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/*****************************************************
 Human sensing LED driver by DC boost with PIC16F785
         By nobcha all right reserved

        Ver 0.3 05/15/2011 for PIC16F785
        Ver 0.4 12/02/2012 25Hz timing
        Ver 0.5 12/30/2012 RC1 change more than 25Hz

PIC16F785 + Infraired ceramic sencer + photo Diode
PIN Assign      #20 Vss
                #17 RA2:Monitor LED
                #15 RC1/AN5:焦電型センサー増幅後信号
                #14 RC2/OP2
                #13 RB4/OP2-
                #12 RB5/OP2+
                #10 RB7:DCブーストトランジスタ駆動
                #9  RC7/OP1+:焦電型センサー入力
                #8  RC6/OP1-
                #7  RC3/OP1
                #4  RA3/MCLR:Pull up
                #3  RA4/AN3:フォトダイオード入力
                #1  Vdd

   OSC internal RC 8MHz

  Development Circumstance
  MPLAB IDE V8.85  HiTECH C V9.83

*****************************************************/
#define _LEGACY_HEADERS
#define pic_clk 8000000
#define MHz 000000
#define _XTAL_FREQ 8MHz

#include <htc.h>

__CONFIG(BORDIS & UNPROTECT & DUNPROTECT & PWRTEN & WDTDIS & MCLREN & INTIO & FCMDIS & IESODIS);

// variables
        unsigned short  i, j, adc_data;
        unsigned char k, rc_state;

// proto typing
void led_light(void);

// mail
void main(){
        GIE=0;                          // INT disable

        PORTA=0x00;                     // PORTA initialize
        PORTB=0x00;                     // PORTB
        PORTC=0x00;                     // PORTC

        TRISA=0x3B;                     // PORTA all input without RA2:MON
        TRISB=0x70;                     // PORTB all input without RB7:BOOST
        TRISC=0xCE;                     // PORTC all input without RC0,4,5

        ANSEL0=0x04;                    // RA4/ANS3 is assigned as ADC port
        ANSEL1=0x00;                    // ANS8-11 digital

        OSCCON=0b01110000;              // IRCF=8MHz:111,OSTS:0,HTS:1

        OPA1CON=0x80;                   // OP-AMP1 enable
        OPA2CON=0x80;                   // OP-AMP2 enable
        ADCON1=0x10;                    // FOSC/8

    RA2=1;                              // Turn on the monitor LED for checking
        for(j=500;j>0;j--){             // Turn on LED testing
                __delay_ms(1);          // for 0.5 second
                RB7=1;                  // DC boost dark
                asm("nop");
                RB7=0;                  // buck boost
                asm("nop");
                asm("nop");
                asm("nop");
```

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                asm("nop");
        }
        RA2=0;                          // monitor LED off
        rc_state=RC1;                   // Get RC1 status (1 or 0)
        while(1){
                if(rc_state!=RC1){                      // Sencer signal change
                        rc_state=RC1;
                        __delay_ms(20);                 // 25Hz timing
                        j=10;
                        if( rc_state==RC1){             // Still same state
                                while(rc_state==RC1){   // waiting changing
                                        RA2=1;                  // Mon LED turn on
                                        __delay_ms(200);
                                        RA2=0;
                                        __delay_ms(200);
                                        if(j--<1) break;        // when past 4 sec, go out
                                }

                        }
                        led_light();
                        rc_state=RC1;                           // Remember pre state
                        __delay_ms(100);

                }
        }
}

// LED lighting and PHOTO diode sensing
void led_light(void){
        RA2=1;                                  // monitor LED on
        for(i=167;i>0;i--){                     // 167*2000*10μ   =  3.3S
                ADCON0=0x8F;                    // ADFM,AN3,GODONE,ADON ADC start
                __delay_ms(1);
                while(GODONE){}                 // Wait ADC
                adc_data=((short)((ADRESH&0x03)*256) + (short)(ADRESL));
                                                // ADC value calcurating
                if(adc_data<10){                // Dark checking
                        for(j=2000;j>0;j--){    // DC boost LED drive
                                RB7=1;          // Shortening inducter
                                asm("nop");     // Shortening period streching
                                RB7=0;          // Release
                                for(k=7;k>0;k--){}      // dummy timing
                        }
                }
                __delay_ms(1);
        }
        RA2=0;                                  // monitor LED off
        __delay_ms(1);
}
```