FCC Part 90 Rules
Test Report

Report No.: AGC00589160501FE10

FCC ID	:	PH3DJ-MD40
PRODUCT DESIGNATION	:	UHF DIGITAL TRANSCEIVER
BRAND NAME	:	ALINCO
MODEL NAME	:	DJ-MD40
CLIENT	:	Alinco Incorporated, Electronics Division
DATE OF ISSUE	:	May 11, 2016
STANDARD(S)	:	FCC Part 90 Rules
REPORT VERSION	:	V 1.0

*A*ttestation of *G*lobal *C*ompliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May 11, 2016	Valid	Original Report

TABLE OF CONTENTS

1.VERIFICATION OF COMPLIANCE

Applicant	Alinco Incorporated, Electronics Division
Address	Yodoyabashi Dai Building 13F, 4-4-9 Koraibashi, Chuo-Ku, Osaka 541-0043, Japan
Manufacturer	Alinco Incorporated, Electronics Division
Address	Yodoyabashi Dai Building 13F, 4-4-9 Koraibashi, Chuo-Ku, Osaka 541-0043, Japan
Product Designation	UHF DIGITAL TRANSCEIVER
Hardware Version	V1.00
Software Version	V2.02
Brand Name	ALINCO
Test Model	DJ-MD40
Date of Test	May 06, 2016 to May 10, 2016
Test Result	Pass

WE HEREBY CERTIFY THAT:

The above equipment was tested by Dong guan Precise Testing Service Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA 603. The sample tested as described in this report is in compliance with the FCC Rules Part 90 requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested by

Steven Zhou(Zhou Pengyun) May 11, 2016

Reviewed by

Rock Huang(Huang Dinglue) May 11, 2016

Approved by

Solger Zhang(Zhang Hongyi) May 11, 2016
Authorized Officer

2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

The EUT is a **DIGITAL/ANALOG RADIO** designed for voice/data communication. It is designed by way of utilizing the FM/4FSK modulation achieves the system operating.
A major technical description of EUT is described as following:

Communication Type	Voice / data
Modulation	FM/4FSK
Emission Type	11K0F3E, 7K60FXD, 7K60FXW
Emission Bandwidth	Analog:10.21KHz(5W), 10.27KHz(0.2W) Digital: 9.790KHz(5W), 9.426KHz(0.2W)
Peak Frequency Deviation	Analog:1.86KHz Digital: 1.91KHz
Audio Frequency Response	Analog:10.68 dB Digital: 10.73 dB
Maximum Transmitter Power	Analog:36.91 dBm(5W),22.92 dBm (0.2W) Digital: 36.93 dBm(5W), 22.96 dBm (0.2W)
Output power Modification	5 W /2.5 W /1 W /0.2W (It was fixed by the manufacturer, any individual can't arbitrarily change it.)
Data Rate	9600bps/12.5KHz(Channel Spacing)
Antenna Designation	Detachable
Antenna Model	QA13U
Antenna Gain	2.15 dBi
Power Supply	DC 7.4V, 2600mAh (by battery)
Adapter Parameter	INPUT: 100V-240V , 50/60HZ , 0.4A OUTPUT:12V , 1.0A
Charger Parameter	INPUT :DC12V, 1000mA, OUTPUT: DC8.4V 1000mA
Limiting Voltage	DC 6.00V-8.51V
Operation Frequency Range and Channel	Frequency Range: 400MHz to 480MHz (UHF) Channel Spacing: 12.5KHz (Analog), 12.5KHz(Digital)
	Bottom Channel: 400.025MHz Middle Channel: 440.025MHz Top Channel: 479.975MHz
Frequency Tolerance	1.355ppm

Frequency Range (MHz)	Rated Transmit Power(W)(Conducted)	Transmit Mode/Emission Designator
400-480	5 W /2.5 W /1 W /0.2W	11K0F3E(Analog Vioce;NB)
400-480	5 W /2.5 W /1 W /0.2W	7K60FXD/7K60FXW(9600Data/Digital Voice NB)

Channel No. (6.25KHz)	Channel No. (12.5KHz)	12.5KHz Channel Spaced 400MHz Band Plan(MHz)
1	1-2	400.025
2		
3	3-4	440.025
4		
5	5-6	479.975
6		

FCC Rules and Regulations Part 2.202: Necessary Bandwidth and Emission Bandwidth
Voice –FM Analog (12.5KHz)
Calculation:
Max modulation (M) in kHz : 3.0
Max deviation(D) in kHz:2.5
Constant factor (K): 1(assumed)
Bn= 2XM +2XDK=11.0 KHz
Emission designator: 11K0F3E

9600 Digital Vioce/date (12.5KHz)
Calculation:
Data rate in bps(R)=9600
Deviation Peak deviation of carrier(D)=2359.585
Constant factor (K): 1 (default)
Bn= 3.86D+1.27RK= 3.86(2359.585)+0.27(9600)(1)=11.7KHz
Emission designator: 11K0FXD

2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: **PH3DJ-MD40**, filing to comply with the FCC Part 90 requirements

2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of TIA/EIA 603 and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

2.4 TEST FACILITY

The test site used to collect the radiated data is located on the address of Dong guan Precise Testing Service Co., Ltd. The test site is constructed and calibrated to meet the FCC requirements in documents TIA/EIA 603.

2.5 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 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.

3.2 EUT EXERCISE

The Transmitter was operated in transmitting mode. The TX frequency was fixed which was for the purpose of the measurements.

3.3 GENERAL TECHNICAL REQUIREMENTS

For FCC Part 90 requirements:
(1). Section 90.205: Maximum ERP is dependent upon the station's antenna HAAT and required service area
(2). Section 90.207: Modulation Characteristic
(3). Section 90.209: Occupied Bandwidth
(4). Section 90.210: Emission Mask
(5). Section 90.213: Frequency Tolerance
(6). Section 90.214: Transient Frequency Behavior

3.4 CONFIGURATION OF TESTED SYSTEM

Fig. 2-1 Configuration of Tested System

Table 2-1 Equipment Used in Tested System

Item	Equipment	Brand	Model	Note
1	UHF DIGITAL TRANSCEIVER	ALINCO	DJ-MD40	EUT
2	AC Adapter	ALINCO	CW1201000	Accessory

3.5. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§90.205	Maximum Transmitter Power	Compliant
§90.207	Modulation Characteristic	Compliant
§90.209	Occupied Bandwidth	Compliant
§90.210	Emission Mask	Compliant
§90.213	Frequency Tolerance	Compliant
§90.214	Transient Frequency Behavior	Compliant

4. IDENTIFICATION OF THE RESPONSIBLE TESTING LOCATION

Site	Dongguan Precise Testing Service Co., Ltd.
Location	Building D, Baoding Technology Park,Guangming Road2, Dongcheng District, Dongguan, Guangdong, China.
Description	The test site is constructed and calibrated to meet the FCC requirements in documents TIA/EIA 603.
FCC Registration No.	371540

List of Equipments Used

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NO.	Cal. Date	Cal. Due
CLIMATE CHAMBER	EXPERY	TN-400	TN2007SR038	2015.07.14	2016.07.13
ATTENUATOR	WEINSCHEL CORP	58-30-33	N/A	2015.03.06	2016.03.05
DC POWER SUPPLY	ZHAOXIN	RXN-605D	N/A	2015.03.06	2016.03.05
MODULATION ANALYZER	HP	8920B	3104A03367	2015.07.23	2016.07.22
SIGNAL GENERATOR	AGILENT	E4421B	122501288	2015.07.25	2016.07.24
SIGNAL GENERATOR	R&S	SMT03	A0304261	2015.07.25	2016.07.24
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	2015.07.04	2016.07.03
Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3355	2015.07.04	2016.07.03
Substitution Antenna	SCHWARZBECK	VULB9160	9168-494	2015.07.04	2016.07.03
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	2015.07.04	2016.07.03
RF Cable	SCHWARZBECK	AK9515E	96221	2015.07.04	2016.07.03
3m Anechoic Chamber	CHENGYU	966	PTS-001	2015.06.06	2016.06.05
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Spectrum analyzer	Agilent	E4407B	MY46185649	2015.06.06	2016.06.05
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	2015.06.06	2016.06.05
Substitution ANTENNA	EM	EM-AH-10180	67	2015.06.06	2016.06.05
Modulation Domain Analyzer	HP	53310A	3121A02467	2015.06.06	2016.06.05
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	2015.07.06	2016.07.05
RF Cable	SCHWARZBECK	AK9515E	96222	2015.07.04	2016.07.03
Shielded Room	CHENGYU	843	PTS-002	2015.06.06	2016.06.05

NOTE: 8920B can generate audio modulation frequency.

5. DESCRIPTION OF TEST MODES

RF TEST MODES

The EUT (UHF DIGITAL TRANSCEIVER) has been tested under transmitting condition. (The top channel, the middle channel and the bottom channel) are chosen for testing at each channel separation.

Analog:

No.	TEST MODES	CHANNEL SEPARATION
1	Bottom Channel	12.5 KHz
2	Middle Channel	12.5 KHz
3	Top Channel	12.5 KHz

Digital:

No.	TEST MODES	CHANNEL SEPARATION
1	Bottom Channel	12.5 KHz
2	Middle Channel	12.5 KHz
3	Top Channel	12.5 KHz

EMC TEST MODES

No.	TEST MODES
1	Transmitting

Note: Only the result of the worst case was recorded in the report.

6. FREQUENCY TOLERANCE

6.1 PROVISIONS APPLICABLE

a). According to FCC Part 2 Section 2.1055(a)(1), the frequency stability shall be measured with variation of ambient temperature from –30℃ to +50℃ centigrade.

b). According to FCC Part 2 Section 2.1055(d)(2), 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 manufacturer.

c). According to FCC Part 90 Section 90.213, the frequency tolerance must be maintained within 0.00025% for 12.5 KHz channel separation and 0.0001% for 6.25 KHz channel separation.

6.2 MEASUREMENT PROCEDURE

6.2.1 FREQUENCY STABILITY VERSUS ENVIRONMENTAL TEMPERATURE

1. Setup the configuration per figure 1 for frequencies measurement inside an environment chamber, Install new battery in the EUT.
2. Turn on EUT and set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1KHz and Video Resolution Bandwidth to 1KHz and Frequency Span to 50KHz.Record this frequency as reference frequency.
3. Set the temperature of chamber to 50℃. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4. Repeat step 2 with a 10℃ decreased per stage until the lowest temperature -30℃ is measured, record all measured frequencies on each temperature step.

6.2.2 FREQUENCY STABILITY VERSUS INPUT VOLTAGE

1. Setup the configuration per figure 1 for frequencies measured at temperature if it is within 15℃ to 25℃. Otherwise, an environment chamber set for a temperature of 20℃ shall be used. The EUT shall be powered by DC 7.4V.
2. Set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1 KHz and Video Resolution Bandwidth to 1KHz. Record this frequency as reference frequency.
3. Supply the EUT primary voltage at the operating end point which is specified by manufacturer and record the frequency.

6.3 TEST SETUP BLOCK DIAGRAM

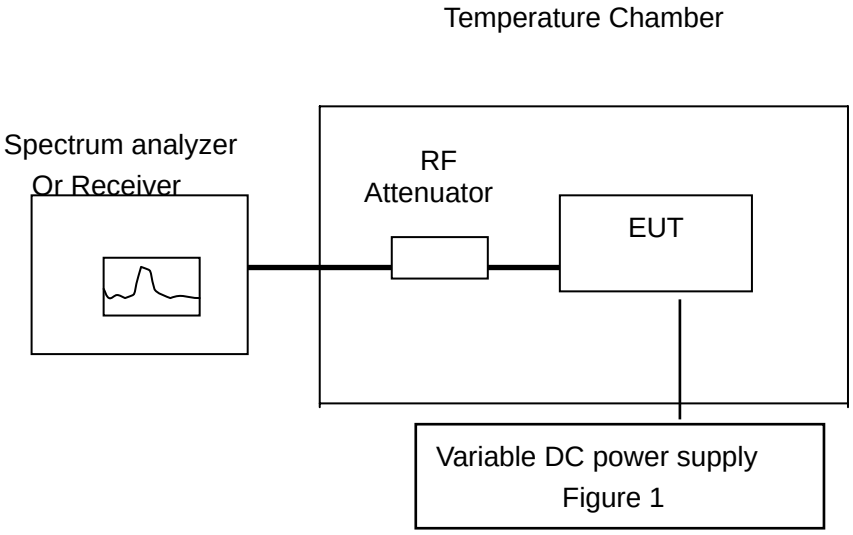


Figure 1

6.4 TEST RESULT

Analog:

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-5W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	400.025325	0.812
40	DC 7.40 V	400.02509	0.225
30	DC 7.40 V	400.025385	0.962
20	DC 7.40 V	400.025146	0.365
10	DC 7.40 V	400.025197	0.492
0	DC 7.40 V	400.025207	0.517
-10	DC 7.40 V	400.025309	0.772
-20	DC 7.40 V	400.025128	0.320
-30	DC 7.40 V	400.025248	0.620

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	440.025147	0.334
40	DC 7.40 V	440.025185	0.420
30	DC 7.40 V	440.025365	0.829
20	DC 7.40 V	440.025214	0.486
10	DC 7.40 V	440.025305	0.693
0	DC 7.40 V	440.025413	0.939
-10	DC 7.40 V	440.025268	0.609
-20	DC 7.40 V	440.025316	0.718
-30	DC 7.40 V	440.025152	0.345

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	479.975225	0.469
40	DC 7.40 V	479.975393	0.819
30	DC 7.40 V	479.975214	0.446
20	DC 7.40 V	479.975192	0.400
10	DC 7.40 V	479.975251	0.523
0	DC 7.40 V	479.975368	0.767
-10	DC 7.40 V	479.975362	0.754
-20	DC 7.40 V	479.975095	0.198
-30	DC 7.40 V	479.975393	0.819

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-5W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	400.025281	0.702
40	DC 6.29 V	400.025163	0.407
30	DC 6.29 V	400.025352	0.880
20	DC 6.29 V	400.025221	0.552
10	DC 6.29 V	400.025391	0.977
0	DC 6.29 V	400.025305	0.762
-10	DC 6.29 V	400.025371	0.927
-20	DC 6.29 V	400.025382	0.955
-30	DC 6.29 V	400.025293	0.732

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	440.025105	0.239
40	DC 6.29 V	440.025324	0.736
30	DC 6.29 V	440.025363	0.825
20	DC 6.29 V	440.025247	0.561
10	DC 6.29 V	440.025296	0.673
0	DC 6.29 V	440.025385	0.875
-10	DC 6.29 V	440.025421	0.957
-20	DC 6.29 V	440.025266	0.605
-30	DC 6.29 V	440.025451	1.025

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	479.975219	0.456
40	DC 6.29 V	479.975251	0.523
30	DC 6.29 V	479.975282	0.588
20	DC 6.29 V	479.975153	0.319
10	DC 6.29 V	479.975085	0.177
0	DC 6.29 V	479.975315	0.656
-10	DC 6.29 V	479.975307	0.640
-20	DC 6.29 V	479.975236	0.492
-30	DC 6.29 V	479.975154	0.321

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-5W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	400.025328	0.820
40	DC 8.51 V	400.025262	0.655
30	DC 8.51 V	400.025151	0.377
20	DC 8.51 V	400.025226	0.565
10	DC 8.51 V	400.025542	1.355
0	DC 8.51 V	400.025385	0.962
-10	DC 8.51 V	400.025274	0.685
-20	DC 8.51 V	400.025292	0.730
-30	DC 8.51 V	400.025334	0.835

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	440.025452	1.027
40	DC 8.51 V	440.025263	0.598
30	DC 8.51 V	440.025115	0.261
20	DC 8.51 V	440.025253	0.575
10	DC 8.51 V	440.025141	0.320
0	DC 8.51 V	440.025228	0.518
-10	DC 8.51 V	440.025259	0.589
-20	DC 8.51 V	440.025082	0.186
-30	DC 8.51 V	440.025178	0.405

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	479.975226	0.471
40	DC 8.51 V	479.97534	0.708
30	DC 8.51 V	479.975185	0.385
20	DC 8.51 V	479.975263	0.548
10	DC 8.51 V	479.975381	0.794
0	DC 8.51 V	479.975474	0.988
-10	DC 8.51 V	479.975362	0.754
-20	DC 8.51 V	479.975291	0.606
-30	DC 8.51 V	479.975358	0.746

(4) Frequency stability versus input voltage (Battery end point is 6.0V) **-5W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(Battery End Point)	(MHz)	ppm
50	DC 6.00 V	400.025114	0.285
40	DC 6.00 V	400.025327	0.817
30	DC 6.00 V	400.025235	0.587
20	DC 6.00 V	400.025039	0.097
10	DC 6.00 V	400.025154	0.385
0	DC 6.00 V	400.025218	0.545
-10	DC 6.00 V	400.025226	0.565
-20	DC 6.00 V	400.025215	0.537
-30	DC 6.00 V	400.025241	0.602

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(Battery End Point)	(MHz)	ppm
50	DC 6.00 V	440.025251	0.570
40	DC 6.00 V	440.025235	0.534
30	DC 6.00 V	440.025185	0.420
20	DC 6.00 V	440.025251	0.570
10	DC 6.00 V	440.025267	0.607
0	DC 6.00 V	440.025282	0.641
-10	DC 6.00 V	440.025337	0.766
-20	DC 6.00 V	440.025219	0.498
-30	DC 6.00 V	440.025367	0.834

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(Battery End Point)	(MHz)	ppm
50	DC 6.00 V	479.975258	0.538
40	DC 6.00V	479.975161	0.335
30	DC 6.00 V	479.975134	0.279
20	DC 6.00 V	479.975386	0.804
10	DC 6.00 V	479.975027	0.056
0	DC 6.00 V	479.975274	0.571
-10	DC 6.00 V	479.975292	0.608
-20	DC 6.00 V	479.975153	0.319
-30	DC 6.00 V	479.975249	0.519

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-0.2W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	400.025225	0.562
40	DC 7.40 V	400.025339	0.847
30	DC 7.40 V	400.025107	0.267
20	DC 7.40 V	400.025276	0.690
10	DC 7.40 V	400.025248	0.620
0	DC 7.40 V	400.025262	0.655
-10	DC 7.40 V	400.025327	0.817
-20	DC 7.40 V	400.025351	0.877
-30	DC 7.40 V	400.025325	0.812

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	440.025296	0.673
40	DC 7.40 V	440.025251	0.570
30	DC 7.40 V	440.025392	0.891
20	DC 7.40 V	440.025256	0.582
10	DC 7.40 V	440.025258	0.586
0	DC 7.40 V	440.025437	0.993
-10	DC 7.40 V	440.025306	0.695
-20	DC 7.40 V	440.025287	0.652
-30	DC 7.40 V	440.025362	0.823

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	479.975251	0.523
40	DC 7.40 V	479.975263	0.548
30	DC 7.40 V	479.975285	0.594
20	DC 7.40 V	479.975341	0.710
10	DC 7.40 V	479.975336	0.700
0	DC 7.40 V	479.975352	0.733
-10	DC 7.40 V	479.975226	0.471
-20	DC 7.40 V	479.975384	0.800
-30	DC 7.40 V	479.975436	0.908

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-0.2W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	400.025242	0.605
40	DC 6.29 V	400.025363	0.907
30	DC 6.29 V	400.025238	0.595
20	DC 6.29 V	400.025329	0.822
10	DC 6.29 V	400.025388	0.970
0	DC 6.29 V	400.025267	0.667
-10	DC 6.29 V	400.025286	0.715
-20	DC 6.29 V	400.025231	0.577
-30	DC 6.29 V	400.025406	1.015

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	440.025153	0.348
40	DC 6.29 V	440.025215	0.489
30	DC 6.29 V	440.025342	0.777
20	DC 6.29 V	440.025128	0.291
10	DC 6.29 V	440.025412	0.936
0	DC 6.29 V	440.025273	0.620
-10	DC 6.29 V	440.025108	0.245
-20	DC 6.29 V	440.025226	0.514
-30	DC 6.29 V	440.025358	0.814

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	479.975324	0.675
40	DC 6.29 V	479.975256	0.533
30	DC 6.29 V	479.975258	0.538
20	DC 6.29 V	479.975207	0.431
10	DC 6.29 V	479.975403	0.840
0	DC 6.29 V	479.975304	0.633
-10	DC 6.29 V	479.975108	0.225
-20	DC 6.29 V	479.975236	0.492
-30	DC 6.29 V	479.975129	0.269

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-0.2W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	400.025252	0.630
40	DC 8.51 V	400.025126	0.315
30	DC 8.51 V	400.025324	0.810
20	DC 8.51 V	400.025416	1.040
10	DC 8.51 V	400.025295	0.737
0	DC 8.51 V	400.025125	0.312
-10	DC 8.51 V	400.025248	0.620
-20	DC 8.51 V	400.025316	0.790
-30	DC 8.51 V	400.025268	0.670

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	440.025284	0.645
40	DC 8.51 V	440.025261	0.593
30	DC 8.51 V	440.025225	0.511
20	DC 8.51 V	440.025396	0.900
10	DC 8.51 V	440.025273	0.620
0	DC 8.51 V	440.025205	0.466
-10	DC 8.51 V	440.025216	0.491
-20	DC 8.51 V	440.025169	0.384
-30	DC 8.51 V	440.025248	0.564

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	479.975228	0.475
40	DC 8.51 V	479.975296	0.617
30	DC 8.51 V	479.975236	0.492
20	DC 8.51 V	479.975158	0.329
10	DC 8.51 V	479.975163	0.340
0	DC 8.51 V	479.975264	0.550
-10	DC 8.51 V	479.975328	0.683
-20	DC 8.51 V	479.975463	0.965
-30	DC 8.51 V	479.975276	0.575

(4) Frequency stability versus input voltage (Battery endpoint is 6V) **-0.2W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.00 V	400.025227	0.567
40	DC 6.00 V	400.025209	0.522
30	DC 6.00 V	400.025316	0.790
20	DC 6.00 V	400.025257	0.642
10	DC 6.00 V	400.025282	0.705
0	DC 6.00 V	400.025224	0.560
-10	DC 6.00 V	400.025236	0.590
-20	DC 6.00 V	400.025315	0.787
-30	DC 6.00 V	400.025264	0.660

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.00 V	440.025285	0.648
40	DC 6.00 V	440.025326	0.741
30	DC 6.00 V	440.025215	0.489
20	DC 6.00 V	440.025305	0.693
10	DC 6.00 V	440.025129	0.293
0	DC 6.00 V	440.025301	0.684
-10	DC 6.00 V	440.025326	0.741
-20	DC 6.00 V	440.025124	0.282
-30	DC 6.00 V	440.025407	0.925

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.00 V	479.975215	0.448
40	DC 6.00 V	479.975363	0.756
30	DC 6.00 V	479.975242	0.504
20	DC 6.00 V	479.975327	0.681
10	DC 6.00 V	479.975193	0.402
0	DC 6.00 V	479.975225	0.469
-10	DC 6.00 V	479.975212	0.442
-20	DC 6.00 V	479.975127	0.265
-30	DC 6.00 V	479.975253	0.527

Digital:

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**-5W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	400.025305	0.762
40	DC 7.40 V	400.025416	1.040
30	DC 7.40 V	400.025254	0.635
20	DC 7.40 V	400.025329	0.822
10	DC 7.40 V	400.025217	0.542
0	DC 7.40 V	400.025322	0.805
-10	DC 7.40 V	400.025408	1.020
-20	DC 7.40 V	400.025349	0.872
-30	DC 7.40 V	400.025117	0.292

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	440.025215	0.489
40	DC 7.40 V	440.025352	0.800
30	DC 7.40 V	440.025453	1.029
20	DC 7.40 V	440.025382	0.868
10	DC 7.40 V	440.025546	1.241
0	DC 7.40 V	440.025252	0.573
-10	DC 7.40 V	440.025116	0.264
-20	DC 7.40 V	440.025319	0.725
-30	DC 7.40 V	440.025327	0.743

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	479.975227	0.473
40	DC 7.40 V	479.975162	0.338
30	DC 7.40 V	479.975295	0.615
20	DC 7.40 V	479.975324	0.675
10	DC 7.40 V	479.975253	0.527
0	DC 7.40 V	479.975223	0.465
-10	DC 7.40 V	479.975315	0.656
-20	DC 7.40 V	479.975452	0.942
-30	DC 7.40 V	479.975216	0.450

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-5W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	400.025228	0.570
40	DC 6.29 V	400.025346	0.865
30	DC 6.29 V	400.025327	0.817
20	DC 6.29 V	400.025362	0.905
10	DC 6.29 V	400.025246	0.615
0	DC 6.29 V	400.025332	0.830
-10	DC 6.29 V	400.025252	0.630
-20	DC 6.29 V	400.025303	0.757
-30	DC 6.29 V	400.025227	0.567

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	440.025324	0.736
40	DC 6.29 V	440.025416	0.945
30	DC 6.29 V	440.025292	0.664
20	DC 6.29 V	440.025124	0.282
10	DC 6.29 V	440.025263	0.598
0	DC 6.29 V	440.025327	0.743
-10	DC 6.29 V	440.025219	0.498
-20	DC 6.29 V	440.025328	0.745
-30	DC 6.29 V	440.025153	0.348

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	479.975425	0.885
40	DC 6.29 V	479.975141	0.294
30	DC 6.29 V	479.975336	0.700
20	DC 6.29 V	479.975252	0.525
10	DC 6.29 V	479.975343	0.715
0	DC 6.29 V	479.975413	0.860
-10	DC 6.29 V	479.975486	1.013
-20	DC 6.29 V	479.975332	0.692
-30	DC 6.29 V	479.975272	0.567

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-5W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	400.025193	0.482
40	DC 8.51 V	400.025358	0.895
30	DC 8.51 V	400.025483	1.207
20	DC 8.51 V	400.025116	0.290
10	DC 8.51 V	400.025292	0.730
0	DC 8.51 V	400.025474	1.185
-10	DC 8.51 V	400.025338	0.845
-20	DC 8.51 V	400.025224	0.560
-30	DC 8.51 V	400.025281	0.702

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	440.025441	1.002
40	DC 8.51 V	440.025363	0.825
30	DC 8.51 V	440.025285	0.648
20	DC 8.51 V	440.025269	0.611
10	DC 8.51 V	440.025475	1.079
0	DC 8.51 V	440.025319	0.725
-10	DC 8.51 V	440.025285	0.648
-20	DC 8.51 V	440.025229	0.520
-30	DC 8.51 V	440.025347	0.789

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	479.975382	0.796
40	DC 8.51 V	479.975246	0.513
30	DC 8.51 V	479.975618	1.288
20	DC 8.51 V	479.975392	0.817
10	DC 8.51 V	479.975251	0.523
0	DC 8.51 V	479.975272	0.567
-10	DC 8.51 V	479.975361	0.752
-20	DC 8.51 V	479.975482	1.004
-30	DC 8.51 V	479.975554	1.154

(4) Frequency stability versus input voltage (Battery end point is 6.0V) **-5W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(Battery End Point)	(MHz)	ppm
50	DC 6.00 V	400.025251	0.627
40	DC 6.00 V	400.025282	0.705
30	DC 6.00 V	400.025364	0.910
20	DC 6.00 V	400.025342	0.855
10	DC 6.00 V	400.025273	0.682
0	DC 6.00 V	400.025282	0.705
-10	DC 6.00 V	400.025213	0.532
-20	DC 6.00 V	400.025386	0.965
-30	DC 6.00 V	400.025388	0.970

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(Battery End Point)	(MHz)	ppm
50	DC 6.00 V	440.025252	0.573
40	DC 6.00 V	440.025246	0.559
30	DC 6.00 V	440.025326	0.741
20	DC 6.00 V	440.025285	0.648
10	DC 6.00 V	440.025291	0.661
0	DC 6.00 V	440.025325	0.739
-10	DC 6.00 V	440.025347	0.789
-20	DC 6.00 V	440.025226	0.514
-30	DC 6.00 V	440.025152	0.345

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	2.5ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(Battery End Point)	(MHz)	ppm
50	DC 6.00 V	479.975325	0.677
40	DC 6.00 V	479.975215	0.448
30	DC 6.00 V	479.975143	0.298
20	DC 6.00 V	479.975119	0.248
10	DC 6.00 V	479.975182	0.379
0	DC 6.00 V	479.975247	0.515
-10	DC 6.00 V	479.975173	0.360
-20	DC 6.00 V	479.975359	0.748
-30	DC 6.00 V	479.975117	0.244

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.40V)**- 0.2W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	400.025352	0.880
40	DC 7.40 V	400.025215	0.537
30	DC 7.40 V	400.025296	0.740
20	DC 7.40 V	400.025252	0.630
10	DC 7.40 V	400.025127	0.317
0	DC 7.40 V	400.025329	0.822
-10	DC 7.40 V	400.025254	0.635
-20	DC 7.40 V	400.025268	0.670
-30	DC 7.40 V	400.025251	0.627

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	440.025218	0.495
40	DC 7.40 V	440.025262	0.595
30	DC 7.40 V	440.025394	0.895
20	DC 7.40 V	440.025318	0.723
10	DC 7.40 V	440.025274	0.623
0	DC 7.40 V	440.025252	0.573
-10	DC 7.40 V	440.025156	0.355
-20	DC 7.40 V	440.025257	0.584
-30	DC 7.40 V	440.025494	1.123

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 7.40 V	479.975258	0.538
40	DC 7.40 V	479.975227	0.473
30	DC 7.40 V	479.975151	0.315
20	DC 7.40 V	479.975263	0.548
10	DC 7.40 V	479.975352	0.733
0	DC 7.40 V	479.975359	0.748
-10	DC 7.40 V	479.975418	0.871
-20	DC 7.40 V	479.975452	0.942
-30	DC 7.40 V	479.975387	0.806

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V) **-0.2W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	400.025252	0.630
40	DC 6.29 V	400.025147	0.367
30	DC 6.29 V	400.025385	0.962
20	DC 6.29 V	400.025259	0.647
10	DC 6.29 V	400.025221	0.552
0	DC 6.29 V	400.025352	0.880
-10	DC 6.29 V	400.025316	0.790
-20	DC 6.29 V	400.025342	0.855
-30	DC 6.29 V	400.025269	0.672

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	440.025252	0.573
40	DC 6.29 V	440.025306	0.695
30	DC 6.29 V	440.025258	0.586
20	DC 6.29 V	440.025526	1.195
10	DC 6.29 V	440.025392	0.891
0	DC 6.29 V	440.025381	0.866
-10	DC 6.29 V	440.025236	0.536
-20	DC 6.29 V	440.025257	0.584
-30	DC 6.29 V	440.025497	1.129

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.29 V	479.975254	0.529
40	DC 6.29 V	479.975382	0.796
30	DC 6.29 V	479.975125	0.260
20	DC 6.29 V	479.975153	0.319
10	DC 6.29 V	479.975186	0.388
0	DC 6.29 V	479.975291	0.606
-10	DC 6.29 V	479.975232	0.483
-20	DC 6.29 V	479.975257	0.535
-30	DC 6.29 V	479.975163	0.340

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) **-0.2W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	400.025246	0.615
40	DC 8.51 V	400.025304	0.760
30	DC 8.51 V	400.025352	0.880
20	DC 8.51 V	400.025223	0.557
10	DC 8.51 V	400.025307	0.767
0	DC 8.51 V	400.025216	0.540
-10	DC 8.51 V	400.025152	0.380
-20	DC 8.51 V	400.025196	0.490
-30	DC 8.51 V	400.025224	0.560

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	440.025526	1.195
40	DC 8.51 V	440.025239	0.543
30	DC 8.51 V	440.025524	1.191
20	DC 8.51 V	440.025262	0.595
10	DC 8.51 V	440.025182	0.414
0	DC 8.51 V	440.025261	0.593
-10	DC 8.51 V	440.025297	0.675
-20	DC 8.51 V	440.025222	0.505
-30	DC 8.51 V	440.025246	0.559

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 8.51 V	479.975426	0.888
40	DC 8.51 V	479.975285	0.594
30	DC 8.51 V	479.975294	0.613
20	DC 8.51 V	479.975228	0.475
10	DC 8.51 V	479.975273	0.569
0	DC 8.51 V	479.975352	0.733
-10	DC 8.51 V	479.975262	0.546
-20	DC 8.51 V	479.975218	0.454
-30	DC 8.51 V	479.975262	0.546

(2) Frequency stability versus input voltage (Battery endpoint is 6V) **-0.2W**

Bottom Channel @ 12.5 KHz Channel Separation

Reference Frequency:	400.025 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.00 V	400.025324	0.810
40	DC 6.00 V	400.025262	0.655
30	DC 6.00 V	400.025521	1.302
20	DC 6.00 V	400.025168	0.420
10	DC 6.00 V	400.025192	0.480
0	DC 6.00 V	400.025216	0.540
-10	DC 6.00 V	400.025246	0.615
-20	DC 6.00 V	400.025281	0.702
-30	DC 6.00 V	400.025293	0.732

Middle Channel @ 12.5 KHz Channel Separation

Reference Frequency:	440.025 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.00 V	440.025282	0.641
40	DC 6.00 V	440.025225	0.511
30	DC 6.00 V	440.025353	0.802
20	DC 6.00 V	440.025252	0.573
10	DC 6.00 V	440.025292	0.664
0	DC 6.00 V	440.025261	0.593
-10	DC 6.00 V	440.025145	0.330
-20	DC 6.00 V	440.025232	0.527
-30	DC 6.00 V	440.025284	0.645

Top Channel @ 12.5 KHz Channel Separation

Reference Frequency:	479.975 MHz	Limit:	5.0ppm
Envionment Temperature	Power Supply	Frequency Deviation	
(℃)	(V)	(MHz)	ppm
50	DC 6.00 V	479.975265	0.552
40	DC 6.00 V	479.975215	0.448
30	DC 6.00 V	479.975275	0.573
20	DC 6.00 V	479.975263	0.548
10	DC 6.00 V	479.975425	0.885
0	DC 6.00 V	479.975117	0.244
-10	DC 6.00 V	479.975168	0.350
-20	DC 6.00 V	479.975136	0.283
-30	DC 6.00 V	479.975285	0.594

7. EMISSION BANDWIDTH

7.1 PROVISIONS APPLICABLE

According to FCC Part 90 Section 90.209:The authorized bandwidth shall be 11.25 KHz for 12.5 KHz channel separation and 6 KHz for 6.25 KHz channel separation.

7.2 MEASUREMENT PROCEDURE

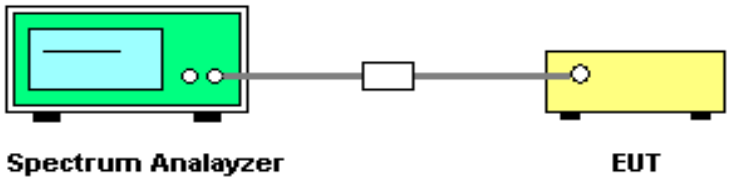
1). The EUT was placed on a turn table which is 0.8m above ground plane.

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).

3). Set SPA Center Frequency = fundamental frequency, RBW=100Hz.VBW= 300 Hz, Span =50 KHz.

4). Set SPA Max hold. Mark peak, -26 dB.

7.3 TEST SETUP BLOCK DIAGRAM

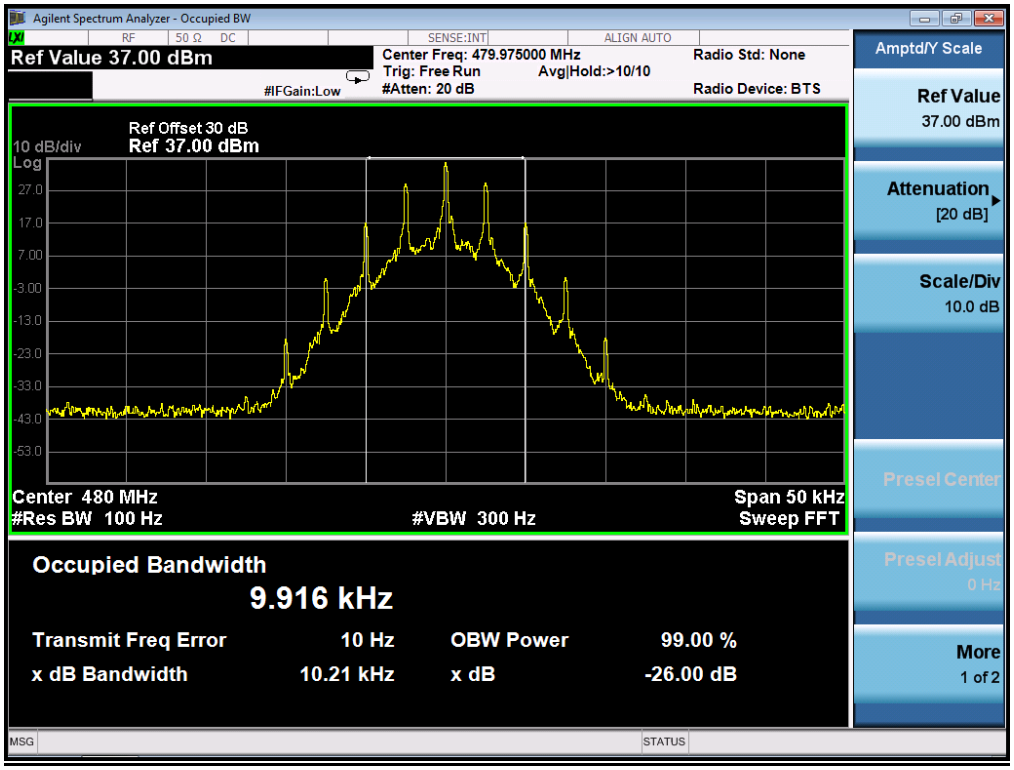


7.4 MEASUREMENT RESULT

Analog:

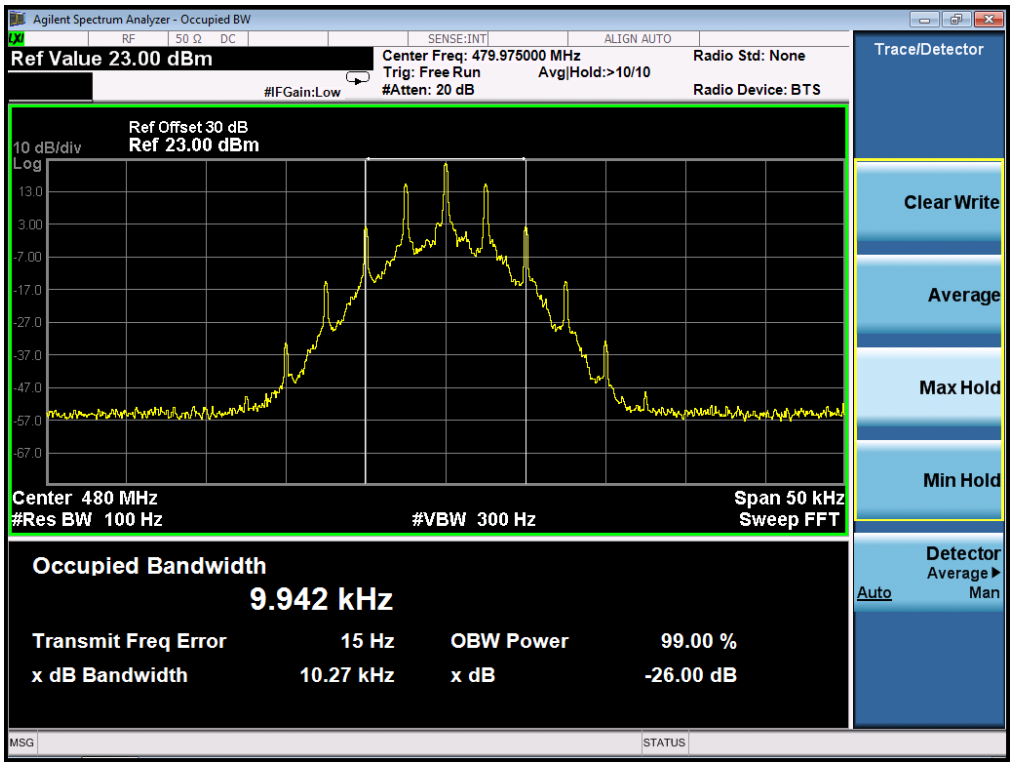
26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation-5W		
	Test Data	Limits	Result
400.025MHz	10.19KHz	11.25 KHz	Pass
440.025MHz	10.15KHz	11.25 KHz	Pass
479.975MHz	10.21KHz	11.25 KHz	Pass

Occupied bandwidth of Top Channel (Maximum)



26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation-0.2W		
	Test Data	Limits	Result
400.025MHz	10.20KHz	11.25 KHz	Pass
440.000MHz	10.22KHz	11.25 KHz	Pass
479.975MHz	10.27KHz	11.25 KHz	Pass

Occupied bandwidth of Top Channel (Maximum)

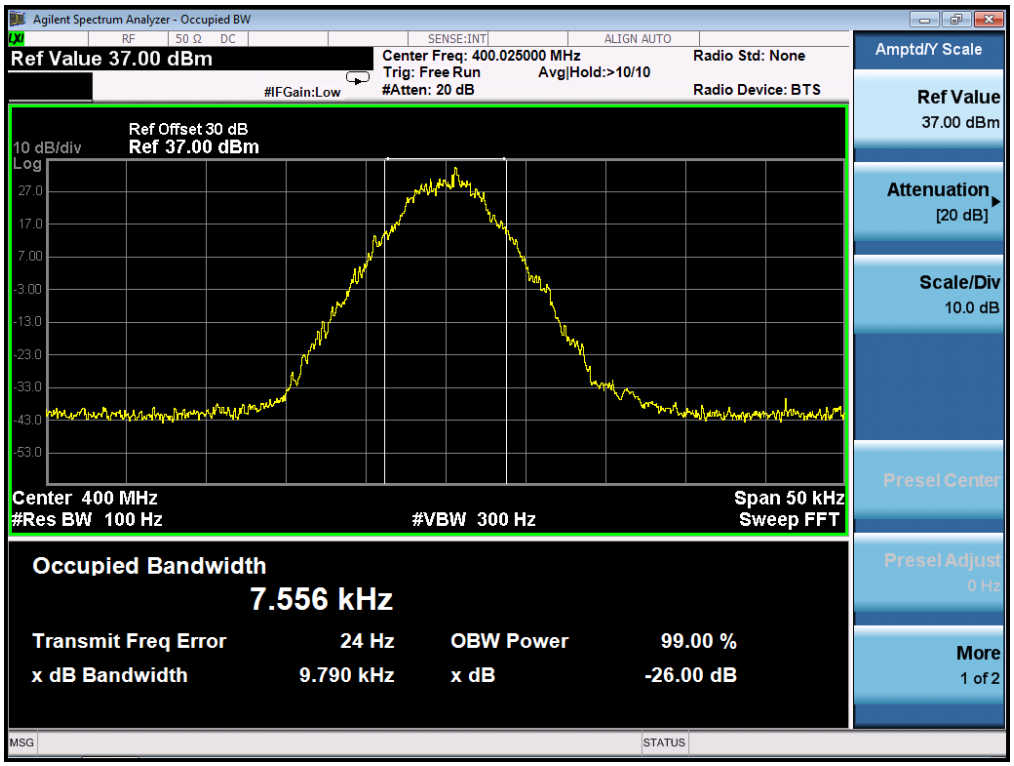


Digital:

TEST RESULTS

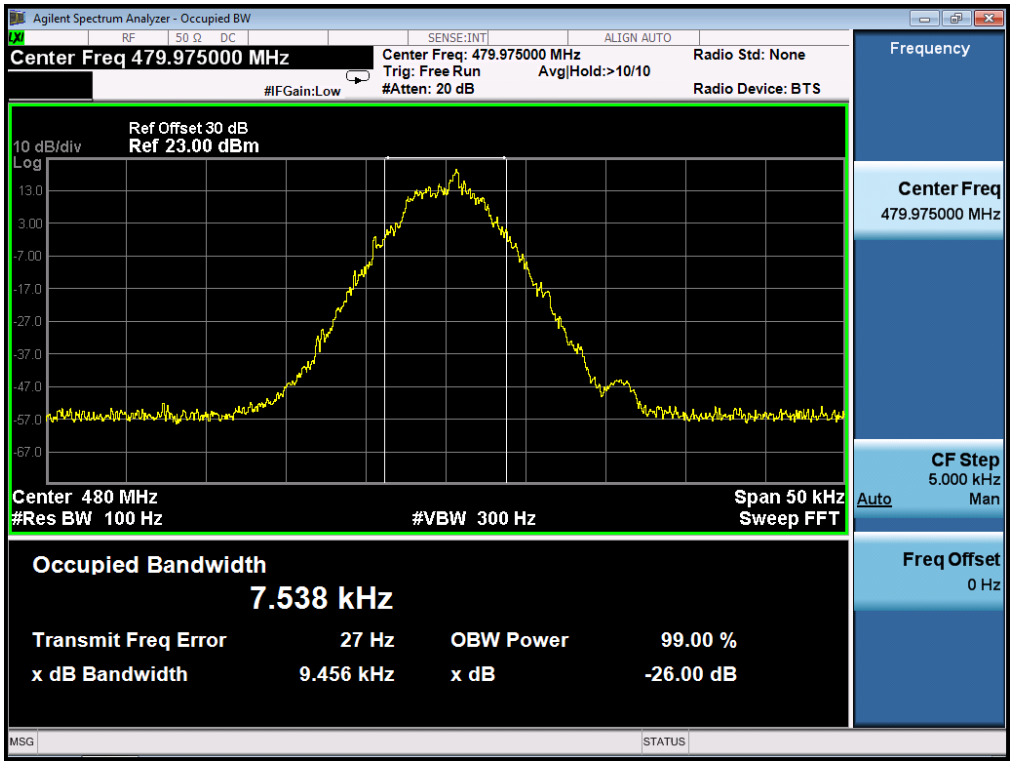
26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation-5W		
	Test Data	Limits	Result
400.025MHz	9.790KHz	11.25 KHz	Pass
440.025MHz	9.759KHz	11.25 KHz	Pass
479.975MHz	9.765KHz	11.25 KHz	Pass

Occupied bandwidth of Bottom Channel (Maximum)



26 DB BANDWIDTH MEASUREMENT RESULT			
Operating Frequency	12.5 KHz Channel Separation-0.2W		
	Test Data	Limits	Result
400.025MHz	9.432 KHz	11.25 KHz	Pass
440.025MHz	9.446KHz	11.25 KHz	Pass
479.975MHz	9.456KHz	11.25 KHz	Pass

Occupied bandwidth of Top Channel (Maximum)



8. UNWANTED RADIATION

8.1 PROVISIONS APPLICABLE

8.1.1 According to Section 90.210, the power of each unwanted emission shall be less than Transmitted Power as specified below for transmitters designed to operate with each channel separation.

For 12.5 KHz Channel Separation:

(1).On any frequency removed from the center of the authorized bandwidth fo to 5.625 KHz removed from fo: Zero dB.

(2).On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (fd in KHz) fo of more than 5.625 KHz but no more than 12.5 KHz: At least 7.27(fd-2.88 KHz) dB

(3).On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (fd in KHz)fo of more than 12.5 KHz: At least 50+10 log(P) dB or 70 dB, which ever is lesser attenuation.

For 6.25 KHz Channel Separation:

(1).On any frequency from the center of the authorized bandwidth fo to 3.0 kHz removed from fo: Zero dB.

(2).On any frequency removed from the center of the authorized bandwidth by a displacement f requency (fd in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(fd´3 kHz) or 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

(3).On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + 10log (P) or 65 dB, whichever is the lesser attenuation.

8.2 MEASUREMENT 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 than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

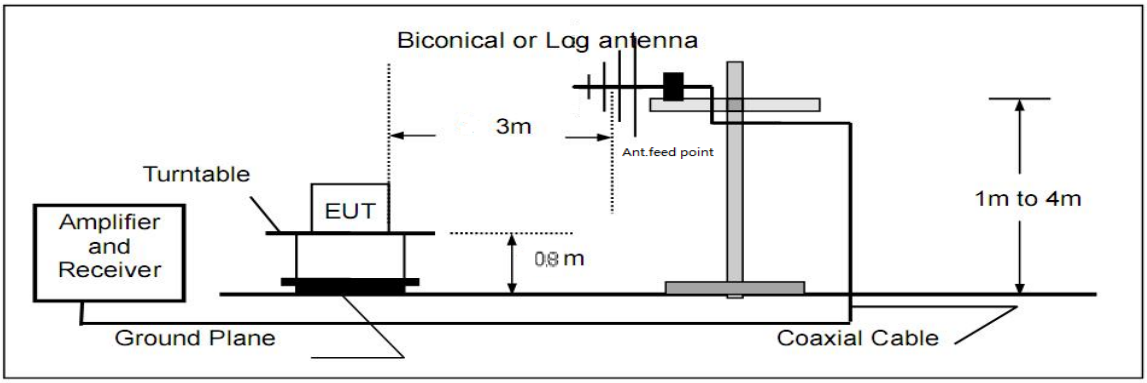
(7)The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.

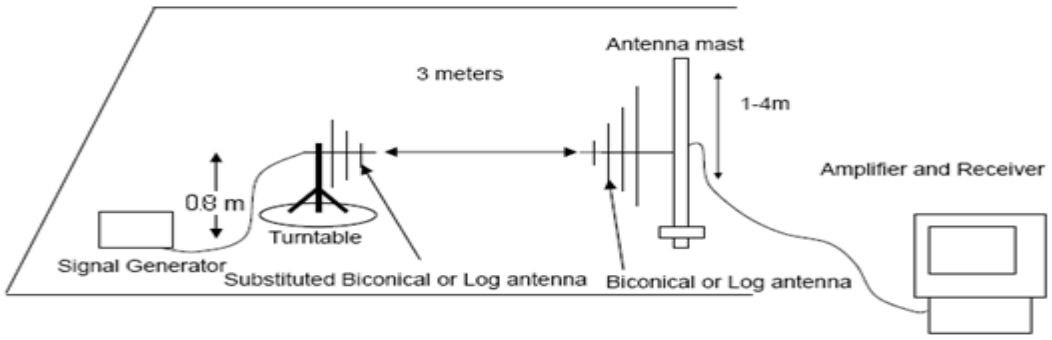
(8)The maximum signal level detected by the measuring receiver shall be noted.
(9)The measurement shall be repeated with the test antenna set to horizontal polarization.
(10) Replace the antenna with a proper Antenna (substitution antenna).
(11)The substitution antenna shall be oriented for vertical 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.

8.3 TEST SETUP BLOCK DIAGRAM

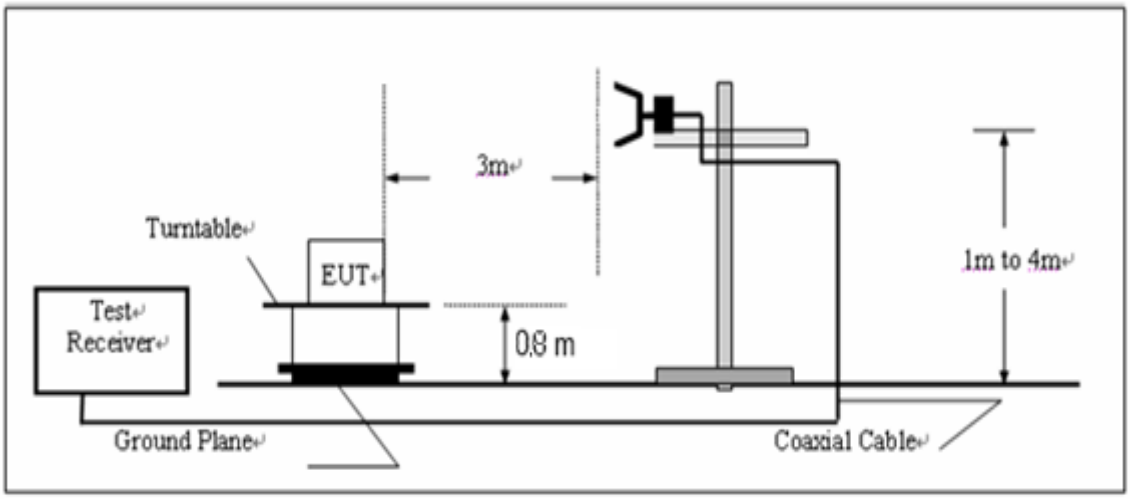
SUBSTITUTION METHOD: (Radiated Emissions)

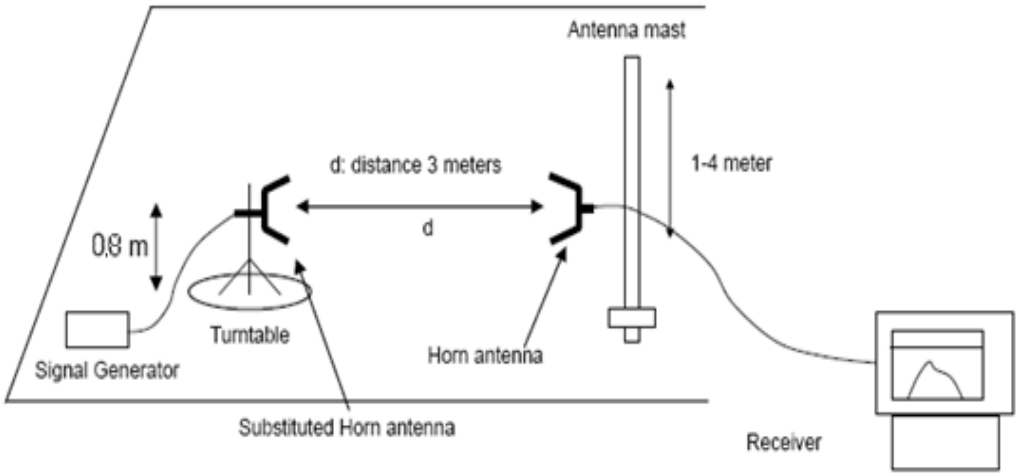
Radiated Below 1GHz





Radiated Above 1 GHz





8.4 MEASUREMENT RESULTS:

Measurement Result for 12.5 KHz Channel Separation

On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (fd in KHz)for of more than 12.5 KHz: at least 50+10 log(P) dB or 70 dB, which ever is lesser attenuation.

Limit: At least 50+10 log (P) =50+10log (5) =57 (dB)—5W
At least 50+10 log (P) =50+10log (1) =43 (dB)—0.2W

Analog:

TEST RESULTS

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
400.025	H	0		pass
800.050	H	71.56	57	pass
1200.075	H	73.61	57	pass
1600.100	H	78.32	57	pass
2000.125	H	80.29	57	pass
2400.150	H	81.54	57	pass
2800.175	H	82.62	57	pass
3200.200	H	80.64	57	pass
3600.225	H	85.29	57	pass
4000.250	H	87.68	57	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
400.025	V	0		pass
800.050	V	70.65	57	pass
1200.075	V	72.03	57	pass
1600.100	V	74.62	57	pass
2000.125	V	82.61	57	pass
2400.150	V	83.69	57	pass
2800.175	V	85.61	57	pass
3200.200	V	87.29	57	pass
3600.225	V	88.66	57	pass
4000.250	V	88.52	57	pass

Measurement Result for 12.5 KHz Channel Separation @ 440.025MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
440.025	H	0		pass
880.050	H	72.95	57	pass
1320.075	H	71.04	57	pass
1760.100	H	74.62	57	pass
2200.125	H	73.49	57	pass
2640.150	H	75.69	57	pass
3080.175	H	76.82	57	pass
3520.200	H	80.51	57	pass
3960.225	H	83.65	57	pass
4400.250	H	88.65	57	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
440.025	V	0		pass
880.050	V	70.58	57	pass
1320.075	V	72.61	57	pass
1760.100	V	73.52	57	pass
2200.125	V	75.91	57	pass
2640.150	V	78.91	57	pass
3080.175	V	80.26	57	pass
3520.200	V	83.62	57	pass
3960.225	V	85.19	57	pass
4400.250	V	86.29	57	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
479.975	H	0		pass
959.950	H	73.51	57	pass
1439.925	H	72.69	57	pass
1919.900	H	75.39	57	pass
2399.875	H	76.85	57	pass
2879.850	H	77.18	57	pass
3359.825	H	79.51	57	pass
3839.800	H	80.64	57	pass
4319.775	H	83.19	57	pass
4799.750	H	85.63	57	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
479.975	V	0		pass
959.950	V	74.81	57	pass
1439.925	V	73.62	57	pass
1919.900	V	76.26	57	pass
2399.875	V	78.64	57	pass
2879.850	V	79.56	57	pass
3359.825	V	80.26	57	pass
3839.800	V	81.69	57	pass
4319.775	V	83.95	57	pass
4799.750	V	86.34	57	pass

TEST RESULTS—0.2W

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
400.025	H	0		pass
800.050	H	79.68	43	pass
1200.075	H	80.67	43	pass
1600.100	H	81.66	43	pass
2000.125	H	83.69	43	pass
2400.150	H	84.24	43	pass
2800.175	H	84.64	43	pass
3200.200	H	86.53	43	pass
3600.225	H	87.95	43	pass
4000.250	H	88.63	43	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
400.025	V	0		pass
800.050	V	80.36	43	pass
1200.075	V	81.54	43	pass
1600.100	V	82.69	43	pass
2000.125	V	83.57	43	pass
2400.150	V	83.64	43	pass
2800.175	V	84.16	43	pass
3200.200	V	85.69	43	pass
3600.225	V	86.15	43	pass
4000.250	V	87.65	43	pass

Measurement Result for 12.5 KHz Channel Separation @ 440.025MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
440.025	H	0		pass
880.050	H	78.94	43	pass
1320.075	H	79.58	43	pass
1760.100	H	80.47	43	pass
2200.125	H	81.64	43	pass
2640.150	H	83.65	43	pass
3080.175	H	82.64	43	pass
3520.200	H	83.64	43	pass
3960.225	H	85.69	43	pass
4400.250	H	86.42	43	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
440.025	V	0		pass
880.050	V	79.08	43	pass
1320.075	V	80.14	43	pass
1760.100	V	82.47	43	pass
2200.125	V	82.94	43	pass
2640.150	V	85.65	43	pass
3080.175	V	88.42	43	pass
3520.200	V	89.57	43	pass
3960.225	V	89.48	43	pass
4400.250	V	90.14	43	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
479.975	H	0		pass
959.950	H	80.42	43	pass
1439.925	H	81.48	43	pass
1919.900	H	82.53	43	pass
2399.875	H	83.66	43	pass
2879.850	H	87.14	43	pass
3359.825	H	88.61	43	pass
3839.800	H	88.19	43	pass
4319.775	H	89.37	43	pass
4799.750	H	90.19	43	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
479.975	V	0		pass
959.950	V	78.15	43	pass
1439.925	V	79.59	43	pass
1919.900	V	80.24	43	pass
2399.875	V	82.64	43	pass
2879.850	V	83.51	43	pass
3359.825	V	84.96	43	pass
3839.800	V	85.19	43	pass
4319.775	V	86.47	43	pass
4799.750	V	87.42	43	pass

Digital:

TEST RESULTS

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
400.025	H	0		pass
800.050	H	75.62	57	pass
1200.075	H	76.94	57	pass
1600.100	H	78.19	57	pass
2000.125	H	80.16	57	pass
2400.150	H	82.65	57	pass
2800.175	H	79.62	57	pass
3200.200	H	83.51	57	pass
3600.225	H	84.19	57	pass
4000.250	H	84.53	57	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
400.025	V	0		pass
800.050	V	72.61	57	pass
1200.075	V	73.52	57	pass
1600.100	V	75.42	57	pass
2000.125	V	76.82	57	pass
2400.150	V	77.63	57	pass
2800.175	V	77.16	57	pass
3200.200	V	79.64	57	pass
3600.225	V	81.63	57	pass
4000.250	V	83.24	57	pass

Measurement Result for 12.5 KHz Channel Separation @ 440.025MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
440.025	H	0		pass
880.050	H	72.51	57	pass
1320.075	H	69.56	57	pass
1760.100	H	72.61	57	pass
2200.125	H	73.28	57	pass
2640.150	H	75.38	57	pass
3080.175	H	74.92	57	pass
3520.200	H	79.61	57	pass
3960.225	H	81.52	57	pass
4400.250	H	83.66	57	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
440.025	V	0		pass
880.050	V	72.62	57	pass
1320.075	V	70.84	57	pass
1760.100	V	73.66	57	pass
2200.125	V	75.17	57	pass
2640.150	V	76.94	57	pass
3080.175	V	79.63	57	pass
3520.200	V	80.69	57	pass
3960.225	V	82.88	57	pass
4400.250	V	85.93	57	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
479.975	H	0		pass
959.950	H	70.39	57	pass
1439.925	H	69.85	57	pass
1919.900	H	71.54	57	pass
2399.875	H	72.36	57	pass
2879.850	H	75.37	57	pass
3359.825	H	76.82	57	pass
3839.800	H	79.68	57	pass
4319.775	H	81.99	57	pass
4799.750	H	85.46	57	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
479.975	V	0		pass
959.950	V	72.69	57	pass
1439.925	V	73.49	57	pass
1919.900	V	75.97	57	pass
2399.875	V	76.24	57	pass
2879.850	V	77.82	57	pass
3359.825	V	79.66	57	pass
3839.800	V	80.46	57	pass
4319.775	V	83.58	57	pass
4799.750	V	85.21	57	pass

TEST RESULTS—0.2W

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
400.025	H	0		pass
800.050	H	80.26	43	pass
1200.075	H	81.62	43	pass
1600.100	H	82.69	43	pass
2000.125	H	84.62	43	pass
2400.150	H	85.15	43	pass
2800.175	H	86.95	43	pass
3200.200	H	87.32	43	pass
3600.225	H	86.95	43	pass
4000.250	H	88.67	43	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
400.025	V	0		pass
800.050	V	79.64	43	pass
1200.075	V	80.25	43	pass
1600.100	V	81.57	43	pass
2000.125	V	82.65	43	pass
2400.150	V	83.59	43	pass
2800.175	V	84.29	43	pass
3200.200	V	85.34	43	pass
3600.225	V	86.24	43	pass
4000.250	V	87.83	43	pass

Measurement Result for 12.5 KHz Channel Separation @ 440.025MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
440.025	H	0		pass
880.050	H	78.64	43	pass
1320.075	H	79.28	43	pass
1760.100	H	80.16	43	pass
2200.125	H	81.44	43	pass
2640.150	H	83.18	43	pass
3080.175	H	84.53	43	pass
3520.200	H	85.48	43	pass
3960.225	H	86.29	43	pass
4400.250	H	87.58	43	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
440.025	V	0		pass
880.050	V	80.17	43	pass
1320.075	V	81.35	43	pass
1760.100	V	83.22	43	pass
2200.125	V	85.64	43	pass
2640.150	V	83.26	43	pass
3080.175	V	86.92	43	pass
3520.200	V	86.04	43	pass
3960.225	V	87.38	43	pass
4400.250	V	88.09	43	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
479.975	H	0		pass
959.950	H	80.56	43	pass
1439.925	H	81.46	43	pass
1919.900	H	82.63	43	pass
2399.875	H	83.96	43	pass
2879.850	H	85.31	43	pass
3359.825	H	87.24	43	pass
3839.800	H	88.54	43	pass
4319.775	H	88.03	43	pass
4799.750	H	89.72	43	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result Below carrier(dBc)	Limit below carrier(dBc)	Result(P/F)
479.975	V	0		pass
959.950	V	78.68	43	pass
1439.925	V	79.62	43	pass
1919.900	V	81.52	43	pass
2399.875	V	82.63	43	pass
2879.850	V	83.42	43	pass
3359.825	V	85.91	43	pass
3839.800	V	86.14	43	pass
4319.775	V	87.63	43	pass
4799.750	V	88.95	43	pass

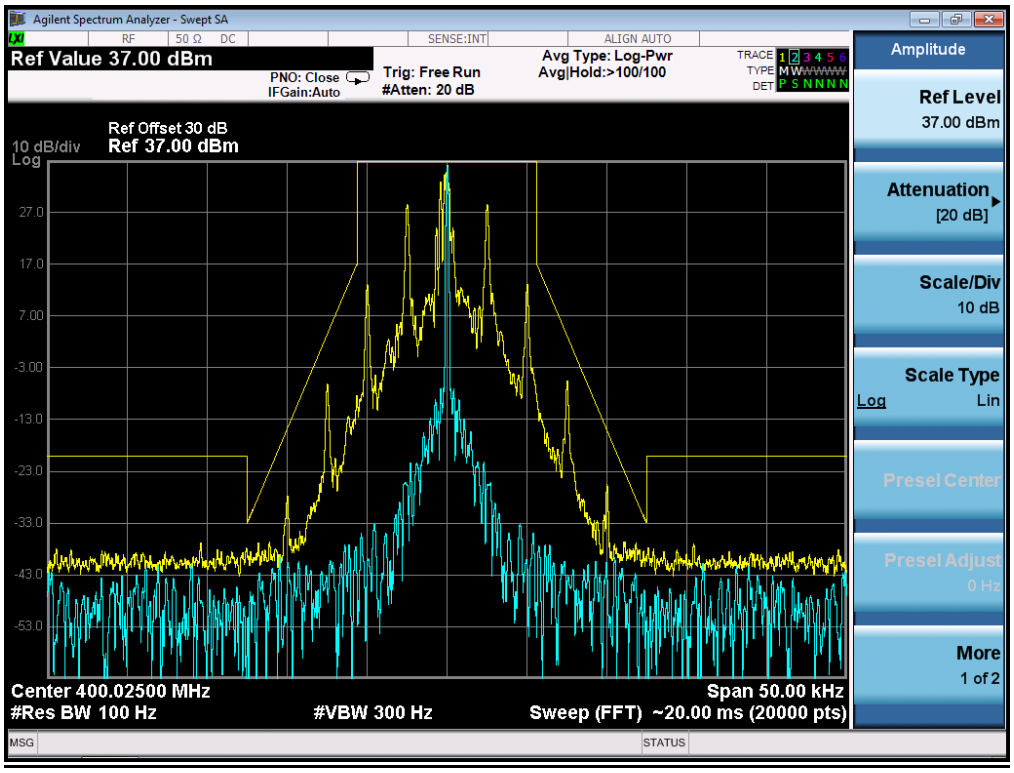
8.5 EMISSION MASK PLOT

The detailed procedure employed for Emission Mask measurements are specified as following:

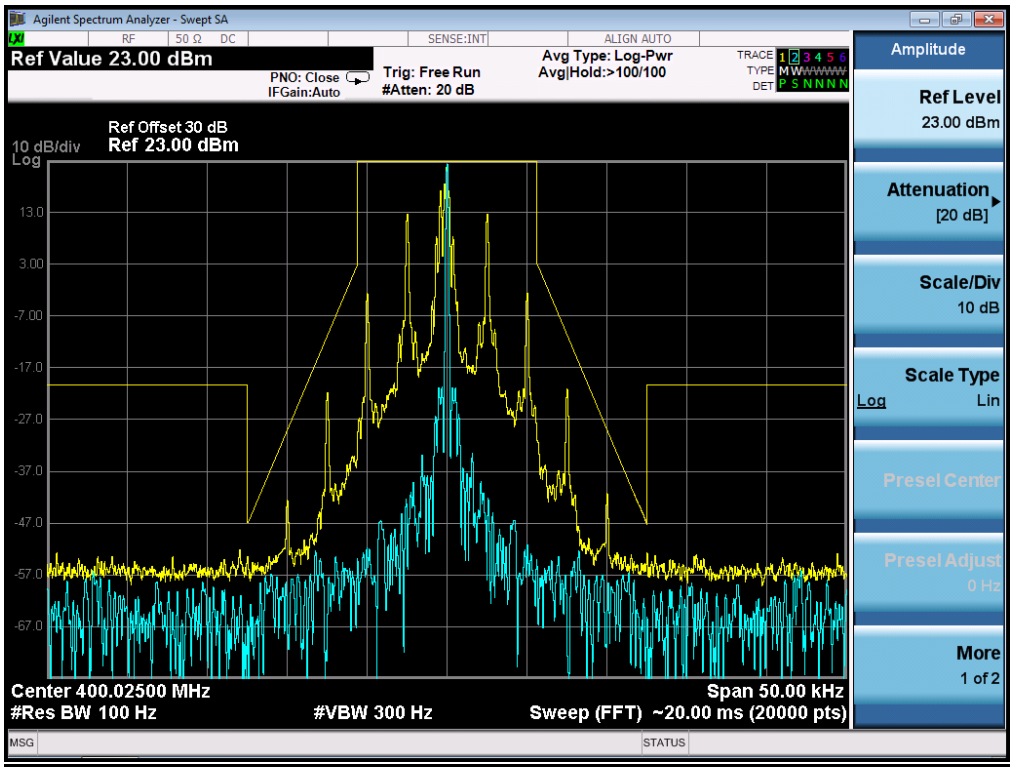
- The transmitter shall be modulated by a 2.5 kHz audio signal,
- The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz.

Analog:

The Worst Emission Mask D for 12.5 KHz channel Separation (5W)

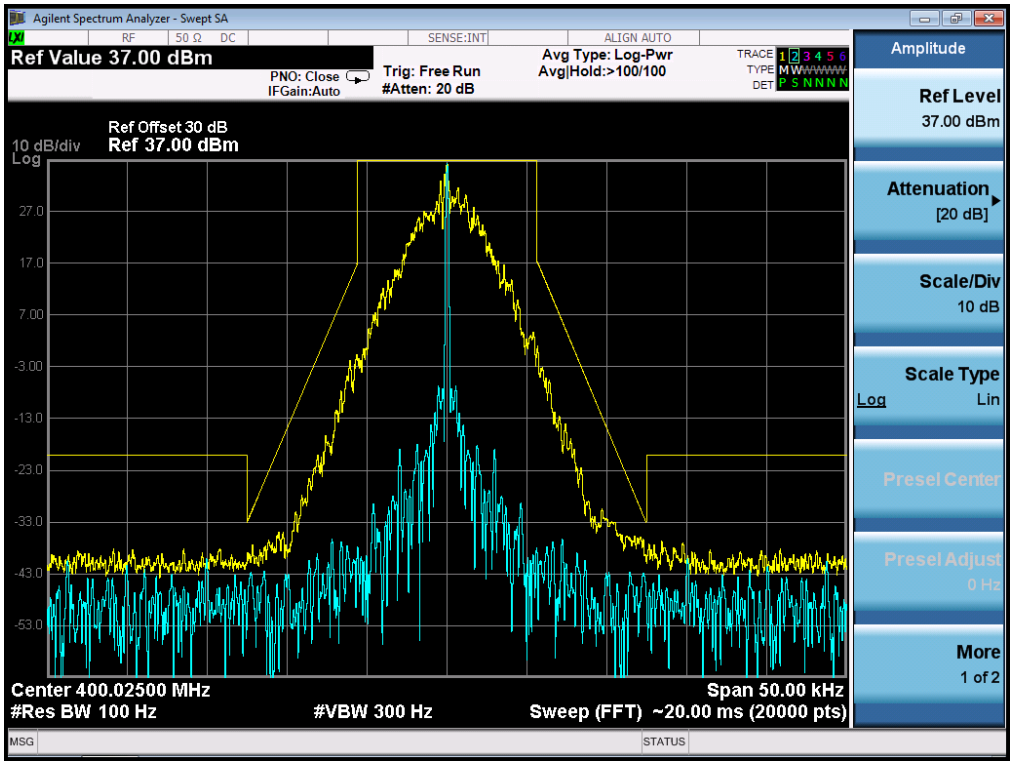


The Worst Emission Mask D for 12.5 KHz channel Separation (0.2W)

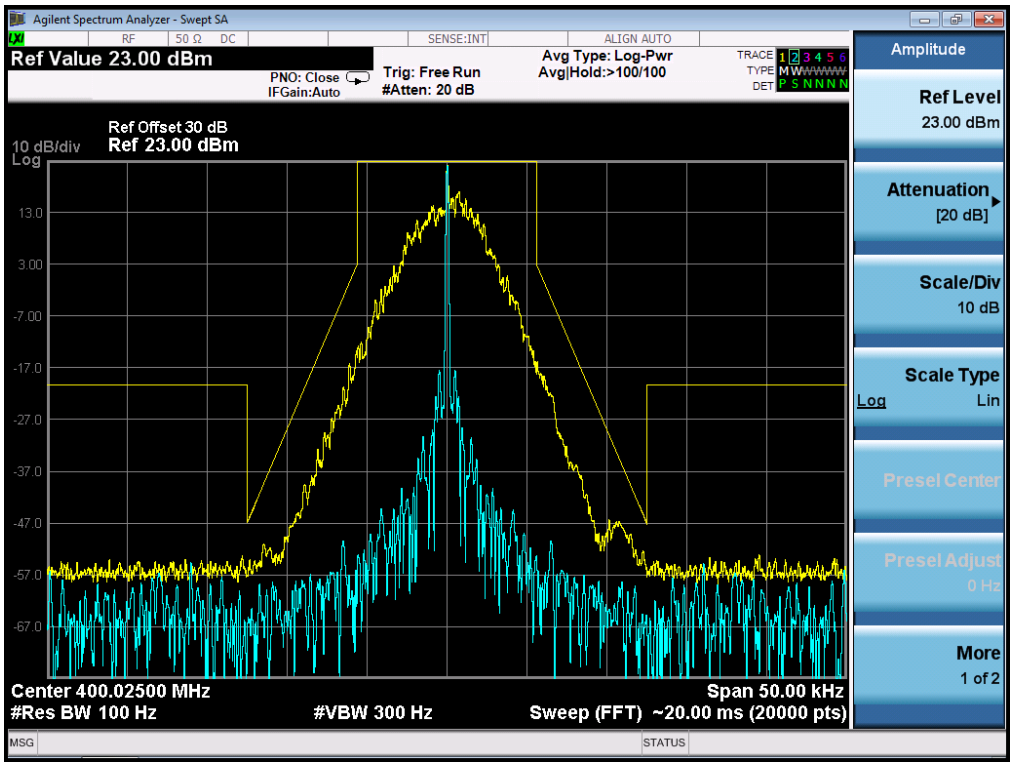


Digital：

The Worst Emission Mask D for 12.5 KHz channel Separation (5W)



The Worst Emission Mask D for 12.5 KHz channel Separation-(0.2V)



9. MODULATION CHARACTERISTICS

9.1 PROVISIONS APPLICABLE

According to CFR 47 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.

9.2 MEASUREMENT METHOD

9.2.1 MODULATION LIMIT

(1). Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1KHz 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, 1000, 1500 and 3000Hz in sequence.

9.2.2 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 (0 dB).

(3). Vary the Audio frequency from 100 Hz to 10 KHz and record the frequency deviation.

(4). Audio Frequency Response = 20log10 (Deviation of test frequency/Deviation of 1 KHz reference).

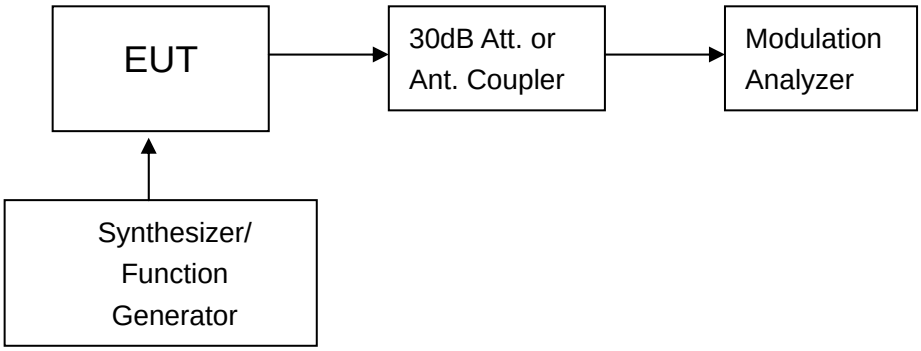


Figure 1: Modulation characteristic measurement configuration

9.3 MEASUREMENT RESULT

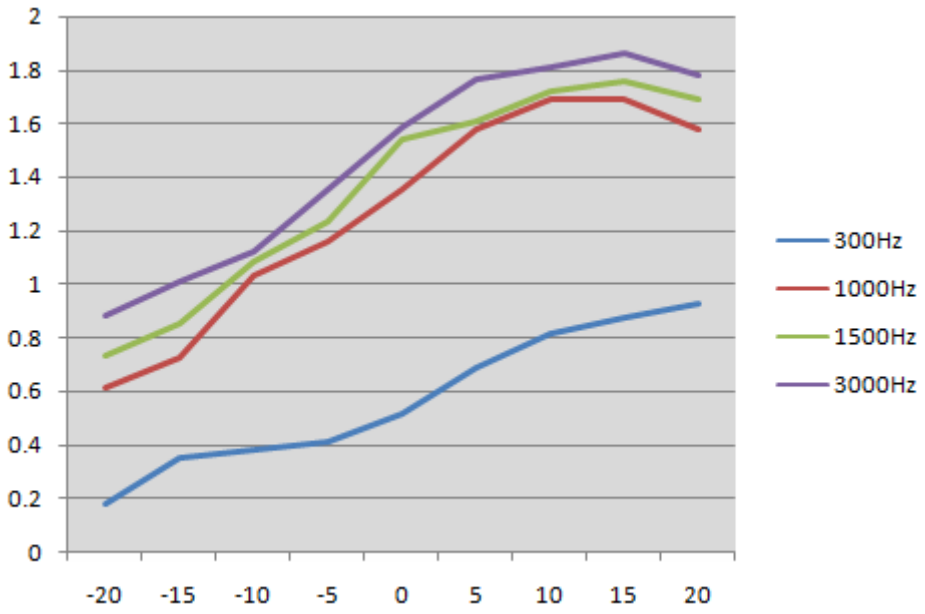
Analog:

TEST RESULT FOR---5W

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.18	0.61	0.73	0.88
-15	0.35	0.72	0.85	1.01
-10	0.38	1.03	1.08	1.12
-5	0.41	1.16	1.23	1.35
0	0.52	1.35	1.54	1.58
+5	0.69	1.58	1.61	1.76
+10	0.82	1.69	1.72	1.81
+15	0.88	1.69	1.76	1.86
+20	0.93	1.58	1.69	1.78



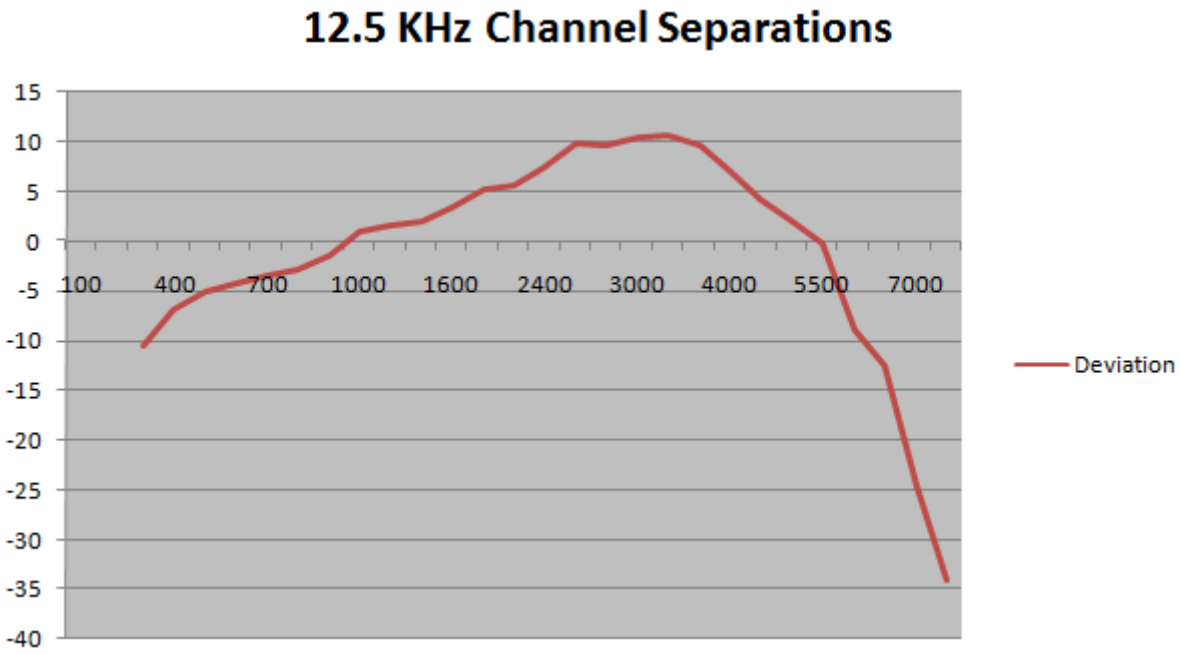
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.15	-10.46
400	0.23	-6.74
500	0.28	-5.04
600	0.31	-4.15
700	0.34	-3.35
800	0.36	-2.85
900	0.43	-1.31
1000	0.56	0.98
1200	0.6	1.58
1400	0.63	2.01
1600	0.74	3.41
1800	0.91	5.20
2000	0.96	5.67
2400	1.18	7.46
2500	1.56	9.88
2800	1.54	9.77
3000	1.69	10.58
3200	1.71	10.68
3600	1.54	9.77
4000	1.12	7.00
4500	0.82	4.30
5000	0.63	2.01
5500	0.49	-0.18
6000	0.18	-8.87
6500	0.12	-12.40
7000	0.03	-24.44
7500	0.01	-33.98
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Middle Channel (UHF)



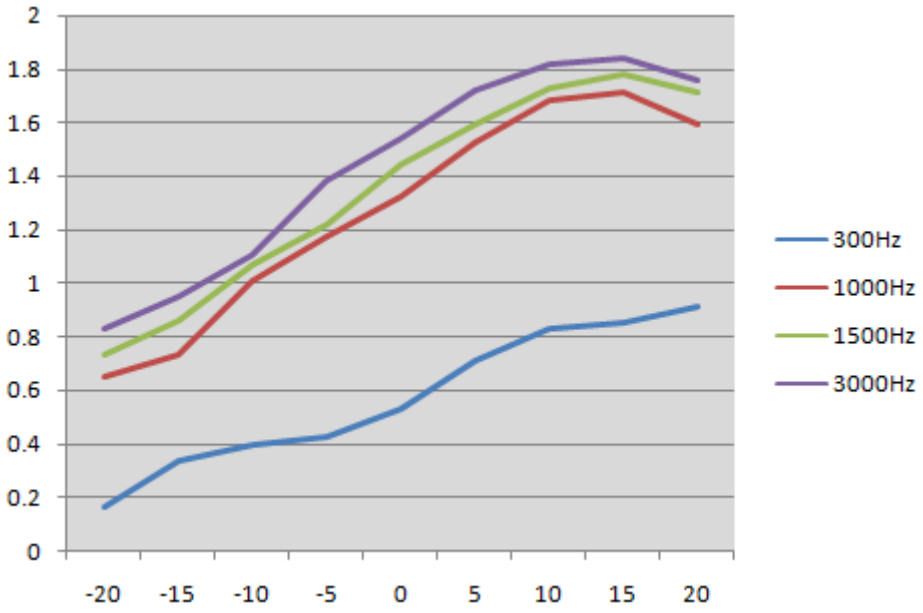
Note: All the modes had been tested, but only the worst data recorded in the report.

TEST RESULT FOR---0.2W

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.16	0.65	0.73	0.83
-15	0.33	0.73	0.86	0.95
-10	0.39	1.01	1.07	1.11
-5	0.42	1.17	1.22	1.38
0	0.53	1.32	1.44	1.54
+5	0.71	1.52	1.59	1.72
+10	0.83	1.68	1.73	1.82
+15	0.85	1.71	1.78	1.84
+20	0.91	1.59	1.71	1.76



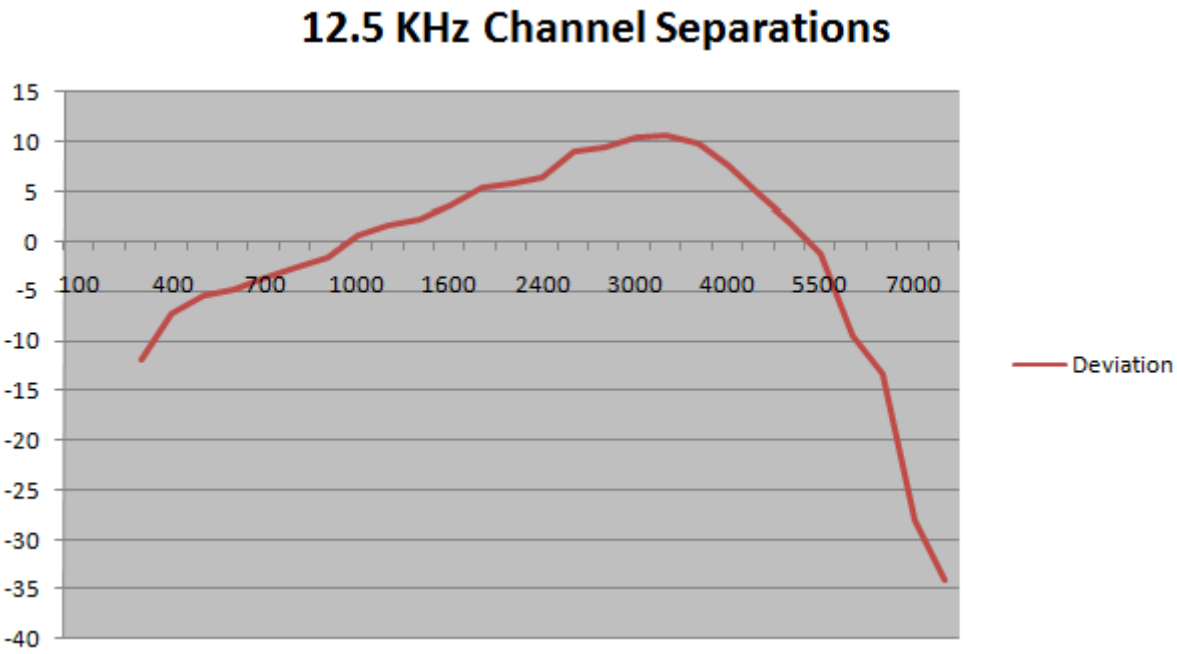
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.13	-11.70
400	0.22	-7.13
500	0.27	-5.35
600	0.29	-4.73
700	0.33	-3.61
800	0.37	-2.62
900	0.42	-1.51
1000	0.54	0.67
1200	0.61	1.73
1400	0.65	2.28
1600	0.76	3.64
1800	0.93	5.39
2000	0.97	5.76
2400	1.04	6.36
2500	1.39	8.88
2800	1.47	9.37
3000	1.64	10.32
3200	1.69	10.58
3600	1.55	9.83
4000	1.19	7.53
4500	0.86	4.71
5000	0.62	1.87
5500	0.44	-1.11
6000	0.17	-9.37
6500	0.11	-13.15
7000	0.02	-27.96
7500	0.01	-33.98
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Middle Channel



Note: All the modes had been tested, but only the worst data recorded in the report.

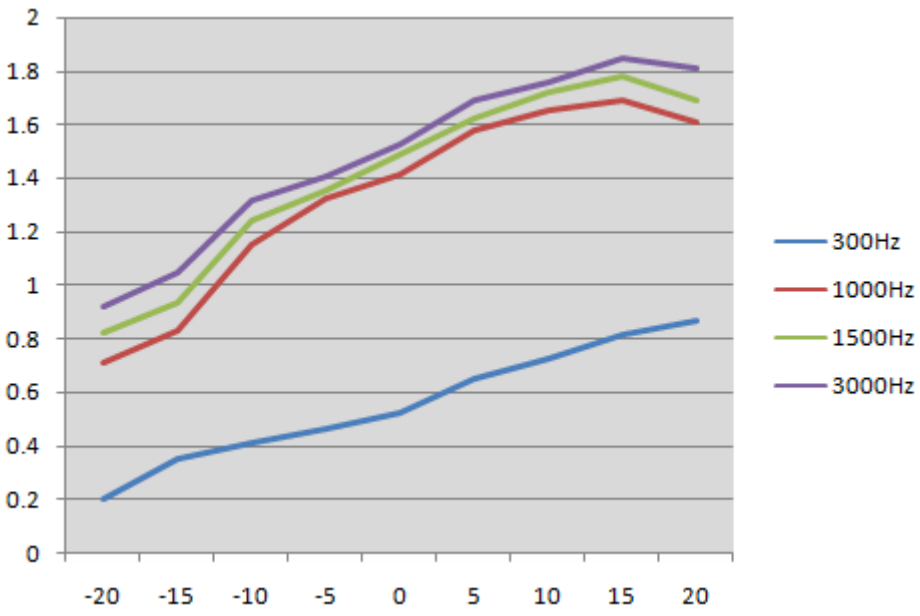
Digital:

TEST RESULT TS FOR-- 5W

(A). MODULATION LIMIT:

High Channel @ 12.5 KHz Channel Separations

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.2	0.71	0.82	0.92
-15	0.35	0.83	0.93	1.05
-10	0.41	1.15	1.24	1.32
-5	0.46	1.32	1.35	1.41
0	0.52	1.41	1.49	1.53
+5	0.65	1.58	1.62	1.69
+10	0.73	1.65	1.72	1.76
+15	0.82	1.69	1.78	1.85
+20	0.87	1.61	1.69	1.81



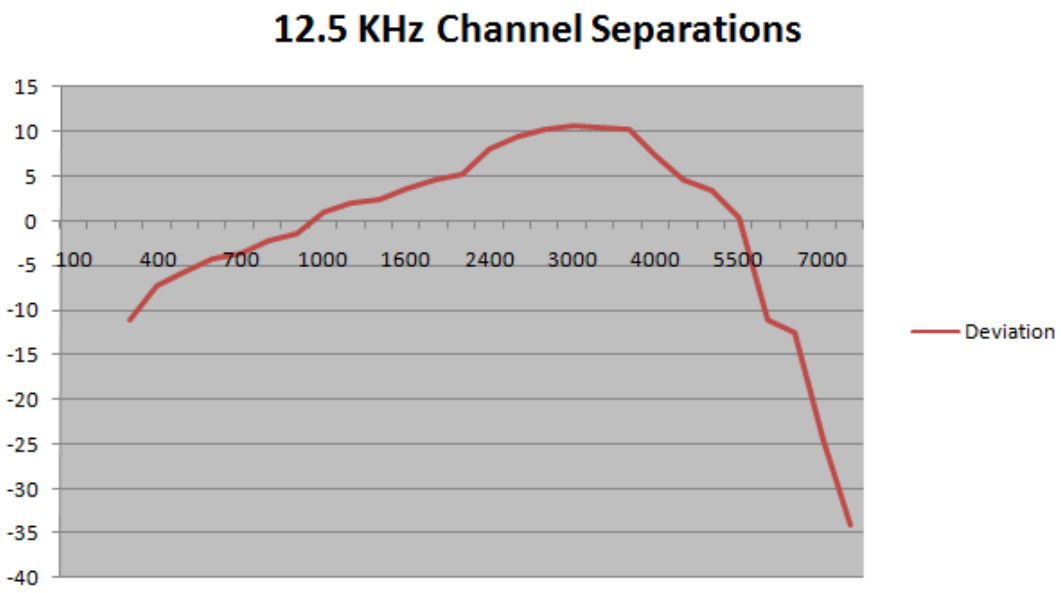
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

High Channel @ 12.5 KHz Channel Separations

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.14	-11.06
400	0.22	-7.13
500	0.26	-5.68
600	0.31	-4.15
700	0.33	-3.61
800	0.39	-2.16
900	0.43	-1.31
1000	0.56	0.98
1200	0.63	2.01
1400	0.66	2.41
1600	0.76	3.64
1800	0.86	4.71
2000	0.91	5.20
2400	1.28	8.16
2500	1.49	9.48
2800	1.63	10.26
3000	1.72	10.73
3200	1.69	10.58
3600	1.63	10.26
4000	1.15	7.23
4500	0.85	4.61
5000	0.74	3.41
5500	0.53	0.51
6000	0.14	-11.06
6500	0.12	-12.40
7000	0.03	-24.44
7500	0.01	-33.98
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Middle Channel



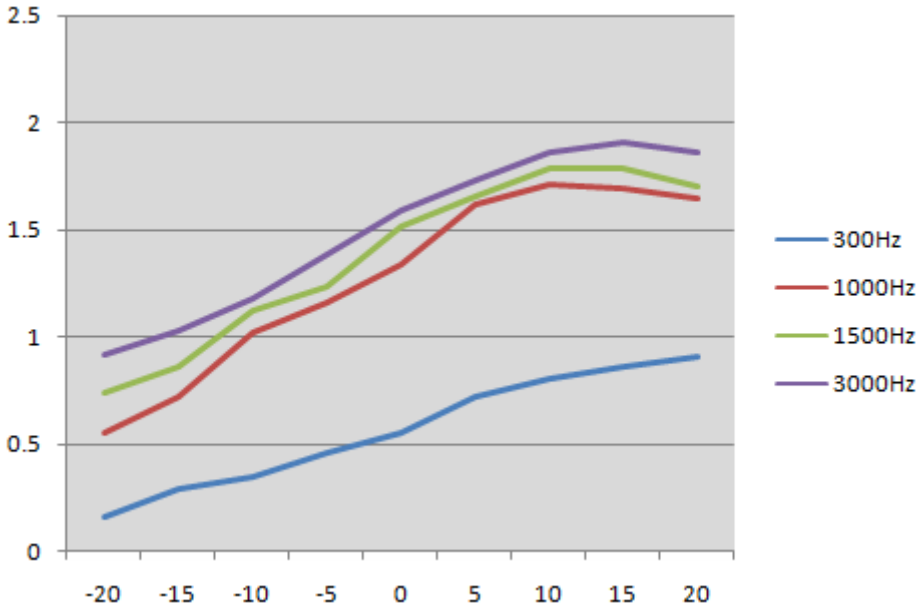
Note: All the modes had been tested, but only the worst data recorded in the report.

TEST RESULT FOR---0.2W

(A). MODULATION LIMIT:

Middle Channel @ 12.5 KHz Channel Separations

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.16	0.55	0.74	0.92
-15	0.29	0.72	0.86	1.03
-10	0.345	1.02	1.12	1.18
-5	0.46	1.16	1.24	1.39
0	0.55	1.34	1.52	1.59
+5	0.72	1.62	1.66	1.73
+10	0.81	1.71	1.79	1.86
+15	0.86	1.69	1.79	1.91
+20	0.91	1.64	1.71	1.86



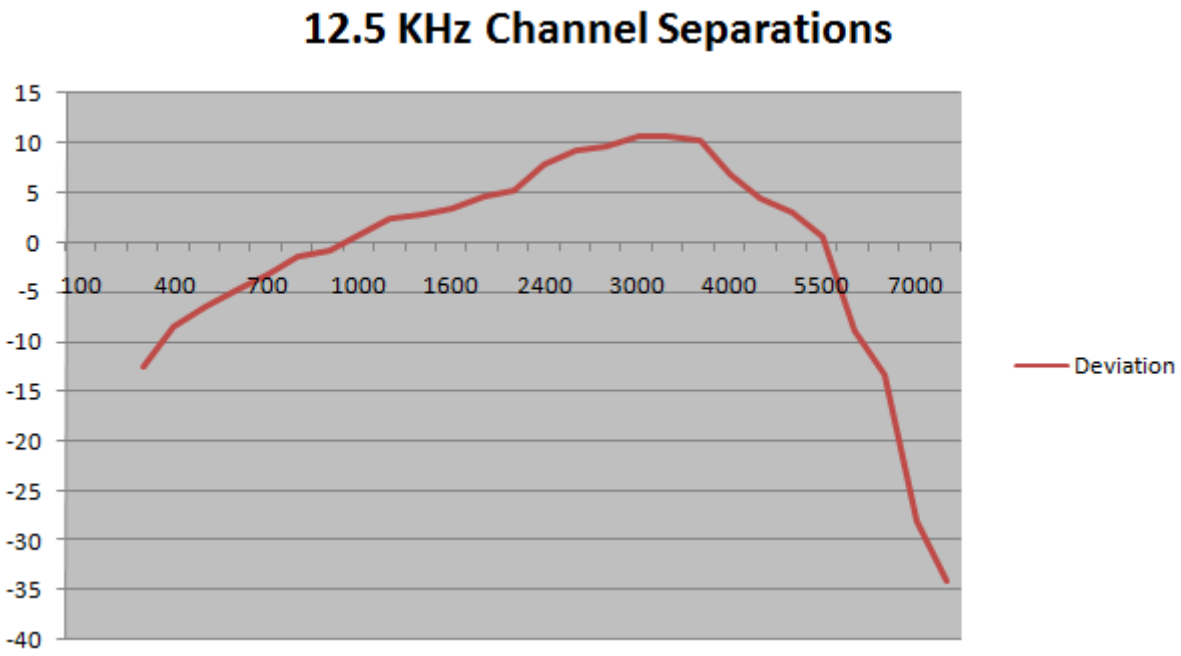
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.12	-12.40
400	0.19	-8.40
500	0.24	-6.38
600	0.29	-4.73
700	0.35	-3.10
800	0.43	-1.31
900	0.46	-0.72
1000	0.55	0.83
1200	0.67	2.54
1400	0.69	2.80
1600	0.75	3.52
1800	0.85	4.61
2000	0.93	5.39
2400	1.25	7.96
2500	1.46	9.31
2800	1.54	9.77
3000	1.72	10.73
3200	1.71	10.68
3600	1.65	10.37
4000	1.12	7.00
4500	0.83	4.40
5000	0.71	3.05
5500	0.54	0.67
6000	0.18	-8.87
6500	0.11	-13.15
7000	0.02	-27.96
7500	0.01	-33.98
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

Frequency Response of Middle Channel (UHF)



Note: All the modes had been tested, but only the worst data recorded in the report.

10. MAXIMUMN TRANSMITTER POWER (CONDUCTED OUTPUT POWER)

10.1 PROVISIONS APPLICABLE

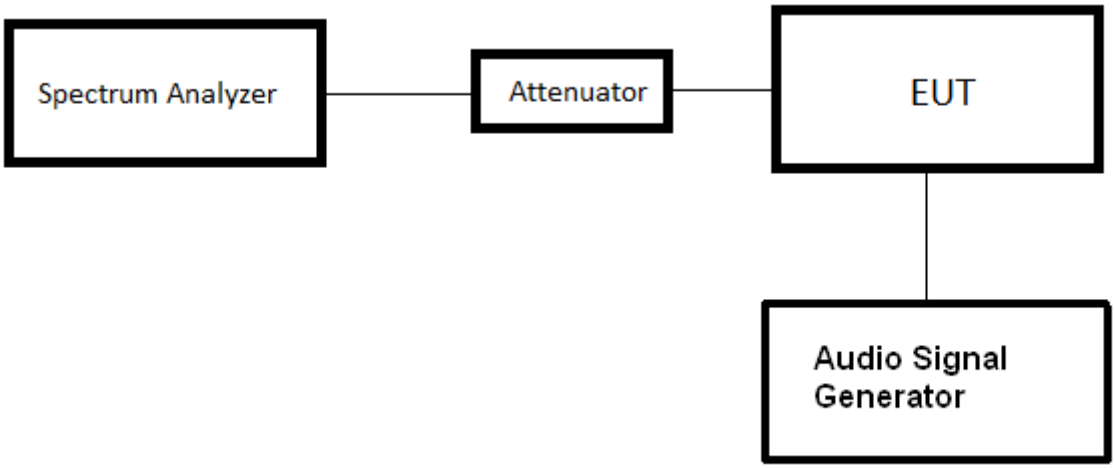
Per FCC §2.1046 and §90.205: Maximum ERP is dependent upon the station's antenna HAAT and required service area.

10.2 TEST PROCEDURE

The RF output of Two-way Radio was conducted to a spectrum analyzer through an appropriate attenuator.

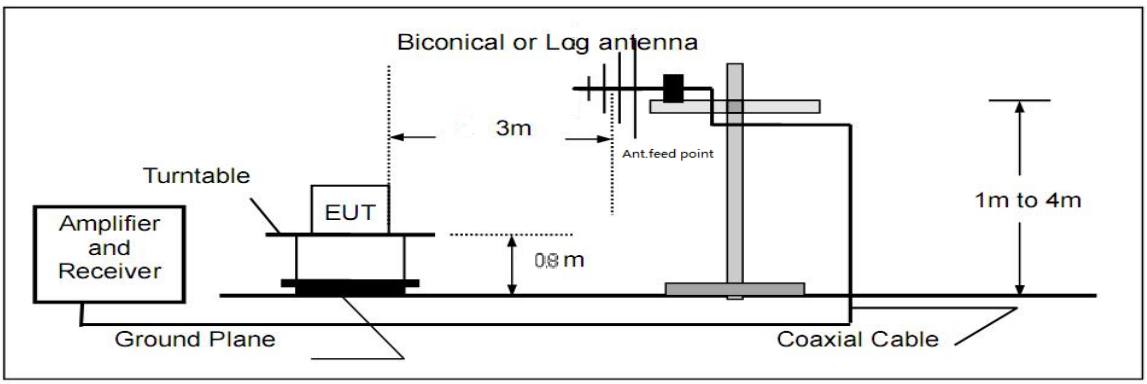
10.3 TEST CONFIGURATION

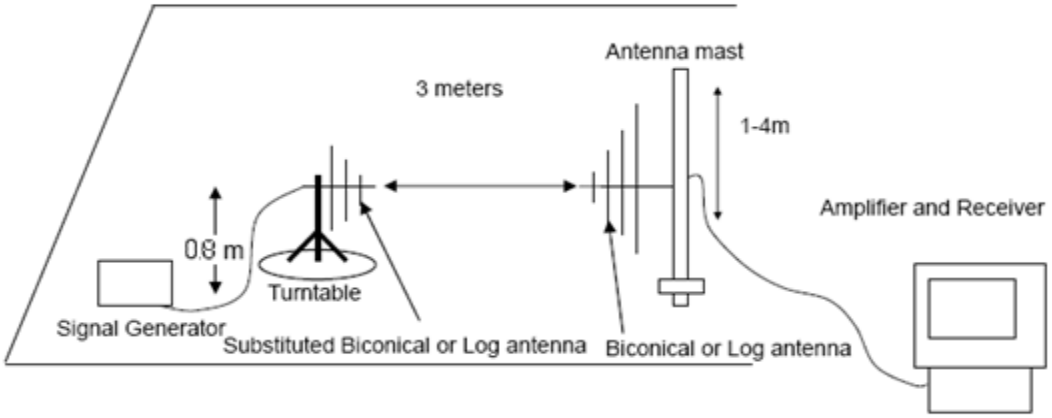
Conducted Output Power:



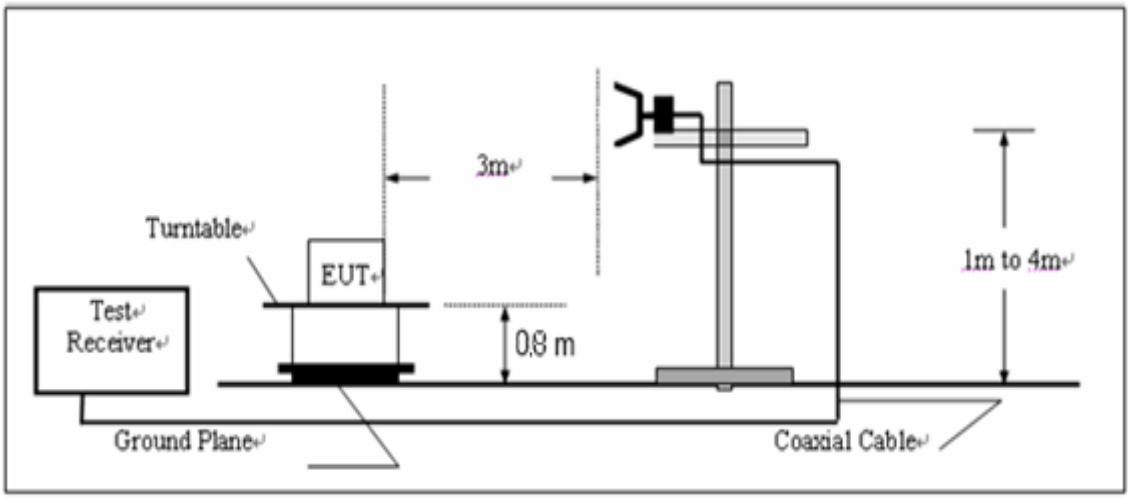
Effective Radiated Power :

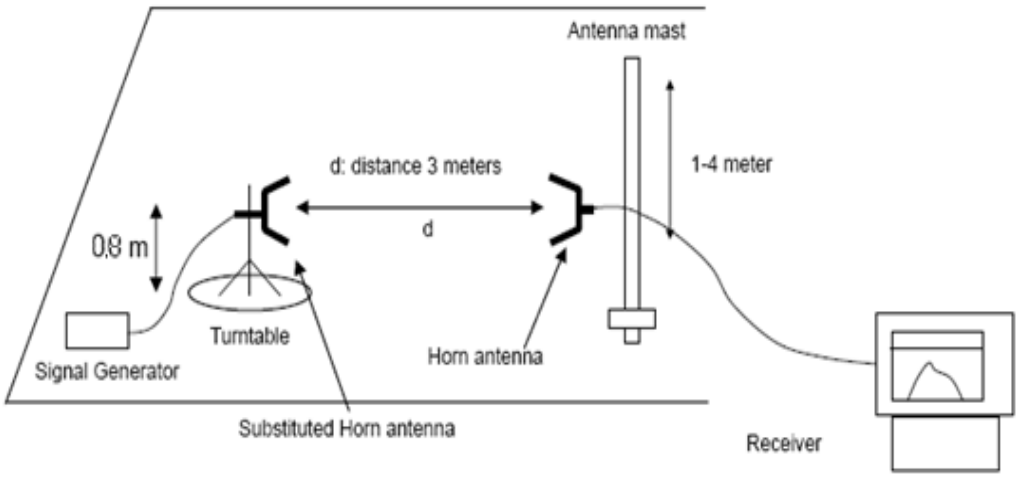
Radiated Below1GHz





Radiated Above 1 GHz





10.4 TEST RESULT

The maximum Conducted Power (CP) is

Analog: 5W/0.2 W for 12.5 KHz Channel Separation

Digital: 5W/0.2 W for 12.5 KHz Channel Separation

Calculation Formula: CP = R + A + L

***** Note:

CP: The final Conducted Power

R : The reading value from spectrum analyzer

A : The attenuation value of the used attenuator

L : The loss of all connection cables

Analog:

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.78
	Middle(440.025MHz)	36.85
	Top (479.975MHz)	36.91

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.86
	Middle(440.025MHz)	36.78
	Top (479.975MHz)	36.83

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 23dBm(0.2W)
12.5 KHz	Bottom(400.025MHz)	22.82
	Middle(440.025MHz)	22.89
	Top (479.975MHz)	22.81

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 23dBm(0.2W)
12.5 KHz	Bottom(400.025MHz)	22.92
	Middle(440.025MHz)	22.76
	Top (479.975MHz)	22.81

Digital:

Date + voice:

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.86
	Middle(440.025MHz)	36.88
	Top (479.975MHz)	36.92

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.93
	Middle(440.025MHz)	36.86
	Top (479.975MHz)	36.89

Data transmission mode:

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.81
	Middle(440.025MHz)	36.78
	Top (479.975MHz)	36.75

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 36.99dBm(5W)
12.5 KHz	Bottom(400.025MHz)	36.84
	Middle(440.025MHz)	36.73
	Top (479.975MHz)	36.76

Data + voice:

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 23dBm(0.2W)
12.5 KHz	Bottom(400.025MHz)	22.89
	Middle(440.025MHz)	22.85
	Top (479.975MHz)	22.86

Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 23dBm(0.2W)
12.5 KHz	Bottom(400.025MHz)	22.96
	Middle(440.025MHz)	22.85
	Top (479.975MHz)	22.87

Data transmission mode:

Conducted Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 23dBm(0.2W)
12.5 KHz	Bottom(400.025MHz)	22.83
	Middle(440.025MHz)	22.76
	Top (479.975MHz)	22.61

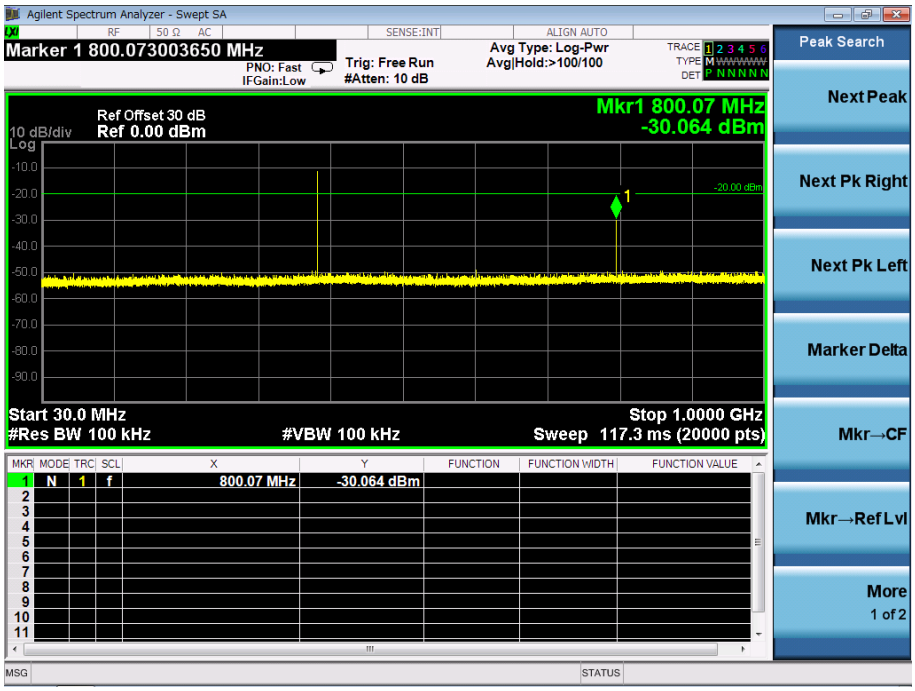
Radiated Power Measurement Results		
Channel Separation	**Channel**	**Measurement Result (dBm)**
		For 23dBm(0.2W)
12.5 KHz	Bottom(400.025MHz)	22.82
	Middle(440.025MHz)	22.66
	Top (479.975MHz)	22.78

10.5 CONDUCT SPURIOUS PLOT

Analog:

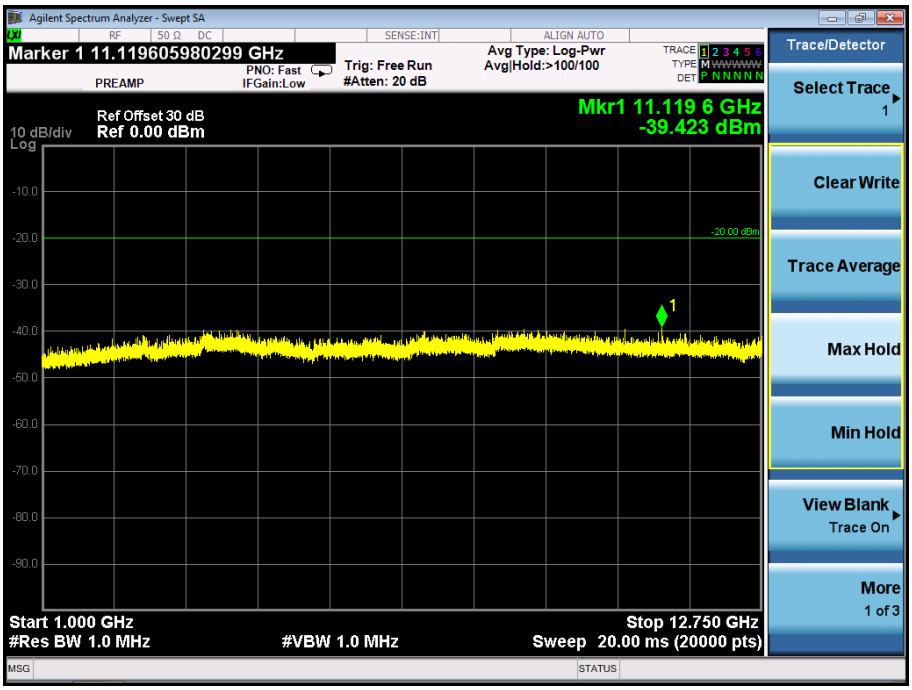
Conducted Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-5W

30MHz-1GHz



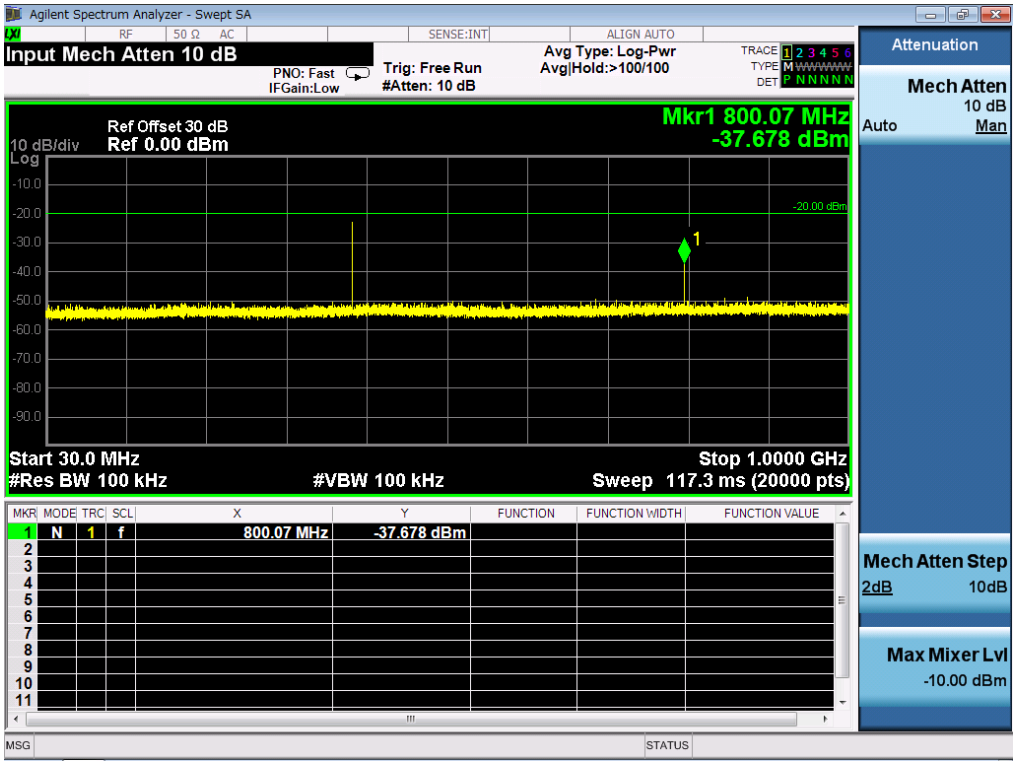
Conduct Spurious Emission (worst) @ 400.025MHz With 12.5 KHz Channel Separation-5W

1GHz-12.75GHz



Conducted Spurious Emission (worst) @400.025 MHz With 12.5 KHz Channel Separation-0.2W

30MHz-1GHz



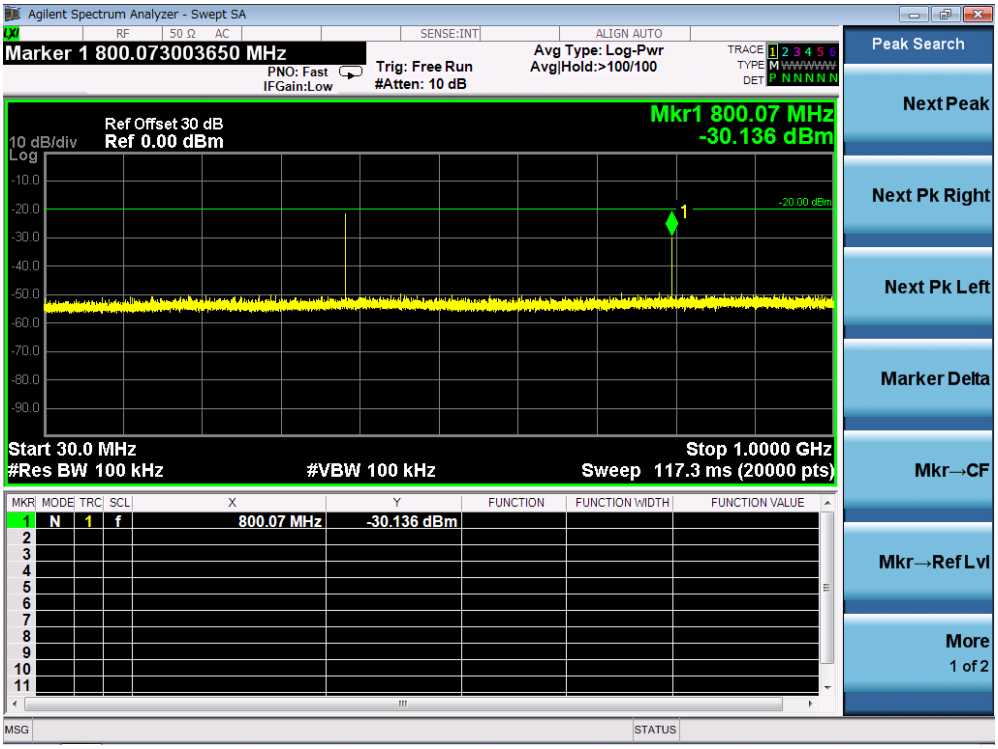
Conduct Spurious Emission (worst) @ 400.025 MHz With 12.5 KHz Channel Separation-0.2W

1GHz-12.75GHz

Digital:

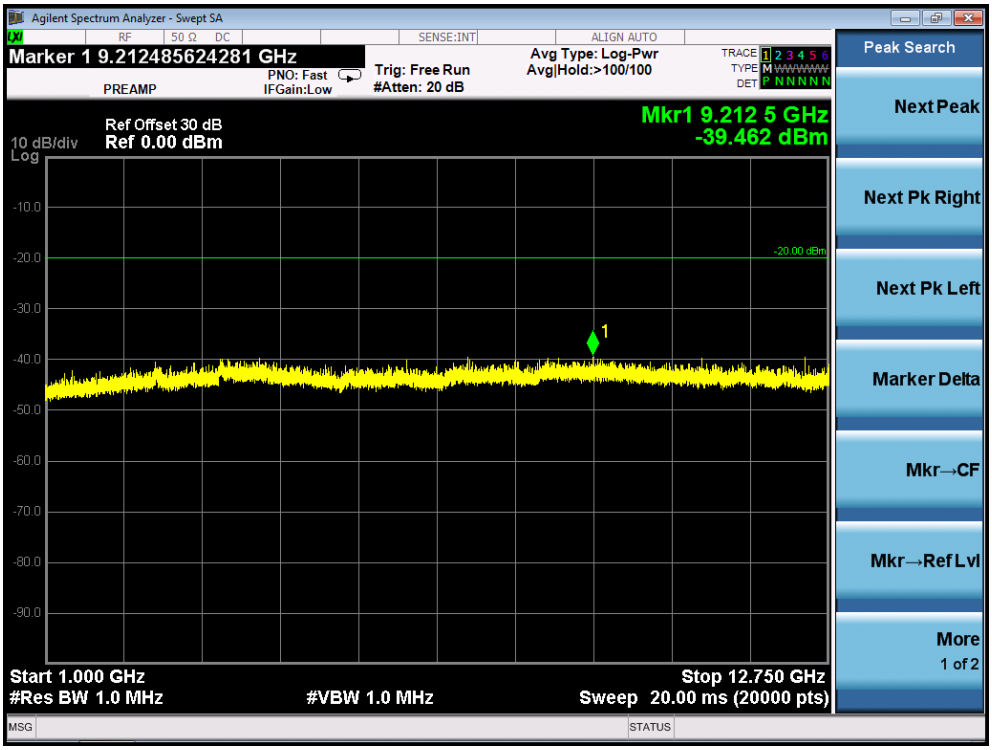
Conducted Spurious Emission (worst) @400.025 MHz With 12.5 KHz Channel Separation-5W

30MHz-1GHz



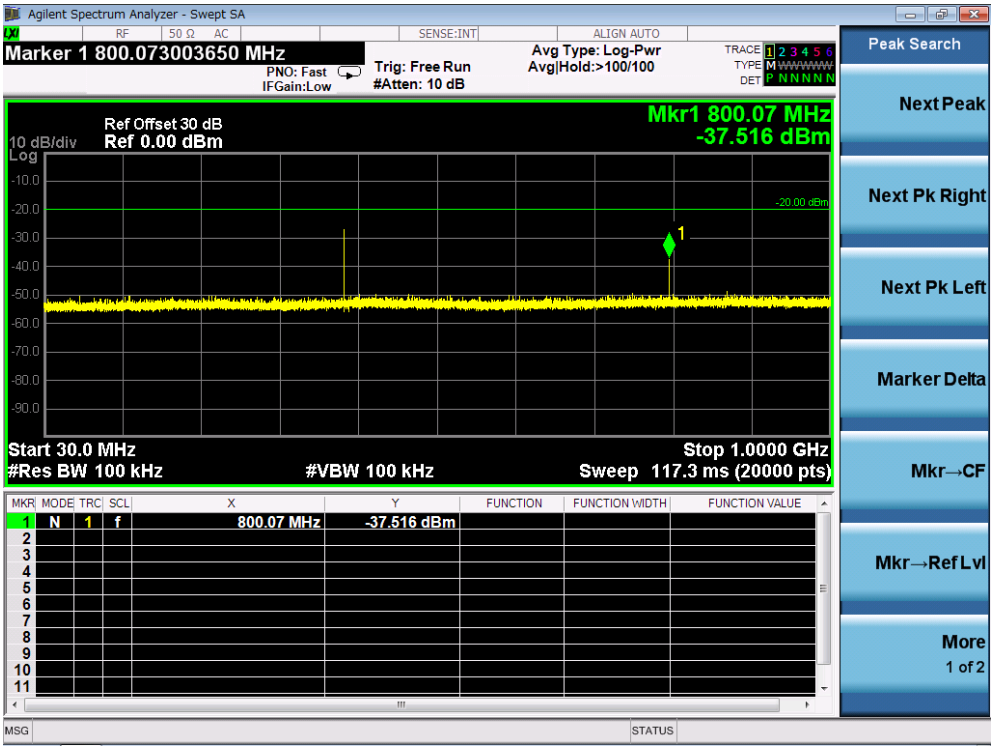
Conduct Spurious Emission (worst) @ 400.025 MHz With 12.5 KHz Channel Separation-5W

1GHz-12.75GHz



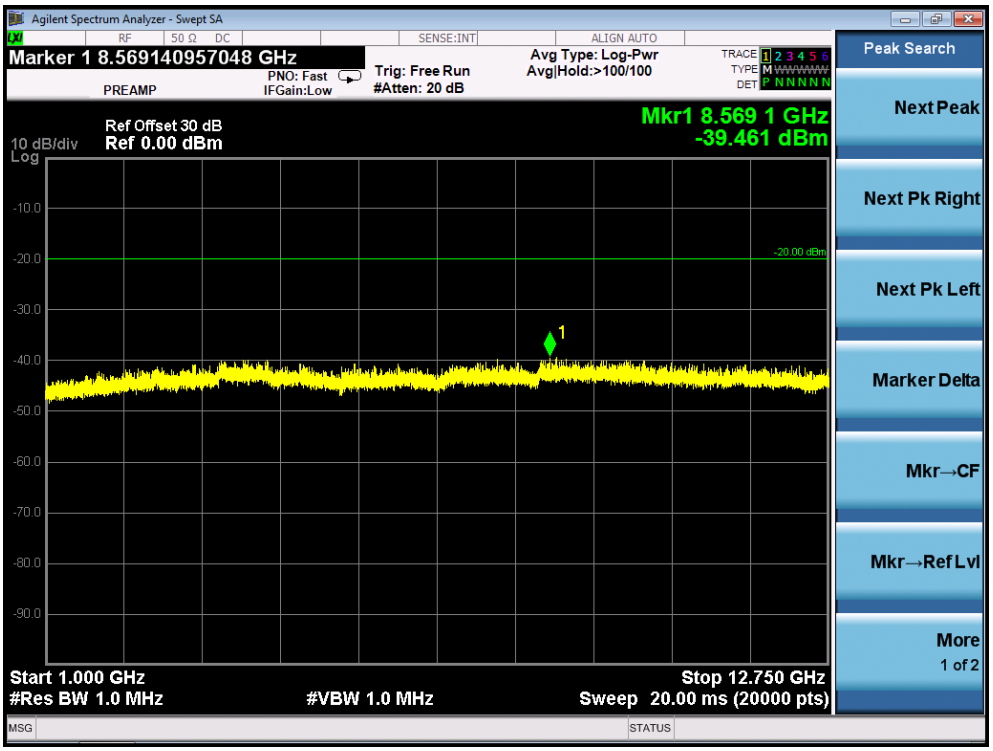
Conducted Spurious Emission (worst) @400.025 MHz With 12.5 KHz Channel Separation-0.2W

30MHz-1GHz



Conduct Spurious Emission (worst) @ 400.025 MHz With 12.5 KHz Channel Separation-0.2W

1GHz-12.75GHz



11. RANSMITTER FREQUENCY BEHAVIOR

11.1PROVISIONS APPLICABLE

Section 90.214

Time intervals [1, 2]	Maximum frequency difference [3]	All equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels			
t_1 [4]	± 25.0 kHz	5.0 ms	10.0 ms
t_2	± 12.5 kHz	20.0 ms	25.0 ms
t_3 [4]	± 25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels			
t_1 [4]	± 12.5 kHz	5.0 ms	10.0 ms
t_2	± 6.25 kHz	20.0 ms	25.0 ms
t_3 [4]	± 12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels			
t_1 [4]	± 6.25 kHz	5.0 ms	10.0 ms
t_2	± 3.125 kHz	20.0 ms	25.0 ms
t_3 [4]	± 6.25 kHz	5.0 ms	10.0 ms

[1] 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.
[2] 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.
[3] Difference between the actual transmitter frequency and the assigned transmitter frequency.
[4] 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.

11.2 TEST METHOD

TIA/EIA-603 2.2.19

11.3 DESCRIBE LIMIT LINE OF RANSMITTER FREQUENCY BEHAVIOR

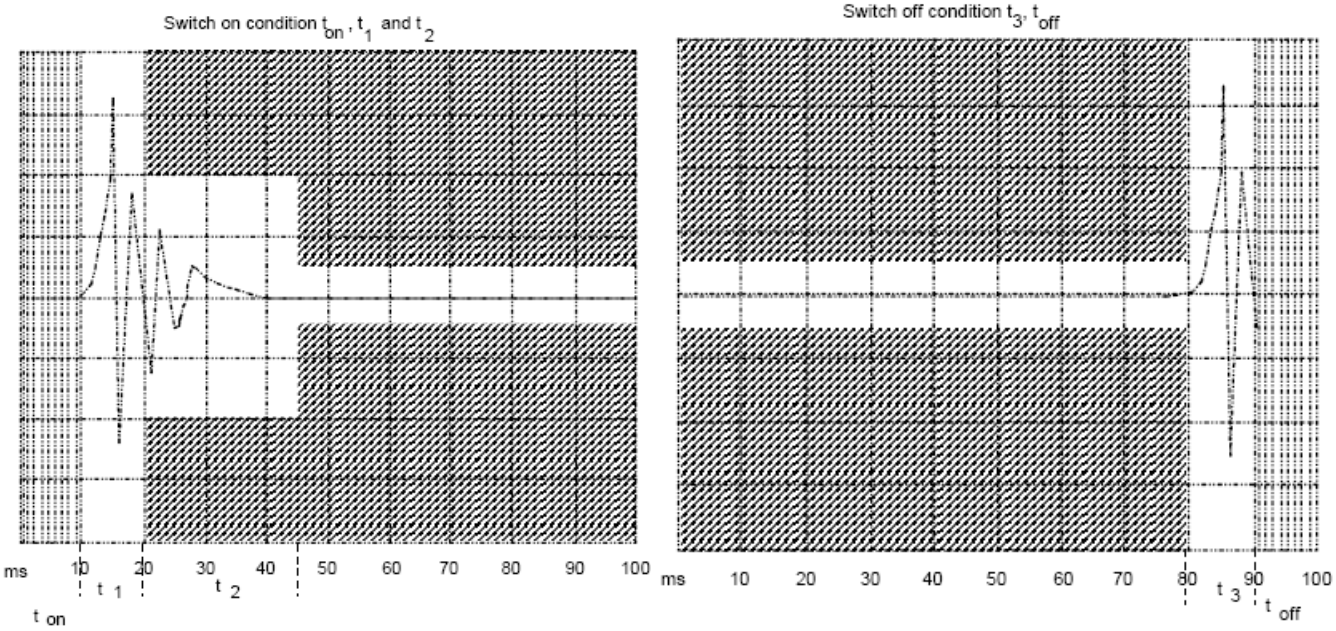
ton: The switch-on instant ton of a transmitter is defined by the condition when the output power, measured at the antenna terminal, exceeds 0,1 % of the full output power (-30 dBc).

t1: period of time starting at ton and finishing according to above 11.1

t2: period of time starting at the end of t1 and finishing according to above 11.1

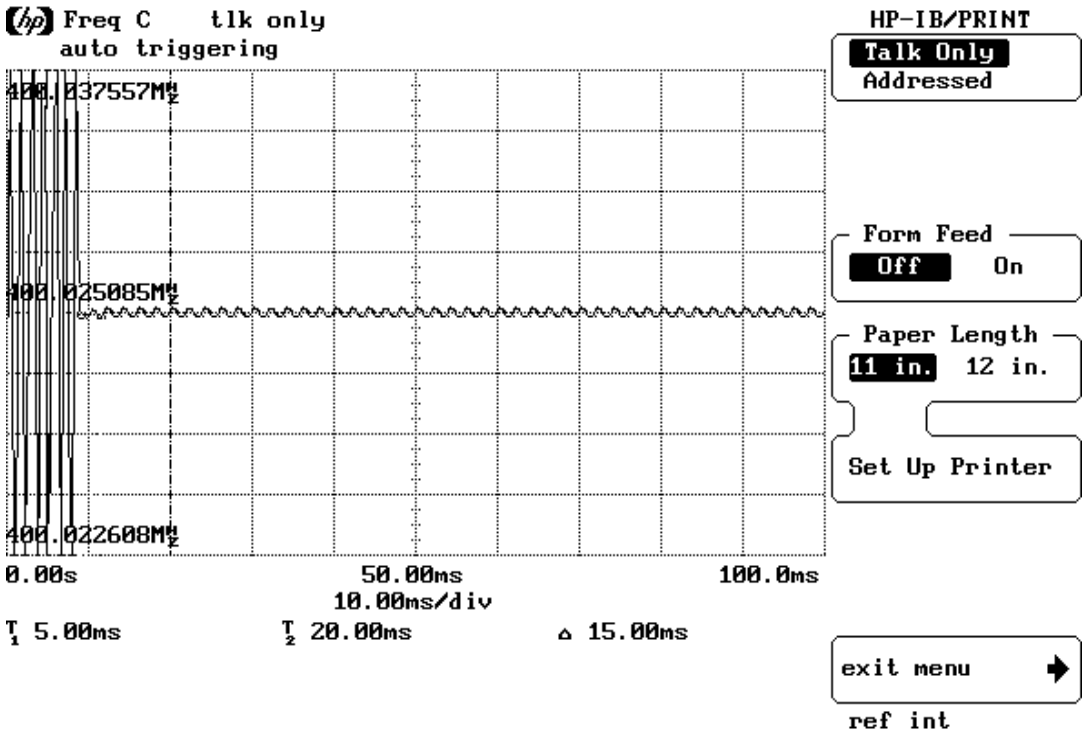
toff: switch-off instant defined by the condition when the output power falls below 0,1 % of the full output power (-30 dBc).

t3: period of time that finishing at toff and starting according to above 11.1

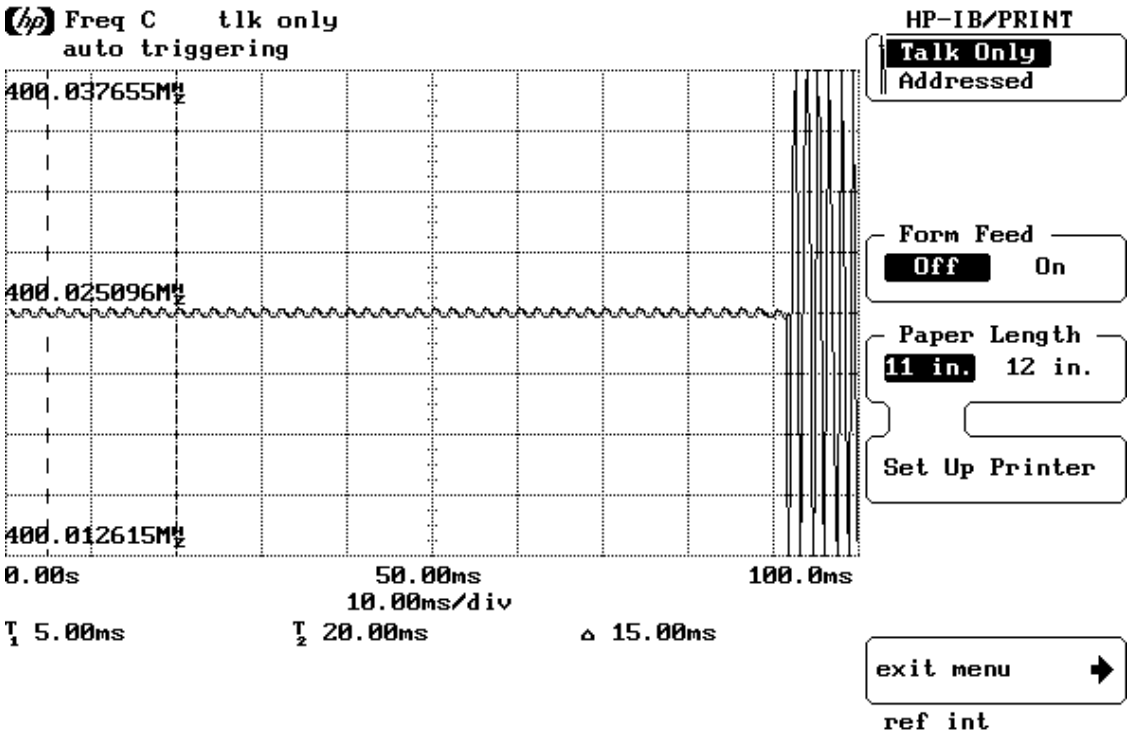


11.4 MEASURE RESULT

Transmitter Frequency Behavior @ 12.5 KHz Channel Separation--Off to On



Transmitter Frequency Behavior @ 12.5 KHz Channel Separation--On to Off



12. AUDIO LOW PASS FILTER RESPONSE

12.1 LIMITS

2.1047(a): Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.
90.242(b)(8): Recommended audio filter attenuation characteristics are given below:

Audio band	Minimum Attenuation Rel. to 1 KHz Attenuation
3 –20 KHz	60 $\log_{10}$(f/3) dB where f is in KHz
20 – 30 KHz	50dB

12.2. METHOD OF MEASUREMENTS

The rated audio input signal was applied to the input of the audio low-pass filter (or of all modulation stages) using an audio oscillator, this input signal level and its corresponding output signal were then measured and recorded using the FFT Digital Spectrum Analyzer. Tests were repeated at different audio signal frequencies from 0 to 50 KHz.

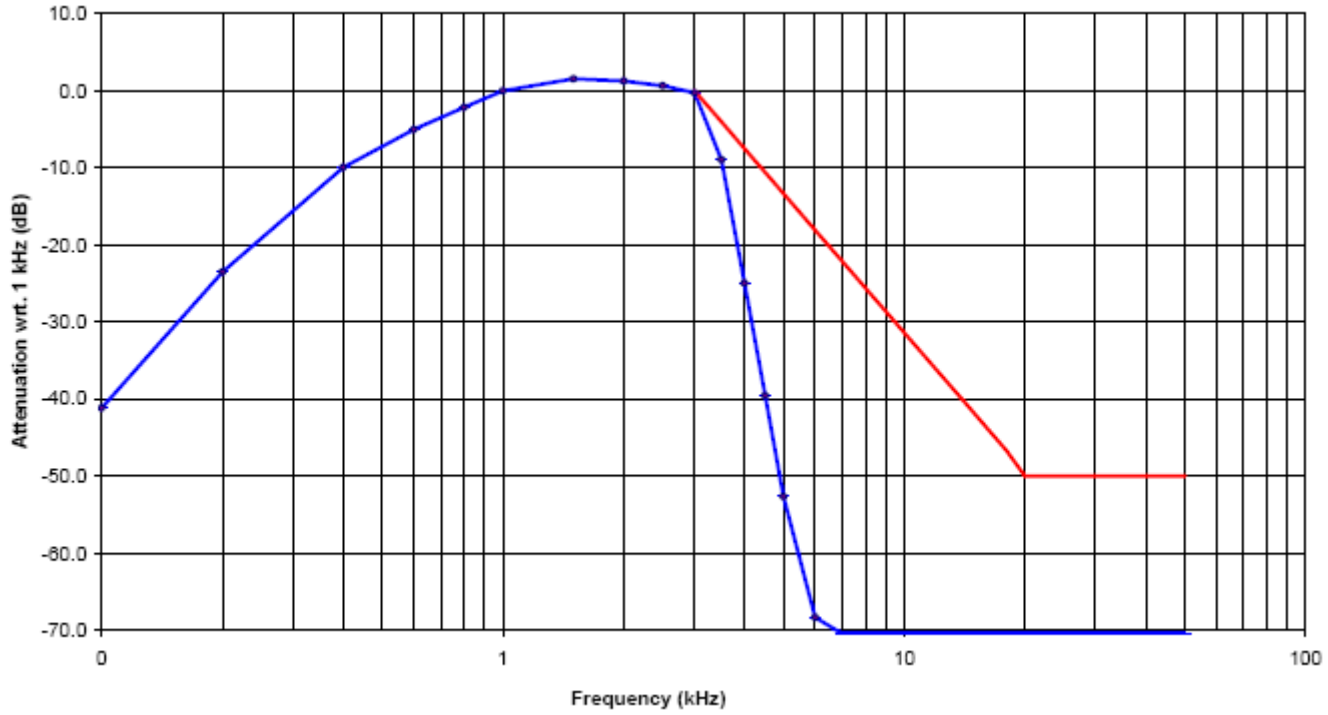
12.3 TEST DATA

Analog:

12.5KHZ CHANNEL SPACING, F3E, FREQUENCY OF ALL MODULATION STATES -5W

Frequency	Audio In	Audio out	Attenuation	Attenuation	Recommended Attenuation
(KHz)	(dBV)	(dBV)	(Out_In)	Rel.to 3 KHz	(dB)
			dB	（dB)	
0.1	-76.16	-31.18	46.34	-36.82	
0.2	-76.16	-17.59	58.23	-25.62	
0.4	-76.16	-6.24	71.64	-12.75	
0.6	-76.16	0.45	74.25	-6.41	
0.8	-76.16	4.24	78.93	-2.63	
1.0	-76.16	7.26	83.61	-0.04	
1.5	-76.16	8.25	84.89	2.16	
2.0	-76.16	8.56	85.38	1.49	
2.5	-76.16	7.41	83.84	0.53	
3.0	-76.16	6.31	82.51	-1.69	0
3.5	-76.16	2.25	78.43	-4.25	-4
4.0	-76.16	-2.22	74.65	-9.63	-7
4.5	-76.16	-9.19	68.22	-16.62	-10
5.0	-76.16	-15.01	60.64	-21.71	-15
6.0	-76.16	-21.12	54.19	-28.29	-18
7.0	-76.16	-31.46	46.24	-36.57	-20
8.0	-76.16	-39.25	37.96	-47.62	-24
9.0	-76.16	-61.93	15.14	-66.81	-26
10.0	-76.16	-61.93	15.13	-66.43	-31
12.0	-76.16	-61.93	15.13	-66.43	-37
14.0	-76.16	-61.93	15.13	-66.43	-42
16.0	-76.16	-61.93	15.13	-66.43	-45
18.0	-76.16	-61.93	15.13	-66.43	-46
20.0	-76.16	-61.93	15.13	-66.43	-47
25.0	-76.16	-61.93	15.13	-66.43	-47
30.0	-76.16	-61.93	15.13	-66.43	-47
35.0	-76.16	-61.93	15.13	-66.43	-47
40.0	-76.16	-61.93	15.13	-66.43	-47
45.0	-76.16	-61.93	15.13	-66.43	-47
50.0	-76.16	-61.93	15.13	-66.43	-47

***Note**: Due to the difficulty of measuring the Frequency Response of the internal low-pass filter, the Frequency Response of All Modulation States is performed to show the roll-off at 3 KHz in comparison with the recommended audio filter attenuation.*

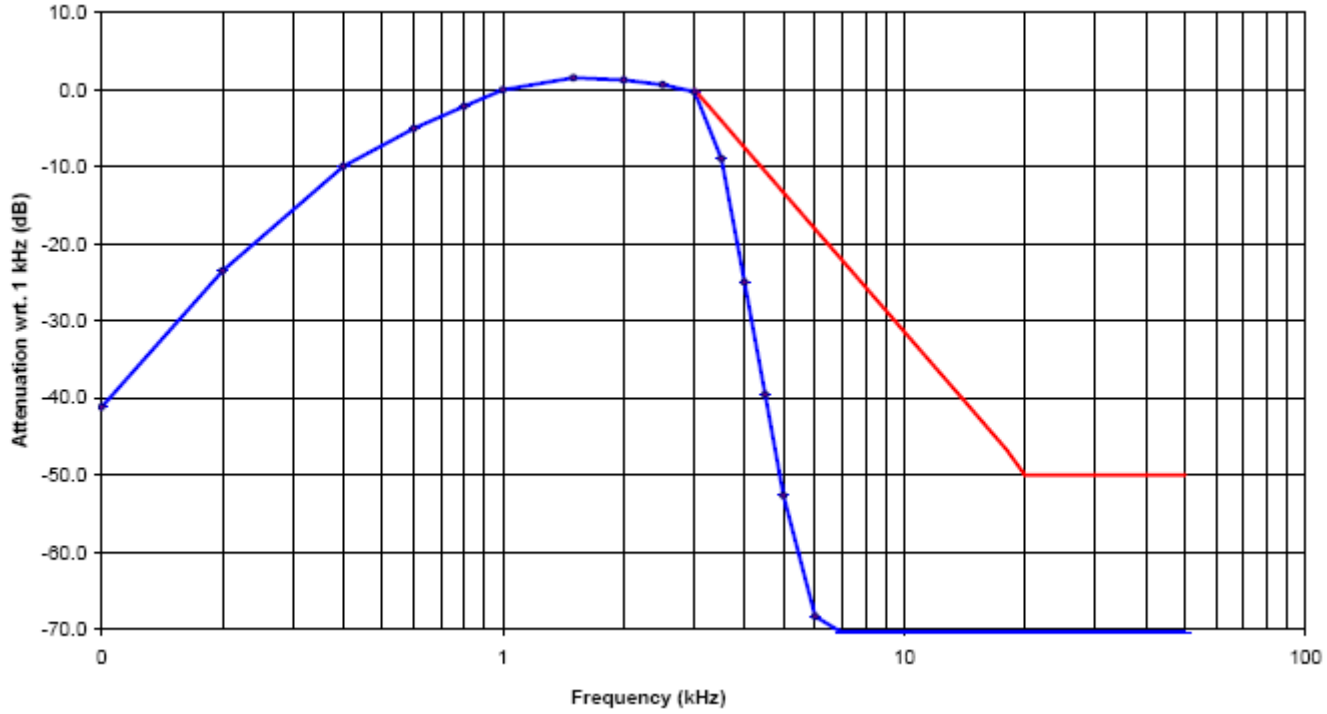


Digital：

12.5KHZ CHANNEL SPACING, FREQUENCY OF ALL MODULATION STATES -5W

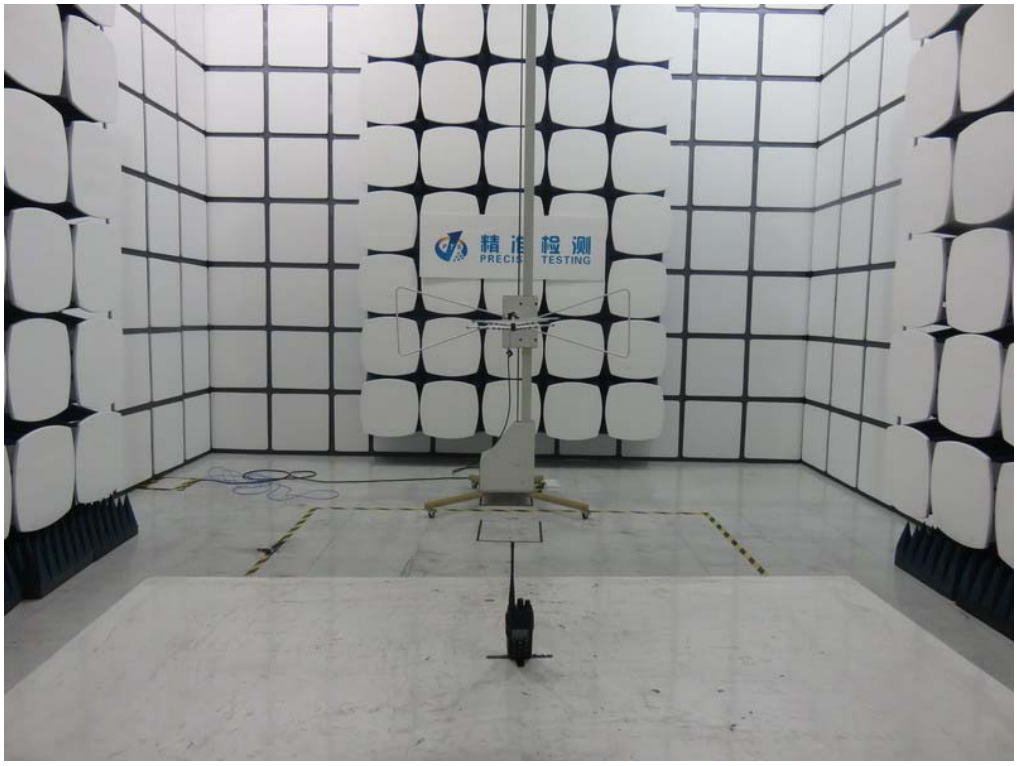
Frequency	Audio In	Audio out	Attenuation	Attenuation	Recommended Attenuation
(KHz)	(dBV)	(dBV)	(Out_In)	Rel.to 3 KHz	(dB)
			dB	（dB)	
0.1	-76.13	-30.85	46.24	-36.6	
0.2	-76.13	-17.62	58.35	-25.25	
0.4	-76.13	-6.02	71.56	-12.51	
0.6	-76.13	0.47	74.15	-6.36	
0.8	-76.13	4.16	78.47	-2.85	
1.0	-76.13	7.18	83.52	-0.01	
1.5	-76.13	8.29	84.62	2.39	
2.0	-76.13	8.94	85.15	1.34	
2.5	-76.13	7.47	83.63	0.92	
3.0	-76.13	6.23	82.24	-1.75	0
3.5	-76.13	2.26	78.52	-4.52	-4
4.0	-76.13	-2.31	74.74	-9.41	-7
4.5	-76.13	-9.21	68.36	-16.85	-12
5.0	-76.13	-15.03	60.29	-20.95	-15
6.0	-76.13	-21.16	54.54	-28.51	-18
7.0	-76.13	-31.45	46.36	-36.13	-20
8.0	-76.13	-39.16	38.40	-47.67	-23
9.0	-76.13	-61.75	15.23	-66.78	-26
10.0	-76.13	-61.75	15.23	-66.26	-29
12.0	-76.13	-61.75	15.23	-66.26	-34
14.0	-76.13	-61.75	15.23	-66.26	-38
16.0	-76.13	-61.75	15.23	-66.26	-42
18.0	-76.13	-61.75	15.23	-66.26	-44
20.0	-76.13	-61.75	15.23	-66.26	-46
25.0	-76.13	-61.75	15.23	-66.26	-46
30.0	-76.13	-61.75	15.23	-66.26	-46
35.0	-76.13	-61.75	15.23	-66.26	-46
40.0	-76.13	-61.75	15.23	-66.26	-46
45.0	-76.13	-61.75	15.23	-66.26	-46
50.0	-76.13	-61.75	15.23	-66.26	-46

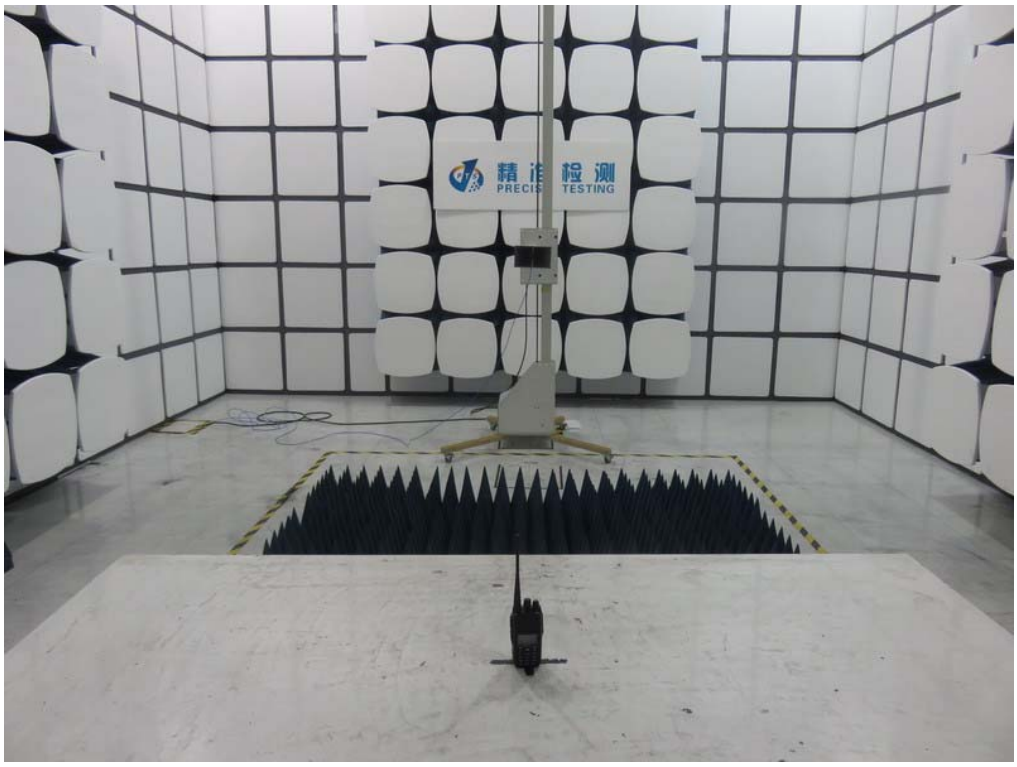
***Note**: Due to the difficulty of measuring the Frequency Response of the internal low-pass filter, the Frequency Response of All Modulation States is performed to show the roll-off at 3 KHz in comparison with the recommended audio filter attenuation.*



APPENDIX I: PHOTOGRAPHS OF SETUP

RADIATED EMISSION TEST SETUP





APPENDIX II: EXTERNAL VIEW OF EUT

TOTAL VIEW OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT

FRONT VIEW OF EUT

BACK VIEW OF EUT

LEFT VIEW OF EUT

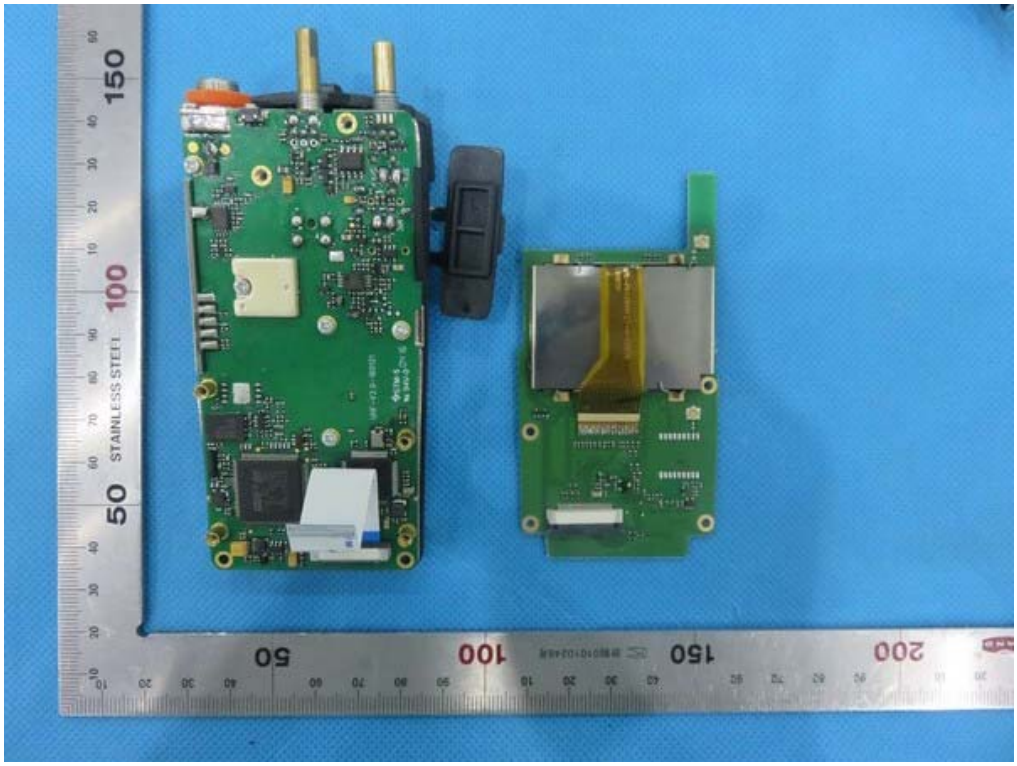
RIGHT VIEW OF EUT

THE LABLE OF POWER ADAPTER

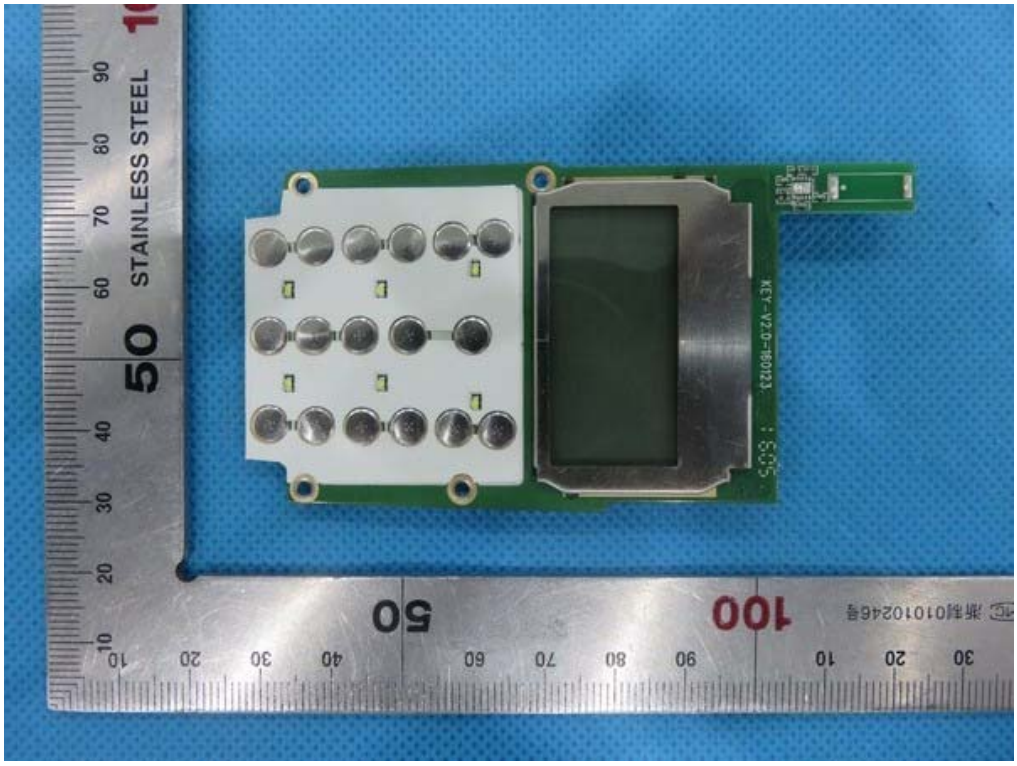
OPEN VIEW-1 OF EUT

OPEN VIEW-2 OF EUT

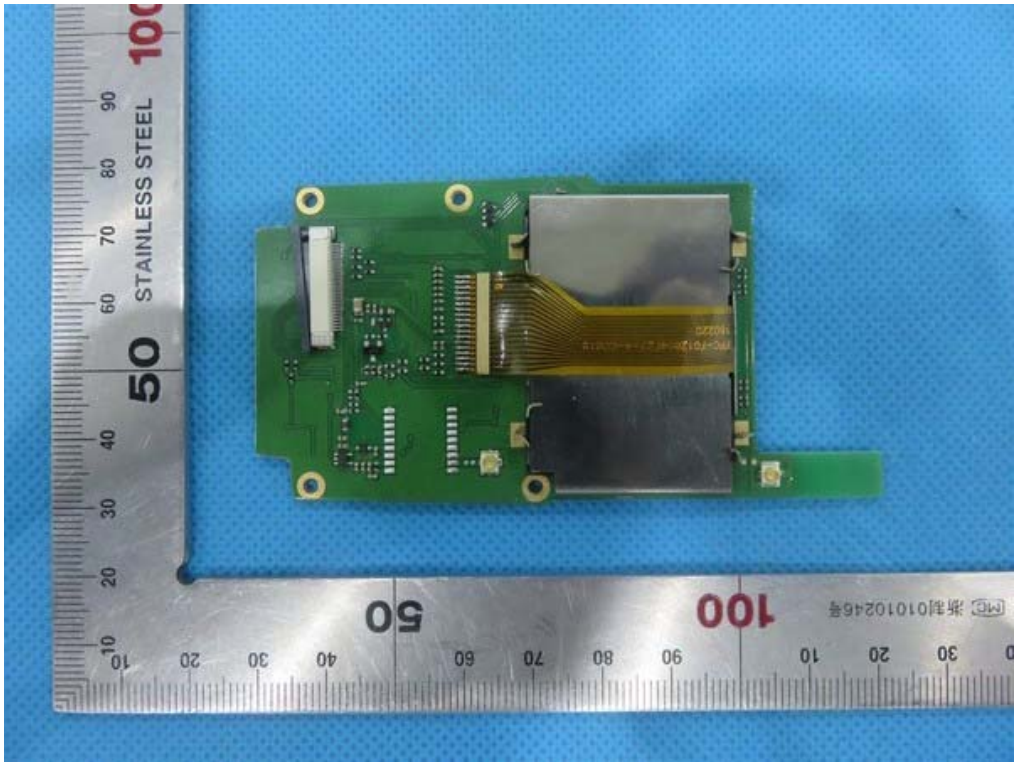
OPEN VIEW-3 OF EUT



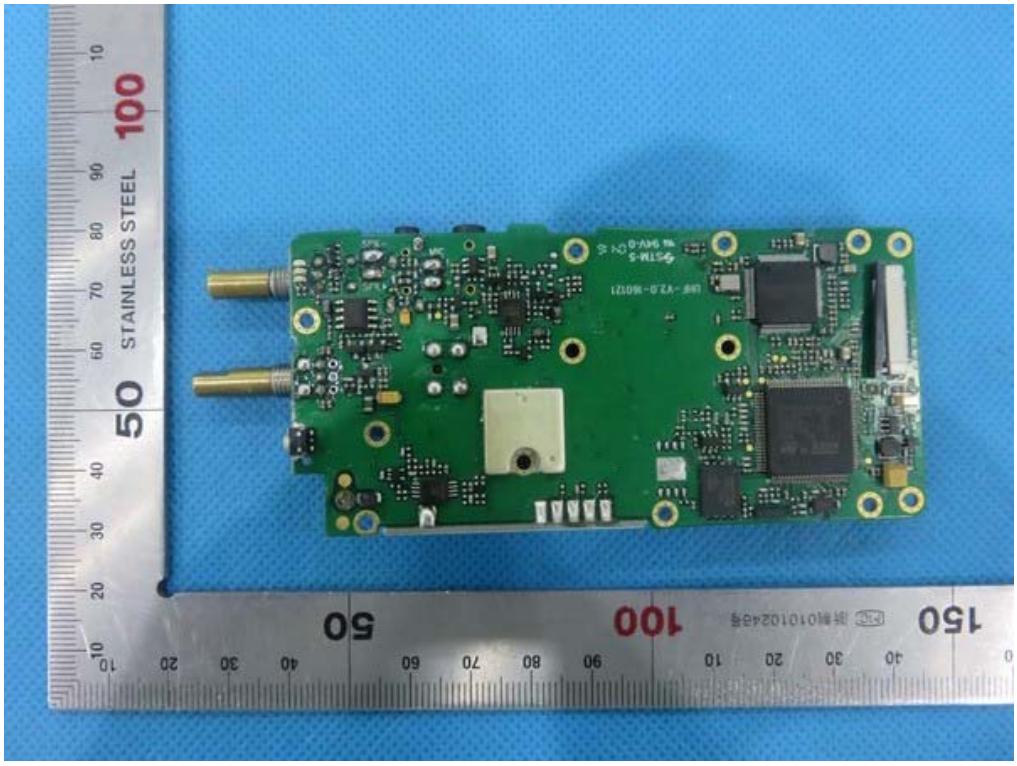
INTERNAL VIEW-1 OF EUT



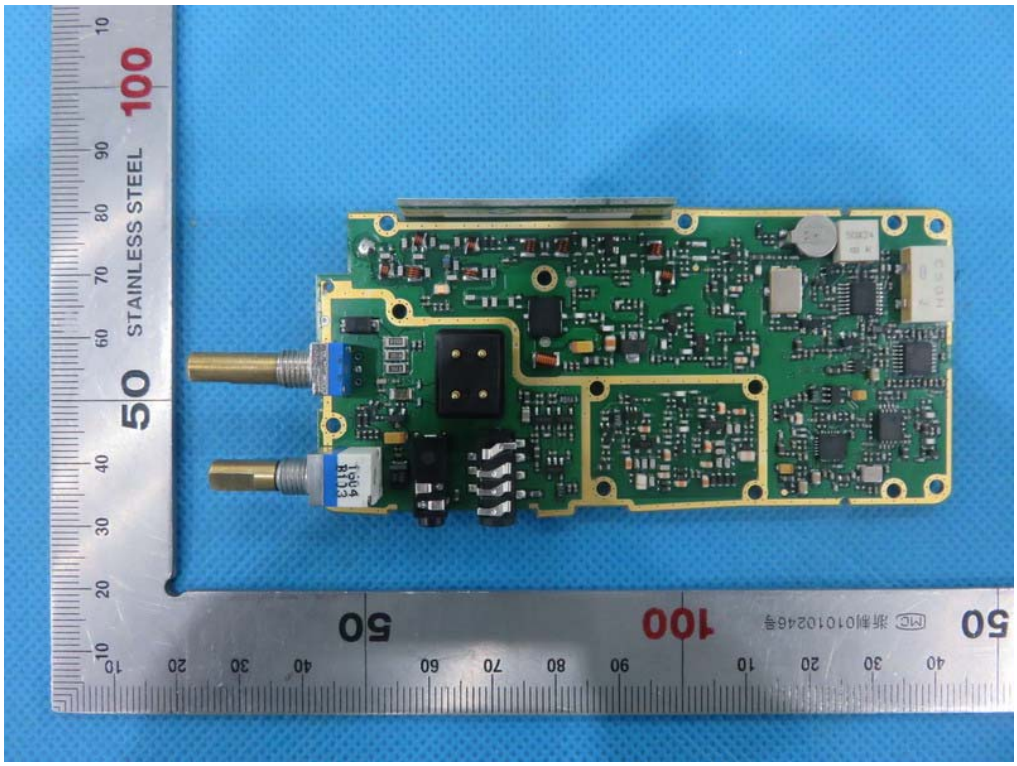
INTERNAL VIEW-2 OF EUT



INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



----END OF REPORT----