M51206L

VOLTAGE COMPARATOR

DESCRIPTION

The M51206L is a semiconductor integrated circuit consisting of precision voltage comparator.
It is designed specifically to operate from a high voltage because of built-in zener diode for stabilization. Input stage has a characteristic of low bias current and output stage is capable of sinking high current. So, it is intended for a wide range of applications, ex. CR Timer, relays or lamps driver. M51206L's package is a mini SIL package, therefore can use very easily.

FEATURES

- Low input current ..... 20nA (typ.)
- Built-in zener diode for stabilization of power supply voltage.
- 60mA output current capability can drive a relay or a lamp.
- High output break down voltage ..... 30V(max.)

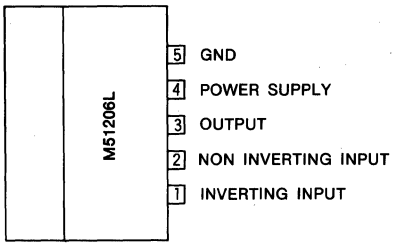
APPLICATIONS

- Electric shutter
- Comparator
- Level detector
- CR Timer
- Time delay circuit

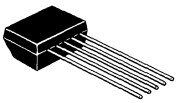
RECOMMENDED OPERATING CONDITIONS

Supply voltage range ..... over 3V
Rated supply voltage ..... 12V (with dropper resistor)

PIN CONFIGURATION (TOP VIEW)

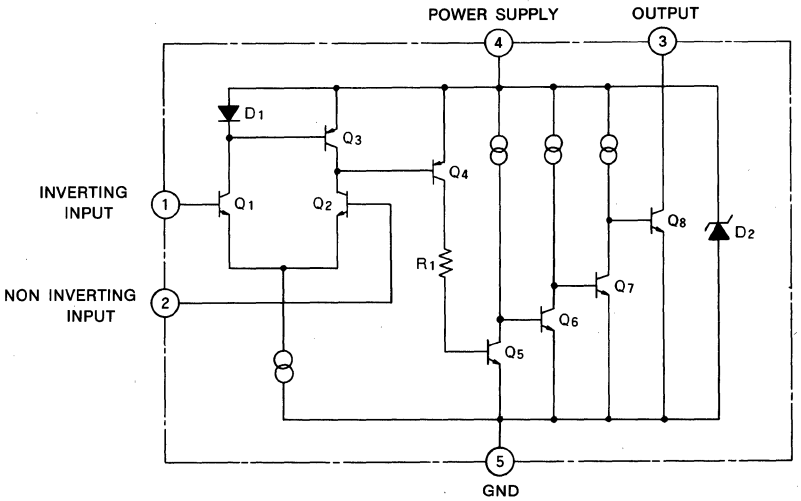


Outline 5P5



5-pin molded plastic SIL

EQUIVALENT CIRCUIT



MITSUBISHI ELECTRIC

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

Symbol	Parameter	Conditions	Limits	Unit
I_{CC}	Circuit current		20	mA
V_{IN}	Input voltage		V④※	V
I_{OL}	Output drive current	Output saturated	60	mA
V_{OH}	Output drive voltage		30	V
P_d	Power dissipation		180	mW
K_θ	Thermal derating	T_a≧25℃	1.8	mW/℃
T_{opr}	Operating temperature		−20～+75	℃
T_{stg}	Storage temperature		−40～+125	℃

※Voltage at Pin④

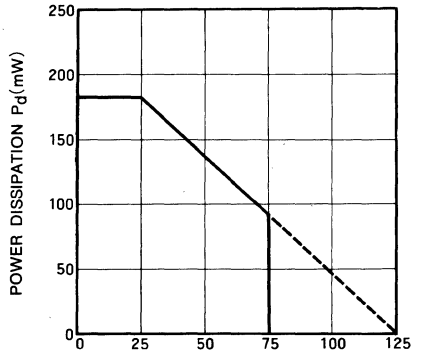
ELECTRICAL CHARACTERISTICS (T_a=25℃)

Symbol	Prarameter	Test conditions		Limits			Unit
		V_{CC}(V)		Min	Typ	Max	
$V_④$	Zener voltage	12.0	R_d=1kΩ	5.0	5.6	7.0	V
V_{IN}	Input voltage range	12.0	R_d=1kΩ	0.8		$V_④$−0.2	V
I_{IN}	Input current	12.0	R_d=1kΩ		20	75	nA
I_{CC}※	Circuit current V_{CC}≦$V_④$	5.0	R_d=0Ω		1.8	2.4	mA
V_{IO}	Input offset voltage	12.0	R_d=1kΩ		2	20	mV
V_{OL}	Output saturation voltage	12.0	R_d=1kΩ,R_L=200Ω		0.3	0.6	V
t_{PLH}	Output "L-H" propagation delay time	12.0	R_d=1kΩ		1		μS
t_{PHL}	Output "H-L" propagation delay time				10		

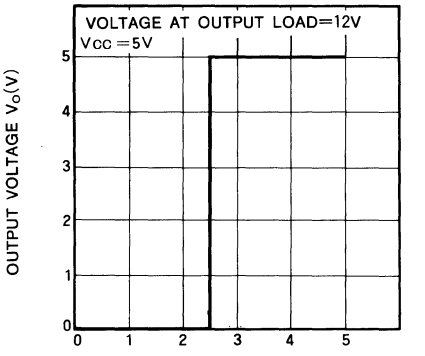
※Excluding zener current of zener diode connected to Pin④

TYPICAL CHARACTERISTICS (T_a=25℃, unless otherwise noted)

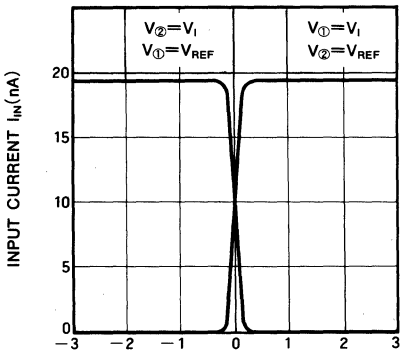
THERMAL DERATING
(MAXIMUM RATING)



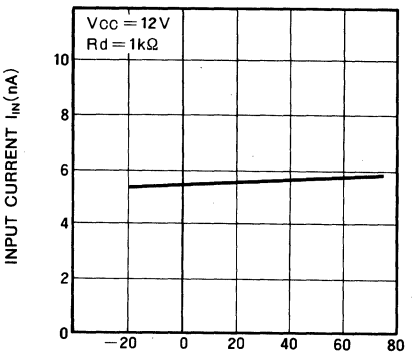
OUTPUT VOLTAGE VS
INPUT VOLTAGE AT PIN ②



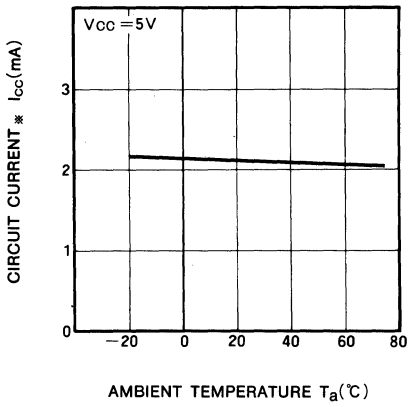
INPUT CURRENT VS INPUT VOLTAGE



INPUT CURRENT VS AMBIENT TEMPERATURE

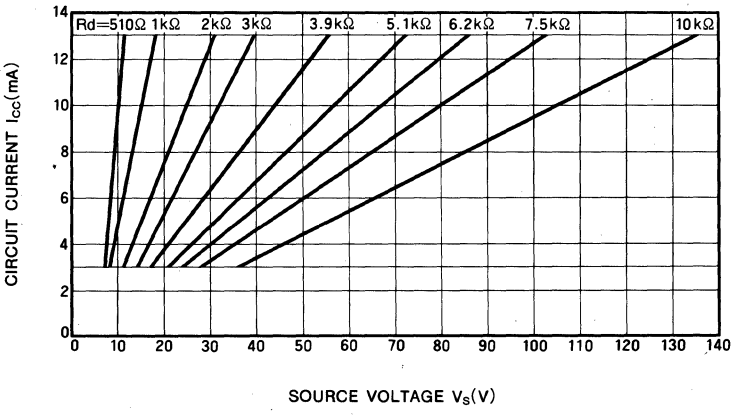


CIRCUIT CURRENT VS AMBIENT TEMPERATURE



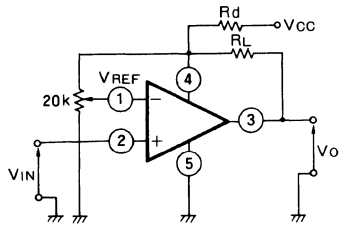
※Excluding zener current of zener diode connected to Pin④

DROPPER RESISTOR (Rd) SELECTION GRAPH

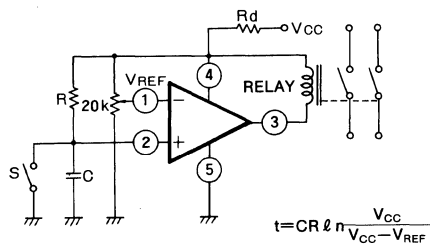


APPLICATION EXAMPLES

Voltage comparator



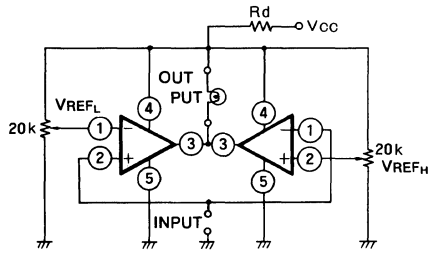
CR Timer



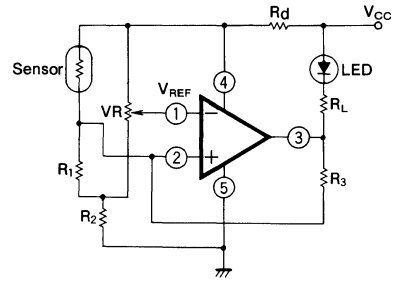
$t = CR\ell n\frac{V_{CC}}{V_{CC}-V_{REF}}$

$0.1ms \leqq t \leqq 60s$

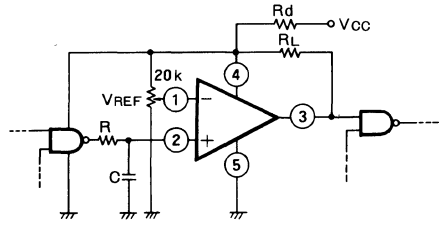
Window comparator



Detector

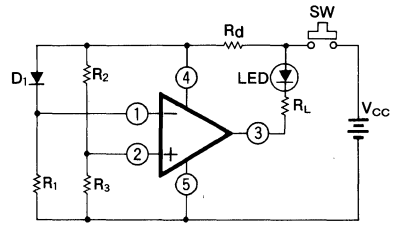


Time delay circuit



$t_{delay} = CR\ell n\frac{V_{CC}}{V_{CC}-V_{REF}}$

Battery checker



PRECAUTIONS FOR USE

1. Paying much attention is necessary for fear that the M51206L may flow large current and reach to destroy because of the structure when the terminals of V_{CC} and GND of the M51206L is connected wrong position each other.
2. Output is "open collector" and a loading resistor is not included. Connect a loading resistor to stabilize operation, in case of driving a next stage.
3. Care should be taken not to apply over 5(V) directly to the terminals between Pin④ and Pin⑤. Connect a dropper resistor (Rd) in series to Pin④, in case of applying over 5(V) between Pin④ and Pin⑤.