

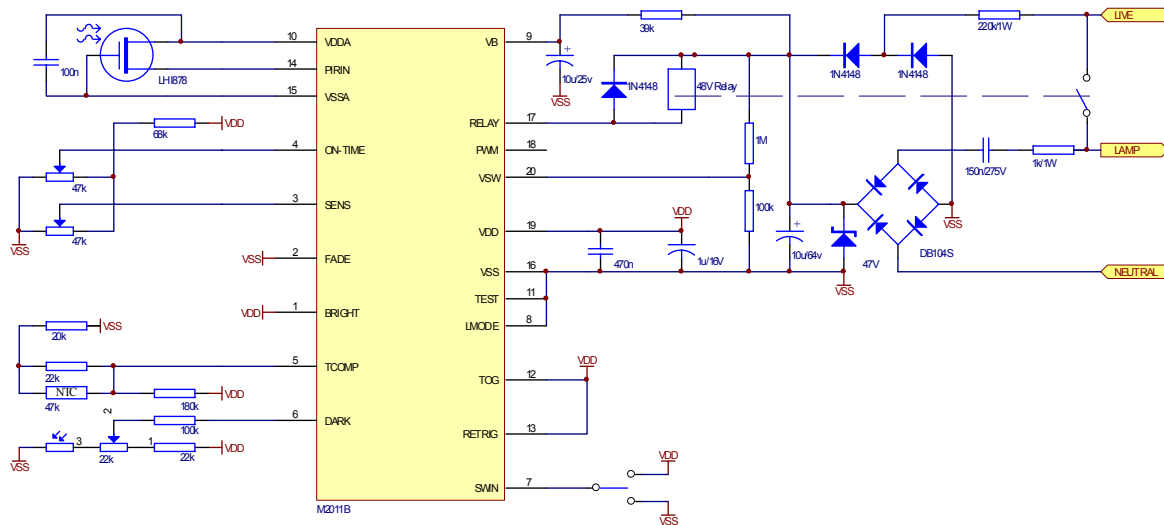
Energy saving with the M2011

Motion sensor light controllers are increasingly used in conjunction with compact florescent lamps (CFL). The M2011B PIR light controller integrated circuit supports the design of very low standby power motion sensor lights of less than 0.5 Watt.

Low energy consumption, high brightness lighting and long life makes the CFL a very popular lighting choice, especially since prices for these lamps are moving toward the 1 USD mark. Switching a CFL with a relay is a robust and reliable solution that requires no special precautions by the consumer.

The power supply circuit in most conventional motion sensors lights is based on a voltage dropper capacitor. Driving the relay coil for switching the light requires most of the current. Capacitor values up to 470nF are sometimes used to satisfy the current requirements. A continuous power drawn from mains of up to 8VA is not uncommon. This is mainly reactive power consumption, but the current loads the system and causes power losses.

Application Circuit



The M2011B supports a dual power supply arrangement. A low power supply circuit powers the motion sensor IC and all peripheral circuitry. If movement is detected, the relay switches and a voltage dropper capacitor is switched on to provide sufficient current for the relay coil. The switching of the relay is controlled by the M2011B. The M2011B also monitors the voltage on the storage capacitor in the supply circuitry, which is charged by the low power circuitry (low current supply).

Outputs PWM and RELAY are only activated when the voltage is above the user defined value. This feature makes it possible to draw a minimal current from the mains when the light is switched off.

Inside the M2011B

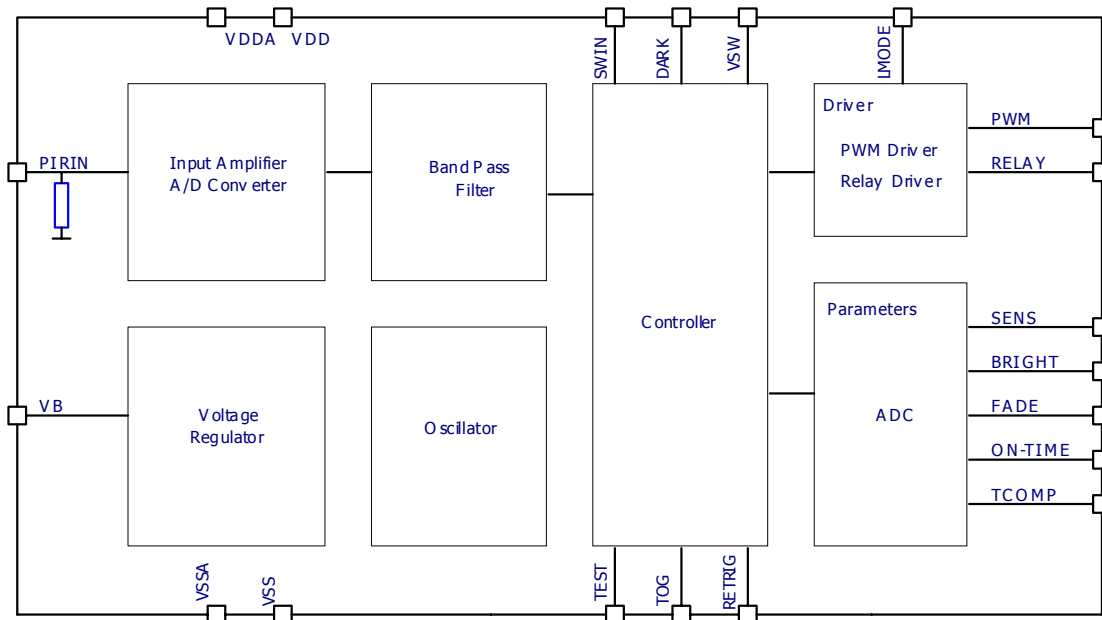
The M2011B PIR controller is based on digital signal processing. The result is no drift and minimum external component count.

A conventional PIR sensor connects directly to the PIR input of the M2011. The pull-down resistor and DC decoupling circuitry are integrated on chip. There are no external components in the signal path. The PIR signal is converted to a 15 bit digital value. Unwanted frequency components are removed with second order Butterworth low-pass and high-pass filters. The result is compared against a user defined threshold.

The parameters for sensitivity, fade time, on-time and brightness are defined with the voltages applied to the corresponding inputs of the M2011B. A LDR input allows for daylight sensing and inhibits load switching during day time.

All MOS PIR motion controllers feature temperature compensation. The sensitivity is adjusted due to environmental temperature changes - thereby effectively keeping the sensitivity and detection range constant.

The M2011B integrated circuit contains a low dropout voltage regulator with a wide input voltage range of 4.5V to 18V.



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Ordering Information _____

M2011B-SO20-300 (20 pin Surface mount, 300 mil)

Other packages are available on request.

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