

PROGRAMMABLE LIGHT-ACTIVATED TIMER

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FEATURES:

- Input interface to Photo Resistor
- Programmable Duration Selection
- Shunt regulator
- 50Hz / 60Hz time base selection
- Relay Driver output
- 6.0V ± 0.75V operating voltage range (V_{DD} - V_{SS})
- LS7217 (DIP), LS7217-S (SOIC) - See Figure 1 -

APPLICATIONS

Lighting control for low voltage landscape lighting, etc.

DESCRIPTION

The LS7217 is a Programmable Timer IC designed to turn on a relay at night and turn off the relay at dawn or after a selectable number of hours. Figure 2 shows a typical application schematic. The circuit is powered from a step-down transformer and the output drives low-voltage AC loads such as incandescent light bulbs.

PIN DESCRIPTION:

The following describes the operation of the inputs and outputs of the IC.

V_{DD} (Pin 2)

V_{DD} is the supply voltage positive terminal. It is regulated internally in the IC. The **internal voltage regulator produces 6.0V ± 0.75V**. A series resistor is required to limit current into the regulator from 5mA to 10mA over the full transformer operating voltage range.

V_{SS} (Pin 6)

V_{SS} is the supply voltage negative terminal.

50Hz / 60 Hz SELECT Input (Pin 8)

A **high** at this at this input selects the correct timing for 50Hz operation. **Floating** this input selects the correct timing for 60Hz operation. A **low** at this input places the LS7217 into **Test Mode** where the timeouts are accelerated by a factor of 60.

50Hz / 60 Hz Input (Pin 7)

This input is the clock source for all timing functions. This input accepts a 9VAC to 16VAC input voltage. An external dropping resistor of 220k Ohms is needed to limit current. This input has a Schmitt trigger to ensure a clean internal clock waveform.

PIN ASSIGNMENT TOP VIEW

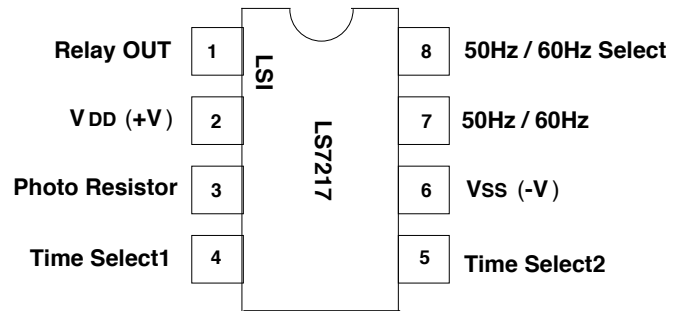


FIGURE 1

TIME SELECT Inputs TS1, TS2 (Pins 4, 5)

The two Select inputs determine the time duration that the Relay output stays on after the photocell goes low. Both inputs have internal pulldown transistors so that float is logic zero and connection to V_{DD} is logic 1. The Time Select Table is as follows:

Time Select1	Time Select2	Time Duration
0	0	4 Hours
0	1	6 Hours
1	0	8 Hours
1	1	Dusk -to-Dawn

Dusk to Dawn duration is determined solely by the photocell; i.e., the Relay output is on whenever the photocell recognizes an ambient dark condition.

PHOTO RESISTOR Input (Pin 3)

The photo resistor input has hysteresis for a positive trip point. The input will work with a photo resistor connected between the input and V_{DD}. The photo resistor provides a low impedance in the presence of ambient light and a high impedance in the presence of ambient darkness.

The IC is configured so that detection of a **light condition** must remain for 6.0 seconds (± 0.5 seconds) continuously in order to be recognized as a **valid light condition**. A **dark condition** must remain for 1.0 seconds (± 0.25 seconds) continuously in order to be recognized as a **valid dark condition**.

RELAY Output (Pin 1)

This output is configured to drive the base of an external NPN transistor (see Figure 2).

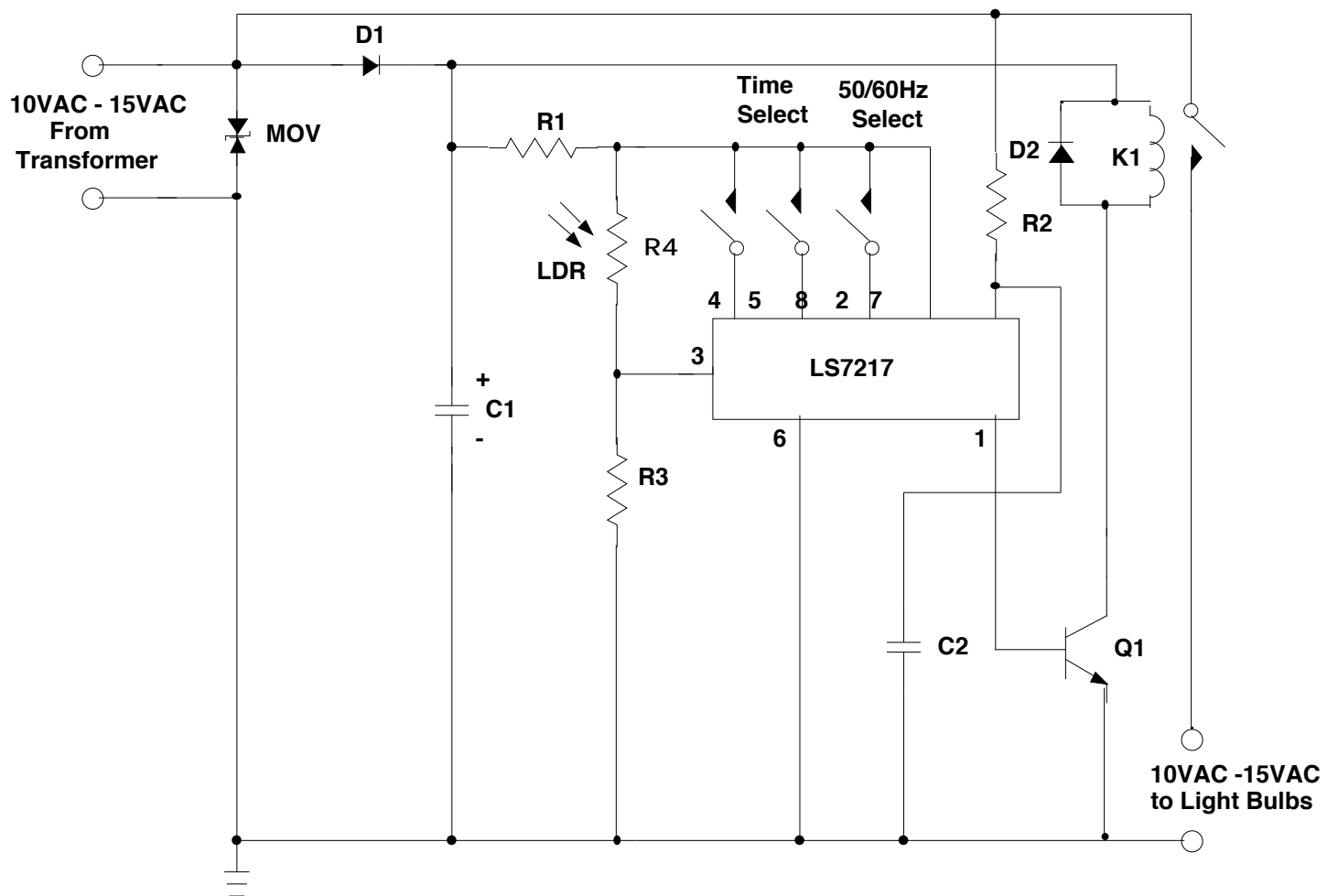


FIGURE 2. TYPICAL LANDSCAPE LIGHTING APPLICATION SCHEMATIC

D1 = 1N4004

D2 = 1N4004

C1 = 220uF, 25V

C2 = 470pF, 10V

Q1 = 2N3904 (Typical)

R1 = 1k

R2 = 220k

R3 = 25k

R4 = **Silonex** NSL-19M51 (Typical)

Note: All resistors, 1/4W

ABSOLUTE MAXIMUM RATINGS: (All voltages referenced to V_{SS})

	SYMBOL	VALUE	UNIT
DC Supply Voltage	V _{DD}	+8	V
Voltage (Any Pin)	V _{IN}	V _{SS} -0.3 to V _{DD} + 0.3	V
Operating Temperature	T _A	- 20 to +85	°C
Storage Temperature	T _{STG}	-40 to +150	°C

DC ELECTRICAL CHARACTERISTICS:(T_A = 25°C, V_{DD} = 6.0V unless otherwise specified.)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
TS1, TS2 Low	T _{LO}	-	-	1.4	V
TS1, TS2 High	T _{HI}	3.0	-	-	V
50/60 Hz Low	V _{HZL}	-	-	2.9	V
50/60 Hz High	V _{HZH}	4.4	-	-	V
Photo Resistor					
Inhibit Threshold	V _{IT}	3.5	-	-	V
Enable Threshold	V _{ET}	-	-	2.9	V
Input Current					
(All inputs high)					
50Hz/60Hz Select] TS1, TS2]	I _{IH}	-	24	-	mA
Output Current					
Sourcing, V _O = 0.7V	I _{OH}	4.0	-	-	mA
Sinking, V _O = 0.4V	I _{OL}	-50	-	-	mA

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