



## FCC PART 90 TEST REPORT

### FCC Part 90

Report Reference No. ....: TRE1207006301 R/C:59336

FCC ID. ....: WVTWOUXUN09

Compiled by

( position+printed name+signature) ..: File administrators Tim Zhang

Tim Zhang

Supervised by

( position+printed name+signature) ..: Test Engineer Eric Zhang

Eric Zhang

Approved by

( position+printed name+signature) ..: Manager Wenliang Li

Wenliang Li

Date of issue. ....: Aug 08, 2012

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

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

Applicant's name .....: QUANZHOU WOUXUN ELECTRONICS CO., LTD.

Address. ....: NO.928 NANHUAN ROAD, JIANGNAN HIGH TECHNOLOGY  
INDUSTRY PARK, QUANZHOU, FUJIAN 362000, CHINA.

#### Test specification:

Standard .....: FCC Part 90/FCC Part 2

TRF Originator .....: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF .....: Dated 2006-06

**Shenzhen Huatongwei International Inspection Co., Ltd. All rights reserved.**

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Huatongwei International Inspection Co., Ltd is acknowledged as copyright owner and source of the material. Shenzhen Huatongwei International Inspection Co., Ltd takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test item description .....: TWIN BAND MOBILE/BASE TRANSCEIVER

Trade Mark .....: 

Model/Type reference .....: KG-UV920R

Listed Models .....: KG-UV920R-A, KG-UV920R-E, KG-UV920P, KG-UV920P-A,  
KG-UV920P-E, KG-UV920H, KG-UV920H-A, KG-UV920H-E,  
KG-UV920G, KG-UV920G-A, KG-UV920G-E, KG-UV920X,  
KG-UV920X-A, KG-UV920X-E, KG-UV950R, KG-UV950R-A,  
KG-UV950R-E, KG-UV950P, KG-UV950P-A, KG-UV950P-E,  
KG-UV950H, KG-UV950H-A, KG-UV950H-E, KG-UV980R,  
KG-UV980R-A, KG-UV980R-E, KG-UV980P, KG-UV980P-A,  
KG-UV980P-E, KG-UV980H, KG-UV980H-A, KG-UV980H-E

Rated Output Power .....: 50 Watts(46.99dBm)for VHF/40 Watts(46.02dBm)for UHF

Modulation .....: FM

Frequency Range .....: From 136MHz to 174MHz/400MHz-470MHz

Result. ....: Positive

**T E S T   R E P O R T**

<b>Test Report No. :</b> <b>TRE1207006301</b>	Aug 08, 2012 Date of issue
---	-------------------------------

Equipment under Test : TWIN BAND MOBILE/BASE TRANSCEIVER

Model /Type : KG-UV920R

Listed Models : KG-UV920R-A, KG-UV920R-E, KG-UV920P, KG-UV920P-A, KG-UV920P-E, KG-UV920H, KG-UV920H-A, KG-UV920H-E, KG-UV920G, KG-UV920G-A, KG-UV920G-E, KG-UV920X, KG-UV920X-A, KG-UV920X-E, KG-UV950R, KG-UV950R-A, KG-UV950R-E, KG-UV950P, KG-UV950P-A, KG-UV950P-E, KG-UV950H, KG-UV950H-A, KG-UV950H-E, KG-UV980R, KG-UV980R-A, KG-UV980R-E, KG-UV980P, KG-UV980P-A, KG-UV980P-E, KG-UV980H, KG-UV980H-A, KG-UV980H-E

**Applicant** : **QUANZHOU WOUXUN ELECTRONICS CO., LTD.**

Address : NO.928 NANHUAN ROAD, JIANGNAN HIGH TECHNOLOGY INDUSTRY PARK, QUANZHOU, FUJIAN 362000, CHINA.

**Manufacturer** : **QUANZHOU WOUXUN ELECTRONICS CO., LTD.**

Address : NO.928 NANHUAN ROAD, JIANGNAN HIGH TECHNOLOGY INDUSTRY PARK, QUANZHOU, FUJIAN 362000, CHINA.

<b>Test Result</b> according to the standards on page 4:	<b>Positive</b>
--	-----------------

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.

## Contents

<b>1.</b>	<b><u>TEST STANDARDS</u></b>	<b>4</b>
<b>2.</b>	<b><u>SUMMARY</u></b>	<b>5</b>
2.1.	General Remarks	5
2.2.	Product Description	5
2.3.	Equipment under Test	5
2.4.	EUT Configuration	6
2.5.	EUT operation mode	6
2.6.	EUT configuration	6
2.7.	Related Submittal(s) / Grant (s)	6
2.8.	Modifications	6
2.9.	Note	6
<b>3.</b>	<b><u>TEST ENVIRONMENT</u></b>	<b>7</b>
3.1.	Address of the test laboratory	7
3.2.	Test Facility	7
3.3.	Environmental conditions	8
3.4.	Configuration of Tested System	8
3.5.	Discription of Tested Modes	8
3.6.	Statement of the measurement uncertainty	8
3.7.	Test Description	9
3.8.	Equipments Used during the Test	9
<b>4.</b>	<b><u>TEST CONDITIONS AND RESULTS</u></b>	<b>11</b>
4.1.	Conducted Emissions	11
4.2.	Occupied Bandwidth & Emission Mask	16
4.3.	Transmitter Radiated Spurious Emssion	27
4.4.	Spurious Emssion on Antenna Port	32
4.5.	Modulation Charcateristics	40
4.6.	Frequency Stability	45
4.7.	Maximum Transmitter Power	47
4.8.	Transmitter Frequency Behavior	51
4.9.	Receiver Radiated Spurious Emssion	54
4.10.	Receiver Conducted Spurious Emssion	64
<b>5.</b>	<b><u>TEST SETUP PHOTOS OF THE EUT</u></b>	<b>71</b>
<b>6.</b>	<b><u>EXTERNAL AND INTERNAL PHOTOS OF THE EUT</u></b>	<b>75</b>

## **1. TEST STANDARDS**

The tests were performed according to following standards:

**FCC Rules Part 90:** PRIVATE LAND MOBILE RADIO SERVICES.

**TIA/EIA 603:** Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

**FCC Rules Part 15 Subpart B:** RADIO FREQUENCY DEVICES-Unintentional Radiators

**FCC Part 2:** FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample	:	July 17, 2012
Testing commenced on	:	July 17, 2012
Testing concluded on	:	Aug 08, 2012

### 2.2. Product Description

The **QUANZHOU WOUXUN ELECTRONICS CO., LTD.**'s Model: KG-UV920R or the "EUT" as referred to in this report; more general information as follows:

Name of EUT	TWIN BAND MOBILE/BASE TRANSCEIVER	
Model Number	KG-UV920R	
Rated Output Power	50 Watts(46.99dBm)for VHF/40 Watts(46.02dBm)for UHF	
Modulation Type	FM for Analog Voice	
Emission Designator	Analog	11K0F3E for 12.5KHz Channel Separation
Channel Separation	Analog Voice	12.5KHz only for FCC
Antenna Type	External	
Frequency Range	From 136MHz to 174MHz/400MHz-470MHz	
Maximum Transmitter Power	Analog/FCC	50.70W for VHF12.5KHz Channel Separation 40.27W for UHF12.5KHz Channel Separation

### 2.3. Equipment under Test

#### Power supply system utilised

Power supply voltage	:	<input type="radio"/> 120V / 60 Hz	<input type="radio"/> 115V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below)	

DC 13.80V

#### Test frequency list

Frequency	Channel Separation	Test Channel	Test Frequency
VHF	12.5 KHz	Low Channel	138.5000 MHz
		Middle Channel	155.0000 MHz
		High Channel	173.5000 MHz
UHF	12.5 KHz	Low Channel	406.5000 MHz
		Middle Channel	435.0000 MHz
		High Channel	469.5000 MHz

## 2.4. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

## 2.5. EUT operation mode

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

## 2.6. EUT configuration

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

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	3
		Shield :	Unshield
		Detachable :	Undetachable
○	Multimeter	Manufacturer :	/
		Model No. :	/

## 2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **WVTWOUXUN09** filing to comply with FCC Part 90&FCC Part 2&FCC Part 15B Rules.

## 2.8. Modifications

No modifications were implemented to meet testing criteria.

## 2.9. Note

The EUT is frequency bands (136-174 MHz/400-470 MHz) TWIN BAND MOBILE/BASE TRANSCEIVER, The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 90	TRE1207006301
Health	Oet 65	TRE1207006302
Health	Oet 65	TRE1207006303

### **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 (2009) 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. 29, 2012. Valid time is until Feb. 28, 2015.

##### **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, 2013.

##### **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 Jul. 01, 2009, valid time is until Jun. 30, 2012.

##### **IC-Registration No.: 5377A**

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. 5377A on Jan. 25, 2011, valid time is until Jan. 24, 2014.

##### **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 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the authorization is valid through July 07, 2013

##### **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.: G-292. Date of Registration: Dec. 24, 2010. Valid time is until Dec. 23, 2013.

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: Dec. 20, 2009. Valid time is until Dec. 19, 2012.

Telecommunication 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.: T-1837. Date of Registration: May 07, 2010. Valid time is until May 06, 2013.

### 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.

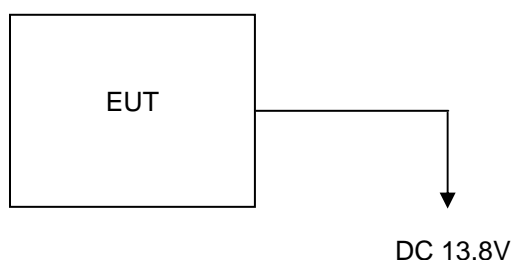
### 3.3. Environmental conditions

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

Fig. 2-1 Configuration of Tested System



### 3.5. Discription of Tested Modes

The EUT (Mobile Radio) has been tested under normal operating condition. Three channels (the high, the middle and the low) are chosen for testing at each channel separation.

### 3.6. 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 Items	Measurement Uncertainty	Notes
Frequency stability	22 Hz	(1)
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-12.75 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-12.75 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)
Emission Mask	-----	(1)
Modulation Characteristic	-----	(1)
Transmitter Frequency Behavior	-----	(1)

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

### 3.7. Test Description

FCC Rules	Description of Test	Test Result
§ 15.107	Conducted Emission	Complies
§ 15.109	Receiver Radiated Spurious Emission	Complies
§ 15.109	Receiver Conducted Spurious Emission	Complies
§ 90.205	Maximum Transmitter Power	Complies
§ 90.207	Modulation Characteristic	Complies
§ 90.209	Occupied Bandwidth	Complies
§ 90.210	Emission Mask	Complies
§ 90.213	Frequency Stability	Complies
§ 90.214	Transmitter Frequency Behavior	Complies
§ 90.210	Transmitter Radiated Spurious Emission	Complies
§ 90.210	Spurious Emission On Antenna Port	Complies
§ 2.1091	RF Exposure Evaluation	Complies

### 3.8. Equipments Used during the Test

DC Power Conducted Emission				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCS 30	100038	10/23/2012
Artificial Mains	Rohde&Schwarz	ESH3-Z6	100210	10/23/2012
Artificial Mains	Rohde&Schwarz	ESH3-Z6	100211	10/23/2012
Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	10/23/2012
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	10/23/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/23/2012

Modulation Characteristic				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	23/10/2012

Transmitter Radiated Spurious Emssion & Receiver Radiated Spurious Emssion				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Ultra-Broadband Antenna	Rohde&Schwarz	HL562	100015	23/10/2012
EMI Test Receiver	Rohde&Schwarz	ESI 26	100009	23/10/2012
HORN ANTENNA	Rohde&Schwarz	HF906	100039	23/10/2012
Turntable	ETS	2088	2149	N/A
Antenna Mast	ETS	2075	2346	N/A
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	23/10/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	23/10/2012
Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	23/10/2012
Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	23/10/2012
HORN ANTENNA	ShwarzBeck	9120D	1011	23/10/2012
TURNTABLE	MATURO	TT2.0	----	----
ANTENNA MAST	MATURO	TAM-4.0-P	----	----
ANTENNA MAST	MATURO	CAM-4.0-P	----	----

Frequency Stability				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Climate Chamber	ESPEC	EL-10KA	05107008	10/23/2012
Receiver	Rohde&Schwarz	ESI 26	100009	10/23/2012

Maximum Transmitter Power & Spurious Emssion On Antenna Port				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Receiver	Rohde&Schwarz	ESI 26	100009	10/23/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/23/2012
High-Pass Filter	Anritsu	MP526B	6220875256	10/23/2012
High-Pass Filter	Anritsu	MP526D	6220878392	10/23/2012
Spectrum Analyzer	Aglient	E4407B	MY44210775	23/10/2012
Spectrum Analyzer	Rohde&Schwarz	FSP40	1164.4391.40	23/10/2012

Transient Frequency Behavior				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Storage Oscilloscope	Tektronix	TDS3054B	B033027	10/23/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/23/2012

The calibration interval was one year.

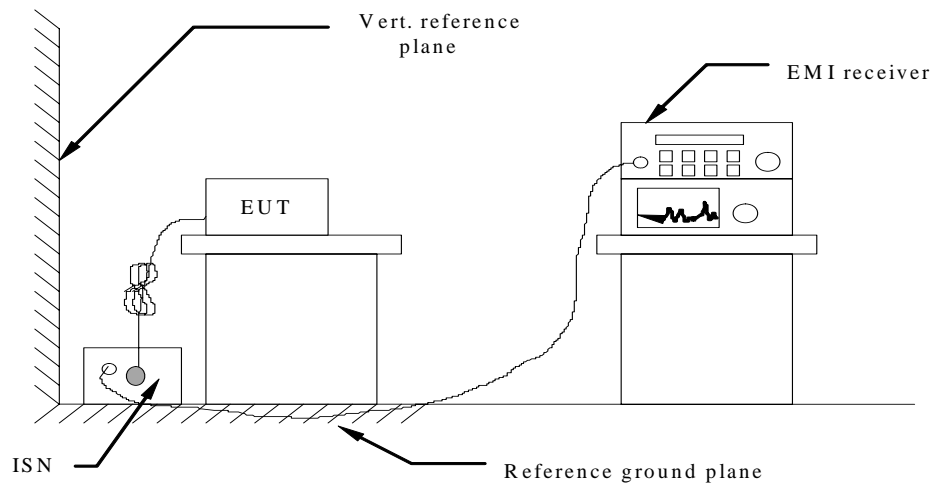
## 4. TEST CONDITIONS AND RESULTS

### 4.1. Conducted Emissions

#### TEST APPLICABLE

The EUT was tested according to ANSI C63.4 - 2009. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 u Henry as specified by section 5.1 of ANSI C63.4 - 2009. Cables and peripherals were moved to find the maximum emission levels for each frequency.

#### 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

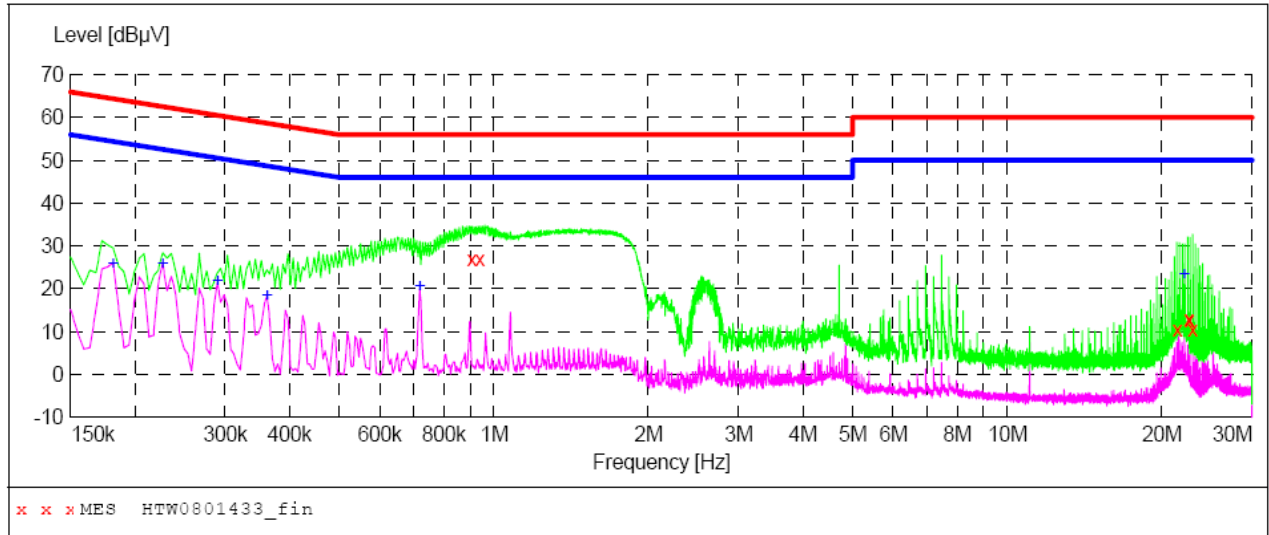
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

## TEST RESULTS

### For VHF @ 12.5 KHz TX Mode

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

Short Description: 150K-30M Voltage



#### MEASUREMENT RESULT: "HTW0801433\_fin"

8/2/2012 9:32AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.906000	27.00	10.1	56	29.0	QP	+	GND
0.937500	27.10	10.1	56	28.9	QP	+	GND
21.448500	10.60	10.5	60	49.4	QP	+	GND
22.591500	12.90	10.6	60	47.1	QP	+	GND
22.663500	12.60	10.6	60	47.4	QP	+	GND
22.960500	10.70	10.6	60	49.3	QP	+	GND

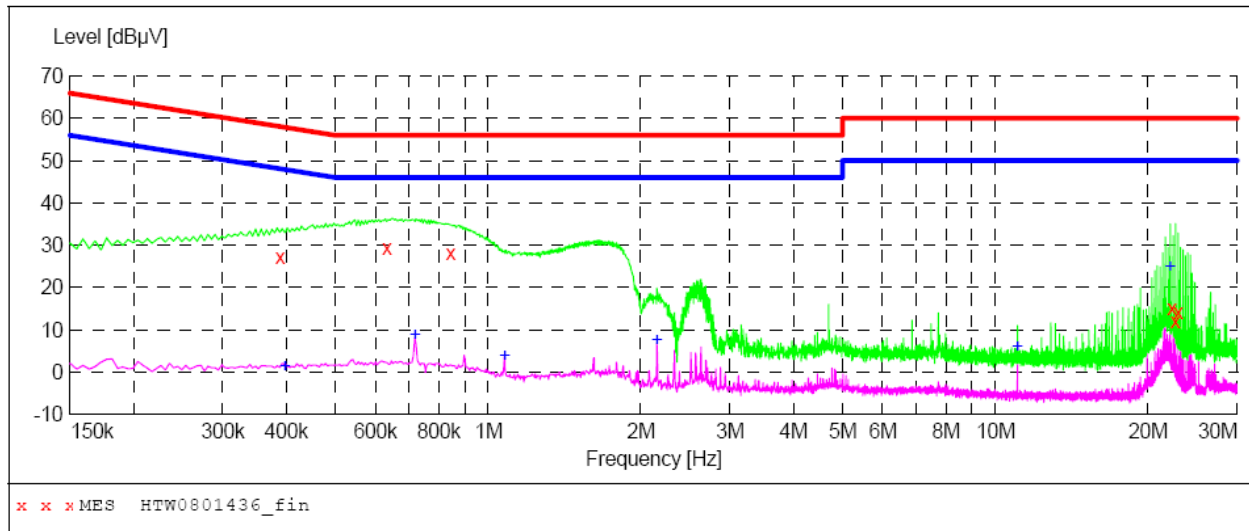
#### MEASUREMENT RESULT: "HTW0801433\_fin2"

8/2/2012 9:32AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.181500	25.90	10.1	54	28.5	AV	+	GND
0.226500	26.10	10.1	53	26.5	AV	+	GND
0.289500	22.00	10.1	51	28.5	AV	+	GND
0.361500	18.70	10.1	49	30.0	AV	+	GND
0.717000	20.70	10.1	46	25.3	AV	+	GND
22.119000	23.50	10.5	50	26.5	AV	+	GND

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

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0801436\_fin"**

8/2/2012 9:42AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.388500	27.20	10.1	58	30.9	QP	-	GND
0.631500	29.40	10.1	56	26.6	QP	-	GND
0.843000	28.20	10.1	56	27.8	QP	-	GND
22.299000	15.30	10.5	60	44.7	QP	-	GND
22.654500	12.10	10.6	60	47.9	QP	-	GND
22.956000	14.20	10.6	60	45.8	QP	-	GND

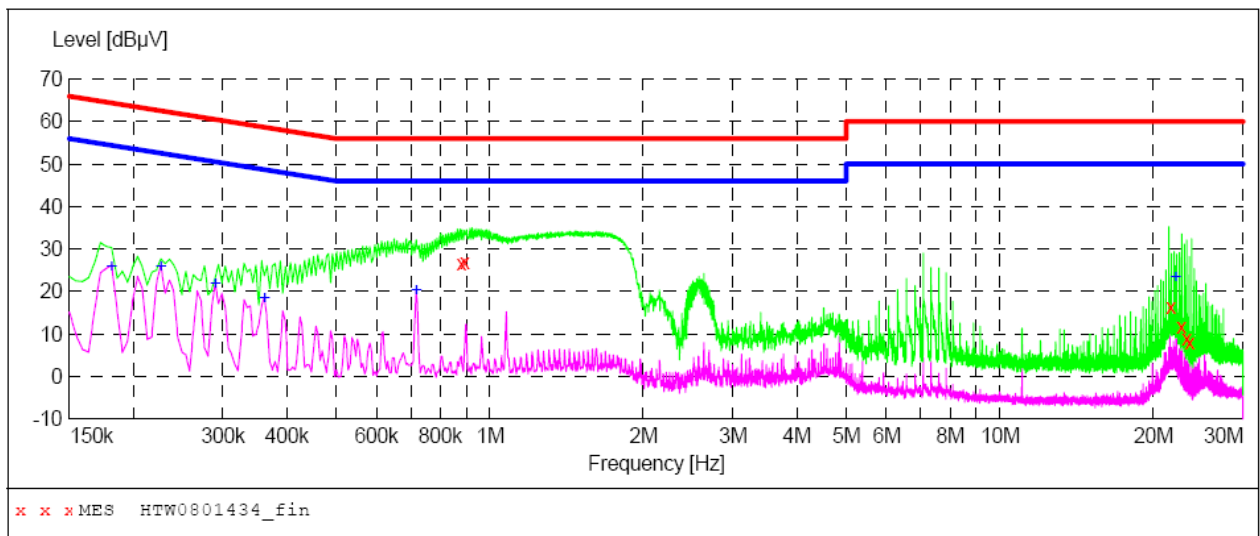
**MEASUREMENT RESULT: "HTW0801436\_fin2"**

8/2/2012 9:42AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.397500	1.50	10.1	48	46.4	AV	-	GND
0.717000	9.00	10.1	46	37.0	AV	-	GND
1.077000	4.00	10.2	46	42.0	AV	-	GND
2.152500	7.90	10.2	46	38.1	AV	-	GND
11.062500	6.10	10.4	50	43.9	AV	-	GND
22.119000	25.20	10.5	50	24.8	AV	-	GND

**For UHF @ 12.5 KHz TX Mode****SCAN TABLE: "Voltage (9K-30M) FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0801434\_fin"**

8/2/2012 9:35AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.879000	26.70	10.1	56	29.3	QP	L1	GND
0.892500	26.80	10.1	56	29.2	QP	L1	GND
21.624000	16.30	10.5	60	43.7	QP	L1	GND
22.731000	11.90	10.6	60	48.1	QP	L1	GND
23.266500	9.00	10.6	60	51.0	QP	L1	GND
23.563500	8.10	10.6	60	51.9	QP	L1	GND

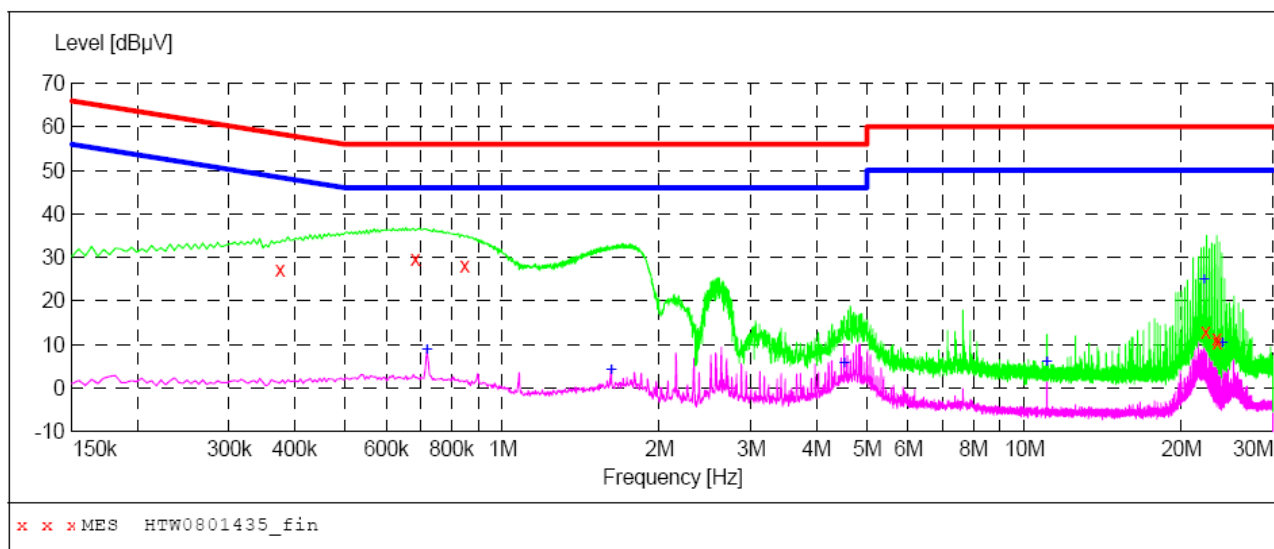
**MEASUREMENT RESULT: "HTW0801434\_fin2"**

8/2/2012 9:35AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.181500	25.90	10.1	54	28.5	AV	L1	GND
0.226500	26.10	10.1	53	26.5	AV	L1	GND
0.289500	22.00	10.1	51	28.5	AV	L1	GND
0.361500	18.60	10.1	49	30.1	AV	L1	GND
0.717000	20.60	10.1	46	25.4	AV	L1	GND
22.119000	23.40	10.5	50	26.6	AV	L1	GND

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

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0801435\_fin"**

8/2/2012 9:39AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.375000	27.20	10.1	58	31.2	QP	-	GND
0.681000	29.80	10.1	56	26.2	QP	-	GND
0.847500	28.20	10.1	56	27.8	QP	-	GND
22.263000	12.90	10.5	60	47.1	QP	-	GND
23.379000	11.40	10.6	60	48.6	QP	-	GND
23.428500	10.50	10.6	60	49.5	QP	-	GND

**MEASUREMENT RESULT: "HTW0801435\_fin2"**

8/2/2012 9:39AM

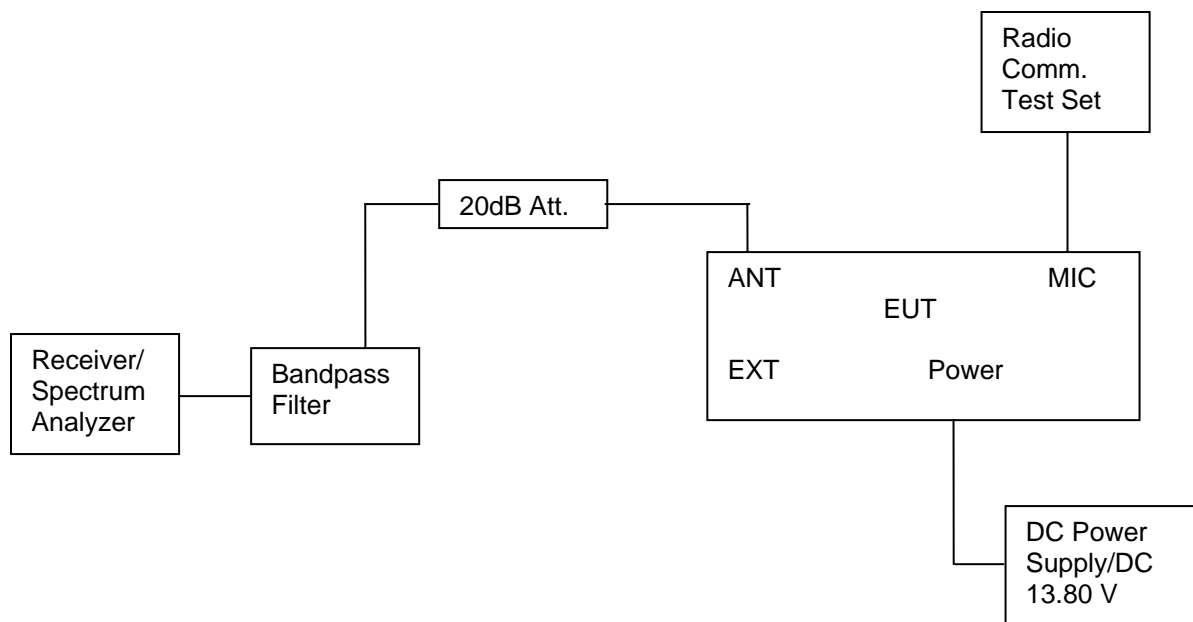
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.717000	9.00	10.1	46	37.0	AV	-	GND
1.617000	4.30	10.2	46	41.7	AV	-	GND
4.524000	5.80	10.2	46	40.2	AV	-	GND
11.062500	6.10	10.4	50	43.9	AV	-	GND
22.119000	25.20	10.5	50	24.8	AV	-	GND
24.000000	10.50	10.7	50	39.5	AV	-	GND

## 4.2. Occupied Bandwidth & Emission Mask

### TEST APPLICABLE

- (a). Occupied Bandwidth: The EUT was connected to the audio signal generator and the spectrum analyzer via the main RF connector, and through an appropriate attenuator. The EUT was controlled to transmit its maximum power. Then the bandwidth of 99% power can be measured by the spectrum analyzer.
- (b). Emission Mask B: For transmitters that are equipped with an audio low-pass filter pursuant to §90.211(a) and RSS-119 Section 5.8, the power of any emission must be below the unmodulated carrier power (P) as follows:
- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
  - (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
  - (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log (P)$  dB.
- (c). Emission Mask D, 12.5 kHz channel bandwidth equipment: For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:
- (1) On any frequency from the center of the authorized bandwidth  $f_0$  to 5.625 kHz removed from  $f_0$ : Zero dB.
  - (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least  $7.27(f_d - 2.88 \text{ kHz})$  dB.
  - (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 12.5 kHz: At least  $50 + 10 \log (P)$  dB or 70 dB, whichever is the lesser attenuation.

### TEST CONFIGURATION



### TEST PROCEDURE

- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 The EUT was modulated by 2.5 KHz Sine wave audio signal, The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz (12.5 kHz channel spacing) and 5 kHz (25 kHz channel spacing).
- 3 Set EUT as normal operation.
- 4 Set SPA Center Frequency = fundamental frequency, RBW=300Hz, VBW= 3 KHz, span =50 KHz.
- 5 Set SPA Max hold. Mark peak, Set 99% Occupied Bandwidth and 26dB Occupied Bandwidth.

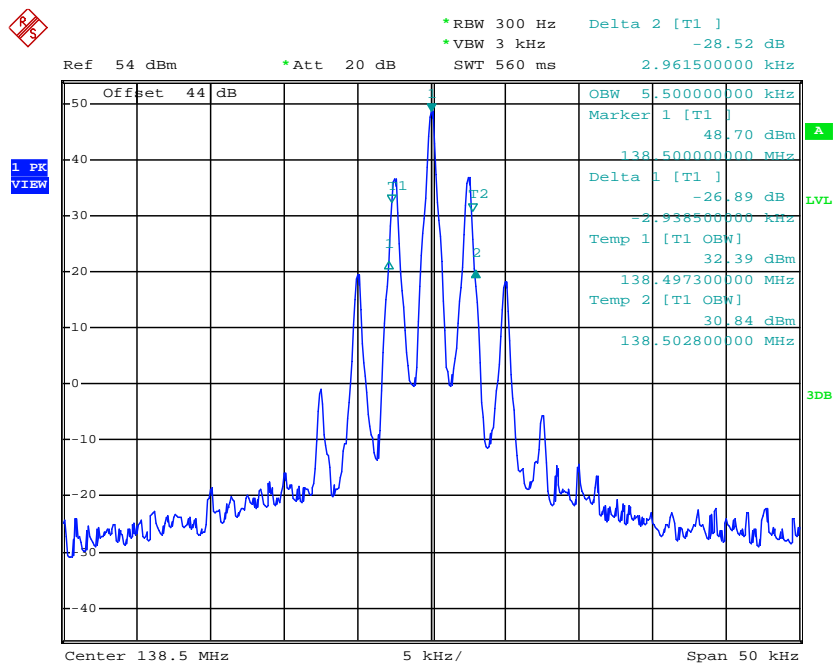


**TEST RESULTS****4.2.1 Occupied Bandwidth**

Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Occupied Bandwidth (KHz)		Remark
				99%	26dB	
FM/Analog	12.5KHz	Low	138.5000	5.50	5.89	FCC
		Middle	155.0000	5.50	5.90	
		High	173.5000	5.50	5.90	
	12.5KHz	Low	406.5000	5.50	5.90	FCC
		Middle	435.0000	5.50	5.90	
		Middle	469.5000	5.50	5.90	
Limit		11.25KHz for 12.5KHz Channel Separation				
Test Results		Compliance				

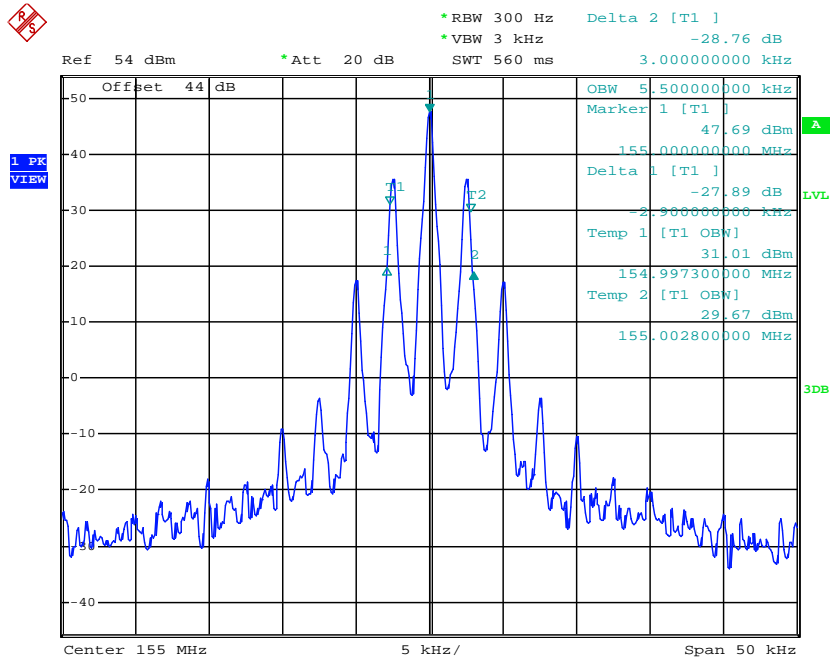
**Plots of 99% and 26dB Bandwidth Measurement**

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	138.5000	5.50	5.89	11.25	Compliance



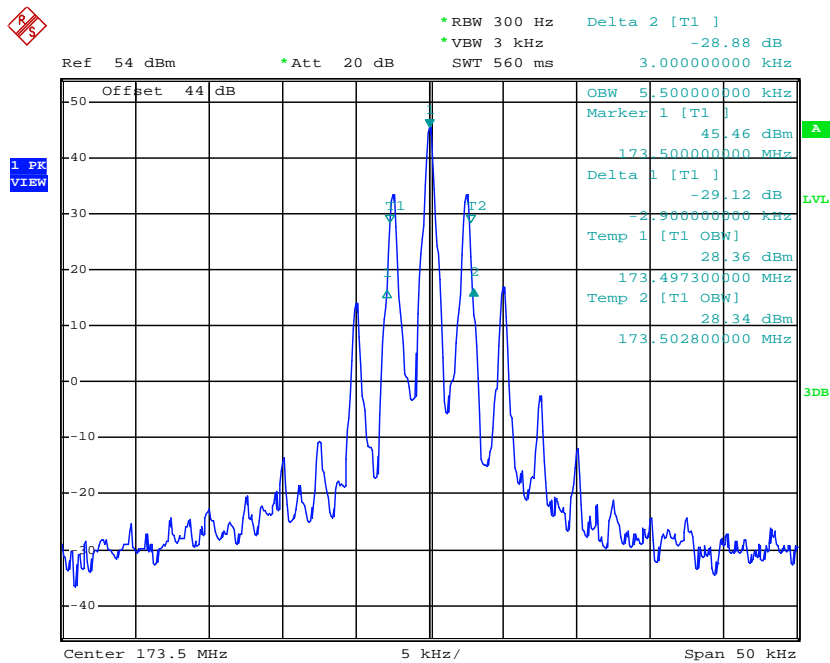
Date: 7.AUG.2012 10:17:55

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	155.0000	5.50	5.90	11.25	Complicance



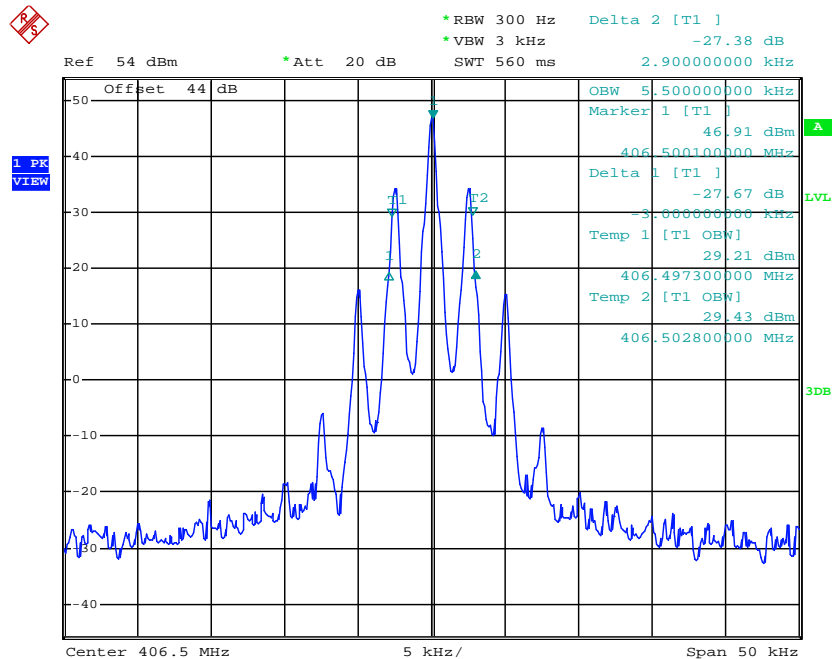
Date: 7.AUG.2012 10:16:36

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	173.5000	5.50	5.90	11.25	Complicance



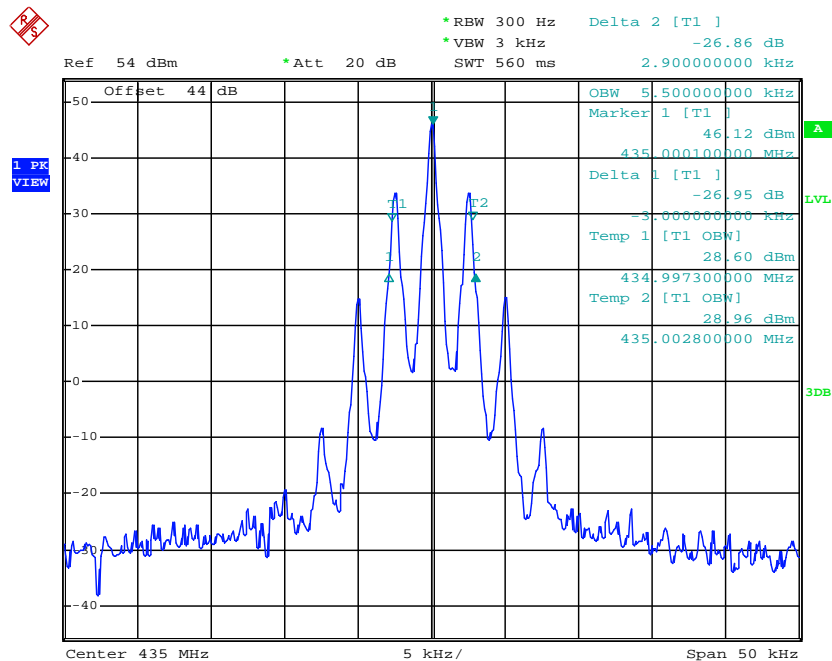
Date: 7.AUG.2012 10:15:43

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	406.5000	5.50	5.90	11.25	Complicance



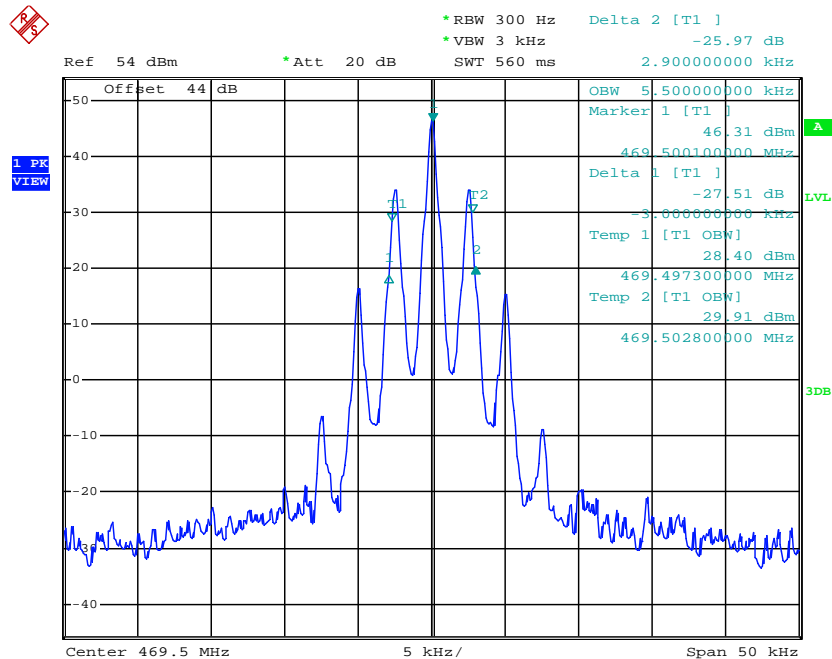
Date: 7.AUG.2012 10:14:36

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	435.0000	5.50	5.90	11.25	Complicance



Date: 7.AUG.2012 10:13:43

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	469.5000	5.50	5.90	11.25	Compliance



Date: 7.AUG.2012 10:12:55

## 4.2.2 Emission Mask

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Applicable Mask	RBW (Hz)	Remark
FM/Analog	12.5KHz	Low	138.5000	D	100	FCC Review
		Middle	155.0000	D	100	
		High	173.5000	D	100	
	12.5KHz	Low	406.5000	D	100	
		Middle	435.0000	D	100	
		Middle	469.5000	D	100	
Test Results		Compliance				

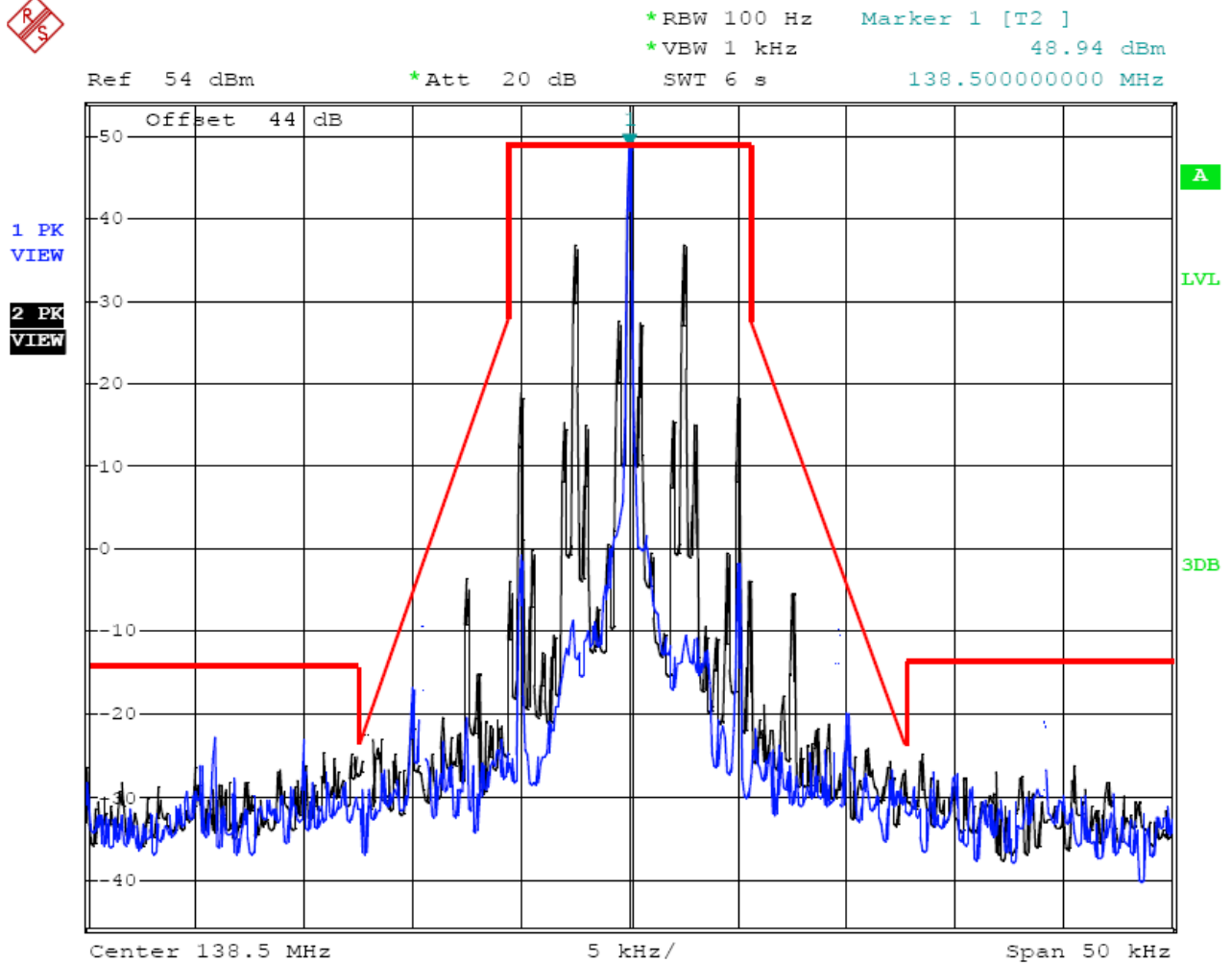
### Plots of Emission Mask Measurement

Referred as the attached plot hereinafter

Note: The yellow curve represents unmodulated signal.

The green curve represents modulated signal.

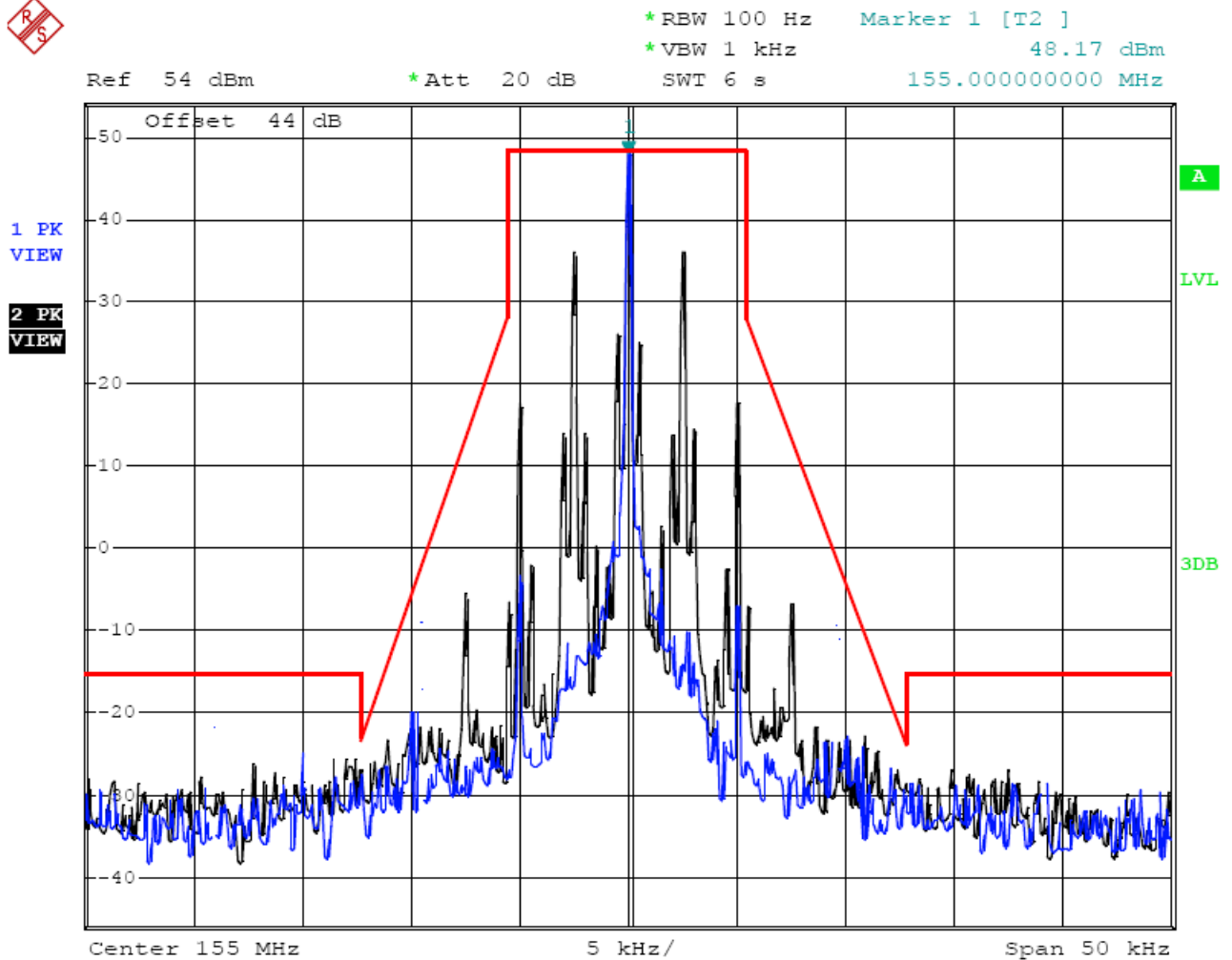
Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	138.5000	D	100Hz	2.5	Compliance



Date: 7.AUG.2012 13:31:34

12.5 kHz Channel Spacing, 138.5000 MHz, 2500 Hz Audio Modulation Only

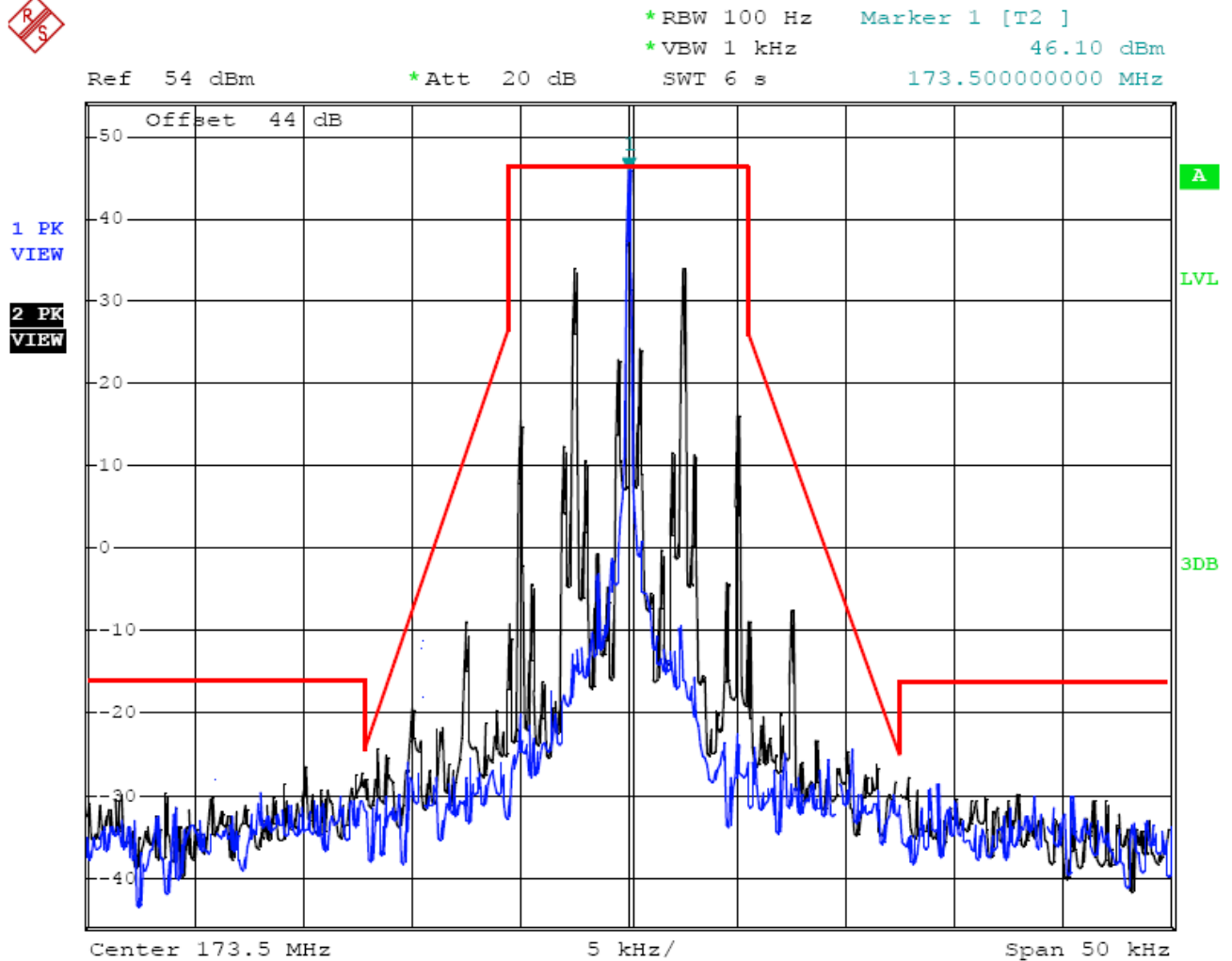
Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	155.0000	D	100Hz	2.5	Compliance



Date: 7.AUG.2012 13:32:40

12.5 kHz Channel Spacing, 155.0000 MHz, 2500 Hz Audio Modulation Only

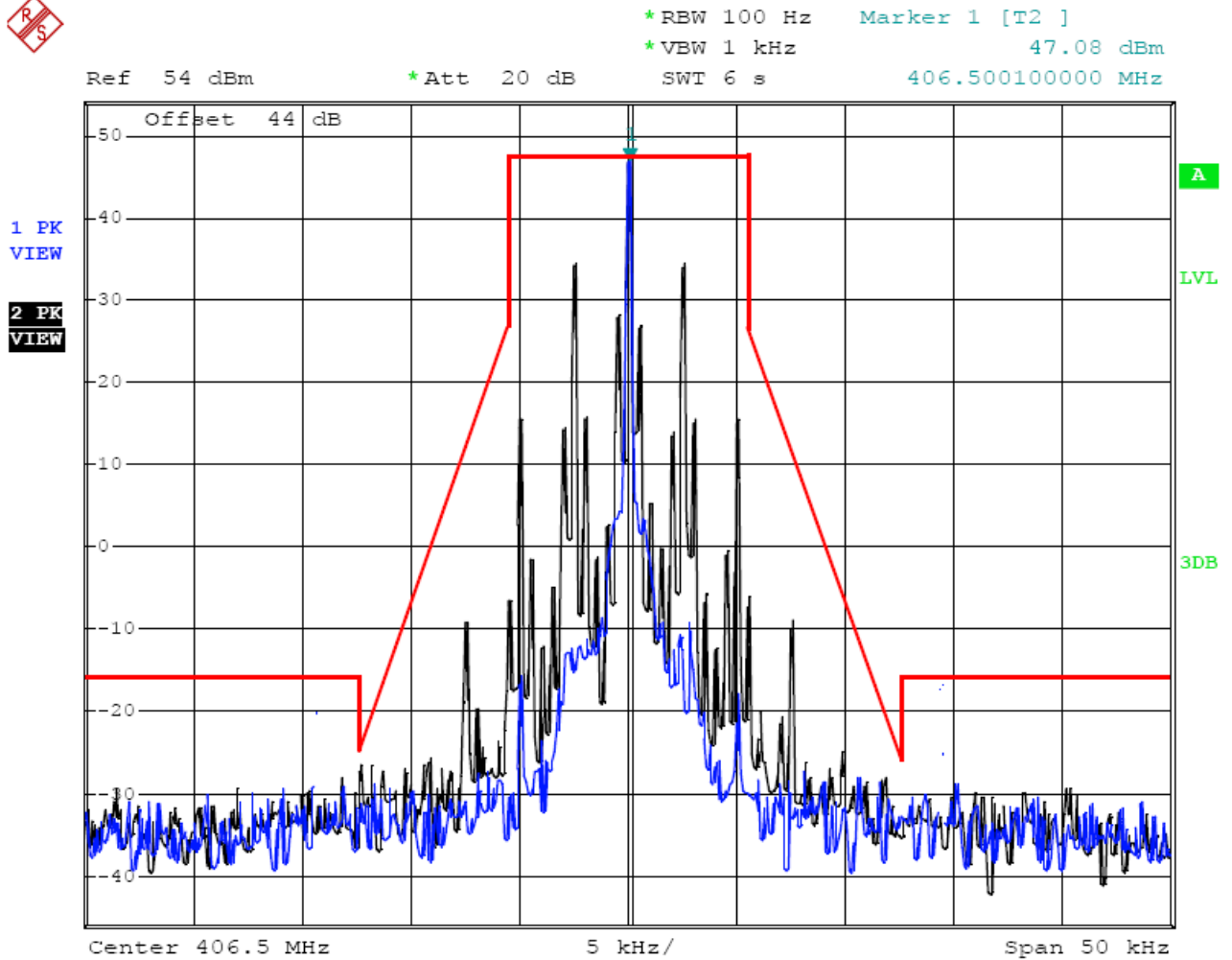
Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	173.5000	D	100Hz	2.5	Compliance



Date: 7.AUG.2012 13:34:42

12.5 kHz Channel Spacing, 173.5000 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	406.5000	D	100Hz	2.5	Compliance

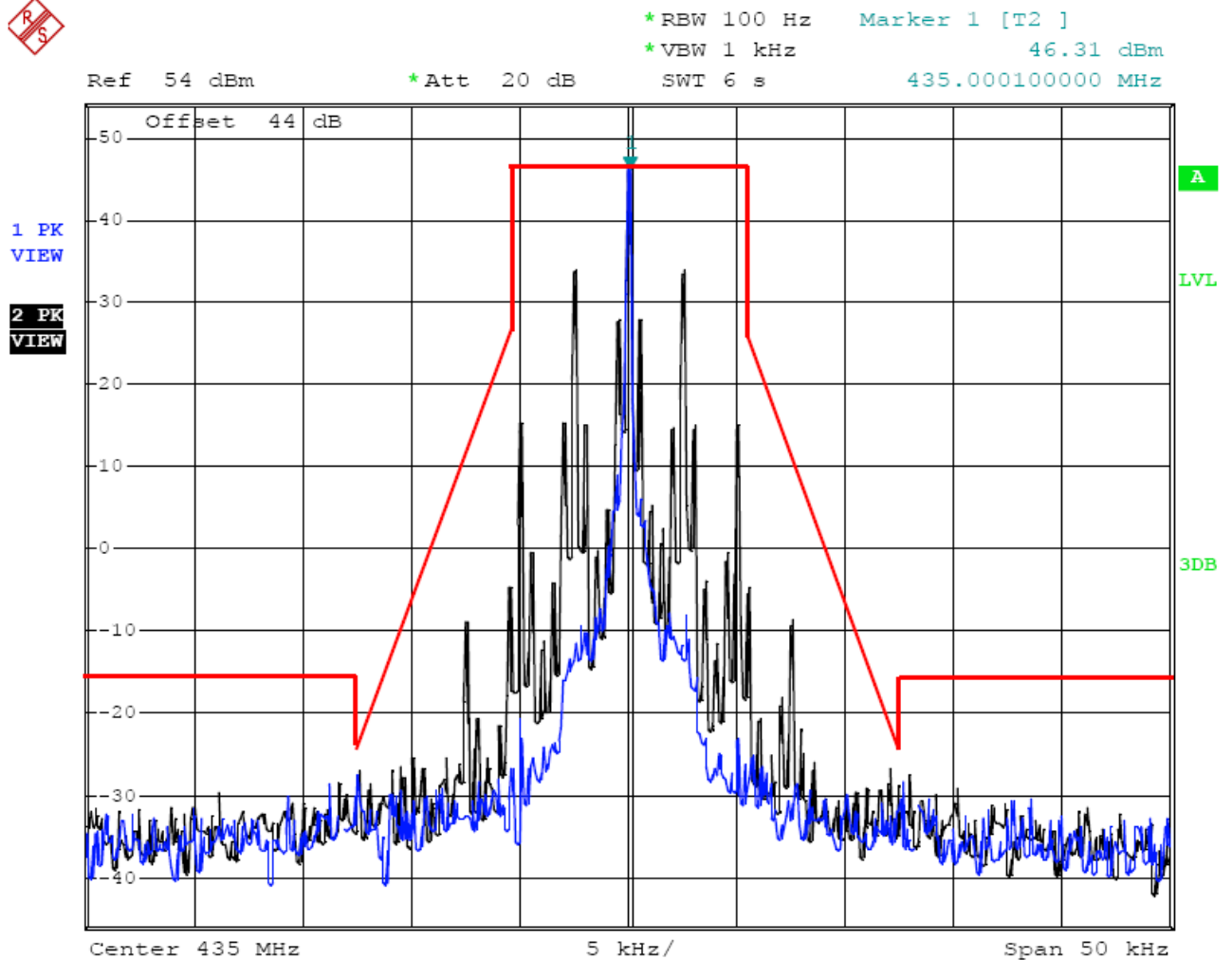


Date: 7.AUG.2012 13:27:57

12.5 kHz Channel Spacing, 406.5000 MHz, 2500 Hz Audio Modulation Only



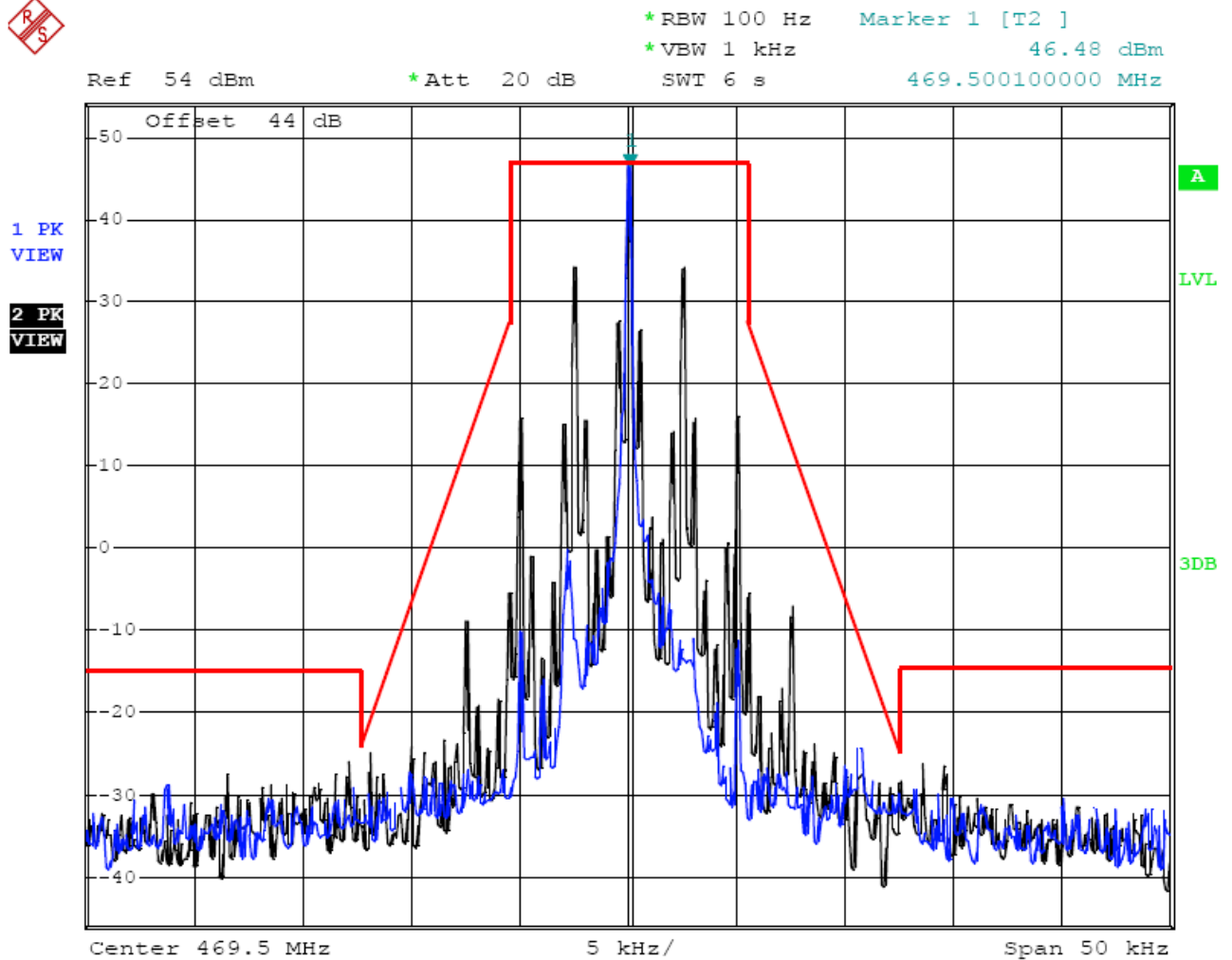
Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	435.0000	D	100Hz	2.5	Compliance



Date: 7.AUG.2012 13:29:08

12.5 kHz Channel Spacing, 435.0000 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	469.5000	D	100Hz	2.5	Compliance



Date: 7.AUG.2012 13:30:13

12.5 kHz Channel Spacing, 469.5000 MHz, 2500 Hz Audio Modulation Only

### 4.3. Transmitter Radiated Spurious Emission

#### TEST APPLICABLE

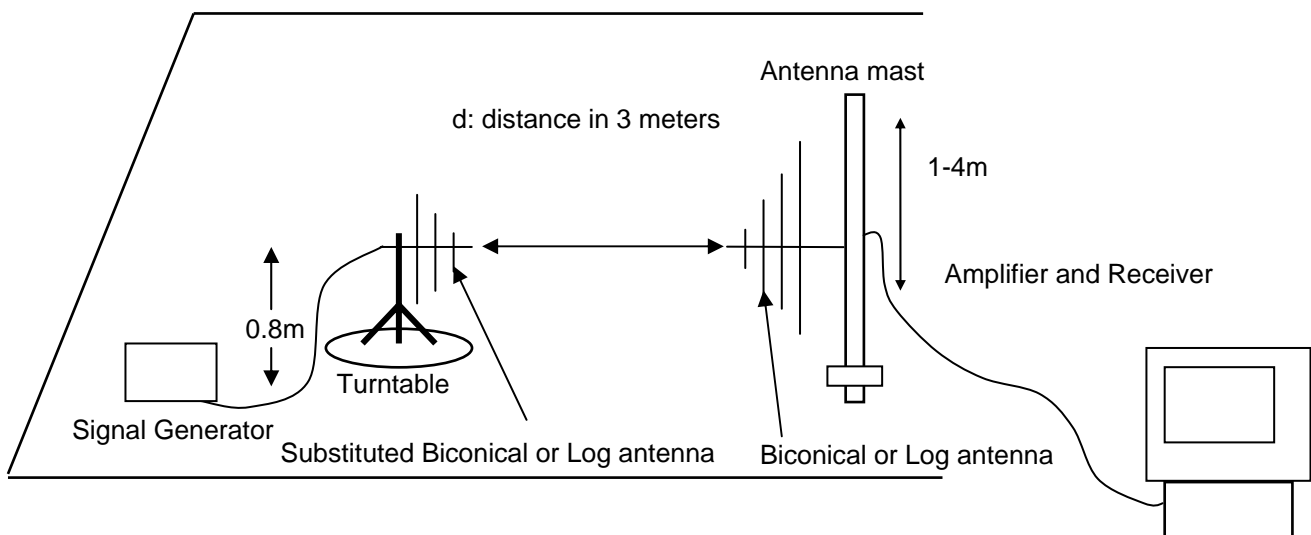
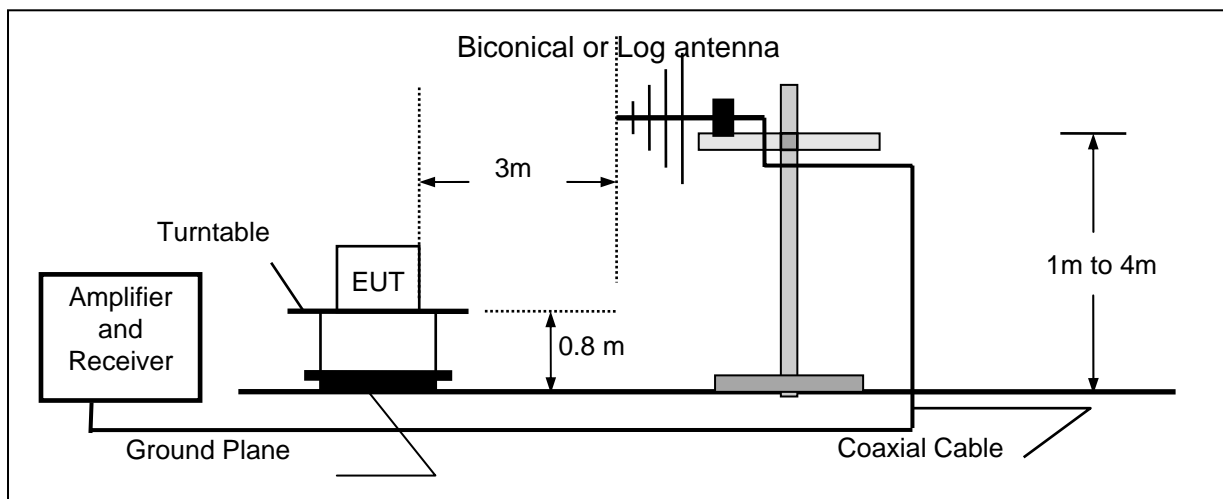
According to the TIA/EIA 603 test method, and according to Section 90.210 and RSS-119 Section 5.8, the power of each unwanted emission shall be less than Transmitted Power as specified below for transmitters designed to operate with 12.5 KHz channel bandwidth:

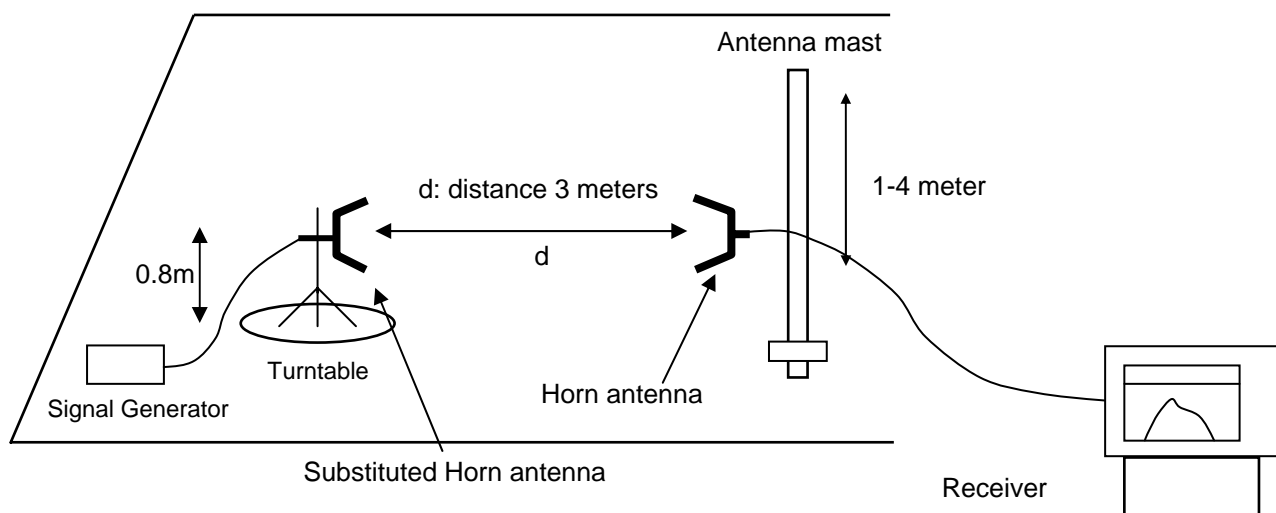
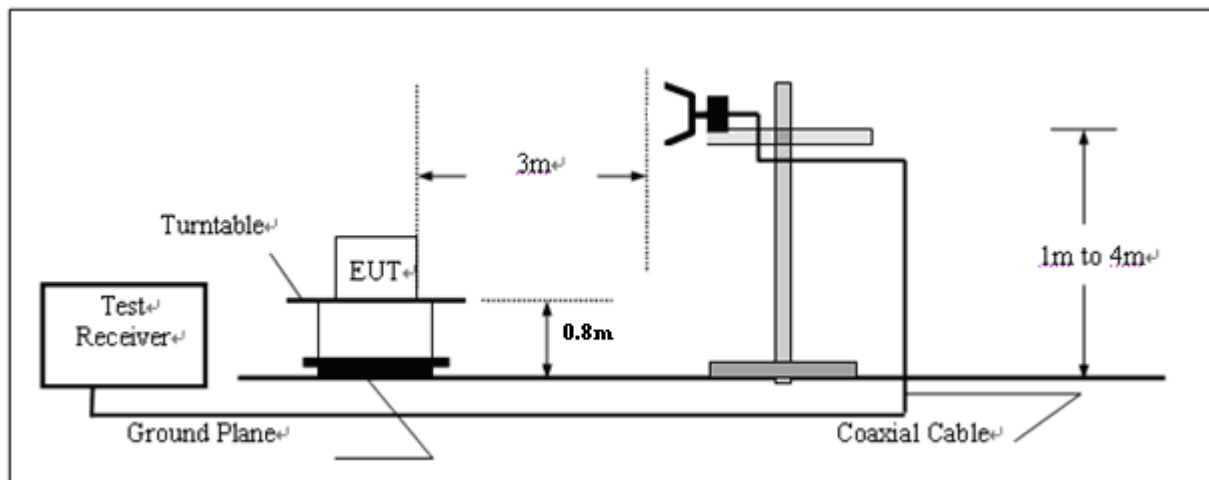
- 1 On any frequency removed from the center of the authorized bandwidth  $f_0$  to 5.625 KHz removed from  $f_0$ : Zero dB
  - 2 On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in KHz)  $f_0$  of more than 5.625 KHz but no more than 12.5 KHz: At least 7.27dB
  - 3 On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in KHz)  $f_0$  of more than 12.5 KHz: At least  $50 + 10 \log(P)$  dB or 70 dB, which ever is lesser attenuation.
- For transmitters designed to transmit with 25 KHz channel separation and equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as following:

- 1 On any frequency removed from the assigned frequency by more than 50 percent, but no more than 100 percent of the authorized bandwidth: At least 25 dB.
- 2 On any frequency removed from the assigned frequency by more than 100 percent, but no more than 250 percent of the authorized bandwidth: At least 35 dB.
- 3 On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log(P)$  dB.

#### TEST CONFIGURATION

Below 1GHz



**Above 1GHz****TEST PROCEDURE**

- 1 On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- 2 The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- 3 The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4 The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5 The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- 6 The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7 The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- 8 The maximum signal level detected by the measuring receiver shall be noted.
- 9 The measurement shall be repeated with the test antenna set to horizontal polarization.
- 10 Replace the antenna with a proper Antenna (substitution antenna).
- 11 The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- 12 The substitution antenna shall be connected to a calibrated signal generator.
- 13 If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 14 The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

- 15 The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 16 The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 17 The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization

## TEST RESULTS

### Modulation Type: FM

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 9 (12.5 kHz bandwidth only): On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f d in kHz) of more than 12.5 kHz at least:

Low:  $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (50.11) = 67.00 \text{ dB}$

High:  $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (50.70) = 67.05 \text{ dB}$

Note: In general, the worse case attenuation requirement shown above was applied.

Calculation: Limit (dBm) = EL-50-10log10 (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,  
In this application, the EL is 47.05 dBm.

Limit (dBm) = 47.05-50-10log10 (50.70) = -20 dBm

Note: 1. In general, the worse case attenuation requirement shown above was applied.

2. The measurement frequency range from 30MHz to 6GHz.

3. \*\*\* means that the emission level is too low to be measured or at least 20 dB down than the limit.

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		Low Channel		Test Frequency		138.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
277.00	72.10	Peak	H	100	325	-22.77	-20	2.77
415.50	66.45	Peak	H	150	252	-27.09	-20	7.09
1662.00	63.77	Peak	H	200	120	-29.37	-20	9.37
...			H					
277.00	70.12	Peak	V	100	17	-25.12	-20	5.12
415.50	63.64	Peak	V	100	356	-30.88	-20	10.88
1662.00	63.95	Peak	V	100	257	-30.20	-20	10.2
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		Middle Channel		Test Frequency		155.0000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
310.00	71.51	Peak	H	130	320	-23.36	-20	3.36
465.00	67.23	Peak	H	200	185	-26.31	-20	6.31
1705.00	65.50	Peak	H	150	350	-27.64	-20	7.64
...			H					
310.00	72.37	Peak	V	100	53	-22.87	-20	2.87
465.00	68.35	Peak	V	120	78	-26.17	-20	6.17
1705.00	68.53	Peak	V	150	118	-25.62	-20	5.62
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		High Channel		Test Frequency		173.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
347.00	73.52	Peak	H	150	34	-21.35	-20	1.35
694.00	68.44	Peak	H	100	173	-25.10	-20	5.10
1561.50	63.55	Peak	H	300	233	-29.59	-20	9.59
...			H					
347.00	72.41	Peak	V	100	158	-22.83	-20	2.83
694.00	69.15	Peak	V	120	35	-25.37	-20	5.37
1561.50	63.74	Peak	V	1500	200	-30.41	-20	10.41
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		Low Channel		Test Frequency		406.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
813.00	73.05	Peak	H	200	57	-21.82	-20	1.82
1219.50	65.55	Peak	H	150	342	-27.99	-20	7.99
1626.00	62.55	Peak	H	200	117	-30.59	-20	10.59
...			H					
813.00	72.42	Peak	V	100	237	-22.82	-20	2.82
1219.50	65.35	Peak	V	100	88	-29.17	-20	9.17
1626.00	63.53	Peak	V	100	57	-30.62	-20	10.62
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		Middle Channel		Test Frequency		435.0000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
870.00	72.35	Peak	H	100	354	-22.52	-20	2.52
1305.00	66.18	Peak	H	200	249	-27.36	-20	7.36
1740.00	63.60	Peak	H	100	57	-29.54	-20	9.54
...			H					
870.00	72.06	Peak	V	100	53	-23.18	-20	3.18
1305.00	65.37	Peak	V	100	353	-29.15	-20	9.15
1740.00	64.20	Peak	V	150	110	-29.95	-20	9.95
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		High Channel		Test Frequency		469.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
939.00	72.35	Peak	H	155	118	-22.52	-20	2.52
1408.50	68.32	Peak	H	200	354	-25.22	-20	5.22
1878.000	64.87	Peak	H	100	254	-28.27	-20	8.27
...			H					
939.00	71.35	Peak	V	100	264	-23.89	-20	3.89
1408.50	68.50	Peak	V	120	154	-26.02	-20	6.02
1878.000	66.40	Peak	V	110	224	-27.75	-20	7.75
...	...		V					

#### 4.4. Spurious Emssion on Antenna Port

##### TEST APPLICABLE

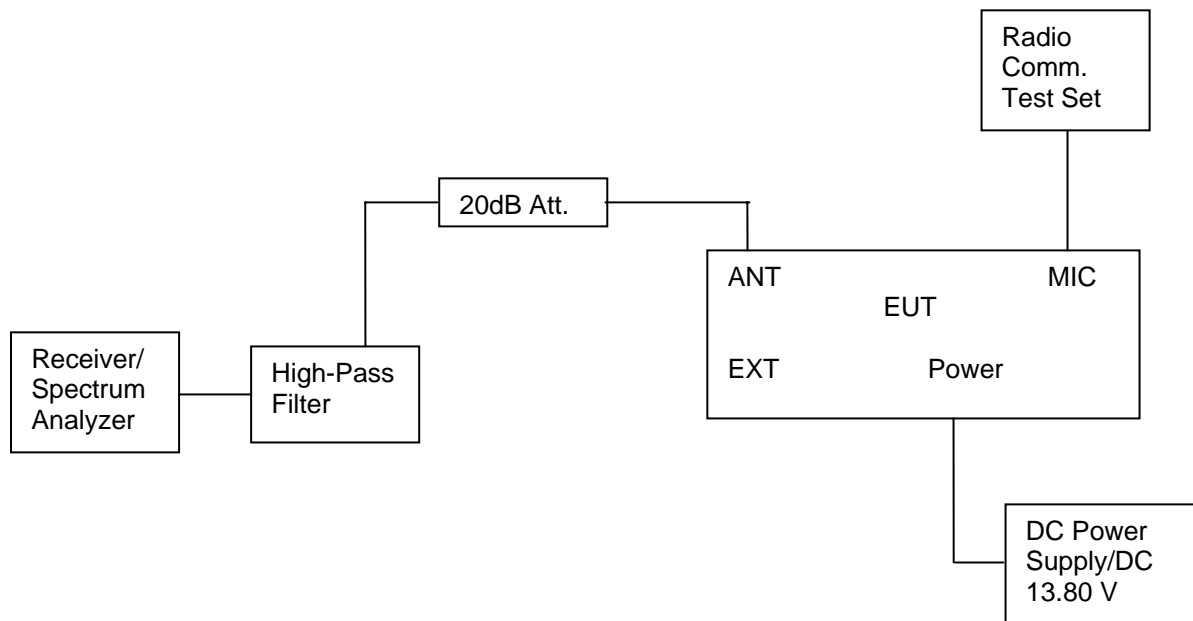
The same as Section 4.3

##### TEST PROCEDURE

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set to 100 kHz. Sufficient scans were taken to show any out of band emission up to 10th. Harmonic for the lower and the highest frequency range. RBW 100 kHz, VBW 300 kHz,

The audio input was set to 0 to get the unmodulated carrier, the resulting picture is print out for each channel separation.

##### TEST CONFIGURATION



##### TEST RESULTS

###### **Modulation Type: FM**

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 9 (12.5 kHz bandwidth only): On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f d in kHz) of more than 12.5 kHz at least:

Low:  $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (50.11) = 67.00 \text{ dB}$

High:  $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (50.70) = 67.05 \text{ dB}$

Note: In general, the worse case attenuation requirement shown above was applied.

Calculation: Limit (dBm) = EL - 50 - 10log10 (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 47.05 dBm.

Limit (dBm) = 47.05 - 50 - 10log10 (50.70) = -20 dBm

Note: 1. In general, the worse case attenuation requirement shown above was applied.

2. The measurement frequency range from 30MHz to 5 GHz.



**For Rated Power (50Watt)**

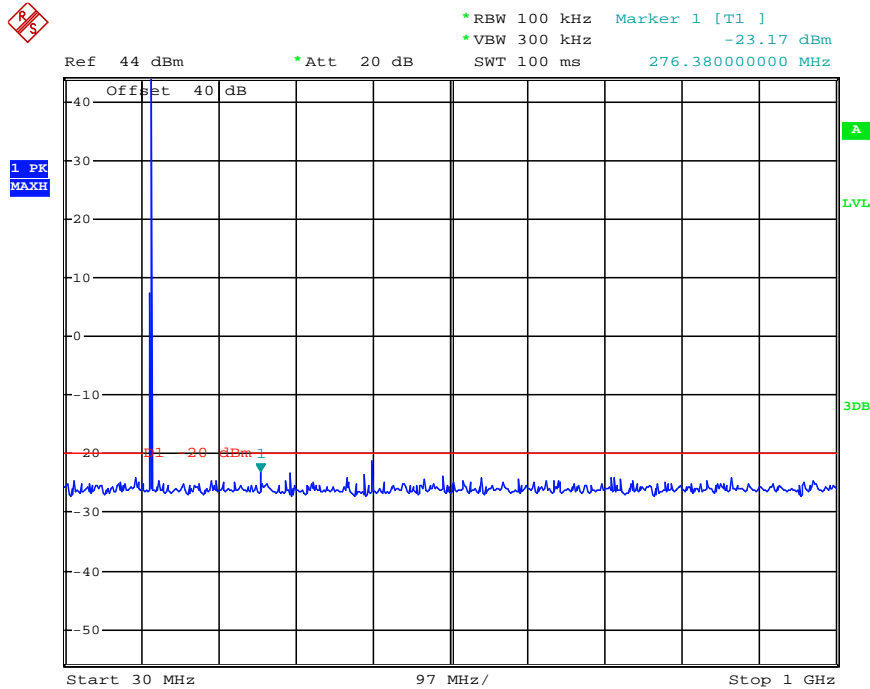
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz	
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)
FM/Analog	12.5KHz	Low	138.5000	680.96	-26.39	4414.82	-36.24
		Middle	155.0000	972.74	-24.77	1625.25	-37.13
		High	173.5000	979.16	-22.31	2843.69	-21.54
Limit		-20dBm for 12.5KHz Channel Separation					
Test Results		Compliance					

**For Rated Power (40Watt)**

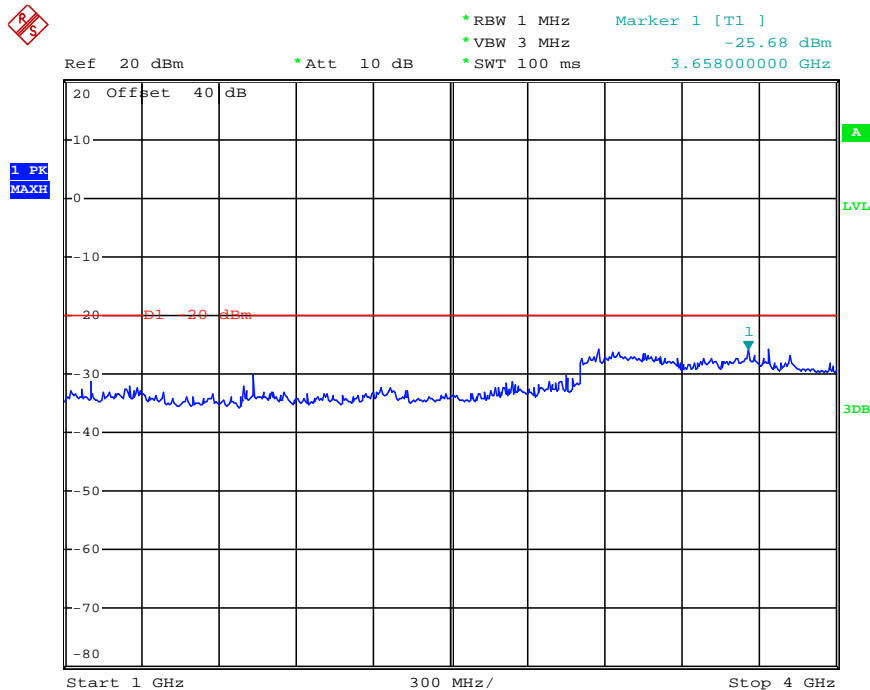
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz	
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)
FM/Analog	12.5KHz	Low	406.5000	814.02	-25.03	3509.01	-37.02
		Middle	429.5000	858.91	-25.12	3933.86	-36.82
		Middle	450.5000	901.40	-23.93	4671.34	-36.13
Limit		-20dBm for 12.5KHz Channel Separation					
Test Results		Compliance					

**Plots of Spurious Emission on Antenna Port Measurement**

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	138.5000	276.38	-23.17	3658.00	-25.68	-20dBm
Test Results				Compliance				

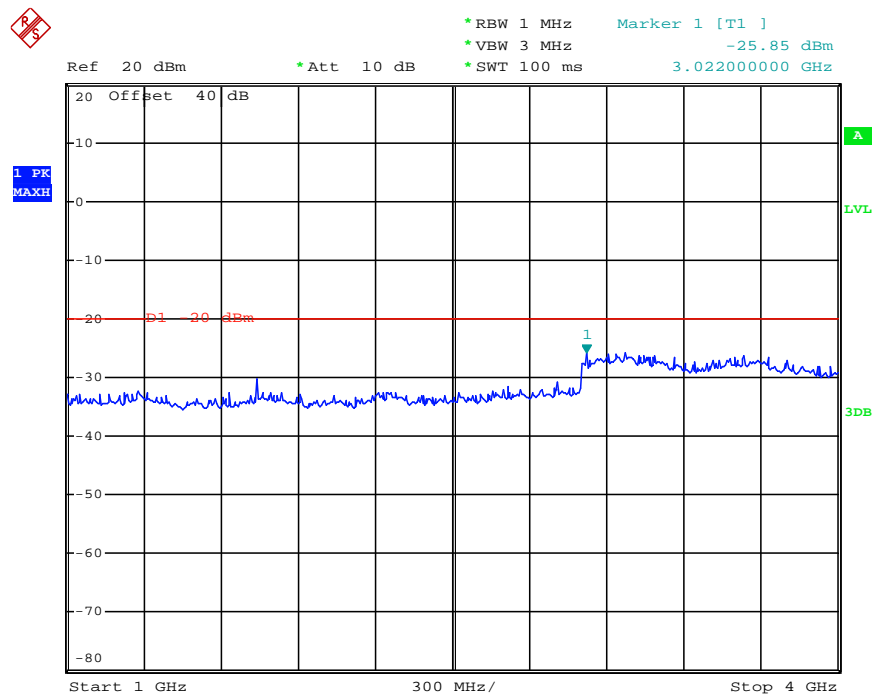
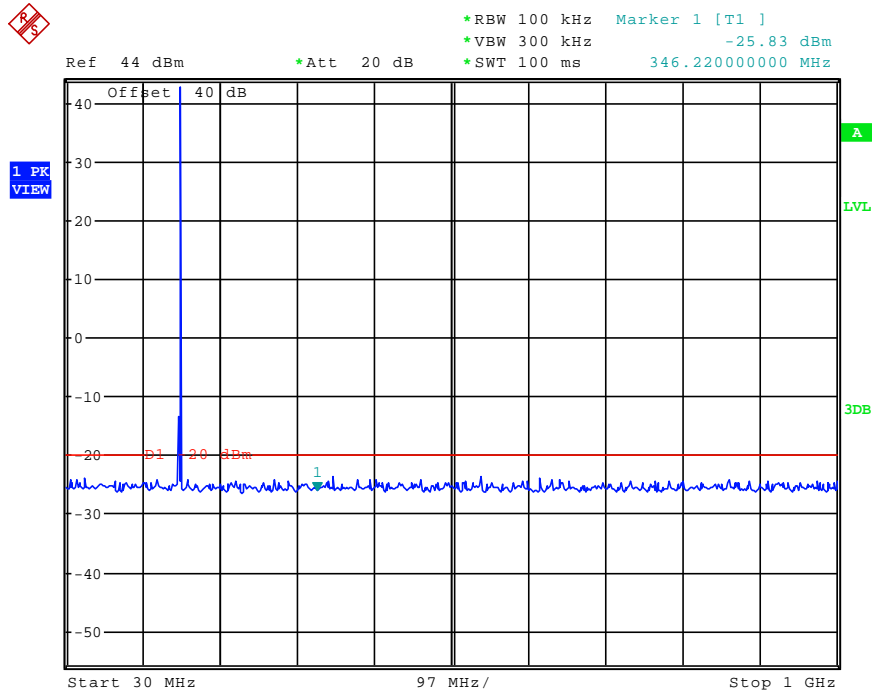


Date: 7.AUG.2012 10:30:29



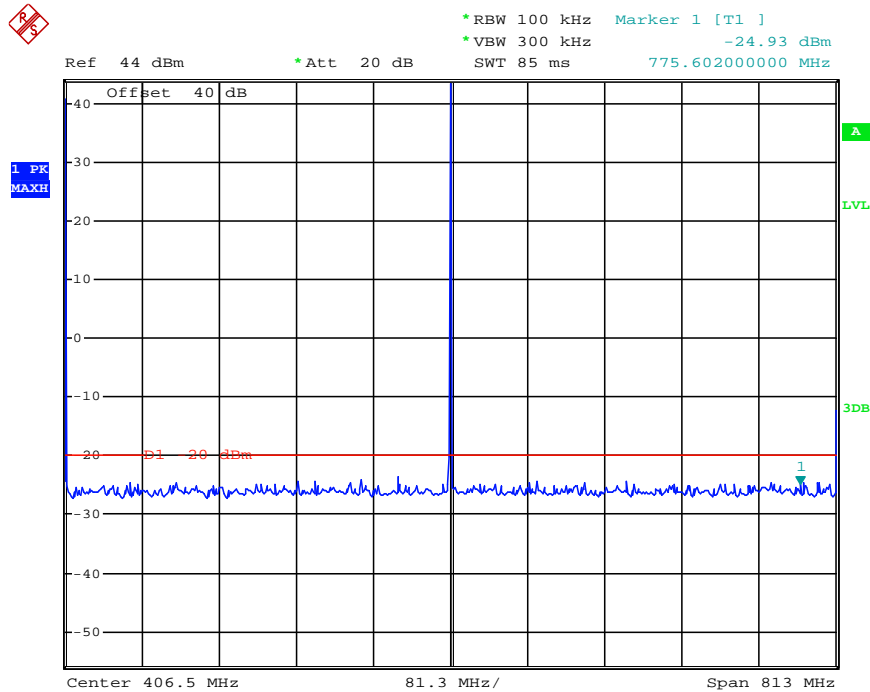
Date: 7.AUG.2012 10:44:20

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	155.0000	346.22	-25.83	3022.00	-25.85	-20dBm
Test Results				Compliance				

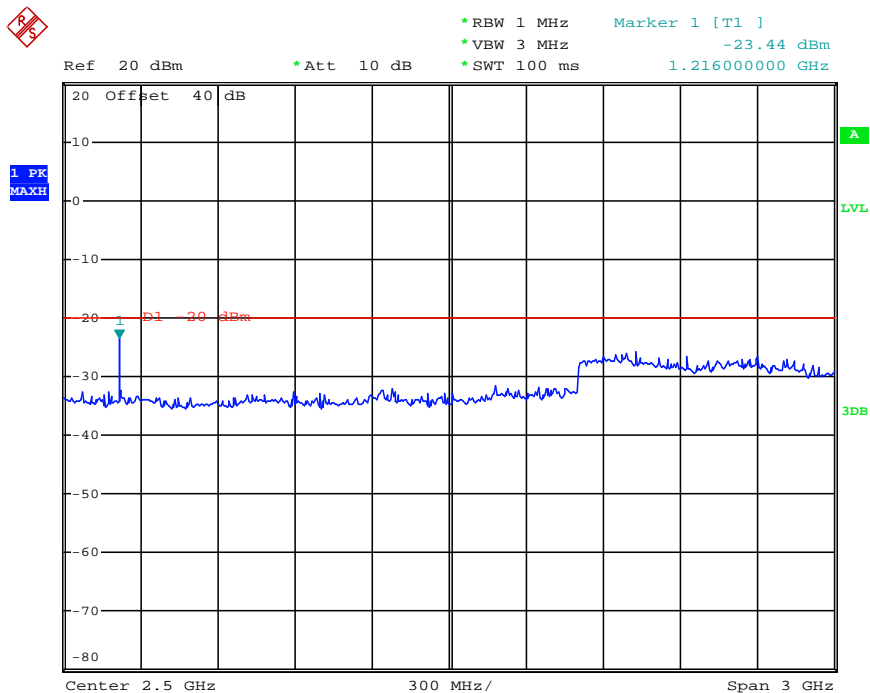


Date: 7.AUG.2012 10:43:46

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	173.5000	775.62	-24.93	1216.00	-23.44	-20dBm
Test Results				Compliance				

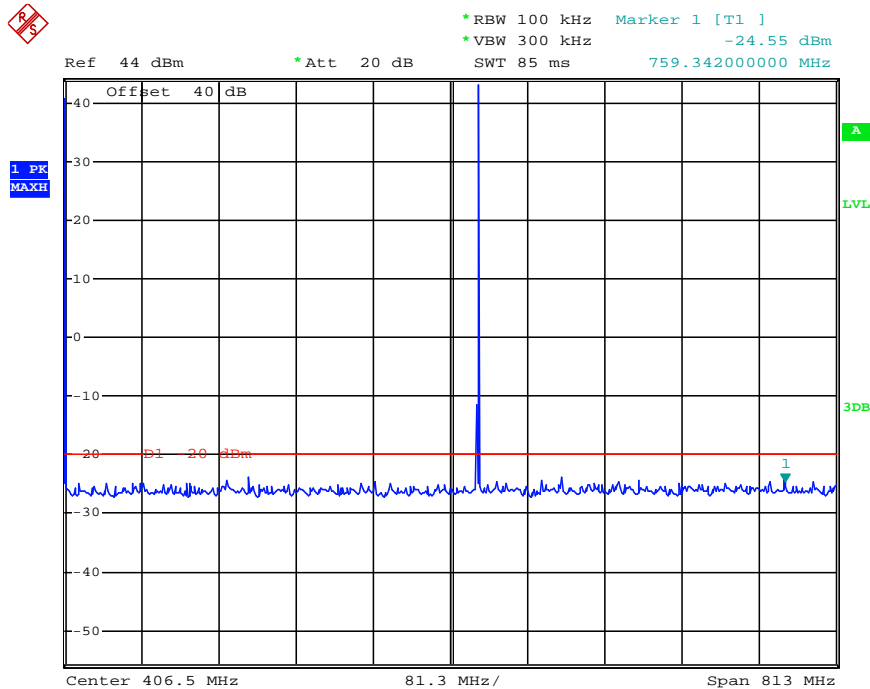


Date: 7.AUG.2012 10:35:50

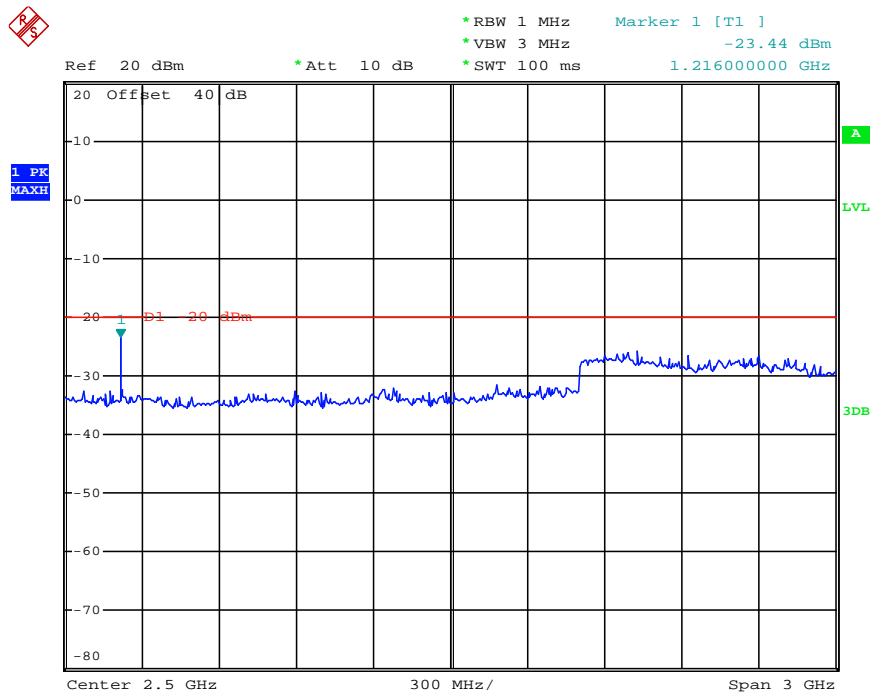


Date: 7.AUG.2012 10:47:41

Modulation Type	Channel SpARATION	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	759.34	-24.55	1216.00	-23.44	-20dBm
Test Results				Compliance				

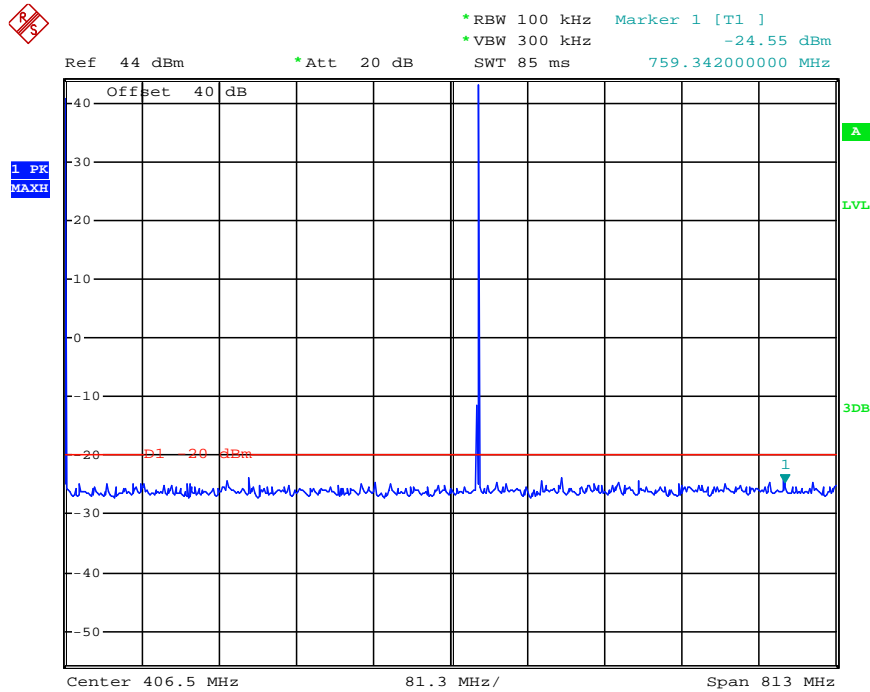


Date: 7.AUG.2012 10:36:20

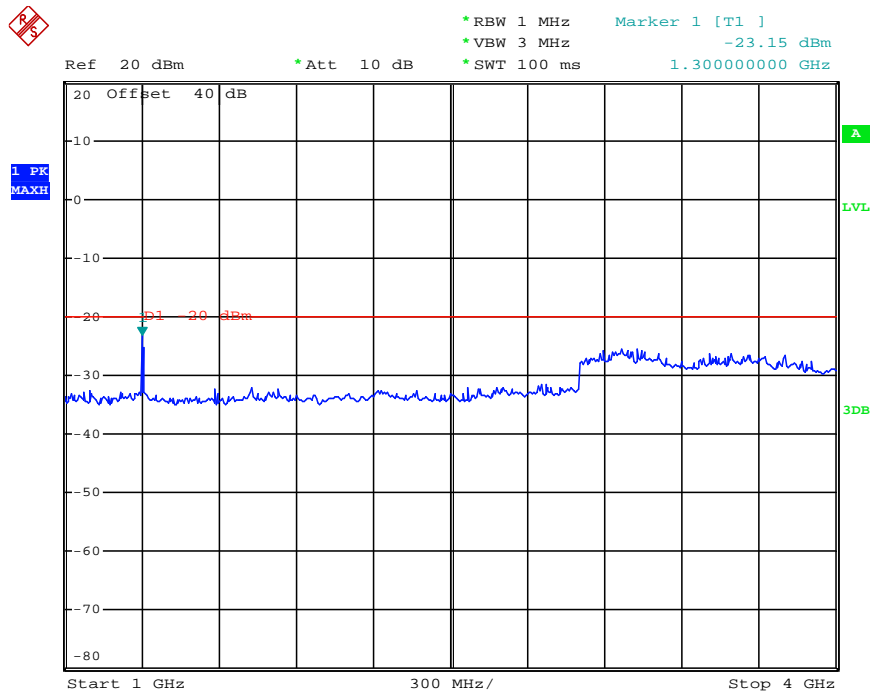


Date: 7.AUG.2012 10:47:41

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	435.0000	759.34	-24.55	1300.00	-23.15	-20dBm
Test Results				Compliance				

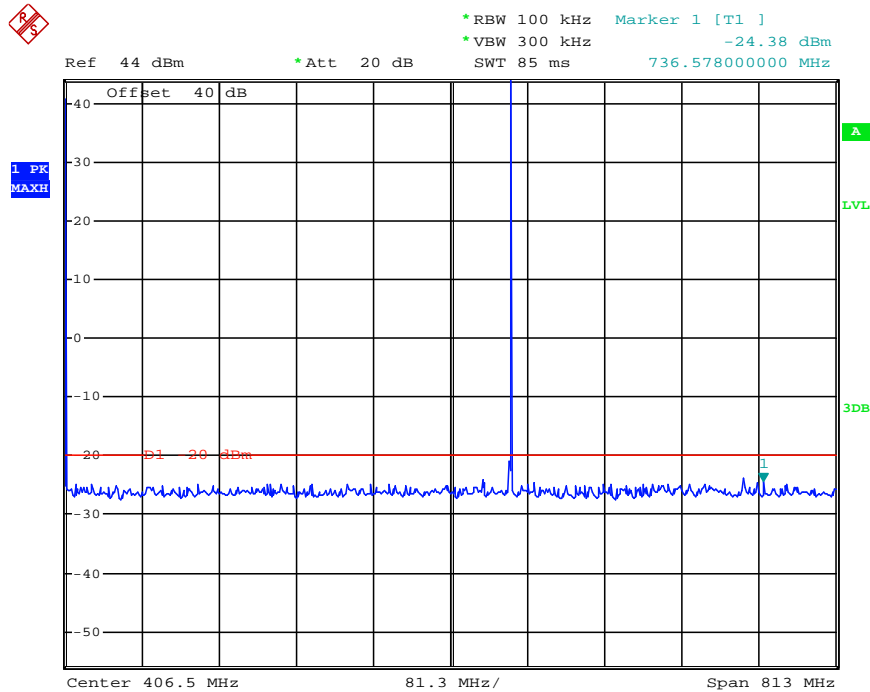


Date: 7.AUG.2012 10:36:20

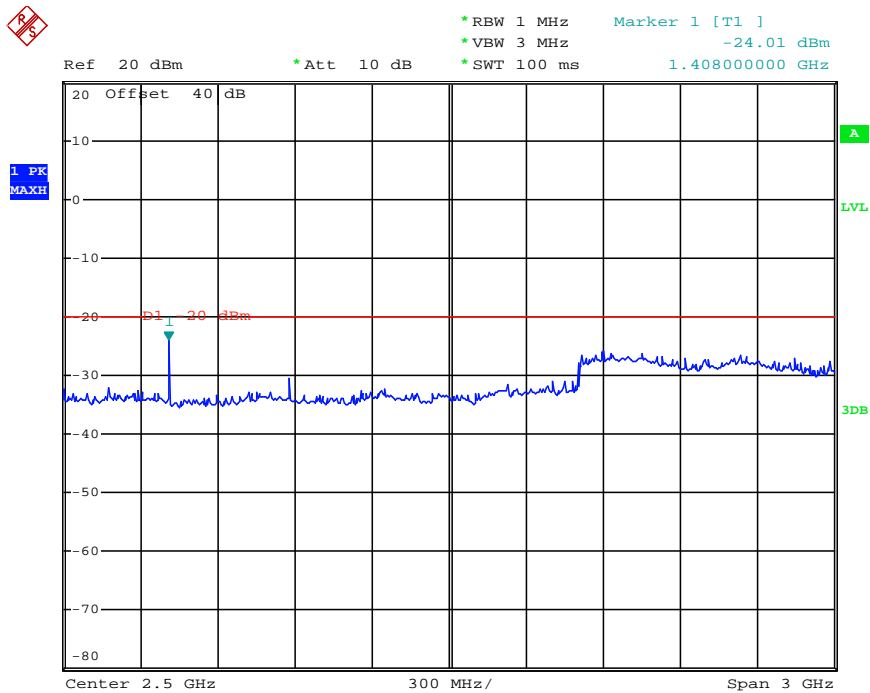


Date: 7.AUG.2012 10:46:50

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	469.5000	736.57	-24.38	1408.00	-24.01	-20dBm
Test Results				Compliance				



Date: 7.AUG.2012 10:36:53



Date: 7.AUG.2012 10:47:16

## 4.5. Modulation Characteristics

### TEST APPLICABLE

According to CFR47 section 2.1047(a), for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

### TEST PROCEDURE

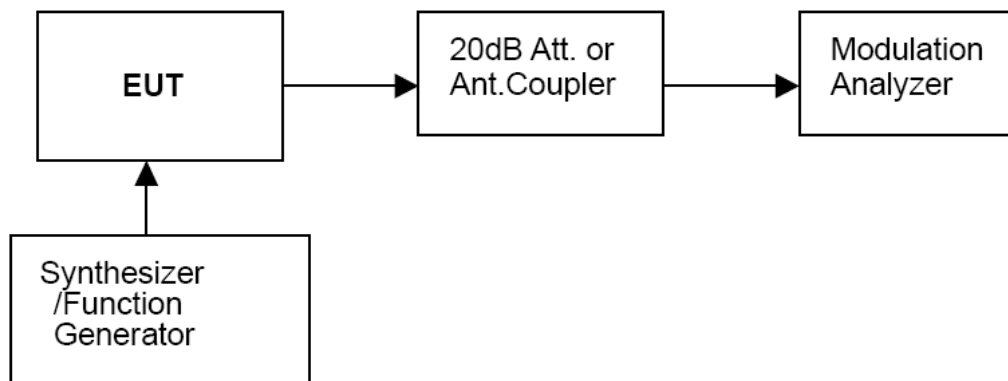
#### **Modulation Limit**

- 1 Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1 KHz using this level as a reference (0dB) and vary the input level from -20 to +20dB. Record the frequency deviation obtained as a function of the input level.
- 2 Repeat step 1 with input frequency changing to 300, 1004, and 2500Hz in sequence.

#### **Audio Frequency Response**

- 1 Configure the EUT as shown in figure 1.
- 2 Adjust the audio input for 20% of rated system deviation at 1 KHz using this level as a reference (0dB).
- 3 Vary the Audio frequency from 100 Hz to 10 KHz and record the frequency deviation.
- 4 Audio Frequency Response =  $20\log_{10} (\text{Deviation of test frequency} / \text{Deviation of 1 KHz reference})$ .

### TEST CONFIGURATION



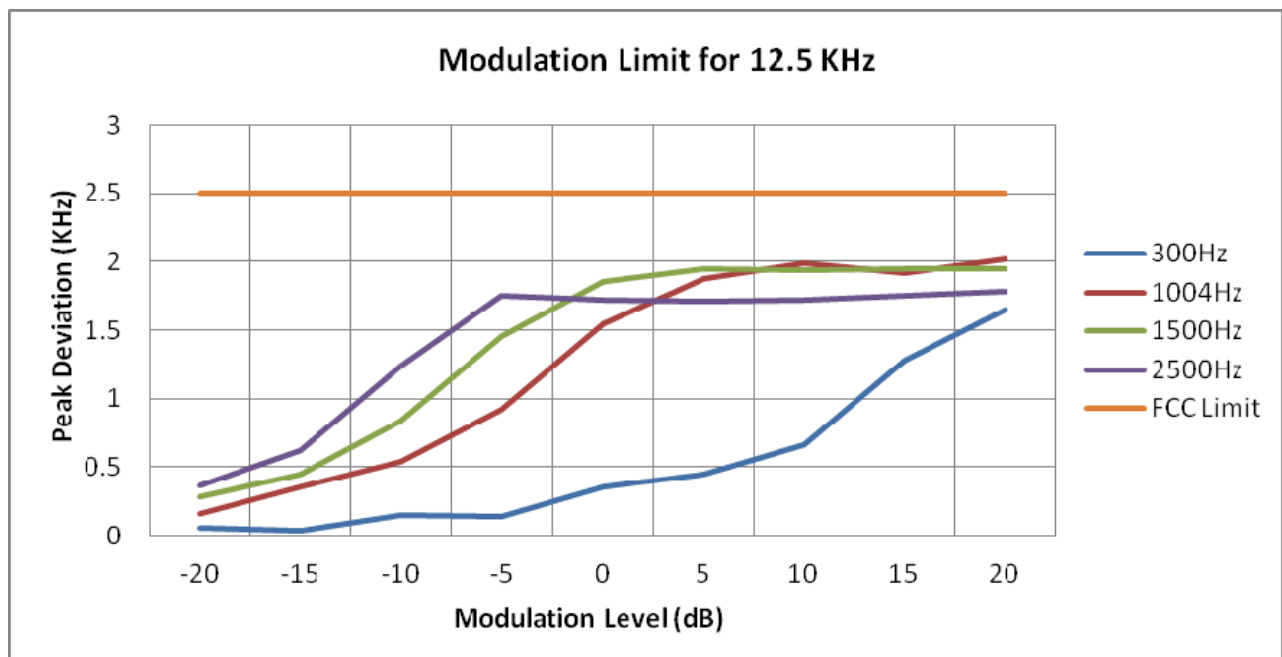
### TEST RESULTS

#### For VHF Frequency Band

#### 12.5 KHz Channel Separation

Modulation Level(dB)	Peak Freq. Deviation At 300 Hz(KHz)	Peak Freq. Deviation At 1004 H(KHz)	Peak Freq. Deviation At 1500 Hz(KHz)	Peak Freq. Deviation At 2500 Hz(KHz)
-20	0.06	0.16	0.28	0.36
-15	0.04	0.35	0.45	0.62
-10	0.15	0.54	0.84	1.24
-5	0.14	0.92	1.45	1.75
0	0.35	1.55	1.86	1.72
+5	0.45	1.88	1.95	1.71
+10	0.66	1.99	1.94	1.72
+15	1.28	1.92	1.95	1.75
+20	1.65	2.02	1.95	1.78

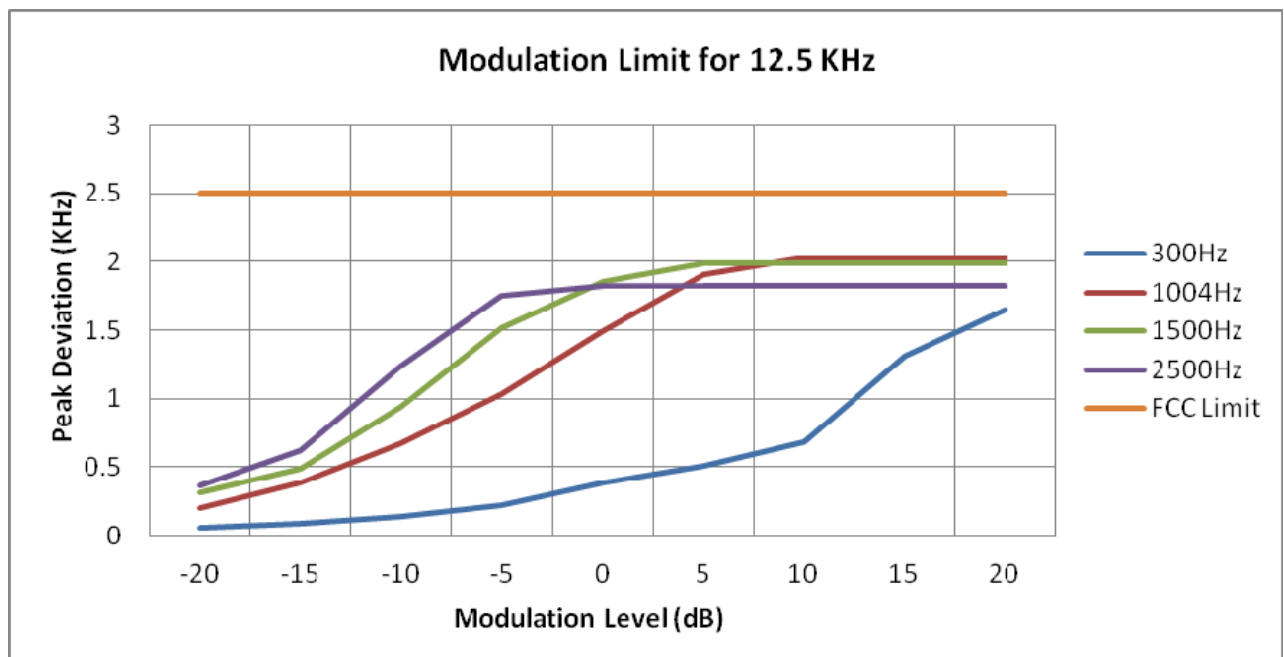




**For UHF Frequency Band**

**12.5 KHz Channel Separation**

Modulation Level(dB)	Peak Freq. Deviation At 300 Hz(KHz)	Peak Freq. Deviation At 1004 H(KHz)	Peak Freq. Deviation At 1500 Hz(KHz)	Peak Freq. Deviation At 2500 Hz(KHz)
-20	0.06	0.20	0.31	0.36
-15	0.09	0.39	0.49	0.62
-10	0.14	0.67	0.94	1.24
-5	0.22	1.03	1.52	1.75
0	0.39	1.50	1.86	1.82
+5	0.51	1.91	1.99	1.82
+10	0.68	2.03	1.99	1.82
+15	1.31	2.03	1.99	1.82
+20	1.65	2.03	1.99	1.82



#### **b). Audio Frequency Response:**

**Rule Part No.: Part 2.1407(a) (b)**

##### **Method of Measurement:**

The audio frequency response was measured in accordance with TIA/EIA Specification 603 with no exception. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 300-3000Hz shall be submitted and Audio Post Limiter Low Pass Filter Response from 3.0 KHz to 50KHz. However, the audio frequency response should test from 100Hz to 5.0 KHz according to FCC Part 90.

##### **Modulation Type: FM**

The audio frequency response curve is show below.and

**Test Audio Level (1 KHz and 20% maximum deviation) for 4.40mv for 12.5 KHz channel separation.**

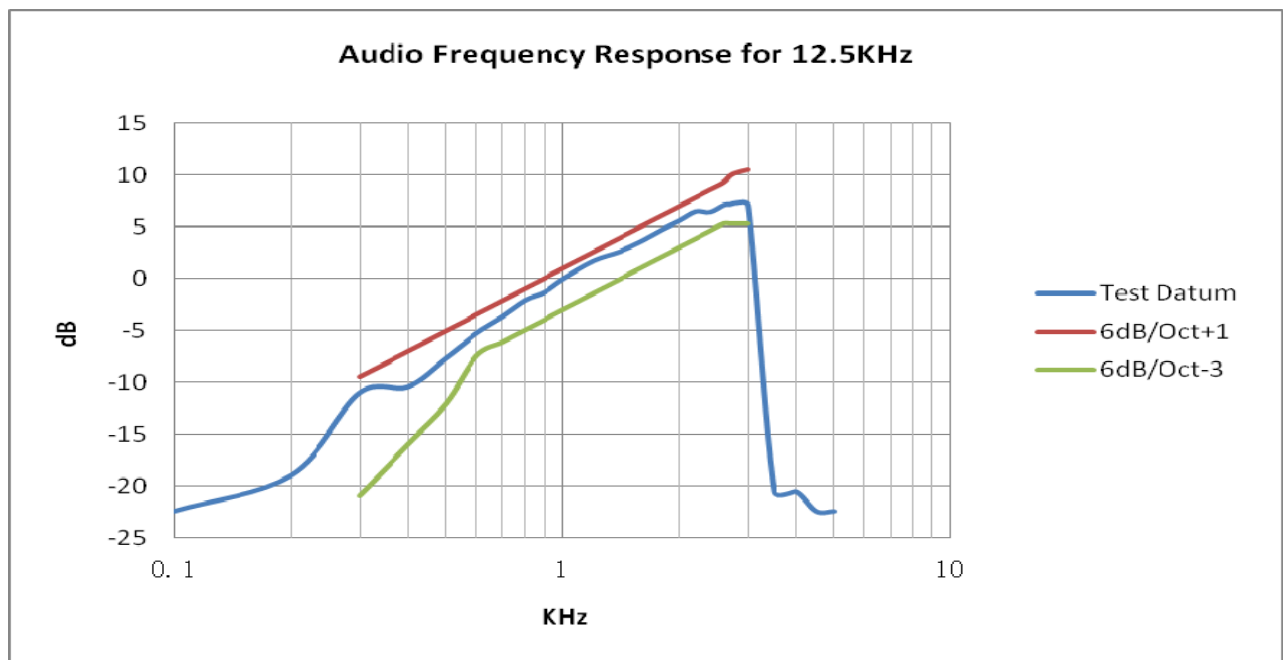
##### **Note:**

- 1 Not applicable to new standard. However, tests are conducted under FCC's recommendation.
- 2 The Audio Frequency Response is identical for 12.5 KHz channel separation

##### **For VHF Frequency Band**

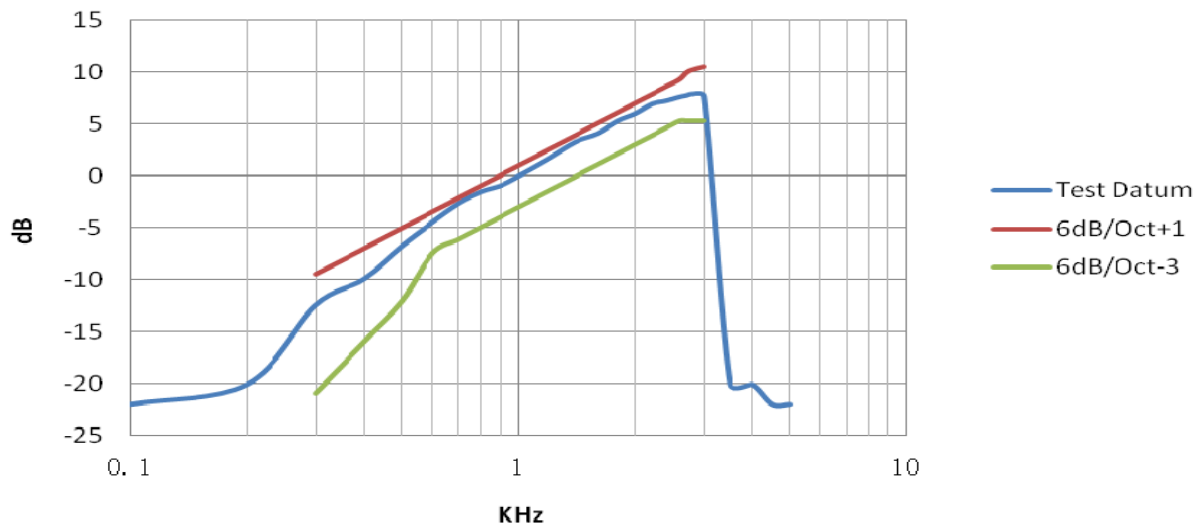
**For 12.5 KHz**

Frequency (KHz )	Frequency Deviation (KHz)	1KHz Referece Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.04	0.53	-22.44
0.2	0.06	0.53	-18.92
0.3	0.15	0.53	-10.96
0.4	0.16	0.53	-10.40
0.5	0.22	0.53	-7.63
0.6	0.29	0.53	-5.23
0.7	0.35	0.53	-3.60
0.8	0.42	0.53	-2.02
0.9	0.46	0.53	-1.23
1.0	0.53	0.53	0.00
1.2	0.65	0.53	1.78
1.4	0.72	0.53	2.67
1.6	0.81	0.53	3.69
1.8	0.92	0.53	4.80
2.0	1.02	0.53	5.69
2.2	1.13	0.53	6.58
2.4	1.12	0.53	6.50
2.6	1.21	0.53	7.18
2.7	1.22	0.53	7.25
2.8	1.24	0.53	7.39
3.0	1.21	0.53	7.18
3.5	0.05	0.53	-20.50
4.0	0.05	0.53	-20.50
4.5	0.04	0.53	-22.44
5.0	0.04	0.53	-22.44



**For UHF Frequency Band****For 12.5 KHz**

Frequency (KHz )	Frequency Deviation (KHz)	1KHz Refenerce Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.04	0.50	-21.93
0.2	0.05	0.50	-20.00
0.3	0.12	0.50	-12.39
0.4	0.16	0.50	-9.89
0.5	0.23	0.50	-6.74
0.6	0.30	0.50	-4.43
0.7	0.37	0.50	-2.61
0.8	0.42	0.50	-1.51
0.9	0.45	0.50	-0.91
1.0	0.50	0.50	0.00
1.2	0.61	0.50	1.73
1.4	0.73	0.50	3.29
1.6	0.80	0.50	4.09
1.8	0.92	0.50	5.30
2.0	1.00	0.50	6.03
2.2	1.11	0.50	6.93
2.4	1.15	0.50	7.24
2.6	1.20	0.50	7.61
2.7	1.22	0.50	7.75
2.8	1.24	0.50	7.89
3.0	1.21	0.50	7.68
3.5	0.05	0.50	-20.00
4.0	0.05	0.50	-20.00
4.5	0.04	0.50	-21.93
5.0	0.04	0.50	-21.93

**Audio Frequency Response for 12.5KHz**

## 4.6. Frequency Stability

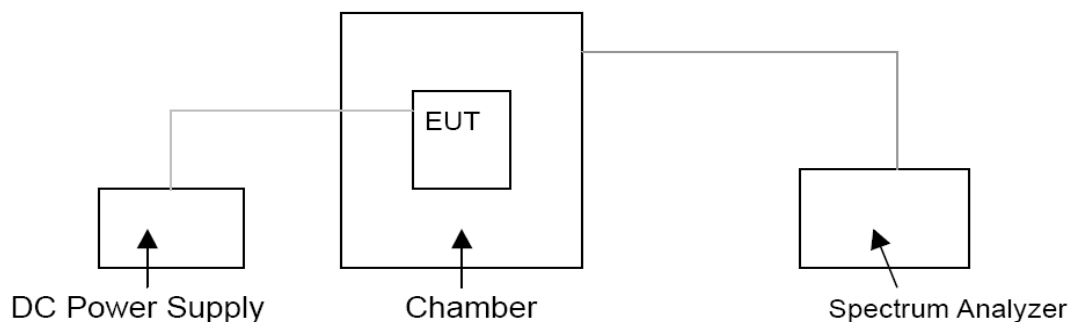
### TEST APPLICABLE

- 1 According to FCC Part 2 Section 2.1055 (a) (1) and RSS-119 Section 5.3, the frequency stability shall be measured with variation of ambient temperature from -30°C to +60°C centigrade.
- 2 According to FCC Part 2 Section 2.1055 (a) (2) and RSS-119 Section 5.3, for battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacture.
- 3 Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
- 4 According to §90.213 and RSS-119 Section 5.3, the frequency stability limit is 5.0 ppm for 12.5KHz channel separation at 150-174MHz and 2.5 ppm for 12.5KHz channel separation at 421-512MHz.

### TEST PROCEDURE

The EUT was set in the climate chamber and connected to an external DC power supply. The RF output was directly connected to Spectrum Analyzer ESI 26. The coupling loss of the additional cables was recorded and taken in account for all the measurements. After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded. For Frequency stability Vs. Voltage the EUT was connected to a DC power supply and the voltage was adjusted in the required ranges. The result was recorded.

### TEST CONFIGURATION



### TEST LIMITS

According to 90.213, Transmitters used must have minimum frequency stability as specified in the following table.

Frequency Range (MHz)	Channel Bandwidth (KHz)	Frequency Tolerance (ppm)		
		Fixed and Base Stations	Mobile Stations	
			> 2 W	≤ 2 W
150-174 MHz	6.25	1.0	2.0	2.0
	12.5	2.5	5.0	5.0
	25	5.0	5.0	50.0*
421-512 MHz	6.25	0.5	1.0	1.0
	12.5	1.5	2.5	2.5
	25	2.5	5.0	5.0

- Stations operating in the 154.45 to 154.49 MHz or the 173.2 to 173.4 MHz bands must have a frequency stability of 5 ppm.
- Paging transmitters operating on paging-only frequencies must operate with frequency stability of 5 ppm in the 150-174 MHz band and 2.5 ppm in the 421-512 MHz band.

**TEST RESULTS**

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)		
		Voltage(V)	Temp(°C)	138.500 MHz	155.000MHz	173.500MHz
Analog/FM	12.5KHz	13.80	-30	-1.95	-1.86	-1.75
			-20	-1.65	-1.56	-1.69
			-10	-1.45	-1.45	-1.52
			0	-1.45	-1.31	-1.34
			10	-1.21	-1.22	-1.15
			20	-1.14	-1.22	-1.15
			30	-1.14	-1.22	-1.15
			40	-1.45	-1.25	-1.68
			50	-1.54	-1.71	-1.68
		11.73 (85% Rated)	20	-1.54	-1.41	-1.14
		15.87 (115% Rated)	20	-1.54	-1.41	-1.14
Limit			5.0 ppm			
Conclusion			Complies			

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)		
		Voltage(V)	Temp(℃)	406.500 MHz	435.000MHz	469.500MHz
Analog/FM	12.5KHz	13.80	-30	-1.66	-1.62	-1.58
			-20	-1.52	-1.55	-1.45
			-10	-1.41	-1.48	-1.45
			0	-1.32	-1.48	-1.32
			10	-1.15	-1.04	-1.15
			20	-1.10	-1.04	-0.99
			30	-1.10	-1.04	-0.99
			40	-1.26	-1.25	-1.16
			50	-1.32	-1.35	-1.38
		11.73 (85% Rated)	20	-1.14	-1.09	-1.00
		15.87 (115% Rated)	20	-1.14	-1.09	-1.00
Limit			2.5 ppm			
Conclusion			Complies			

## 4.7. Maximum Transmitter Power

### TEST APPLICABLE

Per FCC «2.1046 and «90.205 and RSS-119 Section 5.4: Maximum ERP is dependent upon the station's antenna HAAT and required service area.

Per RSS-119 Section 5.4 and 5.4.1: The output power shall be within  $\pm 1.0$  dB of the manufacturer's rated power. Typical transmitter output powers are 110 watts for base and/or fixed stations (paging transmitters excepted), and 30 watts for mobile stations. Higher powers may be certified, but it should be noted that mobile stations are normally only licensed up to 30 watts. See the SRSP relevant to the operating frequency for equipment power limits.

### TEST PROCEDURE

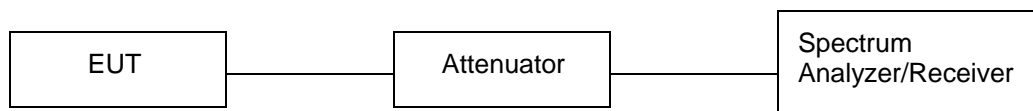
Measurements shall be made to establish the radio frequency power delivered by the transmitter the standard output termination. The power output shall be monitored and recorded and no adjustment shall be made to the transmitter after the test has begun, except as noted below:

If the power output is adjustable, measurements shall be made for the highest and lowest power levels.

The EUT connect to the Receiver through 40 dB attenuator.

Measurement with Spectrum Analyzer ESI 26 conducted, external power supply with 13.60V stabilized supply voltage.

### TEST CONFIGURATION



The EUT was directly connected to a RF Communication  
Test set by a 40 dB attenuator

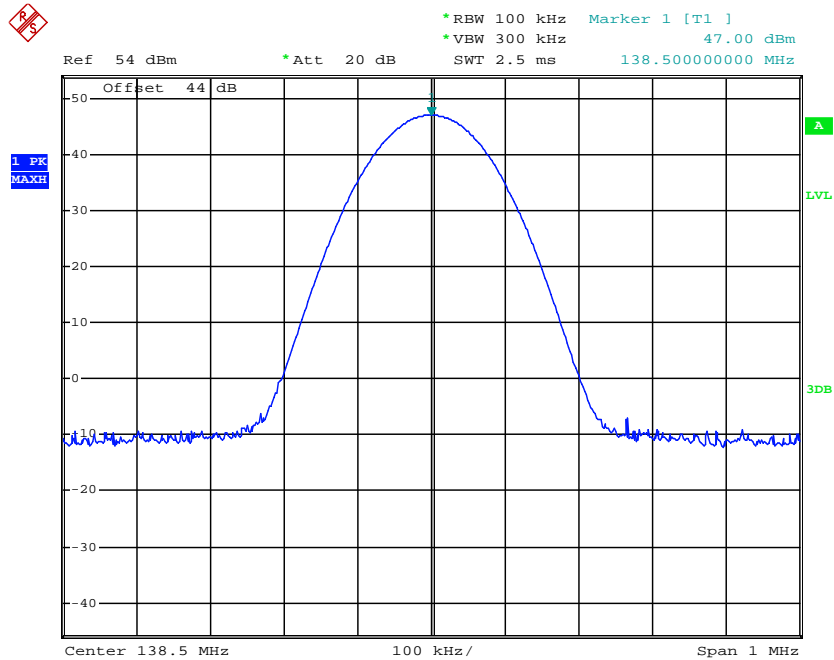
### TEST RESULTS

Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Transmitter Power (dBm)
				Power Level
Analog/FM	12.5KHz	Low	138.5000	47.00
		Middle	155.5000	47.05
		High	173.5000	47.03
Limit		The limit is dependent upon the station's antenna HAAT and required service area.		
Test Results		Compliance		

Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Transmitter Power (dBm)
				Power Level
Analog/FM	12.5KHz	Low	406.5000	46.05
		Middle	435.5000	46.04
		High	469.5000	46.05
Limit		The limit is dependent upon the station's antenna HAAT and required service area.		
Test Results		Complicance		

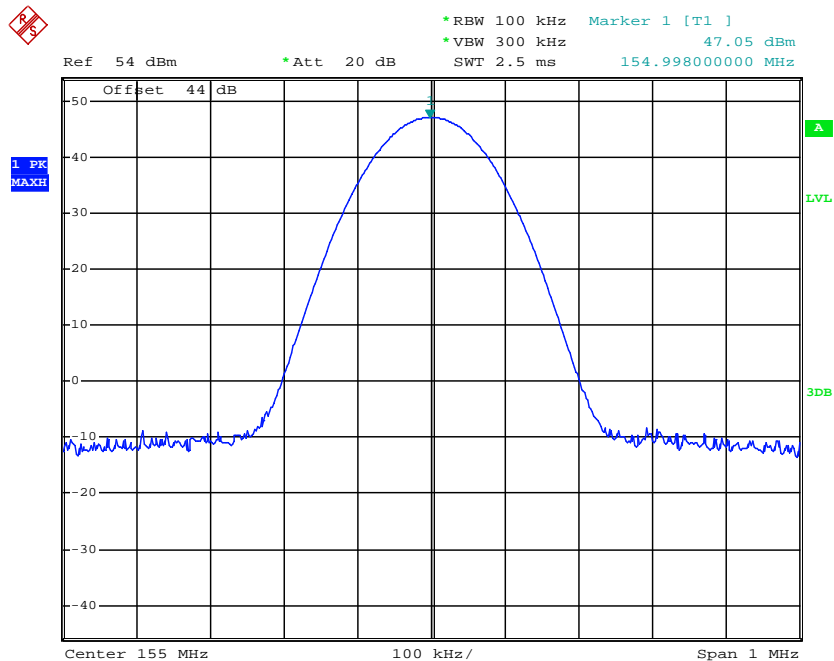
### Plots of Maximum Transmitter Power Measurement

Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	138.5000	50	47.00	Varies	Complicance



Date: 7.AUG.2012 10:03:38

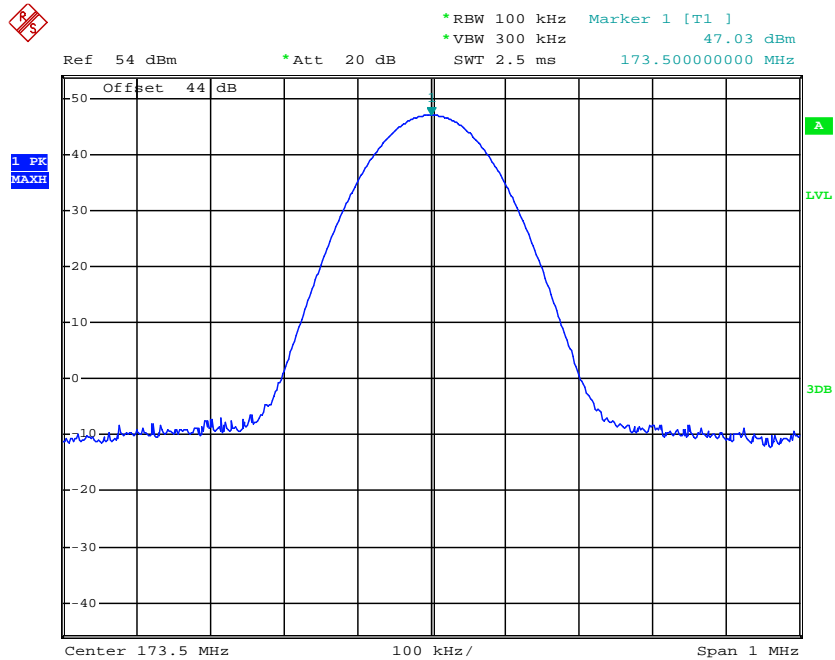
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	155.0000	50	47.05	Varies	Complicance



Date: 7.AUG.2012 10:01:10

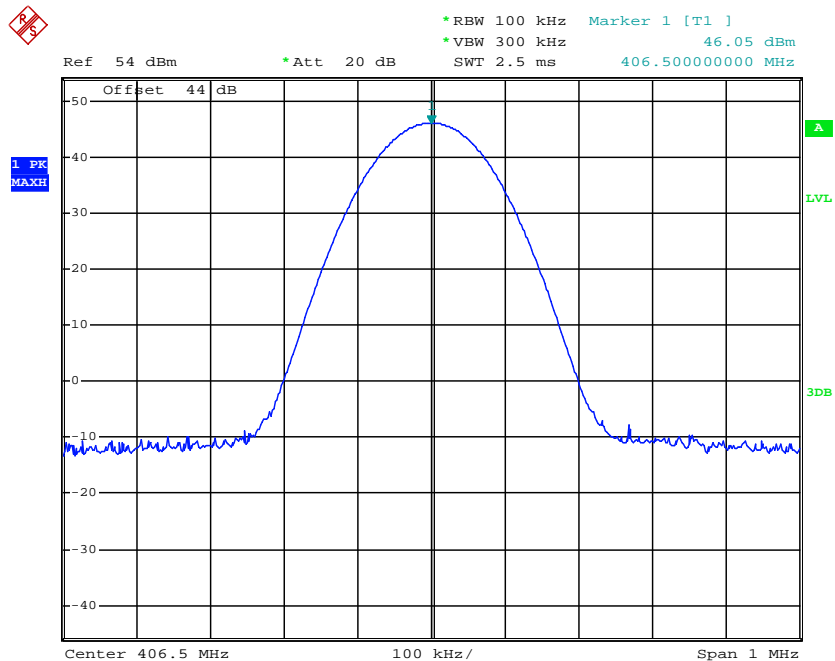


Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	173.5000	50	47.03	Varies	Complicance



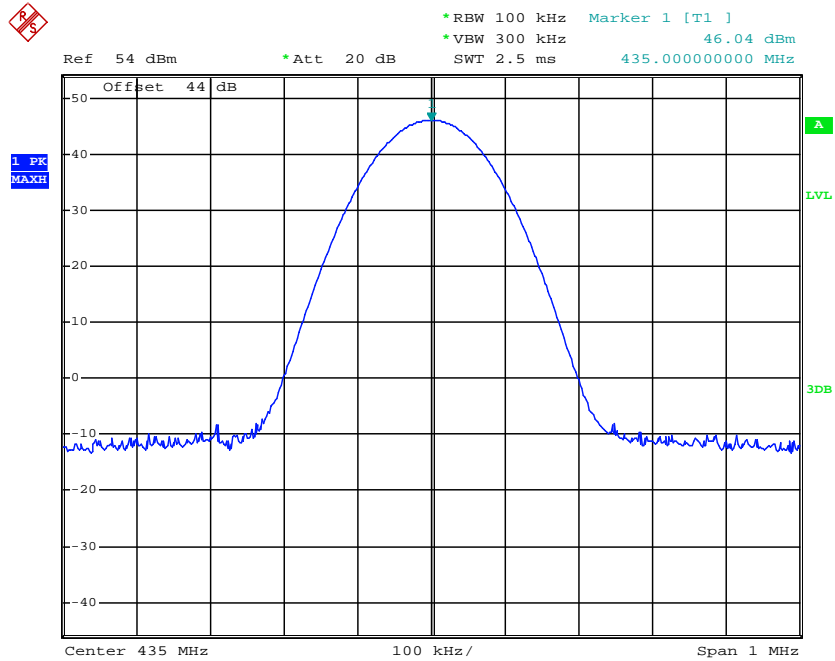
Date: 7.AUG.2012 10:05:30

Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	406.5000	40	46.05	Varies	Complicance



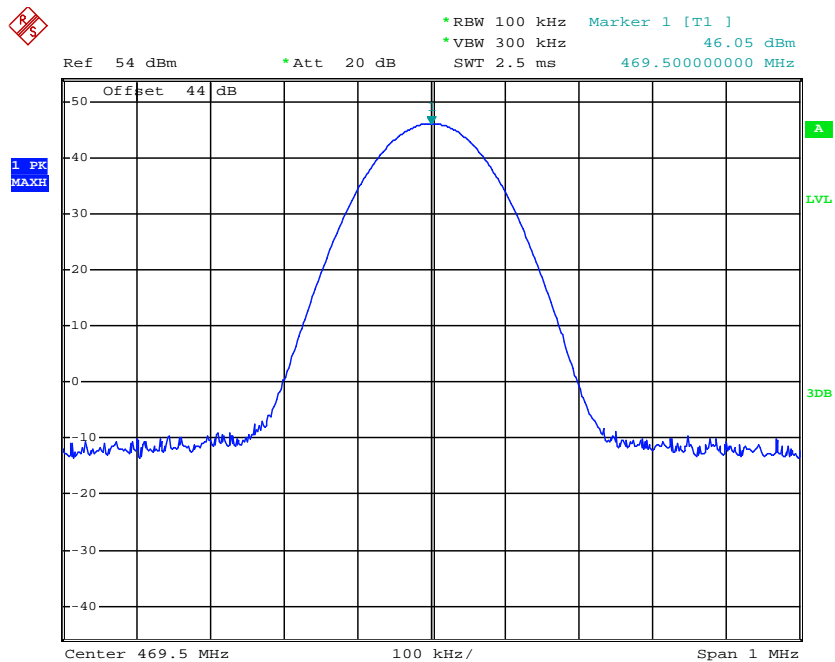
Date: 7.AUG.2012 10:07:10

Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	435.0000	40	46.04	Varies	Complicance



Date: 7.AUG.2012 10:08:53

Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	469.5000	40	46.05	Varies	Complicance



Date: 7.AUG.2012 10:10:24

## 4.8. Transmitter Frequency Behavior

### TEST APPLICABLE

Section 90.214 and ESS-119 Section 5.9

Transient frequencies must be within the maximum frequency difference limits during the time intervals indicated:

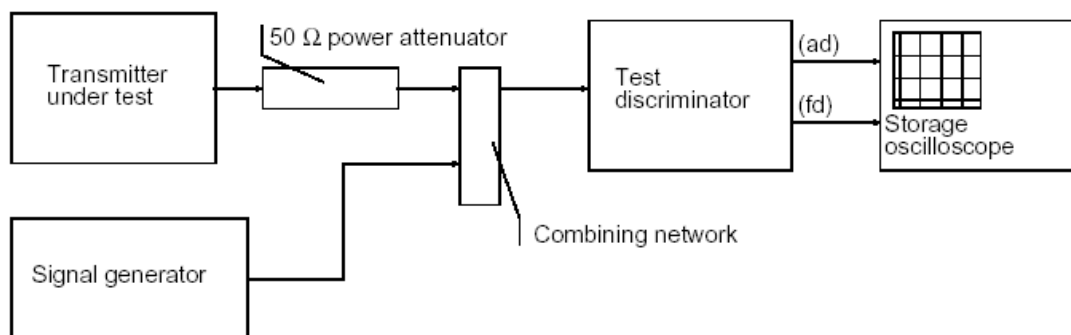
Time intervals <sup>1, 2</sup>	Maximum frequency difference <sup>3</sup>	All equipment	
		150 to 174 MHz	421 to 512MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 KHz Channels			
t <sub>1</sub> <sup>4</sup> .....	± 25.0 KHz	5.0 ms	10.0 ms
t <sub>2</sub> .....	± 12.5 KHz	20.0 ms	25.0 ms
t <sub>3</sub> <sup>4</sup> .....	± 25.0 KHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 KHz Channels			
t <sub>1</sub> <sup>4</sup> .....	± 12.5 KHz	5.0 ms	10.0 ms
t <sub>2</sub> .....	± 6.25 KHz	20.0 ms	25.0 ms
t <sub>3</sub> <sup>4</sup> .....	± 12.5 KHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 KHz Channels			
t <sub>1</sub> <sup>4</sup> .....	±6.25 KHz	5.0 ms	10.0 ms
t <sub>2</sub> .....	±3.125 KHz	20.0 ms	25.0 ms
t <sub>3</sub> <sup>4</sup> .....	±6.25 KHz	5.0 ms	10.0 ms

- $t_{on}$  is the instant when a 1 KHz test signal is completely suppressed, including any capture time due to phasing.  
 $t_1$  is the time period immediately following  $t_{on}$ .  
 $t_2$  is the time period immediately following  $t_1$ .  
 $t_3$  is the time period from the instant when the transmitter is turned off until  $t_{off}$ .  
 $t_{off}$  is the instant when the 1 KHz test signal starts to rise.
- During the time from the end of  $t_2$  to the beginning of  $t_3$ , the frequency difference must not exceed the limits specified in § 90.213.
- Difference between the actual transmitter frequency and the assigned transmitter frequency.
- If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

### TEST PROCEDURE

TIA/EIA-603 2.2.19

### TEST CONFIGURATION

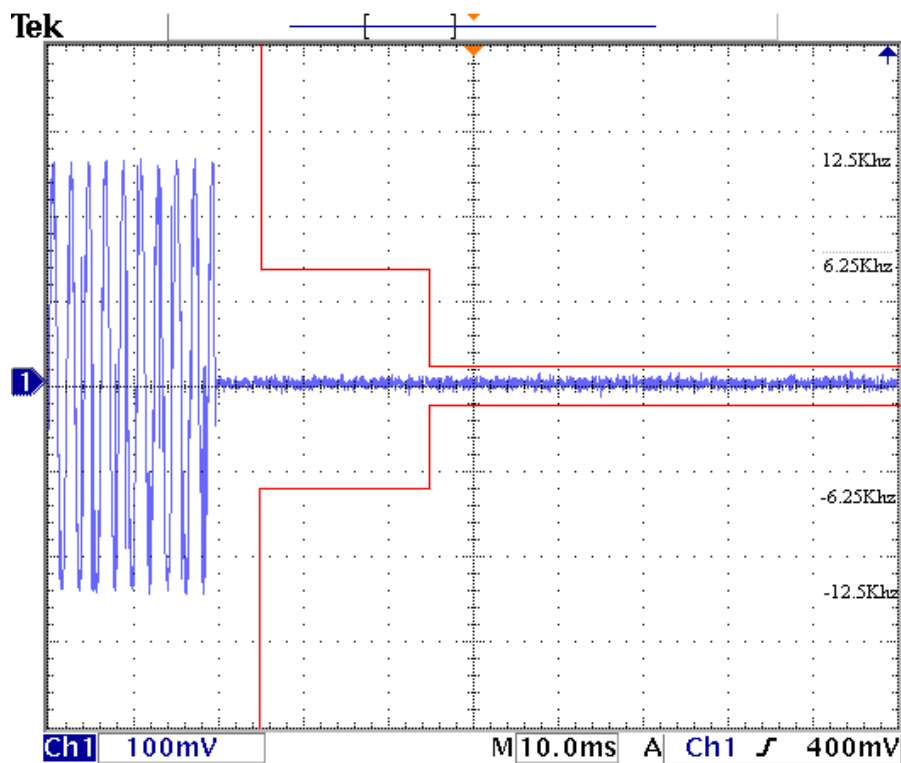


### TEST RESULTS

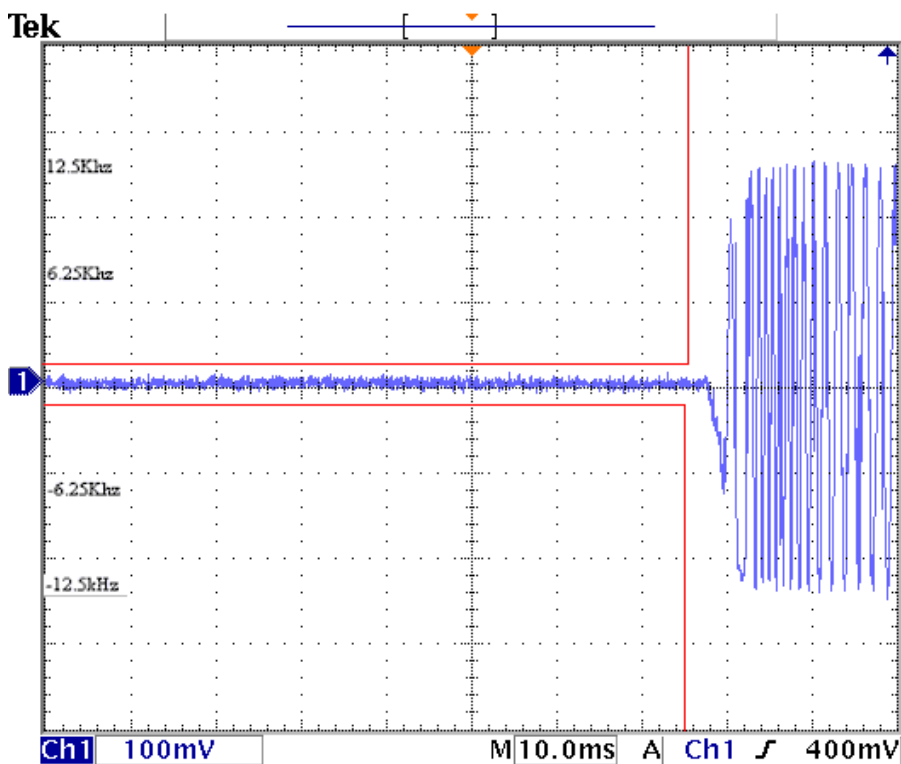
Please refer to the following plots.

**For VHF Frequency Band**

## Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----Off – On

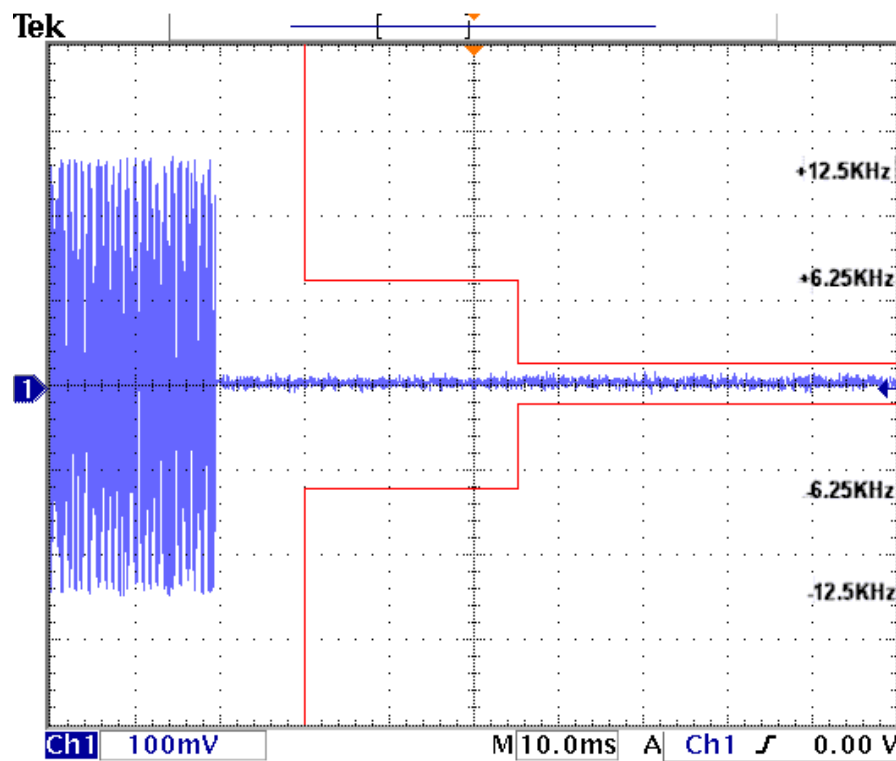


## Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----On - Off

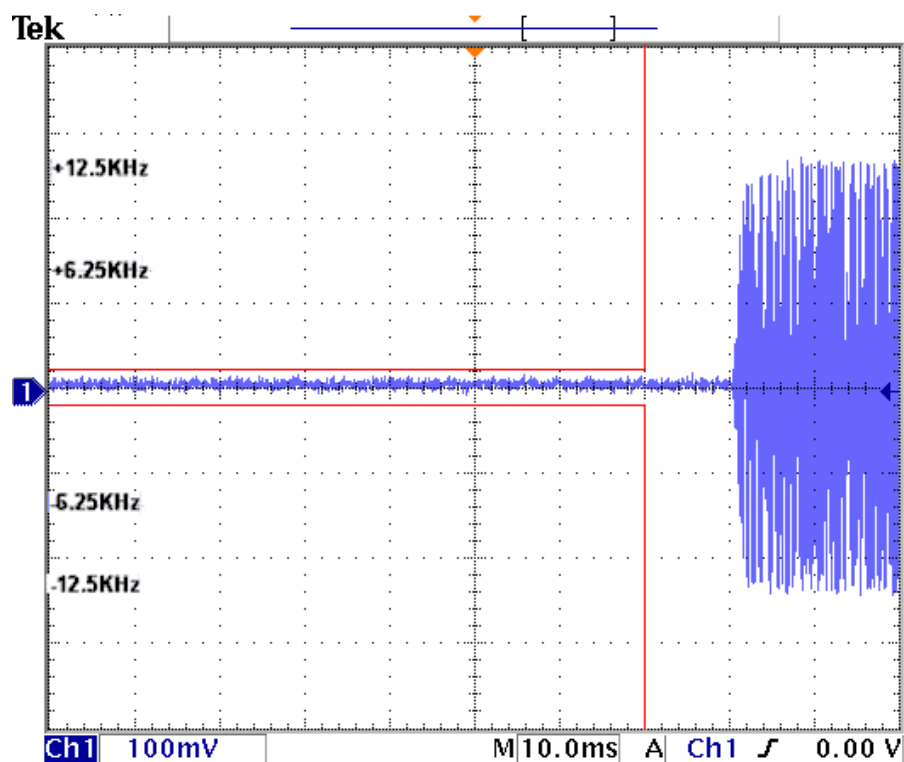


## For UHF Frequency Band

Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----Off – On



Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----On - Off



## 4.9. Receiver Radiated Spurious Emission

### TEST APPLICABLE

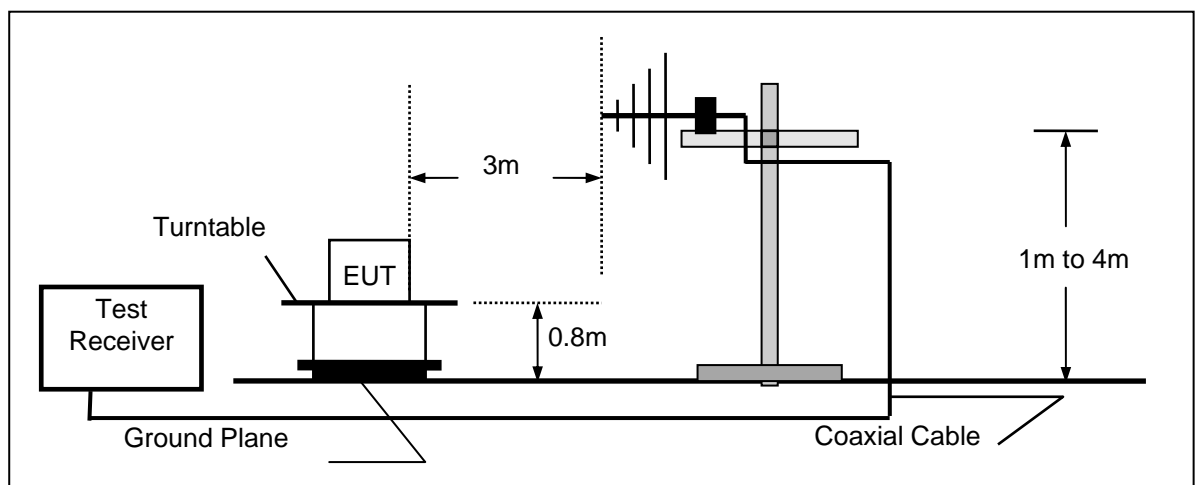
The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

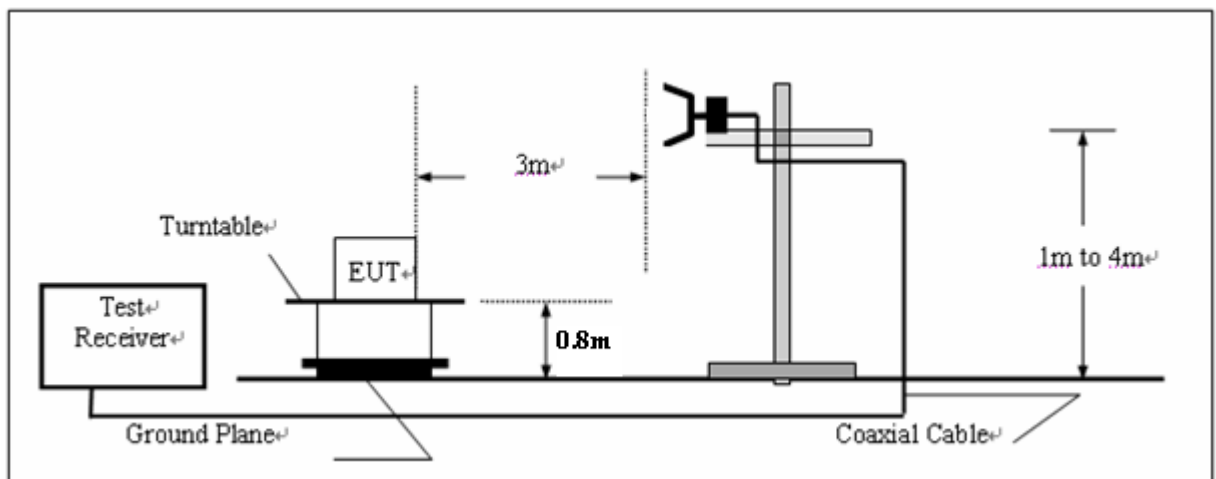
Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

### TEST CONFIGURATION

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



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



### TEST PROCEDURE

- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
- 3 And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4 Repeat above procedures until all frequency measurements have been completed.

**RECEIVER RADIATED SPOUIOUS LIMIT**

For unintentional device, according to § 15.109(a) and RSS-Gen, 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 (dB $\mu$ V/m)	Radiated ( $\mu$ V/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.

**TEST RESULTS**

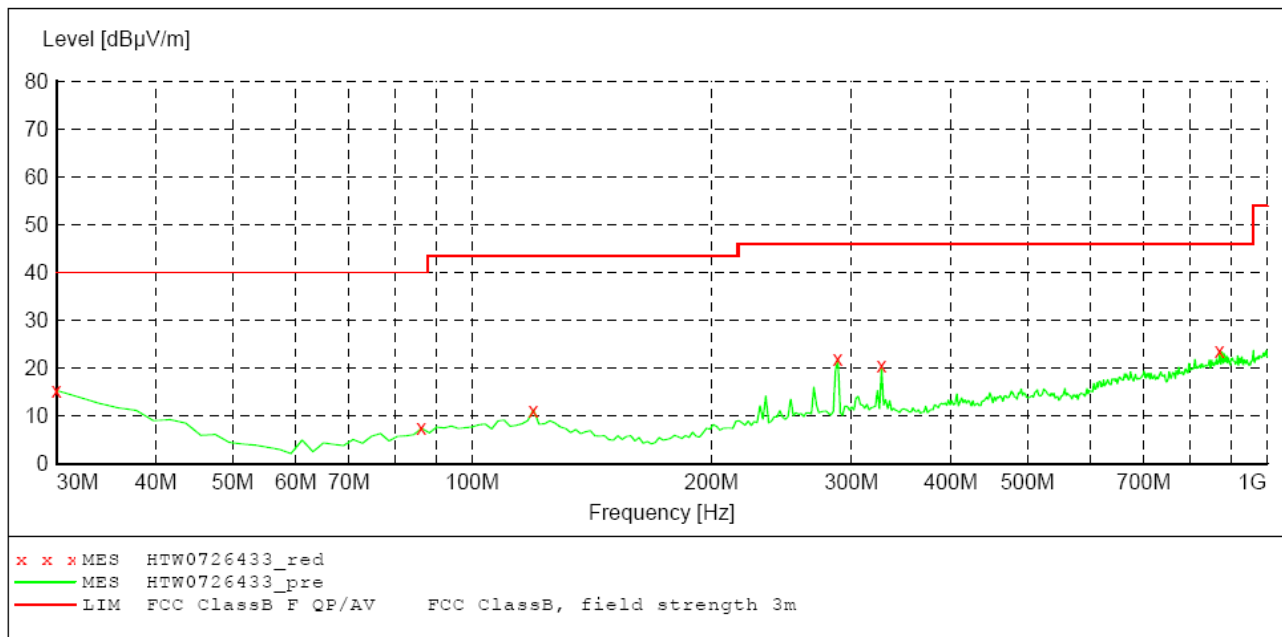
The Radiated Measurement are performed to the three channels (the top channel, the middle channel and the bottom channel), the datum recorded below is the worst case for each channel separation;and the EUT shall be scanned from 30 MHz to the 5th harmonic of the highest oscillator frequency in the digital devices or 1 GHz whichever is higher.

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	12.5 KHz	406.5000	H	871.70	23.60	46
			V	37.77	18.00	40
Test Results			Compliance			

***SWEEP TABLE: "test (30M-1G)"***

Short Description: Field Strength

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

***MEASUREMENT RESULT: "HTW0726433\_red"***

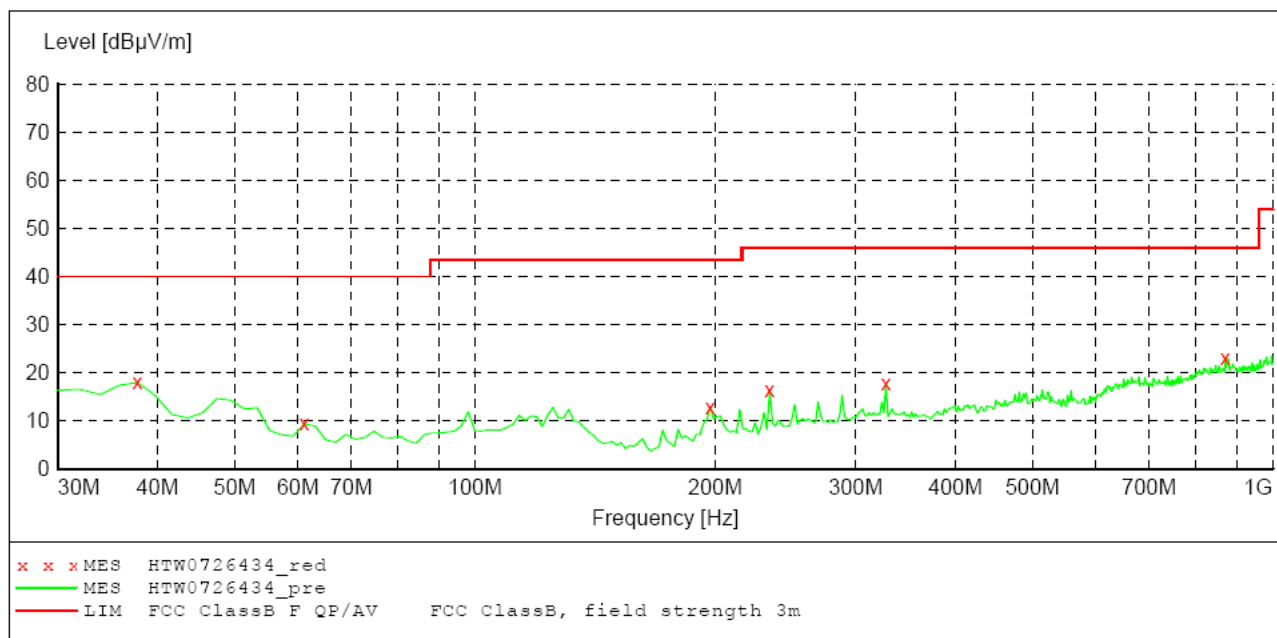
07/26/2012 9:40PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	15.30	-17.7	40.0	24.7	PK	300.0	360.00	HORIZONTAL
86.372745	7.40	-27.3	40.0	32.6	PK	100.0	26.00	HORIZONTAL
119.418838	11.30	-25.9	43.5	32.2	PK	100.0	56.00	HORIZONTAL
288.537074	21.90	-24.4	46.0	24.1	PK	100.0	268.00	HORIZONTAL
327.414830	20.50	-22.9	46.0	25.5	PK	100.0	100.00	HORIZONTAL
871.703407	23.60	-14.3	46.0	22.4	PK	100.0	241.00	HORIZONTAL



***SWEEP TABLE: "test (30M-1G)"***

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

***MEASUREMENT RESULT: "HTW0726434\_red"***

07/26/2012 9:41PM

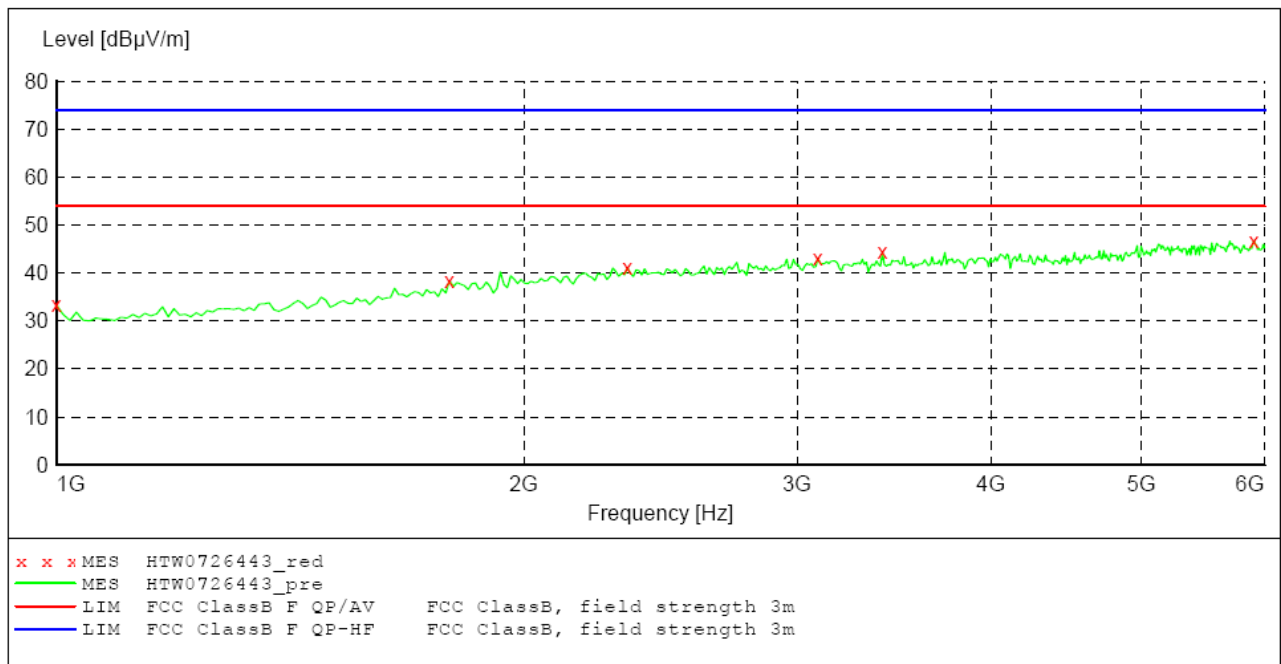
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
37.775551	18.00	-21.7	40.0	22.0	PK	100.0	46.00	VERTICAL
61.102204	9.40	-31.3	40.0	30.6	PK	100.0	286.00	VERTICAL
197.174349	12.90	-28.2	43.5	30.6	PK	100.0	293.00	VERTICAL
234.108216	16.40	-25.9	46.0	29.6	PK	100.0	293.00	VERTICAL
327.414830	17.70	-22.9	46.0	28.3	PK	100.0	208.00	VERTICAL
871.703407	23.10	-14.3	46.0	22.9	PK	100.0	39.00	VERTICAL

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	12.5 KHz	406.5000	H	5679.35	47.60	54.00
			V	5909.82	46.80	54.00
Test Results			Compliance			

***SWEEP TABLE: "test (30M-1G)"***

Short Description: Field Strength

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

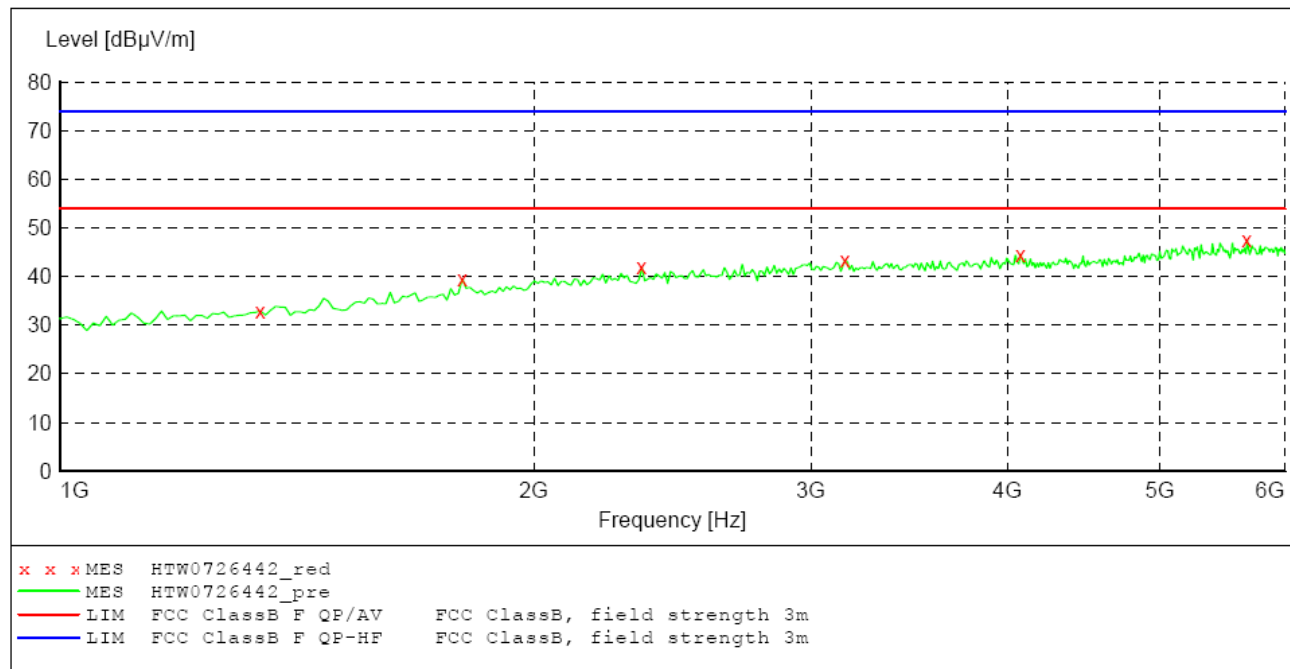
***MEASUREMENT RESULT: "HTW0726443\_red"***

07/26/2011 9:58PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1000.000000	33.40	-9.8	54.0	20.6	PK	100.0	357.00	VERTICAL
1791.583166	38.40	-3.1	54.0	15.6	PK	100.0	261.00	VERTICAL
2332.665331	41.20	0.2	54.0	12.8	PK	100.0	0.00	VERTICAL
3094.188377	43.20	2.2	54.0	10.8	PK	100.0	151.00	VERTICAL
3404.809619	44.40	2.5	54.0	9.6	PK	100.0	69.00	VERTICAL
5909.819639	46.80	7.2	54.0	7.2	PK	100.0	268.00	VERTICAL

***SWEEP TABLE: "test (30M-1G)"***

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

***MEASUREMENT RESULT: "HTW0726442\_red"***

07/26/2012 9:56PM

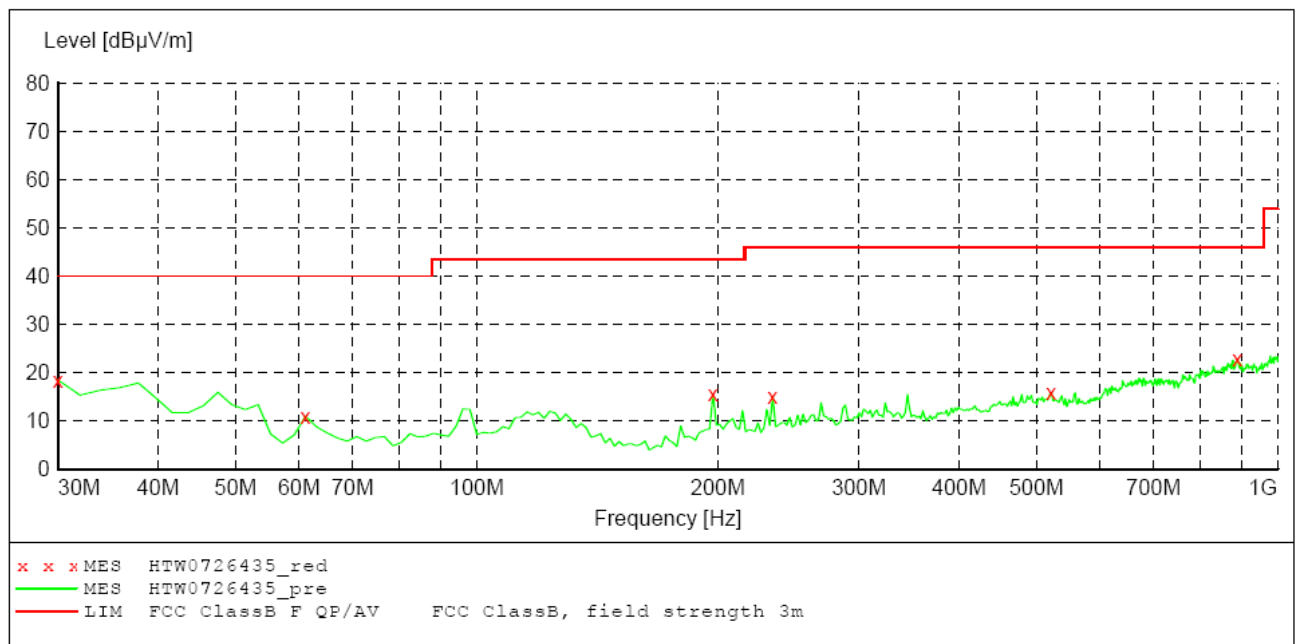
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1340.681363	33.00	-7.0	54.0	21.0	PK	100.0	106.00	HORIZONTAL
1801.603206	39.60	-3.0	54.0	14.4	PK	100.0	332.00	HORIZONTAL
2342.685371	41.90	0.2	54.0	12.1	PK	100.0	164.00	HORIZONTAL
3154.308617	43.40	2.3	54.0	10.6	PK	100.0	133.00	HORIZONTAL
4076.152305	44.60	3.6	54.0	9.4	PK	100.0	6.00	HORIZONTAL
5679.358717	47.60	6.9	54.0	6.4	PK	100.0	218.00	HORIZONTAL

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	12.5 KHz	138.5000	H	871.80	24.20	46
			V	30.00	18.50	40
Test Results			Compliance			

***SWEEP TABLE: "test (30M-1G)"***

Short Description: Field Strength

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

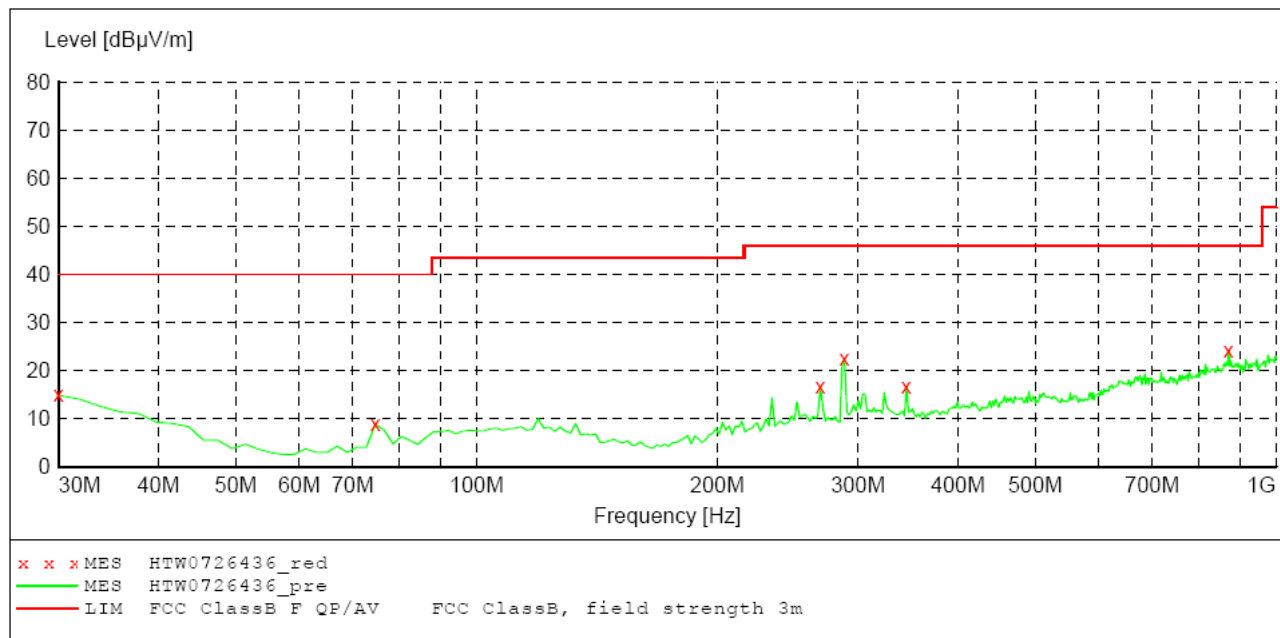
***MEASUREMENT RESULT: "HTW0726435\_red"***

07/26/2012 9:43PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	18.50	-17.7	40.0	21.5	PK	100.0	157.00	VERTICAL
61.102204	11.00	-31.3	40.0	29.0	PK	100.0	305.00	VERTICAL
197.174349	15.50	-28.2	43.5	28.0	PK	100.0	255.00	VERTICAL
234.108216	15.10	-25.9	46.0	30.9	PK	100.0	278.00	VERTICAL
521.803607	15.90	-19.9	46.0	30.1	PK	100.0	322.00	VERTICAL
891.142285	22.80	-14.0	46.0	23.2	PK	100.0	197.00	VERTICAL

***SWEEP TABLE: "test (30M-1G)"***

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

***MEASUREMENT RESULT: "HTW0726436\_red"***

07/26/2012 9:45PM

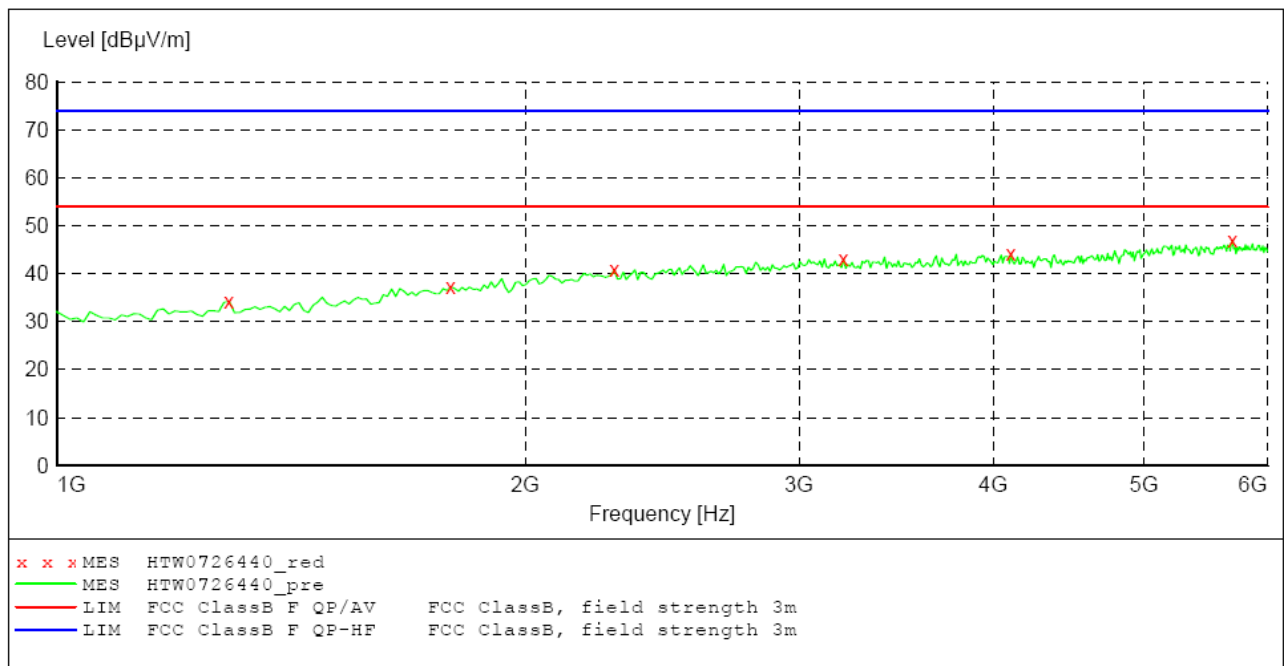
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	14.90	-17.7	40.0	25.1	PK	100.0	39.00	HORIZONTAL
74.709419	8.90	-28.9	40.0	31.1	PK	100.0	153.00	HORIZONTAL
269.098196	16.80	-24.7	46.0	29.2	PK	100.0	251.00	HORIZONTAL
288.537074	22.50	-24.4	46.0	23.5	PK	100.0	265.00	HORIZONTAL
344.909820	16.80	-23.3	46.0	29.2	PK	100.0	72.00	HORIZONTAL
871.703407	24.20	-14.3	46.0	21.8	PK	100.0	55.00	HORIZONTAL

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	12.5 KHz	138.5000	H	5158.31	46.70	54.00
			V	5699.39	47.00	54.00
Test Results			Compliance			

***SWEEP TABLE: "test (30M-1G)"***

Short Description: Field Strength

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

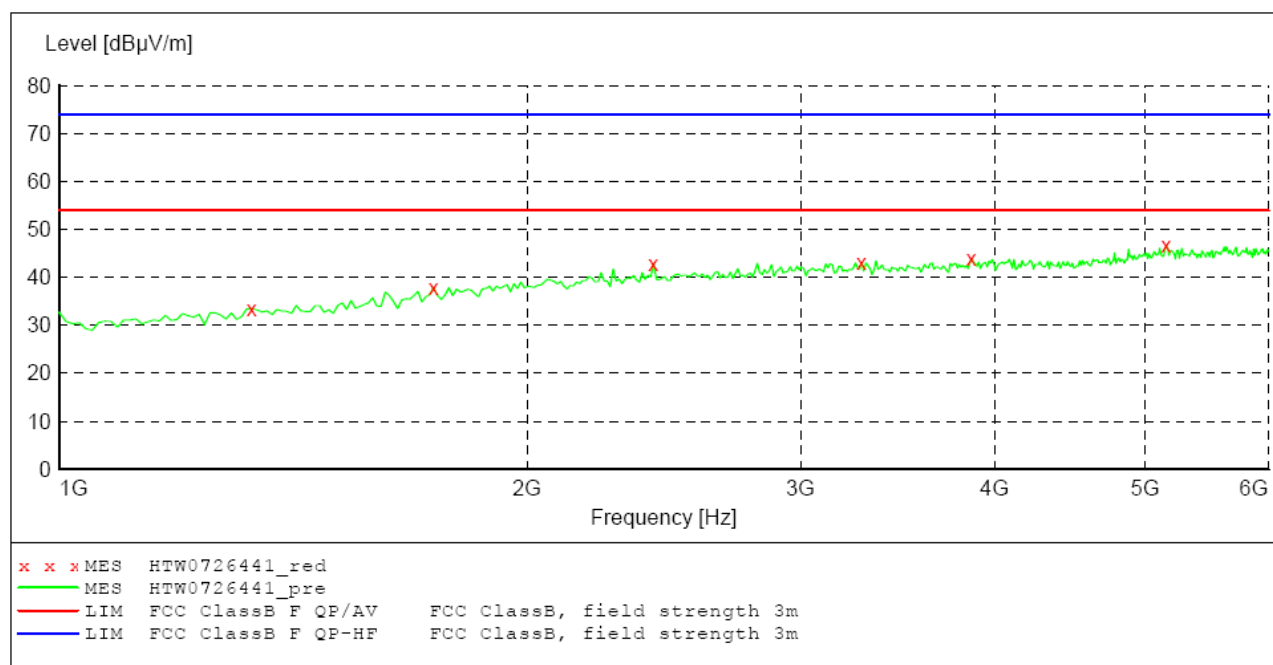
***MEASUREMENT RESULT: "HTW0726440\_red"***

07/26/2012 9:53PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1290.581162	34.30	-7.4	54.0	19.7	PK	100.0	166.00	VERTICAL
1791.583166	37.30	-3.1	54.0	16.7	PK	100.0	31.00	VERTICAL
2282.565130	40.90	0.0	54.0	13.1	PK	100.0	152.00	VERTICAL
3204.408818	43.20	2.3	54.0	10.8	PK	100.0	330.00	VERTICAL
4106.212425	44.20	3.6	54.0	9.8	PK	100.0	242.00	VERTICAL
5699.398798	47.00	6.9	54.0	7.0	PK	100.0	253.00	VERTICAL

***SWEEP TABLE: "test (30M-1G)"***

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

***MEASUREMENT RESULT: "HTW0726441\_red"***

07/26/2012 9:55PM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1330.661323	33.50	-7.1	54.0	20.5	PK	100.0	36.00	HORIZONTAL
1741.482966	38.00	-3.6	54.0	16.0	PK	100.0	19.00	HORIZONTAL
2412.825651	42.90	0.5	54.0	11.1	PK	100.0	201.00	HORIZONTAL
3284.569138	43.20	2.4	54.0	10.8	PK	100.0	53.00	HORIZONTAL
3865.731463	44.00	3.4	54.0	10.0	PK	100.0	295.00	HORIZONTAL
5158.316633	46.70	5.9	54.0	7.3	PK	100.0	356.00	HORIZONTAL

#### 4.10. Receiver Conducted Spurious Emission

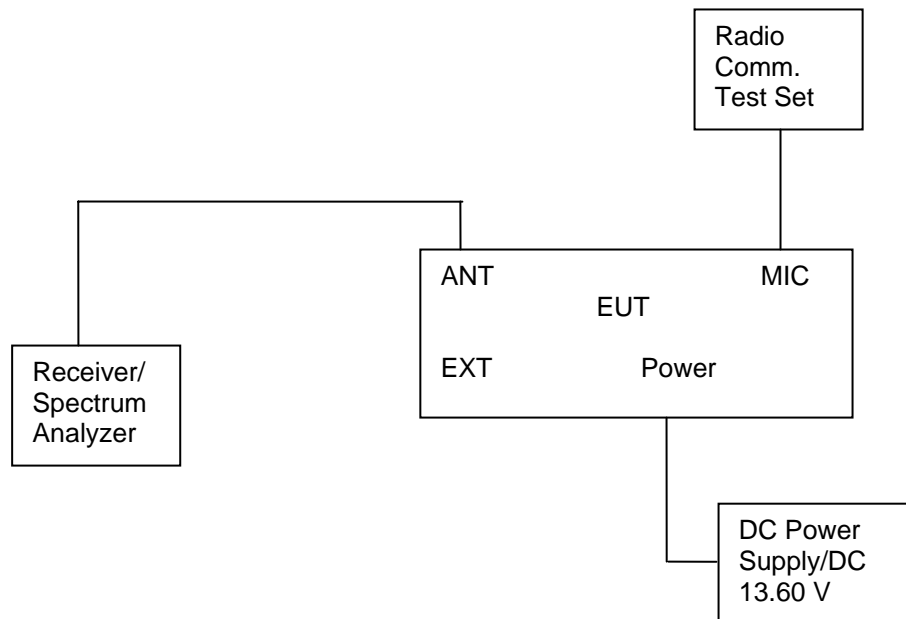
##### TEST APPLICABLE

The same as Section 4.3

##### TEST PROCEDURE

The spectrum analyzer was connected to the RF output power of the EUT, the EUT was setup in receiving mode; The RBW of the spectrum analyzer was set to 100 kHz and the VBW set to 300 KHz below the test frequency 1GHz. While the RBW of the spectrum analyzer was set to the 1MHz and VBW set to the 3MHz from 1GHz to the 10<sup>th</sup> harmonic.

##### TEST CONFIGURATION



##### LIMIT

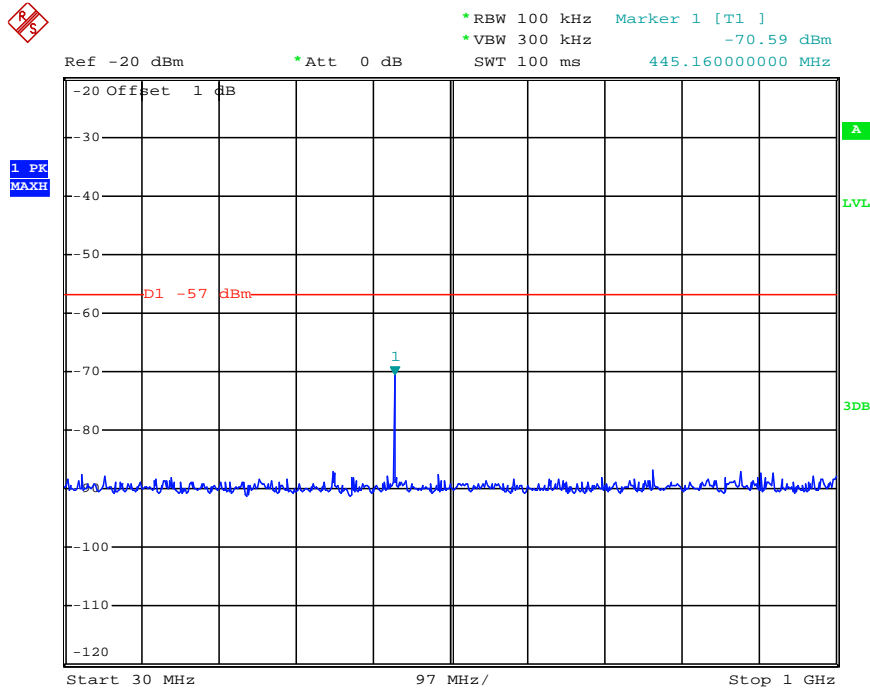
The power at the antenna terminal shall not exceed 2.0 nanowatts (-57dBm).

##### TEST RESULTS

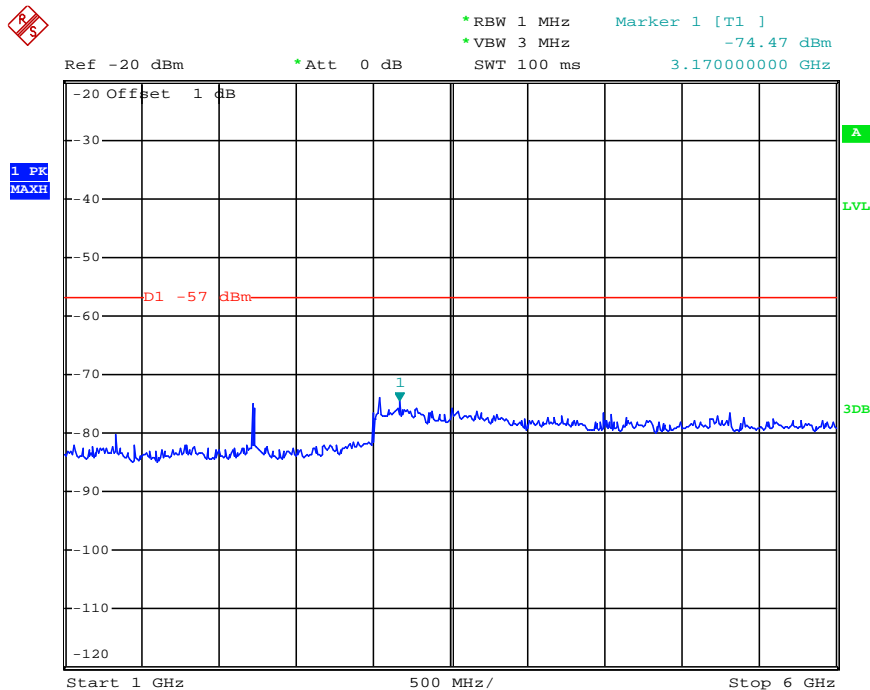
The Receiver Conducted Spurious Emissions Measurement is performed to the three channels (the high channel, the middle channel and the low channel), the datums recorded below were for the three channels; and the EUT shall be scanned from 30 MHz to the 6 GHz.



Modulation Type	Channel SpARATION	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	138.5000	445.16	-70.59	3170.00	-74.47	-57dBm
Test Results				Compliance				

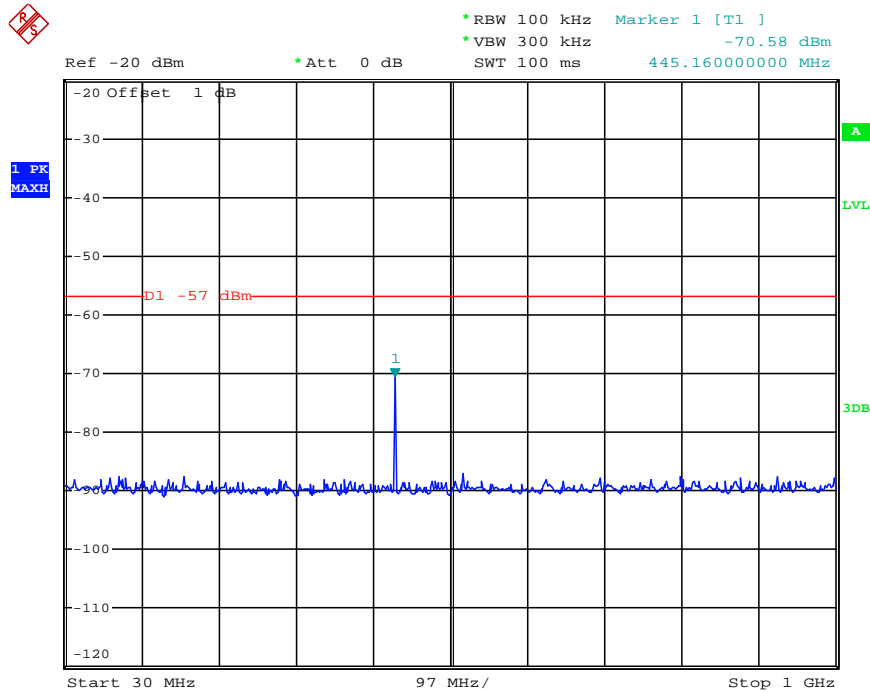


Date: 7.AUG.2012 13:40:10

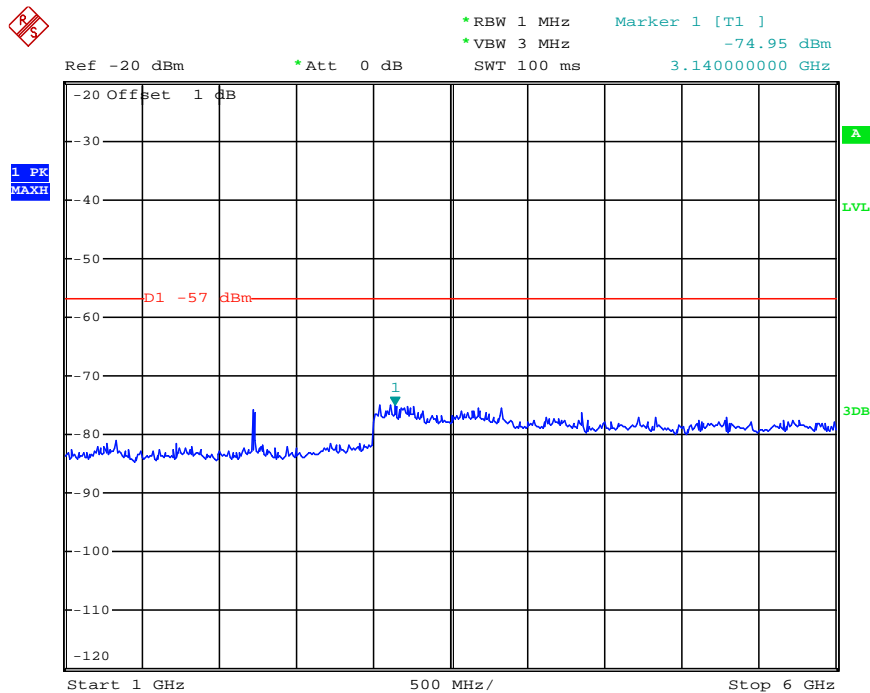


Date: 7.AUG.2012 13:45:07

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	155.0000	445.16	-70.58	3140.00	-74.95	-57dBm
Test Results				Compliance				

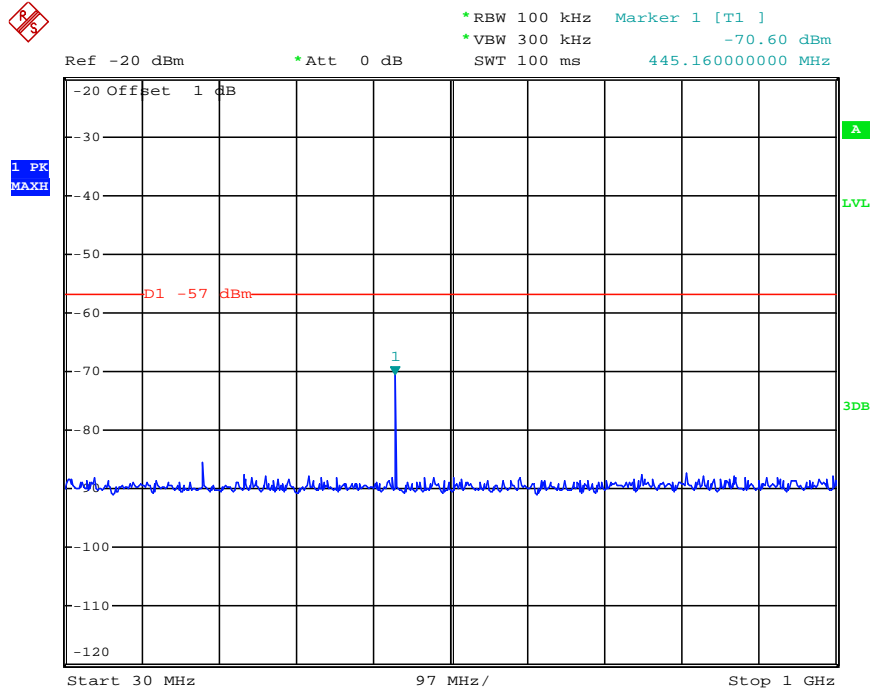


Date: 7.AUG.2012 13:40:38

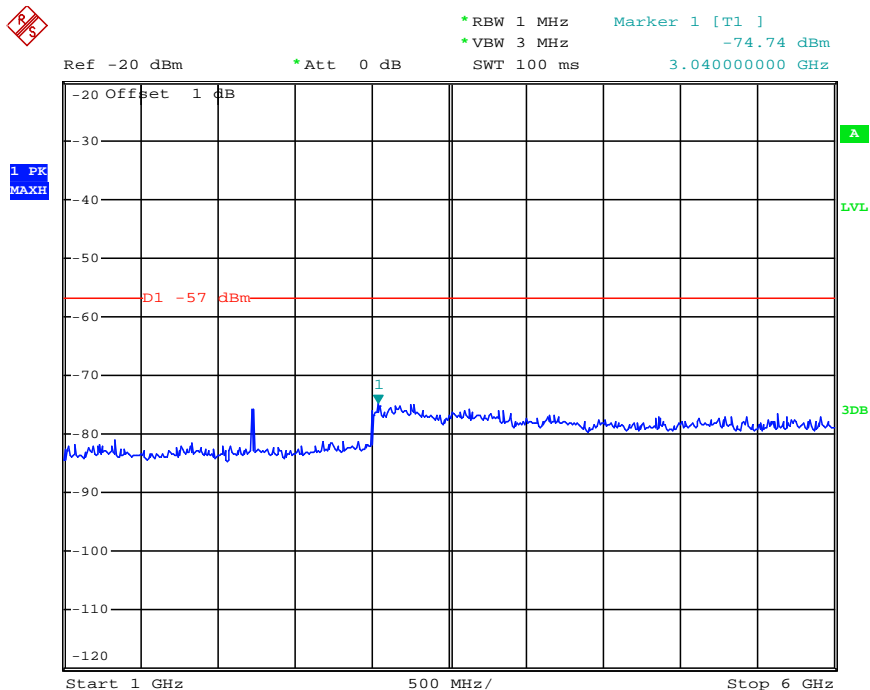


Date: 7.AUG.2012 13:44:37

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	173.5000	445.16	-70.60	3040.00	-74.74	-57dBm
Test Results				Compliance				

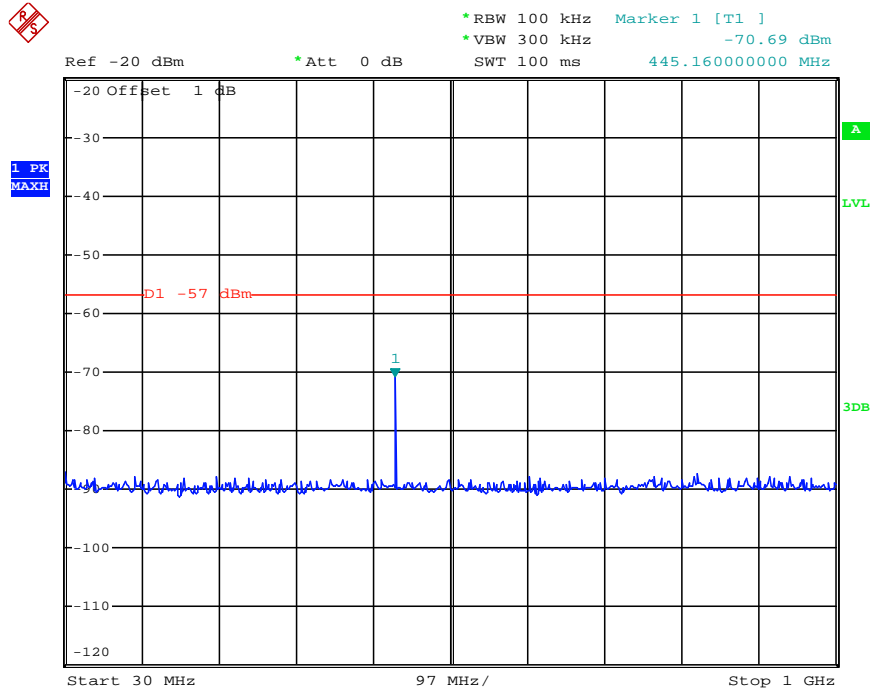


Date: 7.AUG.2012 13:40:57

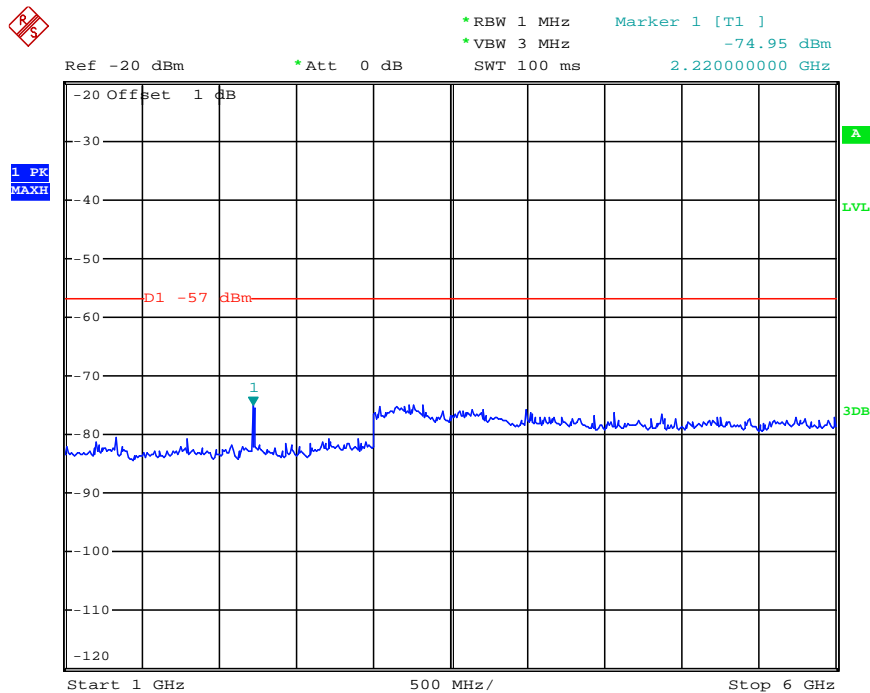


Date: 7.AUG.2012 13:44:24

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	445.16	-70.69	2220.00	-74.95	-57dBm
Test Results				Compliance				

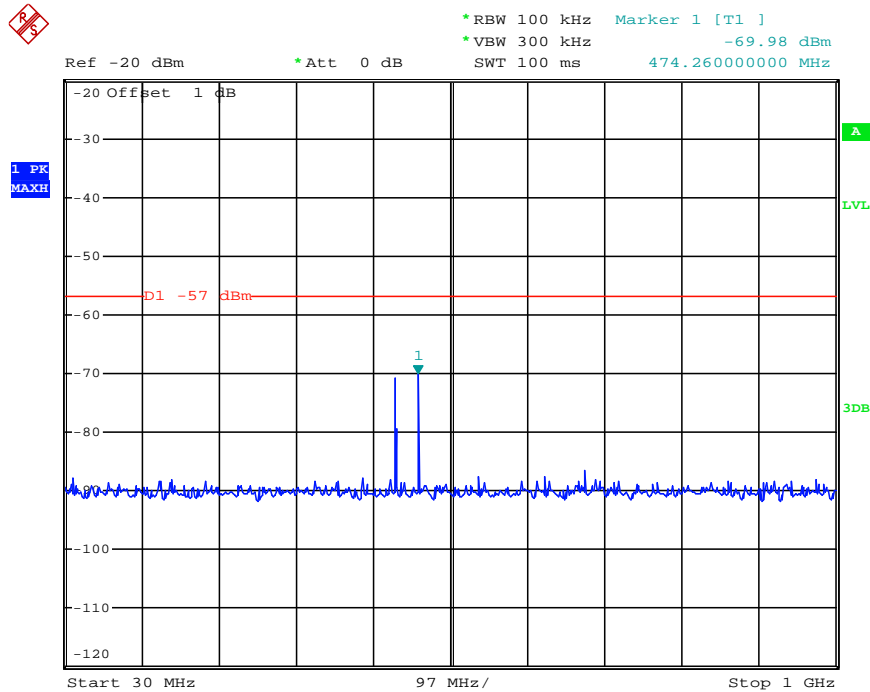


Date: 7.AUG.2012 13:41:28

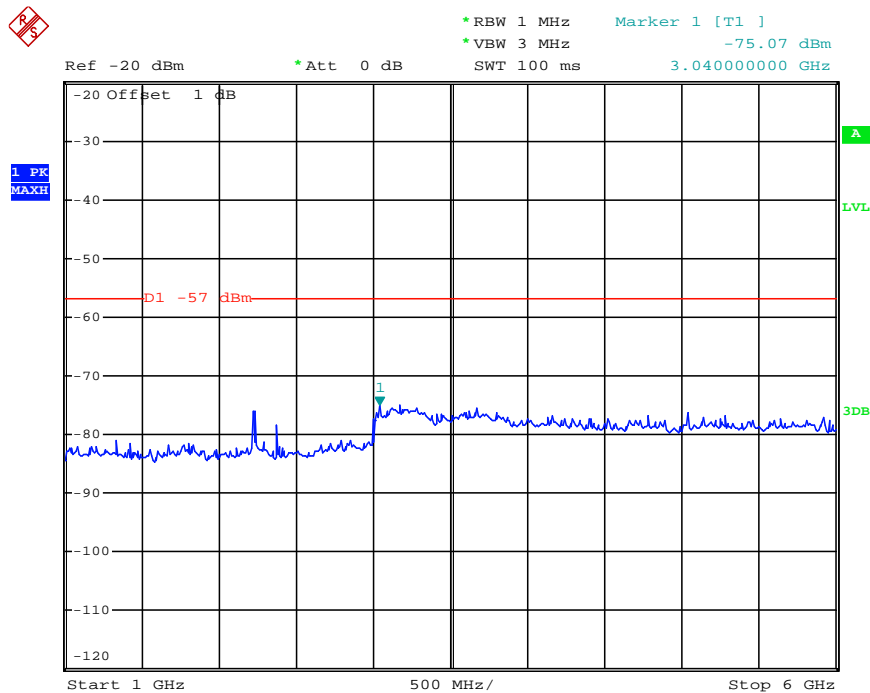


Date: 7.AUG.2012 13:44:06

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	435.0000	474.26	-69.98	3040.00	-75.07	-57dBm
Test Results				Compliance				

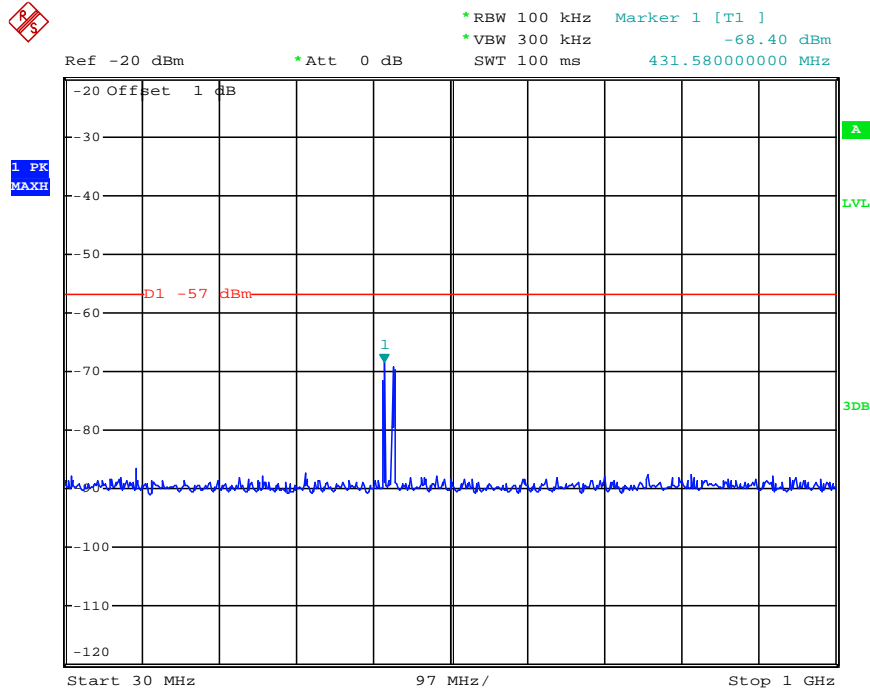


Date: 7.AUG.2012 13:42:14

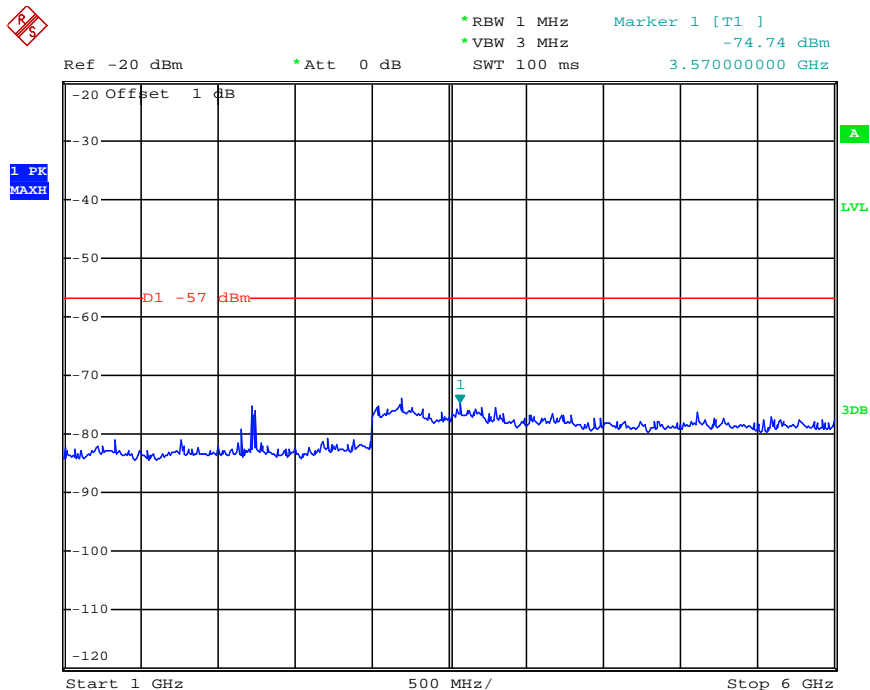


Date: 7.AUG.2012 13:43:44

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	469.5000	431.58	-68.40	3570.00	-74.74	-57dBm
Test Results				Compliance				



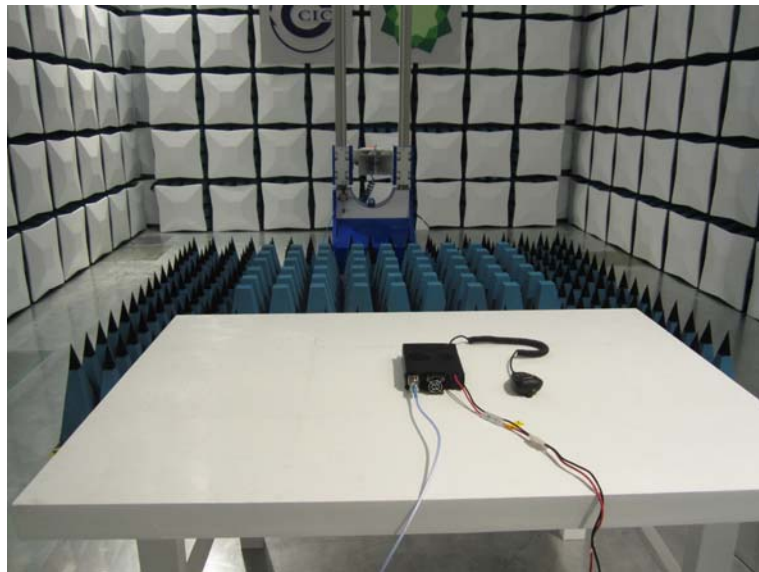
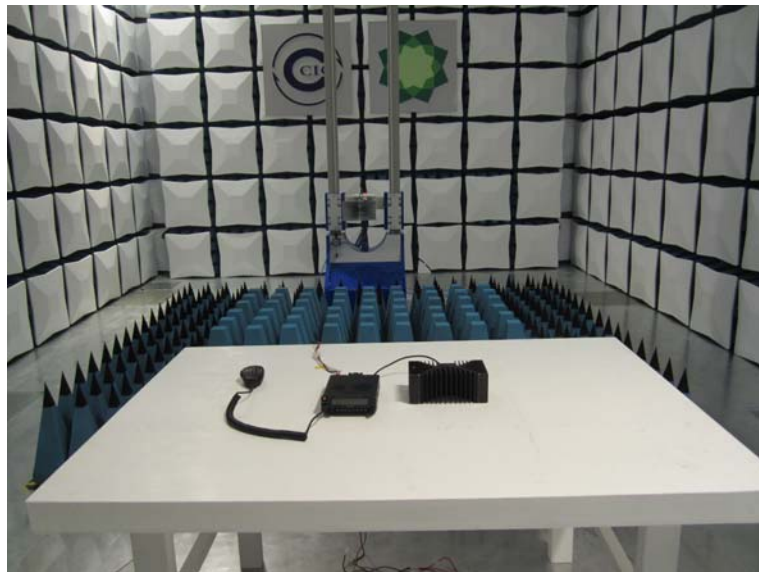
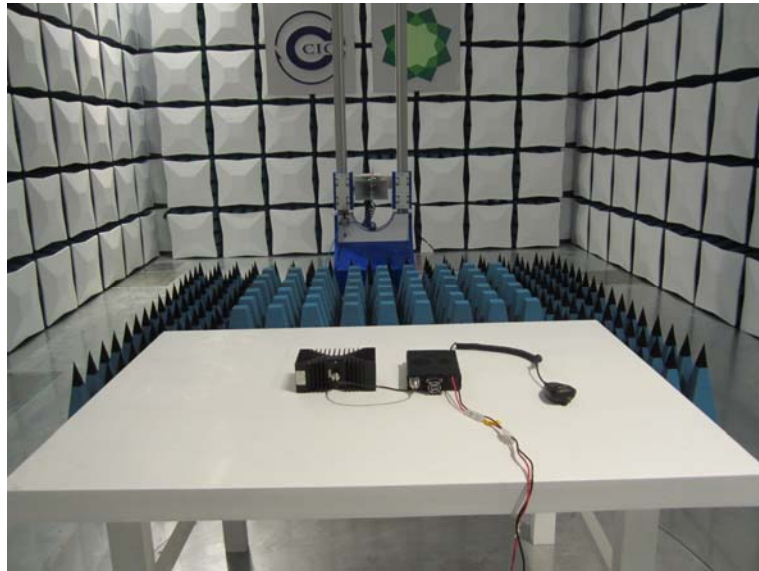
Date: 7.AUG.2012 13:42:36



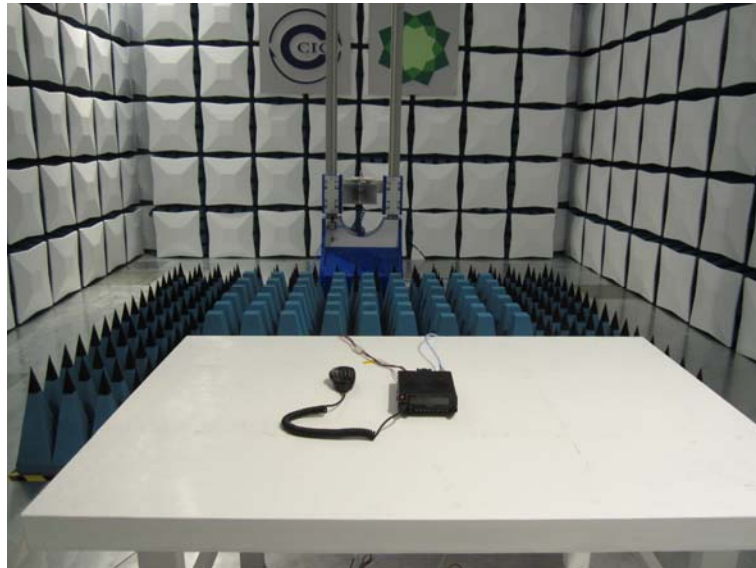
Date: 7.AUG.2012 13:43:23

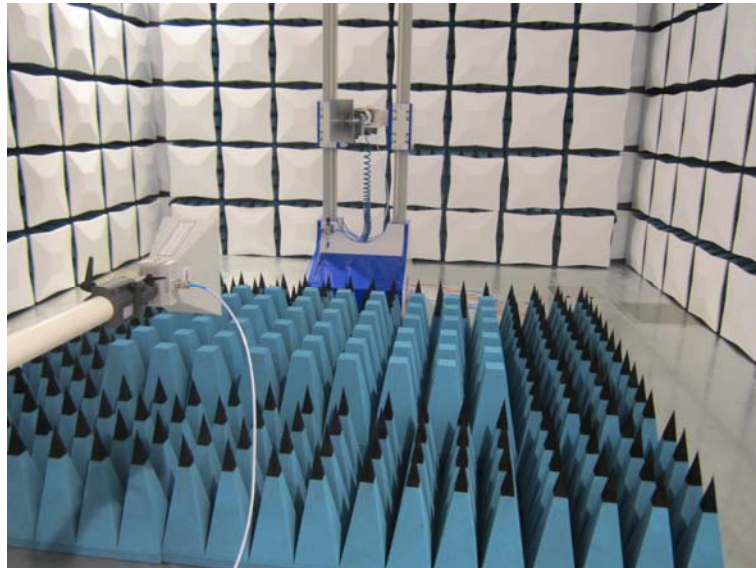
## **5. Test Setup Photos of the EUT**











## 6. External and Internal Photos of the EUT

### External photos of the EUT

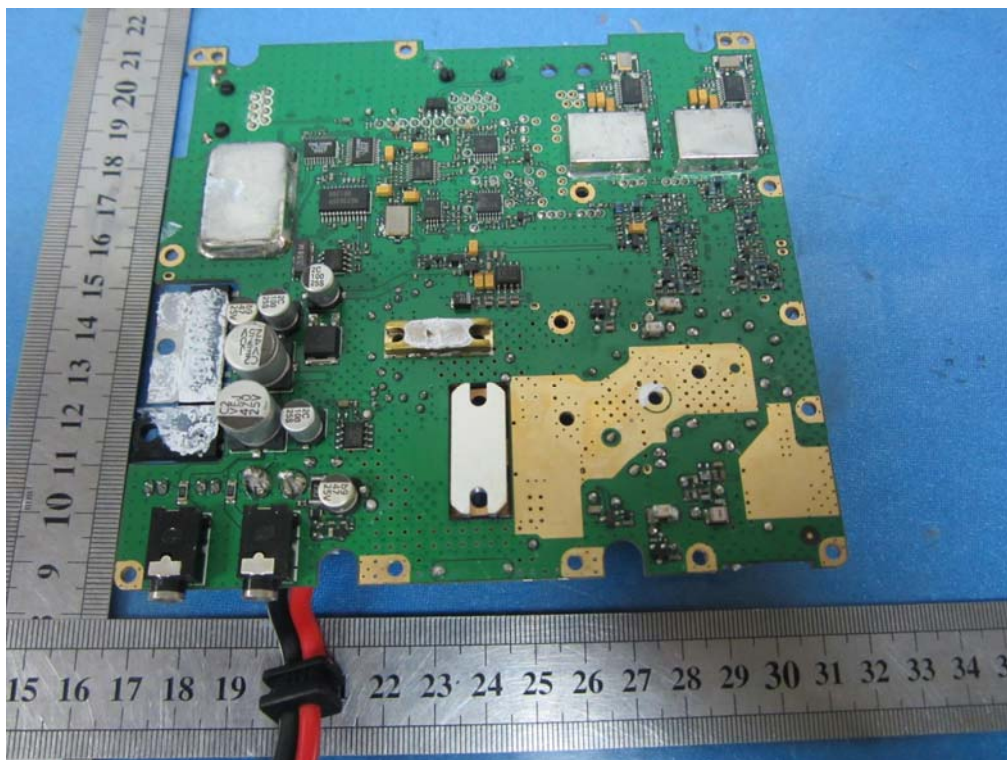
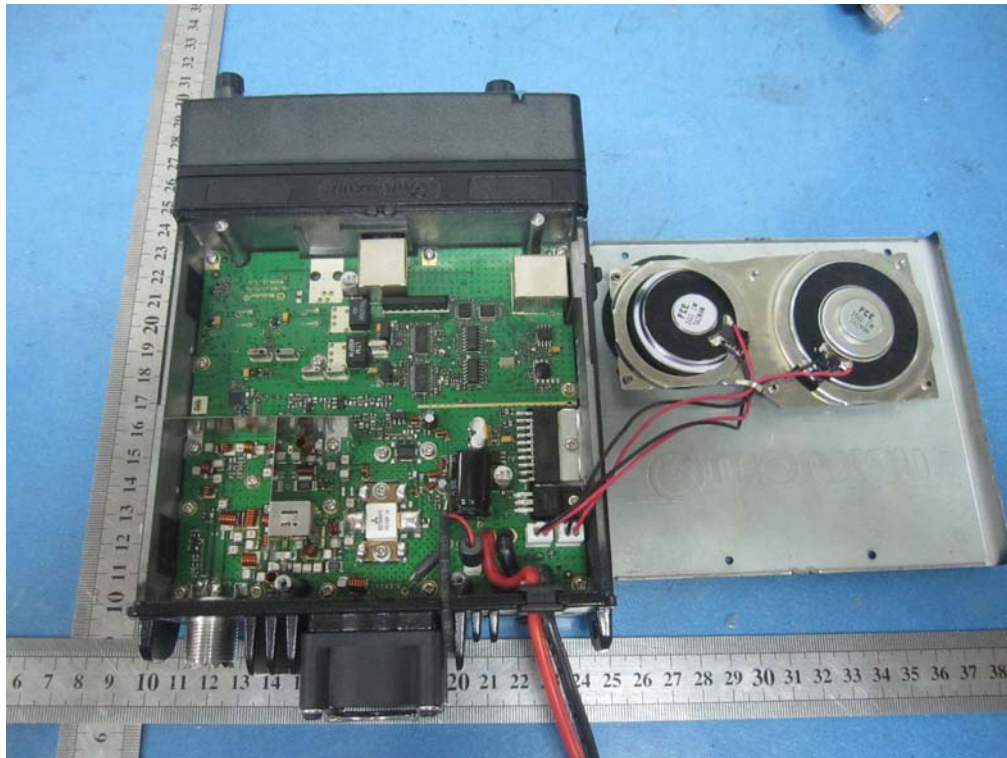




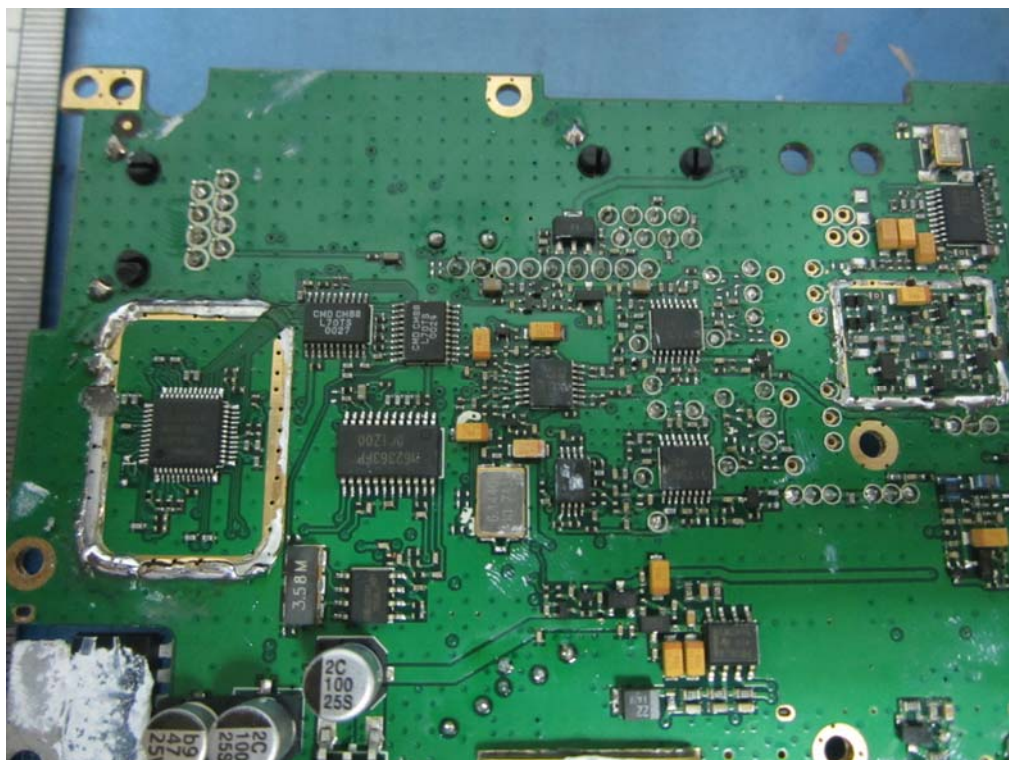
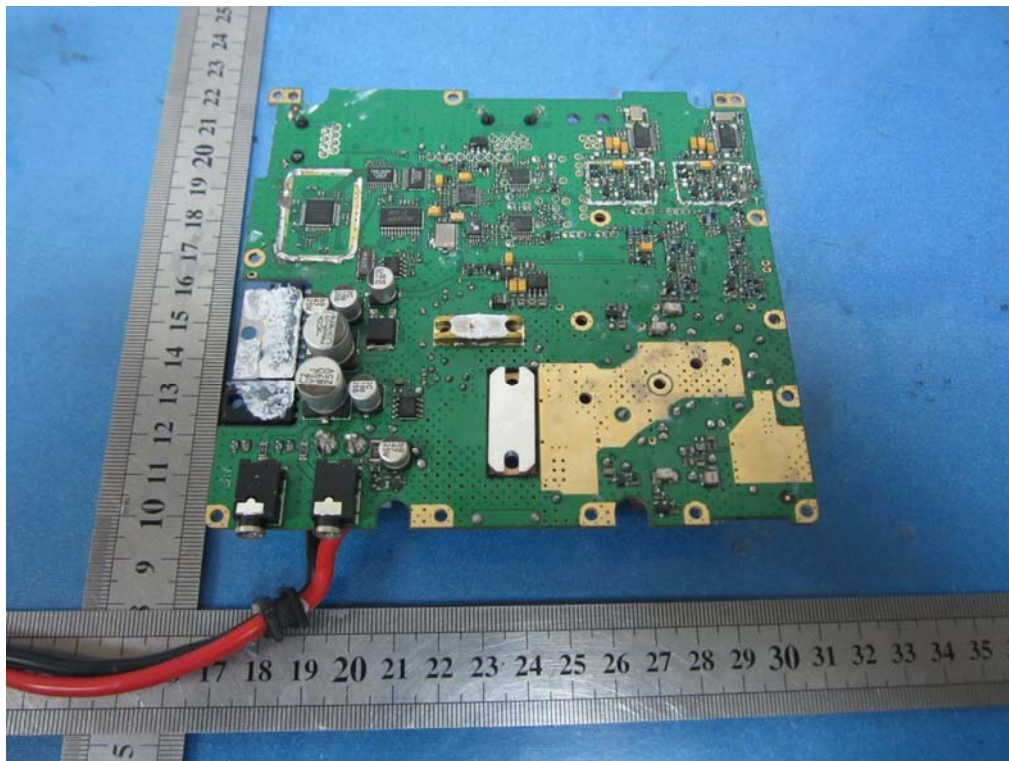




Internal photos of the EUT

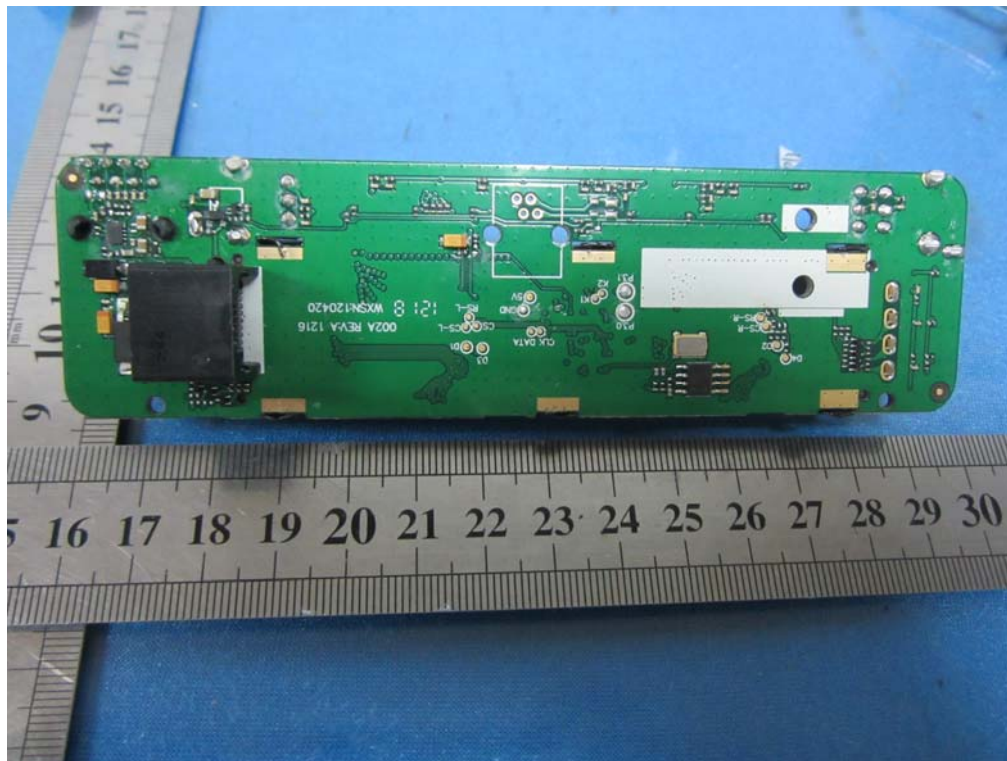












.....End of Report.....