

# RF Exposure Evaluation Report

## 1 RF EXPOSURE

Product Name: Projector

Model No.: XH269, XH269PRO, XH269MAX, XH269ULTRA, XH500, XH500PRO, XH500MAX, XH500ULTRA, K4, K5, K6, K8, K9, H5, H6, H8, T5, T6, T8

FCC ID: 2BPVL-XH269

## 2. RF Exposure Evaluation

FCC KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures.

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices.

### 2.1 LIMITS

According to FCC Part1.1310: 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 part1.1307(b)

Table 1 to § 1.1310(e)(1)—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)
(i) Limits for Occupational/Controlled Exposure				
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
300–1,500			f/300	<6
1,500–100,000			5	<6
(ii) 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
300–1,500			f/1500	<30
1,500–100,000			1.0	<30

F= Frequency in MHz Friis Formula

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

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  is 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.

## 2.2 EUT RF EXPOSURE EVALUATION

BT/WIFI ANT: 0.9dBi; 5GWIFI ANT:1.81dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.0 in linear scale.

The Max Conducted Peak Output Power data refer to report DACE250513016RL001 & DACE250513016RL002

BT-3-DH5 worst mode and channel:						
Test channel (MHz)	PK Power (dBm)	Maximum tune-up Power (dbm)	Maximum tune-up Power (dbm)	Maximum tune-up Power (mW)	Calculated value (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2402	1.40	2.0±1	3.0	1.995	0.0005	1.0

Remark:  $P_d = (P_{out} * G) / (4 * \pi * R^2) = (1.995 * 1.23) / (4 * 3.1416 * 20^2) = 0.0005$ ,  $G = 10^{gain/10} = 1.23$

WIFI worst mode and channel:

Test channel (MHz)	PK Power (dBm)	Maximum tune-up Power (dbm)	Max.MIMO tune-up Power (dbm)	Max.MIMO tune-up Power (mW)	Calculated value (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
802.11n--5240	7.31	8±1	9.0	7.943	0.0024	1.0
802.11a--5825	10.30	11±1	12.0	15.849	0.0048	1.0

Remark: 5.2G-- $P_d = (P_{out} * G) / (4 * \pi * R^2) = (7.943 * 1.5171) / (4 * 3.14159 * 20^2) = 0.0024$ ,  $G = 10^{gain/10} = 1.5171$   
 5.8G-- $P_d = (P_{out} * G) / (4 * \pi * R^2) = (15.849 * 1.5171) / (4 * 3.14159 * 20^2) = 0.0048$ ,  $G = 10^{gain/10} = 1.5171$

### RF Exposure Evaluation simultaneous transmission operations:

According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits :

Simultaneous transmission mode	The sum of the ratios	SUM	Limit
BT+5GWIFI	0.0005+0.0048	0.0053	1.0

Conclusion:  $0.0053 < 1.0$ , So there is no sar requirement

NOTE: EUT BT & wifi module is more than 20cm away from the human body.

### Conclusion:

the sum of the ratios is less than the limit value of 1.0, so there is no sar requirement.