

Simple Reset Circuits for the ST62

T. CASTAGNET, J. NICOLAI, L. PERIER

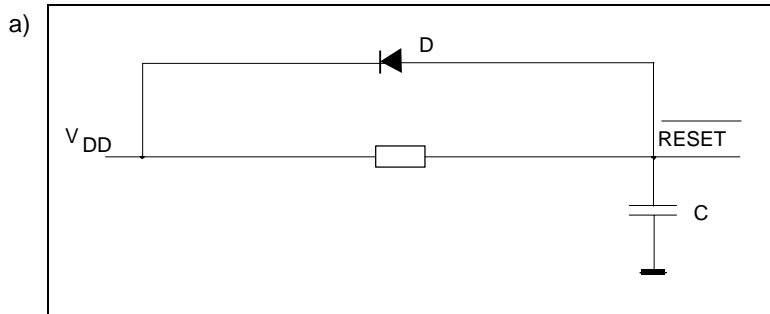
INTRODUCTION

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.

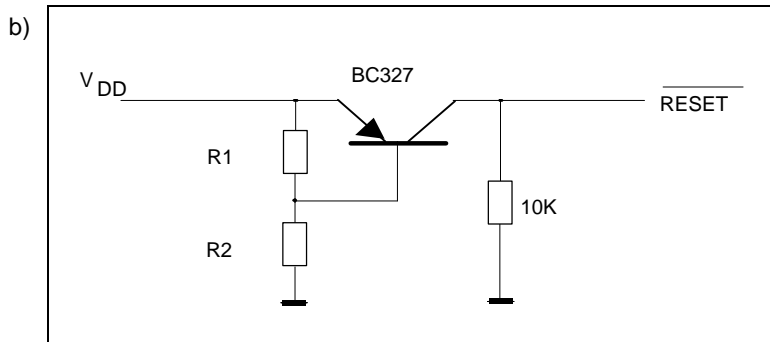
The second part of this note presents a program which takes advantage of the presence of a watchdog inside the ST62 microcontroller to prevent a loss of functions in case of bad or noisy reset input signal.

1 HARDWARE IMPLEMENTATIONS

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

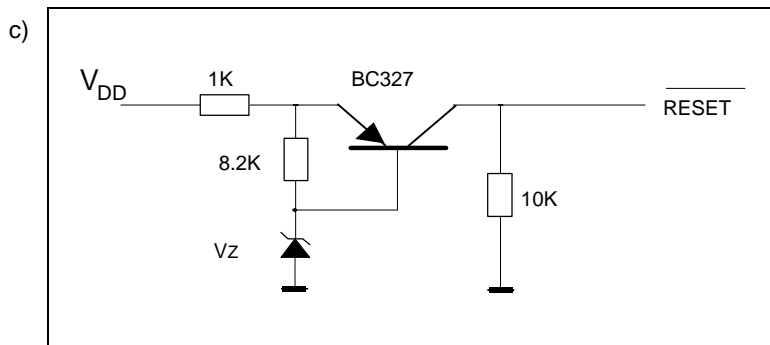


- Simple and cost effective, but is active only at power on.
- Needs a delay between two successive power-on cycles to discharge C.

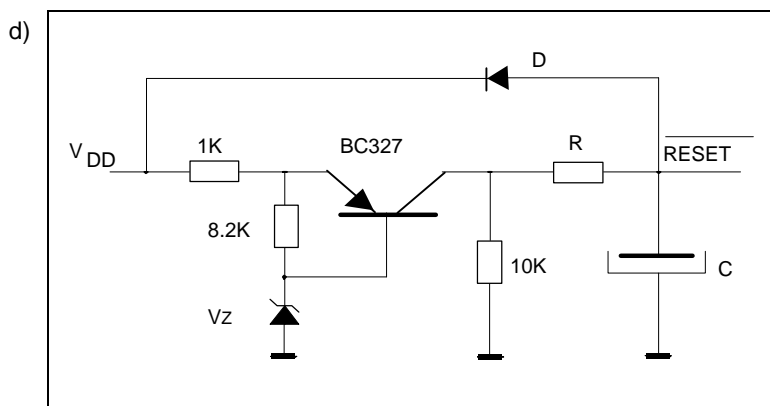


- Reset signal is held low at both Power on and Power off for security.
- Monitored voltage:

$$V_S + 0.6 \times \frac{R_1 + R_2}{R_1}$$



- Similar to b), but with slightly more precise voltage switching.
- Monitored voltage:
 $V_S = V_Z$



- 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
    ...
    ...
    ...
```

SIMPLE RESET CIRCUITS FOR THE ST62

THE SOFTWARE INCLUDED IN THIS NOTE IS FOR GUIDANCE ONLY. SGS-THOMSON SHALL NOT BE HELD LIABLE FOR ANY DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES WITH RESPECT TO ANY CLAIMS ARISING FROM USE OF THE SOFTWARE.

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without the express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I²C Components by SGS-THOMSON Microelectronics, conveys a license under the Philips I²C Patent. Rights to use these components in an I²C system, is granted provided that the system conforms to the I²C Standard Specifications as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco
The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom -
U.S.A.