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	Computer
Model	TREK-743; TREK-743XXXXXXXXXXXXXXXX (where "X" may be any alphanumeric character , "-" or blank)
Frequency band (Operating)	☒ 802.11b/g/n HT20: 2.412GHz ~ 2.462GHz ☒ 802.11n HT40: 2.422GHz ~ 2.452GHz ☒ GMSK/8PSK 850MHz: 824.2MHz ~ 848.8MHz ☒ GMSK/8PSK 1900MHz: 1850.2MHz ~ 1909.8MHz ☒ WCDMA/HSDPA/HSUPA 850MHz: 824.2MHz ~ 846.6MHz ☒ WCDMA/HSDPA/HSUPA1900MHz: 1852.4MHz ~ 1907.6MHz ☐ Others
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 Specification	2.4GHz: Dipole Antenna / Gain: 2.0 dBi, (Numeric gain: 1.58) 850MHz: Dipole Antenna / Gain: -7.66 dBi, (Numeric gain: 0.17) 1900MHz: Dipole Antenna / Gain: -0.69 dBi, (Numeric gain: 0.85)
Max. output power	2.4GHz: IEEE 802.11b : 19.74 dBm (94.189mW) IEEE 802.11g : 11.92 dBm (15.560mW) IEEE 802.11n HT20 : 12.68 dBm (18.535mW) IEEE 802.11n HT40 : 11.95 dBm (15.668mW) GMSK: 850MHz : 31.83 dBm (1524.053mW) 1900MHz : 28.71 dBm (743.019mW) 8PSK: 850MHz : 27.11 dBm (514.044mW) 1900MHz : 25.87 dBm (386.367mW)

Max. output power	WCDMA R99: 850MHz : 23.09 dBm (203.704mW) 1900MHz : 23.31 dBm (214.289mW) HSDPA: 850MHz : 22.74 dBm (187.932mW) 1900MHz : 22.88 dBm (194.089mW) HSUPA: 850MHz : 22.63 dBm (183.231mW) 1900MHz : 22.86 dBm (193.197mW)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A
Remark: *The maximum output power is <u>31.83dBm (1524.053mW) at 824. 2MHz (with 0.17 numeric antenna gain.)</u>*	

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TEST RESULTS

No non-compliance noted.

Calculation

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

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

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

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

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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

IEEE 802.b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
1	2412	94.189	1.58	20	0.0296	1

IEEE 802.g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	15.560	1.58	20	0.0049	1

IEEE 802.n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
11	2462	18.535	1.58	20	0.0058	1

IEEE 802.n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
9	2452	15.668	1.58	20	0.0049	1

GMSK mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
128	824.2	1524.05	0.17	20	0.0516	0.6

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
512	1850.20	743.019	0.85	20	0.1257	1

8PSK mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
128	824.2	514.044	0.17	20	0.0174	0.6

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
512	1850.20	386.367	0.85	20	0.0654	1

WCDMA R99 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
4132	826.4	203.704	0.17	20	0.0069	0.6

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
9262	1852.40	214.289	0.85	20	0.0362	1

HSDPA mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
4182	836.4	187.932	0.17	20	0.0064	0.6

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
9262	1852.40	194.089	0.85	20	0.0328	1

HSUPA mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
4182	836.4	183.231	0.17	20	0.0062	0.6

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
9262	1852.40	193.197	0.85	20	0.0327	1

Simultaneously MPE

Simultaneously MPE = MPE1/Limit1 + MPE2/Limit2

Simultaneously MPE = (0.0296 mW/cm^2 **/ 1) + (0.1257** mW/cm^2 **/ 1) = 0.1553**