Lab Code: 200707-0

FCC PART 15.407

MEASUREMENT AND TEST REPORT

For

Dfine Technology Co., Ltd.

4th Floor Building A2, Tianfu Software Park, No. 765 Tianfu Road Zhongduan,

Chengdu, Sichuan, China

FCC ID: Y48JDHMDZ-D1AT

Report Type:	**Product Type:**
Original Report	WHDI Wireless Transceiver Module (Tx)

Test Engineer:	Felix Li
Report Number:	RSZ10101107-Tx
Report Date:	2011-02-17
Reviewed By:	Merry Zhao EMC Engineer
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

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Dfine Technology Co., Ltd.*'s product, model number: *JDHMDZ-D1AT (FCC ID: Y48JDHMDZ-D1AT)* or the "EUT" as referred to in this report is a transmitter of *WHDI Wireless Transceiver Module,* which measures approximately: 14.6 cm (L) x 9.3 cm (W) x 2.5 cm (H), rated input voltage: DC 5V adapter.

Operating frequency: 5725-5825MHz
Adapter Information: AC ADAPTER
Model: 5FF0500300A18A
Input: 100-240 V 50/60 Hz 0.4 A
Output: 5.0 V 3.0 A

**All measurement and test data in this report was gathered from production sample serial number: 1010023 (Assigned by BACL, Shenzhen). The EUT was received on 2010-10-11.*

Specification	Transmitter(JDHMDZ-D1AT)
Frequency Range	5.725-5 .825 GHz
Operation Channel	5.755GHz & 5.795GHz
Antennas(Internal PCB antenna)	Downlink(TX)×4; Uplink(RX)×1
RF Output Power	15dBm(Typ)
Bandwidth	40MHz
Modulation	OFDM
Operating Mode	Operating mode 2 on the DL and Operating mode 1 on the UL. Operating mode 2 (multiple antennas, no beam forming)

Objective

This Type approval report is prepared on behalf of *Dfine Technology Co., Ltd.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, and section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

Related Submittal(s)/Grant(s)

Receiver part submission with FCC ID: Y48JDHMDZ-D1AR.

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. (Shenzhen). 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 in 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 a National Institute of Standards and Technology (NIST) accredited laboratory, under the 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.

EUT Exercise Software

The driver: usb2com driver.exe and UART_install.zip
The apply software: jre-6u21-windows-i586-s.exe

Equipment Modifications

No modification was made to the unit tested.

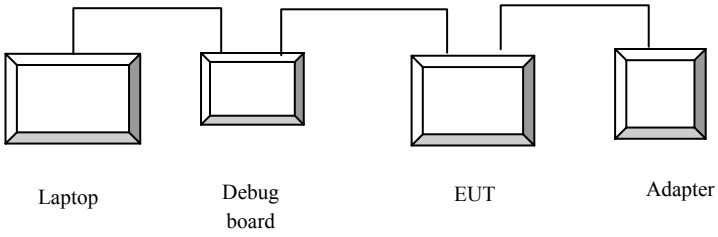
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Laptop	D600	5812005F0F	DoC

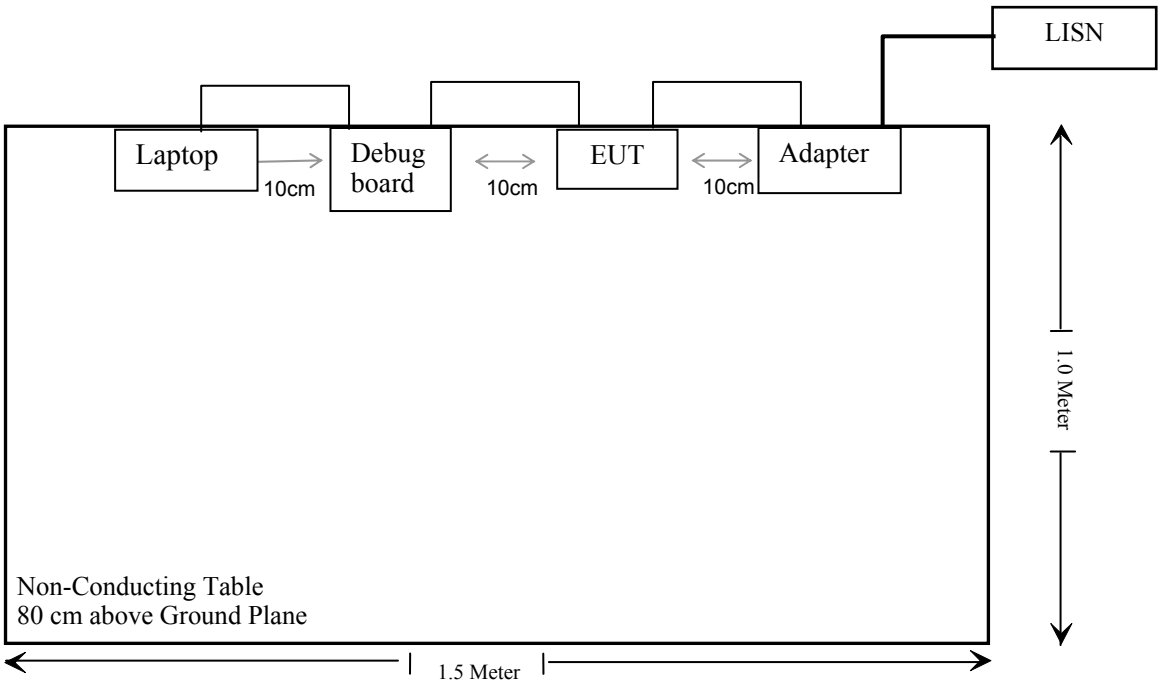
External I/O Cable

Cable Description	Length (m)	From Port	To
Shielded Detachable USB to Serial Cabel	1.2	Laptop	Debug board

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.407 (f), §2.1091, §1.1307(b)(1)	Maximum Permissible Exposure (MPE)	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) (4),(6),(7)	Undesirable Emission& Restricted Bands	Compliance
§15.407(a) (3)	26 dB Bandwidth	Compliance
§15.407(a)(3),	Conducted Transmitter Output Power	Compliance
§15.407 (a)(3),(5)	Power Spectral Density	Compliance
§15.407(a)(6)	Peak Excursion Ratio	Compliance
§15.407(g)	Frequency Stability	Compliance

FCC §15.407(f) & §2.1091 – MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to FCC §15.407 (f) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

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

Limits for General Population/Uncontrolled Exposure

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

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. Mw/cm2)
P = power input to the antenna (in appropriate units, e.g., Mw).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency (MHz)	**Antenna Gain**		**Conducted Power**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
	(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
5755	1.5	1.41	21.39	137.77	20	0.038666	1.0
5795	1.5	1.41	20.90	123.10	20	0.034548	1.0

Result

The EUT meets the MPE limit at 20 cm distance.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC §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 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi 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 has four integral (printed on PCB) antennas for downlink (transmitting), in accordance to section 15.203, otherwise, the EUT has an integral (printed on PCB) antenna for uplink (receiving) only; please refer to the internal photos.

Result: Compliance.

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

Applicable Standard

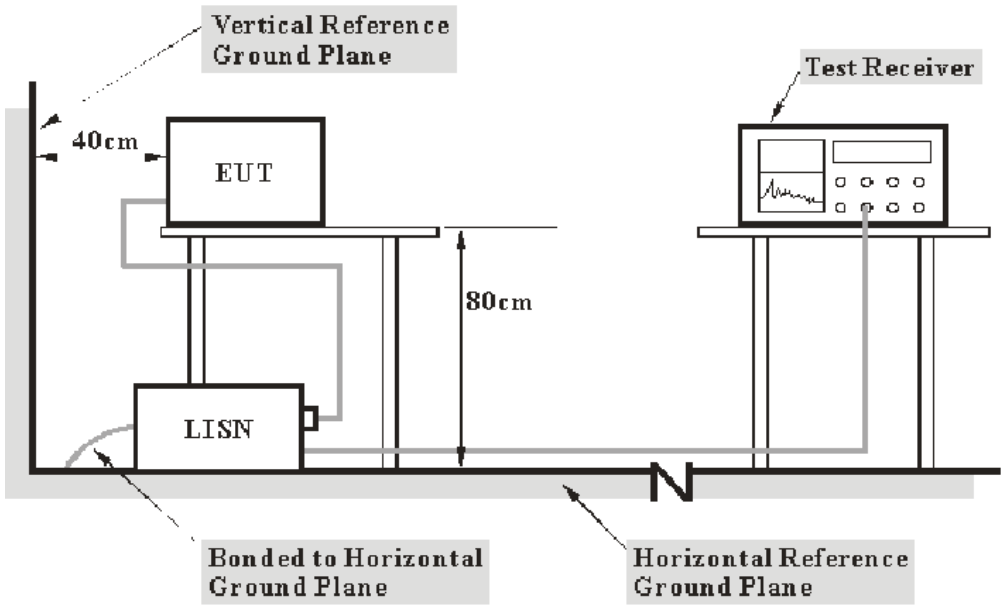
FCC §15.207, §15.407(b)(6).

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 NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±2.4 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 120 VAC/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:

Frequency Range	***IF B/W***
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	ESCS30	830245/006	2010-03-03	2011-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2010-03-09	2011-03-08

***Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) 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 was connected to 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:

13.23 dB at **0.150 MHz** in the **Neutral** conductor mode

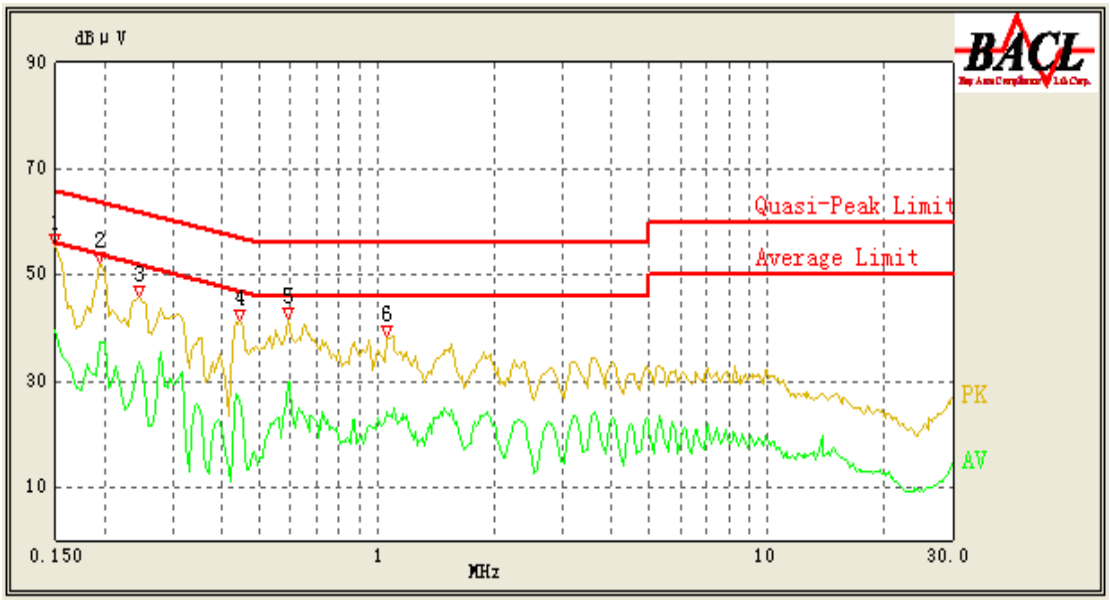
Environmental Conditions

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

The testing was performed by Felix Li on 2010-12-19.

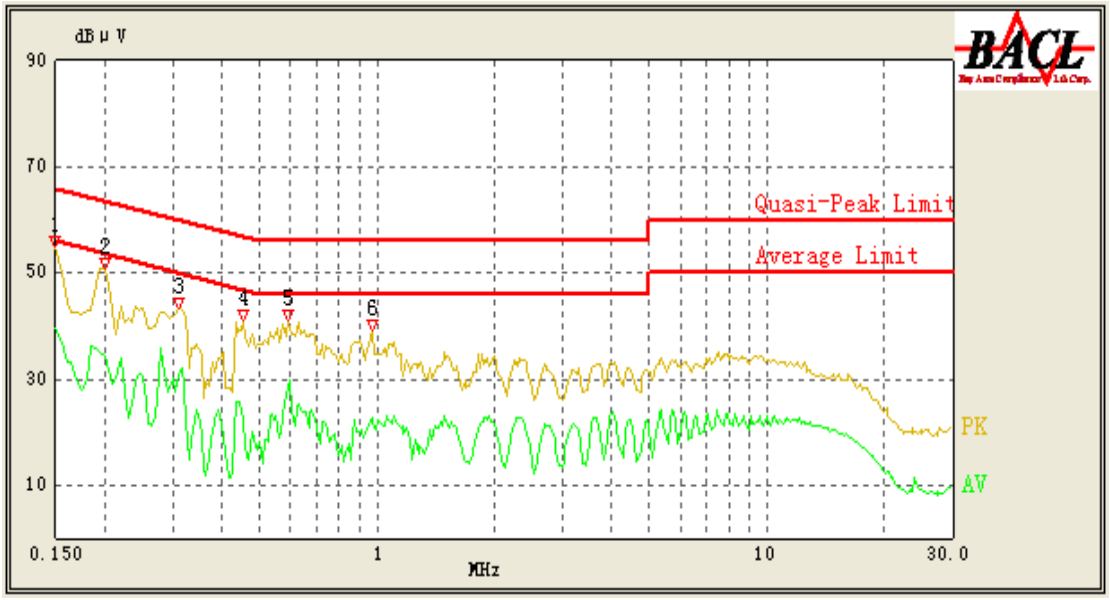
Test Mode: Transmitting (worse case)

120 V, 60 Hz, Line:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Factor (dB)	Cord. Result (dBμV)	Limit (dBμV)	Margin (dB)	Remark (PK/QP/Ave.)
0.150	52.18	10.10	66.00	13.82	QP
0.590	29.76	10.18	46.00	16.24	Ave.
0.150	39.39	10.10	56.00	16.61	Ave.
0.195	47.89	10.07	64.71	16.82	QP
0.195	37.49	10.07	54.71	17.22	Ave.
0.590	37.31	10.18	56.00	18.69	QP
0.245	33.63	10.04	53.29	19.66	Ave.
0.245	42.84	10.04	63.29	20.45	QP
0.445	26.32	10.14	47.57	21.25	Ave.
1.065	24.32	10.11	46.00	21.68	Ave.
0.445	33.59	10.14	57.57	23.98	QP
1.065	31.90	10.11	56.00	24.10	QP

120V, 60 Hz, Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Remark (PK/QP/Ave.)**
0.150	52.77	10.10	66.00	13.23	QP
0.150	39.59	10.10	56.00	16.41	Ave.
0.590	28.20	10.18	46.00	17.80	Ave.
0.200	46.18	10.07	64.57	18.39	QP
0.590	37.57	10.18	56.00	18.43	QP
0.200	34.28	10.07	54.57	20.29	Ave.
0.310	30.80	10.01	51.43	20.63	Ave.
0.310	40.07	10.01	61.43	21.36	QP
0.970	22.72	10.11	46.00	23.28	Ave.
0.455	33.98	10.15	57.29	23.31	QP
0.455	22.82	10.15	47.29	24.47	Ave.
0.970	29.33	10.11	56.00	26.67	QP

FCC §15.209, §15.205 & §15.407(b)(4)(6)(7) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (4), (6), (7); §15.209; §15.205;
Undesirable emission limits:

For transmitters operating in the 5.725–5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of –17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27 dBm/MHz.

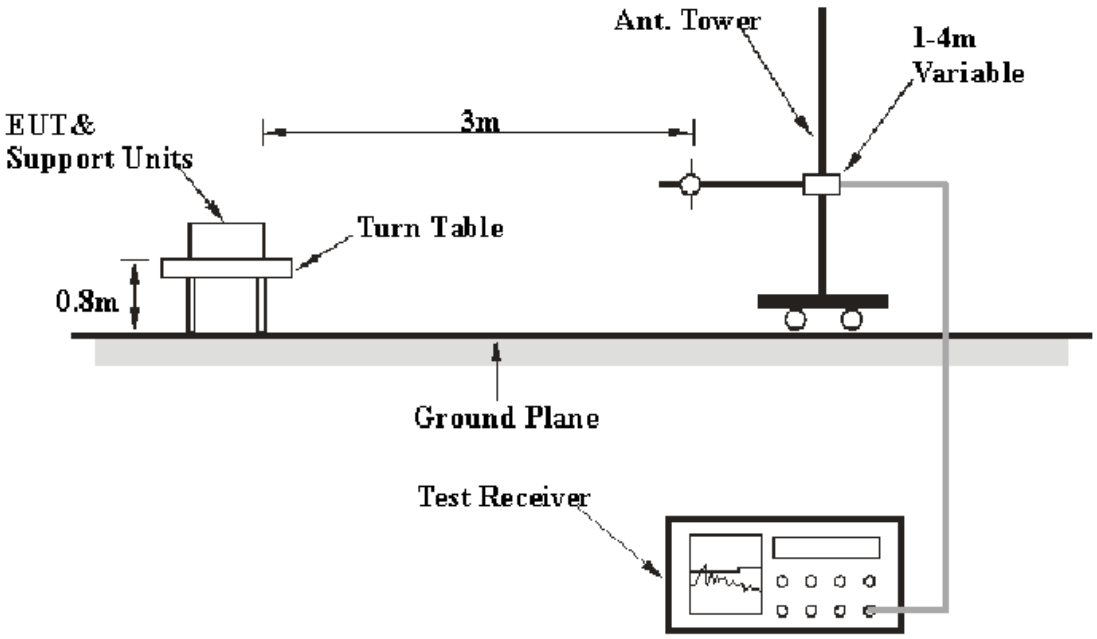
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

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 NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ±4.0 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 25 GHz.

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

Frequency Range	***RBW***	***Video B/W***
30MHz – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25 GHz	1 MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
HP	Amplifier	8449B	3008A00277	2010-09-12	2011-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

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

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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - 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:

Margin = Limit – Corrected Amplitude

Test Procedure

For the radiated emissions test, the adapter was connected to the AC floor.

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.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, Section 15.205, 15.209 and 15.407, with the worst margin reading of:

4.90dB at **11510 MHz** in the **vertical** polarization for 5755 MHz

Test Data

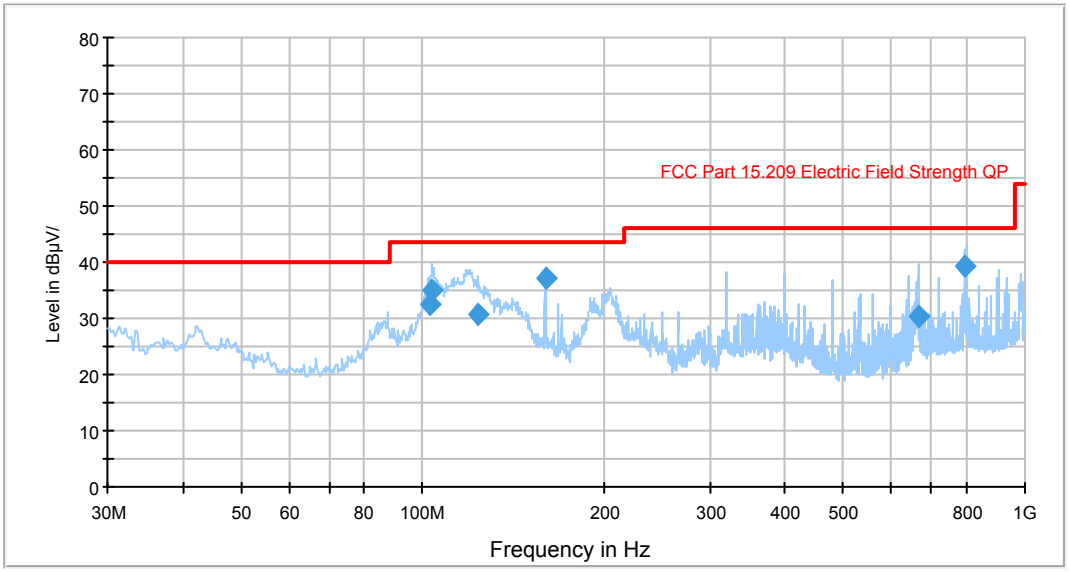
Environmental Conditions

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

The testing was performed by Felix Li on 2010-12-15, 2011-02-16.

30-1000 MHz:

Test Mode: Transmitting (wost case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
160.010000	37.0	201.0	H	160.0	-14.3	43.5	6.5
797.791250	39.4	100.0	H	43.0	-1.9	46.0	6.6
104.036500	34.9	400.0	H	222.0	-14.1	43.5	8.6
102.527750	32.7	298.0	H	0.0	-14.3	43.5	10.8
123.778500	30.9	100.0	V	16.0	-12.3	43.5	12.6
665.426000	30.4	132.0	H	40.0	-4.3	46.0	15.6

Above 1GHz:

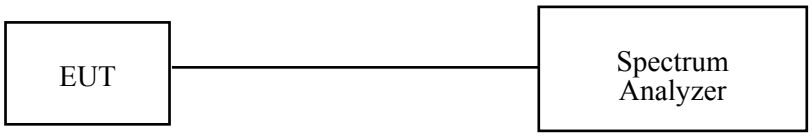
Indicated		Detector (PK/AV)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.407/15.205/15.205			
Frequency (MHz)	S.A. Reading (dBμV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low channel (5755 MHz)												
11510	28.21	AV	160	1.0	V	40.4	6.69	26.2	49.1	54	4.90	Restricted band
11510	26.29	AV	160	1.0	H	41.4	6.69	26.2	48.18	54	5.82	Restricted band
17265	22.15	AV	254	1.2	V	43.5	8.22	25.90	48.19	54	5.85	harmonic
23020	15.36	AV	168	1.1	V	45.6	10.35	24.7	46.61	54	7.39	Restricted band
17265	19.27	AV	254	1.2	H	43.7	8.22	25.90	45.29	54	8.71	harmonic
23020	12.45	AV	168	1.1	H	45.9	10.35	24.7	44	54	10.00	Restricted band
23020	32.12	PK	168	1.1	V	45.6	10.35	24.7	63.37	74	10.63	Restricted band
11510	40.64	PK	160	1.0	H	41.4	6.69	26.2	62.53	74	11.47	Restricted band
11510	41.35	PK	160	1.0	V	40.4	6.69	26.2	62.24	74	11.76	Restricted band
17265	35.24	PK	254	1.2	V	43.5	8.22	25.90	61.24	74	12.76	harmonic
23020	28.44	PK	168	1.1	H	45.9	10.35	24.7	59.99	74	14.01	Restricted band
17265	32.12	PK	254	1.2	H	43.7	8.22	25.90	58.14	74	15.86	harmonic
5101.80	32.04	AV	60	1.3	H	36.6	4.43	26.75	46.32	54	7.68	Restricted band
4922.38	33.09	AV	45	1.2	V	35.4	4.40	26.75	46.14	54	7.86	Restricted band
5101.80	46.22	PK	60	1.3	H	36.6	4.43	26.75	60.5	74	13.50	Restricted band
4922.38	47.44	PK	45	1.2	V	35.4	4.40	26.75	60.49	74	13.51	Restricted band
High channel (5795 MHz)												
11590	28.32	AV	10	1.2	V	40.4	6.71	26.2	49.23	54	4.77	Restricted band
11590	25.4	AV	10	1.2	H	41.4	6.71	26.2	47.31	54	6.69	Restricted band
17385	21.24	AV	157	1.1	V	43.5	8.22	25.90	47.26	54	6.74	harmonic
23180	15.05	AV	125	1.0	V	45.6	10.35	24.7	46.3	54	7.70	harmonic
17385	18.33	AV	157	1.1	H	43.7	8.22	25.90	44.35	54	9.65	harmonic
11590	42.34	PK	10	1.2	H	41.4	6.71	26.2	64.25	74	9.75	Restricted band
11590	42.71	PK	10	1.2	V	40.4	6.71	26.2	63.62	74	10.38	Restricted band
23180	12.02	AV	125	1.0	H	45.9	10.35	24.7	43.57	54	10.43	harmonic
23180	31.45	PK	125	1.0	V	45.6	10.35	24.7	62.7	74	11.30	harmonic
17385	35.05	PK	157	1.1	V	43.5	8.22	25.90	61.07	74	12.93	harmonic
23180	27.17	PK	125	1.0	H	45.9	10.35	24.7	58.72	74	15.28	harmonic
17385	30.14	PK	157	1.1	H	43.7	8.22	25.90	56.16	74	17.84	harmonic
5353.52	33.24	AV	89	1.2	V	35.5	4.51	26.70	46.55	54	7.45	Restricted band
5431.78	31.98	AV	25	1.2	H	36.7	4.49	26.70	46.47	54	7.53	Restricted band
5353.52	47.54	PK	89	1.2	V	35.5	4.51	26.70	60.85	74	13.15	Restricted band
5431.78	46.01	PK	25	1.2	H	36.7	4.49	26.70	60.5	74	13.50	Restricted band

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 1MHz, The Video bandwidth is set to 1MHz, report the peak value out of the oprating band.
3. Repeat above procedures until all frequencies measured were complete.

Offset value =attenuation+combiner loss +cable loss

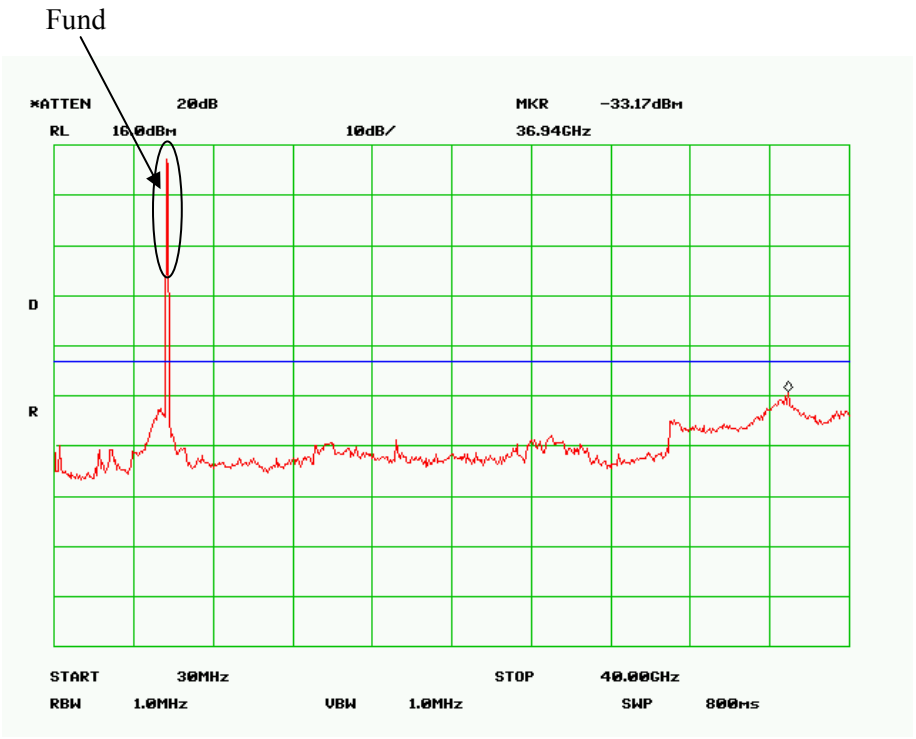


Test data

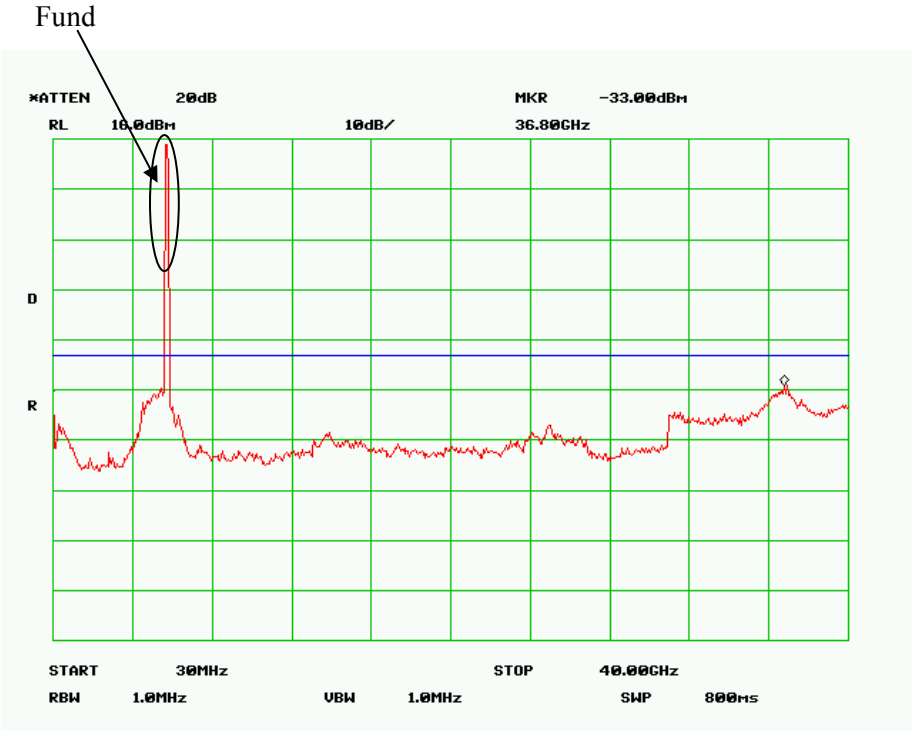
TX Chain	Frequency (MHz)	Corrected Reading (dBm)	Antenna Gain (dBi)	Calculated Value (dBm/MHz)	Limited (dBm/MHz)	Margin (dB)
5755 MHz						
Chain 0	36940	-33.17	1.5	-31.67	-27	4.67
Chain 1	36800	-33.00	1.5	-31.50	-27	4.50
Chain 2	36940	-33.50	1.5	-32.00	-27	5.00
Chain 3	36800	-33.17	1.5	-31.67	-27	4.67
5795 MHz						
Chain 0	36940	-34.17	1.5	-32.67	-27	5.67
Chain 1	36940	-33.33	1.5	-31.83	-27	4.83
Chain 2	36800	-33.33	1.5	-31.83	-27	4.83
Chain 3	36800	-33.83	1.5	-32.33	-27	5.33

Please refer to the following plots.

5755 MHz, Chain 0

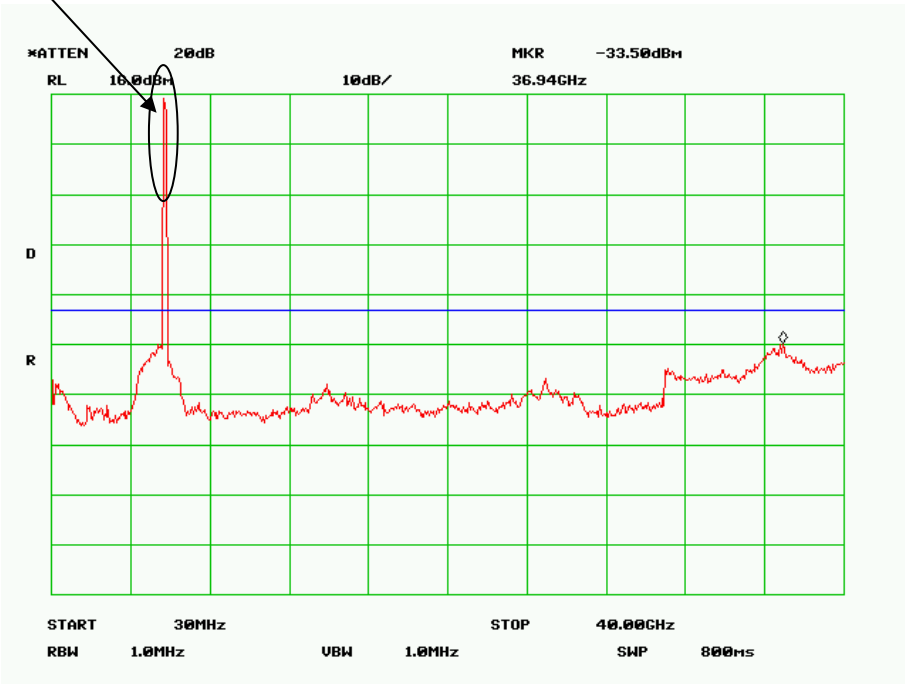


5755 MHz, Chain 1



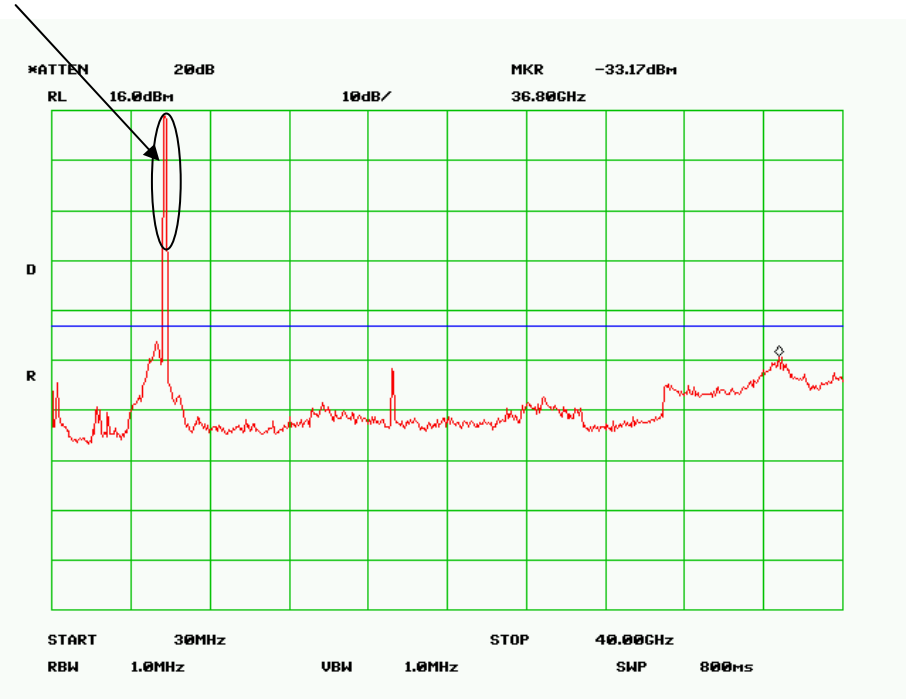
5755 MHz, Chain 2

Fund



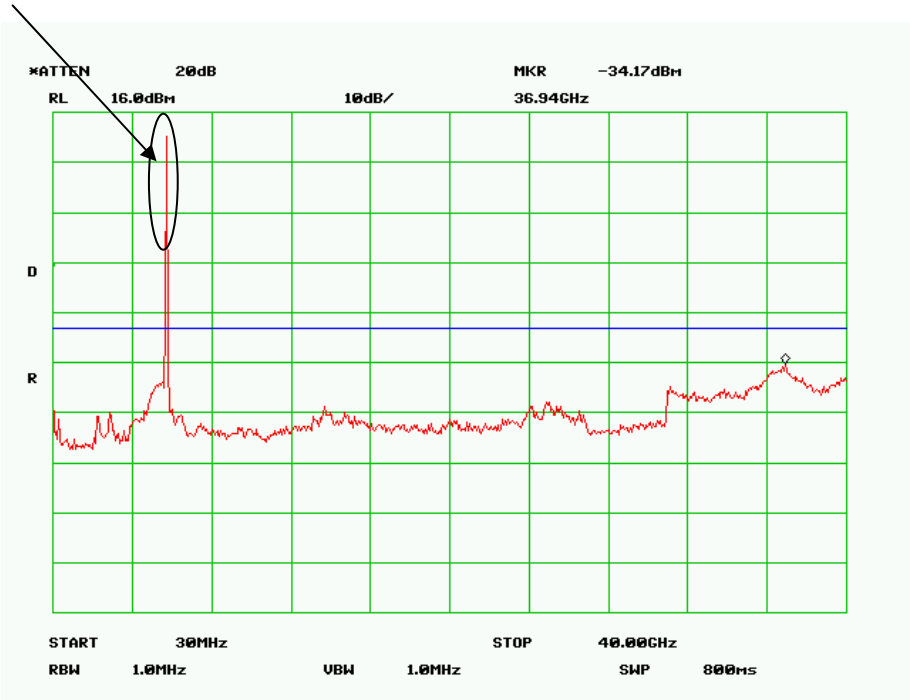
5755 MHz, Chain 3

Fund



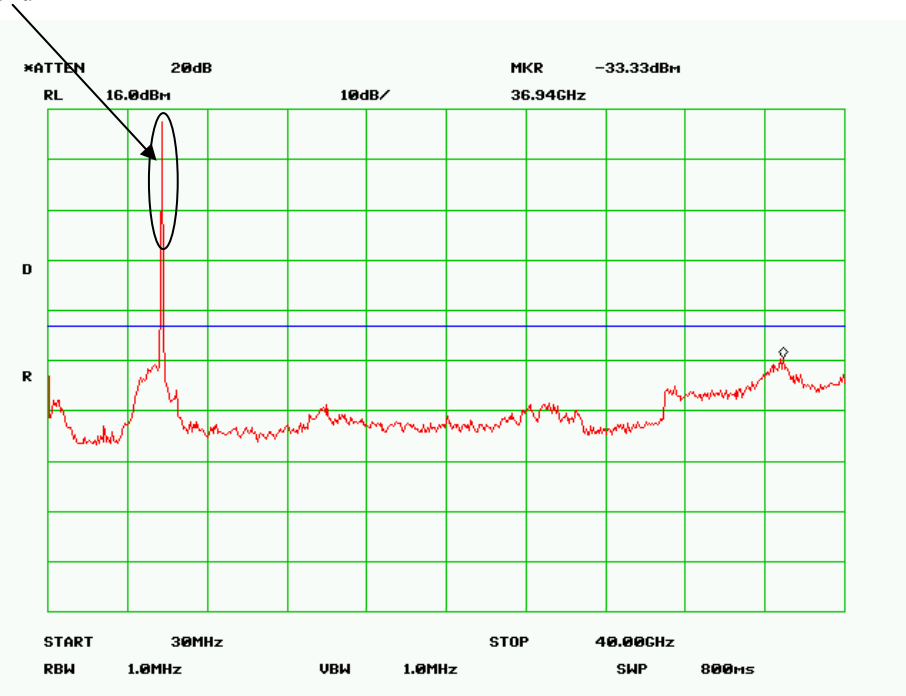
5795 MHz, Chain 0

Fund



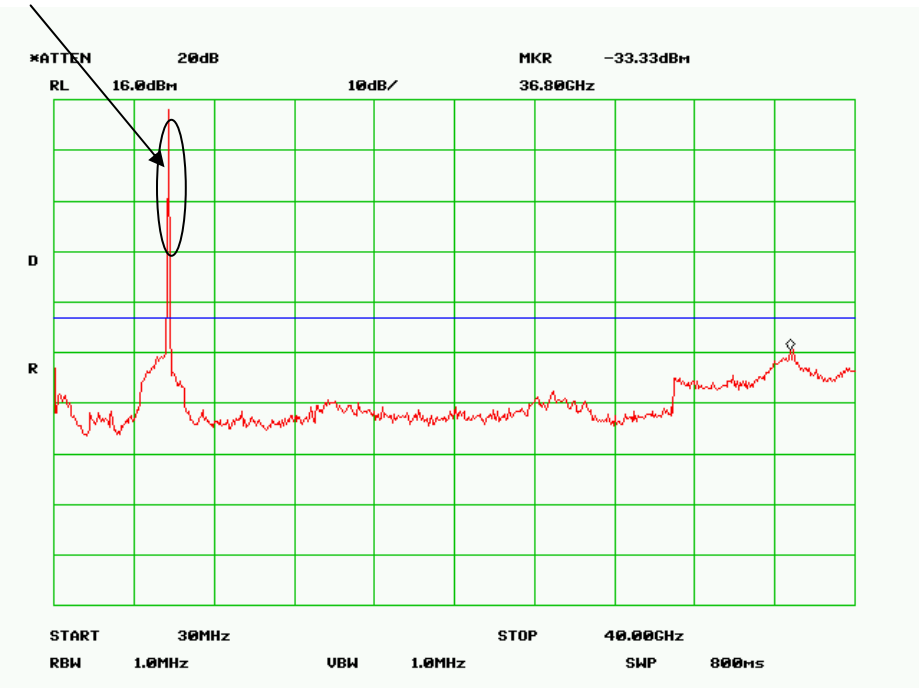
5795 MHz, Chain 1

Fund



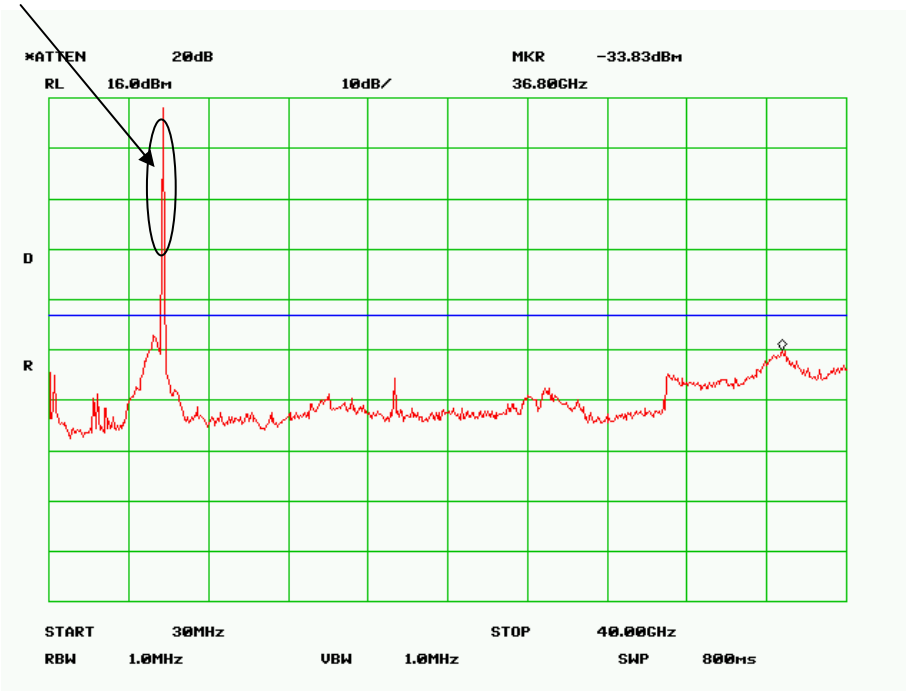
5795 MHz, Chain 2

Fund



5795 MHz, Chain 3

Fund



Band Edge Testing

Test Procedure

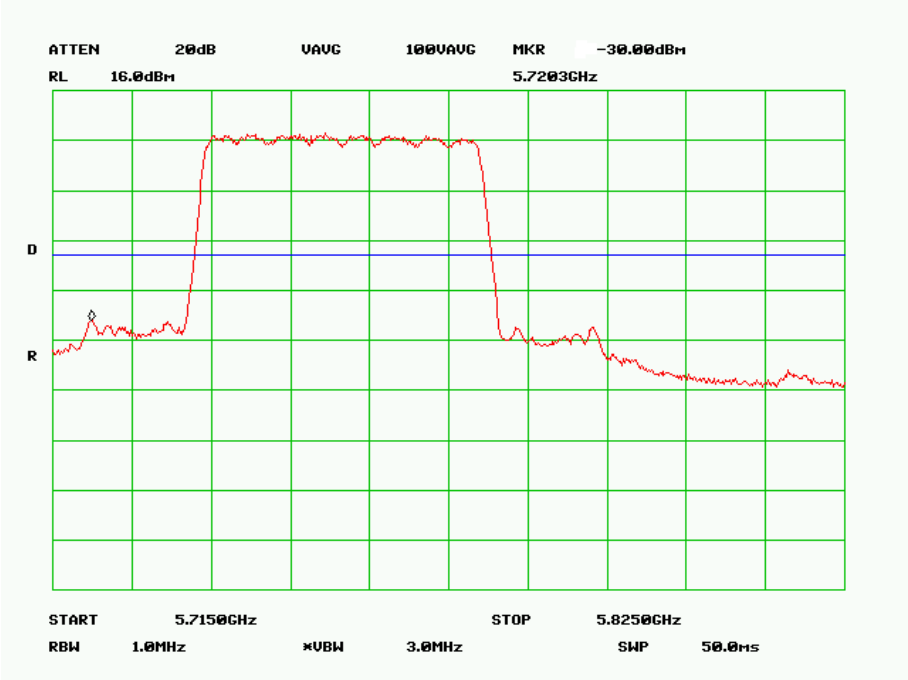
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 1 MHz and VBW of spectrum analyzer to 1 MHz with a convenient frequency span including 10MHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test data

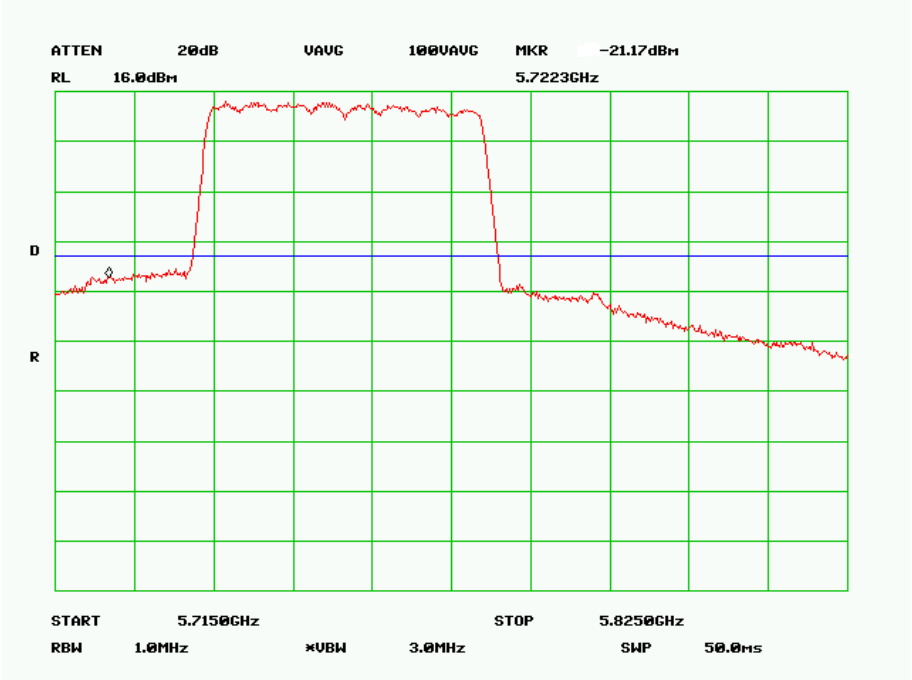
TX Chain	Frequency (MHz)	Corrected Reading (dBm)	Antenna Gain (dBi)	Calculated Value (dBm/MHz)	Limited (dBm/MHz)	Margin (dB)
5715-5725 MHz						
Chain 0	5720.3	-30.00	1.5	-28.50	-17	11.5
Chain 1	5722.3	-21.17	1.5	-19.67	-17	2.67
Chain 2	5720.5	-21.00	1.5	-19.50	-17	2.50
Chain 3	5720.3	-20.50	1.5	-19.0	-17	2.00
5825-5835 MHz						
Chain 0	5826.8	-21.67	1.5	-20.17	-17	3.17
Chain 1	5830.1	-23.17	1.5	-21.67	-17	4.67
Chain 2	5829.9	-25.17	1.5	-23.67	-17	6.67
Chain 3	5829.9	-24.00	1.5	-22.50	-17	5.50

Please refer to following plots.

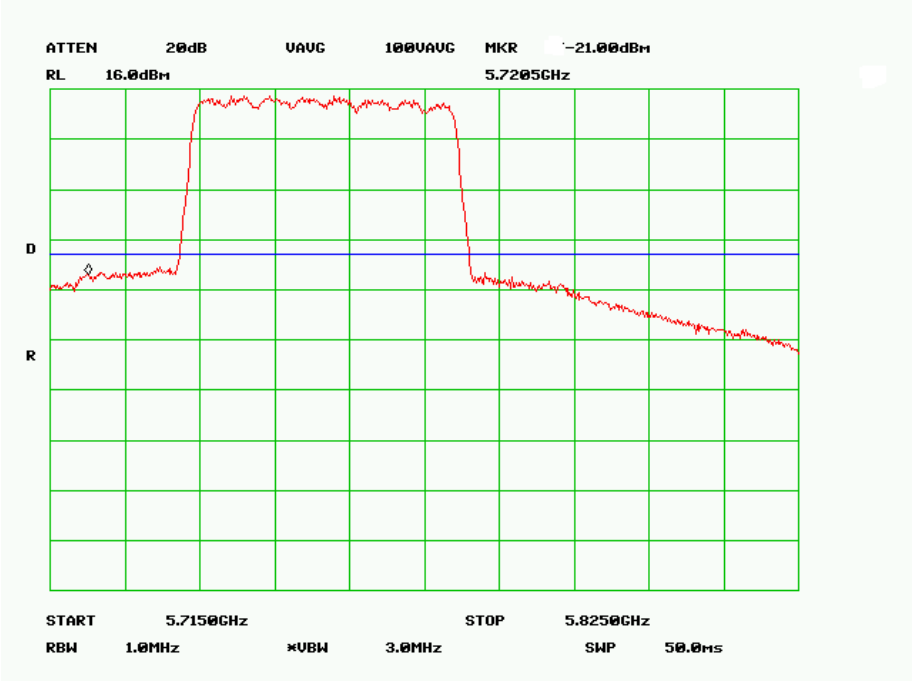
5755 MHz Band Edge, Left Side, Chain 0



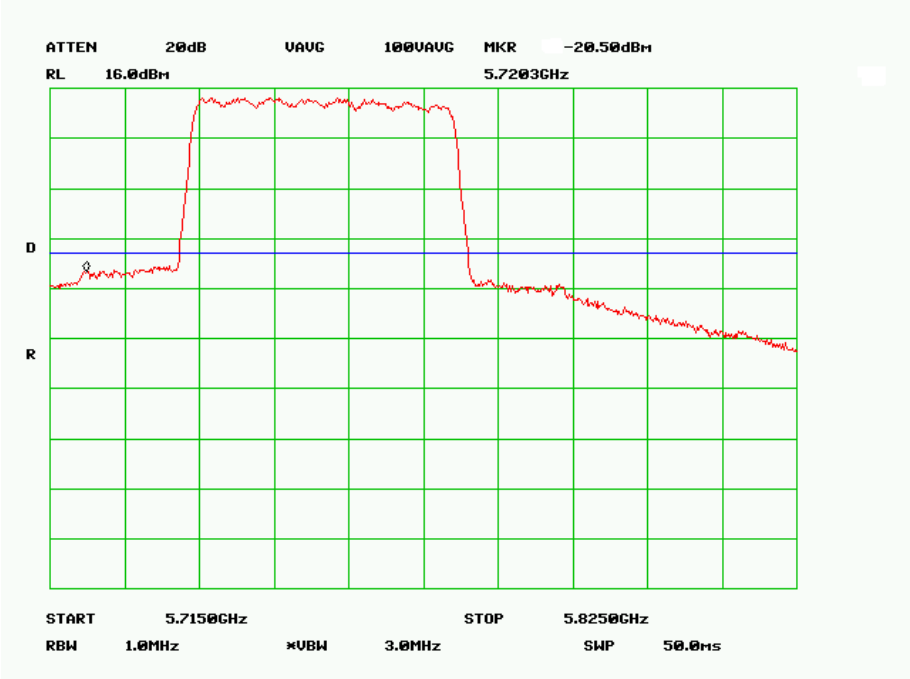
5755 MHz Band Edge, Left Side, Chain 1



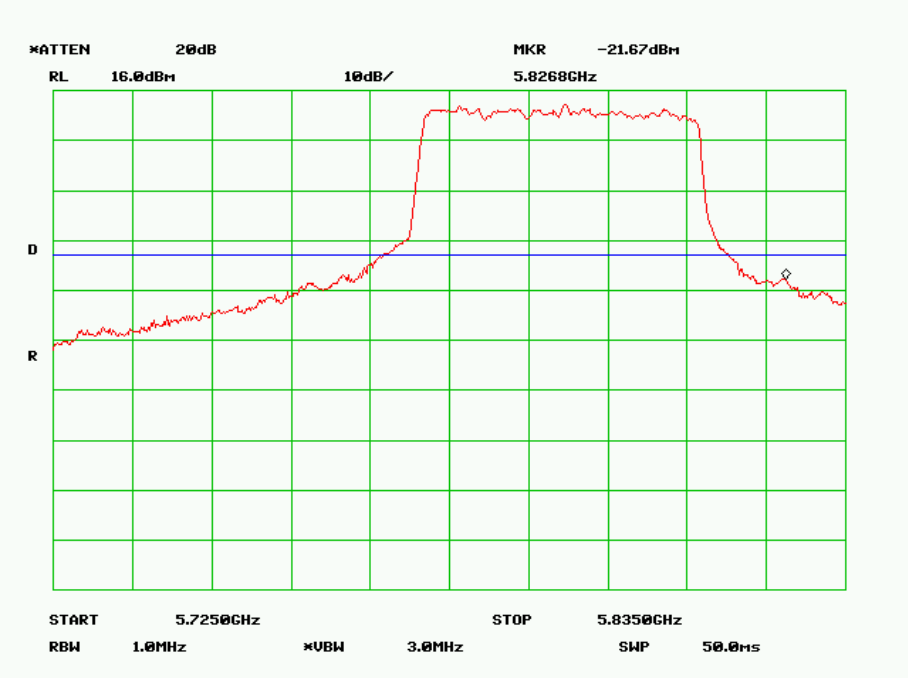
5755 MHz Band Edge, Left Side, Chain 2



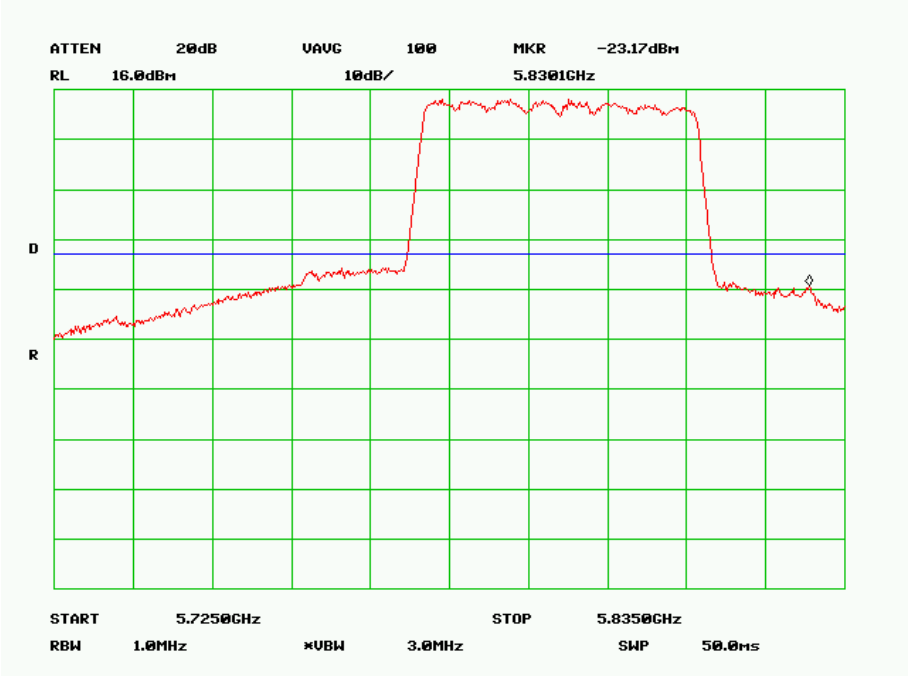
5755 MHz Band Edge, Left Side, Chain 3



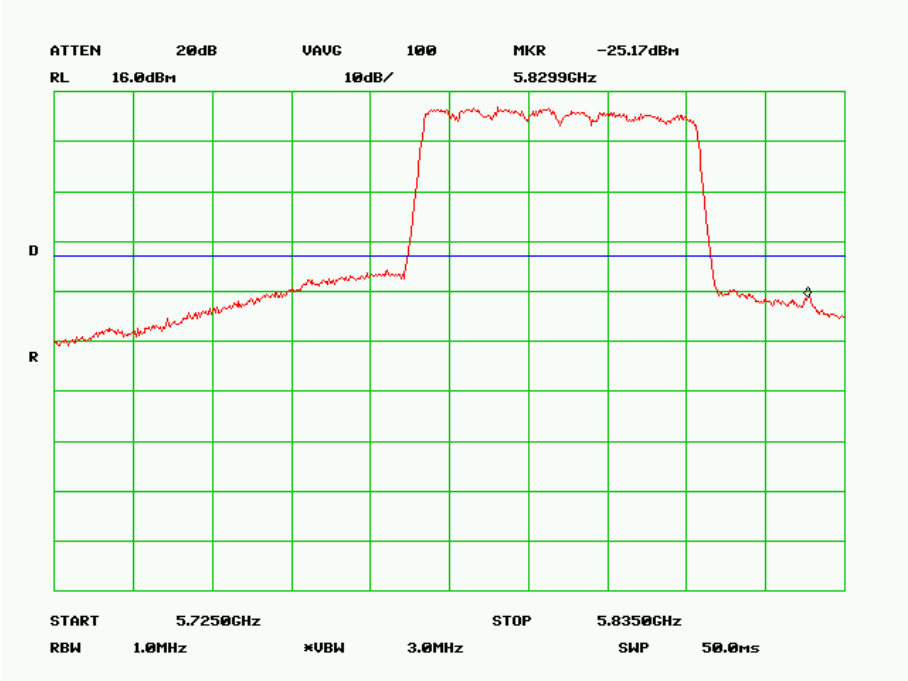
5795 MHz Band Edge, Right Side, Chain 0



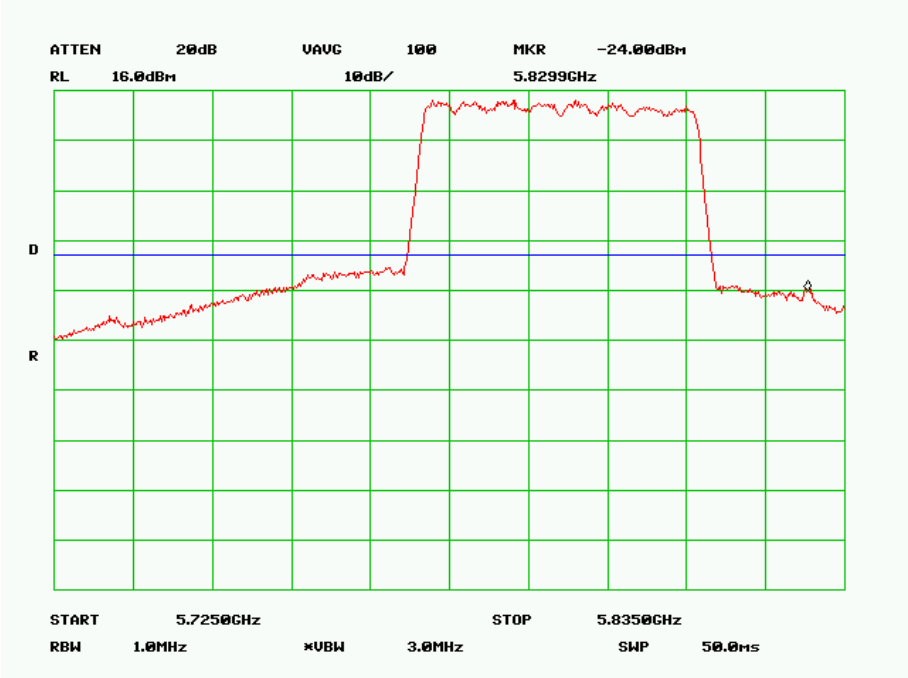
5795 MHz Band Edge, Right Side, Chain 1



5795 MHz Band Edge, Right Side, Chain 2



5795 MHz Band Edge, Right Side, Chain 3



FCC §15.407(a) (3) – 26 dB OCCUPIED BANDWIDTH

Applicable Standard

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For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1–MHz 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

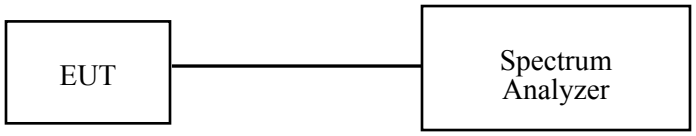
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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 viewbutton 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

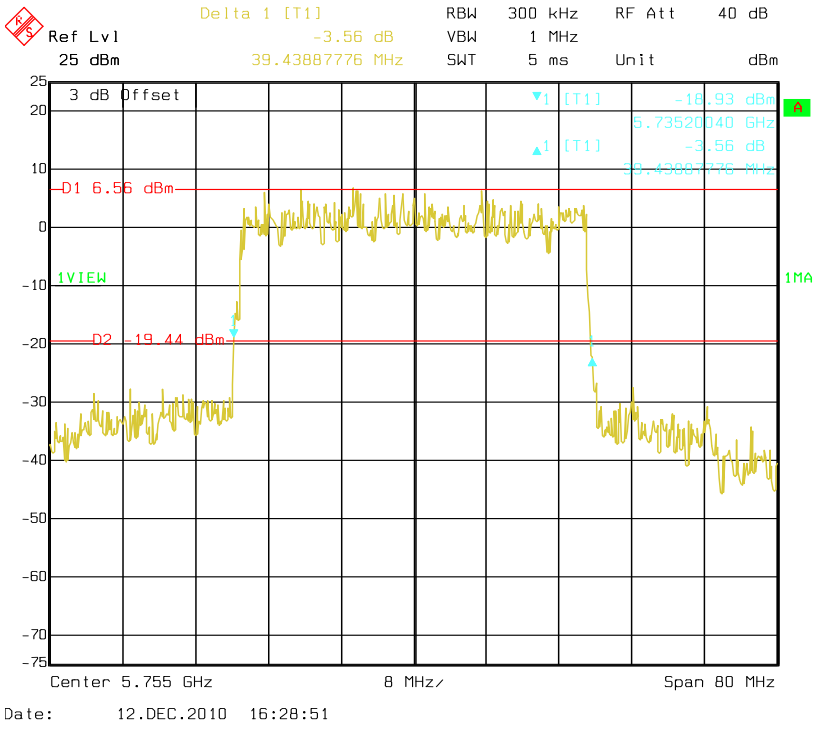
The testing was performed by Felix Li on 2010-12-12.

Test Result: Pass.

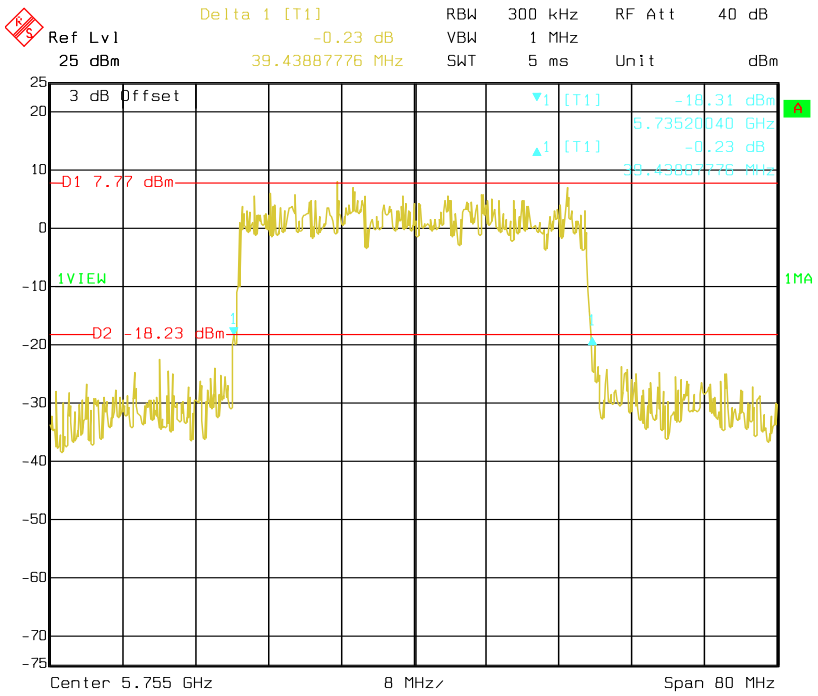
Please refer to the following tables and plots.

Frequency Band (MHz)	Frequency (MHz)	TX Chain	26 dB Bandwidth (MHz)
5725-5825	5755	Chain 0	39.4389
		Chain 1	39.4389
		Chain 2	39.4389
		Chain 3	39.4389
	5795	Chain 0	39.4389
		Chain 1	39.4389
		Chain 2	39.4389
		Chain 3	39.4389

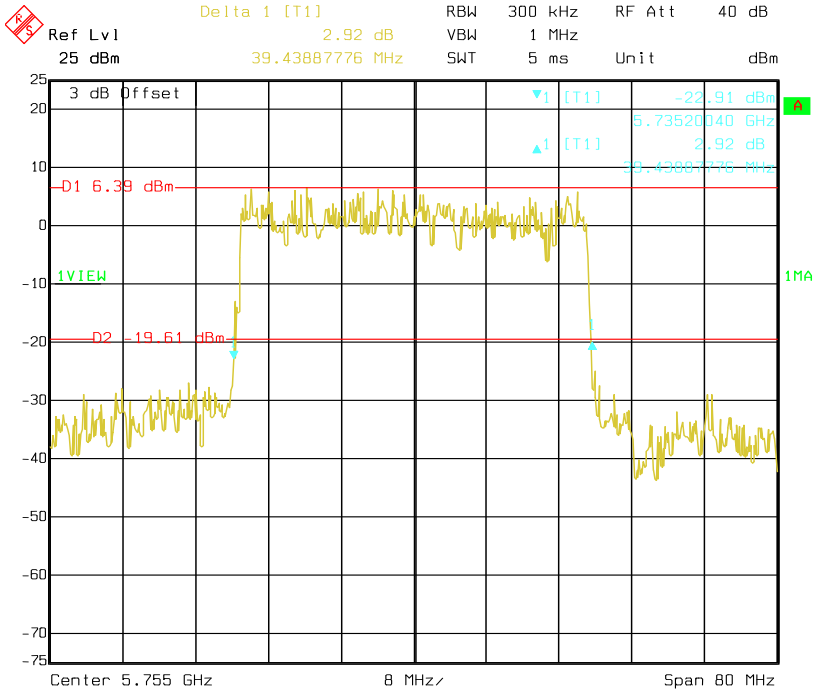
5755 MHz, Chain 0



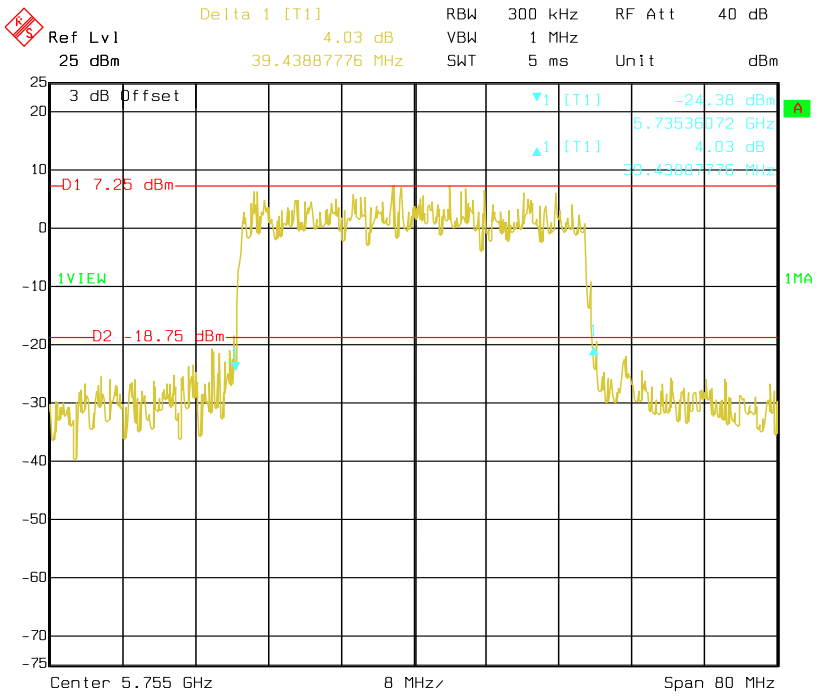
5755 MHz, Chain 1



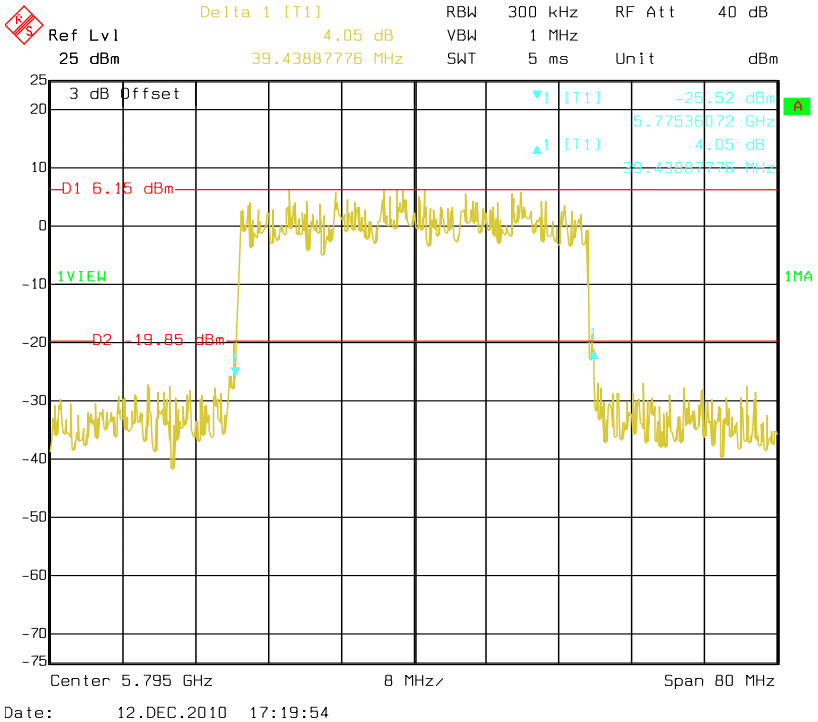
5755 MHz, Chain 2



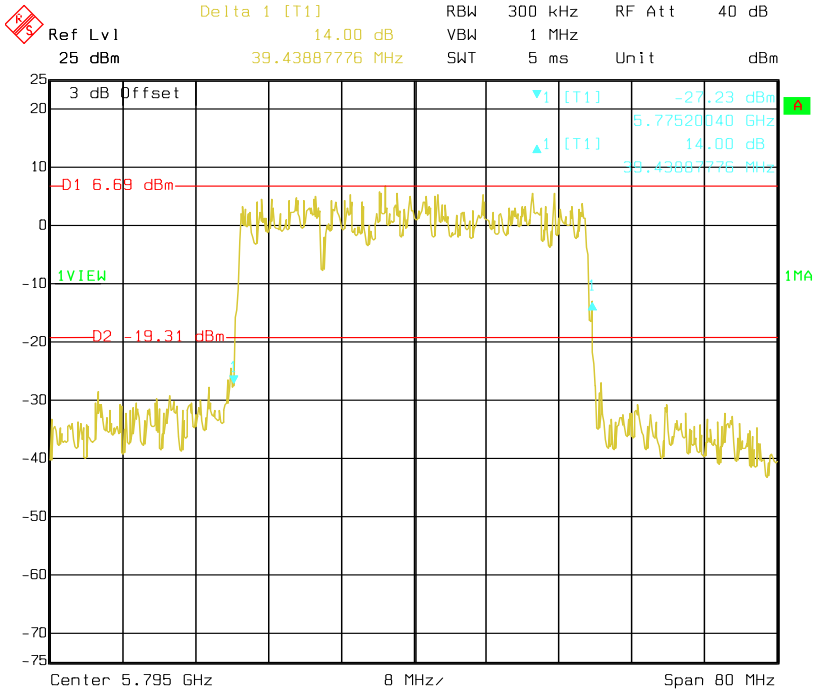
5755 MHz, Chain 3



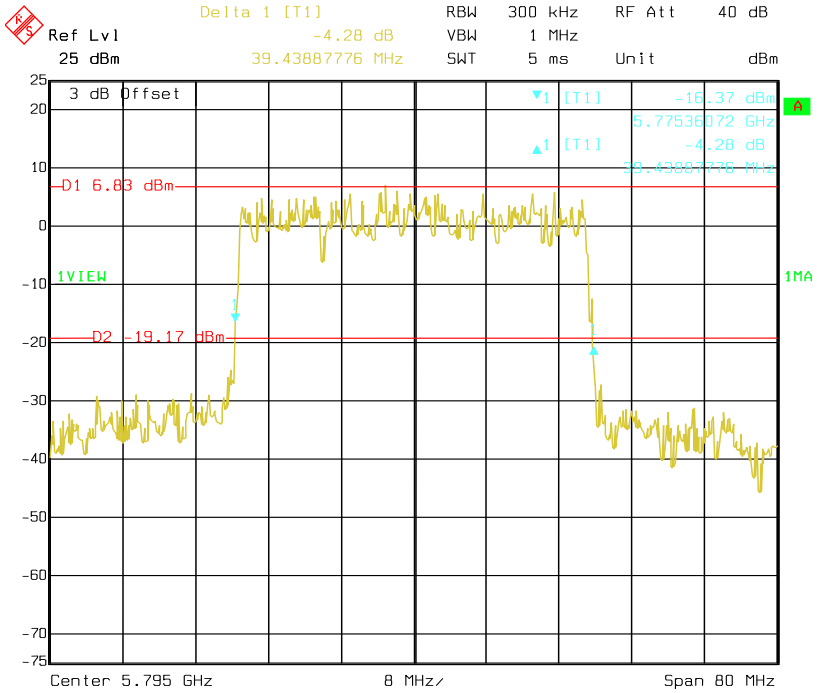
5795 MHz, Chain 0



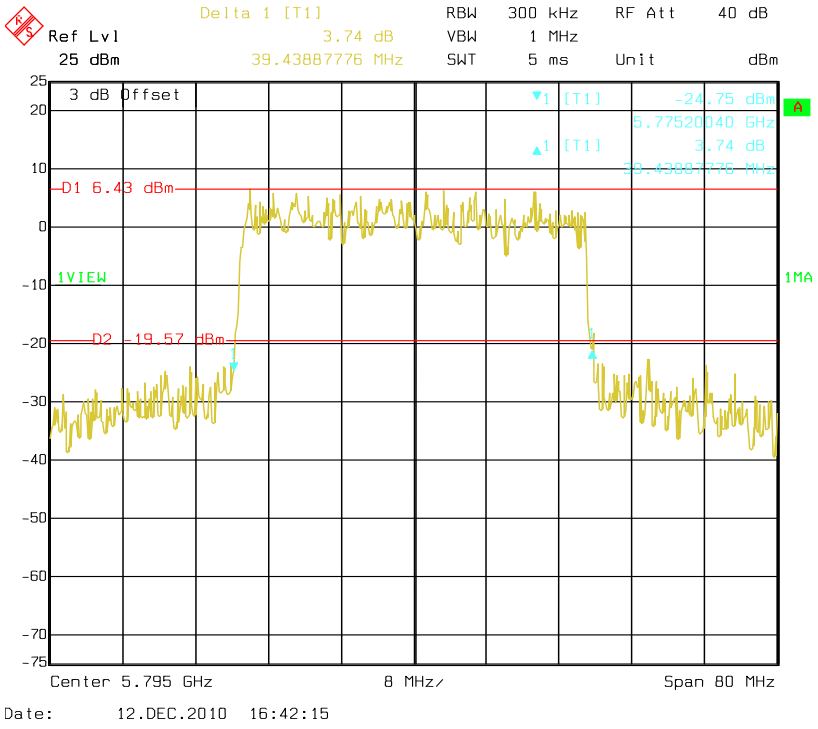
5795 MHz, Chain 1



5795 MHz, Chain 2



5795 MHz, Chain 3



FCC §15.407(a)(3) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm+ 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) 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 Felix Li on 2010-12-12.

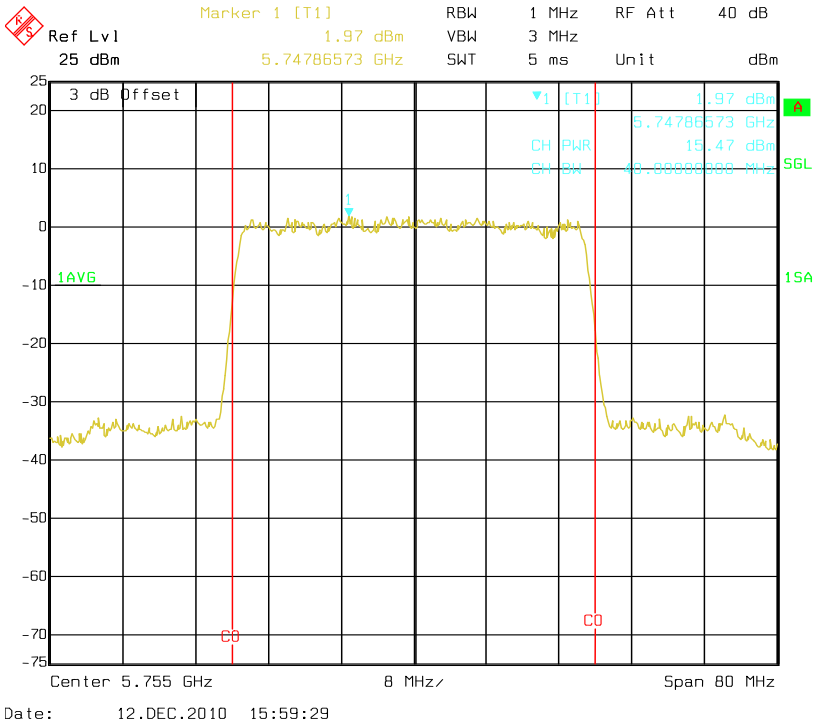
Test Mode: Transmitting

Test Result: Pass

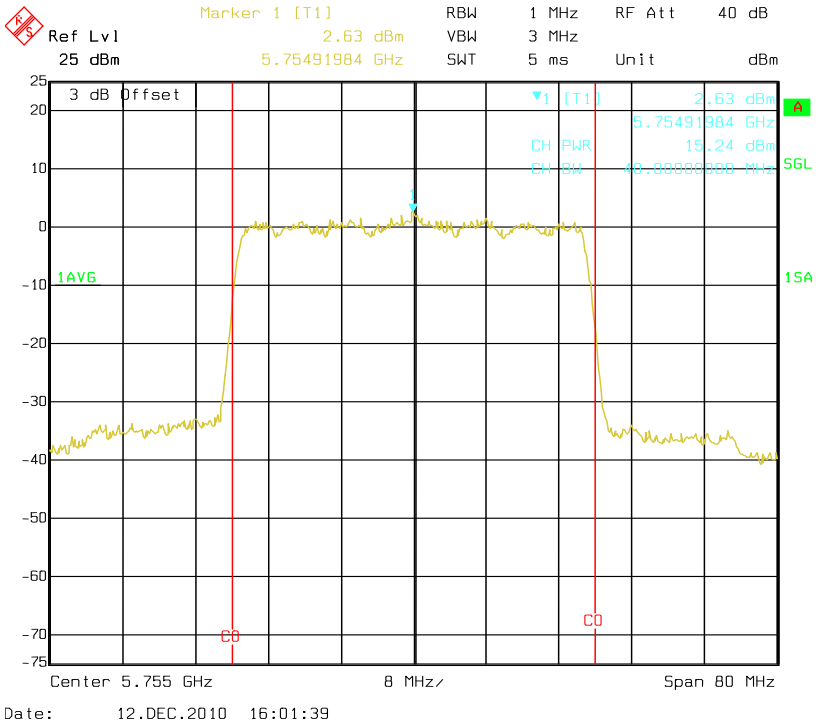
Please refer to the following tables and plots.

Frequency Band (MHz)	Frequency (MHz)	TX Chain	Conducted Output Power (dBm)	Total Power (mW)	Limit (mW)
5725-5825	5755	Chain 0	15.47	137.77	1000
		Chain 1	15.24		
		Chain 2	15.32		
		Chain 3	15.45		
	5795	Chain 0	15.08	123.10	1000
		Chain 1	14.78		
		Chain 2	14.60		
		Chain 3	15.05		

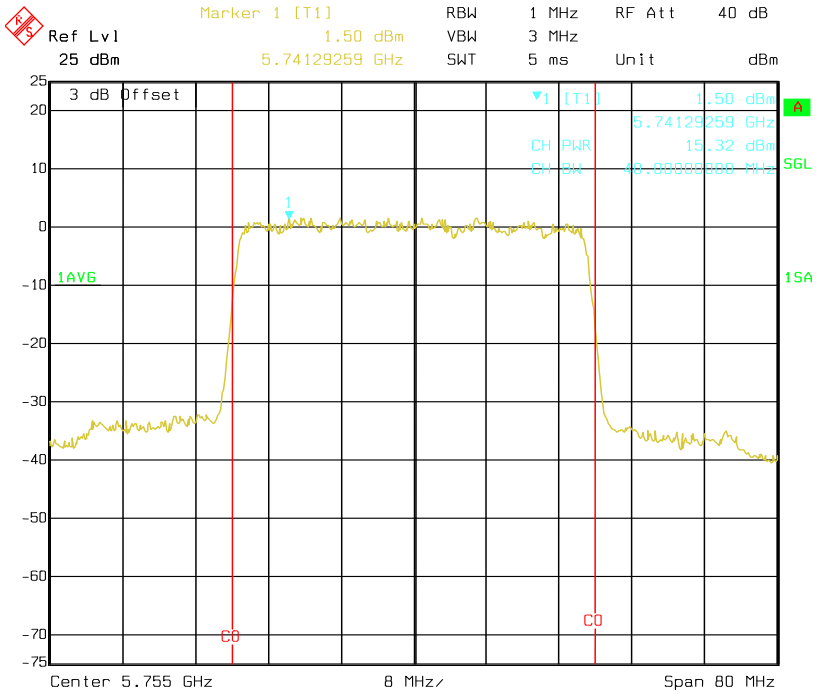
5755 MHz, Chain 0



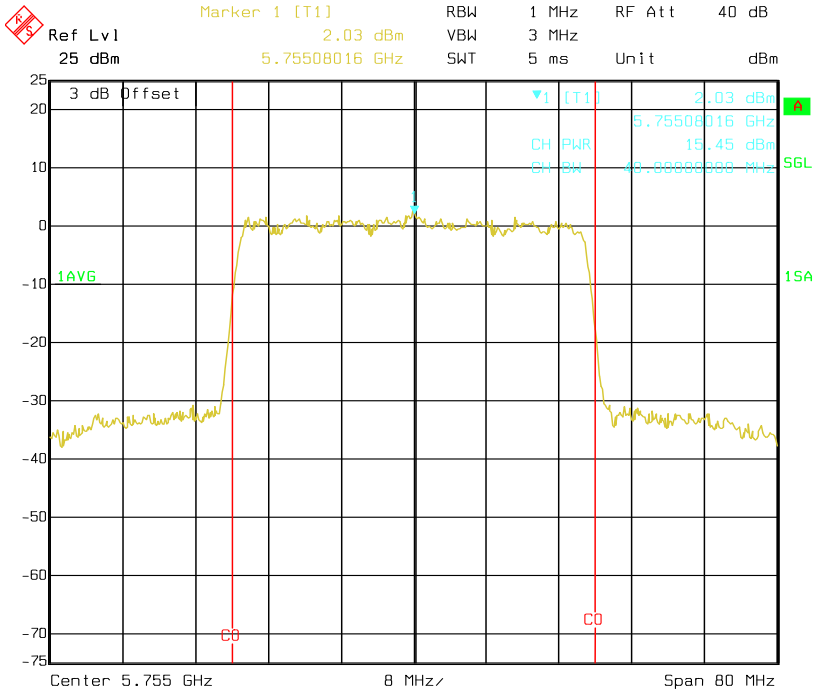
5755 MHz, Chain 1



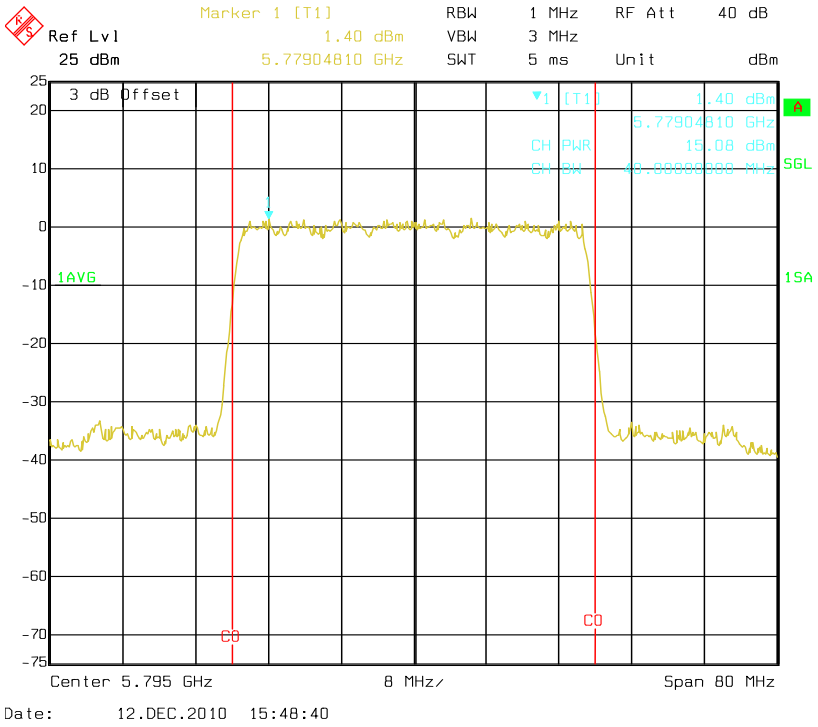
5755 MHz, Chain 2



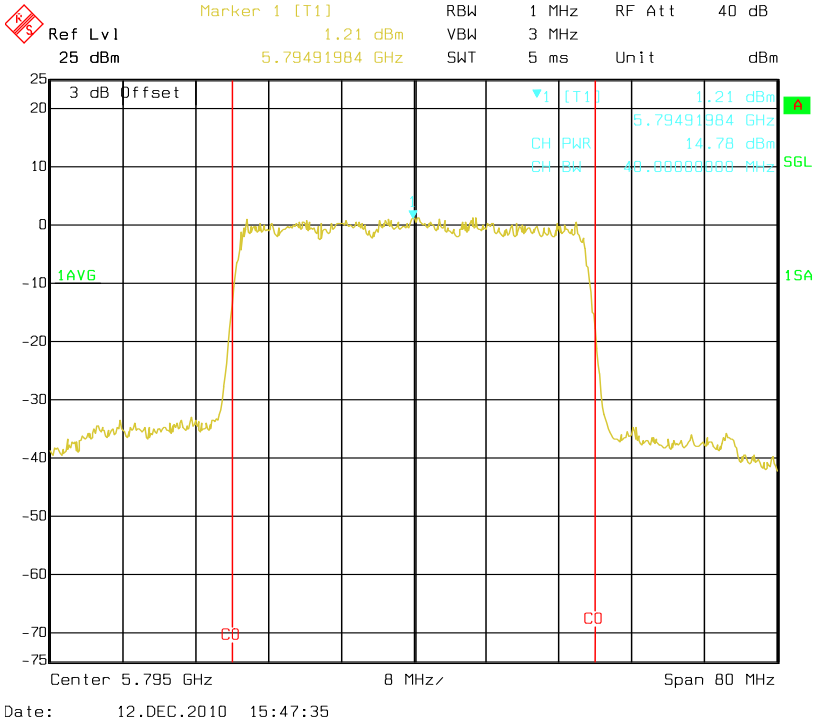
5755 MHz, Chain 3



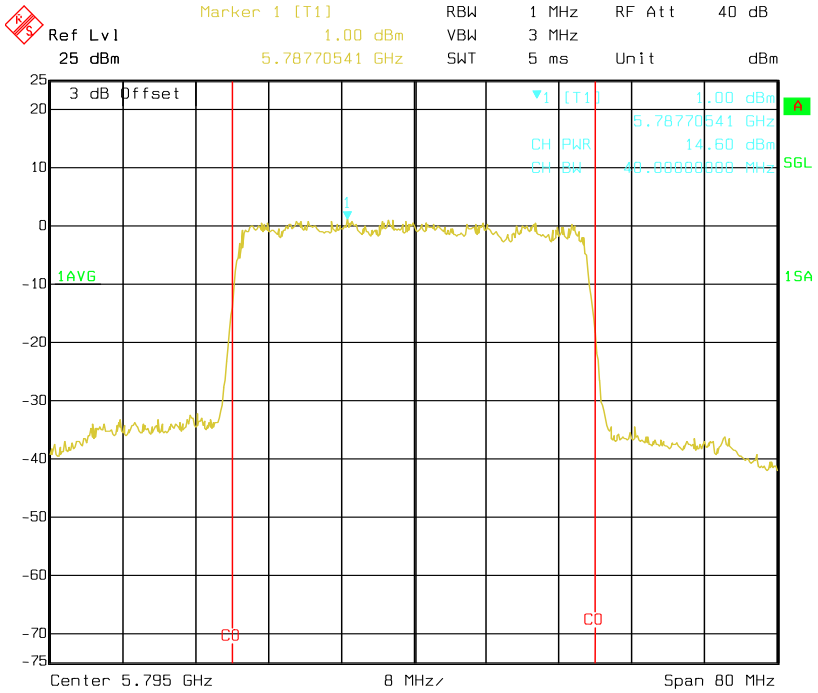
5795 MHz, Chain 0



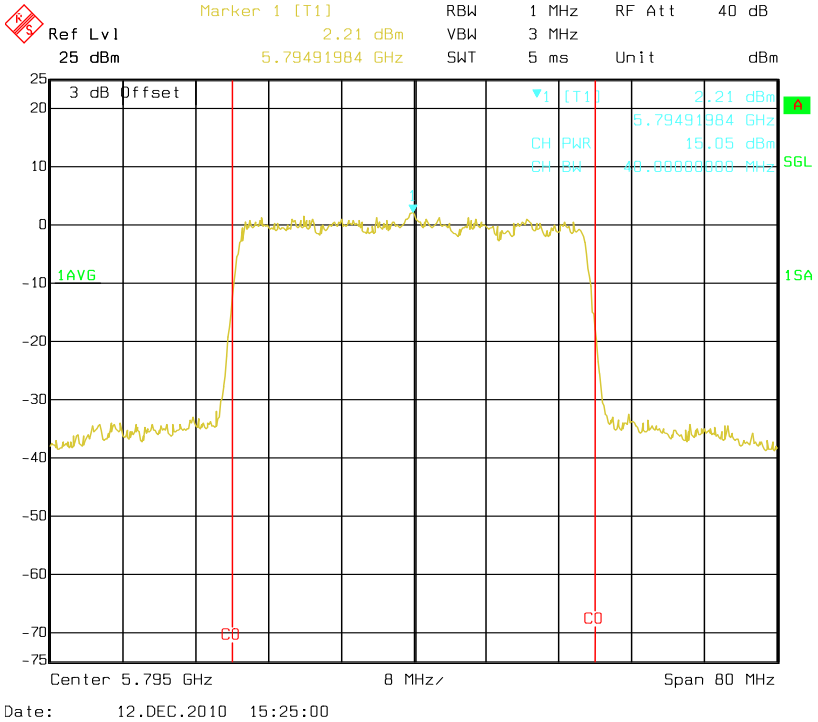
5795 MHz, Chain 1



5795 MHz, Chain 2



5795 MHz, Chain 3



FCC §15.407(a) (3),(5) - POWER SPECTRAL DENSITY

Applicable Standard

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1–MHz 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations

The peak power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) 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. 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

4. 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.
5. 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 Felix Li on 2010-12-13.

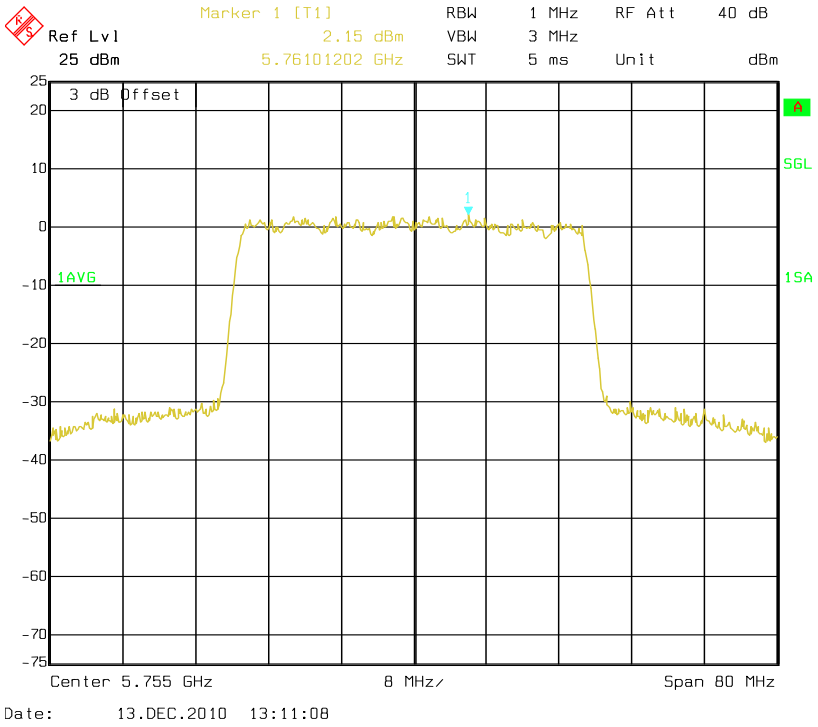
Test Mode: Transmitting

Test Result: Pass

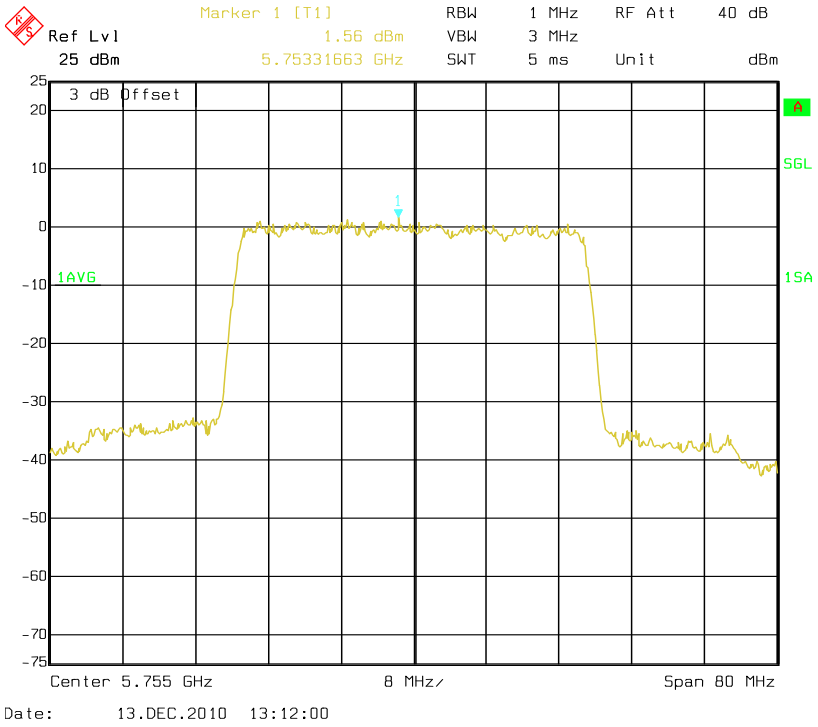
Frequency Band (MHz)	Frequency (MHz)	TX Chain	PSD (dBm/MHz)	Total PDS (dBm/MHz)	Limit (dBm/MHz)
5725-5825	5755	Chain 0	2.15	7.98	17
		Chain 1	1.56		
		Chain 2	2.00		
		Chain 3	2.09		
	5795	Chain 0	0.06	6.37	17
		Chain 1	-0.27		
		Chain 2	0.43		
		Chain 3	1.06		

Please refer to the following plots

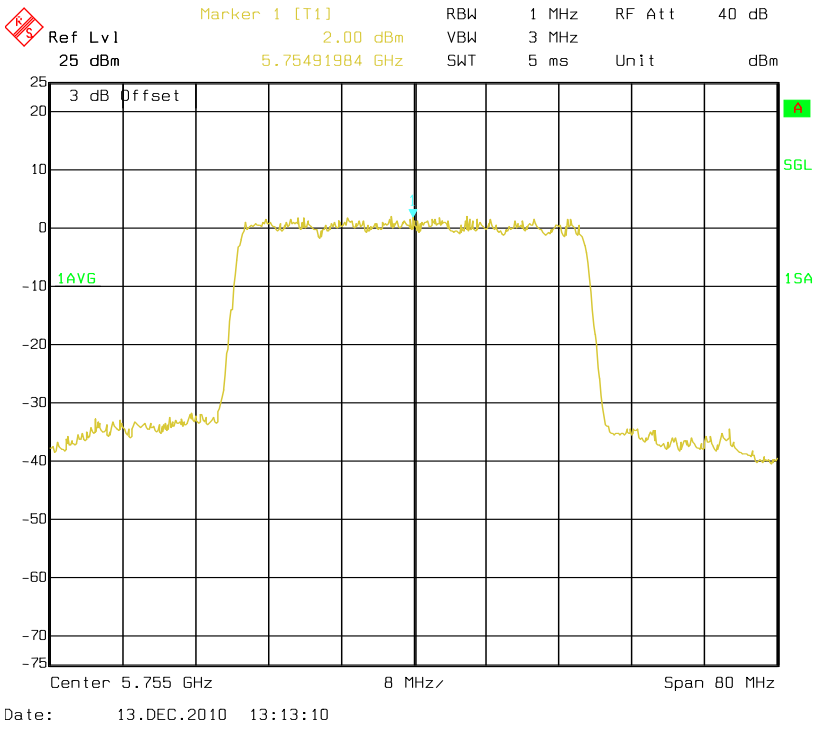
5755 MHz, Chain 0



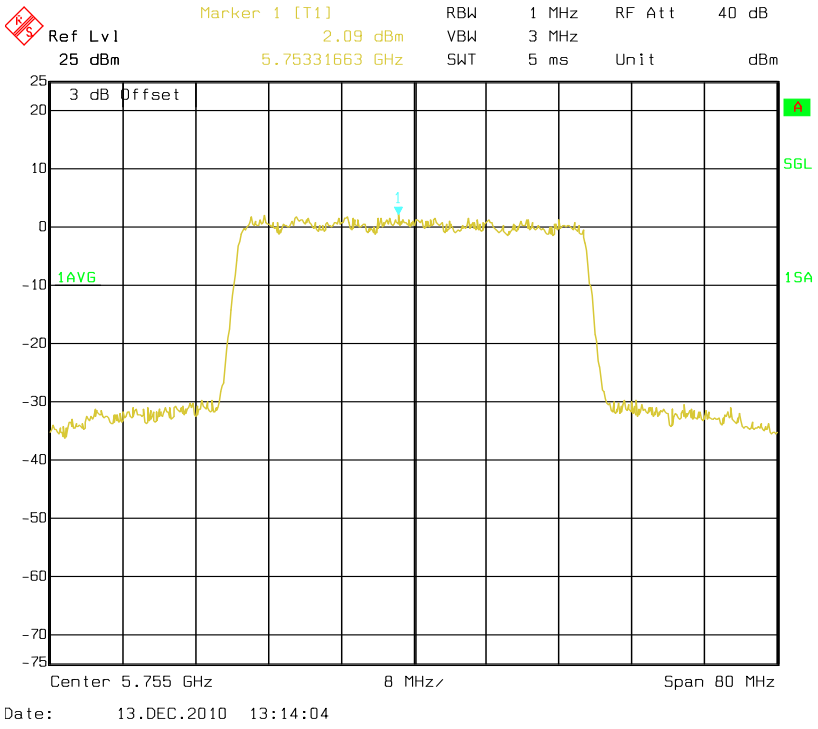
5755 MHz, Chain 1



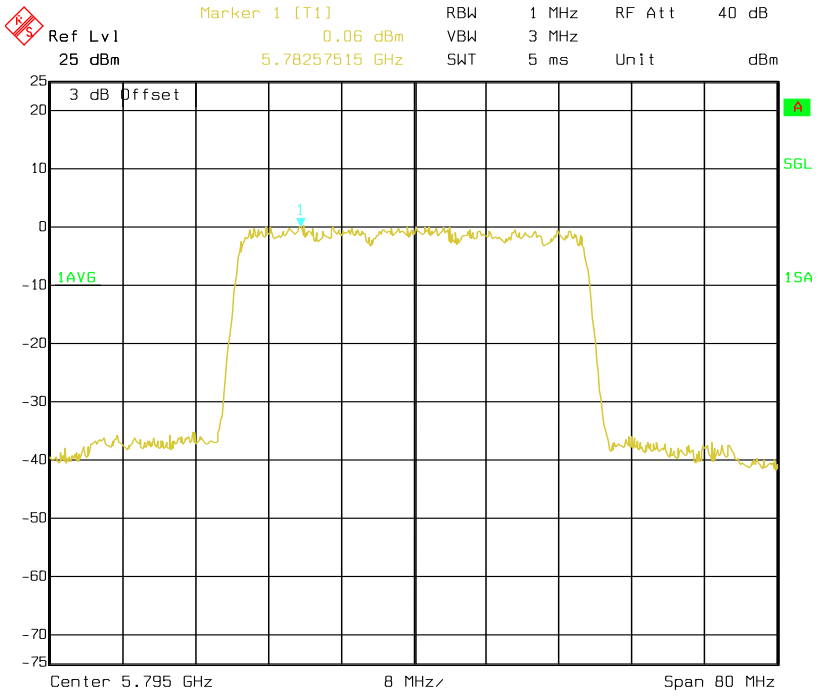
5755 MHz, Chain 2



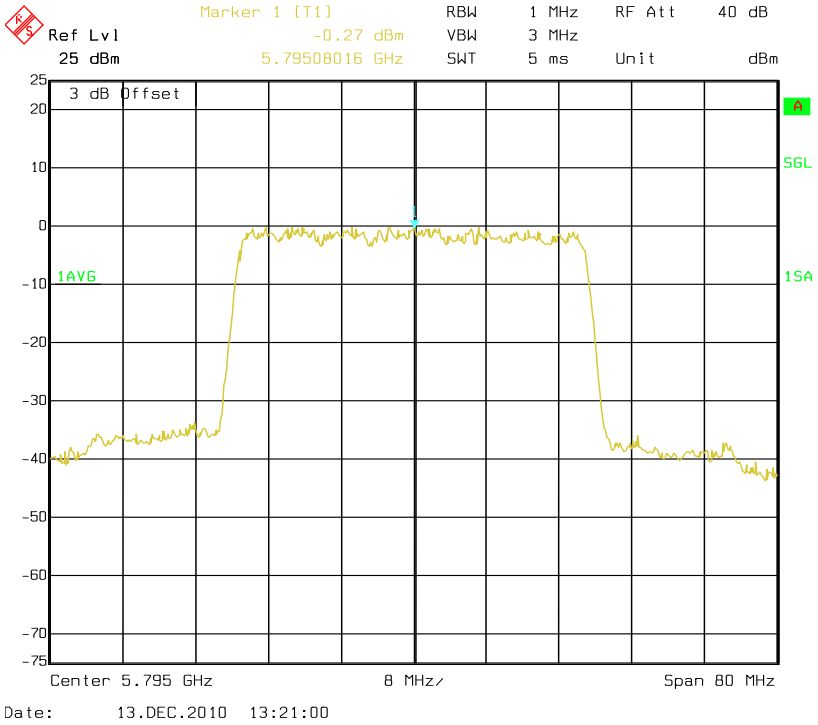
5755 MHz, Chain 3



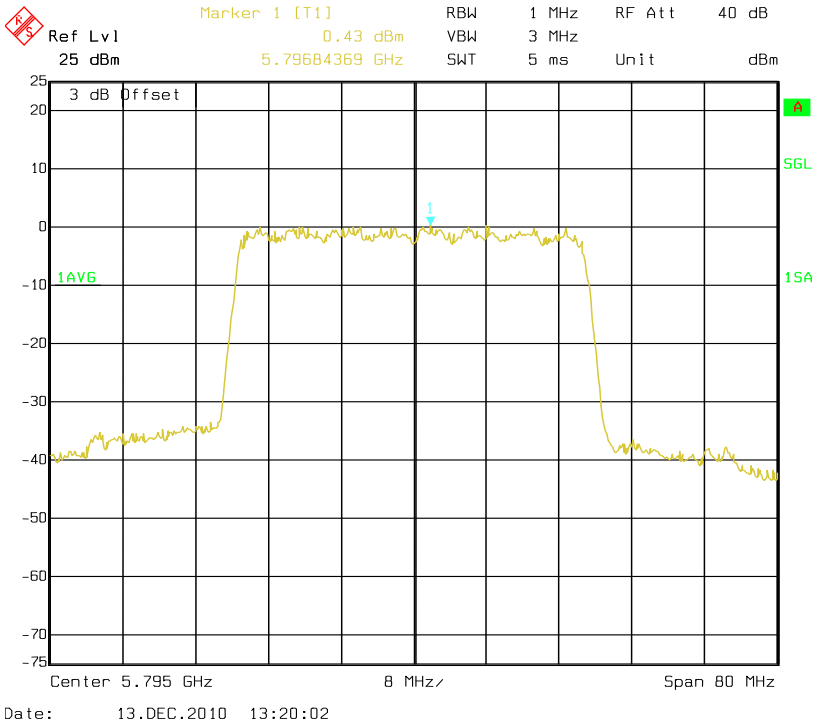
5795 MHz, Chain 0



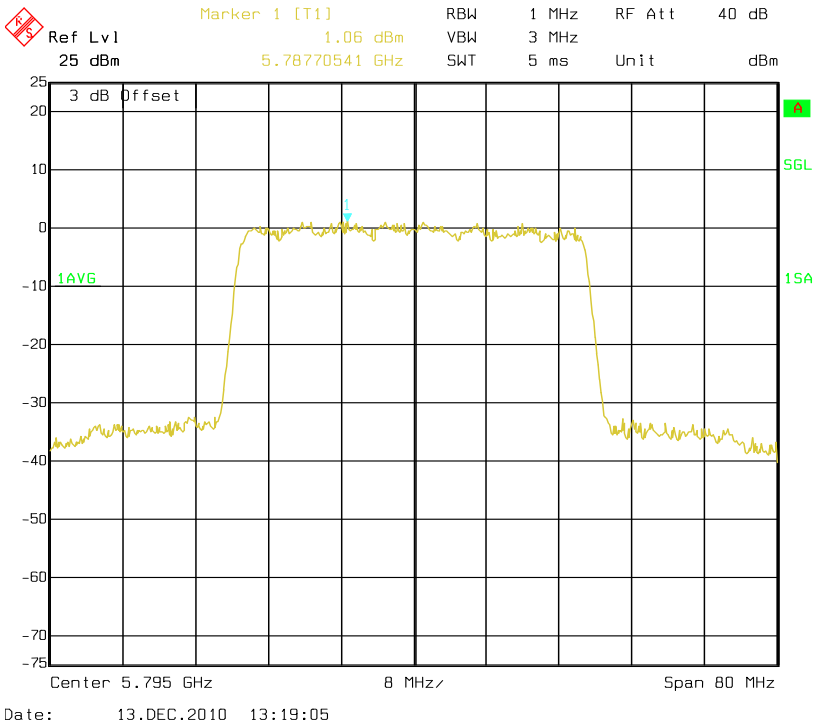
5795 MHz, Chain 1



5795 MHz, Chain 2



5795 MHz, Chain 3



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

Applicable Standard

According to FCC §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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

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

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 setion "FCC §15.407(a)(1)(2) – CONDUCTED TRANSMITTER OUTPUT POWER".

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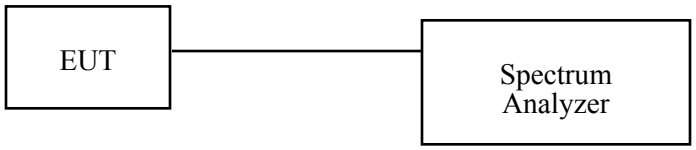


Test Data

Environmental Conditions

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

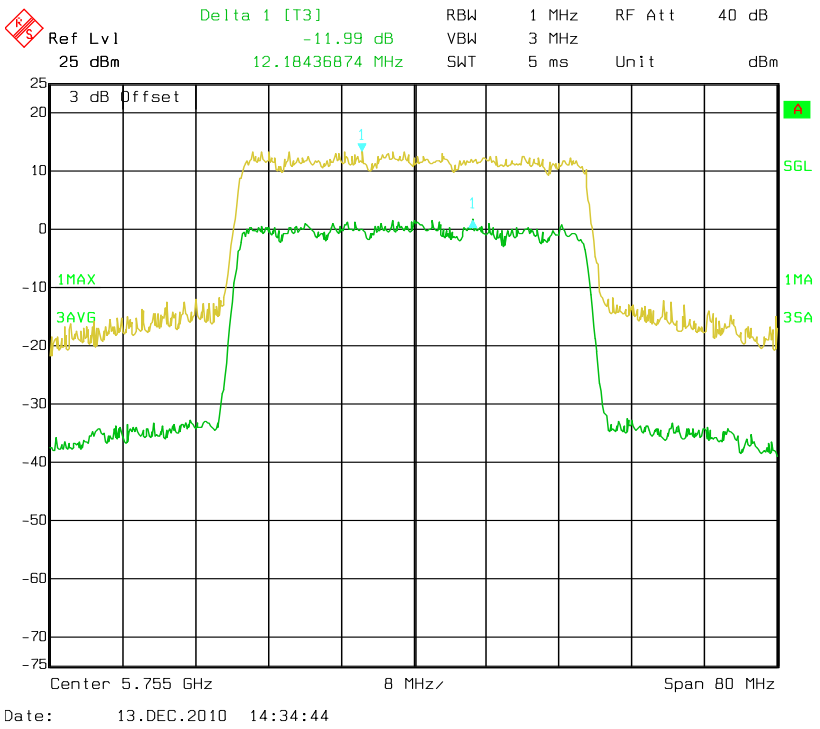
The testing was performed by Felix Li on 2010-12-13.

Test Mode: Transmitting

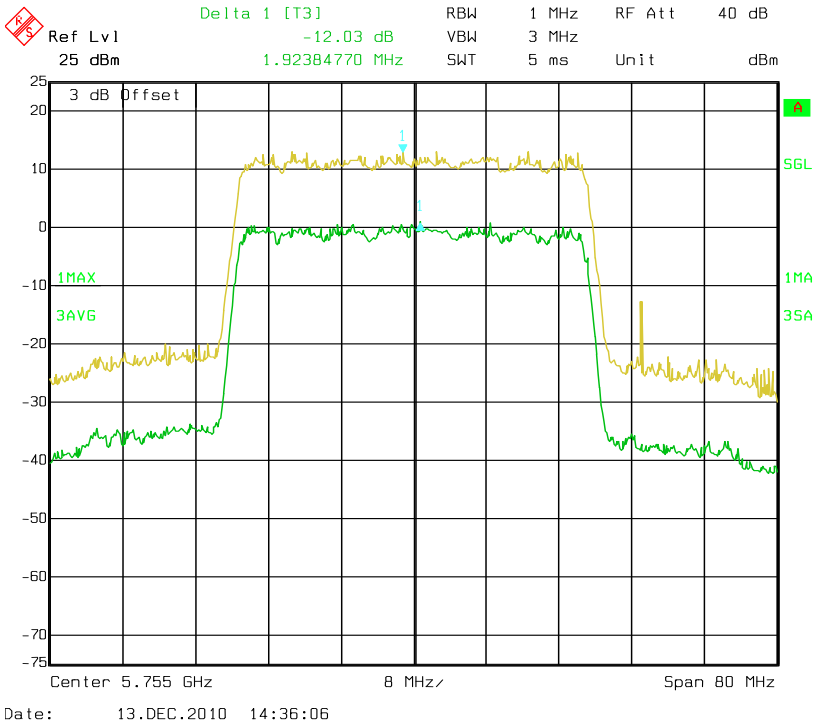
Frequency Band (MHz)	Frequency (MHz)	TX Chain	Peak Excursion Ratio (dB)	Limit (dB)
5725-5825	5755	Chain 0	11.99	13
		Chain 1	12.03	
		Chain 2	12.23	
		Chain 3	12.61	
	5795	Chain 0	12.32	13
		Chain 1	12.26	
		Chain 2	12.43	
		Chain 3	12.41	

Please refer to the following plots.

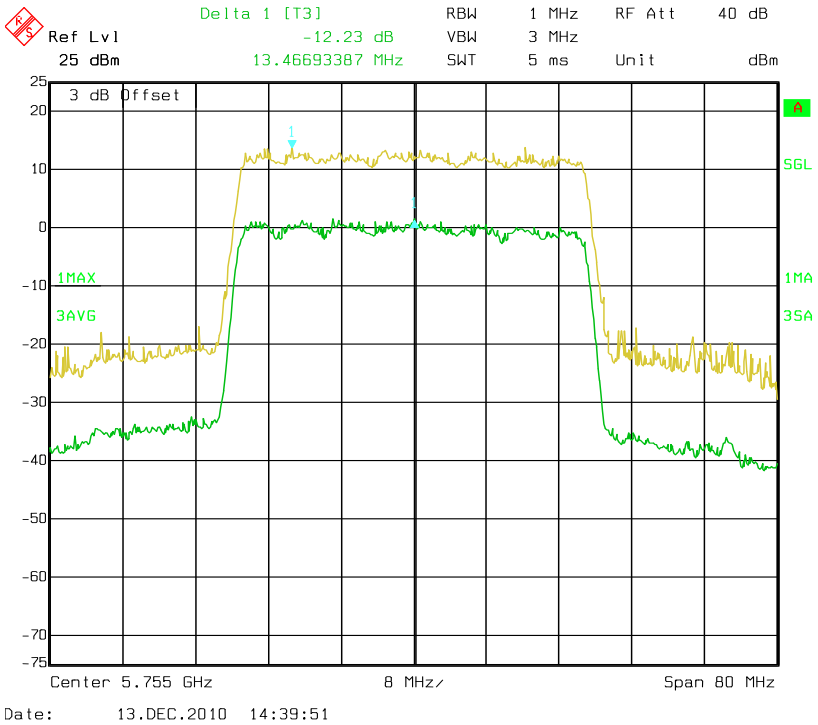
5755 MHz, Chain 0



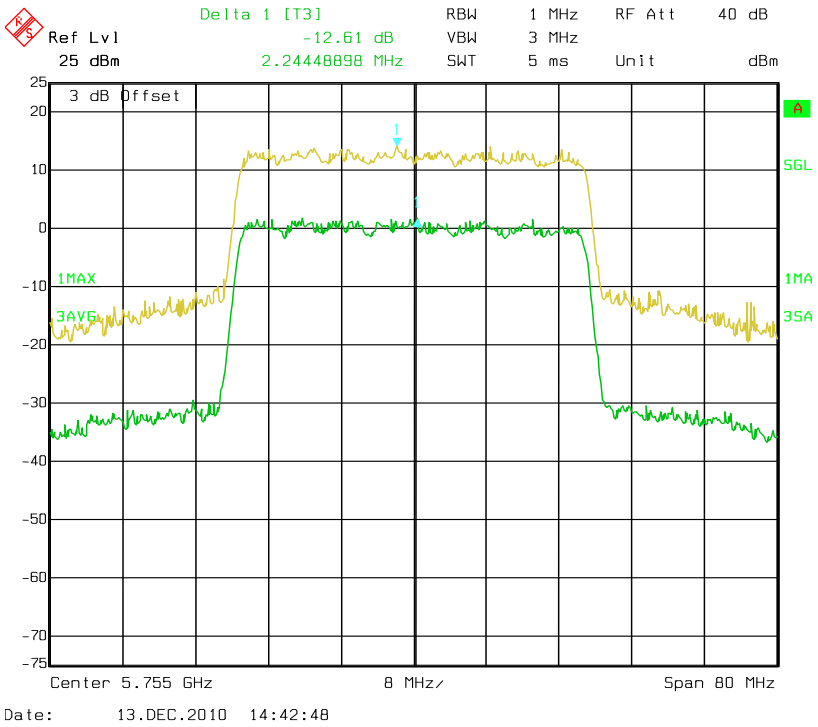
5755 MHz, Chain 1



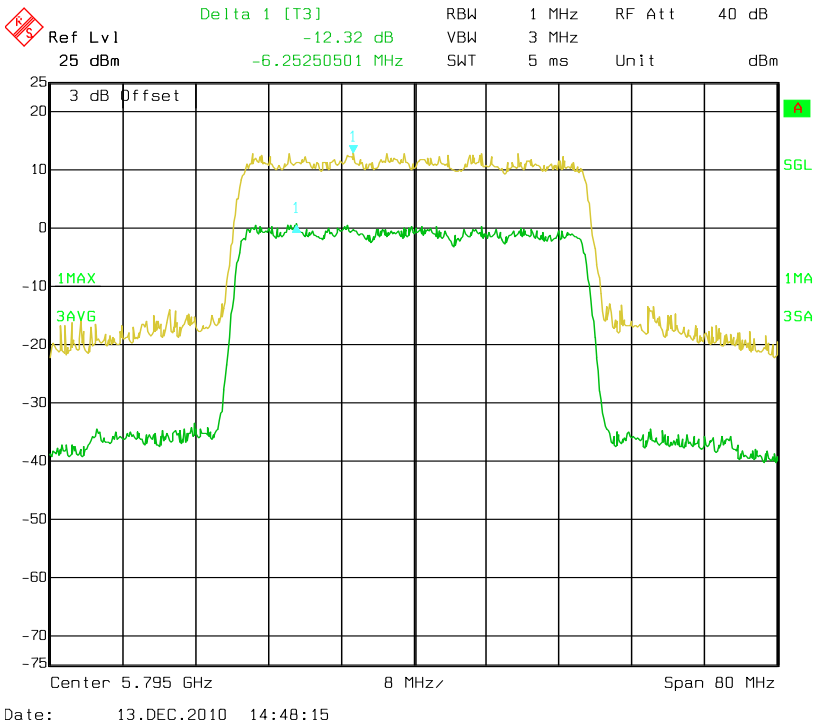
5755 MHz, Chain 2



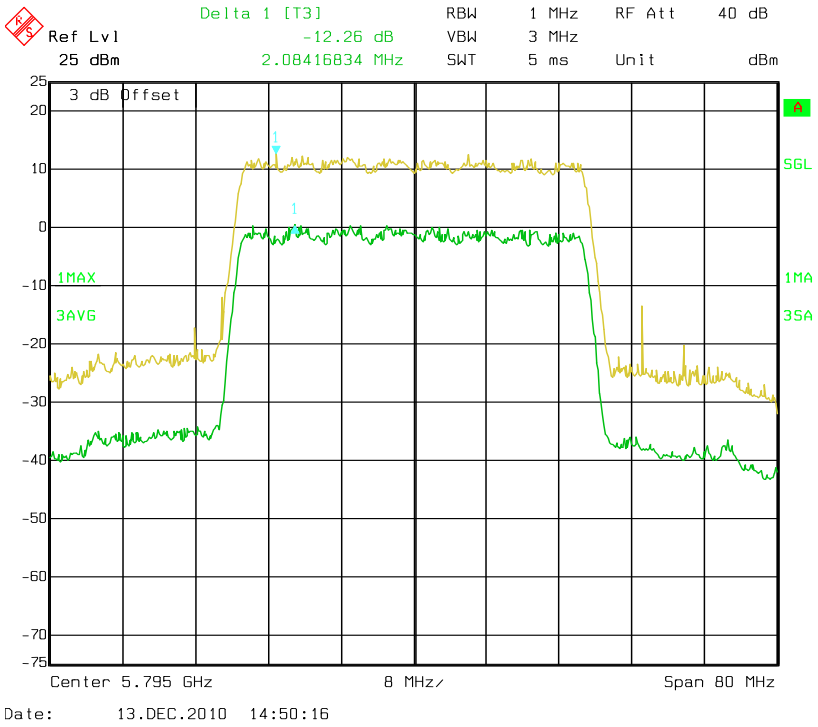
5755 MHz, Chain 3



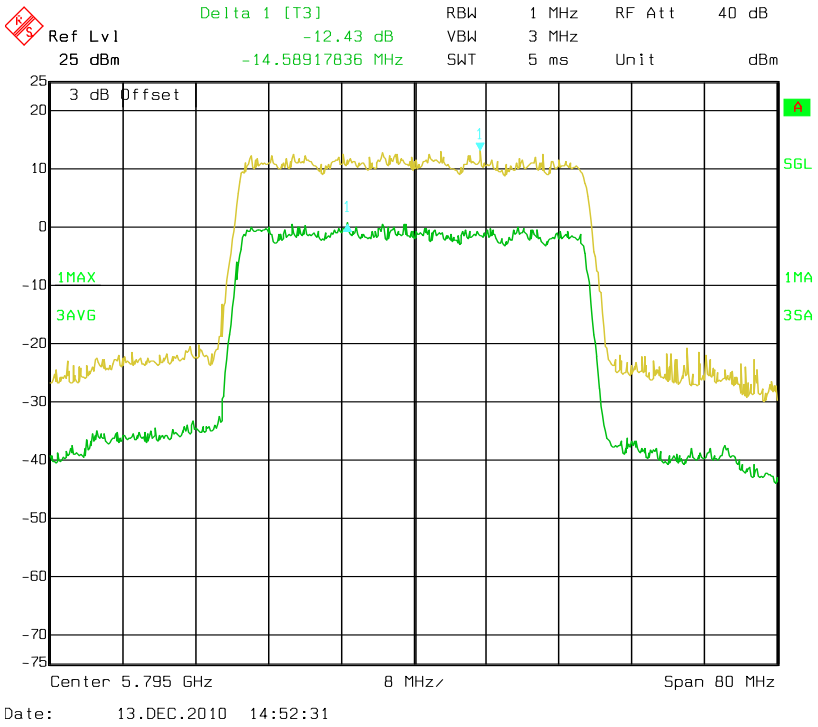
5795 MHz, Chain 0



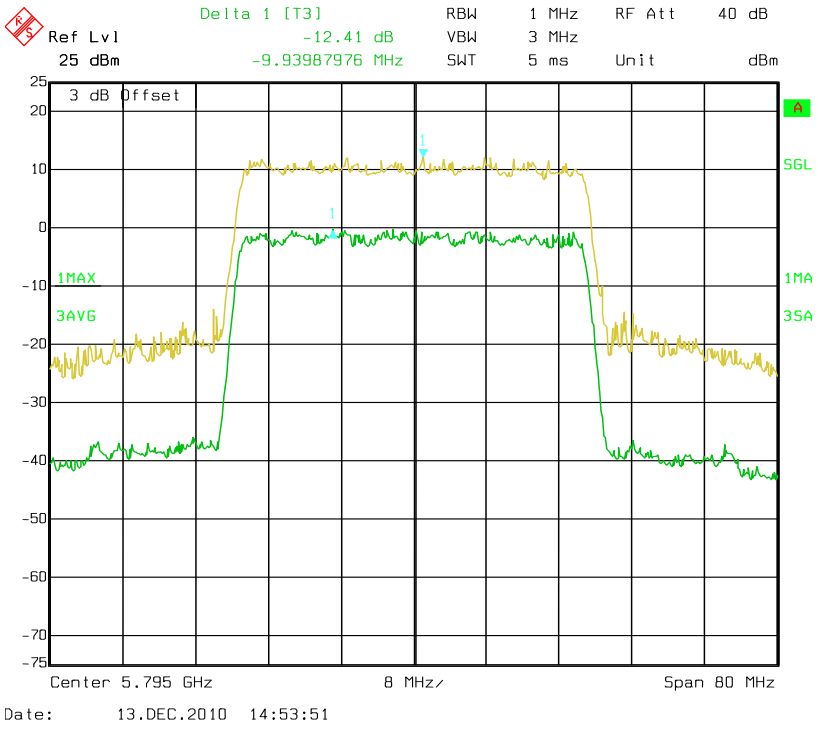
5795 MHz, Chain 1



5795 MHz, Chain 2



5795 MHz, Chain 3



FCC §407(g) - FREQUENCY STABILITY

Applicable Standards

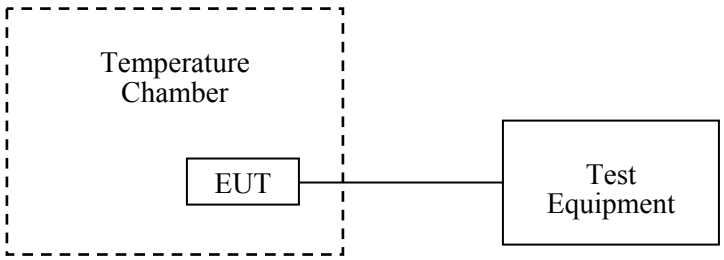
FCC §407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

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 80% 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	2010-06-04	2011-06-03
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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:	100.0kPa

The testing was performed by Felix Li on 2010-12-20.

Test Mode: Transmitting

Frequency Band (MHz)	Frequency (MHz)	Temperature (^{O}C)	Power Supply (V_{AC})	Measurement Frequency (MHz)
5725-5825	5755	55	138	5754.94561
			120	5755.05105
			102	5755.05456
		25	138	5754.98156
			120	5755.05006
			102	5755.05009
		-10	138	5754.98338
			120	5755.05015
			102	5755.05228
	5795	55	138	5794.98652
			120	5795.05001
			102	5795.05337
		25	138	5794.98654
			120	5795.05001
			102	5795.05238
		-10	138	5794.98563
			120	5795.05116
			102	5795.05122

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