

DESCRIPTION

The M5172L is a semiconductor integrated circuit designed for use in zero-point ignition temperature control circuits. It consists of a rectifier circuit, zero-point synchronous pulse generator circuit, temperature adjustment circuit using a differential amplifier, and a pulse generator circuit that is used in safety circuit.

The built-in zero-point ignition circuit and differential amplifier can operate directly from commercial power supply voltage through a resistor of 10k (at 100Vrms AC), permitting the M5172L to be widely applied in temperature control circuits using thyristors.

FEATURES

- Can be driven directly from commercial power supply voltage (100Vrms AC)
- Built-in zero-point ignition control circuit
- Can compensate for line voltage and line frequency fluctuations
- Includes a pulse generator circuit for a safety circuit

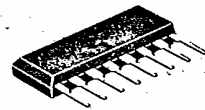
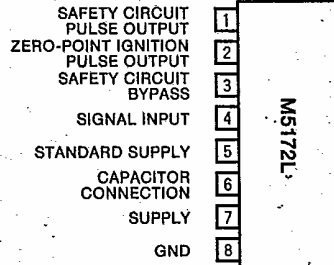
APPLICATION

Temperature control circuit for electric blankets, zero-point ignition circuit for thyristors, and all kinds of temperature control circuits.

RECOMMENDED OPERATING CONDITIONS

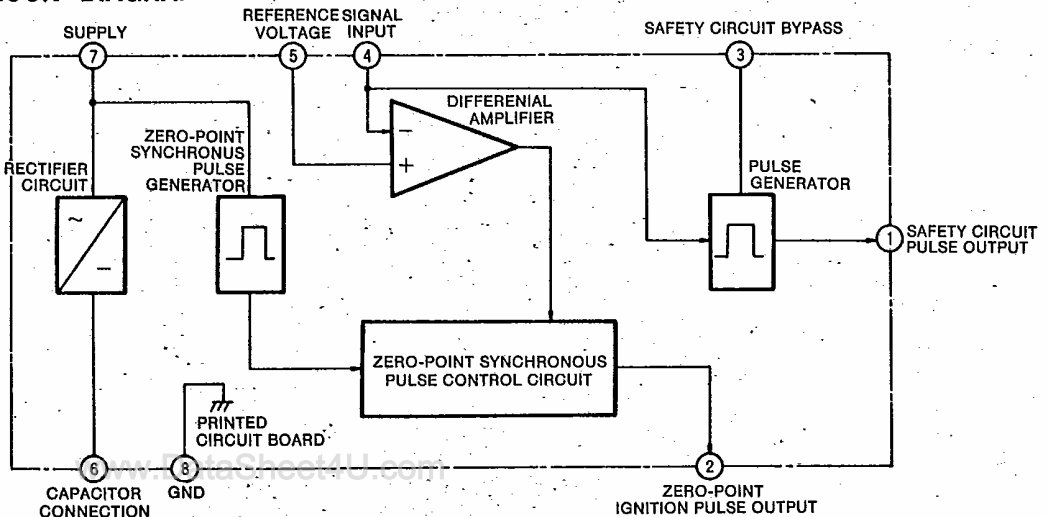
AC supply voltage range.....90~110Vrms(50~60Hz)
 Rated AC supply voltage.....100Vrms(50~60Hz)
 (Note that a resistor of 10k or greater ($\geq 2W$) should be connected between pin ⑦ and the AC supply voltage.)

PIN CONFIGURATION (TOP VIEW)



8-pin molded plastic SIP

BLOCK DIAGRAM



ZERO-POINT IGNITION TEMPERATURE CONTROL CIRCUIT

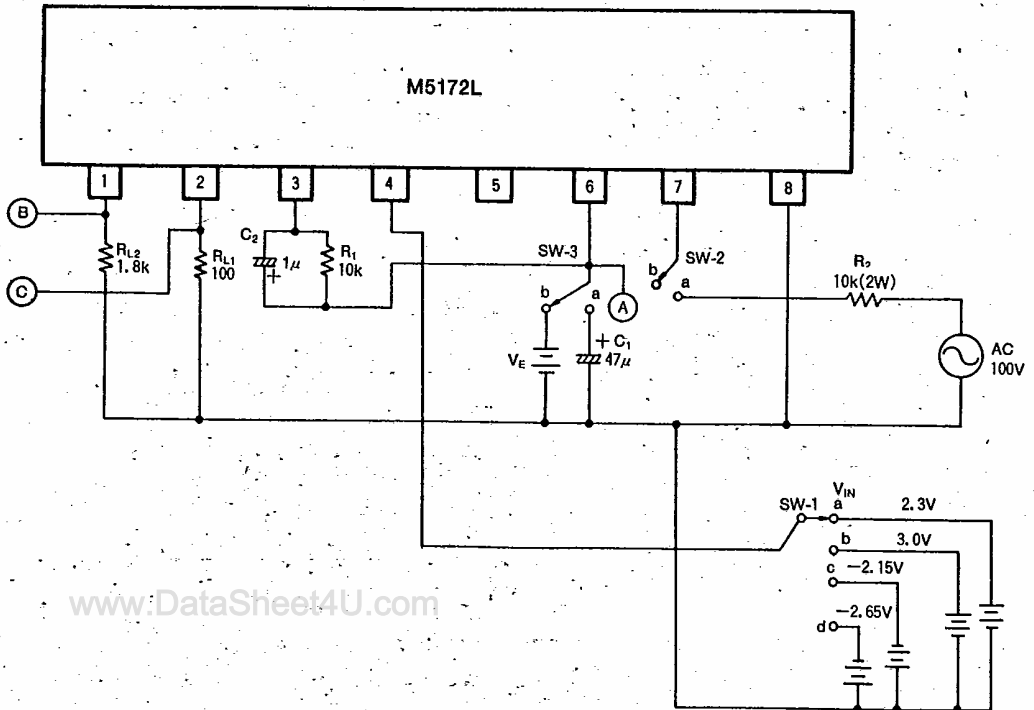
ABSOLUTE MAXIMUM RATINGS (T_a=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V _{CC}	Supply voltage (between pins ⑦ and ⑧)		10	V
I _Q	Pin ⑦ sink current		10	mA
P _D	Power dissipation		360	mW
K _θ	Thermal derating	T _a ≥ 25°C	3.5	mW/°C
Topg	Operating temperature range		-20 ~ +60	°C
Tstg	Storage temperature range		-20 ~ +125	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
V _{DC}	Rectification current (between pins ⑥ and ⑧)	C ₁ =47μF, R ₂ =10kΩ	5.85		6.9	V
V _{TH-T}	Differential amplifier ON level	V _E =5.9V	2.3	2.7	3.0	V
V _{TH-S}	Safety circuit ON level	V _E =5.9V	-2.65	-2.4	-2.15	V
V _{OH(T)}	Zero-point synchronous pulse peak value	R _{L1} =100Ω, V _E =5.9V	0.65			V
V _{OH(S)}	Safety circuit output pin "H" level	R _{L2} =1.8kΩ, V _E =5.9V	0.59			V

TEST CIRCUIT



Unit

Resistance : Ω

Capacitance : F

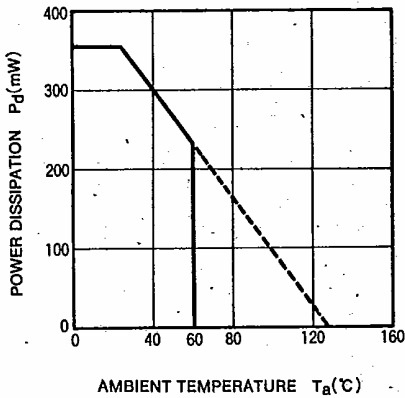
TEST METHODS

Symbol	SW-1	SW-2	SW-3	Measurement point
V_{DC}	a	a	a	A
V_{TH-T}	a b	b	b	C
V_{TH-T}	c d	b	b	B
$V_{OH}(T)$	a	b	b	C
$V_{OH}(S)$	d	b	b	B

TYPICAL CHARACTERISTICS

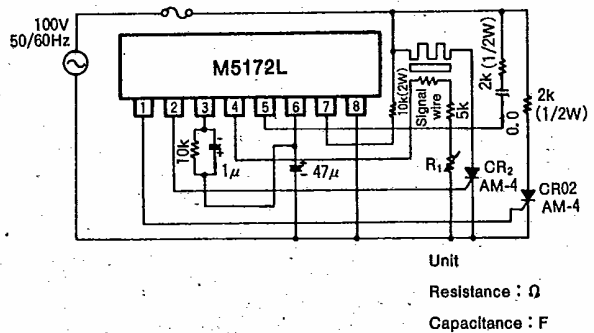
($T_a=25^\circ\text{C}$, unless otherwise noted)

THERMAL DERATING (MAXIMUM RATING)

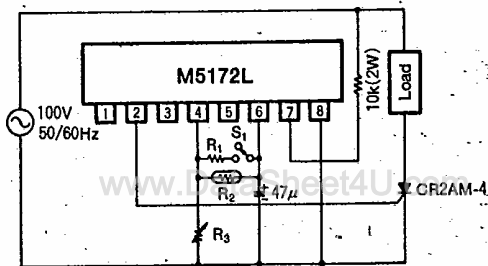


APPLICATION EXAMPLES

(1) Electric Blanket Temperature Control Circuit



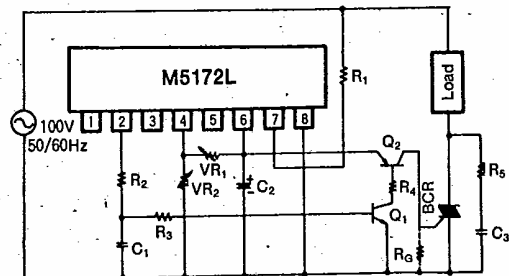
(2) Thyristor Zero-Point Ignition Circuit



R_2 : NTC thermistor 10k
 S_1 : OFF Only when thermistor used
 S_1 : ON Linear compensation of thermistor
 R_1 : 10k Ω

Unit
Resistance : Ω
Capacitance : F

(3) BCR Zero-Point Ignition Circuit



R_1 : 10k Ω (2W) R_2 : 1k Ω (1/4W) R_3 : 10k Ω (1/4W)
 R_4 : 1k Ω (1/4W) R_5 : 100 Ω (1/2W) C_1 : 0.068 μF (50WV)
 C_2 : 220 μF (25WV) C_3 : 0.1 μF (400WV) Q_1 : 2SC712-D
 Q_2 : 2SA696-D BCR : BCR3AM~BCR25A