WT-SPIdisp128x160v2

CMS (Compact Modular Solution)

Description:

The SPIdisp130x162 is a robust, field proven 132RGB x 162dot 262K Color LCD display module with integrated Frame Memory. Based on the proven ST7735S controller family this module communicates with the host via a high speed 4 wire serial peripheral interface. V2 has a wider operating voltage range and a slightly bigger display area and provision for adding a backlight transistor and base resistor if required.

Features:

- Complete colour LCD display with a thin form factor of typically < 6mm
- A resolution of 162 x 130 pixels in a 1.8" active area
- Built in frame memory and partial window scrolling
- 262k colour capability (18 bit colour depth)
- Built in LED backlight
- No additional components required*
- Simple four wire serial connection.
- Pin for pin replacement for PCD8544 monochrome display

Functions:

Display data can be stored in the on-chip display data RAM of 132 x 162 x 18 bits. It can perform display data RAM read/write operation with no external operation clock to minimize power consumption. In addition, the inclusion of the integrated power supply circuits necessary to drive liquid crystal, it is possible to make a display system with fewer components. It also has the option of adding a backlight driver transistor.

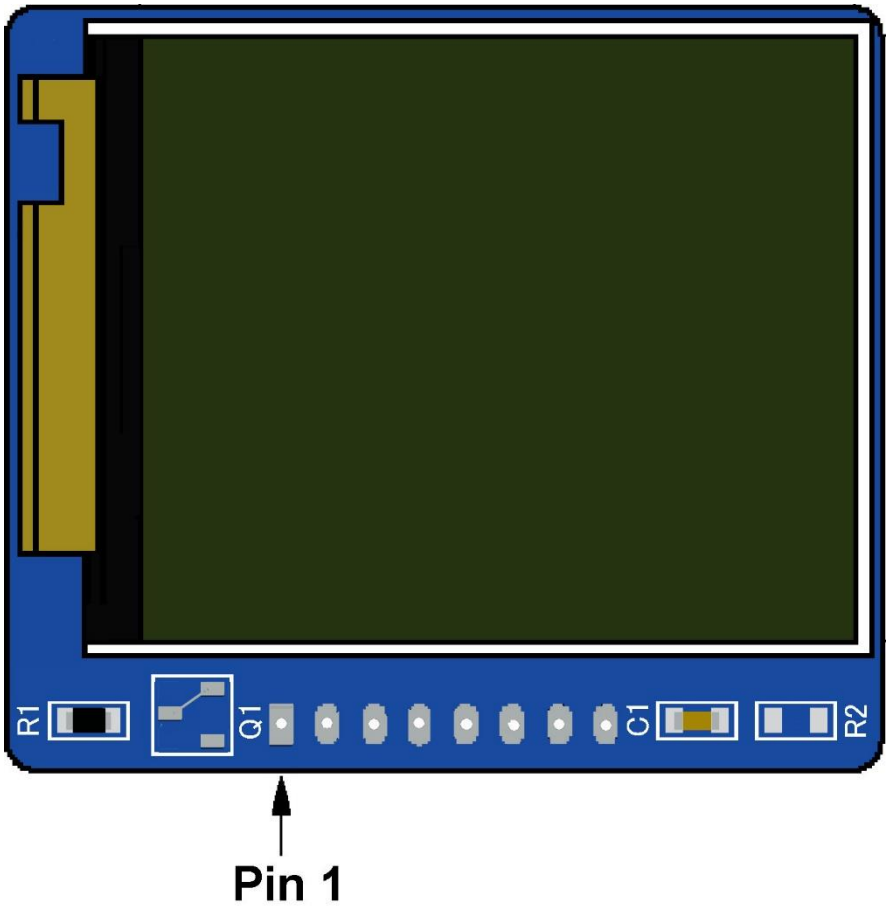
Operating Characteristics:

- Operating voltage:
  - 3.3 volts direct current (5.1v maximum) *
- LED Operating current :
  - 15ma, typical
- Controller current (typical):
  - 1.2ma<
- SPI bus rate (after built in 10mS delay)
  - ~ 32mhz **
- Number of possible colours
  - 262,144
- Temperature Range:
  - Industrial: -30°C to +85°C

**This device does NOT require localised decoupling capacitors..*
***Maximum speed after start-up period.*

Connection Diagram

Fig 1



PIN	NAME	FUNCTION
1	RES	Hardware reset from MPU
2	CS	Chip select, this enables the serial interface module
3	D/C	Data / Command denotes the type of data being sent
4	SDA	Serial data input line is an active high pulse
5	SCL	Serial clock input line strobes the data bit in
6	VDD	Supply voltage to the module, typically 3.3v
7	BL	Back light LED supply input / control
8	GND	Module common ground connection

Pin number one is indicated by a rectangular shape, orientation is such that this pad is positioned in the lower left centre. Pin numbering goes from 1 through to 8. Suggested values for R2 is 1K and for Q1 a BC847 SOT23-3. The device is supplied with a link which must be removed when adding Q1 and R2.

TIMING DIAGRAMS

Fig 2

When CS is “high” the interface is initialised and SCL clock is ignored. At the falling edge of CS, SCL can be high or low as SDA is sampled at the rising edge of SCL. D/C is low for command (D/C=’0’) or parameter/RAM data (D/C=’1’). and is sampled on the 8th rising edge of SCL.

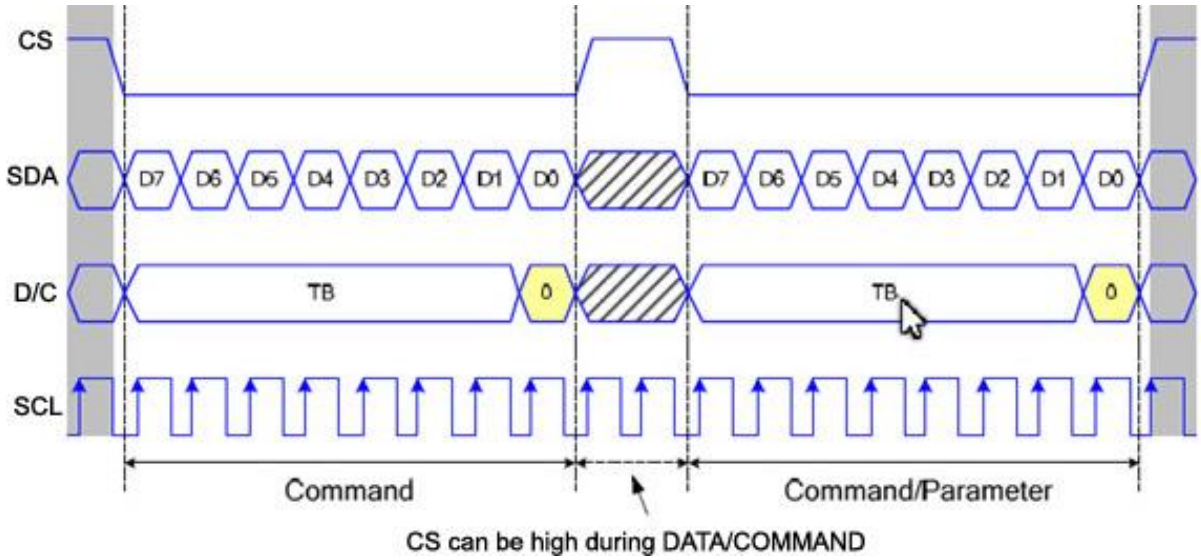
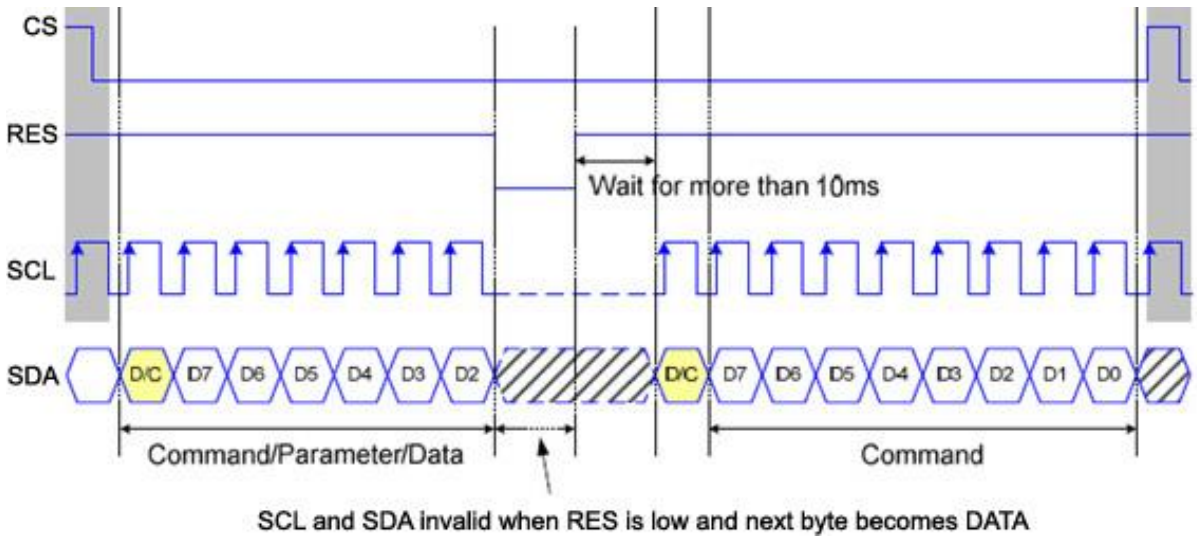


Fig 3

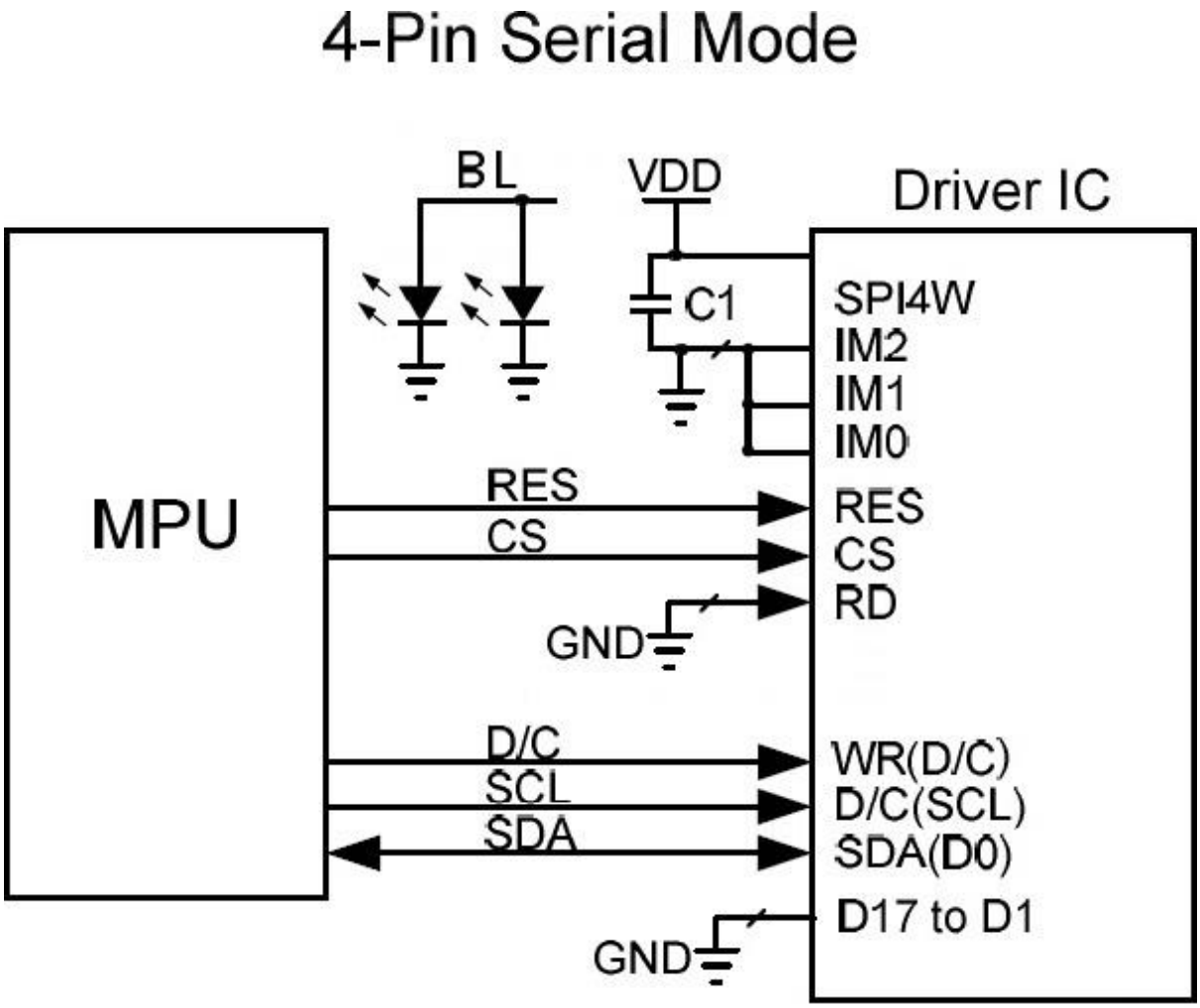
If RES drops while transferring data before Bit D0 of the byte has been completed, the driver will reject the previous bits and reset the interface such that it will be ready to receive command data again when the chip select line (CS) is next activated after RES have been HIGH state.



Device notes

The application schematic is shown below, note that the module has a decoupling capacitor onboard. There are two (2) backlight LEDs incorporated into this display for a more even backlight distribution. A current limit resistor should be used on the BL input.

Fig 4



(†). It is important that you ensure that the device is not forced to operate in conditions outside of the absolute maximums stipulated in the ELECTRICAL SPECIFICATIONS section within this document.

IMPORTANT NOTE **(†)**

To ensure correct operation of this device do not expose it to voltages in excess of 5.1vdc

ELECTRICAL SPECIFICATIONS

† IMPORTANT NOTICE: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure of the module above maximum rating conditions will affect device reliability.

Absolute Maximum Ratings (†)

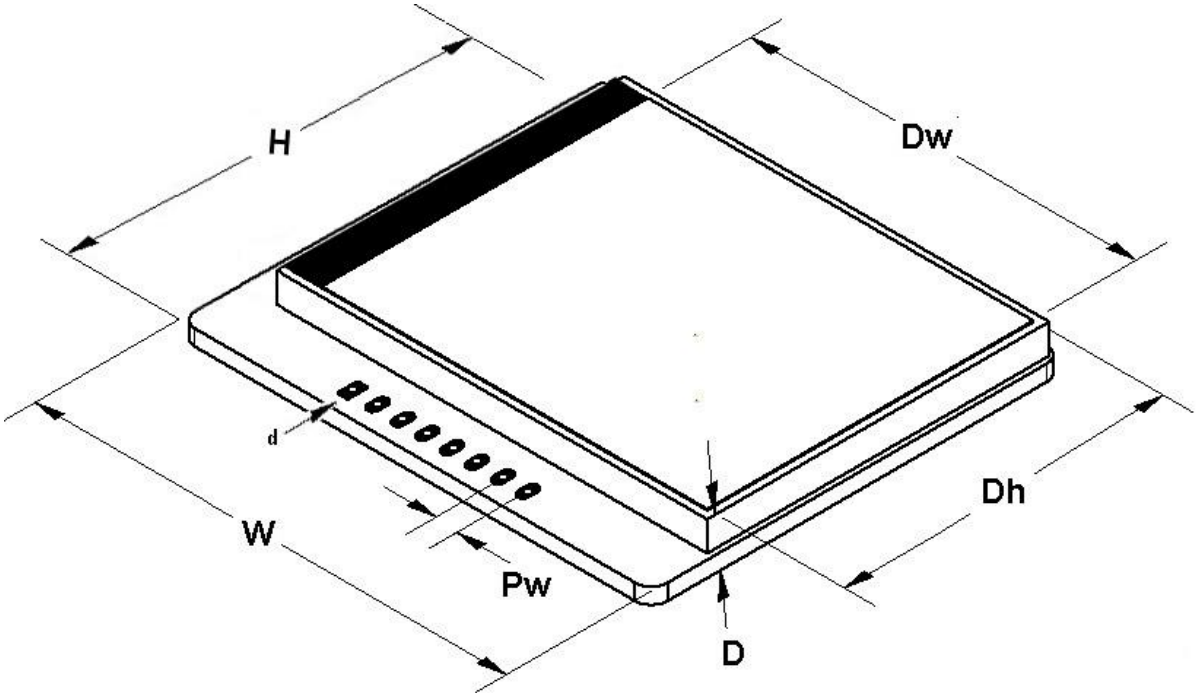
Ambient temperature under bias..... -30°C to +85°C
Storage temperature ..... -40°C to +100°C
Maximum voltage On V_{DD} pin.....+5.1 vdc
Maximum voltage On any control pin.....+5.1 vdc
Minimum operating voltage.....+2.7 vdc
Device current with backlight on (maximum)..... 22 mA
Settling delay at turn on…… < 100 mS

Document Revisions

1.0 – First release
2.0 – V2 replacement device

Package information

Fig 5



Datum	Dimension specifics	mm		
Identifier		Min	Nom	Max
H	Overall Height	41.7	42	42.1
W	Overall Width	48.6	48	48.2
D	Overall Depth	4.4	4.6	4.8
Pw	Pin spacing	2.53	2.54	2.56
d	Hole diameter (all pads)	0.84	0.85	0.9
Dh	Active display height	-	31.8	-
Dw	Active display width	-	37	-

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