深圳市希恩凯电子有限公司
SHENZHEN CNK ELECTRONIC CO.,LTD.

Product Specification For LCD Module

Model NO.：CNKT0800-19306A2

CUSTOMERITEM NO.：

REVISION：A

☐APPROVAL FOR SPECIFICATIONS ONLY

■ **APPROVAL FOR SPECIFICATIONS AND SAMPLE**

CUSTOMER：	APPROVED BY：

CNK LCM R&D CENTER

APPROVED BY	CHECKED BY	PREPARED BY
DIRECTOR	MANAGER	Engineer

深圳市希恩凯电子有限公司
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CONTENTS:

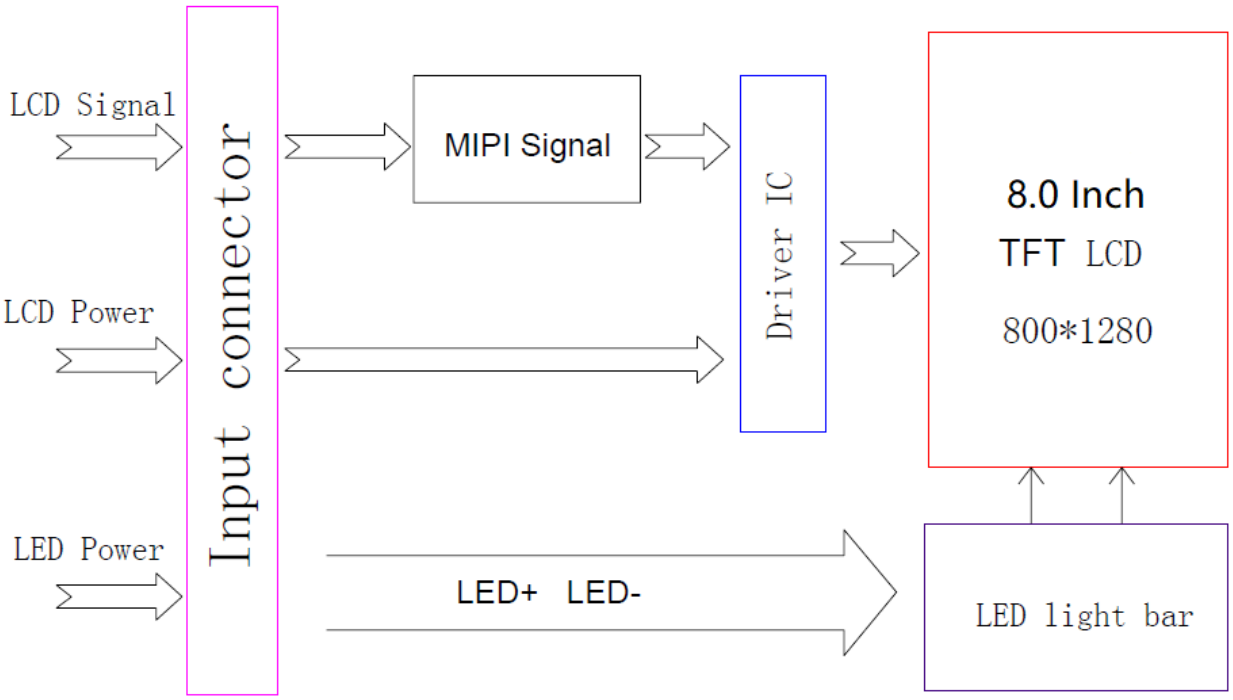
1 VERSION HISTORY

SAMPLE VERSION	DATE	DESCRIPTION	REVISED BY
A00	2018-12-27	FIRST DEVELOPED	Wenlu Liao
A01	2019-03-06	Update PIN Definition (MIPI Signal) Description Section on Page 7 of Specification	Wenlu Liao

2 GENERAL INFORMATION

Item	Contents	Unit
LCD Size	8.0	inch
Driver element	a-Si TFT active matrix	--
Viewing direction	Normally black	--
Module size	114.60(W)*184.10(H)*2.5(T)mm	mm
Panel Active Area	107.64(W)*172.22(H)	mm
Number of Dots	800*RGB*1280	pixel
Driver IC	ILI8881C	--
Colors	16.7M	--
Surface Treatment	Glare	
Interface	MIPI (4 Lane)	--
Brightness	350cd/㎡(typ)	--
NTSC	55%(typ)	--
Backlight power consumption	1.37W(typ)	W
Panel power consumption	TBD	W
Weight	TBD	g
Backlight Type	LED	--
Operating Temperature	-10℃--50℃	℃
Storage Temperature	-20℃--60℃	℃

3 BIOCK DIAGRAM



4 OPERATION SPECIFTCATIONS

4.1 ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Values		Unit
		Min.	Max.	
Power Voltage	VDD	-0.5	4.8	V
	VDDIO	-0.5	3.3	V
Input Signal Voltage	V_I	-0.3	VDD	V
Backlight forward current	I_{LED}	0	21	mA(For each LED)
Operating temperature	TOP	-10	50	℃
Storage temperature	TST	-20	60	℃
Humidity	RH	-	90%(Max50℃)	RH

Note :The absolute maximum rating values of this product are not allowed to be exceeded at any times.Should a module be used with any of the absolute maximum ratings exceeded,the characteristics of the module may not be recovered,or in an extreme case,the module may be permanently destroyed.

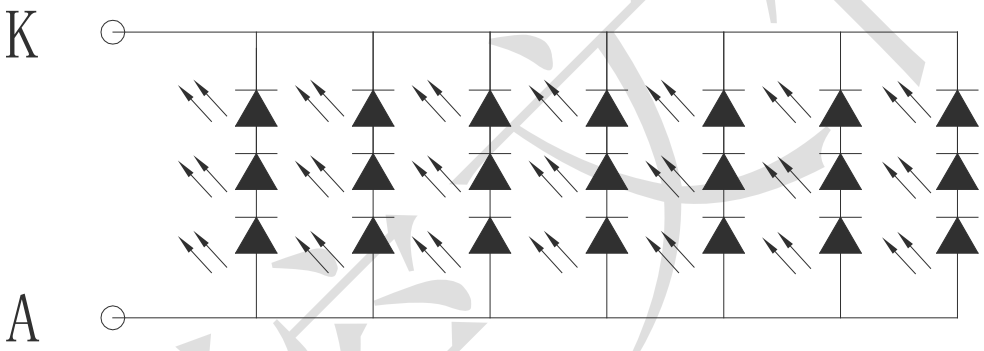
4.2 Typical Operation Conditions

Parameter	Symbol	Values			Unit
		Min	Typ	Max	
Power Voltage	VDD	3.0	3.3	3.6	V
	VDDIO	1.65	1.8	1.9	V
Current Consumption	I_{VDD}	-	-	-	mA
	I_{VDDIO}	-	-	-	mA
	I_{BL}	-	140		mA
Power Consumption	P_{LCD}	-	TBD	-	W
	P_{BL}	-	1.37	-	W

Note :Frame Rate=60Hz,VDD=3.3V,DC Current; Operating at 25℃ at white pattern.

5 BACKLIGHT CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	Vf	9	9.75	10.5	V	If=140mA
Luminance	LV	220	270	-	cd/㎡	
Number of LED	-	21			Piece	-
Connection mode	p	Series and parallel			-	-



21 CHIP WHITE LEDs
Vf=9.0V~10.5V, If=140mA

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6. EXTERNAL DIMENSIONS

PIN No.	SYMBOL
1	VDD
2	VDDIO
3	RESET
4	LPTE
5	GND
6	MIPI_D3N
7	MIPI_D3P
8	GND
9	MIPI_D2N
10	MIPI_D2P
11	GND
12	MIPI_D1N
13	MIPI_D1P
14	GND
15	MIPI_D0N
16	MIPI_D0P
17	GND
18	MIPI_CN
19	MIPI_CP
20	GND
21	LEDK
22	LEDK
23	LEDA
24	LEDA
25	GND
26	NC
27	NC
28	NC
29	GND
30	NC

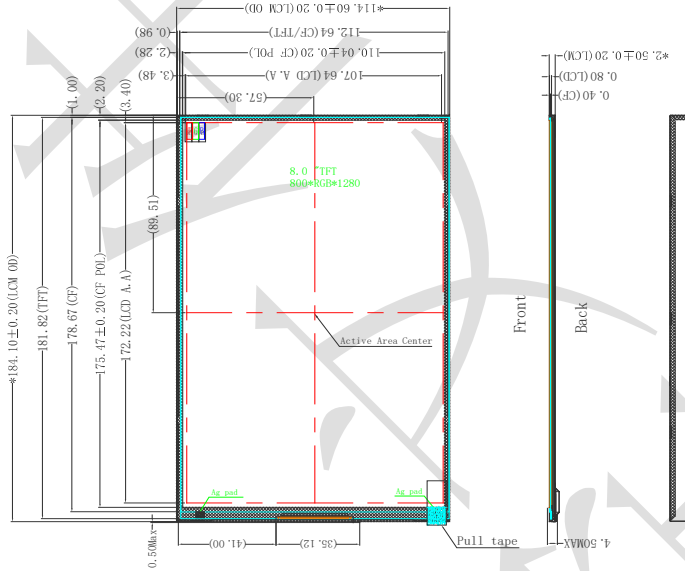
产品阶段

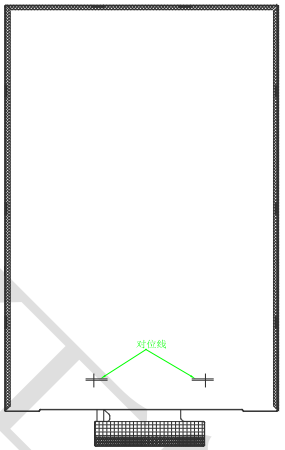
EVT 阶段

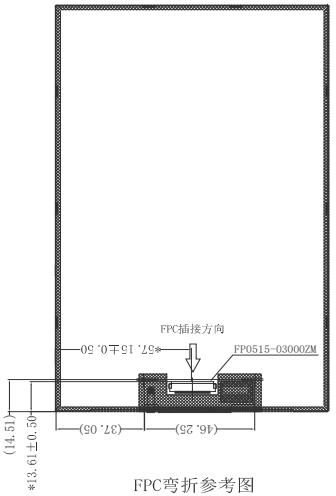
DVT 阶段

MP 阶段

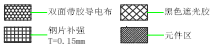
标记	DESCRIPTION(描述)	REVISER(修改人)	DATE(日期)
A	新版发行	Quincy Xie	2018.11.01



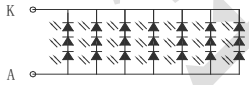




FPC弯折参考图



Notes:
1. DISPLAY TYPE: 8.0″,TFT LCD
2. DISPLAY MODE:Transmissive,normally black
3. VIEWING DIRECTION:Full View
4. DRIVER IC:ILI9881C
5. LCM Brightness(centre point):350cd/m² (MIN),270cd/m²(TYP)
   Chromaticity(centre point): 0.30+/-0.03;0.32+/-0.03
   Uniformity(5 AVG 1/6):75%(MIN),80%(TYP)
6. OPERATING TEMP: -10° C TO +50° C;
   STORAGE TEMP: -20° C TO +60° C;
7. BACK LIGHT: 21 chip white LEDs If=20mA/LED
8. 带*编号为重点尺寸，未注公差为±0.20。
9. SUGGESTION:TP window size unilateral increase 0.3~0.5mm than LCM A.A
   Gasket covered above top polarizer edge, 0.3mm min
10. 所有材料及工艺须符合我司《环境有害物质与产品管制程序》文件编号HK-QP-033的要求



21 CHIP WHITE LEDs
Vf=9.0V~10.5V,If=140mA

TITLE: LCM MODULE DRAWING				GENERAL :	±0.2
PROJECT NO:	CNKT0800-19306A2			TOLERANCE:	Angle=1°
PART NO:		REV:	V00	Pro.(3):	
	NAME	DATE		SCALE:	1:1
DESIGNED:	Quincy	2018.12.20		SIZE:	A4
CHECKED:				UNIT:	MM
APPROVED:				SHEET:	1 OF 1

7 Interface Signal

Pin No.	Symbol	Description
1	VDD	Power supply(3.3V)
2	VDDIO	Power supply(1.8V)
3	RESET	Reset pin(typ 1.8V)
4	LPTE	Tearing Effect pin of each scan line.
5	GND	Power ground
6	MIPI_3N	MIPI data pair 3 negative signal
S7	MIPI_3P	MIPI data pair 3 positive signal
8	GND	Power ground
9	MIPI_2N	MIPI data pair 2 negative signal
10	MIPI_2P	MIPI data pair 2 positive signal
11	GND	Power ground
12	MIPI_1N	MIPI data pair 1 negative signal
13	MIPI_1P	MIPI data pair 1 positive signal
14	GND	Power ground
15	MIPI_0N	MIPI data pair 0 negative signal
16	MIPI_0P	MIPI data pair 0 positive signal
17	GND	Power ground
18	MIPI_CLKN	MIPI CLK negative signal
19	MIPI_CLKP	MIPI CLK positive signal

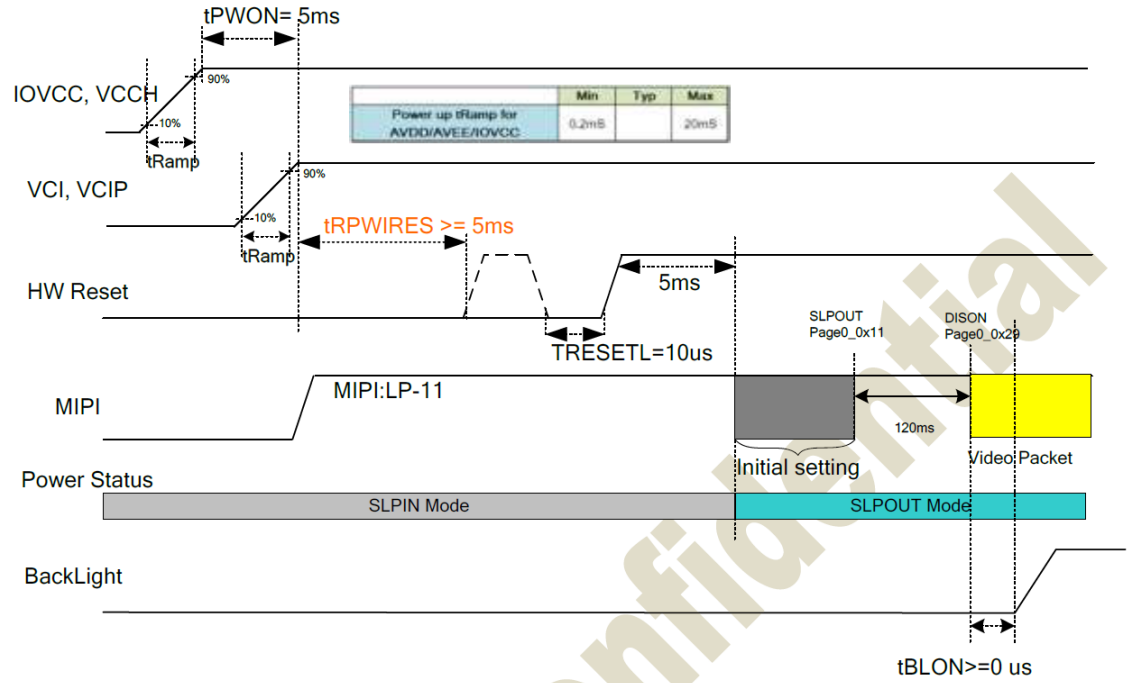
20	GND	Power ground
21	LEDK	LED Cathode
22	LEDK	LED Cathode
23	LEDA	LED Anode
24	LEDA	LED Anode
25	GND	Power ground
26	NC	Not connect
27	NC	Not connect
28	NC	Not connect
29	GND	Power ground
30	NC	Not connect

Connector ： FP0515-03000ZM Or equivalent

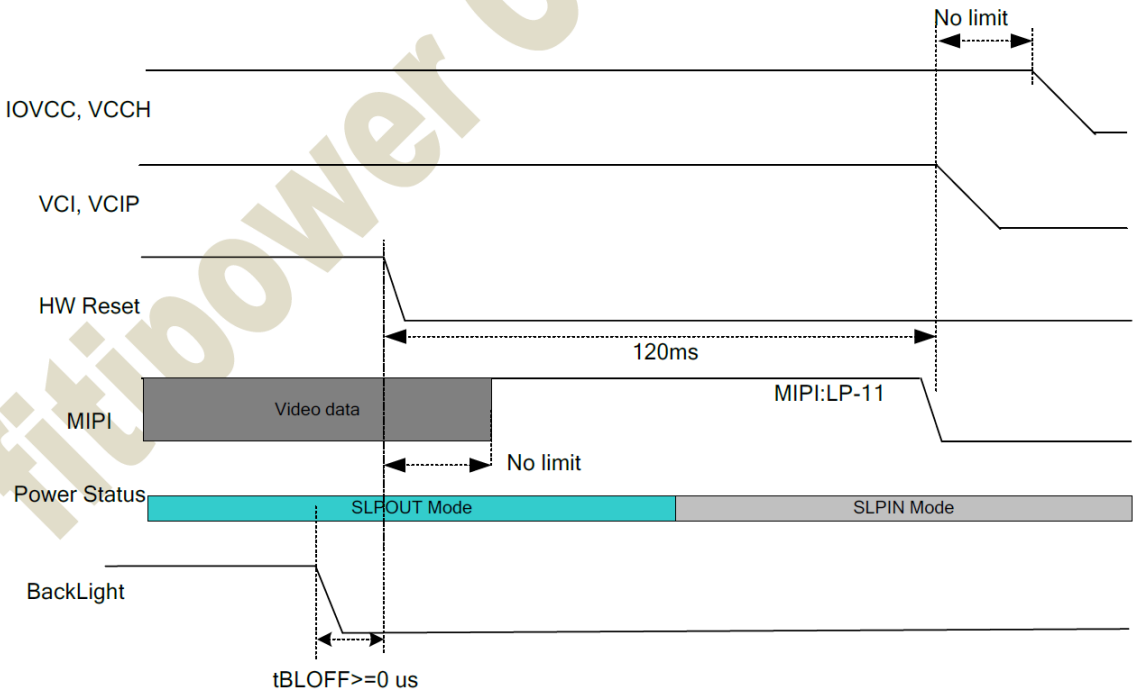
8 SIGNAL TIMING CHARACTERISTICS

8.1.Power On/Off Sequence

Power on:



Power off:



Note:IOVCC=VDDIO.Power supply 1.8V.

8.2 MIPI Interface Timing Sequence

1) MIPI interface DC characteristic：

Item		Parameter	Min.	Typ.	Max.	Unit
LP_TW	Thevenin output high level	VOH	1.1	1.2	1.3	V
	Thevenin output low level	VOL	-50		50	mV
	Output impedance of LP transmitter	ZOLP	110	—	—	Ω
HS_RX	Common-mode voltage HS receive mode	VCMRX(DC)	70	—	330	mV
	Differential input high threshold	VIDTH	—	—	70	mV
	Differential input low threshold	VIDTL	-70	—	—	mV
	Single-ended input high voltage	VIHHS	—	—	460	mV
	Single-ended input low voltage	VILHS	-40	—	—	mV
	Single-ended threshold for HS termination enable	VTERM-EN	—	—	450	mV
	Differential input impedance	ZID	80	100	125	Ω
LP_RX	Logic 1 input voltage	VIH	880	—	1350	mV
	Logic 0 input voltage. not in ULPState	VIL	0	—	550	mV
	Input hysteresis	VHYST	25	—	—	mV
LP_CD	Logic 1 contention threshold	VIHCD	450	—	1350	mV
	Logic 1 contention threshold	VILCD	0	—	200	mV

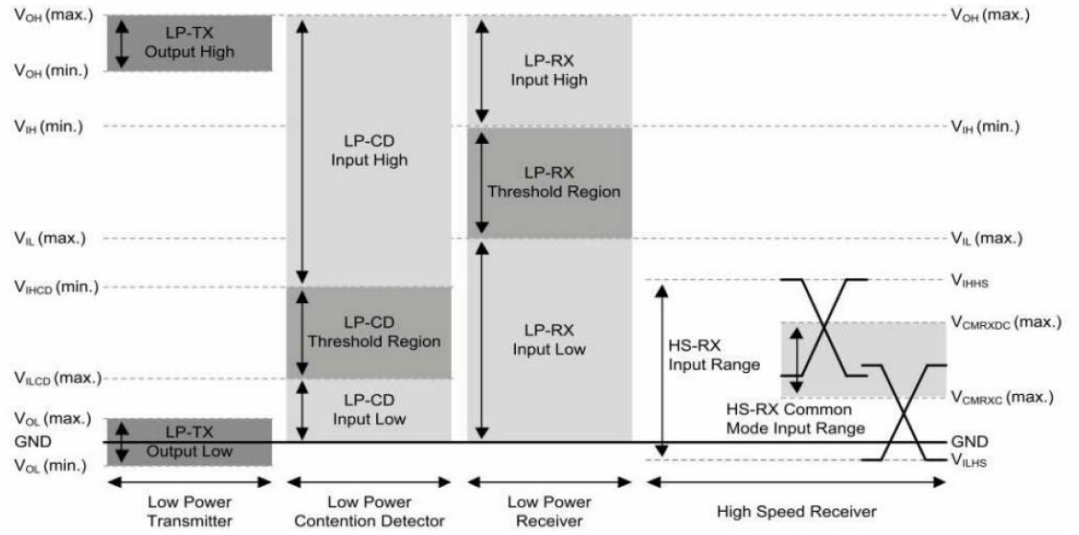


Figure1. MIPI DC Diagram

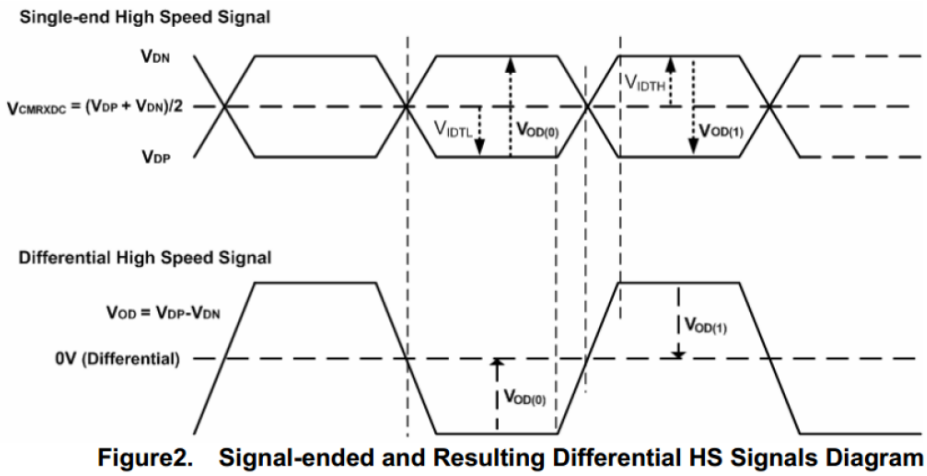


Figure2. Signal-ended and Resulting Differential HS Signals Diagram

2) MIPI data to clock timing definitions

Clock Parameter	Symbol	Min	Typ.	Max.	Unit
UI instantaneous	UI INST	2	—	12.5	ns
Data to Clock Setup Time[Receiver]	T SETUP[RX]	0.15	—	—	UI INST
Clock to Data Hold Time[Receiver]	T HOLD[RX]	0.15	—	—	UI INST
Data to Clock Skew (Measured at transmitter)	T SKEW[TX]	-0.15	—	0.15	—

【Note】

*1) This max value corresponds to a minimum 80 Mbps data rate per lane

*2) The minimum UI shall not be violated for any single bit period, i.e., any DDR half cyclewithin a data burst.

*3) Total silicon and package delay budget of 0.3 UIINST
4) Total setup and hold window for receiver of 0.3 UIINST
*5) T SETUP[Rx] and T HOLD[RX] are only for RX without FPCB and connector and guaranteed by design.

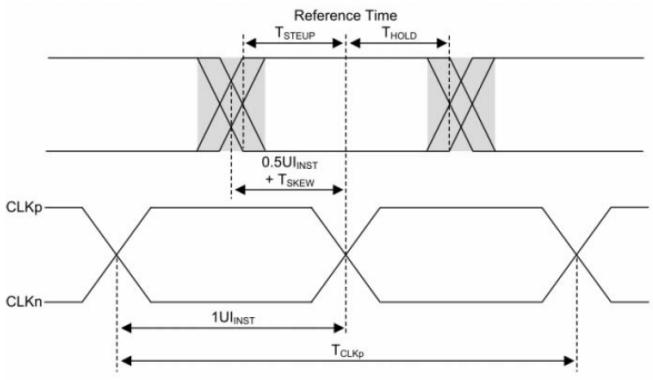
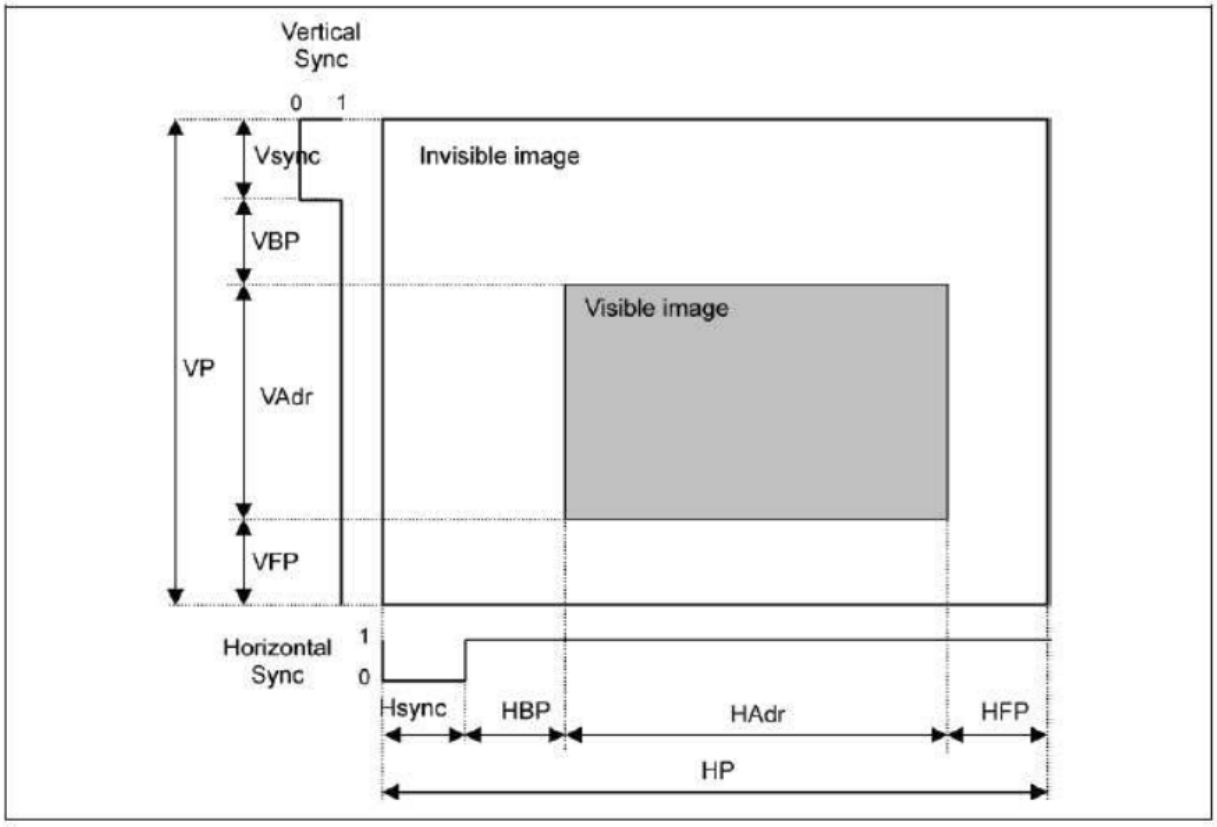
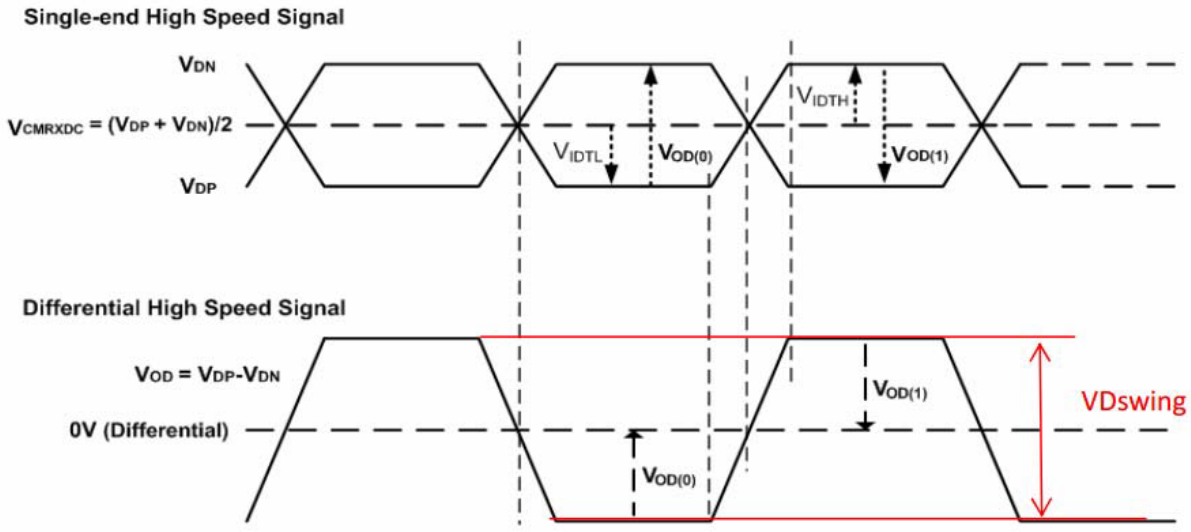


Figure3. MIPI data to clock timing definitions

8.3 Timing Chart

ITEM			SYNBOL	Timing	UNIT
LCD	Frame Rate		-	(60)	Hz
Timing	DCLK	Frequency	fCLK	(68.43)	MHz
		Period	Tclk	(14.61)	ns
	Horizontal	Horizontal total time	tHP	(880)	t_{CLK}
		Horizontal Active time	tHadr	(800)	t_{CLK}
		Horizontal Pulse Width	tHsync	(5)	t_{CLK}
		Horizontal Back Porch	tHBP	(59)	t_{CLK}
		Horizontal Front Porch	tHFP	(16)	t_{CLK}
	Vertical	Vertical total time	tvp	(1296)	t_H
		Vertical Active time	tVadr	(1280)	t_H
		Vertical Pulse Width	tVsync	(5)	t_H
		Vertical Back Porch	tVBP	(3)	t_H
		Vertical Front Porch	tVFP	(8)	t_H
Differential Swing			VDswing	(250)	mV
Bit Rate			TX SPD(MBPS)	(450)	Mbps
Pixel Fomat				(888)	Data bit/pixel
Lane				4	Lane




Single-end High Speed Signal
VDN
VCMRXDC = (VDP + VDN)/2
VDP
VIDTL
VOD(0)
VIDTH
VOD(1)
Differential High Speed Signal
VOD = VDP-VDN
0V (Differential)
VOD(1)
VOD(0)
VDswing

8.4 Reset Input Timing

Symbol	Parameter	Pad	Min.	Typ.	Max.	Unit	Note
tRESW	Reset low pulse width	RESX	10			us	
tREST	Reset completion time	RESX			5	ms	Reset during Sleep In mode
		RESX			120(5)		Reset during Sleep Out mode

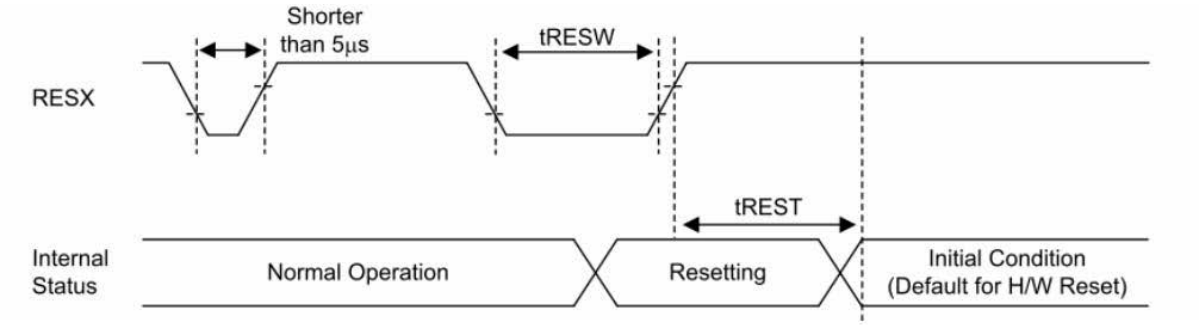


Figure4. Reset Input Timing

Note】

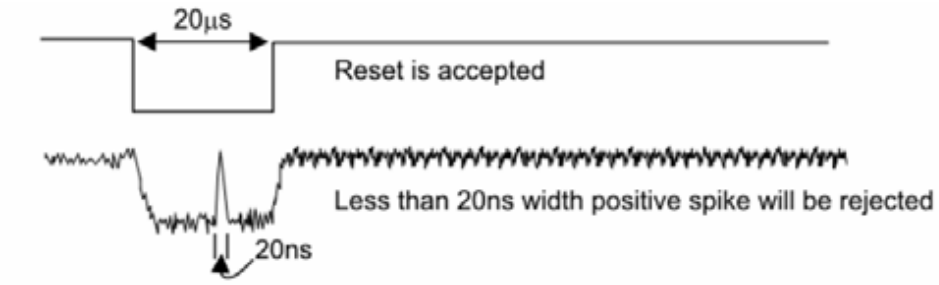
*1) Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

RESX Pulse	Action
Shorter than 5us	Reset Rejected
Longer than 10us	Reset
Between 5us and 10us	Reset Start

*2) During the reset period, the display will be blanked. (The display is entering blanking sequence, for which the maximum time is 120ms, when Reset starts is sleep out-mode. The display remains in the blank state is Sleep In-mode) and then return to default condition for H/W reset.

*3) During Reset Completion Time, ID bytes (or similar) value in MTP block will be latched to the internal register during this period. This loading is done every time when there is H/W reset complete
time (tREST) within 5ms after a rising edge of RESX.

*4) Spike Rejection also applies during a valid reset pulse as shown below:



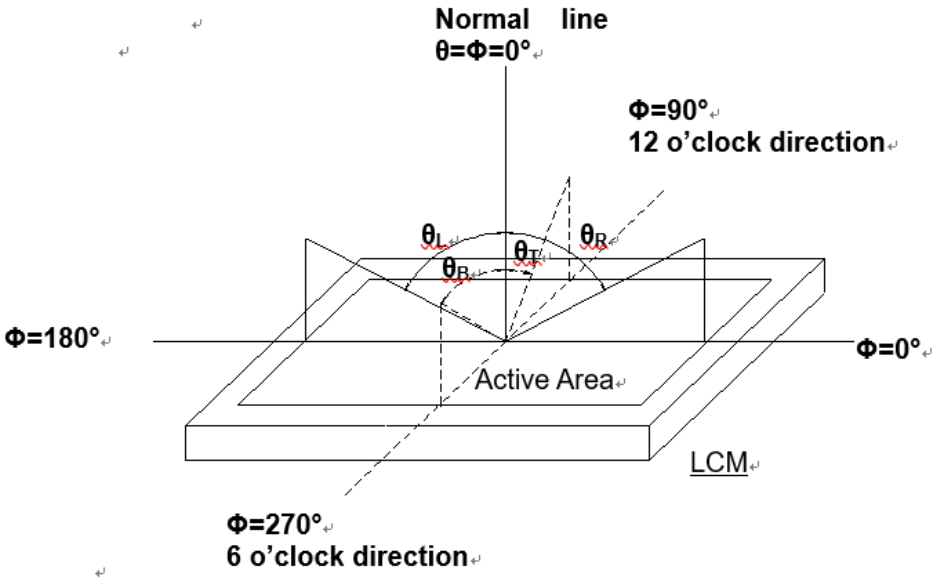
*5) It is necessary to wait for 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

9 ELECTRO-OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
Response time		Tr+Tf	θ=0° □ Ta=25 ℃	-	25	30	ms	Note 2 Note 3
Contrast ratio		Cr		600	800	-	-	Note 2 Note 4
Luminance uniformity		δ WHITE		75	80	-	%	Note 2 Note 6
Surface Luminance		LV		220	270	-	cd/㎡	Note 2
Viewing angle range		θ	□ =90°	-	85	-	deg	Note1
			□ =270°	-	85	-	deg	
			□ =0°	-	85	-	deg	
			□ =180°	-	85	-	deg	
CIE(x,y) chromaticity	Red	x	θ=0° Ta=25 ℃	-	-	-		Note 2 Note 5
		y		-	-	-		
	Green	x		-	-	-		
		y		-	-	-		
	Blue	x		-	-	-		
		y		-	-	-		
	White	x		0.27	0.30	0.33		
		y		0.29	0.32	0.35		

Note 1: Definition of viewing angle range

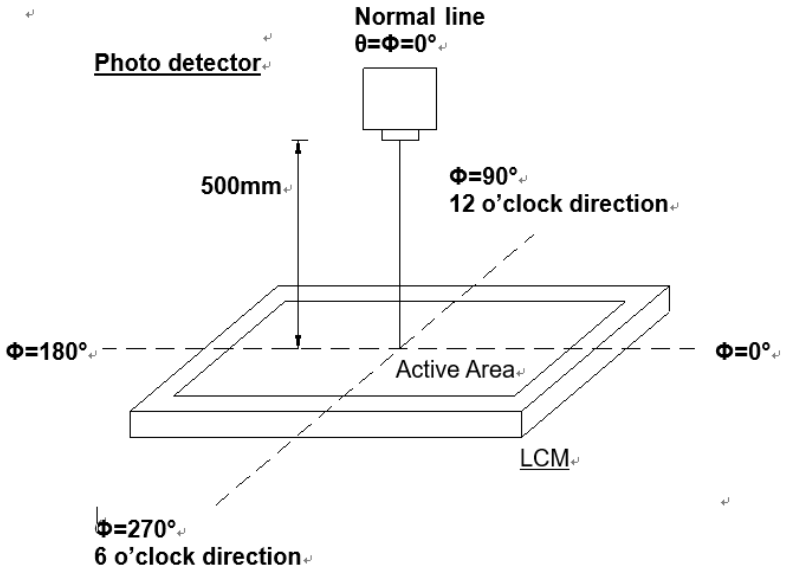
Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface



Definition of viewing angle

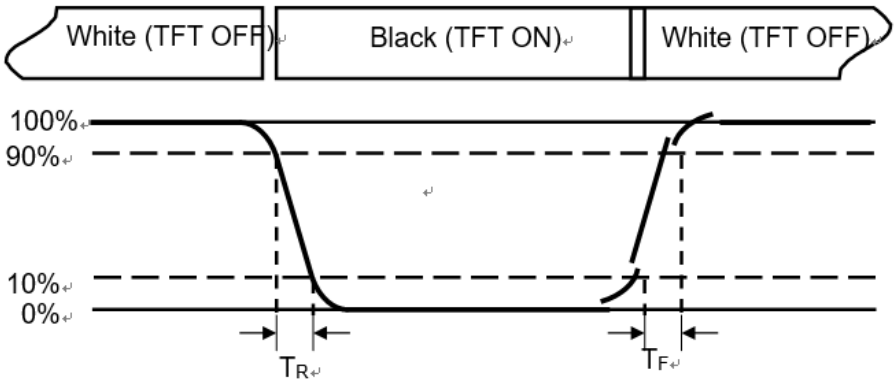
Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm ,Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/ Field of view: 1° /Height: 500mm.)



Note 3: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_R) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_F) is the time between photo detector output intensity changed from 10% to 90%.



Definition of response time

Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

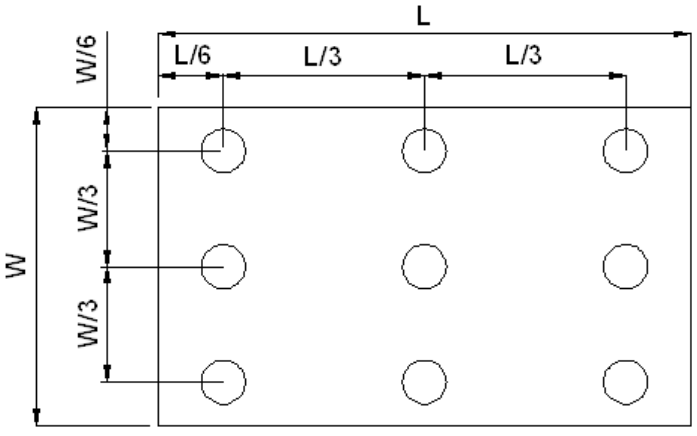
Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity ("White" state)

Active area is divided into 9 measuring areas.Every measuring point is placed at the center of each measuring area.

$$Luminance\ Uniformity\ (Yu) = \frac{B_{min}}{B_{max}}$$



Definition of measuring points

B_{max}: The measured maximum luminance of all measurement position.

B_{min}: The measured minimum luminance of all measurement position.

10 RELIABILITY TEST

Reliability test conditions (Polarizer characteristics null)

No.	Test Items	Test Condition	Remarks
1	High Temperature Storage	T = 60℃ for 96hr	Module (Without Contamination)
2	Low Temperature Storage	T = -20℃ for 96hr	
3	High Temperature Operating	T = 50℃ for 96hr	
4	Low Temperature Operating	T = -10℃ for 96hr (But no condensation of dew)	
5	High Temp. and High Humidity Operating	T = 50℃ /90% for 96hr (But no condensation dew)	
6	Thermal Shock	-10±2℃~25~50±2℃×10cycles (30min.) (5min.) (30min.)	
7	Packing Shock	1corner, 3edge, 6face / 76cmDrop	Packing
8	Packing Vibration	Random 1.06Grms XYZ 30min for each direction	
9	Electrostatic Discharge	Contact: ±4KV Air: ±8KV 150PF/330Ω,5Points/panel,5times	Class B.Note1

※ 1) No.1~ No.6 : No guarantee for panel, only for module with the above test conditions.
※2) No.7~ No.8 : Refer to 7-1) Packing Ass'y on page 14.

Note1

Class	Performance
A	All functions perform as designed during and after exposure to interference
B	Temporary degradation or less of performance which is self-recoverable
C	Degradation or less of performance which requires operator intervention or system reset to recover
D	Degradation or less of function which is not recoverable

Result Evaluation Criteria
TFT- LCD Panel should be at room temperature for 2 hours when the display quality test is over. There should be no particular change which might affect the practical display function and the display quality test should be conducted under normal operating condition.

11 Quality level

TBD

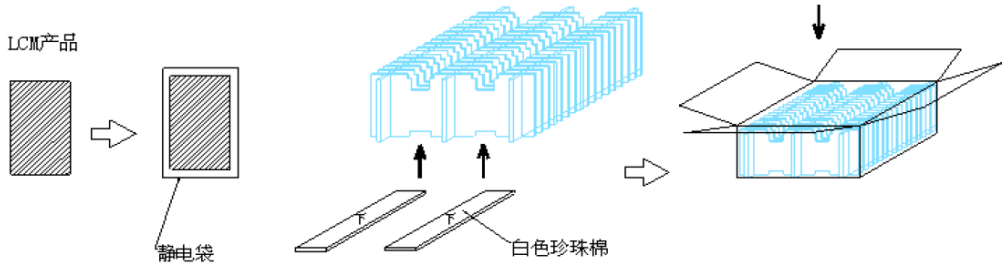
12 Package Drawing

LCM 产品（刀卡类）包装流程图

LCM Product(Card Type) Packing Flow Diagram

1.0 包装材料清单请参考 LCM BOM;
Packing BOM: Please Reference the LCM BOM

2.0 包装方法（Packing Procedure）



第一步
将产品装入静电袋

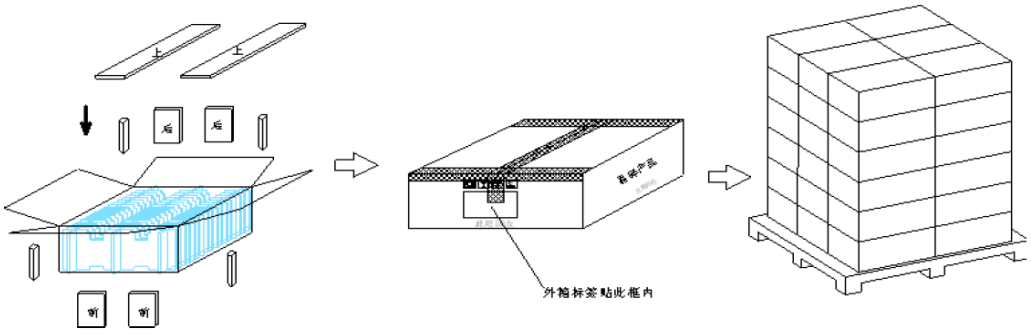
First step
Putting every piece of LCM into anti-static bag.

第二步
把长卡、短卡组成卡阵（短卡朝向一致）形状和数量按照 BOM 实际物料，卡阵底部放对应的白色珍珠棉后装箱

Second step
Assemble a carton matrix with the right white EPE down below ,then place them into the carton.

第三步
每个卡槽内放两片产品，2 片产品显示面相对，中间粉色珍珠棉一起

Third step
Put a pink EPE between 2 pcs products(face to face) while insert all of them into the carton matrix.



第四步
装箱后，按照 BOM 实际物料在纸箱内侧与卡阵避空位置放白色泡棉；

Fourth step
Insert all other white EPE into the right place of the carton matrix .

第五步
用胶带封箱，贴外箱标签

Fifth step
seal the carton with cellulose tape ;
Stick on a carton label,

第六步
将箱子整齐的放在栈板上并包裹，最高可堆叠 6 层；

Sixth step
Place the boxes together on a pallet (6 layers at most),