



August 22, 2018

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 v06 and RSS-102 Issue 5 March 2015.**

FCC ID: PKRNX35L7504

IC: 3229A-NX35L7504

**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:**

Mode	Output Power	Power Density (mW/cm <sup>2</sup> )
Bluetooth	8.00 dBm	0.0213
LTE	23.96 dBm	0.0652

Bluetooth values are from the original filing of the EUT

**3. Co-Located Transmitters transmission table:**

Transmitter type	Transmitter type that can transmit at the same time
Bluetooth	LTE
LTE	Bluetooth

**4. Simultaneous Transmission MPE:**

Transmitter type	MPE (mw/cm <sup>2</sup> )	FCC Limit (mW/cm <sup>2</sup> )	IC Limit (mW/cm <sup>2</sup> )	FCC MPE ratio (MPE/Limit)	ISED MPE ratio (MPE/Limit)
Bluetooth	0.0213	1.0	0.53446	0.0213	0.03985
LTE	0.0652	0.55767	0.26022	0.2505	0.25055
Sum of the ratios (should be <1.0)				0.2718	0.29040

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

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>23.96</b>	(dBm)
Maximum peak output power at antenna input terminal:	<b>248.89</b>	(mW)
Antenna gain(typical):	<b>1.2</b>	(dBi)
Maximum antenna gain:	<b>1.318</b>	(numeric)
Prediction distance:	<b>20</b>	(cm)
Source Based Time Average Duty Cycle:	<b>100</b>	(%)
Prediction frequency:	<b>836.5</b>	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	<b>0.558</b>	(mW/cm <sup>2</sup> )
ISED MPE limit for uncontrolled exposure at prediction frequency:	<b>0.260</b>	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	<b>0.06527</b>	(mW/cm <sup>2</sup> )
Power density at prediction frequency:	<b>0.6527</b>	(W/m <sup>2</sup> )
FCC Margin of Compliance:	<b>-9.32</b>	(dB)
ISED Margin of Compliance:	<b>-6.01</b>	(dB)

Sincerely,

A handwritten signature in black ink, appearing to read 'Ferdie S. Custodio', written over a horizontal line.

Ferdie S. Custodio

Name

Authorized Signatory

Title: Senior EMC Test Engineer /Wireless Team Lead