

RF Exposure Report

(Part 0: SAR Char Evaluation)

APPLICANT : FCNT LLC.
EQUIPMENT : Mobile cellular phone
BRAND NAME : Raku-Raku smartphone
MODEL NAME : F-53E
FCC ID : 2BEPUFMP201
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 |
|------------|---------|-------------------------|---------------|
| FA480803C | 01 | Initial issue of report | Oct. 23, 2024 |
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1. Introduction

The Qualcomm® Smart Transmit™ 3.0 of Smart Transmit (GEN2) Feature operates based on pre-defined sub6 antenna groups (AG). This Device is enabled with the Qualcomm® Smart Transmit Gen2 feature. The RF exposure limit is defined based on time-averaged RF exposure. 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 $\leq 6\text{GHz}$). 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. Smart Transmit 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) version 20 to enable the Smart Transmit GEN2 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 | Mobile cellular phone |
| Brand Name | Raku-Raku smartphone |
| Model Name | F-53E |
| FCC ID | 2BEPUFMP201 |
| Wireless Technology and Frequency Range | GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3450 MHz ~ 3550 MHz 5G NR n78: 3450 MHz ~ 3550 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 RMC/AMR 12.2Kbps HSDPA/HSUPA DC-HSDPA HSPA+(16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM 5G NR : CP-OFDM / DFT-s-OFDM, PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 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 :

| Exposure Conditions | Measure Distance | SAR (W/kg) | |
|---------------------|------------------|----------------------|----------------------|
| | | WWAN 2/3/4/5G AG1 | WWAN 2/3/4/5G AG0 |
| Body Worn (1g) | 5 mm | 1.03 | 0.71 |
| Hotspot (1g) | 5 mm | 1.03 | 0.50 |
| Head (1g) | touch&tilt 15deg | 1.03 | 0.71 |
| Extremity (10g) | 0 mm | 2.55 | 1.98 |

Uncertainty:

| Item | Uncertainty dB (k=2) |
|-------------------|----------------------|
| Total uncertainty | 1.5 |

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

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

Antenna Group:

| | |
|-----------------------|-------------|
| Antenna Group 0 (AG0) | ANT4 & ANT5 |
| Antenna Group 1 (AG1) | ANT0 & ANT1 |

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 DSI 2 | Body-worn DSI 3 | Hotspot DSI 7 | Extremity DSI 6 | Sensor off DSI 4 | P _{max} * |
|-------------|---------|------------|-----------------|---------------|-----------------|------------------|--------------------|
| GSM850 | Ant 0 | 28.3 | 24.1 | 24.1 | 23.7 | 23.7 | 23.7 |
| GSM850 | Ant 4 | 17.8 | 24.8 | 23.7 | 23.7 | 25.0 | 25.0 |
| GSM1900 | Ant 1 | 29 | 19.8 | 20.3 | 22.9 | 19.5 | 19.5 |
| WCDMA V | Ant 0 | 29.3 | 24.8 | 24.8 | 23.0 | 23.0 | 23.0 |
| WCDMA V | Ant 4 | 19.5 | 23.3 | 21.7 | 22.0 | 22.0 | 22.0 |
| LTE Band 5 | Ant 0 | 30 | 24.8 | 24.8 | 23.0 | 23.0 | 23.0 |
| LTE Band 5 | Ant 4 | 18.6 | 24.4 | 22.9 | 22.0 | 22.0 | 22.0 |
| LTE Band 12 | Ant 0 | 29.8 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 |
| LTE Band 12 | Ant 4 | 19.2 | 23.4 | 22.5 | 22.0 | 22.0 | 22.0 |
| LTE Band 41 | Ant 1 | 27.8 | 20.9 | 20.6 | 22.9 | 21.0 | 21.0 |
| LTE Band 42 | Ant 5 | 17.3 | 19.2 | 17.7 | 21.3 | 21.0 | 21.0 |
| FR1 n78 | Ant 5 | 17.4 | 20.2 | 18.0 | 22.6 | 23.0 | 23.0 |

Note: 1) *P_{max} is used for RF tune up procedure. The maximum allowed output power is equal to P_{max} +1dB device uncertainty.

2) **All P_{limit} 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 & NR TDD).

3) The max allowed output power is the P_{limit} +1dB device uncertainty, and if P_{limit} is higher than P_{max}, the device output power will be P_{max} instead.

4) 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 |
| NR TDD | 100% | 0.0 |