FCC PART 15.407

TEST REPORT

For

IDX Company, Ltd.

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

FCC ID: OFJCW-1-12061201

Report Type:	Product Type:
Original Report	Wireless Video Transmission System(TX part)

Test Engineer:	Lion Cai
Report Number:	R1DG120613004-00
Report Date:	2012-07-02
Reviewed By:	Jerry Zhang EMC Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *IDX Company, Ltd.*'s product, model number: CW-1 *(FCC ID: OFJCW-1-12061201)* ("EUT") in this report is a Wireless Video Transmission System(TX part) (named as Wireless Video Transmission System by applicant), which was measured approximately: 9.7cm (L) x 1.5cm (W) x1.4 cm (H), rated input voltage: DC 5V from adapter.

Adapter Information：
MODEL：SSA051F050100USU
INPUT：100-240V, 50/60Hz, 0.2A
OUTPUT: 5V, 1A

** All measurement and test data in this report was gathered from production sample serial number: 120613004 (Assigned by Dongguan 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-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, section 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. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) 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 February 02, 2012. 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.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

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

No modification.

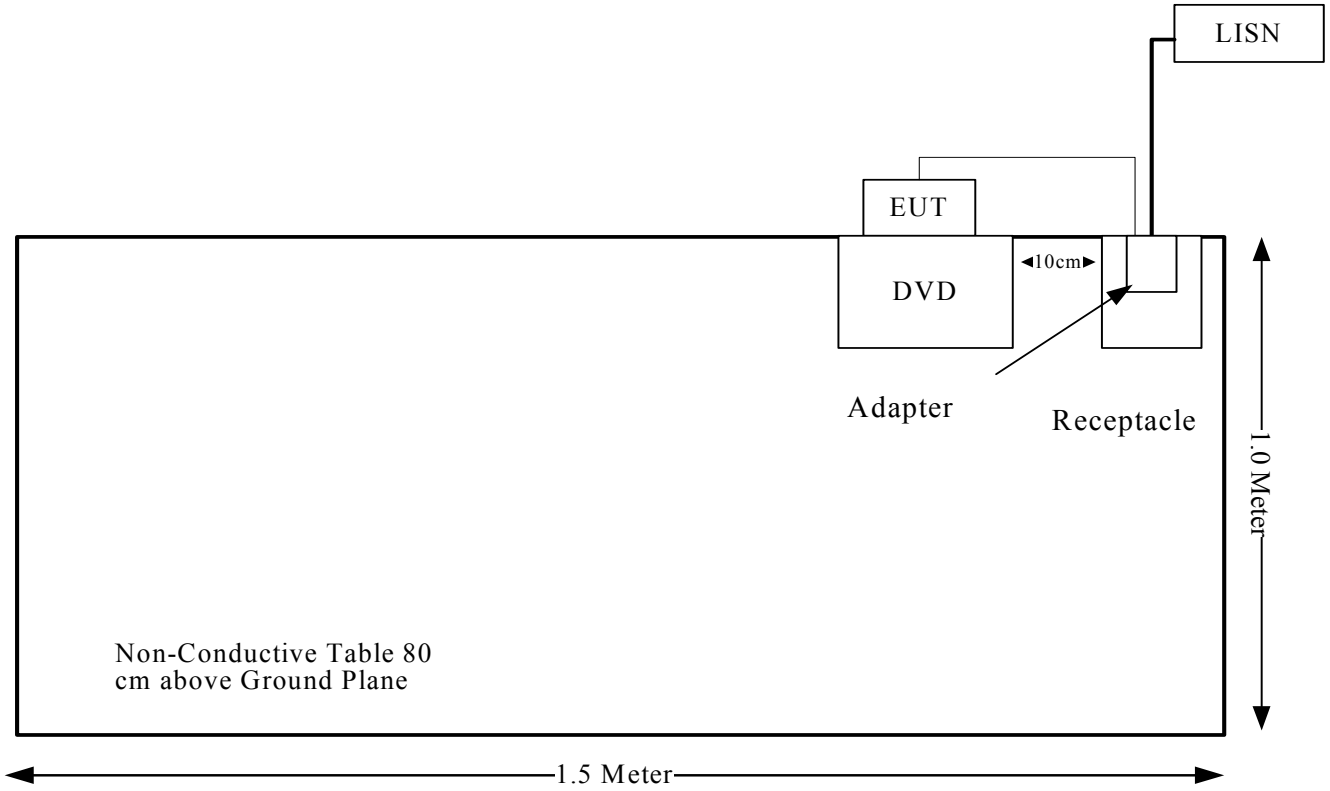
Local Support Equipment

Manufacturer	Description	Model	Serial Number
Philips	DVD	DVP3560K/93	KX1C1108079973

External Cable

Cable Description	Length (m)	From/Port	To
Unshielded detachable USB cable	0.8	EUT	Adapter

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)	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 Bandwidth	Compliance
§15.407(a)(2),	Conducted Transmitter Output Power	Compliance
§15.407 (a)(2),(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, §1.1307(b) (1) – RF EXPOSURE EVALUATION

Applicable Standard

According to subpart 15.247(i)and subpart §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.

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.

Calculated Formulary:

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
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);

Calculated Data:

Frequency (MHz)	**Antenna Gain**		**Conducted Power**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
	(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
5310	2.0	1.58	12.22	16.67	20	0.005	1.0
5670	2.0	1.58	12.69	18.58	20	0.006	1.0

Result: The device meet FCC MPE 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 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 have two “Microwave Multi-Layer Chip Type Ceramic Antenna”, one for transmitting and receiving, the rest only for transmitting, 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) – CONDUCTED EMISSIONS

Applicable Standard

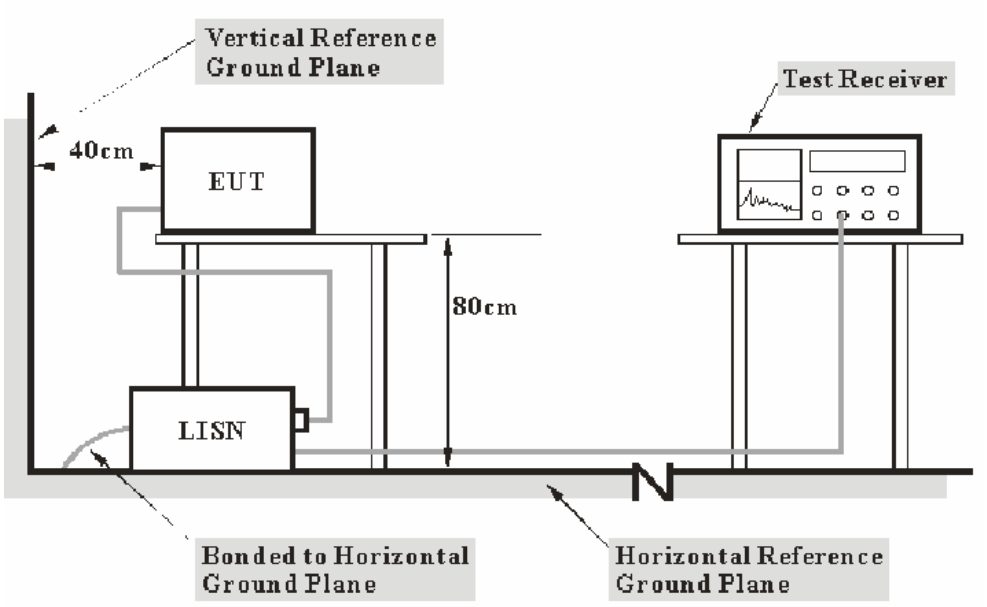
FCC §15.207, §15.407(b) (6)

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 DVD 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:

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 Reciever	ESCS 30	830245/006	2011-10-8	2012-10-7
Rohde & Schwarz	LISN	ESH3-Z5	843331/015	2011-10-8	2012-10-7

Test Procedure

During the conducted emission test, the DVD 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:

19.60 dB at **0.515 MHz** in the **Neutral** mode.

Test Data

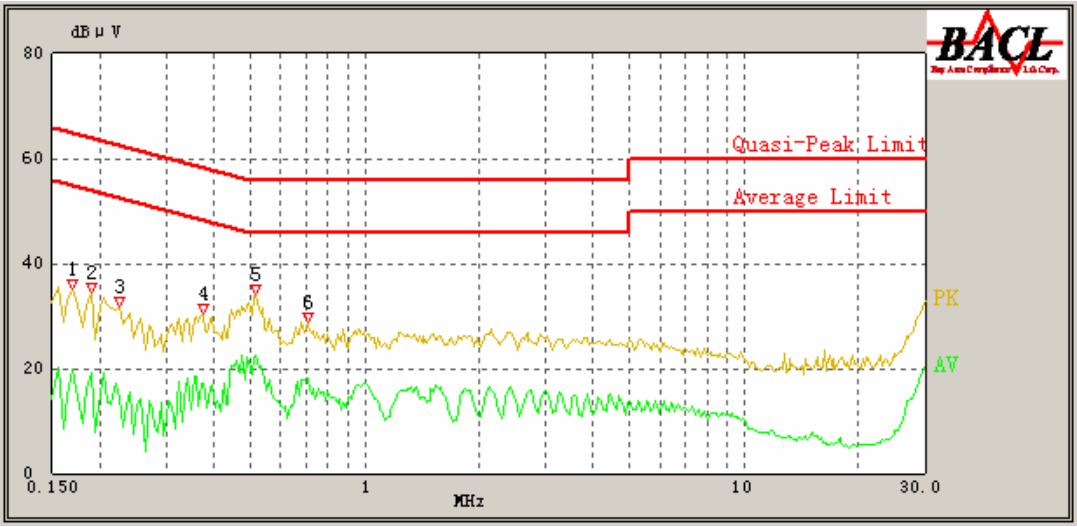
Environmental Conditions

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

The testing was performed by Lion Cai on 2012-06-20.

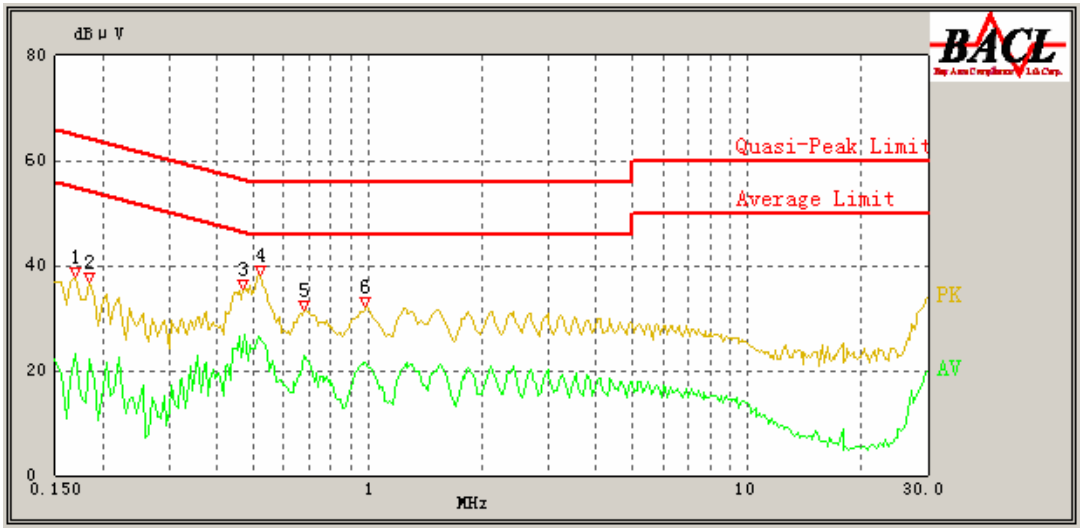
Test Mode: Transmitting

120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK /QP/Ave.)
0.515	22.57	0.42	46.00	23.43	Ave.
0.515	29.41	0.42	56.00	26.59	QP
0.705	18.14	0.44	46.00	27.86	Ave.
0.705	23.99	0.44	56.00	32.01	QP
0.375	27.12	0.42	59.57	32.45	QP
0.375	17.08	0.42	49.57	32.49	Ave.
0.170	32.33	0.41	65.43	33.10	QP
0.190	30.95	0.42	64.86	33.91	QP
0.225	28.33	0.42	63.86	35.53	QP
0.190	19.22	0.42	54.86	35.64	Ave.
0.170	19.72	0.41	55.43	35.71	Ave.
0.225	14.62	0.42	53.86	39.24	Ave.

120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK /QP/Ave.)
0.515	26.40	0.42	46.00	19.60	Ave.
0.520	33.68	0.42	56.00	22.32	QP
0.470	24.03	0.42	46.86	22.83	Ave.
0.680	22.98	0.44	46.00	23.02	Ave.
0.985	21.64	0.45	46.00	24.36	Ave.
0.470	32.12	0.42	56.86	24.74	QP
0.680	28.92	0.44	56.00	27.08	QP
0.985	28.48	0.45	56.00	27.52	QP
0.170	34.50	0.41	65.43	30.93	QP
0.185	33.49	0.41	65.00	31.51	QP
0.170	23.15	0.41	55.43	32.28	Ave.
0.185	22.14	0.41	55.00	32.86	Ave.

FCC §15.209, §15.205 & §15.407(b) (2) (3) (6) (7) – 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.

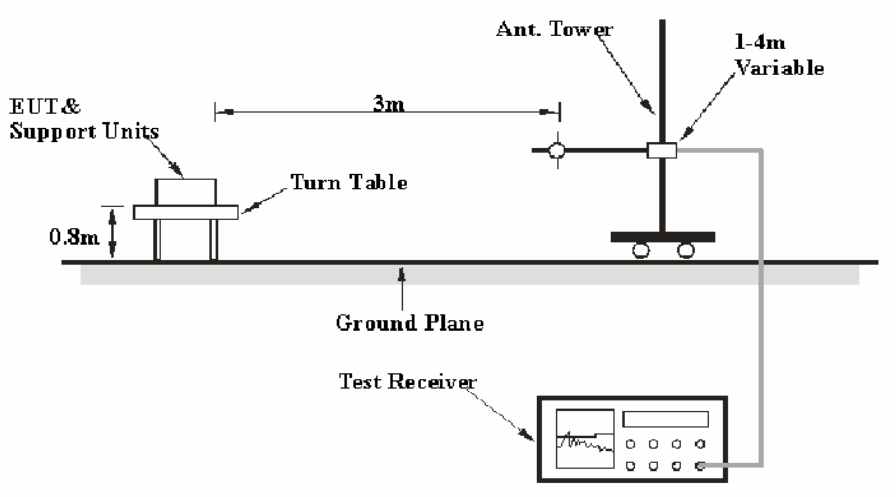
Measurement Uncertainty

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.

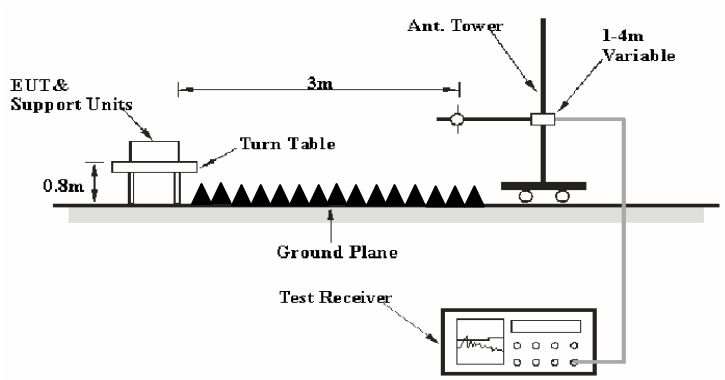
Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement from 30 MHz to 1 GHz at Bay Area Compliance Laboratories Corp. (Dongguan) is 4.9 dB.

EUT Setup

Below 1GHz:



Above 1GHz:



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 DVD 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:

Frequency Range	***RBW***	***Video B/W***	***Detector***
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 DVD 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:

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 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – 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
R&S	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

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:

2.91 dB at **891.36 MHz** in the **Horizontal** polarization for operating in 5250-5350 MHz
1.53 dB at **11340 MHz** in the **vVertical** 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 to2012-06-28.

Test Mode: Transmitting

5250-5350 MHz:

Polar	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Comennt
H\V	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)	
Operating frequency: 5270 MHz								
H	891.36	40.32	QP	2.77	43.09	46	2.91*	spurious
V	891.36	40.18	QP	2.77	42.95	46	3.05*	spurious
V	10540	28.04	AVG	21.75	49.79	54	4.21*	harmonic
V	10540	41.72	peak	21.75	63.47	68.2	4.73*	harmonic
H	10540	38.28	peak	21.75	60.03	68.2	8.17	harmonic
H	10540	23.13	AVG	21.75	44.88	54	9.12	harmonic
V	5150	19.18	AVG	12.37	31.55	54	22.45	spurious
V	5150	33.21	peak	12.37	45.58	68.2	22.62	spurious
H	5150	18.66	AVG	12.37	31.03	54	22.97	spurious
H	5150	32.57	peak	12.37	44.94	68.2	23.26	spurious
H	5270	76.89	peak	12.1	88.99	N/A	N/A	fundamental
H	5270	60.25	AVG	12.1	72.35	N/A	N/A	fundamental
V	5270	84.83	peak	12.1	96.93	N/A	N/A	fundamental
V	5270	68.17	AVG	12.1	80.27	N/A	N/A	fundamental
Operating frequency: 5310 MHz								
H	891.36	40.23	QP	2.77	43	46	3*	spurious
V	891.36	40.16	QP	2.77	42.93	46	3.07*	spurious
V	10620	27.06	AVG	22.22	49.28	54	4.72*	harmonic
V	10620	39.28	peak	22.22	61.5	68.2	6.7	harmonic
H	10620	38.28	peak	22.22	60.5	68.2	7.7	harmonic
H	10620	22.72	AVG	22.22	44.94	54	9.06	harmonic
H	5350	37.53	peak	11.77	49.3	68.2	18.9	spurious
H	5350	19.92	AVG	11.77	31.69	54	22.31	spurious
V	5350	18.69	AVG	11.77	30.46	54	23.54	spurious
V	5350	31.95	peak	11.77	43.72	68.2	24.48	spurious
H	5310	79.65	peak	12.18	91.83	N/A	N/A	fundamental
H	5310	60.29	AVG	12.18	72.47	N/A	N/A	fundamental
V	5310	80.34	peak	12.18	92.52	N/A	N/A	fundamental
V	5310	64.41	AVG	12.18	76.59	N/A	N/A	fundamental

5470-5725 MHz:

Ploar	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Comment
H\V	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)	
Operating frequency: 5510 MHz								
V	11020	28.06	AVG	24.34	52.4	54	1.6*	harmonic
V	11020	37.83	peak	24.34	62.17	68.2	6.03	harmonic
H	11020	33.32	peak	24.34	57.66	68.2	10.54	harmonic
H	11020	19.02	AVG	24.34	43.36	54	10.64	harmonic
V	5460	18.77	AVG	12.13	30.9	54	23.1	spurious
H	5460	18.22	AVG	12.13	30.35	54	23.65	spurious
H	5460	31.85	peak	12.13	43.98	68.2	24.22	spurious
V	5460	31.82	peak	12.13	43.95	68.2	24.25	spurious
H	5510	71.16	peak	12.31	83.47	N/A	N/A	fundamental
H	5510	50.91	AVG	12.31	63.22	N/A	N/A	fundamental
V	5510	81.29	peak	12.31	93.6	N/A	N/A	fundamental
V	5510	61.99	AVG	12.31	74.3	N/A	N/A	fundamental
Operating frequency: 5550 MHz								
V	11100	28.03	AVG	24.07	52.1	54	1.9*	harmonic
V	11100	37.83	peak	24.07	61.9	68.2	6.3	harmonic
H	11100	18.99	AVG	24.07	43.06	54	10.94	harmonic
H	11100	31.58	peak	24.07	55.65	68.2	12.55	harmonic
V	7450	15.62	AVG	19.3	34.92	54	19.08	spurious
H	7450	15.38	AVG	19.3	34.68	54	19.32	spurious
V	7450	29.54	peak	19.3	48.84	68.2	19.36	spurious
H	7450	29.13	peak	19.3	48.43	68.2	19.77	spurious
H	5550	73.49	peak	12.34	85.83	N/A	N/A	fundamental
H	5550	55.63	AVG	12.34	67.97	N/A	N/A	fundamental
V	5550	80.15	peak	12.34	92.49	N/A	N/A	fundamental
V	5550	62.54	AVG	12.34	74.88	N/A	N/A	fundamental
Operating frequency: 5670 MHz								
V	11340	29.22	AVG	23.25	52.47	54	1.53*	harmonic
H	11340	28.79	AVG	23.25	52.04	54	1.96*	harmonic
V	11340	36.94	peak	23.25	60.19	68.2	8.01	harmonic
H	11340	36.46	peak	23.25	59.71	68.2	8.49	harmonic
V	5725	17.54	AVG	19.10	36.64	54	17.36	spurious
H	5725	17.39	AVG	19.10	36.49	54	17.51	spurious
V	5725	31.46	peak	19.10	50.56	68.2	17.64	spurious
H	5725	31.38	peak	19.10	50.48	68.2	17.72	spurious
H	5670	73.49	peak	12.81	86.3	N/A	N/A	fundamental
H	5670	54.62	AVG	12.81	67.43	N/A	N/A	fundamental
V	5670	80.15	peak	12.81	92.96	N/A	N/A	fundamental
V	5670	62.54	AVG	12.81	75.35	N/A	N/A	fundamental

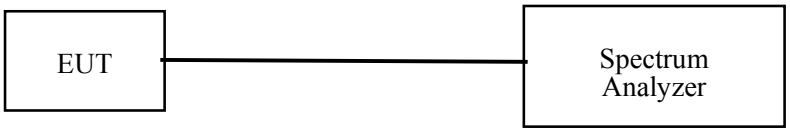
***Within measurement uncertainty!**

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 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

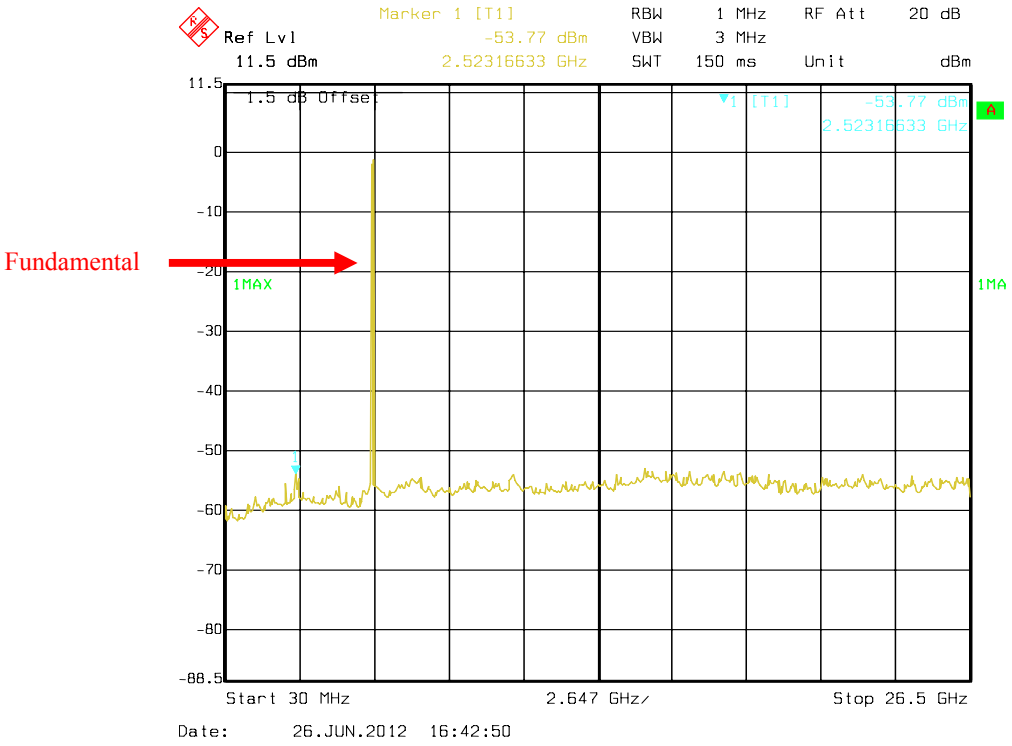


Test data

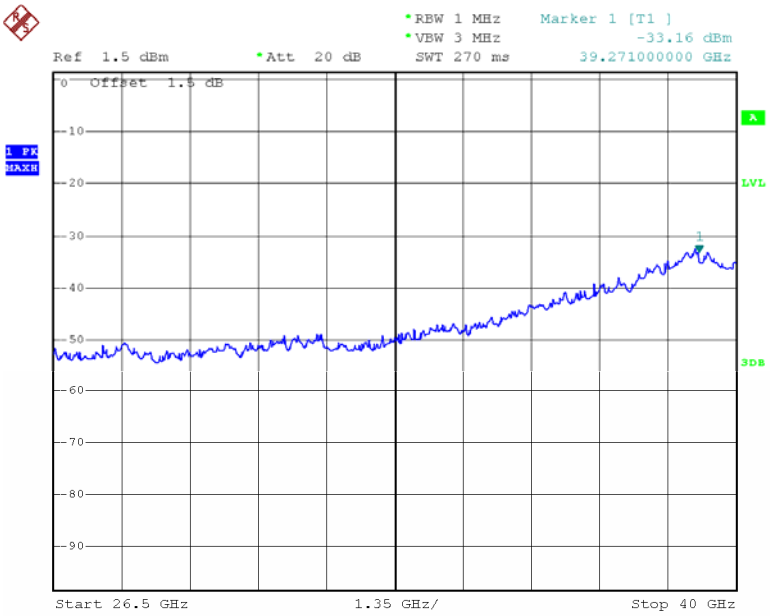
Please refer to the following plots.

5250-5350 MHz:

5270 MHz-Chain 0（30M-26.5G）

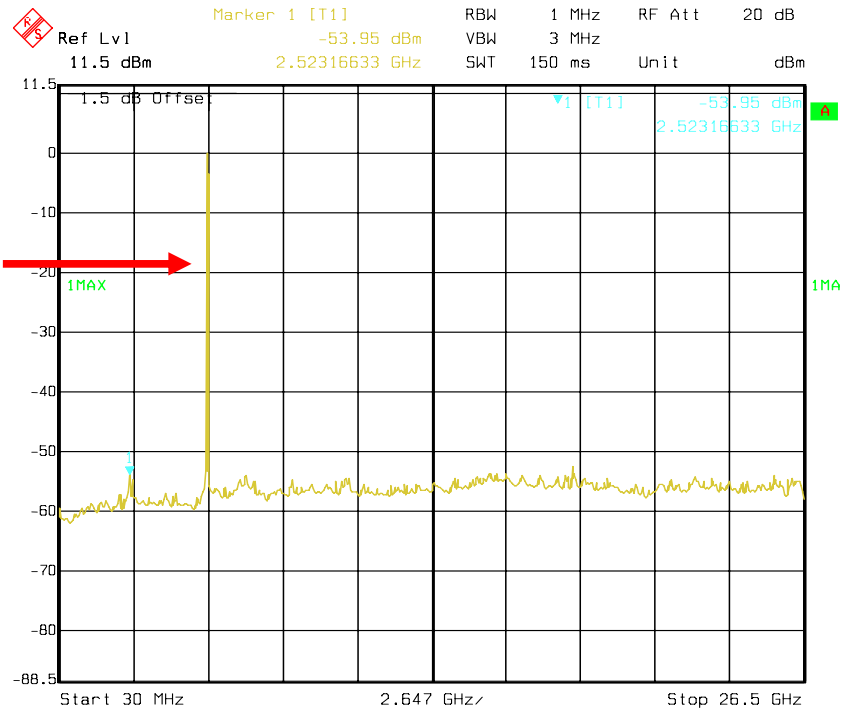


5270 MHz-Chain 0（26.5 G-40 G）



Date: 26.JUN.2012 13:22:15

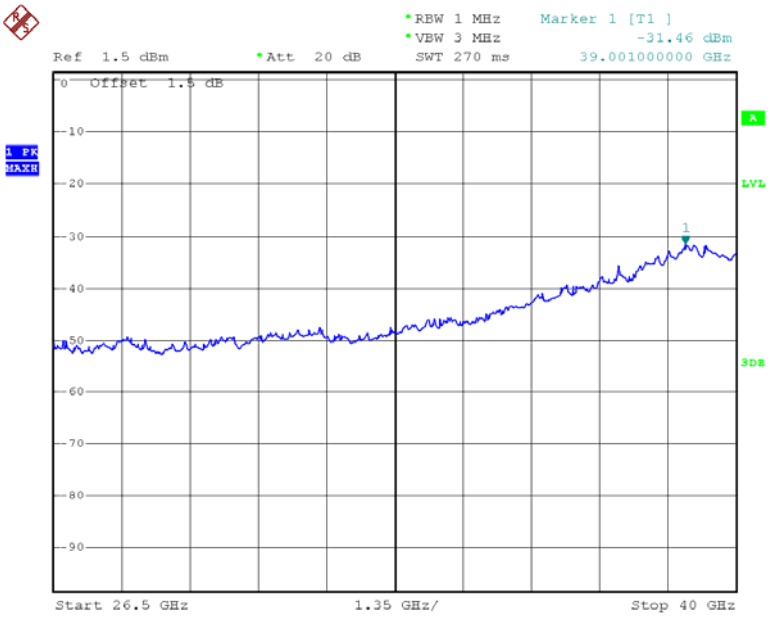
5310 MHz-Chain 0（30M-26.5G）



Fundamental

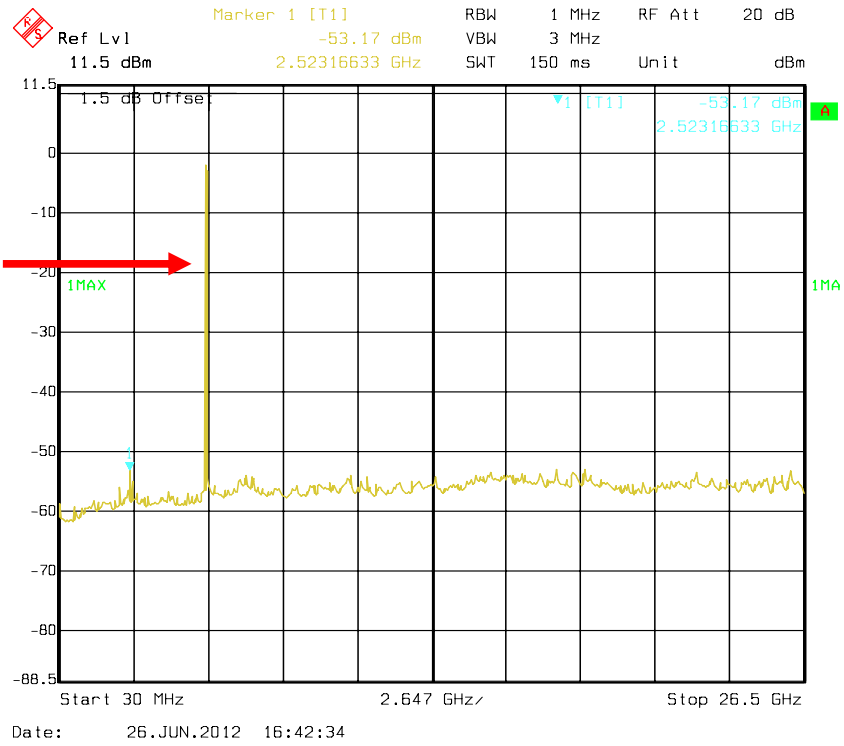
Date: 26.JUN.2012 17:07:12

5310 MHz-Chain 0（26.5 G-40 G）

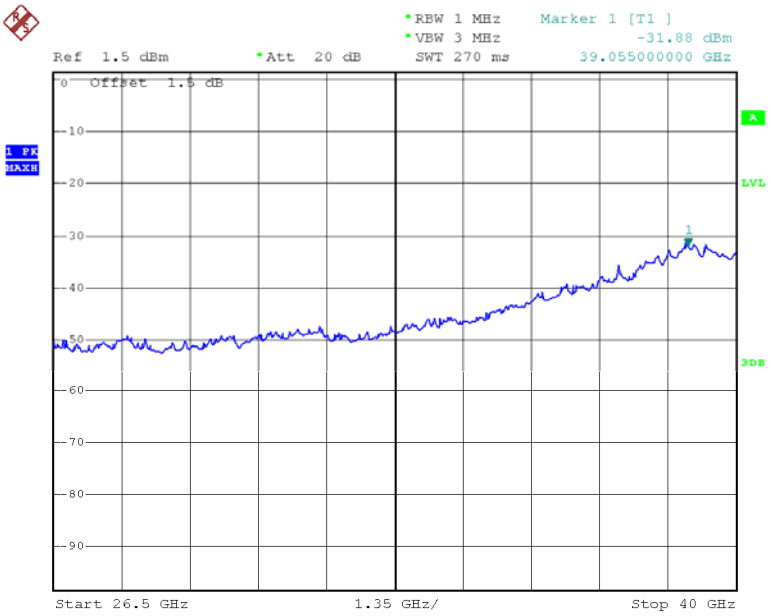


5270 MHz-Chain 1（30M-26.5G）

Fundamental

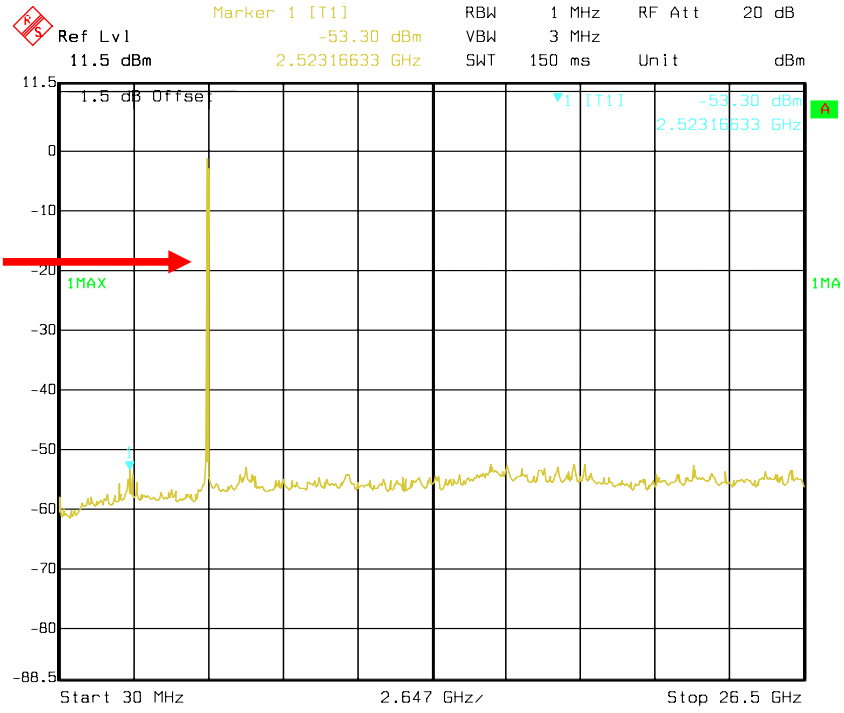


5270 MHz-Chain 1（26.5 G-40 G）



Date: 26.JUN.2012 13:21:53

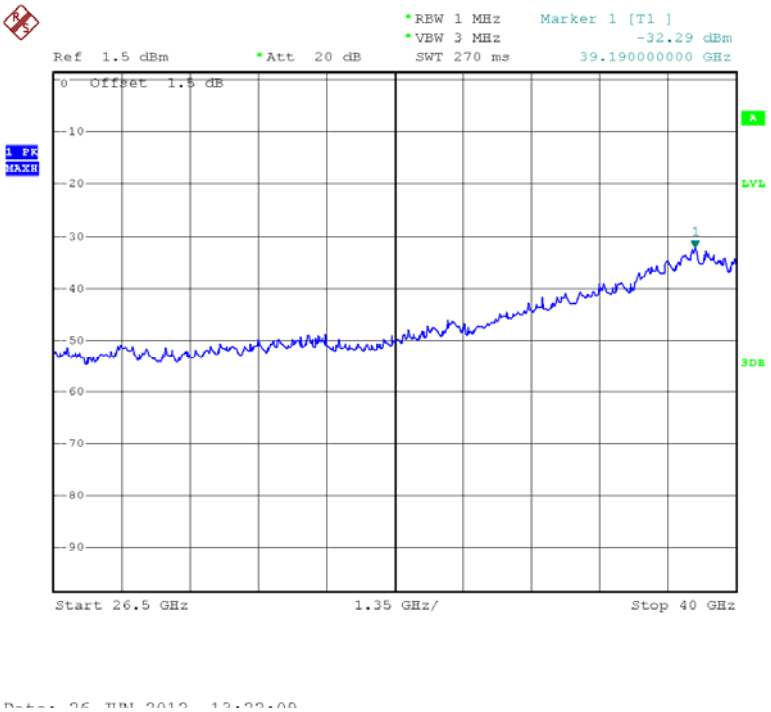
5310 MHz-Chain 1（30M-26.5G）



Fundamental

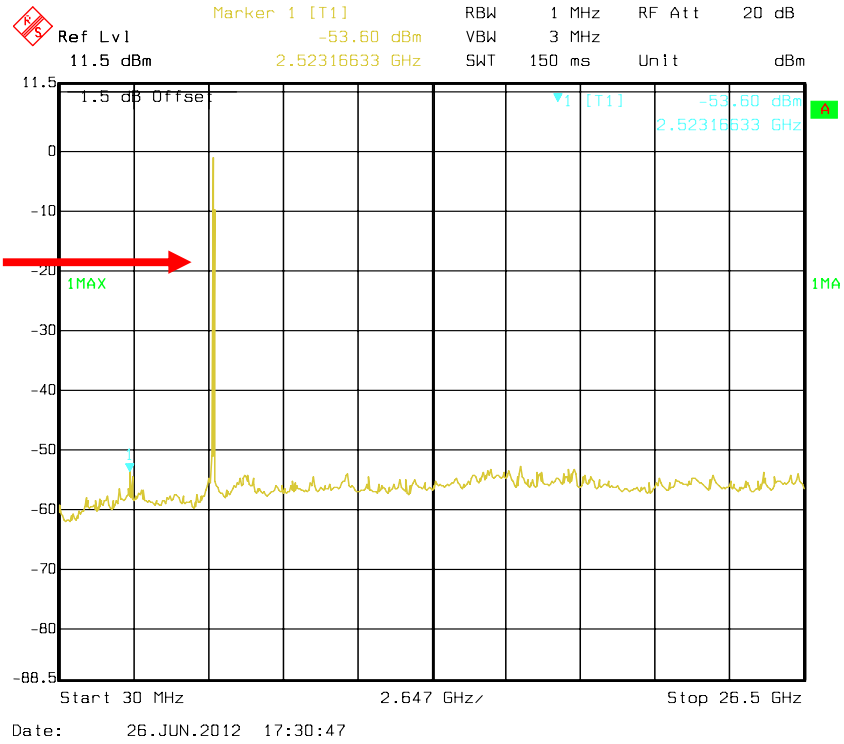
Date: 26.JUN.2012 17:07:02

5310 MHz-Chain 1（26.5 G-40 G）



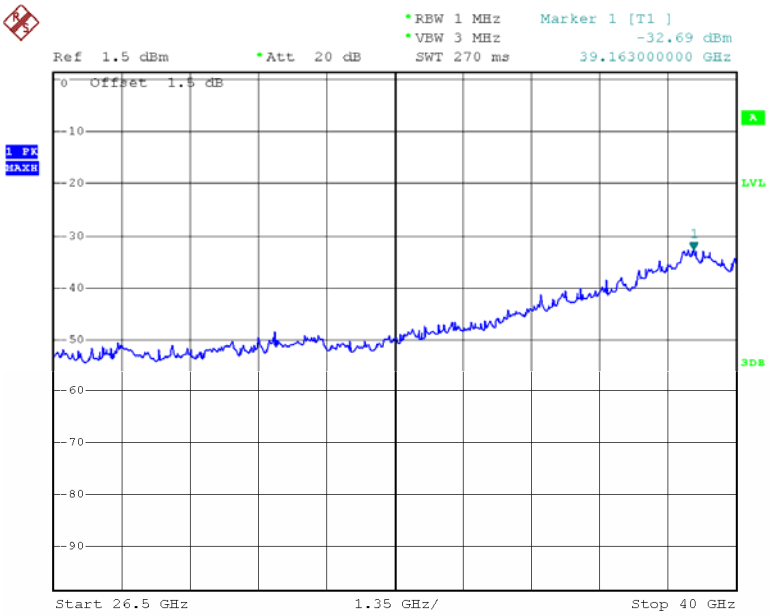
5470-5725 MHz:

5510 MHz-Chain 0（30M-26.5G）



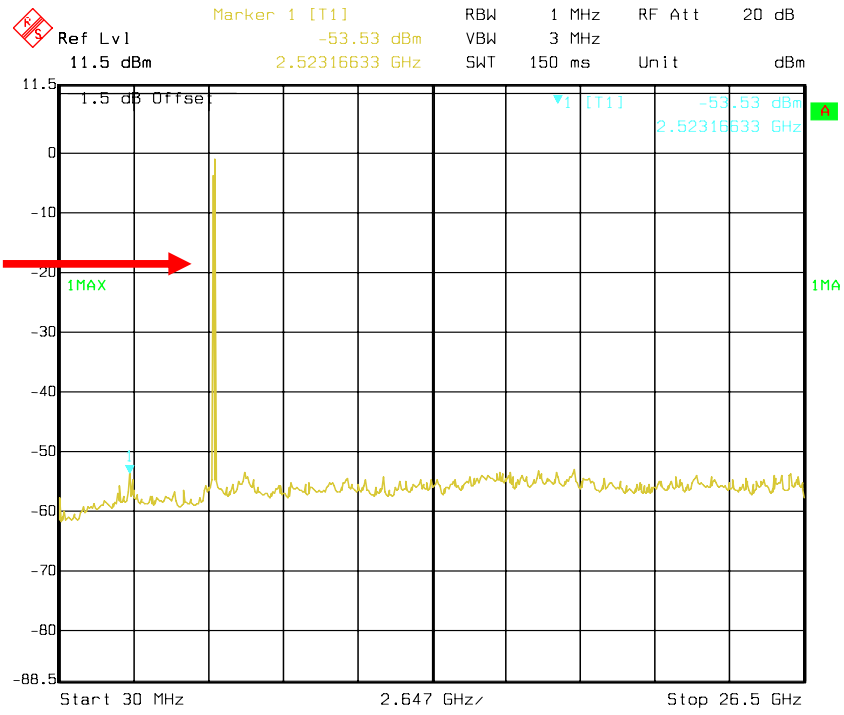
Fundamental

5510 MHz-Chain 0（26.5 G-40 G）



Date: 26.JUN.2012 13:22:47

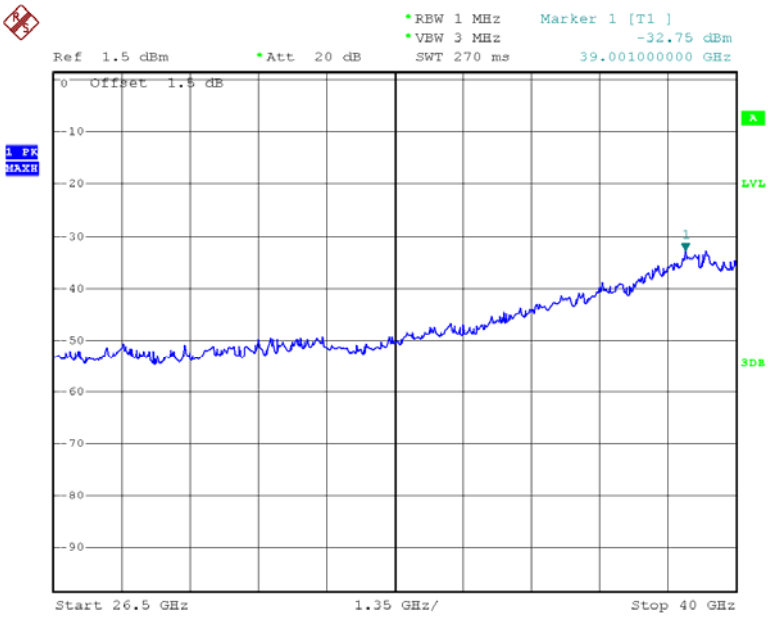
5550 MHz-Chain 0（30M-26.5G）



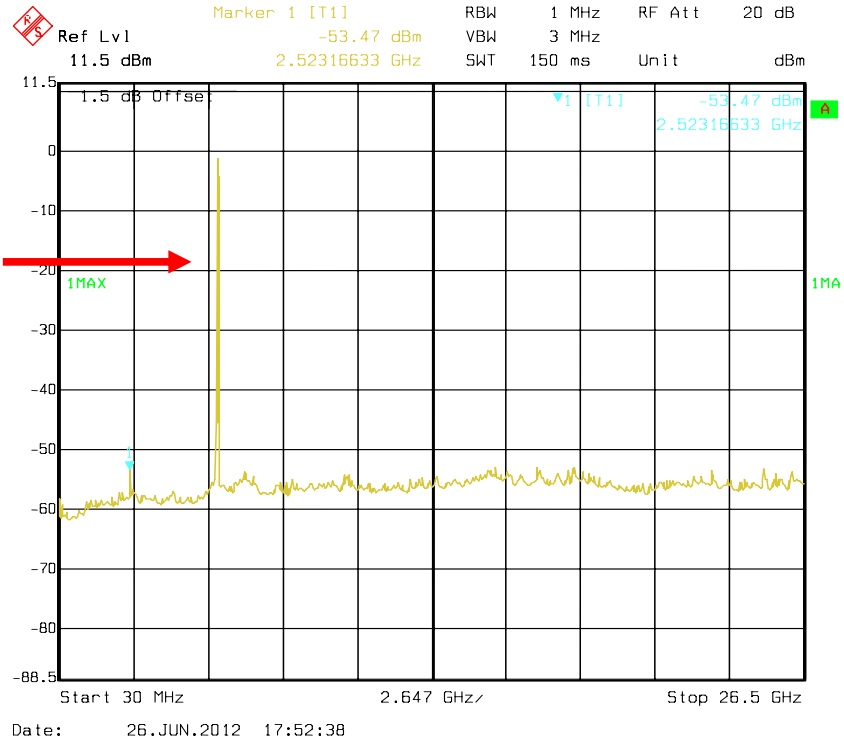
Fundamental

Date: 26.JUN.2012 17:51:11

5550 MHz-Chain 0（26.5 G-40 G）

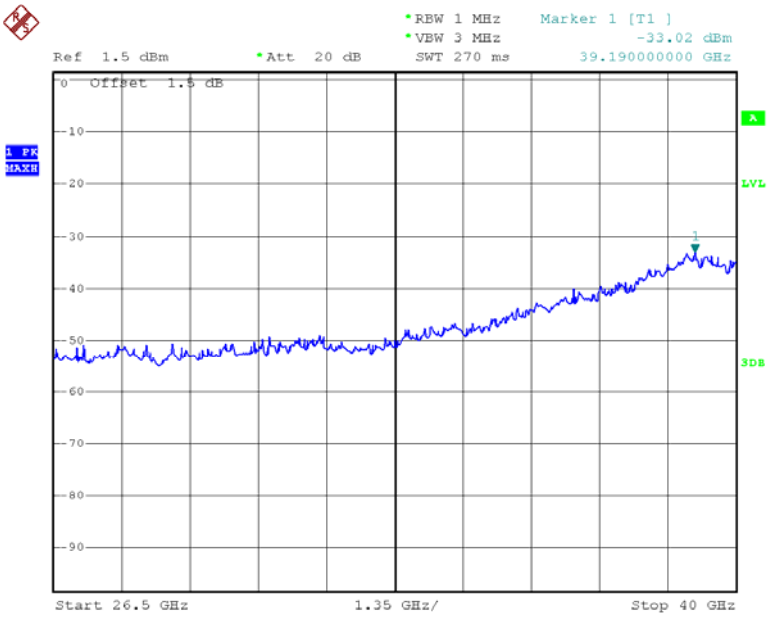


5670 MHz-Chain 0（30M-26.5G）



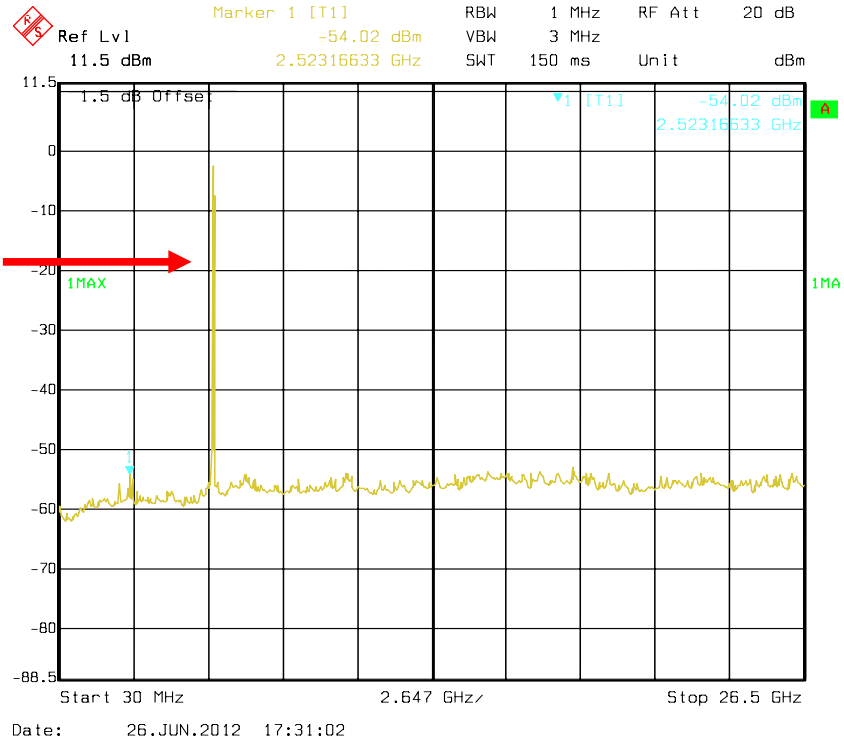
Fundamental

5670 MHz-Chain 0（26.5 G-40 G）

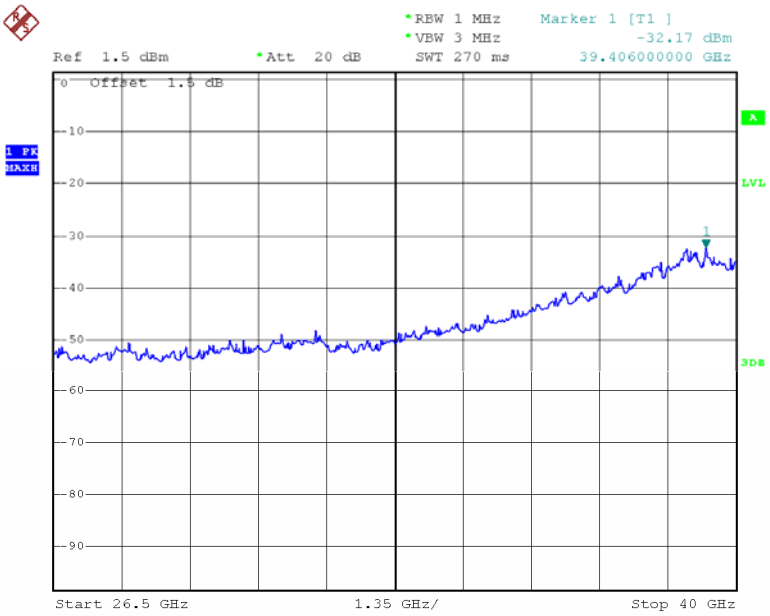


5510 MHz-Chain 1（30M-26.5G）

Fundamental

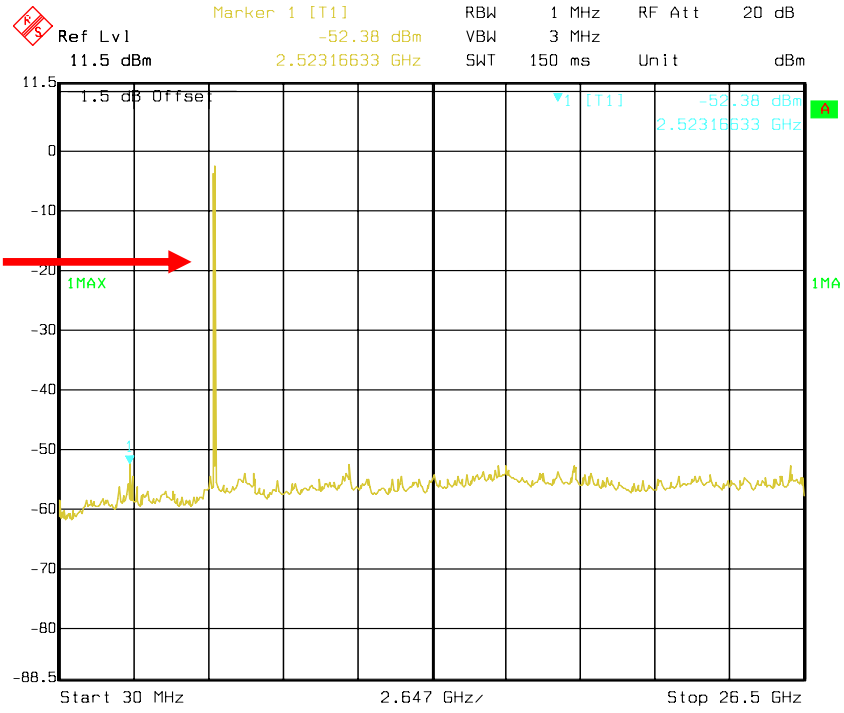


5510 MHz-Chain 1（26.5 G-40 G）



Date: 26.JUN.2012 13:22:20

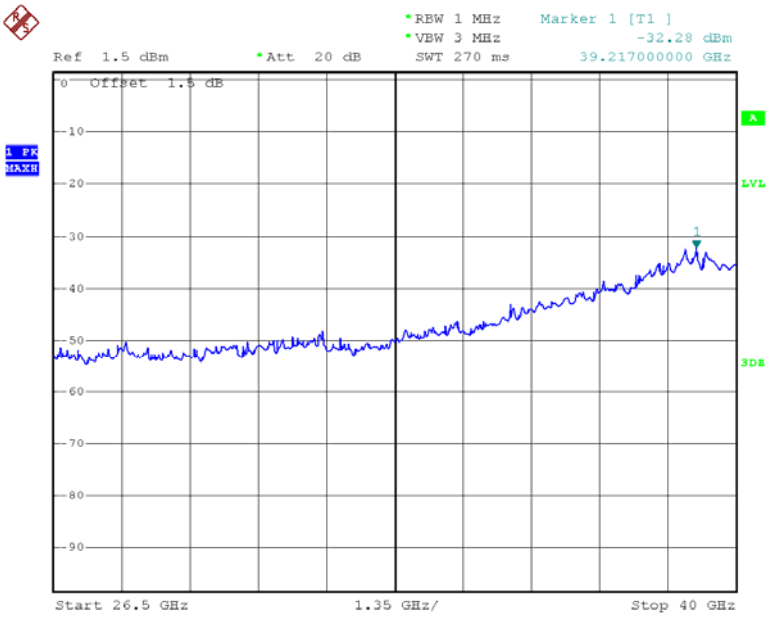
5550 MHz-Chain 1（30M-26.5G）



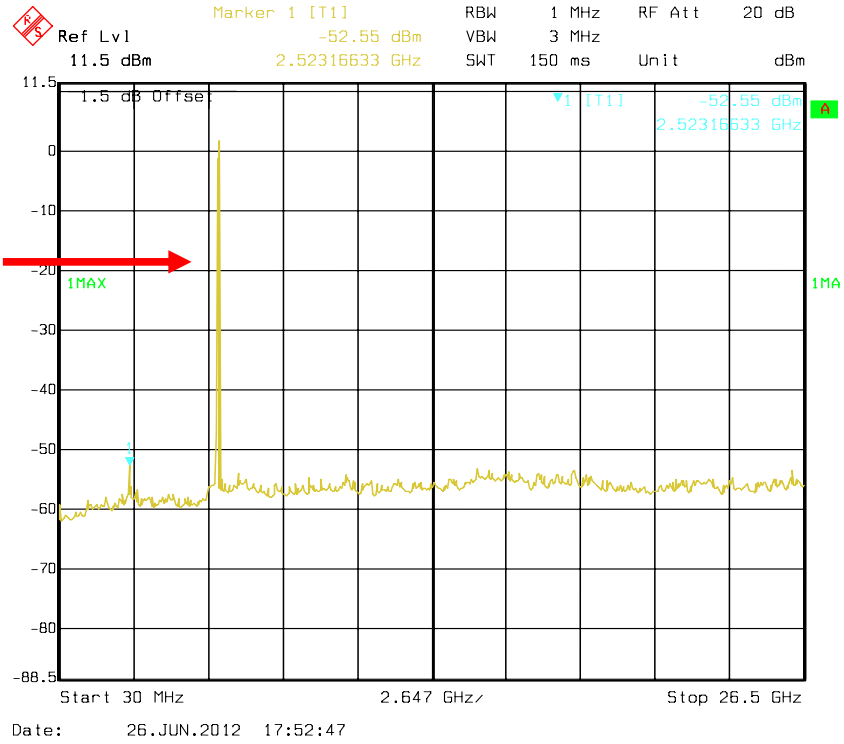
Fundamental

Date: 26.JUN.2012 17:51:24

5550 MHz-Chain 1（26.5 G-40 G）

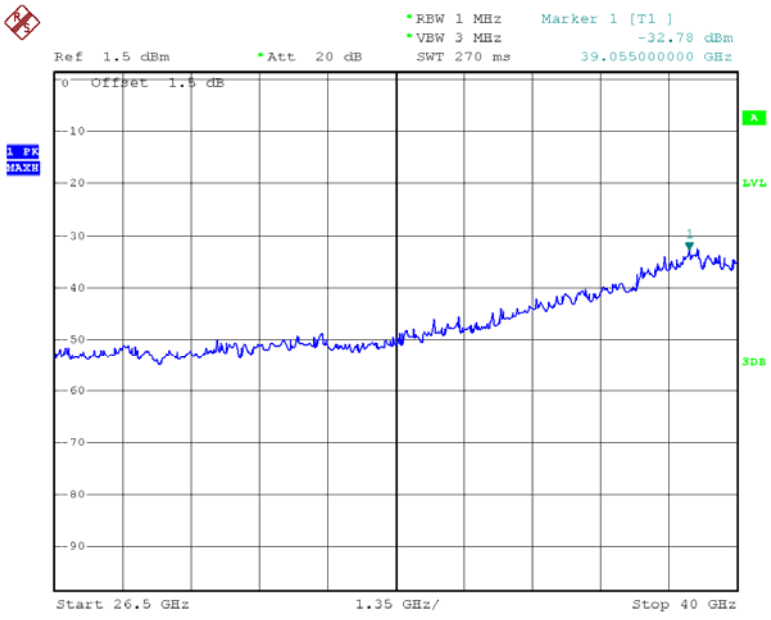


5670 MHz-Chain 1（30M-26.5G）



Fundamental

5670 MHz-Chain 1（26.5 G-40 G）



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

Applicable Standard

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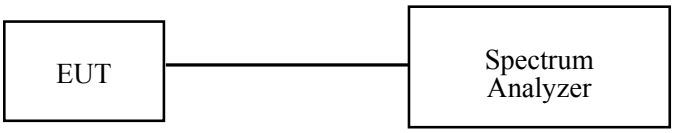
For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm 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

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 Lion Cai on 2012-06-26.

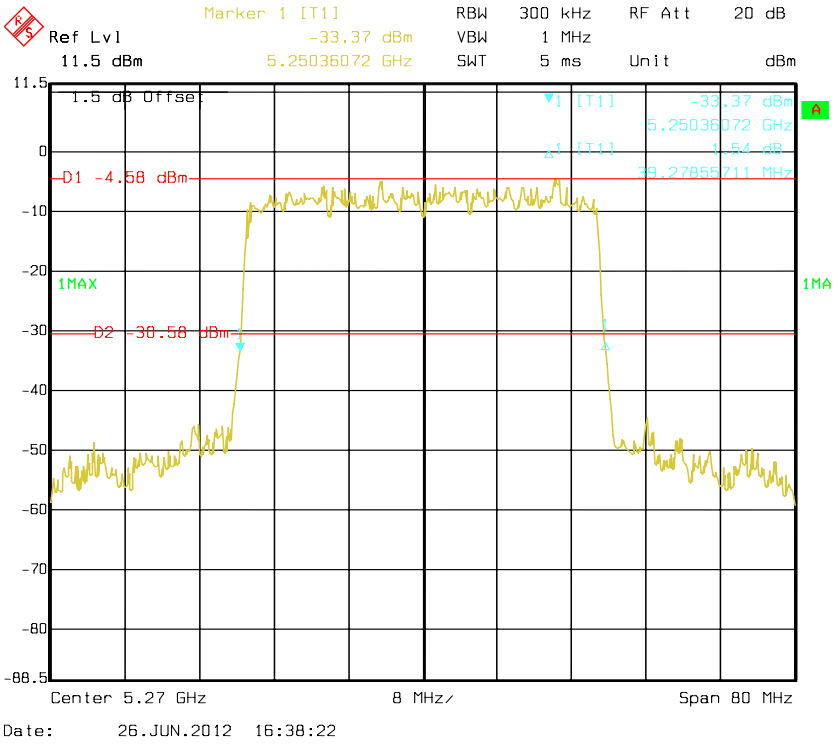
Test Result: Pass.

Please refer to the following tables and plots.

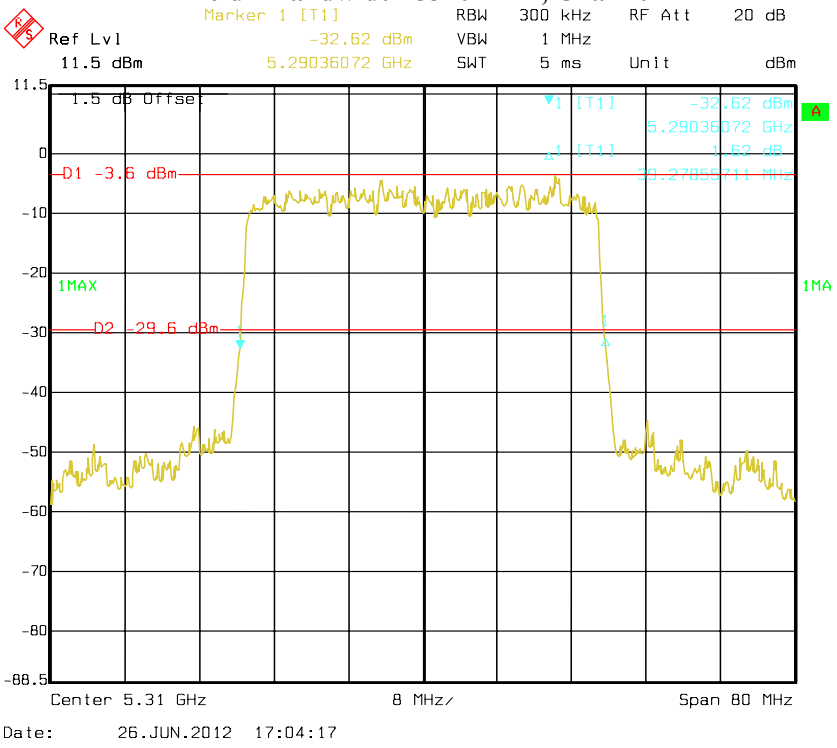
5250-5350 MHz:

Channel Frequency (MHz)	Antenna Port	26dB Bandwidth (MHz)
5270MHz	Chain 0	39.28
	Chain 1	39.28
5310MHz	Chain 0	39.28
	Chain 1	39.28

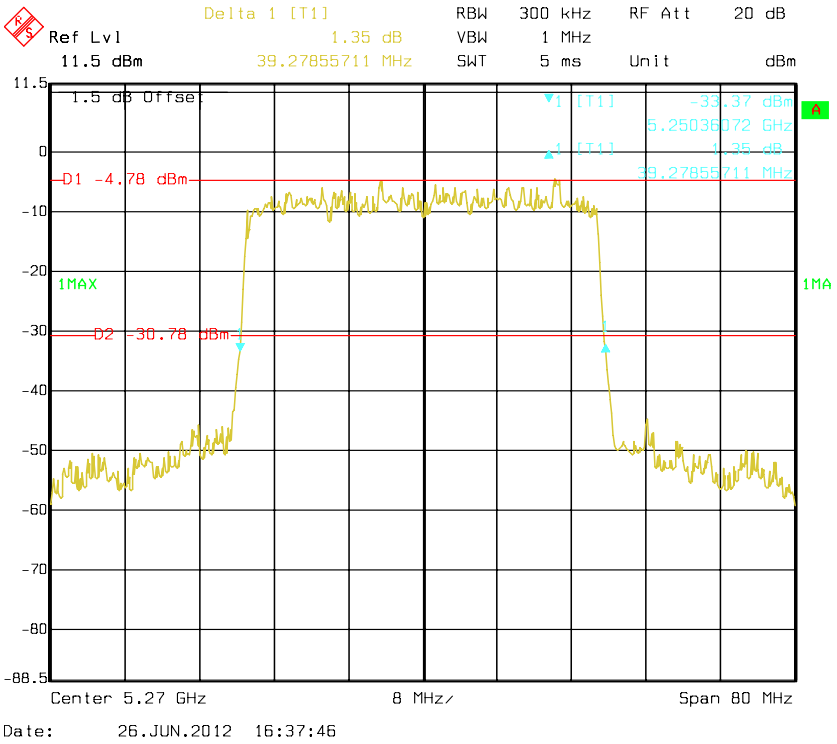
26 dB Bandwidth-5270 MHz, Chain 0



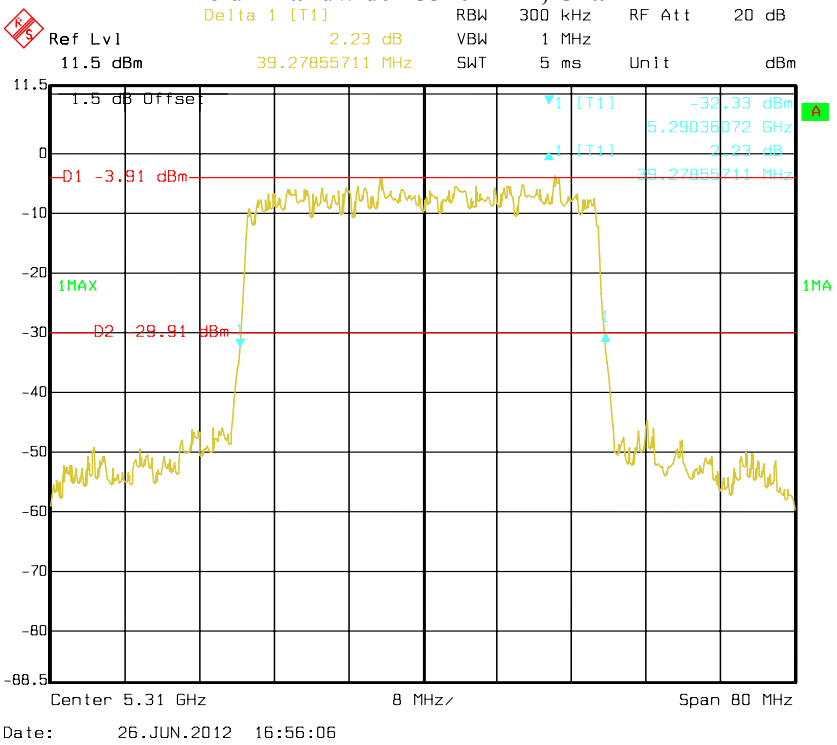
26 dB Bandwidth-5310 MHz, Chain 0



26 dB Bandwidth-5270 MHz, Chain 1



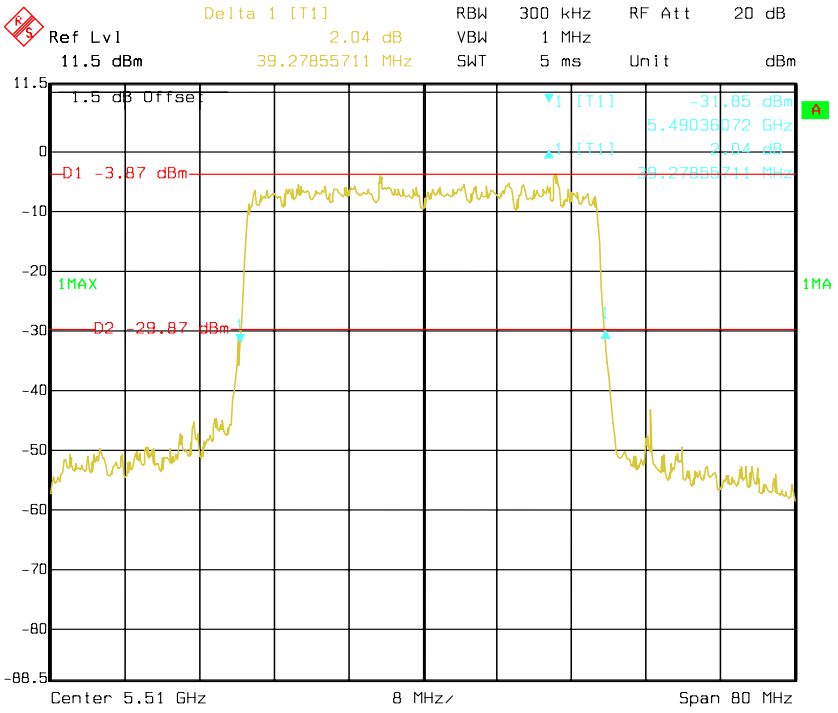
26 dB Bandwidth-5310 MHz, Chain 1



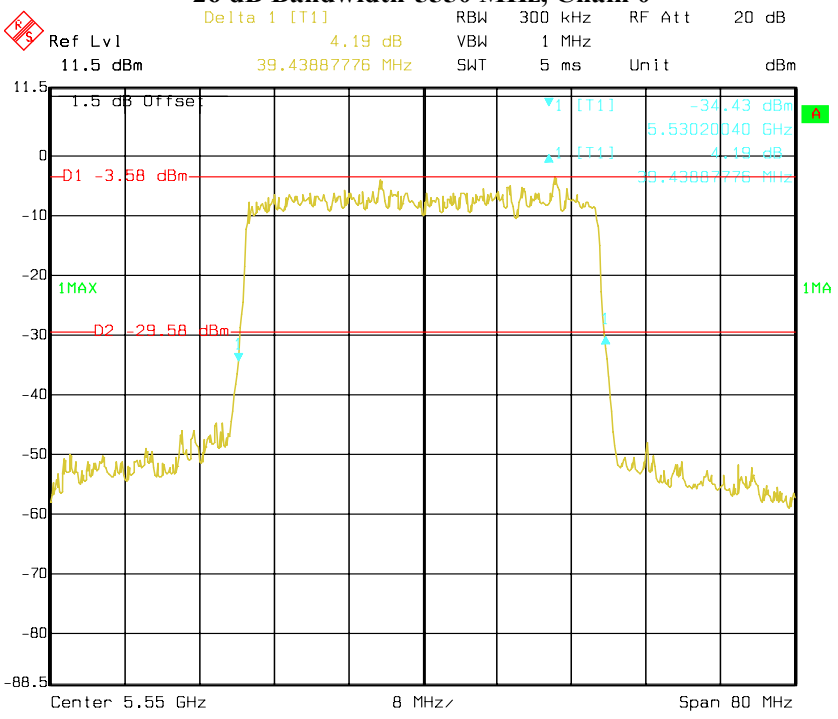
5470-5725 MHz:

Channel Frequency (MHz)	Antenna Port	26dB Bandwidth (MHz)
5510MHz	Chain 0	39.27
	Chain 1	39.27
5550MHz	Chain 0	39.43
	Chain 1	39.27
5670 MHz	Chain 0	39.27
	Chain 1	39.27

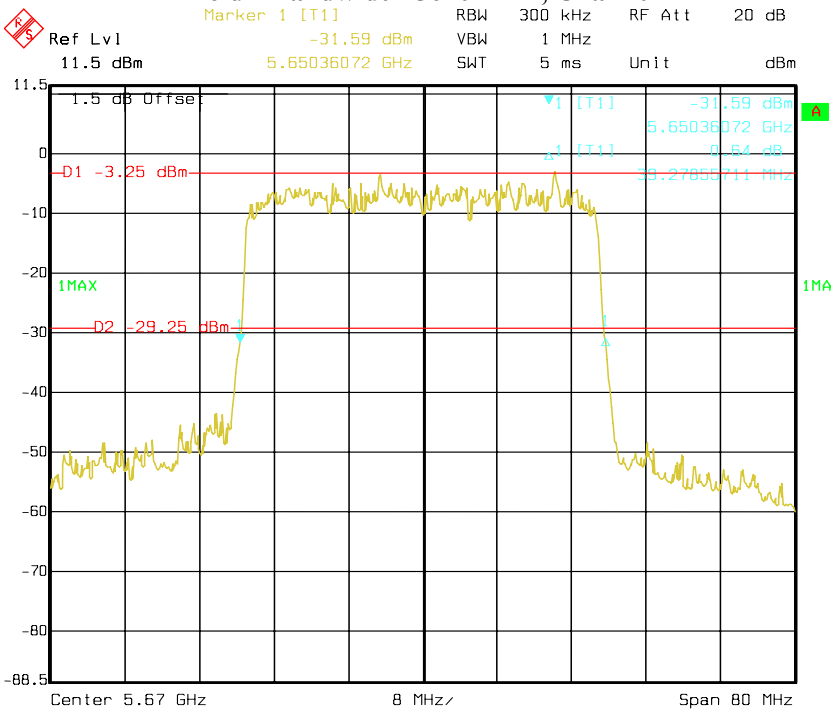
26 dB Bandwidth-5510 MHz, Chain 0



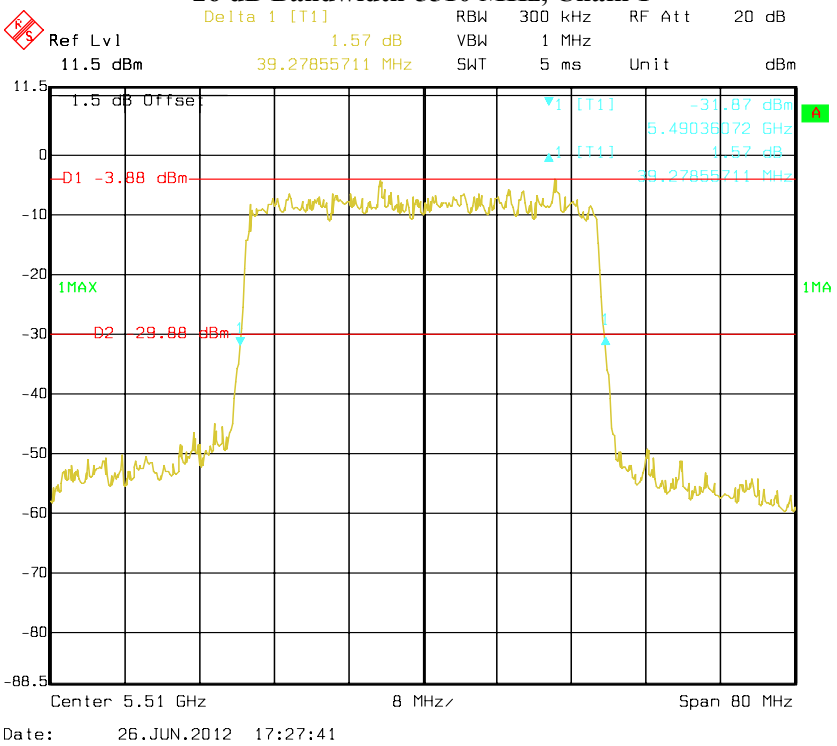
26 dB Bandwidth-5550 MHz, Chain 0



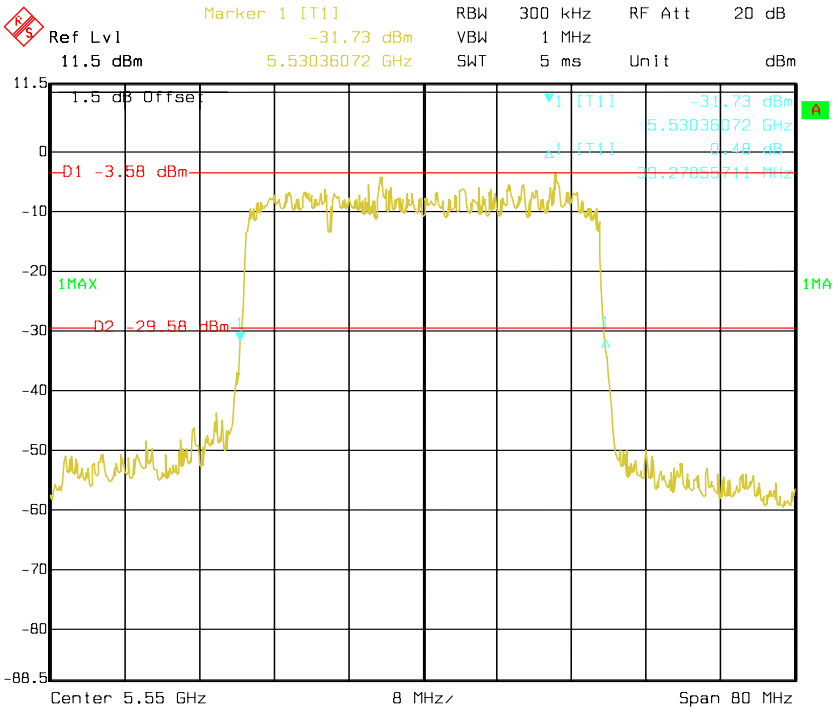
26 dB Bandwidth-5670 MHz, Chain 0



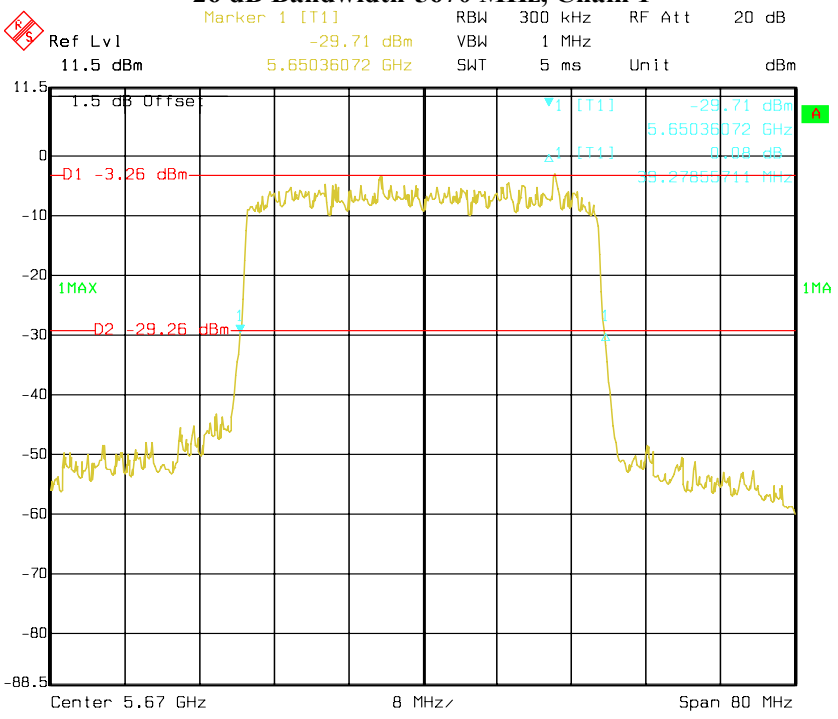
26 dB Bandwidth-5510 MHz, Chain 1



26 dB Bandwidth-5550 MHz, Chain 1



26 dB Bandwidth-5670 MHz, Chain 1



FCC §15.407(a) (2) – CONDUCTED TRANSMITTER 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 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 Reciever	FSP38	100478	2012-5-13	2013-5-12

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.

5250-5350 MHz:

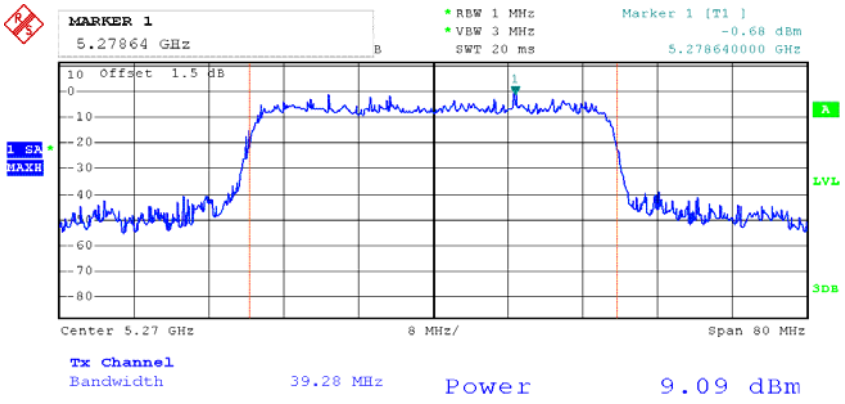
Channel Frequency (MHz)	Antenna Port	Output Power (dBm)	Chain 0+ Chain 1 (dBm)	Limit (dBm)
5270MHz	Chain 0	9.09	12.20	24
	Chain 1	9.28		
5310MHz	Chain 0	9.13	12.22	24
	Chain 1	9.28		

5470-5725 MHz:

Channel Frequency (MHz)	Antenna Port	Output Power (dBm)	Chain 0+ Chain 1 (dBm)	Limit (dBm)
5510MHz	Chain 0	9.19	12.26	24
	Chain 1	9.31		
5550MHz	Chain 0	9.27	12.35	24
	Chain 1	9.40		
5670 MHz	Chain 0	9.81	12.69	24
	Chain 1	9.55		

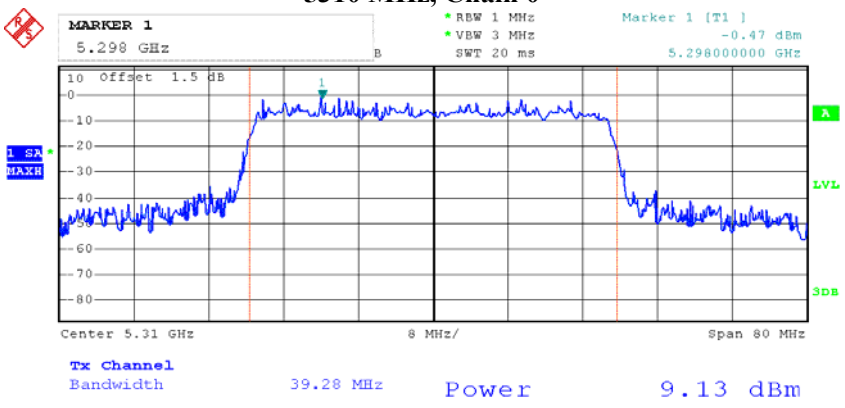
5250-5350 MHz:

5270 MHz, Chain 0



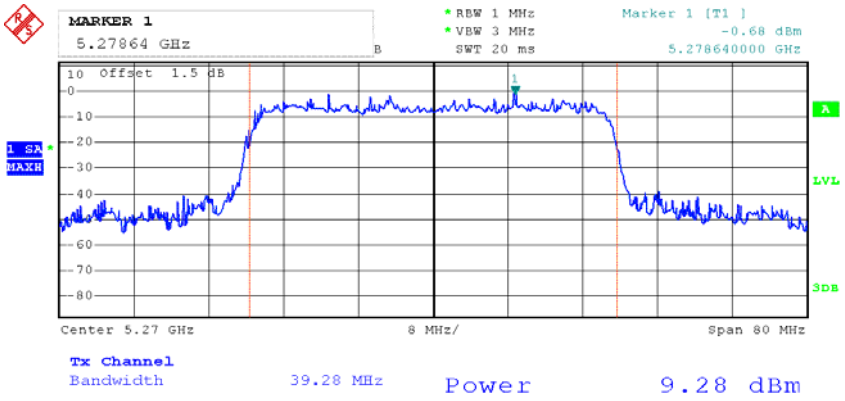
Date: 29.JUN.2012 12:10:17

5310 MHz, Chain 0



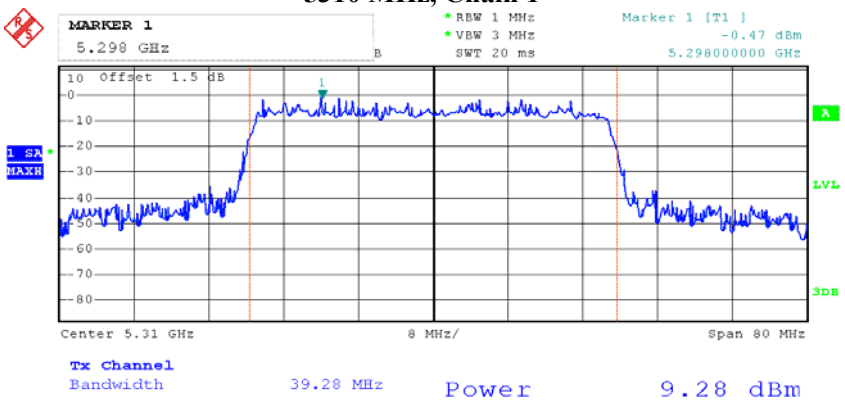
Date: 29.JUN.2012 12:11:23

5270 MHz, Chain 1



Date: 29.JUN.2012 12:10:22

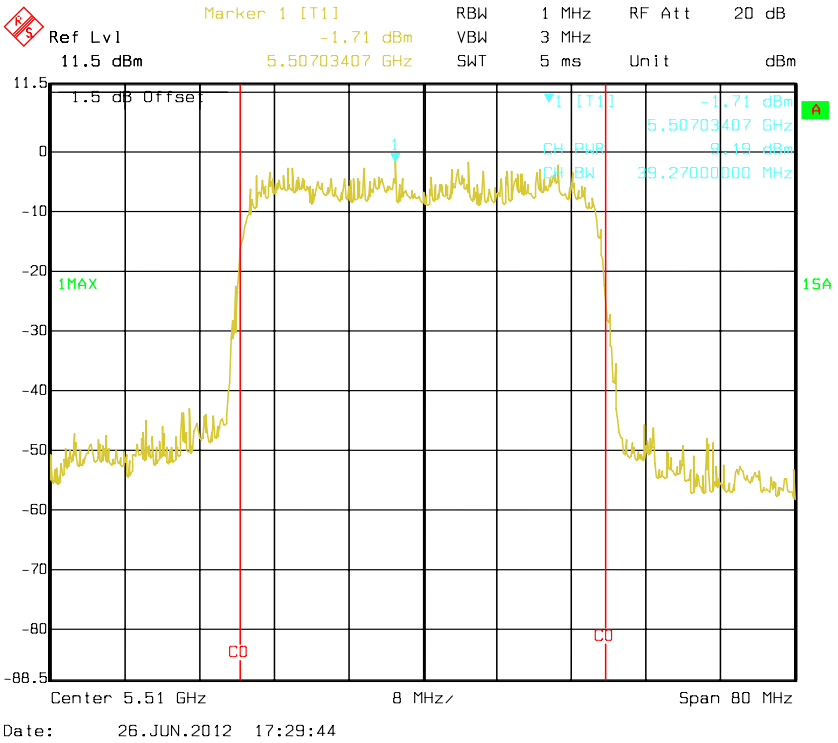
5310 MHz, Chain 1



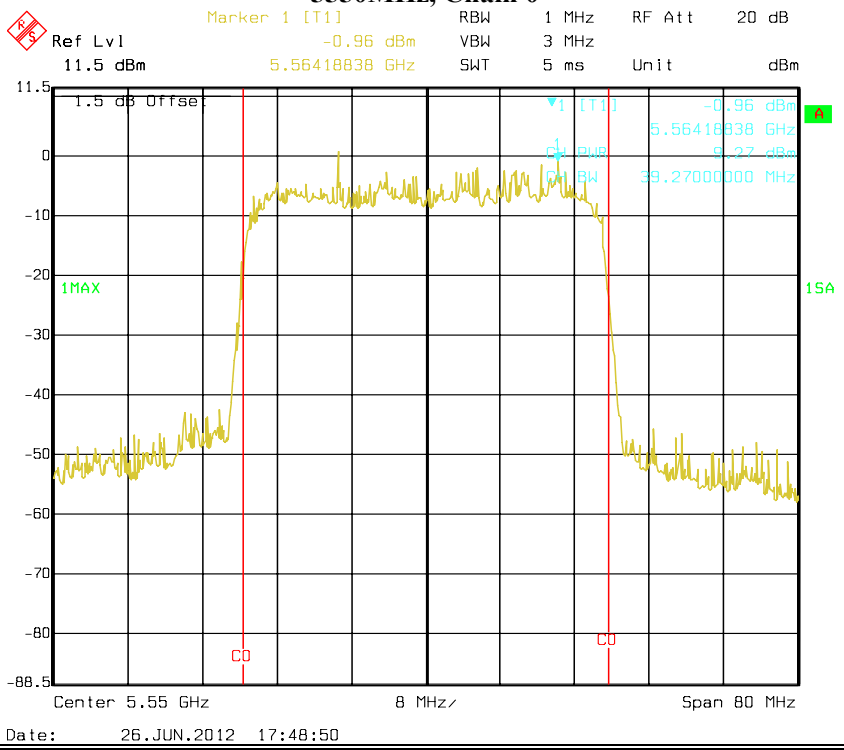
Date: 29.JUN.2012 12:11:27

5470-5725 MHz:

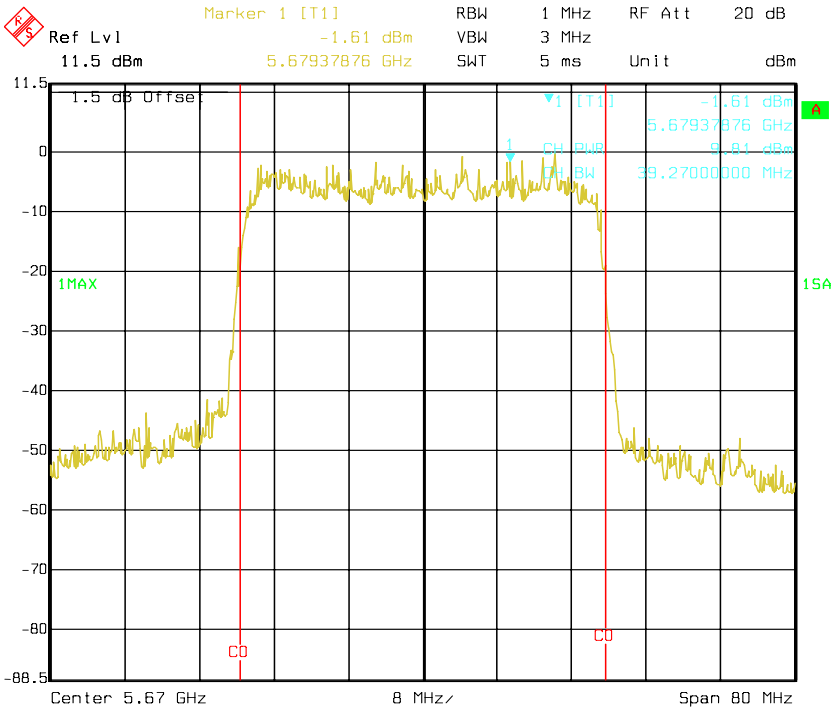
5510MHz, Chain 0



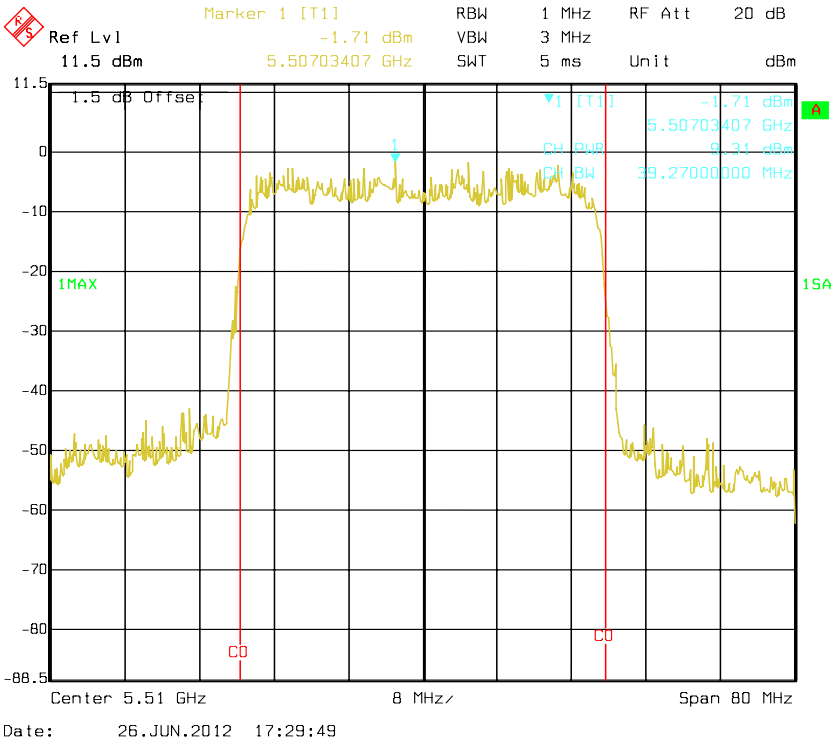
5550MHz, Chain 0



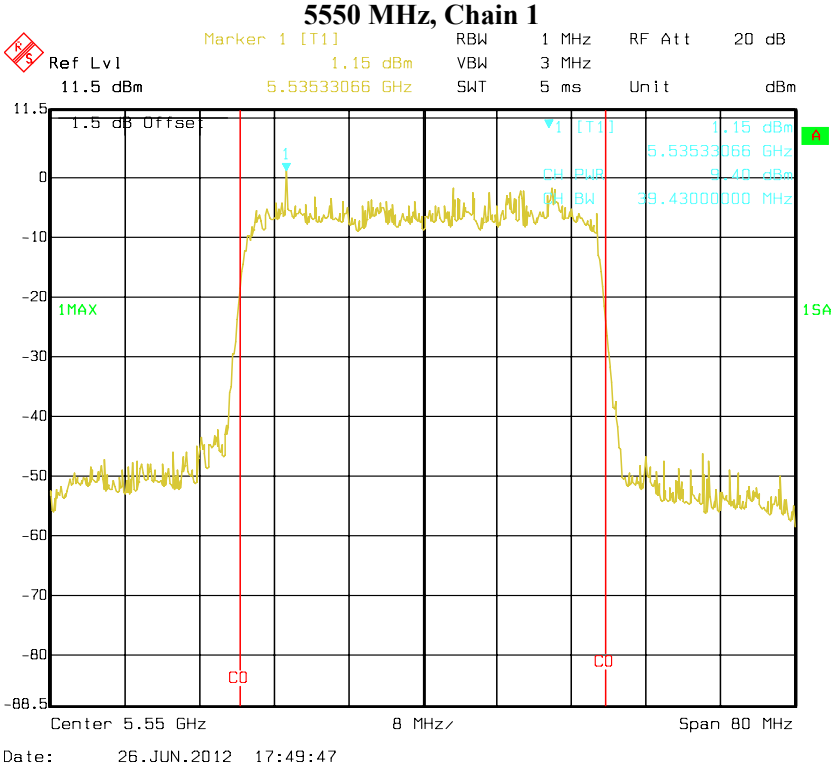
5670MHz, Chain 0



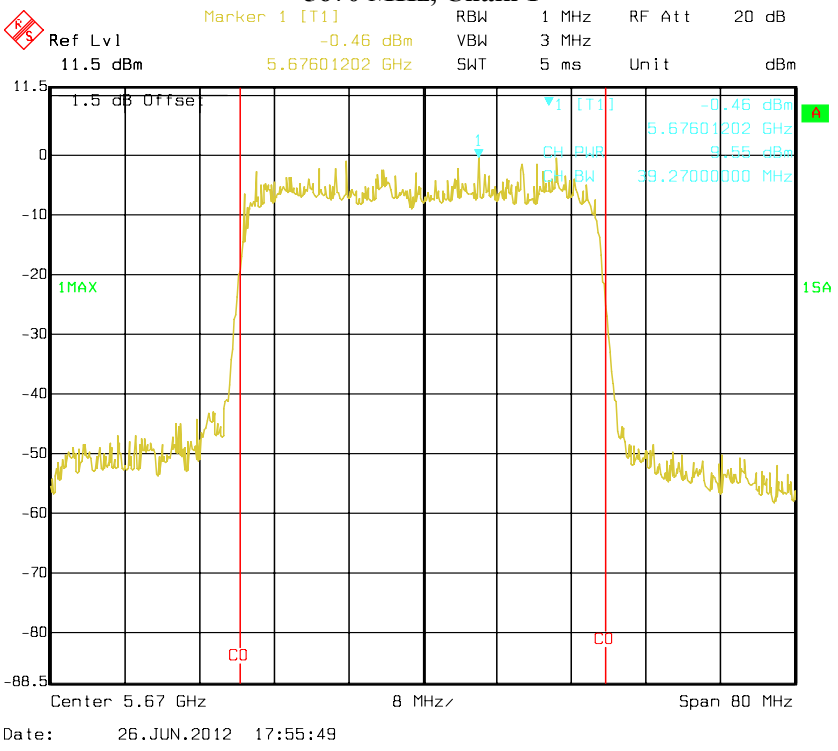
5510MHz, Chain 1



5550 MHz, Chain 1



5670 MHz, Chain 1



FCC §15.407(a) (2) (5) - 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

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

5250-5350 MHz:

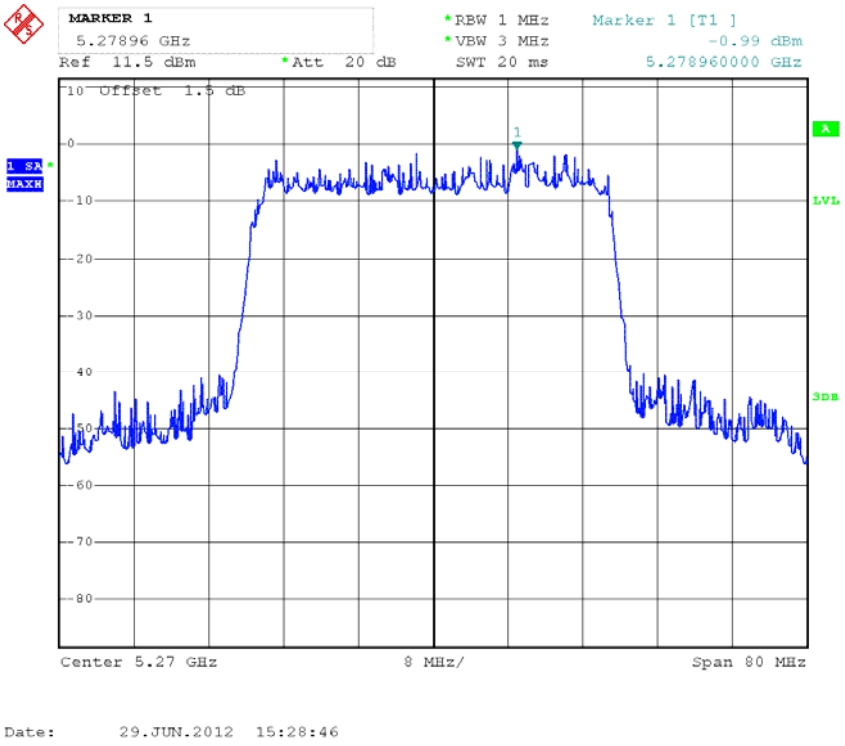
Channel Frequency (MHz)	Antenna Port	Output Power (dBm)	Chain 0+ Chain 1 (dBm)	Limit (dBm)
5270MHz	Chain 0	-0.99	1.83	11
	Chain 1	-1.37		
5310MHz	Chain 0	-1.11	1.64	11
	Chain 1	-1.64		

5470-5725 MHz:

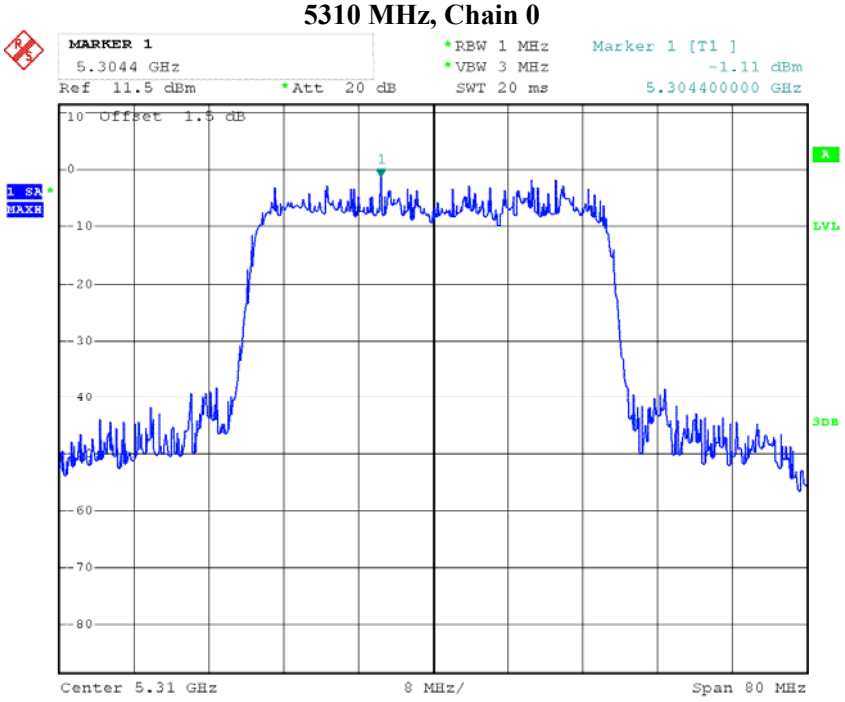
Channel Frequency (MHz)	Antenna Port	Output Power (dBm)	Chain 0+ Chain 1 (dBm)	Limit (dBm)
5510MHz	Chain 0	-1.07	2.25	11
	Chain 1	-0.47		
5550MHz	Chain 0	-1.67	1.30	11
	Chain 1	-1.76		
5670 MHz	Chain 0	-1.76	1.45	11
	Chain 1	-1.36		

5250-5350 MHz:

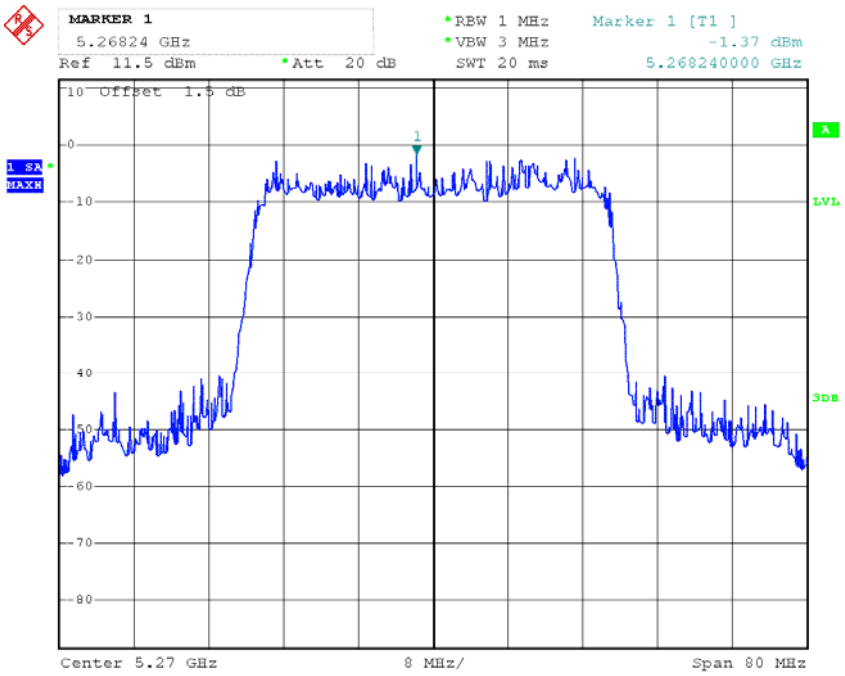
5270 MHz, Chain 0



5310 MHz, Chain 0

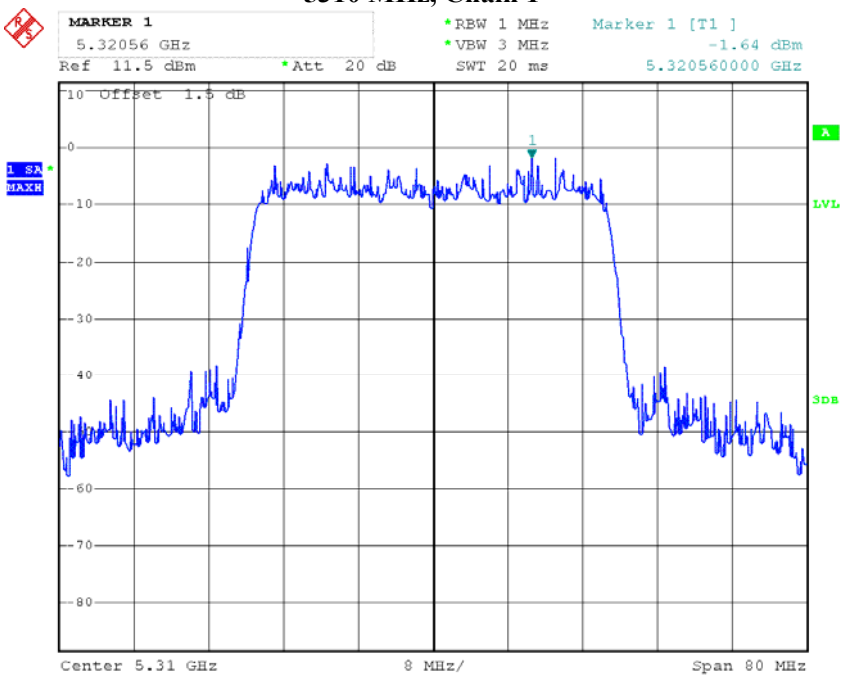


5270 MHz, Chain 1



Date: 29.JUN.2012 15:28:11

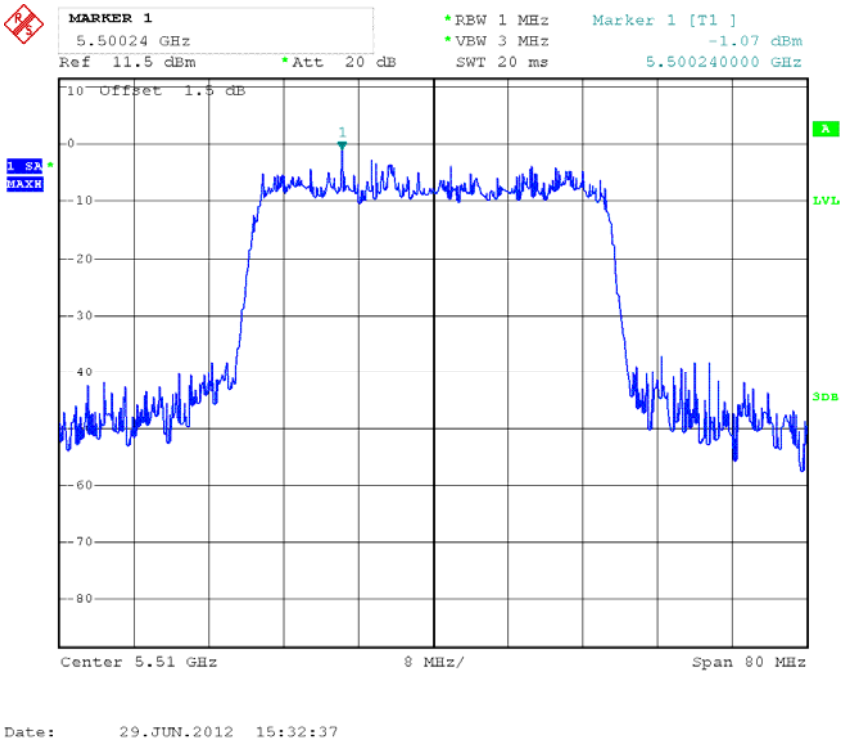
5310 MHz, Chain 1



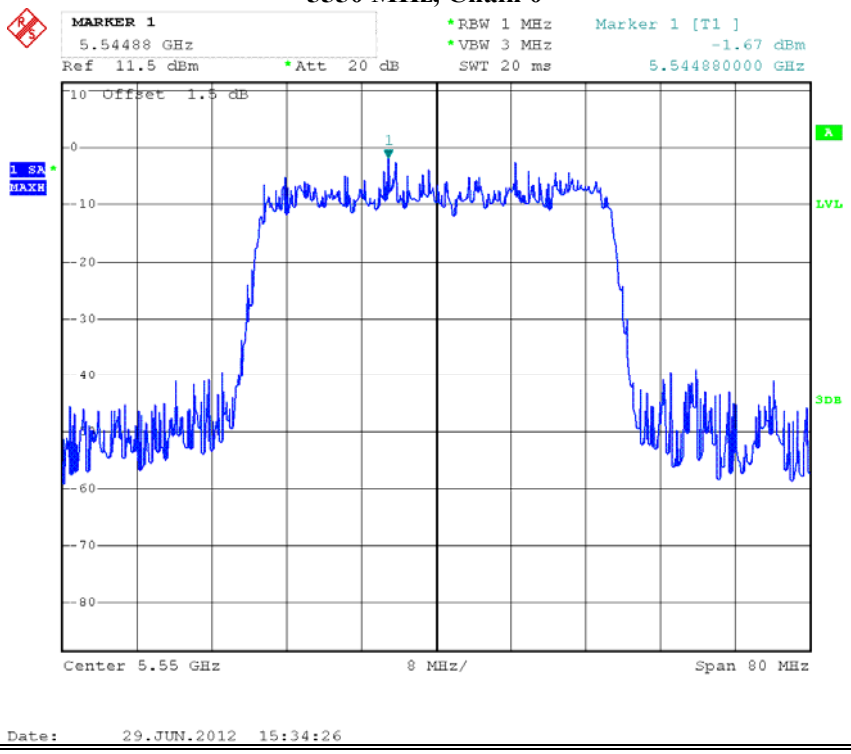
Date: 29.JUN.2012 15:30:38

5470-5725 MHz:

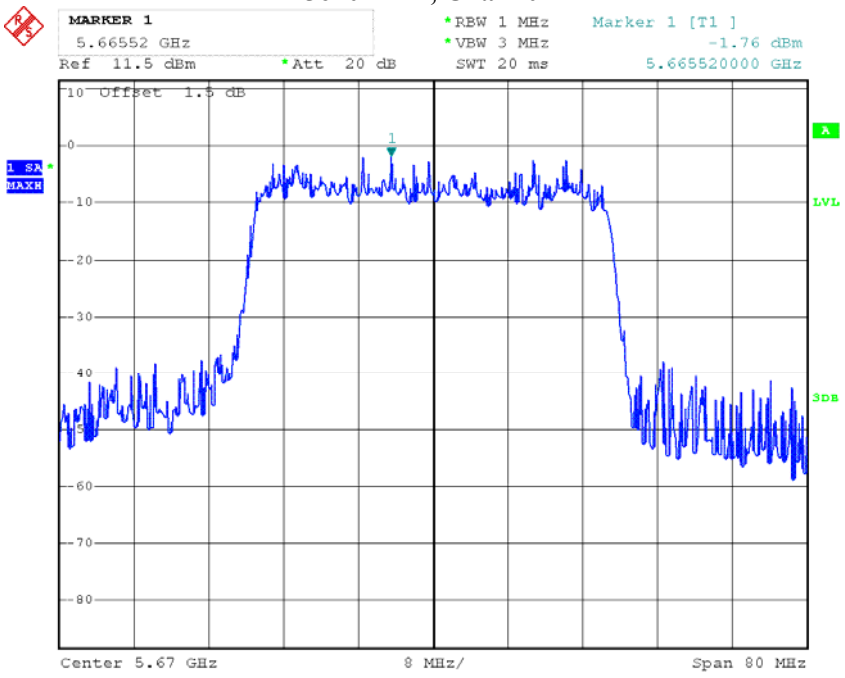
5510 MHz, Chain 0



5550 MHz, Chain 0

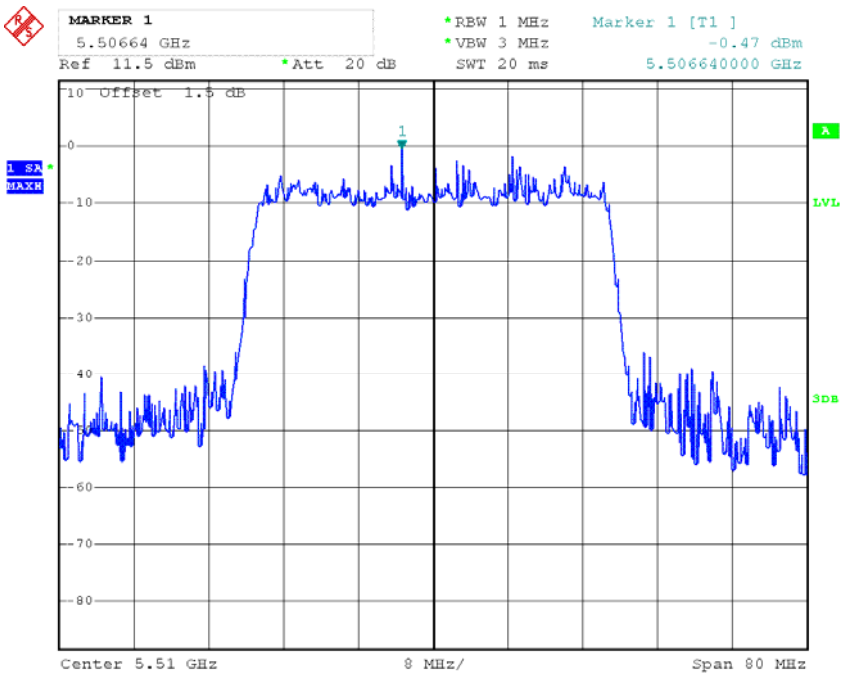


5670 MHz, Chain 0



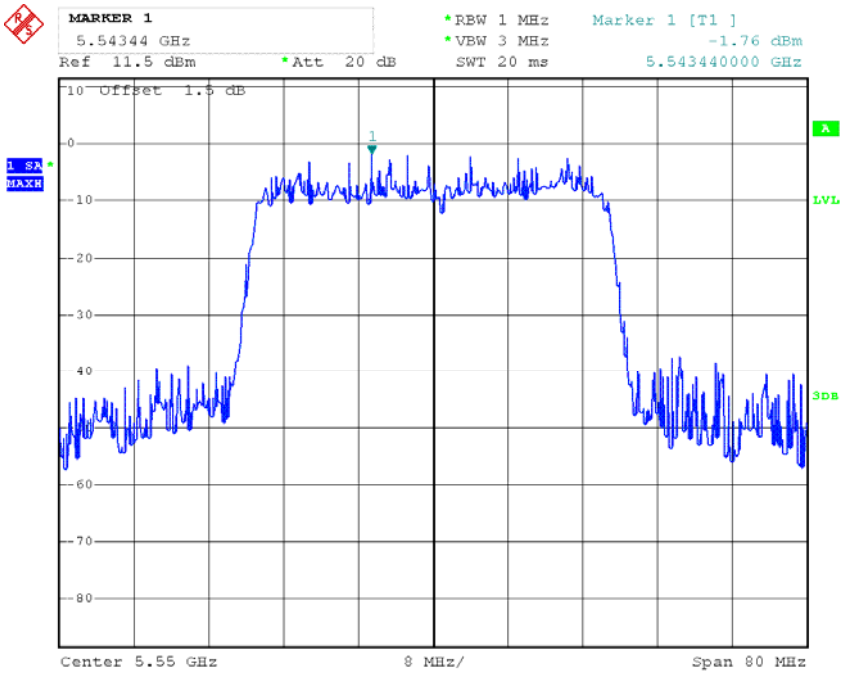
Date: 29.JUN.2012 16:02:51

5510 MHz, Chain 1

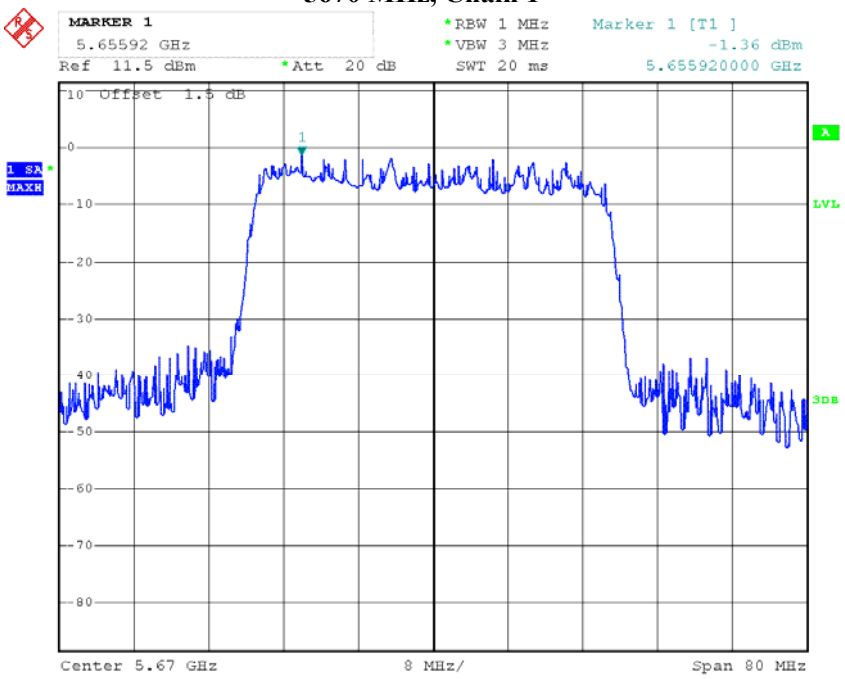


Date: 29.JUN.2012 15:33:00

5550 MHz, Chain 1



5670 MHz, Chain 1



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

Applicable Standard

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

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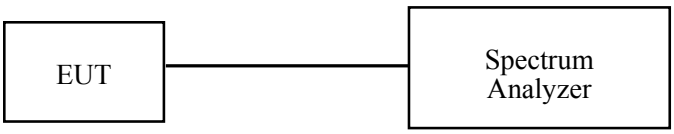


Test Equipment List and Details

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

Test Data

Environmental Conditions

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

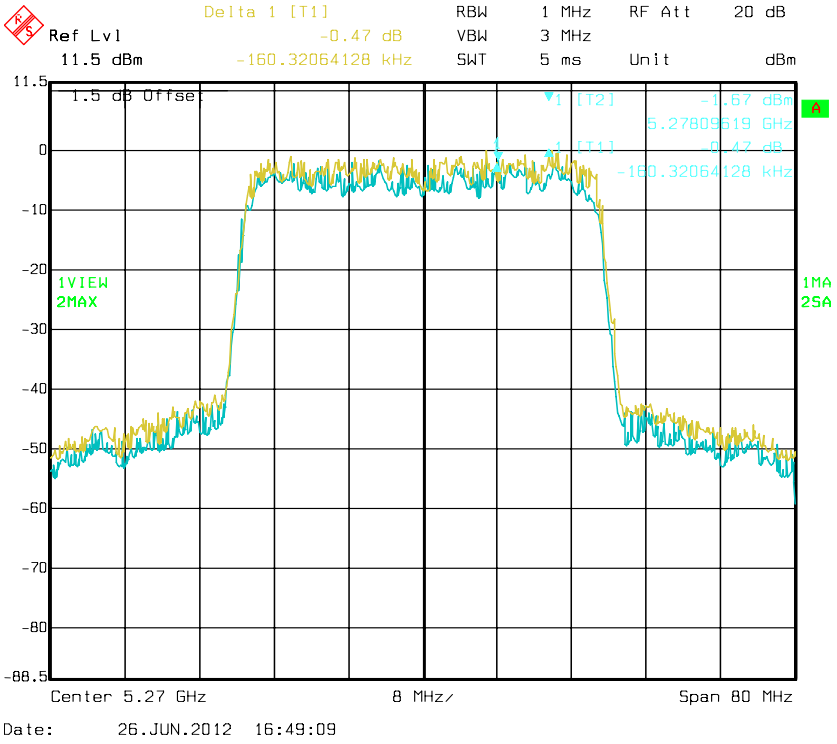
The testing was performed by Lion Cai on 2012-06-26.

Test Mode: Transmitting

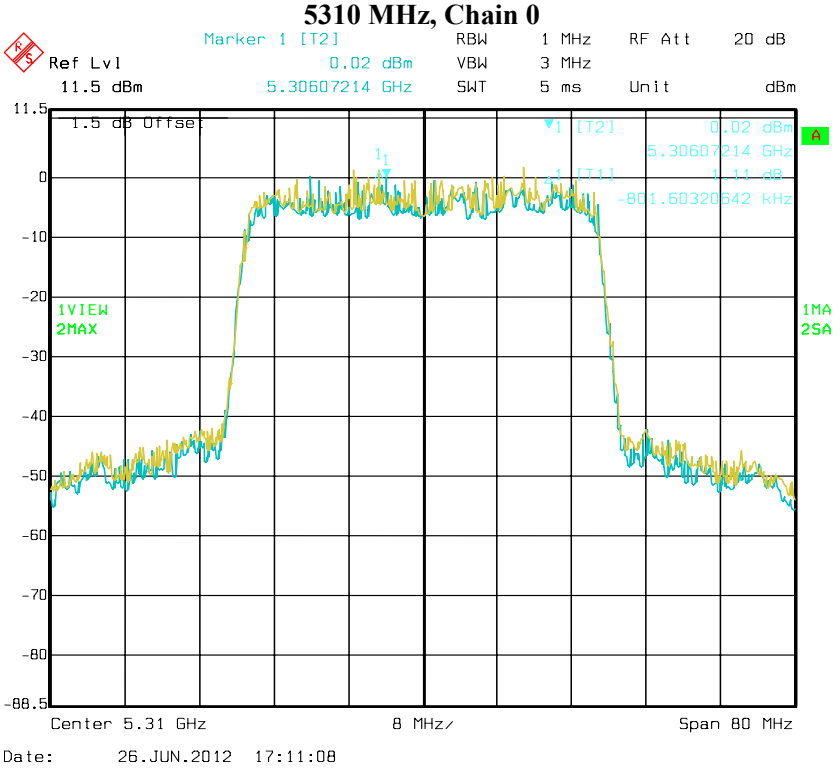
5250-5350 MHz:

Channel Frequency (MHz)	Antenna Port	Peak Excursion Ratio (dB)	Limit (dB)
5270MHz)	Chain 0	0.47	13
	Chain 1	0.66	
5310MHz	Chain 0	1.11	13
	Chain 1	2.07	

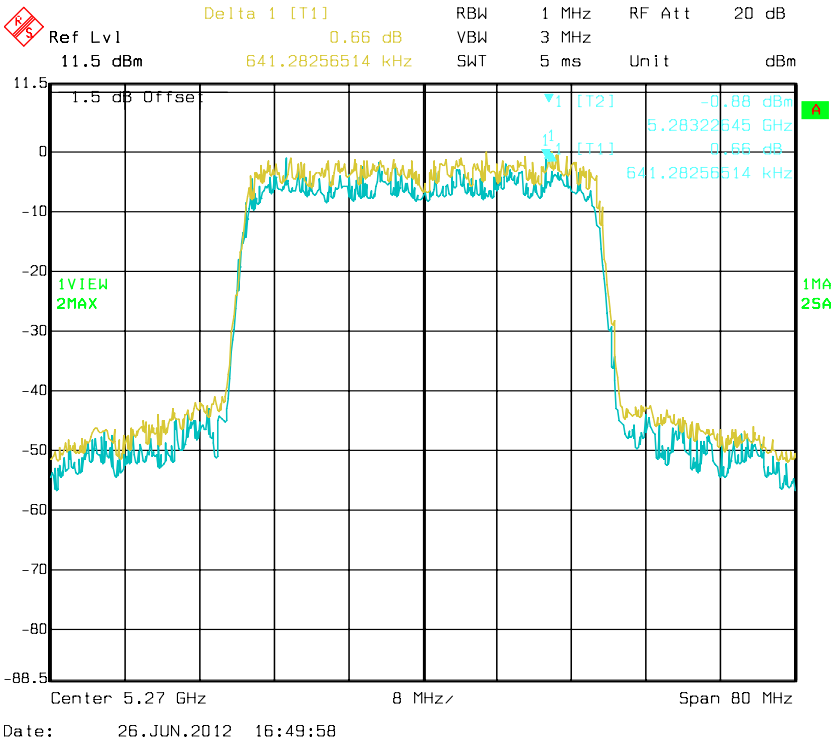
5270 MHz, Chain 0

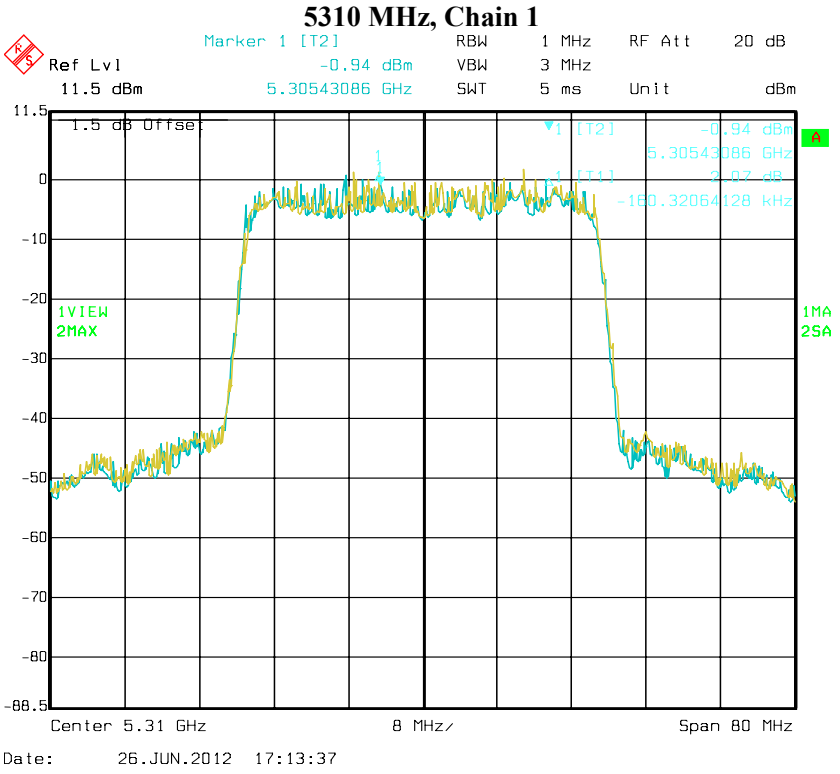


5310 MHz, Chain 0



5270 MHz, Chain 1

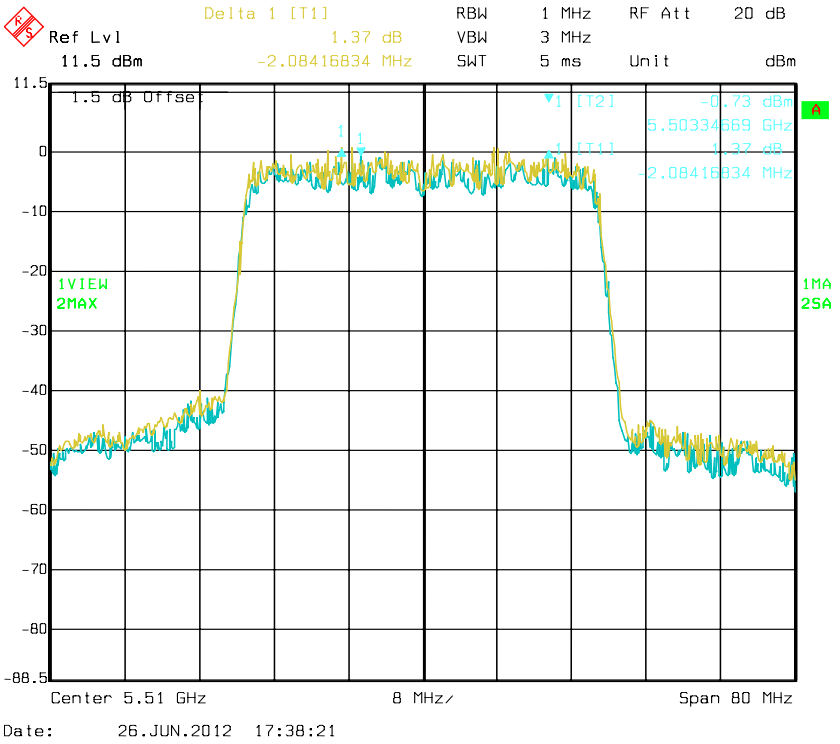




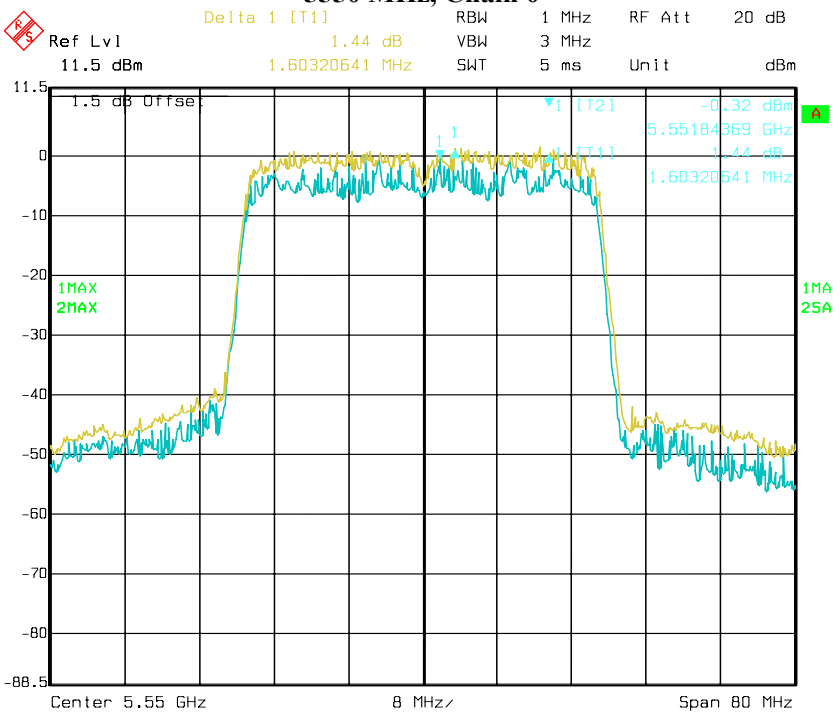
5470-5725 MHz:

Channel Frequency (MHz)	Antenna Port	Peak Excursion Ratio (dB)	Limit (dB)
5510MHz)	Chain 0	1.37	13
	Chain 1	2.62	
5550MHz	Chain 0	1.44	13
	Chain 1	0.69	
5670MHz	Chain 0	1.62	13
	Chain 1	1.16	

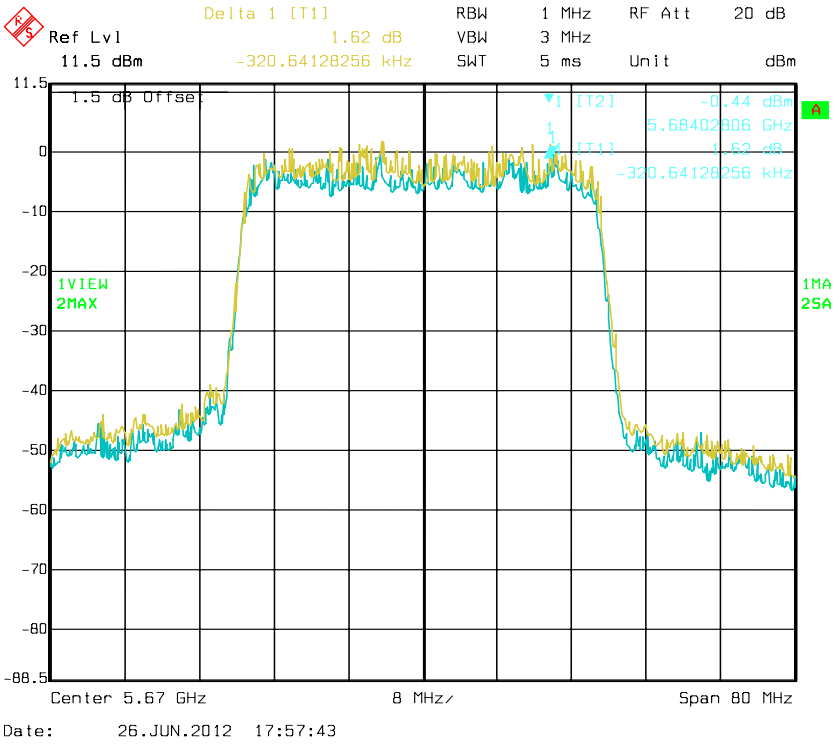
5510 MHz, Chain 0



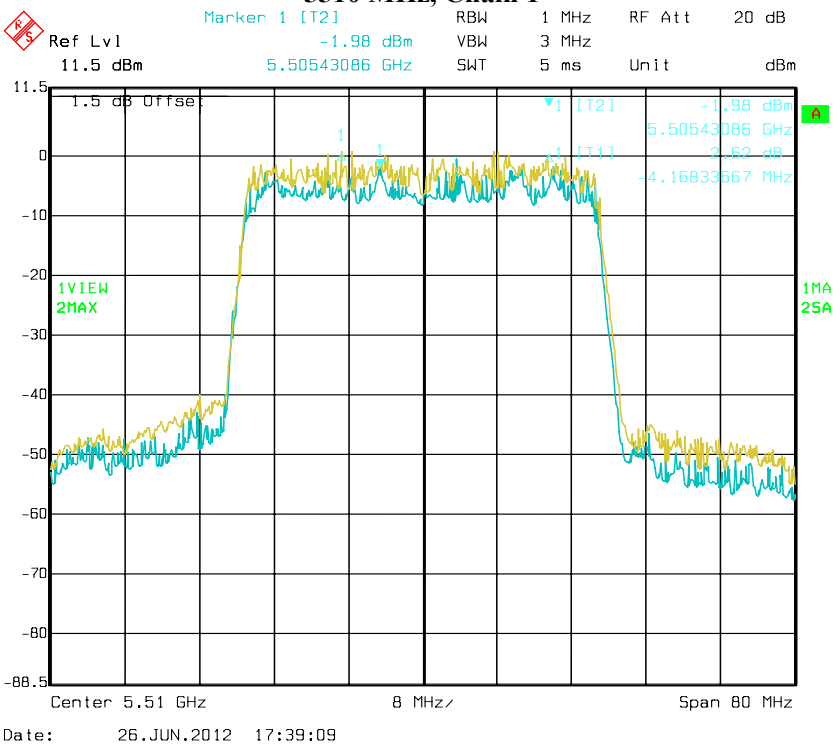
5550 MHz, Chain 0



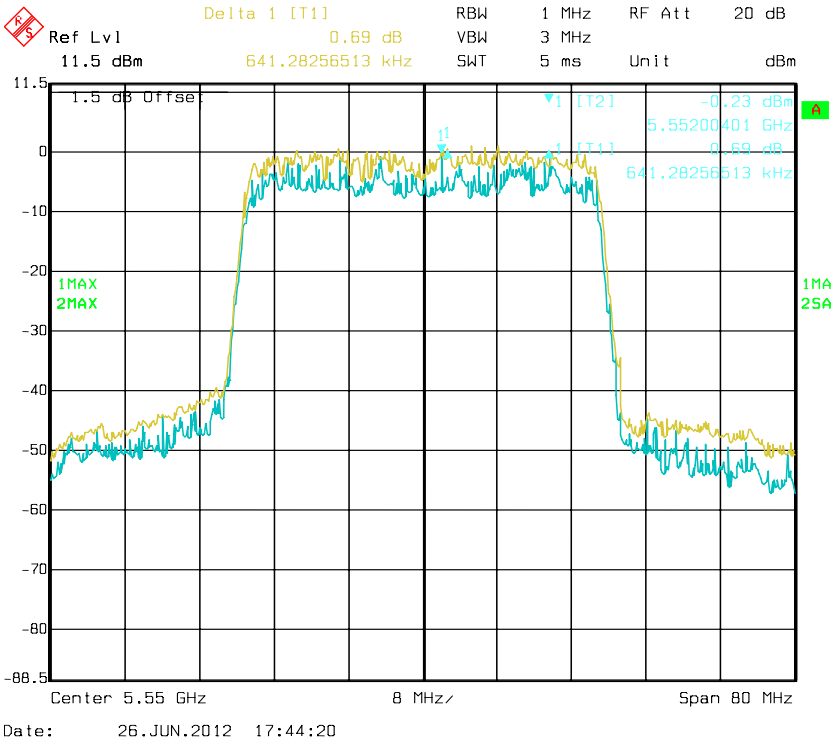
5670 MHz, Chain 0



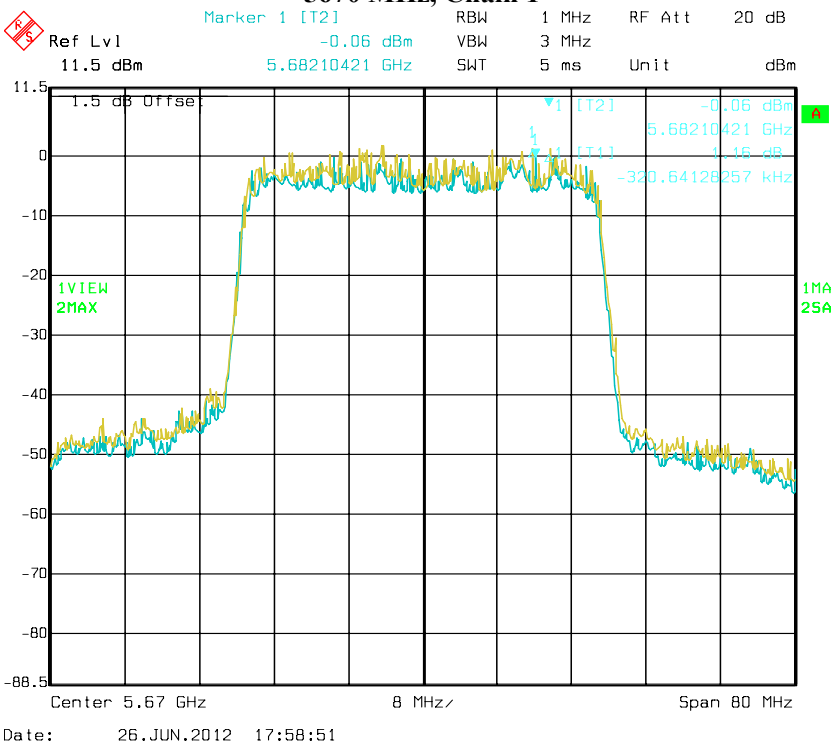
5510 MHz, Chain 1



5550 MHz, Chain 1



5670 MHz, Chain 1



FCC §407(g) - FREQUENCY STABILITY

Applicable Standards

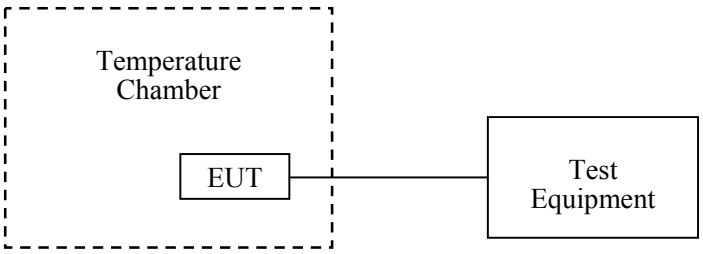
FCC§407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

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	2012-06-04	2013-06-03
Rohde & Schwarz	Spectrum Analyzer	FSEM	DE31388	2012-3-15	2013-3-14

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)	Power supply (V_{AC})	Temperature (℃)	Measurement Frequency (MHz)
5270	120	-30	5269.971
		-20	5269.974
		-10	5269.966
		+0	5269.971
		+10	5269.968
		+20	5269.972
		+30	5269.973
		+40	5269.967
		+50	5269.979
	138	+20	5269.972
	102	+20	5269.979

5470-5725 MHz:

Channel Frequency (MHz)	Power supply (V_{AC})	Temperature (℃)	Measurement Frequency (MHz)
5510	120	-30	5509.966
		-20	5509.972
		-10	5509.974
		+0	5509.970
		+10	5509.968
		+20	5509.975
		+30	5509.971
		+40	5509.962
		+50	5509.980
	138	+20	5509.977
	102	+20	5509.965

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