



Neutron Engineering Inc.

FCC&IC Radio Test Report

FCC ID: 2AANU-HTL3110

IC: 11260A-HTL3110

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

Issued Date : Mar. 04, 2014
Project No. : 1312C260B
Equipment : SOUNDBAR SPEAKER
Model Name : HTL3110B/F7; HTL31X0X/F7(the "X" can
For FCC be blank or can be "0" to "9" or "A" to "Z" for
market use only)
Model Name : HTL3110B/F7
For IC
Applicant : WOOX Innovations Limited
Address : 5/F Philips Electronics Building, 5 Science
Park East Ave, HK Science Park Shatin, NT
Hong Kong

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Feb. 20, 2014
Date of Test: Feb. 20, 2014~ Mar. 03, 2014

Testing Engineer : David Mao
(David Mao)
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Neutron Engineering Inc.

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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 **R.O.C.**, 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-FICP-2-1312C260	Original Issue.	Jan. 17, 2014
NEI-FICP-2-1312C260B	Original Issue. Compared with the previous report (NEI-FICP-1-1312C260), the difference as below: 1. The wireless antenna has changed of the product, the BT parts are the same to original product. The Radiated above 1G, Bandwidth, Antenna Conducted are re-test.	Mar. 04, 2014



1. CERTIFICATION

Equipment : SOUNDBAR SPEAKER
Brand Name : PHILIPS
Model Name : HTL3110B/F7; HTL31X0X/F7(the "X" can be blank or can be "0" to "9" or "A" to
For FCC "Z" for market use only)
Model Name : HTL3110B/F7
For IC
Applicant : WOOX Innovations Limited
Manufacturer : WOOX Innovations Limited
Address : 5/F Philips Electronics Building, 5 Science Park East Ave, HK Science Park
Shatin, NT Hong Kong
Factory : 1) Eastech Electronics (Hui Yang) Co. Ltd.
2) Dixon Technologies (India) Pvt. Ltd.
3) Philips do Brasil Ltda
4) Fabrica Austral de Productos Electricos Sociedad Anonima
5) Jasz - Plasztk Ltd
6) SKH plastic. spol. s.r.o
7) Woon Innovations
Address : 1) Dong Feng District Xinxu, Hui Yang, Hui Zhou, Guangdong, P.R.China
2) Khasara no. 992 / 2 , Central Hope Town , Industrial Area , Selaqui ,
Dehardun , Uttaranchal, India.
3) Avenue Torquato Tapajos 2236, Flores Cep 67048-0660
Manaus-Amazonas, BRAZIL
4) Islas Malvinas 1180, CP 9240. Rio Grande, Tierra del Fuego , ARGENTINA .
5) H-5100 Jászberény, Necs telep 1. Jászberény, Hungary
6) Matúškovo 1586, Galanta, Slovakia
7) Avenida Torquato Tapajós, 7503 Tarumã - CEP 69041-025, Manaus -
Amazonas
Date of Test : Feb. 20, 2014~ Mar. 03, 2014
Test Sample : Engineering Sample
Standard(s) : FCC Part15, Subpart C(15.249)/ ANSI C63.4-2009
Canada RSS-210:2010
RSS-GEN Issue 3, Dec 2010

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-FICP-2-1312C260B) 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

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.249) Canada RSS-210:2010; RSS-GEN Issue 3, Dec 2010				
StandardSection		Test Item	Judgment	Remark
FCC	IC			
15.207	RSS-GEN Issue 3, Dec 2010 7.2.4	Conducted Emission	PASS	
15.209 15.249	RSS-210, Issue 8, Annex 2, Section 2.9	Radiated Spurious Emission	PASS	

NOTE:

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



2.1 TEST FACILITY

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

Neutron's test firm number for FCC: 319330

Neutron's test firm number for IC: 4428B-1

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	SOUNDBAR SPEAKER	
Brand Name	PHILIPS	
Model Name For FCC	HTL3110B/F7; HTL31X0X/F7(the "X" can be blank or can be "0" to "9" or "A" to "Z" for market use only)	
Model Name For IC	HTL3110B/F7	
Model Difference	Please refer to page 5.	
Product Description	Operation Frequency	2405.376~2466.816 MHz
	Modulation Technology	GFSK(1Mbps)
	Data rate	
	Field Strength	93.86dBuV/m (AV Max.)
Power Source	DC voltage supplied from AC Adapter #1 Brand: DYS Model name: DYS602-210309W #2 Brand: PHILIPS Model name: AS650-210-AA309	
Power Rating	#1 I/P: AC 100-240V~ 50/60Hz 1.5A O/P: 21.0V 3.09A #2 I/P: AC 100-240V~ 50/60Hz 1.5A O/P: 21.0V 3.09A	
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.

Frequency Channel			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2405.376	05	2442.240
02	2414.592	06	2451.456
03	2423.808	07	2460.672
04	2433.024	08	2466.816

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	PCB	N/A	2	-

Note: The EUT has two types antenna, only PCB antenna is used, the PIFA antennas no used.



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 possible 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
Mode 2	Low – 2405.376MHz
Mode 3	Middle – 2433.024MHz
Mode 4	High -2466.816MHz

For Conducted Test	
Final Test Mode	Description
Mode 1	TX Mode

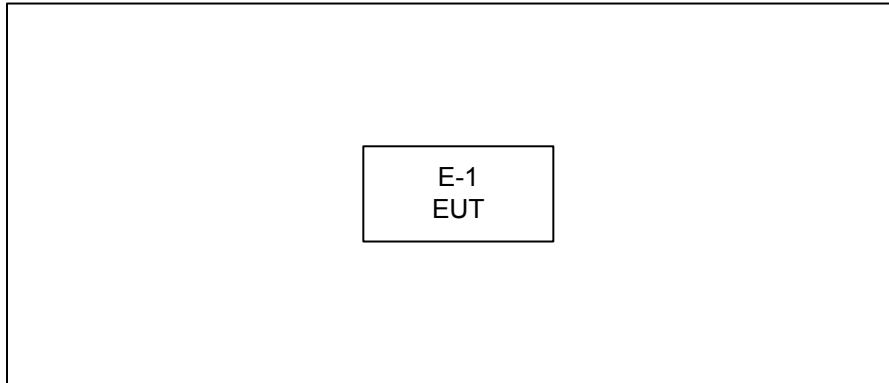
For Radiated Test	
Final Test Mode	Description
Mode 2	Low – 2405.376MHz
Mode 3	Middle – 2433.024MHz
Mode 4	High -2466.816MHz

Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2)The EUT has two adapters (DYS602-210309W and AS650-210-AA309, were found to be the worst case during the pre-scanning test as Adapter: AS650-210-AA309.



3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED





3.4 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/IC	Series No.	Note
E-1	SOUNDBAR SPEAKER	PHILIPS	HTL3110B/F7	2AANU-HTL3110 11260A-HTL3110	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	



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	66.00	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.

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

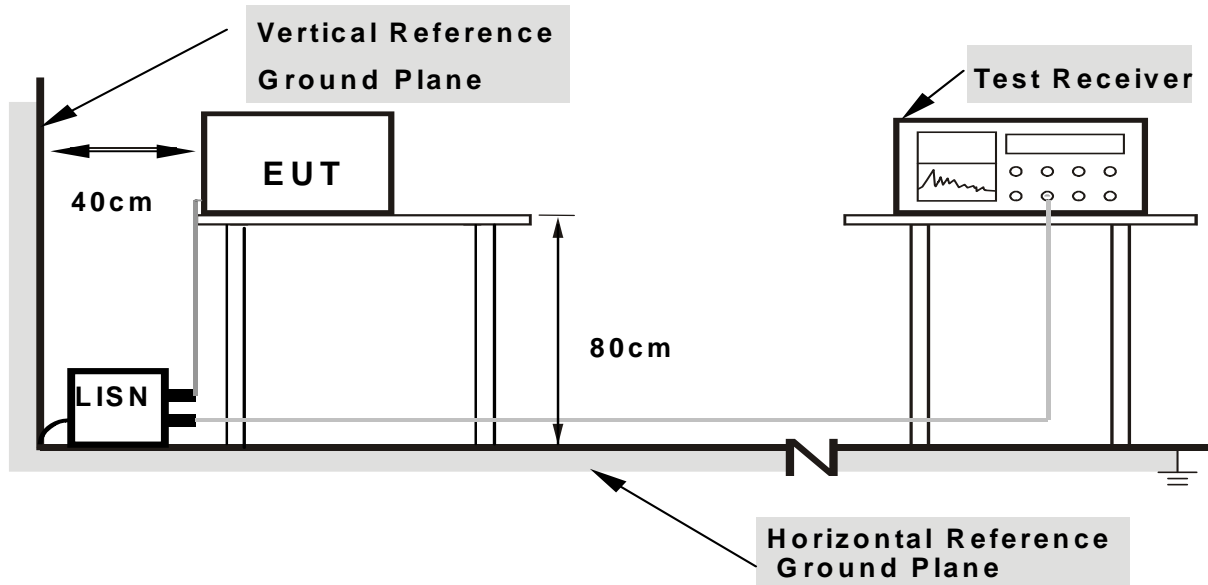
4.1.2 TEST PROCEDURE

- a. 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.
- b. 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.
- c. 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.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 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

4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting mode.

4.1.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: 120V/60Hz

4.1.7 TEST RESULTS

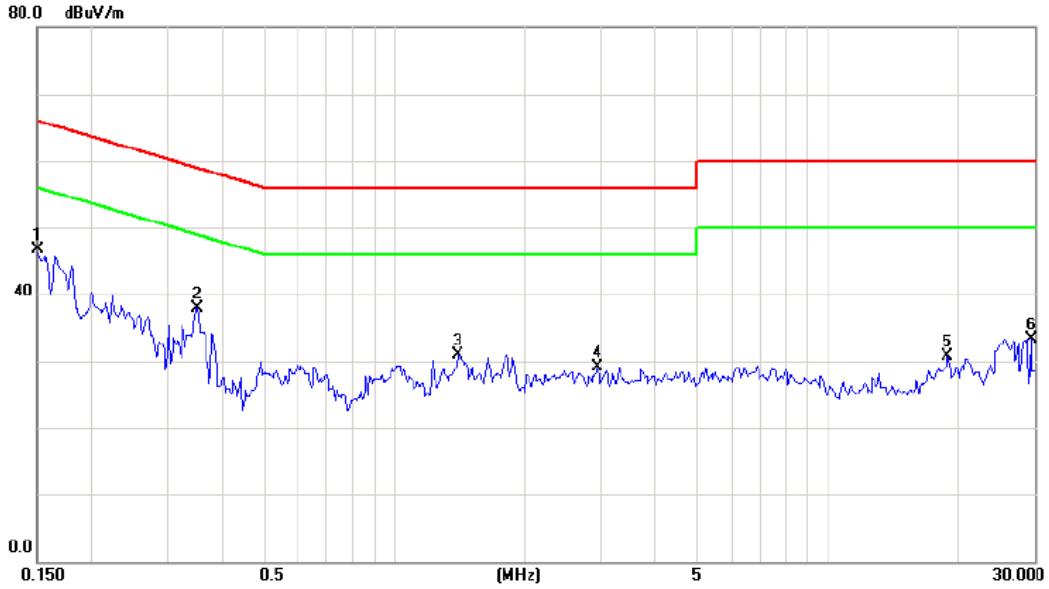
Remark:

- (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

Line

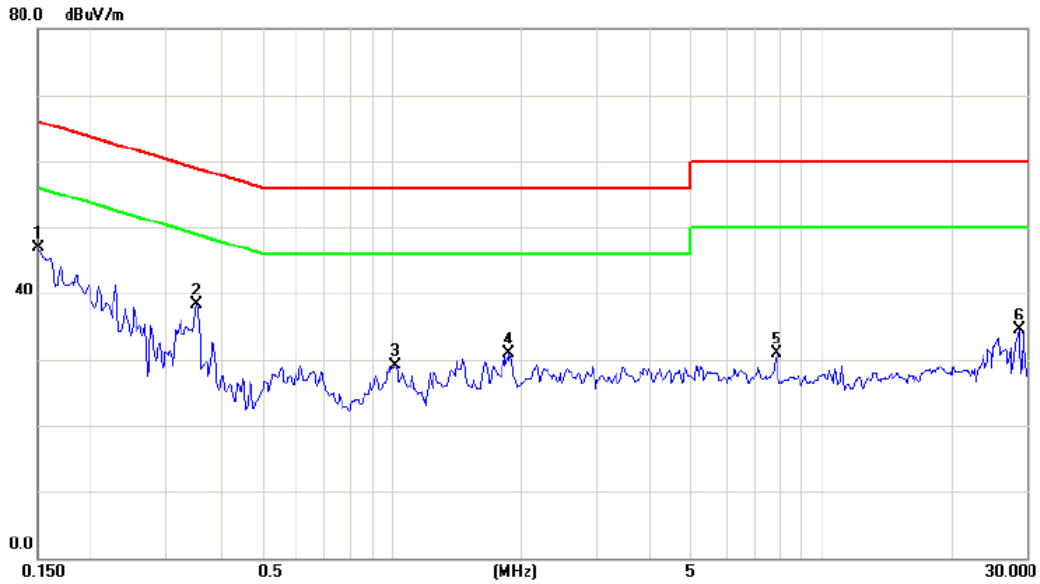


No.	Mk.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.1500	37.07	9.63	46.70	66.00	-19.30	peak	
2		0.3531	28.20	9.68	37.88	58.89	-21.01	peak	
3		1.4073	21.18	9.78	30.96	56.00	-25.04	peak	
4		2.9546	19.29	9.86	29.15	56.00	-26.85	peak	
5		18.9960	20.41	10.26	30.67	60.00	-29.33	peak	
6		29.4140	23.06	10.32	33.38	60.00	-26.62	peak	



Test Mode: TX Mode

Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.1500	37.15	9.70	46.85	66.00	-19.15	peak	
2		0.3531	28.52	9.73	38.25	58.89	-20.64	peak	
3		1.0250	19.31	9.77	29.08	56.00	-26.92	peak	
4		1.8843	21.15	9.85	31.00	56.00	-25.00	peak	
5		7.8593	20.83	10.06	30.89	60.00	-29.11	peak	
6		28.8003	23.88	10.64	34.52	60.00	-25.48	peak	



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

Frequencies (MHz)	Field Strength (microrvolts/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
960~1000	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

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).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range (MHz)
Field strength of fundamental 50000 μV/m (94 dBμV/m) @ 3 m	2400-2483.5
Field strength of harmonics 500 μV/m (54 dBμV/m) @ 3 m	Above 2483.5



Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic

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 TEST PROCEDURE

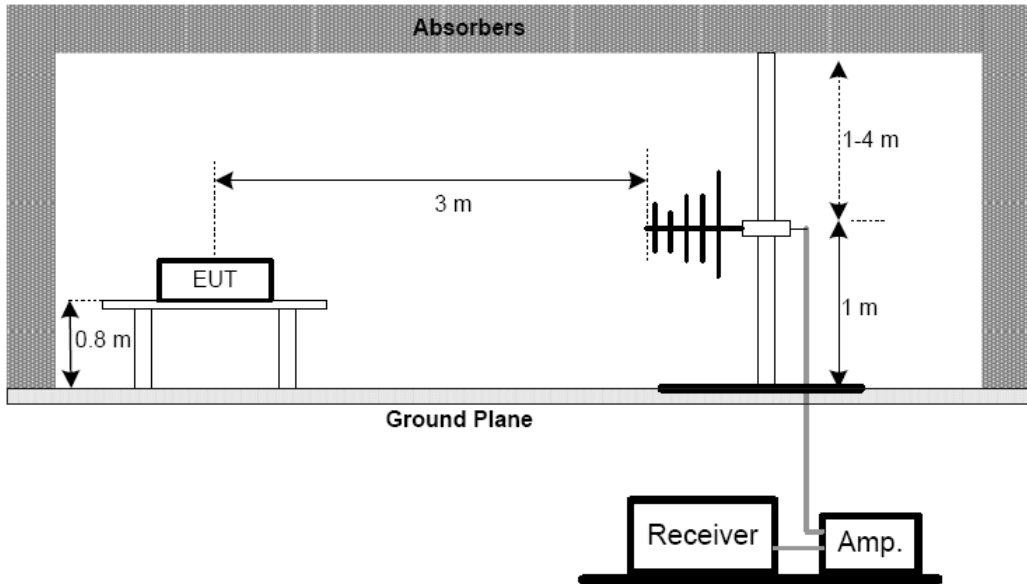
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. 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.
- d. 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 AV detector mode re-measured.
- e. 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.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

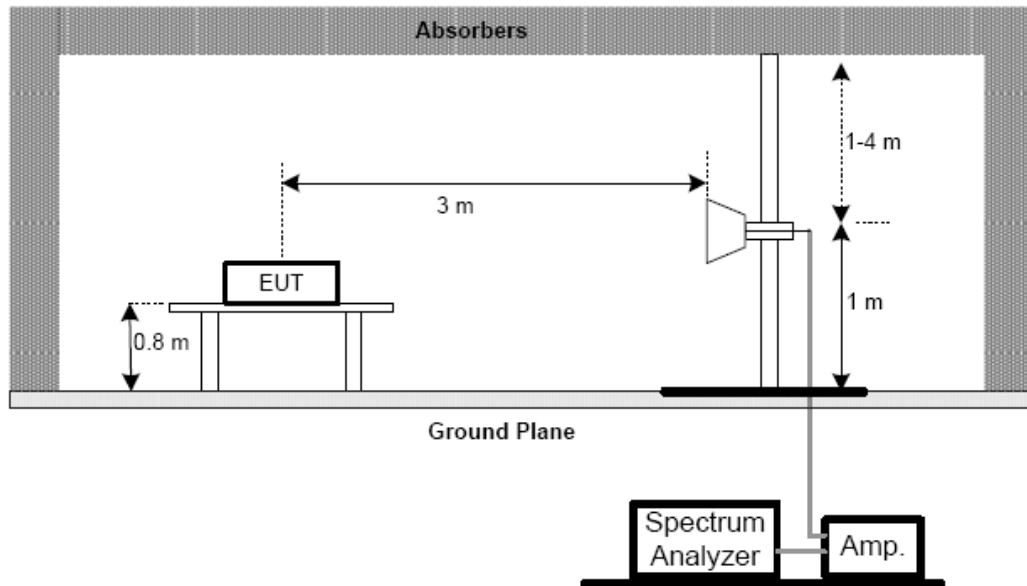
No deviation

4.2.4 TEST SETUP

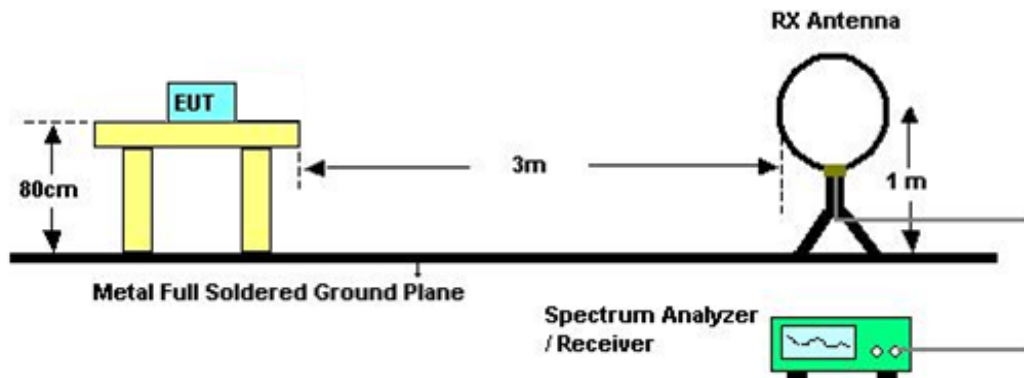
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For radiated emissions below 30MHz



4.2.5 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.

4.2.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: 120V/60Hz



4.2.7 TEST RESULTS (BELOW 30MHz)

Test Mode:	TX2405.376MHz
------------	---------------

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0095	0°	25.13	24.30	49.43	128.05	-78.62	AVG
0.0095	0°	29.11	24.30	53.41	148.05	-94.64	PK
0.0254	0°	21.08	23.96	45.04	119.50	-74.46	AVG
0.0254	0°	24.31	23.96	48.27	139.50	-91.23	PK
0.0385	0°	21.21	23.13	44.34	115.89	-71.55	AVG
0.0385	0°	24.13	23.13	47.26	135.89	-88.63	PK
0.0665	0°	18.38	22.07	40.45	111.15	-70.70	AVG
0.0665	0°	23.11	22.07	45.18	131.15	-85.97	PK
0.2659	0°	20.45	20.36	40.81	99.11	-58.30	AVG
0.2659	0°	22.72	20.36	43.08	119.11	-76.03	PK
1.4837	0°	27.21	19.55	46.76	64.18	-17.42	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0097	90°	19.21	24.30	43.51	127.91	-84.40	AVG
0.0097	90°	20.91	24.30	45.21	147.91	-102.70	PK
0.0224	90°	15.21	24.15	39.36	120.60	-81.24	AVG
0.0224	90°	17.11	24.15	41.26	140.60	-99.34	PK
0.0466	90°	18.32	22.61	40.93	114.23	-73.30	AVG
0.0466	90°	21.21	22.61	43.82	134.23	-90.41	PK
0.0776	90°	21.21	21.85	43.06	109.81	-66.75	AVG
0.0776	90°	22.01	21.85	43.86	129.81	-85.95	PK
0.3753	90°	21.13	20.10	41.23	96.12	-54.89	AVG
0.3753	90°	24.07	20.10	44.17	116.12	-71.95	PK
1.6963	90°	25.21	19.53	44.74	63.01	-18.27	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..



4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHz)

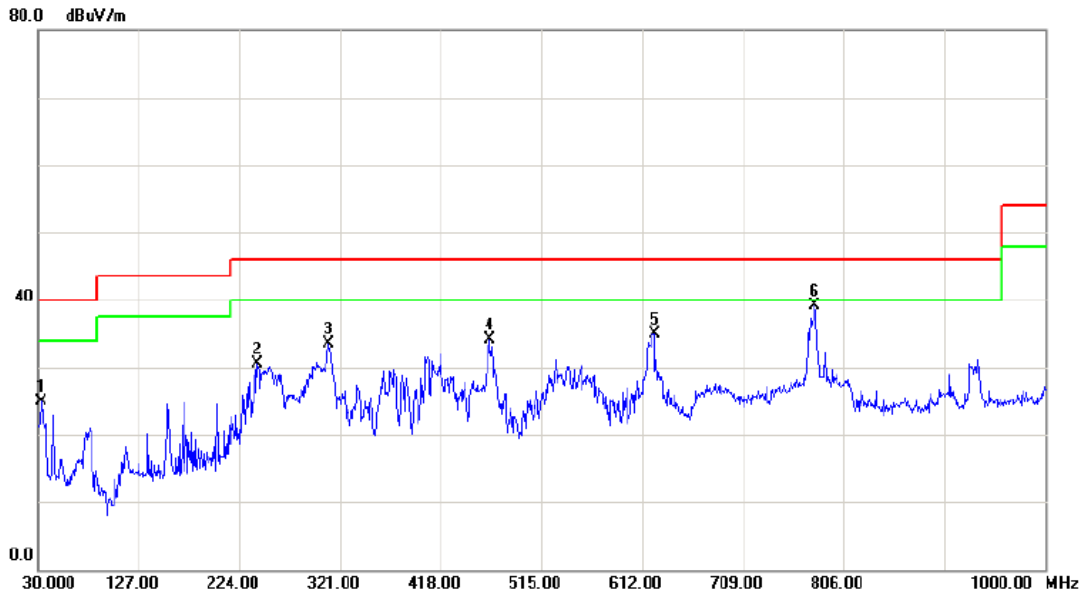
Remark :

- (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.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP 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.



Test Mode: TX 2405.376MHz

Vertical

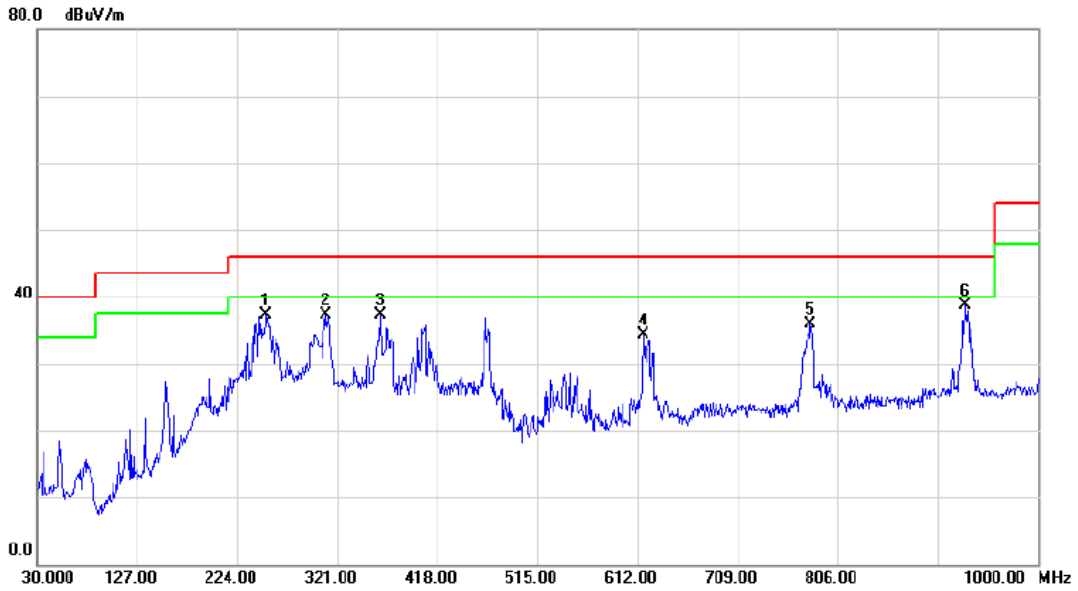


No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	32.9100	40.71	-15.75	24.96	40.00	-15.04	peak	
2	241.4600	45.37	-14.85	30.52	46.00	-15.48	peak	
3	310.3300	44.88	-11.29	33.59	46.00	-12.41	peak	
4	464.5600	43.36	-9.33	34.03	46.00	-11.97	peak	
5	623.6400	41.87	-6.90	34.97	46.00	-11.03	peak	
6 *	777.8700	42.93	-3.91	39.02	46.00	-6.98	peak	



Test Mode: TX 2405.376MHz

Horizontal

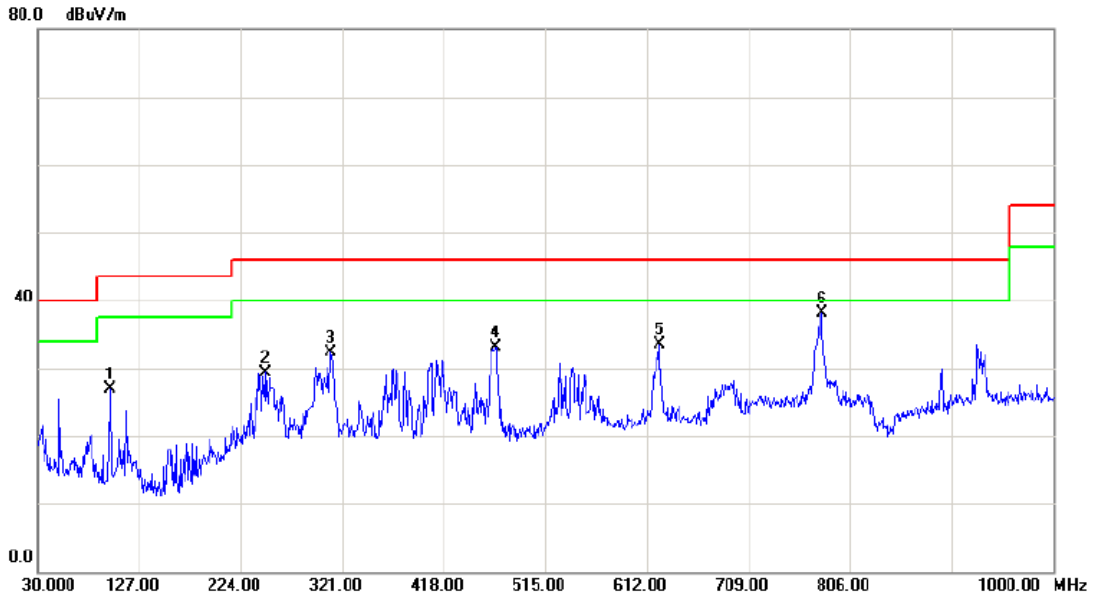


No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	252.1300	52.33	-14.93	37.40	46.00	-8.60	peak	
2	309.3600	48.69	-11.29	37.40	46.00	-8.60	peak	
3	362.7100	48.29	-11.06	37.23	46.00	-8.77	peak	
4	617.8200	41.55	-7.20	34.35	46.00	-11.65	peak	
5	779.8100	39.74	-3.84	35.90	46.00	-10.10	peak	
6 *	929.1900	39.50	-0.84	38.66	46.00	-7.34	peak	



Test Mode: TX 2433.024MHz

Vertical

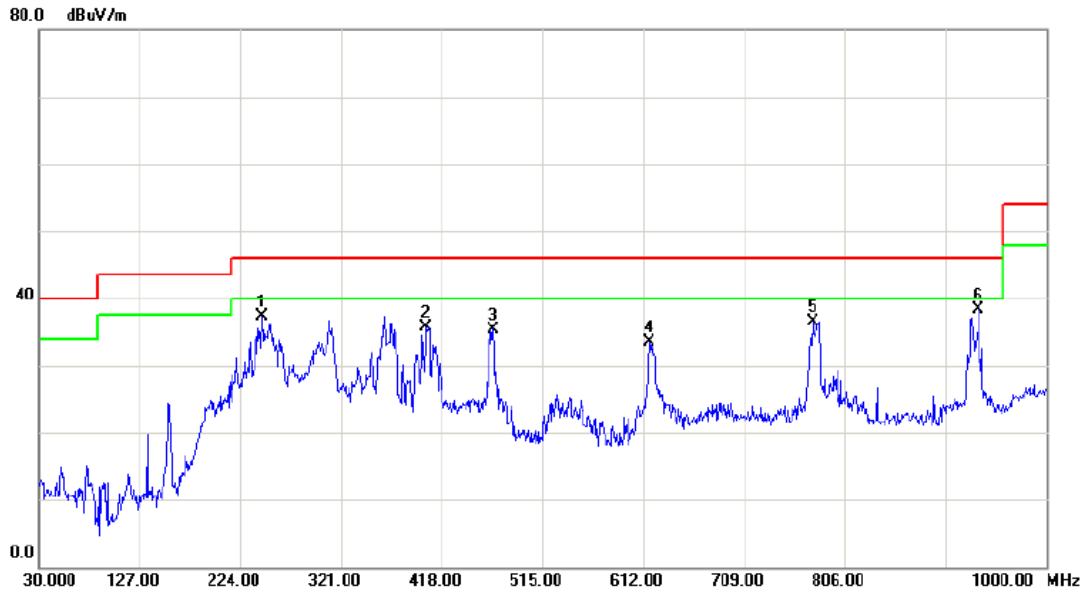


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		98.8700	43.41	-16.46	26.95	43.50	-16.55	peak	
2		248.2500	44.35	-14.95	29.40	46.00	-16.60	peak	
3		309.3600	43.66	-11.29	32.37	46.00	-13.63	peak	
4		467.4700	42.44	-9.41	33.03	46.00	-12.97	peak	
5		623.6400	40.46	-6.90	33.56	46.00	-12.44	peak	
6	*	778.8400	42.05	-3.87	38.18	46.00	-7.82	peak	



Test Mode: TX 2433.024MHz

Horizontal

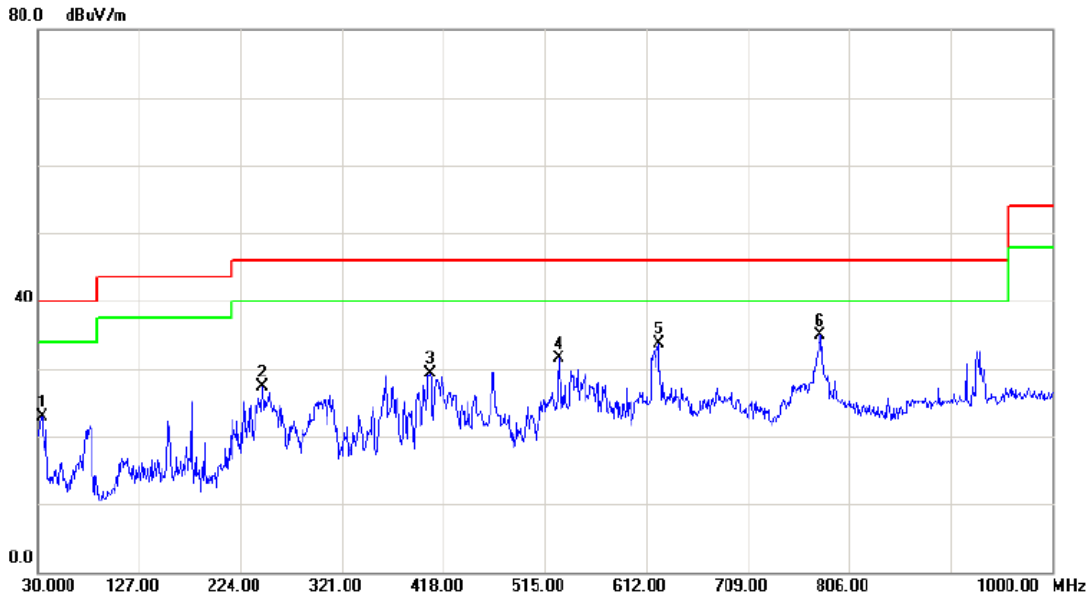


No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	245.3400	52.11	-14.90	37.21	46.00	-8.79	peak	
2	403.4500	45.59	-9.81	35.78	46.00	-10.22	peak	
3	467.4700	44.81	-9.41	35.40	46.00	-10.60	peak	
4	617.8200	40.72	-7.20	33.52	46.00	-12.48	peak	
5	774.9600	40.53	-4.01	36.52	46.00	-9.48	peak	
6 *	935.0100	39.03	-0.75	38.28	46.00	-7.72	peak	



Test Mode: TX 2466.816MHz

Vertical

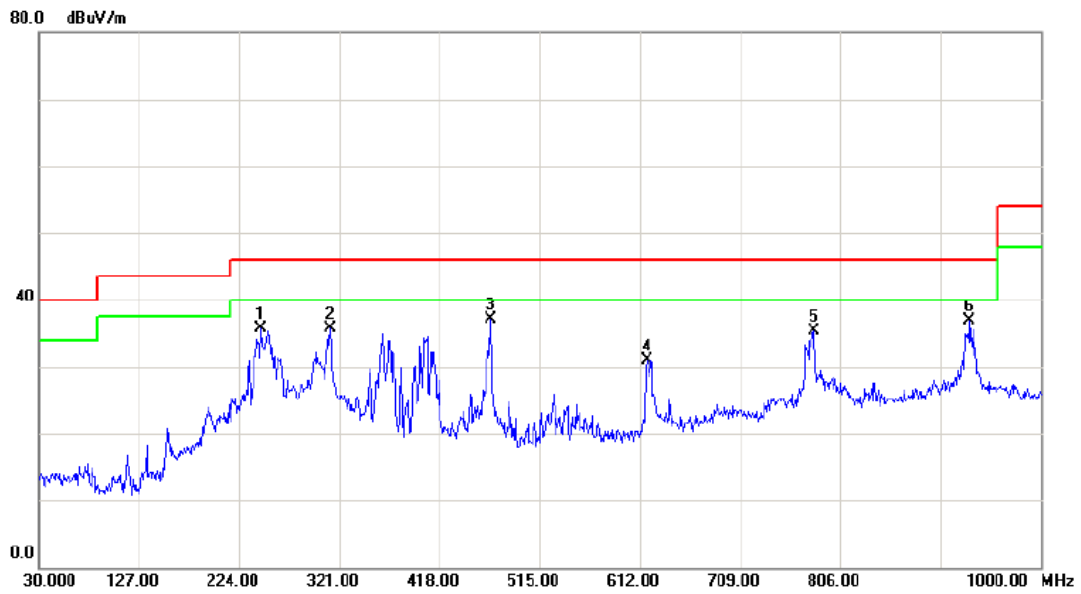


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		33.8800	38.43	-15.54	22.89	40.00	-17.11	peak	
2		245.3400	42.13	-14.90	27.23	46.00	-18.77	peak	
3		405.3900	39.08	-9.78	29.30	46.00	-16.70	peak	
4		528.5800	40.32	-8.80	31.52	46.00	-14.48	peak	
5		623.6400	40.52	-6.90	33.62	46.00	-12.38	peak	
6	*	777.8700	38.87	-3.91	34.96	46.00	-11.04	peak	



Test Mode: TX 2466.816MHz

Horizontal



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	245.3400	50.55	-14.90	35.65	46.00	-10.35	peak	
2	312.2700	47.08	-11.30	35.78	46.00	-10.22	peak	
3 *	467.4700	46.60	-9.41	37.19	46.00	-8.81	peak	
4	618.7900	38.02	-7.15	30.87	46.00	-15.13	peak	
5	780.7800	39.18	-3.81	35.37	46.00	-10.63	peak	
6	931.1300	37.77	-0.81	36.96	46.00	-9.04	peak	



4.2.9 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 2405.376MHz

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	28.22	13.10	34.09	62.31	47.19	74.00	54.00	X/E
2404.70	V	69.22	58.37	34.14	103.36	92.51	114.00	94.00	X/F
4809.34	V	33.09	25.12	6.39	39.48	31.51	74.00	54.00	X/H
7214.39	V	31.07	22.39	11.93	43.00	34.32	74.00	54.00	X/H

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	31.62	13.09	34.09	65.71	47.18	74.00	54.00	X/E
2404.80	H	70.60	59.64	34.14	104.74	93.78	114.00	94.00	X/F
4809.89	H	34.26	27.01	6.39	40.65	33.40	74.00	54.00	X/H
7214.54	H	31.25	22.34	11.93	43.18	34.27	74.00	54.00	X/H

Test Mode: TX 2433.024MHz

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2436.50	V	68.92	58.73	34.23	103.15	92.96	114.00	94.00	X/F
4866.02	V	42.04	30.56	6.56	48.60	37.12	74.00	54.00	X/H
7304.25	V	39.16	27.45	12.12	51.28	39.57	74.00	54.00	X/H

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2435.50	H	70.12	59.19	34.23	104.35	93.42	114.00	94.00	X/F
4866.01	H	42.35	31.08	6.65	49.00	37.73	74.00	54.00	X/H
7304.12	H	39.11	28.08	12.12	51.23	40.20	74.00	54.00	X/H

Test Mode: TX 2466.816MHz

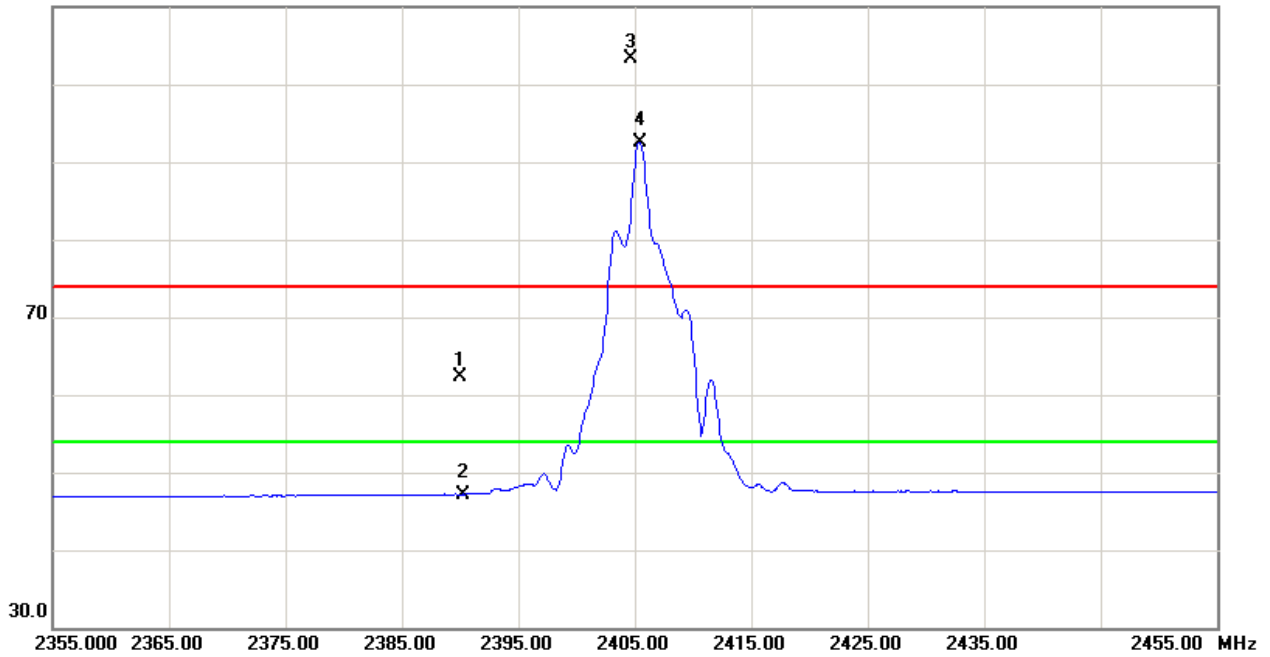
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2474.30	V	67.47	56.32	34.34	101.81	90.66	114.00	94.00	X/F
2483.50	V	31.63	15.41	34.37	66.00	49.78	74.00	54.00	X/E
4948.92	V	41.48	30.32	6.80	48.28	37.12	74.00	54.00	X/H
7243.19	V	39.65	27.68	11.99	51.64	39.67	74.00	54.00	X/H

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2474.30	H	70.67	59.52	34.34	105.01	93.86	114.00	94.00	X/F
2483.50	H	28.61	16.68	34.37	62.98	51.05	74.00	54.00	X/E
4948.61	H	40.23	29.63	6.80	47.03	36.43	74.00	54.00	X/H
7243.11	H	37.56	27.12	11.99	49.55	39.11	74.00	54.00	X/H

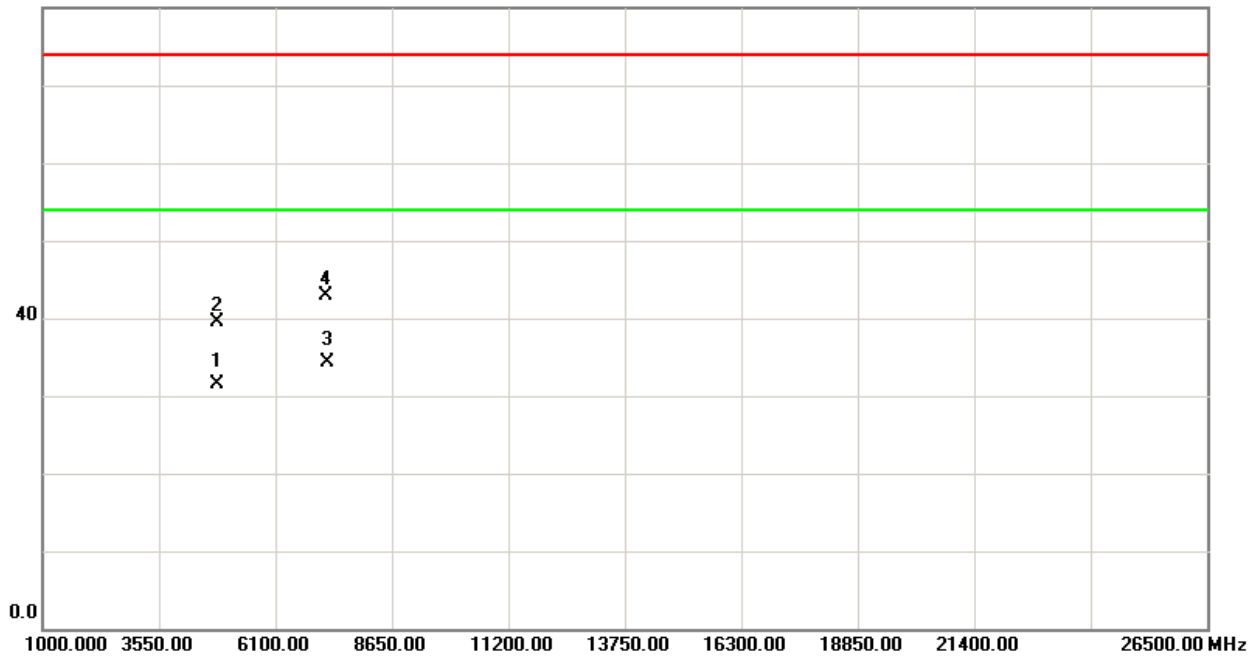


TX 2405.376MHz (Above 1000 MHz, Vertical)

110.0 dBuV/m

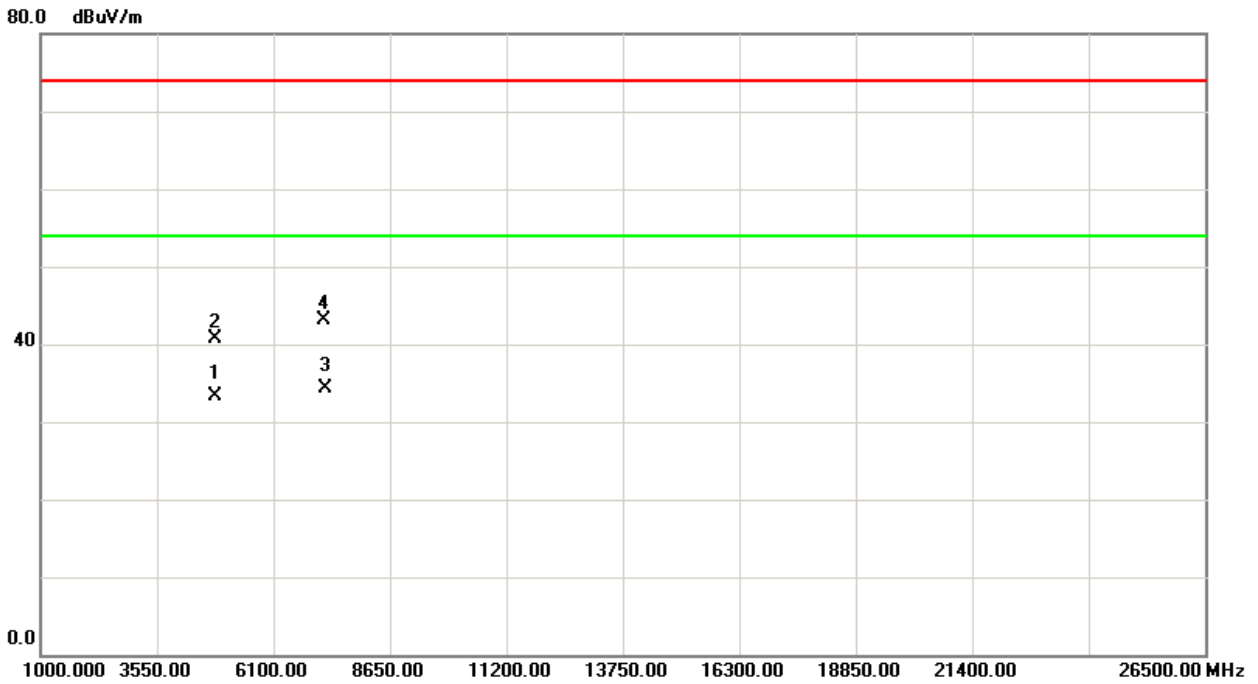
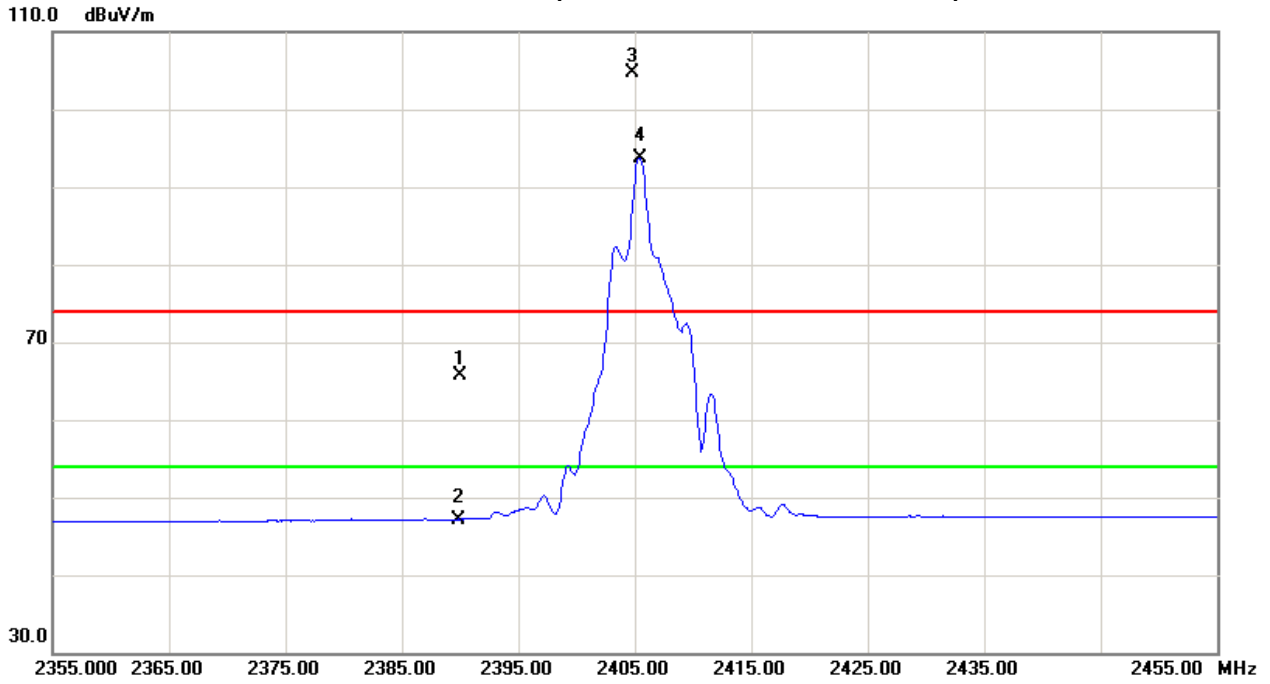


80.0 dBuV/m





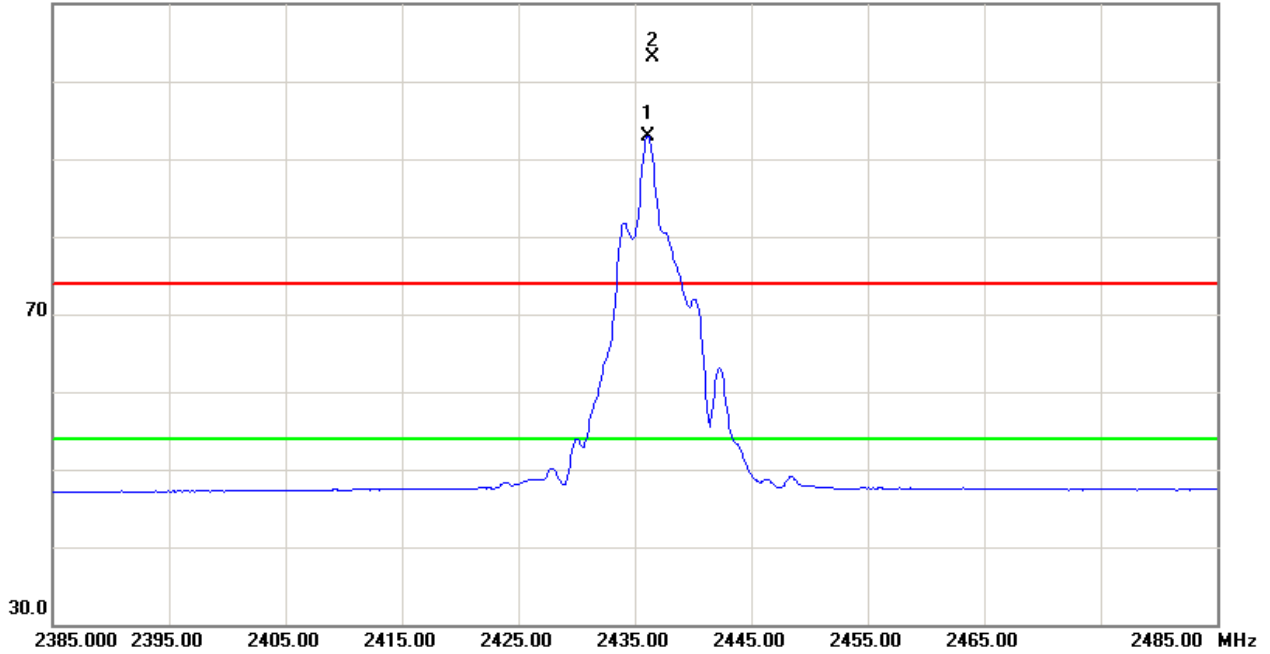
TX 2405.376MHz (Above 1000 MHz, Horizontal)



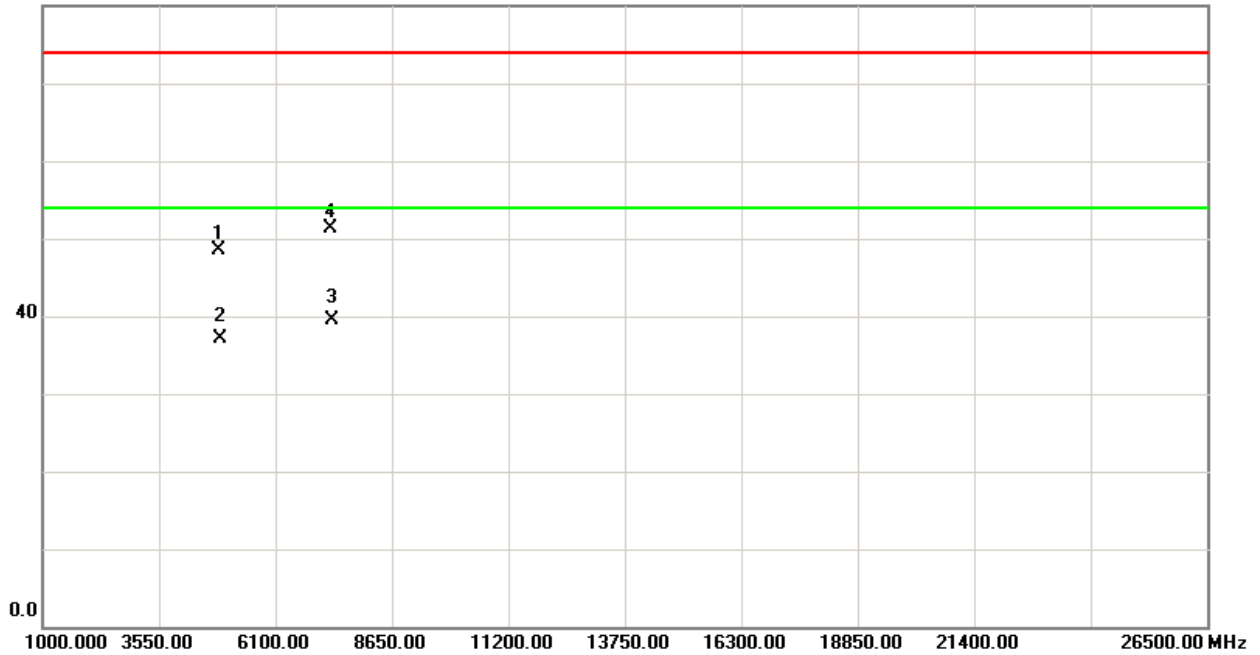


TX 2433.024 MHz (Above 1000 MHz, Vertical)

110.0 dBuV/m

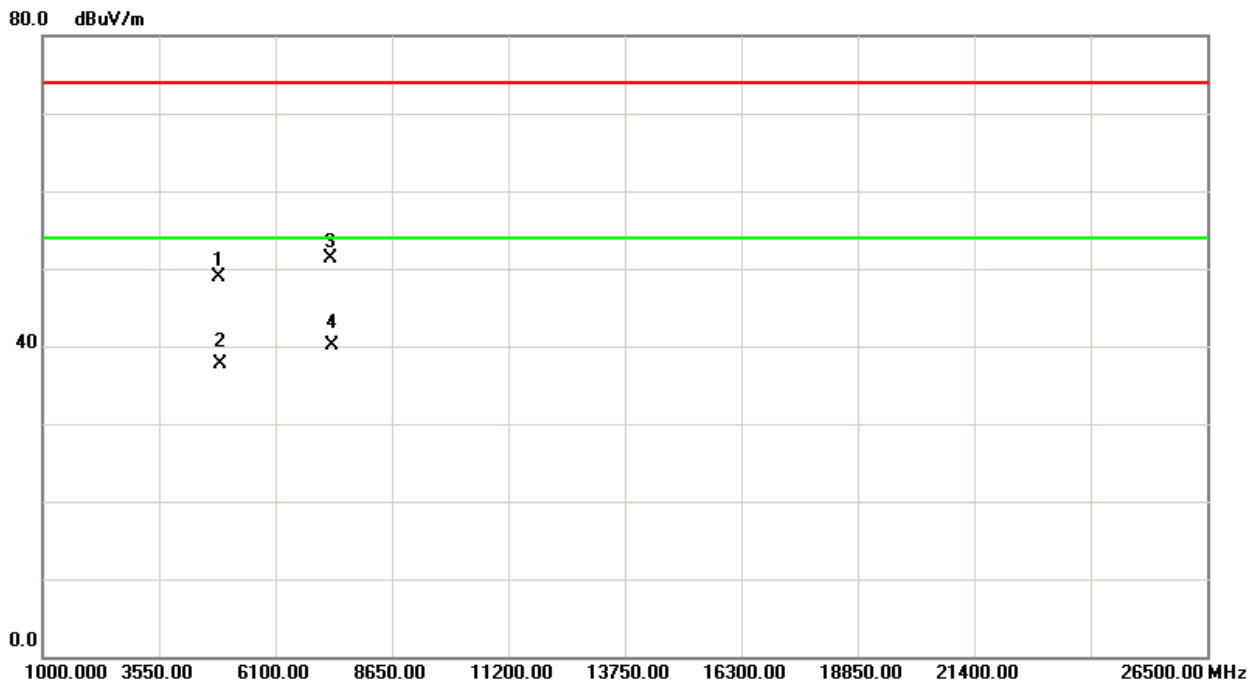
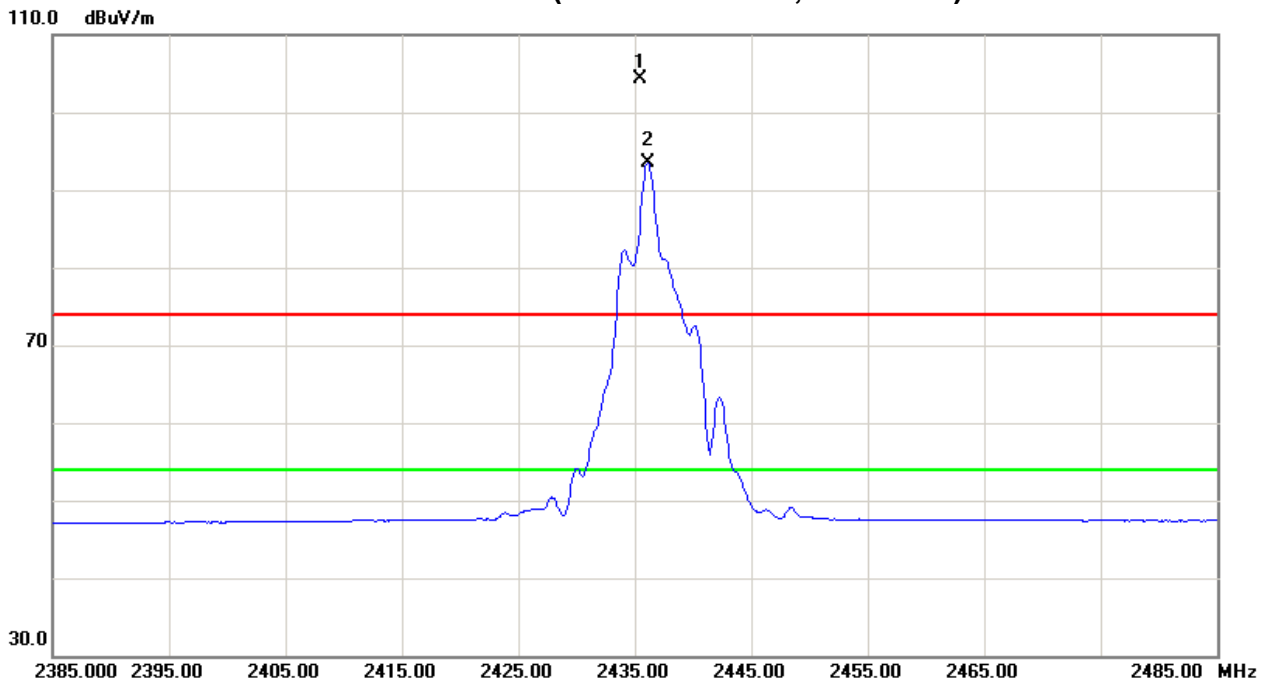


80.0 dBuV/m



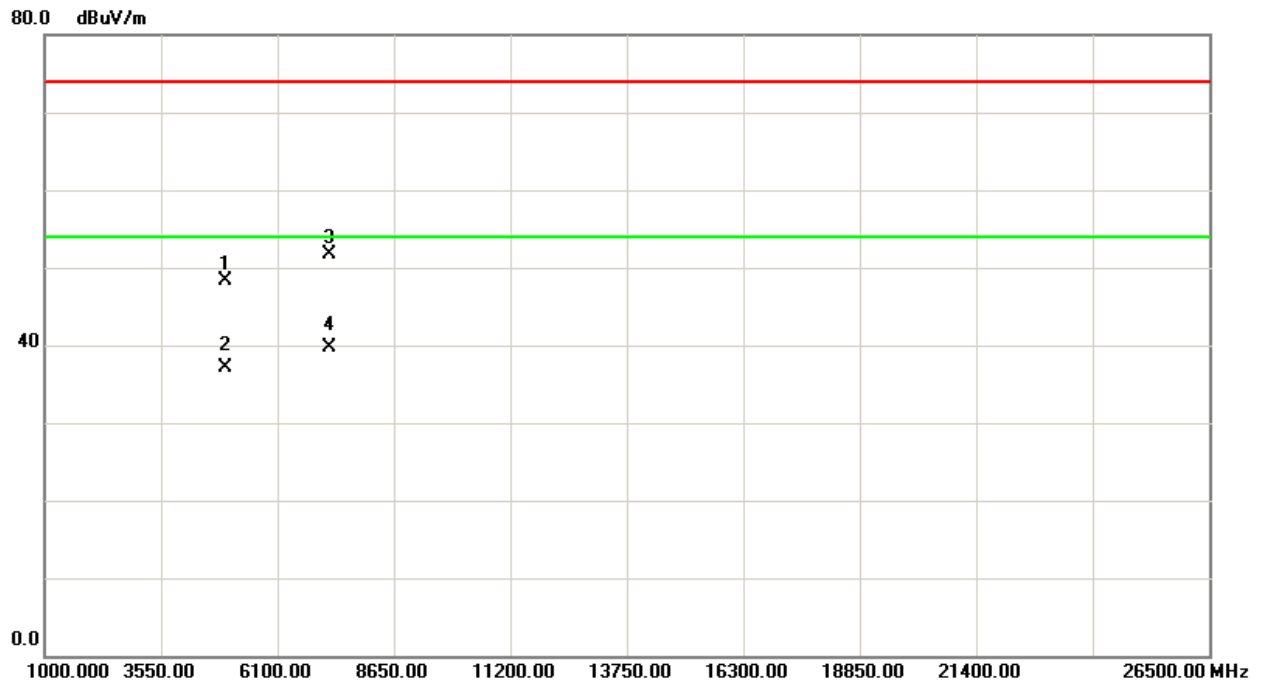
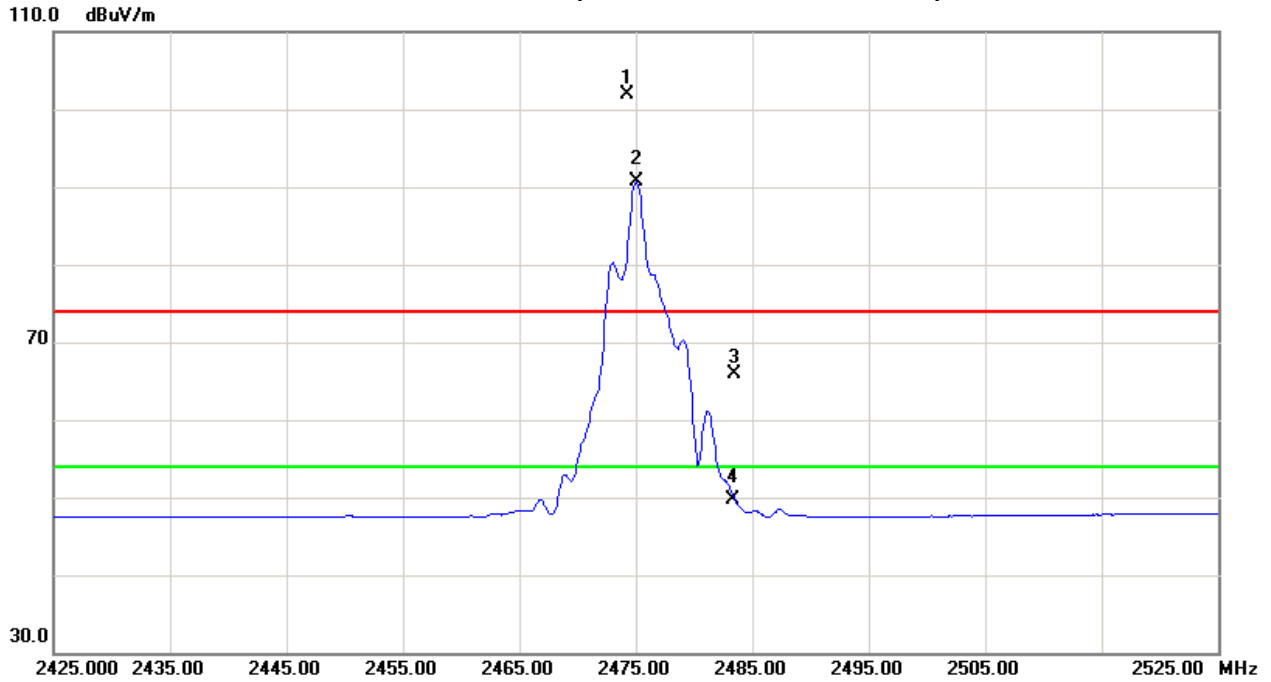


TX 2433.024MHz (Above 1000 MHz, Horizontal)





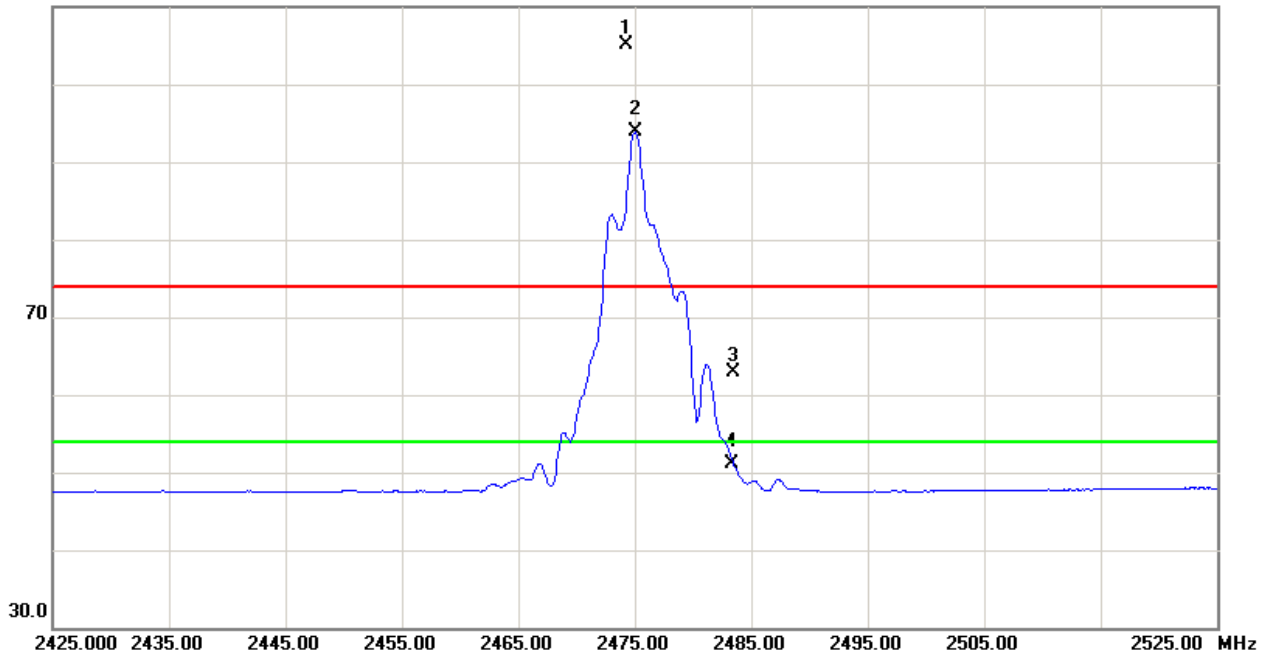
TX 2466.816MHz (Above 1000 MHz, Vertical)



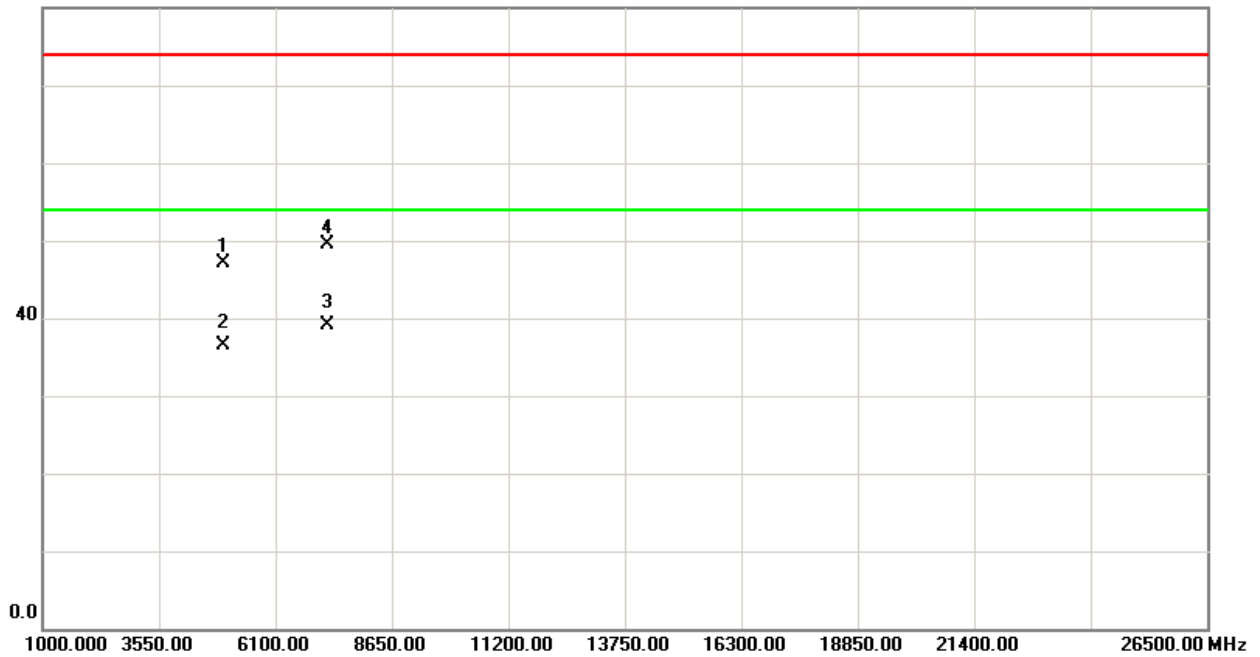


TX 2466.816MHz (Above 1000 MHz, Horizontal)

110.0 dBuV/m



80.0 dBuV/m





5. BANDWIDTH TEST

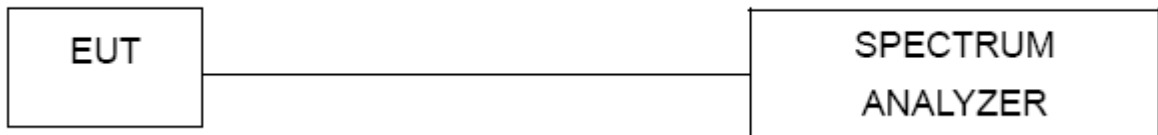
5.1 TEST PROCEDURE

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

5.2 DEVIATION FROM STANDARD

No deviation.

5.3 TEST SETUP



5.4 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.

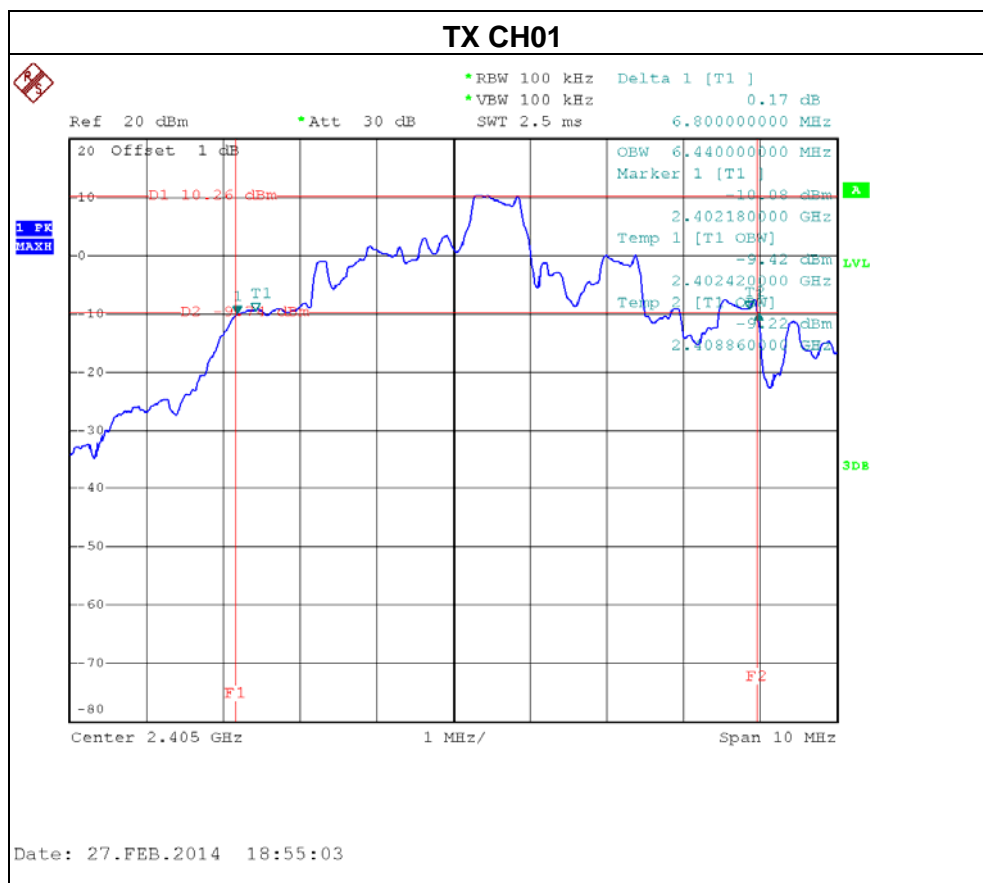
5.5 EUT TEST CONDITIONS

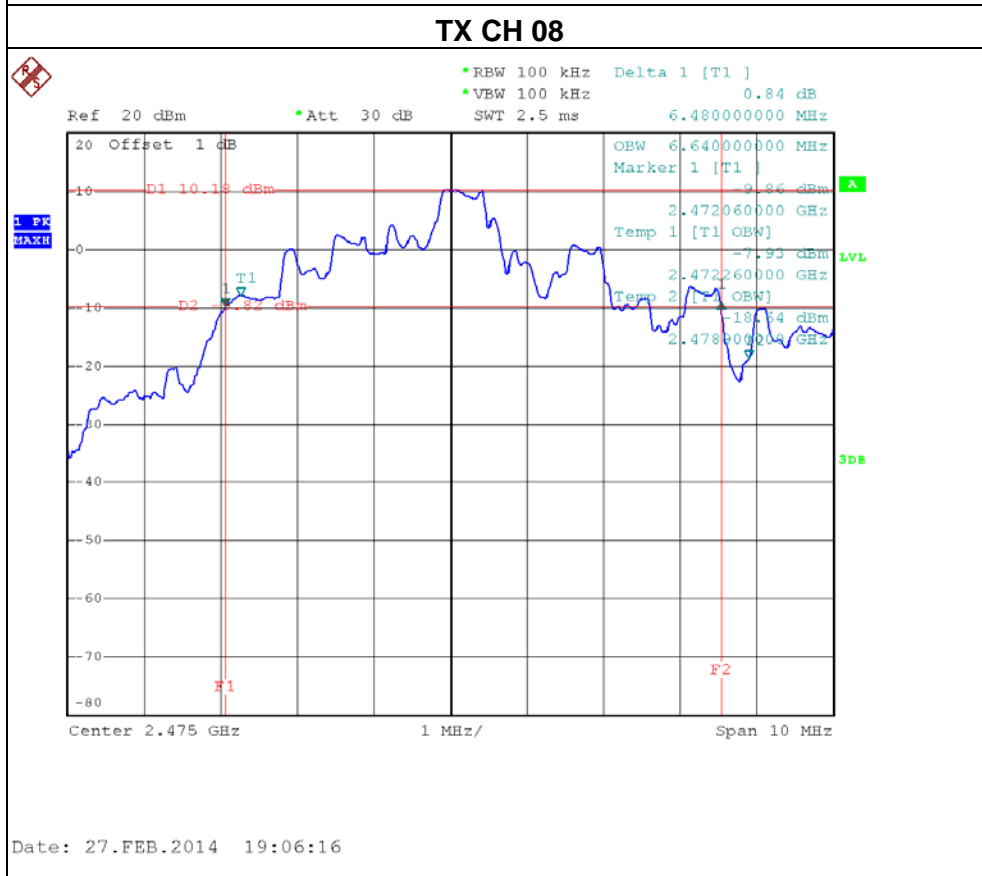
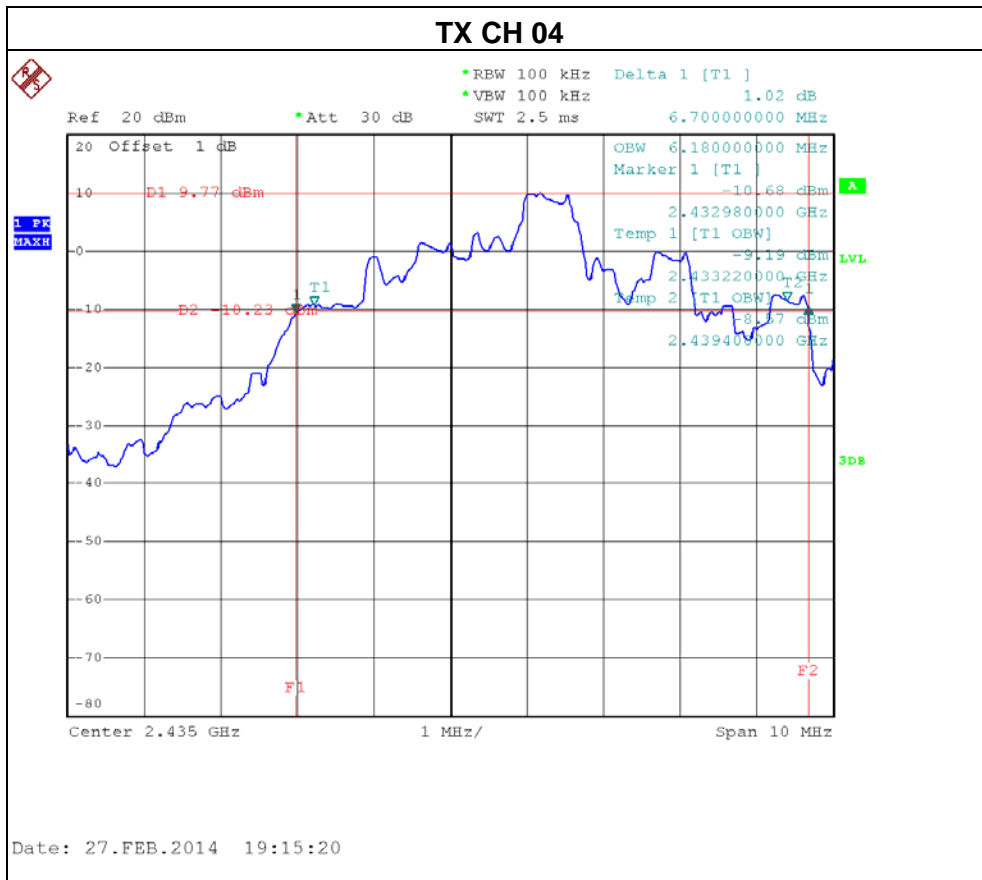
Temperature: 25°C
Relative Humidity: 55%
Test Voltage: 120V/60Hz



5.6 TEST RESULTS

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% occupied Bandwidth(MHz)
CH 01	2405.376	6.80	6.44
CH 04	2433.024	6.74	6.18
CH 08	2466.816	6.48	6.64







6. ANTENNA CONDUCTED SPURIOUS EMISSION

6.1 APPLIED PROCEDURES / LIMIT

20dB 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
960~1000	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

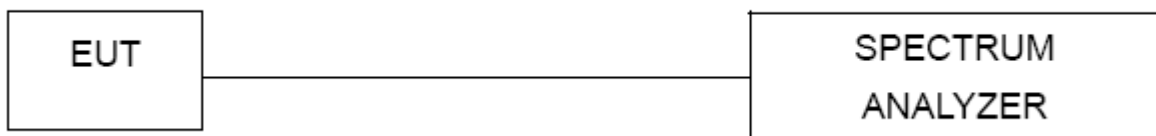
6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 10 ms.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP





6.1.4 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.

6.1.5 EUT TEST CONDITIONS

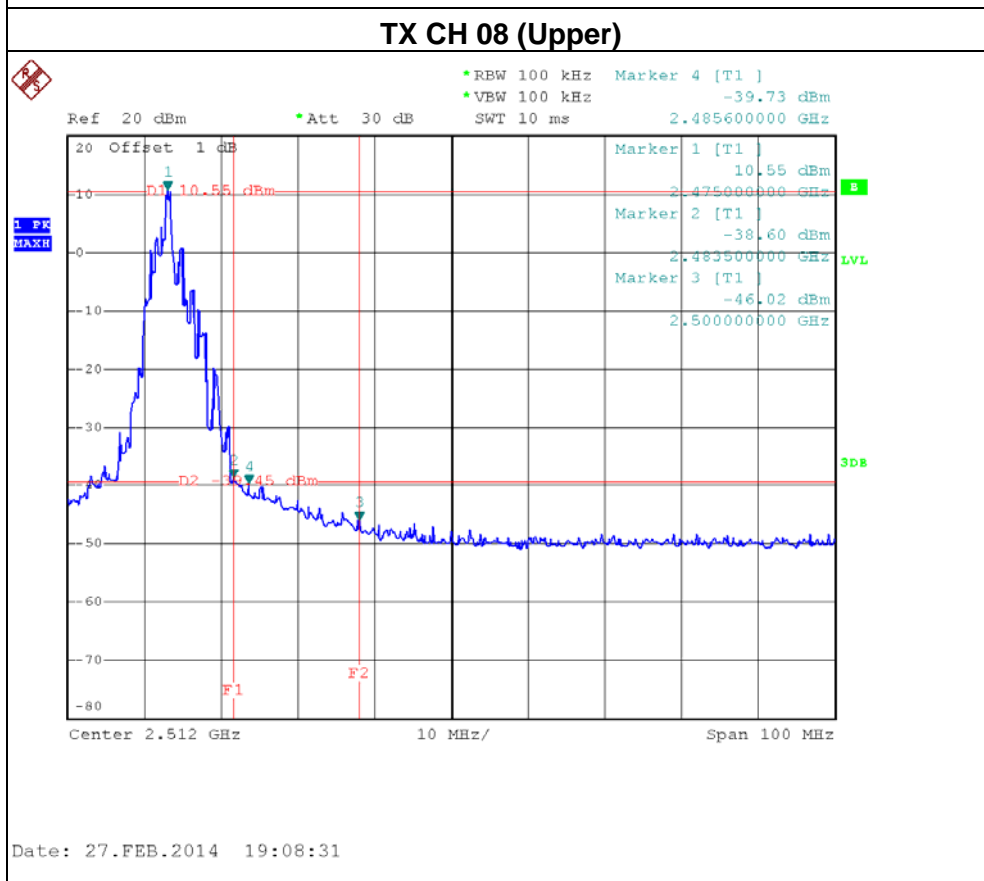
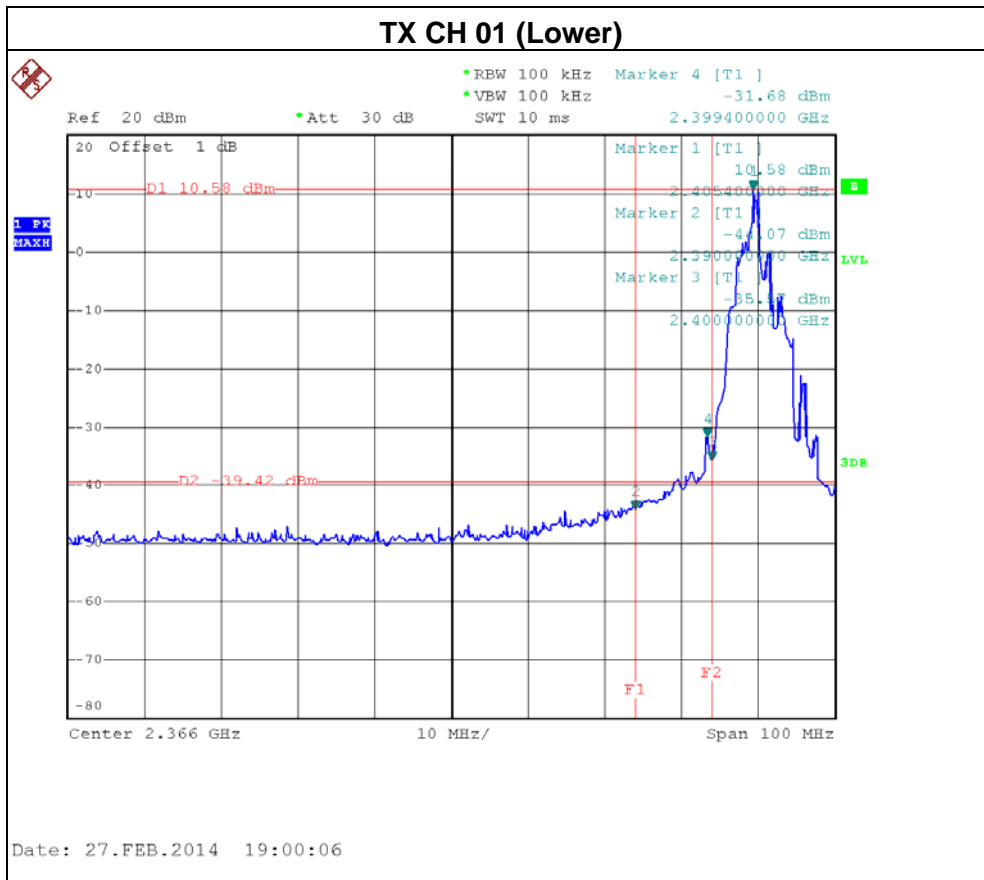
Temperature: 25°C

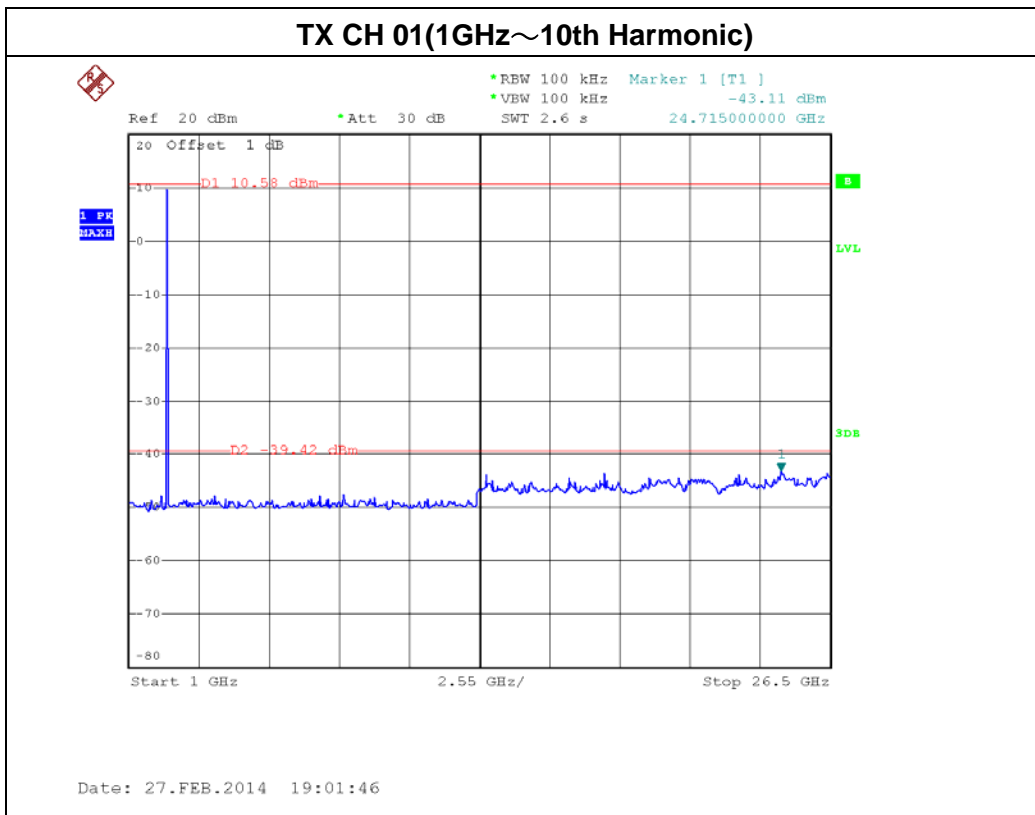
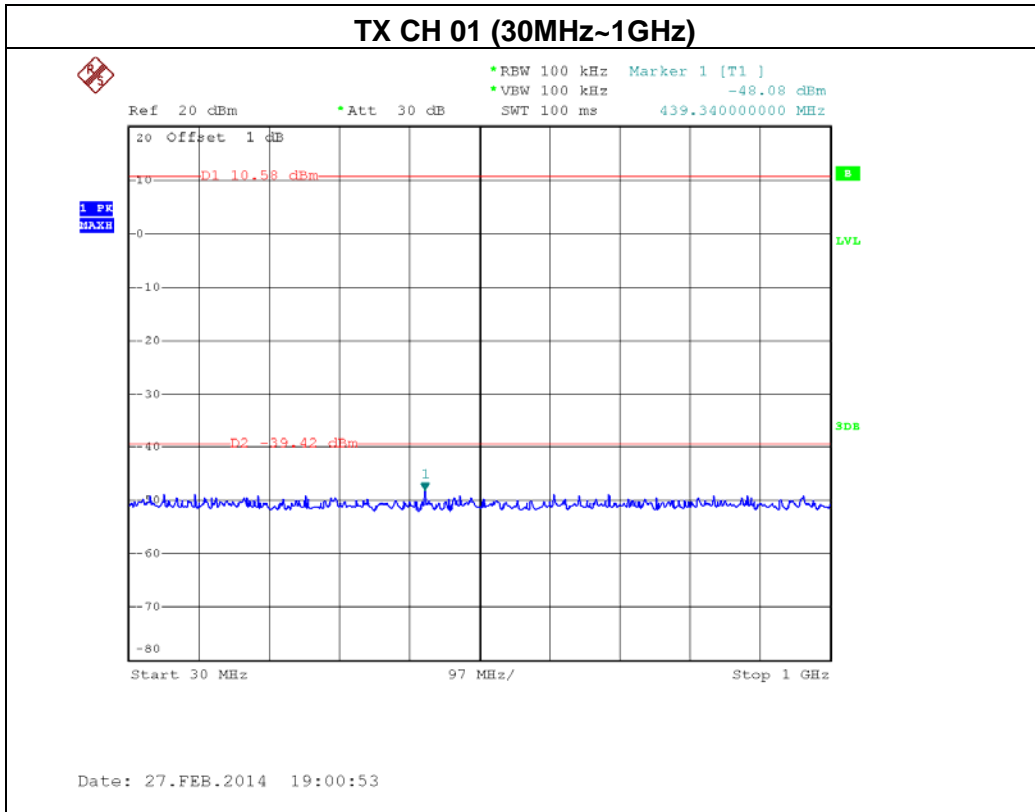
Relative Humidity: 55%

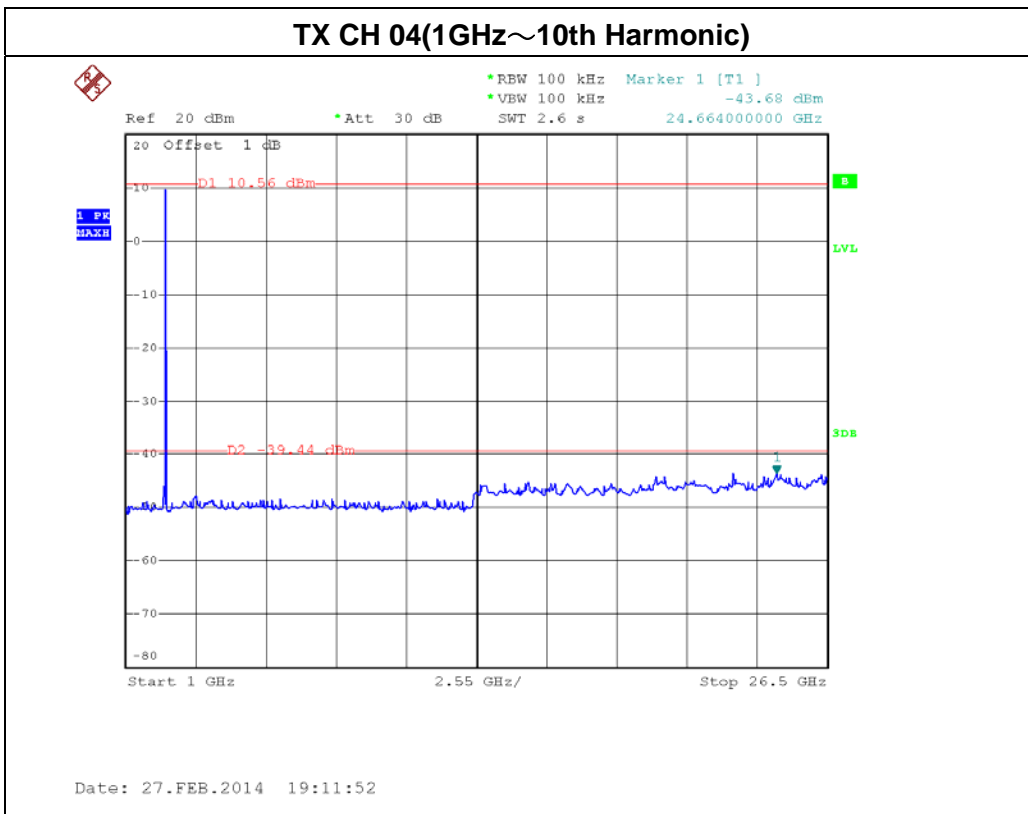
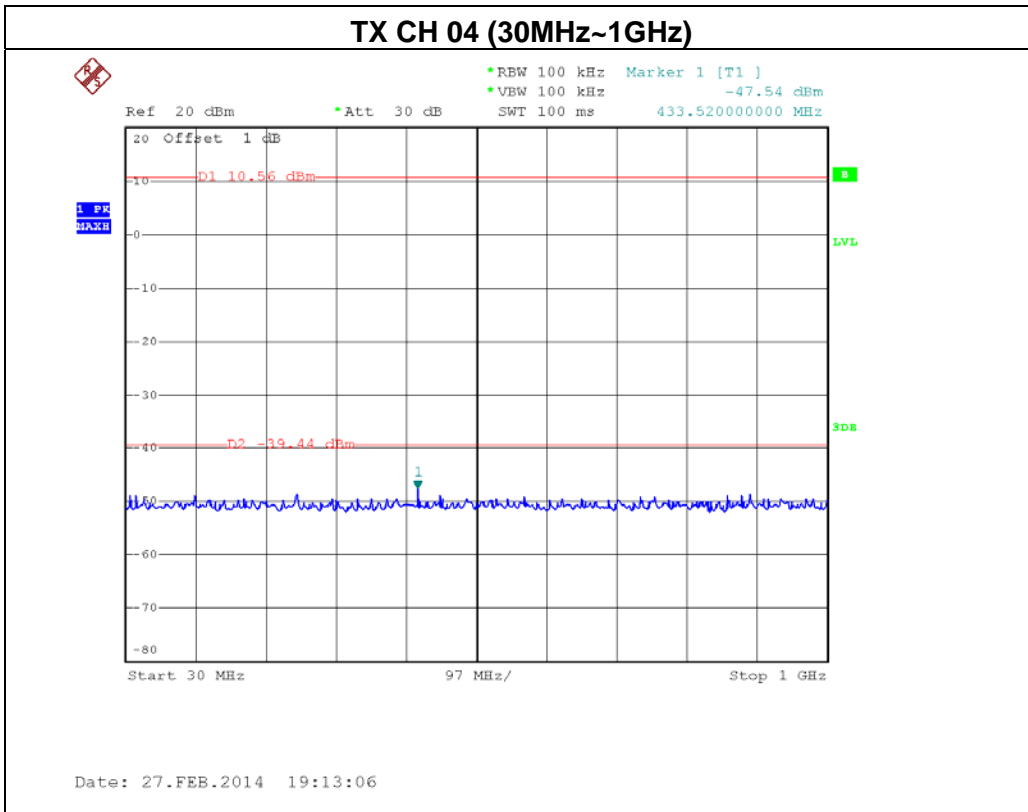
Test Voltage: 120V/60Hz

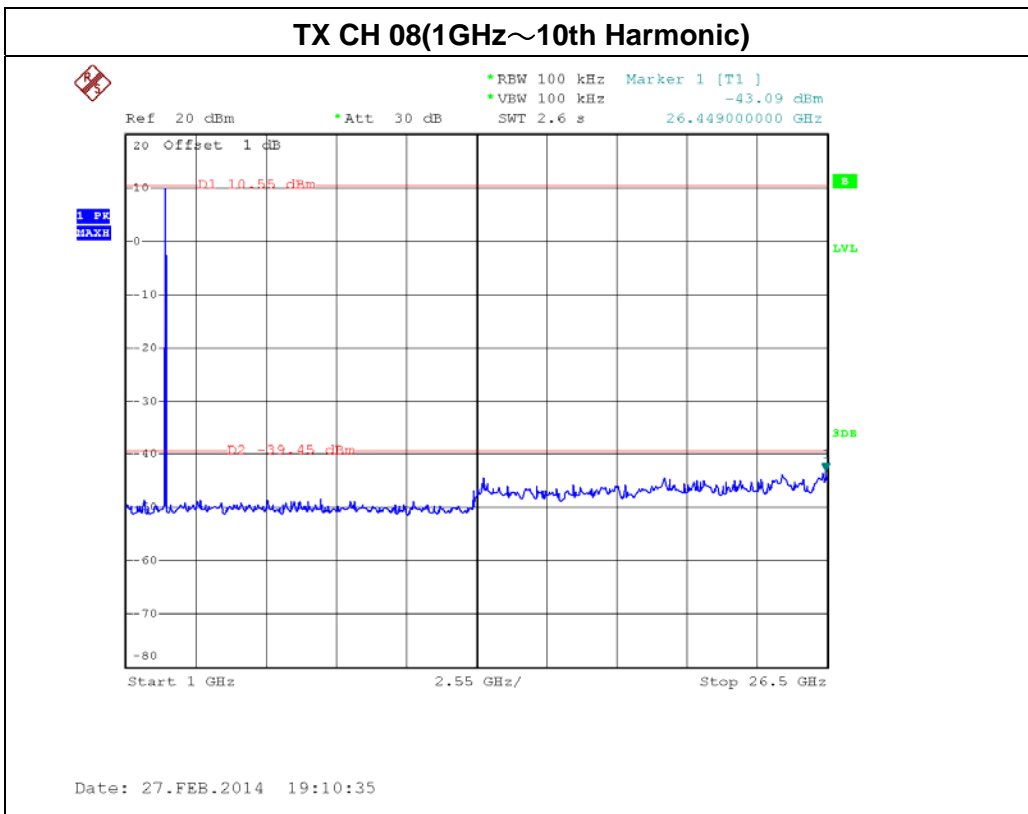
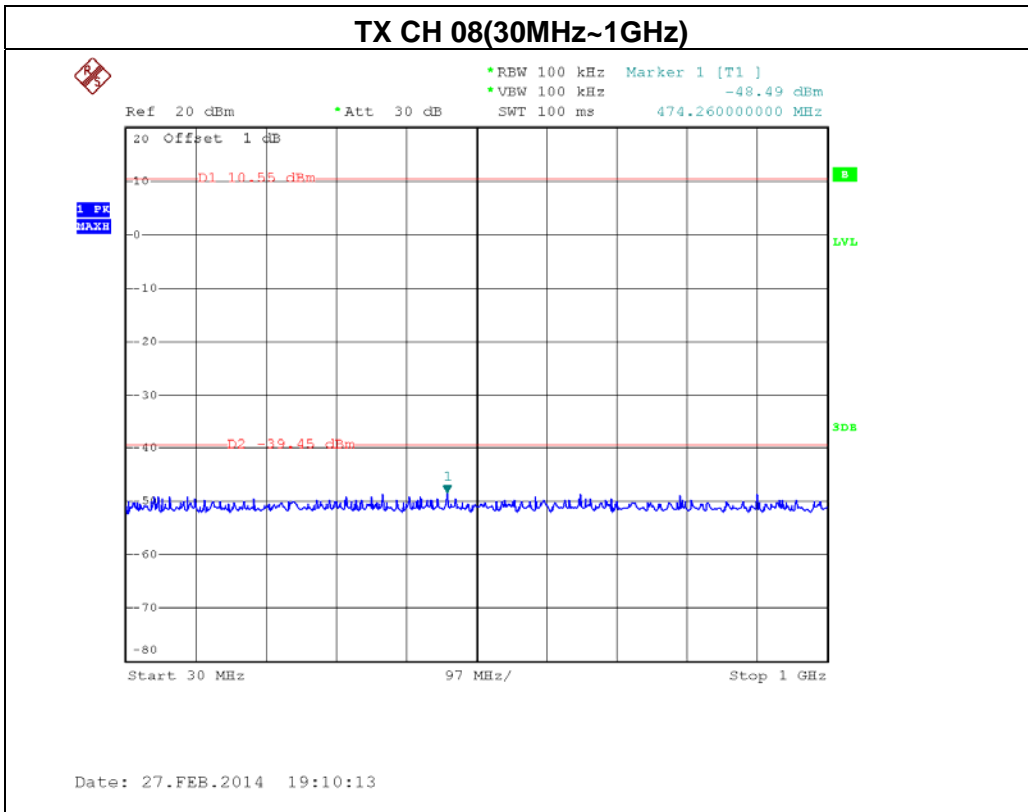


6.1.6 TEST RESULTS











7. MEASUREMENT INSTRUMENTS LIST AND SETTING

Conducted Emission Measurement					
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

Radiated Emission Measurement					
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

Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 09, 2014

Antenna Conducted Spurious Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 09, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.



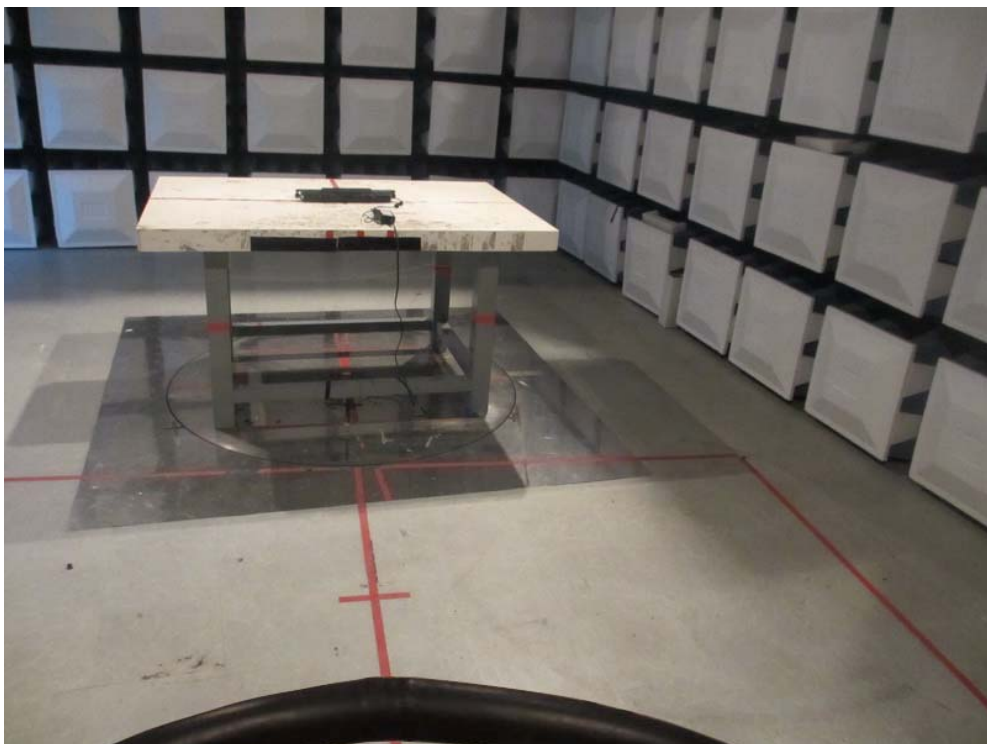
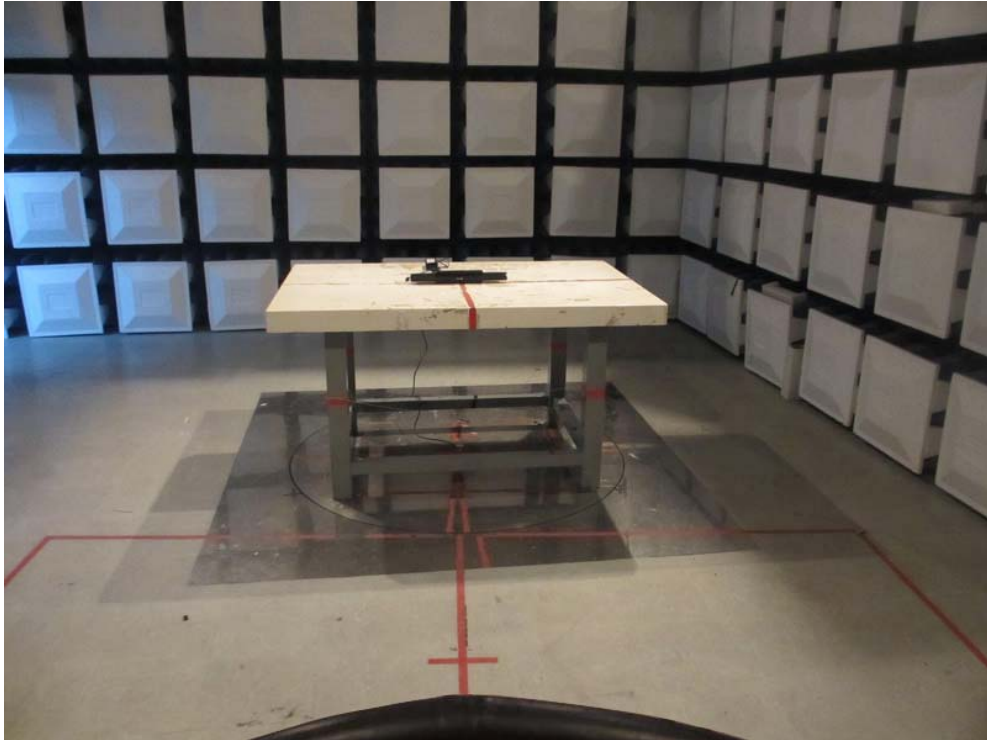
8. EUT TEST PHOTO

Conducted Measurement Photos



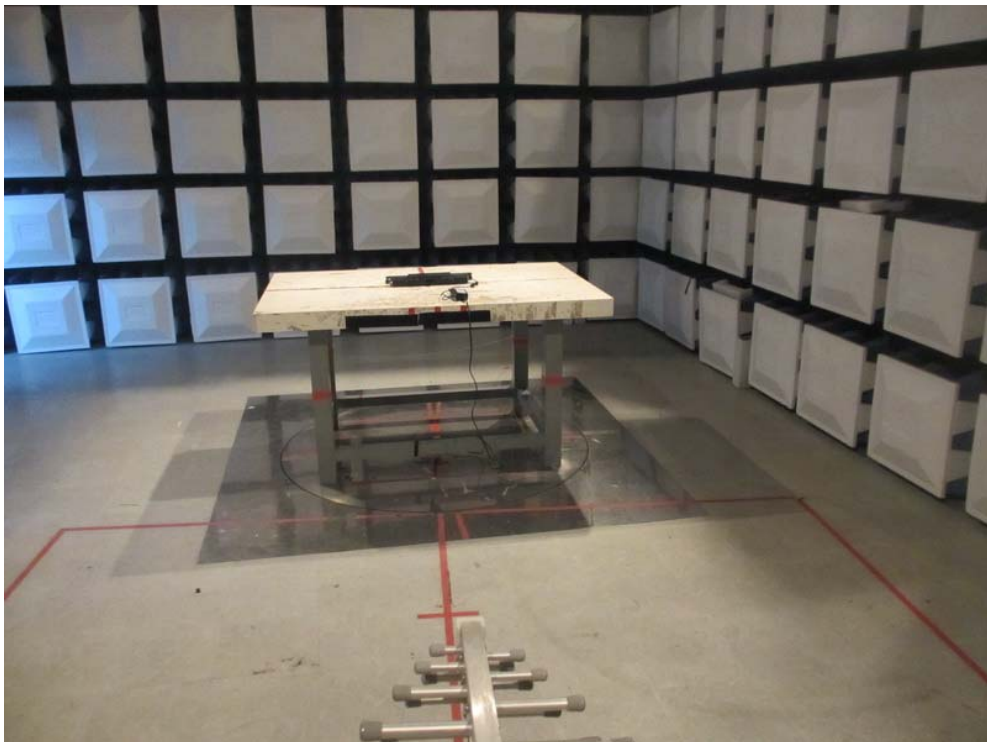
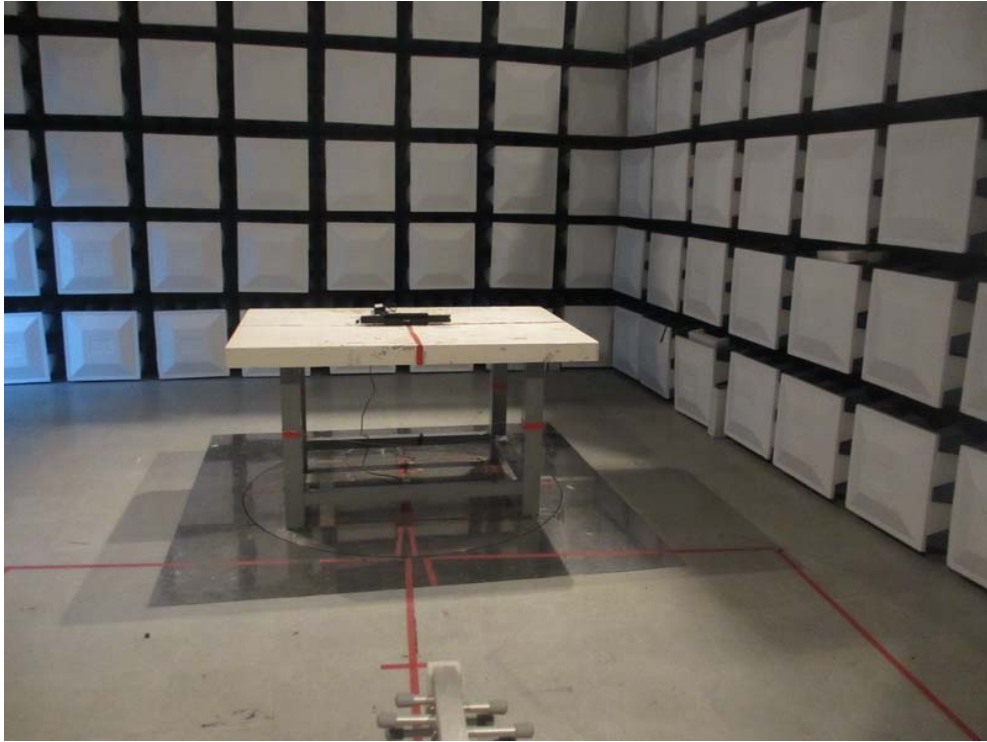


**Radiated Measurement Photos
9K~30MHz**





**Radiated Measurement Photos
30~1000MHz**





**Radiated Measurement Photos
Above 1000MHz**

