SUPPLY VOLTAGE MONITOR

ZM33064

ISSUE 4 - JANUARY 2003

DEVICE DESCRIPTION

The ZM33064 is a three terminal under voltage monitor circuit for use in microprocessor systems. The threshold voltage of the device has been set to 4.6 volts making it ideal for 5 volt circuits.

Included in the device is a precise voltage reference and a comparator with built in hysteresis to prevent erratic operation. The ZM33064 features an open collector output capable of sinking at least l0mA which only requires a single external resistor to interface to following circuits.

Operation of the device is guaranteed from one volt upwards, from this level to the device threshold voltage the output is held low providing a power on reset function. Should the supply voltage, once established, at any time drop below the threshold level then the output again will pull low.

The device is available in a TO92 package for through hole applications as well as SOT223 for surface mount requirements.
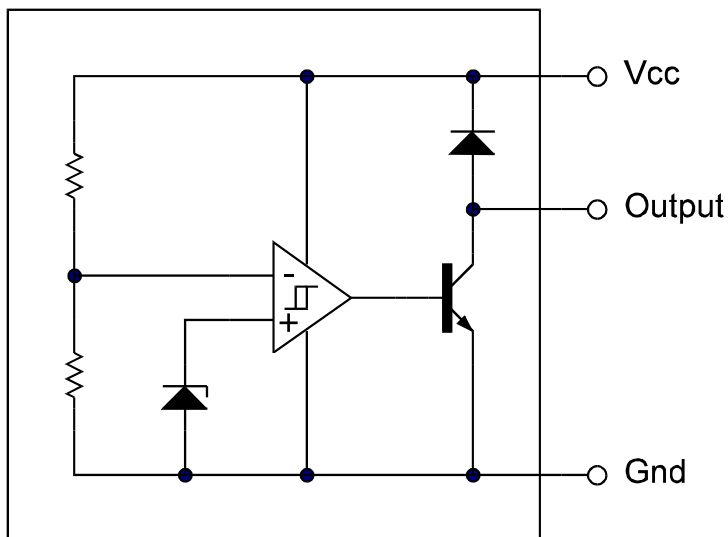
FEATURES

- SOT223 and TO92 packages
- Power on reset generator
- Automatic reset generation
- Low standby current
- Guaranteed operation from 1 volt
- Wide supply voltage range
- Internal clamp diode to discharge delay capacitor
- 4.6 volt threshold for 5 volt logic
- 20mV hysteresis prevents erratic operation

APPLICATIONS

- Microprocessor systems
- Computers
- Computer peripherals
- Instrumentation
- Automotive
- Battery powered equipment

SCHEMATIC DIAGRAM

ZM33064

ABSOLUTE MAXIMUM RATING

Input Supply Voltage   -1 to 10V   **Power Dissipation**

Offstate Output Voltage   10V   TO92   780mW

Onstate Output
Sink Current(Note 1)   Internally limited SOT223   2W(Note 2)

Clamp diode
Forward Current(Note 1)   100mA

Operating junction
temperature   150°C

Operating Temperature   -40 to 85°C

Storage Temperature   -65 to 150°C

TEST CONDITIONS
(T_{amb}=25°C for typical values, T_{amb}=-40 to 85°C for min/max values (Note3))

COMPARATOR

PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNITS
Threshold Voltage High state output (Vcc increasing) Low state output (Vcc decreasing)	V_{IH} V_{IL}	4.5 4.5	4.61 4.59	4.7 4.7	V V
Hysteresis	V_H	0.01	0.02	0.05	V

OUPUT

PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNITS
Output sink saturation:	V_{OL}				
(V_{cc}=4.0V, I_{sink}=8.0mA)			0.46	1.0	V
(V_{cc}=4.0V, I_{sink}=2.0mA)			0.15	0.4	V
(V_{cc}=1.0V, I_{sink}=0.1mA)				0.25	V
Onstate output sink current (V_{cc} , Output=4V)	I_{sink}	10	20	60	mA
Offstate output leakage current (V_{cc} , Output=5V)	I_{oh}		0.02	0.5	µA
Clamp diode forward voltage (I_f=10mA)	V_f	0.6	1.2	1.5	V
Propagation delay (V_{in} 5V to 4V, R_l=10k, T_{amb}=25°C)	T_d		1.5		µs

TOTAL DEVICE

PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNITS
Operating input voltage range	V_{cc}	1.0 to 6.5			V
Quiescent input current (V_{cc}=5V)	I_q		135	200	µA

Note:
1. Maximum package power dissipation must be observed
2. Maximum power dissipation for the SOT223 package is calculated assuming that the device is mounted on a PCB measuring 2 inches square.
3. Low duty cycle pulse techniques are used during test to maintain junction temperatures as
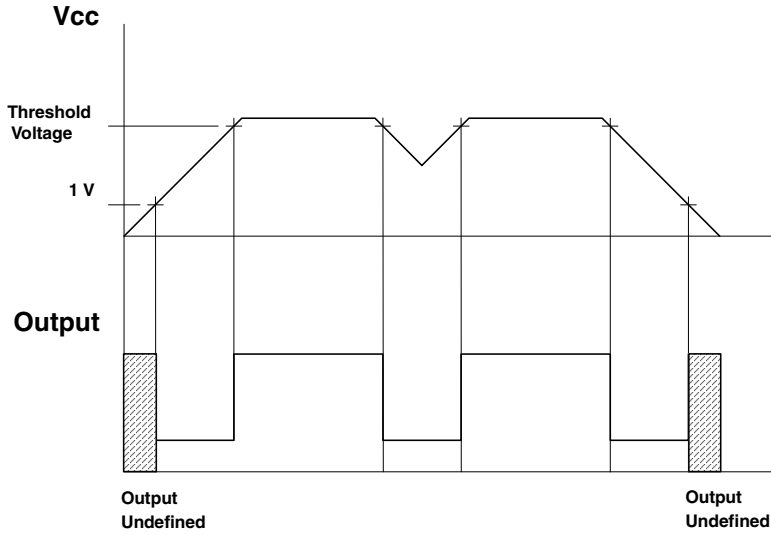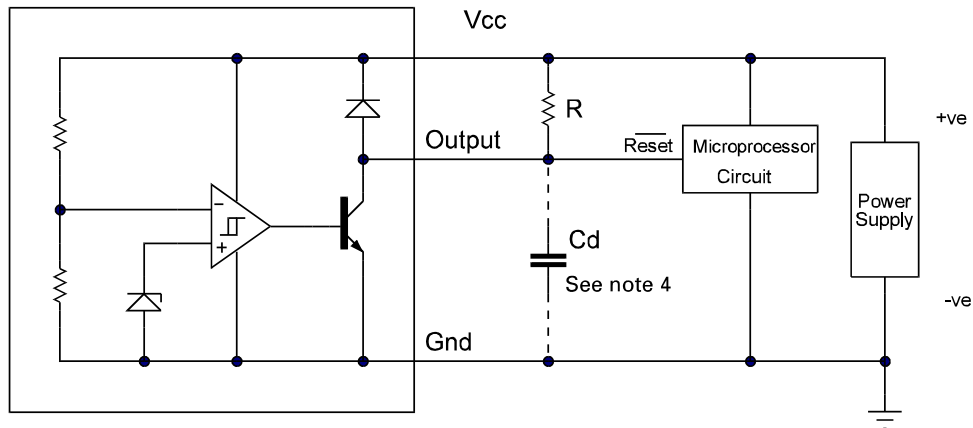
TYPICAL CHARACTERISTICS

Input Current vs. Input Voltage

Output Voltage vs. Input Voltage

Output Saturation Voltage vs. Sink Current

Reset Delay Time

Clamp Diode Forward Current vs. Voltage

Threshold Voltage vs. Temperature

ZM33064

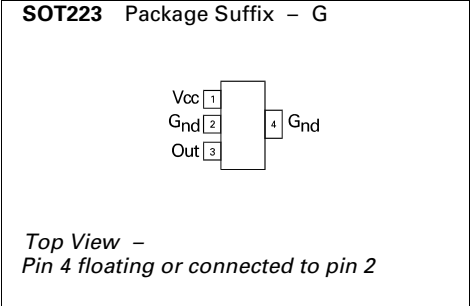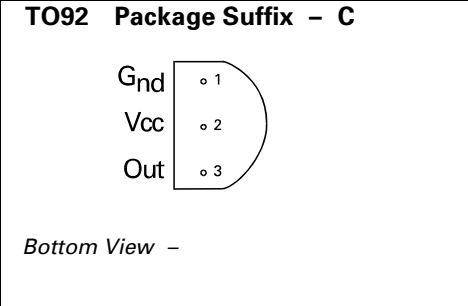**TIMING DIAGRAM**

APPLICATION CIRCUIT

Note 4:   A time delayed reset can be accomplished with the additional Cd.

$$T_{DY} = RCd \ \ln\left(\frac{1}{1 - \dfrac{V_{TH(mpu)}}{V_{in}}}\right)$$

T_{DY} =Time (Seconds)
V_{TH} =Microprocessor Reset Threshold
V_{in} =Power Supply Voltage

ZM33064

CONNECTION DIAGRAMS

TO92   Package Suffix – C

G$_{nd}$ o 1

Vcc   o 2

Out   o 3

Bottom View –

SOT223   Package Suffix – G

Vcc 1

G$_{nd}$ 2   4 G$_{nd}$

Out 3

Top View –
Pin 4 floating or connected to pin 2

ORDERING INFORMATION

Part Number	Package	Part Mark
ZM33064G	SOT223	ZM33064
ZM33064C	TO92	ZM33064