

DOUBLE THE OUTPUT CURRENT TO A LOAD WITH THE DUAL OPA2604 AUDIO OP AMP

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Headphones typically have an impedance of 40Ω to 300Ω . By using the dual OPA2604 and four resistors one can economically drive a 2.8V peak signal into the 40Ω headphones.

Figure 1 illustrates a circuit that can be used to drive loads that exceed the output current capabilities of an operational amplifier, but not enough to require the use of a power operational amplifier. The OPA2604 used in this application is a dual, FET-input operational amplifier that can typically sink or source 35mA on the output. By taking advantage of the fact that the OPA2604 is a dual, this circuit will sink or source 70mA. In addition, each operational amplifier has its own short circuit protection of $\pm 40\text{mA}$ (typ), which makes the overall typical short circuit current of this application $\pm 80\text{mA}$.

One side of the dual OPA2604, A_2 , is in the feedback loop of the other side of the dual, A_1 . The current, I_1 , which is

supplied by A_1 is matched by the current I_2 , the output current of A_2 . The load will receive a total current of $I_1 + I_2$. The ratio between the output currents, I_1 and I_2 , is equal to:

$$I_2 = I_1 (R_3/R_4)$$

Resistors R_3 and R_4 are set equal for equal output currents. Resistors R_1 and R_2 set the overall gain of the circuit. The transfer function is:

$$V_{OUT} = V_{IN} (1 + R_2/R_1)$$

The OPA2604 is a dual, FET-input operational amplifier designed for enhanced AC performance. Very low distortion, low noise and wide bandwidth provide superior performance in high quality audio applications. The OPA2604 is available in plastic 8-pin DIP and plastic 8-pin SOIC.

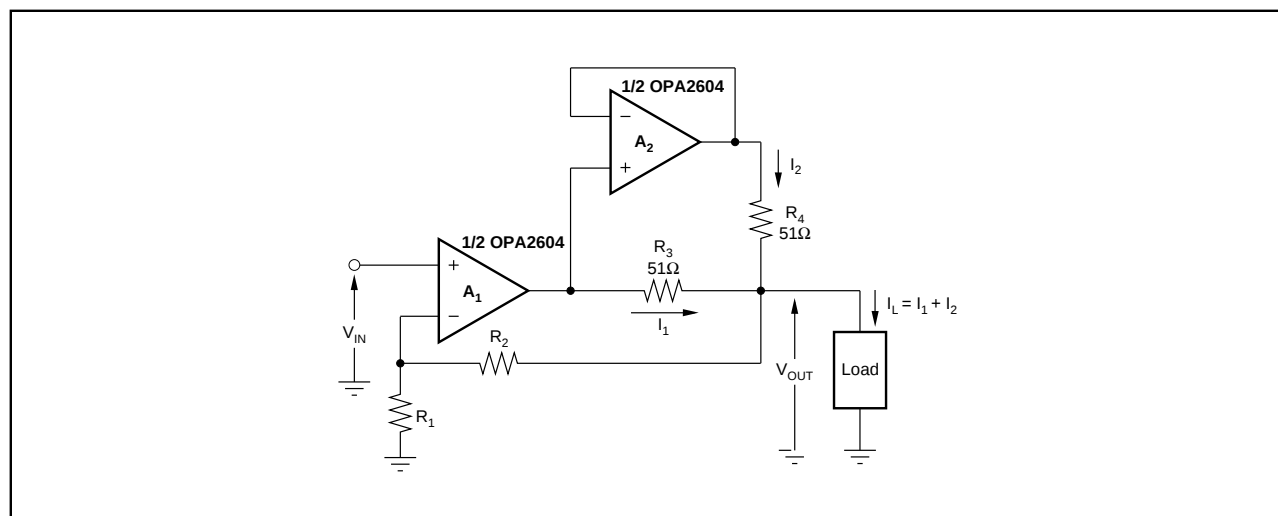


FIGURE 1. Using the Dual OPA2604 Op Amp to Double the Output Current to a Load.

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