

Radiofrequency radiation exposure evaluation: mobile devices

RESULT :

Pass

Test Specification

Test item : Motionblinds Wifi Matter Bridge
 Identification / Type No. : CM-55
 FCC ID : ZY4CM55
 Test standard : CFR47 FCC Part 2: Section 2.1091
 CFR47 FCC Part 1: Section 1.1310
 FCC KDB Publication 447498 D04

➤ FCC requirements

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

MPE Calculation Method according to KDB 447498 D04

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES
 SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	$1,920 R^2$
1.34	–	30	35.6 m	–	1.6 m	$3,450 R^2/f^2$
30	–	300	1.6 m	–	159 mm	$3.83 R^2$
300	–	1,500	159 mm	–	31.8 mm	$0.0128 R^2f$
1,500	–	100,000	31.8 mm	–	0.5 mm	$19.2R^2$

Subscripts L and H are low and high; λ is wavelength.
 From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

a) EUT RF Exposure Evaluation operations

For 433.92MHz, E.I.R.P = 89.27- 95.2 = -5.93dBm

Test Mode	Measured Power (dBm)	ERP (dBm)	ERP (mW)	Minimum Separation Distances (cm)	Limit (mW)
BLE	9.10	10.37	10.89	20	3060
BR+EDR	11.88	13.15	20.65		
2.4GHz band Wi-Fi	13.93	14.82	30.33		
433.92MHz	-5.93	-5.93	0.255	20	885

Multi TX Calculation:

BLE/BR+EDR/2.4G Wi-Fi: $10.89+20.65+30.33/3060 \approx 0.02$

433.92MHz: $0.255/885 \approx 0.003$

All simultaneous transmission possibilities are $0.02 + 0.003 = 0.023 < 1$