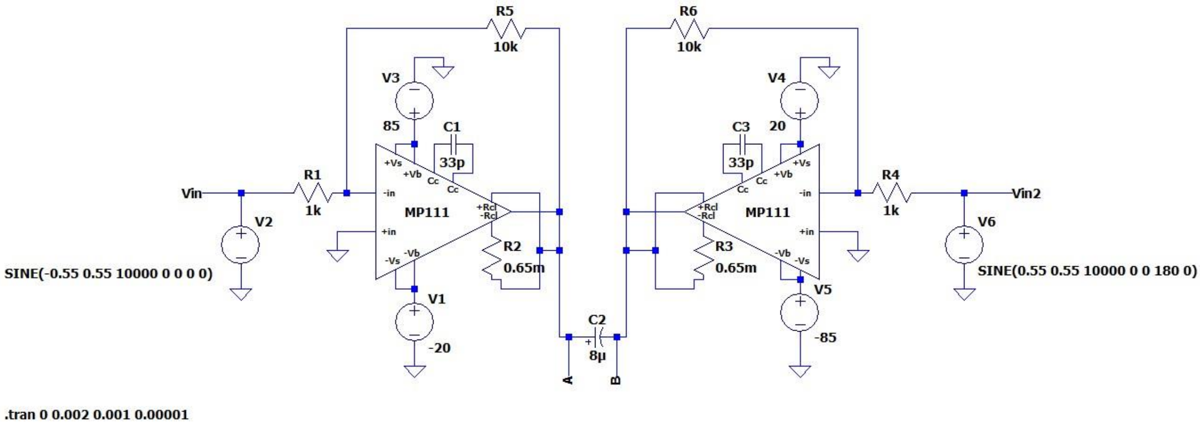
The driving circuit is the following:



The power dissipated by one power amplifier of the bridge:

$$P_{AMPL} = P_{SUPPLY} - \frac{P_{LOAD}}{2}$$

$$P_{SUPPLY} = V_{P_{SUPPLY}} \cdot I_{RMS} = V_{P_{SUPPLY}} \cdot \frac{I_{P_{LOAD}}}{\sqrt{2}}$$

$$I_{P_{LOAD}} = C_{LOAD} \cdot \frac{dV}{dt} = C_{LOAD} \cdot \pi \cdot f \cdot V_{PP_{LOAD}}$$

$$P_{LOAD} = \frac{\pi}{4} \cdot \tan(\delta) \cdot f \cdot C_{LOAD} \cdot {V_{PP_{LOAD}}}^2$$

$$\left(\frac{\pi}{8} \cdot \tan(\delta) \cdot f \cdot C_{LOAD}\right) \cdot {V_{PP_{LOAD}}}^2 - \left(\frac{V_{P_{SUPPLY}} \cdot C_{LOAD} \cdot \pi \cdot f}{\sqrt{2}}\right) \cdot V_{PP_{LOAD}} + P_{AMPL} = 0$$

Dividing by the constants which multiply ${V_{PP_{LOAD}}}^2$:

$${V_{PP_{LOAD}}}^2 - \frac{8 \cdot V_{P_{SUPPLY}}}{\sqrt{2} \cdot \tan(\delta)} \cdot V_{PP_{LOAD}} + \frac{8 \cdot P_{AMPL}}{\pi \cdot \tan(\delta) \cdot f \cdot C_{load}} = 0$$

$$V_{PP_{LOAD}} = \frac{\left(\frac{8 \cdot V_{P_{SUPPLY}}}{\sqrt{2} \cdot \tan(\delta)}\right) - \sqrt{\left(\frac{8 \cdot V_{P_{SUPPLY}}}{\sqrt{2} \cdot \tan(\delta)}\right)^2 - 4 \cdot \left(\frac{8 \cdot P_{AMPL}}{\pi \cdot \tan(\delta) \cdot f \cdot C_{load}}\right)}}{2}$$

From the datasheet the maximum power that can be dissipated in the Apex MP111 can be computed as $P_{AMPL} = \frac{T_j - T_a}{R_{jc}} = \frac{175-25}{0.65\ W} = 231\ W$.

The requirement for $C_{LOAD} = 8 \cdot 10^{-6}$.

The voltage supplied to each power amplifier:

$$V_{P_{SUPPLY}} = \frac{V_{max} - V_{min}}{2} = \frac{85 - -20}{2} = 52.5\ V$$

Considering a high dielectric loss factor:

$$\tan(\delta) = 0.3$$