

FCC 47 CFR PART 15 SUBPART C

Product Type : Thin Client Terminal
Applicant : Dell Inc.
Address : One Dell Way, Round Rock, Texas USA 78682
Trade Name : Dell
Model Numbers : CSxyyyy(x and y= 0-9, A-Z, a-z or blank), CSx
Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2012
ANSI C63.4-2009
Receive Date : Jul. 09, 2013
Test Period : Jul. 17 ~ Jul. 24, 2013; Sep. 10, 2013
Issue Date : Oct. 01, 2013

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Aug. 02, 2013	Initial Issue	
01	Aug. 12, 2013	Change Antenna type	Gili Huang
02	Oct. 01, 2013	Re-test middle and high channel.	Joyce Liao

Verification of Compliance

Issued Date: 10/01/2013

Product Type : Thin Client Terminal
Applicant : Dell Inc.
Address : One Dell Way, Round Rock, Texas USA 78682
Trade Name : Dell
Model Number : CSxyyyy(x and y= 0-9, A-Z, a-z or blank), CSx
FCC ID : E2KCS1A13
EUT Rated Voltage : DC 5.0V, 0.5A
Test Voltage : 120 Vac / 60 Hz
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2012
ANSI C63.4-2009

Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.
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<http://www.atl-lab.com.tw/e-index.htm>



The above equipment was tested by A Test Lab Techno Corp. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 .

The test results of this report relate only to the tested sample identified in this report.

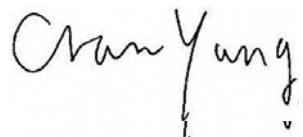

Approved By :  Reviewed By : 
(Manager) (Cran Yang) (Testing Engineer) (Fly Lu)

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1 General Information

1.1 Summary of Test Result

Standard		Item	Result	Remark
15.247	RSS-GEN			
15.207	7.2.2	AC Power Conducted Emission	N/A	This device's power is supplied by DC source.
Standard		Item	Result	Remark
15.247	RSS-210			
15.247(d)	A8.5	Transmitter Radiated Emissions	PASS	-----
15.247(b)(3)	A8.4	Max. Output Power	PASS	-----
15.247(a)(2)	A8.2 (a)	6dB RF Bandwidth	PASS	-----
15.247(e)	A8.2 (b)	Power Spectral Density	PASS	-----
15.247(c)	A8.5	Out of Band Conducted Spurious Emission	PASS	-----
15.247(d)	A8.5	Band Edge Measurement	PASS	-----
15.247(c)	A8.5	Occupied Bandwidth Measurement	PASS	-----
15.203	-	Antenna Requirement	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.24 dB.

Radiated Emission

The measurement uncertainty is evaluated as ± 3.072 dB.

2 EUT Description

Product	Thin Client Terminal
Trade Name	Dell
Model No.	CSxyyyy(x and y= 0-9, A-Z, a-z or blank), CSx (Those model numbers differ from each other in selling regions.)
Applicant	Dell Inc. One Dell Way, Round Rock, Texas USA 78682
Manufacturer	Wyse Technology LLC 5455 Great America Parkway, Santa Clara, CA 95054
FCC ID	E2KCS1A13
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz: 2412 ~ 2472 MHz IEEE 802.11a / IEEE 802.11n 5 GHz U-NII Band IV: 5745 ~ 5825 MHz Bluetooth v4.0 LE: 2402 ~ 2480 MHz
Modulation Type	IEEE 802.11b:DSSS IEEE 802.11g:DSSS + OFDM IEEE 802.11n 2.4GHz / IEEE 802.11a / IEEE 802.11n 5 GHz U-NII Band IV: OFDM Bluetooth v4.0 LE: GFSK
Antenna Type	Chip Antenna
Antenna Gain	2.4GHz: 3.3 dBi, 5 GHz: -1.1 dBi
RF Output Power	IEEE 802.11b: 0.066 W / 18.20 dBm IEEE 802.11g: 0.238 W / 23.76 dBm IEEE 802.11n 2.4GHz 20MHz: 0.238 W / 23.76 dBm IEEE 802.11a U-NII Band IV: 0.292 W / 24.65 dBm IEEE 802.11n U-NII Band IV 20MHz: 0.271 W / 24.33 dBm IEEE 802.11n U-NII Band IV 40MHz: 0.249 W / 23.96 dBm Bluetooth v4.0 LE: 0.006 W / 7.95 dBm

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Normal Operation Mode
Mode 2: IEEE 802.11b Link Mode
Mode 3: IEEE 802.11g Link Mode
Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode
Mode 5: IEEE 802.11a U-NII Band IV Link Mode
Mode 6: IEEE 802.11n U-NII Band IV 20MHz Link Mode
Mode 7: IEEE 802.11n U-NII Band IV 40MHz Link Mode
Mode 8: Bluetooth v4.0 LE Link Mode

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

IEEE 802.11b mode:

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2472MHz) with 1Mbps data rate were chosen for full testing.

IEEE 802.11g mode:

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2472MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n 2.4GHz 20MHz mode:

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2472MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11a mode / 5745 ~ 5825MHz:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n U-NII Band IV 20MHz mode / 5745 ~ 5825MHz:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n U-NII Band IV 40MHz mode / 5755 ~ 5795MHz:

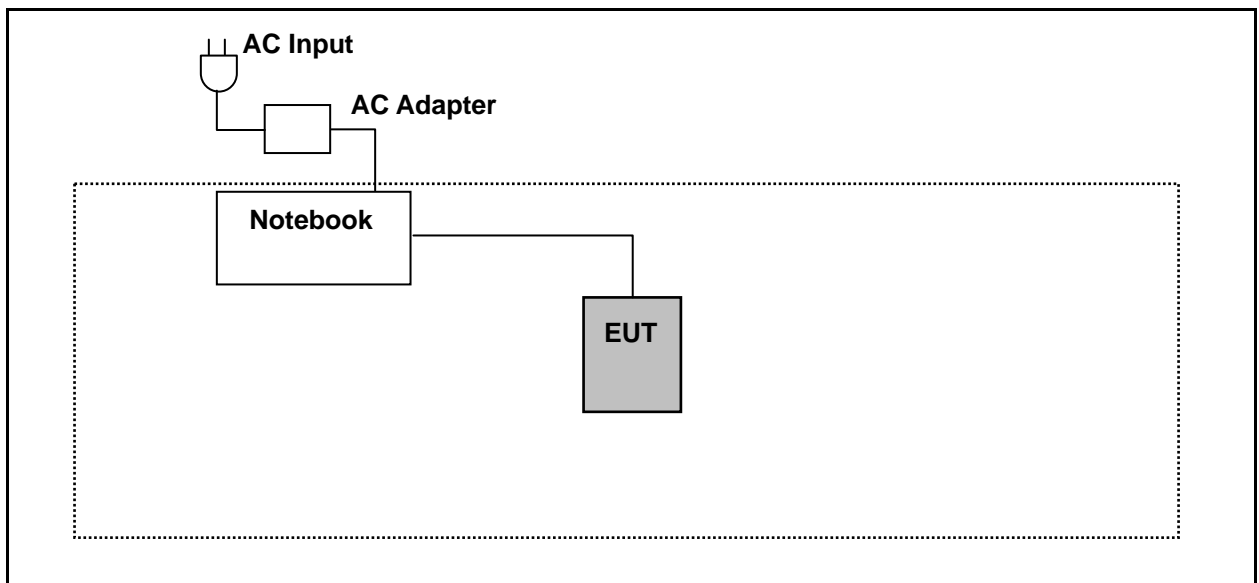
Channel Low (5755MHz) and Channel High (5795MHz) with 6.5Mbps data rate were chosen for full testing.

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

3.2. EUT Exercise Software

1.	Setup the EUT shown on 3.3.
2.	Turn on the power of all equipment.
3.	EUT run test program.
4.	The EUT will start to operate function.

3.3. Configuration of Test System Details



3.4. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

4 Conducted Emission Measurement

4.1. Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

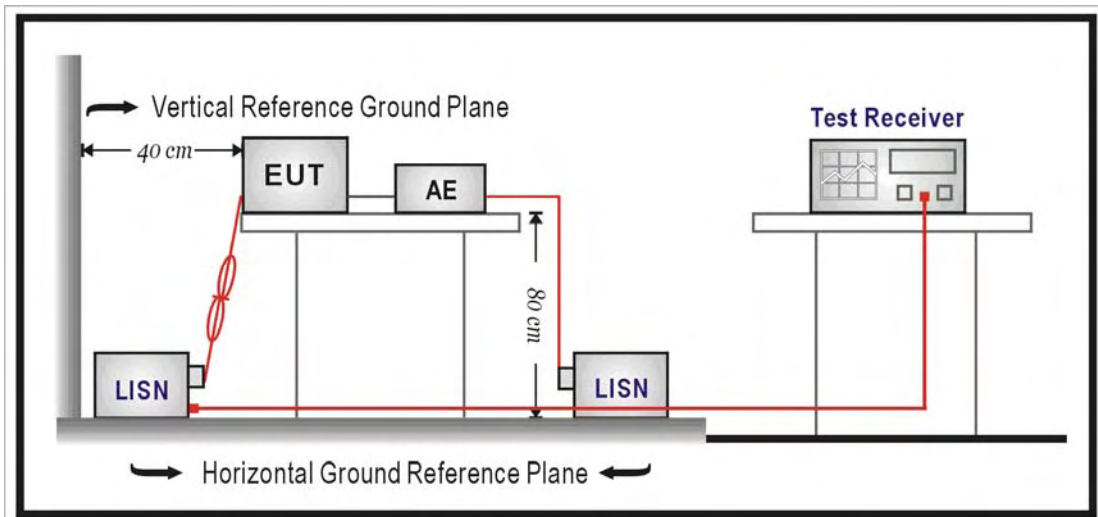
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/06/2013	(1)
LISN	R&S	ENV216	101040	03/04/2013	(1)
LISN	R&S	ENV216	101041	03/04/2013	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

4.3. Test Setup



4.4. Test Procedure

The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

4.5. Test Result

Not applicable, this device's power is supplied by DC source.

5 Radiated Emission Measurement

5.1. Limit

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 ($\mu\text{V}/\text{m}$ at 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

** 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.

5.2. Test Instruments

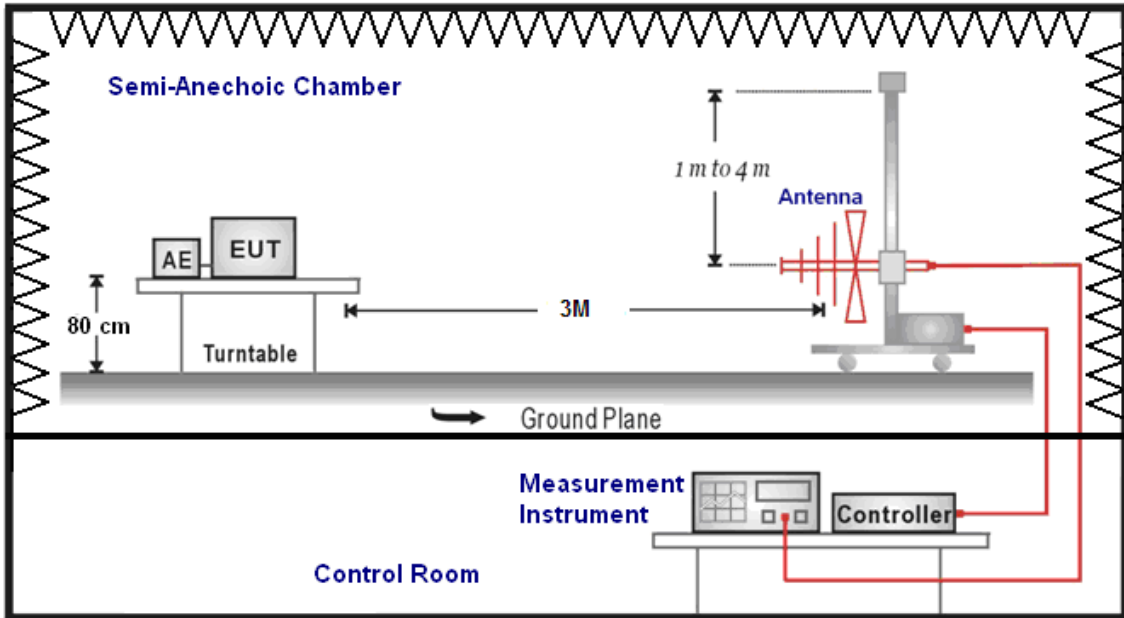
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/16/2012	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/21/2013	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2013	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2013	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/16/2013	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/10/2013	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/13/2013	(1)
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	08/14/2012	(3)
Test Site	ATL	TE01	888001	08/28/2012	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

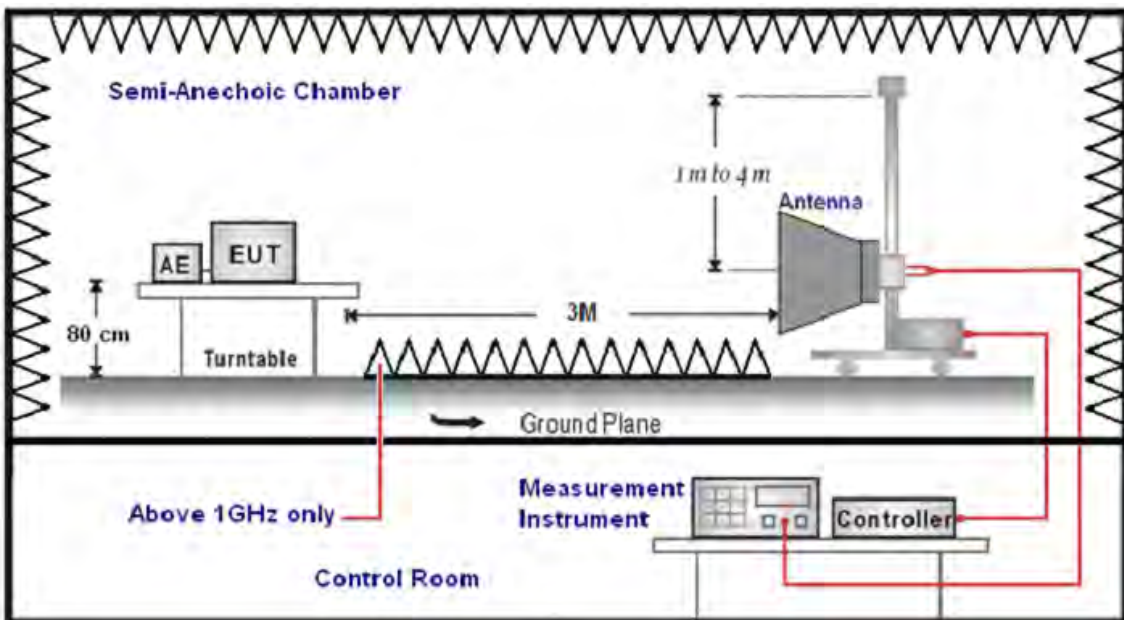
Note: N.C.R. = No Calibration Request.

5.3. Setup

Below 1GHz



Above 1GHz



5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) $\text{Amplitude (dBuV/m)} = \text{FI (dBuV)} + \text{AF (dBuV)} + \text{CL (dBuV)} - \text{Gain (dB)}$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) $\text{Actual Amplitude (dBuV/m)} = \text{Amplitude (dBuV)} - \text{Dis(dB)}$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark 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.

5.5. Test Result

Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	07/18/2013
		Test By:	Fly Lu

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
199.0000	46.81	-14.39	32.42	43.50	-11.08	QP	H
272.0000	45.55	-11.02	34.53	46.00	-11.47	QP	H
398.5000	38.45	-8.23	30.22	46.00	-15.78	QP	H
587.0000	34.43	-4.28	30.15	46.00	-15.85	QP	H
742.5000	41.14	-1.34	39.80	46.00	-6.20	QP	H
799.5000	35.30	-0.15	35.15	46.00	-10.85	QP	H
200.0000	44.58	-14.39	30.19	43.50	-13.31	QP	V
400.0000	47.39	-8.20	39.19	46.00	-6.81	QP	V
529.5000	42.82	-5.67	37.15	46.00	-8.85	QP	V
742.5000	36.25	-1.34	34.91	46.00	-11.09	QP	V
796.5000	32.59	-0.22	32.37	46.00	-13.63	QP	V
979.5000	31.98	3.32	35.30	54.00	-18.70	QP	V

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Above 1GHz

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	07/18/2013		
Frequency:	2412MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2890.000	36.92	5.63	42.55	74.00	-31.45	peak	H
4549.000	34.69	11.01	45.70	74.00	-28.30	peak	H
6418.000	33.22	17.16	50.38	74.00	-23.62	peak	H
2911.000	36.15	5.68	41.83	74.00	-32.17	peak	V
4549.000	35.15	11.01	46.16	74.00	-27.84	peak	V
6390.000	31.92	17.08	49.00	74.00	-25.00	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	09/10/2013		
Frequency:	2442MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3198.000	37.54	6.34	43.88	74.00	-30.12	peak	H
4549.000	34.04	11.01	45.05	74.00	-28.95	peak	H
6467.000	33.32	17.31	50.63	74.00	-23.37	peak	H
3023.000	36.58	5.96	42.54	74.00	-31.46	peak	V
4570.000	34.82	11.06	45.88	74.00	-28.12	peak	V
6222.000	32.43	16.56	48.99	74.00	-25.01	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	09/10/2013		
Frequency:	2472MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3002.000	36.03	5.91	41.94	74.00	-32.06	peak	H
4591.000	34.52	11.11	45.63	74.00	-28.37	peak	H
6362.000	32.96	16.99	49.95	74.00	-24.05	peak	H
3261.000	35.89	6.47	42.36	74.00	-31.64	peak	V
4591.000	36.07	11.11	47.18	74.00	-26.82	peak	V
6362.000	33.69	16.99	50.68	74.00	-23.32	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	07/18/2013		
Frequency:	2412MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2918.000	35.94	5.70	41.64	74.00	-32.36	peak	H
4549.000	35.01	11.01	46.02	74.00	-27.98	peak	H
6418.000	33.09	17.16	50.25	74.00	-23.75	peak	H
2939.000	37.35	5.75	43.10	74.00	-30.90	peak	V
4542.000	34.41	10.99	45.40	74.00	-28.60	peak	V
6502.000	33.31	17.42	50.73	74.00	-23.27	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	09/10/2013		
Frequency:	2442MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	36.93	6.02	42.95	74.00	-31.05	peak	H
4577.000	34.98	11.07	46.05	74.00	-27.95	peak	H
6334.000	32.85	16.90	49.75	74.00	-24.25	peak	H
2974.000	36.41	5.84	42.25	74.00	-31.75	peak	V
4570.000	35.54	11.06	46.60	74.00	-27.40	peak	V
6306.000	33.90	16.82	50.72	74.00	-23.28	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	09/10/2013		
Frequency:	2472MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	36.36	5.97	42.33	74.00	-31.67	peak	H
4549.000	34.40	11.01	45.41	74.00	-28.59	peak	H
6397.000	32.40	17.10	49.50	74.00	-24.50	peak	H
3002.000	37.60	5.91	43.51	74.00	-30.49	peak	V
4570.000	34.19	11.06	45.25	74.00	-28.75	peak	V
6383.000	32.70	17.06	49.76	74.00	-24.24	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	07/18/2013		
Frequency:	2412MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2939.000	36.17	5.75	41.92	74.00	-32.08	peak	H
4535.000	34.13	10.97	45.10	74.00	-28.90	peak	H
6425.000	32.83	17.18	50.01	74.00	-23.99	peak	H
2946.000	37.06	5.76	42.82	74.00	-31.18	peak	V
4549.000	35.19	11.01	46.20	74.00	-27.80	peak	V
6397.000	32.94	17.10	50.04	74.00	-23.96	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	09/10/2013		
Frequency:	2442MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3226.000	36.26	6.41	42.67	74.00	-31.33	peak	H
4591.000	35.26	11.11	46.37	74.00	-27.63	peak	H
6362.000	33.15	16.99	50.14	74.00	-23.86	peak	H
3226.000	36.26	6.41	42.67	74.00	-31.33	peak	V
4591.000	35.26	11.11	46.37	74.00	-27.63	peak	V
6362.000	33.15	16.99	50.14	74.00	-23.86	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	09/10/2013		
Frequency:	2472MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2974.000	37.45	5.84	43.29	74.00	-30.71	peak	H
4598.000	36.09	11.14	47.23	74.00	-26.77	peak	H
6341.000	31.93	16.92	48.85	74.00	-25.15	peak	H
2939.000	37.45	5.75	43.20	74.00	-30.80	peak	V
4577.000	35.03	11.07	46.10	74.00	-27.90	peak	V
6411.000	33.74	17.14	50.88	74.00	-23.12	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	07/24/2013		
Frequency:	5745MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2715.000	36.79	5.17	41.96	74.00	-32.04	peak	H
4577.000	34.55	11.07	45.62	74.00	-28.38	peak	H
6362.000	32.43	16.99	49.42	74.00	-24.58	peak	H
2897.000	36.43	5.64	42.07	74.00	-31.93	peak	V
4549.000	34.99	11.01	46.00	74.00	-28.00	peak	V
6397.000	32.74	17.10	49.84	74.00	-24.16	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	07/24/2013		
Frequency:	5785MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2687.000	39.35	5.11	44.46	74.00	-29.54	peak	H
4563.000	35.93	11.05	46.98	74.00	-27.02	peak	H
6369.000	33.13	17.00	50.13	74.00	-23.87	peak	H
2694.000	36.71	5.12	41.83	74.00	-32.17	peak	V
4570.000	35.24	11.06	46.30	74.00	-27.70	peak	V
6390.000	33.57	17.08	50.65	74.00	-23.35	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	07/24/2013		
Frequency:	5825MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2722.000	37.20	5.19	42.39	74.00	-31.61	peak	H
4570.000	34.62	11.06	45.68	74.00	-28.32	peak	H
6327.000	33.45	16.88	50.33	74.00	-23.67	peak	H
2701.000	37.35	5.13	42.48	74.00	-31.52	peak	V
4563.000	34.43	11.05	45.48	74.00	-28.52	peak	V
6397.000	32.74	17.10	49.84	74.00	-24.16	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	6			Date:	07/24/2013		
Frequency:	5745MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2883.000	36.40	5.61	42.01	74.00	-31.99	peak	H
4549.000	34.34	11.01	45.35	74.00	-28.65	peak	H
6383.000	33.41	17.06	50.47	74.00	-23.53	peak	H
2673.000	36.97	5.07	42.04	74.00	-31.96	peak	V
4542.000	34.13	10.99	45.12	74.00	-28.88	peak	V
6453.000	32.89	17.26	50.15	74.00	-23.85	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	6			Date:	07/24/2013		
Frequency:	5785MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2897.000	36.96	5.64	42.60	74.00	-31.40	peak	H
4570.000	34.53	11.06	45.59	74.00	-28.41	peak	H
6411.000	32.60	17.14	49.74	74.00	-24.26	peak	H
2582.000	36.57	4.83	41.40	74.00	-32.60	peak	V
4549.000	36.39	11.01	47.40	74.00	-26.60	peak	V
6369.000	33.48	17.00	50.48	74.00	-23.52	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	6			Date:	07/24/2013		
Frequency:	5825MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2890.000	36.92	5.63	42.55	74.00	-31.45	peak	H
4591.000	34.77	11.11	45.88	74.00	-28.12	peak	H
6397.000	32.58	17.10	49.68	74.00	-24.32	peak	H
2561.000	37.58	4.78	42.36	74.00	-31.64	peak	V
4549.000	34.77	11.01	45.78	74.00	-28.22	peak	V
6439.000	32.99	17.22	50.21	74.00	-23.79	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	7			Date:	07/24/2013		
Frequency:	5755MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2897.000	36.35	5.64	41.99	74.00	-32.01	peak	H
4563.000	35.86	11.05	46.91	74.00	-27.09	peak	H
6467.000	33.59	17.31	50.90	74.00	-23.10	peak	H
2855.000	37.47	5.54	43.01	74.00	-30.99	peak	V
4549.000	33.76	11.01	44.77	74.00	-29.23	peak	V
6411.000	33.50	17.14	50.64	74.00	-23.36	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	7			Date:	07/24/2013		
Frequency:	5795MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2603.000	37.49	4.89	42.38	74.00	-31.62	peak	H
4570.000	35.35	11.06	46.41	74.00	-27.59	peak	H
6383.000	33.05	17.06	50.11	74.00	-23.89	peak	H
2939.000	37.74	5.75	43.49	74.00	-30.51	peak	V
4570.000	35.01	11.06	46.07	74.00	-27.93	peak	V
6369.000	31.64	17.00	48.64	74.00	-25.36	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	8			Date:	07/18/2013		
Frequency:	2402MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2946.000	36.90	5.76	42.66	74.00	-31.34	peak	H
4549.000	34.80	11.01	45.81	74.00	-28.19	peak	H
6362.000	32.94	16.99	49.93	74.00	-24.07	peak	H
2939.000	36.07	5.75	41.82	74.00	-32.18	peak	V
4563.000	34.46	11.05	45.51	74.00	-28.49	peak	V
6362.000	32.45	16.99	49.44	74.00	-24.56	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	8			Date:	07/18/2013		
Frequency:	2440MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2939.000	35.56	5.75	41.31	74.00	-32.69	peak	H
4563.000	34.28	11.05	45.33	74.00	-28.67	peak	H
6369.000	32.91	17.00	49.91	74.00	-24.09	peak	H
2897.000	37.02	5.64	42.66	74.00	-31.34	peak	V
4549.000	34.52	11.01	45.53	74.00	-28.47	peak	V
6362.000	32.68	16.99	49.67	74.00	-24.33	peak	V

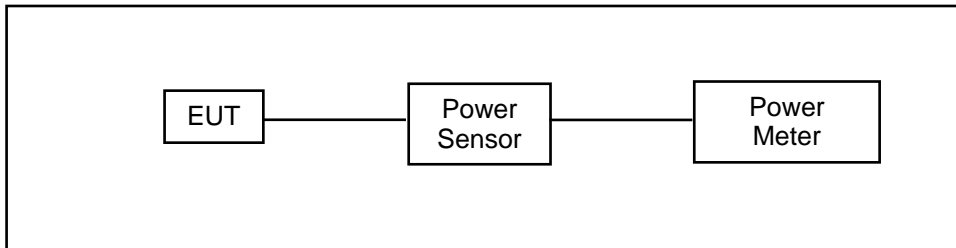
Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	CS1A13			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	8			Date:	07/18/2013		
Frequency:	2480MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2925.000	36.09	5.72	41.81	74.00	-32.19	peak	H
4535.000	35.77	10.97	46.74	74.00	-27.26	peak	H
6439.000	33.17	17.22	50.39	74.00	-23.61	peak	H
2925.000	35.64	5.72	41.36	74.00	-32.64	peak	V
4563.000	35.70	11.05	46.75	74.00	-27.25	peak	V
6355.000	32.77	16.97	49.74	74.00	-24.26	peak	V

6 Maximum Conducted Output Power Measurement

6.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm.

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Single Channel PK Power Sensor	Agilent	N1911A	MY45101619	12/19/2012	(1)
Wideband Power Meter	Agilent	N1921A	MY45241957	12/19/2012	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

6.4. Test Procedure

The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

6.5. Test Result

Model Number	CS1A13					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 2: IEEE 802.11b Link Mode					
Date of Test	07/17/2013, 09/10/2013			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412.0	1M	14.95	0.031	18.12	0.065	< 30
2442.0		14.82	0.030	18.15	0.065	< 30
2467.0		14.90	0.031	18.10	0.065	< 30
2472.0		14.97	0.031	18.20	0.066	< 30
2442.0	2M	14.80	0.030	18.10	0.065	< 30
2442.0	5.5M	14.75	0.030	18.06	0.064	< 30
2442.0	11M	14.73	0.030	18.11	0.065	< 30

Model Number	CS1A13					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: IEEE 802.11g Link Mode					
Date of Test	07/17/2013, 09/10/2013			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412.0	6M	15.66	0.037	23.76	0.238	< 30
2442.0		15.63	0.037	23.72	0.236	< 30
2467.0		13.05	0.020	13.87	0.024	< 30
2472.0		10.66	0.012	18.62	0.073	< 30
2442.0	9M	15.60	0.036	23.68	0.233	< 30
2442.0	12M	15.58	0.036	23.64	0.231	< 30
2442.0	18M	15.60	0.036	23.65	0.232	< 30
2442.0	24M	15.55	0.036	23.68	0.233	< 30
2442.0	36M	15.57	0.036	23.62	0.230	< 30
2442.0	48M	15.54	0.036	23.66	0.232	< 30
2442.0	54M	15.56	0.036	23.64	0.231	< 30

Model Number	CS1A13					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode					
Date of Test	07/17/2013, 09/10/2013			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412.0	6.5M	15.08	0.032	23.72	0.236	< 30
2442.0		15.10	0.032	23.76	0.238	< 30
2467.0		13.04	0.020	13.89	0.024	< 30
2472.0		10.61	0.012	18.75	0.075	< 30
2442.0	13M	15.03	0.032	23.64	0.231	< 30
2442.0	19.5M	15.02	0.032	23.65	0.232	< 30
2442.0	26M	15.00	0.032	23.54	0.226	< 30
2442.0	39M	15.01	0.032	23.52	0.225	< 30
2442.0	52M	15.02	0.032	23.51	0.224	< 30
2442.0	58.5M	15.06	0.032	23.53	0.225	< 30
2442.0	65M	15.00	0.032	23.45	0.221	< 30

Model Number	CS1A13					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 5: IEEE 802.11a U-NII Band IV Link Mode					
Date of Test	07/17/2013			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
5745.0	6M	15.60	0.036	24.64	0.291	< 30
5765.0		15.54	0.036	24.60	0.288	< 30
5785.0		15.54	0.036	24.49	0.281	< 30
5805.0		15.64	0.037	24.65	0.292	< 30
5825.0		15.52	0.036	24.60	0.288	< 30
5745.0	54M	15.50	0.035	24.45	0.279	< 30
5765.0		15.48	0.035	24.49	0.281	< 30
5785.0		15.50	0.035	24.45	0.279	< 30
5805.0		15.53	0.036	24.52	0.283	< 30
5825.0		15.46	0.035	24.45	0.279	< 30

Model Number	CS1A13					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 6: IEEE 802.11n U-NII Band IV 20MHz Link Mode					
Date of Test	07/17/2013			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
5745.0	6.5M	14.32	0.027	24.31	0.270	< 30
5765.0		14.35	0.027	24.26	0.267	< 30
5785.0		14.37	0.027	24.30	0.269	< 30
5805.0		14.42	0.028	24.33	0.271	< 30
5825.0		14.36	0.027	24.29	0.269	< 30
5745.0	65M	14.30	0.027	24.14	0.259	< 30
5765.0		14.34	0.027	24.09	0.256	< 30
5785.0		14.33	0.027	24.23	0.265	< 30
5805.0		14.35	0.027	24.18	0.262	< 30
5825.0		14.35	0.027	24.17	0.261	< 30

Model Number	CS1A13					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 7: IEEE 802.11n U-NII Band IV 40MHz Link Mode					
Date of Test	07/17/2013			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
5755.0	6.5M	13.32	0.021	23.94	0.248	< 30
5795.0		13.35	0.022	23.96	0.249	< 30
5755.0	65M	12.92	0.020	23.71	0.235	< 30
5795.0		12.95	0.020	23.77	0.238	< 30

Model Number	CS1A13					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 8: Bluetooth v4.0 LE Link Mode					
Date of Test	07/17/2013			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2402	---	6.52	0.004	6.88	0.005	< 30
2440	---	7.63	0.006	7.95	0.006	< 30
2480	---	7.35	0.005	7.67	0.006	< 30

7 6dB RF Bandwidth & 99 % Occupied Bandwidth Measurement

7.1. Limit

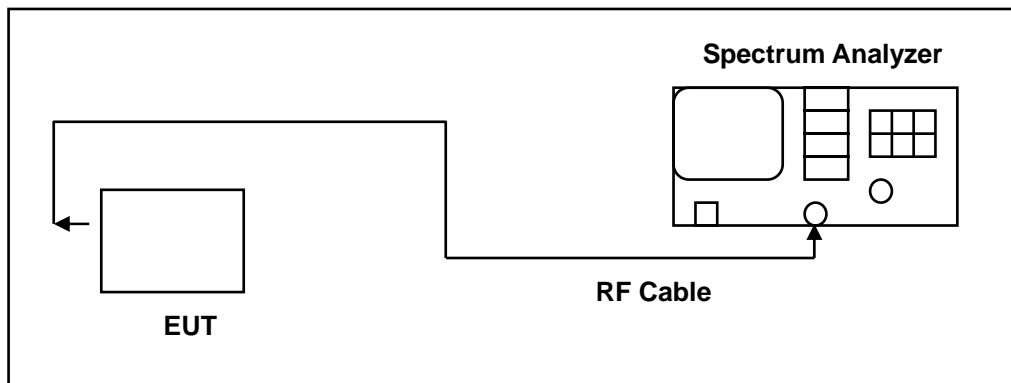
6dB RF Bandwidth

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

99 % Occupied Bandwidth

N/A

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2012	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

dRemark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

7.4. Test Procedure

6dB RF Bandwidth

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Oct 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

The test was performed at 3 channels (Channel 1, 6, 11)

99 % Occupied Bandwidth

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%.

The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

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

7.5. Test Result

Model Number	CS1A13		
Test Item	6dB RF Bandwidth & 99 % Occupied Bandwidth		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	07/18/2013, 09/10/2013		Test Site TE05
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
2412	7.551	12.2040	> 500
2442	8.083	12.1519	> 500
2472	7.622	12.1494	> 500

Model Number	CS1A13		
Test Item	6dB RF Bandwidth & 99 % Occupied Bandwidth		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	07/18/2013, 09/10/2013		Test Site TE05
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
2412	15.097	16.3137	> 500
2442	15.606	16.3316	> 500
2472	15.160	16.3127	> 500

Model Number	CS1A13		
Test Item	6dB RF Bandwidth & 99 % Occupied Bandwidth		
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode		
Date of Test	07/18/2013, 09/10/2013		Test Site TE05
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
2412	16.889	17.4742	> 500
2442	16.193	17.4853	> 500
2472	14.591	17.4733	> 500

Model Number	CS1A13		
Test Item	6dB RF Bandwidth & 99 % Occupied Bandwidth		
Test Mode	Mode 5: IEEE 802.11a U-NII Band IV Link Mode		
Date of Test	07/19/2013	Test Site	TE05
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
5745	14.840	16.3010	> 500
5785	15.191	16.2884	> 500
5825	15.318	16.3004	> 500

Model Number	CS1A13		
Test Item	6dB RF Bandwidth & 99 % Occupied Bandwidth		
Test Mode	Mode 6: IEEE 802.11n U-NII Band IV 20MHz Link Mode		
Date of Test	07/19/2013	Test Site	TE05
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
5745	14.732	17.4631	> 500
5785	15.115	17.4494	> 500
5825	17.138	17.4593	> 500

Model Number	CS1A13		
Test Item	6dB RF Bandwidth & 99 % Occupied Bandwidth		
Test Mode	Mode 7: IEEE 802.11n U-NII Band IV 40MHz Link Mode		
Date of Test	07/19/2013	Test Site	TE05
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
5755	32.693	35.8290	> 500
5795	35.150	35.7506	> 500

Model Number	CS1A13		
Test Item	6dB RF Bandwidth & 99 % Occupied Bandwidth		
Test Mode	Mode 8: Bluetooth v4.0 LE Link Mode		
Date of Test	07/19/2013	Test Site	TE05
Frequency (MHz)	6dB Bandwidth (KHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
2402	738.854	1.0793	> 500
2440	738.662	1.0775	> 500
2480	740.119	1.0814	> 500

7.6. Test Graphs

Mode 2: IEEE 802.11b Link Mode	
2412	<p>Agilent R T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>#Peak Log 10 dB/Offset 10.8 dB</p> <p>Center 2.412 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 12.2040 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -2.346 kHz</p> <p>x dB Bandwidth 7.551 MHz</p> <p>Freq/Channel</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2442	<p>Agilent R T</p> <p>Ch Freq 2.442 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak Log 10 dB/Offset 10.8 dB</p> <p>Center 2.442 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 12.1519 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 254.471 Hz</p> <p>x dB Bandwidth 8.083 MHz</p> <p>Freq/Channel</p> <p>Center Freq 2.44200000 GHz</p> <p>Start Freq 2.42700000 GHz</p> <p>Stop Freq 2.45700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2472	<p>Agilent R T</p> <p>Ch Freq 2.472 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak Log 10 dB/Offset 10.8 dB</p> <p>Center 2.472 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 12.1494 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 4.565 kHz</p> <p>x dB Bandwidth 7.622 MHz</p> <p>Freq/Channel</p> <p>Center Freq 2.47200000 GHz</p> <p>Start Freq 2.45700000 GHz</p> <p>Stop Freq 2.48700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	
<p>2442</p>	
<p>2472</p>	

Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

<p>2412</p>	
<p>2442</p>	
<p>2472</p>	

Mode 5: IEEE 802.11a U-NII Band IV Link Mode	
5745	<p>Agilent R T</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>#Peak Log 10 dB/Offset 10.8 dB</p> <p>Center 5.745 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 16.3010 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -31.233 kHz x dB Bandwidth 14.840 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.74500000 GHz</p> <p>Start Freq 5.73000000 GHz</p> <p>Stop Freq 5.76000000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
5785	<p>Agilent R T</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>#Peak Log 10 dB/Offset 10.8 dB</p> <p>Center 5.785 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 16.2884 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -43.646 kHz x dB Bandwidth 15.191 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.78500000 GHz</p> <p>Start Freq 5.77000000 GHz</p> <p>Stop Freq 5.80000000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
5825	<p>Agilent R T</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>#Peak Log 10 dB/Offset 10.8 dB</p> <p>Center 5.825 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 16.3004 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -49.829 kHz x dB Bandwidth 15.318 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.82500000 GHz</p> <p>Start Freq 5.81000000 GHz</p> <p>Stop Freq 5.84000000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Mode 6: IEEE 802.11n U-NII Band IV 20MHz Link Mode

<p>5745</p>	
<p>5785</p>	
<p>5825</p>	

Mode 7: IEEE 802.11n U-NII Band IV 40MHz Link Mode

5755	
5795	

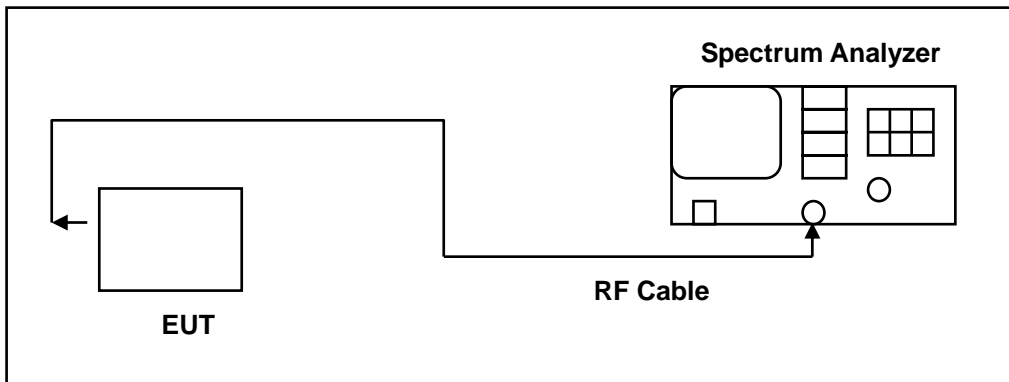
Mode 8: Bluetooth v4.0 LE Link Mode	
2402	<p>Agilent R T</p> <p>Ch Freq 2.402 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 15 dBm #Atten 25 dB</p> <p>#Peak Log 10 dB/ Offset 0.8 dB</p> <p>Center 2.402 GHz Span 3 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>1.0793 MHz x dB -6.00 dB</p> <p>Transmit Freq Error -8.127 kHz</p> <p>x dB Bandwidth 738.854 kHz</p> <p>Freq/Channel</p> <p>Center Freq 2.4020000 GHz</p> <p>Start Freq 2.4005000 GHz</p> <p>Stop Freq 2.4035000 GHz</p> <p>CF Step 300.000000 kHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p>
2440	<p>Agilent R T</p> <p>Ch Freq 2.44 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 15 dBm #Atten 25 dB</p> <p>#Peak Log 10 dB/ Offset 0.8 dB</p> <p>Center 2.44 GHz Span 3 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>1.0775 MHz x dB -6.00 dB</p> <p>Transmit Freq Error -14.054 kHz</p> <p>x dB Bandwidth 738.662 kHz</p> <p>Freq/Channel</p> <p>Center Freq 2.4400000 GHz</p> <p>Start Freq 2.4385000 GHz</p> <p>Stop Freq 2.4415000 GHz</p> <p>CF Step 300.000000 kHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p>
2480	<p>Agilent R T</p> <p>Ch Freq 2.48 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 15 dBm #Atten 25 dB</p> <p>#Peak Log 10 dB/ Offset 0.8 dB</p> <p>Center 2.48 GHz Span 3 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>1.0814 MHz x dB -6.00 dB</p> <p>Transmit Freq Error -21.489 kHz</p> <p>x dB Bandwidth 740.119 kHz</p> <p>Freq/Channel</p> <p>Center Freq 2.4800000 GHz</p> <p>Start Freq 2.4785000 GHz</p> <p>Stop Freq 2.4815000 GHz</p> <p>CF Step 300.000000 kHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p>

8 Maximum Power Density Measurement

8.1. Limit

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

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2012	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

8.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

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

8.5. Test Result

Model Number	CS1A13		
Test Item	Maximum Power Density		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	07/19/2013, 09/10/2013	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
2412	-4.763		< 8
2442	-5.719		< 8
2472	-5.344		< 8

Model Number	CS1A13		
Test Item	Maximum Power Density		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	07/19/2013, 09/10/2013	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
2412	-8.713		< 8
2442	-9.546		< 8
2472	-13.82		< 8

Model Number	CS1A13		
Test Item	Maximum Power Density		
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode		
Date of Test	07/19/2013, 09/10/2013	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
2412	-9.952		< 8
2442	-9.108		< 8
2472	-14.97		< 8

Model Number	CS1A13		
Test Item	Maximum Power Density		
Test Mode	Mode 5: IEEE 802.11a U-NII Band IV Link Mode		
Date of Test	12/19/2012	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
5745	-15.93		< 8
5785	-14.64		< 8
5825	-13.44		< 8

Model Number	CS1A13		
Test Item	Maximum Power Density		
Test Mode	Mode 6: IEEE 802.11n U-NII Band IV 20MHz Link Mode		
Date of Test	12/19/2012	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
5745	-16.14		< 8
5785	-15.56		< 8
5825	-15.53		< 8

Model Number	CS1A13		
Test Item	Maximum Power Density		
Test Mode	Mode 7: IEEE 802.11n U-NII Band IV 40MHz Link Mode		
Date of Test	12/19/2012	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
5755	-20.76		< 8
5795	-20.04		< 8

Model Number	CS1A13		
Test Item	Maximum Power Density		
Test Mode	Mode 8: Bluetooth v4.0 LE Link Mode		
Date of Test	12/19/2012	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
2402	-6.619		< 8
2440	-5.661		< 8
2480	-6.098		< 8

8.6. Test Graphs

Mode 2: IEEE 802.11b Link Mode	
2412	<p>Agilent R T Ref 20 dBm #Atten 20 dB Mkr1 2.41254 GHz #Peak Log 10 dB/Offset 10.8 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.412 GHz Span 12 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 1.372 s (401 pts)</p> <p>Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.40600000 GHz Stop Freq 2.41800000 GHz CF Step 1.20000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2442	<p>Agilent R T Ref 20 dBm Atten 20 dB Mkr1 2.44137 GHz Peak Log 10 dB/Offset 10.8 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.442 GHz Span 12 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 1.372 s (401 pts)</p> <p>Freq/Channel Center Freq 2.44200000 GHz Start Freq 2.43600000 GHz Stop Freq 2.44800000 GHz CF Step 1.20000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2472	<p>Agilent R T Ref 20 dBm Atten 20 dB Mkr1 2.47125 GHz #Peak Log 10 dB/Offset 10.8 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.472 GHz Span 12 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 1.372 s (401 pts)</p> <p>Freq/Channel Center Freq 2.47200000 GHz Start Freq 2.46600000 GHz Stop Freq 2.47800000 GHz CF Step 1.20000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	
<p>2442</p>	
<p>2472</p>	

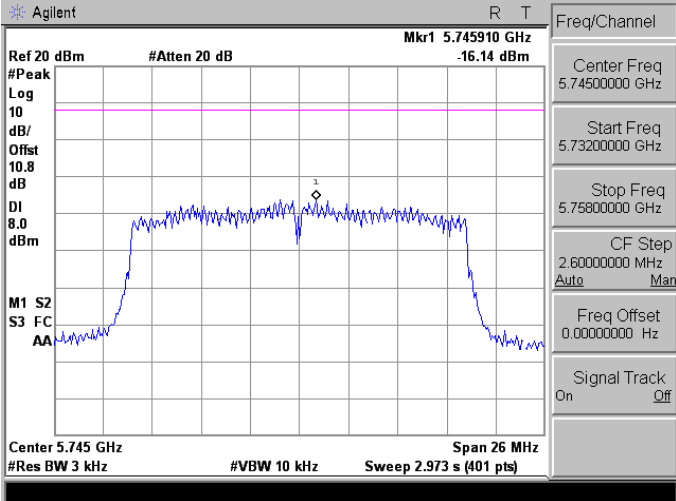
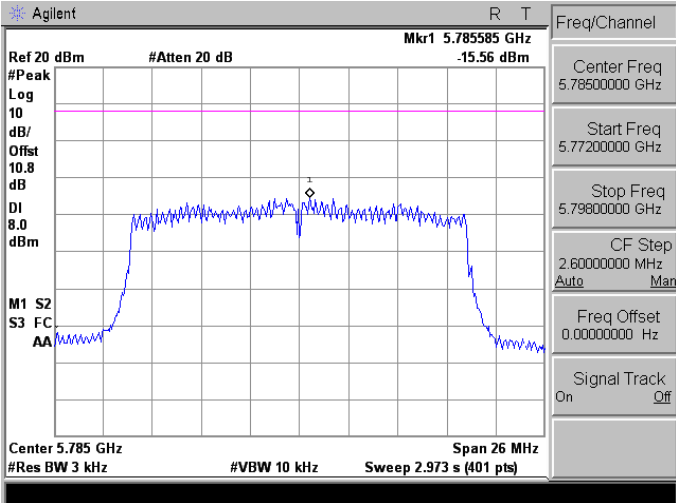
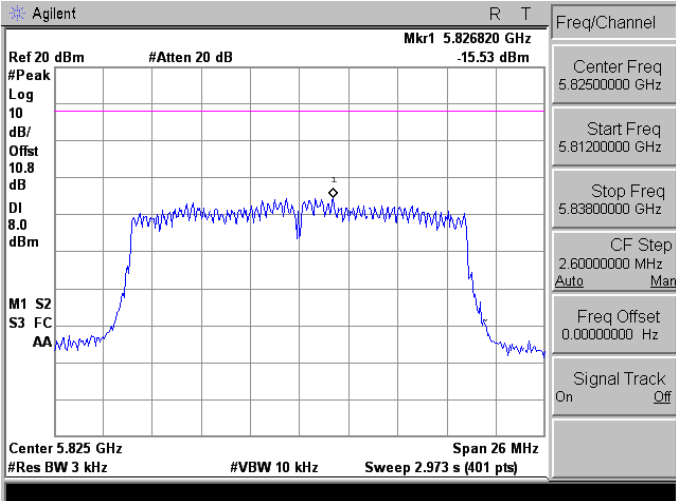
Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

<p>2412</p>	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.4106875 GHz</p> <p>#Peak Log 10 dB/Offset 10.8 dB DI 8.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 2.412 GHz Span 25 MHz</p> <p>#Res BW 3 kHz #VBW 10 kHz Sweep 2.859 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39950000 GHz</p> <p>Stop Freq 2.42450000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
<p>2442</p>	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.4413750 GHz</p> <p>#Peak Log 10 dB/Offset 10.8 dB DI 8.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 2.442 GHz Span 25 MHz</p> <p>#Res BW 3 kHz #VBW 10 kHz Sweep 2.859 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.44200000 GHz</p> <p>Start Freq 2.42950000 GHz</p> <p>Stop Freq 2.45450000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
<p>2472</p>	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.4732500 GHz</p> <p>#Peak Log 10 dB/Offset 10.8 dB DI 8.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 2.472 GHz Span 25 MHz</p> <p>#Res BW 3 kHz #VBW 10 kHz Sweep 2.859 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.47200000 GHz</p> <p>Start Freq 2.45950000 GHz</p> <p>Stop Freq 2.48450000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

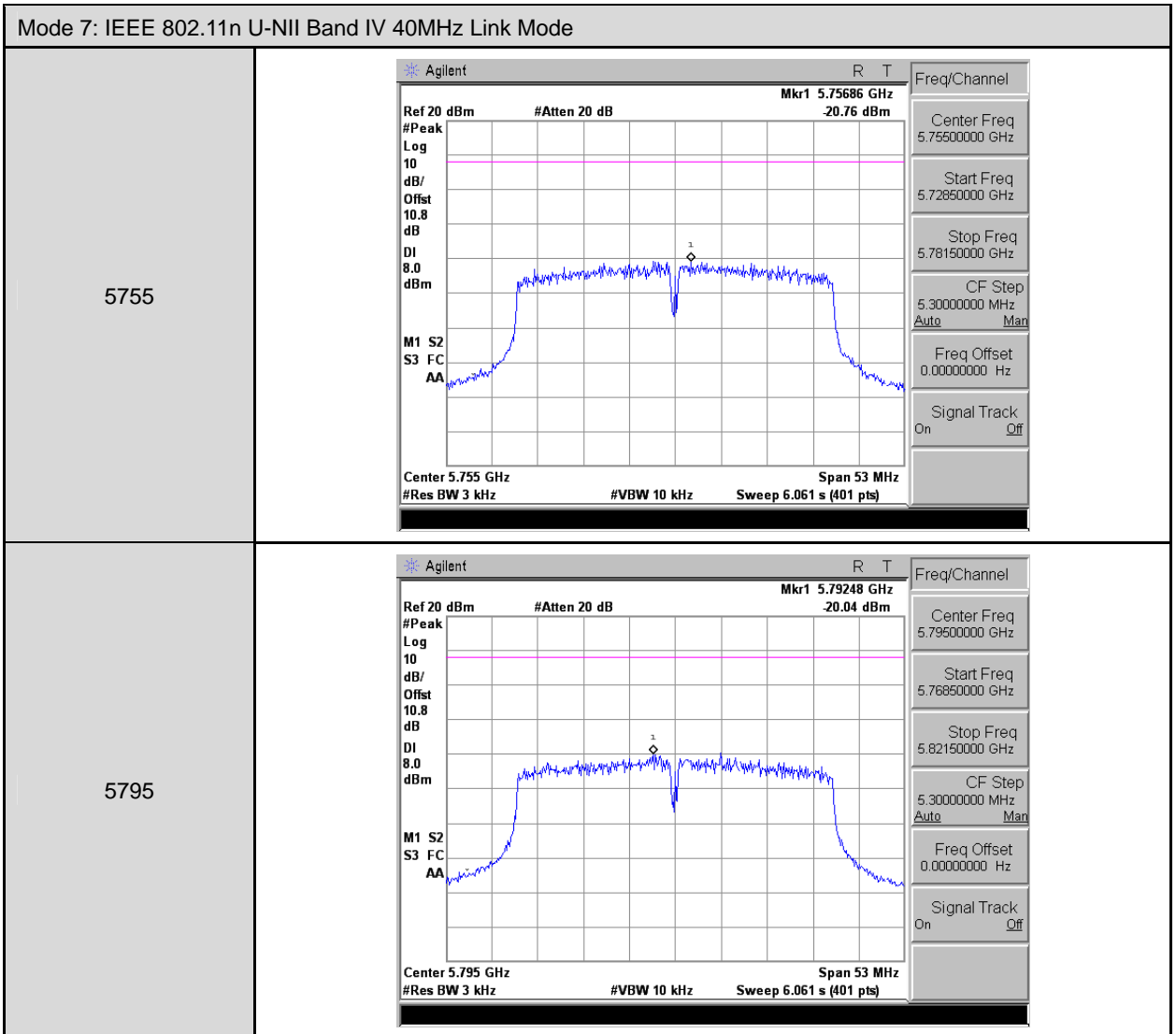
Mode 5: IEEE 802.11a U-NII Band IV Link Mode

5745	<p>Agilent R T Ref 20 dBm #Atten 20 dB Mkr1 5.751240 GHz #Peak Log 10 dB/Offst 10.8 dB DI 8.0 dBm M1 S2 S3 FC AA Center 5.745 GHz Span 26 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 2.973 s (401 pts)</p> <p>Freq/Channel Center Freq 5.74500000 GHz Start Freq 5.73200000 GHz Stop Freq 5.75800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
5785	<p>Agilent R T Ref 20 dBm #Atten 20 dB Mkr1 5.784610 GHz #Peak Log 10 dB/Offst 10.8 dB DI 8.0 dBm M1 S2 S3 FC AA Center 5.785 GHz Span 26 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 2.973 s (401 pts)</p> <p>Freq/Channel Center Freq 5.78500000 GHz Start Freq 5.77200000 GHz Stop Freq 5.79800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
5825	<p>Agilent R T Ref 20 dBm #Atten 20 dB Mkr1 5.824675 GHz #Peak Log 10 dB/Offst 10.8 dB DI 8.0 dBm M1 S2 S3 FC AA Center 5.825 GHz Span 26 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 2.973 s (401 pts)</p> <p>Freq/Channel Center Freq 5.82500000 GHz Start Freq 5.81200000 GHz Stop Freq 5.83800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

Mode 6: IEEE 802.11n U-NII Band IV 20MHz Link Mode

5745	
5785	
5825	

Mode 7: IEEE 802.11n U-NII Band IV 40MHz Link Mode



Mode 8: Bluetooth v4.0 LE Link Mode

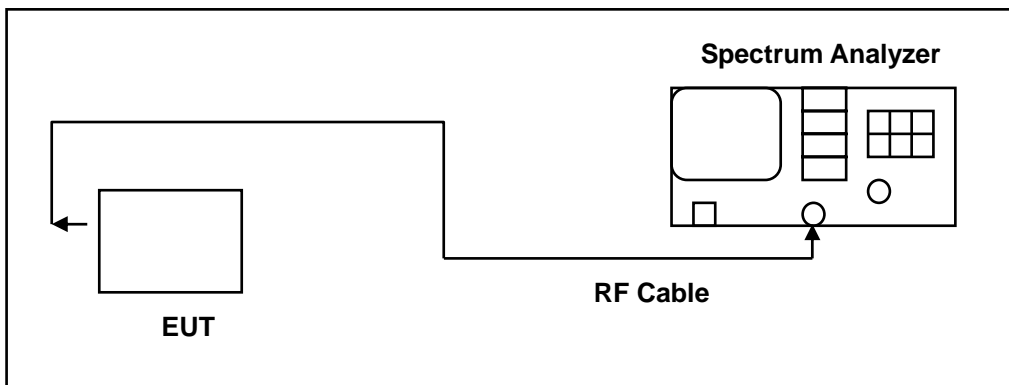
2402	<p>Agilent R T</p> <p>Ref 15 dBm #Atten 25 dB Mkr1 2.401973 GHz Peak 10 dB/Offset 0.8 dB DI 8.0 dBm</p> <p>Center 2.402 GHz Span 1.2 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 137.2 ms (401 pts)</p> <p>Freq/Channel Center Freq 2.4020000 GHz Start Freq 2.40140000 GHz Stop Freq 2.40260000 GHz CF Step 120.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2440	<p>Agilent R T</p> <p>Ref 15 dBm #Atten 25 dB Mkr1 2.439964 GHz Peak 10 dB/Offset 0.8 dB DI 8.0 dBm</p> <p>Center 2.44 GHz Span 1.2 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 137.2 ms (401 pts)</p> <p>Freq/Channel Center Freq 2.4400000 GHz Start Freq 2.43940000 GHz Stop Freq 2.44060000 GHz CF Step 120.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2480	<p>Agilent R T</p> <p>Ref 15 dBm #Atten 25 dB Mkr1 2.479958 GHz Peak 10 dB/Offset 0.8 dB DI 8.0 dBm</p> <p>Center 2.48 GHz Span 1.2 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 137.2 ms (401 pts)</p> <p>Freq/Channel Center Freq 2.4800000 GHz Start Freq 2.47940000 GHz Stop Freq 2.48060000 GHz CF Step 120.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

9 Out of Band Conducted Emissions Measurement

9.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2012	(1)
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/11/2013	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

9.4. Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band.

The test was performed at 3 channels (Channel 1, 6, 11)

9.5. Test Graphs

Reference level

Mode 2: IEEE 802.11b Link Mode	
2412	<p>Agilent R T Ref 20 dBm #Atten 20 dB Mkr1 2.41149 GHz 9.608 dBm #Peak Log 10 dB/Offst 10.8 dB M1 S2 S3 FC AA Center 2.412 GHz Span 12 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.40600000 GHz Stop Freq 2.41800000 GHz CF Step 1.20000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2442	<p>Agilent R T Ref 20 dBm #Atten 20 dB Mkr1 2.44251 GHz 9.372 dBm #Peak Log 10 dB/Offst 10.8 dB M1 S2 S3 FC AA Center 2.442 GHz Span 12 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 2.44200000 GHz Start Freq 2.43600000 GHz Stop Freq 2.44800000 GHz CF Step 1.20000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2472	<p>Agilent R T Ref 20 dBm #Atten 20 dB Mkr1 2.44251 GHz 9.372 dBm #Peak Log 10 dB/Offst 10.8 dB M1 S2 S3 FC AA Center 2.442 GHz Span 12 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 2.44200000 GHz Start Freq 2.43600000 GHz Stop Freq 2.44800000 GHz CF Step 1.20000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.4132500 GHz 4.946 dBm</p> <p>#Peak Log 10 dB/Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 2.412 GHz Span 25 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39950000 GHz</p> <p>Stop Freq 2.42450000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
<p>2442</p>	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.4432500 GHz 4.806 dBm</p> <p>#Peak Log 10 dB/Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 2.442 GHz Span 25 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.44200000 GHz</p> <p>Start Freq 2.42950000 GHz</p> <p>Stop Freq 2.45450000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
<p>2472</p>	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.4732500 GHz 0.017 dBm</p> <p>#Peak Log 10 dB/Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 2.472 GHz Span 25 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.47200000 GHz</p> <p>Start Freq 2.45950000 GHz</p> <p>Stop Freq 2.48450000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

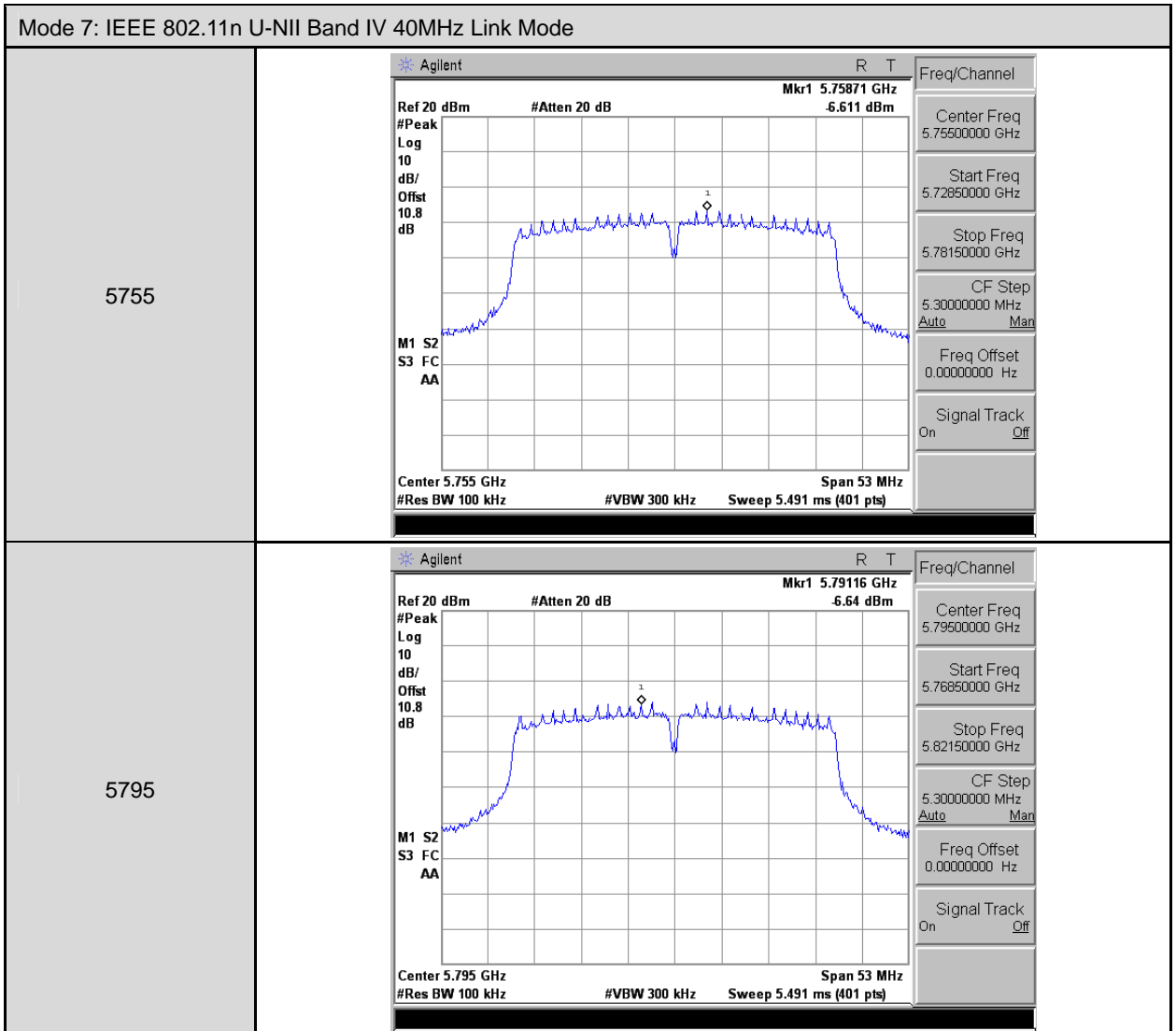
<p>2412</p>	
<p>2442</p>	
<p>2472</p>	

Mode 5: IEEE 802.11a U-NII Band IV Link Mode	
5745	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 5.743700 GHz -2.215 dBm</p> <p>#Peak Log 10 dB/ Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 5.745 GHz Span 26 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 5.74500000 GHz Start Freq 5.73200000 GHz Stop Freq 5.75800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
5785	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 5.787405 GHz -2.719 dBm</p> <p>#Peak Log 10 dB/ Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 5.785 GHz Span 26 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 5.78500000 GHz Start Freq 5.77200000 GHz Stop Freq 5.79800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
5825	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 5.826170 GHz -0.793 dBm</p> <p>#Peak Log 10 dB/ Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 5.825 GHz Span 26 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 5.82500000 GHz Start Freq 5.81200000 GHz Stop Freq 5.83800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

Mode 6: IEEE 802.11n U-NII Band IV 20MHz Link Mode

5745	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 5.746235 GHz 2.694 dBm</p> <p>#Peak Log 10 dB/ Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 5.745 GHz Span 26 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 5.74500000 GHz Start Freq 5.73200000 GHz Stop Freq 5.75800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
5785	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 5.786235 GHz 2.047 dBm</p> <p>#Peak Log 10 dB/ Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 5.785 GHz Span 26 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 5.78500000 GHz Start Freq 5.77200000 GHz Stop Freq 5.79800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
5825	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 5.823960 GHz 3.099 dBm</p> <p>#Peak Log 10 dB/ Offst 10.8 dB</p> <p>M1 S2 S3 FC AA</p> <p>Center 5.825 GHz Span 26 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Freq/Channel Center Freq 5.82500000 GHz Start Freq 5.81200000 GHz Stop Freq 5.83800000 GHz CF Step 2.60000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

Mode 7: IEEE 802.11n U-NII Band IV 40MHz Link Mode



Mode 8: Bluetooth v4.0 LE Link Mode	
2402	<p>Agilent R T</p> <p>Ref 15 dBm #Atten 25 dB Mkr1 2.401991 GHz 5.795 dBm</p> <p>Center 2.402 GHz Span 1.2 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.40200000 GHz</p> <p>Start Freq 2.40140000 GHz</p> <p>Stop Freq 2.40260000 GHz</p> <p>CF Step 120.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2440	<p>Agilent R T</p> <p>Ref 15 dBm #Atten 25 dB Mkr1 2.439988 GHz 6.86 dBm</p> <p>Center 2.44 GHz Span 1.2 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.44000000 GHz</p> <p>Start Freq 2.43940000 GHz</p> <p>Stop Freq 2.44060000 GHz</p> <p>CF Step 120.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2480	<p>Agilent R T</p> <p>Ref 15 dBm #Atten 25 dB Mkr1 2.479976 GHz 6.547 dBm</p> <p>Center 2.48 GHz Span 1.2 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 5 ms (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.48000000 GHz</p> <p>Start Freq 2.47940000 GHz</p> <p>Stop Freq 2.48060000 GHz</p> <p>CF Step 120.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Out of Band Conducted Emissions

Mode 2: IEEE 802.11b Link Mode

<p>2412</p>	
<p>2442</p>	
<p>2472</p>	

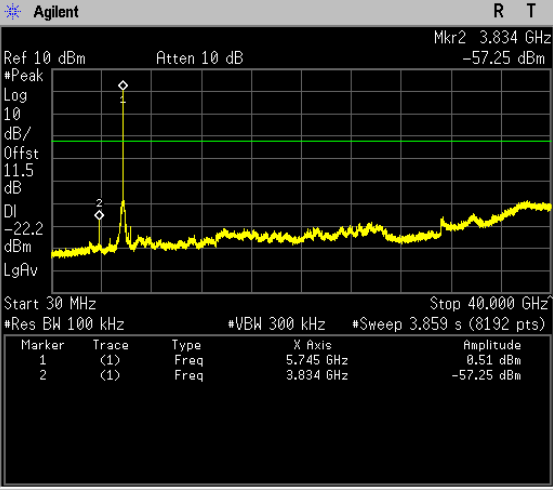
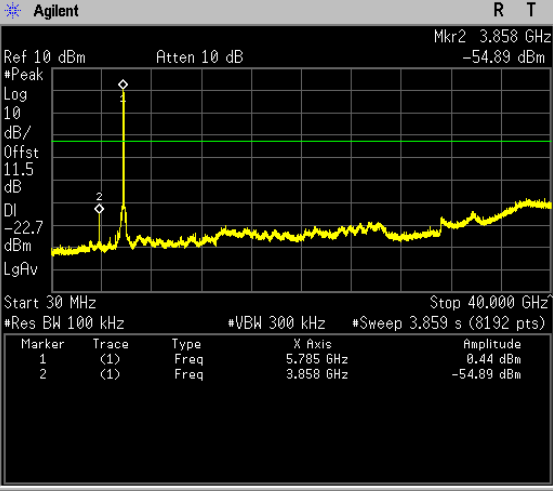
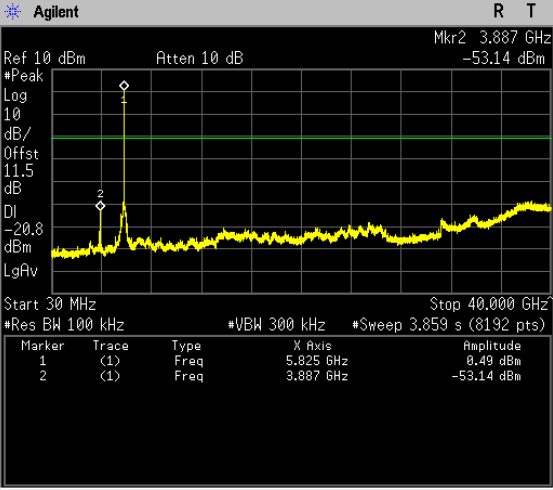
Mode 3: IEEE 802.11g Link Mode

2412	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.41 GHz 4.105 dBm</p> <p>#Peak Log 10 dB/ Offst 10.8 dB DI -15.1 dBm</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts) Stop 26.5 GHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.41 GHz</td> <td>4.105 dBm</td> </tr> </tbody> </table> <p>Freq/Channel: Center Freq 13.2650000 GHz, Start Freq 30.0000000 MHz, Stop Freq 26.5000000 GHz, CF Step 2.64700000 GHz, Freq Offset 0.00000000 Hz, Signal Track On</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.41 GHz	4.105 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.41 GHz	4.105 dBm							
2442	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.44 GHz 3.434 dBm</p> <p>Peak Log 10 dB/ Offst 10.8 dB DI -15.2 dBm</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts) Stop 26.5 GHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.44 GHz</td> <td>3.434 dBm</td> </tr> </tbody> </table> <p>Freq/Channel: Center Freq 13.2650000 GHz, Start Freq 30.0000000 MHz, Stop Freq 26.5000000 GHz, CF Step 2.64700000 GHz, Freq Offset 0.00000000 Hz, Signal Track On</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.44 GHz	3.434 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.44 GHz	3.434 dBm							
2472	<p>Agilent R T</p> <p>Ref 20 dBm #Atten 20 dB Mkr1 2.47 GHz -2.116 dBm</p> <p>Peak Log 10 dB/ Offst 10.8 dB DI -20.0 dBm</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts) Stop 26.5 GHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.47 GHz</td> <td>-2.116 dBm</td> </tr> </tbody> </table> <p>Freq/Channel: Center Freq 13.2650000 GHz, Start Freq 30.0000000 MHz, Stop Freq 26.5000000 GHz, CF Step 2.64700000 GHz, Freq Offset 0.00000000 Hz, Signal Track On</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.47 GHz	-2.116 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.47 GHz	-2.116 dBm							

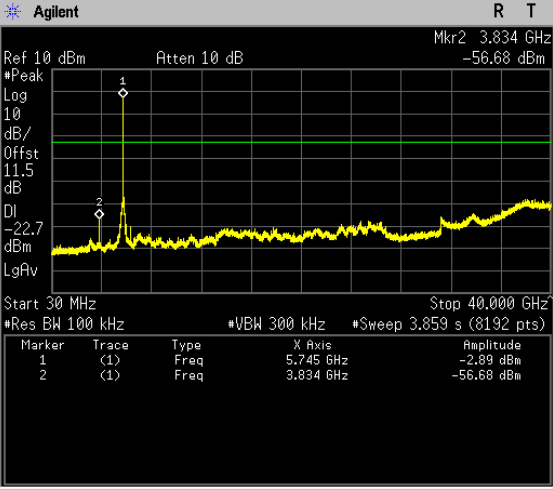
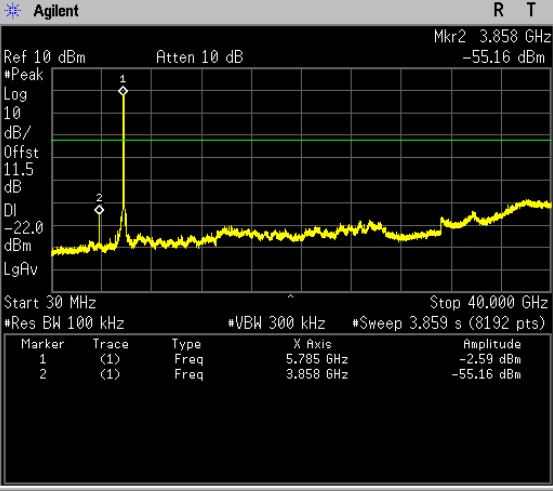
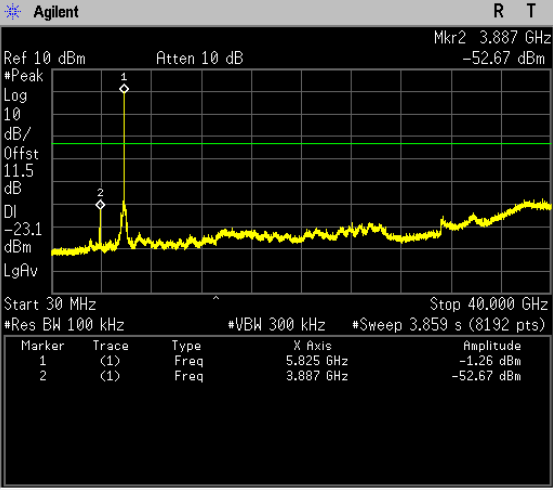
Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

<p>2412</p>	
<p>2442</p>	
<p>2472</p>	

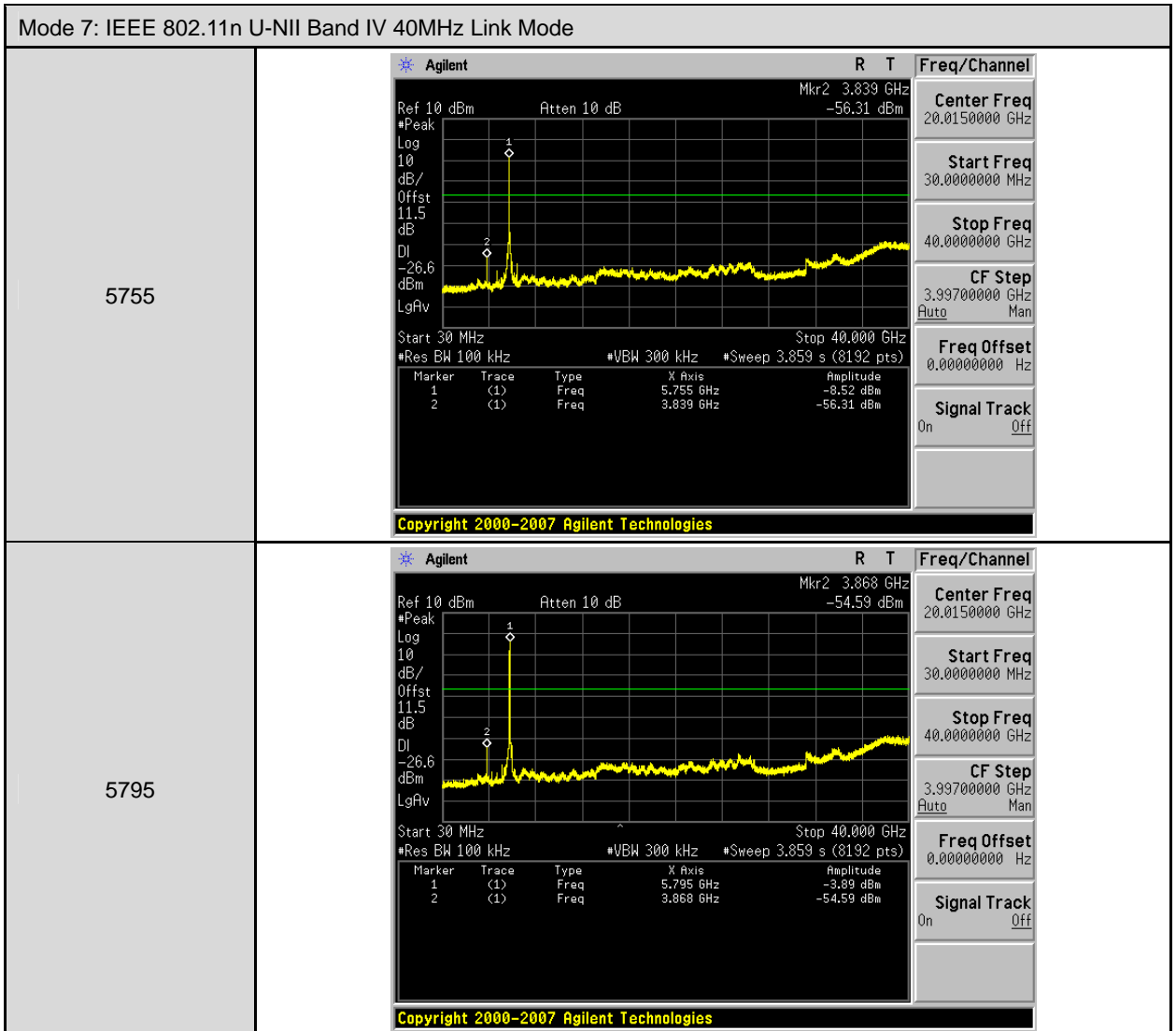
Mode 5: IEEE 802.11a U-NII Band IV Link Mode

5745	 <p>Copyright 2000-2007 Agilent Technologies</p>
5785	 <p>Copyright 2000-2007 Agilent Technologies</p>
5825	 <p>Copyright 2000-2007 Agilent Technologies</p>

Mode 6: IEEE 802.11n U-NII Band IV 20MHz Link Mode

5745	 <p>Copyright 2000-2007 Agilent Technologies</p>
5785	 <p>Copyright 2000-2007 Agilent Technologies</p>
5825	 <p>Copyright 2000-2007 Agilent Technologies</p>

Mode 7: IEEE 802.11n U-NII Band IV 40MHz Link Mode



Mode 8: Bluetooth v4.0 LE Link Mode

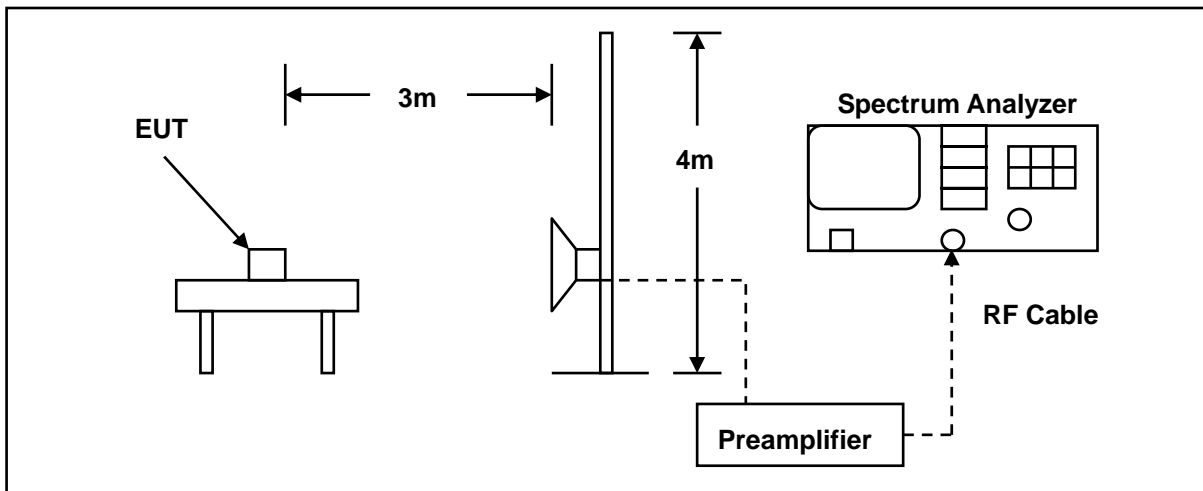
<p>2402</p>	<p>Agilent R T</p> <p>Ref 10 dBm #Atten 20 dB Mkr1 2.40 GHz 5.5 dBm</p> <p>Peak Log 10 dB/Offst 0.8 dB DI -14.2 dBm</p> <p>Start 30 MHz Stop 26.5 GHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.40 GHz</td> <td>5.5 dBm</td> </tr> </tbody> </table> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts)</p> <p>Freq/Channel: Center Freq 13.2650000 GHz, Start Freq 30.0000000 MHz, Stop Freq 26.5000000 GHz, CF Step 2.64700000 GHz, Freq Offset 0.00000000 Hz, Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.40 GHz	5.5 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.40 GHz	5.5 dBm							
<p>2440</p>	<p>Agilent R T</p> <p>Ref 15 dBm #Atten 25 dB Mkr1 2.44 GHz 6.725 dBm</p> <p>Peak Log 10 dB/Offst 0.8 dB DI -13.1 dBm</p> <p>Start 30 MHz Stop 26.5 GHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.44 GHz</td> <td>6.725 dBm</td> </tr> </tbody> </table> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts)</p> <p>Freq/Channel: Center Freq 13.2650000 GHz, Start Freq 30.0000000 MHz, Stop Freq 26.5000000 GHz, CF Step 2.64700000 GHz, Freq Offset 0.00000000 Hz, Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.44 GHz	6.725 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.44 GHz	6.725 dBm							
<p>2480</p>	<p>Agilent R T</p> <p>Ref 15 dBm #Atten 25 dB Mkr1 2.48 GHz 6.345 dBm</p> <p>Peak Log 10 dB/Offst 0.8 dB DI -13.5 dBm</p> <p>Start 30 MHz Stop 26.5 GHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.48 GHz</td> <td>6.345 dBm</td> </tr> </tbody> </table> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts)</p> <p>Freq/Channel: Center Freq 13.2650000 GHz, Start Freq 30.0000000 MHz, Stop Freq 26.5000000 GHz, CF Step 2.64700000 GHz, Freq Offset 0.00000000 Hz, Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.48 GHz	6.345 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.48 GHz	6.345 dBm							

10 Band Edges Measurement

10.1.Limit

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

10.2.Test Setup



10.3.Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/21/2013	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/21/2013	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2013	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2013	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/16/2013	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/10/2013	(1)
Test Site	ATL	TE01	888001	08/28/2012	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

10.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Oct 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

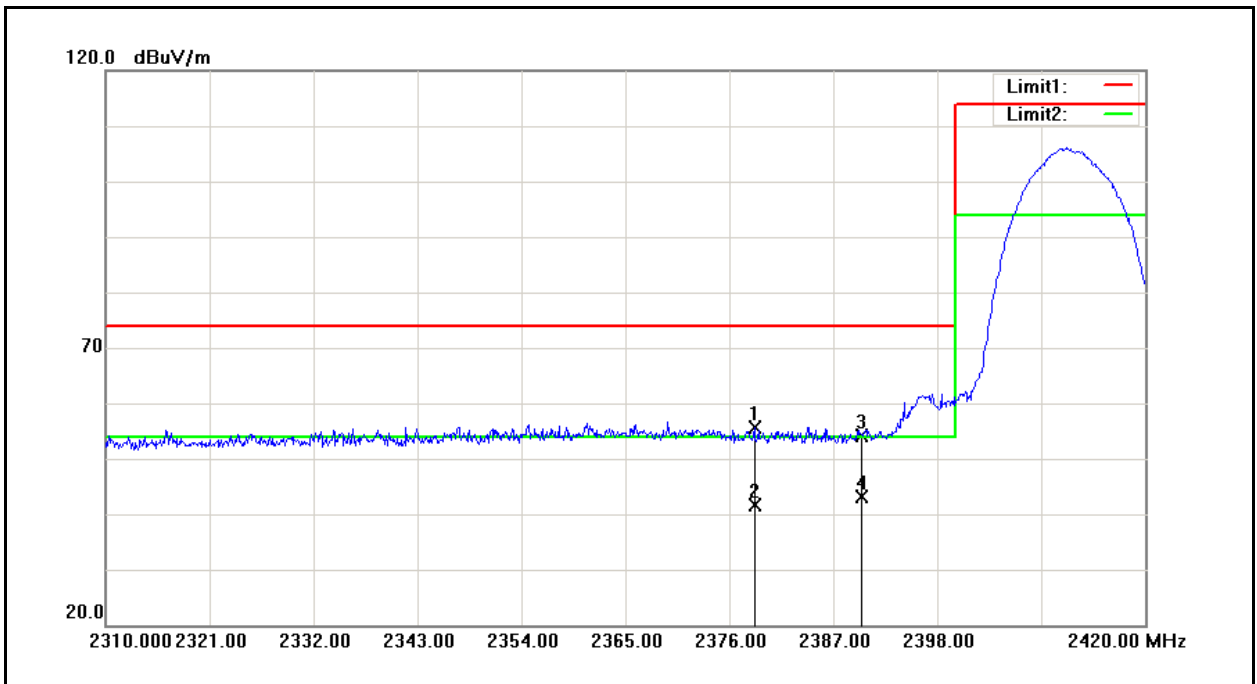
The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

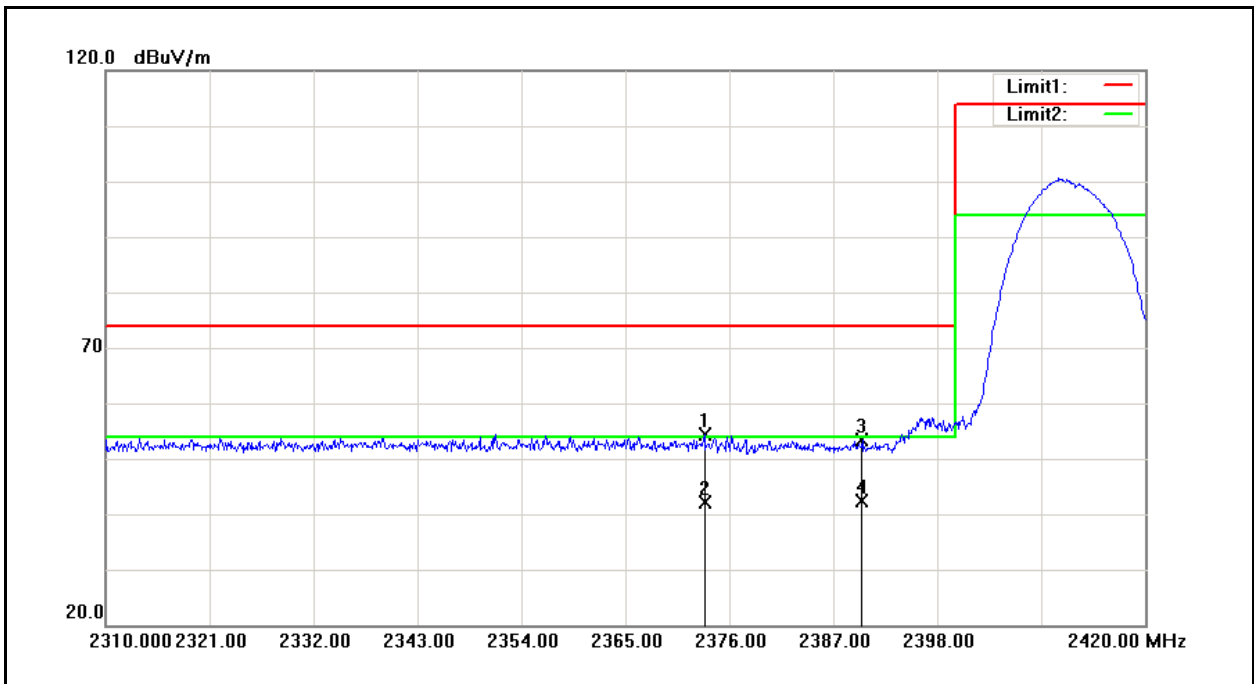
10.5. Test Result

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	07/17/2013
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



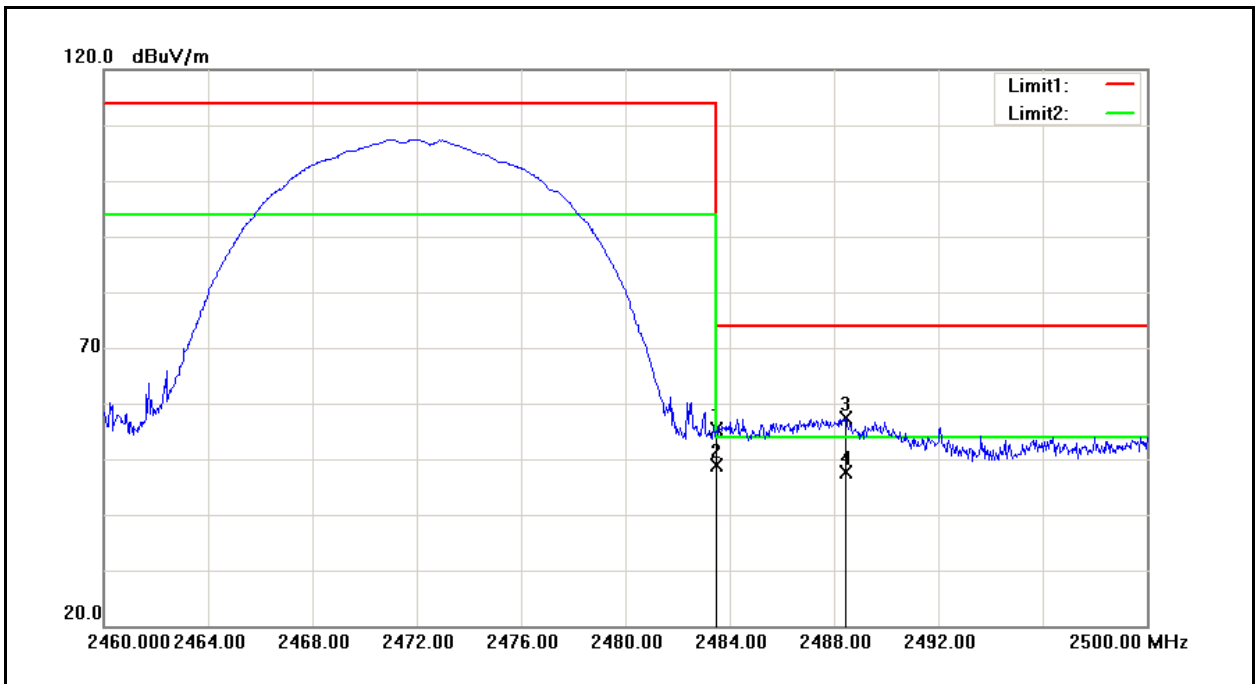
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2378.640	51.80	3.80	55.60	74.00	-18.40	peak
2	2378.640	37.82	3.80	41.62	54.00	-12.38	AVG
3	2390.000	50.18	3.88	54.06	74.00	-19.94	peak
4	2390.000	39.35	3.88	43.23	54.00	-10.77	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	07/17/2013
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



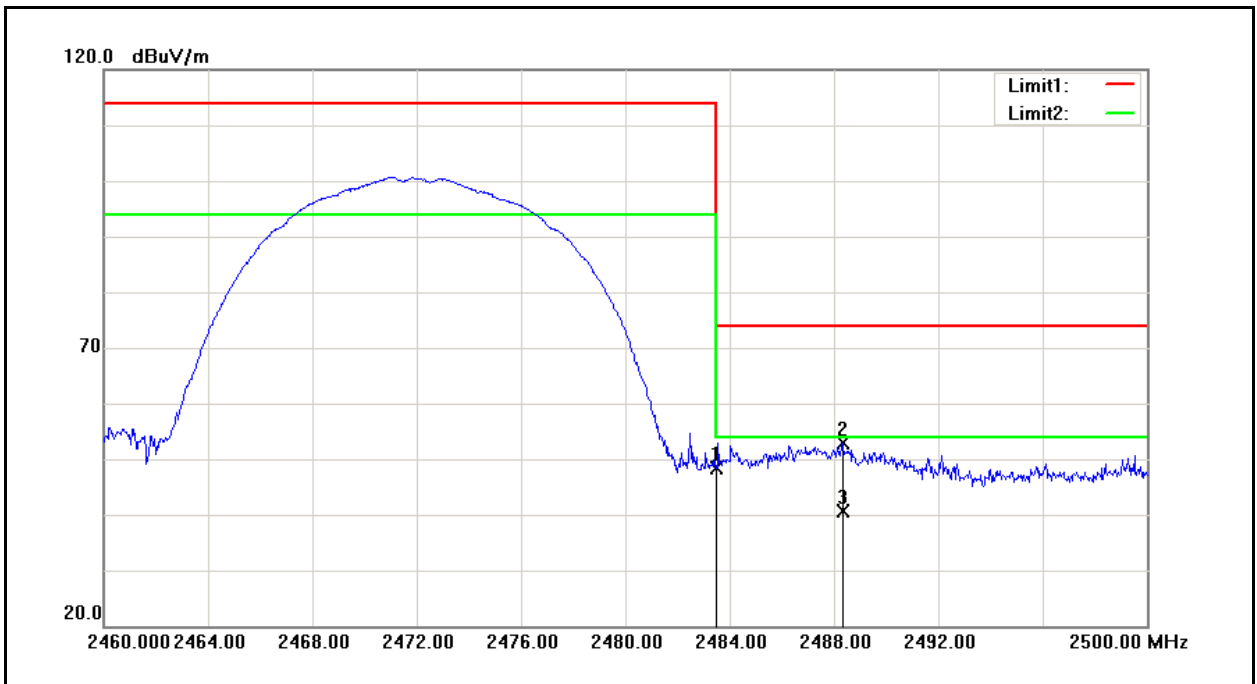
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2373.360	50.50	3.77	54.27	74.00	-19.73	peak
2	2373.360	38.29	3.77	42.06	54.00	-11.94	AVG
3	2390.000	49.58	3.88	53.46	74.00	-20.54	peak
4	2390.000	38.42	3.88	42.30	54.00	-11.70	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	09/10/2013
Frequency:	2472 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



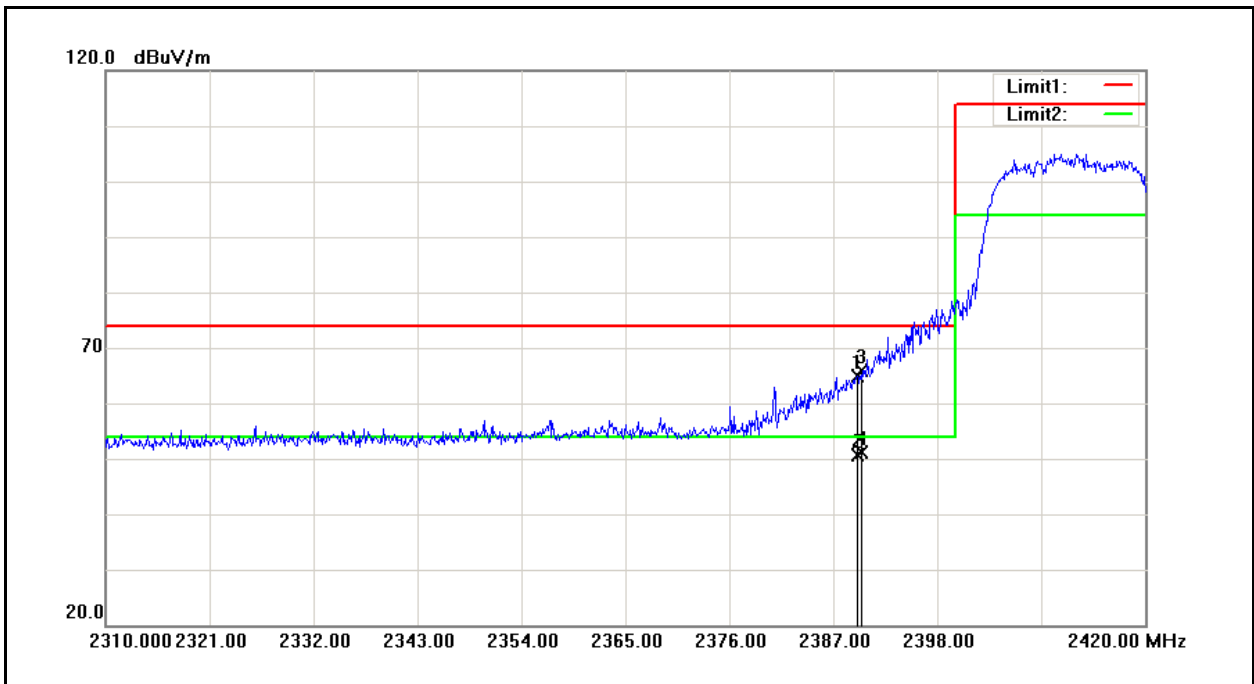
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	50.78	4.50	55.28	74.00	-18.72	peak
2	2483.500	44.41	4.50	48.91	54.00	-5.09	AVG
3	2488.440	52.73	4.54	57.27	74.00	-16.73	peak
4	2488.440	43.05	4.54	47.59	54.00	-6.41	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	09/10/2013
Frequency:	2472 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



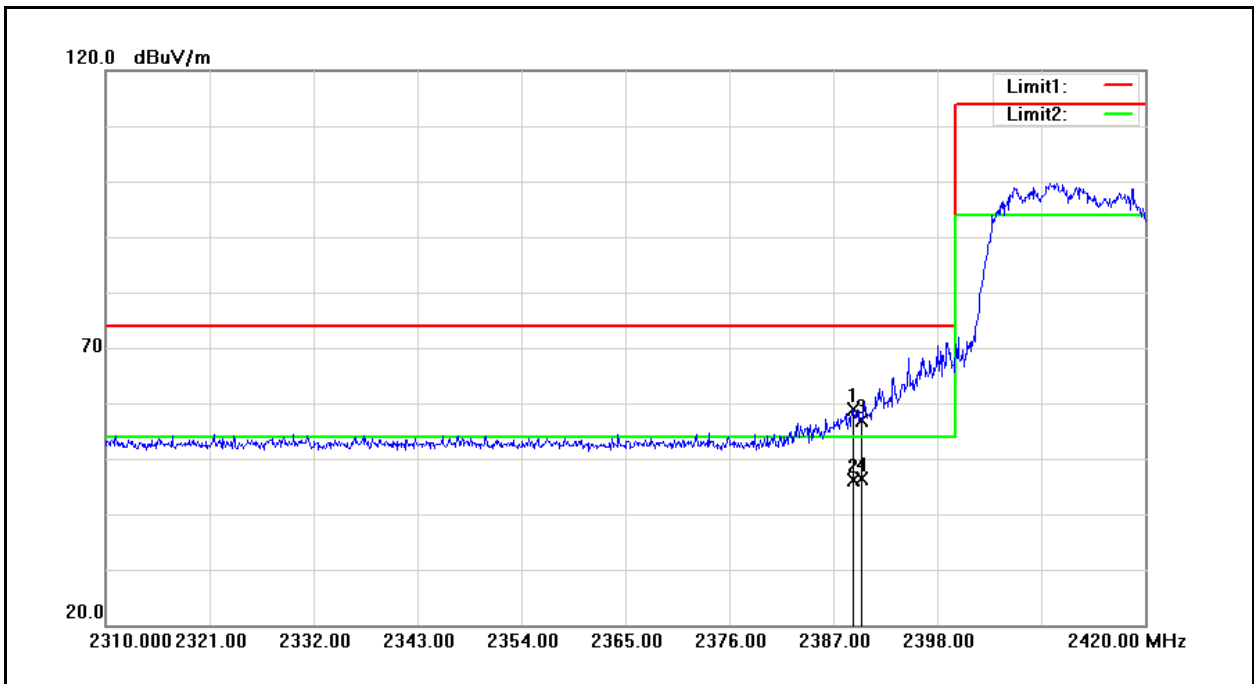
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	43.84	4.50	48.34	74.00	-25.66	peak
2	2488.320	48.26	4.53	52.79	74.00	-21.21	peak
3	2488.320	36.02	4.53	40.55	54.00	-13.45	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	07/17/2013
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



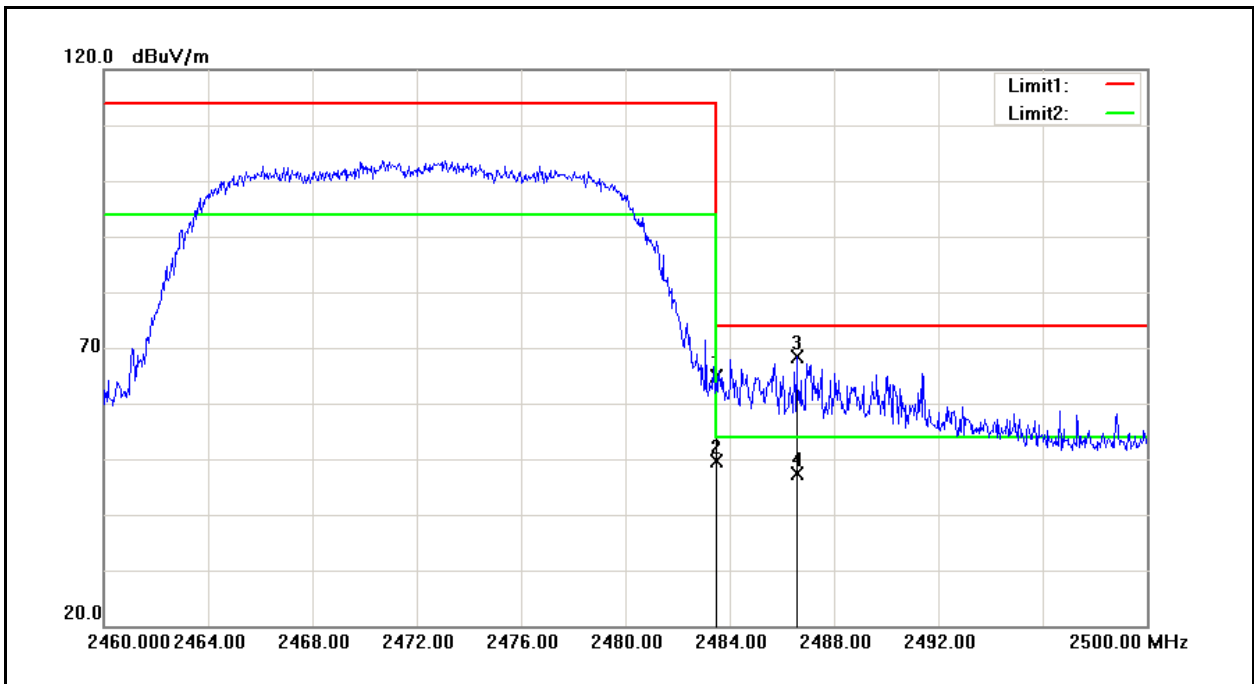
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.530	60.91	3.88	64.79	74.00	-9.21	peak
2	2389.530	46.67	3.88	50.55	54.00	-3.45	AVG
3	2390.000	62.08	3.88	65.96	74.00	-8.04	peak
4	2390.000	47.18	3.88	51.06	54.00	-2.94	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	07/17/2013
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



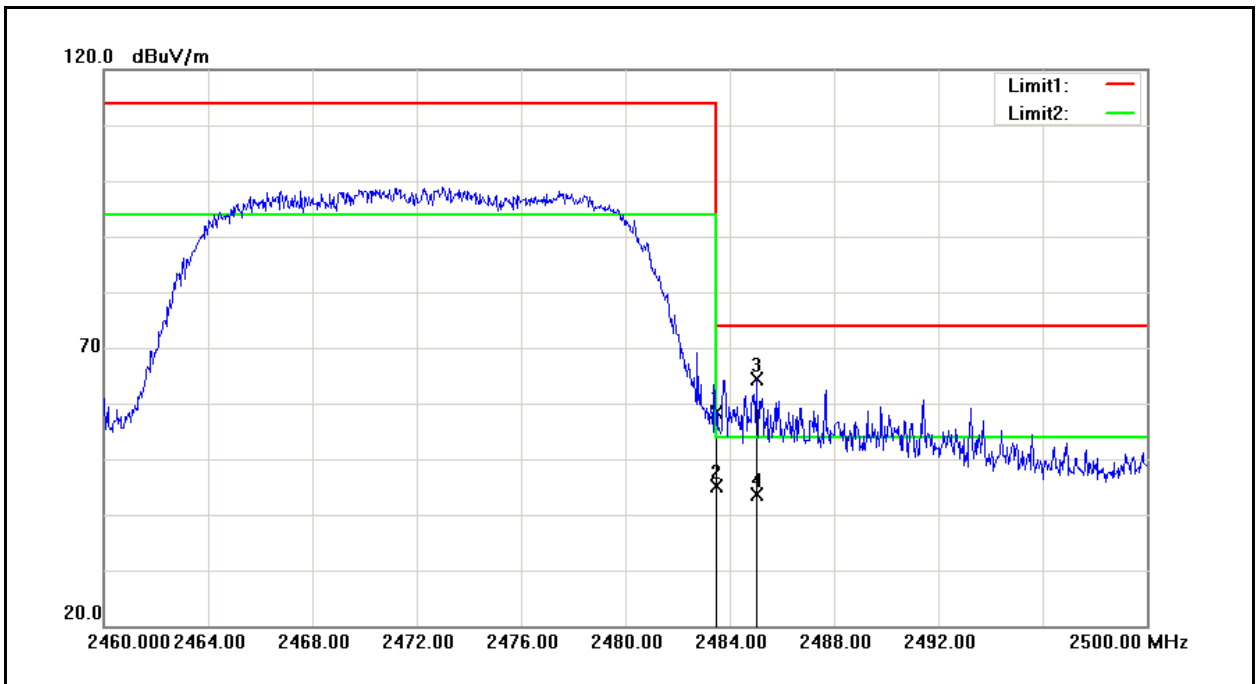
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.090	55.10	3.88	58.98	74.00	-15.02	peak
2	2389.090	42.36	3.88	46.24	54.00	-7.76	AVG
3	2390.000	52.91	3.88	56.79	74.00	-17.21	peak
4	2390.000	42.50	3.88	46.38	54.00	-7.62	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	09/10/2013
Frequency:	2472 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



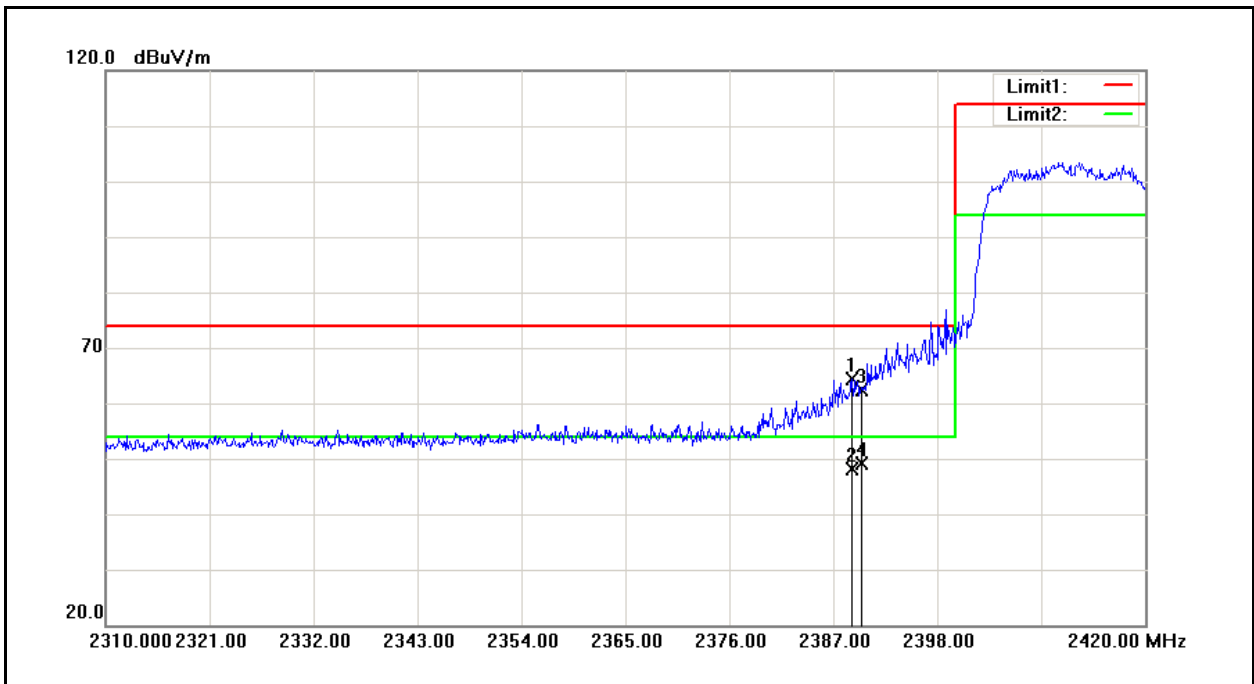
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	60.42	4.50	64.92	74.00	-9.08	peak
2	2483.500	45.23	4.50	49.73	54.00	-4.27	AVG
3	2486.560	63.82	4.53	68.35	74.00	-5.65	peak
4	2486.560	42.78	4.53	47.31	54.00	-6.69	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	09/10/2013
Frequency:	2472 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



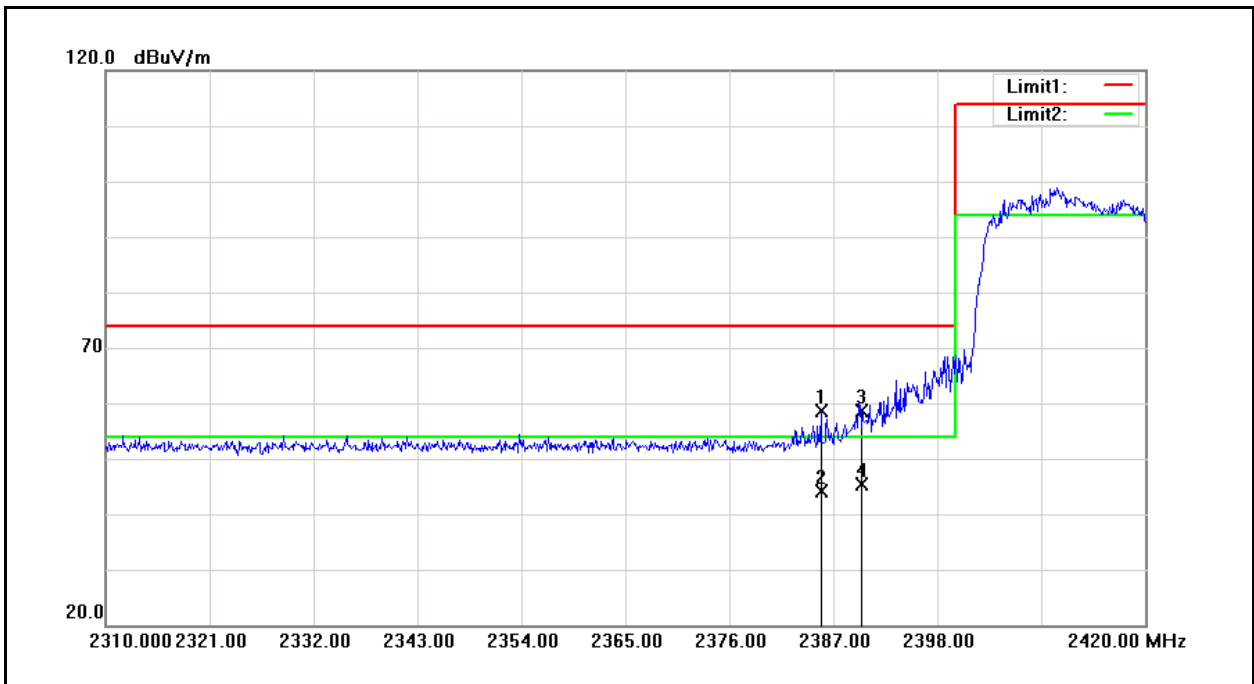
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	53.95	4.50	58.45	74.00	-15.55	peak
2	2483.500	40.55	4.50	45.05	54.00	-8.95	AVG
3	2485.040	59.96	4.52	64.48	74.00	-9.52	peak
4	2485.040	39.20	4.52	43.72	54.00	-10.28	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	07/17/2013
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



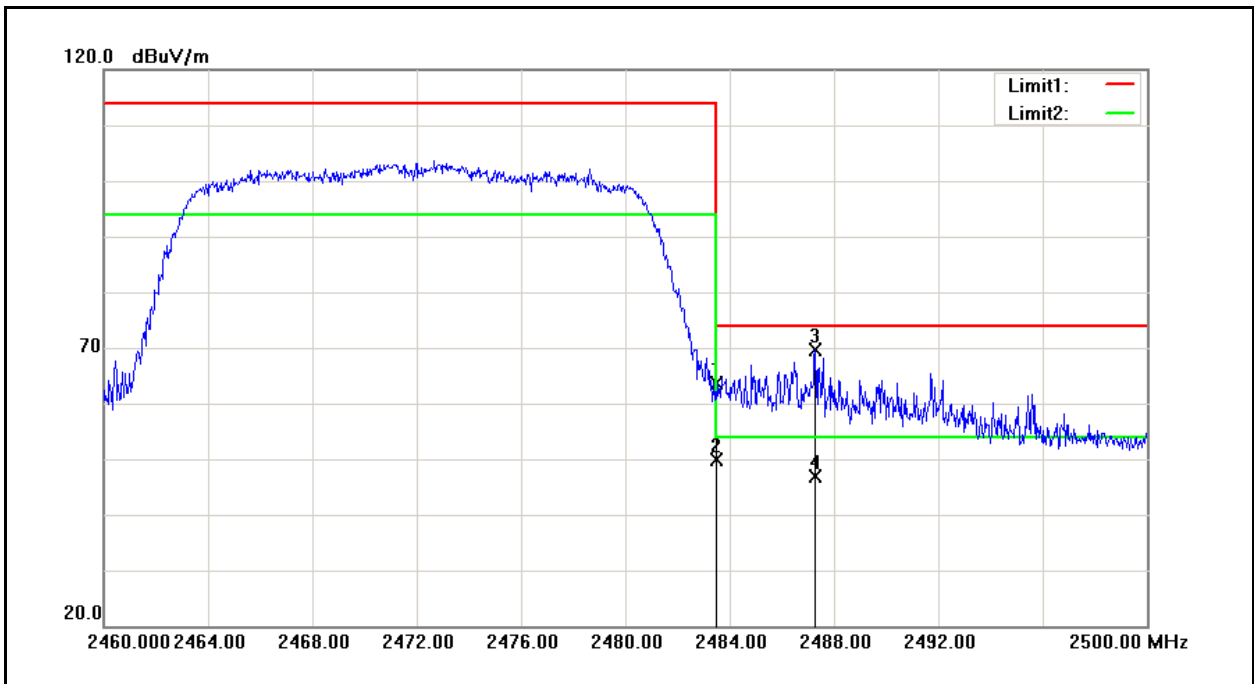
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.980	60.59	3.88	64.47	74.00	-9.53	peak
2	2388.980	44.32	3.88	48.20	54.00	-5.80	AVG
3	2390.000	58.56	3.88	62.44	74.00	-11.56	peak
4	2390.000	45.19	3.88	49.07	54.00	-4.93	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	07/17/2013
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



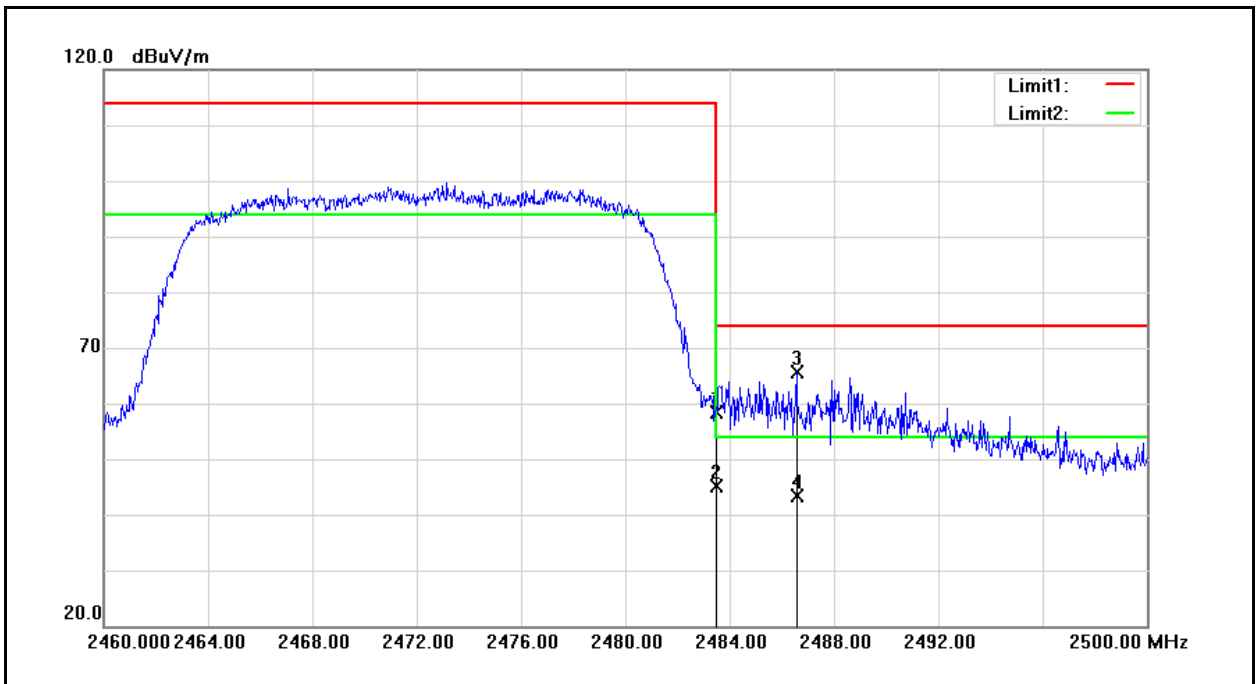
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2385.680	54.74	3.85	58.59	74.00	-15.41	peak
2	2385.680	40.19	3.85	44.04	54.00	-9.96	AVG
3	2390.000	54.65	3.88	58.53	74.00	-15.47	peak
4	2390.000	41.41	3.88	45.29	54.00	-8.71	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	09/10/2013
Frequency:	2472 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



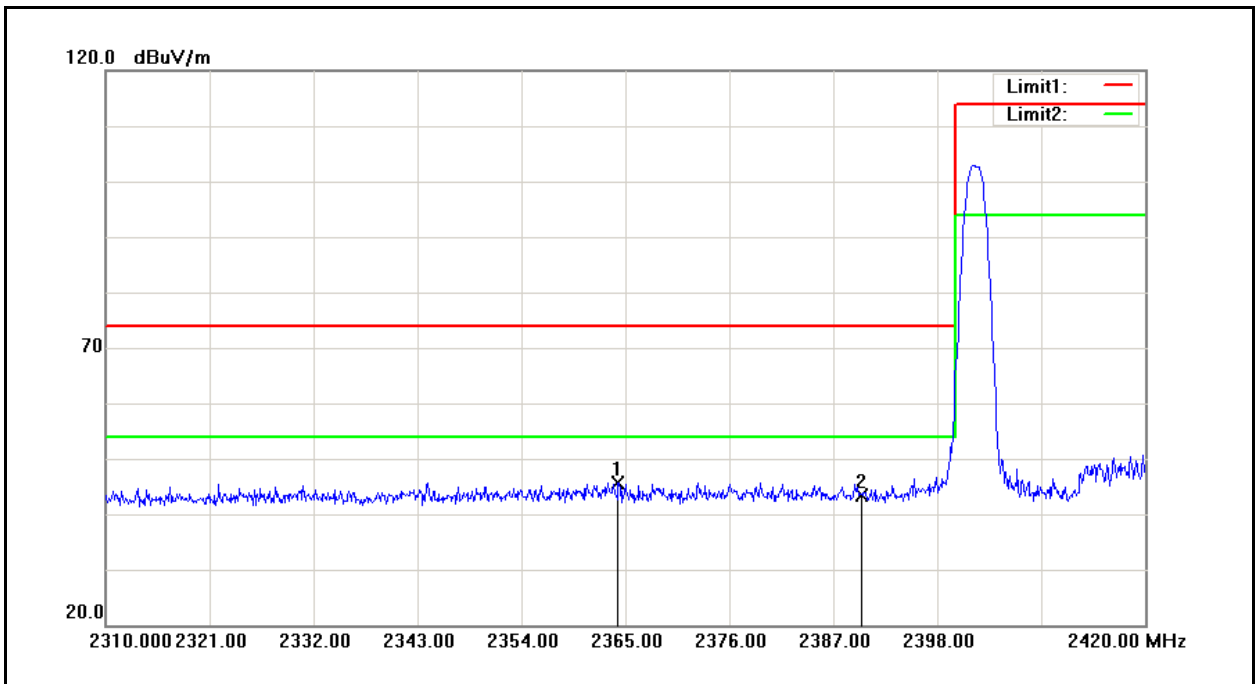
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	59.02	4.50	63.52	74.00	-10.48	peak
2	2483.500	45.37	4.50	49.87	54.00	-4.13	AVG
3	2487.280	65.12	4.53	69.65	74.00	-4.35	peak
4	2487.280	42.45	4.53	46.98	54.00	-7.02	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	09/10/2013
Frequency:	2472 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



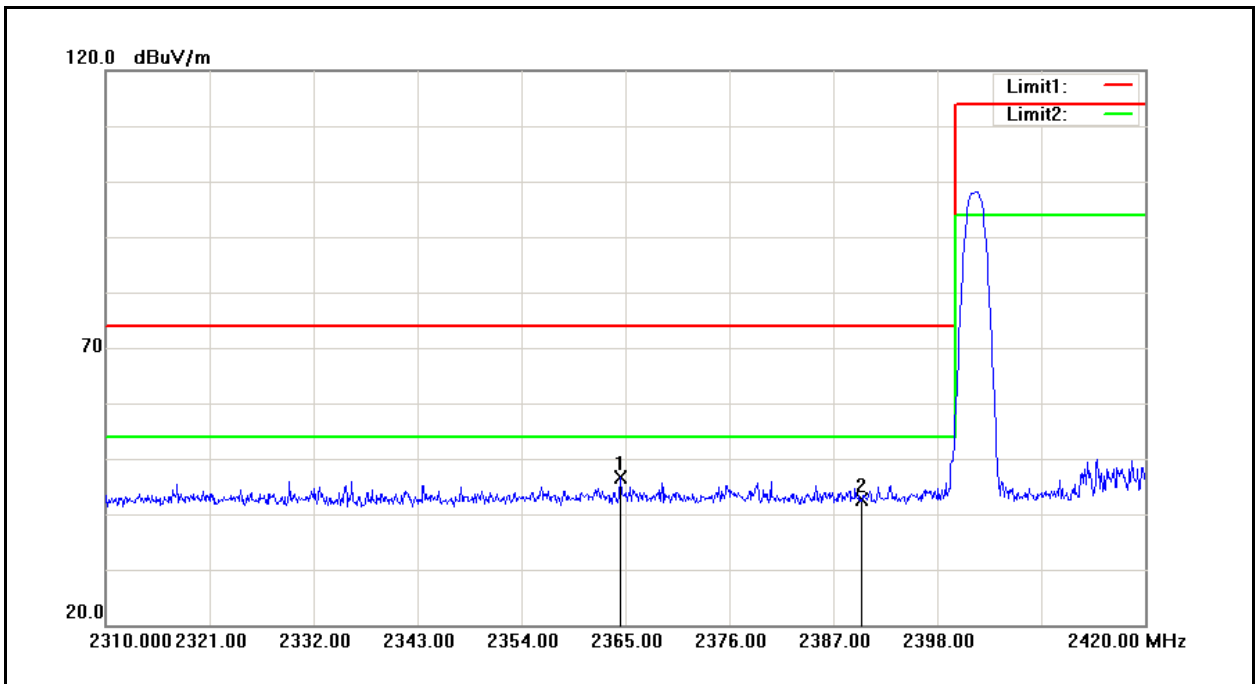
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	53.76	4.50	58.26	74.00	-15.74	peak
2	2483.500	40.68	4.50	45.18	54.00	-8.82	AVG
3	2486.560	61.02	4.53	65.55	74.00	-8.45	peak
4	2486.560	38.78	4.53	43.31	54.00	-10.69	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	8	Date:	07/18/2013
Frequency:	2402 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



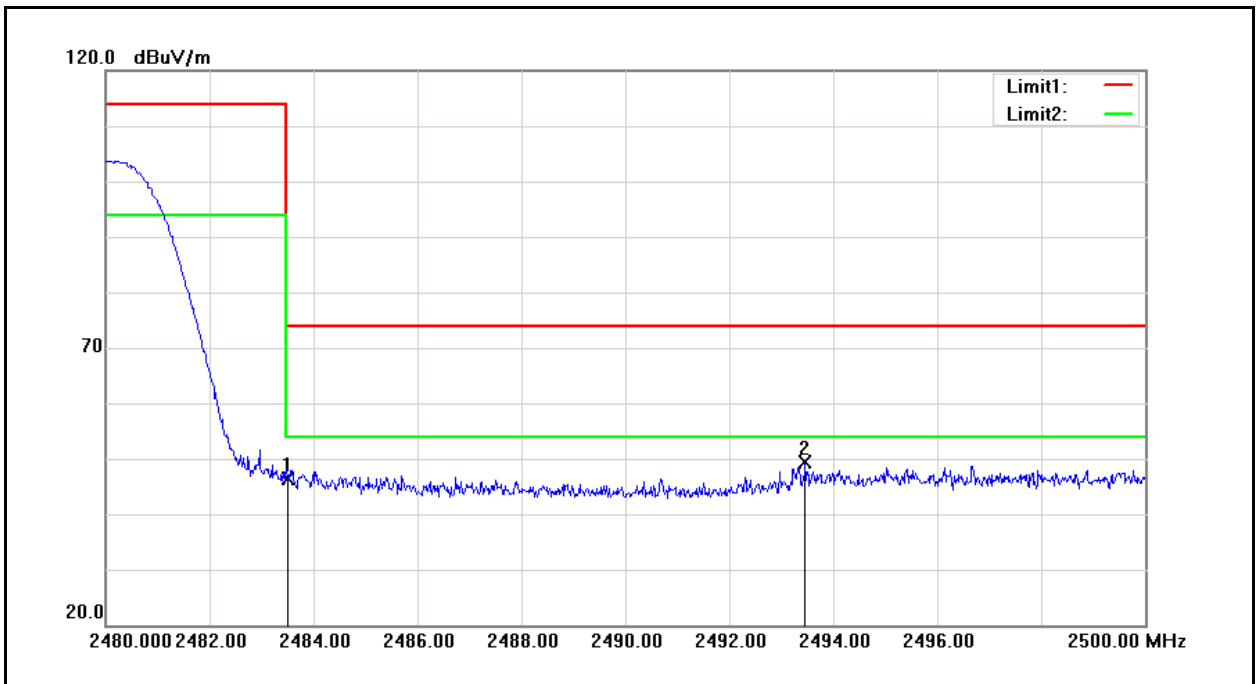
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2364.230	41.98	3.71	45.69	74.00	-28.31	peak
2	2390.000	39.38	3.88	43.26	74.00	-30.74	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	8	Date:	07/18/2013
Frequency:	2402 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



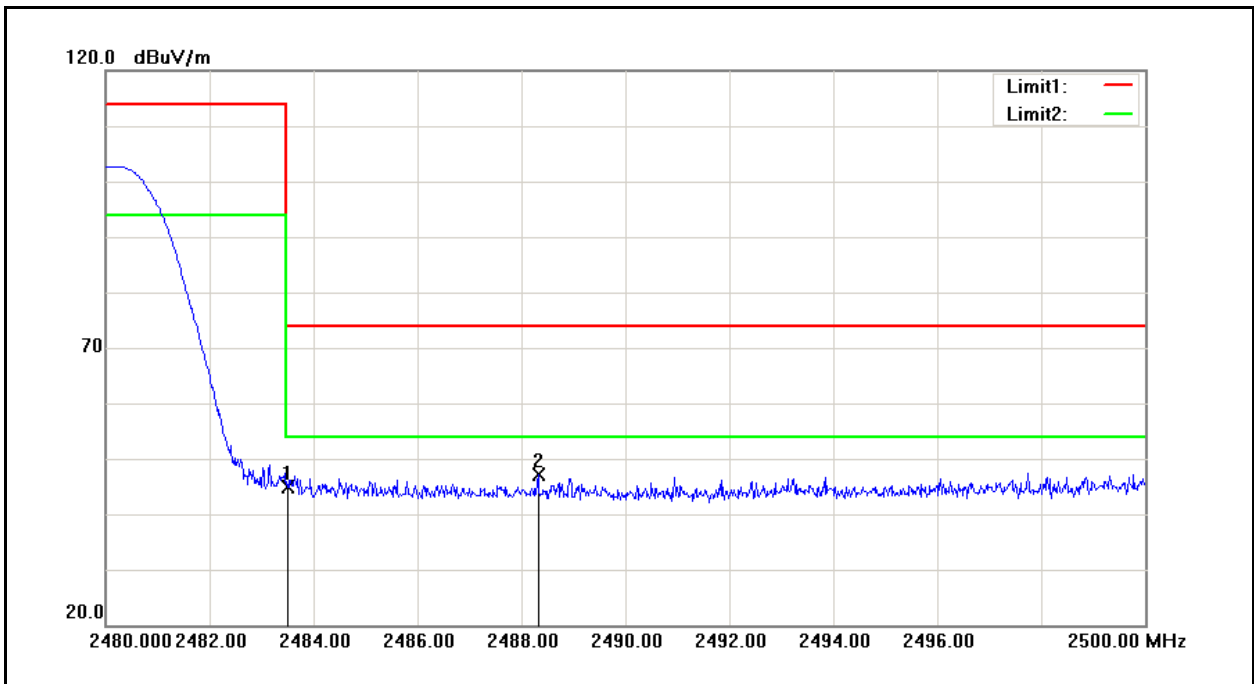
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2364.450	42.81	3.71	46.52	74.00	-27.48	peak
2	2390.000	38.87	3.88	42.75	74.00	-31.25	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	8	Date:	07/18/2013
Frequency:	2480 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	41.85	4.50	46.35	74.00	-27.65	peak
2	2493.460	44.70	4.57	49.27	74.00	-24.73	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	CS1A13	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	8	Date:	07/18/2013
Frequency:	2480 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	40.49	4.50	44.99	74.00	-29.01	peak
2	2488.320	42.63	4.53	47.16	74.00	-26.84	peak

11 Antenna Measurement

11.1.Limit

For intentional device, according to 15.203, 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.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2.Antenna Connector Construction

The antenna used in this product is Chip Antenna. And the maximum Gains of this antenna are as below:

2.4GHz: 3.3 dBi, 5 GHz: -1.1 dBi