Opamp with increased output current

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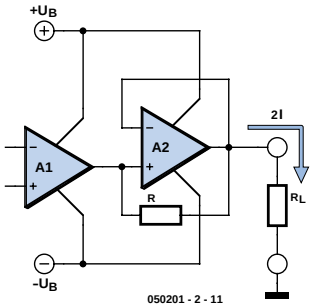

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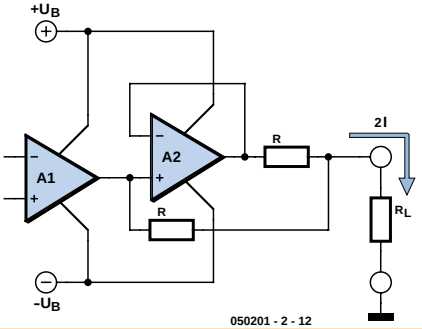

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Integrated opamps offer advantages such as ease of use, good price-performance ratio and small physical size. However, they seldom have an output current drive capability of greater than about 12 mA, and so they are not suitable for use in 20 mA current loop applications, for example. One solution is to add a driver stage with the necessary output power, comprising perhaps two to four transistors and a number of other components. This design takes up board space and is relatively expensive, tending to offset the advantages of the integrated device.

An alternative possibility is to boost the output drive capability by connecting opamps in parallel. The output current will then be approximately proportional to the number of opamps. Instead of a single opamp a dual or quad device is used to achieve greater output power.

The idea is shown in **Figure 1**. The output of the first opamp is connected to the input of a further non-inverting opamp stage as well as being connected to the output of the circuit via a resistor. The first opamp thus drives the second non-inverting amplifier which provides all the output current of the circuit as long as that remains within its normal capability. As the output current demand increases the second opamp will reach the limit of its drive capability. Its gain will then fall off and a voltage difference will develop across its inputs. The first opamp will then start to deliver more and more current to the output via the resistor, and the sum of the output currents of the two opamps thus flows through load resistor R_L.

By adding another resistor we can compare the current contributions from the two opamps (**Figure 2**). The complete circuit with two opamps is shown in **Figure 3**.

The principle of the circuit can be extended to more opamps with their output currents being added together (see **Figure 4**).

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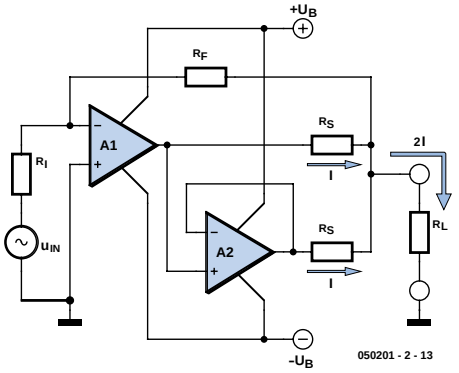

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