



SPECIFICATION FOR TFT LCD MODULE

CUSTOMER : _____

CUSTOMER MODULE : _____

HL MODEL : HG080WX038

Preliminary Specification

Final Specification

Customer Confirmation column:

Approved by : _____ Dept. : _____ Data : _____

Please return one of the copies of the specification with your signature to us within two weeks after you receive this document. If it is not returned, we will assume that you agree to the entire contents of this specification document.

Designed by	Checked by	Approved by

DOCUMENT REVISION HISTORY

Version	DATE	DESCRIPTION	CHANGED BY



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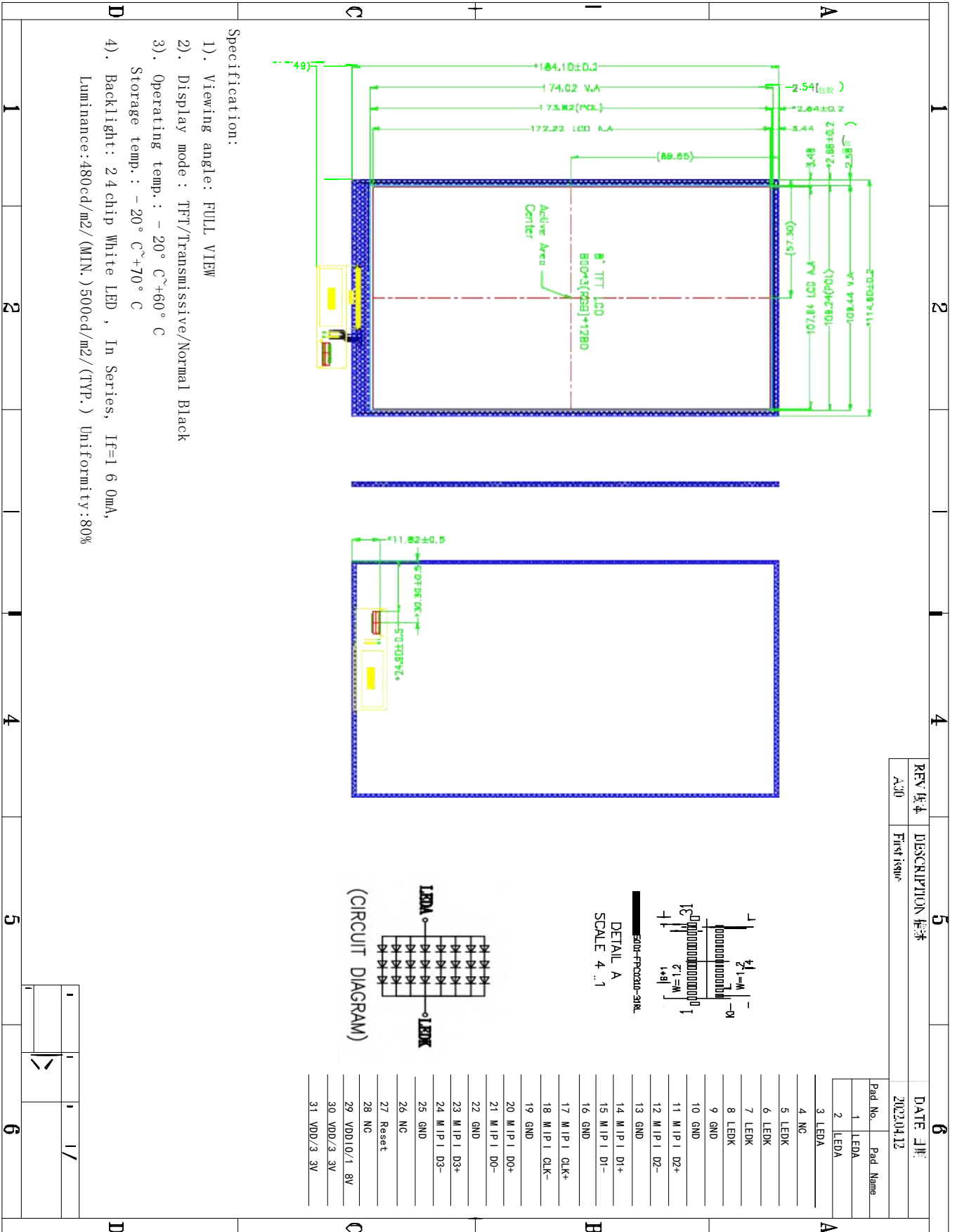


1. Features & Mechanical Specifications

Item	Contents	Unit
	LCD	
LCD Type	TFT / Transmissive / Normally Black	--
Sizes	8.0	inc
Backlight	White LED x 24	--
Interface	4 Lanes MIPI Interface	--
Outline Dimension	114.6(W) × 184.1(H) × 2.6(T)	mm
Glass area (W×H×T)	112.64× 181.80× 0.8	mm
Active area (W×H)	107.64× 172.22	mm
Number of Dots	800(RGB) ×1280	--
Dot pitch (W×H)	0.0449 × 0.1346	mm
Pixel pitch (W×H)	0.1346 × 0.1346	mm
Operating Temperature	-20 ~ +60	°C
Storage temperature	-20 ~ +70	°C
Polarizer	Top: IPS film	--
	Bottom: IPS film	



2. Dimensional Outline





3. Pin Description

PIN No.	SYMBOL	Function
1,2,3	LEDA	Anode for light bar
4	NC	No connection
5,6,7,8	LEDK	Cathode for light bar
9	GND	Ground
10	GND	Ground
11	MIPI_D2+	MIPI differential data2 input(Positive)
12	MIPI_D2-	MIPI differential data2 input(Negative)
13	GND	Ground
14	MIPI_D1+	MIPI differential data 1 input(Positive)
15	MIPI_D1-	MIPI differential data 1 input(Negative)
16	GND	Ground
17	MIPI_CLK+	MIPI differential clock input(Positive)
18	MIPI_CLK-	MIPI differential clock input(Negative)
19	GND	Ground
20	MIPI_D0+	MIPI differential data0 input(Positive)
21	MIPI_D0-	MIPI differential data0 input(Negative)
22	GND	Ground
23	MIPI_D3+	MIPI differential data3 input(Positive)
24	MIPI_D3-	MIPI differential data3 input(Negative)
25	GND	Ground
26	NC	No connection
27	RESET	Device reset signal 1.8V
28	NC	No connection
29	VDDIO 1.8V	1.8V input
30	VDD 3.3V	3.3V input
31	VDD 3.3V	3.3V input



4. Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Digital Supply Voltage	VDD/VDDIO	-0.3 to +4.0	V
Operating Temperature range	T _{OP}	-20 to +60	°C
Storage Temperature range	T _{ST}	-20 to +70	°C

5. Electrical Characteristics

DC Characteristics

Item	Symbol	Min.	Type.	Max.	Unit
Digital Power Supply Voltage	VDD	3.0	3.3	3.6	V

6. Backlight Characteristics

(White LED × 4 in series) × 8 in Parallel

(T_a = 25°C)

Item	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	V _F	I _F = 160mA	8.4	9	9.9	V
Uniformity	ΔB _p	-	80	-	-	%
LCM Luminance	L _v	I _F = 160mA	480	500	-	cd/m ²

7. Electro-Optical Characteristics

The test of Optical specifications shall be measured in a dark room (ambient luminance $\leq 1\text{lux}$ and temperature = $25\pm 2^\circ\text{C}$) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0° . We refer to $\theta=0$ ($=\theta_3$) as the 3 o'clock direction (the "right"), $\theta=90$ ($=\theta_{12}$) as the 12 o'clock direction ("upward"), $\theta=180$ ($=\theta_9$) as the 9 o'clock direction ("left") and $\theta=270$ ($=\theta_6$) as the 6 o'clock direction ("bottom"). While scanning θ and/or Φ , the center of the measuring spot on the Display surface shall stay fixed.

Optimum viewing angle direction is 6 o'clock.

Item	Symbol	Condition	Value			Unit	Note
			Min	Typ	Max		
Uniformity	ΔB_p		70	80		%	Note 4
Viewing Angle	Left	θ_L	$Cr \geq 10$	85		deg	Note 1
	Right	θ_R		85			
	Top	ψ_T		85			
	Bottom	ψ_B		85			
Contrast Ratio	Cr	$\theta = 0$	700	900			Note 2
Response Time	Tr+Tf	$= 0$	--	25	--	ms	
	Tgray					ms	
Color Coordinate of CIE1931	Red	X	$\theta = 0$ $= 0$	TBD	TBD	TBD	Note 5
		y		TBD	TBD	TBD	
	Green	X		TBD	TBD	TBD	
		y		TBD	TBD	TBD	
	Blue	X		TBD	TBD	TBD	
		y		TBD	TBD	TBD	
	White	X		TBD	TBD	TBD	
		y		TBD	TBD	TBD	



Note :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).
2. Contrast measurements shall be made at viewing angle of $\Theta = 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Transmittance is the Value with Polarizer
4. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
5. The electro-optical response time measurements shall be made as FIGURE 3 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r , and 90% to 10% is T_d .



8. MIPI ELECTRICAL CHARACTERISTICS

a) DC Characteristics for DSI LP Mode

DC levels of the LP-00, LP-01, LP-10 and LP-11 are defined in the table below: DC Characteristics for the DSI LP mode when LP-RX, LP-CD or LP-TX is mentioned in the condition column. Other logical levels in the table are for MCU interface.

Parameter	Symbol	Condition	Specification			Unit
			Min.	Typ.	Max.	
Logic 1 output voltage	V _{OH}	I _{OUT} =-1mA, Note 2	TBD	-	TBD	V
Logic 0 output voltage	V _{OL}	I _{OUT} =1mA, Note 2	TBD	-	TBD	V
Logic 1 input voltage	V _{IHLPCD}	LP-CD, Note 3	TBD	-	TBD	mV
Logic 0 input voltage	V _{ILLPCD}	LP-CD, Note 3	TBD	-	TBD	mV
Logic 1 input voltage	V _{IHLPRX}	LP-RX (CLK, D0, D1, D2, D3), Note 3	TBD	-	TBD	mV
Logic 0 input voltage	V _{ILLPRX}	LP-RX (CLK, D0, D1, D2, D3), Note 3	TBD	-	TBD	mV
Logic 0 input voltage	V _{ILLPRXULP}	LP-RX (CLK ULP mode), Note 3	TBD	-	TBD	mV
Logic 1 output voltage	V _{OHLPTX}	LP-TX (D0), Note 3	TBD	TBD	TBD	V
Logic 0 output voltage	V _{OLLPTX}	LP-TX (D0), Note 3	TBD	-	TBD	mV
Logic 1 input current	I _{IH}	LP-CD, LP-RX, Note 3	-	-	TBD	uA
Logic 0 input current	I _{IL}	LP-CD, LP-RX, Note 3	TBD	-	-	uA

Notes:

1. Ta = -30°C to 70°C (to +85°C no damage)
2. BC, TE, PANEL_TE
3. DSI High Speed mode is off.



b) DC Characteristics for DSI HS Mode

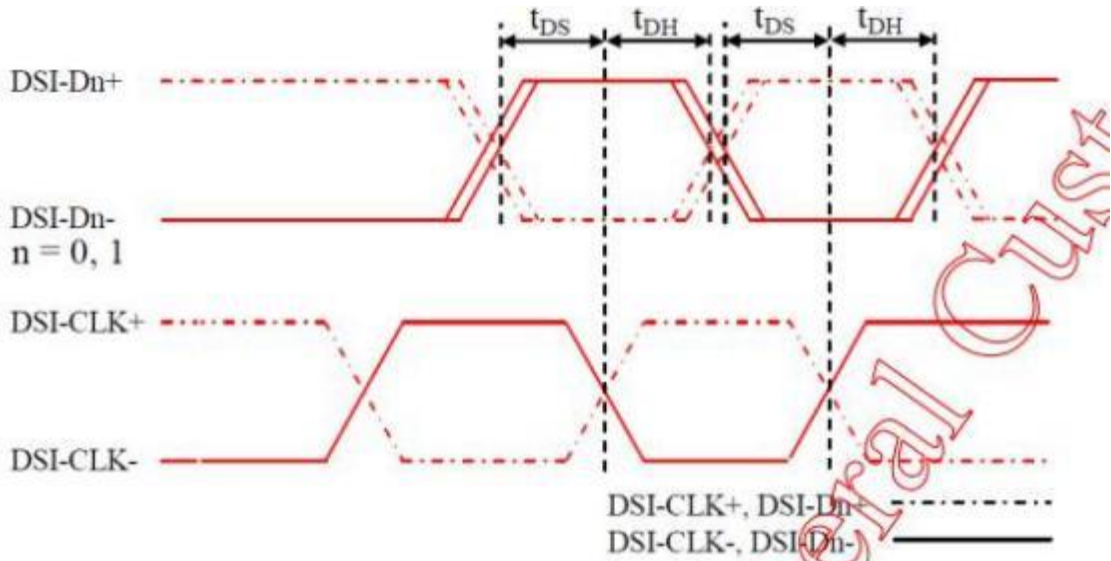
Parameter	Symbol	Condition	Specification			Unit
Input Common Mode Voltage for Clock	V_{CMCLK}	CLKP/N Note 2, Note 3	TBD	-	TBD	mV
Input Common Mode Voltage for Data	V_{CMDATA}	DnP/N Note 2, Note 3, Note 5	TBD	-	TBD	mV
Common Mode Ripple for Clock Equal or Less than 450MHz	$V_{CMRCLK450}$	CLKP/N Note 4	TBD	-	TBD	mV
Common Mode Ripple for Data Equal or Less than 450MHz	$V_{CMRDAT450}$	DnP/N Note 4, Note 5	TBD	-	TBD	mV
Common Mode Ripple for Clock More than 450MHz (peak sine wave)	$V_{CMRCLK450}$	CLKP/N	-	-	TBD	mV
Common Mode Ripple for Data More than 450MHz (peak sine wave)	$V_{CMRDAT450}$	DnP/N Note 5	-	-	TBD	mV
Differential Input Low Level Threshold Voltage for Clock	V_{THCLK-}	CLKP/N	TBD	-	-	mV
Differential Input Low Level Threshold Voltage for Data	$V_{THDATA-}$	DnP/N Note 5	TBD	-	-	mV
Differential Input High Level Threshold Voltage for Clock	V_{THCLK+}	CLKP/N	-	-	TBD	mV
Differential Input High Level Threshold Voltage for Data	$V_{THDATA+}$	DnP/N Note 5	-	-	TBD	mV
Single-ended Input Low Voltage	V_{ILHS}	CLKP/N, DnP/N Note 3, Note 5	TBD	-	-	mV
Single-ended Input High Voltage	V_{IHHS}	CLKP/N, DnP/N Note 3, Note 5	-	-	TBD	mV
Differential Termination Resistor	R_{TERM}	CLKP/N, DnP/N Note 5	TBD	TBD	TBD	Ω
Single-ended Threshold Voltage for Termination Enable	V_{TEHS}	CLKP/N, DnP/N Note 5	-	-	TBD	mV
Termination Capacitor	C_{TERM}	CLKP/N, DnP/N Note 5, Note 6	-	-	TBD	pF

Notes:

1. $T_a = -30^{\circ}\text{C}$ to 70°C (to $+85^{\circ}\text{C}$ no damage), $V_{CI} = 2.5\text{V}$ to 3.3V , $V_{DD3} = V_{DD3_M} = 1.65\text{V}$ to 3.3V
2. Includes 50mV (-50mV to 50mV) ground difference
3. Without $V_{CMRCLK450}/V_{CMRDAT450}$
4. Without 50mV (-50mV to 50mV) ground difference
5. $n = 0$ and 1
6. For higher bit rates, a 14pF capacitor will be needed to meet the common-mode return loss specification.



c) High Speed Mode Data Clock Channel Timing

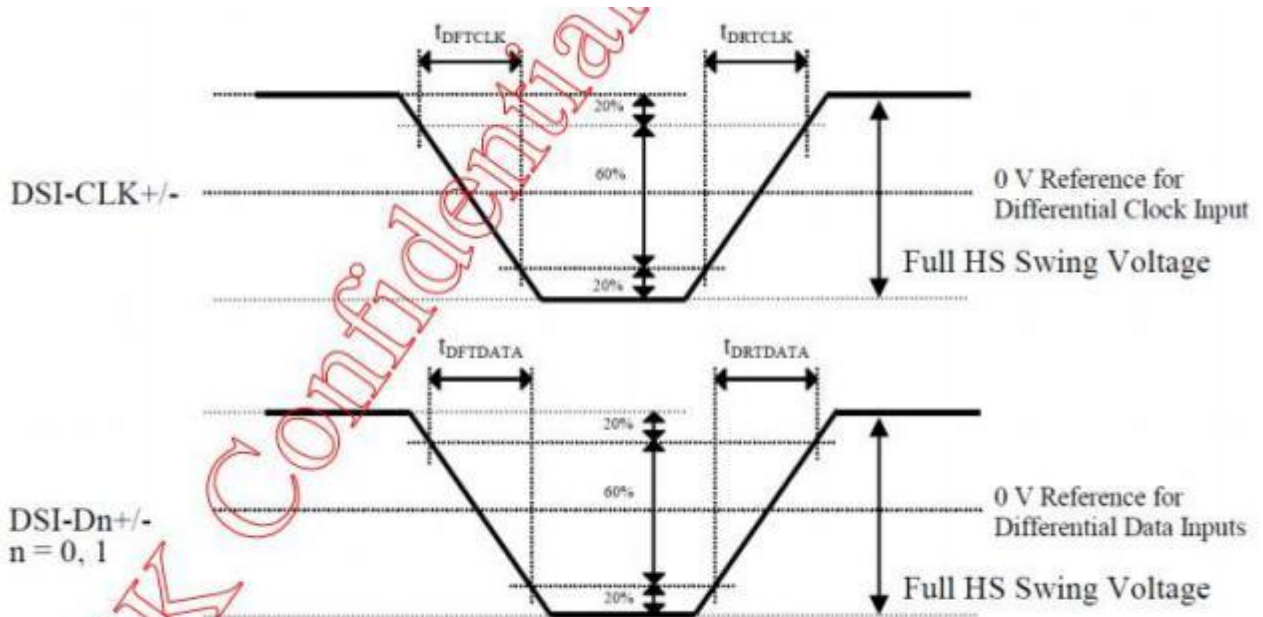


DSI Data to Clock Channel Timings

DSI Data to Clock Channel Timings

Signal	Symbol	Parameter	Min	Max
DnP/N, n=0 and 1	t_{DS}	Data to Clock Setup time	TBD	-
	t_{DH}	Clock to Data Hold Time	TBD	-

d) High Speed Mode - Rising and Falling Timings



Rising and Falling Timings on Clock and Data Channels



9. Quality Specifications

All The raw material are Rohs complicant.

9. Standard of the product appearance test

9.1.1 通常在 $22\pm 3^{\circ}\text{C}$ ， $50\pm 10\%RH$ 的环境，光强度 $350\text{--}700\text{Lux}$ 下（ 20W 日光灯， 40cm 距离左

右，)检验员的眼睛与模块之间的距离为 $35\text{cm}\pm 5\text{cm}$ ，LCD下面用背光源来检查（见图4:）

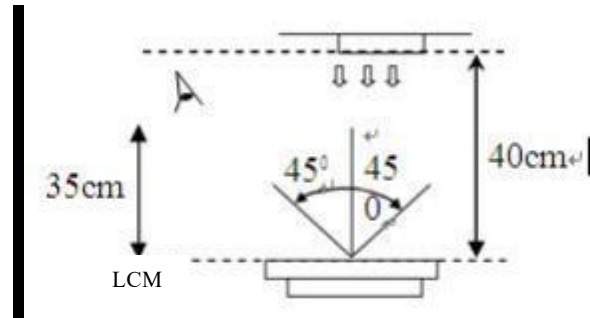


图 4)

9.1.2 模块目视检验方向，按图纸规定视角方向偏离 LCD 平面法线 45° ；

9.2、包装

9.2.1 产品的内外包装方法参照图纸及设计要求来包装。

9.2.2 如客户有特殊的包装要求，按客户的要求执行。



10. Reliability of LCM

Reliability test condition:

Item	Condition	Time (hrs)	Assessment
High temp. Storage	70°C	48	No abnormalities in functions and appearance
High temp. Operating	60°C	48	
Low temp. Storage	-20°C	48	
Low temp. Operating	-20°C	48	
Humidity	50°C/ 80%RH	48	

Note: the above experimental conditions need to assemble the finished product prototype in the experiment;

Recovery time should be 24 hours minimum. Moreover, functions, performance and appearance shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature ($23 \pm 2^{\circ}\text{C}$), normal humidity (below 45%~ 75% RH), and in the area not exposed to direct sun light.