

SPECIFICATIONS

CUSTOMER	:	CES008
SAMPLE CODE	:	SE320240WRF-001-HQ
MASS PRODUCTION CODE	:	PE320240WRF-001-HQ
SAMPLE VERSION	:	03
SPECIFICATIONS EDITION	:	004
DRAWING NO. (Ver.)	:	JLMD- PE320240WRF-001-HQ_002
PACKAGING NO. (Ver.)	:	JPKG- PE320240WRF-001-HQ_001

Customer Approved

Date:



Approved	Checked	Designer
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- ☐ Preliminary specification for design input
☒ Specification for sample approval

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History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
01/25/2006	-	0	Mass production JP70-1,JP71-2,JP72-1,JP73-1,JP74-2 JP75-2,JP76-2,JP77-2 SHORT	-	Yuan
02/18/2008	01	001	Modify 1.6 Backlight Characteristics. Modify 3.2 Inspection Specification. Modify 4.1 Reliability Test Condition.	10 18~23 24	Louis
07/17/2008	01	002	Modify 2.3 Timing Characteristics.	13~17	Louis
10/15/2011	02	003	Modify BL	-	Jacob
02/27/2013	03	004	Change LC	-	Bruce

Total : 29 Page

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Note : For detailed information please refer to IC data sheet :

Sitronix ST8016 , ST8024

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	320 * 240 Dots
LCD Type	FSTN, Positive, Transflective
Driver Condition	LCD Module: 1/240 Duty, 1/15 Bias
Viewing Direction	6 O'clock
Backlight	LED B/L
Weight	150g
Interface	4 bits parallel data input
Controller IC	Driver IC Sitronix ST8024 , ST8016
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer web side : http://www.powertip.com.tw/news/LatestNews.asp

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	143.0 (L) * 96.8 (w) * 12.6(H)(Max)	mm
Viewing Area	106.0 (L) * 81.0 (w)	mm
Active Area	95.985 (L) * 71.985 (w)	mm
Dot Size	0.285 (L) * 0.285 (w)	mm
Dot Pitch	0.30 (L) * 0.30 (w)	mm

Note : For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage	$V_{DD}-V_{SS}$	—	-0.3	+7.0	V
LCD Driver Supply Voltage	$V_0 -V_{SS}$	—	-0.3	+35.0	V
Input Voltage	V_{IN}	—	-0.3	$V_{DD}+0.3$	V
Operating Temperature	T_{OP}	—	-20	70	°C
Storage Temperature.	T_{ST}	—	-30	80	°C
Storage Humidity	H_D	$T_a < 60\text{ }^{\circ}\text{C}$	20	90	%RH

1.4 DC Electrical Characteristics

$V_{DD} = 4.5V \sim 5.5V$, $V_{SS} = 0V$, $T_a = 25^{\circ}C$

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	V_{DD}	—	4.5	5.0	5.5	V
“H” Input Voltage	V_{IH}	—	$0.8 V_{DD}$	—	V_{DD}	V
“L” Input Voltage	V_{IL}	—	V_{SS}	—	$0.2 V_{DD}$	V
“H” Output Voltage	V_{OH}	$I_{OH} = -0.4mA$	$V_{DD} - 0.4$	—	—	V
“L” Output Voltage	V_{OL}	$I_{OL} = +0.4mA$	—	—	0.4	V
Supply current	I_{DD}	$V_{DD} = 5.0V$	-	0.16	0.3	mA
	I_{OP}	$V_{OP} = 21.3V$		4.1	7	
LCM driving voltage	V_{OP} (V_{C9})	$-20^{\circ}C$	22.3	22.5	22.8	V
		$25^{\circ}C$	21.0	21.3	21.5	
		$70^{\circ}C$	19.5	19.7	19.9	

Test condition : M : 35Hz FLM : 70Hz

Note: Need to make sure that there is no flicker and ripper phenomenon when setting the frame frequency in your set

1.5 Optical Characteristics

LCD Panel: 1/240Duty, 1/15Bias, $V_{LCD} = 21.3V$, $T_a = 25^{\circ}C$

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Reference
Response Time	Rise	tr	C≥2.0, ∅ = 270°	-	120	180	ms	Note2
	Fall	tf		-	340	510		
Viewing angle range	Top	ΘY+		-	35	-	Deg.	Notes 1
	Bottom	ΘY-		-	35	-		
	Left	ΘX-		-	40	-		
	Right	ΘX+	-	40	-			
Contrast Ratio		C	θ = 0°, ∅ =270°	-	6	-		Note 3
Average Brightness (with LCD) *1		IV	IF=120mA	40	70	-	cd/m ²	Note 4
CIE Color Coordinate (with LCD)		X		0.28	0.33	0.38	-	
		Y		0.30	0.35	0.40		
Uniformity *2		△B		70	-	-	%	

Note 4 :

1 : $\Delta B = B(\min) / B(\max) * 100\%$

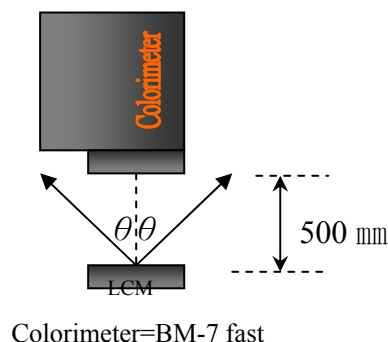
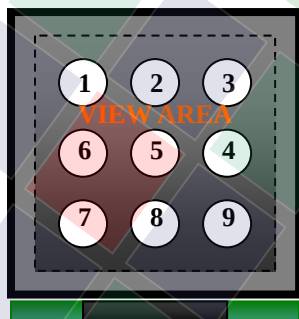
2 : Measurement Condition for Optical Characteristics:

a : Environment: $25^{\circ}C \pm 5^{\circ}C$ / $60 \pm 20\%$ R.H , no wind , dark room below 10 Lux at typical lamp current and typical operating frequency.

b : Measurement Distance: 500 ± 50 mm , ($\theta = 0^{\circ}$)

c : Equipment: TOPCON BM-7 fast , (field 1°) , after 10 minutes operation.

d : The uncertainty of the C.I.E coordinate measurement ± 0.01 , Average Brightness $\pm 4\%$

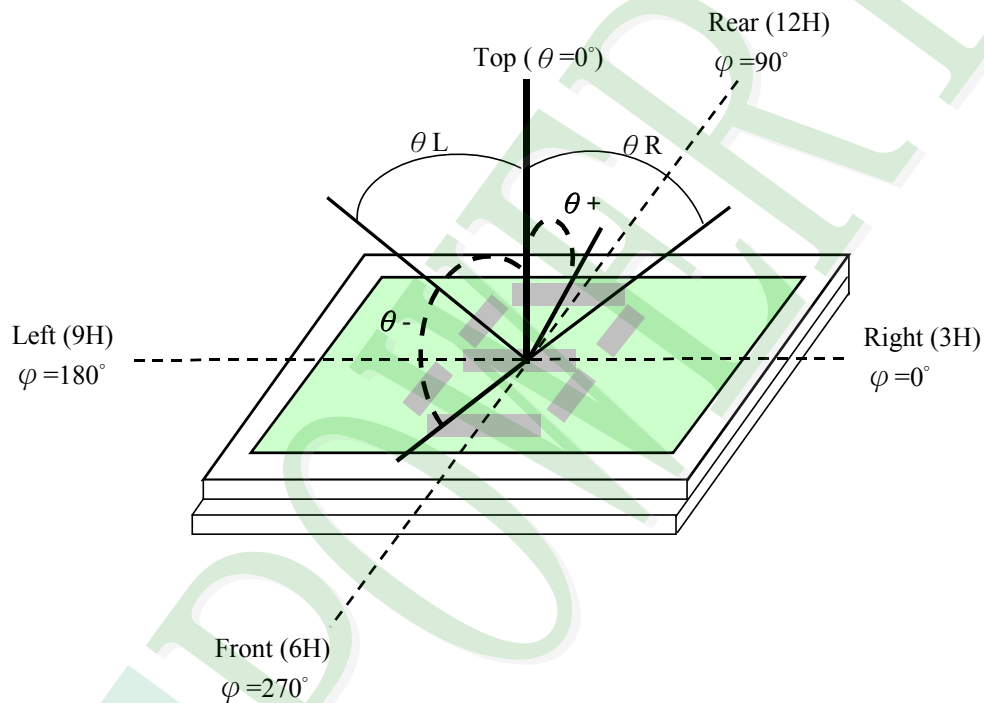




Note 1.

Optical characteristics-2

Viewing angle

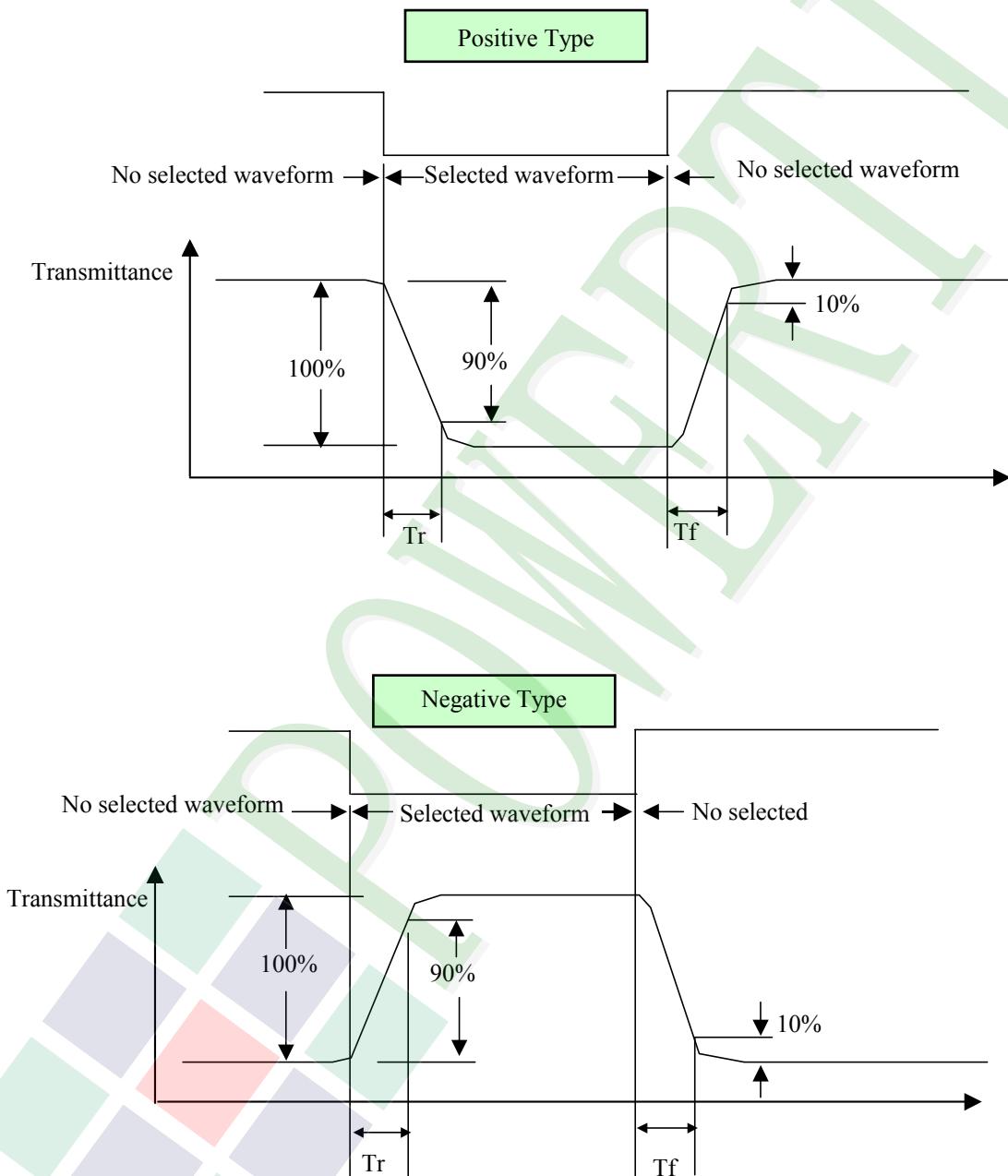




Note 2.

Optical characteristics-3

Fig.2 Definition of response time





Electrical characteristics-2

※2 Drive waveform

V_{op} : Drive voltage

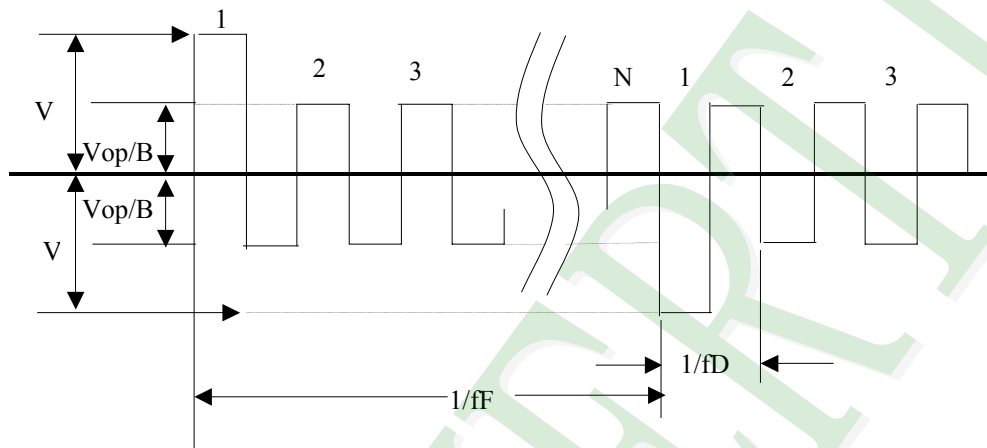
f_F : Frame frequency

$1/B$: Bias

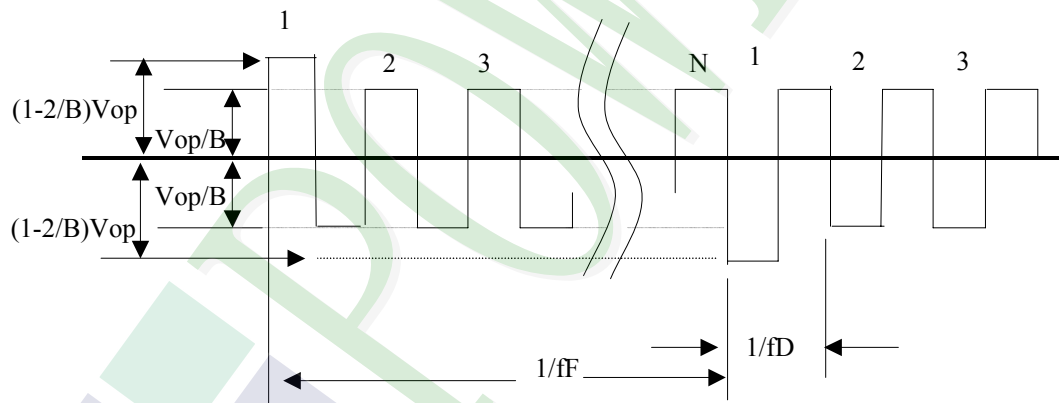
f_D : Drive frequency

N : Duty

(1) Selected waveform



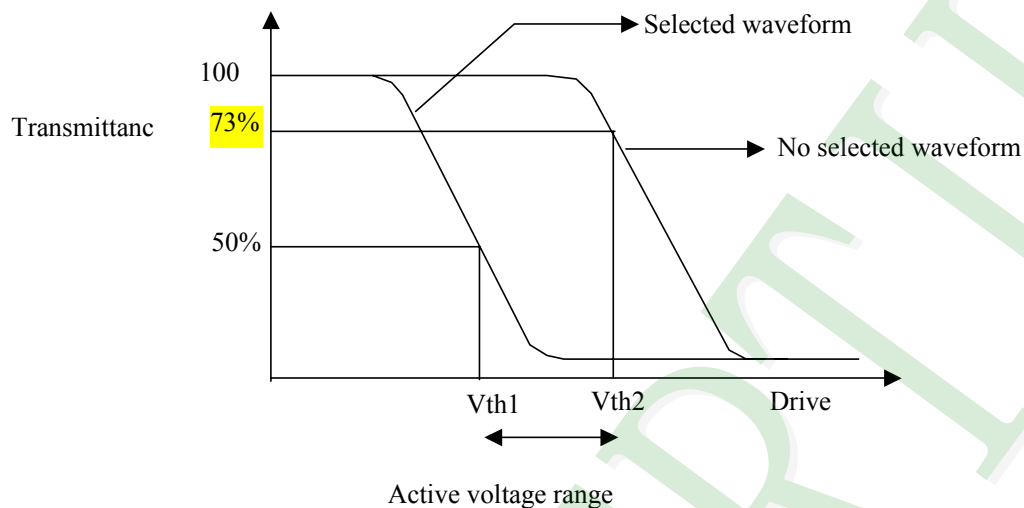
(2) Non- Selected waveform



Note:

Frame frequency is defined as follows: Common side supply voltage peak - to - peak / 2 = 1 period

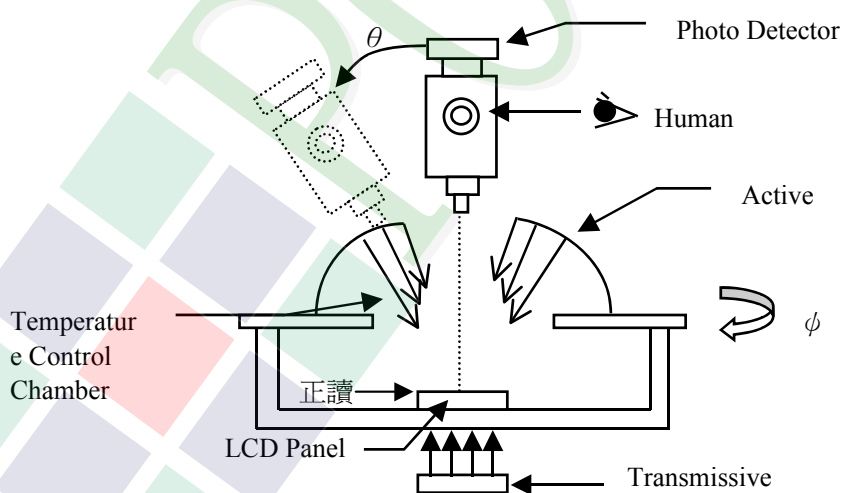
Note 3. : Definition of Vth



	Vth1	Vth2
View direction	10°	40°
Drive waveform	(Selected waveform)	(No selected waveform)
Transmittance	50%	73%

※1 Contrast ratio
= (Brightness in OFF state) / (Brightness in ON state)

Outline of Electro-Optical Characteristics Measuring System



1.6 Backlight Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25℃	—	245	mA
Reverse Voltage	VR	Ta =25℃	—	5	V
Reverse Current	IR	VR=5 V	—	0.35	mA
Power Dissipation	PO	Ta =25℃	—	1.03	W

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	If= 120mA	—	-	4.2	V
Average Brightness	IV	If=120 mA	250	350	—	cd/m ²
CIE Color Coordinate	X	IF=120mA	0.28	-	0.34	-
	Y		0.28	-	0.35	
Uniformity *1	△B	IF=120mA	70	—	—	%
Color	white					

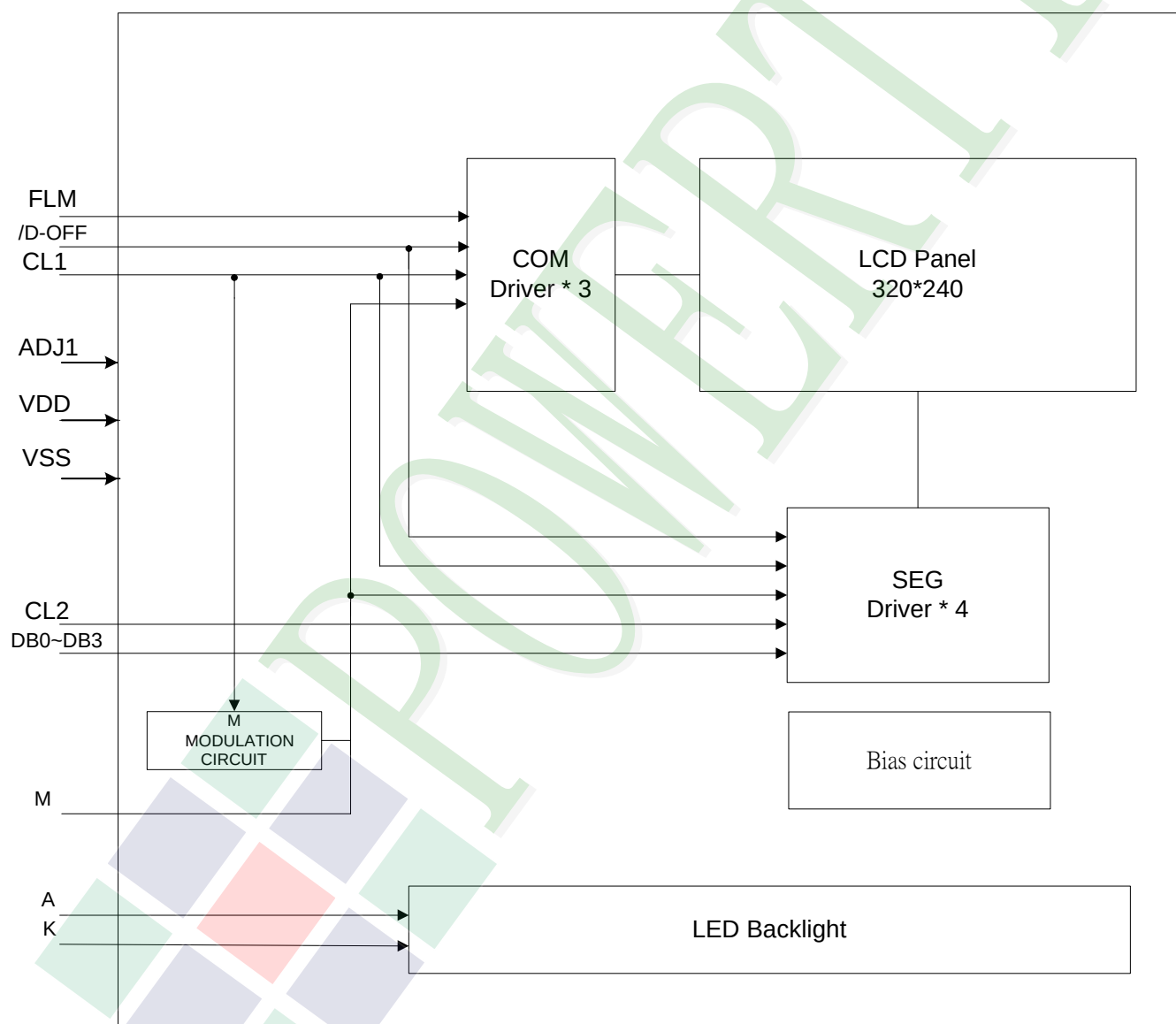
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram

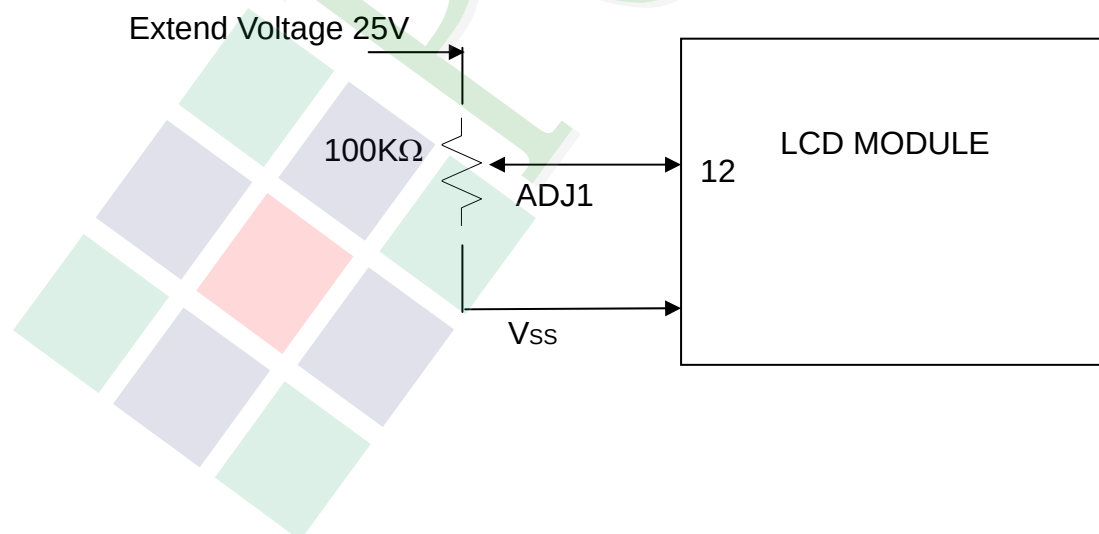


2.2 Interface Pin Description

Pin No.	Symbol	Function
1	FLM	Indicates the beginning of each display cycle.
2	M	Alternation control signal ,No connection , Must be open
3	CL1	The CL1 latches the serial data in the shift registers.
4	CL2	Clock signal for shifting the serial data.
5	/D-OFF	Display enable signal . H:ON L:OFF
6	DB0	Data bit 0 H:ON(White) L:OFF(Black)
7	DB1	Data bit 1 H:ON(White) L:OFF(Black)
8	DB2	Data bit 2 H:ON(White) L:OFF(Black)
9	DB3	Data bit 3 H:ON(White) L:OFF(Black)
10	V _{DD}	Power supply voltage for logic.
11	V _{SS}	Ground
12	V _{SS}	Ground
13	ADJ1	Operating voltage for LCD driving.
14	NC	No connection , Must be open
15	A	Power supply for LED backlight anode input
16	K	Power supply for LED backlight cathode input

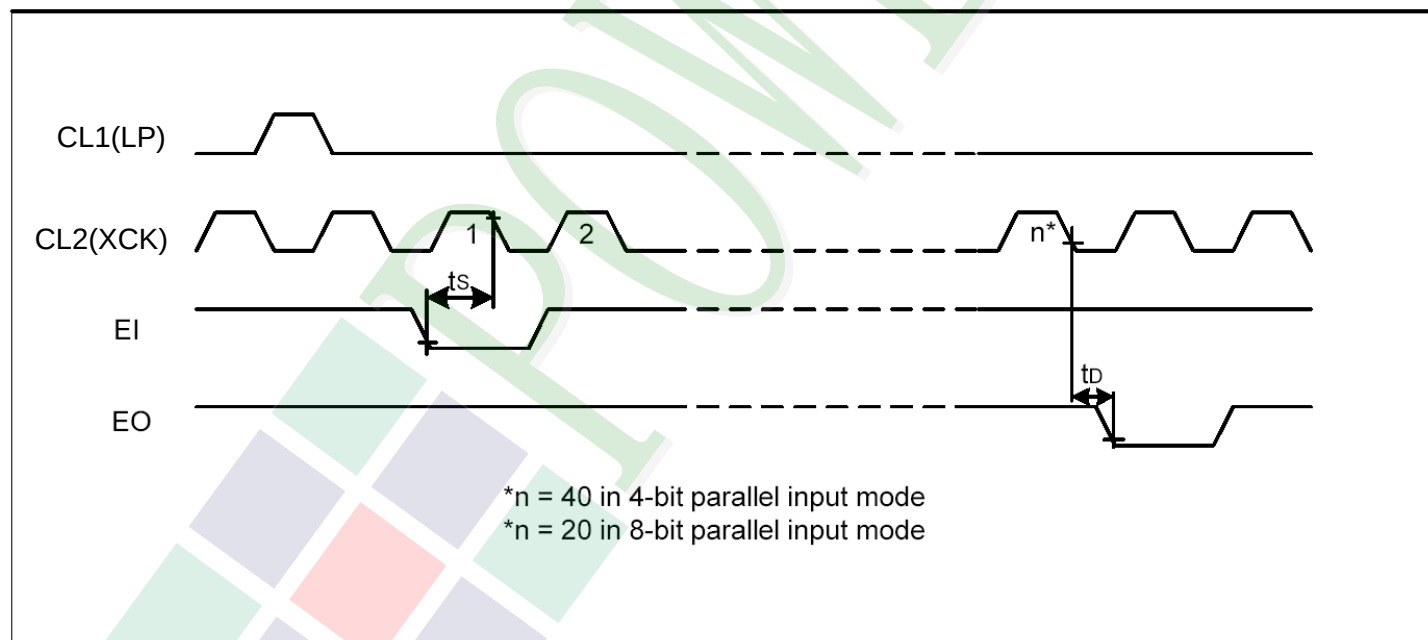
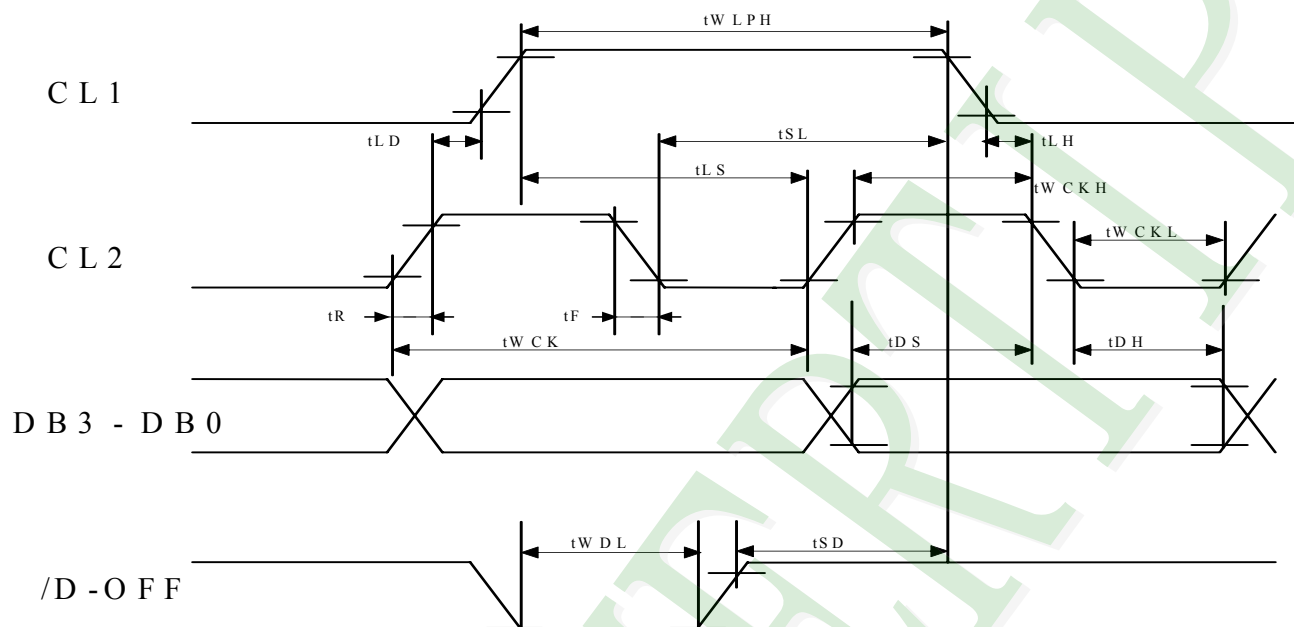
Note : FLM Recommended 55Hz ~ 85Hz

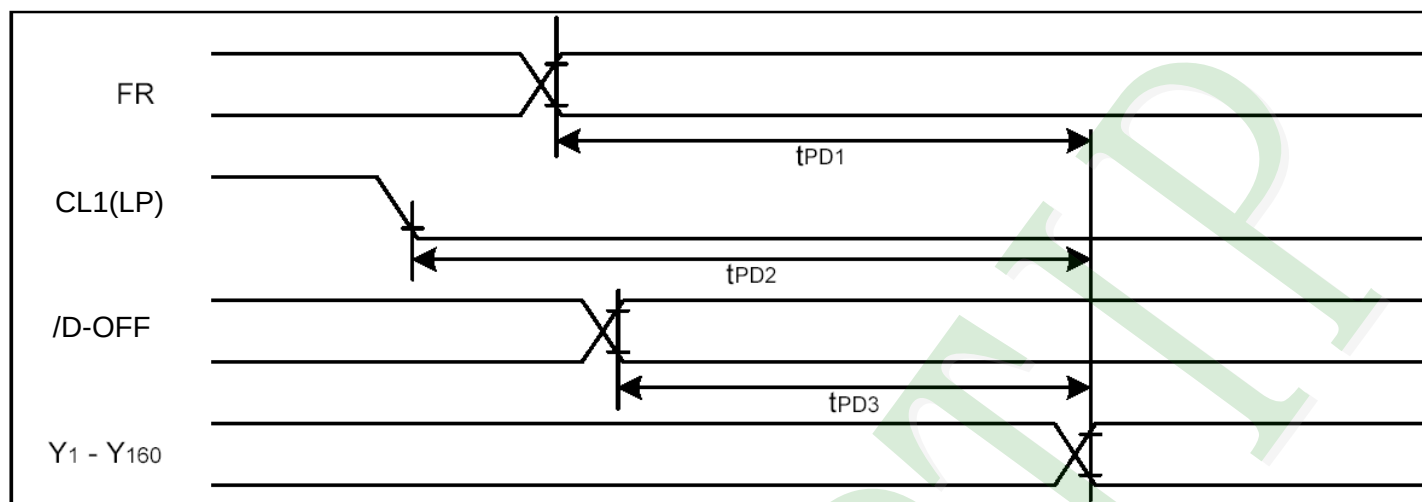
Contrast adjustment



2.3 Timing Characteristics

ST8016 Segment mode





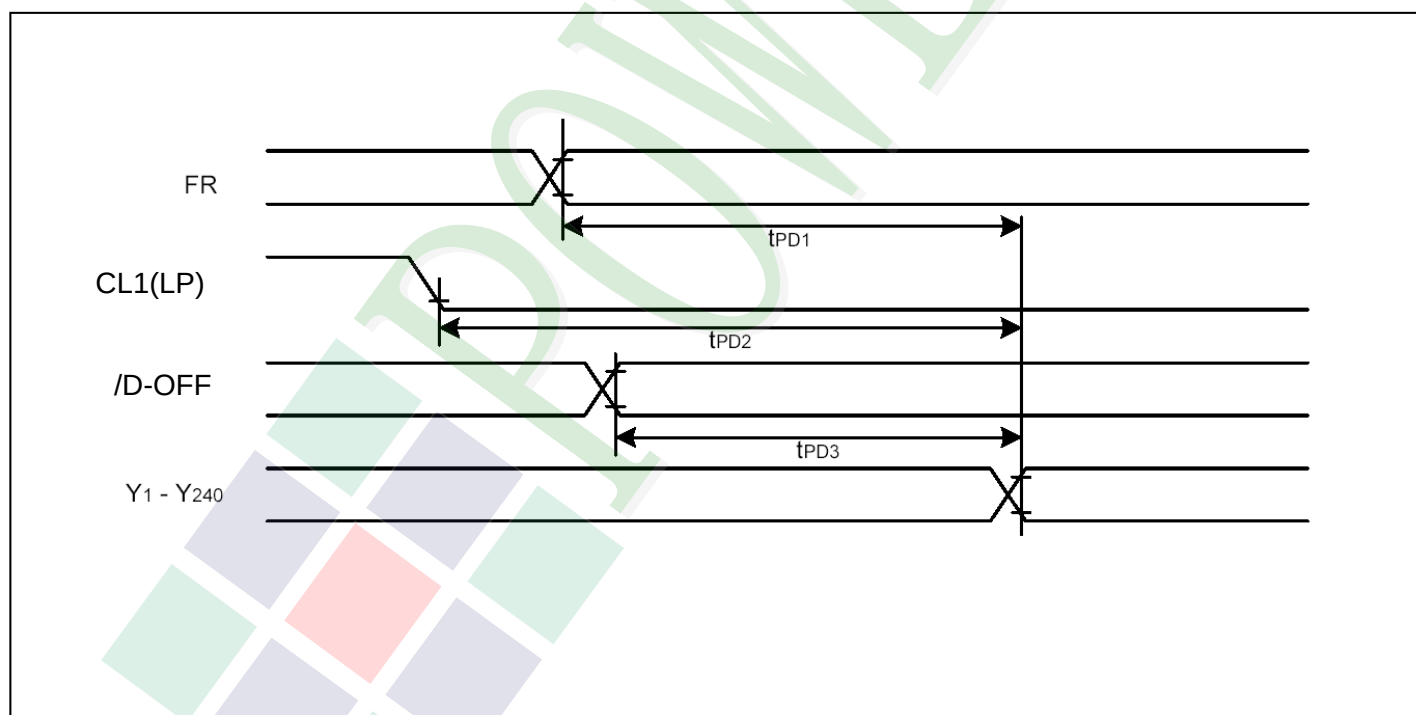
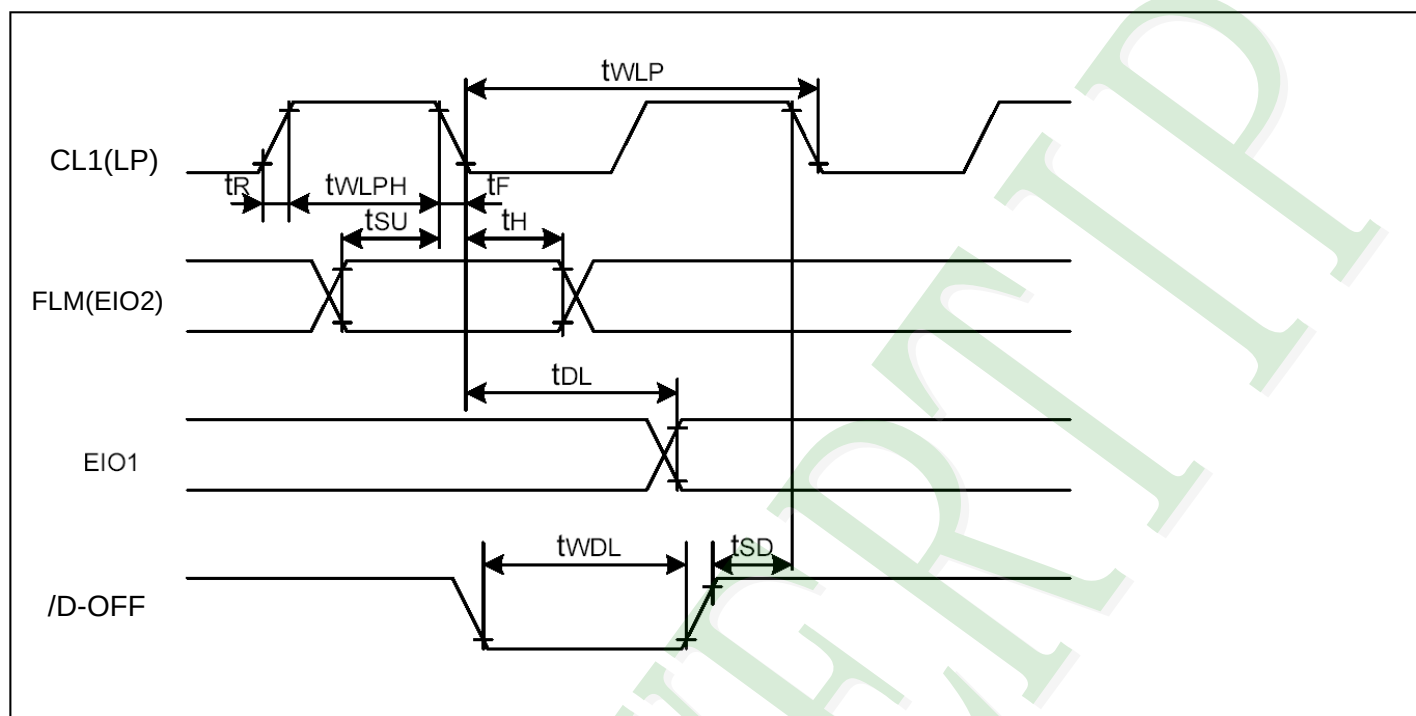
V_{SS}=0V, V_{DD}=4.5V to 5.5V, T_a=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	NOTE
Shift clock period (Note 1)	t _{WCK}	t _r , t _f ≤ 10 ns	66			ns	1
Shift clock "H" pulse width	t _{WCKH}		23			ns	
Shift clock "L" pulse width	t _{WCKL}		23			ns	
Data setup time	t _{DS}		15			ns	
Data hold time	t _{DH}		23			ns	
Latch pulse "H" pulse width	t _{WLPH}		30			ns	
Shift clock rise to Latch pulse rise time	t _{LD}		0			ns	
Shift clock fall to Latch pulse fall time	t _{SL}		50			ns	
Latch pulse rise to Shift clock rise time	t _{LS}		30			ns	
Latch pulse fall to Shift clock fall time	t _{LH}		30			ns	
Enable set time	t _S		15			ns	
Input signal rise time	t _R				50	ns	2
Input signal fall time	t _F				50	ns	2
/Dispoff removal time	t _{SD}		100			ns	
/Dispoff "L" pulse width	t _{WDL}		1.2			us	
Output delay time (1)	t _D	CL=15 pF			4.1	ns	
Output delay time (2)	t _{pd1} , t _{pd2}	CL=15 pF			1.2	us	
Output delay time (3)	t _{pd3}	CL=15 pF			1.2	us	

NOTE:

1. Takes the cascade connection into consideration.
2. (t_{WCK} - t_{WCKH} - t_{WCKL})/2 is maximum in the case of high speed operation.

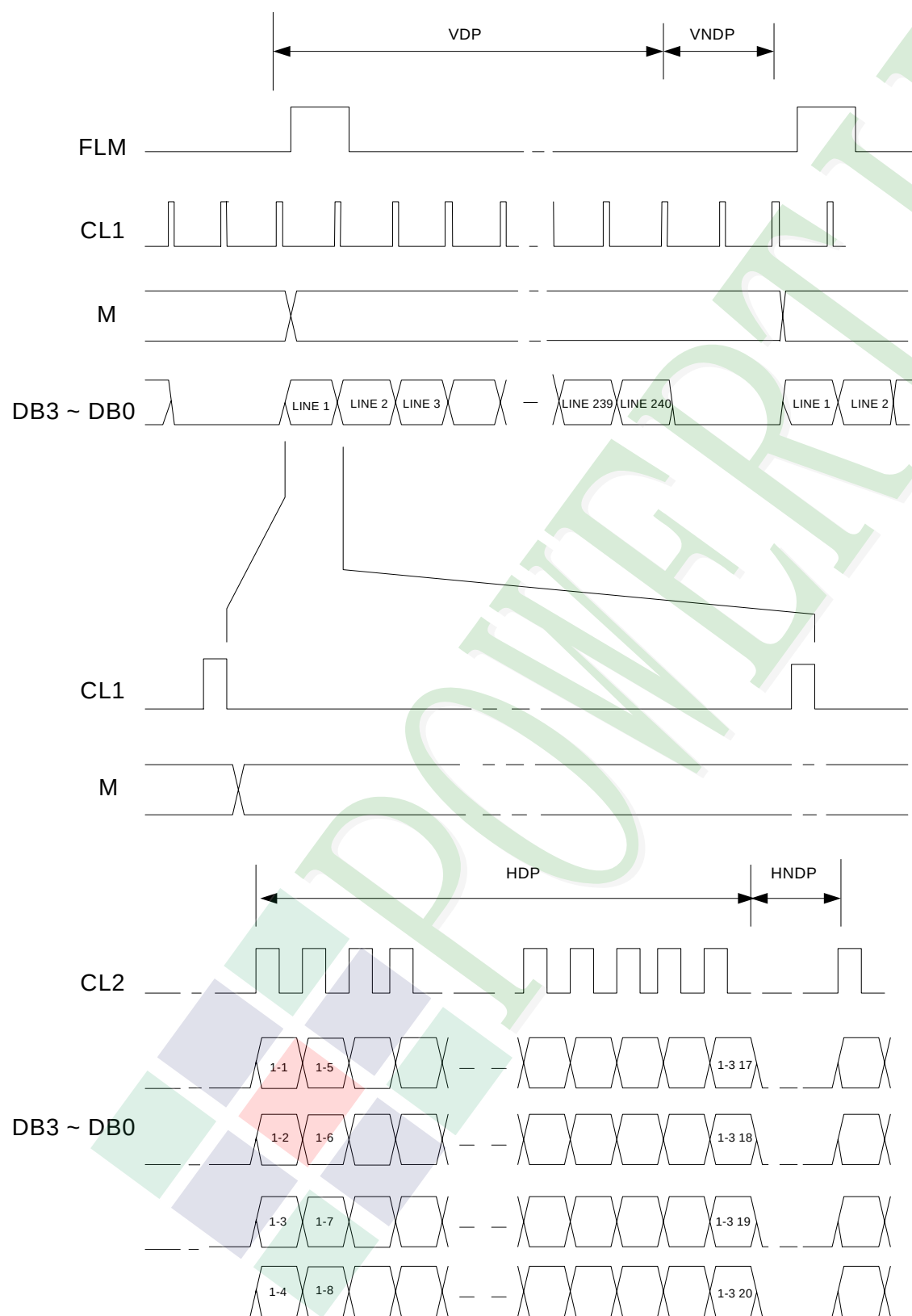
ST8024 Common mode



Vss=0V, Vdd=4.5V to 5.5V, Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Shift clock period	t_{WLP}	$t_R, t_F \leq 20ns$	250			ns
Shift clock "H" pulse width	t_{WLPH}	$V_{DD} = +5.0 \pm 0.5V$	15			ns
		$V_{DD} = +2.5 + 4.5V$	30			ns
Data setup time	t_{SU}		30			ns
Data hold time	t_H		50			ns
Input signal rise time	t_R				50	ns
Input signal fall time	t_F				50	ns
DISPOFF removal time	t_{SD}		100			ns
DISPOFF "L" pulse width	t_{WDL}		1.2			μs
Output delay time (1)	t_{DL}	$CL = 15 pF$			200	ns
Output delay time (2)	t_{PD1}, t_{PD2}	$CL = 15 pF$			1.2	μs
Output delay time (3)	t_{PD3}	$CL = 15 pF$			1.2	μs

4 Bits Panel Timing



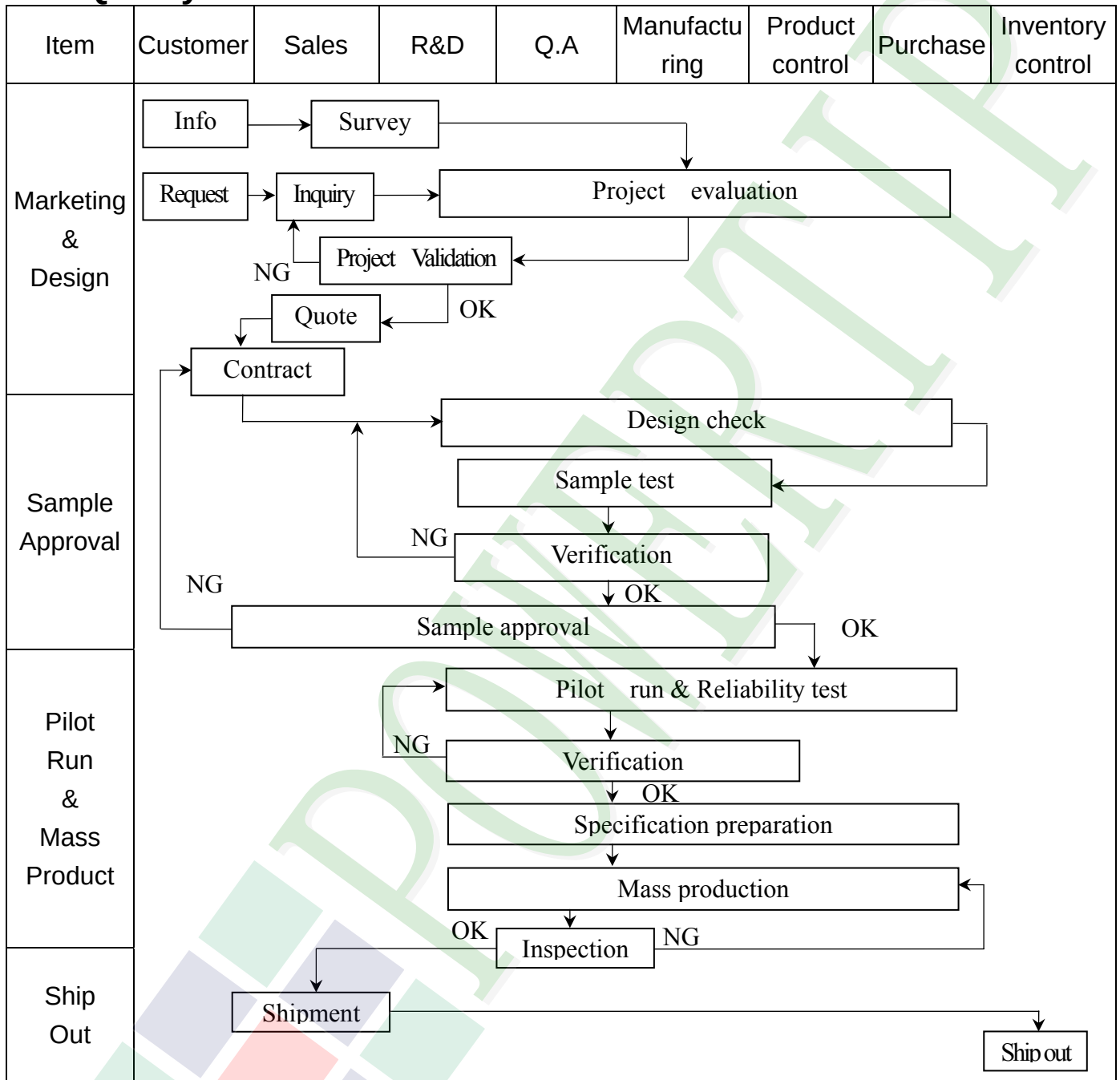
2.4 JUMPER(Setting different use)

JP70-1,JP71-2,JP72-1,JP73-1,JP74-2,JP75-2,JP76-2,JP77-2 SHORT



3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart





Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	<pre>graph TD; Info[Info] --> Claim[Claim]; Claim --> Failure[Failure analysis]; Failure --> Report[Analysis report]; Failure --> Action[Corrective action]; Action --> Tracking[Tracking];</pre>							
Q.A Activity	1. ISO 9001 Maintenance Activities 3. Equipment calibration 5. Standardization Management				2. Process improvement proposal 4. Education And Training Activities			

3.2 Inspection Specification

◆ Scope : The document shall be applied to LCD Module for Monotype and Color STN(Ver. B01).

◆ Inspection Standard : MIL-STD-105E Table Normal Inspection Single Sampling Level II .

◆ Equipment : Gauge 、 MIL-STD 、 Powertip Tester 、 Sample

◆ Defect Level : Major Defect AQL : 0.4 ; Minor Defect : AQL : 1.5 .

◆ OUT Going Defect Level : Sampling .

◆ Manner of appearance test :

(1). The test be under 20W×2 fluorescent light ' and distance of view must be at 30 cm.

(2). Standard of inspection : (Unit : mm)

(3). The test direction is base on about around 45° of vertical line. (Fig. 1)

(4). Definition of area . (Fig. 2)

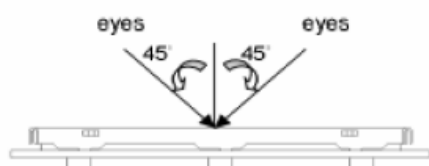


Fig.1

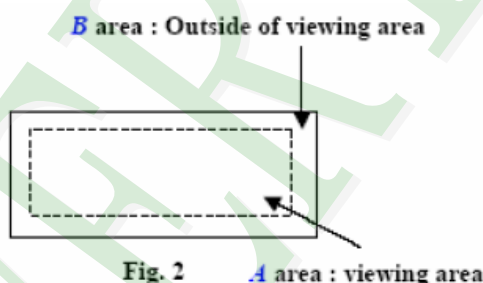


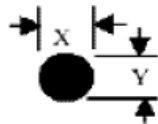
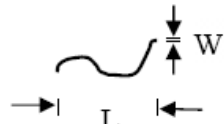
Fig. 2

◆ Specification:

NO	Item	Criterion	Level
01	Product condition	1. 1 The part number is inconsistent with work order of Production.	Major
		1. 2 Mixed production types.	Major
		1. 3 Assembled in inverse direction.	Major
02	Quantity	2. 1 The quantity is inconsistent with work order of production.	Major
03	Outline dimension	3. 1 Product dimension and structure must conform to Structure diagram.	Major
04	Electrical Testing	4. 1 Missing line character and icon.	Major
		4. 2 No function or no display.	Major
		4. 3 Output data is error.	Major
		4. 4 LCD viewing angle defect.	Major
		4. 5 Current consumption exceeds product specifications.	Major

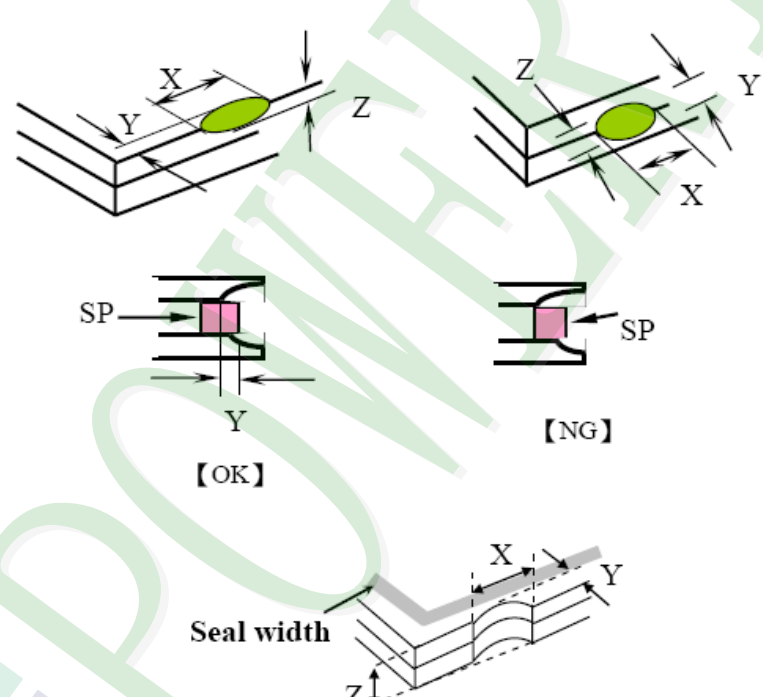
◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level																			
05	Black or white dot 、 scratch 、 contamination	5. 1 Round type: 5. 1. 1 display only : • White and black spots on display ≤ 0.30 mm , no more than 4 white or black spots present. • Densely spaced : NO more than two spots or lines within 3 mm. 5. 1. 2 Non-display :	Minor																			
	Round type	<table><tr><th rowspan="2">Dimension (diameter : Φ)</th><th colspan="2">Acceptance (Q'ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td>$\Phi \leq 0.10$</td><td>Accept no dense</td><td rowspan="4">Ignore</td></tr><tr><td>$0.10 < \Phi \leq 0.20$</td><td>3</td></tr><tr><td>$0.20 < \Phi \leq 0.30$</td><td>2</td></tr><tr><td>Total quantity</td><td>4</td></tr></table>		Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.10$	Accept no dense	Ignore	$0.10 < \Phi \leq 0.20$	3	$0.20 < \Phi \leq 0.30$	2	Total quantity	4					
	Dimension (diameter : Φ)	Acceptance (Q'ty)																				
		A area		B area																		
	$\Phi \leq 0.10$	Accept no dense		Ignore																		
$0.10 < \Phi \leq 0.20$	3																					
$0.20 < \Phi \leq 0.30$	2																					
Total quantity	4																					
																						
$\Phi=(x+y)/2$																						
Line type	<table><tr><th colspan="2">Dimension</th><th colspan="2">Acceptance (Q'ty)</th></tr><tr><th>Length (L)</th><th>Width (W)</th><th>A area</th><th>B area</th></tr><tr><td>---</td><td>$W \leq 0.03$</td><td>Accept no dense</td><td rowspan="4">Ignore</td></tr><tr><td>$L \leq 3.0$</td><td>$0.03 < W \leq 0.05$</td><td rowspan="2">4</td></tr><tr><td>$L \leq 2.5$</td><td>$0.05 < W \leq 0.075$</td></tr><tr><td>---</td><td>$W > 0.075$</td><td colspan="2">As round type</td></tr></table>	Dimension		Acceptance (Q'ty)		Length (L)	Width (W)	A area	B area	---	$W \leq 0.03$	Accept no dense	Ignore	$L \leq 3.0$	$0.03 < W \leq 0.05$	4	$L \leq 2.5$	$0.05 < W \leq 0.075$	---	$W > 0.075$	As round type	
Dimension		Acceptance (Q'ty)																				
Length (L)	Width (W)	A area	B area																			
---	$W \leq 0.03$	Accept no dense	Ignore																			
$L \leq 3.0$	$0.03 < W \leq 0.05$	4																				
$L \leq 2.5$	$0.05 < W \leq 0.075$																					
---	$W > 0.075$	As round type																				
																						
06	Polarizer Bubble	<table><tr><th rowspan="2">Dimension (diameter : Φ)</th><th colspan="2">Acceptance (Q'ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td>$\Phi \leq 0.20$</td><td>Accept no dense</td><td rowspan="5">Ignore</td></tr><tr><td>$0.20 < \Phi \leq 0.50$</td><td>3</td></tr><tr><td>$0.50 < \Phi \leq 1.00$</td><td>2</td></tr><tr><td>$\Phi > 1.00$</td><td>0</td></tr><tr><td>Total quantity</td><td>4</td></tr></table>	Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.20$	Accept no dense	Ignore	$0.20 < \Phi \leq 0.50$	3	$0.50 < \Phi \leq 1.00$	2	$\Phi > 1.00$	0	Total quantity	4	Minor			
		Dimension (diameter : Φ)		Acceptance (Q'ty)																		
			A area	B area																		
		$\Phi \leq 0.20$	Accept no dense	Ignore																		
		$0.20 < \Phi \leq 0.50$	3																			
		$0.50 < \Phi \leq 1.00$	2																			
		$\Phi > 1.00$	0																			
Total quantity	4																					

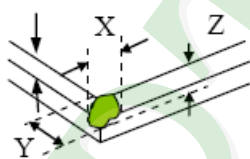
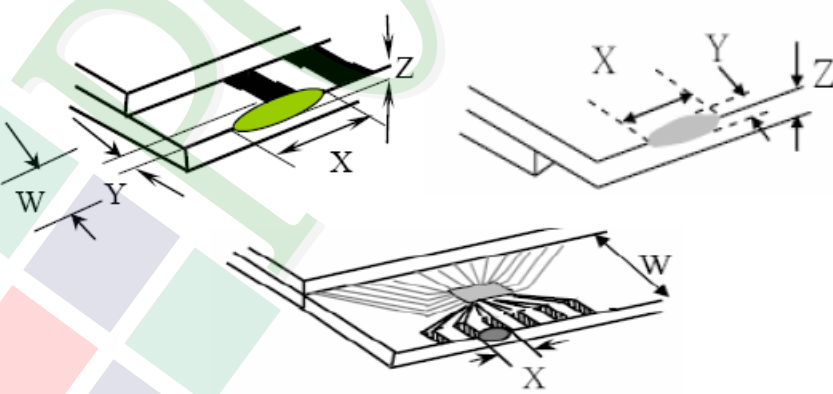
◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level						
07	The crack of glass	Symbols : X : The length of crack Z : The thickness of crack t : The thickness of glass Y : The width of crack. W : terminal length a : LCD side length	Minor						
		7.1 General glass chip : 7.1.1 Chip on panel surface and crack between panels:  <table><thead><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>$\leq a$</td><td>Crack can't enter viewing area</td><td>$\leq 1/2 t$</td></tr><tr><td>$\leq a$</td><td>Crack can't exceed the half of SP width.</td><td>$1/2 t < Z \leq 2 t$</td></tr></tbody></table>		X	Y	Z	$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$
X	Y	Z							
$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$							
$\leq a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$							

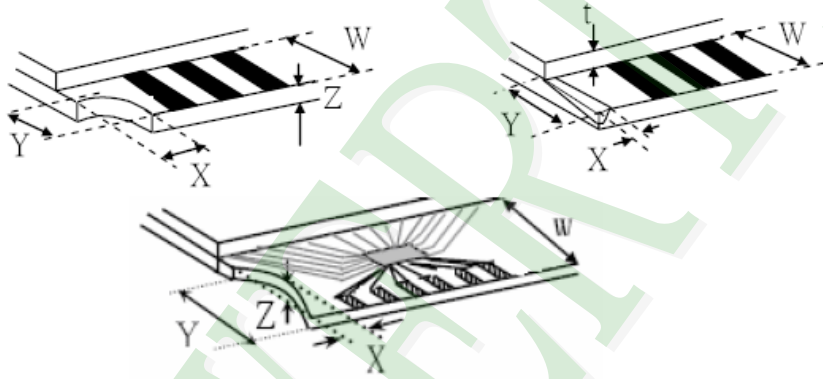
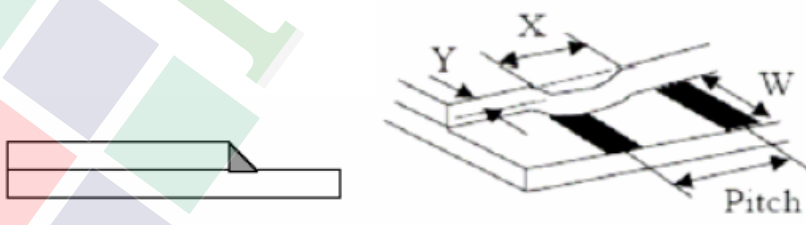
◆Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level									
07	The crack of glass	Symbols : X : The length of crack Z : The thickness of crack t : The thickness of glass Y : The width of crack. W : terminal length a : LCD side length 7.1.2 Corner crack :  <table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td>$\leq 1/5 a$</td><td>Crack can't enter viewing area</td><td>$Z \leq 1/2 t$</td></tr><tr><td>$\leq 1/5 a$</td><td>Crack can't exceed the half of SP width.</td><td>$1/2 t < Z \leq 2 t$</td></tr></table>	X	Y	Z	$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$	$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$	Minor
		X	Y	Z								
$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$										
$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$										
7.2 Protrusion over terminal : 7.2.1 Chip on electrode pad :  <table><tr><th></th><th>X</th><th>Y</th><th>Z</th></tr><tr><td>Front</td><td>$\leq a$</td><td>$\leq 1/2 W$</td><td>$\leq t$</td></tr><tr><td>Back</td><td colspan="3">Neglect</td></tr></table>		X	Y	Z	Front	$\leq a$	$\leq 1/2 W$	$\leq t$	Back	Neglect		
	X	Y	Z									
Front	$\leq a$	$\leq 1/2 W$	$\leq t$									
Back	Neglect											

◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level									
07	The crack of glass	Symbols : X : The length of crack Z : The thickness of crack t : The thickness of glass Y : The width of crack. W : terminal length a : LCD side length	Minor									
		7.2.2 Non-conductive portion :  <table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td>$\leq 1/3 a$</td><td>$\leq W$</td><td>$\leq t$</td></tr></table> ⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. 7.2.3 Glass remain :  <table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td>$\leq a$</td><td>$\leq 1/3 W$</td><td>$\leq t$</td></tr></table>		X	Y	Z	$\leq 1/3 a$	$\leq W$	$\leq t$	X	Y	Z
X	Y	Z										
$\leq 1/3 a$	$\leq W$	$\leq t$										
X	Y	Z										
$\leq a$	$\leq 1/3 W$	$\leq t$										

◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level
08	Backlight elements	8. 1 Backlight can't work normally.	Major
		8. 2 Backlight doesn't light or color is wrong.	Major
		8. 3 Illumination source flickers when lit.	Major
09	General appearance	9. 1 Pin type must match type in specification sheet.	Major
		9. 2 No short circuits in components on PCB or FPC.	Major
		9. 3 Product packaging must the same as specified on packaging specification sheet.	Minor
		9. 4 The folding and peeled off in polarizer are not acceptable.	Minor
		9. 5 The PCB or FPC between B/L assembled distance (PCB or FPC) is ≤ 1.5 mm.	Minor

4. RELIABILITY TEST

4.1 Reliability Test Condition

(Ver.B01)

NO.	TEST ITEM	TEST CONDITION											
1	High Temperature Storage Test	Keep in 80 ±2℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.											
2	Low Temperature Storage Test	Keep in -30 ±2℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.											
3	High Temperature / High Humidity Storage Test	Keep in 60 ℃ / 90% R.H duration for 96 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer)											
4	Temperature Cycling Storage Test	-30℃ → +25℃ → 80℃ → +25℃ (30mins) (5mins) (30mins) (5mins) 10 Cycle Surrounding temperature, then storage at normal condition 4hrs.											
5	ESD Test	Air Discharge: Apply 2 KV with 5 times Discharge for each polarity +/-	Contact Discharge: Apply 250 V with 5 times discharge for each polarity +/-										
		1. Temperature ambience : 15℃ ~35℃ 2. Humidity relative : 30% ~60% 3. Energy Storage Capacitance(Cs+Cd) : 150pF±10% 4. Discharge Resistance(Rd) : 330 Ω±10% 5. Discharge, mode of operation : Single Discharge (time between successive discharges at least 1 sec) (Tolerance if the output voltage indication : ±5%)											
6	Vibration Test (Packaged)	1. Sine wave 10~55 Hz frequency (1 min/sweep) 2. The amplitude of vibration :1.5 mm 3. Each direction (X、Y、Z) duration for 2 Hrs											
7	Drop Test (Packaged)	<table><tr><th>Packing Weight (Kg)</th><th>Drop Height (cm)</th></tr><tr><td>0 ~ 45.4</td><td>122</td></tr><tr><td>45.4 ~ 90.8</td><td>76</td></tr><tr><td>90.8 ~ 454</td><td>61</td></tr><tr><td>Over 454</td><td>46</td></tr></table>		Packing Weight (Kg)	Drop Height (cm)	0 ~ 45.4	122	45.4 ~ 90.8	76	90.8 ~ 454	61	Over 454	46
		Packing Weight (Kg)	Drop Height (cm)										
0 ~ 45.4	122												
45.4 ~ 90.8	76												
90.8 ~ 454	61												
Over 454	46												
		Drop Direction :※1 corner / 3 edges / 6 sides each 1time											

5. PRECAUTION RELATING PRODUCT HANDLING

5.1 SAFETY

- 5.1.1 If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.
- 5.1.2 If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

5.2 HANDLING

- 5.2.1 Avoid any strong mechanical shock which can break the glass.
- 5.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module , be sure to ground your body and any electrical equipment you may be using.
- 5.2.3 Do not remove the panel or frame from the module.
- 5.2.4 The polarizing plate of the display is very fragile. So , please handle it very carefully ,do not touch , push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)
- 5.2.5 Do not wipe the polarizing plate with a dry cloth , as it may easily scratch the surface of plate.
- 5.2.6 Do not touch the display area with bare hands , this will stain the display area.
- 5.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

5.3 STORAGE

- 5.3.1 Store the panel or module in a dark place where the temperature is $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and the humidity is below 65% RH.
- 5.3.2 Do not place the module near organics solvents or corrosive gases.
- 5.3.3 Do not crush , shake , or jolt the module.

5.4 TERMS OF WARRANTY

- 5.4.1 Applicable warrant period
The period is within thirteen months since the date of shipping out under normal using and storage conditions.
- 5.4.2 Unaccepted responsibility
This product has been manufactured to your company's specification as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment , we cannot take responsibility if the product is used in nuclear power control equipment , aerospace equipment , fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.

Ver.001

Documents NO. JPKG-PE320240WRF-001-HQ

LCM包裝規格書
LCM Packaging Specifications

Approve

Check

Contact

Ryan

Eddy

Terry

1.包裝材料規格表 (Packaging Material) : (per carton)

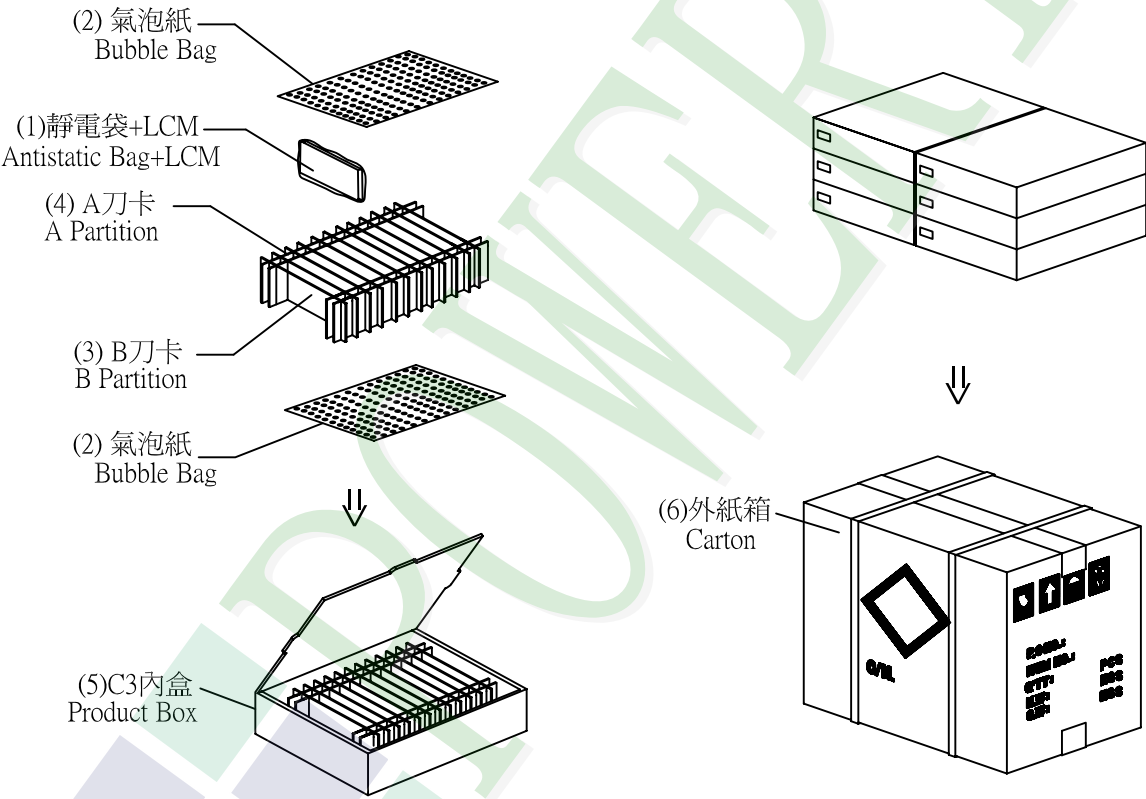
No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PE320240WRF-001-HQ	143.0*96.8*12.6max	0.155	66	10.23
2	靜電袋(1)Antistatic Bag	BAG170150BRABA	170*150*0.05	0.0045	66	0.297
3	氣泡紙(2)Bubble Bag	BAG290240BRBBA	290*240*5	0.0029	12	0.0348
4	A刀卡(3) Partition	BX00000000050	295*105*3.5	0.020	24	0.48
5	B刀卡(4)Partition	BX00000000051	245*105*3.5	0.0165	72	1.188
6	C3內盒(5)Product Box	BX31025511AABA	310*255*116	0.2140	6	1.284
7	外紙箱(6)Carton	BX52532536CCBA	525* 325 *360	1.0920	1	1.092
8						
9						

2.一整箱總重量 (Total LCM Weight in carton) : 14.61 Kg±10%

3.單箱數量規格表 (Packaging Specifications and Quantity) :

(1)Quantity Of Spacer : A刀卡 X 12 , B刀卡 X 4

(2)Total LCM quantity in carton : quantity per box 11 x no. of boxes 6 = 66



特 記 事 項 (REMARK)

1. Label Specifications :

MODEL:

LOT NO:

QUANTITY:

CHECK:

LCD面朝外,最後一欄面朝內
前,后各空一欄