

RF Exposure Report

(Part 0: SAR Char Evaluation)

FCC ID : 2ABTU-FN990A28
Equipment : 5G NR Module
Brand Name : RuggON
Model No. : PX501
Applicant : RuggON Corporation
4F, No. 298, Yang Guan St., Neihu Dist., Taipei City, Taiwan
Standard : FCC 47 CFR Part 2 (2.1093)

We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures 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., the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA4N2217C	01	Initial issue of report	Apr. 14, 2025

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) 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 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

Plimit	The time-averaged RF power which corresponds to SAR_design_target.
Pmax	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	Plimit for all the technologies/bands for all applicable DSI

Test Lab Information

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FCC Designation No.	TW1190
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2. 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.

2.1 SAR design target and uncertainty

<SAR design target and uncertainty>

The detail SAR design target relate to each exposure conditions pls refer to operation description

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

Band	Antenna	1g SAR design target (W/kg)	TDD duty cycle	Power Tolerance (dB)
WCDMA II	0	0.949	100.00%	1
WCDMA IV	0	0.949	100.00%	1
WCDMA V	0	0.949	100.00%	1
LTE Band 7	0	0.949	100.00%	1
LTE Band 12/17	0	0.949	100.00%	1
LTE Band 13	0	0.949	100.00%	1
LTE Band 14	0	0.949	100.00%	1
LTE Band 25/2	0	0.949	100.00%	1
LTE Band 26/5	0	0.949	100.00%	1
LTE Band 30	0	0.949	100.00%	1
LTE Band 66/4	0	0.949	100.00%	1
LTE Band 71	0	0.949	100.00%	1
LTE Band 41/38**	0	0.949	63.30%	1
LTE Band 41 HPUE**	0	0.949	43.30%	1
LTE Band 42**	3	0.949	63.30%	1
LTE Band 43**	3	0.949	63.30%	1
LTE Band 48**	3	0.949	63.30%	1
n5	0	0.949	100.00%	1
n7	0	0.949	100.00%	1
n25/2	0	0.949	100.00%	1
n30	0	0.949	100.00%	1
n66	0	0.949	100.00%	1
n71	0	0.949	100.00%	1
n38	0	0.949	100.00%	1
n41	0	0.849	100.00%	1.5
n41 HPUE**	0	0.949	50.00%	1
n41/n38	2	0.849	100.00%	1.5
n41 HPUE**	2	0.949	50.00%	1
n48	1	0.949	100.00%	1
n48	3	0.949	100.00%	1
n77/78	1	0.849	100.00%	1.5
n77/78 HPUE**	1	0.949	50.00%	1
n77/78	3	0.849	100.00%	1.5
n77/78 HPUE**	3	0.949	50.00%	1

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

2.2 SAR Char Table

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

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

**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).

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

Band	Antenna	TDD duty cycle	P _{limit} *		P _{max} * (dBm)	Power Tolerance (dB)
			DSI:0 Sensor off	DSI:1 Sensor on		
WCDMA II	0	100.00%	23.5	22.7	23.5	1
WCDMA IV	0	100.00%	23.5	20.3	23.5	1
WCDMA V	0	100.00%	24.2	24.2	23.5	1
LTE Band 7	0	100.00%	24.3	24.3	23.0	1
LTE Band 12/17	0	100.00%	27.6	27.6	23.0	1
LTE Band 13	0	100.00%	25.7	25.7	23.0	1
LTE Band 14	0	100.00%	25.4	25.4	23.0	1
LTE Band 25/2	0	100.00%	23.0	22.3	23.0	1
LTE Band 26/5	0	100.00%	24.3	24.3	23.0	1
LTE Band 30	0	100.00%	23.5	23.5	22.0	1
LTE Band 66/4	0	100.00%	23.0	20.4	23.0	1
LTE Band 71	0	100.00%	29.5	29.5	23.0	1
LTE Band 41/38**	0	63.30%	27.0	27.0	21.0	1
LTE Band 41 HPUE**	0	43.30%			21.9	1
LTE Band 42**	3	63.30%	13.9	13.9	19.5	1
LTE Band 43**	3	63.30%	15.2	15.2	19.5	1
LTE Band 48**	3	63.30%	14.5	14.5	19.5	1
n5	0	100.00%	24.1	24.1	23.5	1
n7	0	100.00%	23.7	23.7	23.5	1
n25/2	0	100.00%	23.5	22.0	23.5	1
n30	0	100.00%	23.7	23.7	22.0	1
n66	0	100.00%	23.5	21.0	23.5	1
n71	0	100.00%	30.2	30.2	23.5	1
n38	0	100.00%	24.7	24.7	24.0	1
n41	0	100.00%	23.6	23.6	23.0	1.5
n41 HPUE**	0	50.00%			23.5	1
n41/n38	2	100.00%	16.2	16.2	23.0	1.5
n41 HPUE**	2	50.00%			23.5	1
n48	1	100.00%	16.8	16.8	21.5	1
n48	3	100.00%	14.3	14.3	21.5	1
n77/78	1	100.00%	15.7	15.7	23.0	1.5
n77/78 HPUE**	1	50.00%			23.5	1
n77/78	3	100.00%	12.7	12.7	23.0	1.5
n77/78 HPUE**	3	50.00%			23.5	1