

**According to KDB 447498 D01 General RF Exposure Guidance v06 and part 2.1091****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)

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: $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

Pd = power density in mW/cm², **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 is the limit of MPE, 1 mW/cm². 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

EDR1 mode

Mode	Output power to antenna (dBm)	Tune UP tolerance (dBm)	Max Tune UP power (dBm)	Max Tune UP power (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
GFSK	10.127	10±1	11	12.59	0.002191	1.0	PASS
	11.370	11±1	12	15.85	0.002759	1.0	PASS
	10.518	10±1	11	12.59	0.002191	1.0	PASS
$\pi/4$ -DQPSK	12.001	12±1	13	19.95	0.003473	1.0	PASS
	13.323	13±1	14	25.12	0.004372	1.0	PASS
	12.486	12±1	13	19.95	0.003473	1.0	PASS
8-DPSK	12.500	12±1	13	19.95	0.003473	1.0	PASS
	13.850	13±1	14	25.12	0.004372	1.0	PASS
	13.065	13±1	14	25.12	0.004372	1.0	PASS

Antenna Gain = -0.58 dBi

EDR2 mode

Mode	Output power to antenna (dBm)	Tune UP tolerance (dBm)	Max Tune UP power (dBm)	Max Tune UP power (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
GFSK	9.973	9±1	10	10.00	0.001741	1.0	PASS
	11.315	11±1	12	15.85	0.002759	1.0	PASS
	10.536	10±1	11	12.59	0.002191	1.0	PASS
$\pi/4$ -DQPSK	12.070	12±1	13	19.95	0.003473	1.0	PASS
	13.353	13±1	14	25.12	0.004372	1.0	PASS
	12.575	12±1	13	19.95	0.003473	1.0	PASS
8-DPSK	12.527	12±1	13	19.95	0.003473	1.0	PASS
	13.815	13±1	14	25.12	0.004372	1.0	PASS
	13.038	13±1	14	25.12	0.004372	1.0	PASS

Antenna Gain = 4.45 dBi

Note: The device EDR1 and EDR2 can transmit at the same time;

So the worst simultaneous transmitting consideration:

The ratio = $MPE_{(EDR1)} / \text{limit} + MPE_{(EDR2)} / \text{limit} = 0.004372 / 1.0 + 0.004372 / 1.0 = 0.008744 < 1.0$.