

SPECIFICATION

VER:1.0

BE101IA-01D

APPROVAL SHEET

客户名称 CUSTOMER	标准品 Standard module	DATA OF APPROVAL 承认日期
产品模式 Product	VA 模式 ; 1280*800 点阵 ; 10.1TFT;	
客户项目型 号:		
客户签核 Approved signature by customer		

制作 PREPARED BY	审核 CHECKED BY	核准 APPROVED BY

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Shenzhen Honsean Smart Display Technology Co., LTD

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1. General Description

This specification applies to the 10.1 inch wide Color a-Si TFT-LCD Modue EE101IA-01D. The display supports the 1280(H) x 800(V) screen format and 16.7M colors(8 bits LVDS data input). this module Including T-con Board power consumption and including contain an driver board for backlight.

2. Display Characteristics

Item	Contents	Unit	Note
LCD Type	10.1TFT	-	
Display color	65 K	-	
Contrast Ratio (Center of screen)	800 (Typ)	-	
Viewing Direction	All 85/85/85/85	O'Clock	
Viewing Area(W×H)	220.56(H) x139.2(V)mm	mm	
Active Area(W×H)	216.96(W) h x135.60(H) mm	mm	
Number of Dots	1280 RGB(W)×800(H) Dots	mm	
Outline Dimensions	229.46(W) ×149.1(H) ×2.6(D) mm	mm	
VCI	3.3	V	
Data Transfer	LVDS-8bit (客户可选择)	-	
Polarizer Mode	Anti-Glare, AG20% 3H	-	
Backlight	LED (white)	-	
White Luminance (Center)	330(Typ)	Mcd/m2	
Power Consumption (LCD Module + Backligh unit)	5.8 W	watt	
Operating Temperature	-0~+50℃	-	
Storage Temperature	-10~+60℃	-	
Weight	TBD/pcs 44/Box TBDKG/Box		

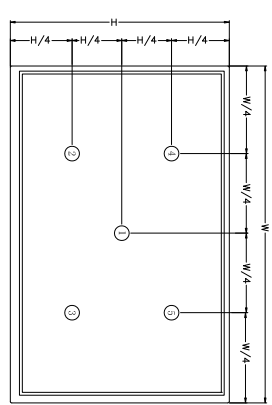
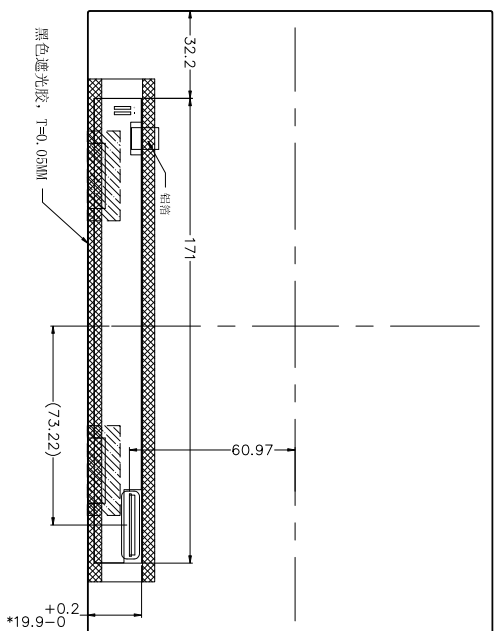
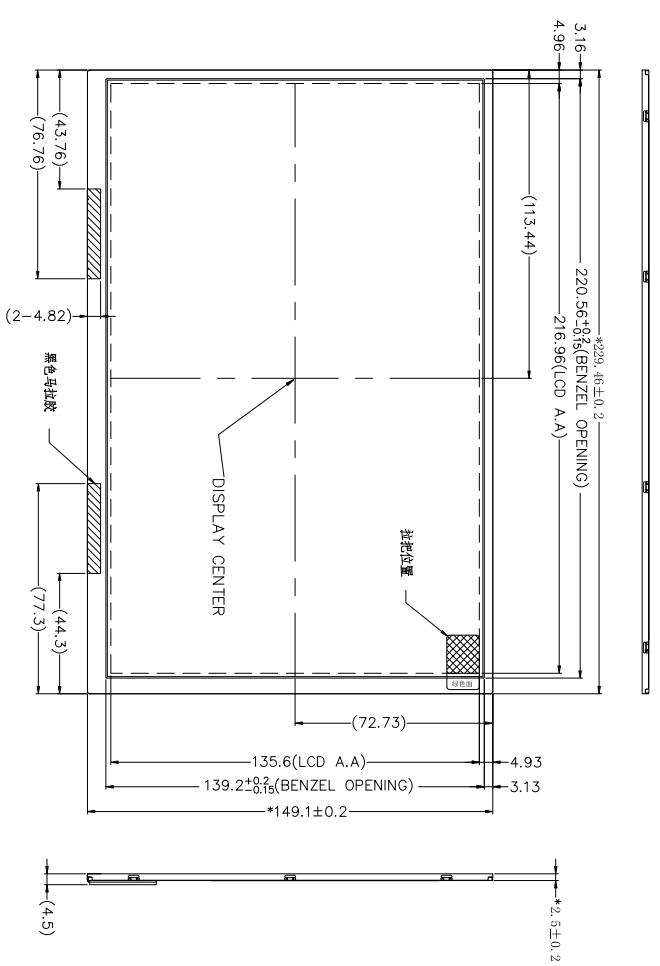
Environmental Protection:RoHS

3. Outline Drawing

ISSUE	DATE	DESCRIPTION	REVISER
1	20171117	首次发行	夏雷

4. Test Point (测试点):

1. Environment Luminance (环境亮度): ≤ 0.1 cd/m²
2. Test Instrument (测试仪器): BM-7
3. Test Distance (测试距离): 500 mm
4. Aperture Diameter (光圈直径): $\phi 7.7(1^\circ)$



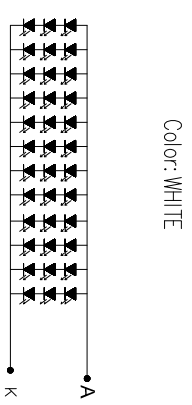
5点测试示意图

1. Mechanical Outline (Unspecified Tolerances is ± 0.3 mm)

2. Electrical-Optical Characteristics ($T_a = 25^\circ\text{C}$)

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Forward Voltage	VF	8.4	9.3	10.5	V	定电流
Dominant Wave Length	X	0.25	0.29	0.33		IF = 260mA
	Y	0.28	0.32	0.36		
Uniformity	Avg	70			%	
Module Luminance	Lv	300	350		cd/m ²	

3. Circuit Diagram (LED SMT 3*12=36 PCS)



TYPE	TFT液晶模组		DITTING MODE	
CUSTOM NO		EDITION	A2	DATE
CUSTOM MODEL		UNIT	MM	APPROVED
CUST Drawing	SCALE	1:1	CHECK	
	PAGE	1/1	DESIGNED	

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Operating Temperature: 0~+50°C Storage Temperature: -20~+60°C

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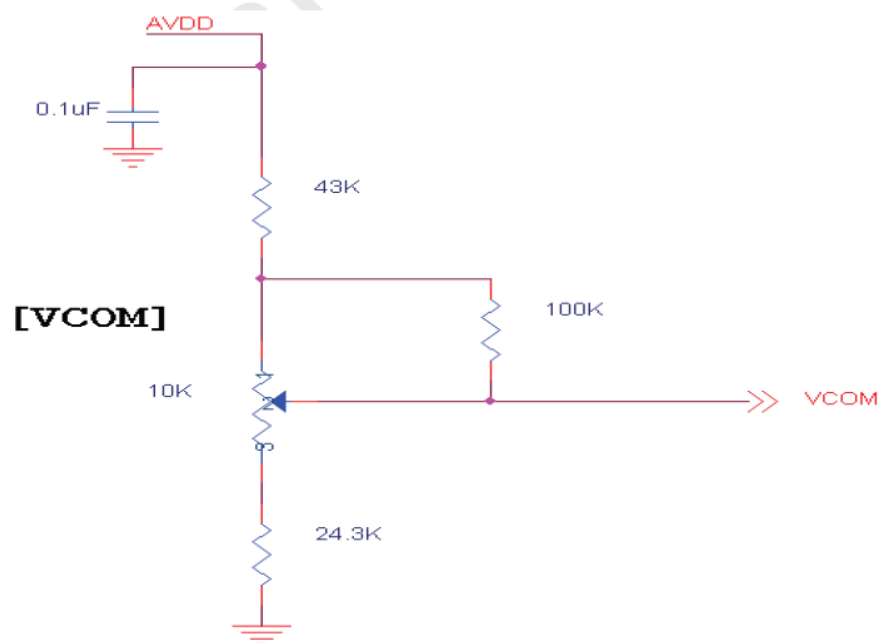
40pin connector is used for the module electronics interface. This model used

196479-40041-3 manufactured by P2 connector

Pin No.	Symbol	I/O	Function	Remark
1	VCOM	P	Common Voltage	
2	VDD	P	Power Supply	
3	VDD	P	Power Supply	
4	NC	--	No connection	
5	NC	--	No connection	
6	NC	--	No connection	
7	GND	P	Ground	
8	Rxin0-	I	-LVDS Differential Data Input	R0-R5, G0
9	Rxin0+	I	+LVDS Differential Data Input	
10	GND	P	Ground	
11	Rxin1-	I	-LVDS Differential Data Input	G1-G5, B0,B1
12	Rxin1+	I	+LVDS Differential Data Input	
13	GND	P	Ground	
14	Rxin2-	I	-LVDS Differential Data Input	B2-B5,HS,VS, DE
15	Rxin2+	I	+LVDS Differential Data Input	
16	GND	P	Ground	
17	RxCLK-	I	-LVDS Differential Clock Input	LVDS CLK
18	RxCLK+	I	+LVDS Differential Clock Input	
19	GND	P	Ground	
20	Rxin3-	I	-LVDS Differential Data Input	R6, R7, G6, G7, B6, B7
21	Rxin3+	I	+LVDS Differential Data Input	
22	GND	P	Ground	
23	NC	--	No connection	
24	NC	--	No connection	
25	GND	P	Ground	
26	NC	--	No connection	

27	NC	--	No connection	
28	NC	--	No connection	
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	
31	LED-	P	LED Cathode	
32	LED-	P	LED Cathode	
33	NC	--	No connection	
34	NC	--	No connection	
35	VGL	P	Gate OFF Voltage	
36	NC	--	No connection	
37	NC	--	No connection	
38	VGH	P	Gate ON Voltage	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

4. Electrical characteristic



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(Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	VDD	-0.3	3.9	V	
	AVDD	-0.3	14	V	
	V _{GH}	-0.3	42.0	V	
	V _{GL}	-19	0.3	V	
	V _{GH} -V _{GL}	12	40.0	V	
Operation Temperature	T _{OP}	-20	70	°C	
Storage Temperature	T _{ST}	-30	80	°C	

Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	VDD	2.3	2.5	2.7	V	Note 2
	AVDD	8.0	8.2	8.4	V	
	V _{GH}	21.7	22	22.3	V	
	V _{GL}	-7.3	-7	-6.7	V	
Input signal voltage	VCOM	2.7	3.0	3.3	V	Note 4
Input logic high voltage	V _{IH}	0.8 VDD	-	3.6	V	Note 3
Input logic low voltage	V _{IL}	0	-	0.2 DV _{DD}	V	

Note 1: Be sure to apply VDD and V_{GL} to the LCD first, and then apply V_{GH}.

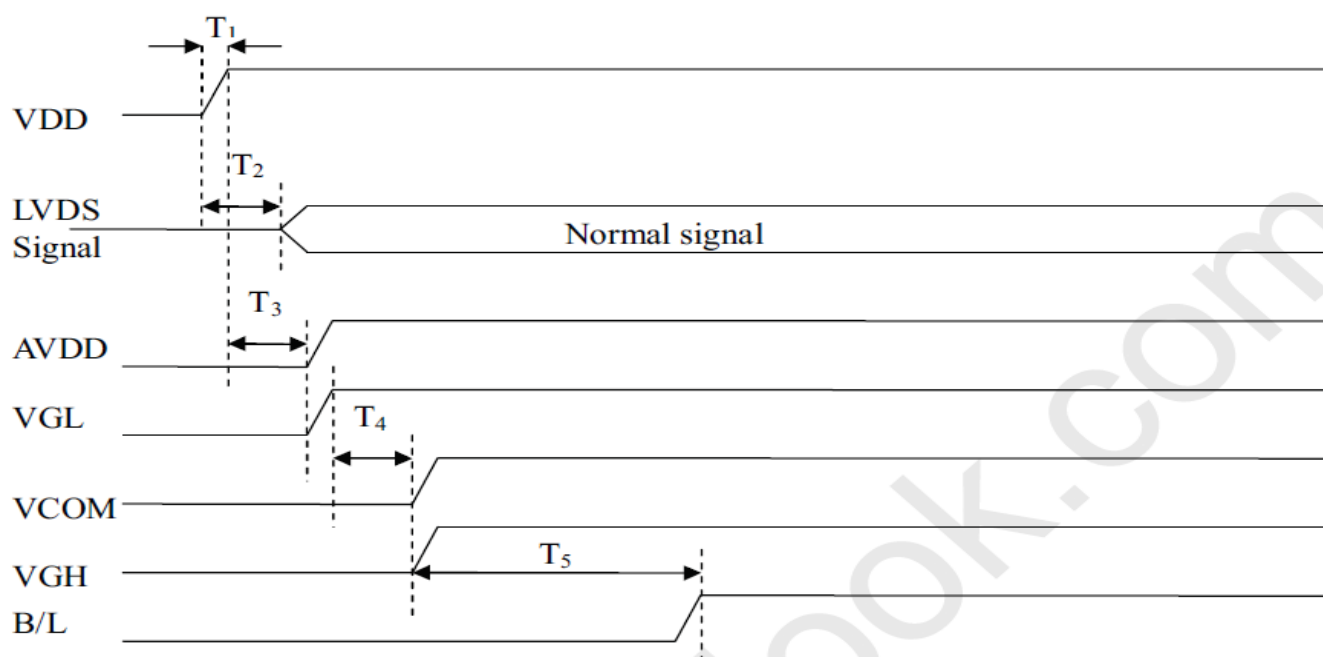
Note 2: VDD setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note 4: Typical VCOM is only a reference value, it must be optimized according to each LCM. Be sure to use VR.

3.3. Current Consumption

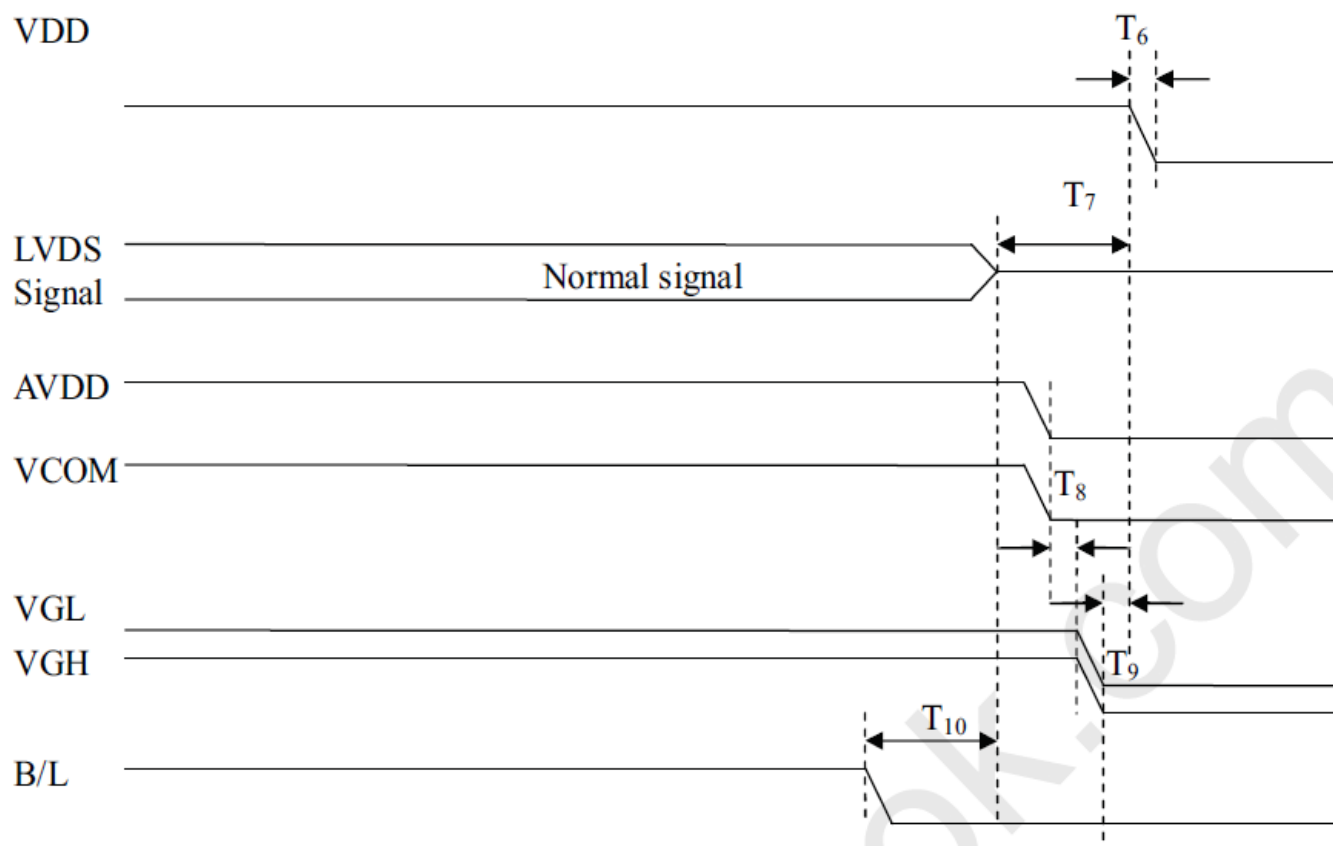
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	300	705	1000	μA	$V_{GH} = 22V$
	I_{GL}	300	705	1000	μA	$V_{GL} = -7V$
	I_{VDD}	50	95	120	mA	$V_{DD} = 2.5V$
	I_{AVDD}	8	45	70	mA	$AV_{DD} = 8.2V$

a. Power on:



Symbol	Value			Unit
	Min.	Typ.	Max.	
T1	0.5	2	10	ms
T2	0	5	50	ms
T3	0	5	50	ms
T4	0	6	100	ms
T5	120	130	200	ms

b. Power off:



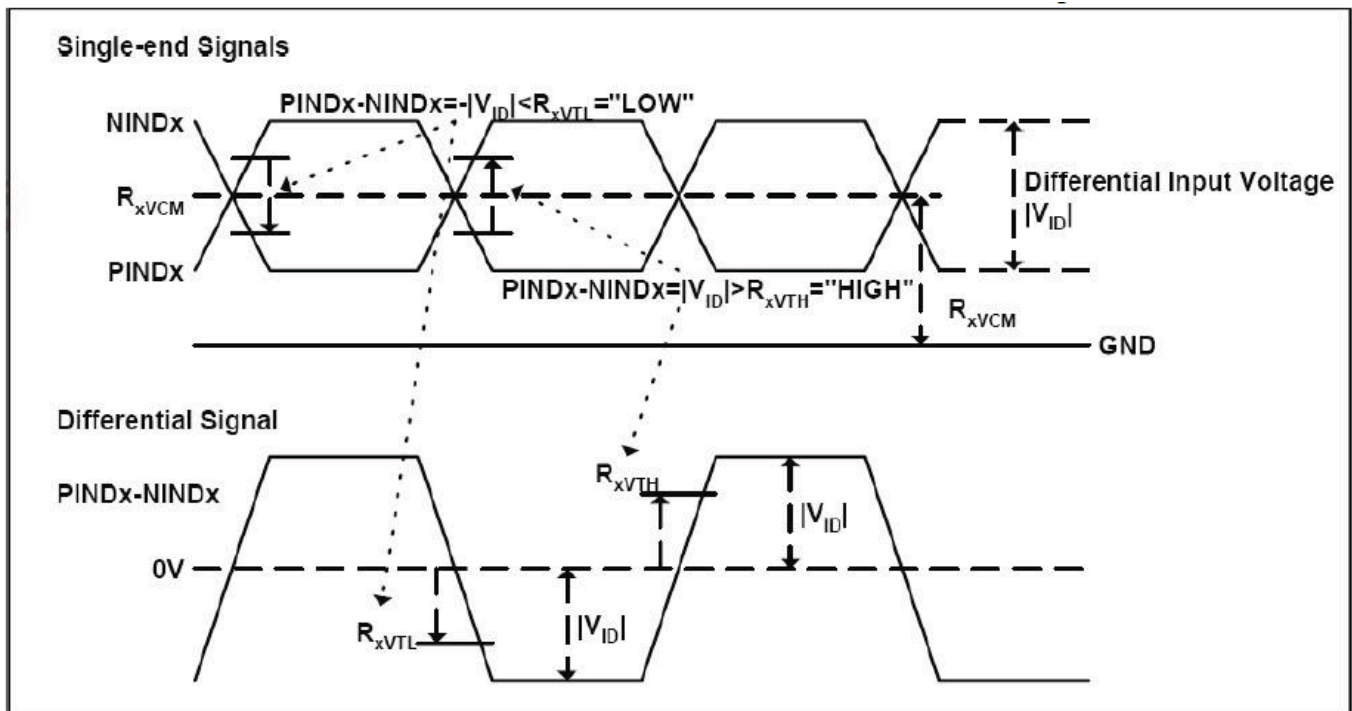
Symbol	Value			Unit Min.
	Min.	Typ.	Max.	
T6	0.5	2	10	ms
T7	0	7	50	ms
T8	0	5	10	ms
T9	0	1	10	ms
T10	0	2	100	ms

5. Interface and data mode

3.5. LVDS Signal Timing Characteristics

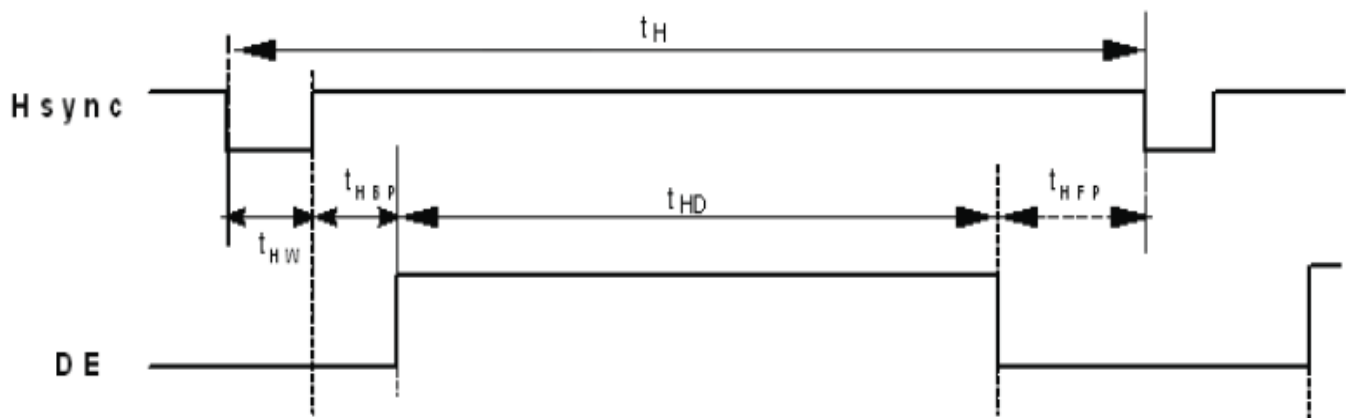
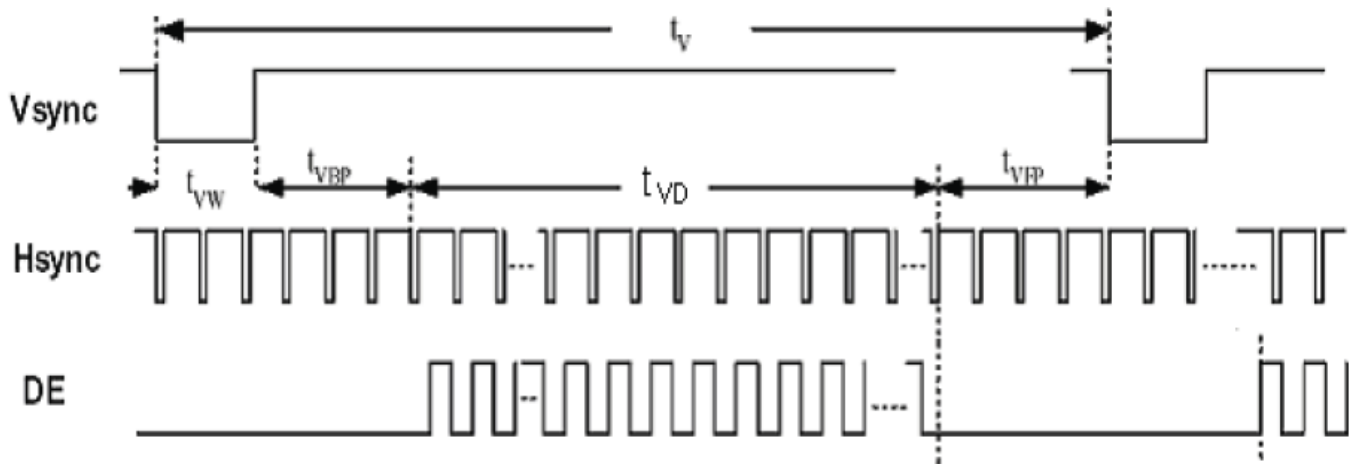
3.5.1. AC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
LVDS Differential input high Threshold voltage	R_{xVTH}	-	-	+100	mV	$R_{xVCM}=1.2V$
LVDS Differential input low Threshold voltage	R_{xVTL}	-100	-	-	mV	
LVDS Differential input common mode voltage	R_{xVCM}	0.7	-	1.6	V	
LVDS Differential voltage	$ V_{ID} $	200	-	600	mV	

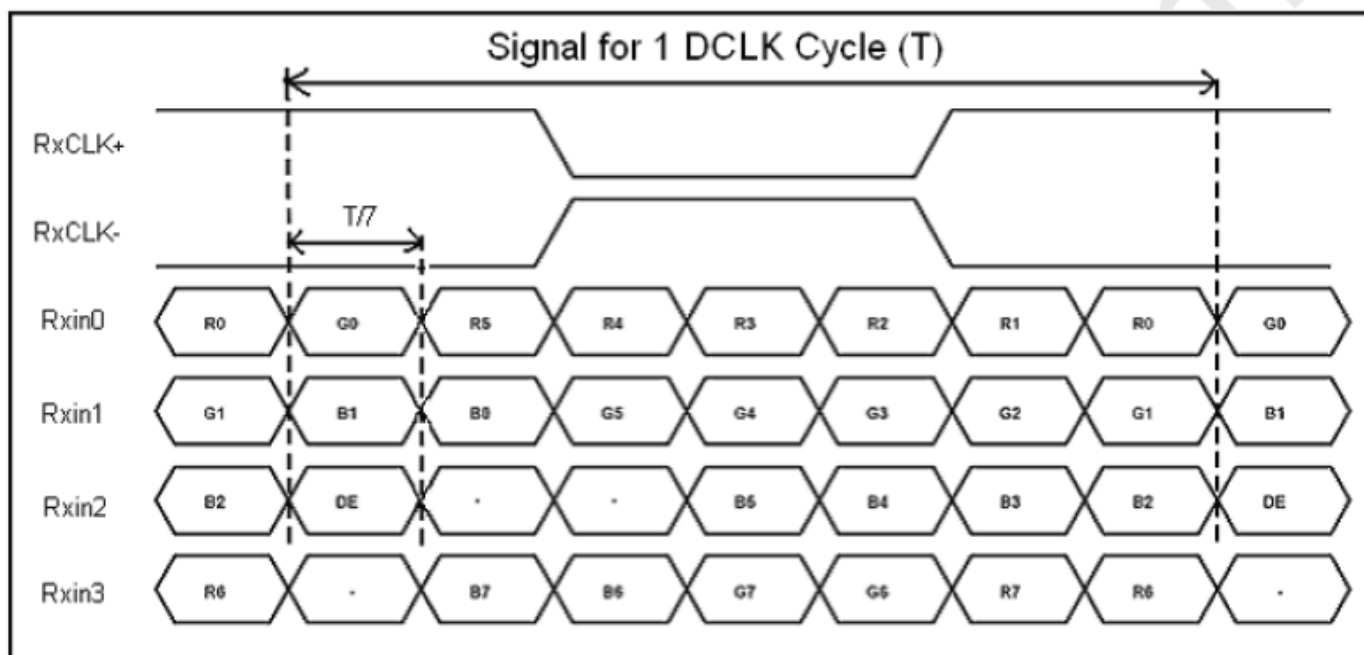


3.5.2. Timing Table

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	1/Tc	68.9	71.1	73.4	MHz	Frame rate =60Hz
Horizontal display area	t _{HD}	1280				
HS period time	t _H	1410	1440	1470	Tc	
HS Width +Back Porch +Front Porch	t _{HW} + t _{HBP} +t _{HFP}	60	160	190	Tc	
Vertical display area	t _{VD}	800				
VS period time	t _V	815	823	833	t _H	
VS Width +Back Porch +Front Porch	t _{VW} + t _{VBP} +t _{VFP}	15	23	33	t _H	



3.5.3. LVDS Data Input Format



6. Optical Characteristics

1、VDD=5V Fv=60HZ Ta=25°C

Items	Symbol	Condition	Specifications			Unit	Note
			Min.	Typ.	Max.		
Lw	White Luminance(center of screen)		300	320	350		
Contrast Ratio	CR(Center of screen)		-	800	-	-	
Response Time	T_R		-	13	28	ms	
	T_F		-	5	8	ms	
	T_R+T_F		-	18	36	ms	
Chromaticity	Red	X_R	0.604	0.634	0.664	-	TBD
		Y_R	0.298	0.328	0.358	-	
	Green	X_G	0.264	0.294	0.324	-	
		Y_G	0.547	0.577	0.607	-	
	Blue	X_B	0.107	0.137	0.167	-	
		Y_B	0.104	0.134	0.164	-	
	White	X_W	0.272	0.302	0.332	-	
	Y_W	0.305	0.335	0.365	-		
Viewing angle(CR=10)	Hor.	$\phi 1(3\text{ o'clock})$	75	85	-	deg.	
		$\phi 2(9\text{ o'clock})$	75	85	-		
	Ver.	$\theta 2(12\text{ o'clock})$	75	85	-		
		$\theta 1(6\text{ o'clock})$	75	85	-		
NTSC ratio				-		%	

Note 1: Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

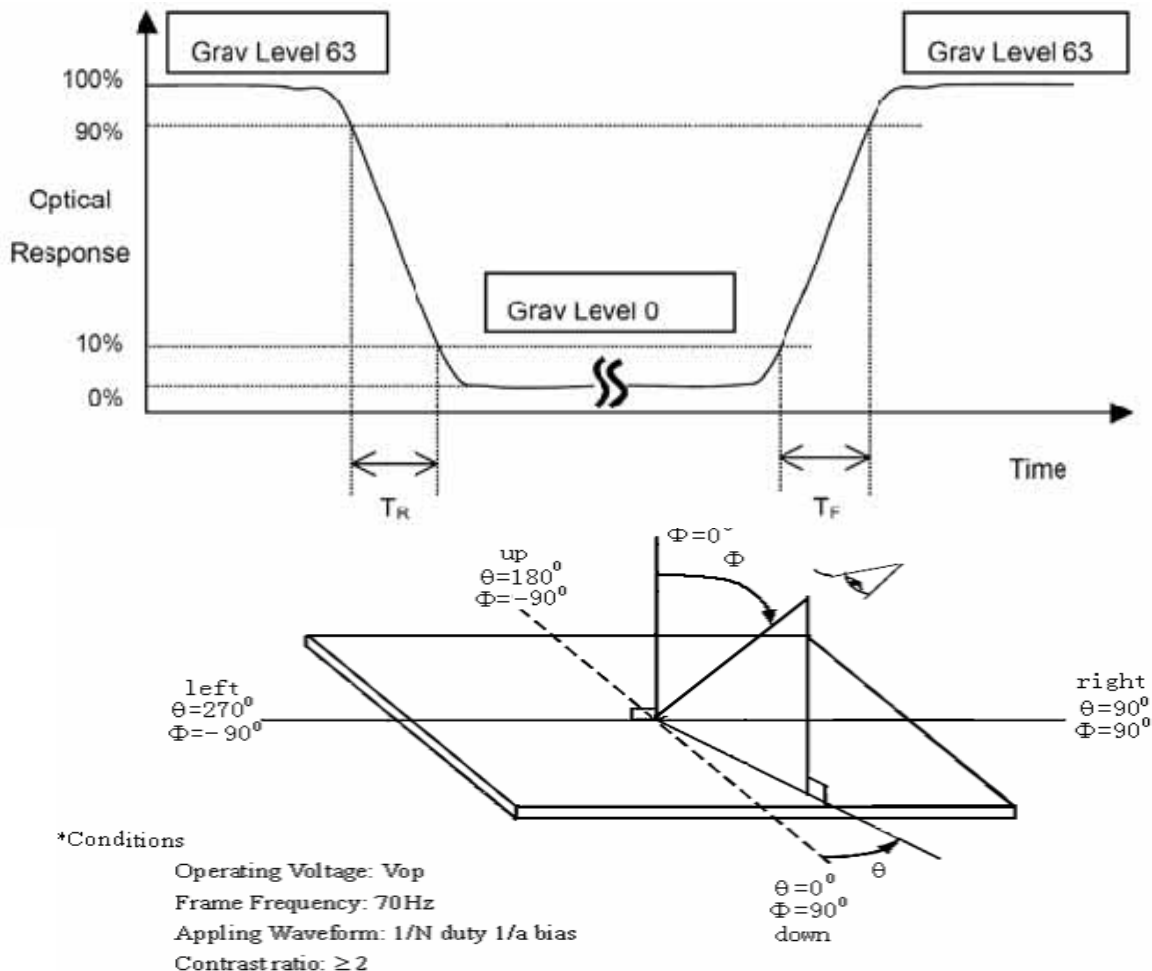
$$\text{Contrast Ratio (CR)} = L_{63} / L_0$$

L63: Luminance of gray level 63

L0: Luminance of gray level 0

$$\text{CR} = \text{CR} (10)$$

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note 5



The above “Viewing Angle” is the measuring position with Largest Contrast Ratio; not for good image quality. View Direction for good image quality is 6 O’ clock. Module maker can increase the “Viewing Angle” by applying Wide View Film.

7. Reliability

Test Item	Test Condition	
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Temperature Humidity Bias (THB)	Ta= 25°C, 80%RH, 300hours	
High temperature storage	Ta=60°C, 300hours	
Low temperature storage	Ta= -10°C, 300hours	
High Temperature Operation(LTO)	Ta= 50°C 50%RH, 300hours	
Low Temperature Operation(LTO)	Ta= 0°C, 300hours	
Vibration Test (Non-operation)	Acceleration: 1.5 Grms Wave: Random Frequency: 10 - 200 Hz Sweep: 30 Minutes each Axis (X, Y, Z)	
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction:+/-X,+/-Y,+/-Z (one time for each Axis)	
Thermal Shock Test (TST)	-20°C/30min, 60°C/30min, 100cycles	
On/Off Test	On/10sec, Off/10sec, 30,000 cycles	
ESD (Electro Static Discharge)	Contact Discharge +/-5KV,150PF(330Ω) 1sec 8 points 25 times/point	
	Air discharge +/-8KV,150PF(330Ω) 1sec 8 points 25 times/point	
Altitude Test	Operation:18,000 ft Non-Operation:40,000 ft	

8.Packing (Reference only)

