SAMSUNG ELECTRONICS

Approval

LEAD-FREE

TO : Fujitsu

DATE : June. 24, 2011

SAMSUNG TFT-LCD

MODEL NO. : LTN101AL01-F01

NOTE : Extension code [-F01]
→ LTN101AL01-F
Surface type [**Glare**]

Any Modification of Spec is not allowed without SEC' permission..

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PREPARED BY : **Application Engineering group, LCD Sales & Marketing Team**

Application engineering part, Mobile Division
Samsung Electronics Co., Ltd.

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REVISION HISTORY

Approval

Date	Revision No.	Page	Summary
Oct. 15, 2010	P00	All	. The preliminary specification of LTN101AL01-X01 model was issued first.
Nov. 12. 2010	P01	p. 14	LED placement structure was removed.
Nov. 15. 2010	P02	p. 6 p. 13	Weight was changed from 185g max to 165g max. LED string structure was changed from VF X 9LEDs to VF x 6LEDs
Nov. 18. 2010	P03	p. 7 p. 14 p. 15 p.17~ 19 p. 22 p. 26 p. 27 p. 28	BLU driving voltage was updated. LED placement structure was updated. User connector was changed from I-PEX 35pin to DDK 45pin. Input connector was changed from I-PEX 40pin to DDK 45pin. LVDS characteristics was updated as 8bit base. Power sequence and Timing parameters were updated as w/o LED Driver. Acceptance number of pilling and carton size were updated. Packing material, Markings and others were updated. Packing small box attach was updated.
Dec. 1. 2010	P04	p. 5 p. 11 p. 13 p. 15 ~16	Typo was corrected. [Pixel pitch 0.1695(H) x 0.0.1695(V) → 0.1695(H) x 0.1695(V) LVDS interface voltage was changed from 3.3V to 3.6V. Current of power supply were changed as PLS type. [AS-IS] White, Mosaic, V.stripe (max pattern) [TO-CE] White (max pattern), black, mosaic Voltage of power supply was updated. LED driver specification was removed due to without LED driver. Pin assignment was updated.
Dec. 7. 2010	P05	p. 7 p. 11 p. 13	Vcc was changed from 3.3V to 3.6V Vdd was changed from 2.5V to 3.6V VBLU was removed. Min. & Max. of main frequency was updated. LED array voltage was changed from 26.1V to 17.4V.
Dec. 23. 2010	P06	p. 6 p. 7 p. 15~ 16	Weight was changed from Max. 165g to Typ. 145g & Max. 155g. Vcc and Vdd were changed from 3.6V to 3.3V. Input terminal PIN assignment was updated.
Dec. 27. 2010	P07	p. 5 p. 11	The comment 'Onboard EEDID chip ' was removed. 3.6V LVDS Interface was changed to 3.3V LVDS Interface. Voltage of Power Supply was changed from 3.6V to 3.3V. The pictures of current of power supply was updated.

REVISION HISTORY

Approval

Date	Revision No.	Page	Summary
Dec. 27. 2010	P07	p. 15 ~ 16	Pin assignment was updated as Fujitsu's request.
Jan. 14. 2011	P08	p. 11 p. 25	Min. of main frequency was changed from 63.84MHz to 64.07MHz. Outline dimension was updated.
Jan. 27. 2011	P09	p. 11 p. 21 p. 25	Min of main frequency was changed from 64.07MHz to 66.11MHz. Min of one line scanning time and frame frequency were updated. Outline dimension was updated as Fujitsu's request.
Apr. 14. 2011	P10	p. 25 p. 27,28	Outline dimension was updated with tapes. Marking and Others was updated as Fujitsu label.
May. 4. 2011	P11	p. 18 p. 25	Timing Diagrams of LVDS For Transmission was changed from JEIDA mode to NS mode. Outline dimension was updated.
May. 18. 2011	P12	p. 27 p. 28	Fujitsu P/N was changed from CA51010-0157A1 to CA51010-0157. Box label was updated.
May. 20. 2011	P13	p. 25	Outline dimension was updated.
May. 24. 2011	P14	p. 25	Outline dimension was updated.
June. 9. 2011	P15	p. 25	Outline dimension was updated.
June. 14. 2011	P16	p. 15	Connector was changed from 'I-PEX 20455-040E-02R or equivalent ' to 'I-PEX 20455-040E-02R only'
June. 24. 2011	A00	p. 6 p. 8	Typ. of Horizontal outline was changed from 229.5mm to 229.62mm and typ. Of Vertical outline was changed from 149.8mm to 149.87mm. Color Chromaticity was updated.

GENERAL DESCRIPTION

DESCRIPTION

LTN101AL01 is a color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as switching devices. This model is composed of a TFT LCD panel, a driver circuit and a backlight unit. The resolution of a 10.1" contains 1280 x 800 pixels and can display up to 16,777,216 colors. 6 O'clock direction is the optimum viewing angle.

FEATURES

- High contrast ratio
- WXGA (1280 x 800 pixels) resolution
- Low power consumption
- Fast Response
- DE (Data enable) only mode
- 3.3V LVDS Interface
- Green product (RoHS compliant)

APPLICATIONS

- Notebook PC
- If the usage of this product is not for PC application, but for others, please contact SEC

GENERAL INFORMATION

Item	Specification	Unit	Note
Display area	216.96(H) x 135.60(V) (10.1” diagonal)	mm	
Driver element	a-Si TFT active matrix		
Display colors	16,777,216	colors	6bit +FRC
Number of pixel	1280 x 800	pixel	
Pixel arrangement	RGB vertical stripe		
Pixel pitch	0.1695(H) x 0.1695(V)	mm	TYP
Display Mode	Normally black, PLS mode		
Surface treatment	Glare		

Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal (H)	229.12	229.62	230.12	mm	Without flanges
	Vertical (V)	149.37	149.87	150.37	mm	
	Depth (D)	-	-	5.4	mm	(1)
Weight		-	145	155	g	

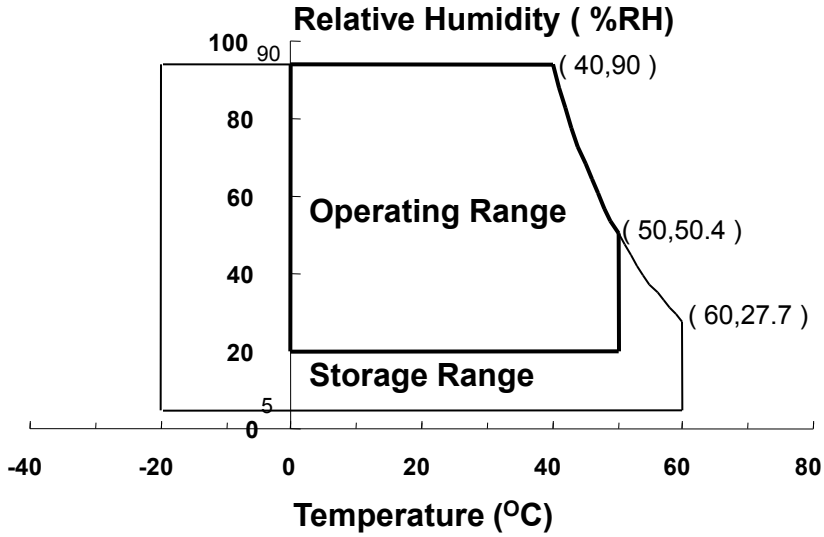
Note (1) Measurement condition of outline dimension
. Equipment : Bernier Calipers
. Push Force : 600g ·f (minimum)

1. ABSOLUTE MAXIMUM RATINGS

1.1 ENVIRONMENTAL ABSOLUTE RATINGS

Item	Symbol	Min.	Max.	Unit	Note
Storage temperate	TSTG	-20	60	°C	(1)
Operating temperate (Temperature of glass surface)	TOPR	0	50	°C	(1)
Shock (non-operating)	Snop	-	240	G	(2),(4)
Vibration (non-operating)	Vnop	-	2.41	G	(3),(4)

Note (1) Temperature and relative humidity range are shown in the figure below.
95 % RH Max. (40 °C ≥ Ta)
Maximum wet - bulb temperature at 39 °C or less. (Ta > 40 °C) No condensation



(2) 2ms, half sine wave, one time for ±X, ±Y, ± Z.
(3) 5 - 500 Hz, random vibration, 30min for X, Y, Z.
(4) At testing Vibration and Shock, the fixture in holding the Module to be tested have to be hard and rigid enough so that the Module would not be twisted or bent by the fixture.

1.2 ELECTRICAL ABSOLUTE RATINGS

(1) TFT LCD MODULE

(V_{CC} =3.3V, V_{SS} = GND = 0V, V_{DD} = 3.3V)

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V_{DD}	V_{DD} - 0.3	V_{DD} + 0.3	V	(1)
Logic Input Voltage	V_{IN}	V_{DD} - 0.3	V_{DD} + 0.3	V	(1)

Note (1) Within Ta (25 ± 2 °C)

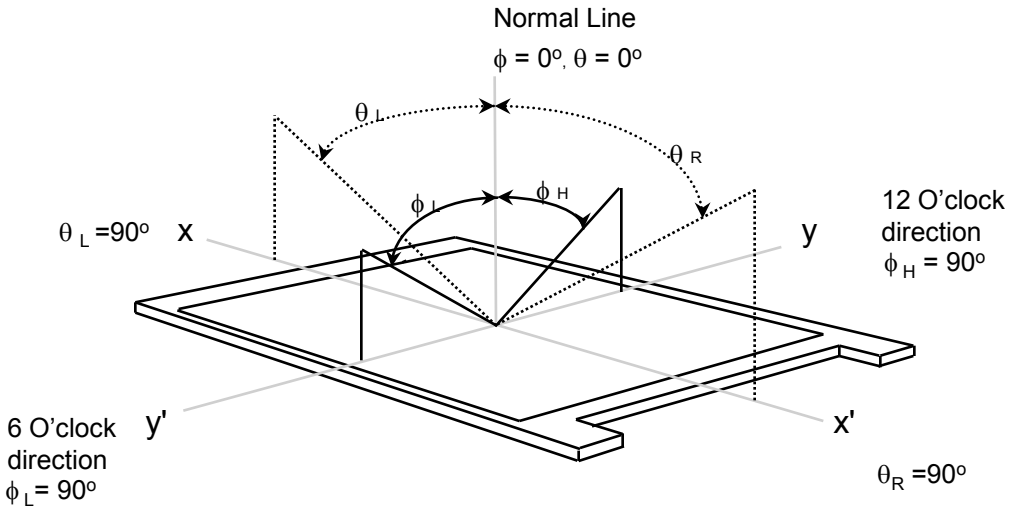
2. OPTICAL CHARACTERISTICS

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state with the methods shown in Note (5).
Measuring equipment : TOPCON SR-3

* Ta = 25 ± 2 °C, V_{DD}=3.3V, fv= 60Hz, f_{DCLK} = 68.94MHz, I_L = 23.0 mA

Item		Symbol	Condition	Min.	Typ.	Max	Unit	Note
Contrast Ratio (5 Points)		CR	Normal Viewing Angle $\phi = 0$ $\theta = 0$	400	500	-	-	(1), (2), (5)
Response Time at Ta (Rising + Falling)		T_{RT}		-	30	-	msec	(1), (3)
Average Luminance of White (Center 1p)		$Y_{L,AVE}$		340	400	-	cd/m^2	I_L=23.0mA (1), (4)
Color Chromaticity (CIE)	Red	R_X		0.551	0.581	0.611	-	(1), (5) SR-3
		R_Y		0.311	0.341	0.371		
	Green	G_X		0.321	0.351	0.381		
		G_Y		0.553	0.583	0.613		
	Blue	B_X		0.121	0.151	0.181		
		B_Y		0.081	0.111	0.141		
	White	W_X		0.283	0.313	0.343		
		W_Y		0.299	0.329	0.359		
Viewing Angle	Hor.	θ_L	CR ≥ 10 At center	-	80		Degrees	(1), (5) SR-3
		θ_H		-	80			
	Ver.	ϕ_H		-	80			
		ϕ_L		-	80			
Color Gamut		CG			45		%	
13 Points White Variation		δ_L		-	-	1.7	-	(6)

Note 1) Definition of Viewing Angle : Viewing angle range(10 ≤ C/R)

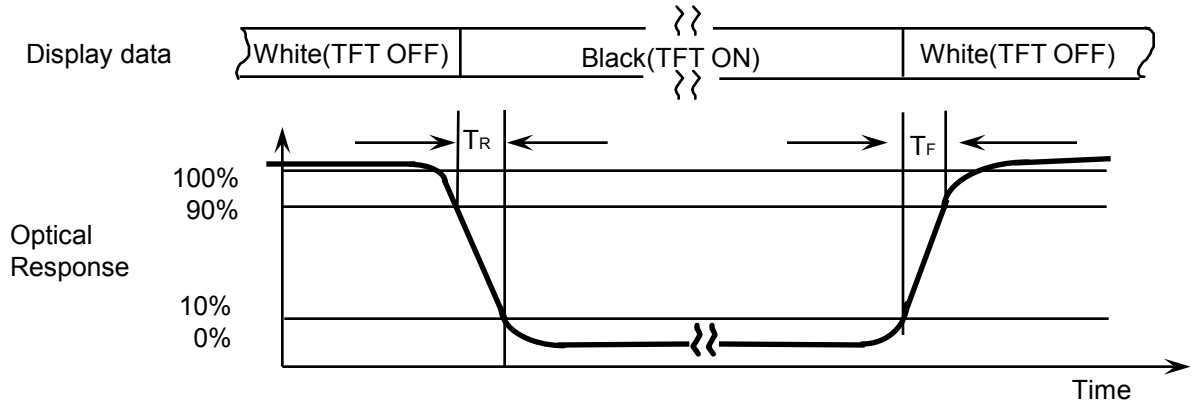


Note 2) Definition of Contrast Ratio (CR) : Ratio of gray max (Gmax) ,gray min (Gmin) at 5 points(4, 5, 7, 9, 10)

$$CR = \frac{CR(4) + CR(5) + CR(7) + CR(9) + CR(10)}{5}$$

Points : ④ , ⑤ , ⑦ , ⑨ , ⑩ at the figure of Note (6).

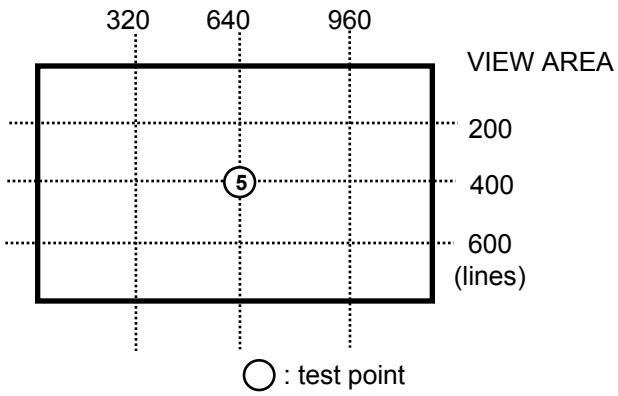
Note 3) Definition of Response time :



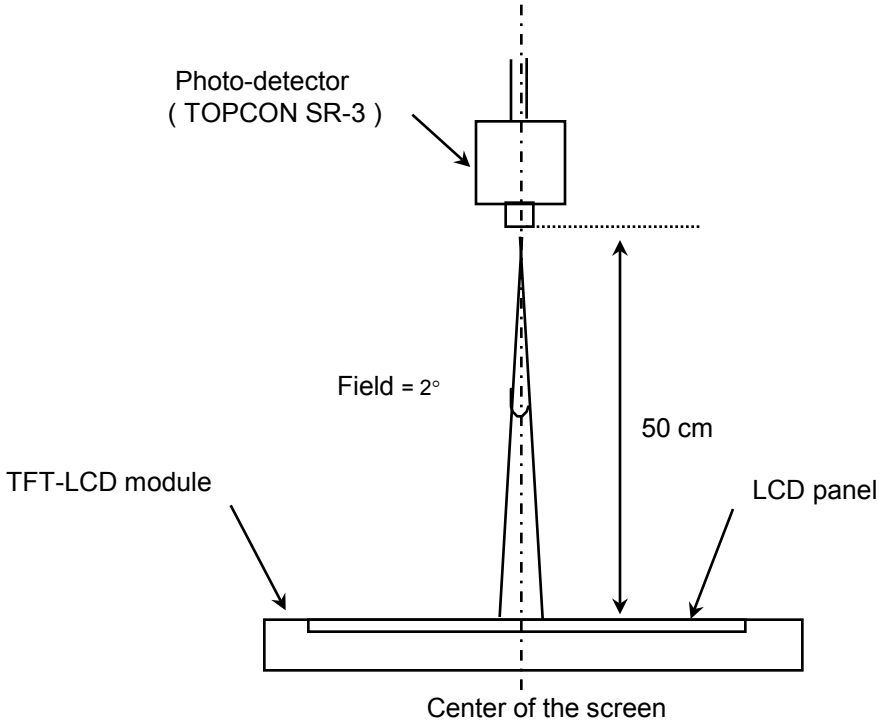
Note 4) Definition of Luminance of White : measure the luminance of white at center points.

Average Luminance of White ($Y_{L,AVE}$)

$Y_{L,AVE}$ = YL7



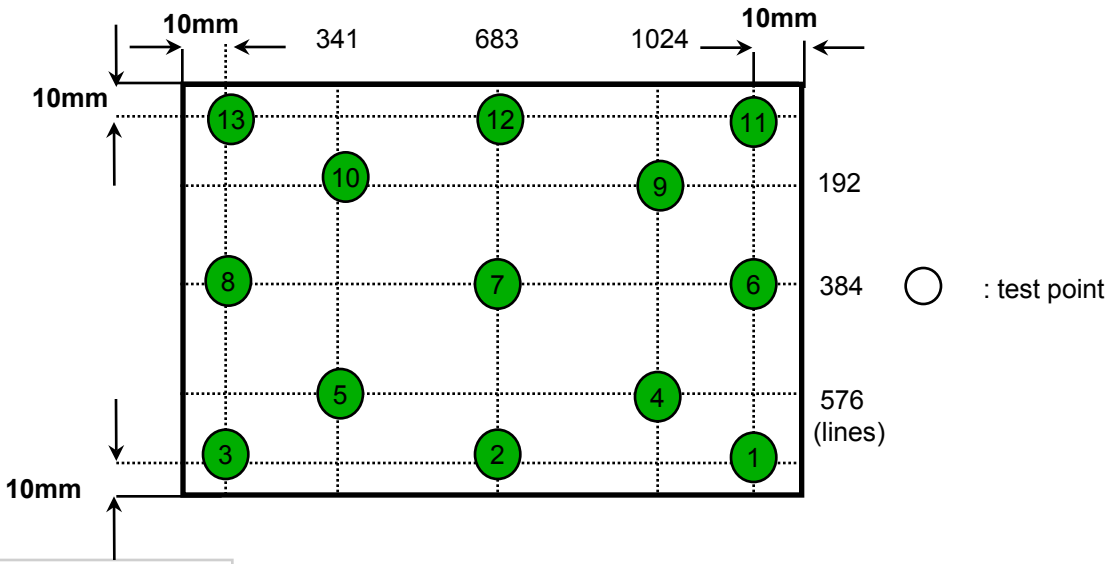
Note 5) After stabilizing and leaving the panel alone at a given temperature for 30 min , the measurement should be executed. Measurement should be executed in a stable, windless and dark room. 30 min after lighting the backlight. This should be measured in the center of screen.
LED current : 23.0mA
Environment condition : Ta = 25 ± 2 °C



[Optical characteristics measurement setup]

Note 6) Definition of 13 points white variation (δ_L), CR variation(C_{VER}) [① ~ ⑬]

$$\delta_L = \frac{\text{Maximum luminance of 13 points}}{\text{Minimum luminance of 13 points}}$$



3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

Ta= 25 ± 2°C

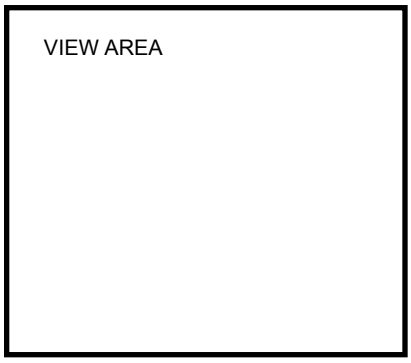
Item		Symbol	Min.	Typ.	Max.	Unit	Note
Voltage of Power Supply		V_{DD}	3.0	3.3	3.6	V	
Differential Input Voltage for LVDS Receiver Threshold	High	V_{IH}	-	-	+100	mV	V_{CM} = +1.2V
	Low	V_{IL}	-100	-	-	mV	
Vsync Frequency		fv	-	60	-	Hz	
Hsync Frequency		f_H	-	48.96	-	KHz	
Main Frequency		f_{DCLK}	66.11	68.94	74.97	MHz	
Rush Current		I_{RUSH}	-	-	1.5	A	(4)
Current of Power Supply	White	I_{DD}	-	280	310	mA	(2),(3)*a
	Black		-	210	-	mA	(2),(3)*b
	Mosaic		-	260		mA	(2),(3)*c

Note (1) Display data pins and timing signal pins should be connected.(GND = 0V)

(2) f_V = 60Hz, f_{DCLK} = 68.94MHZ, V_{DD} = 3.3V , DC Current.

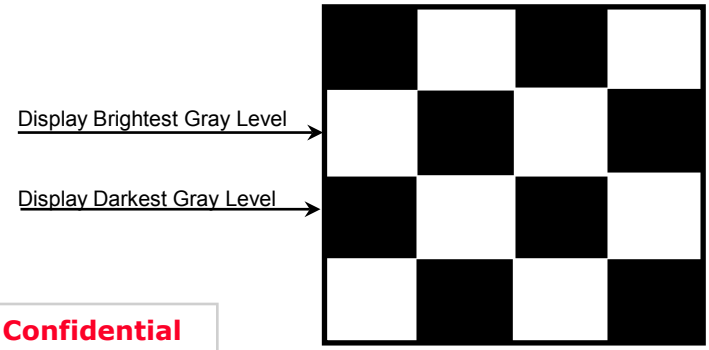
(3) Power dissipation pattern

*a) White Pattern

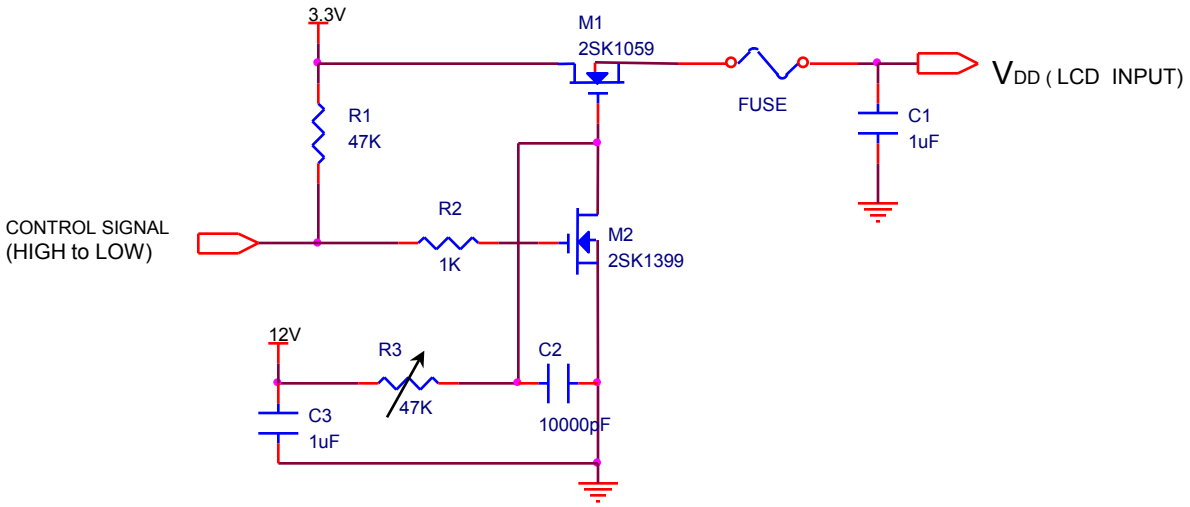


*b) Black Pattern

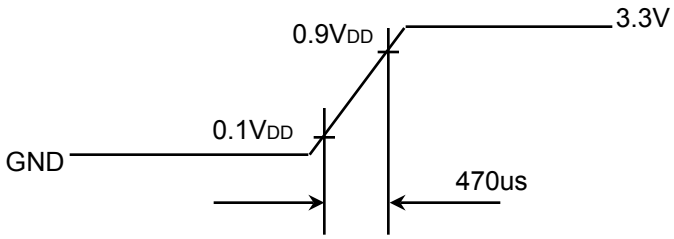
*C) Mosaic Pattern



4) Rush current measurement condition



VDD rising time is 470us



3.2 BACK-LIGHT UNIT

Ta= 25 ± 2 °C

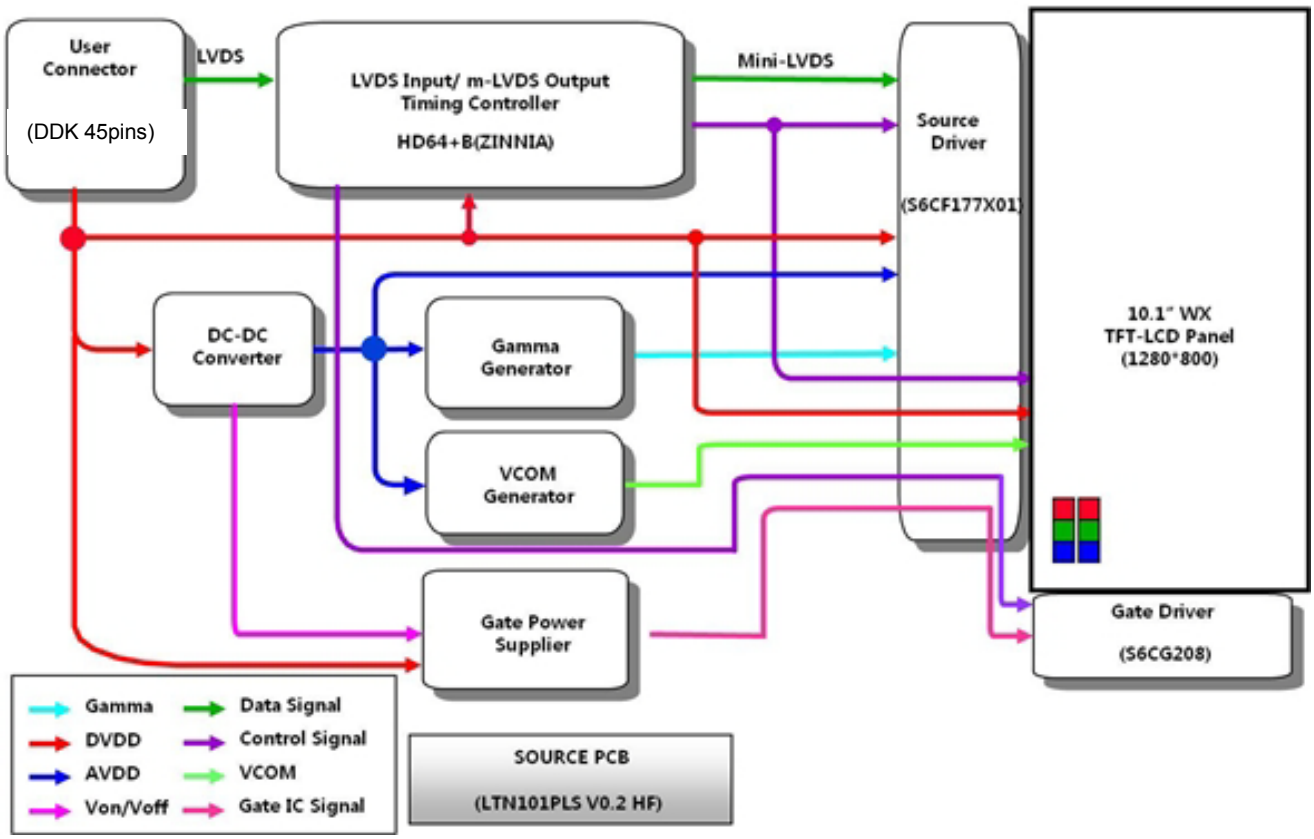
Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED Forward Current	IF	-	23	-	mA	
LED Forward Voltage	VF	2.8	2.9	3.0	V	
LED Array Voltage	VP	-	17.4	-	V	VF X 6LEDs
Power Consumption	P	-	2.40	2.5	W	IF X VF X 36LEDs
Operating Life Time	Hr	10000	-	-	Hour	(1)

Note (1) Life time (Hr) of LEDs can be defined as the time in which it continues to operate under the condition Ta= 25 ± 2 °C and IF = 25.5 mArms until one of the following event occurs.
1. When the brightness becomes 50% or lower than the original.

3.3 LED Driver (w/o driver)

4. BLOCK DIAGRAM

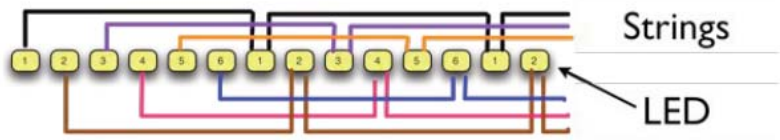
4.1 TFT LCD Module



4.2 LED placement structure

String	LED1	LED2	LED3	LED4	LED5	LED6
1	1	7	13	19	25	31
2	2	8	14	20	26	32
3	3	9	15	21	27	33
4	4	10	16	22	28	34
5	5	11	17	23	29	35
6	6	12	18	24	30	36

LED Assignments on FPC String



LED Connection on FPC

5. INPUT TERMINAL PIN ASSIGNMENT

5.1. Input Signal & Power (LVDS, Connector : I-PEX 20455-040E-02R only)

No.	Symbol	Function	Polarity	Remarks
1	GND	Ground		
2	AVDD	Power Supply 3.3V (typical)		
3	AVDD	Power Supply 3.3V (typical)		
4	DVDD	DDC 3.3V power		
5	WPN	Writing Protection Pin (SEC's use)		
6	SCL	DDC Clock		
7	SDA	DDC Data		
8	RIN0-	LVDS differential data input	Negative	
9	RIN0+	LVDS differential data input	Positive	
10	GND	Ground		
11	RIN1-	LVDS differential data input	Negative	
12	RIN1+	LVDS differential data input	Positive	
13	GND	Ground		
14	RIN2-	LVDS differential data input	Negative	
15	RIN2+	LVDS differential data input	Positive	
16	GND	Ground		
17	CLK-	LVDS differential clock input	Negative	
18	CLK+	LVDS differential clock input	Positive	
19	GND	Ground		
20	RIN3-	LVDS differential data input	Negative	
21	RIN3+	LVDS differential data input	Positive	
22	GND	Ground		
23	NC	No Connection		
24	NC	No Connection		
25	GND	Ground		
26	NC	No Connection		
27	NC	No Connection		
28	FB1	Feedback 1		
29	FB2	Feedback 2		
30	FB3	Feedback 3		

No.	Symbol	Function	Polarity	Remarks
31	FB4	Feedback 4		
32	FB5	Feedback 5		
33	FB6	Feedback 6		
34	NC	No Connection		
35	VBL+	LED VCC		
36	VBL+	LED VCC		
37	VBL+	LED VCC		
38	VBL+	LED VCC		
39	VBL+	LED VCC		
40	VBL+	LED VCC		

5.2 LVDS Interface

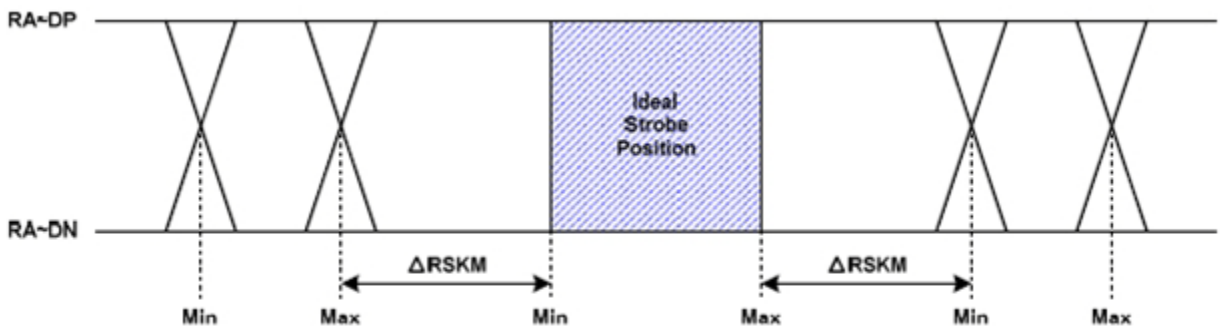
5.2.1 LVDS DC characteristic

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
LVDS Differential Voltage	|VID|	100	-	400	mV	
Input Common Mode Voltage	V_{CM}	0.6	0.8	1.0		
		0.8	1.2	1.4	V	

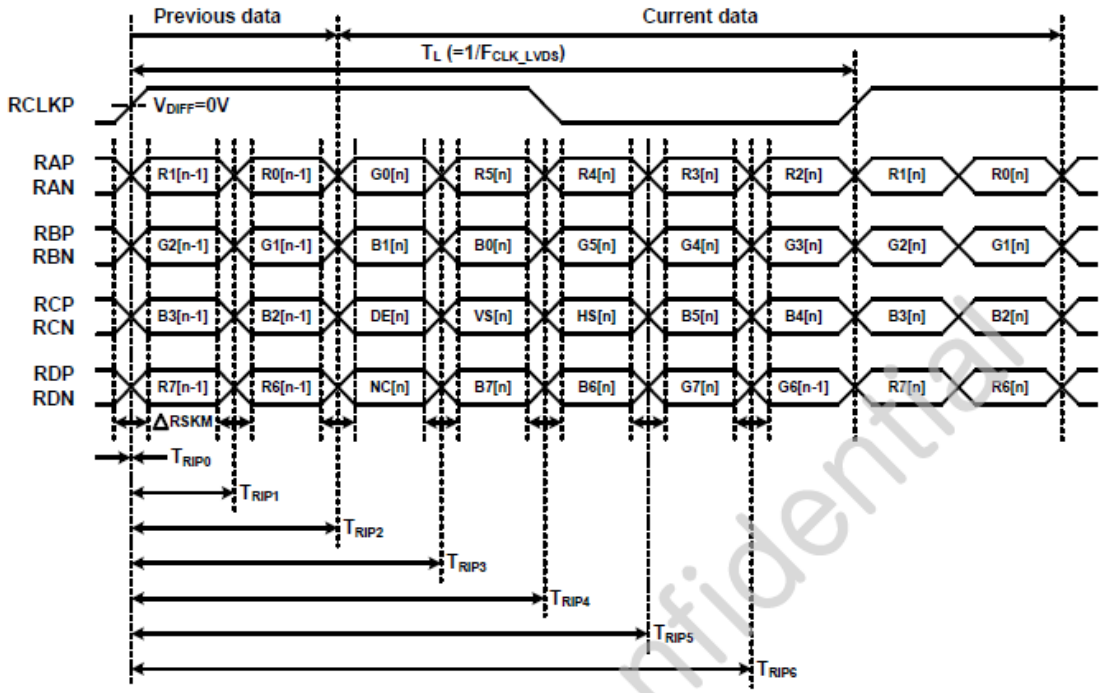
5.2.2 LVDS AC characteristic

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
LVDS input clock frequency		F_{CLK_LVDS}	20		90	MHz	
RIN skew margin	90MHz > F_{CLK_LVDS} ≥ 65MHz	△RSKM	-400	0	400	ps	(1),(2)
	65MHz > F_{CLK_LVDS} ≥ 20MHz		-600	0	600	ps	(1),(2)
Modulating frequency of LVDS input clock during SSCG		F_{CLK_MOD}	-	-	300	KHz	
Maximum deviation of LVDS input clock during SSCG		F_{CLK_DEV}	-	-	± 3	%	

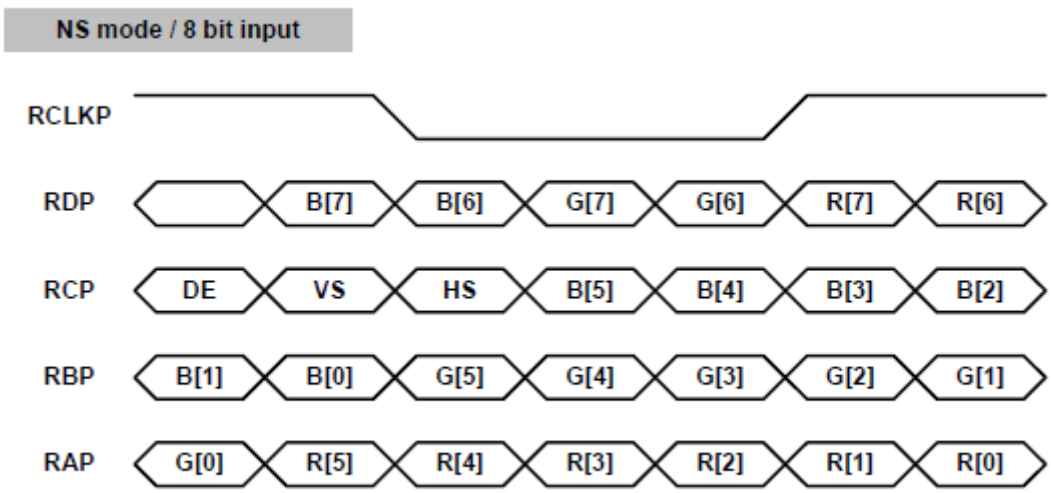
Note (1) : LVDS Input Skew (Strobe) Margin



Note (2) : LVDS Input Timing Diagram



5.3 Timing Diagrams of LVDS For Transmission

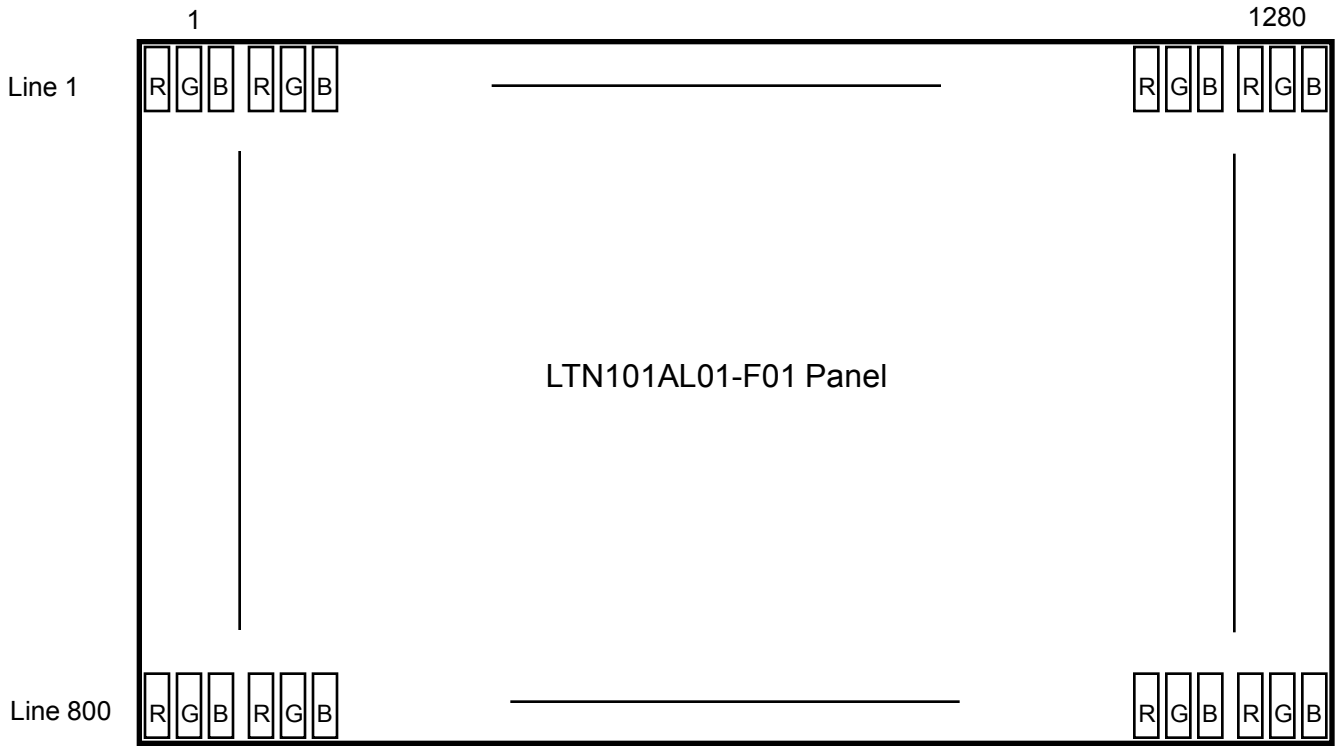


5.4 Input Signals, Basic Display Colors and Gray Scale of Each Color

	Display	Data Signal																							Gray Scale Level
		Red								Green								Blue							
		R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3	B4	B5	B6	B7	
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	-
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	-
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	-
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	-
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
Gray Scale Of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R0
	Dark	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R1
	↑	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	R3~R252
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R253
	Light	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R254
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R255
Gray Scale Of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G0
	Dark	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G1
	↑	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	G3~G252
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	G253
	Light	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	G254
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	G255
Gray Scale Of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B0
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	B1
	↑	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	B2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	B3~B252
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	B253
	Light	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	B254
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	B255

Note 1) Definition of gray :
Rn: Red gray, Gn: Green gray, Bn: Blue gray (n=gray level)
Note 2)Input signal: 0 =Low level voltage, 1=High level voltage

5.5 Pixel Format in the display

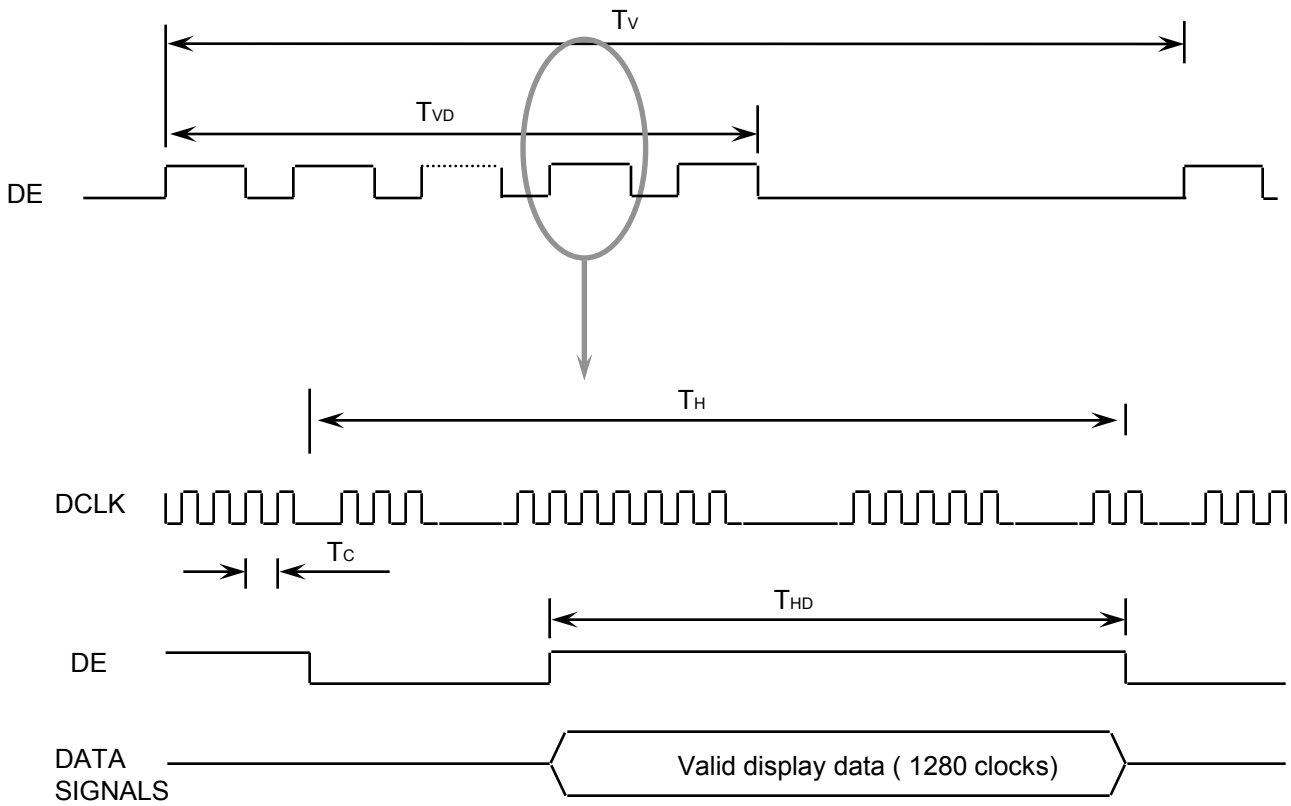


6. INTERFACE TIMING

6.1 Timing Parameters

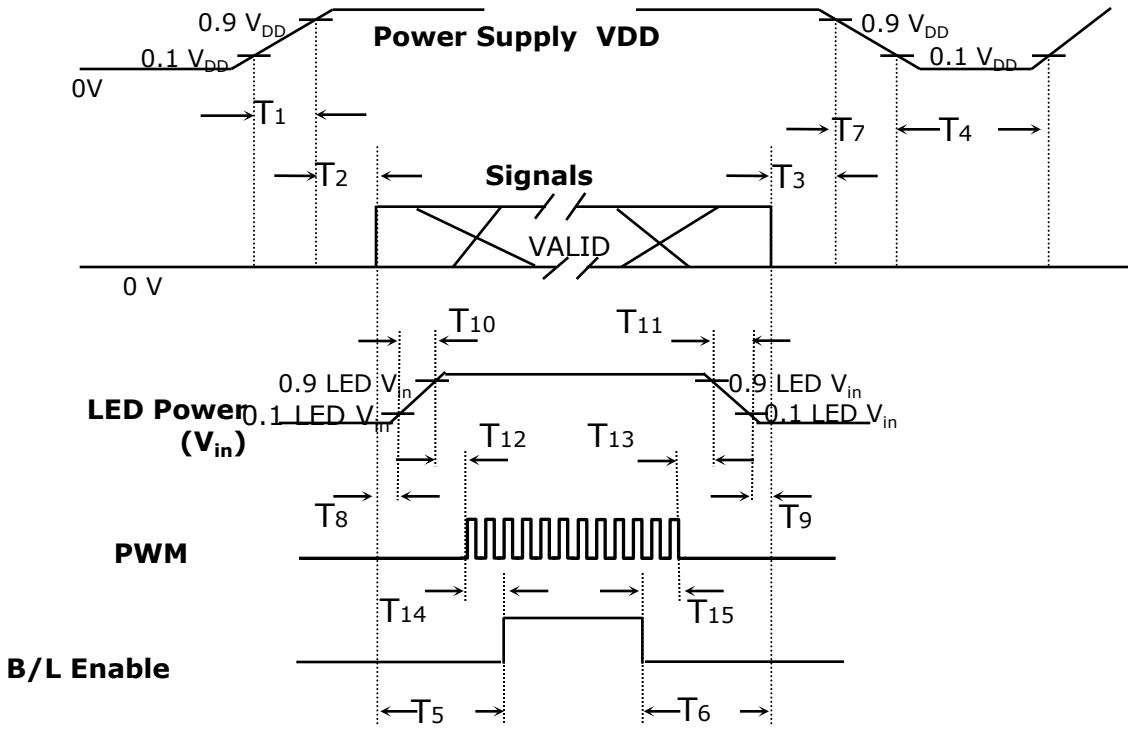
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
Frame Frequency	Cycle	TV	809	**816**	-	Lines	
Vertical Active Display Term	Display Period	TVD	-	800	-	Lines	
One Line Scanning Time	Cycle	TH	1362	**1408**	-	Clocks	
Horizontal Active Display Term	Display Period	THD	-	1280	-	Clocks	

6.2 Timing diagrams of interface signal



6.3 Power ON/OFF Sequence

: To prevent a latch-up or DC operation of the LCD module, the power on/off sequence should be as the diagram below.



Power Sequence & Timing Parameters

Timing (ms)	Remarks
0.5 ≤ T1 ≤ 10	V_{DD} rising time from 10% to 90%
0 ≤ T2 ≤ 50	Delay from V_{DD} to valid data at power ON
0 ≤ T3 ≤50	Delay from valid data OFF to V_{DD} OFF at power Off
500 ≤ T4	V_{DD} OFF time for Windows restart
300 ≤ T5	Delay from valid data to B/L enable at power ON
200 ≤ T6	Delay from B/L disable to valid data off at power Off
0 ≤ T7	
0 ≤ T8	
0 ≤ T9	
0 ≤T10	

Power Sequence & Timing Parameters

NOTE.

(1) The supply voltage of the external system for the module input should be the same as the definition of V_{DD}.

(2) Apply the lamp voltage within the LCD operation range. When the back-light turns on before the LCD operation or the LCD turns off before the back-light turns off, the display may momentarily become white.

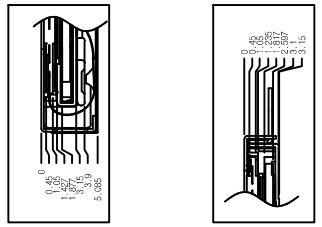
(3) In case of V_{DD} = off level, please keep the level of input signals on the low or keep a high impedance.

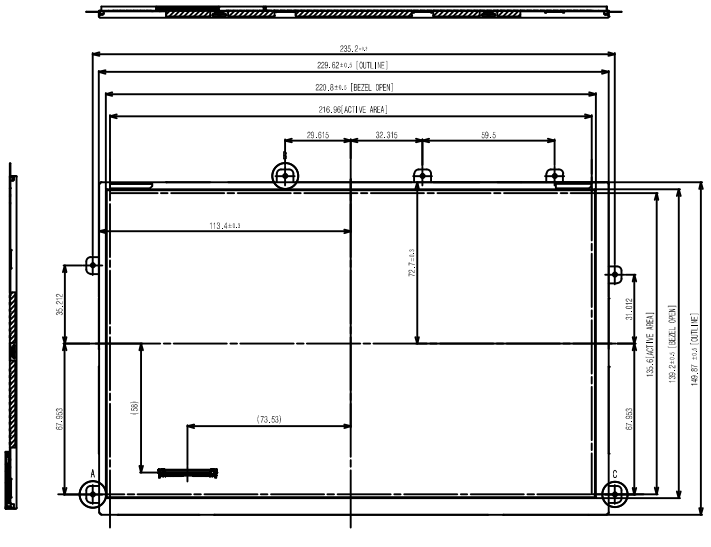
(4) T4 should be measured after the module has been fully discharged between power off and on period.

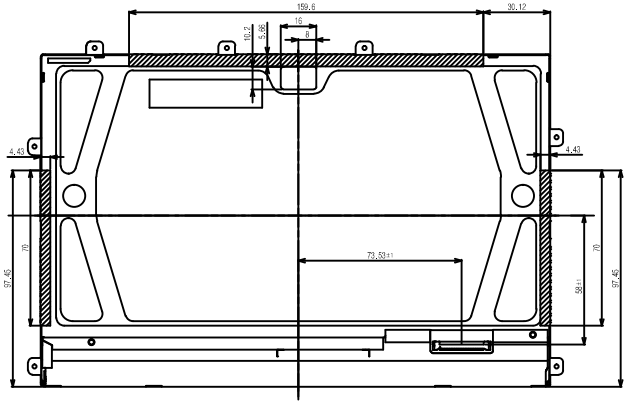
(5) Interface signal shall not be kept at high impedance when the power is on.

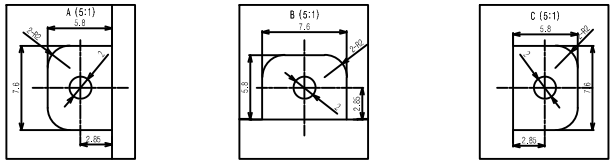
7. Mechanical Outline Dimension

Refer to the next page









TAPE-CONDUCTIVE T0.06

NOTES

1. SIGNAL INTERFACE CONNECTOR TO BE SPECIFIED AS BELOW
   - PART NO./MAKER : 20455-040E-02R, I-PEX
2. LED CONNECTOR FOR BACKLIGHT TO BE SPECIFIED AS BELOW
   - PART NO./MAKER : FFC6D-0108-C11
3. CALIPERS MEASURING FORCE : 750gf-cm
4. WEIGHT : 155g MAX

REVISION

GENERAL TOLERANCE			
STEP	LEVEL 1	LEVEL 2	LEVEL 3
0 < X ≤ 4	±0.05	±0.1	±0.2
4 < X ≤ 16	±0.08	±0.15	±0.3
16 < X ≤ 64	±0.12	±0.25	±0.5
64 < X ≤ 256	±0.25	±0.4	±0.8

REV.	DATE	DESCRIPTION OF REVISION				REASON	CHK'D BY
UNIT	mm	DRAWN BY	DES'D BY	CHK'D BY	APP'D BY		
SCALE	1/1	K.S.KIM					
CHKD. NUMBER		2011.04.06					

SAMSUNG ELECTRONICS

SPEC. NO.

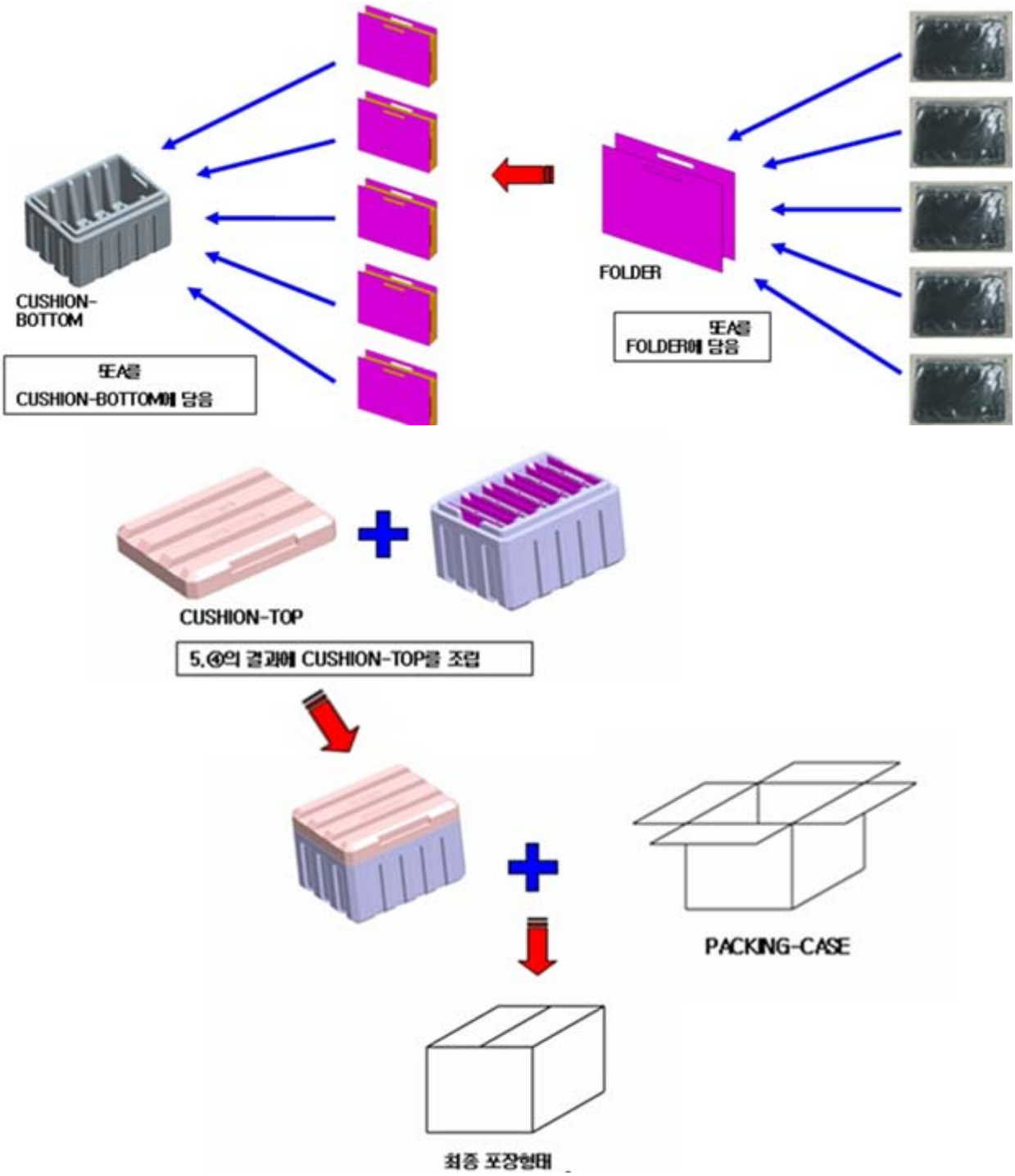
MODLE NAME	LTN101AL01-F01
PART/SHEET NAME	OUTLINE
CODE NO.	
SHEET	
VER.	

8. PACKING

1. CARTON(Internal Package)

(1) Packing Form
Styrofoam cushion box as shock absorber

(2) Packing Method



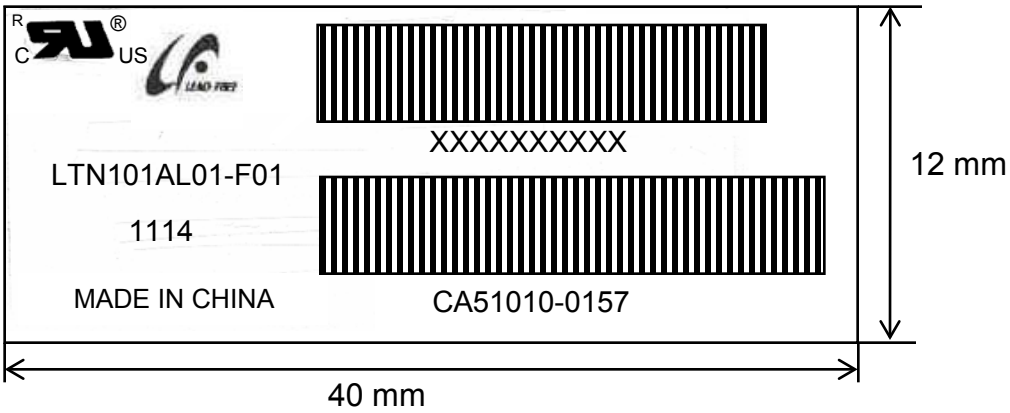
Note 1)Total Weight : Approximately 7 kg
2) Acceptance number of piling : 25 sets
3) Carton size : 475(W) × 356(D) × 278(H)

(3)Packing Material

No	Part name	Quantity
1	Static electric protective sack	25
2	Cushion Pad(Inner Box) Included shock absorber.	1 set
3	Carton	1 set

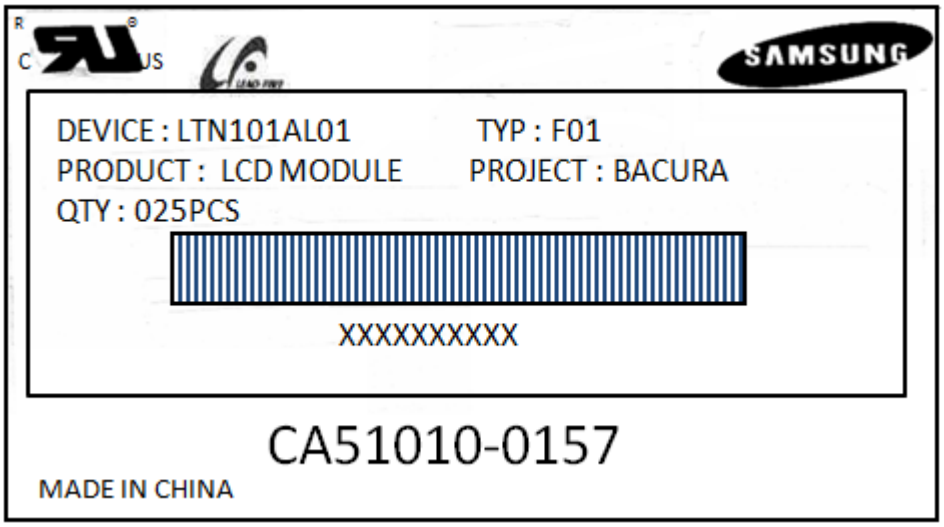
9. MARKINGS & OTHERS

A nameplate bearing followed by is affixed to a shipped product at the specified location on each product.



Parts name : LTN101AL01-F01
Lot number : XXXXXXXXXX
Inspected work week : 1114 (2011 year 14th week)
Product Revision Code : F01
Fujitsu CP number : CA51010-0157

(1) Packing small box attach



10. GENERAL PRECAUTIONS

1. Handling

(a) When the module is assembled, It should be attached to the system firmly using every mounting holes. Be careful not to twist and bend the modules.

(b) Refrain from strong mechanical shock and / or any force to the module. In addition to damage, this may cause improper operation or damage to the module.

(c) Note that polarizers are very fragile and could be easily damaged. Do not press or scratch the surface harder than a HB pencil lead.

(d) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, Staining and discoloration may occur.

(e) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.

(f) The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane.
Do not use Ketone type materials(ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. They might cause permanent damage to the polarizer due to chemical reaction.

(g) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth . In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

(h) Protect the module from static , it may cause damage to the C-MOS Gate Array IC.

(i) Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.

(j) Do not disassemble the module.

(k) Do not adjust the variable resistor which is located on the back side.

(l) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.

(m) Pins of I/F connector shall not be touched directly with bare hands.

2. STORAGE

(a) Do not leave the module in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 5 to 40 °C and relative humidity of less than 70%.

(b) Do not store the TFT-LCD module under the direct sunlight.

(c) The module shall be stored in a dark place. It is prohibited to apply sunlight or fluorescent light during storage.

(d) Storage period is recommended not to exceed 1 year.

3. OPERATION

(a) Do not connect, disconnect the module in the " Power On" condition.

(b) Power supply should always be turned on/off according to the following item 6.3 " Power on/off sequence ".

(c) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.

(d) The standard limited warranty is only applicable when the module is used for general notebook applications. If used for purposes other than as specified, SEC is not to be held reliable for the defective operations. It is strongly recommended to contact SEC to find out fitness for a particular purpose.

4. OTHERS

(a) Ultra-violet ray filter is necessary for outdoor operation.

(b) Avoid condensation of water. It may result in improper operation or disconnection of electrode.

(c) Do not exceed the absolute maximum rating value. (the supply voltage variation, input voltage variation, variation in part contents and environmental temperature, so on) Otherwise the module may be damaged.

(d) If the module displays the same pattern continuously for a long period of time, it can be the situation when the image "sticks" to the screen.

(e) This module has its circuitry PCB's on the rear side and should be handled carefully in order not to let it stressed.