

MITSUBISHI <LINEAR ICs>
M51203TL,FP

VOLTAGE COMPARATOR

DESCRIPTION

The M51203 is a semiconductor integrated circuit for a voltage comparator that operates from a single power supply. Especially the M51203 has superiority as to characteristics of input current (high input resistance) and fits to wide ranged applications, for example CR timer, etc. M51203TL, FP's package is a mini SIP and FLAT package, therefore can use very easily.

FEATURES

- Low input current (high input resistance) 20nA(typ.)
- Operates at low supply voltage 3.0~28V
- Capable of directly driving a relay or a lamp
- Low power dissipation 2.5mA(max.)
- Including reference voltage for comparison
- Hysteresis characteristic between input and output
- High output breakdown voltage 30V(max.)

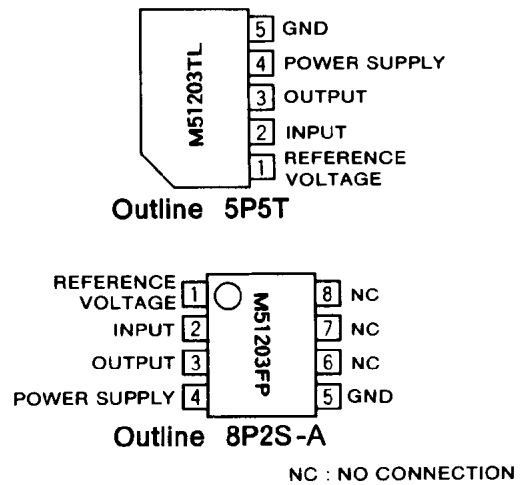
APPLICATION

Electric shutter, CR timer, voltage comparator, time delay circuit, oscillator (square wave)

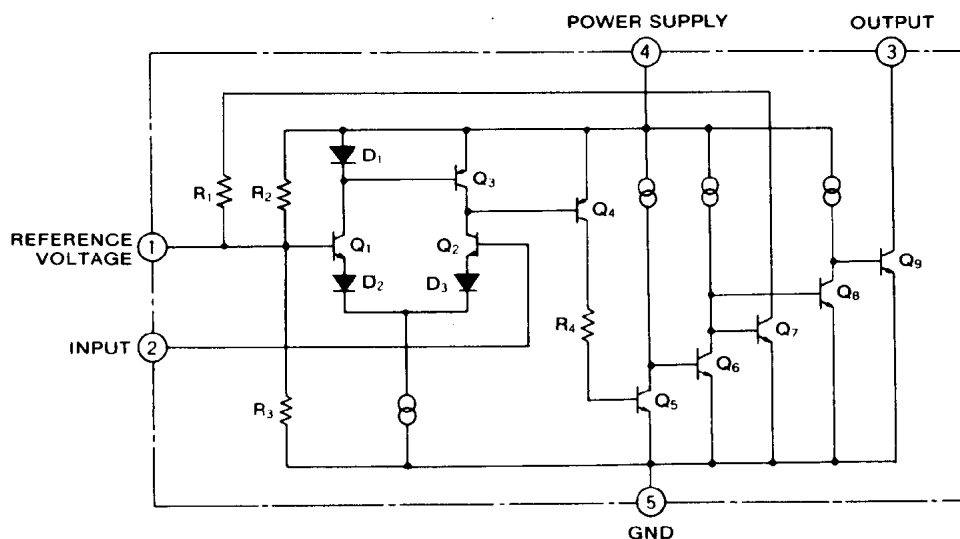
RECOMMENDED OPERATING CONDITIONS

Supply voltage range 3.0~28V
 Rated supply voltage 12V

PIN CONFIGURATION (TOP VIEW)



EQUIVALENT CIRCUIT



VOLTAGE COMPARATOR

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

Symbol	Parameter	Conditions	Ratings	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
P_d	Power dissipation		180(M51203TL) 300(M51203FP)	mW
K_θ	Thermal derating	$T_a \geq 25^\circ\text{C}$	1.8(M51203TL) 3.0(M51203FP)	mW/ $^\circ\text{C}$
T_{opr}	Operating temperature		$-20 \sim +75$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-40 \sim +125$	$^\circ\text{C}$

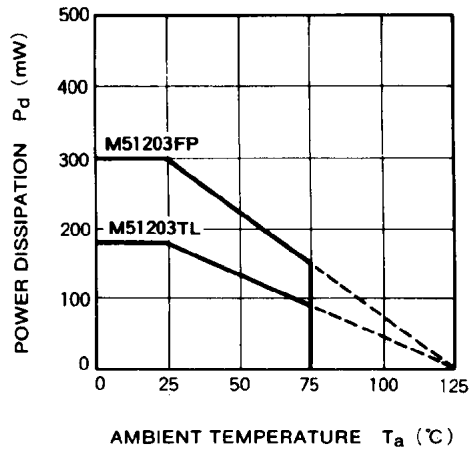
ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

Symbol	Parameter	Test conditions		Limits			Unit
		$V_{CC}(\text{V})$		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			1.4		$V_{CC}-0.2$	V
I_{IN}	Input current	6.0			20	75	nA
		12.0					
		24.0					
V_{REF}	Reference voltage	6.0	$V_{IN}=0\text{V}$	2.7	3.0	3.3	V
		12.0		5.4	6.0	6.6	
		24.0		10.8	12.0	13.2	
ΔV_{hys}	Input/output hysteresis width voltage	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	$R_L=100\Omega$		0.3	0.6	V
		12.0	$R_L=200\Omega$				
		24.0	$R_L=400\Omega$				
t_{PLH}	Output "L-H" propagation delay time	12.0			1		μs
t_{PHL}	Output "H-L" propagation delay time				10		μs

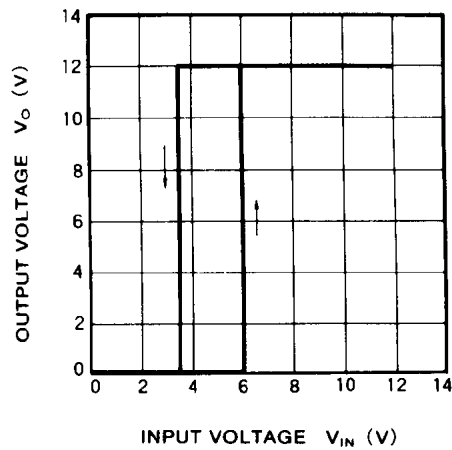
VOLTAGE COMPARATOR

TYPICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, $V_{CC}=12\text{V}$, unless otherwise noted)

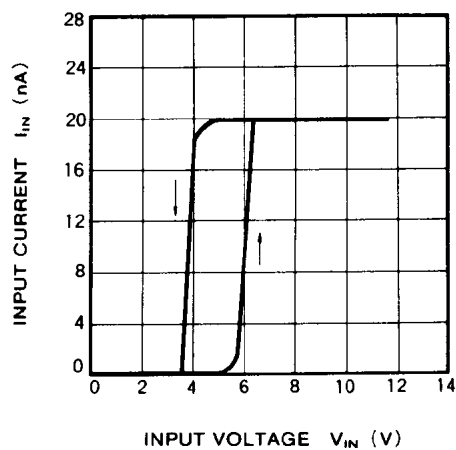
THERMAL DERATING (MAXIMUM RATING)



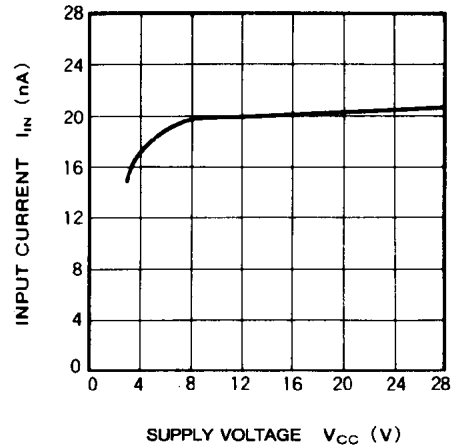
OUTPUT VOLTAGE VS. INPUT VOLTAGE



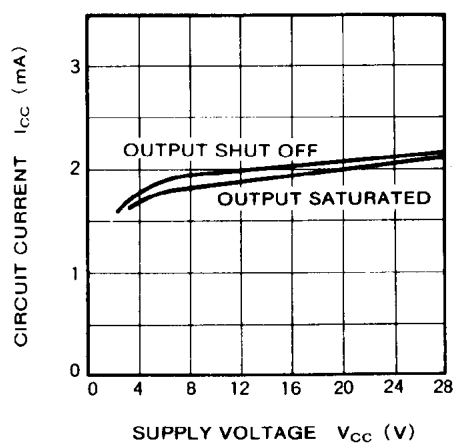
INPUT CURRENT VS. INPUT VOLTAGE



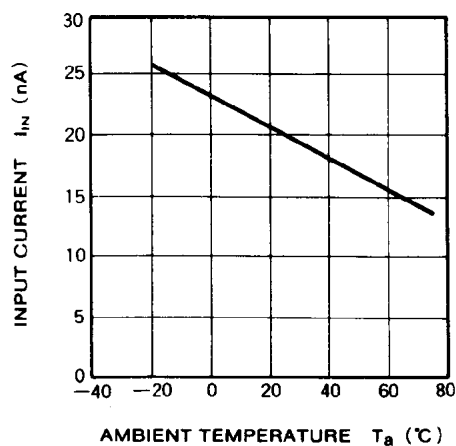
INPUT CURRENT VS. SUPPLY VOLTAGE



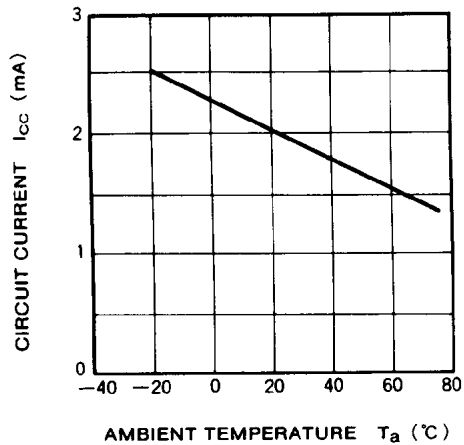
CIRCUIT CURRENT VS. SUPPLY VOLTAGE



INPUT CURRENT VS. AMBIENT TEMPERATURE

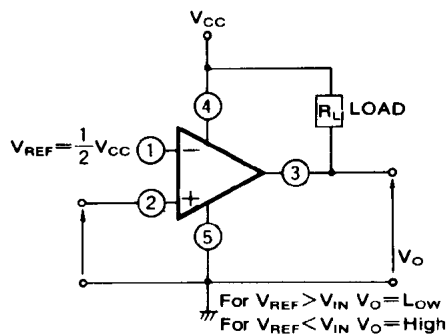


CIRCUIT CURRENT VS. AMBIENT TEMPERATURE

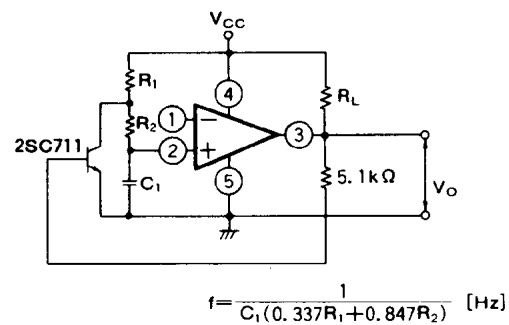


APPLICATION EXAMPLES

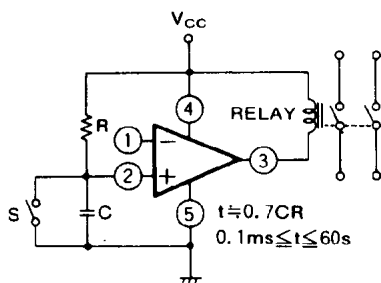
(1) Voltage comparator



(2) Oscillator



(3) CR Timer



PRECAUTIONS FOR USE

1. Paying much attention is necessary for fear that the M51203TL,FP may flow large current and reach to destroy because of the structure when the terminals of V_{CC} and GND of the M51203TL,FP 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.