

## RF Exposure Evaluation

According to KDB 447498 D01 General RF Exposure Guidance v06 and part 2.1091, Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition(s), listed below, is (are) satisfied.

### 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 <sup>2</sup> )	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 <sup>2</sup> )	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 <sup>2</sup> )	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:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

**Pd** = power density in mW/cm<sup>2</sup>, **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/cm<sup>2</sup>. 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

	Modulation	Frequency (MHz)	Output power to antenna (dBm)	Target power W/tolerance (dBm)	Max Output power to antenna (dBm)	Max Output power to antenna (mW)	Power Density at R=20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
BT	GFSK	2402	-1.82	-2±1	-1	0.794	0.000154	1.0	PASS
		2441	-1.02	-2±1	-1	0.794	0.000154	1.0	PASS
		2480	-1.19	-2±1	-1	0.794	0.000154	1.0	PASS
	Π/4-DQPSK	2402	-1.00	-1±1	0	1.000	0.000194	1.0	PASS
		2441	-0.20	-1±1	0	1.000	0.000194	1.0	PASS
		2480	-0.40	-1±1	0	1.000	0.000194	1.0	PASS
	8DPSK	2402	-0.37	-1±1	0	1.000	0.000194	1.0	PASS
		2441	0.43	0±1	1	1.259	0.000244	1.0	PASS
		2480	0.20	0±1	1	1.259	0.000244	1.0	PASS
BLE	GFSK (1Mbps)	2402	-2.94	-3±1	-2	0.631	0.000122	1.0	PASS
		2440	-2.67	-3±1	-2	0.631	0.000122	1.0	PASS
		2480	-2.59	-3±1	-2	0.631	0.000122	1.0	PASS

So a SAR test is not required