



**Neutron Engineering Inc.**

# FCC Radio Test Report

**FCC ID: 2AB3G-SNPRFM001**

This report concerns (check one): ☒ Original Grant ☐ Class II Change

**Issued Date** : Mar. 05, 2014  
**Project No.** : 1402C179  
**Equipment** : RF wireless Module  
**Model Name** : NA  
**Applicant** : SNAP NETWORKS PRIVATE LIMITED  
**Address** : #294/22, 7th Cross, Jayanagar 1st Block,  
Bangalore, INDIA - 560011

**Tested by:** Neutron Engineering Inc. EMC Laboratory

**Date of Receipt:** Feb. 28, 2014

**Date of Test:** Feb. 28, 2014 ~ Mar. 04, 2014

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### **Declaration**

**Neutron** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of **CHINA**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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### **Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.



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**REPORT ISSUED HISTORY**

Issued No.	Description	Issued Date
NEI-FCCP-1-1402C179	Original Issue.	Mar. 05, 2014



## **1. CERTIFICATION**

Equipment : RF wireless Module  
Brand Name : VIOLET3D  
Model Name : NA  
Applicant : SNAP NETWORKS PRIVATE LIMITED  
Manufacture : MICROCHIP  
Address : 2, International Business Park, The Strategy, Tower 2, #03-27, Singapore – 609930  
Factory : Namuga (Suzhou) Technologies Co. Ltd  
Address : 445 Su Hong Middle Road, Suzhou Industrial Park, Jiangsu, China  
Date of Test : Feb. 28, 2014 ~ Mar. 04, 2014  
Test Item : ENGINEERING SAMPLE  
Standard(s) : FCC Part15(2012), Subpart C(15.247) / ANSI C63.4-2009

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1402C179) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).



## 2. SUMMARY OF TEST RESULTS

Applied Standard(s): FCC Part15 (15.247) , Subpart C			
Standard(s) Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247(d)	Antenna conducted Spurious Emission	PASS	
15.247(a)(2)	6dB Bandwidth	PASS	
15.247(b)(3)	Peak Output Power	PASS	
15.247(e)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	
15.209/15.205	Transmitter Radiated Emissions	PASS	
-	Receiver Radiated Emissions	PASS	

**NOTE:**

(1) "N/A" denotes test is not applicable in this test report.

(2) The test follows FCC KDB Publication No. 558074 D01 DTS Meas Guidance v03r01  
(Measurement Guidelines of DTS)



## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-CB03/DG-C02** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.523792  
Neutron's test firm number for FCC: 319330

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

### A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

### B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
DG-CB03	CISPR	9KHz~30MHz	V	3.79	
		9KHz~30MHz	H	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	





### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	RF wireless Module	
Brand Name	VIOLET3D	
Model Name	NA	
Product Description	Operation Frequency	5736~5814 MHz
	Modulation Type	QPSK
	Bit Rate of Transmitter	100Kbps
	Number of Channel	3 CH, Please see note 2.
	Antenna Designation	Please see note 3.
	Antenna Gain(Peak)	
	Output Power	16.60 dBm
	More details of EUT technical specification, please refer to the User's Manual.	
Power Source	Supplied from System.	
Power Rating	DC 90-265V 50/60Hz	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	5736	02	5762	03	5814

#### 3. Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
A	N/A	N/A	PCB	N/A	3.0
B	N/A	N/A	PCB	N/A	3.0

**Note: Only "one" antenna is selected for use at any one time, through the on-board Transmit-Receive / Diversity RF switch.**



### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode CHANNEL 01/02/03
Mode 4	TX Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Test	
Final Test Mode	Description
Mode 4	TX Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode CHANNEL 01/02/03

Note:

- (1) The measurements are performed at the high, middle, low available channels.



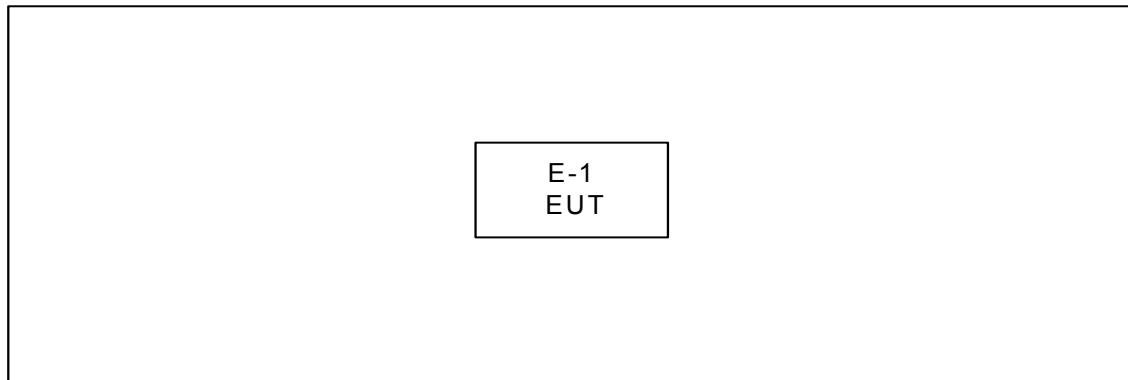
### **3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING**

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product

Test software version	N/A		
Frequency	5736 MHz	5762 MHz	5814MHz
TX Mode	N/A	N/A	N/A



### 3.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



### 3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
-	-	-	-	-	-	

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in m in 『Length』 column.



## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.0	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

#### 4.1.2 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	Apr. 25, 2014
2	LISN	R&S	ENV216	100087	Nov.09, 2014
3	Test Cable	N/A	C_17	N/A	Mar.15, 2014
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	Apr. 25, 2014
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Apr. 25, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of Equipment List is One Year.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

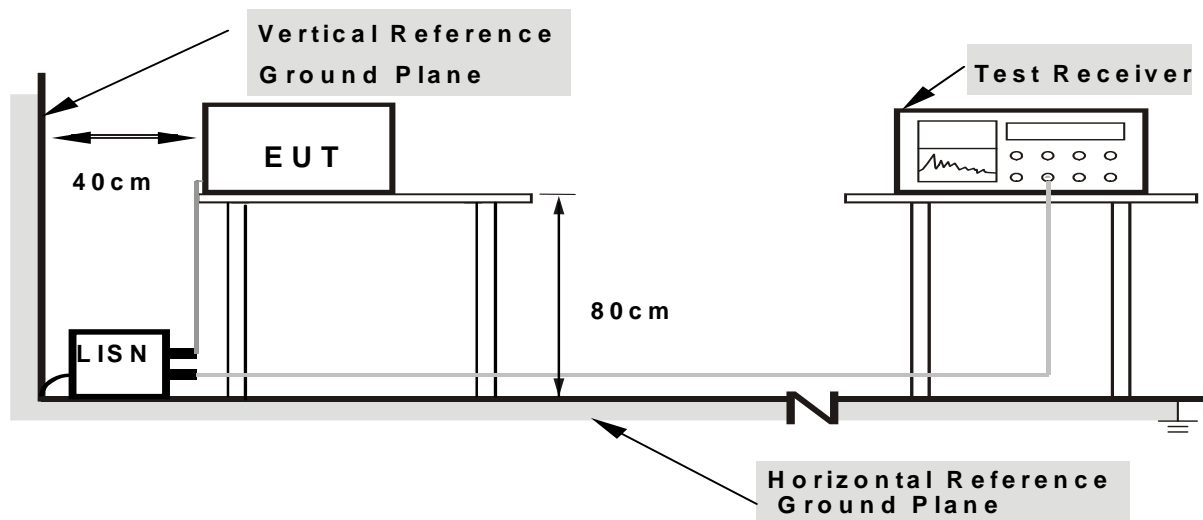
#### 4.1.3 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



**Note: 1.**Support units were connected to second LISN .

**2.**Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

#### 4.1.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: 120V/50Hz



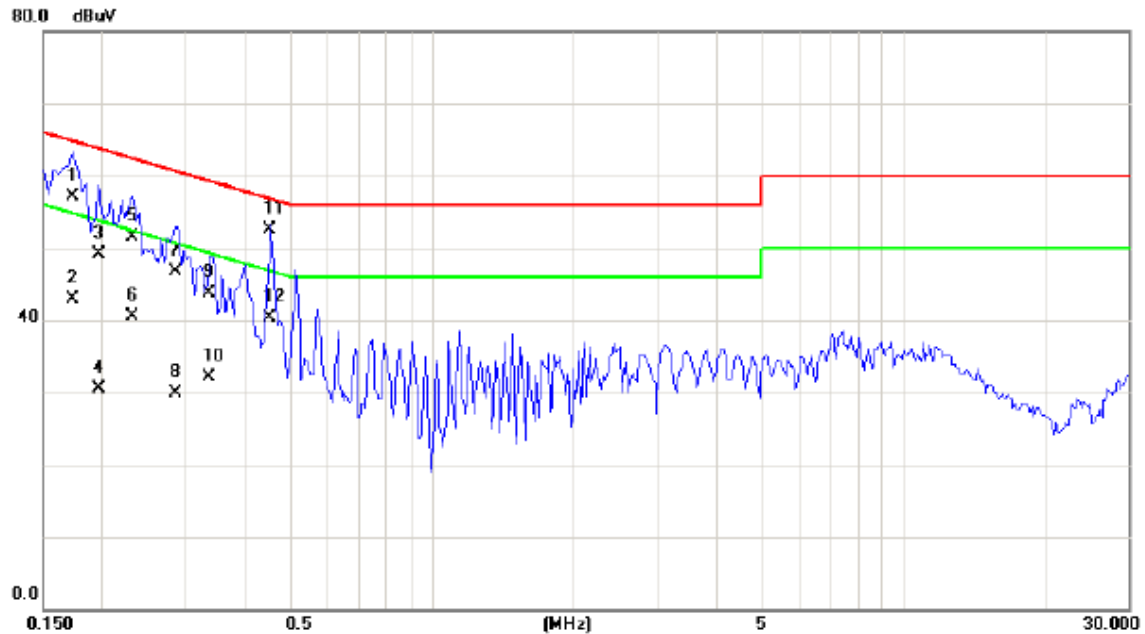
#### **4.1.7 TEST RESULTS**

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “ \* ” marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.



Test Mode :	TX Mode	Phase:	Line
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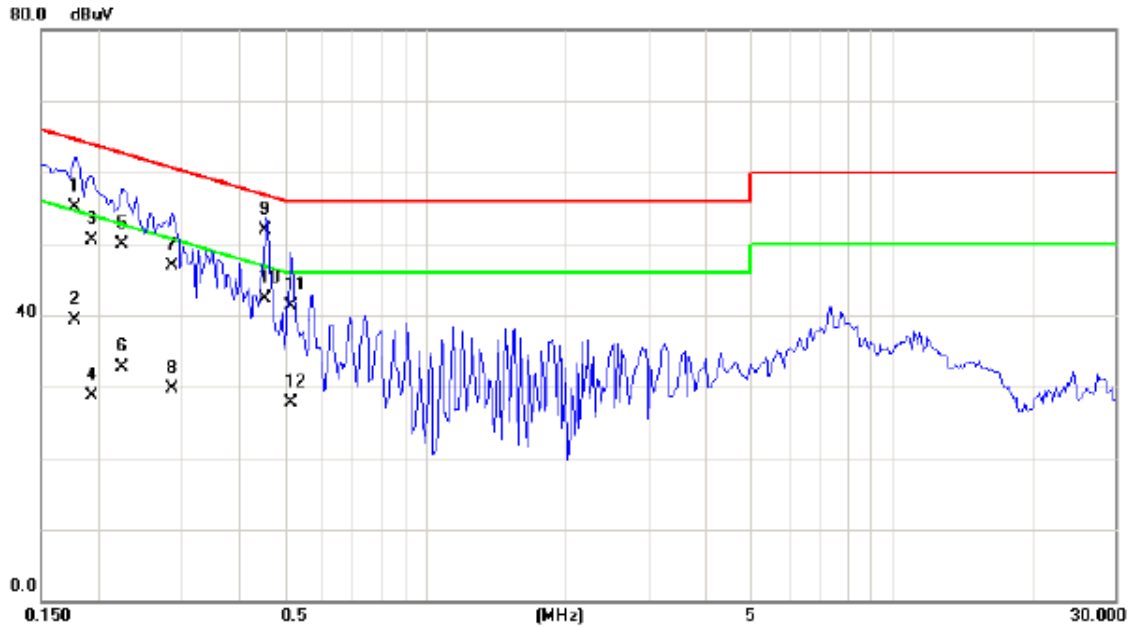


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1734	47.40	9.63	57.03	64.80	-7.77	QP	
2		0.1734	33.30	9.63	42.93	54.80	-11.87	AVG	
3		0.1970	39.50	9.65	49.15	63.74	-14.59	QP	
4		0.1970	20.90	9.65	30.55	53.74	-23.19	AVG	
5		0.2320	41.80	9.65	51.45	62.38	-10.93	QP	
6		0.2320	30.80	9.65	40.45	52.38	-11.93	AVG	
7		0.2867	37.00	9.67	46.67	60.62	-13.95	QP	
8		0.2867	20.20	9.67	29.87	50.62	-20.75	AVG	
9		0.3375	34.10	9.67	43.77	59.26	-15.49	QP	
10		0.3375	22.40	9.67	32.07	49.26	-17.19	AVG	
11	*	0.4547	42.80	9.70	52.50	56.79	-4.29	QP	
12		0.4547	30.60	9.70	40.30	46.79	-6.49	AVG	





Test Mode :	TX Mode	Phase:	Neutral
-------------	---------	--------	---------



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1773	45.30	9.71	55.01	64.61	-9.60	QP	
2		0.1773	29.60	9.71	39.31	54.61	-15.30	AVG	
3		0.1930	40.70	9.71	50.41	63.91	-13.50	QP	
4		0.1930	19.00	9.71	28.71	53.91	-25.20	AVG	
5		0.2242	40.20	9.71	49.91	62.66	-12.75	QP	
6		0.2242	22.90	9.71	32.61	52.66	-20.05	AVG	
7		0.2867	37.10	9.72	46.82	60.62	-13.80	QP	
8		0.2867	20.00	9.72	29.72	50.62	-20.90	AVG	
9		0.4547	42.20	9.74	51.94	56.79	-4.85	QP	
10	*	0.4547	32.60	9.74	42.34	46.79	-4.45	AVG	
11		0.5172	31.50	9.74	41.24	56.00	-14.76	QP	
12		0.5172	17.90	9.74	27.64	46.00	-18.36	AVG	



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz to 1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) & RSS-210 section 2.2 & Annex 8 (A8.5), then the 15.209(a) & RSS-Gen limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz for PK/AVG detector
Start ~ Stop Frequency	90kHz~110kHz for QP detector
Start ~ Stop Frequency	110kHz~490kHz for PK/AVG detector
Start ~ Stop Frequency	490kHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector



#### 4.2.2 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Apr. 25, 2014
2	Amplifier	HP	8447D	2944A09673	Apr. 25, 2014
3	Test Receiver	R&S	ESCI	100382	Apr. 25, 2014
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 02, 2014
5	Antenna	ETS	3115	00075789	Apr. 25, 2014
6	Amplifier	Agilent	8449B	3008A02274	Apr. 25, 2014
7	Spectrum	Agilent	E4408B	US39240143	Nov. 09, 2014
8	Test Cable	HUBER+SUHNER	C-45	N/A	Apr. 30, 2014
9	Controller	CT	SC100	N/A	N/A
10	Horn Antenna	EMCO	3115	9605-4803	Apr. 25, 2014
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Apr. 25, 2014
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Oct. 22, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of Equipment List is One Year.

#### 4.2.3 TEST PROCEDURE

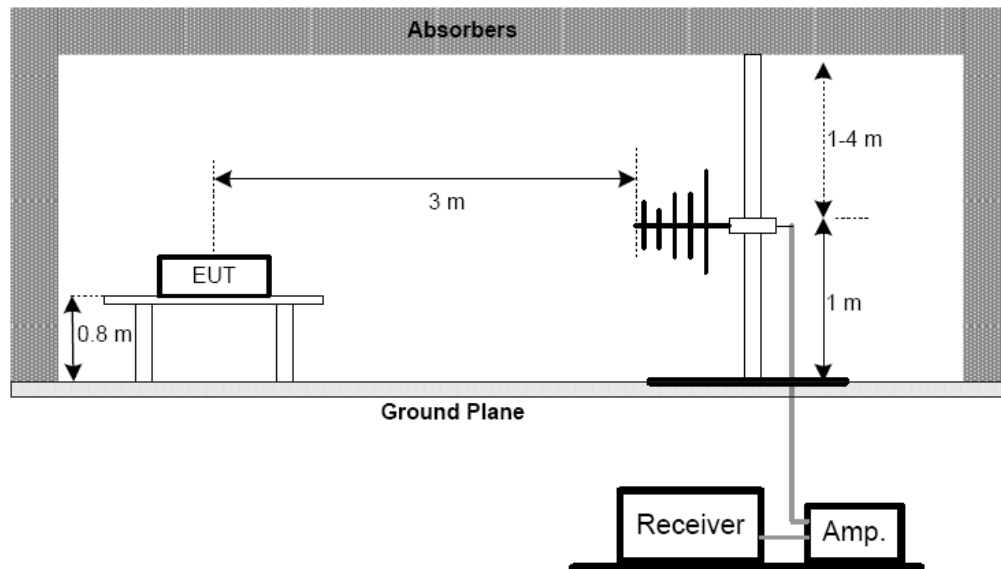
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.2.4 DEVIATION FROM TEST STANDARD

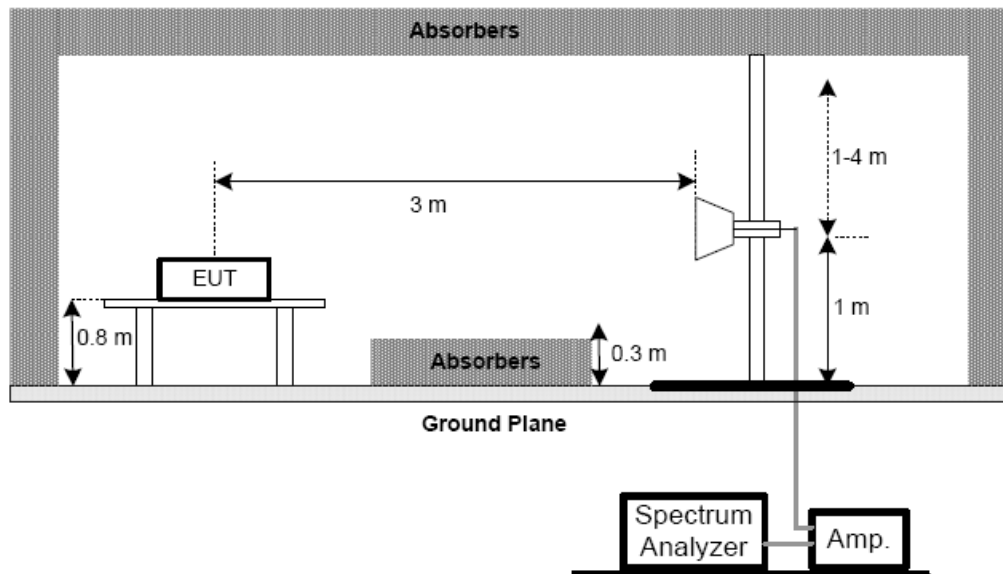
No deviation

#### 4.2.5 TEST SETUP

##### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz



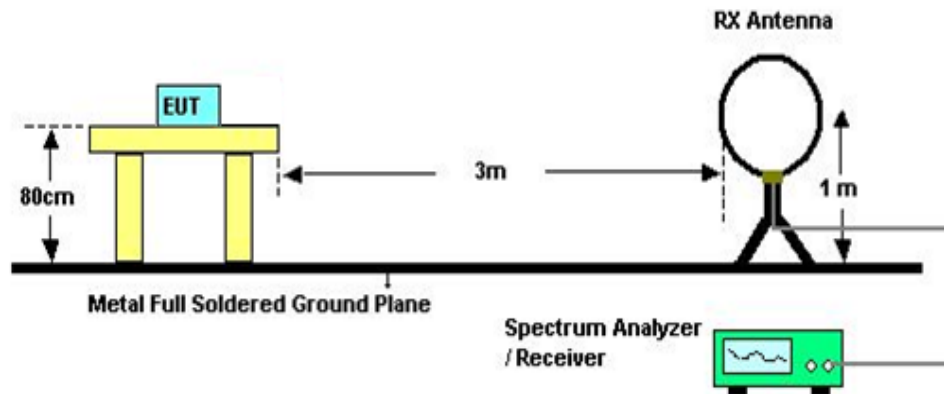
##### (B) Radiated Emission Test Set-Up Frequency Above 1 GHz



#### 4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

(C) For radiated emissions below 30MHz



#### **4.2.7 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

#### **4.2.8 EUT TEST CONDITIONS**

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: 120V/50Hz



#### 4.2.9 TEST RESULTS (9KHZ TO 30MHZ)

Test Mode : TX Mode 5736MHz

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0088	0°	25.31	24.30	49.61	128.71	-79.10	AV
0.0088	0°	29.55	24.30	53.85	148.71	-94.86	PK
0.0251	0°	21.34	23.98	45.32	119.60	-74.29	AV
0.0251	0°	24.42	23.98	48.40	139.60	-91.21	PK
0.0383	0°	21.24	23.14	44.38	115.93	-71.55	AV
0.0383	0°	24.73	23.14	47.87	135.93	-88.06	PK
0.0676	0°	18.73	22.05	40.78	111.01	-70.23	AV
0.0676	0°	23.42	22.05	45.47	131.01	-85.54	PK
0.2637	0°	20.78	20.37	41.15	99.18	-58.03	AVG
0.2637	0°	22.74	20.37	43.11	119.18	-76.07	PK
1.4736	0°	27.34	19.55	46.89	64.24	-17.34	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0092	90°	19.12	24.30	43.42	128.30	-84.88	AVG
0.0092	90°	20.45	24.30	44.75	148.30	-103.55	PK
0.0228	90°	15.24	24.13	39.37	120.46	-81.10	AVG
0.0228	90°	17.96	24.13	42.09	140.46	-98.38	PK
0.0464	90°	18.75	22.63	41.38	114.28	-72.90	AVG
0.0464	90°	21.64	22.63	44.27	134.28	-90.01	PK
0.0775	90°	21.37	21.85	43.22	109.82	-66.60	AVG
0.0775	90°	22.53	21.85	44.38	129.82	-85.44	PK
0.3754	90°	21.58	20.10	41.68	96.12	-54.44	AVG
0.3754	90°	24.89	20.10	44.99	116.12	-71.13	PK
1.6864	90°	25.47	19.53	45.00	63.07	-18.06	QP

**Remark:**

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.



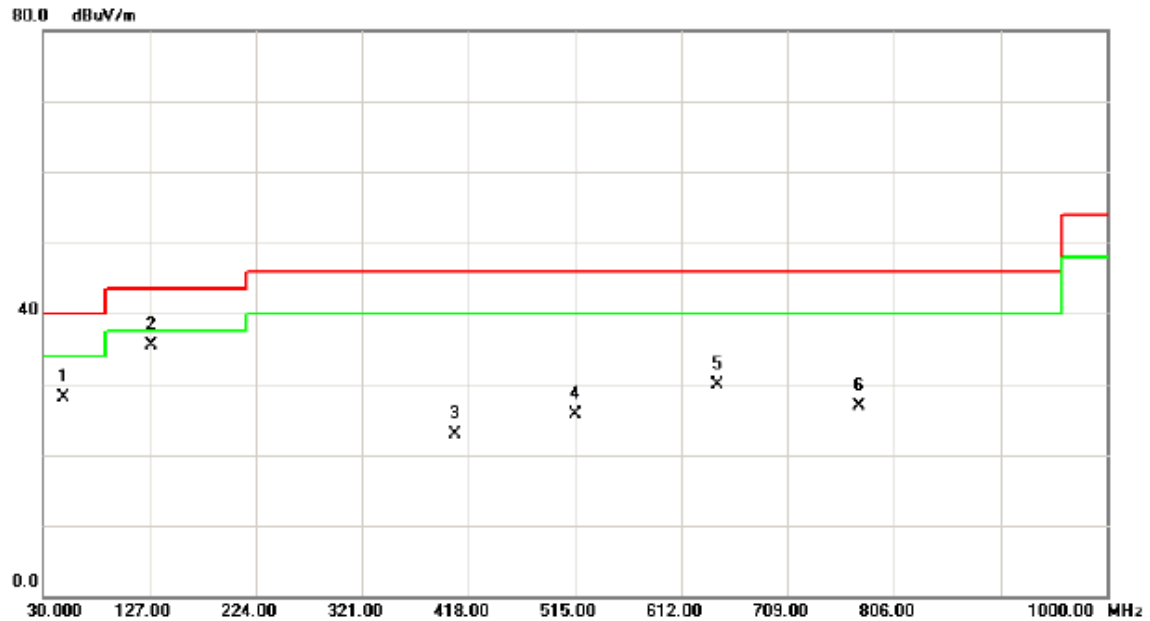
#### **4.2.10 TEST RESULTS (BETWEEN 30MHZ TO 1000 MHZ)**

Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.



Test Mode :	TX Mode 5736MHz	Phase:	Vertical
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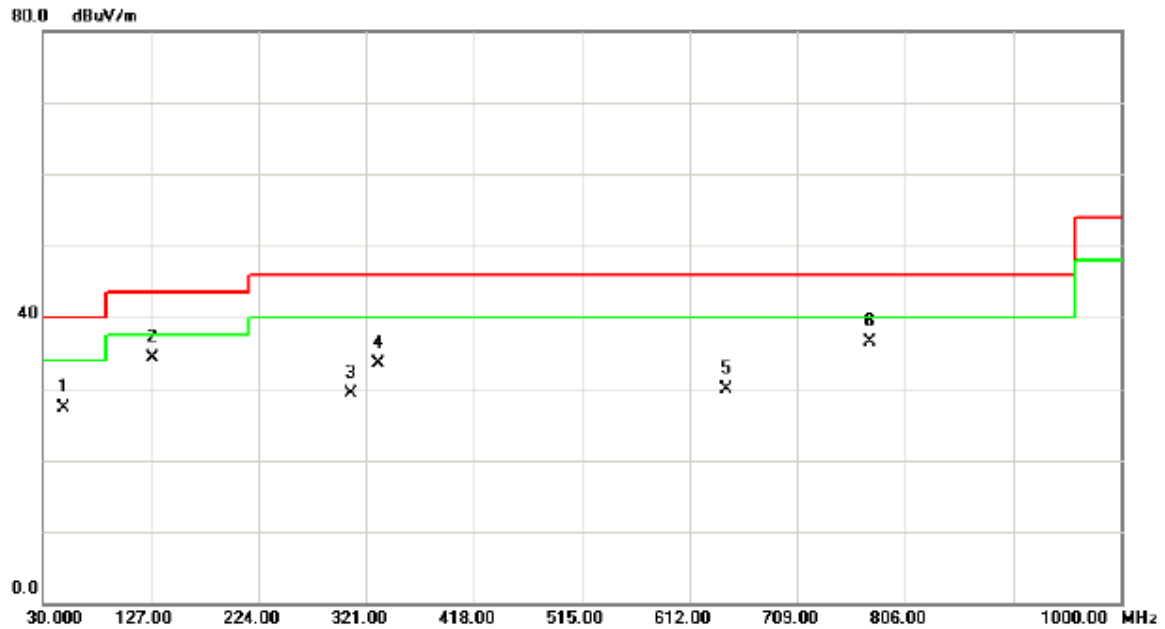


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		48.4300	42.60	-14.57	28.03	40.00	-11.97	QP	
2	*	128.9400	48.90	-13.39	35.51	43.50	-7.99	QP	
3		405.3900	32.60	-9.78	22.82	46.00	-23.18	QP	
4		515.9700	35.10	-9.49	25.61	46.00	-20.39	QP	
5		644.9800	35.80	-5.82	29.98	46.00	-16.02	QP	
6		773.9900	30.90	-4.05	26.85	46.00	-19.15	QP	





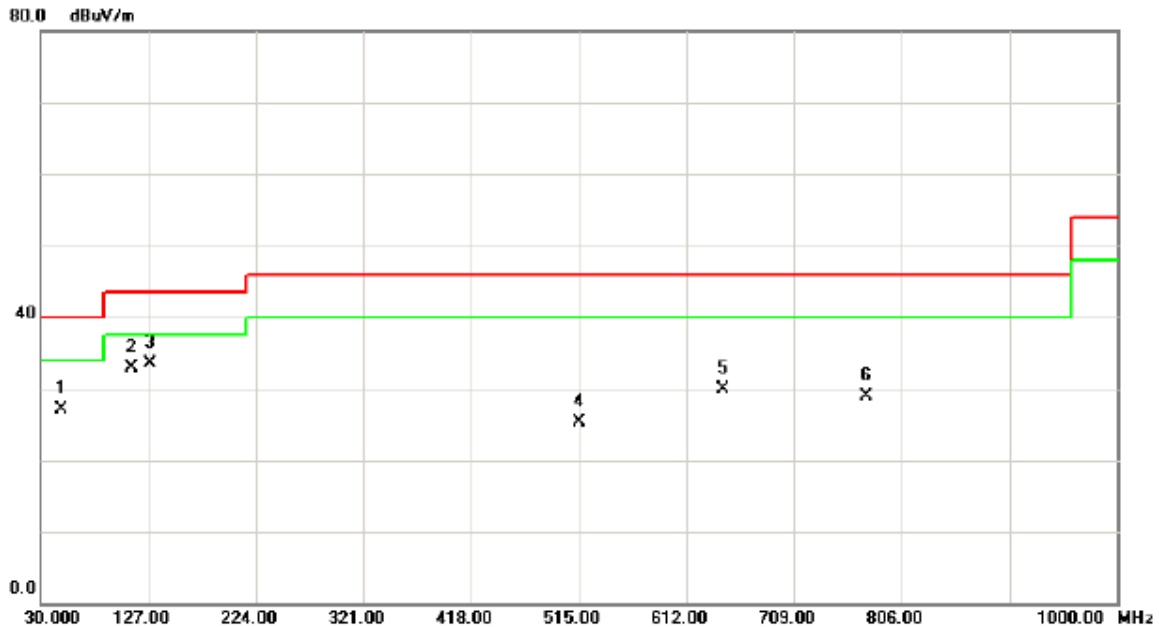
Test Mode :	TX Mode 5736MHz	Phase:	Horizontal
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		48.4300	41.90	-14.57	27.33	40.00	-12.67	QP	
2	*	128.9400	47.60	-13.39	34.21	43.50	-9.29	QP	
3		307.4200	40.50	-11.28	29.22	46.00	-16.78	QP	
4		331.6700	44.80	-11.38	33.42	46.00	-12.58	QP	
5		644.9800	35.80	-5.82	29.98	46.00	-16.02	QP	
6		773.9900	40.60	-4.05	36.55	46.00	-9.45	QP	



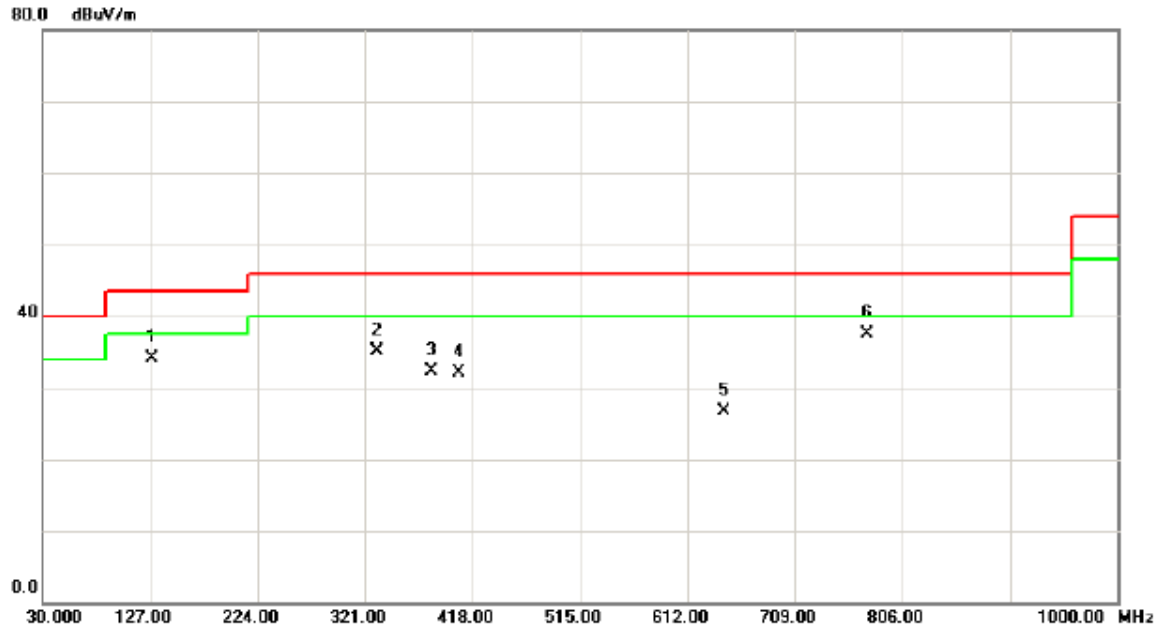
Test Mode :	TX Mode 5762MHz	Phase:	Vertical
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		48.4300	41.60	-14.57	27.03	40.00	-12.97	QP	
2		111.4800	47.50	-14.61	32.89	43.50	-10.61	QP	
3	*	128.9400	46.90	-13.39	33.51	43.50	-9.99	QP	
4		515.9700	34.80	-9.49	25.31	46.00	-20.69	QP	
5		644.9800	35.80	-5.82	29.98	46.00	-16.02	QP	
6		773.9900	32.90	-4.05	28.85	46.00	-17.15	QP	



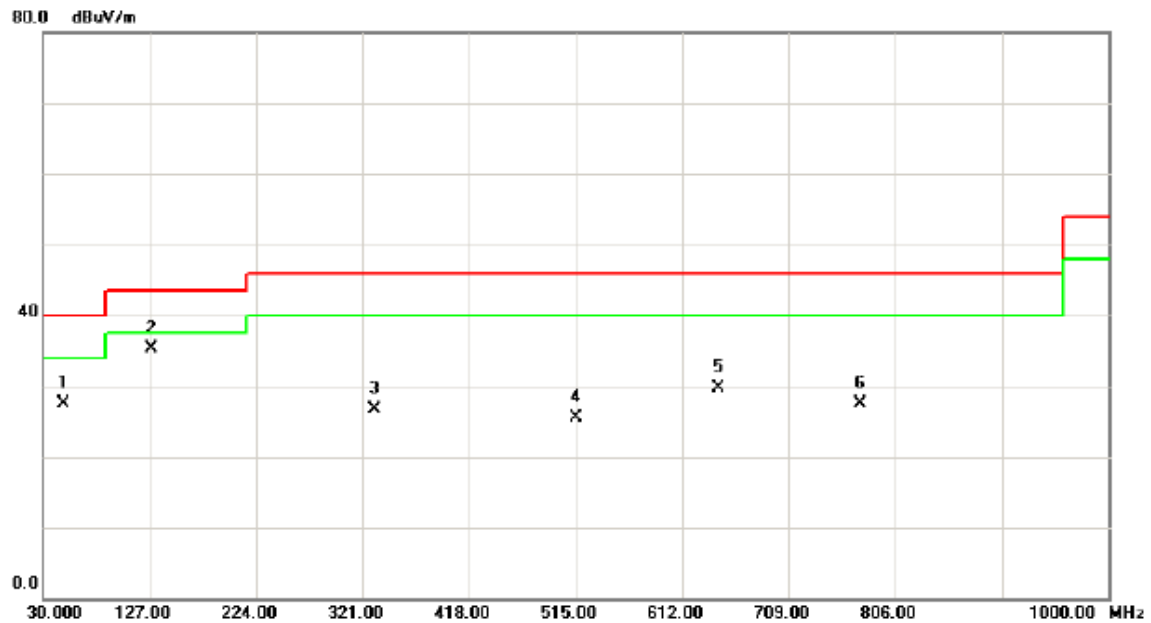
Test Mode :	TX Mode 5762MHz	Phase:	Horizontal
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		128.9400	47.50	-13.39	34.11	43.50	-9.39	QP	
2		331.6700	46.50	-11.38	35.12	46.00	-10.88	QP	
3		381.1400	42.80	-10.48	32.32	46.00	-13.68	QP	
4		405.3900	41.80	-9.78	32.02	46.00	-13.98	QP	
5		644.9800	32.50	-5.82	26.68	46.00	-19.32	QP	
6	*	773.9900	41.50	-4.05	37.45	46.00	-8.55	QP	



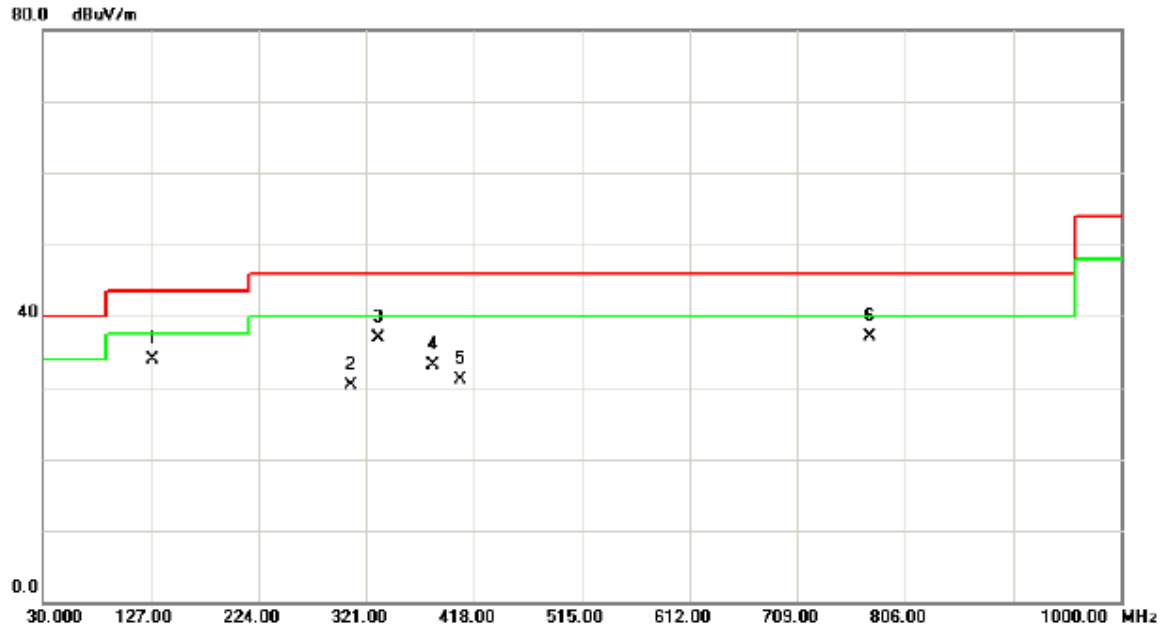
Test Mode :	TX Mode 5814MHz	Phase:	Vertical
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		48.4300	42.10	-14.57	27.53	40.00	-12.47	QP	
2	*	128.9400	48.60	-13.39	35.21	43.50	-8.29	QP	
3		331.6700	38.10	-11.38	26.72	46.00	-19.28	QP	
4		515.9700	34.90	-9.49	25.41	46.00	-20.59	QP	
5		644.9800	35.50	-5.82	29.68	46.00	-16.32	QP	
6		773.9900	31.60	-4.05	27.55	46.00	-18.45	QP	



Test Mode :	TX Mode 5814MHz	Phase:	Horizontal
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		128.9400	47.20	-13.39	33.81	43.50	-9.69	QP	
2		307.4200	41.60	-11.28	30.32	46.00	-15.68	QP	
3		331.6700	48.20	-11.38	36.82	46.00	-9.18	QP	
4		381.1400	43.50	-10.48	33.02	46.00	-12.98	QP	
5		405.3900	40.90	-9.78	31.12	46.00	-14.88	QP	
6	*	773.9900	41.20	-4.05	37.15	46.00	-8.85	QP	



#### **4.2.11 TEST RESULTS (ABOVE 1000 MHZ)**

**Remark:**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency; "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:  
"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



Test Mode :	TX Mode 5736MHz
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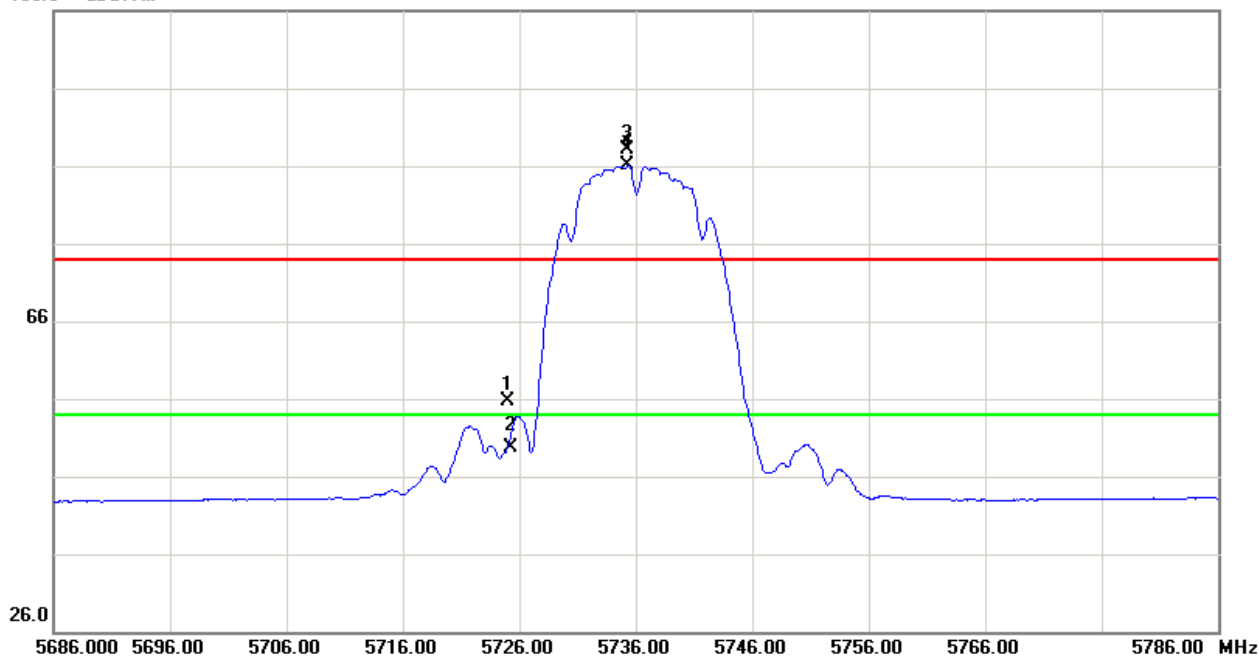
Freq.	Ant. Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
5725.00	V	11.44	5.46	44.34	55.78	49.80	68.01	66.02	X/E
<b>5735.20</b>	<b>V</b>	<b>43.62</b>	<b>41.63</b>	<b>44.39</b>	<b>88.01</b>	<b>86.02</b>			<b>X/F</b>
11471.85	V	40.36	31.84	18.42	58.78	50.26	74.00	54.00	X/H

Freq.	Ant. Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
5725.00	H	15.53	10.57	44.34	59.87	54.91	72.81	70.85	X/E
<b>5734.40</b>	<b>H</b>	<b>48.43</b>	<b>46.47</b>	<b>44.38</b>	<b>92.81</b>	<b>90.85</b>			<b>X/F</b>
11472.20	H	41.79	33.51	18.42	60.21	51.93	74.00	54.00	X/H

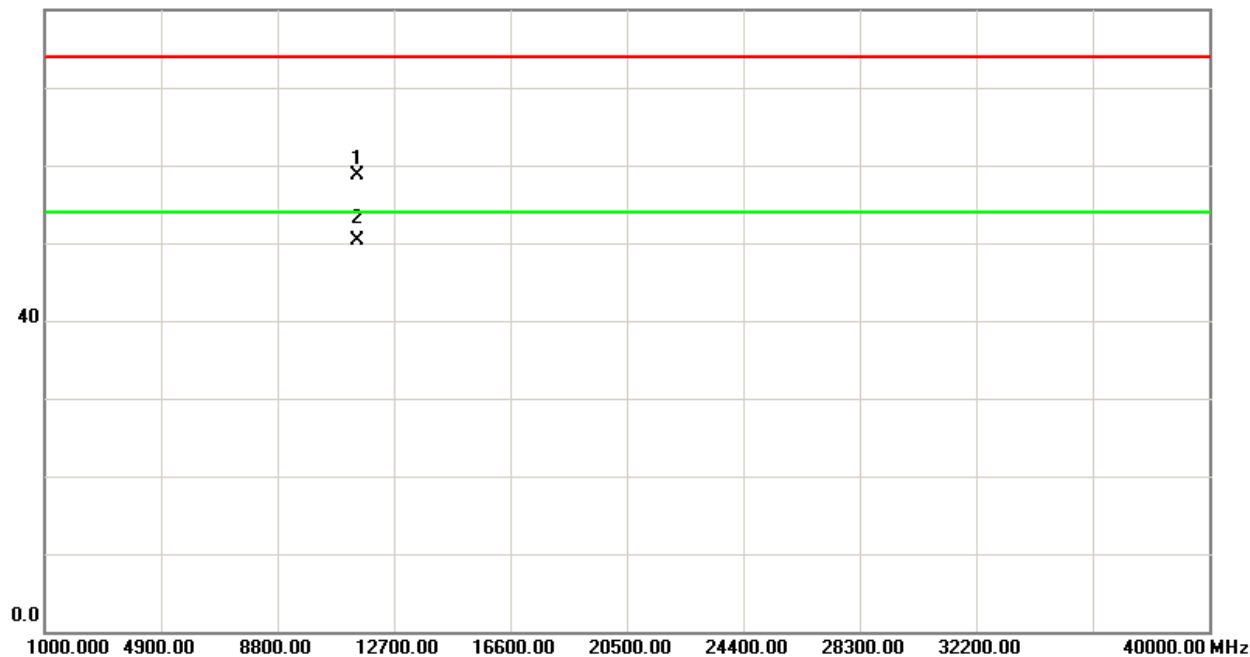


TX CH01 (Above 1000 MHz, Vertical)

106.0 dBuV/m



80.0 dBuV/m

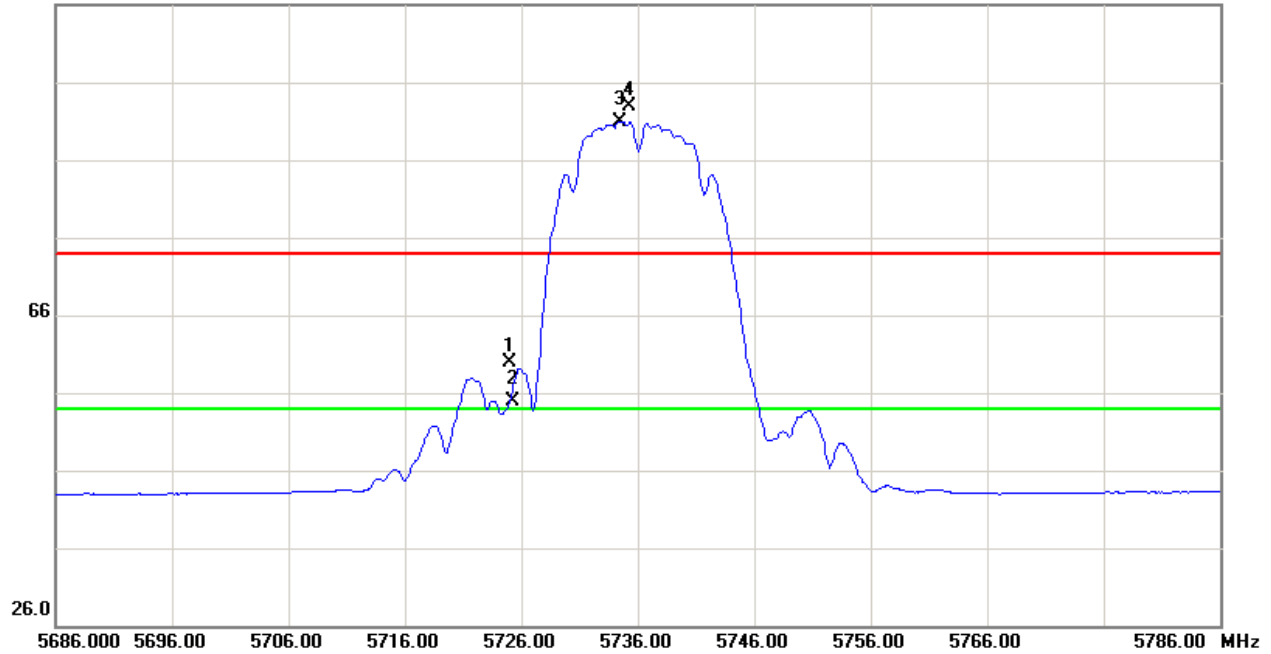




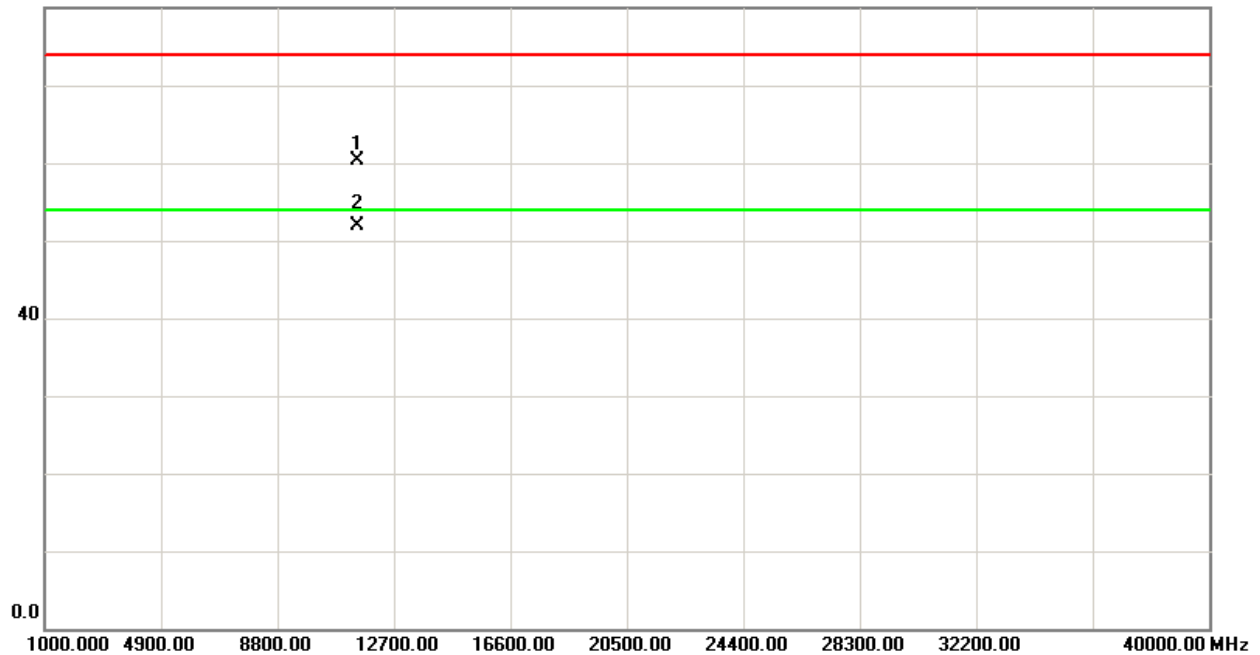


TX CH01 (Above 1000 MHz, Horizontal)

106.0 dBuV/m



80.0 dBuV/m





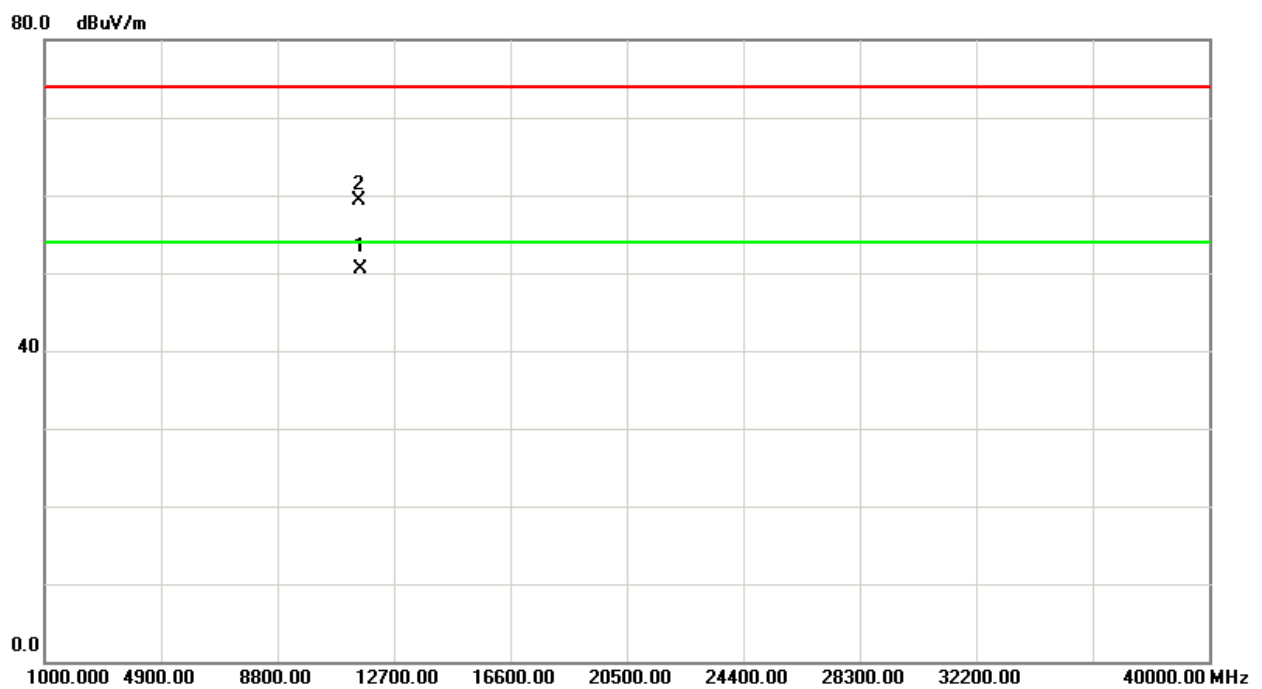
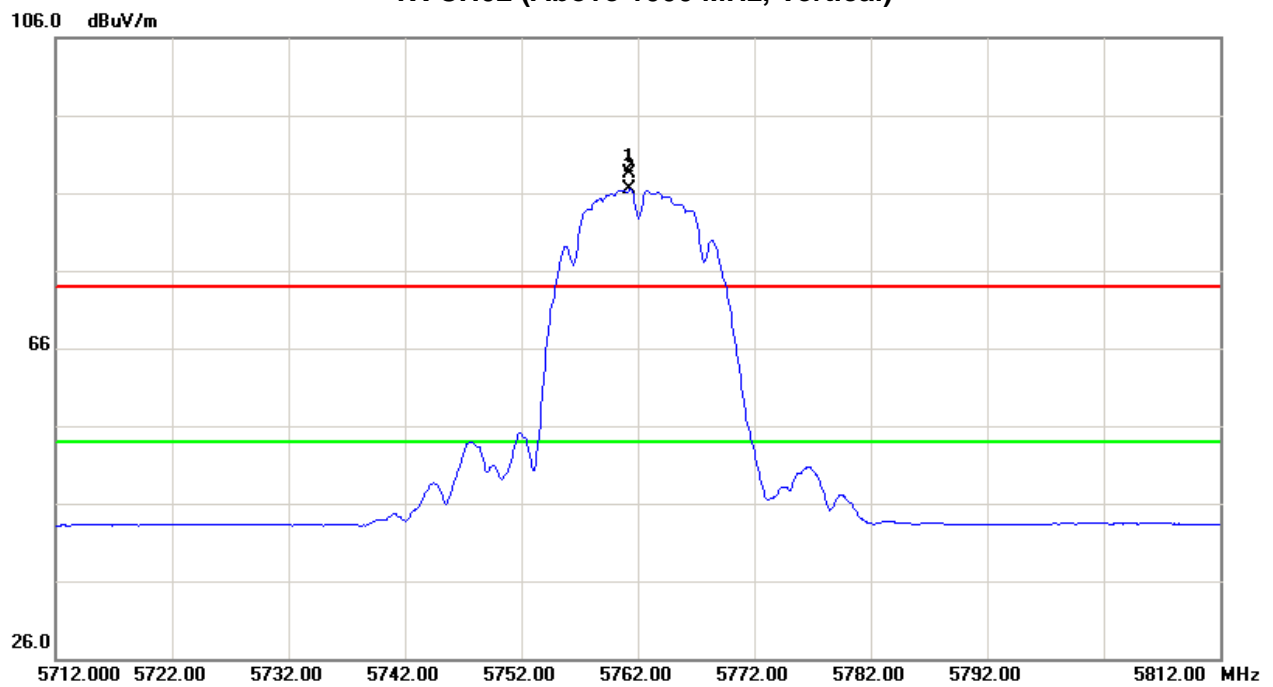
Test Mode :	TX Mode 5762MHz
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Freq.	Ant. Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>5761.20</b>	<b>V</b>	<b>43.94</b>	<b>41.98</b>	<b>44.47</b>	<b>88.41</b>	<b>86.45</b>			<b>X/F</b>
11548.00	V	40.69	31.88	18.61	59.30	50.49	74.00	54.00	X/H

Freq.	Ant. Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>5761.20</b>	<b>H</b>	<b>48.57</b>	<b>46.50</b>	<b>44.47</b>	<b>93.04</b>	<b>90.97</b>			<b>X/F</b>
11526.00	H	41.83	33.69	18.56	60.39	52.25	74.00	54.00	X/H

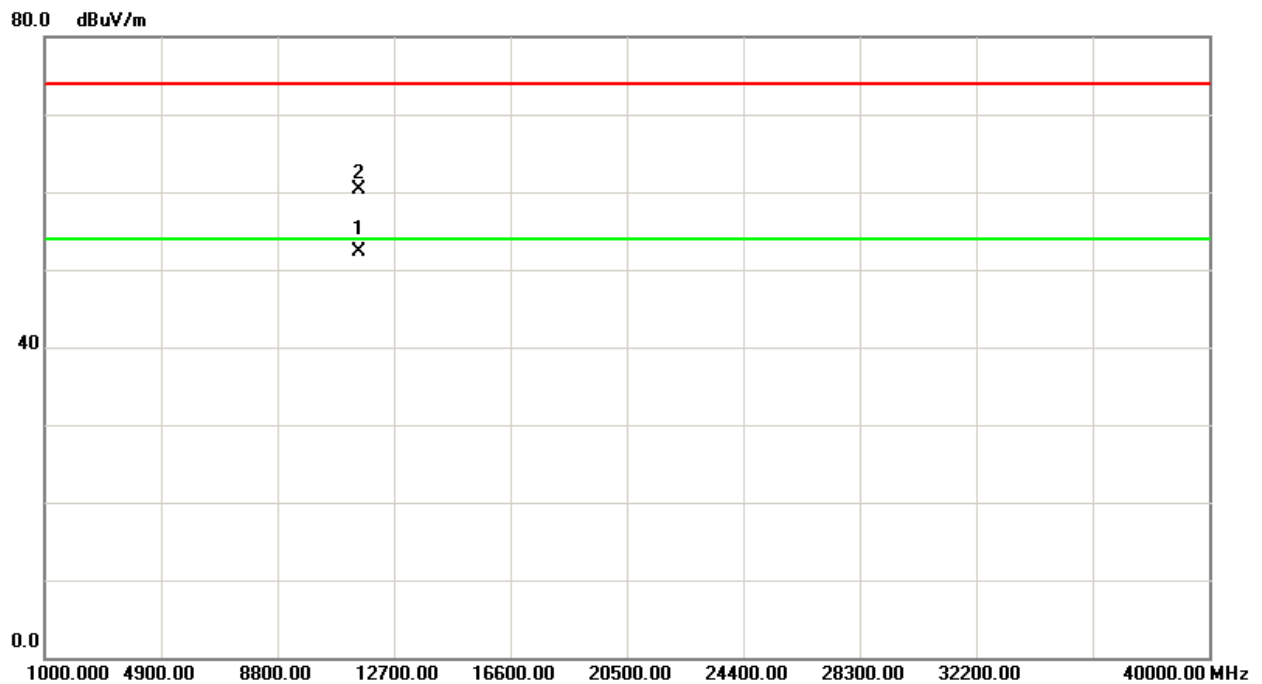
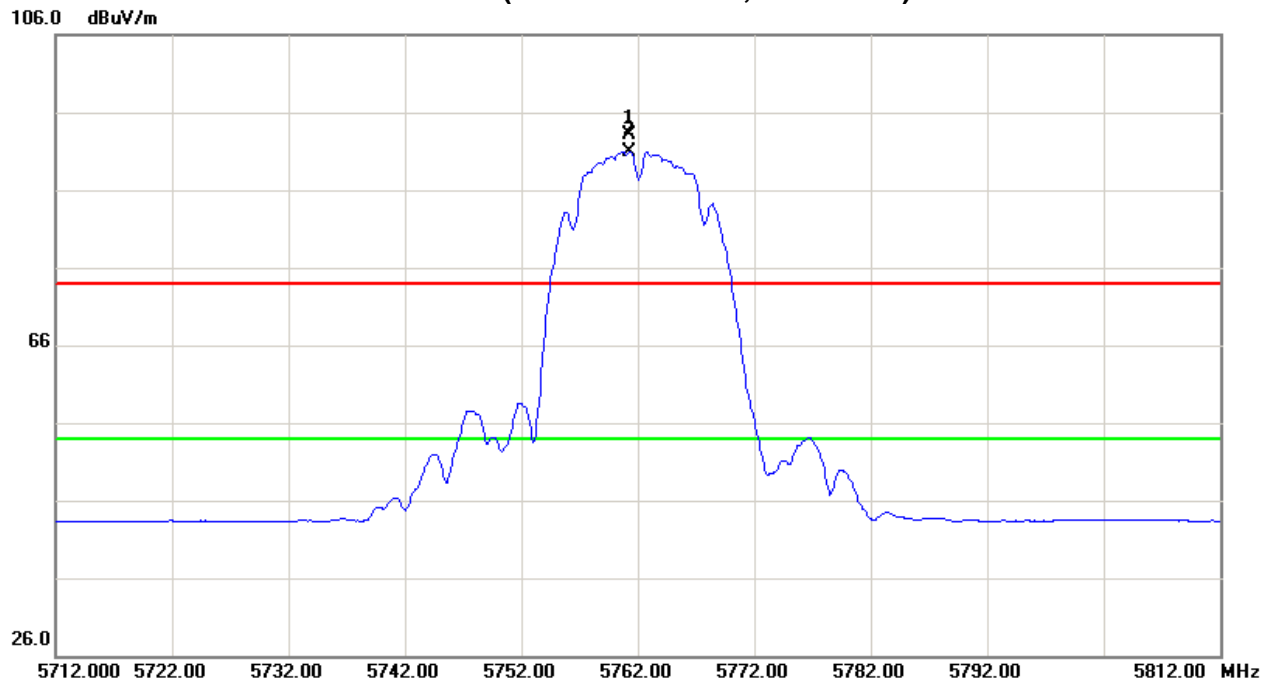


TX CH02 (Above 1000 MHz, Vertical)





TX CH02 (Above 1000 MHz, Horizontal)





Test Mode : TX Mode 5814MHz

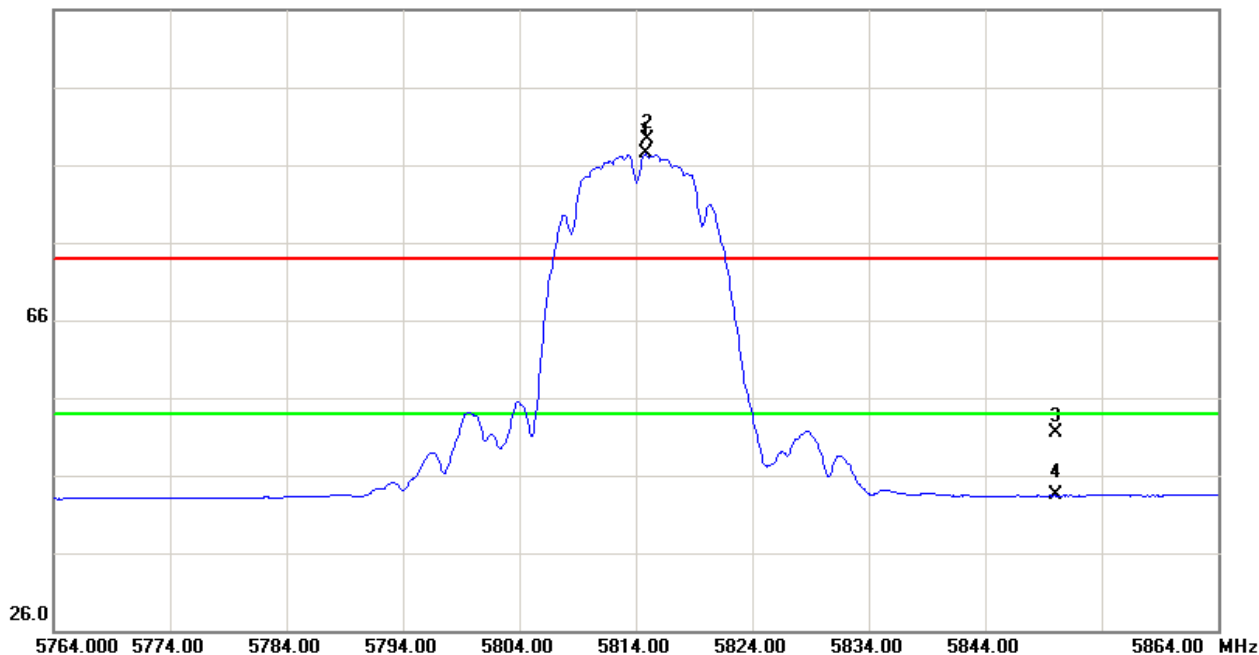
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>5814.80</b>	<b>V</b>	<b>44.63</b>	<b>42.77</b>	<b>44.65</b>	<b>89.28</b>	<b>87.42</b>			<b>X/F</b>
5850.00	V	6.74	-1.36	44.78	51.52	43.42	74.00	54.00	X/E
11623.00	V	40.06	31.25	18.80	58.86	50.05	74.00	54.00	X/H

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>5813.30</b>	<b>H</b>	<b>47.50</b>	<b>45.68</b>	<b>44.65</b>	<b>92.15</b>	<b>90.33</b>			<b>X/F</b>
5850.00	H	6.70	-1.38	44.78	51.48	43.40	74.00	54.00	X/E
11624.00	H	41.29	33.18	18.80	60.09	51.98	74.00	54.00	X/H

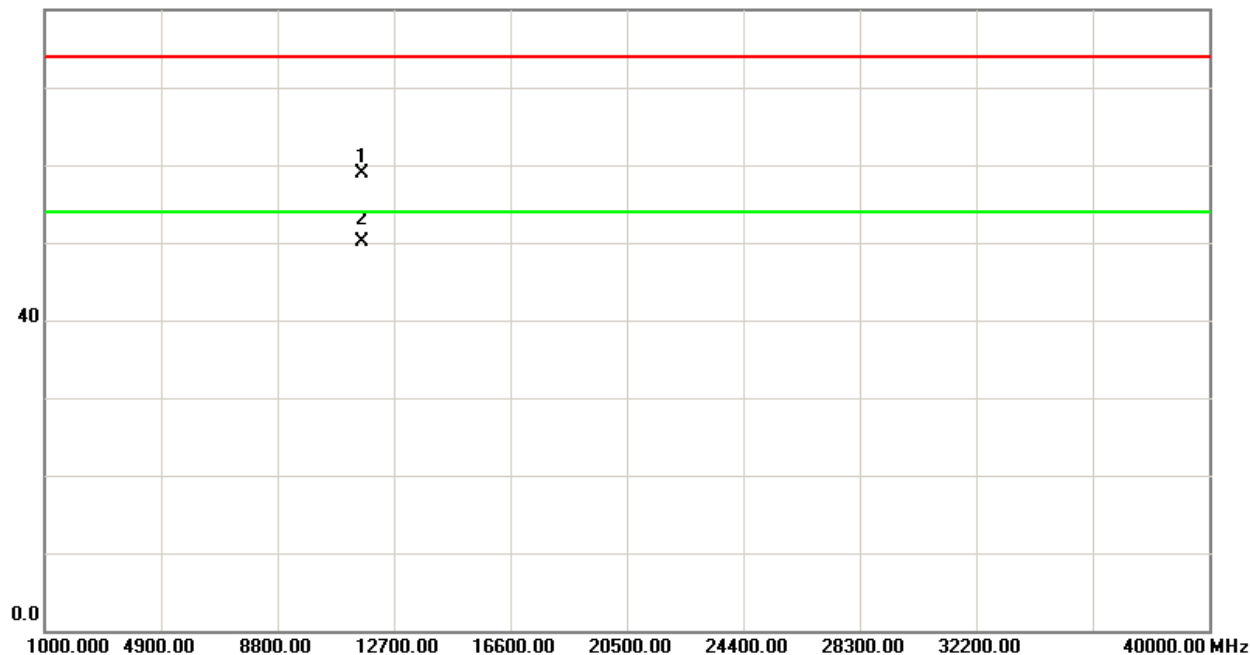


TX CH03 (Above 1000 MHz, Vertical)

106.0 dBuV/m



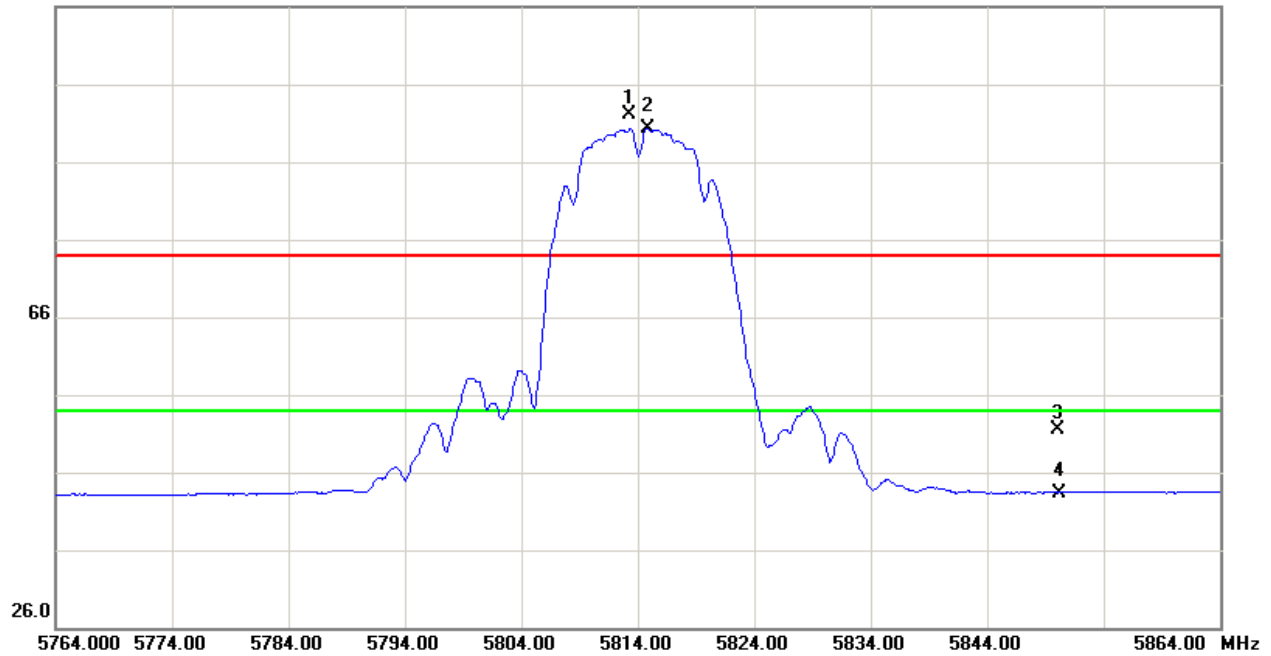
80.0 dBuV/m



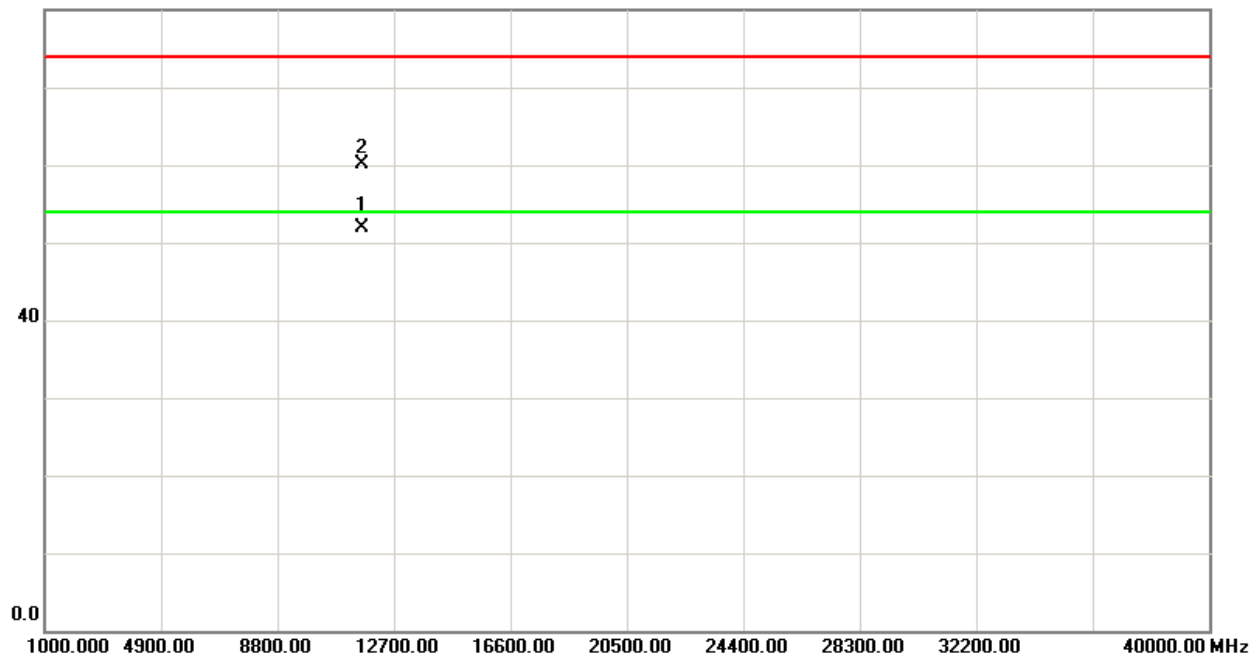


TX CH03 (Above 1000 MHz, Horizontal)

106.0 dBuV/m



80.0 dBuV/m





## 5. BANDWIDTH TEST

### 5.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
115.247(a)(2)	Bandwidth	5725 - 5825	PASS

### 5.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov. 09, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of Equipment List is One Year.

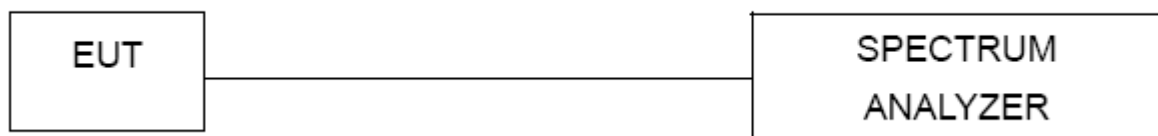
### 5.1.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

### 5.1.3 DEVIATION FROM STANDARD

No deviation.

### 5.1.4 TEST SETUP



### 5.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

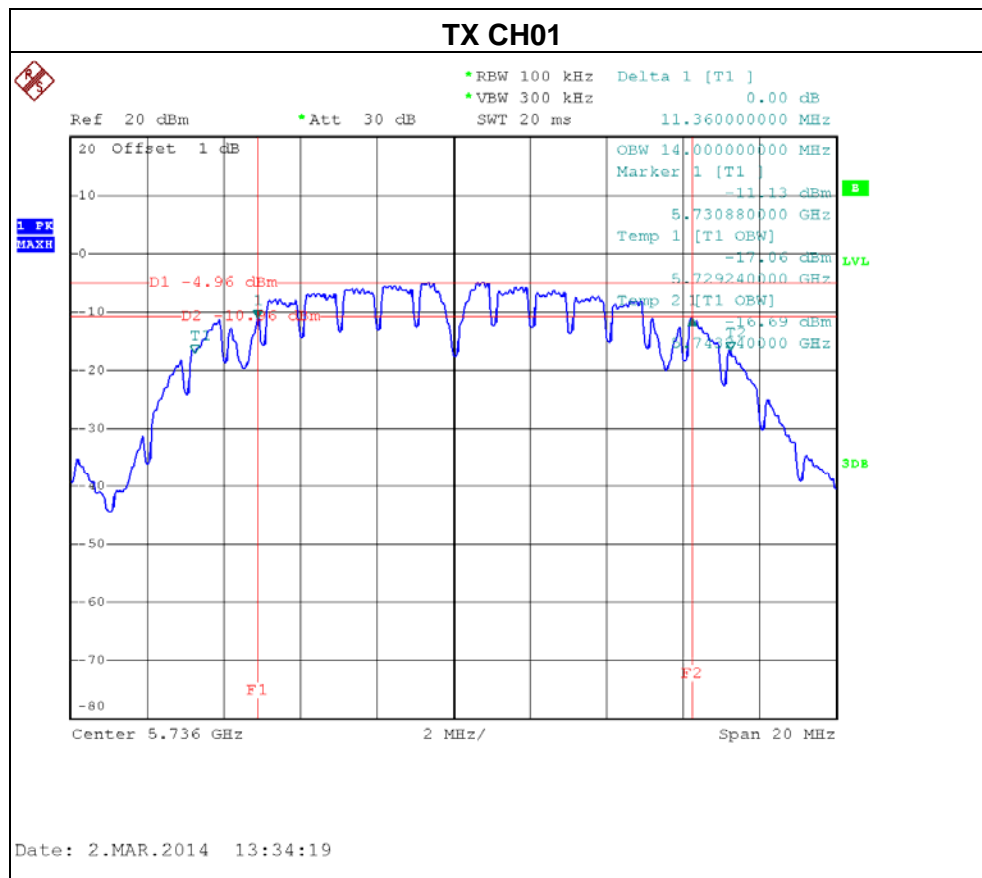


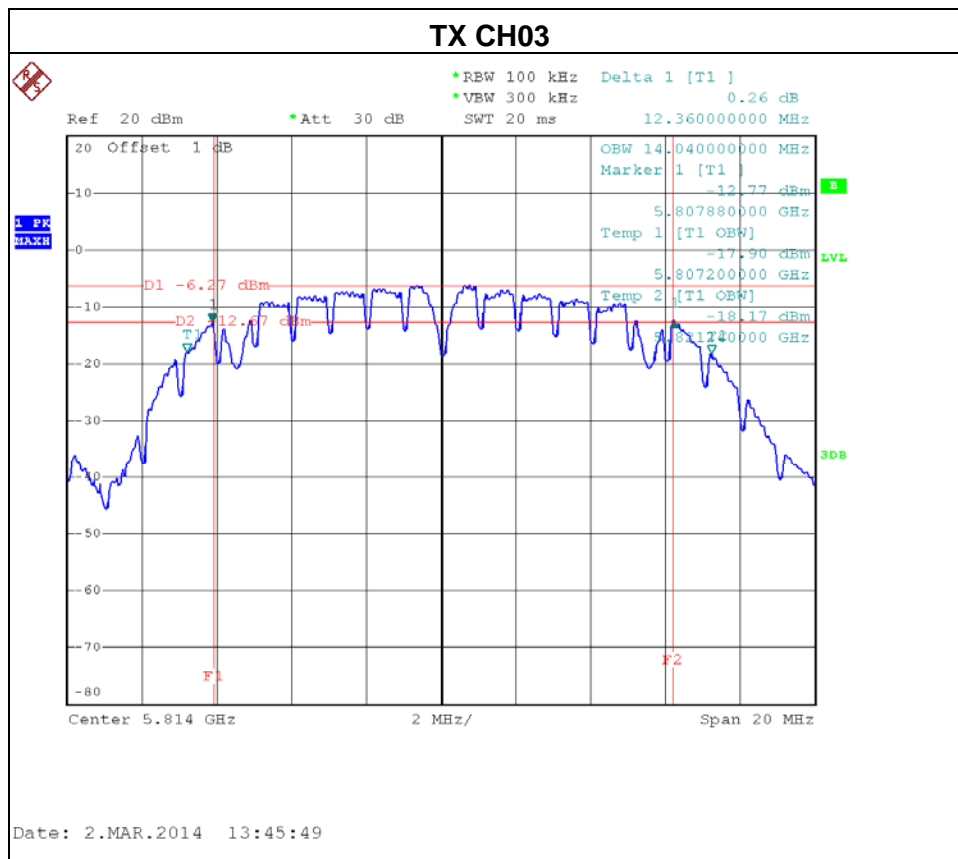
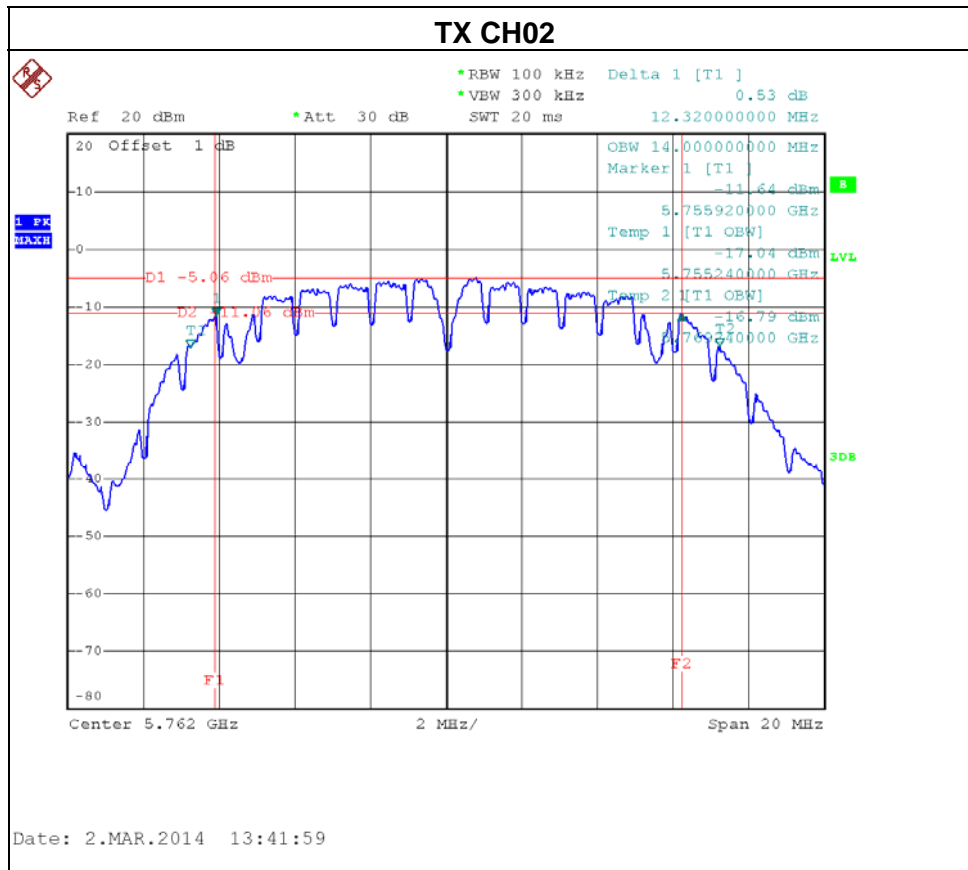


### 5.1.6 TEST RESULTS

Test Mode :	TX Mode /CH01, CH02, CH03
-------------	---------------------------

Test Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Result
CH01	5736	11.36	14.00	PASS
CH02	5762	12.32	14.00	PASS
CH03	5814	12.36	14.04	PASS





**6. MAXIMUM OUTPUT POWER TEST****6.1 Applied procedures / limit**

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Maximum Output Power	1 watt or 30dBm	5725 - 5825	PASS

**6.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Next Calibration
1	P-series Power meter	Agilent	N1911A	MY45100473	Apr.25.2014
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Apr.25.2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of Equipment List is One Year.

**6.1.2 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

**6.1.3 DEVIATION FROM STANDARD**

No deviation.

**6.1.4 TEST SETUP****6.1.5 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



#### 6.1.6 TEST RESULTS

Test Mode :	TX Mode /CH01, CH02, CH03
-------------	---------------------------

Test Channel	Frequency (MHz)	Maximum Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	5736 MHz	16.60	30	1
CH02	5762 MHz	16.43	30	1
CH03	5814 MHz	15.16	30	1



## 7. ANTENNA CONDUCTED SPURIOUS EMISSION

### 7.1 Applied procedures / limit

20dBc in any 100KHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) & RSS-210 section 2.2 & Annex 8 (A8.5), then the 15.209(a) & RSS-GEN limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

### 7.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov. 09, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of Equipment List is One Year.

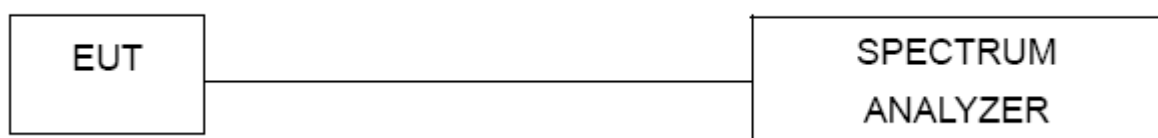
### 7.1.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = Auto.

### 7.1.3 DEVIATION FROM STANDARD

No deviation.

### 7.1.4 TEST SETUP



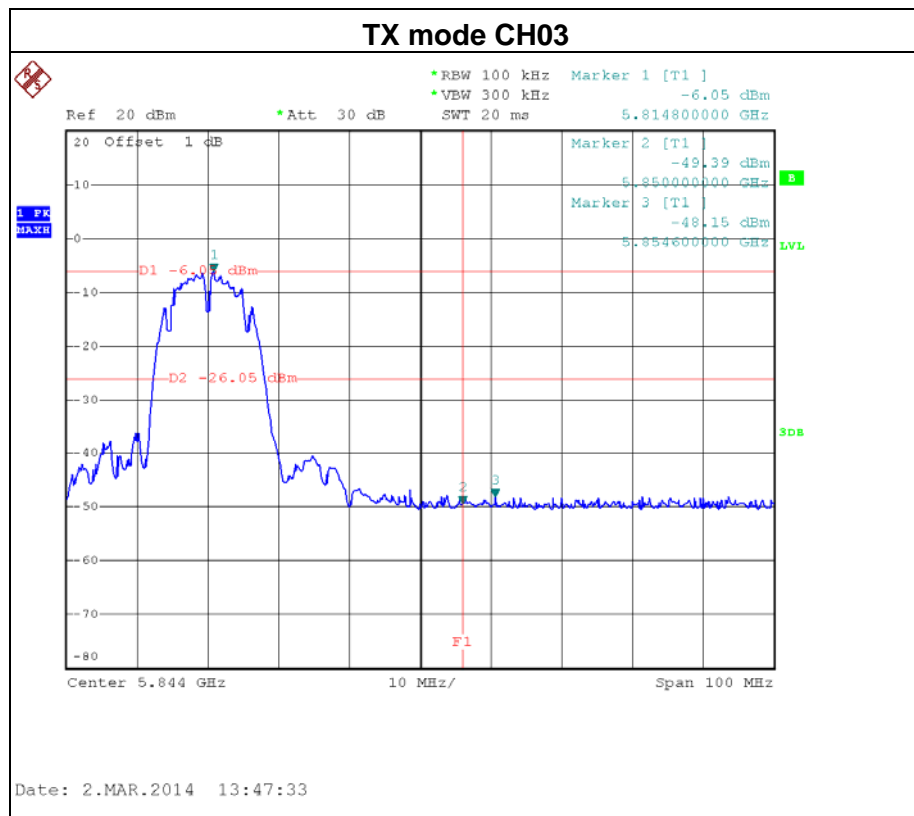
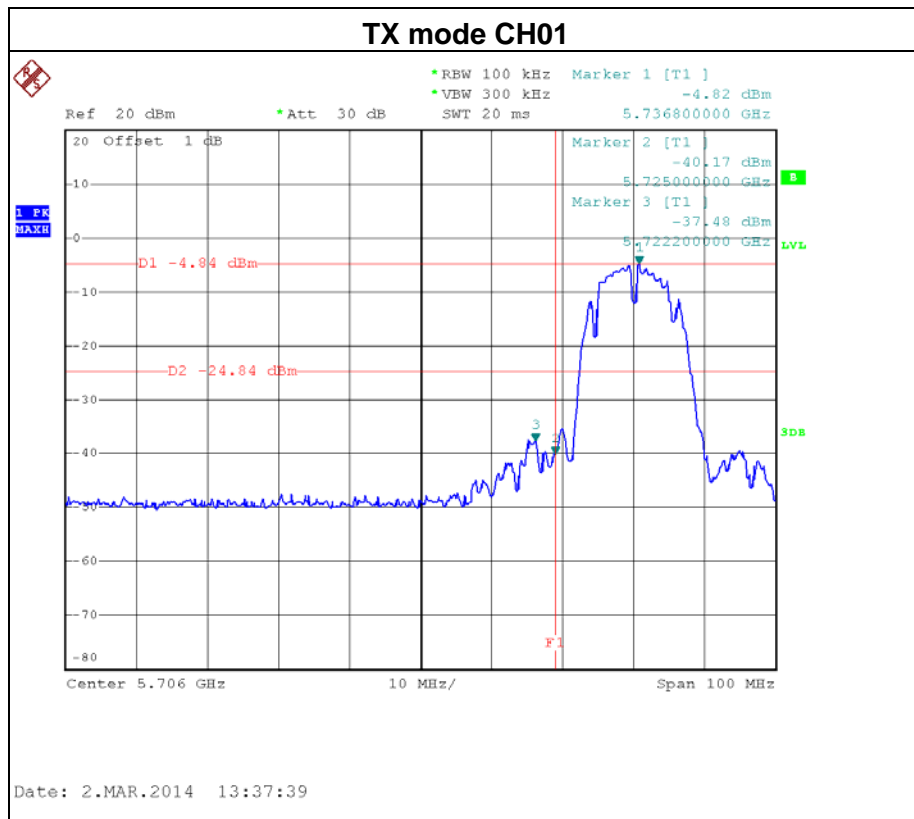
### 7.1.5 EUT OPERATION CONDITIONS

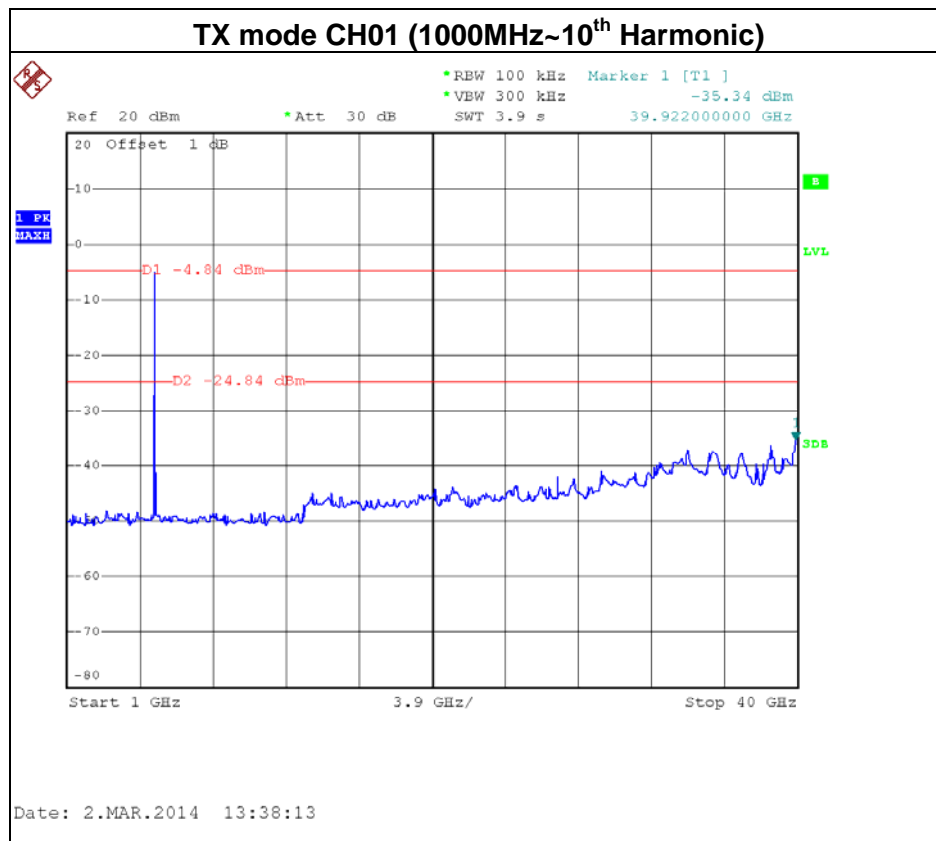
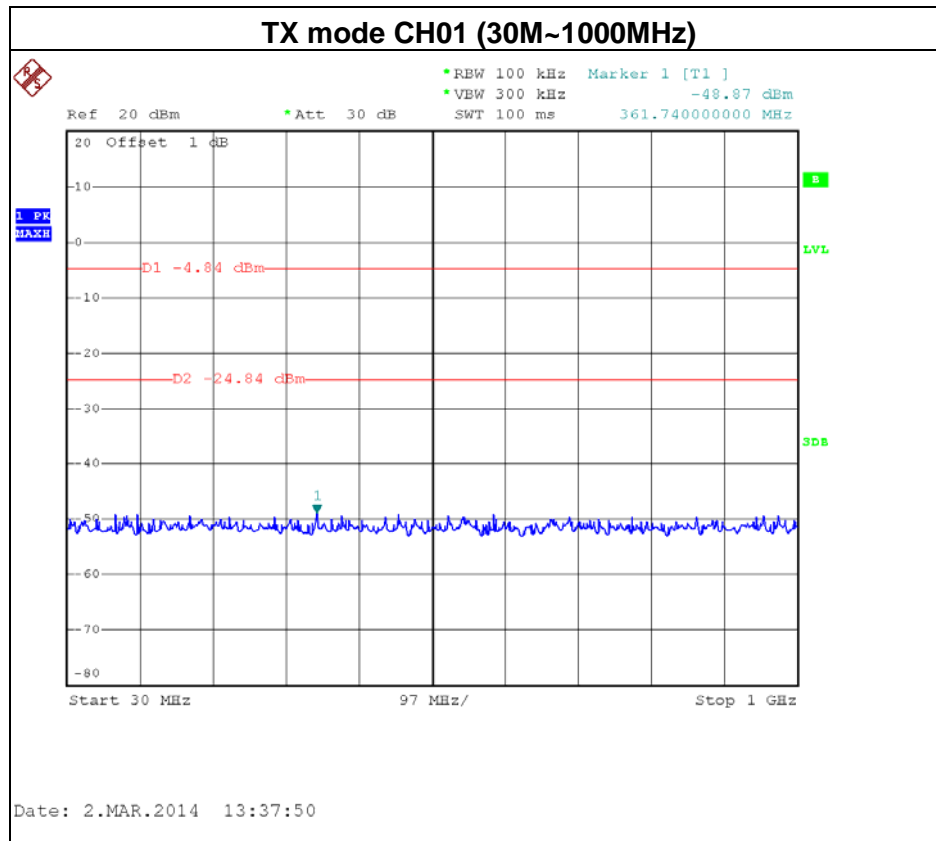
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



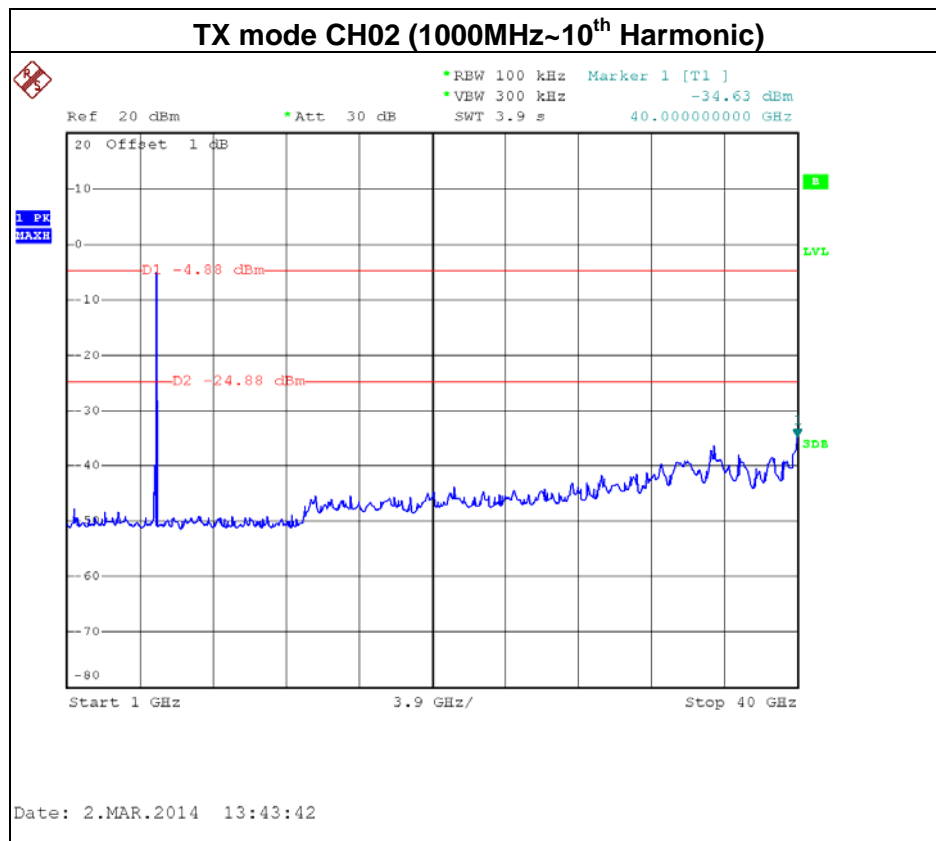
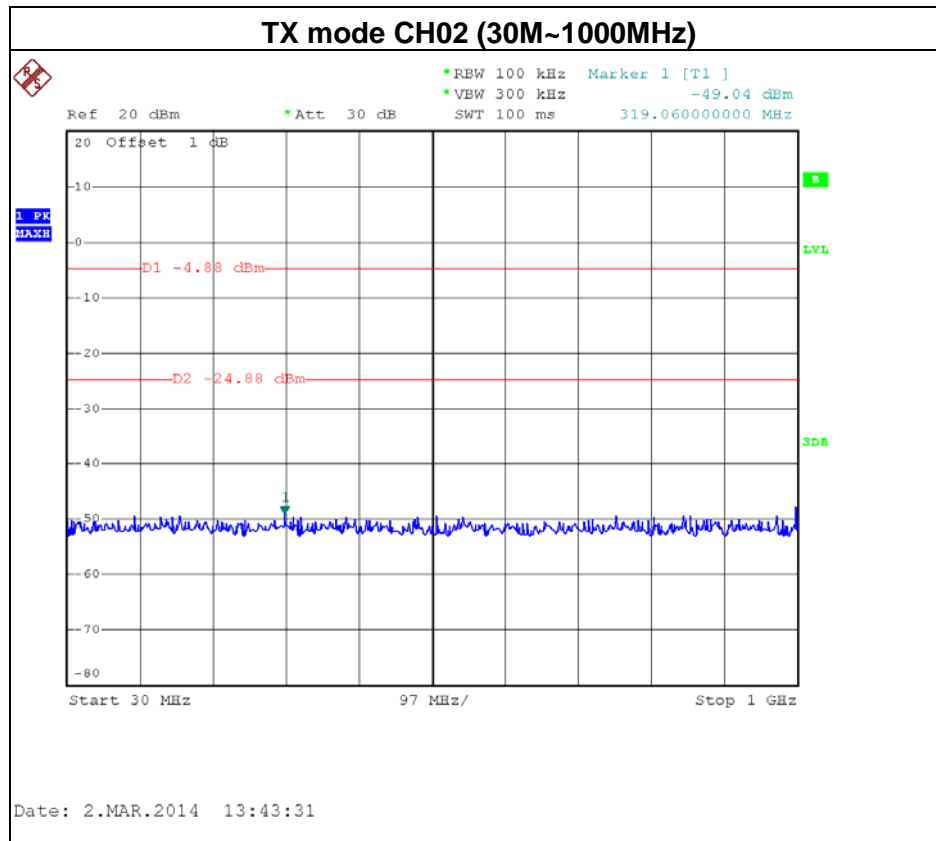
**7.1.6 TEST RESULTS**

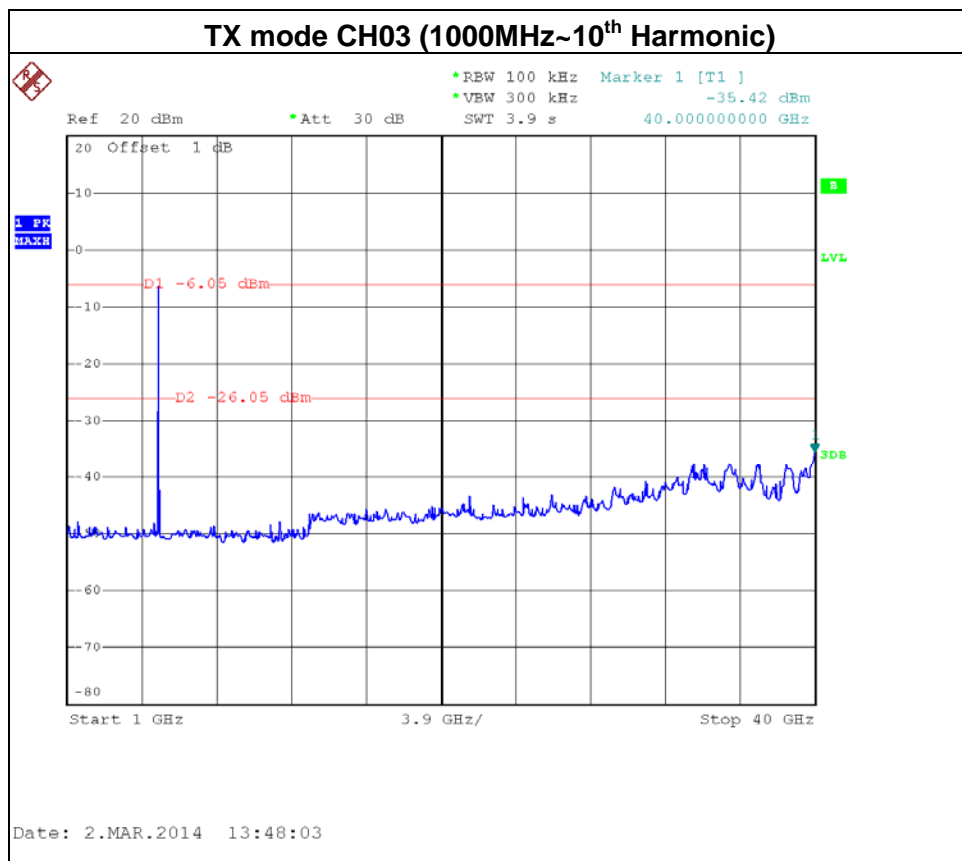
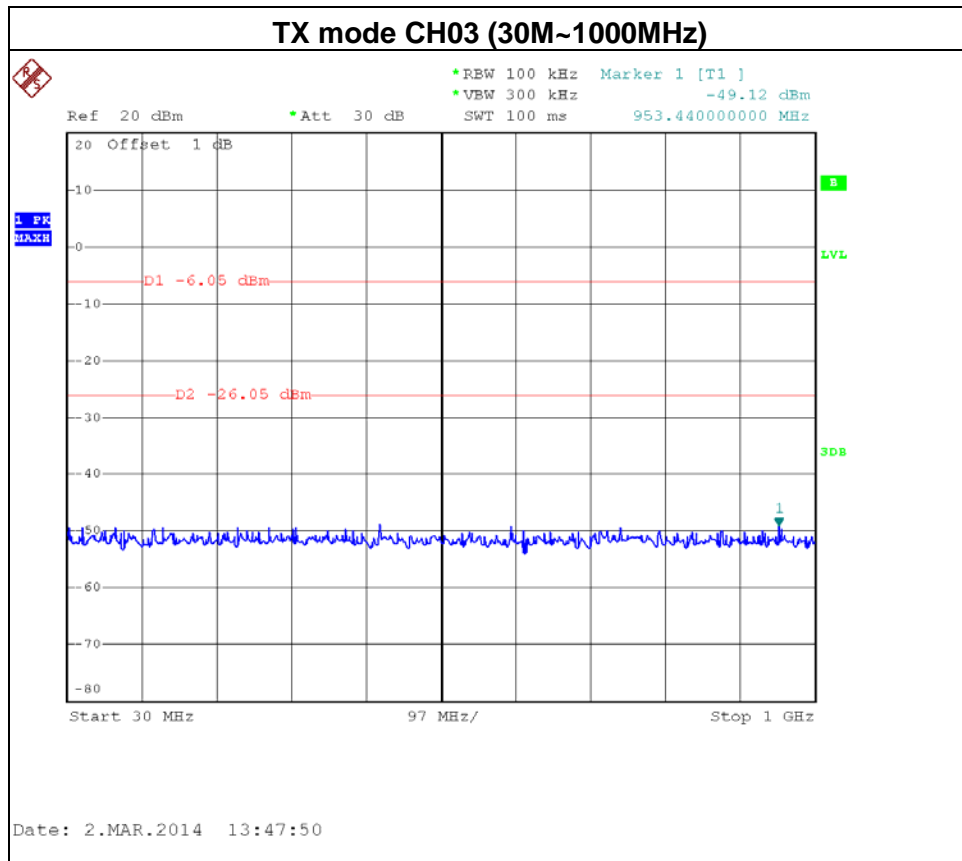
Test Mode :	TX Mode
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## 8. POWER SPECTRAL DENSITY TEST

### 8.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e)	Power Spectral Density	8 dBm (in any 3KHz)	5736 - 5814	PASS

### 8.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov. 09, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of Equipment List is One Year.

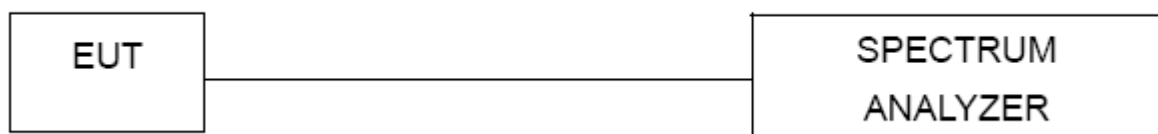
### 8.1.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW=3KHz, VBW=10KHz, Sweep time = Auto.

### 8.1.3 DEVIATION FROM STANDARD

No deviation.

### 8.1.4 TEST SETUP



### 8.1.5 EUT OPERATION CONDITIONS

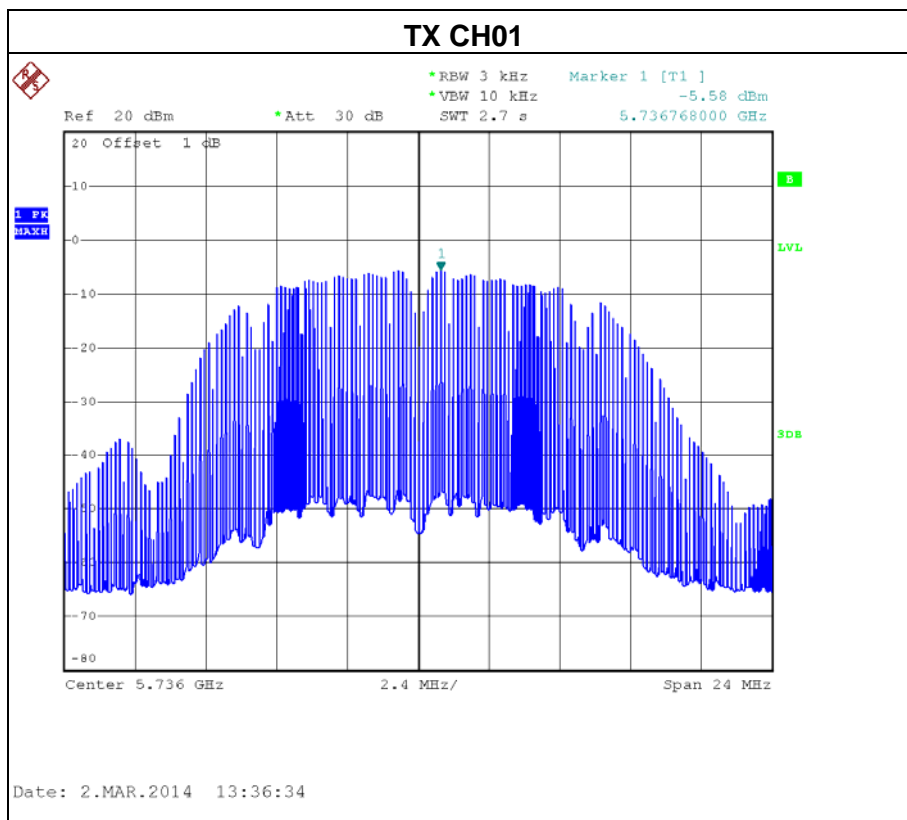
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

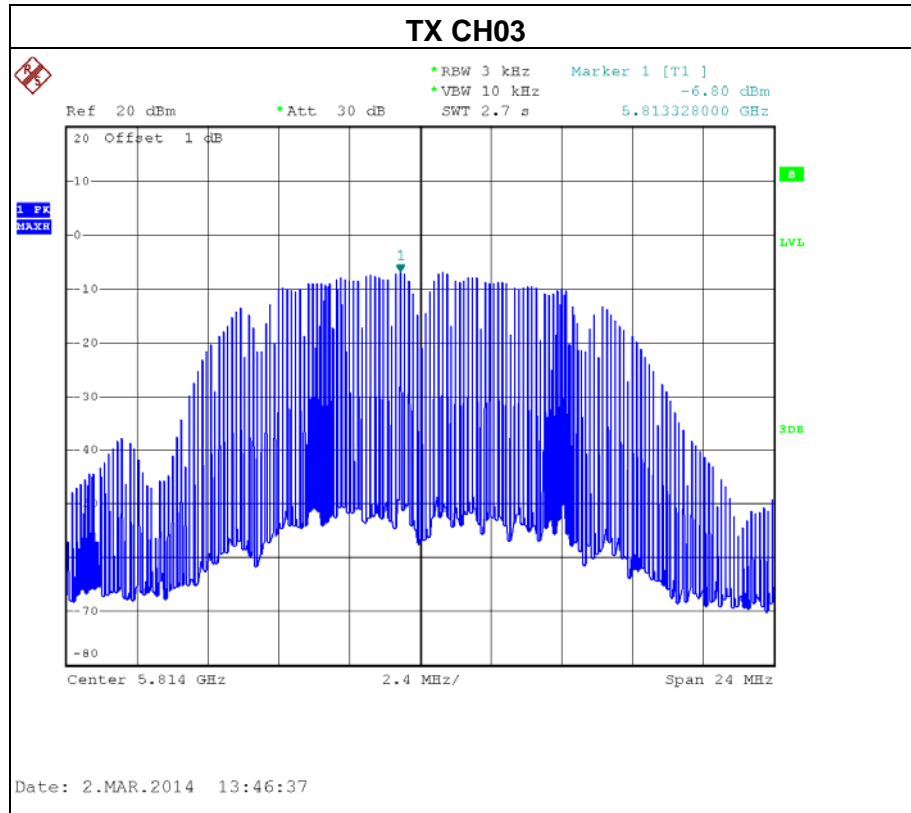
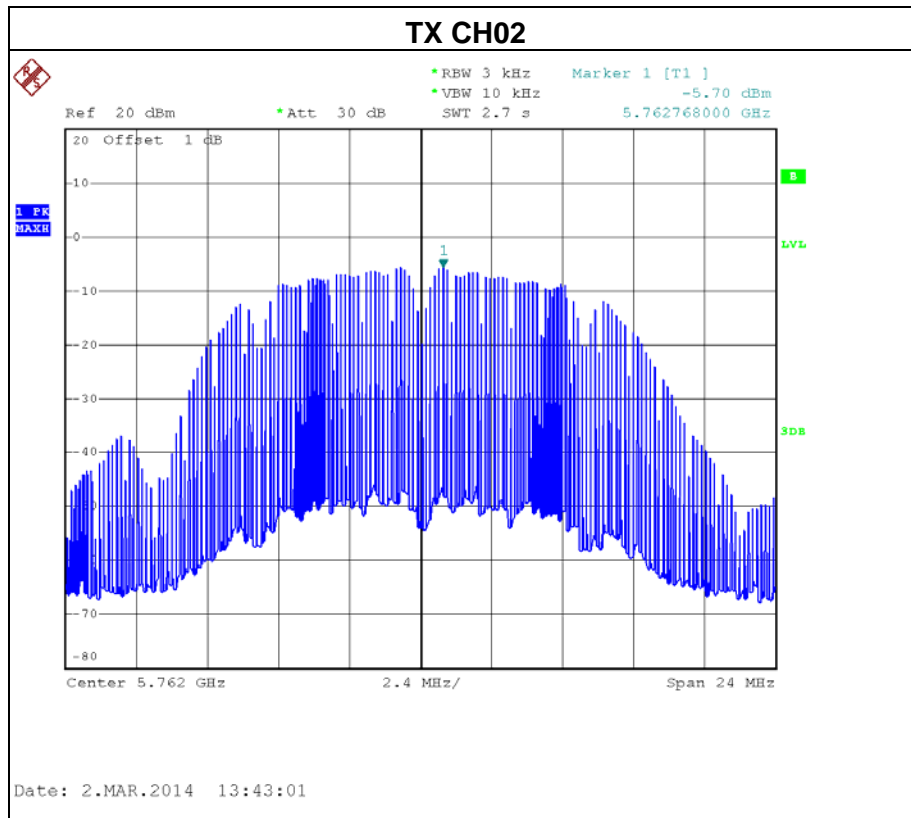


### 8.1.6 TEST RESULTS

Test Mode :	TX Mode /CH01, CH02, CH03
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Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	5736 MHz	-5.58	8
CH02	5762 MHz	-5.70	8
CH03	5814 MHz	-6.80	8







## 9. EUT TEST PHOTO

### Conducted Measurement Photos



**Radiated Measurement Photos  
9KHz to 30MHz**





**Radiated Measurement Photos  
30MHz to 1GHz**





**Radiated Measurement Photos  
Above 1G**

