

FCC PART 15.407

TEST REPORT

For

IDX Company, Ltd.

6-28-11 Shukugawara, Tama-ku, Kawasaki-shi Kanagawa-ken, Japan

FCC ID: OFJCW-1-12061202

Report Type: Original Report	Product Type: Wireless Video Transmission System (RX Part)
Test Engineer: Lion Cai	<i>Lion Cai</i>
Report Number: R1DG120613006-00	
Report Date: 2012-07-02	
Reviewed By: EMC Engineer	<i>Jerry Zhang</i>
Prepared by:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government. * This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EUT EXERCISE SOFTWARE	6
EQUIPMENT MODIFICATIONS	6
LOCAL SUPPORT EQUIPMENT.....	6
EXTERNAL CABLE.....	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS.....	8
FCC §15.407(f) & §2.1091 – RF EXPOSURE EVALUATION	9
APPLICABLE STANDARD	9
FCC §15.203 – ANTENNA REQUIREMENT.....	10
APPLICABLE STANDARD	10
ANTENNA CONNECTOR CONSTRUCTION	10
FCC §15.407(b)(6) & §15.207(a) – AC LINE CONDUCTED EMISSIONS.....	11
APPLICABLE STANDARD	11
MEASUREMENT UNCERTAINTY	11
EUT SETUP.....	11
EMI TEST RECEIVER SETUP.....	12
TEST EQUIPMENT LIST AND DETAILS.....	12
TEST PROCEDURE	12
TEST RESULTS SUMMARY	12
TEST DATA	12
FCC §15.205, §15.209 & §15.407(b) – UNDESIRABLE EMISSION & RESTRICTED BANDS.....	15
APPLICABLE STANDARD	15
MEASUREMENT UNCERTAINTY	15
EUT SETUP.....	15
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	16
TEST PROCEDURE	16
CORRECTED AMPLITUDE & MARGIN CALCULATION	16
TEST EQUIPMENT LIST AND DETAILS.....	17
TEST RESULTS SUMMARY	17
TEST DATA	17
CONDUCTED SPURIOUS EMISSION AT ANTENNA PORT.....	20
TEST DATA	20
FCC §15.407(a) (2) – 26 dB EMISSION BANDWIDTH.....	26
APPLICABLE STANDARD	26
TEST EQUIPMENT LIST AND DETAILS.....	26
TEST PROCEDURE	26
TEST DATA	27

FCC §15.407(a) (2) – MAXIMUM CONDUCTED OUTPUT POWER	31
APPLICABLE STANDARD	31
TEST EQUIPMENT LIST AND DETAILS	31
TEST PROCEDURE	31
TEST DATA	32
FCC §15.407(a) (2) (5) – PEAK POWER SPECTRAL DENSITY	36
APPLICABLE STANDARD	36
TEST PROCEDURE	36
TEST EQUIPMENT LIST AND DETAILS	36
TEST DATA	36
FCC §15.407(a) (6) – PEAK EXCURSION RATIO	41
APPLICABLE STANDARD	41
TEST PROCEDURE	41
TEST EQUIPMENT LIST AND DETAILS	41
TEST DATA	41
FCC §407(g) - FREQUENCY STABILITY	45
APPLICABLE STANDARDS	45
TEST PROCEDURE	45
TEST EQUIPMENT LIST AND DETAILS	45
TEST DATA	46

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *IDX Company, Ltd.*'s product, model number: CW-1 (*FCC ID:OFJ CW-1-12061202*) ("EUT") in this report is a Wireless Video Transmission System (RX Part) (named as Wireless Video Transmission System by applicant), which was measured approximately: 9.9cm (L) x 5.6cm (W) x 2.0cm (H), the operating frequency is 5250~5350 MHz and 5470~5725 MHz, rated input voltage: DC 5 V from adapter.

Item	Technical Specification
Frequencies	W53: 5270 MHz, 5310 MHz W56: 5510 MHz, 5550 MHz, 5670 MHz
Channel Bandwidth	40 MHz
Modulation	OFDM
Output Power	18 dBm
Antenna Gain	2.0 dBi

AC/DC Adapter information:

Model: GP005U-050-200

Input: 100-240V, 50/60Hz, 0.5A

Output: 5V, 2A, 10VA MAX LPS

** All measurement and test data in this report was gathered from production sample serial number: 120613006 (Assigned by Shenzhen BACL). The EUT was received on 2012-06-15.*

Objective

This type approval report is prepared on behalf of *IDX Company, Ltd.* in accordance with Part 2-Subpart J, Part 15.407 of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which is provided by manufacture. The operating frequency range is 5250~5350 MHz, 5470~5725 MHz; the test frequencies are 5270 MHz, 5310 MHz, 5510 MHz, 5550 MHz and 5670 MHz, those are requested by the applicant.

EUT Exercise Software

Control software: AppCom_3.0.3.16; Driver: whdi_device_2.0.0.3

Equipment Modifications

EUT was covered by copper tapes on the PCB board. Plesse refer to the internal photos of EUT.

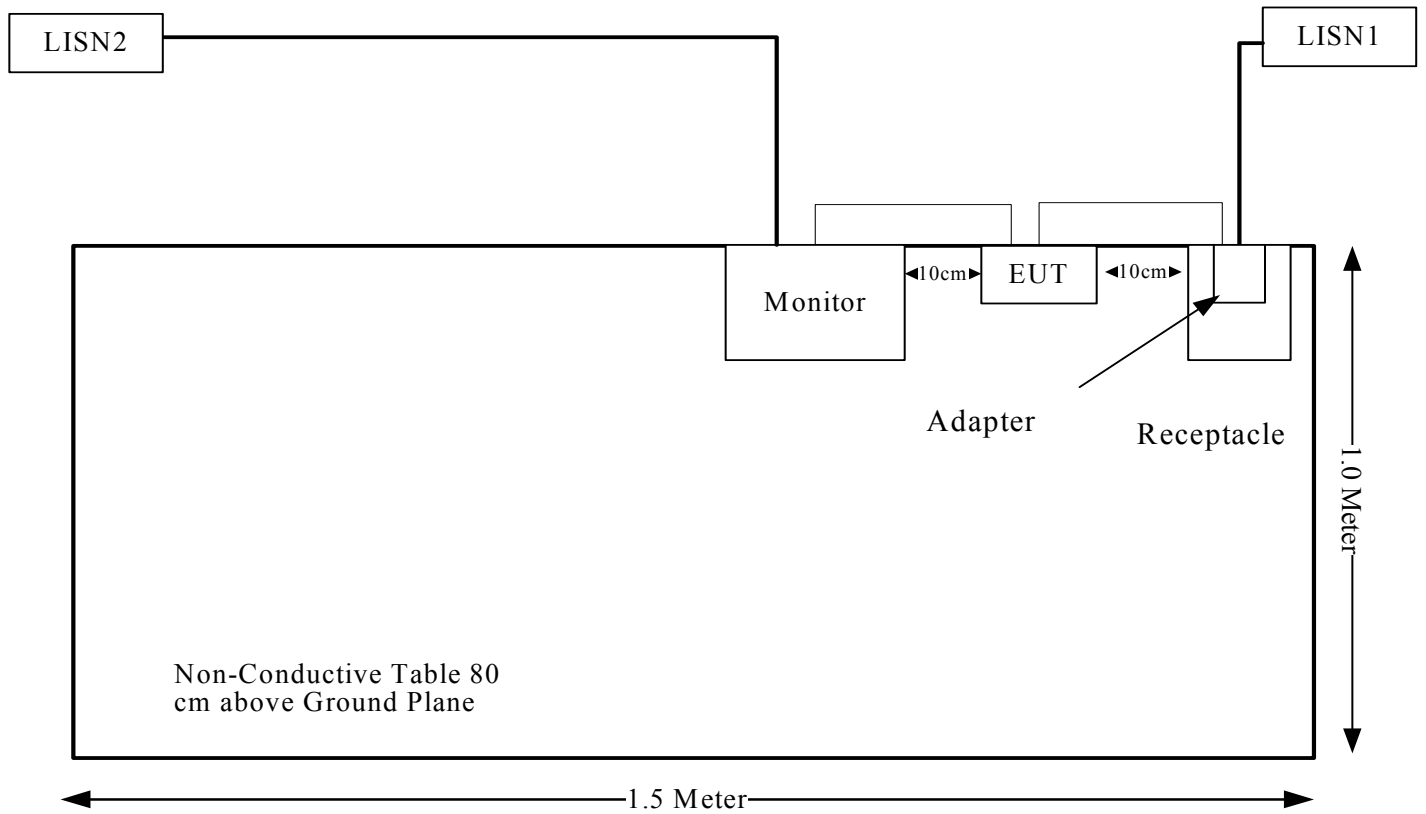
Local Support Equipment

Manufacturer	Description	Model	Serial Number
DELL	Monitor	U3011t	CN-OPH5NY-74445-16T-290L

External Cable

Cable Description	Length (m)	From/Port	To
shielded detachable HDMI cable	2.5	EUT	Monitor

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.407 (f), §2.1091, §1.1307(b)(1)	RF Exposure Evaluation	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6) & §15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209 & §15.407(b) (2), (3),(6),(7)	Undesirable Emission & Restricted Bands	Compliance
§15.407(a) (2)	26 dB Emission Bandwidth	Compliance
§15.407(a)(2)	Maximum Output Power	Compliance
§15.407 (a)(2),(5)	Peak Power Spectral Density	Compliance
§15.407(a)(6)	Peak Excursion Ratio	Compliance
§15.407(g)	Frequency Stability	Compliance
§15.407(h)	Dynamic Frequency Selection (DFS)	Compliance*

Note: * please refer to the DFS test report issued by BACL, report number: R1207114-FCC DFS.

FCC §15.407(f) & §2.1091 – RF EXPOSURE EVALUATION

Applicable Standard

According to subpart 15.407(f) and §2.1091, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

MPE Calculation

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = gain of the antenna;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

MPE Result

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
5270	2.0	1.58	18.36	68.55	20	0.0216	1.0
5510	2.0	1.58	15.56	35.97	20	0.0113	1.0

Result: The device meets FCC MPE limit at 20 cm distance

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC §15.407 (a), if the transmitting antennas of directional gain greater than 6 dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT have six “Microwave Multi-Layer Chip Type Ceramic Antenna”, one for transmitting and receiving, the rest only for receiving, which in accordance to section 15.203, the maximum gain is 2.0 dBi; please refer to the internal photos.

Result: Compliance.

FCC §15.407(b)(6) & §15.207(a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

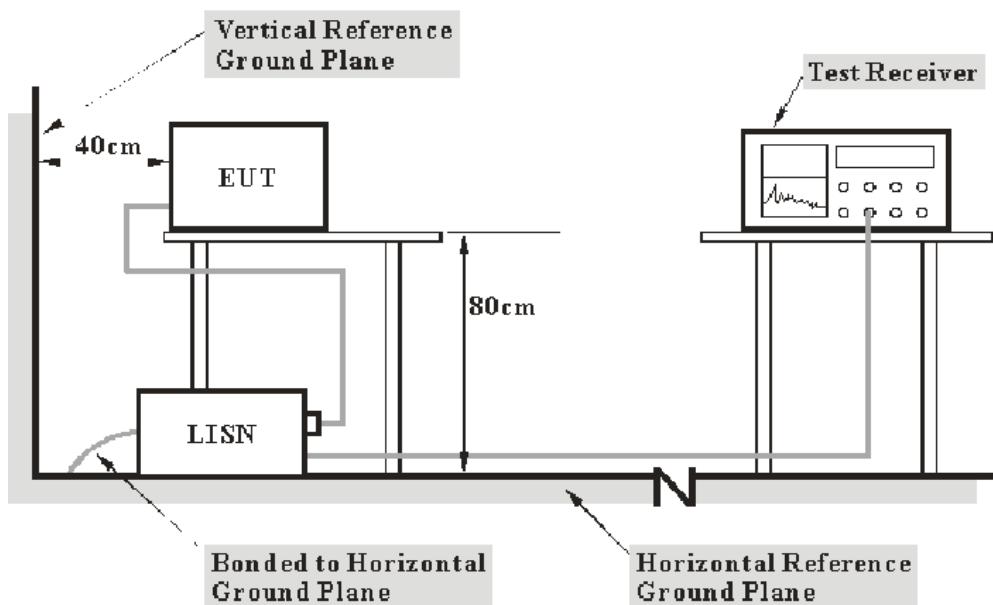
FCC §15.207, §15.407(b) (6)

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. (Dongguan) is 1.5 dB.

EUT Setup



- Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>IF B/W</i>
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	830245/006	2011-10-8	2012-10-7
Rohde & Schwarz	LISN	ESH3-Z5	843331/015	2011-10-8	2012-10-7

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the adapter of laptop was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

18.36 dB at 0.165 MHz in the Neutral line.

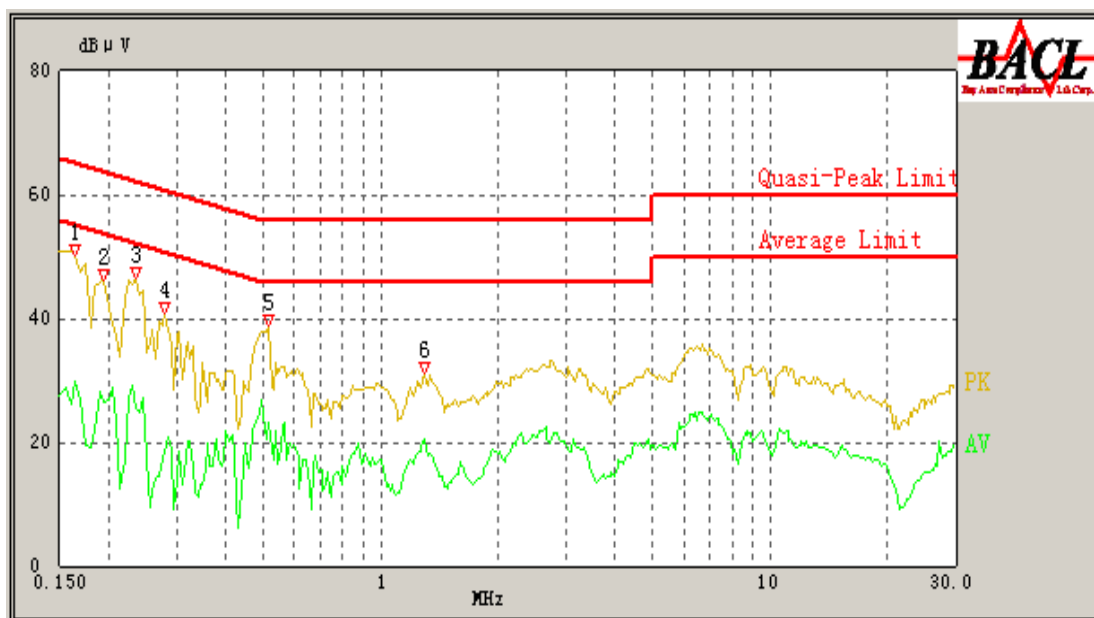
Test Data

Environmental Conditions

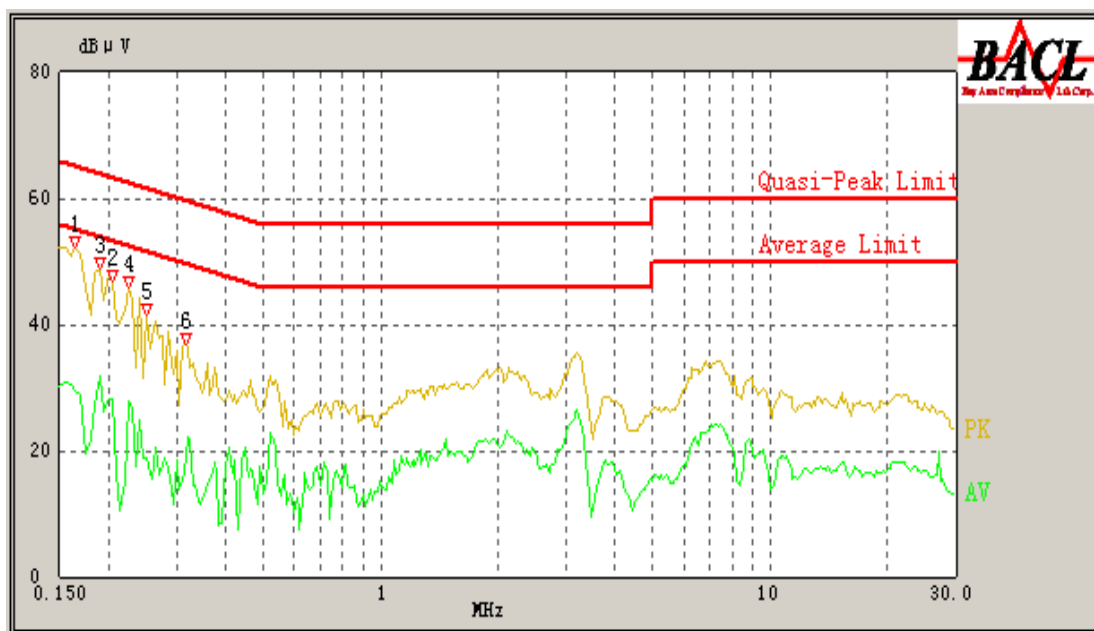
Temperature:	25 ° C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Lion Cai on 2012-06-26.

Test Mode: Transmitting

120 V, 60 Hz, Line:

Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	FCC Limit (dBμV)	Margin (dB)	Detector (PK /QP/Ave.)
0.165	46.06	0.41	65.57	19.51	QP
0.515	33.68	0.42	56.00	22.32	QP
0.515	23.33	0.42	46.00	22.67	Ave.
0.195	41.91	0.42	64.71	22.80	QP
0.235	38.48	0.42	63.57	25.09	QP
1.290	20.56	0.46	46.00	25.44	Ave.
0.165	29.92	0.41	55.57	25.65	Ave.
0.280	34.91	0.42	62.29	27.38	QP
0.235	25.66	0.42	53.57	27.91	Ave.
0.195	26.62	0.42	54.71	28.09	Ave.
1.290	26.59	0.46	56.00	29.41	QP
0.280	18.10	0.42	52.29	34.19	Ave.

120V, 60 Hz, Neutral:

Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	FCC Limit (dBμV)	Margin (dB)	Detector (PK /QP/Ave.)
0.165	47.21	0.41	65.57	18.36	QP
0.190	43.91	0.42	64.86	20.95	QP
0.190	31.84	0.42	54.86	23.02	Ave.
0.205	41.21	0.42	64.43	23.22	QP
0.225	27.91	0.42	53.86	25.95	Ave.
0.165	29.34	0.41	55.57	26.23	Ave.
0.205	28.15	0.42	54.43	26.28	Ave.
0.225	37.39	0.42	63.86	26.47	QP
0.250	36.09	0.42	63.14	27.05	QP
0.315	30.78	0.42	61.29	30.51	QP
0.315	18.76	0.42	51.29	32.53	Ave.
0.250	19.00	0.42	53.14	34.14	Ave.

FCC §15.205, §15.209 & §15.407(b) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (2), (3), (6), (7); §15.209; §15.205;

For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15–5.25 GHz band. Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

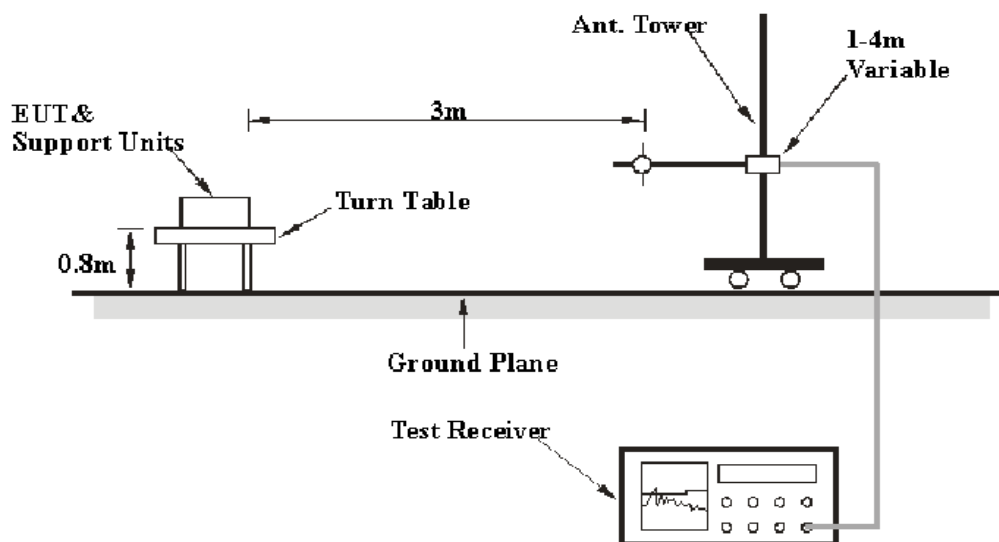
For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of –27 dBm/MHz.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement from 30 MHz to 1 GHz at Bay Area Compliance Laboratories Corp. (Dongguan) is 4.9 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.407 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source,

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 40 GHz	1 MHz	3 MHz	PK
1000 MHz – 40 GHz	1 MHz	10 Hz	Ave.

Test Procedure

During the radiated emission test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Reciever	ESCI	100224	2012-5-13	2013-5-12
Sunol Sciences	Hybrid Antennas	JB3	A060611-1	2011-9-6	2012-9-5
HP	Pre-amplifier	8447E	2434A02181	2011-10-8	2012-10-7
Rohde & Schwarz	Spectrum Analyzer	FSEM	1079 8500	2011-10-9	2012-10-8
Dayang	Horn Antenna	OMCDH10180	10279001B	2010-7-30	2013-7-29
mini-circuits	Wideband Amplifier	ZVA-183-S+	96901149	2012-4-24	2013-4-23
Rohde & Schwarz	EMI Test Reciever	FSP38	100478	2012-5-13	2013-5-12

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.209 and 15.407, with the worst margin reading of:

2.65 dB at 891.34 MHz in the **Horizontal** polarization for operating in 5250-5350 MHz

1.61 dB at 11100 MHz in the **Horizontal** polarization for operating in 5470-5725 MHz

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Lion Cai from 2012-06-26 to 2012-06-28.

Test Mode: Transmitting

5250-5350 MHz:

Ant. Polar (H/V)	Frequency (MHz)	S.A. Reading (dBuV/m)	Detector	Correction Factor (dB)	Cord. Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comennt
Operating frequency: 5270 MHz								
H	891.36	40.56	QP	2.77	43.33	46	2.67*	spurious
V	891.36	40.38	QP	2.77	43.15	46	2.85*	spurious
H	10640	24.95	Ave.	21.75	46.7	54	7.3	harmonic
V	10640	24.85	Ave.	21.75	46.6	54	7.4	harmonic
H	10640	37.59	PK	21.75	59.34	68.2	8.86	harmonic
V	10640	34.97	PK	21.75	56.72	68.2	11.48	harmonic
H	5150	22.26	Ave.	12.37	34.63	54	19.37	spurious
H	5150	36.36	PK	12.37	48.73	68.2	19.47	spurious
V	5150	22.02	Ave.	12.37	34.39	54	19.61	spurious
V	5150	35.67	PK	12.37	48.04	68.2	20.16	spurious
H	5270	91.26	PK	12.1	103.36	N/A	N/A	Fund.
H	5270	77.76	Ave.	12.1	89.86	N/A	N/A	Fund.
V	5270	85.83	PK	12.1	97.93	N/A	N/A	Fund.
V	5270	72.02	Ave.	12.1	84.12	N/A	N/A	Fund.
Operating frequency: 5310 MHz								
H	891.34	40.58	QP	2.77	43.35	46	2.65*	spurious
V	891.34	40.37	QP	2.77	43.14	46	2.86*	spurious
H	10620	28.45	Ave.	22.22	50.67	54	3.33*	harmonic
V	10620	23.76	Ave.	22.22	45.98	54	8.02	harmonic
H	10620	35.72	PK	22.22	57.94	68.2	10.26	harmonic
V	10620	33.03	PK	22.22	55.25	68.2	12.95	harmonic
H	5350	36.33	PK	11.77	48.1	68.2	20.1	spurious
H	5350	21.07	Ave.	11.77	32.84	54	21.16	spurious
V	5350	19.56	Ave.	11.77	31.33	54	22.67	spurious
V	5350	32.46	PK	11.77	44.23	68.2	23.97	spurious
H	5310	86.93	PK	12.18	99.11	N/A	N/A	Fund.
H	5310	74.08	Ave.	12.18	86.26	N/A	N/A	Fund.
V	5310	83.42	PK	12.18	95.6	N/A	N/A	Fund.
V	5310	69.91	Ave.	12.18	82.09	N/A	N/A	Fund.

5470-5725 MHz:

Ant. Polar (H/V)	Frequency (MHz)	S.A. Reading (dBuV/m)	Detector	Correction Factor (dB)	Cord. Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comennt
Operating frequency: 5510 MHz								
V	11020	26.9	Ave.	24.34	51.24	54	2.76*	harmonic
V	891.36	39.54	QP	2.77	42.31	46	3.69*	spurious
H	11020	25.78	Ave.	24.34	50.12	54	3.88*	harmonic
H	891.36	39.31	QP	2.77	42.08	46	3.92*	spurious
H	11020	37.99	PK	24.34	62.33	68.2	5.87	harmonic
V	11020	37.86	PK	24.34	62.2	68.2	6	harmonic
H	5460	18.56	Ave.	12.13	30.69	54	23.31	spurious
H	5460	31.34	PK	12.13	43.47	68.2	24.73	spurious
H	5510	83.4	PK	12.31	95.71	N/A	N/A	Fund.
H	5510	70.01	Ave.	12.31	82.32	N/A	N/A	Fund.
V	5510	85.6	PK	12.31	97.91	N/A	N/A	Fund.
V	5510	68.33	Ave.	12.31	80.64	N/A	N/A	Fund.
Operating frequency: 5550 MHz								
H	11100	28.32	Ave.	24.07	52.39	54	1.61*	harmonic
H	891.36	39.85	QP	2.77	42.62	46	3.38*	spurious
V	891.36	39.56	QP	2.77	42.33	46	3.67*	spurious
H	11100	38.14	PK	24.07	62.21	68.2	5.99	harmonic
V	11100	23.67	Ave.	24.07	47.74	54	6.26	harmonic
V	11100	37.63	PK	24.07	61.7	68.2	6.5	harmonic
H	7650	33.15	PK	19.10	52.25	68.2	15.95	spurious
H	5550	82.58	PK	12.34	94.92	N/A	N/A	Fund.
H	5550	68.38	Ave.	12.34	80.72	N/A	N/A	Fund.
V	5550	85.34	PK	12.34	97.68	N/A	N/A	Fund.
V	5550	68.58	Ave.	12.34	80.92	N/A	N/A	Fund.
Operating frequency: 5670 MHz								
V	891.36	39.56	QP	2.77	42.33	46	3.67*	spurious
H	891.36	39.34	QP	2.77	42.11	46	3.89*	spurious
H	11340	25.01	Ave.	23.25	48.26	54	5.74	harmonic
H	11340	38.09	PK	23.25	61.34	68.2	6.86	harmonic
V	11340	38.07	PK	23.25	61.32	68.2	6.88	harmonic
V	11340	23.5	Ave.	23.25	46.75	54	7.25	harmonic
H	7350	32.18	PK	19.20	51.38	68.2	16.82	spurious
H	5670	80.37	PK	12.81	93.18	N/A	N/A	Fund.
H	5670	67.85	Ave.	12.81	80.66	N/A	N/A	Fund.
V	5670	82.25	PK	12.81	95.06	N/A	N/A	Fund.
V	5670	67.34	Ave.	12.81	80.15	N/A	N/A	Fund.

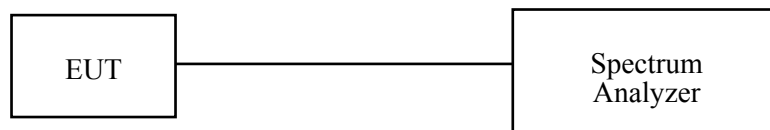
*Within measurement uncertainty!

Conducted Spurious Emission at Antenna Port

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Use a combiner combine all the transmit chains (antenna outputs) into a single test point, then connect to the spectrum analyzer. The Resolution bandwidth is set to 1 MHz, The Video bandwidth is set to 1 MHz, report the peak value out of the operating band.
3. Repeat above procedures until all frequencies measured were complete.

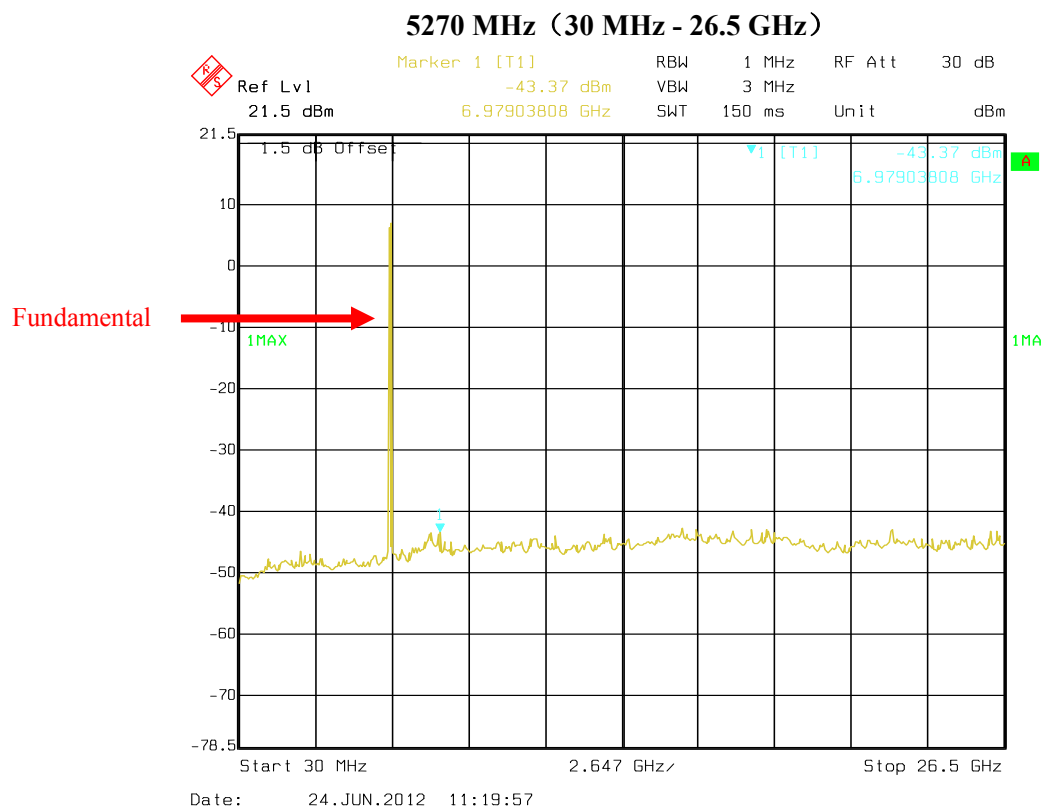
Offset value =attenuation+combiner loss +cable loss



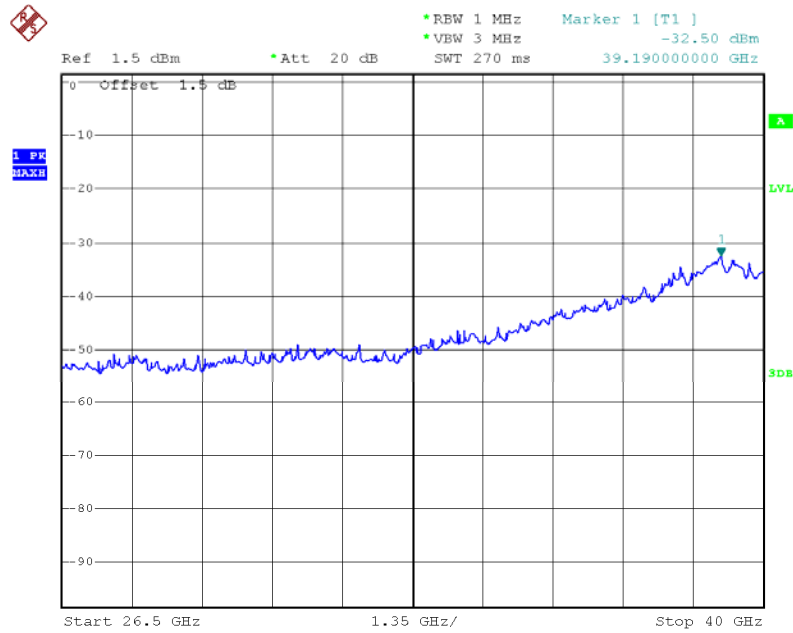
Test data

Please refer to the following plots.

5250-5350 MHz:

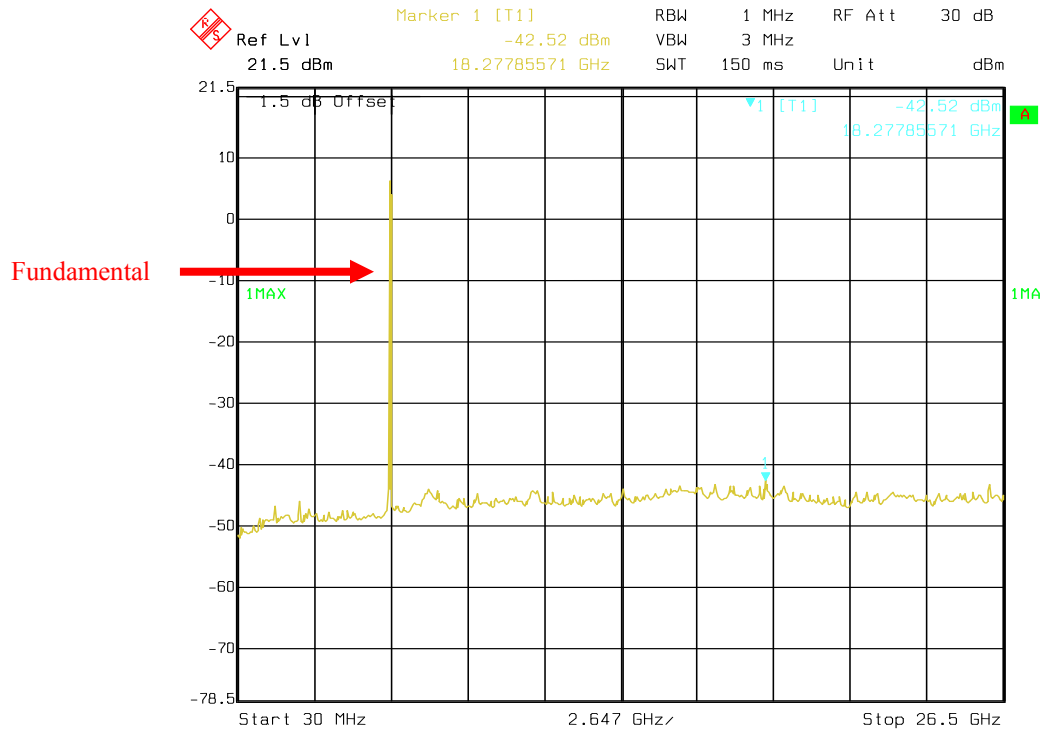


5270 MHz (26.5 GHz - 40 GHz)



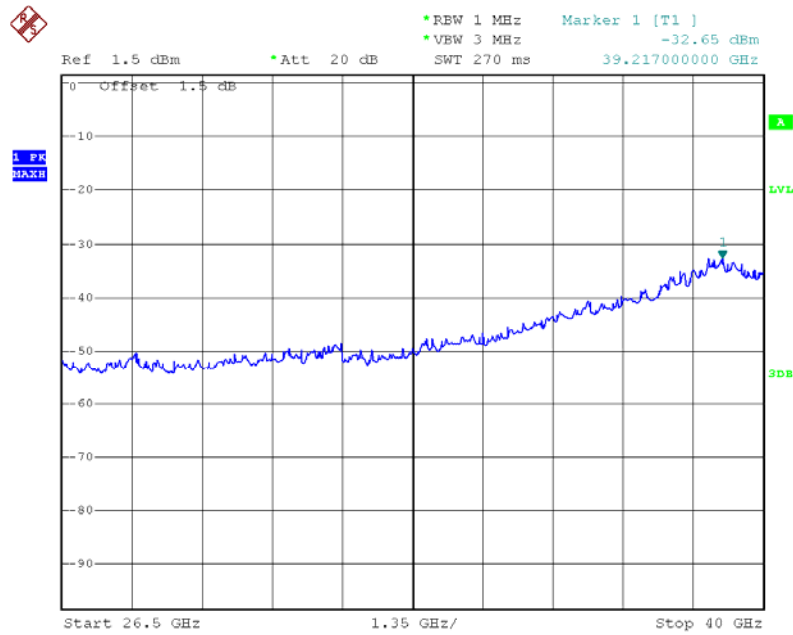
Date: 26.JUN.2012 13:23:03

5310 MHz (30 MHz - 26.5 GHz)



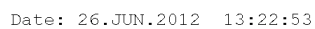
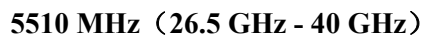
Date: 24.JUN.2012 11:36:44

5310 MHz (26.5 GHz - 40 GHz)



Date: 26 JUN 2012 12:22:00

5510 MHz (30 MHz - 26.5 GHz)



Ref Lvl 11.5 dBm

Marker 1 [T1] -51.14 dBm

2.14599198 GHz

RBW 1 MHz RF Att 20 dB

VBW 3 MHz

SWT 150 ms Unit dBm

11.5 dB Offset

1MAX

1 [T1] -51.14 dBm

2.14599198 GHz

Start 30 MHz

2.647 GHz

Stop 26.5 GHz

Date: 26.JUN.2012 15:27:28

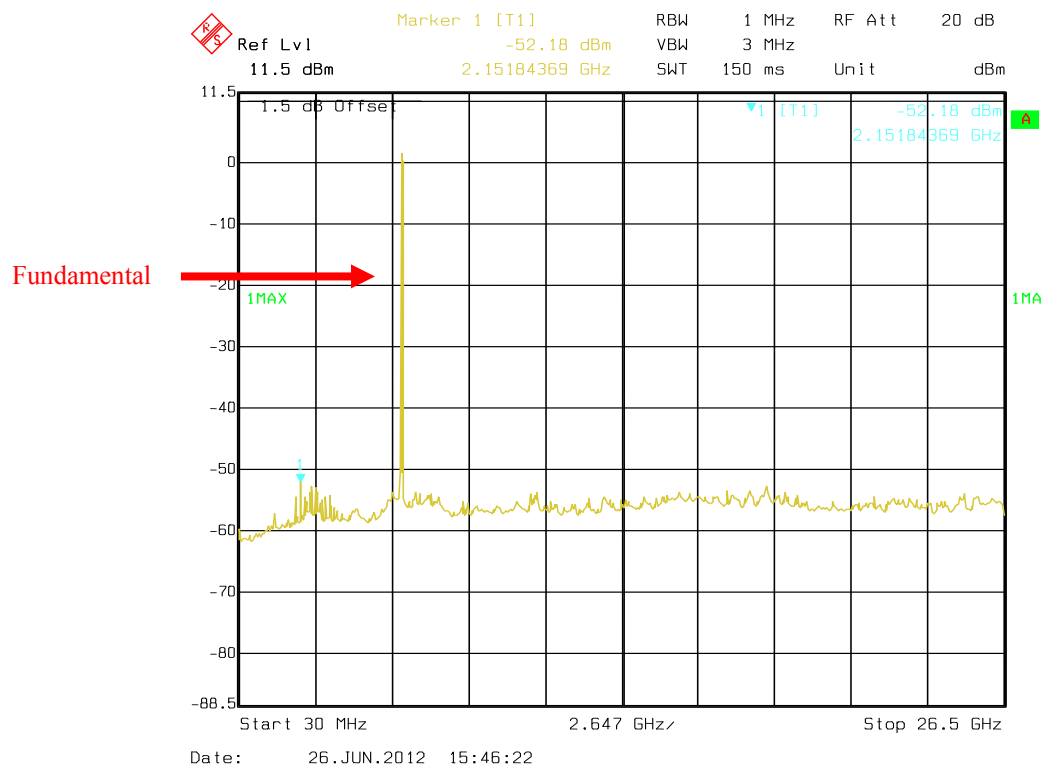
Ref 1.5 dBm • Att 20 dB • RBW 1 MHz Marker 1 [T1] -32.72 dBm
 • VEW 3 MHz SWT 270 ms 39.406000000 GHz

0 Offset 1.5 dB

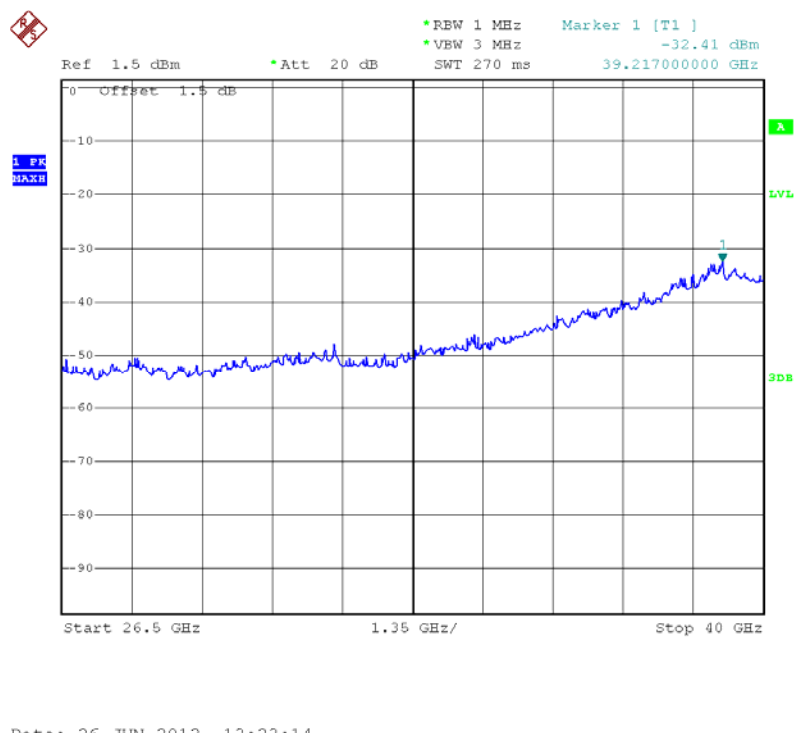
1 PK
MAX

Start 26.5 GHz 1.35 GHz/ Stop 40 GHz

5670 MHz (30 MHz - 26.5 GHz)



5670 MHz (26.5 GHz - 40 GHz)



FCC §15.407(a) (2) – 26 dB EMISSION BANDWIDTH

Applicable Standard

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

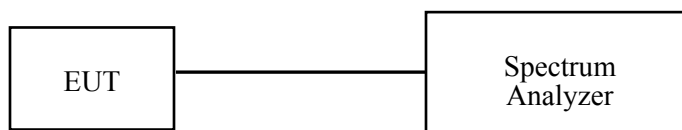
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Use a RBW = approximately 1% of the emission bandwidth. Set the VBW > RBW. Use a peak detector. Do not use the Max Hold function. Rather, use the view button to capture the emission. Measure maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat, measurement as needed until the RBW/EBW ratio is approximately 1%.
4. Repeat above procedures until all frequencies measured were complete.



Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

The testing was performed by Lion Cai on 2012-06-26.

Test Result: Please refer to the following tables and plots.

Channel Frequency (MHz)	26 dB Emission Bandwidth (MHz)
5270	38.64
5310	38.78
5510	38.48
5550	38.48
5670	38.32

26 dB Bandwidth - 5270 MHz

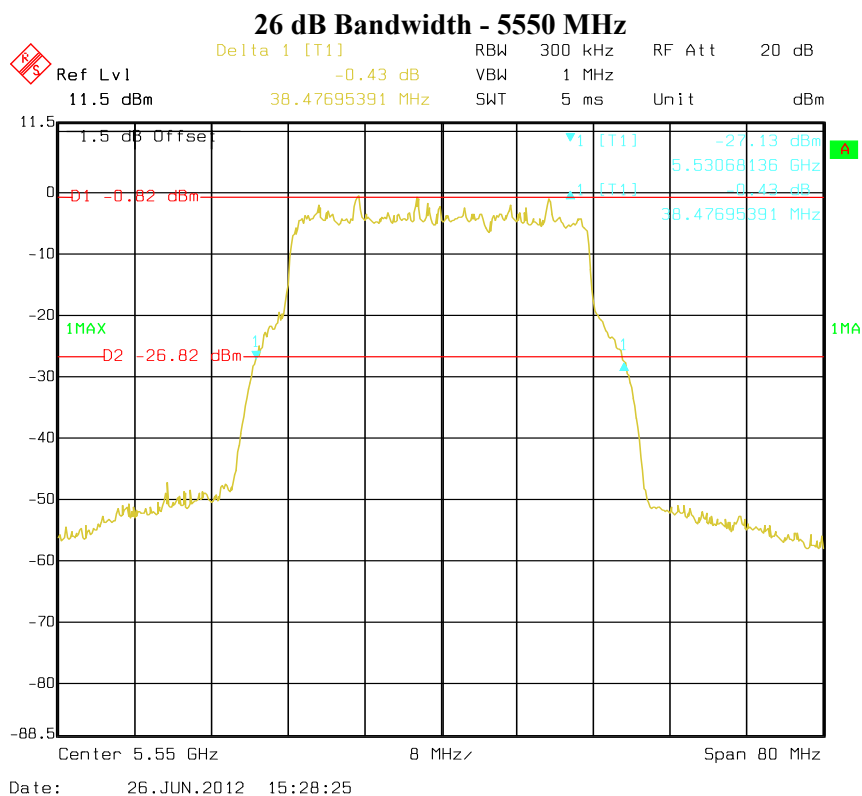


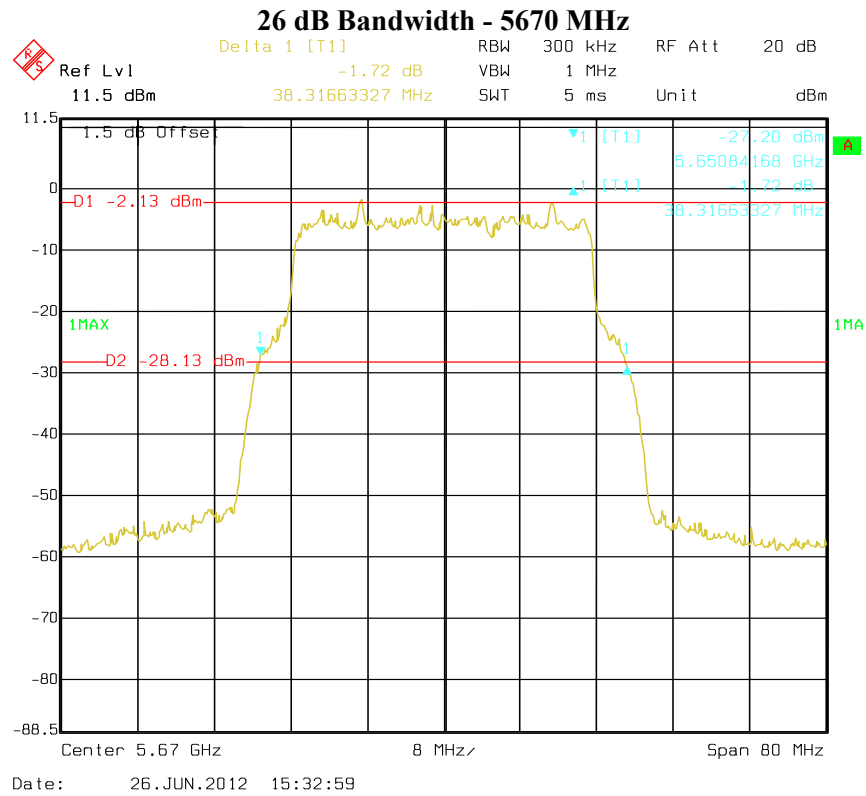
Delta 1 [T1] -0.04 dB
 RBW 300 kHz RF Att 20 dB
 Ref Lvl 11.5 dBm -0.04 dB
 11.5 dBm 38.47695391 MHz
 VBW 1 MHz
 SWT 5 ms Unit dBm

1.5 dB Offset
 D1 -0.3 dBm
 1MAX
 D2 -26.03 dBm
 1 [T1] -26.31 dBm
 5.49068136 GHz
 1 [T1] -0.04 dBm
 38.47695391 MHz
 1MAX

Center 5.51 GHz 8 MHz Span 80 MHz

Date: 26.JUN.2012 15:15:58





FCC §15.407(a) (2) – MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

For the 5.25–5.35 GHz and 5.47– 5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14
Rohde & Schwarz	EMI Test Receiver	FSP38	100478	2012-5-13	2013-5-12

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set span = 80MHz (to encompass the entire emission bandwidth (EBW) of the signal). Set RBW = 1 MHz. Set VBW ≥ 3 MHz. Use sample detector mode. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to "free run". Trace average 100 traces in power averaging mode. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.
4. Repeat above procedures until all frequencies measured were complete.

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

The testing was performed by Lion Cai on 2012-06-26.

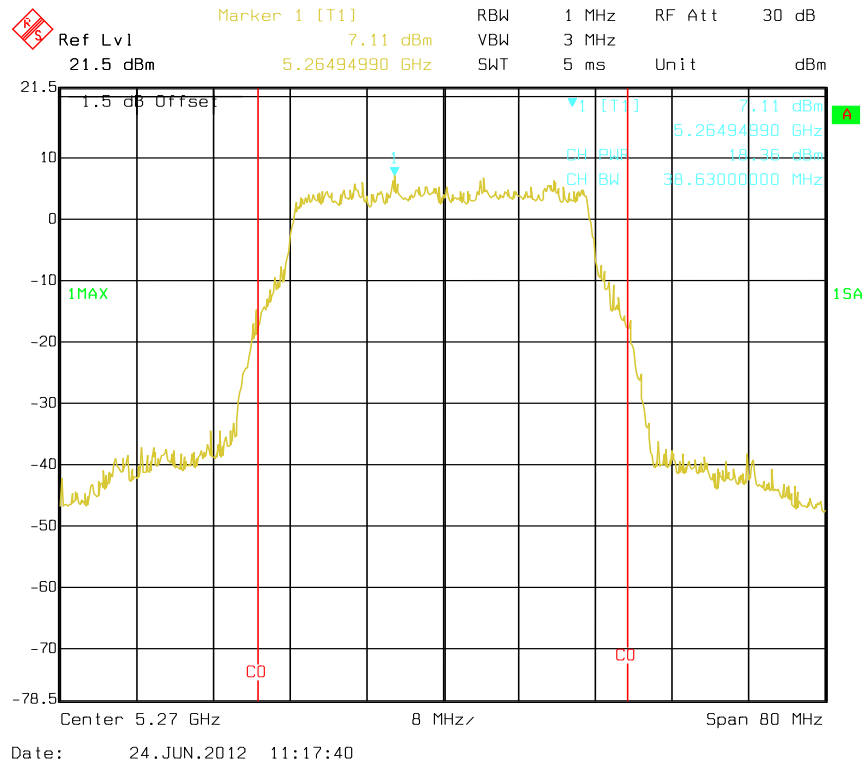
Test Mode: Transmitting

Test Result: Pass; please refer to the following tables and plots.

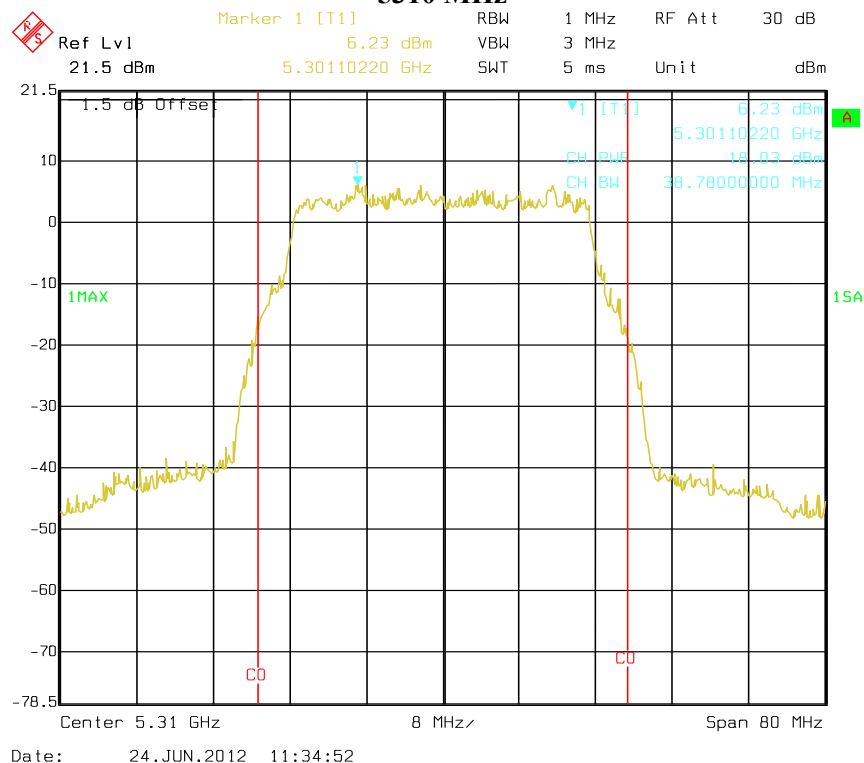
Channel Frequency (MHz)	Conducted Output Power (dBm)	FCC Limit (dBm)
5270	18.36	24
5310	18.03	24
5510	15.56	24
5550	15.24	24
5670	15.04	24

5250-5350 MHz:

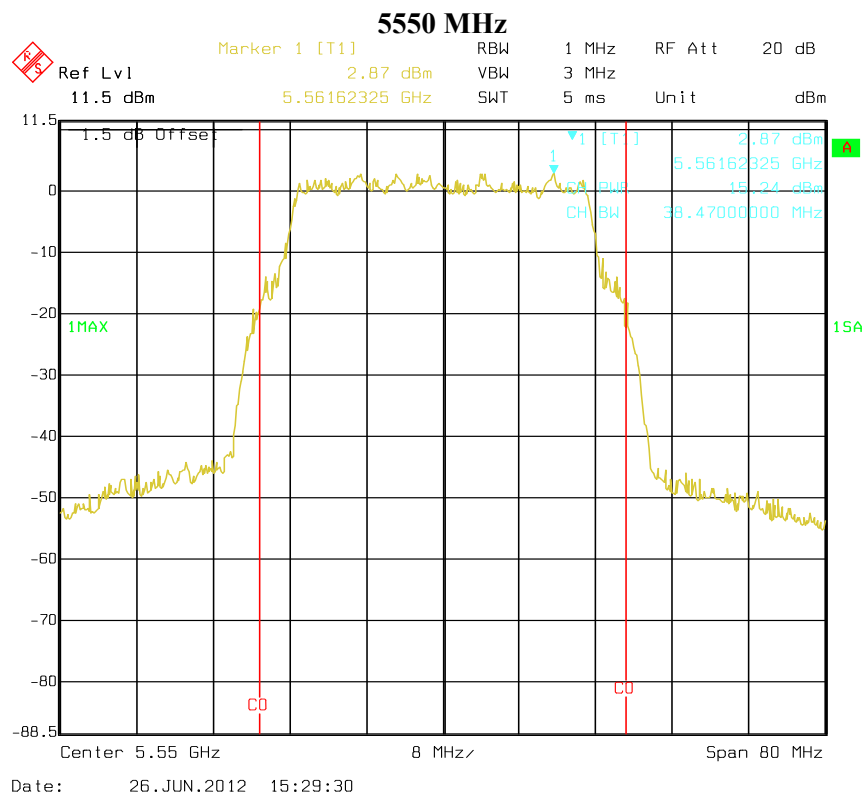
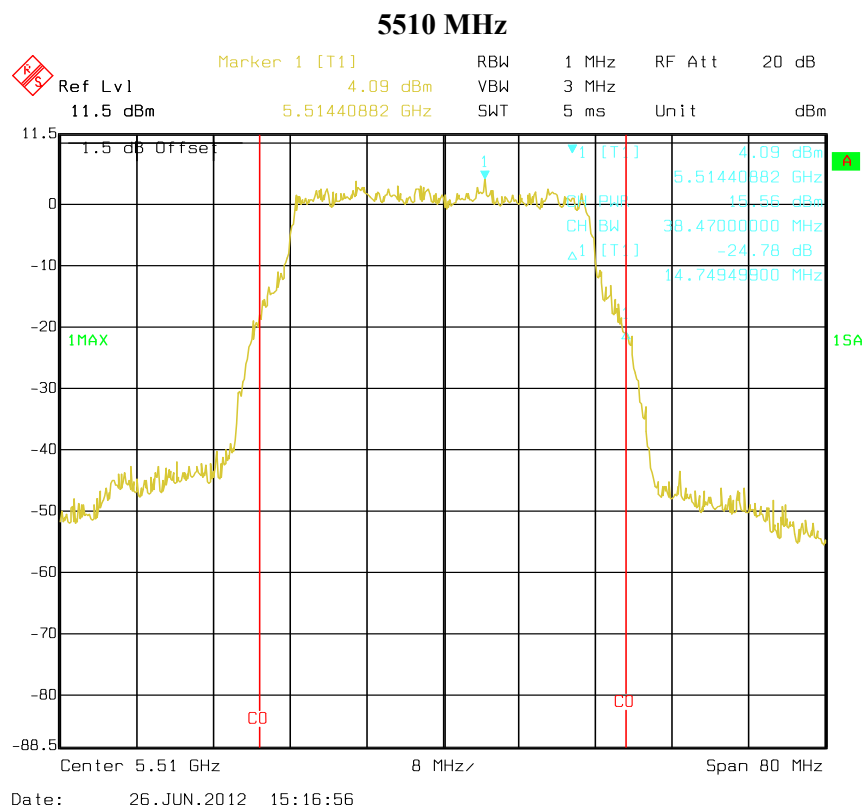
5270 MHz

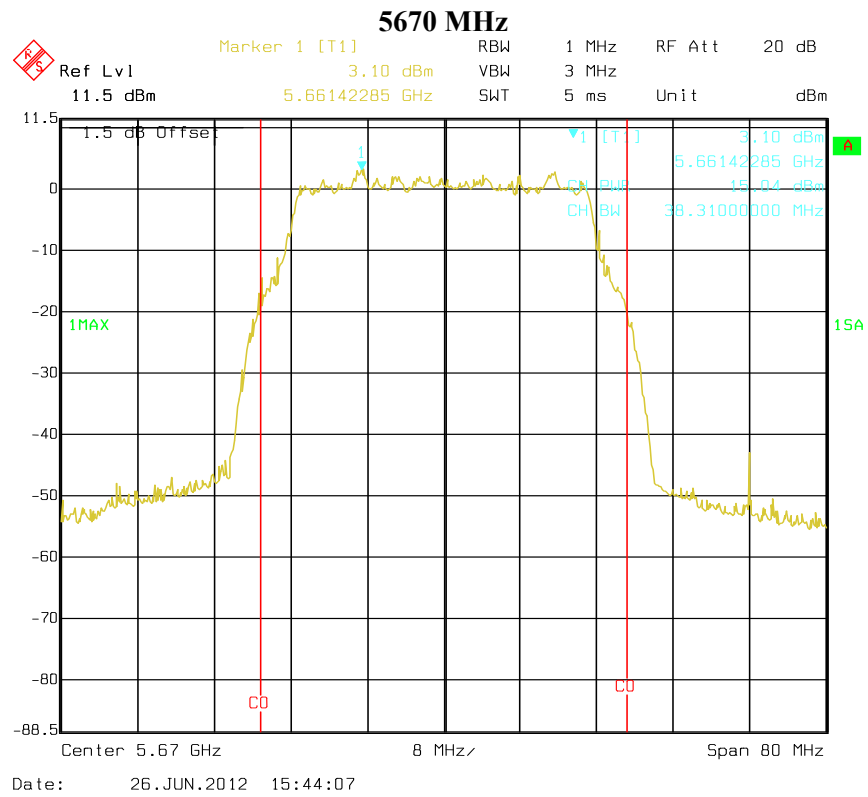


5310 MHz



5470-5725 MHz:





FCC §15.407(a) (2) (5) – PEAK POWER SPECTRAL DENSITY**Applicable Standard**

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Use sample detector and power averaging (not video averaging) mode. Set RBW= 1 MHz*, VBW > 1 MHz. The PPSD is the highest level found across the emission in any 1-MHz band after 100 sweeps of averaging. This method is permitted only if the transmission pulse or sequence of pulses remains at maximum transmits power throughout each of the 100 sweeps of averaging and that the interval between pulses is not included in any of the sweeps.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Reciever	FSP38	100478	2012-5-13	2013-5-12

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data**Environmental Conditions**

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Lion Cai on 2012-06-29.

Test Mode: Transmitting

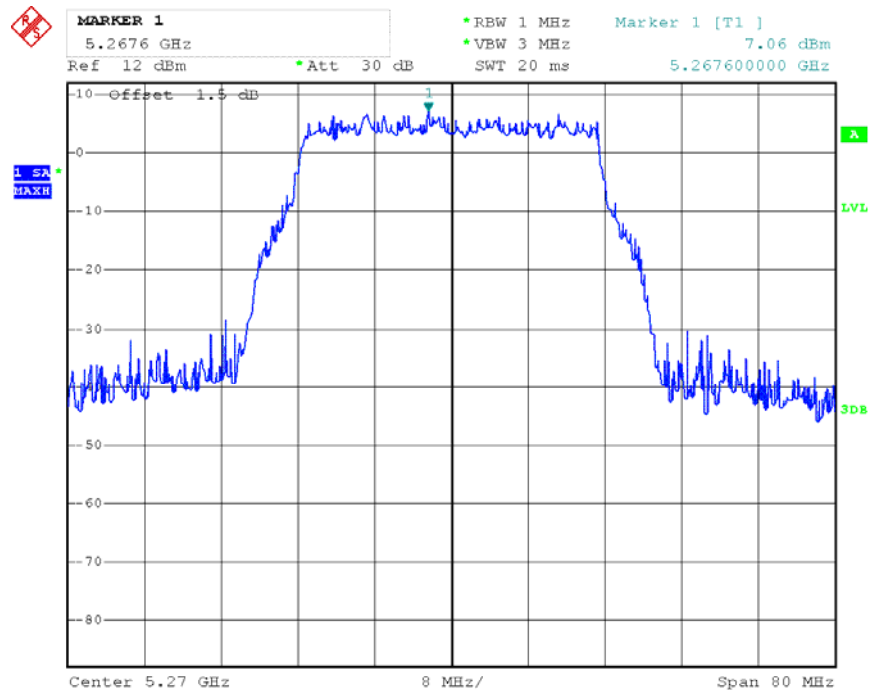
Test Result: Pass, please refer to the following table and plots.

5250-5350 MHz:

Channel Frequency (MHz)	Peak Power Spectral Density (dBm/MHz)	FCC Limit (dBm/MHz)
527	7.06	11
5310	6.81	11
5510	3.47	11
5550	3.34	11
5670	2.43	11

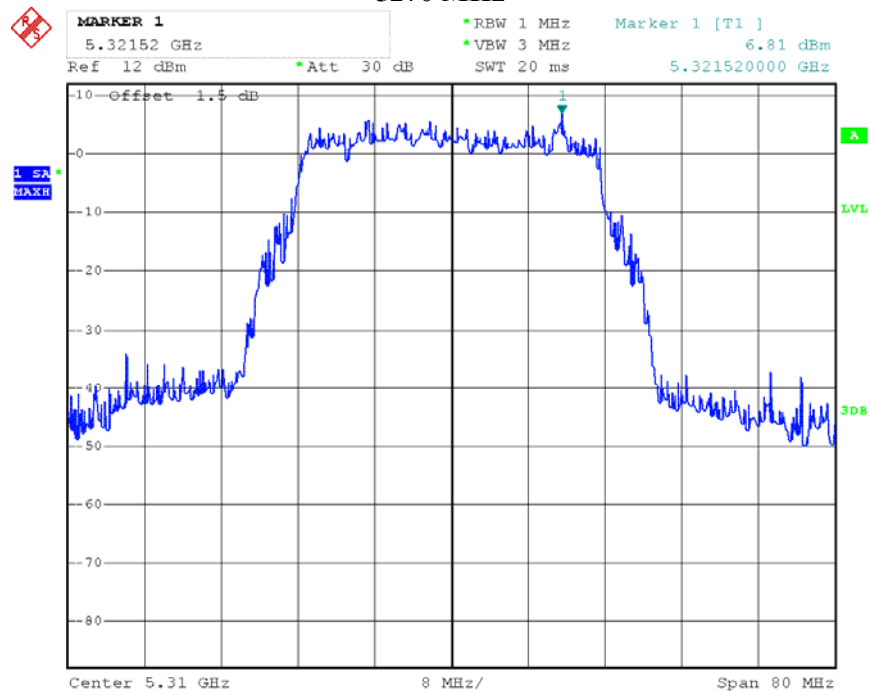
5250-5350 MHz:

5230 MHz



Date: 29.JUN.2012 15:40:49

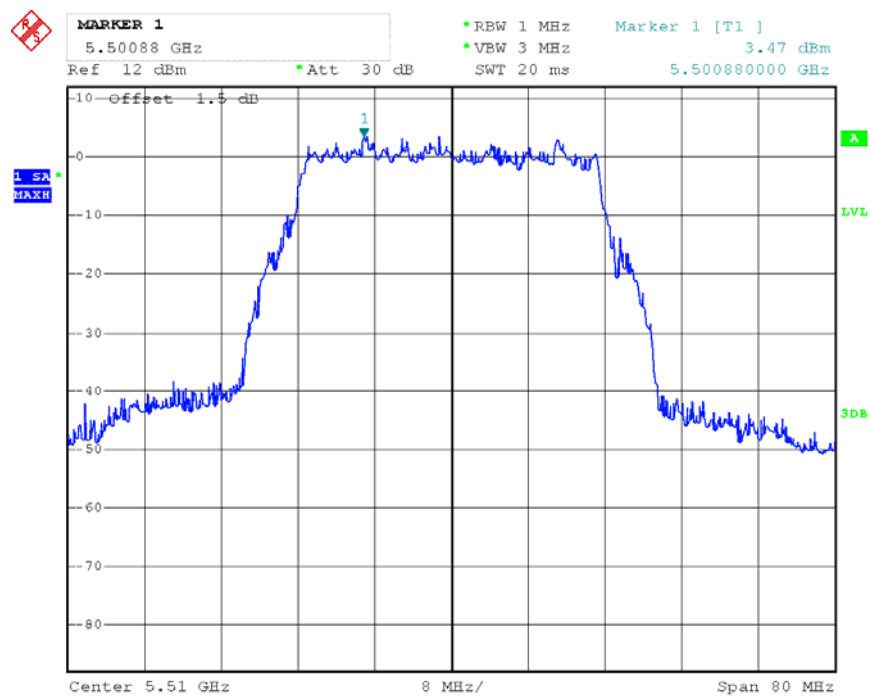
5270 MHz



Date: 29.JUN.2012 15:42:06

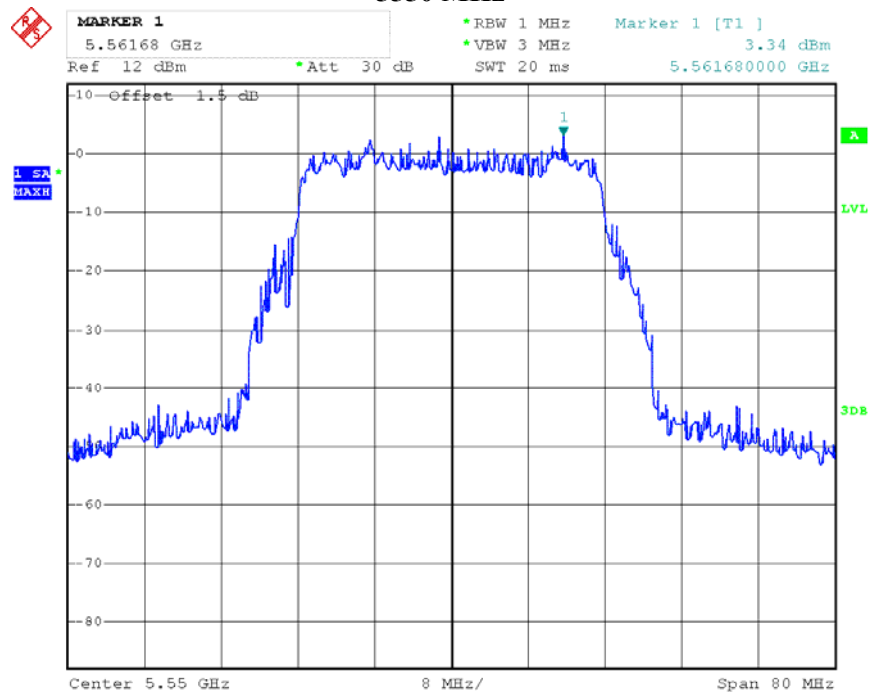
5470-5725 MHz:

5510 MHz

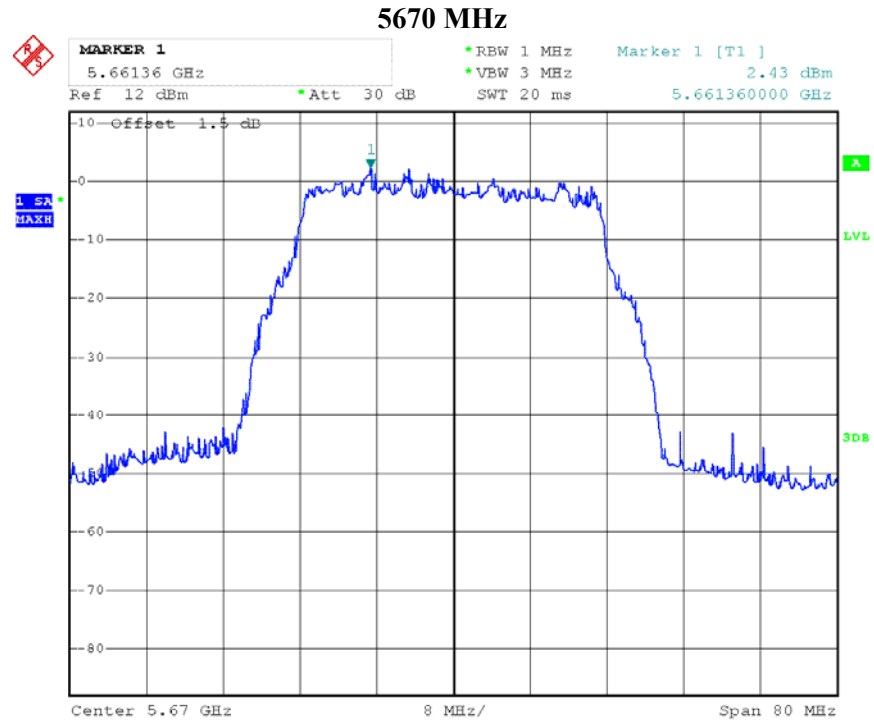


Date: 29.JUN.2012 15:43:53

5550 MHz



Date: 29.JUN.2012 15:44:48



Date: 29.JUN.2012 15:49:09

FCC §15.407(a) (6) – PEAK EXCURSION RATIO

Applicable Standard

According to §15.407(a) (6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Test Procedure

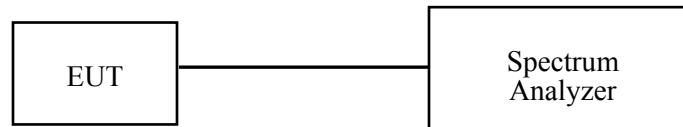
Set the spectrum analyzer span to view the entire emission bandwidth.
The largest difference between the following two traces must be ≤ 13 dB for all frequencies across the emission bandwidth. Submit a plot.

1st Trace:

- Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and maxhold settings.

2nd Trace:

- create the 2nd trace using the settings described in the section “FCC §15.407(a)(2) – CONDUCTED TRANSMITTER OUTPUT POWER”.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

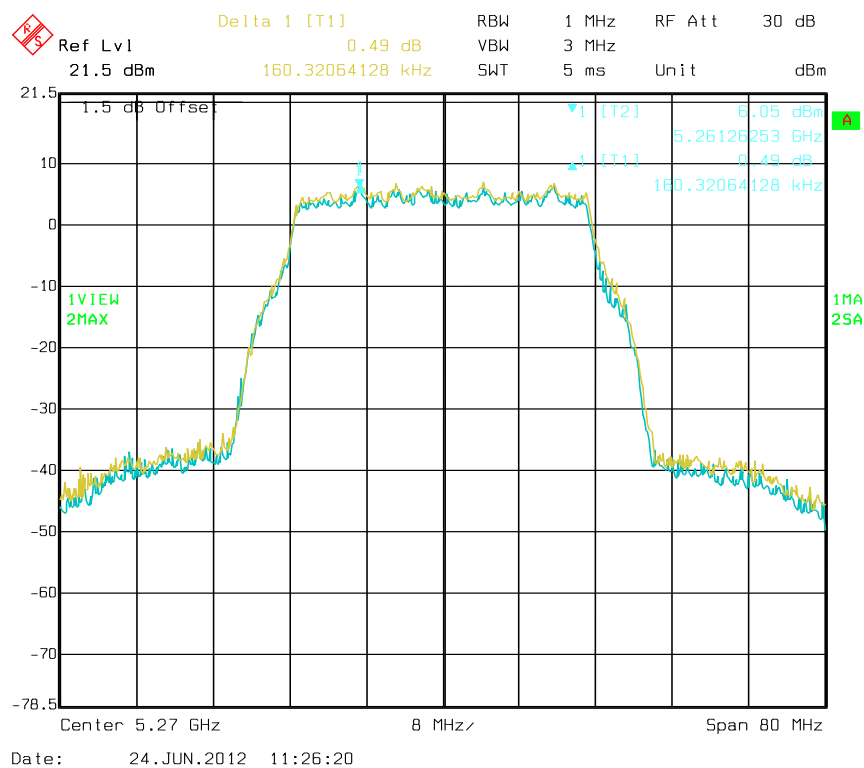
Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Lion Cai on 2012-06-26.

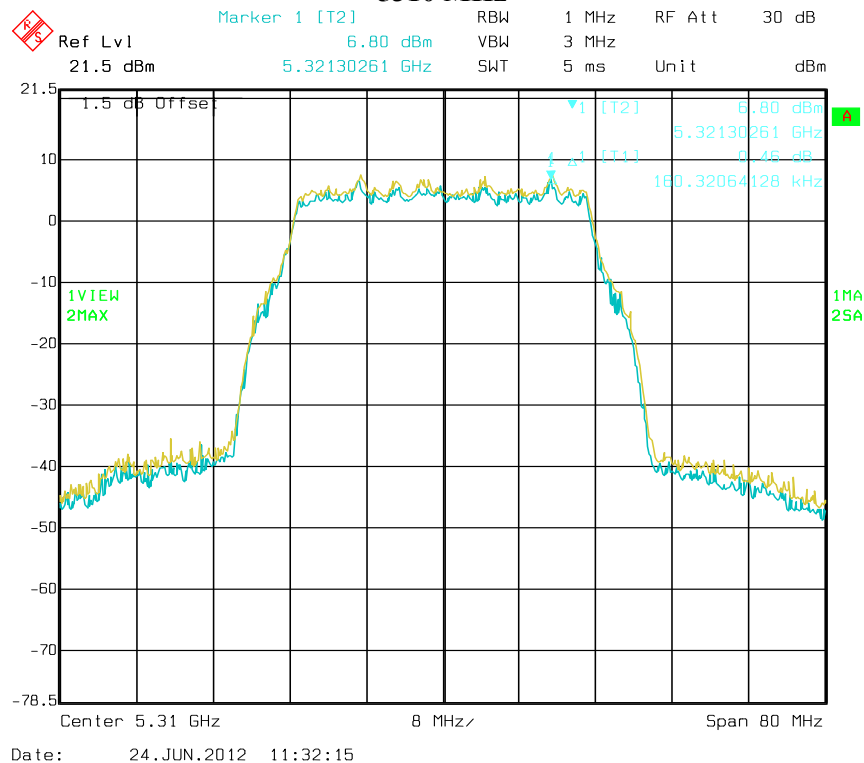
Test Mode: Transmitting

5250-5350 MHz:

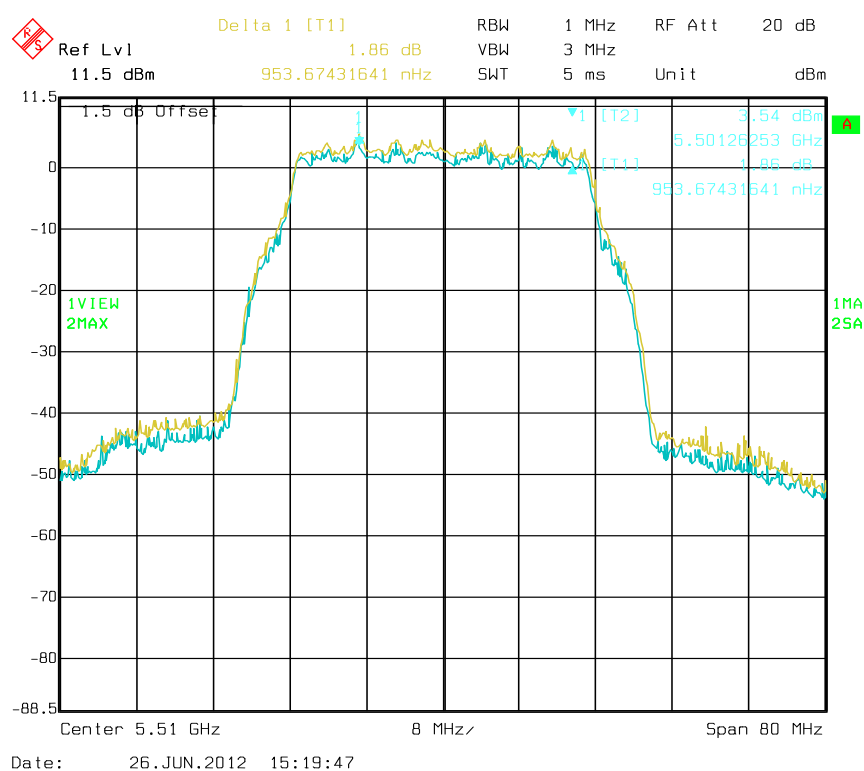
Channel Frequency (MHz)	Peak Excursion Ratio (dB)	Limit (dB)
5270	0.49	13
5310	0.46	13
5510	1.86	13
5550	0.79	13
5670	0.17	13

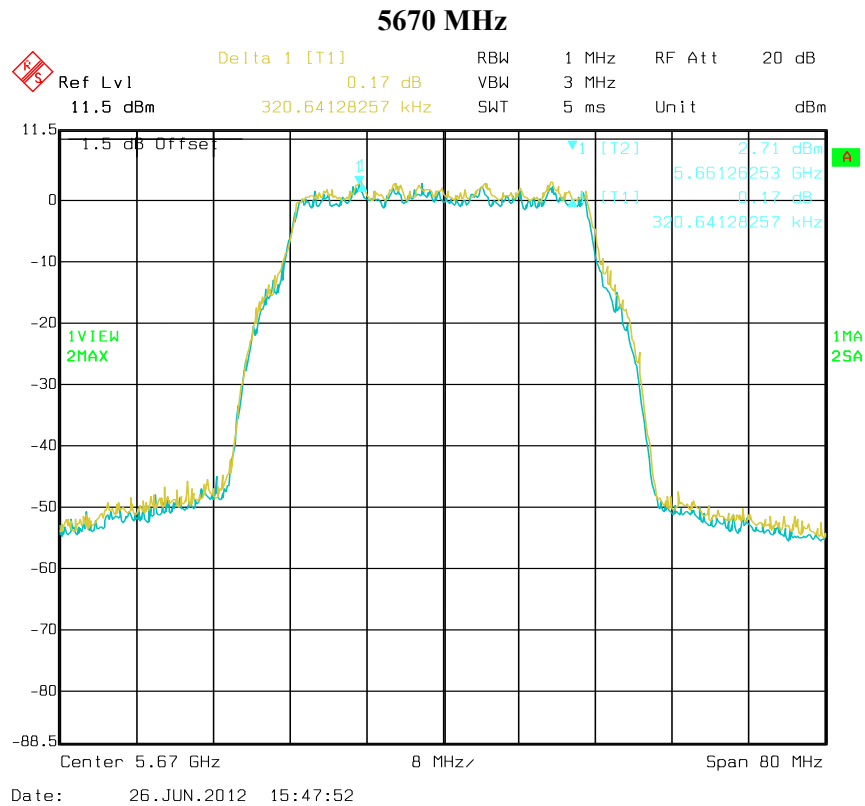
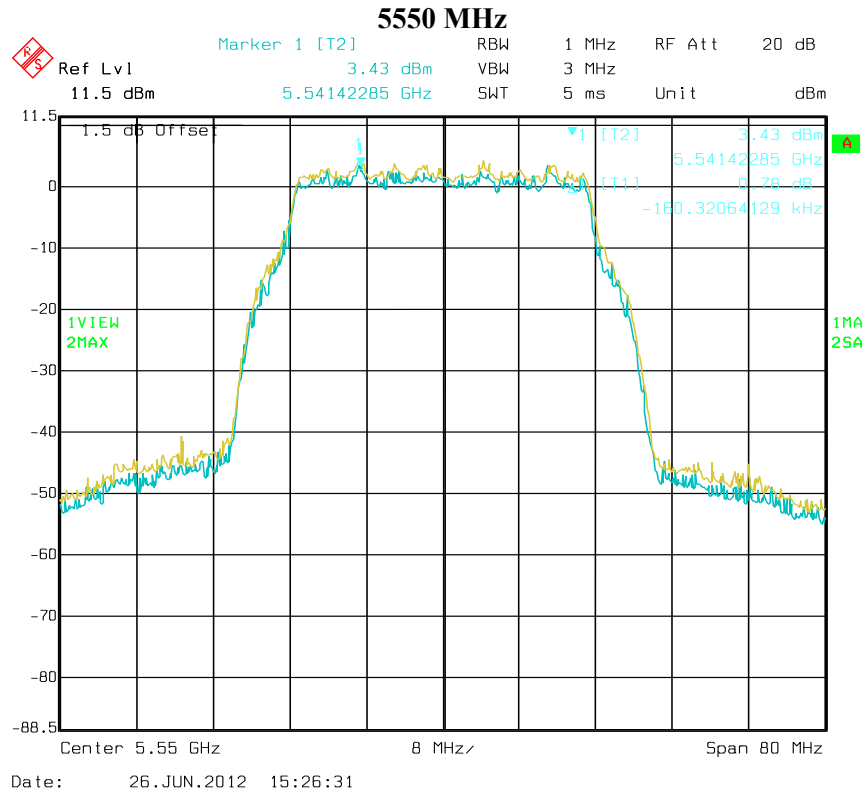
5270 MHz

5310 MHz



5510 MHz





FCC §407(g) - FREQUENCY STABILITY

Applicable Standards

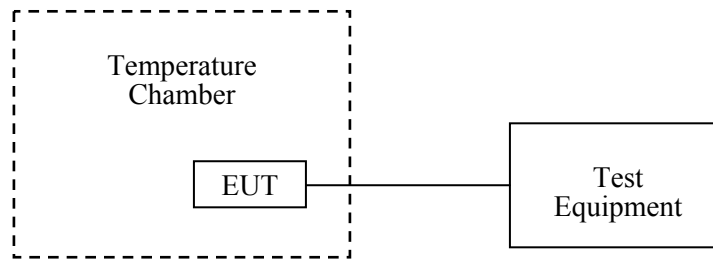
FCC§407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The AC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable AC power supply was connected to the adaptor terminals of the equipment under test. The voltage was set to 85% and 115% of the nominal value and was then decreased until the transmitter light no longer illuminated. The output frequency was recorded for each voltage.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
WUHUAN	Temperature & Humidity Chamber	HTP205	20021115	2011-06-04	2012-06-03
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data**Environmental Conditions**

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Lion Cai on 2012-06-26.

Test Mode: Transmitting

5250-5350 MHz

Frequency (MHz)	Power supply (V _{AC})	Temperature (°C)	Measured Frequency (MHz)
5270	120	-30	5269.964
		-20	5269.967
		-10	5269.968
		+0	5269.961
		+10	5269.966
		+20	5269.973
		+30	5269.959
		+40	5269.962
		+50	5269.969
	138	+20	5269.967
	102	+20	5269.973

5470-5725 MHz

Frequency (MHz)	Power supply (V _{AC})	Temperature (°C)	Measured Frequency (MHz)
5510	120	-30	5509.969
		-20	5509.965
		-10	5509.961
		+0	5509.968
		+10	5509.964
		+20	5509.959
		+30	5509.972
		+40	5509.969
		+50	5509.965
	138	+20	5509.966
	102	+20	5509.959

***** END OF REPORT *****