

Test Report

Verified code: 308307

Report No.: E202112276794-6

Customer: NunoErin, LLC

Address: 533 Commerce Street, Jackson MS 39201 USA

Sample Name: Table top touch screen

Sample Model: UCTTA-42

Receive Sample Date: Dec.29,2021

Test Date: Dec.31,2021 ~ Apr.21,2022

Reference Document: CFR 47, FCC Part 2.1091 Radio frequency radiation exposure evaluation: mobile devices.

Test Result: Pass

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Reviewed by: *Jiang Tao*

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GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-06-02

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202112276794-6	Original Issue	2022-04-27

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1. GENERAL DESCRIPTION OF EUT

1.1. APPLICANT

Name: NunoErin, LLC
Address: 533 Commerce Street, Jackson MS 39201 USA

1.2. MANUFACTURER

Name: Chengdu Vantron Technology Co., Ltd.
Address: No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045

1.3. FACTORY

Name: Chengdu Vantron Technology Co., Ltd.
Address: No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045

1.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Table top touch screen
Model No.: UCTTA-42
Adding Model: /
Trade Name: NunoErin
FCC ID: 2A5VA-UCTTA42
Rating: Input: 100-240V~ 50/60Hz 2A
Frequency Range: BT&BLE:
2402-2480MHz
2.4G wifi:
2412MHz-2462MHz for 802.11b/g/n HT20
5G wifi:
U-NII-1: 5150 MHz~5250 MHz
U-NII-3: 5725 MHz~5850 MHz
Transmit Power: BLE:
3.28dBm for BLE 1M,
3.19dBm for BLE 2M
BT:
GFSK: 7.48dBm
 $\pi/4$ -DQPSK: 7.49dBm
8DPSK: 6.11dBm
2.4G wifi:
15.75dBm for 802.11b mode
11.07dBm for 802.11g mode
11.19dBm for 802.11n HT20 mode
5G wifi:
U-NII-1:
15.37dBm for IEEE 802.11a
15.13dBm for IEEE 802.11n HT20

	15.08dBm for IEEE 802.11ac VHT20
	12.58dBm for IEEE 802.11n HT40
	12.43dBm for IEEE 802.11ac VHT40
	12.31dBm for IEEE 802.11ac VHT80
	U-NII-3:
	15.04dBm for IEEE 802.11a
	14.71dBm for IEEE 802.11n HT20
	14.61dBm for IEEE 802.11ac VHT20
	15.19dBm for IEEE 802.11n HT40
	15.13dBm for IEEE 802.11ac VHT40
	14.20dBm for IEEE 802.11ac VHT80
Modulation type:	BLE: GFSK
	BT: FHSS (GFSK for 1Mbps, $\pi/4$ -DQPSK for 2Mbps, 8DPSK for 3Mbps)
	2.4G wifi:
	DSSS for 802.11b mode;
	OFDM for 802.11g/n mode
	5G wifi:
	OFDM for 802.11a/n/ac mode
Antenna	BLE&BT:
Specification:	Internal antenna with 3dBi gain (Max.)
	2.4G wifi:
	Internal antenna with 3dBi gain (Max.)
	5G wifi:
	U-NII-1:
	Internal antenna with 3dBi gain (Max.)
	U-NII-3:
	Internal antenna with 3dBi gain (Max.)
Temperature	
Range:	0°C ~ 50°C
Hardware Version:	V 2.0
Software Version:	Android 10
Sample No:	E202112276794-0003

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2. LABORATORY AND ACCREDITATIONS

2.1. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add.: No.1301 Guangang Road Xinlan Community, Guanlan Street, Longhua District
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P.C.: 518110

Tel : 0755-61180008

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2.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:2017.

USA A2LA(Certificate #2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada ISED (Company Number: 24897, CAB identifier:CN0069)

USA FCC (Registration Number: 759402, Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site,
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3. EVALUATION METHOD

Exposure category: General population/uncontrolled environment

EUT Type: Production Unit

Device Type: Mobile Device

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

4. LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

(B)Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength(H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time[E] ² , [H] ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100,000	/	/	1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

5. CALCULATION METHOD

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to anisotropic radiator

R=distance to the center of radiation of the antenna

From the EUT RF output power, the minimum mobile separation distance, $d=0.2\text{m}$, as well as the maximum gain of the used as following information, the RF power density can be obtained.

Frequency Band	Antenna type	Maximum antenna gain
BT	Internal antenna	3dBi
BLE	Internal antenna	3dBi
2.4GHz Wi-Fi	Internal antenna	3dBi
5GHz Wi-Fi	Internal antenna	3dBi

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6. ESTIMATION RESULT

6.1. CONDUCTED POWER RESULTS

2.4G Wi-Fi

Mode	Frequency(MHz)	Peak Conducted Output Power (dBm)
IEEE 802.11b	2412	15.32
	2437	15.54
	2462	15.75
IEEE 802.11g	2412	10.48
	2437	10.88
	2462	11.07
IEEE 802.11n HT20	2412	10.77
	2437	11.06
	2462	11.19

5GHz Wi-Fi

Test Mode	Band	Frequency (MHz)	AVG Conducted Output Power (dBm)
IEEE 802.11a	U-NII-1	5180	15.37
		5200	15.24
		5240	14.96
	U-NII-3	5745	15.04
		5785	14.78
		5825	14.44
IEEE 802.11n HT20	U-NII-1	5180	15.13
		5200	14.83
		5240	14.78
	U-NII-3	5745	14.71
		5785	14.45
		5825	14.12
IEEE 802.11ac VHT20	U-NII-1	5180	15.08
		5200	14.95
		5240	14.68
	U-NII-3	5745	14.61
		5785	14.33
		5825	14.02
IEEE 802.11n HT40	U-NII-1	5190	12.58
		5230	12.56
	U-NII-3	5755	15.19
		5795	15.06
IEEE 802.11ac VHT40	U-NII-1	5190	12.43
		5230	12.42
	U-NII-3	5755	15.13
		5795	14.88

IEEE 802.11ac VHT80	U-NII-1	5210	12.31
	U-NII-3	5775	14.20

BLE

Mode	Frequency(MHz)	Peak Conducted Output Power (dBm)
1Mbps	2402	2.28
	2440	3.28
	2480	3.02
2Mbps	2402	2.27
	2440	3.19
	2480	2.96

BT

Mode	Frequency(MHz)	Peak Conducted Output Power (dBm)
DH5	2402	6.33
	2441	7.48
	2480	7.38
2DH5	2402	6.35
	2441	7.49
	2480	7.39
3DH5	2402	5.37
	2441	6.11
	2480	5.96

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6.2. MANUFACTURING TOLERANCE

Frequency (MHz)	2.4G Wi-Fi			
	IEEE 802.11b	IEEE 802.11g	IEEE 802.11n HT20	IEEE 802.11n HT40
	2462	2462	2462	/
Target (dBm)	15.0	11.0	11.0	/
Tolerance $\pm$ (dB)	1.0	1.0	1.0	/

Frequency (MHz)	5G Wi-Fi (U-NII-1)			
	802.11a	802.11n HT20	802.11ac VHT20	802.11n HT40
	5180	5180	5180	5190
Target (dBm)	15.0	15.0	15.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0	1.0

Frequency (MHz)	5G Wi-Fi (U-NII-1)	
	802.11ac VHT40	802.11ac VHT80
	5190	5210
Target (dBm)	12.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0

Frequency (MHz)	5G Wi-Fi (U-NII-3)			
	802.11a	802.11n HT20	802.11ac VHT20	802.11n HT40
	5745	5745	5745	5755
Target (dBm)	15.0	14.0	14.0	15.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0	1.0

Frequency (MHz)	5G Wi-Fi (U-NII-3)	
	802.11ac VHT40	802.11ac VHT80
	5755	5775
Target (dBm)	15.0	14.0
Tolerance $\pm$ (dB)	1.0	1.0

Frequency (MHz)	BLE	
	1Mbps	2Mbps
	2440	2440
Target (dBm)	3.0	3.0
Tolerance $\pm$ (dB)	1.0	1.0

Frequency (MHz)	BT		
	DH5	2DH5	3DH5
	2441	2441	2441
Target (dBm)	7.0	7.0	6.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0

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6.3. MEASUREMENT RESULTS

6.3.1. STANDALONE MPE

2.4G Wi-Fi

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle (%)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	(dBm)	(mW)					
IEEE 802.11b	16	39.8107	3	1.9953	99.64	0.0158	1.0000
IEEE 802.11g	12	15.8489	3	1.9953	97.20	0.0063	1.0000
IEEE 802.11n HT20	12	15.8489	3	1.9953	97.01	0.0063	1.0000

5G Wi-Fi (U-NII-1)

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle (%)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	(dBm)	(mW)					
IEEE 802.11a	16	39.8107	3	1.9953	97.18	0.0158	1.0000
IEEE 802.11n HT20	16	39.8107	3	1.9953	97.01	0.0158	1.0000
IEEE 802.11n HT40	13	19.9526	3	1.9953	97.04	0.0079	1.0000
IEEE 802.11ac VHT20	16	39.8107	3	1.9953	97.01	0.0158	1.0000
IEEE 802.11ac VHT40	13	19.9526	3	1.9953	94.20	0.0079	1.0000
IEEE 802.11ac VHT80	13	19.9526	3	1.9953	88.89	0.0079	1.0000

5G Wi-Fi (U-NII-3)

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle (%)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	(dBm)	(mW)					
IEEE 802.11a	16	39.8107	3	1.9953	97.18	0.0158	1.0000
IEEE 802.11n HT20	15	31.6228	3	1.9953	97.01	0.0126	1.0000
IEEE 802.11n HT40	16	39.8107	3	1.9953	97.18	0.0158	1.0000
IEEE 802.11ac VHT20	15	31.6228	3	1.9953	97.01	0.0126	1.0000
IEEE 802.11ac VHT40	16	39.8107	3	1.9953	94.20	0.0158	1.0000
IEEE 802.11ac VHT80	15	31.6228	3	1.9953	88.89	0.0126	1.0000

BT

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle (%)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	(dBm)	(mW)					
DH5	8	6.3096	3	1.9953	77.27	0.0025	1.0000
2DH5	8	6.3096	3	1.9953	77.27	0.0025	1.0000
3DH5	7	5.0119	3	1.9953	77.33	0.0020	1.0000

BLE

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle (%)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	(dBm)	(mW)					
1M	4	2.5119	3	1.9953	61.29	0.0010	1.0000
2M	4	2.5119	3	1.9953	32.79	0.0010	1.0000

Remark: 1. Maximum average power including tune-up tolerance;

2. MPE use distance is 20cm from manufacturer declaration of user manual.

Maximum Simultaneous transmission MPE Ratio for 2.4G Wi-Fi and BT

Maximum MPE ratio 2.4G Wi-Fi	Maximum MPE ratio BT	Σ MPE ratios	Limit	Results
0.0158	0.0025	0.0183	1.000	Pass

Note: 1. 2.4G Wi-Fi Maximum MPE ratio= $0.0158 \text{ mW/cm}^2 / 1.0000 \text{ mW/cm}^2 = 0.0158$

2. BT Maximum MPE ratio= $0.0025 \text{ mW/cm}^2 / 1.0000 \text{ mW/cm}^2 = 0.0025$

3. $\Sigma \text{ MPE ratios} = 0.0158 + 0.0025 = 0.0183$

4. The estimation distance is 20cm.

Maximum Simultaneous transmission MPE Ratio for 5G Wi-Fi (U-NII-1) and BT

Maximum MPE ratio 5G Wi-Fi(U-NII-1)	Maximum MPE ratio BT	Σ MPE ratios	Limit	Results
0.0158	0.0025	0.0183	1.000	Pass

Note: 1. 5G Wi-Fi(U-NII-1) Maximum MPE ratio= $0.0158 \text{ mW/cm}^2 / 1.0000 \text{ mW/cm}^2 = 0.0158$

2. BT Maximum MPE ratio= $0.0025 \text{ mW/cm}^2 / 1.0000 \text{ mW/cm}^2 = 0.0025$

3. $\Sigma \text{ MPE ratios} = 0.0158 + 0.0025 = 0.0183$

4. The estimation distance is 20cm.

Maximum Simultaneous transmission MPE Ratio for 5G Wi-Fi (U-NII-3) and BT

Maximum MPE ratio 5G Wi-Fi(U-NII-3)	Maximum MPE ratio BT	Σ MPE ratios	Limit	Results
0.0158	0.0025	0.0183	1.000	Pass

Note: 1. 5G Wi-Fi(U-NII-3) Maximum MPE ratio= $0.0158 \text{ mW/cm}^2 / 1.0000 \text{ mW/cm}^2 = 0.0158$

2. BT Maximum MPE ratio= $0.0025 \text{ mW/cm}^2 / 1.0000 \text{ mW/cm}^2 = 0.0025$

3. $\Sigma \text{ MPE ratios} = 0.0158 + 0.0025 = 0.0183$

4. The estimation distance is 20cm.

7. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

----- End of Report -----