M51202L

VOLTAGE COMPARATOR

DESCRIPTION

The M51202L is a semiconductor integrated circuit consisting of precision voltage comparator. It is designed specifically to operate from a single power supply of low voltage. 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 application, ex. CR Timer, relays or lamps driver. M51202L's package is a mini SIL package, therefore can use very easily.

FEATURES

- Low input current ..... 8nA(typ.)
- 60mA output current capability can drive a relay or a lamp.
- Built-in protection zener diodes for reverse E.M.F. at the output terminal.
- Wide supply voltage range ..... 1.7 ~ 6.5V
- High output break down voltage ..... 18V(max.)

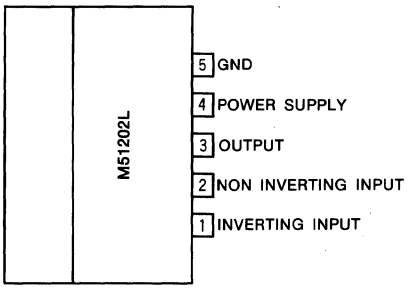
APPLICATIONS

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

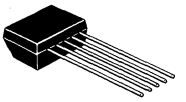
RECOMMENDED OPERATING CONDITIONS

Supply voltage range ..... 1.7~6.5V
Rated supply voltage ..... 3V±10%

PIN CONFIGURATION (TOP VIEW)

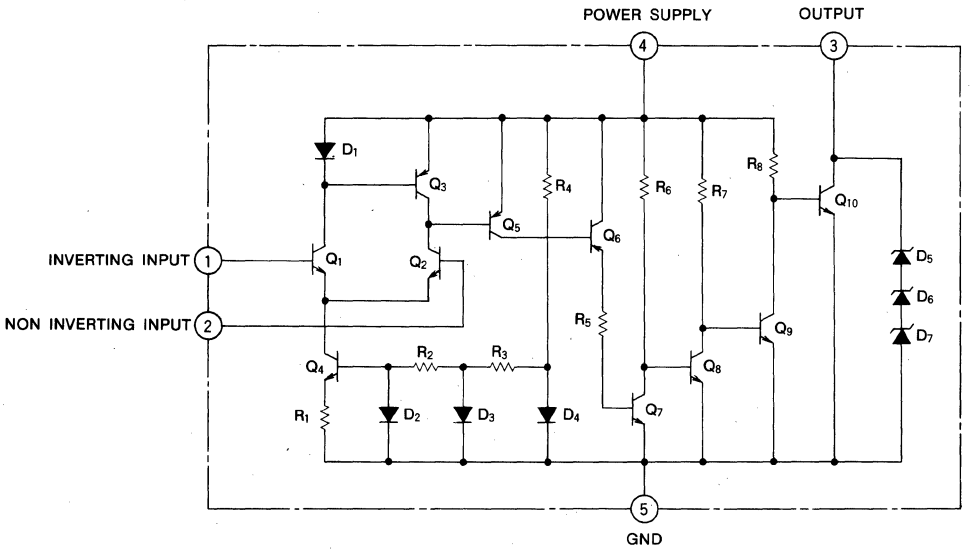


Outline 5P5



5-pin molded plastic SIL

EQUIVALENT CIRCUIT



MITSUBISHI ELECTRIC

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

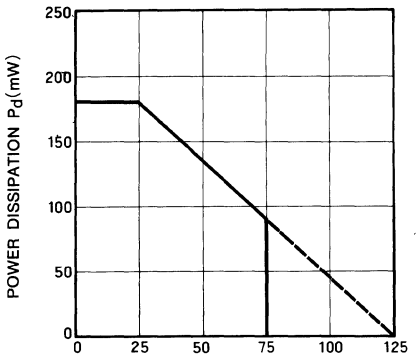
Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Supply voltage		6.5	V
I_{OL}	Output drive current	output saturated	60	mA
V_{IN}	Input voltage		V_{CC}	V
P_d	Power dissipation		180	mW
K_θ	Thermal derating	T_a≧25℃	1.8	mW/℃
T_{opr}	Operating temperature		−20～+75	℃
T_{stg}	Storage temperature		−40～+125	℃

ELECTRICAL CHARACTERISTICS (T_a=25℃)

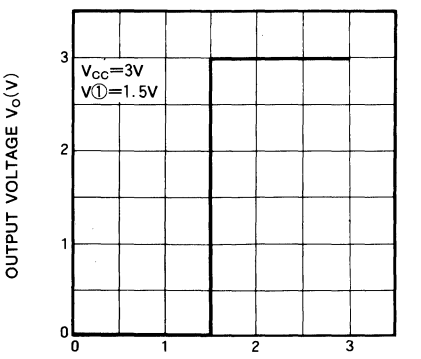
Symbol	Parameter	V_{CC}(V)	Test conditions	Limits			Unit
				Min	Typ	Max	
V_{CC}	Supply voltage range			1.7		6.5	V
I_{CC}	Circuit current	2.65			1.7	3.2	mA
		6.0			4.4	8.2	
I_{IN}	Input current	2.65			8	100	nA
V_{IO}	Input offset voltage	2.65			2	50	mV
V_{OL}	Output saturation voltage	6.0	I_{OL}=60mA		0.2	0.6	V
V_Z	Output zener voltage		I_Z=5mA	18	22	26	V
t_{PLH}	Output "L-H" propagation delay time	6.0	V_{REF}=V_{CC}/2		0.2		μs
t_{PHL}	Output "H-L" propagation delay time	6.0	V_{REF}=V_{CC}/2		50		μs
V_{IN}	Input voltage			0.8		V_{CC}−0.2	V

TYPICAL CHARACTERISTICS (T_a=25℃, V_{CC}=3V, unless otherwise noted)

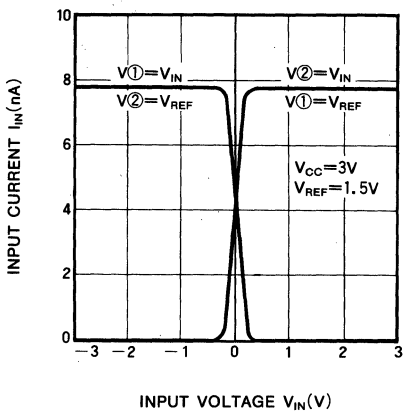
THERMAL DERATING (MAXIMUM RATING)



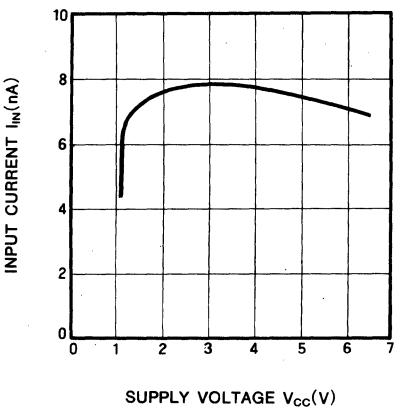
OUTPUT VOLTAGE VS INPUT VOLTAGE AT PIN②



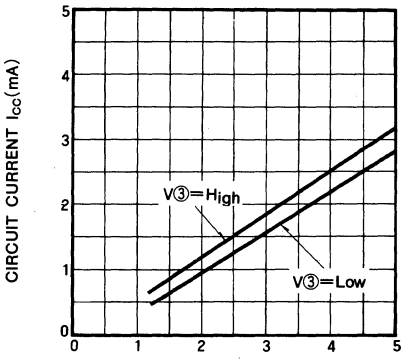
INPUT CURRENT VS INPUT VOLTAGE



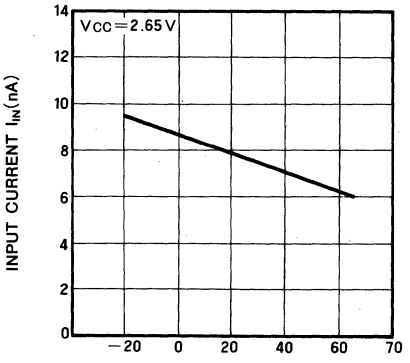
INPUT CURRENT VS SUPPLY VOLTAGE



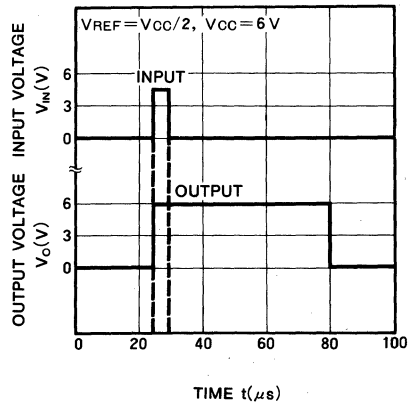
CIRCUIT CURRENT VS SUPPLY VOLTAGE



INPUT CURRENT VS AMBIENT TEMPERATURE

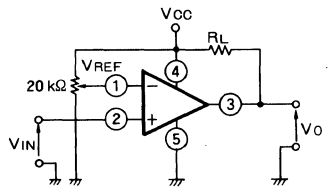


PULSE RESPONSE CHARACTERISTICS



APPLICATION EXAMPLES

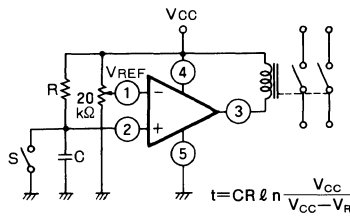
Voltage comparator



if $V_{REF} > V_{IN}$ V_O=Low

if $V_{REF} < V_{IN}$ V_O=High

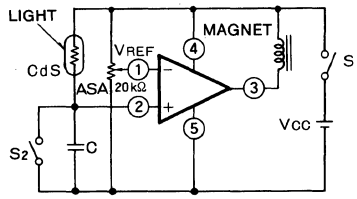
CR Timer



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

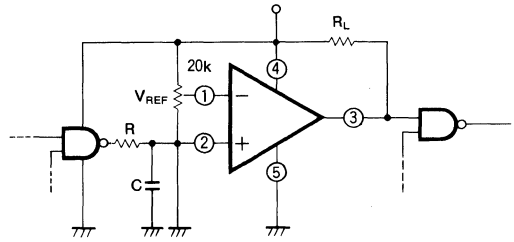
0.1ms≦ t≦180s

Electric shutter



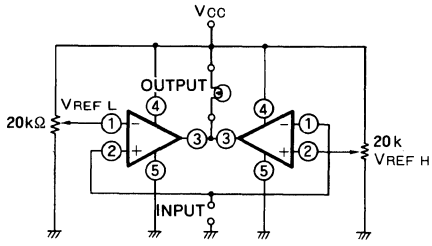
$t = CR cds\ \ell n\frac{V_{CC}}{V_{CC}-V_{REF}}$ [s]

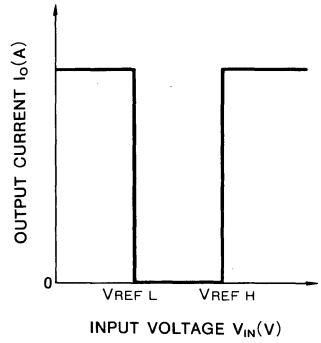
Time delay circuit



$ts = CR\ell n\frac{V_{CC}}{V_{CC}-V_{REF}}$ [s]

Window comparator (alarm circuit)





PRECAUTIONS FOR USE

1. Paying much attention is necessary for fear that the M51202L may flow large current and reach to destroy because of the structure when the terminals of V_{CC} and GND of the M51202L 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.