

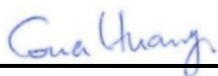
RF Exposure Evaluation

(Mobile Condition)

FCC ID : A4RG1AZG
Equipment : Phone
Model Name : G1AZG
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.)



Table of Contents

1. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	4
2. MAXIMUM TUNE-UP LIMIT (UNIT: DBM)	5
3. RF EXPOSURE LIMIT INTRODUCTION	14
4. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION	15
4.1. Power Density Calculation.....	15



History of this test report

Report No.	Version	Description	Issued Date
FA161608-17	Rev. 01	Initial issue of report	Nov. 28, 2022

**1. Description of Equipment Under Test (EUT)**

Product Feature & Specification	
Equipment Name	Phone
Model Name	G1AZG
FCC ID	A4RG1AZG
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 n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450 MHz ~ 3550 MHz 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
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
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 4 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 Burst Average Power (dBm)				
Band	Config	Antenna	Duty cycle	Default
				Index 1
GSM850 GSM/GPRS 1TX	TX0	0	12.50%	33.50
GSM850 GPRS 2TX	TX0	0	25.00%	32.50
GSM850 GPRS 3TX	TX0	0	37.50%	31.50
GSM850 GPRS 4TX	TX0	0	50.00%	30.50
GSM850 EDGE 1TX	TX0	0	12.50%	28.00
GSM850 EDGE 2TX	TX0	0	25.00%	27.50
GSM850 EDGE 3TX	TX0	0	37.50%	27.50
GSM850 EDGE 4TX	TX0	0	50.00%	25.50
GSM1900 GSM/GPRS 1TX	TX0	2	12.50%	30.85
GSM1900 GPRS 2TX	TX0	2	25.00%	29.35
GSM1900 GPRS 3TX	TX0	2	37.50%	28.85
GSM1900 GPRS 4TX	TX0	2	50.00%	27.85
GSM1900 EDGE 1TX	TX0	2	12.50%	26.35
GSM1900 EDGE 2TX	TX0	2	25.00%	24.85
GSM1900 EDGE 3TX	TX0	2	37.50%	24.85
GSM1900 EDGE 4TX	TX0	2	50.00%	23.85
WCDMA B2	TX0	2	100.00%	25.25
WCDMA B4	TX0	2	100.00%	25.25
WCDMA B5	TX0	0	100.00%	25.30
LTE B7	TX0	2	100.00%	25.20
LTE B12/17	TX0	0	100.00%	25.30
LTE B13	TX0	0	100.00%	25.30
LTE B14	TX0	0	100.00%	25.50
LTE B25/2	TX0	2	100.00%	25.50
LTE B26/5	TX0	0	100.00%	25.50
LTE B30	TX0	2	100.00%	24.60
LTE B41/B38 PC3	TX0	2	63.30%	25.40
LTE B38 PC2	TX0	2	43.30%	27.20
LTE B41 PC2	TX0	2	43.30%	27.70
LTE B48	TX0	6	63.30%	24.00
LTE B66/4	TX0	2	100.00%	25.25
LTE B71	TX0	0	100.00%	25.30
FR1 n5	TX0	0	100.00%	25.50
FR1 n7	TX0	2	100.00%	25.20
FR1 n12	TX0	0	100.00%	25.30
FR1 n25/2	TX0	2	100.00%	25.70
FR1 n30	TX0	2	100.00%	24.60
FR1 n66	TX0	2	100.00%	25.25
FR1 n71	TX0	0	100.00%	25.30
FR1 n77 PC3	TX0	6	100.00%	25.00
FR1 n77 PC2	TX0	6	50.00%	27.20



Maximum Transmit Burst Average Power (dBm)				
Band	Config	Antenna	Duty cycle	Default
				Index 1
GSM850 GSM/GPRS 1TX	TX1	1	12.50%	33.50
GSM850 GPRS 2TX	TX1	1	25.00%	32.50
GSM850 GPRS 3TX	TX1	1	37.50%	31.50
GSM850 GPRS 4TX	TX1	1	50.00%	30.50
GSM850 EDGE 1TX	TX1	1	12.50%	28.00
GSM850 EDGE 2TX	TX1	1	25.00%	27.50
GSM850 EDGE 3TX	TX1	1	37.50%	27.50
GSM850 EDGE 4TX	TX1	1	50.00%	25.50
GSM1900 GSM/GPRS 1TX	TX1	0	12.50%	31.00
GSM1900 GPRS 2TX	TX1	0	25.00%	29.50
GSM1900 GPRS 3TX	TX1	0	37.50%	29.00
GSM1900 GPRS 4TX	TX1	0	50.00%	28.00
GSM1900 EDGE 1TX	TX1	0	12.50%	26.50
GSM1900 EDGE 2TX	TX1	0	25.00%	25.00
GSM1900 EDGE 3TX	TX1	0	37.50%	25.00
GSM1900 EDGE 4TX	TX1	0	50.00%	24.00
WCDMA B2	TX1	0	100.00%	25.70
WCDMA B4	TX1	0	100.00%	25.70
WCDMA B5	TX1	1	100.00%	25.70
LTE B7	TX1	0	100.00%	25.20
LTE B12/17	TX1	1	100.00%	25.20
LTE B13	TX1	1	100.00%	25.20
LTE B14	TX1	1	100.00%	25.20
LTE B25/2	TX1	0	100.00%	25.20
LTE B26/5	TX1	1	100.00%	25.20
LTE B30	TX1	0	100.00%	25.00
LTE B41/B38 PC3	TX1	0	63.30%	25.20
LTE B41/B38 PC2	TX1	0	43.30%	27.20
LTE B48	TX1	2	63.30%	23.20
LTE B66/4	TX1	0	100.00%	25.20
LTE B71	TX1	1	100.00%	25.20
FR1 n5	TX1	1	100.00%	25.20
FR1 n7	TX1	0	100.00%	25.20
FR1 n12	TX1	1	100.00%	25.20
FR1 n25/2	TX1	0	100.00%	25.70
FR1 n30	TX1	0	100.00%	25.00
FR1 n66	TX1	0	100.00%	25.70
FR1 n71	TX1	1	100.00%	25.20
FR1 n77 PC3	TX1	2	100.00%	23.75
FR1 n77 PC2	TX1	2	50.00%	25.90

<WLAN Maximum Power>
<2.4GHz WLAN>

Transmit Antenna				SISO Ant 4
2.4GHz WLAN	Mode	Channel	Frequency (MHz)	Tune-Up Limit
	802.11b 1Mbps	1	2412	22.00
		6	2437	22.00
		11	2462	22.00
		12	2467	22.00
		13	2472	22.00

Transmit Antenna				SISO Ant 3
2.4GHz WLAN	Mode	Channel	Frequency (MHz)	Tune-Up Limit
	802.11b 1Mbps	1	2412	22.00
		6	2437	22.00
		11	2462	22.00
		12	2467	22.00
		13	2472	22.00

Transmit Antenna				MIMO Ant 4+3		
2.4GHz WLAN	Mode	Channel	Frequency (MHz)	Tune-Up Limit 4+3(4)	Tune-Up Limit 4+3(3)	Tune-Up Limit 4+3
	802.11g 6Mbps	1	2412	18.50	18.50	21.5
		6	2437	21.50	21.50	24.5
		11	2462	19.50	19.50	22.5
		12	2467	19.00	19.00	22.0
		13	2472	17.50	17.50	20.5
	802.11n-HT20 MCS0	1	2412	18.50	18.50	21.5
		6	2437	21.50	21.50	24.5
		11	2462	19.50	19.50	22.5
		12	2467	19.00	19.00	22.0
		13	2472	17.50	17.50	20.5
	802.11ac-VHT20 MCS0	1	2412	18.50	18.50	21.5
		6	2437	21.50	21.50	24.5
		11	2462	19.50	19.50	22.5
		12	2467	19.00	19.00	22.0
		13	2472	17.50	17.50	20.5
	802.11ax-HE20 MCS0	1	2412	18.50	18.50	21.5
		6	2437	21.50	21.50	24.5
		11	2462	19.50	19.50	22.5
		12	2467	19.00	19.00	22.0
		13	2472	17.50	17.50	20.5



<5GHz WLAN>

Transmit Antenna				MIMO Ant 4+3		
	Mode	Channel	Frequency (MHz)	Tune-Up Limit 4+3(4)	Tune-Up Limit 4+3(3)	Tune-Up Limit 4+3
5.2GHz WLAN	802.11a 6Mbps	36	5180	20.00	20.00	23.0
		40	5200	20.00	20.00	23.0
		44	5220	20.00	20.00	23.0
		48	5240	20.00	20.00	23.0
	802.11n-HT20 MCS0	36	5180	20.00	20.00	23.0
		40	5200	20.00	20.00	23.0
		44	5220	20.00	20.00	23.0
		48	5240	20.00	20.00	23.0
	802.11n-HT40 MCS0	38	5190	16.00	16.00	19.0
		46	5230	19.00	19.00	22.0
	802.11ac-VHT20 MCS0	36	5180	20.00	20.00	23.0
		40	5200	20.00	20.00	23.0
		44	5220	20.00	20.00	23.0
		48	5240	20.00	20.00	23.0
	802.11ac-VHT40 MCS0	38	5190	16.00	16.00	19.0
		46	5230	19.00	19.00	22.0
	802.11ac-VHT80 MCS0	42	5210	16.50	16.50	19.5
	802.11ax-HE20 MCS0	36	5180	20.00	20.00	23.0
		40	5200	20.00	20.00	23.0
		44	5220	20.00	20.00	23.0
		48	5240	20.00	20.00	23.0
	802.11ax-HE40 MCS0	38	5190	16.00	16.00	19.0
		46	5230	19.00	19.00	22.0
	802.11ax-HE80 MCS0	42	5210	16.50	16.50	19.5



Transmit Antenna				MIMO Ant 4+3		
5.3GHz WLAN	Mode	Channel	Frequency (MHz)	Tune-Up Limit 4+3(4)	Tune-Up Limit 4+3(3)	Tune-Up Limit 4+3
	802.11a 6Mbps	52	5260	20.00	20.00	23.0
		56	5280	20.00	20.00	23.0
		60	5300	19.00	19.00	22.0
		64	5320	19.50	19.50	22.5
	802.11n-HT20 MCS0	52	5260	20.00	20.00	23.0
		56	5280	20.00	20.00	23.0
		60	5300	20.00	20.00	23.0
		64	5320	20.00	20.00	23.0
	802.11n-HT40 MCS0	54	5270	19.00	19.00	22.0
		62	5310	17.00	17.00	20.0
	802.11ac-VHT20 MCS0	52	5260	20.00	20.00	23.0
		56	5280	20.00	20.00	23.0
		60	5300	20.00	20.00	23.0
		64	5320	20.00	20.00	23.0
	802.11ac-VHT40 MCS0	54	5270	19.00	19.00	22.0
		62	5310	17.00	17.00	20.0
	802.11ac-VHT80 MCS0	58	5290	15.50	15.50	18.5
	802.11ac-VHT160 MCS0	50	5250	14.00	14.00	17.0
	802.11ax-HE20 MCS0	52	5260	20.00	20.00	23.0
		56	5280	20.00	20.00	23.0
		60	5300	20.00	20.00	23.0
		64	5320	20.00	20.00	23.0
	802.11ax-HE40 MCS0	54	5270	19.00	19.00	22.0
		62	5310	17.00	17.00	20.0
	802.11ax-HE80 MCS0	58	5290	15.50	15.50	18.5
	802.11ax-HE160 MCS0	50	5250	14.00	14.00	17.0



Transmit Antenna				MIMO Ant 4+3		
5.5GHz WLAN	Mode	Channel	Frequency (MHz)	Tune-Up Limit 4+3(4)	Tune-Up Limit 4+3(3)	Tune-Up Limit 4+3
	802.11a 6Mbps	100	5500	20.00	20.00	23.0
		116	5580	20.00	20.00	23.0
		124	5620	20.00	20.00	23.0
		132	5660	20.00	20.00	23.0
		144	5720	20.00	20.00	23.0
	802.11n-HT20 MCS0	100	5500	19.50	19.50	22.5
		116	5580	20.00	20.00	23.0
		124	5620	20.00	20.00	23.0
		132	5660	20.00	20.00	23.0
		144	5720	20.00	20.00	23.0
	802.11n-HT40 MCS0	102	5510	17.00	17.00	20.0
		110	5550	19.00	19.00	22.0
		126	5630	19.00	19.00	22.0
		134	5670	19.00	19.00	22.0
		142	5710	19.00	19.00	22.0
	802.11ac-VHT20 MCS0	100	5500	19.50	19.50	22.5
		116	5580	20.00	20.00	23.0
		124	5620	20.00	20.00	23.0
		132	5660	20.00	20.00	23.0
		144	5720	20.00	20.00	23.0
	802.11ac-VHT40 MCS0	102	5510	17.00	17.00	20.0
		110	5550	19.00	19.00	22.0
		126	5630	19.00	19.00	22.0
		134	5670	19.00	19.00	22.0
		142	5710	19.00	19.00	22.0
	802.11ac-VHT80 MCS0	106	5530	16.00	16.00	19.0
		122	5610	19.00	19.00	22.0
		138	5690	19.00	19.00	22.0
	802.11ac-VHT160 MCS0	114	5570	15.00	15.00	18.0
	802.11ax-HE20 MCS0	100	5500	19.50	19.50	22.5
		116	5580	20.00	20.00	23.0
		124	5620	20.00	20.00	23.0
		132	5660	20.00	20.00	23.0
		144	5720	20.00	20.00	23.0
	802.11ax-HE40 MCS0	102	5510	17.00	17.00	20.0
		110	5550	19.00	19.00	22.0
		126	5630	19.00	19.00	22.0
		134	5670	19.00	19.00	22.0
		142	5710	19.00	19.00	22.0
	802.11ax-HE80 MCS0	106	5530	16.00	16.00	19.0
		122	5610	19.00	19.00	22.0
		138	5690	19.00	19.00	22.0
	802.11ax-HE160 MCS0	114	5570	15.00	15.00	18.0

Transmit Antenna				MIMO Ant 4+3		
5.8GHz WLAN	Mode	Channel	Frequency (MHz)	Tune-Up Limit 4+3(4)	Tune-Up Limit 4+3(3)	Tune-Up Limit 4+3
	802.11a 6Mbps	149	5745	20.00	20.00	23.0
		157	5785	20.00	20.00	23.0
		165	5825	20.00	20.00	23.0
	802.11n-HT20 MCS0	149	5745	20.00	20.00	23.0
		157	5785	20.00	20.00	23.0
		165	5825	20.00	20.00	23.0
	802.11n-HT40 MCS0	151	5755	19.00	19.00	22.0
		159	5795	19.00	19.00	22.0
	802.11ac-VHT20 MCS0	149	5745	20.00	20.00	23.0
		157	5785	20.00	20.00	23.0
		165	5825	20.00	20.00	23.0
	802.11ac-VHT40 MCS0	151	5755	19.00	19.00	22.0
		159	5795	19.00	19.00	22.0
	802.11ac-VHT80 MCS0	155	5775	19.00	19.00	22.0
	802.11ax-HE20 MCS0	149	5745	20.00	20.00	23.0
		157	5785	20.00	20.00	23.0
		165	5825	20.00	20.00	23.0
	802.11ax-HE40 MCS0	151	5755	19.00	19.00	22.0
		159	5795	19.00	19.00	22.0
	802.11ax-HE80 MCS0	155	5775	19.00	19.00	22.0

Transmit Antenna				MIMO Ant 4+3		
5.8GHz Uni4	Mode	Channel	Frequency (MHz)	Tune-Up Limit 4+3(4)	Tune-Up Limit 4+3(3)	Tune-Up Limit 4+3
	802.11a 6Mbps	169	5845	20.00	20.00	23.0
		173	5865	20.00	20.00	23.0
		177	5885	20.00	20.00	23.0
	802.11n-HT20 MCS0	169	5845	20.00	20.00	23.0
		173	5865	20.00	20.00	23.0
		177	5885	20.00	20.00	23.0
	802.11n-HT40 MCS0	167	5835	19.00	19.00	22.0
		175	5875	19.00	19.00	22.0
	802.11ac-VHT20 MCS0	169	5845	20.00	20.00	23.0
		173	5865	20.00	20.00	23.0
		177	5885	20.00	20.00	23.0
	802.11ac-VHT40 MCS0	167	5835	19.00	19.00	22.0
		175	5875	19.00	19.00	22.0
	802.11ac-VHT80 MCS0	171	5855	19.00	19.00	22.0
	802.11ac-VHT160 MCS0	163	5815	19.00	19.00	22.0
	802.11ax-HE20 MCS0	169	5845	20.00	20.00	23.0
		173	5865	20.00	20.00	23.0
		177	5885	20.00	20.00	23.0
	802.11ax-HE40 MCS0	167	5835	19.00	19.00	22.0
		175	5875	19.00	19.00	22.0
	802.11ax-HE80 MCS0	171	5855	19.00	19.00	22.0
	802.11ax-HE160 MCS0	163	5815	19.00	19.00	22.0

**<6E 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	20	20	23
		49	6195	20	20	23
		93	6415	19.5	19.5	22.5
		117	6535	19.5	19.5	22.5
		149	6695	20	20	23
		181	6855	20	20	23
	802.11ax-HE20 MCS0	1	5955	20	20	23
		49	6195	20	20	23
		93	6415	20	20	23
		117	6535	20	20	23
		149	6695	20	20	23
		181	6855	20	20	23
	802.11ax-HE40 MCS0	3	5965	19	19	22
		51	6205	19	19	22
		91	6405	19	19	22
		123	6565	19	19	22
		147	6685	19	19	22
		179	6845	19	19	22
	802.11ax-HE80 MCS0	7	5985	18.5	18.5	21.5
		55	6225	19	19	22
		87	6385	19	19	22
		135	6625	19	19	22
		151	6705	19	19	22
		167	6785	19	19	22
	802.11ax-HE160 MCS0	15	6025	18	18	21
		47	6185	19	19	22
		79	6345	19	19	22
		143	6665	19	19	22



<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	19	19

Mode	Burst Average Power (dBm)				
	Ant 3			Ant 3	
	BR / EDR			LE	
	1Mbps	2Mbps	3Mbps	1Mbps	2Mbps
Tune-up Limit	21	18	18	19	19

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		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/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)	-2.90	33.50	30.6	1.15	144.54	0.029	0.549	0.052
GPRS 850 (2 Tx slots)	-2.90	32.50	29.6	0.91	228.00	0.045	0.549	0.083
GPRS 850 (3 Tx slots)	-2.90	31.50	28.6	0.72	271.64	0.054	0.549	0.098
GPRS 850 (4 Tx slots)	-2.90	30.50	27.6	0.58	288.40	0.057	0.549	0.104
EGPRS 850 (1 Tx slot)	-2.90	28.00	25.1	0.32	40.74	0.008	0.549	0.015
EGPRS 850 (2 Tx slots)	-2.90	27.50	24.6	0.29	72.10	0.014	0.549	0.026
EGPRS 850 (3 Tx slots)	-2.90	27.50	24.6	0.29	108.15	0.022	0.549	0.039
EGPRS 850 (4 Tx slots)	-2.90	25.50	22.6	0.18	90.99	0.018	0.549	0.033
GSM/GPRS 1900 (1 Tx slot)	-0.80	31.00	30.2	1.05	131.83	0.026	1.000	0.026
GPRS 1900 (2 Tx slots)	-0.80	29.50	28.7	0.74	185.33	0.037	1.000	0.037
GPRS 1900 (3 Tx slots)	-0.80	29.00	28.2	0.66	247.74	0.049	1.000	0.049
GPRS 1900 (4 Tx slots)	-0.80	28.00	27.2	0.52	263.03	0.052	1.000	0.052
EGPRS 1900 (1 Tx slot)	-0.80	26.50	25.7	0.37	46.77	0.009	1.000	0.009
EGPRS 1900 (2 Tx slots)	-0.80	25.00	24.2	0.26	65.76	0.013	1.000	0.013
EGPRS 1900 (3 Tx slots)	-0.80	25.00	24.2	0.26	98.64	0.020	1.000	0.020
EGPRS 1900 (4 Tx slots)	-0.80	24.00	23.2	0.21	104.46	0.021	1.000	0.021
WCDMA Band 2	-0.80	25.70	24.9	0.31	309.03	0.062	1.000	0.062
WCDMA Band 4	-0.30	25.70	25.4	0.35	346.74	0.069	1.000	0.069
WCDMA Band 5	-2.90	25.70	22.8	0.19	190.55	0.038	0.549	0.069
LTE Band 2	-0.80	25.50	24.7	0.30	295.12	0.059	1.000	0.059
LTE Band 4	-0.30	25.25	25.0	0.31	312.61	0.062	1.000	0.062
LTE Band 5	-2.90	25.50	22.6	0.18	181.97	0.036	0.549	0.066
LTE Band 7	0.60	25.20	25.8	0.38	380.19	0.076	1.000	0.076
LTE Band 12	-4.60	25.30	20.7	0.12	117.49	0.023	0.466	0.050
LTE Band 13	-3.80	25.30	21.5	0.14	141.25	0.028	0.518	0.054
LTE Band 14	-3.80	25.50	21.7	0.15	147.91	0.029	0.525	0.056
LTE Band 17	-3.80	25.30	21.5	0.14	141.25	0.028	0.469	0.060
LTE Band 25	-0.80	25.50	24.7	0.30	295.12	0.059	1.000	0.059
LTE Band 26	-3.00	25.50	22.5	0.18	177.83	0.035	0.543	0.065
LTE Band 30	-1.70	25.00	23.3	0.21	213.80	0.043	1.000	0.043
LTE Band 38	0.60	25.40	26.0	0.40	398.11	0.079	1.000	0.079
LTE Band 38 HPUE	0.60	27.20	27.8	0.60	602.56	0.120	1.000	0.120
LTE Band 41	0.60	25.40	26.0	0.40	398.11	0.079	1.000	0.079
LTE Band 41 HPUE	0.60	27.70	28.3	0.68	676.08	0.135	1.000	0.135
LTE Band 48	-2.20	24.00	21.8	0.15	151.36	0.030	1.000	0.030
LTE Band 66	-0.30	25.25	25.0	0.31	312.61	0.062	1.000	0.062
LTE Band 71	-5.90	25.30	19.4	0.09	87.10	0.017	0.442	0.039
5G NR n2	-0.80	25.70	24.9	0.31	309.03	0.062	1.000	0.062
5G NR n5	-2.90	25.50	22.6	0.18	181.97	0.036	0.549	0.066
5G NR n7	0.60	25.20	25.8	0.38	380.19	0.076	1.000	0.076
5G NR n12	-4.60	25.30	20.7	0.12	117.49	0.023	0.466	0.050
5G NR n25	-0.80	25.70	24.9	0.31	309.03	0.062	1.000	0.062
5G NR n30	-1.70	25.00	23.3	0.21	213.80	0.043	1.000	0.043
5G NR n66	-0.30	25.70	25.4	0.35	346.74	0.069	1.000	0.069
5G NR n71	-5.90	25.30	19.4	0.09	87.10	0.017	0.442	0.039
5G NR n77	-2.20	25.00	22.8	0.19	190.55	0.038	1.000	0.038
5G NR n77 HPUE	-2.20	27.20	25.0	0.32	316.23	0.063	1.000	0.063
WLAN2.4GHz Band	-0.20	24.50	24.3	0.27	269.15	0.054	1.000	0.054
WLAN5GHz/6GHz Band	-0.60	23.00	22.4	0.17	173.78	0.035	1.000	0.035
Bluetooth	-0.20	21.00	20.8	0.12	120.23	0.024	1.000	0.024

WWAN Power Density / Limit	2.4GHz WLAN Power Density / Limit	5GHz/6GHz WLAN Power Density / Limit	Σ (Power Density / Limit)
0.135	0.054	0.035	0.224
WWAN Power Density / Limit	5GHz/6GHz WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit)
0.135	0.035	0.024	0.194

Note:

1. For colocation analysis, the highest (power density/limit) among all WWAN wireless modes is chosen for summation.
2. In 5G NR + LTE + WLAN + BT simultaneous transmission, 5G NR and LTE transmission are managed and controlled by Samsung S.LSI TAS feature, while the RF exposure from WLAN and BT radios is managed using legacy approach, i.e., through a fixed power back-off if needed, therefore simultaneous transmission compliance can be assessed on LTE+WiFi/BT and 5G NR+WiFi/BT.
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/6GHz WLAN transmitter or WWAN + 5GHz/6GHz WLAN + Bluetooth 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 3 collocated transmitters is compliant.

Conclusion:

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