RF Exposure Report

Report No.:	SABDYL-WTW-P21050433
FCC ID:	2ARF9CSW630
Test Model:	CSW630
Received Date:	2021/05/12
Test Date:	2021/8/16
Issued Date:	2021/9/8
Applicant:	Versa Networks
Address:	6001 America Center Dr, 4th floor, Suite 400, San Jose, CA 95002
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
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SABDYL-WTW-P21050433	Original release.	2021/9/8

1   Certificate of Conformity

Product:	Versa Cloud Services Access Point
Brand:	Versa Networks
Test Model:	CSW630
Sample Status:	Engineering sample
Applicant:	Versa Networks
Test Date:	2021/8/16
Standards:	FCC Part 2 (Section 2.1091)
	KDB 447498 D01 General RF Exposure Guidance v06

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 : *Vivian Huang* , **Date:** 2021/9/8

Vivian Huang / Specialist

Approved by : _____ , **Date:** 2021/9/8

Clark Lin / Technical 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				
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 56 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
5G0_baseline	5.7	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G1_baseline	5.9	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G2_baseline	5.3	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G3_baseline	5.6	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
DUAL0	5.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	6.3	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL1	3.4	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.9	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL2	4.7	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.8	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL3	4.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	6	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
BLE_baseline	4.5	2.4~2.4835GHz	PIFA	i-pex(MHF)
SCANNING_baseline	5.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.2	5.15~5.85GHz		

*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.5   Calculation Result of Maximum Conducted Power

For DBS

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm²)	Limit (mW/cm²)	Pass/Fail
WLAN 2.4GHz	2412 ~ 2462	597.648	10.37	56	0.16514	1	Pass
WLAN U-NII-1 (8TX_Master)	5180 ~ 5240	271.667	14.85	56	0.2106	1	Pass
WLAN U-NII-1 (8TX_Client)	5180 ~ 5240	131.966	14.85	56	0.1023	1	Pass
WLAN U-NII-3 (8TX)	5745 ~ 5825	926.412	14.85	56	0.71816	1	Pass
BT-LE	2402 ~ 2480	6.668	4.50	56	0.00048	1	Pass

For SBS

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm²)	Limit (mW/cm²)	Pass/Fail
WLAN U-NII-1 (4TX_Master)	5180 ~ 5240	257.064	11.65	56	0.09538	1	Pass
WLAN U-NII-1 (4TX_Client)	5180 ~ 5240	134.693	11.65	56	0.04998	1	Pass
WLAN U-NII-3 (4TX)	5745 ~ 5825	292.814	12.02	56	0.11831	1	Pass

For Scanning Radio

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm²)	Limit (mW/cm²)	Pass/Fail
WLAN 2.4GHz	2412-2462	59.979	56	5.10	0.00493	1	Pass
WLAN U-NII-1	5180 ~ 5240	39.355	56	5.20	0.00331	1	Pass
WLAN U-NII-3	5745 ~ 5825	41.02	56	5.20	0.00345	1	Pass

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. WLAN 2.4GHz:

For 4TX: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 /4]$ = 10.37dBi.
For Scanning Radio: The directional gain = 5.1dBi.

3. WLAN 5GHz:

For 8TX: The directional gain= $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20} + 10^{G5/20} + 10^{G6/20} + 10^{G7/20})^2 / 8]$ = 14.85 dBi.
For 4TX:
U-NII-1: The directional gain= $10 \log[(10^{G4/20} + 10^{G5/20} + 10^{G6/20} + 10^{G7/20})^2 / 4]$ = 11.65 dBi.
U-NII-3: The directional gain= $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4]$ = 12.02 dBi
For Scanning Radio: The directional gain = 5.2dBi.

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

Condition	Technology			
1	WLAN (2.4GHz)	WLAN (8TX_5GHz)	Bluetooth	2.4GHz Scanning Radio
2	WLAN (2.4GHz)	WLAN (8TX_5GHz)	Bluetooth	5GHz Scanning Radio
3	WLAN (2.4GHz)	WLAN (4TX_5GHz Low band)	Bluetooth	2.4GHz Scanning Radio
4	WLAN (2.4GHz)	WLAN (4TX_5GHz Low band)	Bluetooth	5GHz Scanning Radio

Condition 1:

WLAN (2.4GHz) + WLAN (8TX_5GHz) + Bluetooth + Scan Radio (2.4GHz)

= 0.16514 / 1 + 0.71816 / 1 + 0.00048 / 1 + 0.00493 / 1= 0.88871

Condition 2:

WLAN (2.4GHz) + WLAN (8TX_5GHz) + Bluetooth + Scan Radio (5GHz)

= 0.16514 / 1 + 0.71816 / 1 + 0.00048 / 1 + 0.00345 / 1= 0.88723

Condition 3:

WLAN (2.4GHz) + WLAN (4TX_5GHz Low band) + Bluetooth + Scan Radio (2.4GHz)

= 0.16514 / 1 + 0.09538 / 1 + 0.00048 / 1 + 0.00493 / 1= 0.26593

Condition 4:

WLAN (2.4GHz) + WLAN (4TX_5GHz Low band) + Bluetooth + Scan Radio (5GHz)

= 0.16514 / 1 + 0.09538 / 1 + 0.00048 / 1 + 0.00345 / 1= 0.26445

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

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