Application Note: AN-154

IS31FL3743B PWM Frequency Options

INTRODUCTION

The IS31FL3743B is a general purpose 18×n (n=1~11) LED Matrix programmed via 12MHz SPI interface. Each LED can be dimmed individually with 8-bit PWM data and 8-bit DC scaling data which allowing 256 steps of linear PWM dimming and 256 steps of DC current adjustable level. Additionally, each LED open state can be detected, IS31FL3743B store the open information in Open-Registers. The Open Registers allowing MCU to read out via SPI, inform MCU whether there are LEDs open or short LEDs.

The IS31FL3743B operates from 2.7V to 5.5V and features a very low shutdown and operational current. IS31FL3743B is available in UQFN-40 (5mm×5mm) package. It operates from 2.7V to 5.5V over the temperature range of -40°C to +125°C.

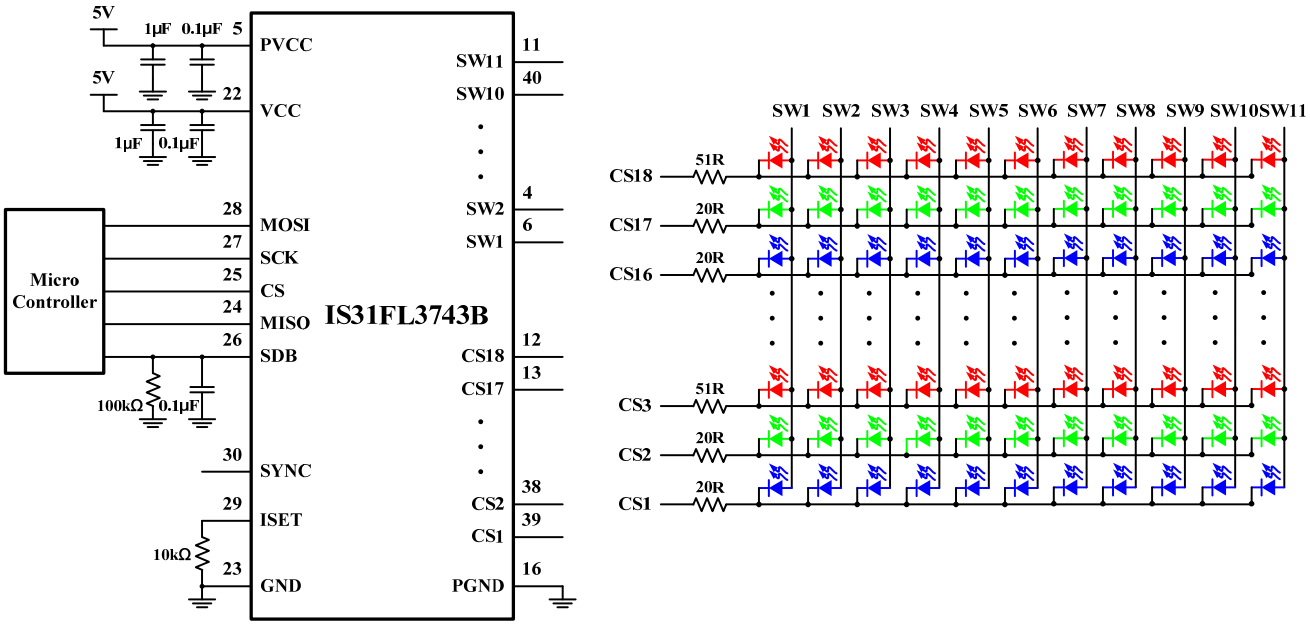

Figure 1 Typical Application Circuit of IS31FL3743B

HOW TO CHANGE THE PWM FREQUENCY SETTING

IS32FL3743B has a PWM frequency setting register in test mode, which can set different PWM frequency through E0h/E2h register in page 2 (PG2, Page No. = 0x52).

E0h Test Mode Enable Register

Bit	D7:D1	D0
Name	-	TMEN
Default	0000 000	0

The Test Mode Enable Register enter or quit test mode.
If TMEN="1", the device enter test mode and user can modify E1~E2h register value.
If TMEN="0", the device will quit test mode.

TMEN	Test Mode Enable
0	Not in/quit test mode
1	In test mode

E1h Iout Trim Register

Bit	D7:D6	D5:D4	D3:D0
Name	PWM_DC	Lookahead	Iout_trim
Default	00	00	0000

This register is for I_OUT trim, write any value except '0x00' may change the I_OUT value and could not recovery. It is not allowed to write any value except '0x00' into this register.

E2h PWM Frequency Setting Register

Bit	D7:D5	D4	D3:D0
Name	PF	SW_TEN	SW_TSEL
Default	000	0	0000

PWM Frequency Setting Register is used to set the PWM frequency.
In order not to affect LED normal display, D4: D0 should write with '00000'.

PF	PWM Frequency
000/111	31.25kHz
001	15.6kHz
010	7.8kHz
011	3.9kHz
100	1.95kHz
101	977Hz (SW1~SWn scan, n≤8)
110	488Hz (SW1~SWn scan, n≤4)

SW_TEN	
0	SW test mode disable
1	SW test mode enable

SW_TEN	SW Test Channel Select
0000	SW1 always on, other SW off
0001	SW2 always on, other SW off
0010	SW3 always on, other SW off
0011	SW4 always on, other SW off
0100	SW5 always on, other SW off
0101	SW6 always on, other SW off
0110	SW7 always on, other SW off
0111	SW8 always on, other SW off
1000	SW9 always on, other SW off
1001	SW10 always on, other SW off
1010	SW11 always on, other SW off
Others	Reserved

SOFTWARE SPI COMMAND EXAMPLE

```
// void SPI_Write(u8 DeviceAddress, u8 WriteAddress, u8 SendByte)
SPI_Write (0x52,0xE0,0x01);     //Enter test mode
SPI_Write (0x52,0xE2,0x20);     //0x00 or 0xE0:31.25k,
                                //0x20:15.6k,
                                //0x40:7.8k,
                                //0x60: 3.9k,
                                //0x80:1.95k,
                                //0xA0: 977Hz,
                                //0xC0:488Hz.
SPI_Write (0x52,0xE0,0x00);     //Quit test mode
```

RESOURCES

Lumissil Microsystems,

IS31FL3743B 18×n (n=1~11) LED Matrix DRIVER,https://www.lumissil.com/assets/pdf/core/IS31FL3743B_DS.pdf