

Chefree Technology Corp.

CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: CH101CLHL-001
(Complied with RoHS)

CUSTOMER: _____

Version:P0.1

C O N T E N T S

ISSUE:AUG.13.2015

Spec Condition: Preliminary

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CUSTOMER	CHEFREE		
APPROVAL	APPROVAL	CHECKER	PREPARE
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2. RECORD OF REVISION

Rev	DATE	PAGE	SUMMARY
0.1	2015.08.13	ALL	Preliminary specification was first issued.

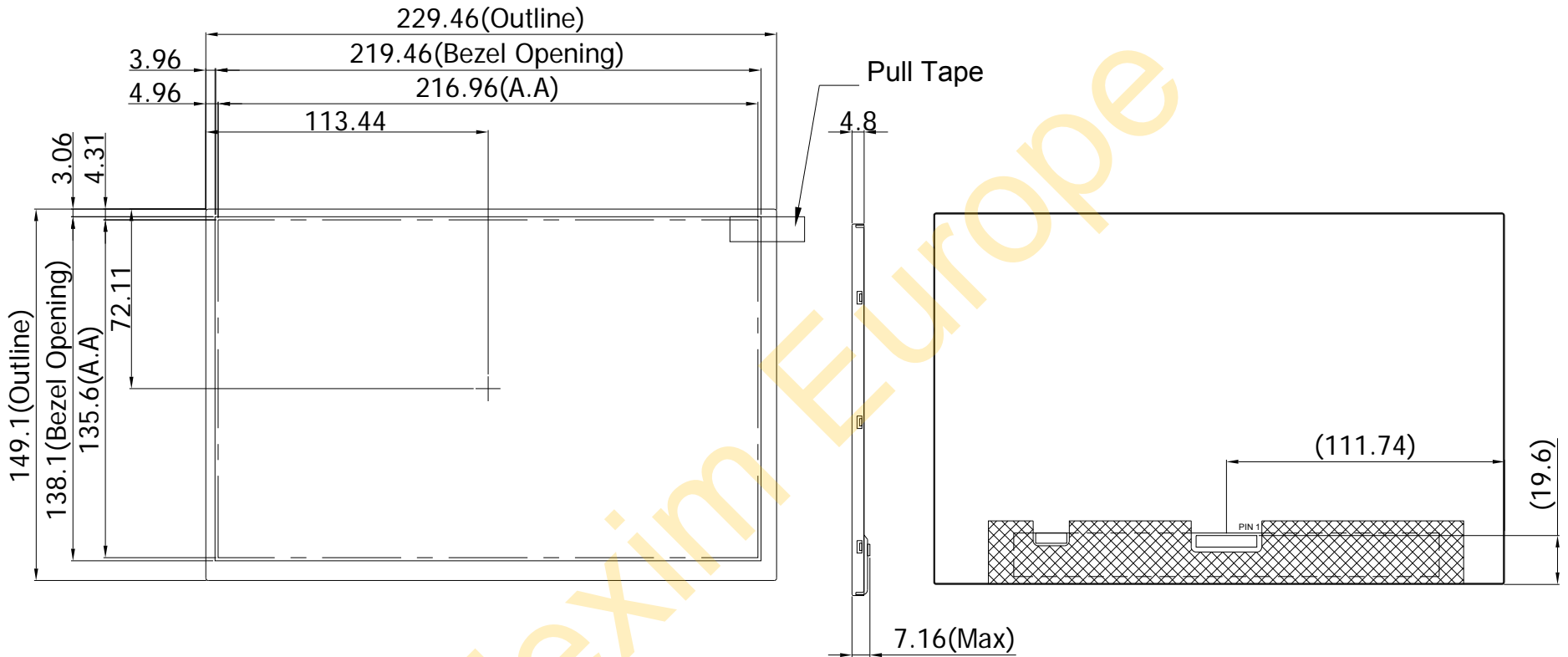
Texim Europe

3. MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1280(R.G.B) X 800
(2)	Module Size(mm)	229.46(W) X 149.1(H) X 4.8(D)
(3)	Active Area(mm)	216.96(H) X 135.60(V)
(4)	Pixel Pitch(mm)	0.1695(H) X 0.1695(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/Black
(6)	LED Backlight Color	White LED
(7)	Viewing Direction	ALL
(8)	Color Configuration	R.G.B Vertical Stripe
(9)	Module Weight(g)	TBD. (Typ.)

Texim Europe

1	2	3	4	5	6	7	8 樣式 QT2-RD02-008
文件題目	圖號	頁	次頁			No.	修訂日期
發行日	舊版日	登入號碼	機密等級			修訂內容	作成
						新版	修訂日期



NOTE:
 1. Unit: mm
 2. Without Tolerance: ±0.3

備考	單位	投影法	比例尺
製圖	mm	☉	圖號
Swallow 150813	名稱		CH101CLHL-001
入庫			
審查			
承認			

5. INTERFACE PIN CONNECTION

5.1 LCM PANEL DRIVING SECTION

CN1: Vigorconn F62240-H1210A or equivalent

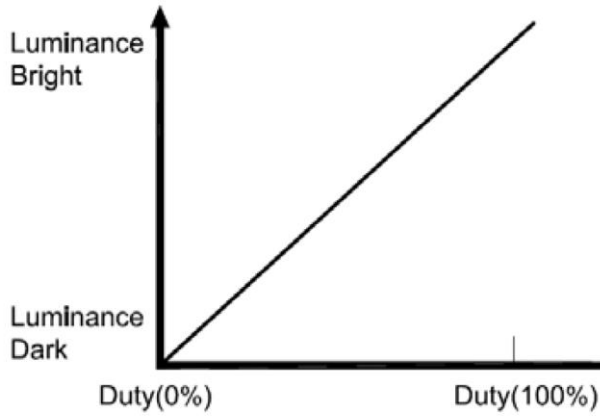
PIN NO.	SYMBOL	FUNCTION	REMARKS
1	VCOM	Common Voltage	
2	VDD	Power Supply	
3	VDD	Power Supply	
4	NC	No connection	
5	NC	No connection	
6	NC	No connection	
7	GND	Ground	
8	Rxin0-	- LVDS differential data input(R0~R5,G0)	
9	Rxin0+	+ LVDS differential data input(R0~R5,G0)	
10	GND	Ground	
11	Rxin1-	- LVDS differential data input(G1~G5,B0,B1)	
12	Rxin1+	+ LVDS differential data input(G1~G5,B0,B1)	
13	GND	Ground	
14	Rxin2-	- LVDS differential data input(B2-B5,HS,VS,DE)	
15	Rxin2+	+ LVDS differential data input(B2-B5,HS,VS,DE)	
16	GND	Ground	
17	RxCLK-	-LVDS differential clock input	
18	RxCLK+	+LVDS differential clock input	
19	GND	Ground	
20	Rxin3-	- LVDS differential data input(R6,R7,G6,G7,B6,B7)	
21	Rxin3+	+ LVDS differential data input(R6,R7,G6,G7,B6,B7)	
22	GND	Ground	
23	NC	No connection	
24	NC	No connection	
25	GND	Ground	
26	NC	No connection	
27	LED_PWM	CABC controller signal output for backlight	Note 2
28	NC	No connection	
29	AVDD	Power for Analog Circuit	
30	GND	Ground	
31	LED-	LED Cathode	
32	LED-	LED Cathode	
33	NC	No connection	
34	NC	No connection	
35	VGL	Gate OFF Voltage	
36	NC	No connection	
37	CABC_EN	CABC Enable Input	Note 1

38	VGH	Gate ON Voltage	
39	LED+	LED Anode	
40	LED+	LED Anode	

Note1: The setting of CABC function are as follows.

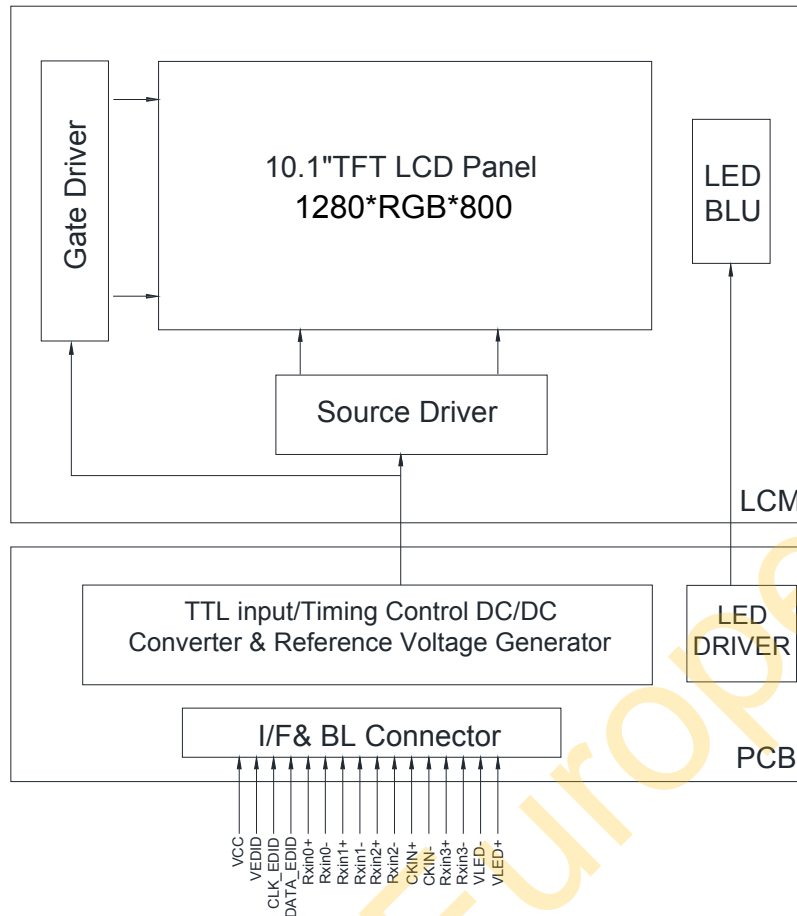
Pin	Enable	Disable
CABC_EN	High Voltage	Low Voltage or Open

Note2: LED PWM is used to adjust backlight brightness.



Texim Europe

6. BLOCK DIAGRAM



7. ABSOLUTE MAXIMUM RATINGS

7.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

TA=25°C

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
Power Voltage	VCC	-0.3	3.9	V	
	AVDD	-0.3	14	V	
	VGH	-0.3	42	V	
	VGL	-19	0.3	V	
	VGH+VGL	12	40	V	

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

7.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		COMMENT
	MIN	MAX	MIN	MAX	
Ambient Temperature(°C)	-20	70	-30	80	Note 1,2,3
Humidity(% RH)	5~90		5~90		Note 4

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 : Operation Ta=70°C & -20°C ≤ 120Hrs.

Note 4 : Storage Ta=40°C & RH=90% ≤ 120Hrs.

8. ELECTRICAL CHARACTERISTICS

8.1 ELECTRICAL CHARACTERISTICS OF LCD

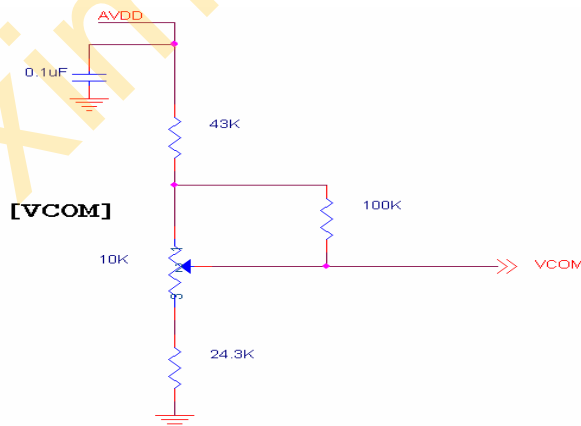
Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage	VDD	2.3	2.5	2.7	V	Note2
	AVDD	8.0	8.2	8.4	V	
	VGH	21.7	22	22.3	V	
	VGL	-7.3	-7	-6.7	V	
Input Signal Voltage	VCOM	2.7	3.0	3.3	V	Note3
Input Logic High Voltage	VIH	0.8VCC	-	3.6	V	Note2
Input Logic Low Voltage	VIL	0	-	0.2VCC	V	Note2
Current For Driver	IGH	-	705	1000	uA	VGH=22V
	IGL	-	705	1000	uA	VGL=-7V
	IVCC	-	95	120	mA	VCC=2.5V
	IAVDD	-	45	70	mA	AVDD=8.2V

Note1: Be sure to apply VDD and VGL to the LCD first, and then apply VGH.

Note2: VDD setting should match the signals output voltage of customer's system board.

Note3: Typ. VCOM is only a reference value; it must be optimized according to each LCM. Be sure to use VR.



8.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Input Voltage	VLED	16.8	(19.5)	21	V	Note1
	ILED	200	240	280	mA	
LED Life Time	LT	50,000	-	-	Hours	Note2

Note1: The LED Supply Voltage is defined by the number of LED at Ta=-25°C and IL=240mA.

Note2: The "LED life time" is defined as the module brightness decrease to 50% original brightness at Ta=-25°C and IL=240mA. The LED lifetime could be decreased if operating IL is larger than 240mA.

9. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing	600	800	-	-	Note1
Response Time	TR	Normal	-	10	20	ms	Note2
	TF	Angle	-	15	30	ms	
Chromaticity	White	x	0.28	0.31	0.34	-	
		y	0.29	0.32	0.35	-	
Viewing Angle	Hor.	Θ_{X+}	75	85	-	Deg.	Note3
		Θ_{X-}	75	85	-		
	Ver.	Θ_{Y+}	75	85	-		
		Θ_{Y-}	75	85	-		
		$\Theta_{X}=\Theta_{Y}$ $=0^{\circ}$ $CR \geq 10$					
Luminance	L	PWM:100%	400	500	-	cd/m ²	Center
Luminance Uniformity	YU		70	-	-	%	Note5

*Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

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

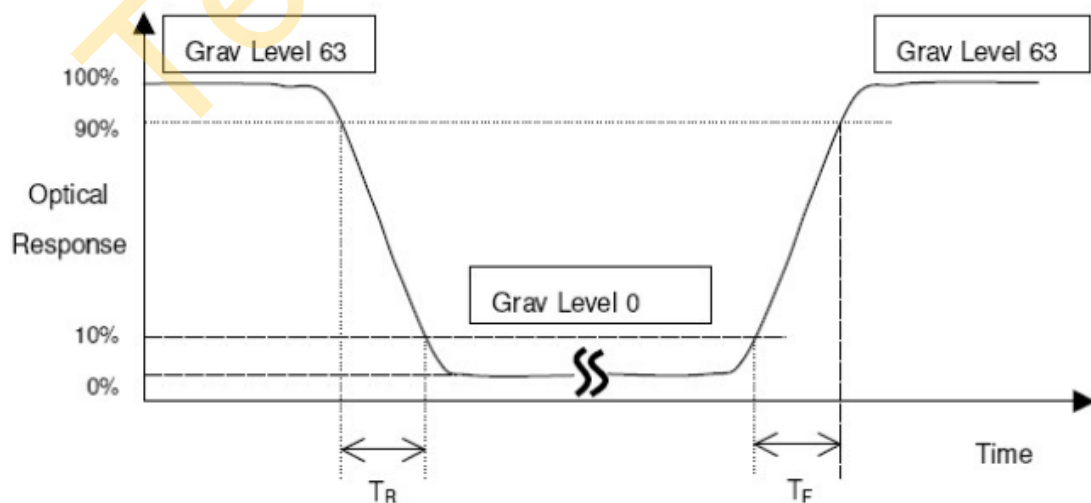
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

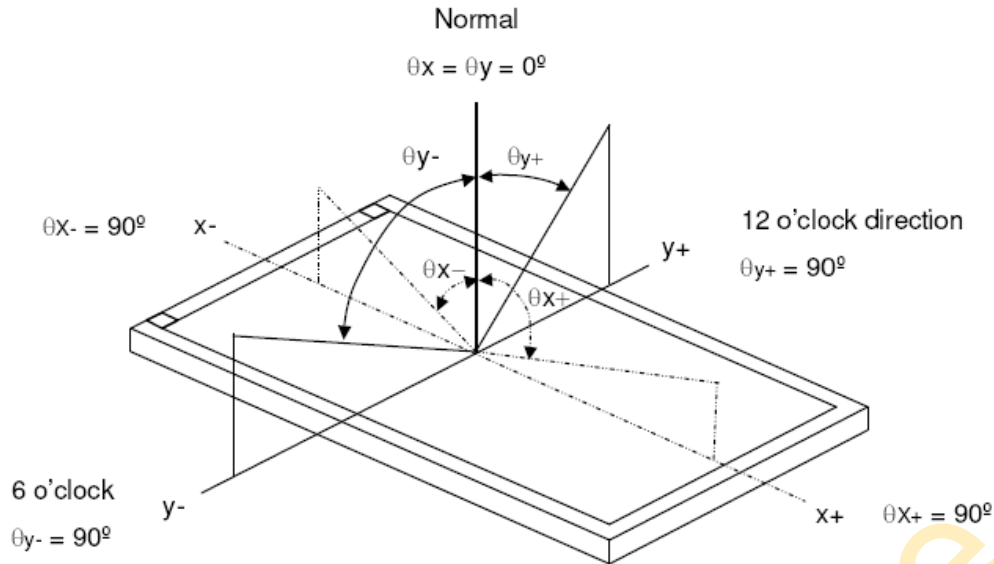
$$CR = CR (5)$$

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

*Note (2) Definition of Response Time (T_R , T_F):

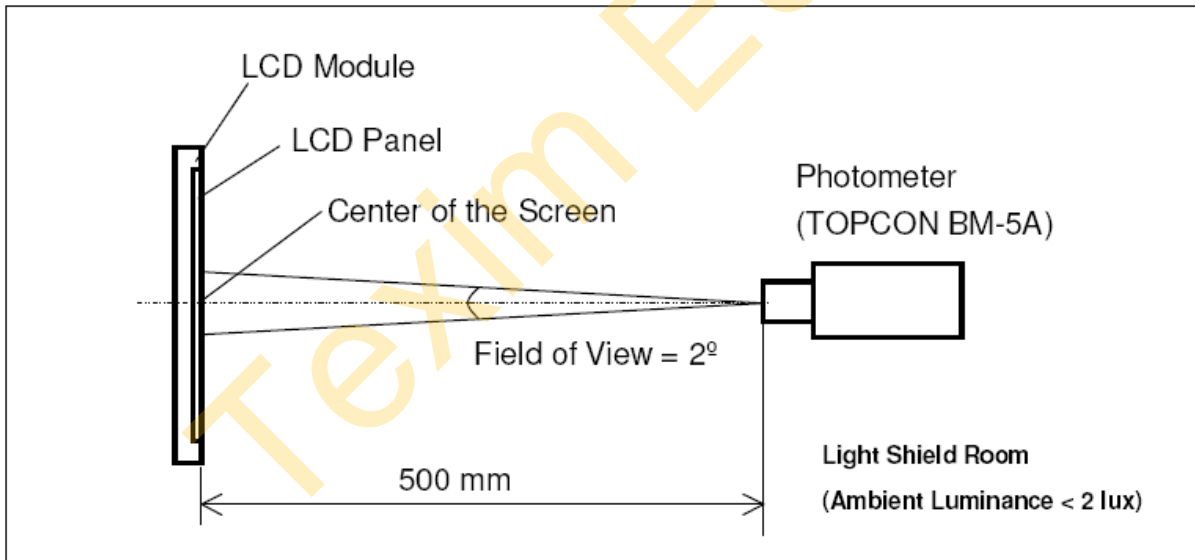


*Note(3) Definition of Viewing Angle

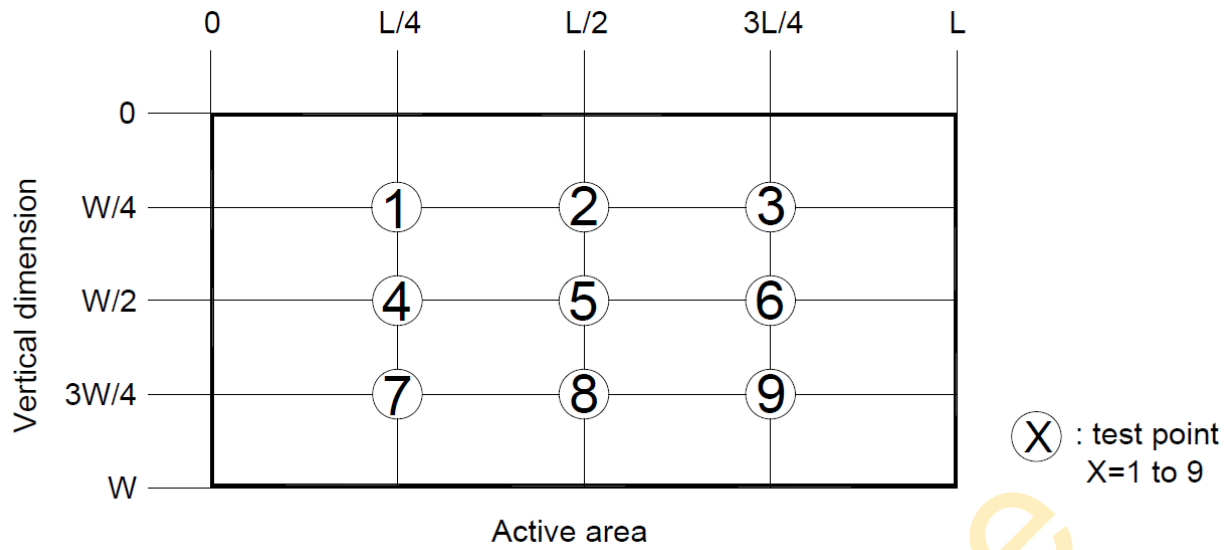


*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



*Note (5)

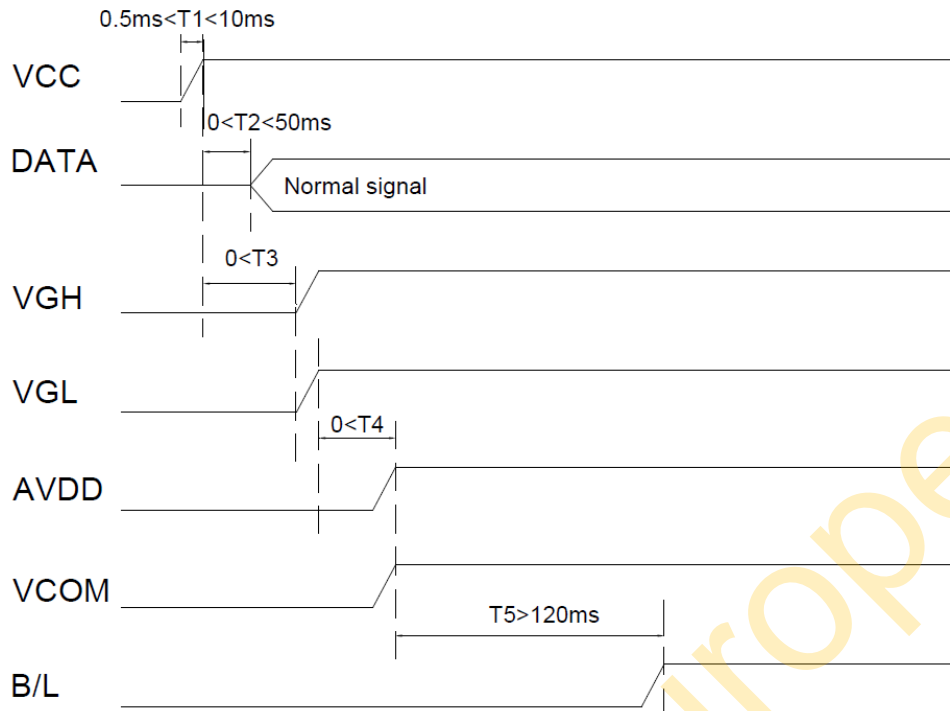


$$\left[1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right] \times 100\% \geq 70\%$$

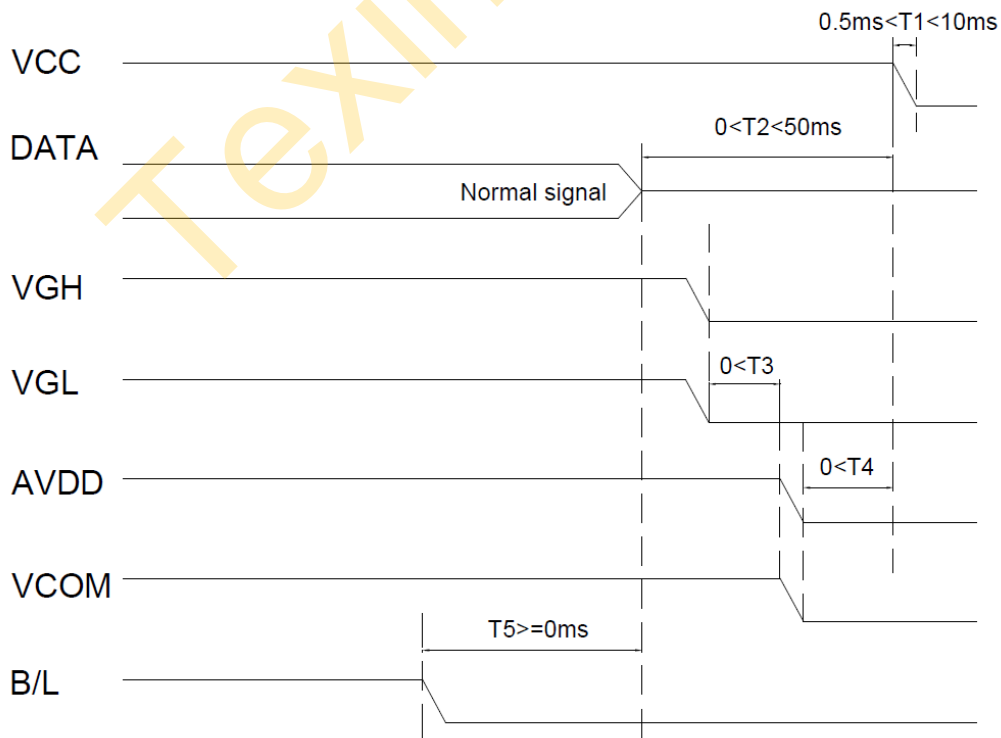
10. TIMING SPECIFICATIONS

10.1 POWER SIGNAL SEQUENCE

10.1.1 Power on:



10.1.2 Power off:

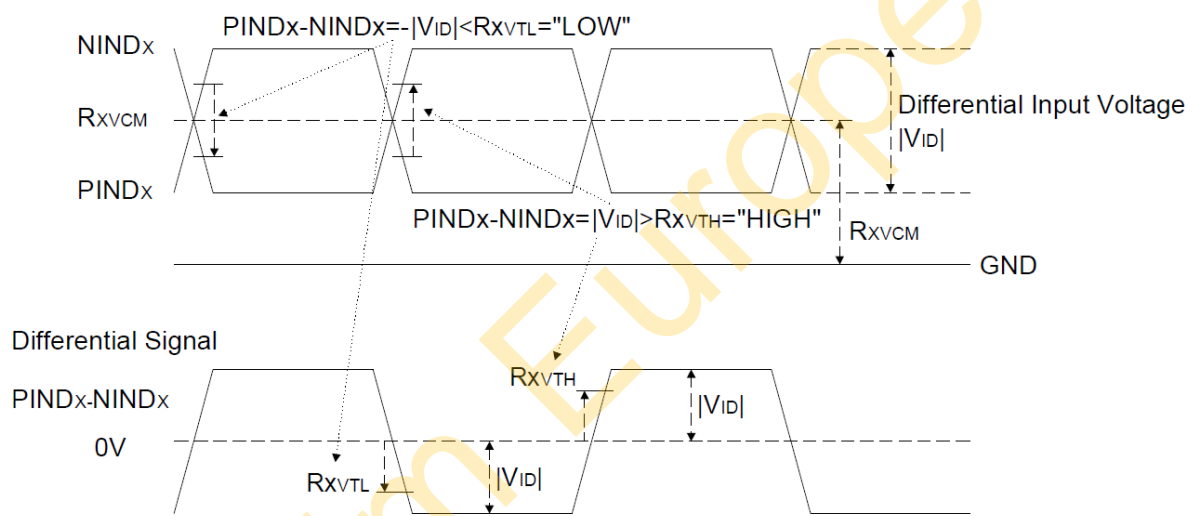


10.2 TIMING CHARACTERISTICS OF INPUT SIGNALS

10.2.1 AC Characteristics

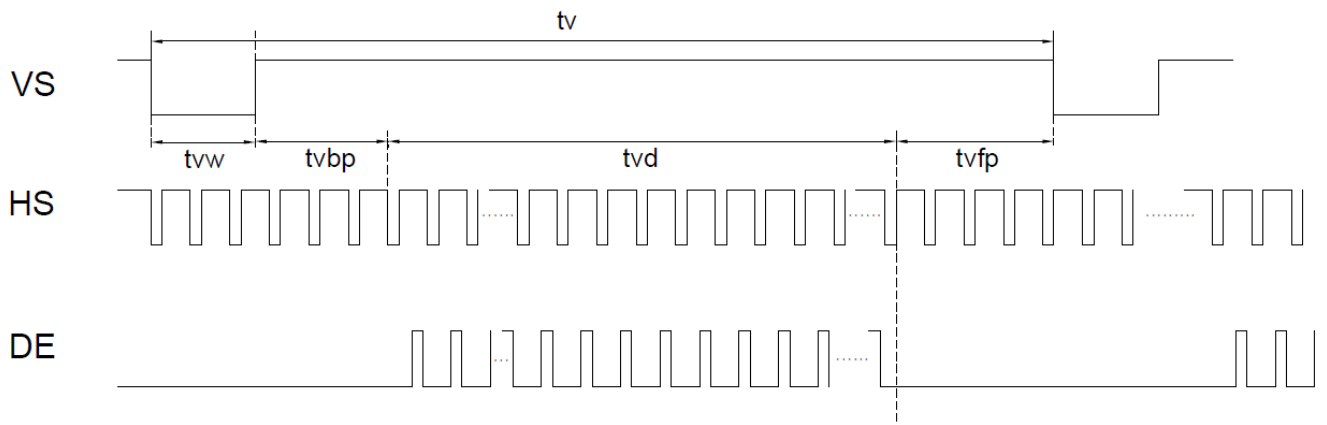
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Differential input high Threshold voltage	RXVTH	-	-	+100	mV	RXVCM=1.2V
Differential input low Threshold voltage	RXVTL	-100	-	-	mV	
Differential input common Mode voltage	RXVCM	0.7	-	1.6	V	
Differential voltage	VID	200	-	600	mV	

Single-end signals

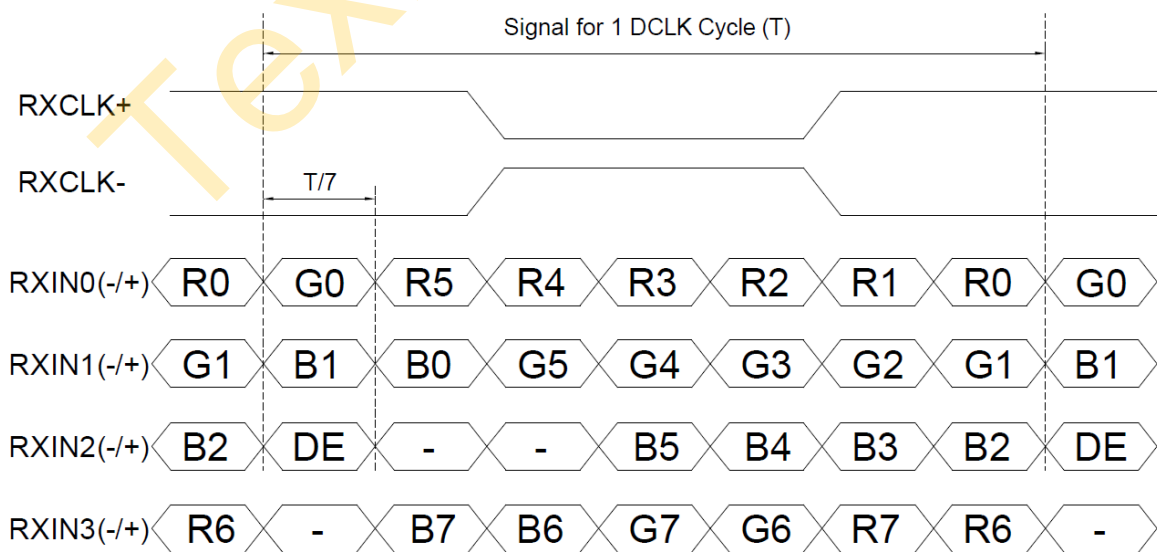
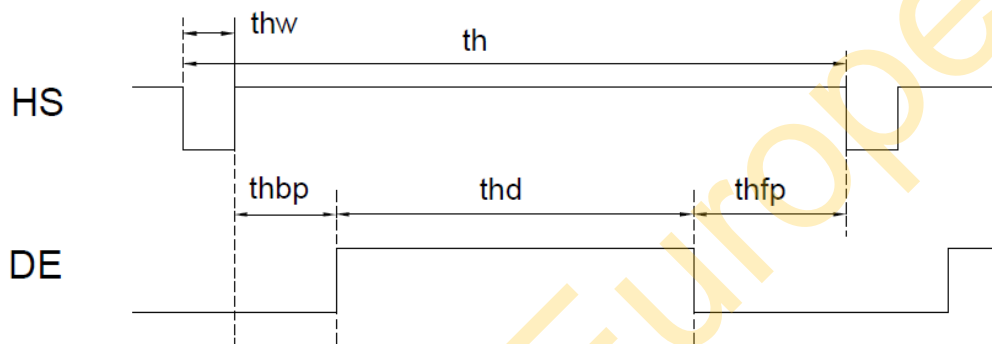


10.2.2 Timing

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Clock Frequency	1/T _c	68.9	71.11	73.4	MHz	Frame Rate=60Hz
Horizontal display area	t _{HD}	1280			T _c	
HS period time	t _H	1410	1440	1470	T _c	
HS Width + Back Porch + Front Porch	t _{HW} +t _{HBP} +t _{HFP}	130	160	190	T _c	
Vertical display	t _{vd}	800			t _H	
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	



10.2.3 LVDS Data Input Format



11. RELIABILITY TEST

ENVIRONMENTAL TEST FOR LCM			
NO.	ITEM	CONDITIONS	REMARK
1	High Temperature Storage	85°C , 240hrs	Note1,4
2	Low Temperature Storage	-30°C , 240hrs	Note1,4
3	High Temperature Operation	70°C , 240hrs	Note2,4
4	Low Temperature Operation	-20°C , 240hrs	Note1,4
5	High Temperature and High Humidity Operation	40°C , 90%RH, 240hrs	Note2,4
6	Thermal Cycling Test (No operation)	-30°C → 25°C → 80°C , 100 Cycles 30 min 5 min 30 min	Note1,4
7	Vibration Test (No operation)	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X. Y. Z. (6 hours for total)	
8	Mechanical Shock	100G 6ms,±X, ±Y, ±Z 3 times for each direction	
9	ESD Test	± 2KV, Human Body Mode, 100pF/1500Ω	

Note 1: Ta is the ambient temperature of samples.

Note 2: Ts is the temperature of panel's surface.

Note 3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

12. PRECAUTIONS FOR USE

12.1 SAFETY

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

12.2 STORAGE CONDITIONS

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

12.3 HANDLING PRECAUTIONS

- (1) Avoid static electricity which can damage the CMOS LSI.
- (2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
- (6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.
- (9) When the module is assembled, it should be attached to the system firmly, be careful not to twist and bend the module.
- (10) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, staining and discoloration may occur.
- (11) 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.

12.4 WARRANTY

- (1) Acceptance inspection period: The period is within one month after the arrival of contracted commodity at the buyer's factory site.
- (2) Applicable warrant period: The panel is within 12 months since the date of shipping out under normal using and storage conditions.

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