

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

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

where: $S =$ maximum power density (mW/cm ²)		transmitter operating variables:		must be blank if dB values are entered	
$P =$	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)

$$(P G) / (4 * R^2 * \pi) = S \quad (mW/cm^2)$$

$$\left(\frac{0.260015956 \text{ (mw)}}{1.58489 \text{ (gain)}} \right) / \left(4 * \frac{20^2 \text{ (cm)}}{\pi} \right) = S \quad (mW/cm^2)$$

$$(0.412097519) / (4 * 400 * \pi) = S \quad (mW/cm^2)$$

$$(0.412097519) / (5026.548246) = 0.000082 \quad (mW/cm^2)$$

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:		S =	maximum power density (mW/cm ²)	transmitter operating variables:		must be blank if dB values are entered	
	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)

$(P \quad G)$	$/$	$(4 * R^2 * \pi)$	$=$	S	(mW/cm^2)
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$(15.13561248 \quad 1.62181)$	$/$	$(4 * 20^2 * \pi)$	$=$	S	(mW/cm^2)
(mw)		(cm)			

(24.54708916)	$/$	$(4 * 400 * \pi)$	$=$	S	(mW/cm^2)

(24.54708916)	$/$	(5026.548246)	$=$	0.004883	(mW/cm^2)

Power Density for 802.11a

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

Device FCC ID OXM000104

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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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