
FCC Part 90 Test Report

Report No.: AGC00589151101FE09

FCC ID : T4KD868V
PRODUCT DESIGNATION : DIGITAL RADIO
BRAND NAME : N/A
MODEL NAME : D868, D848, D838, D828, D818, D808, 868, 848, 838, 828
CLIENT : Qixiang Electron Science & Technology Co., Ltd.
DATE OF ISSUE : Nov.13, 2015
STANDARD(S) : FCC Part 90 Rules
REPORT VERSION : V 1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
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| V1.0 | / | Nov.13, 2015 | Valid | Original Report |

TABLE OF CONTENTS

1. VERIFICATION OF COMPLIANCE 5

2. GENERAL INFORMATION 6

2.1 PRODUCT DESCRIPTION 6

2.2 RELATED SUBMITTAL(S) / GRANT (S)..... 7

2.3 TEST METHODOLOGY 8

2.4 TEST FACILITY 8

2.5 SPECIAL ACCESSORIES 8

2.6 EQUIPMENT MODIFICATIONS 8

3. SYSTEM TEST CONFIGURATION 9

3.1 EUT CONFIGURATION 9

3.2 EUT EXERCISE 9

3.3 GENERAL TECHNICAL REQUIREMENTS 9

3.4 CONFIGURATION OF TESTED SYSTEM 10

3.5. SUMMARY OF TEST RESULTS 10

4. IDENTIFICATION OF THE RESPONSIBLE TESTING LOCATION 11

5. DESCRIPTION OF TEST MODES..... 12

6. FREQUENCY TOLERANCE..... 13

6.1 PROVISIONS APPLICABLE..... 13

6.2 MEASUREMENT PROCEDURE 13

6.2.1 FREQUENCY STABILITY VERSUS ENVIRONMENTAL TEMPERATURE..... 13

6.2.2 FREQUENCY STABILITY VERSUS INPUT VOLTAGE..... 13

6.3 TEST SETUP BLOCK DIAGRAM 14

6.4 TEST RESULT..... 15

7.UNWANTED RADIATION 27

7.1 PROVISIONS APPLICABLE..... 31

7.2 MEASUREMENT PROCEDURE 31

7.3 TEST SETUP BLOCK DIAGRAM 31

7.4 MEASUREMENT RESULT 32

8. UNWANTED RADIATION 36

8.1 PROVISIONS APPLICABLE..... 36

8.2 MEASUREMENT PROCEDURE 36

8.3 TEST SETUP BLOCK DIAGRAM 37

8.4 MEASUREMENT RESULTS:..... 39

8.5 EMISSION MASK PLOT 48

9. MODULATION CHARACTERISTICS 51

9.1 PROVISIONS APPLICABLE..... 51

| | |
|---|-----------|
| 9.2 MEASUREMENT METHOD | 51 |
| 9.2.1 MODULATION LIMIT | 51 |
| 9.2.2 AUDIO FREQUENCY RESPONSE..... | 51 |
| 9.3 MEASUREMENT RESULT | 52 |
| 10. MAXIMUM TRANSMITTER POWER | 61 |
| 10.1 PROVISIONS APPLICABLE..... | 64 |
| 10.2 TEST PROCEDURE..... | 64 |
| 10.3 TEST CONFIGURATION | 64 |
| 10.4 TEST RESULT | 66 |
| 10.5 CONDUCT SPURIOUS PLOT | 69 |
| 11. TRANSMITTER FREQUENCY BEHAVIOR..... | 73 |
| 11.1 PROVISIONS APPLICABLE..... | 73 |
| 11.2 TEST METHOD | 73 |
| 11.3 DESCRIBE LIMIT LINE OF TRANSMITTER FREQUENCY BEHAVIOR..... | 74 |
| 11.4 MEASURE RESULT | 76 |
| 12. AUDIO LOW PASS FILTER RESPONSE | 77 |
| 12.1 LIMITS | 77 |
| 12.2. METHOD OF MEASUREMENTS | 77 |
| 12.3 TEST DATA..... | 78 |
| APPENDIX I: PHOTOGRAPHS OF SETUP | 80 |
| APPENDIX II: EXTERNAL VIEW OF EUT | 81 |

1. VERIFICATION OF COMPLIANCE

| | |
|-------------------------------|--|
| Applicant | Qixiang Electron Science & Technology Co., Ltd. |
| Address | Qixiang Building, Tangxi Industrial Zone, Luojiang District, Quanzhou, Fujian, China |
| Manufacturer | Qixiang Electron Science & Technology Co., Ltd. |
| Address | Qixiang Building, Tangxi Industrial Zone, Luojiang District, Quanzhou, Fujian, China |
| Product Designation | DIGITAL RADIO |
| Brand Name | N/A |
| Test Model | D868 |
| Series Model | D848, D838, D828, D818, D808, 868, 848, 838, 828 |
| Difference description | All the same except for the model name and appearances (the concave-convex grain of top view). |
| Date of Test | Nov.06, 2015 to Nov.08, 2015 |

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

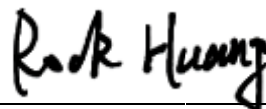
The test results of this report relate only to the tested sample identified in this report.

Tested by



Steven Zhou(Zhou Pengyun) Nov.13, 2015

Reviewed by



Rock Huang(Huang Dinglue) Nov.13, 2015

Approved by



Solger Zhang(Zhang Hongyi)
Authorized Officer Nov.13, 2015

2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

The EUT is a DIGITAL 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 |
| Emission Type | 11K0F3E, 7K60FXD, 7K60FXW |
| Modulation | FM/4FSK |
| Emission Bandwidth | Analog:7.808KHz(5W), 10.26KHz(1W) Digital:9.743KHz(5W), 9.468KHz(1W) |
| Peak Frequency Deviation | Analog:1.79KHz Digital:1.76KHz |
| Audio Frequency Response | Analog:11.68dB Digital:10.93 dB |
| Maximum Transmitter Power | Analog: 36.92 dBm(5W), 29.93dBm (1W) Digital: 36.86 dBm(5W), 29.94dBm (1W) |
| Output power Modification | 1/5W (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 | QA13V |
| Antenna Gain | 2.15 dBi |
| Antenna Length | 13 cm |
| Power Supply | DC 7.4V, 2000mAh (by battery) |
| Adapter Parameter | Input: 100-240V, 50Hz, 0.4A Output: 12V, 0.5A |
| Limiting Voltage | DC 6V-DC 8.51V |
| Operation Frequency Range and Channel | Frequency Range: 136MHz to 174MHz Channel Separation:12.5KHz (Analog), 12.5KHz(Digital) |
| | Top Channel: 136.025MHz Centre Channel: 155.025MHz Bottom Channel: 173.975MHz |
| Frequency Tolerance | 1.051ppm |

| Frequency Range (MHz) | Rated Transmit Power(W)(Conducted) | Transmit Mode/Emission Designator |
|-----------------------|------------------------------------|---|
| 136-174 | 1/5 | 11K0F3E(Analog Vioce;NB) |
| 136-174 | 1/5 | 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 | 136.025 |
| 2 | | |
| 3 | 3-4 | 155.025 |
| 4 | | |
| 5 | 5-6 | 173.975 |
| 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)

$B_n = 2XM + 2XDK = 11.0 \text{ KHz}$

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)

$B_n = 3.86D + 1.27RK = 3.86(2359.585) + 0.27(9600)(1) = 11.7 \text{ KHz}$

Emission designator: 11K0FXD

2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: T4KD868V**, 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 the normal operating 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 | Model No. | Identifier | Note |
|------|---------------|-----------|------------------|------|
| 1 | DIGITAL RADIO | D868 | FCC ID: T4KD868V | EUT |

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 | WEINSCHTEL CORP | 58-30-33 | ML030 | 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 |
| Active loop antenna (9K-30MHz) | Schwarzbeck | FMZB1519 | 1519-038 | 2015.06.06 | 2016.06.05 |
| 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 (DIGITAL RADIO) has been tested under normal operating 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 | Low Channel | 12.5 KHz |
| 2 | Middle Channel | 12.5 KHz |
| 3 | High Channel | 12.5 KHz |

Digital:

| No. | TEST MODES | CHANNEL SEPARATION |
|-----|----------------|--------------------|
| 1 | Low Channel | 12.5 KHz |
| 2 | Middle Channel | 12.5 KHz |
| 3 | High Channel | 12.5 KHz |

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°C to $+50^{\circ}\text{C}$ 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

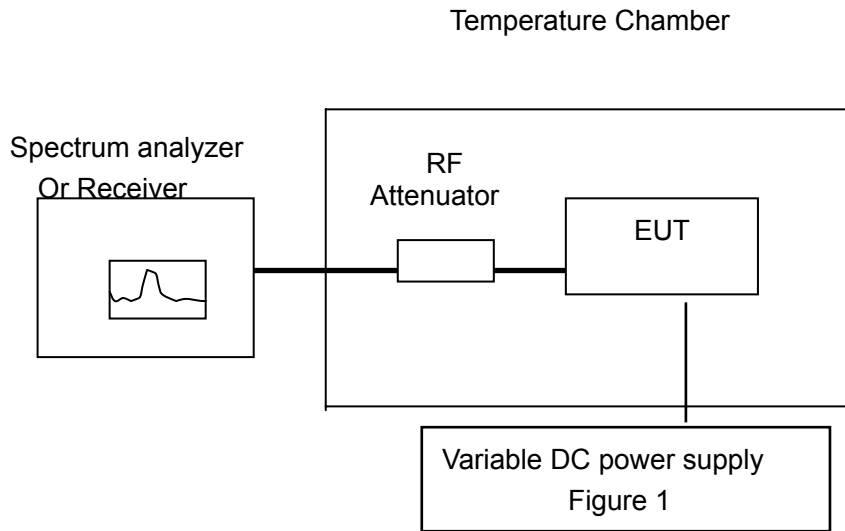
6.2.1 FREQUENCY STABILITY VERSUS ENVIRONMENTAL TEMPERATURE

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°C . 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°C decreased per stage until the lowest temperature -30°C 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°C to 25°C . Otherwise, an environment chamber set for a temperature of 20°C 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



6.4 TEST RESULT

Analog:

(1)Frequency stability versus input voltage (Supply nominal voltage is 7.4V)--5W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 136.025063 | 0.463 |
| 40 | DC 7.4 V | 136.025091 | 0.669 |
| 30 | DC 7.4 V | 136.025047 | 0.346 |
| 20 | DC 7.4 V | 136.025082 | 0.603 |
| 10 | DC 7.4 V | 136.025061 | 0.448 |
| 0 | DC 7.4 V | 136.025054 | 0.397 |
| -10 | DC 7.4 V | 136.025079 | 0.581 |
| -20 | DC 7.4 V | 136.025135 | 0.992 |
| -30 | DC 7.4 V | 136.025127 | 0.934 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 155.025153 | 0.987 |
| 40 | DC 7.4 V | 155.025127 | 0.819 |
| 30 | DC 7.4 V | 155.025148 | 0.955 |
| 20 | DC 7.4 V | 155.025136 | 0.877 |
| 10 | DC 7.4 V | 155.025151 | 0.974 |
| 0 | DC 7.4 V | 155.025139 | 0.897 |
| -10 | DC 7.4 V | 155.025127 | 0.819 |
| -20 | DC 7.4 V | 155.025132 | 0.851 |
| -30 | DC 7.4 V | 155.025140 | 0.903 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 173.975105 | 0.604 |
| 40 | DC 7.4 V | 173.975135 | 0.776 |
| 30 | DC 7.4 V | 173.975130 | 0.747 |
| 20 | DC 7.4 V | 173.975143 | 0.822 |
| 10 | DC 7.4 V | 173.975149 | 0.856 |
| 0 | DC 7.4 V | 173.975112 | 0.644 |
| -10 | DC 7.4 V | 173.975125 | 0.718 |
| -20 | DC 7.4 V | 173.975131 | 0.753 |
| -30 | DC 7.4 V | 173.975149 | 0.856 |

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

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 136.025064 | 0.471 |
| 40 | DC 6.29 V | 136.025072 | 0.529 |
| 30 | DC 6.29 V | 136.025091 | 0.669 |
| 20 | DC 6.29 V | 136.025103 | 0.757 |
| 10 | DC 6.29 V | 136.025124 | 0.912 |
| 0 | DC 6.29 V | 136.02511 | 0.809 |
| -10 | DC 6.29 V | 136.025084 | 0.618 |
| -20 | DC 6.29 V | 136.025061 | 0.448 |
| -30 | DC 6.29 V | 136.025062 | 0.456 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 155.025083 | 0.535 |
| 40 | DC 6.29 V | 155.025051 | 0.329 |
| 30 | DC 6.29 V | 155.025062 | 0.400 |
| 20 | DC 6.29 V | 155.025086 | 0.555 |
| 10 | DC 6.29 V | 155.025092 | 0.593 |
| 0 | DC 6.29 V | 155.025057 | 0.368 |
| -10 | DC 6.29 V | 155.025073 | 0.471 |
| -20 | DC 6.29 V | 155.025081 | 0.522 |
| -30 | DC 6.29 V | 155.025064 | 0.413 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 173.975124 | 0.713 |
| 40 | DC 6.29 V | 173.975136 | 0.782 |
| 30 | DC 6.29 V | 173.975095 | 0.546 |
| 20 | DC 6.29 V | 173.975083 | 0.477 |
| 10 | DC 6.29 V | 173.975091 | 0.523 |
| 0 | DC 6.29 V | 173.975082 | 0.471 |
| -10 | DC 6.29 V | 173.975091 | 0.523 |
| -20 | DC 6.29 V | 173.975069 | 0.397 |
| -30 | DC 6.29 V | 173.975105 | 0.604 |

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

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 136.0250904 | 0.665 |
| 40 | DC 8.51 V | 136.025121 | 0.890 |
| 30 | DC 8.51 V | 136.025082 | 0.603 |
| 20 | DC 8.51 V | 136.025109 | 0.801 |
| 10 | DC 8.51 V | 136.025095 | 0.698 |
| 0 | DC 8.51 V | 136.025115 | 0.845 |
| -10 | DC 8.51 V | 136.025093 | 0.684 |
| -20 | DC 8.51 V | 136.025076 | 0.559 |
| -30 | DC 8.51 V | 136.025083 | 0.610 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 155.025057 | 0.368 |
| 40 | DC 8.51 V | 155.025091 | 0.587 |
| 30 | DC 8.51 V | 155.025104 | 0.671 |
| 20 | DC 8.51 V | 155.025092 | 0.593 |
| 10 | DC 8.51 V | 155.025097 | 0.626 |
| 0 | DC 8.51 V | 155.025113 | 0.729 |
| -10 | DC 8.51 V | 155.025145 | 0.935 |
| -20 | DC 8.51 V | 155.025051 | 0.329 |
| -30 | DC 8.51 V | 155.025116 | 0.748 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 173.975058 | 0.333 |
| 40 | DC 8.51 V | 173.975096 | 0.552 |
| 30 | DC 8.51 V | 173.975082 | 0.471 |
| 20 | DC 8.51 V | 173.975091 | 0.523 |
| 10 | DC 8.51 V | 173.975114 | 0.655 |
| 0 | DC 8.51 V | 173.975125 | 0.718 |
| -10 | DC 8.51 V | 173.975088 | 0.506 |
| -20 | DC 8.51 V | 173.975083 | 0.477 |
| -30 | DC 8.51 V | 173.975091 | 0.523 |

(4) Frequency stability versus input voltage (Battery endpoint is 6V) --5W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 136.025064 | 0.471 |
| 40 | DC 6.00 V | 136.025072 | 0.529 |
| 30 | DC 6.00 V | 136.025091 | 0.669 |
| 20 | DC 6.00 V | 136.025103 | 0.757 |
| 10 | DC 6.00 V | 136.025124 | 0.912 |
| 0 | DC 6.00 V | 136.02511 | 0.809 |
| -10 | DC 6.00 V | 136.025084 | 0.618 |
| -20 | DC 6.00 V | 136.025061 | 0.448 |
| -30 | DC 6.00 V | 136.025062 | 0.456 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 155.025083 | 0.535 |
| 40 | DC 6.00 V | 155.025051 | 0.329 |
| 30 | DC 6.00 V | 155.025062 | 0.400 |
| 20 | DC 6.00 V | 155.025086 | 0.555 |
| 10 | DC 6.00 V | 155.025092 | 0.593 |
| 0 | DC 6.00 V | 155.025057 | 0.368 |
| -10 | DC 6.00 V | 155.025073 | 0.471 |
| -20 | DC 6.00 V | 155.025081 | 0.522 |
| -30 | DC 6.00 V | 155.025064 | 0.413 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 173.975124 | 0.713 |
| 40 | DC 6.00 V | 173.975136 | 0.782 |
| 30 | DC 6.00 V | 173.975095 | 0.546 |
| 20 | DC 6.00 V | 173.975083 | 0.477 |
| 10 | DC 6.00 V | 173.975091 | 0.523 |
| 0 | DC 6.00 V | 173.975082 | 0.471 |
| -10 | DC 6.00 V | 173.975091 | 0.523 |
| -20 | DC 6.00 V | 173.975069 | 0.397 |
| -30 | DC 6.00 V | 173.975105 | 0.604 |

(1)Frequency stability versus input voltage (Supply nominal voltage is 7.4V)--1W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 136.025085 | 0.625 |
| 40 | DC 7.4 V | 136.025096 | 0.706 |
| 30 | DC 7.4 V | 136.025062 | 0.456 |
| 20 | DC 7.4 V | 136.025054 | 0.397 |
| 10 | DC 7.4 V | 136.025082 | 0.603 |
| 0 | DC 7.4 V | 136.025046 | 0.338 |
| -10 | DC 7.4 V | 136.025072 | 0.529 |
| -20 | DC 7.4 V | 136.025114 | 0.838 |
| -30 | DC 7.4 V | 136.025084 | 0.618 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 155.025086 | 0.555 |
| 40 | DC 7.4 V | 155.025048 | 0.310 |
| 30 | DC 7.4 V | 155.025053 | 0.342 |
| 20 | DC 7.4 V | 155.025095 | 0.613 |
| 10 | DC 7.4 V | 155.025104 | 0.671 |
| 0 | DC 7.4 V | 155.025112 | 0.722 |
| -10 | DC 7.4 V | 155.025084 | 0.542 |
| -20 | DC 7.4 V | 155.025109 | 0.703 |
| -30 | DC 7.4 V | 155.025107 | 0.690 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 173.975114 | 0.655 |
| 40 | DC 7.4 V | 173.975162 | 0.931 |
| 30 | DC 7.4 V | 173.975095 | 0.546 |
| 20 | DC 7.4 V | 173.975076 | 0.437 |
| 10 | DC 7.4 V | 173.975042 | 0.241 |
| 0 | DC 7.4 V | 173.975103 | 0.592 |
| -10 | DC 7.4 V | 173.975124 | 0.713 |
| -20 | DC 7.4 V | 173.975109 | 0.627 |
| -30 | DC 7.4 V | 173.975126 | 0.724 |

(2) Frequency stability versus input voltage (Battery Limiting voltage is 6.29V) --1W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 136.025034 | 0.250 |
| 40 | DC 6.29 V | 136.025062 | 0.456 |
| 30 | DC 6.29 V | 136.025057 | 0.419 |
| 20 | DC 6.29 V | 136.025096 | 0.706 |
| 10 | DC 6.29 V | 136.025104 | 0.765 |
| 0 | DC 6.29 V | 136.025048 | 0.353 |
| -10 | DC 6.29 V | 136.025093 | 0.684 |
| -20 | DC 6.29 V | 136.025052 | 0.382 |
| -30 | DC 6.29 V | 136.025088 | 0.647 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 155.025099 | 0.639 |
| 40 | DC 6.29 V | 155.025064 | 0.413 |
| 30 | DC 6.29 V | 155.025094 | 0.606 |
| 20 | DC 6.29 V | 155.025106 | 0.684 |
| 10 | DC 6.29 V | 155.025086 | 0.555 |
| 0 | DC 6.29 V | 155.025092 | 0.593 |
| -10 | DC 6.29 V | 155.025048 | 0.310 |
| -20 | DC 6.29 V | 155.025065 | 0.419 |
| -30 | DC 6.29 V | 155.025086 | 0.555 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 173.975105 | 0.604 |
| 40 | DC 6.29 V | 173.975126 | 0.724 |
| 30 | DC 6.29 V | 173.975068 | 0.391 |
| 20 | DC 6.29 V | 173.975096 | 0.552 |
| 10 | DC 6.29 V | 173.975106 | 0.609 |
| 0 | DC 6.29 V | 173.975087 | 0.500 |
| -10 | DC 6.29 V | 173.975076 | 0.437 |
| -20 | DC 6.29 V | 173.975097 | 0.558 |
| -30 | DC 6.29 V | 173.975093 | 0.535 |

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) --1W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 136.025086 | 0.632 |
| 40 | DC 8.51 V | 136.025106 | 0.779 |
| 30 | DC 8.51 V | 136.025096 | 0.706 |
| 20 | DC 8.51 V | 136.025125 | 0.919 |
| 10 | DC 8.51 V | 136.025101 | 0.743 |
| 0 | DC 8.51 V | 136.025085 | 0.625 |
| -10 | DC 8.51 V | 136.025081 | 0.595 |
| -20 | DC 8.51 V | 136.025086 | 0.632 |
| -30 | DC 8.51 V | 136.025071 | 0.522 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 155.025085 | 0.548 |
| 40 | DC 8.51 V | 155.025089 | 0.574 |
| 30 | DC 8.51 V | 155.025109 | 0.703 |
| 20 | DC 8.51 V | 155.025098 | 0.632 |
| 10 | DC 8.51 V | 155.025106 | 0.684 |
| 0 | DC 8.51 V | 155.025124 | 0.800 |
| -10 | DC 8.51 V | 155.025116 | 0.748 |
| -20 | DC 8.51 V | 155.025086 | 0.555 |
| -30 | DC 8.51 V | 155.025092 | 0.593 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 173.975081 | 0.466 |
| 40 | DC 8.51 V | 173.975096 | 0.552 |
| 30 | DC 8.51 V | 173.975062 | 0.356 |
| 20 | DC 8.51 V | 173.975095 | 0.546 |
| 10 | DC 8.51 V | 173.975102 | 0.586 |
| 0 | DC 8.51 V | 173.975113 | 0.650 |
| -10 | DC 8.51 V | 173.975063 | 0.362 |
| -20 | DC 8.51 V | 173.975098 | 0.563 |
| -30 | DC 8.51 V | 173.975082 | 0.471 |

(4) Frequency stability versus input voltage (Battery endpoint is 6V) --1W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 136.025085 | 0.625 |
| 40 | DC 6.00 V | 136.025076 | 0.559 |
| 30 | DC 6.00 V | 136.025094 | 0.691 |
| 20 | DC 6.00 V | 136.025052 | 0.382 |
| 10 | DC 6.00 V | 136.025049 | 0.360 |
| 0 | DC 6.00 V | 136.025081 | 0.595 |
| -10 | DC 6.00 V | 136.025083 | 0.610 |
| -20 | DC 6.00 V | 136.025087 | 0.640 |
| -30 | DC 6.00 V | 136.025053 | 0.390 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 155.025103 | 0.664 |
| 40 | DC 6.00 V | 155.025125 | 0.806 |
| 30 | DC 6.00 V | 155.025052 | 0.335 |
| 20 | DC 6.00 V | 155.025074 | 0.477 |
| 10 | DC 6.00 V | 155.025086 | 0.555 |
| 0 | DC 6.00 V | 155.025092 | 0.593 |
| -10 | DC 6.00 V | 155.025079 | 0.510 |
| -20 | DC 6.00 V | 155.025086 | 0.555 |
| -30 | DC 6.00 V | 155.025053 | 0.342 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 173.975106 | 0.609 |
| 40 | DC 6.00 V | 173.975115 | 0.661 |
| 30 | DC 6.00 V | 173.975082 | 0.471 |
| 20 | DC 6.00 V | 173.975089 | 0.512 |
| 10 | DC 6.00 V | 173.975091 | 0.523 |
| 0 | DC 6.00 V | 173.975072 | 0.414 |
| -10 | DC 6.00 V | 173.975064 | 0.368 |
| -20 | DC 6.00 V | 173.975072 | 0.414 |
| -30 | DC 6.00 V | 173.975105 | 0.604 |

Digital:

(1)Frequency stability versus input voltage (Supply nominal voltage is 7.4V) --5W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 136.025051 | 0.375 |
| 40 | DC 7.4 V | 136.025061 | 0.448 |
| 30 | DC 7.4 V | 136.025071 | 0.522 |
| 20 | DC 7.4 V | 136.025083 | 0.610 |
| 10 | DC 7.4 V | 136.025064 | 0.471 |
| 0 | DC 7.4 V | 136.025076 | 0.559 |
| -10 | DC 7.4 V | 136.0250892 | 0.656 |
| -20 | DC 7.4 V | 136.025089 | 0.654 |
| -30 | DC 7.4 V | 136.025073 | 0.537 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 155.025121 | 0.781 |
| 40 | DC 7.4 V | 155.025095 | 0.613 |
| 30 | DC 7.4 V | 155.025113 | 0.729 |
| 20 | DC 7.4 V | 155.025104 | 0.671 |
| 10 | DC 7.4 V | 155.025131 | 0.845 |
| 0 | DC 7.4 V | 155.025087 | 0.561 |
| -10 | DC 7.4 V | 155.025103 | 0.664 |
| -20 | DC 7.4 V | 155.025086 | 0.555 |
| -30 | DC 7.4 V | 155.025095 | 0.613 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 173.975105 | 0.604 |
| 40 | DC 7.4 V | 173.975064 | 0.368 |
| 30 | DC 7.4 V | 173.975093 | 0.535 |
| 20 | DC 7.4 V | 173.975082 | 0.471 |
| 10 | DC 7.4 V | 173.97513 | 0.747 |
| 0 | DC 7.4 V | 173.975117 | 0.673 |
| -10 | DC 7.4 V | 173.975083 | 0.477 |
| -20 | DC 7.4 V | 173.975056 | 0.322 |
| -30 | DC 7.4 V | 173.975124 | 0.713 |

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

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 136.025102 | 0.750 |
| 40 | DC 6.29 V | 136.025094 | 0.691 |
| 30 | DC 6.29 V | 136.025064 | 0.471 |
| 20 | DC 6.29 V | 136.025064 | 0.471 |
| 10 | DC 6.29 V | 136.025072 | 0.529 |
| 0 | DC 6.29 V | 136.025084 | 0.618 |
| -10 | DC 6.29 V | 136.025048 | 0.353 |
| -20 | DC 6.29 V | 136.025078 | 0.573 |
| -30 | DC 6.29 V | 136.025049 | 0.360 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 155.025092 | 0.593 |
| 40 | DC 6.29 V | 155.025034 | 0.219 |
| 30 | DC 6.29 V | 155.025051 | 0.329 |
| 20 | DC 6.29 V | 155.025037 | 0.239 |
| 10 | DC 6.29 V | 155.025095 | 0.613 |
| 0 | DC 6.29 V | 155.025104 | 0.671 |
| -10 | DC 6.29 V | 155.025091 | 0.587 |
| -20 | DC 6.29 V | 155.025083 | 0.535 |
| -30 | DC 6.29 V | 155.025094 | 0.606 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 173.975132 | 0.759 |
| 40 | DC 6.29 V | 173.975114 | 0.655 |
| 30 | DC 6.29 V | 173.975083 | 0.477 |
| 20 | DC 6.29 V | 173.975091 | 0.523 |
| 10 | DC 6.29 V | 173.975082 | 0.471 |
| 0 | DC 6.29 V | 173.975116 | 0.667 |
| -10 | DC 6.29 V | 173.975125 | 0.718 |
| -20 | DC 6.29 V | 173.975093 | 0.535 |
| -30 | DC 6.29 V | 173.975109 | 0.627 |

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

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 136.025082 | 0.603 |
| 40 | DC 8.51 V | 136.025073 | 0.537 |
| 30 | DC 8.51 V | 136.025068 | 0.500 |
| 20 | DC 8.51 V | 136.025105 | 0.772 |
| 10 | DC 8.51 V | 136.025093 | 0.684 |
| 0 | DC 8.51 V | 136.025125 | 0.919 |
| -10 | DC 8.51 V | 136.025069 | 0.507 |
| -20 | DC 8.51 V | 136.02512 | 0.882 |
| -30 | DC 8.51 V | 136.025103 | 0.757 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 155.025092 | 0.593 |
| 40 | DC 8.51 V | 155.025105 | 0.677 |
| 30 | DC 8.51 V | 155.025072 | 0.464 |
| 20 | DC 8.51 V | 155.025064 | 0.413 |
| 10 | DC 8.51 V | 155.025091 | 0.587 |
| 0 | DC 8.51 V | 155.025131 | 0.845 |
| -10 | DC 8.51 V | 155.025151 | 0.974 |
| -20 | DC 8.51 V | 155.025113 | 0.729 |
| -30 | DC 8.51 V | 155.025132 | 0.851 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 173.975056 | 0.322 |
| 40 | DC 8.51 V | 173.975092 | 0.529 |
| 30 | DC 8.51 V | 173.975113 | 0.650 |
| 20 | DC 8.51 V | 173.9751 | 0.575 |
| 10 | DC 8.51 V | 173.975129 | 0.741 |
| 0 | DC 8.51 V | 173.975106 | 0.609 |
| -10 | DC 8.51 V | 173.975132 | 0.759 |
| -20 | DC 8.51 V | 173.975152 | 0.874 |
| -30 | DC 8.51 V | 173.975134 | 0.770 |

(4) Frequency stability versus input voltage (Battery endpoint is 6V) -5W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 136.025102 | 0.750 |
| 40 | DC 6.00 V | 136.025094 | 0.691 |
| 30 | DC 6.00 V | 136.025064 | 0.471 |
| 20 | DC 6.00 V | 136.025064 | 0.471 |
| 10 | DC 6.00 V | 136.025072 | 0.529 |
| 0 | DC 6.00 V | 136.025084 | 0.618 |
| -10 | DC 6.00 V | 136.025048 | 0.353 |
| -20 | DC 6.00 V | 136.025078 | 0.573 |
| -30 | DC 6.00 V | 136.025049 | 0.360 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 155.025092 | 0.593 |
| 40 | DC 6.00 V | 155.025034 | 0.219 |
| 30 | DC 6.00 V | 155.025051 | 0.329 |
| 20 | DC 6.00 V | 155.025037 | 0.239 |
| 10 | DC 6.00 V | 155.025095 | 0.613 |
| 0 | DC 6.00 V | 155.025104 | 0.671 |
| -10 | DC 6.00 V | 155.025091 | 0.587 |
| -20 | DC 6.00 V | 155.025083 | 0.535 |
| -30 | DC 6.00 V | 155.025094 | 0.606 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 173.975132 | 0.759 |
| 40 | DC 6.00 V | 173.975114 | 0.655 |
| 30 | DC 6.00 V | 173.975083 | 0.477 |
| 20 | DC 6.00 V | 173.975091 | 0.523 |
| 10 | DC 6.00 V | 173.975082 | 0.471 |
| 0 | DC 6.00 V | 173.975116 | 0.667 |
| -10 | DC 6.00 V | 173.975125 | 0.718 |
| -20 | DC 6.00 V | 173.975093 | 0.535 |
| -30 | DC 6.00 V | 173.975109 | 0.627 |

(1)Frequency stability versus input voltage (Supply nominal voltage is 7.4V) --1W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 136.025068 | 0.500 |
| 40 | DC 7.4 V | 136.025079 | 0.581 |
| 30 | DC 7.4 V | 136.025082 | 0.603 |
| 20 | DC 7.4 V | 136.025089 | 0.654 |
| 10 | DC 7.4 V | 136.025091 | 0.669 |
| 0 | DC 7.4 V | 136.025075 | 0.551 |
| -10 | DC 7.4 V | 136.025081 | 0.595 |
| -20 | DC 7.4 V | 136.025087 | 0.640 |
| -30 | DC 7.4 V | 136.025096 | 0.706 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 155.025105 | 0.677 |
| 40 | DC 7.4 V | 155.025096 | 0.619 |
| 30 | DC 7.4 V | 155.025109 | 0.703 |
| 20 | DC 7.4 V | 155.025086 | 0.555 |
| 10 | DC 7.4 V | 155.025082 | 0.529 |
| 0 | DC 7.4 V | 155.025095 | 0.613 |
| -10 | DC 7.4 V | 155.025082 | 0.529 |
| -20 | DC 7.4 V | 155.025074 | 0.477 |
| -30 | DC 7.4 V | 155.025081 | 0.522 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 7.4 V | 173.975061 | 0.351 |
| 40 | DC 7.4 V | 173.975082 | 0.471 |
| 30 | DC 7.4 V | 173.975107 | 0.615 |
| 20 | DC 7.4 V | 173.975096 | 0.552 |
| 10 | DC 7.4 V | 173.975091 | 0.523 |
| 0 | DC 7.4 V | 173.975083 | 0.477 |
| -10 | DC 7.4 V | 173.975096 | 0.552 |
| -20 | DC 7.4 V | 173.975115 | 0.661 |
| -30 | DC 7.4 V | 173.975124 | 0.713 |

(2) Frequency stability versus input voltage (Battery Limiting voltage is 6.29V) --1W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 136.025106 | 0.779 |
| 40 | DC 6.29 V | 136.025094 | 0.691 |
| 30 | DC 6.29 V | 136.025083 | 0.610 |
| 20 | DC 6.29 V | 136.025086 | 0.632 |
| 10 | DC 6.29 V | 136.025084 | 0.618 |
| 0 | DC 6.29 V | 136.025092 | 0.676 |
| -10 | DC 6.29 V | 136.025081 | 0.595 |
| -20 | DC 6.29 V | 136.025056 | 0.412 |
| -30 | DC 6.29 V | 136.025068 | 0.500 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 155.025086 | 0.555 |
| 40 | DC 6.29 V | 155.025097 | 0.626 |
| 30 | DC 6.29 V | 155.025093 | 0.600 |
| 20 | DC 6.29 V | 155.025057 | 0.368 |
| 10 | DC 6.29 V | 155.025092 | 0.593 |
| 0 | DC 6.29 V | 155.025081 | 0.522 |
| -10 | DC 6.29 V | 155.025096 | 0.619 |
| -20 | DC 6.29 V | 155.025072 | 0.464 |
| -30 | DC 6.29 V | 155.025058 | 0.374 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.29 V | 173.975102 | 0.586 |
| 40 | DC 6.29 V | 173.975095 | 0.546 |
| 30 | DC 6.29 V | 173.975085 | 0.489 |
| 20 | DC 6.29 V | 173.975074 | 0.425 |
| 10 | DC 6.29 V | 173.975098 | 0.563 |
| 0 | DC 6.29 V | 173.975105 | 0.604 |
| -10 | DC 6.29 V | 173.975106 | 0.609 |
| -20 | DC 6.29 V | 173.975089 | 0.512 |
| -30 | DC 6.29 V | 173.975087 | 0.500 |

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V) --1W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 136.025089 | 0.654 |
| 40 | DC 8.51 V | 136.025047 | 0.346 |
| 30 | DC 8.51 V | 136.025083 | 0.610 |
| 20 | DC 8.51 V | 136.025084 | 0.618 |
| 10 | DC 8.51 V | 136.025096 | 0.706 |
| 0 | DC 8.51 V | 136.025082 | 0.603 |
| -10 | DC 8.51 V | 136.025075 | 0.551 |
| -20 | DC 8.51 V | 136.025051 | 0.375 |
| -30 | DC 8.51 V | 136.025076 | 0.559 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 155.025082 | 0.529 |
| 40 | DC 8.51 V | 155.025047 | 0.303 |
| 30 | DC 8.51 V | 155.025089 | 0.574 |
| 20 | DC 8.51 V | 155.025084 | 0.542 |
| 10 | DC 8.51 V | 155.025096 | 0.619 |
| 0 | DC 8.51 V | 155.025107 | 0.690 |
| -10 | DC 8.51 V | 155.025124 | 0.800 |
| -20 | DC 8.51 V | 155.025163 | 1.051 |
| -30 | DC 8.51 V | 155.025114 | 0.735 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 8.51 V | 173.975056 | 0.322 |
| 40 | DC 8.51 V | 173.975092 | 0.529 |
| 30 | DC 8.51 V | 173.975113 | 0.650 |
| 20 | DC 8.51 V | 173.9751 | 0.575 |
| 10 | DC 8.51 V | 173.975129 | 0.741 |
| 0 | DC 8.51 V | 173.975106 | 0.609 |
| -10 | DC 8.51 V | 173.975132 | 0.759 |
| -20 | DC 8.51 V | 173.975152 | 0.874 |
| -30 | DC 8.51 V | 173.975134 | 0.770 |

(4) Frequency stability versus input voltage (Battery endpoint is 6V) -1W

Bottom Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 136.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 136.025096 | 0.706 |
| 40 | DC 6.00 V | 136.025091 | 0.669 |
| 30 | DC 6.00 V | 136.025053 | 0.390 |
| 20 | DC 6.00 V | 136.025061 | 0.448 |
| 10 | DC 6.00 V | 136.025052 | 0.382 |
| 0 | DC 6.00 V | 136.025088 | 0.647 |
| -10 | DC 6.00 V | 136.025056 | 0.412 |
| -20 | DC 6.00 V | 136.025071 | 0.522 |
| -30 | DC 6.00 V | 136.025051 | 0.375 |

Middle Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 155.025 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 155.025058 | 0.374 |
| 40 | DC 6.00 V | 155.025092 | 0.593 |
| 30 | DC 6.00 V | 155.025082 | 0.529 |
| 20 | DC 6.00 V | 155.025046 | 0.297 |
| 10 | DC 6.00 V | 155.025098 | 0.632 |
| 0 | DC 6.00 V | 155.025082 | 0.529 |
| -10 | DC 6.00 V | 155.025108 | 0.697 |
| -20 | DC 6.00 V | 155.025116 | 0.748 |
| -30 | DC 6.00 V | 155.025101 | 0.652 |

Top Channel @ 12.5 KHz Channel Separation

| Reference Frequency: | 173.975 MHz | Limit: | 5.0ppm |
|-------------------------|--------------|---------------------|--------|
| Environment Temperature | Power Supply | Frequency Deviation | |
| (°C) | (V) | (MHz) | ppm |
| 50 | DC 6.00 V | 173.975105 | 0.604 |
| 40 | DC 6.00 V | 173.975117 | 0.673 |
| 30 | DC 6.00 V | 173.975092 | 0.529 |
| 20 | DC 6.00 V | 173.975052 | 0.299 |
| 10 | DC 6.00 V | 173.975068 | 0.391 |
| 0 | DC 6.00 V | 173.975124 | 0.713 |
| -10 | DC 6.00 V | 173.975104 | 0.598 |
| -20 | DC 6.00 V | 173.975058 | 0.333 |
| -30 | DC 6.00 V | 173.975063 | 0.362 |

7. UNWANTED RADIATION

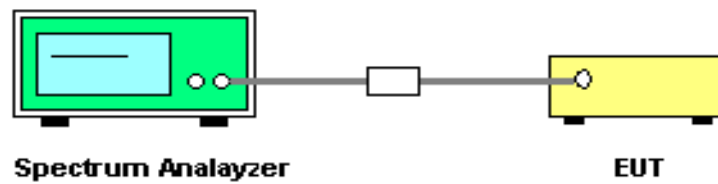
7.1 PROVISIONS APPLICABLE

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=100 Hz, VBW= 300 Hz, Span =50 KHz.
- 4). Set SPA Max hold. Mark peak, -26 dB.

7.3 TEST SETUP BLOCK DIAGRAM

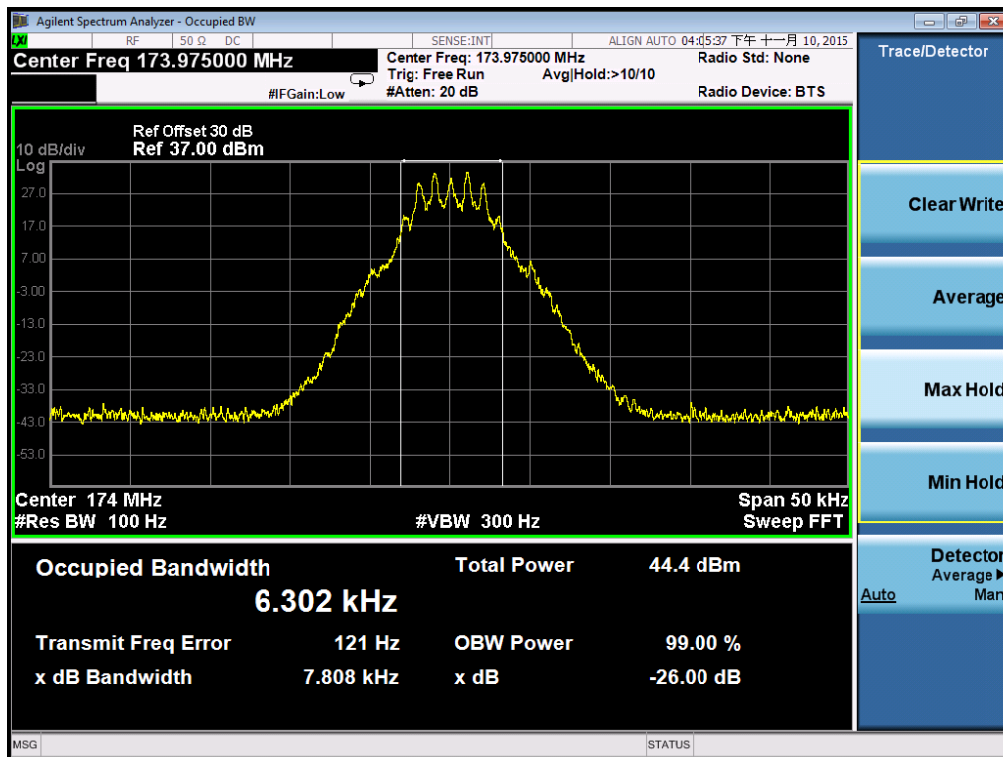


7.4 MEASUREMENT RESULT

Analog:

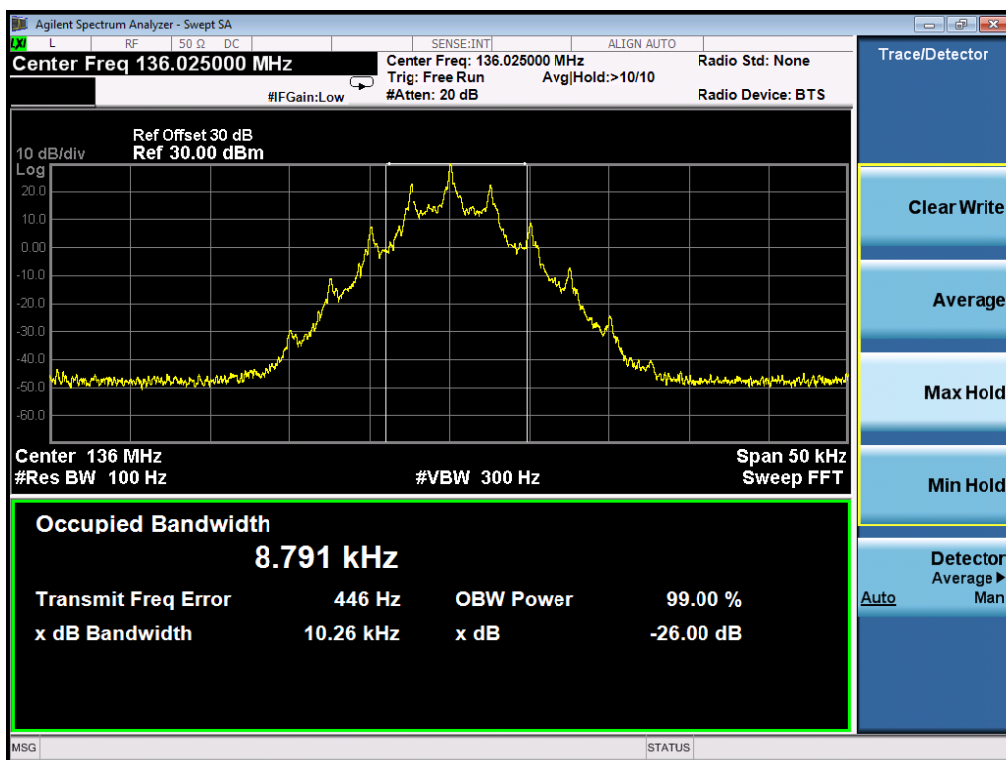
| 26 dB Bandwidth Measurement Result--5W | | | |
|--|-----------------------------|-----------|--------|
| Operating Frequency | 12.5 KHz Channel Separation | | |
| | Test Data | Limits | Result |
| 136.025MHz | 7.793KHz | 11.25 KHz | Pass |
| 155.025MHz | 7.780KHz | 11.25 KHz | Pass |
| 173.975MHz | 7.808KHz | 11.25 KHz | Pass |

Occupied bandwidth of High Channel (173.975MHz) @ 12.5 KHz Channel Separation



| 26 dB Bandwidth Measurement Result | | | |
|------------------------------------|-----------------------------|-----------|--------|
| Operating Frequency | 12.5 KHz Channel Separation | | |
| | Test Data | Limits | Result |
| 136.025MHz | 10.26KHz | 11.25 KHz | Pass |
| 155.025MHz | 10.15KHz | 11.25 KHz | Pass |
| 173.975MHz | 10.20KHz | 11.25 KHz | Pass |

Occupied bandwidth of High Channel (136.025MHz) @ 12.5 KHz Channel Separation

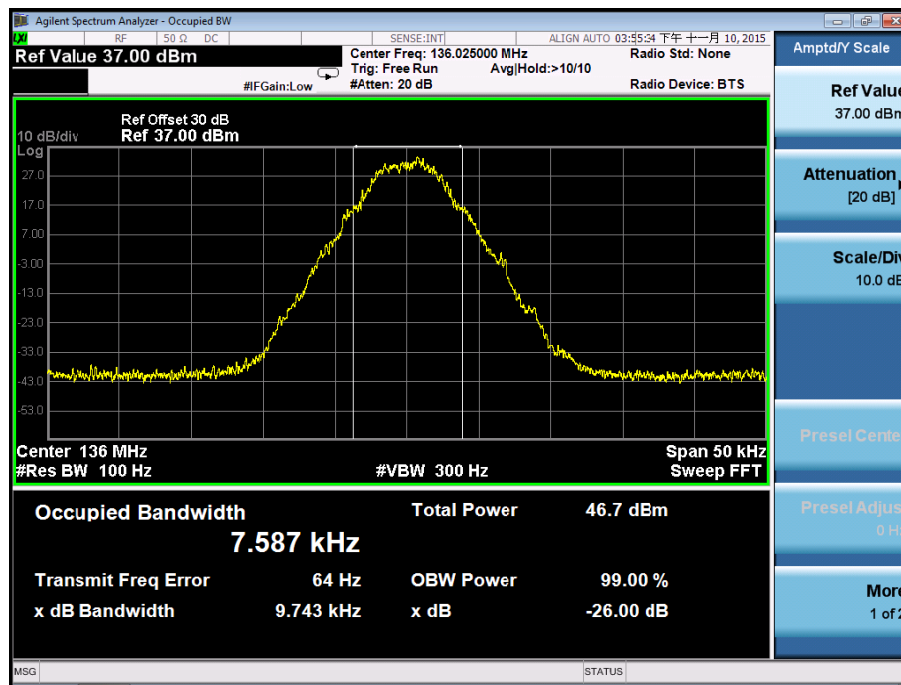


Digital:

TEST RESULTS

| 26 DB BANDWIDTH MEASUREMENT RESULT--5W | | | |
|--|-----------------------------|-----------|--------|
| Operating Frequency | 12.5 KHz Channel Separation | | |
| | Test Data | Limits | Result |
| 136.025MHz | 9.743KHz | 11.25 KHz | Pass |
| 155.025MHz | 9.729KHz | 11.25 KHz | Pass |
| 173.975MHz | 9.740KHz | 11.25 KHz | Pass |

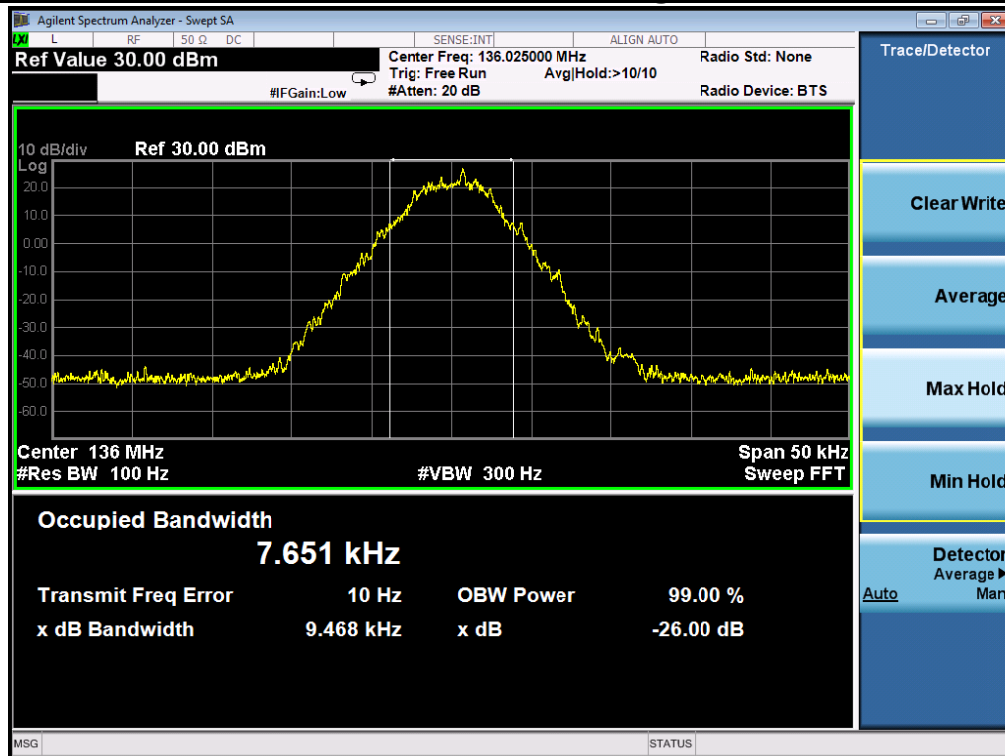
Occupied bandwidth of Low Channel (136.025 MHz) @ 12.5 KHz Channel Separation



TEST RESULTS

| 26 DB BANDWIDTH MEASUREMENT RESULT--1W | | | |
|--|-----------------------------|-----------|--------|
| Operating Frequency | 12.5 KHz Channel Separation | | |
| | Test Data | Limits | Result |
| 136.025MHz | 9.468KHz | 11.25 KHz | Pass |
| 155.025MHz | 9.326KHz | 11.25 KHz | Pass |
| 173.975MHz | 9.402KHz | 11.25 KHz | Pass |

Occupied bandwidth of Low Channel (136.025 MHz) @ 12.5 KHz Channel Separation



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 f_0 to 5.625 KHz removed from f_0 : Zero dB.
- (2). On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (f_d in KHz) f_0 of more than 5.625 KHz but no more than 12.5 KHz: At least $7.27(f_d - 2.88 \text{ KHz})$ dB
- (3). On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (f_d in KHz) f_0 of more than 12.5 KHz: At least $50 + 10 \log(P)$ dB or 70 dB, whichever is lesser attenuation.

For 6.25 KHz Channel Separation:

- (1). On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0 : Zero dB.
- (2). On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least $30 + 16.67(f_d - 3 \text{ kHz})$ 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 $55 + 10 \log(P)$ or 65 dB, whichever is the lesser attenuation.

8.2 MEASUREMENT PROCEDURE

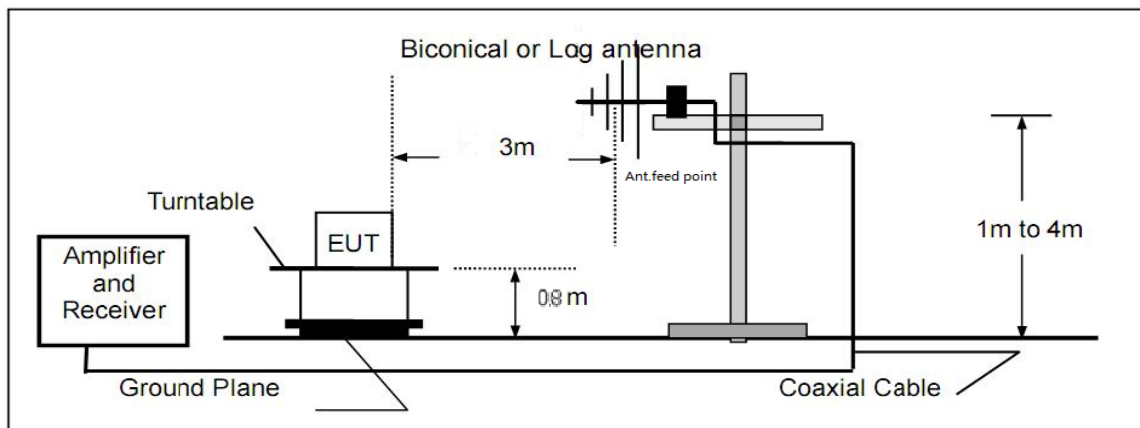
- (1) On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- (2) The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- (3) The output of the antenna shall 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 then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- (7) The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.

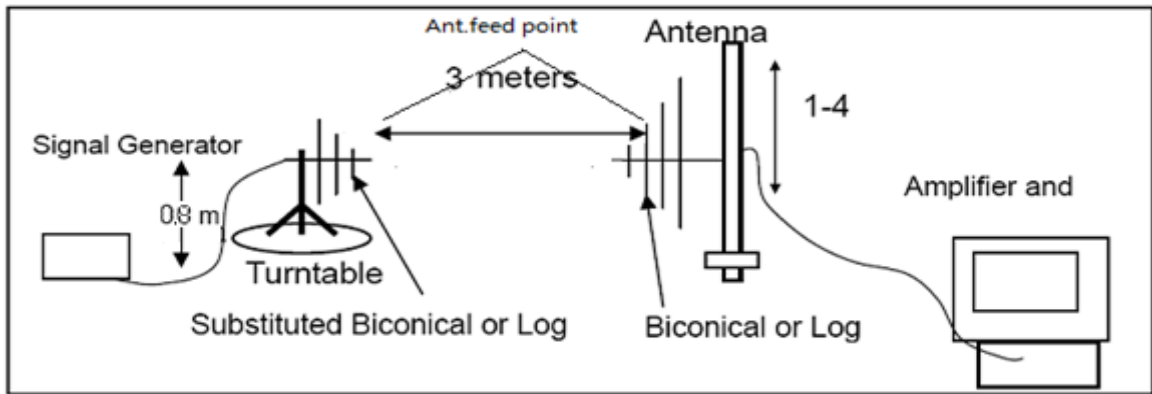
- (8)The maximum signal level detected by the measuring receiver shall be noted.
- (9)The measurement shall be repeated with the test antenna set to horizontal polarization.
- (10) Replace the antenna with a proper Antenna (substitution antenna).
- (11)The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- (12)The substitution antenna shall be connected to a calibrated signal generator.
- (13)If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- (14)The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- (15)The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- (16)The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- (17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

8.3 TEST SETUP BLOCK DIAGRAM

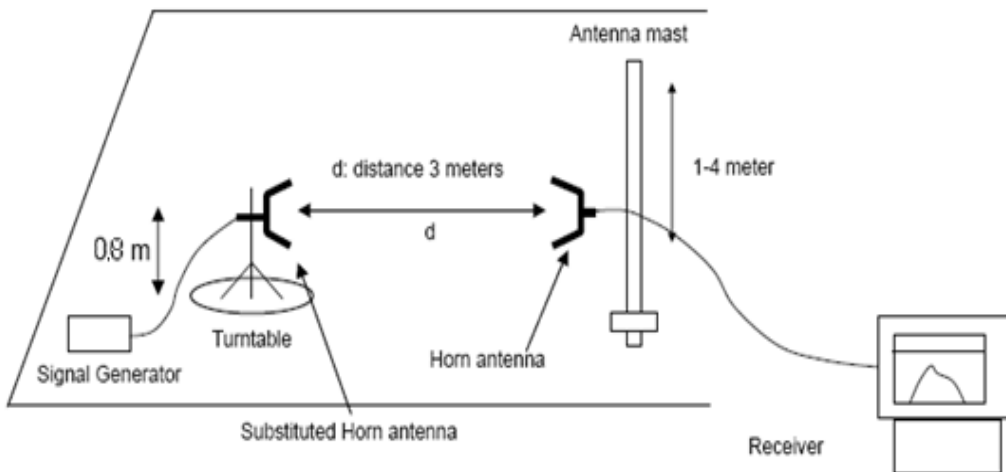
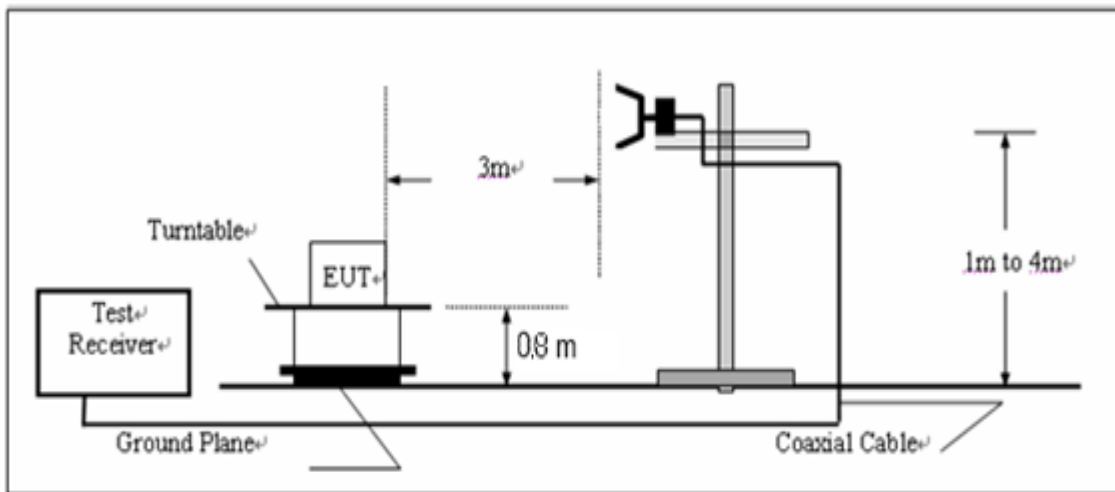
SUBSTITUTION METHOD: (Radiated Emissions)

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) fo 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) =50 (dB)—1W

Analog:

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-5W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 136.025 | H | 0 | | pass |
| 272.050 | H | 71.26 | 57 | pass |
| 408.08 | H | 72.42 | 57 | pass |
| 544.100 | H | 72.35 | 57 | pass |
| 680.125 | H | 72.61 | 57 | pass |
| 816.150 | H | 75.31 | 57 | pass |
| 952.175 | H | 76.15 | 57 | pass |
| 1088.200 | H | 80.09 | 57 | pass |
| 1224.225 | H | 81.34 | 57 | pass |
| 1360.250 | H | 82.39 | 57 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/H) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 136.025 | V | 0 | | pass |
| 272.050 | V | 69.25 | 57 | pass |
| 408.08 | V | 70.37 | 57 | pass |
| 544.100 | V | 71.03 | 57 | pass |
| 680.125 | V | 71.92 | 57 | pass |
| 816.150 | V | 73.47 | 57 | pass |
| 952.175 | V | 75.04 | 57 | pass |
| 1088.200 | V | 76.24 | 57 | pass |
| 1224.225 | V | 78.19 | 57 | pass |
| 1360.250 | V | 80.52 | 57 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-5W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 155.025 | H | 0 | | pass |
| 310.050 | H | 70.59 | 57 | pass |
| 465.075 | H | 71.68 | 57 | pass |
| 620.100 | H | 71.46 | 57 | pass |
| 775.125 | H | 73.25 | 57 | pass |
| 930.150 | H | 74.36 | 57 | pass |
| 1085.175 | H | 77.67 | 57 | pass |
| 1240.200 | H | 77.91 | 57 | pass |
| 1395.225 | H | 82.32 | 57 | pass |
| 1550.250 | H | 82.68 | 57 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/H) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 155.025 | V | 0 | | pass |
| 310.050 | V | 69.24 | 57 | pass |
| 465.075 | V | 70.51 | 57 | pass |
| 620.100 | V | 72.43 | 57 | pass |
| 775.125 | V | 75.25 | 57 | pass |
| 930.150 | V | 75.09 | 57 | pass |
| 1085.175 | V | 78.46 | 57 | pass |
| 1240.200 | V | 79.38 | 57 | pass |
| 1395.225 | V | 81.26 | 57 | pass |
| 1550.250 | V | 80.35 | 57 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-5W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 173.975 | H | 0 | | pass |
| 347.950 | H | 71.26 | 57 | pass |
| 521.925 | H | 71.93 | 57 | pass |
| 695.900 | H | 73.6 | 57 | pass |
| 869.875 | H | 74.83 | 57 | pass |
| 1043.850 | H | 76.91 | 57 | pass |
| 1217.825 | H | 77.53 | 57 | pass |
| 1391.800 | H | 78.81 | 57 | pass |
| 1565.775 | H | 80.24 | 57 | pass |
| 1739.750 | H | 82.48 | 57 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 173.975 | V | 0 | | pass |
| 347.950 | V | 70.62 | 57 | pass |
| 521.925 | V | 71.69 | 57 | pass |
| 695.900 | V | 74.83 | 57 | pass |
| 869.875 | V | 74.58 | 57 | pass |
| 1043.850 | V | 75.61 | 57 | pass |
| 1217.825 | V | 77.49 | 57 | pass |
| 1391.800 | V | 79.26 | 57 | pass |
| 1565.775 | V | 80.19 | 57 | pass |
| 1739.750 | V | 81.57 | 57 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-1W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 136.025 | H | 0 | | pass |
| 272.050 | H | 73.26 | 50 | pass |
| 408.08 | H | 72.91 | 50 | pass |
| 544.100 | H | 72.64 | 50 | pass |
| 680.125 | H | 74.81 | 50 | pass |
| 816.150 | H | 75.63 | 50 | pass |
| 952.175 | H | 77.58 | 50 | pass |
| 1088.200 | H | 79.92 | 50 | pass |
| 1224.225 | H | 80.46 | 50 | pass |
| 1360.250 | H | 82.47 | 50 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/H) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 136.025 | V | 0 | | pass |
| 272.050 | V | 71.58 | 50 | pass |
| 408.08 | V | 72.61 | 50 | pass |
| 544.100 | V | 73.56 | 50 | pass |
| 680.125 | V | 74.58 | 50 | pass |
| 816.150 | V | 76.52 | 50 | pass |
| 952.175 | V | 77.59 | 50 | pass |
| 1088.200 | V | 78.51 | 50 | pass |
| 1224.225 | V | 80.62 | 50 | pass |
| 1360.250 | V | 81.37 | 50 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-1W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 155.025 | H | 0 | | pass |
| 310.050 | H | 71.52 | 50 | pass |
| 465.075 | H | 72.68 | 50 | pass |
| 620.100 | H | 73.92 | 50 | pass |
| 775.125 | H | 74.69 | 50 | pass |
| 930.150 | H | 75.81 | 50 | pass |
| 1085.175 | H | 78.68 | 50 | pass |
| 1240.200 | H | 80.69 | 50 | pass |
| 1395.225 | H | 81.57 | 50 | pass |
| 1550.250 | H | 82.41 | 50 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/H) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 155.025 | V | 0 | | pass |
| 310.050 | V | 70.52 | 50 | pass |
| 465.075 | V | 71.63 | 50 | pass |
| 620.100 | V | 72.61 | 50 | pass |
| 775.125 | V | 74.61 | 50 | pass |
| 930.150 | V | 75.68 | 50 | pass |
| 1085.175 | V | 76.52 | 50 | pass |
| 1240.200 | V | 78.96 | 50 | pass |
| 1395.225 | V | 80.13 | 50 | pass |
| 1550.250 | V | 81.47 | 50 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-1W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 173.975 | H | 0 | | pass |
| 347.950 | H | 72.58 | 50 | pass |
| 521.925 | H | 73.69 | 50 | pass |
| 695.900 | H | 76.14 | 50 | pass |
| 869.875 | H | 75.81 | 50 | pass |
| 1043.850 | H | 76.27 | 50 | pass |
| 1217.825 | H | 78.62 | 50 | pass |
| 1391.800 | H | 79.43 | 50 | pass |
| 1565.775 | H | 80.47 | 50 | pass |
| 1739.750 | H | 81.63 | 50 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 173.975 | V | 0 | | pass |
| 347.950 | V | 71.47 | 50 | pass |
| 521.925 | V | 72.64 | 50 | pass |
| 695.900 | V | 75.82 | 50 | pass |
| 869.875 | V | 76.25 | 50 | pass |
| 1043.850 | V | 76.94 | 50 | pass |
| 1217.825 | V | 77.28 | 50 | pass |
| 1391.800 | V | 79.26 | 50 | pass |
| 1565.775 | V | 81.45 | 50 | pass |
| 1739.750 | V | 83.16 | 50 | pass |

Digital:

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-5W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 136.025 | H | 0 | | pass |
| 272.050 | H | 70.51 | 57 | pass |
| 408.08 | H | 71.68 | 57 | pass |
| 544.100 | H | 72.69 | 57 | pass |
| 680.125 | H | 73.17 | 57 | pass |
| 816.150 | H | 74.66 | 57 | pass |
| 952.175 | H | 76.94 | 57 | pass |
| 1088.200 | H | 81.36 | 57 | pass |
| 1224.225 | H | 81.51 | 57 | pass |
| 1360.250 | H | 82.81 | 57 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 136.025 | V | 0 | | pass |
| 272.050 | V | 71.35 | 57 | pass |
| 408.08 | V | 71.36 | 57 | pass |
| 544.100 | V | 72.14 | 57 | pass |
| 680.125 | V | 72.47 | 57 | pass |
| 816.150 | V | 74.27 | 57 | pass |
| 952.175 | V | 76.53 | 57 | pass |
| 1088.200 | V | 79.59 | 57 | pass |
| 1224.225 | V | 80.24 | 57 | pass |
| 1360.250 | V | 81.27 | 57 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-5W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 155.025 | H | 0 | | pass |
| 310.050 | H | 71.52 | 57 | pass |
| 465.075 | H | 72.36 | 57 | pass |
| 620.100 | H | 73.46 | 57 | pass |
| 775.125 | H | 74.37 | 57 | pass |
| 930.150 | H | 76.23 | 57 | pass |
| 1085.175 | H | 79.02 | 57 | pass |
| 1240.200 | H | 79.36 | 57 | pass |
| 1395.225 | H | 80.54 | 57 | pass |
| 1550.250 | H | 81.82 | 57 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/H) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 155.025 | V | 0 | | pass |
| 310.050 | V | 69.72 | 57 | pass |
| 465.08 | V | 70.63 | 57 | pass |
| 620.100 | V | 70.16 | 57 | pass |
| 775.125 | V | 71.36 | 57 | pass |
| 930.150 | V | 71.65 | 57 | pass |
| 1085.175 | V | 74.59 | 57 | pass |
| 1240.200 | V | 75.8 | 57 | pass |
| 1395.225 | V | 79.86 | 57 | pass |
| 1550.250 | V | 81.36 | 57 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-5W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 173.975 | H | 0 | | pass |
| 347.950 | H | 70.91 | 57 | pass |
| 521.925 | H | 71.63 | 57 | pass |
| 695.900 | H | 72.26 | 57 | pass |
| 869.875 | H | 74.48 | 57 | pass |
| 1043.850 | H | 73.15 | 57 | pass |
| 1217.825 | H | 75.27 | 57 | pass |
| 1391.800 | H | 78.49 | 57 | pass |
| 1565.775 | H | 81.72 | 57 | pass |
| 1739.750 | H | 82.64 | 57 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 173.975 | V | 0 | | pass |
| 347.950 | V | 71.52 | 57 | pass |
| 521.925 | V | 72.69 | 57 | pass |
| 695.900 | V | 74.91 | 57 | pass |
| 869.875 | V | 75.47 | 57 | pass |
| 1043.850 | V | 76.38 | 57 | pass |
| 1217.825 | V | 76.15 | 57 | pass |
| 1391.800 | V | 78.43 | 57 | pass |
| 1565.775 | V | 80.29 | 57 | pass |
| 1739.750 | V | 80.83 | 57 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-1W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 136.025 | H | 0 | | pass |
| 272.050 | H | 70.52 | 50 | pass |
| 408.08 | H | 71.66 | 50 | pass |
| 544.100 | H | 73.91 | 50 | pass |
| 680.125 | H | 74.41 | 50 | pass |
| 816.150 | H | 75.52 | 50 | pass |
| 952.175 | H | 76.91 | 50 | pass |
| 1088.200 | H | 78.18 | 50 | pass |
| 1224.225 | H | 80.54 | 50 | pass |
| 1360.250 | H | 81.63 | 50 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/H) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 136.025 | V | 0 | | pass |
| 272.050 | V | 73.62 | 50 | pass |
| 408.08 | V | 74.69 | 50 | pass |
| 544.100 | V | 75.84 | 50 | pass |
| 680.125 | V | 75.91 | 50 | pass |
| 816.150 | V | 76.05 | 50 | pass |
| 952.175 | V | 77.59 | 50 | pass |
| 1088.200 | V | 76.93 | 50 | pass |
| 1224.225 | V | 81.25 | 50 | pass |
| 1360.250 | V | 82.51 | 50 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-1W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 155.025 | H | 0 | | pass |
| 310.050 | H | 69.51 | 50 | pass |
| 465.075 | H | 72.61 | 50 | pass |
| 620.100 | H | 73.51 | 50 | pass |
| 775.125 | H | 75.41 | 50 | pass |
| 930.150 | H | 76.15 | 50 | pass |
| 1085.175 | H | 78.91 | 50 | pass |
| 1240.200 | H | 79.51 | 50 | pass |
| 1395.225 | H | 80.18 | 50 | pass |
| 1550.250 | H | 82.57 | 50 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/H) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 155.025 | V | 0 | | pass |
| 310.050 | V | 69.15 | 50 | pass |
| 465.075 | V | 71.62 | 50 | pass |
| 620.100 | V | 73.61 | 50 | pass |
| 775.125 | V | 75.81 | 50 | pass |
| 930.150 | V | 77.35 | 50 | pass |
| 1085.175 | V | 76.81 | 50 | pass |
| 1240.200 | V | 79.64 | 50 | pass |
| 1395.225 | V | 81.52 | 50 | pass |
| 1550.250 | V | 82.69 | 50 | pass |

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-1W

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 173.975 | H | 0 | | pass |
| 347.950 | H | 68.24 | 50 | pass |
| 521.925 | H | 69.41 | 50 | pass |
| 695.900 | H | 71.52 | 50 | pass |
| 869.875 | H | 73.94 | 50 | pass |
| 1043.850 | H | 74.63 | 50 | pass |
| 1217.825 | H | 77.92 | 50 | pass |
| 1391.800 | H | 78.54 | 50 | pass |
| 1565.775 | H | 79.83 | 50 | pass |
| 1739.750 | H | 80.27 | 50 | pass |

| Emission Frequency (MHz) | Ant. Polarity(H/V) | Measurement Result Below carrier(dBc) | Limit below carrier(dBc) | Result(P/F) |
|--------------------------|--------------------|---------------------------------------|--------------------------|-------------|
| 173.975 | V | 0 | | pass |
| 347.950 | V | 70.51 | 50 | pass |
| 521.925 | V | 71.62 | 50 | pass |
| 695.900 | V | 72.57 | 50 | pass |
| 869.875 | V | 75.92 | 50 | pass |
| 1043.850 | V | 77.84 | 50 | pass |
| 1217.825 | V | 78.64 | 50 | pass |
| 1391.800 | V | 79.92 | 50 | pass |
| 1565.775 | V | 80.25 | 50 | pass |
| 1739.750 | V | 81.65 | 50 | pass |

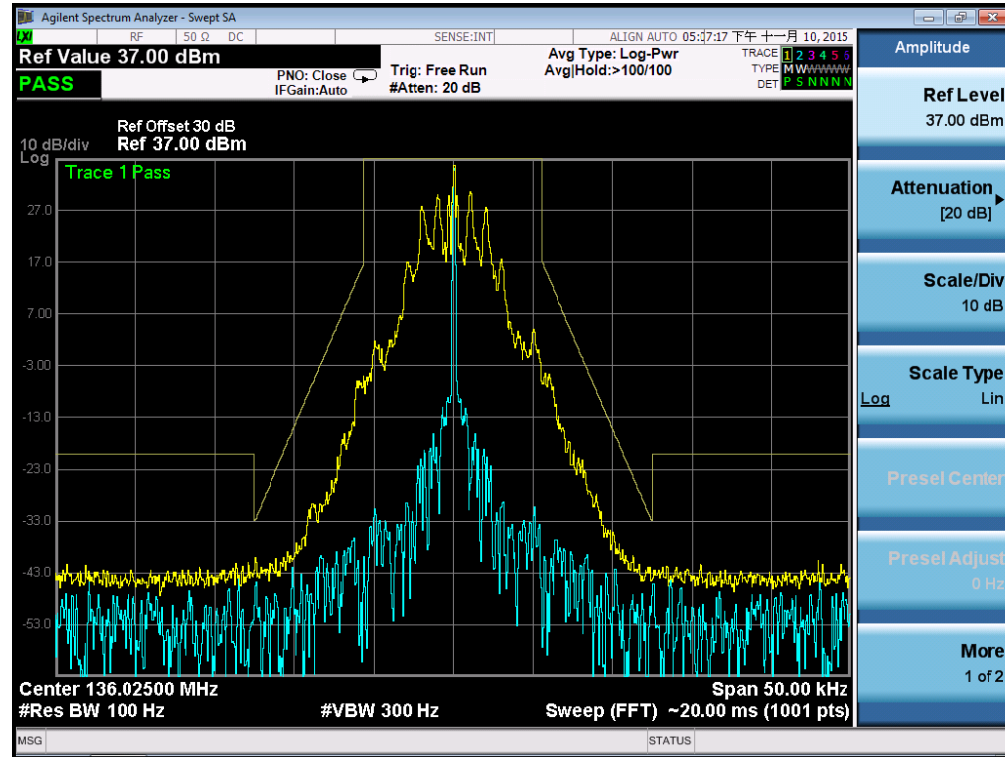
8.5 EMISSION MASK PLOT

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

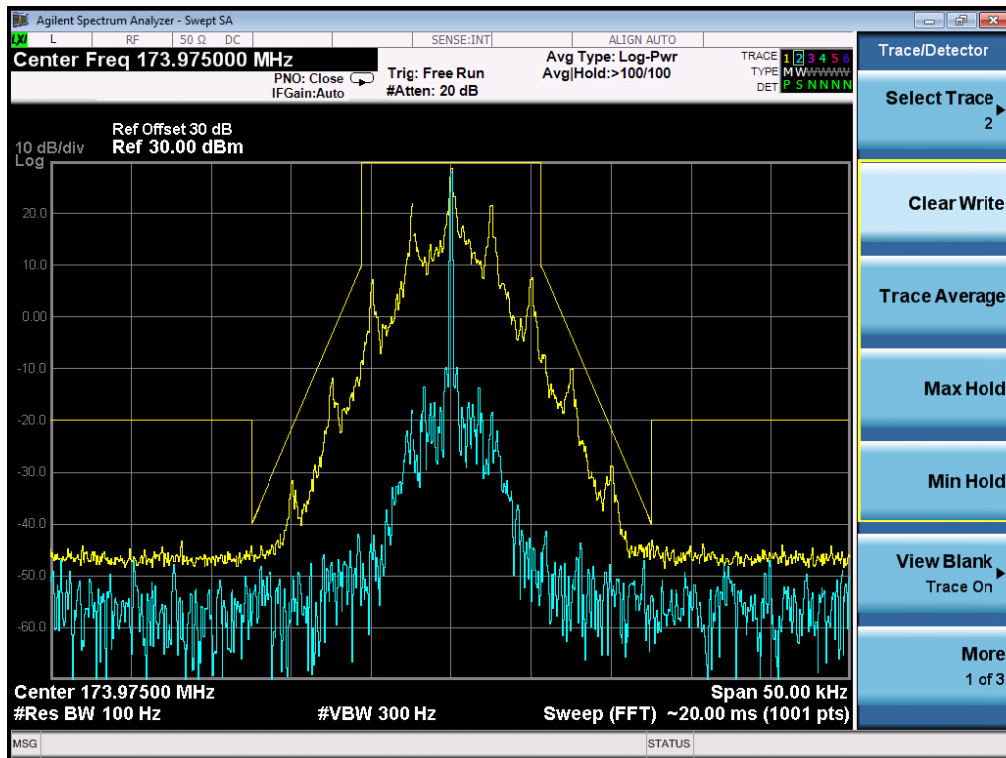
- The transmitter shall be modulated by a 2.5 kHz audio signal,
- The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz.

Analog:

The Worst Emission Mask (136.025MHz) for 12.5 KHz channel Separation (5W)

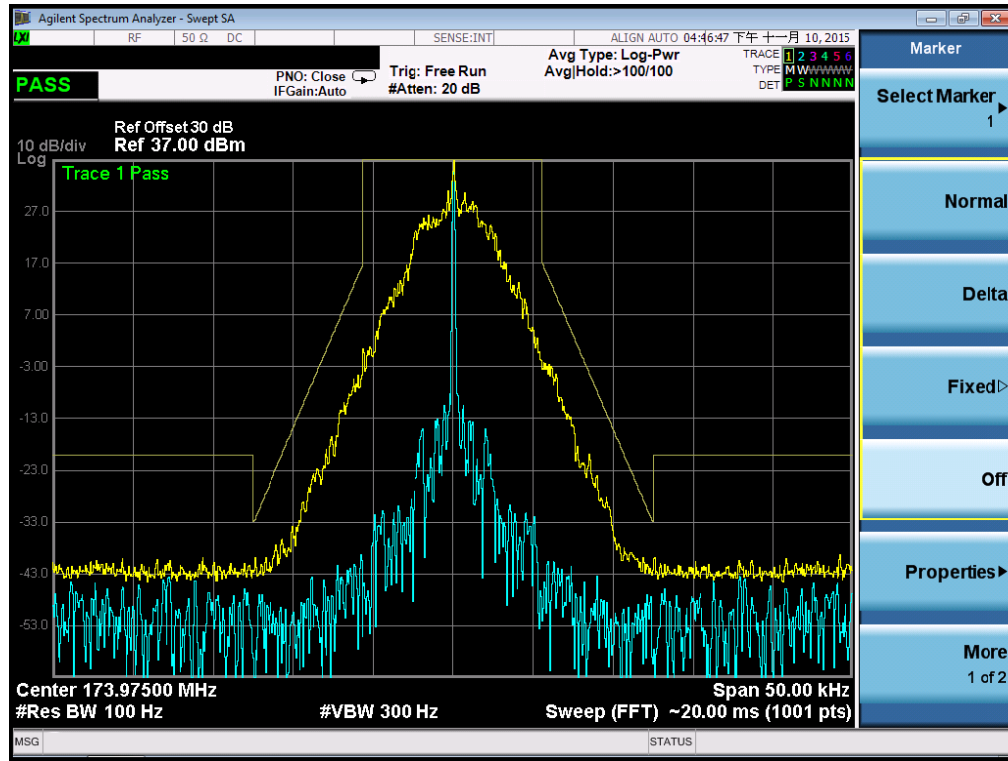


The Worst Emission Mask (173.975MHz) for 12.5 KHz channel Separation (1W)

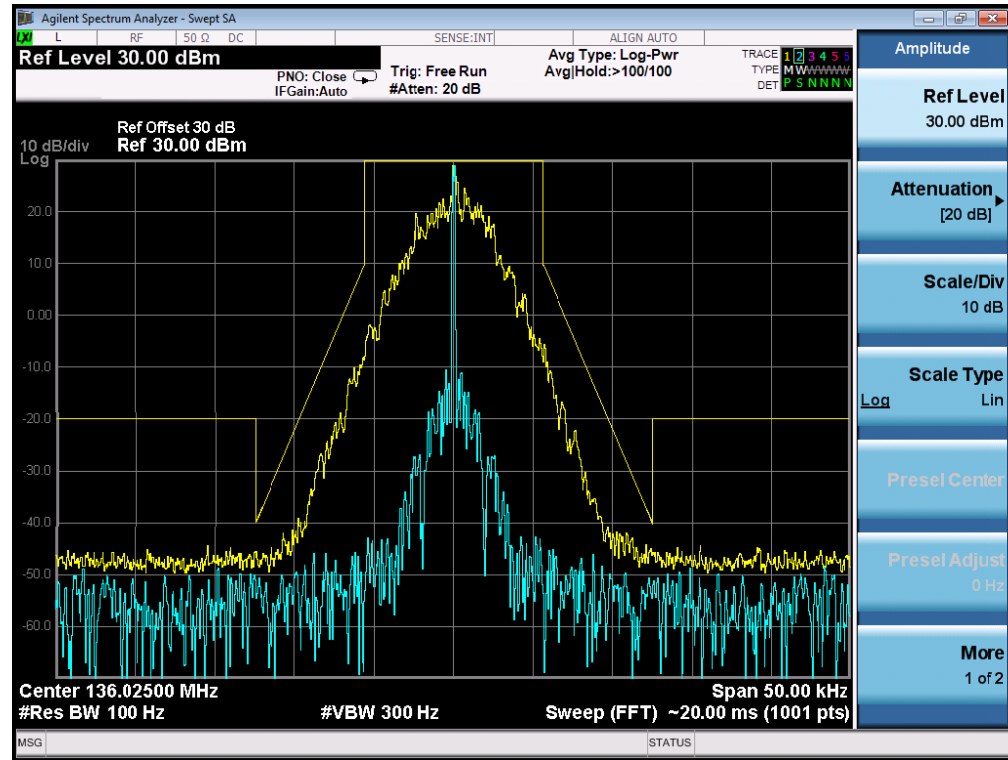


Digital:

The Worst Emission Mask (173.975MHz) for 12.5 KHz channel Separation (5W)



The Worst Emission Mask (136.025MHz) for 12.5 KHz channel Separation (1W)



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 = $20\log_{10}(\text{Deviation of test frequency}/\text{Deviation of 1 KHz reference})$.

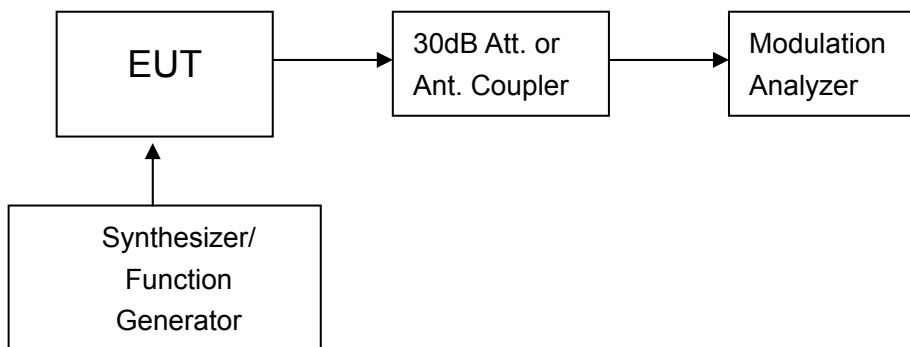


Figure 1: Modulation characteristic measurement configuration

9.3 MEASUREMENT RESULT

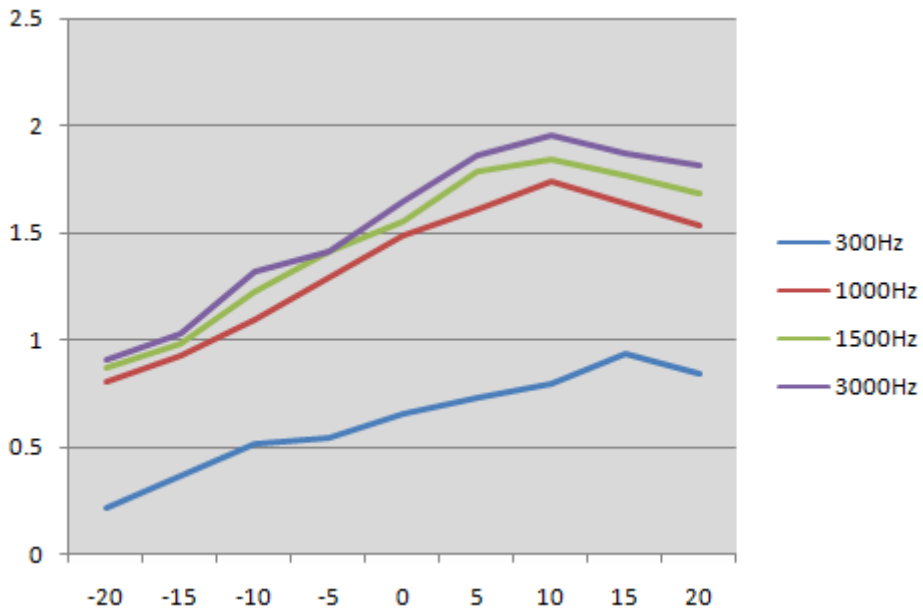
Analog:

TEST RESULTS—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 | 0.21 | 0.8 | 0.87 | 0.91 |
| -15 | 0.36 | 0.92 | 0.98 | 1.03 |
| -10 | 0.51 | 1.09 | 1.22 | 1.32 |
| -5 | 0.54 | 1.29 | 1.41 | 1.41 |
| 0 | 0.65 | 1.49 | 1.55 | 1.64 |
| +5 | 0.72 | 1.61 | 1.78 | 1.86 |
| +10 | 0.79 | 1.74 | 1.84 | 1.95 |
| +15 | 0.93 | 1.64 | 1.77 | 1.87 |
| +20 | 0.84 | 1.53 | 1.68 | 1.81 |



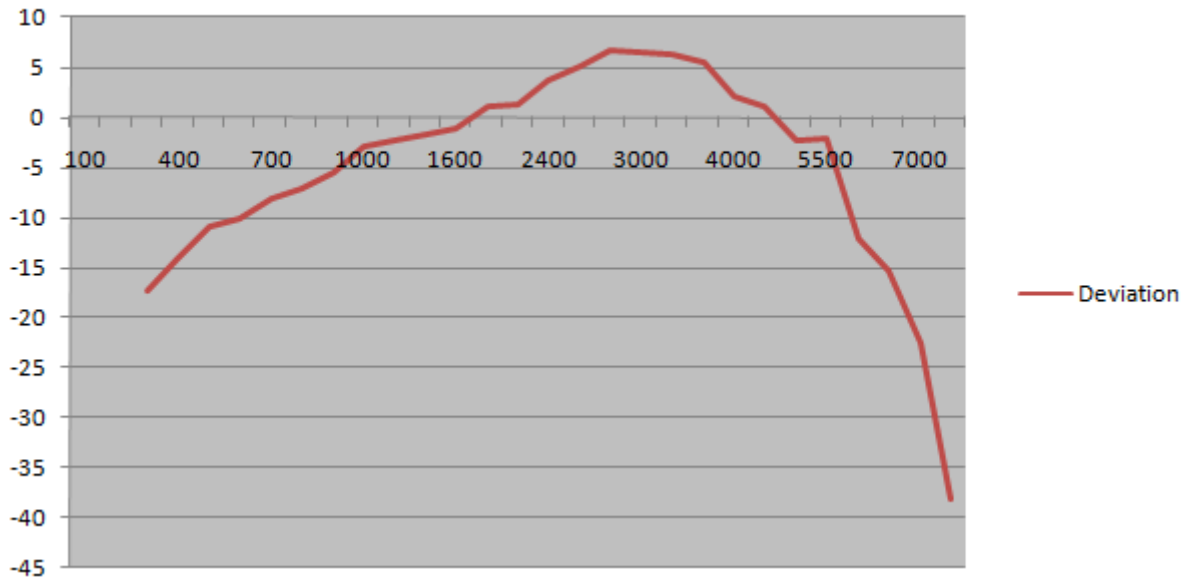
Note: All the modes had been tested, but only the worst data recorded in the report.

(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations

| Frequency (Hz) | Deviation (KHz) | Audio Frequency Response(dB) |
|----------------|-----------------|------------------------------|
| 100 | -- | -- |
| 200 | -- | -- |
| 300 | 0.11 | -13.15 |
| 400 | 0.16 | -9.90 |
| 500 | 0.23 | -6.74 |
| 600 | 0.25 | -6.02 |
| 700 | 0.32 | -3.88 |
| 800 | 0.36 | -2.85 |
| 900 | 0.43 | -1.31 |
| 1000 | 0.58 | 1.29 |
| 1200 | 0.62 | 1.87 |
| 1400 | 0.66 | 2.41 |
| 1600 | 0.72 | 3.17 |
| 1800 | 0.91 | 5.20 |
| 2000 | 0.93 | 5.39 |
| 2400 | 1.24 | 7.89 |
| 2500 | 1.46 | 9.31 |
| 2800 | 1.75 | 10.88 |
| 3000 | 1.72 | 10.73 |
| 3200 | 1.69 | 10.58 |
| 3600 | 1.53 | 9.71 |
| 4000 | 1.02 | 6.19 |
| 4500 | 0.91 | 5.20 |
| 5000 | 0.62 | 1.87 |
| 5500 | 0.64 | 2.14 |
| 6000 | 0.20 | -7.96 |
| 6500 | 0.14 | -11.06 |
| 7000 | 0.06 | -18.42 |
| 7500 | 0.01 | -33.98 |
| 9000 | -- | -- |
| 10000 | -- | -- |
| 14000 | -- | -- |
| 18000 | -- | -- |
| 20000 | -- | -- |
| 30000 | -- | -- |

Frequency Response of Middle Channel
20 KHz Channel Separations

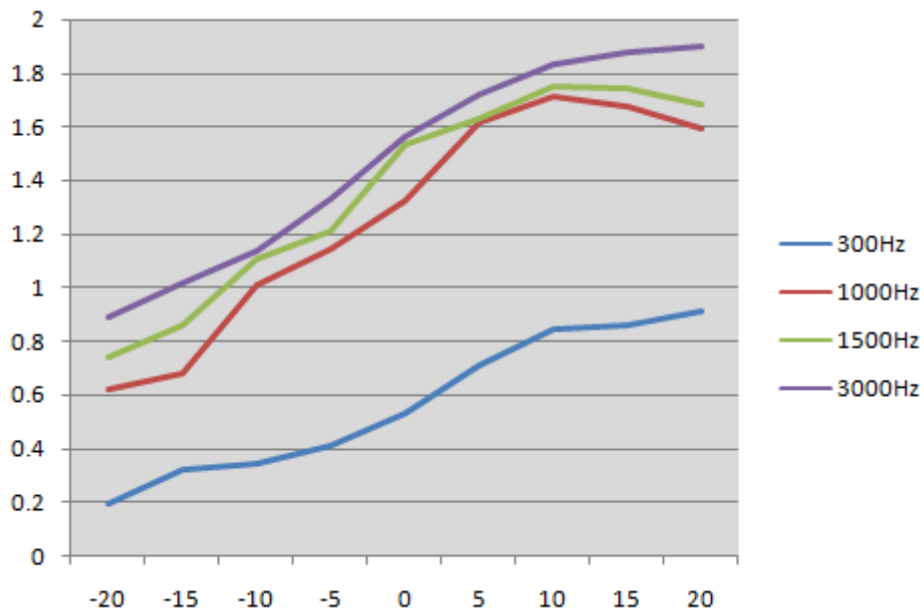


Note: All the modes had been tested, but only the worst data recorded in the report.

TEST RESULTS—1W
(A). MODULATION LIMIT

Bottom 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 | 0.19 | 0.62 | 0.74 | 0.89 |
| -15 | 0.32 | 0.68 | 0.86 | 1.02 |
| -10 | 0.34 | 1.01 | 1.11 | 1.14 |
| -5 | 0.41 | 1.14 | 1.21 | 1.33 |
| 0 | 0.53 | 1.32 | 1.53 | 1.56 |
| +5 | 0.71 | 1.61 | 1.63 | 1.72 |
| +10 | 0.84 | 1.71 | 1.75 | 1.83 |
| +15 | 0.86 | 1.67 | 1.74 | 1.88 |
| +20 | 0.91 | 1.59 | 1.68 | 1.9 |



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

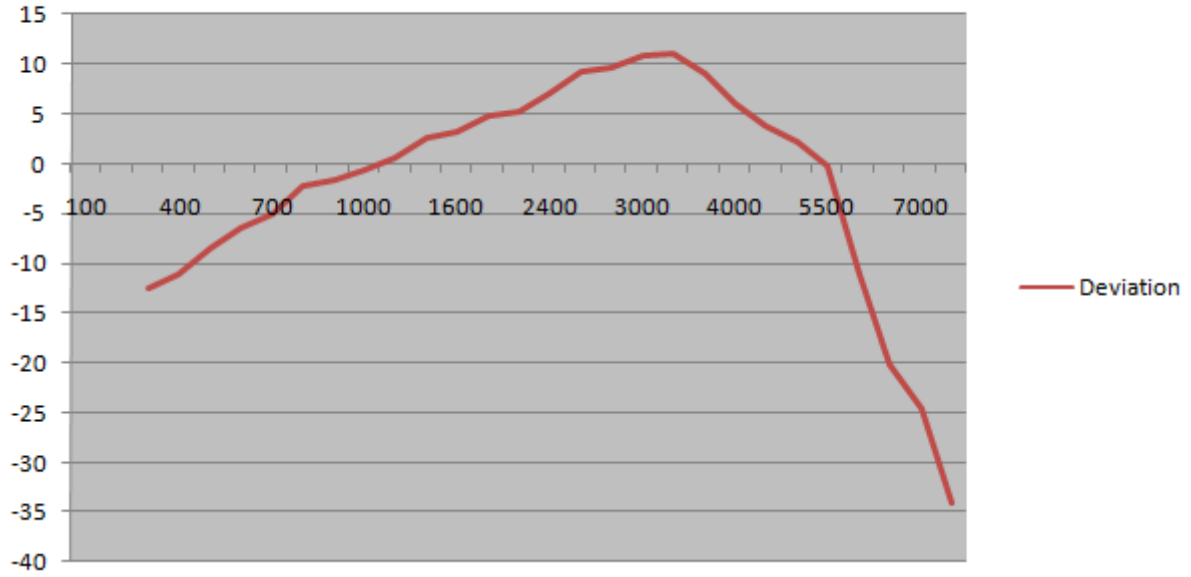
(B). AUDIO FREQUENCY RESPONSE:

Bottom Channel @ 12.5 KHz Channel Separations

| Frequency (Hz) | Deviation (KHz) | Audio Frequency Response(dB) |
|----------------|-----------------|------------------------------|
| 100 | -- | -- |
| 200 | -- | -- |
| 300 | 0.12 | -12.40 |
| 400 | 0.14 | -11.06 |
| 500 | 0.19 | -8.40 |
| 600 | 0.24 | -6.38 |
| 700 | 0.28 | -5.04 |
| 800 | 0.39 | -2.16 |
| 900 | 0.42 | -1.51 |
| 1000 | 0.47 | -0.54 |
| 1200 | 0.54 | 0.67 |
| 1400 | 0.67 | 2.54 |
| 1600 | 0.73 | 3.29 |
| 1800 | 0.88 | 4.91 |
| 2000 | 0.91 | 5.20 |
| 2400 | 1.13 | 7.08 |
| 2500 | 1.46 | 9.31 |
| 2800 | 1.51 | 9.60 |
| 3000 | 1.75 | 10.88 |
| 3200 | 1.79 | 11.08 |
| 3600 | 1.43 | 9.13 |
| 4000 | 1.01 | 6.11 |
| 4500 | 0.78 | 3.86 |
| 5000 | 0.65 | 2.28 |
| 5500 | 0.49 | -0.18 |
| 6000 | 0.14 | -11.06 |
| 6500 | 0.05 | -20.00 |
| 7000 | 0.03 | -24.44 |
| 7500 | 0.01 | -33.98 |
| 9000 | -- | -- |
| 10000 | -- | -- |
| 14000 | -- | -- |
| 18000 | -- | -- |
| 20000 | -- | -- |
| 30000 | -- | -- |

Frequency Response of Bottom Channel

12.5 KHz Channel Separations



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

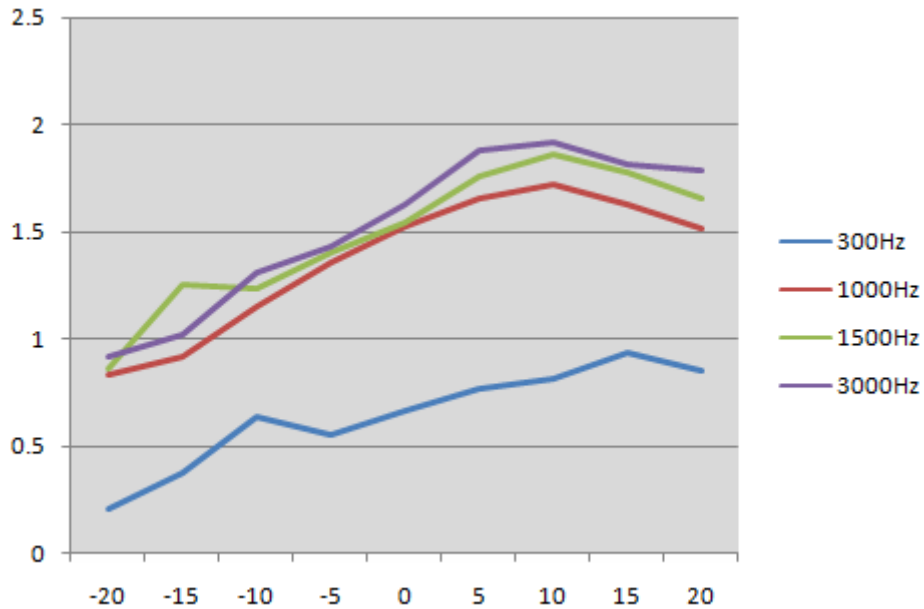
Digital:

TEST RESULTS—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 | 0.2 | 0.83 | 0.86 | 0.92 |
| 1 | 0.37 | 0.91 | 1.25 | 1.02 |
| -10 | 0.63 | 1.15 | 1.23 | 1.31 |
| -5 | 0.55 | 1.35 | 1.4 | 1.43 |
| 0 | 0.66 | 1.52 | 1.54 | 1.63 |
| +5 | 0.76 | 1.65 | 1.76 | 1.88 |
| +10 | 0.81 | 1.72 | 1.86 | 1.92 |
| +15 | 0.93 | 1.63 | 1.78 | 1.82 |
| +20 | 0.85 | 1.51 | 1.65 | 1.79 |



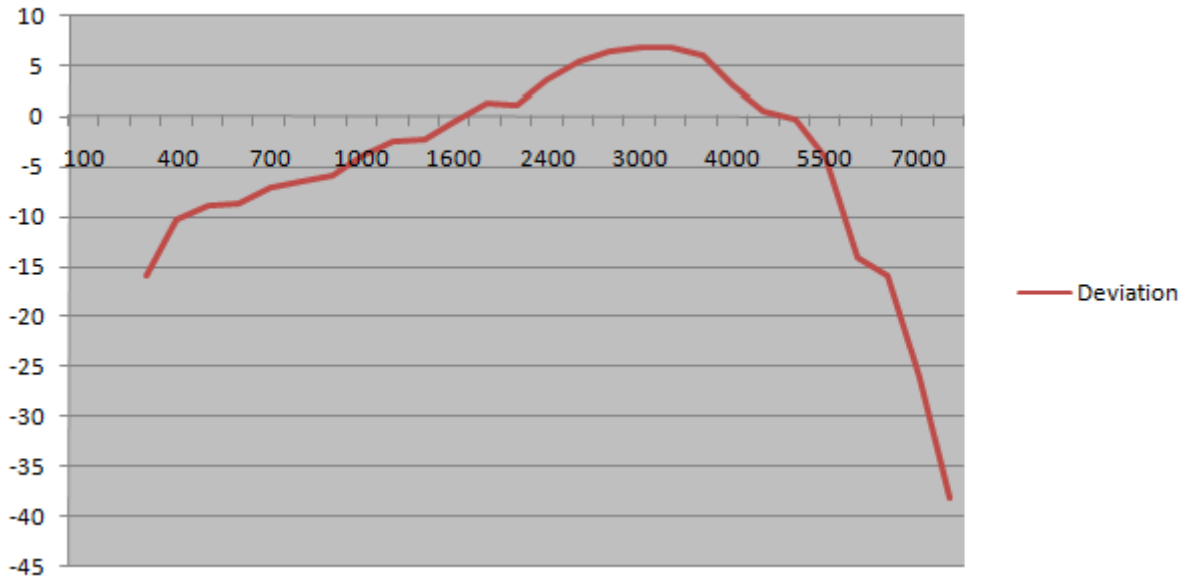
Note: All the modes had been tested, but only the worst data recorded in the report.

(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 | 0.25 | -6.02 |
| 500 | 0.29 | -4.73 |
| 600 | 0.30 | -4.44 |
| 700 | 0.36 | -2.85 |
| 800 | 0.38 | -2.38 |
| 900 | 0.41 | -1.72 |
| 1000 | 0.52 | 0.34 |
| 1200 | 0.61 | 1.73 |
| 1400 | 0.62 | 1.87 |
| 1600 | 0.76 | 3.64 |
| 1800 | 0.94 | 5.48 |
| 2000 | 0.93 | 5.39 |
| 2400 | 1.22 | 7.75 |
| 2500 | 1.51 | 9.60 |
| 2800 | 1.68 | 10.53 |
| 3000 | 1.76 | 10.93 |
| 3200 | 1.74 | 10.83 |
| 3600 | 1.60 | 10.10 |
| 4000 | 1.13 | 7.08 |
| 4500 | 0.86 | 4.71 |
| 5000 | 0.78 | 3.86 |
| 5500 | 0.51 | 0.17 |
| 6000 | 0.16 | -9.90 |
| 6500 | 0.13 | -11.70 |
| 7000 | 0.04 | -21.94 |
| 7500 | 0.01 | -33.98 |
| 9000 | -- | -- |
| 10000 | -- | -- |
| 14000 | -- | -- |
| 18000 | -- | -- |
| 20000 | -- | -- |
| 30000 | -- | -- |

Frequency Response of Middle Channel
20 KHz Channel Separations



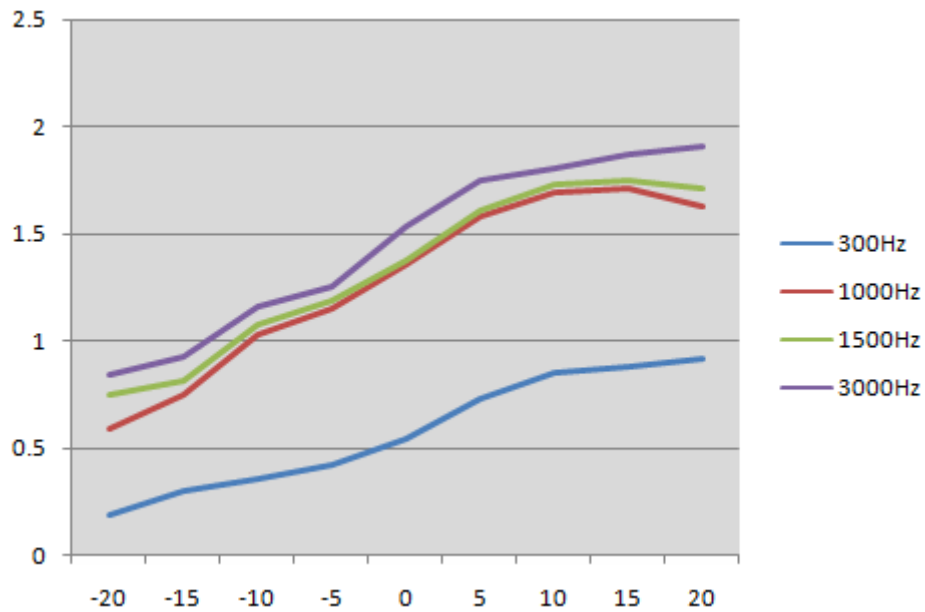
Note: All the modes had been tested, but only the worst data recorded in the report.

TEST RESULTS—1W

(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 | 0.19 | 0.59 | 0.75 | 0.84 |
| 1 | 0.3 | 0.75 | 0.82 | 0.92 |
| -10 | 0.36 | 1.03 | 1.08 | 1.16 |
| -5 | 0.42 | 1.15 | 1.19 | 1.25 |
| 0 | 0.55 | 1.36 | 1.38 | 1.53 |
| +5 | 0.73 | 1.58 | 1.61 | 1.75 |
| +10 | 0.85 | 1.69 | 1.73 | 1.81 |
| +15 | 0.88 | 1.71 | 1.75 | 1.87 |
| +20 | 0.92 | 1.63 | 1.71 | 1.91 |



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

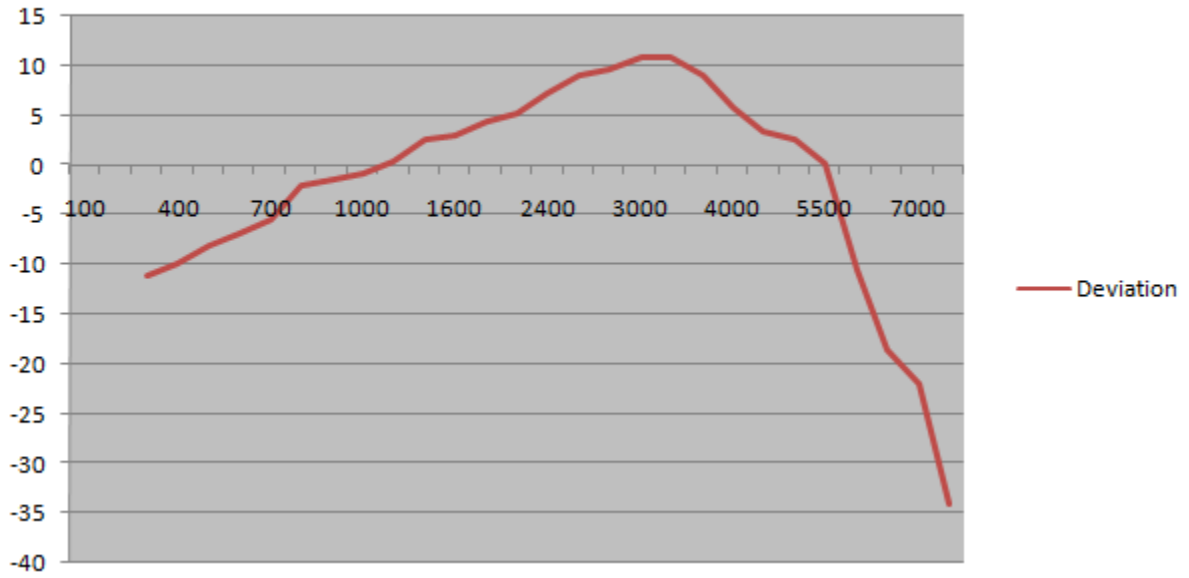
(B). AUDIO FREQUENCY RESPONSE:

Middle Channel @ 12.5 KHz Channel Separations

| Frequency (Hz) | Deviation (KHz) | Audio Frequency Response(dB) |
|-----------------------|------------------------|-------------------------------------|
| 100 | -- | -- |
| 200 | -- | -- |
| 300 | 0.14 | -11.06 |
| 400 | 0.16 | -9.90 |
| 500 | 0.2 | -7.96 |
| 600 | 0.23 | -6.74 |
| 700 | 0.27 | -5.35 |
| 800 | 0.4 | -1.94 |
| 900 | 0.43 | -1.31 |
| 1000 | 0.46 | -0.72 |
| 1200 | 0.52 | 0.34 |
| 1400 | 0.68 | 2.67 |
| 1600 | 0.71 | 3.05 |
| 1800 | 0.83 | 4.40 |
| 2000 | 0.91 | 5.20 |
| 2400 | 1.16 | 7.31 |
| 2500 | 1.43 | 9.13 |
| 2800 | 1.52 | 9.66 |
| 3000 | 1.74 | 10.83 |
| 3200 | 1.75 | 10.88 |
| 3600 | 1.41 | 9.00 |
| 4000 | 0.98 | 5.85 |
| 4500 | 0.75 | 3.52 |
| 5000 | 0.67 | 2.54 |
| 5500 | 0.51 | 0.17 |
| 6000 | 0.15 | -10.46 |
| 6500 | 0.06 | -18.42 |
| 7000 | 0.04 | -21.94 |
| 7500 | 0.01 | -33.98 |
| 9000 | -- | -- |
| 10000 | -- | -- |
| 14000 | -- | -- |
| 18000 | -- | -- |
| 20000 | -- | -- |
| 30000 | -- | -- |

Frequency Response of Middle Channel

12.5 KHz Channel Separations



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

10. MAXIMUM TRANSMITTER POWER

10.1 PROVISIONS APPLICABLE

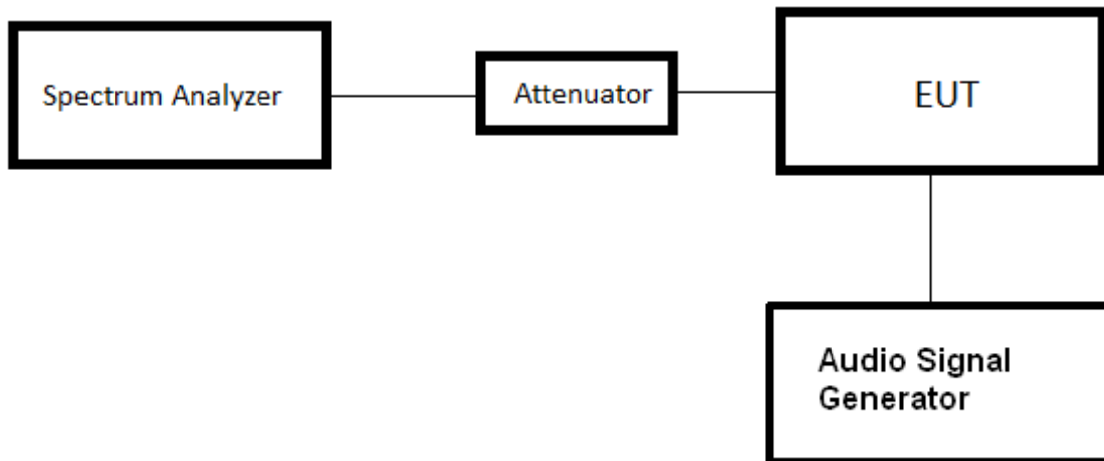
Per FCC §2.1046 and §90.205: Maximum ERP is dependent upon the station's antenna HAAT and required service area.

10.2 TEST PROCEDURE

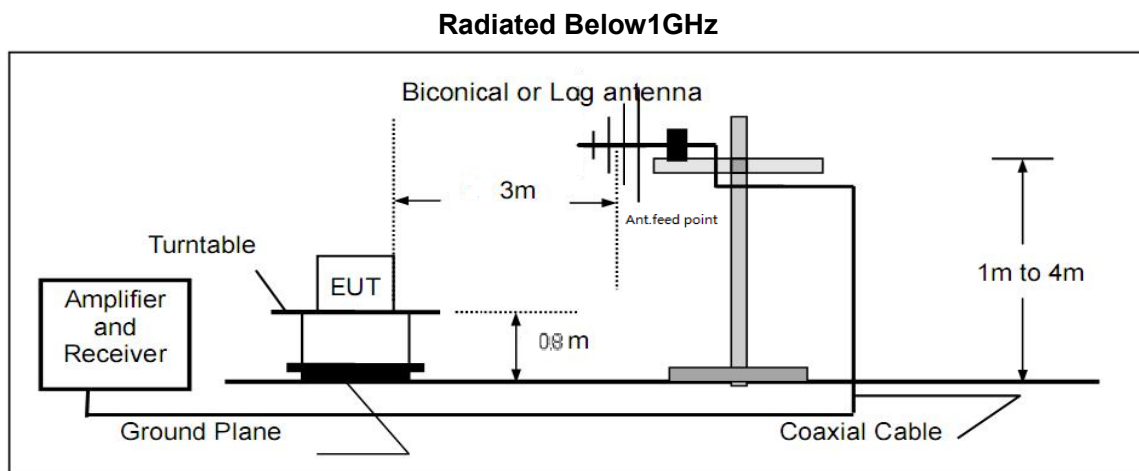
The RF output of Two-way Radio was conducted to a spectrum analyzer through an appropriate attenuator.

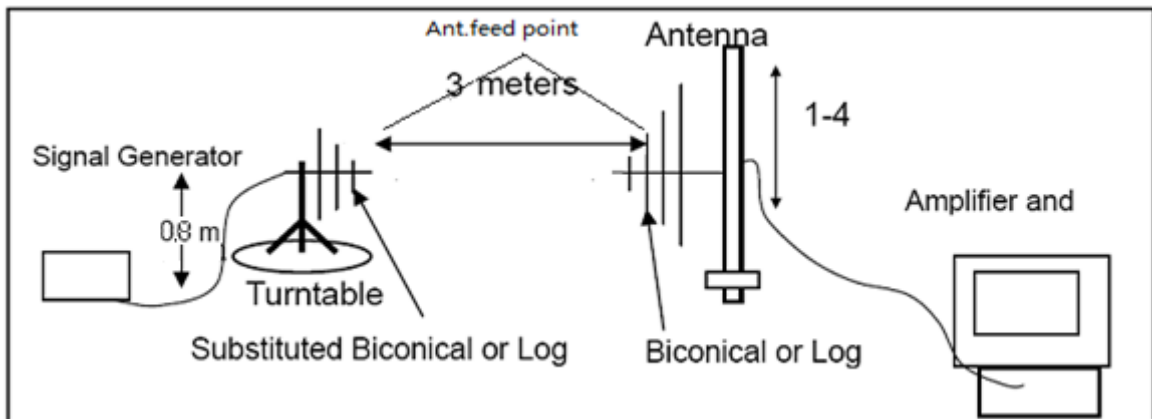
10.3 TEST CONFIGURATION

Conducted Output Power:

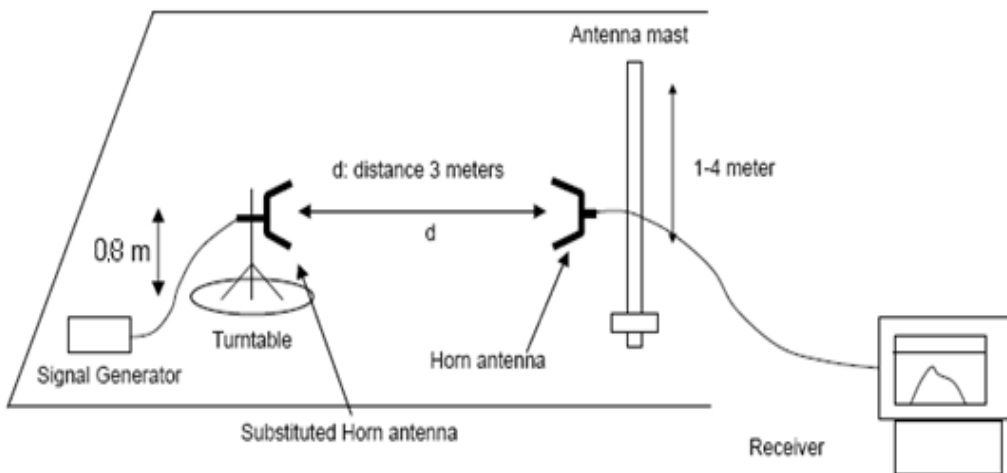
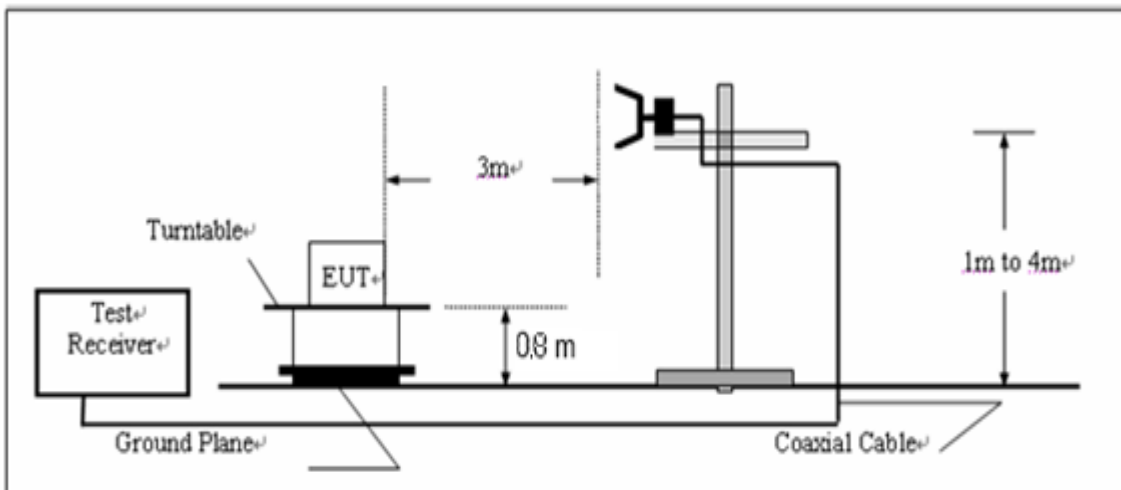


Effective Radiated Power :





Radiated Above 1 GHz



10.4 TEST RESULT

The maximum Conducted Power (CP) is

Analog: 5W/1 W for 12.5 KHz Channel Separation

Digital: 5W/1 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(136.025MHz) | 36.92 |
| | Middle(155.025MHz) | 36.85 |
| | Top (173.975MHz) | 36.81 |

| Radiated Power Measurement Results | | |
|---|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 36.99dBm(5W) |
| 12.5 KHz | Bottom(136.025MHz) | 36.83 |
| | Middle(155.025MHz) | 36.79 |
| | Top (173.975MHz) | 36.89 |

| Conducted Power Measurement Results | | |
|--|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 30dBm(1W) |
| 12.5 KHz | Bottom(136.025MHz) | 29.78 |
| | Middle(155.025MHz) | 29.91 |
| | Top (173.975MHz) | 29.87 |

| Radiated Power Measurement Results | | |
|---|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 30dBm(1W) |
| 12.5 KHz | Bottom(136.025MHz) | 29.85 |
| | Middle(155.025MHz) | 29.81 |
| | Top (173.975MHz) | 29.93 |

Digital:

Date + voice:

| Conducted Power Measurement Results | | |
|--|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 36.99dBm(5W) |
| 12.5 KHz | Bottom(136.025MHz) | 36.80 |
| | Middle(155.025MHz) | 36.85 |
| | Top (173.975MHz) | 36.76 |

| Radiated Power Measurement Results | | |
|---|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 36.99dBm(5W) |
| 12.5 KHz | Bottom(136.025MHz) | 36.79 |
| | Middle(155.025MHz) | 36.86 |
| | Top (173.975MHz) | 36.81 |

Date transmission mode:

| Conducted Power Measurement Results | | |
|--|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 36.99dBm(5W) |
| 12.5 KHz | Bottom(136.025MHz) | 36.68 |
| | Middle(155.025MHz) | 36.80 |
| | Top (173.975MHz) | 36.75 |

| Radiated Power Measurement Results | | |
|---|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 36.99dBm(5W) |
| 12.5 KHz | Bottom(136.025MHz) | 36.85 |
| | Middle(155.025MHz) | 36.77 |
| | Top (173.975MHz) | 36.82 |

Date + voice:

| Conducted Power Measurement Results | | |
|--|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 30dBm(1W) |
| 12.5 KHz | Bottom(136.025MHz) | 29.85 |
| | Middle(155.025MHz) | 29.89 |
| | Top (173.975MHz) | 29.92 |

| Radiated Power Measurement Results | | |
|---|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 30dBm(1W) |
| 12.5 KHz | Bottom(136.025MHz) | 29.79 |
| | Middle(155.025MHz) | 29.85 |
| | Top (173.975MHz) | 29.94 |

Date transmission mode:

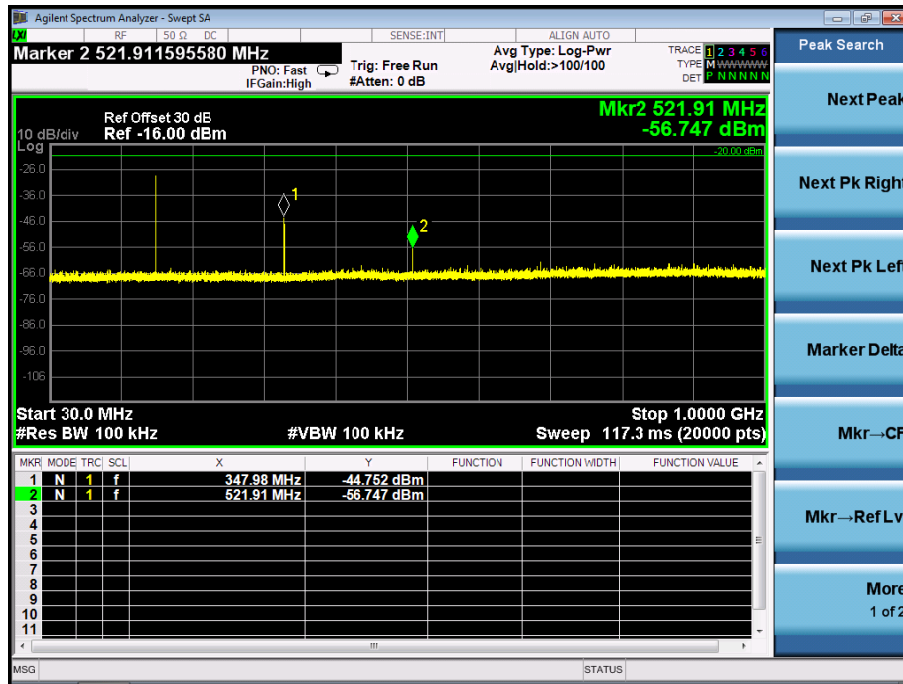
| Conducted Power Measurement Results | | |
|--|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 30dBm(1W) |
| 12.5 KHz | Bottom(136.025MHz) | 29.80 |
| | Middle(155.025MHz) | 29.75 |
| | Top (173.975MHz) | 29.83 |

| Radiated Power Measurement Results | | |
|---|--------------------|---------------------------------|
| Channel Separation | Channel | Measurement Result (dBm) |
| | | For 30dBm(1W) |
| 12.5 KHz | Bottom(136.025MHz) | 29.81 |
| | Middle(155.025MHz) | 29.76 |
| | Top (173.975MHz) | 29.84 |

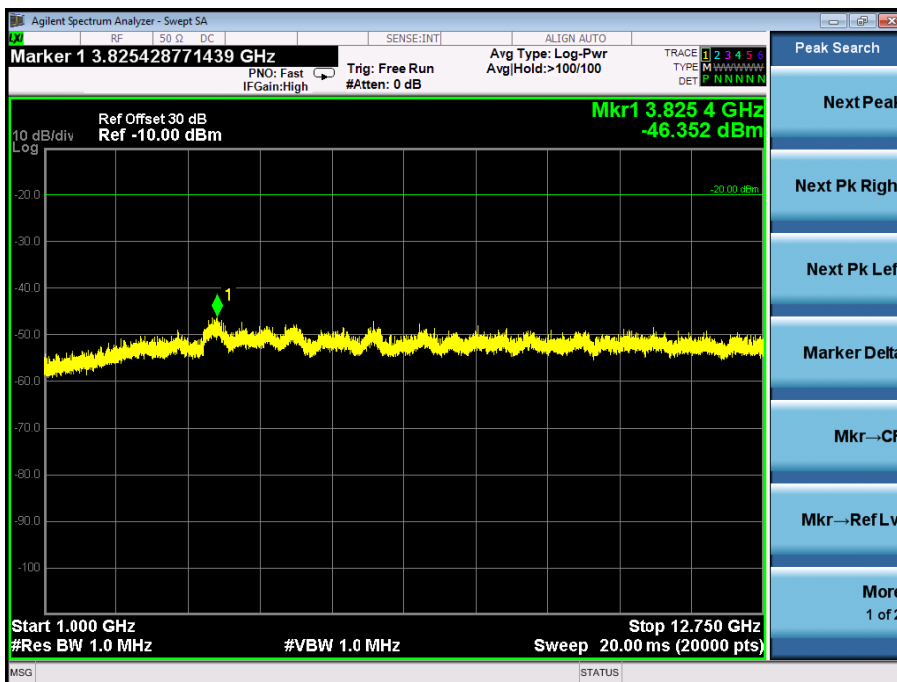
10.5 CONDUCT SPURIOUS PLOT

Analog:

Conducted Spurious Emission (worst) @173.975MHz With 12.5 KHz Channel Separation-5W
 30MHz-1GHz

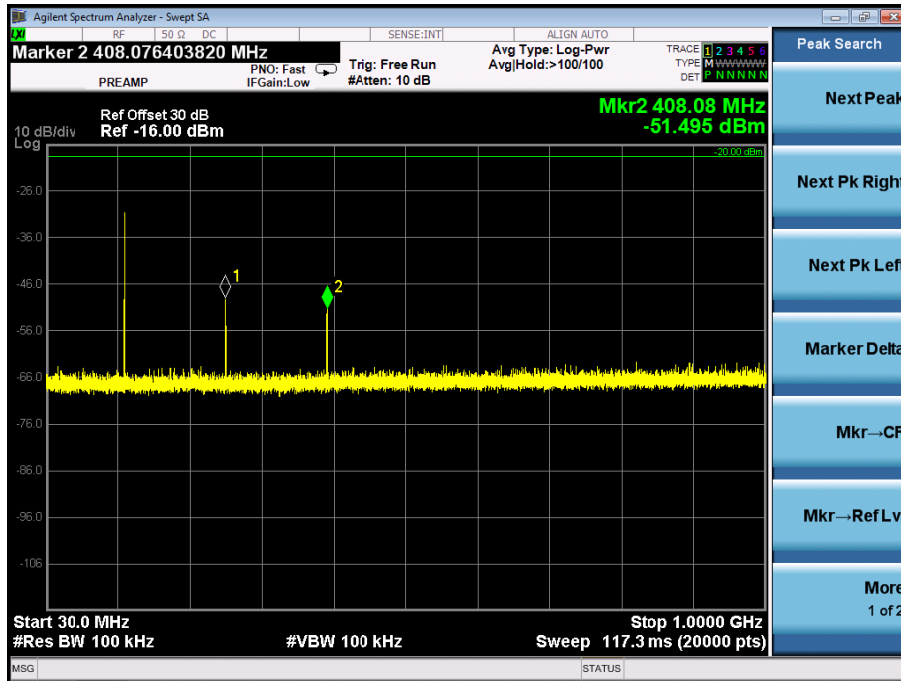


Conduct Spurious Emission (worst) @ 173.975MHz With 12.5 KHz Channel Separation-5W
 1GHz-12.75GHz

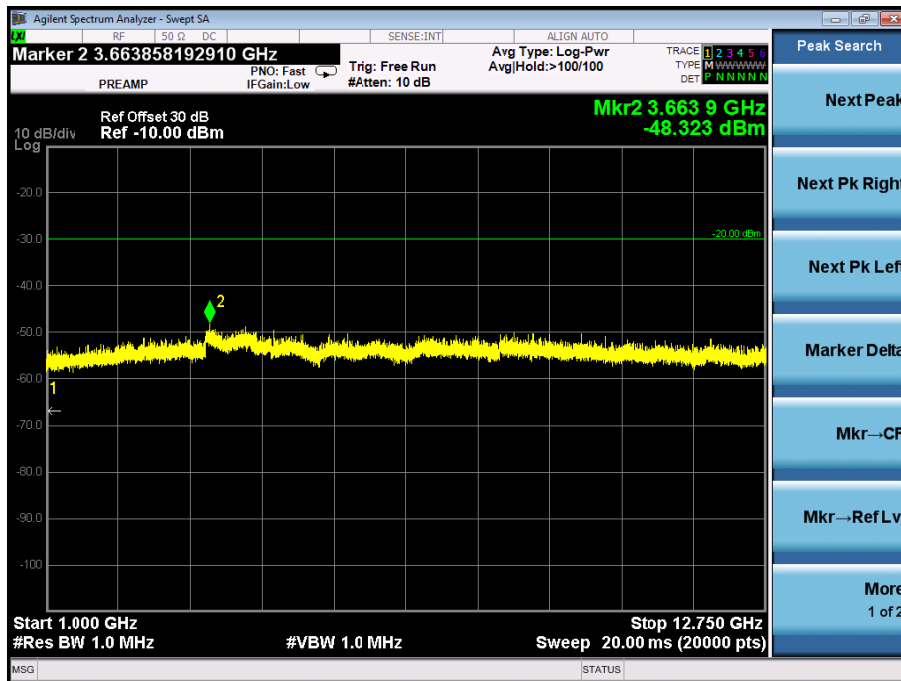


Digital:

Conducted Spurious Emission (worst) @136.025 MHz With 12.5 KHz Channel Separation
30MHz-1GHz



Conduct Spurious Emission (worst) @ 136.025MHz With 12.5 KHz Channel Separation
1GHz-12.75GHz



Note: only result the worst case in this part.

11. TRANSMITTER FREQUENCY BEHAVIOR

11.1 PROVISIONS 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 TRANSMITTER FREQUENCY BEHAVIOR

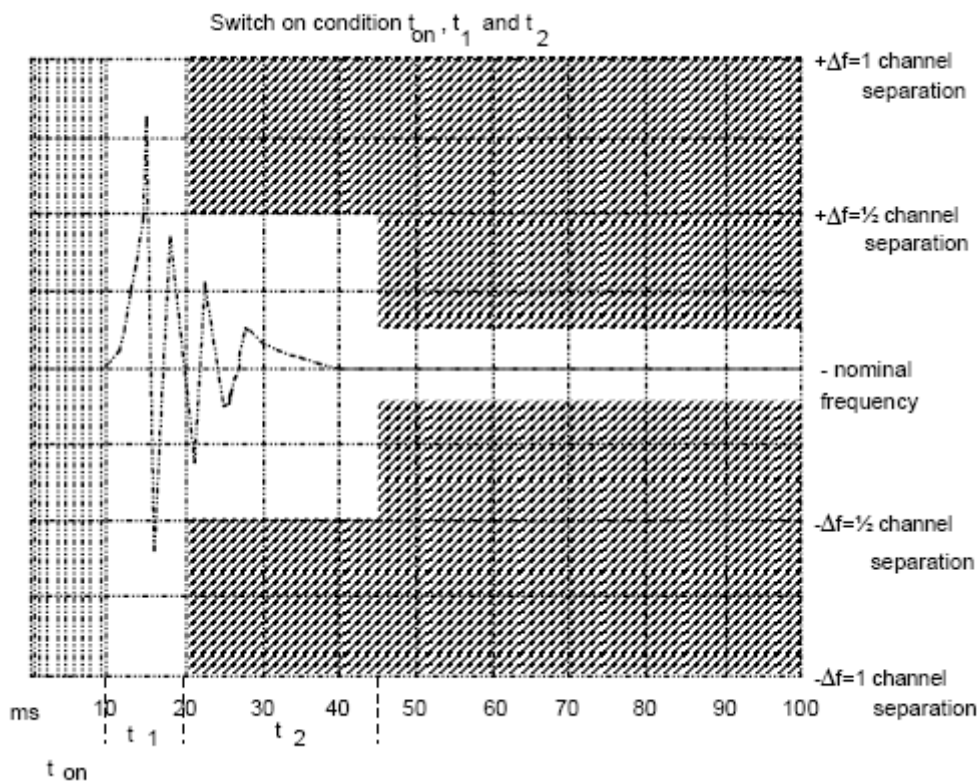
ton: The switch-on instant t_{on} of a transmitter is defined by the condition when the output power, measured at the antenna terminal, exceeds 0,1 % of the full output power (-30 dBc).

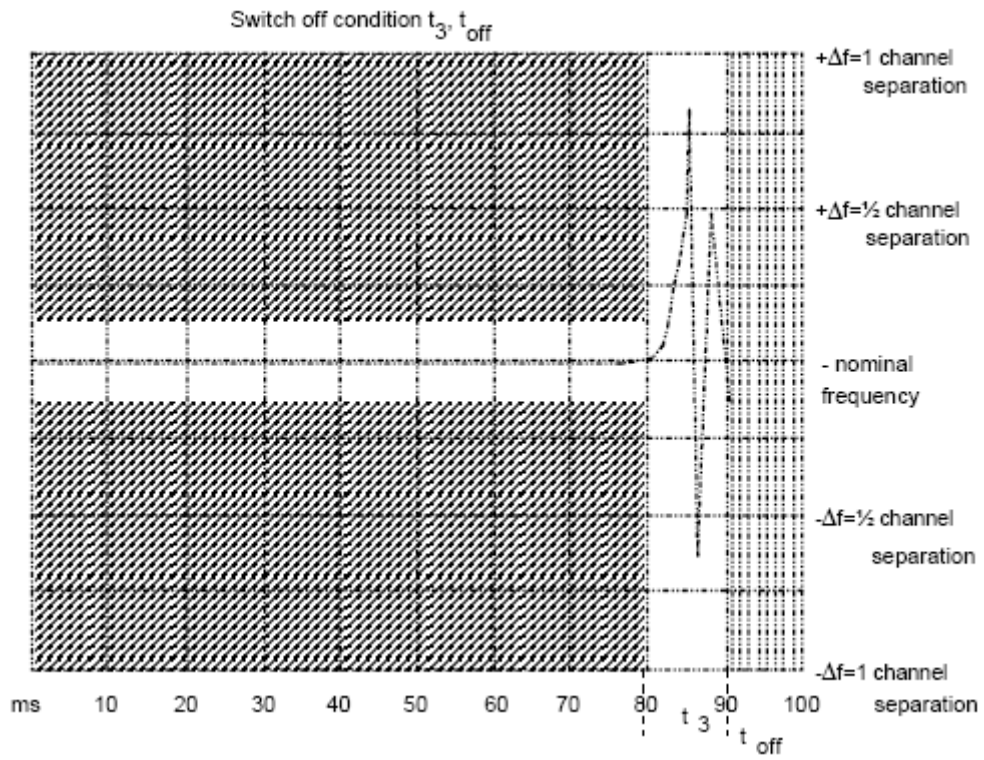
t1: period of time starting at t_{on} and finishing according to above 11.1

t2: period of time starting at the end of t_1 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).

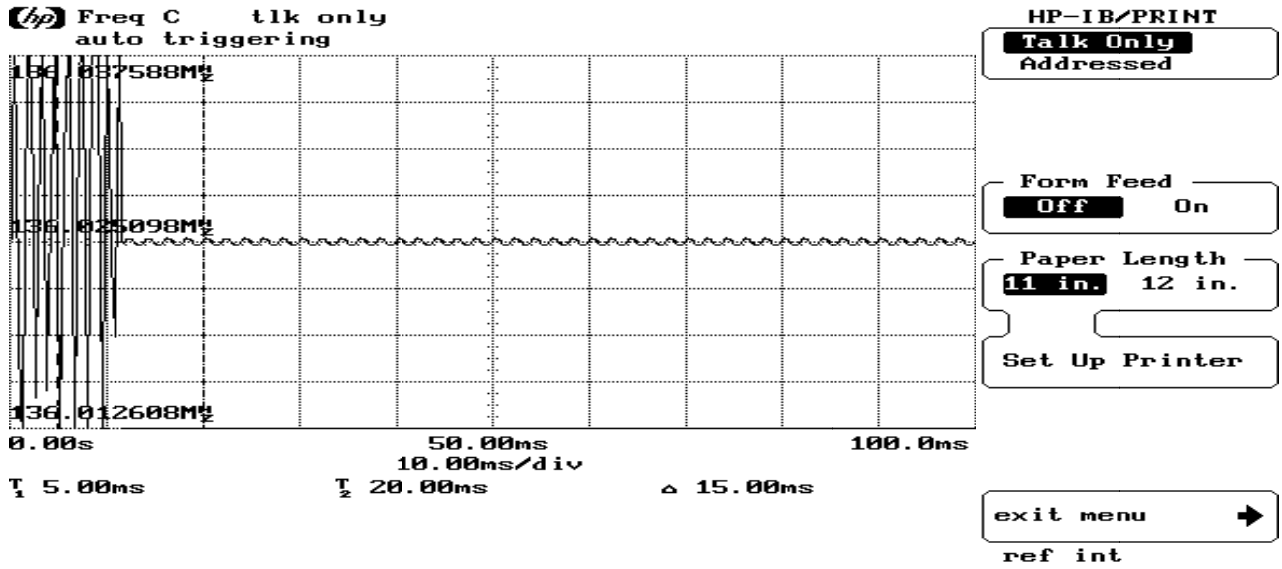
t3: period of time that finishing at t_{off} and starting according to above 11.1



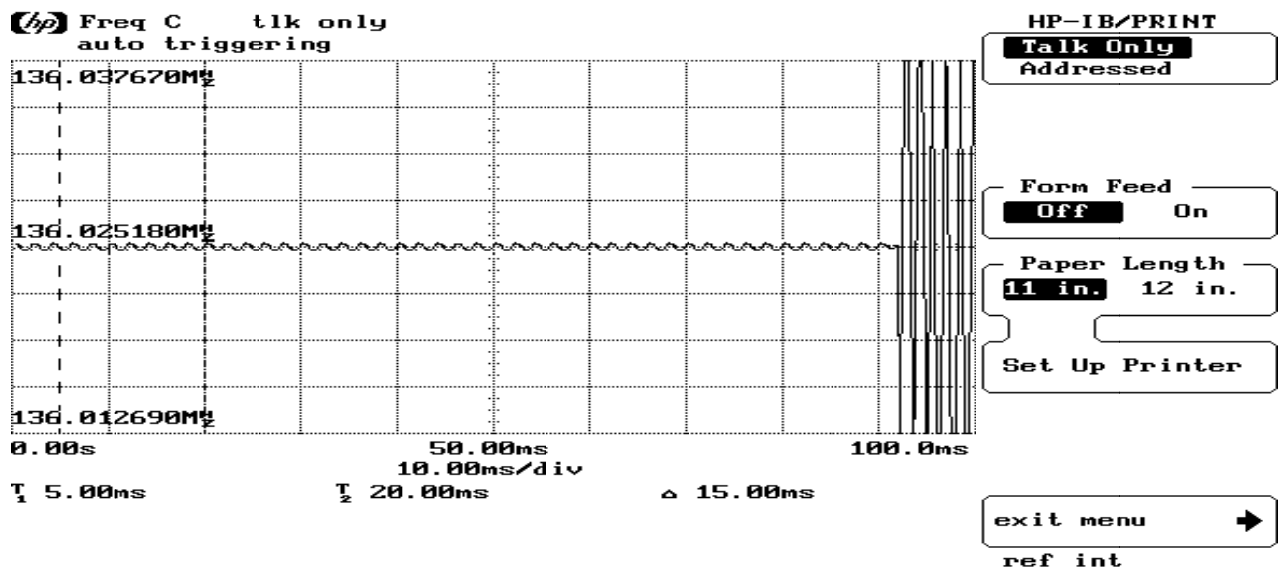


11.4 MEASURE RESULT

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 20 – 30 KHz | $60 \log_{10}(f/3)$ dB where f is in KHz 50dB |

12.2. METHOD OF MEASUREMENTS

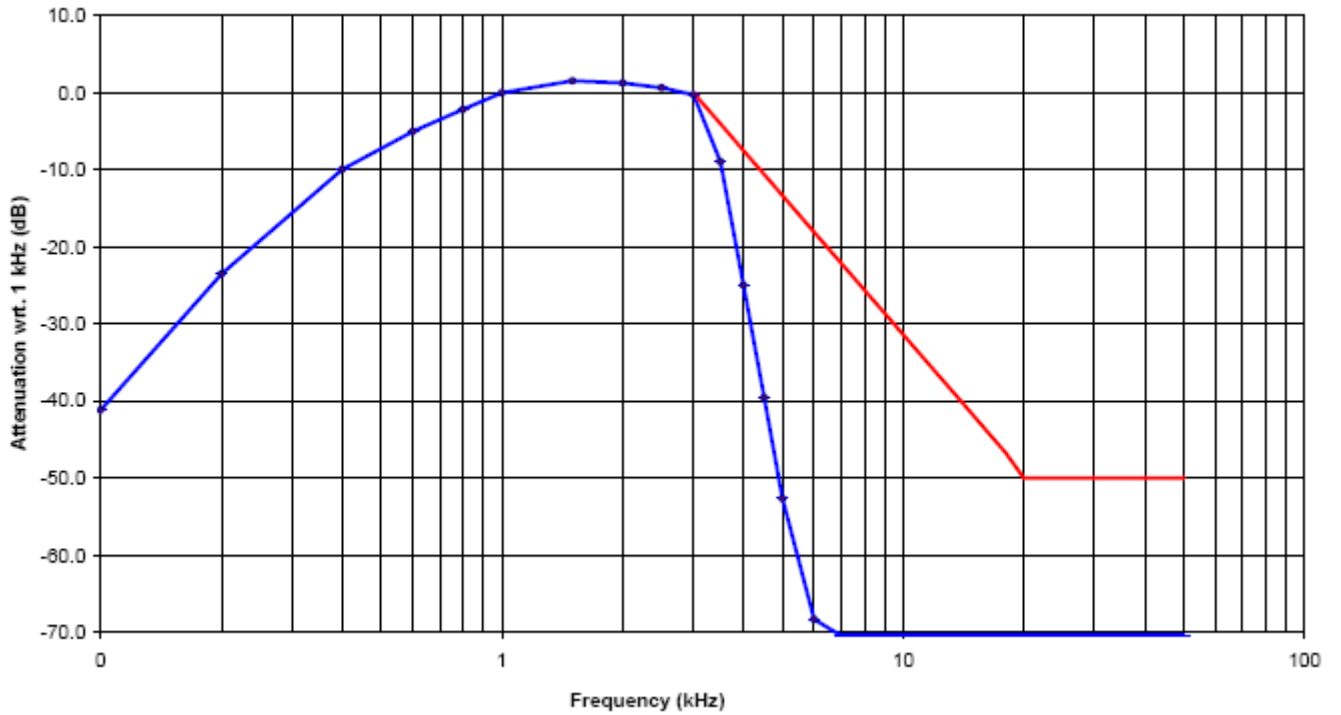
The rated audio input signal was applied to the input of the audio low-pass filter (or of all modulation stages) using an audio oscillator, this input signal level and its corresponding output signal were then measured and recorded using the FFT Digital Spectrum Analyzer. Tests were repeated at different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

12.3 TEST DATA

12.5 KHZ CHANNEL SPACING, F3E, FREQUENCY OF ALL MODULATION STATES R VHF)

| Frequency | Audio In | Audio out | Attenuation | Attenuation | Recommended |
|-----------|----------|-----------|-------------|--------------|-------------|
| (KHz) | (dBV) | (dBV) | (Out_In) | Rel.to 3 KHz | Attenuation |
| | | | dB | (dB) | (dB) |
| 0.1 | -76.17 | -30.35 | 45.98 | -35.86 | |
| 0.2 | -76.17 | -18.39 | 57.15 | -25.32 | |
| 0.4 | -76.17 | -6.18 | 71.35 | -12.16 | |
| 0.6 | -76.17 | 0.43 | 74.26 | -6.25 | |
| 0.8 | -76.17 | 4.21 | 78.86 | -2.95 | |
| 1.0 | -76.17 | 7.23 | 83.53 | -0.02 | |
| 1.5 | -76.17 | 8.24 | 84.45 | 2.15 | |
| 2.0 | -76.17 | 8.89 | 85.39 | 1.61 | |
| 2.5 | -76.17 | 7.61 | 83.79 | 0.68 | |
| 3.0 | -76.17 | 6.51 | 82.26 | -1.83 | 0 |
| 3.5 | -76.17 | 2.34 | 78.43 | -4.94 | -4 |
| 4.0 | -76.17 | -2.26 | 74.66 | -9.46 | -7 |
| 4.5 | -76.17 | -9.25 | 68.31 | -16.59 | -12 |
| 5.0 | -76.17 | -15.18 | 60.58 | -21.62 | -15 |
| 6.0 | -76.17 | -21.31 | 54.36 | -28.63 | -18 |
| 7.0 | -76.17 | -31.59 | 46.28 | -36.44 | -22 |
| 8.0 | -76.17 | -39.52 | 37.87 | -47.69 | -26 |
| 9.0 | -76.17 | -61.95 | 15.15 | -66.76 | -28 |
| 10.0 | -76.17 | -61.95 | 15.15 | -66.43 | -31 |
| 12.0 | -76.17 | -61.95 | 15.15 | -66.43 | -37 |
| 14.0 | -76.17 | -61.95 | 15.15 | -66.43 | -41 |
| 16.0 | -76.17 | -61.95 | 15.15 | -66.43 | -45 |
| 18.0 | -76.17 | -61.95 | 15.15 | -66.43 | -46 |
| 20.0 | -76.17 | -61.95 | 15.15 | -66.43 | -49 |
| 25.0 | -76.17 | -61.95 | 15.15 | -66.43 | -49 |
| 30.0 | -76.17 | -61.95 | 15.15 | -66.43 | -49 |
| 35.0 | -76.17 | -61.95 | 15.15 | -66.43 | -49 |
| 40.0 | -76.17 | -61.95 | 15.15 | -66.43 | -49 |
| 45.0 | -76.17 | -61.95 | 15.15 | -66.43 | -49 |
| 50.0 | -76.17 | -61.95 | 15.15 | -66.43 | -49 |

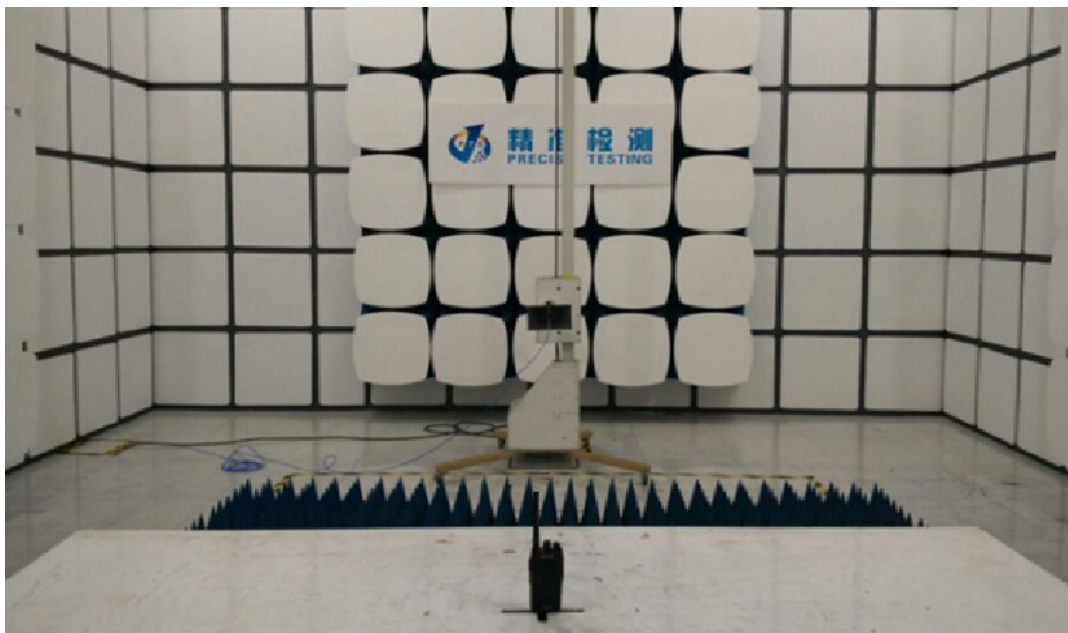
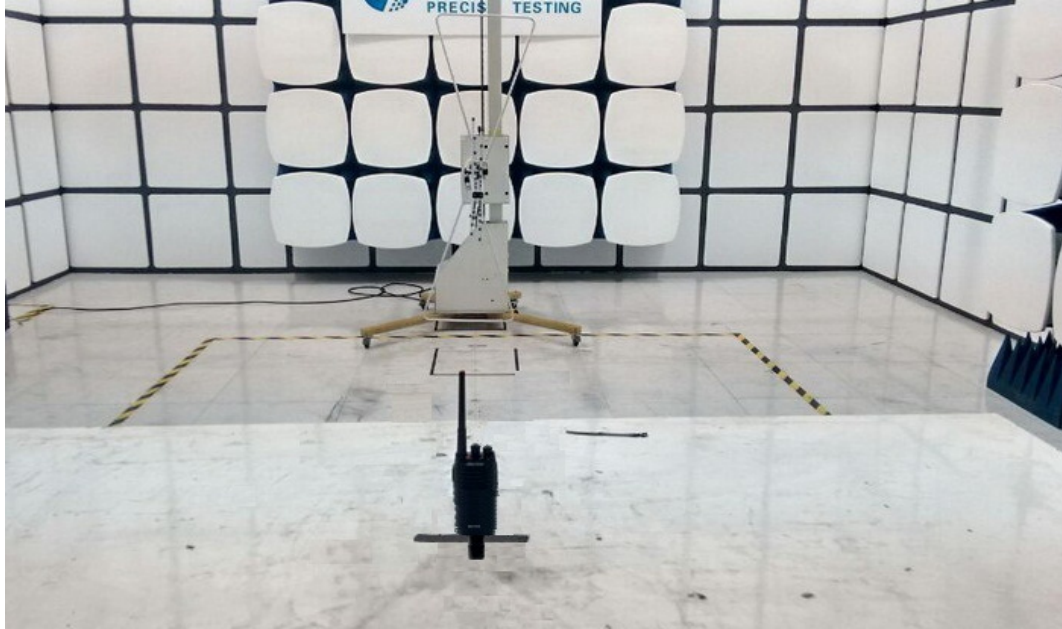
Note: Due to the difficulty of measuring the Frequency Response of the internal low-pass filter, the Frequency Response of All Modulation States is performed to show the roll-off at 3 KHz in comparison with the recommended audio filter attenuation.



Note: All the VHF had been test, but only the worst data recorded in the reported.

APPENDIX I: PHOTOGRAPHS OF SETUP

RADIATED EMISSION TEST SETUP



APPENDIX II: EXTERNAL VIEW OF EUT

ALL 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



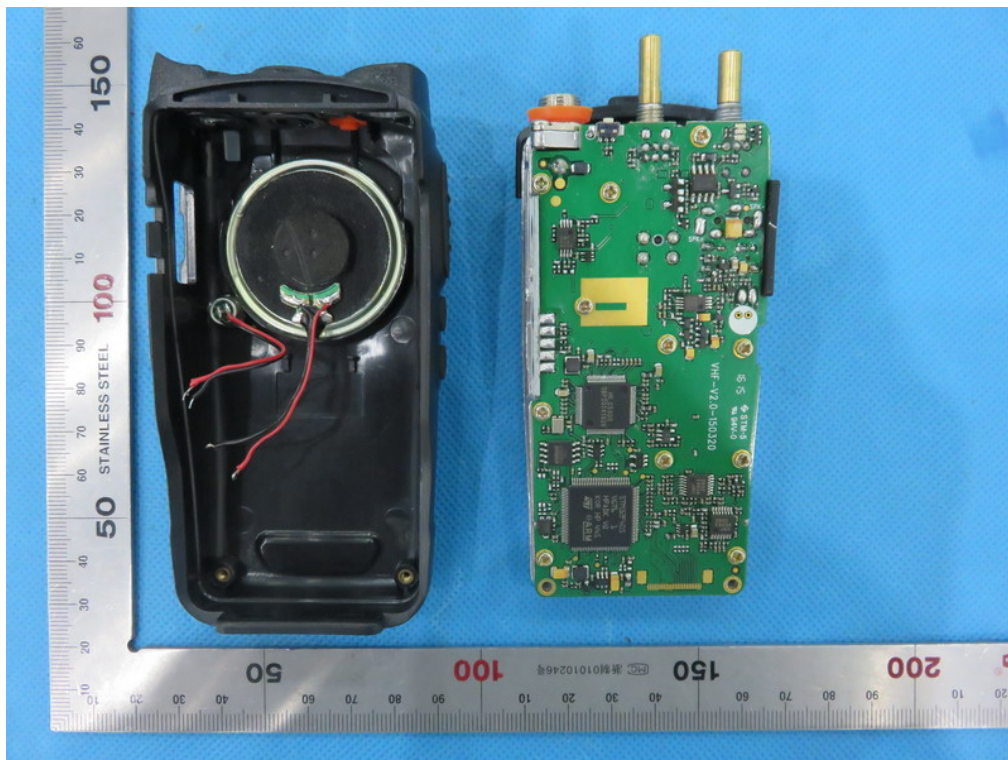
THE LABEL OF POWER ADAPTER



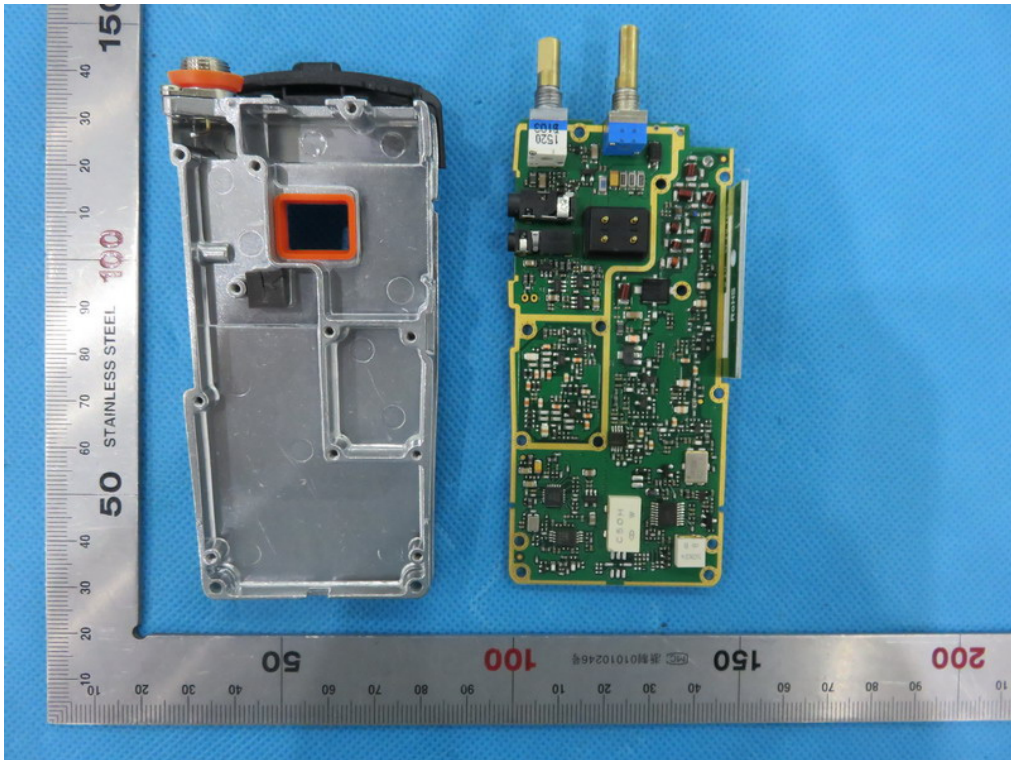
OPEN VIEW OF EUT-1



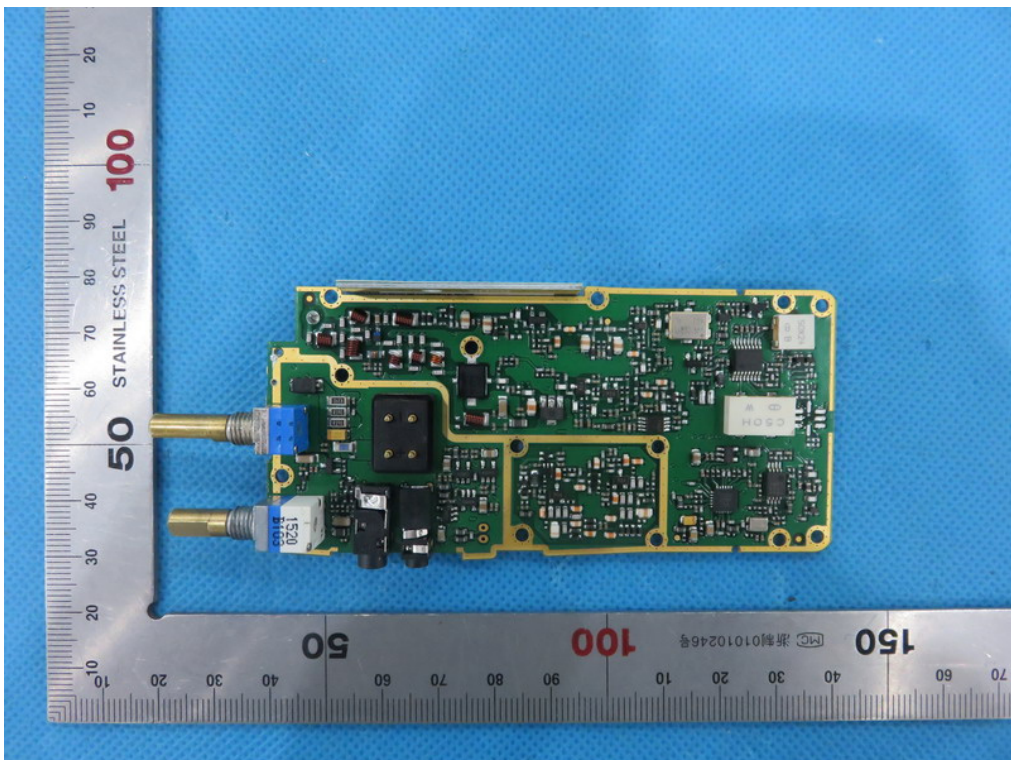
OPEN VIEW OF EUT-2



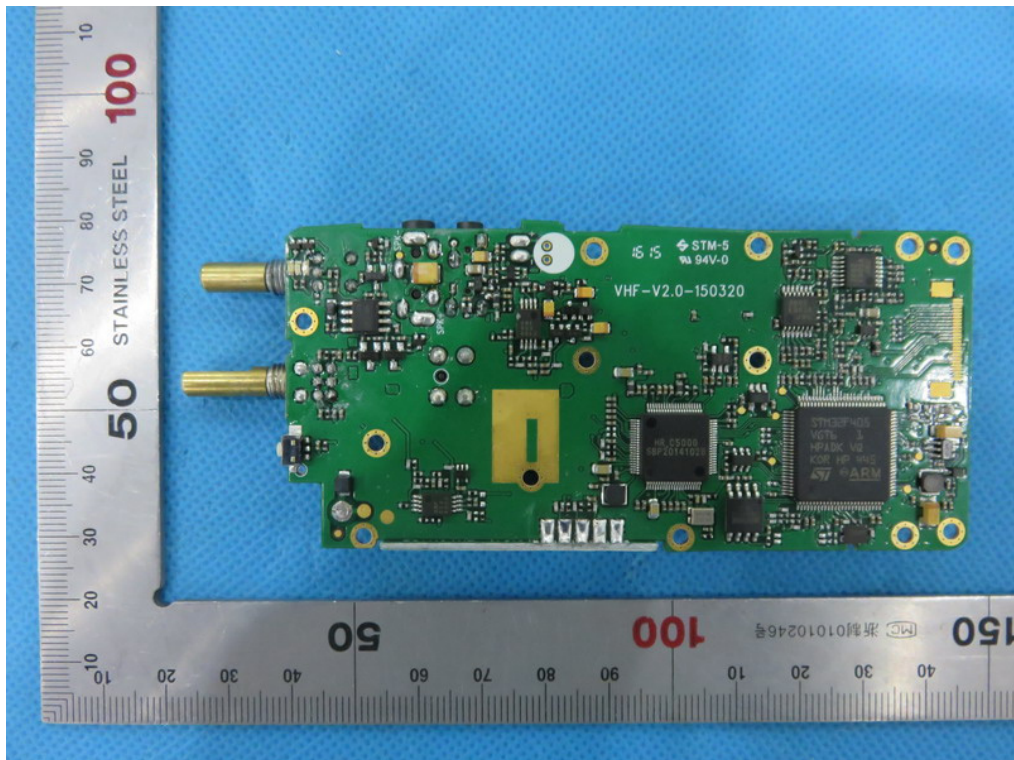
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



-----END OF REPORT-----