June 18, 2015

TUV SUD BABT
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Attention: Director of Certification

RE: Analysis of RF Exposure for Portable and Mobile according to FCC 2.1091 and RSS-102 Issue 5 March 2015.

FCC ID: IFU1001012
IC: N/A

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

Mode	Output Power (dBm)	Power Density (mW/cm^2)
802.11b	12.29	0.0066
802.11g	11.72	0.0058
802.11a	11.64	0.0037
802.11n	11.62	0.0056
Bluetooth Low Energy	9.77	0.0037
Bluetooth	11.97	0.0069
NFC	39.9 dBµV/m @ 3 meters	0.00000000058

2. *Co-Located Transmitters transmission table:*

Transmitter type	Transmitter type that can transmit at the same time
WiFi 802.11b/g/n/a	NFC
BLE	NFC
BT	NFC
NFC	WiFi or BT/ BLE

3. Simultaneous Transmission MPE:

Transmitter type	MPE (mw/cm^2)	Limit (mW/cm^2)	MPE ratio (MPE/Limit)
Sum of the ratios (should be <1.0)			

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

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:	12.29	(dBm)
Maximum peak output power at antenna input terminal:	16.94	(mW)
Antenna gain(typical):	2.9	(dBi)
Maximum antenna gain:	1.95	(numeric)
Prediction distance:	20	(cm)
Sourse Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1.000	(mW/cm^2)
Power density at prediction frequency:	0.0066	(mW/cm^2)
Power density at prediction frequency:	0.066	(W/m^2)
Margin of Compliance:	-21.82	(dB)

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

Maximum peak output power at antenna input terminal:	11.72	(dBm)
Maximum peak output power at antenna input terminal:	14.86	(mW)
Antenna gain(typical):	2.9	(dBi)
Maximum antenna gain:	1.95	(numeric)
Prediction distance:	20	(cm)
Sourse Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1.000	(mW/cm^2)
Power density at prediction frequency:	0.0058	(mW/cm^2)
Power density at prediction frequency:	0.058	(W/m^2)
Margin of Compliance:	-22.29	(dB)

6.

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

Maximum peak output power at antenna input terminal:	**11.64**	(dBm)
Maximum peak output power at antenna input terminal:	**14.56**	(mW)
Antenna gain(typical):	**2.9**	(dBi)
Maximum antenna gain:	**1.95**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**5180**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.000**	(mW/cm^2)
Power density at prediction frequency:	**0.0037**	(mW/cm^2)
Power density at prediction frequency:	**0.037**	(W/m^2)
Margin of Compliance:	**-24.37**	(dB)

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

Maximum peak output power at antenna input terminal:	**11.62**	(dBm)
Maximum peak output power at antenna input terminal:	**14.52**	(mW)
Antenna gain(typical):	**2.9**	(dBi)
Maximum antenna gain:	**1.95**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2437**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.000**	(mW/cm^2)
Power density at prediction frequency:	**0.0056**	(mW/cm^2)
Power density at prediction frequency:	**0.056**	(W/m^2)
Margin of Compliance:	**-22.49**	(dB)

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

Maximum peak output power at antenna input terminal:	**9.77**	(dBm)
Maximum peak output power at antenna input terminal:	**9.48**	(mW)
Antenna gain(typical):	**2.9**	(dBi)
Maximum antenna gain:	**1.95**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2440**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.00**	(mW/cm^2)
Power density at prediction frequency:	**0.0037**	(mW/cm^2)
Power density at prediction frequency:	**0.037**	(W/m^2)
Margin of Compliance:	**-24.34**	(dB)

10. *Mobile MPE Calculation using a 20cm separation distance (BT):*

Maximum peak output power at antenna input terminal:	**12.49**	(dBm)
Maximum peak output power at antenna input terminal:	**17.74**	(mW)
Antenna gain(typical):	**2.9**	(dBi)
Maximum antenna gain:	**1.95**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2440**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.00**	(mW/cm^2)
Power density at prediction frequency:	**0.0069**	(mW/cm^2)
Power density at prediction frequency:	**0.069**	(W/m^2)
Margin of Compliance:	**-21.62**	(dB)

11. *Mobile MPE Calculation using a 20cm separation distance (NFC):*

Maximum peak output power at antenna input terminal:	**39.9**	(dBm)
Maximum peak output power at antenna input terminal:	**0.906**	(mW)
Antenna gain(typical):	**0**	(dBi)
Maximum antenna gain:	**1.0**	(numeric)
Prediction distance:	**20**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**13.56**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**0.9789**	(mW/cm^2)
Power density at prediction frequency:	**0.00000000058**	(mW/cm^2)
Power density at prediction frequency:	**0.0000000058**	(W/m^2)
Margin of Compliance:	**-92.25**	(dB)

Sincerely,

Xiaoying Zhang
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Authorized Signatory
Title: EMC/Wireless Test Engineer