



MPE Calculation

Applicant:	Hangzhou Tuya Information Technology Co., Ltd
Address:	Room 301,Building 1,Huace Center,Xihu District, Hangzhou,Zhejiang, China
Product:	Smart Kit
FCC ID:	2ANDL-MDWBRCU2D
Model No.:	MDWBRCU2D
Reference RF report #	709502605195-00B, 709502605195-00C, 709502605195-00D

According to subpart 15.247(i) and subpart §1.1307(b)(1), 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 of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (KDB 447498 D01, §1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	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; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

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 (appropriate units, e.g., cm);



Calculated Data: BLE

Maximum peak output power at antenna input terminal (dBm):	8.51
Maximum peak output power at antenna input terminal (mW):	7.10
Output power tune-up tolerance (dB)	± 1.0
Maximum tune-up conducted power(dBm):	9.51
Maximum tune-up conducted power(mW):	8.93
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	0.88
Maximum Antenna Gain (numeric):	1.22
The worst case is power density at predication frequency at 20 cm (mW/cm ²):	0.0022
MPE limit for general population exposure at prediction frequency (mW/cm ²):	1.00

Note: The maximum tune-up conducted power (9.51 dBm) was declared by the manufacturer.

The max power density 0.0022 (mW/cm²) < 1 (mW/cm²)

Result: Compliant

Calculated Data: 2.4GHz Wi-Fi

Maximum peak output power at antenna input terminal (dBm):	25.83
Maximum peak output power at antenna input terminal (mW):	382.82
Output power tune-up tolerance (dB)	± 1.0
Maximum tune-up conducted power(dBm):	26.83
Maximum tune-up conducted power(mW):	481.95
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	0.88
Maximum Antenna Gain (numeric):	1.22
The worst case is power density at predication frequency at 20 cm (mW/cm ²):	0.1174
MPE limit for general population exposure at prediction frequency (mW/cm ²):	1.00

Note: The maximum tune-up conducted power (26.83 dBm) was declared by the manufacturer.

The max power density 0.1174 (mW/cm²) < 1 (mW/cm²)

Result: Compliant



Calculated Data: 5.0GHz Wi-Fi

Maximum peak output power at antenna input terminal (dBm):	16.98
Maximum peak output power at antenna input terminal (mW):	49.89
Output power tune-up tolerance (dB)	± 1.0
Maximum tune-up conducted power(dBm):	17.98
Maximum tune-up conducted power(mW):	62.81
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	1.53
Maximum Antenna Gain (numeric):	1.42
The worst case is power density at predication frequency at 20 cm (mW/cm ²):	0.0178
MPE limit for general population exposure at prediction frequency (mW/cm ²):	1.00

Note: The maximum tune-up conducted power (17.98 dBm) was declared by the manufacturer.

The max power density 0.0178 (mW/cm²) < 1 (mW/cm²)

Result: Compliant

Remark: The device does not support simultaneous 2.4GHz Wi-Fi ,2.4GHz BLE or 5GHz Wi-Fi, because they share the same antenna and can't transmit simultaneously. There is not simultaneous transmission possibility.

- TÜV SÜD Products Testing (Shanghai) Co., Ltd.

FCC-Registration No.: 820234 Designation Number: CN1183

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Reviewed by:

Hui Tong

Hui TONG

Review Engineer

Prepared by:

Jiaxi XU

Jiaxi XU

Project Engineer

Tested by:

Doujun XU

Doujun XU

EMC Test Engineer

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Date: 2026-07-17

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