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CUSTOMER APPROVAL SHEET

Company Name	YOURITECH TECHNOLOGY
	ET262BA01-KN
CUSTOMER APPROVED	Title : Name :

- ☐ **APPROVAL FOR SPECIFICATIONS ONLY (Spec. [Ver. 14](#))**
- ☐ **CUSTOMER REMARK :**



Product Specification

COLOR TFT-LCD MODULE

MODEL NAME: ET262BA01-KN

< >Preliminary Specification

< ◆ >Final Specification



Record of Revision

Version	Revise Date	Page	Content
1	2021/11/01	All	初版规格书
2	2021/11/30	19	增加CR 视角
3	2021/11/30	19	修改亮度
4	2021/12/09	19	亮度与对比ID18/ID19/ID20 更新
5	2022/02/24	9-11	图面
6	2022/03/23	9-11	图面
7	2022/03/23	25-26	Packing and label
8	2022/03/23	23	RA update
9	2022/03/23	8	Lens 规格
10	2022/03/23	23	增加单体EMI规格
11	2022/03/30	7-8	盖板黑边note,surface hardness
12	2022/03/30	9-11	图面
13	2022/05/29	6	重量
14	2022/07/14	8	移除Lens 黑边note_(定版不磨黑边)
15	2022/07/14	9-14	图面
16	2022/07/14	26	增加de-rating curve
17	2022/08/30	25	LED rank
18	2022/09/06	16	Forward Scan
19	2022/10/26	7	AR< 0.65% - @ 400~700nm
20	2022/10/26	8	Glove thickness 定义
21	2022/11/15	4	General description
22	2022/11/15	8,29	客户零件号_VPN3SF-18A910-AB
23	2022/11/15	28	Packing _Total weight
24	2022/11/15	27	低温测试(Ta= -30 °C)下不对影像品质做判定
25	2022/11/15	29	箱测参考标准JISZ0200
26	2022/11/23	25	Forward Current (定电流)与Note 5
27	2022/12/04	27	EMI _CISPR 25 2016 Class3
28	2022/12/04	6	Outline dimension(依图纸)
29	2022/12/28	2	Final specification



Contents

1. General Description.....	6
2. Features.....	6
3. Physical Specifications.....	7
A. TFT-LCD.....	8
B. Touch Panel.....	8
4. Outline Dimension.....	错误！未定义书签。
5. Electrical Specifications.....	10
A. Pin Assignment.....	10
B. DC Electrical Characteristics.....	11
a. Power Specification.....	12
b. DP DC Electrical Characteristics.....	13
C. AC Electrical Characteristics.....	14
a. I2C AC Timing.....	14
D. Timing Condition.....	15
a. Timing Table.....	15
E. Timing Diagram.....	15
F. Power on/off sequence.....	16
G. Power on/off timing:.....	16
6. Optical specifications.....	17
7. Backlight Driving Conditions.....	20
8. Reliability Test Items.....	22



1. General Description

ET262BA01-KN is a LTPS & Transmissive type Thin Film Transistor Liquid Crystal

Display (TFT-LCD) with AHVA (Advanced Hyper View Angle) and in cell touch technology. This model is composed of a TFT-LCD, TDDI IC, FPC, lens lamination with OCA and eDP bridge PCBA.

2. Features

- 27.0-inch (6:1) display
- In Cell Touch sensor
- 4320RGB x 720 resolution in RGB stripe dot arrangement
- Interfaces: eDP*4Lane
- Advanced Hyper View Angle – Normal Black wide view technology
- RoHs compliance

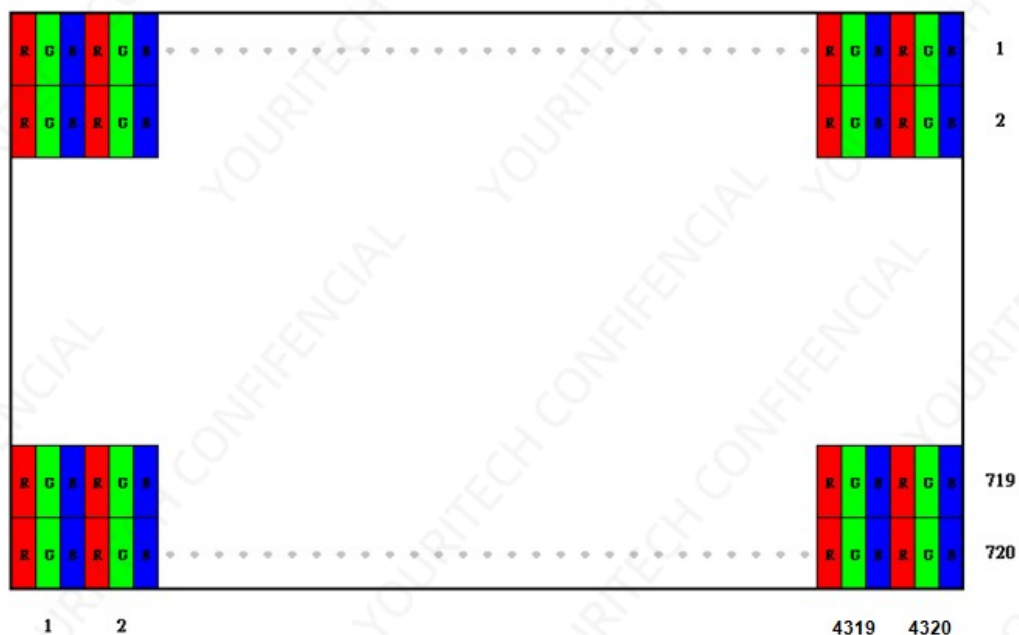


3. Physical Specifications

A. TFT-LCD

NO.	Item	Unit	Specification	Remark
1	Display Resolution	dot	4320 RGB(H) x 720 (V)	
2	Active Area	mm	657.072 (H) x 109.512 (V)	
3	Screen Size	inch	26.2" (Diagonal)	
4	Dot Pitch	μ m	152.1x152.1	
5	Color Configuration	--	R. G. B. Stripe	
6	Color Depth	--	16.7M Colors	
7	Overall Dimension (Module outline)	mm	(739.39)(H) x (182.84)(V) x (57.5)(T)	With Diecasting
8	Weight	g	1900	+/-50
9	Display Mode	--	Normally Black	
10	Surface Treatment	H	Hard Coating	

Note 1: Below figure shows dot stripe arrangement.



B. Touch Panel

NO.	Item	Unit	Specification	Remark
1	Sensor Mode	-	In-cell	Self-Capacitance
2	Touch Panel Controller	-	HX83192	TDDI
3	TP Channel	channels	2400 channels	120x20
4	Sensor Pitch	mm	5.475mm*5.475mm	
5	Accuracy	mm	Edge area<2.0mm	
			Center area<1.5mm	
6	Precision	mm	Edge area <2.0mm	
			Center area <1.5mm	
7	Linearity	mm	Edge area <2.0mm	
			Center area <1.5mm	
8	Jitter	mm	Edge area <0.3mm	
			Center area <0.2mm	
9	Report Rate	Hz	120Hz	
10	Support Finger numbers	points	5 points	
11	Finger Separation	mm	X & Y axis min 13mm / Diagonal min 15mm	
12	Glove thickness	mm	4mm	CG + OCA + Glove < 6.5mm, PMMA=2mm
13	Surface Hardness	H	≥ 7H,750g	Cover Lens
14	Surface Reflection	%	≤3	after lamination TFT
15	Water angle (AF)	deg	≥ 110	Cover Lens
16	Gloss (AG)	GU	120±10	Cover Lens
17	Haze (AG)	%	1~5%	Cover Lens



18	AR	-	AR< 0.65% - @ 400~700nm	1.Cover Lens_BM area CMB00D 测试 2.仪器测试上限 700nm
19	強化層	-	CS $\geq$ 750MPa、DOL > 35 μ m	Cover Lens
20	True black Δ E BM 与 AA 区域 Δ E (SCI)	-	≤ 3	≤ 3.0 -after lamination TFT (Δ E (SCI) 以樣品實測值為主)

1.Cover lens: 1.3mm AGC DT glass

2.不磨边 lens 架构对应客户料号 VPN3SF-18A910-AB

3.AR @400nm~780nm 可满足小于 0.65%,但基于 CMB00D 仪器量测限制,规格标示范围 400nm~700nm,以利生产监控



5. Electrical Specifications

A.Pin Assignment

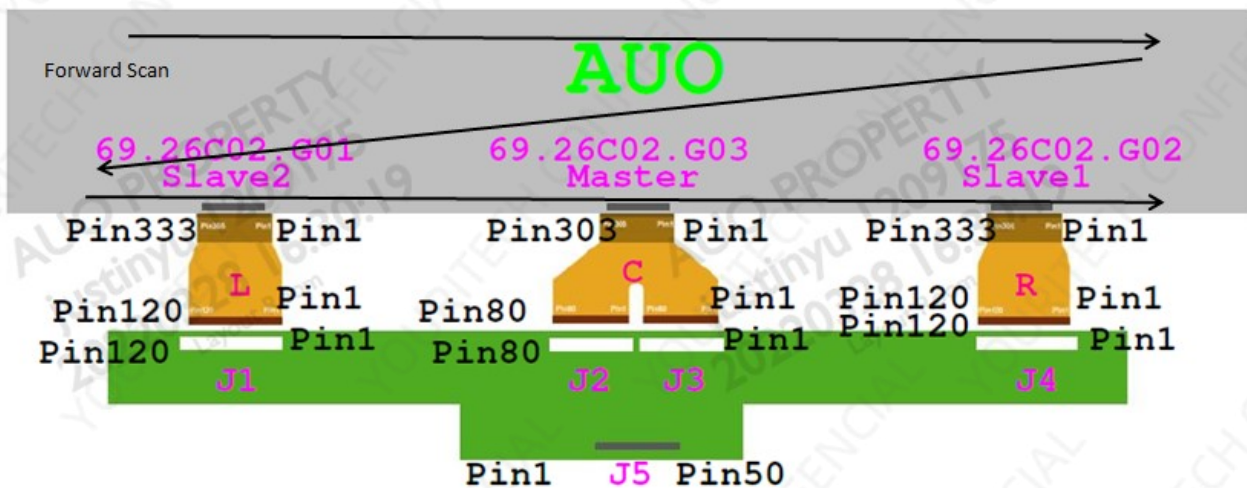
Recommend Connector= Hirose FH52-50S-0.5SH

No.	Pin Name	I/O	Description	Remarks
1	GND	P	Ground	
2	GND	P	Ground	
3	GPIO1	O	GPIO1	
4	GPIO0	O	GPIO0	
5	M_SCL	I	eDP Bridge IC: I2C Clock	
6	M_SDA	I/O	eDP Bridge IC: I2C Data	
7	SPI_WP		eDP Bridge IC Flash: Write Protect Input 1: Hardware Unprotected	
8	NC	-	NC	
9	VCC_IN	P	Power Supply 3.3V	
10	VCC_IN	P	Power Supply 3.3V	
11	VCC_IN	P	Power Supply 3.3V	
12	VCC_IN	P	Power Supply 3.3V	
13	VCC_IN	P	Power Supply 3.3V	
14	NC	-	NC	
15	NC	-	NC	
16	FAIL_DET	O	TDDI: Fail Detection Output	
17	GND	P	Ground	
18	TP_RST	I	Touch Reset (0: Reset)	
19	TP_ATTN	O	Touch Interrupt	
20	DD_RST	I	TDDI: Reset (0: Reset)	
21	GND	P	Ground	
22	STBYB	I	Sleep In / Sleep Out 0: Sleep In, 1: Sleep Out	
23	TP_SCL	I	Touch: I2C Clock	
24	TP_SDA	I/O	Touch: I2C Data	
25	DD_SCL	I	Display: I2C Clock	
26	DD_SDI_SDA	I/O	Display: I2C Data	
27	NC	-	NC	
28	NC	-	NC	
29	NC	-	NC	
30	BIST	i	Built-In Self Test 1: No Video in, BIST Pattern 0: No Video in, Black Pattern	
31	GND	P	Ground	
32	AUX_NO	I	AUXN	
33	AUX_PO	I	AUXP	
34	GND	P	Ground	
35	RX0P	I	RX0P	
36	RX0N	I	RX0N	
37	GND	P	Ground	
38	RX1P	I	RX1P	



39	RX1N	I	RX1N	
40	GND	P	Ground	
41	RX2P	I	RX2P	
42	RX2N	I	RX2N	
43	GND	P	Ground	
44	RX3P	I	RX3P	
45	RX3N	I	RX3N	
46	GND	P	Ground	
47	HPD_O	O	Hot Plug Detect	
48	FAIL_FLAGO	O	eDP Bridge IC: Fail Detection Output	
49	GND	P	Ground	
50	GND	P	Ground	

I: Digital signal input, P: Power input, O: Digital signal output



B.DC Electrical Characteristics

The following items are measured under stable condition and suggested application circuit.

a. Power Specification

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply	VDD		3.3		V
	IVDD		758	910	mA
	IVDD inrush current			2	A
Input high voltage	V _{IH}	0.7VDD	-	VDD	V
Input low voltage	V _{IL}	GND	-	0.3VDD	V
Output high voltage	V _{OH}	0.8VDD	-	-	V
Output low voltage	V _{OL}	-	-	0.2VDD	V

Note 1 : Test pattern is the following picture(white pattern)

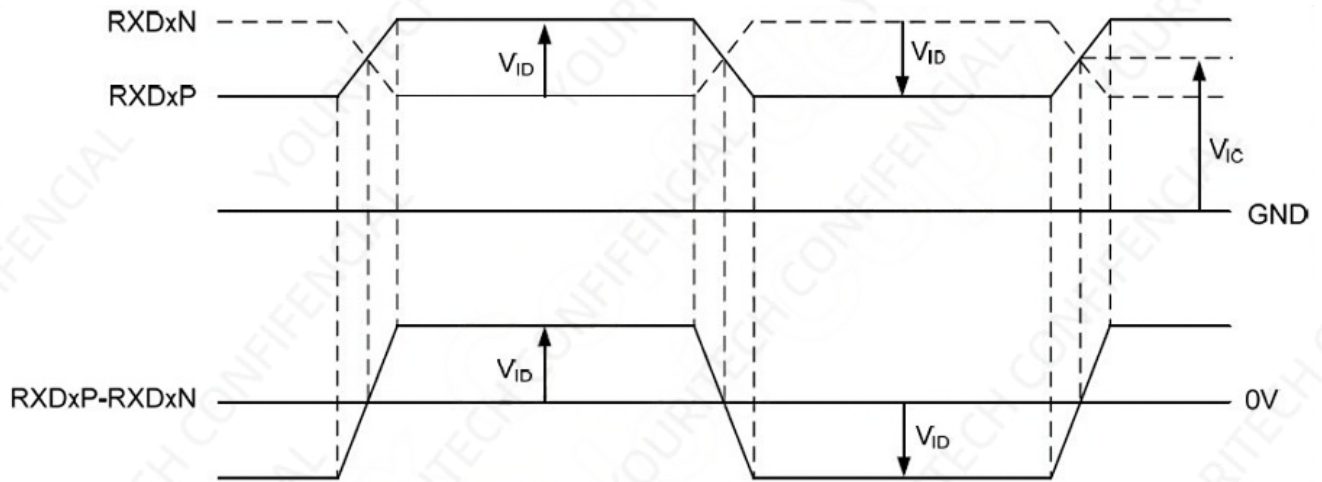


Fig. 3. Test pattern for power specification

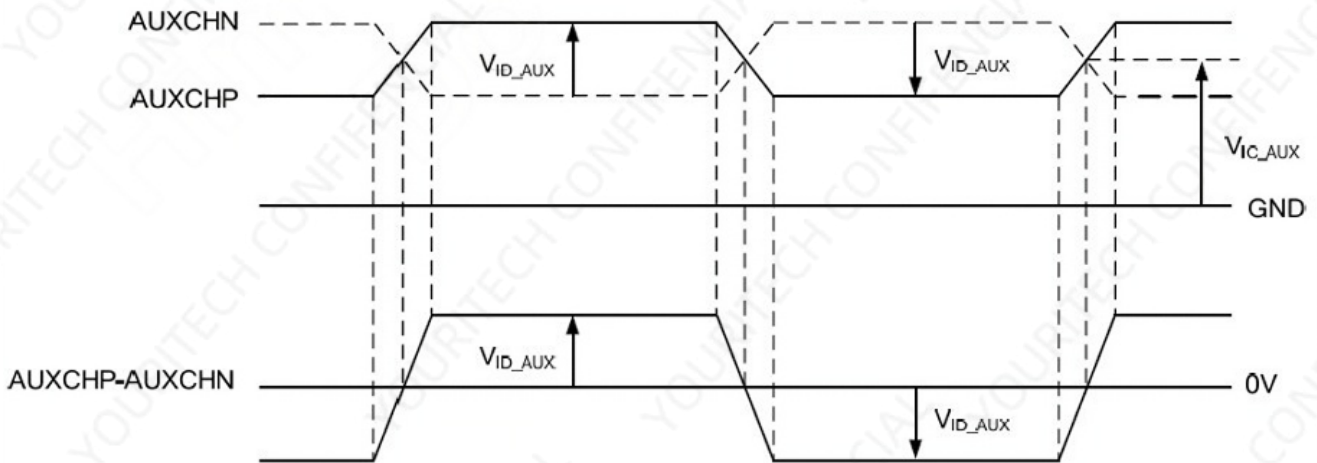
b. DP DC Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Main link common mode voltage	V _{IC}	0	-	2.0	V	
Main link swing voltage	V _{ID}	±60	-	±600	mV	2.7Gbps
		±60	-	±600	mV	1.62Gbps
AUX common mode voltage	V _{IC_AUX}	0	-	2.0	V	
AUX swing voltage	V _{ID_AUX}	±0.195	-	±0.69	V	Transmitting
		±0.16	-	±0.68	V	Receiving





Main Link V_{ID} and V_{IC} definition



AUX CH V_{ID_AUX} and V_{IC_AUX} definition

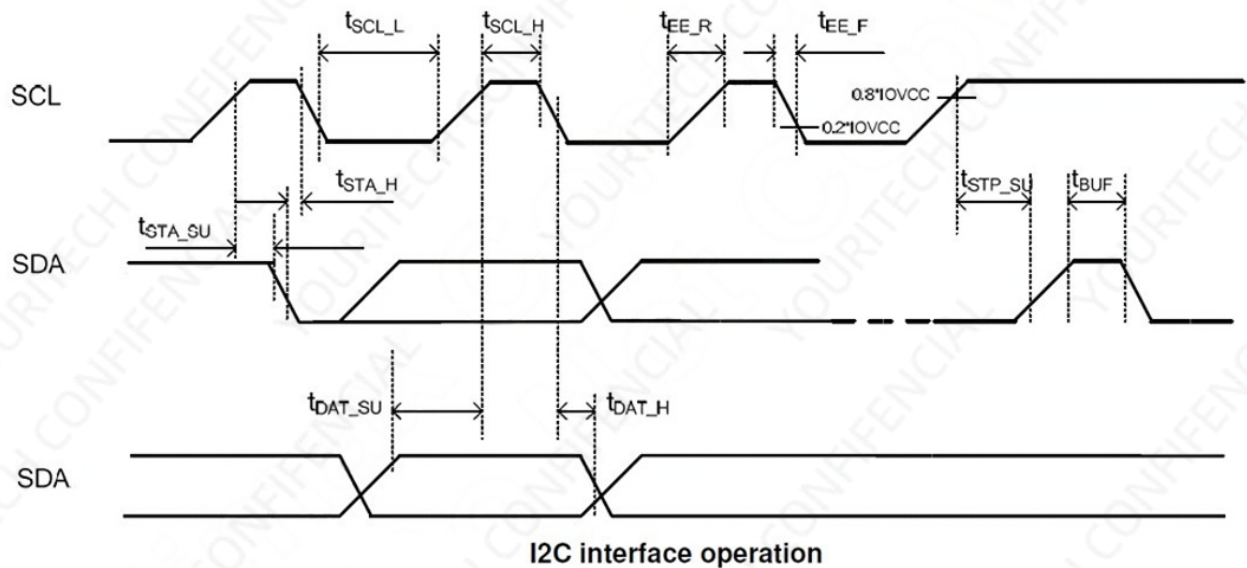
C.AC Electrical Characteristics

a. I2C AC Timing

Item	Symbol	Min	Typ.	Max.	Unit
SCL clock frequency	t_{SCL}	-	-	400	kHz
Clock high time	$t_{SCL\ H}$	1.0	-	-	μs
Clock low time	$t_{SCL\ L}$	1.2	-	-	μs
SCL,SDA rise time	$T_{EE\ R}$	-	-	300	ns
SCK,SDA fall time	$T_{EE\ F}$	-	-	300	ns
Start condition setup time	$t_{STA\ SU}$	1.0	-	-	μs
Start condition Hold time	$t_{STA\ H}$	0.8	-	-	μs



Stop condition setup time	t_{STP_SU}	1.0	-	-	us
Data setup time	T_{DAT_SU}	250	-	-	ns
Data hold time	T_{DAT_H}	250	-	-	ns
Bus free time	T_{BUF}	1.5	-	-	us



D. Timing Condition

Please follow timing setting (Typ.) as below:

The LCD's performance (e.g. Optical、EMI) could be poor when wrong timing setting.

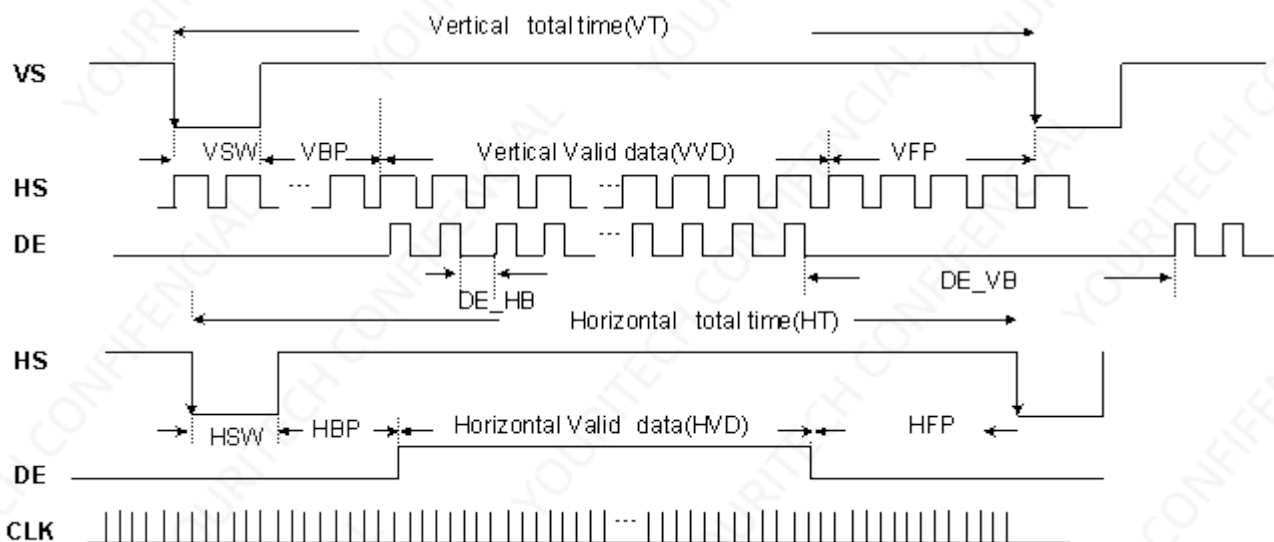
a. Timing Table

Parameter		Symbol	Min.	Typ.	Max.	Unit.	Remark
CLK Frequency		FCLK=1/TCLK	186.36	188.10	189.84	MHz	
HS	Period	THT	4530	4560	4590	TCLK	
	Horizontal display area	THDE	4320			TCLK	
	Horizontal pulse width	THSW	54	60	66	TCLK	
	Horizontal back porch	THBP	54	60	66	TCLK	
	Horizontal front porch	THFP	102	120	138	TCLK	
VS	Period	TVT	748	750	752	THT	
	Vertical display area	TVDE	720			THT	
	Vertical pulse width	TVSW	2	2	2	THT	
	Vertical back porch	TVBP	8	8	8	THT	
	Vertical front porch	TVFP	18	20	22	THT	
Frame rate				55		Hz	

NOTE:

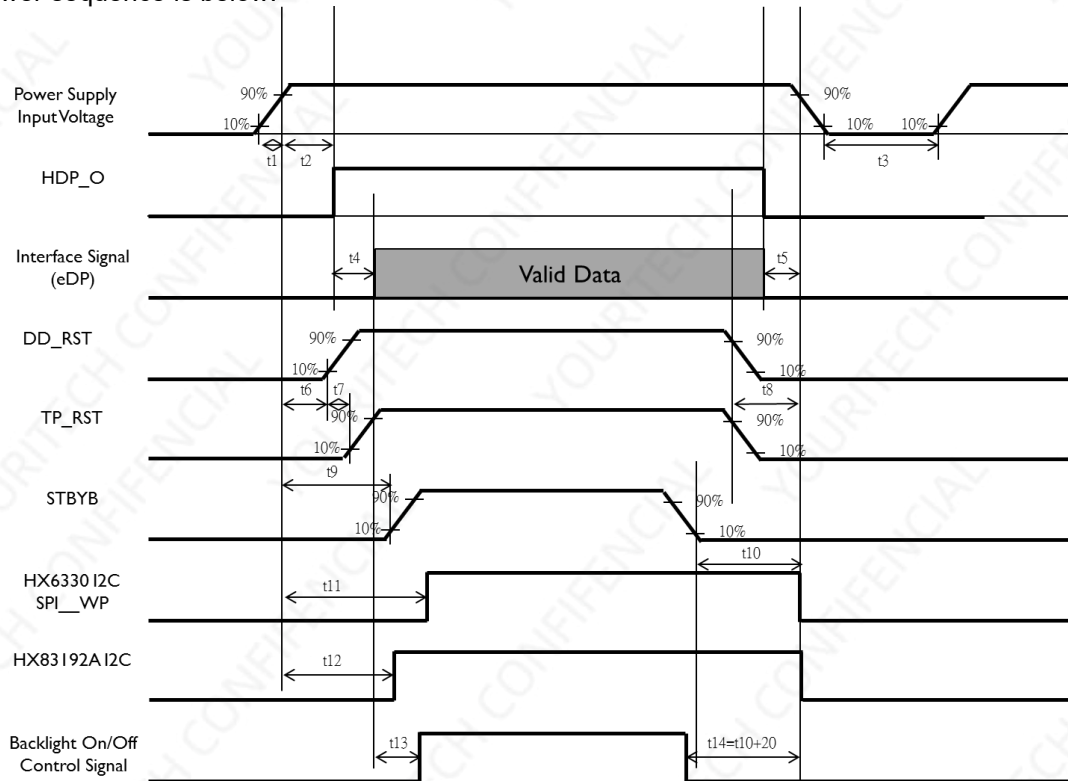
1. If out of the specifications, it may affect the display quality and touch function.

E. Timing Diagram



F. Power on/off sequence

The LCD could be permanently damaged under a wrong power on/off sequence. The suggested LCD power sequence is below:



G. Power on/off timing:

Parameter	Value			Units	Note
	Min.	Typ.	Max.		
t1	3	-	5	ms	
t2	-	-	20 ^{*1}	ms	
t3	100	-	-	ms	
t4	-	-	50	ms	
t5	-	-	-	ms	
t6	5	-	-	ms	
t7	0	-	-	ms	
t8	0 ^{*2}	-	-	ms	
t9	100	-	-	ms	
t10	100	-	-	ms	
t11	500	-	-	ms	
t12	100	-	-	ms	
t13	215	-	-	ms	
t14	t10+20	-	-	ms	

Note:

(1) $t2 \leq 20\text{ms}$ is based on $t1 < 8\text{ms}$

DD_RST 拉 Low 時, 83192-A I2C disable。



6. Optical specifications

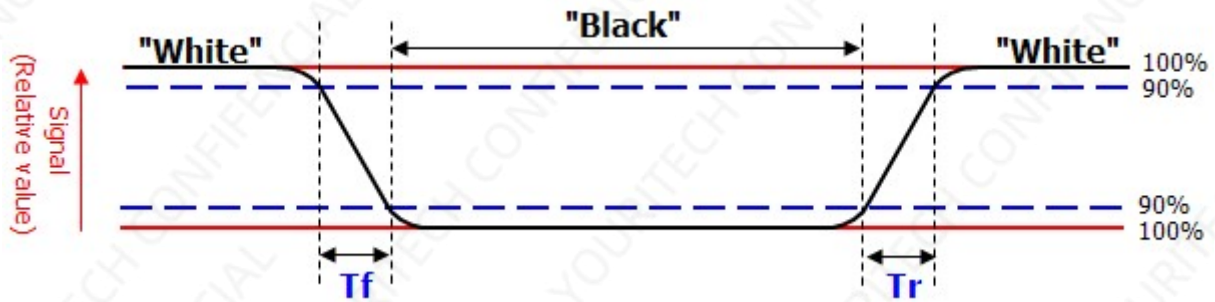
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response Time		Tr+Tf	$\theta = 0^\circ$, 25°C	--	-	20	ms	Note 1,2
			$\theta = 0^\circ$, -20°C			200		
			$\theta = 0^\circ$, -30°C			350		
Contrast ratio		CR	$\theta = 0^\circ$	1200	-	--	-	Note 3, 4 Only for DVT1-1 with ALCF BLU
			Area A+	1000	-	-		
			Area A	500	-	-		
			Area B	300	-	-		
Brightness		-	$\theta = 0^\circ$	850	-	--	nits	Only for DVT1-1 with ALCF BLU
			Area A+	800	-	-		
			Area A	350	-	-		
			Area B	230	-	-		
Viewing angle		Viewing angle up	CR ≥ 10	80			deg.	Note 3, 4
		Viewing angle down		80			deg.	Note 3, 4
		Viewing angle left		80			deg.	Note 3, 4
		Viewing angle right		80			deg.	Note 3, 4
Chromaticity	Wx	--	$\theta = 0^\circ$		0.296		--	+/-0.03
	Wy	--	$\theta = 0^\circ$		0.312		--	
	Rx	--	$\theta = 0^\circ$		0.662		--	
	Ry	--	$\theta = 0^\circ$		0.309		--	
	Gx	--	$\theta = 0^\circ$		0.296		--	
	Gy	--	$\theta = 0^\circ$		0.666		--	
	Bx	--	$\theta = 0^\circ$		0.151		--	
	By	--	$\theta = 0^\circ$		0.056		--	
NTSC		--	--	--	87	--	%	
Uniformity (9 points)	White	--	$\theta = 0^\circ$	80	--	--	%	Note 5
	Black	--	$\theta = 0^\circ$	50	-	-	%	



Note 1: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "black" to "white"(rising time) and from "white" to "black"(falling time), respectively.

The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below.



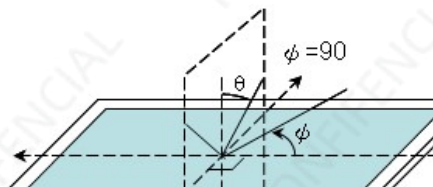
Note 2. From liquid crystal characteristics, response time will become slower and the color of panel will become darker when ambient temperature is below 25℃.

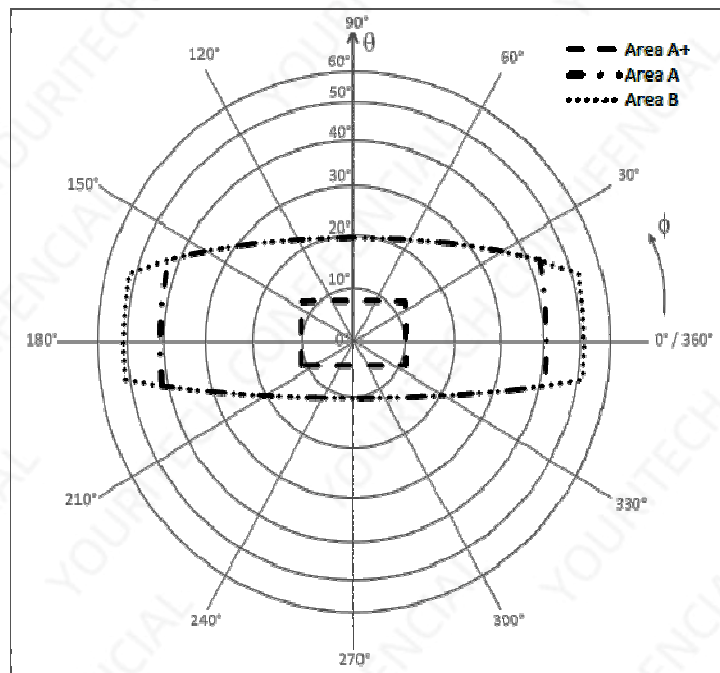
Note 3. Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" status}}{\text{Photo detector output when LCD is at "Black" status}}$$

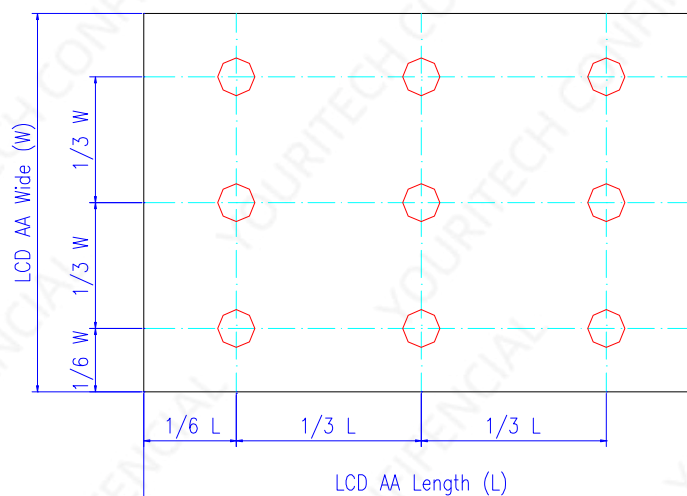
Note 4. Definition of viewing angle: refer to figure as below.





	upper left		upper right		lower left		lower right	
	θ	Φ	θ	Φ	θ	Φ	θ	Φ
A+	12.7	141.5	12.7	38.6	10.7	201.6	10.7	338.4
A	42.5	156.6	42.5	23.5	40.6	191.9	40.6	348.2
B	51.3	163	51.3	17	50.3	188.4	50.3	351.6

Note 5. Transmittance uniformity is measured by 9 points methods.

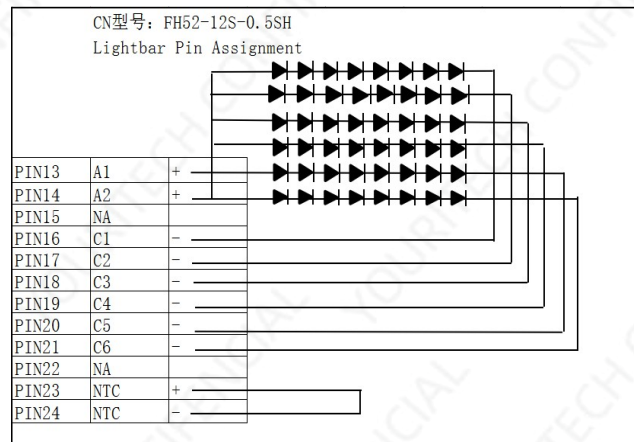
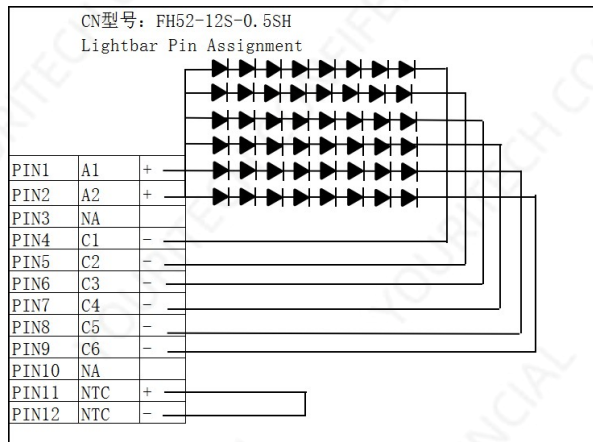


$$\text{Uniformity} = \frac{\text{minimum transmittance}}{\dots}$$

7. Backlight Driving Conditions

LED rank (亿光 BLA-3014PZ1UHBC)(C2C3C4D2D3D4)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Forward Current	I _F	At 25°C	80mA			mA	Single series (定电流)
Forward Voltage	V _F	IF=80mA At 25°C	21.6	24	26.4	V	Note 1 & 2
LED Supply power	P	At 25°C	10.368	11.52	12.672	W	Note 1
LED Life Time	T _{LED}	At 25°C	10000	---	---	Hr	Note 3



*** LED backlight is composed by total 96LEDs (两条 Lbar , 单条 Lbar: 6strings, 8pcs per string).

Note 1: The LED backlight supply power is for 6 strings of LEDs.

Note 2: The voltage capacity of LED driver IC must be over the max of LED Supply Voltage condition.

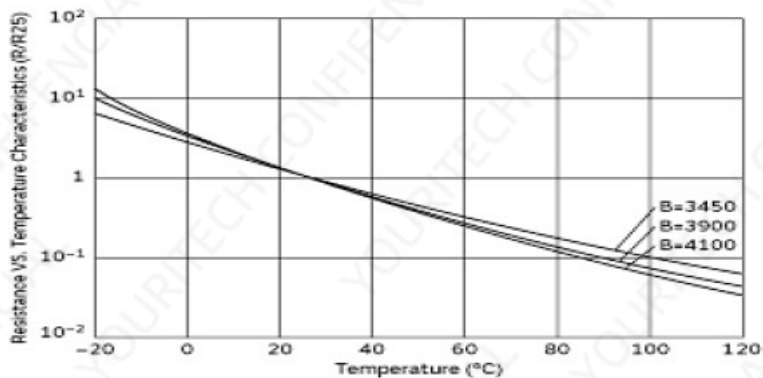
Note 3: The LED lifetime 10000hrs means: after 10000hrs normally use at 80mA, under +25°C, the brightness decreases to 50% of original level.

Note 4: Derating curve

Note 5: LED Max. Rating 90mA, LED rank (亿光 BLA-3014PZ1UHBC)(C2C3C4D2D3D4)最佳光学, Thermal 评估, Life 定义保证以定电流 80mA 驱动为主

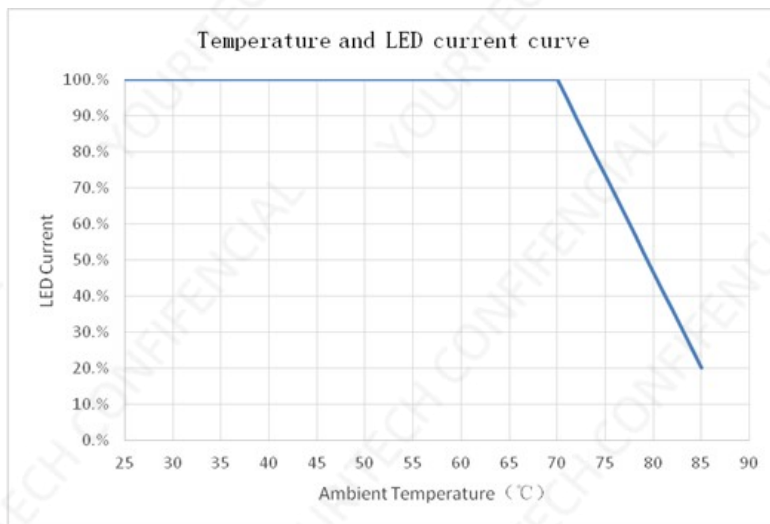


NTC 型号: NCU15XH103F6SRC



电阻-温度特性

De-rating curve



8. Reliability Test Items

No.	Test items	Conditions		Remark
1	High temperature storage	Ta= 95 °C	500 Hrs	
2	Low temperature storage	Ta= -40 °C	500 Hrs	
3	High temperature operation	Ta= 85 °C	500 Hrs	
4	Low temperature operation	Ta= -30 °C	500 Hrs	低温测试下不对影像品质 做判定
5	High temperature and high humidity	Ta= 60 °C, 90 % RH	500 Hrs	Operation
6	Heat shock	-40 °C ~ 85 °C / 100 cycles 1 Hrs/cycle		Non-operation
7	Shock	100 G, 6 ms, ±X, ±Y, ±Z 3 times for each direction		
8	Electrostatic Discharge	Contact = ± 8 kV, class B Air = ± 15 kV, class B		IEC61000-4-2
9	EMI	CISPR25 2016 Class3		
9	Vibration	Frequency range	8 ~ 33.3 Hz	JIS D1601,A10 Condition A
		Stoke	1.3 mm	
		Sweep	2.9 G, 33.3 ~ 400Hz	
		Cycle	15 min.	
		2 hours for each direction of X, Z 4 hours for Y direction		
10	Vibration (with carton)	Random vibration: 0.015 G²/Hz from 5 ~ 200 Hz - 6 dB/Octave from 200 ~ 500 Hz		IEC 68-34
11	Drop (with carton)	Height: 60 cm 1 corner, 3 edges, 6 surfaces		JISZ0200

Note 1: Ta: Ambient temperature.

Note 2: In the standard condition, there is not display function NG issue occurred. All the cosmetic specification is judged before the reliability stress.

Note 3: Short time operation between -40°C~-30°C doesn't provide full performance but a correct image on the LCD. The LCD is guaranteed to suffer no permanent damage.

Note 4: Tray damage can be accepted and function ok.

