



Engineering and Testing for EMC and Safety Compliance



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Class II Permissive Change Report

Model: P7200 700/800 MHz Portable Radio

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FCC ID: BV8P7200
IC: 3670A-P7200

October 22, 2008

Standards Referenced for this Report	
Part 2: 2007	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 90: 2007	Private Land Mobile Radio Services
ANSI TIA-603-C-2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI/TIA/EIA – 102.CAAA; 2002	Digital C4FM/CQPSK Transceiver Measurement Methods
Industry Canada RSS-119 Issue 9 June 2007	Land Mobile and Fixed Radio Transmitters and Receivers Operating in the Frequency Range 27.41- 960 MHz

Report Prepared by Test Engineer: Daniel Baltzell

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The modes affected by this Class II Permissive Change are shown in ***bold italic*** font.

Frequency Range (MHz)	Measured Output Power (W) Conducted	Frequency Tolerance (ppm)	Modulation	Mode	Emission Designator
809-824	3.24	1.5	Analog FM (SMR)	OCF Trunked/Conventional	16K3F9W
806-824	3.24	1.5	Analog FM (SMR)	OCF Trunked/Conventional	16K0F3E
806-824	3.24	1.5	Analog FM (NPSPAC)	OCF Trunked/Conventional	14K0F3E
<i>851-869</i>	<i>2.7</i>	<i>1.5</i>	<i>Analog FM (SMR)</i>	<i>OCF Talkaround</i>	<i>16K0F3E</i>
<i>851-869</i>	<i>2.7</i>	<i>1.5</i>	<i>Analog FM (NPSPAC)</i>	<i>OCF Talkaround on NPSPAC channels</i>	<i>14K0F3E</i>
806-809, 821-824	3.20	1.5	2-level (digitized data/voice)	NPSPAC Trunked/Conventional	11K9F1D/E
806-824	3.20	1.5	2-level (digitized data/voice)	SMR Trunked/Conventional	14K2F1D/E
<i>851-854, 866-869</i>	<i>2.7</i>	<i>1.5</i>	<i>2-level (digitized data/voice)</i>	<i>NPSPAC T/A</i>	<i>11K9F1D/E</i>
<i>851-869</i>	<i>2.7</i>	<i>1.5</i>	<i>2-level (digitized data/voice)</i>	<i>SMR T/A</i>	<i>14K2F1D/E</i>
806-824	3.31	1.5	P25 (digitized data/voice)	Trunked or Conventional	8K40F1D/E
<i>851-869</i>	<i>2.7</i>	<i>1.5</i>	<i>P25 (digitized data/voice)</i>	<i>Talkaround</i>	<i>8K40F1D/E</i>
806-809, 821-824	3.24	1.5	OTP	NPSPAC Trunked	13K2F9W
806-824	3.20	1.5	OTP	SMR Trunked	13K2F9W
764-767, 773-776	2.82	0.4	P25 (digitized data/voice)	Talkaround	8K40F1D/E
794-797, 803-806	2.82	0.4	P25 (digitized data/voice)	Trunked or Conventional	8K40F1D/E
794-797, 803-806	2.88	0.4	OTP	Trunked	13K2F9W
764-767, 773-776	1.86	0.4	Analog FM (12.5 kHz channel spacing)	Talkaround	11K0F3E
794-797, 803-806	1.91	0.4	Analog FM (12.5 kHz channel spacing)	Trunked or Conventional	11K0F3E

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1 General Information

The following Class II Permissive Change report is prepared on behalf of **M/A-COM, Inc.** in accordance with the Federal Communications Commission and Industry Canada Rules and Regulations. The Equipment Under Test (EUT) was the **P7200 700/800 MHz Portable Radio; FCC ID: BV8P7200, IC: 3670A-P7200.** The test results reported in this document relate only to the item that was tested.

All measurements contained in this application were conducted in accordance with the applicable portions of FCC Rules and Regulations CFR 47 Parts 2 and 90, and Industry Canada RSS-119. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.1 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report submitted to and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.2 Related Submittal(s)/Grant(s)

The purpose of this Class II Permissive Change is to document and demonstrate continued compliance of the P7200 700/800 MHz radio following an allowable reduction in power to 2.7 W for the "Talk Around" modes in the 800 MHz band (851–869 MHz). No hardware revision or change was made for this lower power.

The original FCC grant and IC certificates were issued September 20, 2005, and September 19, 2005, respectively; permissive change grants were issued September 27, 2006 and October 13, 2007. Testing was performed, and a Class I report was generated on June 25, 2008.

2 Tested System Details

The test sample was received on October 17, 2008. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable. The device was programmed for multiple modes of operation and modulation types.

Table 2-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	Cable	RTL Bar Code
Radio	M/A-COM, Inc.	P7200 700/800 MHz Portable Radio, System, MAPT-T7HXX	A400410085ED	BV8P7200	N/A	18669
Radio	M/A-COM, Inc.	P7200 700/800 MHz Portable Radio, MAPT-T7HXX	A40041008199	BV8P7200	N/A	18670

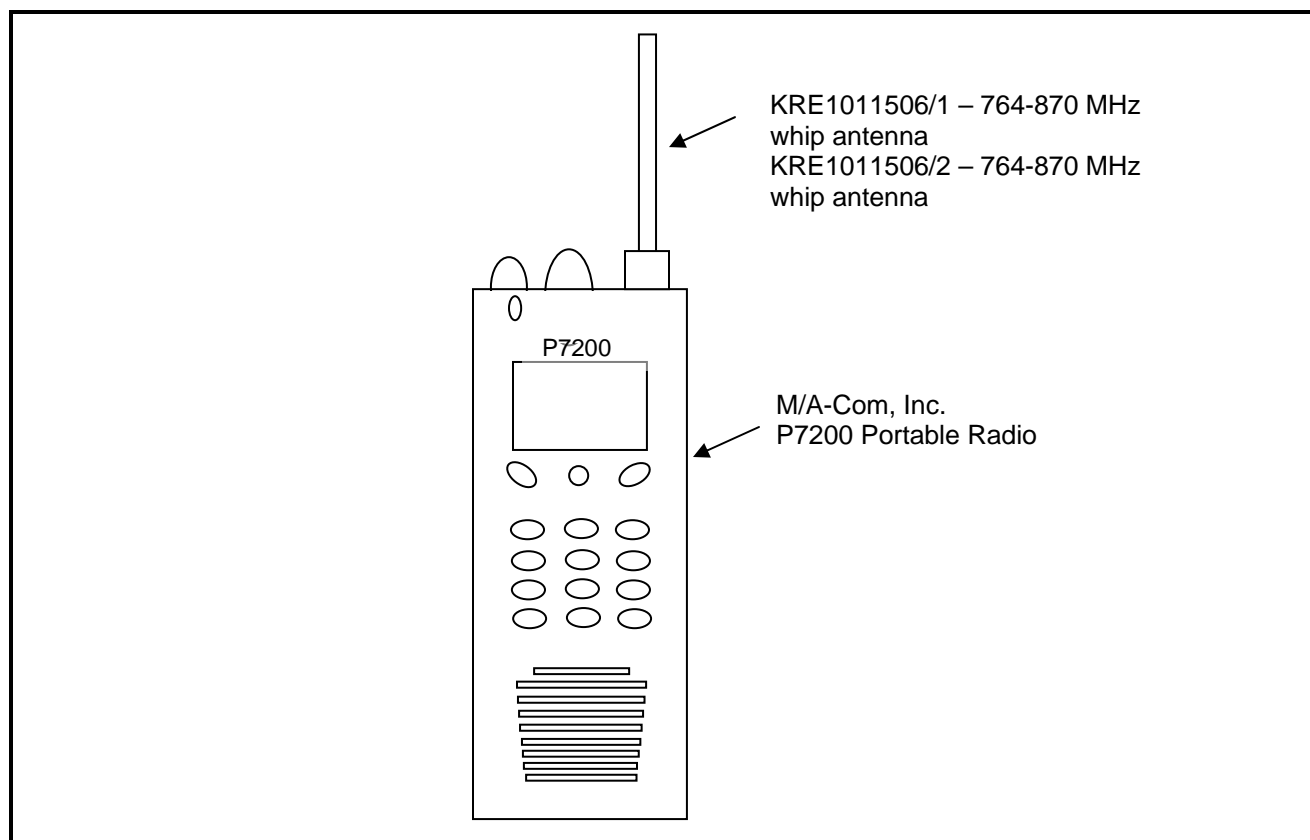


Figure 2-1: Configuration of Tested System

3 FCC Rules and Regulations Part 2 §2.1046(a): RF Power Output: Conducted; Part 90 §90.541(c): Transmitting Power Limits; RSS-119 §5.4: RF Power Output: Conducted

3.1 Test Procedure

ANSI/TIA/EIA-603-2002, section 2.2.1

The EUT was connected to a coaxial attenuator having a 50 Ω load impedance.

3.2 Test Data

Table 3-1: RF Power Output: Carrier Output Power

Frequency (MHz)	High Power (dBm)	High Power (W)	Low Power (dBm)	Low Power (W)
861.36250	34.43	2.773	30.05	1.012
866.20000	34.35	2.723	30.03	1.007

* Measurement accuracy: +/- .02 dB (logarithmic mode)


Table 3-2: RF Power Output (Rated Power)

Rated Power	
High Power (W)	Low Power (W)
2.7	1

Table 3-3: Test Equipment Used For Testing RF Power Output - Conducted

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901356	Agilent Technologies	E9323A	Power Sensor	31764-264	10/24/08
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	10/24/08
901138	Weinschel Corp.	48-40-34 DC-18GHz	Attenuator, 100W 40dB	BK5883	1/13/09

Test Personnel:

Daniel Baltzell		October 21, 2008
Test Engineer	Signature	Date Of Test

4 FCC Rules and Regulations Part 2 §2.1051: Spurious Emissions at Antenna Terminals; Part 90 §90.543(b): Out of Band Emissions Limit; RSS-119 §5.8

4.1 Test Procedure

ANSI/TIA/EIA-603-2002, Section 2.2.13

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer.

Device with digital modulation: Modulated to its maximum extent using a pseudo random data sequence – 19,200 bps for OTP and 9,600 bps for P25 and EDACS modes.


4.2 Test Data

No conducted spurious emissions were found within 20 dB of the limit; per 2.1051 no data is being reported.

Table 4-1: Test Equipment Used For Testing Conducted Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	7/31/09
901307	Inmet	6N-10dB	Attenuator 10 dB	64671	1/11/09
901128	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	2/1/09

Test Personnel:

Daniel Baltzell		October 21, 2008
Test Engineer	Signature	Date Of Test

5 FCC Rules and Regulations Part 2 §2.1053(a): Field Strength of Spurious Radiation; Part 90 §90.543(b): Out of Band Emissions Limit; RSS-119 §5.8

5.1 Test Procedure

ANSI/TIA/EIA-603-2002, section 2.2.12

Analog Modulation: The transmitter is terminated with a 50 Ω load and is modulated with a 2,500 Hz sine wave at an input level 16 dB greater than that required to produce 50% of the rated system deviation at 1,000 Hz.

Device with digital modulation: Modulated to its maximum extent using a pseudo random data sequence – 19,200 bps for OTP and 9,600 bps for P25 and EDACS modes.

The spurious emissions levels were measured, and the device under test was replaced by a substitution antenna connected to a signal generator. The signal generator level was then corrected by subtracting the cable loss from the substitution antenna to the signal generator, and the gain of the antenna was further corrected to a half wave dipole.


5.2 Test Data

No radiated spurious emissions were found within 20 dB of the limit; per 2.1057(c) no data is being reported.

Table 5-1: Test Equipment Used For Testing Field Strength of Spurious Radiation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901053	Schaffner-Chase	CBL6112	Antenna (25 MHz–2 GHz)	2648	12/20/08
900772	EMCO	3161-02	Horn Antenna (2-4 GHz)	9804-1044	6/14/10
900321	EMCO	3161-03	Horn Antenna (4.0-8.2 GHz)	9508-1020	6/14/10
901365	MITEQ	JS4-00102600-41-5P	Amplifier, 0.1-26 GHz, 30dB gain	N/A	2/15/09
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	7/31/09
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	NA	10/19/09
901425	Insulated Wire, Inc.	KPS-1503-2400-KPS	RF cable, 20'	NA	10/19/09
901426	Insulated Wire Inc.	KPS-1503-3600-KPS	RF cable, 30'	NA	10/19/09
900928	Hewlett Packard	83752A	Synthesized Sweeper, 0.01 to 20 GHz	3610A00866	12/7/08
901158	Compliance Design, Inc.	Roberts Dipole Antenna	Adjustable Elements Dipole 25-1000 MHz Antennas	00401	2/4/09

Test Personnel:

Daniel Baltzell		October 22, 2008
Test Engineer	Signature	Date Of Test

6 FCC Rules and Regulations Part 2 §2.1049(c)(1): Occupied Bandwidth; Part 90 §90.543(d): Authorized Bandwidth; RSS-119 §5.8

Occupied Bandwidth - Compliance with the emission masks

6.1 Test Procedure

ANSI/TIA/EIA-603-2002, section 2.2.11 and TIA/EIA-102.CAAA-2002 section 2.2.5

Device with digital modulation: Modulated to its maximum extent using a pseudo random data sequence – 19,200 bps for OTP mode, and 9600 bps for P25 and EDACS modes.

6.2 Test Data

Plot 6-1: Occupied Bandwidth; Analog Wideband; 861.3625 MHz; High Power; Mask B

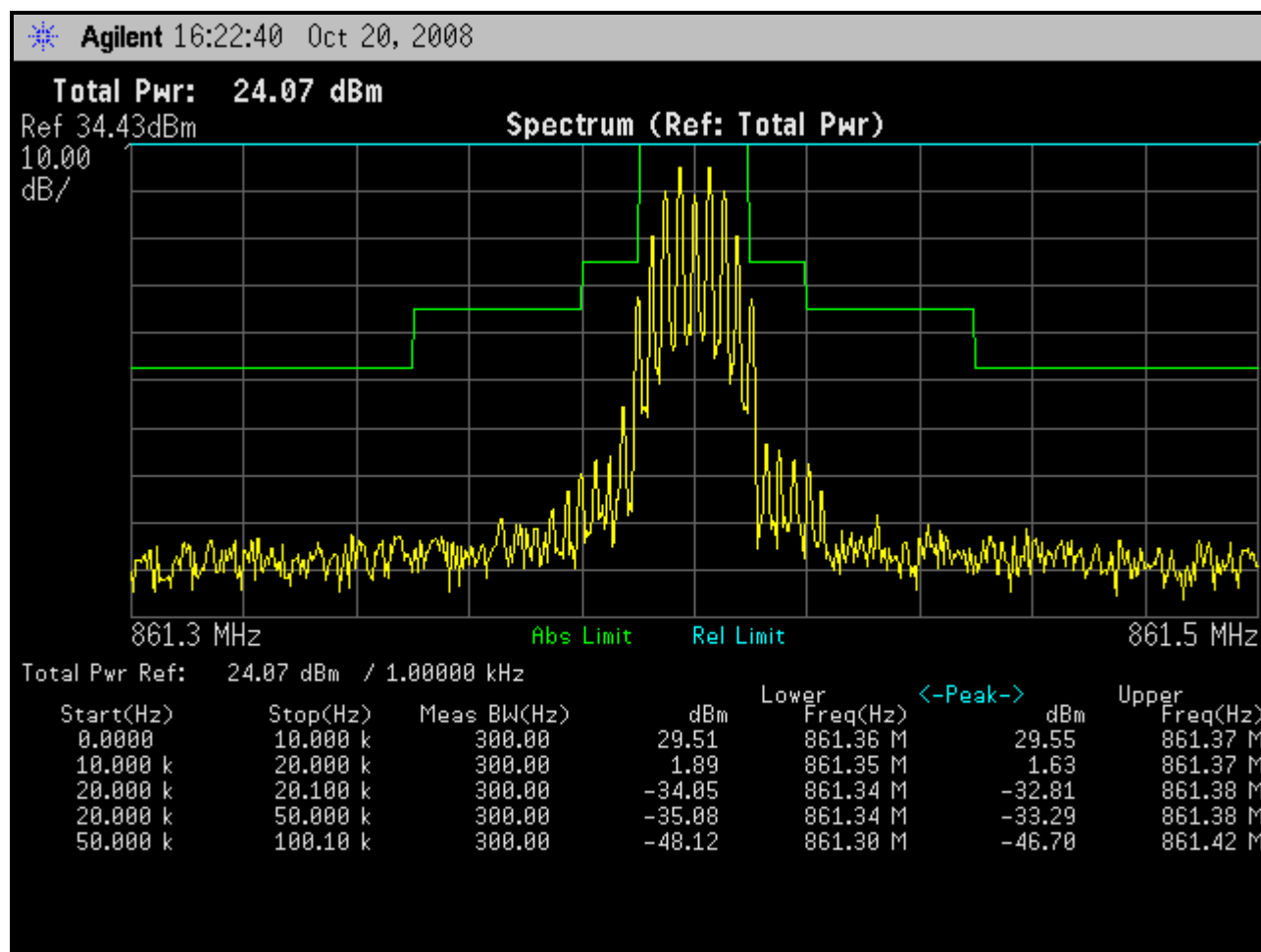



Table 6-1: Test Equipment Used For Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	7/31/09
901307	Inmet	6N-10dB	Attenuator 10 dB	64671	1/11/09

Test Personnel:

Daniel Baltzell		October 20, 2008
Test Engineer	Signature	Date Of Test

7 Conclusion

The data in this measurement report shows that the **M/A-COM, Inc. Model P7200 700/800 MHz Portable Radio; FCC ID: BV8P7200, IC: 3670A-P7200**, complies with all the applicable requirements of Parts 90 and 2 of the FCC Rules, and Industry Canada RSS-119, and meets the requirements of a Class II Permissive Change.