RF Exposure Report

Report No.:	SA160322E08A
FCC ID:	2ABTEG2100
Test Model:	Fios-G2100
Received Date:	Mar. 22, 2016
Test Date:	June 08 to July 07, 2016
Issued Date:	Nov. 21, 2016
Applicant:	Verizon Online LLC
Address:	1300 I Street NW, Room 400W, Washington, District of Columbia, 20005 United State
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
SA160322E08A	Original release.	Nov. 21, 2016

1 Certificate of Conformity

Product:	Fios-G2100
Brand:	Verizon
Test Model:	Fios-G2100
Sample Status:	ENGINEERING SAMPLE
Applicant:	Verizon Online LLC
Test Date:	June 08 to July 07, 2016
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992

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:** Nov. 21, 2016

Claire Kuan / Specialist

Approved by : _____ , **Date:** Nov. 21, 2016

May Chen / Manager

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^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

2.2 MPE Calculation Formula

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

where

Pd = power density in mW/cm^2

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 24cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

WLAN					
5GHz					
Antenna No.	Transmitter Circuit	Antenna Gain(dBi)	Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type
1	Chain (0)	4.37	5150~5250	PCB	i-pex(MHF)
		4.92	5250~5350		
		4.23	5470~5725		
		4.23	5725~5850		
2	Chain (1)	4.13	5150~5250	PCB	i-pex(MHF)
		4.06	5250~5350		
		4.03	5470~5725		
		4.03	5725~5850		
3	Chain (2)	3.01	5150~5250	PCB	i-pex(MHF)
		3.72	5250~5350		
		4.79	5470~5725		
		4.71	5725~5850		
4	Chain (3)	3.87	5150~5250	PCB	i-pex(MHF)
		4.26	5250~5350		
		4.61	5470~5725		
		4.3	5725~5850		
2.4GHz					
Antenna No.	Transmitter Circuit	Antenna Gain(dBi)	Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type
5	Chain (0)	3.9	2400~2483.5	PCB	i-pex(MHF)
6	Chain (1)	5.1			
7	Chain (2)	3.95			
8	Chain (3)	3.51			
DECT					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type
9	5.46		1920~1930	Embedded	NA
10	5.46		1920~1930	Embedded	NA
Z-wave					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type
11	1.02		908~916	On Board Printed	NA
Zigbee					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type
12	4.23		2400~2483.5	On Board Printed	NA
Note 1. For WLAN 2.4GHz will fix transmission on Chain (0), Chain (1) and Chain (2).					

The Directional gain table:

Frequency	Max Gain (dBi)
2.4GHz	5.85
5GHz	4.61

Note:

1. Non-TxBF mode & TxBF mode antenna gain refer to KDB 662911 F 2) f) (ii)

$$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

2.5 Calculation Result Of Maximum Conducted Power

WLAN

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	985.723	5.85	24	0.52375	1
5180-5240	813.01	4.61	24	0.32469	1
5260-5320	246.747	4.61	24	0.09854	1
5500-5720	229.5	4.61	24	0.09165	1
5745-5825	675.244	4.61	24	0.26967	1

NOTE:
2.4GHz:
The directional gain is 5.85dBi.
5GHz:
The directional gain is 4.61dBi.

Zigbee

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2405-2475	6.776	4.23	24	0.00248	1

Z-Wave

Frequency Band (MHz)	Field Strength of Fundamental (dBuV/m) @3m	Pout EIRP (dBm)	Pout EIRP (mW)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
908.4	93.9	-1.33	0.736	24	0.0001	0.6056

Note:

1. Limit of Power Density =F/1500
2. Pout EIRP (dBm) = Field Strength of Fundamental (dBuV/m) @3m – 95.23 (dB)

DECT

Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
80.91	5.46	24	0.03930	1

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz + Zigbee + Z-Wave + DECT = 0.52375 / 1 + 0.32469 / 1 + 0.00248 / 1 + 0.0001 / 0.6056 + 0.03930 / 1 = 0.89039

Therefore the maximum calculations of above situations are less than the "1" limit.

--- END ---