

EXHIBIT 7 – FCC SAR REPORT OR FCC RF EXPOSURE (MPE) REPORT

MPE of WiFi Transmitter, Standalone

Prediction of MPE Limit 47 CFR § 2.1091

$$S_{20} = \frac{P_A G_N}{4\pi R_{20}^2}$$

$$S_C = \frac{P_A G_N}{4\pi R_C^2}$$

$$R_C = \sqrt{\frac{P_A G_N}{4\pi S_L}}$$

$$S_L = \frac{1}{\text{cm}^2} \text{ (mW/cm}^2\text{)}$$

S_{20} = Power Density of the Device at 20cm

S_L = Power Density Limit

S_C = Power Density of the Device at the Compliance Distance R_C

R_{20} = 20cm

R_C = Minimum Distance to the Radiating Element to Meet Compliance

P_T = Power Input to Antenna

P_A = Adjust Power

G_N = Numeric Gain of the Antenna

f = Transmit Frequency

Transmit Duty Cycle = 100%

Use Group = General Population

Transmit Duty Cycle:	100.00	(%)
Tx Frequency (f):	2412.000	(MHz)
RF Power at Antenna Input Port (P_T):	260.00	(mW)
Antenna Gain:	2.30	(dBi)
Numeric Antenna Gain (G_N):	1.70	(numeric)
Cable or Other Loss:	0.00	(dB)
Duty Cycle/Loss Adjusted Power (P_A):	260.00	(mW)

S_L =	1.000	(mW/cm ²)
S_{20} at 20cm =	0.088	(mW/cm ²)
R_C =	5.9	(cm)
S_C =	1.00	(mW/cm ²)

RESULT **PASS**

MPE of Bluetooth Transmitter, Standalone

Prediction of MPE Limit 47 CFR § 2.1091

$$S_{20} = \frac{P_A G_N}{4\pi R_{20}^2}$$

$$S_C = \frac{P_A G_N}{4\pi R_C^2}$$

$$R_C = \sqrt{\frac{P_A G_N}{4\pi S_L}}$$

$$S_L = \frac{1}{\text{cm}^2} \text{ (mW/cm}^2\text{)}$$

S_{20} = Power Density of the Device at 20cm

S_L = Power Density Limit

S_C = Power Density of the Device at the Compliance Distance R_C

R_{20} = 20cm

R_C = Minimum Distance to the Radiating Element to Meet Compliance

P_T = Power Input to Antenna

P_A = Adjust Power

G_N = Numeric Gain of the Antenna

f = Transmit Frequency

Transmit Duty Cycle = 100%

Use Group = General Population

Transmit Duty Cycle:	100.00	(%)
Tx Frequency (f):	2402.000	(MHz)
RF Power at Antenna Input Port (P_T):	7.00	(mW)
Antenna Gain:	2.00	(dBi)
Numeric Antenna Gain (G_N):	1.58	(numeric)
Cable or Other Loss:	0.00	(dB)
Duty Cycle/Loss Adjusted Power (P_A):	7.00	(mW)

S_L =	1.000	(mW/cm ²)
S_{20} at 20cm =	0.002	(mW/cm ²)
R_C =	0.9	(cm)
S_C =	1.00	(mW/cm ²)

RESULT PASS

For mobile applications, $R = 20\text{cm}$. The combined power density of the WiFi and Bluetooth transmitters is given by:
 $S_{\text{Wifi}} + S_{\text{BT}} = 0.088 + 0.002 = 0.09\text{mW/cm}^2$ which is less than the limit of 1.0mW/cm^2

MPE of Amateur Radio, Standalone

Prediction of MPE Limit 47 CFR § 2.1091

$$S_{20} = \frac{P_A G_N}{4\pi R_{20}^2}$$

$$S_C = \frac{P_A G_N}{4\pi R_C^2}$$

$$R_C = \sqrt{\frac{P_A G_N}{4\pi S_L}}$$

$$S_L = \frac{0.02}{\text{(mW/cm}^2\text{)}}$$

S_{20} = Power Density of the Device at 20cm

S_L = Power Density Limit

S_C = Power Density of the Device at the Compliance Distance R_C

R_{20} = 20cm

R_C = Minimum Distance to the Radiating Element to Meet Compliance

P_T = Power Input to Antenna

P_A = Adjust Power

G_N = Numeric Gain of the Antenna

f = Transmit Frequency

Transmit Duty Cycle = 100%

Use Group = General Population

Transmit Duty Cycle:	100.00	(%)
Tx Frequency (f):	144.000	(MHz)
RF Power at Antenna Input Port (P_T):	50000.00	(mW)
Antenna Gain:	0.00	(dBi)
Numeric Antenna Gain (G_N):	1.00	(numeric)
Cable or Other Loss:	0.00	(dB)
Duty Cycle/Loss Adjusted Power (P_A):	50000.00	(mW)
S_L =	0.200	(mW/cm ²)
S_{20} at 20cm =	9.947	(mW/cm ²)
R_C =	141.0	(cm)
S_C =	0.20	(mW/cm ²)

User's Manual must indicate a minimum separation distance of: 142cm

At a distance of 142cm, $S_{WiFi} = 0.0017\text{mW/cm}^2$, $S_{BT} = 0.0004\text{mW/cm}^2$

Combined Power Density is given by $S_A + S_{WiFi} + S_{BT} = 0.2 + 0.0017 + 0.00004 = 0.20174\text{mW/cm}^2$