

FCC PART 15.407

TEST REPORT

For

Amimon Ltd.

2 Maskit St. Herzlia, Israel

FCC ID: VQSCB390802120528

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Amimon Ltd.*'s product, model number: AMN32200-IR (*FCC ID: VQSCB390802120528*) ("EUT") in this report is a RGB, which was measured approximately: 9.7cm (L) x 1.5cm (W) x1.4 cm (H). This device is Master,the operating frequency is 5150~5250MHz ,5250~5350MHz, 5470~5725MHz., 5725~5825MHz rated input voltage: DC 3.3V from IDX connector port.

** All measurement and test data in this report was gathered from production sample serial number: 120621006 (Assigned by Dongguan BACL). The EUT was received on 2012-06-21.*

Objective

This type approval report is prepared on behalf of *Amimon 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 5150MHz~5250MHz, 5250~5350 MHz, 5470~5725 MHz and 5725~5825MHz, the frequencies are 5190MHz, 5230MHz for 5150MHz~5250MHz band, 5270 MHz, 5310 MHz for 5250~5350 MHz band, 5510 MHz, 5550 MHz for 5470~5725 MHz band, 5755MHz,5795MHz for 5725Mhz~5825MHz band, which was provided by the manufacturer.

EUT Exercise Software

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

Equipment Modifications

No modification.

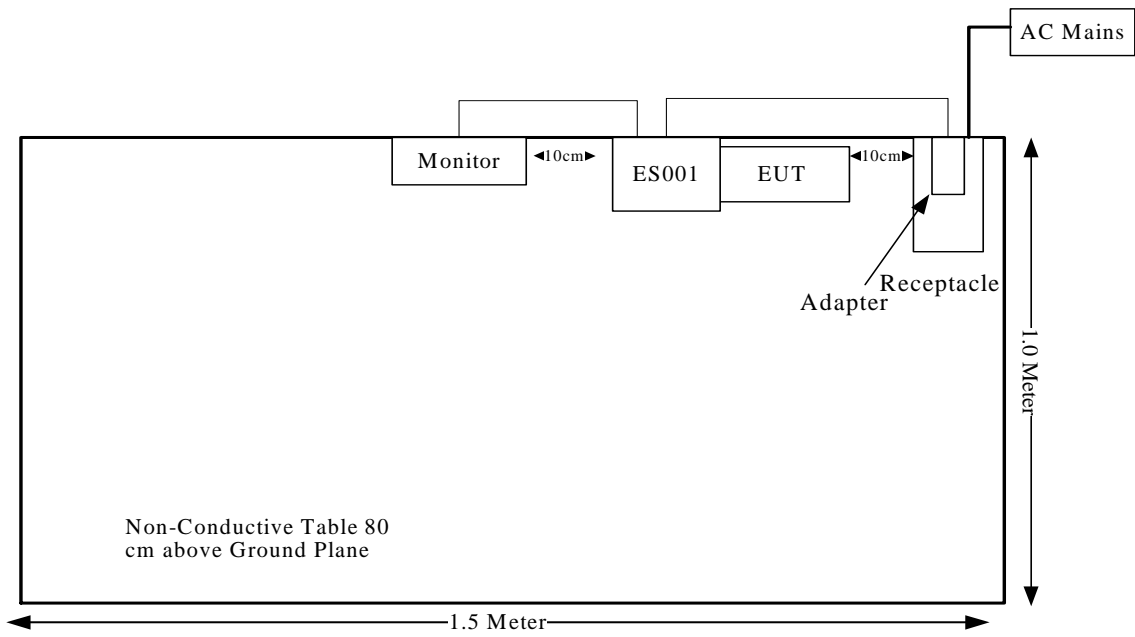
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
manufacturer	Test fixer	ES001	N/A
DELL	Monitor	U3011t	CN-OPH5NY-74445-175-138L

External I/O Cable

Cable Description	Length (m)	From Port	To
Shielded Detachable HDMI Cable	1.2	ES001	Monitor

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.407 (f), §2.1091, §1.1307(b)(1)	RF Exposure Evaluation	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	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(h)(2)	Dynamic Frequency Selection	Compliance*

Compliance*:please refer the DFS test report.

FCC §15.407 (f), §2.1091, §1.1307(b) (1) – RF EXPOSURE EVALUATION

Applicable Standard

According to subpart 15.407(f) 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/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);

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)			
5270	2.9	1.95	14.78	30.06	20	0.0117	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 five printer Antenna on the print circuit board, which is complied with the section 15.203, and one for transmitting and receiving, the rest only for receiving , the maximum gain is 2.9 dBi; please refer to the internal photos.

Result: Compliance.

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

Applicable Standard

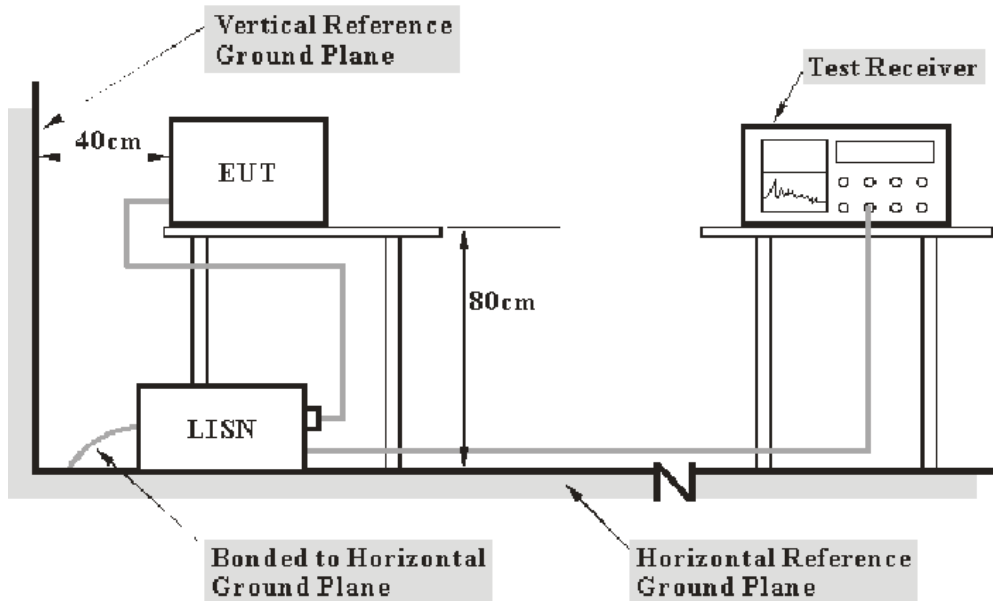
FCC §15.207, §15.407(b) (6)

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 2.4 dB, and the uncertainty will not be taken into consideration for all the test data recorded in the report.

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Equipment List and Details

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

Test Procedure

During the conducted emission test, the EUT 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:

4.23 dB at 0.600 MHz in the Neutral mode.

Test Data

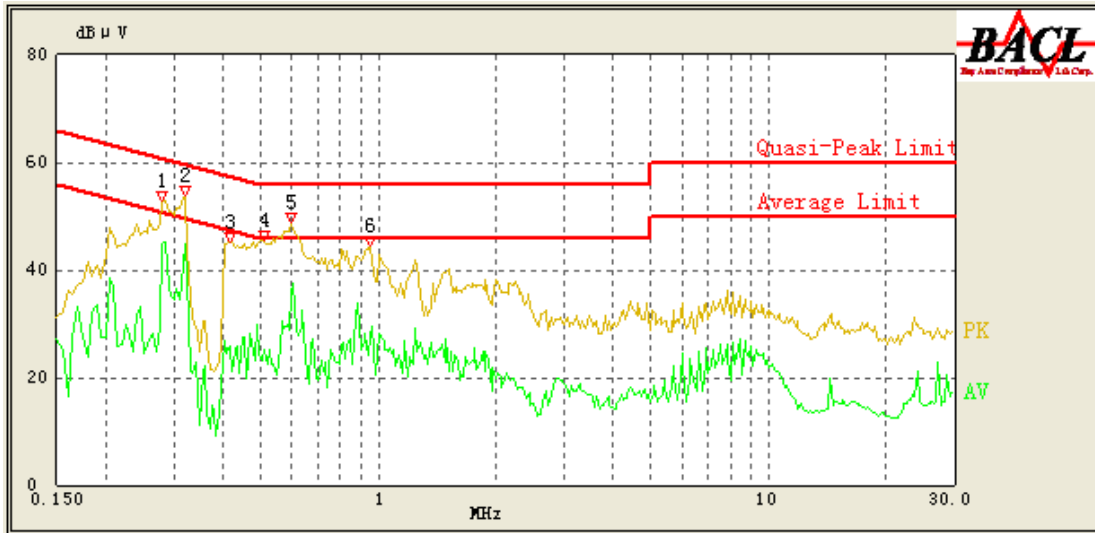
Environmental Conditions

Temperature:	25.3 °C
Relative Humidity:	48 %
ATM Pressure:	100.2 kPa

The testing was performed by Ares Liu on 2012-07-11.

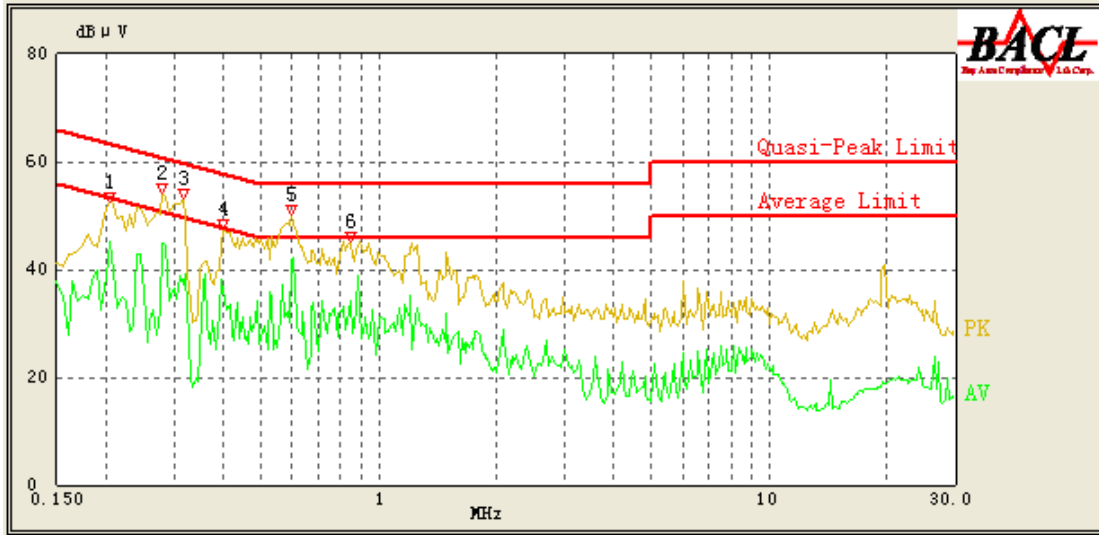
Test Mode: Transmitting

120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK /QP/Ave.)
0.320	44.75	0.42	51.14	6.39	QP
0.280	44.78	0.42	52.29	7.51	QP
0.600	35.97	0.43	46.00	10.03	Ave.
0.600	43.93	0.43	56.00	12.07	QP
0.320	48.12	0.42	61.14	13.02	Ave.
0.280	48.84	0.42	62.29	13.45	Ave.
0.950	40.14	0.45	56.00	15.86	Ave.
0.510	38.88	0.42	56.00	17.12	QP
0.415	41.12	0.42	58.43	17.31	QP
0.950	27.80	0.45	46.00	18.20	Ave.
0.510	25.25	0.42	46.00	20.75	QP
0.415	26.00	0.42	48.43	22.43	Ave.

120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK /QP/Ave.)
0.600	41.77	0.43	46.00	4.23	QP
0.280	44.80	0.42	52.29	7.49	Ave.
0.205	45.08	0.42	54.43	9.35	QP
0.600	45.64	0.43	56.00	10.36	QP
0.315	50.16	0.42	61.29	11.13	Ave.
0.845	34.04	0.44	46.00	11.96	Ave.
0.280	50.18	0.42	62.29	12.11	Ave.
0.400	36.24	0.42	48.86	12.62	QP
0.315	37.21	0.42	51.29	14.08	QP
0.205	50.16	0.42	64.43	14.27	Ave.
0.400	44.04	0.42	58.86	14.82	QP
0.845	38.91	0.44	56.00	17.09	Ave.

FCC §15.209, §15.205 & §15.407(b) (2) (3) (6) (7) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (1),(2), (3), (6), (7); §15.209; §15.205;

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz.

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.

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.

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.

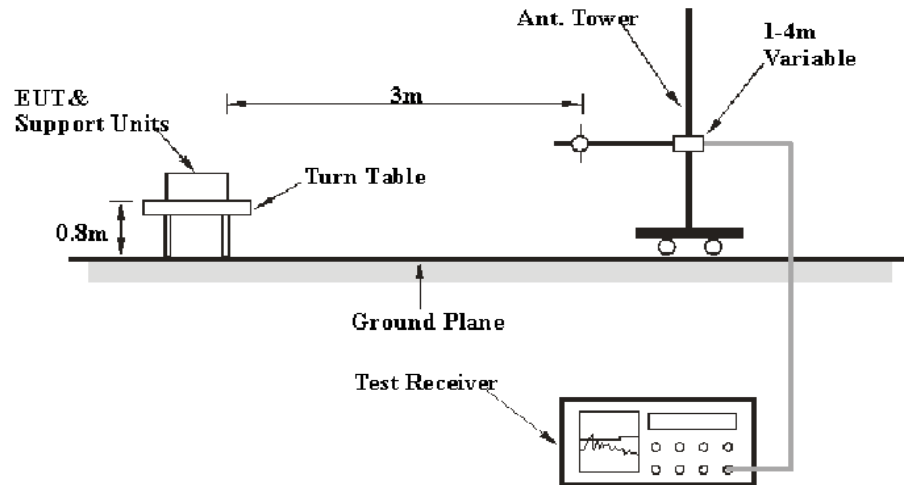
Measurement Uncertainty

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.

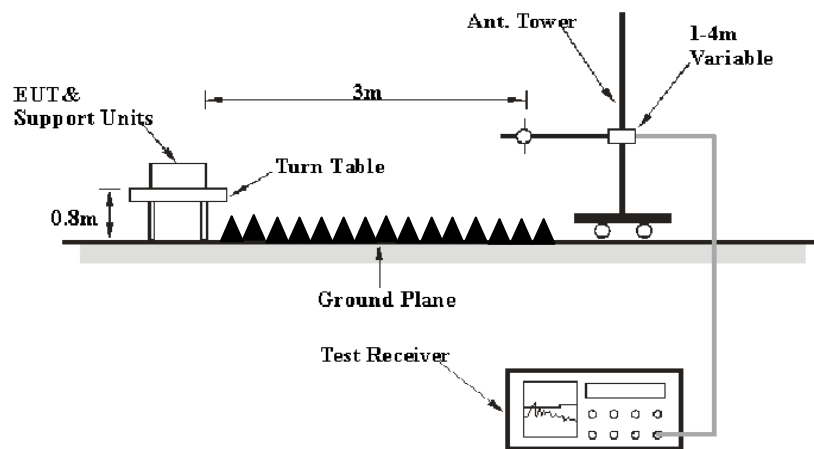
Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement from 30 MHz to 1 GHz at Bay Area Compliance Laboratories Corp. (Dongguan) is 4.0 dB, and the uncertainty will not be taken into consideration for all the test data recorded in the report.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

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

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

Test Procedure

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

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

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

Corrected Amplitude & Margin Calculation

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2012-5-13	2013-5-12
Sunol Sciences	Hybrid Antennas	JB3	A060611-1	2011-11-6	2012-11-5
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 Receiver	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:

2.85 dB at **5835 MHz** in the **Vertical** polarization for 5725-5825MHz

Test Data

Environmental Conditions

Temperature:	26 ° C
Relative Humidity:	54 %
ATM Pressure:	100.5 kPa

The testing was performed by Ares Liu from 2012-06-27 to 2012-09-11.

Test Mode: Transmitting

5150-5250MHz:

Frequency (MHz)	Reading (dB μ V)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dB/m)	Correction Data (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Comment
(5190MHz)								
5150	29.68	PK	V	35.35	65.03	68.2	3.37*	Restrict band
5150	14.63	Ave.	V	35.35	49.98	54	4.02	Restrict band
5150	14.41	Ave.	H	35.35	49.76	54	4.24	Restrict band
5150	28.11	PK	H	35.35	63.46	68.2	4.94	Restrict band
10380	37.71	PK	V	21.36	59.07	68.2	9.33	Harmonic
336.43	41.03	QP	V	-4.66	36.37	46	9.63	spurious
10380	36.12	PK	H	21.36	57.48	68.2	10.92	Harmonic
336.42	39.64	QP	H	-4.66	34.98	46	11.02	spurious
5190	63.59	PK	H	35.48	99.07	N/A	N/A	Fundamental
5190	55.23	Ave.	H	35.48	90.71	N/A	N/A	Fundamental
5190	65.19	PK	V	35.48	100.67	N/A	N/A	Fundamental
5190	54.82	Ave.	V	35.48	90.3	N/A	N/A	Fundamental
(5230MHz)								
5350	28.59	PK	V	34.78	63.37	68.2	4.83	Restrict band
5350	13.78	Ave.	V	34.78	48.56	54	5.44	Restrict band
5350	13.32	Ave.	H	34.78	48.1	54	5.9	Restrict band
5350	27.16	PK	H	34.78	61.94	68.2	6.26	Restrict band
337.8	41.64	QP	V	-4.66	36.98	46	9.02	spurious
10460	36.55	PK	V	21.46	58.01	68.2	10.39	Harmonic
10460	35.41	PK	H	21.46	56.87	68.2	11.53	Harmonic
337.74	39.06	QP	H	-4.66	34.4	46	11.6	spurious
5230	62.84	PK	V	35.26	98.1	N/A	N/A	Fundamental
5230	53.22	Ave.	V	35.26	88.48	N/A	N/A	Fundamental
5230	64.51	PK	H	35.26	99.77	N/A	N/A	Fundamental
5230	53.67	Ave.	H	35.26	88.93	N/A	N/A	Fundamental

***Within measurement uncertainty!**

5250-5350 MHz:

Frequency	Reading	Detector	Polar	Corrected Amplitude	Correction Data	Limit	Margin	Comment
(MHz)	(dB μ V)	(PK/QP /Ave.)	(H/V)	(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)	
(5270MHz)								
5150	29.49	PK	H	35.35	64.84	68.2	3.36*	Restrict band
5150	28.78	PK	H	35.35	64.13	68.2	4.07	Restrict band
5150	14.23	Ave.	H	35.35	49.58	54	4.42	Restrict band
5150	13.26	Ave.	V	35.35	48.61	54	5.39	Restrict band
10540	37.21	PK	V	21.75	58.96	68.2	9.44	Harmonic
337.65	40.06	QP	V	-4.66	35.4	46	10.6	spurious
10540	36.02	PK	H	21.75	57.77	68.2	10.63	Harmonic
337.66	39.51	QP	H	-4.66	34.85	46	11.15	spurious
5270	62.41	PK	H	35.04	97.45	N/A	N/A	Fundamental
5270	53.12	Ave.	H	35.04	88.16	N/A	N/A	Fundamental
5270	64.89	PK	V	35.04	99.93	N/A	N/A	Fundamental
5270	54.03	Ave.	V	35.04	89.07	N/A	N/A	Fundamental
(5310MHz)								
5350	30.31	PK	V	34.78	65.09	68.2	3.31*	Restrict band
5350	14.82	Ave.	V	34.78	49.6	54	4.4	Restrict band
5350	14.63	Ave.	H	34.78	49.41	54	4.59	Restrict band
5350	28.33	PK	H	34.78	63.11	68.2	5.29	Restrict band
10620	24.01	Ave.	V	22.22	46.23	54	7.77	Harmonic
10620	37.67	PK	V	22.22	59.89	68.2	8.51	Harmonic
10620	22.65	Ave.	H	22.22	44.87	54	9.13	Harmonic
337.65	41.31	QP	V	-4.66	36.65	46	9.35	spurious
10620	36.15	PK	H	22.22	58.37	68.2	10.03	Harmonic
337.66	40.02	QP	H	-4.66	35.36	46	10.64	spurious
5310	63.02	PK	H	34.93	97.95	N/A	N/A	Fundamental
5310	53.01	Ave.	H	34.93	87.94	N/A	N/A	Fundamental
5310	65.46	PK	V	34.93	100.39	N/A	N/A	Fundamental
5310	53.37	Ave.	V	34.93	88.3	N/A	N/A	Fundamental

5470-5725 MHz:

Frequency	Reading	Detector	Polar	Corrected Amplitude	Correction Data	Limit	Margin	Comment
(MHz)	(dB μ V)	(PK/QP /Ave.)	(H/V)	(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB)	
(5510MHz)								
5460	14.73	Ave.	V	34.91	49.64	54	4.36	Restrict band
5460	28.98	PK	V	34.91	63.89	68.2	4.51	Restrict band
5460	14.52	Ave.	H	34.91	49.43	54	4.57	Restrict band
11020	24.83	Ave.	V	24.34	49.17	54	4.83	Harmonic
5460	27.86	PK	H	34.91	62.77	68.2	5.63	Restrict band
11020	38.02	PK	V	24.34	62.36	68.2	6.04	Harmonic
11020	23.15	Ave.	H	24.34	47.49	54	6.51	Harmonic
11020	36.54	PK	H	24.34	60.88	68.2	7.52	Harmonic
337.65	40.26	QP	V	-4.66	35.6	46	10.4	spurious
337.66	39.54	QP	H	-4.66	34.88	46	11.12	spurious
5510	63.02	PK	H	35.1	98.12	N/A	N/A	Fundamental
5510	53.11	Ave.	H	35.1	88.21	N/A	N/A	Fundamental
5510	65.34	PK	V	35.1	100.44	N/A	N/A	Fundamental
5510	53.35	Ave.	V	35.1	88.45	N/A	N/A	Fundamental
(5550MHz)								
5725	28.76	PK	V	35.48	64.24	68.2	4.16	Outside band
11100	25.36	Ave.	V	24.07	49.43	54	4.57	Harmonic
5725	28.31	PK	H	35.48	63.79	68.2	4.61	Outside band
11100	24.13	Ave.	H	24.07	48.2	54	5.8	Harmonic
11100	37.43	PK	V	24.07	61.5	68.2	6.90	Harmonic
11100	35.89	PK	H	24.07	59.96	68.2	8.44	Harmonic
337.65	41.02	QP	V	-4.66	36.36	46	9.64	spurious
337.66	39.69	QP	H	-4.66	35.03	46	10.97	spurious
5550	62.85	PK	H	35.2	98.05	N/A	N/A	Fundamental
5550	52.46	Ave.	H	35.2	87.66	N/A	N/A	Fundamental
5550	64.94	PK	V	35.2	100.14	N/A	N/A	Fundamental
5550	53.32	Ave.	V	35.2	88.52	N/A	N/A	Fundamental

5725-5825MHz:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	(FCC 15.407)	
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBµV/m)	Margin (dB)
Low Channel:5755MHz									
5755	50.37	AV	H	34.65	5.17	0	90.19	N/A	N/A
5755	65.83	PK	H	34.65	5.17	0	105.65	N/A	N/A
5755	51.29	AV	V	34.65	5.17	0	91.11	N/A	N/A
5755	67.42	PK	V	34.65	5.17	0	107.24	N/A	N/A
11510	42.07	PK	V	41.02	7.84	26.10	64.83	68.20	3.37*
5715	25.21	PK	V	34.64	4.83	0	64.67	68.20	3.53*
11510	26.42	AV	V	41.02	7.84	26.10	49.18	54.00	4.82
332.84	42.91	QP	V	14.71	2.17	21.60	38.18	46.00	7.82
5725	26.14	PK	V	34.64	4.83	0	65.61	78.2	12.59
1587.32	33.87	PK	V	26.08	3.14	27.43	35.66	68.20	32.54
1587.32	15.59	AV	V	26.08	3.14	27.43	17.38	54.00	36.62
High Channel:5795MHz									
5795	48.26	AV	H	34.68	5.14	0	88.08	N/A	N/A
5795	63.93	PK	H	34.68	5.14	0	103.75	N/A	N/A
5795	50.11	AV	V	34.68	5.14	0	89.93	N/A	N/A
5795	65.85	PK	V	34.68	5.14	0	105.67	N/A	N/A
5835	25.31	PK	V	34.70	5.35	0	65.36	68.20	2.85*
11590	41.78	PK	V	41.16	8.01	26.00	64.96	68.20	3.24*
11590	26.31	AV	V	41.16	8.01	26.00	49.49	54.00	4.51
332.67	42.54	QP	V	14.71	2.17	21.60	37.81	46.00	8.19
5825	26.02	PK	V	34.7	5.35	0	66.07	78.2	12.13
1587.28	33.46	PK	V	26.08	3.14	27.43	35.25	68.20	32.95
1587.28	14.79	AV	V	26.08	3.14	27.43	16.58	54.00	37.42

**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 operating band.
3. Repeat above procedures until all frequencies measured were complete.

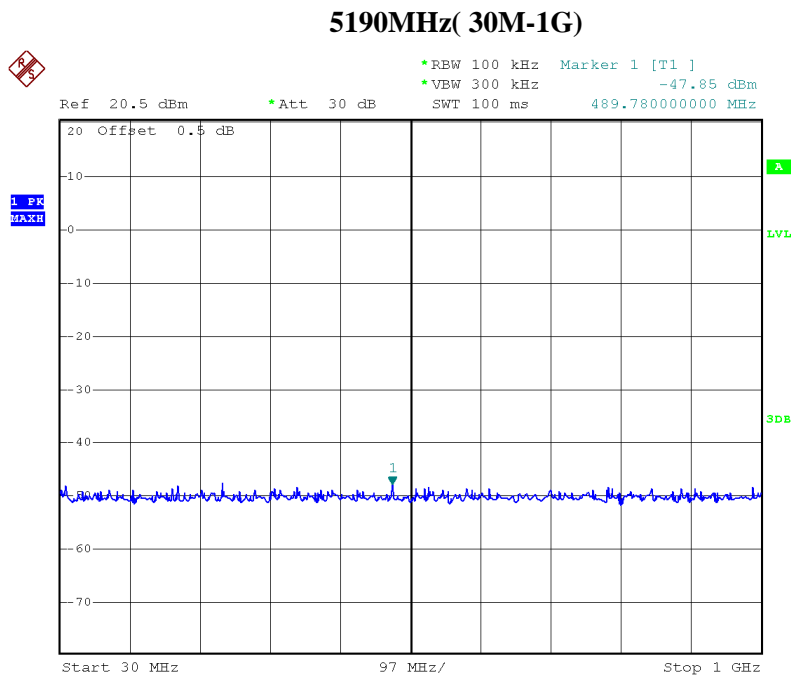
Offset value =attenuation+combiner loss +cable loss



Test data

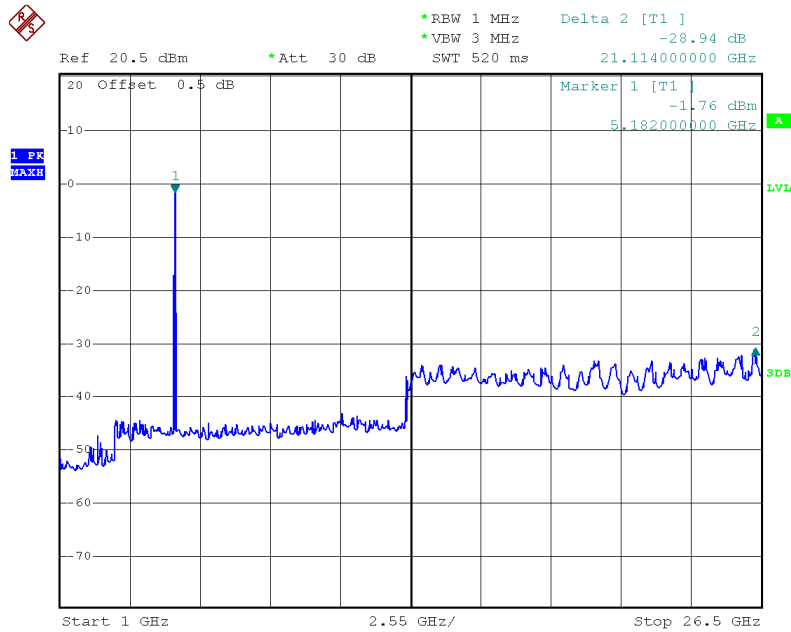
Please refer to the following plots.

5150MHz~5250MHz:



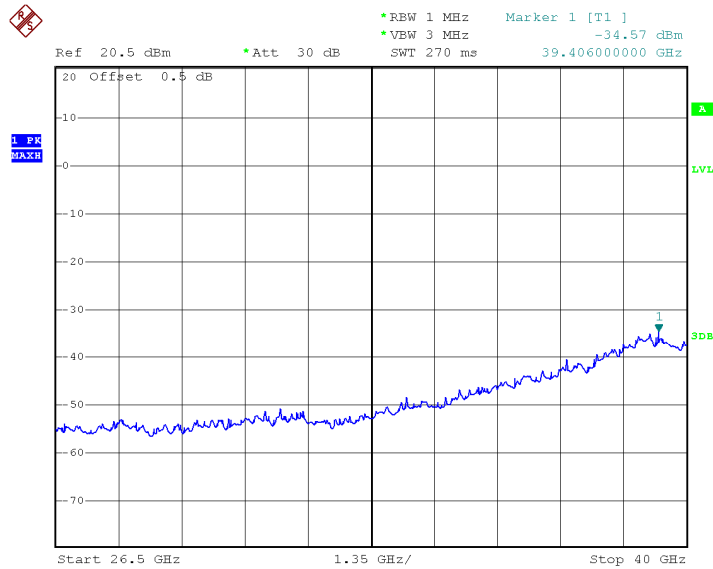
Date: 27.JUN.2012 18:46:17

5190MHz(1 G-26.5 G)



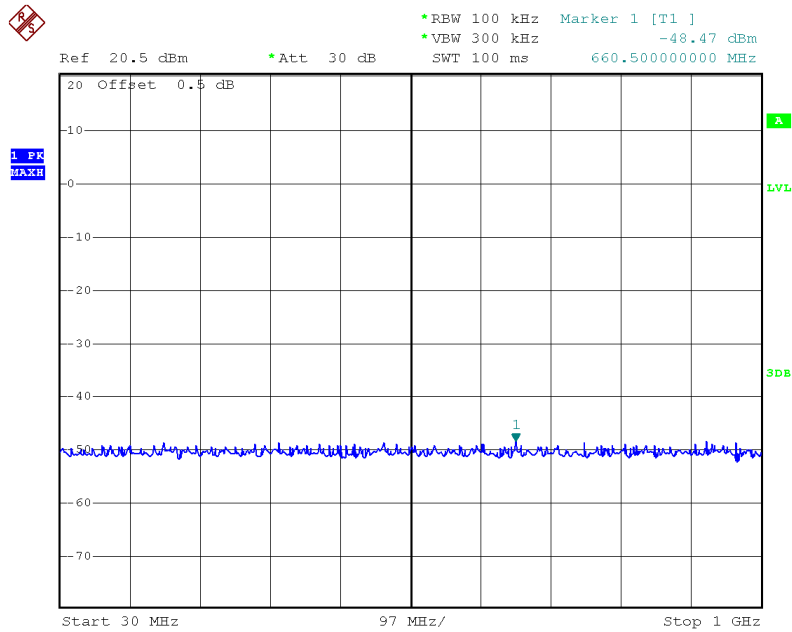
Date: 27.JUN.2012 18:46:52

5190MHz(26.5 G-40 G)



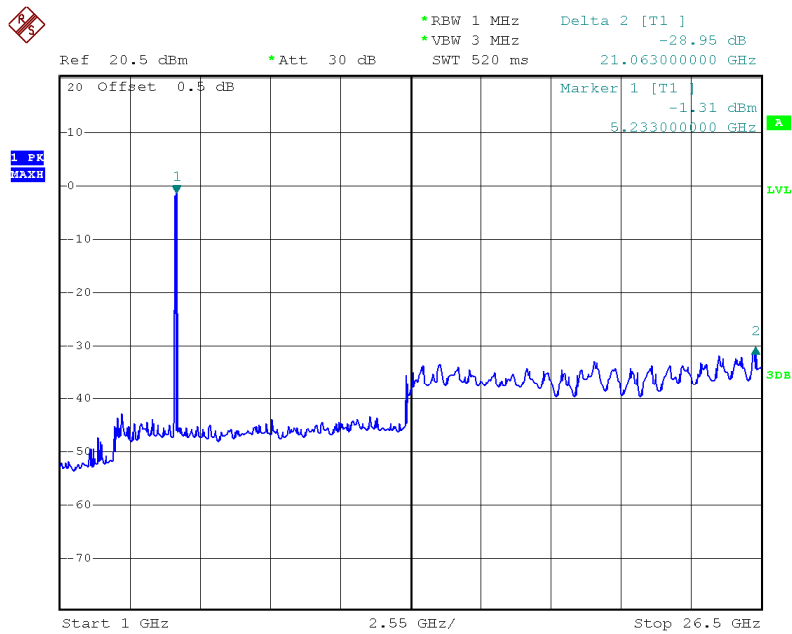
Date: 10.JUL.2012 16:08:59

5230MHz(30M-1G)



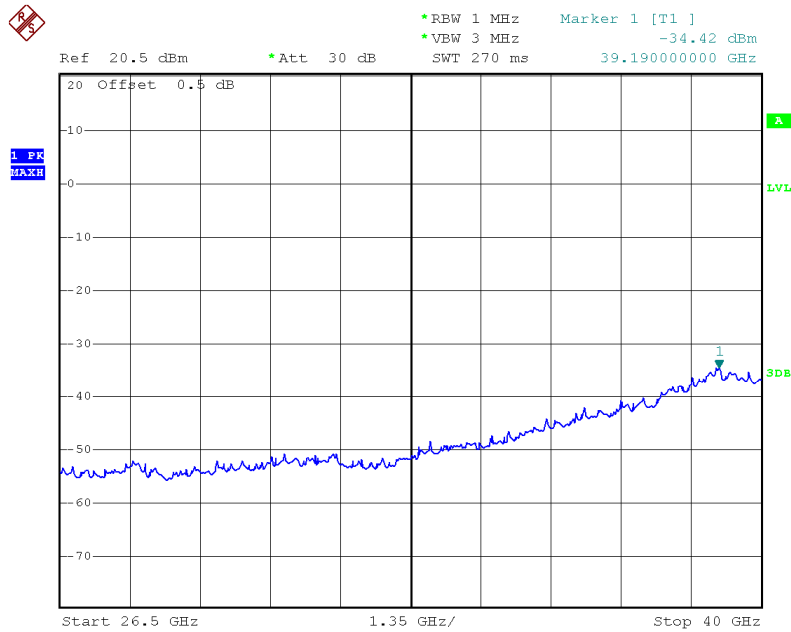
Date: 27.JUN.2012 18:51:53

5230MHz(1G-26.5 G)



Date: 27.JUN.2012 18:52:21

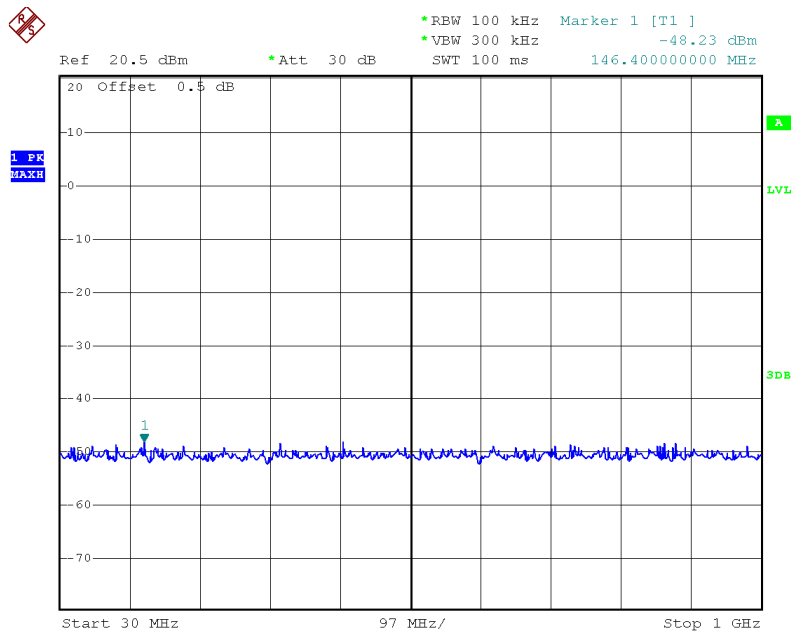
5230MHz(26.5 G-40 G)



Date: 10.JUL.2012 16:08:14

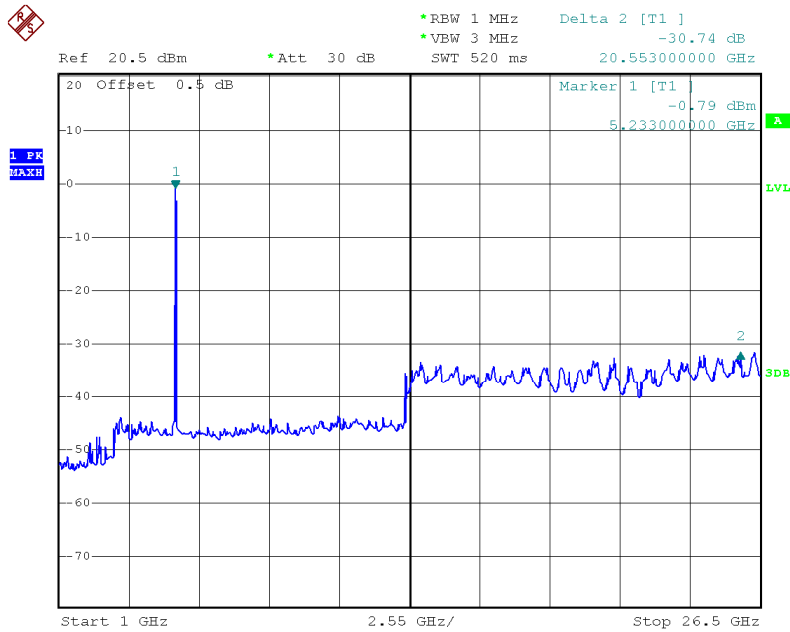
5250-5350 MHz:

5270 MHz (30M-1G)



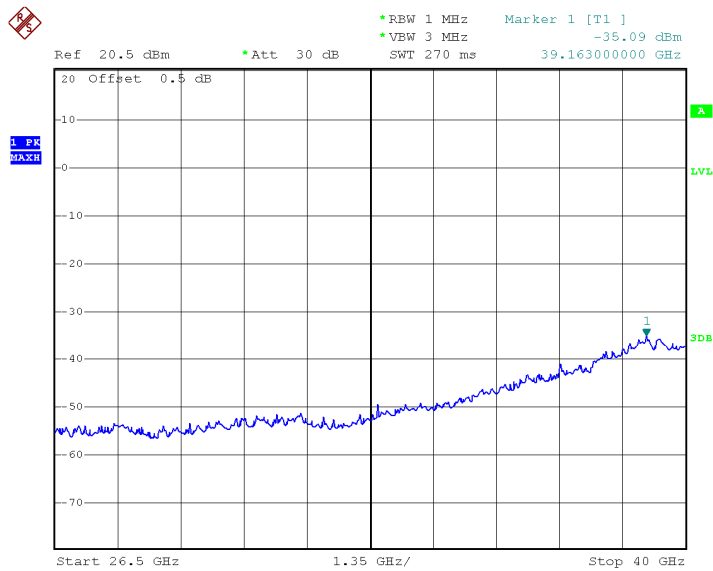
Date: 27.JUN.2012 19:00:10

5270 MHz (1 G-26.5 G)



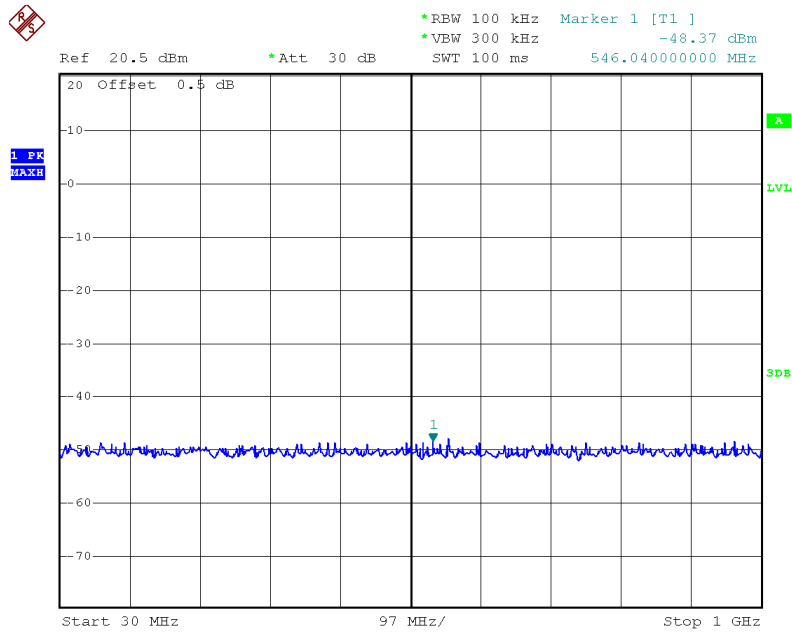
Date: 27.JUN.2012 19:00:37

5270 MHz (26.5 G-40 G)



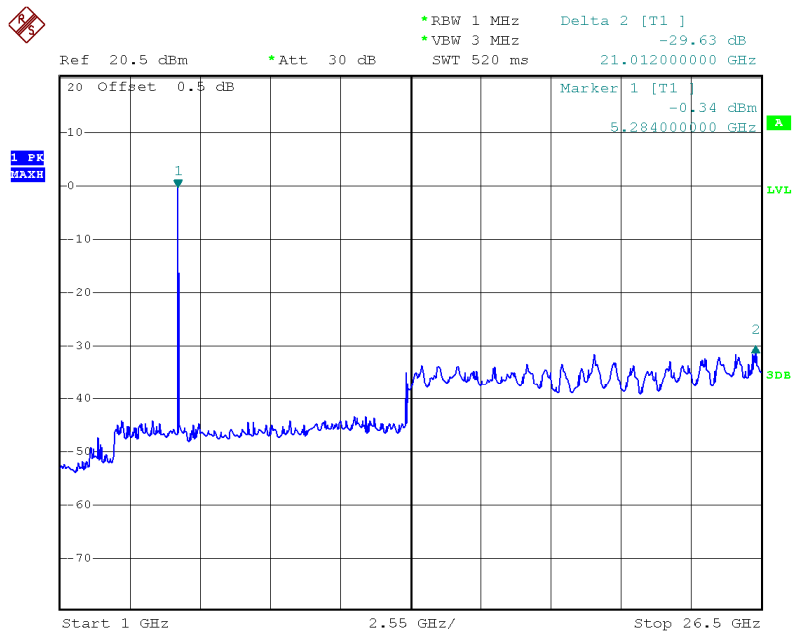
Date: 10.JUL.2012 16:07:37

5310 MHz (30M-1G)



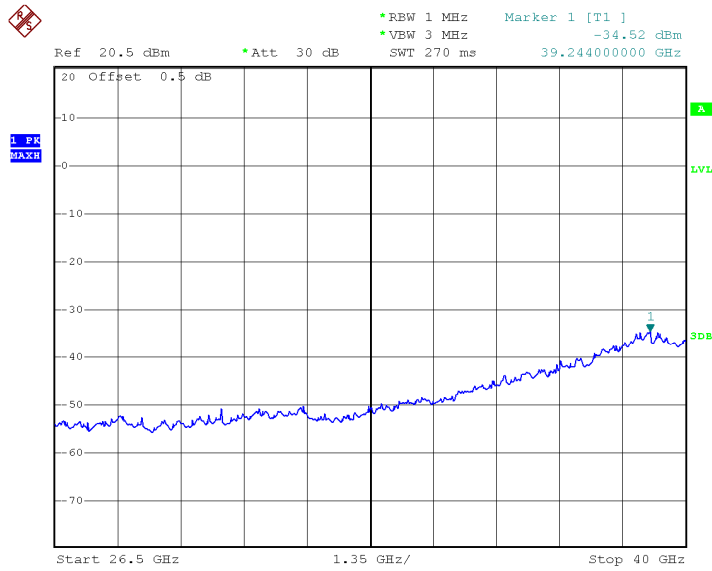
Date: 27.JUN.2012 19:44:01

5310 MHz (1G-26.5 G)



Date: 27.JUN.2012 19:44:32

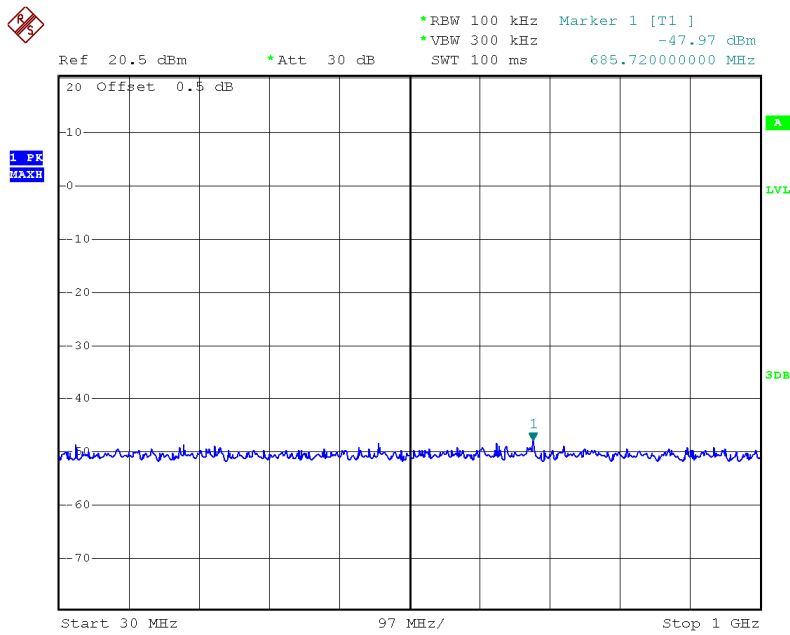
5310 MHz (26.5 G-40 G)



Date: 10.JUL.2012 16:06:56

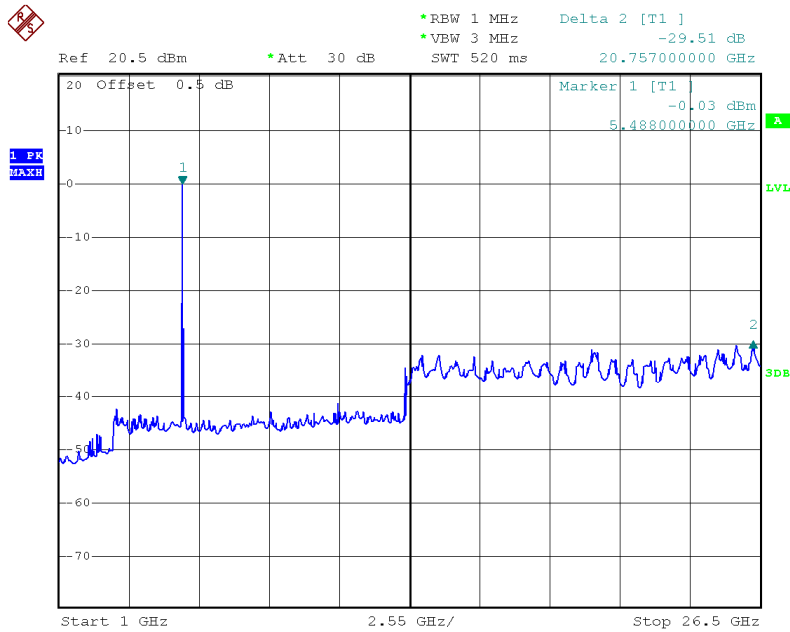
5470-5725 MHz:

5510 MHz (30M-1G)



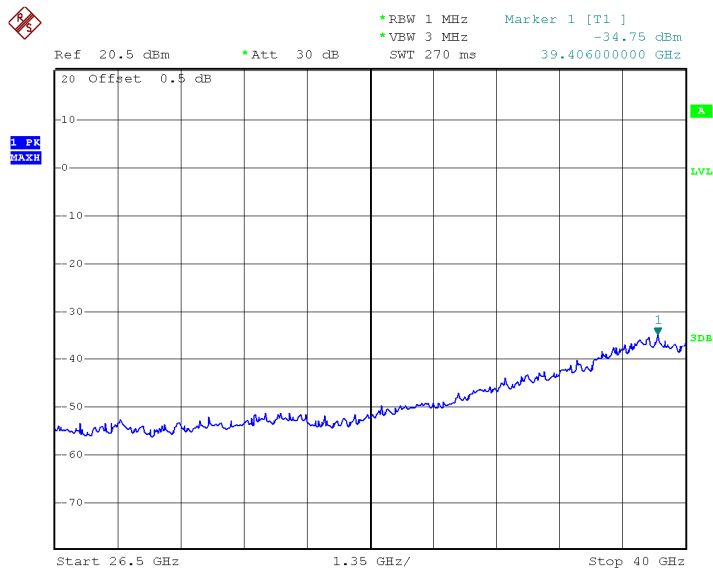
Date: 27.JUN.2012 19:56:01

5510 MHz (1 G-26.5 G)



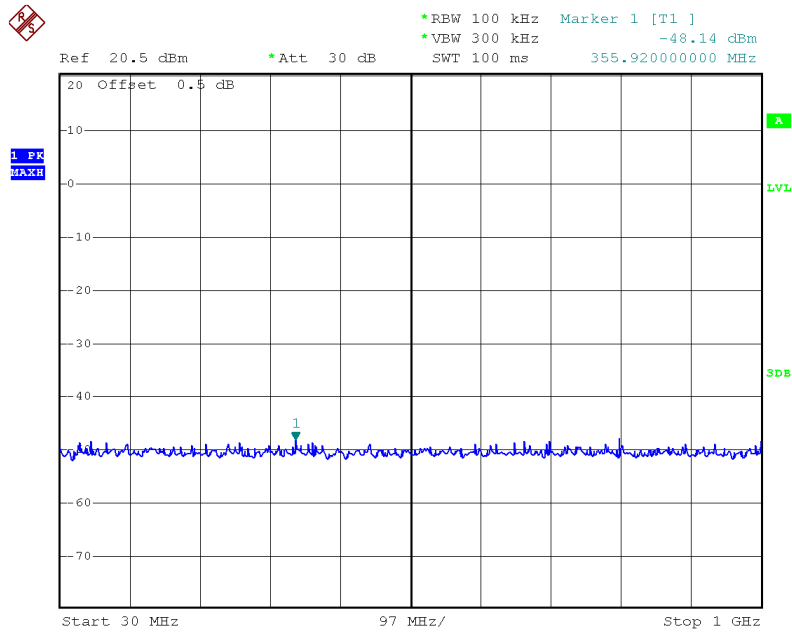
Date: 27.JUN.2012 19:59:38

5510 MHz (26.5 G-40 G)



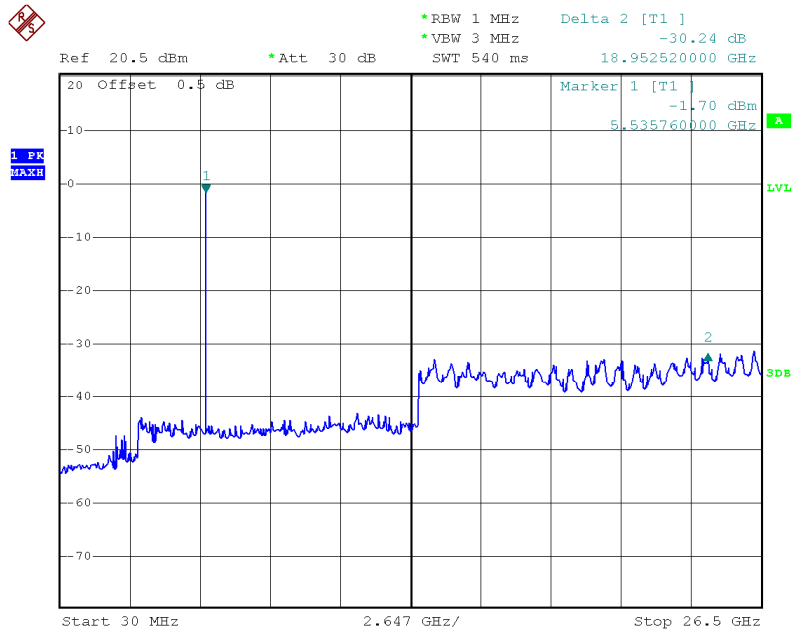
Date: 10.JUL.2012 16:06:14

5550 MHz (30M-1G)



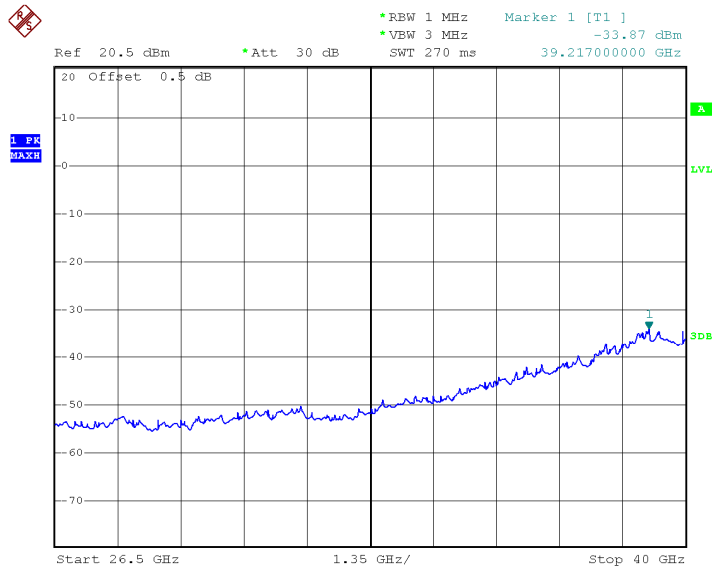
Date: 27.JUN.2012 20:06:17

5550 MHz (1G-26.5 G)



Date: 27.JUN.2012 20:06:47

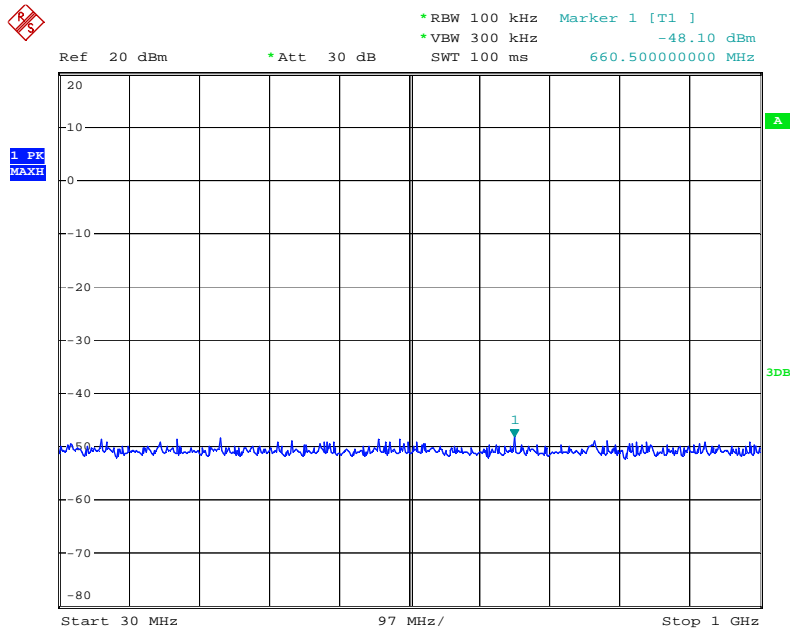
5550 MHz (26.5 G-40 G)



Date: 10.JUL.2012 16:05:28

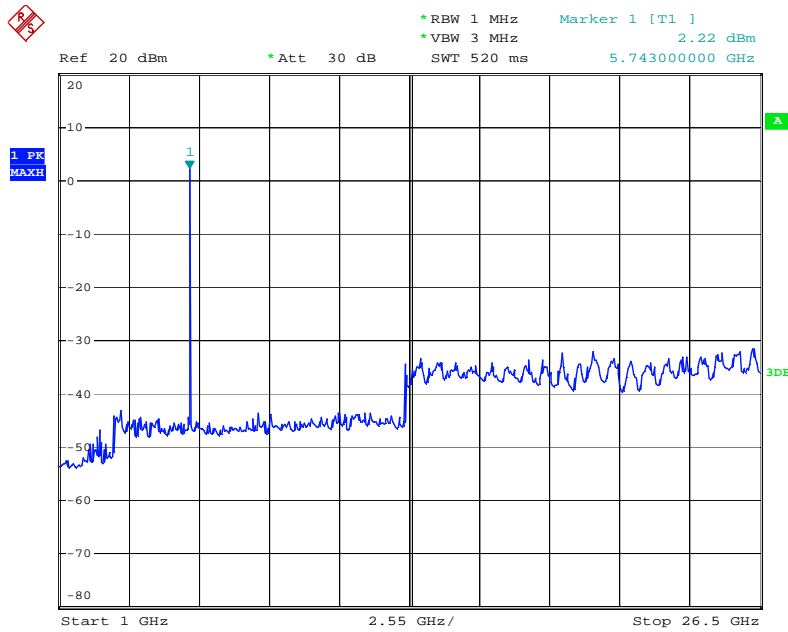
5725-5825MHz:

5755MHz(30MHz-1GHz)



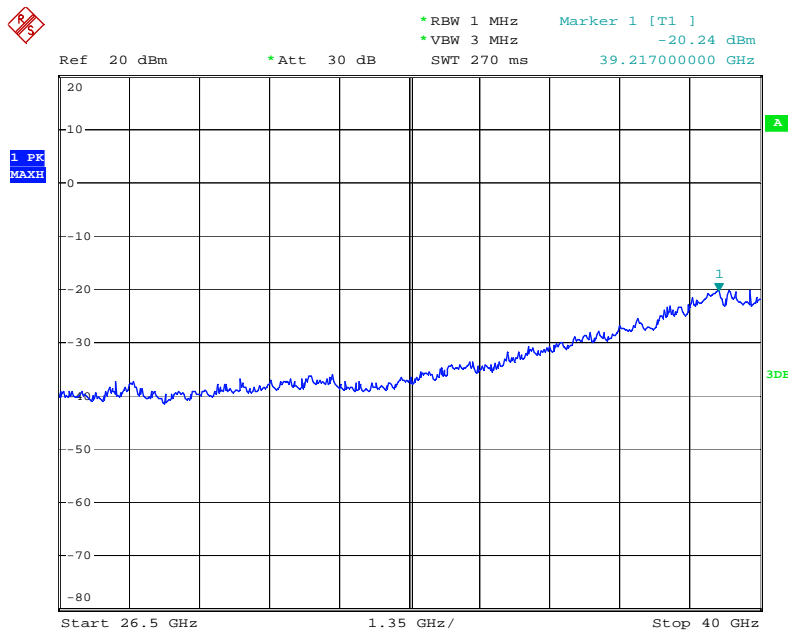
Date: 11.SEP.2012 14:40:06

5755MHz(1GHz-26.5GHz)



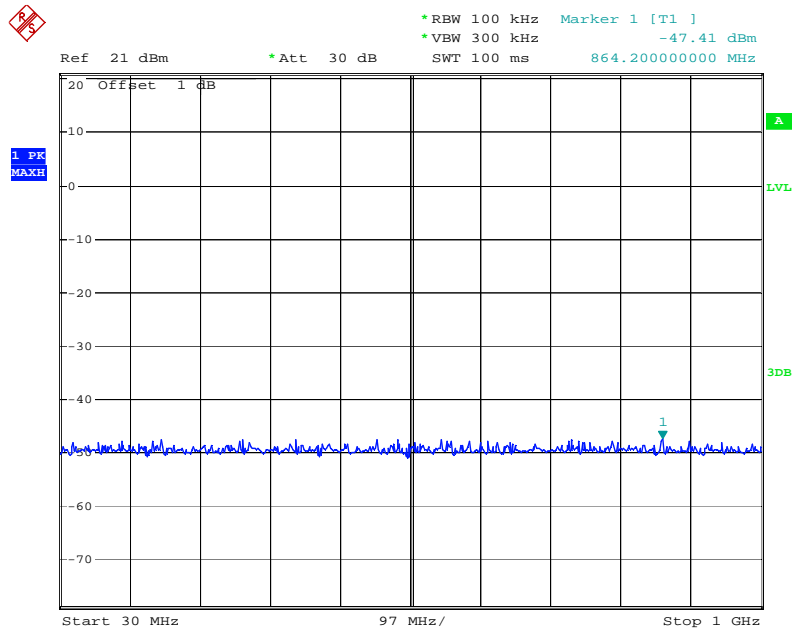
Date: 11.SEP.2012 14:40:42

5755MHz(26.5GHz-40GHz)



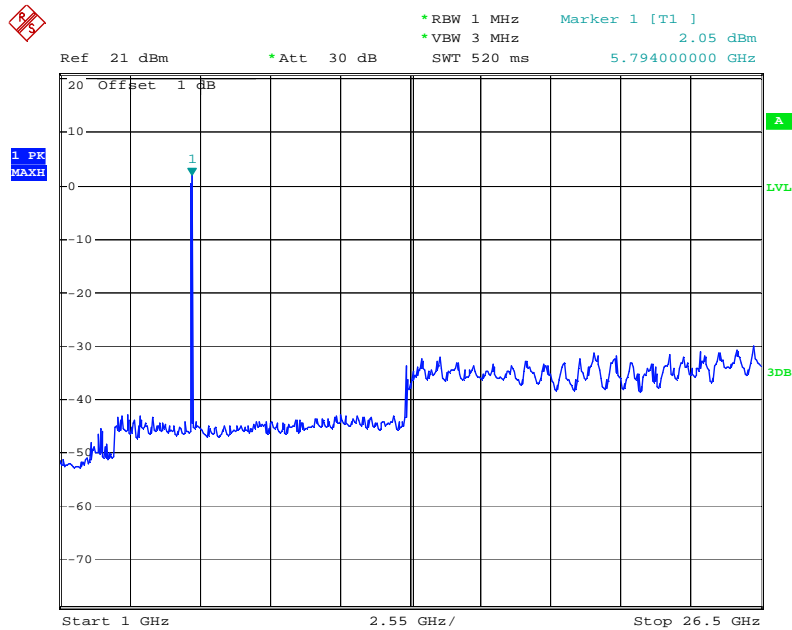
Date: 11.SEP.2012 14:41:22

5795MHz(30MHz-1GHz)



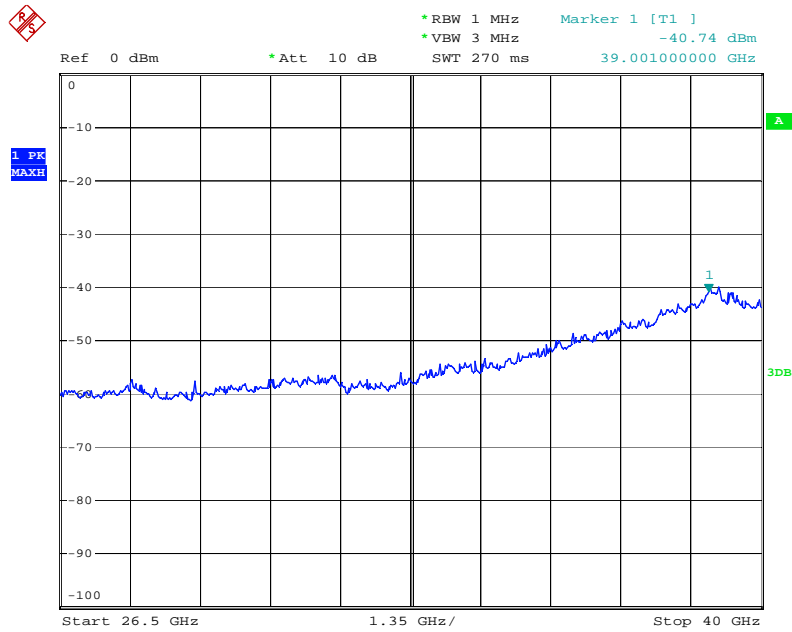
Date: 11.SEP.2012 13:51:45

5795MHz(1GHz-26.5GHz)



Date: 11.SEP.2012 13:52:49

5795MHz(26.5GHz-40GHz)



Date: 11.SEP.2012 14:14:27

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

Applicable Standard

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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.

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

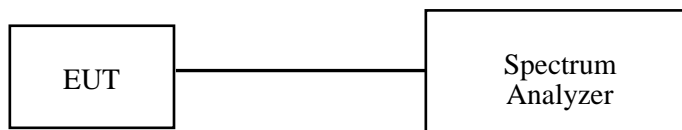
For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or $17 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

Test Procedure

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



Test Data

Environmental Conditions

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

The testing was performed by Ares Liu from 2012-06-27 to 2012-09-11.

Test Result: Pass.

Please refer to the following tables and plots.

5150-5250MHz:

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5190	38.88
High	5230	38.56

5250-5350 MHz:

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5270	38.72
High	5310	38.88

5470-5725 MHz:

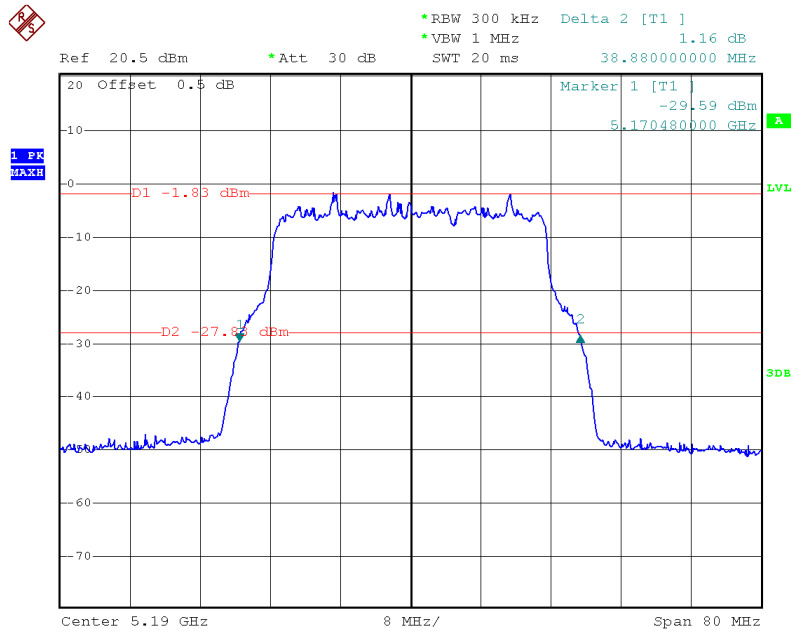
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5510	38.56
High	5550	37.92

5725-5825MHz:

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5755	38.88
High	5795	39.04

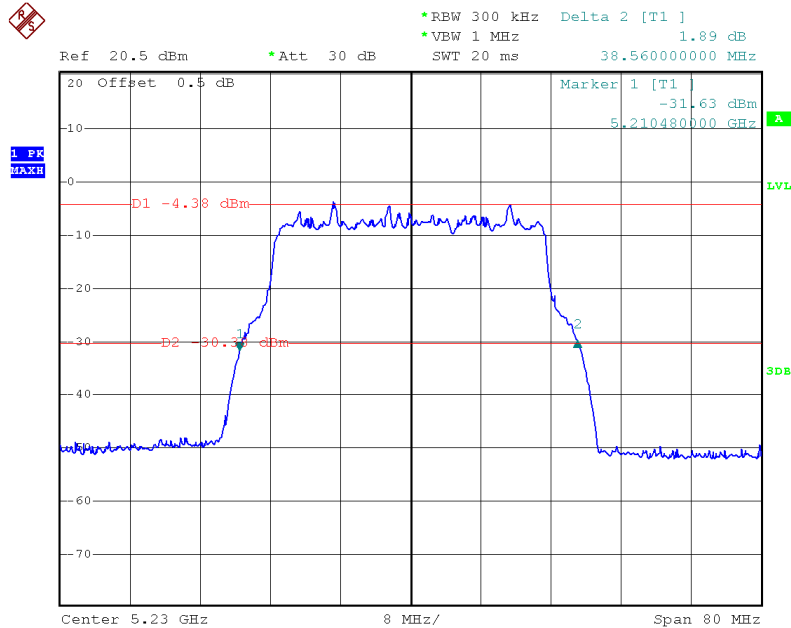
5150-5250MHz:

26 dB Bandwidth-5190 MHz



Date: 27.JUN.2012 18:42:11

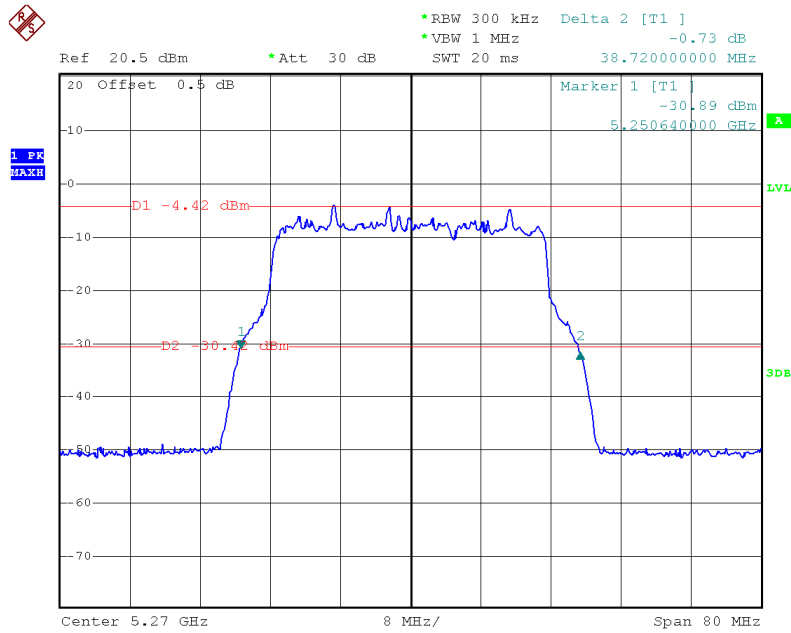
26 dB Bandwidth-5230 MHz



Date: 27.JUN.2012 18:49:01

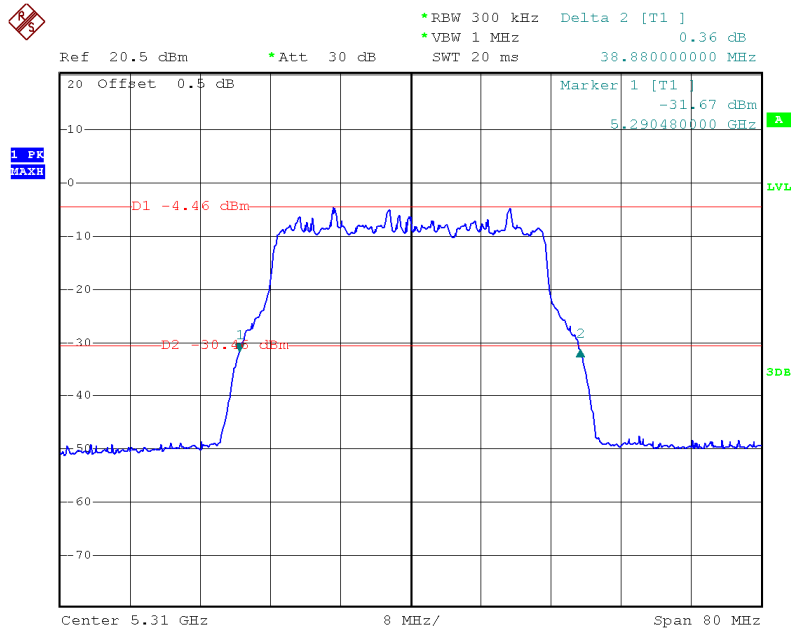
5250-5350 MHz:

26 dB Bandwidth-5270 MHz



Date: 27.JUN.2012 18:57:28

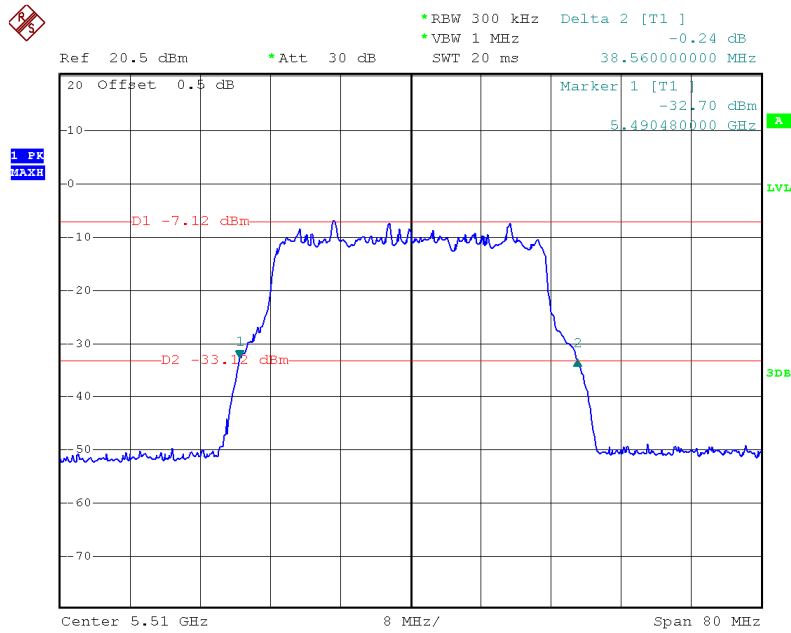
26 dB Bandwidth-5310 MHz



Date: 27.JUN.2012 19:06:05

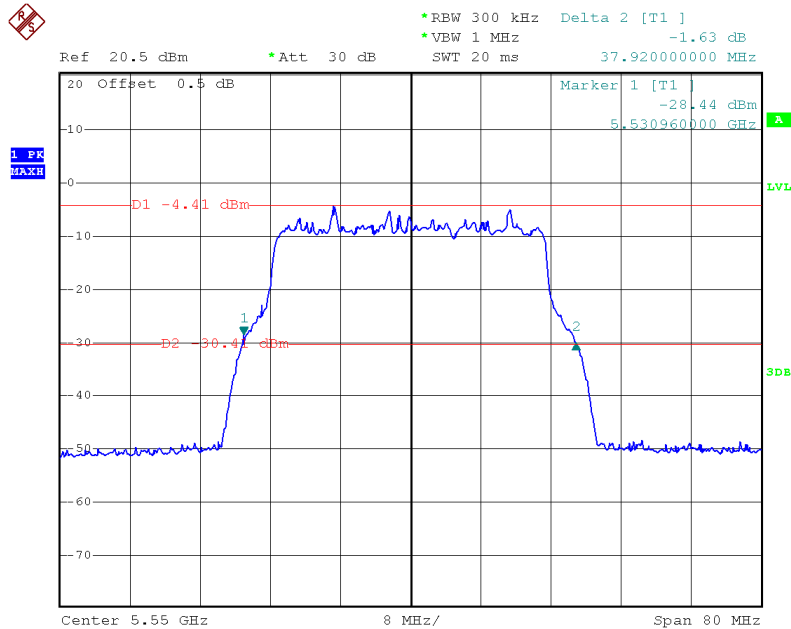
5470-5725 MHz:

26 dB Bandwidth-5510 MHz



Date: 27.JUN.2012 19:48:12

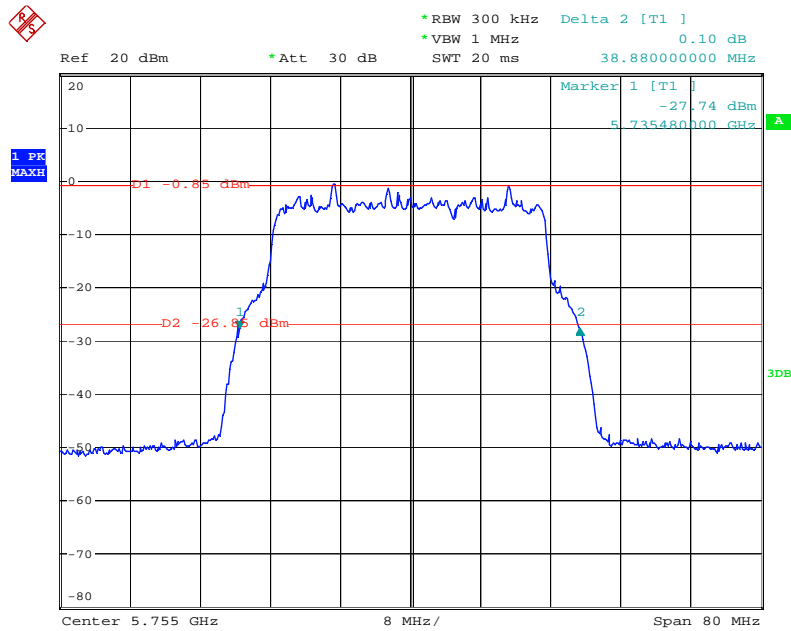
26 dB Bandwidth-5550 MHz



Date: 27.JUN.2012 20:02:26

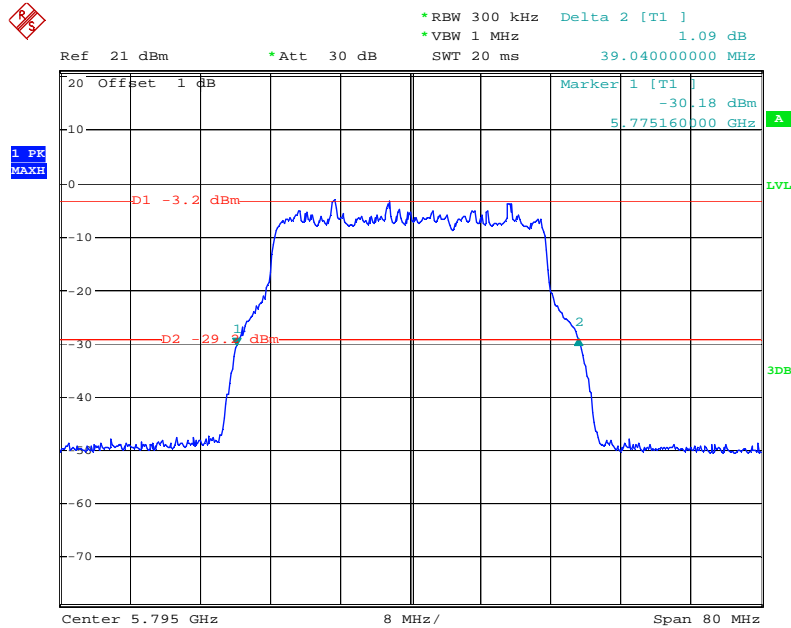
5725-5825MHz:

26 dB Bandwidth-5755MHz



Date: 11.SEP.2012 14:33:50

26 dB Bandwidth-5795MHz



Date: 11.SEP.2012 13:33:29

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

Applicable Standard

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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.

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

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 $17 \text{ dBm} + 10 \log B$, 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

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 \geq 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:	28.4 °C
Relative Humidity:	67%
ATM Pressure:	100.5kPa

The testing was performed by Ares Liu from 2012-06-27 to 2012-09-11.

Test Mode: Transmitting

Test Result: Pass

Please refer to the following tables and plots.

5150-5250MHz:

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
Low	5190	14.69	17
High	5230	14.69	17

5250-5350MHz:

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
Low	5270	14.78	24
High	5310	14.53	24

5470-5725MHz:

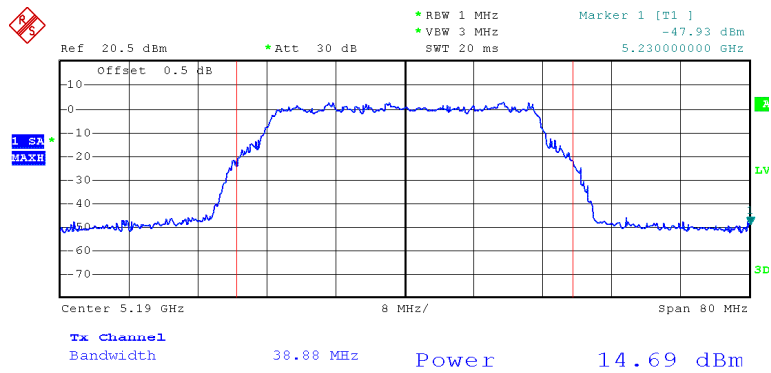
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
Low	5510	14.35	24
High	5550	14.36	24

5725-5825MHz:

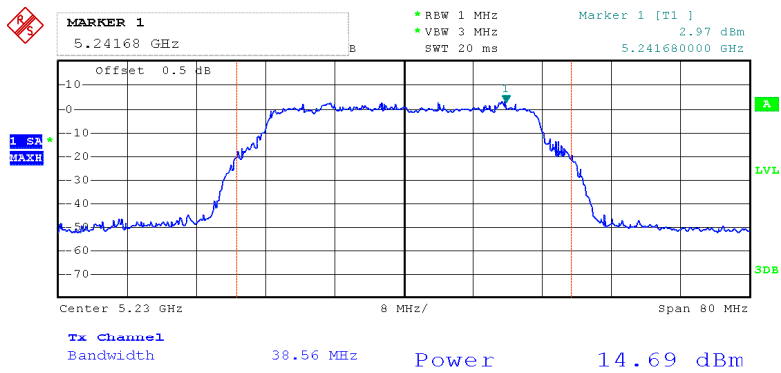
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
Low	5755	14.33	30
High	5795	14.49	30

5150-5250MHz:

Power-5190 MHz

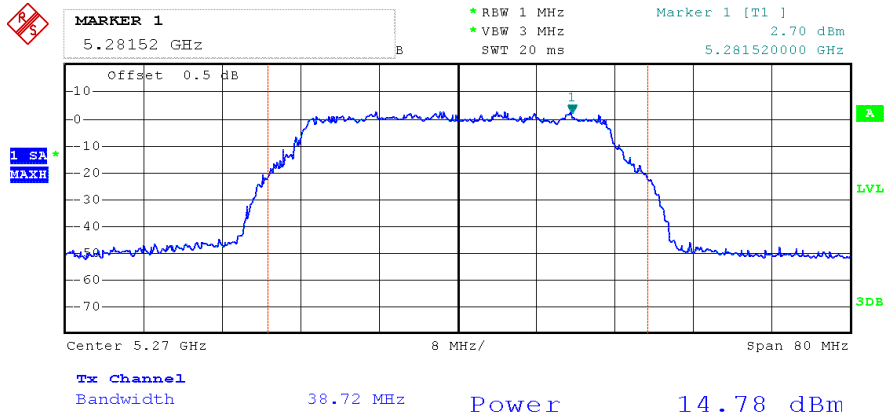


Power-5230 MHz

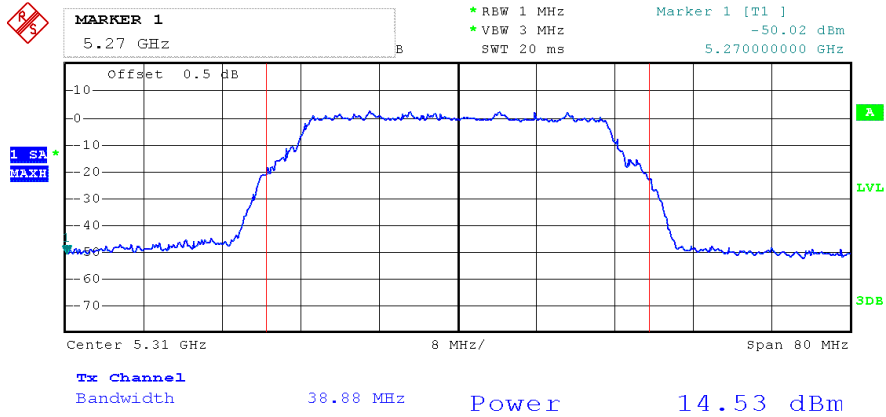


5250-5350MHz:

Power-5270 MHz

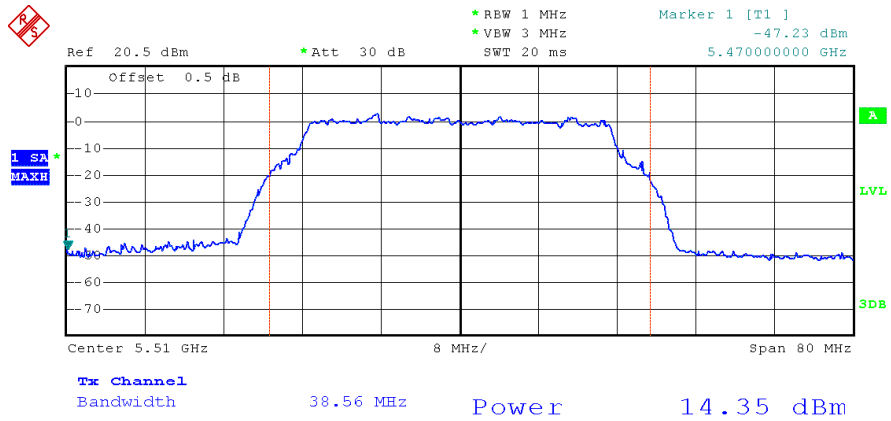


Power-5310 MHz

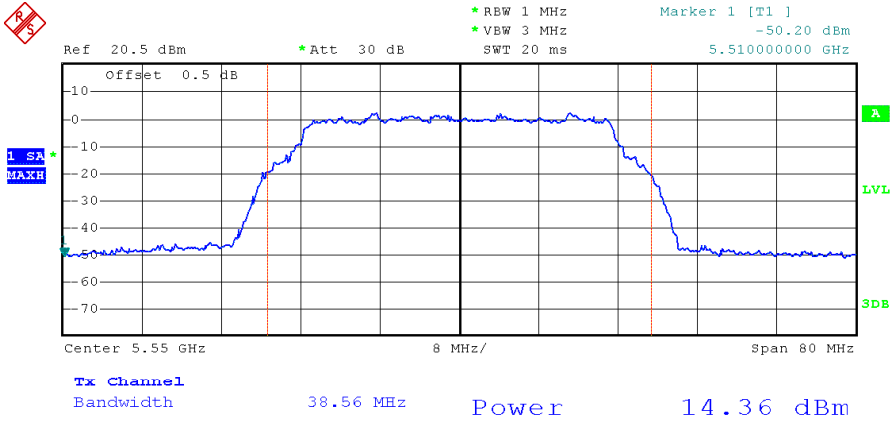


5470-5725MHz:

Power-5510 MHz

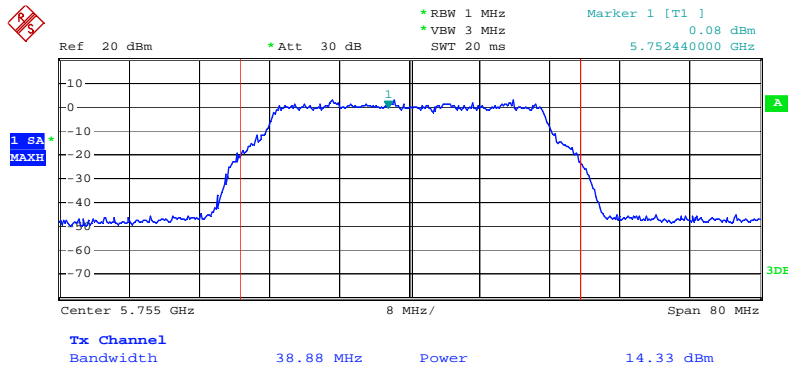


Power-5550 MHz



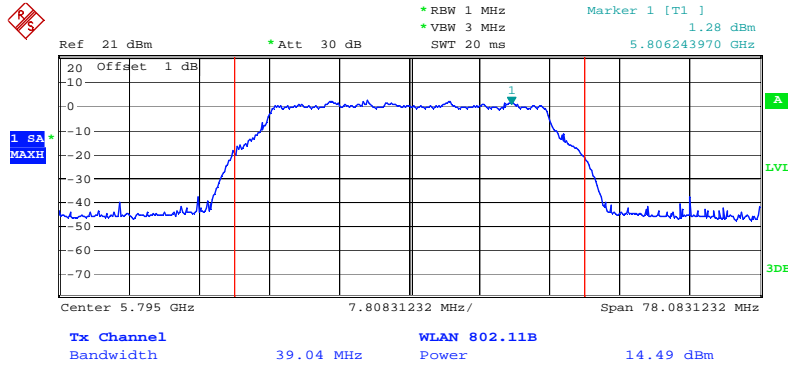
5725-5825MHz:

Power-5755 MHz



Date: 11.SEP.2012 14:35:53

Power-5795 MHz



Date: 11.SEP.2012 13:41:34

FCC §15.407(a) (2) (5) - POWER SPECTRAL DENSITY

Applicable Standard

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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.

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

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 $17 \text{ dBm} + 10 \log B$, 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.

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	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

Test Data**Environmental Conditions**

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

The testing was performed by Ares Liu from 2012-06-27 to 2012-09-11.

Test Mode: Transmitting

Test Result: Pass

5150-5250MHz:

Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
Low	5190	3.10	4	Pass
High	5230	2.36	4	Pass

5250-5350MHz:

Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
Low	5270	2.18	11	Pass
High	5310	2.91	11	Pass

5470-5725MHz:

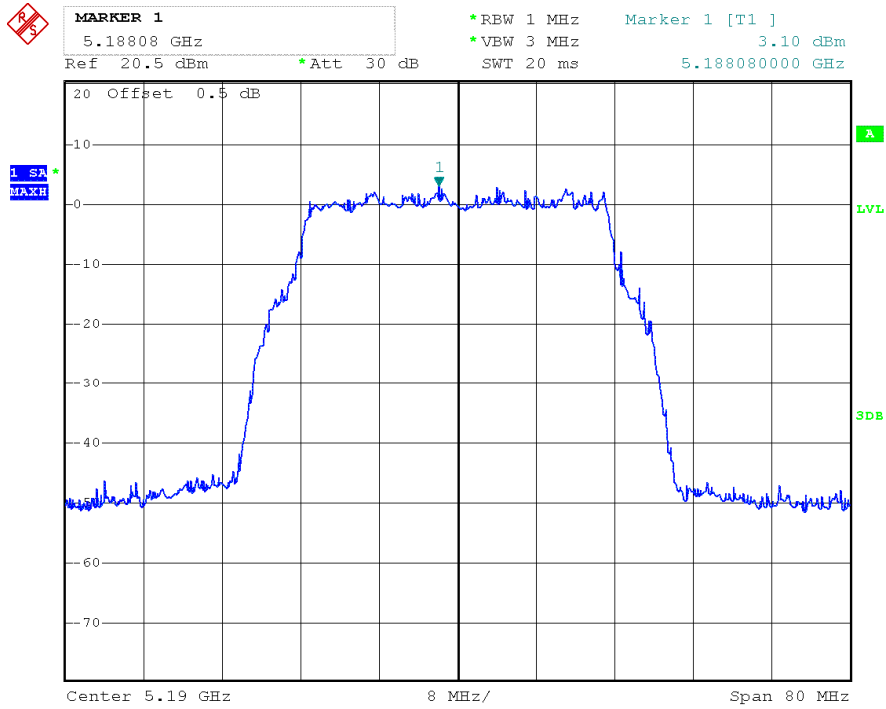
Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
Low	5510	1.15	11	Pass
High	5550	1.72	11	Pass

5725-5825MHz:

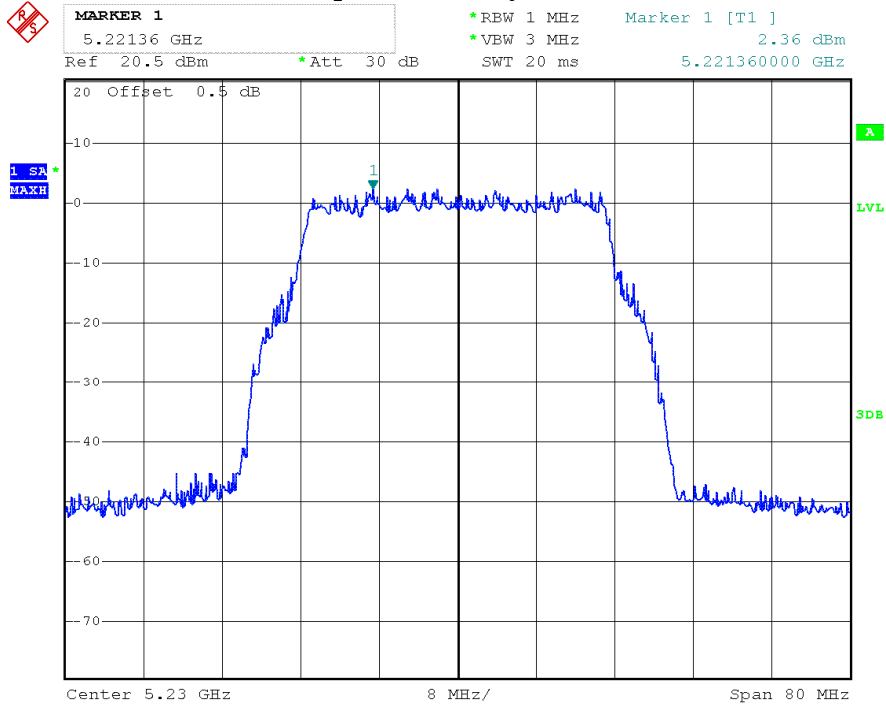
Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
Low	5755	3.22	17	Pass
High	5795	2.44	17	Pass

5150-5250MHz:

Power Spectral Density-5190 MHz

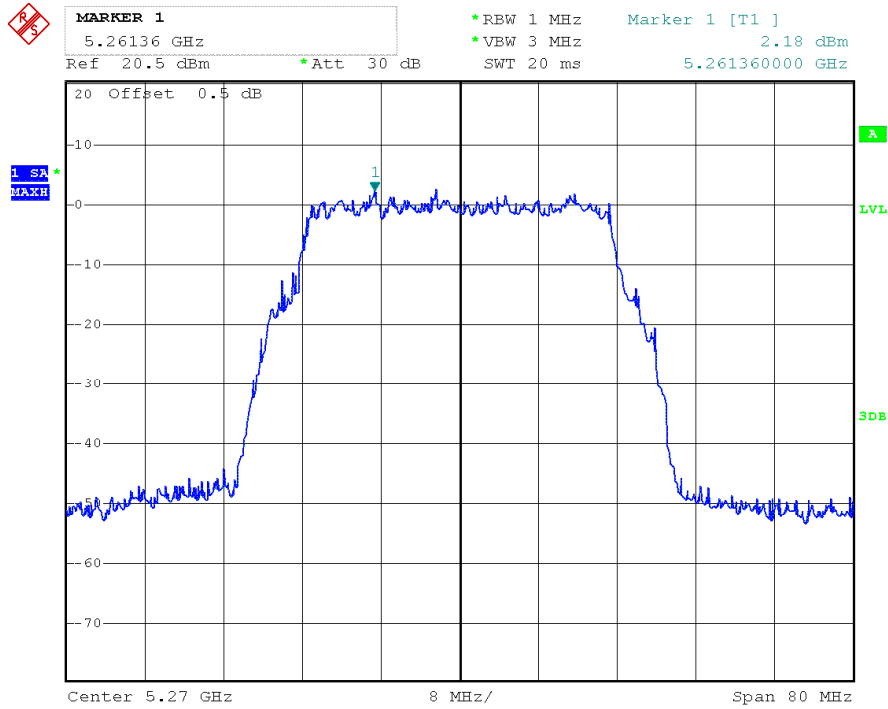


Power Spectral Density-5230 MHz

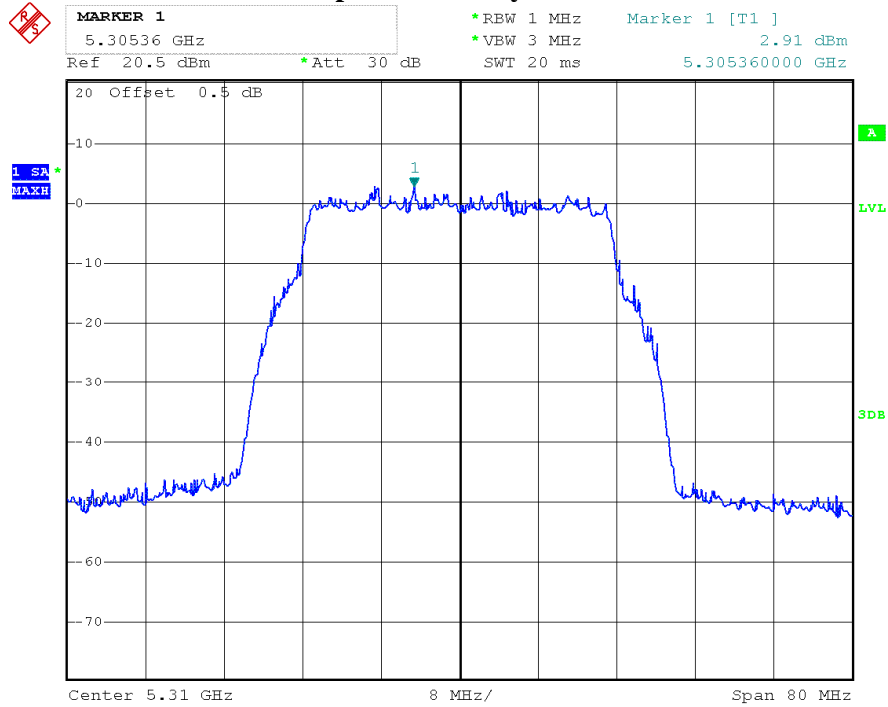


5250-5350MHz:

Power Spectral Density-5270 MHz

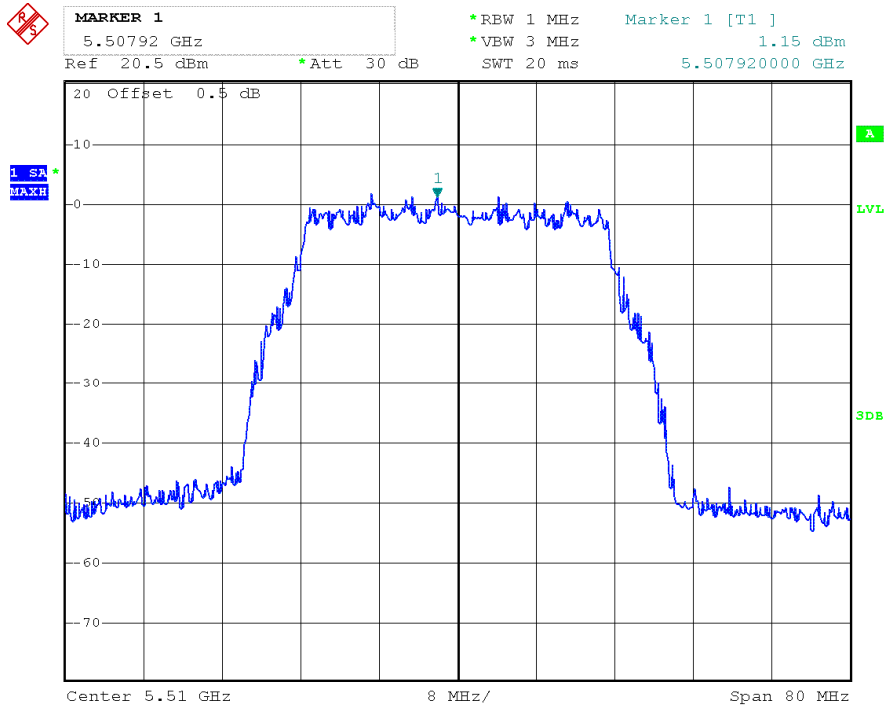


Power Spectral Density-5310 MHz

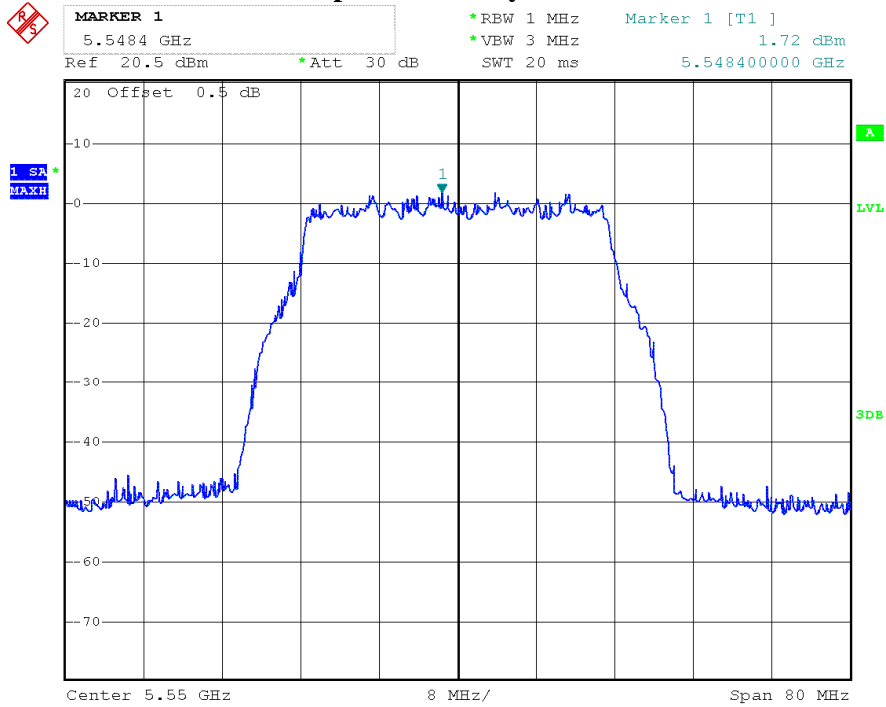


5470-5725MHz:

Power Spectral Density-5510 MHz

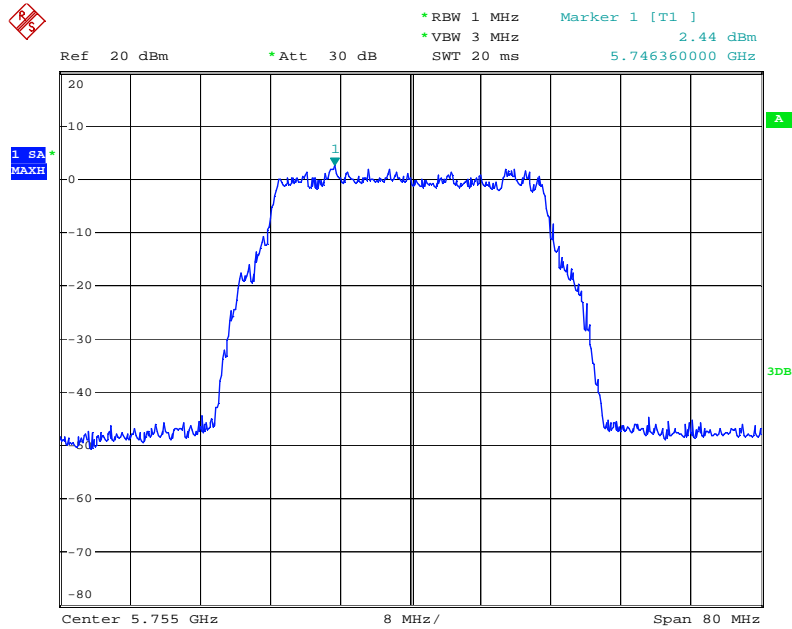


Power Spectral Density-5550 MHz



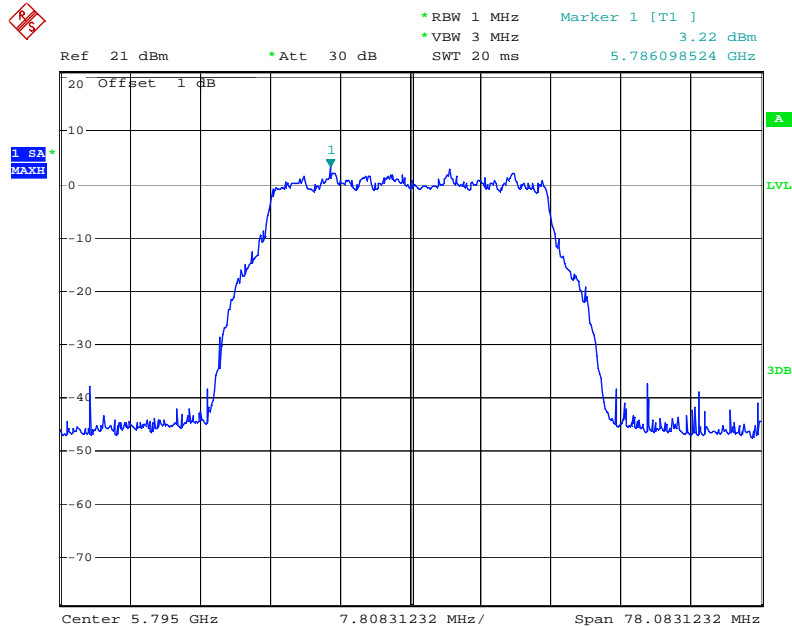
5725-5825MHz:

Power Spectral Density-5755 MHz



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Power Spectral Density-5795 MHz



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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

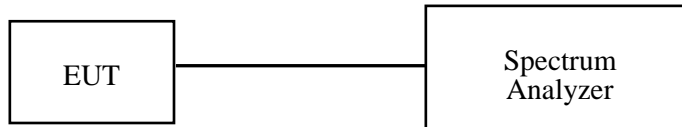
Set the spectrum analyzer span to view the entire emission bandwidth. The largest difference between the following two traces must be ≤ 13 dB for all frequencies across the emission bandwidth. Submit a plot.

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”.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP38	100478	2012-5-14	2013-5-13

Test Data

Environmental Conditions

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

The testing was performed by Ares Liu from 2012-06-27 to 2012-09-11.

Test Mode: Transmitting

5150-5250MHz:

Channel Frequency (MHz)	Peak Excursion Ratio (dB)	Limit (dB)	Result
5190MHz	1.84	13	Pass
5230MHz	2.40	13	Pass

5250-5350MHz:

Channel Frequency (MHz)	Peak Excursion Ratio (dB)	Limit (dB)	Result
5270MHz	1.73	13	Pass
5310MHz	2.57	13	Pass

5470-5725MHz:

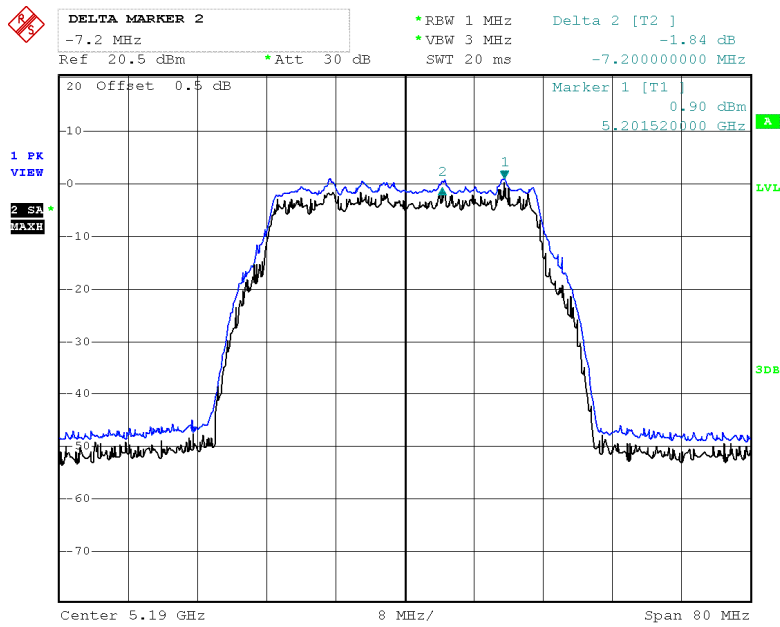
Channel Frequency (MHz)	Peak Excursion Ratio (dB)	Limit (dB)	Result
5510MHz	1.45	13	Pass
5550MHz	1.83	13	Pass

5725-5825MHz:

Channel Frequency (MHz)	Peak Excursion Ratio (dB)	Limit (dB)	Result
5755	1.24	13	Pass
5795	1.33	13	Pass

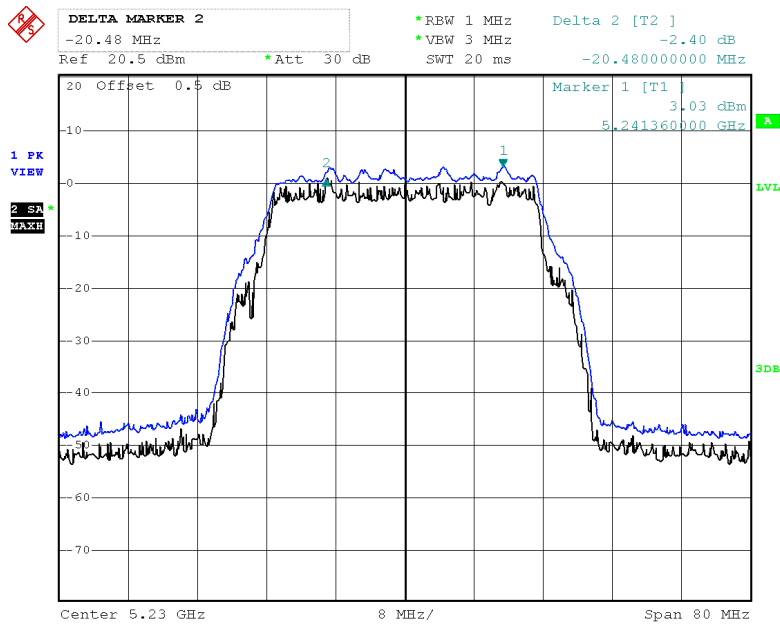
5150-5250MHz:

5190 MHz



Date: 1.JAN.2000 00:26:14

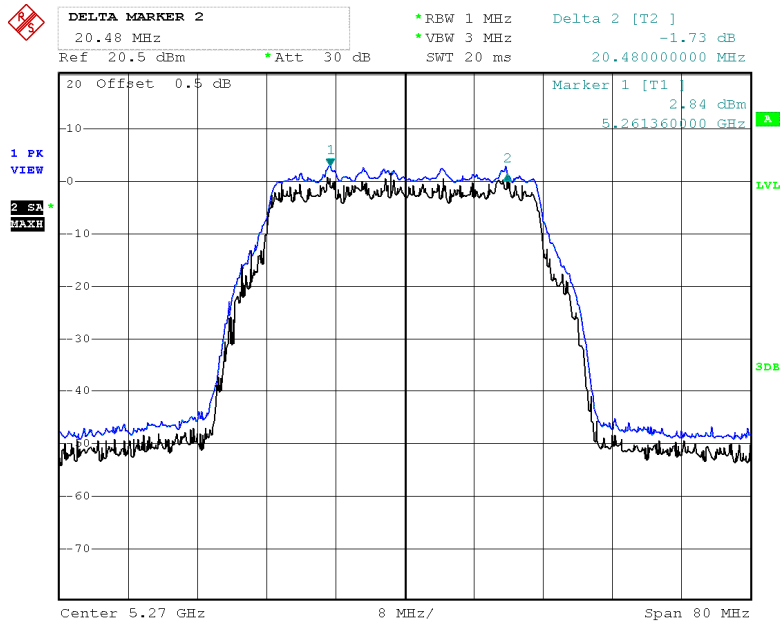
5230 MHz



Date: 1.JAN.2000 00:34:38

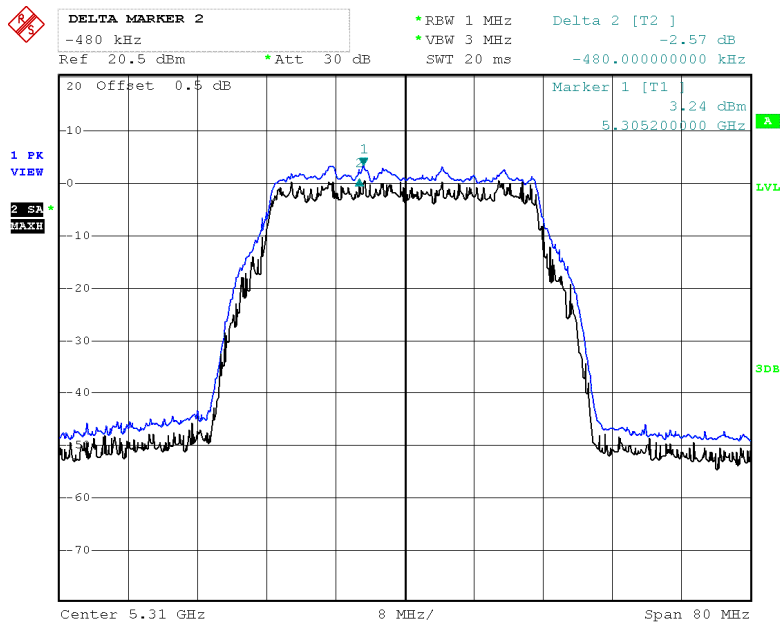
5250-5350MHz:

5270 MHz



Date: 1.JAN.2000 00:27:54

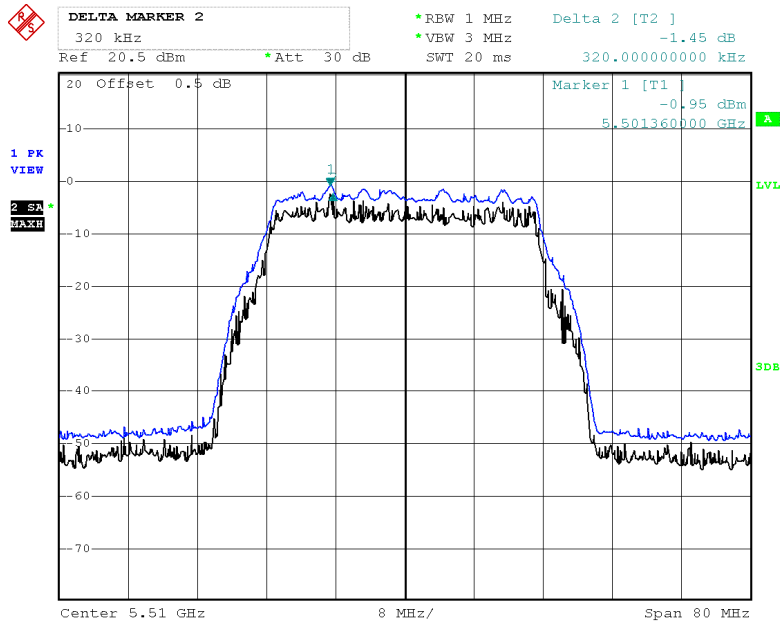
5310 MHz



Date: 1.JAN.2000 00:36:43

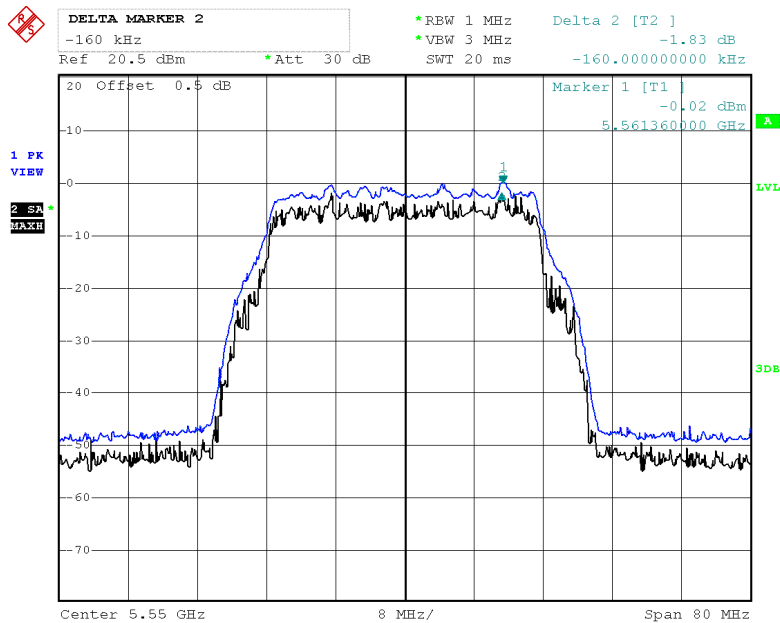
5470-5725MHz:

5510 MHz



Date: 1.JAN.2000 00:30:09

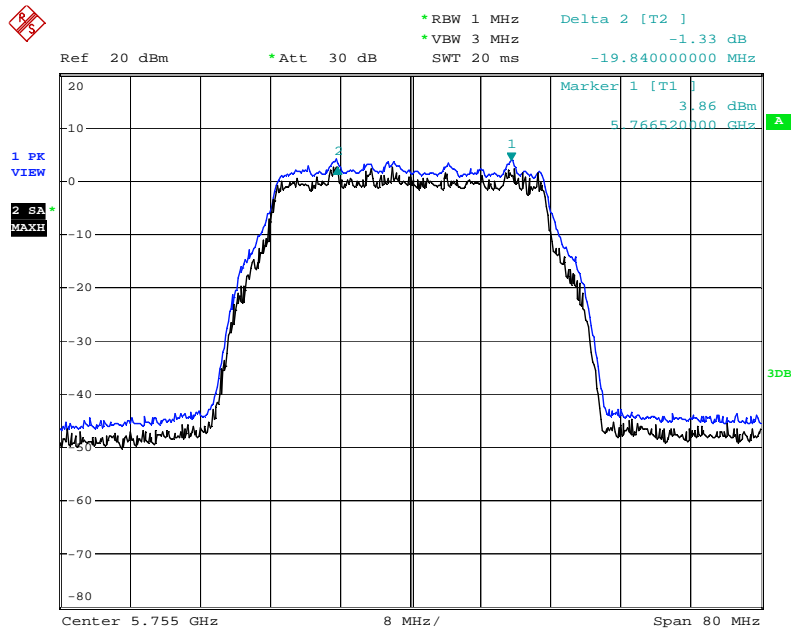
5550 MHz



Date: 1.JAN.2000 00:39:49

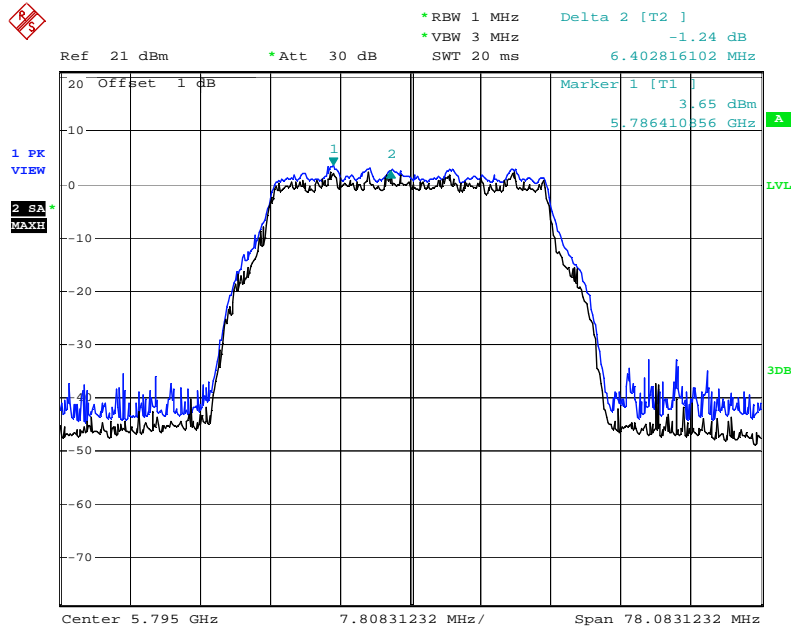
5725-5825MHz:

5755 MHz



Date: 11.SEP.2012 14:37:34

5795 MHz



Date: 11.SEP.2012 13:45:45

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