



# LIMITED RF EXPOSURE REPORT

**REPORT NO.:** SA120720E09D

**MODEL NO.:** VC70N0

**FCC ID:** UZ7VC70N0

**RECEIVED:** Aug. 01, 2013

**TESTED:** Sep. 02, 2013

**ISSUED:** Sep. 11, 2013

**APPLICANT:** Motorola Solutions, Inc.

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
(H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

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## REPORT ISSUE HISTORY RECORD OF EUT (VC70N0)

ATTACHMENT NO.	ISSUE DATE	DESCRIPTION
120720E09	Nov. 08, 2012	Original
120720E09D	Sep. 11, 2013	Add one new Stubby antenna of the EUT.

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA120720E09D	Original release	Sep. 11, 2013



## 1. CERTIFICATION

**PRODUCT:** Vehicle Computer  
**BRAND NAME:** MOTOROLA  
**MODEL NO.:** VC70N0  
**TEST SAMPLE:** MASS-PRODUCTION  
**APPLICANT:** Motorola Solutions, Inc.  
**TESTED:** Sep. 02, 2013  
**STANDARDS:** FCC Part 2 (Section 2.1091)  
FCC OET Bulletin 65, Supplement C (01-01)  
IEEE C95.1

The above equipment (Model: VC70N0) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY :** , **DATE:** Sep. 11, 2013  
(Lori Chung, Specialist)

**APPROVED BY :** , **DATE:** Sep. 11, 2013  
(May Chen, Manager)

## 2. RF EXPOSURE LIMIT

### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm <sup>2</sup> )	AVERAGE TIME (minutes)
<b>LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE</b>				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

### 3. MPE CALCULATION FORMULA

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

r = distance between observation point and center of the radiator in cm

### 4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 5. ANTENNA GAIN

The antenna (new Stubby antenna) provided to the EUT, please refer to the following table:

Brand	Model	ANT Type	Connector Type (External only)	Freq. Range (MHz to MHz)	Gain (dBi)	Cable Loss (dB)	Cable Length
CENTURION	WTS2450-RP SMA	Dipole (for External WLAN)	Reverse Polarity SMA-Male	2400-2500	2.1	NA	NA
				5150-5350	2.6		
				5470-5725	3.4		
				5725-5850	3.4		

## 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247(2.4GHz)

### 802.11b

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412-2472	182.390	2.1	20	0.05885	1.00

### 802.11g

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412-2472	214.783	2.1	20	0.06930	1.00

### 802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412-2472	209.894	2.1	20	0.06772	1.00

For 15.247(5GHz)

### 802.11a

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5745 ~ 5825	169.824	3.4	20	0.07391	1.00

### 802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5745 ~ 5825	167.109	3.4	20	0.07273	1.00

**For 15.407(5GHz)  
802.11a**

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 ~ 5700	101.391	2.6	20	0.04413	1.00

**802.11n (HT20)**

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 ~ 5700	73.451	2.6	20	0.03197	1.00

**For Bluetooth(Reference original report : SA120720E09):  
GFSK**

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2402 ~ 2480	1.510	1.7	20	0.00037	1.00

**8DPSK**

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2402 ~ 2480	1.774	1.7	20	0.00052	1.00

**CONCLUSION:**

1. WLAN: 2.4GHz and 5GHz technology cannot transmit at same time.
2. Both of the WLAN and Bluetooth can transmit simultaneously, the formula of calculated the MPE is:

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + \dots \text{etc.} < 1$$

**CPD = Calculation power density**

**LPD = Limit of power density**

Therefore, the worst-case situation is  $0.07391 / 1 + 0.00052 / 1 = 0.074$ , which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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