

## 3, 4 AND 8 PIN AUTOMATIC SHUT-OFF TIMERS

### ADVANCE INFORMATION

January 2002

**FEATURES:**

- Minimizes external components and power consumption
- Factory calibrated timer
- Mask programmable from 2.5 minutes to 32 hours

**APPLICATIONS**

Control of household appliances, heaters, lighting and AC motors.

**DESCRIPTION**

The basic ASOT is a CMOS integrated circuit timer that can be mask programmed from 2.5 minutes to 32 hours as shown in Table 1. The output of the IC is used to turn on a 12V relay and has a duty cycle which can be mask programmed from 5% to 37.5% in 2.5% steps as shown in Table 2. The duty cycle can be selected to optimize operation for a particular relay coil. There are 5 different versions of the IC.

The ASOT is a 3-Pin version housed in a TO-92 package. The application schematic is shown in Figure 2. When latching switch S1 is closed, the output turns on energizing relay L1 and keeping switch S1 closed. When the programmed time-out expires, the output turns off deenergizing relay L1 and causing switch S1 to open.

The ASOTR is a 4-Pin version as shown in Figure 3. The output turns on in the same manner as in the 3-Pin version. If momentary switch S2 is closed, the timer resets and starts timing out again. The S2 input has an internal pull-up resistor. Every subsequent momentary switch closure resets the timer. As in the 3-Pin version, the output remains on until the timeout expires.

The ASOTT is also a 4-Pin version as shown in Figure 4. In this version contacts C1 replace switch S1 and are not accessible. The application of power caused by closing

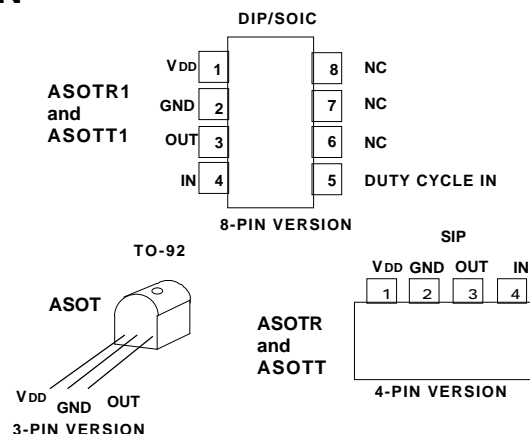


FIGURE 1. PACKAGE OPTIONS

the momentary switch S2 causes the output to toggle on as in the 3-Pin version. If the momentary switch is closed again, the output toggles off causing contact C1 to open and power to be removed. The R2 input has an internal pull-up resistor.

The default operation of the output produces a double duty cycle for the first 10 milliseconds of output activation to increase the pull-in torque of the relay. The option to remove this feature is factory selectable in the ASOT (3-Pin), ASOTR (4-Pin) and ASOTT (4-Pin) versions. There are also two 8-Pin versions available which allow the user to change this feature. The ASOTR1 is the 8-Pin version used in the Figure 3 application and the ASOTT1 is the 8-Pin version used in the Figure 4 application. In both cases, the duty cycle input has an internal pull-up resistor. Tying the input to Vss removes the double duty cycle feature.

TABLE 1

Timeout Numbers	Auto Shut-Off Times									
	0h 2.5m	0h 5m	0h 7.5m	0h 10m	0h 12.5m	0h 15m	0h 17.5m	0h 20m	0h 22.5m	0h 25m
01 - 10										
11 - 20	0h 30m	0h 35m	0h 37.5m	0h 40m	0h 45m	0h 50m	0h 52.5m	1h 0m	1h 10m	1h 15m
21 - 30	1h 20m	1h 30m	1h 40m	1h 45m	2h 0m	2h 20m	2h 30m	2h 40m	3h 0m	3h 20m
31 - 40	3h 30m	4h 0m	4h 40m	5h 0m	5h 20m	6h 0m	6h 40m	7h 0m	8h 0m	9h 0m
41 - 50	9h 20m	10h 0m	10h 40m	12h 0m	14h 0m	16h 0m	20h 0m	24h 0m	28h 0m	32h 0m

TABLE 2

Duty Cycle Numbers	Duty Cycle Percentages						
	5	7.5	10	12.5	15	17.5	20
01 - 07							
08 - 14	22.5	25	27.5	30	32.5	35	37.5

**ABSOLUTE MAXIMUM RATINGS:**

(All voltages referenced to Vss)

	SYMBOL	VALUE	UNIT
Maximum	V <sub>DD</sub>	+85	V
Input	V <sub>IN</sub>	+5 to V <sub>ss</sub> - 0.3	V
Operating Temperature	T <sub>A</sub>	0 to +85	°C
Storage Temperature	T <sub>STG</sub>	-65 to +150	°C

**ELECTRICAL CHARACTERISTICS:**

(All voltages referenced to Vss)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	CONDITION
Shunt Regulator Voltage	V <sub>BD</sub>	70	75	80	V	-
Regulator Sink Current	I <sub>SK</sub>	-	-	10	mA	-
Supply Current	I <sub>DD</sub>	-	-	370	μA	V <sub>DD</sub> = 48V
Power-On-Reset	V <sub>POR</sub>	32	37	42	V	-
POR Hysteresis	V <sub>HYS</sub>	7	-	12	V	-
Output Driver - ON	I <sub>O</sub>	70	-	-	mA	V <sub>O</sub> = 5V
	I <sub>O</sub>	50	-	-	mA	V <sub>O</sub> = 3V
Output Driver - OFF	I <sub>O</sub>	-	-	50	μA	V <sub>O</sub> = V <sub>DD</sub>
Output Frequency	F <sub>O</sub>	20.5	21.8	23.11	kHz	-
Switch On Delay	S <sub>OD</sub>	-	47	-	ms	V <sub>DD</sub> > V <sub>POR</sub>
<b>INPUT</b>						
Switching Voltage	V <sub>SW</sub>	-	-	2.5	V	ASOTR, ASOTT
Source Current	I <sub>SC</sub>	-	20	-	μA	ASOTR
@ V <sub>IN</sub> = 0V						
Positive Clamp Voltage	V <sub>PC</sub>	-	-	4	V	ASOTT
@ Input Sink Current = 350μA						
Negative Clamp Voltage	V <sub>NC</sub>	-	-	1	V	ASOTT
@ Input Sink Current = 350μA						
Duty Cycle Select	I <sub>DC</sub>	-	20	-	μA	ASOTR1, ASOTT1
Source Current						
@ V <sub>IN</sub> = 0V						

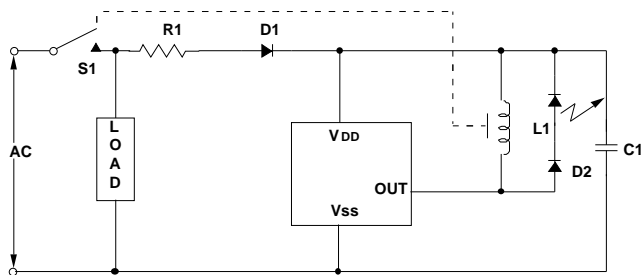


FIGURE 2. ASOT

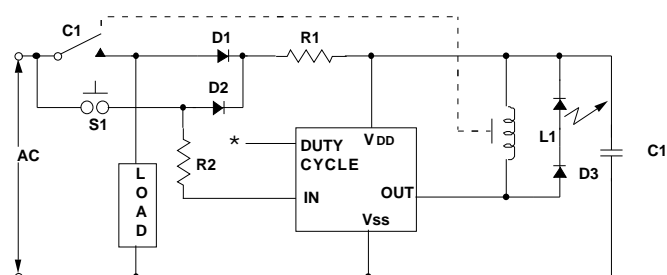


FIGURE 4. ASOTT, ASOTT1

\* This input available only for ASOTT1

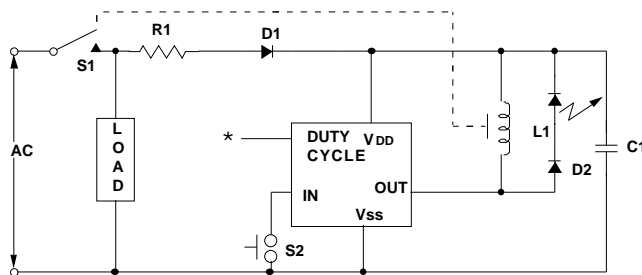


FIGURE 3. ASOTR, ASOTR1

\* This input available only for ASOTR1

The information included herein is believed to be accurate and reliable. However, LSI Computer Systems, Inc. assumes no responsibilities for inaccuracies, nor for any infringements of patent rights of others which may result from its use.