SAMSUNG ELECTRONICS

Approval

LEAD-FREE

TO : Sony

DATE : Sep. 10. 2010

SAMSUNG TFT-LCD

MODEL NO. : LTN116AT04-S01

NOTE : Extension code [-S01]
→ LTN116AT04-S01
Surface type [**Glare**]

The information described in this SPEC is preliminary and can be changed without prior notice.

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Samsung Electronics Co., Ltd.

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REVISION HISTORY

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Date	Revision No.	Page	Summary
Apr. 12. 2010	P00	All	The Preliminary specification of LTN116AT04-S01 was issued first.
June. 28. 2010	P01	P. 7	Color Chromaticity is added
Sep. 10. 2010	A00	All	The Approval specification of LTN116AT04-S01 was issued first.

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GENERAL DESCRIPTION

DESCRIPTION

LTN116AT04 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 11.6" 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
- HD (1366 x 768 pixels) resolution
- 45% Color Gamut
- Fast Response Time
- Low power consumption
- LED BLU Structure
- DE (Data enable) only mode.
- 3.3V LVDS Interface
- On board EDID chip
- Green product (RoHS Compliance)

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	256.125(H) X 144.0(V) (11.6”diagonal)	mm	
Driver element	a-si TFT active matrix		
Display colors	262,144		
Number of pixel	1366 x 768	pixel	16 : 9
Pixel arrangement	RGB vertical stripe		
Pixel pitch	0.2265(H) x 0.2265(V)	mm	
Display Mode	Normally white		
Surface treatment	Haze 0, Hard-Coating 3H		

Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal (H)	(267.5)	(268.0)	(268.5)	mm	
		(277.5)	(278.0)	(278.5)	mm	w/ Bracket
	Vertical (V)	(157.0)	(157.5)	(158.0)	mm	w/o PCB
		(168.0)	(168.5)	(169.0)	mm	w/ PCB
	Depth (D)	-	-	(3.6)	mm	(1)
Weight		-	-	(235)	g	

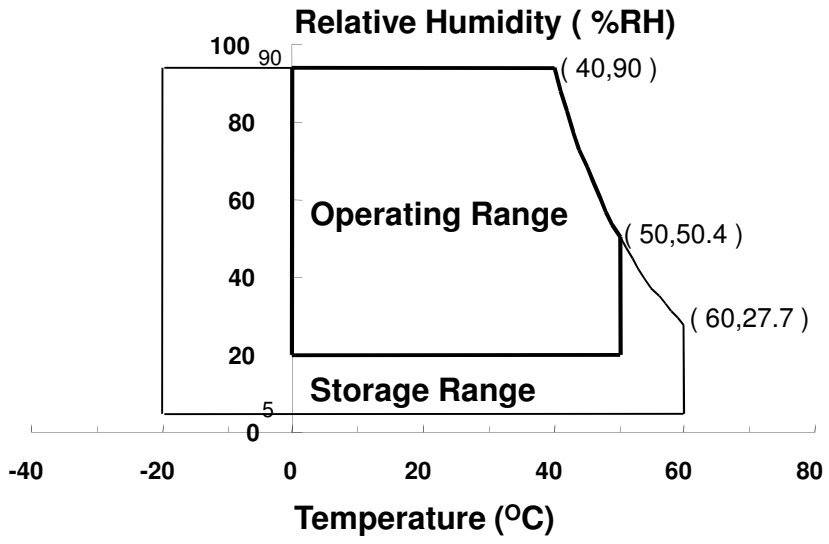
Note (1) Measurement condition of outline dimension
. Equipment : Vernier Calipers
. Push Force : 750g ·f (minimum)

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.

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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)

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} = 72.3MHz, I_F = (25.8) mA

Item		Symbol	Condition	Min.	Typ.	Max	Unit	Note
Contrast Ratio (5 Points)		CR	Normal Viewing Angle $\phi = 0$ $\theta = 0$	-	(400)	-	-	(1), (2), (5)
Response Time at Ta (Rising + Falling)		T_{RT}		-	16	25	msec	(1), (3)
Average Luminance of White (5 Points)		$Y_{L,AVE}$		170	200	-	cd/m^2	IF= (25.8)mA (1), (4)
Color Chromaticity (CIE)	Red	R_X		0.535	0.565	0.595	-	(1), (5) SR-3
		R_Y		0.310	0.340	0.370		
	Green	G_X		0.305	0.335	0.365		
		G_Y		0.520	0.550	0.580		
	Blue	B_X		0.130	0.160	0.190		
		B_Y		0.090	0.120	0.150		
	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_H		(40)	(45)	-		
	Ver.	ϕ_H		(10)	(15)	-		
		ϕ_L		(25)	(30)	-		
Color Gamut		CG		-	45	-	%	
13 Points White Variation		δ_L		-	-	1.7	-	(6)

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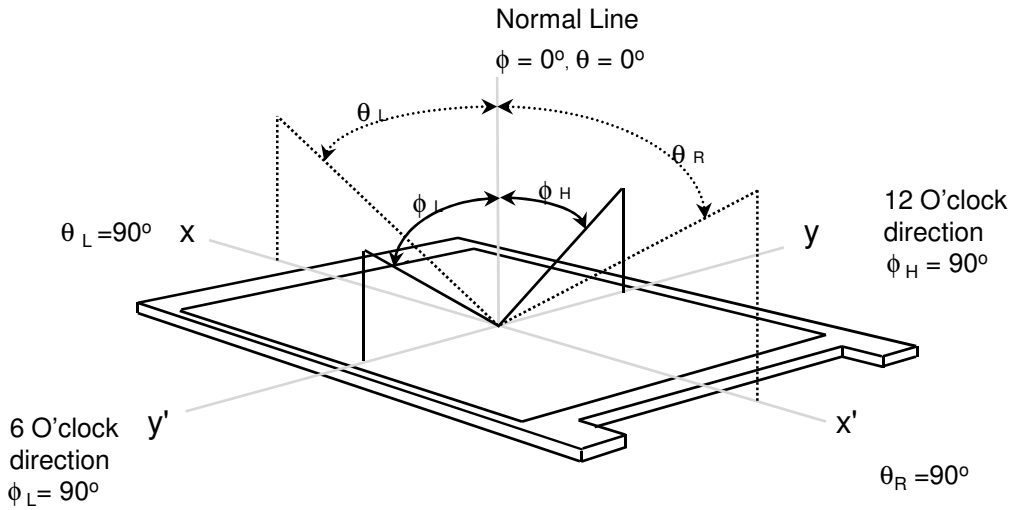
Note 1) Definition of Viewing Angle : Viewing angle range(10 ≤ C/R)

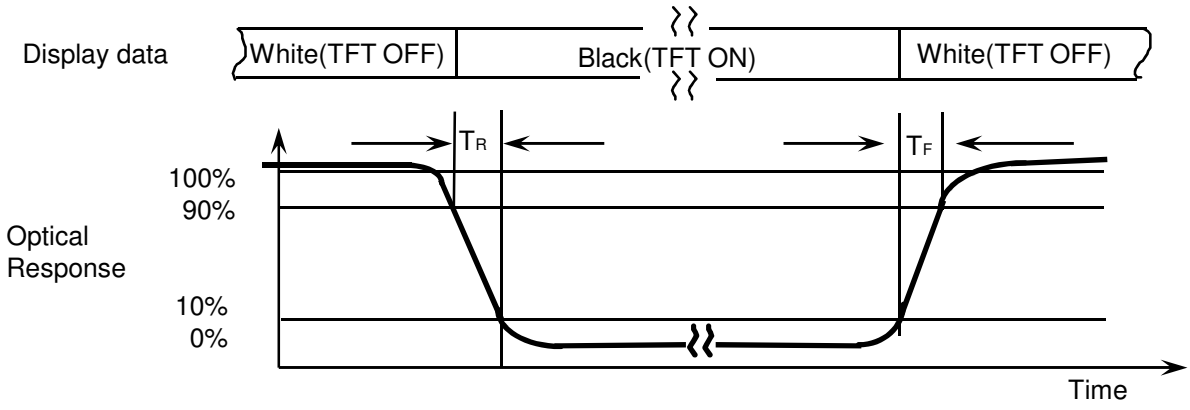


Note 2) Definition of Contrast Ratio (CR) : Ratio of gray max (Gmax) ,gray min (Gmin) at 5 points(4, 5, 7, 9, 10)

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

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

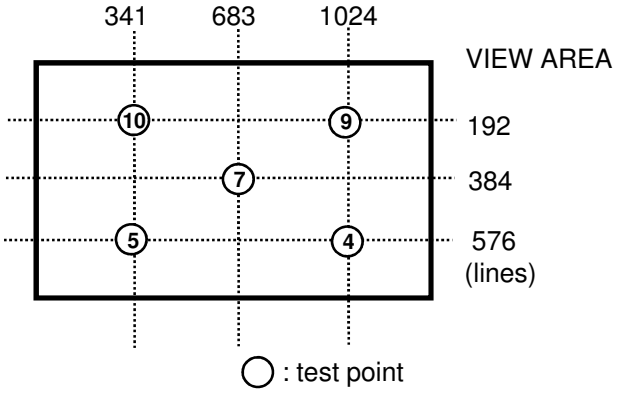
Note 3) Definition of Response time :



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

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

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



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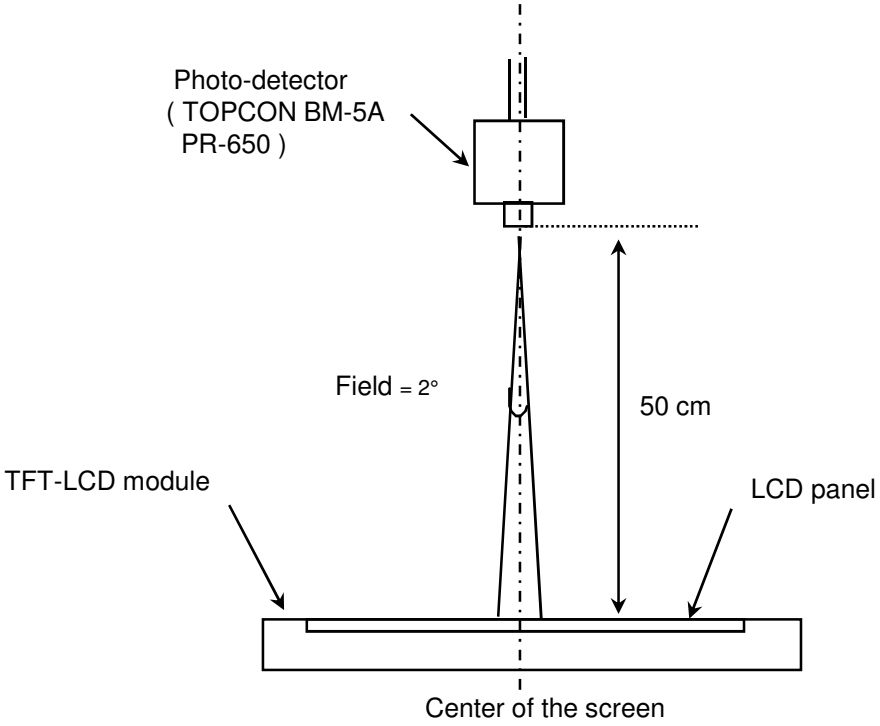
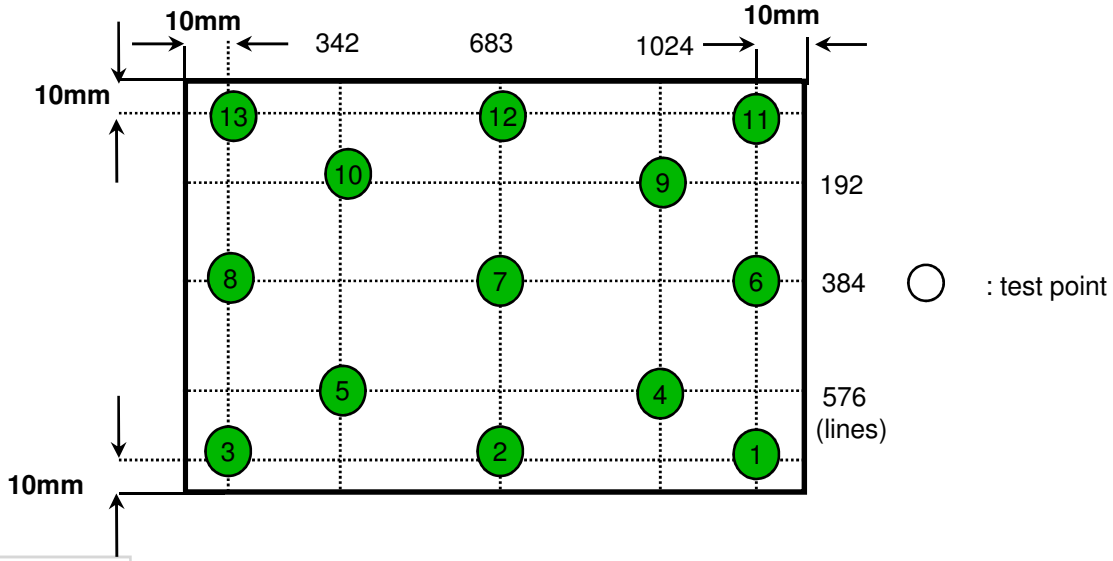
Note 5) After stabilizing and leaving the panel alone at a given temperature for 30 min , the measurement should be executed. Measurement should be executed in a stable, windless,and dark room.
30 min after lighting the backlight. This should be measured in the center of screen.
IF current : (25.8) mA
Environment condition : Ta = 25 ± 2 °C



[Optical characteristics measurement setup]

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

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



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3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

Ta= 25 ± 2°C

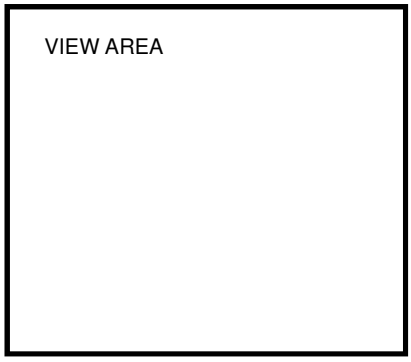
Item		Symbol	Min.	Typ.	Max.	Unit	Note
Voltage of Power Supply		V_{DD}	3.0	3.3	3.6	V	
Differential Input Voltage for LVDS Receiver Threshold	High	V_{IH}	-	-	+100	mV	V_{CM} = +1.2V
	Low	V_{IL}	-100	-	-	mV	
Vsync Frequency		fv	-	60	-	Hz	
Hsync Frequency		f_H	-	47.4	-	KHz	Vsync=60Hz
Main Frequency		f_{DCLK}	-	69.3	-	MHz	
Rush Current		I_{RUSH}	-	-	1.5	A	(4)
Current of Power Supply	White	I_{DD}	-	130	-	mA	(2),(3)*a
	Mosaic		-	190	-	mA	(2),(3)*b
	V. Stripe		-	260	300	mA	(2),(3)*c

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

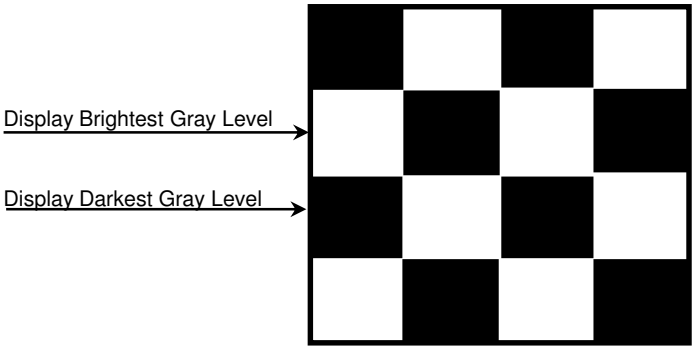
(2) f_V = 60Hz, f_{DCLK} =(69.3)MHZ, V_{DD} = 3.3V , DC Current.

(3) Power dissipation pattern

*a) White Pattern



*b) Mosaic Pattern



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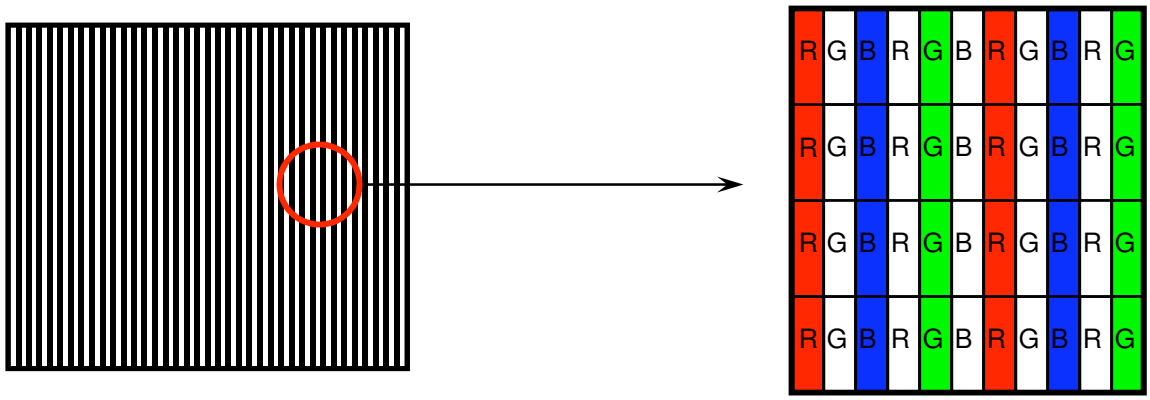
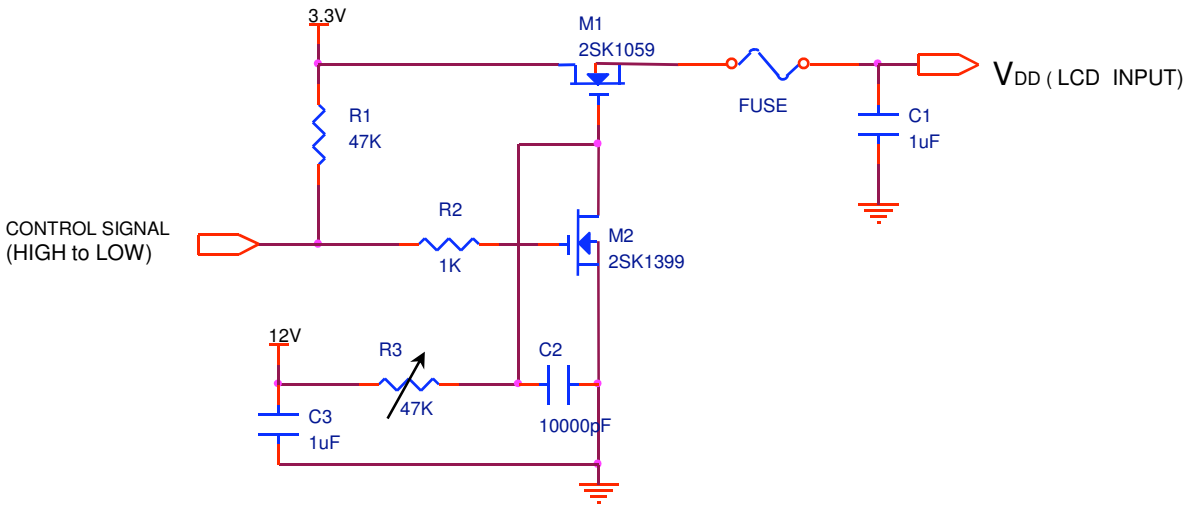
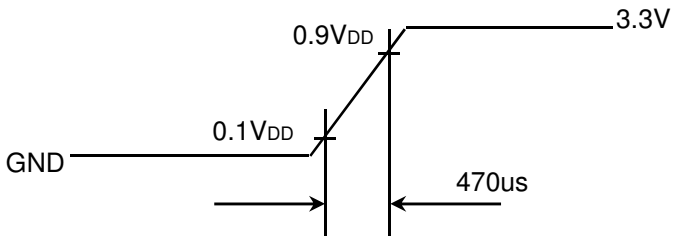
*c) 1dot Vertical stripe pattern



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	-	(25.0)	-	mA	
LED Forward Voltage	VF	-	(3.4)	-	V	
LED Array Voltage	VP	-	(30)	-	V	VF X 9 LEDs
Power Consumption	P	-	(2.8)	(3.06)	W	IF X VF X 27LEDs
Operating Life Time	Hr	10,000	-	-	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 = 25.8 mArms until one of the following event occurs.
1. When the brightness becomes 50% or lower than the original.

3.3 LED Driver

- LED Driver Manufacturer : Richitek

Ta= 25 ± 2 °C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Input Voltage	V_{in}	(7)	(12)	(21)	V	
Enable Control Level	V	(0)	-	(3.3)	V	ON Level : 2V~3.3V OFF Level : 0V ~ 0.8V
PWM Control Duty Ratio	%	(5)	-	(100)	%	
External PWM Dimming Control Frequency (BLIM)	Hz	(0.2)	-	(1)	KHz	
Operating Frequency	F_o	(0.8)	(1.0)	(1.2)	MHz	

Note - Test Equipment : Fluke 45

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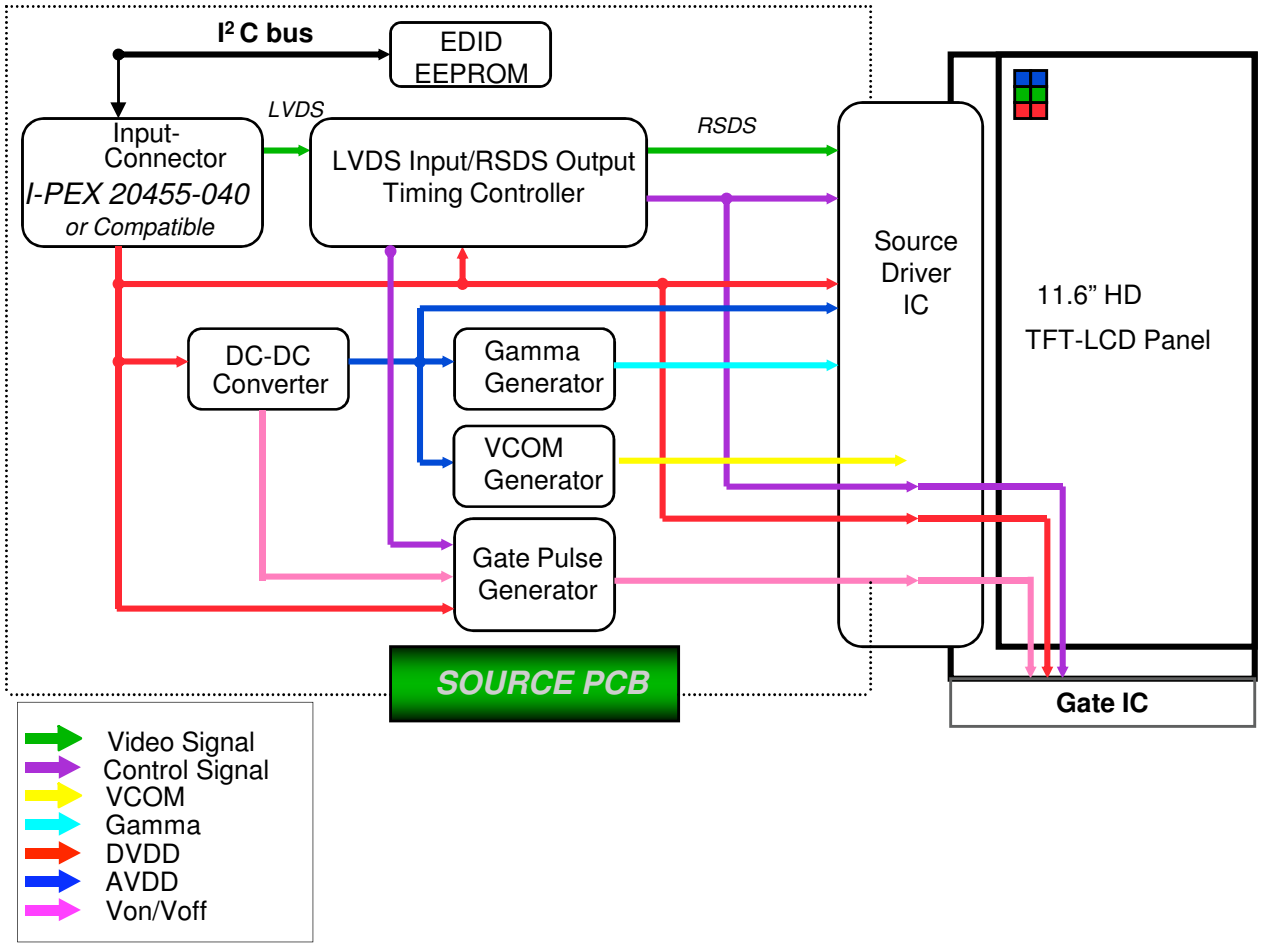
4. BLOCK DIAGRAM

4.1 TFT LCD Module



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5. INPUT TERMINAL PIN ASSIGNMENT

5.1. Input Signal & Power (LVDS, Connector : I-PEX 20455-040 or equivalent)

Pin	Symbol	Function
1	NC	No Connection
2~3	AVDD	Power Supply 3.3V (typical)
4	VEDID	EDID 3.3V power
5	NC	No Connection
6	CLK	EDID clock
7	DATA	EDID data
8	RIN0-	- LVDS differential data input (R0-R5, G0)
9	RIN0+	+ LVDS differential data input (R0-R5, G0)
10	GND	Ground
11	RIN1-	- LVDS differential data input (G1-G5, B0-B1)
12	RIN1+	+ LVDS differential data input (G1-G5, B0-B1)
13	GND	Ground
14	RIN2-	- LVDS differential data input (B2-B5,HS,VS, DE)
15	RIN2+	+ LVDS differential data input (B2-B5,HS,VS, DE)
16	GND	Ground
17	CLK-	- LVDS differential clock input
18	CLK+	+ 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_PWMIN	System PWM Signal Input
36	BL_Enable	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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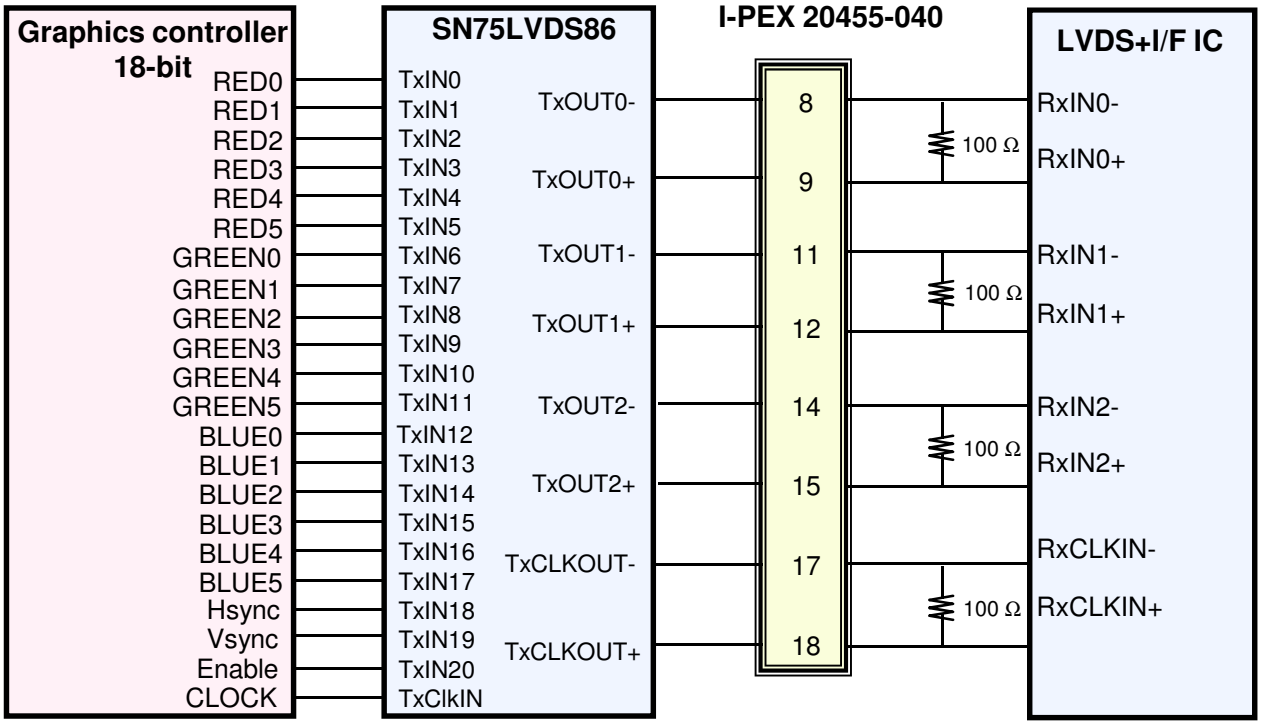
5.2 LVDS Interface : Transmitter SN75LVDS86 or Compatible

Pin No.	Name	RGB Signal	Pin No.	Name	RGB Signal
44	TxIN0	R0	12	TxIN11	G5
45	TxIN1	R1	13	TxIN12	B0
47	TxIN2	R2	15	TxIN13	B1
48	TxIN3	R3	16	TxIN14	B2
1	TxIN4	R4	18	TxIN15	B3
3	TxIN5	R5	19	TxIN16	B4
4	TxIN6	G0	20	TxIN17	B5
6	TxIN7	G1	22	TxIN18	Hsync
7	TxIN8	G2	23	TxIN19	Vsync
9	TxIN9	G3	25	TxIN20	DE
10	TxIN10	G4	26	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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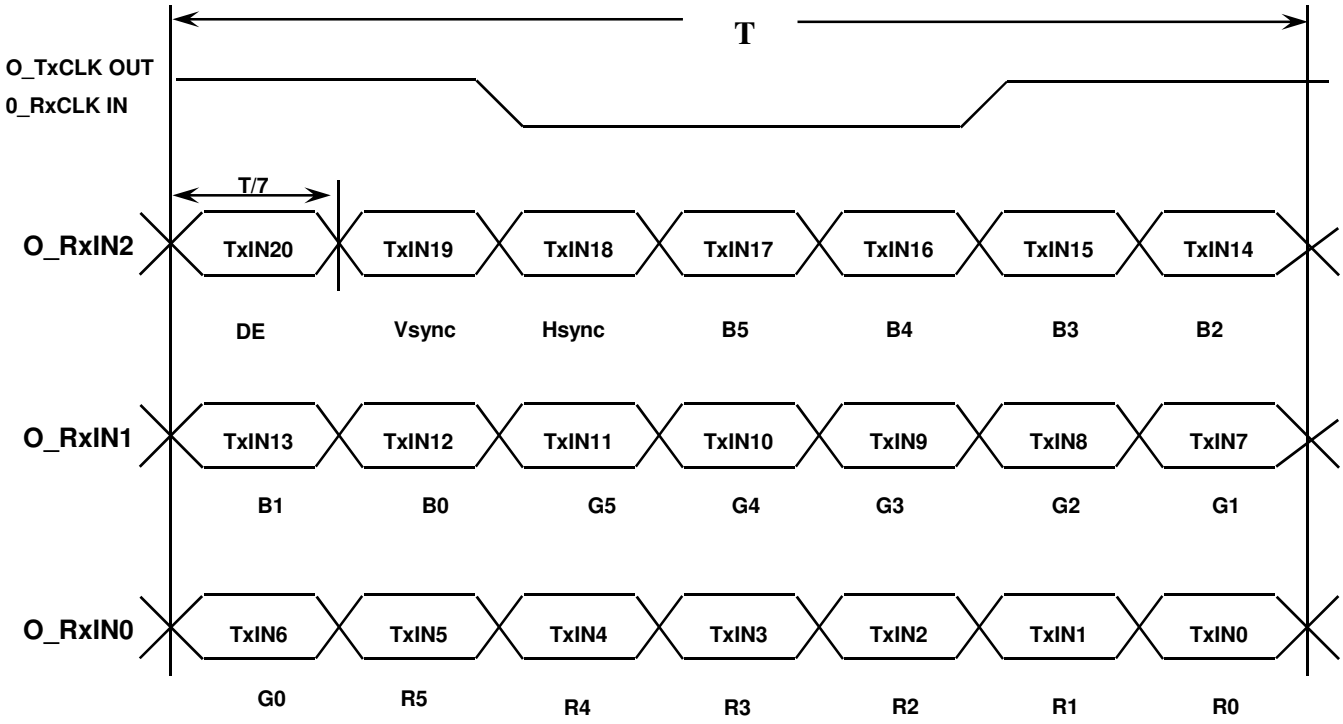
5.3 Timing Diagrams of LVDS For Transmission

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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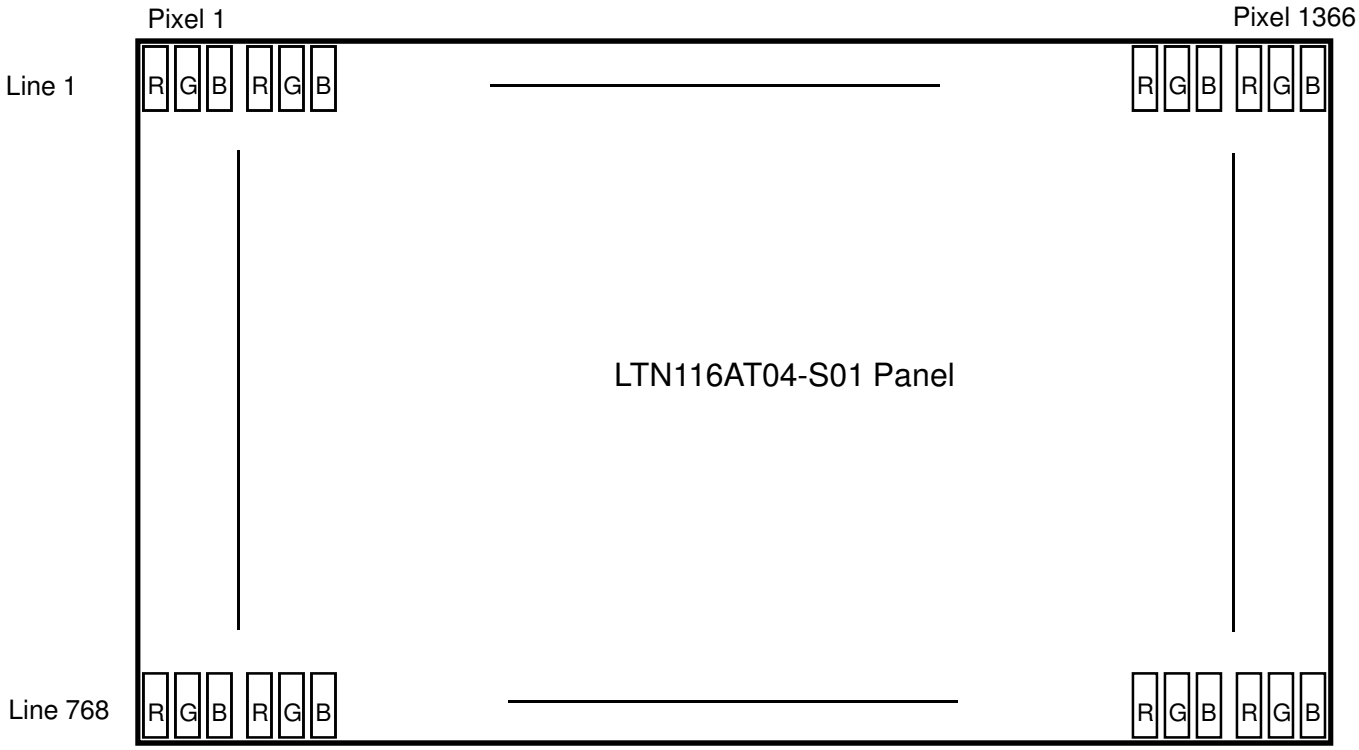
5.5 Pixel Format in the display



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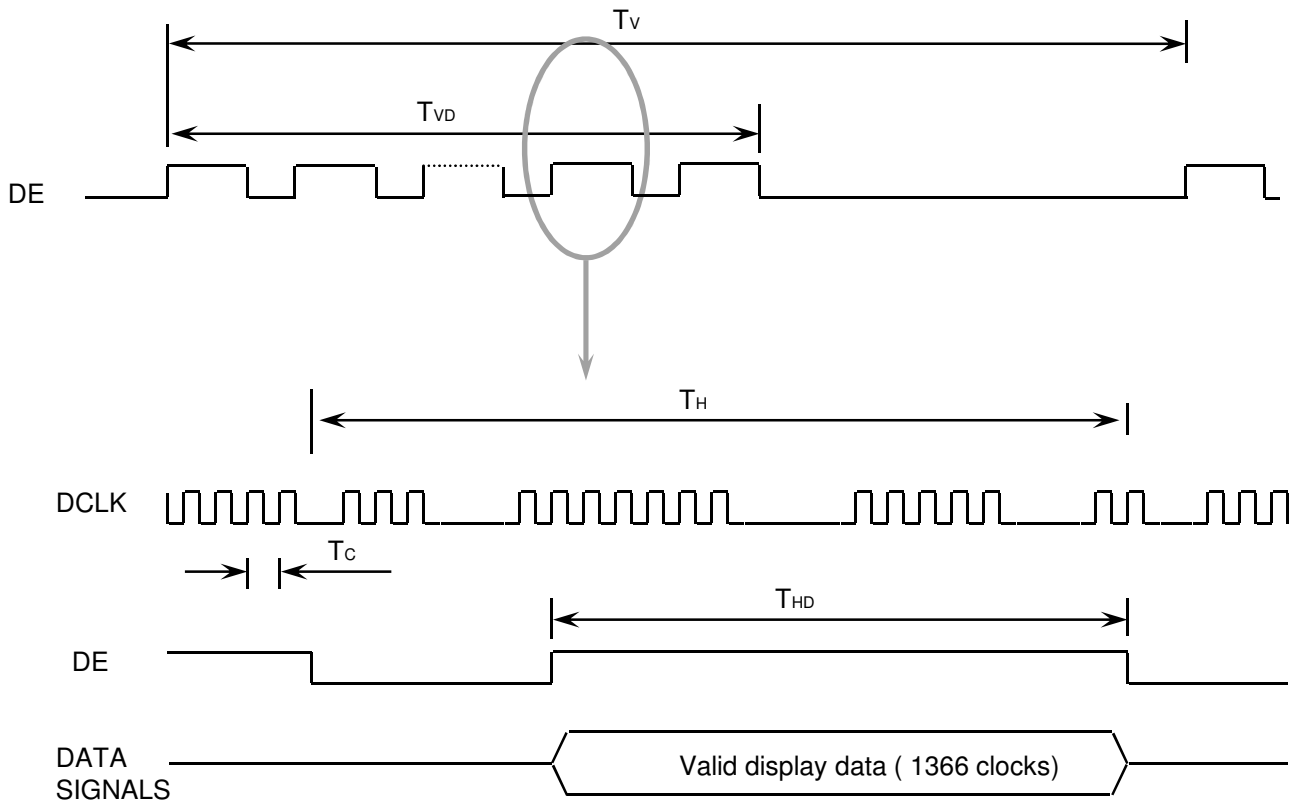
6. INTERFACE TIMING

6.1 Timing Parameters

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
Frame Frequency	Cycle	TV	(780)	(790)	(850)	Lines	-
Vertical Active Display Term	Display Period	TVD	-	768	-	Lines	-
One Line Scanning Time	Cycle	TH	(1450)	(1526)	(1750)	Clocks	-
Horizontal Active Display Term	Display Period	THD	-	1366	-	Clocks	-

6.2 Timing diagrams of interface signal



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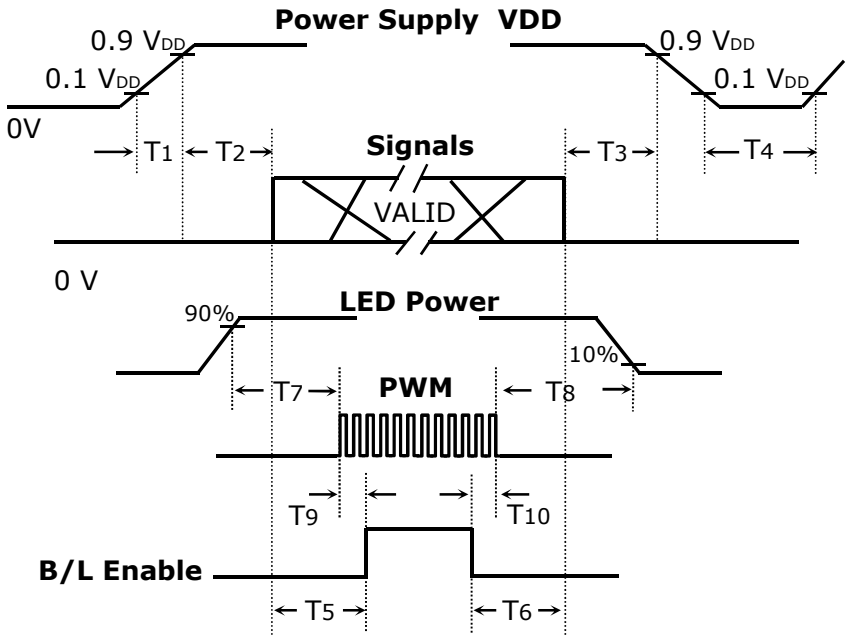
6.3 Power ON/OFF Sequence

: 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
$0 < T_3 \leq 50$	Delay from valid data OFF to V_{DD} off at power OFF
$500 \leq T_4$	V_{DD} OFF time for Windows restart
$200 \leq T_5$	Delay from valid data to B/L enable at power ON
$200 \leq T_6$	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
$10 \leq T_9$	Delay from PWM ON to B/L Enable ON
$0 < T_{10}$	Delay from B/L Enable Off to PWM OFF

NOTE.

(1) The supply voltage of the external system for the module input should be the same as the definition of VDD.

(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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[Refer to the next page]

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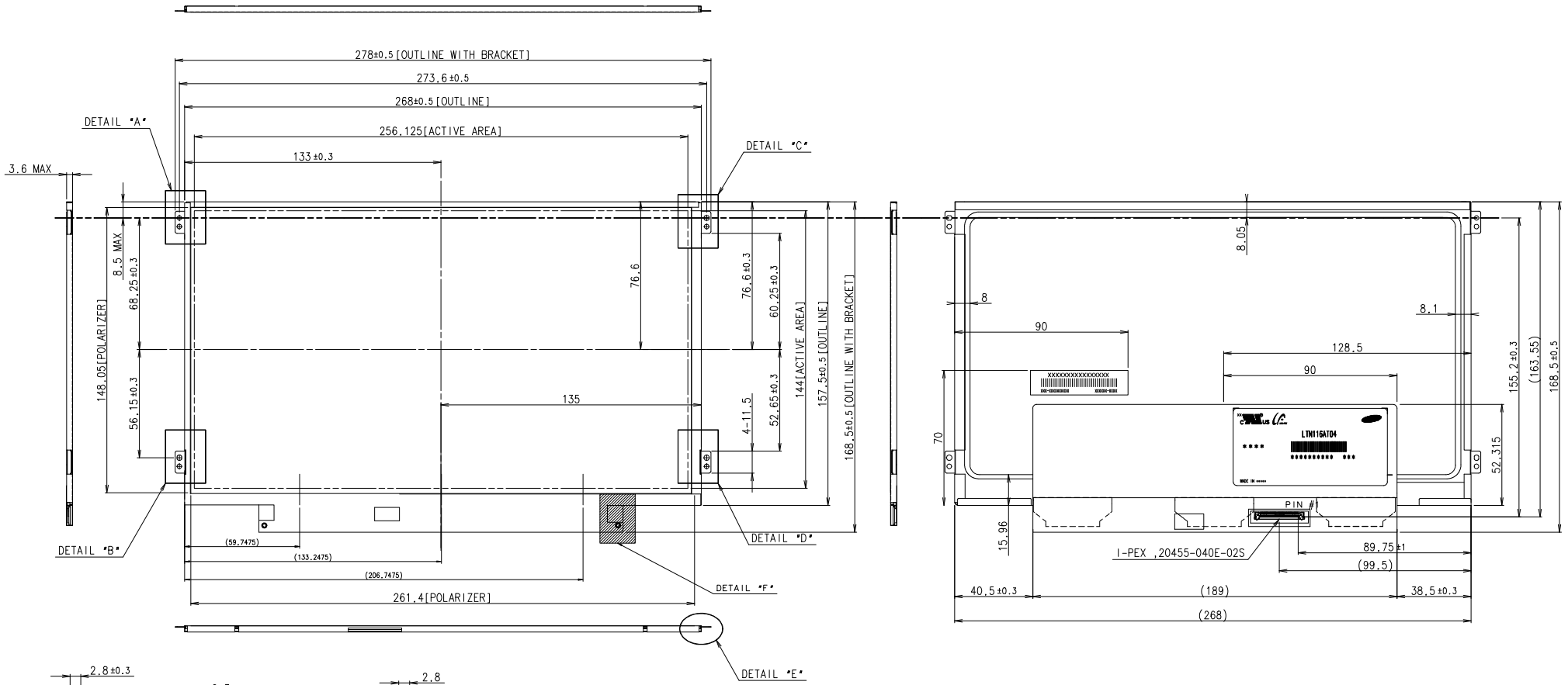
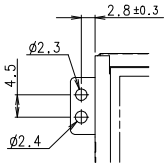
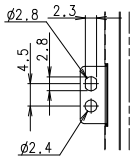
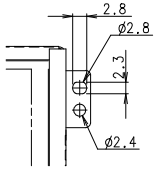




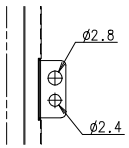
DETAIL "A"
SCALE (2:1)



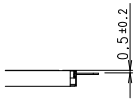
DETAIL "B"
SCALE (2:1)



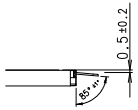
DETAIL "C"
SCALE (2:1)



DETAIL "D"
SCALE (2:1)



DETAIL "E"
SCALE (2:1)



DETAIL "F"
SCALE (2:1)

LTN116AT04-S01

Approval spec

* NOTE

1. INPUT SIGNAL INTERFACE CONNECTOR TO BE SPECIFIED AS BELOW.
   - MAKER : I-PEX OR COMPATIBLE
   - INPUT CONNECTOR : I-PEX ,I-PEX ,20455-040E-02S
2. CALIFERS MEASURUNG FORCE : 750 gf.cm
3. WEIGHT SPEC : 235g MAX
4. In order to avoid IC damage, it is not allow that overlapping of cables or antennas, camera , WLAN , WWAN over these COF locations.

REVISION

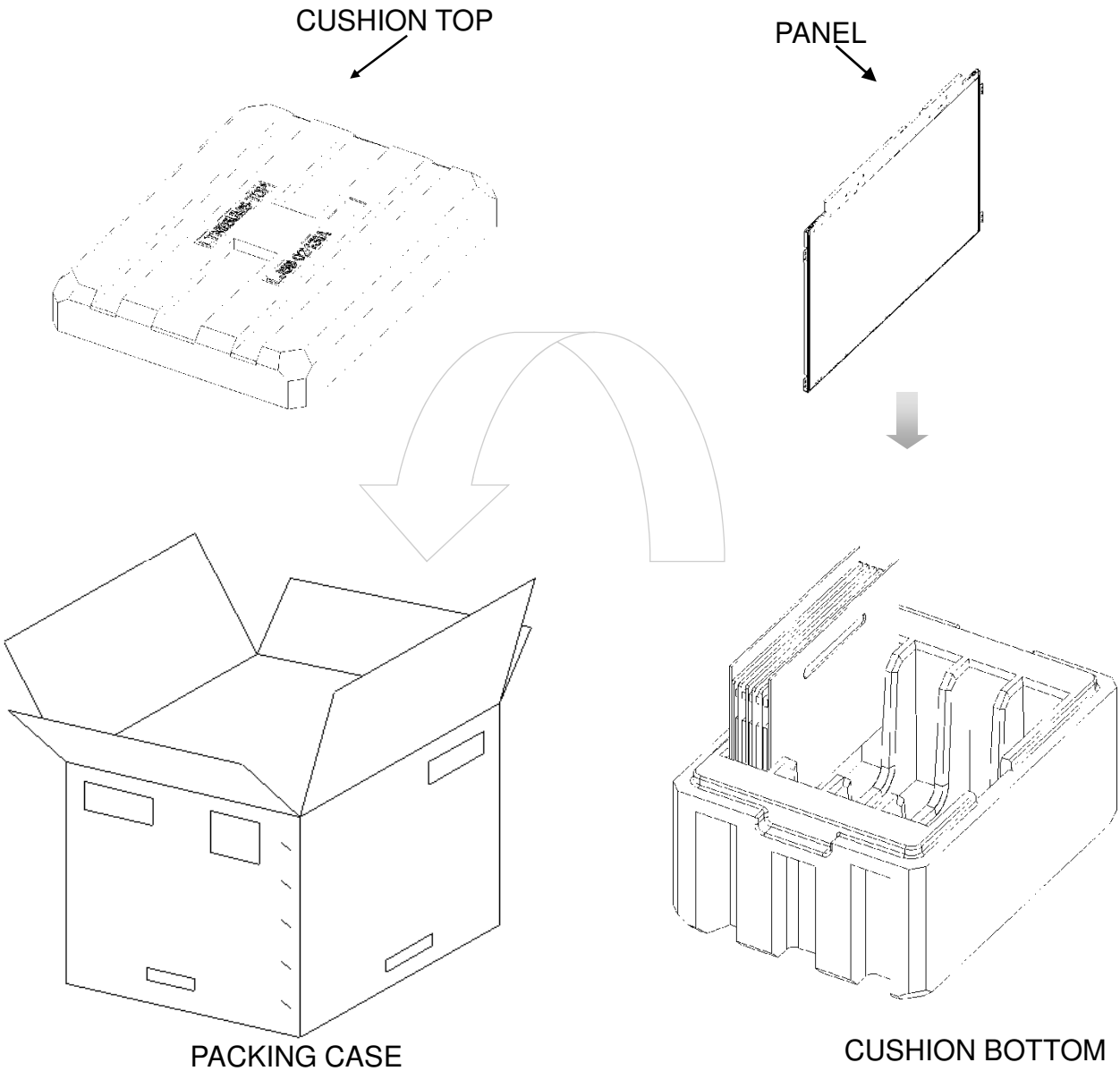
REV	DATE	DESCRIPTION OF REVISION	DRA'N BY	DES'D BY	CHK'D BY	APP'D BY	REASON	CHG'D BY
UNIT	mm							
SCALE	1/1			E.W.SEO		C.Y. BANG	MODEL NAME	LTN116AT04-S01
TOLERANCE	±0.5			10.07.01		10.07.01	PART/SHEET NAME	OUTLINE DIMENSION
SAMSUNG ELECTRONICS						SPEC. NO	CODE NO.	SHEET 1/1 VER. 002

8. PACKING

1. CARTON(Internal Package)

(1) Packing Form
Styrofoam cushion box as shock absorber

(2) Packing Method



Note 1)Total Weight : Approximately (TBD) kg
2) Acceptance number of piling : (TBD) sets
3) Carton size : (TBD)(W) × (TBD) (D) × (TBD)(H)

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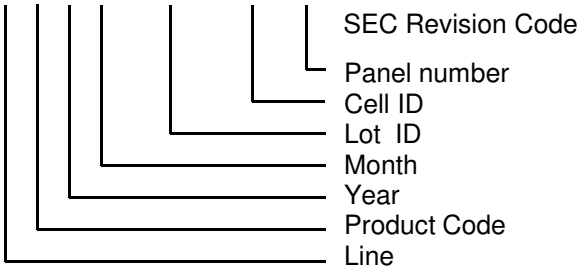
(3) Packing Material

No	Part name	Quantity
1	Static electric protective sack	(20) EA
2	Packing case (Inner box) included shock absorber	1 set
3	Pictorial marking	2
4	Carton	1 set

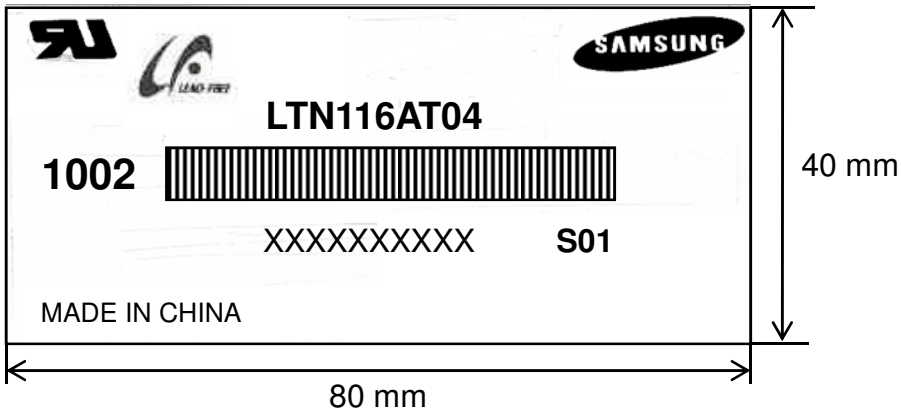
9. MARKINGS & OTHERS

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

(1) Parts number : LTN116AT04
(2) Revision code : 3 letters
(3) Lot number : X X X X XXX XX X **S01**



(5) Nameplate Indication



Parts name : LTN116AT04
Lot number : XXXXXXXXXX
Inspected work week : 1002(2010 year, 2nd week)

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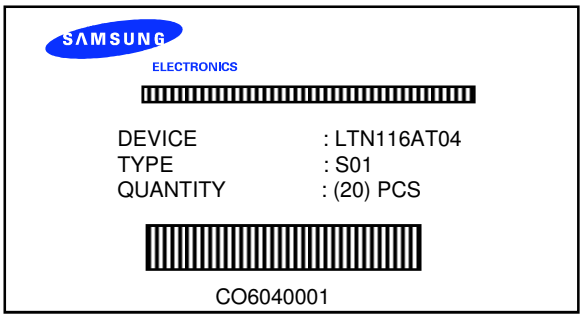
(6) Packing small box attach



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 and back-light.

(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 (Isoprophyl Alcohol) or Hexane.
Do not use Ketone type materials(ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might 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 pull or fold the lamp wire.

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

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

(n) 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 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 FPC cable between the LED chips and its converter power supply shall be a minimized length and be connected directly . The longer cable between the back-light and the converter may cause lower luminance of light source (LED).

(e) 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.

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11. EDID

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Address (HEX)	FUNCTION	Value HEX	BIN	DEC	ASCII or Data	Notes	Comments
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	These Characters represent Vendor ID which is assigned
					E		
09		A3	10100011	163	C	"SEC"	by Microsoft.
0A	ID Product Code	42	01000010	66	[B]		
0B		31	00110001	49	[1]		
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	**value**=year-1990
12	EDID Structure Ver.	01	00000001	1	1	EDID Ver. 1.0	Version no.
13	EDID revision #	03	00000011	3	3	EDID Rev. 3	Revision no.
14	Video input definition	80	10000000	128			
15	Max H image size	1A	00011010	26	26	26 cm (approx)	horizontal size (cm)
16	Max V image size	0E	00001110	14	14	14 cm (approx)	vertical size (cm)
17	Display Gamma	78	01111000	120	2.2	Gamma 2.2	gamma value=(1.00~3.54) / value stored=(gamma x 100)-100
18	Feature support	0A	00001010	10			
19	Red/green low bits	34	00110100	52		10000111	Color coordinates Data
1A	Blue/white low bits	05	00000101	5		11111110	
1B	Red x/ high bits	93	10010011	147	0.574	Red x 0.574= 10010011	
1C	Red y	56	01010110	86	0.339	Red y 0.3339= 01010110	
1D	Green x	55	01010101	85	0.333	Green x 0.333= 01010101	
1E	Green y	92	10010010	146	0.570	Green y 0.570= 10001110	
1F	Blue x	29	00101001	41	0.160	Blue x 0.160= 00101001	
20	Blue y	20	00100000	32	0.125	Blue y 0.125= 00011101	
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	Unused field in this section shall be set to 01H.
27		01	00000001	1			
28	Standard timing #2	01	00000001	1		not used	Unused field in this section shall be set to 01H.
29		01	00000001	1			
2A	Standard timing #3	01	00000001	1		not used	Unused field in this section shall be set to 01H.
2B		01	00000001	1			
2C	Standard timing #4	01	00000001	1		not used	Unused field in this section shall be set to 01H.
2D		01	00000001	1			
2E	Standard timing #5	01	00000001	1		not used	Unused field in this section shall be set to 01H.
2F		01	00000001	1			
30	Standard timing #6	01	00000001	1		not used	Unused field in this section shall be set to 01H.
31		01	00000001	1			
32	Standard timing #7	01	00000001	1		not used	Unused field in this section shall be set to 01H.
33		01	00000001	1			
34	Standard timing #8	01	00000001	1		not used	Unused field in this section shall be set to 01H.
35		01	00000001	1			
36	Detailed timing/monitor descriptor #1	12	00010010	18	69.3	Main clock= 69.3 MHz	Pixel clock / 10000 (Stored LSB first)
37		1B	00011011	27			
38		56	01010110	86	1366	Hor active=1366 pixels	Horizontal Active
39		6C	01101100	108	108	Hor blanking=108 pixels	Horizontal Blanking
3A		50	01010000	80		4bit : 4bit	Horizontal Active : Horizontal Blanking (upper 4bit)
3B		00	00000000	0	768	Vertcal active=768 lines	Vertical Active
3C		10	00010000	16	16	Vertical blanking=16 lines	Vertical Blanking (DE Blanking min for DE only mode panel)
3D		30	00110000	48		4bit : 4bit	Vertical Active : Vertical Blanking (upper 4bit)
3E		20	00100000	32	32		Horizontal Sync. Offset
3F		16	00010110	22	22	H sync. Width=22 pixels	Horizontal Sync. Pulse Width
40		24	00100100	36	2 4	V sync. Offset=2 lines V sync. Width=5 lines	Vertical Sync. Offset : Vertical Sync. Pulse Width
41		00	00000000	0		2bit : 2bit :2bit :2bit	Horizontal Sync. Offset (upper 2bit) Horizontal Sync Pulse Width (upper 2bit) Vertical Sync. Offset (upper 2bit) Vertical Sync. Pulse Width (upper 2bit)
42		00	00000000	0	256	H image size= 256 mm(approx)	Horizontal Image Size
43		90	10010000	144	144	V image size = 144 mm(approx)	Vertical Image Size
44		10	00010000	16			Horizontal & Vertical Image Size (upper 4bit)
45		00	00000000	0		No Horizontal Border	Horizontal Border
46		00	00000000	0		No Vertical Border	Vertical Border
47		19	00011001	25			Flag
48	Detailed timing/monitor descriptor #2	00	00000000	0		Manufacturer Specified (Timing)	Data type Tag
49		00	00000000	0			
4A		00	00000000	0			
4B		0F	00001111	15			
4C		00	00000000	0			
4D		00	00000000	0		**Value**=HSPWmin / 2	DE only mode
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		2A	00101010	42		Thpmin=**value***2 + HA pixelclks	
56		C0	11000000	192		Thpmax=**value***2 + HA pixelclks	
57		06	00000110	6		Tvpmin=**value***2 + VA lines	
58		29	00101001	41		Tvpmax=**value***2 + VA lines	
59		00	00000000	0		Module revision	

5A		00	00000000	0		ASCII Data String Tag	Data type Tag
5B		00	00000000	0			
5C		00	00000000	0			
5D		FE	11111110	254			
5E		00	00000000	0			
5F		53	01010011	83	[S]		Supplier Name
60		41	01000001	65	[A]		
61	Detailed timing/monitor	4D	01001101	77	[M]		
62	descriptor #3	53	01010011	83	[S]		
63		55	01010101	85	[U]		
64		4E	01001110	78	[N]		
65		47	01000111	71	[G]		
66		0A	00001010	10	[^]		
67		20	00100000	32	[ ]		
68		20	00100000	32	[ ]		
69		20	00100000	32	[ ]		
6A		20	00100000	32	[ ]		
6B		20	00100000	32	[ ]		
6C		00	00000000	0		Monitor Name Tag (ASCII)	Data type Tag
6D		00	00000000	0			
6E		00	00000000	0			
6F		FE	11111110	254			
70		00	00000000	0			
71		31	00110001	49	[1]		Supplier Product Name
72		31	00110001	49	[1]		
73	Detailed timing/monitor	36	00110110	54	[6]		
74	descriptor #4	41	01000001	65	[A]		
75		54	01010100	84	[T]		
76		30	00110000	48	[0]		
77		34	00110100	52	[4]		
78		2D	00101101	45	[-]		
79		53	01010011	83	[S]		
7A		30	00110000	48	[0]		
7B		31	00110001	49	[1]		
7C		0A	00001010	10	[^]		
7D		20	00100000	32	[ ]		
7E	Extension Flag	00	00000000	0			
7F	Checksum	**42**	01000010	66			