



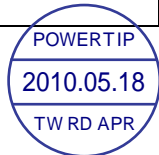
SPECIFICATIONS

CUSTOMER	:	PTC
SAMPLE CODE	:	PS320240WRF-008H01
MASS PRODUCTION CODE	:	PE320240WRF-008-HQ
SAMPLE VERSION	:	03
SPECIFICATIONS EDITION	:	005
DRAWING NO. (Ver.)	:	LMD-PE320240WRF-008-HQ (Ver.001)
PACKAGING NO. (Ver.)	:	PKG-PE320240WRF-008-HQ (Ver.002)

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
10/30/2007	01	0	New drawing.	-	Louis
11/02/2007	01	A	Modify FFC Design.	Appendix	Louis
02/12/2009	01	001	First Sample.	-	Louis
05/06/2009	02	002	Modify B/L. Modify 1.6 Backlight Characteristics.	- 11	Louis
05/26/2009	02	003	Modify LCM Packaging Specifications. Modify 4.1 Reliability Test Condition.	Appendix 27~28	Louis
10/09/2009	02	004	Modify 3.2 Inspection Specification. Modify 4.1 Reliability Test Condition.	21~26 27	Louis
05/17/2010	03	005	Modify 1.5 Optical Characteristics (Modify PLZ)	P.6	Timter

Total : 28 Page



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Note : For detailed information please refer to IC data sheet : NOVATEK --- NT7711H-D
NT7712H-D

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, 1/13 Bias
Viewing Direction	6 O'clock
Backlight	LED B/L
Weight	180 g
Interface	4 bits parallel data input
Driver IC	NT7711H-D, NT7712H-D
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	167.0 (L) * 111.0 (w) * 7.5 (H)	mm
Viewing Area	120.2 (L) * 90.0 (w)	mm
Active Area	115.185 (L) * 86.385 (w)	mm
Dot Size	0.345 (L) * 0.345 (w)	mm
Dot Pitch	0.36(L) * 0.36 (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_{op}	—	-0.3	+38	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

$V_{DD} = 2.9V \sim 5.5V$, $V_{SS} = 0V$, $T_a = 25^\circ C$

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	VDD	-	2.9	5.0	5.5	V
“H” Input Voltage	V _{IH}	-	0.8 V _{DD}	-	-	V
“L” Input Voltage	V _{IL}	-	-	-	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} = 3V ; V _{OP} = 23.0V; Pattern= Full display	-	0.1	-	mA
		V _{DD} = 3V ; V _{OP} = 23.0V; Pattern= Net dots*1	-	0.1	0.3	
Supply Current	I _{dd}	V _{DD} = 5V ; V _{OP} = 23.0V; Pattern= Full display	-	0.1	-	mA
		V _{DD} = 5V ; V _{OP} = 23.0V; Pattern= Net dots *1	-	0.3	0.5	
Supply Current	I _{op}	V _{DD} = 3V ; V _{OP} = 23.0V; Pattern= Full display	-	1.5	-	mA
		V _{DD} = 3V ; V _{OP} = 23.0V; Pattern= Horizontal line*1	-	5	10	
Supply Current	I _{op}	V _{DD} = 5V ; V _{OP} = 23.0V; Pattern= Full display	-	1.5	-	mA
		V _{DD} = 5V ; V _{OP} = 23.0V; Pattern= Horizontal line*1	-	5	10	
LCM Driver Voltage	V _{OP} *2	-20°C	24.0	24.2	24.4	V
		25°C	22.7	23.0	23.3	
		70°C	21.9	22	22.1	

NOTE: *1 The Maximum current display;

*2 The VOP test point is VOP+ ~VOP-.

1.5 Optical Characteristics

LCD Panel: 1/240 Duty, 1/13 Bias, $V_{op} = 23\text{ V}$, $T_a = 25^\circ\text{C}$

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Reference	
Response Time	Rise	tr	25°C	-	140	210	ms	Note 2
	Fall	tf	25°C	-	370	555		
Viewing angle range	Top	$\Theta Y+$	$C \geq 2.0$, $\varnothing = 270^\circ$	-	35	-	-	Note 1
	Bottom	$\Theta Y-$		-	35	-		
	Left	$\Theta X-$		-	35	-		
	Right	$\Theta X+$		-	40	-		
Contrast Ratio	CR	$\theta = 0^\circ$, $\varnothing = 270^\circ$	2	4	-	-	Note 4	
Average Brightness (With B/L)	IV	IF= 160mA	50	60	-	cd/m^2	-	
CIE Color Coordinate (With B/L)	X		0.26	0.31	0.36	-	Note 4	
	Y	0.28	0.33	0.38				
Uniformity	ΔB	IF= 160mA	70	-	-	%	-	

Note 4:

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

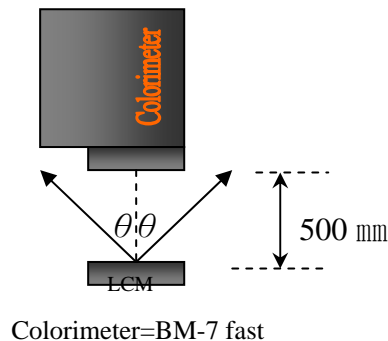
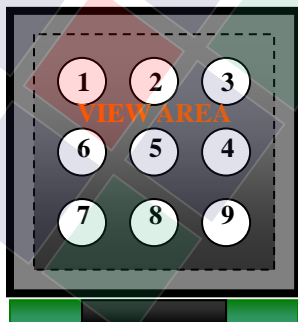
2 : Measurement Condition for Optical Characteristics:

a : Environment: 25 ± 5 / $60 \pm 20\%$ 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 $\pm 4\%$

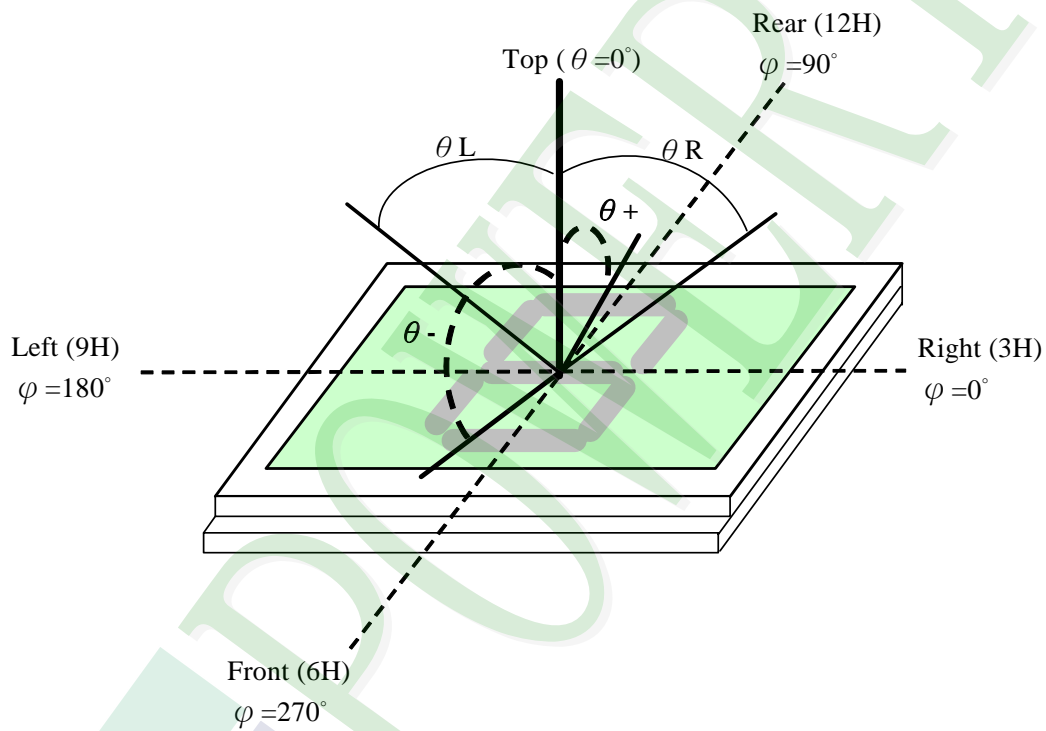




Note 1.

Optical characteristics-2

Viewing angle



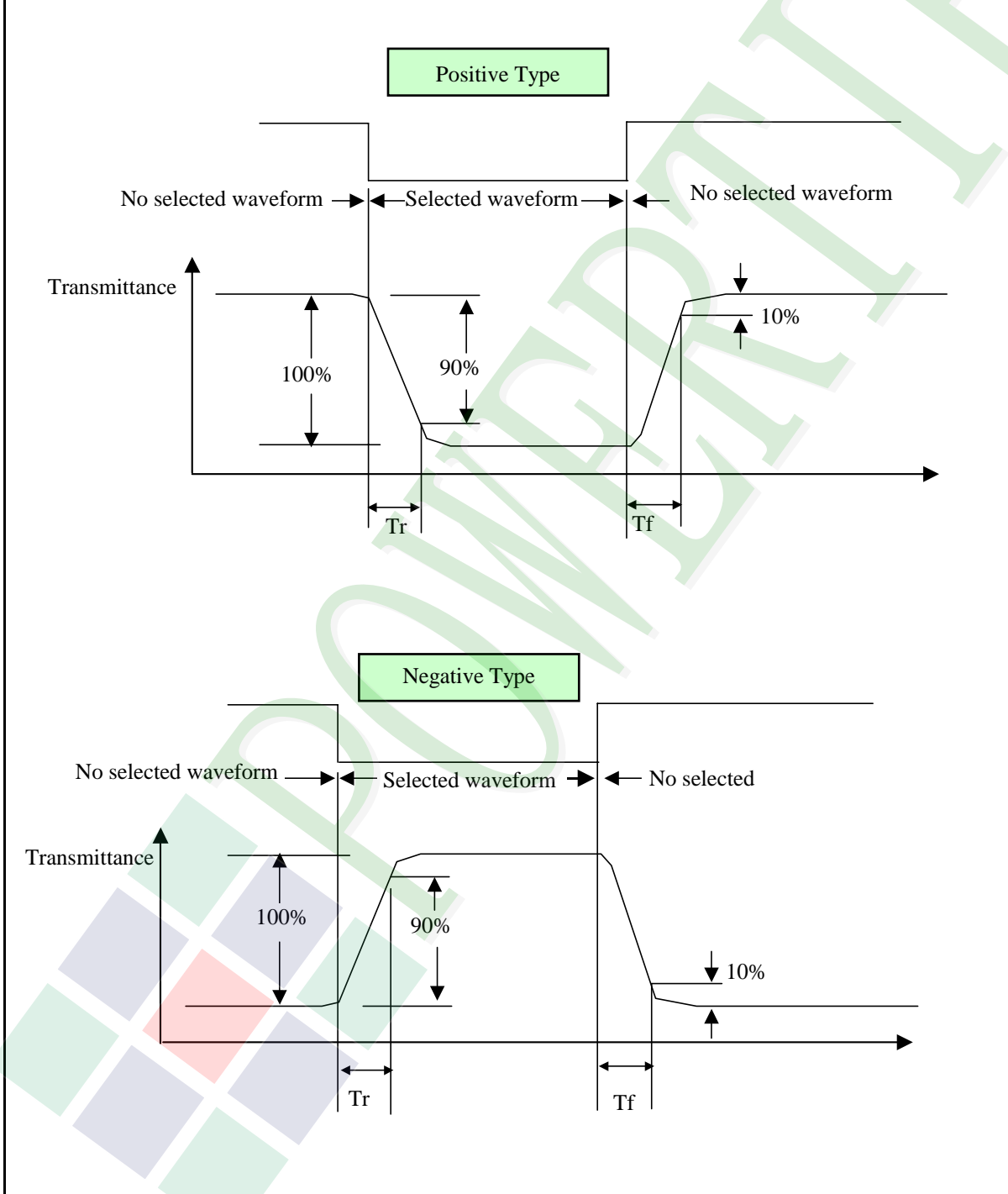
Viewing angle



Note 2.

Optical characteristics-3

Fig.2 Definition of response time





Electrical characteristics-2

2 Drive waveform

V_{op} : Drive voltage

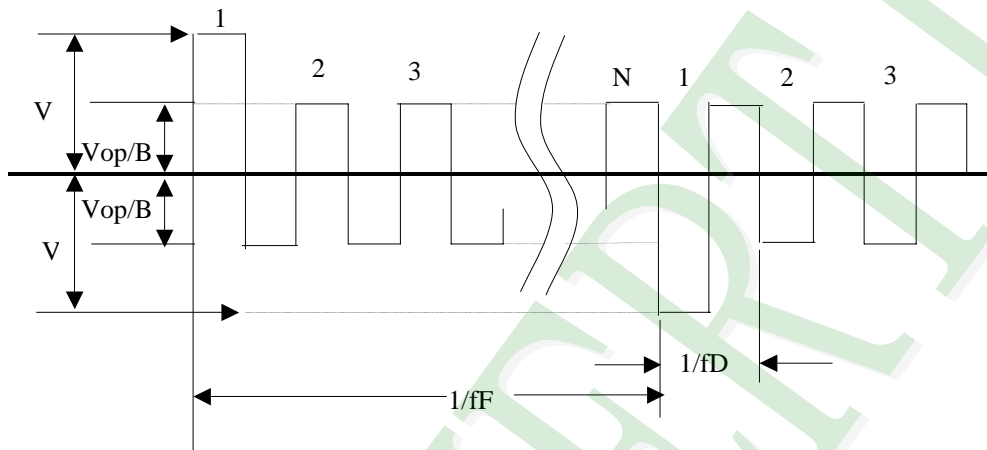
f_F : Frame frequency

$1/B$: Bias

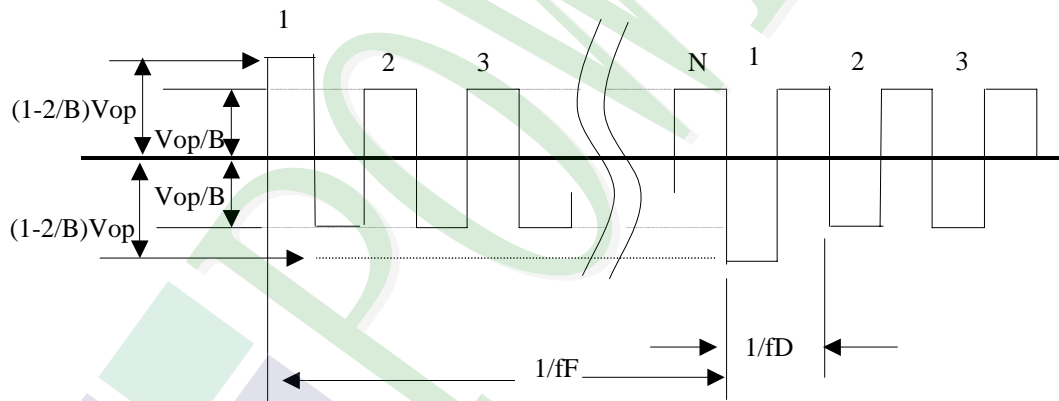
f_D : Drive frequency

N : Duty

(1) Selected waveform



(2) Non- Selected wave form

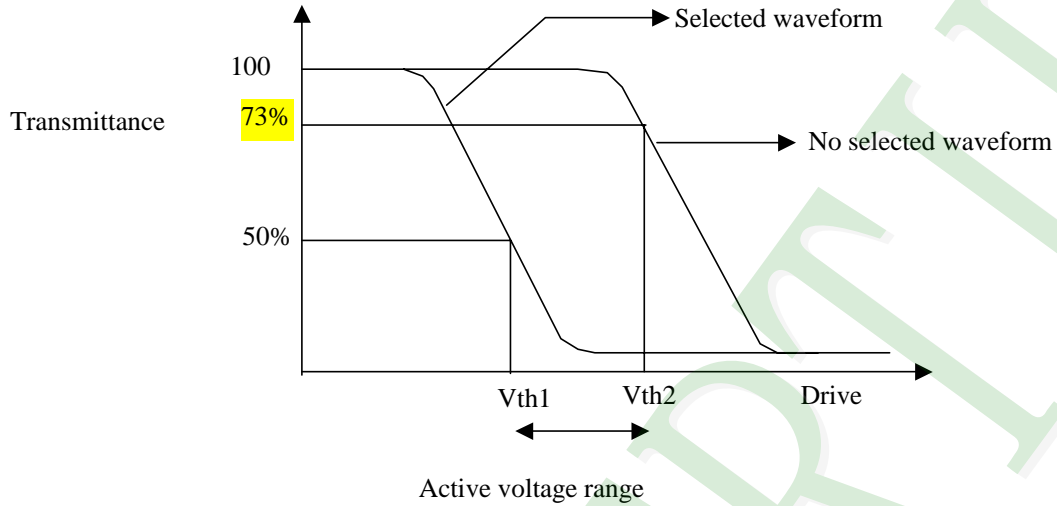


Note:

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



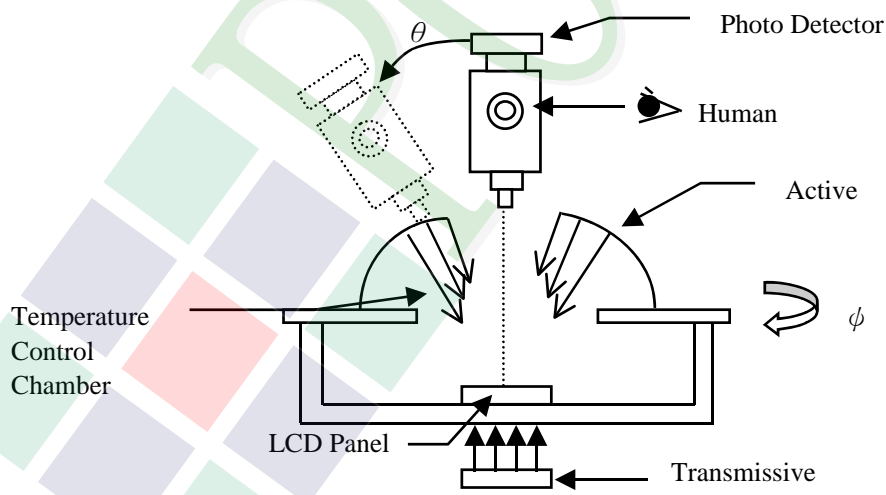
Note 3. : Definition of Vth



	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



Measuring System: Autronic DMS-803

1.6 Backlight Characteristics

LCD Module with LED Backlight

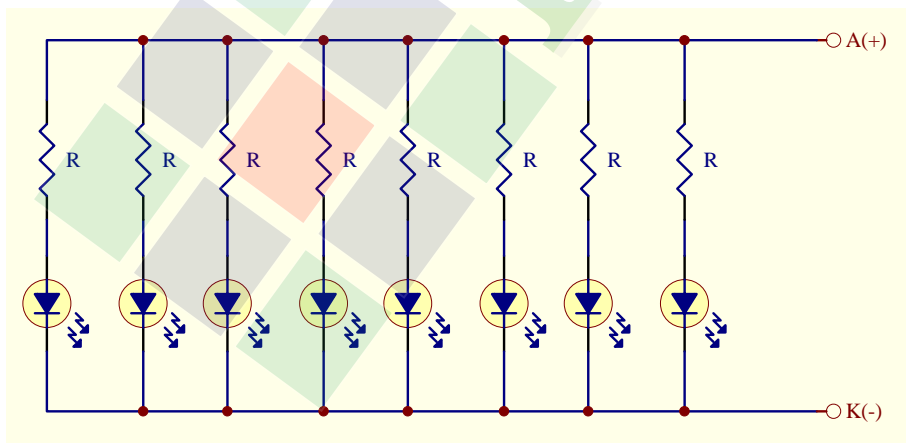
Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	I_F	$T_a = 25^\circ\text{C}$	-	160	mA
Reverse Voltage	V_R	$T_a = 25^\circ\text{C}$	-	0.8	V
Power Dissipation	P_d	$T_a = 25^\circ\text{C}$	-	0.48	W
Operating Temperature	T_{OP}	-	-20	70	$^\circ\text{C}$
Storage Temperature.	T_{ST}	-	-30	80	$^\circ\text{C}$

Electrical / Optical Characteristics

$T_a = 25^\circ\text{C}$						
Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F = 160\text{mA}$	-	3.3	3.5	V
Average Brightness (Without LCD)	I_V		450	600	-	cd/m^2
CIE Color Coordinate (Without LCD)	X		0.26	-	0.31	-
	Y		0.26	-	0.31	-
Color	White					

Internal Circuit Diagram:



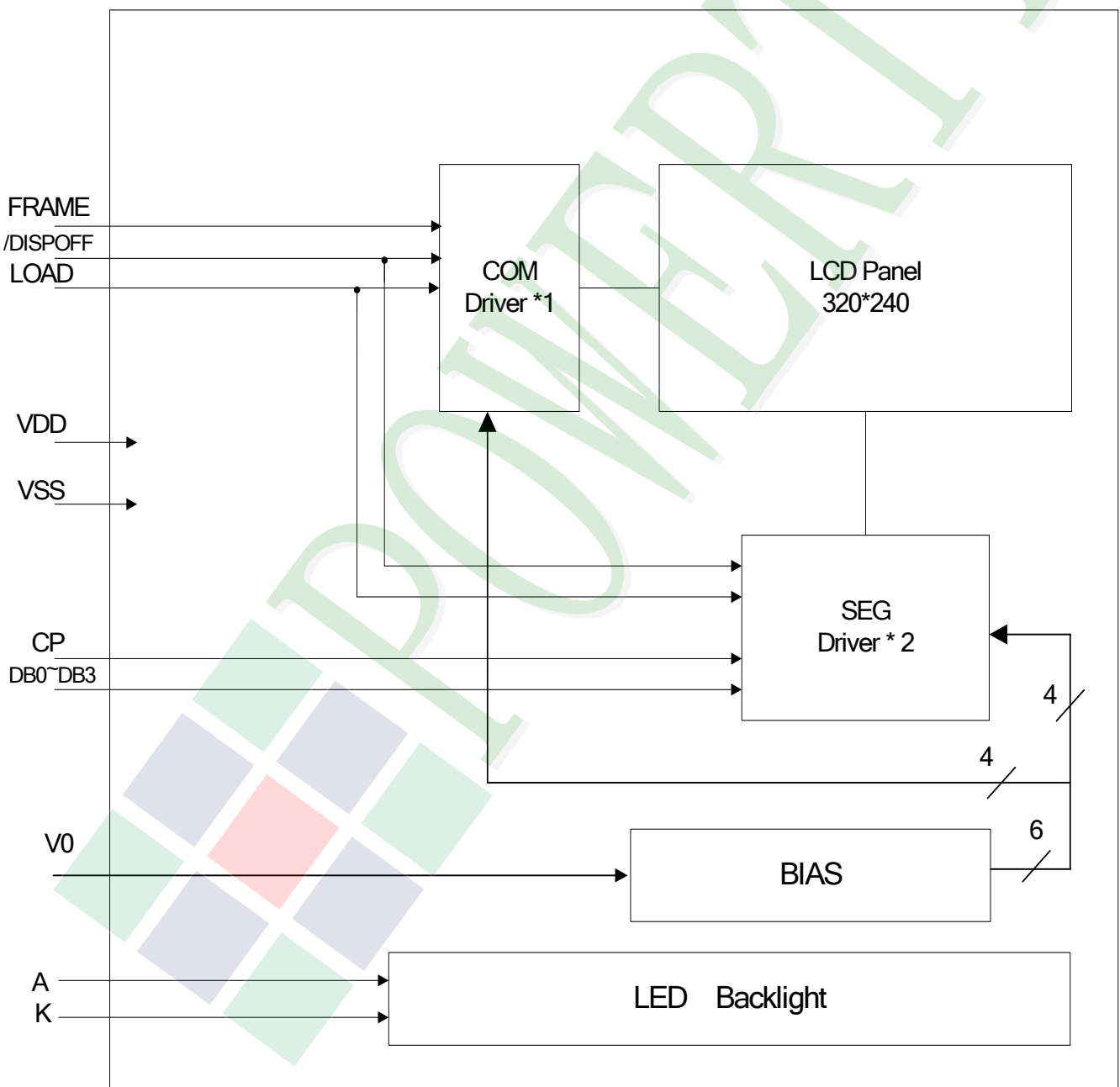
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

Block Diagram



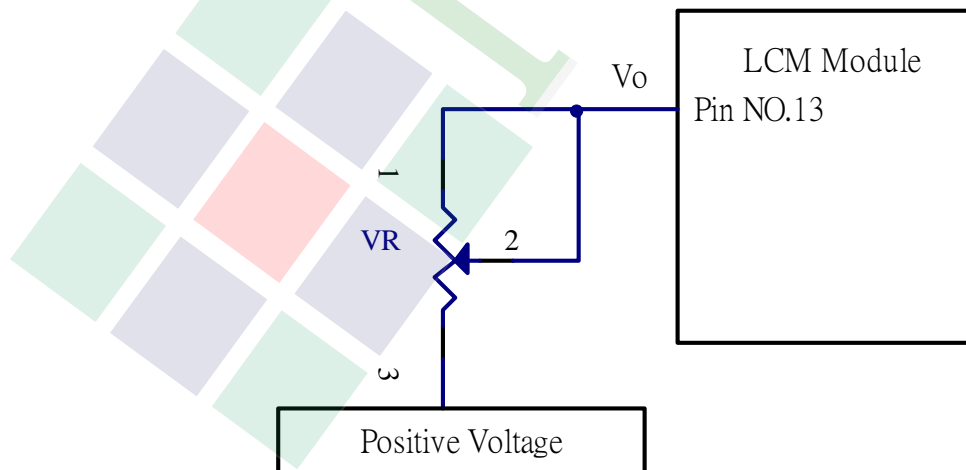
2.2 Interface Pin Description

Pin No.	Symbol	Function
1	DB0	Display data input pin
2	DB1	Display data input pin
3	DB2	Display data input pin
4	DB3	Display data input pin
5	/DISPOFF	Enable Driver On (H) or Off (L)
6	FRAME	First Line Marker
7	N C	Not Connect , Must be open
8	LOAD	Input data latch signal
9	CP	Data input shift signal
10	V _{DD}	Logic system power supply pin
11	V _{SS}	System Ground
12	NC	Not Connect
13	V _o	LCD Contrast Adjust
14	V _{SS}	System Ground

B/L Interface Pin Description

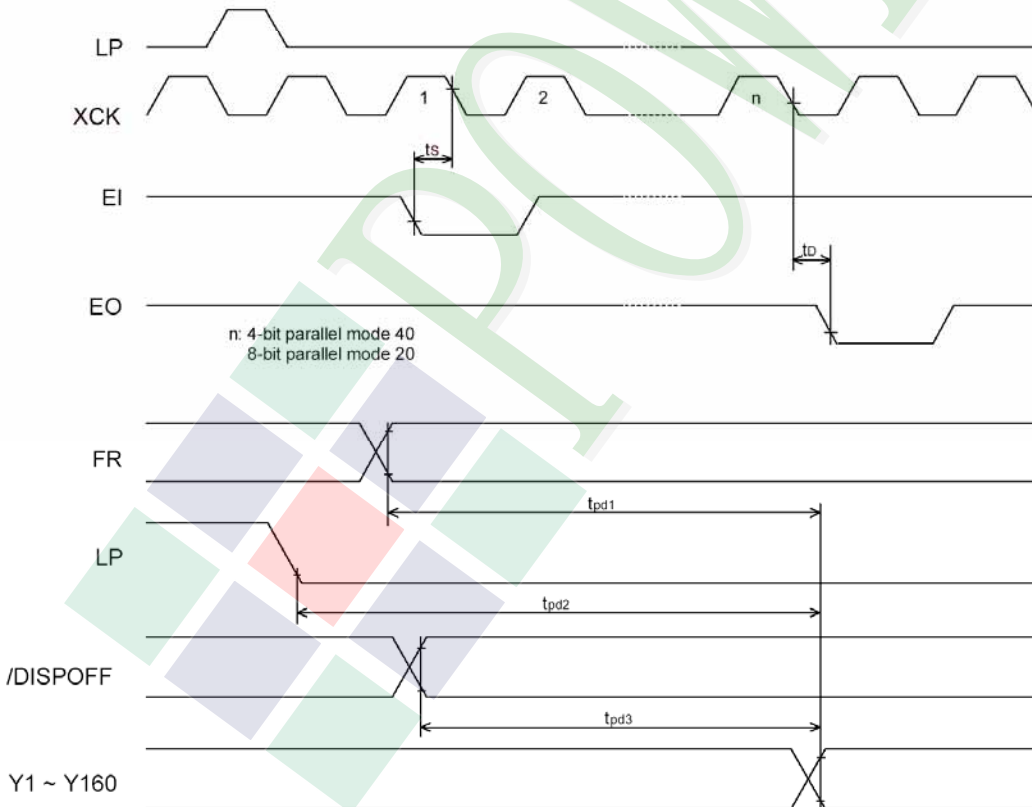
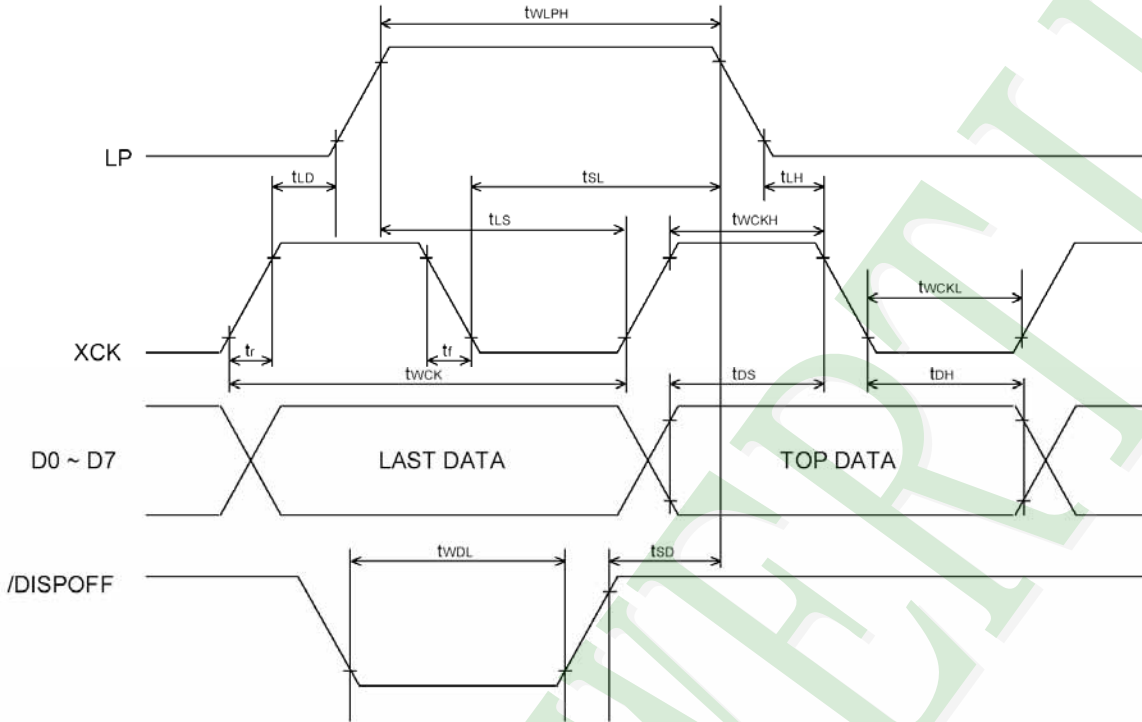
Pin No.	Symbol	Function
1	A	Power supply for LED backlight anode input
2	-	-
3	K	Power supply for LED backlight cathode input

Contrast Adjust:



2.3 Timing Characteristics

NT7711 Segment Mode



VDD=4.5~5.5V

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Shift clock period	tWCK	50	-		ns	tr, tf ≤ 10ns, Note 1
Shift clock "H" pulse width	tWCKH	15	-		ns	
Shift clock "L" pulse width	tWCKL	15	-		ns	
Data setup time	tDS	10	-		ns	
Data hold time	tDH	12	-		ns	
Latch pulse "H" pulse width	tWLPH	15	-		ns	
Shift clock rise to Latch pulse rise time	tLD	0	-		ns	
Shift clock fall to Latch pulse fall time	tSL	30	-		ns	
Latch pulse rise to Shift clock rise time	tLS	25	-		ns	
Latch pulse fall to Shift clock fall time	tLH	25	-		ns	
Input signal rise time	tr		-	50	ns	Note 2
Input signal fall time	tf		-	50	ns	Note 2
Enable setup time	tS	20	-		ns	
/DISPOFF Removal time	tSD	100	-		ns	
/DISPOFF enable pulse width	tWDL	1.2	-		μs	
Output delay time (1)	tD		-	30	ns	CL=15pF
Output delay time (2)	tpd1, tpd2		-	1.2	μs	CL=15pF
Output delay time (3)	tpd3		-	1.2	μs	CL=15pF

Note

1. Take the cascade connection into consideration.
2. $(tWCK - tWCKH - tWCKL)/2$ is the maximum in the case of high speed operation.

VDD=2.9~4.5V

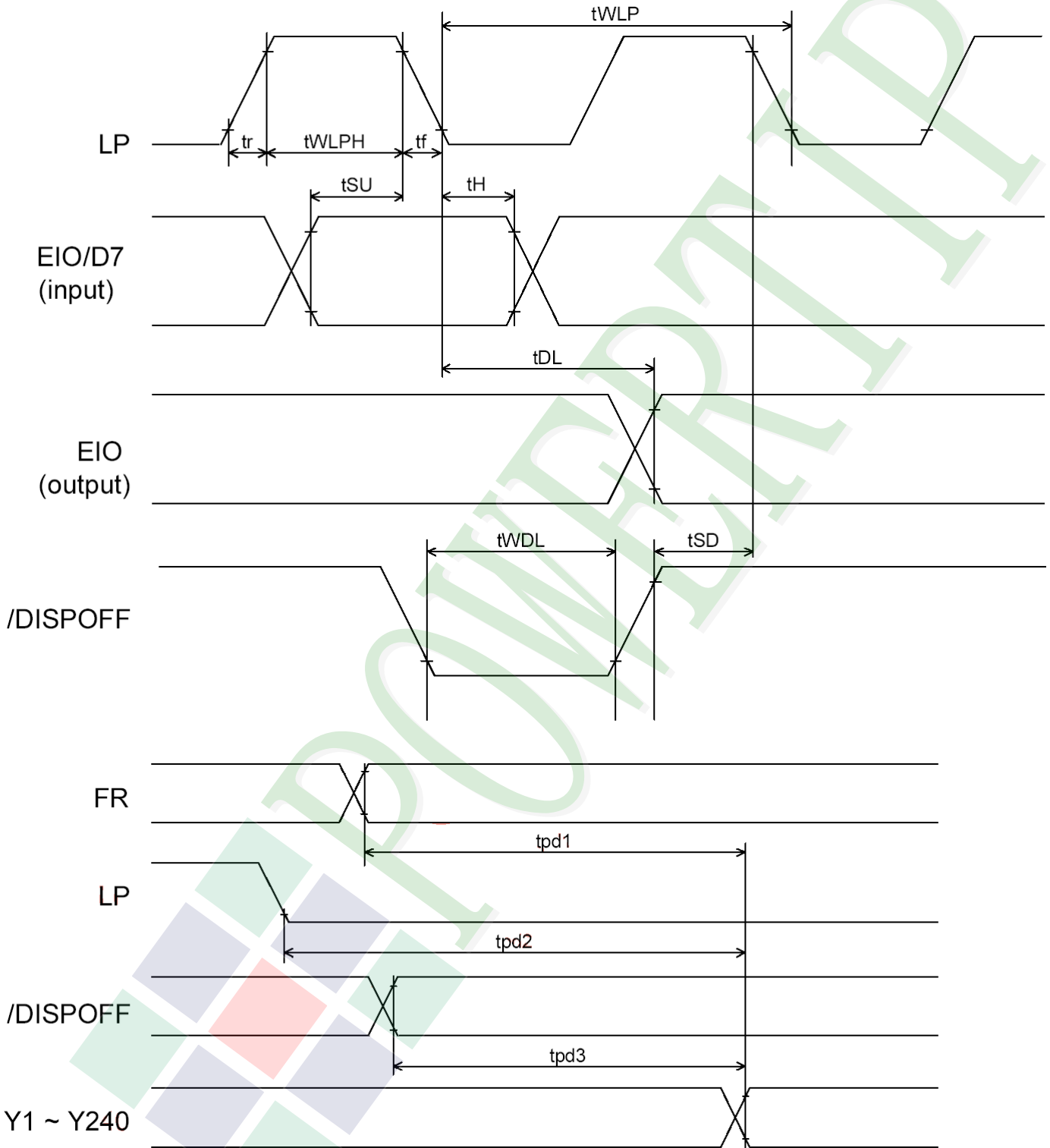
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Shift clock period	tWCK	82	-		ns	tr, tf ≤ 10ns, Note 1
Shift clock "H" pulse width	tWCKH	28	-		ns	
Shift clock "L" pulse width	tWCKL	28	-		ns	
Data setup time	tDS	20	-		ns	
Data hold time	tDH	23	-		ns	
Latch pulse "H" pulse width	tWLPH	30	-		ns	
Shift clock rise to Latch pulse rise time	tLD	0	-		ns	
Shift clock fall to Latch pulse fall time	tSL	65	-		ns	
Latch pulse rise to Shift clock rise time	tLS	30	-		ns	
Latch pulse fall to Shift clock fall time	tLH	35	-		ns	
Input signal rise time	tr		-	50	ns	Note 2
Input signal fall time	tf		-	50	ns	Note 2
Enable setup time	tS	30	-		ns	
/DISPOFF Removal time	tSD	100	-		ns	
/DISPOFF enable pulse width	tWDL	1.2	-		μs	
Output delay time (1)	tD		-	57	ns	CL=15pF
Output delay time (2)	tpd1, tpd2		-	1.2	μs	CL=15pF
Output delay time (3)	tpd3		-	1.2	μs	CL=15pF

Note

1. Take the cascade connection into consideration.
2. $(tWCK - tWCKH - tWCKL)/2$ is the maximum in the case of high speed operation.



NT7712 Common Mode



VDD=2.9~5.5V

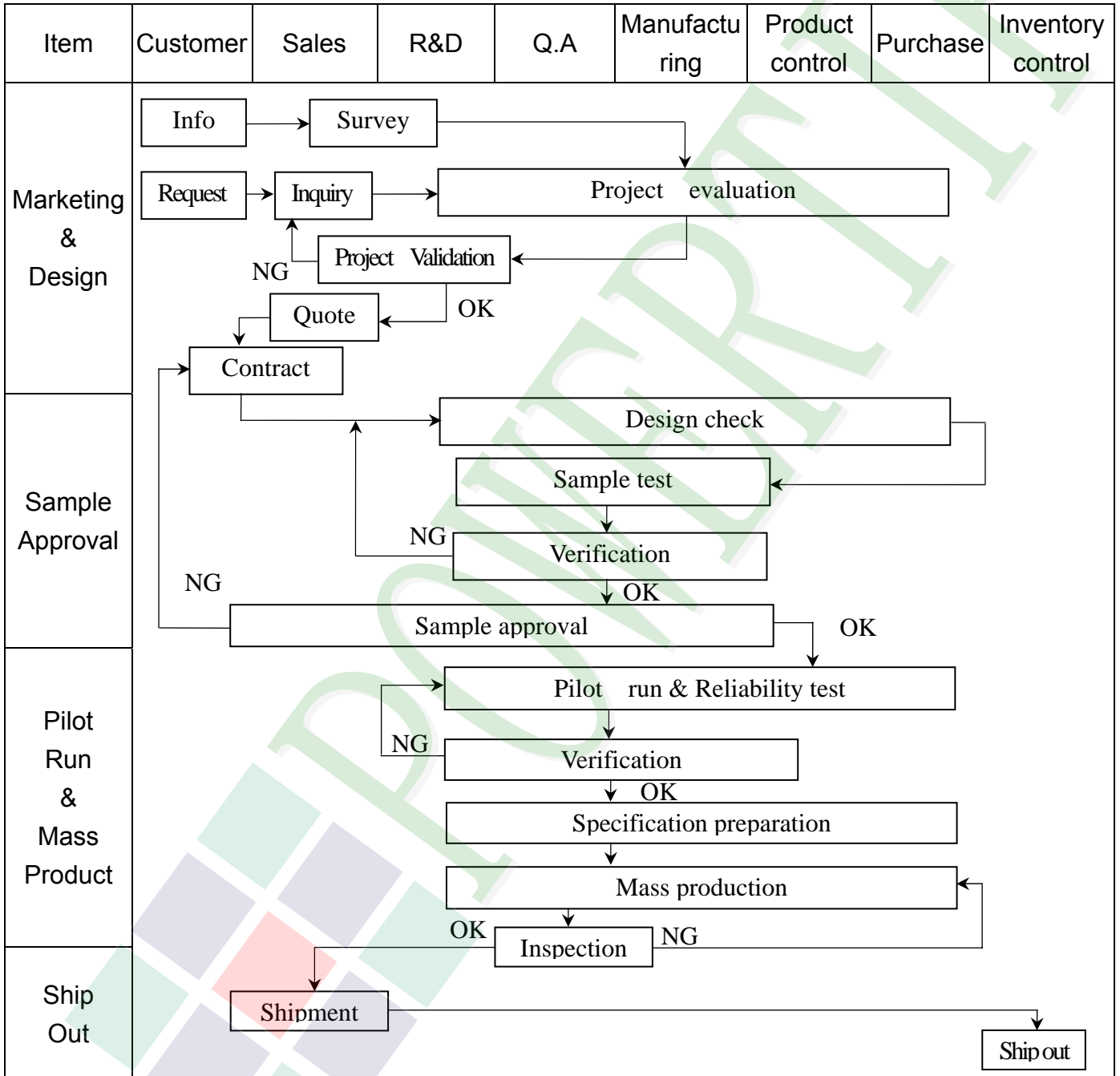
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Shift clock period	t _{WLP}	250	-	-	ns	t _r , t _f ≤ 20ns
Shift clock "H" pulse width	t _{WLPH}	15	-	-	ns	VDD=5.0V±10%
		30	-	-	ns	VDD=2.5~4.5V
Data setup time	t _{SU}	30	-	-	ns	
Data hole time	t _H	50	-	-	ns	
Input signal rise time	t _r		-	50	ns	
Input signal fall time	t _f		-	50	ns	
/DISPOFF Removal time	t _{SD}	100	-	-	ns	
/DISPOFF enable pulse width	t _{WDL}	1.2	-	-	μs	
Output delay time (1)	t _{DL}	-	-	200	ns	CL=15pF
Output delay time (2)	t _{pd1} , t _{pd2}	-	-	1.2	μs	CL=15pF
Output delay time (3)	t _{pd3}	-	-	1.2	μs	CL=15pF

2.4 JUMPER(Setting different use)

JO(3-2) 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 --> FA[Failure analysis] Claim --> AR[Analysis report] FA --> CA[Corrective action] CA --> 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)

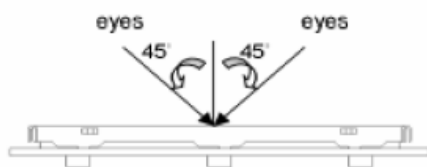


Fig.1

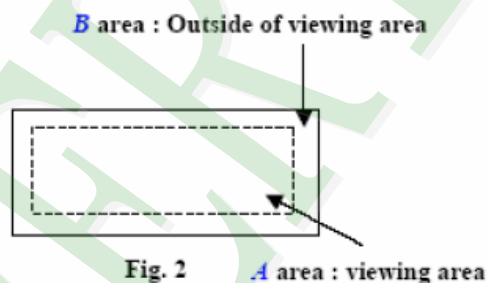


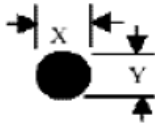
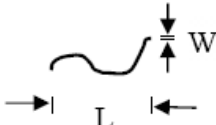
Fig. 2

◆ 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 Round type  $\Phi = (x+y)/2$ Line type 	5. 1 Round type: 5. 1. 1 display only : <ul style="list-style-type: none"> • 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 : <table border="1" data-bbox="491 739 1332 1079"> <thead> <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> </thead> <tbody> <tr> <td>$\Phi \leq 0.10$</td> <td colspan="2">Accept no dense</td> </tr> <tr> <td>$0.10 < \Phi \leq 0.20$</td> <td>3</td> <td rowspan="2">Ignore</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.30$</td> <td>2</td> </tr> <tr> <td>Total quantity</td> <td colspan="2">4</td> </tr> </tbody> </table> 5. 1. 3 Line type: <table border="1" data-bbox="443 1153 1380 1489"> <thead> <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> </thead> <tbody> <tr> <td>---</td> <td>$W \leq 0.03$</td> <td>Accept no dense</td> <td rowspan="3">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> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.10$	Accept no dense		$0.10 < \Phi \leq 0.20$	3	Ignore	$0.20 < \Phi \leq 0.30$	2	Total quantity	4		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		Minor
Dimension (diameter : Φ)	Acceptance (Q'ty)																																							
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$L \leq 2.5$	$0.05 < W \leq 0.075$																																							
---	$W > 0.075$	As round type																																						
06	Polarizer Bubble	<table border="1" data-bbox="446 1556 1380 1937"> <thead> <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> </thead> <tbody> <tr> <td>$\Phi \leq 0.20$</td> <td colspan="2">Accept no dense</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.50$</td> <td>3</td> <td rowspan="3">Ignore</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 colspan="2">4</td> </tr> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.20$	Accept no dense		$0.20 < \Phi \leq 0.50$	3	Ignore	$0.50 < \Phi \leq 1.00$	2	$\Phi > 1.00$	0	Total quantity	4		Minor																			
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◆ Specification For Monotype and Color STN :

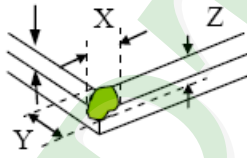
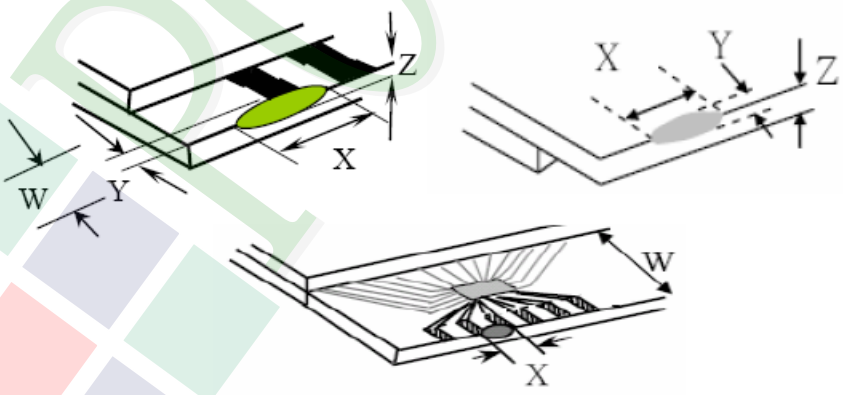
(Ver. B01)

NO	Item	Criterion	Level									
07	The crack of glass	<p>Symbols :</p> <p>X : The length of crack Z : The thickness of crack t : The thickness of glass</p> <p>Y : The width of crack. W : terminal length a : LCD side length</p> <hr/> <p>7.1 General glass chip :</p> <p>7.1.1 Chip on panel surface and crack between panels:</p> <table border="1" data-bbox="507 1574 1310 1861"> <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	$\leq 1/2 t$	$\leq a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$	Minor
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◆ Specification For Monotype and Color STN :

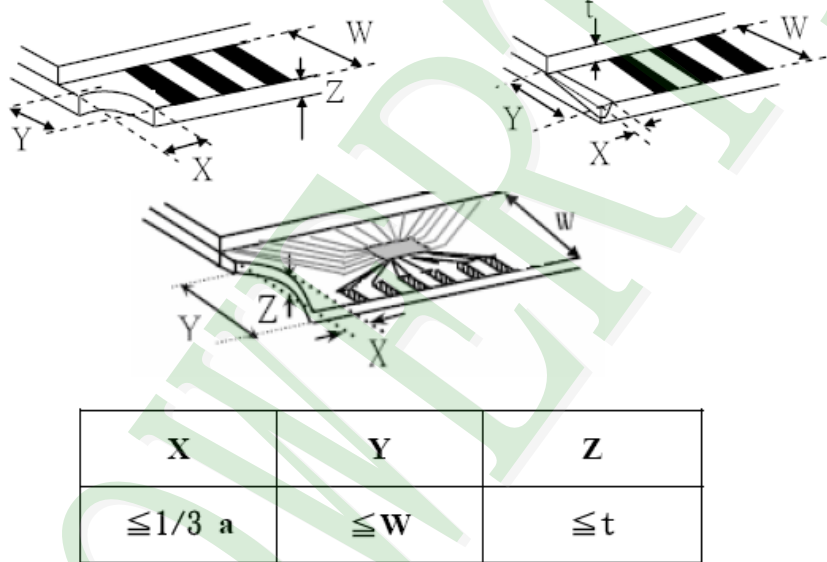
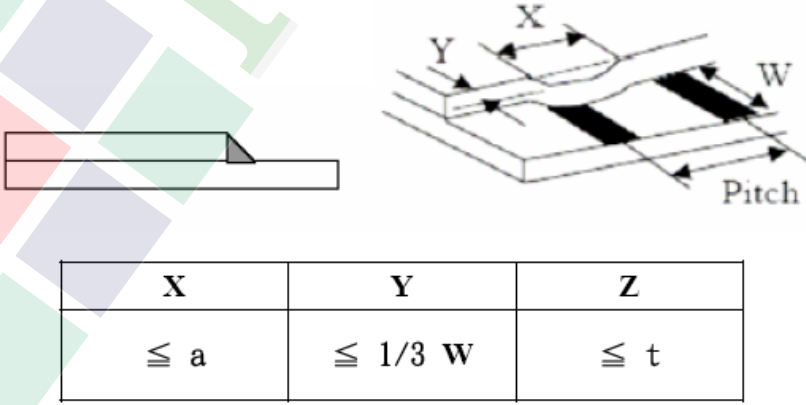
(Ver. B01)

NO	Item	Criterion	Level									
07	The crack of glass	<p>Symbols :</p> <p>X : The length of crack Z : The thickness of crack t : The thickness of glass</p> <p>Y : The width of crack. W : terminal length a : LCD side length</p> <hr/> <p>7.1.2 Corner crack :</p>  <table border="1" data-bbox="502 884 1316 1176"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <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> </tbody> </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.	$1/2 t < Z \leq 2 t$										
<p>7.2 Protrusion over terminal :</p> <p>7.2.1 Chip on electrode pad :</p>  <table border="1" data-bbox="470 1758 1252 1937"> <thead> <tr> <th></th> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <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> </tbody> </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	<p>Symbols :</p> <p>X : The length of crack Z : The thickness of crack t : The thickness of glass</p> <p>Y : The width of crack. W : terminal length a : LCD side length</p>	Minor
		<p>7.2.2 Non-conductive portion :</p>  <p>⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.</p> <p>7.2.3 Glass remain :</p> 	

**◆ 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 $+80 \pm 2^\circ\text{C}$ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.										
2	Low Temperature Storage Test	Keep in $-30 \pm 2^\circ\text{C}$ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.										
3	High Temperature / High Humidity Storage Test	Keep in $+60^\circ\text{C}$ / 90% R.H duration for 96 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer)										
4	Temperature Cycling Storage Test	<p style="text-align: center;"> -30°C \rightarrow $+25^\circ\text{C}$ \rightarrow $+80^\circ\text{C}$ \rightarrow $+25^\circ\text{C}$ (30mins) (5mins) (30mins) (5mins) $\xleftarrow{\hspace{10em}} \hspace{2em} \xrightarrow{\hspace{10em}}$ 10 Cycle </p> <p>Surrounding temperature, then storage at normal condition 4hrs.</p>										
5	ESD Test	Air Discharge: Apply 2 KV with 5 times Discharge for each polarity +/- <table border="1" style="float: right;"> <tr> <td>Contact Discharge: Apply 250 V with 5 times discharge for each polarity +/-</td> </tr> </table>	Contact Discharge: Apply 250 V with 5 times discharge for each polarity +/-									
		Contact Discharge: Apply 250 V with 5 times discharge for each polarity +/-										
<ol style="list-style-type: none"> Temperature ambience : $15^\circ\text{C} \sim 35^\circ\text{C}$ Humidity relative : $30\% \sim 60\%$ Energy Storage Capacitance($C_s + C_d$) : $150\text{pF} \pm 10\%$ Discharge Resistance(R_d) : $330\Omega \pm 10\%$ Discharge, mode of operation : <p>Single Discharge (time between successive discharges at least 1 sec) (Tolerance if the output voltage indication : $\pm 5\%$)</p>												
6	Vibration Test (Packaged)	<ol style="list-style-type: none"> Sine wave 10 55 Hz frequency (1 min/sweep) The amplitude of vibration : 1.5 mm Each direction (X、Y、Z) duration for 2 Hrs 										
7	Drop Test (Packaged)	<table border="1"> <thead> <tr> <th>Packing Weight (Kg)</th> <th>Drop Height (cm)</th> </tr> </thead> <tbody> <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> </tbody> </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.
- 5.2.8 To control temperature and time of soldering is $320 \pm 10^{\circ}\text{C}$ and 3-5 sec.
- 5.2.9 To avoid liquid (include organic solvent) stained on LCM

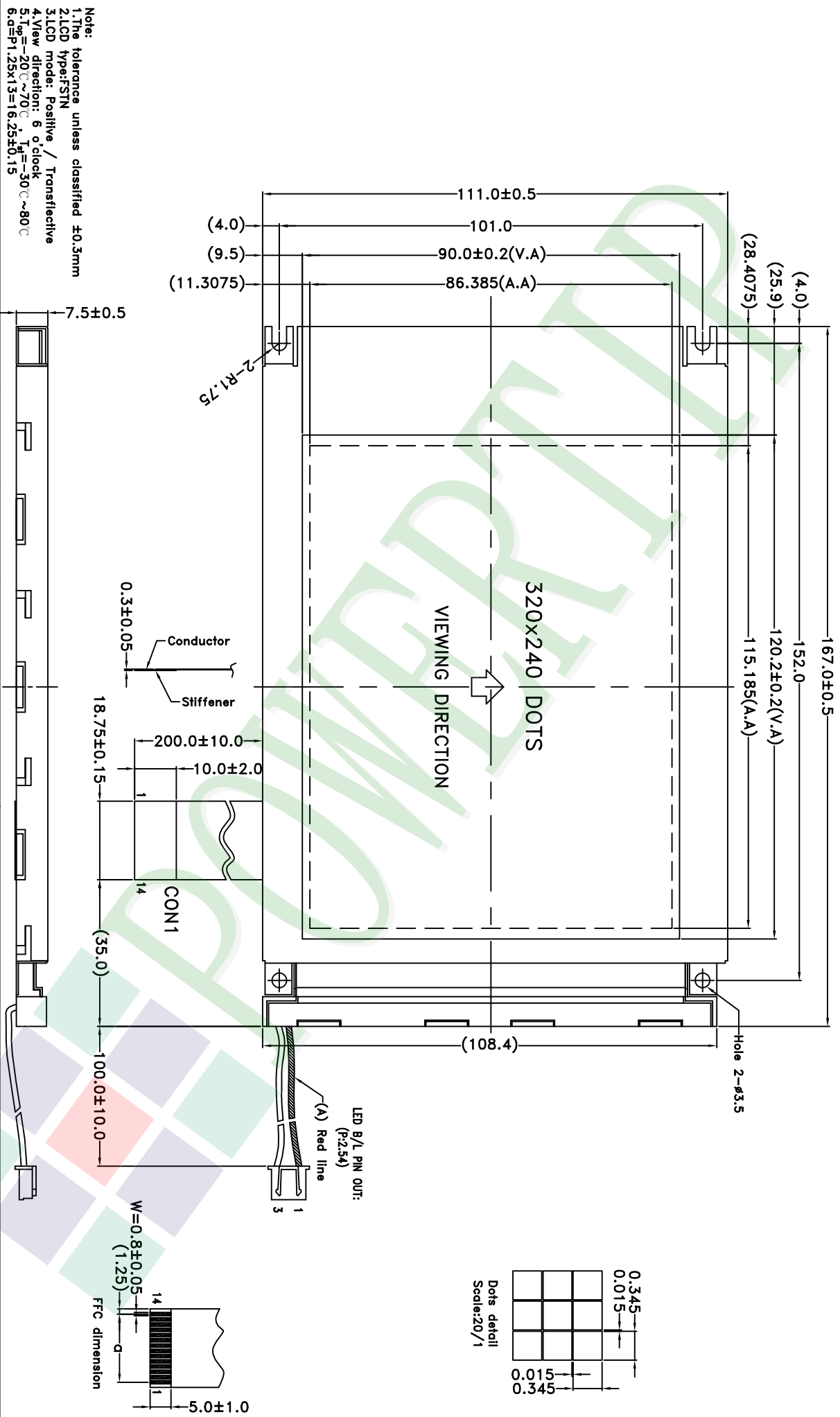
5.3 STORAGE

- 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.

A B C D E F G H



007		PART NO:	PE320240WRF-008-HQ	Design	Stone	Surface	(3)			精 級
006		DRAWING NAME:	LMD-PE320240WRF-008-HQ	Check	Mag	Material	1 ~ 4			
005		TITLE:	LCD MODULE DRAWING	Approve	Oliver	Thickness	16 ~ 63			
004						Quantity	63 ~ 250			
003							250 ~ 1000			
002	NEW DRAWING									
001	REV BY	REVISER	DATE							
REV										

LCM包裝規格書

LCM Packaging Specifications

Documents NO.

PKG-PE320240WRF-008-HQ

Approve

Check

Contact

Linda

Stone

Eve

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

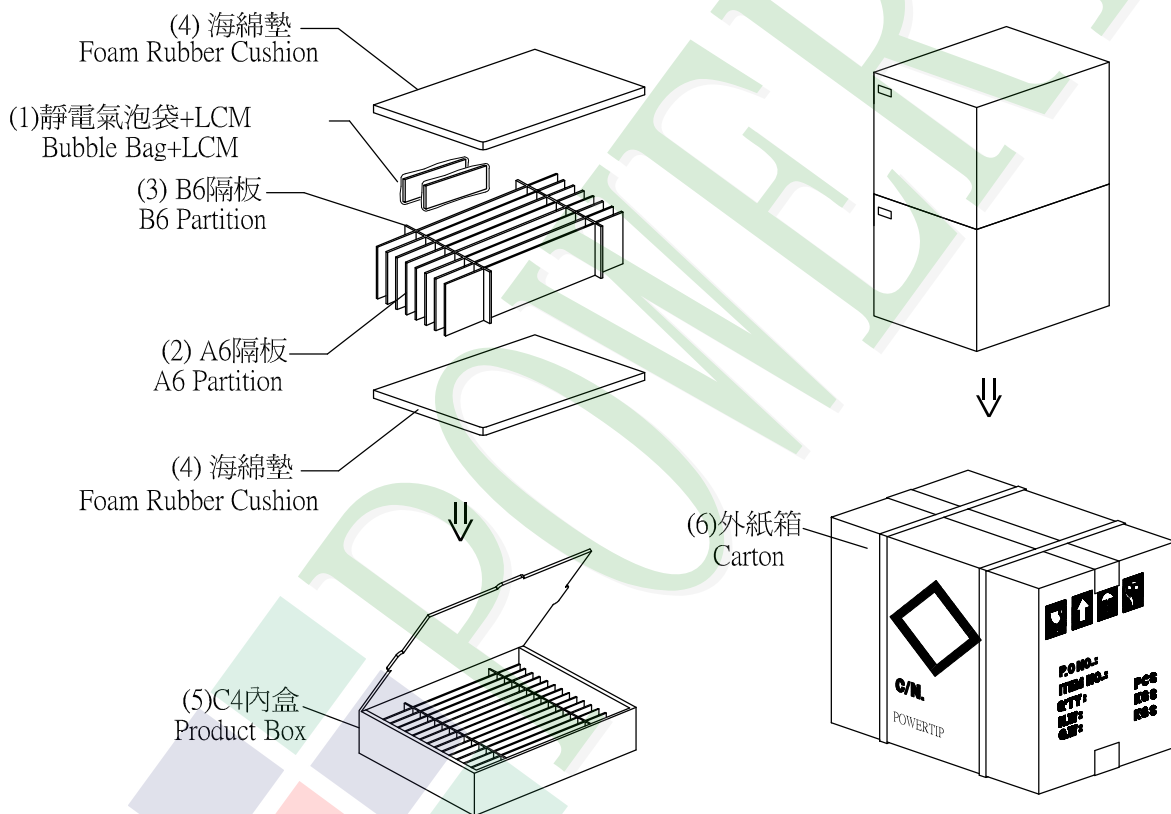
No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PE320240WRF-008-HQ	167.0 X 111.0	0.1825	28	5.11
2	靜電氣泡袋(1)Bubble Bag	BAG170150BRABA	150 X 175	0.0047	28	0.132
3	A6隔板(2)A6 Partition	BX33800012BZBA	338 X 125 X 3	0.038	16	0.608
4	B6隔板(3)B6 Partition	BX29800012BZBA	298 X 125 X 3	0.023	4	0.092
5	海綿墊(4)Foam Rubber Cushion	OTFOAM00005ABA	330 X 290 X 10	0.025	4	0.1
6	C4內盒(5)Product Box	BX36031014AABA	360 X 310 X 142	0.406	2	0.812
7	外紙箱(6)Carton	BX39432432CCBA	394 X 324 X 321	0.884	1	0.884
8						
9						

2. 一整箱總重量 (Total LCD Weight in carton) : 7.74 Kg±10%

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

(1)Quantity Of Spacer : A6隔板 X 8 , B6隔板 X 2

(2)Total LCM quantity in carton : quantity per box 14 x no of boxes 2 = 28



特記事項 (REMARK)

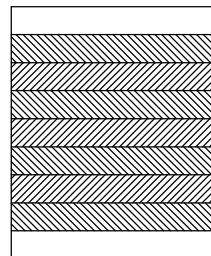
1. Label Specifications :

MODEL:
LOT NO:
QUANTITY:
CHECK:

2. 每個間隔放2片模組，前後間隔不放置模組。(如示意圖)
2. 2 LCM are placed on every other slot of the divider.
Note: First and last slot should be empty.
(See remarks 3 on packaging specifications)

3. 放置格示意圖:

3. Each divider is placed inside a product Box



- 1. 模組(LCM) X 2pcs.
- 2. 空格(Blank Space)