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Appendix I

Operating Scenario for ZMN2405HPA

The ZMN2405HPA is used in a portable network application using Direct Sequence Spread Spectrum (DSSS) technology. The ZMN2405HPA is a ZigBee device utilizing IEEE 802.15.4 physical layer with propriety software to create network infrastructure that is decentralized and inexpensive, as each node need transmit only as far as the next node. Nodes act as repeaters to transmit data from nearby nodes to peers that are too far away to reach, resulting in a network that can span a large distance, especially over rough or difficult terrain. These products may be used as a portable, fixed or mobile devices.

Maximum Transmit Duty Cycle

Each remote ZMN2405HPA can transmit a maximum length of 2 ms in a 100 ms window. This is set by design and cannot be adjusted by the user.

Therefore, our source-averaged transmit duty cycle becomes 0.2.

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Calculated Average Power

The Power Threshold for 'General Population' portable designation without SAR testing is: (based on Oct 2005 TCB workshop PPT slide)

($60 / F_{GHz}$) mW for distances < 2.5 cm

For the 2.4 GHz frequency band, this results in a limit of **25 mW**.

Note that we use the more restrictive "General Population" limit in this case even though the individuals using this product will certainly be aware of its function and would qualify under the 'occupational' category.

Given the maximum transmit duty cycle specified in Appendix II, the average transmitted power of a ZMN2405HPA remote can be calculated as:

Maximum Pout = **63 mW** (18 dBm nominal)

Maximum Antenna Gain = 0 **dBi** (for portable use)

Maximum Transmit Duty cycle (per above) = **0.2**

Pave (Source-based average) = 0.063 * 0.2 = **12.6 mW**

Conclusion:

The ZMN2405HPA meets the MPE limits for a 'Portable' device operating in the 'General Population'.