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SGS-CSTC Standards Technical Services（Shanghai） Co., Ltd.

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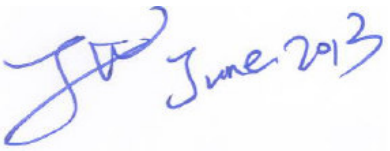
TEST REPORT

Application No. :	SHEM1303000415RF
Applicant:	Astro Gaming, Inc.
Equipment Under Test (EUT):	
NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
EUT Name:	5.8G USB Dongle
Brand Name:	ASTRO
Model No:	USB TX
FCC ID:	YQ6-AG20130004
IC ID:	9207A-AG2010004
Standards:	FCC PART 15 SUBPART C, Section 15.247:2012
	RSS-210 Issue 8 (December 2010)
	RSS-Gen Issue 3 (December 2010)
Date of Receipt:	March 20, 2013
Date of Test:	March 22, 2013 to March 23, 2013
Date of Issue:	June 03, 2013
Test Result:	**PASS ***

* In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.



Tony Wu

E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00	/	May 23, 2013	/	Original

Authorized for issue by:				
Engineer		Zenger Zhang **Print Name**		Zenger Zhang
Clerk		Susie Liu **Print Name**		Susie Liu
Reviewer		Keny Xu **Print Name**		Keny.xu

3 Test Summary

TEST ITEM	FCC REFERANCE	IC REFERANCE	Test Procedure	RESULT
Power line conducted emission	15.207	RSS-Gen Issue 8 Clause 7.2.4	ANSI C63.10,2009 Clause 6.2	Pass
Minimum 6dB Bandwidth	15.247(a)(2)	RSS-210 Issue 8 Annex 8	ANSI C63.10,2009 Clause 6.9	Pass
Maximum peak output power	15.247(b)	RSS-210 Issue 8 Annex 8	ANSI C63.10,2009 Clause 6.10.2	Pass
Power spectrum density	15.247(e)	RSS-210 Issue 8 Annex 8	ANSI C63.10,2009 Clause 6.11	Pass
RF Conducted Spurious Emissions	15.247(d)	RSS-210 Issue 8 Annex 8	ANSI C63.10 2009 Clause 6.9	Pass
Radiated Emission BandEdge	15.247(d)	RSS-210 Issue 8 Annex 8	ANSI C63.10,2009 Clause 6.9	Pass
Emission outside the Frequency band	15.247(d),15.205 & 15.209	RSS-210 Issue 8 Annex 8	ANSI C63.4,2003 Clause 6.12	Pass
Occupied bandwidth	---	RSS-Gen Issue 3 Clause 4.6.1	RSS-Gen Issue 3 Clause 4.6.1	Tested

4 Contents

5 General Information

5.1 Client Information

Applicant:	Astro Gaming, Inc.
Address of Applicant:	348 6th St. San Francisco, CA 94103
Manufacturer:	Shenzhen Grandsun Electronic Co., Ltd
Address of Manufacturer:	Pingdi Gaoqiao Industry Zone, Longgang District, Shenzhen, China
Factory:	Shenzhen Grandsun Electronic Co., Ltd

5.2 General Description of E.U.T.

Product Name:	5.8G USB Dongle	
Model No.(EUT):	USB TX	
Trade Mark:	ASTRO	
Power Supply	DC 5V (USB supply power)	
Frequency Band Channels :	5.8GHz Band Channel Description:	
	Channel of Tranmitter	Frequency(MHz)
	Low	5736
	Mid	5762
	High	5814
Modulation Type:	QPSK	
Antenna Type:	Integral antenna(Antenna Gain 3.0dBi)	

5.3 Details of Test Mode

Test mode	Detail description of the Test mode

5.4 Standards Applicable for Testing

The standard used were FCC PART 15 Subpart C: 2012, ANSI C63.10: 2009. RSS-210 Issue 8, RSS-Gen Issue 3.

5.5 Test Location

Tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

5.6 Other Information Requested by the Customer

None.

5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

  CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

  SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

  The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

6 Test Instruments

Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2013-02-23	2014-02-22
2	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2013-02-23	2014-02-22
3	Line impedance stabilization network	ETS	3816/2	00034161	2013-02-23	2014-02-22

Radiated Spurious Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2013-02-23	2014-02-22
2	Antenna	SCHWARZBECK	VULB9168	9168-313	2013-03-07	2014-03-06
3	CONTROLLER	INNCO	CO200	474	/	/
4	Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2013-03-07	2014-03-06
5	Antenna	SCHWARZBECK	BBHA9170	9170-373	2013-03-07	2014-03-06
6	Low nosie amplifier	LNA6900	TESEQ	71033	2013-02-23	2014-02-22
7	Active Loop Antenna	Beijing Daze	ZN30900A	0097	2012-10-28	2013-10-27
8	Horn Antenna	Rohde & Schwarz	HF906	100284	2013-03-12	2014-03-10
9	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-06-03	2013-06-02

☒ **RF Conducted Test**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-03	2013-06-01
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-06-03	2013-06-01
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2012-06-03	2013-06-01
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-06-03	2013-06-01
5	Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170373	2012-11-15	2013-11-14
6	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-10-09	2013-10-08
7	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2009P	--	2012-10-09	2013-10-08
8	CLAMP METER	FLUKE	316	86080010	2012-06-03	2013-06-01
9	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-10-09	2013-10-08
10	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2012-06-03	2013-06-01
11	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT1800.0/ 2000.0-0.2/40-5SSK	11	2012-06-03	2013-06-01
12	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/ 880.0-0.2/40-5SSK	9	2012-06-03	2013-06-01
13	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2012-06-03	2013-06-01
14	Low nosie amplifier	TESEQ	LNA6900	70133	2012-06-03	2013-06-01
15	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-06-03	2013-06-01

16	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2012-06-03	2013-06-01

General Equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Digital pressure meter	YONGZHI	DYM3-01	101012	2012-01-16	2014-01-15
2	Digital Multimeter	FLUKE	17B	10560713	2013-01-07	2014-01-06
3	Temperature& humidity recorder	ShangHai weather meter work	ZJ 1-2B	0804081 0802150 0805177	2012-08-27	2013-08-26

7 Test Procedure & Measurement Data

7.1 E.U.T. Operation

Input voltage: 120VAC(EUT's Power Supply is from PC USB port.)

Operating Environment:

Temperature: 20.0 -25.0 °C

Humidity: 35-75 % RH

Atmospheric Pressure: 992 -1020 mbar

EUT Operation: The EUT has been tested under operating condition.

Test program was used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

7.2 Conducted Emission Test

Test Requirement: FCC Part15C 15.207

Test date: March 23, 2013

Standard Applicable According to section 15.207,frequency 150KHz to 30MHz shall not not exceed the limit table as blew.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

*

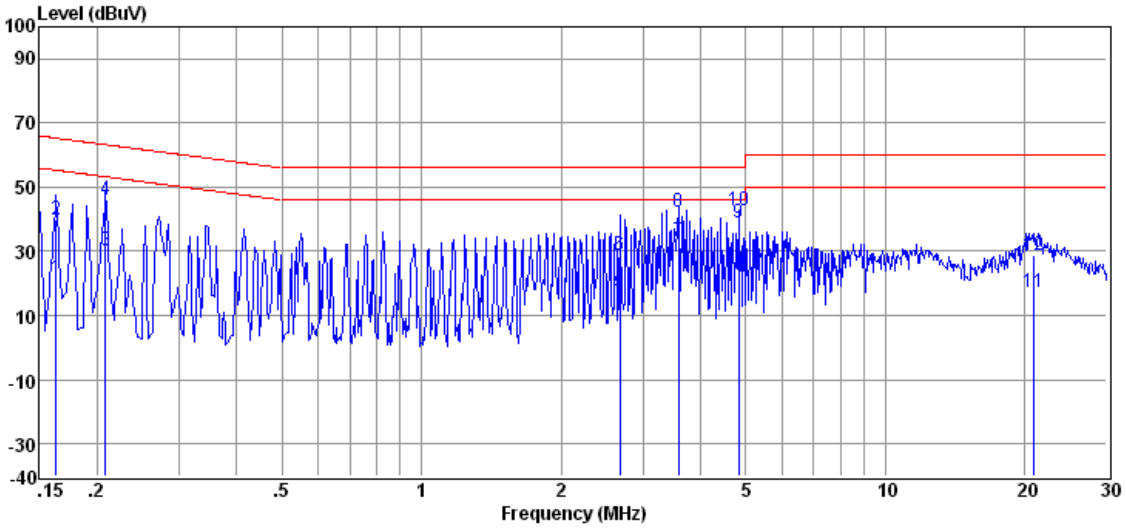
EUT Setup 1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.10-2009.

2.EUT is charged with PC.The AC Power adaptor of PC was plug-in LISN.The rear of the EUT and periphearals were placed flushed with the rear of the tabletop.

3.The LISN was connected with 120V AC/60Hz power source.

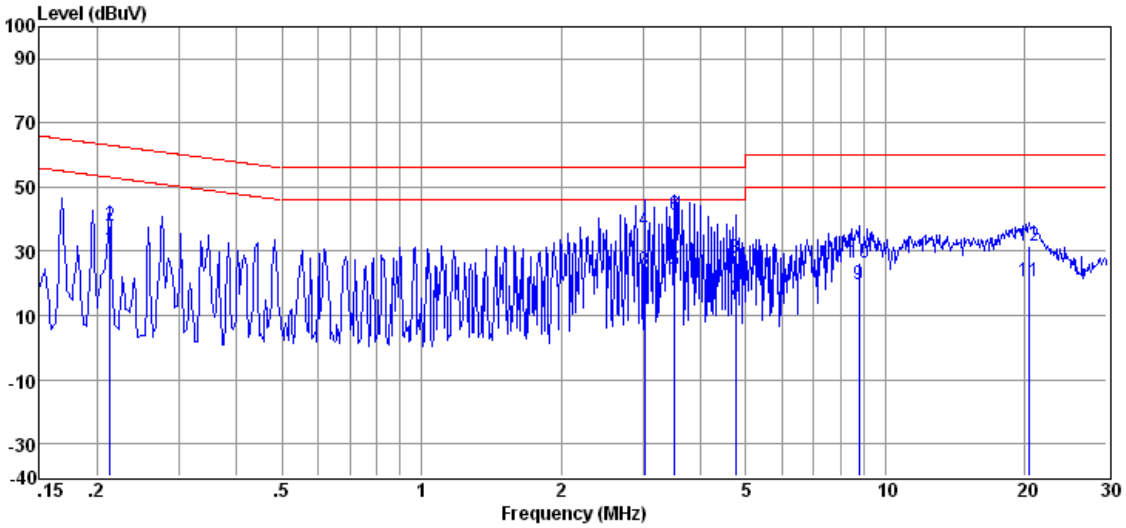
Measurement Result Operation mode: transmitting mode

L line:



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)	
1	0.163	21.14	0.17	0.10	21.41	55.30	-33.89	Average
2	0.163	39.77	0.17	0.10	40.04	65.30	-25.26	QP
3	0.208	29.89	0.10	0.10	30.09	53.27	-23.18	Average
4	0.208	45.97	0.10	0.10	46.17	63.27	-17.10	QP
5	2.678	16.66	0.30	0.12	17.08	46.00	-28.92	Average
6	2.678	28.47	0.30	0.12	28.89	56.00	-27.11	QP
7	3.584	32.57	0.30	0.15	33.02	46.00	-12.98	Average
8	3.584	41.61	0.30	0.15	42.06	56.00	-13.94	QP
9	4.822	38.53	0.30	0.19	39.02	46.00	-6.98	Average
10	4.822	42.08	0.30	0.19	42.57	56.00	-13.43	QP
11	20.924	16.46	0.64	0.20	17.30	50.00	-32.70	Average
12	20.924	27.76	0.64	0.20	28.60	60.00	-31.40	QP

N Line:



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)	
1	0.213	30.50	0.10	0.10	30.70	53.10	-22.40	Average
2	0.213	37.56	0.10	0.10	37.76	63.10	-25.34	QP
3	3.025	23.54	0.25	0.13	23.92	46.00	-22.08	Average
4	3.025	36.29	0.25	0.13	36.67	56.00	-19.33	QP
5	3.509	23.55	0.24	0.15	23.94	46.00	-22.06	Average
6	3.509	40.90	0.24	0.15	41.29	56.00	-14.71	QP
7	4.746	14.27	0.21	0.19	14.67	46.00	-31.33	Average
8	4.746	27.57	0.21	0.19	27.97	56.00	-28.03	QP
9	8.776	19.06	0.42	0.14	19.62	50.00	-30.38	Average
10	8.776	26.00	0.42	0.14	26.56	60.00	-33.44	QP
11	20.377	19.81	0.61	0.20	20.62	50.00	-29.38	Average
12	20.377	31.07	0.61	0.20	31.88	60.00	-28.12	QP

7.3 6dB Bandwidth

Test Requirement: FCC Part15 247(a)(2)

Test date: March 23, 2013

Standard Applicable: According to section 15.247(a)(2),Systems using digital modulationg techniques may operate in the 902-928MHz,2400-2483.5MHz,and 5725-5850MHz bands.The minimum 6dB bandwidth shall be at least 500KHz.

Measurement Procedure:
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW =3* RBW, Span=30/ 50MHz, Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

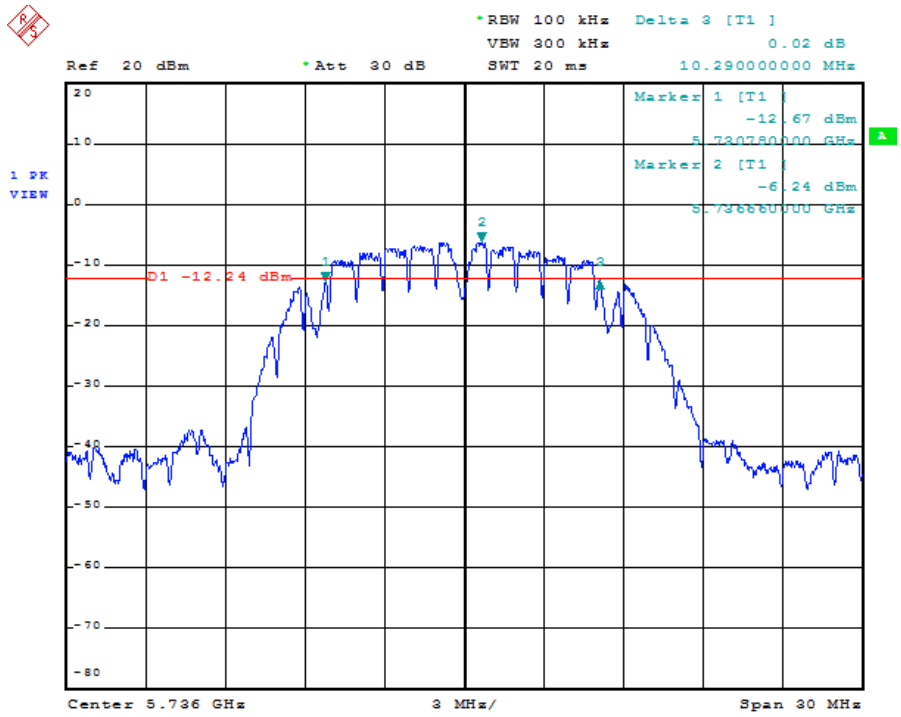
Measurement Result:

Test mode: Transmitting mode

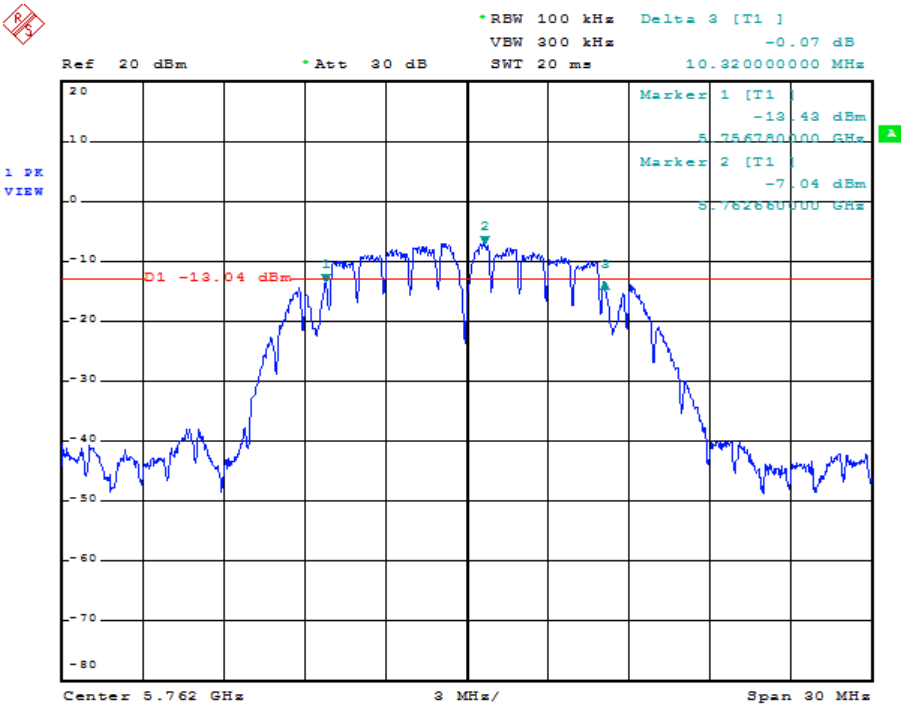
CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	5736	10.29	500	PASS
Mid	5762	10.32	500	PASS
High	5814	10.26	500	PASS

Test Plots:

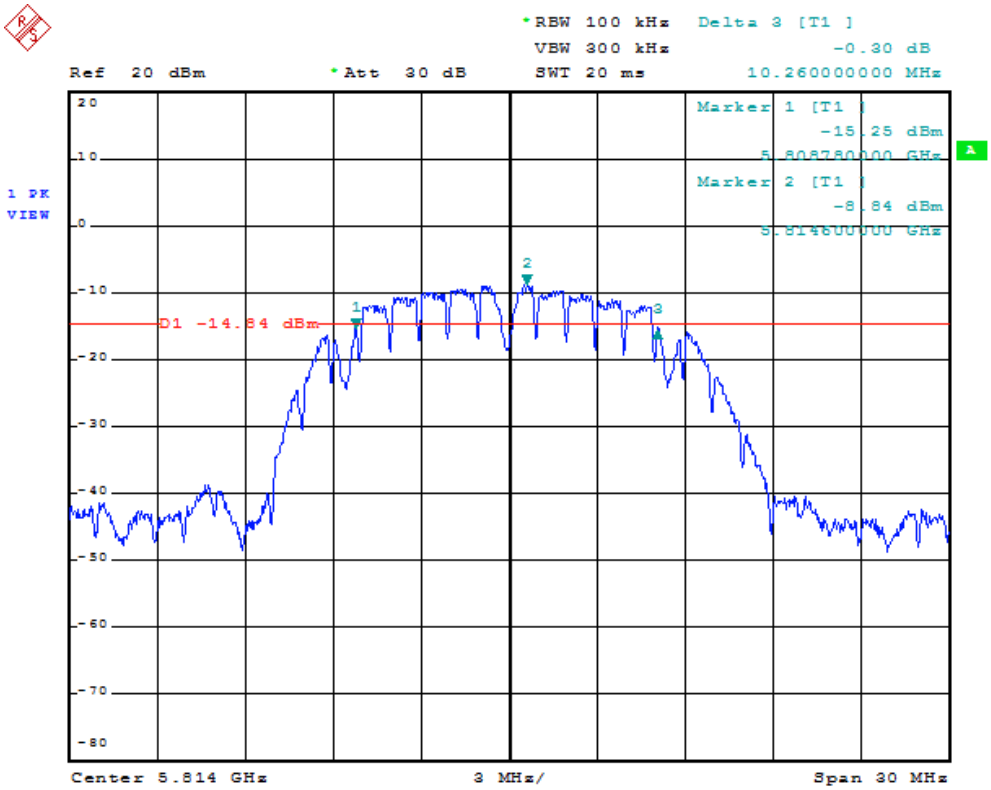
Test mode: Transmitting mode Low Channel



Test mode: Transmitting mode Middle Channel



Test mode: Transmitting mode High Channel



7.4 Peak Output Power Measurement

Test Requirement: FCC Part 15 15.247(a)(2),(b)

Test date March 23, 2013

Standard Applicable: According to section 15.247(a)(2),(b)
(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Measuremet Produre

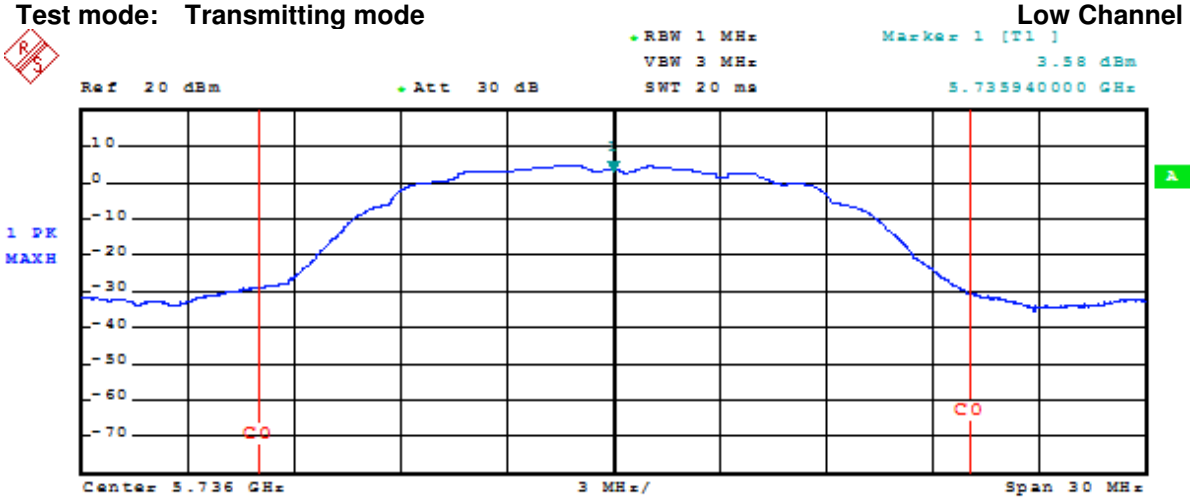
a) Measure the EUT 6dB bandwith of the emission. reference section 5.3.3 6dB bandwidth results.
b) When the analyzer RBW is not large enough, the analyzer band power function can be used,
c) Set the RBW=1MHz(the anlalyzer maximum available), VBW=3MHz, band limits granter than 26dB bandwidth.
d) Turn averaging off, set sweep to automatic, the span just large enough to capture the emission.
e) Use peak detector on max hold.
Record the measured channel power.

Measurement Result:

Test mode: Transmitting mode

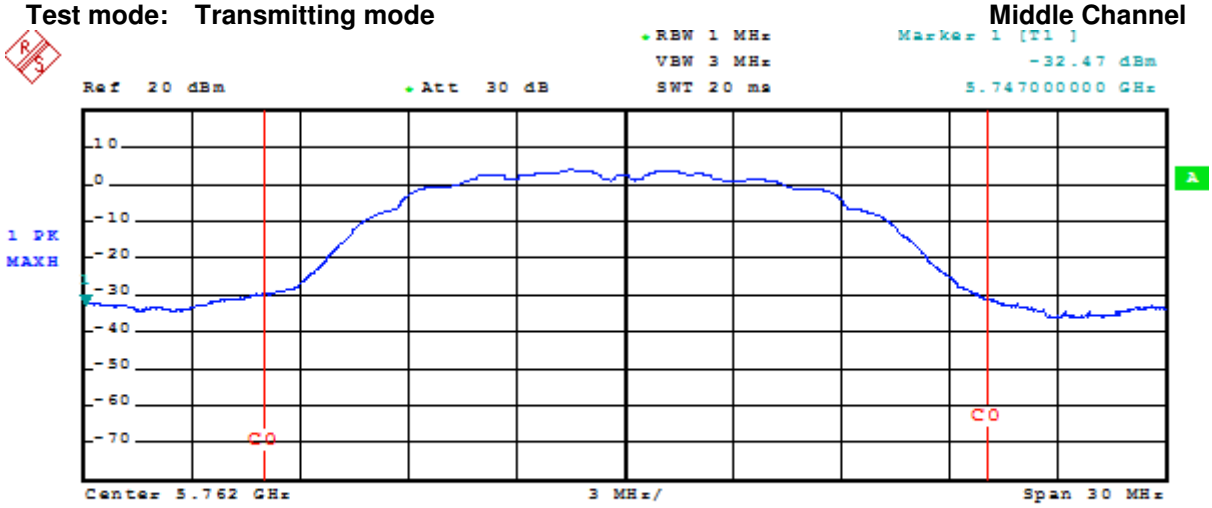
CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Peak Power Limit (dBm)	Result
Low	5736	12.86	1.9	14.76	30	PASS
Mid	5762	11.96	1.9	13.86	30	PASS
High	5814	10.75	1.9	12.65	30	PASS

Test mode: Transmitting mode **Low Channel**



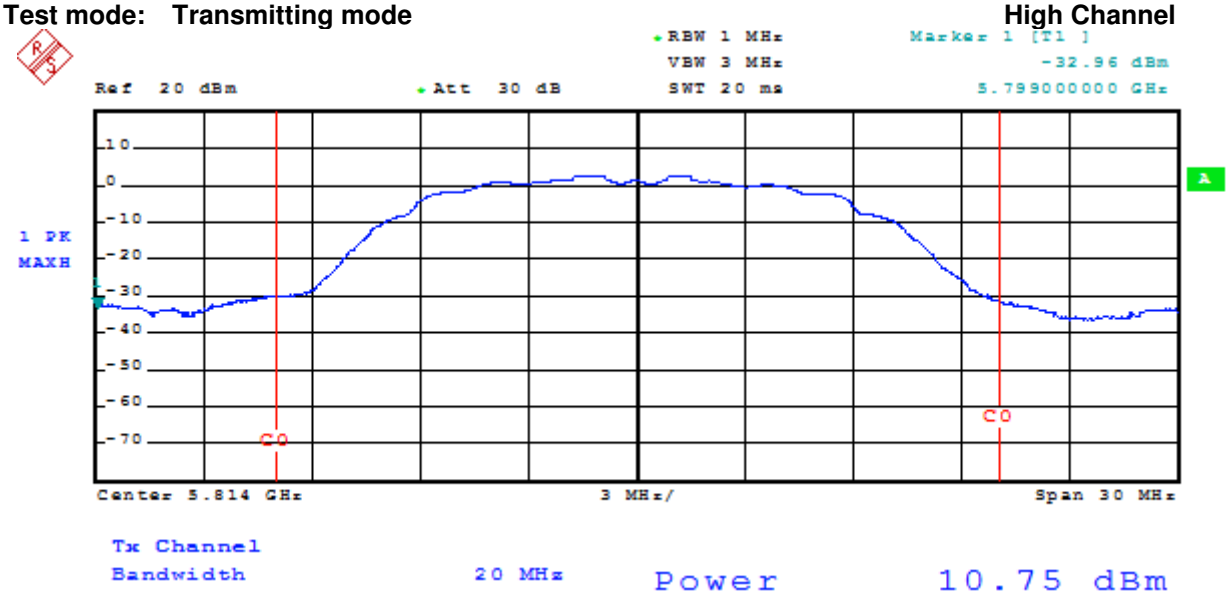
Tx Channel
Bandwidth 20 MHz Power 12.86 dBm

Test mode: Transmitting mode **Middle Channel**



Tx Channel
Bandwidth 20 MHz Power 11.96 dBm

Test mode: Transmitting mode **High Channel**



7.5 Peak Power Spectral Density

Test Requirement: FCC Part15 247(e)

Test date: March 23, 2013

Standard Applicable: According to section 15.247(e),For digitally modulated systems,the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dB in any 3KHz band during any time in terval of continuous transmission.This power spectral density shall be determined in accordance with the provisions of paragraph(b) of this section.The same method of determining the conducted output power shall be used to determine the powr spectral density.

Measurement Procedure: The EUT was tested according toANSI C63.10 to FCC 47CFR 15.247 requiremnts.
Set RBW=3KHz,Set VBW=10KHz,Span=3MHz,Sweep time=100s,Set detector=Peak detector.

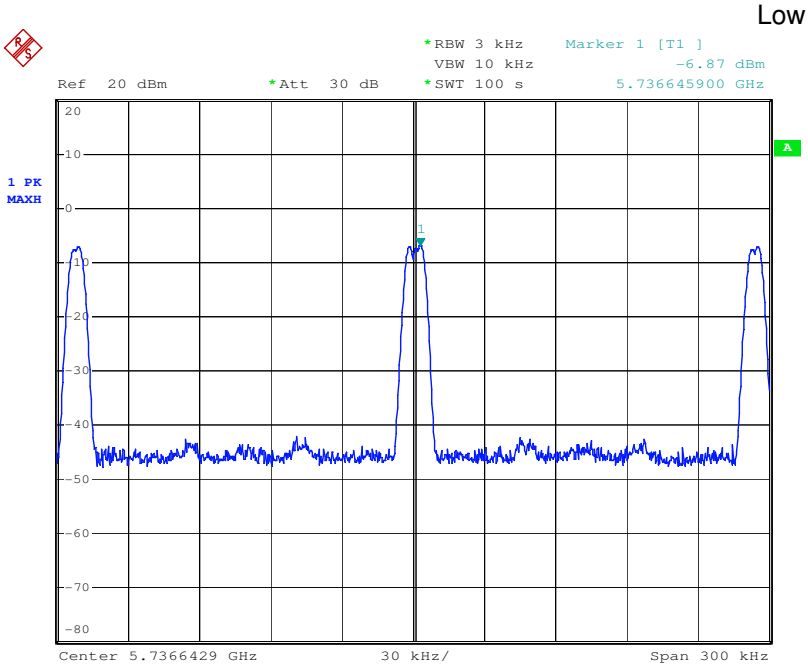
Measurement Result:

Test Mode Transmitting mode

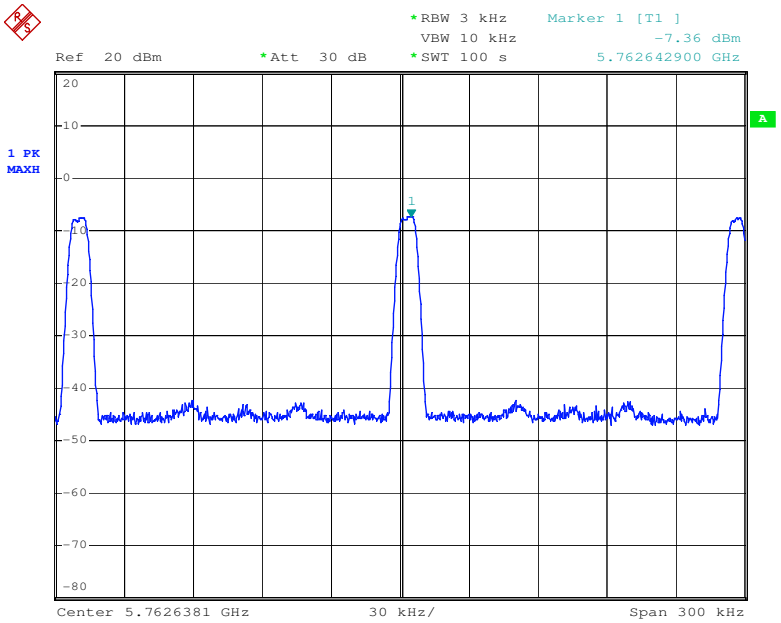
CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	5736	-6.87	1.9	-4.97	8	PASS
MID	5762	-7.36	1.9	-5.46	8	PASS
HIGH	5814	-9.30	1.9	-7.40	8	PASS

Power Spectral Density Test Plot

Transmitting mode Low Channel

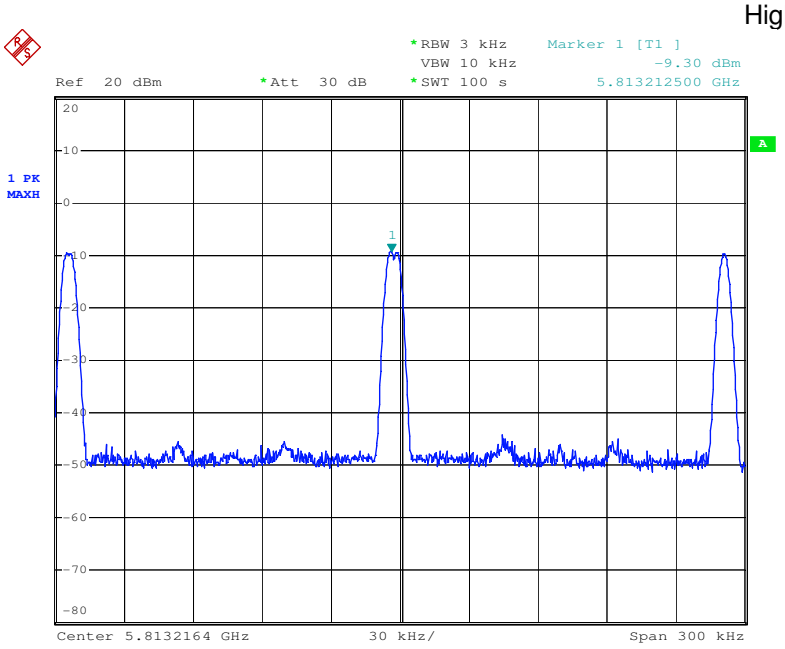


Transmitting mode Middle Channel



Transmitting mode

High Channel



7.6 Conducted Spurious Emission Test

Test Requirement: FCC Part15 247(c)
RSS-210 Issue 8 Annex 8

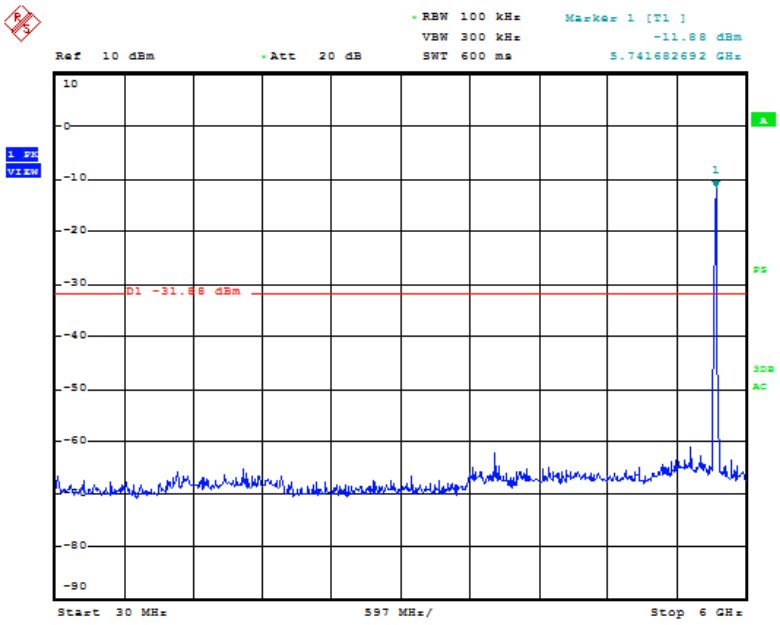
Standard Applicable: According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,In addition,radiated emissions which fall in the restricted bands,as defined in section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).

Measurement Procedure:
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW=100KHz VBW=300KHz, Sweep = auto
6. Repeat above procedures until all frequency measured were complete.

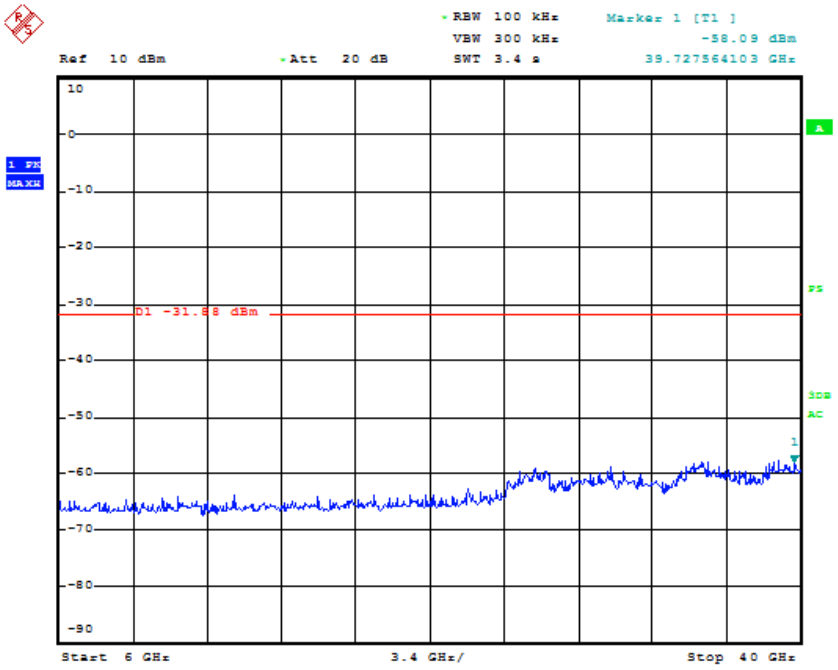
Measurement Result:

Test mode:	5.8GHz Band	Test channel:	Low

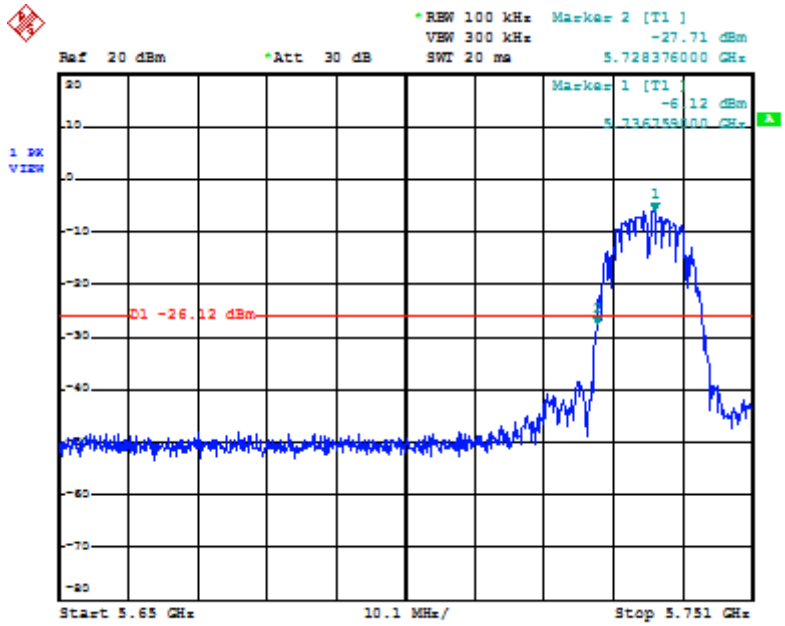
30MHz-6GHz



6GHz-40GHz

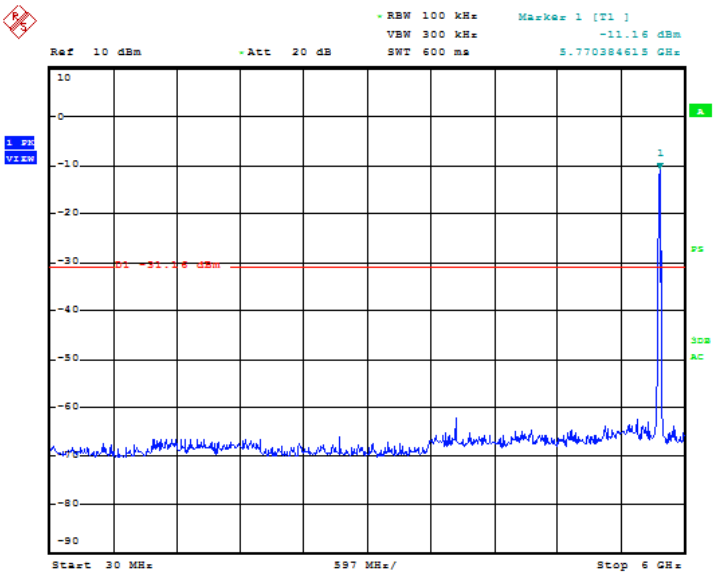


Band Edge

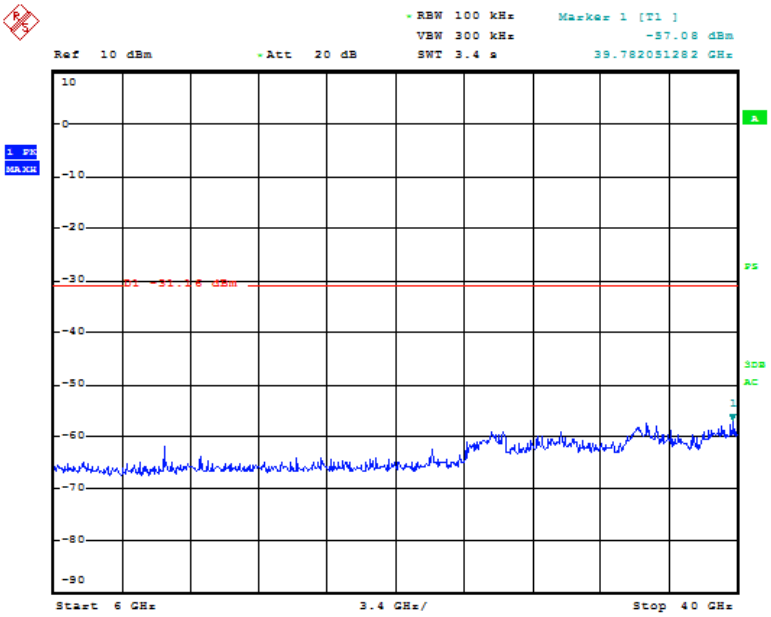


Test mode:	5.8GHz Band	Test channel:	Middle

30MHz-6GHz

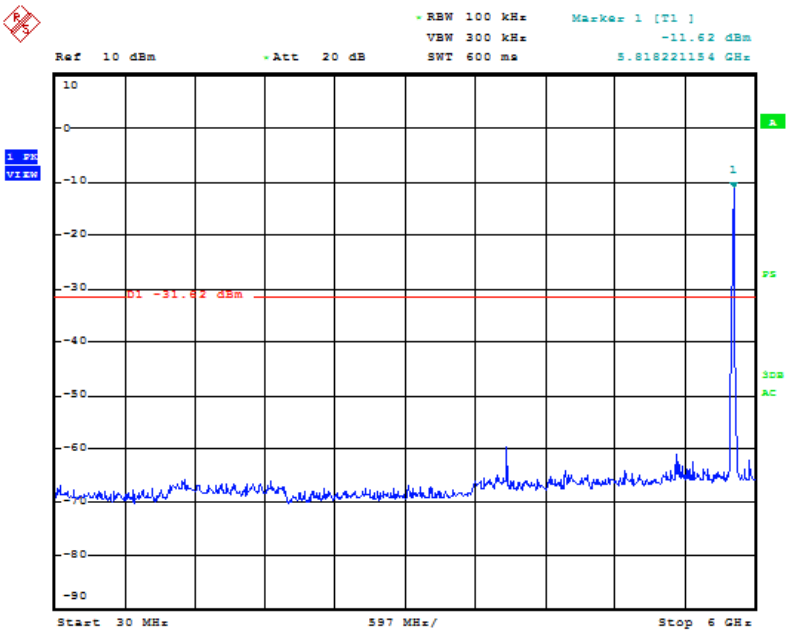


6GHz-40GHz

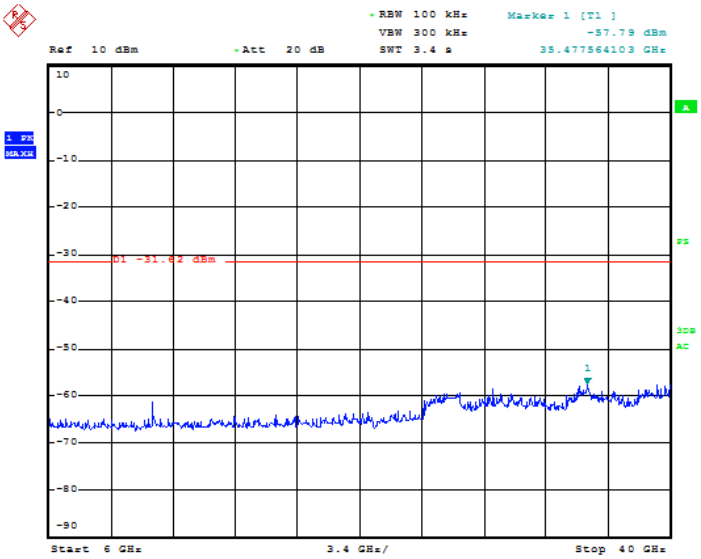


Test mode:	5.8GHz Band	Test channel:	High

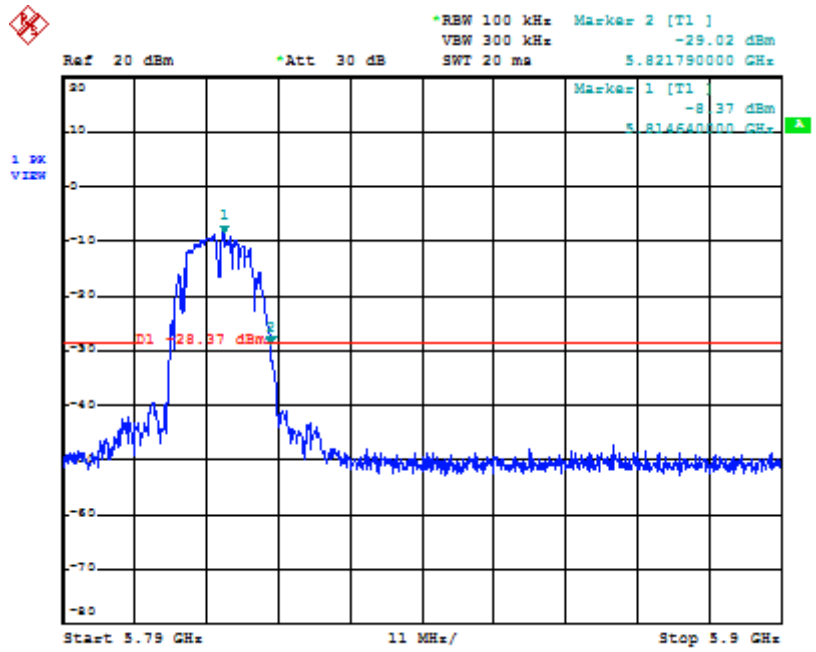
30MHz-6GHz



6GHz-40GHz



Band Edge



7.7 Radiated Spurious Emission

Test Requirement: FCC Part15 247(c)

Test date: March 23, 2013

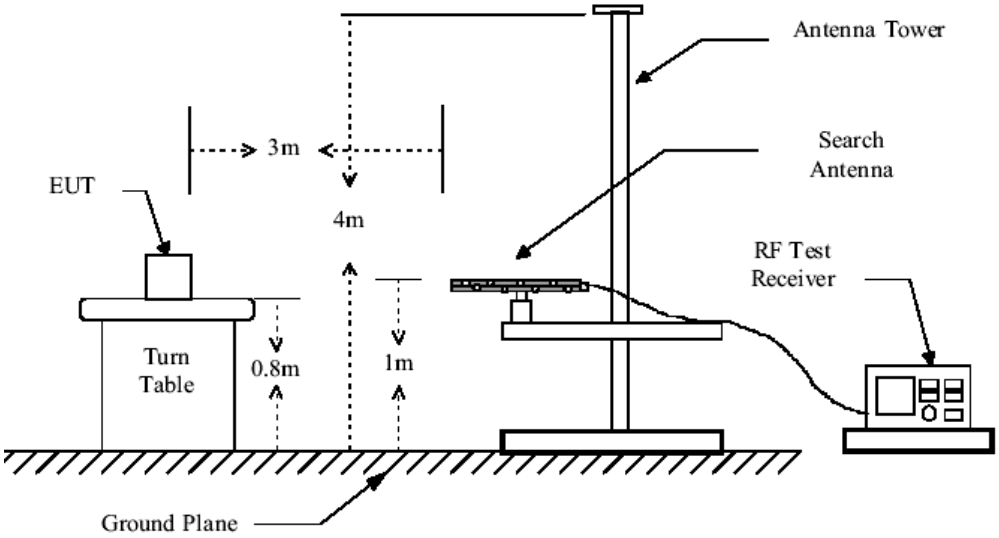
Standard Applicable: According to section 15.247(c),all other emissions outside these bands shall not exceed the general radiated emission limits specified in section15.209(a).And according to section 15.33(a)(1),for an intentional radiator operates below 10GHz,the frequency range of measurements:to the tenth harmonic of the highest fundamental frequency or to 40GHz,which is lower.

Measurement Procedure:

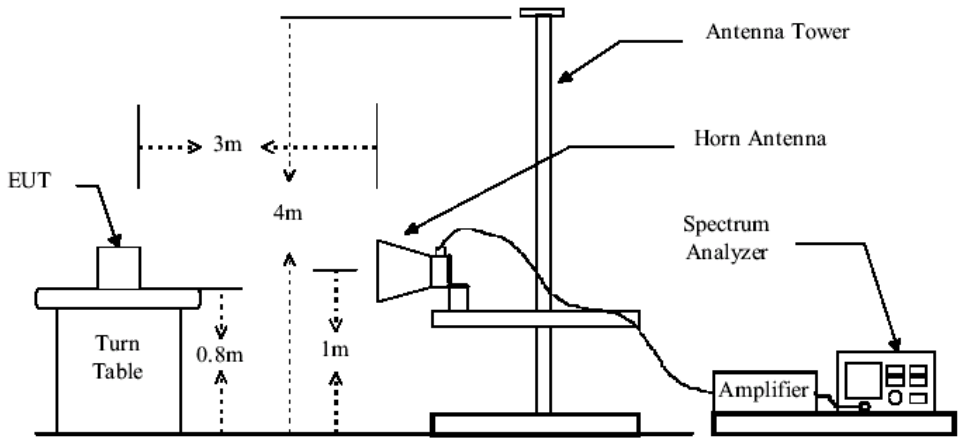
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz – 25GHz)
Above 1GHz
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

Radiated Test Set-up:

Radiated Emission Test Set-up,Frequency Below 1000MHz

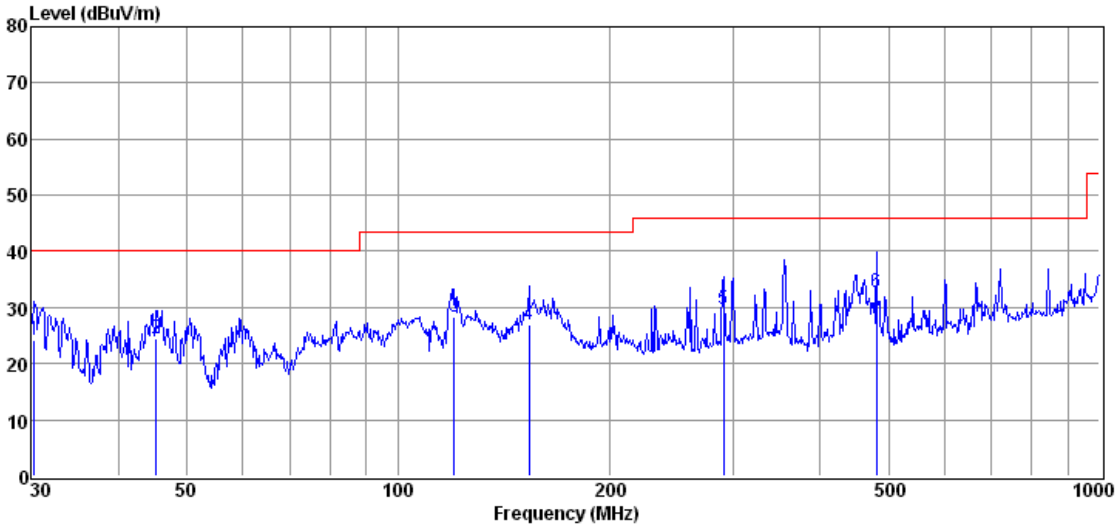


Radiated Emission Test Set-up Frequency Over 1GHz



Low nosie amplifier was used below 1GHz,High pass Filter was used above 1GHz.
30MHz~1GHz Spurious Emissions Measurement

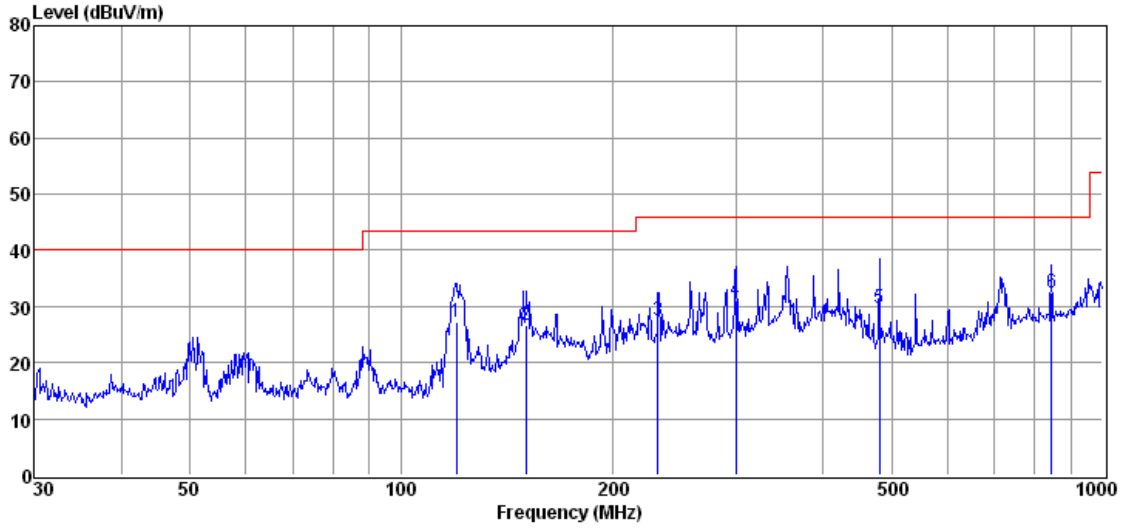
Vertical:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1	30.32	36.23	12.12	24.70	0.42	24.07	40.00	-15.93	QP
2	45.22	35.54	13.09	24.70	0.60	24.53	40.00	-15.47	QP
3	120.28	41.57	10.21	24.70	1.14	28.22	43.50	-15.28	QP
4	153.74	37.59	12.66	24.70	1.29	26.84	43.50	-16.66	QP
5	291.04	40.03	12.15	24.50	1.91	29.59	46.00	-16.41	QP

6	480.53	38.26	16.34	24.38	2.55	32.77	46.00	-13.23	QP

Horizontal:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	119.86	39.61	11.18	24.70	1.14	27.23	43.50	-16.27	QP
2	150.54	37.44	12.69	24.70	1.27	26.70	43.50	-16.80	QP
3	232.53	40.85	9.58	24.57	1.65	27.51	46.00	-18.49	QP
4	300.37	41.16	12.41	24.50	1.95	31.02	46.00	-14.98	QP
5	480.53	35.05	16.34	24.38	2.55	29.56	46.00	-16.44	QP
6	845.09	30.17	22.56	23.90	3.55	32.38	46.00	-13.62	QP

Above 1GHz Spurious Emissions . Peak & Average Measurement Low Channel

Frequency (MHz)	factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Detector	Limit (dBμV/m)	Margin (dB)	Antenna polarization
1989.00	-7.24	53.06	45.82	Peak	54	8.18	Vertical
7341.00	6.93	41.23	48.16	Peak	54	5.84	Vertical
11472.00	9.22	42.43	51.65	Peak	54	2.35	Vertical
15297.00	10.26	47.21	57.47	Peak	74	16.53	Vertical
15303.70	10.27	34.98	45.25	AVG	54	8.75	Vertical
2045.00	-7.04	46.70	39.66	Peak	54	14.34	Horizontal
4927.00	0.32	44.10	44.42	Peak	54	9.58	Horizontal
11472.00	9.22	45.82	55.04	Peak	74	18.96	Horizontal
11472.22	9.22	42.50	51.72	AVG	54	2.28	Horizontal
15348.00	10.34	46.46	56.80	Peak	74	17.20	Horizontal
15349.56	10.34	34.37	44.71	AVG	54	9.29	Horizontal

Above 1GHz Spurious Emissions . Peak & Average Measurement Middle Channel

Frequency (MHz)	factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Detector	Limit (dBμV/m)	Margin (dB)	Antenna polarization
1969.00	-7.38	55.1	47.72	Peak	54	6.28	Vertical
3873.00	-2.64	47.28	44.64	Peak	54	9.36	Vertical
11523.00	9.16	43.35	52.51	Peak	54	1.49	Vertical
15212.00	10.12	45.88	56.00	Peak	74	18.00	Vertical
15212.88	10.12	34.54	44.66	AVG	54	9.34	Vertical
1782.00	-8.86	48.17	39.31	Peak	54	14.69	Horizontal
11523.00	9.16	46.07	55.23	Peak	74	18.77	Horizontal
11524.12	9.15	42.82	51.97	AVG	54	2.03	Horizontal
15246.00	10.18	46.97	57.15	Peak	74	16.85	Horizontal
15253.12	10.18	34.87	45.05	AVG	54	8.95	Horizontal

Above 1GHz Spurious Emissions . Peak & Average Measurement High Channel

Frequency (MHz)	factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Detector	Limit (dBμV/m)	Margin (dB)	Antenna polarization
2122.00	-6.95	50.14	43.19	Peak	54	10.81	Vertical
3873.00	-2.64	45.13	42.49	Peak	54	11.51	Vertical
11625.00	9.09	42.12	51.21	Peak	54	2.79	Vertical
15343.50	10.34	34.97	45.31	AVG	54	8.69	Vertical
15348.00	10.34	45.78	56.12	Peak	74	17.88	Vertical
2003.00	-7.13	50.01	42.88	Peak	54	11.12	Horizontal
3873.00	-2.64	44.38	41.74	Peak	54	12.26	Horizontal
11625.00	9.09	46.29	55.38	Peak	74	18.62	Horizontal
11627.96	9.09	42.85	51.94	AVG	54	2.06	Horizontal
15356.68	10.35	34.88	45.23	AVG	54	8.77	Horizontal
15365.00	10.37	46.02	56.39	Peak	74	17.61	Horizontal

7.8 Radiated Emission Band Edge

Test Requirement: FCC Part15 247(c)

Test date: March 23, 2013

Standard Applicable: According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,In addition,radiated emissions which fall in the restricted bands,as defined in section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).

Measurement Distance: 3m (Semi-Anechoic Chamber)

Limit: 40.0 dBμV/m between 30MHz & 88MHz;

43.5 dBμV/m between 88MHz & 216MHz;

46.0 dBμV/m between 216MHz & 960MHz;

AV 54.0 dBμV/m PK 74.0dBμV/m above 960MHz.

Measurement Procedure: The EUT was setup according to ANSI 63.10,2009 for compliance to FCC 47 CFR 15.247 requirements.The EUT is placed on a turn table which is 0.8 m above ground.The turn table is rotated 360 degrees to determine to the position of the maximum emission level.The EUT was positioned such that the distance from antenna to the EUT was 3 menters.The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level

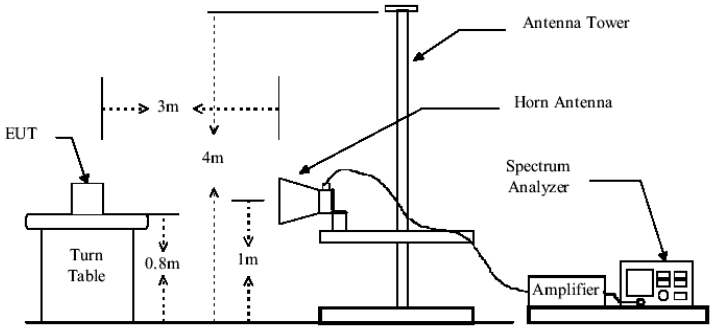
This is repeated for both horizontal and vertical polarization of the antenna.In order to find the maximum emission,all of the interface cables were manipulated according to ANSIC 63.10:2009 on radiated measurement.

Spectrum analyzer parameters setting as shown below:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

Radiated Emission Test Set-up Frequency Over 1GHz



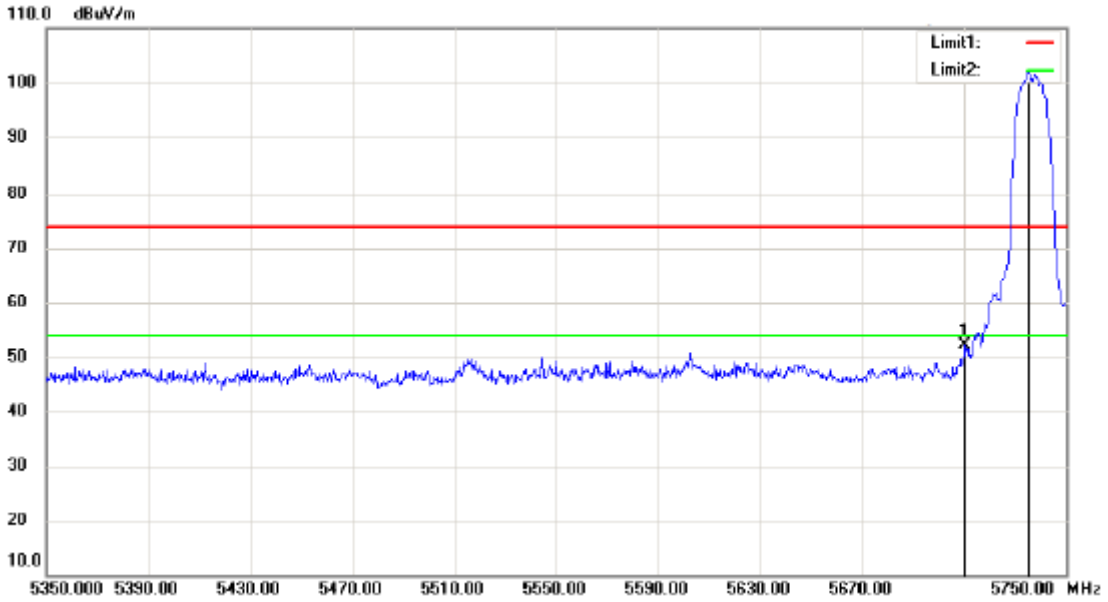
The field strength is calculated by adding the Antenna Factor,Preamplifier Factor&Cable Factor. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

Radiated Bandedge Measurement Result:

CH Low 5736MHz Radiated Bandedge

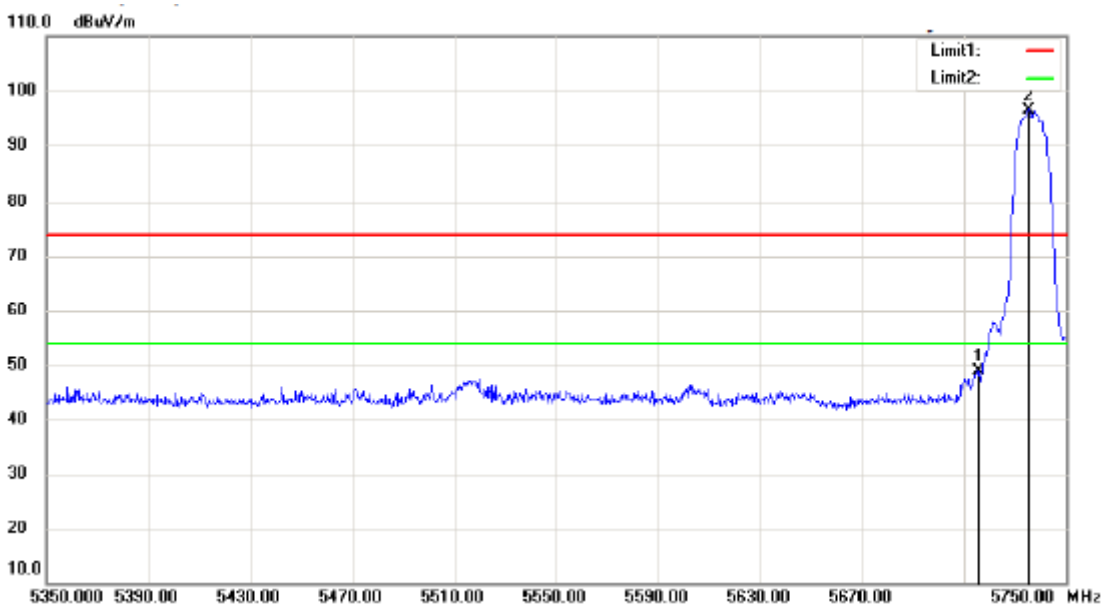
Horizontal, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5710.400	50.54	peak	1.50	52.04	74.00	-21.96
2	5735.200	100.27	peak	1.56	101.83	74.00	27.83

CH Low 5736MHz Radiated Bandedge

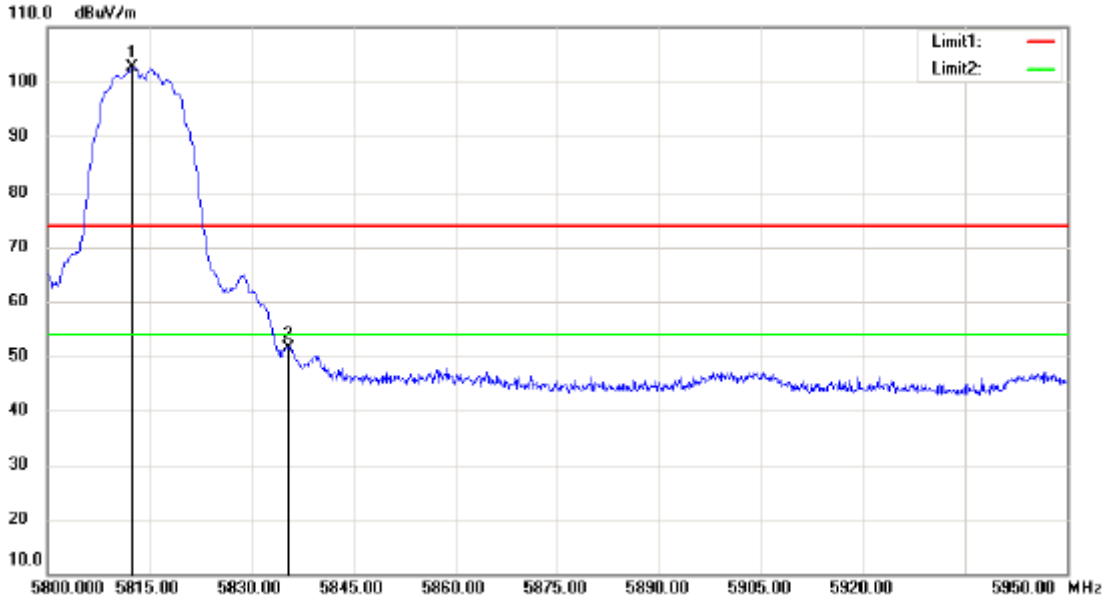
Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5715.600	47.24	peak	1.52	48.76	74.00	-25.24
2	5735.200	94.94	peak	1.56	96.50	74.00	22.50

CH High 5814MHz Radiated Bandedge

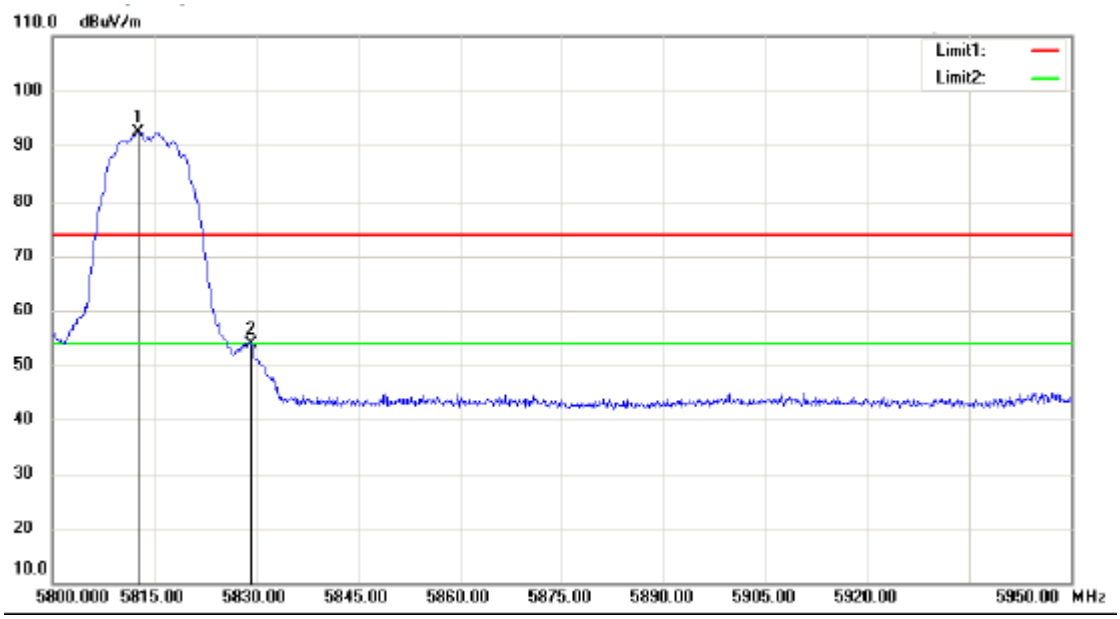
Horizontal, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5812.450	100.87	peak	1.72	102.59	74.00	28.59
2	5835.550	49.58	peak	1.78	51.36	74.00	-22.64

CH High 5814MHz Radiated Bandedge

Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	5812.750	90.66	peak	1.73	92.39	74.00	18.39
2	5829.250	52.03	peak	1.76	53.79	74.00	-20.21

Remark: When the peak measurement level is less than the average limit 54dBμV/m, the average measurement need not to be performented.

7.9 Occupied Bandwidth Test

Test Requirement: RSS-Gen Issue 3 Clause 4.6.1

Test date: March 23, 2013

Standard Applicable According to the section RSS-Gen Issue 3 Clause 4.6.1

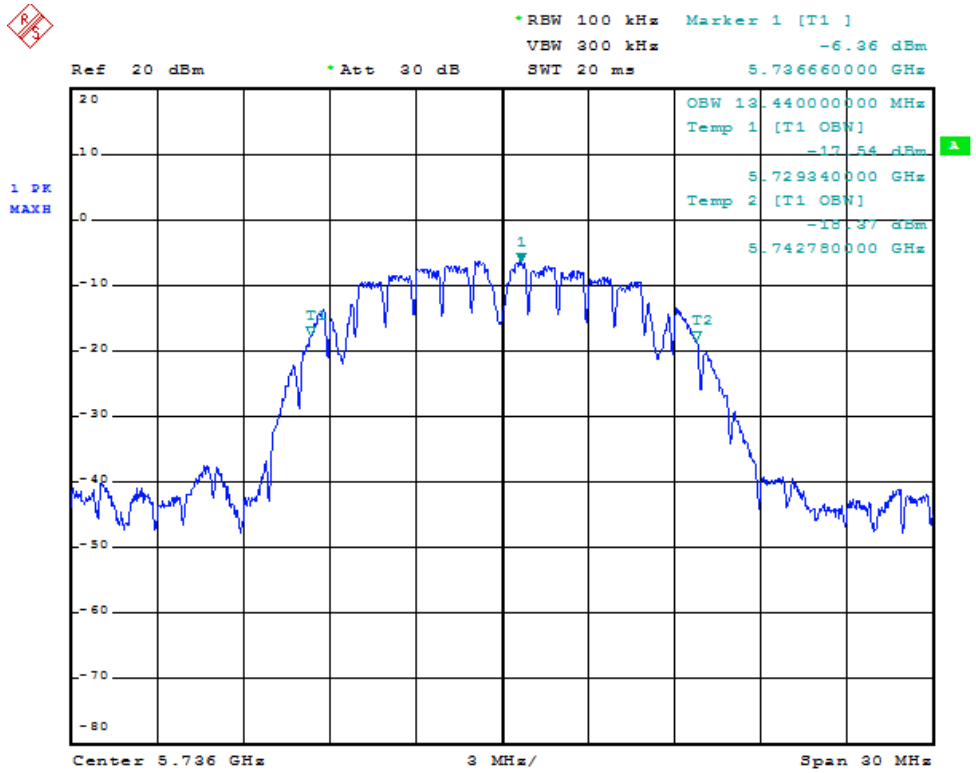
EUT Setup The occupied bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions set at 100kHz,the video bandwidth set at 300kHz.

Measurement Result:

Transmitting mode

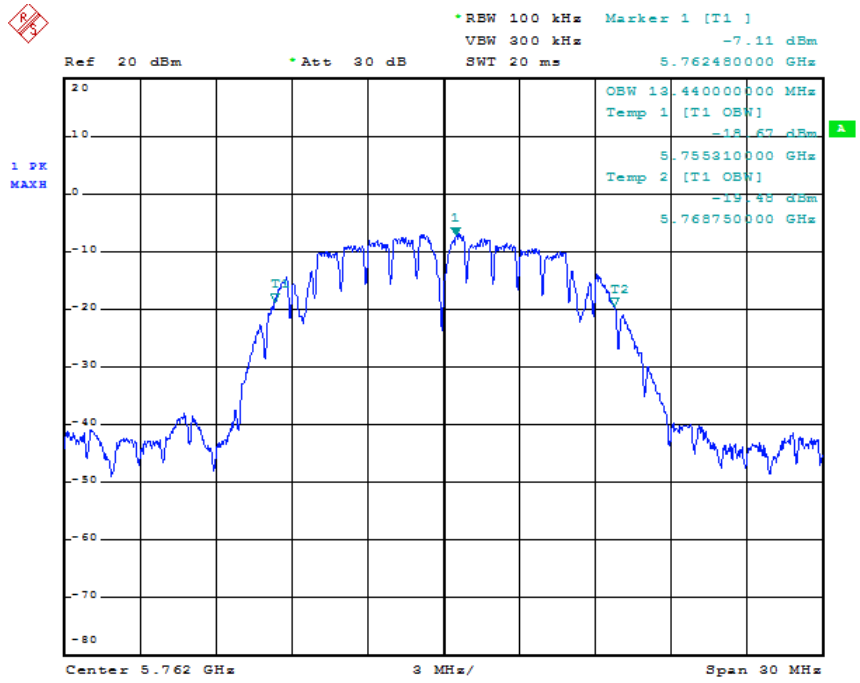
Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	5736	13.44
MID	5762	13.44
HIGH	5814	13.47

Transmitting mode Low Channel



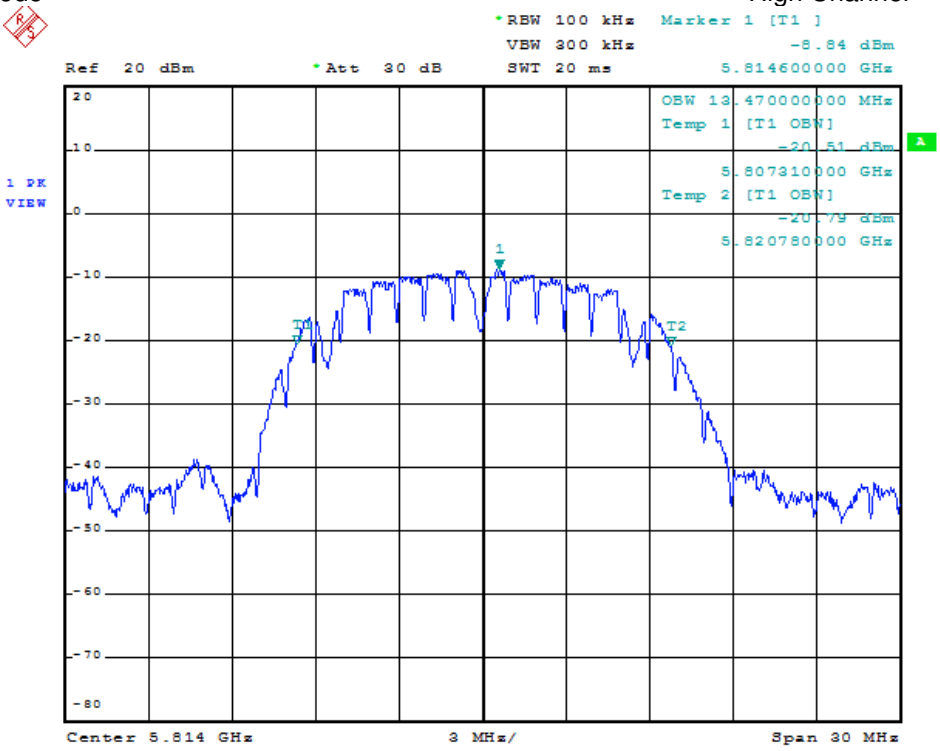
Transmitting mode

Middle Channel



Transmitting mode

High Channel



8 Test Setup Photographs

Refer to the < USB TX_Test Setup photos>.

9 EUT Constructional Details

Refer to the < USB TX _External Photos > & < USB TX _Internal Photos >.

End of Report