

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-4759/22-02-04 Exemption / MPE (FCC)

Certification numbers and labeling requirements	
FCC ID	2A9CE-TM

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EUT technologies:

Technologies:	Power Average Conducted [dBm]			Power EIRP ²⁺³ [dBm]	Max. Power for RF Exposure [dBm]	Data taken from (#)
	Module grant values	Max. declared (Tune-Up)	Difference ¹ (Tune-Up Correction)			
LTE FDD 2 1900 MHz	21.8	20.0 (+2/-2 dB)	0.2	25.5	25.5	A, B, C
LTE FDD 4 1750 MHz	21.8	20.0 (+2/-2 dB)	0.2	25.5	25.5	A, B, C
LTE FDD 5 850 MHz	21.8	20.0 (+2/-2 dB)	0.2	21.4	22.0	A, B, C
LTE FDD 12 700 MHz	21.8	20.0 (+2/-2 dB)	0.2	20.2	22.0	A, B, C
LTE FDD 13 700 MHz	21.8	20.0 (+2/-2 dB)	0.2	20.2	22.0	A, B, C
LTE FDD 14 700 MHz	21.8	20.0 (+2/-2 dB)	0.2	20.2	22.0	A, B, C
LTE FDD 26 850 MHz	21.8	20.0 (+2/-2 dB)	0.2	21.4	22.0	A, B, C
LTE FDD 71 680 MHz	21.8	20.0 (+2/-2 dB)	0.2	20.2	22.0	A, B, C
LTE FDD 85 700 MHz	21.8	20.0 (+2/-2 dB)	0.2	20.2	22.0	A, B, C

¹Difference (Tune-Up Correction) = Max. declared conducted power (Tune-Up) – measured conducted Power²Output power below 1 GHz is corrected with 2.15 dB³ Antenna Gain added

Details and origins of the measurements shown in the table above:

#	Results from:
A	Tune up info from module manufacturer
B	Module grant emission lines of the FCC ID XMR201912BG77
C	Antenna data sheet Inversa-SR4L034-PS-1.0-1367581.pdf

Declared minimum safety distances: 20 cm

Prediction of MPE limit at given distance (KDB 447498 D01 General RF Exposure Guidance v06)

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

where: S = Power density
 P = Power input to the antenna
 G = Antenna gain
 R = Distance to the center of radiation of the antenna
 PG = Output Power including antenna gain

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled "Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure"

Frequency Range (MHz)	Power Density (mW/cm ²)	Averaging Time (minutes)
300 -1500	f/1500	30
1500 - 100000	1.0	30

where f = Frequency (MHz)

Prediction: worst case

Technologies:		Cellular	
	Frequency (MHz)	700	
PG	Declared max power (EIRP)	22	dBm
R	Distance	20	cm
S	MPE limit for uncontrolled exposure	0.5	mW/cm ²
	Calculated Power density:	0.0315	mW/cm ²
	Calculated percentage of Limit:	6.76%	

This prediction demonstrates the following:

The power density levels for FCC at a distance of 20 cm are below the maximum levels allowed by regulations.

Conclusion: RF exposure evaluation is not required.