PART 0 SAR CHAR REPORT

No. I22Z62197-SEM01

For

HONOR Device Co., Ltd.

Smart Phone

Model Name: PGT-N19

with

Hardware Version: HN2PGETM

Software Version: 7.1.0.107(C900E100R1P2)

FCC ID: 2AYGCPGT-N19

Issued Date: 2023-1-31

Note:

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I22Z62197-SEM01	Rev.0	2023-1-31	Initial creation of test report

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TABLE OF CONTENT

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1 Test Laboratory

1.1 Testing Location

Company Name:	CTTL
Address:	No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

1.2 Testing Environment

Temperature:	18°C~25°C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω
Ambient noise & Reflection:	< 0.012 W/kg

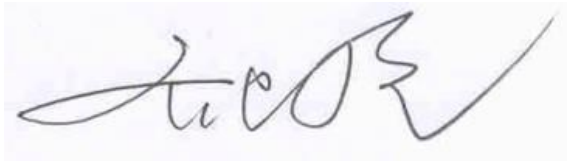
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	December 20, 2022
Testing End Date:	January 31, 2023

1.4 Signature

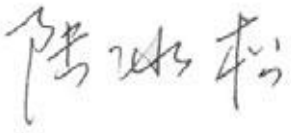
Lin Xiaojun

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)



Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

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2 Introduction

The equipment under test (EUT) is a smart phone. It contains the Qualcomm modem supporting 2G/3G/4G technologies and 5G NR Sub-6 GHz technologies. These modems enable Qualcomm Smart Transmit feature to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance with the FCC requirement.

In the Part 0 report, the EUT SAR are characterized for WWAN radios (2G/3G/4G/Sub6 NR) to determine the power limit that corresponds to the exposure design target after accounting for all device design related uncertainties, i.e., SAR_design_target (< FCC SAR limit) for sub-6. The SAR characterization are denoted as SAR Char. SAR Char will be used as input for Qualcomm Smart Transmit to operate. SAR Char will be loaded and store in the EUT via the Embedded File System (EFS).

The compliance test under the static transmission scenario and simultaneous transmission analysis are reported in Part 1 report. The validation of the time-averaging algorithm and compliance under the dynamic (time- varying) transmission scenario for WWAN technologies are reported in Part 2 report.

The EUT supports WLAN/BT radio as well but WLAN/BT modem is not enabled with Smart Transmit.

Nomenclature for Part 0 Report

Term	Description
P_{limit}	The time-averaged RF power which corresponds to SAR_design_target.
P_{max}	Maximum target power level
SAR_design_target:	The design target for SAR compliance. It should be less than regulatory power density limit to account for all device design related uncertainties.
SAR Char	P_{limit} for all the technologies/bands for all applicable DSI

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3 Equipment Under Test (EUT) Overview

Description:	Smart Phone
Model name:	PGT-N19
Tested Band:	GSM850/1900, WCDMA B2/4/B5 LTE Band2/4/5/7/12/13/17/25/26/38/41/66 5G NR N2/5/7/38/41/66/78 BT, Wi-Fi(2.4G), Wi-Fi(5G),NFC
Tx Frequency:	824 – 849 MHz (GSM 850)
	1850 – 1910 MHz (GSM 1900)
	824–849 MHz (WCDMA 850 Band V)
	1710 – 1755 MHz (WCDMA 1700 Band IV)
	1850–1910 MHz (WCDMA1900 Band II)
	1850 – 1910 MHz(LTE Band 2)
	1710 – 1755 MHz (LTE Band 4)
	824 – 849 MHz (LTE Band 5)
	2500 – 2570 MHz(LTE Band 7)
	699 – 716 MHz (LTE Band 12)
	777 –787 MHz (LTE Band 13)
	704 –716 MHz (LTE Band 17)
	1850 – 1915 MHz(LTE Band 25)
	814 – 849 MHz (LTE Band 26)
	2570 – 2620 MHz (LTE Band 38)
	2496 – 2690 MHz (LTE Band 41)
	1710 – 1780 MHz (LTE Band 66)
	2412 – 2462 MHz (Wi-Fi 2.4G)
	5180 – 5240 MHz (Wi-Fi 5.2G)
	5260 – 5320 MHz (Wi-Fi 5.3G)
	5500 – 5720 MHz (Wi-Fi 5.5G)
	5745 – 5825 MHz (Wi-Fi 5.8G)
	2400 – 2483.5 MHz (Bluetooth)
	1850 – 1910 MHz(n2)
	824 – 849 MHz(n5)
	2500 – 2570 MHz (n7)
	2570 – 2620 MHz (n38)
	2496 – 2690 MHz (n41)
	1710– 1780 MHz (n66)
	3450 – 3550 MHz (n78)
	13.56 MHz (NFC)
Rx Frequency:	869 – 894 MHz (GSM 850)
	1930 – 1990 MHz (GSM 1900)
	869 – 894 MHz (WCDMA 850 Band V)
	2110 – 2155 MHz (WCDMA 1700 Band IV)
	1930 – 1990 MHz (WCDMA1900 Band II)
	1930 – 1990 MHz(LTE Band 2)
	2110 – 2155 MHz (LTE Band 4)
	869 – 894 MHz (LTE Band 5)
	2620 – 2690 MHz(LTE Band 7)
	729 – 746 MHz (LTE Band 12)
	746 – 756 MHz (LTE Band 13)

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	734 –746 MHz (LTE Band 17)
	1930 – 1995 MHz(LTE Band 25)
	859 – 894 MHz (LTE Band 26)
	2570 – 2620 MHz (LTE Band 38)
	2496 – 2690 MHz (LTE Band 41)
	2110 – 2200 MHz (LTE Band 66)
	2400 – 2483.5 MHz (Wi-Fi 2.4G)
	5150 - 5250 MHz (Wi-Fi 5.2G)
	5250 - 5350 MHz (Wi-Fi 5.3G)
	5470 - 5725 MHz (Wi-Fi 5.5G)
	5725 - 5850 MHz (Wi-Fi 5.8G)
	2400 – 2483.5 MHz (Bluetooth)
	1930 – 1990 MHz(n2)
	869 – 894 MHz(n5)
	2620 – 2690 MHz (n7)
	2570 – 2620 MHz (n38)
	2496 – 2690 MHz (n41)
	2110 – 2200 MHz (n66)
	3450 – 3550 MHz (n78)
GPRS/EGPRS Multislot Class:	12
Test device production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Hotspot mode:	Support

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4 SAR Characterization

4.1 DSI and SAR Determination

This device uses different Device State Index (DSI) to configure different time averaged power levels based on certain exposure scenarios. Depending on the detection scheme implemented in the smartphone, the worst-case SAR is further grouped and determined for each or combined exposure scenario

DSI and Corresponding Exposure Scenarios

Scenario	Description
DSI1	Receiver on(Standalone)
DSI3	Receiver off(Standalone)
DSI5	Receiver on(WWAN+WLAN5G+BT)
DSI7	Receiver on(WWAN+WLAN2.4G)
DSI9	Receiver off(WWAN+WLAN5G+BT)
DSI11	Receiver off(WWAN+WLAN2.4G)
DSI13	Hotspot on

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4.2 SAR Design Target and Uncertainty

SAR_design_target is determined by ensuring that it is less than FCC SAR limit after accounting for total device designed related uncertainties specified by the manufacturer.
To account for total uncertainty, SAR_design_target should be determined as:

$$SAR\_design\_target < SARregulatory\_limit \times 10^{\frac{-total\ uncertainty}{10}}$$

Exposure conditions	Trigger Conditions	DSI	SAR design target	target-W/kg	report-W/kg	Remark
Head	Rcv On	1	1g SAR design target	0.69	0.98	For GSM
Head	Rcv On	1	1g SAR design target	0.78	0.98	For WCDMA & LTE
Head	Rcv On	1	1g SAR design target	0.69	0.98	For NR
Head	Rcv On+WIFI2.4G+Wifi5G+BT ANT1	5	1g SAR design target	0.22	0.31	For GSM
Head	Rcv On+WIFI2.4G+Wifi5G+BT ANT1	5	1g SAR design target	0.25	0.31	For WCDMA & LTE
Head	Rcv On+WIFI2.4G+Wifi5G+BT ANT1	5	1g SAR design target	0.22	0.31	For NR
Head	Rcv On+Wifi2.4G +BT ANT1 or Rcv On +Wifi5G+BT	7	1g SAR design target	0.18	0.25	For GSM
Head	Rcv On+Wifi2.4G +BT ANT1 or Rcv On +Wifi5G+BT	7	1g SAR design target	0.20	0.25	For WCDMA & LTE
Head	Rcv On+Wifi2.4G +BT ANT1 or Rcv On +Wifi5G+BT	7	1g SAR design target	0.18	0.25	For NR
Body Worn	Hotspot	13	1g SAR design target	0.69	0.98	For GSM
Body Worn	Hotspot	13	1g SAR design target	0.78	0.98	For WCDMA & LTE
Body Worn	Hotspot	13	1g SAR design target	0.69	0.98	For NR
Extremity	Rcv Off	3	10g SAR design target	1.98	2.8	For GSM
Extremity	Rcv Off	3	10g SAR design target	2.22	2.8	For WCDMA & LTE
Extremity	Rcv Off	3	10g SAR design target	1.98	2.8	For NR
Extremity	Rcv Off+WIFI2.4G+Wifi5G+BT ANT1	9	10g SAR design target	0.63	0.89	For GSM
Extremity	Rcv Off+WIFI2.4G+Wifi5G+BT ANT1	9	10g SAR design target	0.71	0.89	For WCDMA & LTE
Extremity	Rcv Off+WIFI2.4G+Wifi5G+BT ANT1	9	10g SAR design target	0.63	0.89	For NR
Extremity	Rcv Off+Wifi2.4G +BT ANT1 or Rcv On +Wifi5G+BT	11	10g SAR design target	0.50	0.70	For GSM
Extremity	Rcv Off+Wifi2.4G +BT ANT1 or Rcv On +Wifi5G+BT	11	10g SAR design target	0.56	0.70	For WCDMA & LTE
Extremity	Rcv Off+Wifi2.4G +BT ANT1 or Rcv On +Wifi5G+BT	11	10g SAR design target	0.50	0.70	For NR

	Uncertainty dB (k=2)3/4G(except B7/B38/B41)	Uncertainty dB (k=2)B7/B38/B41	Uncertainty dB (k=2)2G+NR
Sub6 radio TxAGC	1	1.2	1.5
Device to device variation	0.5	0.5	0.5
Total uncertainty	1.1	1.3	1.55

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4.2 SAR Char

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating. Plimit is calculated by linearly scaling with the measured SAR at the Ppart0 to correspond to the SAR_design_target. When Plimit < Pmax, Ppart0 was used as Plimit in the Smart Transmit EFS. When Plimit >Pmax and Ppart0=Pmax, calculated Pmax was used in the Smart Transmit EFS. All reported SAR obtained from the Ppart0 SAR tests was less than SAR_Design_target+ device uncertainty.

Band	Antenna	plimit							Pmax
		Head	body	WWAN+wifi5G+BT Head	WWAN+wifi2.4G Head	WWAN+wifi5G+BT body	WWAN+wifi2.4G body	WWAN+Hotspot	
		DSI 1	DSI 3	DSI 5	DSI 7	DSI 9	DSI 11	DSI 13	
GSM_B850	0	30	32.5	25	24	27.5	26.5	24	32.5
GSM_B850	3	29.4	32	24.4	23.4	27.5	26.5	23.4	32
GSM_B1900	4	26.5	29.5	21.5	20.5	24.5	23.5	20.5	29.5
GSM_B1900	1	29.2	29.2	27.2	26.2	24.6	23.6	23.6	29.2
LTE_B2	4	17.7	22.5	12.7	11.7	17.5	16.5	11.7	24
LTE_B2	1	23.7	22	21.7	20.7	17	16	16	23.7
LTE_B4	4	17.1	20.7	12.1	11.1	15.7	14.7	11.1	24.5
LTE_B4	1	24.2	22.7	22.2	21.2	17.7	16.7	16.7	24.2
LTE_B4	2	20.5	21.2	15.5	14.5	16.2	15.2	14.5	23
LTE_B4	8	17.9	19.5	12.9	11.9	14.5	13.5	11.9	20
LTE_B5	0	23.7	23.7	18.7	17.7	18.7	17.7	17.7	24.5
LTE_B5	3	20.7	24	15.7	14.7	19	18	14.7	**24**
LTE_B7	4	17	19.9	12	11	14.9	13.9	11	**24**
LTE_B7	1	21	21.2	16	15	16.2	15.2	15	**23.9**
LTE_B7	2	19.7	19.5	14.7	13.7	14.5	13.5	13.5	**22.5**
LTE_B7	8	16.6	18.2	11.6	10.6	13.5	12.5	10.6	**18.2**
LTE_B12	0	24.5	24.1	22.5	21.5	19.1	18.1	18.1	**24.5**
LTE_B12	3	21.9	24	16.9	15.9	22	21	15.9	**24**
LTE_B13	0	23.5	23.5	21.5	20.5	18.7	17.7	17.7	**23.5**
LTE_B13	3	23.1	23.1	19.3	18.3	21.1	20.1	18.3	**23.1**
LTE_B17	0	24.5	24.2	22.5	21.5	19.2	18.2	18.2	**24.5**
LTE_B17	3	22	24.1	17	16	22.1	21.1	16	**24.1**
LTE_B25	4	17.7	22.5	12.7	11.7	17.5	16.5	11.7	**24**
LTE_B25	1	23.5	21.8	21.5	20.5	16.8	15.8	15.8	**23.5**
LTE_B26	0	24.5	23.9	22.5	21.5	18.9	17.9	17.9	**24.5**
LTE_B26	3	20	24	15	14	20.6	19.6	14	**24**
LTE_B38	4	18.1	22.4	13.1	12.1	17.4	16.4	12.1	**24.5**
LTE_B38	1	23	22.7	18	17	17.7	16.7	16.7	**24.4**
LTE_B38	2	21.4	21.4	16.4	15.4	16.4	15.4	15.4	**22.4**
LTE_B38	8	19	19	14.7	13.7	16.1	15.1	13.7	**19**
LTE_B41-PC2	4	19.6	23.9	14.6	13.6	18.9	17.9	13.6	**26**
LTE_B41-PC2	1	24.5	24.2	19.5	18.5	19.2	18.2	18.2	**25.9**
LTE_B41-PC2	2	22.9	22.9	17.9	16.9	17.9	16.9	16.9	**23.9**
LTE_B41-PC2	8	20.3	20.3	15.3	14.3	18.1	17.1	14.3	**20.3**
LTE_B41-PC3	4	**18.1**	**22.4**	**13.1**	**12.1**	**17.4**	**16.4**	**12.1**	**24.5**
LTE_B41-PC3	1	**23**	**22.7**	**18**	**17**	**17.7**	**16.7**	**16.7**	**24.4**
LTE_B41-PC3	2	**21.4**	**21.4**	**16.4**	**15.4**	**16.4**	**15.4**	**15.4**	**22.4**
LTE_B41-PC3	8	**18.8**	**18.8**	**13.8**	**12.8**	**16.6**	**15.6**	**12.8**	**18.8**
LTE_B66	4	17.1	20.7	12.1	11.1	15.7	14.7	11.1	**24.5**
LTE_B66	1	24.2	22.7	22.2	21.2	17.7	16.7	16.7	**24.2**
LTE_B66	2	20.5	21.2	15.5	14.5	16.2	15.2	14.5	**23**
LTE_B66	8	17.6	19.2	12.6	11.6	14.2	13.2	11.6	**19.7**
NRSG_N2	4	16.8	20.8	11.8	10.8	15.8	14.8	10.8	**24**
NRSG_N2	1	23.7	21.5	20.7	19.7	16.5	15.5	15.5	**23.7**
NRSG_N2-NSA	2	18.2	18.5	13.2	12.2	13.5	12.5	12.2	**23**
NRSG_N2-NSA	8	15.2	18	10.2	9.2	13	12	9.2	**19.3**
NRSG_N5	0	23.9	23.9	18.9	17.9	18.9	17.9	17.9	**24.5**
NRSG_N5	3	20.1	24	15.1	14.1	19	18	14.1	**24**
NRSG_N7	4	16	19.2	11	10	14.2	13.2	10	**24**
NRSG_N7	1	20.7	20.3	15.7	14.7	15.3	14.3	14.3	**23.9**
NRSG_N7	2	19.1	19.1	14.1	13.1	14.1	13.1	13.1	**22.5**
NRSG_N7	8	16.7	18.8	11.7	10.7	13.8	12.8	10.7	**18.8**
NRSG_N38	4	16	19.2	11	10	14.2	13.2	10	**24.5**
NRSG_N38	1	20	20	15	14	15	14	14	24.4
NRSG_N38	2	19.1	19.1	14.1	13.1	14.1	13.1	13.1	22.4
NRSG_N38	8	16.2	19	11.2	10.2	14	13	10.2	19.2
NRSG_N41-PC2	4	15.9	19.2	10.9	9.9	14.2	13.2	9.9	**26**
NRSG_N41-PC2	1	20.1	20	15.1	14.1	15	14	14	**25.9**
NRSG_N41-PC2	2	19	19	14	13	14	13	13	**23.9**
NRSG_N41-PC2	8	16.5	19.4	11.5	10.5	14.4	13.4	10.5	**20**
NRSG_N41-PC3	4	15.9	19.2	10.9	9.9	14.2	13.2	9.9	**23**
NRSG_N41-PC3	1	20.1	20	15.1	14.1	15	14	14	**22.6**
NRSG_N41-PC3	2	19	19	14	13	14	13	13	**23**
NRSG_N41-PC3	8	16.5	18.7	11.5	10.5	14.4	13.4	10.5	**18.7**
NRSG_N66	4	16.8	20.2	11.8	10.8	15.2	14.2	10.8	24.5
NRSG_N66	1	24.2	22.3	21.2	20.2	17.3	16.3	16.3	**24.2**
NRSG_N66	2	20.2	21.8	15.2	14.2	16.8	15.8	14.2	**23**
NRSG_N66	8	17.6	19.6	12.6	11.6	14.6	13.6	11.6	**20.3**
NRSG_N78-PC2	4	14.9	18.4	9.9	8.9	13.4	12.4	8.9	**26**
NRSG_N78-PC2	7	16.3	20.8	11.3	10.3	15.8	14.8	10.3	**20.8**
NRSG_N78-PC2	2	17.6	18.2	12.6	11.6	13.2	12.2	11.6	**25.3**
NRSG_N78-PC2	6	16.1	17.3	11.1	10.1	12.3	11.3	10.1	**20.1**
NRSG_N78-PC3	4	14.9	18.4	9.9	8.9	13.4	12.4	8.9	**23**
NRSG_N78-PC3	7	16.3	20.8	11.3	10.3	15.8	14.8	10.3	**23.9**
NRSG_N78-PC3	2	17.6	18.2	12.6	11.6	13.2	12.2	11.6	**21.7**
NRSG_N78-PC3	6	16.1	17.3	11.1	10.1	12.3	11.3	10.1	**23**
WCDMA_B2	4	17.6	22.4	12.6	11.6	17.4	16.4	11.6	**24**
WCDMA_B2	1	23.7	22	21.7	20.7	17	16	16	**23.7**
WCDMA_B4	4	17.2	21.2	12.2	11.2	16.2	15.2	11.2	**24.5**
WCDMA_B4	1	23.7	22.6	21.7	20.7	17.6	16.6	16.6	**23.7**
WCDMA_B5	0	23.6	23.6	18.6	17.6	18.6	17.6	17.6	**24.5**
WCDMA_B5	3	21	24	16	15	19	18	15	**24**

Note:

1 When Pmax <Plimit, the DUT will operate at a power level up to Pmax.

2 Pmax is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + device uncertainty.

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5 Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

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