Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

RF Exposure evaluation

Report Reference No. ..... :	**GTS20241121026-1-05**
FCC ID. ..... :	**2BEE4-PSU6200**
Compiled by (position+printed name+signature)..:	File administrators Peter Xiao
Supervised by (position+printed name+signature)..:	Test Engineer Evan Ouyang
Approved by (position+printed name+signature)..:	Manager Jason Hu
Date of issue.....:	Dec.06, 2024

Representative Laboratory Name :	**Shenzhen Global Test Service Co.,Ltd.**
Address.....:	No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong,China
Applicant's name.....:	**Shanghai Orange Box Digital Technology Co., Ltd.**
Address.....:	Room 3As126, 4th Floor, No. 1155, Fangdian Road, Pudong District, Shanghai, China
Test specification ..... **:**	
Standard .....:	**47CFR §1.1310** **47CFR §2.1093** **KDB447498 D01 General RF Exposure Guidance v06**
TRF Originator .....:	Shenzhen Global Test Service Co.,Ltd.
Master TRF.....:	Dated 2014-12

Test item description ..... :	**Mobile data collection terminal**
Trade Mark .....:	Q CUBE
Manufacturer.....:	Shanghai Orange Box Digital Technology Co., Ltd.
Model/Type reference.....:	PSU6200
Listed Models .....:	N/A
Exposure category.....:	General population/uncontrolled environment
EUT Type.....:	Portable
Hardware Version .....:	N/A
Software Version .....:	N/A
Rating .....:	DC 3.8V by battery Recharged by DC 5.0V
Result.....:	**PASS**

TEST REPORT

Test Report No. :	**GTS20241121026-1-05**	Dec.06, 2024 Date of issue

Equipment under Test	:	Mobile data collection terminal
Model /Type	:	PSU6200
Listed model	:	N/A
Applicant	:	**Shanghai Orange Box Digital Technology Co., Ltd.**
Address	:	Room 3As126, 4th Floor, No. 1155, Fangdian Road, Pudong District, Shanghai, China
Manufacturer	:	**Shanghai Orange Box Digital Technology Co., Ltd.**
Address	:	Room 3As126, 4th Floor, No. 1155, Fangdian Road, Pudong District, Shanghai, China

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. SUMMARY

1.1. Product Description

Product Name:	Mobile data collection terminal
Trade Mark:	Q CUBE
Model/Type reference:	PSU6200
List Model:	N/A
Model Declaration	N/A
Power supply:	DC 3.8V by battery Recharged by DC 5.0V
Hardware Version	N/A
Software Version	N/A
Sample ID	GTS20241121026-1-S0001-1# &GTS20241121026-1-S0001-2#
Bluetooth	
Frequency Range	2402MHz ~ 2480MHz
Channel Number	79 channels for Bluetooth (DSS) 40 channels for Bluetooth (DTS)
Channel Spacing	1MHz for Bluetooth (DSS) 2MHz for Bluetooth (DTS)
Modulation Type	GFSK, π/4-DQPSK, 8DPSK for Bluetooth (DSS) GFSK for Bluetooth (DTS)
2.4GWLAN	
WLAN Operation frequency	IEEE 802.11b:2412-2462MHz IEEE 802.11g:2412-2462MHz IEEE 802.11n HT20:2412-2462MHz IEEE 802.11n HT40:2422-2452MHz
WLAN Modulation Type	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel number:	13 Channel for IEEE 802.11b/g/n(HT20) 9 Channel for IEEE 802.11n (HT40)
Channel separation:	5MHz
WIFI(5.2G/5.8G Band)	
WLAN Operation frequency	5180-5240MHz/ 5745MHz to 5825MHz
WLAN Modulation Type	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11ac VHT20: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT40: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT80: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Channel number:	4 Channels for 20MHz bandwidth(5180-5240MHz) 5 channels for 20MHz bandwidth(5745-5825MHz) 2 channels for 40MHz bandwidth(5190~5230MHz) 2 channels for 40MHz bandwidth(5755~5795MHz) 1 channels for 80MHz bandwidth(5210MHz) 1 channels for 80MHz bandwidth(5775MHz)
Antenna Description	PIFA Antenna, 2.15dBi (Max.) for 2.4G Band and 1.58dBi (Max.) for 5G Band.

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong,China

2.2. Test Facility

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

CNAS (No. CNAS L8169)
Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.
A2LA (Certificate No. 4758.01)
Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.
Industry Canada Registration Number. is 24189.
FCC Designation Number is CN1234.
FCC Registered Test Site Number is165725.

2.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Method of measurement

3.1. Applicable Standard

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
FCC KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures.
FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.
FCC CFR 47 part2 2.1093: Radiofrequency radiation exposure evaluation: portable devices

3.2. Evaluation Method and Limit

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1 Standalone SAR test exclusion considerations: "Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The 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 (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc."
[(max. power of channel, including tune-up tolerance, mW)/ (min. test separation distance, mm)] · [√f (GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:
• f (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 f) in section 4.1 is applied to determine SAR test exclusion.

When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.
The [∑ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg] + [∑ of MPE ratios] is ≤ 1.0.
The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all ≤ 0.04, and the [∑ of MPE ratios] is ≤ 1.0.

4. Conducted Power Results

Bluetooth(BT)

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	5.83
	39	2441	5.99
	78	2480	4.47
π/4DQPSK	0	2402	4.74
	39	2441	4.48
	78	2480	3.64
8DPSK	0	2402	4.77
	39	2441	4.48
	78	2480	3.71
GFSK(BT LE)	0	2402	-4.27
	19	2440	-2.23
	39	2480	-2.17

2.4GWLAN

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
802.11b	01	2412	8.10
	06	2437	8.03
	11	2462	8.62
802.11g	01	2412	8.54
	06	2437	8.40
	11	2462	8.64
802.11n(HT20)	01	2412	7.65
	06	2437	8.55
	11	2462	8.93
802.11n(HT40)	03	2422	7.75
	06	2437	7.88
	09	2452	8.48

5.2GWLAN

Mode	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
802.11a	36	5180	5.59
	40	5200	5.85
	48	5240	5.44
802.11n20	36	5180	4.50
	40	5200	4.70
	48	5240	5.21
802.11n40	38	5190	5.52
	46	5230	4.79
802.11ac20	36	5180	5.45
	40	5200	5.94
	48	5240	5.36
802.11ac40	38	5190	5.43
	46	5230	4.83
802.11ac80	42	5210	5.68

5.8GWLAN

Mode	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
802.11a	149	5745	4.41
	157	5785	6.55
	165	5825	6.87
802.11n20	149	5745	6.33
	157	5785	6.51
	165	5825	6.71
802.11n40	151	5755	6.44
	159	5795	6.48
802.11ac20	149	5745	6.46
	157	5785	6.77
	165	5825	6.09
802.11ac40	151	5755	6.43
	159	5795	6.50
802.11ac80	155	5775	6.58

5. Manufacturing Tolerance

Bluetooth(BT)

GFSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	5.0	5.0	4.0
Tolerance ±(dB)	1.0	1.0	1.0
π/4DQPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	4.0	4.0	3.0
Tolerance ±(dB)	1.0	1.0	1.0
8DPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	4.0	4.0	3.0
Tolerance ±(dB)	1.0	1.0	1.0
GFSK BT LE (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	-4.0	-2.0	-2.0
Tolerance ±(dB)	1.0	1.0	1.0

2.4GWLAN

IEEE 802.11b (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	8.0	8.0	8.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11g (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	8.0	8.0	8.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	7.0	8.0	8.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Peak)			
Channel	Channel 03	Channel 06	Channel 09
Target (dBm)	7.0	7.0	8.0
Tolerance ±(dB)	1.0	1.0	1.0

5.2GWLAN

IEEE 802.11a (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	5.0	5.0	5.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	4.0	4.0	5.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n VHT40 (Average)			
Channel	Channel 38	Channel 46	/
Target (dBm)	5.0	4.0	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	5.0	5.0	5.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 38	Channel 46	/
Target (dBm)	5.0	4.0	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802. 11ac VHT80 (Average)			
Channel	Channel 42	/	/
Target (dBm)	5.0	/	/
Tolerance ±(dB)	1.0	/	/

5.8GWLAN

IEEE 802.11a (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	4.0	6.0	6.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	6.0	6.0	6.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n VHT40 (Average)			
Channel	Channel 151	Channel 159	/
Target (dBm)	6.0	6.0	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	6.0	6.0	6.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 151	Channel 159	/
Target (dBm)	6.0	6.0	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802. 11ac VHT80 (Average)			
Channel	Channel 155	/	/
Target (dBm)	6.0	/	/
Tolerance ±(dB)	1.0	/	/

6. Evaluation Results

6.1. Standalone Evaluation

Bluetooth(BT)

Band/Mode	f (GHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion
			dBm	mW		
GFSK	2.480	5	6.00	3.9811	1.25 < 3.0	Yes
π/4DQPSK	2.480	5	5.00	3.1623	1.0 < 3.0	Yes
8DPSK	2.480	5	5.00	3.1623	1.0 < 3.0	Yes
GFSK(BLE)	2.480	5	-1.00	0.7943	0.25 < 3.0	Yes

2.4GWLAN

Band/Mode	f (GHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion
			dBm	mW		
802.11b	2.462	5	9.00	7.9433	2.49 < 3.0	Yes
802.11g	2.462	5	9.00	7.9433	2.49 < 3.0	Yes
802.11n(HT20)	2.462	5	9.00	7.9433	2.49 < 3.0	Yes
802.11n(HT40)	2.452	5	9.00	7.9433	2.49 < 3.0	Yes

5.2GWLAN

Band/Mode	f (GHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion
			dBm	mW		
802.11a	5.240	5	6.00	3.9811	1.82 < 3.0	Yes
802.11n20	5.240	5	6.00	3.9811	1.82 < 3.0	Yes
802.11n40	5.240	5	6.00	3.9811	1.82 < 3.0	Yes
802.11ac20	5.240	5	6.00	3.9811	1.82 < 3.0	Yes
802.11ac40	5.240	5	6.00	3.9811	1.82 < 3.0	Yes
802.11ac80	5.240	5	6.00	3.9811	1.82 < 3.0	Yes

5.8GWLAN

Band/Mode	f (GHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion
			dBm	mW		
802.11a	5.825	5	7.00	5.0119	2.42 < 3.0	Yes
802.11n20	5.825	5	7.00	5.0119	2.42 < 3.0	Yes
802.11n40	5.825	5	7.00	5.0119	2.42 < 3.0	Yes
802.11ac20	5.825	5	7.00	5.0119	2.42 < 3.0	Yes
802.11ac40	5.825	5	7.00	5.0119	2.42 < 3.0	Yes
802.11ac80	5.825	5	7.00	5.0119	2.42 < 3.0	Yes

Remark:
1. Output power including tune up tolerance;
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 of KDB447498 D01 General RF Exposure Guidance v06 is applied to determine SAR test exclusion.

7. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB447498 D01 General RF Exposure Guidance v06, No SAR is required.

.....End of Report.....