



April 07, 2016

TUV SUD BABT  
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 v05r02 and RSS-102 Issue 5 March 2015.**

FCC ID: XM5-SMG2SMT

## 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*



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

Mode (Worst Case)	Output Power	Power Density (mW/cm <sup>2</sup> )
Mobile Satellite Service	8.13 watt	0.6468
WLAN	0.058 watt	0.0262

**3. Simultaneous Transmission MPE:**

Transmitter type	MPE (mW/cm <sup>2</sup> )	FCC Limit (mW/cm <sup>2</sup> )	FCC MPE ratio (MPE/Limit)
Mobile Satellite Service	0.6468	1	0.6468
WLAN	0.0262	1	0.0262
Sum of the ratios (should be <1.0)			0.673



**4. Mobile MPE Calculation using a 100cm separation distance (Mobile Satellite Service):**

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 peak output power at antenna input terminal:	<b>39.10</b>	(dBm)
Maximum peak output power at antenna input terminal:	<b>8128.31</b>	(mW)
Antenna gain(typical):	<b>10</b>	(dBi)
Maximum antenna gain:	<b>10.000</b>	(numeric)
Prediction distance:	<b>100</b>	(cm)
Source Based Time Average Duty Cycle:	<b>100</b>	(%)
Prediction frequency:	<b>1643.7</b>	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	<b>1.000</b>	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	<b>0.6468</b>	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	<b>6.468</b>	(W/m <sup>2</sup> )
FCC Margin of Compliance:	<b>-1.89</b>	(dB)



**5. Mobile MPE Calculation using a 20cm separation distance (WLAN):**

Maximum peak output power at antenna input terminal:	<b>17.69</b>	(dBm)
Maximum peak output power at antenna input terminal:	<b>58.75</b>	(mW)
Antenna gain(typical):	<b>3.5</b>	(dBi)
Maximum antenna gain:	<b>2.239</b>	(numeric)
Prediction distance:	<b>20</b>	(cm)
Source Based Time Average Duty Cycle:	<b>100</b>	(%)
Prediction frequency:	<b>2412</b>	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	<b>1.000</b>	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	<b>0.0262</b>	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	<b>0.262</b>	(W/m <sup>2</sup> )
FCC Margin of Compliance:	<b>-15.82</b>	(dB)

Sincerely,

  
Alex Chang

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Name

Authorized Signatory

Title: Senior EMC/Wireless Test Engineer