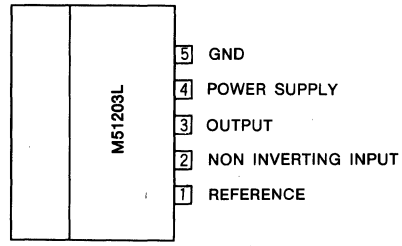
M51203L

VOLTAGE COMPARATOR

DESCRIPTION

The M51203L is a semiconductor integrated circuit consisting of precision voltage comparator. It is designed specifically to operate from a single power supply of wide range. One of the input stages has a characteristic of low bias current and the other has built-in reference voltage with hysteresis. 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. M51203L's package is a mini SIL package, therefore can use very easily.

PIN CONFIGURATION (TOP VIEW)



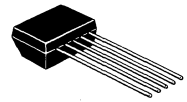
Outline 5P5

FEATURES

- Low input current ..... 20nA(typ.)
- Wide supply voltage range ..... 3.0~28V
- Low circuit current ..... 2.5mA(max.)
- 60mA output current capability can drive a relay or a lamp
- High output break down voltage ..... 30V(max.)
- Including both reference voltage circuit and hysteresis for switching

APPLICATIONS

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

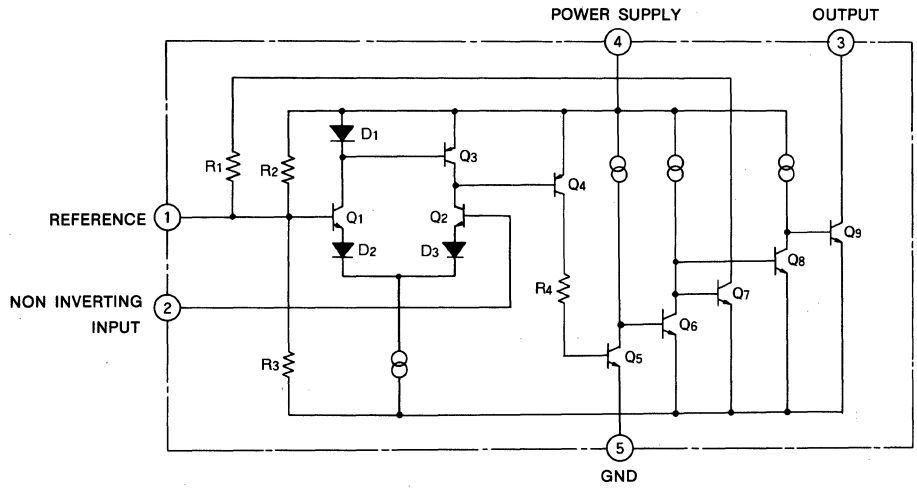


5-pin molded plastic SIL

RECOMMENDED OPERATING CONDITIONS

Supply voltage range ..... 3~28V
Rated supply voltage ..... 12V±10%

EQUIVALENT CIRCUIT



MITSUBISHI ELECTRIC

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

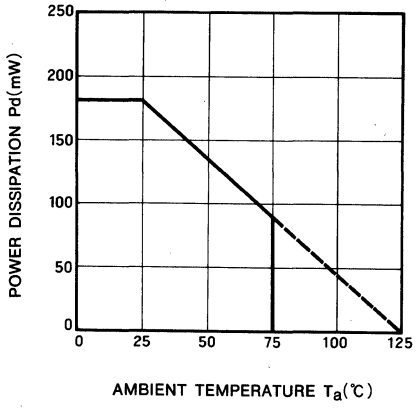
Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Supply voltage		28	V
V_{IN}	Input voltage		V_{CC}	V
I_{OL}	Output drive current	Output saturated	60	mA
V_{OH}	Output drive voltage		30	V
Pd	Power dissipation		180	mW
K_θ	Thermal derating	$T_a \geqq 25℃$	1.8	mW/℃
Topr	Operating temperature		−20～+75	℃
Tstg	Storage temperature		−40～+125	℃

ELECTRICAL CHARACTERISTICS (T_a=25℃)

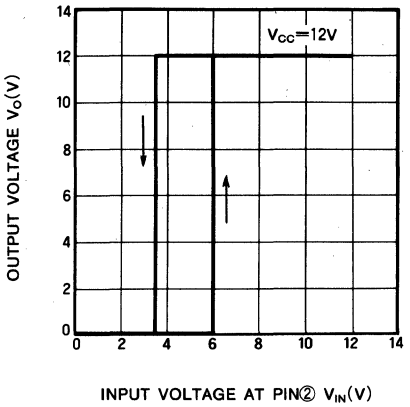
Symbol	Parameter	Test conditions		Limits			Unit
		V_{CC}(V)		Min	Typ	Max	
V_{CC}	Supply voltage range			3.0		28	V
I_{CC}	Circuit current	6.0			1.9	2.5	mA
		12.0			2.0		
		24.0			2.1		
V_{IN}	Input voltage range			1.4		V_{CC}−0.2	V
I_{IN}	Input current	6.0			20	75	nA
		12.0					
		24.0					
V_{IO}	Input offset voltage	6.0			2.0	20	mV
		12.0					
		24.0					
ΔV_{hys}	Hysteresis for switching	6.0		1.0	1.2	1.4	V
		12.0		1.9	2.4	2.9	
		24.0		3.8	4.8	5.8	
V_{OL}	Output saturation voltage	6.0	I_{OL}=60mA		0.3	0.6	V
		12.0					
		24.0					
t_{PLH}	Output "L-H" propagation delay time	12.0			1		μs
t_{PHL}	Output "H-L" propagation delay time				10		
V_{REF}	Reference voltage at Pin②			$0.85 \times \frac{V_{CC}}{2}$	$\frac{V_{CC}}{2}$	$11.5 \times \frac{V_{CC}}{2}$	V

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

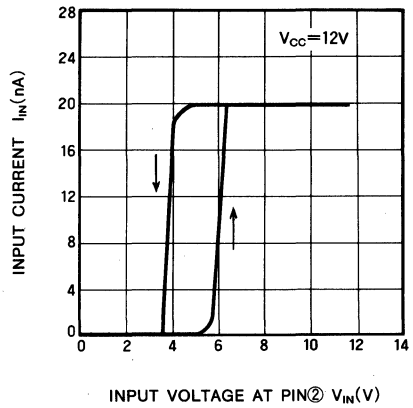
THERMAL DERATING (MAXIMUM RATING)



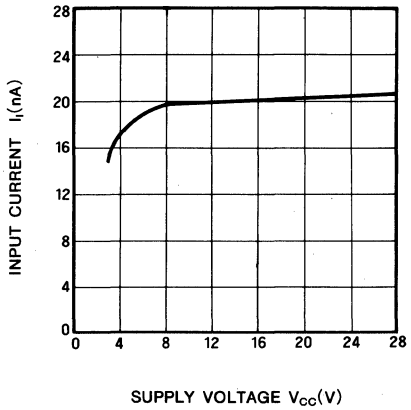
OUTPUT VOLTAGE VS INPUT VOLTAGE AT PIN②



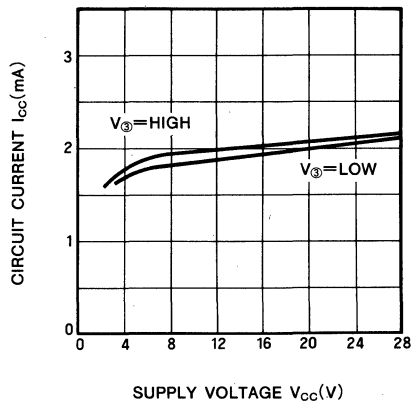
INPUT CURRENT VS INPUT VOLTAGE AT PIN②



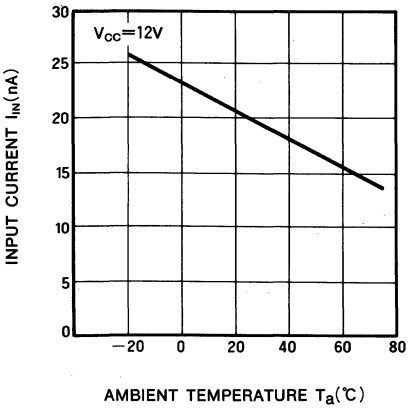
INPUT CURRENT VS SUPPLY VOLTAGE



CIRCUIT CURRENT VS SUPPLY VOLTAGE



INPUT CURRENT VS AMBIENT TEMPERATURE



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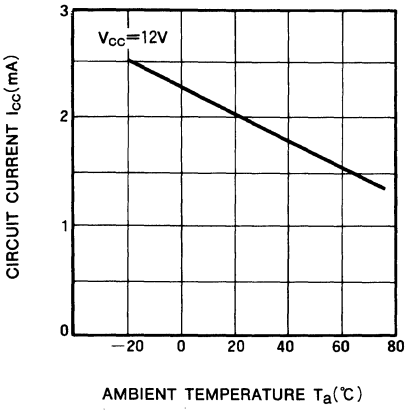
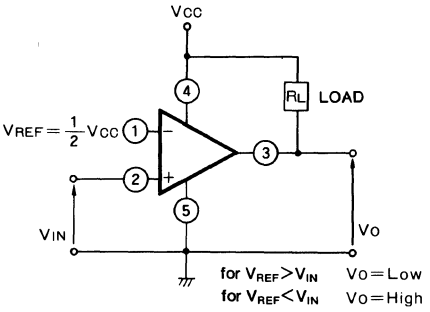
CIRCUIT CURRENT VS AMBIENT TEMPERATURE

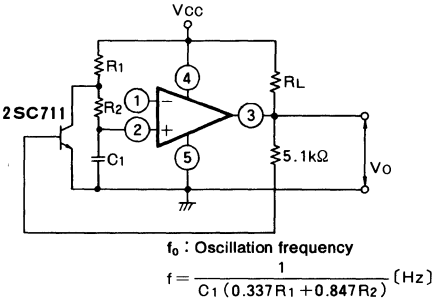


APPLICATION EXAMPLES

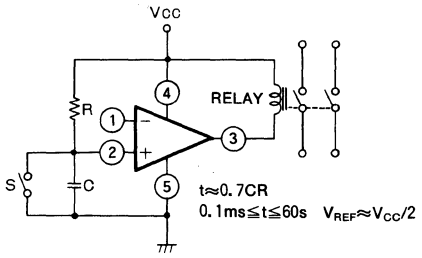
Voltage comparator



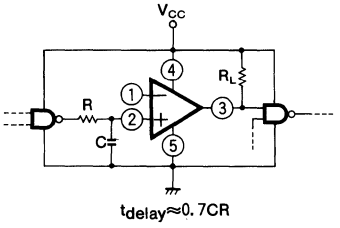
Oscillator



CR Timer



Time delay circuit



PRECAUTIONS FOR USE

1. Paying much attention is necessary for fear that the M51203L may flow large current and reach to destroy because of the structure when the terminals of V_{CC} and GND of the M51203L 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.