TECHNICAL   SPECIFICATION

MODEL   NO. : ED050SC3

The content of this information is subject to be changed without notice.

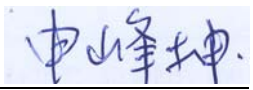Please contact PVI or its agent for further information

☐Customer's Confirmation

Customer

Date

By

☐PVI's Confirmation

Confirmed By

Prepared By

◆ PRIME VIEW

Revision History

Rev.	Issued Date	Revised Contents
1.0	August.15.2008	New
2.0	October.7.2008	Add Page 7 6-2) Absolute maximum rating Page 16 11.Bar Code definition Page 17 12.Border definition Modify Page 4 3. Mechanical Specifications Page 5 4. Mechanical Drawing of EPD Module Page 7 6-3) Panel DC characteristics Page 9 7.Power on sequence Page 14 9. Handling, Safety and Environment Requirements Del Preliminary specification Page 15 10.Reliability test 14.Stylus Tapping Top R:0.4mm Load: 300gf Speed: 5 times/sec Total 13,500times change to Top R:0.8mm Load: 300gf Speed: 2 times/sec Total 13,500times Page 12 8-1)Specifications Add Contrast ratio Typ= 7 Update time 1000/540 change to 780/260 (2-4 bits/1bits) Page 13 Note 8-1 Page 18 Packing
3.0	May,7,2009	Modify Page 4 1.Application Add Note 1-1 Page 6 5.Input / Output Terminals Page 7. 6-3) Panel DC characteristics Typical / Maximum Power consumption Add Note 6-1 / 6-2 Add Maximum Icom inrush current Page 9 6-4)Panel AC characteristics Page 11 Power On Sequence Page 16 10.Reliability test Storage item add ''Test In White Pattern''

TECHNICAL   SPECIFICATION

CONTENTS

◈ PRIME VIEW

1. Application

   The display is a TFT active matrix electrophoretic display, with associated interface and control logic, and a reference system design.

   The 5" active area contains 800x600 pixels, the display is capable to display images at 2-16 gray levels (1-4 bits) depending on the display controller and the associated waveform file used.(Note 1-1)

Note 1-1
The standard waveform provided by PVI are 3 bits waveform for broadsheet & 8track,2 bits waveform for PVI-6001A.

2. Features

➢ High contrast TFT electrophoretic

➢ 800x600 display

➢ High reflectance

➢ Ultra wide viewing angle

➢ Ultra low power consumption

➢ Pure reflective mode

➢ Bi-stable

➢ Commercial temperature range

➢ Landscape, portrait mode

➢ Antiglare hard-coated front-surface

3. Mechanical Specifications

Parameter	Specifications	Unit	Remark
Screen Size	5	Inch	
Display Resolution	800 (H) ×600(V)	Pixel	
Active Area	101.6 (H)×76.2 (V)	mm	
Pixel Pitch	0.127(H)x0.127(V)	mm	
Pixel Configuration	Rectangle		
Outline Dimension	114.6(H) ×89.6(V) ×1.18(D) (panel area height) 114.6(H) ×89.6(V) ×2.0(D) (FPC area height with capacitor)	mm	Panel height is measured without released film
Module Weight	24±2	g	

PRIME VIEW

4. Mechanical Drawing of EPD Module

PRIME VIEW
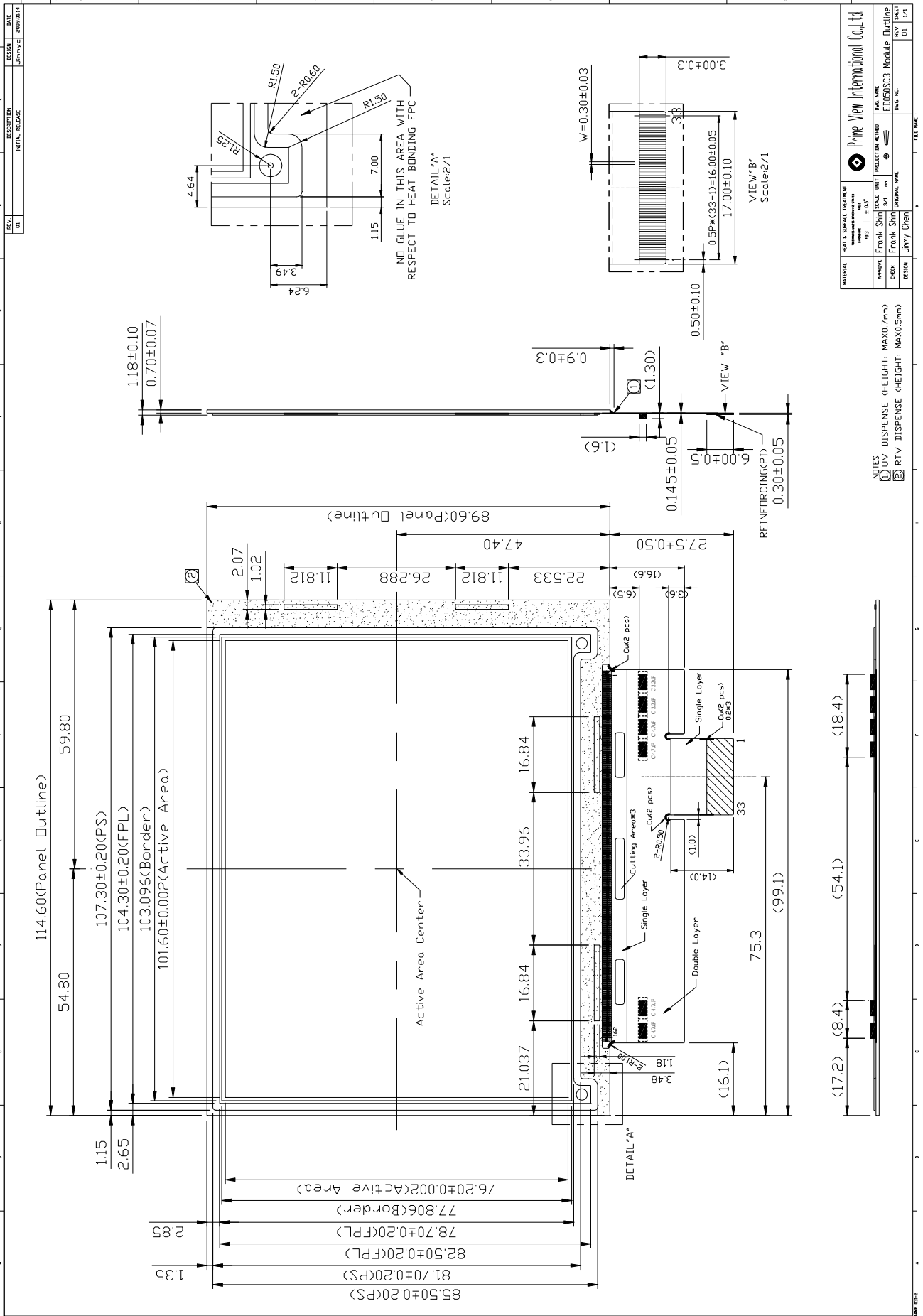
5. Input/Output Terminals

5-1)Pinout List

Pin #	Signal	Description
1	VNEG	Negative power supply source driver
2	NC	NO Connection
3	VPOS	Positive power supply source driver
4	NC	NO Connection
5	VSS	Ground
6	NC	NO Connection
7	VDD	Digital power supply drivers
8	CKH	Clock source driver
9	LEH	Latch enable source driver
10	OEH	Output enable source driver
11	RL	Shift direction source driver
12	STH	Start pulse source driver
13	D0	Data signal source driver
14	D1	Data signal source driver
15	D2	Data signal source driver
16	D3	Data signal source driver
17	D4	Data signal source driver
18	D5	Data signal source driver
19	D6	Data signal source driver
20	D7	Data signal source driver
21	NC	NO Connection
22	VCOM	Common voltage
23	NC	NO Connection
24	VGG	Positive power supply gate driver
25	NC	NO Connection
26	VEE	Negative power supply gate driver
27	NC	NO Connection
28	MODE2	Output mode selection gate driver
29	MODE1	Output mode selection gate driver
30	UD	Shift direction gate driver
31	STV	Start pulse gate driver
32	CKV	Clock gate driver
33	BORDER	Border connection

PRIME VIEW

6.Electrical Characteristics
6-1) Panel interface description

This panel is driven by ASIC PVI-6001A or "Apollo" display controller ASIC. See control product specification for details.

6-2) Absolute maximum rating

Parameter	Symbol	Rating	Unit
Logic Supply Voltage	V_{DD}	-0.3 to +7	V
Positive Supply Voltage	V_{POS}	-0.3 to +18	V
Negative Supply Voltage	V_{NEG}	+0.3 to -18	V
Max .Drive Voltage Range	$V_{POS} - V_{NEG}$	36	V
Supply Voltage	VGG	-0.3 to +45	V
Supply Voltage	VEE	-25.0 to +0.3	V
Supply Range	VGG-VEE	-0.3 to +45	V
Operating Temp. Range	TOTR	0 to +50	℃
Storage Temperature	TSTG	-25 to +70	℃

6-3) Panel DC characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Signal ground	V_{SS}		-	0	-	V
Logic Voltage supply	V_{DD}		3.0	3.3	3.6	V
	I_{VDD}	V_{DD}=3.3V	-	0.2	1.1	mA
Gate Negative supply	V_{EE}		-21	-20	-19	V
	I_{EE}	V_{EE}=-20V	-	0.3	1	mA
Gate Positive supply	V_{GG}		21	22	23	V
	I_{GG}	V_{GG} = 22V	-	0.4	0.9	mA
Source Negative supply	V_{NEG}		-15.4	-15	-14.6	V
	I_{NEG}	V_{NEG} = -15V	-	3.6	26	mA
Source Positive supply	V_{POS}		14.6	15	15.4	V
	I_{POS}	V_{POS} = 15V	-	3.4	26	mA
Border supply	V_{Border}	V_{POS} = 15V	14.6	15	15.4	V
		V_{NEG} = -15V	-15.4	-15	-14.6	V
Asymmetry source	V_{Asym}	$V_{POS}+V_{NEG}$	-800	0	800	mV
Common voltage	V_{COM}		-2.5	Adjusted	-1.0	V
	I_{COM}		-	0.25	-	mA
Maximum power panel	P_{MAX}		-	-	850	mW
Standby power panel	P_{STBY}		-	-	0.4	mW
Typical power panel	P_{TYP}		-	120	-	mW
Operating temperature			0	-	50	℃
Storage temperature			-25	-	70	℃
Image update time at 25℃			-	780	-	ms

◆ PRIME VIEW

- The maximum power consumption is measured with following pattern transition: from pattern of repeated 1 consecutive black scan lines followed by 1 consecutive white scan line to that of repeated 1 consecutive white scan lines followed by 1 consecutive black scan lines.(Note 6-1)
- The Typical power consumption is measured with following pattern transition: from horizontal 4 gray scale pattern to vertical 4 gray scale pattern.(Note 6-2)
- The standby power is the consumed power when the panel controller is in standby mode.
- The listed electrical/optical characteristics are only guaranteed under the controller & waveform provided by PVI
- Vcom is recommended to be set in the range of assigned value $\pm$ 0.1V
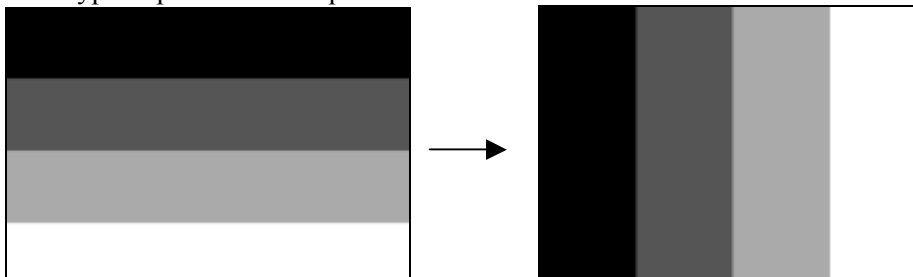- The maximum I_{COM} inrush current is about 640 mA

Note 6-1

The maximum power consumption
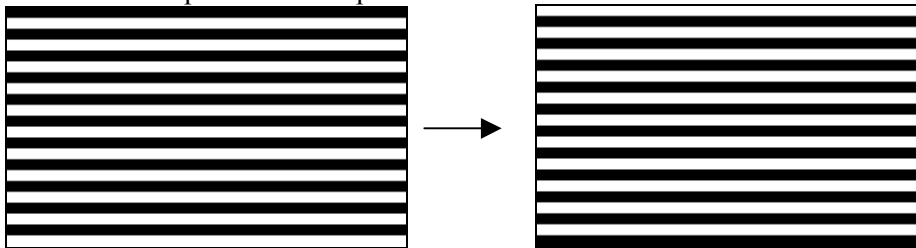
Note 6-2

The Typical power consumption

◇ PRIME VIEW

6-4)Panel AC characteristics

VDD=3.0V to 3.6V, unless otherwise specified.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Clock frequency	fckv	-	-	200	kHz
Minimum "L" clock pulse width	twL	0.5	-	-	us
Clock rise time	trckv	-	-	100	ns
Clock fall time	tfckv	-	-	100	ns
Data setup time	tSU	100	-	-	ns
Data hold time	tH	100	-	-	ns
Pulse rise time	trspv	-	-	100	ns
Pulse fall time	tfspv	-	-	100	ns
Clock CKH cycle time	tcy	50	-	DC	ns
D0 .. D7 setup time	tsu	8	-	-	ns
D0 .. D7 hold time	th	1	-	-	ns
STH setup time	tstls	10	-	-	ns
STH hold time	tstlh	10	-	-	ns
LEH on delay time	tLEdly	40	-	-	ns
LEH high-level pulse width	tLEw	40	-	-	ns
LEH off delay time	tLEoff	200	-	-	ns
Output setting time to +/- 30mV(C_{load}=200pF)	tout	-	-	12	us

CLOCK & DATA TIMING

OUTPUT LATCH CONTROL SIGNALS
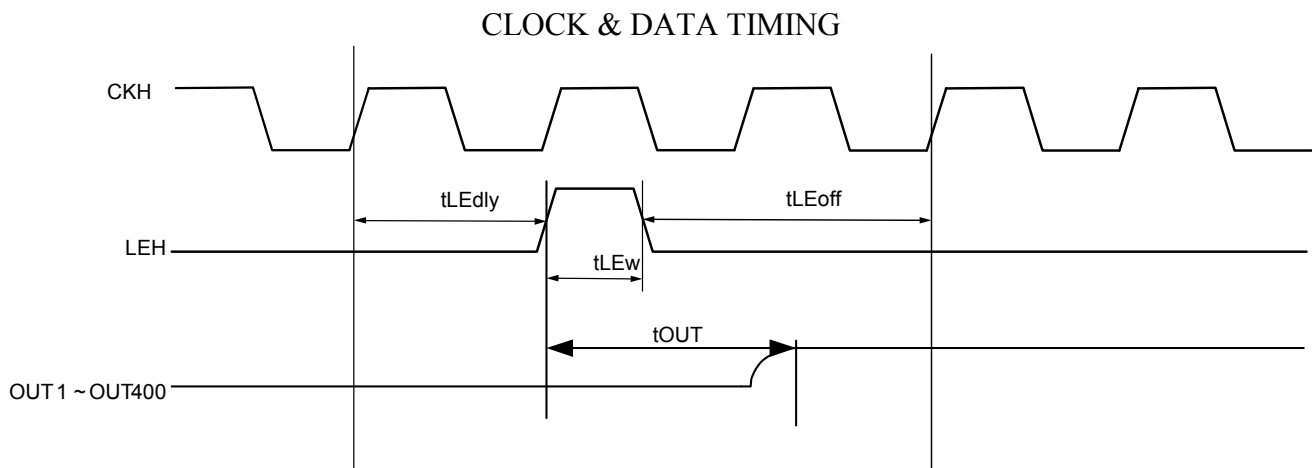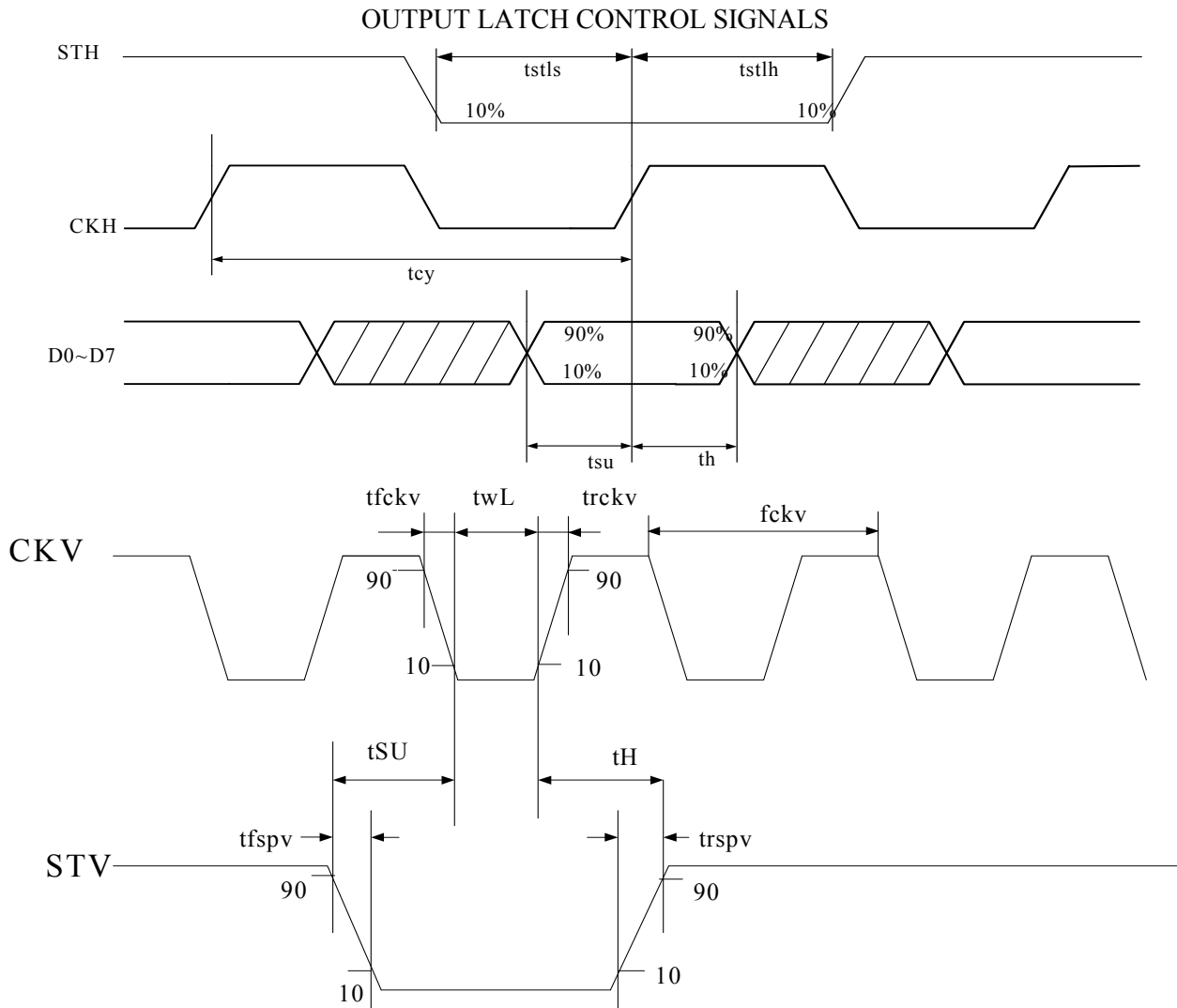
6-5) Power Consumption

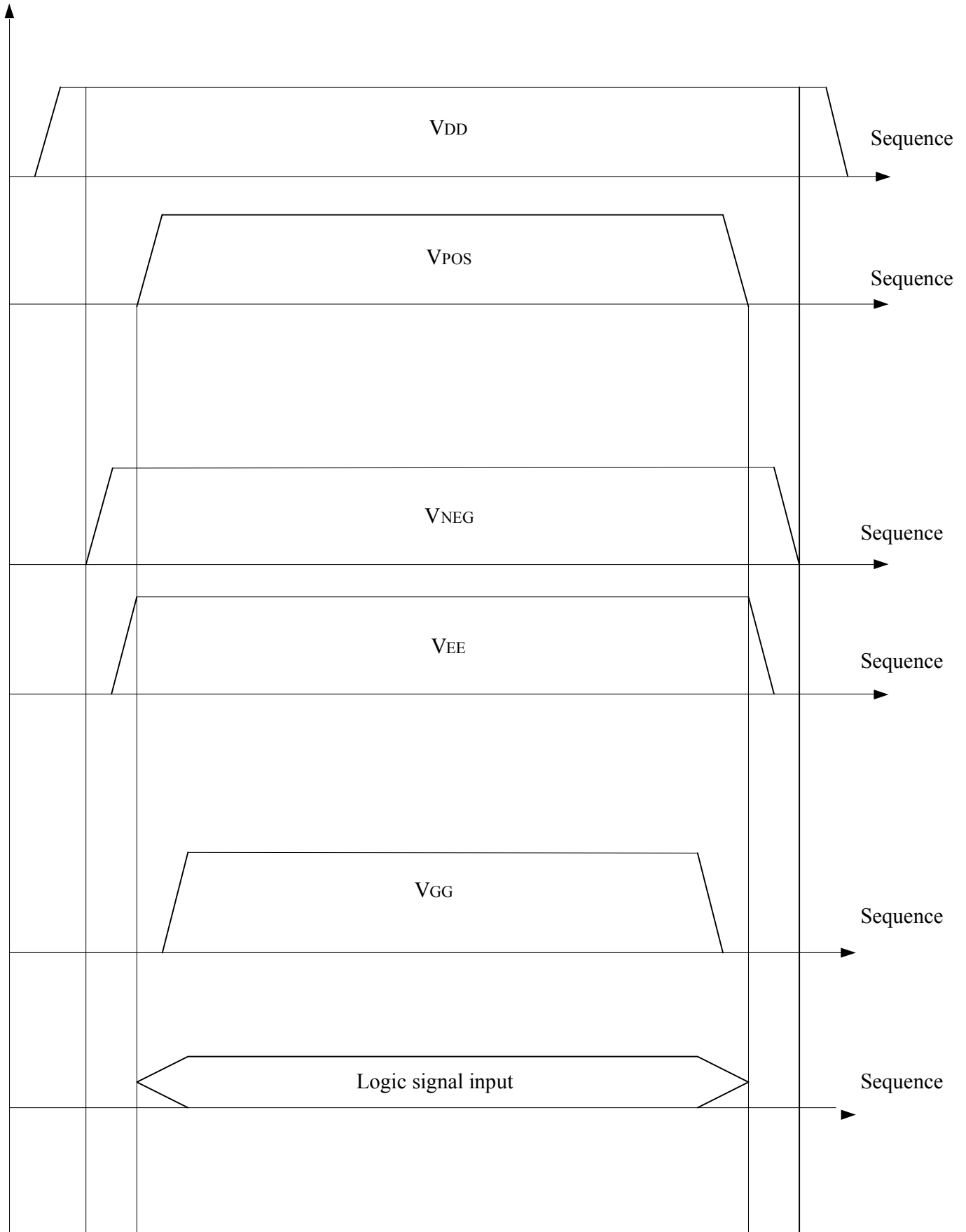| Parameter	Symbol	Conditions	TYP	Max	Unit	Remark
Panel power consumption during update	-	-	120	850	mW	
Power consumption in standby mode	-	-	-	0.4	mW	

PRIME VIEW

7.Power on Sequence

1. VSS → VDD → VNEG → VPOS (Source driver)

2. VEE → VGG(Gate driver)

＊Power on sequence's timing chart as blew :
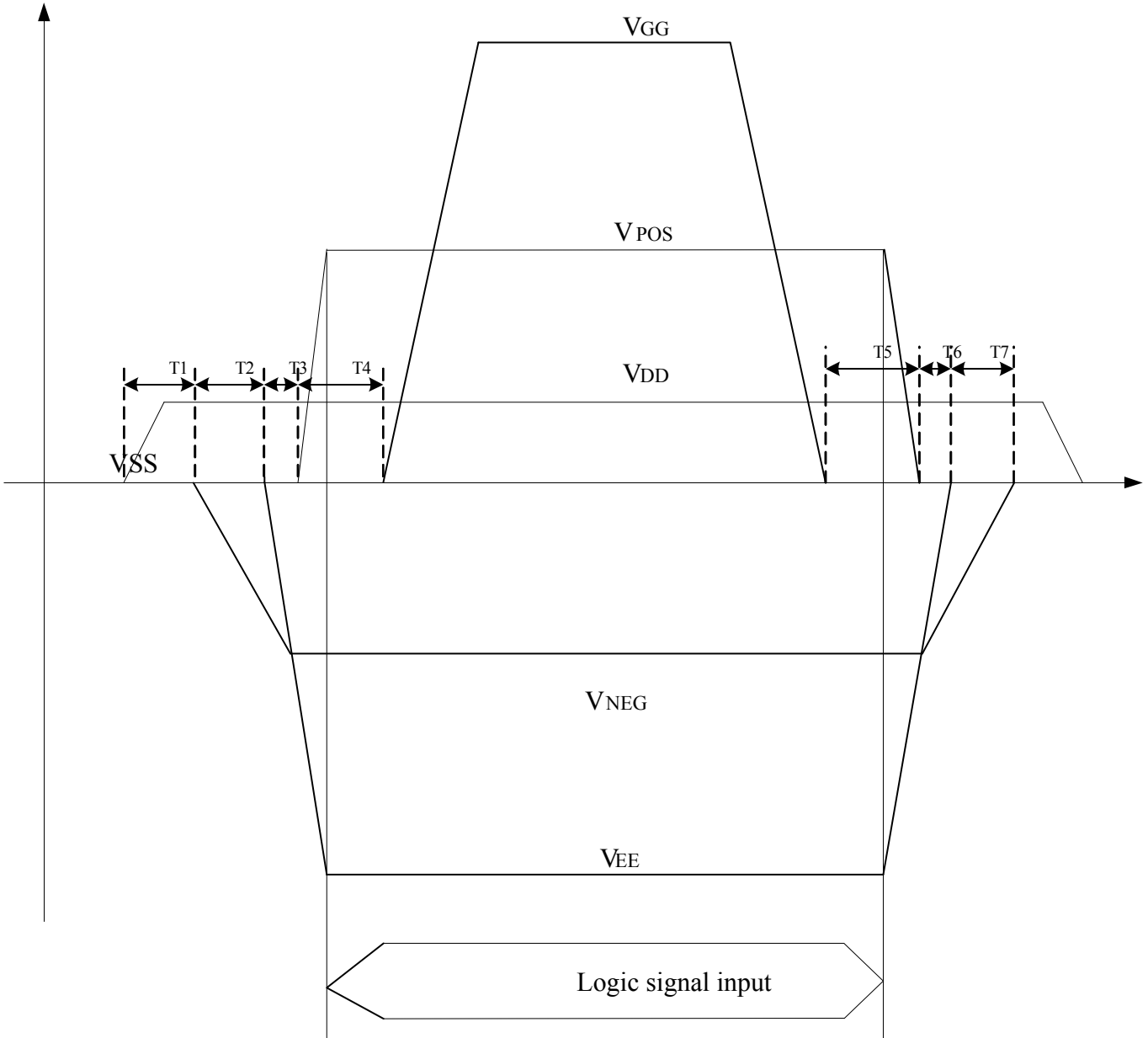
T1: 100μs (min)
T2: 0μs(min)
T3: 1000μs(min)
T4: 0μs(min)
T5: 0μs(min)
T6: 0μs(min)
T7: 0μs(min)

◇ PRIME VIEW

＊It is expanded as blew.

V_{DD}

Sequence

V_{POS}

Sequence

V_{NEG}

Sequence

V_{EE}

Sequence

V_{GG}

Sequence

Logic signal input

Sequence

◆ PRIME VIEW   ED050SC3

8. Optical characteristics

8-1)Specifications

Measurements are made with that the illumination is under an angle of 30 degrees, the detection is perpendicular unless otherwise specified.

$T = 25^{o}C$

| SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT	Note
R	Reflectance	White	30	35	-	%	Note 8-1
Gn	N$_{th}$ Grey Level	-	-	DS+(WS-DS)×n/(m-1)	-	L*	-
CR	Contrast Ratio	-	6	7	-		-
T$_{update}$	Update time	2~4-bit mode 1-bit mode		780 260	- 	ms ms	-

WS: White state , DS: Dark state, Gray state from Dark to White :DS、G1、G2…、Gn…、Gm-2、WS

m:4、8、16   when 2、3、4 bits mode

Note 8-1: Luminance meter :Eye – One Pro Spectrophotometer

8-2)Definition of contrast ratio

The contrast ratio (CR) is the ratio between the reflectance in a full white area (Rl) and the reflectance in a dark area (Rd):
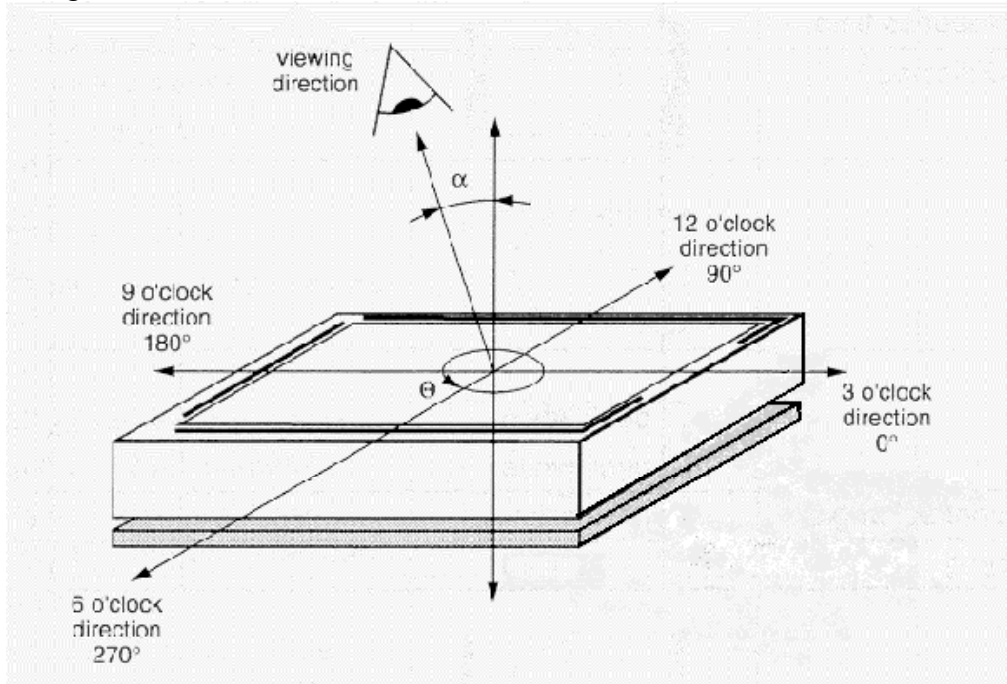
CR = Rl/Rd
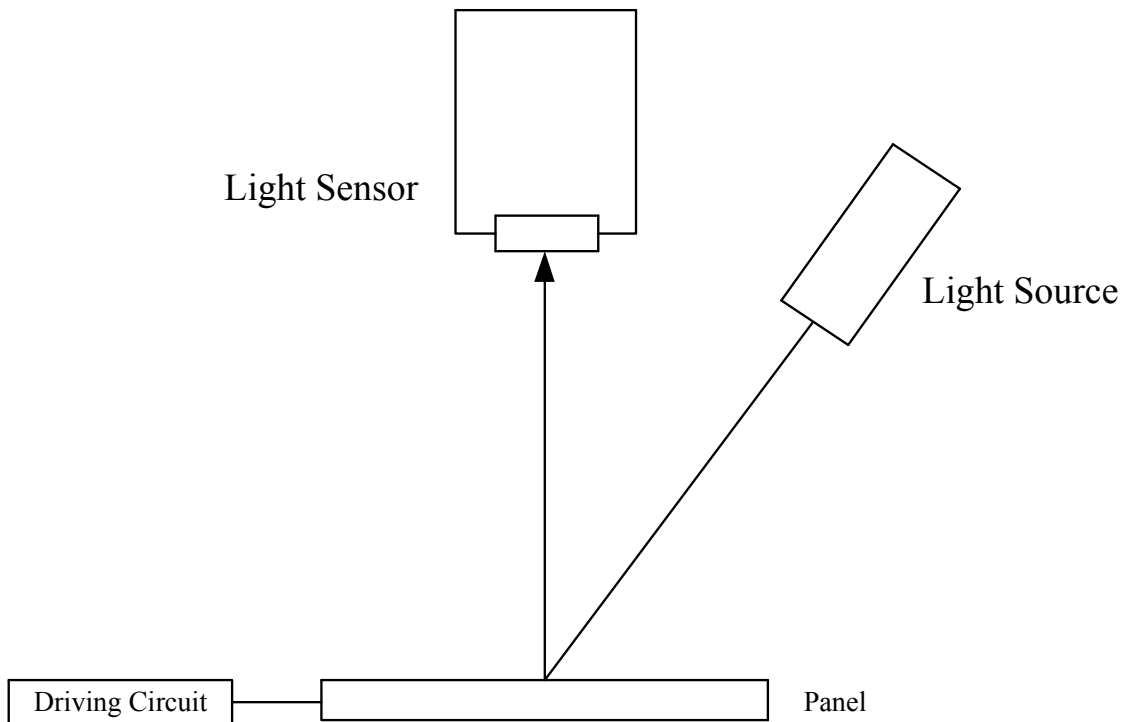
8-3)Reflection Ratio

The reflection ratio is expressed as:

$R = \text{Reflectance Factor}_{\text{white board}} \quad \text{x} \quad (L_{\text{center}} / L_{\text{white board}})$

L_{center} is the luminance measured at center in a white area (R=G=B=1). $L_{\text{white board}}$ is the luminance of a standard white board. Both are measured with equivalent illumination source. The viewing angle shall be no more than 2 degrees.

α = declination   / θ = azimuth

◈ PRIME VIEW

9.HANDLING, SAFETY AND ENVIROMENTAL REQUIREMENTS

WARNING
The display glass may break when it is dropped or bumped on a hard surface. Handle with care. Should the display break, do not touch the electrophoretic material. In case of contact with electrophoretic material, wash with water and soap.

CAUTION
The display module should not be exposed to harmful gases, such as acid and alkali gases, which corrode electronic components.
Disassembling the display module can cause permanent damage and invalidate the warranty agreements.

Observe general precautions that are common to handling delicate electronic components. The glass can break and front surfaces can easily be damaged. Moreover the display is sensitive to static electricity and other rough environmental conditions.

Data sheet status	
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

10. Reliability test

	TEST	CONDITION	METHOD	REMARK
1	High-Temperature Operation	T = +50°C, RH = 30%　for 240 hrs	IEC 60 068-2-2Bp	At the end of the test, electric, mechanical, and optical specifications shall be satisfied.
2	Low-Temperature Operation	T = 0°C for 240 hrs	IEC 60 068-2-2Ab	At the end of the test, electric, mechanical, and optical specifications shall be satisfied.
3	High-Temperature Storage	T = +70°C, RH=23% for 240 hrs (Test In White Pattern)	IEC 60 068-2-2Bp	At the end of the test, electric, mechanical, and optical specifications shall be satisfied.
4	Low-Temperature Storage	T = -25°C for 240 hrs (Test In White Pattern)	IEC 60 068-2-1Ab	At the end of the test, electric, mechanical, and optical specifications shall be satisfied.
5	High-Temperature, High-Humidity Operation	T = +40°C, RH = 90% for 168 hrs	IEC 60 068-2-3CA	At the end of the test, electric, mechanical, specifications shall be satisfied.
6	High Temperature, High- Humidity Storage	T = +50℃, RH=80%　for 240hrs (Test In White Pattern)	IEC 60 068-2-3CA	At the end of the test, electric, mechanical, specifications shall be satisfied.
7	Temperature Cycle	1 cycle:[-25℃ 30min]→[+70℃ 30 min] :100 cycles (Test In White Pattern)	IEC 60 068-2-14	At the end of the test, electric, mechanical, specifications shall be satisfied.
8	UV exposure Resistance	765 W/m^2 for 168hrs,40℃ (Test In White Pattern)	IEC60 068-2-5Sa	Optical characteristics shall be satisfied.
9	Package Vibration	1.04G, Frequency: 10~500Hz Direction: X,Y,Z Duration: 1 hours in each direction	Full packed for shipment	At the end of the test, electric, mechanical, and optical specifications shall be satisfied.
10	Package Drop Impact	Drop from height of 122 cm on concrete surface. Drop sequence: 1 corner, 3 edges, 6 faces One drop for each.	Full packed for shipment	At the end of the test, electric, mechanical, and optical specifications shall be satisfied.
11	Electrostatic Effect (non-operating)	(Machine model)+/- 250V 0Ω, 200pF	IEC 62179, IEC 62180	At the end of the test, electric, mechanical, specifications shall be satisfied.
12	Altitude test Operation	700hPa (= 3000m) 48Hr		At the end of the test, electric, mechanical, specifications shall be satisfied.
13	Altitude test Storage	260hPa (= 10000m) 48Hr (Test In White Pattern)		At the end of the test, electric, mechanical, specifications shall be satisfied.
14	Stylus Tapping	POLYACETAL Pen: Top R:0.8mm Load: 300gf Speed: 2 times/sec Total 13,500times,		Pass criteria – no glass breakage or damage to microcapsules.

Actual EMC level to be measured on customer application

◈ PRIME VIEW

11. Bar Code definition

E0Y	00	4	01	1	I	7	4	00361	A	T
1	2	3	4	2	5	6	2	7	2	8

1 ：EPD model code:

　　ED050SC3:E0Y , E1N

2 ：Internal control codes:

3 ：FPL reversion code

　　V100:3,V110:4

4 ：FPL batch code:

　　(BL/P/B...)001~009:01~99, 100~109:A0~A9, 110-119:B0~B9… 320~329:Z0~Z9

5 ：Year:

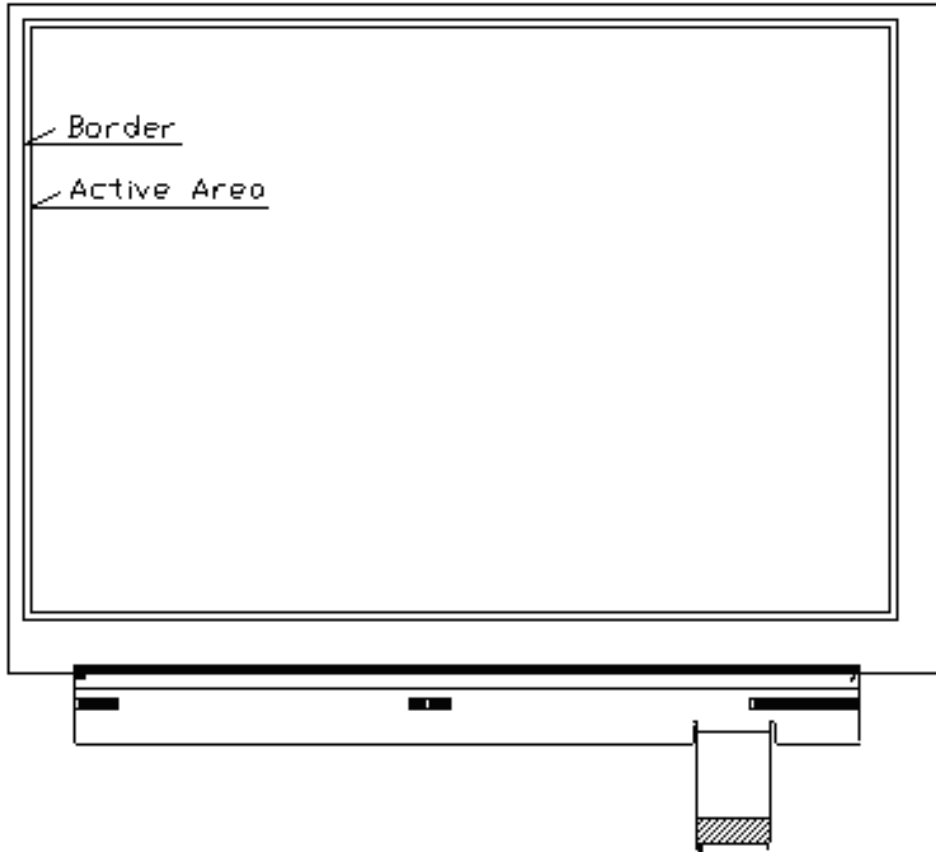　　F:2005 / G:2006 / H:2007 / I:2008 /... / Z:2025

6 ：Month:

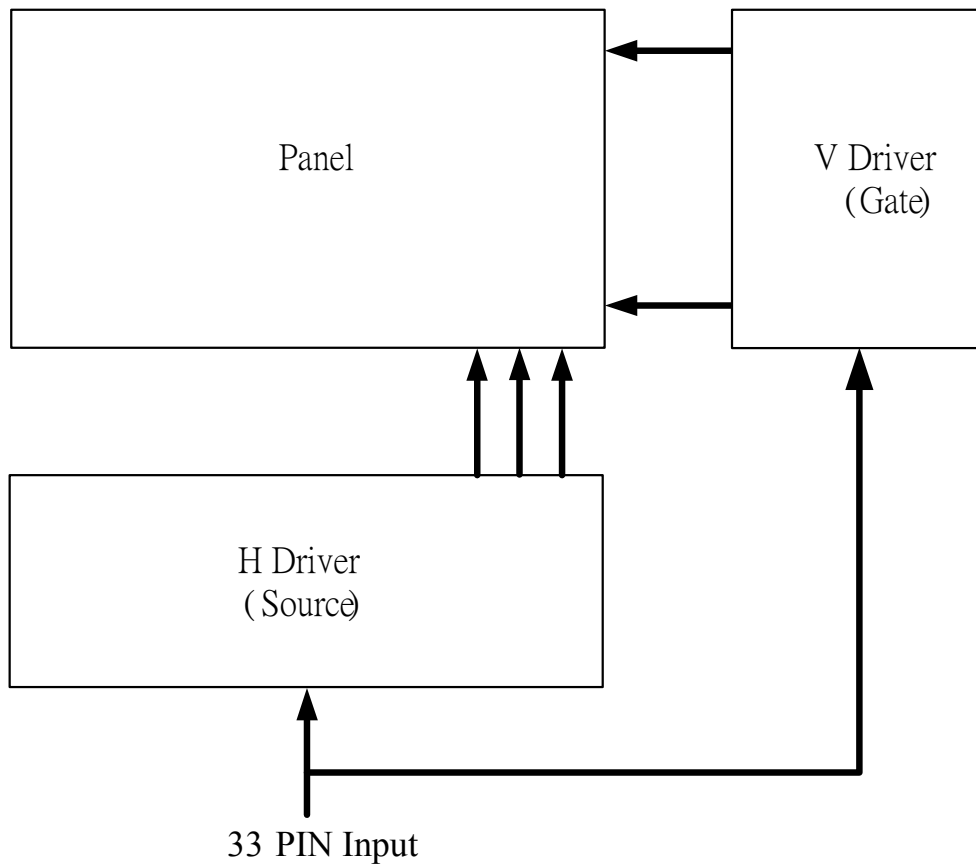　　1:Jan.　2:Feb. ... 9:Sep. A:Oct. B:Nov. C:Dec.

7 ：Serial number

8 ：MFG code:

　　TOC:T, PVI:P

PRIME VIEW

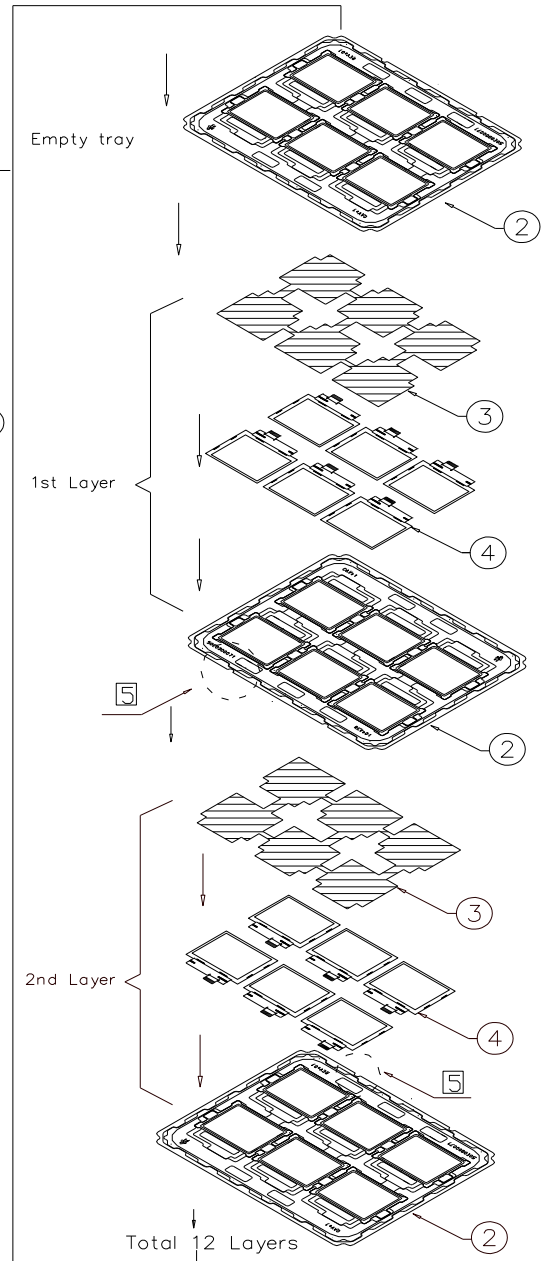## 12. Border definition

13.Block Diagram

PRIME VIEW

14.Packing

REV	DESCRIPTION	DESIGN	DATE
01	INITIAL RELEASE	Jimmyc	'08.08.19
⚠2	Translate Chinese to English of Note: 5	Patrickl	'08.11.06

Empty tray

1st Layer

2nd Layer

Total 12 Layers

6	50-0100091	CARTON INTERNAL	1	
5	50-0500041	摺口袋450*380*700mm	1	抗靜電
4		EPD 5" Panel	72	
3	50E0200031	EPE CUSHION SHEET	12	抗靜電
2	50E0300071	PS TRAY	13	抗靜電
1	50-0300491	EPE FOAM	2	
ITEM	PART NO.	DESCRIPTION	QTY	REMARK
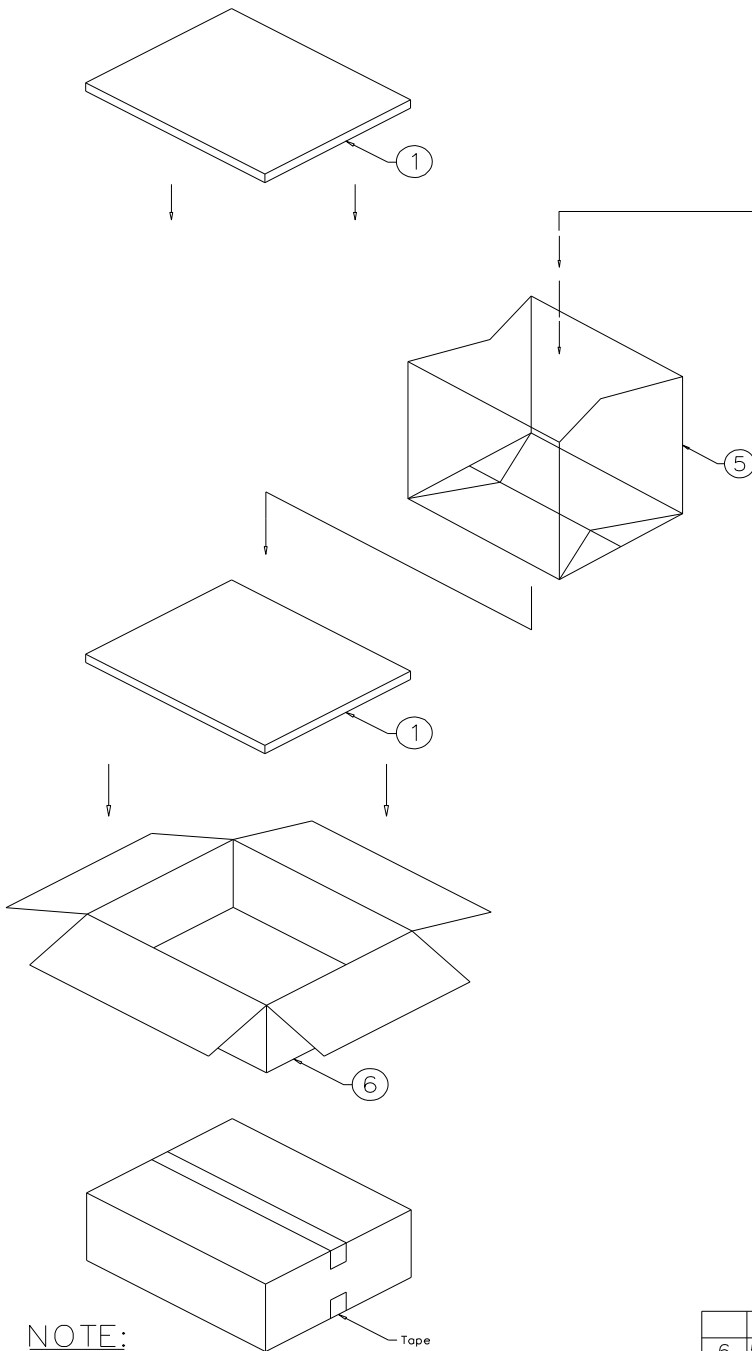
NOTE:
1. One layer include:1 piece of cushion sheet, 6pcs panel & 1 piece of tray.
2. Q'TY: 72 pcs panel/carton.
3. Dimension: 455*375*190mm
4. Weight: 4.7 KG
⚠5 Make sure tray stacked with 180° rotation.
⚠2 We can check this by lateral side view.

Tape

MTL.SPEC.	UNSPECIFIED TOL'S		REMARK	
	ANGLE			
	ROUGHNESS			

元太科技股份有限公司
Prime View Internation Co.,ltd.

APPROVE	Frank Shin	SCALE	UNIT	SHEET	DWG.TITLE
		1:1	mm	1 OF 1	ED050SC3 PACKING DRAW
CHECK	Frank Shin				
DESIGN	Jimmyc	MTL.NO.			DWG.NO.	REV. 02	A4 SIZE