

CUSTOMER APPROVAL SHEET

Company Name	
MODEL	C080VTN03.1
CUSTOMER APPROVED	Title : Name :

- ☐ APPROVAL FOR SPECIFICATIONS ONLY (Spec. Ver. 0.3)
- ☐ APPROVAL FOR SPECIFICATIONS AND ES SAMPLE (Spec. Ver. 0.3)
- ☐ APPROVAL FOR SPECIFICATIONS AND CS SAMPLE (Spec. Ver. 0.3)
- ☐ CUSTOMER REMARK :

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Product Specification

8.0" COLOR TFT-LCD MODULE (EWV)

Model Name:	C080VTN03.1
Planned Lifetime:	From 2012/Apr To 2016/Jun
Phase-out Control:	From 2016/Jan To 2016/Jun
EOL Schedule:	2016/Jun

< ◆ > Preliminary Specification
 < > Final Specification



Records of Revision

Version	Date	Page	Content
0.0	2012/04/16	-	First draft.
0.1	2012/05/07	7	Update typical operating conditions
		8	Update Current consumption condition and Backlight driving conditions
		15	Update Recommended Gamma Voltage
0.2	2012/05/21	3	Update module drawing (modify bezel opening)
		7	Update Backlight driving Section
		16	Update optical specification (modify contrast ratio and add uniformity spec)
		19	Update Reliability test condition
0.3	2012/10/26	2	Update Physical specifications
		3	Update module drawing (BLU Power supply from wire change to FPC type)
		4~6	Update Pin assignment description
		7	Update backlight driving section and typical operating conditions
		8	Update Backlight driving conditions
		16	Update Response time data and R / G / B chromaticity
		19	Update Reliability test conditions

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A. Physical specifications

No	Item	Specification	Remark
1	Display resolution (dot)	800RGB(H)×480(V)	
2	Active area (mm)	175.20(H)×105.12(V)	
3	Screen size (inch)	8.0(Diagonal)	
4	Pixel pitch (mm)	0.073(H)×3×0.219(V)	
5	Color configuration	R. G. B. stripe	
6	Overall dimension (mm)	186.5(H)×117.12(V)×5.3(T)	Note 1
7	Weight (g)	180 +/- 10%	
8	Surface treatment	AG with EWW film / 3H	
9	Backlight unit	LED	
10	Viewing direction	6 o'clock (gray inversion)	

Note 1: Outline dimension drawing of PCB board are not included in this item

[illegible]

C. Electrical specifications

1. Pin assignment

a. TFT-LCD driving section

No	Symbol	I/O	Description	Remark
1	GND	P	Power ground pin	
2	VCOM	I	Common Electro Voltage	
3	DIO1	I/O	Horizontal start pulse for signal input or output	Note 1
4	GND	P	Power ground pin	
5	VCC(DVDD)	P	Voltage for digital circuit	
6	EDGSL	I	Edge selection: Selecting only rising or both rising and falling edge for triggering When EDGSL = "0" Latching source data onto the line latches at rising edge of dclk. When EDGSL = "1" Latching source data onto the line latches every rising edge and falling edge of clk	
7	CLK	I	Pixel clock	
8	LR	I	Horizontal scan selection LR= High → Left to Right direction LR=Low → Right to Left direction	Note 1
9	R0 (LSB)	I	Red data line	
10	R1	I	Red data line	
11	R2	I	Red data line	
12	R3	I	Red data line	
13	R4	I	Red data line	
14	R5 (MSB)	I	Red data line	
15	G0 (LSB)	I	Green data line	
16	G1	I	Green data line	
17	G2	I	Green data line	
18	G3	I	Green data line	
19	G4	I	Green data line	
20	G5 (MSB)	I	Green data line	
21	AVDD	P	Analog voltage for source driver	
22	V1	I	Gamma correction reference voltage	
23	V2	I	Gamma correction reference voltage	
24	V3	I	Gamma correction reference voltage	
25	V4	I	Gamma correction reference voltage	
26	V5	I	Gamma correction reference voltage	
27	V6	I	Gamma correction reference voltage	
28	V7	I	Gamma correction reference voltage	
29	V8	I	Gamma correction reference voltage	
30	V9	I	Gamma correction reference voltage	
31	V10	I	Gamma correction reference voltage	
32	V11	I	Gamma correction reference voltage	
33	V12	I	Gamma correction reference voltage	

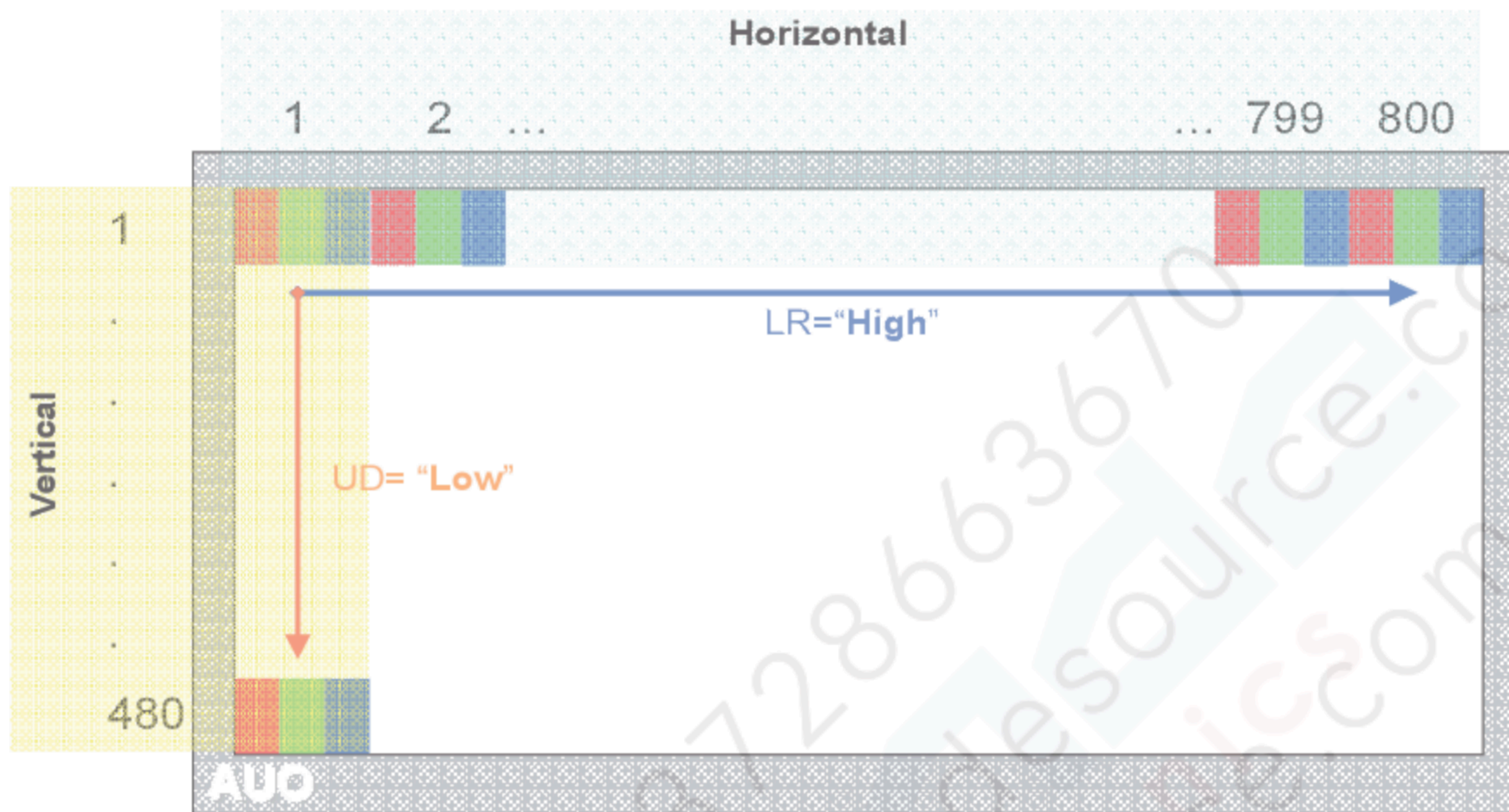
34	V13	I	Gamma correction reference voltage	
35	V14	I	Gamma correction reference voltage	
36	AVSS	P	Analog ground for source driver	
37	B0 (LSB)	I	Blue data line	
38	B1	I	Blue data line	
39	B2	I	Blue data line	
40	B3	I	Blue data line	
41	B4	I	Blue data line	
42	B5 (MSB)	I	Blue data line	Note 1
43	LD	I	Latch and switch data to output	Note 2
44	REV	I	Control Whether RGB data are inverted or not, normally pulled low. When "REV" = 1 these data will be inverted. Ex. "00"→"3F", "07"→"38", and so on.	
45	POL	I	Polarity selection	Note 3
46	VCC(DVDD)	P	Voltage for digital circuit	
47	GND	P	Power ground	
48	CHNSL	I	Don't care	
49	AVDD	P	Analog voltage for source driver	
50	DIO2	I/O	Horizontal start pulse for signal input or output	Note 1
51	VCOM	I	Common voltage	
52	OEVS	I	Output enable, active low. The gate driver outputs are disable when OEVS = "H".	
53	UD	I	Vertical scan selection UD= High → Down to Up direction UD=Low → Up to down direction	
54	CKV	I	Vertical CLK	
55	STVU	I/O	Vertical start pulse for signal input/output	Note 1
56	STVD	I/O	Vertical start pulse for signal input/output	Note 1
57	VGH	P	Voltage for TFT gate control	
58	VGL	P	Voltage for TFT gate control	
59	VCC(DVDD)	P	Voltage for digital circuit	
60	GND	P	Power ground	

P: Power source I: Input I/O: Input/Output

Recommended PCB board connector: FH28-60S-0.5SH(05)

Note 1: Scan direction setting:

Normally, the scan direction is set as **left to right (High)** and **up to down (Low)** as figure shown below:



Also, scan direction can be changed by the table setting as shown below:

Pin No.8	LR	Direction	DIO1	DIO2
=High		Left → Right	Input	Output
=Low		Right → Left	Output	Input

Pin No.53	UD	Direction	STVU	STVD
=Low		Up → Down	Input	Output
=High		Down → Up	Output	Input

Note 2: LD

Latches the polarity of outputs and switches the new data to outputs.

1. At the rising edge, latches the "POL" signal to control the polarity of the outputs.
2. The pin also controls the switch of the line registers that switches the new incoming data to outputs.

Note 3: POL

"POL" value is latched at the rising edge of "LD" to control the polarity of the even or odd outputs.

POL=1: Even outputs range from V1 ~ V7, and Odd outputs range from V8 ~ V14

POL=0: Even outputs range from V8 ~ V14, and Odd outputs range from V1 ~ V7

b. Backlight driving section

1	+	I	Current Input	
2	+	I	Current Input	
3	NA	NA	NA	
4	-	O	GND of string A	
5	-	O	GND of string A	
6	-	O	GND of string A	
7	NA	NA	NA	
8	NA	NA	NA	

2. Absolute Maximum Ratings

Items	Symbol	Product Specification			Unit
		Min.	Typ.	Max.	
Power Voltage	Vcc	-0.5		5	V
	AVDD	-0.5		15	V
	VGH	-0.3		40	V
	VGL	-20		0.3	V
Input Signal Voltage	VGH-VGL			40	V
	Vi	-0.3		Vcc+0.3	V
	Vref(V1~V7)	0.4AVDD		AVDD+0.3	V
	Vref(V8~V14)	-0.3		0.6AVDD	V
	VCOM	3.0		5.0	V
Operating Temperature	Topa	-30		85	°C
Storage Temperature	Tstg	-40		95	°C

3. Typical operating conditions (GND=AVSS=0V)

Items	Symbol	Product Specification			Unit
		Min.	Typ.	Max.	
Power Voltage	VCC	3.1	3.3	3.5	V
	AVDD	10.7	11	11.3	V
	VGH	19	20	21	V
	VCOM	4.25	4.27	4.29	V
	VGL	-9	-10	-11	V
Gamma Input Reference Voltage	V1~V7	0.4AVDD	—	AVDD-0.1	V
	V8~V14	0.1	—	0.6AVDD	V
Input H/L level Voltage	VIH	0.8VCC	—	VCC	V
	VIL	0	—	0.2VCC	V

4. Current consumption conditions (GND=AVSS=0V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Current For Driver	IGH	VGH = 20V	—	150	200	uA
	IGL	VGL = -10V	—	-150	-200	uA
	ICC	VCC = 3.3V	—	3	5	mA
	IDD	AVDD = 11V	—	20	30	mA

5. Backlight driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I _L		240	255	mA	(Note 3)
LED voltage	V _L		12.4	13.6	V	Note 3, +25° C
LED Lifetime	L _L	10000			Hrs	Note 2

Note 1: LED backlight is 12 LEDs (3 strings, 4pcs for each string).

Note 2: The LED life time is determined as the brightness of LED to be 50% compare with its initial value at normal use: 80mA, room temperature +25 ° C.

Note 3: The LED Current 80mA is for 1 string of LED

6. Timing conditions

AC Electrical Characteristics (VCC=3.3V, AVDD=9.8V, AVSS=GND=0V, TA=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
CLK frequency (EDGSL = '0')	Fclk		33	40	MHz
CLK frequency (EDGSL = '1')	Fclk		16.5	20	MHz
CLK cycle time	Tcph	25	30		ns
CLK pulse width	Tcw	40%		60%	Tcph
Data set-up time	Tsu	4			ns
Data hold time	Thd	2			ns
Propagation delay of DIO2/1	Tphl	6	10	15	ns
Time that the last data to LD	Tld	1			Tcph
Pulse width of LD	Twld	2			Tcph
Time that LD to DIO1/2	Tlds	5			Tcph
POL set-up time	Tpsu	6			ns
POL hold time	Tphd	6			ns
STV setup time	T _{SUV}	300			ns
STV hold time	T _{HDV}	400			ns
CKV pulse width	T _{CKV}	500			ns
Output stable time	Tst			12	us
STV(R/L) width (Note.1)	Tstv	-	1	-	Tpckv
Charging time1 (Note.2)	Tch1	20			us
Charging time2 (Note.2)	Tch2	20			us

* Due to panel is a passive component and no leakage current allowed for better performance, it may need extra circuit to make sure the TFT LCD panel storage capacitor's shorter discharge time when system power off. Customers should study the discharge circuit according to system design.

Note.1: Pulse width of STV(R/L) should be set to 1 Tpckv (Time period of CKV).

Note.2: If OEV is used, charging time must be followed to Tch1 setting, at least 20 us.

Otherwise, if OEV is unused, charging time must be followed by Tch2 setting, at least 20 us.

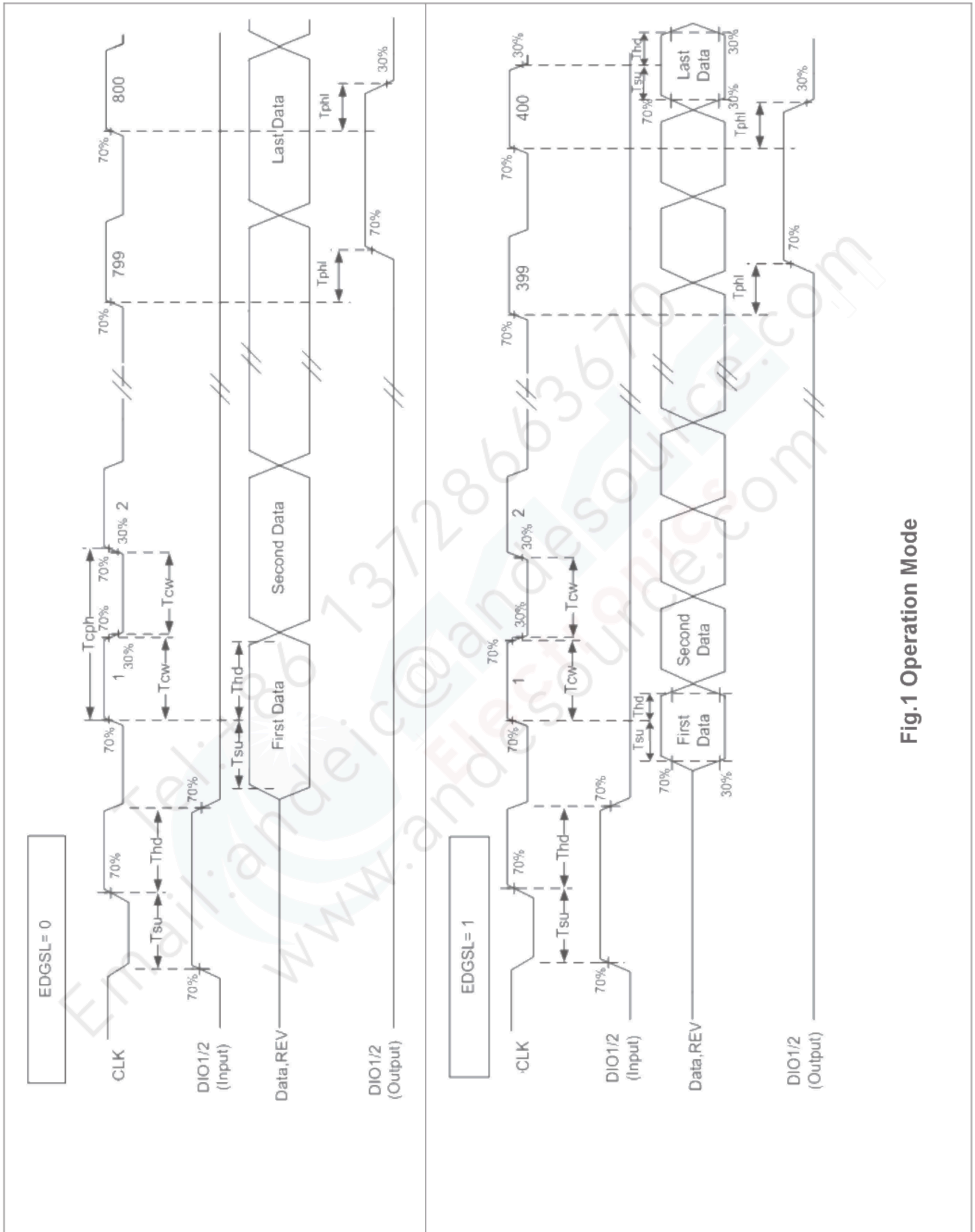


Fig.1 Operation Mode

■ Timing Diagram 2

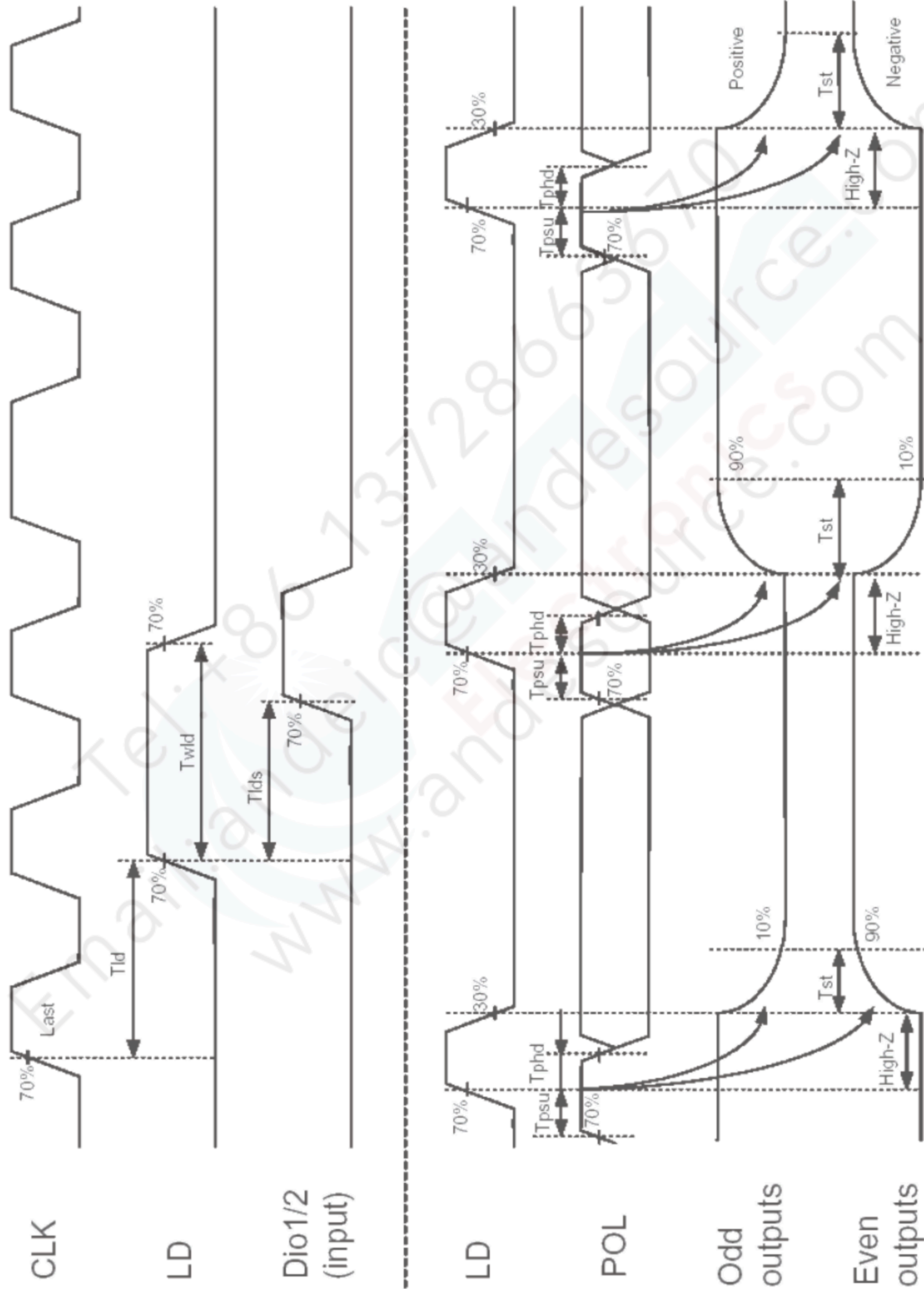


Fig.2 Horizontal timing

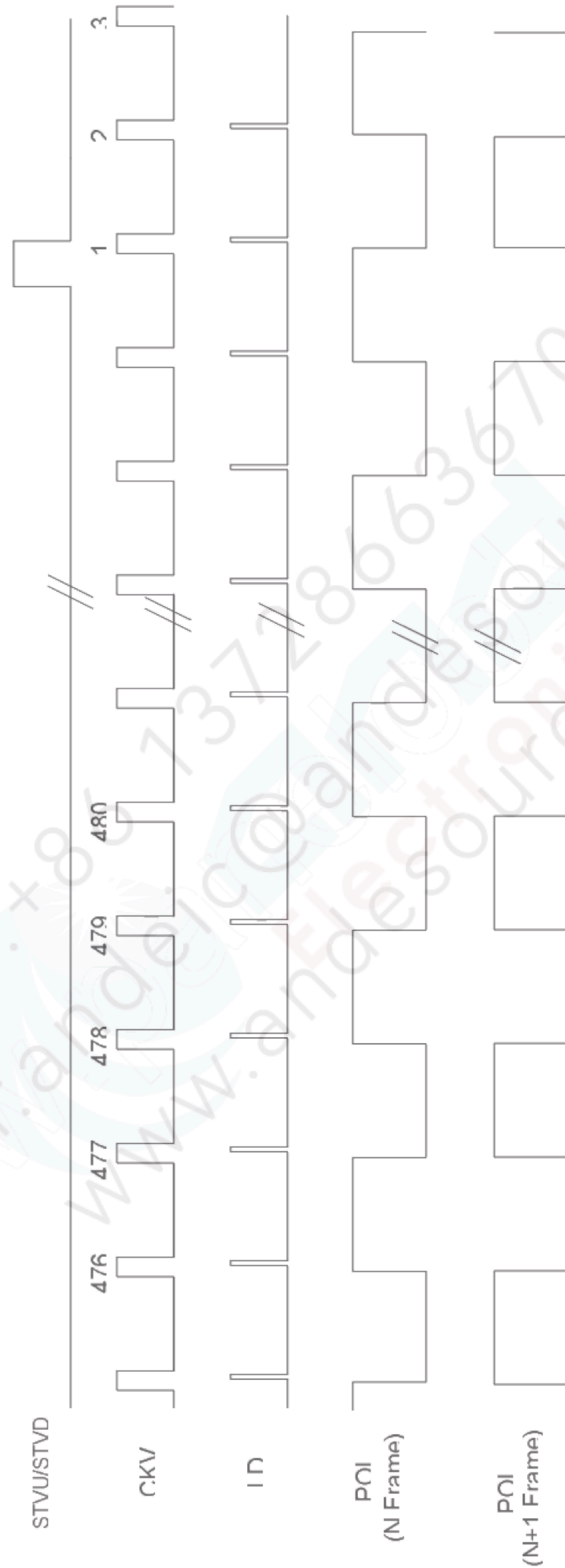


Fig.3 Vertical timing (from up to down)

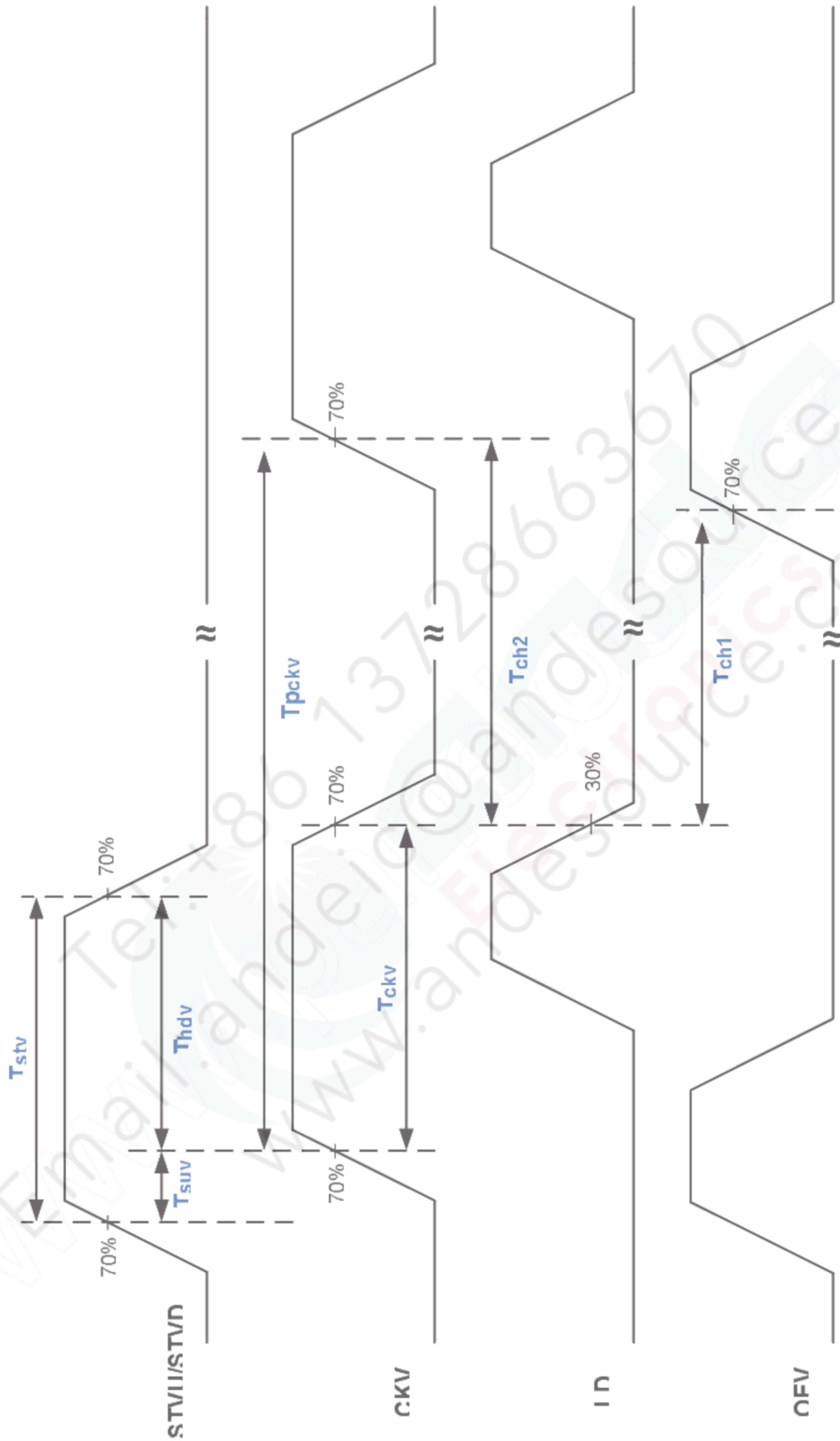
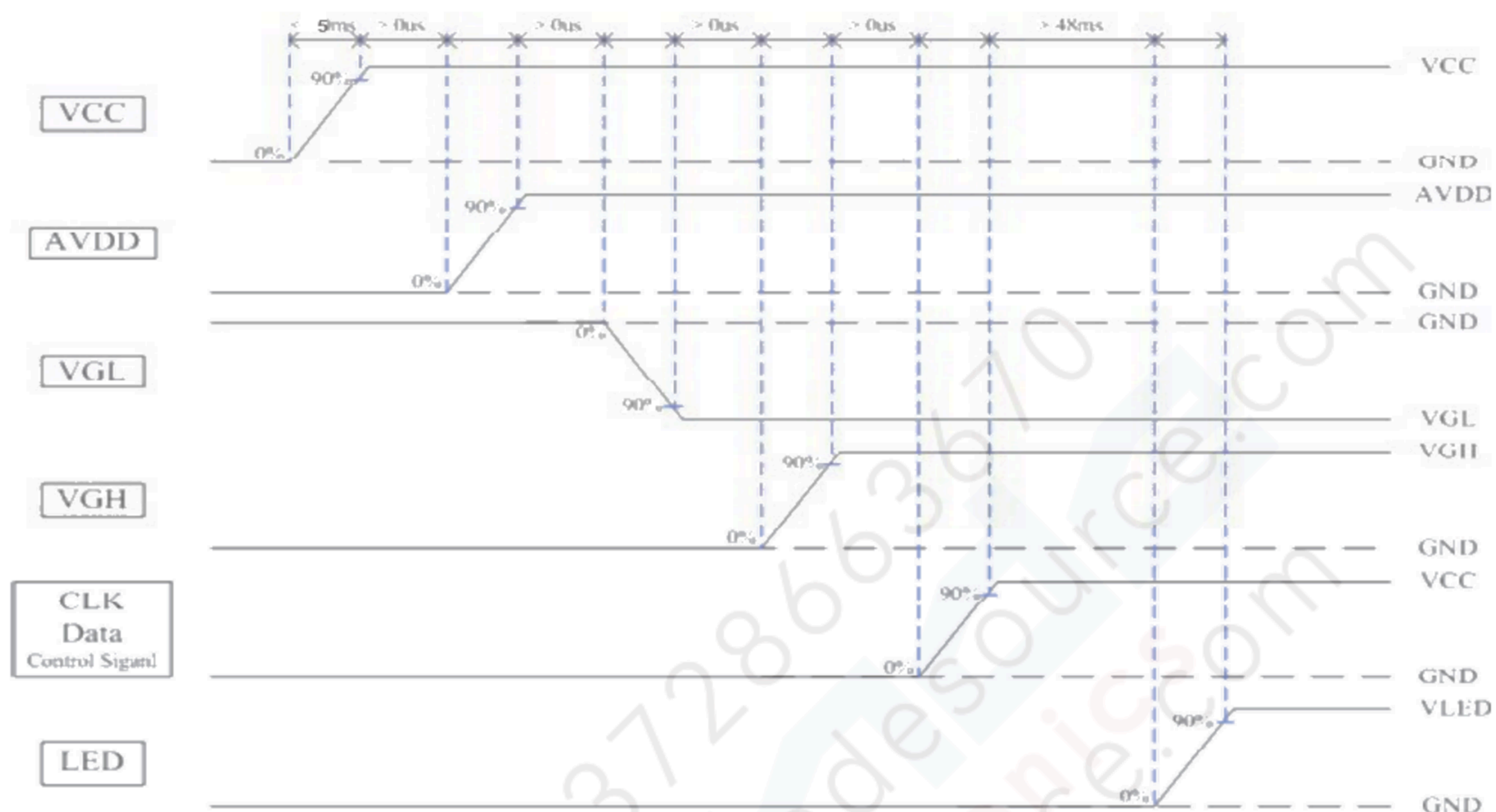


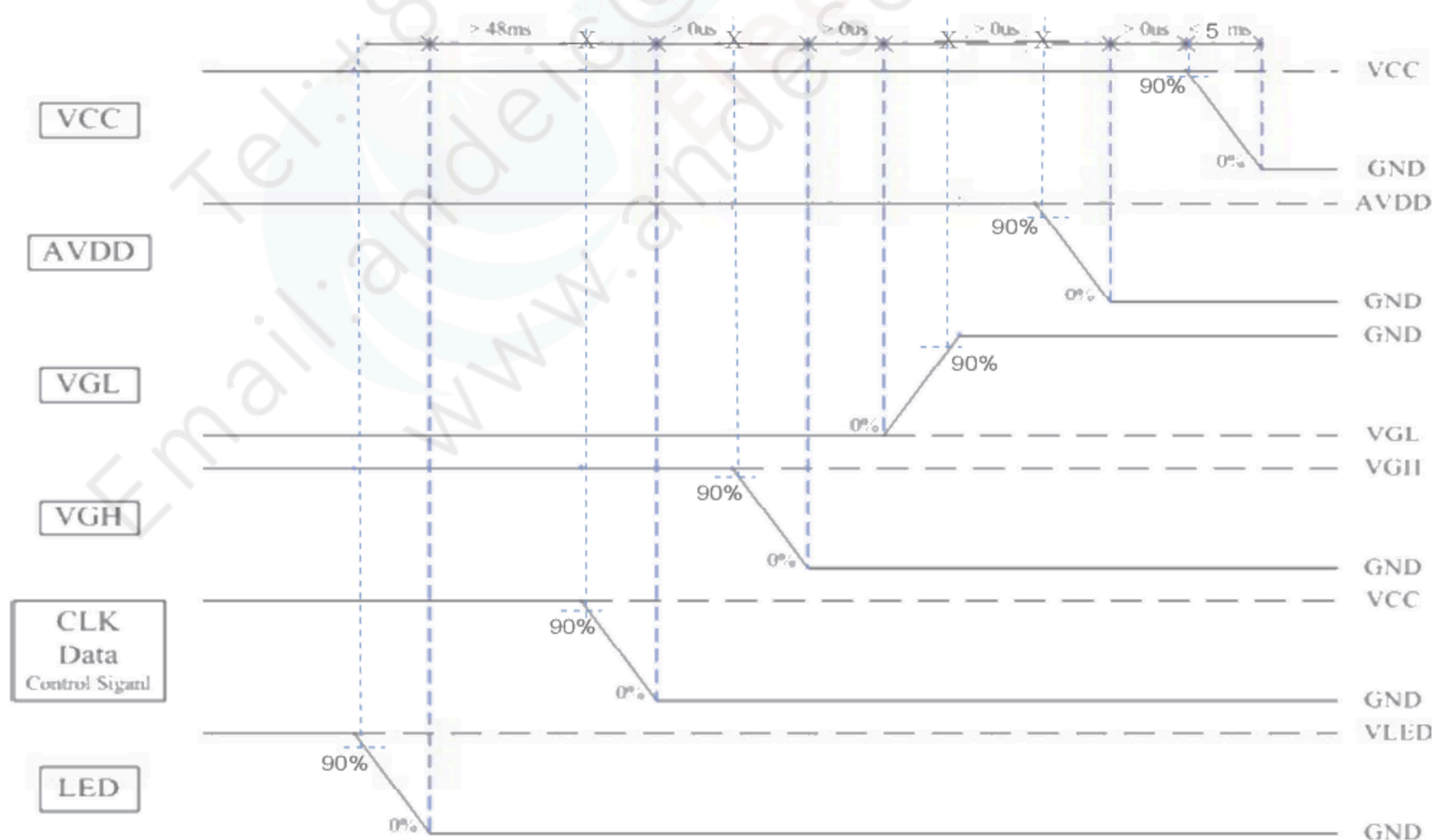
Fig.4 Vertical shift clock timing

7. Power On/Off Sequence

Power-On



Power-Off



Gamma 2.2		
	AVDD	11.0
00H	V1	10.8
01H	V2	9.7
10H	V3	8.55
20H	V4	7.98
30H	V5	7.6
3EH	V6	6.92
3FH	V7	5.6
3FH	V8	5.4
3EH	V9	4.04
30H	V10	3.27
20H	V11	2.9
10H	V12	2.1
01H	V13	1.3
00H	V14	0.2

D. Optical specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time	Rising Falling	$\theta=0^\circ$	- -	12 18	15 25	ms ms	Note 1
Contrast ratio	CR	At optimized Viewing angle	400	600	-		Note 2
Viewing angle	Top Bottom Left Right	$CR \geq 10$	30 50 50 50	40 60 60 60	- - - -	deg.	Note 2
3Brightness	Y_L	$I_L=80\text{mA}$, 25°C	400	500	-	nit	Note 3
White chromaticity	x y	$\theta=0^\circ$ $\theta=0^\circ$	0.27 0.29	0.31 0.33	0.35 0.37		Note 3
Red chromaticity	x y	$\theta=0^\circ$ $\theta=0^\circ$		0.635 0.346			
Green chromaticity	x y	$\theta=0^\circ$ $\theta=0^\circ$		0.324 0.614			
Blue chromaticity	x y	$\theta=0^\circ$ $\theta=0^\circ$		0.149 0.060			
Uniformity		9-point, $\theta=0^\circ$	75	-	-	%	Note 6

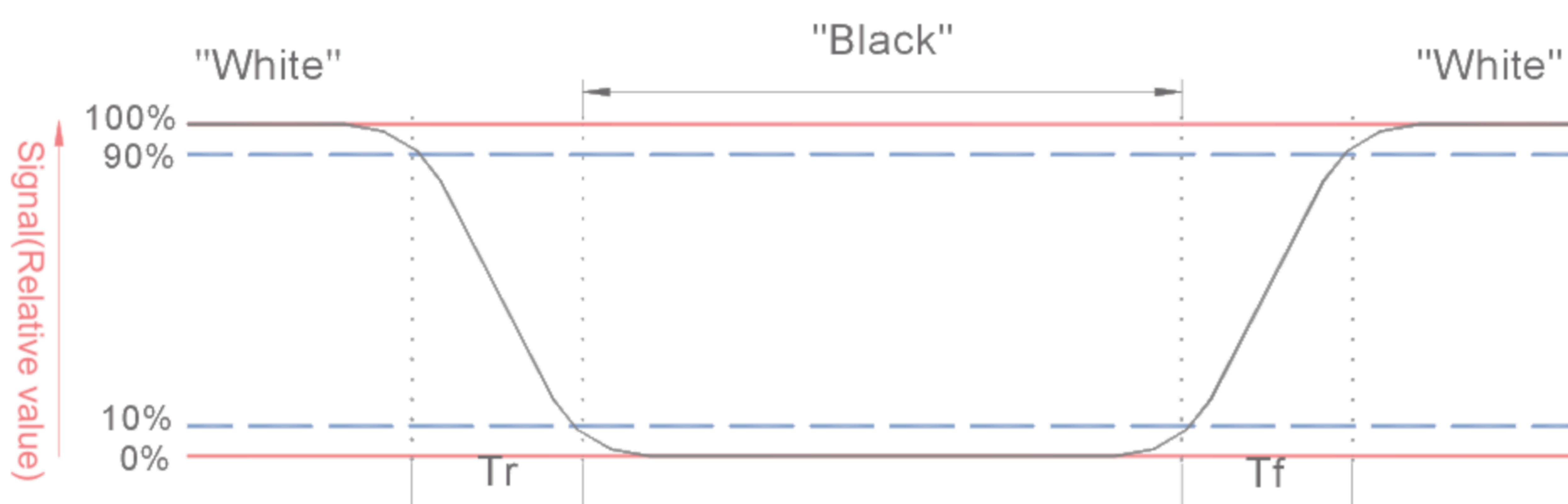
* Ambient temperature =25°C, and LED current $I = 80 \text{ mA}$. To be measured in the dark room.

* To be measured on the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7, after 10 minutes operation.

Note 1. Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "black" to "white"(falling time) and from "white" to "black"(rising time), respectively.

The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below.

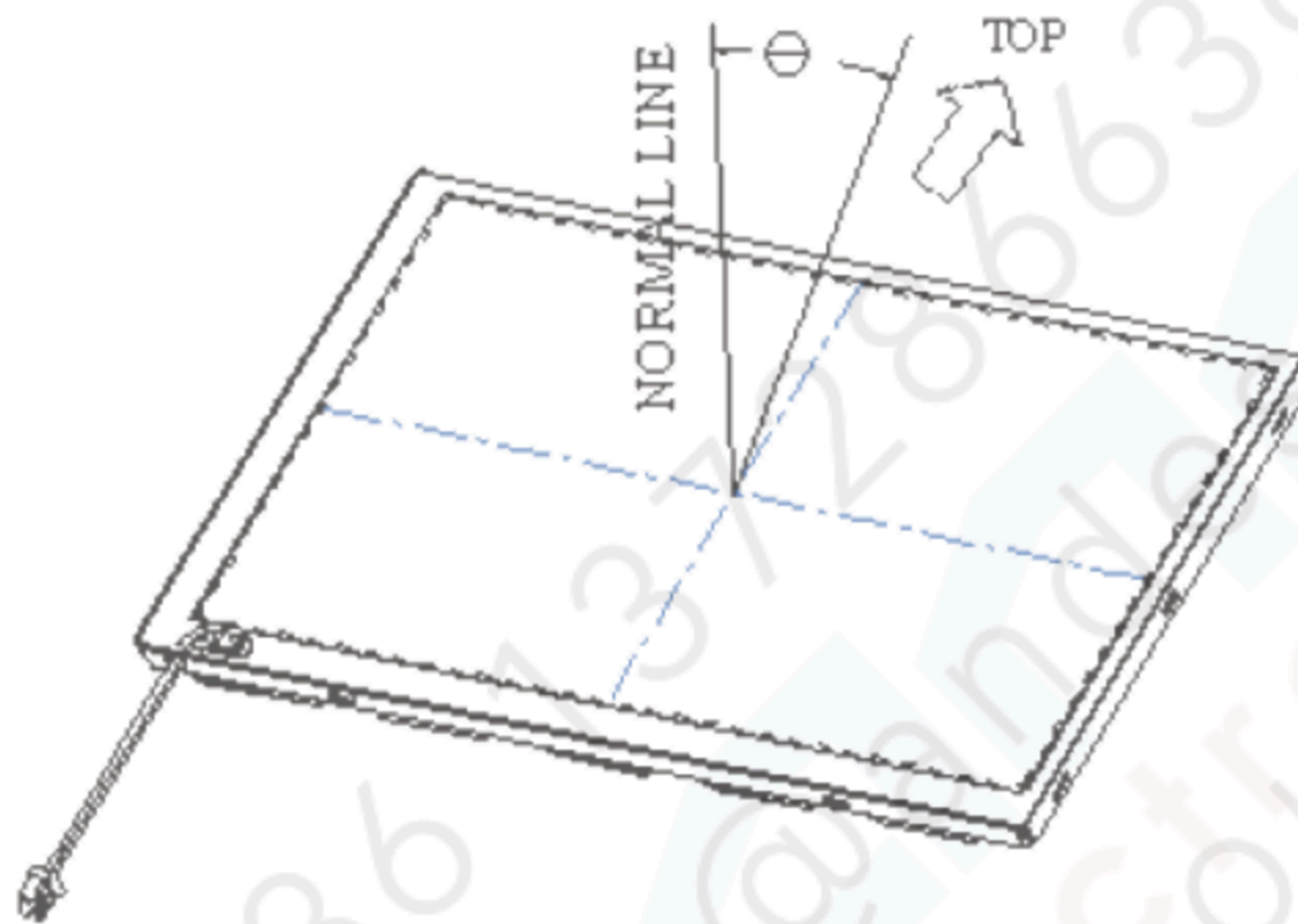


Note 2. Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

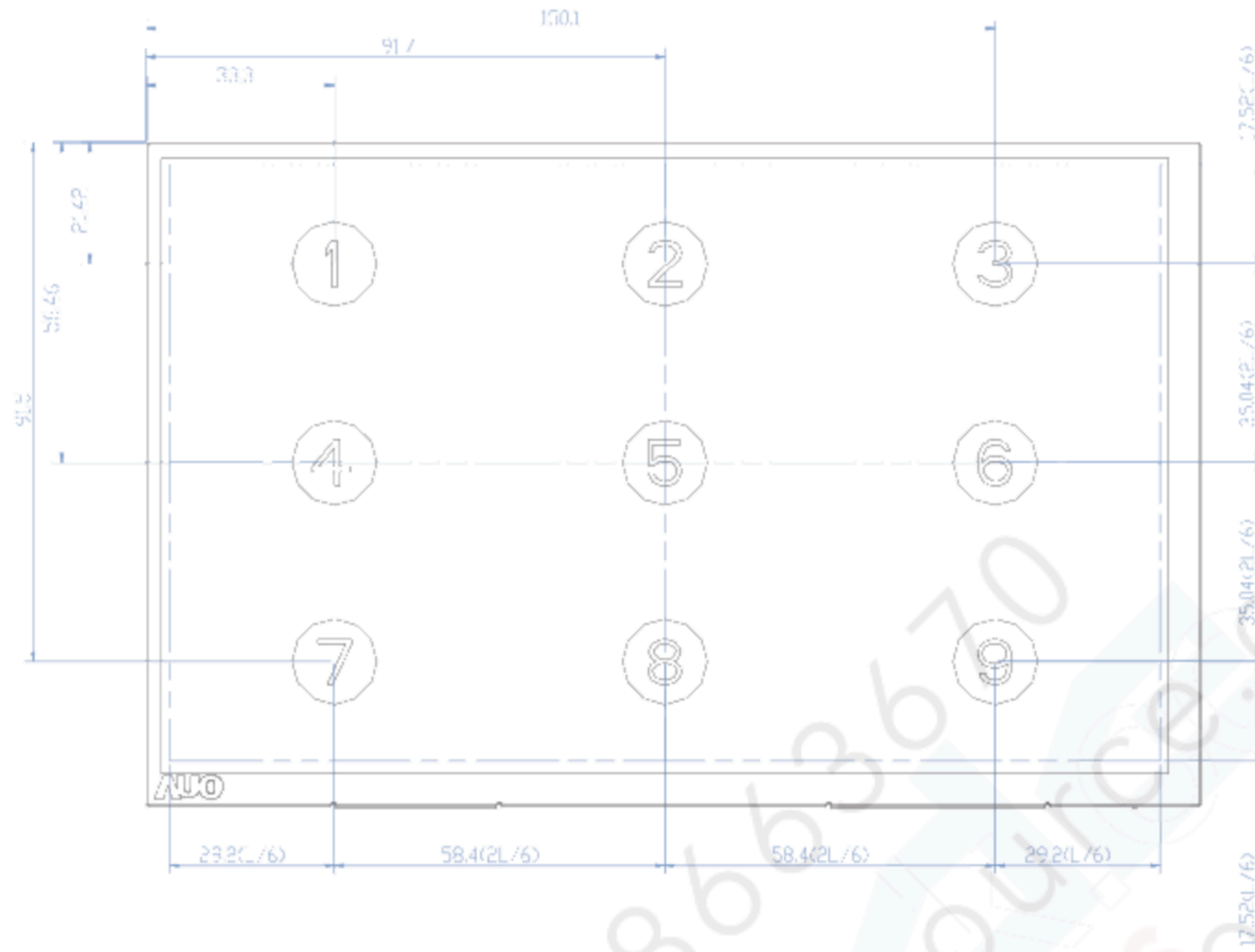
$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black" state}}$$

Note 3. Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.



Note 6. Luminance Uniformity is defined as following within the 9 measurements (L1~L9),

$$\text{Luminance Uniformity(\%)} = \frac{\text{Minimum luminance(brightness)}}{\text{Maximum luminance(brightness)}}$$



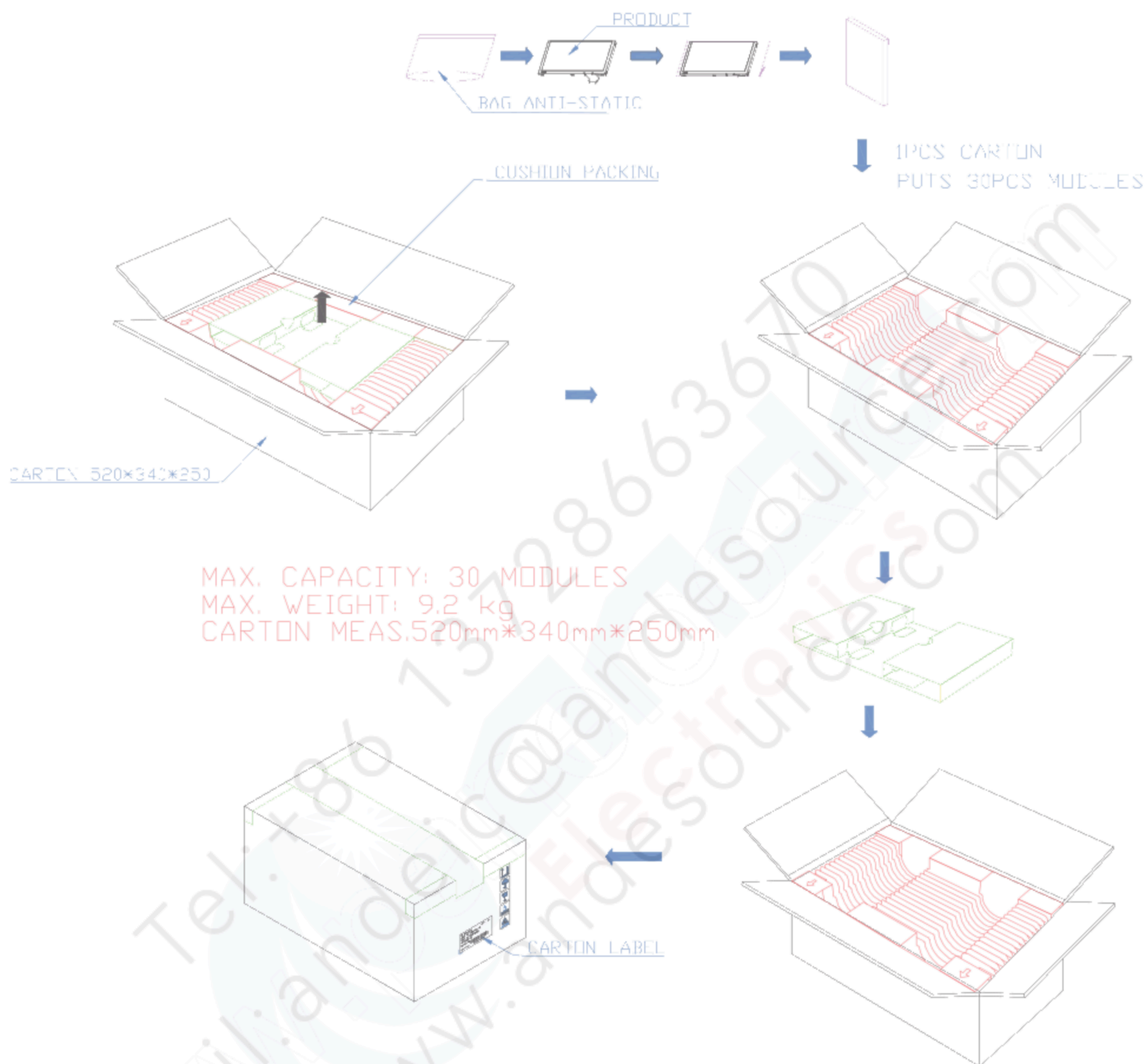
E. Reliability test items

No.	Test items	Conditions	Remark
1	High temperature storage	Ta= 95°C 240Hrs	
2	Low temperature storage	Ta= -40°C 240Hrs	
3	High temperature operation	Ta= 85°C 240Hrs	
4	Low temperature operation	Ta= -30°C 240Hrs	
5	High temperature and high humidity	Ta= 60°C, 90% RH 240Hrs	Operation
6	Heat shock	-30°C ~85°C /200 cycles 1Hrs/cycle	Non-operation
7	Electrostatic discharge	Contact mode = ± 4 kV, class B Air mode = ± 8 kV, class B	IEC61000-4-2
8	Vibration	Frequency range : 8~33.3Hz Stoke : 1.3mm Sweep : 2.9G, 33.3 ~ 400Hz Cycle : 15 minutes 2 hours for each direction of X,Z 4 hours for Y direction	JIS C7021, A-10 Condition A
9	Mechanical shock	100G, 6ms, ±X,±Y,±Z 3 times for each direction	JIS C7021, A-7 Condition C
10	Vibration (with carton)	Random vibration: 0.015G ² /Hz from 5~200Hz -6dB/octave from 200~500Hz	IEC 68-34
11	Drop (with carton)	Height: 60cm 1 corner, 3 edges, 6 surfaces	JIS Z0202

* Ta: Ambient Temperature.

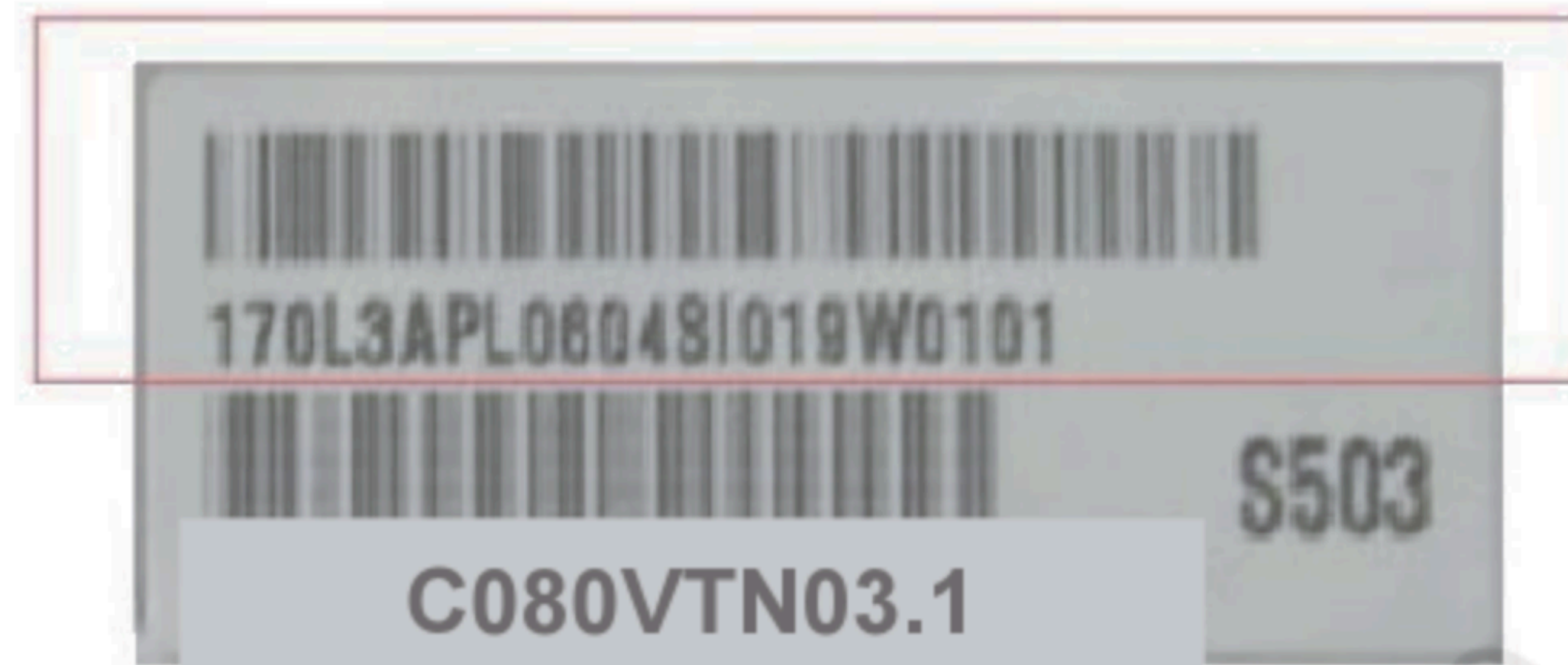
* In the standard conditions, there is not display function NG issue occurred. All the cosmetic specification is judged before the reliability stress.

F. Packing form



G. Label Format -- Tentative

Label Format



1st to 2nd: production week code:

50 => WK50

3rd: Model version

1 => V1

4th to 6th : Production side

L3A: Taiwan

S16: China Xiamen

8th to 18th : AUO Lot number

流水號 : from 19th to 20th character

21st to 22nd : AUO 流水號