

M51951A,B/M51952A,B

Voltage Detecting, System Resetting IC Series

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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 μ 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

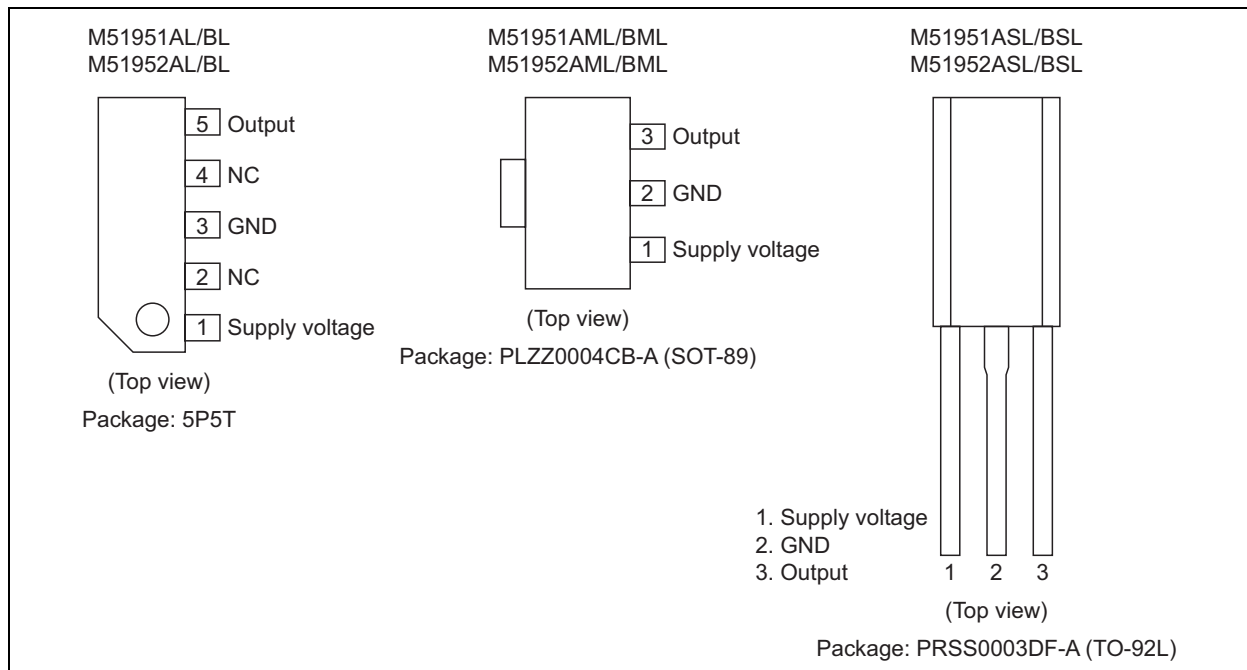
Application

- 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

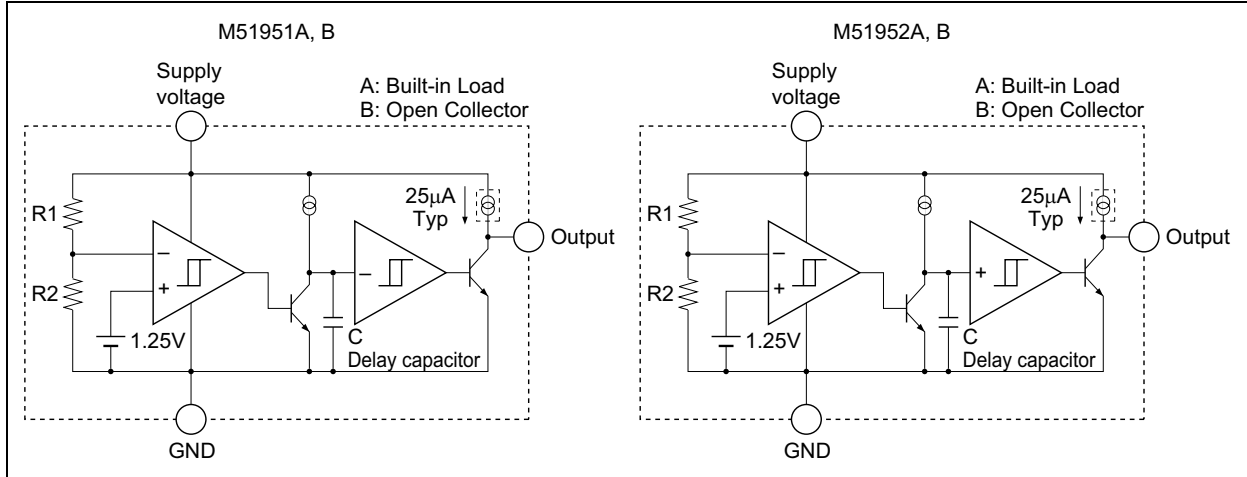
Recommended Operating Condition

- Supply voltage range: 2 V to 17 V

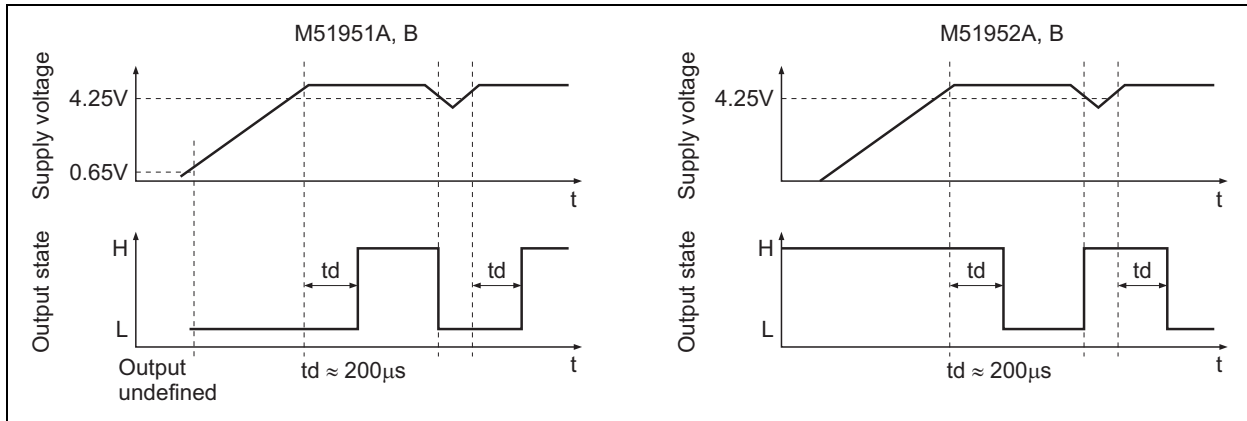
Pin Arrangement



Block Diagram



Operating Waveform



Absolute Maximum Ratings

(Ta = 25°C, unless otherwise noted)

| Item | Symbol | Ratings | Unit | Conditions | |
|-----------------------|-------------------|-----------------|-------|--|-----------|
| Supply voltage | V _{CC} | 18 | V | | |
| Output sink current | I _{sink} | 6 | mA | | |
| Output voltage | V _O | V _{CC} | V | Type A (output with constant current load) | |
| | | 18 | | Type B (open collector output) | |
| Power dissipation | P _d | 450 | mW | 5-pin SIP | |
| | | 700 | | 3-pin SIP | |
| | | 500 | | 3-pin SOP | |
| Thermal derating | K _θ | 4.5 | mW/°C | Ta ≥ 25°C | 5-pin SIP |
| | | 7 | | | 3-pin SIP |
| | | 5 | | | 3-pin SOP |
| Operating temperature | Topr | -30 to +85 | °C | | |
| Storage temperature | Tstg | -40 to +125 | °C | | |

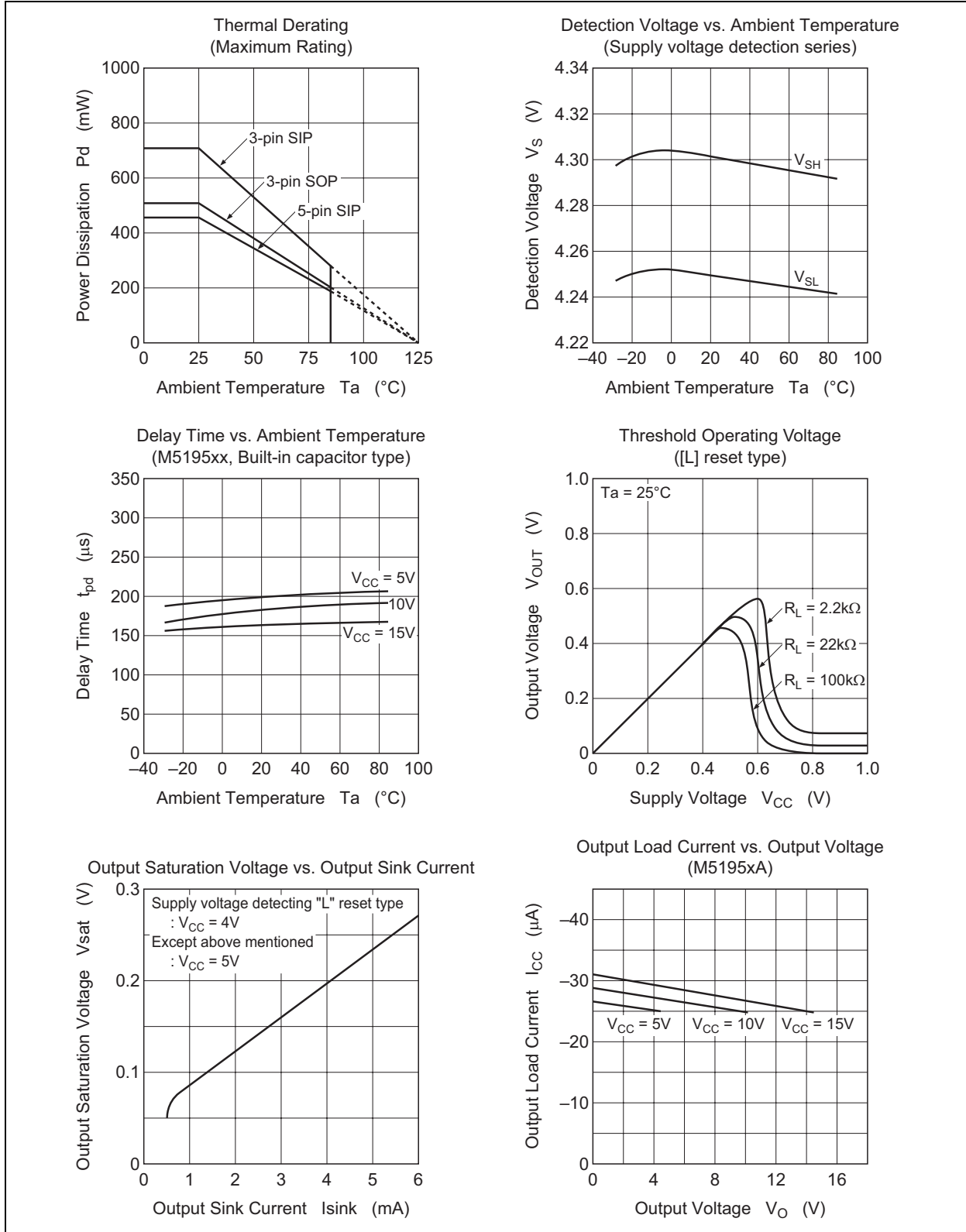
Electrical Characteristics

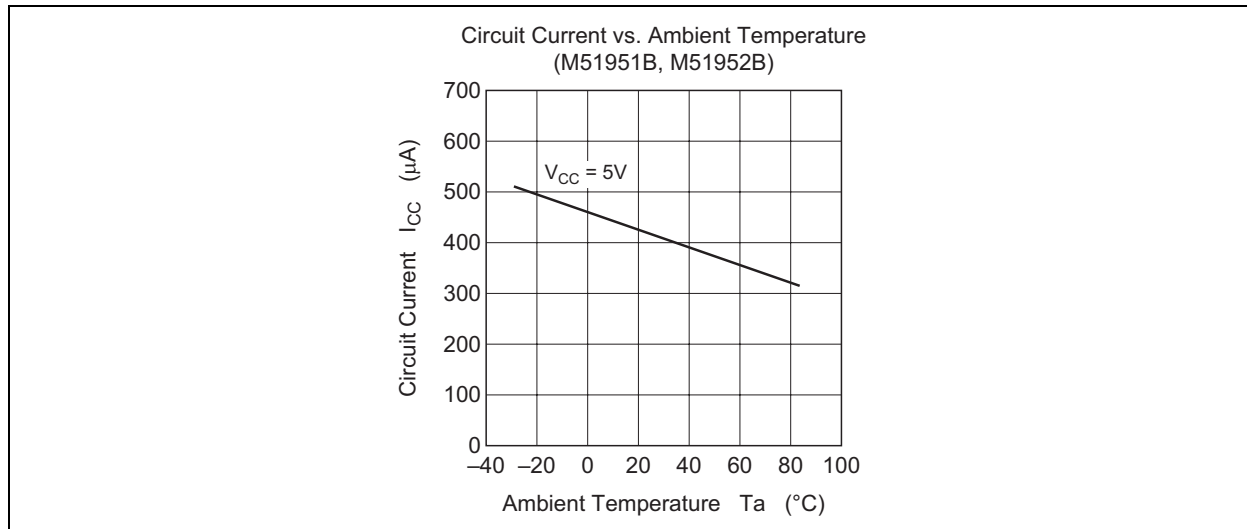
(Ta = 25°C, unless otherwise noted)

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

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

Typical Characteristics





Example of Application Circuit

Reset Circuit of M5195xx Series

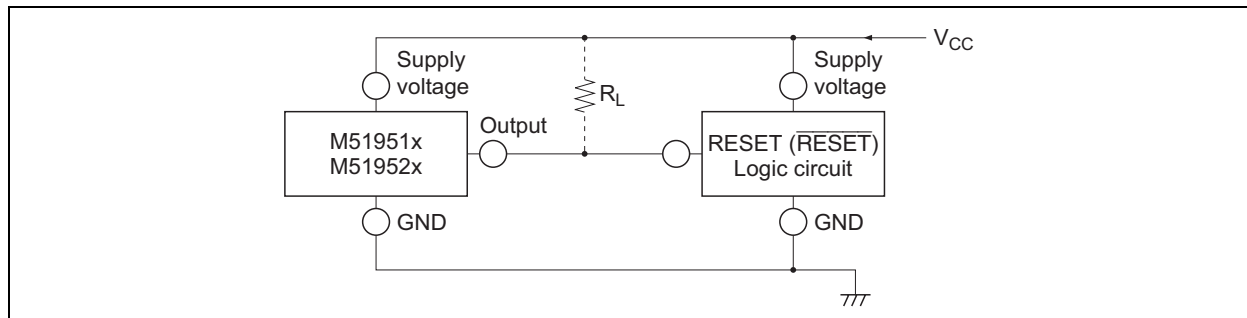


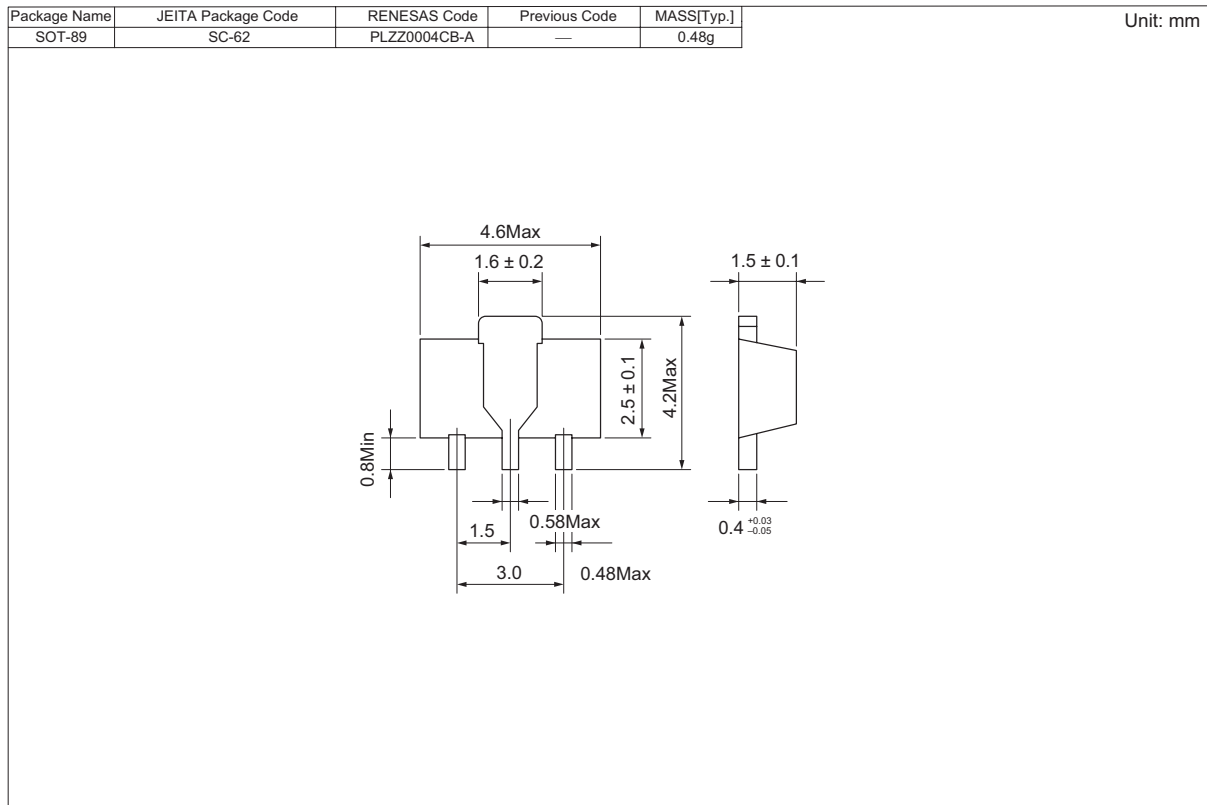
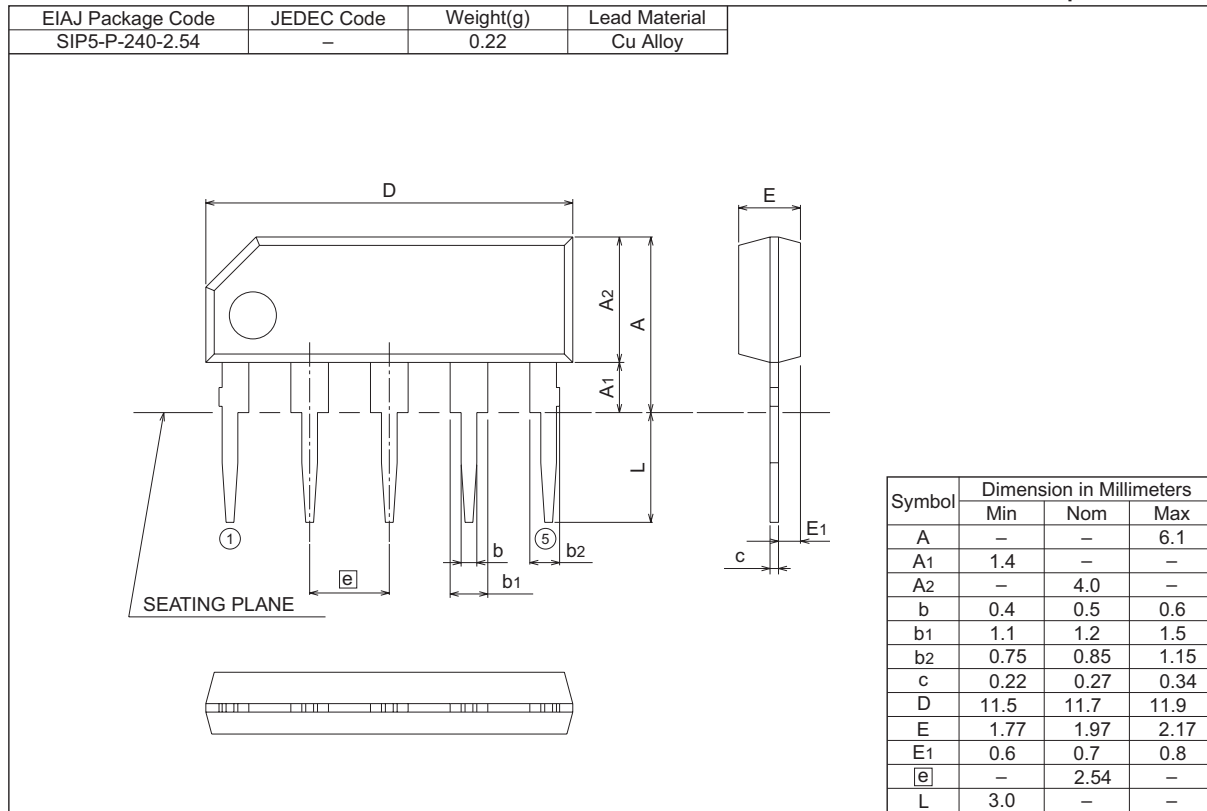
Figure 1 Reset Circuit of M5195xx Series

- 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

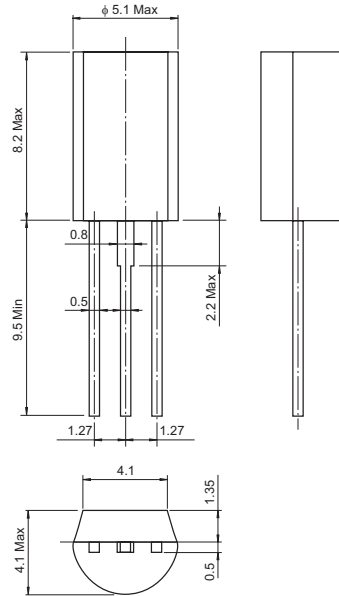
Plastic 5pin 240mil SIP



M51951A,B/M51952A,B

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

Unit: mm



Notes:

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