



May 8, 2019

TUV SUD BAPT  
 Octagon House, Concorde Way  
 Segensworth Rd N, Fareham  
 PO15 5RL

Attention: Director of Certification

**RE: Analysis of RF Exposure for Portable and Mobile use per KDB 447498 D01 Mobile Portable RF Exposure v06 and RSS-102 Issue 5 March 2015.**

FCC ID: 2AHIS-V80G

IC: 21498-V80G

**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 <sup>2</sup> )	Averaging Time (minutes)
0.3 - 1.34	614	1.63	*(100)	30
1.34 - 30	824/f	2.19/f	*(180/f <sup>2</sup> )	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 <sup>2</sup> )	Reference Period (minutes)
0.003 - 10 <sup>21</sup>	83	90	-	Instantaneous
0.1 - 10	-	0.73/f	-	6**
1.1 - 10	87/f <sup>0.5</sup>	-	-	6**
10 - 20	27.46	0.0728	2	6
20 - 48	-58.07/f <sup>0.25</sup>	0.1540/f <sup>0.25</sup>	8.944/f <sup>0.5</sup>	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	$0.158f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

*f* is frequency in MHz

\*Based on nerve stimulation (NS)

\*\* Based on specific absorption rate (SAR)

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

Model	Output Power	Antenna Gain	E.I.R.P	Power Density (mW/cm <sup>2</sup> )
V80G (77 to 81GHz)	-10.9 dBm	5.0 dBi	0.0813 mW	0.00005

**3. 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

Maximum output power at antenna input terminal:	<u>-15.90</u>	(dBm)
Maximum output power at antenna input terminal:	<u>0.03</u>	(mW)
Antenna gain(typical):	<u>5</u>	(dBi)
Maximum antenna gain:	<u>3.162</u>	(numeric)
Prediction distance:	<u>20</u>	(cm)
Source Based Time Average Duty Cycle:	<u>100</u>	(%)
Prediction frequency:	<u>79000</u>	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	<u>1.000</u>	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	<u>0.00002</u>	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	<u>0.000</u>	(W/m <sup>2</sup> )
Margin of Compliance:	<u>-47.91</u>	(dB)



**4. Exemption Limits for Routine Evaluation — RF Exposure Evaluation (RSS-102):**

- At or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).
- **EUT is exempt** since the measured EIRP is 0.0813mW. Even if using the total band power (4GHz) of 25.09dBm, the EUT is still exempt when transmitting from 77 to 81GHz. The EUT is meant for 20cm separation with the user (mobile).

Sincerely,

A handwritten signature in black ink that reads 'Sandipan Basu'.

Sandipan Basu

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Name

Authorized Signatory

Title: EMC/Wireless Test Engineer