APPENDIX I
RADIO FREQUENCY EXPOSURE

LIMIT

EUT Specification

EUT	IPC
Frequency band (Operating)	☐ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☒ Others: LTE Band 17: Channel Bandwidth: 5MHz: 706.5MHz ~ 713.5MHz Channel Bandwidth: 10MHz: 709MHz ~ 711MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Max. output power	Channel Bandwidth: 5MHz: QPSK: 17.74dBm(59.43mW) 16QAM: 9.83dBm(9.62mW) Channel Bandwidth: 10MHz: QPSK: 17.74dBm(59.43mW) 16QAM: 10.60dBm(11.48mW)
Antenna gain (Max)	2 dBi (Numeric gain: 1.58)
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation ☐ N/A

Remark:

The maximum output power is 17.74dBm (59.43mW) at 710.0MHz (with 1.58 numeric antenna gain.)

TEST RESULTS

No non-compliance noted.

Calculation

Given $\quad E = \dfrac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \dfrac{E^2}{3770}$

$\qquad$ *Where* $\quad$ *E = Field strength in Volts / meter*

$\qquad\qquad$ *P = Power in Watts*

$\qquad\qquad$ *G = Numeric antenna gain*

$\qquad\qquad$ *d = Distance in meters*

$\qquad\qquad$ *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:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$\qquad$ *P (mW) = P (W) / 1000 and*

$\qquad$ *d (cm) = d(m) / 100*

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \qquad \textbf{\textit{Equation 1}}$$

$\qquad$ *Where* $\quad$ *d = Distance in cm*

$\qquad\qquad$ *P = Power in mW*

$\qquad\qquad$ *G = Numeric antenna gain*

$\qquad\qquad$ *S = Power density in mW / cm²*

Maximum Permissible Exposure

EUT output power = 59.43mW

Numeric Antenna gain = 1.58

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

Yields

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

Where $\quad$ *P = Power in mW*

$\qquad\quad$ *G = Numeric antenna gain*

$\qquad\quad$ *S = Power density in mW / cm²*

→ *Power density = 0.0187 mW / cm²*

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.)

EUT Specification

EUT	IPC

Frequency band (Operating)	☐ WLAN: 2.412GHz ~ 2.462GHz
	☐ WLAN: 5.725GHz ~ 5.850GHz
	☐ WLAN: 5.15GHz ~ 5.35GHz
	☒ LTE Band 4:
	   Channel Bandwidth: 5MHz: 1712.5MHz ~1752.5MHz
	   Channel Bandwidth: 10MHz: 1715.0MHz ~1750.0MHz
	   Channel Bandwidth: 20MHz: 1710MHz ~1755MHz

Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm2) ☒ General Population/Uncontrolled exposure (S=1mW/cm2)

Antenna diversity	☐ Single antenna
	☒ Multiple antennas
	   ☒ Tx diversity
	   ☐ Rx diversity
	   ☐ Tx/Rx diversity

Max. output power	Channel Bandwidth: 5MHz: QPSK: 17.77dBm dBm (59.84mW) 16QAM: 18.02dBm dBm (63.39mW) Channel Bandwidth: 10MHz: QPSK: 17.69dBm dBm (58.75mW) 16QAM: 17.69dBm dBm (58.75mW) Channel Bandwidth: 20MHz: QPSK: 17.69 dBm dBm (58.75mW) 16QAM: 14.89dBm dBm (30.83mW)
Antenna gain (Max)	5 dBi (Numeric gain: 3.16)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

The maximum output power is __18.02dBm dBm (63.39mW)__ at __1752.5MHz__ (with __3.16 numeric antenna gain.__)

TEST RESULTS

No non-compliance noted

Calculation

Given $\quad E = \dfrac{\sqrt{30 \times P \times G}}{d}$ $\quad$ & $\quad S = \dfrac{E^2}{3770}$

$\qquad$ *Where* $\quad$ *E = Field strength in Volts / meter*

$\qquad\qquad$ *P = Power in Watts*

$\qquad\qquad$ *G = Numeric antenna gain*

$\qquad\qquad$ *d = Distance in meters*

$\qquad\qquad$ *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:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$\qquad$ *P (mW) = P (W) / 1000 and*

$\qquad$ *d (cm) = d(m) / 100*

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \qquad \textbf{\textit{Equation 1}}$$

$\qquad$ *Where* $\quad$ *d = Distance in cm*

$\qquad\qquad$ *P = Power in mW*

$\qquad\qquad$ *G = Numeric antenna gain*

$\qquad\qquad$ *S = Power density in mW / cm^2*

Maximum Permissible Exposure

EUT output power = 63.39 mW

Numeric Antenna gain = 3.16

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

Yields

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

Where $\quad$ *P = Power in mW*

$\qquad\quad$ *G = Numeric antenna gain*

$\qquad\quad$ *S = Power density in mW / cm^2*

→ *Power density = 0.0399 mW / cm^2*

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.)