January 29, 2016

TUV SUD BABT
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Attention: Director of Certification

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

FCC ID: 2ABLPAT2220
IC: 20546-AT2220

1. Mobile MPE Calculation Summary using a 47cm separation distance:

Mode	Output Power (dBm)	Power Density (mW/cm^2)
802.11b	19.38	0.001
802.11g	15.32	0.0003
Bluetooth	7.25	0.00005
Satellite (L-Band)	29.92	0.158

2. Co-Located Transmitters transmission table:

Transmitter type	Transmitter type that can transmit at the same time
WiFi 802.11 b/g	Satellite (L-Band) / Bluetooth
Bluetooth	WiFi / Satellite (L-Band)
Satellite	WiFi / Bluetooth

3. Simultaneous Transmission MPE:

Transmitter type	MPE (mW/cm^2)	Limit (mW/cm^2)	MPE ratio (MPE/Limit)
WiFi (802.11b)	0.001	1.0	0.001
Bluetooth	0.0003	1.0	0.0003
Satellite (L-Band)	0.158	1.0	0.158
Sum of the ratios (should be <1.0)			0.1593

4. *Mobile MPE Calculation using a 47cm 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:	**19.38**	(dBm)
Maximum peak output power at antenna input terminal:	**86.70**	(mW)
Antenna gain(typical):	**-4.79**	(dBi)
Maximum antenna gain:	**0.332**	(numeric)
Prediction distance:	**47**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2462**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.000**	(mW/cm^2)
Power density at prediction frequency:	**0.0010**	(mW/cm^2)
Power density at prediction frequency:	**0.010**	(W/m^2)
Margin of Compliance:	**-29.84**	(dB)

5. *Mobile MPE Calculation using a 47cm separation distance (802.11g):*

Maximum peak output power at antenna input terminal:	**15.32**	(dBm)
Maximum peak output power at antenna input terminal:	**34.04**	(mW)
Antenna gain(typical):	**-6.23**	(dBi)
Maximum antenna gain:	**0.238**	(numeric)
Prediction distance:	**47**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2412**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.000**	(mW/cm^2)
Power density at prediction frequency:	**0.0003**	(mW/cm^2)
Power density at prediction frequency:	**0.003**	(W/m^2)
Margin of Compliance:	**-35.34**	(dB)

6. *Mobile MPE Calculation using a 47cm separation distance (Bluetooth):*

Maximum peak output power at antenna input terminal:	**7.25**	(dBm)
Maximum peak output power at antenna input terminal:	**5.31**	(mW)
Antenna gain(typical):	**-6.01**	(dBi)
Maximum antenna gain:	**0.251**	(numeric)
Prediction distance:	**47**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**2440**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.000**	(mW/cm^2)
Power density at prediction frequency:	**0.00005**	(mW/cm^2)
Power density at prediction frequency:	**0.0005**	(W/m^2)
Margin of Compliance:	**-43.19**	(dB)

7. *Mobile MPE Calculation using a 47cm separation distance (Satellite L-Band):*

Maximum peak output power at antenna input terminal:	**29.92**	(dBm)
Maximum peak output power at antenna input terminal:	**981.75**	(mW)
Antenna gain(typical):	**6.5**	(dBi)
Maximum antenna gain:	**4.467**	(numeric)
Prediction distance:	**47**	(cm)
Sourse Based Time Average Duty Cycle:	**100**	(%)
Prediction frequency:	**1626.5**	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	**1.000**	(mW/cm^2)
Power density at prediction frequency:	**0.1580**	(mW/cm^2)
Power density at prediction frequency:	**1.580**	(W/m^2)
Margin of Compliance:	**-8.01**	(dB)

Sincerely,

Alex Chang
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Authorized Signatory
Title: EMC/Wireless Test Engineer