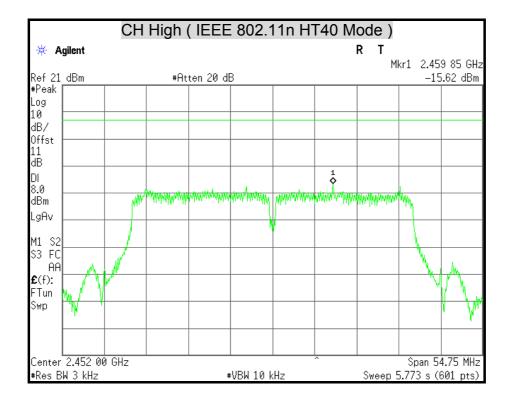


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7.4 CONDUCTED SPURIOUS EMISSION

<u>LIMITS</u>

§ 15.247(d) 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 and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. 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)).

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4407B	US41443108	09/12/2013

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

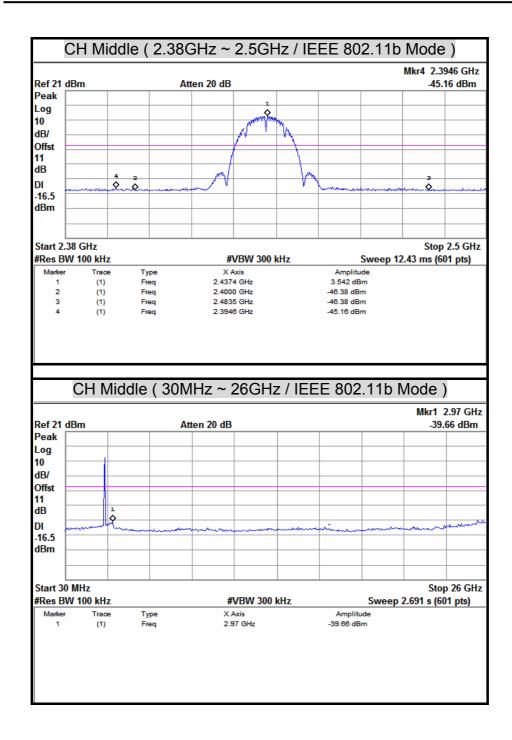


TEST RESULTS

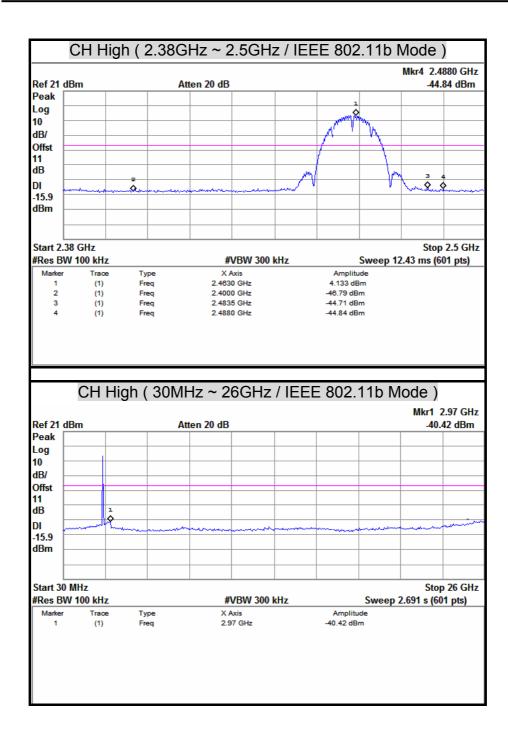
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

				Mkr4 2.49	
ef 21 dBm		Atten 20 dB		-44.	5 dBm
eak					
g		\$			
		man have been ha			
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TST					
3	2				
· _				3	
3.9	unit 1	V Virana		···· \$	
.9 m					
art 2.38 G	iHz			Stop	2.5 GH
es BW 10	0 kHz	#VBW 300 kH	z Swee	o 12.43 ms (60	
Marker	Trace Type	X Axis	Amplitude		
1	(1) Freq	2.4114 GHz	1.068 dBm		
2 3	(1) Freq (1) Freq	2.4000 GHz 2.4835 GHz	-35.92 dBm -45.87 dBm		
4	(1) Freq	2.4988 GHz	-44.5 dBm	Mode)	
4				,	.97 GF
4 (f 21 dBm				Mkr1 2	
4 (f 21 dBm ak		0MHz ~ 26GHz /		Mkr1 2	
4 f 21 dBm ak g		0MHz ~ 26GHz /		Mkr1 2	
4 f 21 dBm ak g		0MHz ~ 26GHz /		Mkr1 2	
4 f 21 dBm ak g		0MHz ~ 26GHz /		Mkr1 2	
4 f 21 dBm ak g		0MHz ~ 26GHz /		Mkr1 2	
4 (f 21 dBm ak g / ist	CH Low (3	0MHz ~ 26GHz /		Mkr1 2	
4 (f 21 dBm ak g / ist		0MHz ~ 26GHz /		Mkr1 2	
4 (f 21 dBm ak g / ist	CH Low (3	0MHz ~ 26GHz /		Mkr1 2	
4 (f 21 dBm ak g / st .9 .9	CH Low (3	0MHz ~ 26GHz /		Mkr1 2	97 GH
4 (f 21 dBm ak g / st .9 .9	CH Low (3	0MHz ~ 26GHz /		Mkr1 2	
4 (f 21 dBm ak g / ist	CH Low (3	0MHz ~ 26GHz /		Mkr1 2	
4 f 21 dBm ak g / ist	CH Low (3	0MHz ~ 26GHz /		Mkr1 2 _40.0)5 dBn
4	CH Low (3	0MHz ~ 26GHz /	IEEE 802.11b	Mkr1 2 _40.0	26 GH
4	CH Low (3	OMHz ~ 26GHz /	IEEE 802.11b	Mkr1 2 _40.0	26 GF

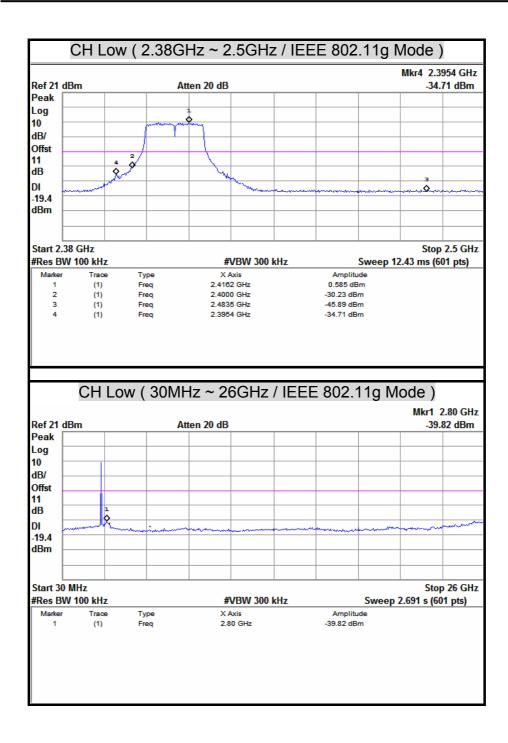




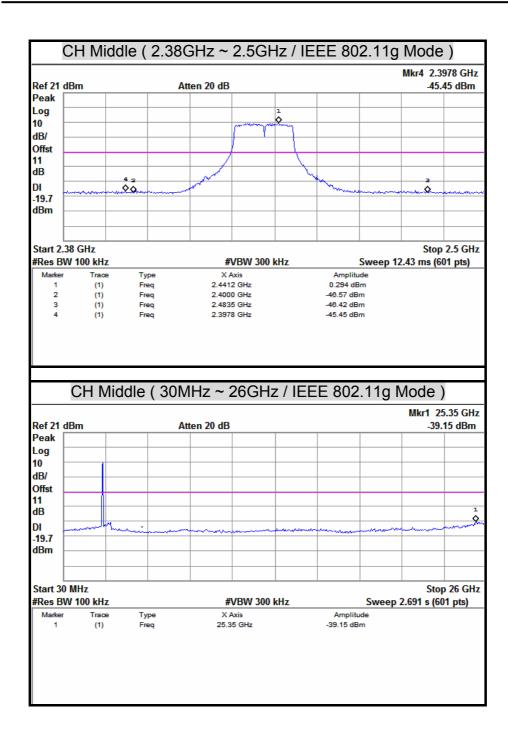




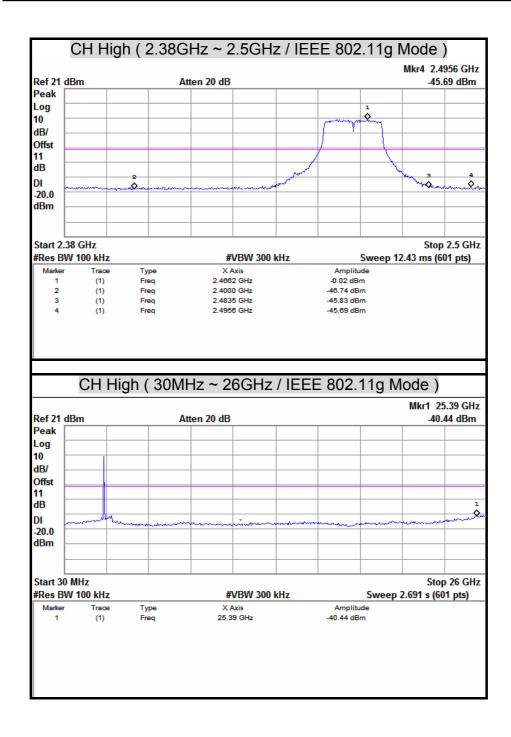




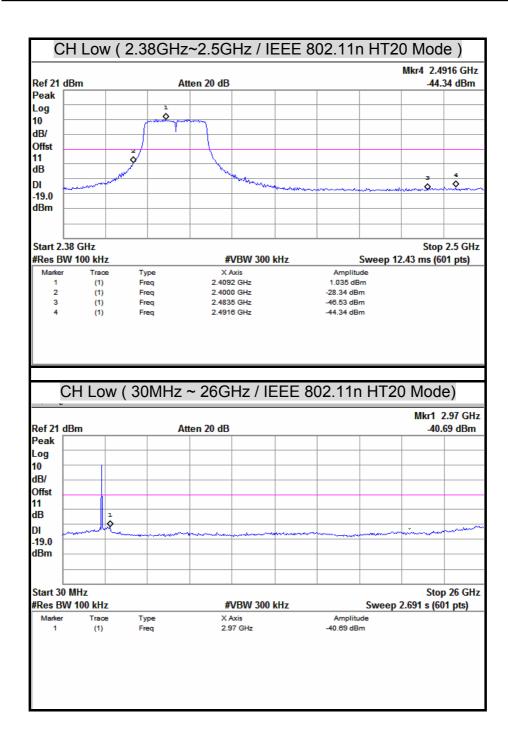




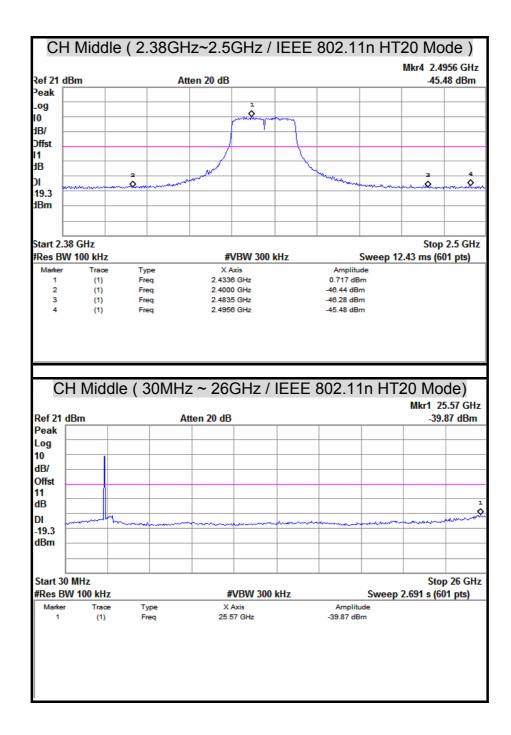




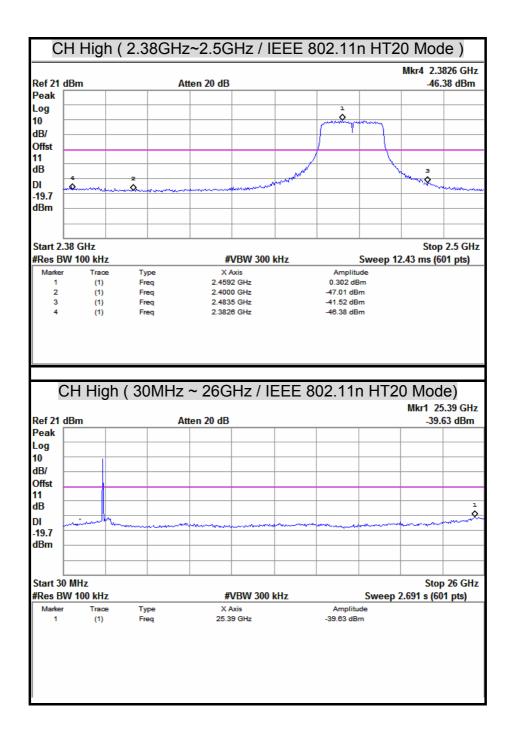




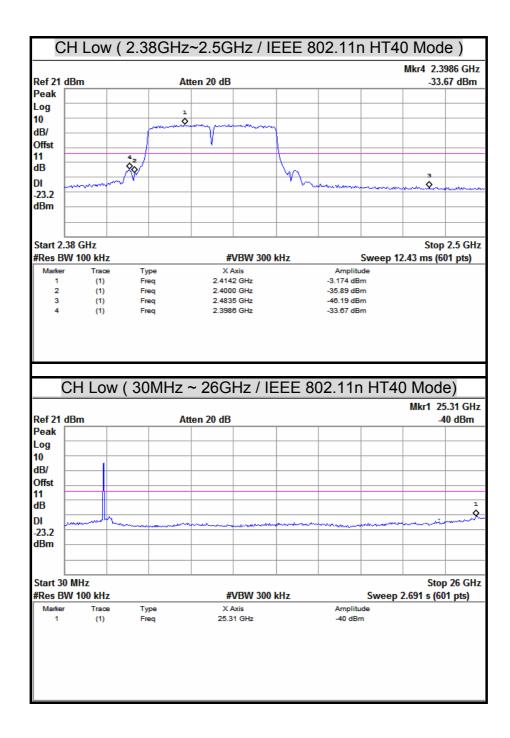




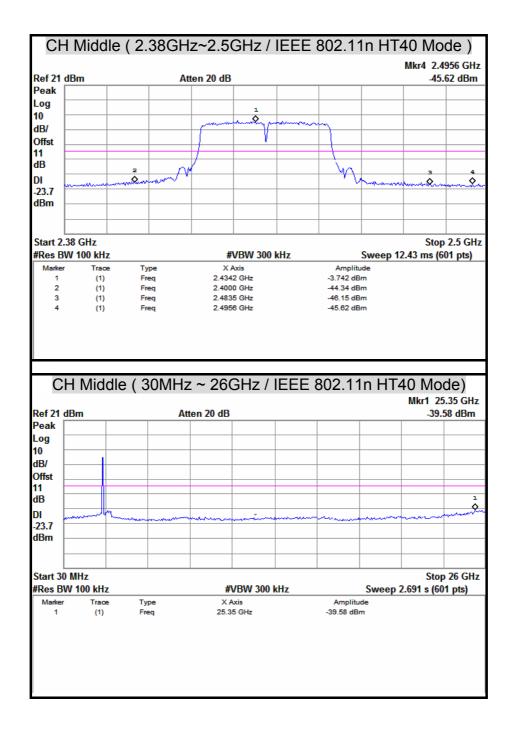




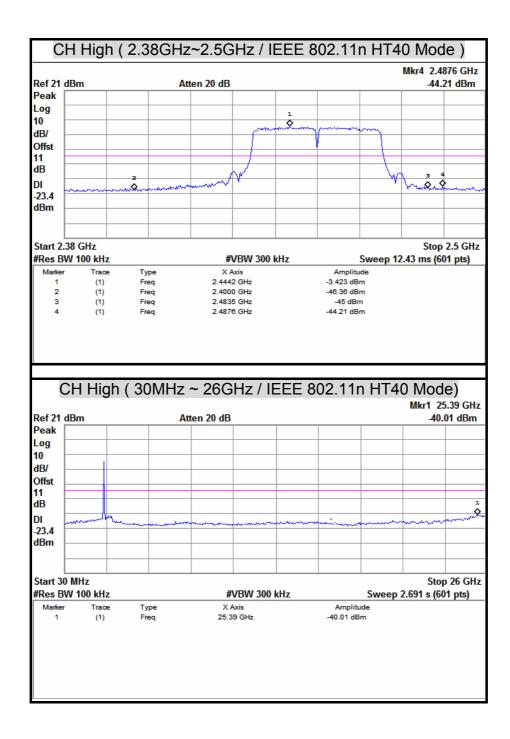














7.5 RADIATED EMISSION

LIMITS

(1) According to § 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	(²)
13.36 - 13.41			

Remark:

1.¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

2.² Above 38.6

(2) According to § 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



(3) According to § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

Remark: **Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(4) According to § 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST EQUIPMENT

966Chamber_B

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/14/2013
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101131	01/15/2013
Broadband Hybrid Bi-Log Antenna	Sunol Sciences	JB1	A100209-4	10/01/2013
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078733	12/06/2012
Horn Antenna	COM-POWER	AH-840	03077	12/06/2012
Pre-Amplifier	Agilent	8447D	2944A10052	07/17/2013
Pre-Amplifier	Agilent	8449B	3008A01916	07/17/2013
LOOP Antenna	EMCO	6502	8905-2356	06/10/2013
Notch Filters Band Reject	Micro-Tronics	BRM05702-01	026	N.C.R

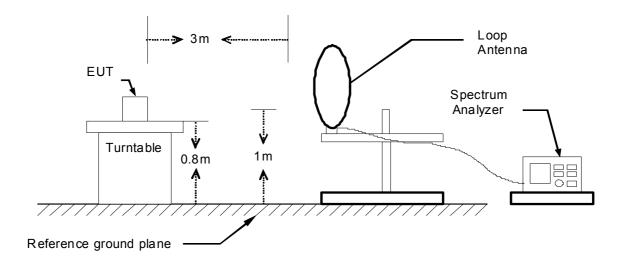
Remark: 1. Each piece of equipment is scheduled for calibration once a year. 2. N.C.R = No Calibration Request.

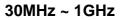


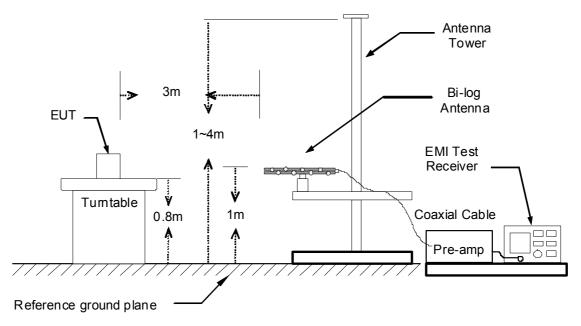
TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.

9kHz ~ 30MHz

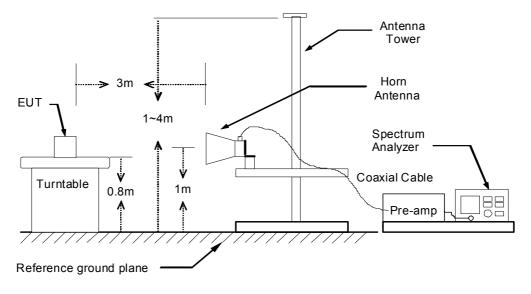








The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



TEST PROCEDURE

- 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2. While measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. While measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna.
- 3. The antenna is a broadband antenna, and its 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 polarization of the antenna are set to make the measurement.
- 4. 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 table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 6. If the emission level of the EUT in peak mode was 10 dB 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 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Remark :

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

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TEST RESULTS

Below 1 GHz (9kHz ~ 30MHz)

No emission found between lowest internal used/generated frequency to 30MHz.

Below 1 GHz (30MHz ~ 1GHz)

Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/10/24
Test Mode	Normal Operating / Power Adapter AMIGO	Temp. & Humidity	25 [°] C, 49%

966 Chamber_B at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
250.19	48.79	-13.24	35.54	46.00	-10.46	Peak
399.57	49.80	-9.58	40.22	46.00	-5.78	QP
475.23	44.60	-8.20	36.40	46.00	-9.60	QP
675.05	41.95	-5.15	36.80	46.00	-9.20	Peak
725.49	41.94	-4.35	37.59	46.00	-8.41	Peak
774.96	43.10	-3.46	39.64	46.00	-6.36	QP
800.18	42.20	-3.04	39.16	46.00	-6.84	QP
825.40	44.10	-2.64	41.46	46.00	-4.54	QP

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
43.58	48.20	-15.48	32.72	40.00	-7.28	QP
250.19	51.27	-13.24	38.03	46.00	-7.97	Peak
424.79	48.67	-9.15	39.52	46.00	-6.48	Peak
450.01	47.14	-8.72	38.42	46.00	-7.58	Peak
475.23	50.20	-8.20	42.00	46.00	-4.00	QP
500.45	46.19	-7.69	38.50	46.00	-7.50	Peak
524.70	43.08	-7.45	35.63	46.00	-10.37	Peak
874.87	39.45	-1.88	37.56	46.00	-8.44	Peak

Remark:

1. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.

2. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)

- 4. Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)
- 5. Margin (dB) = Remark result (dBuV/m) Quasi-peak limit (dBuV/m).



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/10/24
Test Mode	Normal Operating / Power Adapter DVE	Temp. & Humidity	25 [°] C, 49%

966 Chamber_B at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
399.57	46.03	-9.58	36.45	46.00	-9.55	Peak
475.23	48.50	-8.20	40.30	46.00	-5.70	QP
500.45	44.83	-7.69	37.14	46.00	-8.86	Peak
725.49	42.74	-4.35	38.39	46.00	-7.61	Peak
774.96	42.24	-3.46	38.78	46.00	-7.22	Peak
800.18	44.80	-3.04	41.76	46.00	-4.24	QP
825.40	44.00	-2.64	41.36	46.00	-4.64	QP
874.87	40.51	-1.88	38.63	46.00	-7.37	Peak

966 Chamber_B at 3Meter / Vertical						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
37.76	42.60	-11.30	31.30	40.00	-8.70	QP
250.19	51.97	-13.24	38.73	46.00	-7.27	Peak
424.79	46.73	-9.15	37.59	46.00	-8.41	Peak
450.01	46.43	-8.72	37.71	46.00	-8.29	Peak
475.23	49.80	-8.20	41.60	46.00	-4.40	QP
500.45	44.88	-7.69	37.19	46.00	-8.81	Peak
800.18	41.45	-3.04	38.41	46.00	-7.59	Peak
825.40	40.45	-2.64	37.80	46.00	-8.20	Peak

1. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.

2. Data of measurement within this frequency range shown " ---- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)

4. Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)

5. Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).



Above 1 GHz

Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11b TX / CH Low	Temp. & Humidity	24 [°] C, 49%

	966 Chamber_B at 3Meter / Horizontal										
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)			Limit-AV (dBuV/m)	Margin (dB)	Remark		
1600.00	51.34		-1.35	49.99		74.00	54.00	-4.01	Peak		
2294.00	45.50		3.25	48.75		74.00	54.00	-5.25	Peak		
2524.00	44.27		4.00	48.27		74.00	54.00	-5.73	Peak		
3945.00	40.63		7.05	47.68		74.00	54.00	-6.32	Peak		
4830.00	47.13	43.69	9.24	56.37	52.93	74.00	54.00	-1.07	AVG		
7245.00	41.17	30.17	13.29	54.46	43.46	74.00	54.00	-10.54	AVG		

966 Chamber B at 3Meter / Vertical

Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark		
1600.00	48.41		-1.35	47.06		74.00	54.00	-6.94	Peak		
2250.00	46.41		3.10	49.51		74.00	54.00	-4.49	Peak		
2568.00	45.83		4.09	49.92		74.00	54.00	-4.08	Peak		
4380.00	40.73		8.08	48.81		74.00	54.00	-5.19	Peak		
4830.00	42.53		9.24	51.77		74.00	54.00	-2.23	Peak		
7230.00	43.70	36.33	13.28	56.98	49.61	74.00	54.00	-4.39	AVG		

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11b TX / CH Middle	Temp. & Humidity	24 [°] C, 49%

	966 Chamber_B at 3Meter / Horizontal											
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark			
1600.00	51.00		-1.35	49.65		74.00	54.00	-4.35	Peak			
2356.00	52.45	42.38	3.46	55.91	45.84	74.00	54.00	-8.16	AVG			
2598.00	45.36		4.16	49.51		74.00	54.00	-4.49	Peak			
3915.00	40.91		6.98	47.89		74.00	54.00	-6.11	Peak			
4875.00	46.47	43.00	9.36	55.83	52.36	74.00	54.00	-1.64	AVG			
7320.00	39.54		13.34	52.87		74.00	54.00	-1.13	Peak			

Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	47.08		-1.35	45.73		74.00	54.00	-8.27	Peak
2336.00	48.31		3.39	51.70		74.00	54.00	-2.30	Peak
2536.00	48.28		4.03	52.30		74.00	54.00	-1.70	Peak
3930.00	40.59		7.02	47.60		74.00	54.00	-6.40	Peak
4875.00	41.24		9.36	50.60		74.00	54.00	-3.40	Peak
7305.00	39.67		13.33	53.00		74.00	54.00	-1.00	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11b TX / CH High	Temp. & Humidity	24 [°] C, 49%

	966 Chamber_B at 3Meter / Horizontal										
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark		
1600.00	52.41		-1.35	51.06		74.00	54.00	-2.94	Peak		
2382.00	52.80	43.40	3.55	56.35	46.95	74.00	54.00	-7.05	AVG		
2560.00	46.71		4.08	50.78		74.00	54.00	-3.22	Peak		
3180.00	42.29		5.37	47.66		74.00	54.00	-6.34	Peak		
4920.00	44.78	37.71	9.48	54.26	47.19	74.00	54.00	-6.81	AVG		
7380.00	44.83	39.16	13.38	58.21	52.54	74.00	54.00	-1.46	AVG		

Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	47.84		-1.35	46.49		74.00	54.00	-7.51	Peak
2384.00	52.57	42.50	3.56	56.13	46.06	74.00	54.00	-7.94	AVG
2556.00	52.73	42.08	4.07	56.80	46.15	74.00	54.00	-7.85	AVG
3915.00	41.01		6.98	48.00		74.00	54.00	-6.00	Peak
4920.00	42.28		9.48	51.76		74.00	54.00	-2.24	Peak
7380.00	45.10	37.74	13.38	58.48	51.12	74.00	54.00	-2.88	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11g TX / CH Low	Temp. & Humidity	24 [°] C, 49%

	966 Chamber_B at 3Meter / Horizontal										
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark		
1600.00	51.73		-1.35	50.38		74.00	54.00	-3.62	Peak		
2334.00	52.88	42.61	3.39	56.27	46.00	74.00	54.00	-8.00	AVG		
2500.00	48.10		3.95	52.05		74.00	54.00	-1.95	Peak		
4830.00	47.18	37.62	9.24	56.42	46.86	74.00	54.00	-7.14	AVG		
5040.00	40.63		9.74	50.37		74.00	54.00	-3.63	Peak		
7230.00	44.67	32.04	13.28	57.95	45.32	74.00	54.00	-8.68	AVG		

Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)		Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	48.18		-1.35	46.83		74.00	54.00	-7.17	Peak
2328.00	54.24	42.74	3.37	57.61	46.11	74.00	54.00	-7.89	AVG
2570.00	52.44	42.36	4.10	56.54	46.46	74.00	54.00	-7.54	AVG
4275.00	40.62		7.83	48.45		74.00	54.00	-5.55	Peak
4830.00	39.99		9.24	49.24		74.00	54.00	-4.76	Peak
7245.00	45.39	32.01	13.29	58.68	45.30	74.00	54.00	-8.70	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11g TX / CH Middle	Temp. & Humidity	24 [°] C, 49%

966 Chamber_B at 3Meter / Horizontal											
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark		
1600.00	51.58		-1.35	50.23		74.00	54.00	-3.77	Peak		
2284.00	47.46		3.22	50.67		74.00	54.00	-3.33	Peak		
2352.00	54.15	44.26	3.45	57.60	47.71	74.00	54.00	-6.29	AVG		
3180.00	42.66		5.37	48.03		74.00	54.00	-5.97	Peak		
4875.00	41.14		9.36	50.50		74.00	54.00	-3.50	Peak		
7305.00	46.65	33.18	13.33	59.98	46.51	74.00	54.00	-7.49	AVG		

Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)		Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	48.68		-1.35	47.33		74.00	54.00	-6.67	Peak
2362.00	52.77	42.37	3.48	56.25	45.85	74.00	54.00	-8.15	AVG
2520.00	52.20	40.31	3.99	56.19	44.30	74.00	54.00	-9.70	AVG
4290.00	40.36		7.87	48.23		74.00	54.00	-5.77	Peak
4875.00	39.92		9.36	49.28		74.00	54.00	-4.72	Peak
7305.00	45.33	33.62	13.33	58.66	46.95	74.00	54.00	-7.05	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11g TX / CH High	Temp. & Humidity	24 [°] C, 49%

966 Chamber_B at 3Meter / Horizontal												
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark			
1600.00	50.95		-1.35	49.60		74.00	54.00	-4.40	Peak			
2376.00	55.84	43.93	3.53	59.37	47.46	74.00	54.00	-6.54	AVG			
2546.00	47.20		4.05	51.25		74.00	54.00	-2.75	Peak			
3900.00	41.02		6.95	47.97		74.00	54.00	-6.03	Peak			
4920.00	41.81		9.48	51.29		74.00	54.00	-2.71	Peak			
7380.00	47.43	35.17	13.38	60.81	48.55	74.00	54.00	-5.45	AVG			

Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)		Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	47.75		-1.35	46.40		74.00	54.00	-7.60	Peak
2388.00	53.57	43.07	3.57	57.14	46.64	74.00	54.00	-7.36	AVG
2544.00	52.49	42.30	4.04	56.53	46.34	74.00	54.00	-7.66	AVG
4005.00	40.61		7.19	47.80		74.00	54.00	-6.20	Peak
5010.00	39.49		9.70	49.20		74.00	54.00	-4.80	Peak
7395.00	49.01	35.83	13.39	62.40	49.22	74.00	54.00	-4.78	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11n HT20 TX / CH Low	Temp. & Humidity	24 [°] C, 49%

966 Chamber_B at 3Meter / Horizontal											
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)			Limit-AV (dBuV/m)	Margin (dB)	Remark		
1600.00	52.47		-1.35	51.12		74.00	54.00	-2.88	Peak		
2328.00	53.70	41.81	3.37	57.07	45.18	74.00	54.00	-8.82	AVG		
2498.00	47.82		3.94	51.76		74.00	54.00	-2.24	Peak		
3225.00	42.73		5.46	48.19		74.00	54.00	-5.81	Peak		
4830.00	41.17		9.24	50.41		74.00	54.00	-3.59	Peak		
7230.00	45.47	31.17	13.28	58.75	44.45	74.00	54.00	-9.55	AVG		

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Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)		Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	49.50		-1.35	48.15		74.00	54.00	-5.85	Peak
2248.00	51.60	40.17	3.09	54.69	43.26	74.00	54.00	-10.74	AVG
2498.00	51.30	39.19	3.94	55.24	43.13	74.00	54.00	-10.87	AVG
3900.00	41.13		6.95	48.07		74.00	54.00	-5.93	Peak
4935.00	40.16		9.52	49.68		74.00	54.00	-4.32	Peak
7230.00	45.10	31.84	13.28	58.38	45.12	74.00	54.00	-8.88	AVG

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11n HT20 TX / CH Middle	Temp. & Humidity	24 [°] C, 49%

966 Chamber_B at 3Meter / Horizontal											
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)			Limit-AV (dBuV/m)	Margin (dB)	Remark		
1600.00	52.85		-1.35	51.50		74.00	54.00	-2.50	Peak		
2350.00	55.31	42.23	3.44	58.75	45.67	74.00	54.00	-8.33	AVG		
2524.00	48.04		4.00	52.04		74.00	54.00	-1.96	Peak		
3870.00	41.18		6.88	48.06		74.00	54.00	-5.94	Peak		
4875.00	40.81		9.36	50.17		74.00	54.00	-3.83	Peak		
7320.00	46.26	33.08	13.34	59.60	46.42	74.00	54.00	-7.58	AVG		

966 Cham	ber_B at 3	3Meter / V	ertical	

Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	48.62		-1.35	47.27		74.00	54.00	-6.73	Peak
2350.00	52.78	36.89	3.44	56.22	40.33	74.00	54.00	-13.67	AVG
2516.00	51.22	38.29	3.98	55.20	42.27	74.00	54.00	-11.73	AVG
3975.00	40.66		7.12	47.78		74.00	54.00	-6.22	Peak
4875.00	40.15		9.36	49.51		74.00	54.00	-4.49	Peak
7320.00	48.19	33.00	13.34	61.53	46.34	74.00	54.00	-7.66	AVG

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11 n HT20 TX / CH High	Temp. & Humidity	24 [°] C, 49%

	966 Chamber_B at 3Meter / Horizontal												
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)			Limit-AV (dBuV/m)	Margin (dB)	Remark				
1600.00	49.61		-1.35	48.26		74.00	54.00	-5.74	Peak				
2378.00	55.23	42.90	3.54	58.77	46.44	74.00	54.00	-7.56	AVG				
2540.00	47.91		4.03	51.95		74.00	54.00	-2.05	Peak				
4395.00	40.37		8.12	48.49		74.00	54.00	-5.51	Peak				
4920.00	41.01		9.48	50.49		74.00	54.00	-3.51	Peak				
7395.00	48.77	35.13	13.39	62.16	48.52	74.00	54.00	-5.48	AVG				

966 Chamber_B at 3Meter / Vertical	
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				—					
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)		Limit-PK (dBuV/m)		Margin (dB)	Remark
1600.00	48.70		-1.35	47.35		74.00	54.00	-6.65	Peak
2388.00	54.79	44.13	3.57	58.36	47.70	74.00	54.00	-6.30	AVG
2544.00	54.43	42.87	4.04	58.47	46.91	74.00	54.00	-7.09	AVG
4410.00	40.19		8.16	48.34		74.00	54.00	-5.66	Peak
4920.00	39.24		9.48	48.72		74.00	54.00	-5.28	Peak
7380.00	47.77	35.27	13.38	61.15	48.65	74.00	54.00	-5.35	AVG

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11n HT40 TX / CH Low	Temp. & Humidity	24 [°] C, 49%

	966 Chamber_B at 3Meter / Horizontal												
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)			Limit-AV (dBuV/m)	Margin (dB)	Remark				
1600.00	49.21		-1.35	47.86		74.00	54.00	-6.14	Peak				
2272.00	47.19		3.17	50.37		74.00	54.00	-3.63	Peak				
2594.00	46.54		4.15	50.69		74.00	54.00	-3.31	Peak				
4515.00	40.06		8.41	48.47		74.00	54.00	-5.53	Peak				
4845.00	40.61		9.28	49.89		74.00	54.00	-4.11	Peak				
7260.00	42.46	31.41	13.30	55.76	44.71	74.00	54.00	-9.29	AVG				

966 Chamber	_B at 3Meter / Vertical
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Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)		Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	48.54		-1.35	47.19		74.00	54.00	-6.81	Peak
2258.00	50.94	39.96	3.13	54.07	43.09	74.00	54.00	-10.91	AVG
2588.00	50.56	39.89	4.13	54.69	44.02	74.00	54.00	-9.98	AVG
3945.00	40.55		7.05	47.60		74.00	54.00	-6.40	Peak
4845.00	39.27		9.28	48.55		74.00	54.00	-5.45	Peak
7275.00	41.88	31.26	13.31	55.19	44.57	74.00	54.00	-9.43	AVG

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11n HT40 TX / CH Middle	Temp. & Humidity	24 [°] C, 49%

	966 Chamber_B at 3Meter / Horizontal												
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)			Limit-AV (dBuV/m)	Margin (dB)	Remark				
1600.00	51.67		-1.35	50.32		74.00	54.00	-3.68	Peak				
2294.00	47.54		3.25	50.79		74.00	54.00	-3.21	Peak				
2592.00	45.36		4.14	49.50		74.00	54.00	-4.50	Peak				
3945.00	40.83		7.05	47.88		74.00	54.00	-6.12	Peak				
4875.00	40.03		9.36	49.39		74.00	54.00	-4.61	Peak				
7320.00	41.49	31.16	13.34	54.83	44.50	74.00	54.00	-9.50	AVG				

Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	48.63		-1.35	47.28		74.00	54.00	-6.72	Peak
2272.00	49.33		3.17	52.50		74.00	54.00	-1.50	Peak
2588.00	50.35	39.34	4.13	54.48	43.47	74.00	54.00	-10.53	AVG
4080.00	40.28		7.37	47.65		74.00	54.00	-6.35	Peak
4785.00	39.77		9.12	48.89		74.00	54.00	-5.11	Peak
7320.00	39.03		13.34	52.36		74.00	54.00	-1.64	Peak

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Average test would be performed if the peak result were greater than the average limit.

3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/11/01
Test Mode	IEEE 802.11 n HT40 TX / CH High	Temp. & Humidity	24 [°] C, 49%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)			Limit-AV (dBuV/m)	Margin (dB)	Remark
1600.00	51.52		-1.35	50.17		74.00	54.00	-3.83	Peak
2298.00	47.69		3.26	50.95		74.00	54.00	-3.05	Peak
2612.00	45.57		4.19	49.76		74.00	54.00	-4.24	Peak
4905.00	40.12		9.44	49.56		74.00	54.00	-4.44	Peak
5745.00	39.89		10.96	50.86		74.00	54.00	-3.14	Peak
7365.00	41.26	30.63	13.37	54.63	44.00	74.00	54.00	-10.00	AVG

966 Chamber_B at 3Meter / Vertical	
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—									
Frequency (MHz)	Reading- PK (dBuV)	Reading- AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)		Margin (dB)	Remark
1600.00	48.55		-1.35	47.20		74.00	54.00	-6.80	Peak
2294.00	48.66		3.25	51.91		74.00	54.00	-2.09	Peak
2616.00	50.25	39.44	4.19	54.44	43.63	74.00	54.00	-10.37	AVG
4290.00	40.23		7.87	48.10		74.00	54.00	-5.90	Peak
4935.00	40.06		9.52	49.58		74.00	54.00	-4.42	Peak
7365.00	41.88	30.02	13.37	55.25	43.39	74.00	54.00	-10.61	AVG

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

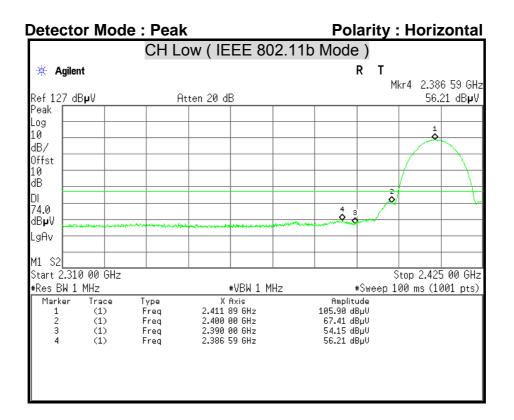
2. Average test would be performed if the peak result were greater than the average limit.

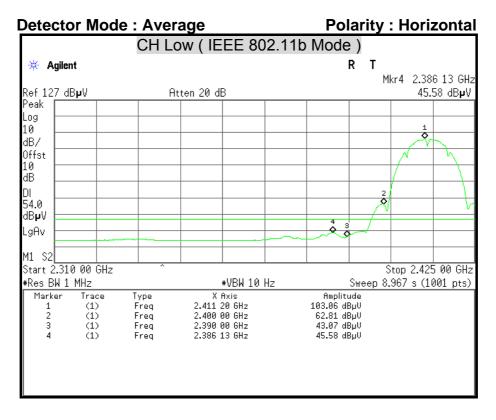
3. Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

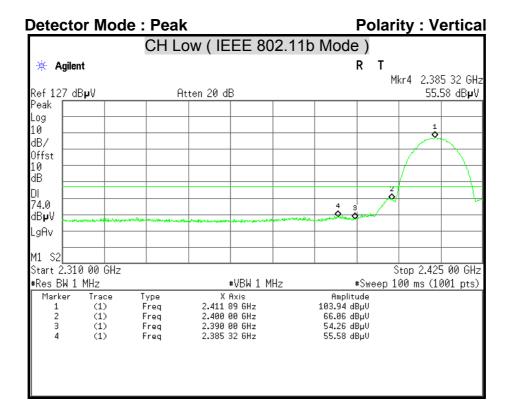


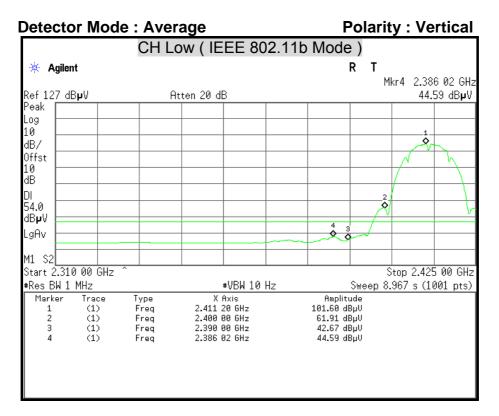
Restricted Band Edges



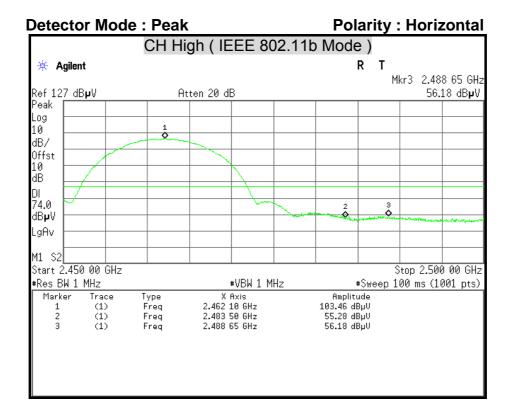


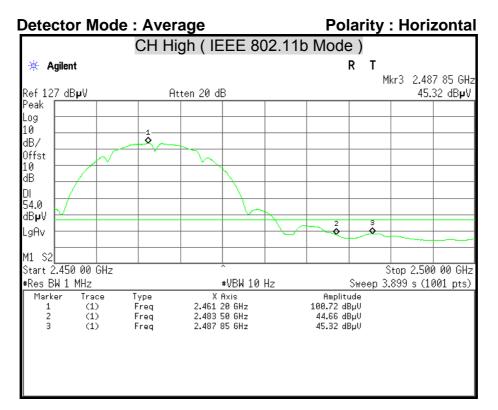




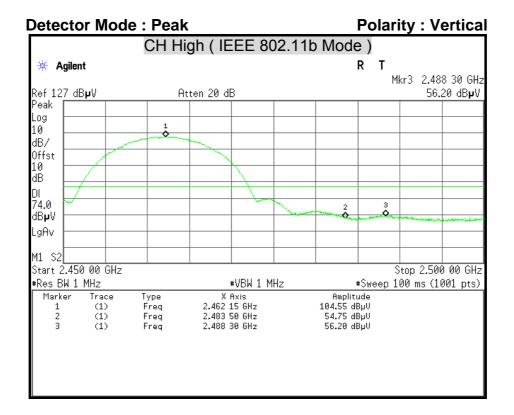


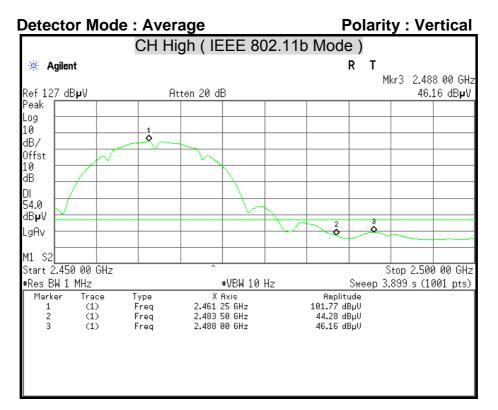




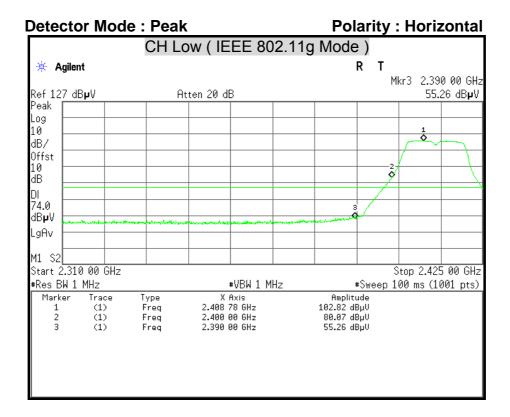


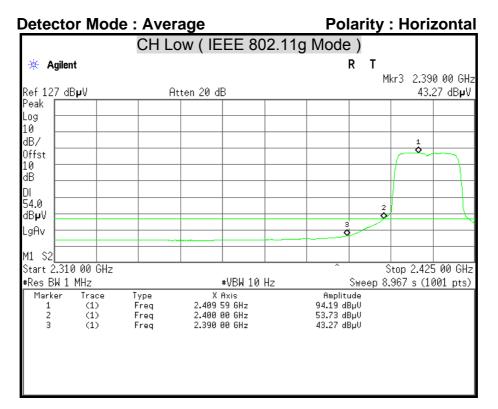




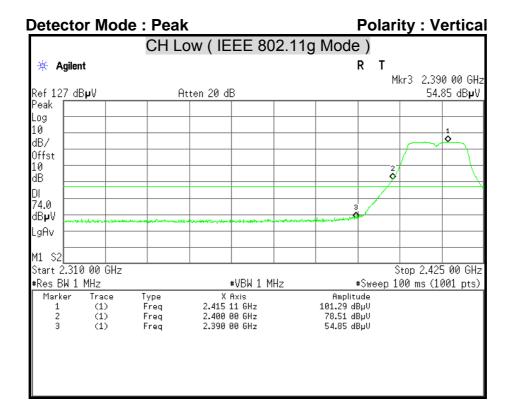


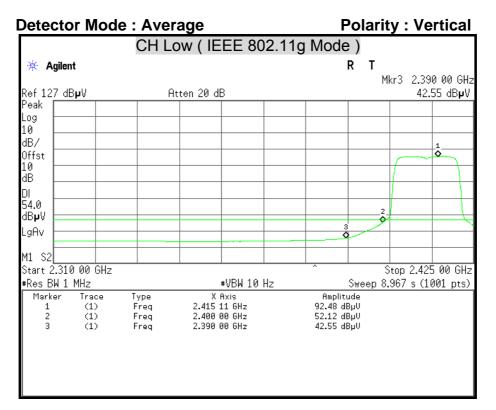




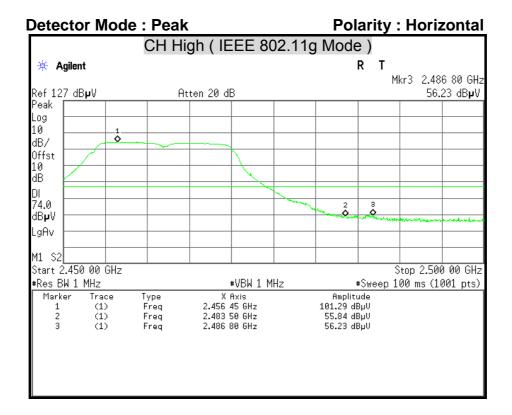


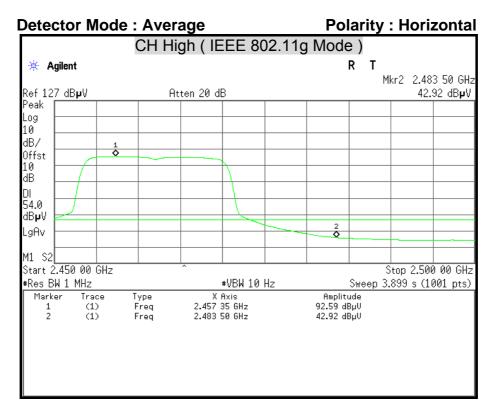




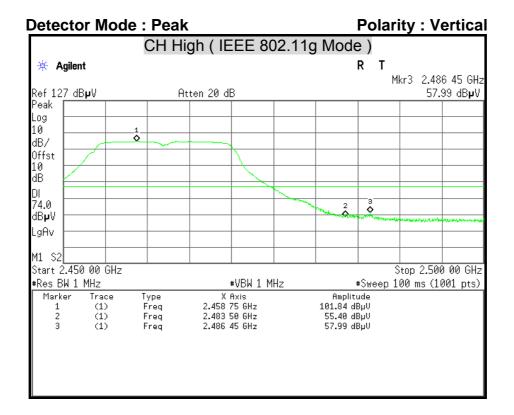


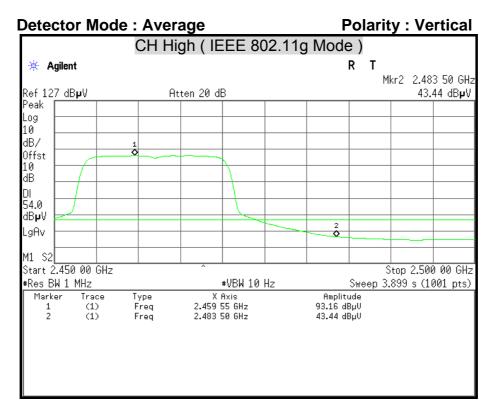




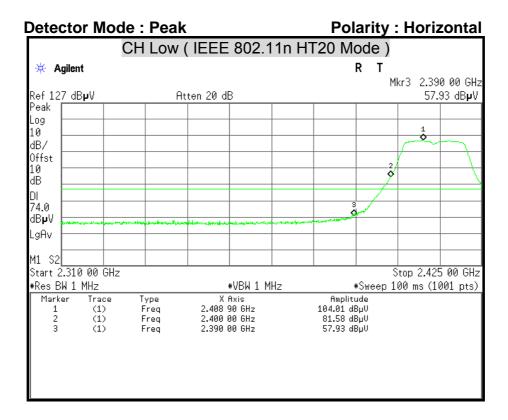


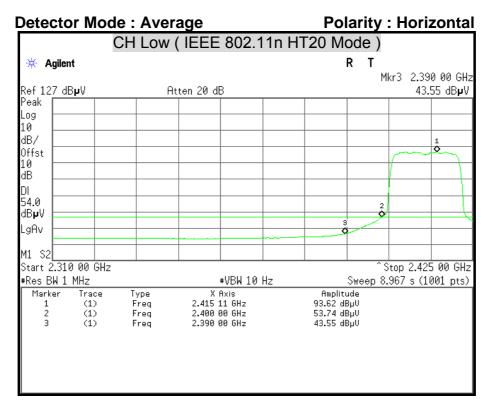




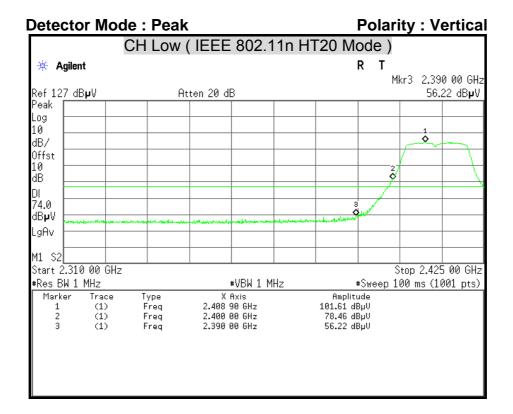


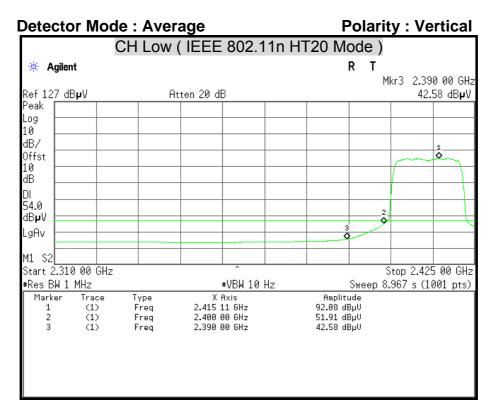




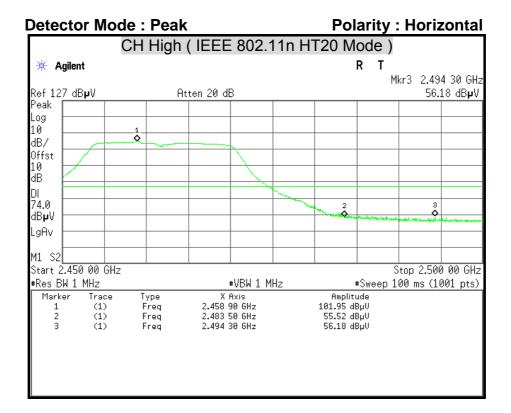


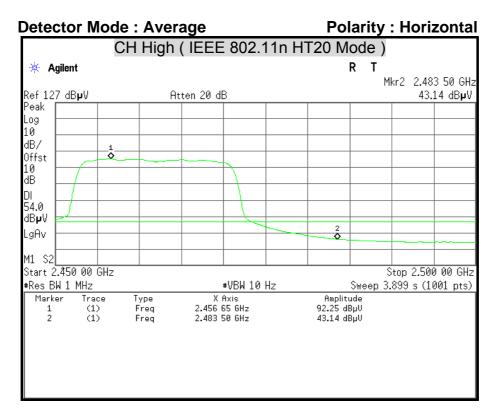




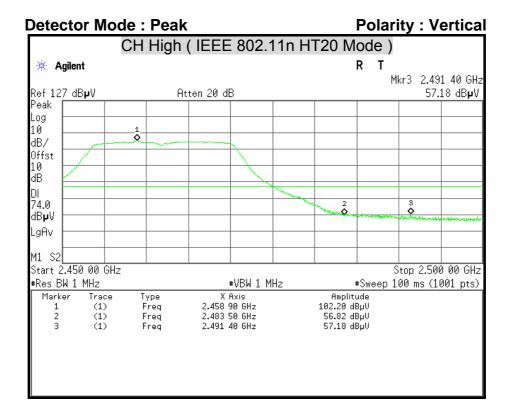


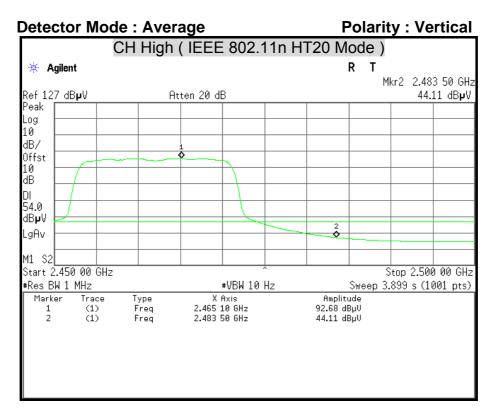




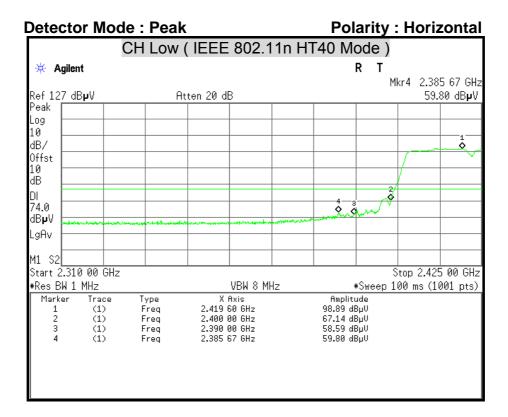


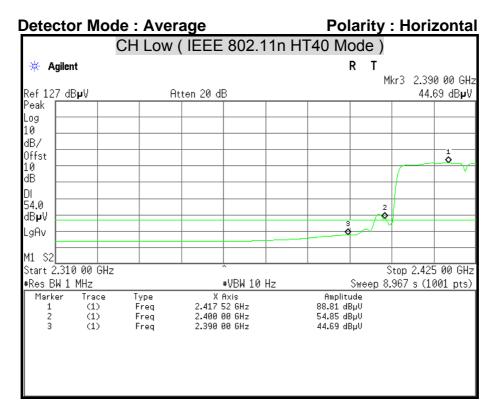




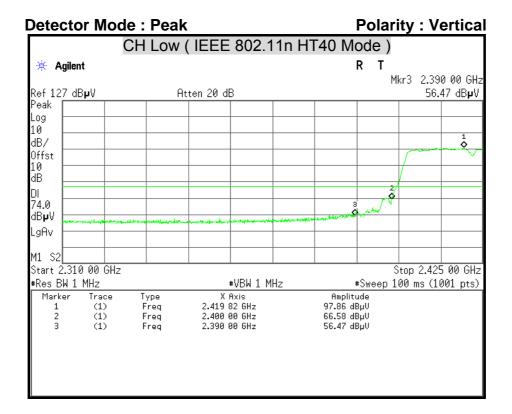


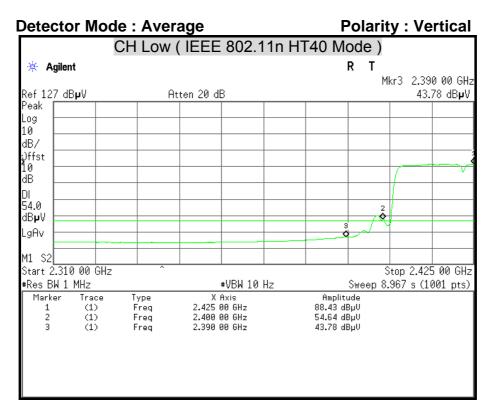




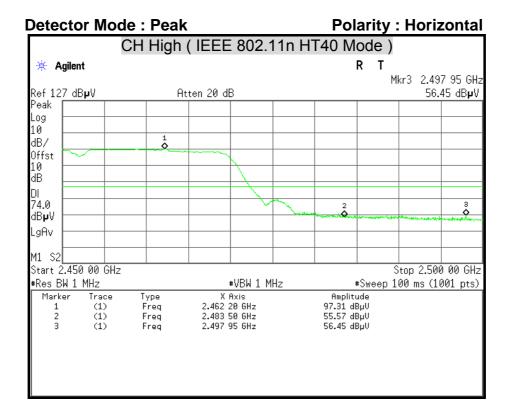


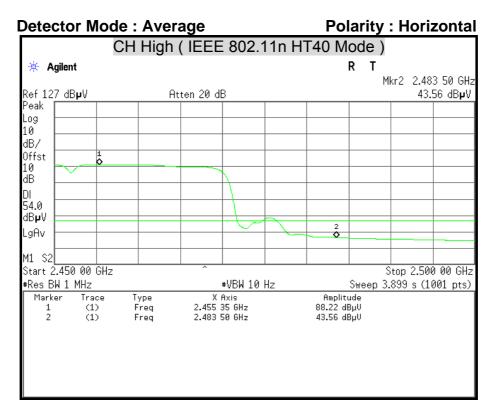




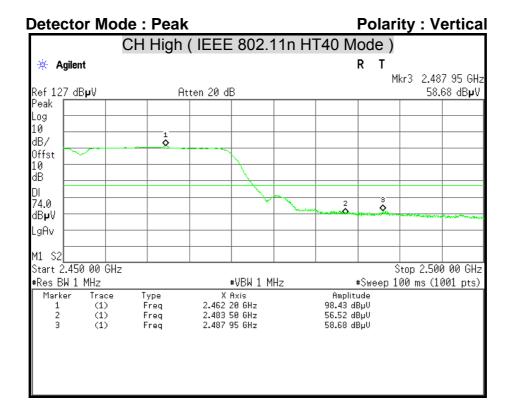


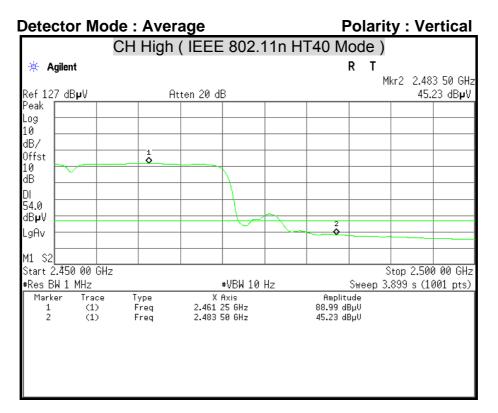














7.6 CONDUCTED EMISSION

<u>LIMITS</u>

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range	Conducted Limit (dBµv)		
(MHz)	Quasi-peak	Average	
0.15 - 0.50	66 to 56	56 to 46	
0.50 - 5.00	56	46	
5.00 - 30.0	60	50	

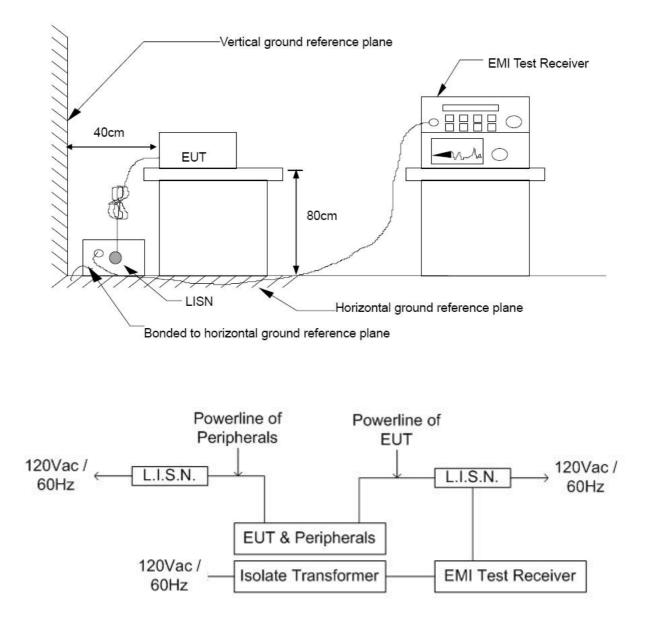
TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-465	08/07/2013
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-473	03/12/2013
EMI Receiver	ROHDE & SCHWARZ	ESCS 30	835418/008	10/16/2013
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	100117	07/03/2013

Remark: Each piece of equipment is scheduled for calibration once a year.



TEST SETUP



TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2003.

The test procedure is performed in a 4m × 3m × 2.4m (L×W×H) shielded room.

The EUT along with its peripherals were placed on a 1.0m (W) × 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.

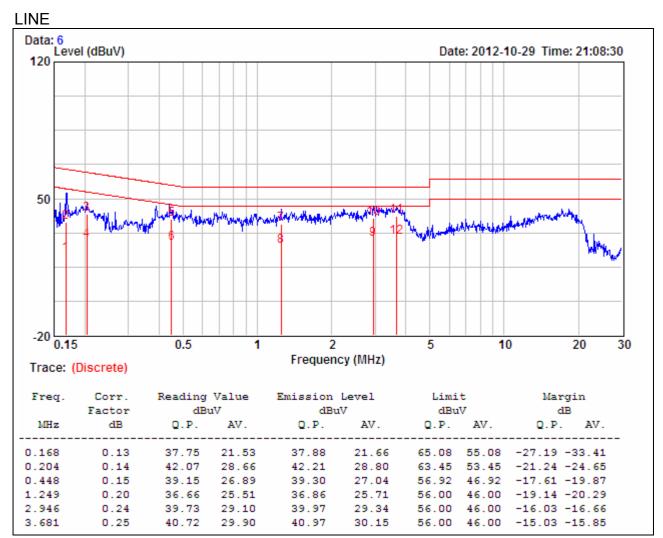
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.

The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.



TEST RESULTS

Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/10/29
Test Mode	Normal Operating / Power Adapter AMIGO	Temp. & Humidity	25°C, 51%



Remark:

1. Correction Factor = Insertion loss + Cable loss

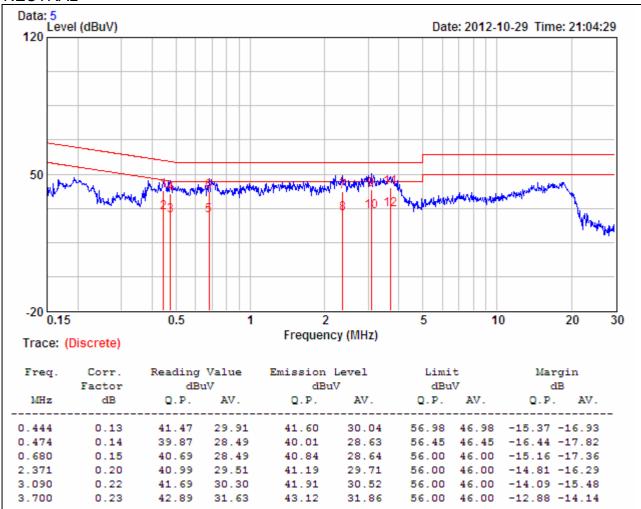
2. Emission level = Reading Value + Correction factor

3. Margin value = Emission level - Limit value



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/10/29
Test Mode	Normal Operating / Power Adapter AMIGO	Temp. & Humidity	25°C, 51%





Remark:

1. Correction Factor = Insertion loss + Cable loss

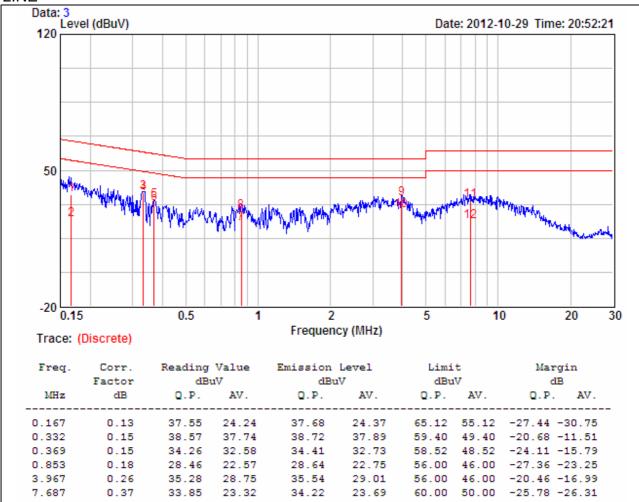
2. Emission level = Reading Value + Correction factor

3. Margin value = Emission level – Limit value



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/10/29
Test Mode	Normal Operating / Power Adapter DVE	Temp. & Humidity	25°C, 51%





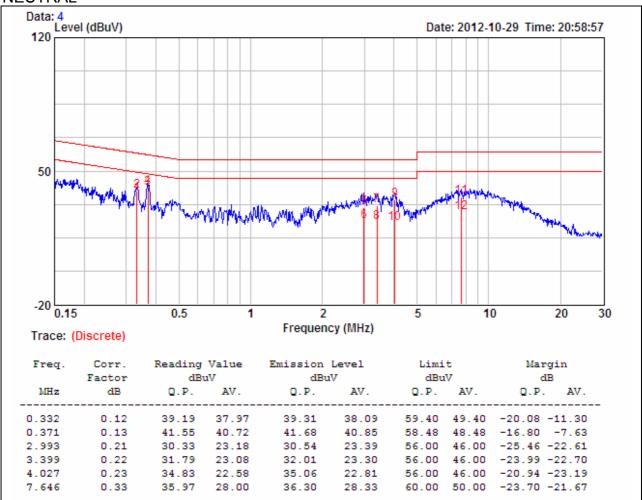
Remark:

- 1. Correction Factor = Insertion loss + Cable loss
- 2. Emission level = Reading Value + Correction factor
- 3. Margin value = Emission level Limit value



Product Name	IP CAM	Test By	Waternil Guan
Test Model	F3005	Test Date	2012/10/29
Test Mode	Normal Operating / Power Adapter DVE	Temp. & Humidity	25°C, 51%





Remark:

1. Correction Factor = Insertion loss + Cable loss

2. Emission level = Reading Value + Correction factor

3. Margin value = Emission level - Limit value