

# ASI-T-2201DA0EN/D

Item	Contents	Unit
Size	2.2	inch
Resolution	240(RGB) X20	/
Interface	RGB 18 bitsSPI	/
Color Depth	262Kdithering	/
Technology type	a-si TFT	/
Pixel pitch	0.141x0.141	mm
Pixel Configuration	R.G.B. Vertical Strip	
OutlineDimension (W x H x D)	40.6x56.6x2.7	mm
Active Area	33.84 x45.12	mm
Display Mode	Transflective(ECB)	/
Viewing Direction	12 } [ o }	/
Backlight Type	LED	/
Driver IC	ILI9341	/



\$ 6 , 7 ' \$ ( 1 ' )

### Record of Revision

Date	Revision No.	Summary
2010-04-20	1.0	Rev 1.0 was issued
2012-09-03	2.0	IC update
2015-11-14	3.0	Update the panel



\$ 6 , 7 ' \$ ( 1 ' )

6FRSH

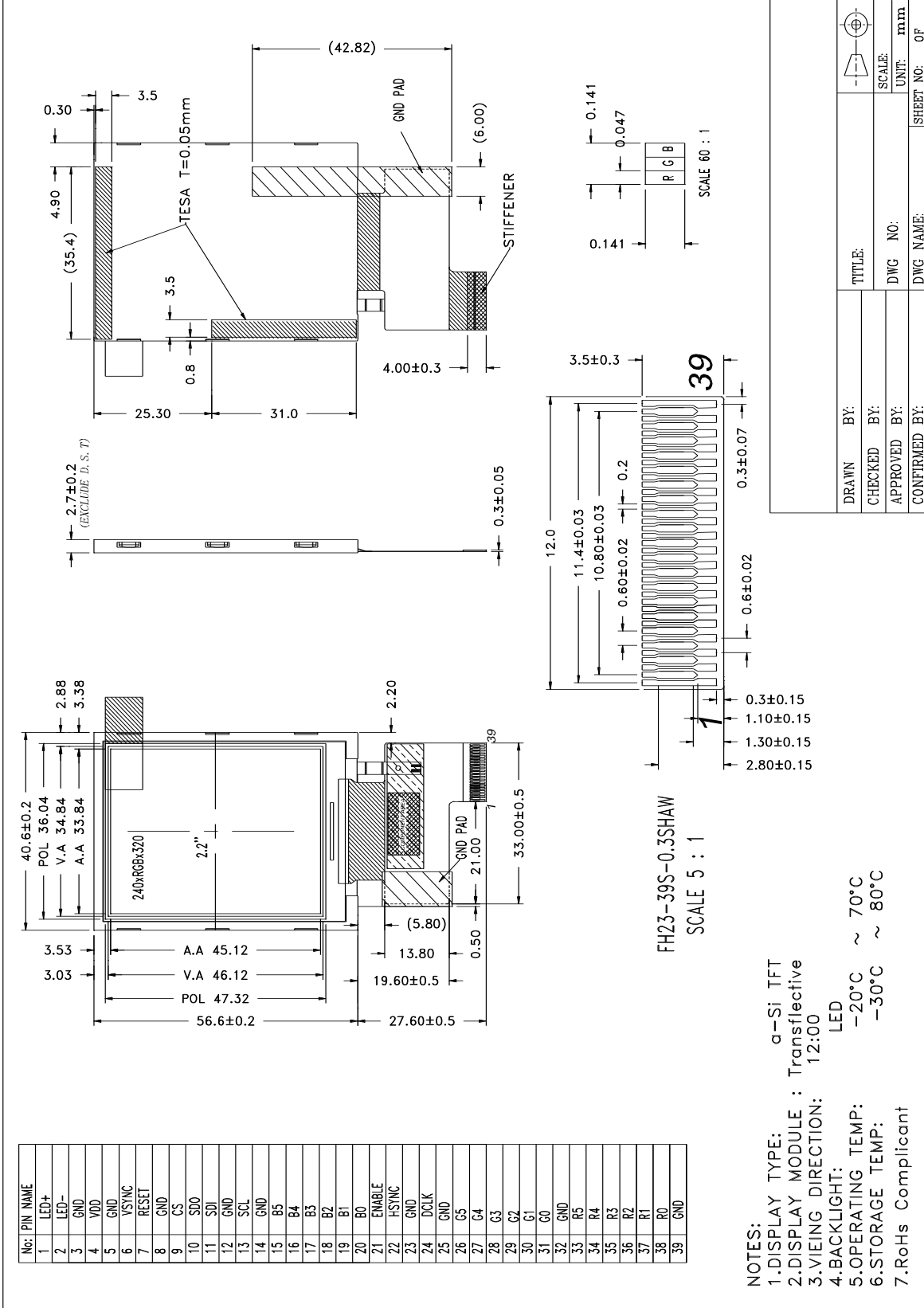
7KLV GDWD VKHHW LV WR LQV \$ 6 R G X F H ' \$ W ( K H ' F W \$ H Y H I P D N W O Z R Q R  
 PRGX,WH LV FRPSRVHG RI D FRORU 7)7 / 8 ' Q S B D F H N O L G U K W Y X Q L W V  
 GLVSOD\ DUHD F R O W D L S V [ H O V

\$SSOLF DWLRQ

'LJLWDO HTXLSPHQWV ZKLRK VGHUFRGUF R O E U O G L Q S O Y D J D W R U Y L G  
 \* H Q H U O I R U P D W L R Q

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2XWOLQH 'UDZLQJ





\$6, 7 '\$ (1 ')

,QWHUIDFH VLJQDOV

No	Symbol	Description	Remarks
1	9/ (/' )	3RZHU VXSSO\ IRU /(' +LJK YR	OWDJH
2	9/ (/' )	3RZHU VXSSO\ IRU /(' /RZ YR	OWDJH
3	* 1'	*URXQG	
4	9''	3RZHU VXSSO\ RI JDWH GULYHU	KLJK OHYHO
5	* 1'	*URXQG	
6	96<1&	9HUWLFDO V\QF VLJQDO	
7	5(6(7	5HVHW (QDEOH	
8	* 1'	*URXQG	
9	&6	63, &KLS VHOHFW	
10	6'2	63, VHULDO 'DWD RXWSXW	
11	6',	63, VHULDO 'DWD LQSWXW	
12	* 1'	*URXQG	
13	6&/	63, VHULDO LQWHUIDFH FORFN	
14	* 1'	*URXQG	
15	%	%OXH GDWD VLJQDO	
16	%	%OXH GDWD VLJQDO	
17	%	%OXH GDWD VLJQDO	
18	%	%OXH GDWD VLJQDO	
19	%	%OXH GDWD VLJQDO	
20	%	%OXH GDWD VLJQDO	
21	(1\$%/(	'DWD HQDEOH VLJQDO	
22	+6<1&	+RULJRQWDO V\QF VLJQDO	
23	* 1'	*URXQG	
24	'&/.	'DWD VDPSOLQJ FORFN VLJQDO	
25	* 1'	*URXQG	
26	*	*UHHQ GDWD VLJQDO	
27	*	*UHHQ GDWD VLJQDO	
28	*	*UHHQ GDWD VLJQDO	
29	*	*UHHQ GDWD VLJQDO	
30	*	*UHHQ GDWD VLJQDO	
31	*	*UHHQ GDWD VLJQDO	
32	* 1'	*URXQG	
33	5	5HG GDWD VLJQDO	
34	5	5HG GDWD VLJQDO	
35	5	5HG GDWD VLJQDO	
36	5	5HG GDWD VLJQDO	
37	5	5HG GDWD VLJQDO	
38	5	5HG GDWD VLJQDO	
39	* 1'	*URXQG	

&RUUHVSRQGHG FRQGHFWRU )+



\$ 6 , 7 ' \$ ( 1 ' )

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Power Supply Voltage	VCI	-0.3	4.6	V	
Power Supply Voltage for logic	VDDI	-0.3	4.6	V	
Logic input voltage Range	VIN	-0.3	VDDI+0.3	V	

VIN: R0~R5,G0~G5,B0~B5,ENABLE,DCLK,HSYNC,VSYNC,/CS,SCL,SDI,SDO/RESET

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	-20	70		
Storage Temperature	TSTG	-30	80		

6.3. LED Backlight Absolute max. ratings

Item	Symbol	MIN	MAX	Unit	Remark
Back Light Forward Current	ILED	--	25	mA	



\$ 6 , 7 ' \$ ( 1 ' )

7. Electrical Specifications

7.1 Electrical characteristics

GND=0V, Ta=25

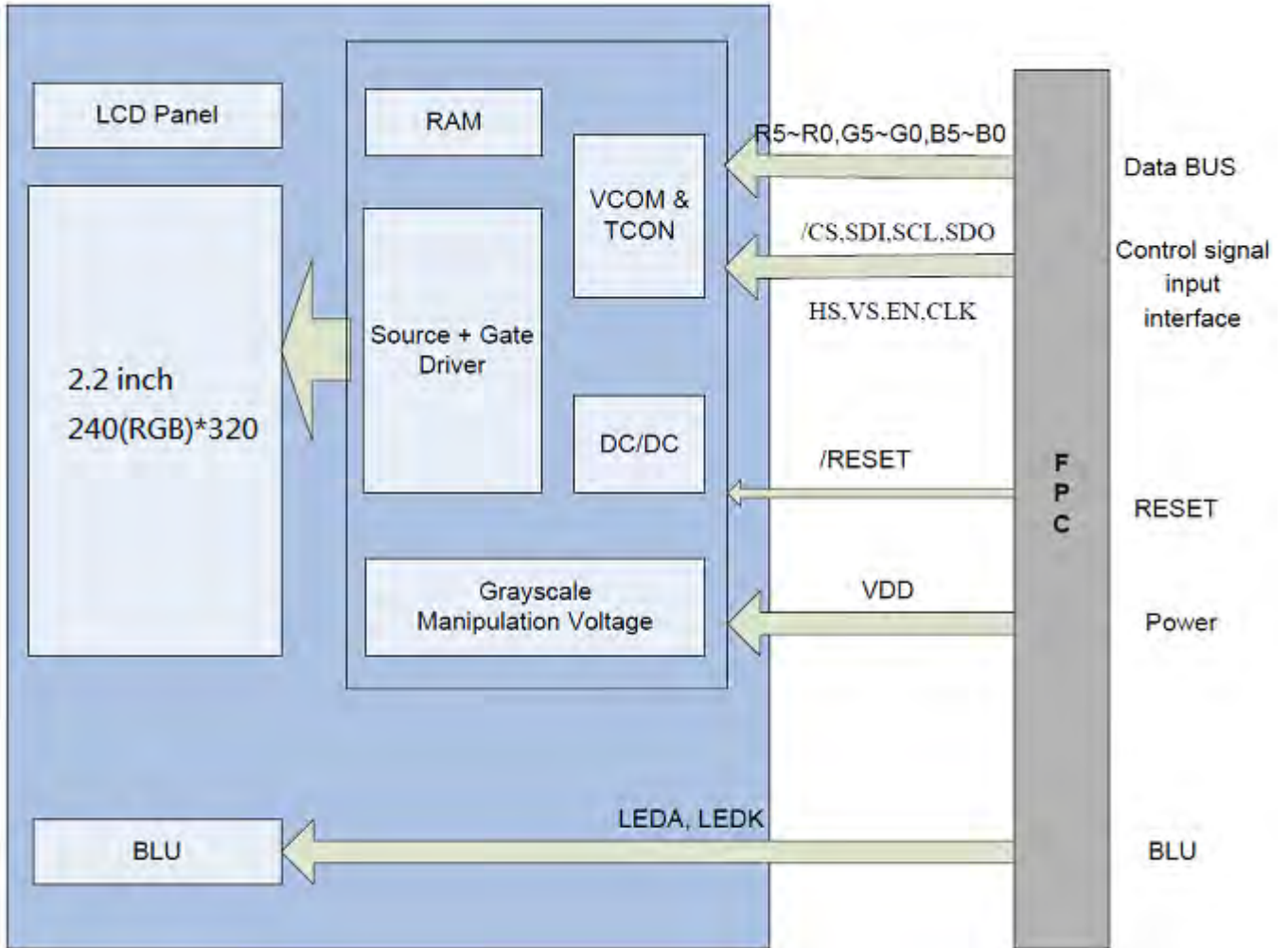
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Supply Voltagefor analoge	VDD	2.5	2.8	3.3	V	
Input Signal Voltage	Low Level	VIL	VSS	--	0.3*VDD	V
	High Level	VIH	0.7*VDD	--	VDD	V
Output Signal Voltage	Low Level	VOL	VSS	--	0.2*VDD	V
	High Level	VOH	0.8*VDD	--	VDD	V
Supply Voltagefor digital	VDDI	1.65	2.8	3.3	V	

7.2 LED Backlight

Ta=25

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	IF	--	20	25	mA	4LEDs serial
Forward Voltage	VF	--	12.8	--	V	
Power Consumption	WBL	--	256	--	mW	
LED life time	--	10,000	20,000	--	Hrs	

7.3 6FKHPDWLF RI /&' PRGXOH V\ VWHP







\$ 6 , 7 ' \$ ( 1 ' )

## 8. Command/AC Timing

### 8.1 AC Characteristics

### 8.2 3 Wire-SPI Interface Input Timing parameters

CPU Input Timing Parameters



\$ 6 , 7 ' \$ ( 1 ' )

### 8.3 Parallel 18/16/6-bit RGB Interface Timing Characteristics

### 8.4 Parallel 18/16/6-bit RGB Interface Timing Parameters



\$ 6 , 7 ' \$ ( 1 ' )

### 8.5 Reset Timing

### 8.6 Power ON/Off Sequence



\$ 6 , 7 ' \$ ( 1 ' )

9. Optical Specification

9.1 Driving the backlight condition(Transmissivemode)

Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio	CR	} A°i	100	120	-		Note1 Note3
Response Time	Ton/ Toff	25 -	-	35	50	ms	Note1 Note4
View Angles	:T	CRŠ10	38	48	-	Degree	Note 2
	:B		35	45	-		
	:>		30	40	-		
	}Z		30	45	-		
Chromaticity	White	Brightness is on	x	0.273			Note5,
			y	0.296			
Luminance	L		80	90	-	cd/m <sup>2</sup>	Note6
Uniformity			70	80		%	Note8
NTSC			45	50		%	

9.2 Not Driving the backlight condition(Reflective mode)

Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio	CR	} A°i	7	10	-		Note1 Note3
Response Time	Ton/ Toff	25 -	-	35	40	ms	Note1 Note4
View Angles	:T	CRŠ10	60	70	-	Degree	Note 2
	:B		60	70	-		
	:>		60	70	-		
	}Z		60	70	-		
NTSC			5.5	7		%	
Reflectance	R		4.8	5.5	-	%	Note7



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1RWH'HILQLWLRQ RI RSWLFDO PHDVXUHPHQW V\ VWHP  
7HPSHUDWXUH  
/(' EDFN OLJKW 21 (QYLURQPHQW EULJKWQHVV O[

1RWH&RQWUDVW GHIDWRIG DV IROORZ  
& R Q W 5 D D V L V  
6 X U I D X P H L Q D Q F H Z K D Z W H O V  
6 X U I D X P H L Q D Q F H Z K D Z W H O V

1RWH5HVSRQVH WLPH LV GHILQHG DV IROORZ  
5HVSRQVH WLPH LV WKH WLPH UHTXLUHG IRU WKH GLVSOD\ WR WU  
ZKLWR EODFN 'HFD\ 7LPH 7I

1RWH9LHZLQJ DQJOH UDQJH LV GHILQHG DV IROORZ  
9LHZLQJ IDQPHQW VXUHG DW WKH/8HQWHU SRLQW RI WKH



\$ 6 , 7 ' \$ ( 1 ' )

Note 5: Color chromaticity is defined as follow: (CIE1931)

Color coordinates measured at center point of LCD.

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$

Note 6: Luminance is defined as follow:

Luminance is defined as the brightness of all pixels "White" at the center of display area on optimum contrast.

Note 7: Reflectance measurement system is defined as follow:

Note 8: Luminance Uniformity is defined as follow:

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.



\$ 6 , 7 ' \$ ( 1 ' )

$$\text{Uniformity}(U) = \frac{\text{Minimum Luminance (brightness) in 9 points}}{\text{Maximum Luminance (brightness) in 9 points}}$$

Fig. 2 Definition of uniformity



\$ 6 , 7 ' \$ ( 1 ' )

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Operation Temp	Ts=-70 , 240hrs	Per table in below
2	Low Operation Temp	Ta=20 , 240hrs	Per table in below
3	High Storage Temp	Ta=80 , 240hrs	Per table in below
4	Low Temp Storage	Ta= -30 - , 240hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+40 , 90% RH 240 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	30 30 min +80 30 min, Change time:5min, 10 Cycles	Per table in below
7	ESD (Operation)	A í ñ ì % & U Z Aq, ì O 5points/panel Air:±8KV, 5times; Contact:±4KV, 5 times;	Per table in below
8	Vibration (Non-operation)	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz~10H 2 hours for each direction of X.Y.Z.	Per table in below
9	Shock (Non-operation)	60G 6ms, ±X,±Y,±Z 3times, for each direction	Per table in below
10	Package Drop Test	Height:80 cm, 1 corner, 3 edges, 6 surfaces	Per table in below

INSPECTION	CRITERION(after test)
Appearance	No Crack on the FPC, on the LCD Panel
Alignment of LCD Panel	No Bubbles in the LCD Panel No other Defects of Alignment in Active area
Electrical current	Within device specifications
Function / Display	No Broken Circuit, No Short Circuit or No Black line No Other Defects of Display





\$ 6 , 7 ' \$ ( 1 ' )

3 U H F D X W L R Q V I R U 8 V H R I / & ' 0 R G X O H V

**6 D I H W \**

The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

**+ D Q G O L Q J**

- A. The LCD and touch panel is made of plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
- B. Do not handle the product by holding the flexible pattern portion in order to assure the reliability
- C. Transparency is an important factor for the touch panel. Please wear clear finger sacks, gloves and mask to protect the touch panel from finger print or stain and also hold the portion outside the view area when handling the touch panel.
- D. Provide a space so that the panel does not come into contact with other components.
- E. To protect the product from external force, put a covering lens (acrylic board or similar board) and keep an appropriate gap between them.
- F. Transparent electrodes may be disconnected if the panel is used under environmental conditions where dew condensation occurs.
- G. Property of semiconductor devices may be affected when they are exposed to light, possibly resulting in IC malfunctions.
- H. To prevent such IC malfunctions, your design and mounting layout shall be done in the way that the IC is not exposed to light in actual use.

**6 W D W L F ( O H F W U L F L W \**

- A. Ground soldering iron tips, tools and testers when they are in operation.
- B. Ground your body when handling the products.
- C. Power on the LCD module before applying the voltage to the input terminals.
- D. Do not apply voltage which exceeds the absolute maximum rating.
- E. Store the products in an anti-electrostatic bag or container.

**6 W R U D J H**

- A. Store the products in a dark place at +25°C ±10°C with low humidity (40% RH to 60% RH). Don't expose to sunlight or fluorescent light.
- B. Storage in a clean environment, free from dust, active gas, and solvent.

**& O H D Q L Q J**

- A. Do not wipe the touch panel with dry cloth, as it may cause scratch.
- B. Wipe off the stain on the product by using soft cloth moistened with ethanol. Do not allow ethanol to get in between the upper film and the bottom glass. It may cause peeling issue or defective operation. Do not use any organic solvent or detergent other than ethanol.

**& D X W L R Q V I R U L Q V W D O O L Q J D Q G D V V H P E O L Q J**

Bezel edge must be positioned in the area between the Active area and View area. The bezel may press the touch screen and cause activation if the edge touches the active area. A gap of approximately 0.5mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There is a tolerance of 0.2 to 0.3mm for the outside dimensions of the touch panel and tail. A gap must be made to absorb the tolerance in the case and connector.

