Radio Test Report

FCC ID: R4K-B36-ADBA

This report concerns (check one) : ■ **Original Grant** □ **Class I Change**

Issued Date : Nov. 22, 2012
Project No. : 1210276
Equipment : Set Top Box
Model Name : ADB-1750WM

Applicant : Advanced Digital Broadcast SA
Address : 15F, 205, Peihsin Rd. SEC. 3, Hsintien Dist., New Taipei City 23143, Taiwan, R.O.C.

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Nov. 07, 2012
Date of Test: Nov. 07, 2012 ~ Nov. 16, 2012

Testing Engineer : Rush Kao
(Rush Kao)

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(Jeff Yang)

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(Andy Chiu)

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Testing Laboratory
0659

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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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

Revised Version No.	Description	Issued Date
-	Initial Issue.	Nov. 22, 2012

1. CERTIFICATION

Equipment : Set Top Box
Brand Name : ADB
Model Name : ADB-1750WM
Applicant : Advanced Digital Broadcast SA
Date of Test : Nov. 07, 2012 ~ Nov. 16, 2012
Standards : FCC Part15, Subpart C: 2010(15.247) / ANCI 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-1-1210276) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and 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: 2010			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (c)	Antenna conducted Spurious Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	
1.1307 1.1310 2.1091 2.1093	RF Exposure Compliance	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:

Conducted emission Test:

C02: (VCCI RN: C-3477; FCC RN: 614388; FCC DN: TW1054)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Below 1 GHz):

CB08: (FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC rules and for reference only.

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

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission test:

Test Site	Measurement Frequency Range	U，(dB)	NOTE
C02	150 kHz ~ 30 MHz	2.59	

B. Radiated emission test:

Test Site	Item	Measurement Frequency Range		Uncertainty	NOTE
CB08	Radiated emission at 3m	Horizontal Polarization	30 - 200MHz	3.35 dB	
			200 - 1000MHz	3.11 dB	
			1 - 18GHz	3.97 dB	
			18 - 40GHz	4.01 dB	
		Vertical Polarization	30 - 200MHz	3.22 dB	
			200 - 1000MHz	3.24 dB	
			1 - 18GHz	4.05 dB	
			18 - 40GHz	4.04 dB	

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR}, as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR}.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Set Top Box
Brand Name	ADB
Model Name	ADB-1750WM
OEM Brand/Model Name	N/A
Model Difference	N/A
Product Description	The EUT is a Set Top Box. Operation Frequency: 2425~2475 MHz Modulation Type: GFSK Number Of Channel 11CH (Note 2) Antenna Designation: Please refer to the Note 3. Antenna Gain(Peak) Please refer to the Note 3. Output Power: -4.76dBm (Max.) Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Power Source	DC Voltage supplied from External Power Supply.
Power Rating	I/P: AC 100-120V~1.2A 60Hz / O/P: DC 5V 3A
Connecting I/O Port(s	Please refer to the User's Manual
Products Covered	1* AC ADAPTER: DELTA / ADP-15AR AA

Note:

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

2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
15	2425	19	2445	23	2465
16	2430	20	2450	24	2470
17	2435	21	2455	25	2475
18	2440	22	2460		

3. Table of Filed Antenna:

Antenna	Brand	Model Name	Type	Connector Type	Gain (dBi)
1	N/A	N/A	Ant. On PCB	N/A	3.78

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.

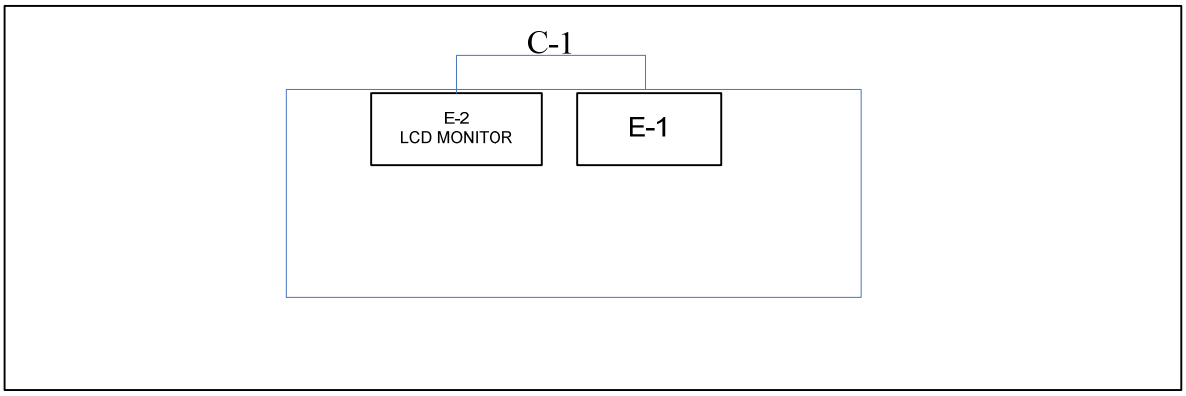
Pretest Test Mode	Description
Mode 1	2425 MHz
Mode 2	2450 MHz
Mode 3	2475 MHz

Conducted emission test	
Final Test Mode	Description
Mode 2	2450 MHz

Radiated Test (Below 1 GHz)	
Final Test Mode	Description
Mode 2	2450 MHz

Radiated Test (Above 1 GHz)	
Final Test Mode	Description
Mode 1	2425 MHz
Mode 2	2450 MHz
Mode 3	2475 MHz

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	Series No.	Note
E-1	Set Top Box	ADB	ADB-1750WM	R4K-B36-ADBA	N/A	EUT
E-2	24" LCD Monitor	DELL	2408WFPb	DOC	071863-11	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	NO	1.8M	HDMI CABLE

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION TEST

4.1.1 LIMITS (FREQUENCY RANGE 150 KHZ-30MHZ)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 - 5.0	73.00	60.00	56.00	46.00
5.0 - 30.0	73.00	60.00	60.00	50.00

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.

(3) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
Margin Level = Measurement Value – Limit Value

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Apr. 06, 2013
2	LISN	EMCO	3816/2	00066528	Mar. 26, 2013
3	Test Cable	TIMES	CFD300-NL	130	Jun. 14, 2013
4	EMI Test Receiver	Agilent	N9038A	MY51210215	Jul. 26, 2013
5	50Ω BNC TYPE Terminator	N/A	N/A	05	Jun. 02, 2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

4.1.3 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.

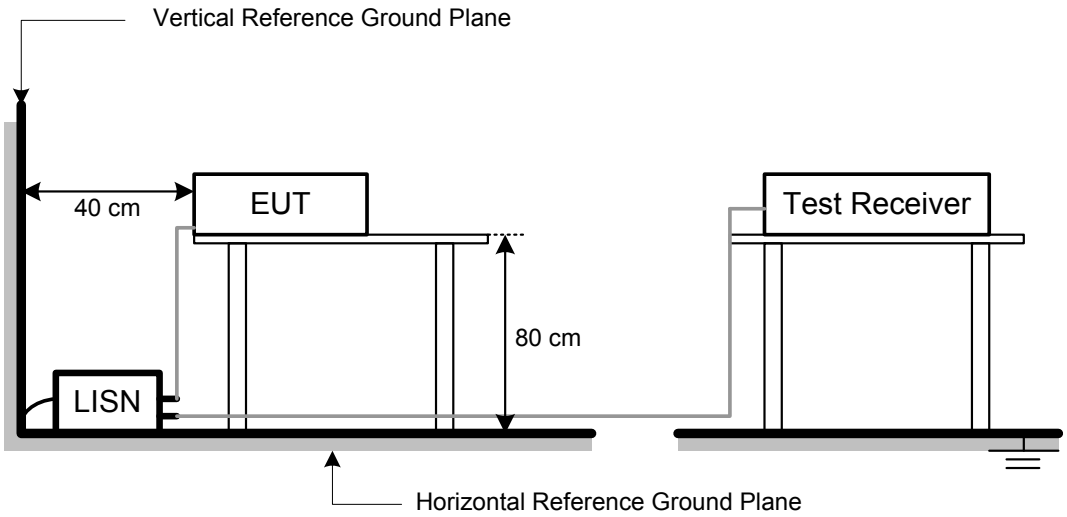
NOTE:

a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or 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 Peak or QP Mode was measured, but AVG Mode didn‘t perform.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



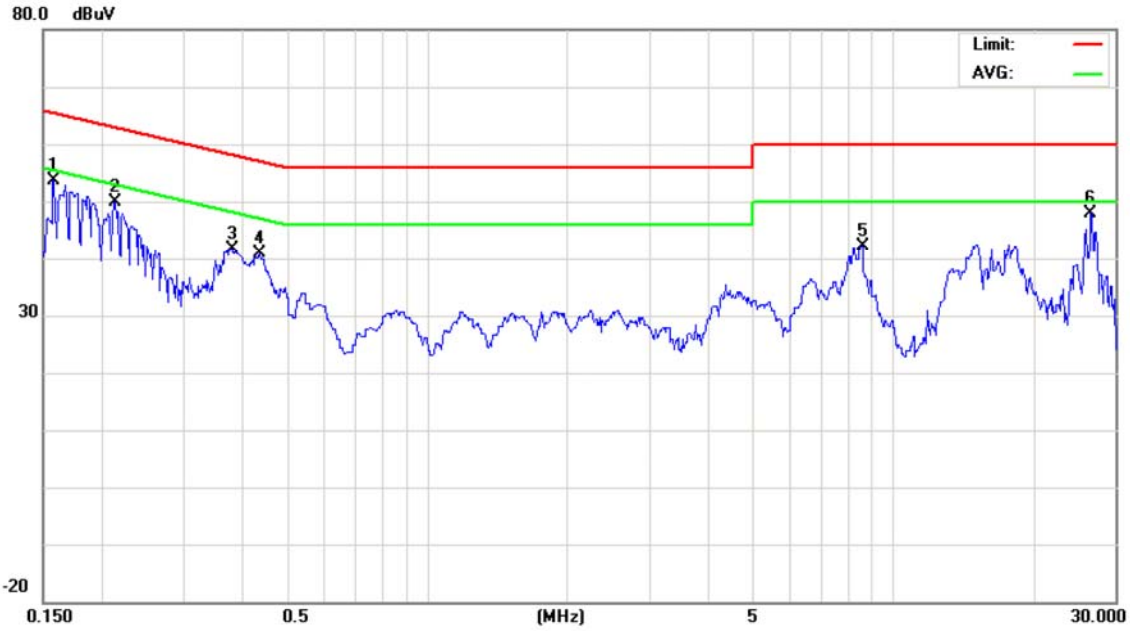
4.1.6 EUT OPERATING CONDITIONS

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.

4.1.7 TEST RESULTS

E.U.T	Set Top Box	Model Name	ADB-1750WM
Temperature	24˚C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2425 MHz		

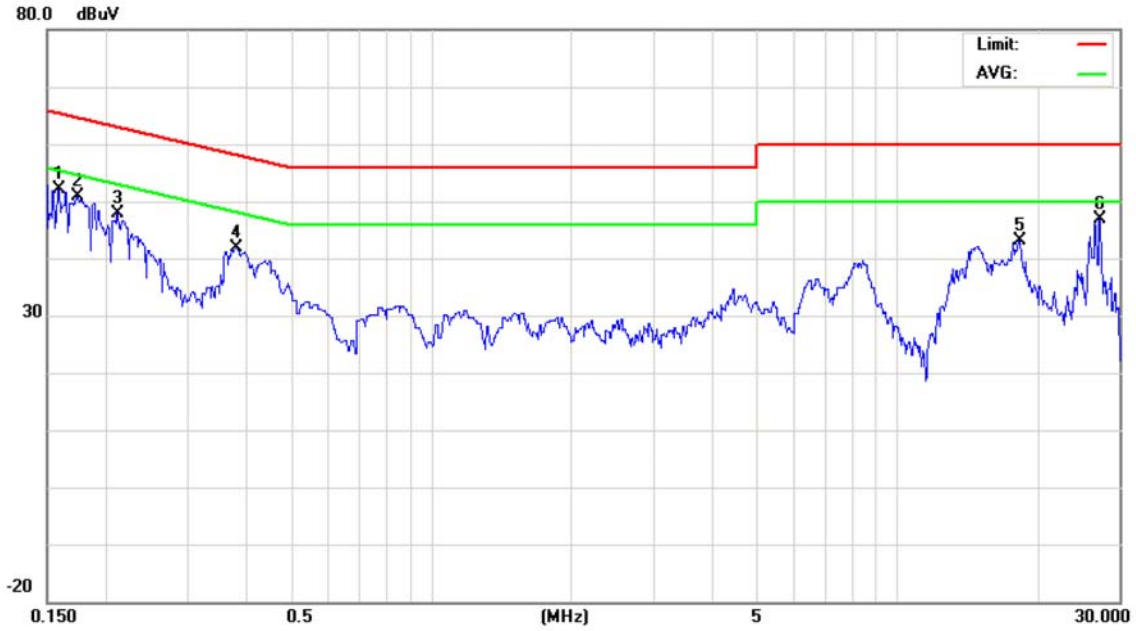
Phase: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1578	43.78	9.78	53.56	65.58	-12.02	peak	
2		0.2129	40.12	9.75	49.87	63.09	-13.22	peak	
3		0.3792	31.95	9.72	41.67	58.30	-16.63	peak	
4		0.4369	31.27	9.71	40.98	57.12	-16.14	peak	
5		8.5625	32.24	9.82	42.06	60.00	-17.94	peak	
6		26.5000	38.03	9.89	47.92	60.00	-12.08	peak	

E.U.T	Set Top Box	Model Name	ADB-1750WM
Temperature	24˚C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2425 MHz		

Phase: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1587	42.26	9.78	52.04	65.53	-13.49	peak	
2		0.1736	41.02	9.76	50.78	64.79	-14.01	peak	
3		0.2121	38.09	9.74	47.83	63.12	-15.29	peak	
4		0.3800	32.28	9.71	41.99	58.28	-16.29	peak	
5		18.2500	33.17	9.87	43.04	60.00	-16.96	peak	
6	*	27.1875	37.02	9.95	46.97	60.00	-13.03	peak	

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on15.205(a), then the 15.209(a) 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)	Class B (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).

(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
Margin Level = Measurement Value – Limit Value

4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 16, 2013
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 17, 2013
4	Microflex Cable	N/A	N/A	1m	May. 14, 2013
5	Microflex Cable	AISI	S104-SMAP-1	10m	May. 14, 2013
6	Microflex Cable	N/A	N/A	3m	May. 14, 2013
7	Test Cable	N/A	LMR-400	966_12m	May. 15, 2013
8	Test Cable	N/A	LMR-400	966_3m	May. 15, 2013
9	Pre-Amplifier	EMC	EMC-330	980001	May. 31, 2013
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 12, 2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

4.2.3 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
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 radiated 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.
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.
g. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
h. EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand
i. 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

NOTE: (30-1000MHz)

a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz; SPA setting in RBW=120 kHz, VBW =120 kHz, Swp. Time = 0.3 sec./ MHz.
b. 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.

NOTE: (Above 1000MHz)

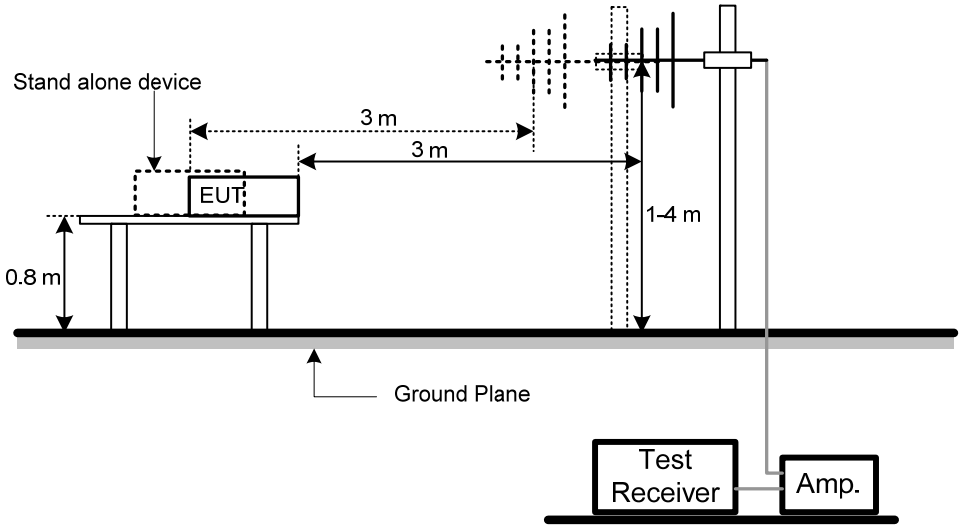
a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
b. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.

4.2.4 DEVIATION FROM TEST STANDARD

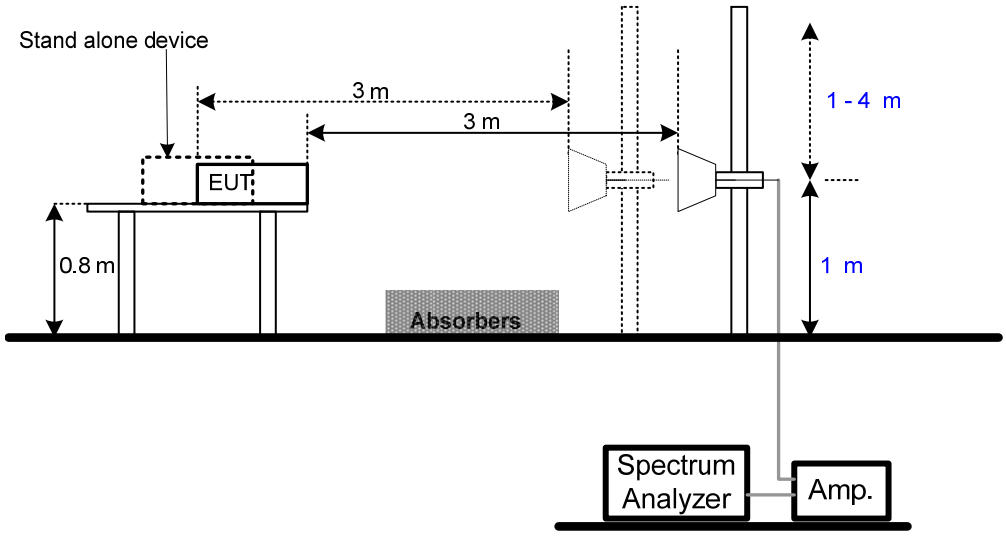
No deviation

4.2.5 TEST SETUP

Below 1 GHz



Above 1 GHz



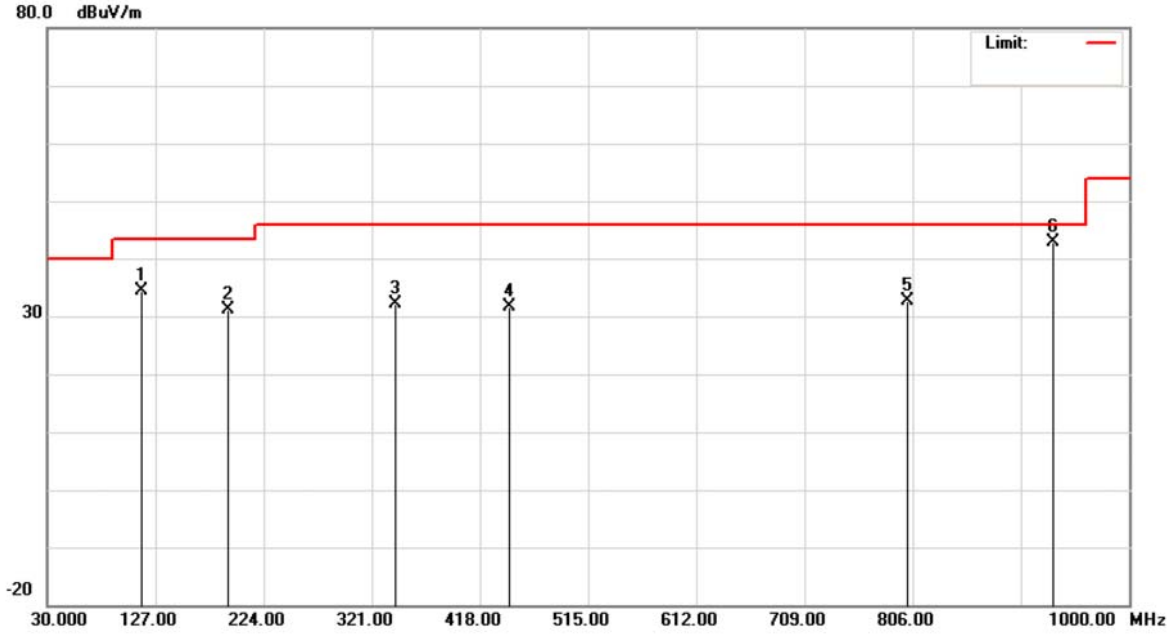
4.2.6 EUT OPERATING CONDITIONS

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 operation condition was tested and used to collect the included data.

4.2.7 TEST RESULTS-BELLOW 1 GHZ

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2450 MHz		

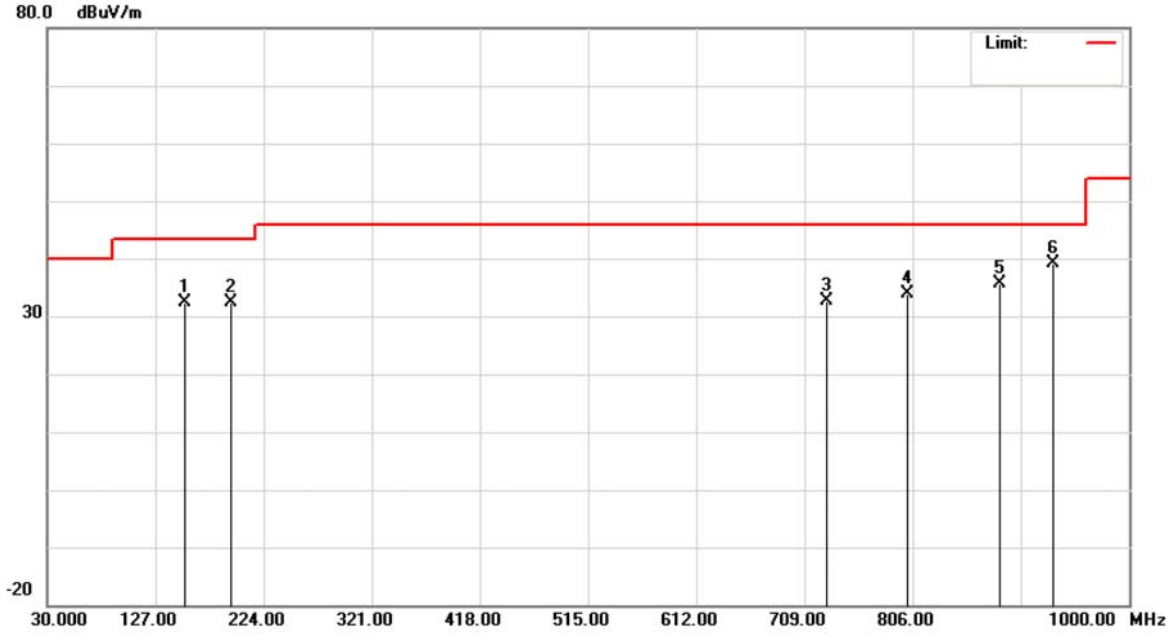
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		114.8750	56.09	-21.59	34.50	43.50	-9.00	peak	
2		192.4750	52.92	-21.72	31.20	43.50	-12.30	peak	
3		342.8250	49.22	-17.16	32.06	46.00	-13.94	peak	
4		444.6749	45.99	-14.38	31.61	46.00	-14.39	peak	
5		801.1500	40.67	-8.03	32.64	46.00	-13.36	peak	
6	*	932.0999	48.74	-5.86	42.88	46.00	-3.12	peak	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2450 MHz		

Polarization: Horizontal

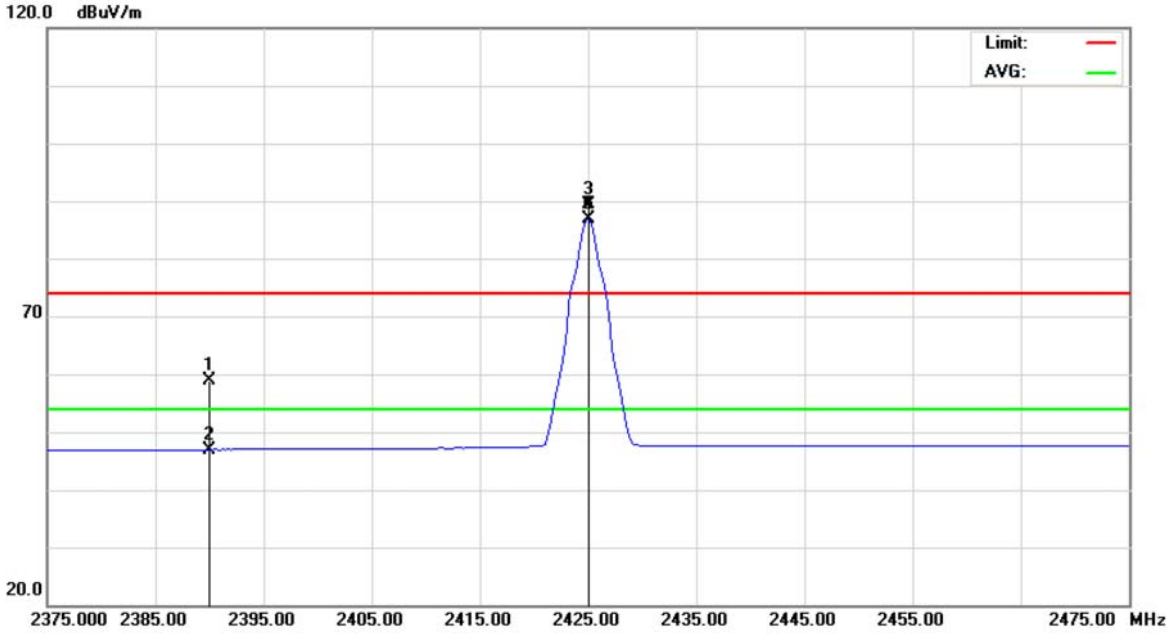


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		153.6750	51.39	-18.93	32.46	43.50	-11.04	peak	
2		194.8999	54.18	-21.72	32.46	43.50	-11.04	peak	
3		728.4000	41.79	-9.06	32.73	46.00	-13.27	peak	
4		801.1500	42.00	-8.03	33.97	46.00	-12.03	peak	
5		883.5999	42.49	-6.78	35.71	46.00	-10.29	peak	
6	*	932.0999	44.95	-5.86	39.09	46.00	-6.91	peak	

4.2.8 TEST RESULTS-ABOVE 1 GHZ

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2425 MHz		

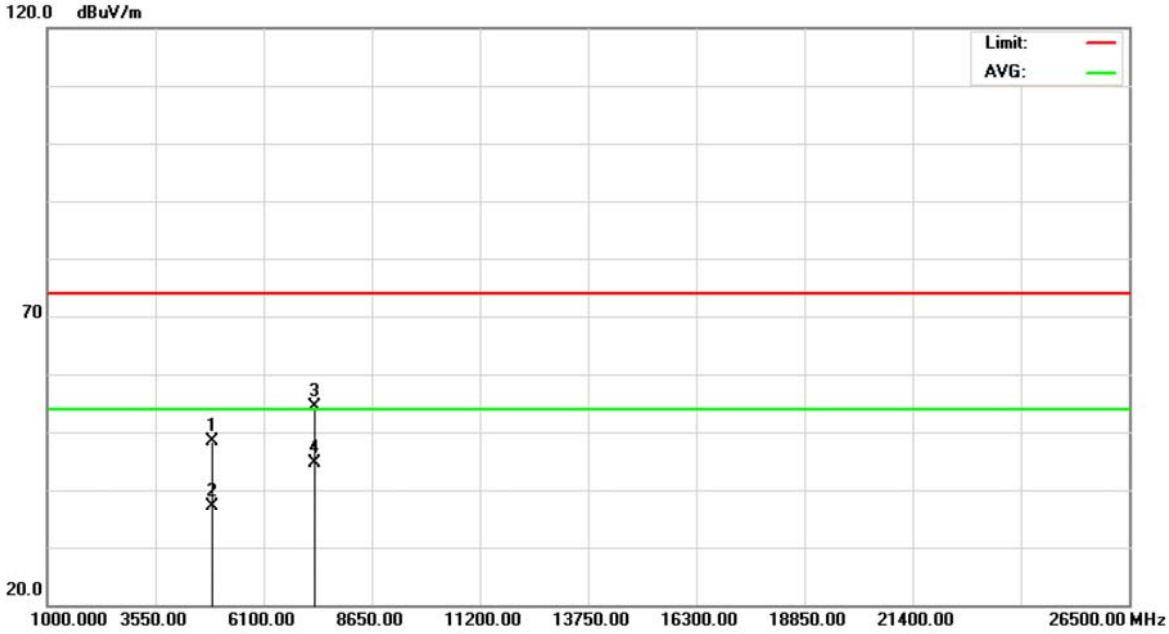
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	25.35	33.42	58.77	74.00	-15.23	peak	
2		2390.000	13.57	33.42	46.99	54.00	-7.01	AVG	
3	X	2425.000	55.83	33.61	89.44	74.00	15.44	peak	
4	X	2425.000	53.30	33.61	86.91	74.00	12.91	peak	
5	*	2425.000	53.32	33.61	86.93	54.00	32.93	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2425 MHz		

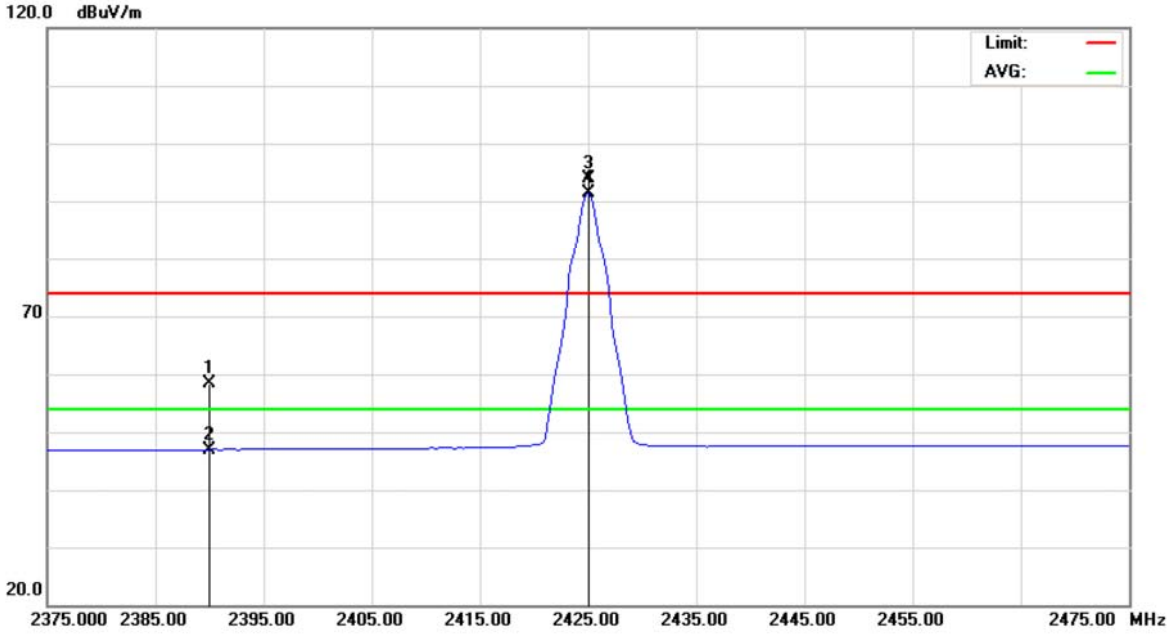
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4850.100	40.84	7.58	48.42	74.00	-25.58	peak	
2		4850.100	29.61	7.58	37.19	54.00	-16.81	AVG	
3		7274.700	39.43	14.97	54.40	74.00	-19.60	peak	
4	*	7274.700	29.59	14.97	44.56	54.00	-9.44	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2425 MHz		

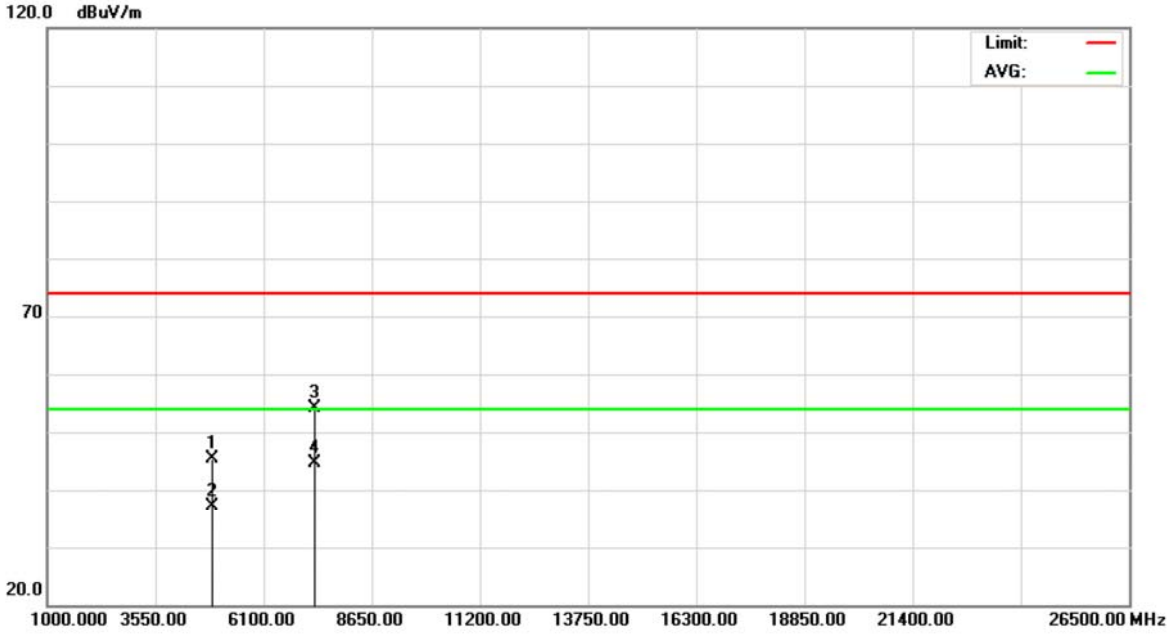
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.98	33.42	58.40	74.00	-15.60	peak	
2		2390.000	13.55	33.42	46.97	54.00	-7.03	AVG	
3	X	2425.000	60.21	33.61	93.82	74.00	19.82	peak	
4	*	2425.000	57.79	33.61	91.40	54.00	37.40	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2425 MHz		

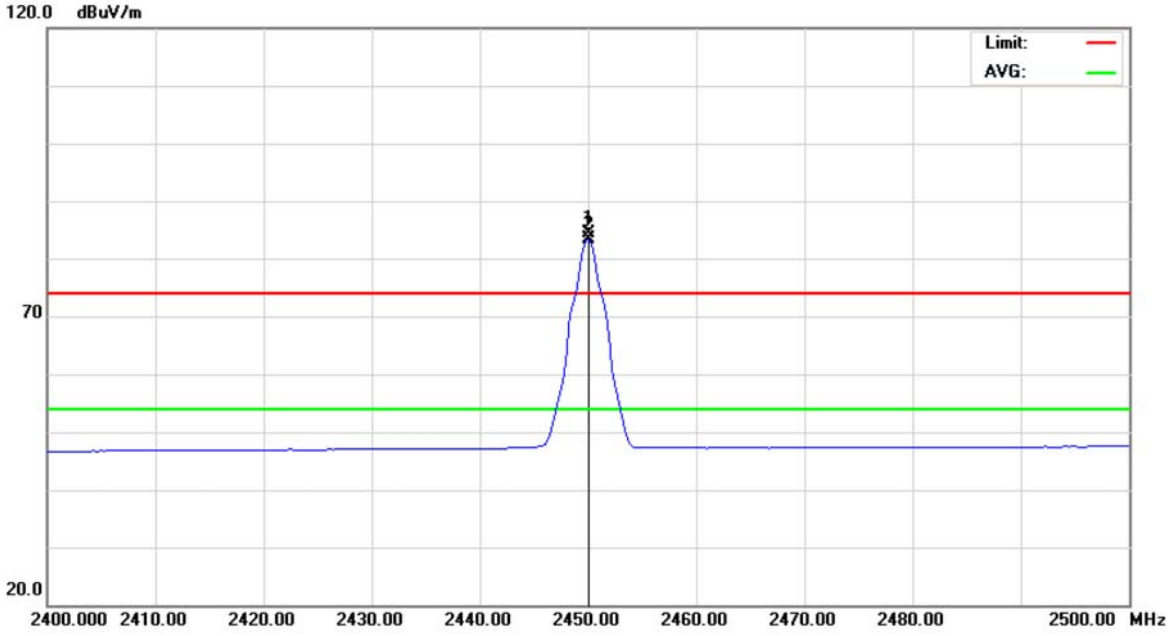
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4850.250	37.78	7.58	45.36	74.00	-28.64	peak	
2		4850.250	29.44	7.58	37.02	54.00	-16.98	AVG	
3		7275.050	39.08	14.97	54.05	74.00	-19.95	peak	
4	*	7275.050	29.58	14.97	44.55	54.00	-9.45	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2450 MHz		

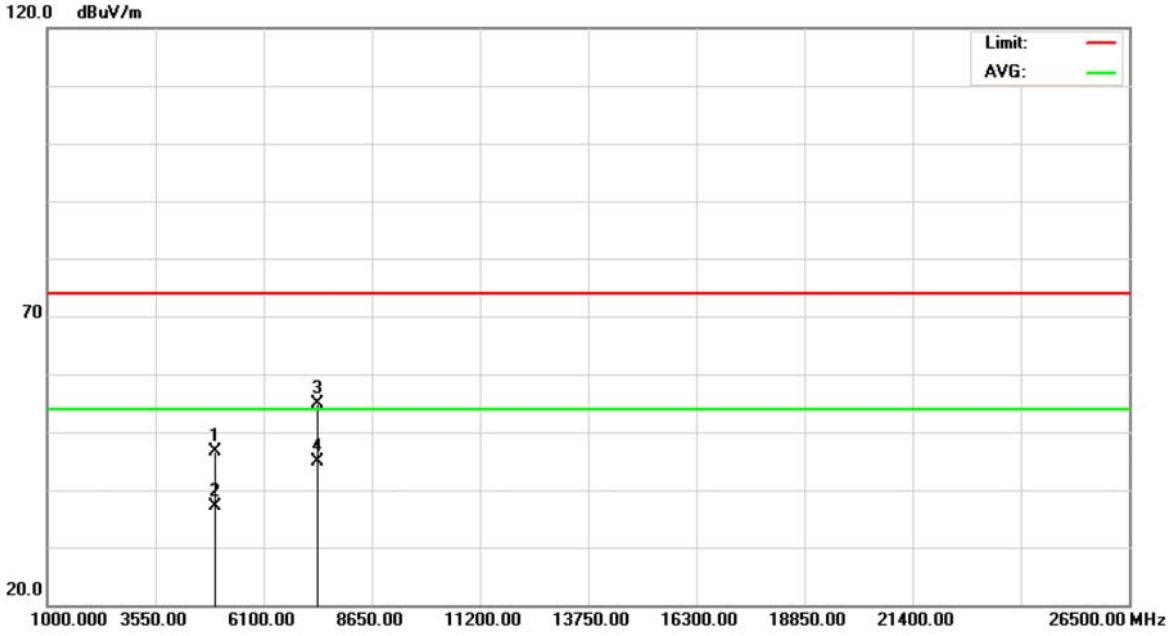
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2450.000	51.04	33.32	84.36	74.00	10.36	peak	
2	*	2450.000	50.00	33.32	83.32	54.00	29.32	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2450 MHz		

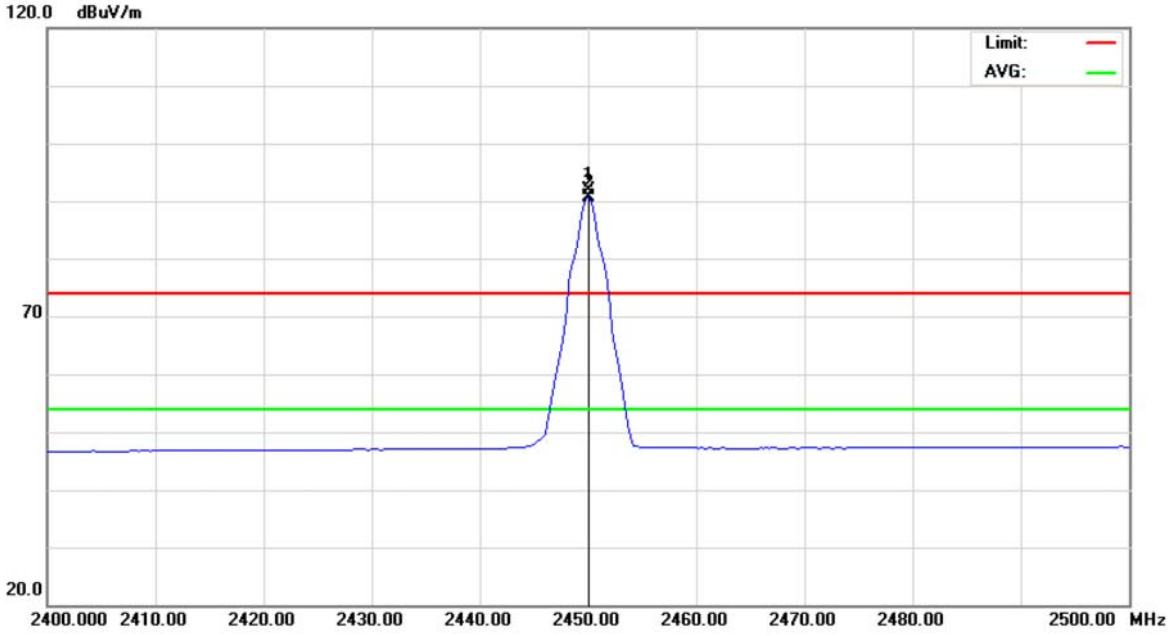
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4900.100	38.85	7.76	46.61	74.00	-27.39	peak	
2		4900.100	29.25	7.76	37.01	54.00	-16.99	AVG	
3		7350.150	39.70	15.17	54.87	74.00	-19.13	peak	
4	*	7350.150	29.71	15.17	44.88	54.00	-9.12	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2450 MHz		

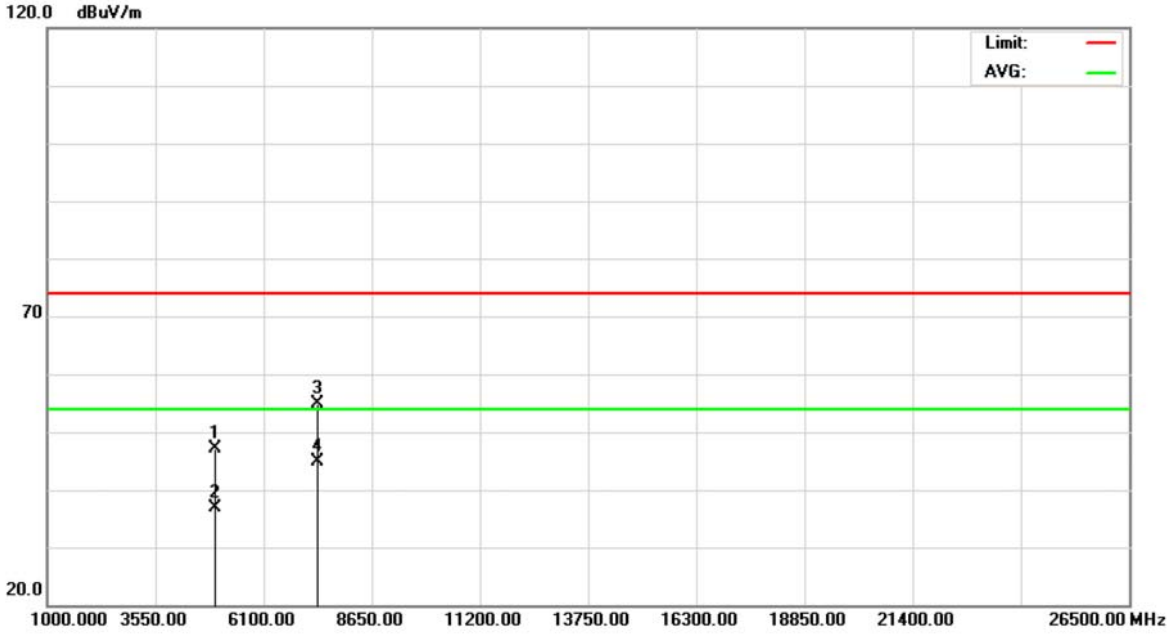
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2450.000	58.63	33.32	91.95	74.00	17.95	peak	
2	*	2450.000	57.23	33.32	90.55	54.00	36.55	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2450 MHz		

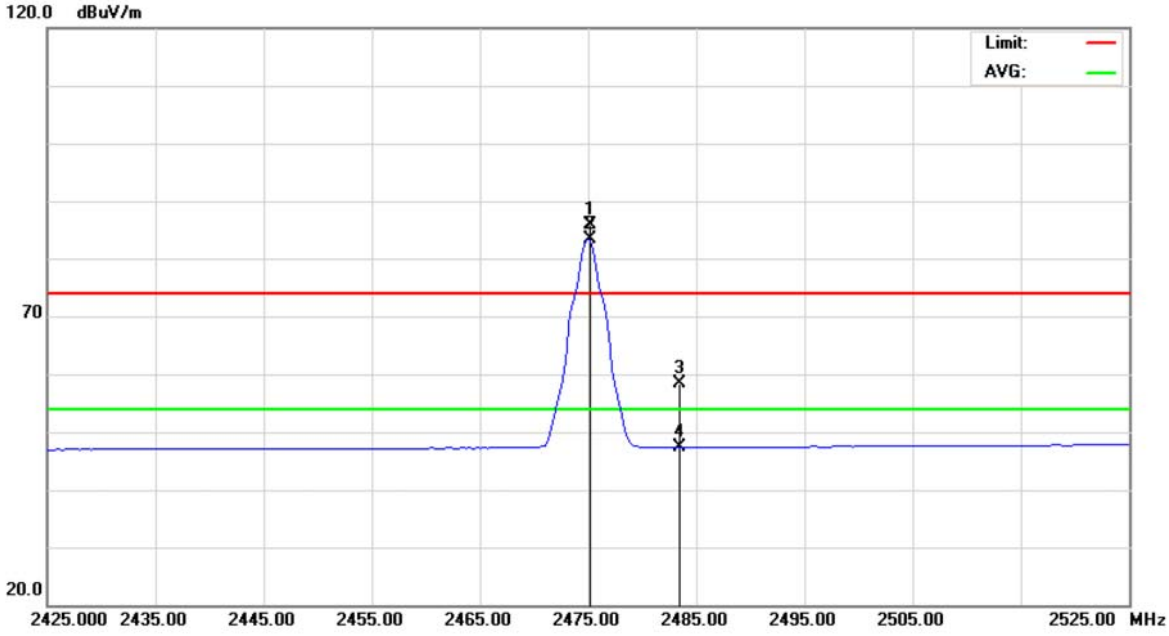
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4900.250	39.30	7.76	47.06	74.00	-26.94	peak	
2		4900.250	29.11	7.76	36.87	54.00	-17.13	AVG	
3		7350.150	39.63	15.17	54.80	74.00	-19.20	peak	
4	*	7350.150	29.69	15.17	44.86	54.00	-9.14	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2475 MHz		

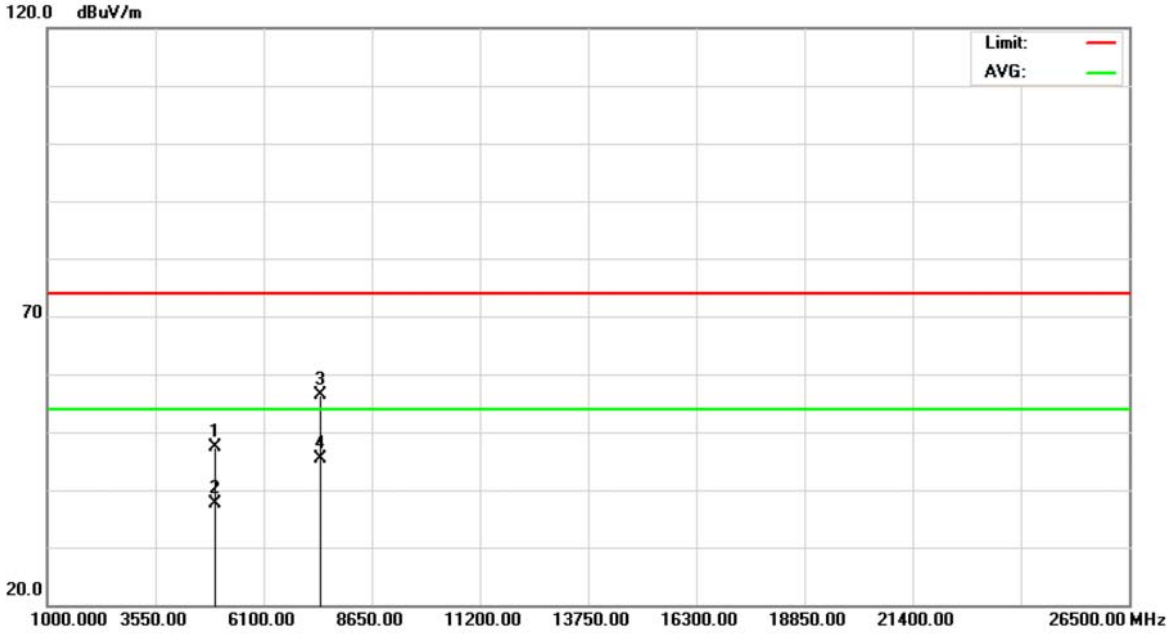
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2475.050	52.48	33.45	85.93	74.00	11.93	peak	
2	*	2475.050	49.93	33.45	83.38	54.00	29.38	AVG	
3		2483.500	24.92	33.50	58.42	74.00	-15.58	peak	
4		2483.500	13.93	33.50	47.43	54.00	-6.57	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2475 MHz		

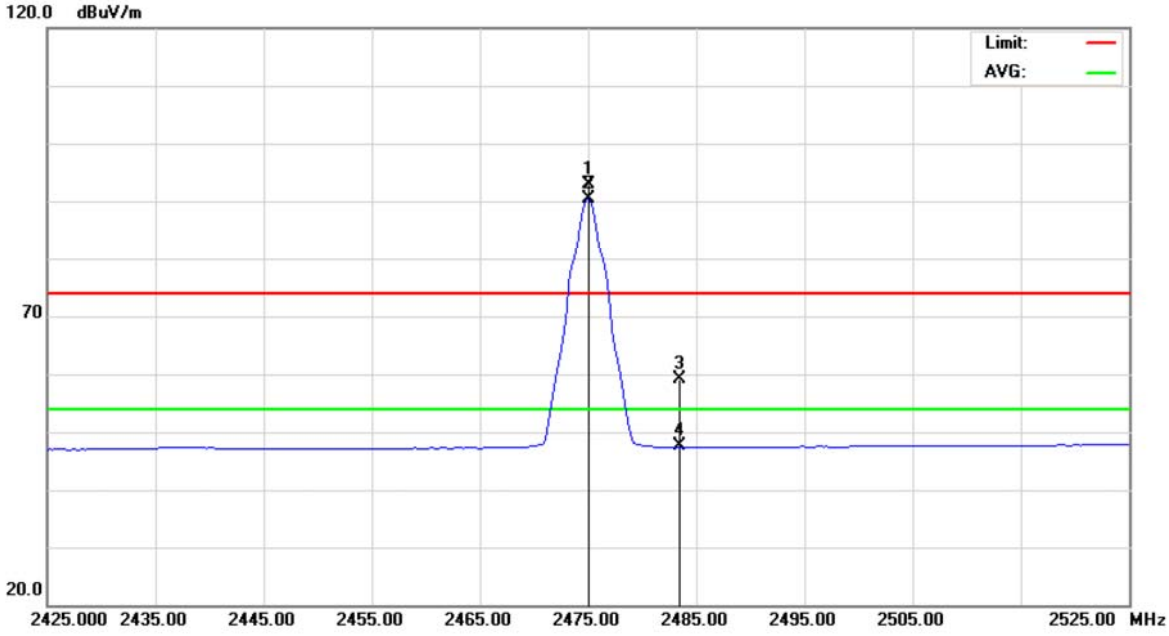
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4949.850	39.40	7.94	47.34	74.00	-26.66	peak	
2		4949.850	29.57	7.94	37.51	54.00	-16.49	AVG	
3		7425.000	40.99	15.36	56.35	74.00	-17.65	peak	
4	*	7425.000	30.07	15.36	45.43	54.00	-8.57	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2475 MHz		

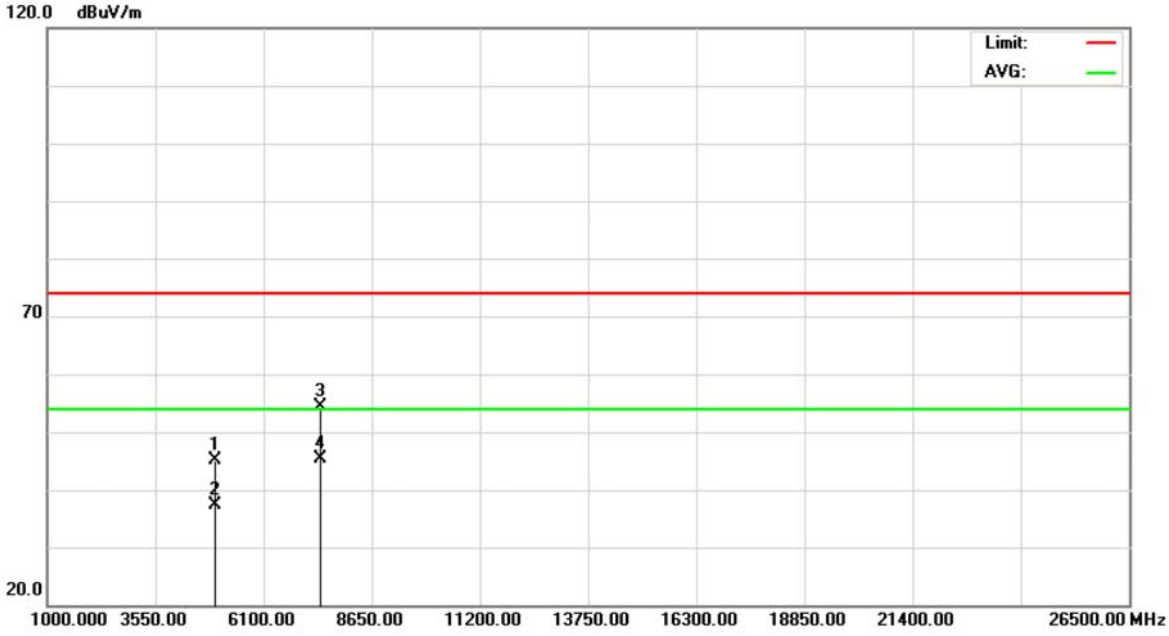
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2475.000	59.33	33.45	92.78	74.00	18.78	peak	
2	*	2475.000	56.92	33.45	90.37	54.00	36.37	AVG	
3		2483.500	25.69	33.50	59.19	74.00	-14.81	peak	
4		2483.500	14.01	33.50	47.51	54.00	-6.49	AVG	

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2475 MHz		

Polarization: Horizontal

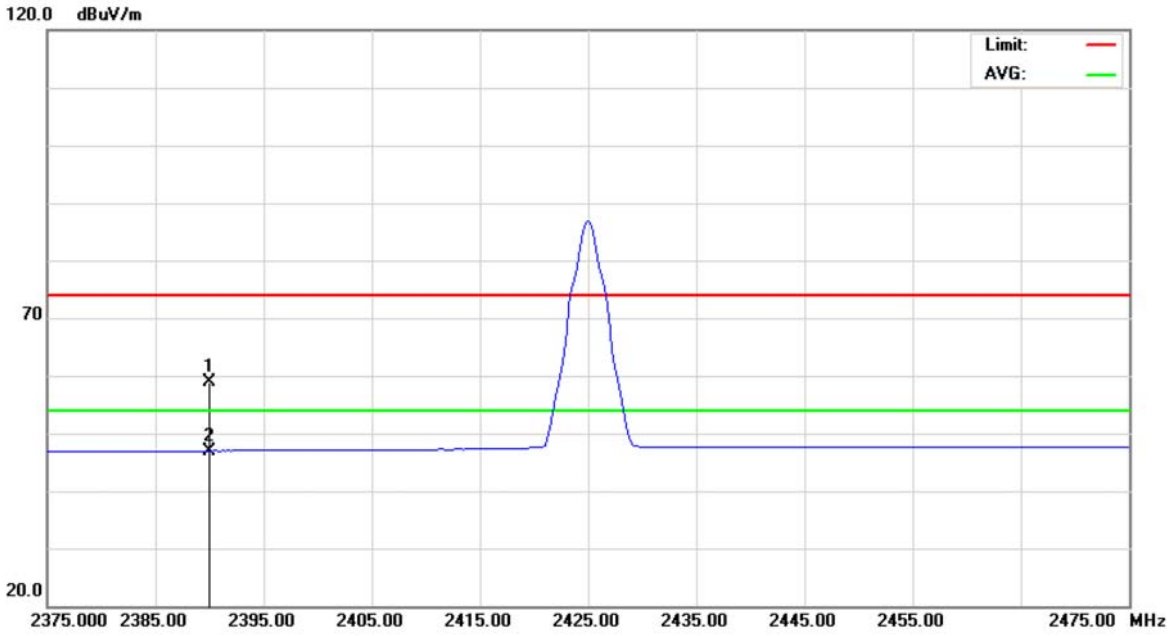


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4950.150	37.13	7.94	45.07	74.00	-28.93	peak	
2		4950.150	29.39	7.94	37.33	54.00	-16.67	AVG	
3		7424.900	38.96	15.36	54.32	74.00	-19.68	peak	
4	*	7424.900	30.02	15.36	45.38	54.00	-8.62	AVG	

4.2.9 TEST RESULTS-RESTRICTED BANDS REQUIREMENTS

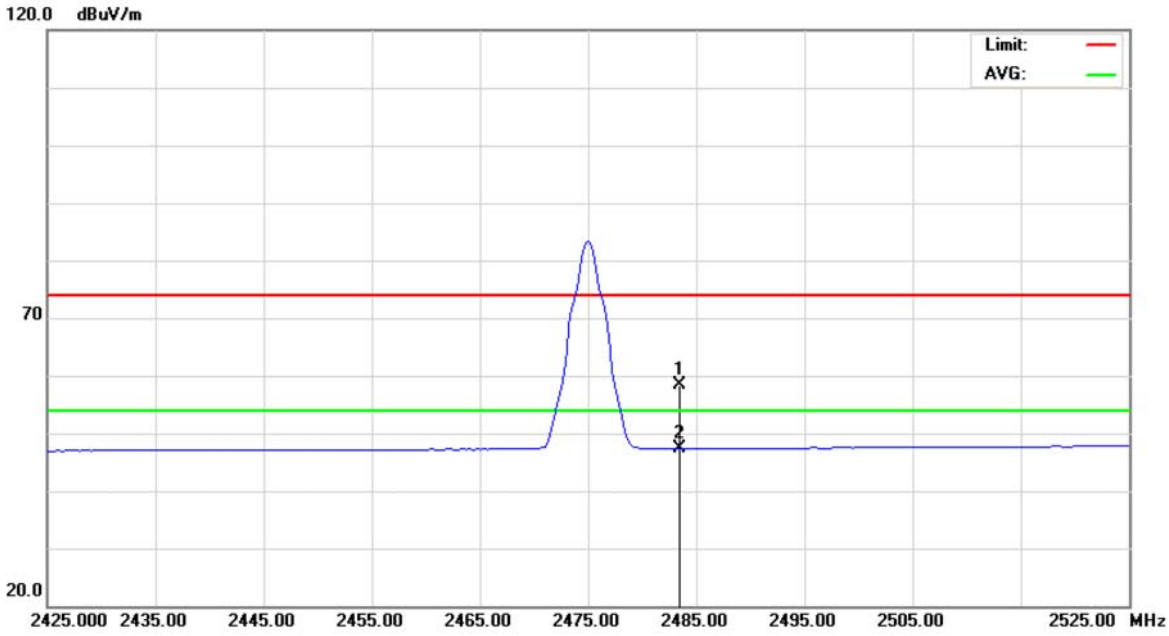
EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	TX CH 2425 MHz/2475 MHz(Vertical)		
Note：	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (2425 MHz). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was configured with the worst case antenna and setup to transmit at the highest channel (2475 MHz). Then the field strength was measured at 2483.5-2500 MHz.		

2425 MHz/ Orthogonal Axes: X Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	25.35	33.42	58.77	74.00	-15.23	peak	
2	*	2390.000	13.57	33.42	46.99	54.00	-7.01	AVG	

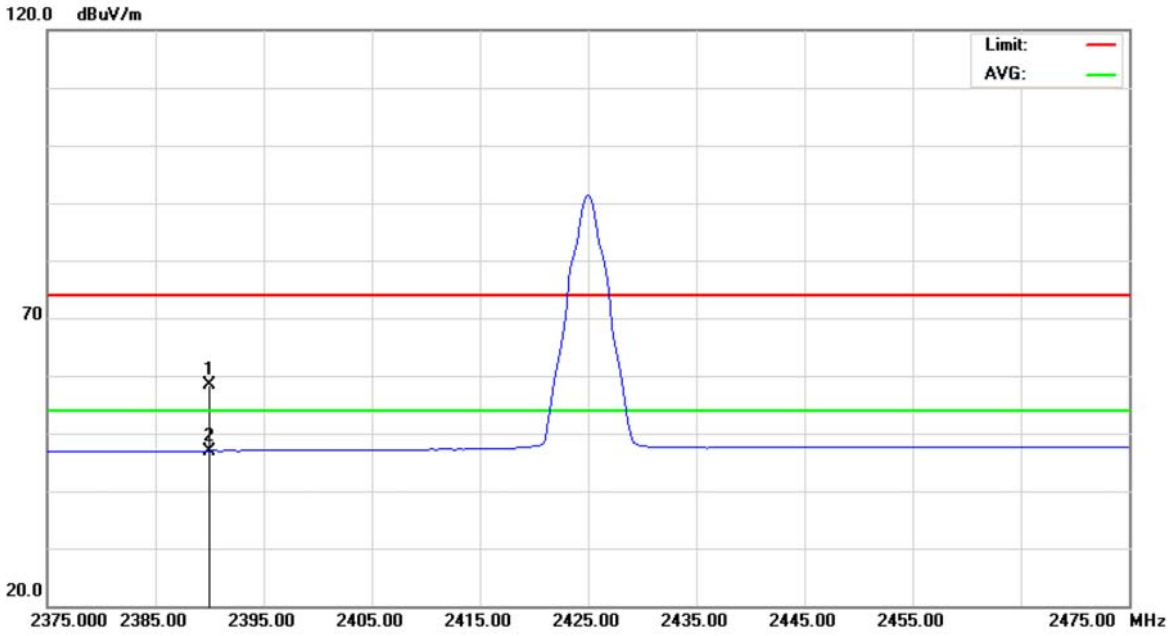
2475 MHz/ Orthogonal Axes: X Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	24.92	33.50	58.42	74.00	-15.58	peak	
2	*	2483.500	13.93	33.50	47.43	54.00	-6.57	AVG	

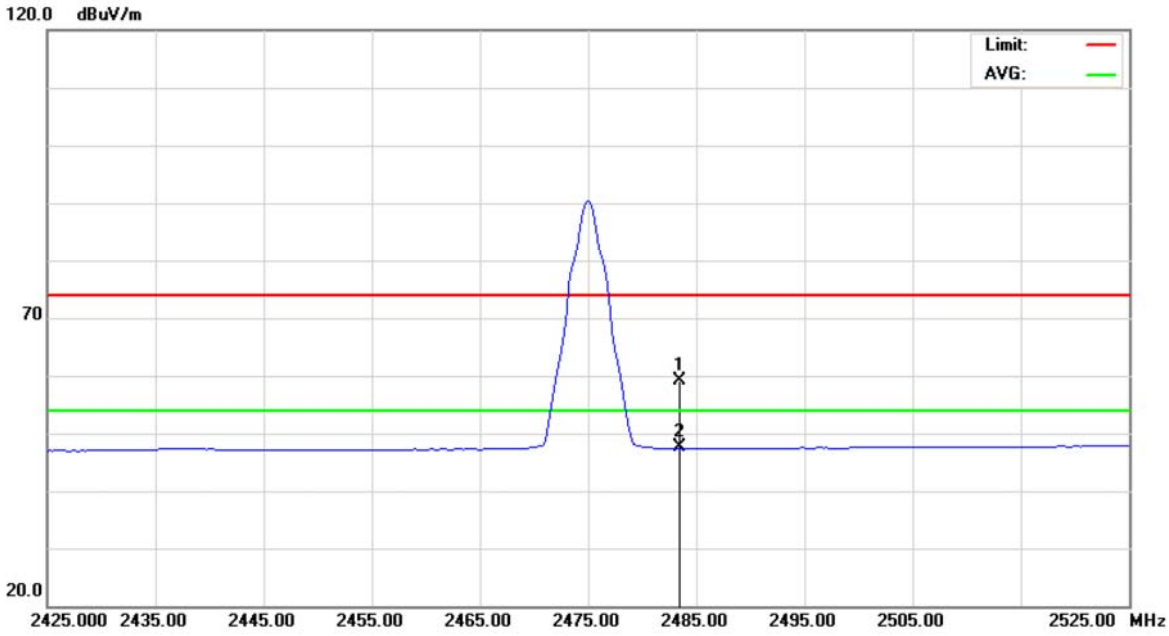
EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	TX CH 2425 MHz/2475 MHz (Horizontal)		
Note：	The emission of the carrier radiated field strength is measured for (Peak and AV) as following: 1. The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel (2425 MHz). Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was configured with the worst case antenna and setup to transmit at the highest channel (2475 MHz). Then the field strength was measured at 2483.5-2500 MHz.		

2425 MHz/ Orthogonal Axes: X Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.98	33.42	58.40	74.00	-15.60	peak	
2	*	2390.000	13.55	33.42	46.97	54.00	-7.03	AVG	

2475 MHz/ Orthogonal Axes: X Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	25.69	33.50	59.19	74.00	-14.81	peak	
2	*	2483.500	14.01	33.50	47.51	54.00	-6.49	AVG	

5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 29, 2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

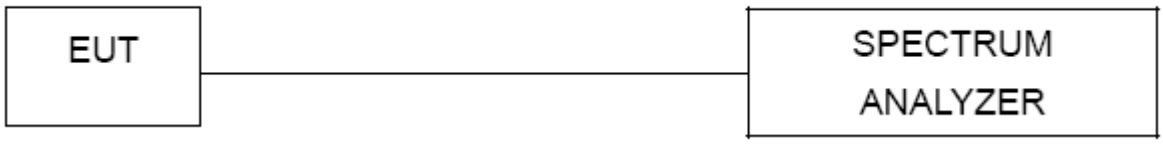
5.3 TEST PROCEDURE

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.

5.4 DEVIATION FROM STANDARD

No deviation.

5.5 TEST SETUP



5.6 EUT OPERATION CONDITIONS

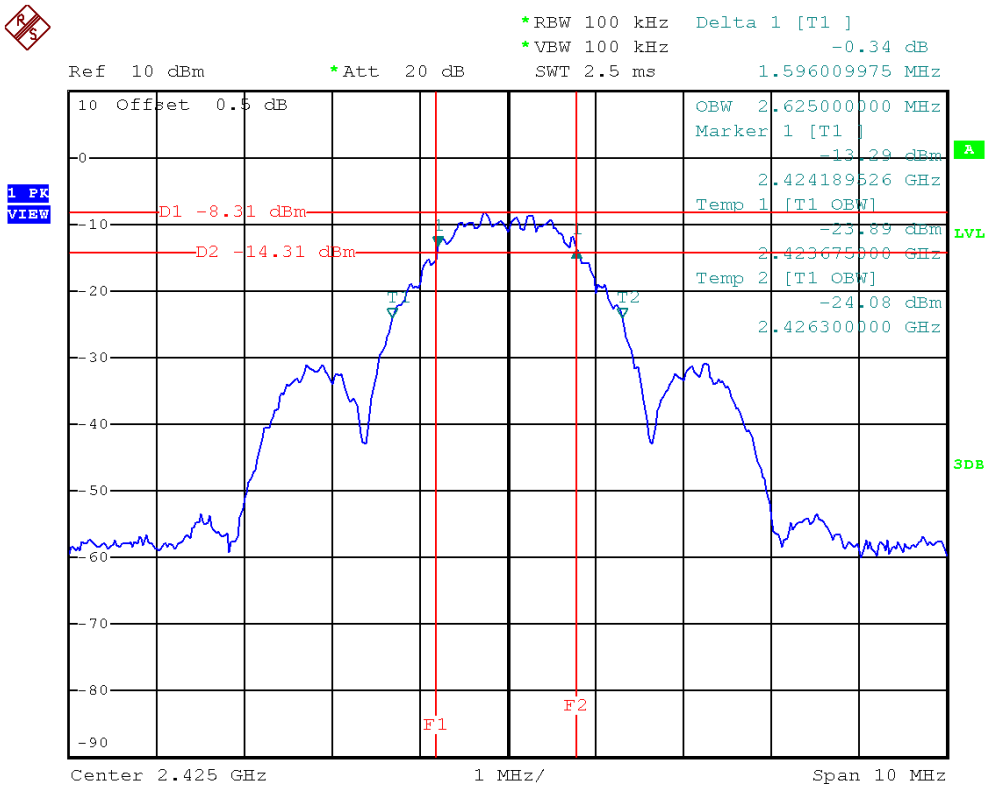
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.7 TEST RESULTS

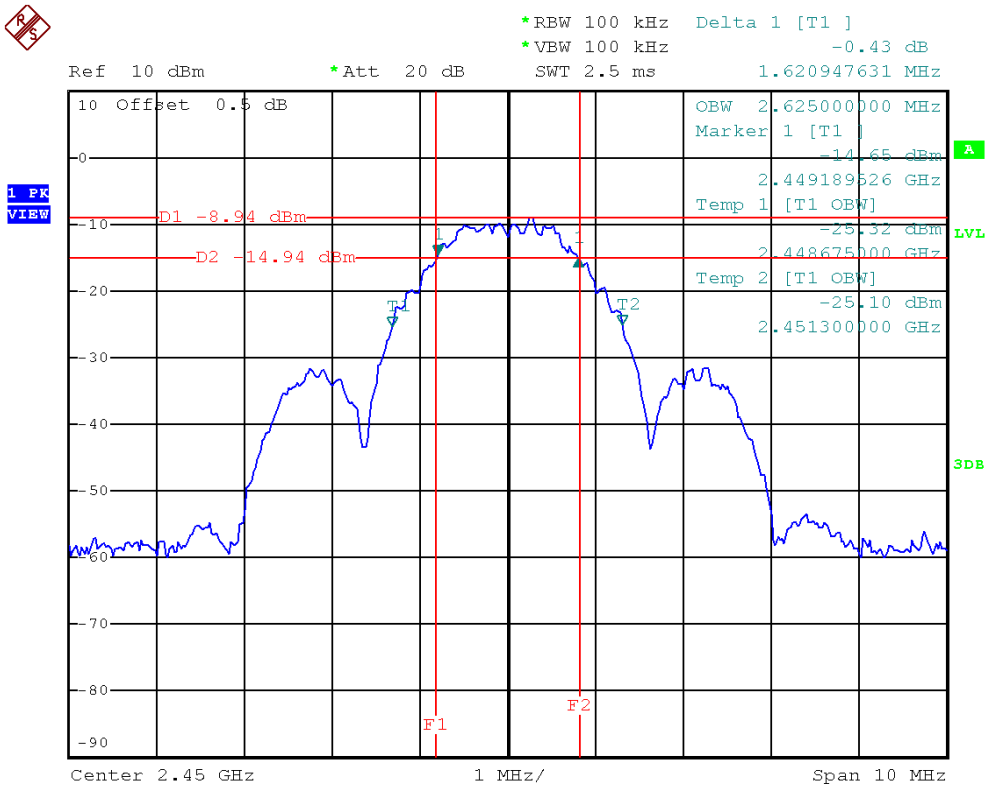
EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity：	60%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2425 MHz/2450 MHz/2475 MHz		

Frequency	Bandwidth (MHz)	99% Occupied BW (MHz)	LIMIT (MHz)
2425 MHz	1.60	2.63	>=500KHz
2450 MHz	1.62	2.63	>=500KHz
2475 MHz	1.60	2.63	>=500KHz

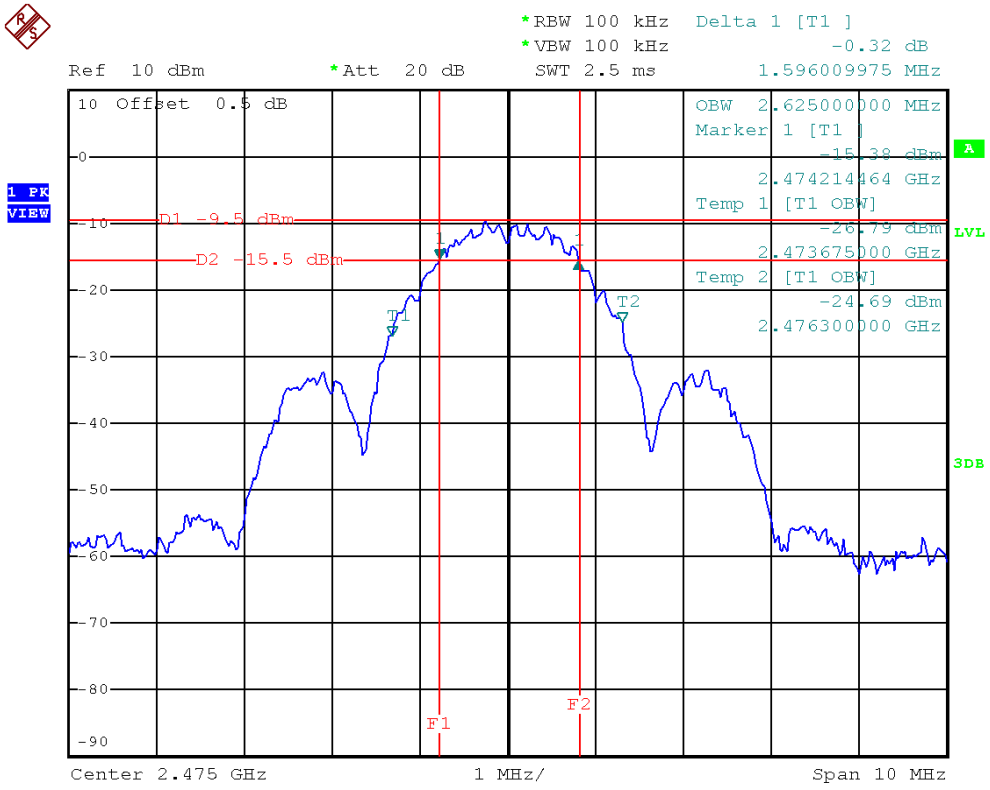
2425 MHz



2450 MHz



2475 MHz



6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Feb,20,2013
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Feb,20,2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

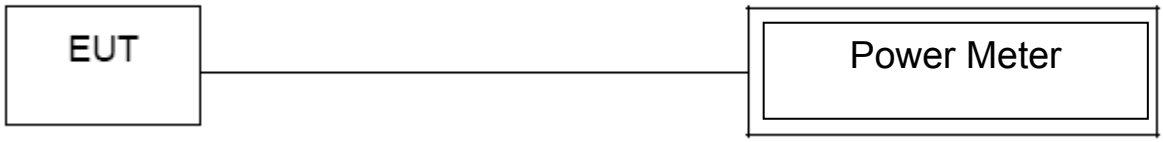
6.3 TEST PROCEDURE

The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,

6.4 DEVIATION FROM STANDARD

No deviation.

6.5 TEST SETUP



6.6 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.

6.7 TEST RESULTS

EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	26°C	Relative Humidity :	60%
Test Voltage :	AC 120V/60Hz		
Test Mode ：	2425 MHz/2450 MHz/2475 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
2425 MHz	-4.76	30	1
2450 MHz	-4.77	30	1
2475 MHz	-4.89	30	1

7. ANTENNA CONDUCTED SPURIOUS EMISSION

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Antenna conducted Spurious Emission	20dB less than the peak value of fundamental frequency	30-25000	PASS

7.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 29, 2013

Remark: ” N/A” denotes No Model Name, Serial No. or No Calibration specified.

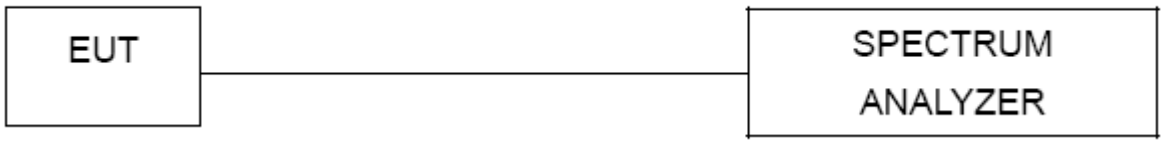
7.3 TEST PROCEDURE

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.

7.4 DEVIATION FROM STANDARD

No deviation.

7.5 TEST SETUP



7.6 EUT OPERATION CONDITIONS

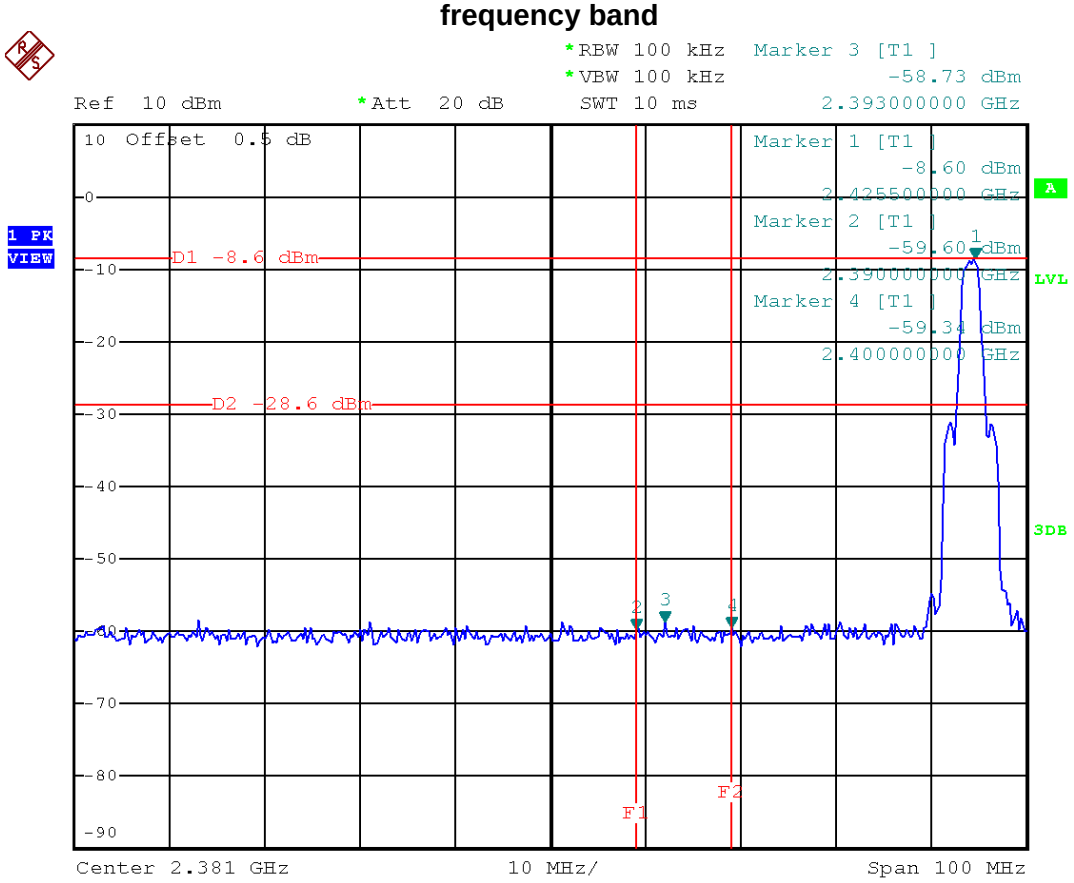
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

7.7 TEST RESULTS

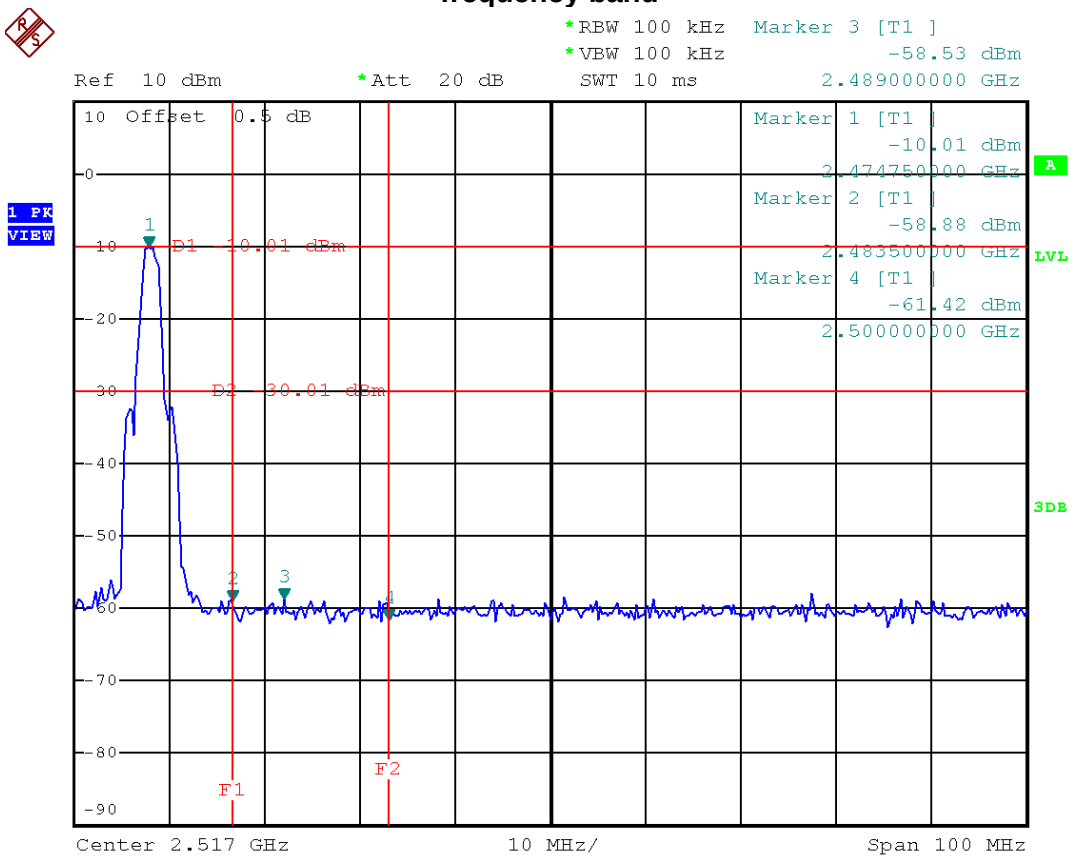
EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	24°C	Relative Humidity：	54%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2425 MHz/2475 MHz		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2393.00	-58.73	2489.00	-58.53
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

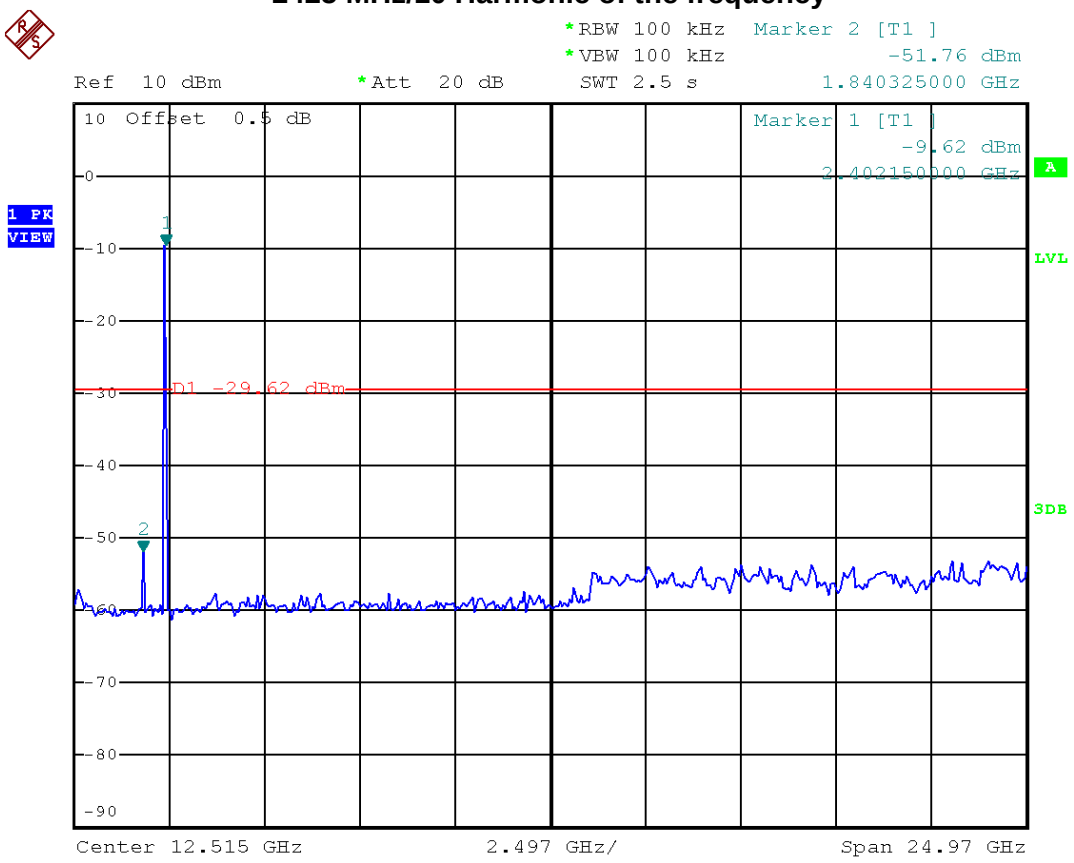
2425 MHz/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



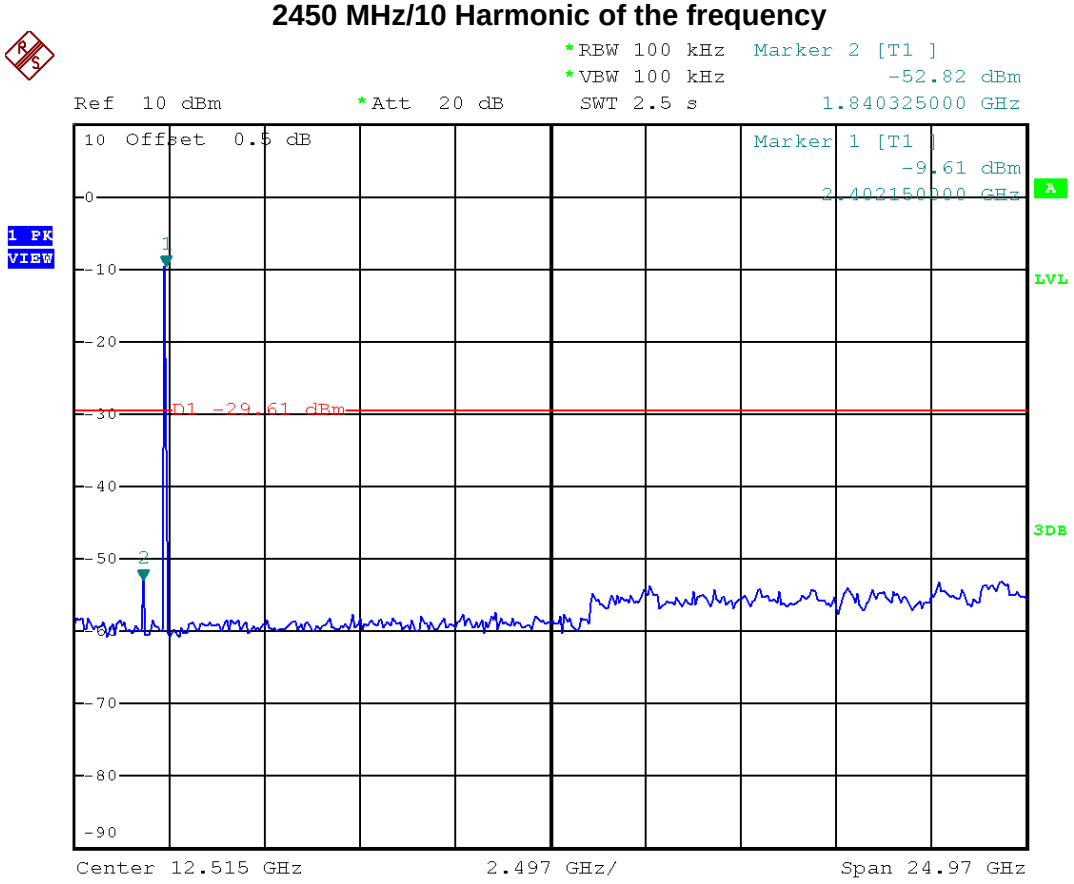
2475 MHz/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



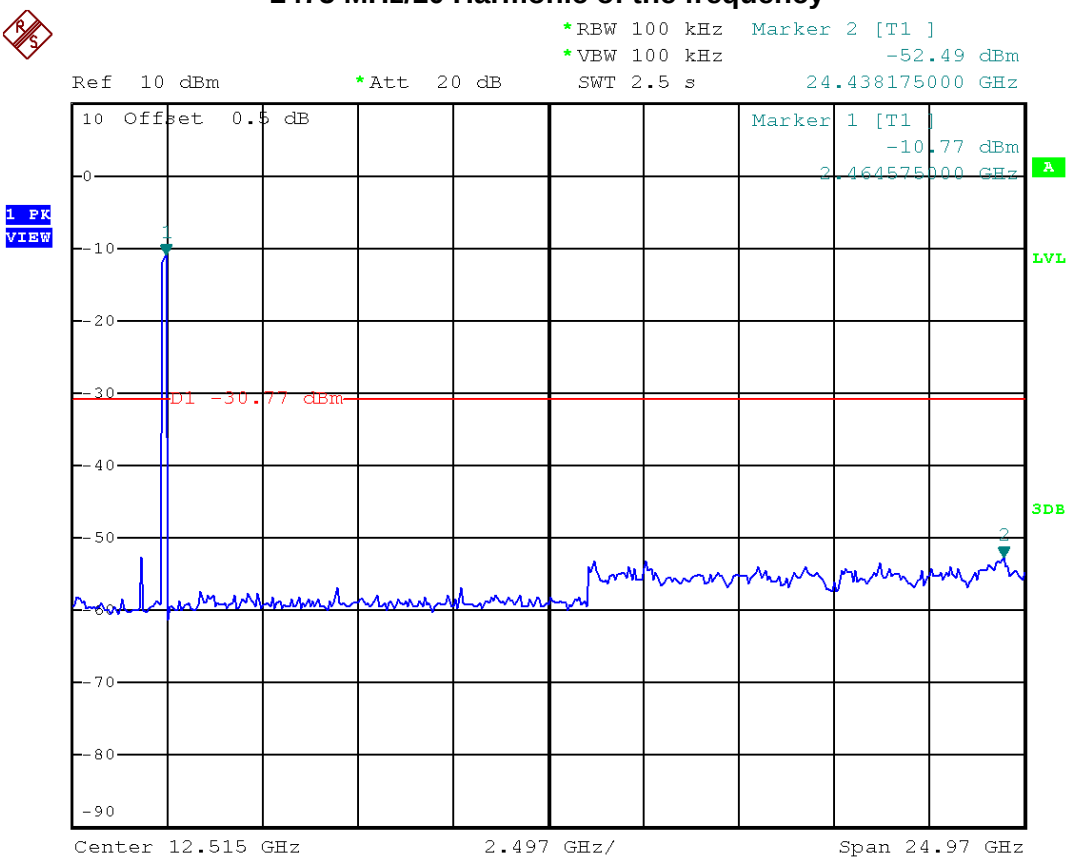
2425 MHz/10 Harmonic of the frequency



2450 MHz/10 Harmonic of the frequency



2475 MHz/10 Harmonic of the frequency



8. POWER SPECTRAL DENSITY TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart C: 2010			
Test Item	Limit	Frequency Range (MHz)	Result
Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

8.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Aug. 29, 2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

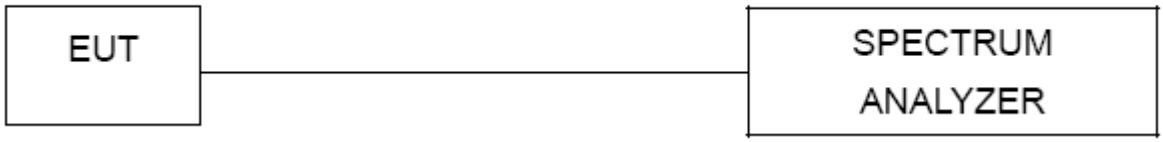
8.3 TEST PROCEDURE

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=3KHz, VBW=30KHz, Sweep time = 500s.

8.4 DEVIATION FROM STANDARD

No deviation.

8.5 TEST SETUP



8.6 EUT OPERATION CONDITIONS

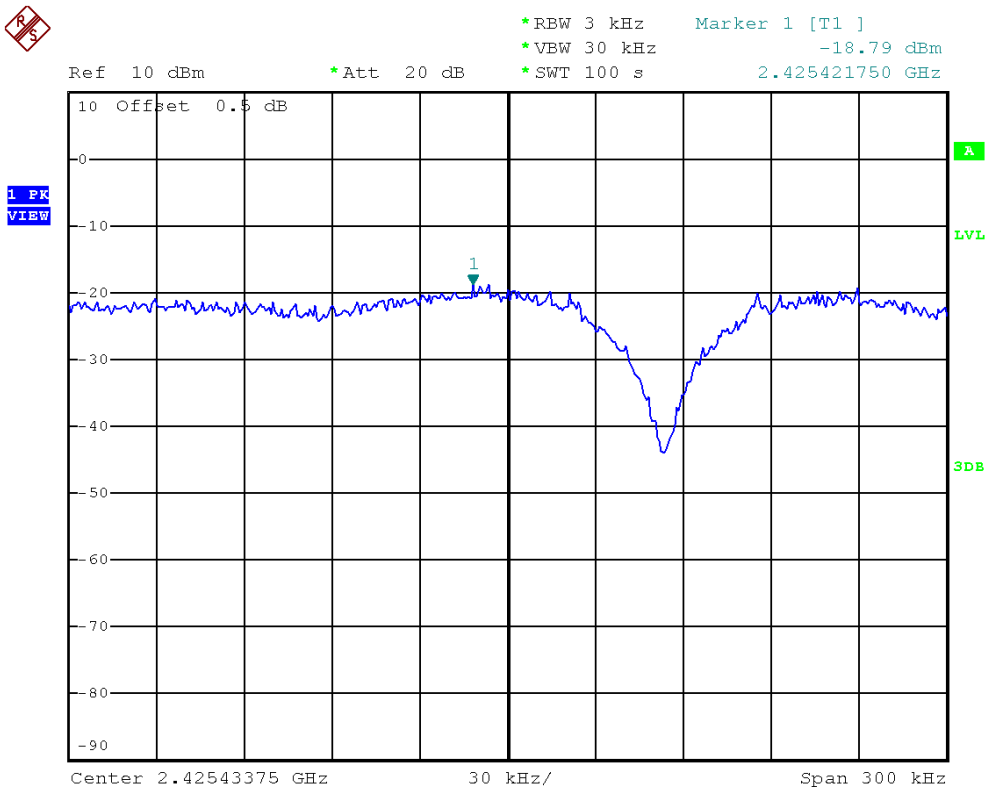
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

8.7 TEST RESULTS

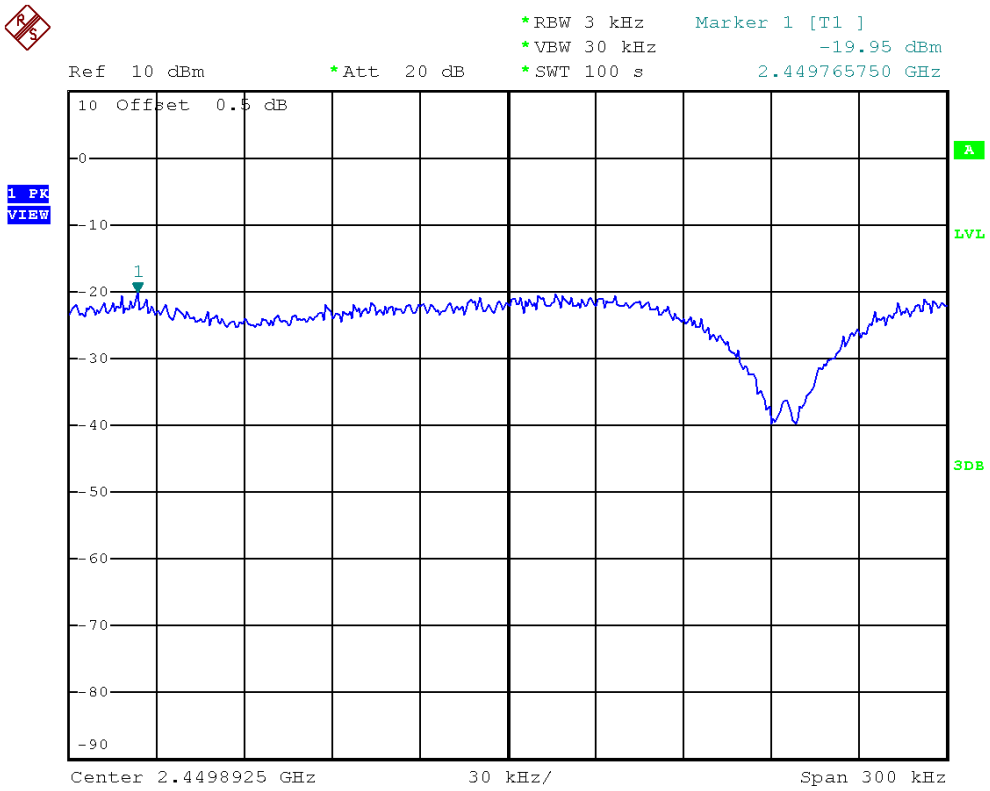
EUT：	Set Top Box	Model Name ：	ADB-1750WM
Temperature：	24°C	Relative Humidity：	54%
Test Voltage：	AC 120V/60Hz		
Test Mode ：	2425 MHz/2450 MHz/2475 MHz		

Frequency	Power Density (dBm)	LIMIT (dBm)
2425 MHz	-18.79	8
2450 MHz	-19.95	8
2475 MHz	-20.46	8

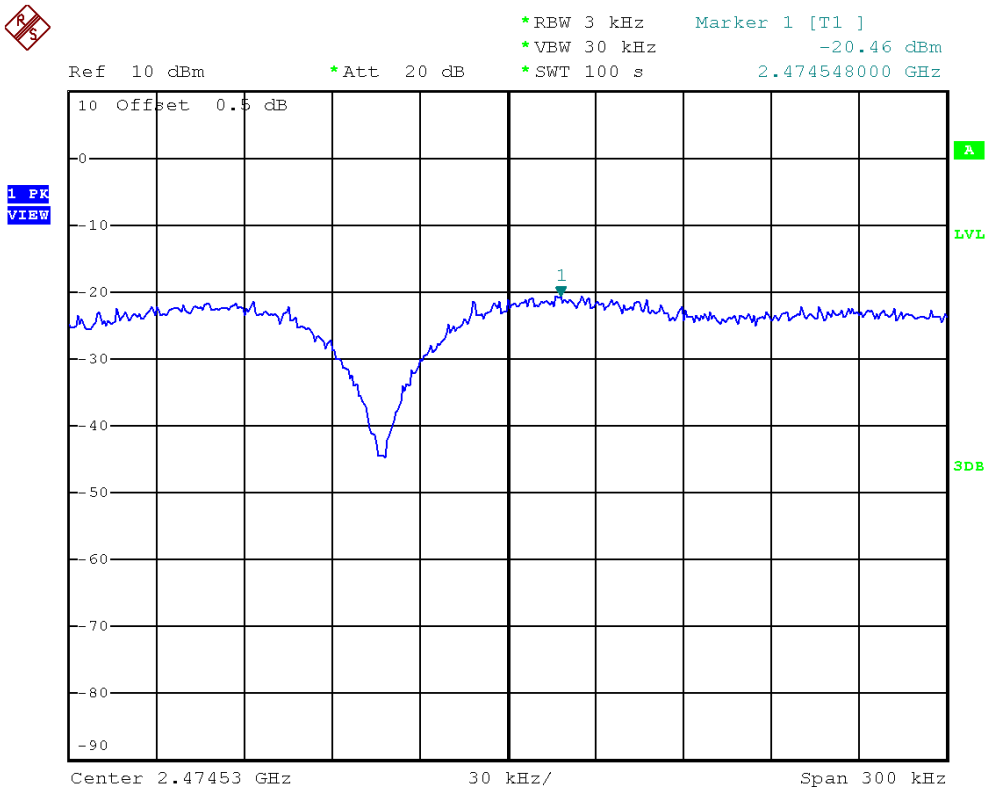
2425 MHz



2450 MHz



2475 MHz



9. RF EXPOSURE TEST

9.1 APPLIED PROCEDURES / LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

9.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Jul. 13, 2012
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Jul. 18, 2012

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

9.3 MPE CALCULATION METHOD & TEST RESULTS

The power is too low, so no RF calculations are needed.