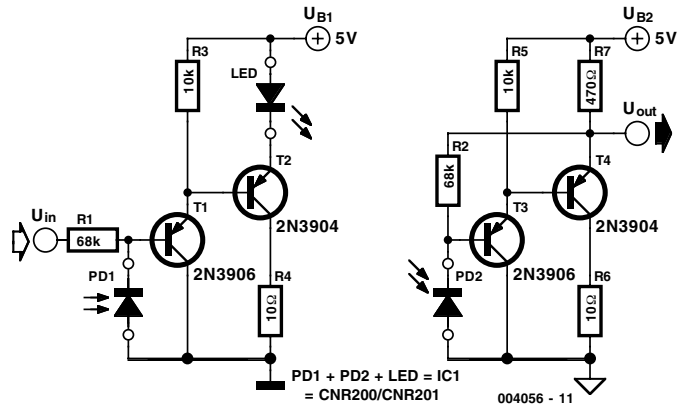


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It is sometimes necessary to make an electrically isolated connection in a circuit. An optocoupler is usually the key component in such a situation. In most optocouplers, a single light-emitting diode (transmitter) and a single photodiode (receiver) are optically coupled inside the package. This solution is satisfactory for transferring digital levels (such as the control signals for a thyristor), since only two logical states (LED on or LED off) have to be transferred. An exact (analogue) coupling is thus not necessary.

If an analogue voltage must be transferred, then it is important that the voltages at the input and the output closely track each other. To make this possible, the transmitter and receiver must employ comparable components that are incorporated into an analogue circuit. The type CNR200 and CNR201 opto-



couplers that are available from Agilent (formerly Hewlett-Packard) contain all the essential components for such a function. There are two photodiodes and one LED in a single package, with an optical coupling between the LED and one of the photodiodes. The schematic diagram shows how the transmitter LED is optically coupled to the photodiode in the receiver. The remaining photodiode is incorporated into the transmitter and ensures that the characteristic of the trans-

mitter amplifier is the same as that of the receiver. Assuming a supply voltage of 5 V, analogue voltages in the range of 0 to 3 V can be readily transferred. The isolation voltage between the input and output of this optocoupler is 1000 V. The value that can be achieved in practice depends on the printed circuit board layout.