Figure 17. Weighted-current-sink DAC employing an inverted R-2R ladder.

DAC (Figure 15). Proper operation requires an extra ladder-termination sink with a current equal to that of the LSB. Multiple four-bit sections of this type were used in early 8- and 12-bit converters.

The R-2R ladder may also be employed to generate weighted current sinks for a D/A converter, as shown in Figure 16. Each transistor carries one-half the current, going from MSB to LSB, of the proceeding device. To maintain proper weighting of the current sinks, however, the emitter areas of the transistors must still be scaled.

Another method of using the R-2R ladder is shown in Figure 17. An inverted ladder is driven by equal-valued current sinks. This technique keeps transistor area to a minimum. The sink currents are selectively switched into the various nodes of the ladder, which provides scaling by the proper power of two. Since currents are being switched into the resistor network, the settling time of the ladder slows the response of this DAC, and, if current-mode out-