## POWER DENSITY ESTIMATIONS BASED ON POWER OUTPUT, ANTENNA GAIN, AND DISTANCE FROM ANTENNA

$$(P\,G)/(4\,R^{2}\,\pi) = S$$

| where: | | | transmitter operating variables: | | must be blank if dB values are entered | |
|---|---|---|---|---|---|---|
| S = | maximum power density ($mW/cm^2$) | | | | | |
| P = | power input to the antenna ---------->> | = | -5.85 (dBm) | - or - | | (mW) |
| G = | gain of the antenna - worst case ---------->> | = | 2 (dBi) | - or - | | (numeric gain) |
| R = | distance to the center of the radiation of the antenna -->> | = | 20 | | | (cm) |

| | | | |
|---|---|---|---|
| ( P G ) / ( 4 * R $^2$ * π ) | = | S | ($mW/cm^2$) |
| ( 0.260015956 (mw) 1.58489 (gain) ) / ( 4 * 20 (cm) $^2$ * π ) | = | S | ($mW/cm^2$) |
| ( 0.412097519 ) / ( 4 * 400 * π $^3$ ) | = | S | ($mW/cm^2$) |
| ( 0.412097519 ) / ( 5026.548246 ) | = | 0.000082 | ($mW/cm^2$) |

Power Density of the BLE Module

## POWER DENSITY ESTIMATIONS BASED ON POWER OUTPUT, ANTENNA GAIN, AND DISTANCE FROM ANTENNA

$$(P\,G)/(4\,R^{2}\,\pi) = S$$

| where: | | | transmitter operating variables: | | must be blank if dB values are entered | |
|---|---|---|---|---|---|---|
| S = | maximum power density ($mW/cm^2$) | | | | | |
| P = | power input to the antenna ---------->> | = | 11.8 (dBm) | - or - | | (mW) |
| G = | gain of the antenna - worst case ---------->> | = | 2.1 (dBi) | - or - | | (numeric gain) |
| R = | distance to the center of the radiation of the antenna -->> | = | 20 | | | (cm) |

| | | | |
|---|---|---|---|
| ( P G ) / ( 4 * R $^2$ * π ) | = | S | ($mW/cm^2$) |
| ( 15.13561248 (mw) 1.62181 (gain) ) / ( 4 * 20 (cm) $^2$ * π ) | = | S | ($mW/cm^2$) |
| ( 24.54708916 ) / ( 4 * 400 * π $_3$ ) | = | S | ($mW/cm^2$) |
| ( 24.54708916 ) / ( 5026.548246 ) | = | 0.004883 | ($mW/cm^2$) |

Power Density for 802.11a

MPE Ratio of simultanious operation based on highest power density compared to the **FCC** limits

Device FCC ID OXM000104

Date August 13, 2020

Prepared By Kyle F.

| e.i.r.p | | | |
|---|---|---|---|
| -3.85 | 0.000082 | Ratio 1 | BLE |
| 13.9 | 0.004883 | Ratio 2 | UNII |
| | **0.00497** | Total | Ratio Must be <=1 |
| | 0.995035 | Remaining | |

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0, according to calculated/estimated, numerically modeled, or measured field strengths or power density.

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