Opto-isolated RS-232 interface achieves high data rate

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When signals originating from isolated sources are transferred to a destination at a different voltage, coupling circuitry must be used to minimize signal distortion and interference. Unfortunately this circuitry slows down data-transmission rates. However, General Instrument's dual-phototransistor opto-isolator MCT66 may be used to isolate an RS-232 interface and still achieve a relatively high data rate of 9,600 bits per second.

The opto-isolated RS-232 interface (a) uses the MCT66, two diodes, an inverter, and a resistor. If pull-up resistors were used instead of transistors Q_1 and Q_3, the rising edge of the signal would be slow and thus would limit the transmission rate to below 1,200 b/s. This limiting depends on the values of the resistors and the length of the RS-232 cable. However, if the pull-up resistor's value is reduced below 1 kilohm, intolerable power dissipation occurs.

This circuit not only achieves high data rates but also enables the polarity of the signal to be changed, without using an additional inverter, by altering the connections between transistors Q_1 and Q_2 or Q_3 and Q_4 (b). □

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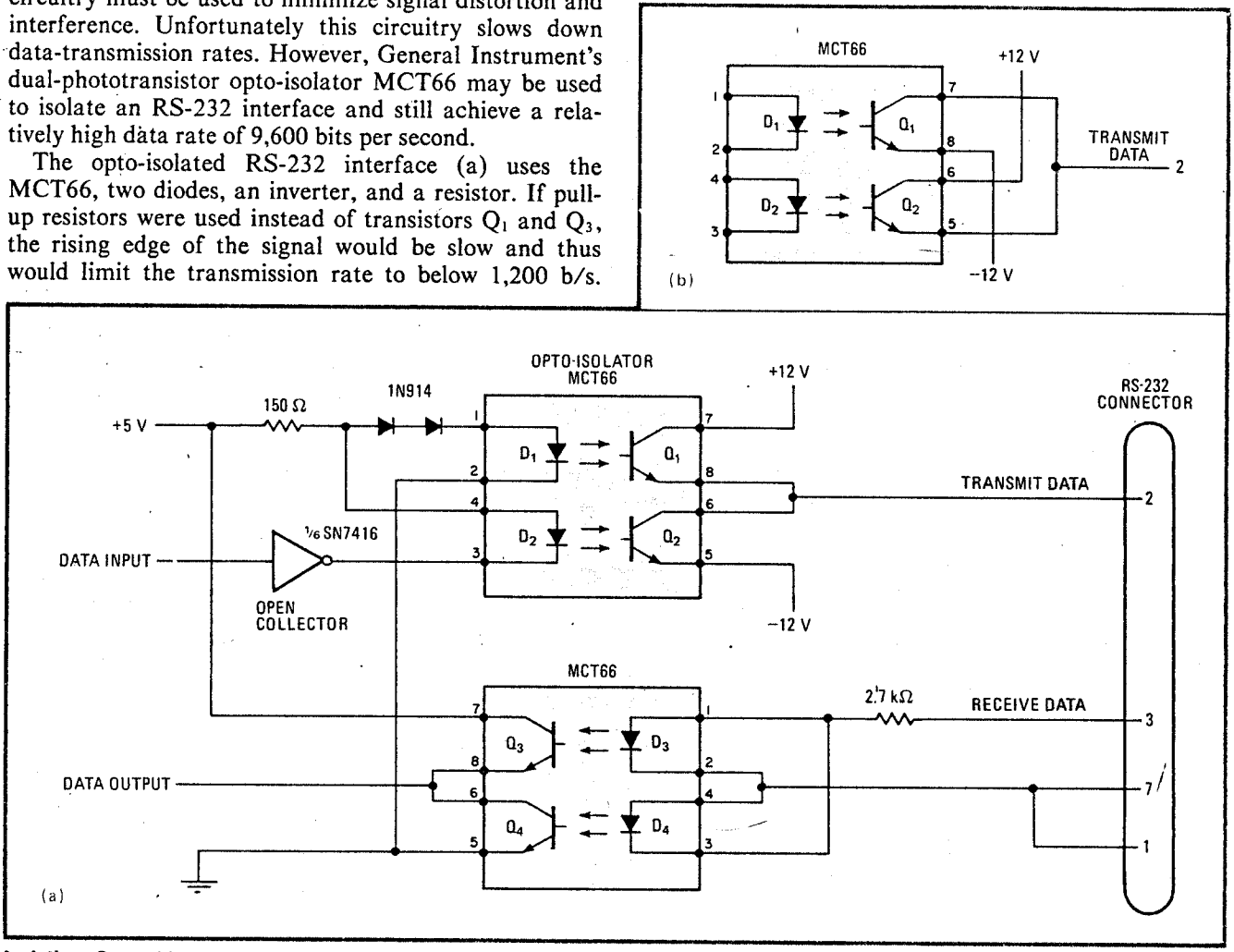

Isolation. General Instrument's dual-phototransistor opto-isolator MCT66 isolates the RS-232 interface (a) and achieves a high data rate of 9,600 b/s. The signal's polarity may be changed by altering the connections between Q_1 and Q_2 or Q_3 and Q_4 (b).

Spectrum analyzer measures integrated-circuit noise figure

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Now that video detectors are incorporated into an amplifier chip containing intermediate-frequency circuitry (MC13001), only the detector output is available, thus making noise-figure measurement difficult. However, a method using a spectrum analyzer eliminates this difficulty. A bonus is that it can test any frequency.

The noise figure of an amplifier is the signal-to-noise ratio at the input divided by the S/N ratio at the output.