



FCC PART 15 SUBPART C TEST REPORT

FCC Part 15.249

Report Reference No.: WE10080005

FCC ID: T54AD312RECEIVER

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Date of issue: Sep 10, 2010

Testing Laboratory Name: Shenzhen Huatongwei International Inspection Co., Ltd

Address: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Applicant's name: AnJieLun Electronic Technology Limited

Address: 2F, 12st, LONGBI INDUSTRIAL PARK BANTIAN VILLAGE, BUJI TOWN

Test specification:

Standard: FCC Part 15.249: Operation within the bands 920-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0 - 24.25 GHz.

TRF Originator: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF: Dated 2006-06

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Test item description: AD312RECEIVER

Trade Mark: /

Model/Type reference: SW322-YDW-RECEIVER

Listed Models: /

Modulation: GFSK

Result: Positive

TEST REPORT

Test Report No. : WE10080005	Sep 10, 2010 Date of issue
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Equipment under Test : AD312RECEIVER

Model /Type : SW322-YDW-RECEIVER

Listed Models : /

Applicant : AnJieLun Electronic Technology Limited

Address : 2F, 12st, LONGBI INDUSTRIAL PARK BANTIAN VILLAGE, BUJI TOWN

Manufacturer : SHENZHEN ANJIELUN ELECTRONIC TECHNOLOGY LTD

Address : 12ST LONGBI INDUSTRIAL PARK BUJI TOWN BANTIAN VILLAGE SHENZHEN CHINA

Test Result according to the standards on page 4:	Positive
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.249: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0 - 24.25 GHz.

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : Aug 11, 2010

Testing commenced on : Aug 11, 2010

Testing concluded on : Aug 20, 2010

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☒ 120V / 60 Hz ☐ 115V / 60Hz
☐ 12 V DC ☐ 24 V DC
☐ Other (specified in blank below)

2.3. Short description of the Equipment under Test (EUT)

2.4GHz device contains transmit and receive functions.

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.4. EUT operation mode

The EUT has been tested under typical operating condition.

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

☐ - supplied by the manufacturer

☒ - supplied by the lab

☐ AC ADAPTER

Manufacturer: Nalin

Model No.: NLA10050W1A

Power Cable: 150cm

☐ USB Cable

Length: 100cm

Shield: shielded

☐ A/V Cable

Length: 120cm

Shield : Unshielded

- TV
Manufacturer: Hisense
Model No.: TLM19V68
- Notebook PC
Manufacturer: DELL
Model No.: PP11L
- Printer
Manufacturer: HP
Model No.: Laserjet 6L C3990A
- Gigabit Switch
Manufacturer: D-Link
Model No.: DGS-1005D

2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **T54AD312RECEIVER** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

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

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: Mar 30, 2009. Valid time is until Mar 29, 2012.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sept 30, 2011.

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date Jun 01, 2009.

IC-Registration No.: 5377

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377 on November Feb 13, 2009. Valid time is until Feb 13, 2011.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025:2005 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the Authorization is valid through July 07, 2011.

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: December 20, 2006. Valid time is until December 20, 2012.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: December 20, 2006. Valid time is until December 19, 2012.

DNV

Shenzhen Huatongwei International Inspection Co Ltd has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025(2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug 24, 2013.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

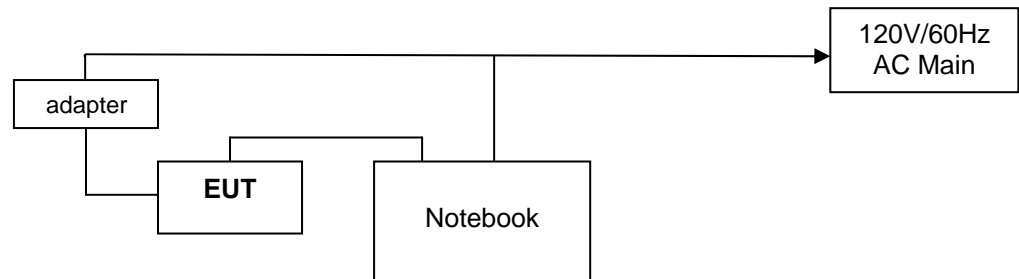
Temperature: 15-35 ° C

Humidity: 30-60 %

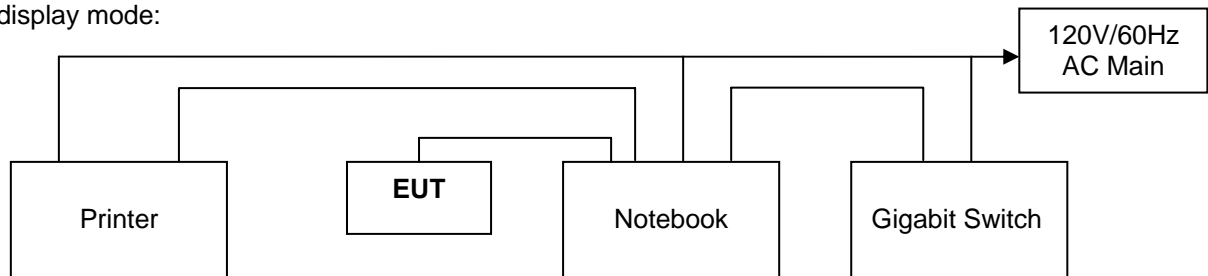
Atmospheric pressure: 950-1050mbar

3.4. Configuration of Tested System

A/V display mode:



USB display mode:



Equipment Used in Tested System

No.	Product	Manufacturer	Model No.	Serial No.	Note
1	AC ADAPTER	Nalin	NLA10050W1A	/	/
2	TV	Hisense	TLM19V68	1RE9T10119	/
3	Notebook PC	DELL	PP11L	H5917A01	/
2	Printer	HP	Laserjet 6L C3990A	JPZP024664	2
3	Gigabit Switch	D-Link	DGS-1005D	DRJP576000511	3

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.22dB	(1)
Radiated Emission	1~18GHz	5.16dB	(1)
Radiated Emission	18~40GHz	5.54dB	(1)
Conducted Disturbance	0.15~30MHz	3.29dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6. Equipments Used during the Test

AC Power Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS30	100038	2009/11
2	ARTIFICIAL MAINS	ROHDE & SCHWARZ	ESH2-Z5	100028	2009/11
3	PULSE LIMITER	ROHDE & SCHWARZ	ESHSZ2	100044	2009/11
4	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ES-K1 1.71	N/A	2009/11
5	HORN ANTENNA	ROHDE & SCHWARZ	HF906	100039	2009/11

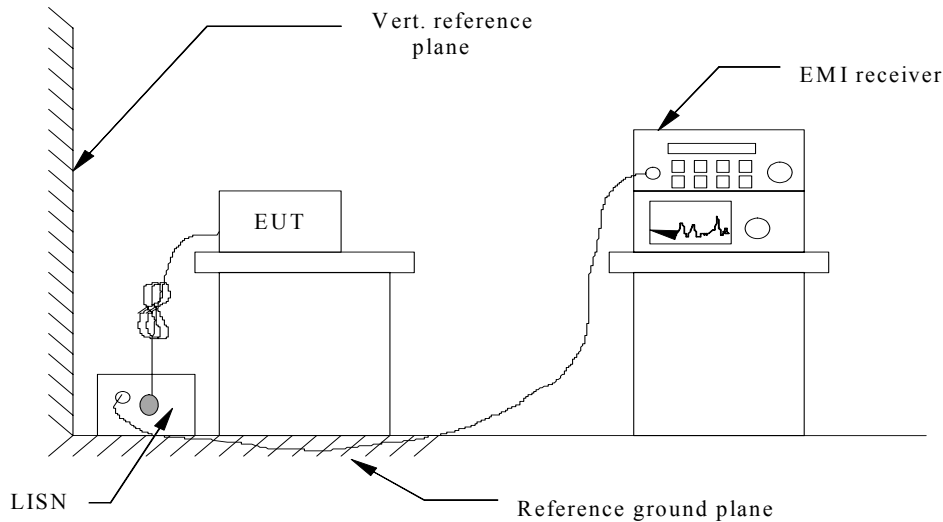
Radiated Emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2010/05
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2009/11
3	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2009/11
4	TURNTABLE	ETS	2088	2149	2009/11
5	ANTENNA MAST	ETS	2075	2346	2009/11
6	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2009/11

Bandwidth / Band Edge Measurement					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI	100106	2009/11

4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2009.
- 2 Support equipment, if needed, was placed as per ANSI C63.4-2009.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2009.
- 4 If a EUT received DC power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

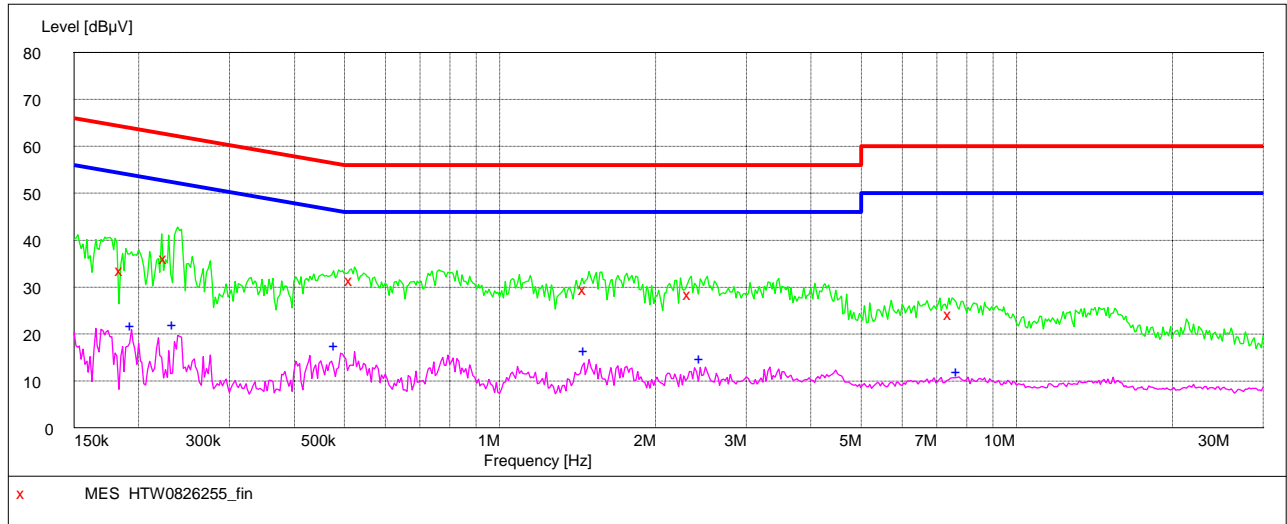
TEST RESULTS

Please see next page

Test condition: A/V display mode**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description:

150K-30M Voltage

**MEASUREMENT RESULT: "HTW0826255_fin"**

8/26/2010 3:46PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.186000	33.90	10.1	64	30.3	QP	L1	GND
0.226500	36.40	10.2	63	26.2	QP	L1	GND
0.519000	31.70	10.2	56	24.3	QP	L1	GND
1.468500	29.70	10.2	56	26.3	QP	L1	GND
2.341500	28.70	10.3	56	27.3	QP	L1	GND
7.480500	24.40	10.5	60	35.6	QP	L1	GND

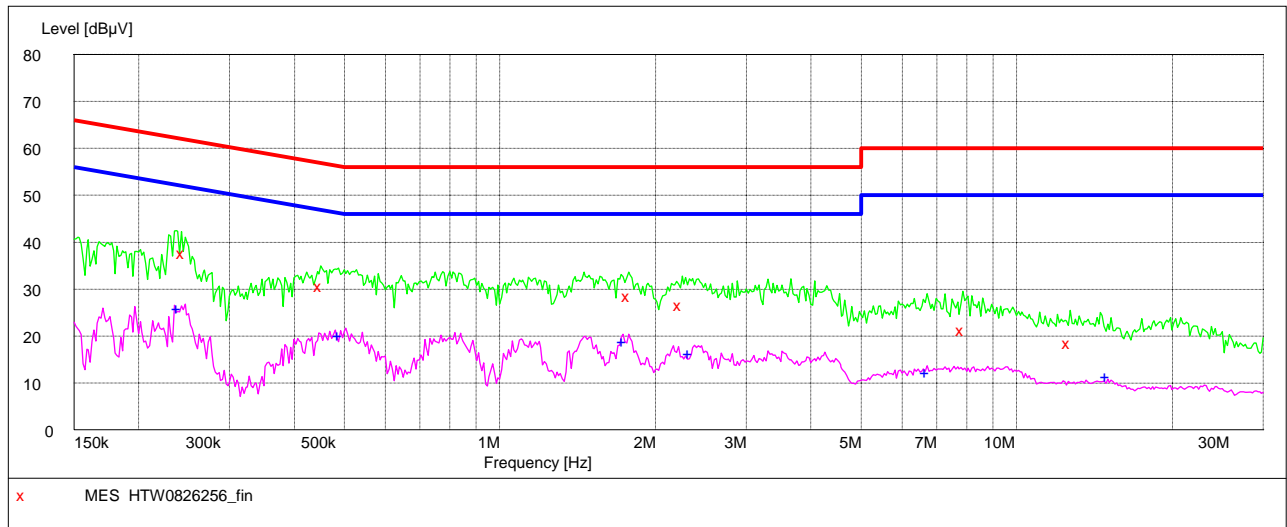
MEASUREMENT RESULT: "HTW0826255_fin2"

8/26/2010 3:46PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.195000	22.00	10.2	54	31.8	AV	L1	GND
0.235500	22.40	10.2	52	29.9	AV	L1	GND
0.483000	17.80	10.2	46	28.5	AV	L1	GND
1.473000	16.70	10.2	46	29.3	AV	L1	GND
2.463000	15.10	10.3	46	30.9	AV	L1	GND
7.746000	12.40	10.5	50	37.6	AV	L1	GND

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0826256_fin"**

8/26/2010 3:55PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.244500	37.90	10.2	62	24.0	QP	N	GND
0.451500	30.80	10.2	57	26.0	QP	N	GND
1.779000	28.70	10.2	56	27.3	QP	N	GND
2.242500	26.90	10.3	56	29.1	QP	N	GND
7.899000	21.40	10.6	60	38.6	QP	N	GND
12.678000	18.80	10.5	60	41.2	QP	N	GND

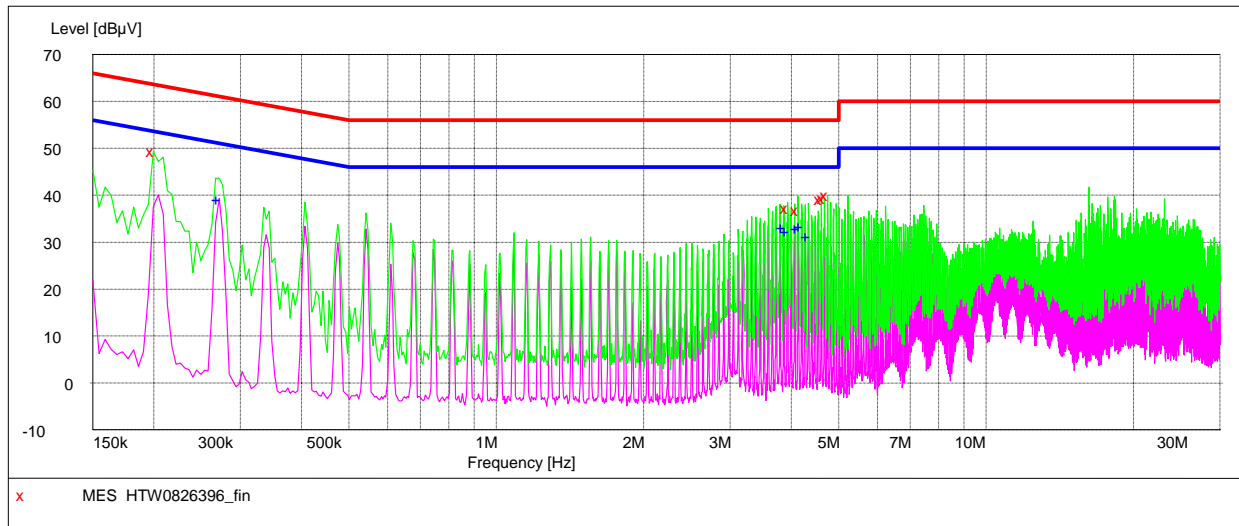
MEASUREMENT RESULT: "HTW0826256_fin2"

8/26/2010 3:55PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.240000	26.10	10.2	52	26.0	AV	N	GND
0.492000	20.30	10.2	46	25.8	AV	N	GND
1.743000	19.10	10.2	46	26.9	AV	N	GND
2.337000	16.60	10.3	46	29.4	AV	N	GND
6.733500	12.60	10.4	50	37.4	AV	N	GND
15.000000	11.70	10.5	50	38.3	AV	N	GND

Test condition: USB display mode**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0826396_fin"**

8/26/2010 8:32PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.199500	49.70	10.1	64	13.9	QP	L1	GND
3.930000	37.40	10.2	56	18.6	QP	L1	GND
4.132500	37.00	10.2	56	19.0	QP	L1	GND
4.609500	39.30	10.2	56	16.7	QP	L1	GND
4.677000	39.70	10.2	56	16.3	QP	L1	GND
4.744500	40.20	10.2	56	15.8	QP	L1	GND

MEASUREMENT RESULT: "HTW0826396_fin2"

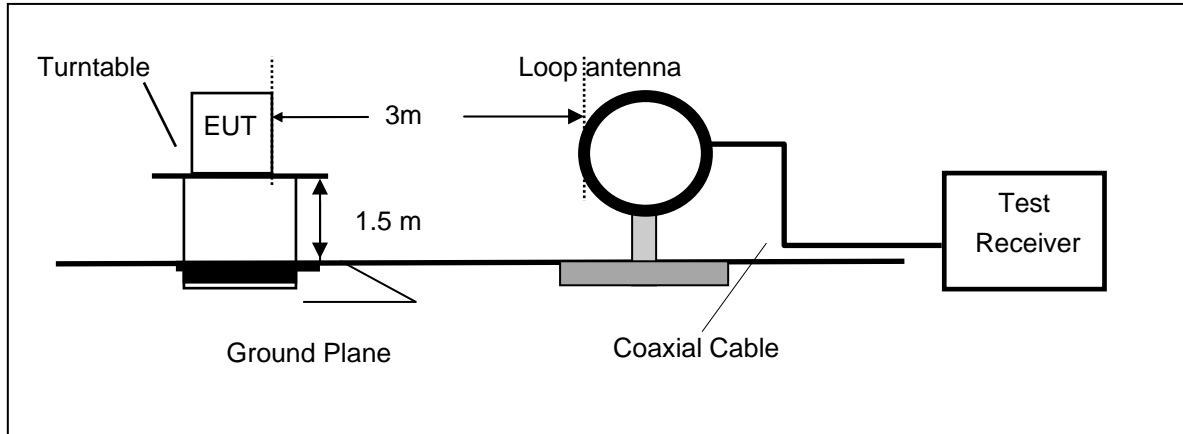
8/26/2010 8:32PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.271500	39.30	10.1	51	11.8	AV	L1	GND
3.862500	33.30	10.2	46	12.7	AV	L1	GND
3.930000	32.60	10.2	46	13.4	AV	L1	GND
4.132500	33.20	10.2	46	12.8	AV	L1	GND
4.204500	33.70	10.2	46	12.3	AV	L1	GND
4.335000	31.60	10.2	46	14.4	AV	L1	GND

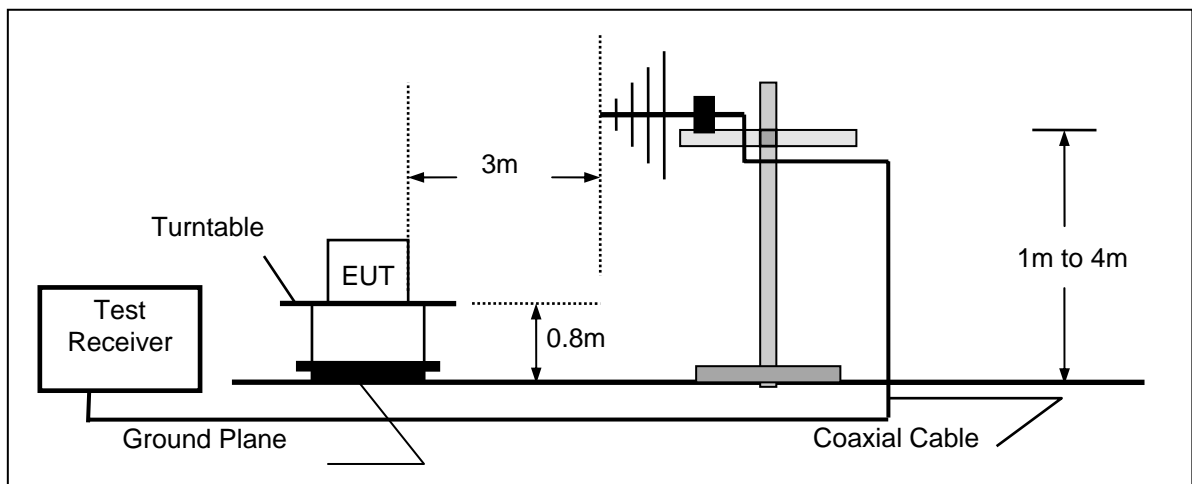
4.2. Radiated Emission Test

TEST CONFIGURATION

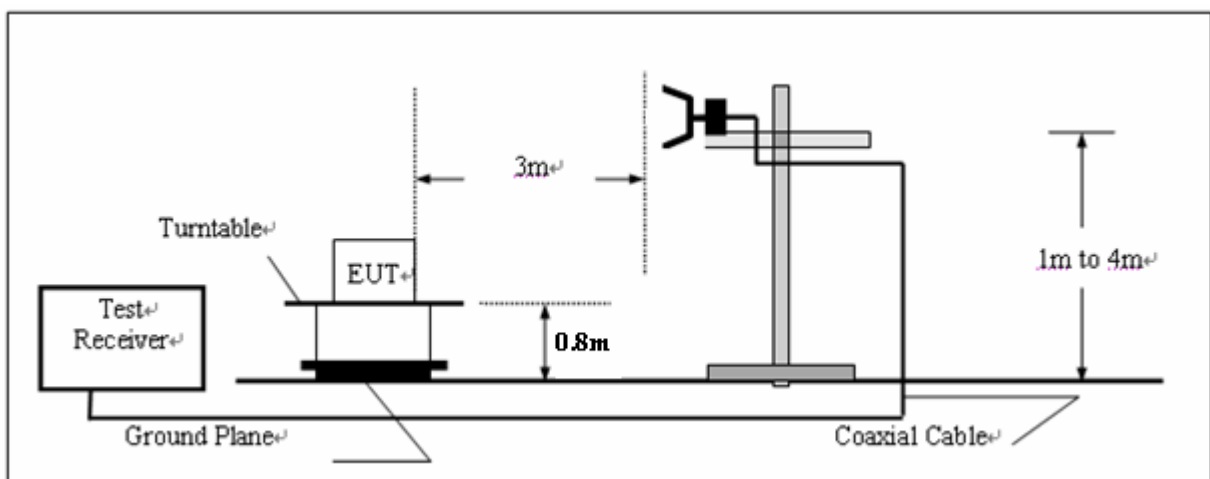
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

RADIATION LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

Fundamental and Harmonics Emission Limits

Frequency MHz	Field Strength of Fundamental (mV/m @3m)	Field Strength of Harmonics (dBuV/m @3m)	Field Strength of Harmonics (uV/m @3m)	Field Strength of Harmonics (dBuV/m @3m)
2400-2483.5	50	94 (Average) 114 (Peak)	500	54 (Average) 74 (Peak)

TEST RESULTS

Test condition: A/V display mode

Operation Mode: TX on Top Channel

Temperature: 20 °C Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (Peak/AV/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2475	V	Peak	107.06	-3.50	103.56	114.00	-10.44	F
2475	H	Peak	97.48	-3.50	93.98	114.00	-20.02	F
2475	V	AV	88.42	-3.50	84.92	94.00	-9.08	F
2475	H	AV	86.18	-3.50	82.68	94.00	-11.32	F
4950	V	Peak	40.22	3.80	44.02	54.00	-9.98	H
4950	H	Peak	43.00	3.80	48.90	54.00	-5.10	H
7425	V		---					H
7425	H		---					H
64.99	H	QP	57.30	-24.40	32.90	43.50	-10.60	
64.99	V	QP	53.30	-21.40	31.90	43.50	-11.60	
142.75	H	QP	46.80	-21.20	25.60	46.00	-20.40	
72.77	V	QP	54.70	-23.50	31.20	46.00	-14.80	
599.56	H	QP	43.40	-12.10	31.30	46.00	-14.70	
840.60	V	QP	42.40	-7.60	34.80	46.00	-11.20	
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes harmonic frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (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) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz
- (6) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX on Mid Channel

Temperature: 20 °C Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (Peak/AV/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2448	V	Peak	104.76	-3.50	101.26	114.00	-12.74	F
2448	H	Peak	94.72	-3.50	91.22	114.00	-22.78	F
2448	V	AV	91.44	-3.50	87.94	94.00	-6.06	F
2448	H	AV	84.77	-3.50	81.27	94.00	-12.73	F
4896	V	Peak	45.00	3.80	48.80	54.00	-5.20	H
4896	H	Peak	43.00	3.80	49.20	54.00	-4.80	H
7344	V		---					H
7344	H		---					H
64.99	H	QP	54.50	-21.40	33.10	43.50	-10.40	
64.99	V	QP	56.00	-21.40	34.60	43.50	-8.90	
142.75	H	QP	42.00	-12.90	29.10	46.00	-16.90	
72.77	V	QP	50.40	-19.90	30.50	46.00	-15.50	
599.56	H	QP	44.50	-10.90	33.60	46.00	-12.40	
840.60	V	QP	46.70	-10.90	35.80	46.00	-10.20	
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes harmonic frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (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) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz
- (6) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX on Bot Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (Peak/AV/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2408	V	Peak	111.34	-3.50	107.84	114.00	-6.16	F
2408	H	Peak	100.54	-3.50	97.04	114.00	-16.96	F
2408	V	AV	90.28	-3.50	86.78	94.00	-7.22	F
2408	H	AV	83.20	-3.50	79.70	94.00	-14.30	F
4816	V	Peak	43.80	3.80	47.60	54.00	-6.40	H
4816	H	Peak	43.00	3.80	46.40	54.00	-7.60	H
7224	V		---					H
7224	H		---					H
64.99	H	QP	55.50	-21.40	34.10	43.50	-9.40	
64.99	V	QP	54.90	-21.40	33.50	43.50	-10.00	
142.75	H	QP	40.30	-12.90	27.40	46.00	-18.60	
72.77	V	QP	56.30	-19.90	36.40	46.00	-9.60	
599.56	H	QP	41.30	-10.90	30.40	46.00	-15.60	
840.60	V	QP	44.50	-10.90	33.60	46.00	-12.40	
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes harmonic frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (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) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz
- (6) The average measurement was not performed when the peak measured data under the limit of average detection.

Test condition: USB display mode

Operation Mode: TX on Top Channel

Temperature: 20 °C Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (Peak/AV/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2475	V	Peak	107.00	-3.50	103.50	114.00	-10.50	F
2475	H	Peak	97.48	-3.50	93.98	114.00	-20.02	F
2475	V	AV	90.01	-3.50	86.51	94.00	-7.49	F
2475	H	AV	81.80	-3.50	78.30	94.00	-15.70	F
4950	V	Peak	43.41	3.80	47.21	54.00	-6.79	H
4950	H	Peak	43.00	3.80	48.38	54.00	-5.62	H
7425	V		---					H
7425	H		---					H
59.16	H	QP	58.70	-24.70	34.00	43.50	-9.50	
59.16	V	QP	59.10	-24.70	34.40	43.50	-9.10	
432.38	H	QP	54.00	-15.40	38.60	46.00	-7.40	
624.83	V	QP	51.30	-12.00	39.30	46.00	-6.70	
673.43	H	QP	51.00	-10.90	40.10	46.00	-5.90	
673.43	V	QP	53.00	-10.90	42.10	46.00	-3.90	
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes harmonic frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (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) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz
- (6) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX on Mid Channel

Temperature: 20 °C Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (Peak/AV/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2448	V	Peak	101.86	-3.50	98.36	114.00	-15.64	F
2448	H	Peak	97.65	-3.50	94.15	114.00	-19.85	F
2448	V	AV	87.83	-3.50	84.33	94.00	-9.67	F
2448	H	AV	85.07	-3.50	81.57	94.00	-12.43	F
4896	V	Peak	45.00	3.80	48.80	54.00	-5.20	H
4896	H	Peak	43.00	3.80	49.20	54.00	-4.80	H
7344	V		---					H
7344	H		---					H
59.16	H	QP	60.10	-24.70	35.40	43.50	-8.10	
59.16	V	QP	59.40	-24.70	34.70	43.50	-8.80	
432.38	H	QP	50.60	-15.40	35.20	46.00	-10.80	
624.83	V	QP	50.60	-12.00	38.60	46.00	-7.40	
673.43	H	QP	51.92	-10.90	41.02	46.00	-4.98	
673.43	V	QP	54.00	-10.90	43.10	46.00	-2.90	
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes harmonic frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (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) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz
- (6) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX on Bot Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (Peak/AV/QP)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2408	V	Peak	104.33	-3.50	100.83	114.00	-13.17	F
2408	H	Peak	99.30	-3.50	95.80	114.00	-18.20	F
2408	V	AV	90.72	-3.50	87.22	94.00	-6.78	F
2408	H	AV	91.07	-3.50	87.57	94.00	-6.43	F
4816	V	Peak	43.80	3.80	47.60	54.00	-6.40	H
4816	H	Peak	43.00	3.80	46.40	54.00	-7.60	H
7224	V		---					H
7224	H		---					H
59.16	H	QP	57.70	-24.70	33.00	43.50	-10.50	
59.16	V	QP	56.40	-24.70	31.70	43.50	-11.80	
432.38	H	QP	55.50	-15.40	40.10	46.00	-5.90	
624.83	V	QP	49.10	-12.00	37.10	46.00	-8.90	
673.43	H	QP	51.90	-10.90	41.00	46.00	-5.00	
673.43	V	QP	51.80	-10.90	40.90	46.00	-5.10	
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 25 GHz.s
- (2) "F" denotes fundamental frequency; "H" denotes harmonic frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (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) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz
- (6) The average measurement was not performed when the peak measured data under the limit of average detection.

4.3. Band Edge Measurement

TEST CONFIGURATION

Same as Section 4.2

TEST PROCEDURE

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 1MHz and VBM to 3MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBM to 300 KHz, to measure the conducted peak band edge.

LIMIT

FCC PART 15.249(d) 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 to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

TEST RESULTS

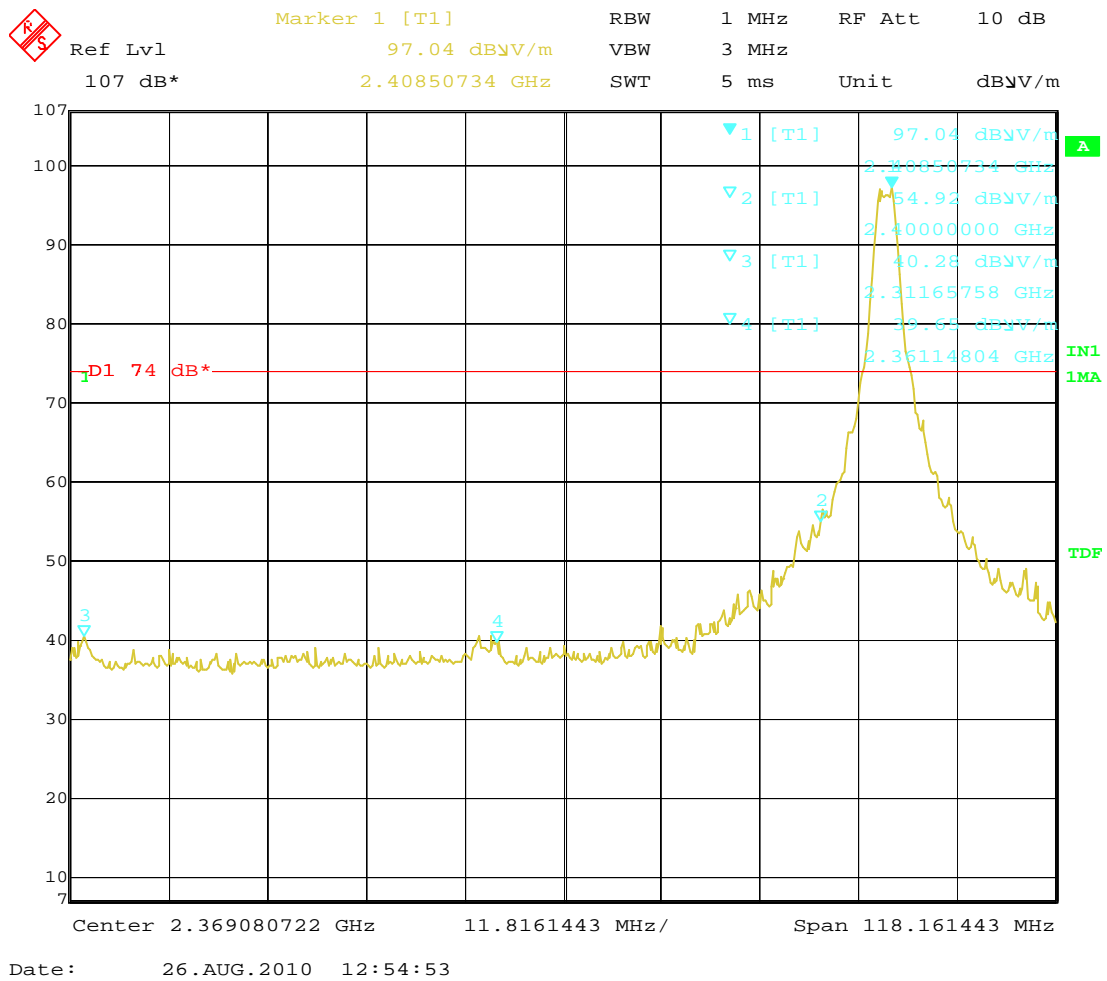
Please see next page

Test condition: A/V display mode

Operation Mode: TX on Bot Channel

Temperature: 20 °C Humidity: 70 % RH

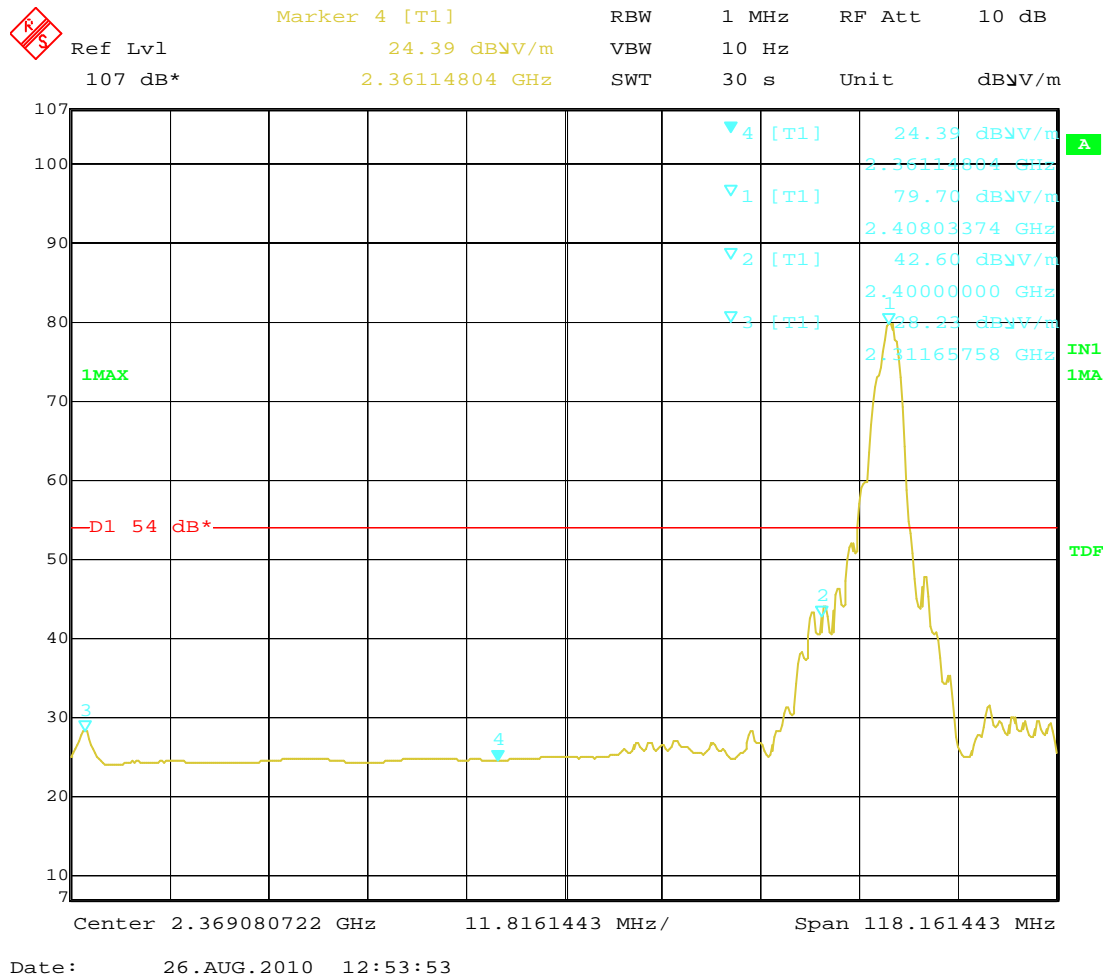
Polarity: Hor.



Note:

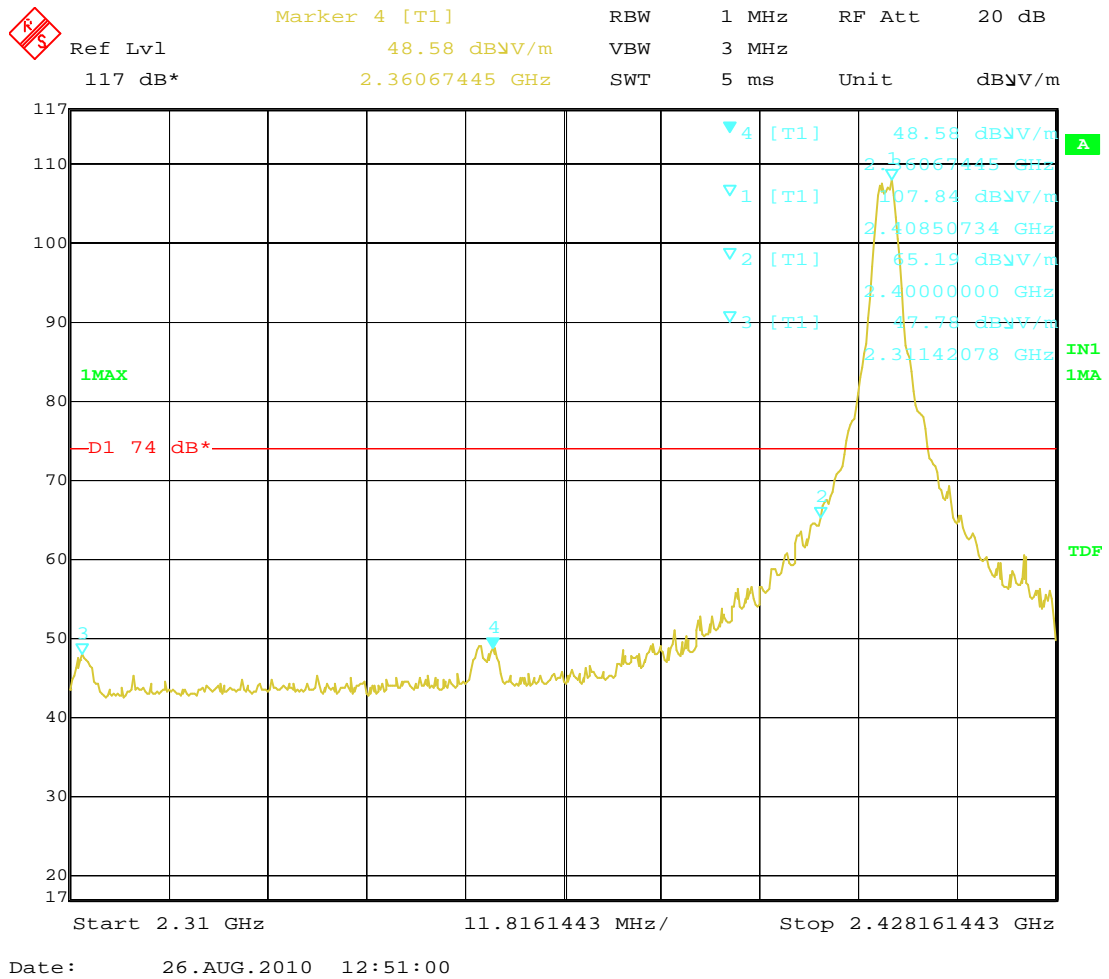
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dBμv/m.

Operation Mode: TX on Bot Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Hor.

**Note:**

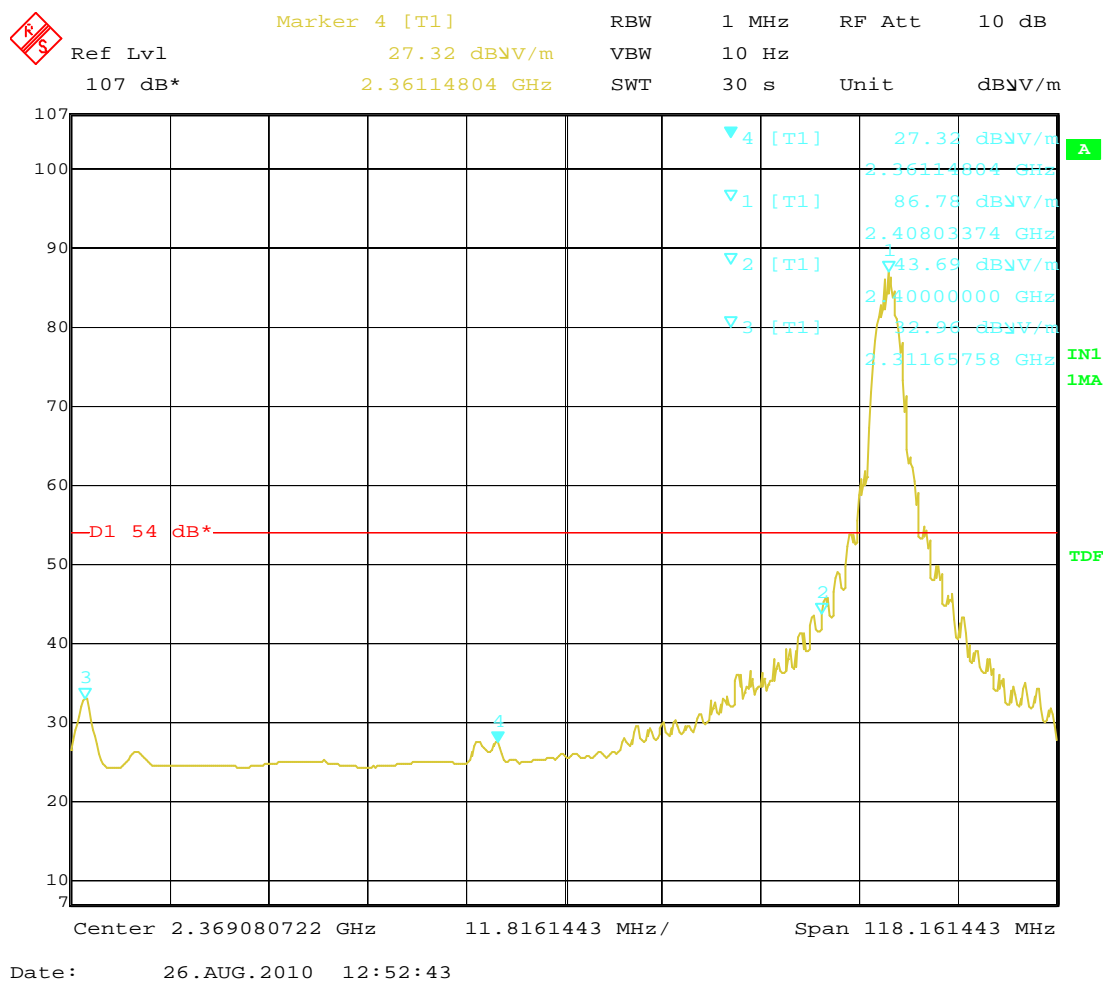
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dBμv/m.

Operation Mode: TX on Bot Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver.

**Note:**

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dBμv/m.

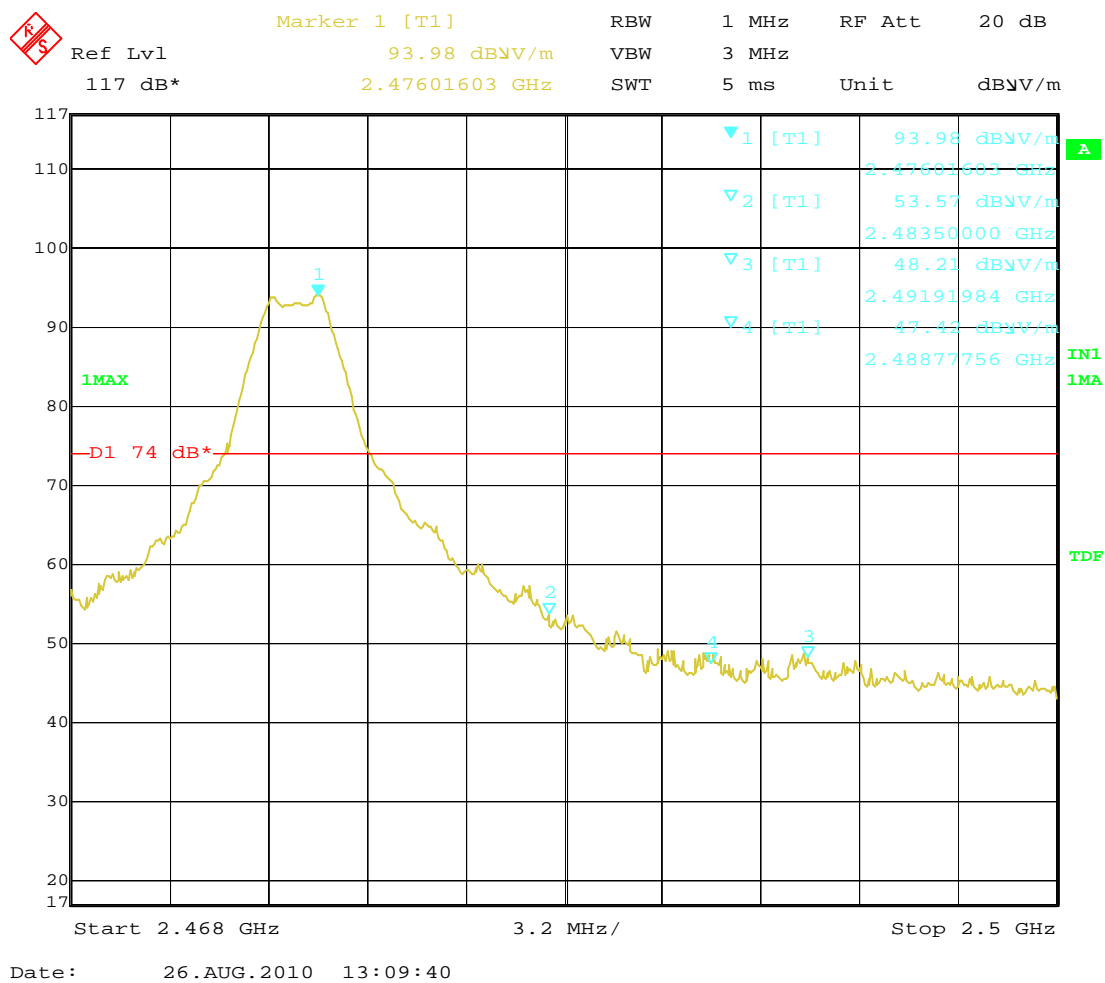
Operation Mode: TX on Bot Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver.



Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dBμv/m.

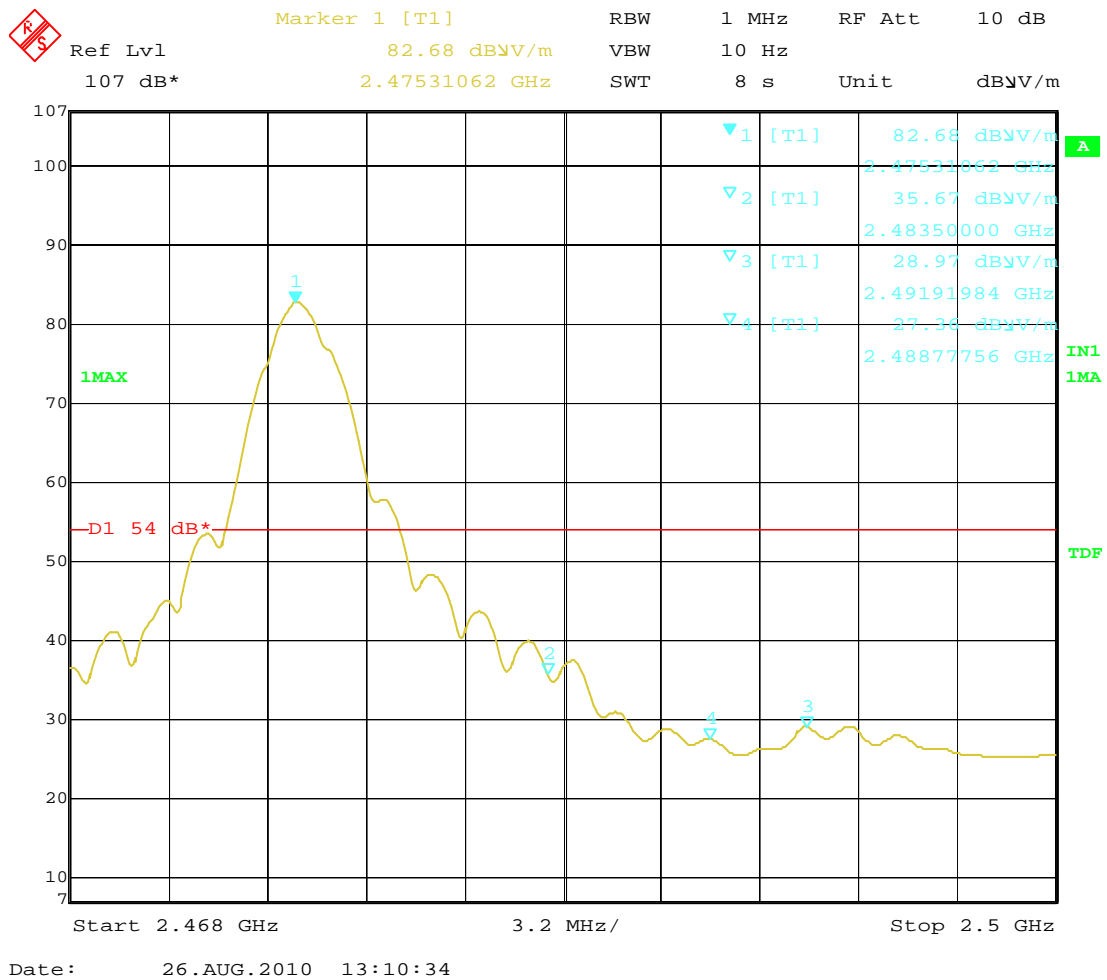
Operation Mode: TX on Top Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Hor.



Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dBμv/m.

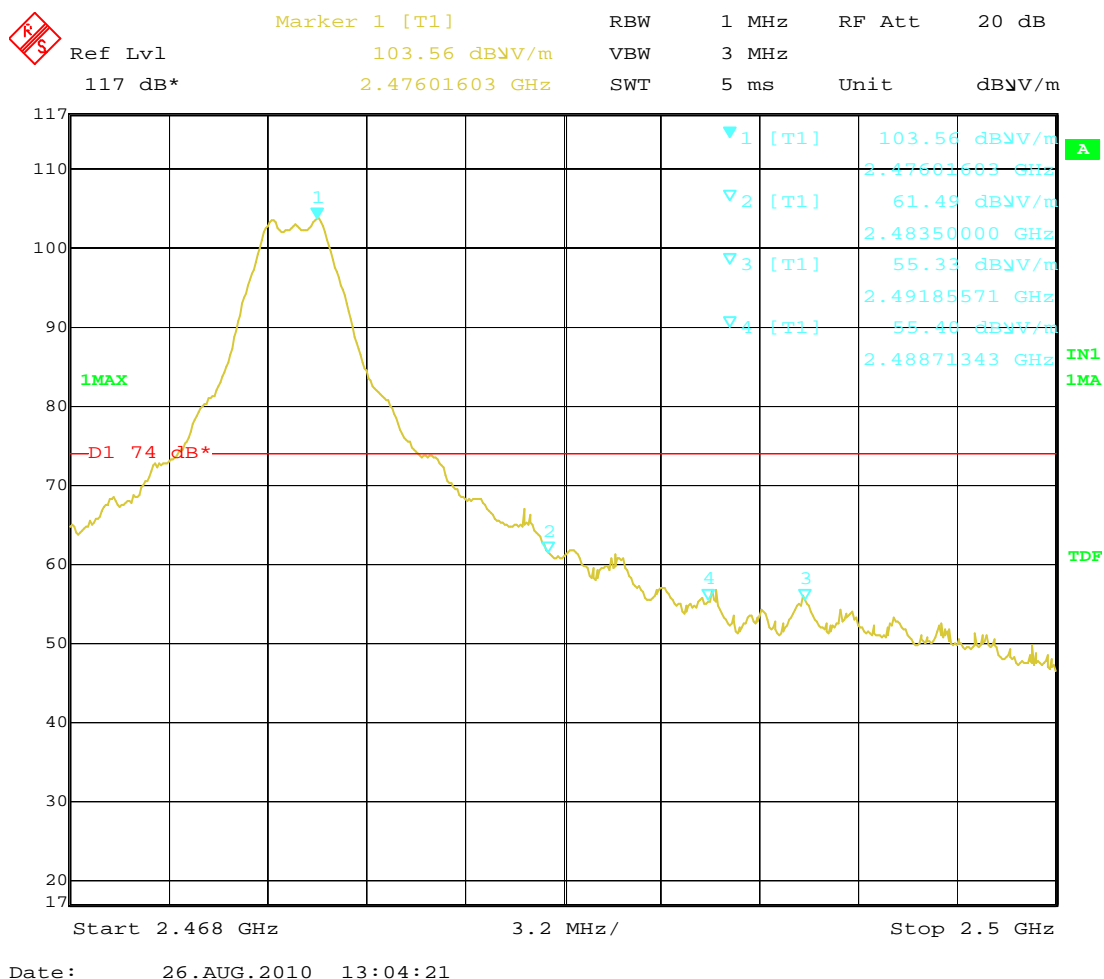
Operation Mode: TX on Top Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Hor.



Note:

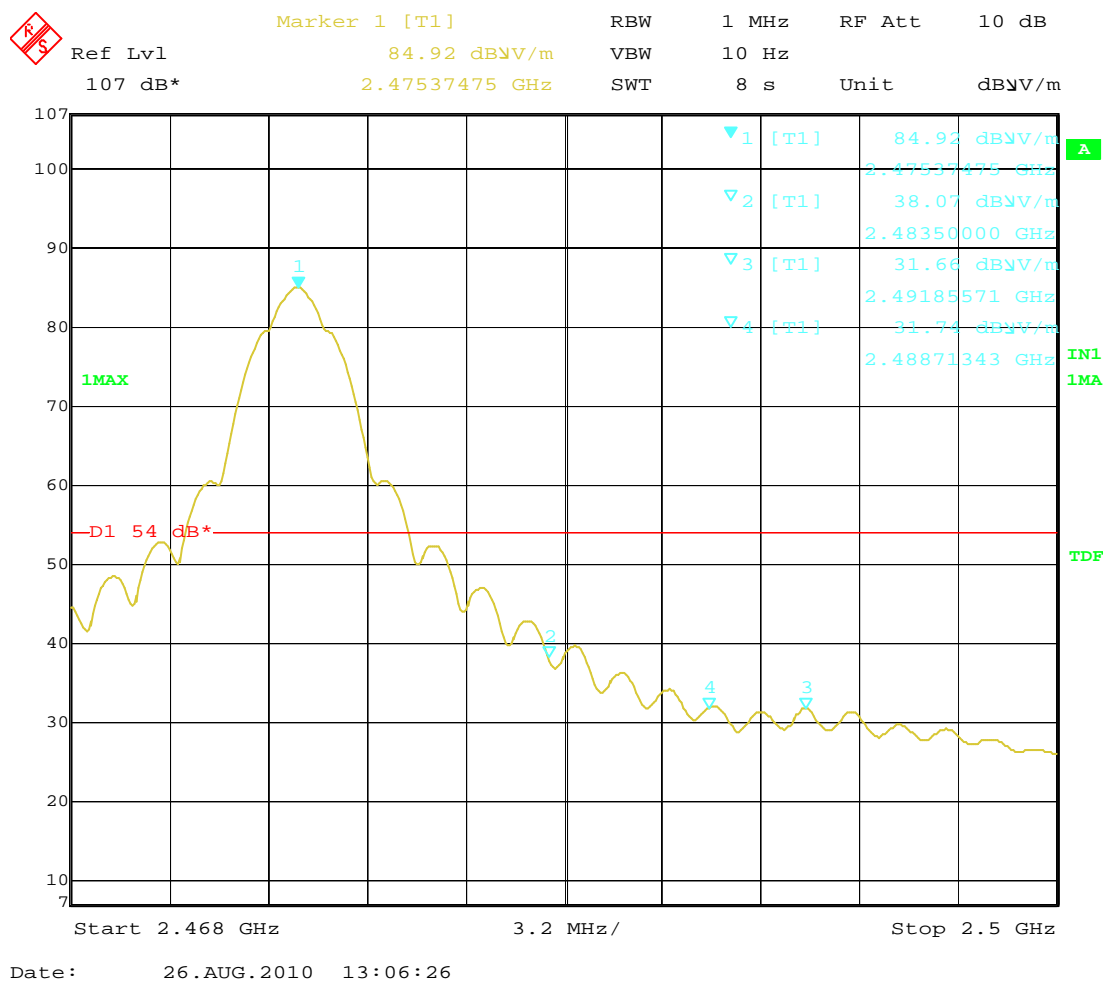
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall not exceed 54 dBV/m.

Operation Mode: TX on Top Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver.

**Note:**

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dBμv/m.

Operation Mode: TX on Top Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver.



Note:

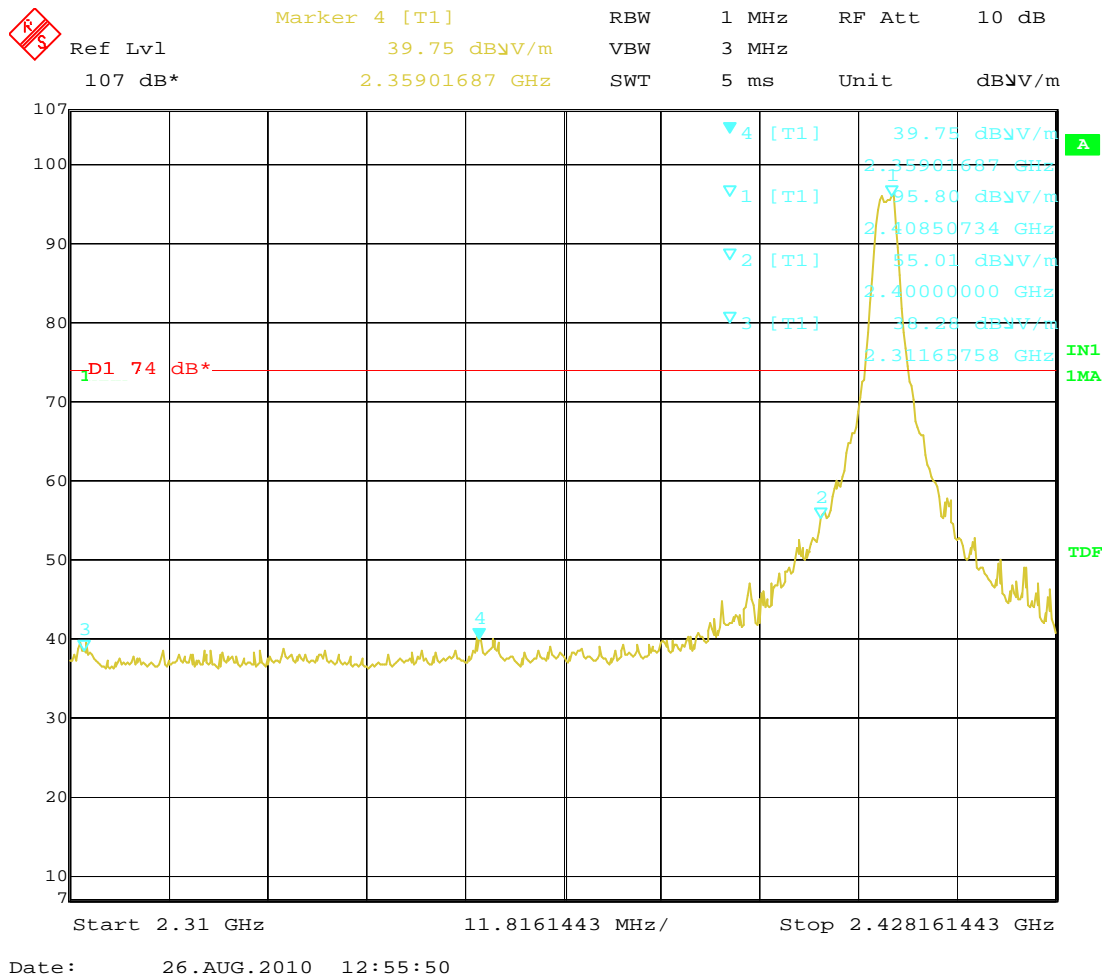
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dBμv/m.

Test condition: USB display mode

Operation Mode: TX on Bot Channel

Temperature: 20 °C Humidity: 70 % RH

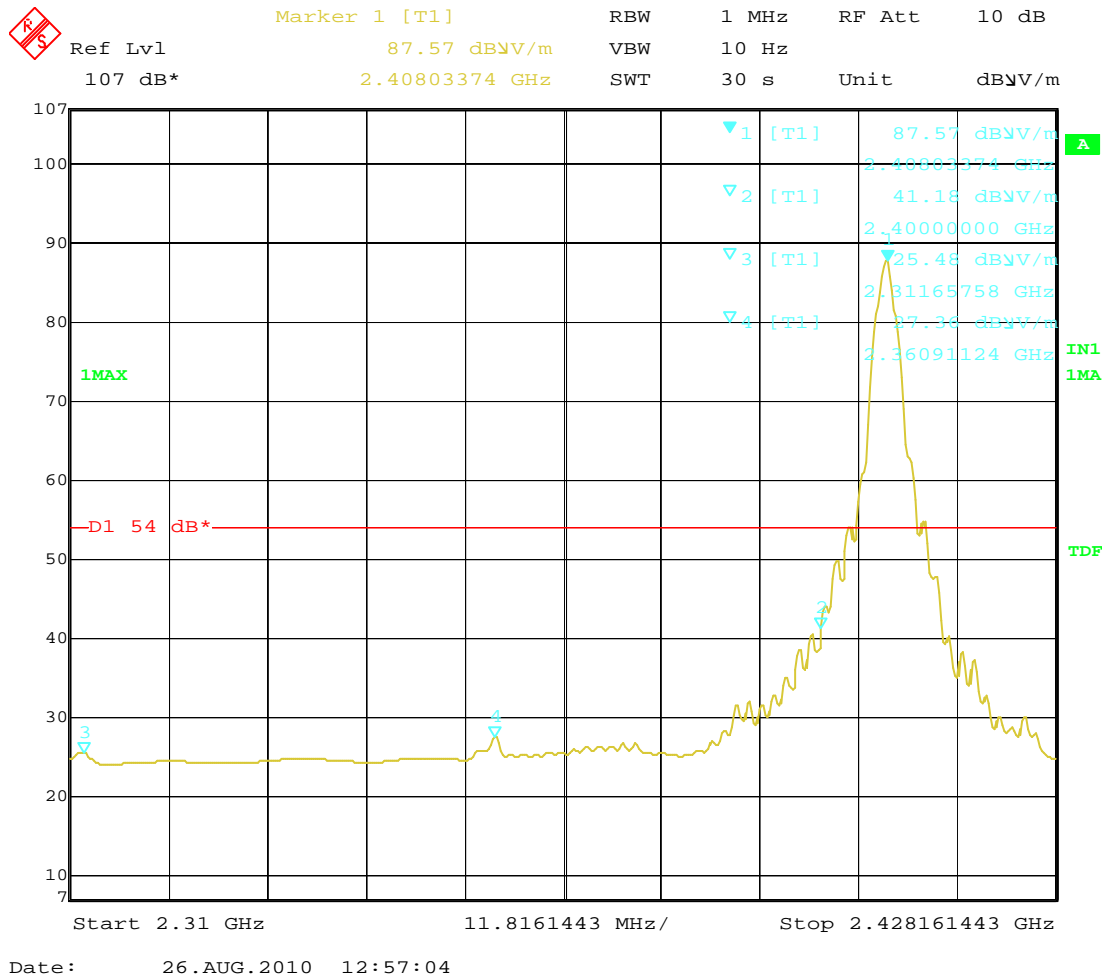
Polarity: Hor.



Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dBμv/m.

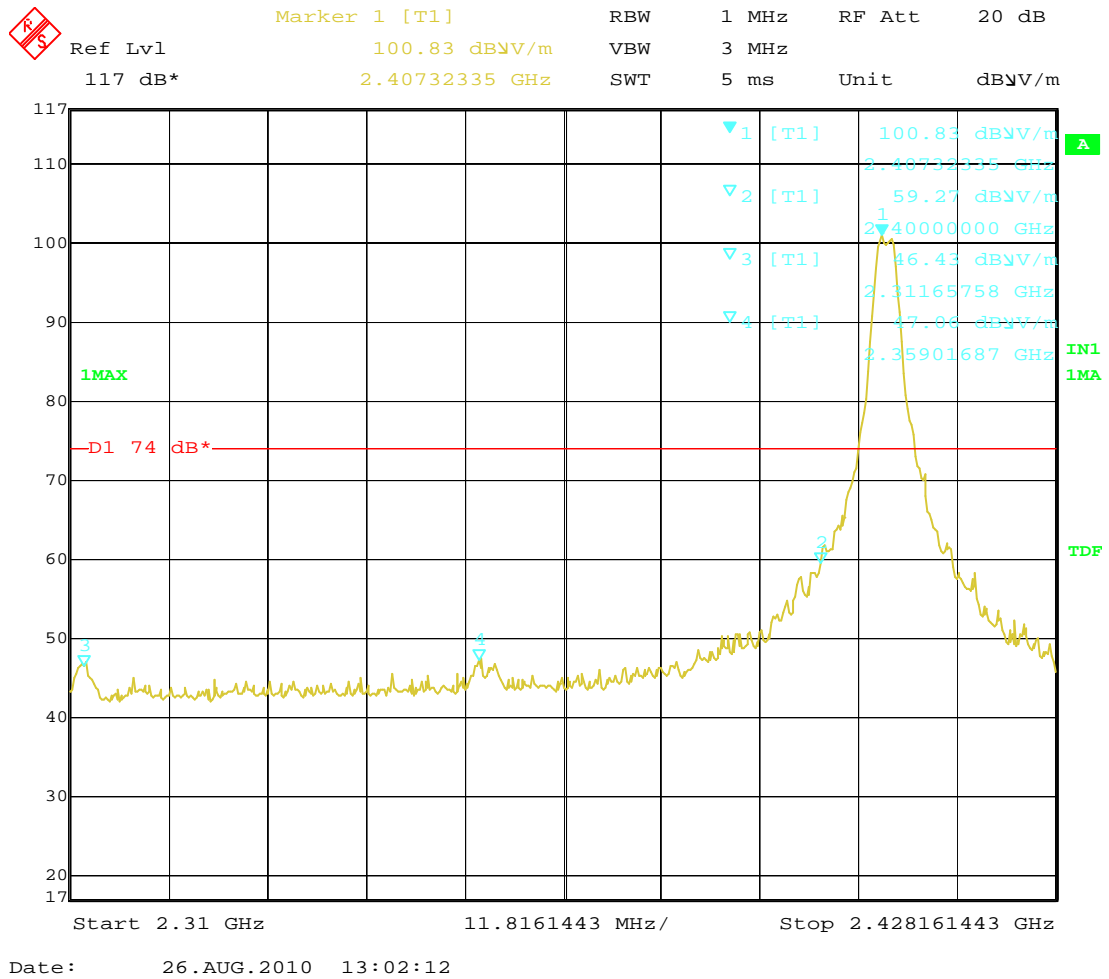
Operation Mode: TX on Bot Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Hor.



Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dB μ v/m.

Operation Mode: TX on Bot Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver.

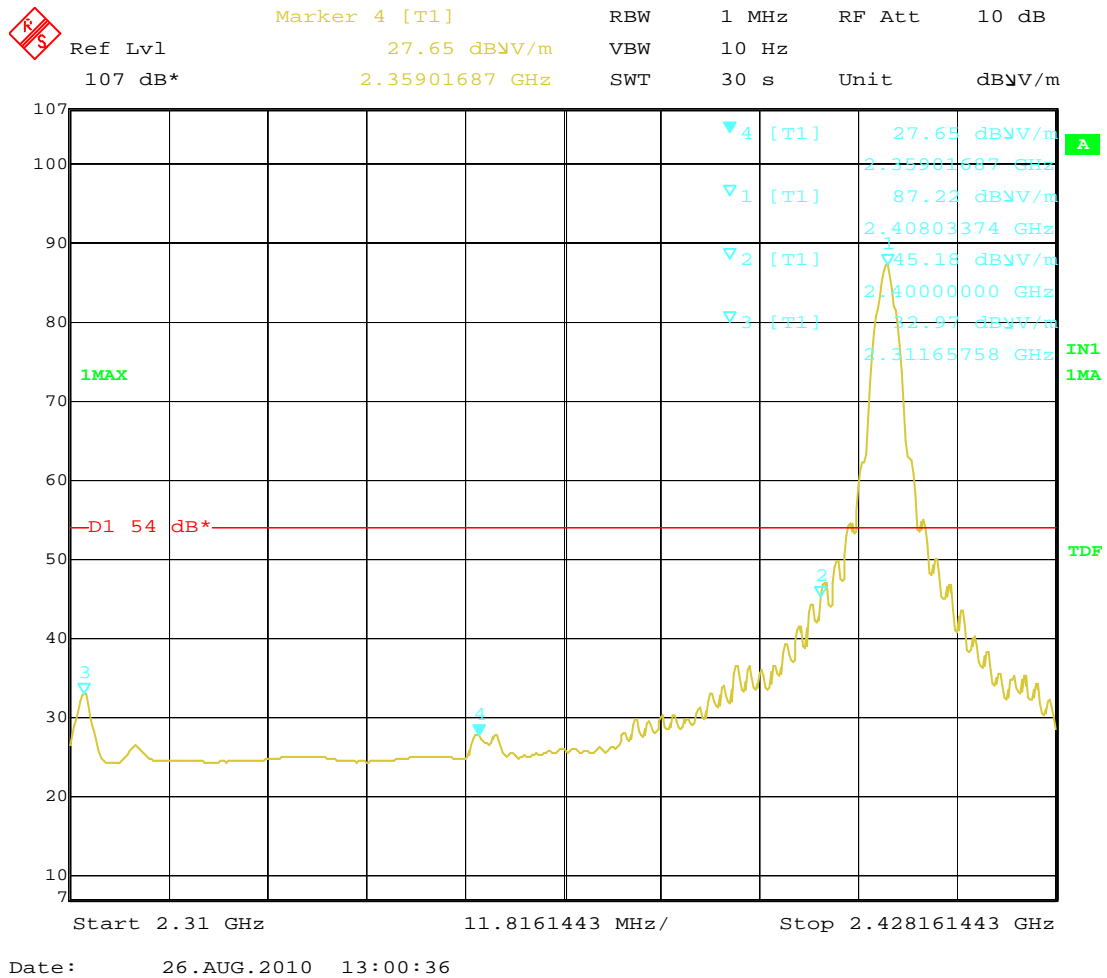
**Note:**

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dBμv/m.

Operation Mode: TX on Bot Channel

Temperature: 20 °C Humidity: 70 % RH

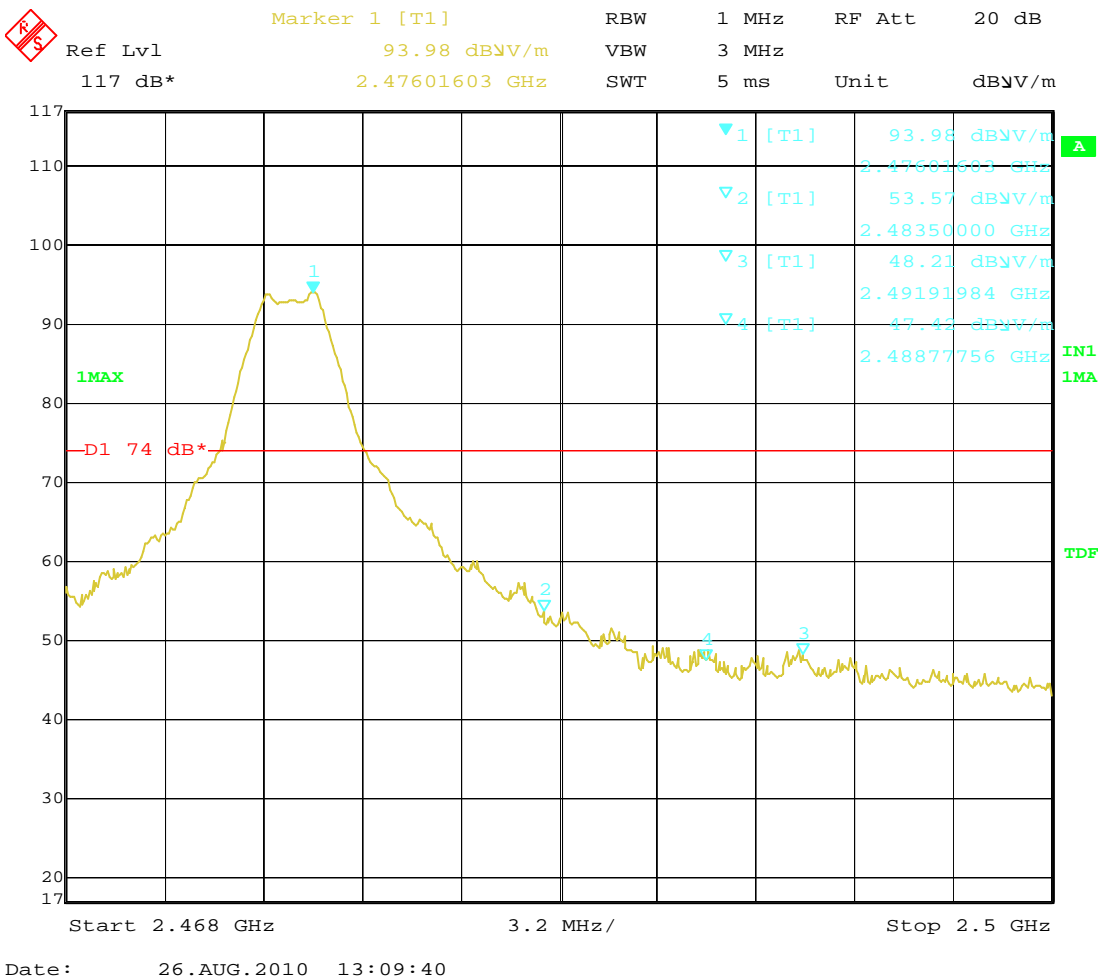
Polarity: Ver.



Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall be 54dBμV/m.

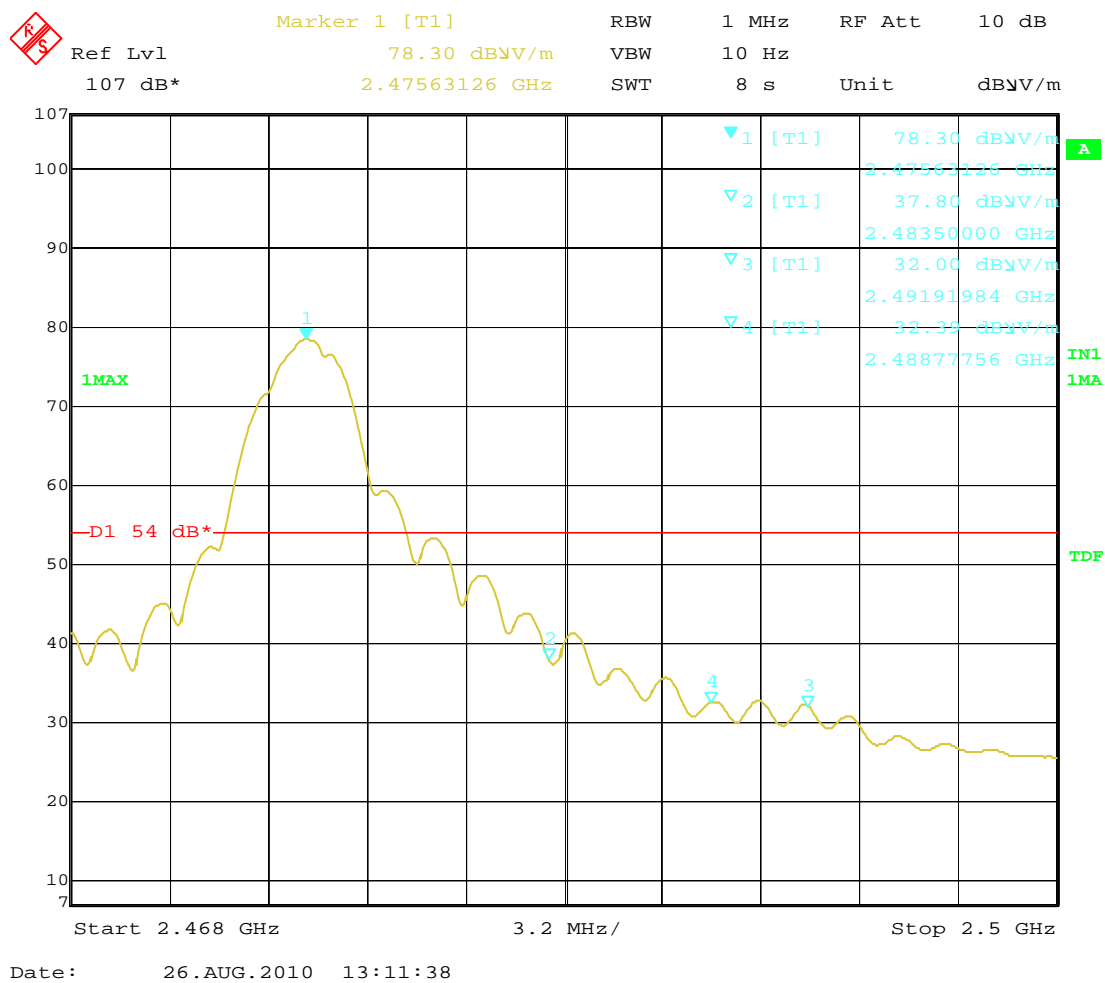
Operation Mode: TX on Top Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Hor.



Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dBμv/m.

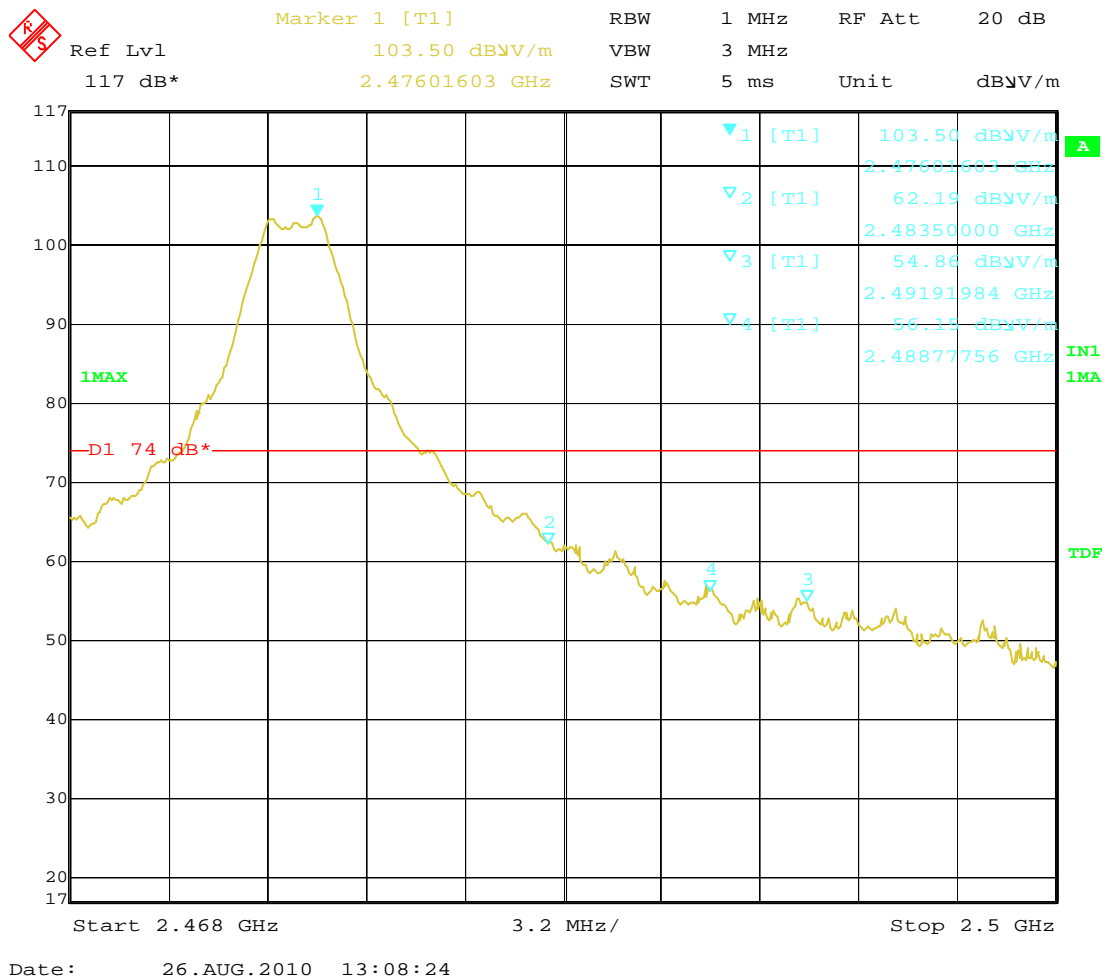
Operation Mode: TX on Top Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Hor.



Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dBμv/m.

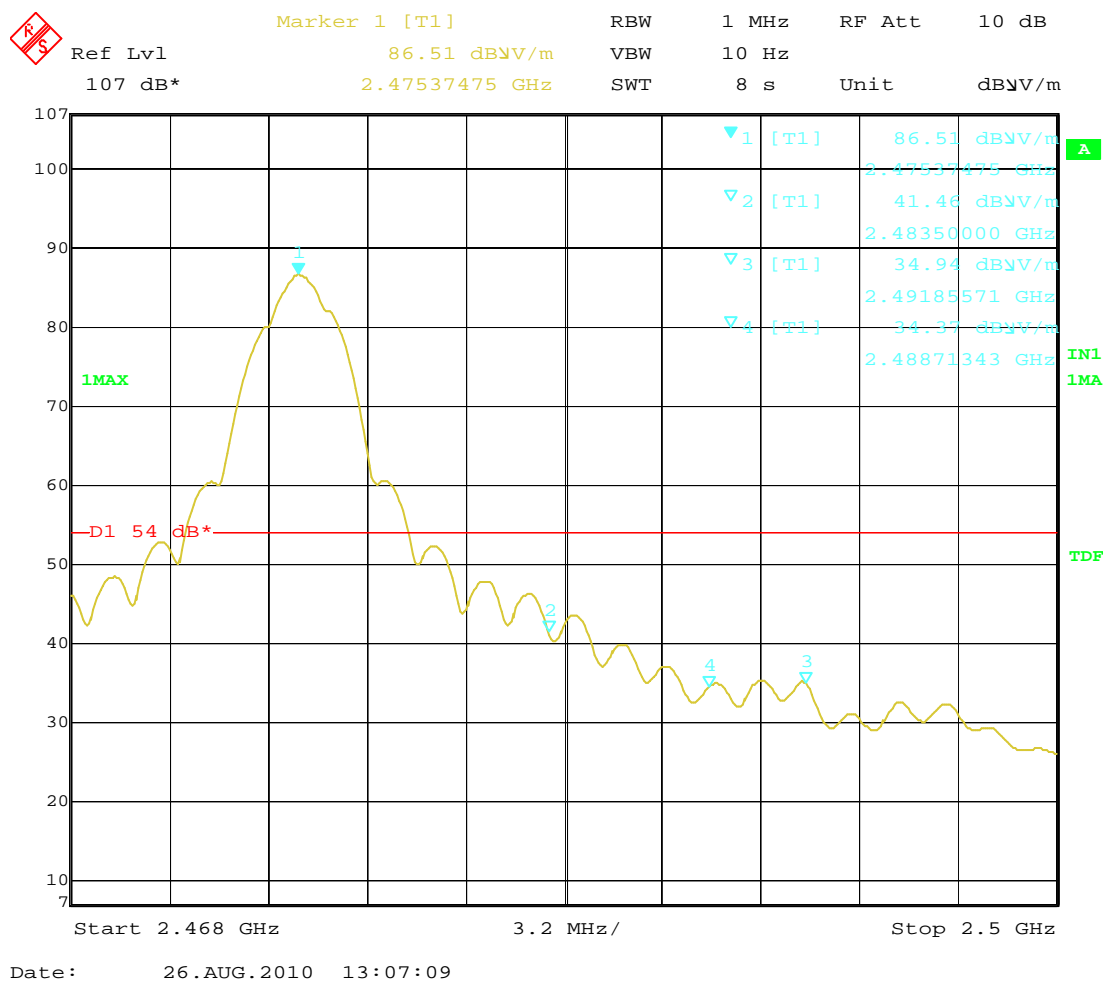
Operation Mode: TX on Top Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver.



Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall not exceed 74dBμV/m.

Operation Mode: TX on Top Channel Temperature: 20 °C Humidity: 70 % RH Polarity: Ver.

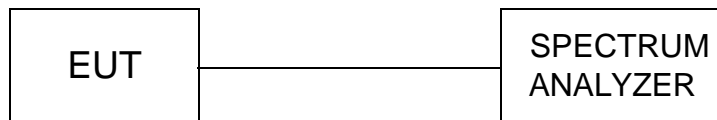


Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dBμv/m.

4.4. 20dB Bandwidth Measurement

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 100 KHz and VBW is set 300 KHz.

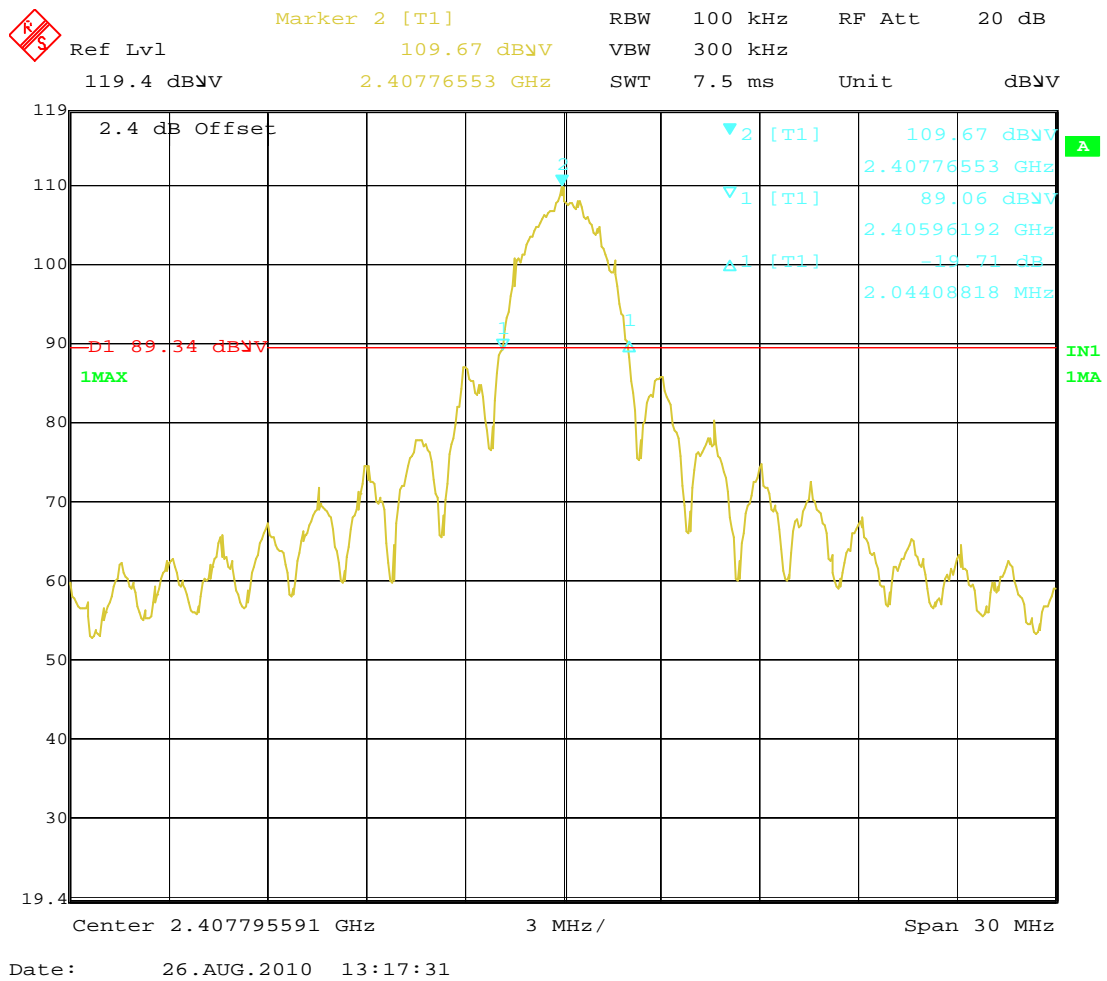
LIMIT

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

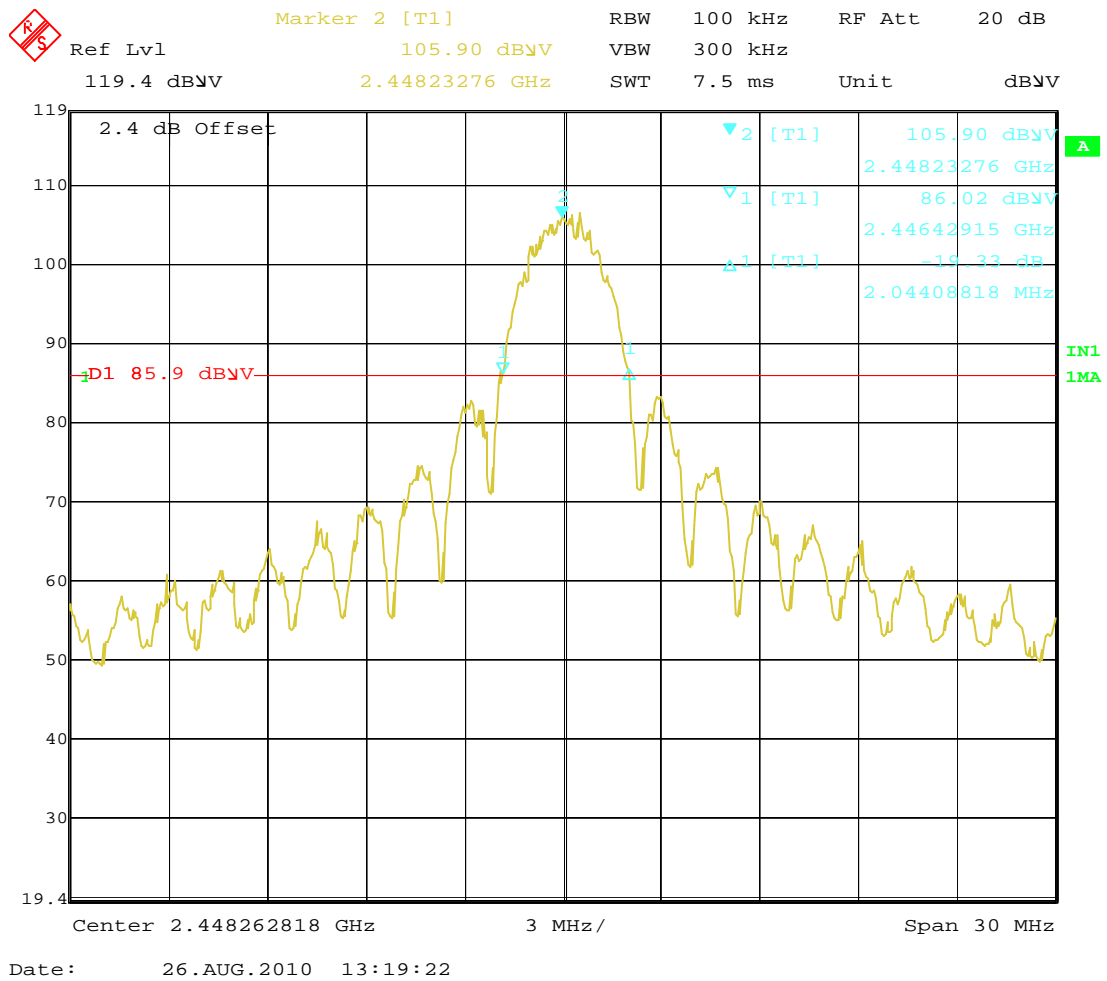
TEST RESULTS

20dB Bandwidth Measurement Result					
Operating Frequency	Test Data(MHz)		Limits(MHz)		Result
	Lower Frequency	Upper Frequency	Lower Frequency	Upper Frequency	
Bottom Channel	2405.96	2408.00	>2400	<2483.5	PASS
Middle Channel	2446.43	2448.47	>2400	<2483.5	PASS
Top Channel	2473.44	2475.36	>2400	<2483.5	PASS

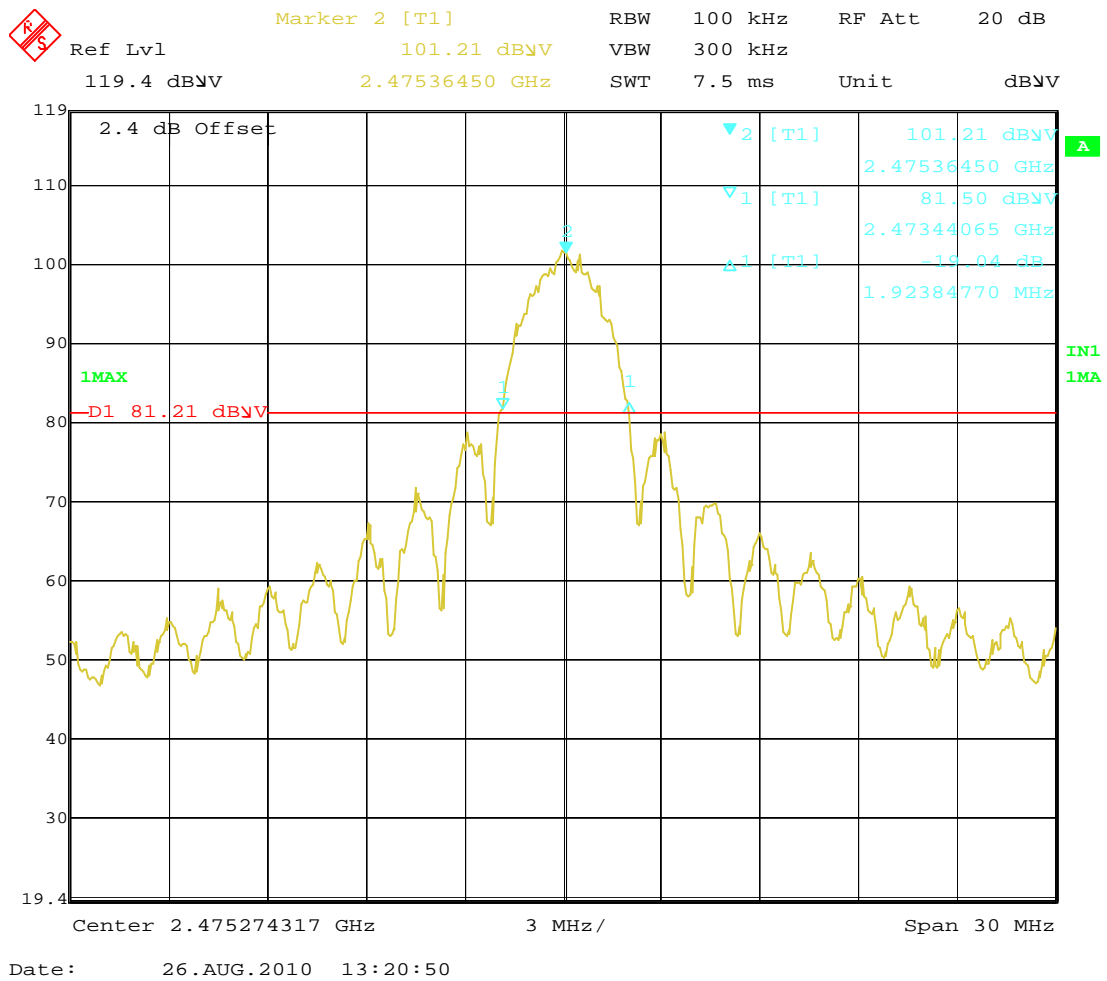
Bottom Channel:



Mid Channel:



Top Channel:

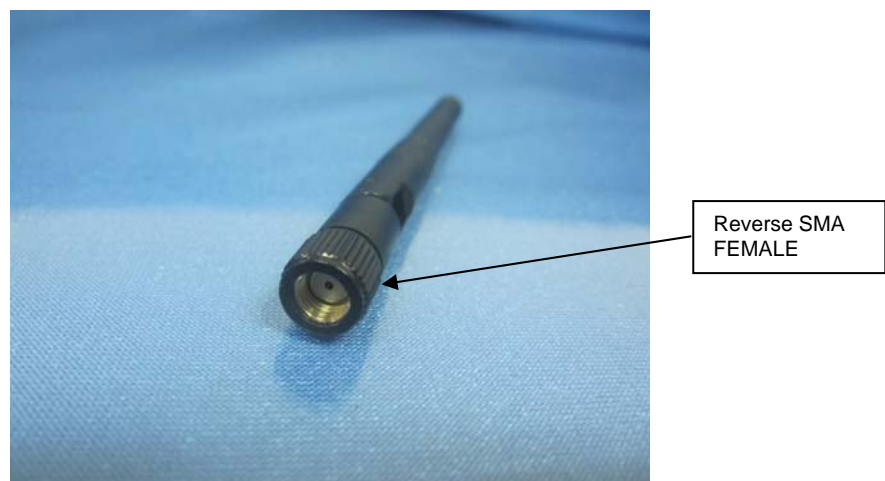
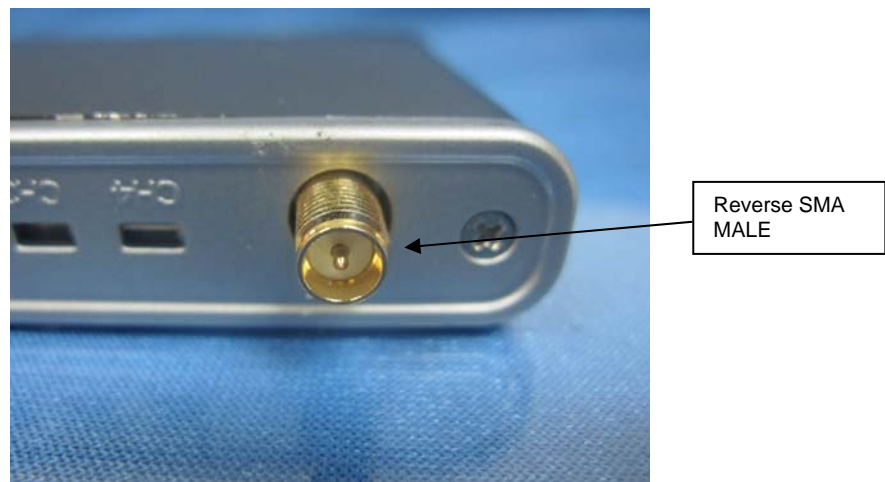
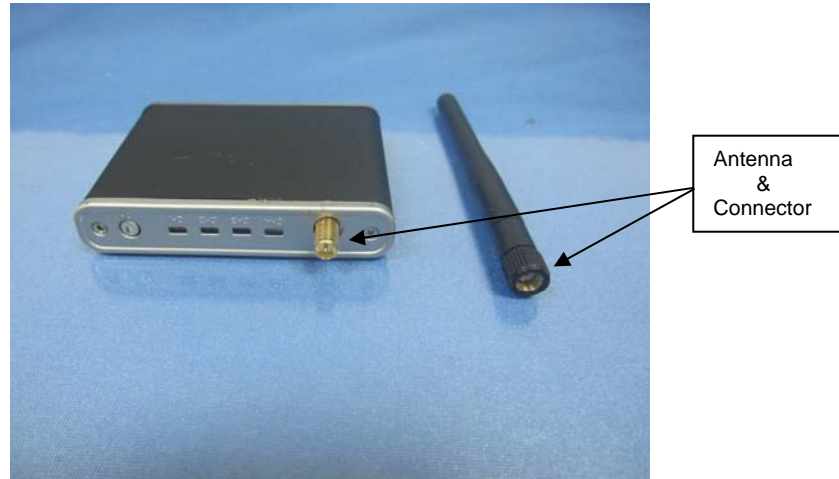


4.5. Antenna Requirement

According to FCC Part 15C § 15.203,

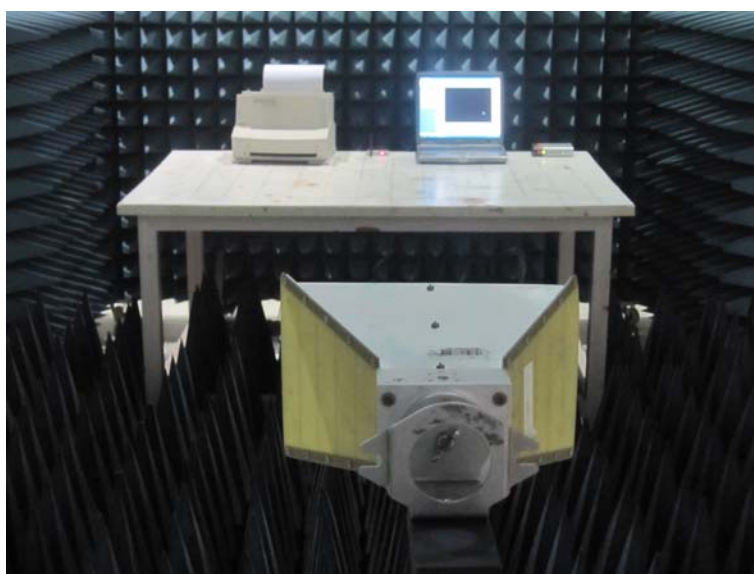
- a), An intentional radiator shall be de-signed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
- b), The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The EUT use of a nonstandard antenna connector (Reverse SMA), so the EUT meets the requirements of antenna. Detial please see the photos as following:



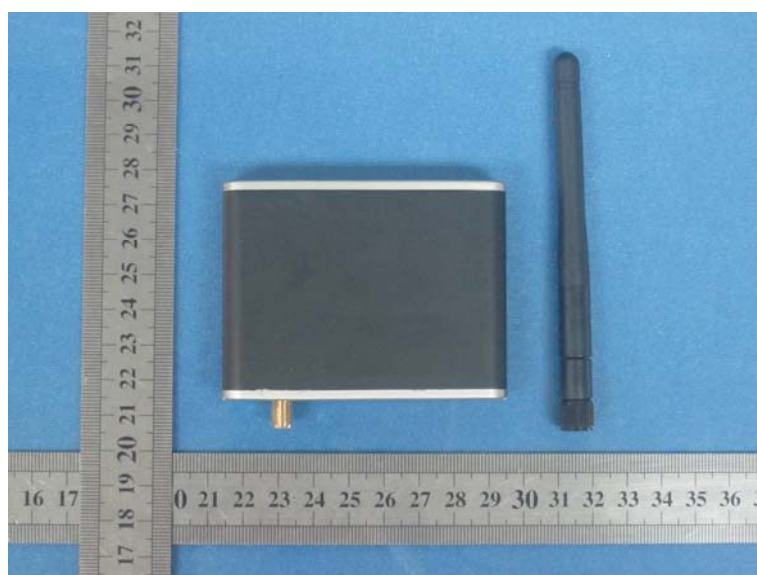
5. Test Setup Photos of the EUT



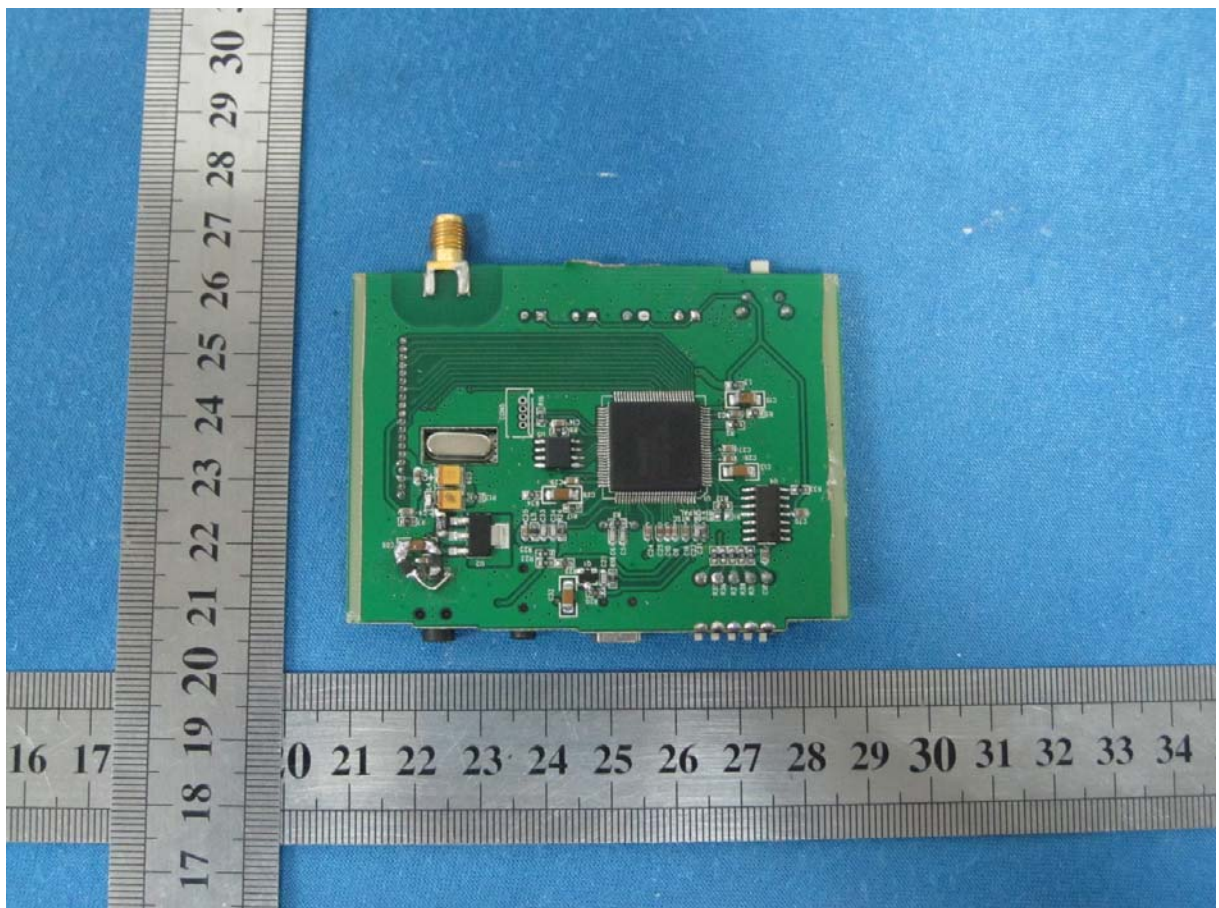
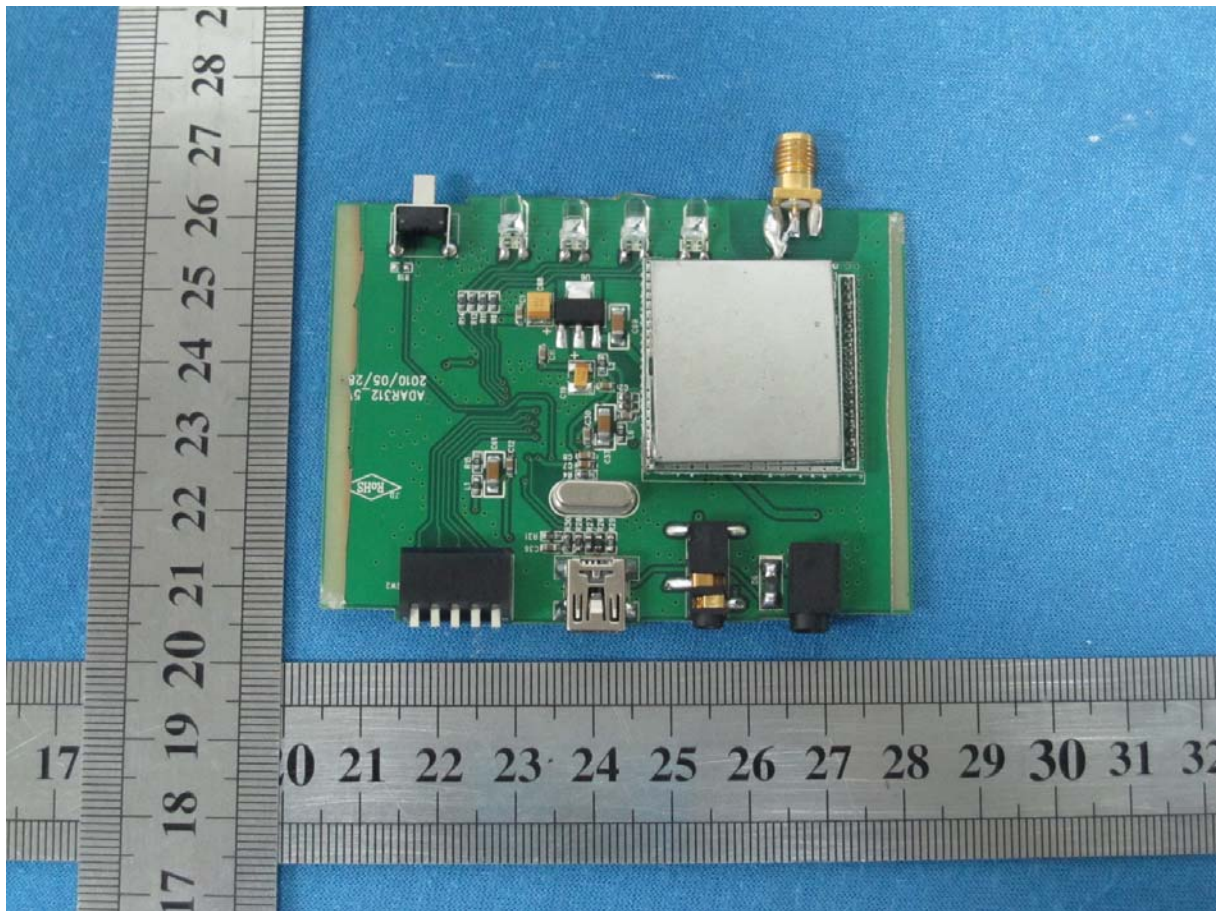


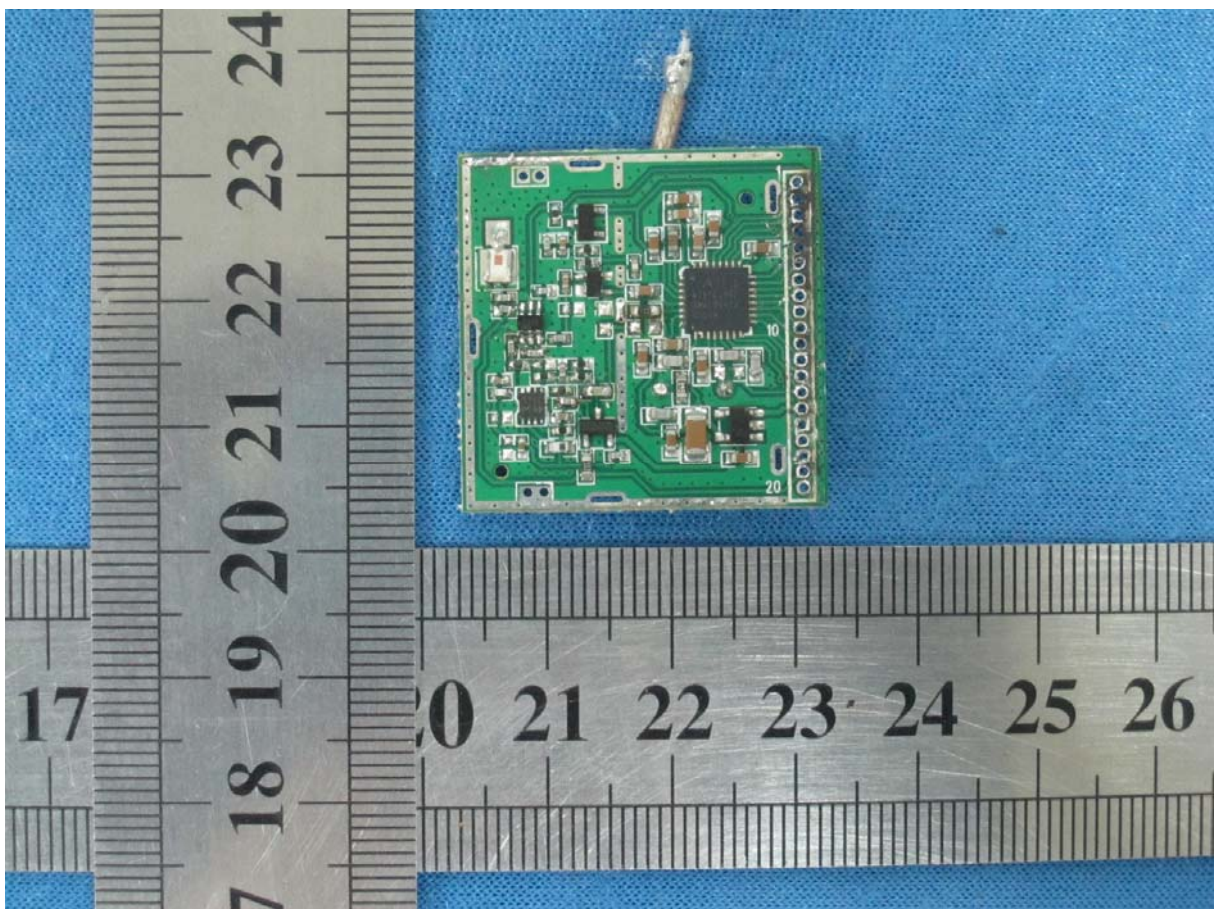
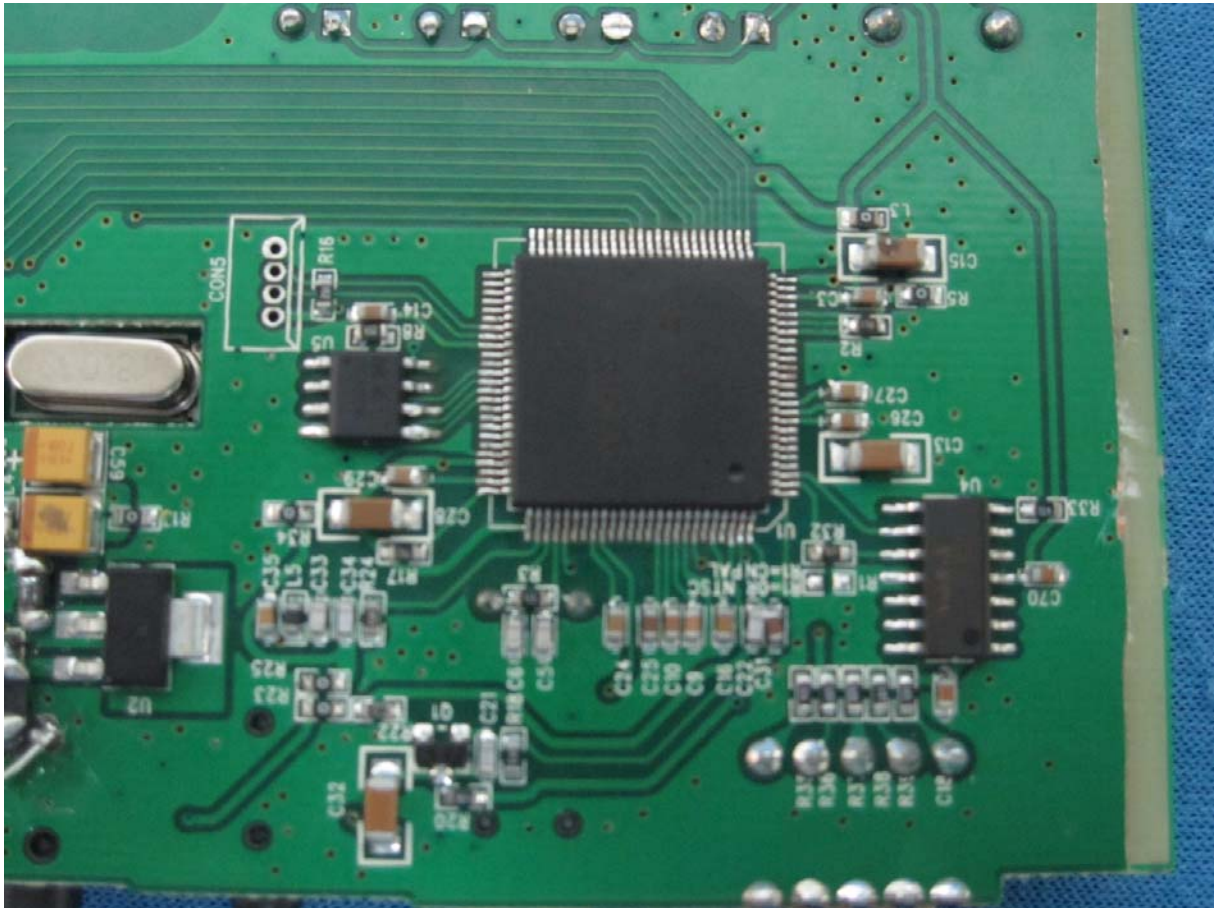
6. External and Internal Photos of the EUT

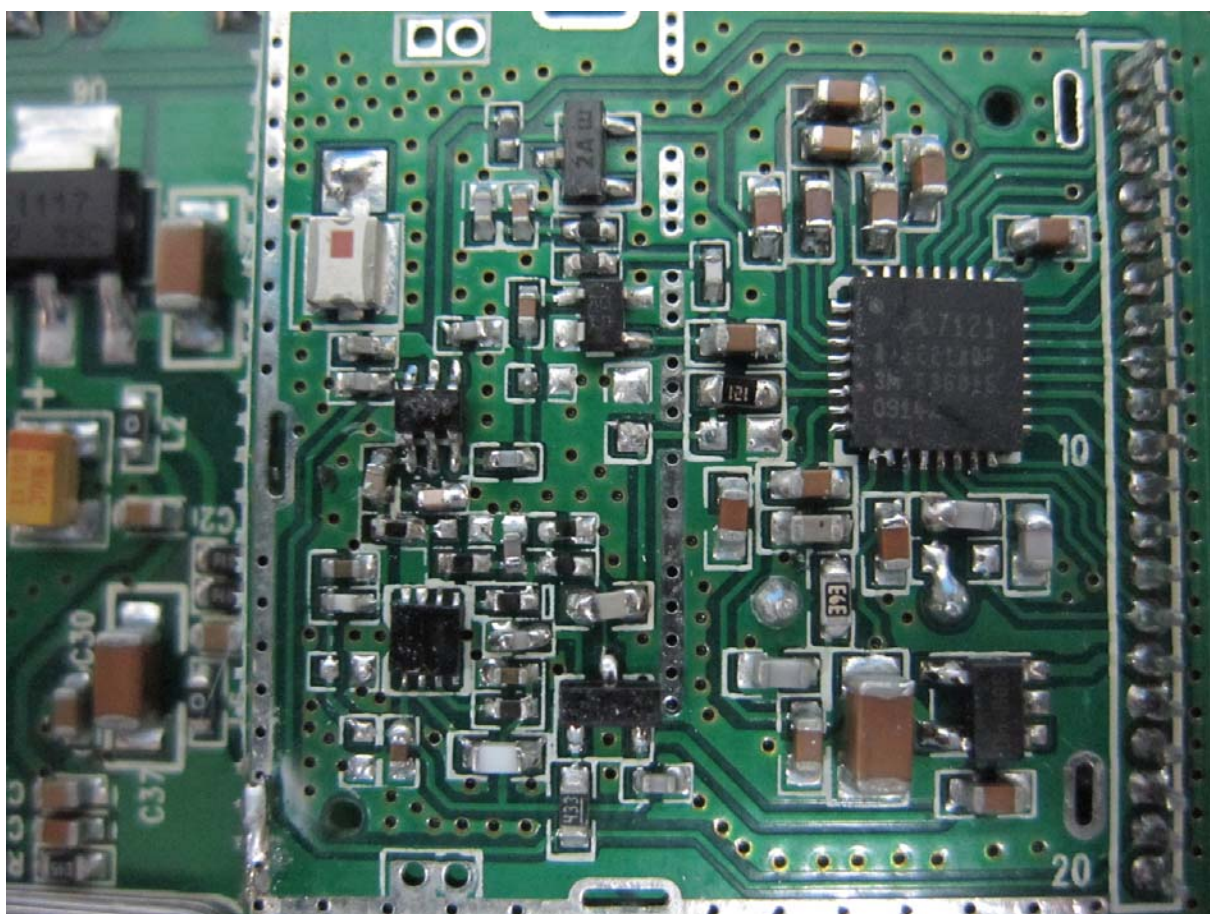
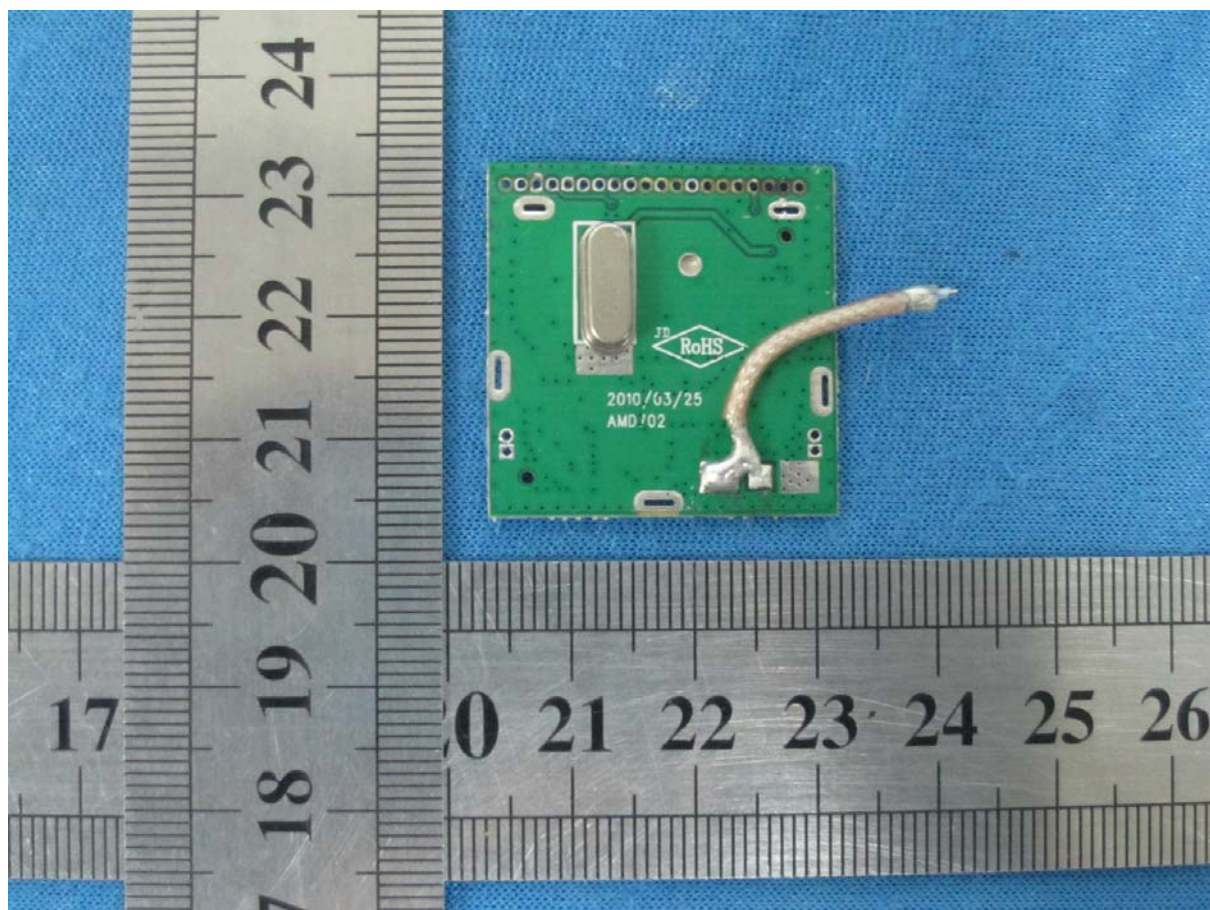
External Photos





Internal Photos





.....End of Report.....