

To our customers,

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# M51951A,B/M51952A,B

## Voltage Detecting, System Resetting IC Series

REJ03D0775-0400

Rev.4.00

Sep 18, 2007

### Description

M51951A,B/M51952A,B are semiconductor integrated circuits designed 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  $\mu$ s Typ).

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

### Features

- Few external parts
- Low threshold operating voltage (Supply voltage to keep low-state at low supply voltage): 0.6 V (Typ) at  $R_L = 22 \text{ k}\Omega$
- Wide supply voltage range: 2 V to 17 V
- Wide application range

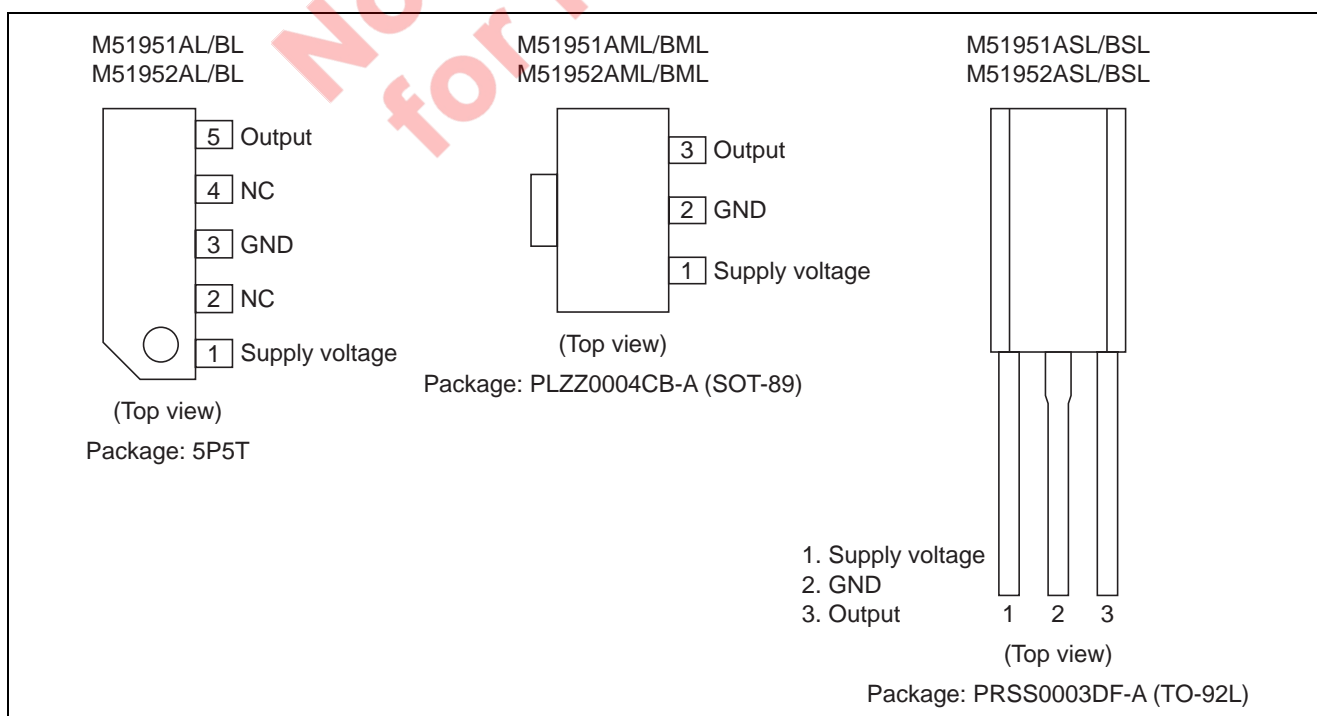
### Application

- Reset circuit of Pch, Nch, CMOS, microcomputer, CPU and MCU, 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 V to 17 V

### Pin Arrangement





## Absolute Maximum Ratings

(Ta = 25°C, unless otherwise noted)

Item	Symbol	Ratings	Unit	Conditions	
Supply voltage	V <sub>CC</sub>	18	V		
Output sink current	I <sub>sink</sub>	6	mA		
Output voltage	V <sub>O</sub>	V <sub>CC</sub>	V	Type A (output with constant current load)	
		18		Type B (open collector output)	
Power dissipation	P <sub>d</sub>	450	mW	5-pin SIP	
		700		3-pin SIP	
		500		3-pin SOP	
Thermal derating	K <sub>θ</sub>	4.5	mW/°C	Ta ≥ 25°C	5-pin SIP
		7			3-pin SIP
		5			3-pin SOP
Operating temperature	T <sub>opr</sub>	−30 to +85	°C		
Storage temperature	T <sub>stg</sub>	−40 to +125	°C		

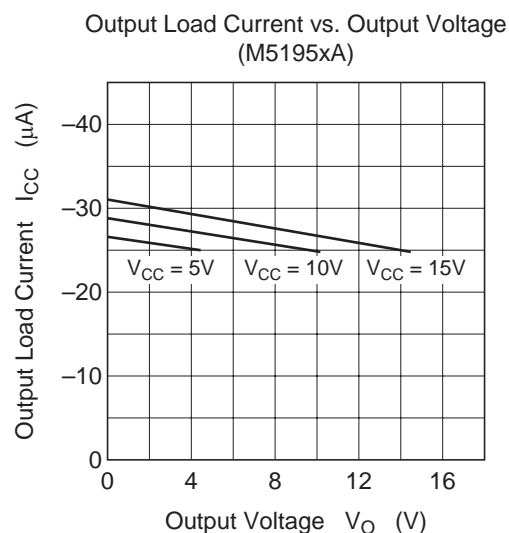
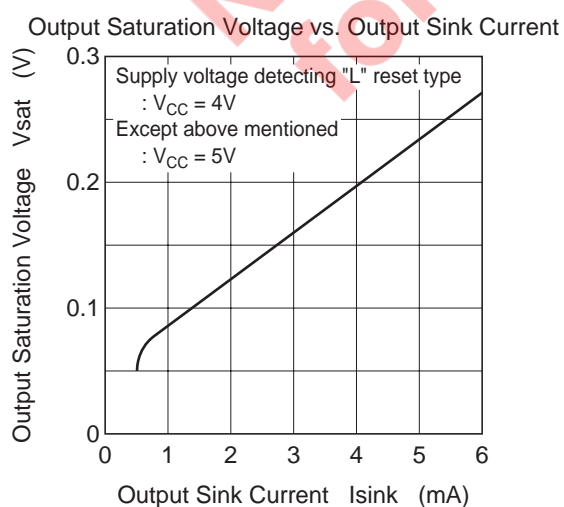
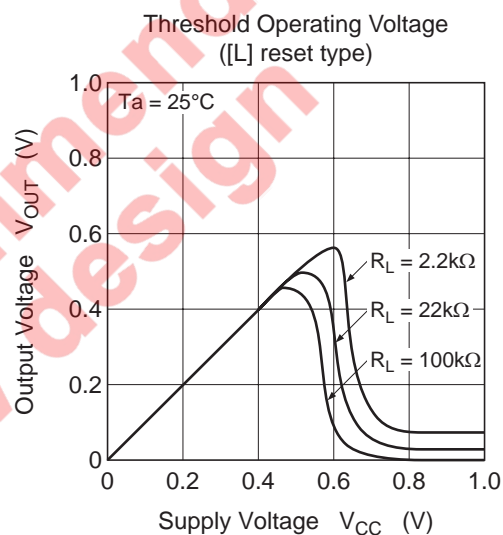
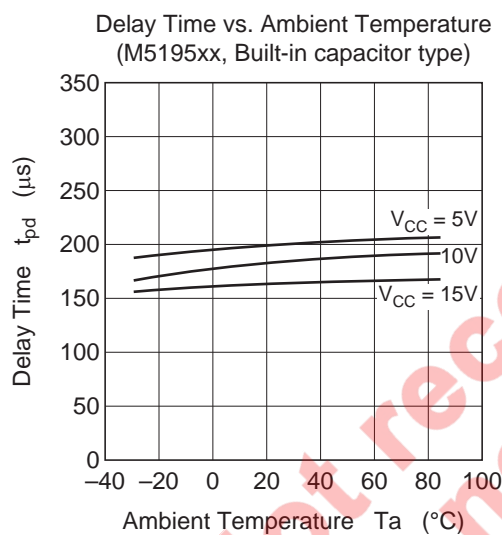
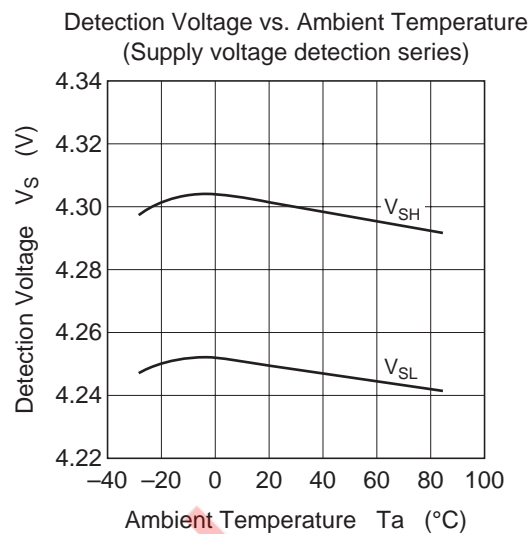
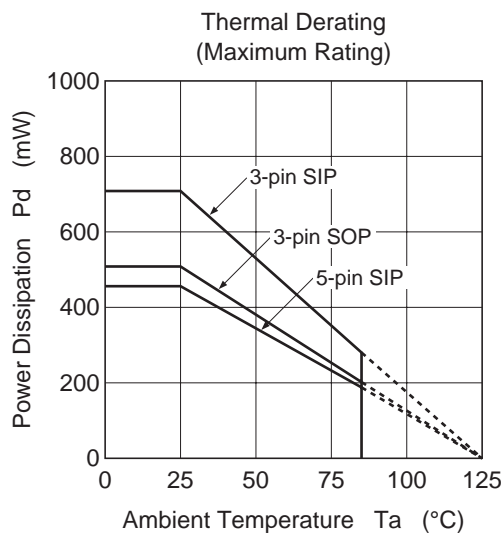
## Electrical Characteristics

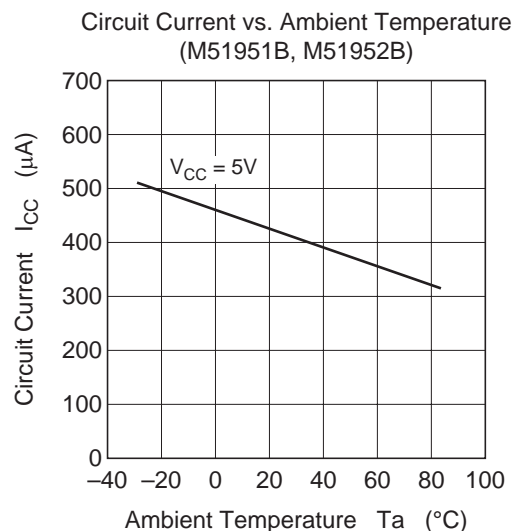
(Ta = 25°C, unless otherwise noted)

- “L” reset type M51951A, M51951B
- “H” reset type M51952A, M51952B

Item	Symbol	Min	Typ	Max	Unit	Test Conditions	
Detecting voltage	V <sub>S</sub>	4.05	4.25	4.45	V		
Hysteresis voltage	ΔV <sub>S</sub>	30	50	80	mV		
Detecting voltage temperature coefficient	V <sub>S</sub> /ΔT	—	0.01	—	%/°C		
Circuit current	I <sub>CC</sub>	—	450	680	μA	Type A, V <sub>CC</sub> = 5V	
		—	420	630		Type B, V <sub>CC</sub> = 5V	
Delay time	t <sub>pd</sub>	80	200	500	μs		
Output saturation voltage	V <sub>sat</sub>	—	0.2	0.4	V	L reset type, V <sub>CC</sub> = 4V, I <sub>sink</sub> = 4mA	
		—	0.2	0.4		H reset type, V <sub>CC</sub> = 5V, I <sub>sink</sub> = 4mA	
Threshold operating voltage	V <sub>OPL</sub>	—	0.67	0.8	V	L reset type minimum supply voltage for IC operation	R <sub>L</sub> = 2.2kΩ, V <sub>sat</sub> ≤ 0.4V
		—	0.55	0.7			R <sub>L</sub> = 100kΩ, V <sub>sat</sub> ≤ 0.4V
Output leakage current	I <sub>OH</sub>	—	—	30	nA	Type B	
Output load current	I <sub>OC</sub>	−40	−25	−17	μA	Type A, V <sub>CC</sub> = 5V, V <sub>O</sub> = 1/2 × V <sub>CC</sub>	
Output high voltage	V <sub>OH</sub>	V <sub>CC</sub> −0.2	V <sub>CC</sub> −0.06	—	V	Type A	

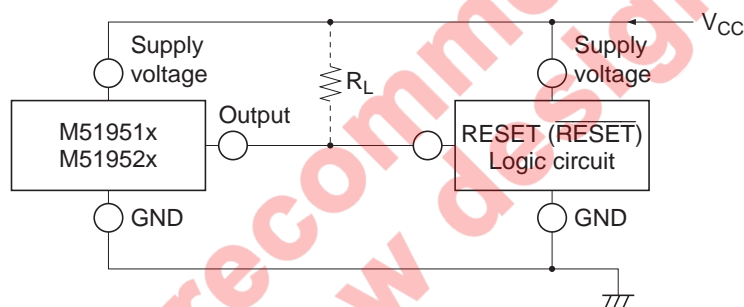
## Typical Characteristics





## Example of Application Circuit

### Reset Circuit of M5195xx Series



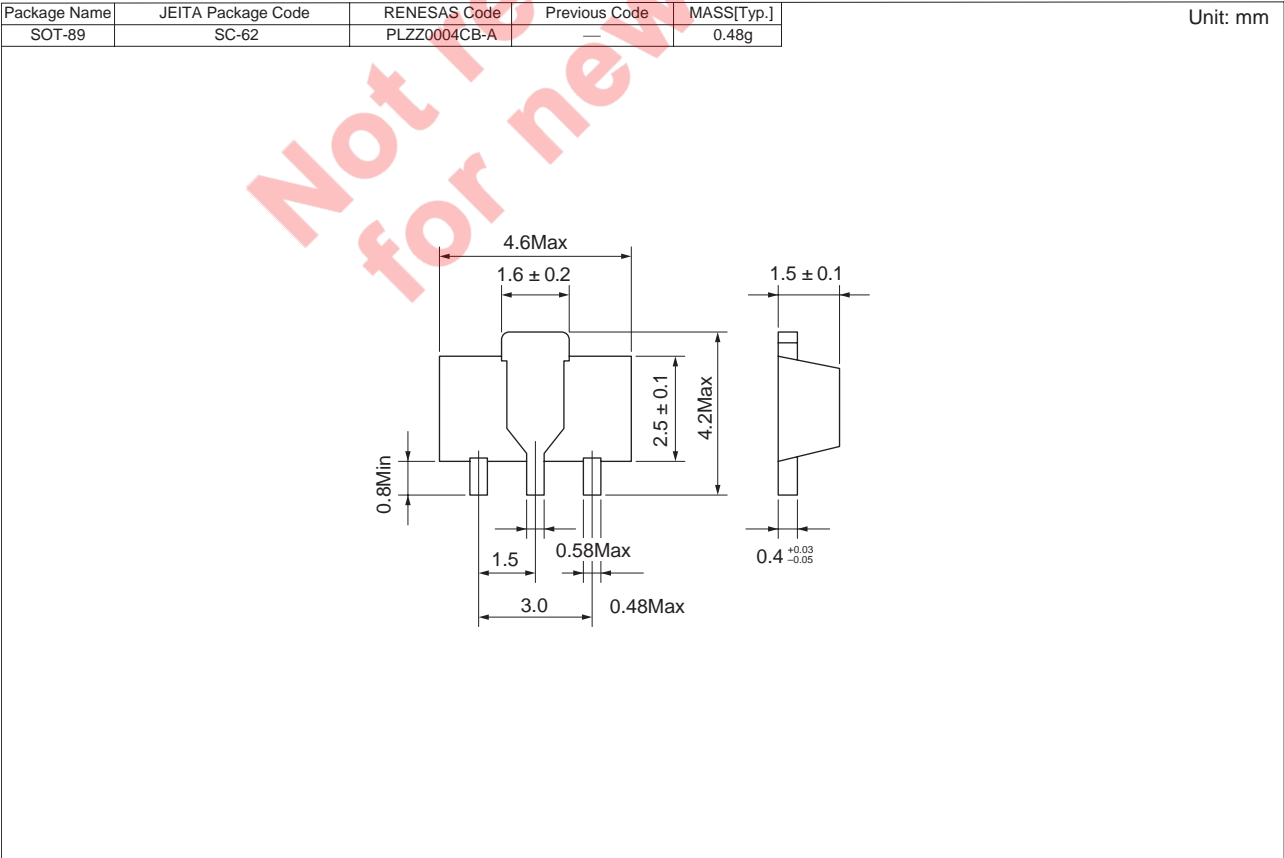
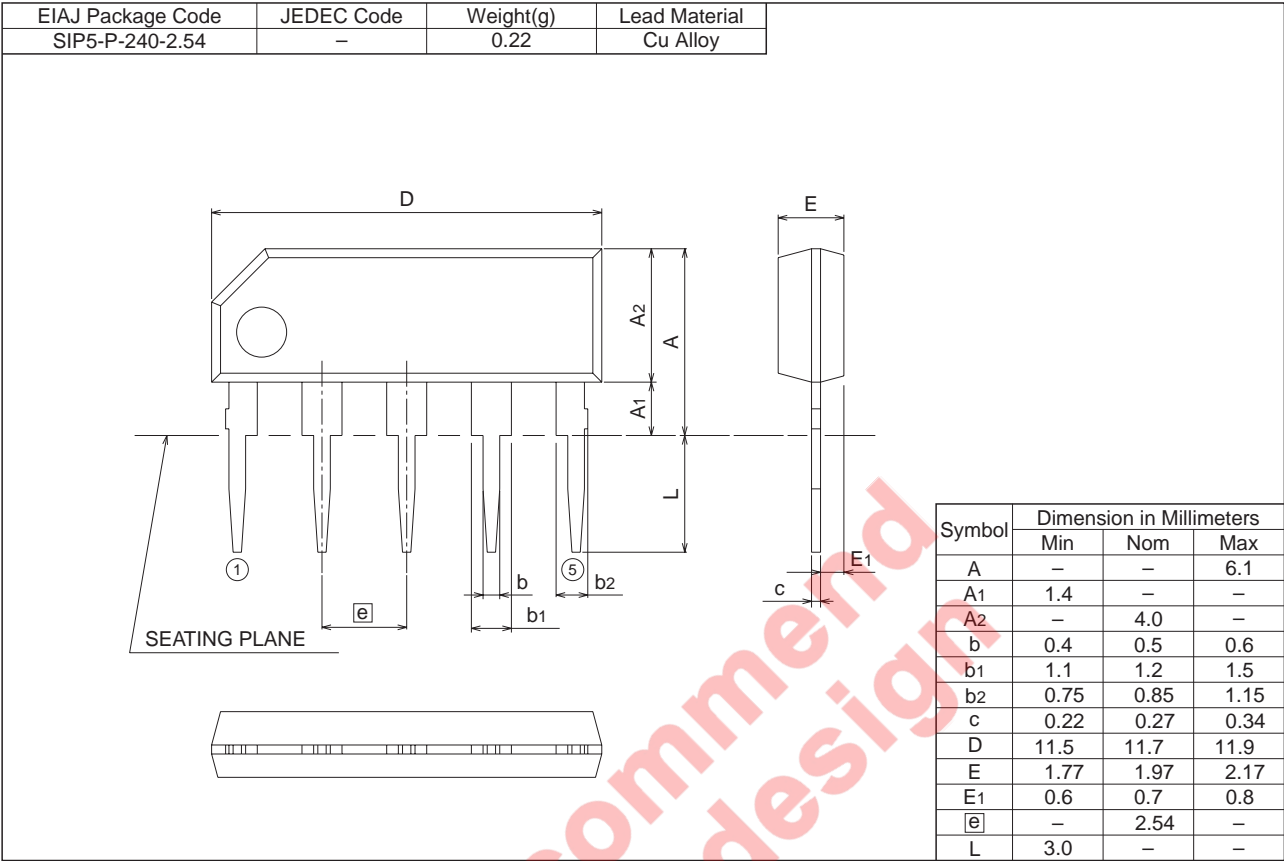
**Figure 1 Reset Circuit of M5195xx Series**

- Notes:
1. When the detecting supply voltage is 4.25 V, M51951, M51952, M51953 and M51954 are used. When the voltage is anything except 4.25 V, M51955, M51956, M51957 and M51958 are used.
  2. When the delay time is short, M51951, M51952, M51955 and M51956 are available. These ICs have a delay capacity and the delay time is about 200 μs. If a longer delay time is necessary, M51953, M51954, M51957 and M51958 are used.
  3. If the M5195xx and the logic circuit share a common power source, type A (built-in load type) can be used whether a pull-up resistor is included in the logic circuit or not.
  4. The logic circuit preferably should not have a pull-down resistor, but if one is present, add load resistor  $R_L$  to overcome the pull-down resistor.
  5. When the reset terminal in the logic circuit is of the low reset type, M51951, M51953, M51955 and M51957 are used and when the terminal is of the high reset type, M51952, M51954, M51956 and M51958 are used.
  6. When a negative supply voltage is used, the supply voltage side of M5195xx and the GND side are connected to negative supply voltage respectively.

Package Dimensions

5P5T

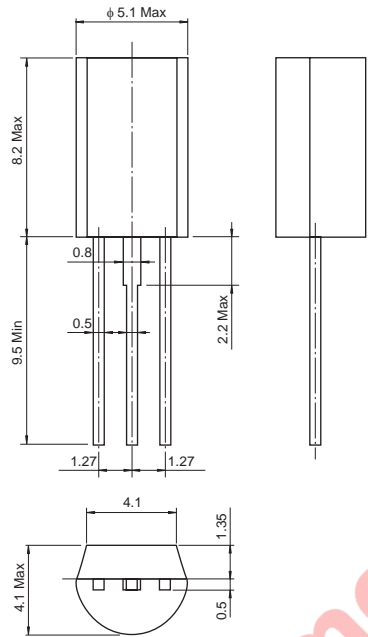
Plastic 5pin 240mil SIP





JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
—	PRSS0003DF-A	TO-92L	0.34g

Unit: mm



Not recommend  
for new design

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