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## RF Exposure Report

**Report No.:** SA150401E01A

**FCC ID:** PPD-QCNFA425

**Test Model:** QCNFA425

**Received Date:** Apr. 01, 2015

**Test Date:** July 23 to 24, 2015

**Issued Date:** Aug. 07, 2015

**Applicant:** Qualcomm Atheros, Inc.

**Address:** 1700 Technology Drive, San Jose, CA 95110

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
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### Release Control Record

Issue No.	Description	Date Issued
SA150401E01A	Original release.	Aug. 07, 2015

## 1 Certificate of Conformity

**Product:** Single Stream 802.11a/b/g/n/ac + BT 4.1 M.2 1216 Type Card

**Brand:** Qualcomm Atheros

**Test Model:** QCNFA425

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Qualcomm Atheros, Inc.

**Test Date:** July 23 to 24, 2015

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D03

IEEE C95.1

The above equipment 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:** Aug. 07, 2015  
Claire Kuan / Specialist

**Approved by :**  , **Date:** Aug. 07, 2015  
May Chen / Manager



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## 2 RF Exposure

### 2.1 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)
Limits For General Population / Uncontrolled Exposure				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

### 2.2 MPE Calculation Formula

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

where

Pd = power density in mW/cm<sup>2</sup>

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

### 2.3 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**.



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### 3 Calculation Result Of Maximum Conducted Power

For WLAN: (2.4GHz)

802.11b

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
2412 - 2472	20.50	112.202	3.62	20	0.05137	1

NOTE: 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table

802.11g

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
2412 - 2472	20.50	112.202	3.62	20	0.05137	1

NOTE: 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table

802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
2412 - 2472	20.50	112.202	3.62	20	0.05137	1

NOTE: 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table

802.11n (HT40)

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
2422 - 2462	19.50	89.125	3.62	20	0.04081	1

NOTE: 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table



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**For WLAN: (5GHz)**  
**802.11a**

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
5180 - 5240, 5260 - 5320	17.5	56.234	5.56	20	0.04025	1
5500 - 5580 & 5660 - 5720	17.5	56.234	5.34	20	0.03826	1
5745 - 5825	18.0	63.096	4.76	20	0.03756	1

**NOTE:** 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table

**802.11ac (VHT20)**

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
5180 - 5240, 5260 - 5320	17.5	56.234	5.56	20	0.04025	1
5500 - 5580 & 5660 - 5720	17.5	56.234	5.34	20	0.03826	1
5745 - 5825	17.5	56.234	4.76	20	0.03348	1

**NOTE:** 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table

**802.11ac (VHT40)**

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
5190 - 5230	17.0	50.119	5.56	20	0.03587	1
5270 - 5310	17.0	50.119	5.34	20	0.03410	1
5510 - 5550 & 5670 - 5710	17.0	50.119	4.76	20	0.03039	1
5745 - 5825	16.5	44.668	4.76	20	0.03039	1

**NOTE:** 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table

**802.11ac (VHT80)**

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
5210, 5290	13.5	22.387	5.56	20	0.01602	1
5530, 5610, 5690	17.0	50.119	5.34	20	0.03410	1
5775	15.0	31.623	4.76	20	0.01882	1

**NOTE:** 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table



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## For Bluetooth:

### BT-EDR

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
2402-2480	12.5	17.783	3.62	20	0.00814	1

NOTE: 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table

### BT-LE

FREQUENCY BAND (MHz)	MAX POWER AVG. (dBm)	MAX POWER AVG. (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
2402-2480	4.0	2.512	3.62	20	0.00115	1

NOTE: 1. This power include tune-up tolerance range that specified in QCNFA425 Tune Up power table

## CONCLUSION:

Both of the Bluetooth and WLAN (5GHz) 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  $0.04025 + 0.00814 = 0.048$ , which is less than "1".

---END---