RF Exposure Evaluation

FCC Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) 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
1500–100,000			1.0	30

f = frequency in MHz

Friis transmission formula: **$Pd = (Pout*G)/(4*pi*r^2)$**

Where

Pd = power density in mW/cm^2, **Pout** = output power to antenna in mW;

G = gain of antenna in linear scale, **Pi** = 3.1416;

R = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

Test Result of RF Exposure Evaluation

For MikroTikR11e-5HacD (FCC ID: TV7R11E5HACD):

Maximum Peak output power at antenna terminal: 27.2dBm(524.24mW)

Prediction distance: 20cm

Prediction Frequency: 5785MHz

Maximum antenna gain: 5.59dBi

Power Density prediction frequency at 20cm: 0.378mW/cm^2<1mW/cm^2

For NIVIDAJETSON TX2 (FCC ID: VOB-P3310):

Maximum Peak output power at antenna terminal: 19.31dBm(85.31mW)

Prediction distance: 20cm

Prediction Frequency: 5600MHz

Maximum antenna gain: 5.0dBi

Power Density prediction frequency at 20cm: 0.054mW/cm^2<1mW/cm^2

For HUAWEI ME909u-523 Mini PCIe(FCC ID: QISME909U-523):

Maximum Peak output power at antenna terminal: 23dBm(199.53mW)

Prediction distance: 20cm

Maximum antenna gain: 5.48dBi

Power Density prediction frequency at 20cm: 0.14mW/cm^2<1mW/cm^2

For these modules collocated transmit, Maximum Power Density is 0.572 mW/cm^2<1mW/cm^2

So, compliance.