

Simple Reset Circuits for the ST62

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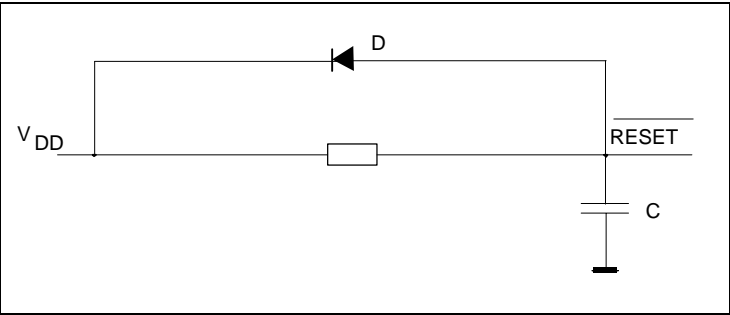
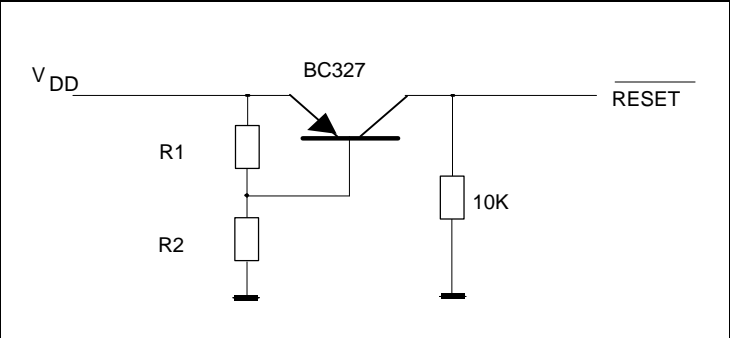
INTRODUCTION

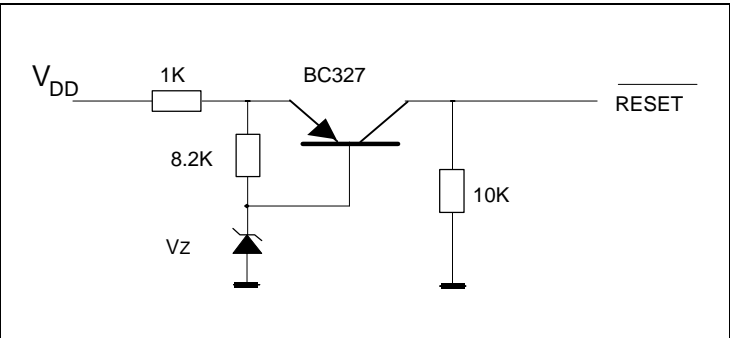
The following circuit schematics show examples of reset circuits for the ST62xx microcontrollers. These circuits range from a very simple solution, which is only efficient at power down, to a circuit providing power up and power down monitoring with a delay at power on. When used with the watchdog Timer and a software implementation, an efficient and reliable reset of the ST62 can be made.

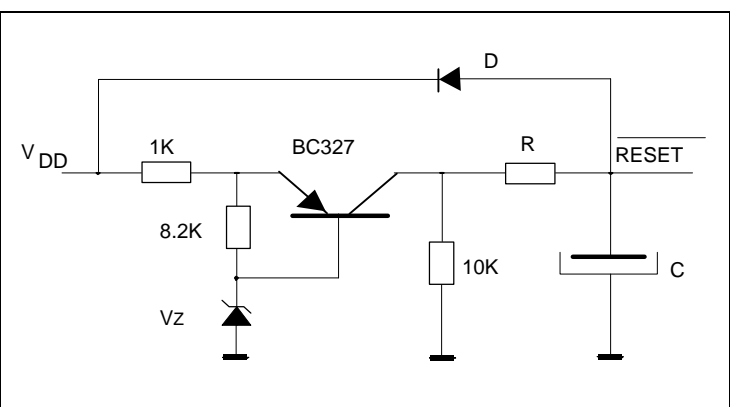
The second part of this note presents a program which takes advantage of the presence of a watchdog inside the ST62 microcontroller to prevent a loss of functions in case of bad or noisy reset input signal.

1 HARDWARE IMPLEMENTATIONS

The RESET signal should not go high if the voltage supply is outside the microcontroller frequency/voltage range

- a) 
- Simple and cost effective, but is active only at power on.
 - Needs a delay between two successive power-on cycles to discharge C.
- b) 
- Reset signal is held low at both Power on and Power off for security.
 - Monitored voltage:

$$V_S + 0.6 \times \frac{R_1 + R_2}{R_1}$$
- c) 
- Similar to b), but with slightly more precise voltage switching.
 - Monitored voltage:

$$V_S = V_Z$$
- d) 
- Reset signal is held active at both Power on and Power off.
 - Delay at Power on and Power off determined by the time constant of RC.
 - Monitored voltage:

$$V_S = V_Z$$

With the internal configuration of the ST62 I/O pins, the diode d can be externally suppressed.

Software implementation

To prevent a loss of function from a bad or noisy reset input, a software loop lasting approximately 20ms can be implemented immediately after the reset. In this loop, within the first few instructions, the Watchdog Timer is activated with a short time-out delay.

If, during this loop, the ST62 program gets lost due to an incorrect reset, the Watchdog will time-out and provide a further clean reset. This will continue until the program exits the delay with correct operation.

EXAMPLE RESET ROUTINE

<Software>

```
start
    ldi    wdt,10000011b    ; start watchdog for 384uS
    ldi    count,0
n1
    ldi    wdt,10000011b
    ldi    a,0

n2    inc    a                ; 19 x 16.25uS = 338uS
    cpi    a,19
    jrc    n2

    inc    count
    ld     a,count
    cpi    a,59                ; 59 x 338us = 19.9mS
    jrc    n1

; program starts here
; CAUTION, watchdog is now activated forever

    ldi    wdt,11111111b
    ...
    ...
    ...
    ldi    wdt,11111111b
    ...
    ...
    ...
    ldi    wdt,11111111b
    ...
    ...
    ...
```

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