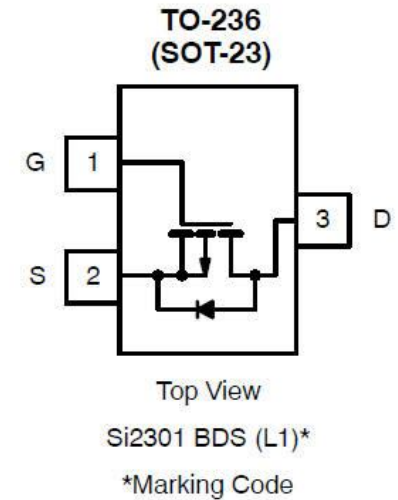
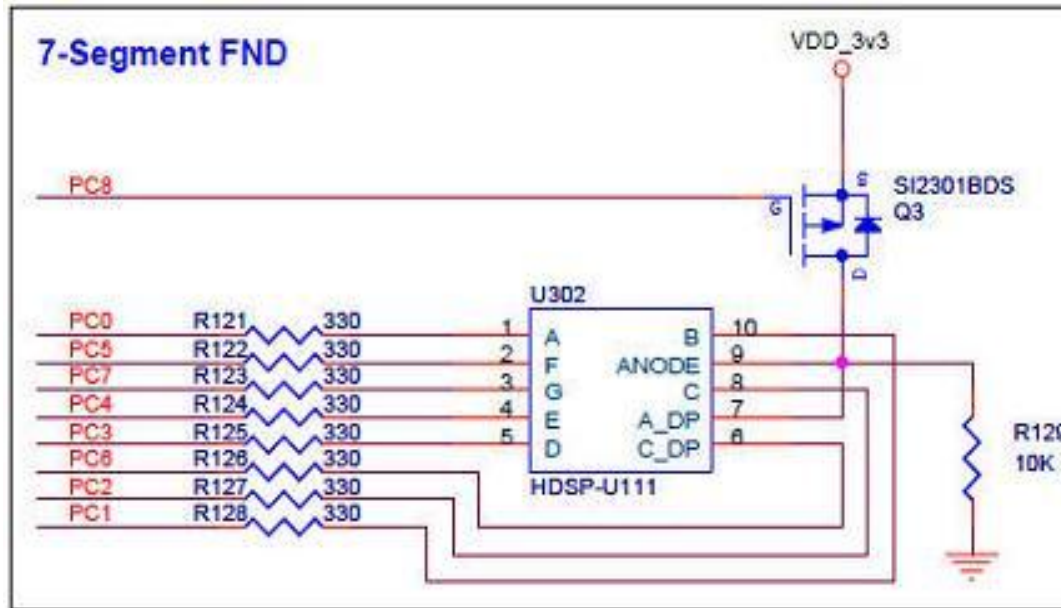


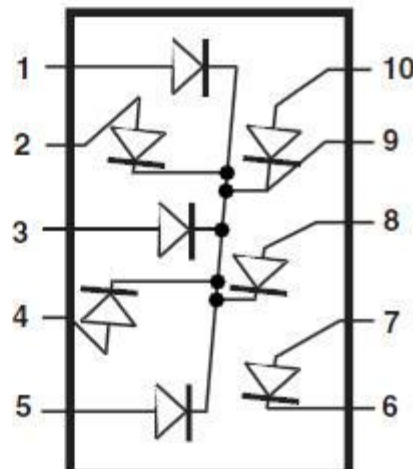
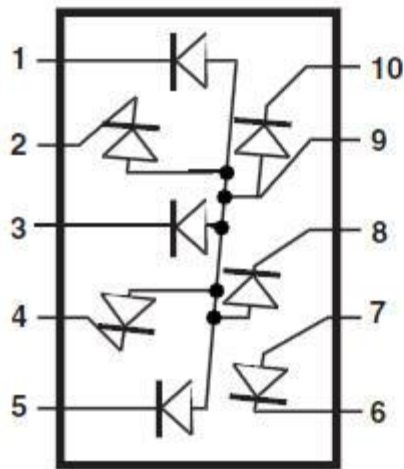
7 Segment 실습

2010.02.08

7-Segment (1)

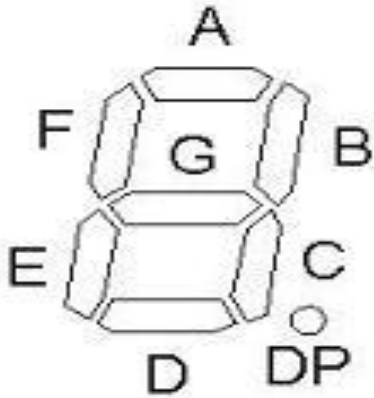


P-channel MOSFET



PIN	FUNCTION	
	A	B
1	CATHODE a	ANODE a
2	CATHODE f	ANODE f
3	CATHODE g	ANODE g
4	CATHODE e	ANODE e
5	CATHODE d	ANODE d
6	CATHODE DP	CATHODE DP
7	ANODE DP	ANODE DP
8	CATHODE c	ANODE c
9	ANODE	CATHODE
10	CATHODE b	ANODE b

7-Segment (2)



- 7-segment라는 이름에서 보여지듯이 7가지의 불빛으로 아라비아 숫자를 모두 나타낼 수 있는 것이다.
- 사실 동작시켜야 할 GPIO는 9개
 - A ~ G: 7개
 - DP로 점을 나타내는 부분
 - Power 부분

Pin 번호 설정 (1)

```
#define GPIO_Pin_0 ((uint16_t)0x0001) /*!< Pin 0 selected */
#define GPIO_Pin_1 ((uint16_t)0x0002) /*!< Pin 1 selected */
#define GPIO_Pin_2 ((uint16_t)0x0004) /*!< Pin 2 selected */
#define GPIO_Pin_3 ((uint16_t)0x0008) /*!< Pin 3 selected */
#define GPIO_Pin_4 ((uint16_t)0x0010) /*!< Pin 4 selected */
#define GPIO_Pin_5 ((uint16_t)0x0020) /*!< Pin 5 selected */
#define GPIO_Pin_6 ((uint16_t)0x0040) /*!< Pin 6 selected */
#define GPIO_Pin_7 ((uint16_t)0x0080) /*!< Pin 7 selected */
#define GPIO_Pin_8 ((uint16_t)0x0100) /*!< Pin 8 selected */
#define GPIO_Pin_9 ((uint16_t)0x0200) /*!< Pin 9 selected */
#define GPIO_Pin_10 ((uint16_t)0x0400) /*!< Pin 10 selected */
#define GPIO_Pin_11 ((uint16_t)0x0800) /*!< Pin 11 selected */
#define GPIO_Pin_12 ((uint16_t)0x1000) /*!< Pin 12 selected */
#define GPIO_Pin_13 ((uint16_t)0x2000) /*!< Pin 13 selected */
#define GPIO_Pin_14 ((uint16_t)0x4000) /*!< Pin 14 selected */
#define GPIO_Pin_15 ((uint16_t)0x8000) /*!< Pin 15 selected */
#define GPIO_Pin_All ((uint16_t)0xFFFF) /*!< All pins selected */
```

Pin 번호 설정 (2)

```
#define GPIO_7_SEG_POWER_PIN    GPIO_Pin_8
```

```
#define GPIO_7_SEG_A_PIN        GPIO_Pin_0
```

```
#define GPIO_7_SEG_B_PIN        GPIO_Pin_1
```

```
#define GPIO_7_SEG_C_PIN        GPIO_Pin_2
```

```
#define GPIO_7_SEG_D_PIN        GPIO_Pin_3
```

```
#define GPIO_7_SEG_E_PIN        GPIO_Pin_4
```

```
#define GPIO_7_SEG_F_PIN        GPIO_Pin_5
```

```
#define GPIO_7_SEG_G_PIN        GPIO_Pin_7
```

```
#define GPIO_7_SEG_DP_PIN       GPIO_Pin_6
```

Address Define

```
#define PERIPH_BASE          ((uint32_t)0x40000000)
#define APB1PERIPH_BASE     PERIPH_BASE
#define APB2PERIPH_BASE     (PERIPH_BASE + 0x10000)
#define AHBPERIPH_BASE      (PERIPH_BASE + 0x20000)

#define GPIOA_BASE          (APB2PERIPH_BASE + 0x0800)
#define GPIOB_BASE          (APB2PERIPH_BASE + 0x0C00)
#define GPIOC_BASE          (APB2PERIPH_BASE + 0x1000)
... ..

#define RCC_BASE             (AHBPERIPH_BASE + 0x1000)
#define RCC                  ((RCC_TypeDef *) RCC_BASE)

#define GPIOA                ((GPIO_TypeDef *) GPIOA_BASE)
#define GPIOB                ((GPIO_TypeDef *) GPIOB_BASE)
#define GPIOC                ((GPIO_TypeDef *) GPIOC_BASE)
... ..
```

APB2ENR 레지스터 설정

```
typedef struct
{
    __IO uint32_t CR;
    __IO uint32_t CFGR;
    __IO uint32_t CIR;
    __IO uint32_t APB2RSTR;
    __IO uint32_t APB1RSTR;
    __IO uint32_t AHBENR;
    __IO uint32_t APB2ENR;
    __IO uint32_t APB1ENR;
    __IO uint32_t BDCR;
    __IO uint32_t CSR;
} RCC_TypeDef;
```

```
#define RCC_BASE    \
    (AHBPERIPH_BASE + \
    0x1000)
#define RCC          \
    ((RCC_TypeDef *) \
    RCC_BASE)

int main(void)
{
    int i = 0;
    RCC->APB2ENR |=
        RCC_APB2Periph_GPIOC;
    ... ..
}
```

GPIO 초기화

```
void GPIO_Configuration(void)
{
    GPIO_InitTypeDef GPIO_InitStructure;

    // 7_SEG configuration ...
    GPIO_InitStructure.GPIO_Pin
        = GPIO_7_SEG_POWER_PIN | GPIO_7_SEG_A_PIN
          | GPIO_7_SEG_B_PIN | GPIO_7_SEG_C_PIN
          | GPIO_7_SEG_D_PIN | GPIO_7_SEG_E_PIN
          | GPIO_7_SEG_F_PIN | GPIO_7_SEG_G_PIN
          | GPIO_7_SEG_DP_PIN;
    GPIO_InitStructure.GPIO_Speed = GPIO_Speed_50MHz;
    GPIO_InitStructure.GPIO_Mode  = GPIO_Mode_Out_PP;
    GPIO_Init(GPIO_7_SEG, &GPIO_InitStructure);
}
```


GPIO_TypeDef

```
typedef struct
```

```
{
```

```
    __IO uint32_t CRL;
```

```
    __IO uint32_t CRH;
```

```
    __IO uint32_t IDR;
```

```
    __IO uint32_t ODR;
```

```
    __IO uint32_t BSRR;
```

```
    __IO uint32_t BRR;
```

```
    __IO uint32_t LCKR;
```

```
} GPIO_TypeDef;
```

```
#define GPIOC          ((GPIO_TypeDef *) GPIOC_BASE)
```

```
#define GPIO_7_SEG      GPIOC
```

7_SEG 함수들

```
void PowerOn_7_SEG(void) {  
    GPIO_7_SEG->BRR |= GPIO_7_SEG_POWER_PIN;  
}
```

```
void PowerOff_7_SEG(void) {  
    GPIO_7_SEG->BSRR |= GPIO_7_SEG_POWER_PIN;  
}
```

```
void On_7_SEG_OnePin(uint16_t pinNum) {  
    GPIO_7_SEG->BRR |= pinNum;  
}
```

```
void Off_7_SEG_OnePin(uint16_t pinNum) {  
    GPIO_7_SEG->BSRR |= pinNum;  
}
```

```
void On_7_SEG_AllPin(void) {  
    On_7_SEG_OnePin  
        (GPIO_7_SEG_A_PIN | GPIO_7_SEG_B_PIN | GPIO_7_SEG_C_PIN  
         | GPIO_7_SEG_D_PIN | GPIO_7_SEG_E_PIN | GPIO_7_SEG_F_PIN  
         | GPIO_7_SEG_G_PIN | GPIO_7_SEG_DP_PIN);  
}
```