

# **MPE Calculation**

| Product:                      | Mi TV Stick  |  |
|-------------------------------|--|--|
| Model no.:                    | MDZ-24-AA  |  |
| FCC ID:                       | 2AIMRMITVMDZ24AA   |  |
| Brand name                    | MI   |  |
| HVIN                          | MDZ-24-AA  |  |
| Rating:                       | 5VDC/1000mA (Supplied By AC/DC Adapter)  |  |
| RF Transmission<br>Frequency: | Bluetooth:2402-2480MHz<br>For Wi-Fi 2.4G: 2412~2462 MHz<br>For Wi-Fi 5GHz: 5.180GHz~5.240GHz;<br>5.745GHz~5.825GHz |  |
| Antenna Type:                 | Internal Antenna   |  |
| Max Antenna Gain:             | Bluetooth: 1.0dBi<br>Wi-Fi 2.4GHz: 3.0dBi<br>Wi-Fi 5GHz: 5.0dBi  |  |
| Description of the EUT:       | MDZ-24-AA isTV Stick with Bluetooth, Wi-Fi function.   |  |

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) (§1.1310, §2.1091)

| (B) Limits for General Population/Uncontrolled Exposure |                                  |                                  |                           |                          |
|---|----------------------------------|----------------------------------|---------------------------|--------------------------|
| Frequency Range<br>(MHz)                                | Electric Field<br>Strength (V/m) | Magnetic Field<br>Strength (A/m) | Power Density<br>(mW/cm2) | Averaging Time (minutes) |
| 0.3–1.34  | 614                              | 1.63                             | *(100)                    | 30                       |
| 1.34–30   | 824/f                            | 2.19/f                           | *(180/f²)                 | 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);

# TUV

## Calculated Data:

## for 5G Wi-Fi

| Maximum peak output power at antenna input terminal (dBm):                  | 17.4   |
|---|--------|
| Maximum peak output power at antenna input terminal (mW):                   | 54.9   |
| Prediction distance (cm):   | 20     |
| Antenna Gain, typical (dBi):  | 5.0    |
| Maximum Antenna Gain (numeric):   | 5.0    |
| The worst case is power density at predication frequency at 20 cm (mW/cm2): | 0.0546 |
| MPE limit for general population exposure at prediction frequency (mW/cm2): | 1.0    |

## For 2.4G Wi-Fi

| Maximum peak output power at antenna input terminal (dBm):                  | 20.0   |
|---|--------|
| Maximum peak output power at antenna input terminal (mW):                   | 100.0  |
| Prediction distance (cm):   | 20     |
| Antenna Gain, typical (dBi):  | 3.0    |
| Maximum Antenna Gain (numeric):   | 3.0    |
| The worst case is power density at predication frequency at 20 cm (mW/cm2): | 0.0596 |
| MPE limit for general population exposure at prediction frequency (mW/cm2): | 1.0    |

#### For Bluetooth

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|---|---------|
| Maximum peak output power at antenna input terminal (dBm):                  | 3.03    |
| Maximum peak output power at antenna input terminal (mW):                   | 2.01    |
| Prediction distance (cm):   | 20      |
| Antenna Gain, typical (dBi):  | 1       |
| Maximum Antenna Gain (numeric):   | 1       |
| The worst case is power density at predication frequency at 20 cm (mW/cm2): | 0.00040 |
| MPE limit for general population exposure at prediction frequency (mW/cm2): | 1.0     |

# For BLE

| Maximum peak output power at antenna input terminal (dBm):                  | 5.35    |
|---|---------|
| Maximum peak output power at antenna input terminal (mW):                   | 3.42    |
| Prediction distance (cm):   | 20      |
| Antenna Gain, typical (dBi):  | 1       |
| Maximum Antenna Gain (numeric):   | 1       |
| The worst case is power density at predication frequency at 20 cm (mW/cm2): | 0.00068 |
| MPE limit for general population exposure at prediction frequency (mW/cm2): | 1.0     |



#### For simultaneous transmission

| Simultaneous transmission configuration | Power density(mW/cm2) | MPE Limit (mW/cm2) |
|---|-----------------------|--------------------|
| 5G Wi-Fi+BT                             | 0.05824               | 1.0                |
| 5G Wi-Fi+BLE                            | 0.05548               | 1.0                |
| 2.4G Wi-Fi+BT                           | 0.06000               | 1.0                |
| 2.4G Wi-Fi+BLE                          | 0.06028               | 1.0                |

Result: Compliant

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