

**SAR evaluation**  
**FCC ID: 2BRQE-C31**

MPE Calculation Method

$$E \text{ (V/m)} = (30 \cdot P \cdot G)^{0.5} / d$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = E^2 / 377$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = (30 \cdot P \cdot G) / (377 \cdot d^2)$$

From the peak EUT RF output power, the minimum mobile separation distance,  
d=0.2m, as well

as the gain of the used antenna, the RF power density can be obtained.

**Calculated Image Transmissions Result and Limit (WORSE CASE IS AS BELOW)**

| Antenna Gain<br>(Numeric) | Peak Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|---------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 6.35 dBi<br>(4.315)       | 359.7<br>(25.56dBm)    | 0.3088                                  | 1                                                | Compiles    |

Note:

Antenna Gain: 3.34dBi (2.4G Band)

Assembly Antenna Gain: 6.35dBi (2.4G Band)

Assembly Antenna Gain (Numeric): 4.315

$$\text{ERP} = 25.56 + 6.35 - 2.15 = 29.76 \text{ dBm (946.2mW)}$$

2.4G band and 5G band cannot transmit Simultaneously

**Calculated WIFI Result and Limit (WORSE CASE IS AS BELOW)**

| Antenna Gain<br>(Numeric) | Peak Output Power (mW) | Power Density (S) (mW/cm2) | Limit of Power Density (S) (mW/cm2) | Test Result |
|---------------------------|------------------------|----------------------------|-------------------------------------|-------------|
| 3.46 dBi<br>(2.218)       | 61.80<br>(17.91dBm)    | 0.0273                     | 1                                   | Compiles    |

Note:

Antenna Gain: 3.46dBi (2.4G Band)

Antenna Gain (Numeric): 2.218dBi

ERP=17.91+3.46-2.15=19.22 dBm(83.56mW)

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} = 359.7/3060 + 61.80/3060 = 0.1377$$

$$\sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} = (946.2 + 83.56) / 3060 = 0.3365$$

$$\sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} = (0.0273 + 0.3088) / 1 = 0.3361$$

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

$$0.1377 + 0.3365 + 0.3361 = 0.8103 < 1$$