



June 16, 2021

TUV SUD America Inc.
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Attention: Director of Certification

RE: Analysis of RF Exposure for Mobile and Portable Device per KDB 447498 D01 General RF Exposure Guidance v06, RSS-102 Issue 5 March 2015 and AS/NZS 2772.2:2016.

FCC ID: 2AZ91-LTBS

1. Limits

Limits for General Population/Uncontrolled Exposure (Title 47 Subpart J §2.1091 and KDB 447498 D01 referring to limits under §1.1310)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Electric Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time (minutes)
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

f = frequency in MHz

*Plane-wave equivalent power density

Limits for Devices Used by the General Public (Uncontrolled Environment (RSS-102 Issue 5 March 2015)

Frequency Range (MHz)	Electric Field Strength (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003 - 10 ²¹	83	90	-	Instantaneous*
0.1 - 10	-	0.73/f	-	6**
1.1 - 10	87/f ^{0.5}	-	-	6**
10 - 20	27.46	0.0728	2	6
20 - 48	-58.07/f ^{0.25}	0.1540/f ^{0.25}	8.944/f ^{0.5}	6
48 - 300	22.06	0.05852	1.291	6
300 - 6000	3.142 f ^{0.3417}	0.008335 f ^{0.3417}	0.02619 f ^{0.6834}	6
6000 - 15000	61.4	0.163	10	6
15000 - 150000	61.4	0.163	10	616000/f ^{1.2}
150000 - 300000	0.158f ^{0.5}	4.21 x 10 ⁻⁴ f ^{0.5}	6.67 x 10 ⁻⁵ f	616000/f ^{1.2}

f is frequency in MHz

*Based on nerve stimulation (NS)

** Based on specific absorption rate (SAR)



2. MPE Calculation Summary using a 20cm separation distance:

Mode (Worst Case)	Output Power (mW)	Power Density (mW/cm ²)
ISM 900 MHz	25.12	0.0079201
LTE Band 12	251.19	0.1989437

3. Co-Located Transmitters transmission table:

Transmitter type	Transmitter type that can transmit at the same time
ISM 900 MHz	LTE B12 (worst case band of the Cell Modem)
LTE B12	ISM 900 MHz

4. Worst Case Simultaneous Transmission MPE:

Transmitter type	MPE (mw/cm ²)	FCC Limit (mW/cm ²)	ISED Limit (W/m ²)	FCC MPE ratio (MPE/Limit)	ISED MPE ratio (MPE/Limit)
ISM 900 MHz	0.0079201	0.601	2.740245	0.013178	0.028903
LTE Band 12	0.1989437	0.466	2.301713	0.426918	0.864329
Sum of the ratios (should be <1.0)				0.440096	0.893232

5. Mobile MPE Calculation using a 20cm separation distance

Using Power Density formula:

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

where: S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to isotropic

R = distance to the center of radiation of the antenna



6. ISM 900 MHz at 20 cm Separate Distance:

Maximum peak output power at antenna input terminal:	14.0	(dBm)
Maximum peak output power at antenna input terminal:	25.12	(mW)
Antenna gain(typical):	2.0	(dBi)
Maximum antenna gain:	1.585	(numeric)
Prediction distance:	20	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	902.2	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	0.601	(mW/cm ²)
ISED MPE limit for uncontrolled exposure at prediction frequency:	2.740245	(W/m ²)
Power density at prediction frequency:	0.0079201	(mW/cm ²)
Power density at prediction frequency:	0.079201	(W/m ²)
FCC Margin of Compliance:	-18.80	(dB)
ISED Margin of Compliance:	-15.39	(dB)

7. Worst Case Cell Modem Band LTE Band 12 at 20 cm Separate Distance:

Maximum peak output power at antenna input terminal:	24.0	(dBm)
Maximum peak output power at antenna input terminal:	251.19	(mW)
Antenna gain(typical):	6.0	(dBi)
Maximum antenna gain:	3.981	(numeric)
Prediction distance:	20	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	699	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	0.466	(mW/cm ²)
ISED MPE limit for uncontrolled exposure at prediction frequency:	2.301713	(W/m ²)
Power density at prediction frequency:	0.1989437	(mW/cm ²)
Power density at prediction frequency:	1.989437	(W/m ²)
FCC Margin of Compliance:	-3.7	(dB)
ISED Margin of Compliance:	-0.63	(dB)

Sincerely,

Xiaoying Zhang

Name

Authorized Signatory

Title: Senior RF Wireless Test Engineer