Test Report

Verified code: 642813

Report No.: E20230224734401-3

Name:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China
Sample Name:	OnePlus Stylo
Sample Model:	OPN2202
Receive Sample Date:	Feb.27,2023
Test Date:	Mar.06,2023 ~ Mar.06,2023
Reference Document:	CFR 47, FCC Part 2.1093 Radiofrequency radiation exposure evaluation: portable devices.
Test Result:	Pass

Prepared by: Huang Lifang Reviewed by: Jiang Jun Approved by: Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2023-04-04

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Statement

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5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20230224734401-3	Original Issue	2023-03-20

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1. GENERAL DESCRIPTION OF EUT

1.1 APPLICANT

Name:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China

1.2 MANUFACTURER

Name:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China

1.3 FACTORY

Name:	Shenzhen Qianfenyi Intelligent Technology Co., Ltd.
Address:	Room 2101, Building 3, Nanshan i Park Chongwen, No. 3370 Liuxian Avenue, Fuguang Community, Taoyuan Street, Nanshan District, Shenzhen City, Guangdong Province P.R.China

1.4 BASIC DESCRIPTIONOF EQUIPMENTUNDER TEST

Equipment:	OnePlus Stylo
Model No.:	OPN2202
Adding Model:	/
Trade Name:	ONEPLUS
FCC ID:	2ABZ2-OPN2202
Power supply:	DC 3.82V power supplied by battery DC 5V power supplied by ONEPLUS Pad OPD2203
Battery Specification:	Model name:BLB001; Nominal voltage:3.82V; Rated capacity:82mAh/0.31Wh
Frequency Band:	2402-2480MHz
Maximum Transmit Power:	GFSK for 1Mbps:0.77dBm
Modulation type:	GFSK
Antenna Specification:	FPC antenna with 1.2dBi gain (Max.)
Temperature Range:	0℃~+35℃
Hardware Version:	V5.4
Software Version:	V4D45.02.01.19
Sample No:	E20230224734401-0004
Note:	/

2. LABORATORY & ACCREDITATIONS

2.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add.:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.
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.

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, http://www.grgtest.com

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3. LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

Exposure category: General population/uncontrolled environment
EUT Type: Production Unit
Device Type: Portable Device
According to the KDB 447498 D04 Interim General RF Exposure Guidance v01:
SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time averaged power or maximum time-averaged ERP, whichever is greater. If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of λ/4. As for devices with antennas of length greater than λ/4 where the gain is not well defined, but always less than that of a half-wave dipole (length λ/2), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known. The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna. The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold Pth (mW). This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by Formula as below:

$$P_{\text{th}}\ (\text{mW}) = \begin{cases} ERP_{20\ \text{cm}}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ \text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ \text{cm}}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and ERP20cm is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

$$P_{\text{th}}\ (\text{mW}) = ERP_{20\ \text{cm}}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases} \qquad \text{(B. 1)}$$

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

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3.1 MEASUREMENT RESULTS

Table 1 Antenna Specification

Frequency Band	Antenna type	Internal Identification	Maximum antenna gain (dBi)
BLE	FPC antenna	Antenna 1	1.2dBi

Table 2 Transmit Power for ERP & Maximum Conducted Output Average Power

Antenna type	Maximum Conducted output peak Power (dBm)	ERP (dBm)	Target Maximum Conducted Output peak Power (dBm)	Tolerance (dB)	Maximum Tune-up Maximum Conducted Output peak Power (dBm)
FPC antenna	0.77	-0.18	0	±1	1

ERP of FPC antenna = Maximum Conducted Output peak Power + antenna gain -2.15= 0.77+1.2-2.15= -0.18dBm

STANDALONE MPE

Mode	Antenna type	Frequency (MHz)	Maximum Tune-up Maximum Conducted Output peak Power (dBm)	Maximum Tune-up Maximum Conducted Output peak Power (mW)	Exemption Limit (mW)	Verdict
BLE	FPC antenna	2480	1	1.26	2.77	PASS

Remark:

1. Threshold Maximum Conducted Output Power (mW)=$(0.5/20)^{-\log(60/3060/\sqrt{f})}$= $(0.5/20)^{-\log(60/3060/\sqrt{2.480})}$=2.77mW.

4. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure of portable device.

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