RF Exposure Evaluation

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) ,KDB-447498 D01 V06.

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, 1 mW/cm^2. 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

WI-FI Mode: SRD 900MHz

Test Mode	Channel	Output power to antenna (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
lowest	906MHz	55.08076	0.013700268	0.6	PASS
middle	916MHz	55.46257	0.013795236	0.6	PASS
Highest	926MHz	56.88529	0.014149109	0.6	PASS

Remark: antenna gain=0.97dBi

WI-FI Mode: 2.4GHz

Test Mode	Channel	Output power to antenna (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
802.11b	Lowest (2412MHz)	37.93149	0.01207060	1.0	PASS
	Middle (2437MHz)	30.97419	0.00985664	1.0	PASS
	Highest (2462MHz)	31.11716	0.00990214	1.0	PASS
802.11g	Lowest (2412MHz)	23.22736	0.00739143	1.0	PASS
	Middle (2437MHz)	19.05460	0.00606357	1.0	PASS
	Highest (2462MHz)	19.27524	0.00613379	1.0	PASS
802.11n(HT20)	Lowest (2412MHz)	19.27524	0.00613379	1.0	PASS
	Middle (2437MHz)	15.41700	0.00490601	1.0	PASS
	Highest (2462MHz)	16.51961	0.00525689	1.0	PASS

Remark: antenna gain=2.04dBi

For Simultaneous transmitting, 1): The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits =0.014149109/0.6 + 0.01207060/1 = 0.03565243< 1 Since the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in the device is ≤ 1.0, the EUT is considered to satisfy MPE compliance for simultaneous transmission operations.