

RF Exposure Evaluation

(Mobile Condition)

FCC ID : A4RG8V0U
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.

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Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA121931-24A	Rev. 01	Initial issue of report	Nov. 29, 2022



1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
Equipment Name	Phone
FCC ID	A4RG8V0U
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 : 3450MHz ~ 3550MHz, 3700 MHz ~ 3980 MHz 5G NR n258 : 24.25 GHz~24.45 GHz, 24.75GHz ~25.25GHz 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 UWB: 6489.6 MHz, 7987.2 MHz
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: ASK UWB: BPM-BPSK
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%	34.0
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%	25.25
WCDMA B4	TX0	2	100.00%	25.25
WCDMA B5	TX0	0	100.00%	25.4
LTE B7	TX0	2	100.00%	25.5
LTE B12/17	TX0	0	100.00%	25.5
LTE B13	TX0	0	100.00%	25.5
LTE B14	TX0	0	100.00%	25.5
LTE B25/2	TX0	2	100.00%	25.5
LTE B26/5	TX0	0	100.00%	25.5
LTE B30	TX0	2	100.00%	25.5
LTE B41/B38 PC3	TX0	2	63.30%	25.5
LTE B38 PC2	TX0	2	43.30%	27
LTE B41 PC2	TX0	2	43.30%	27.5
LTE B48	TX0	6	63.30%	25.5
LTE B66/4	TX0	2	100.00%	25.5
LTE B71	TX0	0	100.00%	25.5
FR1 n25/2	TX0	2	100.00%	25.5
FR1 n5	TX0	0	100.00%	25.5
FR1 n7	TX0	2	100.00%	25.5
FR1 n12	TX0	0	100.00%	25.5
FR1 n30	TX0	2	100.00%	25.5
FR1 n41/38 PC3	TX0	5	100.00%	25.5
FR1 n41/38 PC2	TX0	5	50.00%	27.0
FR1 n66	TX0	2	100.00%	25.5
FR1 n71	TX0	0	100.00%	25.5
FR1 n77 PC3	TX0	6	100.00%	25.3
FR1 n77 PC2	TX0	6	50.00%	27.0

Maximum Transmit Burst Average Power (dBm)				
Band	Config	Antenna	duty cycle	Default
				Index 1
GSM850 GPRS 1TX	TX1	1	12.50%	34.0
GSM850 GPRS 2TX	TX1	1	25.00%	32.0
GSM850 GPRS 3TX	TX1	1	37.50%	30.7
GSM850 GPRS 4TX	TX1	1	50.00%	29.5
GSM850 EDGE 1TX	TX0	1	12.50%	27.7
GSM850 EDGE 2TX	TX0	1	25.00%	27.3
GSM850 EDGE 3TX	TX0	1	37.50%	27.2
GSM850 EDGE 4TX	TX0	1	50.00%	24.9
GSM1900 GPRS 1TX	TX1	0	12.50%	30.8
GSM1900 GPRS 2TX	TX1	0	25.00%	28.7
GSM1900 GPRS 3TX	TX1	0	37.50%	27.5
GSM1900 GPRS 4TX	TX1	0	50.00%	26.2
GSM1900 EDGE 1TX	TX0	0	12.50%	25.4
GSM1900 EDGE 2TX	TX0	0	25.00%	24.3
GSM1900 EDGE 3TX	TX0	0	37.50%	24.1
GSM1900 EDGE 4TX	TX0	0	50.00%	22.8
WCDMA B2	TX1	0	100.00%	24.3
WCDMA B4	TX1	0	100.00%	24.5
WCDMA B5	TX1	1	100.00%	25.2
LTE B7	TX1	0	100.00%	24.1
LTE B12/17	TX1	1	100.00%	25.2
LTE B13	TX1	1	100.00%	25.2
LTE B14	TX1	1	100.00%	25.2
LTE B25/2	TX1	0	100.00%	24.6
LTE B26/5	TX1	1	100.00%	25.0
LTE B30	TX1	0	100.00%	24.4
LTE B41/38 PC3	TX1	0	63.30%	24.5
LTE B38 PC2	TX1	0	43.30%	25.7
LTE B41 PC2	TX1	0	43.30%	26.6
LTE B48	TX1	2	63.30%	22.9
LTE B66/4	TX1	0	100.00%	24.4
LTE B71	TX1	1	100.00%	25.0
FR1 n25/2	TX1	0	100.00%	24.6
FR1 n5	TX1	1	100.00%	25.1
FR1 n7	TX1	0	100.00%	24.7
FR1 n12	TX1	1	100.00%	25.1
FR1 n30	TX1	0	100.00%	24.5
FR1 n38 PC3	TX1	1	100.00%	25.2
FR1 n41 PC3	TX1	1	100.00%	25.0
FR1 n41/38 PC2	TX1	1	50.00%	26.4
FR1 n66	TX1	0	100.00%	24.2
FR1 n71	TX1	1	100.00%	25.1
FR1 n77 PC3	TX1	2	100.00%	23.3
FR1 n77 PC2	TX1	2	50.00%	25.0

Band	EIRP(dBm)
5G NR n258	27.81
5G NR n260	30.98
5G NR n261	31.54

**<WLAN Maximum Power>****<2.4GHz WLAN>**

Burst Average Power (dBm)						
Transmit Antenna				MIMO		
2.4GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
	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	21.00	21.00	24.0
		6	2437	21.00	21.00	24.0
		11	2462	21.00	21.00	24.0
		12	2467	21.00	21.00	24.0
		13	2472	21.00	21.00	24.0
	802.11n-HT20 MCS0	1	2412	21.00	21.00	24.0
		6	2437	21.00	21.00	24.0
		11	2462	21.00	21.00	24.0
		12	2467	21.00	21.00	24.0
		13	2472	21.00	21.00	24.0
	802.11ac-VHT20 MCS0	1	2412	21.00	21.00	24.0
		6	2437	21.00	21.00	24.0
		11	2462	21.00	21.00	24.0
		12	2467	21.00	21.00	24.0
		13	2472	21.00	21.00	24.0
	802.11ax-HE20 MCS0	1	2412	21.00	21.00	24.0
		6	2437	21.00	21.00	24.0
		11	2462	21.00	21.00	24.0
		12	2467	21.00	21.00	24.0
		13	2472	21.00	21.00	24.0

**<5GHz WLAN>**

Burst Average Power (dBm)						
Transmit Antenna				MIMO		
5.2GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 7+3(7) Tune-Up Limit	Ant 7+3(3) Tune-Up Limit	Ant 7+3 Tune-Up Limit
	802.11a 6Mbps	36	5180	18.00	18.00	21.0
		40	5200	18.00	18.00	21.0
		44	5220	18.50	18.50	21.5
		48	5240	18.50	18.50	21.5
	802.11n-HT20 MCS0	36	5180	18.50	18.50	21.5
		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	21.00	21.00	24.0
		46	5230	20.50	20.50	23.5
	802.11ac-VHT20 MCS0	36	5180	18.50	18.50	21.5
		40	5200	18.00	18.00	21.0
		44	5220	18.50	18.50	21.5
		48	5240	19.00	19.00	22.0
	802.11ac-VHT40 MCS0	38	5190	21.00	21.00	24.0
		46	5230	20.50	20.50	23.5
	802.11ac-VHT80 MCS0	42	5210	16.00	16.00	19.0
	802.11ax-HE20 MCS0	36	5180	18.50	18.50	21.5
		40	5200	18.50	18.50	21.5
		44	5220	18.50	18.50	21.5
		48	5240	19.00	19.00	22.0
	802.11ax-HE40 MCS0	38	5190	20.00	20.00	23.0
		46	5230	19.50	19.50	22.5
	802.11ax-HE80 MCS0	42	5210	16.00	16.00	19.0



Burst Average Power (dBm)						
Transmit Antenna				MIMO		
5.3GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 7+3(7) Tune-Up Limit	Ant 7+3(3) Tune-Up Limit	Ant 7+3 Tune-Up Limit
	802.11a 6Mbps	52	5260	18.50	18.50	21.50
		56	5280	18.50	18.50	21.50
		60	5300	18.50	18.50	21.50
		64	5320	18.50	18.50	21.50
	802.11n-HT20 MCS0	52	5260	18.50	18.50	21.50
		56	5280	18.50	18.50	21.50
		60	5300	18.50	18.50	21.50
		64	5320	18.50	18.50	21.50
	802.11n-HT40 MCS0	54	5270	21.00	21.00	24.00
		62	5310	16.00	16.00	19.00
	802.11ac-VHT20 MCS0	52	5260	18.50	18.50	21.50
		56	5280	18.50	18.50	21.50
		60	5300	18.50	18.50	21.50
		64	5320	18.50	18.50	21.50
	802.11ac-VHT40 MCS0	54	5270	21.00	21.00	24.00
		62	5310	16.50	16.50	19.50
	802.11ac-VHT80 MCS0	58	5290	16.50	16.50	19.50
	802.11ac-VHT160 MCS0	50	5250	15.00	15.00	18.00
	802.11ax-HE20 MCS0	52	5260	18.50	18.50	21.50
		56	5280	18.50	18.50	21.50
		60	5300	18.50	18.50	21.50
		64	5320	18.50	18.50	21.50
	802.11ax-HE40 MCS0	54	5270	20.00	20.00	23.00
		62	5310	16.50	16.50	19.50
	802.11ax-HE80 MCS0	58	5290	16.50	16.50	19.50
	802.11ax-HE160 MCS0	50	5250	18.50	18.50	21.50



Burst Average Power (dBm)						
Transmit Antenna				MIMO		
5.5GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 7+3(7) Tune-Up Limit	Ant 7+3(3) Tune-Up Limit	Ant 7+3 Tune-Up Limit
	802.11a 6Mbps	100	5500	16.50	16.50	19.50
		116	5580	18.50	18.50	21.50
		124	5620	18.50	18.50	21.50
		132	5660	18.50	18.50	21.50
		144	5720	17.00	17.00	20.00
	802.11n-HT20 MCS0	100	5500	18.50	18.50	21.50
		116	5580	17.50	17.50	20.50
		124	5620	18.50	18.50	21.50
		132	5660	18.50	18.50	21.50
		144	5720	18.50	18.50	21.50
	802.11n-HT40 MCS0	102	5510	17.00	17.00	20.00
		110	5550	18.50	18.50	21.50
		126	5630	17.00	17.00	20.00
		134	5670	21.00	21.00	24.00
		142	5710	21.00	21.00	24.00
	802.11ac-VHT20 MCS0	100	5500	21.00	21.00	24.00
		116	5580	21.00	21.00	24.00
		124	5620	17.00	17.00	20.00
		132	5660	18.50	18.50	21.50
		144	5720	18.50	18.50	21.50
	802.11ac-VHT40 MCS0	102	5510	18.50	18.50	21.50
		110	5550	17.00	17.00	20.00
		126	5630	18.50	18.50	21.50
		134	5670	17.00	17.00	20.00
		142	5710	21.00	21.00	24.00
	802.11ac-VHT80 MCS0	106	5530	21.00	21.00	24.00
		122	5610	21.00	21.00	24.00
		138	5690	21.00	21.00	24.00
	802.11ac-VHT160 MCS0	114	5570	16.00	16.00	19.00
	802.11ax-HE20 MCS0	100	5500	21.00	21.00	24.00
		116	5580	21.00	21.00	24.00
		124	5620	16.00	16.00	19.00
		132	5660	17.00	17.00	20.00
		144	5720	18.50	18.50	21.50
	802.11ax-HE40 MCS0	102	5510	18.50	18.50	21.50
		110	5550	18.50	18.50	21.50
		126	5630	17.00	17.00	20.00
		134	5670	18.50	18.50	21.50
		142	5710	17.00	17.00	20.00
	802.11ax-HE80 MCS0	106	5530	20.00	20.00	23.00
		122	5610	20.00	20.00	23.00
		138	5690	20.00	20.00	23.00
	802.11ax-HE160 MCS0	114	5570	20.00	20.00	23.00



Burst Average Power (dBm)						
Transmit Antenna				MIMO		
5.8GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 7+3(7) Tune-Up Limit	Ant 7+3(3) Tune-Up Limit	Ant 7+3 Tune-Up Limit
	802.11a 6Mbps	149	5745	18.50	18.50	21.50
		157	5785	19.00	19.00	22.00
		165	5825	19.00	19.00	22.00
	802.11n-HT20 MCS0	149	5745	19.50	19.50	22.50
		157	5785	19.50	19.50	22.50
		165	5825	19.00	19.00	22.00
	802.11n-HT40 MCS0	151	5755	21.00	21.00	24.00
		159	5795	21.00	21.00	24.00
	802.11ac-VHT20 MCS0	149	5745	19.50	19.50	22.50
		157	5785	19.50	19.50	22.50
		165	5825	19.00	19.00	22.00
	802.11ac-VHT40 MCS0	151	5755	21.00	21.00	24.00
		159	5795	21.00	21.00	24.00
	802.11ac-VHT80 MCS0	155	5775	21.00	21.00	24.00
	802.11ax-HE20 MCS0	149	5745	19.50	19.50	22.50
		157	5785	20.00	20.00	23.00
		165	5825	19.50	19.50	22.50
	802.11ax-HE40 MCS0	151	5755	20.00	20.00	23.00
		159	5795	20.00	20.00	23.00
	802.11ax-HE80 MCS0	155	5775	20.00	20.00	23.00

Burst Average Power (dBm)						
Transmit Antenna				MIMO		
5.8GHz WLAN UNII4	Mode	Channel	Frequency (MHz)	Ant 7+3(7) Tune-Up Limit	Ant 7+3(3) Tune-Up Limit	Ant 7+3 Tune-Up Limit
	802.11a 6Mbps	169	5845	18.50	18.50	21.50
		173	5865	19.00	19.00	22.00
		177	5885	19.00	19.00	22.00
	802.11n-HT20 MCS0	169	5845	19.50	19.50	22.50
		173	5865	19.50	19.50	22.50
		177	5885	19.00	19.00	22.00
	802.11n-HT40 MCS0	167	5835	21.00	21.00	24.00
		175	5875	21.00	21.00	24.00
	802.11ac-VHT20 MCS0	169	5845	19.50	19.50	22.50
		173	5865	19.50	19.50	22.50
		177	5885	19.00	19.00	22.00
	802.11ac-VHT40 MCS0	167	5835	21.00	21.00	24.00
		175	5875	21.00	21.00	24.00
	802.11ac-VHT80 MCS0	171	5855	21.00	21.00	24.00
	802.11ax-HE20 MCS0	169	5845	19.50	19.50	22.50
		173	5865	20.00	20.00	23.00
		177	5885	19.50	19.50	22.50
	802.11ax-HE40 MCS0	167	5835	20.00	20.00	23.00
		175	5875	20.00	20.00	23.00
	802.11ax-HE80 MCS0	171	5855	20.00	20.00	23.00

**<6GHz WLAN>**

Burst Average Power (dBm)						
Transmit Antenna				MIMO		
WiFi 6E	Mode	Channel	Frequency (MHz)	Ant 4+3(4) Tune-Up Limit	Ant 4+3(3) Tune-Up Limit	Ant 4+3 Tune-Up Limit
	802.11a 6Mbps	1	5955	18.5	18.5	21.5
		49	6195	18	18	21
		93	6415	18	18	21
		117	6535	18	18	21
		149	6695	18.5	18.5	21.5
		181	6855	18.5	18.5	21.5
	802.11ax-HE20 MCS0	1	5955	19.5	19.5	22.5
		49	6195	19	19	22
		93	6415	18.5	18.5	21.5
		117	6535	19	19	22
		149	6695	18.5	18.5	21.5
		181	6855	18.5	18.5	21.5
	802.11ax-HE40 MCS0	3	5965	19	19	22
		51	6205	19	19	22
		91	6405	20.5	20.5	23.5
		123	6565	20	20	23
		147	6685	19.5	19.5	22.5
		179	6845	19	19	22
	802.11ax-HE80 MCS0	7	5985	18.5	18.5	21.5
		55	6225	19	19	22
		87	6385	20.5	20.5	23.5
		135	6625	19	19	22
		151	6705	20	20	23
		167	6785	19.5	19.5	22.5
	802.11ax-HE160 MCS0	15	6025	18	18	21
		47	6185	20.5	20.5	23.5
		79	6345	21	21	24
		143	6665	19.5	19.5	22.5

<Bluetooth Maximum Power>

Mode	Burst Average Power (dBm)				
	Ant 4			Ant 4	
	BR / EDR			LE	
	1Mbps	2Mbps	3Mbps	1Mbps	2Mbps
Tune-up Limit	21	18	18	21	21

Mode	Burst Average Power (dBm)				
	Ant 3			Ant 3	
	BR / EDR			LE	
	1Mbps	2Mbps	3Mbps	1Mbps	2Mbps
Tune-up Limit	21	18	18	21	21

Mode	BR / EDR	Burst 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		18	18	21	15	15	18	15	15	18

<UWB maximum Power>

Band	Average Power (dBm)
UWB	-17



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/f ²)	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/f ²)	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)	-3.20	34.00	30.8	1.20	151.36	0.030	0.549	0.055
GPRS 850 (2 Tx slots)	-3.20	32.50	29.3	0.85	212.78	0.042	0.549	0.077
GPRS 850 (3 Tx slots)	-3.20	31.50	28.3	0.68	253.51	0.050	0.549	0.092
GPRS 850 (4 Tx slots)	-3.20	30.50	27.3	0.54	269.15	0.054	0.549	0.098
EGPRS 850 (1 Tx slot)	-3.20	28.00	24.8	0.30	38.02	0.008	0.549	0.014
EGPRS 850 (2 Tx slots)	-3.20	27.50	24.3	0.27	67.29	0.013	0.549	0.024
EGPRS 850 (3 Tx slots)	-3.20	27.50	24.3	0.27	100.93	0.020	0.549	0.037
EGPRS 850 (4 Tx slots)	-3.20	25.50	22.3	0.17	84.91	0.017	0.549	0.031
GSM/GPRS 1900 (1 Tx slot)	-0.50	31.00	30.5	1.12	141.25	0.028	1.000	0.028
GPRS 1900 (2 Tx slots)	-0.50	29.50	29.0	0.79	198.58	0.040	1.000	0.040
GPRS 1900 (3 Tx slots)	-0.50	29.00	28.5	0.71	265.46	0.053	1.000	0.053
GPRS 1900 (4 Tx slots)	-0.50	28.00	27.5	0.56	281.84	0.056	1.000	0.056
EGPRS 1900 (1 Tx slot)	-0.50	26.00	25.5	0.35	44.67	0.009	1.000	0.009
EGPRS 1900 (2 Tx slots)	-0.50	25.00	24.5	0.28	70.46	0.014	1.000	0.014
EGPRS 1900 (3 Tx slots)	-0.50	25.00	24.5	0.28	105.69	0.021	1.000	0.021
EGPRS 1900 (4 Tx slots)	-0.50	24.00	23.5	0.22	111.94	0.022	1.000	0.022
WCDMA Band 2	-0.50	25.25	24.8	0.30	298.54	0.059	1.000	0.059
WCDMA Band 4	-0.70	25.25	24.6	0.29	285.10	0.057	1.000	0.057
WCDMA Band 5	-3.20	25.40	22.2	0.17	165.96	0.033	0.549	0.060
LTE Band 2	-0.50	25.50	25.0	0.32	316.23	0.063	1.000	0.063
LTE Band 4	-0.70	25.50	24.8	0.30	302.00	0.060	1.000	0.060
LTE Band 5	-3.20	25.50	22.3	0.17	169.82	0.034	0.549	0.062
LTE Band 7	-1.70	25.50	23.8	0.24	239.88	0.048	1.000	0.048
LTE Band 12	-3.80	25.50	21.7	0.15	147.91	0.029	0.466	0.063
LTE Band 13	-3.10	25.50	22.4	0.17	173.78	0.035	0.518	0.067
LTE Band 14	-3.10	25.50	22.4	0.17	173.78	0.035	0.525	0.066
LTE Band 17	-3.80	25.50	21.7	0.15	147.91	0.029	0.469	0.063
LTE Band 25	-0.50	25.50	25.0	0.32	316.23	0.063	1.000	0.063
LTE Band 26	-3.20	25.50	22.3	0.17	169.82	0.034	0.543	0.062
LTE Band 30	-0.70	25.50	24.8	0.30	302.00	0.060	1.000	0.060
LTE Band 38	-1.30	25.50	24.2	0.26	263.03	0.052	1.000	0.052
LTE Band 38 HPUE	-1.30	27.00	25.7	0.37	371.54	0.074	1.000	0.074
LTE Band 41	-1.30	25.50	24.2	0.26	263.03	0.052	1.000	0.052
LTE Band 41 HPUE	-1.30	27.50	26.2	0.42	416.87	0.083	1.000	0.083
LTE Band 48	-1.00	25.50	24.5	0.28	281.84	0.056	1.000	0.056
LTE Band 66	-0.70	25.50	24.8	0.30	302.00	0.060	1.000	0.060
LTE Band 71	-3.20	25.50	22.3	0.17	169.82	0.034	0.442	0.076
5G NR n2	-0.50	25.50	25.0	0.32	316.23	0.063	1.000	0.063
5G NR n5	-3.20	25.50	22.3	0.17	169.82	0.034	0.549	0.062
5G NR n7	-1.70	25.50	23.8	0.24	239.88	0.048	1.000	0.048
5G NR n12	-3.80	25.50	21.7	0.15	147.91	0.029	0.466	0.063
5G NR n25	-0.50	25.50	25.0	0.32	316.23	0.063	1.000	0.063
5G NR n30	-0.70	25.50	24.8	0.30	302.00	0.060	1.000	0.060
5G NR n38	-1.30	25.50	24.2	0.26	263.03	0.052	1.000	0.052
5G NR n38 HPUE	-1.30	27.00	25.7	0.37	371.54	0.074	1.000	0.074
5G NR n41	-1.30	25.50	24.2	0.26	263.03	0.052	1.000	0.052
5G NR n41 HPUE	-1.30	27.00	25.7	0.37	371.54	0.074	1.000	0.074
5G NR n66	-0.70	25.50	24.8	0.30	302.00	0.060	1.000	0.060
5G NR n71	-3.20	25.50	22.3	0.17	169.82	0.034	0.442	0.076
5G NR n77	-1.00	25.30	24.3	0.27	269.15	0.054	1.000	0.054
5G NR n77 HPUE	-1.00	27.00	26.0	0.40	398.11	0.079	1.000	0.079
5G NR n258			27.81	0.60	603.95	0.120	1.000	0.120
5G NR n260			30.98	1.25	1253.14	0.249	1.000	0.249
5G NR n261			31.5	1.43	1425.61	0.284	1.000	0.284
WLAN2.4GHz Band	-0.6	26.0	25.4	0.35	346.74	0.069	1.000	0.069
WLAN5GHz/6GHz Band	-0.4	24.0	23.6	0.23	229.09	0.046	1.000	0.046
Bluetooth	-0.6	21.0	20.4	0.11	109.65	0.022	1.000	0.022
UWB	2.8	-17.00	-14.16	< 0.001	0.0384	< 0.001	1.000	< 0.001



WWAN Power Density / Limit	2.4GHz WLAN Power Density / Limit	5GHz/6GHz WLAN Power Density / Limit	WPT	UWB	Σ (Power Density / Limit)
0.284	0.069	0.046	0.039	0.001	0.439
WWAN Power Density / Limit	5GHz/6GHz WLAN Power Density / Limit	Bluetooth Power Density / Limit	WPT	UWB	Σ (Power Density / Limit)
0.284	0.046	0.022	0.039	0.001	0.392

GNote:

1. WPT ratio is, from Sporton WPT evaluation report (FCC ID: A4RG8V0U, Report No.: FA121931-04B), $0.039 = 0.0629 / 1.63$ 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 + UWB transmitter or WWAN + 5GHz WLAN + Bluetooth + WPT + UWB 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.