



# RF EXPOSURE EVALUATION REPORT

**APPLICANT** : Stellar Vision Operations Pty Ltd  
**PRODUCT NAME** : 21.5 inch Full HD LCD POC Terminal  
**MODEL NAME** : HC21SV  
**BRAND NAME** : Nova  
**FCC ID** : 2AXYGHG21SV  
**STANDARD(S)** : FCC 47CFR Part 2(2.1091)  
**RECEIPT DATE** : 2020-10-27  
**TEST DATE** : 2020-11-15 to 2021-03-15  
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**MORLAB**

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Change History		
Version	Date	Reason for Change
1.0	2021-03-22	First edition



# 1. Technical Information

**Note:** Provide by applicant.

## 1.1 Applicant and Manufacturer Information

<b>Applicant:</b>	Stellar Vision Operations Pty Ltd
<b>Applicant Address:</b>	Entertainment Quarter Level 2, Building 215, 122 Lang Road Moore Park, Sydney 2021, Australia
<b>Manufacturer:</b>	Shenzhen Saintway Technology CO., LTD
<b>Manufacturer Address:</b>	8F, Bldg. 1 (3# Elevator), Jia'an Tech Park, Liuxian 1st, Bao'an District, Shenzhen, Guangdong, China

## 1.2 Equipment under Test (EUT) Description

<b>Product Name:</b>	21.5 inch Full HD LCD POC Terminal	
<b>Serial No.:</b>	(N/A, marked #1 by test site)	
<b>Hardware Version:</b>	V2.0	
<b>Software Version:</b>	V2.0	
<b>Frequency Bands:</b>	Bluetooth	2402MHz-2480MHz
	WLAN 2.4GHz	2412MHz-2472MHz
	WLAN 5GHz	5180MHz-5240MHz
		5745MHz-5825MHz
	RFID	13.56MHz
<b>Modulation Mode:</b>	Bluetooth	GFSK(1Mbps), π/4-DQPSK(EDR 2Mbps), 8-DPSK(EDR 3Mbps)
	WLAN 2.4GHz	DSSS, OFDM
	WLAN 5GHz	OFDM
	RFID	ASK
<b>Antenna Information:</b>	Bluetooth / WLAN 2.4GHz / WLAN5G	
	Antenna Type:	PCB Antenna
	Antenna Gain:	2.6dBi
	RFID	
	Antenna Type:	PCB Antenna
	Antenna Gain:	1.0dBi

**Note:** When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% risk level.



## 1.3 Applied Reference Documents

**Leading reference documents for testing:**

Identity	Document Title	Method determination /Remark
FCC 47CFR Part 2(2.1091)	Radio Frequency Radiation Exposure Assessment: mobile devices	No deviation
KDB 447498 D01v06	General RF Exposure Guidance	No deviation
<b>Note 1:</b> Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.		
<b>Note 2:</b> When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% risk level.		



## 2. Device Category and RF Exposure Limit

Per user manual, Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

### Mobile Devices:

#### 47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

### General Population/Uncontrolled Exposure:

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

**Table 1—Limits for Maximum Permissible Exposure (MPE)**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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



### 3. RF Output Power

#### <WLAN 2.4GHz>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-up Power	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	CH 1	2412	12.92	13.0	100.00
		CH 7	2442	13.40	14.0	
		CH 13	2472	<b>13.58</b>	<b>14.0</b>	
	802.11g 6Mbps	CH 1	2412	12.65	13.0	96.88
		CH 7	2442	13.06	13.5	
		CH 13	2472	13.44	14.0	
	802.11n-HT20 MCS0	CH 1	2412	10.57	11.0	96.67
		CH 7	2442	11.03	11.5	
		CH 13	2472	11.26	11.5	

#### <WLAN 5GHz>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-up Power	Duty Cycle %
5.2GHz WLAN	802.11a 1Mbps	CH 36	5180	15.44	16.0	96.65
		CH 44	5220	15.27	16.0	
		CH 48	5240	15.32	16.0	
	802.11n-HT20 MCS0	CH 36	5180	14.88	15.0	96.24
		CH 44	5220	15.30	16.0	
		CH 48	5240	15.23	16.0	
	802.11n-HT40 MCS0	CH 38	5190	15.04	15.5	93.33
		CH 46	5230	15.71	16.0	
	802.11ac-VHT 20 MCS0	CH 36	5180	14.94	15.0	96.45
		CH 44	5220	15.30	16.0	
		CH 48	5240	15.28	16.0	
	802.11ac-VHT 40 MCS0	CH 38	5190	15.04	15.5	93.97
		CH 46	5230	15.62	16.0	
	802.11ac-VHT 80 MCS0	CH 42	5210	14.80	15.0	88.52



	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-up Power	Duty Cycle %
5.8GHz WLAN	802.11a 1Mbps	CH 149	5745	15.70	16.0	96.65
		CH 157	5785	15.00	15.5	
		CH 165	5825	14.65	15.0	
	802.11n-HT20 MCS0	CH 149	5745	15.69	16.0	96.24
		CH 157	5785	15.67	16.0	
		CH 165	5825	14.71	15.0	
	802.11n-HT40 MCS0	CH 151	5755	16.06	16.5	93.33
		CH 159	5795	15.42	16.0	
	802.11ac-VHT 20 MCS0	CH 149	5745	15.64	16.0	96.45
		CH 157	5785	14.96	15.0	
		CH 165	5825	14.68	15.0	
	802.11ac-VHT 40 MCS0	CH 151	5755	<b>16.12</b>	<b>16.5</b>	93.97
		CH 159	5795	15.40	16.0	
	802.11ac-VHT 80 MCS0	CH 155	5775	15.46	16.0	88.52



## &lt;Bluetooth&gt;

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			GFSK	
Bluetooth LE	CH 00	2402	4.39	
	CH 19	2440	5.02	
	CH 39	2480	3.80	
Tune-up Limit			5.50	

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BT classic	CH 00	2402	9.94	6.45	6.39
	CH 39	2441	9.91	5.72	5.85
	CH 78	2480	8.22	4.04	4.12
Tune-up Limit			10.00	6.50	6.50

**Note:**

1. The maximum radiated emission at 13.56MHz refers from RF report NO. SZ20100199W05.
2. The modular for RFID approach to certain low power transmitters that has low radiation, therefore the power density of RFID mode is close to zero.
3. The output power of WLAN and Bluetooth is derived from the report SZ20100199W01/W02/W03/W04.



## 4. RF Exposure Assessment

### ➤ Standalone Transmission Assessment:

Bands	Frequency (MHz)	Tune-up Power(dBm)	Antenna Gain(dBi)	E.I.R.P. (mW)	Power Density (mW/cm <sup>2</sup> )	Limit for MPE (mW/cm <sup>2</sup> )
WLAN 2.4GHz	2472	14.0	2.6	45.71	0.009	1.0
WLAN 5GHz	5755	16.5	2.6	81.28	0.016	1.0
Bluetooth	2402	10.0	2.6	18.20	0.004	1.0

**Note:**

1. According to KDB 447498, SAR test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.
2. For 5GHz WLAN, only the worst case will be used for calculating the power density.
3. MPE calculate method

$$\text{Power Density} = \text{EIRP}/4\pi R^2$$

Where: EIRP = P+G

P = Output Power (dBm)

G = Antenna Gain (dBi)

R = Separation Distance (20cm)

### ➤ Simultaneous Transmission Assessment:

#### Multi-Band Simultaneous Transmission Consideration

Simultaneous Transmission Consideration	Position	Applicable Combination	
		WLAN 2.4GHz+ Bluetooth + RFID	
		WLAN 5GHz+ Bluetooth + RFID	

1. This device contains transmitters that may operate simultaneously, therefore simultaneous transmission analysis is required.
2. The worst condition for WLAN & Bluetooth & RFID will be calculated for transmitting simultaneously.

Formula: Result=Power density<sub>1</sub>/ limit<sub>1</sub> + Power density<sub>2</sub>/ limit<sub>2</sub> + Power density<sub>3</sub>/ limit<sub>3</sub>≤1.

Transmission Bands	Power Density/ SAR	Limit	Simultaneous Transmission Result
WLAN 5GHz	0.016	1	0.02
Bluetooth	0.004	1	
RFID 13.56MHz	0	0.979	



REPORT No. : SZ20100199S01

➤ **Conclusion:**

According to 47 CFR §2.1091, this device complies with human exposure basic restrictions.

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## Annex A General Information

### 1. Identification of the Responsible Testing Laboratory

<b>Laboratory Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
<b>Laboratory Address:</b>	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
<b>Telephone:</b>	+86 755 36698555
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### 2. Identification of the Responsible Testing Location

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
<b>Address:</b>	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

### 3. Facilities and Accreditations

The FCC designation number is CN1192, the test firm registration number is 226174.

END OF REPORT