RF Exposure Report

Report No.:	SABBEB-WTW-P21031098
FCC ID:	2AUAE-M350
Test Model:	M350-W6
Series Model:	M350-6
Received Date:	2021/9/2
Test Date:	2021/10/27
Issued Date:	2022/1/14
Applicant:	Proscend Communications Inc.
Address:	2F, No.36, Industry E. Rd. IV, Hsinchu Science Park, Hsinchu 30077, Taiwan, R.O.C.
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
SABBEB-WTW-P21031098	Original release.	2022/1/14

1   Certificate of Conformity

Product: Industrial Dual SIM CAT6 Cellular Router,

Industrial Dual SIM CAT6 Cellular Router w/WiFi

Brand: PROSCEND

Test Model: M350-W6

Series Model: M350-6

Sample Status: Engineering sample

Applicant: Proscend Communications Inc.

Test Date: 2021/10/27

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:**   2022/1/14

Vivian Huang / Specialist

Approved by :   _____   , **Date:**   2022/1/14

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

2.4 Antenna Gain

Antenna No.	RF Chain No.	Model	Antenna Net Gain(dBi)	Frequency Range	Antenna Type	Antenna Connector
WIFI Ant1	Chain0	WLN98002-A	1	2.4~2.4835 GHz	Dipole	R-SMA
			1.8	5.15~5.85 GHz		
WIFI Ant2	Chain1	WLN98002-A	1	2.4~2.4835 GHz	Dipole	R-SMA
			1.8	5.15~5.85 GHz		
LTE Ant1	Chain0	AN0727-64SP6BSM	2.89	1710~1785 MHz 1850 ~1915 MHz 1920 ~2010 MHz 2300~2400 MHz 2496~2690 MHz	Dipole	SMA
			-0.46	698~748 MHz 777~787 MHz 814 ~862 MHz 880~915 MHz		
LTE Ant2	Chain1	AN0727-64SP6BSM	2.89	1710~1785 MHz 1850 ~1915 MHz 1920 ~2010 MHz 2300~2400 MHz 2496~2690 MHz	Dipole	SMA
			-0.46	698~748 MHz 777~787 MHz 814 ~862 MHz 880~915 MHz		
GPS Ant	Chain0	GPS-21951	5.2	1575~1602 MHz	Dipole	SMA

Note: 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

For WLAN:
CDD Mode

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
WLAN 2.4GHz	2412~2462	90.782	1.00	20	0.02274	1	Pass
WLAN 5GHz (U-NII-1)	5180~5240	62.168	1.8	20	0.01872	1	Pass
WLAN 5GHz (U-NII-3)	5745~5825	59.718	1.80	20	0.01798	1	Pass

Beamforming Mode

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
WLAN 2.4GHz	2412~2462	37.471	4.01	20	0.01877	1	Pass
WLAN 5GHz (U-NII-1)	5180~5240	47.211	4.81	20	0.02843	1	Pass
WLAN 5GHz (U-NII-3)	5745~5825	57.549	4.81	20	0.03466	1	Pass

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 2.4GHz: Directional gain = 1dBi + 10log(2) = 4.01 dBi
3. 5GHz: Directional gain = 1.8dBi + 10log(2) = 4.81 dBi

For WWAN module < FCC ID: XMR201906EM06A>

Operation Mode	Evaluation Frequency (MHz)	Max. Power Average (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
LTE B2 <Worst-case>	1850.7-1909.3	251.1886432	2.89	20	0.09721	1	Pass

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

CDD Mode

WLAN 2.4GHz + WWAN = 0.02274 / 1 + 0.09721 / 1 = 0.11995

WLAN 5GHz + WWAN = 0.01872 / 1 + 0.09721 / 1 = 0.11593

Beamforming Mode

WLAN 2.4GHz + WWAN = 0.01877 / 1 + 0.09721 / 1 = 0.11598

WLAN 5GHz + WWAN = 0.03466 / 1 +   0.09721 / 1 = 0.13187

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

Appendix

WWLAN module
MPE Evaluation for FCC ID: XMR201906EM06A Module

Operation Mode	Evaluation Frequency (MHz)	Total Average Power Output		Directional Gain	Power Density (mW/cm^2)			Ratio
		mW	dBm	dBi	Value	Limit	Result	
LTE B2	1850.7-1909.3	251.1886432	24.00	2.89	0.09721	1	PASS	0.09721
LTE B4	1710.7-1754.3	251.1886432	24.00	2.89	0.09721	1	PASS	0.09721
LTE B5	824.7-848.3	251.1886432	24.00	-0.46	0.04495	0.5498	PASS	0.08176
LTE B7	2502.5-2567.5	251.1886432	24.00	2.89	0.09721	1	PASS	0.09721
LTE B12	699.7-715.3	251.1886432	24.00	-0.46	0.04495	0.46647	PASS	0.09636
LTE B13	779.5-784.5	251.1886432	24.00	-0.46	0.04495	0.51967	PASS	0.08650
LTE B25	1850.7-1914.3	251.1886432	24.00	2.89	0.09721	1	PASS	0.09721
LTE B26 (Part 22H)	824.7-848.3	251.1886432	24.00	-0.46	0.04495	0.5498	PASS	0.08176
LTE B26 (Part 90S)	814.7-848.3	251.1886432	24.00	-0.46	0.04495	0.54313	PASS	0.08276
LTE B30	2307.5-2312.5	251.1886432	24.00	2.89	0.09721	1	PASS	0.09721
LTE B41	2498.5-2687.5	251.1886432	24.00	2.89	0.09721	1	PASS	0.09721
LTE B66	1710.7-1779.3	251.1886432	24.00	2.89	0.09721	1	PASS	0.09721

Note:
1. Distance = 20 cm
2. For Frequency Range between 300-1500 MHz the Limit of Power Density = F/1500.

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