



中国认可
国际互认
检测
TESTING
CNAS L5313



SAR Exemption Evaluation Report

Product Name : Solos

Model No. : 33-00045-00

FCC ID : ZAOSOLOS002

Applicant : Kopin Display Corp.

Address : 125 North Drive, Westborough, Massachusetts ,United
States,01581

Date of Receipt : Dec. 06, 2017

Test Date : Dec. 06, 2017~ Jan. 19, 2018

Issued Date : Feb. 01, 2018

Report No. : 17C2013R-RF-US- P20V02

Report Version : V 1.1

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

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Address : 125 North Drive, Westborough, Massachusetts ,United States,01581

Manufacturer : Kopin Display Corp.

Address : 125 North Drive, Westborough, Massachusetts ,United States,01581

Model No. : 33-00045-00

FCC ID : ZAOSOLOS002

EUT Voltage : 3.4~4.425V

Test Voltage : AC120V/60Hz

Applicable Standard : KDB 447498D01V06
FCC Part1.1310

Test Result : Complied

Performed Location : DEKRA Testing & Certification (Suzhou) Co., Ltd.
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006,
Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Designation Number: CN1199

Documented By : 
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Reviewed By : 
(Senior Engineer: Frank He)

Approved By : 
(Engineering Manager: Harry Zhao)

1. RF Exposure Evaluation

1.1. Limits

According to **KDB 447498 D01 General RF Exposure Guidance v06**

4.3.1 Standalone SAR test exclusion considerations

1) 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:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$$

≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ 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
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

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 according to 5) in section 4.1 is applied to determine SAR test exclusion.

2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following, and as illustrated in Appendix B:

- a) $[\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)] \text{ mW}$, at 100 MHz to 1500 MHz
- b) $[\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot 10] \text{ mW}$ at > 1500 MHz and ≤ 6 GHz

3) The 1-g and 10-g SAR test exclusion thresholds for below 100 MHz at test separation distances ≤ 50 mm are determined by:

- a) The power threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by $[1 + \log(100/f(\text{MHz}))]$ for test separation distances > 50 mm and < 200 mm
- b) The power threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$ for test separation distances ≤ 50 mm
- c) SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable. Note: when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product Name	:	Solos
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

- Antenna Gain:

BT2.1:

Antenna manufacturer	N/A						
Antenna Delivery	☒ 1*TX+1*RX	☐ 2*TX+2*RX	☐ 3*TX+3*RX				
Antenna technology	☒ SISO ☐ MIMO <table border="1" style="margin-left: 20px;"> <tr><td>☐ Basic</td></tr> <tr><td>☐ CDD</td></tr> <tr><td>☐ Beam-forming</td></tr> </table>				☐ Basic	☐ CDD	☐ Beam-forming
☐ Basic							
☐ CDD							
☐ Beam-forming							
Antenna Type	☐ External ☒ Internal <table border="1" style="margin-left: 20px;"> <tr><td>☐ Dipole</td></tr> <tr><td>☐ PIFA</td></tr> <tr><td>☐ PCB</td></tr> <tr><td>☒ Chip Antenna</td></tr> <tr><td>☐ Metal plate type F antenna</td></tr> <tr><td>☐ Monopole antenna</td></tr> </table>	☐ Dipole	☐ PIFA	☐ PCB	☒ Chip Antenna	☐ Metal plate type F antenna	☐ Monopole antenna
☐ Dipole							
☐ PIFA							
☐ PCB							
☒ Chip Antenna							
☐ Metal plate type F antenna							
☐ Monopole antenna							
Antenna Gain	2.72dBi						

BT4.2:

Antenna manufacturer	N/A				
Antenna Delivery	☒ 1*TX+1*RX	☐ 2*TX+2*RX	☐ 3*TX+3*RX		
Antenna technology	☒ SISO				
	☐ MIMO	☐ Basic			
		☐ CDD			
		☐ Beam-forming			
Antenna Type	☐ External	☐ Dipole			
	☒ Internal	☐ PIFA			
		☐ PCB			
		☒ Chip Antenna			
		☐ Stamping Antenna			
		☐ Metal plate type F antenna			
		☐ Monopole antenna			
Antenna Gain	1.0dBi				

Based on The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm and the formula below:

$$\text{Estimated SAR} = \sqrt{f(\text{GHz})} * \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

The Maximum tune up power is 1dBm for BDR/EDR and -7dBm for BLE.

Band	Exposure Condition	Pmax (dBm)	Pmax (mw)	Distance (mm)	f(GHz)	calculation result	Stand-alone Test exclusion threshold	SAR Test
BT2.1	Head	1.0	1.259	5	2.48	0.397	3.00	No
BT4.2	Head	-7.0	0.200	5	2.48	0.063	3.00	No

Conclusion: 2400MHz-2480MHz SAR was not required.

_____ The End _____