



November 01, 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 v05r02 and RSS-102 Issue 5 March 2015.

FCC ID: YETG32-1214

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*



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

Downlink (CU)			
Mode	Output Power (dBm)	Power Density (mW/cm ²)	FCC Limit (mW/cm ²)
LTE Band 12	16.47	0.343	0.489
LTE Band 14	16.12	0.324	0.509
2.4G BLE	-1.01	0.0000499	1

Uplink (NU)			
Mode	Output Power (dBm)*	Power Density (mW/cm ²)	FCC Limit (mW/cm ²)
LTE Band 12	24.29	0.396	0.469
LTE Band 14	23.37	0.453	0.529
2.4G BLE	-1.01	0.0000499	1



3. Co-Located Transmitters transmission table:

Downlink	
Transmitter type	Transmitter type that can transmit at the same time
LTE B12	2.4G BLE
LTE B14	2.4G BLE
2.4G BLE	LTE B12 or LTE B14

Uplink	
Transmitter type	Transmitter type that can transmit at the same time
LTE B12	2.4G BLE
LTE B14	2.4G BLE
2.4G BLE	LTE B12 or LTE B14

4. Simultaneous Transmission MPE:

Downlink			
Transmitter type	MPE (mw/cm ²)	FCC Limit (mW/cm ²)	FCC MPE ratio (MPE/Limit)
LTE Band 12	0.343	0.489	0.7014
2.4G BLE	0.0000499	1	0.0000499
Sum of the ratios (should be <1.0)			0.7014499

Uplink			
Transmitter type	MPE (mw/cm ²)	FCC Limit (mW/cm ²)	FCC MPE ratio (MPE/Limit)
LTE Band 14	0.453	0.529	0.8563
2.4G BLE	0.0000499	1	0.0000499
Sum of the ratios (should be <1.0)			0.8563499



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

LTE Band 12 Downlink:

Maximum peak output power at antenna input terminal:	16.47	(dBm)
Maximum peak output power at antenna input terminal:	44.36	(mW)
Antenna gain(typical):	15.9	(dBi)
Maximum antenna gain:	38.905	(numeric)
Prediction distance:	20	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	734	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	0.489	(mW/cm ²)
Power density at prediction frequency:	0.343	(mW/cm ²)
FCC Margin of Compliance:	-1.54	(dB)

LTE Band 14 Downlink:

Maximum peak output power at antenna input terminal:	16.12	(dBm)
Maximum peak output power at antenna input terminal:	40.93	(mW)
Antenna gain(typical):	16	(dBi)
Maximum antenna gain:	39.811	(numeric)
Prediction distance:	20	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	763	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	0.509	(mW/cm ²)
Power density at prediction frequency:	0.324	(mW/cm ²)
FCC Margin of Compliance:	-1.96	(dB)



America

LTE Band 12 Uplink:

Maximum peak output power at antenna input terminal:	24.29	(dBm)
Maximum peak output power at antenna input terminal:	268.53	(mW)
Antenna gain(typical):	8.7	(dBi)
Maximum antenna gain:	7.413	(numeric)
Prediction distance:	20	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	704	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	0.469	(mW/cm ²)
Power density at prediction frequency:	0.396	(mW/cm ²)
FCC Margin of Compliance:	-0.73	(dB)

LTE Band 14 Uplink:

Maximum peak output power at antenna input terminal:	23.37	(dBm)
Maximum peak output power at antenna input terminal:	217.27	(mW)
Antenna gain(typical):	10.2	(dBi)
Maximum antenna gain:	10.471	(numeric)
Prediction distance:	20	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	793	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	0.529	(mW/cm ²)
Power density at prediction frequency:	0.453	(mW/cm ²)
FCC Margin of Compliance:	-0.68	(dB)



America

2.4GHz BLE:

Maximum peak output power at antenna input terminal:	-1.01	(dBm)
Maximum peak output power at antenna input terminal:	0.79	(mW)
Antenna gain(typical):	-5	(dBi)
Maximum antenna gain:	0.316	(numeric)
Prediction distance:	20	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	2402	(MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	1.00	(mW/cm ²)
ISED MPE limit for uncontrolled exposure at prediction frequency:	5.351	(W/m ²)
Power density at prediction frequency:	0.0000499	(mW/cm ²)
Power density at prediction frequency:	0.000499	(W/m ²)
FCC Margin of Compliance:	-43.02	(dB)
IC Margin of Compliance:	-40.31	(dB)

Sincerely,

Xiaoying Zhang

Name

Authorized Signatory

Title: EMC/Wireless Test Engineer