



RF EXPOSURE EVALUATION REPORT

FCC ID : 2A4DH-4832
Equipment : Electronic Display Device
Model Name : C2V2L3, RS23CV
Applicant : Amazon.com Services LLC
410 Terry Avenue N, Seattle, WA
98109-5210, United States
Standard : 47 CFR Part 2.1093
FCC KDB 447498 D01 v06

We, Sporton International Inc. (Shenzhen) has been evaluated this product in accordance with 47 CFR Part 2.1093 and FCC KDB 447498 D01 v06 and it complies with applicable limit. The results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.



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History of this test report



1. Administration Data

1.1. Testing Laboratory

Sportun International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sportun International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sportun Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-SZ	CN1256	421272

Applicant	
Company Name	Amazon.com Services LLC
Address	410 Terry Avenue N, Seattle, WA 98109-5210, United States

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Electronic Display Device
Model Name	C2V2L3, RS23CV
FCC ID	2A4DH-4832
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	WLAN 2.4GHz 802.11b/g/n/ HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE

Remark: This is a variant report for C2V2L3, RS23CV, the difference between them are display module, more increased brightness (resistor change), new colors (cosmetic change) and RAM change and added 2nd source model name. According to the differences, the differences have no influence on the analysis results, all the results are leveraged from original report (Sportun Report Number FA1O2129-01).



3. RF Exposure Evaluation

- The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$
 for 1-g SAR.
 - $f(\text{GHz})$ is the RF channel transmit frequency in GHz
 - Power and distance are rounded to the nearest mW and mm before calculation
 - The result is rounded to one decimal place for comparison
- The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
- For this e-reader device, the test separation distance is 0mm therefore 5mm is used in the equation. For each of the technologies the maximum output power (nominal power plus tune-up tolerance), corrected for both source- based duty cycle and UBDTF duty cycle calculated in this document, is used in the equation above to determine if SAR is excluded (value is 3.0 or less) or required (value exceeds 3.0). The table on the following page shows the results – thresholds with a green background meet the exclusion criteria, those in red do not.

ANT 1	Tx	Freq. (MHz)	UBDTF Duty Cycle <small>Note 1</small>	Output Power			Separation distance (mm) <small>Note 3</small>	Threshold Value <small>Note 4</small>
				dBm	mW	mW <small>Note 2</small>		
WLAN	2.4GHz	2472	5.18%	17.0	50.1	2.6	5	0.8
WLAN	5GHz	5825	4.84%	15.5	35.5	1.7	5	0.8
BT	BR	2480	83.3%	6	4	3.3	5	1.0

Note :

- UBTDF duty factor calculation in this document.
- Maximum power adjusted for UBTDF (see note 1) and rounded to closest mW as per KDB 447498 procedures.
- Minimum test separation distance between enclosure and person is 5mm per KDB 941225 D07 UMPC mini-tablet devices test procedures.
- To exclude the device from SAR testing the threshold value must be less than 3.0.

- For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v06 based on the formula below:
 - $$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] \text{ W/kg}$$
 for test separation distances ≤ 50 mm; where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.
 - When the minimum separation distance is < 5 mm, the distance is used 5mm to determine SAR test exclusion.
 - 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.
 - Bluetooth estimated SAR is conservatively determined by 10 mm separation, for all applicable exposure positions.

Mode Band	Freq. (MHz)	Max Power (dBm)	UBDTF Duty Cycle	Output Power (mW)	Separation distance (mm)	Exposure Position	Estimated 1g SAR (W/kg)
WLAN 2.4GHz	2472	17.0	5.18%	2.6	5	All Positions	0.109
WLAN 2.4GHz	5825	15.5	4.84%	1.7	5	All Positions	0.111
Bluetooth	2480	6	83.3%	3.3	5	All Positions	0.139



Simultaneous Transmission Analysis

1	2	1+2
WLAN5GHz	Bluetooth	Summed
1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
0.111	0.139	0.25

General Note:

1. EUT will choose either 2.4GHz WLAN or 5GHz WLAN according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
2. 2.4GHz WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.

Conclusion:

According to the UBTDF document analysis exhibit, the WLAN and Bluetooth maximum tune-up power scaled down with the transmission factor is applied in standalone SAR test exclusion threshold analysis and is exempted from SAR testing. Per FCC KDB Publication 447498 D01v06 transmission SAR test exclusion may be applied when the sum of the 1g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is < 1.6 W/kg, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

-----THE END-----