Low-power inverter ignites gas-discharge lamps

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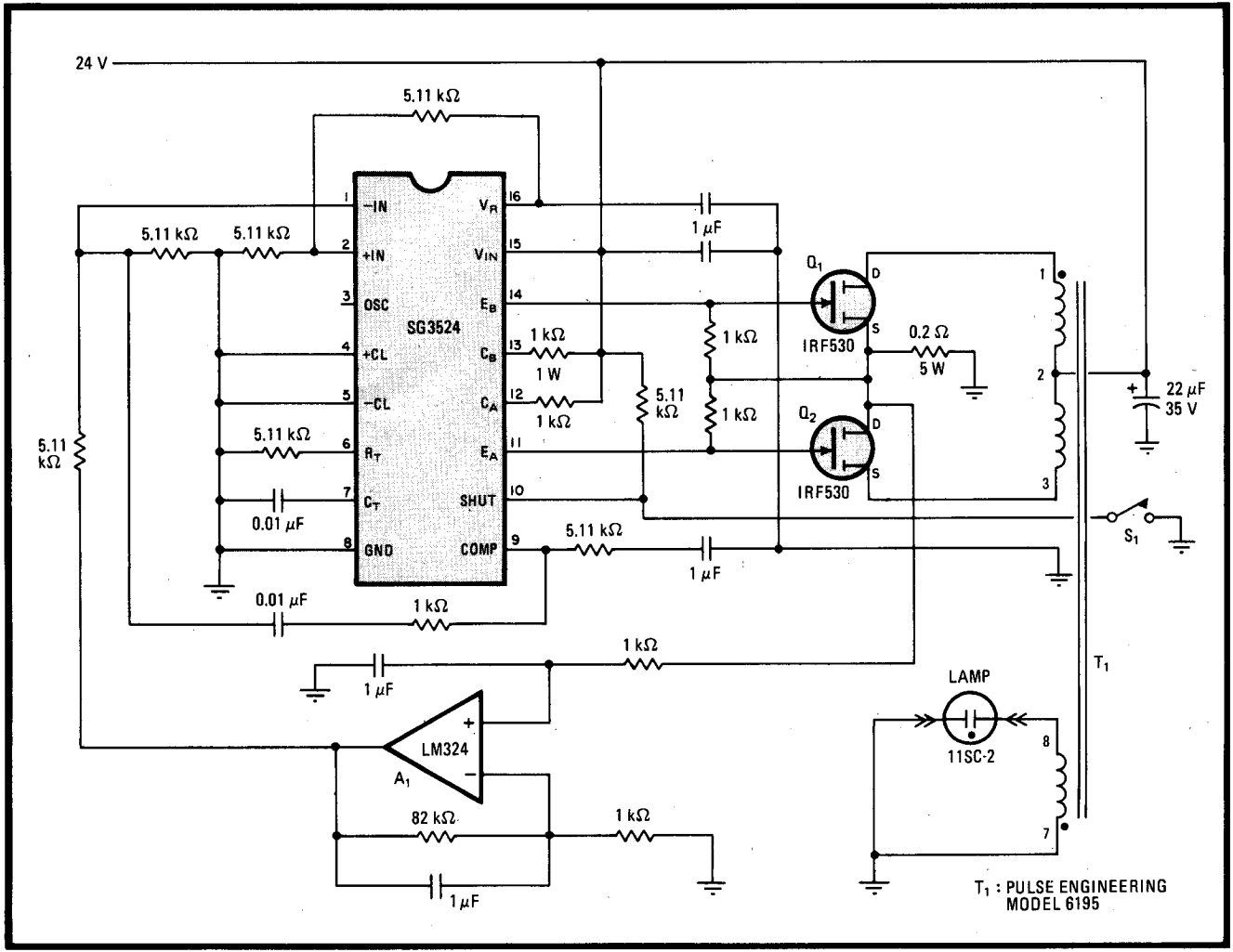
This inexpensive low-power inverter generates the high voltage required to ignite gas-discharge lamps of the mercury-vapor type and supplies the small current needed to maintain conduction. It also prevents the deposition of ions on the lamp's cathode that tends to shorten its operating lifetime. Using one integrated circuit, an operational amplifier, and two field-effect transistors, the inverter can be built for less than $30, including the cost of the unit's pulse transformer.

As shown, the SG3524 pulse-width modulator and transformer T1 convert a 24-volt dc input into the 1,500-v potential required for turning on the Ultra Violet Products 1 lSC2 lamp. When switch S1 is closed, the chip's Ea output goes high, thus inducing a high-voltage square wave across T1's secondary.

As current begins to flow in the primary, feedback amplifier A1 comes into play. Detecting the relative magnitude of the current through the 0.2-ohm sense resistor, A1 automatically sets the width of the kilohertz modulating pulses so that a constant ac current of 5 milliamperes is delivered to the lamp. Use of a push-pull output and the balanced transformer connection ensure that the switched square wave is symmetrical about the zero axis. This ac driving signal thus prevents the migration and subsequent buildup of ions around the lamp's cathode.



Arc-over. Low-power transistor-driven inverter generates high-voltage square wave to fire fluorescent and mercury-vapor lamps and provides low current to maintain ionization. Symmetry of inverter's output prohibits build-up of ions at lamp's cathode, thus increasing operating life.