RF Exposure Evaluation Report

APPLICANT	:	Motorola Solutions, Inc.
EQUIPMENT	:	UHF RFID READER
BRAND NAME	:	MOTOROLA
MODEL NAME	:	RFD5500
FCC ID	:	UZ7RFD5500
STANDARD	:	47 CFR Part 2.1091

This product of UHF RFID reader RFD5500 was used with Motoroal MC67NA (FCC ID: UZ7MC67NA) and Motorola MC659B (FCC ID: UZ7MC659B) mobile computer.

We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA342630	Rev. 01	Initial issue of report	Aug. 19, 2013

1. Administration Data

1.1. Testing Laboratory

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

1.2. Applicant

Company Name	Motorola Solutions, Inc.
Address	One Motorola Plaza, Holtsville, NY 11742-1300, USA

1.3. Manufacturer

Company Name	Motorola Solutions, Inc.
Address	One Motorola Plaza, Holtsville, NY 11742-1300, USA

2. Description of Equipment Under Test (EUT)

RFD5500 Feature	
EUT Type	UHF RFID READER
Brand Name	MOTOROLA
Model Name	RFD5500
FCC ID	UZ7RFD5500
Wireless Technology and Frequency Range	UHF RFID: 902 MHz ~ 928 MHz
EUT Stage	Production Unit

MC67NA Feature	
Brand Name	MOTOROLA
Model Name	MC67NA
FCC ID	UZ7MC67NA
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA V: 826.4 MHz ~ 846.6 MHz WCDMA II: 1852.4 MHz ~ 1907.6 MHz WLAN2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz

MC659B Feature	
Brand Name	MOTOROLA
Model Name	MC659B
FCC ID	UZ7MC659B
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA V: 826.4 MHz ~ 846.6 MHz WCDMA II: 1852.4 MHz ~ 1907.6 MHz CDMA BC 0: 824.7 MHz ~ 848.31 MHz CDMA BC I: 1851.25 MHz ~ 1908.75 MHz WLAN2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz

3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 23 cm to show compliance with the power density limit.

4. Radio Frequency Radiation Exposure Evaluation

4.1. Power Density Calculations

Note:

1. For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band
2. In this report is used the maximum output power perform evaluation and the maximum power is refer to the MC67NA (FCC ID: UZ7MC67NA), MC659B (FCC ID: UZ7MC659B) and RFD5500 (FCC ID: UZ7RFD5500).

(RFD5500 with MC67NA)

Band	Frequency (MHz)	Maximum output Power (mW)	Power Density at 23cm (mW/cm2)	Limit (mW/cm2)	Power Density / Limit
GSM 850	824.2	997.70	0.15	0.55	**0.2733**
GSM 1900	1850.2	931.10	0.14	1.00	0.1401
WCDMA Band 5	826.4	108.40	0.02	0.55	0.0296
WCDMA Band 2	1852.4	231.20	0.03	1.00	0.0348
WLAN2.4GHz Band	2412.0	182.40	0.03	1.00	**0.0275**
WLAN5.2GHz Band	5180.0	15.90	0.00	1.00	0.0024
WLAN5.3GHz Band	5260.0	21.40	0.00	1.00	0.0032
WLAN5.5GHz Band	5500.0	23.90	0.00	1.00	0.0036
WLAN5.8GHz Band	5745.0	60.40	0.01	1.00	0.0091
Bluetooth	5180.0	2.90	0.00	1.00	**0.0004**
UHF RFID	902.0	960.00	0.14	0.60	**0.2403**

(RFD5500 with MC659B)

Band	Frequency (MHz)	Maximum output Power (mW)	Power Density at 23cm (mW/cm2)	Limit (mW/cm2)	Power Density / Limit
GSM 850	824.2	1000.00	0.15	0.55	**0.2739**
GSM 1900	1850.2	840.00	0.13	1.00	0.1264
WCDMA Band 5	826.4	140.00	0.02	0.55	0.0382
WCDMA Band 2	1852.4	260.00	0.04	1.00	0.0391
CDMA2000 BC0	824.7	420.00	0.06	0.55	0.1150
CDMA2000 BC1	1851.3	820.00	0.12	1.00	0.1234
WLAN2.4GHz Band	2412.0	147.00	0.02	1.00	**0.0221**
WLAN5.2GHz Band	5180.0	31.00	0.00	1.00	0.0047
WLAN5.3GHz Band	5260.0	31.00	0.00	1.00	0.0047
WLAN5.5GHz Band	5500.0	27.00	0.00	1.00	0.0041
WLAN5.8GHz Band	5745.0	97.00	0.01	1.00	0.0146
Bluetooth	5180.0	2.00	0.00	1.00	**0.0003**
UHF RFID	902.0	960.00	0.14	0.60	**0.2403**

4.2. Collocated Power Density Calculations

Note:

1. For colocation analysis was chosen of the highest (power density/limit) among all wireless modes perform evaluation.

(RFD5500 with MC67NA)

Mode	Maximum Power Density / Limit	Σ(Power Density / Limit) of WWAN + WLAN + Bluetooth + UHF RFID
GSM850	0.2733	0.5414
WLAN	0.0275	
Bluetooth	0.0004	
UHF RFID	0.2403	

(RFD5500 with MC659B)

Mode	Maximum Power Density / Limit	Σ(Power Density / Limit) of WWAN + WLAN + Bluetooth + UHF RFID
GSM850	0.2739	0.5366
WLAN	0.0221	
Bluetooth	0.0003	
UHF RFID	0.2403	

Conclusion:

According to47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.