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-550; TREK-550XXXXXXXXXXXXXXXX (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 ☒ GPRS/EGPRS 850MHz: 824.2MHz ~ 848.8MHz ☒ GPRS/EGPRS 1900MHz: 1850.2MHz ~ 1909.8MHz ☒ WCDMA/HSDPA/HSUPA Band II: 1852.4MHz ~ 1907.6MHz ☒ WCDMA/HSDPA/HSUPA Band V: 826.4MHz ~ 846.6MHz ☐ Others
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☐ Occupational/Controlled exposure ☒ General Population/Uncontrolled exposure

Antenna Specification	● Frequency@ 2.4GHz:
	  Dipole Antenna / Gain: 2.0 dBi, (Numeric gain: 1.58)
	● Frequency@ 850MHz:
	  Loop Antenna / Gain: 2.1 dBi, (Numeric gain: 1.62)
	● Frequency@ 1900MHz:
	  Loop Antenna / Gain: 3 dBi, (Numeric gain: 2)

Max. output power
GPRS (Class 10)
EGPRS (Class 12)
1uplink slots= -9.0dB
2uplink slots= -6.0dB
3uplink slots= -4.3dB
4uplink slots= -3.0dB
	Wi-Fi 2.4GHz:
	  IEEE 802.11b : 17.8 dBm
	  IEEE 802.11g : 16.7 dBm
	  IEEE 802.11n HT20 : 16.4 dBm
	  IEEE 802.11n HT40 : 16.4 dBm
	GPRS/ EGPRS: (Frame Average Power)
	  GPRS850 : 23.4 dBm
	  EGPRS850 : 20.9 dBm
	  GPRS1900 : 20.9 dBm
	  EGPRS1900 : 19.3 dBm
	WCDMA/ HSDPA/ HSUPA
	  WCDMA Band II : 23.6 dBm
	  HSDPA Band II : 22.3 dBm
	  HSUPA Band II : 22.0 dBm
	  WCDMA Band V : 23.5 dBm
	  HSDPA Band V : 22.2 dBm
	  HSUPA Band V : 22.0 dBm

Tune-up limit	GPRS850 : 35.0 dBm EDGE850 : 30.0 dBm GPRS1900 : 32.0 dBm EDGE1900 : 29.0 dBm WCDMA Band II : 25.0 dBm HSDPA Band II : 25.0 dBm HSUPA Band II : 25.0 dBm WCDMA Band V : 25.0 dBm HSDPA Band V : 25.0 dBm HSUPA Band V : 25.0 dBm
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:
The maximum output power is <u>35.0 dBm-6dB = 29dBm @ 836.60MHz (with 1.62 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

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

802.11b:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
1	2412	60.395	1.58	20	0.0190	1

802.11g:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
6	2437	47.206	1.58	20	0.0148	1

802.11n HT20:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
6	2437	43.853	1.58	20	0.0138	1

802.11n HT40:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
6	2437	43.351	1.58	20	0.0136	1

GPRS850:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
190	836.6	794.330	1.62	20	0.2561	0.6

GPRS1900:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
512	1850.2	398.110	2	20	0.1584	1

EGPRS850:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
251	848.8	501.190	1.62	20	0.1616	0.6

EGPRS1900:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
512	1850.2	398.11	2	20	0.1584	1

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WCDMA Band II:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
9262	1852.4	316.228	2	20	0.1259	1

HSDPA Band II:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
9262	1852.4	316.228	2	20	0.1259	1

HSUPA Band II:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
9538	1907.6	316.228	2	20	0.1259	1

WCDMA Band V:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
4132	826.4	316.228	1.62	20	0.1019	0.6

HSDPA Band V:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
4132	826.4	316.228	1.62	20	0.1019	0.6

HSUPA Band V:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm^2)
4132	826.4	316.228	1.62	20	0.1019	0.6

Simultaneously MPE

Simultaneously MPE = MPE1/Limit1 + MPE2/Limit2

Simultaneously MPE = [(0.019 mW/cm$^{2)}$/1] + [(0.256 mW/cm$^{2)}$/0.6) = 0.446

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