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.
ADDRESS:	One Motorola Plaza Holtsville NY 11742-1300 USA

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by any government agencies.

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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^2)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	…	…	F/1500	30
1500-100,000	…	…	1.0	30

F = Frequency in MHz

3. MPE CALCULATION FORMULA

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm2

Pout = 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	Connecter 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^2)	LIMIT (mW/cm^2)
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^2)	LIMIT (mW/cm^2)
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^2)	LIMIT (mW/cm^2)
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^2)	LIMIT (mW/cm^2)
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^2)	LIMIT (mW/cm^2)
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^2)	LIMIT (mW/cm^2)
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^2)	LIMIT (mW/cm^2)
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^2)	LIMIT (mW/cm^2)
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^2)	LIMIT (mW/cm^2)
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:

$CPD_1 / LPD_1 + CPD_2 / LPD_2$ + ……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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