



MET Laboratories, Inc.

Safety Certification - EMI - Telecom Environmental Simulation

914 W. PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

February 16, 2010

Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501

Dear Neil Leitch,

Enclosed is the EMC Wireless test report for compliance testing of the Harris Corporation, MASTR V, MASV-800M1, tested to the requirements of Title 47 of the Code of Federal Regulations (CFR), Part 90 Subpart Class II Permissive Change for Land Mobile Radio Services and RSS-119, Issue 9, June 2007 Reassessment for a Class A Digital Device.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Jennifer Warnell
Documentation Department

Reference: (\Harris Corporation\EMC28123-FCC90 CIIPC)

Certificates and reports shall not be reproduced except in full, without the written permission of MET Laboratories, Inc.



MET Laboratories, Inc.

Safety Certification - EMI - Telecom Environmental Simulation

914 W. PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

**Electromagnetic Compatibility Criteria
Class II Permissive Change
Test Report**

For the

**Harris Corporation
Model MASTR V, MASV-800M1**

Tested under

**The FCC Verification Rules
Contained in Title 47 of the CFR, Part 90
for Private Land Mobile Radio Services,
RSS-119, Issue 9, June 2007 for a Class A Digital Device**

MET Report: EMC28123-FCC90 CIIPC

February 16, 2010

**Prepared For:
Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501**

**Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Ave.
Baltimore, MD 21230**



Harris Corporation
MASTR V, MASV-800M1

Electromagnetic Compatibility
Cover Page
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

Electromagnetic Compatibility Criteria Class II Permissive Change Test Report

For the

**Harris Corporation
Model MASTR V, MASV-800M1**

Tested under

**The FCC Verification Rules
Contained in Title 47 of the CFR, Part 90
for Private Land Mobile Radio Services
RSS-119, Issue 9, June 2007 for a Class A Digital Device**

MET Report: EMC28123-FCC90 CIIPC



Len Knight
Electromagnetic Compatibility Lab



Jennifer Warnell
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is / is not capable of operation in accordance with the requirements of Part 90 of the FCC Rules and RSS-119, Issue 9, June 2007 under normal use and maintenance.



Shawn McMillen, Wireless Manager
Electromagnetic Compatibility Lab



Harris Corporation
MASTR V, MASV-800M1

Electromagnetic Compatibility
Report Status
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	February 16, 2010	Initial Issue.



Table of Contents

1. Executive Summary	1
1.1. Testing Summary	2
2. Equipment Configuration.....	3
2.1. Overview	4
2.2. Test Site	5
2.3. Description of Test Sample	5
2.4. Equipment Configuration.....	5
2.5. Card Identification	5
2.6. Support Equipment	7
2.7. Ports and Cabling Information	7
2.8. Method of Monitoring EUT Operation	14
2.9. Mode of Operation	14
2.10. Modifications	15
2.10.1. Modifications to EUT	15
2.10.2. Modifications to Test Standard	15
2.11. Disposition of EUT	15
3. Electromagnetic Compatibility Criteria for Intentional Radiators	16
4. Electromagnetic Compatibility Spurious Emissions at Antenna Terminal Requirements	21
4.1. Spurious Emissions at Antenna Terminals.....	21
5. Test Equipment	24
6. Certification Label & User's Manual Information	25
6.1. Verification Information	26
6.2. Label and User's Manual Information	30

All references to section numbers are taken directly from the standard/specification used. Only sections requiring testing or evaluation are included.



List of Tables

Table 1. Card Identification.....	5
Table 2. Support Equipment.....	7
Table 3. Ports and Cabling Information, Internal	7
Table 4. Ports and Cabling Information, External.....	8

List of Figures

Figure 1. Station Layout.....	6
Figure 2. Block Diagram of Test Configuration, Transmitter Chain, Linear	9
Figure 3. Block Diagram of Test Configuration, Receiver.....	9
Figure 4. Block Diagram of Test Configuration, Traffic Controller	10
Figure 5. Block Diagram of Test Configuration, Ethernet Switch	11
Figure 6. Block Diagram of Test Configuration, Transmit Module.....	11
Figure 7. Block Diagram of Test Configuration, Linearizer	12
Figure 8. Block Diagram of Test Configuration, Power Amplifier	12
Figure 9. Block Diagram of Test Configuration, Baseband Module.....	13
Figure 10. Block Diagram of Test Configuration, Power Supply	14
Figure 11. RF Power Output Test Setup.....	17
Figure 12. Spurious Emissions at Antenna Terminals Test Setup.....	23

List of Photographs

Error! No table of figures entries found.



List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
<i>d</i>	Measurement Distance
dB	Decibels
dB_μA	Decibels above one microamp
dB_μV	Decibels above one microvolt
dB_μA/m	Decibels above one microamp per meter
dB_μV/m	Decibels above one microvolt per meter
DC	Direct Current
E	Electric Field
ESD	Electrostatic Discharge
EUT	Equipment Under Test
<i>f</i>	Frequency
FCC	Federal Communications Commission
GRP	Ground Reference Plane
H	Magnetic Field
HCP	Horizontal Coupling Plane
Hz	Hertz
IEC	International Electrotechnical Commission
kHz	kilohertz
kPa	kilopascal
kV	kilovolt
LISN	Line Impedance Stabilization Network
MHz	Megahertz
μH	microhenry
μ	microfarad
μ s	microseconds
NEBS	Network Equipment-Building System
PRF	Pulse Repetition Frequency
RF	Radio Frequency
RMS	Root-Mean-Square
TWT	Traveling Wave Tube
V/m	Volts per meter
VCP	Vertical Coupling Plane



Harris Corporation
MASTR V, MASV-800M1

Executive Summary
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

Executive Summary



Harris Corporation
MASTR V, MASV-800M1

Executive Summary
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

1. Testing Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with select tests from Part 90. All tests were conducted using measurement procedure from ANSI TIA/EIA-603-A-2004 and ANSI C63.4-2003 as appropriate.

Title 47 of the CFR, Part 90	IC Reference	Conformance			Comments
		Yes	No	N/A	
<i>Yes - Equipment complies with the Requirement No - Equipment does not comply with the Requirement N/A - Not applicable to the equipment under tests</i>					
2.1046; 90.205 Peak Power Output		✓			Measured emissions below applicable limits.
2.1051; 90.210 Spurious Emissions at Antenna Terminals		✓			Measured emissions below applicable limits.

Equipment Configuration

2. Equipment Configuration

2.1. Overview

MET Laboratories, Inc. was contracted by Harris Corporation to perform testing on the MASTR V, MASV-800M1 under purchase order number 1066387.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Harris Corporation., MASTR V, MASV-800M1.

An EMC evaluation to determine compliance of the MASV-800M1 with the requirements of Part 90 was conducted. (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect). In accordance with §2.1033, the following data is presented in support of the Certification of the MASV-800M1. Harris Corporation. should retain a copy of this document and it should be kept on file for at least five years after the manufacturing of the EUT has been **permanently** discontinued. The results obtained relate only to the item(s) tested.

Product Name:	MASTR V	
Model(s) Tested:	MASV-800M1	
EUT Specifications:	Primary Power Source: 120 VAC, 60 Hz	
	FCC ID: OWDTR-0053-E	
	Type of Modulations:	C4FM, WCQPSK, HDQPSK
	Peak Output Power:	HDQPSK 51.52 dBm
		CQPSK 51.92 dBm
		C4FM 51.92 dBm
	Equipment Code:	TNB
	EUT Frequency Ranges: 851-869 MHz	
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature (15-35° C):	
	Relative Humidity (30-60%):	
	Barometric Pressure (860-1060 mbar):	
Evaluated by:	Len Knight	
Test Date(s):	01/20/2010 – 01/26/2010	

2.2. Test Site

All testing was performed at MET Laboratories, Inc., 914 W. Patapsco Ave., Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

2.3. Description of Test Sample

The MASTR V is a Radio Base Station/Repeater designed for communications in the Land Mobile Radio environment. The primary communication users are Public Safety, Utility and Military Commercial Of The Shelf.

2.4. Equipment Configuration

The EUT was set up as outlined in Figure 2 - Figure 10, Block Diagram of Test Setup. All cards, racks, etc., incorporated as part of the EUT are included in the following section.

2.5. Card Identification

Ref. ID *	Name / Description	Model Number	Serial Number
Tx #1	Transmit Module #1	EA-555008-012	MACM0006VN
Tx #2	Transmit Module #2	EA-555008-012	MACM0006Y8
Tx #3	Transmit Module #3	EA-555008-012	MACM0006Y7
Tx #4	Transmit Module #4	EA-555008-012	MACM0006Y3
PA #1	Power Amplifier #1	EA-555014-012	MACM0006X0
PA #2	Power Amplifier #2	EA-555014-012	MACM0006WY
PA #3	Power Amplifier #3	EA-555014-012	MACM0006WT
PA #4	Power Amplifier #4	EA-555014-012	MACM0006WC
Rx #1	Receive Module #1	EA-555007-011	MACM00070V
Rx #2	Receive Module #2	EA-555007-011	MACM0006RR
Rx #3	Receive Module #3	EA-555007-011	MACM0006U0
Rx #4	Receive Module #4	EA-555007-011	MACM000719
BB #1	Baseband Module #1	EA-555005	MACM0006E8
BB #2	Baseband Module #2	EA-555005	MACM0006F4
TC #1	Traffic Controller #1	EA-555004	MACM0006QI
TC #2	Traffic Controller #2	EA-555004	MACM0006QG
TC #3	Traffic Controller #3	EA-555004	MACM0006PC
TC #4	Traffic Controller #4	EA-555004	MACM0006QQ
ES #1	E-Switch (Primary)	EA-555012	macm000a7e
ES #2	E-Switch (Redundant)	EA-555012	macm000a7g
PS #1	Power Supply #1	EA-555011-001	UC28080
PS #2	Power Supply #2	EA-555011-001	UF26097
PS #3	Power Supply #3	EA-555011-001	UC28066
PS #4	Power Supply #4	EA-555011-001	UF26096

Table 1. Card Identification

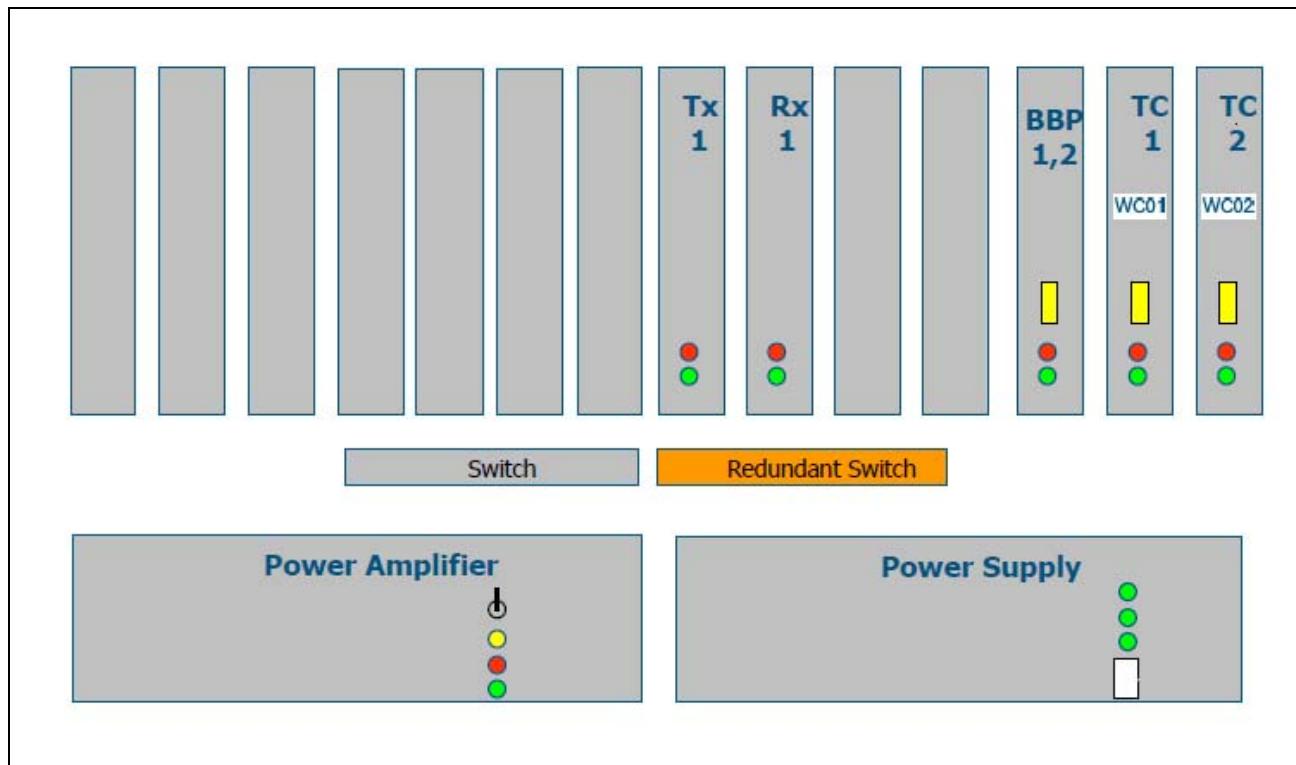


Figure 1. Station Layout

2.6. Support Equipment

Harris Corporation supplied support equipment necessary for the operation and testing of the MASTR V, MASV-800M1. All support equipment supplied is listed in the following Support Equipment List.

Name / Description	Manufacturer	Model Number	Serial Number
HANDHELD BARCODE SCANNER	HP	LS2208-SR20361RSBRE	NONE
100 WATT DUMMY LOAD (QTY 4)	N/A	N/A	NONE

Table 2. Support Equipment

2.7. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty.	Length (m)	Shielded? (Y/N)	Termination Box ID & Port ID
TX #1	RF OUT	COAXIAL CABLE	1	1	Y	PA #1 RF IN
TX #2	RF OUT	COAXIAL CABLE	1	1	Y	PA #2 RF IN
TX #3	RF OUT	COAXIAL CABLE	1	1	Y	PA #3 RF IN
TX #4	RF OUT	COAXIAL CABLE	1	1	Y	PA #4 RF IN
PA #1	RF IN	COAXIAL CABLE	1	1	Y	TX #1 RF OUT
PA #1	CONTROL	15 CONDUCTOR	1	1	Y	BACKPLANE, J21
PA #2	RF IN	COAXIAL CABLE	1	1	Y	TX #2 RF OUT
PA #2	CONTROL	15 CONDUCTOR	1	1	Y	BACKPLANE, J22
PA #3	RF IN	COAXIAL CABLE	1	1	Y	TX #3 RF OUT
PA #3	CONTROL	15 CONDUCTOR	1	1	Y	BACKPLANE, J23
PA #4	RF IN	COAXIAL CABLE	1	1	Y	TX #4 RF OUT
PA #4	CONTROL	15 CONDUCTOR	1	1	Y	BACKPLANE, J24
PS #1	HPA	28 VDC POWER	1	0.5	N	PA #1, POWER
PS #1	SHELF	5V/12V DC POWER	1	1	N	BACKPLANE, J30
PS #2	HPA	28 VDC POWER	1	0.5	N	PA #2, POWER
PS #2	SHELF	5V/12V DC POWER	1	1	N	BACKPLANE, J31
PS #3	HPA	28 VDC POWER	1	0.5	N	PA #3, POWER
PS #4	HPA	28 VDC POWER	1	0.5	N	PA #4, POWER

Table 3. Ports and Cabling Information, Internal

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty.	Length (m)	Shielded? (Y/N)	Termination Box ID & Port ID
PA #1	RF Out	Coaxial Cable	1	3	Y	100W Dummy Load
PA #2	RF Out	Coaxial Cable	1	1	Y	100W Dummy Load
PA #3	RF Out	Coaxial Cable	1	1	Y	100W Dummy Load
PA #4	RF Out	Coaxial Cable	1	1	Y	100W Dummy Load
Rx #1	RF In	none, terminated	1	-	Y	50Ω Dummy Load
Rx #1	Audio	none, bench test only	0	-	-	-
Rx #2	RF In	none, terminated	1	-	Y	50Ω Dummy Load
Rx #2	Audio	none, bench test only	0	-	-	-
Rx #3	RF In	none, terminated	1	-	Y	50Ω Dummy Load
Rx #3	Audio	none, bench test only	0	-	-	-
Rx #4	RF In	none, terminated	1	-	Y	50Ω Dummy Load
Rx #4	Audio	none, bench test only	0	-	-	-
BB #1	M-LAN	Ethernet Cable, CAT5	1	3	N	none
BB #1	Simulcast	15-Conductor Cable	2	3	Y	none
BB #1	COMM	none, test/local control	0	-	-	-
BB #1	Ref In	none, terminated	1	-	Y	50Ω Dummy Load
BB #2	M-LAN	Ethernet Cable, CAT5	1	3	N	none
BB #2	Simulcast	15-Conductor Cable	2	3	Y	none
BB #2	COMM	none, test/local control	0	-	-	-
BB #2	Ref In	none, terminated	1	-	Y	50Ω Dummy Load
TC #1	M-LAN	Ethernet Cable, CAT5	1	3	N	none
TC #1	P-LAN	Ethernet Cable, CAT5	1	3	N	none
TC #1	COMM	none, test/local prog	0	-	-	-
TC #2	M-LAN	Ethernet Cable, CAT5	1	3	N	none
TC #2	P-LAN	Ethernet Cable, CAT5	1	3	N	none
TC #2	COMM	none, test/local prog	0	-	-	-
TC #3	M-LAN	Ethernet Cable, CAT5	1	3	N	none
TC #3	P-LAN	Ethernet Cable, CAT5	1	3	N	none
TC #3	COMM	none, test/local prog	0	-	-	-
TC #4	M-LAN	Ethernet Cable, CAT5	1	3	N	none
TC #4	P-LAN	Ethernet Cable, CAT5	1	3	N	none
TC #4	COMM	none, test/local prog	0	-	-	-
PS #1	A/C In	A/C Power Cord	1	1	N	110 VAC Power
PS #1	5V,12V VDC AUX	none, unused	0	-	-	-
PS #2	A/C In	A/C Power Cord	1	1	N	110 VAC Power
PS #2	5V,12V VDC AUX	none, unused	0	-	-	-
PS #3	A/C In	A/C Power Cord	1	1	N	110 VAC Power
PS #3	5V,12V VDC AUX	none, unused	0	-	-	-
PS #4	A/C In	A/C Power Cord	1	1	N	110 VAC Power
PS #4	5V,12V VDC AUX	none, unused	0	-	-	-
TP	Test Port	none, unused	0	-	-	on Backplane

Table 4. Ports and Cabling Information, External

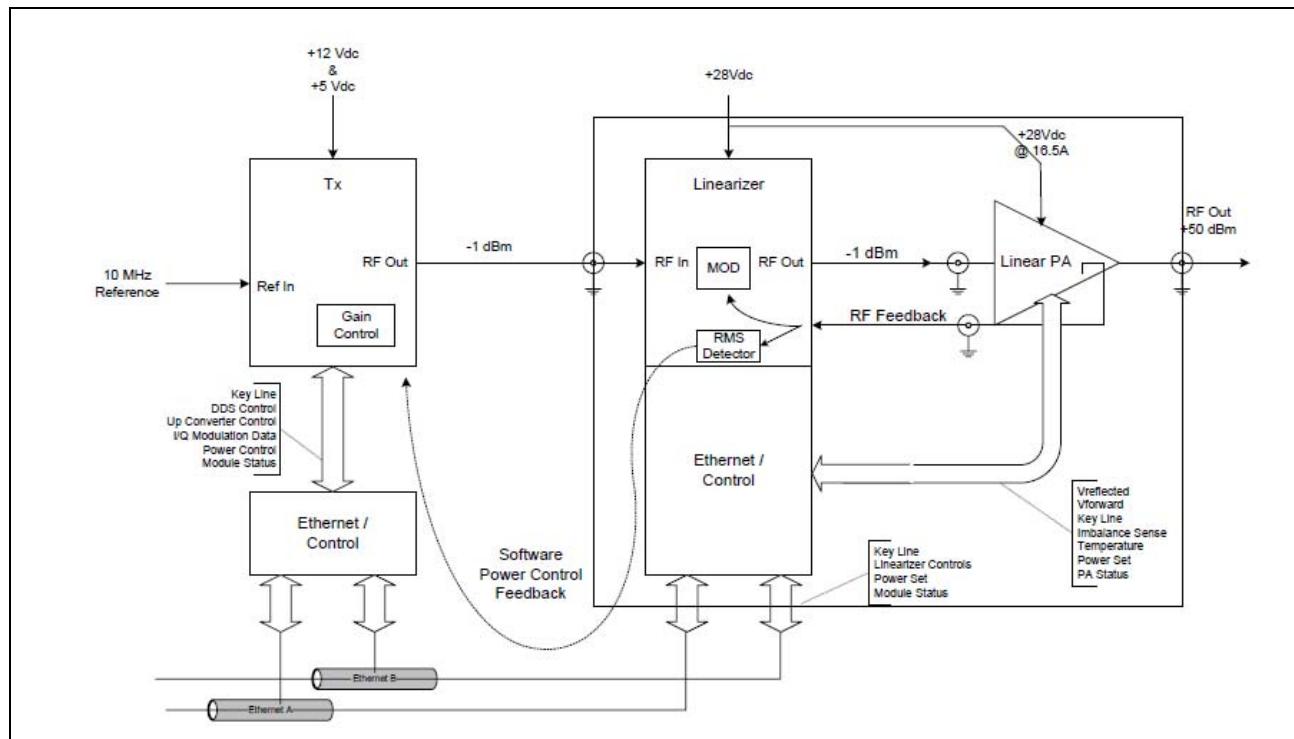


Figure 2. Block Diagram of Test Configuration, Transmitter Chain, Linear

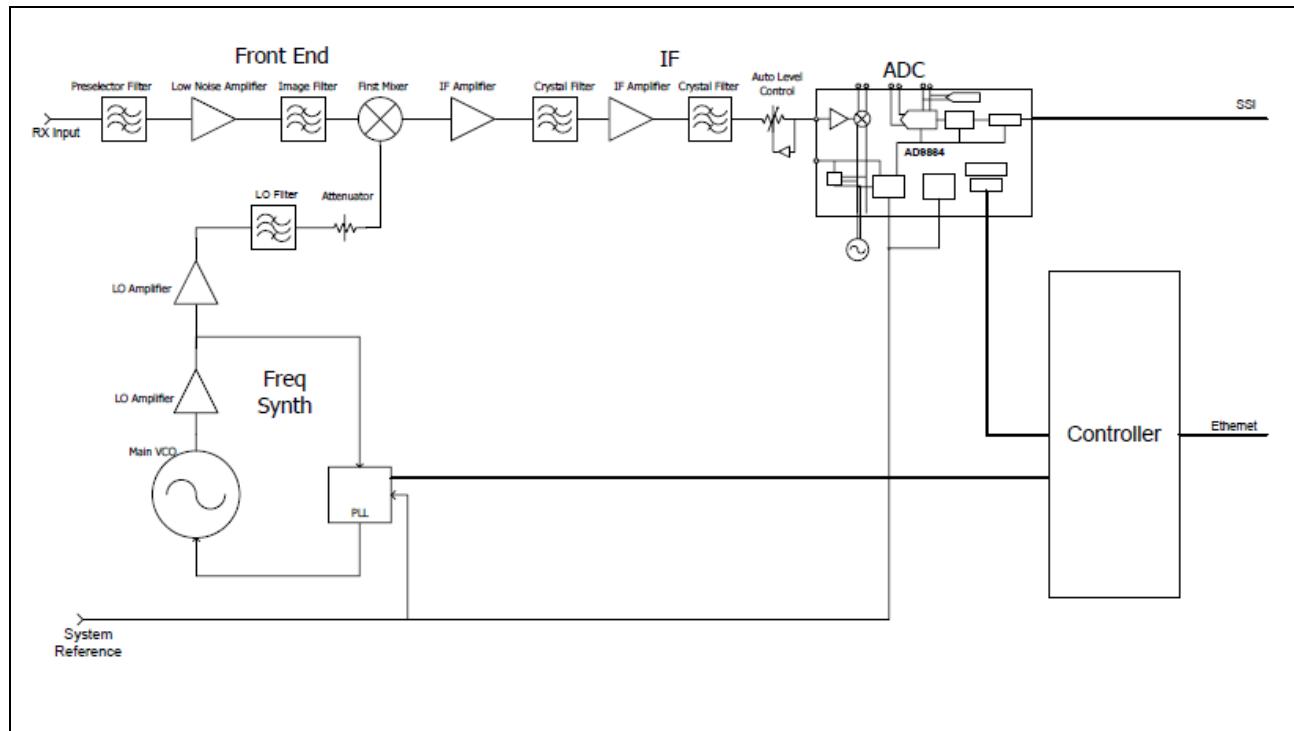


Figure 3. Block Diagram of Test Configuration, Receiver

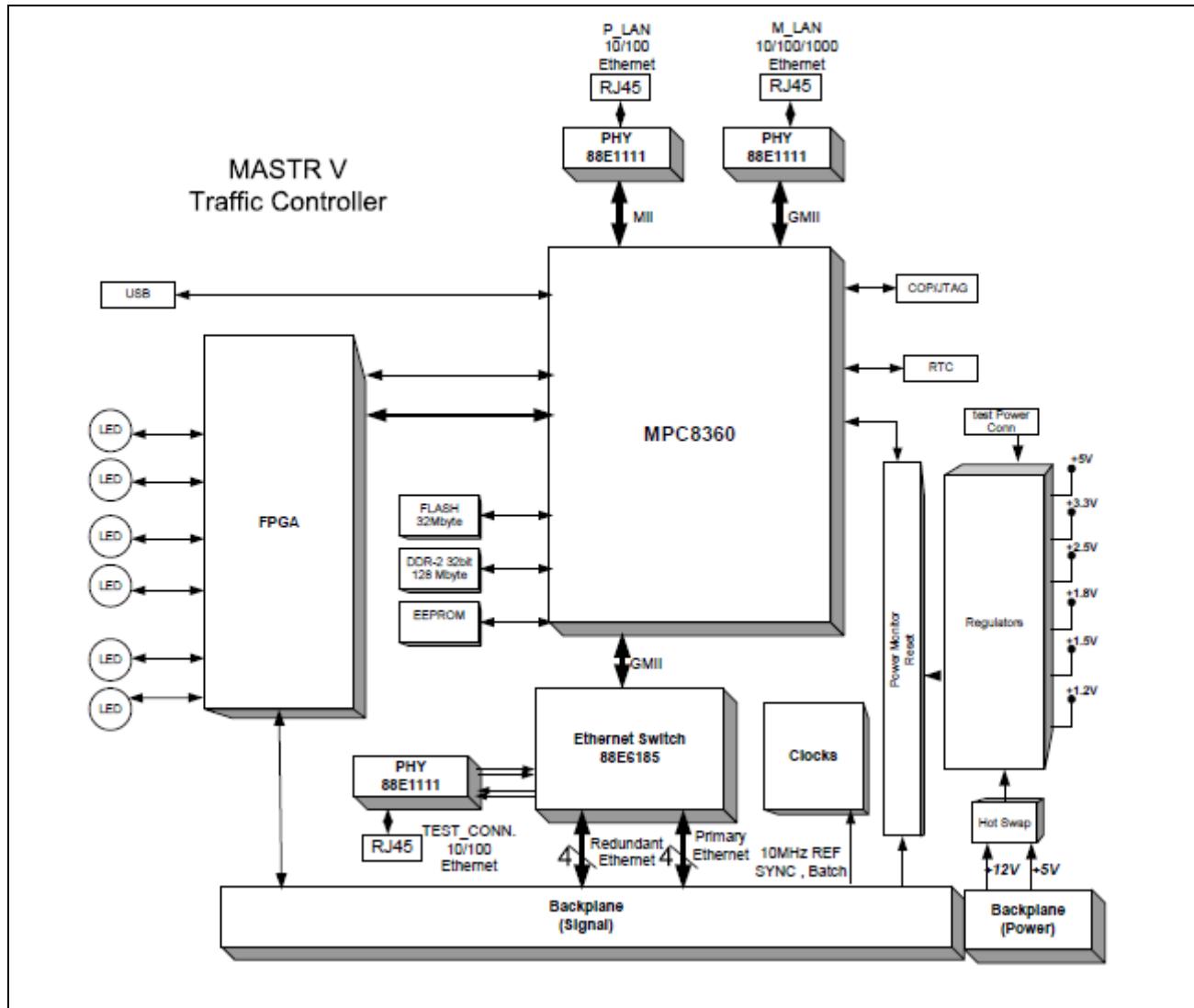


Figure 4. Block Diagram of Test Configuration, Traffic Controller

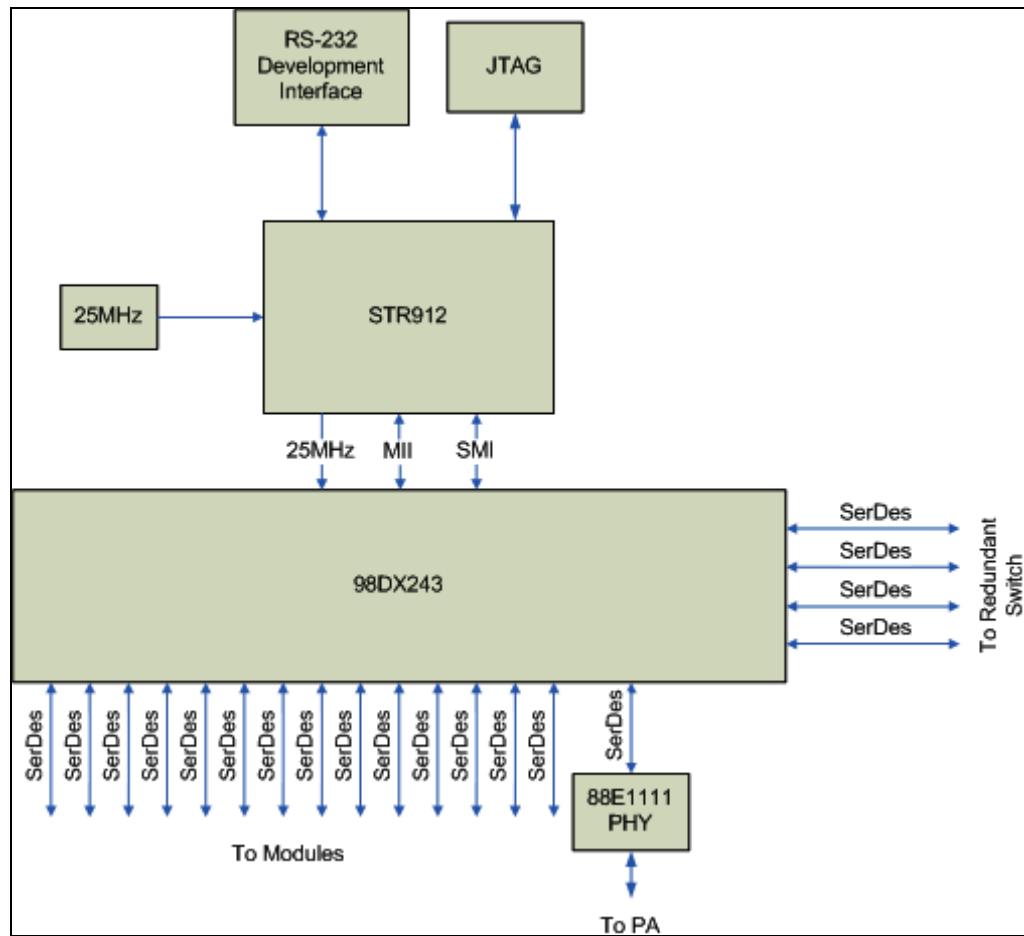


Figure 5. Block Diagram of Test Configuration, Ethernet Switch

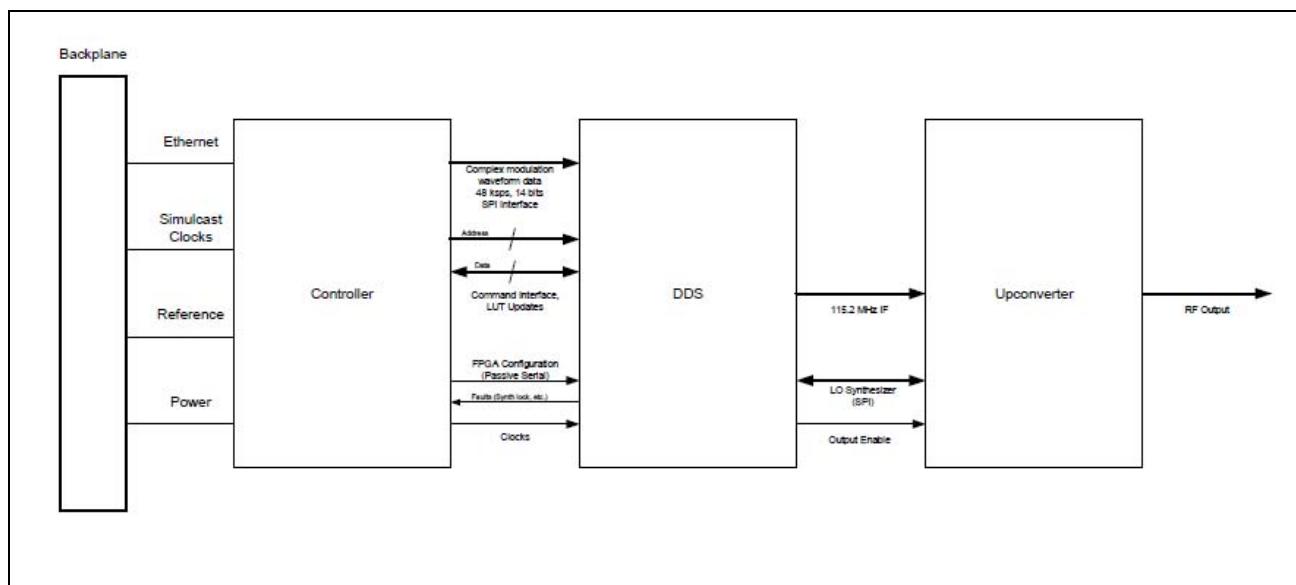


Figure 6. Block Diagram of Test Configuration, Transmit Module

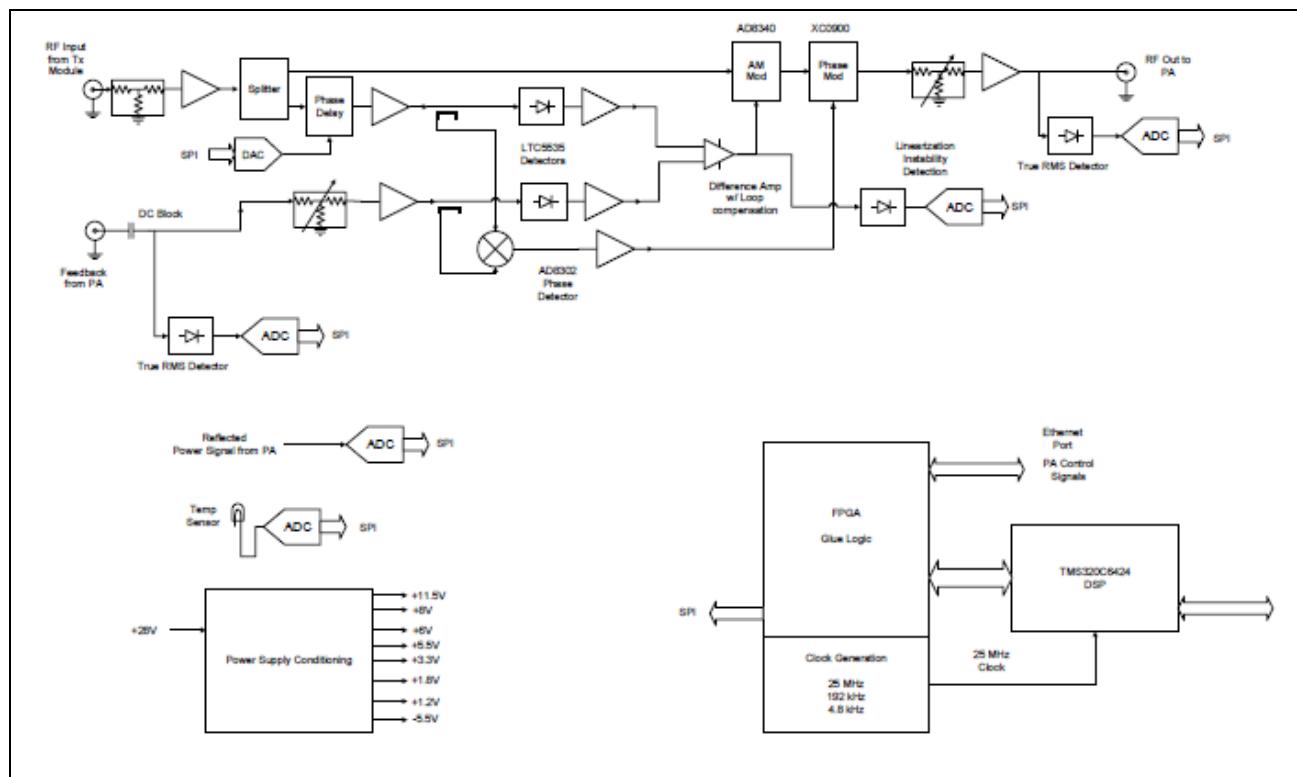


Figure 7. Block Diagram of Test Configuration, Linearizer

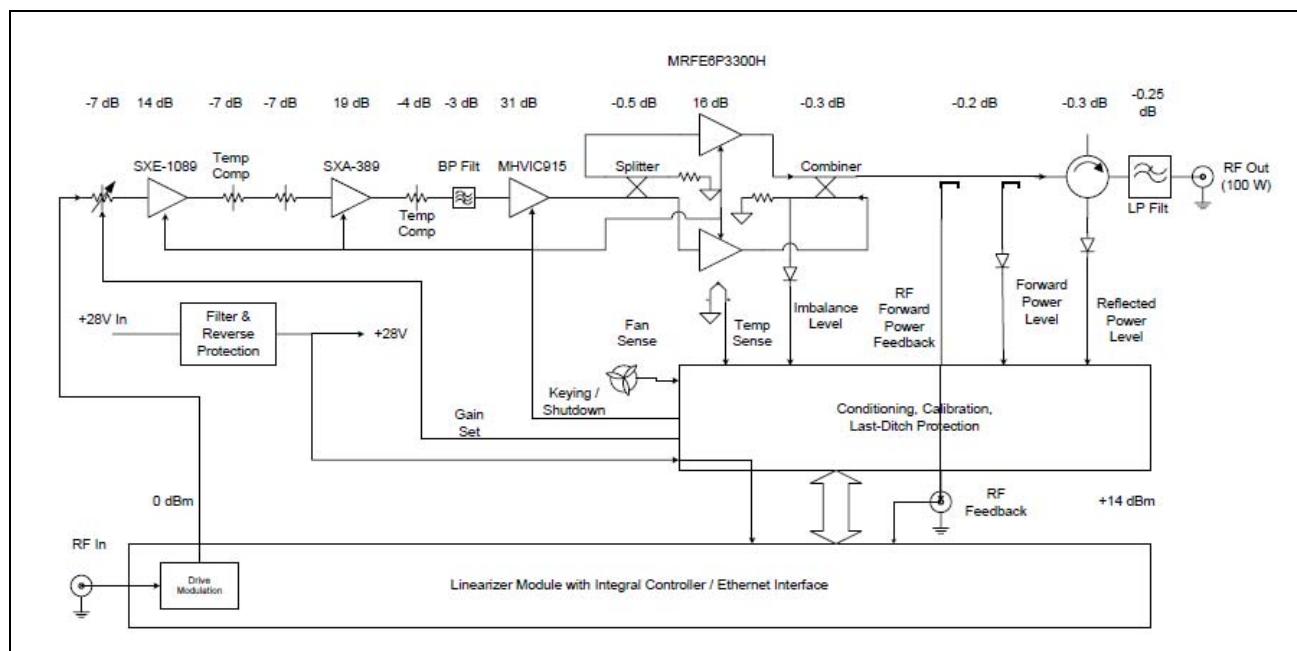


Figure 8. Block Diagram of Test Configuration, Power Amplifier

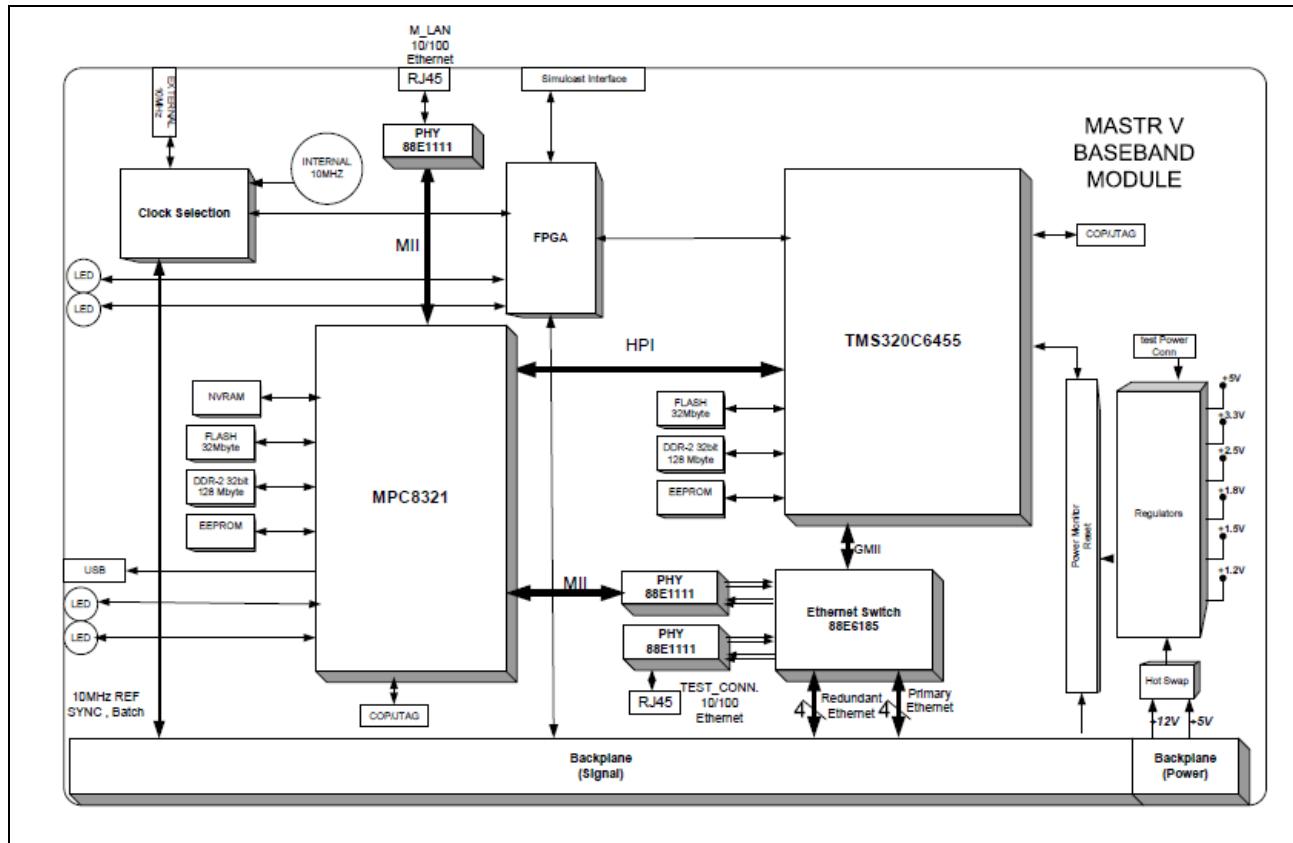


Figure 9. Block Diagram of Test Configuration, Baseband Module

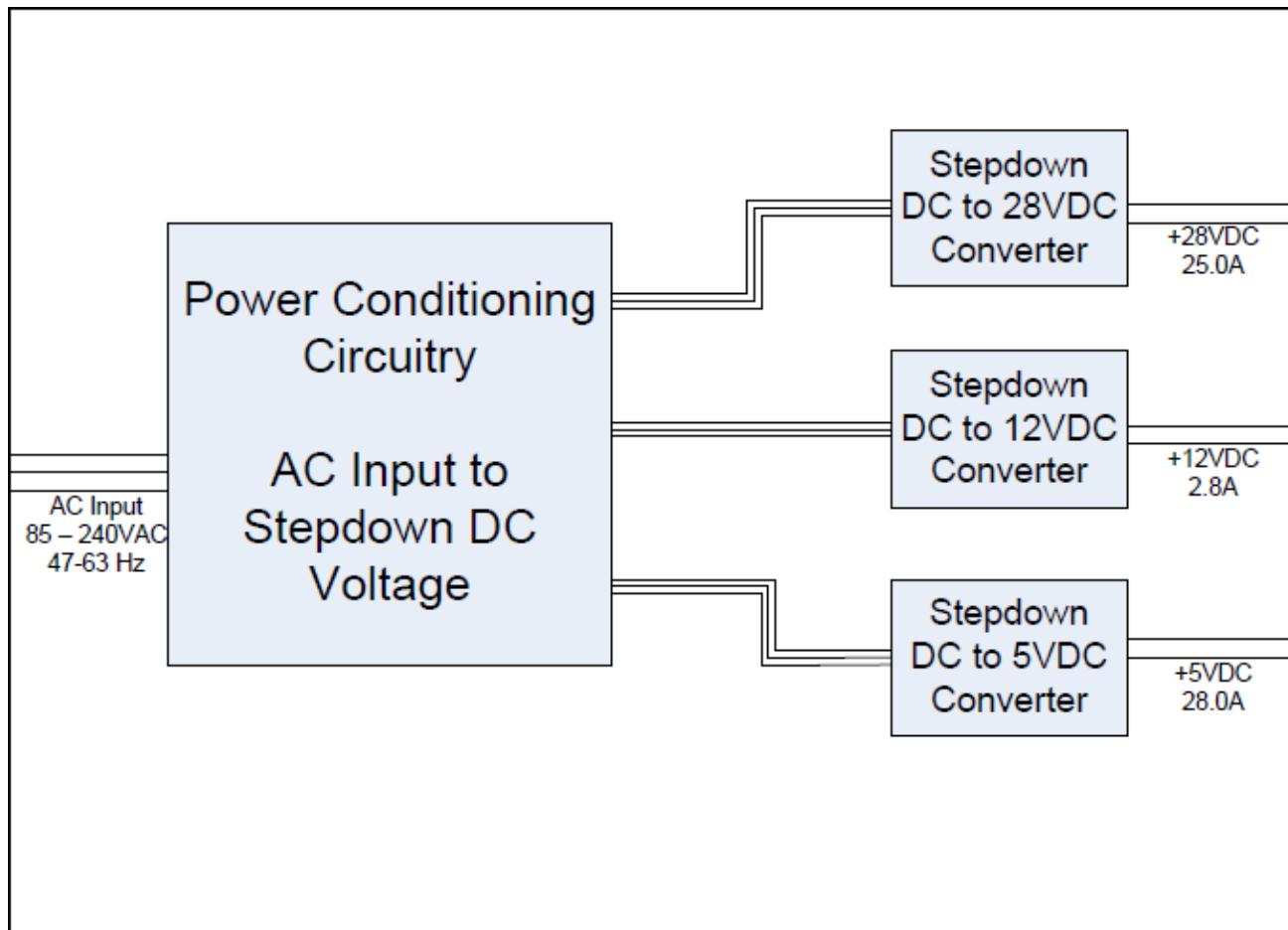


Figure 10. Block Diagram of Test Configuration, Power Supply

2.8. Method of Monitoring EUT Operation

A “STATUS” LED is part of each of the following modules: Tx Module, PA Module, Rx Module, Baseband Module, Traffic Controller and E-Switch. A Red indication on the “STATUS” LED indicates that the module is not functioning properly and the associated channel is taken “Out Of Service”

2.8 Mode of Operation

The MASTR V can generate internal Test Patterns for each modulation mode, selecting the mode and enabling the transmitter is controller with a Bar Code Scanner connected via a standard Laptop PC to M-LAN port of the Baseband Module. No special software was required, all the commands were sent using a Telnet session.

There are three modes of operation:

- P25 Phase I – modulation C4FM
- P25 Linear Simulcast – modulation WCQPSK
- P25 Phase II – modulation HDQPSK

2.9 Modifications

2.9.1 Modifications to EUT

No modifications were made to the EUT.

2.9.2 Modifications to Test Standard

No modifications were made to the test standard.

2.10 Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Harris Corporation upon completion of testing.



Harris Corporation
MASTR V, MASV-800M1

Electromagnetic Compatibility
Intentional Radiators
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

III. Electromagnetic Compatibility Criteria for Intentional Radiators

3. Electromagnetic Compatibility RF Power Output Requirements

3.1. RF Power Output

Test Requirement(s): §2.1046 and §90.215

Test Procedures: As required by 47 CFR 2.1046, *RF power output measurements* were made at the RF output terminals of the EUT.

A laptop was connected to EUT to control the RF power output and modulation. The EUT was connected through an attenuator to a Spectrum Analyzer capable of making power measurements. The EUT power was adjusted enough to produce maximum output power as specified in the owner's manual. The output power was then recorded with peak and average reading. Measurements were made all three different modulations.

Test Results: Equipment complies with 47CFR 2.1046 and 90.215.

Frequency (MHz)	Modulation	Measured Avg. power		Measured Peak Power	
		dBm	Watts	dBm	Watts
851	HDQPSK	50.07	101.6	51.52	141.9
	CQPSK	50.28	106.7	51.92	155.6
	C4FM	49.76	94.6	51.92	155.6

Test Engineer(s): Len Knight

Test Date(s): 01/20/2010

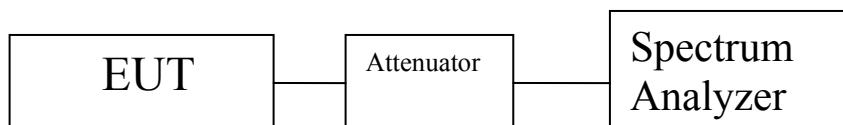
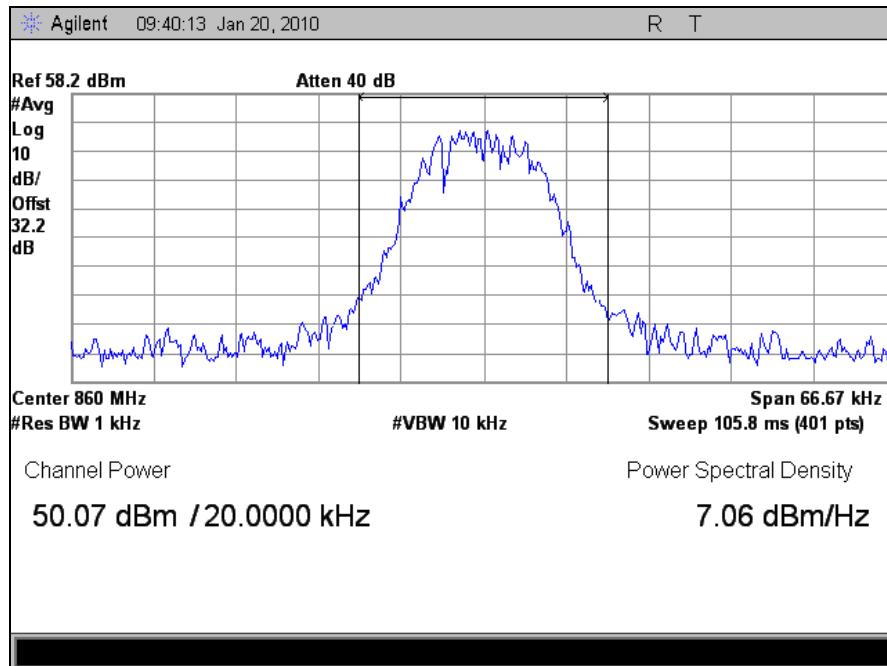
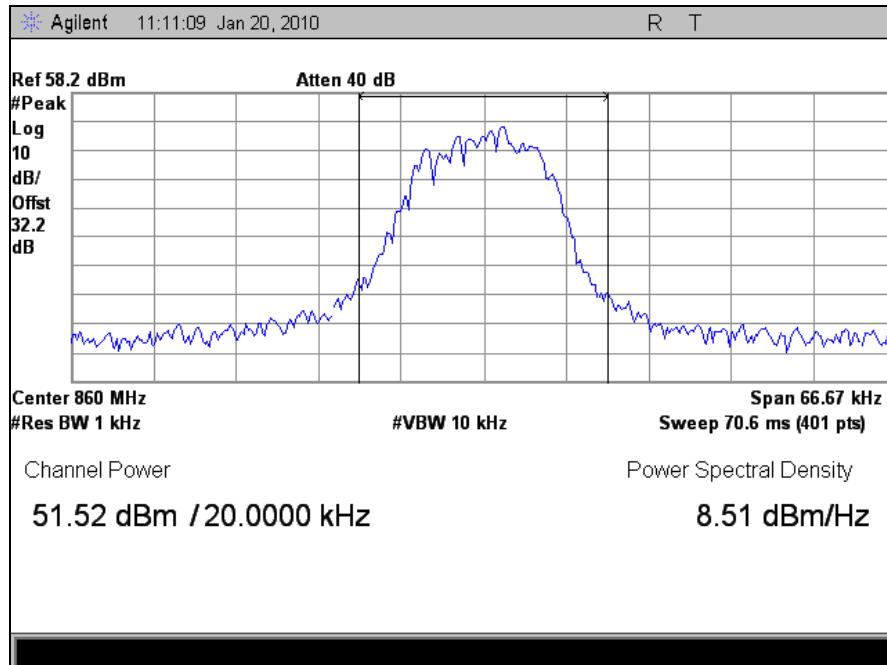


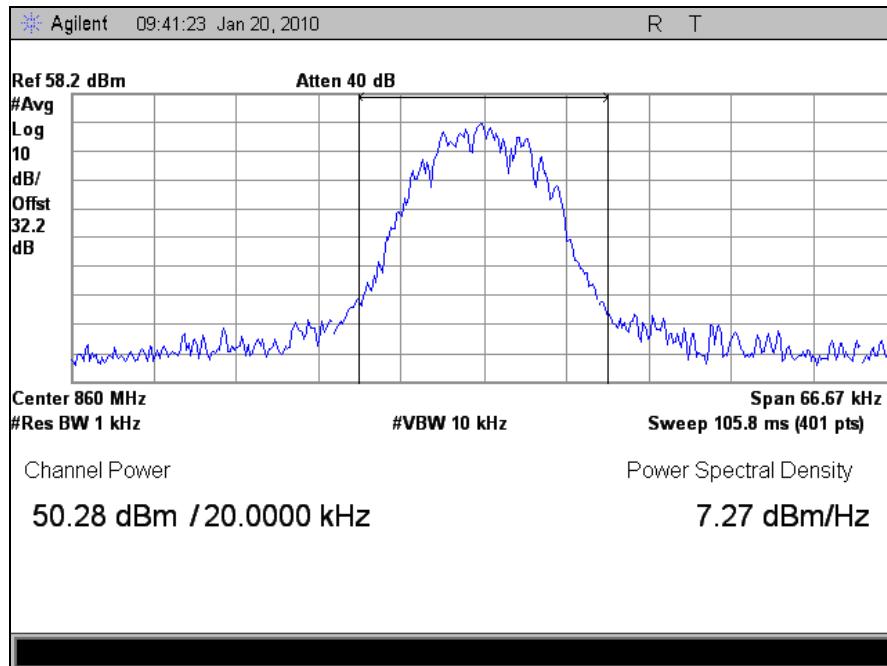
Figure 11. RF Power Output Test Setup



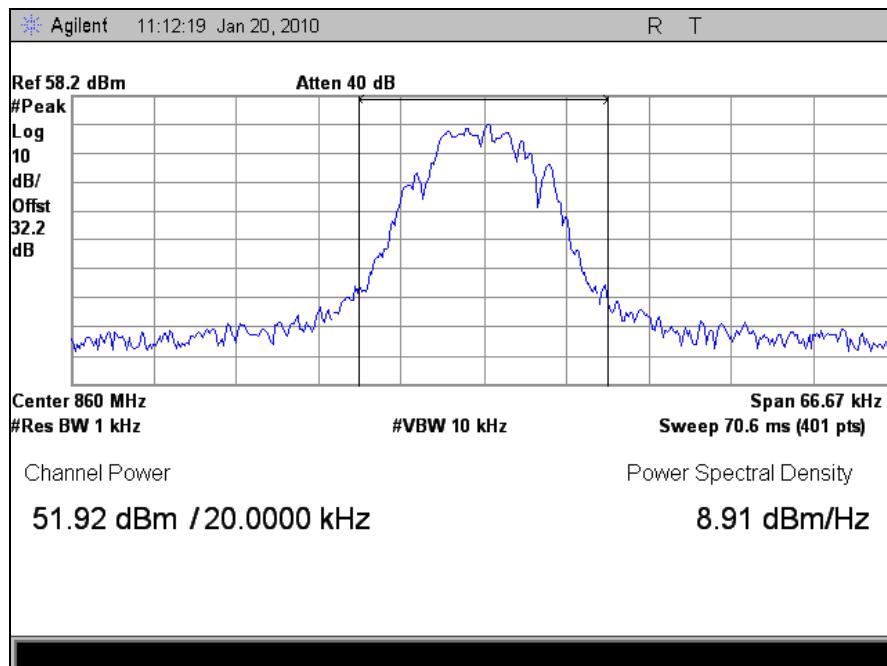
Plot 1. RF Power Output, HDQPSK, Avg.



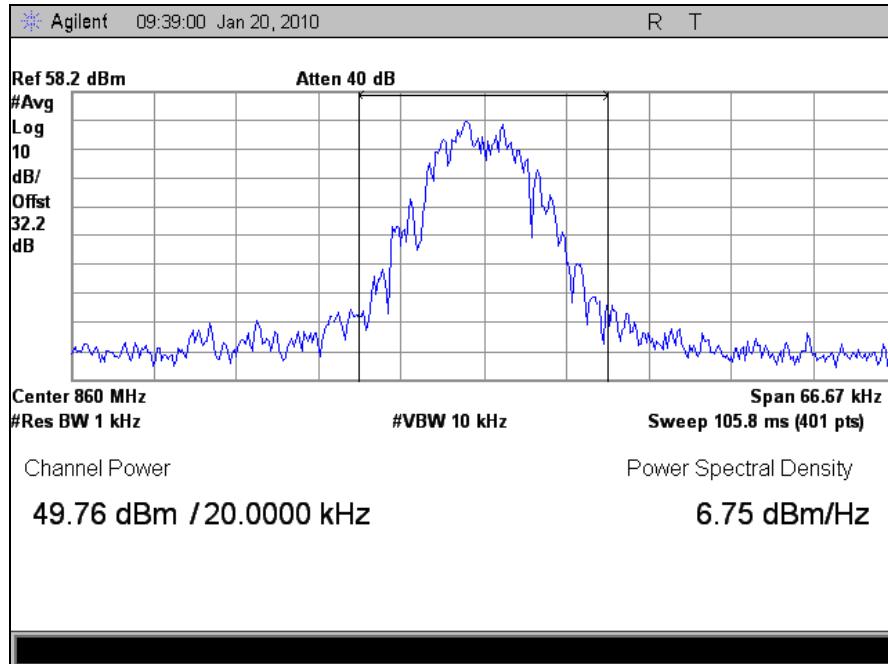
Plot 2. RF Power Output, HDQPSK, Peak



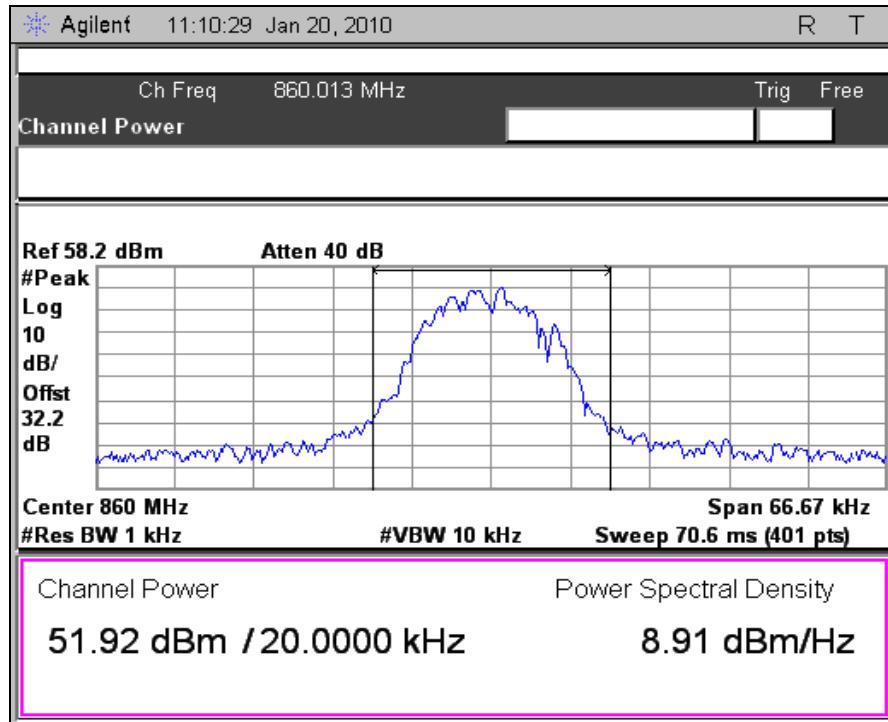
Plot 3. RF Power Output, CQPSK, Avg.



Plot 4. RF Power Output, CQPSK, Peak



Plot 5. RF Power Output, C4FM, Avg.



Plot 6. RF Power Output, C4FM, Peak



Harris Corporation
MASTR V, MASV-800M1

Electromagnetic Compatibility
Intentional Radiators
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

4. Electromagnetic Compatibility Spurious Emissions at Antenna Terminal Requirements

4.1. Spurious Emissions at Antenna Terminals

Test Requirement(s): §2.1051 and §90.210(M) with FCC 04-265

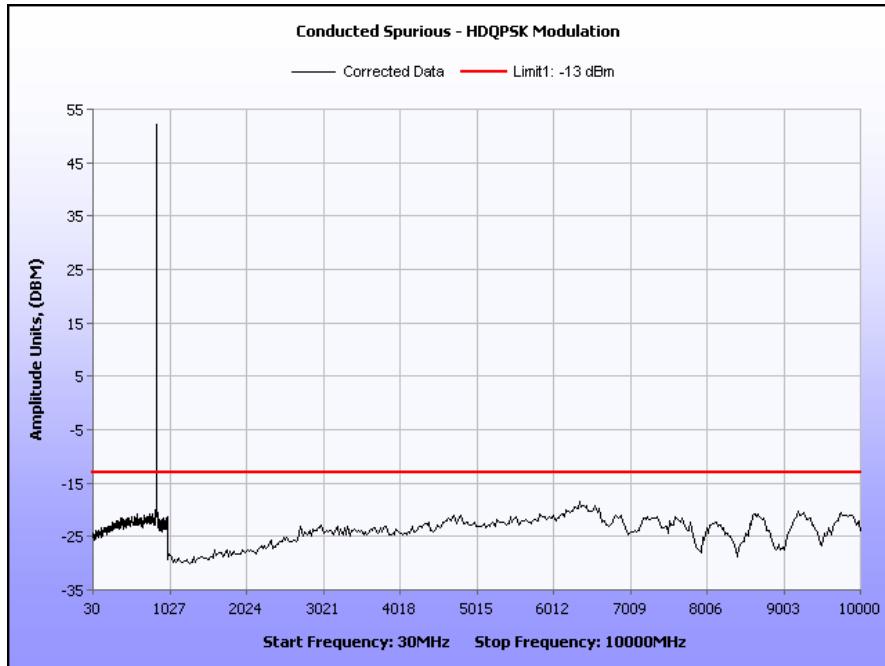
Test Procedures: As required by 47 CFR 2.1051, *spurious emissions at antenna terminal measurements* were made at the RF output terminals of the EUT.

A laptop was connected to EUT to control the RF power output and modulation. The EUT was connected through an attenuator to a Spectrum Analyzer. The Spectrum Analyzer was set to sweep 30 MHz and up to 10th harmonic of the fundamental or 40GHz which ever is the lesser. Measurements were made with all three modulations.

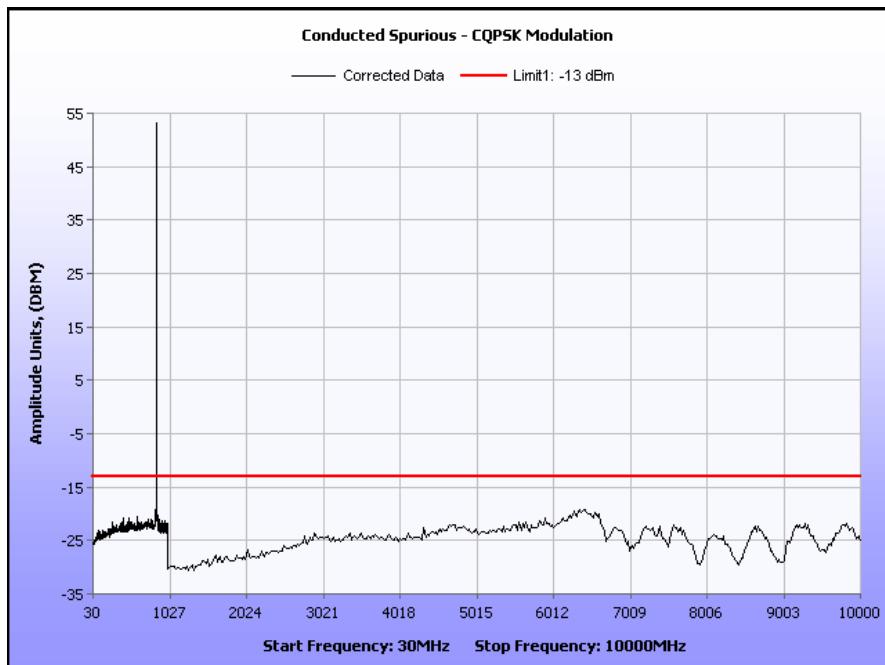
Test Results: Equipment complies with Section 2.1051 and 90.210(M) with FCC 04-265.

Test Engineer(s): Len Knight

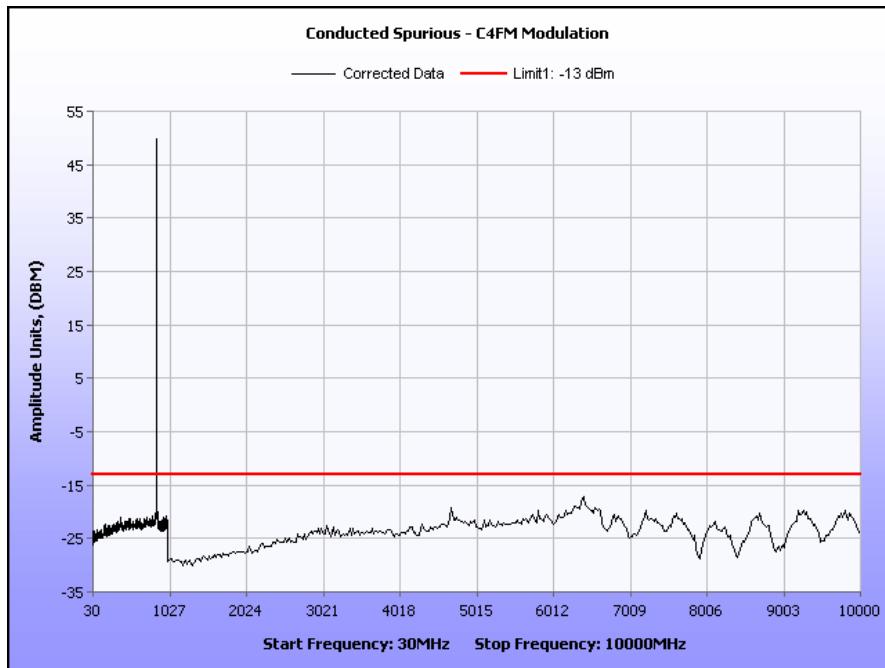
Test Date(s): 01/26/2010



Plot 7. Conducted Spurious Emissions, HDQPSK Modulation, 30 MHz – 1 GHz



Plot 8. Conducted Spurious Emissions, CQPSK Modulation, 30 MHz – 1 GHz



Plot 9. Conducted Spurious Emissions, C4FM Modulation, 30 MHz – 1 GHz

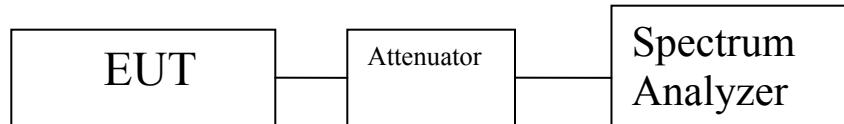


Figure 12. Spurious Emissions at Antenna Terminals Test Setup



Harris Corporation
MASTR V, MASV-800M1

Electromagnetic Compatibility
Test Equipment
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

5. Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ANSI/NCSL Z540-1-1994 and ANSI/ISO/IEC 17025:2000.

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
IT4612	ESA-E SERIES SPECTRUM ANALYZER	AGILENT	E4407B	09/09/2009	09/09/2010



Harris Corporation
MASTR V, MASV-800M1

Electromagnetic Compatibility
Certification & User's Manual Information
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

Certification & User's Manual Information



6. Certification Label & User's Manual Information

6.1. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

- (a) The various types of radio communication transmitting devices described throughout this chapter.
- (b) *The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.*
- (c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.
- (d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

- (a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:
 - (1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or
 - (2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.
- (d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.



(e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:

- (i) *Compliance testing;*
- (ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;
- (iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;
- (iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or
- (v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.

(e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.

(f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a provision that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.



The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart Y — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

- (a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.¹ *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer,* be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.
- (b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant, whichever is applicable.

§ 2.902 Certification.

- (a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.
- (b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

¹ In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.



§ 2.948 Description of measurement facilities.

- (a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.
 - (1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.
 - (i) *If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.*
 - (ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.
 - (2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.



6.2. Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

§ 15.19 Labeling requirements.

(a) *In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:*

- (1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

- (2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

- (3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

- (4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

- (5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.



§ 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

§ 15.105 Information to the user.

(a) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Harris Corporation
MASTR V, MASV-800M1

Electromagnetic Compatibility
End of Report
CFR Title 47 Part 90; RSS-119, Issue 9, June 2007

End of Report