

ASI-T-350G1A3MP6/AT

General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	49.92(H) *74.88(V) (3.5 inch)	mm	-
Driver element	a-Si TFT active matrix	-	-
Display colors	16.7M	colors	-
Number of pixels	640(RGB) *960	dots	-
Pixel arrangement	RGB vertical stripe	-	-
Pixel pitch	0.026(H) *0.078(V)	mm	-
Viewing angle	ALL	o'clock	-
Drive IC	R901-4	-	-
Display mode	Transmissive/ Normally Black	-	-
Operating temperature	-20q +70	W	-
Storage temperature	-30q +80	W	-

Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)	-	64.80	-	mm	f 0.05
	Vertical(V)	-	107.38	-	mm	f 0.05
	Depth(D)	-	3.63	-	mm	f 0.2
Weight		-	TBD	-	g	-

REVISION STATUS

Version	Revise Date	Page	Content	Modified by
V1.0	2017.11.10	-	First Issued.	Zao

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1. General Description

* DESCRIPTION

ASI-T-350G1A3MP6/AT is a color active matrix TFT LCD (liquid crystal display) that uses amorphous silicon TFT as a switching device. This model is composed of a Transmissive type TFT-LCD Panel, driver circuit, back-light unit. The resolution of a 3.5" TFT-LCD contains 640 x 960 pixels, and can display up to 16.7M colors.

* Features

- Low Input Voltage: VIO28_PMU: 2.4~3.3V; VIO18_PMU: 1.65~3.3V;LCD_5V7:5.7V
- Display Colors of TFT LCD:16.7M colors
- CPU Interface: MIPI-4LINE
- Internal Power Supply Circuit.

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Display mode	Transmissive/ Normally Black	-	-
Operating temperature	-20~+70	°C	-
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Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)	-	64.80	-	mm	±0.05
	Vertical(V)	-	107.38	-	mm	±0.05
	Depth(D)	-	3.63	-	mm	±0.2
Weight		-	TBD	-	g	-

3. PIN DESCRIPTION

Pin NO.	Symbol	Level	Function
1	VDD(2.8V)-CTP	H	Power supply
2	SCL(1.8V)-CTP	H/L	CTP-Serial clock input
3	SDA(1.8V)-CTP	H/L	CTP- Serial data input pin
4	RESET(1.8V)-CTP	H/L	CTP-Reset pin
5	INT(1.8V)-CTP	H/L	CTP- Interrupt pin
6	GND-CTP	L	CTP- Ground
7	VIO2.8_PWU	H	Power supply
8	VIO1.8_PWU	H	Power supply
9	GND	L	Ground
10	LCD_5.7V	H	Power supply
11	GND	L	Ground
12-15	NC	/	/
16	DSI_TE	H/L	Tearing effect output
17	LCM_RST	H/L	LCD Reset pin
18	LCD_ID	L	Connect OR to GND
19	GND	L	Ground
20	NC	/	/
21	GND	L	Ground
22	TDN2	H/L	MIPI data signal line
23	TSP2	H/L	MIPI data signal line
24	GND	L	Ground
25	TDN0	H/L	MIPI data signal line
26	TSP0	H/L	MIPI data signal line
27	GND	L	Ground
28	TCN	H/L	MIPI clock signal line
39	TCP	H/L	MIPI clock signal line
30	GND	L	Ground
31	TDN1	H/L	MIPI data signal line
32	TDP1	H/L	MIPI data signal line
33	GND	L	Ground
34	TDN3	H/L	MIPI data signal line
35	TDP3	H/L	MIPI data signal line
36	GND	L	Ground
37	NC	/	/
38	LEDA	H	Backlight Anode
39	LEDK	L	Backlight Cathode
40	NC	/	/

4. ELECTRICAL CHARACTERISTICS

4.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Values		Unit	Remark
		Min	Max.		
Supply Voltage for Logic circuit	VIO18_PMU	-0.3	4.6	V	
Supply Voltage for analog circuit	VIO28_PMU	-0.3	4.6	V	

4.2 DC ELECTRICAL CHARACTERISTICS

4.2.1 OPERATING CONDITIONS

Typical Operating Conditions (Ta=25°C)

Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Power Supply	VIO28_PMU	2.4	2.8	3.3	V	
Power Supply	VIO18_PMU	1.65	1.8	3.3	V	
Power Supply	LCD_5V7	-	5.7	-	V	
TFT Gate ON Voltage	V _{GH}	-	9	-	V	
TFT Gate OFF Voltage	V _{GL}	-	-8	-	V	

4.2.2 BACKLIGHT UNIT (GND=0V)

Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Forward supply Voltage	V _f	17.4	-	20.4	V	
Forward supply Current	I _f	-	20	-	mA	
LCM Luminance	L _v	340	380	-	cd/m ²	I _B =20mA
Uniformity	/	80			%	-

4.3 TIMING CHARACTERISTICS

High-Speed Transmission

High-Speed Data Transmission Burst

Figure 14 shows the sequence of events during the transmission of a Data Burst.

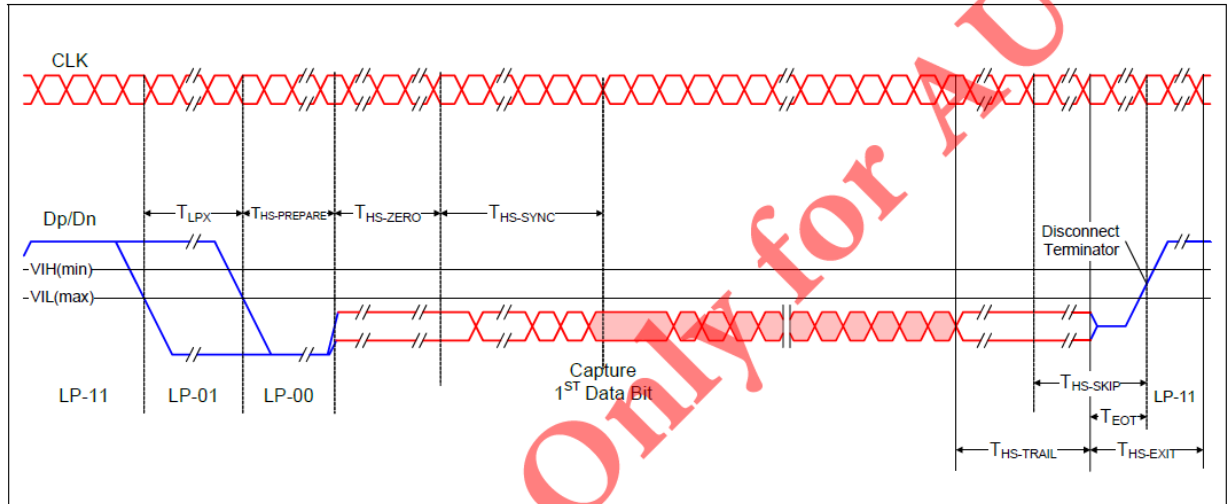


Figure 14 High-Speed Data Transmission in Bursts

5.OPTICAL CHARACTERISTICS

(LCD optical characteristics)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	70	80	-	Deg.	CF POL: HC+LR TFT POL: APF
		Θ_9		70	80	-	Deg.	
	Vertical	Θ_{12}		70	80	-	Deg.	
		Θ_6		70	80	-	Deg.	
Contrast Ratio		CR	$\Theta = 0^\circ$	600	800	-		CF POL: HC+LR TFT POL: APF
Cell Transmittance		Tr		6.7	6.9	-	%	
Color Chromaticity		Rx		0.615	0.605	0.595		Note 4 Only CF @ C Light
		Ry		0.329	0.319	0.309		
		Gx		0.327	0.317	0.307		
		Gy		0.566	0.556	0.546		
		Bx		0.156	0.146	0.136		
		By		0.156	0.146	0.136		
		Wx		0.292	0.307	0.322		
		Wy		0.321	0.336	0.351		
Color Gamut (C light)				48	50	-	%	Only CF @ C Light
Response Time (Rising + Falling)		T_{RT}	Ta= 25°C $\Theta = 0^\circ$	-	25	30	ms	Note 5

Note :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).
2. Contrast measurements shall be made at viewing angle of $\Theta = 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

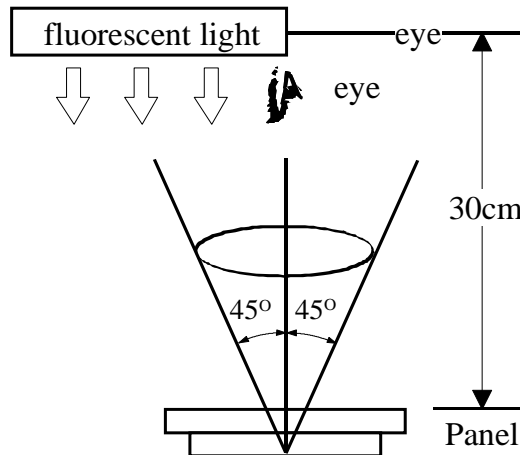
$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Transmittance is the Value with Polarizer
4. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
5. The electro-optical response time measurements shall be made as FIGURE 3 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r , and 90% to 10% is T_d .

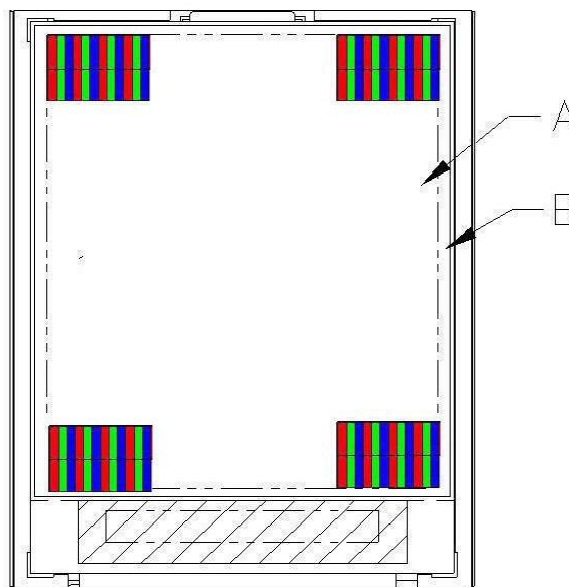
6. QUALITY SPECIFICATIONS

6.1 INSPECTION CONDITION

- (1) Inspect under 300~500Lux fluorescent light, leaving 30~35cm between panels and eyes, and between panels and lights.
- (2) Inspection condition is $23\pm 5^{\circ}\text{C}$, $50\pm 20\% \text{RH}$ maximum.



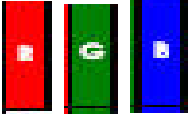
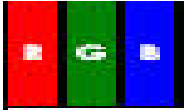
6.2 DEFINITION OF AREA


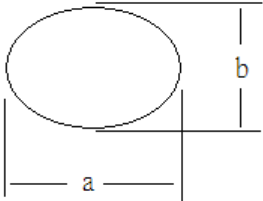


A Area : Viewing area.

B Area : Out of viewing.(outside viewing area)

6.3 INSPECTION SPECIFICATION

NO	Item	Acceptable specification	Judgment Criterion
1	Electrical Testing	<p>1-1 sub pixel classification</p> <ul style="list-style-type: none"> ● Sub Pixel: Number of sub pixel doesn't exceed one dot. <div style="text-align: center;">  <p>Sub Pixel (Dot)</p> </div> <p>a> Dark dot ----one Allowed b> Bright dot ---- one Allowed</p> <ul style="list-style-type: none"> ● Pixel : Three dots link together doesn't exceed ones <div style="text-align: center;">  <p>Pixel</p> </div> <p>1-2 Leakage to light</p> <ul style="list-style-type: none"> ● Leakage to light be not allowed. <p>1-3 Picture to shake</p> <ul style="list-style-type: none"> ● Picture had shake, twinkle and noise etc. instable of defect that be not allowed. <p>1-4 Function</p> <ul style="list-style-type: none"> ● No display or No function. ● Source Line, Gate Line. ● Contrast Ratio ● Current consumption exceeds product specifications. ● Display malfunction. 	<p>$N \leq 1$</p> <p>$N \leq 0$</p> <p>$N=0$</p> <p>$N=0$</p> <p>$N=0$</p>
2	Mechanical Dimension	<p>2-1 Mechanical Dimension exceeds product specifications.</p> <p>2-2 Out of frame and boss of plastic changed shape that be not allowed.</p>	<p>$N=0$</p>

NO	Item	Acceptable specification	Judgment Criterion																		
3	Cosmetic Inspection	<p>3-1 Blemish: Line shapes of defect</p> <table border="1"> <thead> <tr> <th>Length</th> <th>Width</th> <th>Acceptable number</th> <th>Mini. space</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>$W \leq 0.03$</td> <td>Ignore</td> <td rowspan="3">5 m m</td> </tr> <tr> <td>$L \leq 2.5$</td> <td>$0.03 < W \leq 0.05$</td> <td>3</td> </tr> <tr> <td>$L \leq 2.5$</td> <td>$0.05 < W \leq 0.1$</td> <td>2</td> </tr> <tr> <td>--</td> <td>$W > 0.1$</td> <td>Not allowed</td> <td>---</td> </tr> </tbody> </table>	Length	Width	Acceptable number	Mini. space	---	$W \leq 0.03$	Ignore	5 m m	$L \leq 2.5$	$0.03 < W \leq 0.05$	3	$L \leq 2.5$	$0.05 < W \leq 0.1$	2	--	$W > 0.1$	Not allowed	---	
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		<p>L: length(mm) W: width(mm)</p> 																			
		<p>3-2 Blemish: dot shapes of defect.</p> <table border="1"> <thead> <tr> <th>Dimension</th> <th>Acceptable number</th> <th>Mini. Space</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.10$</td> <td>Ignore</td> <td>---</td> </tr> <tr> <td>$0.10 < \Phi \leq 0.15$</td> <td>2</td> <td rowspan="2">5 m m</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.25$</td> <td>1</td> </tr> <tr> <td>$\Phi > 0.25$</td> <td>0</td> <td>---</td> </tr> </tbody> </table>	Dimension	Acceptable number	Mini. Space	$\Phi \leq 0.10$	Ignore	---	$0.10 < \Phi \leq 0.15$	2	5 m m	$0.15 < \Phi \leq 0.25$	1	$\Phi > 0.25$	0	---					
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<p>Foreign Substances</p>  <p style="text-align: right;">$\Phi = (a+b)/2$</p>																					

NO	Item	Acceptable specification	Judgment Criterion			
3	Cosmetic Inspection	3-4 Scratch <ul style="list-style-type: none"> ● Sensate scratch not allowed. ● Impassive scratch as below. <p style="text-align: right; color: red;">Unit:mm</p>				
		Length		Width	Acceptable number	Mini. space
		-----		$W \leq 0.03$	Ignore	5 m m
		$L \leq 2.5$		$0.03 < W \leq 0.05$	3	
		$L \leq 2.5$		$0.05 < W \leq 0.1$	2	
		----		$0.1 < W$	Not allowed	---
		$L > 2.5$		----	Not allowed	
		4		Package	4-1 Mixed product types 4-2 Shipping q'ty should be the same as "shipping notice form" q'ty. 4-3 Outer box can't broken.	N=0
5	LCD Mura	LCD Mura according to ND 5% keep out to determine, if keep out distance at 30cm be seen by eyes is NG, otherwise will be ok if invisible.				

7. RELIABILITY

Test Item	Test Condition
High Temperature Operation	70°C for 96 hours
Low Temperature Operation	-20°C for 96 hours
High Temperature Storage	80°C for 96 hours
Low Temperature Storage	-30°C for 96 hours
High Temperature Operation Humidity Operation	60°C, 90%RH for 72 hours
Thermal Shock	-10°C (30min) ~+25°C (5min)~ +60°C (30min) for 10 cycles
Vibration Test (No Operation)	Frequency: 10-55Hz Amplitude:1.0mm Sweep Time: 11min Test Period: 6 Cycles for each direction of X, Y, Z
Static electricity test	Touch ±4KV,air touch ±8KV

8. HANDLING PRECAUTION

8.1 SAFETY

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

8.2 STORAGE CONDITIONS

- (1) Store the panel or module in a dark place where the temperature is $23\pm 5^{\circ}\text{C}$ and the humidity is below $50\pm 20\% \text{RH}$.
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.

8.3 HANDLING PRECAUTIONS

- (1) Avoid static electricity which can damage the CMOS LSI.
- (2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- (6) Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.