

# M51951A,B/M51952A,B

## DESCRIPTION

M51951A,B/M51952A,B are semiconductor integrated circuits suited for detecting supply voltage and resetting all types of logic circuits such as CPUs.

They include a built-in delay circuit to provide a retardation time (200  $\mu$ sec typ.).

They find extensive applications, including circuits for battery checking, level detecting and waveform shaping.

## FEATURES

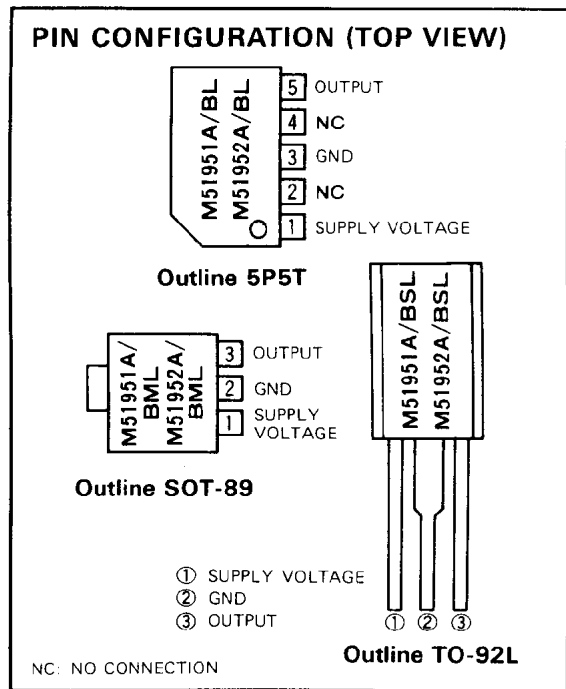
- Few external parts
- Low threshold operating voltage (Supply voltage to keep low-state at low supply voltage  
..... 0.6V (TYP.) at  $R_L = 22k\Omega$ )
- Wide supply voltage range ..... 2 ~ 17V
- Sudden change in power supply has minimal effect on the ICs
- Wide application range
- SIL package of the same height as DIP (5-pin SIP)
- Extra-small 3-pin package (3-pin FLAT)

## APPLICATION

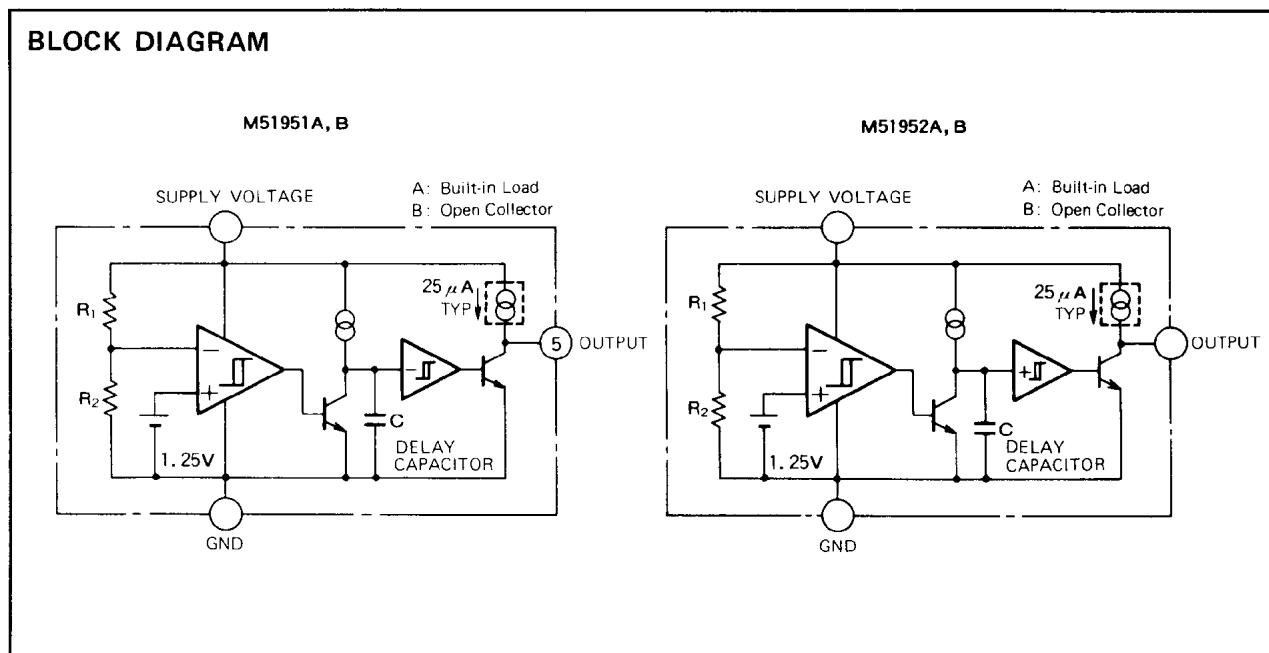
Reset circuit of Pch, Nch, CMOS, microcomputer, CPU and microcomputer, Reset of logic circuit, Battery check circuit, Switching circuit back-up voltage, Level detecting circuit, Waveform shaping circuit, Delay waveform generating circuit, DC-DC converter, Over voltage protection circuit.

## RECOMMENDED OPERATING CONDITION

Supply voltage range ..... 2 ~ 17V

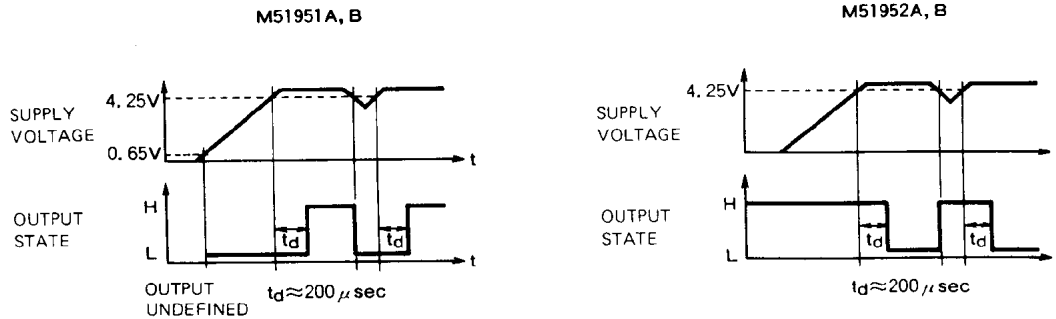


## BLOCK DIAGRAM



# M51951A,B/M51952A,B

## FUNCTION DIAGRAM



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

Symbol	Parameter	Conditions	Ratings	Unit	
V <sub>CC</sub>	Supply voltage		18	V	
I <sub>sink</sub>	Output Sink Current		6	mA	
V <sub>O</sub>	Output voltage	A Type (Output with constant current load)	V <sub>CC</sub>	V	
		B Type (Open collector output)	18		
P <sub>d</sub>	Power dissipation	5P SIL	450	mW	
		3P SIL	700		
		3P FLAT	500		
K <sub>θ</sub>	Thermal Derating	Ta ≥ 25 °C	5P SIL	4.5	mW/°C
			3P SIL	7	
			3P FLAT	5	
T <sub>opr</sub>	Operating temperature		-30 ~ +85	°C	
T <sub>stg</sub>	Storage temperature		-40 ~ +125	°C	

## ELECTRICAL CHARACTERISTICS (Ta = 25 °C, unless otherwise noted)

"L" reset type	"H" reset type
<b>M51951A</b>	<b>M51952A</b>
<b>M51951B</b>	<b>M51952B</b>

Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
V <sub>S</sub>	Detecting voltage		4.05	4.25	4.45	V	
ΔV <sub>S</sub>	Hysteresis voltage		30	50	80	mV	
V <sub>S</sub> /ΔT	Detecting voltage Temperature Coefficient		—	0.01	—	%/°C	
I <sub>CC</sub>	Circuit Current	Type A V <sub>CC</sub> = 5V	—	450	680	μA	
		Type B V <sub>CC</sub> = 5V	—	420	630		
t <sub>pd</sub>	Delay Time	Ta = -30 ~ +85 °C (Note)	80	200	500	μs	
V <sub>sat</sub>	Output Saturation Voltage	L reset type V <sub>CC</sub> = 4V, I <sub>sink</sub> = 4mA	—	0.2	0.4	V	
		H reset type V <sub>CC</sub> = 5V, I <sub>sink</sub> = 4mA	—	0.2	0.4		
V <sub>OPL</sub>	Threshold Operating Voltage	L reset type Minimum supply voltage for IC operation	R <sub>L</sub> = 2.2kΩ, V <sub>sat</sub> ≤ 0.4V	—	0.67	0.8	V
			R <sub>L</sub> = 100kΩ, V <sub>sat</sub> ≤ 0.4V	—	0.55	0.7	
I <sub>OH</sub>	Output Leak Current	Type B	—	—	30	nA	
		Type B, Ta = -30 ~ +85 °C	—	—	1		
I <sub>OC</sub>	Output Load Current	Type A V <sub>CC</sub> = 5V, V <sub>O</sub> = 1/2V <sub>CC</sub>	-40	-25	-17	μA	
V <sub>OH</sub>	Output High Voltage	Type A	V <sub>CC</sub> - 0.2	V <sub>CC</sub> - 0.06	—	V	

Note: Delay time can be changed by changing delay capacitor for external capacitor types.  
(Please refer to typical characteristics)