

FCC PART 80 TEST REPORT

FCC Part 80

Report Reference No.....: TRE1401013501 R/C: 72247

FCC ID.....: RIPHM360

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Date of issue.....: Mar 11, 2014

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

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

Applicant's name.....: Shenzhen Jiuzhou Himunication Technology Co.,Ltd

Address.....: 3rd Floor,Block C, Huafeng Second Industry Park, Hangcheng Road, Gushu, Xixiang town, Baoan District, Shenzhen, China

Test specification :

Standard: FCC Part 80: STATIONS IN THE MARITIME SERVICES

TRF Originator: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF: Dated 2006-06

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Test item description: Handheld marine radio

Trade Mark: /

Manufacturer: Shenzhen Jiuzhou Himunication Technology Co.,Ltd

Model/Type reference.....: HM360

List Model: /

Modulation: PM

Channe Separation.....: 25KHz

Operation Frequency.....: From 156.05 MHz to 157.425 MHz

Rated Power: 5 Watts(36.99dBm)/1 Watts(30.00dBm)

Ratings.....: DC 7.40 V

Result.....: **PASS**

TEST REPORT

Test Report No. :	TRE1401013501	Mar 11, 2014
		Date of issue

Equipment under Test : Handheld marine radio

Model /Type : HM360

Listed Models : /

Applicant : **Shenzhen Jiuzhou Himunication Technology Co.,Ltd**

Address : 3rd Floor,Block C,Huafeng Second Industry Park, Hangcheng Road, Gushu, Xixiang town, Baoan District, Shenzhen, China

Manufacturer : **Shenzhen Jiuzhou Himunication Technology Co.,Ltd**

Address : 3rd Floor,Block C,Huafeng Second Industry Park, Hangcheng Road, Gushu, Xixiang town, Baoan District, Shenzhen, China

Test Result:	PASS
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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 80:](#) STATIONS IN THE MARITIME SERVICES.

[TIA/EIA 603 D:](#) Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[47 CFR FCC Part 15 Subpart B](#) - 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	:	Jan 26, 2014
Testing commenced on	:	Feb 28, 2014
Testing concluded on	:	Mar 11, 2014

2.2. Product Description

The **Shenzhen Jiuzhou Himunication Technology Co.,Ltd**'s Model: HM360 or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	Handheld marine radio	
Model Number	HM360	
Rated Output Power	5 Watts(36.99 dBm)/1 Watts(30.00 dBm)	
Modulation Type	PM for Analog Voice	
Emission Designator	Analog	16K0G3E for 25KHz Channel Separation
Channel Separation	Analog Voice	25KHz
DSC function	Supported DSC function	
Antenna Type	External	
Frequency Range	From 156.05 MHz to 157.425 MHz	

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 7.40 V

Test frequency list

Modulation Type	Test Channel	Test Frequency
Analog/PM	Low Channel(CH1)	156.050 MHz
	Middle Channel(CH16)	156.800 MHz
	High Channel(CH88)	157.425 MHz

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

156.05-157.425 MHz V frequency band Handheld marine radio with GPS function.

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

2.5. 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.

2.6. 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.

2.7. EUT configuration

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

- supplied by the manufacturer

- supplied by the lab

<input type="radio"/>	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
<input type="radio"/>	Multimeter	Manufacturer :	/
		Model No. :	/

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

This submittal(s) (test report) is intended for **FCC ID: RIPHМ360** filing to comply with FCC Part 80 Rules

2.9. Modifications

No modifications were implemented to meet testing criteria.

2.10. Note

1. The EUT is a V frequency band (156.05-157.425MHz) Handheld marine radio with GPS function, The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 80	TRE1401013501
Radio	IEC 62238	TRE1401013502

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: August 02, 2007. 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, 2015.

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 June 01, 2015.

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 Dec 31, 2013. Valid time is until Dec 31, 2016

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.

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, 2013. Valid time is until December 19, 2016.

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, 2012. Valid time is until December 19, 2015.

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, 2016.

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

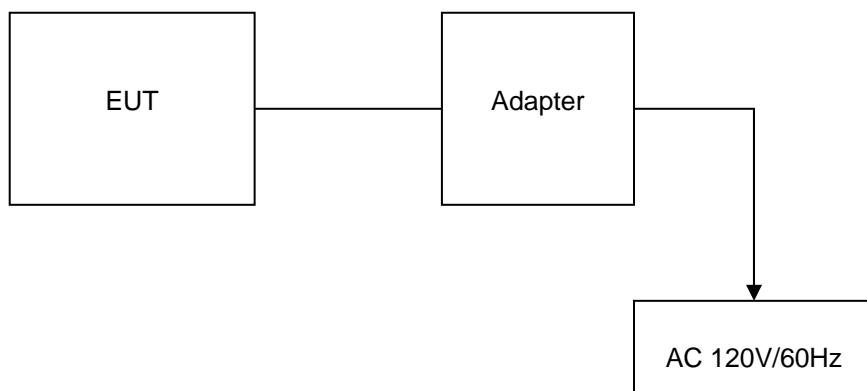


Table 2-1 Equipment Used in Tested System

Adapter:

Model: SW-090100
 Input: 100-240V~, 50/60Hz
 Output: DC 9V 1000mA
 Power Cable: 100cm
 ◇ Shielded ◆ Unshielded

3.5. Description of Tested Modes

The EUT (Handheld marine 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 (25 KHz).

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	25 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)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)

Radiated Emissio 1~18GHz	5.16 dB	(1)
Radiated Emissio 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=1.96.

3.7. Test Description

FCC Rules	Description of Test	Test Result
§80.211(f)(3)	Transmitter Radiated Spurious Emssion	PASS
§80.213	Modulation Characteristic	PASS
§80.205	Occupied Bandwidth	PASS
§80.211(f)	Emission Mask	PASS

3.8. Equipments Used during the Test

Modulation Characteristic				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/25/2014

Occupied Bandwidth & Emission Mask				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Receiver	Rohde&Schwarz	ESI 26	100009	10/25/2014
Attenuator	R&S	ESH3-22	100449	10/25/2014
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/25/2014
High-Pass Filter	Anritsu	MP526B	6220875256	10/25/2014
High-Pass Filter	Anritsu	MP526D	6220878392	10/25/2014
Spectrum Analyzer	Agilent	E4407B	MY44210775	10/25/2014
Spectrum Analyzer	Rohde&Schwarz	FSP40	1164.4391.40	10/25/2014

Transmitter Radiated Spurious Emssion				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESI 26	100009	10/26/2014
RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	N/A
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	N/A
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/25/2014
Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	10/26/2014
Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	10/26/2014
HORN ANTENNA	ShwarzBeck	9120D	1012	10/26/2014
HORN ANTENNA	ShwarzBeck	9120D	1011	10/26/2014
TURNTABLE	MATURO	TT2.0	---	N/A
ANTENNA MAST	MATURO	TAM-4.0-P	---	N/A

The calibration interval was one year.

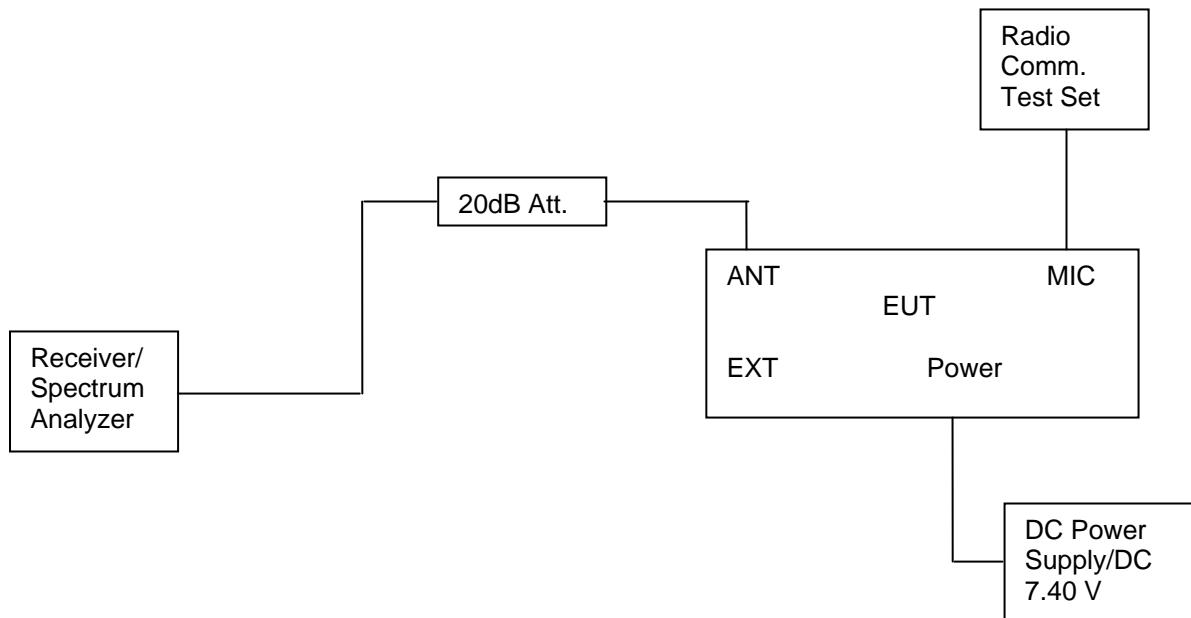
4. TEST CONDITIONS AND RESULTS

4.1. Occupied Bandwidth and Emission Mask Test

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 §80.211(f), 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, 25 KHz channel bandwidth equipment: For transmitters designed to operate with a 25 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 f0 to 5.625 kHz removed from f0: Zero dB.
 - (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 25 kHz: At least $7.27(fd - 2.88 \text{ kHz})$ dB.
 - (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 25 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

TEST CONFIGURATION



TEST PROCEDURE

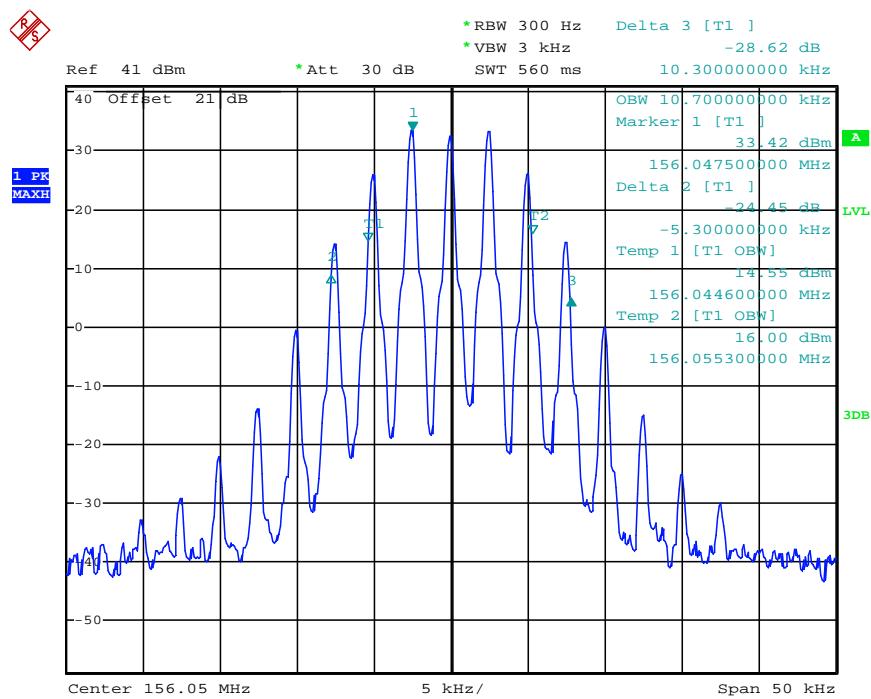
- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 The EUT was modulated by 2.5 KHz Sine wave audio signal; the level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz (25 KHz channel 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 Sparation	Test Channel	Test Frequency	99% Occupied Bandwidth	26dB Occupied Band width	
PM	25KHz	Low	156.0500 MHz	10.70 KHz	15.60 KHz	
		Middle	156.8000 MHz	10.70 KHz	15.60 KHz	
		High	157.4250 MHz	10.80 KHz	15.60 KHz	
Limit		20 KHz for 25KHz Channel Separation				
Test Results		Compliance				

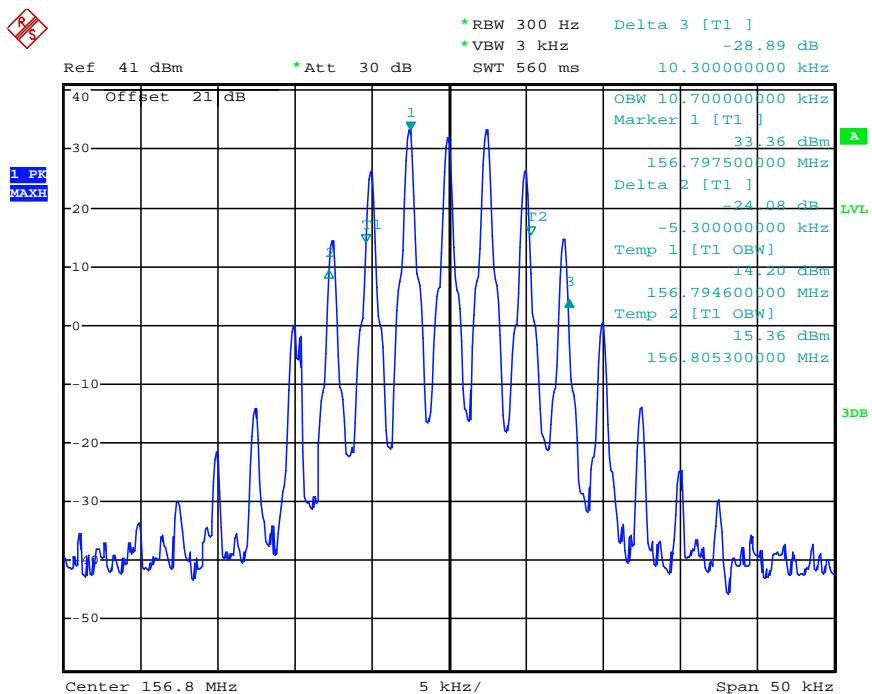
Plots of 99% and 26dB Bandwidth Measurement

Modulation Type	Channel Separation	Freq. (MHz)	Occupied Bandwidth		FCC Limit (KHz)	Results
			99%	26dB		
PM	25 KHz	156.0500	10.70	15.60	20	PASS



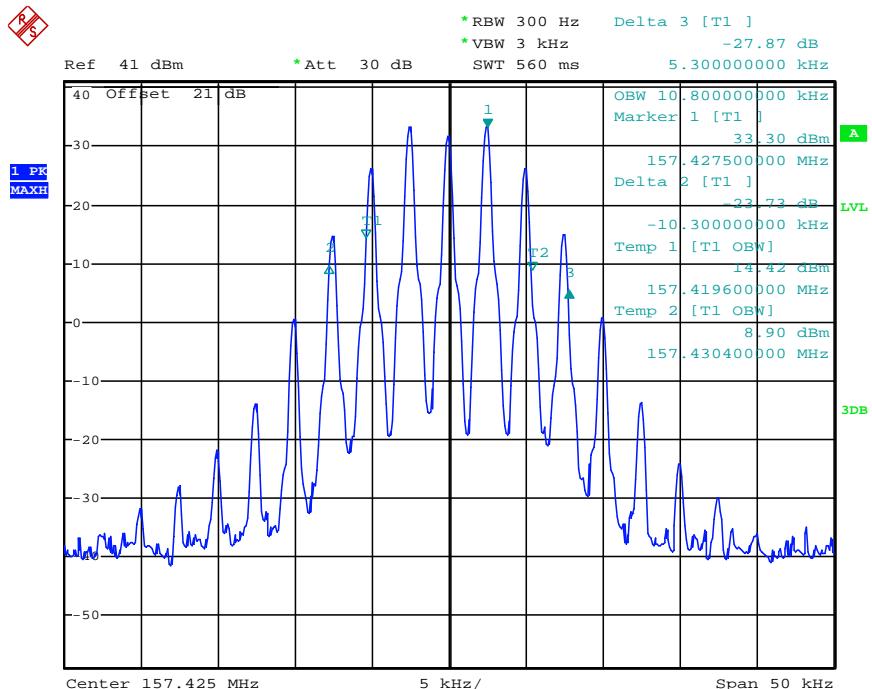
Date: 21.FEB.2014 15:06:41

Modulation Type	Channel Separation	Freq. (MHz)	Occupied Bandwidth		FCC Limit (KHz)	Results
			99%	26dB		
PM	25 KHz	156.8000	10.70	15.60	20	PASS



Date: 21.FEB.2014 15:07:43

Modulation Type	Channel Separation	Freq. (MHz)	Occupied Bandwidth		FCC Limit (KHz)	Results
			99%	26dB		
PM	25 KHz	157.4250	10.80	15.60	20	PASS



Date: 21.FEB.2014 15:08:34

4.2.2 Emission Mask

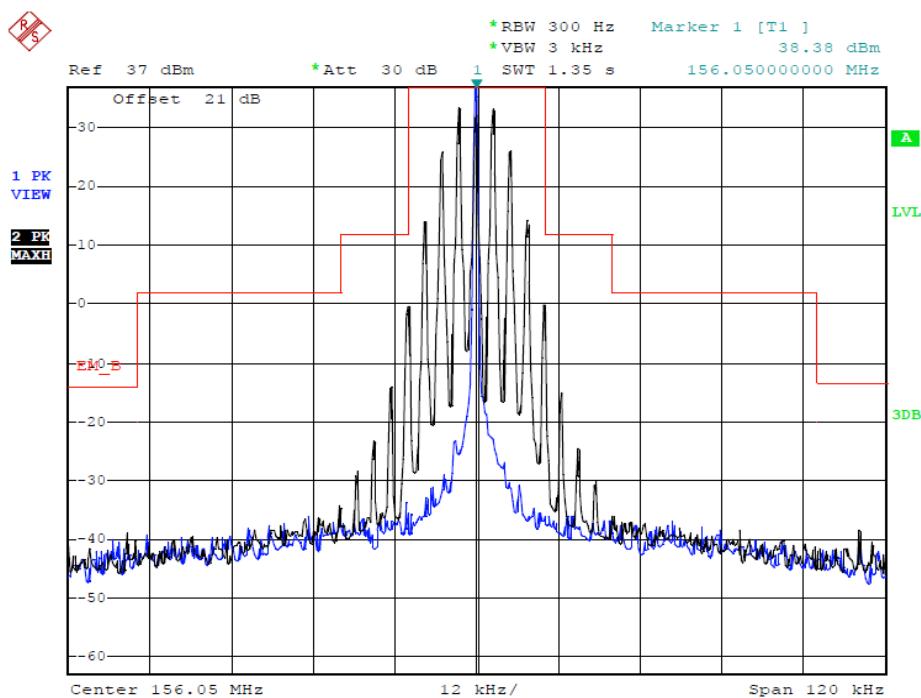
Modulation Type	Channel Sparation	Test Channel	Test Frequency	FCC Applicable Mask	RBW
PM	25 KHz	Low	156.0500 MHz	B	300 Hz
		Middle	156.8000 MHz	B	300 Hz
		High	157.4250 MHz	B	300 Hz
Test Results		Compliance			

Plots of Emission Mask Measurement

Referred as the attached plot hereinafter

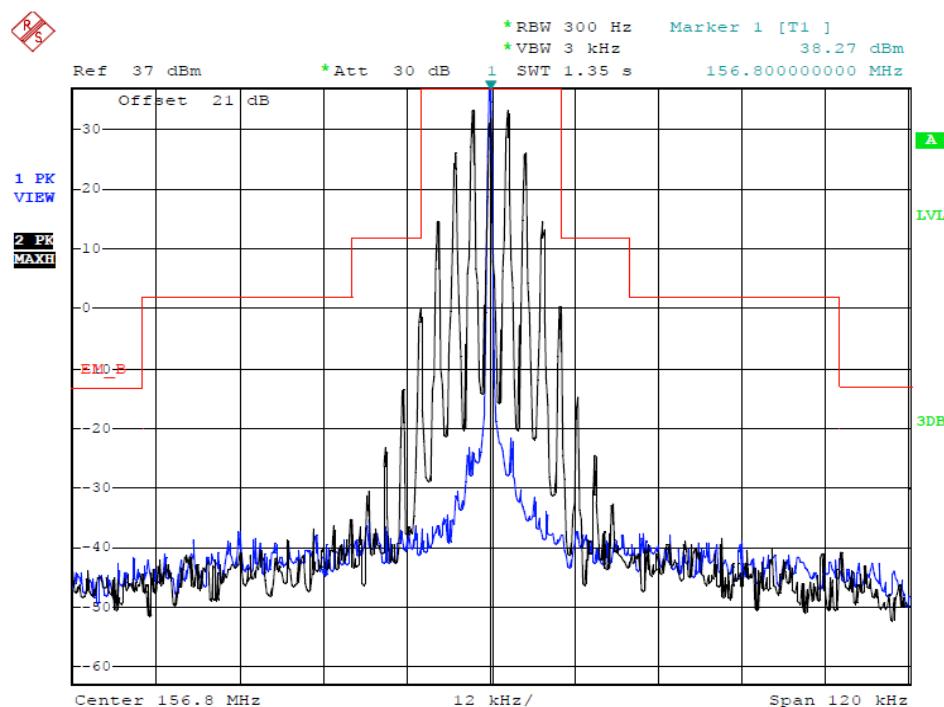
Note: The Blue curve represents unmodulated signal.
The Black curve represents modulated signal.

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
PM	25 KHz	156.0500	B	300	2.5	Compliance



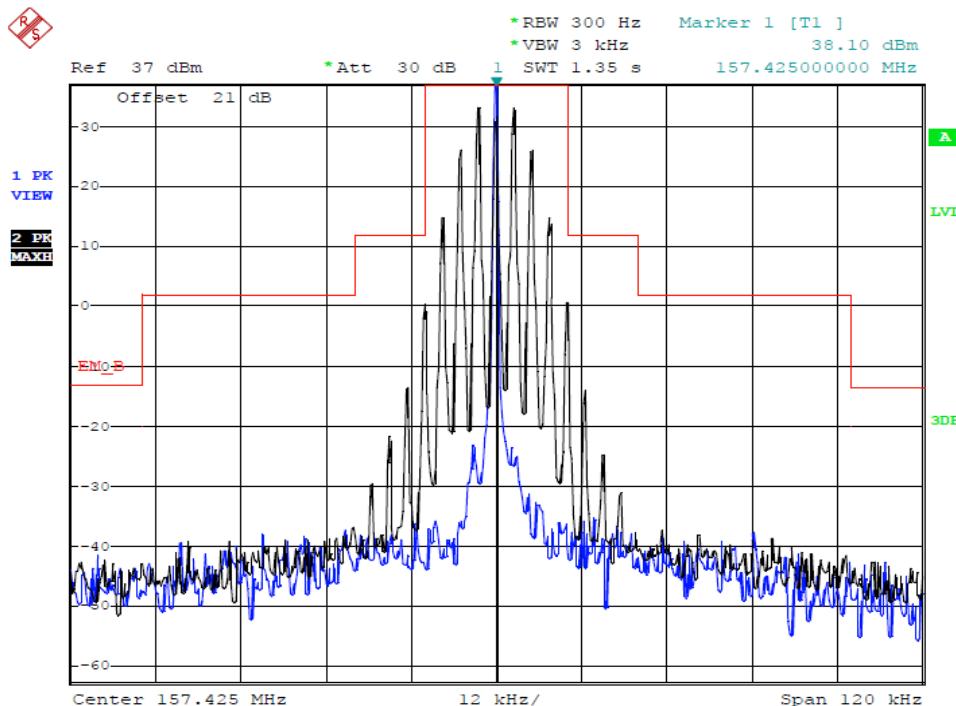
Date: 21.FEB.2014 15:15:39

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
PM	25 KHz	156.8000	B	300Hz	2.5	Compliance



Date: 21.FEB.2014 15:16:32

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
PM	25 KHz	157.4250	B	300Hz	2.5	Compliance



Date: 21.FEB.2014 15:17:41

4.2. 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

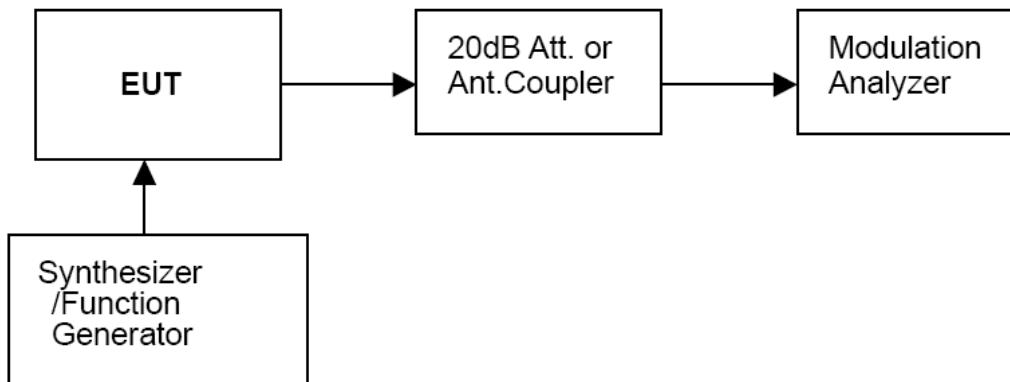
Modulation Limit

- 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, 1500 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 3 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

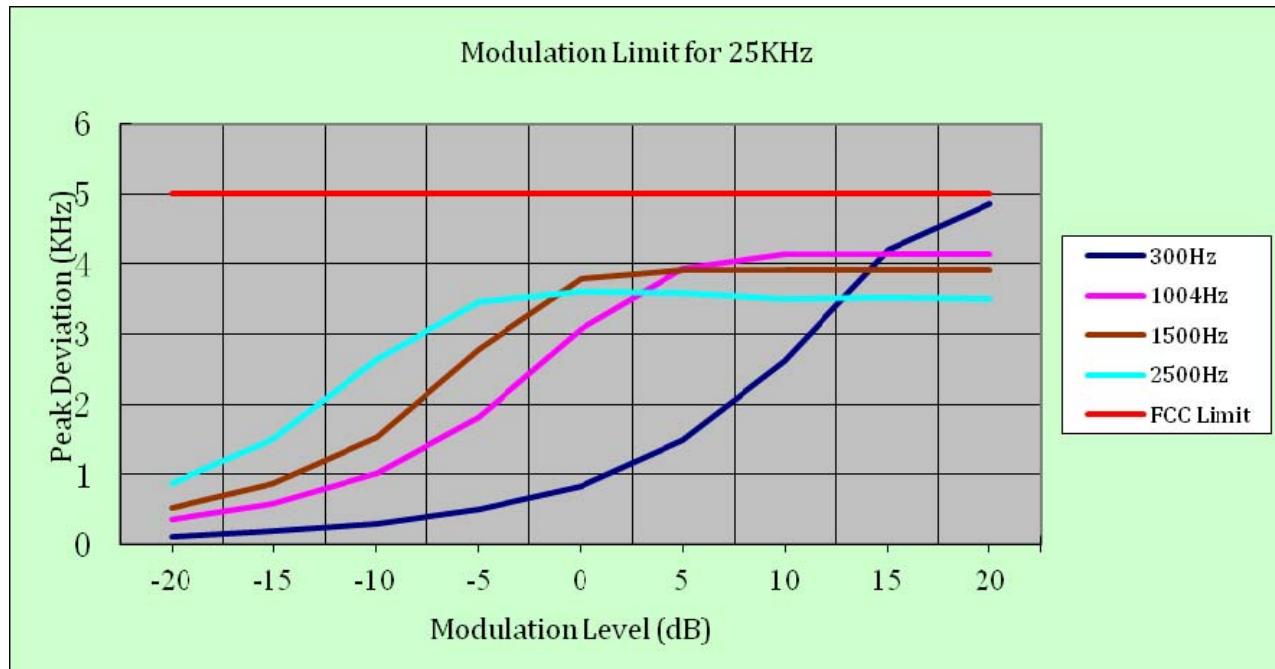


TEST RESULTS

Modulation Type: PM

25 KHz Channel Separation

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (KHz)	Peak Freq. Deviation At 1004 Hz (KHz)	Peak Freq. Deviation At 1500Hz (KHz)	Peak Freq. Deviation At 2500 Hz (KHz)
-20	0.12	0.35	0.52	0.88
-15	0.19	0.58	0.88	1.52
-10	0.30	1.02	1.54	2.65
-5	0.50	1.82	2.79	3.46
0	0.84	3.07	3.80	3.61
+5	1.48	3.94	3.91	3.58
+10	2.62	4.15	3.91	3.50
+15	4.20	4.15	3.91	3.52
+20	4.86	4.15	3.91	3.51



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 80.

Modulation Type: PM

The audio frequency response curve is show below.and

Test Audio Level (1 KHz and 20% maximum deviation) is 2.70mv for 25 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 25 KHz channel separation

25 KHz Channel Separation

Frequency (KHz)	Frequency Deviation (KHz)	1KHz Refenerce Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.10	1.01	-20.09
0.2	0.09	1.01	-21.01
0.3	0.28	1.01	-11.14
0.4	0.40	1.01	-8.05
0.5	0.50	1.01	-6.11
0.6	0.60	1.01	-4.52
0.7	0.70	1.01	-3.18
0.8	0.79	1.01	-2.13
0.9	0.89	1.01	-1.10
1.0	1.01	1.01	0.00
1.2	1.21	1.01	1.57
1.4	1.43	1.01	3.02
1.6	1.67	1.01	4.37
1.8	1.91	1.01	5.53
2.0	2.14	1.01	6.52
2.2	2.36	1.01	7.37
2.4	2.58	1.01	8.15
2.6	2.71	1.01	8.57
2.7	2.75	1.01	8.70
2.8	2.74	1.01	8.67
3.0	2.68	1.01	8.48
3.5	2.18	1.01	6.68
4.0	1.69	1.01	4.47
4.5	1.27	1.01	1.99
5.0	0.98	1.01	-0.26

Audio Frequency Response for 25KHz



4.3. Transmitter Radiated Spurious Emission

TEST APPLICABLE

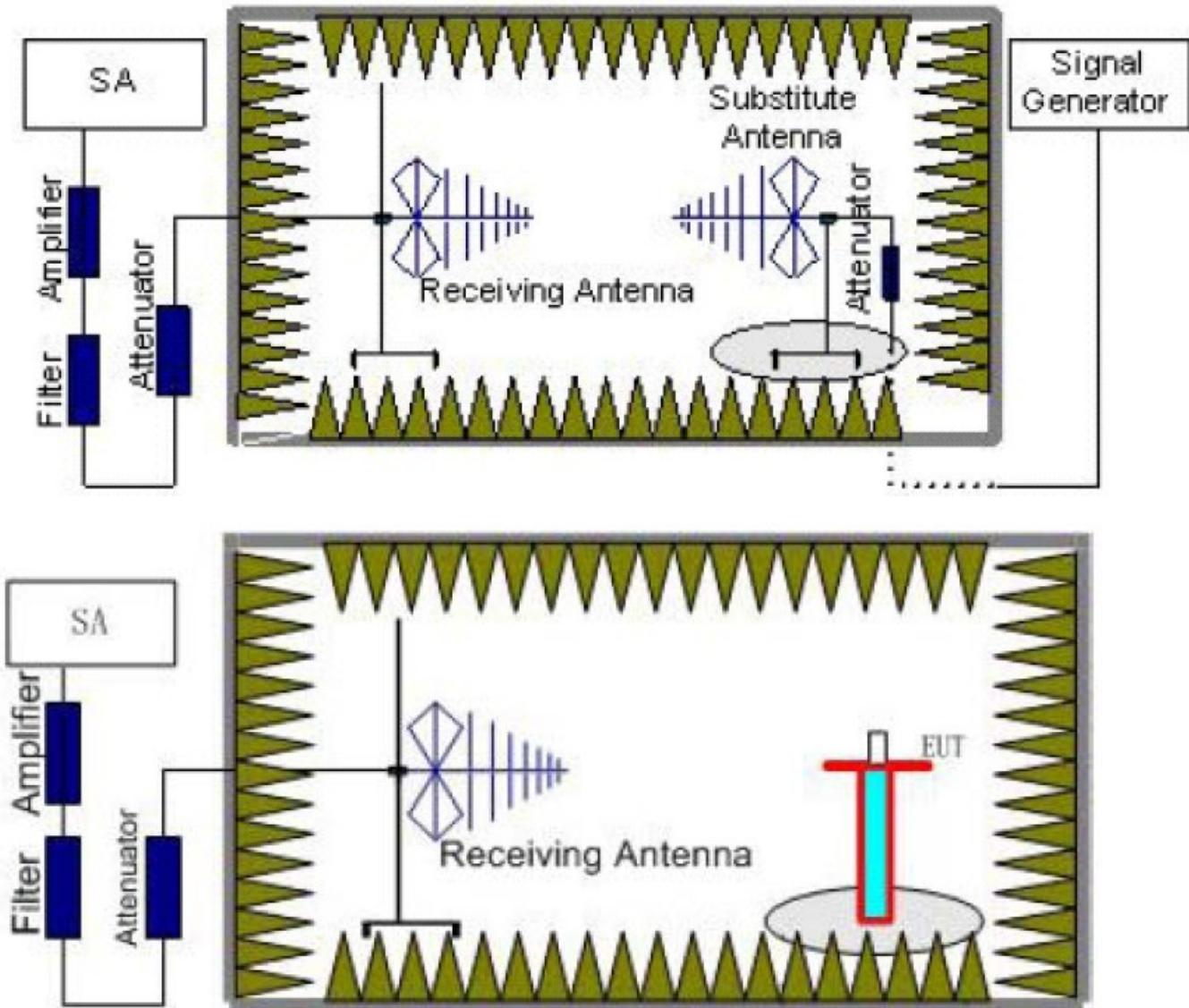
According to the TIA/EIA 603 test method, and according to Section 80.211, the power of each unwanted emission shall be less than Transmitted Power as specified below for transmitters designed to operate with 25 KHz channel bandwidth:

- 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 25 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 25 KHz: At least $50+10 \log (P)$ dB or 70 dB, whichever 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



TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50 m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in six channels were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz for above 1GHz and RBW=100KHz,VBW=300KHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (P_r).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}), the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{Mea} - P_{Ag} - P_{cl} + G_a$$

We used SMF100A microwave signal generator which signal level can up to 33dBm, so we not used power Amplifier for substitution test; The measurement results are amend as described below:

$$\text{Power(EIRP)} = P_{Mea} - P_{cl} + G_a$$
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

LIMIT

The Transmitter Radiated Spurious Emission was performed to the Rated high power (5Watt) and Rated low power (1Watt) the datum that reported below is the worst case (Rated high power) of the two rated power conditions.

Modulation Type: PM

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 11 (25 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 25 KHz at least:

Low: $43 + 10 \log (P_{\text{watts}}) = 43 + 10 \log (1) = 43.00 \text{ dB}$

High: $43 + 10 \log (P_{\text{watts}}) = 43 + 10 \log (5) = 49.99 \text{ dB}$

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

Calculation: Limit (dBm) = $EL - 43 - 10 \log_{10} (TP)$

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

In this application, the EL is 37.02 dBm.

Limit (dBm) = $49.99 - 43 - 10 \log_{10} (5) = -13 \text{ dBm}$

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

2. The measurement frequency range from 30 MHz to 4 GHz.

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

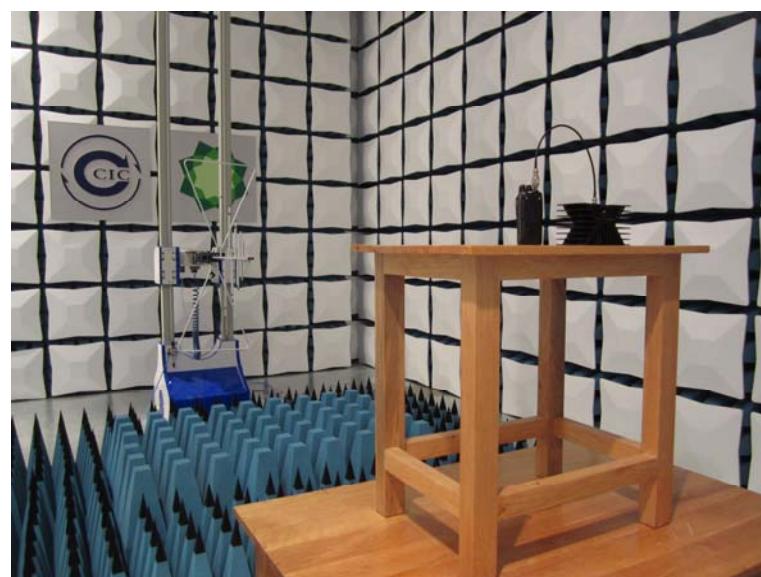
TEST RESULTS

Modulation Type:PM				Channel Separation:25KHz			
Test Channel: Ch1				Test Frequency:156.0500 MHz			
Frequency (MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
312.10	-52.60	0.96	6.80	2.15	-48.91	-13.00	H
468.15	-54.94	1.03	7.89	2.15	-50.23	-13.00	H
624.20	-56.77	1.04	7.85	2.15	-52.11	-13.00	H
...	...	...	...	...	...	...	H
312.10	-51.43	0.96	6.80	2.15	-47.74	-13.00	V
468.15	-53.73	1.03	7.89	2.15	-49.02	-13.00	V
624.20	-56.41	1.04	7.85	2.15	-51.75	-13.00	V
...	...	...	...	...	...	...	V

Modulation Type:PM				Channel Separation:25KHz			
Test Channel: Ch2				Test Frequency:156.8000 MHz			
Frequency (MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
313.60	-53.27	0.96	6.80	2.15	-49.58	-13.00	H
470.40	-56.85	1.03	7.89	2.15	-52.14	-13.00	H
627.20	-60.02	1.04	7.85	2.15	-55.36	-13.00	H
...	...	...	...	...	...	...	H
313.60	-52.66	0.96	6.80	2.15	-48.97	-13.00	V
470.40	-53.73	1.03	7.89	2.15	-49.02	-13.00	V
627.20	-57.89	1.04	7.85	2.15	-53.23	-13.00	V
...	...	...	...	...	...	...	V

Modulation Type:PM				Channel Separation:25KHz			
Test Channel: Ch3				Test Frequency:157.4250 MHz			
Frequency (MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
314.85	-53.39	0.96	6.80	2.15	-49.70	-13.00	H
472.28	-55.87	1.03	7.89	2.15	-51.16	-13.00	H
629.70	-56.94	1.04	7.85	2.15	-52.28	-13.00	H
...	...	...	...	...	...	...	H
314.85	-52.33	0.96	6.80	2.15	-48.64	-13.00	V
472.28	-54.90	1.03	7.89	2.15	-50.19	-13.00	V
629.70	-55.09	1.04	7.85	2.15	-50.43	-13.00	V
...	...	...	...	...	...	...	V

5. Test Setup Photos of the EUT



6. External and Internal Photos of the EUT

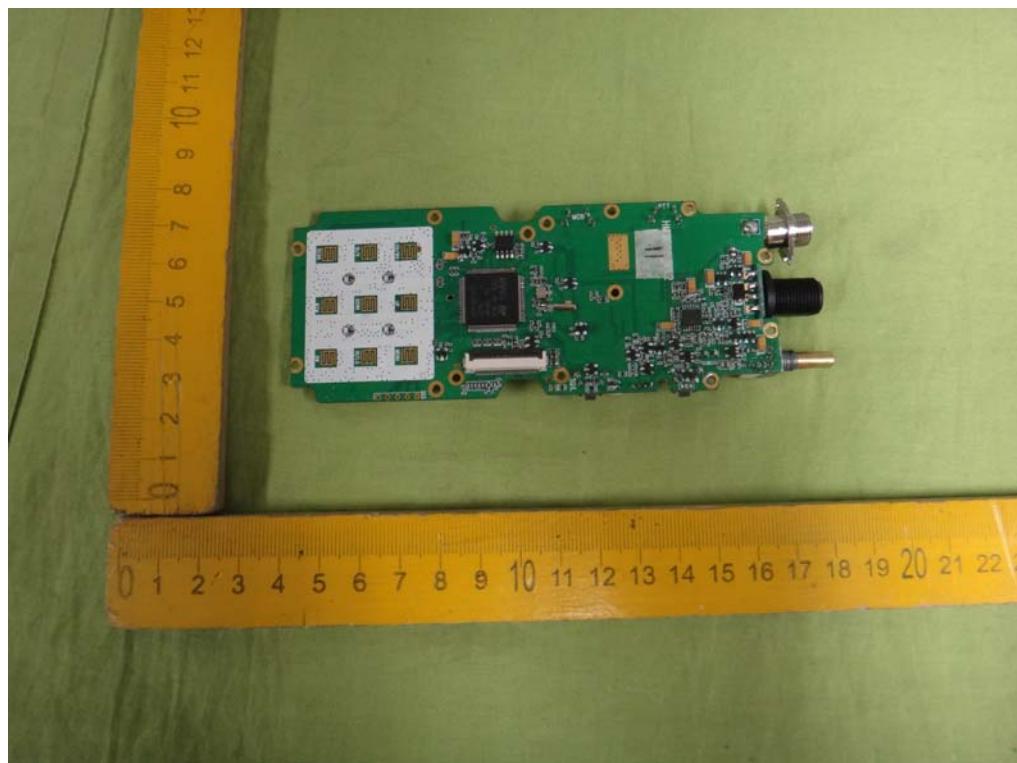
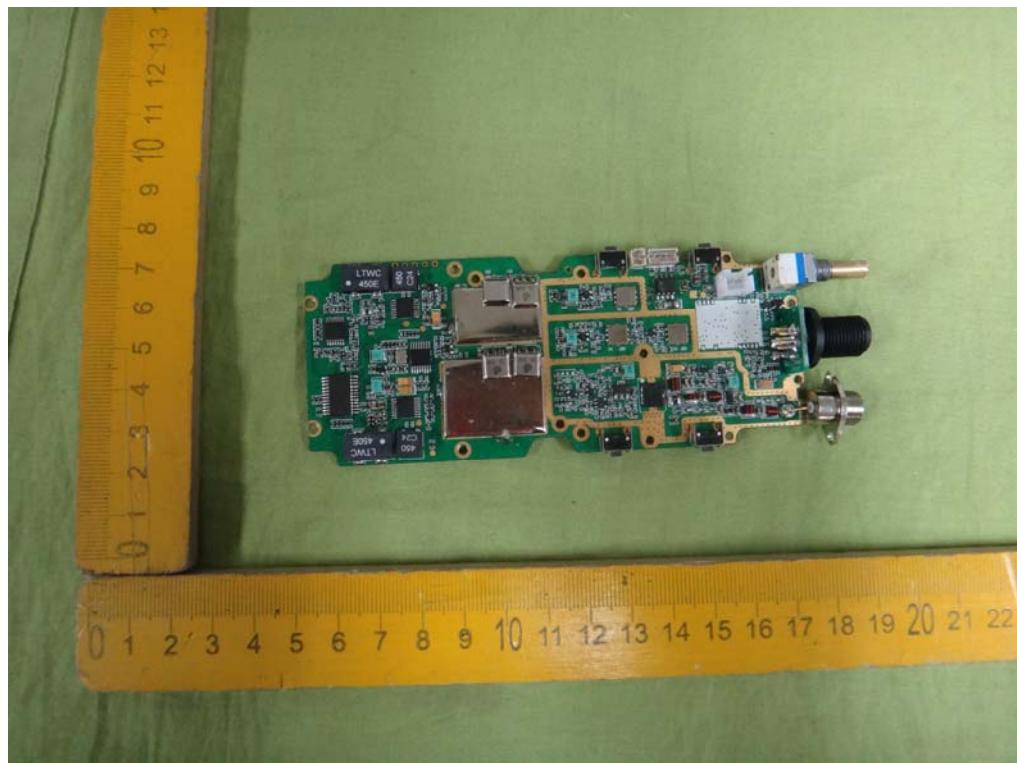
External photos of the EUT





Internal photos of the EUT





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