



# Specification for Approval

Customer: \_\_\_\_\_

Model Name: \_\_\_\_\_

Supplier Approval			Customer approval
R&D Designed	R&D Approved	QC Approved	
<i>Peter</i>	<i>Peng Jun</i>		

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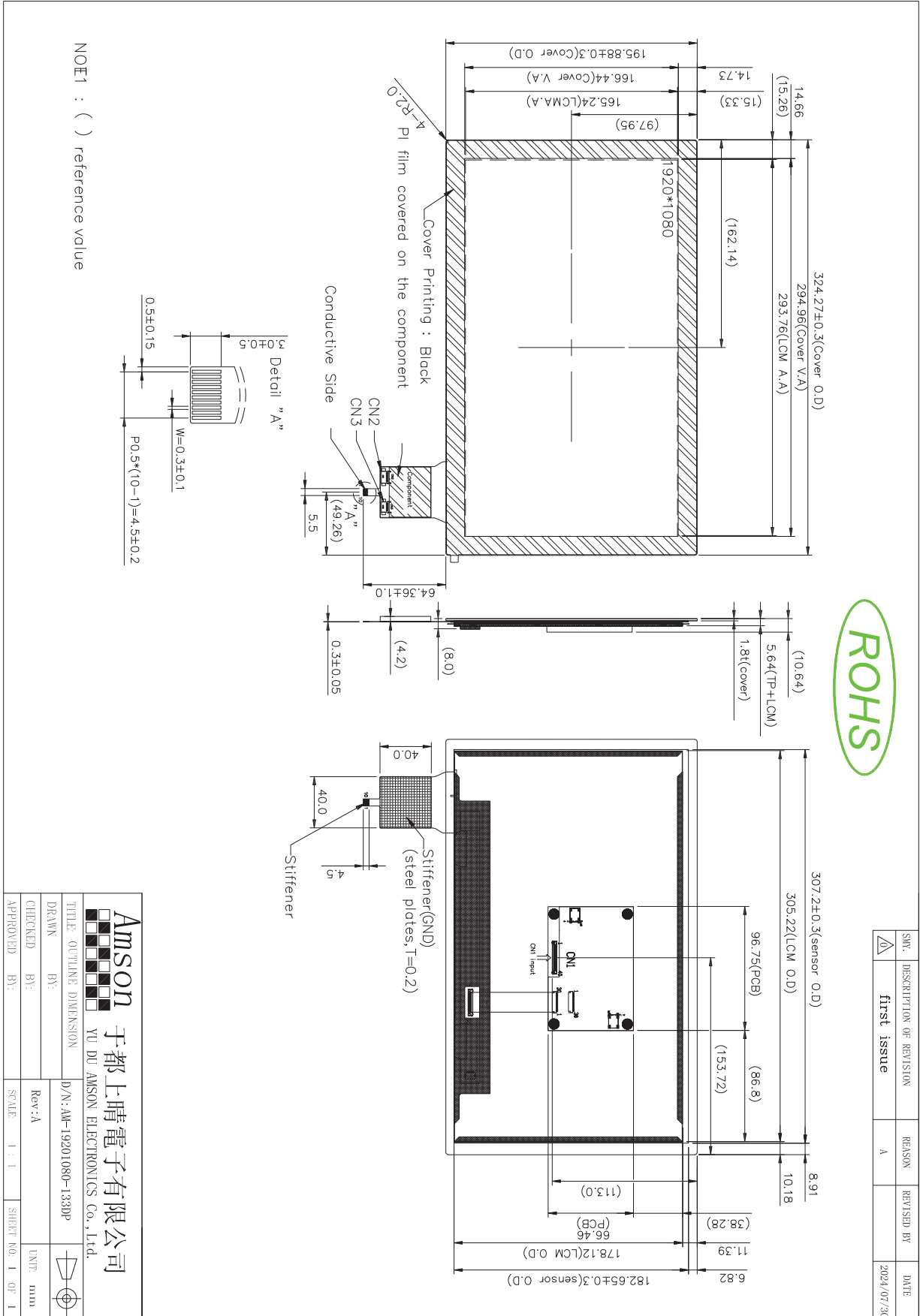
### 1. RECORD OF REVISION

REV NO.	REV DATE	CONTENTS	Note
A	2024-07-30	NEW ISSUE	

## 2. MECHANICAL SPECIFICATIONS

(1)	Number of dots (Dots)	1920 (R.G.B) X 1080
(2)	Module size(mm)	324.27(H) X 195.88(V) X 5.64(D)
(3)	Active area(mm)	293.76(H) x165.24(V))
(4)	Pixel pitch(mm)	0.153(H) x 0.153(V)
(5)	LCD model	TFT Transmissive Normally Black
(6)	Polarizer model	Anti-glare
(7)	LED Backlight color	White
(8)	Viewing direction	Wide Viewing Angle
(9)	Electrical Interface	LVDS Interface
(10)	Color configuration	R.G.B Stripe
(11)	Module weight(g)	TBD

## 3. OUTLINE DIMENSIONS



## 4. INTERFACE PIN CONNECTION

### 4.1 LCM PANEL INTERFACE(CN1)

Connector : 20455-040E-12(I-PEX) or equivalent

PIN NO.	SYMBOL	I/O	FUNCTION	REMARK
1	GND	P	Ground	
2	RXEIN0-	I	- LVDS differential data input	
3	RXEIN0+	I	+ LVDS differential data input	
4	GND	P	Ground	
5	RXEIN1-	I	- LVDS differential data input	
6	RXEIN1+	I	+ LVDS differential data input	
7	GND	P	Ground	
8	RXEIN2-	I	- LVDS differential data input	
9	RXEIN2+	I	+ LVDS differential data input	
10	GND	P	Ground	
11	RXECLKIN-	I	- LVDS differential data input	
12	RXECLKIN+	I	+ LVDS differential data input	
13	GND	P	Ground	
14	RXEIN3-	I	- LVDS differential data input	
15	RXEIN3+	I	+ LVDS differential data input	
16	GND	P	Ground	
17	RXOIN0-	I	- LVDS differential data input	
18	RXOIN0+	I	+ LVDS differential data input	
19	GND	P	Ground	
20	RXOIN1-	I	- LVDS differential data input	
21	RXOIN1+	I	+ LVDS differential data input	
22	GND	P	Ground	
23	RXOIN2-	I	- LVDS differential data input	
24	RXOIN2+	I	+ LVDS differential data input	
25	GND	I	Ground	
26	RXOCLKIN-	I	- LVDS differential data input	
27	RXOCLKIN+	I	+ LVDS differential data input	
28	GND	P	Ground	
29	RXOIN3-	I	- LVDS differential data input	
30	RXOIN3+	I	+ LVDS differential data input	

PIN NO.	SYMBOL	I/O	FUNCTION	REMARK
31	GND	P	Ground	
32	GND	P	Ground	
33	GND	P	Ground	
34	ENABLE	P	Off:0V ; On:3.3V	
35	PWM	P	Backlight Brightness Control Typ : 20K HZ.	
36	VBL	P	BL Power Input 11-15V Typ:12.0V	
37	VBL	P	BL Power Input 11-15V Typ:12.0V	
38	VDD	P	Power for Analog Circuit (3.3V)	
39	VDD	P	Power for Analog Circuit (3.3V)	
40	GND	P	Ground	

Note : "P" stands for Power "I" stands for Input.

## 4.2 PIN assignment for I2C&USB interface

PIN NO.	SYMBOL	I/O	FUNCTION	REMARK
1	CTP_GND	P	Ground	
2	VI2C	P	Power supply for I/O (3.3V)	
3	SCL	I	I2C clock input -3.3V	
4	SDA	I	I2C data input and output- 3.3V	
5	INT	I	External interrupt to the host	
6	RESET	I	External restart Low is active	
7	VUSB	P	Power supply for I/O (5.0V)	
8	D+	I	USB data input	
9	D-	I	USB data input	
10	CTP_GND	P	Ground	

## 4.3 PIN assignment for I2C interface (CN2)

Connector : 50271-0060L-002 or equivalent

PIN NO.	SYMBOL	I/O	FUNCTION	REMARK
1	CTP_GND	P	Ground	
2	VI2C	P	Power supply for I/O (3.3V)	
3	SCL	I	I2C clock input -3.3V	
4	SDA	I	I2C data input and output- 3.3V	
5	INT	I	External interrupt to the host	
6	RESET	I	External restart Low is active	

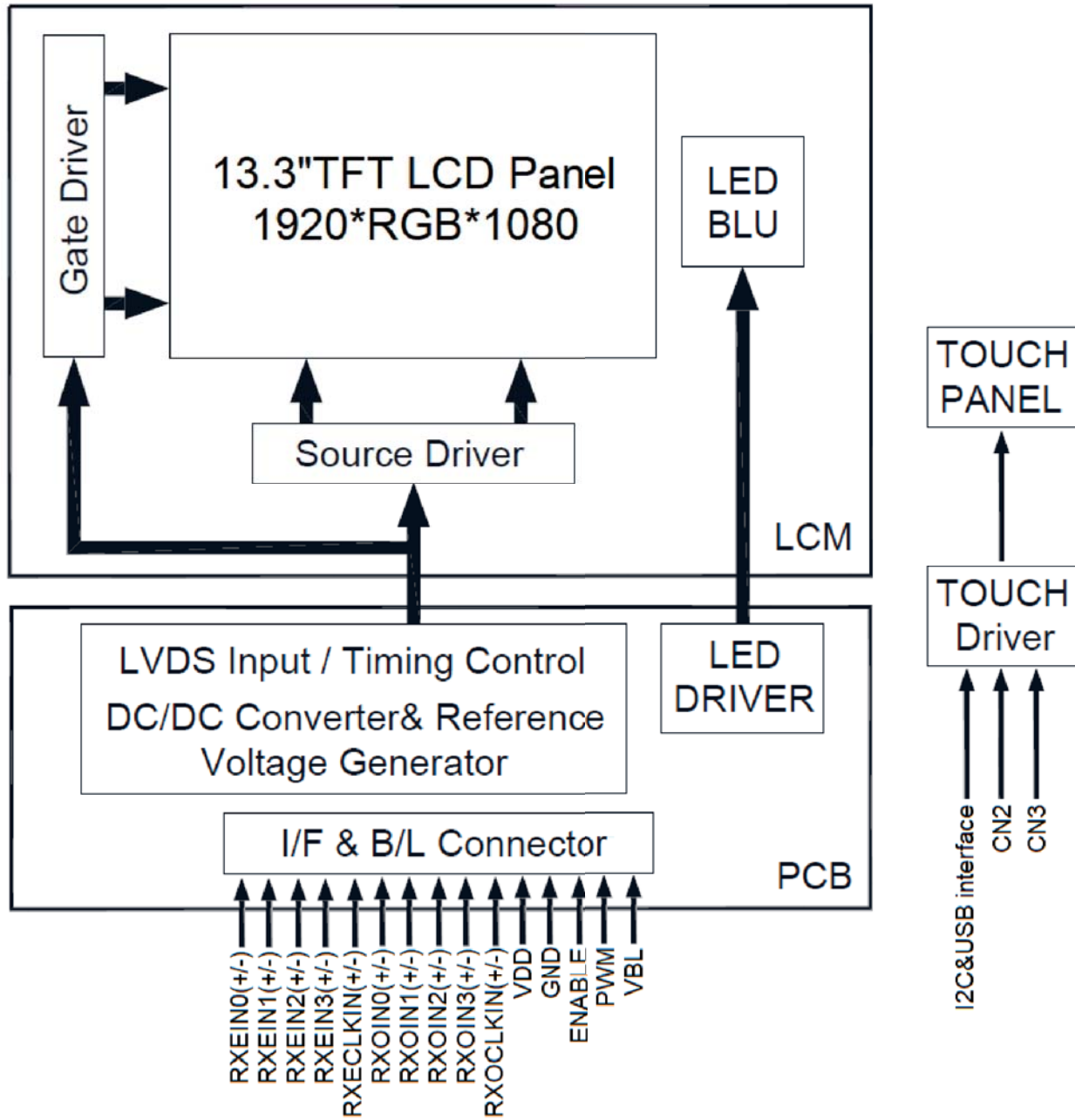
## 4.4 PIN assignment for USB interface (CN3)

Connector : 50271-0050L-002 or equivalent

PIN NO.	SYMBOL	I/O	FUNCTION	REMARK
1	CTP_GND	P	Ground	
2	VUSB	P	Power supply for I/O (5.0V)	
3	CTP_GND	P	Ground	
4	D+	I	USB data input	
5	D-	I	USB data input	



## 5. BLOCK DIAGRAM



## 6. ABSOLUTE MAXIMUM RATINGS

### 6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power supply voltage	VDD	-0.3	4.0	V	

Note : The absolute maximum rating values of this product not allowed to be exceeded at any times. Should be module be 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

### 6.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature(°C)	Ta=-20	Ta=+70	Ta=-30	Ta=+80	Note 1,2
Humidity (% RH)	TBD		TBD		

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

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

## 7. ELECTRICAL CHARACTERISTICS

### 7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	Type	MAX.	UNIT	REMARK
Power supply voltage	VDD	3.0	3.3	3.6	V	
	IDD	-	(273)	(424)	mA	Note1

Note 1 : Test condition : VDD =3.3V ; Test Pattern : Black pattern

### 7.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	Value			UNIT	REMARK
		MIN.	TYP.	MAX.		
Backlight converter voltage	VBL	11	12.0	15	V	Duty 100%
Backlight converter current	IBL	1	1.5	2	A	
Backlight converter Power consumption	PBL	12	18	24	W	
EN control level	Power on	2	-	-	V	
	Power off	-	-	0.5	V	
PWM control level	High level	2	-	-	V	
	Low level	-	-	0.7	V	
PWM control duty ratio		1		100	%	
PWM control frequency		100	-	10K	HZ	
LED Life Time	-	(50,000)			Hrs	Note 1,2

Note 1 : The LED of B/L is drive by current only, drive voltage is for reference only. Drive voltage can make driving current under safety area (current between minimum and maximum).  
50,000 hours is only an estimate for reference.

Note 2 : The life time of LED is defined as the time when it continues to operate under the conditions at Ta= 25 ±2°C and PWM=100% until the brightness becomes ≤50% of its original value.

### 7.3 CTP UNITS

ITEM	Specification	Note
Hardness	≥ 6H	
Driver IC	ILI 2511	
Interface	I2C & USB	
Simultaneous touch points	5 points	
Structure	G+G (cover glass + ITO glass)	

## 8. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK	
Contrast Ratio	CR	Viewing Normal Angle $\Theta_x = \Theta_y = 0^\circ$	700	1,000	-	-	Note 1,4	
Response Time	$T_{ON} + T_{OFF}$		-	25	50	ms	Note 2,4	
Chromaticity	Red		RX	(0.605)	(0.655)	(0.705)	-	Note 4
			RY	(0.275)	(0.325)	(0.375)		
	Green		GX	(0.214)	(0.264)	(0.314)		
			GY	(0.528)	(0.578)	(0.628)		
	Blue		BX	(0.090)	(0.140)	(0.190)		
			BY	(0.037)	(0.087)	(0.137)		
	White		WX	(0.264)	(0.314)	(0.364)		
			WY	(0.281)	(0.331)	(0.381)		
Viewing Angle	Hor.	$\theta_{x+}$	-	85	-	Deg.	Note 3	
		$\theta_{x-}$	-	85	-			
	Ver.	$\theta_{y+}$	-	85	-			
		$\theta_{y-}$	-	85	-			
Luminance for LCM	L	Center of LCM	(350)	(400)	-	cd/m <sup>2</sup>	Note 4	
Luminance Uniformity	YU		70	-	-	%	Note 4,5	

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

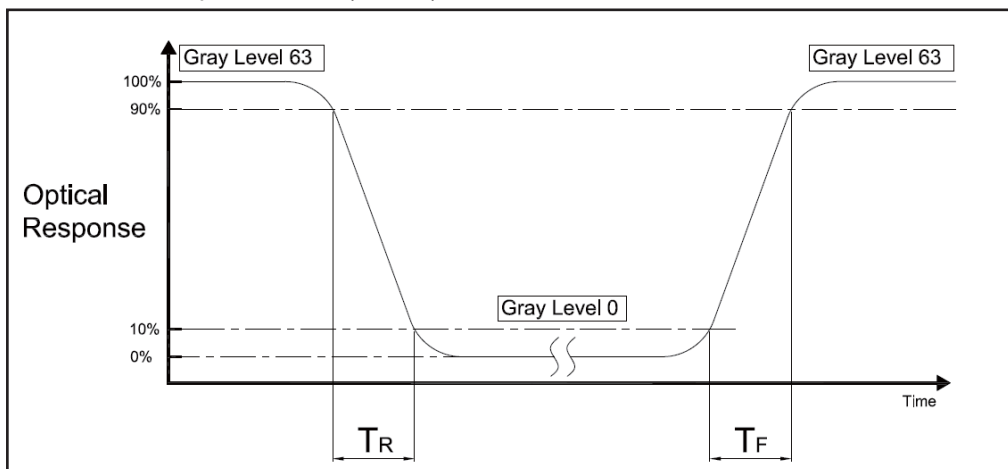
L<sub>63</sub> : Luminance of gray level 63

L<sub>0</sub> : Luminance of gray level 0

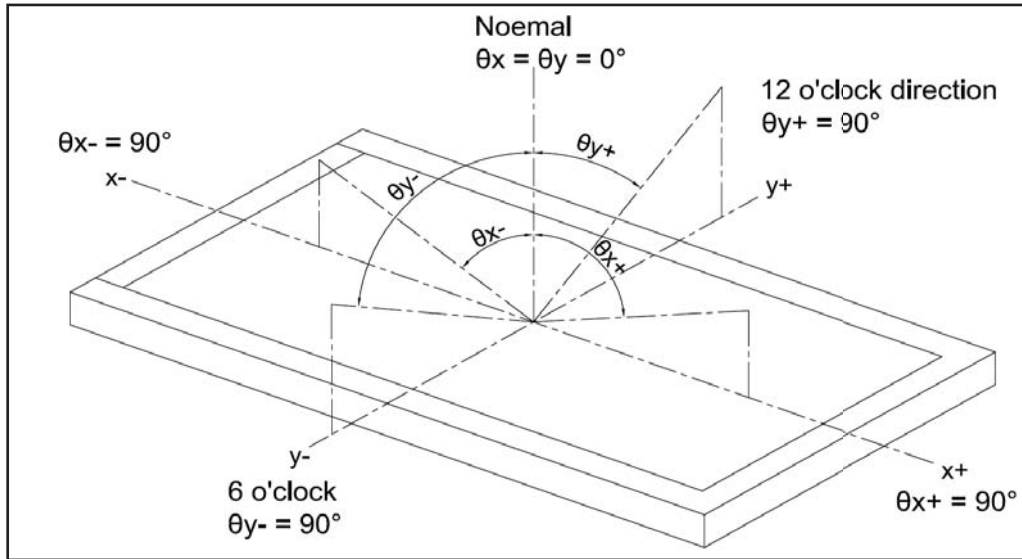
$$CR = CR(5)$$

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

Note 2 : Definition of Response Time (TR,TF)

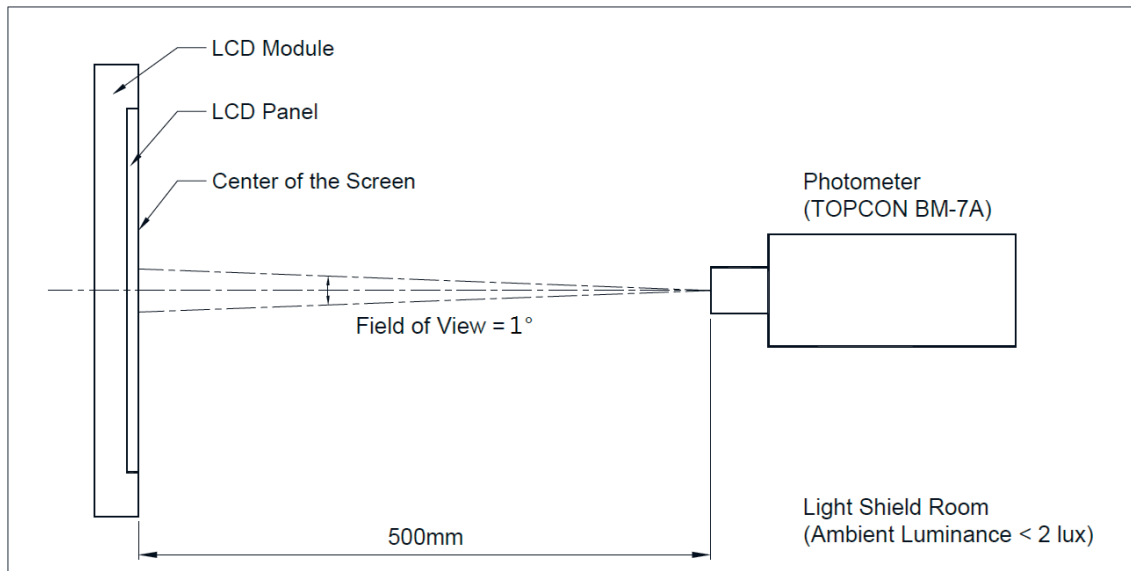


Note 3 : Definition of Viewing Angle

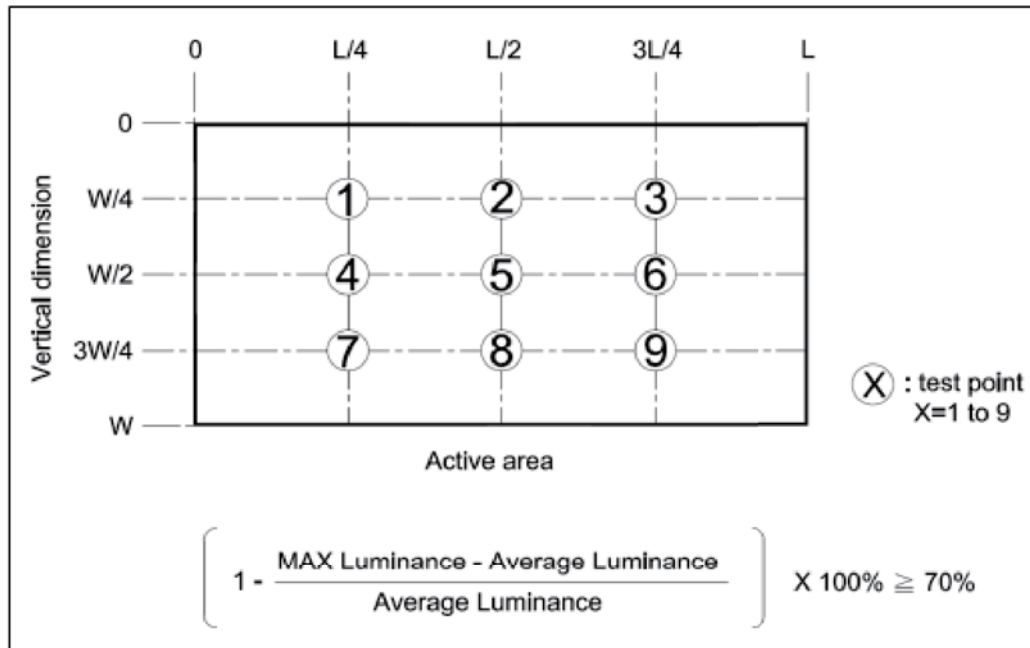


Note 4 : Measurement Set-Up :

The LCD module should be stabilized at a given temperature for 30 minutes to avoid abrupt temperature changes during measuring. In order stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a windless room, and measured at the center point of the LCD screen.



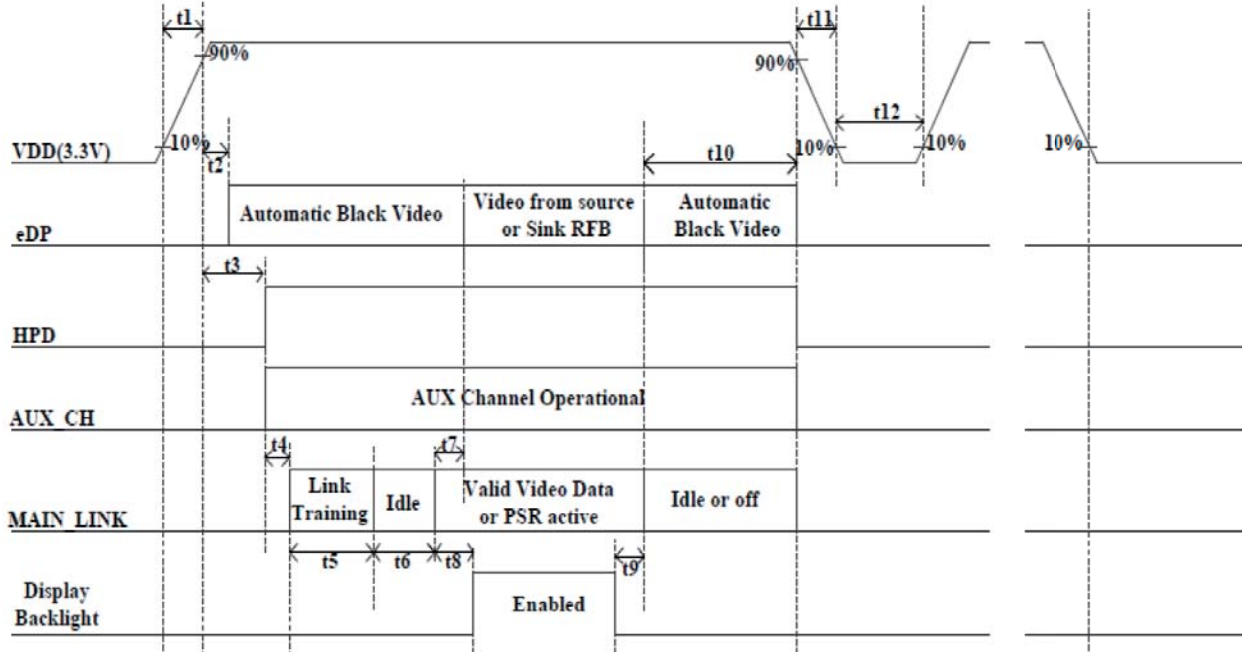
Note 5 : Definition of the luminance uniformity :



## 9. TIMING SPECIFICATIONS

### 9.1 By after LVDS invert to EDP

ON-OFF conditions for supply voltage



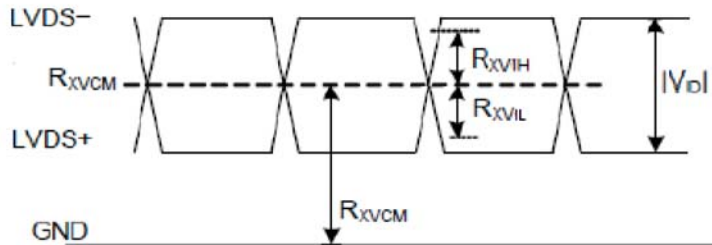
Note : Do not keep the interface signal high-impedance or unusual signal when power is on

SYMBOL	MIN.	MAX.	UNIT	NOTE
t1	0.5	10	ms	
t2	0	100	ms	
t3	0	100	ms	
t4	-	-	ms	
t5	-	-	ms	
t6	-	-	ms	
t7	0	50	ms	
t8			ms	
t9			ms	
t10	0	500	ms	
t11	1	50	ms	
t12	500	-	ms	
t13	-	-	ms	
t14	0.5	10	ms	
t15	100		ms	
t16	-	-	ms	
t17	0	-	ms	
t18	-	-	ms	
t19	-	-	ms	
t20	0.1	-	ms	
t21	100		ms	

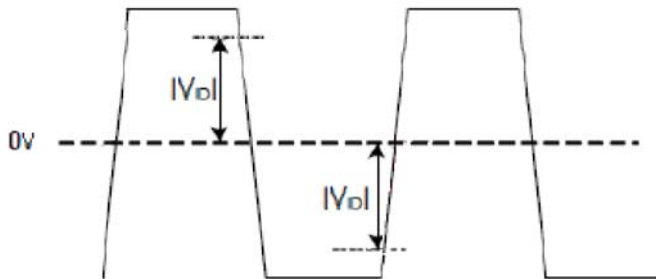
## 9.2 Switching characteristics for LVDS Receiver

ITEM	SYMBOL	MIN.	Type	MAX.	UNIT	REMARK
Differential input high threshold voltage	$R_{xvth}$	+100		+300	mV	
Differential input low threshold voltage	$R_{xvtl}$	-300		-100	mV	
Differential input common mode voltage	$R_{xvcm}$	1.0	1.2	1.7- $ V_{id} /2$	V	
Input leakage current	$I_{in}$	-10		10	uA	RX+/-, RXC+/-
Differential input voltage	$ V_{id} $	200		600	mV	

### Single-end Signal

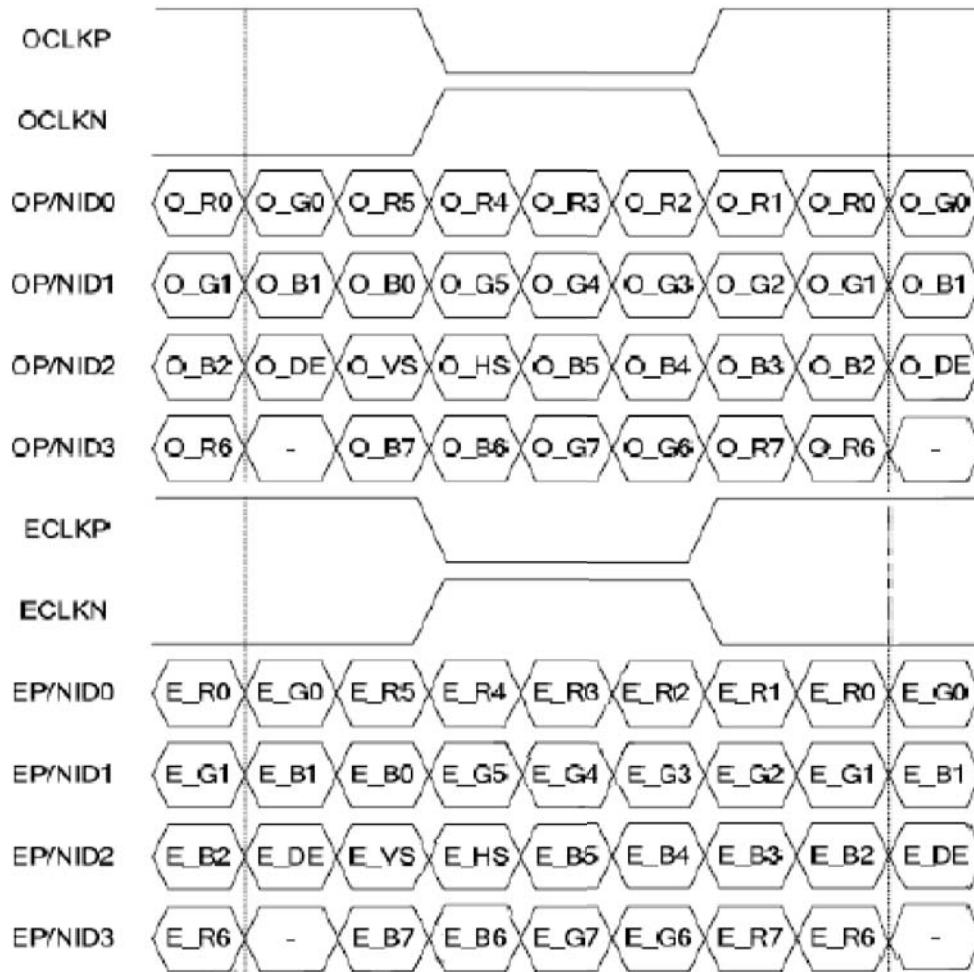


### Differential Signal





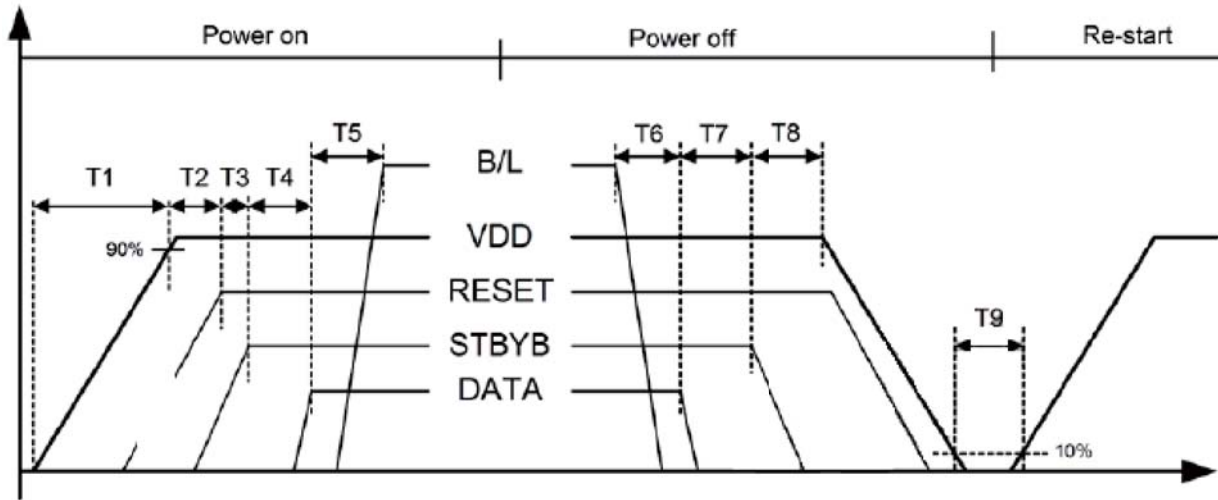
### 9.3 8bit LVDS input



### 9.4 Interface timing by after LVDS invert to EDP(DE mode)

ITEM		SYMBOL	Min.	Typ.	MAX.	UNIT
Clock	Frequency	1/Tc	136.8	141.4	148	MHz
Frame Period	Tv		1096	1100	1120	Lines
			60	60	60	Hz
			16.67	16.67	16.67	ms
Vertical Display Period	Tvd	-	1080	-	lines	
One line Scanning Period	Th	2080	2142	2200	clocks	
Horizontal Display Period	Thd	-	1920	-	clocks	

## 9.5 Power on/off Sequence



PARAMETER	MIN.	TYP.	MAX.	UNIT
T1	0.5	-	20	ms
T2	1	-	-	ms
T3	1	-	-	ms
T4	200	-	-	ms
T5	50	-	-	ms
T6	50	-	-	ms
T7	16	-	-	ms
T8	16	-	-	ms
T9	1000	-	-	ms

## 10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	Ta=80°C	240hrs	Note 1,3
2	Low Temperature Storage	Ta=-30°C	240hrs	Note 1,3
3	High Temperature High Humidity Storage	Ta=60°C, 90%RH	240hrs	Note 3
4	High Temperature Operation	Ts=70°C	240hrs	Note 2,3
5	Low Temperature Operation	Ta=-20°C	240hrs	Note1,3
6	Temperature Cycle Storage	Ta=-10°C ~ Ts=60°C (30min) ~ (30min)	100 cycle	Note2,4

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 1 : Ta is the ambient temperature of samples.

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

Note 3 : Before cosmetic and function test, the product must have enough recovery time, at least 4 hours at room temperature.

Note 4 : Star with cold temperature and end with high temperature.



### 11. PACKAGE INFORMATION

LCM Model	LCM Qty. in the box(pcs)	Inner Box Size (mm)	Weight(Kg)	REMARK
AM-19201080-133DP	TBD	TBD	TBD	

## 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  $50\pm 20\%\text{RH}$ .
- (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 ketonic 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 period is within 12 months since the date of shipping out under normal using and storage conditions.