To all our customers

Regarding the change of names mentioned in the document, such as Mitsubishi Electric and Mitsubishi XX, to Renesas Technology Corp.

The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

DESCRIPTION

M51981 are semiconductor integrated circuits designed for detecting supply voltage and resetting all types of logic circuits such as CPUs.

They find extensive applications, including battery checking circuits, 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) ...... 0.6V(TYP.) at R_L=22kΩ
- Wide supply voltage range .... 2 to 17V
- Sudden change in power supply has minimal effect on the ICs
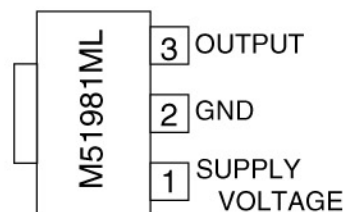- Wide application range

APPLICATION

- Reset pulse generation for almost all logic circuits
- Battery checking, level detecting, waveform shaping circuits
- Delayed waveform generator
- Switching circuit to a back-up power supply
- DC/DC converter
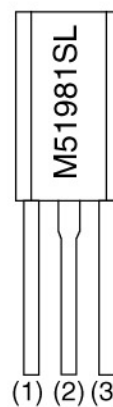- Over voltage protection circuit

RECOMMENDED OPERATING CONDITION

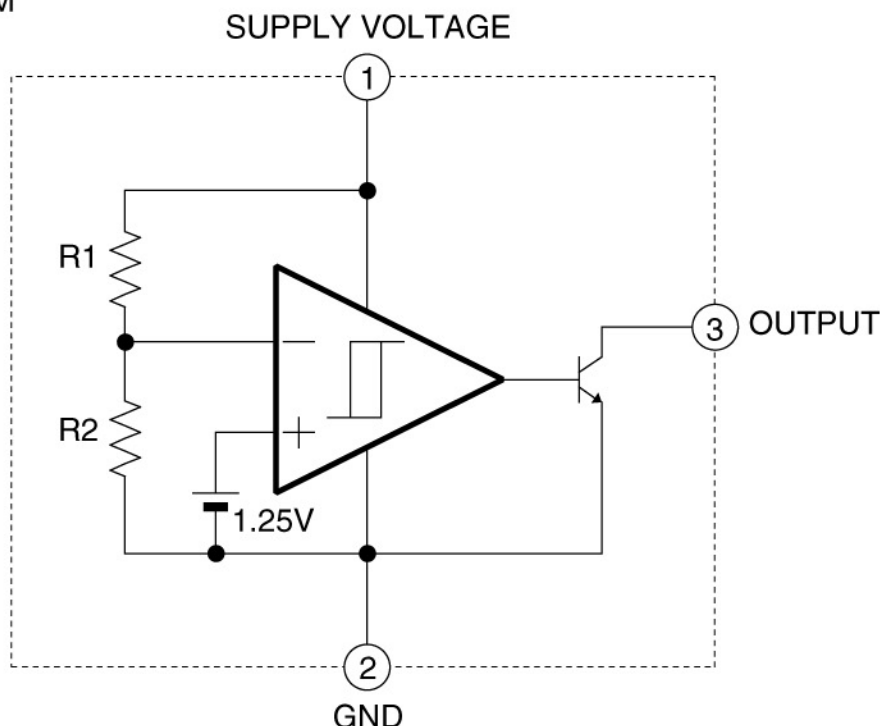- Supply voltage range .... 2 to 17V
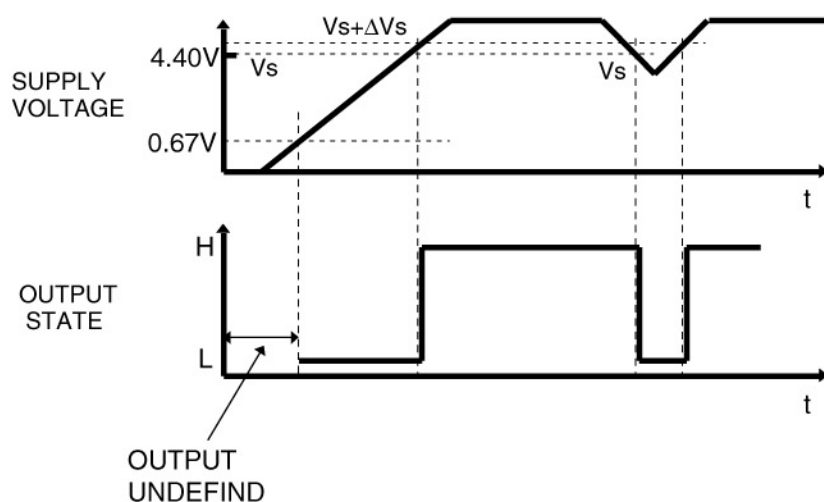
PIN CONFIGURATION (TOP VIEW)

M51981ML
3 OUTPUT
2 GND
1 SUPPLY VOLTAGE

Outline SOT-89

M51981SL

(1) SUPPLY VOLTAGE
(2) GND
(3) OUTPUT

(1) (2) (3)

Outline TO-92L

BLOCK DIAGRAM

SUPPLY VOLTAGE

①

R1

R2

1.25V

③ OUTPUT

②

GND

FUNCTION DIAGRAM

ABSOLUTE MAXIMUM RATINGS (Ta=25°C Unless otherwise noted)

Symbol	Parameter	Test condition	Ratings	Unit
I_{CC}	Supply Voltage		18	V
Isink	Output Sink Current		6	mA
V_O	Output Voltage	Output with constant current load	18	V
Pd	Power Dissipation	SL:TO-92L	700	mW
		ML:SOT-89	500	
K_θ	Thermal Derating	Ta≥25°C SL:TO-92L	7	mW/°C
		ML:SOT-89	5	
Topr	Operating Temperature		-30 to +85	°C
Tstg	Storage Temperature		-40 to +125	°C

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

Symbol	Parameter	Test condition		MIN	TYP	MAX	Unit
				Limits			
V_S	Detecting Voltage			4.20	4.40	4.60	V
ΔV_S	Hysterisis Voltage			30	50	80	mV
$V_S/\Delta T$	Detecting Voltage Temperature Coefficient			——	0.01	——	%/°C
I_{CC}	Circut Current	VCC=5V		——	340	510	μA
Vsat	Output Saturation Voltage	VCC=4V,Isink=4mA		——	0.2	0.4	V
V_{OPL}	Threshold Operating Voltage	Minimum supply voltage for IC operation	RL=2.2kΩ,Vsat≤0.4V	——	0.67	0.8	V
			RL=100kΩ,Vsat≤0.4V	——	0.55	0.7	
I_{OH}	Output Leakage Current			——	——	30	nA
		Ta= -30 to +85°C		——	——	1	μA
tPHL	Propagation Deray Time	Response time when Vcc changes H to L		——	6	——	μs
tPLH		Response time when Vcc changes L to H		——	3	——	

Example of application circuit
Reset Circuit of M51981
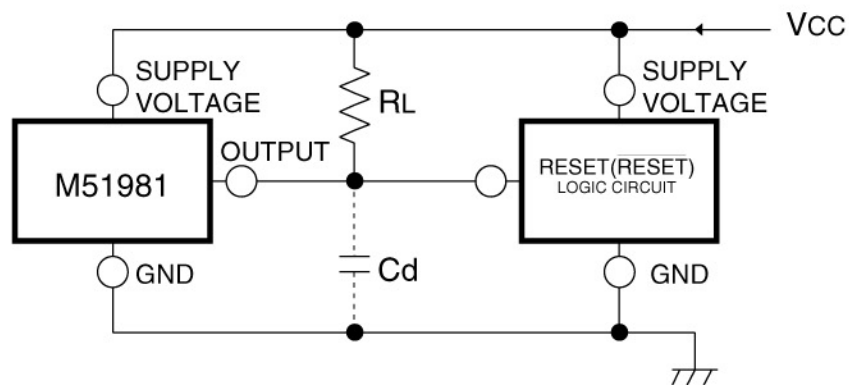
Note 1.
 The logic circuit preferably should not
have a pull-down resistor,but if one is prese-
nt,add load resistor RL to overcome the pull-
down resistor.