MIC5018 Evaluation Board

IttyBitty™ High-Side MOSFET Driver

Description

The MIC5018 evaluation board is an assembled, high-side switch for 2.7V to 9V power-switching applications.

Requirements

The MIC5018 evaluation board requires a power supply, load, and logic output.

Operation

Connect the evaluation board as shown. A function generator with a TTL output, or a logic-level, square wave output, can be used as a control signal. On/off power switch operation can be simulated by setting the output frequency to about 1Hz or 2Hz.

Applying logic high to the control input will energize the load; logic low will de-energize the load.

The MIC5018 makes it possible to switch a supply as low as 2.7V using a logic-level MOSFET such as the IRL3103. Because the IRL3103 also has a ±20V maximum gate voltage rating, the MIC5018 evaluation board can switch a 5V logic supply or higher voltage circuit without an additional gate-to-source clamping zener. (Logic-level MOSFET gates are usually rated at ±10V maximum. See "MOSFET Selection" in the MIC5018 data sheet for more information.)

Supply Precautions

The MIC5018 evaluation board includes a tantalum bypass capacitor on the supply input. Always apply power using the power supply's on/off switch. Avoid applying power by connecting the supply input to an operating power supply. Applying power instantaneously to any tantalum capacitor may cause capacitor failure.

Bill of Materials

Item	*Qty.*	*Description*
—	1	**Micrel, MIC5018BM4** **IttyBitty™ high-side MOSFET driver**
C1	1	AVX, TAJB475M020 Note 1 4.7µF 20V tantalum
Q1	1	International Rectifier, IRL3103 Note 2 14mΩ N-channel power MOSFET

Note 1: See "Operation: Supply Precautions" for information on safely using tantalum capacitors.

Note 2: Manufacturer's preliminary data sheet ratings:
14mΩ at V_{GS} = 10V, I_D = 34A, T_J = 25°C;
19mΩ at V_{GS} = 4.5V, I_D = 28A, T_J = 25°C.
The gate features logic-level performance with ±20V maximum rating. Heat sinking is required at higher currents.

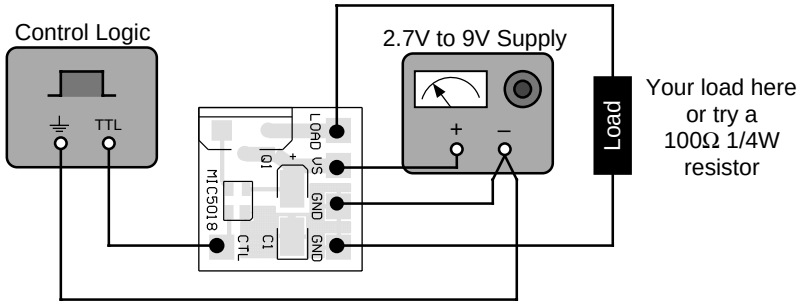
Load Precautions

A 100Ω, 1/4W resistor can be used as a low-current demonstration load. When switching other loads, always stay within the current rating of the MOSFET and power supply. See Note 2, above.

The evaluation board MOSFET is located near the edge of the board so that it can be fastened to a flat heat sink.

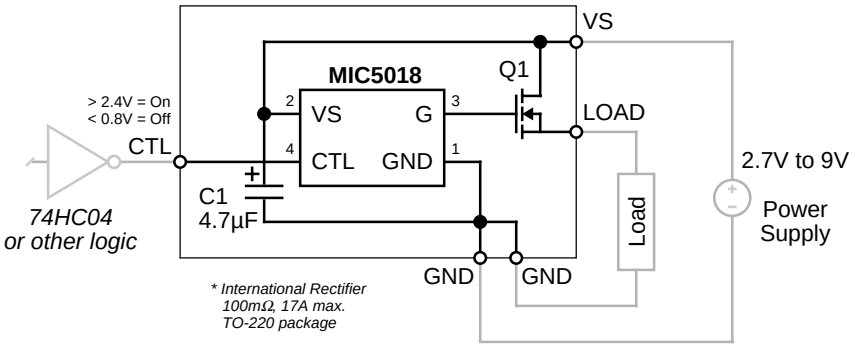
Inductive loads require a Schottky diode to control the inductive kick that occurs upon turnoff. Refer to the MIC5018 data sheet for a connection example. At high current, leads to a resistive load may also exhibit enough inductance to cause significant inductive kick.

Wiring



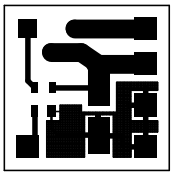
MIC5018 Evaluation Board Wiring

Schematic Diagram

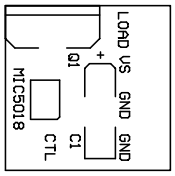


MIC5018 Evaluation Board Schematic Diagram

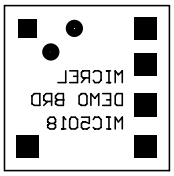
Printed Circuit Layout



Top Actual Size



Silk Screen (Top) Actual Size



Bottom Actual Size

MICREL INC. 1849 FORTUNE DRIVE SAN JOSE, CA 95131 USA

TEL + 1 (408) 944-0800 FAX + 1 (408) 944-0970