

DSDM Hardware Specification

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Brief introduction

Digole Smart Display Module (DSDM) is a new series of display which has an PIC18F26K20 on the board, a firmware which called DSDM API embedded on it, this API can download user program to PIC18F26K20, maintain all functions to deal with the on board display using the identical API on every MSDM.

The user program designed for one DSDM will work on other DSDMs without any modification.

Although some resources on PIC18F26K20 are dedicated for the display panel are not available for user, but there are still have lot of them available for user: Watchdog, Timers, Interrupt, most of I/O pins, A/D, Capture, Compare, PWM, UART, I2C, SPI, EEPROM, RAM, 48K program Flash.

Current available DSDM Color OLED



1.8" 160x128 262K Color OLED DSDM
DSDM160128COLED35



0.96" 96x64 65K Color OLED DSDM
DSDM9664COLED20

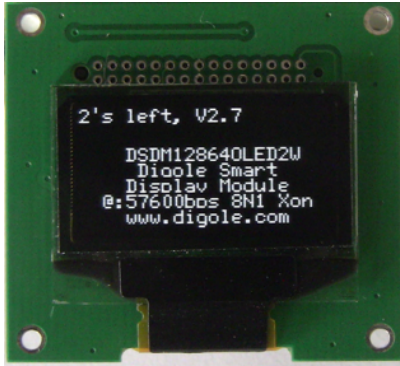
Monochrome OLED



1.3" 128x64 white OLED DSDM
DSDM12864OLED3W



1.3" 128x64 Blue OLED DSDM
DSDM12864OLED3B



0.96" 128x64 White OLED DSDM
DSDM12864OLED2W



0.96" 128x64 Blue OLED DSDM
DSBM12864OLED3W

Monochrome LCD



3.2" 128x64 LCD DSDM(no backlight)
DSDM12864LCDS7

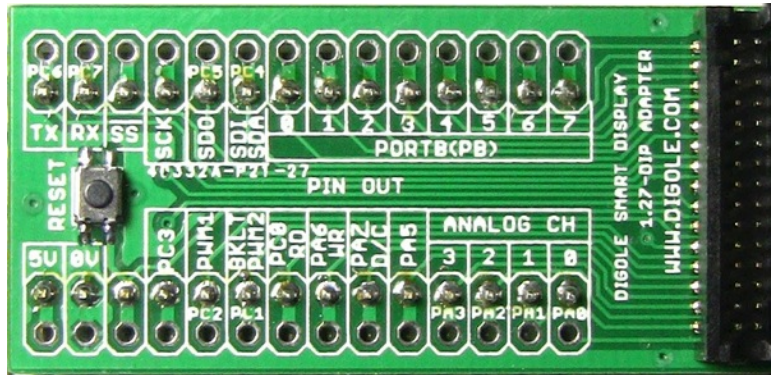


2.7" 128x64 LCD DSDM+Backlight
DSDM12864LCDS6



1.8" 128x64 LCD DSDM+Backlight
DSDM12864LCDS4DSDM

DSDM DIP adapter



Physical Specification

	160128 COLED35	9664 COLED20	12864 OLED3W	12864 OLED3B	12864 OLED2W	12864 OLED2B	12864 LCDS7	12864 LCDS6	12864 LCDS4
Active Area (mm)	36x28.7	20x13.3	29.4x14.7	29.4x14.7	22x12	22x12	72x36	61x30.5	42x21
*Prod. Size WxHxT (mm)	53x37x8	33x32x7	35x32x7.5	35x32x7.5	35x32x7.5	35x32x7.5	83x53x9	72x49x10	46x38x9
Resolution (Pixel)	160x128	96x64	128x64	128x64	128x64	128x64	128x64	128x64	128x64
Display Tech.	Color OLED	Color OLED	White OLED	Blue OLED	White OLED	Blue OLED	Mono LCD	Mono LCD	Mono LCD

* The thickness is include the header, if you remove the header on final product, the thickness is 2.5mm less

Electrical Specification

		160128 COLED35	9664 COLED20	12864 OLED3W	12864 OLED3B	12864 OLED2W	12864 OLED2B	12864 LCDS7	12864 LCDS6	12864 LCDS4
Supply Voltage (V)	Mini.	3.0	3.0	2.5	2.5	2.5	2.5	3.0	3.0	3.0
	Max.	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Current @5.0V MCU @64MHz (mA)	Mini.	<4	<4	<3	<3	<3	<3	<3	<3	<3
	Max.	110	40	20	20	20	20	8	**25	**25
	*Sleep	0.1	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

*Sleep: when turn MCU to sleep, shut down the backlight, shut down the DC/DC converter, turn off the display

** Depends on the current consumption of backlight

Hardware future

**Module	Color Depth	Program Memory (bytes)	Dada Memory		I/O	10-bit A/D (ch)	CCP/ ECCP (PWM)	MSSP		UART	Comp.	Timers 8/16-bit
			SRAM (bytes)	EEPROM (bytes)				SPI	Master I ² C			
160128 COLED35	262K	48K	3584	1024	12	5	1/1	Y	Y	1	2	1/3
9664 COLED20	65K	48K	3584	1024	11	5	0/1	Y	Y	1	1	1/3
12864 OLED3W	B/W	48K	2560/ *3584	1024	12	5	1/1	Y	Y	1	2	1/3
12864 OLED3B	B/W	48K	2560/ *3584	1024	12	5	1/1	Y	Y	1	2	1/3
12864 OLED2W	B/W	48K	2560/ *3584	1024	12	5	1/1	Y	Y	1	2	1/3
12864 OLED2B	B/W	48K	2560/ *3584	1024	12	5	1/1	Y	Y	1	2	1/3
12864 LCDS7	B/W	48K	2560	1024	20	10	1/1	Y	Y	1	2	1/3
12864 LCDS6	B/W	48K	2560	1024	19	10	0/1	Y	Y	1	1	1/3
12864 LCDS4	B/W	48K	2560	1024	19	10	0/1	Y	Y	1	1	1/3

* On these modules, user can choose to use screen buffer in SRAM or not, the buffer size is 1024 bytes, by using the buffer, user can draw the screen faster than none buffer.

** Module definition: numbers=resolution on horizontal and vertical; the following letters= Display Technology, COLED= Color OLED, OLED=Monochrome OLED, LCD=LCD, LCDS=Serial LCD; the last letter is the emitting color on monochrome OLED, W=white, B=Blue. e.g.:12864OLED3B means 128x64 pixels blue color Monochrome OLED

I/O resources map

Legend:

Blue: All function available for user, the module didn't use it internal

Red: This port/pin was reserved for module, user can't operate this pin, other wise, the module

Black: Restrict ports/pin, the user can still use the port, but should be deal with it carefully.

I/O Port	Multiplex Function on Chip	160128CO LED35	9664COLE D20	12864OLED3X 12864OLED2X	128x64 Universal (ST7920/ KS0108)	12864LCDS7 12864LCDS6 12864LCDS4
PA.0 to 3	Analog 0 to 3	✓	✓	✓	✓	✓
PA.4		CS	CS	CS	CS	CS
PA.5	Analog:4, SPI: SS	✓	✓	✓	✓	✓
PA.6		WR	WR	WR	WR	SDI
PA.7		D/C	D/C	D/C	D/C	D/C
PB.0 to 7		DATA I/O	DATA I/O	DATA I/O	DATA I/O	✓
PC.0		RD	RD	RD	RD	SCLK
PC.1	CCP2	✓	Back Light	✓	Back Light	Back Light
PC.2	CCP1	✓	✓	✓	✓	✓
PC.3	I2C/SPI:CLK	✓	✓	✓	✓	✓
PC.4	I2C:SDA,SPI:SDI	✓	✓	✓	✓	✓
PC.5	SPI:SDO	✓	✓	✓	✓	✓
PC.6	UART:TX	✓	✓	✓	✓	✓
PC.7	UART:RX	✓	✓	✓	✓	✓
PE.3	RESET	X	X	X	X	X
Free RAM (Bank)		0-13	0-13	0-9 or *0-13	0-9 or *0-13	0-9

CS: this is the chip selection for display panel, user can use and operation this signal, except want to operate with the panel directly.

WR:Write signal on display panel;

RD: Read signal on display panel;

D/C: Data/Command signal on display panel;

DATA I/O: Data write to and read from display panel;

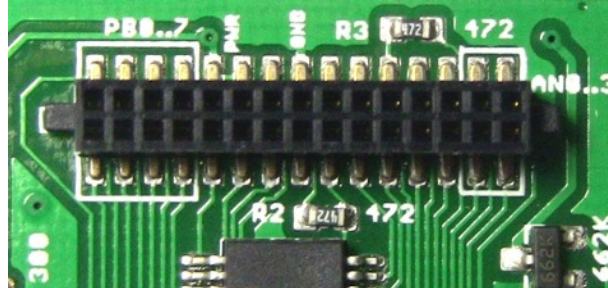
SCLK: ST7565 LCD panel's Clock signal;

SDI: ST7565 LCD panel's Data in signal;

* Depends on "digole_monobuffer";

Pinout on fan out header

There is a 30pin 1.27mm pitch header on every module which fan out of all pins on the PIC18F26K20, user can use the unused pins, the pin out on all headers are identically same, make the DSDM exchangeable.



PB.6	PB.7	
AN11/PB.4	PB.5	
AN8/PB.2	PB.3/AAN9	
AN12/PB.0	PB.1/AAN10	
SDI/SDA/PC.4	VCC	
SDO/PC.5	VCC	
TX/PC.6	PC.7/RX	
GND	GND	
PC.3	SCK/PC.3+R	
CCP1/PC.2	RESET	
BKLT/PC.1	SS/PA.5+R	
WR/PA.6	PC.0/RD	
PA.5	PA.7/DC	
AN2/PA2	PA.3/AN3	
AN0/PA0	PA.1/AN1	

Legend:

Black : Basic I/O function on power up

Blue: Multiplexed function on MCU

Red: Defined function used on display screen

PB.0 to 7 may also used by module on most model, please check the I/O resources map