Dual-coil relay driver uses only two MOSFETs

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Latching relays change their states when you apply a short voltage pulse to their coils. Because these relays require no continuous coil currents to keep their states, you can save considerable power in the driver circuit. In one type of latching relays, you can alternately energize dual coils to change the relay state. Simply apply voltage to one coil for the set state and to the other coil for the reset state. Applying a 25- to 50-msec-wide voltage pulse to the coils is sufficient for operating the relay. Many relays can operate with a continuous coil current, and some dual-coil relays have internal contacts that interrupt the coil current after it completes a state change. Continuous coil voltages can drive such relays if energy efficiency is not a big concern.

The need to differentially drive the coils results in crowded drive circuits for dual-coil relays. Drivers usually in-

clude logic elements to make sure to energize only one coil at a time. The design in **Figure 1** uses only two MOSFETs to drive a dual-coil RF relay. The Agilent Technologies (www.agilent.com) N1810UL RF switch has dual 24V coils and internal current-interrupting contacts.

When logic input is high, Q_1 conducts and changes the relay state by activating L_1. The states of the current-interrupting contacts also change. Meanwhile, Q_2 is off because Q_1 pulls down its gate, which avoids fighting between the coils. If you then apply a low signal to the logic input, Q_1 turns off and keeps the L_1 coil inactive. Because R_1 pulls up Q_2's gate, Q_2 turns on and energizes L_2. The 1N4007 diodes prevent inductive kickback. The idea is applicable to dual-coil relays with continuously rated coils or with current-interrupting contacts. In the absence of current-interruption contacts, L_1 can serve as a pullup, and R_1 therefore becomes redundant.**EDN**
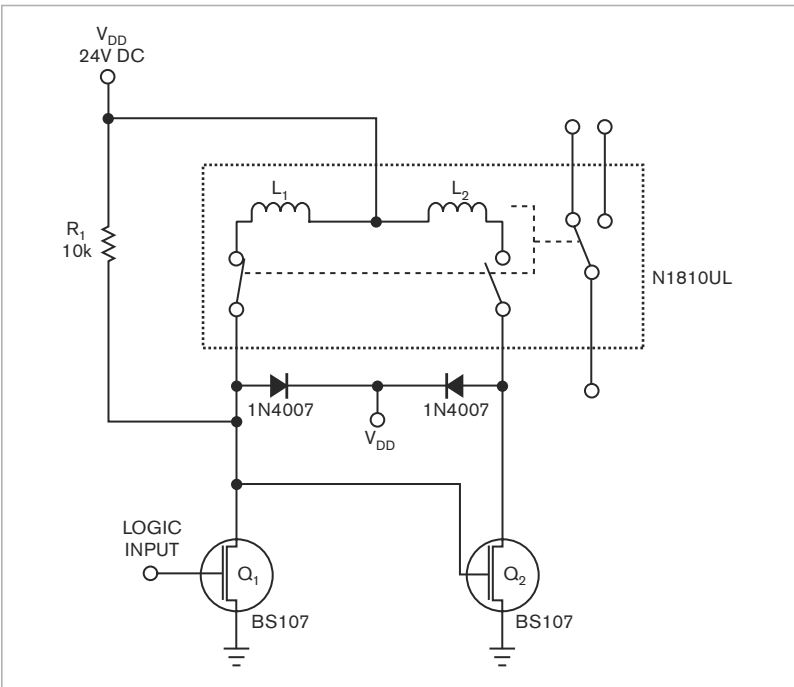

Figure 1 Using two MOSFETs to differentially drive a dual-coil latching relay eliminates the need for any logic components.