

## **Certification Test Report**

**FCC ID: ABZ99FT4091**  
**IC: 109AB-99FT4091**

**FCC Rule Part: Part 90 Subpart I**  
**IC Radio Standards Specifications: RSS-119**

**ACS Report Number: 12-2098.W06.1A**

**Applicant: Motorola Solutions, Inc.**  
**Model: AAH56QCN9PA3AN**

**Test Begin Date: August 15, 2012**  
**Test End Date: August 27, 2012**

**Report Issue Date: September 10, 2012**



For The Scope of Accreditation Under Certificate Number AT-1533

This report must not be used by the client to claim product certification, approval, or endorsement by ACLASS, ANSI, or any agency of the Federal Government.

**Project Manager:**

A handwritten signature in blue ink, appearing to read "Thierry Jean-Charles".

**Thierry Jean-Charles**  
**EMC Engineer**  
**Advanced Compliance Solutions, Inc.**

**Reviewed by:**

A handwritten signature in blue ink, appearing to read "Kirby Munroe".

**Kirby Munroe**  
**Director, Wireless Certifications**  
**Advanced Compliance Solutions, Inc.**

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**This report contains 19 pages**

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## 1.0 GENERAL

### 1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 2 Subpart J, and Part 90 Subpart I of the FCC's Code of Federal Regulations and Industry Canada's Radio Standards Specifications RSS-119 for the specific test requirements described in this document.

### 1.2 Product Description

The Mototrbo 7550 Ex, sales model AAH56QCN9PA3AN, is a 1.26W two way portable radio operating in the UHF1 band (403-470MHz) MHz band. The radio provides 12.5 kHz, 20 kHz, 25 kHz channel bandwidths.

Manufacturer Information:  
Motorola Solutions, Inc.  
Office of Engineering and Technology Laboratory Division,  
Equipment Authorization Branch,  
FCC Laboratory,  
7435 Oakland Mills Road,  
Columbia, MD 21046

Test Sample Serial Numbers: 627TNP0016

Test Sample Condition: The unit was in good operating conditions with no physical damages.

### 1.3 Test Methodology

#### 1.3.1 Configurations and Justification

The radio was tested for radiated spurious emissions only per customer request. The evaluation for radiated spurious emissions was performed up to the 10<sup>th</sup> harmonic of the fundamental frequency for both 12.5 kHz and 25 kHz channel spacing with a 50 ohm terminating load at the antenna connector.

#### 1.3.2 In-Band Testing Methodology

The EUT was preset to the frequencies provided below for both 12.5 kHz and 25 kHz channel bandwidths.

CFR Title 47 Rule Part	Test Frequencies (MHz)
90	403.0125
	406.1125
	429.9875
	469.9875

#### **1.4 Emission Designators**

The AAH56QCN9PA3AN transmitter produces four distinct modulation formats. The emissions designators for the modulation types used by the AAH56QCN9PA3AN transmitter are as follows:

##### **EMISSIONS DESIGNATORS:**

11K0F3E  
16K0F3E  
7K60FXE  
7K60FXD

## **2.0 TEST FACILITIES**

### **2.1 Location**

Unless otherwise noted, the radiated and conducted emissions test sites are located at the following addresses.

Advanced Compliance Solutions, Inc.  
3998 FAU Blvd, Suite 310  
Boca Raton, Florida 33431  
Phone: (561) 961-5585  
Fax: (561) 961-5587  
[www.acstestlab.com](http://www.acstestlab.com)

### **2.2 Laboratory Accreditations/Recognitions/Certifications**

ACS, Boca Raton, Florida, is accredited to ISO/IEC 17025 by ANSI-ASQ National Accreditation Board under their ACLASS program and has been issued certificate number AT-1533 in recognition of this accreditation.

## 2.3 Radiated & Conducted Emissions Test Site Description

### 2.3.1 Semi-Anechoic Chamber Test Site

The EMC radiated test facility consists of an RF-shielded enclosure. The interior dimensions of the indoor semi-anechoic chamber are approximately 48 feet (14.6 m) long by 36 feet (10.8 m) wide by 24 feet (7.3 m) high and consist of rigid, 1/8 inch (0.32 cm) steel-clad, wood core modular panels with steel framing. In the shielded enclosure, the faces of the panels are galvanized and the chamber is self-supporting. 8-foot RF absorbing cones are installed on 4 walls and the ceiling. The steel-clad ground plane is covered with vinyl floor.

The turntable is driven by pneumatic motor, which is capable of supporting a 2000 lb. load. The turntable is flushed with the chamber floor which it is connected to, around its circumference, with metallic loaded springs. An EMC Model 1051 Multi-device Controller controls the turntable position.

A pneumatic motor is used to control antenna polarizations and height relative to the ground. The height information is displayed on the control unit EMC Model 1050.

The control room is an RF shielded enclosure attached to the semi-anechoic chamber with two bulkhead panels for connecting RF, and control cables. The dimension of the room is 7.3 m x 4.9 m x 3 m high and the entrance doors of both control and conducted rooms are 3 feet (0.91 m) by 7 feet (2.13 m).

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3.1-1 below:

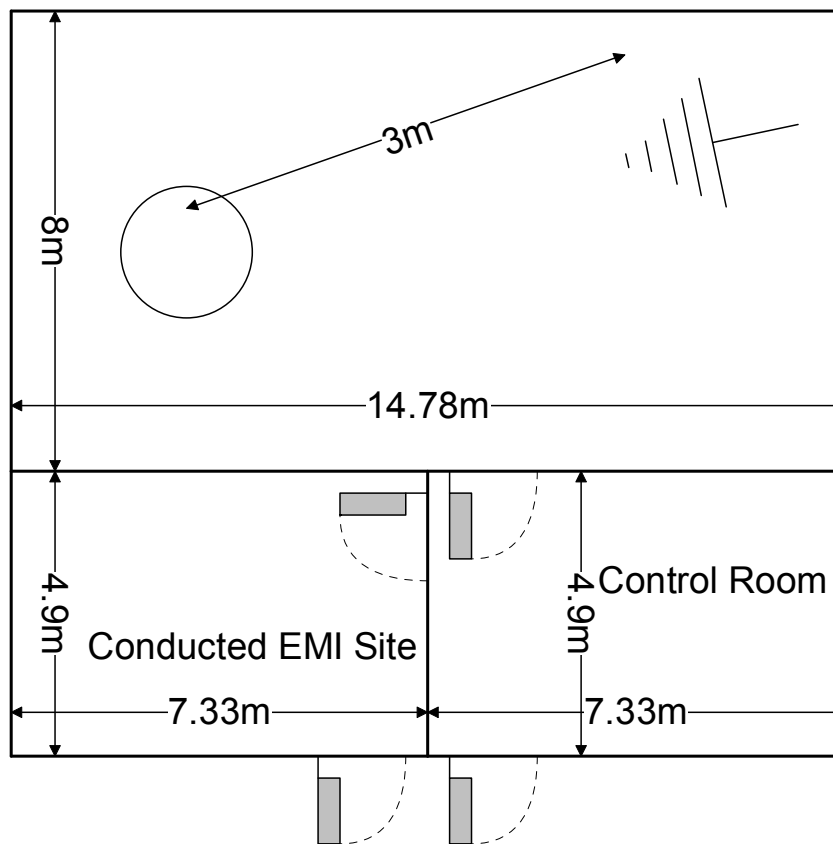


Figure 2.3.1-1: Semi-Anechoic Chamber Test Site

### 2.3.2 Conducted Emissions Test Site Description

The dimensions of the shielded conducted room are 7.3 x 4.9 x 3 m<sup>3</sup>. As per ANSI C63.4 2003 requirements, the data were taken using two LISNs; a Solar Model 8028-50 50  $\Omega$ /50  $\mu$ H and an EMCO Model 3825, which are installed as shown in Photograph 3. For 220 V, 50 Hz, a Polarad LISN (S/N 879341/048) is used in conjunction with a 1 kVA, 50 Hz/220 V EDGAR variable frequency generator, Model 1001B, to filter conducted noise from the generator.

A diagram of the room is shown below in figure 2.3.2-1:

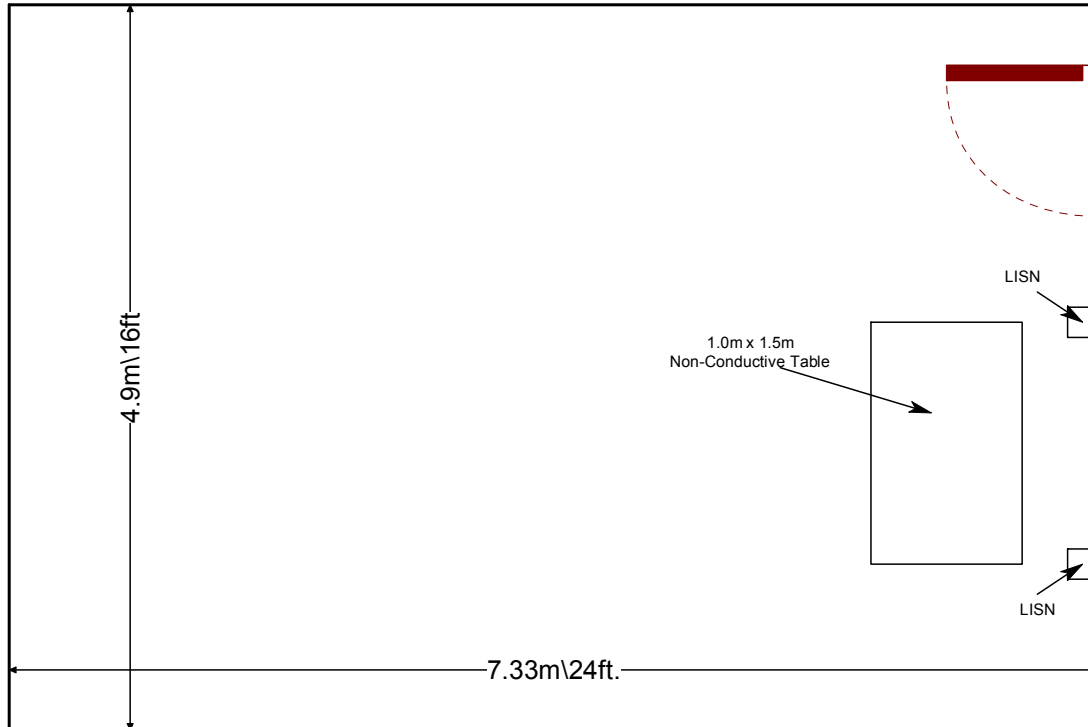


Figure 2.3.2-1: AC Mains Conducted EMI Site

### 3.0 APPLICABLE STANDARD REFERENCES

The following standards were used:

- 1 - ANSI C63.4-2003: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9 kHz to 40GHz - 2003
- 2 - US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures - 2012
- 3 - US Code of Federal Regulations (CFR): Title 47, Part 90, Subpart I: Private Land Mobile Radio Services – 2012
- 4 – TIA-603-C: Land Mobile FM or PM - Communications Equipment - Measurement and Performance Standards – 2004
- 5 – Industry Canada Radio Standards Specification: RSS-119 - Radio Transmitters and Receivers Operating in the Land Mobile and Fixed Services in the Frequency Range 27.41-960 MHz, Issue 11, June 2011

#### 4.0 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

**Table 4-1: Test Equipment**

AssetID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
524	Chase	CBL6111	Antennas	1138	1/7/2011	1/7/2013
2002	EMCO	3108	Antennas	2147	11/30/2011	11/30/2013
2004	EMCO	3146	Antennas	1385	11/30/2011	11/30/2013
2006	EMCO	3115	Antennas	2573	3/2/2011	3/2/2013
2007	EMCO	3115	Antennas	2419	1/18/2012	1/18/2014
2011	Hewlett-Packard	HP 8447D	Amplifiers	2443A03952	1/2/2012	1/2/2013
2037	ACS Boca	Chamber EMI Cable Set	Cable Set	2037	1/2/2012	1/2/2013
2078	ACS Boca	Substitution Cable Set	Cable Set	2078	1/12/2012	1/12/2013
2089	Agilent Technologies, Inc.	83017A	Amplifiers	3123A00214	12/22/2011	12/22/2012
2091	Agilent Technologies, Inc.	8573A	Spectrum Analyzers	2407A03233	12/12/2011	12/12/2013
RE563	Hewlett Packard	8673D	Signal Generators	3034A01078	2/22/2011	2/22/2013

**NCR=No Calibration Required**

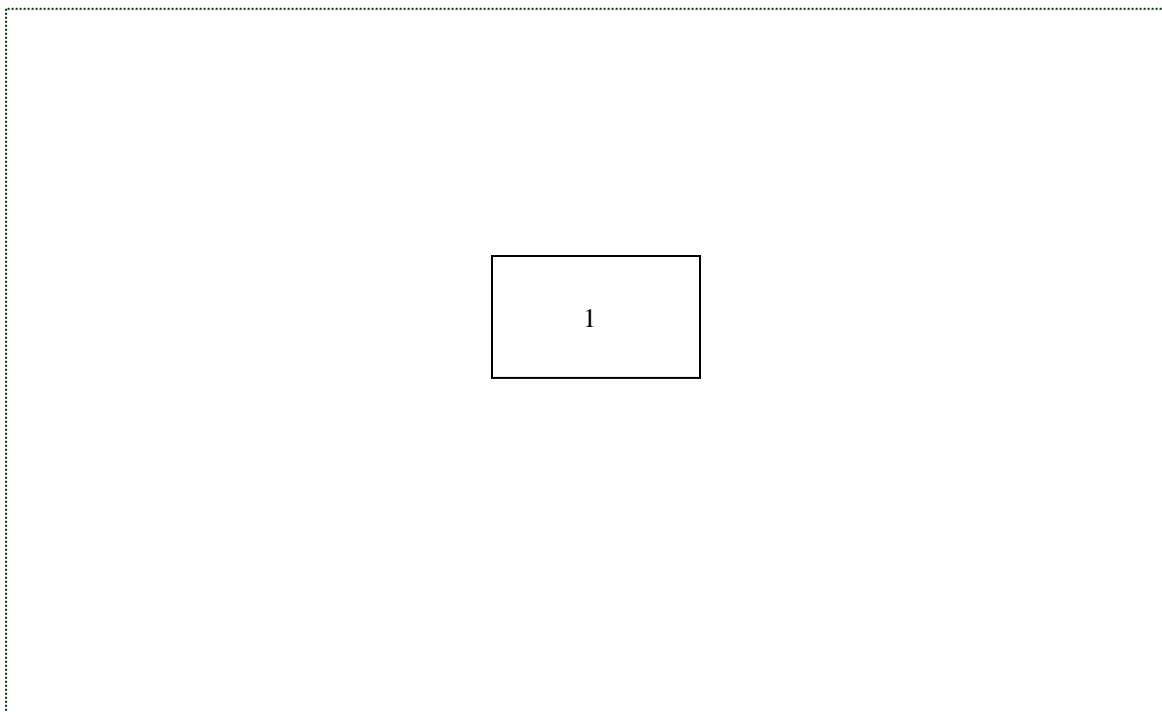


## 5.0 SUPPORT EQUIPMENT

**Table 5-1: Support Equipment**

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	Motorola Solutions, Inc.	AAH56QCN9PA3AN	627TNP0016

## 6.0 EQUIPMENT UNDER TEST SETUP AND BLOCK DIAGRAM



**Figure 6-1: EUT Test Setup**

## 7.0 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

**Table 7-1: Test Results Summary**

Test Parameter	Test Summary
Field Strength of Spurious Emissions	Pass

### 7.1 Field Strength of Spurious Emissions

#### 7.1.1 Measurement Procedure

The equipment under test is placed in the Semi-Anechoic Chamber (described in section 2.3.1) on a wooden table at the turntable center. For each spurious emission, the antenna mast is raised and lowered from one (1) to four (4) meters and the turntable is rotated 360° and the maximum reading on the spectrum analyzer is recorded. This was repeated for both horizontal and vertical polarizations of the receive antenna.

The equipment under test is then replaced with a substitution antenna fed by a signal generator. The signal generator's frequency is set to that of the spurious emission recorded from the equipment under test. The antenna mast is raised and lowered from one (1) to four (4) meters to obtain a maximum reading on the spectrum analyzer. The output of the signal generator is then adjusted until the reading on the spectrum analyzer matches that obtained from the equipment under test. The signal generator level is recorded. The power in dBm of each spurious emission is calculated by correcting the signal generator level for the cable loss and gain of the substitution antenna referenced to a dipole. The spectrum was investigated in accordance to CFR 47 Part 2.1057.

The magnitude of all spurious emissions not reported were attenuated below the noise floor of the measurement system and therefore not specified in this report. Results are shown below.

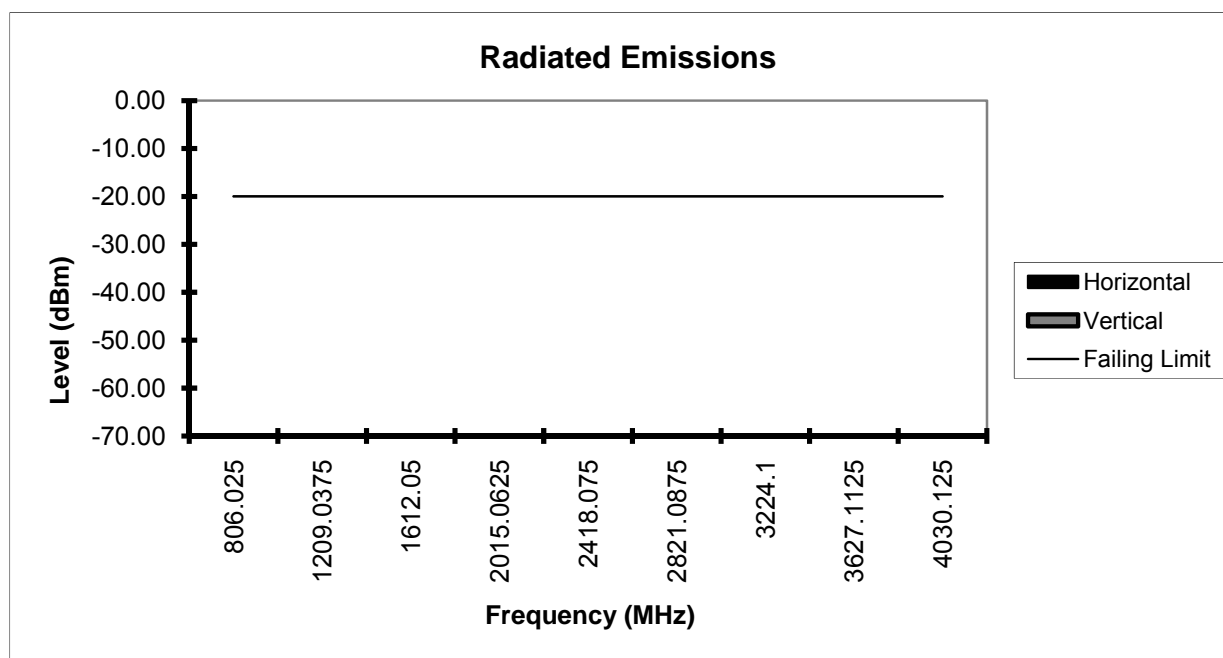
### 7.1.2 Measurement Results

#### Part 90.210(d); RSS-119 5.8.3

**Table 7.1.2-1: Field Strength of Spurious Emissions – 403.0125 MHz, 12.5 kHz**

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Antenna Polarity (H/V)	Antenna Height (cm)	Angle (degrees)	Correction Factor (dB)	Spurious ERP (dBm)	Limit (dBm)	Margin (dB)
Noise Floor								

Note: All spurious emissions were attenuated below the limits and the noise floor of the measurement equipment.



**Figure 7.1.2-1: Field Strength of Spurious Emissions 403.0125 MHz, 12.5 kHz**

Table 7.1.2-2: Field Strength of Spurious Emissions – 406.1125 MHz, 12.5 kHz

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Antenna Polarity (H/V)	Antenna Height (cm)	Angle (degrees)	Correction Factor (dB)	Spurious ERP (dBm)	Limit (dBm)	Margin (dB)
Noise Floor								

Note: All spurious emissions were attenuated below the limits and the noise floor of the measurement equipment.

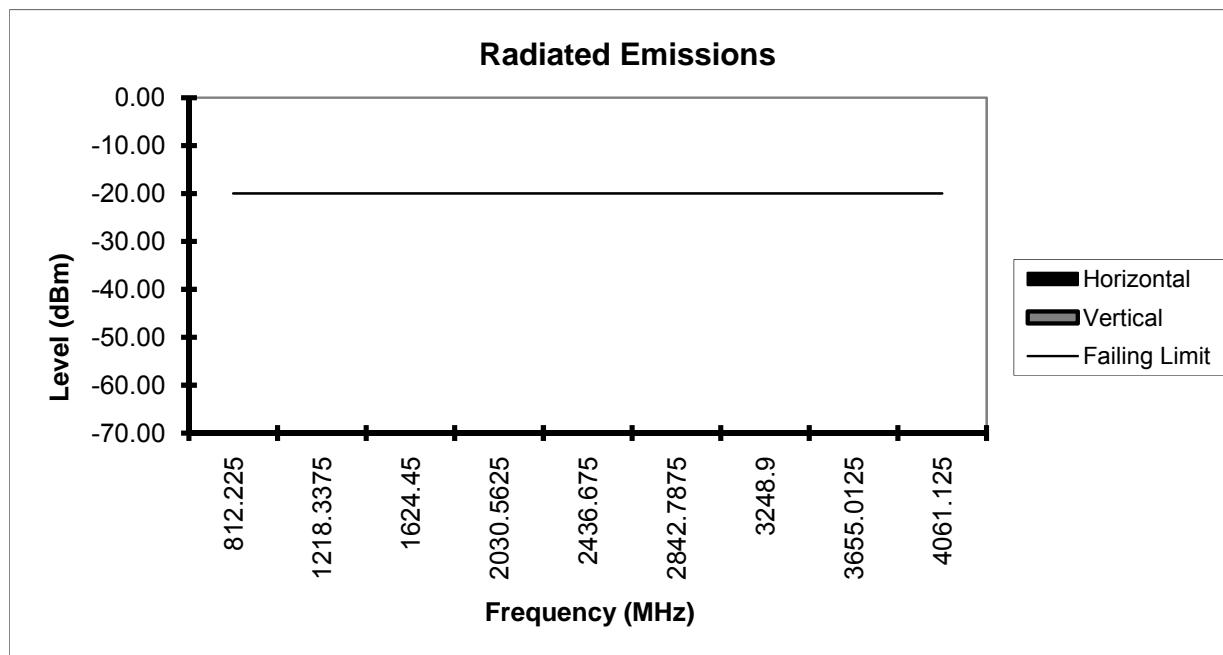


Figure 7.1.2-2: Field Strength of Spurious Emissions 406.1125 MHz, 12.5 kHz

**Table 7.1.2-3: Field Strength of Spurious Emissions – 429.9875 MHz, 12.5 kHz**

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Antenna Polarity (H/V)	Antenna Height (cm)	Angle (degrees)	Correction Factor (dB)	Spurious ERP (dBm)	Limit (dBm)	Margin (dB)
Noise Floor								

Note: All spurious emissions were attenuated below the limits and the noise floor of the measurement equipment.

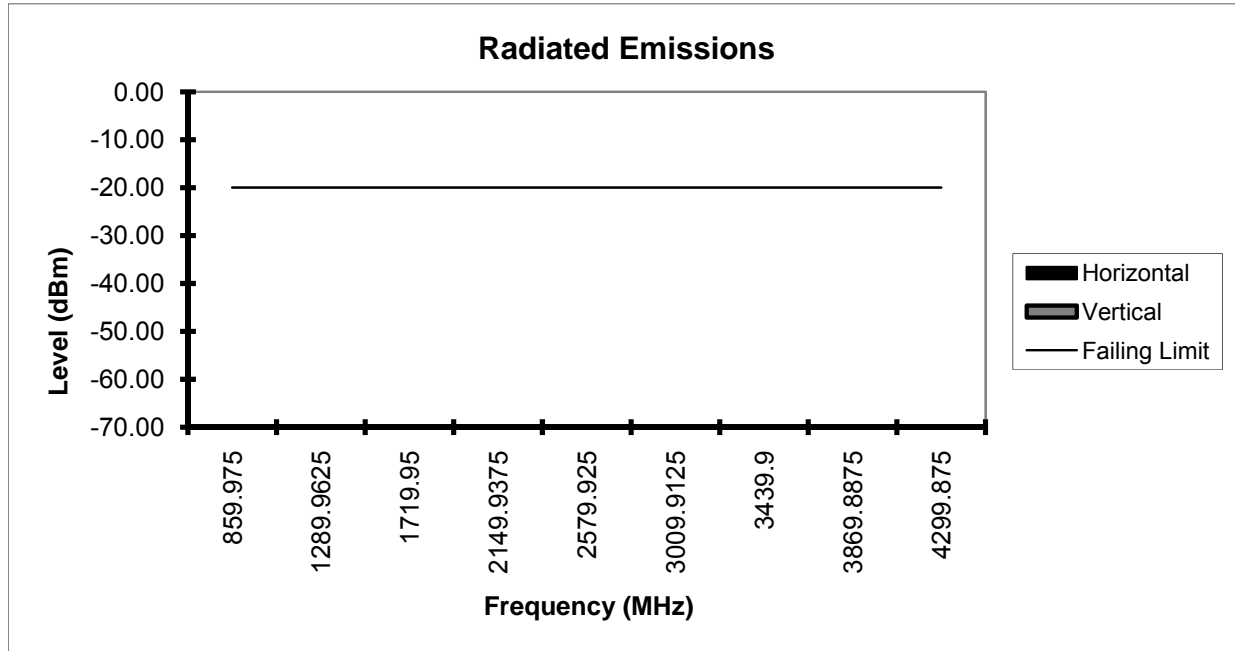
**Figure 7.1.2-3: Field Strength of Spurious Emissions 429.9875 MHz, 12.5 kHz**

Table 7.1.2-4: Field Strength of Spurious Emissions – 469.9875 MHz, 12.5 kHz

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Antenna Polarity (H/V)	Antenna Height (cm)	Angle (degrees)	Correction Factor (dB)	Spurious ERP (dBm)	Limit (dBm)	Margin (dB)
Noise Floor								

Note: All spurious emissions were attenuated below the limits and the noise floor of the measurement equipment.

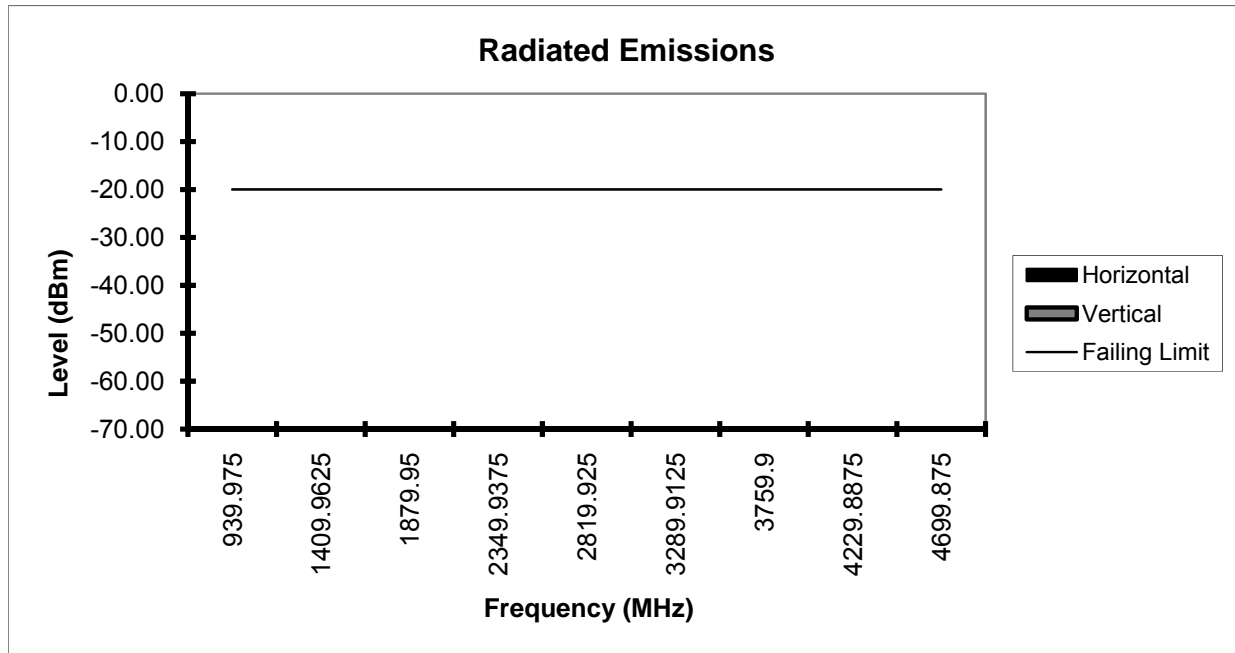


Figure 7.1.2-4: Field Strength of Spurious Emissions 469.9875 MHz, 12.5 kHz

Part 90.210(b); RSS-119 5.8.1**Table 7.1.2-5: Field Strength of Spurious Emissions – 403.0125 MHz, 25 kHz**

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Antenna Polarity (H/V)	Antenna Height (cm)	Angle (degrees)	Correction Factor (dB)	Spurious ERP (dBm)	Limit (dBm)	Margin (dB)
Noise Floor								

Note: All spurious emissions were attenuated below the limits and the noise floor of the measurement equipment.

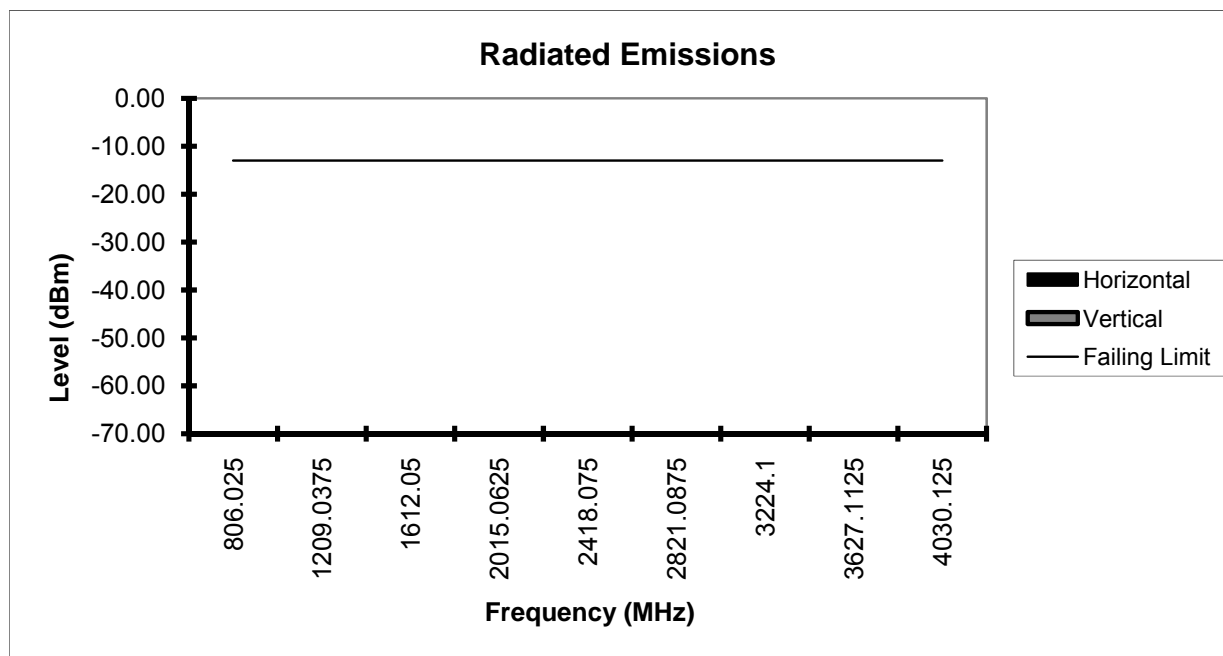
**Figure 7.1.2-5: Field Strength of Spurious Emissions 403.0125 MHz, 25 kHz**

Table 7.1.2-6: Field Strength of Spurious Emissions – 406.1125 MHz, 25 kHz

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Antenna Polarity (H/V)	Antenna Height (cm)	Angle (degrees)	Correction Factor (dB)	Spurious ERP (dBm)	Limit (dBm)	Margin (dB)
Noise Floor								

Note: All spurious emissions were attenuated below the limits and the noise floor of the measurement equipment.

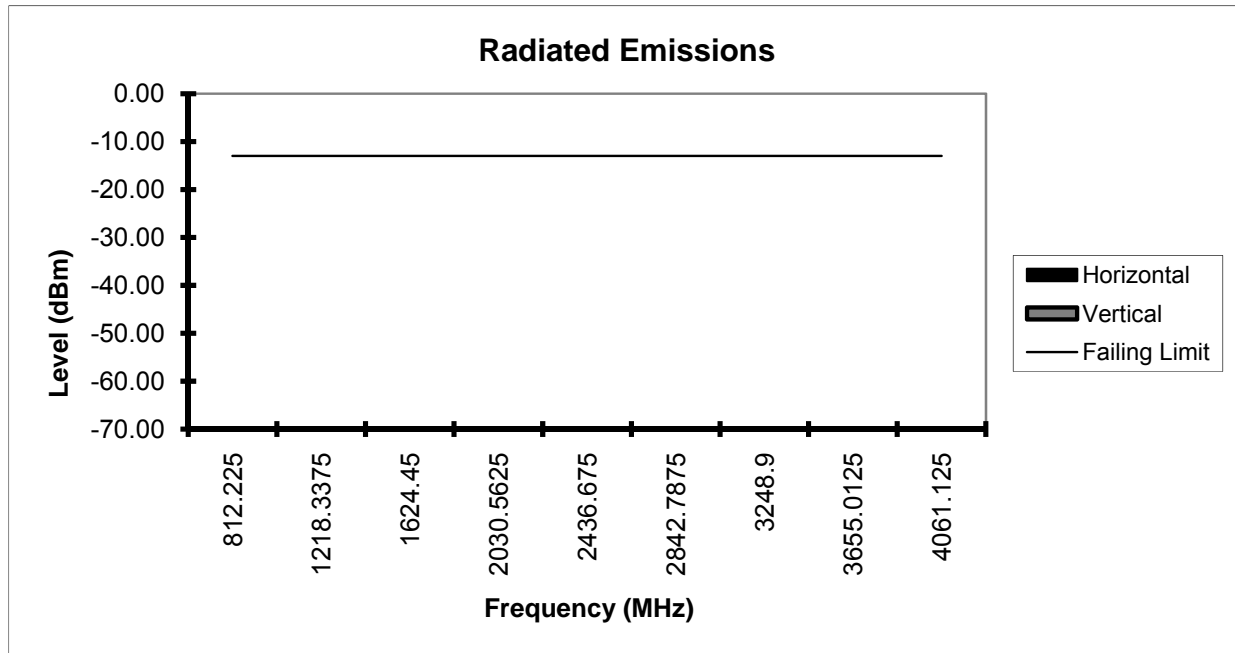


Figure 7.1.2-6: Field Strength of Spurious Emissions 406.1125 MHz, 25 kHz



Table 7.1.2-7: Field Strength of Spurious Emissions – 429.9875 MHz, 25 kHz

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Antenna Polarity (H/V)	Antenna Height (cm)	Angle (degrees)	Correction Factor (dB)	Spurious ERP (dBm)	Limit (dBm)	Margin (dB)
Noise Floor								

Note: All spurious emissions were attenuated below the limits and the noise floor of the measurement equipment.

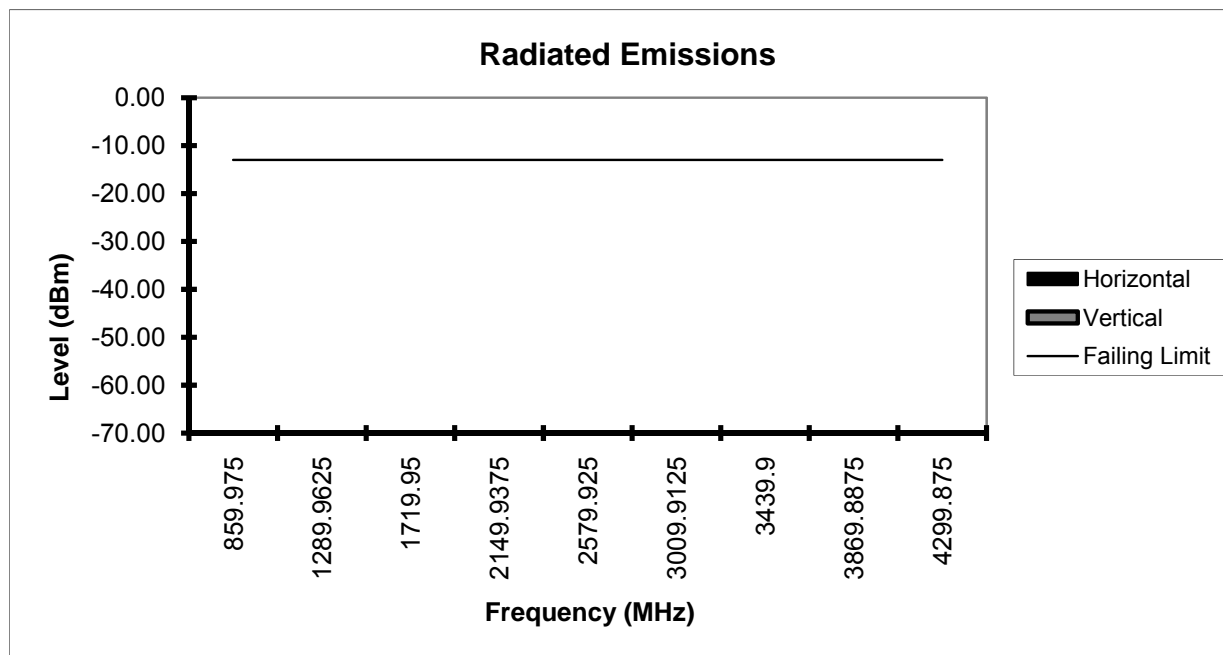


Figure 7.1.2-7: Field Strength of Spurious Emissions 429.9875 MHz, 25 kHz

Table 7.1.2-8: Field Strength of Spurious Emissions – 469.9875 MHz, 25 kHz

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Antenna Polarity (H/V)	Antenna Height (cm)	Angle (degrees)	Correction Factor (dB)	Spurious ERP (dBm)	Limit (dBm)	Margin (dB)
Noise Floor								

Note: All spurious emissions were attenuated below the limits and the noise floor of the measurement equipment.

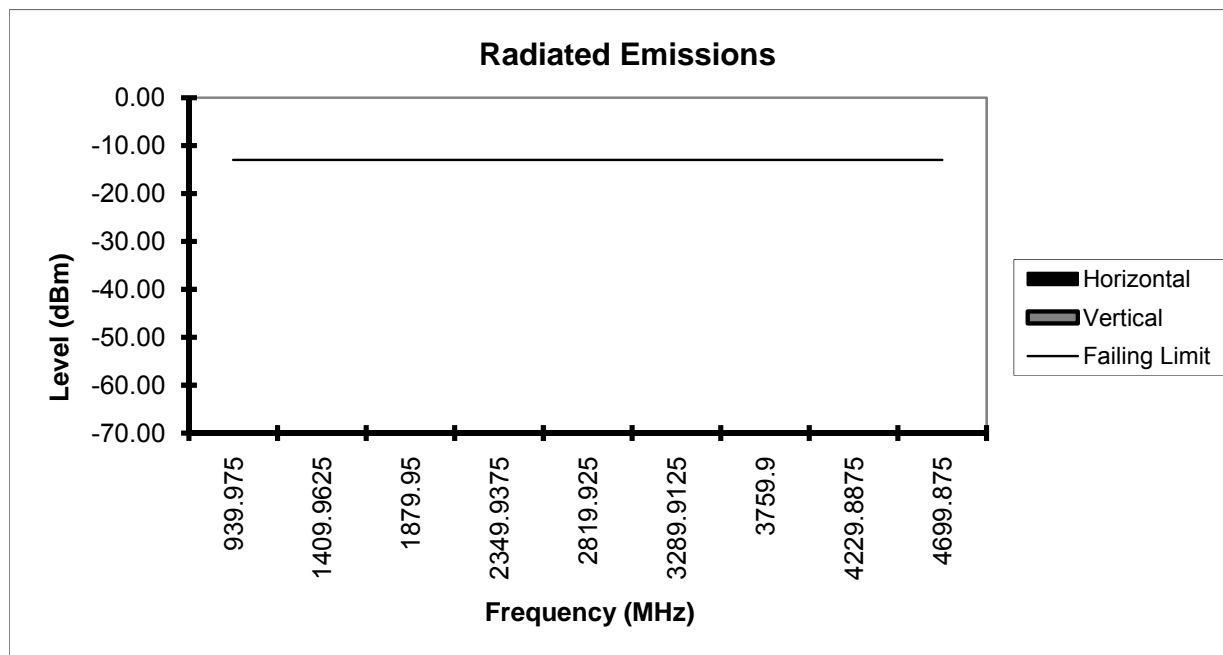


Figure 7.1.2-8: Field Strength of Spurious Emissions 469.9875 MHz, 25 kHz

## 8.0 CONCLUSION

In the opinion of ACS, Inc. the model AAH56QCN9PA3AN, manufactured by Motorola Solutions, Inc., meets the requirements of FCC Part 90 Subpart I and Industry Canada's RSS-119, for the tests documented in this report.

End Report