

# TD6347S, TD6347F

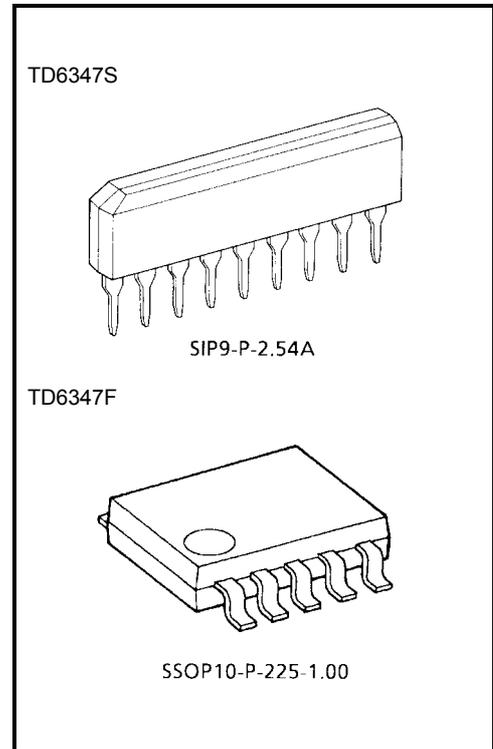
## CONVENTIONAL TIMER

The TD6347S, TD6347F is an automotive I<sup>2</sup>L monolithic timer. It is a long-term timer superior in voltage and temperature characteristics. It produces an NPN transistor open-collector output.

The IC has three inputs : start / reset and two modes, so that it can be used in a variety of application fields.

## FEATURES

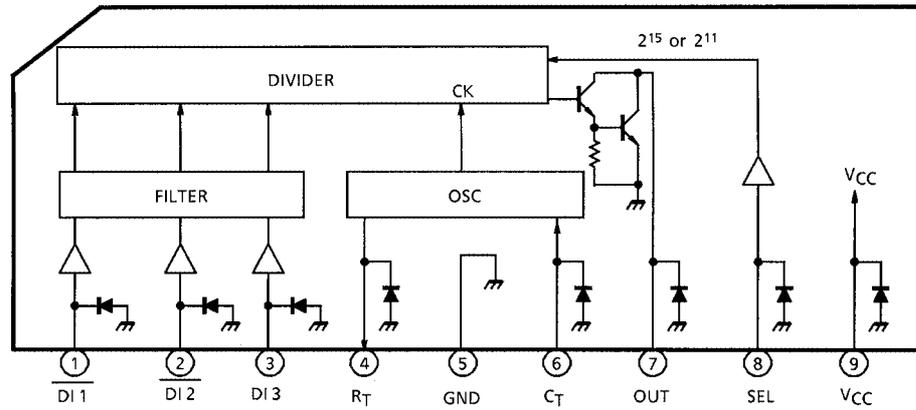
- Small standby current : 1mA
- 3 inputs : start / reset and two modes
- Power-on reset function incorporated
- Good voltage characteristics : ± 0.05% / V
- Good temperature characteristics : ± 0.02% / °C
- Output current / output withstand voltage : 250mA / 30V
- SIP9-PIN (TD6347S)
- SSOP10-PIN (TD6347F)



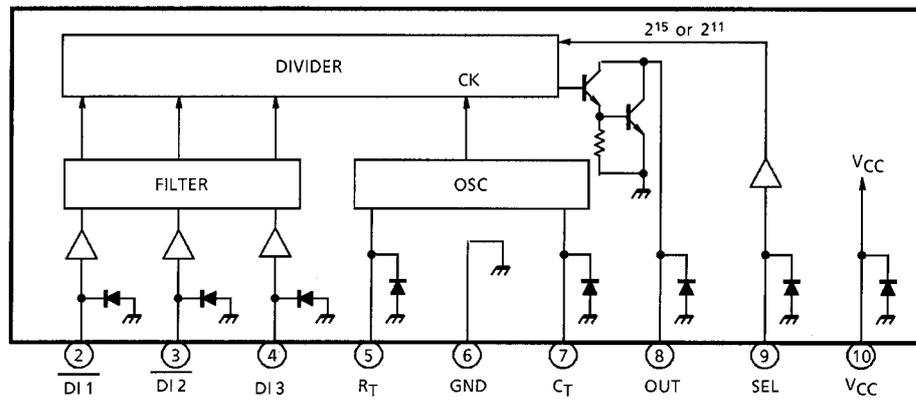
Weght	
SIP9-P-2.54A	: 0.92 g (Typ.)
SSOP10-P-225-1.00	: 0.10 g (Typ.)

**BLOCK DIAGRAM AND PIN LAYOUT**

TD6347S

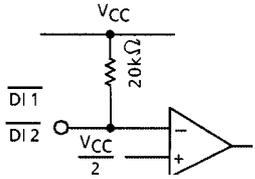
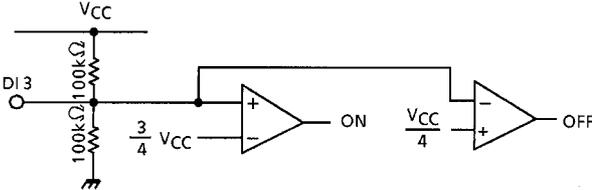
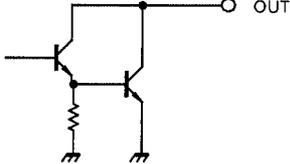
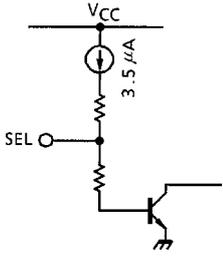


TD6347F



Note: TD6347S and TD6347F are the same chip; only the packages are different.

## PIN DESCRIPTION

PIN No.		SYMBOL	DESCRIPTION
TD6347S	TD6347F		
1	2	$\overline{DI1}$	<p>Connected to the input switch. When this pin is grounded, the IC accepts the input, and the output is reversed. The input circuit is shown at right.</p> 
2	3	$\overline{DI2}$	<p>When this pin is grounded, the IC is reset. The input circuit construction is the same as that of <math>\overline{DI1}</math>.</p>
3	4	DI3	<p>When the input switch is connected and this pin is grounded, the output turns off. When this pin is connected to <math>V_{CC}</math>, the output turns on. The input circuit is shown at right.</p> 
4	5	$R_T$	The resistor for basic clock oscillation is connected between this pin and $C_T$ pin.
5	6	GND	Grounded
6	7	$C_T$	<p>The capacitor for basic clock oscillation is connected to this pin. The clock frequency T is determined by external resistor R and capacitor C as follows :</p> $T \text{ (ms)} = 1.75C \text{ (}\mu\text{F)} R \text{ (k}\Omega\text{)}$ <p>The time constant of the input filter consisting of <math>\overline{DI1}</math>, <math>\overline{DI2}</math>, and DI3 is four times the basic clock period.</p>
7	8	OUT	<p>Output pin. The circuit is shown at right.</p> 
8	9	SEL	<p>Timer time select pin. When this pin is open, the timer time is 32768 (<math>2^{15}</math>) times the clock period. When it is grounded, the timer time is 2048 (<math>2^{11}</math>) times the clock period. The input circuit is shown at right.</p> 
9	10	$V_{CC}$	Power supply pin
—	1	NC	Not connected pin. (Electrically, this pin is completely open.)

## TRUTH TABLE

### (1) Input Switch

Input			Output
D11	D12	D13	
H ┌─── │ └─── L	H	H or M	Inversion
H	H	M ┌─── │ └─── H	ON
H	H	L	OFF
don't care	L	don't care	OFF

### (2) Timer Time

SEL	Timer Time (ms)
H	$2^{15}T^*$
L	$2^{11}T^*$

\*:  $T=1.75CR$ , C : ( $\mu F$ ), R : ( $k\Omega$ )

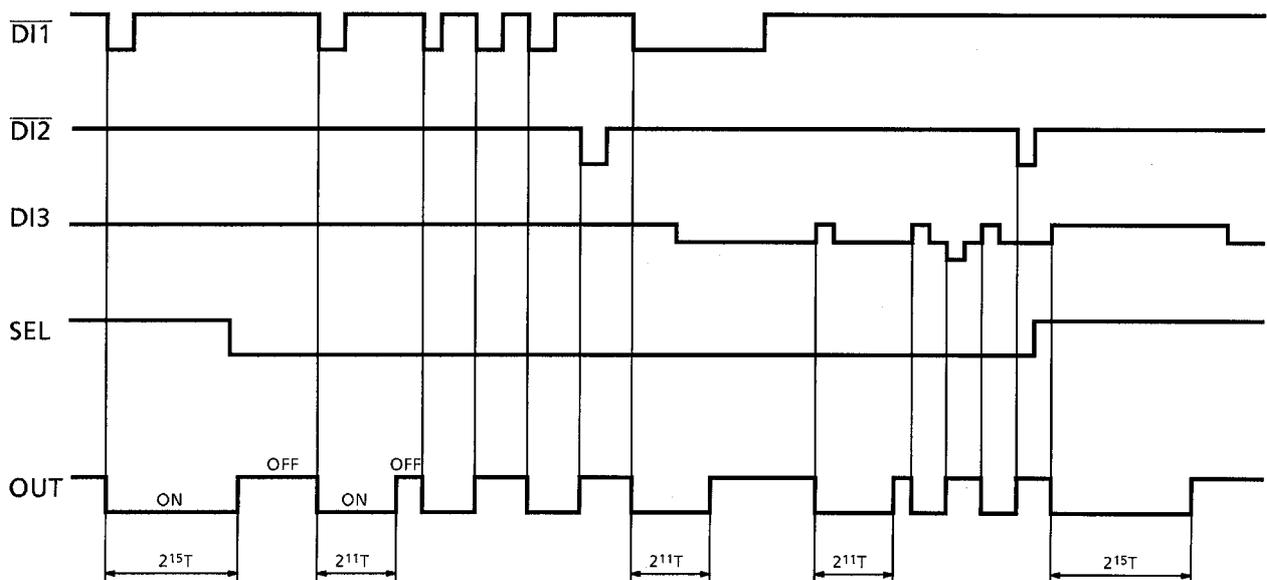
### (3) Filter Time (L,M and H level detection time)

$$2 \times T \sim 4 \times T$$

### (4) C / R Recommend

C	$0.001 \mu F \sim 10 \mu F$
R	$100k\Omega \sim 500k\Omega$

## TIMING CHART



## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	30	V
Output Current	I <sub>OUT</sub>	250	mA
Output Voltage	V <sub>OUT</sub>	30	V
Operating Voltage	V <sub>opr</sub>	5~16	V
Power Dissipation	P <sub>D</sub>	500 / 400 *	mW
Operating Temperature	T <sub>opr</sub>	-40~85	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

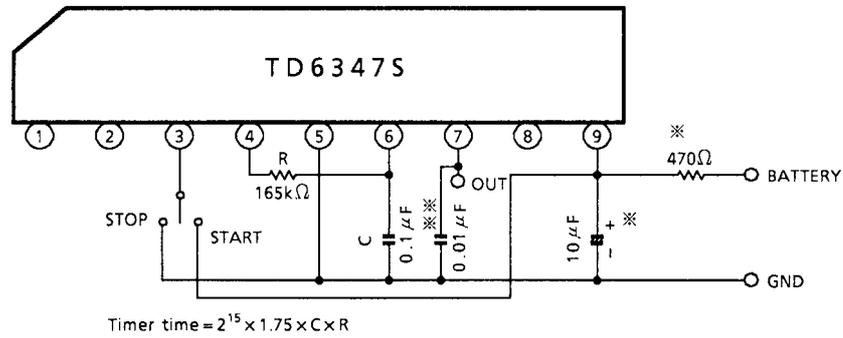
\*:PD TD6347S/TD6347F

## ELECTRICAL CHARACTERISTICS (Ta = 25°C, V<sub>CC</sub> = 12V, unless otherwise specified)

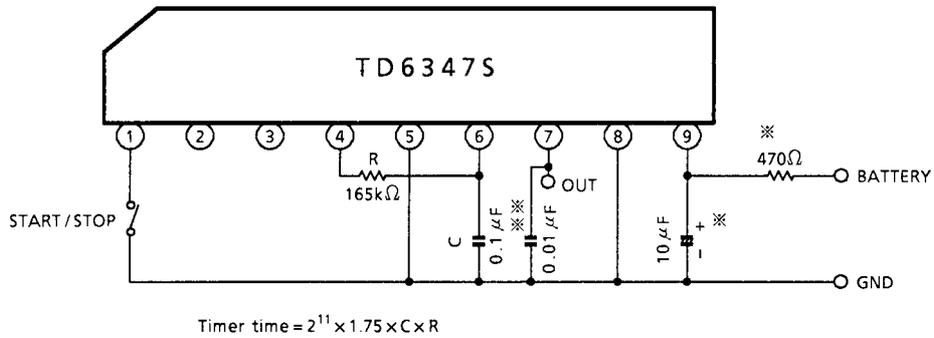
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Current Consumption	I <sub>CC</sub>	V <sub>CC</sub>	—	OUT = OFF	—	—	1.0	mA
Input Threshold Voltage	V <sub>TH</sub>	$\overline{DI1}$	—	—	5.4	6	6.6	V
		$\overline{DI2}$	—	—	5.4	6	6.6	
		DI3	—	START mode	8.1	9	9.9	
			—	STOP mode	2.7	3	3.3	
Input Current	I <sub>IL</sub>	$\overline{DI1}$	—	V <sub>IL</sub> = 0V	—	—	-1.0	mA
		$\overline{DI2}$	—	V <sub>IL</sub> = 0V	—	—	-1.0	
	DI3	—	V <sub>IL</sub> = 0V	—	—	-0.25		
		—	V <sub>IH</sub> = 12V	—	—	0.25		
Output Voltage	V <sub>OL</sub>	OUT	—	I <sub>OL</sub> = 200mA	—	—	1.3	V
Output Leakage Current	I <sub>LEAK</sub>		—	V <sub>OUT</sub> = 30V	—	—	100	μA
Input Current	I <sub>IN</sub>	C <sub>T</sub>	—	V <sub>IN</sub> = 1 to 4V	—	—	±1	μA
Output Voltage	V <sub>OH</sub>	R <sub>T</sub>	—	I <sub>OH</sub> = 50μA	3.5	3.9	4.3	V
	V <sub>OL</sub>		—	I <sub>OL</sub> = 50μA	—	—	0.3	

## EXAMPLE OF APPLICATION CIRCUIT

(1) 15-minute timer (using DI3) (Numbers in ○ show pin numbers of the TD6347S, those in ( ) show pin numbers of the TD6347F)



(2) 56-second timer (using  $\overline{DI1}$ )



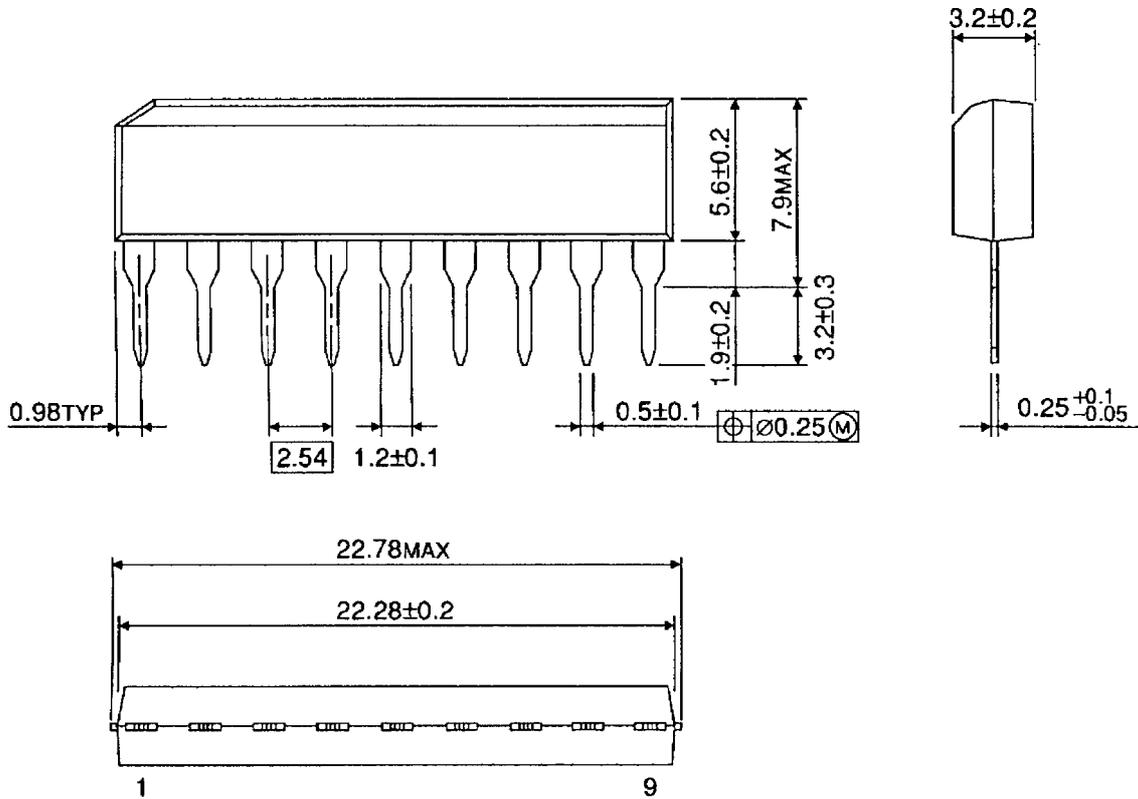
※: If the IC is used with a regulated power supply which is free from surge voltage, the CR combination is unnecessary.

※※: For negative surge absorption

## PACKAGE DIMENSIONS

SIP9-P-2.54A

Unit : mm

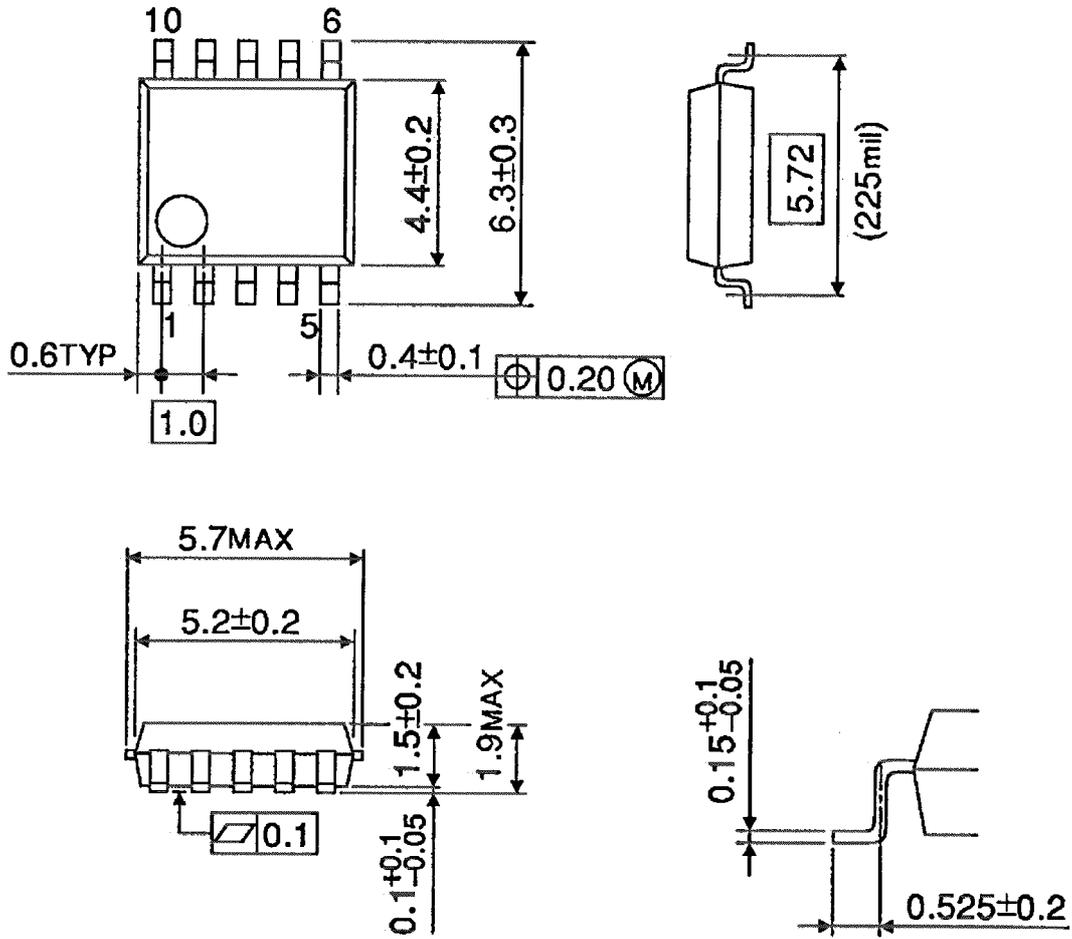


Weight: 0.92 g (Typ.)

**PACKAGE DIMENSIONS**

SSOP10-P-225-1.00

Unit : mm



Weigh : 0.10 g (Typ.)

**RESTRICTIONS ON PRODUCT USE**

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