M51943A,B/M51944A,B

VOLTAGE DETECTING, SYSTEM RESETTING IC SERIES

DESCRIPTION

M51943A,B/M51944A,B 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 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
  .... 0.6V (TYP.) at R_L = 22kΩ
- 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)
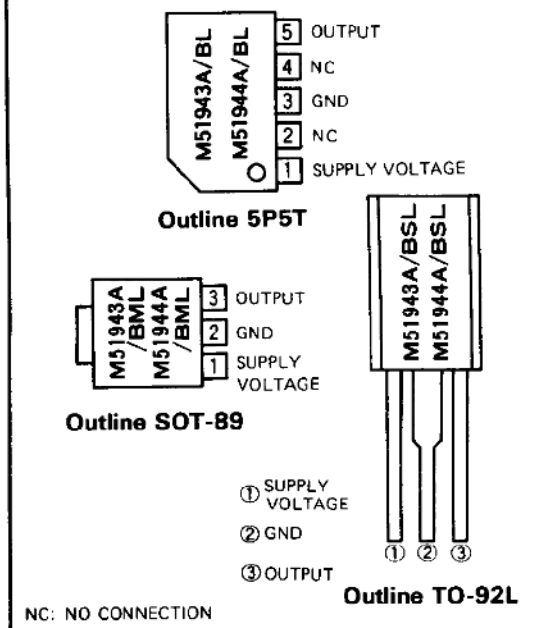- Extra small 3-pin package (3-pin FALT)

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.
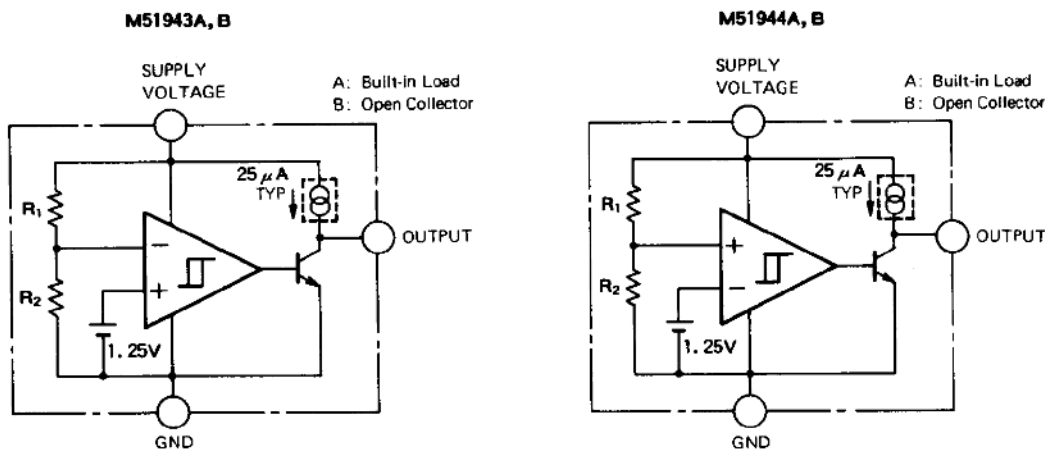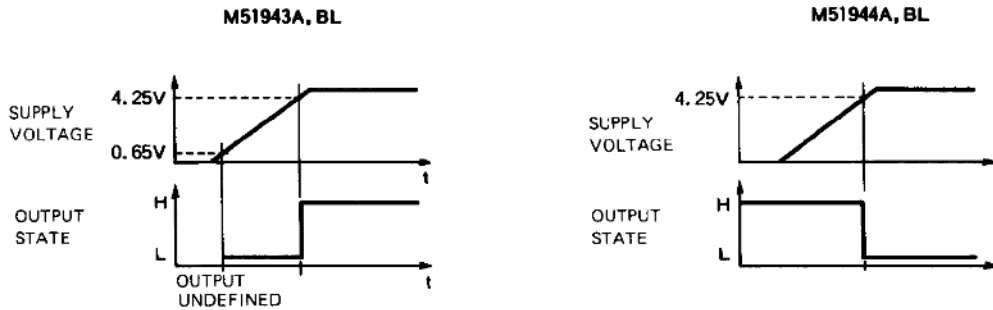
RECOMMENDED OPERATING CONDITION

Supply voltage range .... 2 ~ 17V

PIN CONFIGURATION

M51943A/BL
M51944A/BL

5	OUTPUT
4	NC
3	GND
2	NC
1	SUPPLY VOLTAGE

Outline 5P5T

M51943A/BML
M51944A/BML

3	OUTPUT
2	GND
1	SUPPLY VOLTAGE

Outline SOT-89

M51943A/BSL
M51944A/BSL

① SUPPLY VOLTAGE
② GND
③ OUTPUT

① ② ③

Outline TO-92L

NC: NO CONNECTION

BLOCK DIAGRAM

M51943A, B

SUPPLY VOLTAGE

A: Built-in Load
B: Open Collector

25μA TYP

R_1
R_2

1.25V

OUTPUT

GND

M51944A, B

SUPPLY VOLTAGE

A: Built-in Load
B: Open Collector

25μA TYP

R_1
R_2

1.25V

OUTPUT

GND

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FUNCTION DIAGRAM

M51943A, BL

M51944A, BL

ABSOLUTE MAXIMUM RATINGS (Ta=25℃, unless otherwise noted)

Symbol	Parameter	Conditions		Ratings	Unit
Vcc	Supply voltage			18	V
Isink	Output Sink Current			6	mA
Vo	Output voltage	A Type (Output with constant current load)		Vcc	V
		B Type (Open collector output)		18	
Pd	Power dissipation	5P SIL		450	mW
		3P SIL		700	
		3P FLAT		500	
Kθ	Thermal Derating	Ta≧25℃	5P SIL	4.5	mW/℃
			3P SIL	7	
			3P FLAT	5	
Topr	Operating temperature			−30～+85	℃
Tstg	Storage temperature			−40～+125	℃

ELECTRICAL CHARACTERISTICS (Ta=25℃, unless otherwise noted)

"L" reset type	"H" reset type
M51943A	M51944A
M51943B	M51944B

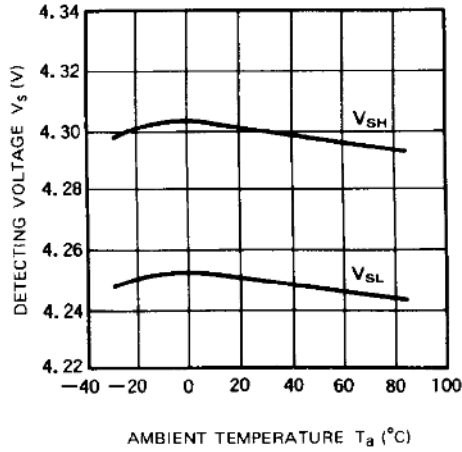| Symbol	Parameter	Test conditions		Limits			Unit
				Min	Typ	Max	
Vs	Detecting voltage			4.05	4.25	4.45	V
⊿Vs	Hysterisis voltage			30	50	80	mV
Vs/⊿T	Detecting voltage Temperature Coefficient			—	0.01	—	%/℃
Icc	Circuit Current	A type Vcc=5V		—	370	560	μA
		B type Vcc=5V		—	370	510	
Vsat	Output Saturation Voltage	L reset type Vcc=4V, Isink=4mA		—	0.2	0.4	V
		H reset type Vcc=5V, Isink=4mA					
VOPL	Threshold Operating voltage	L reset type 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	
IOH	Output Leakage Current	B type		—	—	30	nA
		B Type Ta=−30～+85℃		—	—	1	μA
IOC	Output Load Current	A type Vcc=5V, Vo=1/2×Vcc		−40	−25	−17	μA
VOH	Output High Voltage	A type		Vcc−0.2	Vcc−0.06	—	V
tPHL	Propagation Deray Time	Response time when Vcc changes H→L		—	6	—	μs
tPLH		Response time when Vcc changes L→H		—	3	—	μs

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VOLTAGE DETECTING, SYSTEM RESETTING IC SERIES
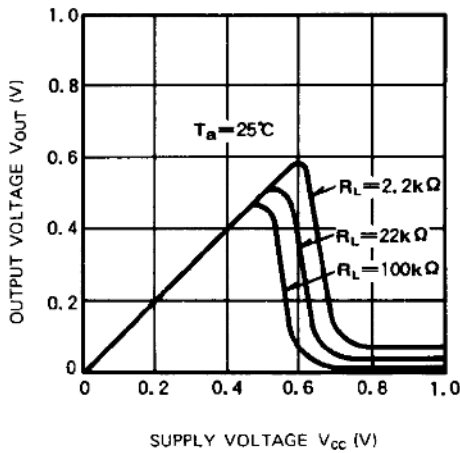
TYPICAL CHARACTERISTICS

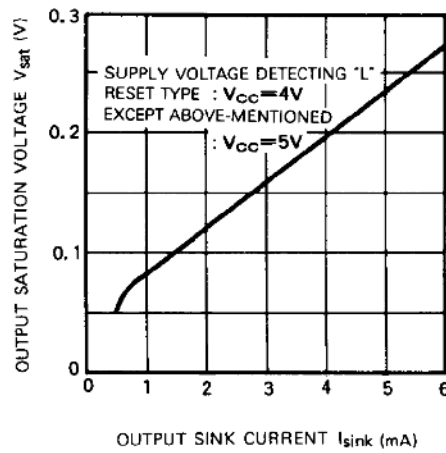### TYPICAL CHARACTERISTICS THERMAL DERATING (MAXIMUM RATING)

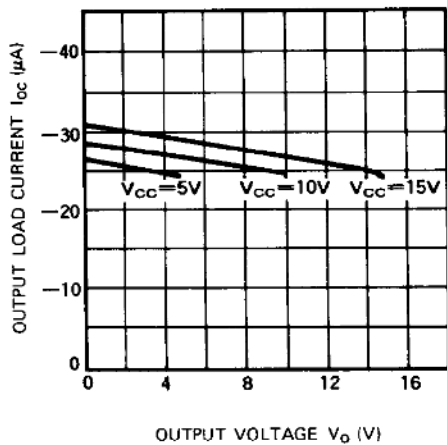### DETECTING VOLTAGE VS. AMBIENT TEMPERATURE (Supply voltage detecting series)

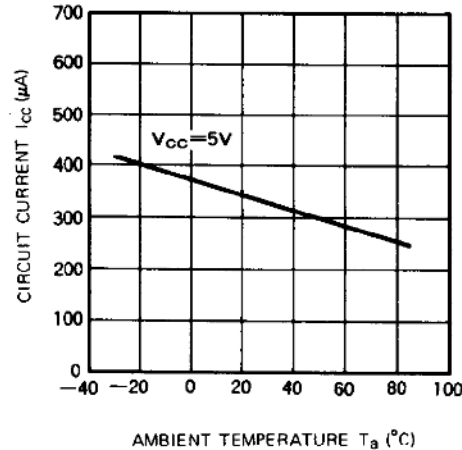### THRESHOLD OPERATING VOLTAGE ([L] reset type)

OUTPUT SATURATION VOLTAGE VS. OUTPUT SINK CURRENT
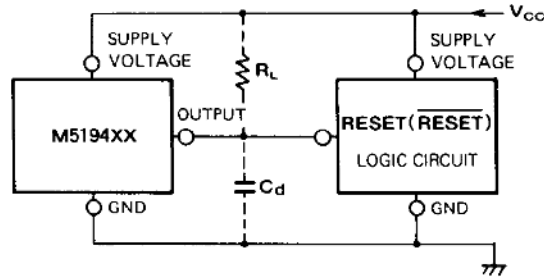

OUTPUT LOAD CURRENT VS. OUTPUT VOLTAGE (M519XXA)

CIRCUIT CURRENT VS. AMBIENT TEMPERATURE (M51943B, M51944B)

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EXAMPLE OF APPLICATION CIRCUIT
Reset Circuit of M5194XX Series

Note 1. When the detecting supply voltage is 4.25V, M51943 and M51944 are used. When the voltage is anything except 4.25V, M51945 and M51946 are used.

Note 2. If the M5194XX and the logic circuit share a common power source, type A (built-in load type) can be used whether a pull-up resister is included in the logic circuit or not.

Note 3. 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.

Note 4. It is better to use the M5195XX series to cause a delay, but if the delay is caused by the M5194XX series, the delay capacitor Cd is applied between the output and GND.

Note 5. When the reset terminal in the logic circuit is of the low reset type, M51943 and M51945 are used and when the terminal is of the high reset type, M51944 and M51946 are used.

Note 6. When a negative supply voltage is used, the supply voltage side of M5194XX and the GND side are connected to GND and the nagative supply voltage respectively.

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