

Simple Timer

Features

- Operating voltage: 3.5V~5.5V.
- Have Reset function
- Relay output disable without external oscillator
- Adjustable Timer: 20mins~16hrs
- Quick test mode(QTM)
- Few external components
- Low cost lead free TO94-4L and SOT23-5L package

Description

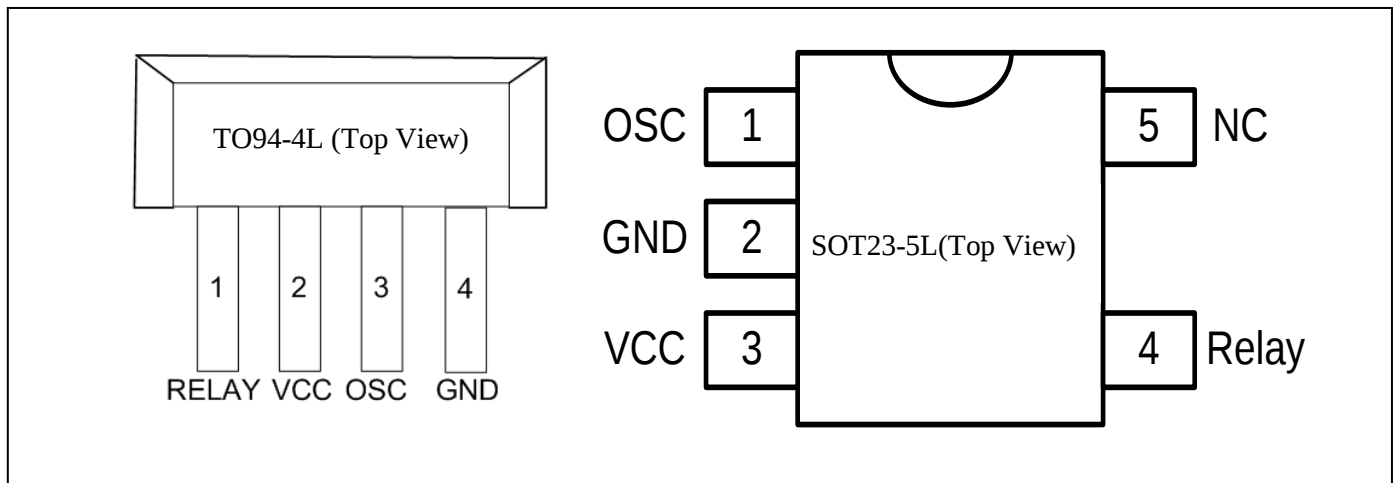
The PT8A2516 is a CMOS LSI chip designed for timer applications, the time can be adjusted by external R/C. It has reset function.

The chip includes: Power on reset circuit, Logic control circuit, Output driver circuit, Key scan circuit, timer circuit, Built-in internal oscillator and external R/C oscillator circuit etc. It is enclosed in lead free TO-94 and SOT23-5 package.

Applications

- Timer

Pin Configuration



Pin Description

Pin No.		Pin Name	I/O	Description
TO94-4L	SOT23-5L			
1	4	Relay	O	Relay output, high active
2	3	VCC	I	Power supply
3	1	OSC	I/O	Oscillator's Frequency of 8.192KHz with an external R1, C1. As input, requires a negative pulse to active "Reset" function.
4	2	GND	I	Ground
-	5	NC	-	Not connected

Maximum Ratings

Storage Temperature.....	-40°C to +125°C
Supply Voltage to Ground Potential (Inputs & V _{CC} only).....	- 0.5 to V _{CC} +0.5V
Supply Voltage to Ground Potential (Outputs & D/O only) ...	- 0.5 to V _{CC} +0.5V
DC Input Voltage	- 0.5V to V _{CC} +0.5V
DC Output Current	20mA
Power Dissipation.....	500mW

Note:

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Recommended Operation Conditions

Sym	Description	Min	Typ	Max	Unit
V _{CC}	Supply voltage.	3.5	5.0	5.5	V
V _{IH}	“H” Input Voltage	0.8 V _{CC}	-	-	V
V _{IL}	“L” Input Voltage	-	-	0.35 V _{CC}	V
T _A	Operation temperature	-40	25	85	°C

DC Electrical Characteristics

(Unless otherwise noted, V_{CC}= 5V, T_A = -40 ~ 85 °C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
I _{OH}	Output Source Current (Relay)	V _{OH} =4.5V	-10	-	-	mA
I _{OL}	Output Sink Current(Relay)	V _{OL} =0.5V	10	-	100	uA
OSC	Frequency of normal oscillator	R1=47KΩ C1=332, see Fig 1	7808	8192	8576	Hz
I _{CC}	Power supply current	V _{CC} =5V, R1=47 KΩ, C1=332, all output floating. See Fig 1	-	-	500	μA

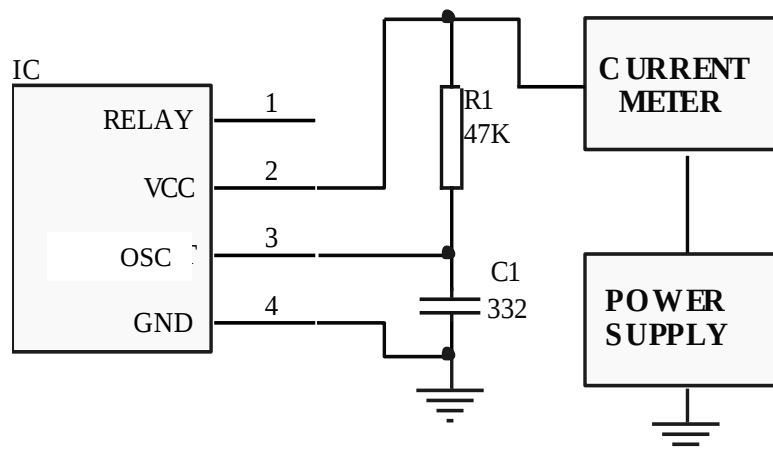
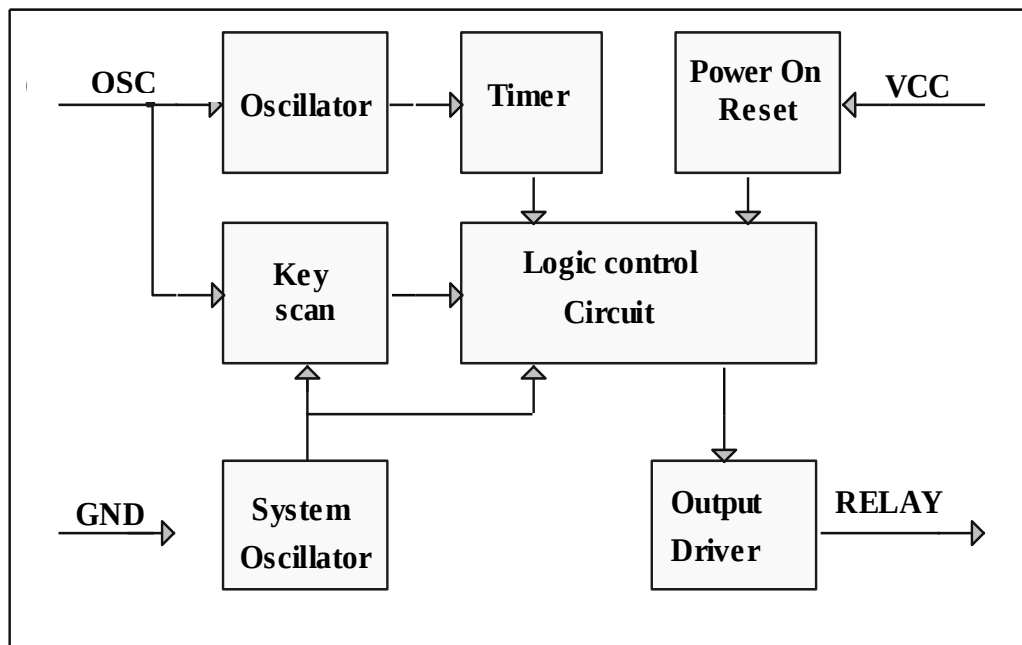


Fig1 Test circuit

Block Diagram



Function Description (Refer to Block Diagram)

The chip mainly includes: Power on reset circuit, Logic control circuit, Output driver circuit, Key scan circuit, timer circuit, external R/C oscillator circuit and internal oscillator circuit etc.

Power on reset circuit

Internal power on reset circuit will reset all the logic circuit and the timer; it will clear all output pins when power on.

Logic control circuit

The logic circuit will carries out all the logic control function. It will check OSC pin status, then control the output drive circuit, when timer is out, it will pull down Relay pin to release relay.

Output driver circuit

The pin Relay will drive a relay.

Key scan circuit

This circuit will detect “Reset/Restart” key at OSC have a low negative pulse, it will active the corresponding work status. When IC worked normal, it will reset the timer; when timer is out, it will reset the timer and restart the output.

Timer circuit

This circuit will provide a timer to logic control circuit. When $F_{osc} = 8.192 \text{ KHz}$, timer output is $29486400/8192=1\text{hrs}$.

External R/C Oscillator circuit

This will produce a system frequency depend on external resistor and cap, the frequency is about 8.192 KHz when $R1=47 \text{ K}\Omega$ and $C1=332$. (Refer to Fig 1).

Note: The system frequency with external resistor and cap must be between 200Hz to 20 KHz.

Internal oscillator

An on-chip RC oscillator with frequency about 256 KHz is used to check the input signal and the wrong statue of external RC oscillator.

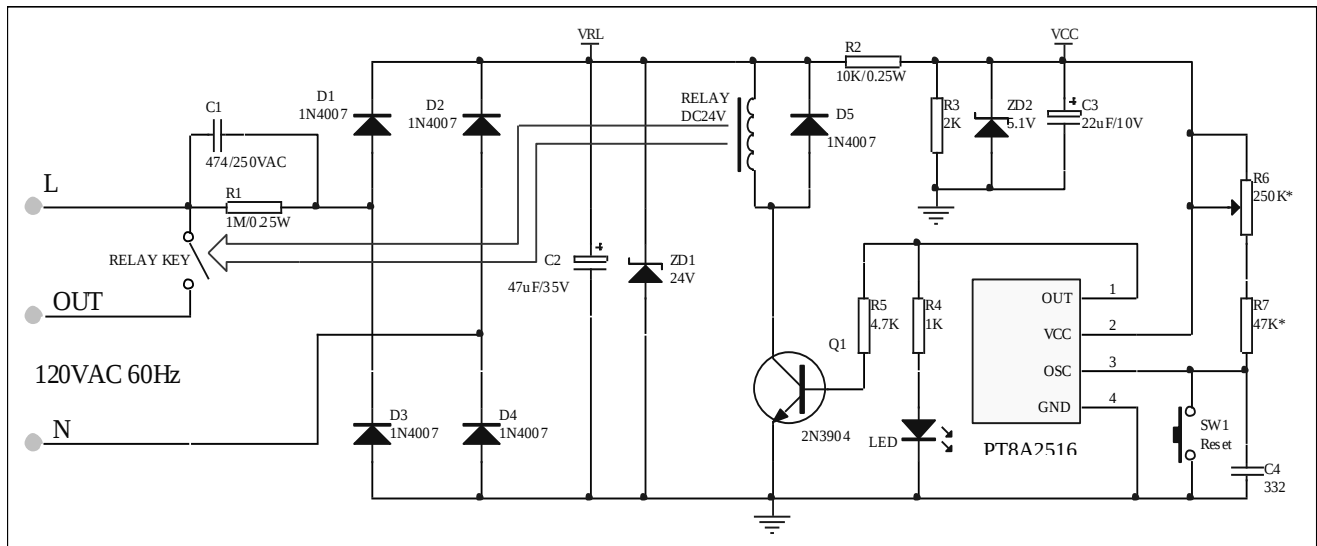
QTM

In order to make the manufacturer’s test convenient, quick test mode is designed to speed up the test.

QTM can be accessed by pressing button (reset) over 3s once power on. It can exit automatically after quick test timer is expired; system comes back normal operation after quick test mode.

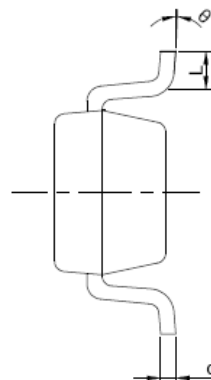
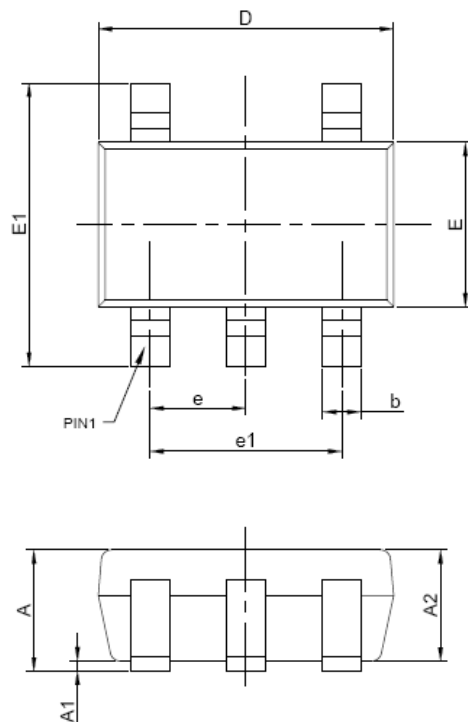
Timer	1hr	16hr
QTM timer	2s	32s

Typical Application Circuit



Mechanical Information

SOT23-5L



PKG. DIMENSIONS(MM)		
SYMBOL	Min	Max
A	1.05	1.25
A1	0.00	0.10
A2	1.05	1.15
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	1.50	1.70
E1	2.65	2.95
e	0.95 BSC	
e1	1.80	2.00
L	0.30	0.80
θ	0°	8°

Note:

1. Ref: JEDEC MO-178C/AA



DATE: 06/18/13

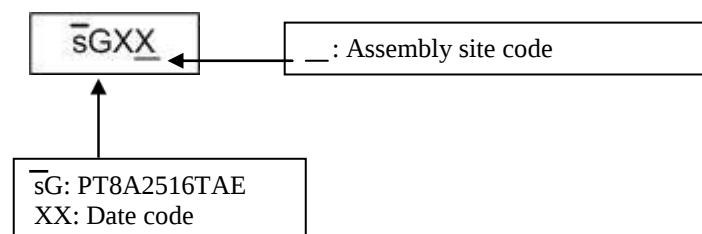
DESCRIPTION: 5-Pin, Small Outline Transistor Plastic Package (SOT23)

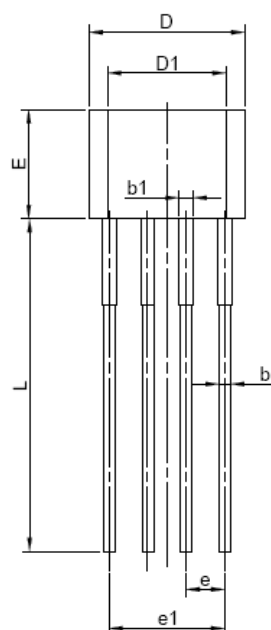
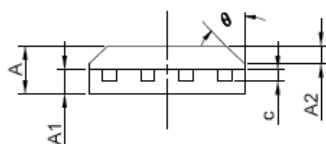
PACKAGE CODE: TA (TA5)

DOCUMENT CONTROL #: PD-2144

REVISION: --

Top Mark Instruction of SOT23-5L package



TO94-4L


PKG. DIMENSIONS(MM)		
SYMBOL	Min	Max
A	1.40	1.80
A1	0.70	0.90
b	0.38	0.50
b1	0.38	0.55
c	0.38	0.51
D	4.98	5.28
D1	3.78	4.08
e	1.27 TYP	
E	3.45	3.75
e1	3.71	3.91
L	14.00	15.30
θ	45° BSC	

Note:



DATE: 06/18/13

DESCRIPTION: 4-Pin, TO94

PACKAGE CODE: N (N4)

DOCUMENT CONTROL #: PD-2150

REVISION: --

Ordering Information

Part No.	Package Code	Package
PT8A2516NE	N	Lead free TO94-4L
PT8A2516TAE	TA	Lead free and Green SOT23-5L

Note:

- E = Pb-free or Pb-free and Green
- Adding X Suffix= Tape/Reel

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