

RF Exposure Report

(Part 0: SAR Char Evaluation)

APPLICANT : Guangdong OPPO Mobile Telecommunications Corp., Ltd.
EQUIPMENT : Mobile Phone
BRAND NAME : OPPO
MODEL NAME : CPH2689
FCC ID : R9C-OP24222
STANDARD : FCC 47 CFR PART 2 (2.1093)

We, Sporton International Inc. (Shenzhen), 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. (Shenzhen), 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
FA491807C	01	Initial issue of report	Nov. 12, 2024

1. Introduction

The RF exposure limit is defined based on time-averaged RF exposure. The product implements MediaTek TA-SAR feature which controls the instantaneous transmitting power for WWAN and WLAN/BT 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. TA-SAR 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 TA-SAR algorithm. Both SAR char will be entered via the MediaTek's NV suggestion to enable the TA-SAR 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 ECI

2. Product Description

Product Feature & Specification	
Equipment Name	Mobile Phone
Brand Name	OPPO
Model Name	CPH2689
FCC ID	R9C-OP24222
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850MHz ~ 1910MHz 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 18: 815 MHz ~ 830 MHz LTE Band 19: 830 MHz ~ 845 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 n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n26: 814 MHz ~ 849 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz 5G NR n78: 3700 MHz ~ 3800 MHz, 3450MHz ~ 3550MHz 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 ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ac VHT20/VHT40 WLAN 2.4GHz 802.11ax HE20/HE40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80/VHT160 WLAN 5GHz 802.11ax 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 WWAN and WLAN/BT bands. It will then be used as input for TA-SAR algorithm to control and manage RF exposure for WWAN and WLAN/BT bands.

3.1 SAR design target and uncertainty

SAR design Target:

Band	Antenna	Body	Head	Hotspot	Head
		ECI 3	ECI 5	ECI 8	ECI 10
GSM850	Ant 0	0.46	0.92	0.70	0.78
GSM850	Ant 1	0.91	0.91	0.36	0.91
GSM1900	Ant 5	0.91	0.91	0.58	0.91
GSM1900	Ant 6	0.26	0.70	0.55	0.58
WCDMA II	Ant 5	0.24	0.91	0.42	0.91
WCDMA II	Ant 6	0.25	0.81	0.54	0.69
WCDMA IV	Ant 5	0.18	0.91	0.38	0.91
WCDMA IV	Ant 6	0.19	0.86	0.43	0.73
WCDMA IV	Ant 11	0.13	0.70	0.24	0.60
WCDMA IV	Ant 7	0.06	0.79	0.14	0.66
WCDMA V	Ant 0	0.31	0.92	0.57	0.78
WCDMA V	Ant 1	0.91	0.91	0.91	0.91
LTE Band 2	Ant 5	0.35	0.91	0.60	0.91
LTE Band 2	Ant 6	0.23	0.85	0.50	0.73
LTE Band 2	Ant 11	0.91	0.88	0.91	0.88
LTE Band 4	Ant 5	0.18	0.91	0.29	0.91
LTE Band 4	Ant 6	0.26	0.88	0.48	0.75
LTE Band 4	Ant 11	0.11	0.68	0.20	0.58
LTE Band 4	Ant 7	0.11	0.80	0.26	0.68
LTE Band 5	Ant 1	0.22	0.33	0.30	0.28
LTE Band 5	Ant 0	0.13	0.36	0.23	0.31
LTE Band 7	Ant 5	0.14	0.91	0.31	0.91
LTE Band 7	Ant 6	0.10	0.55	0.30	0.47
LTE Band 7	Ant 11	0.09	0.50	0.21	0.43
LTE Band 7	Ant 7	0.14	0.55	0.30	0.45
LTE Band 12	Ant 1	0.14	0.91	0.14	0.91
LTE Band 12	Ant 0	0.07	0.16	0.12	0.13
LTE Band 13	Ant 1	0.91	0.91	0.91	0.91
LTE Band 13	Ant 0	0.91	0.26	0.19	0.22
LTE Band 17	Ant 1	0.28	0.91	0.14	0.91
LTE Band 17	Ant 0	0.13	0.36	0.25	0.30
LTE Band 18	Ant 1	0.91	0.91	0.38	0.91
LTE Band 18	Ant 0	0.24	0.40	0.40	0.34
LTE Band 19	Ant 1	0.20	0.91	0.23	0.31
LTE Band 19	Ant 0	0.20	0.54	0.35	0.46
LTE Band 26	Ant 1	0.22	0.33	0.30	0.30
LTE Band 26	Ant 0	0.13	0.36	0.23	0.31
LTE Band 66	Ant 5	0.21	0.91	0.41	0.91
LTE Band 66	Ant 6	0.23	0.88	0.49	0.75
LTE Band 66	Ant 11	0.91	0.68	0.20	0.58
LTE Band 66	Ant 7	0.91	0.80	0.26	0.68
LTE Band 38	Ant 5	0.22	0.91	0.47	0.91
LTE Band 38	Ant 6	0.12	0.81	0.36	0.69
LTE Band 38	Ant 11	0.13	0.79	0.33	0.67
LTE Band 38	Ant 7	0.91	0.86	0.40	0.73
LTE Band 41 PC3	Ant 5	0.18	0.91	0.53	0.91



LTE Band 41 PC2	Ant 5	0.15	0.91	0.48	0.91
LTE Band 41 PC3	Ant 6	0.12	0.91	0.35	0.76
LTE Band 41 PC2	Ant 6	0.11	0.77	0.32	0.65
LTE Band 41 PC3	Ant 11	0.11	0.31	0.34	0.27
LTE Band 41 PC2	Ant 11	0.10	0.29	0.30	0.24
LTE Band 41 PC3	Ant 7	0.91	0.55	0.91	0.47
LTE Band 41 PC2	Ant 7	0.91	0.49	0.91	0.42
FR1 n2	Ant 5	0.27	0.91	0.55	0.91
FR1 n2	Ant 6	0.26	0.77	0.28	0.65
FR1 n5	Ant 1	0.15	0.91	0.33	0.30
FR1 n5	Ant 0	0.21	0.43	0.44	0.37
FR1 n7	Ant 5	0.20	0.91	0.25	0.91
FR1 n7	Ant 6	0.13	0.87	0.24	0.74
FR1 n7	Ant 11	0.11	0.84	0.27	0.72
FR1 n7	Ant 7	0.22	0.87	0.49	0.69
FR1 n12	Ant 1	0.10	0.91	0.09	0.91
FR1 n12	Ant 0	0.05	0.15	0.06	0.13
FR1 n26	Ant 1	0.15	0.91	0.22	0.32
FR1 n26	Ant 0	0.21	0.32	0.43	0.27
FR1 n66	Ant 5	0.23	0.91	0.46	0.91
FR1 n66	Ant 6	0.26	0.74	0.50	0.63
FR1 n66	Ant 11	0.91	0.79	0.24	0.67
FR1 n66	Ant 7	0.91	0.82	0.26	0.66
FR1 n38	Ant 5	0.14	0.91	0.26	0.91
FR1 n38	Ant 6	0.14	0.92	0.30	0.78
FR1 n38	Ant 11	0.11	0.84	0.25	0.72
FR1 n38	Ant 7	0.15	0.87	0.52	0.74
FR1 n41 PC3	Ant 5	0.2	0.91	0.21	0.91
FR1 n41 PC2	Ant 5				
FR1 n41 PC3	Ant 6	0.1	0.36	0.19	0.31
FR1 n41 PC2	Ant 6				
FR1 n41 PC3	Ant 11	0.1	0.27	0.21	0.23
FR1 n41 PC2	Ant 11				
FR1 n41 PC3	Ant 7	0.1	0.49	0.29	0.42
FR1 n41 PC2	Ant 7				
FR1 n77	Ant 9	0.09	0.73	0.09	0.61
FR1 n77	Ant 8	0.20	0.65	0.23	0.55
FR1 n77	Ant 6	0.09	0.56	0.16	0.46
FR1 n77	Ant 0	0.19	0.78	0.53	0.66
FR1 n78 PC3	Ant 9	0.2	0.49	0.17	0.41
FR1 n78 PC2	Ant 9				
FR1 n78 PC3	Ant 8	0.2	0.46	0.22	0.38
FR1 n78 PC2	Ant 8				
FR1 n78 PC3	Ant 6	0.2	0.80	0.27	0.61
FR1 n78 PC2	Ant 6				
FR1 n78 PC3	Ant 0	0.3	0.78	0.66	0.63
FR1 n78 PC2	Ant 0				

Head							
Band	Antenna	Standalone	BT+2.4G	BT+5G	BT+WWAN	2.4G+WWAN+BT	5G+WWAN+BT
Bluetooth	Ant 7	0.46	0.46	0.28	0.28	0.10	0.10

Hotspot							
Band	Antenna	Standalone	BT+2.4G	BT+5G	BT+WWAN	2.4G+WWAN+BT	5G+WWAN+BT
Bluetooth	Ant 7	0.91	0.91	0.20	0.91	0.10	0.10

Body-worn							
Band	Antenna	Standalone	BT+2.4G	BT+5G	BT+WWAN	2.4G+WWAN+BT	5G+WWAN+BT
Bluetooth	Ant 7	0.91	0.91	0.08	0.91	0.10	0.10

Extremity							
Band	Antenna	Standalone	BT+2.4G	BT+5G	BT+WWAN	2.4G+WWAN+BT	5G+WWAN+BT
Bluetooth	Ant 7	2.28	2.28	1.28	2.28	0.51	0.51

Head							
Band	Antenna	Standalone	Simultaneous (2.4G+5G)	Simultaneous (2.4G/5G+BT)	Simultaneous (2.4G/5G+WWAN)	Simultaneous (2.4G/5G+WWAN+BT)	Simultaneous (WWAN+2.4G+5G)
WLAN2.4GHz	7	0.77	0.55	0.48	0.34	0.22	0.20
WLAN2.4GHz	12	0.77	0.77	0.48	0.34	0.22	0.27
WLAN2.4GHz	7+12	0.77	0.77	0.48	0.34	0.22	0.27
WLAN5.2GHz	9	0.63	0.52	0.63	0.29	0.18	0.23
WLAN5.2GHz	8	0.63	0.42	0.63	0.29	0.18	0.19
WLAN5.2GHz	9+8	0.63	0.52	0.63	0.29	0.18	0.23
WLAN5.3GHz	9	0.63	0.52	0.63	0.29	0.18	0.23
WLAN5.3GHz	8	0.63	0.42	0.63	0.29	0.18	0.19
WLAN5.3GHz	9+8	0.63	0.52	0.63	0.29	0.18	0.23
WLAN5.5GHz	9	0.79	0.56	0.79	0.35	0.20	0.28
WLAN5.5GHz	8	0.79	0.44	0.79	0.35	0.20	0.22
WLAN5.5GHz	9+8	0.79	0.56	0.79	0.35	0.20	0.28
WLAN5.8GHz	9	0.54	0.54	0.54	0.26	0.16	0.26
WLAN5.8GHz	8	0.54	0.39	0.54	0.26	0.16	0.19
WLAN5.8GHz	9+8	0.54	0.54	0.54	0.26	0.16	0.26

Hotspot							
Band	Antenna	Standalone	Simultaneous (2.4G+5G)	Simultaneous (2.4G/5G+BT)	Simultaneous (2.4G/5G+WWAN)	Simultaneous (2.4G/5G+WWAN+BT)	Simultaneous (WWAN+2.4G+5G)
WLAN2.4GHz	7	0.69	0.54	0.43	0.43	0.38	0.38
WLAN2.4GHz	12	0.69	0.54	0.43	0.43	0.38	0.38
WLAN2.4GHz	7+12	0.69	0.54	0.43	0.43	0.38	0.38
WLAN5.2GHz	9	0.91	0.43	0.91	0.38	0.24	0.26
WLAN5.2GHz	8	0.91	0.43	0.91	0.38	0.24	0.26
WLAN5.2GHz	9+8	0.91	0.43	0.91	0.38	0.24	0.26
WLAN5.8GHz	9	0.35	0.35	0.35	0.35	0.31	0.28
WLAN5.8GHz	8	0.35	0.35	0.35	0.35	0.31	0.28
WLAN5.8GHz	9+8	0.35	0.35	0.35	0.35	0.31	0.28

Body-worn							
Band	Antenna	Standalone	Simultaneous (2.4G+5G)	Simultaneous (2.4G/5G+BT)	Simultaneous (2.4G/5G+WWAN)	Simultaneous (2.4G/5G+WWAN+BT)	Simultaneous (WWAN+2.4G+5G)
WLAN2.4GHz	7	0.20	0.16	0.12	0.12	0.10	0.10
WLAN2.4GHz	12	0.20	0.16	0.12	0.12	0.10	0.10
WLAN2.4GHz	7+12	0.20	0.16	0.12	0.12	0.10	0.10
WLAN5.2GHz	9	0.91	0.20	0.91	0.17	0.12	0.14
WLAN5.2GHz	8	0.91	0.20	0.91	0.17	0.12	0.14
WLAN5.2GHz	9+8	0.91	0.20	0.91	0.17	0.12	0.14
WLAN5.3GHz	9	0.25	0.20	0.25	0.17	0.12	0.14
WLAN5.3GHz	8	0.25	0.20	0.25	0.17	0.12	0.14
WLAN5.3GHz	9+8	0.25	0.20	0.25	0.17	0.12	0.14
WLAN5.5GHz	9	0.22	0.22	0.22	0.22	0.17	0.17
WLAN5.5GHz	8	0.22	0.22	0.22	0.22	0.17	0.17
WLAN5.5GHz	9+8	0.22	0.22	0.22	0.22	0.17	0.17
WLAN5.8GHz	9	0.19	0.19	0.19	0.19	0.17	0.15
WLAN5.8GHz	8	0.19	0.19	0.19	0.19	0.17	0.15
WLAN5.8GHz	9+8	0.19	0.19	0.19	0.19	0.17	0.15

Extremity							
Band	Antenna	Standalone	Simultaneous (2.4G+5G)	Simultaneous (2.4G/5G+BT)	Simultaneous (2.4G/5G+WWAN)	Simultaneous (2.4G/5G+WWAN+BT)	Simultaneous (WWAN+2.4G+5G)
WLAN2.4GHz	7	2.28	1.81	1.44	1.44	1.14	1.14
WLAN2.4GHz	12	2.28	1.81	1.44	1.44	1.14	1.14
WLAN2.4GHz	7+12	2.28	1.81	1.44	1.44	1.14	1.14
WLAN5.2GHz	9	2.28	1.81	2.28	1.61	1.14	1.28
WLAN5.2GHz	8	2.28	1.81	2.28	1.61	1.14	1.28
WLAN5.2GHz	9+8	2.28	1.81	2.28	1.61	1.14	1.28
WLAN5.3GHz	9	1.94	1.54	1.94	1.37	0.97	1.09
WLAN5.3GHz	8	1.94	1.54	1.94	1.37	0.97	1.09
WLAN5.3GHz	9+8	1.94	1.54	1.94	1.37	0.97	1.09
WLAN5.5GHz	9	1.08	1.08	1.08	1.08	0.86	0.86
WLAN5.5GHz	8	1.08	1.08	1.08	1.08	0.86	0.86
WLAN5.5GHz	9+8	1.08	1.08	1.08	1.08	0.86	0.86
WLAN5.8GHz	9	2.28	2.28	2.28	2.28	1.81	1.81
WLAN5.8GHz	8	2.28	2.28	2.28	2.28	1.81	1.81
WLAN5.8GHz	9+8	2.28	2.28	2.28	2.28	1.81	1.81

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 WWAN and WLAN/BT bands. It will then be used as input for TA-SAR algorithm to control and manage RF exposure for WWAN and WLAN/BT bands.

<P_{limit} for supported technologies and bands>

Band	Antenna	ECI 3	ECI 5	ECI 8	ECI 10	Pmax*	Total Uncertainty dB (k=2)
GSM850	Ant 0	23.1	20.1	21.6	19.4	23.6	1.2
GSM850	Ant 1	31.0	28.4	23.5	28.4	24.0	1.2
GSM1900	Ant 5	26.9	31.1	20.0	31.1	21.3	1.2
GSM1900	Ant 6	19.8	16.2	18.1	15.4	20.5	1.2
WCDMA II	Ant 5	20.7	32.7	18.8	32.7	22.6	1.2
WCDMA II	Ant 6	18.2	15.6	16.5	14.9	21.8	1.2
WCDMA IV	Ant 5	20.3	31.9	18.4	31.9	23.6	1.2
WCDMA IV	Ant 6	19.9	16.6	18.0	15.9	22.8	1.2
WCDMA IV	Ant 11	20.1	20.3	18.2	19.6	23.0	1.2
WCDMA IV	Ant 7	17.4	17.3	15.5	16.5	20.7	1.2
WCDMA V	Ant 0	22.0	20.7	20.3	20.0	23.2	1.2
WCDMA V	Ant 1	30.4	28.0	27.2	28.0	23.6	1.2
LTE Band 2	Ant 5	21.4	33.1	19.5	33.1	22.6	1.2
LTE Band 2	Ant 6	18.6	16.0	16.8	15.3	21.8	1.2
LTE Band 2	Ant 11	31.1	20.3	26.6	20.3	21.8	1.2
LTE Band 4	Ant 5	20.9	31.5	19.0	31.5	23.8	1.2
LTE Band 4	Ant 6	20.9	17.3	19.0	16.6	23.0	1.2
LTE Band 4	Ant 11	22.7	20.4	21.0	19.7	23.2	1.2
LTE Band 4	Ant 7	20.4	18.0	18.8	17.3	20.9	1.2
LTE Band 5	Ant 1	22.7	23.6	20.8	22.9	23.8	1.2
LTE Band 5	Ant 0	18.4	17.1	16.6	16.4	23.4	1.2
LTE Band 7	Ant 5	18.3	30.2	16.4	30.2	23.8	1.2
LTE Band 7	Ant 6	17.7	15.0	15.8	14.3	23.2	1.2
LTE Band 7	Ant 11	15.7	12.6	13.8	11.9	23.3	1.2
LTE Band 7	Ant 7	18.3	15.0	16.6	14.2	20.3	1.2
LTE Band 12	Ant 1	20.9	32.4	19.1	32.4	22.6	1.2
LTE Band 12	Ant 0	19.9	18.6	18.2	17.9	22.2	1.2
LTE Band 13	Ant 1	28.7	29.4	26.6	29.4	22.6	1.2
LTE Band 13	Ant 0	31.9	19.8	20.6	19.1	22.2	1.2
LTE Band 17	Ant 1	21.9	32.4	20.1	32.4	22.6	1.2
LTE Band 17	Ant 0	20.9	19.6	19.2	18.9	22.2	1.2
LTE Band 18	Ant 1	30.1	29.1	23.3	29.1	23.8	1.2
LTE Band 18	Ant 0	21.7	18.6	19.9	17.9	23.4	1.2
LTE Band 19	Ant 1	23.3	28.4	21.8	22.9	23.8	1.2
LTE Band 19	Ant 0	19.4	18.1	17.6	17.4	23.4	1.2
LTE Band 26	Ant 1	23.0	23.3	21.3	22.9	23.8	1.2
LTE Band 26	Ant 0	18.4	17.1	16.6	16.4	23.4	1.2
LTE Band 66	Ant 5	20.8	31.5	18.9	31.5	23.8	1.2
LTE Band 66	Ant 6	20.7	17.5	18.8	16.8	23.0	1.2
LTE Band 66	Ant 11	32.8	21.6	21.5	20.9	23.2	1.2
LTE Band 66	Ant 7	30.5	18.6	19.1	17.9	20.9	1.2
LTE Band 38	Ant 5	19.5	30.0	17.7	30.0	21.8	1.2
LTE Band 38	Ant 6	18.8	15.9	17.0	15.2	21.1	1.2
LTE Band 38	Ant 11	17.4	15.3	15.5	14.6	21.3	1.2
LTE Band 38	Ant 7	26.9	16.6	17.6	15.9	18.1	1.2
LTE Band 41 PC3	Ant 5	19.5	31.4	17.7	31.4	19.6	1.2
LTE Band 41 PC2	Ant 5					21.0	1.2
LTE Band 41 PC3	Ant 6	18.4	15.5	16.5	14.7	18.9	1.2



LTE Band 41 PC2	Ant 6					20.3	1.2
LTE Band 41 PC3	Ant 11					19.1	1.2
LTE Band 41 PC2	Ant 11	17.4	11.6	15.6	10.9	20.5	1.2
LTE Band 41 PC3	Ant 7					16.1	1.2
LTE Band 41 PC2	Ant 7	27.0	15.0	21.0	14.3	17.5	1.2
FR1 n2	Ant 5	22.1	30.8	20.2	30.8	23.0	1.2
FR1 n2	Ant 6	19.3	16.6	17.6	15.9	22.4	1.2
FR1 n5	Ant 1	23.9	28.6	23.0	24.1	24.7	1.2
FR1 n5	Ant 0	21.9	18.4	20.0	17.6	24.3	1.2
FR1 n7	Ant 5	20.0	31.5	18.1	31.5	24.7	1.2
FR1 n7	Ant 6	18.4	16.9	16.6	16.2	24.1	1.2
FR1 n7	Ant 11	17.4	15.5	15.5	14.8	24.2	1.2
FR1 n7	Ant 7	20.0	17.0	18.1	16.3	21.1	1.2
FR1 n12	Ant 1	19.4	31.8	17.5	31.8	23.0	1.2
FR1 n12	Ant 0	18.5	17.6	16.8	16.8	22.6	1.2
FR1 n26	Ant 1	23.9	28.5	22.0	24.1	24.7	1.2
FR1 n26	Ant 0	21.9	17.4	20.0	16.6	24.3	1.2
FR1 n66	Ant 5	21.8	32.0	19.9	32.0	24.7	1.2
FR1 n66	Ant 6	21.3	17.0	19.5	16.3	23.9	1.2
FR1 n66	Ant 11	32.3	21.2	23.0	20.5	24.1	1.2
FR1 n66	Ant 7	30.0	17.7	20.2	17.0	21.8	1.2
FR1 n38	Ant 5	19.9	30.5	18.1	30.5	24.7	1.2
FR1 n38	Ant 6	19.6	16.3	17.7	15.6	24.0	1.2
FR1 n38	Ant 11	17.3	15.8	15.5	15.1	24.2	1.2
FR1 n38	Ant 7	19.7	17.3	18.0	16.6	21.2	1.2
FR1 n41 PC3	Ant 5					22.0	1.2
FR1 n41 PC2	Ant 5	18.8	30.8	17.0	30.8	25.0	1.2
FR1 n41 PC3	Ant 6					21.3	1.2
FR1 n41 PC2	Ant 6	18.2	12.7	16.3	12.0	24.3	1.2
FR1 n41 PC3	Ant 11					21.5	1.2
FR1 n41 PC2	Ant 11	17.5	11.4	15.6	10.7	24.5	1.2
FR1 n41 PC3	Ant 7					18.5	1.2
FR1 n41 PC2	Ant 7	18.3	14.2	16.4	13.5	21.5	1.2
FR1 n77	Ant 9	15.2	10.8	13.3	10.0	23.0	1.2
FR1 n77	Ant 8	17.5	14.7	15.7	14.0	22.2	1.2
FR1 n77	Ant 6	19.9	16.0	18.0	15.3	21.5	1.2
FR1 n77	Ant 0	18.3	13.8	16.5	13.0	21.0	1.2
FR1 n78 PC3	Ant 9					23.0	1.2
FR1 n78 PC2	Ant 9	17.3	13.3	15.4	12.6	26.0	1.2
FR1 n78 PC3	Ant 8					23.1	1.2
FR1 n78 PC2	Ant 8	18.5	13.6	16.6	12.8	26.1	1.2
FR1 n78 PC3	Ant 6					22.0	1.2
FR1 n78 PC2	Ant 6	21.5	14.4	19.6	13.5	24.5	1.2
FR1 n78 PC3	Ant 0					21.5	1.2
FR1 n78 PC2	Ant 0	20.3	14.0	18.4	12.8	24.5	1.2

Head									
Band	Antenna	Standalone	BT+2.4G	BT+5G	BT+WWAN	2.4G+ WWAN +BT	5G+ WWAN +BT	Pmax*	Total Uncertainty dB (k=2)
Bluetooth	Ant 7	15.0	15.0	12.0	15.0	7.0	7.0	18.2	1.2

Body									
Band	Antenna	Standalone	BT+2.4G	BT+5G	BT+ WWAN	2.4G+ WWAN +BT	5G+ WWAN +BT	Pmax*	Total Uncertainty dB (k=2)
Bluetooth	Ant 7	21.0	21.0	15.0	21.0	11.0	11.0	18.2	1.2



Head									
Band	Antenna	Standalone	Simultaneous (2.4G+5G)	Simultaneous (2.4G/5G+BT)	Simultaneous (2.4G/5G+ WWAN)	Simultaneous (2.4G/5G+ WWAN +BT)	Simultaneous (WWAN +2.4G+5G)	Pmax*	Total Uncertainty dB (k=2)
WLAN2.4GHz	7	12.5	12.5	10.5	9.0	7.0	8.0	22.8	1.2
WLAN2.4GHz	12	12.5	12.5	10.5	9.0	7.0	8.0	22.8	1.2
WLAN2.4GHz	7+12	12.5	12.5	10.5	9.0	7.0	8.0	25.8	1.2
WLAN5.2GHz	9	12.5	11.5	12.5	9.0	7.0	8.0	14.8	1.2
WLAN5.2GHz	8	12.5	11.5	12.5	9.0	7.0	8.0	14.8	1.2
WLAN5.2GHz	9+8	12.5	11.5	12.5	9.0	7.0	8.0	17.8	1.2
WLAN5.3GHz	9	12.5	11.5	12.5	9.0	7.0	8.0	15.8	1.2
WLAN5.3GHz	8	12.5	11.5	12.5	9.0	7.0	8.0	15.8	1.2
WLAN5.3GHz	9+8	12.5	11.5	12.5	9.0	7.0	8.0	18.8	1.2
WLAN5.5GHz	9	11.5	10.5	11.5	8.8	6.0	7.5	13.8	1.2
WLAN5.5GHz	8	11.5	10.5	11.5	8.8	6.0	7.5	13.8	1.2
WLAN5.5GHz	9+8	11.5	10.5	11.5	8.8	6.0	7.5	16.8	1.2
WLAN5.8GHz	9	10.5	10.5	10.5	7.0	5.0	7.0	15.8	1.2
WLAN5.8GHz	8	10.5	10.5	10.5	7.0	5.0	7.0	15.8	1.2
WLAN5.8GHz	9+8	10.5	10.5	10.5	7.0	5.0	7.0	18.8	1.2

Body									
Band	Antenna	Standalone	Simultaneous (2.4G+5G)	Simultaneous (2.4G/5G+BT)	Simultaneous (2.4G/5G+ WWAN)	Simultaneous (2.4G/5G+ WWAN +BT)	Simultaneous (WWAN +2.4G+5G)	Pmax*	Total Uncertainty dB (k=2)
WLAN2.4GHz	7	16.5	15.5	14.5	14.5	13.5	13.5	22.8	1.2
WLAN2.4GHz	12	16.5	15.5	14.5	14.5	13.5	13.5	22.8	1.2
WLAN2.4GHz	7+12	16.5	15.5	14.5	14.5	13.5	13.5	25.8	1.2
WLAN5.2GHz	9	21.0	13.5	21.0	13.0	11.5	12.0	14.8	1.2
WLAN5.2GHz	8	21.0	13.5	21.0	13.0	11.5	12.0	14.8	1.2
WLAN5.2GHz	9+8	21.0	13.5	21.0	13.0	11.5	12.0	17.8	1.2
WLAN5.3GHz	9	14.5	13.5	14.5	13.0	11.5	12.0	15.8	1.2
WLAN5.3GHz	8	14.5	13.5	14.5	13.0	11.5	12.0	15.8	1.2
WLAN5.3GHz	9+8	14.5	13.5	14.5	13.0	11.5	12.0	18.8	1.2
WLAN5.5GHz	9	12.0	12.0	12.0	12.0	11.0	11.0	13.8	1.2
WLAN5.5GHz	8	12.0	12.0	12.0	12.0	11.0	11.0	13.8	1.2
WLAN5.5GHz	9+8	12.0	12.0	12.0	12.0	11.0	11.0	16.8	1.2
WLAN5.8GHz	9	12.5	12.5	12.5	12.5	12.0	11.5	15.8	1.2
WLAN5.8GHz	8	12.5	12.5	12.5	12.5	12.0	11.5	15.8	1.2
WLAN5.8GHz	9+8	12.5	12.5	12.5	12.5	12.0	11.5	18.8	1.2

- Note: 1) *P_{max} is used for RF tune up procedure. The maximum allowed output power is equal to P_{max} +total 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 & NR TDD).
- 3) The max allowed output power is the Plimit +total uncertainty, and if Plimit 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
TDD HPUE	43.30%	-3.6
NR FDD/TDD	100%	0.0