TABLE 2-13 P100

PAGE 649 OF DATA SHEET

2 BUSSES
AHB - every clock cycle
APB - every 2 clock cycles

6 GPIO BLOCK
A, B, C, D, E, F

GPIO Interrupts
- masking
- edge
- level

BIT MASKING
< MORE TO COME >

FEATURES
SCHMIDT TRIGGER INPUTS
PULL UP / PULL DOWN
CURRENT SINK CONTROL (2, 4, 8 mA)
SLEW RATE
OPEN DRAIN ENABLES
DIGITAL INPUTS

MULTIPLE FUNCTIONS PER PIN

LOCKED PINS

PAGE 658, 10.4 register map

2 address for each GPIO PORT

REGISTER ACCESS FOR GPIODATA VS. BITBANDING

Program example:

→ PINOUT OF TRANSISTOR

→ FWD BIAS OF LED

→ ASSUME LED IS ACTIVE HIGH VS ACTIVE LOW

→ CODE AHEAD OF TIME

GO OVER ADDRESSING, AGAIN

addr → 0x 4000 73FC

TABLE 2-5, p95

TABLE 2-7, p98

"PERIPHERAL MEMORY"

go to page ~~695~~ 658

4000.7000 → PORT D

(~~4000~~ 4005.B000 Address on AHB)

0x [4000 7] [3FC]

↓ APB, PORT D

→ GPIODATA

0x0 - 0x4000

BIT MASKING

10.2.1.2 P 654

BITS 2:9

11 10 9 8 7 6 5 4 3 2 1 0

0 0 [0 0 0 0 0 0] 0 0

determines bit that are written or read

TO CONTROL GPIO PINS

SET SYSTEM CLOCK

~~GPIO DIR~~ GPIO

~~INTERRUPT~~

ENABLE ↑ CLOCKS

SYSCTL_RCGCGPIO_R p 340

GPIOHBCTL p 258
select AHB
or APB

Set DIRECTION
GPIO_PORTx_DIR_R

SET ENABLE
GPIO_PORTx_DEN_R

PULL UP OR PULL DOWN
GPIO_PORTx_PUR_D
GPIO_PORTx_POR_D
(input only)

LETS LOOK AT THE HEADER, AND RE WRITE THE BITBAND MACRO.

LEARNING OBJECTIVES

STUDENT SHALL BE ABLE TO:

1. WRITE CODE THAT WILL DRIVE SIMPLE LED CIRCUITS AND READ SWITCHES
   - A) SET UP ALL REGISTERS
   - B) PULL UP / PULL DOWN
2. ACCESS THE GPIO_PORTx_DATA_R (reading and writing)
   - A) GPI_PORTx_DATA_R
   - B) BY SELECTING BITS AND USING THE MASK FEATURE
   - C) BIT BANDING
3. SELECT AHB OR APB FOR A SPECIFIC GPIO PORT
4. GIVEN AN ADDRESS, DETERMINE WHAT IT IS?

USING:

1. DATA SHEETS
2. PROCESSOR HEADER FILE
3. MACRO / FUNCTION TO SET SYSTEM CLOCKS
4. (FOR CONVENIENCE) A PROVIDED DELAY FUNCTIONS OR MACRO.