



APPENDIX I RADIO FREQUENCY EXPOSURE

LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

EUT Specification

EUT	4G/LTE Outdoor Router														
Model	BiPAC 6200ZUL-R6, BEC 6800RUL-R6														
Frequency band (Operating)	☒ LTE Band II: 1850.0MHz ~ 1910.0MHz ☒ LTE Band IV: 1710.0MHz ~ 1755.0MHz ☒ LTE Band XVII: 704.0MHz ~ 716.0MHz ☐ Others														
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others														
Exposure classification	☐ Occupational/Controlled exposure ($S = 5\text{mW/cm}^2$) ☒ General Population/Uncontrolled exposure ($S=1\text{mW/cm}^2$)														
Antenna Specification	Antenna Gain : 7.0 dBi (Numeric gain 5.01)														
Measurement Average output power	<table><tr><th>System</th><th>Power</th><th></th></tr><tr><td>LTE Band II</td><td>23.91 dBm</td><td>(246.04 mW)</td></tr><tr><td>LTE Band IV</td><td>23.95 dBm</td><td>(248.31 mW)</td></tr><tr><td>LTE Band XVII</td><td>23.78 dBm</td><td>(238.78 mW)</td></tr></table>	System	Power		LTE Band II	23.91 dBm	(246.04 mW)	LTE Band IV	23.95 dBm	(248.31 mW)	LTE Band XVII	23.78 dBm	(238.78 mW)		
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Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A														



Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	2014/07/28	Initial Issue	ALL	Angel Cheng



TEST RESULTS

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P / 1000) \times G}{377 \times (d / 100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \textbf{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

**Maximum Permissible Exposure**

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

LTE Band II mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm ²)
18900	1800	251.189	5.01	20	0.2504	1.000

LTE Band IV mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm ²)
20375	1752.5	251.189	5.01	20	0.2504	1.000

LTE Band XVII mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm ²)
23780	709	251.189	5.01	20	0.2504	1.000