

FCC 47 CFR MPE REPORT

Zhuhai Gotech Intelligent Technology Co.,Ltd.

4G CPE

Model Number: S441A

FCC ID: 2A4GF-S441A

Applicant:	Zhuhai Gotech Intelligent Technology Co.,Ltd.
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Report Number:	ESTE-R2602156
Date of Test:	Jan. 12, 2026 to Feb. 26, 2026
Date of Report:	Mar. 02, 2026

Maximum Permissible Exposure

1. Applicable Standards

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J & KDB 447498 D04 V01, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

1.1. Limits for Maximum Permissible Exposure (MPE)

(a) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-10000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-10000			1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

1.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

2. Conducted Power Result

Mode	Frequency (MHz)	Antenna	Peak output power (dBm)	Peak output power (mW)
IEEE 802.11b	2412	ant 1	18.07	64.121
		ant 2	16.26	42.267
	2437	ant 1	18.53	71.285
		ant 2	16.98	49.888
	2462	ant 1	18.47	70.307
		ant 2	18.44	69.823
IEEE 802.11g	2412	ant 1	20.99	125.603
		ant 2	19.58	90.782
	2437	ant 1	21.25	133.352
		ant 2	20.44	110.662
	2462	ant 1	21.05	127.350
		ant 2	21.19	131.522
IEEE 802.11n HT20	2412	ant 1	15.33	34.119
		ant 2	14.04	25.351
	2437	ant 1	15.83	38.282
		ant 2	14.82	30.339
	2462	ant 1	16.46	44.259
		ant 2	15.75	37.584
IEEE 802.11n HT40	2422	ant 1	15.22	33.266
		ant 2	14.08	25.586
	2437	ant 1	15.44	34.995
		ant 2	13.82	24.099
	2452	ant 1	15.94	39.264
		ant 2	15.19	33.037
GSM 850(824-849MHz)	25.97			395.367
GSM 1900(1850-1910MH)	22.97			198.153
WCDMA Band II(1850-1910MHz)	25.00			316.228
WCDMA Band IV(1710-1755MHz)	25.00			316.228
WCDMA Band V(824-849MHz)	25.00			316.228



LTE Band2(1850-1910MHz)	25.00	316.228
LTE Band4(1710-1755MHz)	25.00	316.228
LTE Band5(824-849MHz)	25.00	316.228
LTE Band7(2500-2570MHz)	25.00	316.228
LTE Band 66(1710-1780MHz)	25.00	316.228

Note: Cellular Network data is sourced from FCC ID: XMR2025EC200AAUV1.

3. Calculated Result and Limit

SISO

The Worst Mode	Ant.	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain		Power Density (S) (mW /cm ²)	Limited of Power Density (S) (mW /cm ²)	Ratio	Test Result
					(dBi)	(Linear)				
2.4G Band										
IEEE 802.11b	ant 1	18.53	18±1	19	4.63	2.904	0.0459	1	0.0457	Complies
	ant 2	18.44	18±1	19	4.61	2.891	0.0457	1	0.0457	Complies
IEEE 802.11g	ant 1	21.25	21±1	22	4.63	2.904	0.0916	1	0.0916	Complies
	ant 2	21.19	21±1	22	4.61	2.891	0.0911	1	0.0911	Complies
IEEE 802.11n HT20	ant 1	16.46	16±1	17	4.63	2.904	0.0290	1	0.0290	Complies
	ant 2	15.75	15±1	16	4.61	2.891	0.0229	1	0.0229	Complies
IEEE 802.11n HT40	ant 1	15.94	15±1	16	4.63	2.904	0.0230	1	0.0230	Complies
	ant 2	15.19	15±1	16	4.61	2.891	0.0229	1	0.0229	Complies
Cellular Network										
GSM 850(824-849MHz)	ant 1	25.97	25±1	26	0.1	1.023	0.0810	0.5493	0.1475	Complies
GSM 1900(1850-1910MH)	ant 1	22.97	22±1	23	1.6	1.445	0.0574	1	0.0574	Complies
WCDMA Band II(1850-1910MHz)	ant 1	25	25±1	26	1.6	1.445	0.1145	1	0.1145	Complies
WCDMA Band IV(1710-1755MHz)	ant 1	25	25±1	26	1.1	1.288	0.1020	1	0.102	Complies

WCDMA Band V(824-849MHz)	ant 1	25	25±1	26	0.1	1.023	0.0810	0.5493	0.1475	Complies
LTE Band2(1850-1910MHz)	ant 1	25	25±1	26	1.6	1.445	0.1145	1	0.1145	Complies
LTE Band4(1710-1755MHz)	ant 1	25	25±1	26	1.1	1.288	0.1020	1	0.102	Complies
LTE Band5(824-849MHz)	ant 1	25	25±1	26	0.1	1.023	0.0810	0.5493	0.1475	Complies
LTE Band7(2500-2570MHz)	ant 1	25	25±1	26	1.2	1.318	0.1044	1	0.1044	Complies
LTE Band 66(1710-1780MHz)	ant 1	25	25±1	26	1.1	1.288	0.1020	1	0.102	Complies

MIMIO

Mode	Power Density (S) (mW /cm ²) Antenna 0	Power Density (S) (mW /cm ²) Antenna 1	Power Density (S) (mW /cm ²) Total	Limited of Power Density (S) (mW /cm ²)	Ratio	Test Result
2.4G Band						
IEEE 802.11n HT20	0.0290	0.0229	0.0518	1	0.0518	Complies
IEEE 802.11n HT40	0.0230	0.0229	0.0459	1	0.0459	Complies

Simultaneous Transmission Mode (WiFi+GSM+WCDMA+LTE)

Mode	Result	Simultaneous Transmissions Result	Simultaneous Transmissions Limit	Total Result
WIFI	0.0916	0.2391	1	Complies
Cellular Network	0.1475			Complies

End of Test Report