LSI/CSI

LS6301

LSI Computer Systems, Inc. 1235 Walt Whitman Road, Melville, NY 11747 (631) 271-0400 FAX (631) 271-0405

AC LINE FREQUENCY TIMER

June 2004

FEATURES:
- Selectable Timing Intervals
- Internal Voltage Regulator
- Schmitt Trigger on all inputs for high noise immunity
- Power-On-Reset
- Built-in discharge when power is removed
- Output to drive an SCR connected to load
- Output to flash an indicator when timeout has occurred
- LS6301 (DIP); LS6301-S (SOIC) - See Figure 1

DESCRIPTION:
The circuit operates by counting AC power line cycles. When the selected timeout occurs, the circuit will switch an external power device. Selectable timing intervals using 3 mode pins are indicated in Table 1. The circuit contains a Power-On-Reset (POR) to zero out all the timing counters upon power-up. A positive or negative transition of any of the A, B or C timing mode input pins will cause the timer to reset and begin again. Once time-out is achieved, it remains latched until a mode pin transition occurs or POR occurs.
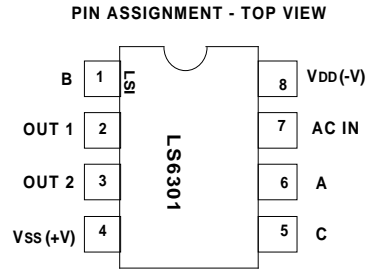
PIN ASSIGNMENT - TOP VIEW

B	1	8 VDD (-V)
OUT 1	2	7 AC IN
OUT 2	3	6 A
VSS (+V)	4	5 C

LS6301

FIGURE 1

The C input mode pin contains an internal pull up resistor for directly connecting to a SPST switch. By tying either the A or B input, or both, to the C input and using the C input as the time-out selection, a maximum number of timeout combinations can be achieved.

Output 1 is normally low and goes high at the end of the selected timing interval. It produces a 1.85Hz output square wave signal and is normally used to drive an SCR with a load such as a thermal relay or a neon indicator lamp.

Output 2 is normally high and goes low at the end of the selected timing interval. The output drives an SCR whose load could be a relay, resistance heater or some other device. The load would be turned off at the end of the timing interval.

TABLE 1. TIMING INTERVALS (60 Hz INPUT)

A INPUT	B INPUT	C INPUT	TIMING INTERVAL
Vss	Vss	Vss	15 Minutes
Vss	Vss	VDD	2 Minutes
Vss	VDD	Vss	30 Minutes
Vss	VDD	VDD	45 Minutes
VDD	Vss	Vss	30 Seconds
VDD	Vss	VDD	15 Minutes
VDD	VDD	Vss	1 Hour
VDD	VDD	VDD	2 Hours

ELECTRICAL CHARACTERISTICS: Operating Temperature 0°C to 85°C

	Min	Typical	Max	Unit
Power-On-Reset	-	3.0	-	V
Hysteresis	-	0.8	-	V
Regulating Voltage	-	5.5	-	V
Timing Mode Pins:				
Pull-up current (Pin 5 only)	-	100	-	uA
Pos. Threshold Voltage (VREG = 5.5V)	-	-	4.9	V
Neg. Threshold Voltage (VREG = 5.5V)	0.7	-	-	V
AC Input Pin				
Maximum frequency	1.0	-	-	MHz
Input Current	± 10	-	-	mA
Positive Threshold Voltage (VREG = 5.5V)	-	-	4.9	V
Negative Threshold Voltage (VREG = 5.5V)	0.7	-	-	V
Hysteresis	2.0	-	-	V
Output 1 (Pin 2); **Output 2** (Pin 3)				
Source Current: Vo = 0.4V; TA = 0°C to 85°C	150	-	950	uA
Sink Current: Vo = 0.4V; TA = 0°C to 85°C	3.8	-	-	mA

MAXIMUM RATINGS:

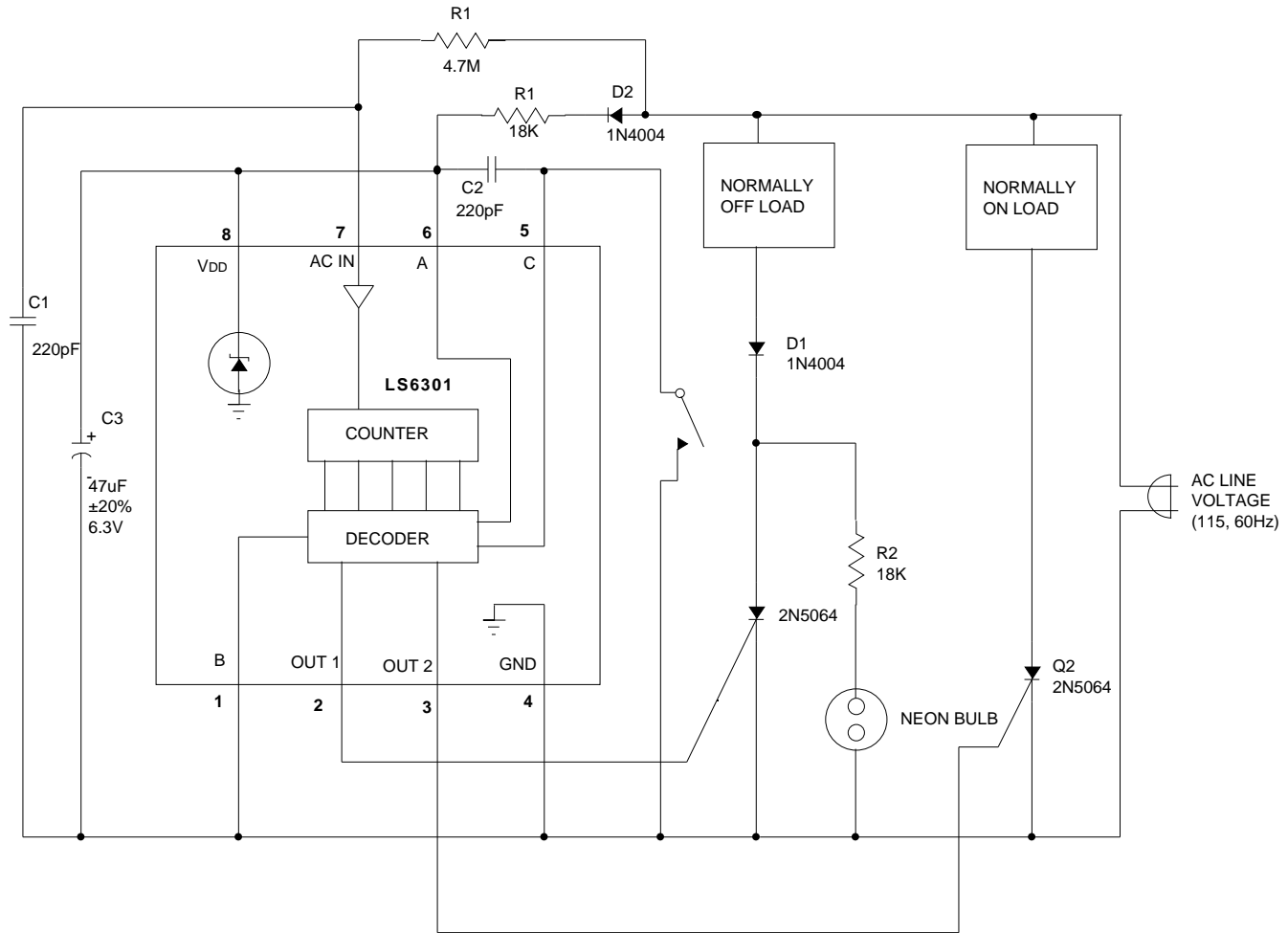| PARAMETER	SYMBOL	VALUE	UNIT
Storage Temperature	T_{STG}	-55 to +150	°C
Operating Temperature	T_A	0 to +85	°C
DC Supply Voltage	$(V_{DD} - V_{SS})$	+7.5	V
Voltage at any input	V_{IN}	V_{SS} - 0.5 to V_{DD} + 0.5	V

FIGURE 2. TYPICAL APPLICATION CIRCUIT

With SW in the open position, the timeout is set to 15 minutes. In the closed position, the time-out is set to 30 seconds. Any change in the switch (SW) position will cause the time-out to reset and begin again. At the end of the time-out the neon bulb will flash at a 1.875Hz rate and the normally on load will be turned off.

6301-060804-2