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

<table>
<tr><td>EUT</td><td>LTE LGA Module</td></tr>
<tr><td>Model</td><td>LI172</td></tr>
<tr><td>Frequency band (Operating)</td><td>☒ LTE Band IV: 1710.0MHz ~ 1755.0MHz
☒ LTE Band XIII: 704.0MHz ~ 716.0MHz
☐ Others</td></tr>
<tr><td>Device category</td><td>☐ Portable (<20cm separation)
☒ Mobile (>20cm separation)
☐ Others</td></tr>
<tr><td>Exposure classification</td><td>☐ Occupational/Controlled exposure (S = 5mW/cm^2)
☒ General Population/Uncontrolled exposure (S=1mW/cm^2)</td></tr>
<tr><td>Antenna Specification</td><td>Antenna Gain (LTE Band IV): 5.86 dBi (Numeric gain: 3.85)
Antenna Gain (LTE Band XIII): 3.82 dBi (Numeric gain: 2.41)</td></tr>
<tr><td>Measurement Average output power</td><td><table><tr><th>System</th><th>Power</th><th></th></tr><tr><td>LTE Band IV</td><td>23.93 dBm</td><td>(247.17 mW)</td></tr><tr><td>LTE Band XIII</td><td>23.85 dBm</td><td>(242.66 mW)</td></tr></table></td></tr>
<tr><td>Power Target / Tolerance</td><td><table><tr><th>System</th><th>Target Power</th><th>Tolerance</th></tr><tr><td>LTE Band IV</td><td>23.0 dBm</td><td>± 2 dB</td></tr><tr><td>LTE Band XIII</td><td>23.0 dBm</td><td>± 2 dB</td></tr></table></td></tr>
<tr><td>Max tune up Power / Max time Average Power</td><td><table><tr><th>System</th><th>Max Tune up Power</th><th>Time Average Power</th></tr><tr><td>LTE Band IV</td><td>25.0dBm (316.228mW)</td><td>25.0dBm (316.228mW)</td></tr><tr><td>LTE Band XIII</td><td>25.0dBm (316.228mW)</td><td>25.0dBm (316.228mW)</td></tr></table></td></tr>
<tr><td>Evaluation applied</td><td>☒ MPE Evaluation*
☐ SAR Evaluation
☐ N/A</td></tr>
</table>

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	2014/04/22	Initial Issue	ALL	Scott Hsu

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:

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

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

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

Where d = Distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

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 / cm^2

LTE Band IV mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
19975	1712.5	316.228	3.85	20	0.2423	1.000

LTE Band XIII mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
23255	784.5	316.228	2.41	20	0.1517	0.523