RF Exposure Report

Report No.:	SA181119C14B
FCC ID:	2ARF9CSG-BT
Test Model:	CSG750
Series Model:	CSG7xxxxxxxxx (Where x can be 0-9, A-Z, a-z, any alphanumeric character or blank)
Received Date:	Nov. 19, 2018
Issued Date:	Aug. 20, 2019
Applicant:	Versa Networks
Address:	6001 America Center Dr, 4th floor, Suite 400, San Jose, CA 95002, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)
FCC Registration/ Designation Number:	788550 / TW0003

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
SA181119C14B	Original release	Aug. 20, 2019

1 Certificate of Conformity

Product:	Cloud Services Gateway
Brand:	Versa
Test Model:	CSG750
Series Model:	CSG7xxxxxxxxxx (Where x can be 0-9, A-Z, a-z, any alphanumeric character or blank)
Sample Status:	Engineering sample
Applicant:	Versa Networks
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.3 -2002

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 RF characteristics under the conditions specified in this report.

Prepared by : Polly Chien , **Date:** Aug. 20, 2019

Polly Chien / Specialist

Approved by : Bruce Chen , **Date:** Aug. 20, 2019

Bruce Chen / Senior Project Engineer

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				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = Frequency in MHz; *Plane-wave equivalent power density

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 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

3 Calculation Result of Maximum Tune up Power

For BT

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
BT EDR 2402~2480	2.50	-1.86	20	0.0002	1
BT LE 2402~2480	-2.88	-1.86	20	0.0001	1

BT: PIFA antenna with -1.86dBi gain

For WLAN (Base on WLAN module report (Model: CSG-W1, FCC ID: 2ARF9CSG-W1)

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN 2.4GHz	25.47	2.35	20	0.120	1
WLAN 5.2GHz	24.56	2.94	20	0.112	1
WLAN 5.8GHz	26.29	2.94	20	0.167	1

WLAN 2.4GHz: Dipole antenna with 2.35dBi gain

WLAN 5GHz: Dipole antenna with 2.94dBi gain

For WWAN: (Base on WWAN module report (Model: MC7455, FCC ID: N7NMC7455)

Function	Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WCDMA Band 2	1852.4-1907.6	23.52	0.49	20	0.050	1
WCDMA Band 4	1712.4-1752.6	23.45	0.55	20	0.050	1
WCDMA Band 5	826.4-846.6	23.51	2.54	20	0.080	0.550
LTE Band 4	1720.0-1745.0	23.97	0.33	20	0.054	1
LTE Band 7	2502.5-2567.5	22.93	-0.67	20	0.033	1
LTE Band 12	699.7-715.3	23.99	0.83	20	0.060	0.466
LTE Band 13	779.5-784.5	23.93	1.00	20	0.062	0.521
LTE Band 25	1850.7-1914.3	23.99	0.49	20	0.056	1
LTE Band 26	814.7-848.3	23.98	2.54	20	0.089	0.546
LTE Band 30	2307.5-2312.5	22.95	0.27	20	0.042	1
LTE Band 41	2498.5-2687.5	21.53	-0.67	20	0.024	1

Frequency Band	Max. Power (dBm)		Total Power (dBm)	Power Limit (dBm)
	WLAN 2.4GHz	BT LE		
2.4GHz	25.47	2.50	25.49	30

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

1. LTE Band 26 (WWAN Module 1) + WLAN 2.4G + BT EDR= 0.089 / 0.546 + 0.120 / 1 + 0.0002 / 1 = 0.163+0.120+0.0002=0.2832
2. LTE Band 26 (WWAN Module 1) + WLAN 2.4G + BT LE = 0.089 / 0.546 + 0.120 / 1 + 0.0001 / 1 = 0.163+0.120+0.0001=0.2831
3. LTE Band 26 (WWAN Module 1) + WLAN 5G + BT EDR = 0.089 / 0.546 + 0.167 / 1 + 0.0002 / 1 = 0.163+0.167+0.0002=0.3302
4. LTE Band 26 (WWAN Module 1) + WLAN 5G + BT LE= 0.089 / 0.546 + 0.167 / 1 + 0.0001 / 1 = 0.163+0.167+0.0002=0.3301
5. LTE Band 25 (WWAN Module 1) + WLAN 2.4G + BT EDR = 0.056 / 1 + 0.120 / 1 + 0.0002 / 1 = 0.056+0.120+0.0002=0.1762
6. LTE Band 25 (WWAN Module 1) + WLAN 2.4G + BT LE = 0.056 / 1 + 0.120 / 1 + 0.0001 / 1 = 0.056+0.120+0.0002=0.1761
7. LTE Band 25 (WWAN Module 1) + WLAN 5G + BT EDR = 0.056 / 1 + 0.167 / 1 + 0.0002 / 1 = 0.056+0.167+0.0002=0.2232
8. LTE Band 25 (WWAN Module 1) + WLAN 5G + BT LE= 0.056 / 1 + 0.167 / 1 + 0.0001 / 1 = 0.056+0.167+0.0001=0.2231
9. LTE Band 12 (WWAN Module 1) + WLAN 2.4G + BT EDR = 0.060 / 0.466 + 0.120 / 1 + 0.0002 / 1 = 0.129+0.120+0.0002=0.2492
10. LTE Band 12 (WWAN Module 1) + WLAN 2.4G + BT LE = 0.060 / 0.466 + 0.120 / 1 + 0.0001 / 1= 0.129+0.120+0.0001=0.2491
11. LTE Band 12 (WWAN Module 1) + WLAN 5G + BT EDR = 0.060 / 0.466 + 0.167 / 1 + 0.0002 / 1 = 0.129+0.167+0.0002=0.2962
12. LTE Band 12 (WWAN Module 1) + WLAN 5G + BT LE = 0.060 / 0.466 + 0.167 / 1 + 0.0001 / 1 = 0.129+0.167+0.0001=0.2961
13. LTE Band 26 (WWAN Module 1) + WLAN 2.4G + BT EDR = 0.089 / 0.546 + 0.120 / 1 + 0.0002 / 1= 0.163+0.120+0.0002=0.2832
14. LTE Band 26 (WWAN Module 1) + WLAN 2.4G + BT LE = 0.089 / 0.546 + 0.120 / 1 + 0.0001 / 1= 0.163+0.120+0.0001=0.2831
15. LTE Band 26 (WWAN Module 1) + WLAN 5G + BT EDR = 0.089 / 0.546 + 0.167 / 1 + 0.0002 / 1= 0.163+0.167+0.0002=0.3302
16. LTE Band 26 (WWAN Module 1) + WLAN 5G + BT LE = 0.089 / 0.546 + 0.167 / 1 + 0.0001 / 1= 0.163+0.167+0.0001=0.3301

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

---END---