



**Dual 5 Amp 40 V Power Operational Amplifiers**

**FEATURES**

- LOW COST
- WIDE COMMON MODE RANGE — Includes negative supply
- WIDE SUPPLY VOLTAGE RANGE  
Single supply: 5V to 40V  
Split supplies:  $\pm 2.5V$  to  $\pm 20V$
- HIGH EFFICIENCY —  $|V_s - 2.2V|$  at 2.5A typ
- HIGH OUTPUT CURRENT — 3A min (PA21A)
- INTERNAL CURRENT LIMIT
- LOW DISTORTION

**APPLICATIONS**

- HALF & FULL BRIDGE MOTOR DRIVERS
- AUDIO POWER AMPLIFIER  
STEREO — 18W RMS per channel  
BRIDGE — 36W RMS per package
- IDEAL FOR SINGLE SUPPLY SYSTEMS  
5V — Peripherals  
12V — Automotive  
28V — Avionic

**DESCRIPTION**

The amplifiers consist of a monolithic dual power op amp in a 8-pin hermetic TO-3 package (PA21 and PA25) and a 12-pin SIP package (PA26). Putting two power op amps in one package and on one die results in an extremely cost effective solution for applications requiring multiple amplifiers per board or bridge mode configurations.

The wide common mode input range includes the negative rail, facilitating single supply applications. It is possible to have a "ground based" input driving a single supply amplifier with ground acting as the "second" or "bottom" supply of the amplifier.

The output stages are also well protected. They possess internal current limit circuits. While the device is well protected, the Safe Operating Area (SOA) curve must be observed. Proper heatsinking is required for maximum reliability.

This hybrid integrated circuit utilizes thick film (cermet) resistors, ceramic capacitors and semiconductor chips to maximize reliability, minimize size and give top performance. Ultrasonically bonded aluminum wires provide reliable interconnections at all operating temperatures. The 8-pin TO-3 package is hermetically sealed and electrically isolated. The use of compressible isolation washers voids the warranty. The tab of the SIP12 plastic package is tied to  $-V_s$ .

**TYPICAL APPLICATION**

R1 and R2 set up amplifier A in a non-inverting gain of 2.8. Amp B is set up as a unity gain inverter driven from the output of amp A. Note that amp B inverts signals about the reference node, which is set at mid-supply (14V) by R5 and R6. When the command input is 5V, the output of amp A is 14V. Since this is equal to the reference node voltage, the output of amp B is also 14V, resulting in 0V across the motor. Inputs more positive than 5V result in motor current flow from left to right (see Figure 1). Inputs less positive than 5V drive the motor in the opposite direction.

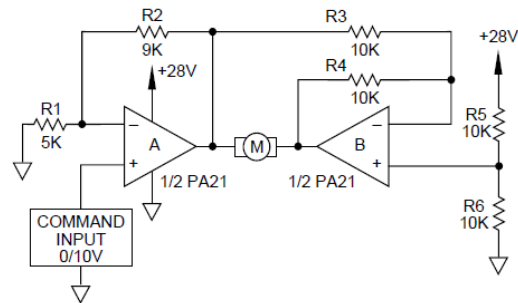
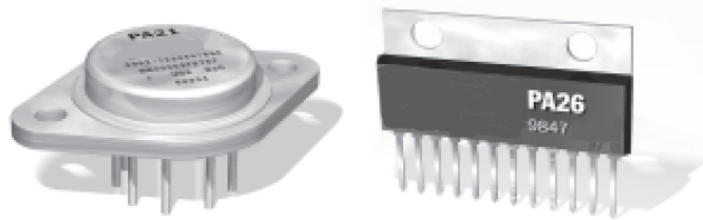


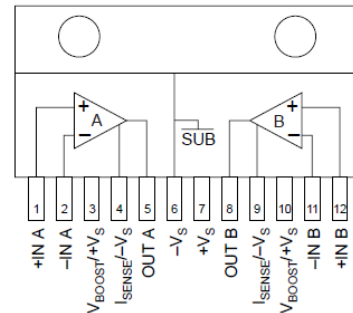
FIGURE 1: BIDIRECTIONAL SPEED CONTROL FROM A SINGLE SUPPLY

The amplifiers are especially well-suited for this application. The extended common mode range allows command inputs as low as 0V. Its superior output swing abilities let it drive within 2V of supply at an output current of 2A. This means that a command input that ranges from 0V to 10V will drive a 24V motor from full scale CCW to full scale CW at up to  $\pm 2A$ . A single power op amp with an output swing capability of  $V_s - 6$  would require  $\pm 30V$  supplies and would be required to swing 48V p-p at twice the speed to deliver an equivalent drive.

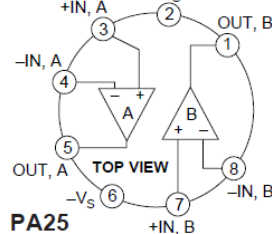
**EXTERNAL CONNECTIONS**

**PA26**

Connect pins 3 and 10 to pin 7 and connect pins 4 and 9 to pin 6 unless special functions are required.



**PA25**



**PA21**

