

Parameters

$$V_{out} = 5$$

$$R_{upper} = (V_{out} - 2.5)/250u$$

$$f_c = 1$$

$$k_{pm} = 100$$

$$G_{fc} = -20$$

$$p_{fc} = -55$$

$$G = 10^{(-G_{fc}/20)}$$

$$\text{Boost} = \text{pm} - (p_{fc} - 90)$$

$$\pi = 3.14159$$

$$K = \tan((\text{boost}/2 + 45) \cdot \pi / 180)$$

$$C2 = 1 / (2 \cdot \pi \cdot f_c \cdot G \cdot k \cdot R_{upper})$$

$$C1 = C2 \cdot (K^2 - 1)$$

$$R2 = k / (2 \cdot \pi \cdot f_c \cdot C1)$$

$$F_{zero} = f_c / k$$

$$F_{pole} = k \cdot f_c$$

$$R_{pullup} = 20k$$

$$R_{LED} = CTR \cdot R_{pullup} / G$$

$$C_{zero} = 1 / (2 \cdot \pi \cdot F_{zero} \cdot R_{upper})$$

$$C_{pole} = 1 / (2 \cdot \pi \cdot F_{pole} \cdot R_{pullup})$$

$$CTR = 1$$

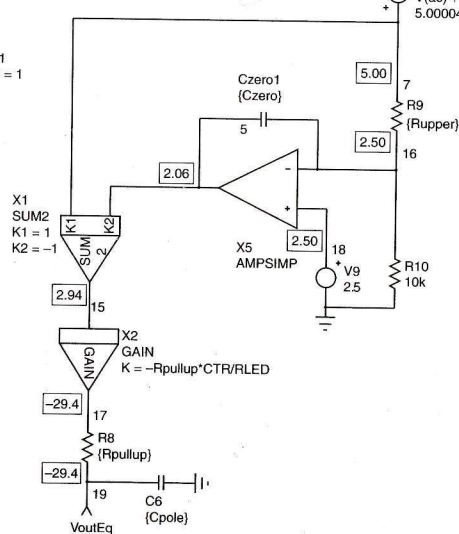
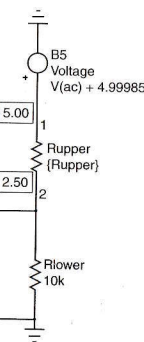
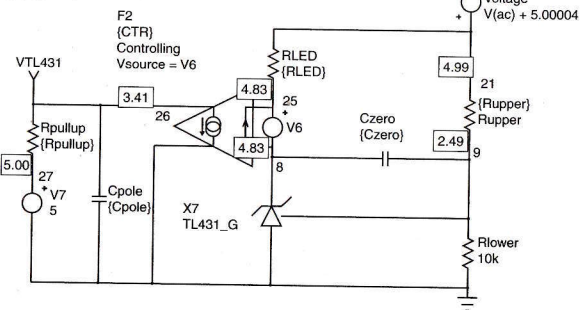


FIGURE 3-39 The comparison between the original op amp-based type 2 amplifier and the TL431 implementation.