

# IDT-0080-0160-IW50-DSN-H13.

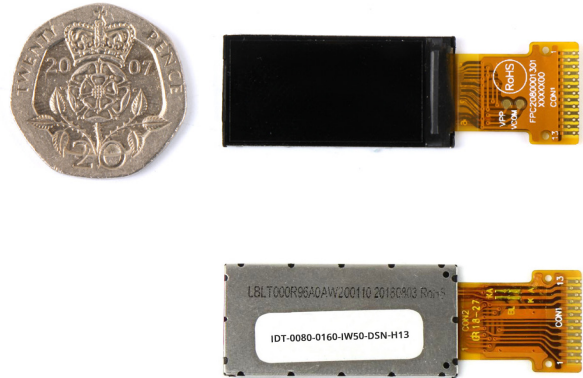
## Overview

IDT-0080-0160-IW50-DSN-H13. Is an IPS, full colour TFT module, offering 80 degree viewing angles all round, with a 500nit backlight. It is a transmissive type display operating in the normally black mode.

This TFT LCD has a 0.96-inch diagonally measured active display area with 80 x 160 dot (80 horizontal by 160 vertical pixel) resolution. Each pixel is divided into Red, Green, Blue dots which are arranged in vertical stripes.

## Technical Specifications

- Size: 0.96 inch
- Dot Matrix: 80 x RGB x 160(TFT) dots
- Module dimension: 13.5(W) x 27.95(H) x 1.40(D) mm
- Active area: 10.8 x 21.696 mm
- Dot pitch: 0.135 x 0.1356 mm
- LCD type: TFT, Normally black, Transmissive
- Viewing Angle: 80/80/80/80
- Aspect Ratio: 1:2
- IC: ST7735S
- Backlight Type: LED, Normally White
- With /Without TP: Without TP
- Surface: Glare



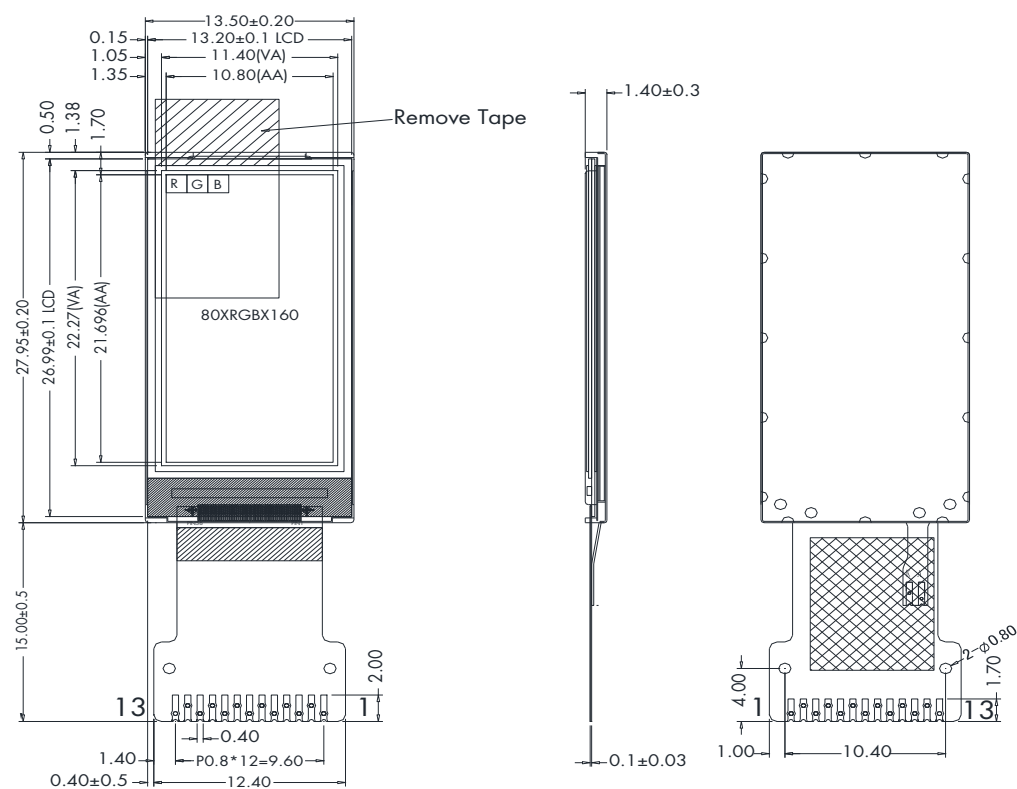
\*Colour tone slight changed by temperature and driving voltage.

Interface

IDT-0080-0160-IW50-DSN-H13. Pin Definition

Pin	Symbol	Function	Remark
1	SPI4W	SPI4W='0', 3-wire SPI. SPI4W='1', 4-wire SPI.	
2	NC	No connection	
3	SDA	Serial interface data	
4	SCL	Serial interface clock	
5	RS	Data/command selection pin (4-wire SPI use)	
6	RES	Reset pin (low active)	
7	CS	Chip selection pin (low active)	
8	GND	Ground	
9	NC	No connection	
10	VCC	Power supply.	
11	LEDK	Back light cathode	
12	LEDA	Back light anode	
13	GND	Ground	

Technical Drawing



PIN No.	Symbol
1	SPI4W
2	NC
3	SDA
4	SCL
5	RS
6	RES
7	CS
8	GND
9	NC
10	VCC
11	LEDK
12	LEDA
13	GND

The non-specified tolerance of dimension is ±0.3 mm .

### Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	-	+70	°C
Storage Temperature	TST	-30	-	+80	°C

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above  
 1. Temp. ≤60°C, 90% RH MAX. Temp.>60°C, Absolute humidity shall be less than 90% RH at 60°C.

### Electrical Characteristics

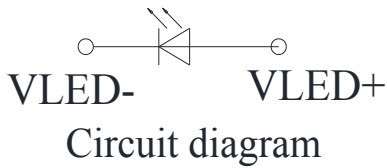
Operating conditions:

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage	VCC	3.0	3.3	3.6	V
Supply LCM current	ICC	-	-	2	mA

### LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I <sub>LED</sub>	-	20	-	mA	
LED voltage	V <sub>LED</sub>	2.8	3.1	3.3	V	Note 1
LED Life Time		-	50000	-	Hr	Note 2,3,4

Note 1 : There are 1 Groups LED



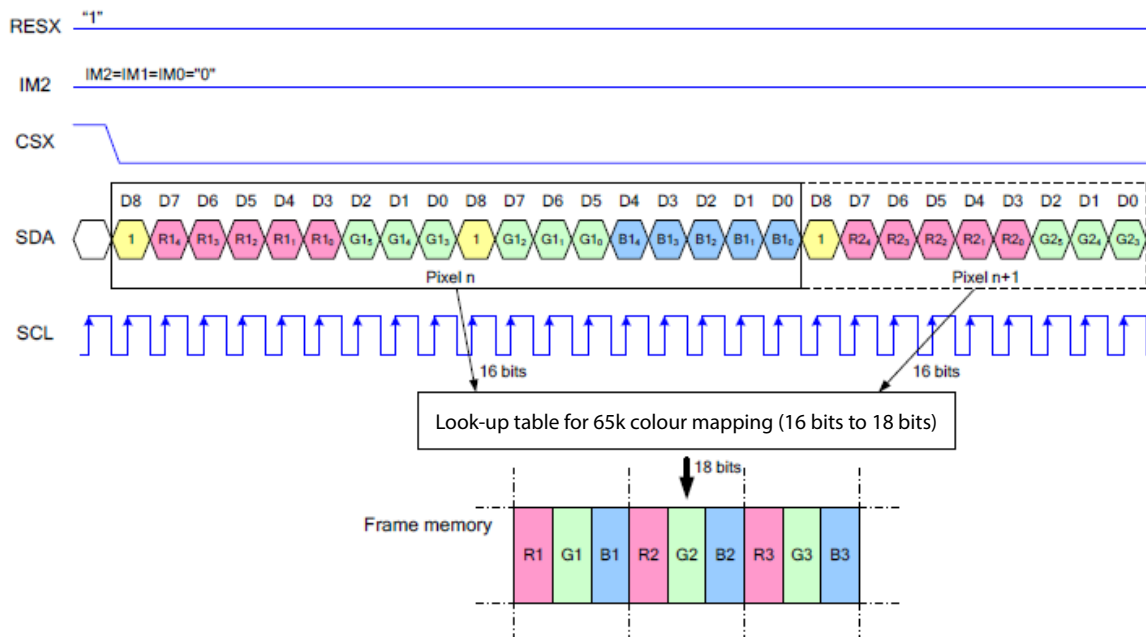
Note 2 : T<sub>a</sub> = 25 °C

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

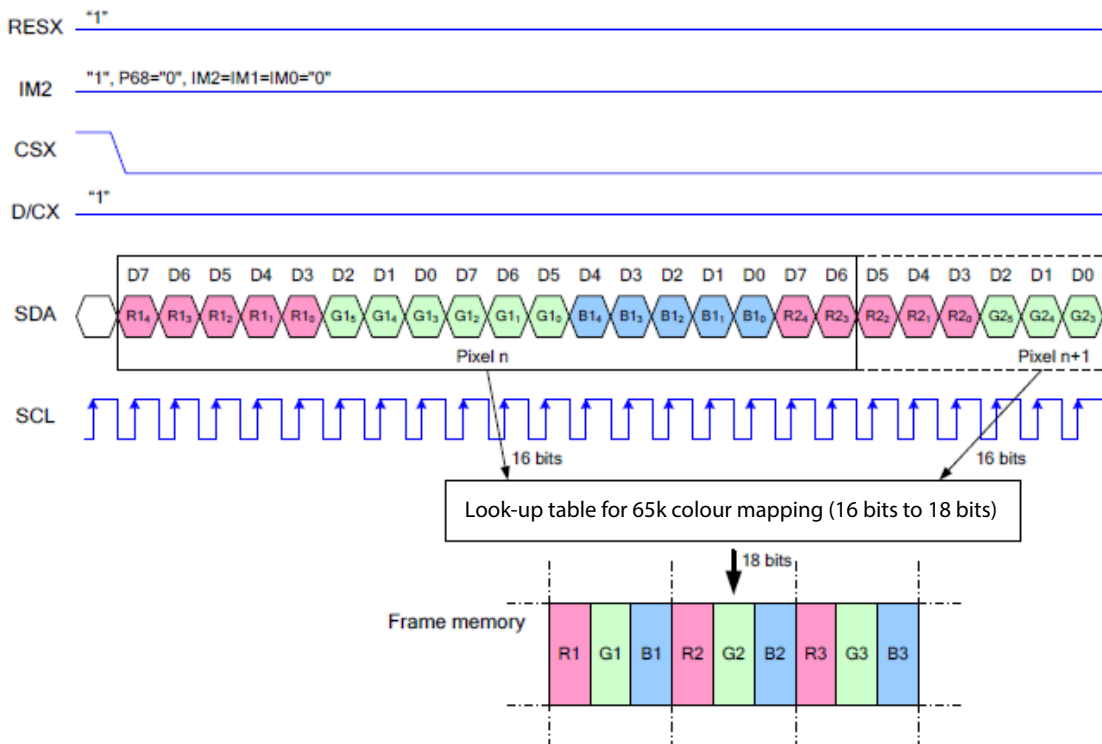
### Data Colour Coding

#### 3-Wire SPI Mode: RGB 5-6-5-bit Input, 65K-Colours, 3AH="05h"



- Note 1: Pixel data with the 16-bit colour depth information
- Note 2: The most significant bits are: Rx4, Gx5 and Bx4
- Note 3: The least significant bits are: Rx0, Gx0 and Bx0

#### 4-Wire SPI Mode: RGB 5-6-5-bit Input, 65K-Colours, 3AH="05h"

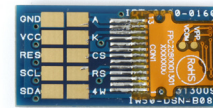


- Note 1. Pixel data with the 16-bit colour depth information
- Note 2. The most significant bits are: Rx4, Gx5 and Bx4
- Note 3. The least significant bits are: Rx0, Gx0 and Bx0

Display Options available

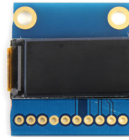
IDT-0080-0160-IW50-DSN-B08.

Display on pcb no mounting



IDT-0080-0160-IW50-DSN-M08.

Display on pcb with mounting

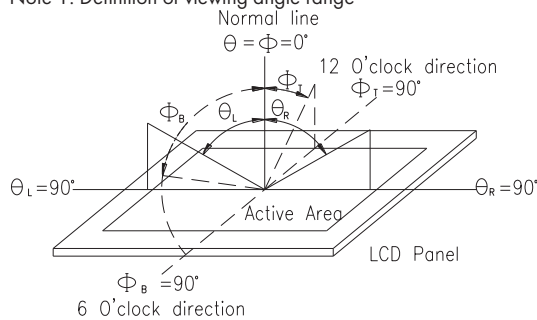


Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr	$\theta=0^\circ \phi=0^\circ$	-	30	40	.ms	Note 3,5
		Tf						
Contrast ratio		CR	At optimized viewing angle	-	800	-	-	Note 4,5
Colour Chromaticity	White	Wx	$\theta=0^\circ \phi=0$	0.26	0.31	0.36		Note 2,6,7
		Wy		0.28	0.33	0.38		
Viewing angle	Hor.	$\theta_R$	CR $\geq$ 10	-	80	-	Deg.	Note 1
		$\theta_L$		-	80	-		
	Ver.	$\phi_T$		-	80	-		
		$\phi_B$		-	80	-		
Brightness		-	-	400	500	-	cd/m2	Center of display

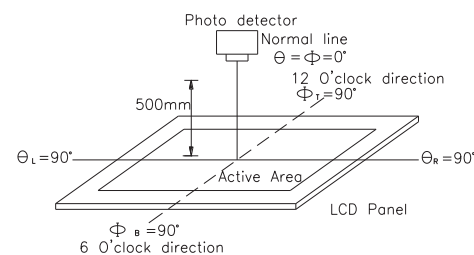
Ta=25±2°C

Note 1: Definition of viewing angle range



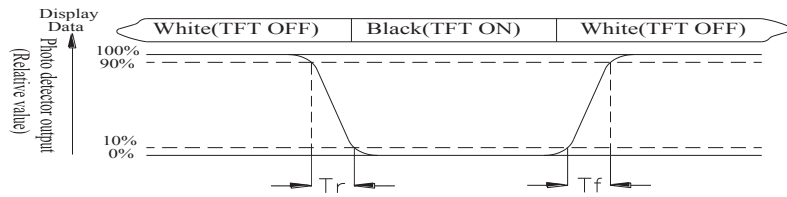
Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7orBM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.



**Note 3: Definition of Response time:**

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time,  $T_r$ , is the time between photo detector output intensity changed from 90% to 10%.



**Note 4: Definition of contrast ratio:**

The contrast ratio is defined as the following expression.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: White  $V_i = V_{i50} \pm 1.5V$

Black  $V_i = V_{i50} \pm 2.0V$

"±" means that the analog input signal swings in phase with VCOM signal.

"±" means that the analog input signal swings out of phase with VCOM signal.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

**Note 6: Definition of colour chromaticity (CIE 1931)**

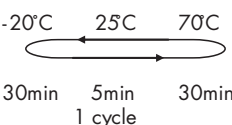
Colour coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

**Reliability**

**Content of Reliability Test (Wide temperature, -20 °C~70 °C)**

**Environmental Test**

Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80 °C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30 °C 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70 °C 200hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20 °C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60 °C,90%RH max	60 °C,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation  	-20 °C/70 °C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±600V(contact) ,±800v(air), RS=330Ω CS=150pF 10 times	—

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.