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**FN0800D083A**

**Product Specification Rev.V0**

BUYER	
SUPPLIER	FANNAL Electronics CO., LTD
FG-Code	FN0800D083A

Preliminary Specification

Approval Specification

ITEM	BUYER SIGNATURE	DATE
Quality	_____	_____
R&D	_____	_____
Approved	_____	_____

ITEM	SUPPLIER SIGNATURE	DATE
Prepared	<u>DONG</u>	<u>2023-05-05</u>
Reviewed	<u>XIONG</u>	<u>2023-05-05</u>
Approved	<u>JACK</u>	<u>2023-05-05</u>

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## REVISION HISTORY

REV.	Page.	DESCRIPTION OF CHANGES	DATE	PREPARED
V0		Initial Release	2023-05-05	JACK

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## 1.0 General Description

### 1.1 Application

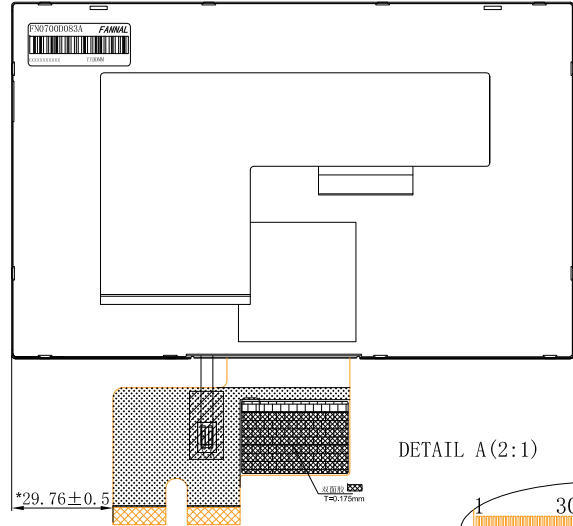
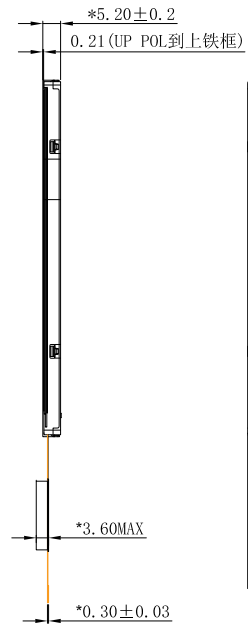
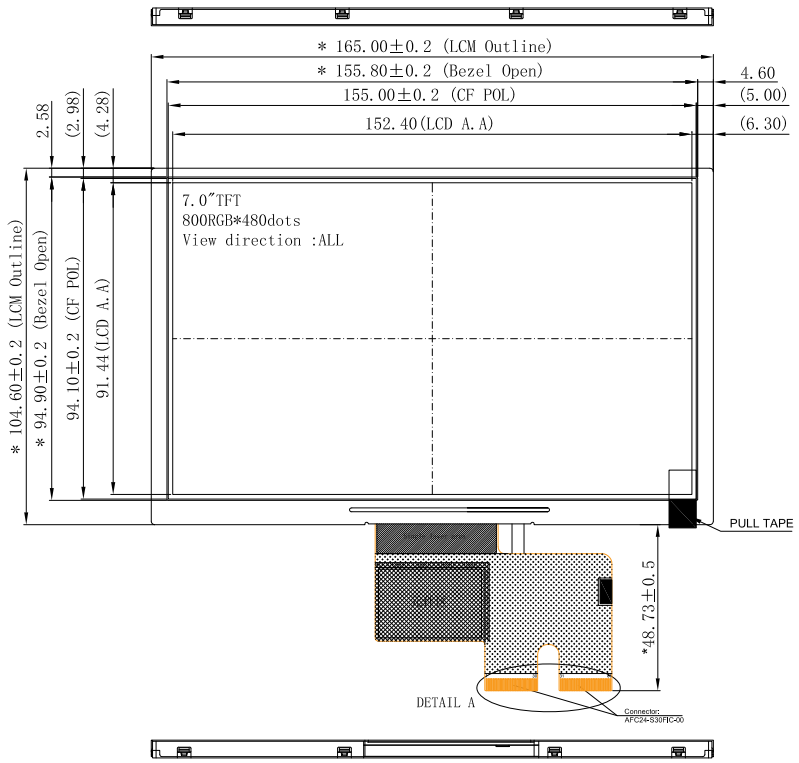
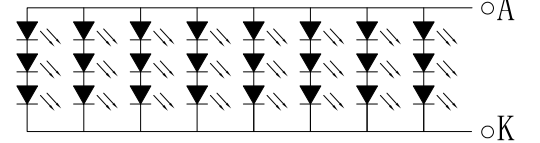
- Industrial     
 Medical     
 Outdoor highlight  
 Automotive     
 Smart Home     
 Digital & Consumer

### 1.2 General Specification

Parameter	Specification	Unit
LCD size	7.0 (Diagonal)	inch
Resolution Ratio	800(H)×480(V)	pixels
Pixel Pitch	0.13455x0.13455(V)	mm
Active Area	152.4(H)×91.44(V)	mm
Module Size	165.0(W)×104.6(H)×5.2(D)	mm
Display Mode	Normally Black	
Interface	RGB-18bit	
Pixel arrangement	RGB-Vertical Stripe	
View Direction	ALL	
Power Supply	3.3	V
Power Consumption	2.0	W
Weight	115	g
Luminance	400 (TYP.)	cd/m <sup>2</sup>
Driver IC	RM53052+RM57452	

VER.	SYMBOL	AMENDMENT	SIGN	DATE
A		First issue	LCF	2023-02-27

LED CIRCUIT DIAGRAM:  
 BACKLIGHT:3S8P=24 CHIP-WHITE LED  
 IF=160mA ; VF=8.4~9.8V



DETAIL A (2:1)

TOP VIEW

SIDE VIEW

BOTTOM VIEW

SIZE	7.0 Inch	Interface	RGB 18bit	PIN	SYMBOL	PIN	SYMBOL	PIN	SYMBOL	PIN	SYMBOL	PIN	SYMBOL
Resolution Ratio	800x480	Power Supply	3.3V	1	LEDA	13	V6/NC	25	R4	37	G0	49	B1
LCD Type	<input checked="" type="checkbox"/> Transmissive <input type="checkbox"/> Transflective <input type="checkbox"/> Reflective	Connection Mode	<input checked="" type="checkbox"/> FPC Plug-in <input type="checkbox"/> FPC Soldering <input type="checkbox"/> Connector	2	LEDA	14	RESET	26	R3	38	DE	50	B0
Display Mode	<input checked="" type="checkbox"/> Normally Black <input type="checkbox"/> Normally White	Driver IC	RMS3052+RMS7452	3	LEDK	15	VCOM/NC	27	R2	39	NC_ATRENB	51	NC_SDI/RL
Display Direction	<input type="checkbox"/> 6 <input type="checkbox"/> 12 <input type="checkbox"/> 3 <input type="checkbox"/> 9	Operation Temperature	-20~+70	4	LEDK	16	GND	28	R1	40	GND	52	V1
Contrast Ratio	1500:1	Storage Temperature	-30~+80	5	NC	17	AVDD/NC	29	R0	41	DCLK	53	V4
Luminance	400(Typ.) 320(Min.)	Environmental Requirements	<input checked="" type="checkbox"/> RoHS-2.0 <input type="checkbox"/> REACH	6	GND	18	NC	30	GND	42	VDD	54	V7
Uniformity	80% Min	Unmarked Tolerance	±0.2mm	7	EDGSL/NC	19	NC	31	GND	43	NC_VDDTP	55	V10
				8	VDD	20	V8	32	G5	44	NC_IFSEL	56	NC_SCL/TB
				9	V9/NC	21	V5	33	G4	45	B5	57	NC_CS
				10	VGL/NC	22	V3	34	G3	46	B4	58	AVDD/NC
				11	V2/NC	23	GND	35	G2	47	B3	59	GND
				12	VGH/NC	24	R5	36	G1	48	B2	60	VCOM/CN

DRAWN	LCF
CHECKED	DONG
APPROVED	<i>1227</i>
CSR APPROVED	
Customer No:	
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TITLE	Drawing NO: FN0700D083A
MODULE SPEC.	Project No:

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### 3.0 ABSOLUTE MAXIMUM RATINGS /绝对最大额定值

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit.

Parameter	Symbol	Min.	Max.	Unit
Digital Supply Voltage	VDD	-0.5	5.0	V
Operating Temperature	T <sub>OP</sub>	-20	+70	°C
Storage Temperature	T <sub>ST</sub>	-30	+80	°C
Humidity	RH	--	90%(Max60 °C)	RH

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**4.0 ELECTRICAL SPECIFICATIONS/电气规范****4.1 TFT LCM Module**

[Ta =25±2 °C]

Parameter	Symbol	Min.	Typ.	Max.	Unit
Digital Supply Voltage	VDD	2.9	3.3	3.6	V
Low Level input voltage	Vil	0	-	0.3VDD	V
High Level input voltage	Vih	0.7VDD	-	VDD	V
Low Level output voltage	Vol	GND	-	GND+0.4	V
High Level output voltage	Voh	VDD-0.4	-	-	V

**4.2 Backlight Driving Conditions /背光驱动条件**

[Ta =25±2 °C]

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Forward voltage	VF	-	9.0	-	V	Note 1
Forward current	IF	-	160	-	mA	-
LED Life Time	-	-	50000	-	Hrs	Note 2

Note1: Under LCM operating, the stable forward current should be inputted. And forward voltage is for reference only.

Note2: Optical performance should be evaluated at Ta=25°C. if LED is driven by high current, high ambient temperature & Humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

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**5.0 Interface Description**

Connector Name/Designation	Interface Connector/Interface Card
Type Part Number	FPC 60PIN 0.5Picht
Mating Housing Part Number	FH34SRJ-30S-0.5SH*2

**5.1 Pin assignment for LCM module**

Pin No.	Symbol	Description
1-2	LEDA	Power for LED backlight(Anode)
3-4	LEDK	Power for LED backlight(Cathode)
5	NC	No connection
6	GND	Ground.
7	NC/EDGSL	No connection
8	VDD	Power Supply (+3.3V)
9	NC/V9	No connection
10	NC/VGL	No connection
11	NC/V2	No connection
12	NC/VGH	No connection
13	NC/V6	No connection
14	RESET	Global reset
15	NC/VCOM	No connection
16	GND	Ground.
17	NC/AVDD	No connection
18	NC	No connection
19	NC	No connection
20	NC/V8	No connection
21	NC/V5	No connection
22	NC/V3	No connection
23	GND	Ground.



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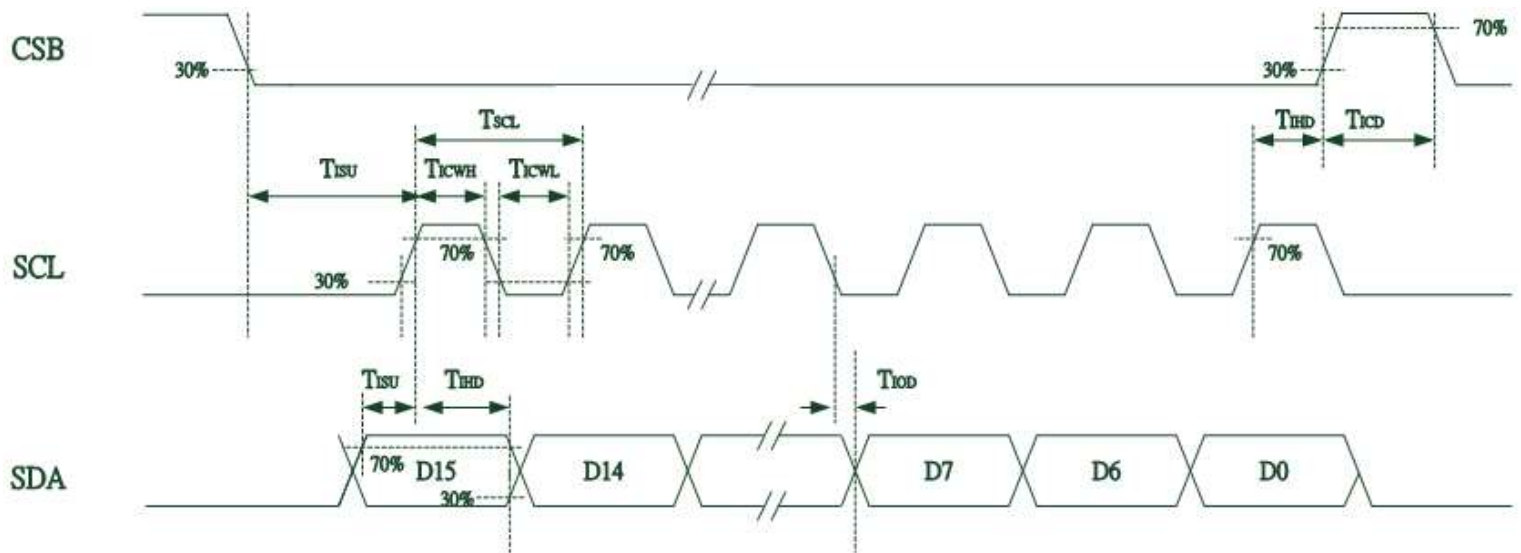
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Pin No.	Symbol	Description
24-29	R5-R0	Red data
30	GND	Ground.
31	GND	Ground.
32-37	G5-G0	Green data
38	DE	Data enable pin
39	NC	No connection
40	GND	Ground.
41	DCLK	Clock Signal Input.
42	VDD	Power Supply (+3.3V)
43	NC	No connection
44	NC	No connection
45-50	B5-B0	Blue data
51	NC	No connection
52	NC/V1	No connection
53	NC/V4	No connection
54	NC/V7	No connection
55	NC/V10	No connection
56	NC	No connection
57	NC	No connection
58	NC/AVDD	No connection
59	GND	Ground.
60	NC/VCOM	No connection

### 5.2 AC Electrical Characteristics

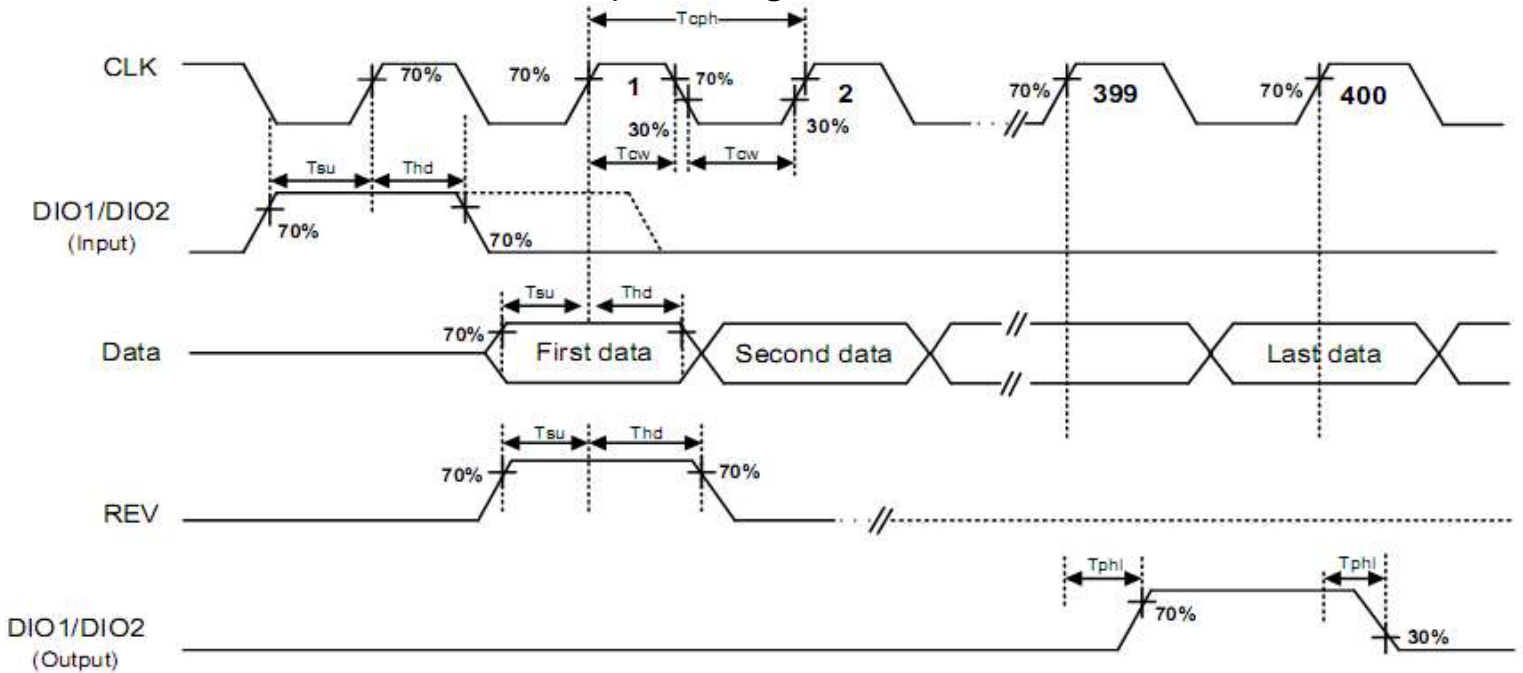
(VDD = 2.9V to 3.6V, GND=0V, TA= -40 to +105°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Serial clock	T <sub>SCL</sub>	330	-	-	ns	
SCL pulse high period	T <sub>ICWH</sub>	150	-	-	ns	
SCL pulse low period	T <sub>ICWL</sub>	150	-	-	ns	
Serial data setup time	T <sub>ISU</sub>	120	-	-	ns	
Serial data hold time	T <sub>IHD</sub>	120	-	-	ns	
Serial output delay time	T <sub>IOD</sub>	-	-	30	ns	SDA at output mode
CSB rising to falling time	T <sub>ICD</sub>	1	-	-	us	

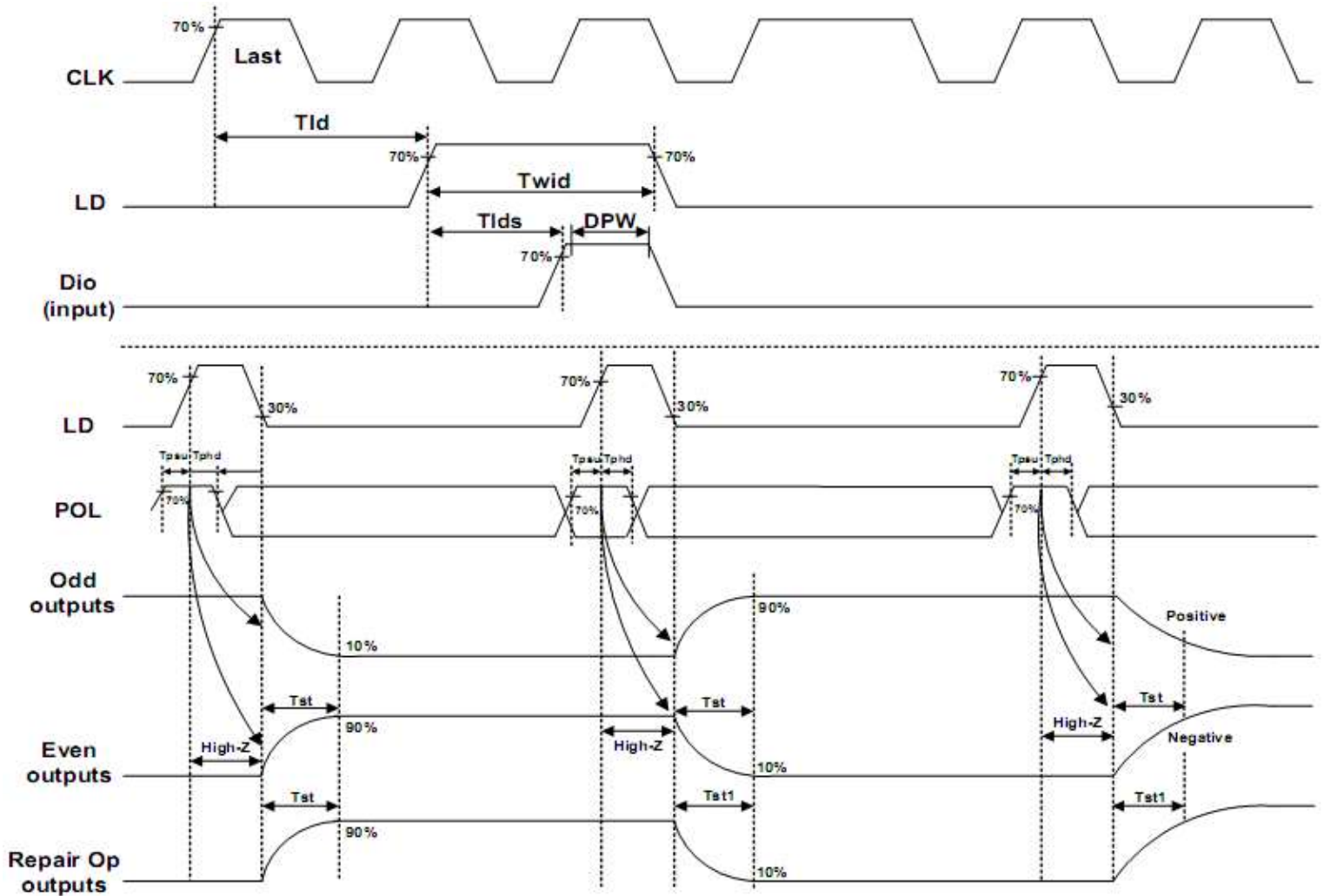


### 5.3 Timing Diagram

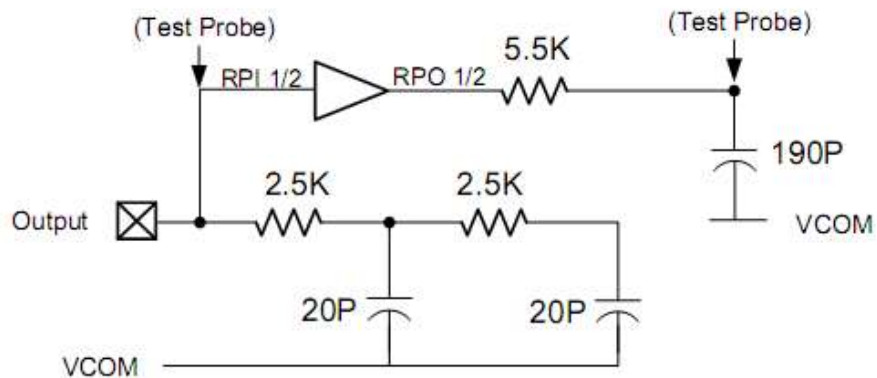
#### 5.3.1 TTL mode Clock and data input timing



5.3.2 Output timing



Output load condition:





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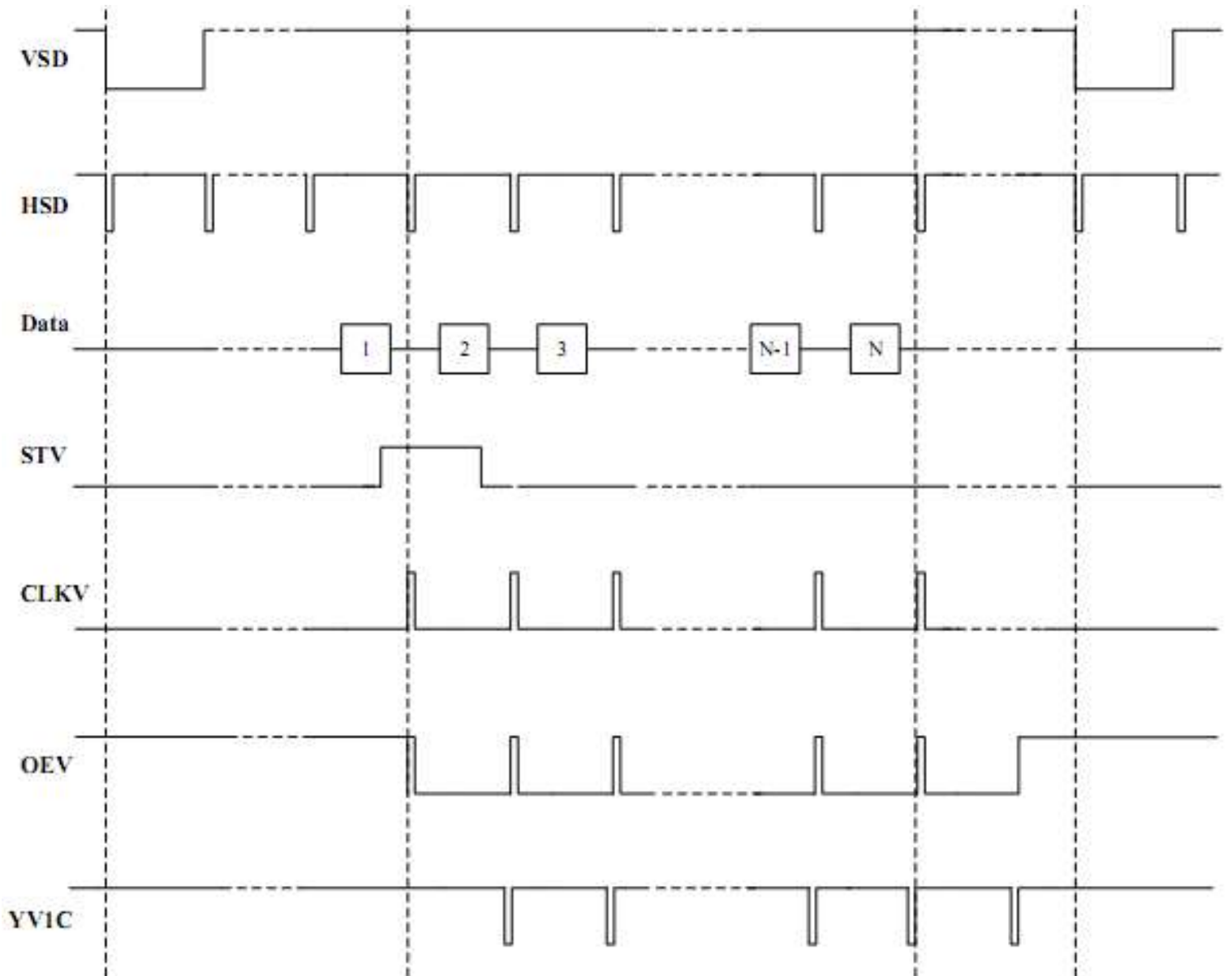
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### 5.3.4 Vertical timing diagram HV (Cascade)



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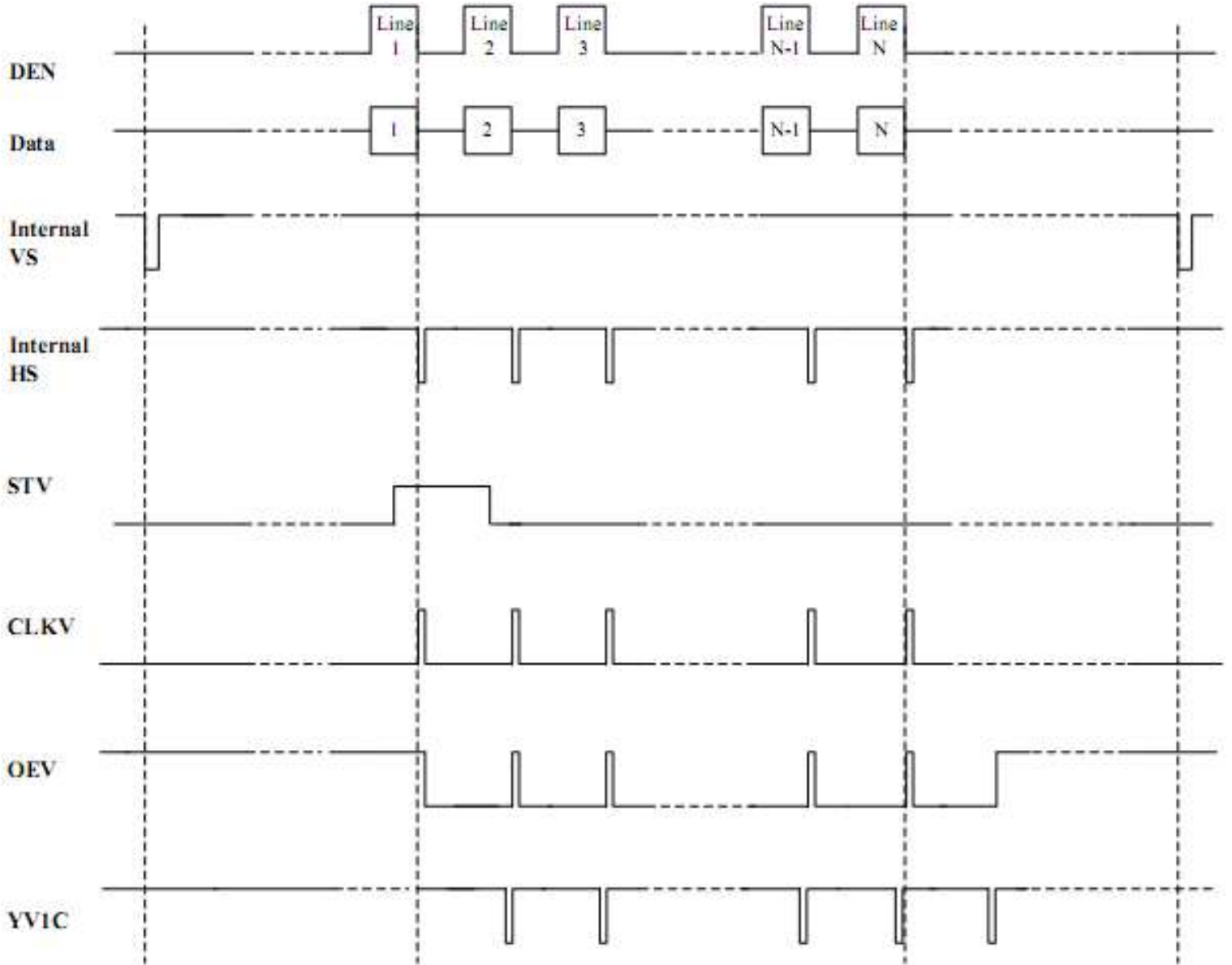
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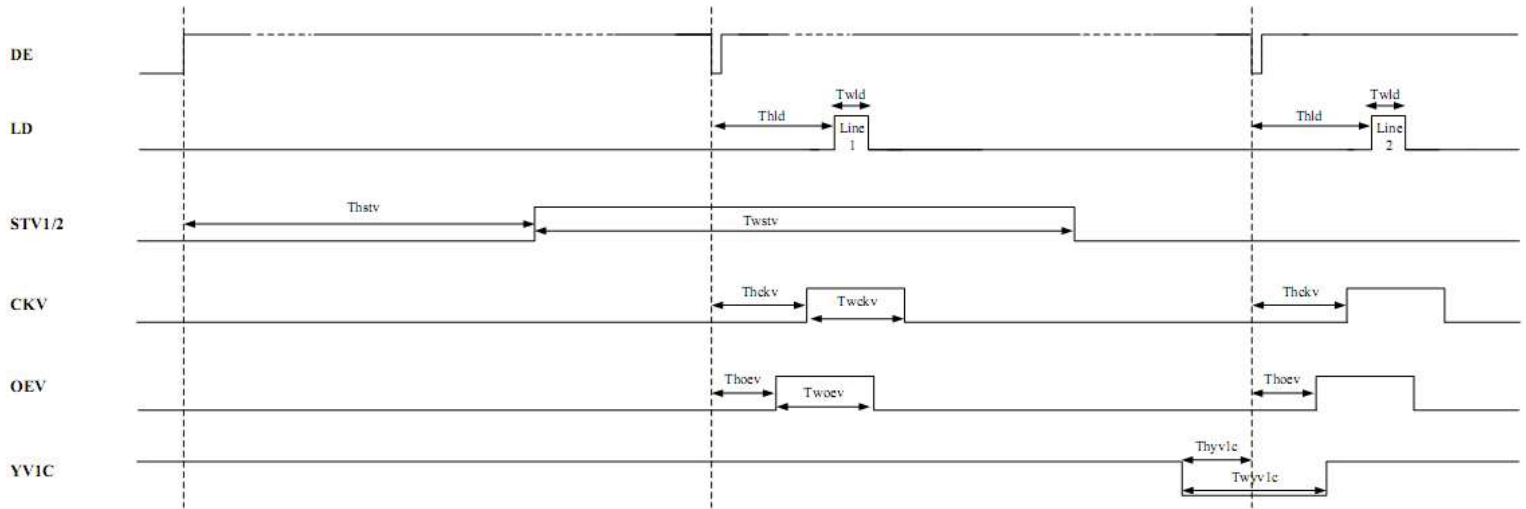
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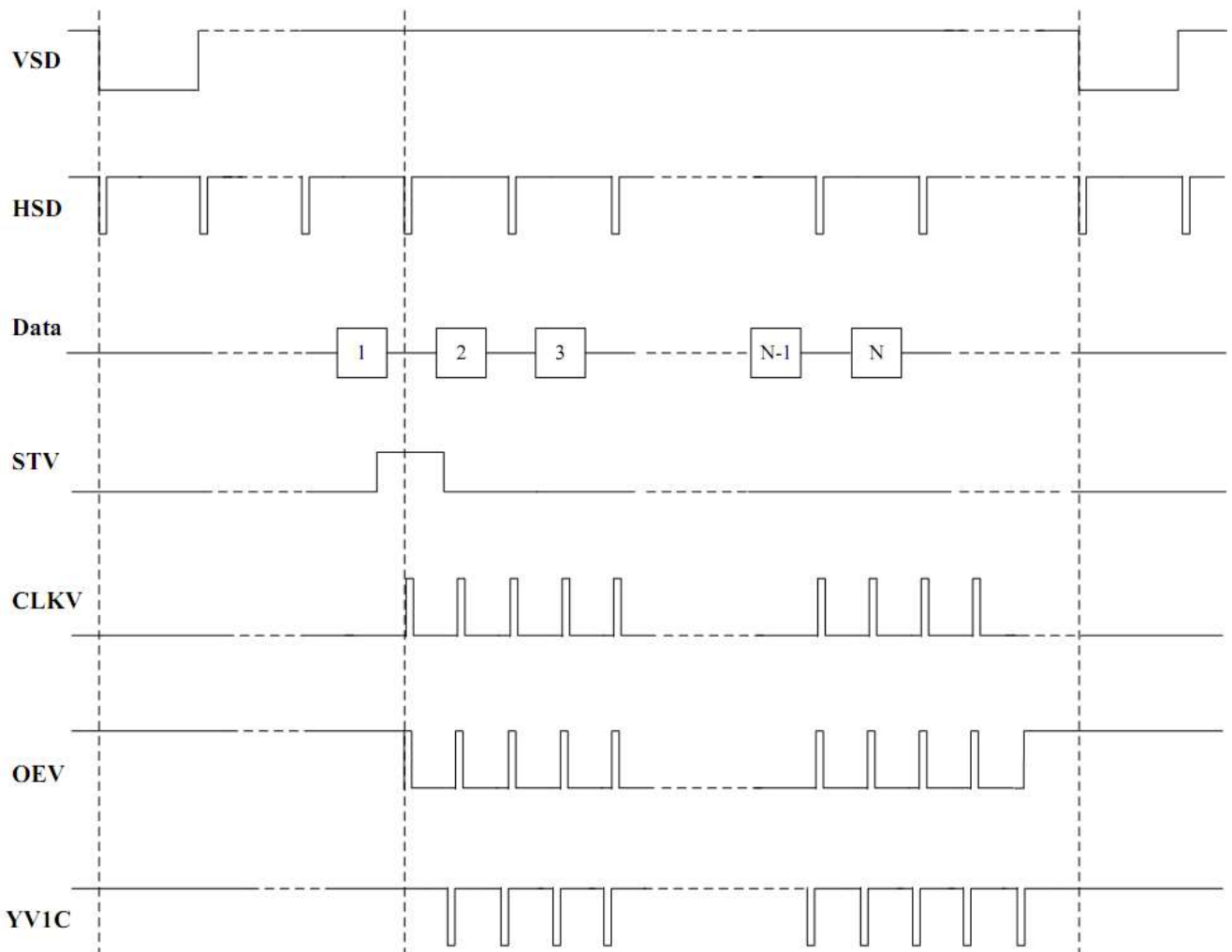
5.3.5 Vertical timing diagram DE (Cascade)



5.3.6 Gate output diagram (Cascade)



5.3.7 Vertical timing diagram HV (Dual gate)





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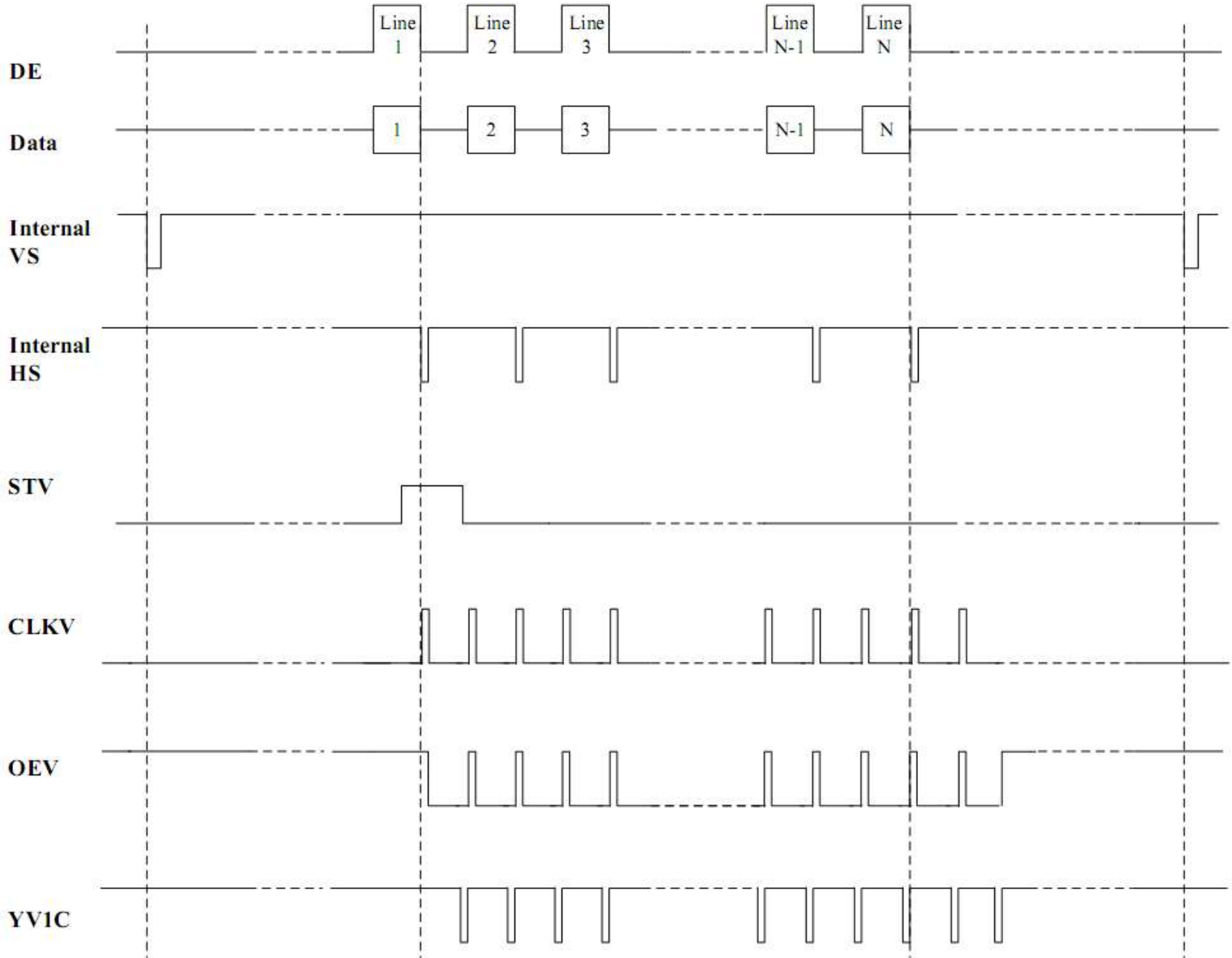
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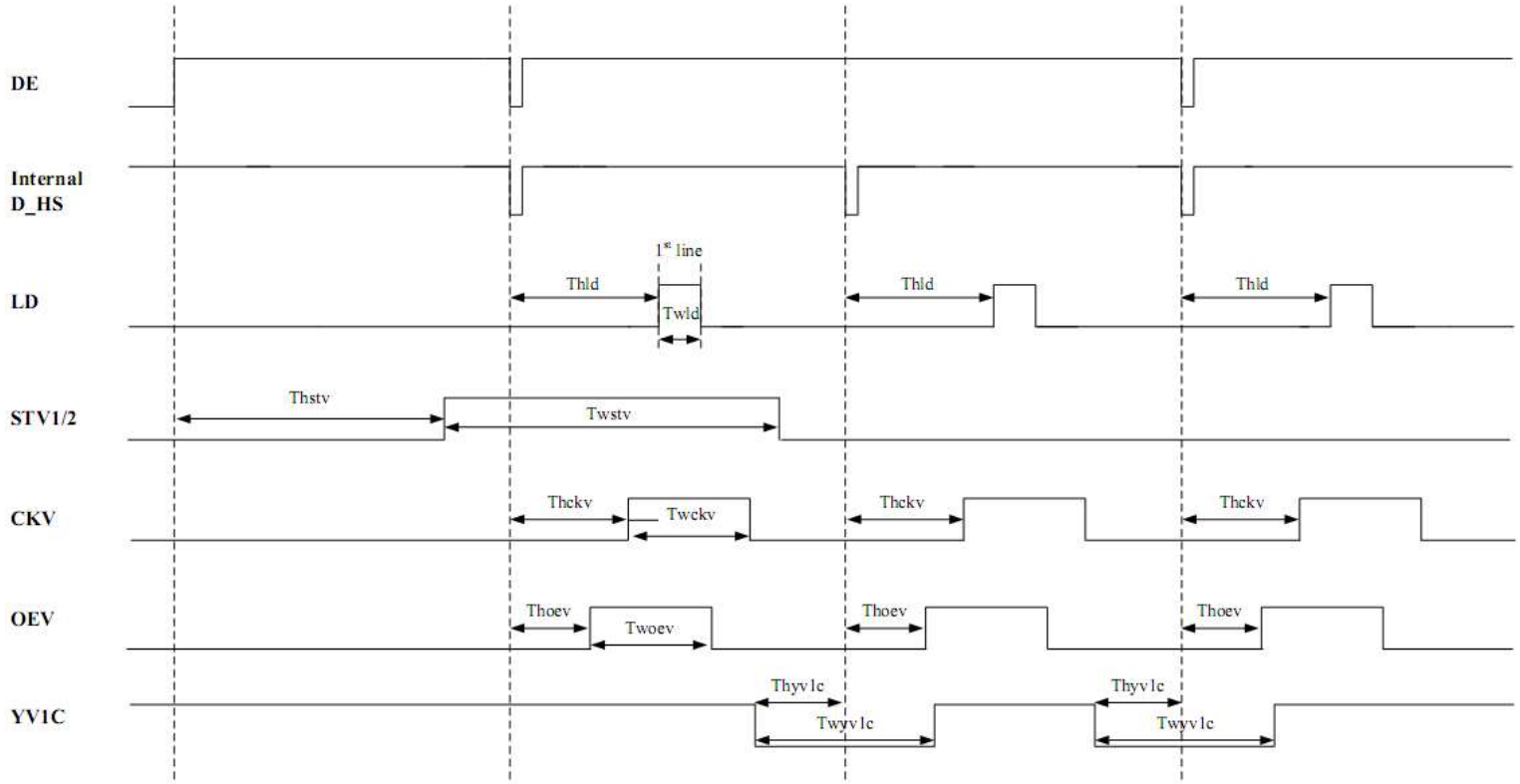
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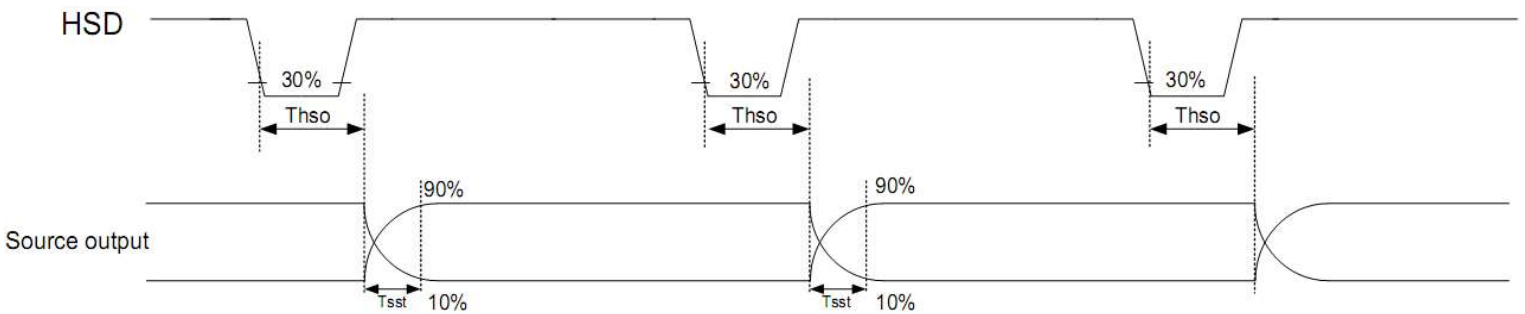
5.3.8 Vertical timing diagram DE (Dual gate)



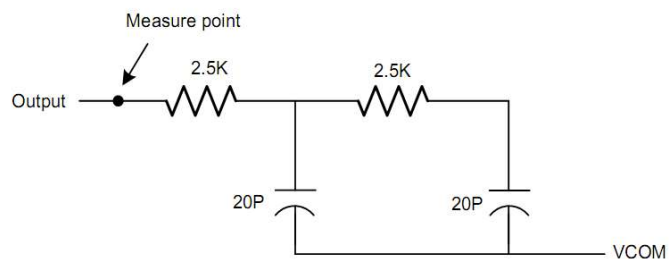
5.3.9 Gate output timing diagram (Dual gate)



5.3.10 Source output timing diagram



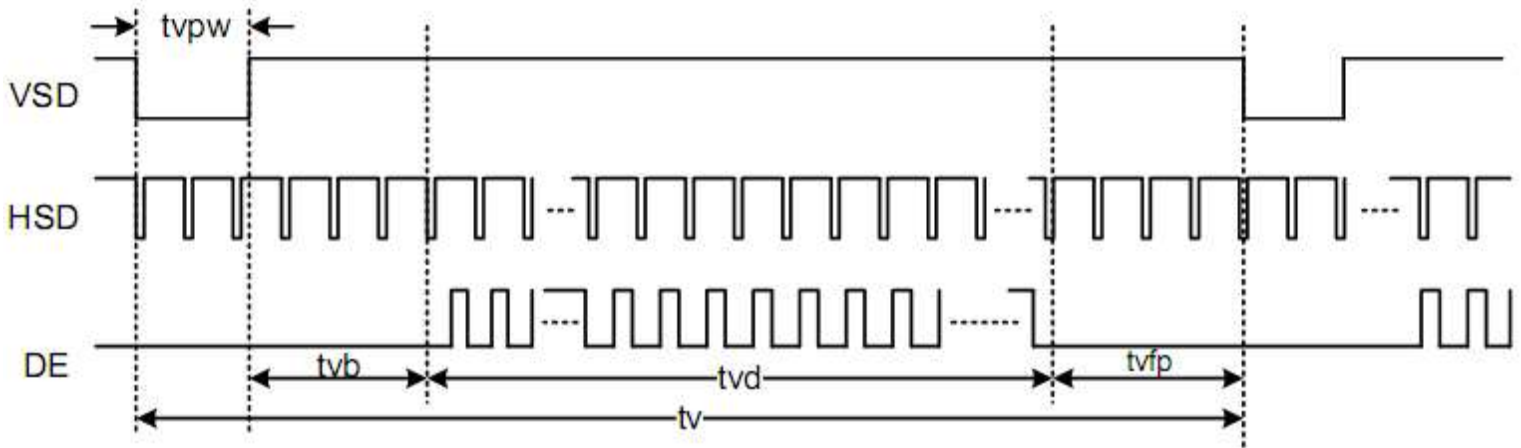
Output load condition:



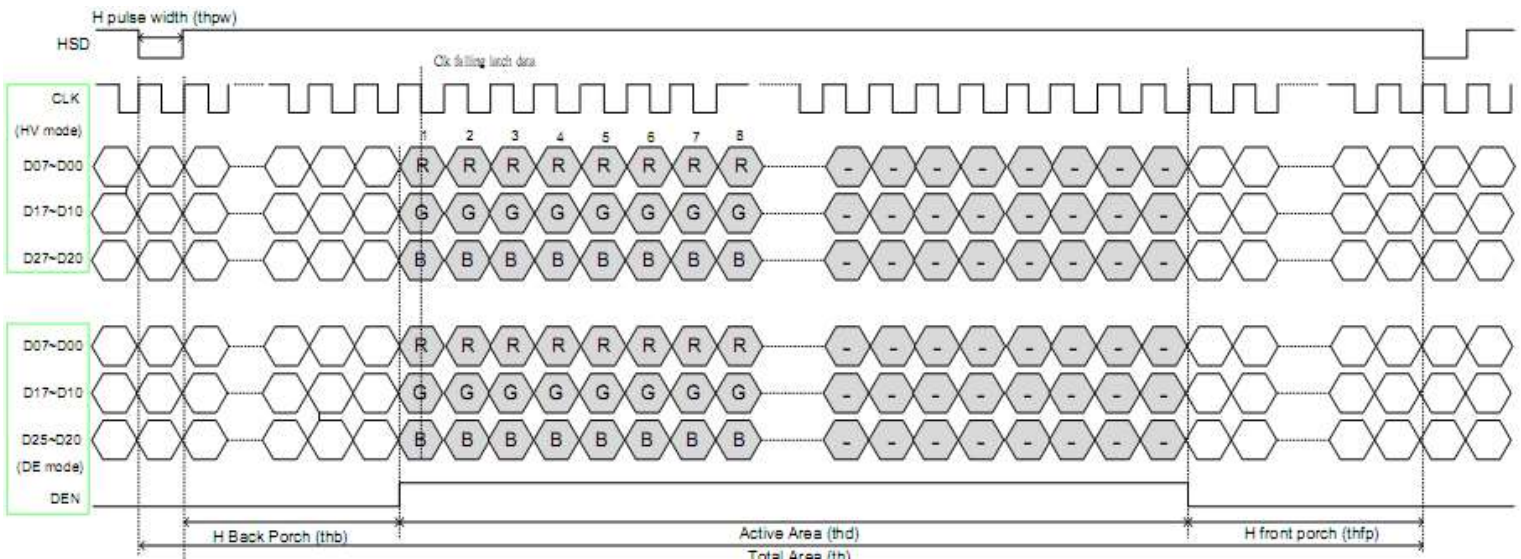
### 5.4 Data Input Format for TTL (for IC as source driver with timing controller)

#### 5.4.1 TTL (with HV or DE) with TCON mode timing diagram

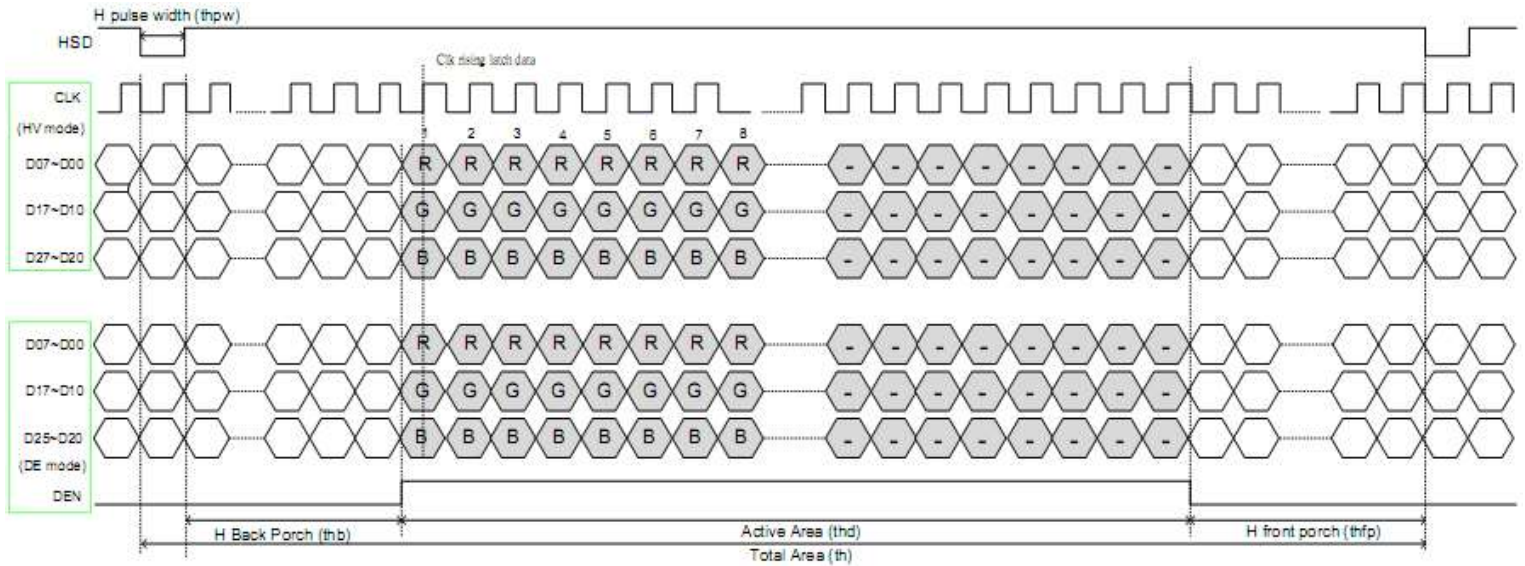
Vertical input timing



Horizontal input timing  
when CLKPOL = LO:

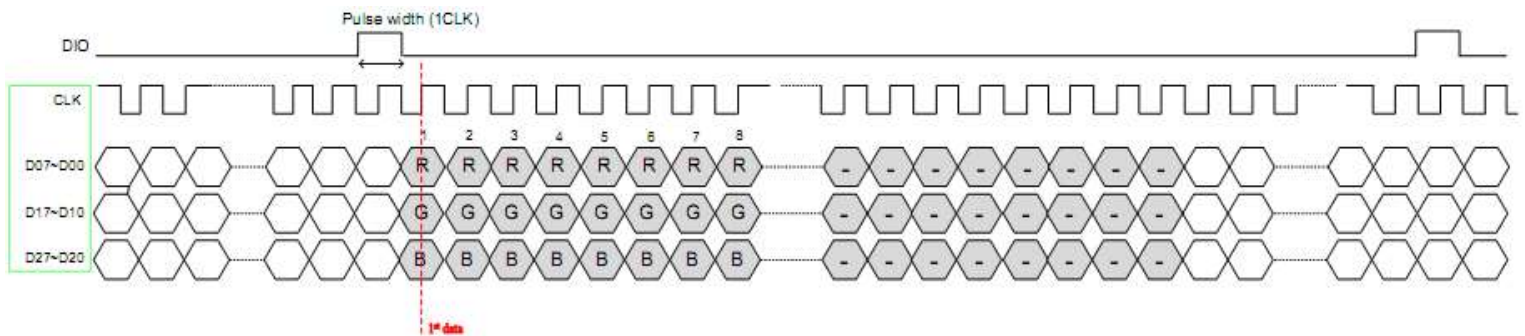


when CLKPOL = HI:

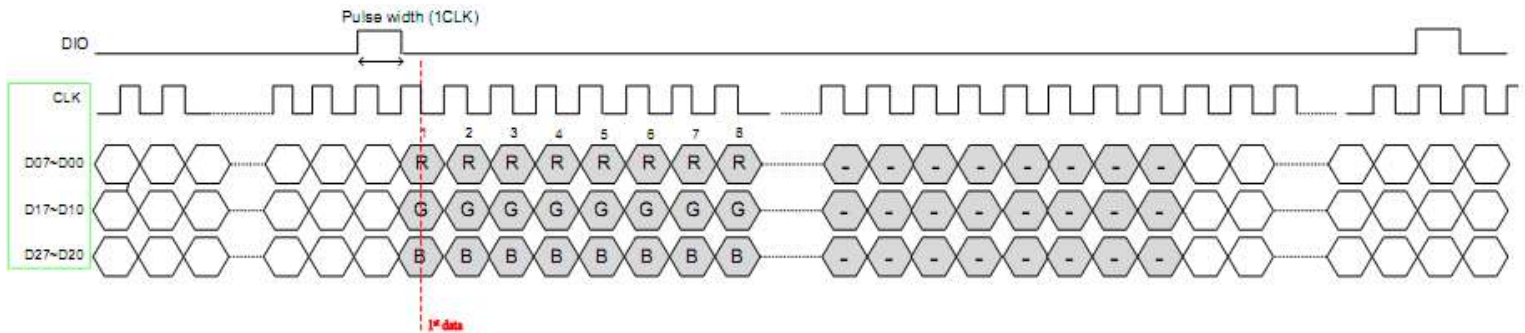


### 5.4.1 TTL (with DIO Without HV or DE) with TCON mode timing diagram

when CLKPOL = LO:



when CLKPOL = HI:



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## 5.5 Timing Characteristic

### Horizontal Input Timing Table

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
DCLK frequency	fclk	20	33.3	42.8	MHz	
Horizontal display area	thd	800			DCLK	
1 Horizontal Line	th	908	928	1178	DCLK	
HSD pulse width	thpw	1	28	47	DCLK	thb+thpw=48 DCLK is fixed.
HSD Back Porch (Blanking)	thb	47	20	1	DCLK	
HSD Front Porch	thfp	60	80	330	DCLK	

### Vertical Input Timing Table

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Vertical display area	tvd	480			H	
VSD period time	tv	517	525	606	H	
VSD pulse width	tpw	1	1	3	H	Tvpw+tvb=5 H is fixed
VSD Back Porch (Blanking)	tvb	4	4	2	H	
VSD Front Porch	tvfp	32	40	121	H	

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## DE mode Input Timing Table

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
DCLK frequency	fclk	21.17	27.62	41.93	MHz	
Horizontal display area	thd	800			DCLK	
1 Horizontal Line	th	864	872	1120	DCLK	
Horizontal blanking	Thb + Thfp	64	72	320	DCLK	

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Vertical display area	tvd	480			H	
Vertical period time	tv	490	528	576	H	
Vertical Blanking	Tvb	10	48	96	H	
Frame rate		50	60	65	Hz	

## 6.0 OPTICAL SPECIFICATIONS /光学规格

### 6.1 Overview /概述

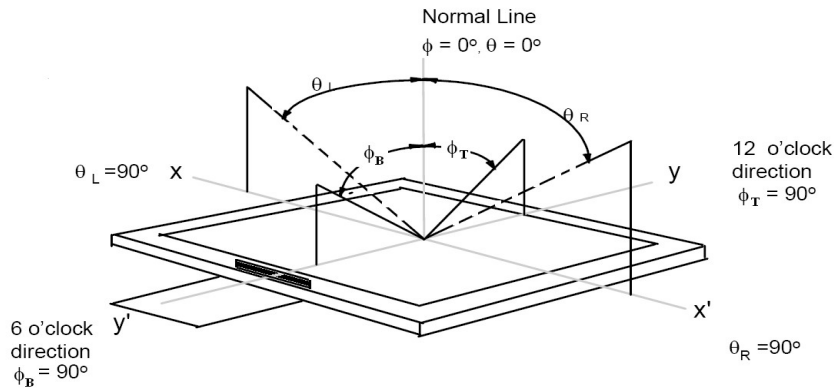
The test of optical specifications shall be measured in a dark room (ambient luminance  $\leq 1$ lux and temperature =  $25 \pm 2^\circ\text{C}$ ) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of  $\theta$  and  $\phi$  equal to  $0^\circ$ . We refer to  $\theta=0$  ( $=\theta_3$ ) as the 3 o'clock direction (the "right"),  $\theta=90$  ( $=\theta_{12}$ ) as the 12 o'clock direction ("upward"),  $\theta=180$  ( $=\theta_9$ ) as the 9 o'clock direction ("left") and  $\theta=270$  ( $=\theta_6$ ) as the 6 o'clock direction ("bottom"). While scanning  $\theta$  and/or  $\phi$ , the center of the measuring spot on the display surface shall stay fixed.

### 6.2 Optical Specifications /光学规格

Item	Symbol	Condition	Min	Typ.	Max	Unit	Note
Viewing Angle	$\theta_L$	$Cr \geq 10$	80	85	-	deg	Note 1
	$\theta_R$		80	85	-		
	$\psi_T$		80	85	-		
	$\psi_B$		80	85	-		
Contrast Ratio	Cr	$\theta=0^\circ$	1000	1500		-	Note 2
Response Time	$Tr+Tf$	$FF=0^\circ$	--	20	30	ms	Note 3
Color Coordinate of CIE1931	$W_x$	$\theta=0^\circ$	0.277	0.307	0.337	-	Note 4
	$W_y$		0.305	0.335	0.365		
	$R_x$		0.612	0.642	0.672		
	$R_y$		0.308	0.338	0.368		
	$G_x$		0.258	0.288	0.318		
	$G_y$		0.600	0.630	0.660		
	$B_x$		0.131	0.151	0.181		
	$B_y$		0.053	0.083	0.113		
Uniformity	U		80	--	--	%	Note 5
Color Gamut			65	70	--	%	
Luminance	L		320	400	--	$\text{cd/m}^2$	Note 6

**Note 1: The definition of Viewing Angle**

Refer to the graph below marked by  $\theta$  and  $\phi$ .



**Note 2: The definition of Contrast Ratio**

$$\text{Contrast Ratio (CR)} = \frac{\text{Luminance When LCD is at "White" state}}{\text{Luminance When LCD is at "Black" state}}$$

(Contrast Ratio is measured in optimum common electrode voltage)

**Note 3: Definition of Response time.** (Test LCD using RD80S or similar equipments):

The output sign also photo detector are measured when the input sign also are changed from "black" to "white" (Voltage falling time) and from "white" to "black" (Voltage rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figures below.

**Note 4: Color Coordinates of CIE 1931**

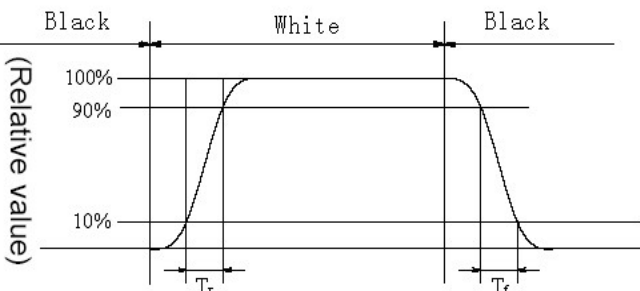
The test condition is at ILED=20mA and measured on the surface of LCD module at 25°C.

Measurement equipment: CS2000 or similar equipments

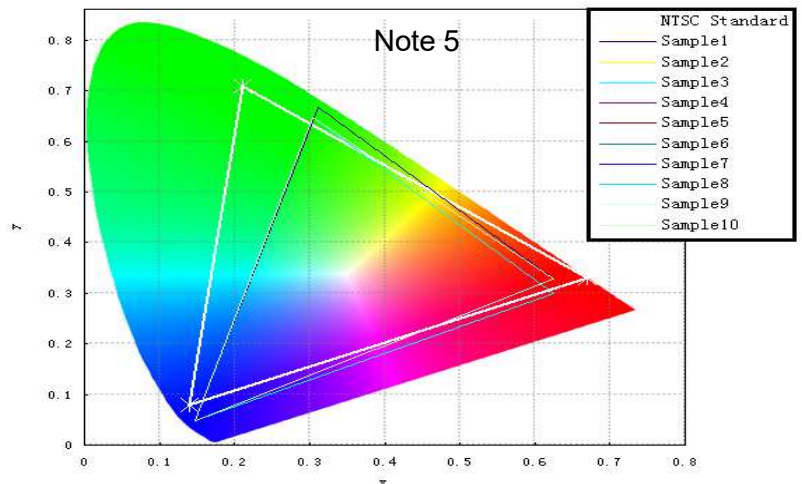
The Color Coordinate (CIE 1931) is the measurement of the center of the display shown in below figure.

**Note 5: Definition of Color of CIE Coordinate and NTSC Ratio.**

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$



Note 3






## 7.0 RELIABILITY TEST

The Reliability test items and its conditions are shown in below.

No	Test Items	Conditions	Testing standard
1	High temperature storage Test	Ta=+80°C, 240 hours	IEC60068-2-1:2007 GB2423.2-2008
2	Low temperature storage Test	Ta=-30°C, 240 hours	IEC60068-2-1:2007 GB2423.1-2008
3	High temperature operation Test	Ta=+70°C, 240 hours	IEC60068-2-1:2007 GB2423.2-2008
4	Low temperature operation Test	Ta=-20°C, 240 hours	IEC60068-2-1:2007 GB2423.1-2008
5	High temperature & humidity (storage Test)	Ta=+60°C, 90%RH max, 240 hours	IEC60068-2-78:2001 GB/T2423.3-2006
6	Thermal shock Test	-30°C 30min~80°C 30min, Change time:5min 20cycle	Start with cold temperature End with high temperature IEC60068-2-14:1984,GB2423.22-2002
7	Vibration Test	Frequency range:10Hz-55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z (6 hours for total)	IEC60068-2-6 GB/T17626.2
8	Mechanical shock	Half Sine Wave 100G 6ms,+X,+Y,+Z 3times for each direction	IEC60068-2-27 GB/T2423.5
9	Dropping Test	Height: 60 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32:1990 GB/T2423.8-1995
10	ESD Test	C=150pF, R=330 Ω, 5 points/panel Air:±8KV, 5 times; Contact: ±4KV, 5times; (Environment:15°C~35°C, 30%~60%RH,86Kpa a~106Kpa)	IEC61000-4-2:2001 GB/T17626.2-2006 Class C

### Notes:

- 1、 Maximum acceleration 20g, 1g=9.8m/s<sup>2</sup>
- 2、 Maximum amplitude 5mm
- 3、 Maximum acceleration =0.002 x F<sup>2</sup> (frequency Hz) x D (amplitude p-pmm)


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- **8.0 Precautions**

- Please pay attention to the followings when you use this TFT LCD Panel.

- **8.1 Mounting Precautions**

- (1) Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (2) You must mount a module using specified mounting holes (Details refer to the drawings).
- (3) Please make sure to avoid external forces applied to the Source PCB or FPC and D-IC during the process of handling or assembling. If not, It causes panel damage or malfunction.
- (4) Note that polarizers are very fragile and could be easily damaged. Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
- (5) Do not pull or fold the source D-IC which connect the source PCB or FPC and the panel.
- Do not pull or fold the LED wire.
- (6) After removing the protective film, when the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with alcohol or purified water.
- Do not strong polar solvent because they cause chemical damage to the polarizer.
- (7) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- (8) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
- (9) Since the LCD is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it falls from a high place or receives a strong shock, the glass may be broken.
- (10) Do not disassemble the module.
- (11) To determine the optimum mounting angle, refer to the viewing angle range in the specification for each model.
- (12) If the customer's set presses the main parts of the LCD, the LCD may show the abnormal display. But this phenomenon does not mean the malfunction of the LCD and should be pressed by the way of mutual agreement.
- (13) Do not drop water or any chemicals onto the LCD's surface.

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## 8.2 Operating Precautions

- (1) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (2) 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 minimized the interference.
- (3) The electrochemical reaction caused by DC voltage will lead to LCD degradation, so DC drive should be avoided.
- (4) The LCD modules use C-MOS LSI drivers, so customers are recommended that any unused input terminal would be connected to Vdd or Vss, do not input any signals before power is turn on, and ground you body, work/assembly area, assembly equipments to protect against static electricity.
- (5) Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on) Otherwise the Module may be damaged.
- (6) Design the length of cable to connect between the connector for back-light and the converter as short as possible and the shorter cable shall be connected directly.  
The longer cable between that of back-light and that of converter may cause the luminance of LED to lower and need a higher startup voltage(Vs).
- (7) Connectors are precise devices for connecting PCB and transmitting electrical signals. Operators should insert and unplug MDL in parallel when assembling MDL.
- (8) Do not connect or disconnect the cable to/ from the module at the "Power On" condition.
- (9) When the module is operating, do not lose CLK, ENAB signals. If any one these signals is lost, the LCD panel would be damaged.
- (10) Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.
- (11) Do not re-adjust variable resistor or switch etc.
- (12) For the Q/Single/OC Product, If the LED designed side view, LED bar should be putted in the Long/short side ; Otherwise, its reliability and function may not be guaranteed.

注：  
 ①(1)涉及到Pol相关条目适用于OC/MDL出货产品，  
 ②(6)(7)涉及到connector相关适用于OC/MDL出货产品  
 ③ (12) 涉及到客户进行BLU设计， LED Bar位置需要避开GOA位置；

## 8.3 Electrostatic Discharge Control

- (1) Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly. Keep products as far away from static electricity as possible.
- (2) Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.

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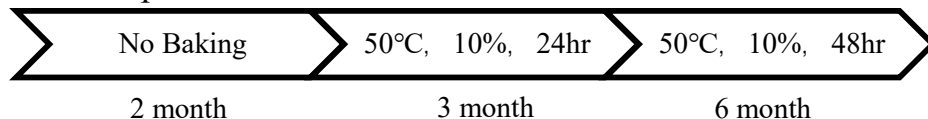
#### 8.4 Precautions for Strong Light Exposure

It is not allowed to store or run directly in strong light or in high temperature and humidity for a long time; Strong light exposure causes degradation of polarizer and color filter.

#### 8.5 Storage Precautions

When storing modules as spares for a long time, the following precautions are necessary.

- (1) The polarizer surface should not come in contact with any other object.  
It is recommended that they be stored in the container in which they were shipped.  
Temperature : 5 ~ 40 °C
- (2) Humidity : 35 ~ 75 %RH
- (3) Period : 6 months
- (4) Control of ventilation and temperature is necessary.
- (5) Please make sure to protect the product from strong light exposure, water or moisture.  
Be careful for condensation.
- (6) Store in a polyethylene bag with sealed so as not to enter fresh air outside in it.
- (7) Do not store the LCD near organic solvents or corrosive gasses.
- (8) Please keep the Modules/OC/FOG at a circumstance shown below Fig.




#### 8.6 Precautions for Protection Film

- (1) Remove the protective film slowly, keeping the removing direction approximate 30-degree not vertical from panel surface, If possible, under ESD control device like ion blower, and the humidity of working room should be kept over 50%RH to reduce the risk of static charge.
- (2) In handling the LCD, wear non-charged material gloves. And the conducting wrist to the earth and the conducting shoes to the earth are necessary.

#### 8.7 Appropriate Condition for Display

- (1) Normal operating condition
  - Temperature: 0 ~ 40°C
  - Operating Ambient Humidity : 10 ~ 90 %
  - Display pattern: dynamic pattern (Real display)
  - Suitable operating time: under 12 hours a day.
- (2) Special operating condition  
If the product will be used in extreme conditions such as high temperature, humidity, display patterns or 7\*24hrs operation time etc., It is strongly recommended to contact us for Application engineering advice. Otherwise, its reliability and function may not be guaranteed.
- (3) Black image or moving image is strongly recommended as a screen save.

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- (4) Lifetime in this spec. is guaranteed only when commercial display is used according to operating usages.
- (5) Please contact us in advance when you display the same pattern for a long time.
- (6) If the Module keeps displaying the same pattern for a long period of time, the image may be “sticked“ or “turn off” to the screen. To avoid image sticking, it is recommended to use a screen saver.
- (7) Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on) Otherwise the Module may be damaged.
- (8) Dew drop atmosphere should be avoided.
- (9) The storage room should be equipped with a good ventilation facility and avoid to expose to corrosive gas , which has a temperature controlling system.
- (10) The LCD should be avoided to expose to corrosive gas for long time, ,the LCD may be affected by the gas as SO<sub>2</sub> ,H<sub>2</sub>S etc.
- (11) When expose to drastic fluctuation of temperature (hot to cold or cold to hot) ,the LCD may be affected; Specifically, drastic temperature fluctuation from cold to hot ,produces dew on the LCD's surface which may affect the operation of the polarizer and the LCD.
- (12) Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD may turn black at temperature above its operational range. However those phenomena do not mean malfunction or out of order with the LCD. The LCD will revert to normal operation once the temperature returns to the recommended temperature range for normal operation

## 8.8 Others

### A. LC Leak

- If the liquid crystal material leaks from the panel, it is recommended to wash the LC with acetone or ethanol and then burn it.
- In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- If LC in mouth, mouth need to be washed, drink plenty of water to induce vomiting and follow medical advice.
- If LC touch eyes, eyes need to be washed with running water at least 15 minutes.

### B. Rework

- When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.

- C. In order to prevent potential problems, flicker should be adjusted by optimizing the Vcom value in customer LCM Line (适用于Q/Single/OC出货产品)

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### 9.0 PACKING INFORMATION

LCM MODEL	LCM Qty. in the Box	Carton Size(mm)	LCM Qty. in the Pallet
FN0700D083A	80pcs/BOX	530*360*275mm	1600pcs/Pallet



PE BAG包折到Panel面

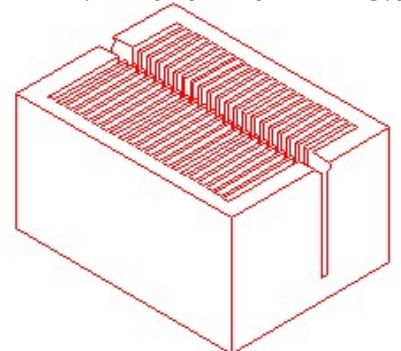
PE BAG: FHXXXXXXXXXX001A



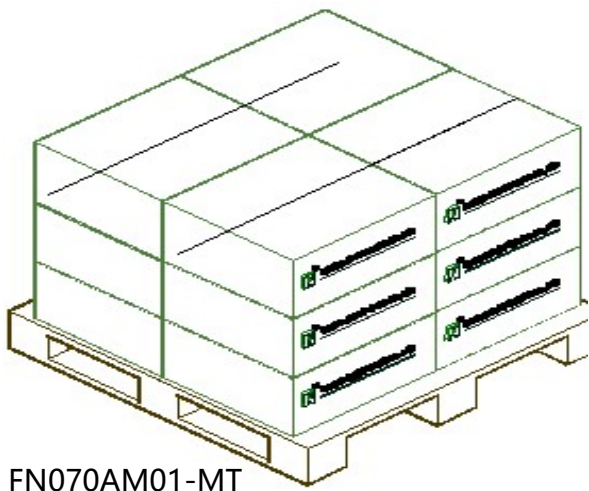
EPE: FN070AM01-ZZ-V5.0



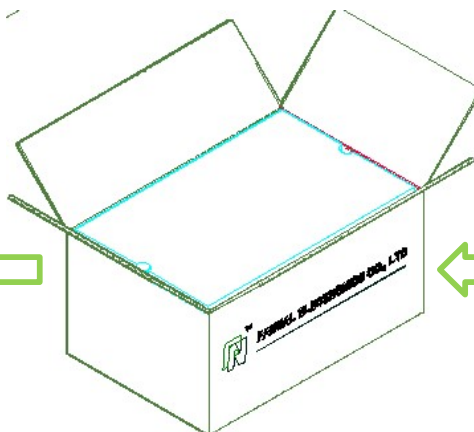
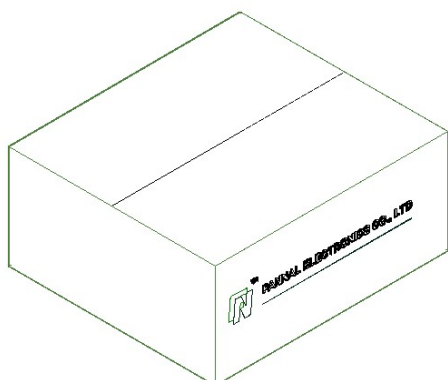
2片叠放, Panel对立



BOX: FN070AM01-ZX-V1.0



FN070AM01-MT



## 10.0 VISUAL INSPECTION CRITERIA FOR ALL CUSTOMERS

### 10.1 Sampling Method

Unless otherwise agreed upon in writing, the sampling inspection shall be applied to the Customers incoming inspection.

10.1.1 Lot size : 1 pallet per same model

10.1.2 Sampling type : Random sampling

10.1.3 Inspection level : II

10.1.4 Sampling table : MIL-STD-105E

### 10.2 Inspection Environment

10.2.1 Ambient conditions

a. Ambient Temperature:  $25 \pm 3^{\circ}\text{C}$

b. Relative Humidity:  $65 \pm 20\% \text{RH}$

c. Ambient Illumination: 300-700LUX (Normal: 500LUX)

10.2.2 Viewing Distance

The distance between the LCM and the inspector's eyes shall be at least 30cm-50cm

10.2.3 Viewing Angle

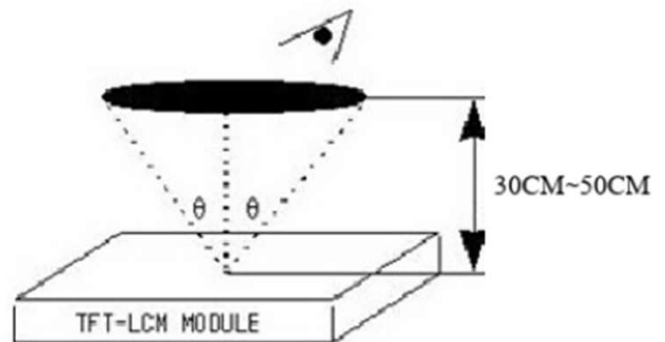
performing in front of the panel

[Vertical] :  $\pm 25^{\circ}$

[Horizontal] :  $\pm 40^{\circ}$

10.2.4 Inspection Area:

Display Area (Active Area)



### 10.3 Definitions

10.3.1 Dark / Bright Spots

Points on display which appear dark/bright and usually result from the contamination.

These defects do not vary in size or intensity (contrast) when contrast is varied.

10.3.2 Dark / Bright Lines

Lines on display which appear dark/bright and usually result from the contamination.

10.3.3 Polarizer Scratch


Lines on display which are seen across a darker background and do not vary in size.

10.3.4 Polarizer Dent

White spots on display which appear against a darker background and do not vary in size.

10.3.5 Bright Dot Defects

Dots (sub-pixels) on display which appear bright in the display area and visible through the 5%ND filter at Black Pattern.

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#### 10.3.6 Dark Dot Defects

Dots(sub-pixels)on display which appear dark in the display area at R.G.B Color Pattern.

#### 10.3.7 Line Defects

All line defects on display which appear bright/dark such as vertical, horizontal, or cross lines.

#### 10.3.8 Mura

Mura on display which appears darker/brighter against background brightness on parts of display area.

#### 10.3.9 BM Defects

Bright(white)Points on display which are off BM(Black Matrix).

#### 10.3.10 Visual Inspection

Inspection for LCM when the unit turns on.

#### 10.3.11 Appearance Inspection

External inspection for LCM when the unit turns off.

#### 10.3.12 Other

Defects which cannot be classified into the above defect definitions.

Note 1: Bright& Dark dots are not smaller than a sub-pixel(Dots smaller than a sub-pixel are not counted as defect dots)

### 10.4 Inspection Criteria

Refer to 《TFT LCM general inspection standard》

### 10.5 Verification

The supplier can verify the defective LCMs to segregate the responsibilities at customer's facility or can request the Customer to ship the defective LCMs to assigned place for verification

This verification result shall be agreed mutually by the Customer and Supplier. This result can be corrected/changed after detail failure analysis at Supplier's facilities.


### 10.6 Supplier Induced Defects

All of the Supplier induced defective LCMs shall be returned to the Supplier for repair or replacement.

Before return the defective LCMs, the Customer needs Supplier's confirmation with RMA Number.

All of the returned LCMs shall be returned to the Customer within agreed time period.



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### 10.7 Customer Induced Defects

The Customer can return the customer induced defective LCMs to the Supplier for repair. The repair cost for Customer induced defective LCMs shall be agreed with both parties, Customer and Supplier.

### 10.8 Warranty Period

In-warranty period is Eighteen(18)Months from manufacturing month of LCM

Note :

- a. Eighteen months are composed of twelfth months in-warranty period and sixth months distribution period
- b. The manufacturing Month is on the LCMs as Supplier's serial No.

### 10.9 Repair Warranty

Repair warranty is Twelve(12)Months from repaired month for repaired LCMs

Note : a. The Label for repair will be added after repairing.

### 10.10 Warranty avoidance

The warranty will be avoided in cases of below:

- a. When the warranty period is expired.
- b. The Customer induced defective LCMs.
- c. When the LCMs were repaired by 3rd party without Supplier's approval.
- d. When the LCMs were treated like Disassemble and Rework by the Customer and/or Customer's representatives without Supplier's approval.

### 10.11 Others

If any problems arise with the LCMs supplied by supplier, the customer and supplier will cooperate and make efforts to solve it with mutual confidence and respect