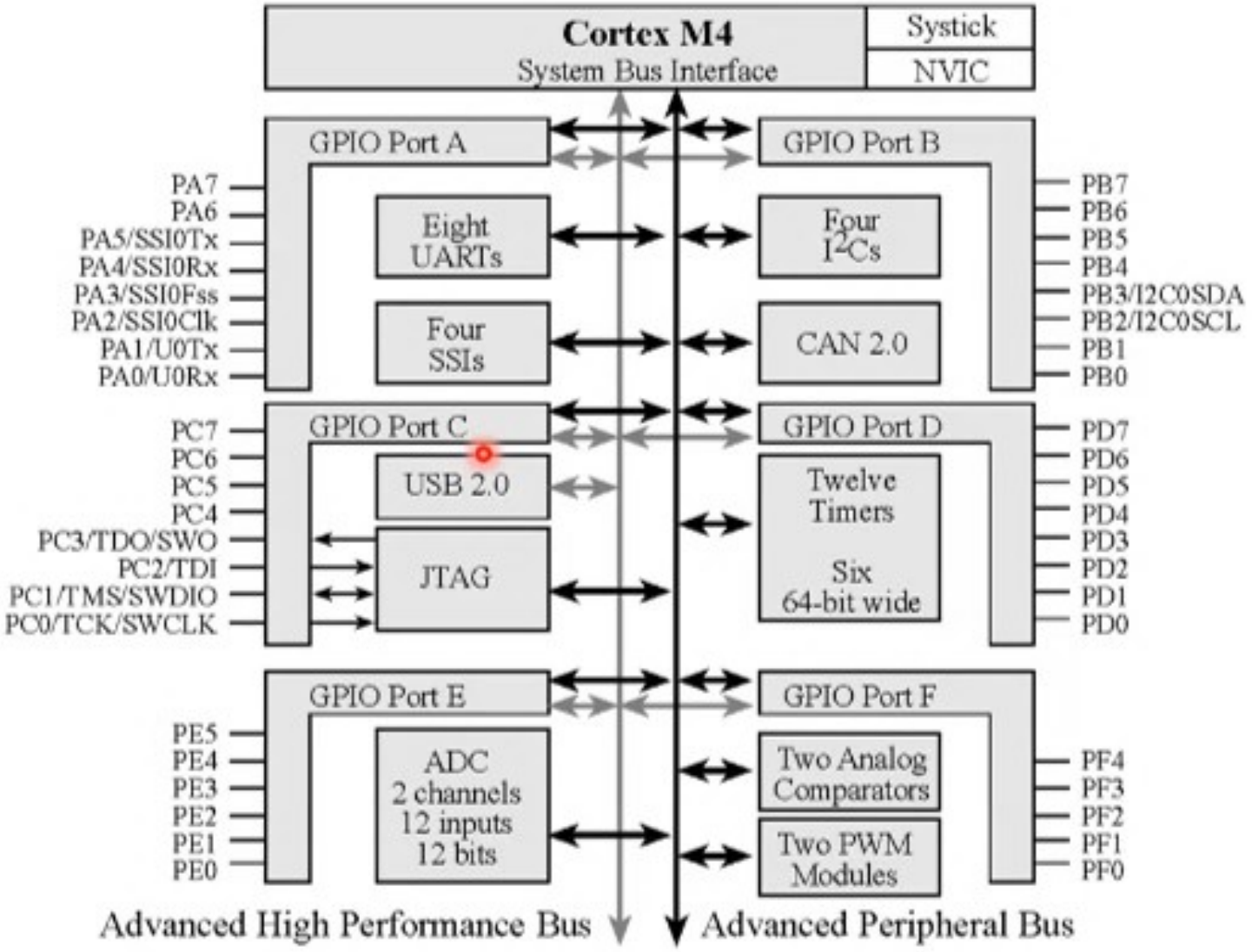
Texas Instruments TM4C123



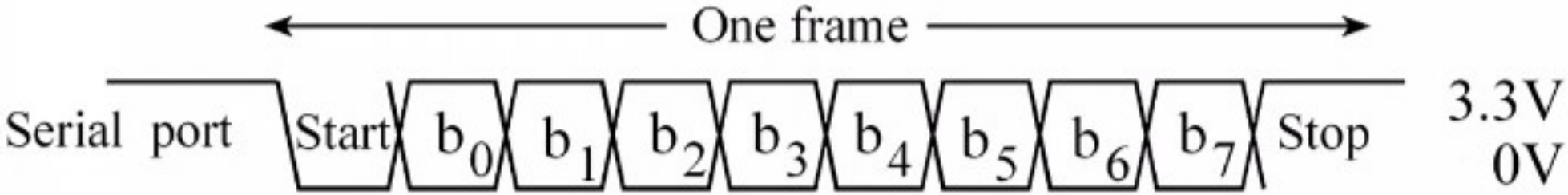
ARM Cortex-M4
+ 256K Flash
+ 32K RAM
+ JTAG
+ 43 Ports
+ SysTick
+ ADC
+ UART

SysTick Timer

```
;------------SysTick_Wait------------
; Time delay using busy wait.
; Input: R0  delay parameter in units of the core clock
;        80 MHz(12.5 nsec each tick)
; Output: none
; Modifies: R1
SysTick_Wait
    SUB  R0, R0, #1    ; delay-1
    LDR  R1, =NVIC_ST_RELOAD_R
    STR  R0, [R1]      ; time to wait
    LDR  R1, =NVIC_ST_CURRENT_R
    STR  R0, [R1]      ; any value written to CURRENT clears
    LDR  R1, =NVIC_ST_CTRL_R
SysTick_Wait_loop
    LDR  R0, [R1]      ; read status
    ANDS R0, R0, #0x00010000 ; bit 16 is COUNT flag
    BEQ  SysTick_Wait_loop   ; repeat until flag set
    BX   LR
```

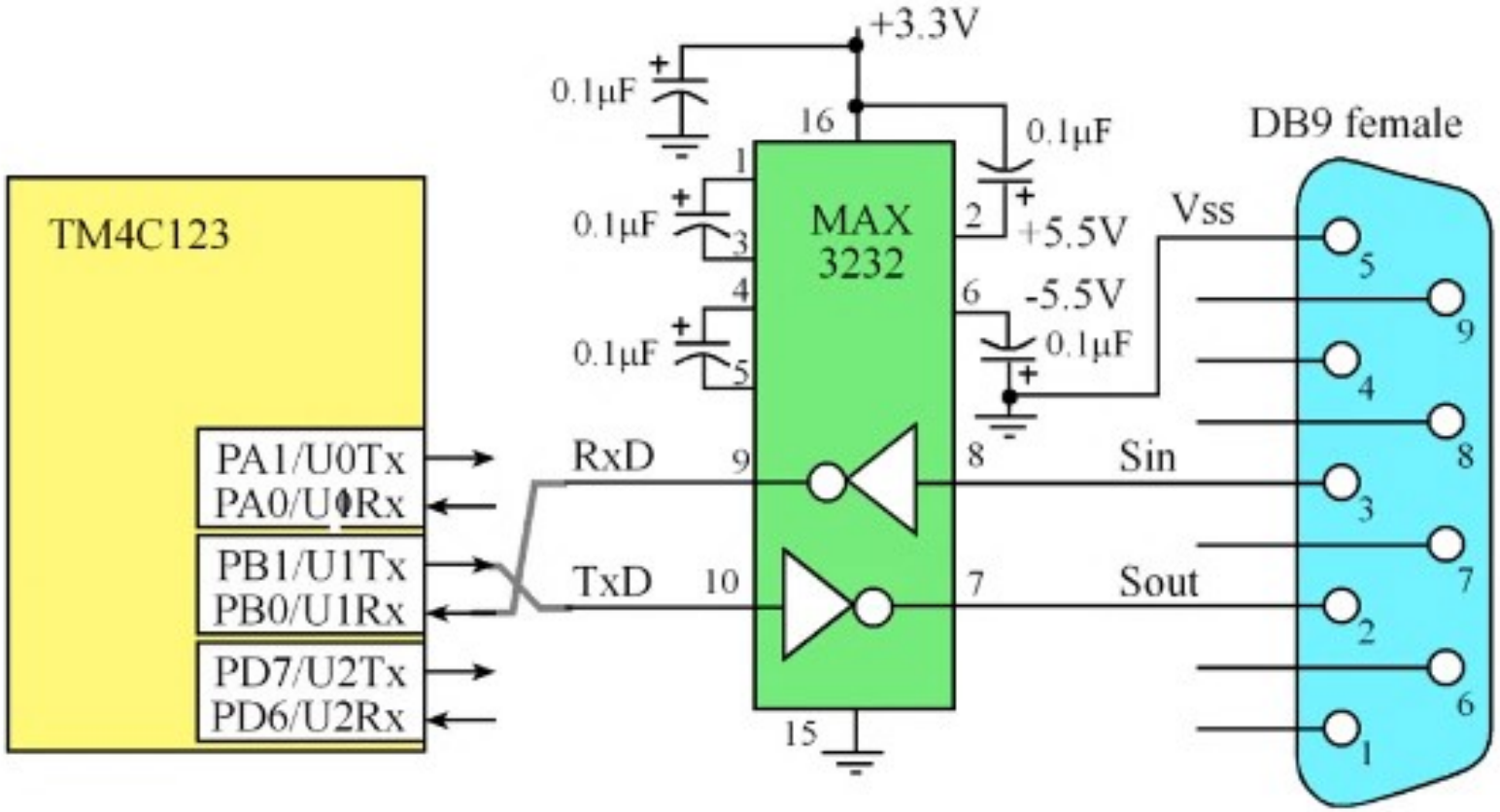
Universal Asynchronous Receiver/Transmitter (UART)

- UART (Serial Port) Interface



- Send/receive a *frame* of (5-8) data bits with a single (start) bit prefix and a 1 or 2 (stop) bit suffix
- Baud rate is total number of bits per unit time
  - Baudrate = 1 / bit-time
- Bandwidth is data per unit time
  - Bandwidth = (data-bits / frame-bits) * baudrate

RS-232 Serial Port



DB25 Pin	RS232 Name	DB9 Pin	EIA-574 Name	Signal	Description	True	DTE	DCE
2	BA	3	103	TxD	Transmit Data	-5.5V	out	in
3	BB	2	104	RxD	Receive Data	-5.5V	in	out
7	AB	5	102	SG	Signal Ground			

UART - Transmitter