



Maximum Permissible Exposure Evaluation

FCC ID: 2BCVV-M01PRO

IC: 31376-M01PRO

1. Client Information

Applicant	:	ZHEJIANG AIKE INTELLIGENTTECHNOLOGY CO.LTD
Address	:	Room 1606, Building 1, Building 1, No. 560 Yueming Road, Binjiang District, Hangzhou City, Zhejiang Province, China
Manufacturer	:	ZHEJIANG AIKE INTELLIGENTTECHNOLOGY CO.LTD
Address	:	Room 1606, Building 1, Building 1, No. 560 Yueming Road, Binjiang District, Hangzhou City, Zhejiang Province, China

2. General Description of EUT

EUT Name	:	Smart Projector
HVIN/Models No.	:	M01 Pro
Brand Name	:	MOJU 摩聚
Model Different	:	----
Sample ID	:	202305-0009-4-1# & 202305-0009-4-2#
Product Description	:	Operation Frequency: 802.11b/g/n(HT20)/ax(HE20): 2412MHz~2462MHz 802.11n(HT40)/ax(HE40): 2422MHz~2452MHz U-NII-1: 5180MHz~5240MHz U-NII-3: 5745MHz~5825MHz
Power Rating	:	Adapter (Model: BSG-60W1903420) Input: 100-240V~ 50/60Hz 1.5A Output: 19V---3.42A
Software Version	:	K35M_2023_07_12
Hardware Version	:	K35M
Remark	:	The antenna gain provided by the applicant, the verified for the RF conduction test and adapter provided by TOBY test lab.

Method of Measurement for FCC

1. Max. Antenna Gain:

2.4G WIFI Antenna: 2.0dBi

5G WIFI Antenna: 2.0dBi.

2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna

Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

$$\sum \text{ of MPE ratios } \leq 1.0$$



4. Test Result:

2.4G WiFi MPE Result								
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
802.11b	1	2412	15.344	15±1	16	2.0	20	0.0126
		2437	15.415	15±1	16	2.0	20	0.0126
		2462	15.423	15±1	16	2.0	20	0.0126
802.11g	1	2412	15.817	16±1	17	2.0	20	0.0158
		2437	13.084	13±1	14	2.0	20	0.0079
		2462	13.083	13±1	14	2.0	20	0.0079
802.11n20	1	2412	14.128	14±1	15	2.0	20	0.0100
		2437	12.978	13±1	14	2.0	20	0.0079
		2462	13.031	13±1	14	2.0	20	0.0079
802.11n40	1	2422	13.874	14±1	15	2.0	20	0.0100
		2437	14.343	14±1	15	2.0	20	0.0100
		2452	14.504	15±1	16	2.0	20	0.0126
802.11ax20	1	2412	14.62	15±1	16	2.0	20	0.0126
		2437	14.68	15±1	16	2.0	20	0.0126
		2462	14.665	15±1	16	2.0	20	0.0126
802.11ax40	1	2422	13.777	14±1	15	2.0	20	0.0100
		2437	14.254	14±1	15	2.0	20	0.0100
		2452	14.464	14±1	15	2.0	20	0.0100
Note: N _{TX} = Number of Transmit Antennas RF Output power specifies that Maximum Conducted Peak Output Power.								



5.2G WiFi MPE Result								
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
802.11a	1	5180	12.304	12±1	13	2.0	20	0.0063
		5200	10.786	11±1	12	2.0	20	0.0050
		5240	11.281	11±1	12	2.0	20	0.0050
802.11n20	1	5180	10.7	11±1	12	2.0	20	0.0050
		5200	10.749	11±1	12	2.0	20	0.0050
		5240	11.262	11±1	12	2.0	20	0.0050
802.11n40	1	5190	10.632	11±1	12	2.0	20	0.0050
		5230	11.148	11±1	12	2.0	20	0.0050
802.11ac20	1	5180	10.764	11±1	12	2.0	20	0.0050
		5200	10.762	11±1	12	2.0	20	0.0050
		5240	11.179	11±1	12	2.0	20	0.0050
802.11ac40	1	5190	10.905	11±1	12	2.0	20	0.0050
		5230	11.221	11±1	12	2.0	20	0.0050
802.11ax20	1	5180	10.984	11±1	12	2.0	20	0.0050
		5200	11.006	11±1	12	2.0	20	0.0050
		5240	11.475	11±1	12	2.0	20	0.0050
802.11ax40	1	5190	10.878	11±1	12	2.0	20	0.0050
		5230	11.244	11±1	12	2.0	20	0.0050
Note: N _{TX} = Number of Transmit Antennas RF Output power specifies that Maximum Conducted average Output Power.								



5.8G WiFi MPE Result								
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
802.11a	1	5745	10.64	11±1	12	2.0	20	0.0050
		5785	10.72	11±1	12	2.0	20	0.0050
		5825	10.13	10±1	11	2.0	20	0.0040
802.11n20	1	5745	11.37	11±1	12	2.0	20	0.0050
		5785	11.25	11±1	12	2.0	20	0.0050
		5825	10.56	11±1	12	2.0	20	0.0050
802.11n40	1	5755	11.64	12±1	13	2.0	20	0.0063
		5795	12.06	12±1	13	2.0	20	0.0063
802.11ac20	1	5745	11.33	11±1	12	2.0	20	0.0050
		5785	11.60	12±1	13	2.0	20	0.0063
		5825	10.75	11±1	12	2.0	20	0.0050
802.11ac40	1	5755	11.69	12±1	13	2.0	20	0.0063
		5795	11.56	12±1	13	2.0	20	0.0063
802.11ax20	1	5745	11.26	11±1	12	2.0	20	0.0050
		5785	11.70	12±1	13	2.0	20	0.0063
		5825	11.02	11±1	12	2.0	20	0.0050
802.11ax40	1	5755	12.16	12±1	13	2.0	20	0.0063
		5795	12.23	12±1	13	2.0	20	0.0063
Note: N _{TX} = Number of Transmit Antennas RF Output power specifies that Maximum Conducted average Output Power.								



5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm ²)
300-1,500	F/1500
1,500-100,000	1.0

For: 2412~2462MHz&5180~5240MHz&5745~5825MHz
MPE limit S: 1mW/ cm²

The MPE is calculated as $0.0158\text{mW} / \text{cm}^2 < \text{limit } 1\text{mW} / \text{cm}^2$.

So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b). The RF Exposure Information page from the manual is included here for reference.



Method of Measurement for IC

1. Applicable Standard

[Radio Standards Specification 102](#), Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands), sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radio communication apparatus designed to be used within the vicinity of the human body.

[ANSI C95.1-1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

2. Evaluation Method and Limit

According to RSS-102 §4 Table 4, RF Filed Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ f	-	6**
1.1-10	87/ $f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ $f^{0.25}$	0.1540/ $f^{0.25}$	8.944/ $f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ $f^{1.2}$
150000-300000	0.158 $f^{0.5}$	4.21 x 10 ⁻⁴ $f^{0.5}$	6.67 x 10 ⁻⁵ f	616000/ $f^{1.2}$
Note: f is frequency in MHz. *Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR).				

Frequency Band	f (MHz)	Limit of Power Density (W/m ²)
2.4G WLAN	2412	5.37
5G WLAN	5180	9.05
Note: Limit=0.02619 $f^{0.6834}$ (where f is in MHz). The f in the limit is the frequency of the lowest Channel.		



4.1 Calculation Formula

Prediction of power density at the distance of the applicable MPE limit:

$S = PG/4\pi R^2$ = Power density (in appropriate units, e.g W/m²)

P = power input to antenna (in appropriate units, e.g W)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g m)

Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

$\sum$ of MPE ratios ≤ 1.0



5. Evaluation Results

Standalone MPE Evaluation:

2.4G WiFi MPE Result									
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (m) [R]	Power Density (W/ m ²) [S]	Limit of Power Density (W/m ²) [S]
802.11b	1	2412	15.344	15±1	16	2.0	0.2	0.126	5.37
		2437	15.415	15±1	16	2.0	0.2	0.126	5.37
		2462	15.423	15±1	16	2.0	0.2	0.126	5.37
802.11g	1	2412	15.817	16±1	17	2.0	0.2	0.158	5.37
		2437	13.084	13±1	14	2.0	0.2	0.079	5.37
		2462	13.083	13±1	14	2.0	0.2	0.079	5.37
802.11n20	1	2412	14.128	14±1	15	2.0	0.2	0.100	5.37
		2437	12.978	13±1	14	2.0	0.2	0.079	5.37
		2462	13.031	13±1	14	2.0	0.2	0.079	5.37
802.11n40	1	2422	13.874	14±1	15	2.0	0.2	0.100	5.37
		2437	14.343	14±1	15	2.0	0.2	0.100	5.37
		2452	14.504	15±1	16	2.0	0.2	0.126	5.37
802.11ax20	1	2412	14.62	15±1	16	2.0	0.2	0.126	5.37
		2437	14.68	15±1	16	2.0	0.2	0.126	5.37
		2462	14.665	15±1	16	2.0	0.2	0.126	5.37
802.11ax40	1	2422	13.777	14±1	15	2.0	0.2	0.100	5.37
		2437	14.254	14±1	15	2.0	0.2	0.100	5.37
		2452	14.464	14±1	15	2.0	0.2	0.100	5.37
Note: N _{TX} = Number of Transmit Antennas RF Output power specifies that Maximum Conducted Peak Output Power.									



5.2G WiFi MPE Result									
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (m) [R]	Power Density (W/ m ²) [S]	Limit of Power Density (W/m ²) [S]
802.11a	1	5180	12.304	12±1	13	2.0	0.2	0.063	9.05
		5200	10.786	11±1	12	2.0	0.2	0.050	9.05
		5240	11.281	11±1	12	2.0	0.2	0.050	9.05
802.11n20	1	5180	10.700	11±1	12	2.0	0.2	0.050	9.05
		5200	10.749	11±1	12	2.0	0.2	0.050	9.05
		5240	11.262	11±1	12	2.0	0.2	0.050	9.05
802.11n40	1	5190	10.632	11±1	12	2.0	0.2	0.050	9.05
		5230	11.148	11±1	12	2.0	0.2	0.050	9.05
802.11ac20	1	5180	10.764	11±1	12	2.0	0.2	0.050	9.05
		5200	10.762	11±1	12	2.0	0.2	0.050	9.05
		5240	11.179	11±1	12	2.0	0.2	0.050	9.05
802.11ac40	1	5190	10.905	11±1	12	2.0	0.2	0.050	9.05
		5230	11.221	11±1	12	2.0	0.2	0.050	9.05
802.11ax20	1	5180	10.984	11±1	12	2.0	0.2	0.050	9.05
		5200	11.006	11±1	12	2.0	0.2	0.050	9.05
		5240	11.475	11±1	12	2.0	0.2	0.050	9.05
802.11ax40	1	5190	10.878	11±1	12	2.0	0.2	0.050	9.05
		5230	11.244	11±1	12	2.0	0.2	0.050	9.05
Note: N _{TX} = Number of Transmit Antennas RF Output power specifies that Maximum Conducted average Output Power.									



5.8G WiFi MPE Result									
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (m) [R]	Power Density (W/ m ²) [S]	Limit of Power Density (W/m ²) [S]
802.11a	1	5745	10.64	11±1	12	2.0	0.2	0.050	9.05
		5785	10.72	11±1	12	2.0	0.2	0.050	9.05
		5825	10.13	10±1	11	2.0	0.2	0.040	9.05
802.11n20	1	5745	11.37	11±1	12	2.0	0.2	0.050	9.05
		5785	11.25	11±1	12	2.0	0.2	0.050	9.05
		5825	10.56	11±1	12	2.0	0.2	0.050	9.05
802.11n40	1	5755	11.64	12±1	13	2.0	0.2	0.063	9.05
		5795	12.06	12±1	13	2.0	0.2	0.063	9.05
802.11ac20	1	5745	11.33	11±1	12	2.0	0.2	0.050	9.05
		5785	11.60	12±1	13	2.0	0.2	0.063	9.05
		5825	10.75	11±1	12	2.0	0.2	0.050	9.05
802.11ac40	1	5755	11.69	12±1	13	2.0	0.2	0.063	9.05
		5795	11.56	12±1	13	2.0	0.2	0.063	9.05
802.11ax20	1	5745	11.26	11±1	12	2.0	0.2	0.050	9.05
		5785	11.70	12±1	13	2.0	0.2	0.063	9.05
		5825	11.02	11±1	12	2.0	0.2	0.050	9.05
802.11ax40	1	5755	12.16	12±1	13	2.0	0.2	0.063	9.05
		5795	12.23	12±1	13	2.0	0.2	0.063	9.05
Note: N _{TX} = Number of Transmit Antennas RF Output power specifies that Maximum Conducted average Output Power.									

For: 2412~2462MHz&5180~5240MHz&5745~5825MHz

The worst MPE is calculated as **0.158W/m²**. So, RF exposure limit warning or SAR test are not required. The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

For a more detailed features description, please refer to the RF Test Report.

-----END OF THE REPORT-----

