

RF EXPOSURE & MPE CALCULATION

RF EXPOSURE CALCULATION

Evaluation:

The SAR test reduction is calculated at below,

Formula description

| | | |
|---|------------|--|
| 1-g SAR with frequency range in 100M-6GHz | Sep ≤ 50mm | <input checked="" type="checkbox"/> $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ |
| | Sep > 50mm | <input type="checkbox"/> a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · (f(MHz)/150)] mW, at 100 MHz to 1500 MHz <input type="checkbox"/> b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz |

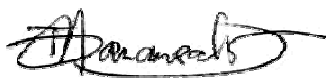
Calculation

For Antenna with separation of 3 cm

| CH (MHz) | Zigbee (dBm) | Max Rated Power/CH | Sep distance (mm) | Power Threshold(mW) | Limit for SAR test reduction (mW) | SAR Test Exclusion |
|----------|--------------|--------------------|-------------------|---------------------|-----------------------------------|--|
| 2405 | 2.61 | 1.85 mW / 2440MHz | 5 | 0.58 | ≤3 | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| 2440 | 2.67 | | | | | |
| 2480 | 2.56 | | | | | |

Conclusion: SAR is not required.

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MPE CALCULATION

| | |
|---|--------------------------------|
| RF Exposure Requirements: | 47 CFR §1. 1307(b) |
| RF Radiation Exposure Limits: | 47 CFR §1. 1310 |
| RF Radiation Exposure Guidelines: | FCC OST/OET Bulletin Number 65 |
| EUT Frequency Band: | 2405-2480 MHz |
| Limits for General Population/Uncontrolled Exposure in the band of: | 1500 - 100,000 MHz |
| Power Density Limit: | 1 mW / cm ² |

Equation: $S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

Where, S = Power Density

P = Power Input to Antenna

G = Antenna Gain

R = distance to the center of radiated antenna

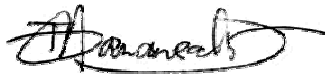
Prediction distance 20cm

Zigbee (2405-2480MHz): Power = 2.670 dBm, antenna gain = 3.3 dBi, Power density= 0.00078 mW/cm²

Maximum MPE 0.00078 mW/cm², which is less than 1.

The Above Result had shown that the device complied with MPE requirement.

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