

M51951A,B/M51952A,B

VOLTAGE DETECTING, SYSTEM RESETTING IC SERIES

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 μ sec typ.).

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

FEATURES

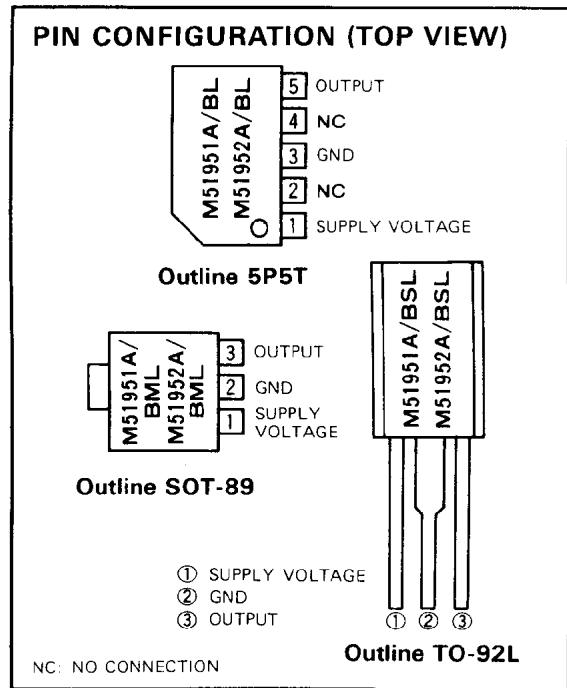
- Few external parts
- Low threshold operating voltage (Supply voltage to keep low-state at low supply voltage
 0.6V (TYP.) at $R_L = 22k\Omega$)
- Wide supply voltage range 2 ~ 17V
- Sudden change in power supply has minimal effect on the ICs
- Wide application range
- SIL package of the same height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

APPLICATION

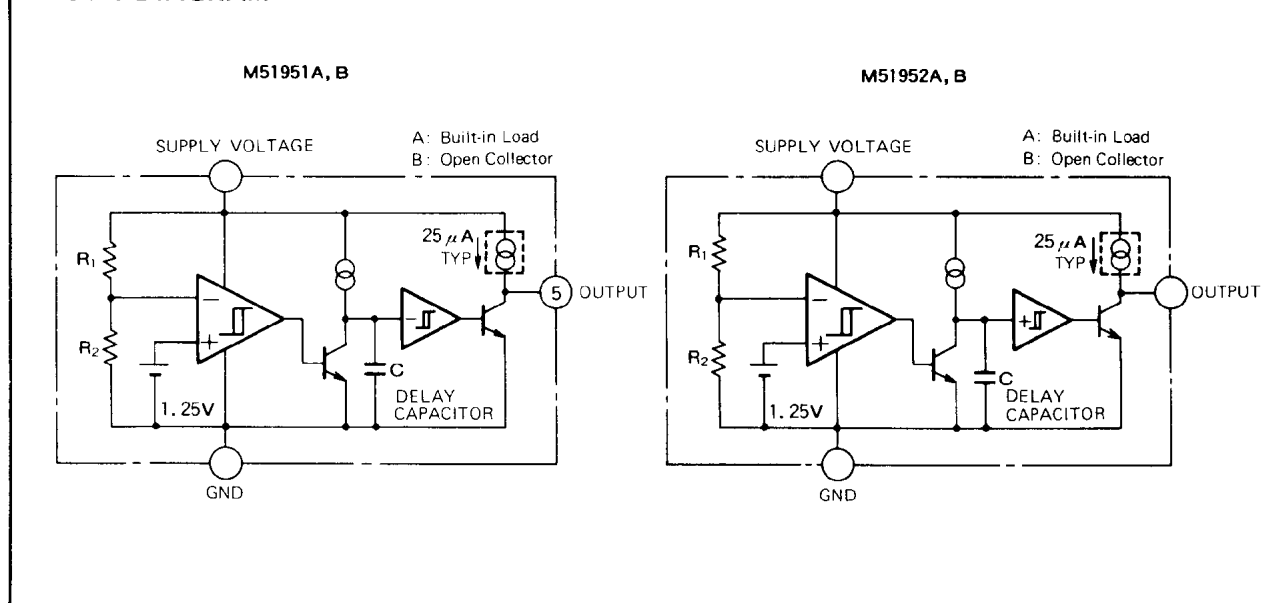
Reset circuit of Pch, Nch, CMOS, microcomputer, CPU and microcomputer, Reset of logic circuit, Battery check circuit, Switching circuit back-up voltage, Level detecting circuit, Waveform shaping circuit, Delay waveform generating circuit, DC-DC converter, Over voltage protection circuit.

RECOMMENDED OPERATING CONDITION

Supply voltage range 2 ~ 17V



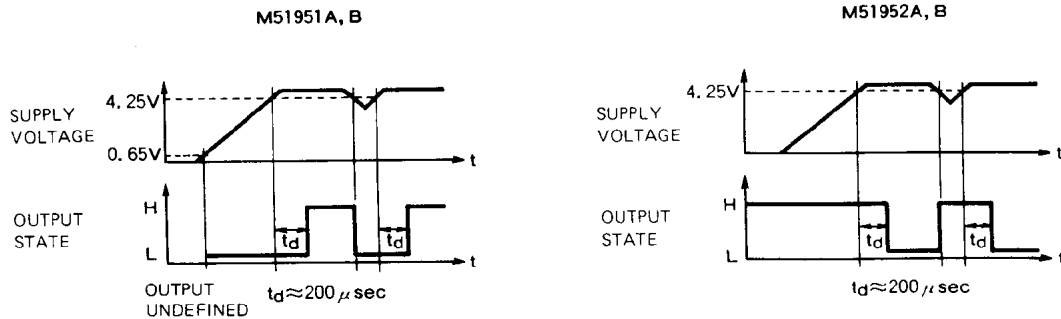
BLOCK DIAGRAM



MITSUBISHI <Dig./Ana. INTERFACE>
M51951A,B/M51952A,B

VOLTAGE DETECTING, SYSTEM RESETTIC IC SERIES

FUNCTION DIAGRAM



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

Symbol	Parameter	Conditions	Rating	Unit	
V_{CC}	Supply voltage		18	V	
I_{sink}	Output Sink Current		6	mA	
V_O	Output voltage	A Type (Output with constant current load)	V_{CC}	V	
		B Type (Open collector output)	18	V	
P_d	Power dissipation	5P SIL	450	mW	
		3P SIL	700		
		3P FLAT	500		
K_θ	Thermal Derating	$T_a \geq 25^\circ\text{C}$	5P SIL	4.5	mW/°C
			3P SIL	7	
			3P FLAT	5	
T_{opr}	Operating temperature		-30 ~ +85	°C	
T_{stg}	Storage temperature		-40 ~ +125	°C	

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, unless otherwise noted)

"L" reset type	"H" reset type
M51951A	M51952A
M51951B	M51952B

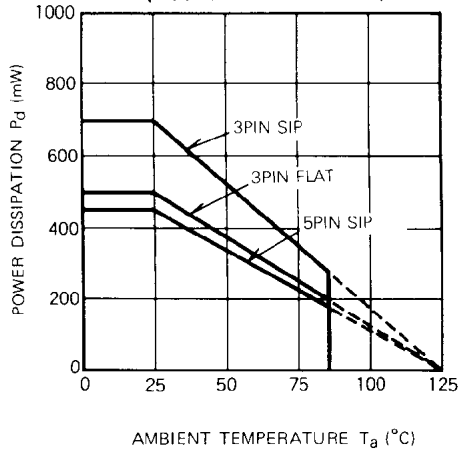
Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
V_S	Detecting voltage		4.05	4.25	4.45	V	
ΔV_S	Hysteresis voltage		30	50	80	mV	
$V_S/\Delta T$	Detecting voltage Temperature Coefficient		—	0.01	—	%/°C	
I_{CC}	Circuit Current	Type A $V_{CC} = 5V$	—	450	680	μA	
		Type B $V_{CC} = 5V$	—	420	630		
t_{pd}	Delay Time	$T_a = -30 \sim +85^\circ\text{C}$ (Note)	80	200	500	μs	
V_{sat}	Output Saturation Voltage	L reset type $V_{CC} = 4V, I_{sink} = 4mA$	—	0.2	0.4	V	
		H reset type $V_{CC} = 5V, I_{sink} = 4mA$	—	0.2	0.4		
V_{OPL}	Threshold Operating Voltage	L reset type Minimum supply voltage for IC operation	$R_L = 2.2k\Omega, V_{sat} \leq 0.4V$	—	0.67	0.8	V
			$R_L = 100k\Omega, V_{sat} \leq 0.4V$	—	0.55	0.7	
I_{OH}	Output Leak Current	Type B	—	—	30	nA	
		Type B, $T_a = -30 \sim +85^\circ\text{C}$	—	—	1	μA	
I_{OC}	Output Load Current	Type A $V_{CC} = 5V, V_O = 1/2V_{CC}$	-40	-25	-17	μA	
V_{OH}	Output High Voltage	Type A	$V_{CC} - 0.2$	$V_{CC} - 0.06$	—	V	

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

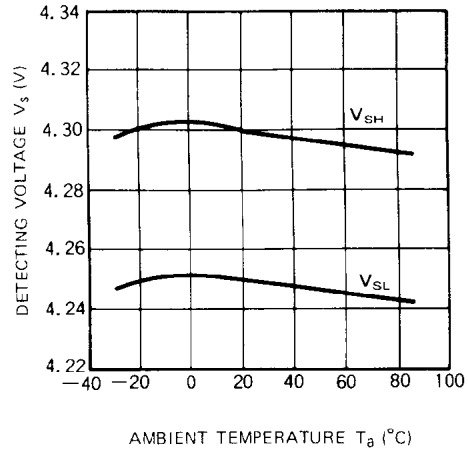
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TYPICAL CHARACTERISTICS

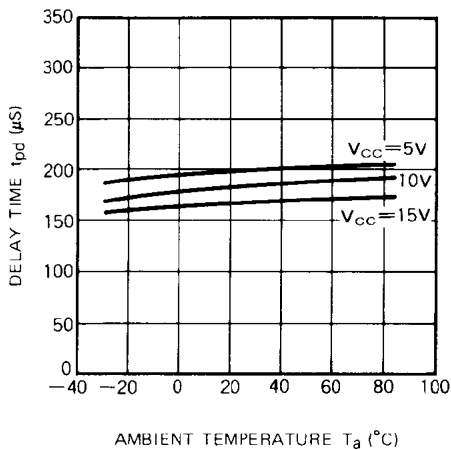
**TYPICAL CHARACTERISTICS
 THERMAL DERATING
 (MAXIMUM RATING)**



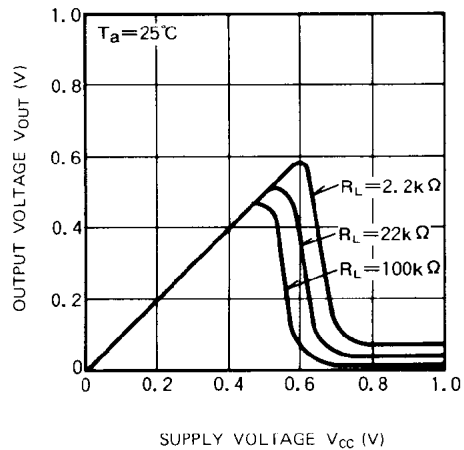
**DETECTING VOLTAGE VS.
 AMBIENT TEMPERATURE
 (Supply voltage detecting series)**



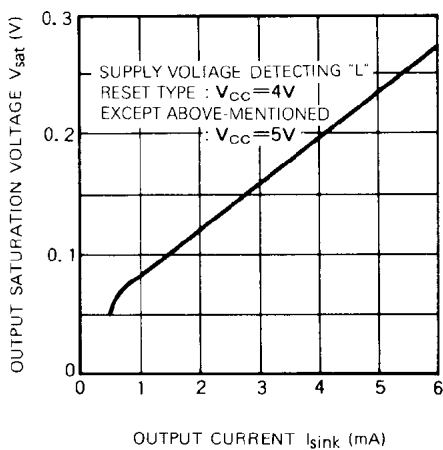
**DELAY TIME VS.
 AMBIENT TEMPERATURE
 (M5195XX, Built-in capacitor type)**



**THRESHOLD OPERATING VOLTAGE
 ([L] reset type)**



**OUTPUT SATURATION VOLTAGE VS.
 OUTPUT SINK CURRENT**



**OUTPUT LOAD CURRENT VS.
 OUTPUT VOLTAGE
 (M519XXA)**

