September 12, 2014

TUV SUD BABT
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Attention: Director of Certification

RE: Analysis of RF Exposure for Portable and Mobile use per KDB 447498 D01 Mobile Portable RF Exposure v05r01

FCC ID: PKRNVWSA1100
IC: 3229A-SA1100

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

Mode	Output Power	Power Density (mW/m^2)
GSM 850	31.86 dBm	0.3844
GSM 1900	29.16 dBm	0.2599
WCDMA Band II	23.07 dBm	0.0639
WCDMA Band V	23.43 dBm	0.0552
802.11b	20.36 dBm	0.0497
802.11g	22.13 dBm	0.0748
802.1n	21.04 dBm	0.0582

2. Co-Located Transmitters transmission table:

Transmitter type	Transmitter type that can transmit at the same time
GSM	WCDMA and WiFi
WCDMA	GSM and WiFi
WiFi	GSM and WCDMA

3. Simultaneous Transmission MPE (worst-case):

Transmitter type	MPE (mw/cm^2)	Limit (mW/cm^2)	MPE ratio (MPE/Limit)
GSM	0.3844	0.549	0.700
WCDMA	0.0639	1.0	0.0639
WiFi (802.11g)	0.0748	1.0	0.0748
Sum of the ratios (should be <1.0)			0.839

4. *Mobile MPE Calculation using a 20cm separation distance (GSM 850):*

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:	**31.86**	(dBm)
Maximum peak output power at antenna input terminal:	**1534.62**	(mW)
Antenna gain(typical):	**1**	(dBi)
Maximum antenna gain:	**1.259**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**824.2**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**0.549**	(mW/cm^2)
Power density at prediction frequency:	**0.3844**	(mW/cm^2)
Power density at prediction frequency:	**3.844**	(W/m^2)
Margin of Compliance:	**-1.55**	(dB)

5. *Mobile MPE Calculation using a 20cm separation distance (GSM 1900):*

Maximum peak output power at antenna input terminal:	**29.16**	(dBm)
Maximum peak output power at antenna input terminal:	**824.14**	(mW)
Antenna gain(typical):	**2**	(dBi)
Maximum antenna gain:	**1.585**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**1850.2**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.000**	(mW/cm^2)
Power density at prediction frequency:	**0.2599**	(mW/cm^2)
Power density at prediction frequency:	**2.599**	(W/m^2)
Margin of Compliance:	**-5.85**	(dB)

6. Mobile MPE Calculation using a 20cm separation distance (WCDMA Band II):

Maximum peak output power at antenna input terminal:	**23.07**	(dBm)
Maximum peak output power at antenna input terminal:	**202.77**	(mW)
Antenna gain(typical):	**2**	(dBi)
Maximum antenna gain:	**1.585**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**1852.4**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.000**	(mW/cm^2)
Power density at prediction frequency:	**0.0639**	(mW/cm^2)
Power density at prediction frequency:	**0.639**	(W/m^2)
Margin of Compliance:	**-11.94**	(dB)

7. Mobile MPE Calculation using a 20cm separation distance (WCDMA Band V):

Maximum peak output power at antenna input terminal:	**23.43**	(dBm)
Maximum peak output power at antenna input terminal:	**220.29**	(mW)
Antenna gain(typical):	**1**	(dBi)
Maximum antenna gain:	**1.259**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**826.4**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**0.551**	(mW/cm^2)
Power density at prediction frequency:	**0.0552**	(mW/cm^2)
Power density at prediction frequency:	**0.552**	(W/m^2)
Margin of Compliance:	**-9.99**	(dB)

8. Mobile MPE Calculation using a 20cm separation distance (802.11b):

Maximum peak output power at antenna input terminal:	**20.36**	(dBm)
Maximum peak output power at antenna input terminal:	**108.64**	(mW)
Antenna gain(typical):	**3.62**	(dBi)
Maximum antenna gain:	**2.301**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2412**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**0.551**	(mW/cm^2)
Power density at prediction frequency:	**0.0497**	(mW/cm^2)
Power density at prediction frequency:	**0.497**	(W/m^2)
Margin of Compliance:	**-10.44**	(dB)

9. Mobile MPE Calculation using a 20cm separation distance (802.11g):

Maximum peak output power at antenna input terminal:	**22.13**	(dBm)
Maximum peak output power at antenna input terminal:	**163.31**	(mW)
Antenna gain(typical):	**3.62**	(dBi)
Maximum antenna gain:	**2.301**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2437**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**0.551**	(mW/cm^2)
Power density at prediction frequency:	**0.0748**	(mW/cm^2)
Power density at prediction frequency:	**0.748**	(W/m^2)
Margin of Compliance:	**-8.67**	(dB)

10. Mobile MPE Calculation using a 20cm separation distance (802.11n):

Maximum peak output power at antenna input terminal:	**21.04**	(dBm)
Maximum peak output power at antenna input terminal:	**127.06**	(mW)
Antenna gain(typical):	**3.62**	(dBi)
Maximum antenna gain:	**2.301**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2437**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**0.551**	(mW/cm^2)
Power density at prediction frequency:	**0.0582**	(mW/cm^2)
Power density at prediction frequency:	**0.582**	(W/m^2)
Margin of Compliance:	**-9.76**	(dB)

Sincerely,

Alex Chang

Name

Authorized Signatory

Title: EMC/Wireless Test Engineer