1 Maximum Permissible Exposure (MPE)

1.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f^2)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

1.2   Maximum Permissible Exposure (MPE) Evaluation

The worst case of Average power: refer to section 6.5 for detail measurement date.

802.11b

Cable loss = 0		Output Power		Limit (dBm)
CH	Frequency (MHz)	Detector		
		PK (dBm)	AV (dBm)	
1	2412	20.05	17.84	30
6	2437	20.25	18.09	
11	2462	20.40	18.16	

MPE Prediction (802.11b)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum average output power at antenna input	18.16	(dBm)
Maximum Average output power at antenna input	65.46361741	(mW)
Duty cycle:	100	(%)
Maximum Pav :	65.46361741	(mW)
Antenna gain (typical):	-2.07	(dBi)
Maximum antenna gain:	0.620869034	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2462	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0080900	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.008 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 2462MHz.

The worst case of Average power: refer to section 6.5 for detail measurement date.

802.11n 20MHz(5G)

Cable loss = 0		Output Power		Limit (dBm)
CH	Frequency (MHz)	Detector		
		PK (dBm)	AV (dBm)	
149	5745	17.53	11.76	30
157	5785	16.88	11.52	
165	5825	17.11	11.84	

MPE Prediction (802.11n 20MHz)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

       P = Power input to antenna

       G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

       R = Distance to the center of radiation of the antenna

Maximum average output power at antenna input	11.84	(dBm)
Maximum Average output power at antenna input	15.27566058	(mW)
Duty cycle:	100	(%)
Maximum Pav :	15.27566058	(mW)
Antenna gain (typical):	0.7	(dBi)
Maximum antenna gain:	1.174897555	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5825	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0035723	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.0036 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5825MHz.