RF Exposure Evaluation

(Mobile Condition)

FCC ID	:	**A4RG9S9B**
Equipment	:	**Phone**
Applicant	:	**Google LLC** **1600 Amphitheatre Parkway,** **Mountain View, California, 94043 USA**
Standard	:	**47 CFR Part 2.1091**

We, SPORTON INTERNATIONAL INC has been evaluated in accordance with 47 CFR Part 2.1091 for the device and pass the limit.

The results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cona Huang / Deputy Manager

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA0D2942-18A	Rev. 01	Initial issue of report	Nov. 18, 2022

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
Equipment Name	Phone
FCC ID	A4RG9S9B
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 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 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 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 n25 : 1850 MHz ~ 1915 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n77: 3450 MHz ~ 3550 MHz 5G NR n260 : 37 GHz~40 GHz 5G NR n261 : 27.5 GHz~28.35 GHz WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz WLAN 5.8G UNII4 Band: 5850 MHz ~ 5895 MHz WLAN 6E: 5925 MHz ~ 6425 MHz, 6425 MHz ~ 6525 MHz, 6525 MHz ~ 6875 MHz, 6875 MHz ~ 7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz WPT: 110KHz ~ 148.5KHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE NFC:ASK WPT: Loop
Remark: **1.** Enable SP mode for UNII-5 and UNII-7.	

Reviewed by: Jason Wang

Report Producer: Paula Chen

2. Maximum Tune-up Limit (unit: dBm)

General Note:

1. For each cellular band, the device has 5 antennas, the antenna selection is based on the connection quality condition, and only one antenna will transmit at a time.
2. The maximum power of the WWAN antenna will be selected to evaluate the power density
3. For MPE calculation is using the highest output among 2Tx switching antennas for each frequency band.

<WWAN Maximum Power>

Maximum Transmit Power Level (dBm)				
Band	Config	Antenna	duty cycle	Default
				Index 1
GSM850 GPRS 1TX	TX0	0	12.50%	33.5
GSM850 GPRS 2TX	TX0	0	25.00%	32.5
GSM850 GPRS 3TX	TX0	0	37.50%	31.5
GSM850 GPRS 4TX	TX0	0	50.00%	30.5
GSM850 EDGE 1TX	TX0	0	12.50%	28.0
GSM850 EDGE 2TX	TX0	0	25.00%	27.5
GSM850 EDGE 3TX	TX0	0	37.50%	27.5
GSM850 EDGE 4TX	TX0	0	50.00%	25.5
GSM1900 GPRS 1TX	TX0	2	12.50%	31.0
GSM1900 GPRS 2TX	TX0	2	25.00%	29.5
GSM1900 GPRS 3TX	TX0	2	37.50%	29.0
GSM1900 GPRS 4TX	TX0	2	50.00%	28.0
GSM1900 EDGE 1TX	TX0	2	12.50%	26.0
GSM1900 EDGE 2TX	TX0	2	25.00%	25.0
GSM1900 EDGE 3TX	TX0	2	37.50%	25.0
GSM1900 EDGE 4TX	TX0	2	50.00%	24.0
WCDMA B2	TX0	2	100.00%	25.0
WCDMA B4	TX0	2	100.00%	25.0
WCDMA B5	TX0	0	100.00%	25.0
LTE B7	TX0	2	100.00%	24.6
LTE B12/17	TX0	0	100.00%	25.0
LTE B13	TX0	0	100.00%	25.0
LTE B14	TX0	0	100.00%	25.0
LTE B25/2	TX0	2	100.00%	25.0
LTE B26/5	TX0	0	100.00%	25.0
LTE B30	TX0	2	100.00%	25.0
LTE B41/B38 PC3	TX0	2	63.30%	23.8
LTE B41/B38 PC2	TX0	2	43.30%	26.8
LTE B48	TX0	6	63.30%	24.0
LTE B66/4	TX0	2	100.00%	25.0
LTE B71	TX0	0	100.00%	25.0
FR1 n25/2	TX0	2	100.00%	25.0
FR1 n5	TX0	0	100.00%	25.0
FR1 n7	TX0	2	100.00%	24.6
FR1 n12	TX0	0	100.00%	25.0
FR1 n30	TX0	2	100.00%	25.0
FR1 n41/38 PC3	TX0	5	100.00%	24.8
FR1 n41 PC2	TX0	5	50.00%	26.8
FR1 n66	TX0	2	100.00%	25.0
FR1 n71	TX0	0	100.00%	25.0
FR1 n77 PC3	TX0	6	100.00%	25.0
FR1 n77 PC2	TX0	6	50.00%	27.0

Maximum Transmit Power Level (dBm)				
Band	Config	Antenna	duty cycle	Default
				Index 1
GSM850 GPRS 1TX	TX1	1	12.50%	33.9
GSM850 GPRS 2TX	TX1	1	25.00%	32.4
GSM850 GPRS 3TX	TX1	1	37.50%	31.4
GSM850 GPRS 4TX	TX1	1	50.00%	30.4
GSM850 EDGE 1TX	TX0	1	12.50%	27.9
GSM850 EDGE 2TX	TX0	1	25.00%	27.4
GSM850 EDGE 3TX	TX0	1	37.50%	27.4
GSM850 EDGE 4TX	TX0	1	50.00%	25.4
GSM1900 GPRS 1TX	TX1	0	12.50%	30.7
GSM1900 GPRS 2TX	TX1	0	25.00%	29.2
GSM1900 GPRS 3TX	TX1	0	37.50%	28.7
GSM1900 GPRS 4TX	TX1	0	50.00%	27.7
GSM1900 EDGE 1TX	TX0	0	12.50%	25.7
GSM1900 EDGE 2TX	TX0	0	25.00%	24.7
GSM1900 EDGE 3TX	TX0	0	37.50%	24.7
GSM1900 EDGE 4TX	TX0	0	50.00%	23.7
WCDMA B2	TX1	0	100.00%	24.7
WCDMA B4	TX1	0	100.00%	24.7
WCDMA B5	TX1	1	100.00%	24.9
LTE B4	TX1	0	100.00%	24.7
LTE B7	TX1	0	100.00%	24.0
LTE B12/17	TX1	1	100.00%	24.9
LTE B13	TX1	1	100.00%	24.9
LTE B14	TX1	1	100.00%	24.9
LTE B25/2	TX1	0	100.00%	24.7
LTE B26/5	TX1	1	100.00%	24.9
LTE B30	TX1	0	100.00%	24.4
LTE B41/38 PC3	TX1	0	63.30%	23.2
LTE B38 PC2	TX1	0	43.30%	26.2
LTE B41 PC2	TX1	0	43.30%	26.5
LTE B48	TX1	2	63.30%	24.5
LTE B66	TX1	0	100.00%	24.7
LTE B71	TX1	1	100.00%	24.9
FR1 n25/2	TX1	0	100.00%	24.7
FR1 n5	TX1	1	100.00%	24.9
FR1 n7	TX1	0	100.00%	24.0
FR1 n12	TX1	1	100.00%	24.9
FR1 n30	TX1	0	100.00%	24.4
FR1 n38 PC3	TX1	1	100.00%	25.2
FR1 n41 PC3	TX1	1	100.00%	25.4
FR1 n41 PC2	TX1	1	50.00%	27.4
FR1 n66	TX1	0	100.00%	24.7
FR1 n71	TX1	1	100.00%	24.9
FR1 n77 PC3	TX1	2	100.00%	25.0
FR1 n77 PC2	TX1	2	50.00%	27.0

Band	EIRP(dBm)
5G NR n260	28.88
5G NR n261	30.70

<WLAN Maximum Power>

<2.4GHz WLAN>

Transmit Antenna				MIMO		
	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
2.4GHz WLAN	802.11b 1Mbps	1	2412	23.00	23.00	26.0
		6	2437	22.00	22.00	25.0
		11	2462	22.50	22.50	25.5
		12	2467	22.50	22.50	25.5
		13	2472	21.00	21.00	24.0
	802.11g 6Mbps	1	2412	20.00	20.00	23.0
		6	2437	21.00	21.00	24.0
		11	2462	19.00	19.00	22.0
		12	2467	17.50	17.50	20.5
		13	2472	16.50	16.50	19.5
	802.11n-HT20 MCS0	1	2412	20.00	20.00	23.0
		6	2437	21.00	21.00	24.0
		11	2462	18.50	18.50	21.5
		12	2467	17.50	17.50	20.5
		13	2472	17.00	17.00	20.0
	802.11ac-VHT20 MCS0	1	2412	20.00	20.00	23.0
		6	2437	21.00	21.00	24.0
		11	2462	18.50	18.50	21.5
		12	2467	17.50	17.50	20.5
		13	2472	17.00	17.00	20.0
	802.11ax-HE20 MCS0	1	2412	20.00	20.00	23.0
		6	2437	21.00	21.00	24.0
		11	2462	18.50	18.50	21.5
		12	2467	17.50	17.50	20.5
		13	2472	17.00	17.00	20.0

<5GHz WLAN>

Transmit Antenna				MIMO		
	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
5.2GHz WLAN	802.11a 6Mbps	36	5180	18.00	18.00	21.0
		40	5200	18.00	18.00	21.0
		44	5220	18.00	18.00	21.0
		48	5240	18.00	18.00	21.0
	802.11n-HT20 MCS0	36	5180	17.50	17.50	20.5
		40	5200	18.00	18.00	21.0
		44	5220	18.00	18.00	21.0
		48	5240	18.50	18.50	21.5
	802.11n-HT40 MCS0	38	5190	17.00	17.00	20.0
		46	5230	20.00	20.00	23.0
	802.11ac-VHT20 MCS0	36	5180	17.50	17.50	20.5
		40	5200	18.00	18.00	21.0
		44	5220	18.00	18.00	21.0
		48	5240	18.50	18.50	21.5
	802.11ac-VHT40 MCS0	38	5190	17.00	17.00	20.0
		46	5230	20.00	20.00	23.0
	802.11ac-VHT80 MCS0	42	5210	16.00	16.00	19.0
	802.11ax-HE20 MCS0	36	5180	17.50	17.50	20.5
		40	5200	18.00	18.00	21.0
		44	5220	18.00	18.00	21.0
		48	5240	18.50	18.50	21.5
	802.11ax-HE40 MCS0	38	5190	17.00	17.00	20.0
		46	5230	20.00	20.00	23.0
	802.11ax-HE80 MCS0	42	5210	16.00	16.00	19.0

Transmit Antenna				MIMO		
	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
5.3GHz WLAN	802.11a 6Mbps	52	5260	18.50	18.50	21.5
		56	5280	18.50	18.50	21.5
		60	5300	18.50	18.50	21.5
		64	5320	18.50	18.50	21.5
	802.11n-HT20 MCS0	52	5260	18.50	18.50	21.5
		56	5280	18.50	18.50	21.5
		60	5300	18.50	18.50	21.5
		64	5320	17.50	17.50	20.5
	802.11n-HT40 MCS0	54	5270	20.00	20.00	23.0
		62	5310	16.00	16.00	19.0
	802.11ac-VHT20 MCS0	52	5260	18.50	18.50	21.5
		56	5280	18.50	18.50	21.5
		60	5300	18.50	18.50	21.5
		64	5320	17.50	17.50	20.5
	802.11ac-VHT40 MCS0	54	5270	20.00	20.00	23.0
		62	5310	16.00	16.00	19.0
	802.11ac-VHT80 MCS0	58	5290	16.00	16.00	19.0
	802.11ac-VHT160 MCS0	50	5250	15.50	15.50	18.5
	802.11ax-HE20 MCS0	52	5260	18.50	18.50	21.5
		56	5280	18.50	18.50	21.5
		60	5300	18.50	18.50	21.5
		64	5320	17.50	17.50	20.5
	802.11ax-HE40 MCS0	54	5270	20.00	20.00	23.0
		62	5310	16.00	16.00	19.0
	802.11ax-HE80 MCS0	58	5290	16.00	16.00	19.0
	802.11ax-HE160 MCS0	50	5250	16.00	16.00	19.0

Transmit Antenna				MIMO		
	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
5.5GHz WLAN	802.11a 6Mbps	100	5500	16.00	16.00	19.0
		116	5580	19.00	19.00	22.0
		124	5620	19.00	19.00	22.0
		132	5660	19.00	19.00	22.0
		144	5720	19.00	19.00	22.0
	802.11n-HT20 MCS0	100	5500	16.00	16.00	19.0
		116	5580	19.00	19.00	22.0
		124	5620	19.00	19.00	22.0
		132	5660	19.00	19.00	22.0
		144	5720	19.00	19.00	22.0
	802.11n-HT40 MCS0	102	5510	17.00	17.00	20.0
		110	5550	20.00	20.00	23.0
		126	5630	20.00	20.00	23.0
		134	5670	20.00	20.00	23.0
		142	5710	20.00	20.00	23.0
	802.11ac-VHT20 MCS0	100	5500	16.00	16.00	19.0
		116	5580	19.00	19.00	22.0
		124	5620	19.00	19.00	22.0
		132	5660	19.00	19.00	22.0
		144	5720	19.00	19.00	22.0
	802.11ac-VHT40 MCS0	102	5510	17.00	17.00	20.0
		110	5550	20.00	20.00	23.0
		126	5630	20.00	20.00	23.0
		134	5670	20.00	20.00	23.0
		142	5710	20.00	20.00	23.0
	802.11ac-VHT80 MCS0	106	5530	16.50	16.50	19.5
		122	5610	20.00	20.00	23.0
		138	5690	20.00	20.00	23.0
	802.11ac-VHT160 MCS0	114	5570	16.50	16.50	19.5
	802.11ax-HE20 MCS0	100	5500	16.00	16.00	19.0
		116	5580	19.00	19.00	22.0
		124	5620	19.00	19.00	22.0
		132	5660	19.00	19.00	22.0
		144	5720	19.00	19.00	22.0
	802.11ax-HE40 MCS0	102	5510	17.00	17.00	20.0
		110	5550	20.00	20.00	23.0
		126	5630	20.00	20.00	23.0
		134	5670	20.00	20.00	23.0
		142	5710	20.00	20.00	23.0
	802.11ax-HE80 MCS0	106	5530	16.50	16.50	19.5
		122	5610	20.00	20.00	23.0
		138	5690	20.00	20.00	23.0
	802.11ax-HE160 MCS0	114	5570	16.50	16.50	19.5

Transmit Antenna				MIMO		
	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
5.8GHz WLAN	802.11a 6Mbps	149	5745	21.00	21.00	24.0
		157	5785	21.00	21.00	24.0
		165	5825	21.00	21.00	24.0
	802.11n-HT20 MCS0	149	5745	21.00	21.00	24.0
		157	5785	21.00	21.00	24.0
		165	5825	21.00	21.00	24.0
	802.11n-HT40 MCS0	151	5755	20.00	20.00	23.0
		159	5795	20.00	20.00	23.0
	802.11ac-VHT20 MCS0	149	5745	21.00	21.00	24.0
		157	5785	21.00	21.00	24.0
		165	5825	21.00	21.00	24.0
	802.11ac-VHT40 MCS0	151	5755	20.50	20.50	23.5
		159	5795	20.00	20.00	23.0
	802.11ac-VHT80 MCS0	155	5775	20.00	20.00	23.0
	802.11ax-HE20 MCS0	149	5745	21.00	21.00	24.0
		157	5785	21.00	21.00	24.0
		165	5825	21.00	21.00	24.0
	802.11ax-HE40 MCS0	151	5755	20.50	20.50	23.5
		159	5795	20.00	20.00	23.0
	802.11ax-HE80 MCS0	155	5775	20.00	20.00	23.0

Burst Average Power (dBm)						
Transmit Antenna				MIMO		
	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
5.8GHz WLAN	802.11a 6Mbps	169	5845	20.0	20.0	23.0
		173	5865	20.0	20.0	23.0
		177	5885	20.0	20.0	23.0
	802.11n-HT20 MCS0	169	5845	21.0	21.0	24.0
		173	5865	20.5	20.5	23.5
		177	5885	19.0	19.0	22.0
	802.11n-HT40 MCS0	167	5835	20.0	20.0	23.0
		175	5875	20.0	20.0	23.0
	802.11ac-VHT20 MCS0	169	5845	21.0	21.0	24.0
		173	5865	20.5	20.5	23.5
		177	5885	19.0	19.0	22.0
	802.11ac-VHT40 MCS0	167	5835	20.5	20.5	23.5
		175	5875	20.0	20.0	23.0
	802.11ac-VHT80 MCS0	171	5855	19.5	19.5	22.5
	802.11ax-HE20 MCS0	169	5845	21.0	21.0	24.0
		173	5865	20.5	20.5	23.5
		177	5885	19.0	19.0	22.0
	802.11ax-HE40 MCS0	167	5835	20.5	20.5	23.5
		175	5875	20.0	20.0	23.0
	802.11ax-HE80 MCS0	171	5855	19.5	19.5	22.5

<6E WLAN>

Burst Average Power (dBm)						
Transmit Antenna				MIMO		
	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
WiFi 6E	802.11a 6Mbps	1	5955	19.5	19.5	22.5
		49	6195	21	21	24
		93	6415	21	21	24
		117	6535	20	20	23
		149	6695	20	20	23
		181	6855	20	20	23
	802.11ax-HE20 MCS0	1	5955	19.5	19.5	22.5
		49	6195	21.5	21.5	24.5
		93	6415	21.5	21.5	24.5
		117	6535	20.5	20.5	23.5
		149	6695	20	20	23
		181	6855	20	20	23
	802.11ax-HE40 MCS0	3	5965	19.5	19.5	22.5
		51	6205	21	21	24
		91	6405	20.5	20.5	23.5
		123	6565	20.5	20.5	23.5
		147	6685	20.5	20.5	23.5
		179	6845	20	20	23
	802.11ax-HE80 MCS0	7	5985	19	19	22
		55	6225	20.5	20.5	23.5
		87	6385	20	20	23
		135	6625	20	20	23
		151	6705	20	20	23
		167	6785	20	20	23
	802.11ax-HE160 MCS0	15	6025	18	18	21
		47	6185	20.5	20.5	23.5
		79	6345	20.5	20.5	23.5
		143	6665	20.5	20.5	23.5

<Bluetooth Maximum Power>

Mode	Average power (dBm)				
	Ant 4			Ant 4	
	BR / EDR			LE	
	1Mbps	2Mbps	3Mbps	1Mbps	2Mbps
Tune-up Limit	20.5	18	17	20	20

Mode	Average power (dBm)				
	Ant 3			Ant 3	
	BR / EDR			LE	
	1Mbps	2Mbps	3Mbps	1Mbps	2Mbps
Tune-up Limit	20.5	18	17	20	20

Mode	BR / EDR	Average power (dBm)								
		1Mbps			2Mbps			3Mbps		
		Ant 4+3(4)	Ant 4+3(3)	Ant 4+3	Ant 4+3(4)	Ant 4+3(3)	Ant 4+3	Ant 4+3(4)	Ant 4+3(3)	Ant 4+3
Tune-up Limit		17.5	17.5	20.5	15	15	18	15	15	18

3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

4. Radio Frequency Radiation Exposure Evaluation

4.1. Power Density Calculation

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
GSM/GPRS 850 (1 Tx slot)	-3.50	33.90	30.4	1.10	138.04	0.027	0.549	0.050
GPRS 850 (2 Tx slots)	-3.50	32.50	29.0	0.79	198.58	0.040	0.549	0.072
GPRS 850 (3 Tx slots)	-3.50	31.50	28.0	0.63	236.59	0.047	0.549	0.086
GPRS 850 (4 Tx slots)	-3.50	30.50	27.0	0.50	251.19	0.050	0.549	0.091
EGPRS 850 (1 Tx slot)	-3.50	28.00	24.5	0.28	35.48	0.007	0.549	0.013
EGPRS 850 (2 Tx slots)	-3.50	27.50	24.0	0.25	62.80	0.012	0.549	0.023
EGPRS 850 (3 Tx slots)	-3.50	27.50	24.0	0.25	94.20	0.019	0.549	0.034
EGPRS 850 (4 Tx slots)	-3.50	25.50	22.0	0.16	79.24	0.016	0.549	0.029
GSM/GPRS 1900 (1 Tx slot)	0.80	31.00	31.8	1.51	190.55	0.038	1.000	0.038
GPRS 1900 (2 Tx slots)	0.80	29.50	30.3	1.07	267.88	0.053	1.000	0.053
GPRS 1900 (3 Tx slots)	0.80	29.00	29.8	0.95	358.10	0.071	1.000	0.071
GPRS 1900 (4 Tx slots)	0.80	28.00	28.8	0.76	380.19	0.076	1.000	0.076
EGPRS 1900 (1 Tx slot)	0.80	26.00	26.8	0.48	60.26	0.012	1.000	0.012
EGPRS 1900 (2 Tx slots)	0.80	25.00	25.8	0.38	95.05	0.019	1.000	0.019
EGPRS 1900 (3 Tx slots)	0.80	25.00	25.8	0.38	142.57	0.028	1.000	0.028
EGPRS 1900 (4 Tx slots)	0.80	24.00	24.8	0.30	151.00	0.030	1.000	0.030
WCDMA Band 2	0.80	25.00	25.8	0.38	380.19	0.076	1.000	0.076
WCDMA Band 4	-0.30	25.00	24.7	0.30	295.12	0.059	1.000	0.059
WCDMA Band 5	-3.50	25.00	21.5	0.14	141.25	0.028	0.549	0.051
LTE Band 2	0.80	25.00	25.8	0.38	380.19	0.076	1.000	0.076
LTE Band 4	-0.30	25.00	24.7	0.30	295.12	0.059	1.000	0.059
LTE Band 5	-3.50	25.00	21.5	0.14	141.25	0.028	0.549	0.051
LTE Band 7	0.50	24.60	25.1	0.32	323.59	0.064	1.000	0.064
LTE Band 12	-1.80	25.00	23.2	0.21	208.93	0.042	0.466	0.089
LTE Band 13	-2.10	25.00	22.9	0.19	194.98	0.039	0.518	0.075
LTE Band 14	-2.30	25.00	22.7	0.19	186.21	0.037	0.525	0.071
LTE Band 17	-1.70	25.00	23.3	0.21	213.80	0.043	0.469	0.091
LTE Band 25	0.50	25.00	25.5	0.35	354.81	0.071	1.000	0.071
LTE Band 26	-3.30	25.00	21.7	0.15	147.91	0.029	0.543	0.054
LTE Band 30	-1.40	25.00	23.6	0.23	229.09	0.046	1.000	0.046
LTE Band 38	-0.70	23.80	23.1	0.20	204.17	0.041	1.000	0.041
LTE Band 38 HPUE	-0.70	26.80	26.1	0.41	407.38	0.081	1.000	0.081
LTE Band 41	-0.30	23.80	23.5	0.22	223.87	0.045	1.000	0.045
LTE Band 41 HPUE	-0.30	26.80	26.5	0.45	446.68	0.089	1.000	0.089
LTE Band 48	-0.30	24.50	24.2	0.26	263.03	0.052	1.000	0.052
LTE Band 66	0.00	25.00	25.0	0.32	316.23	0.063	1.000	0.063
LTE Band 71	-3.20	25.00	21.8	0.15	151.36	0.030	0.442	0.068
5G NR n2	0.80	25.00	25.8	0.38	380.19	0.076	1.000	0.076
5G NR n5	-3.50	25.00	21.5	0.14	141.25	0.028	0.549	0.051
5G NR n7	0.50	24.60	25.1	0.32	323.59	0.064	1.000	0.064
5G NR n12	-1.80	25.00	23.2	0.21	208.93	0.042	0.466	0.089
5G NR n25	0.50	25.00	25.5	0.35	354.81	0.071	1.000	0.071
5G NR n30	-1.40	25.00	23.6	0.23	229.09	0.046	1.000	0.046
5G NR n38	-0.70	25.20	24.5	0.28	281.84	0.056	1.000	0.056
5G NR n41	-0.30	25.40	25.1	0.32	323.59	0.064	1.000	0.064
5G NR n41 HPUE	-0.30	27.40	27.1	0.51	512.86	0.102	1.000	0.102
5G NR n66	0.00	25.00	25.0	0.32	316.23	0.063	1.000	0.063
5G NR n71	-3.20	25.00	21.8	0.15	151.36	0.030	0.442	0.068
5G NR n77	0.40	25.00	25.4	0.35	346.74	0.069	1.000	0.069
5G NR n77 HPUE	0.40	27.00	27.4	0.55	549.54	0.109	1.000	0.109
5G NR n77	0.50	25.00	25.5	0.35	354.81	0.071	1.000	0.071
5G NR n260			28.88	0.77	772.68	0.154	1.000	0.154
5G NR n261			30.7	1.17	1174.90	0.234	1.000	0.234
WLAN2.4GHz Band	-1.1	26.0	24.9	0.31	309.03	0.062	1.000	0.062
WLAN5GHz/6GHz Band	0.7	24.5	25.2	0.33	331.13	0.066	1.000	0.066
Bluetooth	-1.1	20.5	19.4	0.09	87.10	0.017	1.000	0.017

WWAN Power Density / Limit	2.4GHz WLAN Power Density / Limit	5GHz/6GHz WLAN Power Density / Limit	WPT	Σ(Power Density / Limit)
0.234	0.062	0.066	0.01	0.372
WWAN Power Density / Limit	**5GHz/6GHz WLAN Power Density / Limit**	**Bluetooth Power Density / Limit**	**WPT**	**Σ(Power Density / Limit)**
0.234	0.066	0.017	0.01	0.327

GNote:

1. WPT ratio is, from Sporton WPT evaluation report (FCC ID: A4RG9S9B, Report No.: FA0D2942-04B), 0.01 = 0.0174 / 1.63 for calculation.
2. For colocation analysis, the highest (power density/limit) among all WWAN wireless modes is chosen for summation.
3. Σ(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + 2.4GHz WLAN + 5GHz WLAN + WPT transmitter or WWAN + 5GHz WLAN + Bluetooth + WPT transmitter.
4. Considering the all the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 4 collocated transmitters is compliant.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.