

MAXIMUM PERMISSIBLE EXPOSURE

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

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	2A4K9-V12
EUT	Projector
Frequency band (Operating)	<input checked="" type="checkbox"/> BT: 2.402GHz ~ 2.480GH <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> RLAN: 5.180GHz ~ 5.240GHz <input type="checkbox"/> RLAN: 5.260GHz ~ 5.320GHz <input type="checkbox"/> RLAN: 5.500GHz ~ 5.700GHz <input checked="" type="checkbox"/> RLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others:
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others _____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure <input checked="" type="checkbox"/> General Population/Uncontrolled exposure
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Antenna gain (Max)	BT: 2.29dBi WiFi 2.4G ANT 1: 2.56dBi WiFi 2.4G ANT 2: 3.12dBi WiFi 5.2G ANT 1: 3.66dBi WiFi 5.2G ANT 2: 3.94dBi WiFi 5.8G ANT 1: 3.96dBi WiFi 5.8G ANT 2: 3.75dBi
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

Shenzhen Anbotek Compliance Laboratory Limited

Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.
 Tel: (86) 0755-26066440 Fax: (86) 0755-26014772 Email: service@anbotek.com



Hotline
 400-003-0500
 www.anbotek.com.cn



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	8.19	8.19 ±1	9.19	2.29	0.0028	1
BLE	5.13	5.13 ±1	6.13	2.29	0.0014	1
WiFi 2.4G ANT 1	13.41	13.41 ±1	14.41	2.56	0.0099	1
WiFi 2.4G ANT 2	13.62	13.62 ±1	14.62	3.12	0.0118	1
WiFi 5.2G ANT 1	13.03	13.03 ±1	14.03	3.66	0.0117	1
WiFi 5.2G ANT 2	13.12	13.12 ±1	14.12	3.94	0.0127	1
WiFi 5.8G ANT 1	14.47	14.47 ±1	15.47	3.96	0.0175	1
WiFi 5.8G ANT 2	14.42	14.42 ±1	15.42	3.75	0.0164	1



No. Applicable Simultaneous Transmission

1. BDR&EDR+WiFi 2.4G ANT1+WiFi 2.4G ANT2
2. BDR&EDR+WiFi 2.4G ANT1+WiFi 5.2G ANT2
3. BDR&EDR+WiFi 2.4G ANT2+WiFi 5.2G ANT1
4. BDR&EDR+WiFi 2.4G ANT1+WiFi 5.8G ANT2
5. BDR&EDR+WiFi 2.4G ANT2+WiFi 5.8G ANT1
6. BDR&EDR+WiFi 5.2G ANT1+WiFi 5.2G ANT2
7. BDR&EDR+WiFi 5.8G ANT1+WiFi 5.8G ANT2
8. BDR&EDR+WiFi 5.2G ANT1+WiFi 5.8G ANT2
9. BDR&EDR+WiFi 5.2G ANT2+WiFi 5.8G ANT1
10. BLE+WiFi 2.4G ANT1+WiFi 2.4G ANT2
11. BLE+WiFi 2.4G ANT1+WiFi 5.2G ANT2
12. BLE+WiFi 2.4G ANT2+WiFi 5.2G ANT1
13. BLE+WiFi 2.4G ANT1+WiFi 5.8G ANT2
14. BLE+WiFi 2.4G ANT2+WiFi 5.8G ANT1
15. BLE+WiFi 5.2G ANT1+WiFi 5.2G ANT2
16. BLE+WiFi 5.8G ANT1+WiFi 5.8G ANT2
17. BLE+WiFi 5.2G ANT1+WiFi 5.8G ANT2
18. BLE+WiFi 5.2G ANT2+WiFi 5.8G ANT1

The Maximum simultaneous transmission for BDR&EDR+WiFi 5.8G ANT 1+WiFi 5.8G ANT 2:

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

$$= S_{BDR\&EDR} / S_{limit-2.4} + S_{WiFi\ 5.8G\ ANT\ 1} / S_{limit-5.8} + S_{WiFi\ 5.8G\ ANT\ 2} / S_{limit-5.8}$$

$$= 0.0028/1 + 0.0175/1 + 0.0164/1$$

$$= 0.0367$$

$$< 1.0$$

Result: No Standalone SAR test is required.

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