

MAXIMUM PERMISSIBLE EXPOSURE

KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.

2.1091 Radio frequency radiation exposure evaluation: mobile devices.

According to FCC 1.1310: 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)

EUT Specification

FCC ID	SMC-KD11AX
EUT	Smart Projector
Frequency band (Operating)	☒ BT: 2.402GHz ~ 2.480GHz ☒ WLAN: 2.412GHz ~ 2.462GHz ☒ RLAN: 5.180GHz ~ 5.240GHz ☒ RLAN: 5.260GHz ~ 5.320GHz ☒ RLAN: 5.500GHz ~ 5.700GHz ☒ RLAN: 5.745GHz ~ 5.825GHz ☒ Others: Wi-Fi UNII5 Wi-Fi UNII6 Wi-Fi UNII7 Wi-Fi UNII8
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ____
Exposure classification	☐ Occupational/Controlled exposure ☒ General Population/Uncontrolled exposure
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Antenna gain (Max)	BDR+EDR/BLE: 1.80dBi WLAN: 4.81dBi Wi-Fi 5.2G ANT1: 3.20dBi Wi-Fi 5.2G ANT2: 3.30dBi Wi-Fi 5.3G ANT1: 3.30dBi Wi-Fi 5.3G ANT2: 3.30dBi Wi-Fi 5.6G ANT1: 3.40dBi Wi-Fi 5.6G ANT2: 3.40dBi

	WiFi 5.8G ANT1: 3.37dBi WiFi 5.8G ANT2: 3.40dBi Wi-Fi UNII5 ANT1: 3.40dBi Wi-Fi UNII5 ANT2: 3.40dBi Wi-Fi UNII6 ANT1: 3.32dBi Wi-Fi UNII6 ANT2: 3.40dBi Wi-Fi UNII7 ANT1: 3.40dBi Wi-Fi UNII7 ANT2: 3.40dBi Wi-Fi UNII8 ANT1: 3.40dBi Wi-Fi UNII8 ANT2: 3.40dBi
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	30
1500-100000	--	--	1	30

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in Mw

G = gain of antenna in linear scale

π =3.1416

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

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

Measurement Result

Operating Mode	Maximum output power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
BDR+EDR	10.50	10.50 ±1	11.50	1.8	0.0043	1
BLE	6.80	6.80 ±1	7.80	1.8	0.0018	1

WiFi 2.4G	18.30	18.30 ±1	19.30	4.81	0.0513	1
WiFi 5.2GANT1	14.61	14.61 ±1	15.61	3.2	0.0151	1
WiFi 5.2GANT2	15.57	15.57 ±1	16.57	3.3	0.0193	1
WiFi 5.3GANT1	14.71	14.71 ±1	15.71	3.3	0.0158	1
WiFi 5.3GANT2	15.84	15.84 ±1	16.84	3.3	0.0206	1
WiFi 5.6GANT1	15.71	15.71 ±1	16.71	3.4	0.0204	1
WiFi 5.6GANT2	16.24	16.24 ±1	17.24	3.4	0.0231	1
WiFi 5.8GANT1	15.33	15.33 ±1	16.33	3.37	0.0186	1
WiFi 5.8GANT2	16.63	16.63 ±1	17.63	3.4	0.0252	1
Wi-Fi UNII5 ANT1	5.83	5.83 ±1	6.83	3.4	0.0021	1
Wi-Fi UNII5 ANT2	5.46	5.46 ±1	6.46	3.4	0.0019	1
Wi-Fi UNII6 ANT1	4.7	4.7 ±1	5.70	3.32	0.0016	1
Wi-Fi UNII6 ANT2	6.02	6.02 ±1	7.02	3.4	0.0022	1
Wi-Fi UNII7 ANT1	5.49	5.49 ±1	6.49	3.4	0.0019	1
Wi-Fi UNII7 ANT2	5.34	5.34 ±1	6.34	3.4	0.0019	1
Wi-Fi UNII8 ANT1	4.99	4.99 ±1	5.99	3.4	0.0017	1
Wi-Fi UNII8 ANT2	5.75	5.75 ±1	6.75	3.4	0.0021	1

The Maximum simultaneous transmission for BT+WLAN+RLAN+WiFi6E:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$= S_{BT}/S_{limit-2.4} + S_{WLAN}/S_{limit-2.4} + S_{RLAN}/S_{limit-2.4} + S_{WiFi6E}/S_{limit-2.4}$$

$$= 0.0061 + 0.0513 + 0.1581 + 0.0154 = 0.2309$$

$$= 0.2309$$

$$< 1.0$$

Result: No Standalone SAR test is required.