

RF Exposure Report

(Part 0: SAR Char Evaluation)

APPLICANT : Honor Device Co., Ltd.
EQUIPMENT : Smart Phone
BRAND NAME : HONOR
MODEL NAME : FNE-NX9
FCC ID : 2AYGCFNE-NX9
STANDARD : FCC 47 CFR PART 2 (2.1093)

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.



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History of this test report

Report No.	Version	Description	Issued Date
FA242802B	01	Initial issue of report	Jul. 08, 2022



1. Introduction

The RF exposure limit is defined based on time-averaged RF exposure. The product implements Qualcomm Smart Transmit feature which controls the instantaneous transmitting power for WWAN transmitter to ensure the product in compliance with RF exposure limit over a defined time window, for SAR (transmit frequency $\leq$ 6GHz) and power density (transmit frequency $>$ 6GHz) to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is compliant to the regulation requirement. Cannot operate without SAR characterization at the device level, beforehand.

This report describes the procedures for the SAR char generation, and the parameters obtained from SAR characterization (referred to as SAR char, respectively) will be used as input for Smart Transmit. Both SAR char will be entered via the Embedded File System (EFS) to enable the Smart Transmit Feature.

Terminologies in this report

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 uncertainty.
SAR char	P_{limit} for all the technologies/bands for all applicable DSI



2. Product Description

Product Feature & Specification	
Equipment Name	Smart Phone
Brand Name	HONOR
Model Name	FNE-NX9
FCC ID	2AYGCFNE-NX9
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66: 1710 MHz ~ 1780 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	GSM/GPRS/EGPRS AMR / RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM, 256QAM(Downlink only) 5G NR : CP-OFDM / DFT-s-OFDM, PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ax HE20/HE40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac/ax VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE NFC:ASK

3. SAR Characterization

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating at 6 GHz or below. It will then be used as input for Smart Transmit to control and manage RF exposure for $f < 6$ GHz.

3.1 SAR design target and uncertainty

SAR design target:

Band	Antenna	Head 1g SAR (W/kg)	Body Worn 1g SAR (W/kg)	Head simultaneous WWAN+wifi5G/ WWAN+Wi-Fi5G+BT 1g SAR (W/kg)	Head simultaneous WWAN+wifi2.4G 1g SAR (W/kg)	Body Worn simultaneous WWAN+wifi5G/ WWAN+Wi-Fi5G+BT 1g SAR (W/kg)	Body Worn simultaneous WWAN+wifi2.4G 1g SAR (W/kg)	Hotspot 1g SAR (W/kg)	Extremity 10g SAR (W/kg)	Extremity simultaneous WWAN+wifi5G/ WWAN+Wi-Fi5G+BT 10g SAR (W/kg)	Extremity simultaneous WWAN+wifi2.4G 10g SAR (W/kg)
		DSI1	DSI3	DSI5	DSI7	DSI9	DSI11	DSI13	DSI3	DSI9	DSI11
GSM850	0	0.69	0.69	0.08	0.10	0.08	0.10	0.16	1.98	0.95	1.11
GSM850	2	0.47	0.17	0.22	0.26	0.08	0.10	0.18	1.98	0.95	1.11
GSM1900	1	0.69	0.69	0.02	0.03	0.08	0.09	0.15	1.98	0.95	1.11
GSM1900	6	0.69	0.09	0.33	0.39	0.04	0.05	0.18	1.98	0.95	1.11
LTE Band 2	1	0.78	0.27	0.05	0.06	0.13	0.15	0.33	2.22	1.06	1.25
LTE Band 2	6	0.78	0.33	0.37	0.44	0.16	0.19	0.14	2.22	1.06	1.25
LTE Band 4	1	0.78	0.44	0.07	0.09	0.21	0.25	0.36	2.22	1.06	1.25
LTE Band 4	6	0.55	0.16	0.26	0.31	0.08	0.09	0.07	2.22	1.06	1.25
LTE Band 5	0	0.78	0.78	0.08	0.10	0.11	0.13	0.16	2.22	1.06	1.25
LTE Band 5	2	0.78	0.78	0.37	0.44	0.12	0.15	0.29	2.22	1.06	1.25
LTE Band 7	1	0.15	0.25	0.07	0.08	0.12	0.14	0.28	2.22	1.06	1.25
LTE Band 7	6	0.78	0.21	0.37	0.44	0.10	0.12	0.20	2.22	1.06	1.25
LTE Band 7	5	0.78	0.18	0.37	0.44	0.09	0.10	0.11	2.22	1.06	1.25
LTE Band 12	0	0.78	0.78	0.03	0.04	0.06	0.07	0.17	2.22	1.06	1.25
LTE Band 12	2	0.78	0.78	0.16	0.18	0.06	0.07	0.19	2.22	1.06	1.25
LTE Band 13	0	0.78	0.78	0.04	0.05	0.07	0.08	0.11	2.22	1.06	1.25
LTE Band 13	2	0.78	0.78	0.26	0.30	0.10	0.12	0.24	2.22	1.06	1.25
LTE Band 17	0	0.78	0.78	0.05	0.06	0.06	0.07	0.17	2.22	1.06	1.25
LTE Band 17	2	0.78	0.78	0.33	0.38	0.06	0.07	0.19	2.22	1.06	1.25
LTE Band 25	1	0.78	0.27	0.05	0.06	0.13	0.15	0.44	2.22	1.06	1.25
LTE Band 25	6	0.78	0.33	0.37	0.44	0.16	0.19	0.15	2.22	1.06	1.25
LTE Band 26	0	0.78	0.78	0.08	0.10	0.11	0.13	0.22	2.22	1.06	1.25
LTE Band 26	2	0.78	0.78	0.37	0.44	0.12	0.15	0.29	2.22	1.06	1.25
LTE Band 38	1	0.10	0.25	0.05	0.06	0.12	0.14	0.34	2.22	1.06	1.25
LTE Band 38	6	0.78	0.15	0.37	0.44	0.07	0.08	0.11	2.22	1.06	1.25
LTE Band 41	1	0.10	0.25	0.05	0.06	0.12	0.14	0.34	2.22	1.06	1.25
LTE Band 41	6	0.78	0.15	0.37	0.44	0.07	0.08	0.11	2.22	1.06	1.25
LTE Band 66	1	0.78	0.44	0.07	0.09	0.21	0.25	0.49	2.22	1.06	1.25
LTE Band 66	6	0.55	0.16	0.26	0.31	0.08	0.09	0.09	2.22	1.06	1.25
NR5G_N5	0	0.69	0.69	0.07	0.08	0.08	0.10	0.16	1.98	0.95	1.11
NR5G_N5	2	0.44	0.69	0.21	0.25	0.10	0.11	0.15	1.98	0.95	1.11
NR5G_N7	5	0.53	0.14	0.25	0.30	0.07	0.08	0.13	1.98	0.95	1.11
NR5G_N7	1	0.10	0.14	0.05	0.06	0.07	0.08	0.21	1.98	0.95	1.11
NR5G_N7	6	0.69	0.13	0.33	0.39	0.06	0.07	0.15	1.98	0.95	1.11
NR5G_N38	5	0.51	0.20	0.24	0.29	0.10	0.11	0.09	1.98	0.95	1.11
NR5G_N38	9	0.36	0.10	0.17	0.20	0.05	0.06	0.10	1.98	0.95	1.11
NR5G_N38	1	0.08	0.21	0.04	0.04	0.10	0.12	0.27	1.98	0.95	1.11
NR5G_N38	6	0.45	0.14	0.22	0.25	0.07	0.08	0.09	1.98	0.95	1.11
NR5G_N41	5	0.44	0.20	0.21	0.25	0.10	0.11	0.10	1.98	0.95	1.11
NR5G_N41	9	0.39	0.10	0.19	0.22	0.05	0.06	0.11	1.98	0.95	1.11
NR5G_N41	1	0.08	0.21	0.04	0.04	0.10	0.12	0.27	1.98	0.95	1.11
NR5G_N41	6	0.45	0.14	0.22	0.25	0.07	0.08	0.10	1.98	0.95	1.11

NR5G_N66	1	0.69	0.20	0.07	0.09	0.10	0.11	0.34	1.98	0.95	1.11
NR5G_N66	6	0.44	0.17	0.21	0.25	0.08	0.10	0.09	1.98	0.95	1.11
WCDMA Band 2	1	0.78	0.37	0.06	0.07	0.18	0.21	0.52	2.22	1.06	1.25
WCDMA Band 2	6	0.78	0.33	0.37	0.44	0.16	0.19	0.15	2.22	1.06	1.25
WCDMA Band 4	1	0.78	0.44	0.07	0.09	0.21	0.25	0.53	2.22	1.06	1.25
WCDMA Band 4	6	0.57	0.17	0.27	0.32	0.08	0.10	0.10	2.22	1.06	1.25
WCDMA Band 5	0	0.78	0.78	0.11	0.13	0.14	0.16	0.24	2.22	1.06	1.25
WCDMA Band 5	2	0.78	0.78	0.37	0.44	0.19	0.22	0.31	2.22	1.06	1.25

Uncertainty:

Item	Uncertainty dB (k=2) for 3G/4G (Excluding LTE B7/B38/B40/B41)	Uncertainty dB (k=2) for LTE B7/B38/B41	Uncertainty dB (k=2) for 2G/5G NR
Sub6 radio TxAGC	1.00	1.20	1.50
Device to device variation	0.50	0.50	0.50
Total uncertainty	1.10	1.30	1.55

To account for total uncertainty, SAR_design_target should be determined as:

$$SAR_{design_target} < SAR_{regulatory_limit} \times 10^{\frac{-total\ uncertainty}{10}}$$

3.2 SAR Char Table

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating at 6 GHz or below. It will then be used as input for Smart Transmit to control and manage RF exposure for $f < 6$ GHz.

<P_{limit} for supported technologies and bands (P_{limit} in EFS file)>

Band	Antenna	Head	Body Worn /Extremity	Head simultaneous WWAN+wifi5G/ WWAN+WiFi5G+BT	Head simultaneous WWAN+wifi2.4G	Body Worn /Extremity simultaneous WWAN+wifi5G/ WWAN+WiFi5G+BT	Body Worn /Extremity simultaneous WWAN+wifi2.4G	Hotspot	Pmax*
		DSI 1	DSI 3	DSI 5	DSI 7	DSI 9	DSI 11	DSI 13	
GSM850	0	30.1	29.9	20.8	21.5	20.8	21.5	20.8	24.0
GSM850	2	21.2	21.2	18.0	18.7	18.0	18.7	18.0	23.7
GSM1900	1	31.8	26.7	17.3	18.0	17.3	18.0	17.3	20.5
GSM1900	6	16.8	17.3	13.6	14.3	14.1	14.8	13.6	19.8
LTE Band 2	1	32.5	23.1	20.9	21.6	19.9	20.6	19.9	24.1
LTE Band 2	6	16.4	21.4	13.2	13.9	18.2	18.9	13.2	23.4
LTE Band 4	1	31.1	23.0	20.9	21.6	19.8	20.5	19.8	24.1
LTE Band 4	6	19.4	22.8	16.2	16.9	19.6	20.3	16.2	23.4
LTE Band 5	0	31.1	29.9	21.3	22.0	21.3	22.0	21.3	24.5
LTE Band 5	2	23.2	29.0	20.0	20.7	21.0	21.7	20.0	24.2
LTE Band 7	1	21.9	21.7	18.7	19.4	18.5	19.2	18.5	23.5
LTE Band 7	6	14.7	17.9	11.5	12.2	14.7	15.4	11.5	22.5
LTE Band 7	5	16.9	20.0	13.7	14.4	16.8	17.5	13.7	23.5
LTE Band 12	0	35.3	32.3	21.3	22.0	21.3	22.0	21.3	24.5
LTE Band 12	2	28.0	32.1	21.0	21.7	21.0	21.7	21.0	24.2
LTE Band 13	0	33.3	30.7	20.3	21.0	20.3	21.0	20.3	23.5
LTE Band 13	2	24.8	29.0	20.0	20.7	20.0	20.7	20.0	23.2
LTE Band 17	0	33.3	32.3	21.3	22.0	21.3	22.0	21.3	24.5
LTE Band 17	2	24.8	32.1	21.0	21.7	21.0	21.7	21.0	24.2
LTE Band 25	1	32.5	23.1	20.9	21.6	19.9	20.6	19.9	24.1
LTE Band 25	6	16.4	21.4	13.2	13.9	18.2	18.9	13.2	23.4
LTE Band 26	0	31.1	29.9	21.3	22.0	21.3	22.0	21.3	24.5
LTE Band 26	2	23.2	29.0	20.0	20.7	21.0	21.7	20.0	24.2
LTE Band 38	1	21.1	20.3	17.9	18.6	17.1	17.8	17.1	21.5
LTE Band 38	6	14.9	17.1	11.7	12.4	13.9	14.6	11.7	20.5
LTE Band 41	1	21.1	20.3	17.9	18.6	17.1	17.8	17.1	21.5
LTE Band 41	6	14.9	17.1	11.7	12.4	13.9	14.6	11.7	20.5
LTE Band 66	1	31.1	23.0	20.9	21.6	19.8	20.5	19.8	24.1
LTE Band 66	6	19.4	22.8	16.2	16.9	19.6	20.3	16.2	23.4
NR5G_N5	0	31.2	30.4	21.3	22.0	21.3	22.0	21.3	24.5
NR5G_N5	2	22.1	29.5	18.9	19.6	21.0	21.7	18.9	24.2
NR5G_N7	5	17.1	20.0	13.9	14.6	16.8	17.5	13.9	24.0
NR5G_N7	1	20.4	20.4	17.2	17.9	17.2	17.9	17.2	24.0
NR5G_N7	6	14.6	17.9	11.4	12.1	14.7	15.4	11.4	23.0
NR5G_N38	5	17.1	20.5	13.9	14.6	17.3	18.0	13.9	24.0
NR5G_N38	9	20.8	21.7	17.6	18.3	18.5	19.2	17.6	21.7
NR5G_N38	1	19.9	19.7	16.7	17.4	16.5	17.2	16.5	21.3
NR5G_N38	6	14.8	18.1	11.6	12.3	14.9	15.6	11.6	20.5
NR5G_N41_PC3	5	16.7	20.5	13.5	14.2	17.3	18.0	13.5	24.0
NR5G_N41_PC3	9	20.8	21.8	17.6	18.3	18.6	19.3	17.6	21.7
NR5G_N41_PC3	1	19.9	19.7	16.7	17.4	16.5	17.2	16.5	21.3
NR5G_N41_PC3	6	14.8	18.1	11.6	12.3	14.9	15.6	11.6	20.5
NR5G_N41_PC2	5	16.7	20.5	13.5	14.2	17.3	18.0	13.5	26.0
NR5G_N41_PC2	9	20.8	21.8	17.6	18.3	18.6	19.3	17.6	23.7
NR5G_N41_PC2	1	19.9	19.7	16.7	17.4	16.5	17.2	16.5	23.3

NR5G_N41 PC2	6	14.8	18.1	11.6	12.3	14.9	15.6	11.6	22.5
NR5G_N66	1	30.6	20.7	20.9	21.6	17.5	18.2	17.5	24.1
NR5G_N66	6	18.5	21.9	15.3	16.0	18.7	19.4	15.3	23.4
WCDMA Band 2	1	32.1	23.1	20.9	21.6	19.9	20.6	19.9	24.1
WCDMA Band 2	6	16.2	21.1	13.0	13.7	17.9	18.6	13.0	23.4
WCDMA Band 4	1	31.2	23.0	20.9	21.6	19.8	20.5	19.8	24.1
WCDMA Band 4	6	19.7	22.8	16.5	17.2	19.6	20.3	16.5	23.4
WCDMA Band 5	0	29.8	28.9	21.3	22.0	21.3	22.0	21.3	24.5
WCDMA Band 5	2	22.7	27.1	19.5	20.2	21.0	21.7	19.5	24.2

Note:

- 1) *Pmax is used for RF tune up procedure. The maximum allowed output power is equal to Pmax +TxAGC uncertainty.
- 2) All Plimit power levels entered in the Table correspond to average power levels after accounting for duty cycle in the case TDD modulation schemes (for e.g., GSM & LTE TDD).
- 3) If force peak is set to 'x' for a given tech/band/antenna/DSI in the EFS, then the Smart Transmit feature limits the maximum instantaneous Tx power to Plimit for the selected tech/band/antenna/DSI. In other words, with force peak set to 'x', under static condition (i.e., fixed tech/band/antenna/DSI) and in single active Tx scenario, Smart Transmit can guarantee Tx power level of Plimit at all times.
- 4) LTE Band 7 ant 5 only for EN-DC combination.
- 5) The following table is duty cycle and factor used for calculating time average power.

GSM/FDD/TDD	Duty Cycle	Time average calculation factor(dB)
GSM 1TX	12.50%	-9.0
GSM 2TX	25%	-6.0
GSM 3TX	37.50%	-4.3
GSM 4TX	50%	-3.0
FDD LTE	100%	0.0
TDD LTE	63.30%	-2.0
TDD HPUE	43.30%	-3.6
NR FDD/TDD	100%	0.0