

FCC ID: CB2VWHL3
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RE: Calculation of FCC limits Part 15.231

The limits provided for in CFR47 Part 15.231(b) indicate that -

For the frequency range 260MHz - 470MHz, the limit is a linear interpolation between 3750uV/m and 12500uV/m where the limit at 260MHz is 3750uV/m and the limit at 470MHz is 12500uV/m.

A formula to calculate the limit is established with a ratio linearly equating the frequency range to the limit range.

$$(F_0 - F_L) / (F_H - F_L) = (L_0 - L_L) / (L_H - L_L)$$

where F_0 and L_0 represent the frequency in question and its limit
where F_L and L_L represent the lower frequency (260MHz) and its limit (3750uV/m).
Where F_H and L_H represent the higher frequency (470MHz) and its limit (12500uV/m).

The calculations for the frequencies included in the application are:

$$\begin{aligned} 288\text{MHz} \quad & (288 - 260) / (470 - 260) = (L_0 - 3750) / (12500 - 3750) \\ & (28 / 210) * (8750) = L_0 - 3750 \\ & L_0 = 1166.7 + 3750 \\ & L_0 = 4916.7 \text{ uV/m} \end{aligned}$$

$$\begin{aligned} 310\text{MHz} \quad & (310 - 260) / (470 - 260) = (L_0 - 3750) / (12500 - 3750) \\ & (50 / 210) * (8750) = L_0 - 3750 \\ & L_0 = 2083.3 + 3750 \\ & L_0 = 5833.3 \text{ uV/m} \end{aligned}$$

$$\begin{aligned} 418\text{MHz} \quad & (418 - 260) / (470 - 260) = (L_0 - 3750) / (12500 - 3750) \\ & (158 / 210) * (8750) = L_0 - 3750 \\ & L_0 = 6583.3 + 3750 \\ & L_0 = 10333.3 \text{ uV/m} \end{aligned}$$

The limit in dB terms is calculated as the result of 20 times the log of the uV/m limit.

$$288\text{MHz} \quad \text{dB limit is } 20 * \text{LOG}(4916.7 \text{ uV/m}) = 73.8 \text{ dBuV/m}$$

$$310\text{MHz} \quad \text{dB limit is } 20 * \text{LOG}(5833.3 \text{ uV/m}) = 75.3 \text{ dBuV/m}$$

$$418\text{MHz} \quad \text{dB limit is } 20 * \text{LOG}(10333.3 \text{ uV/m}) = 80.3 \text{ dBuV/m}$$