SAMSUNG DISPLAY

Approval

LEAD-FREE

DATE : Apr. 10. 2012

SAMSUNG TFT-LCD

MODEL NO : LTN156AT24-L

NOTE : Extension code [-L]
→ LTN156AT24-L
- Surface type [**Glare**]

Any Modification of Spec is not allowed without SEC' permission

Application Engineering Group
LCD Sales & Marketing Team, LCD Division
Samsung Electronics Co., Ltd.

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CONTENTS

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REVISION HISTORY

Approval

Date	Revision No.	Page	Summary
Apr. 27. 2010	A00	All	. The approval specification was issued first.
May. 27. 2011	A01	24	. Product label definition was updated
July.06.2011	A02	22	. Outline drawing was updated
		24	. Product label definition was revised - USP code was removed
Sep.05.2011	A03	7	. Contrast ratio was revised
		10	. Current power supply at white was updated
		22	. Outline drawing was updated
		27	. Storage condition was updated
Sep. 20. 2011	A04	7	. IL was revised
		22	. Outline drawing was updated
		27	. Storage condition was revised
Sep. 23. 2011	A05	24	. Nameplante indication was updated
Oct. 17. 2011	A06	22	. Outline drawing was updated
Mar. 16. 2012	A07	12	. Operating Life Time was updated. (10,000 → 12,000 hours)
Mar. 22. 2012	A08	7	. View angle spec (Min.) was updated.
Apr.03.2012	A09	24	. Header code was updated.
Apr.10.2012	A10	25	. Small box label was changed.

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GENERAL DESCRIPTION

DESCRIPTION

LTN156AT24-L 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 system. The resolution of a 15.6" contains 1366 x 768 pixels and can display up to 262,144 colors. 6 O'clock direction is the Optimum viewing angle.

FEATURES

- High contrast ratio, high aperture structure
- 1366 x 768 pixels resolution (16:9)
- Fast Response Time
- Low power consumption
- LED BLU Structure
- DE (Data enable) only mode
- 3.3V LVDS Interface
- On board EDID chip
- Pb-free product

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	344.232 (H) x 193.536 (V) (15.6”diagonal)	mm	
Driver element	a-Si TFT active matrix		
Display colors	262,144		
Number of pixel	1366 x RGB(3) x 768	pixel	16 : 9
Pixel arrangement	RGB vertical stripe		
Pixel pitch	0.252 (H) x 0.252 (V) (TYP.)	mm	
Display Mode	Normally white		
Surface treatment	Haze 0 %, Hard- Coating 3H		Glare

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Mechanical Information

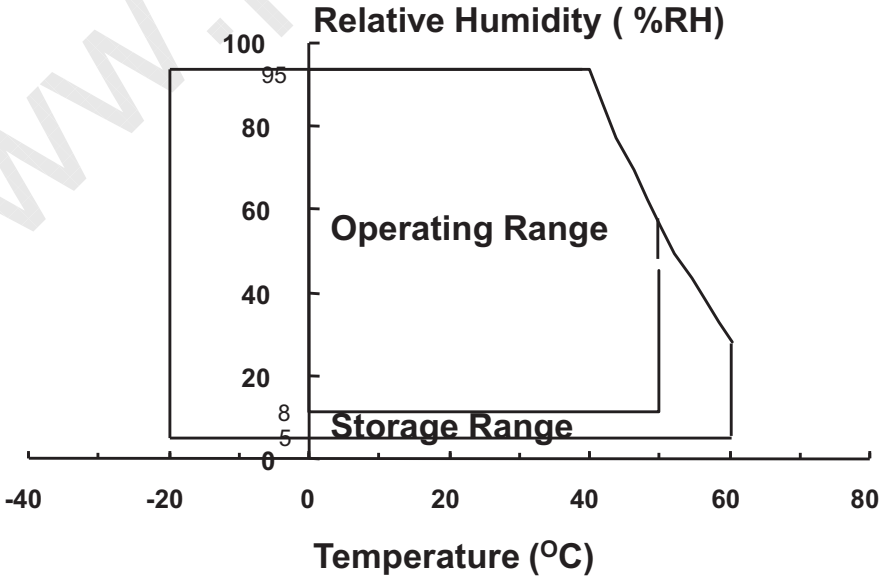
Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal (H)	358.8	359.3	359.8	mm	
	Vertical (V)	209.0	209.5	210	mm	
	Depth (D)	-	-	5.5	mm	(1)
Weight		-	-	450	g	

1. ABSOLUTE MAXIMUM RATINGS

1.1 ENVIRONMENTAL ABSOLUTE RATINGS

Item	Symbol	Min.	Max.	Unit	Note
Storage temperate	T_{STG}	-20	60	°C	(1)
Operating temperate (Temperature of glass surface)	T_{OPR}	0	50	°C	(1)
Shock (non-operating)	Snop	-	210	G	(2),(5)
			50		(3),(5)
Vibration (non-operating)	Vnop	-	2.41	G	(4),(5)

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) 3ms, half sine wave, one time for ±X,±Y,±Z.
(3) 18ms, Trapezoidal wave, one time for ±X,±Y,±Z.
(4) 5~500 Hz, Random vibration, 30 min for X,Y,Z.
(5) 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.



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1.2 ELECTRICAL ABSOLUTE RATINGS

(1) TFT LCD MODULE

V_{DD} =3.3V, V_{SS} = GND = 0V

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_{DD}	V_{DD} – 0.3	V_{DD} + 0.3	V	(1)

Note (1) Within Ta (25 ± 2 °C)

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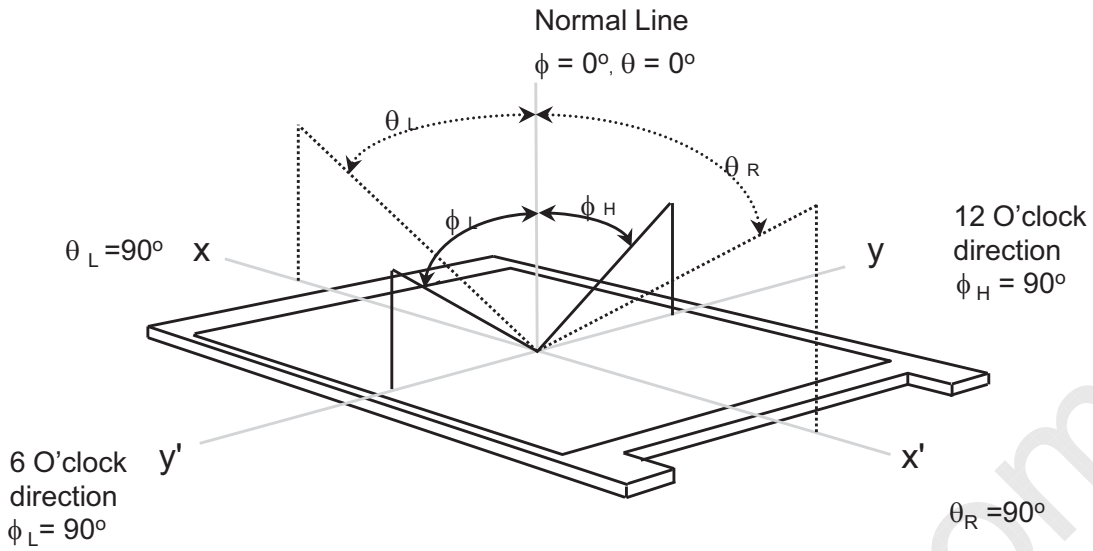
2. OPTICAL CHARACTERISTICS

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, fDCLK = 74.8 MHz, IL = 115mA

Item		Symbol	Condition	Min.	Typ.	Max	Unit	Note
Contrast Ratio (5 Points)		CR	Normal Viewing Angle $\phi = 0$ $\theta = 0$	-	500	-	-	(1), (2), (5)
Response Time at Ta (Rising + Falling)		T_{RT}		-	16	-	msec	(1), (3)
Average Luminance of White (5 Points)		$Y_{L,AVE}$		190	220	-	cd/m^2	I_L=115mA (1), (4)
Color Chromaticity (CIE)	Red	R_X		0.585	0.615	0.645	-	(1), (5) SR-3
		R_Y		0.325	0.355	0.385		
	Green	G_X		0.305	0.335	0.365		
		G_Y		0.580	0.610	0.640		
	Blue	B_X		0.120	0.150	0.180		
		B_Y		0.070	0.100	0.130		
	White	W_X		0.283	0.313	0.343		
		W_Y		0.299	0.329	0.359		
Viewing Angle	Hor.	θ_L	CR ≥ 10	40	45	-	Degrees	(1), (5) SR-3
		θ_R		40	45	-		
	Ver.	ϕ_H		10	15	-		
		ϕ_L		25	30	-		
Color gamut		%		-	60	-		
13 Points White Variation		δ_L		60%	-	-	-	(6)
5 Points White Variation		δ_L		80%	-	-	-	(6)

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

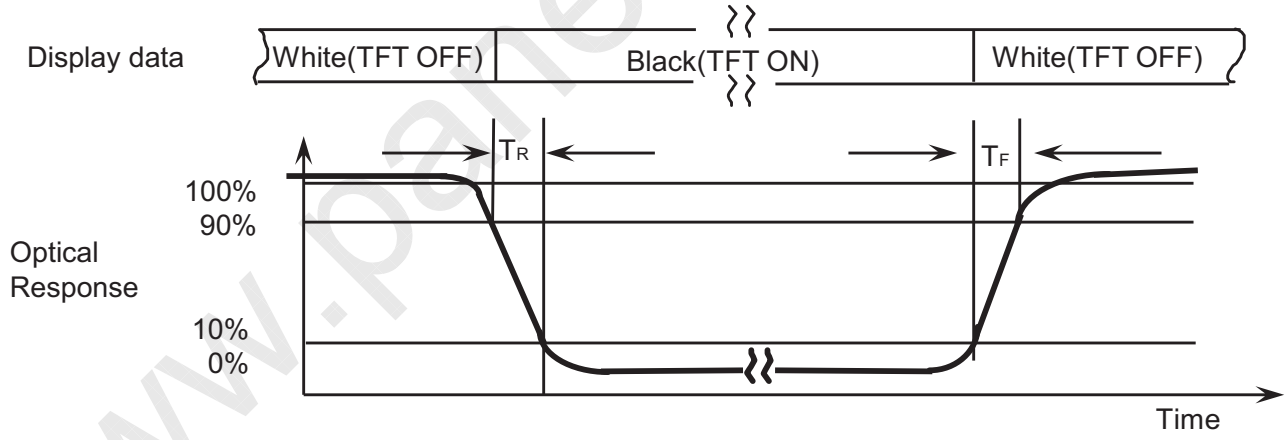


Note 2) Definition of Contrast Ratio (CR) : Ratio of gray max (Gmax) ,gray min (Gmin) at 5 points(4, 5, 7, 9, 10)

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

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

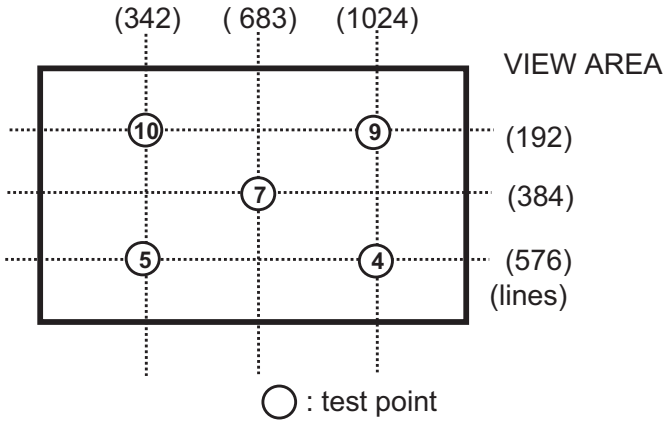
Note 3) Definition of Response time :



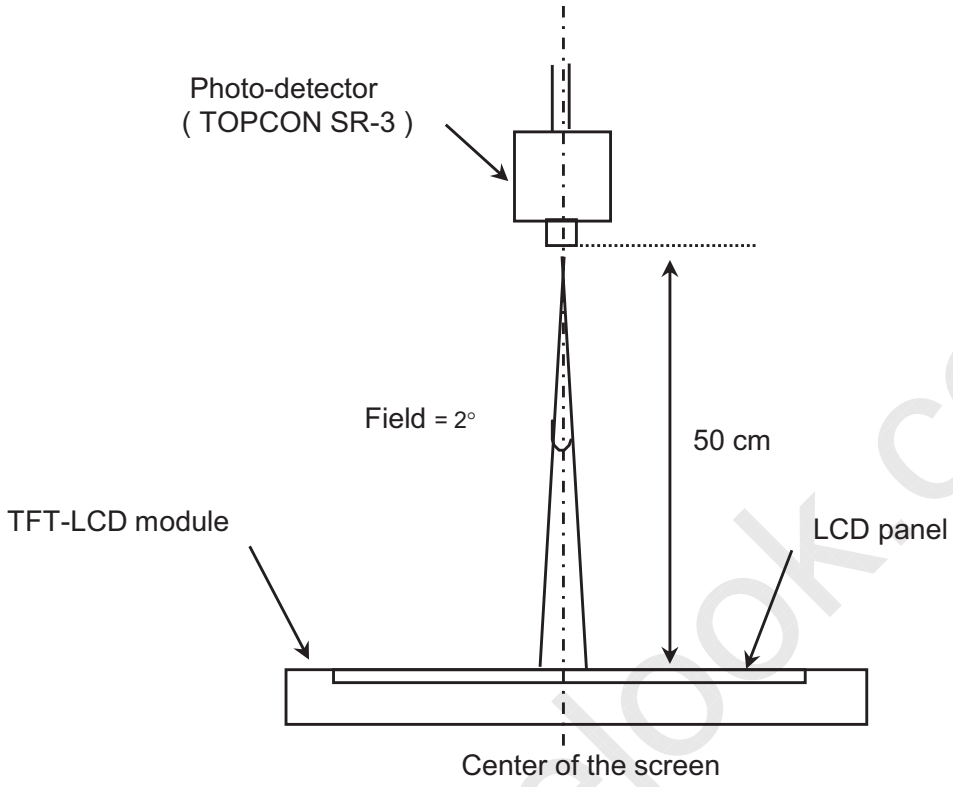
Note 4) Definition of Average Luminance of White : measure the luminance of white at 5 points.

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

$$Y_{L,AVE} = \frac{Y_{L4} + Y_{L5} + Y_{L7} + Y_{L9} + Y_{L10}}{5}$$



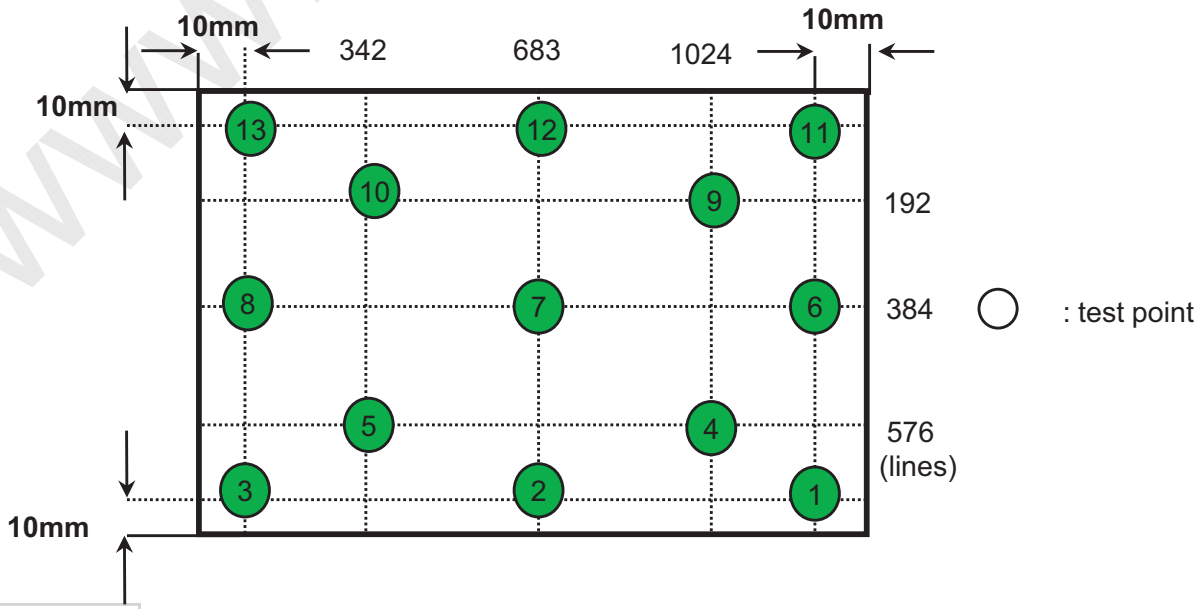
Note 5) After stabilizing and leaving the panel alone at a given temperature for 30 min , the measurement should be executed. Measurement should be executed in a stable, windless,and dark room. 30 min after lighting the backlight. This should be measured in the center of screen.
Environment condition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



[Optical characteristics measurement setup]

Note 6) Definition of 13 points white variation (δ_L), [① ~ ⑬]

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



3. ELECTRICAL CHARACTERISTICS

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3.1 TFT LCD MODULE

Ta= 25 ± 2°C

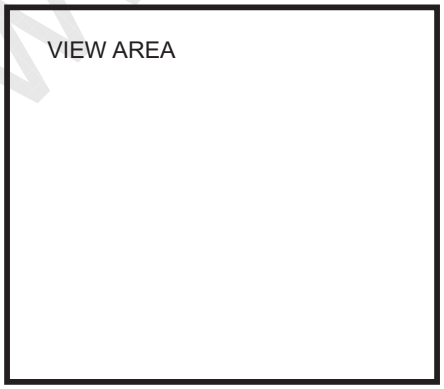
Item			Symbol	Min.	Typ.	Max.	Unit	Note
Voltage of Power Supply			V_{DD}	3.0	3.3	3.6	V	
Differential Input Voltage for LVDS Receiver Threshold		High	V_{IH}	-	-	+100	mV	V_{CM} = +1.2V
		Low	V_{IL}	-100	-	-	mV	
Vsync Frequency	60Hz	Hsync Freq	F_H	-	47.4	-	KHz	
		Main Freq	F_{DCLK}	-	74.80	-	MHz	
	50Hz	Hsync Freq	F_H	-	39.5	-	KHz	
		Main Freq	F_{DCLK}	-	62.33	-	MHz	
	40Hz	Hsync Freq	F_H	-	31.6	-	KHz	
		Main Freq	F_{DCLK}	-	49.86	-	MHz	
Rush Current			I_{RUSH}	-	-	1.5	A	(4)
Current of Power Supply		White	I_{DD}	-	200	-	mA	(2),(3)*a
		Mosaic		-	220	-	mA	(2),(3)*b
		WinXP Pattern		-	220	-	mA	(2),(3)*c
		V. Stripe		-	350	400	mA	(2),(3)*d

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

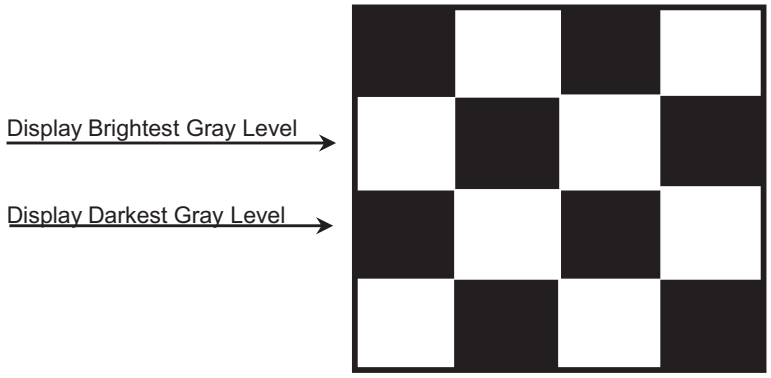
(2) f_V = 60Hz, f_{DCLK} = 74.8 MHZ, V_{DD} = 3.3V , DC Current.

(3) Power dissipation pattern

*a) White Pattern



*b) Mosaic Pattern



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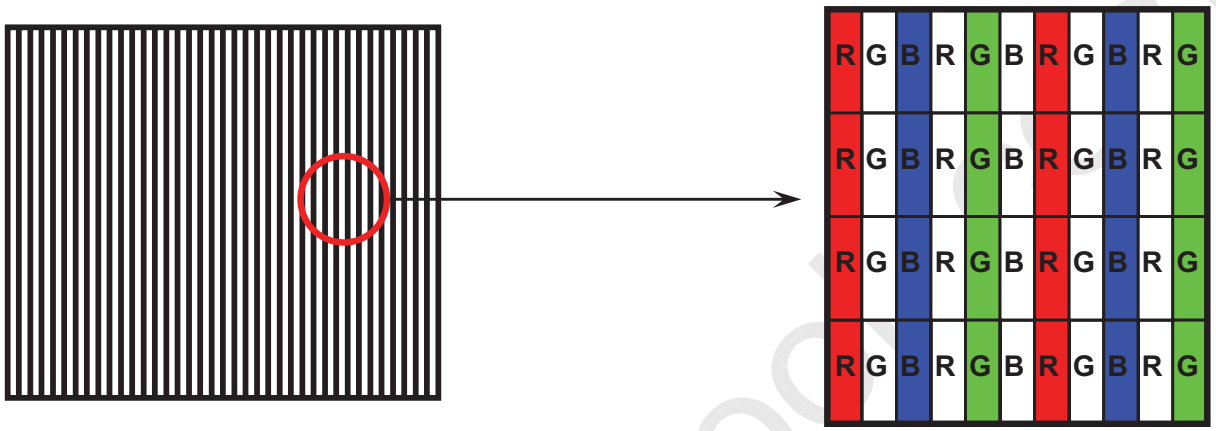
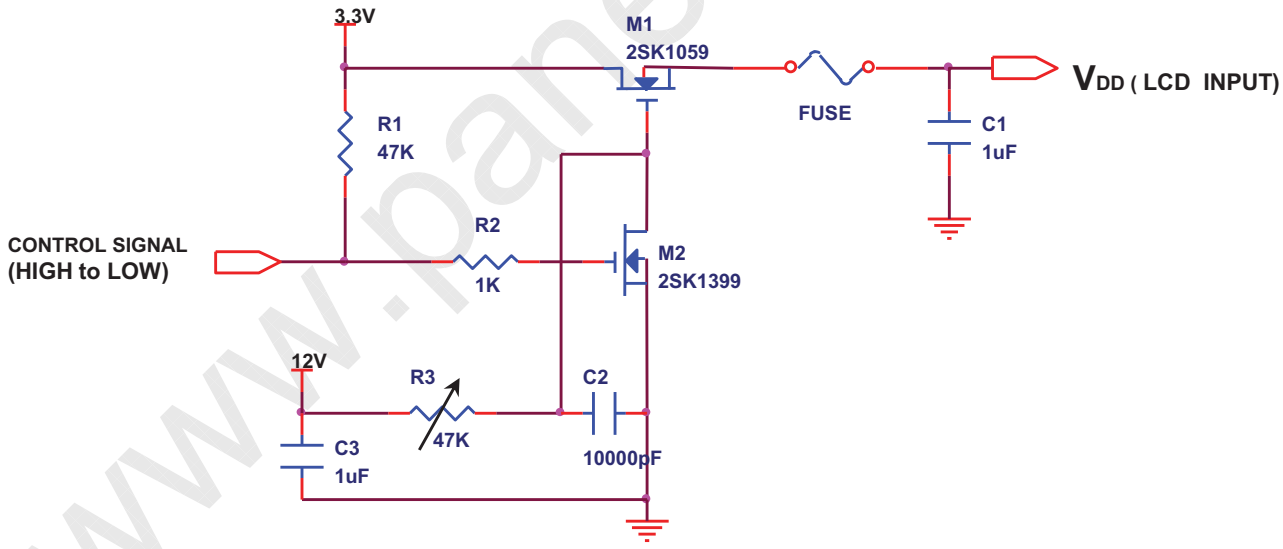
*c) WinXP Pattern

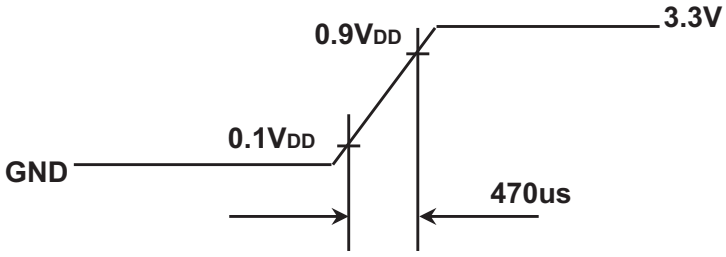
*d) 1dot Vertical stripe pattern



4) Rush current measurement condition



VDD rising time is 470us



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3.2 BACK-LIGHT UNIT

Ta= 25 ± 2 °C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED Forward Current	IF	-	115	-	mA	
LED Forward Voltage	VF	-	6.6	7.2	V	IF=115mA
LED Array Voltage	VP	-	26.4	-	V	VF X 4 LEDs
Power Consumption	P	-	-	3.6	W	IF X VF X 4 LEDs
Operating Life Time	Hr	12,000	-	-	Hr	(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 DC = 115mA until one of the following event occurs.
- When the brightness becomes 50% or lower than the original.

3.3 LED Driver

- LED Driver Manufacturer : RICHTEK , LED qty.: 4 X 1 = 4 EA

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Input Voltage	V_{in}	7	12	21	V	
PWM Duty	D1	1	-	100	%	PWM frequency (120~1khz)
	D2	5	-	100	%	PWM frequency (1~10khz)
	D2	10	-	100	%	PWM frequency (10~30Khz)
PWM Frequency	F_{PWM}	0.12		30	KHz	

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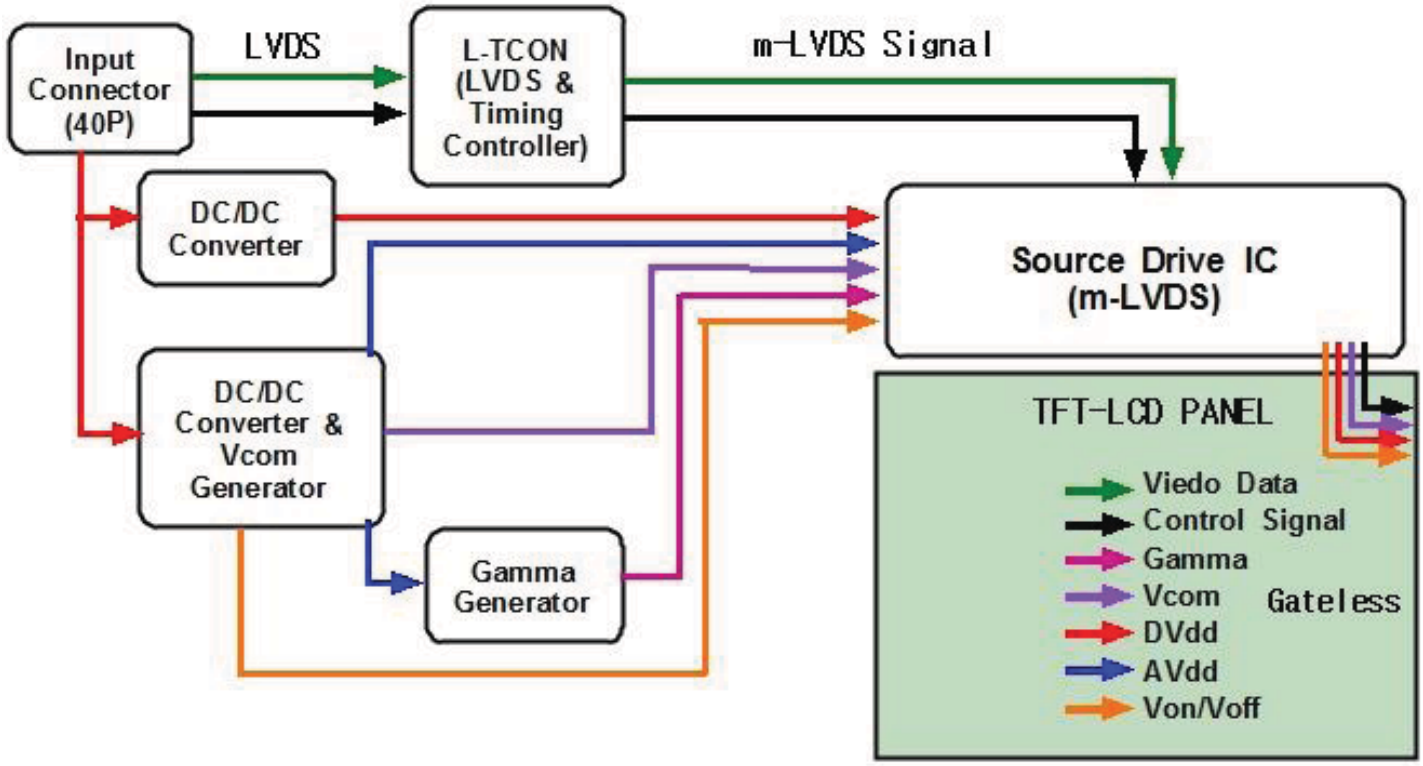
4. BLOCK DIAGRAM

4.1 TFT LCD Module



5. INPUT TERMINAL PIN ASSIGNMENT

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5.1. Input Signal & Power (LVDS, Connector : IPEX 20455-040E)

Pin	Symbol	Function
1	NC	No Connection (Reserved for supplier)
2~3	VDD	Logic power 3.3V (Panel logic, BL logic)
4	VEDID	EDID 3.3V power
5	NC	no connect
6	CLK_EDID	EDID clock
7	DATA_EDID	EDID data
8	RXin0-	- LVDS differential data (R0-R5, G0)
9	RXin0+	+ LVDS differential data (R0-R5, G0)
10	GND	Ground
11	RXin1-	- LVDS differential data (G1-G5, B0-B1)
12	RXn1+	+ LVDS differential data (G1-G5, B0-B1)
13	GND	Ground
14	RXin2-	- LVDS differential data (B2-B5,HS,VS, DE)
15	RXn2+	+ LVDS differential data (B2-B5,HS,VS, DE)
16	GND	Ground
17	ClkIN-	- LVDS differential clock input
18	ClkIN+	+ LVDS differential clock input
19	GND	Ground
20~21	NC	No Connection
22	GND	Ground
23~24	NC	No Connection
25	GND	Ground
26~27	NC	No Connection
28	GND	Ground
29~30	NC	No Connection
31~33	VBL-	LED Ground
34	NC	No Connection
35	S_PWM	System PWM Signal Input
36	LED_EN	BL On/Off (On: 2.0~3.3V, Off: 0~0.8V)
37	NC	No Connection
38~40	VBL+	LED Power Supply 7V-21V

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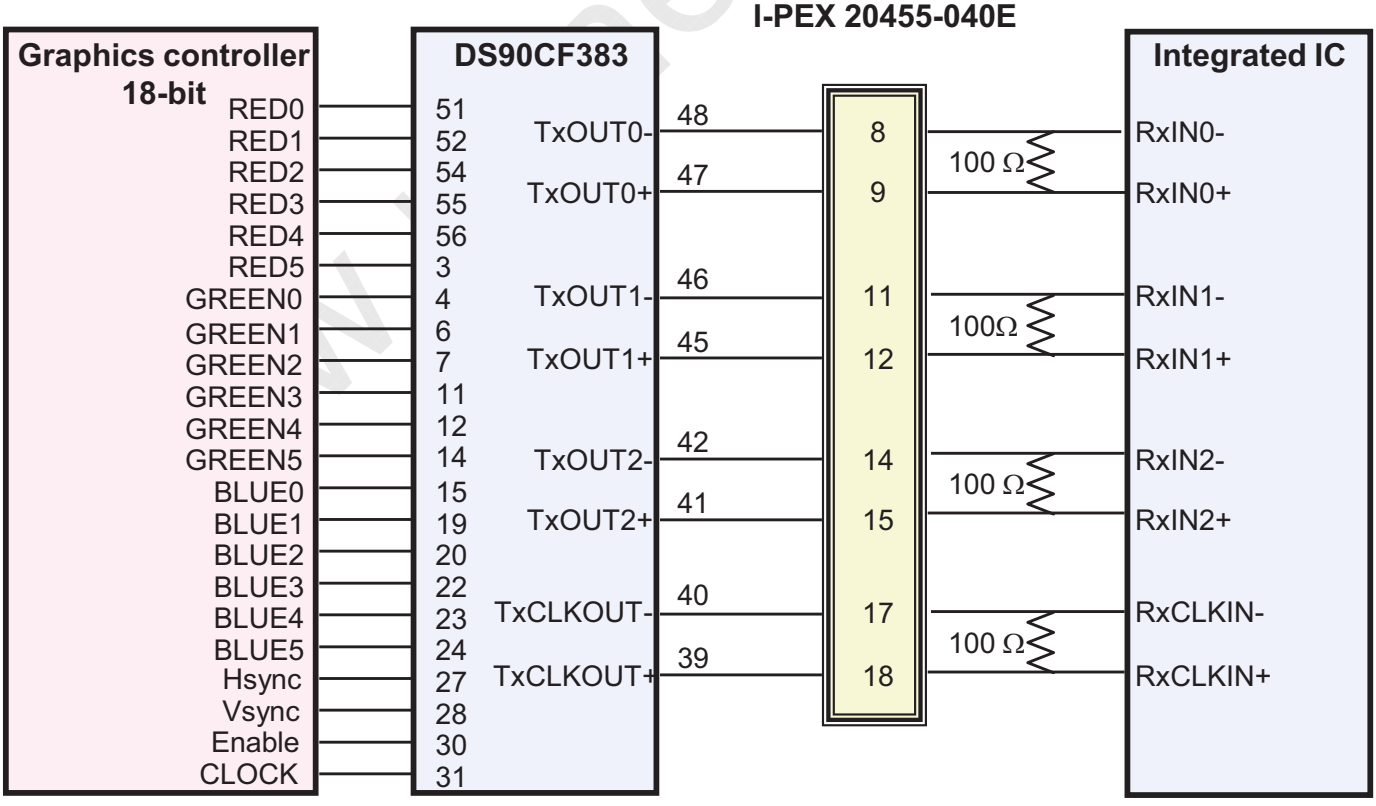
5.2 LVDS Interface

Pin No.	Name	RGB Signal	Pin No.	Name	RGB Signal
51	TxIN0	R0	14	TxIN14	G5
52	TxIN1	R1	15	TxIN15	B0
54	TxIN2	R2	19	TxIN18	B1
55	TxIN3	R3	20	TxIN19	B2
56	TxIN4	R4	22	TxIN20	B3
3	TxIN6	R5	23	TxIN21	B4
4	TxIN7	G0	24	TxIN22	B5
6	TxIN8	G1	27	TxIN24	Hsync
7	TxIN9	G2	28	TxIN25	Vsync
11	TxIN12	G3	30	TxIN26	DE
12	TxIN13	G4	31	TxCLKIN	Clock

LVDS INTERFACE



Note : The LCD Module uses a 100ohm resistor between positive and negative lines of each receiver input.

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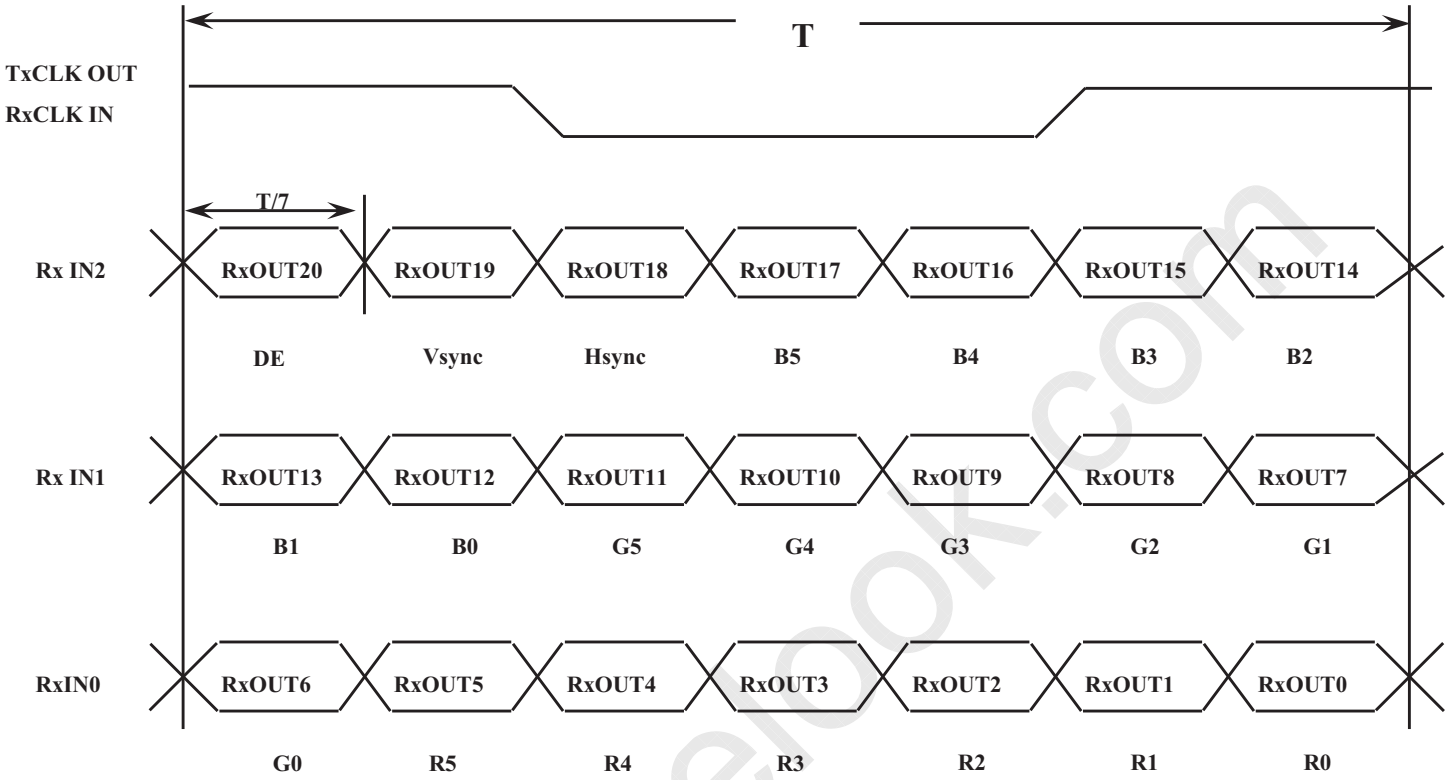
5.3 Timing Diagrams of LVDS For Transmission

LVDS Receiver : Integrated T-CON



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

Color	Display	Data Signal																		Gray Scale Level
		Red						Green						Blue						
		R0	R1	R2	R3	R4	R5	G0	G1	G2	G3	G4	G5	B0	B1	B2	B3	45	B5	
Basic Colors	Black	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	1	1	1	1	1	1	-
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	-
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	-
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	-
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	-
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	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	-
Gray Scale Of Red	Black	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	R1
	↑	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	R3~R60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R61
	Light	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R62
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R63
Gray Scale Of Green	Black	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	1	0	0	0	0	0	0	0	0	0	0	0	G1
	↑	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	G2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	G3~G60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	G61
	Light	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	G62
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	G63
Gray Scale Of Blue	Black	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	1	0	0	0	0	0	B1
	↑	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	B3~B60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	B61
	Light	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	B62
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	B63

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

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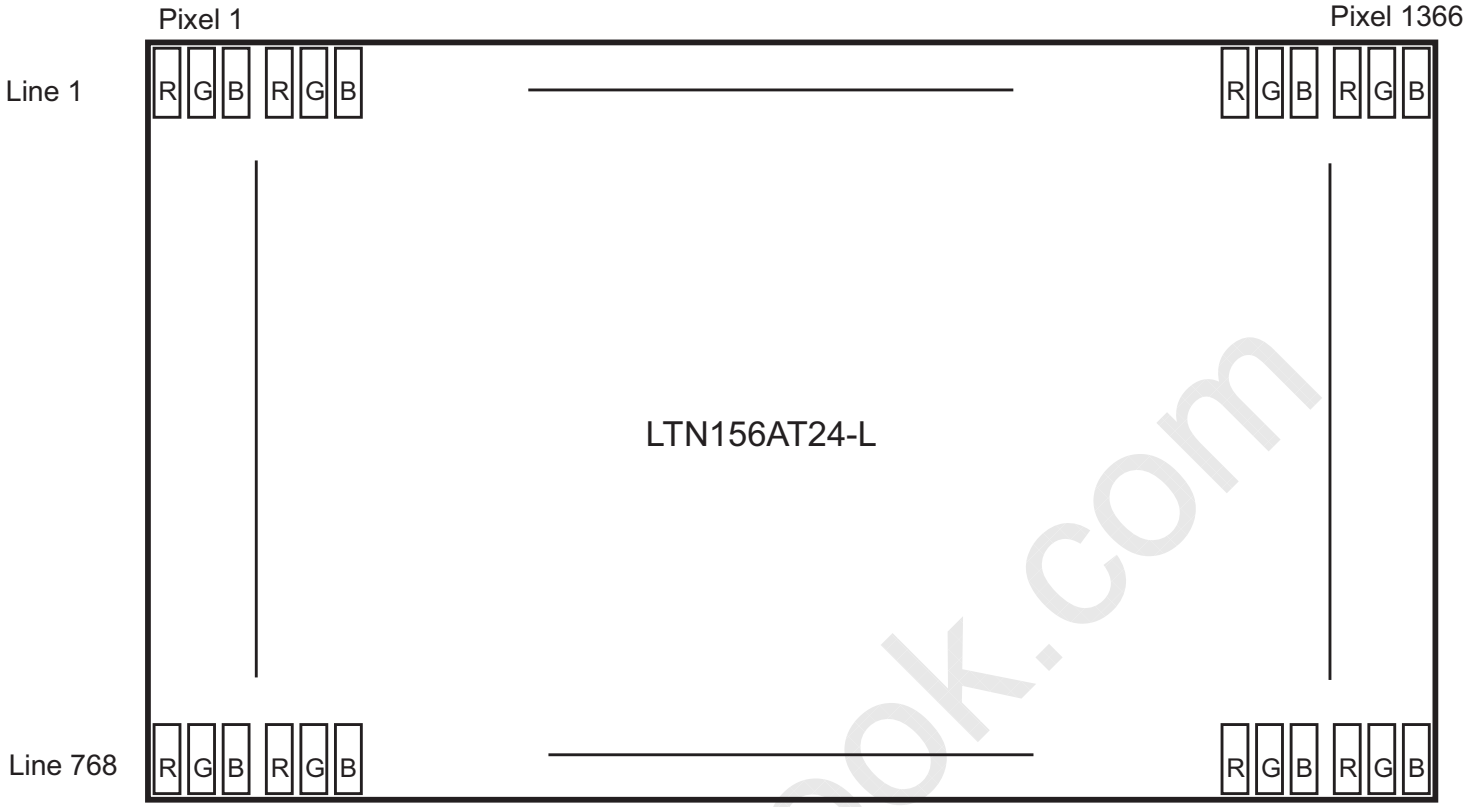
5.5 Pixel Format in the display



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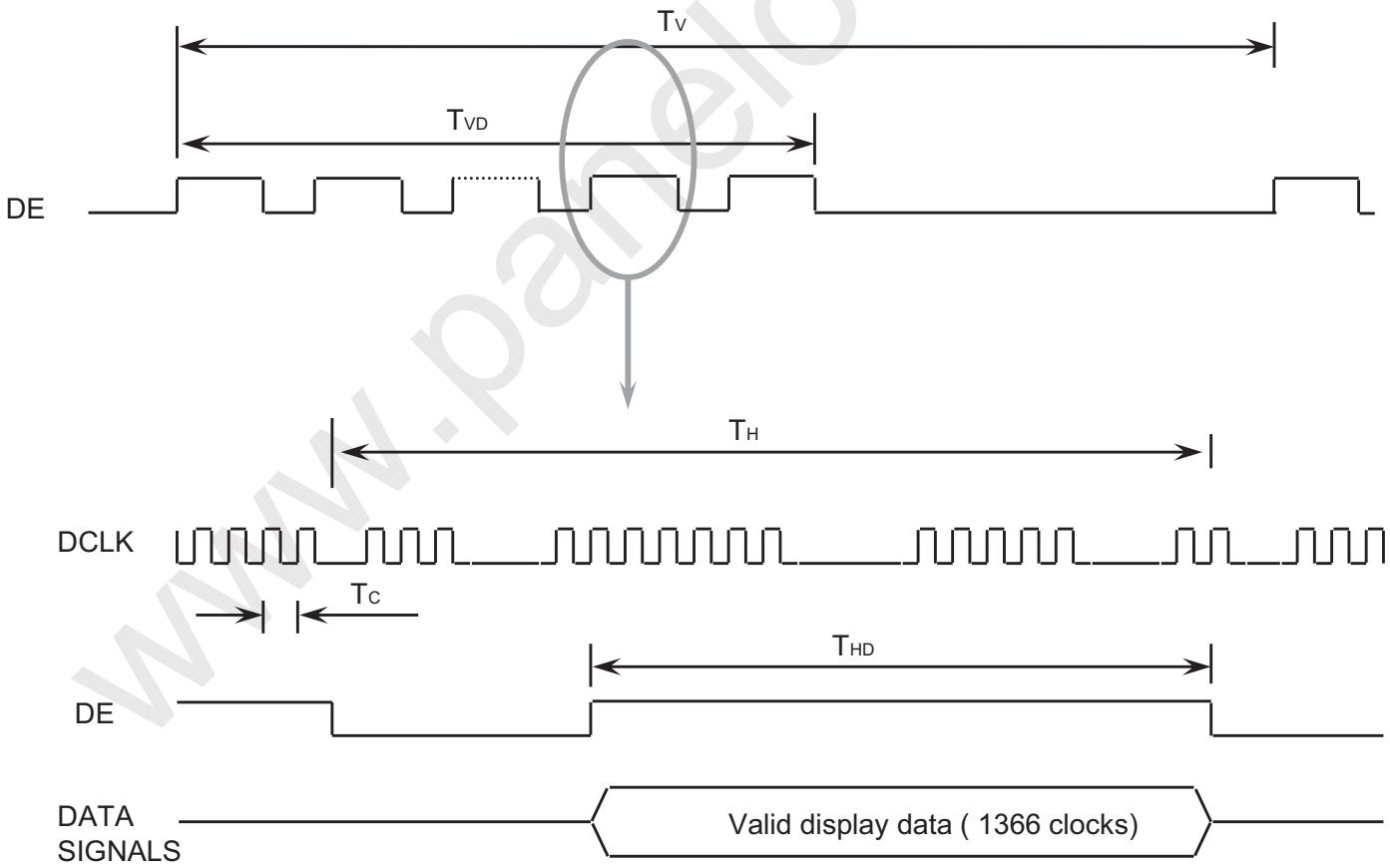
6. INTERFACE TIMING

6.1 Timing Parameters

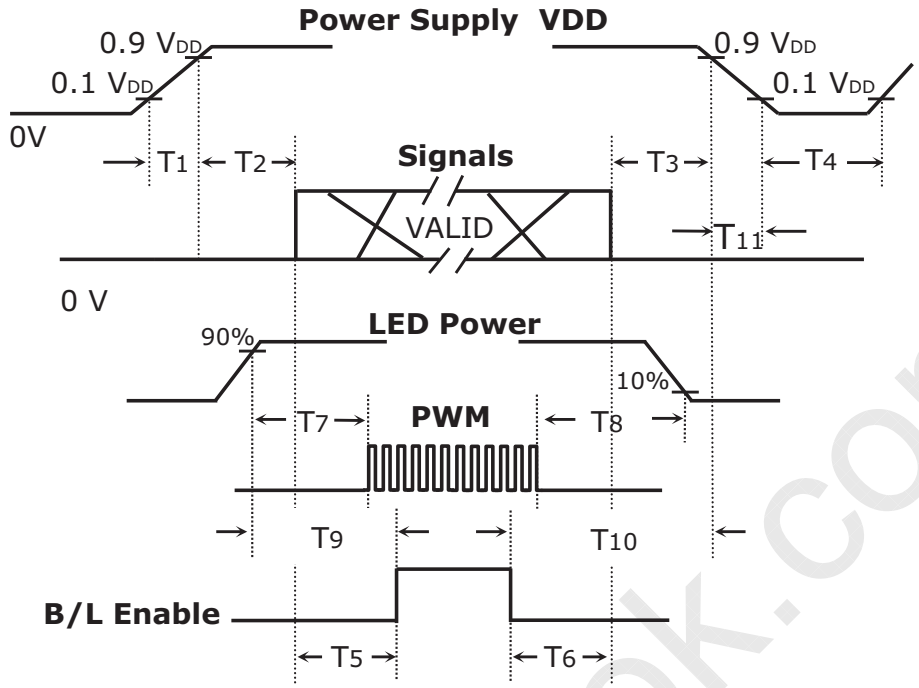
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
Frame Frequency	Cycle	TV	776	790	980	Lines	-
Vertical Active Display Term	Display Period	TVD	-	768	-	Lines	-
One Line Scanning Time	Cycle	TH	1386	1528	1800	Clocks	-
Horizontal Active Display Term	Display Period	THD	-	1366	-	Clocks	-

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 ON/OFF Sequence

Timing (ms)	Remarks
$0.5 < T_1 \leq 10$	V_{DD} rising time from 10% to 90%
$0 < T_2 \leq 50$	Delay from V_{DD} to valid data at power ON
$0 < T_3$	Delay from valid data OFF to V_{DD} off at power OFF
$150 \leq T_4$	V_{DD} OFF time for Windows restart
$200 \leq T_5$	Delay from valid data to B/L enable at power ON
$0 < T_6$	Delay from valid data off to B/L disable at power OFF
$0 < T_7$	Delay from LED driver power ON to PWM ON
$0 < T_8$	Delay from PWM OFF to LED driver power OFF
$0 < T_9$	Delay from VBL on to B/L Enable ON
$0 < T_{10}$	Delay from B/L Enable Off to VBL OFF
$0 < T_{11} \leq 10$	V_{DD} falling time from 90% to 10%

NOTE.

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

(2) In case of VDD = off level, please keep the level of input signals on the low or keep a high impedance.

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

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

7. MECHANICAL OUTLINE DIMENSION

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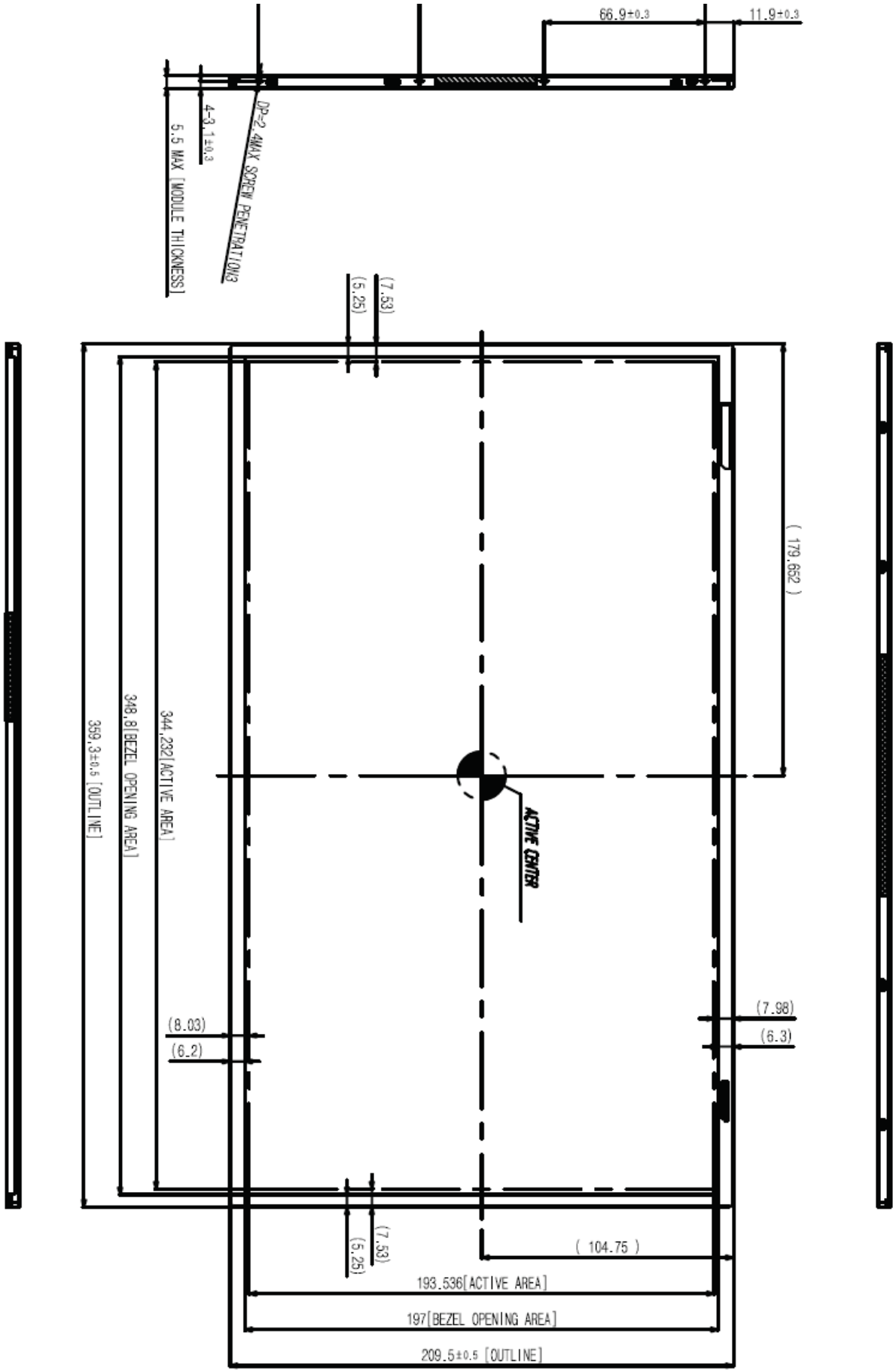

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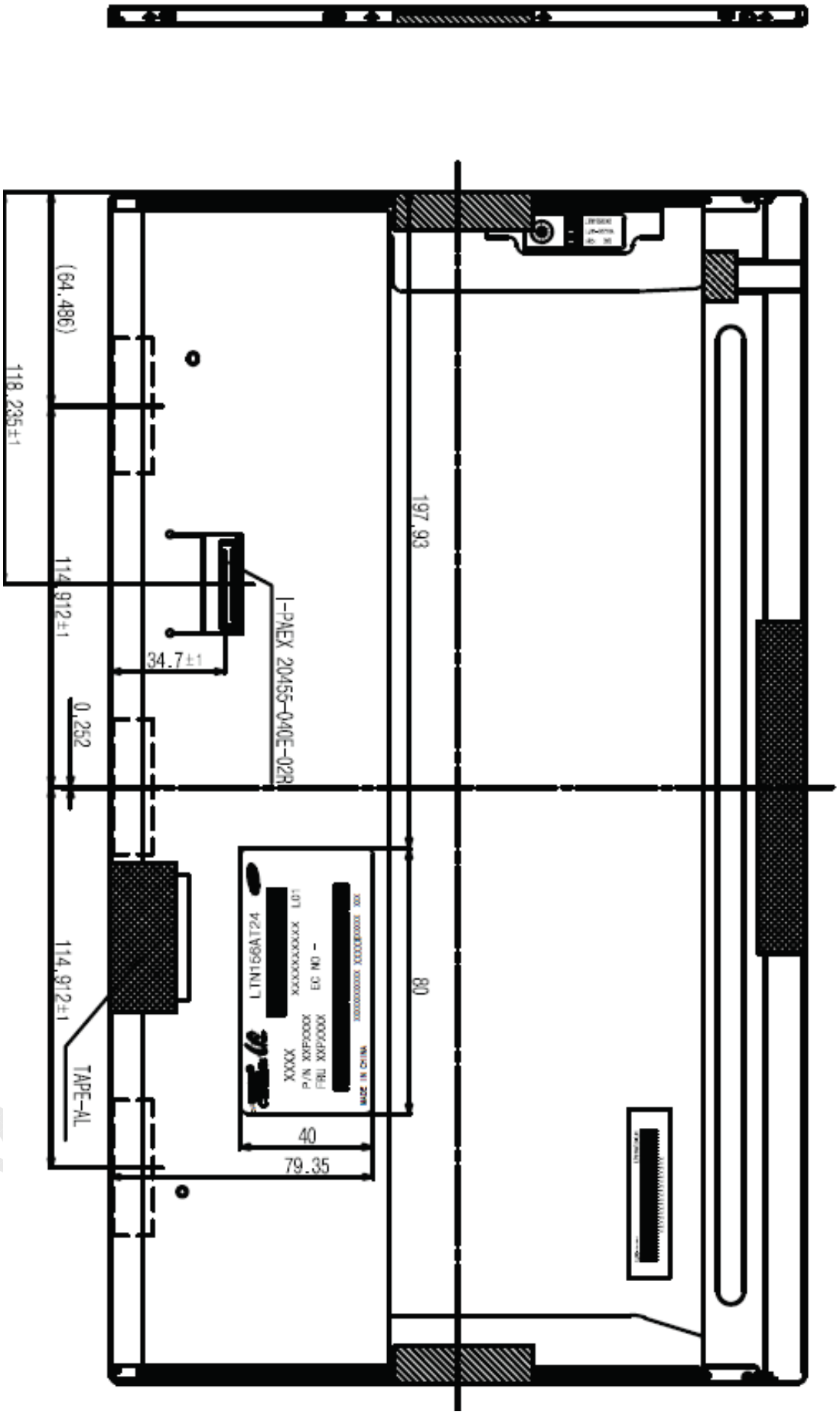

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8. PACKING

Approval

1. CARTON(Internal Package)

(1) Packing Form
Corrugated Cardboard box and paper cushion as shock absorber

(2) Packing Method

Note 1) Total Weight : Approximately 13kg
2) Acceptance number of piling : 22sets
3) Carton size : 401(W) x 283(D) x 263 (H)

Approval

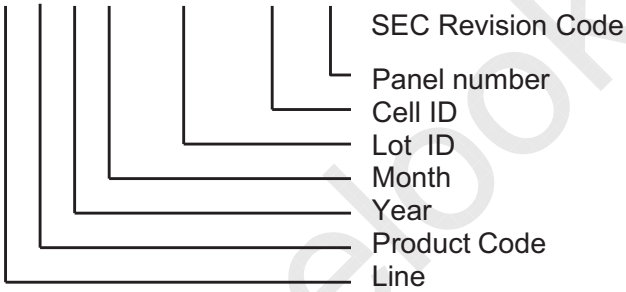
(3)Packing Material

No	Part name	Quantity
1	Static electric protective sack	22 EA
2	Packing case (Inner box) included shock absorber	1 set
3	Pictorial marking	2 pcs
4	Carton	1 set

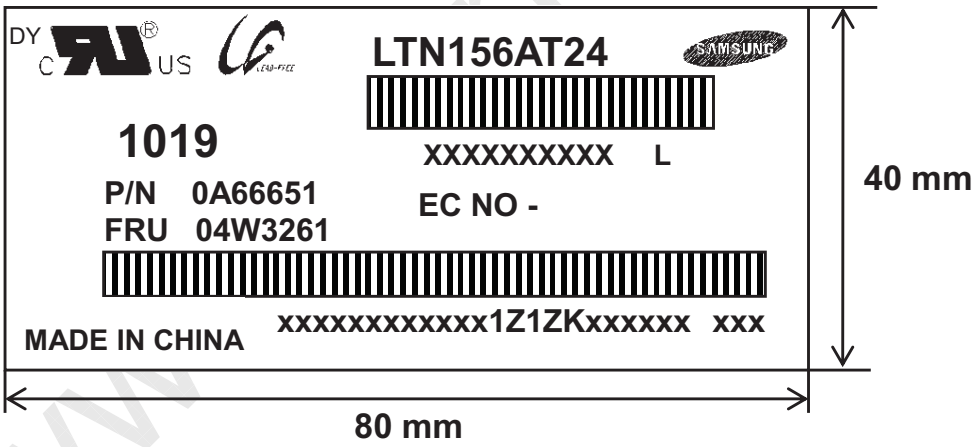
9. MARKINGS & OTHERS

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

(1) Parts number : LTN156AT24
(2) Revision code : 3 letters
(3) Lot number : X X X X XXX XX X **L**



(4) Nameplate Indication



TFT-LCD Product name : LTN156AT24
Lot number : XXXXXXXXXX
Revision Code : L
Inspected work week : 1019(2010 Year, 19nd week)
P/N : Customer Part Number (0A66651)
EC NO : Engineering Change Number (Blank)
FRU : Field Replaceable Unit Part Number (04W3261)
Header Code : 1Z1ZK (One Z One Z K)

Approval

5A	descriptor #3	00	00000000	0		ASCII Data String Tag
5B		00	00000000	0		
5C		00	00000000	0		
5D		FE	11111110	254		
5E		00	00000000	0		
5F		53	01010011	83	[S]	
60		41	00001010	65	[A]	
61		4D	01001101	77	[M]	
62		53	01010011	83	[S]	
63		55	00001010	85	[U]	
64		4E	01001110	78	[N]	
65		47	01000111	71	[G]	
66		0A	00001010	10	[^]	
67		20	00100000	32	[ ]	
68		4C	01001100	76		**supplier ID "SEC"**
69		A3	10100011	163		
6A		41	01000001	65	[A]	Product code "AT"
6B		54	01010100	84	[T]	(Hex, LSB first)
6C	Detailed timing/monitor descriptor #4	00	00000000	0		Monitor Name Tag (ASCII)
6D		00	00000000	0		
6E		00	00000000	0		
6F		FE	11111110	254		
70		00	00000000	0		
71		4C	01001100	76	[L]	
72		54	01010100	84	[T]	
73		4E	01001110	78	[N]	
74		31	00110001	49	[1]	
75		35	00110101	53	[5]	
76		36	00110110	54	[6]	
77		41	01000001	65	[A]	
78		54	01010100	84	[T]	
79		32	00110010	50	[2]	
7A		34	00110100	52	[4]	
7B		4C	01001100	76	[L]	
7C		30	00110000	48	[0]	
7D		31	00110001	49	[1]	
7E	Extension Flag	00	00000000	0		
7F	Checksum	**EF**	11101111	239		

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8. PACKING

Approval

1. CARTON(Internal Package)

(1) Packing Form
Corrugated Cardboard box and paper cushion as shock absorber

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Note 1) Total Weight : Approximately 13kg
2) Acceptance number of piling : 22sets
3) Carton size : 401(W) x 283(D) x 263 (H)

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 0 to 35 °C and relative humidity of less than 70%.

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

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

3. OPERATION

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

(b) Power supply should always be turned on/off by 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 be stressed.

11. EDID

Approval

Address (HEX)	FUNCTION	Value HEX	BIN	DEC	ASCII or Data	Notes
00	Header	00	00000000	0		EDID Header
01		FF	11111111	255		
02		FF	11111111	255		
03		FF	11111111	255		
04		FF	11111111	255		
05		FF	11111111	255		
06		FF	11111111	255		
07		00	00000000	0		
08	ID Manufacturer Name	4C	01001100	76	S	3 character ID
09		A3	10100011	163	E C	"SEC"
0A	ID Product Code	52	01010010	82	[R]	#HD LED
0B		42	01000010	66	[B]	
0C	32-bit serial no.	00	00000000	0		
0D		00	00000000	0		
0E		00	00000000	0		
0F		00	00000000	0		
10	Week of manufacture	00	00000000	0		
11	Year of manufacture	14	00010100	20	2010	2010
12	EDID Structure Ver.	01	00000001	1	1	EDID Ver. 1.0
13	EDID revision #	03	00000011	3	3	EDID Rev. 3
14	Video input definition	80	10000000	128		
15	Max H image size	22	00100010	34	34	34 cm (approx)
16	Max V image size	13	00010011	19	19	19 cm (approx)
17	Display Gamma	78	01111000	120	2.2	Gamma 2.2
18	Feature support	EA	11101010	234		
19	Red/green low bits	C8	11001000	200		10000111
1A	Blue/white low bits	95	10010101	149		11111110
1B	Red x/ high bits	9E	10011110	158	0.620	Red x 0.620= 10011110
1C	Red y	57	01010111	87	0.340	Red y 0.340= 01010111
1D	Green x	54	01010100	84	0.330	Green x 0.330= 01010100
1E	Green y	92	10010010	146	0.570	Green y 0.570= 10010010
1F	Blue x	26	00100110	38	0.150	Blue x 0150= 00100110
20	Blue y	0F	00001111	15	0.060	Blue y 0060= 00001111
21	White x	50	01010000	80	0.313	White x 0.313= 01010000
22	White y	54	01010100	84	0.329	White y 0.329= 01010100
23	Established timing 1	00	00000000	0		
24	Established timing 2	00	00000000	0		
25	Established timing 3	00	00000000	0		

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26	Standard timing #1	01	00000001	1		not used
27		01	00000001	1		
28	Standard timing #2	01	00000001	1		not used
29		01	00000001	1		
2A	Standard timing #3	01	00000001	1		not used
2B		01	00000001	1		
2C	Standard timing #4	01	00000001	1		not used
2D		01	00000001	1		
2E	Standard timing #5	01	00000001	1		not used
2F		01	00000001	1		
30	Standard timing #6	01	00000001	1		not used
31		01	00000001	1		
32	Standard timing #7	01	00000001	1		not used
33		01	00000001	1		
34	Standard timing #8	01	00000001	1		not used
35		01	00000001	1		
36	Detailed timing/monitor descriptor #1	38	00111000	56	74.8	Main clock= 78.02 MHz (@60Hz)
37		1D	00011101	29		
38		56	01010110	86	1366	Hor active=683*2 pixels
39		D4	11010100	212	212	Hor blanking=280pixels
3A		50	01010000	80		4bit : 4bit
3B		00	00000000	0	768	Vertcal active=768 lines
3C		16	00010110	22	22	Vertical blanking=22 lines
3D		30	00110000	48		4bit : 4bit
3E		30	00110000	48	48	Hor sync. Offset=48 pixels
3F		20	00100000	32	32	H sync. Width=32 pixels
40		25	00100101	37	2 5	V sync. Offset=2 lines V sync. Width=5 lines
41		00	00000000	0		2bit : 2bit :2bit :2bit
42		58	01011000	88	344	H image size= 344mm(approx)
43		C2	11000010	194	194	V image size = 194 mm(approx)
44		10	00010000	16		
45		00	00000000	0		No Horizontal Border
46		00	00000000	0		No Vertical Border
47		19	00011001	25		
48	Detailed timing/monitor descriptor #2	00	00000000	0		Manufacturer Specified (Timing)
49		00	00000000	0		
4A		00	00000000	0		
4B		0F	00001111	15		
4C		00	00000000	0		
4D		00	00000000	0		**Value**=HSPWmin / 2
4E		00	00000000	0		**Value**=HSPWmax / 2
4F		00	00000000	0		**Value**=Thbpmin /2
50		00	00000000	0		**Value**=Thbpmax /2
51		00	00000000	0		**Value**=VSPWmin /2
52		00	00000000	0		**Value**=VSPWmax /2
53		00	00000000	0		**Value**=Tvbpmin / 2
54		00	00000000	0		**Value**=Tvbpmax / 2
55		25	00100101	37		Thpmin=**value***2 + HA pixelclks
56		D9	11011001	217		Thpmax=**value***2 + HA pixelclks
57		06	00000110	6		Tvpmin=**value***2 + VA lines
58		6A	01101010	106		Tvpmax=**value***2 + VA lines
59		00	00000000	0		Module revision

Approval

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5C		00	00000000	0		
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5E		00	00000000	0		
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