

# RF EXPOSURE EVALUATION REPORT

**Application No.:** SZCR2404001169AT  
**Applicant:** Vanstone Electronic (Beijing) Co., Ltd.  
**Address of Applicant:** 3F No.2 Building, Aisino Corporation Park 18A, Xingshikou Road, Haidian District, Beijing, China 100195  
**Manufacturer:** Vanstone Electronic (Beijing) Co., Ltd.  
**Address of Manufacturer:** 3F No.2 Building, Aisino Corporation Park 18A, Xingshikou Road, Haidian District, Beijing, China 100195  
**Equipment Under Test (EUT):**  
**EUT Name:** Unattended Payment Terminal  
**Model No.:** A80  
**FCC ID:** OWL-A80-U  
**Standard(s) :** FCC Rules 47 CFR §2.1091  
KDB 447498 D04 interim General RF Exposure Guidance v01  
**Date of Receipt:** 2024-04-03  
**Date of Evaluation:** 2024-04-26 to 2024-06-14  
**Date of Issue:** 2024-06-21

<b>Evaluation Result:</b>	<b>Pass*</b>
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\* In the configuration evaluated, the EUT complied with the standards specified above.



Keny Xu  
EMC Laboratory Manager



Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2024-06-21		Original

<b>Authorized for issue by:</b>			
		Calvin Weng	
		Calvin Weng/Project Engineer	
		Eric Fu	
		Eric Fu/Reviewer	



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### 3 General Information

#### 3.1 General Description of E.U.T.

Product Type:	<input type="checkbox"/> Portable device
	<input type="checkbox"/> Mobile device
	<input checked="" type="checkbox"/> Fixed device

#### 3.2 Details of E.U.T.

Power supply:	DC12-48V, 3A
For BT:	
Cable Loss (for RF conducted test):	0.7dB
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Antenna Type:	FPC Antenna
Antenna Gain:	-1.19 dBi
For BLE:	
Cable Loss (for RF conducted test):	0.7dB
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	FPC Antenna
Antenna Gain:	-1.19 dBi
For 2.4G WIFI:	
Cable Loss (for RF conducted test):	0.7dB
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11;802.11n(HT40):7



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Channel Spacing:	5MHz
Antenna Type:	FPC Antenna
Antenna Gain:	-1.19 dBi
For 5G WIFI:	
Cable Loss (for RF conducted test):	1.5dB
Operation Frequency/Number of channels (20MHz):	5180-5240MHz (4 Channels); U-NII-2A: 5260-5320MHz (4 Channels); U-NII-2C: 5500-5700MHz (11 Channels); U-NII-3: 5745-5825MHz (5 Channels)
Operation Frequency/Number of channels/(40MHz):	5190-5230MHz (2 Channels); U-NII-2A: 5270-5310MHz (2 Channels); U-NII-2C: 5510-5670MHz (5 Channels); U-NII-3: 5755-5795MHz (2 Channels)
Operation Frequency/Number of channels (80MHz):	5210MHz (1 Channel); U-NII-2A: 5290MHz (1 Channels); U-NII-2C: 5530-5610MHz (2 Channels); U-NII-3: 5775MHz (1 Channel)
Modulation Type:	OFDM (64QAM, 16QAM, QPSK, BPSK); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing:	802.11a/n/ac 20: 20MHz; 802.11n/ac 40: 40MHz; 802.11ac 80: 80MHz
DFS Function:	Slave without Radar detection
TPC Function:	Without TPC function
Antenna Type:	FPC Antenna
Antenna Gain:	U-NII-1/2A: 2.88dBi; U-NII-2C: 0.6dBi; U-NII-3: -0.92dBi
For 2G:	
Sample Type:	Fixed production
Support Network:	GPRS, EGPRS
Operation Frequency Band:	GSM850/PCS1900
Modulation Type:	GMSK for GPRS/EGPRS; 8PSK for EGPRS;
GPRS Class:	12
EGPRS Class:	12
Antenna Type:	External Antenna/Internal Antenna
Antenna Gain:	GSM850: -2.9dBi, PCS:1900: -0.4dBi



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For 3G:	
Sample Type:	Fixed production
Support Network:	RMC, HSDPA, HSUPA
Operation Frequency Band:	UMTS FDD Band II/IV/V
Modulation Type:	QPSK for WCDMA
Supported Channel Bandwidth:	5MHz for WCDMA
UMTS Power Class:	Level 3
Antenna Type:	External Antenna/Internal Antenna
Antenna Gain:	WCDMA B2: -0.4dBi; B4: -0.4dBi; B5: -2.9dBi
For 4G:	
Sample Type:	Fixed production
LTE Operation Frequency Band:	LTE FDD Band 2,4,5,7,38
Modulation Type:	QPSK, 16QAM
LTE Power Class:	Level 3
Antenna Type:	External Antenna/Internal Antenna
Antenna Gain:	LTE B2: -0.4dBi; B4: -0.4dBi; B5: -2.9dBi; B7: 2.6dBi; B38:2.9dBi

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

**Note:**

(1) The antenna gain value is provided by the customer. The test lab will not be responsible for wrong test result due to incorrect information about antenna gain values.

**3.3 Separation Distance**

Minimum test separation distance:	20cm
Remark: This minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.	



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### 3.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

### 3.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

### 3.6 Deviation from Standards

None

### 3.7 Abnormalities from Standard Conditions

None



## 4 FCC Radiofrequency radiation exposure limits

According to §1.1310, the limit for general population/uncontrolled exposures

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<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



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## 5 Measurement and Calculation

### MPE Calculation

According to the formula  $S=P/4\pi R^2$ , we can calculate S which is MPE.

Note:

- 1) P (mW)
- 2) R = distance to the center of radiation of antenna (in centimeter)
- 3) MPE limit = 1mW/cm<sup>2</sup>

Band	Burst Tune up Power(dBm)	DivisionFactors (dB)	Time-Averaged Tune upPower (dBm)
GSM 850(1TX slots)	33	-9.03	23.97
GSM 850(2TX slots)	31	-6.02	24.98
GSM 850(3TX slots)	29	-4.26	24.74
GSM 850(4TX slots)	28	-3.01	<b>24.99</b>
GSM 1900(1TX slots)	30	-9.03	20.97
GSM 1900(2TX slots)	28	-6.02	21.98
GSM 1900(3TX slots)	27	-4.26	22.74
GSM 1900(4TX slots)	26	-3.01	<b>22.99</b>

### Note:Division Factors

To average the power, the division factor is as follows:

- 1Txslot = 1 transmit time slot out of 8 time slots  
=> conducted power divided by (8/1)=> -9.03 dB
- 2Txslots = 2 transmit time slots out of 8 time slots  
=> conducted power divided by (8/2)=> -6.02 dB
- 3Txslots = 3 transmit time slots out of 8 time slots  
=> conducted power divided by (8/3)=> -4.26 dB
- 4Txslots = 4 transmit time slots out of 8 time slots=>  
conducted power divided by (8/4) => -3.01 dB



Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Power (dBm)	EIRP(ERP) (dBm)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	conclusion	MPE Ratio
BT	2402.0	-1.19	11.00	9.81	0.0019	1.0000	Pass	0.0019
BLE	2402.0	-1.19	3.00	1.81	0.0003	1.0000	Pass	0.0003
2.4G WIFI	2437.0	-1.19	13.00	11.81	0.0030	1.0000	Pass	0.0030
5G WIFI	5500.0	2.88	11.00	13.88	0.0049	1.0000	Pass	0.0049
GSM850	824.2	-2.90	24.99	19.94	0.0039	0.5495	Pass	0.0071
PCS1900	1850.2	-0.40	22.99	22.59	0.0361	1.0000	Pass	0.0361
WCDMA Band II	1852.4	-0.40	24.00	23.60	0.0456	1.0000	Pass	0.0456
WCDMA Band IV	1712.4	-0.40	24.00	23.60	0.0456	1.0000	Pass	0.0456
WCDMA Band V	826.4	-2.90	24.00	18.95	0.0256	0.5509	Pass	0.0465
LTE Band 2	1850.7	-0.40	24.00	23.60	0.0456	1.0000	Pass	0.0456
LTE Band 4	1710.7	-0.40	24.00	23.60	0.0456	1.0000	Pass	0.0456
LTE Band 5	824.7	-2.90	24.00	18.95	0.0256	0.5498	Pass	0.0466
LTE Band 7	2502.5	2.60	24.00	26.60	0.0909	1.0000	Pass	0.0909
LTE Band 38	2572.5	2.90	24.00	26.90	0.0974	1.0000	Pass	0.0974

In order to ensure compliance with the MPE for a un-controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unit.

The product also has multiple transmitters The Simultaneous Transmission Possibilities are as below:

Simultaneous Tx Combination	Configuration
1	WWAN + WiFi 2.4G
2	WWAN + WiFi 5G

No.	Mode	Total Ratio	Limit	Result
1	LTE band38+ WiFi 2.4G	0.1004	1.0000	Pass
	LTE band38 + WiFi 5G	0.1023		

-End of the Report-



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