RF Exposure Report

Report No.:	MFBFBE-WTW-P21118016A
FCC ID:	YAW539848-Z
Test Model:	PVS6
Received Date:	2022/6/16
Test Date:	2022/6/28
Issued Date:	2022/7/20
Applicant:	SunPower Corporation
Address:	1414 Harbour Way South Suite 1901, Richmond, CA 94804, USA
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
MFBFBE-WTW-P21118016A	Original release.	2022/7/20

1 Certificate of Conformity

Product:	SunPower Monitoring System with PVS6
Brand:	SUNPOWER
Test Model:	PVS6
Sample Status:	Engineering sample
Applicant:	SunPower Corporation
Test Date:	2022/6/28
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:** 2022/7/20

Vivian Huang / Specialist

Approved by : , **Date:** 2022/7/20

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				
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

WLAN / Bluetooth							
Ant No.	Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency rang (GHz)	Antenna type	Connector type
1	Chain 0 (Including BT)	airgain	65-031-212002B	2.2	2.4~2.4835	PCB	I-PEX
				3.8	5.15~5.25		
				4.2	5.725~5.85		
2	Chain 1 (WLAN use only)	airgain	65-031-212003B	4.2	2.4~2.4835	PCB	I-PEX
				4.1	5.15~5.25		
				4.8	5.725~5.85		

LTE						
Ant No.	Brand	Model	Antenna Gain (dBi)	Frequency rang (MHz)	Antenna type	Connector type
3	airgain	65-031-212001B	2.7	1850~1910	PCB	I-PEX
				1710~1755		
				698~716		

*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

Operation Mode	Evaluation Frequency (MHz)	Max Avg. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
WLAN 2.4GHz	2412-2462	356.522	4.2	20	0.18656	1	Pass
WLAN 5GHz (U-NII-1)	5180-5240	97.175	4.1	20	0.04969	1	Pass
WLAN 5GHz (U-NII-3)	5745-5825	177.985	4.8	20	0.10693	1	Pass
Bluetooth	2402-2480	9.462	2.2	20	0.00312	1	Pass
WWAN-LTE <Worst band>	699.7-715.3	110.00	2.7	20	0.04075	0.46647	Pass

NOTE:

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. LTE: Limit of Power Density = F/1500

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 + Bluetooth + LTE = 0.18656 / 1 + 0.00312 / 1 + 0.04075 / 0.46647 = 0.27704

WLAN 5GHz + Bluetooth + LTE = 0.10693 / 1 + 0.00312 / 1 + 0.04075 / 0.46647 = 0.19741

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

Appendix

WWAN module
MPE Evaluation for FCC ID: XMR2020BG95M1

Operation Mode	Evaluation Frequency (MHz)	The Worst Case		Max Avg. Power		Directional Gain	Power Density (mW/cm^2)		Ratio
		Channel Number	Freq. (MHz)	mW	dBm	dBi	Value	Limit	
LTE (Band 2)	1850.7-1909.3	18607	1850.7	123	20.90	2.70	0.04557	1	0.04557
LTE (Band 4)	1710.7-1754.3	19957	1710.7	120	20.79	2.70	0.04445	1	0.04445
LTE (Band 12)	699.7-715.3	23017	699.7	110	20.41	2.70	0.04075	0.46647	0.08736

*Distance = 20 cm

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