Specification

For

LCD Module

CTM800480N01

CUSTOMER APPROVED:

PREPARED BY	CHECKED BY	APPROVED BY

RECORDS OF REVISION

Date	Rev.	Description	Note	Page
2008-12-24	B	Preliminary		

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

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	800*(R,G,B)*480 Dots
LCD Type	Color TFT , Transmissive , Extended Temp
Screen Size(inch)	7.0 (Diagonal)
Viewing Direction	6 O'clock
Backlight	White Edge LED B/L
Weight	TBD
Interface	Digital Parallel 18 bits RGB Data Bus
Other(controller/driver IC)	TBD

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	165(W) * 104(L) * 4.0(H)(Max)	mm
Active Area	152.4(W) * 91.44 (L)	mm
Dots Pitch	0.1905 (W)*0.1905(L)	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}	-	-0.3	5.0	V
Input Voltage	V_{IN}	-	Vss -0.3	V_{DD}+0.3	V
Operating Temperature	T_{OP}	-	-20	70	℃
Storage Temperature	T_{ST}	-	-30	80	℃
Storage Humidity	H_D	Ta < 40 ℃	20	90	%RH

1.4 DC Electrical Characteristics

V_{DD} = 3.3 V ± 10% , V_{SS} = 0V , Ta = 25℃

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	V_{DD}	-	3.0	3.3	3.6	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}	-	0.8 V_{DD}	-	V_{DD}	V
“L” Output Voltage	V_{OL}	-	V_{SS}	-	0.2 V_{DD}	V
Supply Current	I_{DD}	V_{DD} = 3.3V	-	TBD		mA
LCM Driver Voltage	V_{COM}	V_{COM}-V_{SS} (-20℃)	-	-	-	V
		V_{COM}-V_{SS} (25℃)	-3.5	4.5	5.5	
		V_{COM}-V_{SS} (70℃)	-	-	-	

1.5 Optical Characteristics

Ta = 25°C

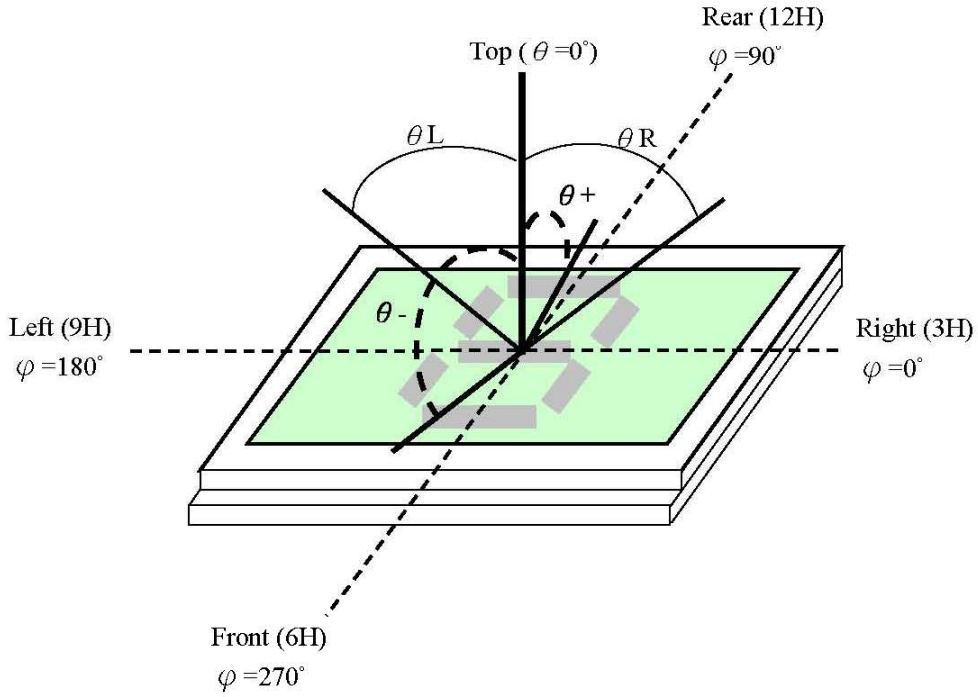
Item		Symbol	Conditions	Min.	Typ.	Max.	Reference
View Angle	TOP	Θy+	C≥2.0, ∅ = 0°	40°	45°	-	Notes 1 & 2
	BOTTOM	Θy-		10°	15°	-	
	LEFT	Θx+		40°	45°	-	
	RIGHT	Θx-		40°	45°	-	
CIE *1	WHITE	X	TA=25° Θx, ΘY=0°	0.295	0.315	0.335	
		Y		0.326	0.346	0.366	
	RED	X		0.583	0.603	0.623	
		Y		0.324	0.344	0.364	
	GREEN	X		0.301	0.321	0.341	
		Y		0.517	0.537	0.557	
	BLUE	X		0.118	0.138	0.158	
		Y		0.141	0.161	0.181	
Contrast Ratio		C	θY = 5°, ∅ = 0°	200	250	-	Note 3
Response Time(rise)		tr	θ = 5°, ∅ = 0°	-	10ms	30 ms	Note 2
Response Time(fall)		tf	θ = 5°, ∅ = 0°	-	30ms	50 ms	Note 2

*1: This value will be changed while mass product.

Note 1.

Optical characteristics-2

Viewing angle

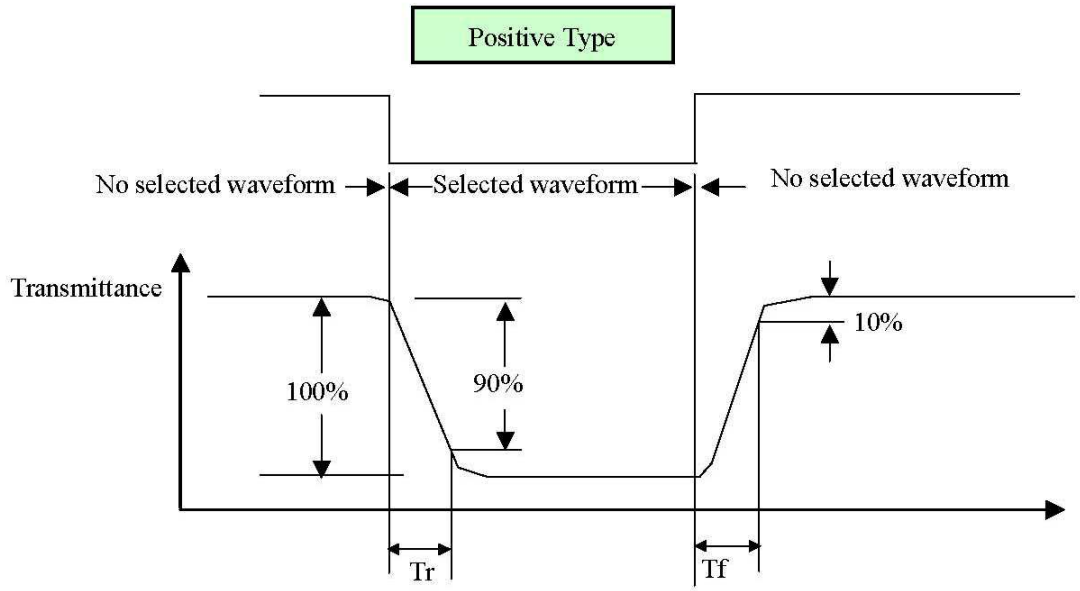


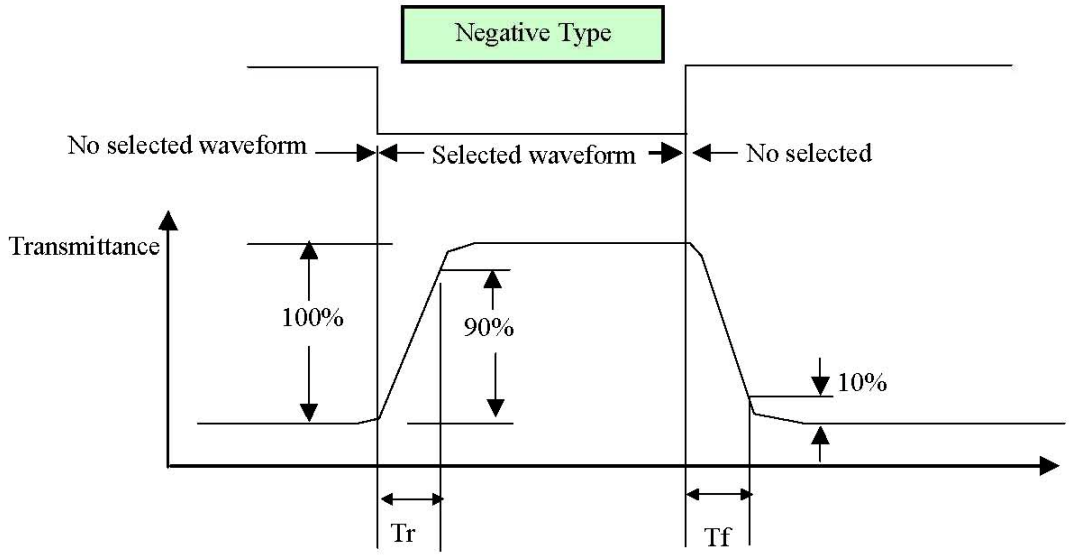
Viewing angle

Note 2.

Optical characteristics-3

Fig.2 Definition of response time





Electrical characteristics-2

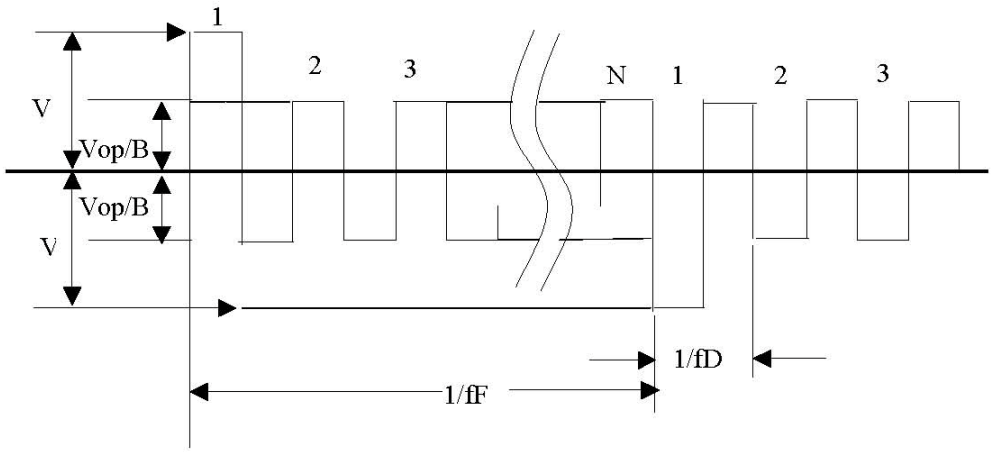
※2 Drive waveform

Vop: Drive voltage　　fF: Frame frequency

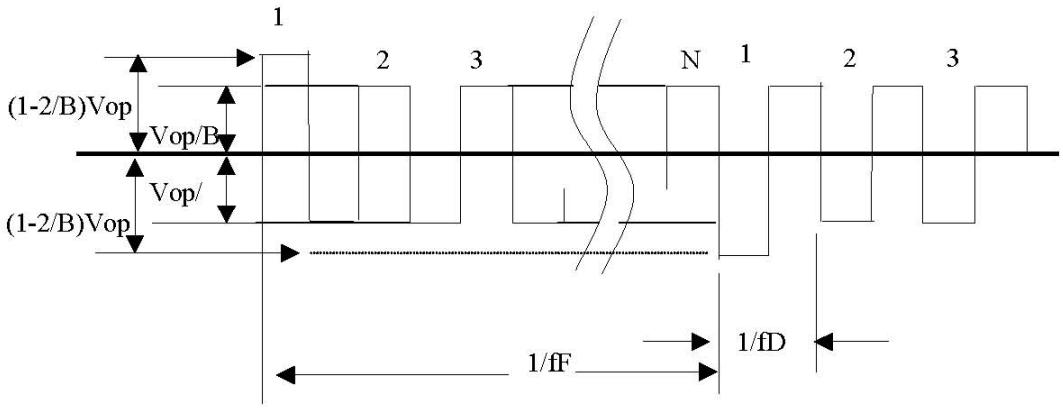
1/B: Bias　　fD :Drive frequency

N: Duty

(1) Selected waveform



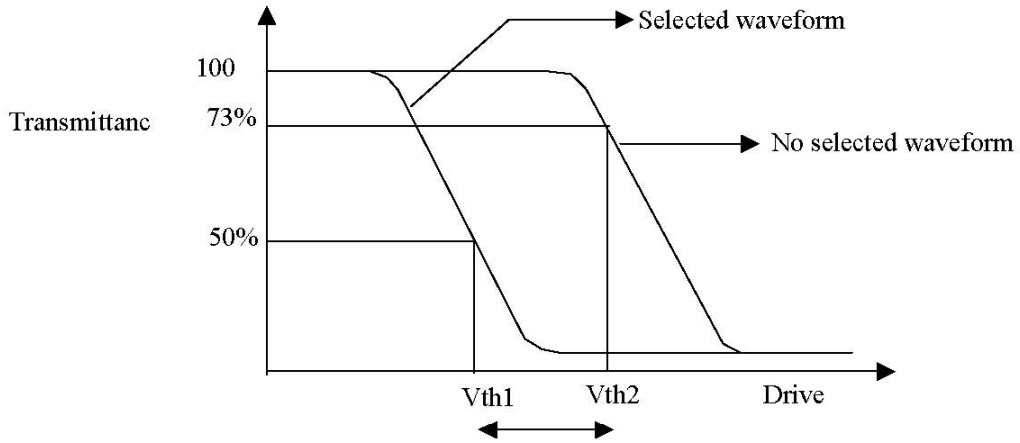
(2) Non- Selected wave form



Note:

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

Note 3. : Definition of Vth

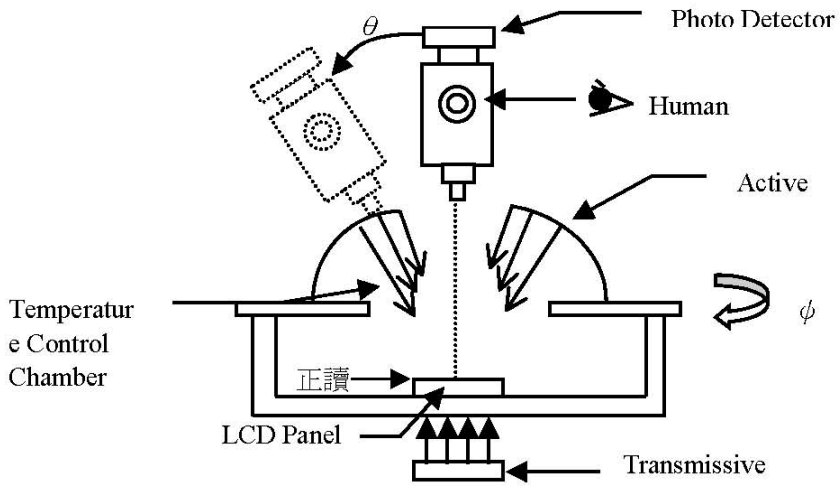


Active voltage range

	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	One LED	-	25	mA
Reverse Voltage	V_R	One LED	-	15	V
Power Dissipation	P_d	One LED	-	64	mW
Operating Temperature	T_{OP}	-	-20	70	ºC
Storage Temperature	T_{ST}	-	-30	80	ºC

Electrical / Optical Characteristics

Ta =25ºC

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage(Single LED)	V_F	I_F=20 mA	3.0	3.3	3.6	V
Reverse Current	I_R	V_R=9.5 V	-	8	50	uA
Average Brightness (with LCD)	I_V	I_F=20 mA	220	264	-	cd/m^2
CIE Color Coordinate (Without LCD)	X	I_F=20 mA	0.27	0.305	0.34	-
	Y		0.28	0.33	0.34	
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	VCOM	Common Voltage
2	XON	Out all-on control
3	DIO1	Horizontal start Pulse Signal I/O
4	VCC	Power Supply for Digital Circuit of Source IC
5	CLK	Horizontal Clock
6	SHL	Select Left / Right Shift
7	D00	Red Data (LSB)
8	D01	Red Data
9	D02	Red Data
10	D03	Red Data
11	D04	Red Data
12	D05	Red Data (MSB)
13	D10	Green Data (LSB)
14	D11	Green Data
15	D12	Green Data
16	D13	Green Data
17	D14	Green Data
18	D15	Green Data (MSB)
19	AVDD	Power Supply for Analog Circuit
20	VR1	Gamma Voltage Level 1
21	VR2	Gamma Voltage Level 2
22	VR3	Gamma Voltage Level 3
23	VR4	Gamma Voltage Level 4
24	VR5	Gamma Voltage Level 5
25	VR6	Gamma Voltage Level 6
26	VR7	Gamma Voltage Level 7
27	VR8	Gamma Voltage Level 8
28	VR9	Gamma Voltage Level 9
29	VR10	Gamma Voltage Level 10
30	VR11	Gamma Voltage Level 11
31	VR12	Gamma Voltage Level 12
32	VR13	Gamma Voltage Level 13
33	VR14	Gamma Voltage Level 14
34	AVSS	Power Ground

35	D20	Blue Data (LSB)
36	D21	Blue Data
37	D22	Blue Data
38	D23	Blue Data
39	D24	Blue Data
40	D25	Blue Data (MSB)
41	LD	Latch The Polarity of Output and Switch The New Data to Output
42	REV	Control Signals are Inverted or not
43	POL	Polarity Selection
44	GND	Power Ground
45	DIO2	Horizontal start Pulse Signal I/O
46	OEV	Output Enable
47	UD	Up / Down Control Pin
48	VCLK	Vertical Clock
49	STVU	Vertical start Pulse Signal I/O
50	STVD	Vertical start Pulse Signal I/O
51	VGH	Gate on voltage
52	VGL	Gate off voltage
53	VCC	Power Supply for Digital Circuit of Gate IC
54	GND	Power Ground

2.3 Timing Characteristics

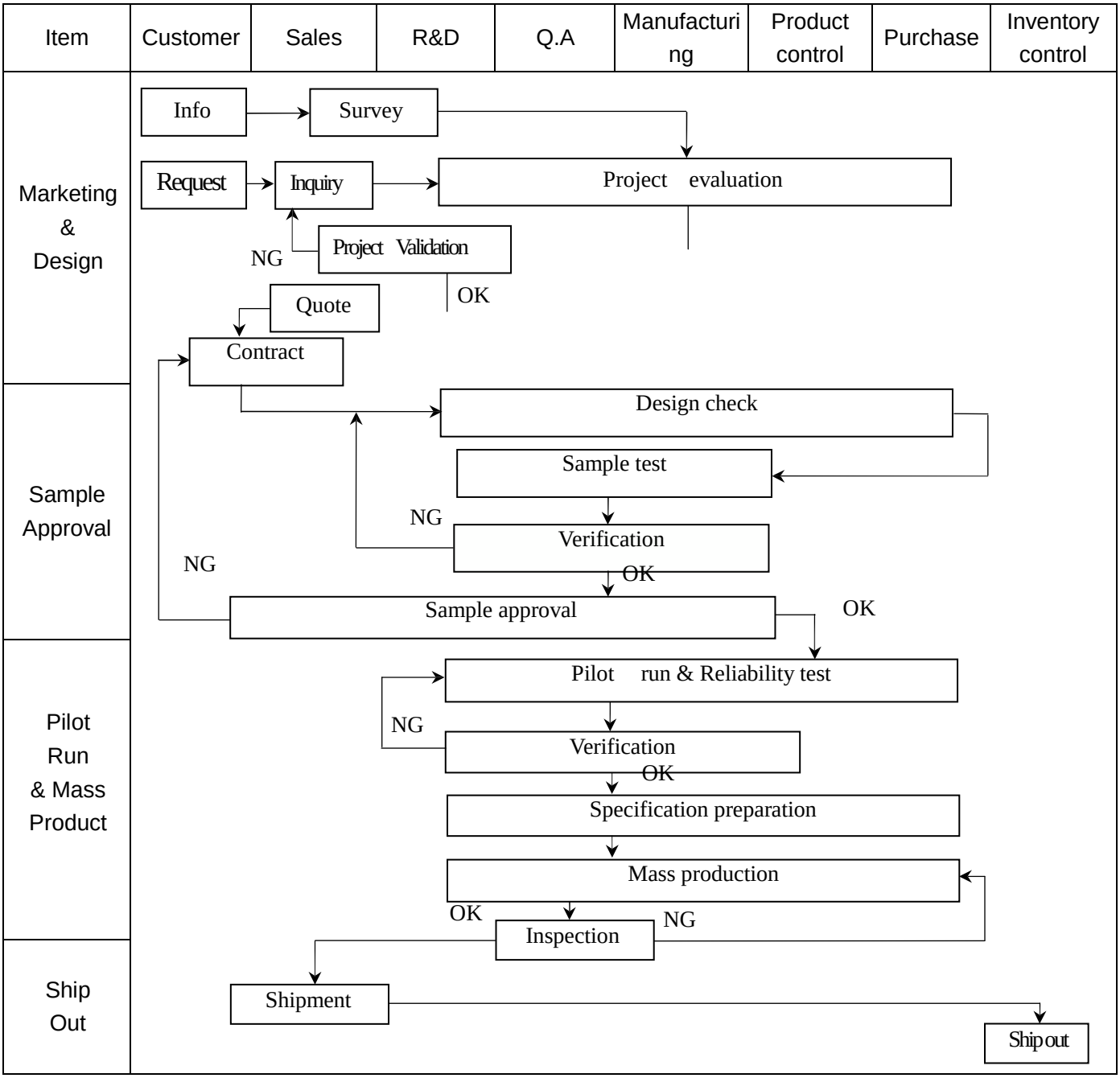
TBD.

2.4 Display Command

TBD.

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



3.2 Inspection Specification

Inspection Standard : MIL-STD-105E Table Normal Inspection Single Sampling Level II
Equipment : Gauge , MIL-STD , Casilsemi Tester , Sample
IQC Defect Level : Major Defect AQL 0.4; Minor Defect AQL 1.5
FQC Defect Level : 100% Inspection
OUT Going Defect Level : Sampling
Specification :

NO	Item	Specification	Judge	Level
1	Part Number	The part number is inconsistent with work order of production	N.G.	Major
2	Quantity	The quantity is inconsistent with work order of production	N.G.	Major
3	Electronic characteristics of LCM A=(L + W)／2	The display lacks of some patterns.	N.G.	Major
		Missing line.	N.G.	Major
		The size of missing dot, A is > 1/2 Dot size	N.G.	Major
		There is no function.	N.G.	Major
		Output data is error	N.G.	Major
4	Appearance of LCD A=(L + W)／2 Dirty particle (Including scratch、bubble)	Material is different with work order of production	N.G.	Major
		LCD is assembled in inverse direction	N.G.	Major
		Bezel is assembled in inverse direction	N.G.	Major
		Shadow is within LCD viewing area + 0.5 mm	N.G.	Major
		The diameter of dirty particle, A is > 0.4 mm	N.G.	Minor
		Dirty particle length is > 3.0mm, and 0.01mm < width ≤ 0.05mm	N.G.	Minor
		Display is without protective film	N.G.	Minor
		Conductive rubber is over bezel 1mm	N.G.	Minor
		Polarizer exceeds over viewing area of LCD	N.G.	Minor
		Area of bubble in polarizer, A > 1.0mm, the number of bubble is > 1 piece.	N.G.	Minor
		0.4mm < Area of bubble in polarizer, A < 1.0mm, the number of bubble is > 4 pieces.	N.G.	Minor
5	Appearance of PCB A=(L + W)／2	Burned area or wrong part number is on PCB	N.G.	Major
		The symbol, character, and mark of PCB are unidentifiable.	N.G	Minor
		The stripped solder mask , A is > 1.0mm	N.G.	Minor
		0.3mm < stripped solder mask or visible circuit, A < 1.0mm, and the number is ≥ 4 pieces	N.G.	Minor
		There is particle between the circuits in solder mask	N.G	Minor
		The circuit is peeled off or cracked	N.G	Minor
		There is any circuits risen or exposed.	N.G	Minor
		0.2mm < Area of solder ball, A is ≤ 0.4mm The number of solder ball is ≥ 3 pieces	N.G	Minor
		The magnitude of solder ball, A is > 0.4mm.	N.G	Minor

4. RELIABILITY TEST

4.1 Reliability Test Condition

NO	Item	Test Condition	
1	High Temperature Storage	Storage at 80 ± 2℃ 96~100 hrs Surrounding temperature, then storage at normal condition 4hrs	
2	Low Temperature Storage	Storage at -30 ± 2℃ 96~100 hrs Surrounding temperature, then storage at normal condition 4hrs	
3	High Temperature /Humidity Storage	1.Storage 96~100 hrs 60 ± 2℃, 90~95%RH surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer). or 2.Storage 96~100 hrs 40 ± 2℃, 90~95%RH surrounding temperature, then storage at normal condition 4 hrs.	
4	Temperature Cycling	-20℃ → 25℃ → 70℃ → 25℃ (30mins) (5mins) (30mins) (5mins) 10 Cycle	
5	Vibration	10~55Hz (1 minute) 1.5mm X,Y and Z direction * (each 2hrs)	
6	ESD Test	Air Discharge: Apply 6 KV with 5 times discharge for each polarity +/-	Contact Discharge: Apply 250V with 5 times discharge for each polarity +/-
		Testing location: Around the face of LCD	Testing location: 1.Apply to bezel. 2.Apply to Vdd, Vss.
7	Drop Test	Packing Weight (Kg)	Drop Height (cm)
		0 ~ 45.4	122
		45.4 ~ 90.8	76
		90.8 ~ 454	61
		Over 454	46

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 280 ± 10℃ 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℃ ± 5℃ 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

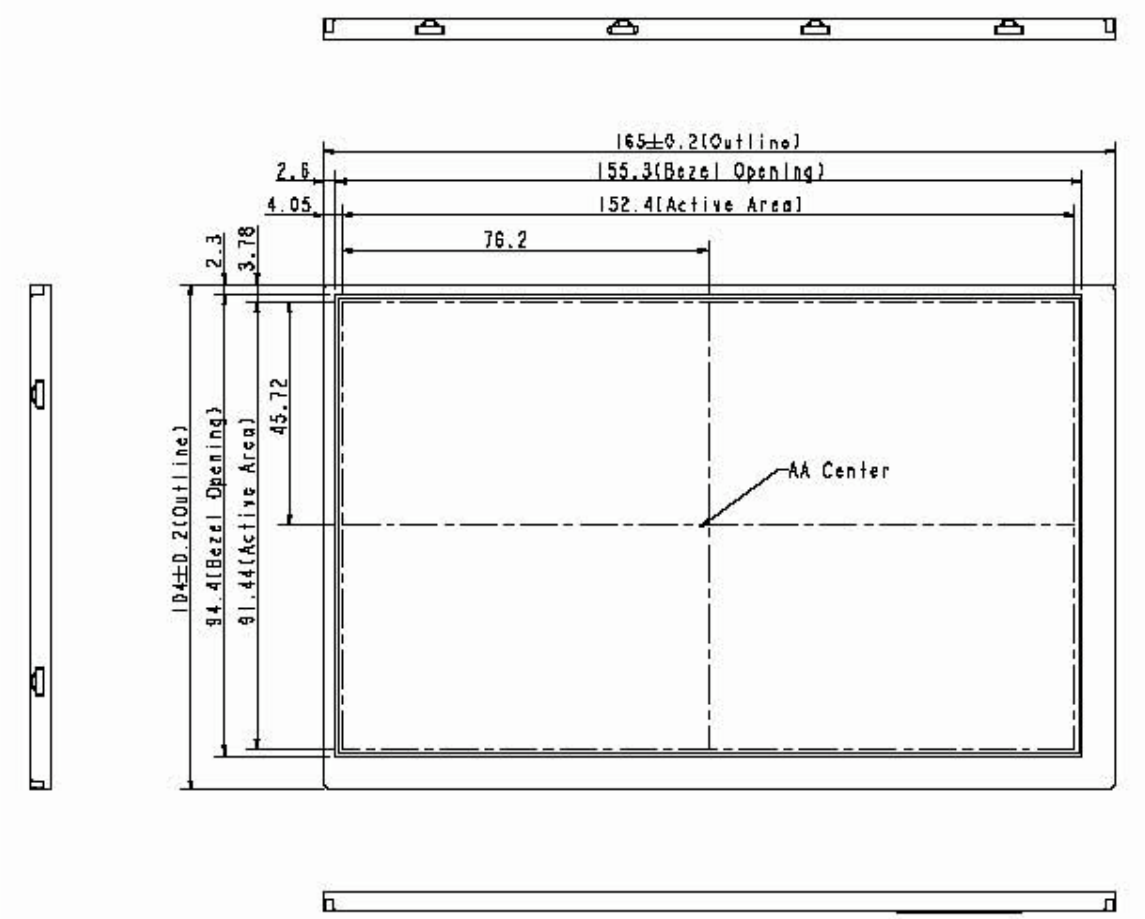
5.4.1 Applicable warrant period

The period is within thirteen months since the date of shipping out under normal using and storage conditions.

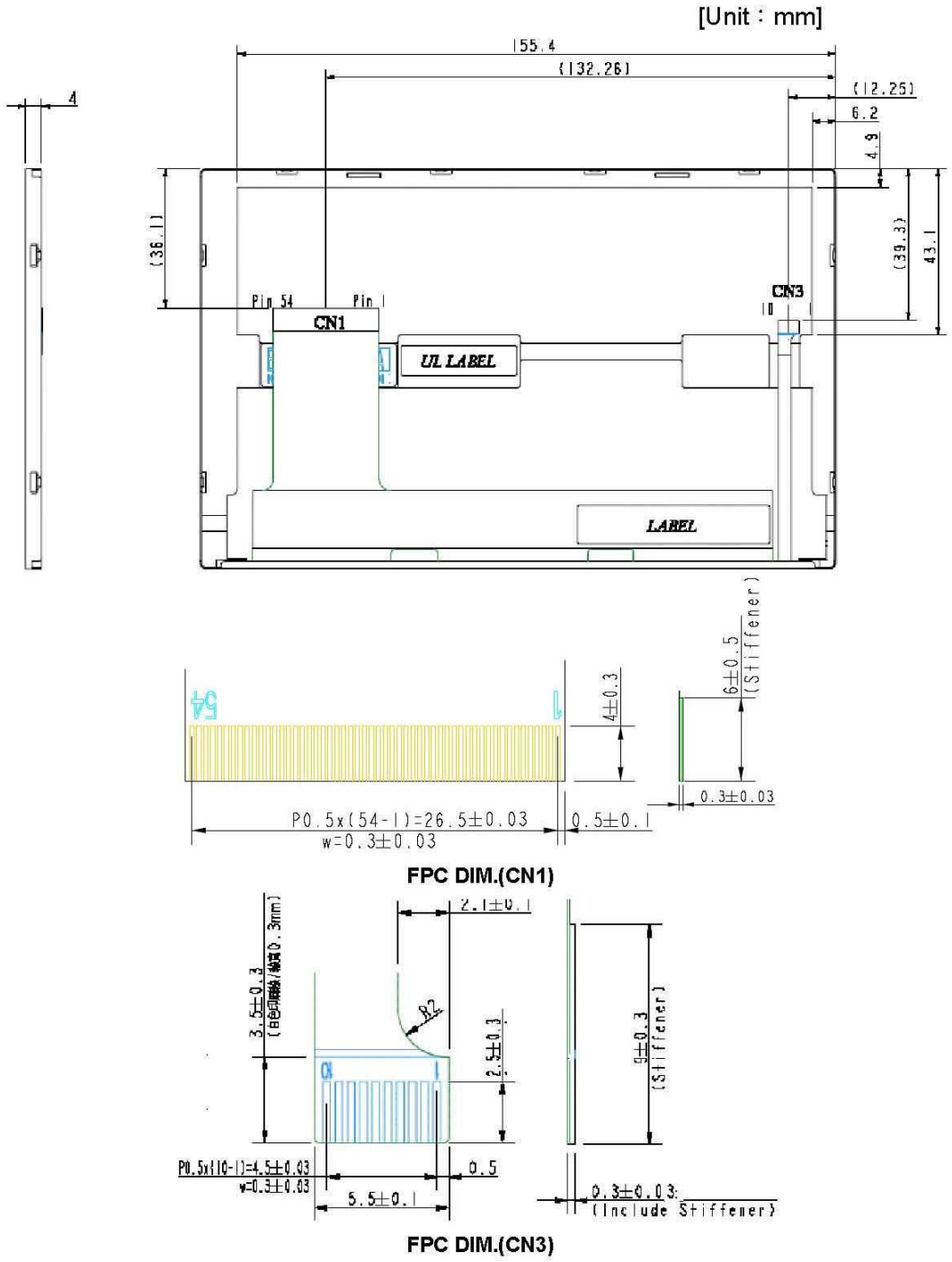
5.4.2 Unaccepted responsibility

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.



Remark : Un-indication tolerance is ±0.5mm



Remark : Un-indication tolerance is ±0.5mm