

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

By Morgan Monks

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 ±40mA (typ), which makes the overall typical short circuit current of this application ±80mA.

One side of the dual OPA2604, A₂, is in the feedback loop of the other side of the dual, A₁. The current, I₁, which is

supplied by A₁ is matched by the current I₂, the output current of A₂. The load will receive a total current of I₁ + I₂. The ratio between the output currents, I₁ and I₂, is equal to:

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

Resistors R₃ and R₄ are set equal for equal output currents. Resistors R₁ and R₂ 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.

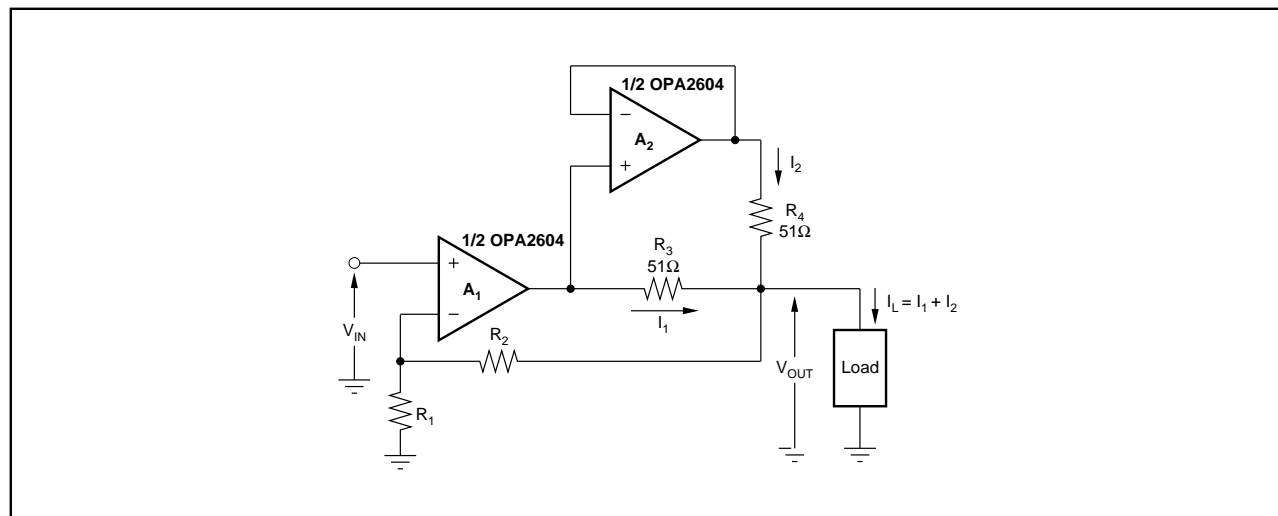


FIGURE 1. Using the Dual OPA2604 Op Amp to Double the Output Current to a Load.