

TFT Displays 10.1" – IPS – 1000cd/m²

Dimension 235x161x13.1mm

FEATURES

- 1280x800 DOTS FULL COLOR TFT (24 BIT) 16:9
- IPS TECHNOLOGY FOR WIDE VIEWING ANGLE OF 80° IN ALL DIRECTIONS
- LVDS INTERFACE
- HIGH BRIGHTNESS 1100cd/m² MAKES IT SUNLIGHT READABLE
- OPERATING TEMPERATURE RANGE (T_{OP} -20°C .. +70°C)
- INCL. MOUNTING BEZEL FOR PCB MOUNT

ORDERING CODE

10.1" TFT PANEL, IPS, 1100cd/m² WITH LVDS INTERFACE

EA W1280X-101ALW

ACCESSORIES

FFC CABLE 0.5MM PITCH, LENGTH 51MM
ZIFF CONNECTOR 0.5mm PITCH, BOTTOM CONTACT
TOUCHPANEL, PCAP 10.1", SELF-ADHESIVE
ZIFF CONNECTOR FOR TOUCH, BOTTOM CONTACT

EA KF050-40L51
EA WF050-40S
EA TOUCH1280-101C1
EA WF100-06S

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REVISION HISTORY

Date	Rev.	Page(s)	Description
2021-03-04	1.0	All	First issue
2023-04-27		1, 4, 5, 6, 11, 13	Temp. Range, El. Char., Power sequence, Opt. Char., Pinout

SUMMARY

This 10.1" TFT is an IPS transmissive type color active matrix TFT liquid crystal display. In-Plane Switching (IPS) was one of the first refinements to produce significant gains in the light-transmissive characteristics of TFT panels. It is a technology that addresses the two main issues of a standard twisted nematic (TN) TFT display: colour and viewing angle.

GENERAL SPECIFICATIONS

Item	Dimension	Unit
Screen Diagonal	10.1	inch
Number of Pixels	1280 x 3(RGB) x 800	dots
Module dimension	235.0 x 161.0 x 13.1	mm
Active area	216.96 (H) x 135.6(V)	mm
Pixel pitch	0.1695 × 0.1695	mm
Display Mode	IPS, Normally Black	
Pixel Arrangement	R.G.B. Vertical Stripe	
TFT Driver IC	EK79202B1 or Equivalent	
Backlight Type	LED White	
Brightness	1100 cd/m ²	
Aspect Ratio	16:9	
Electrical Interface (Logic)	LVDS	
With /Without TP	Optional Touch Panel	
Surface	Glare	

*Color tone slight changed by temperature and driving voltage.

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T _{op.}	-20	—	+70	°C
Storage Temperature	T _{Stor.}	-30	—	+80	°C

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp. $\leq 60^{\circ}\text{C}$, 90% RH MAX. Temp. $> 60^{\circ}\text{C}$, Absolute humidity shall be less than 90% RH at 60°C

ELECTRICAL CHARACTERISTICS

TYPICAL OPERATION CONDITIONS

(Note 1)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	MAX.		
Power voltage	VCC	3.0	3.3	3.5	V	
	VGH		18		V	Note 1
	VGL		-10		V	Note 2
	VSP		5.5		V	Note 3
	VSN		-5.5		V	Note 3

Note 1. VGH is TFT Gate operating Voltage.

Note 2. VGL is TFT Gate operating Voltage.

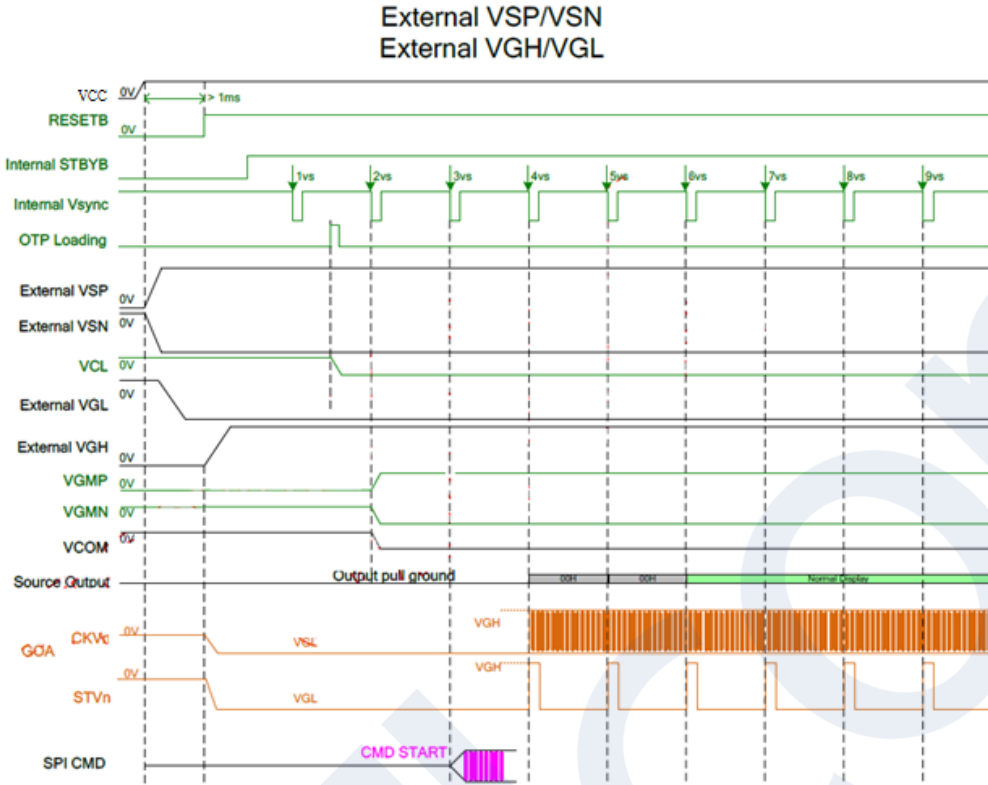
Note 3. VSP / VSN does not require an external power supply voltage, it is provided by IC on the PCB

CURRENT CONSUMPTION

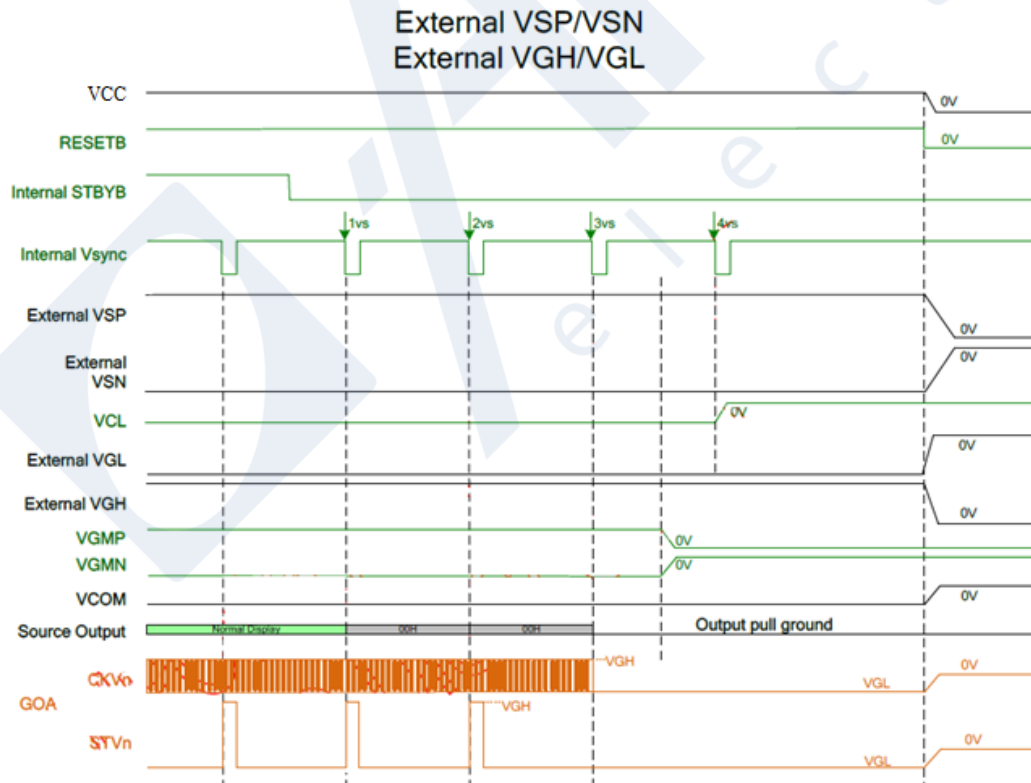
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	MAX.		
Current for Driver	IGH	—	7.7	—	mA	VGH =18V
	IGL	—	7.7	—	mA	VGL = -10V
	IVCC	—	85	130	mA	—

POWER SEQUENCE

Power on



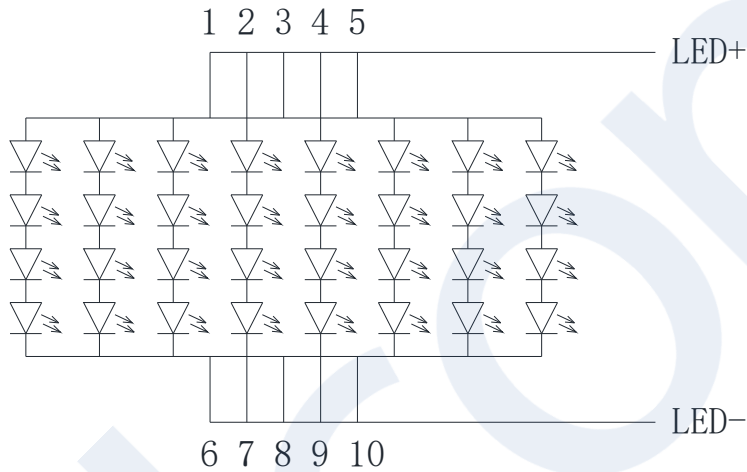
Power off



BACKLIGHT CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply voltage of white LED backlight	VL	—	12.8	13.6	V	Note 1
Current for LED backlight	IL	—	480	—	mA	
LED life time	-	50000	-	-	Hr	Note 1

Note 1 : There are 8 groups LED



Note 2 : Ta = 25 °C

Note 3 : Brightness to be decreased to 50% of the initial value

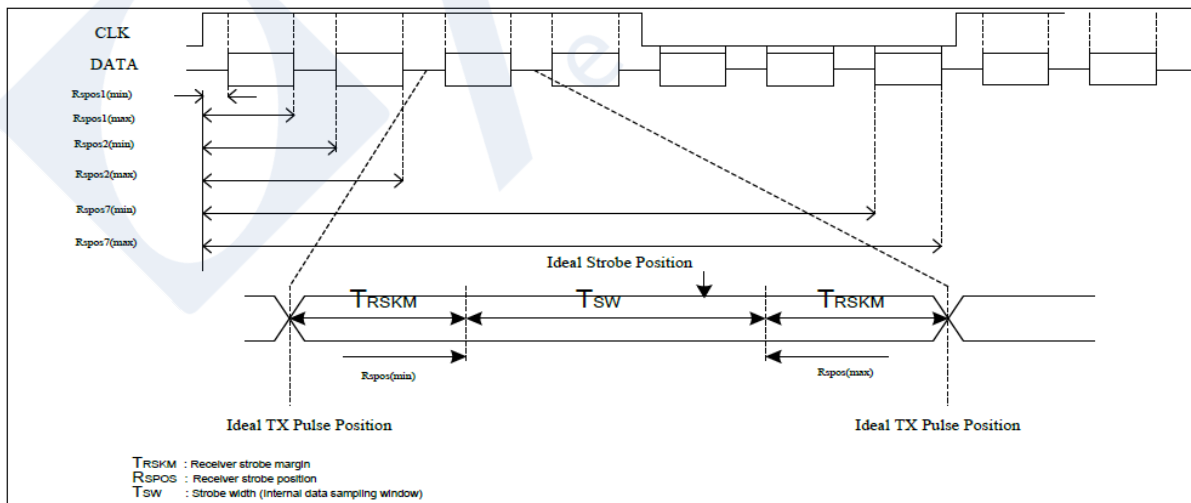
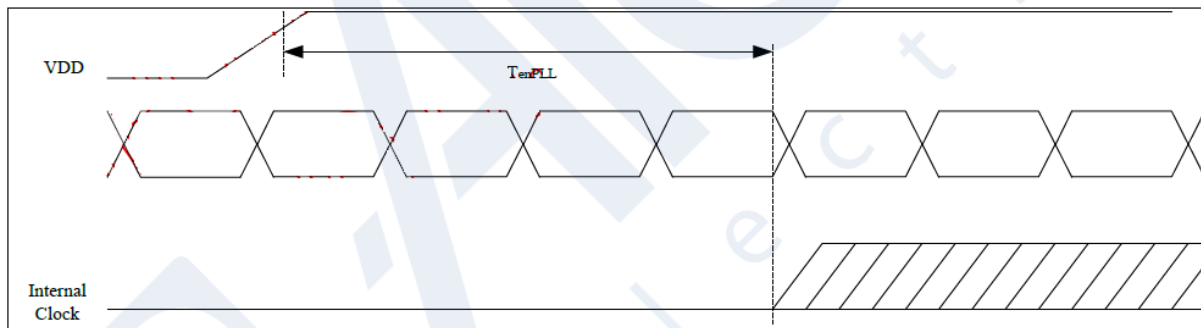
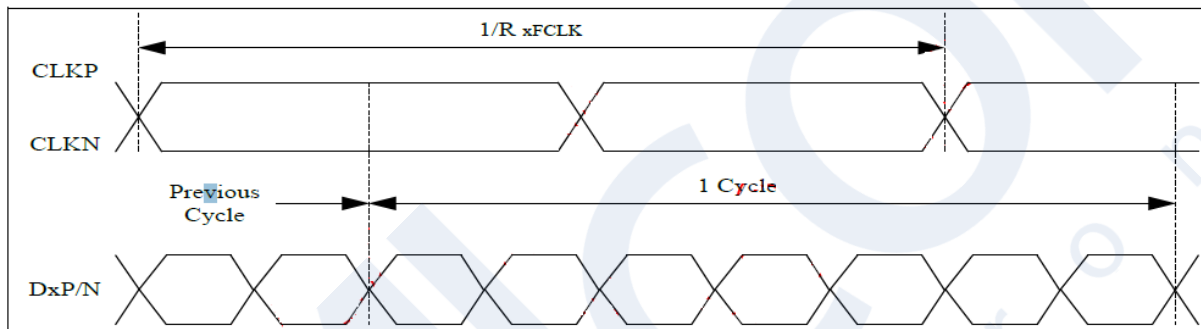
Note 4 : The single LED lamp case

LVDS SIGNAL TIMING CHARACTERISTICS

AC ELECTRICAL CHARACTERISTICS

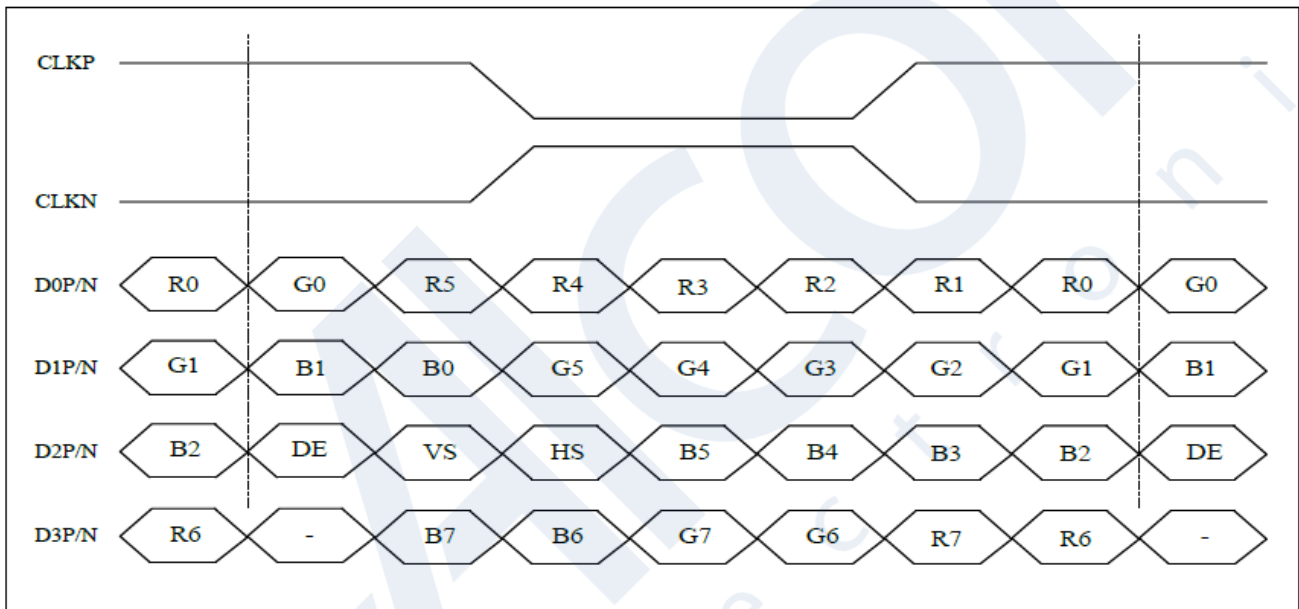
Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Clock frequency	R _x FCLK	30	-	TBD	MHz	Refer to input timing table for each display resolution
Input data skew margin	T _{RSKM}	500	†	-	ps	VID = 200mV RxVCM = 1.2V RxFCLK = 81MHz
Clock high time	T _{LVCH}	-	4/(7* R _x FCLK)	-	ns	
Clock low time	T _{LVCL}	-	3/(7* R _x FCLK)	-	ns	
PLL wake-up time	T _{enPLL}	-	-	150	us	

LVDS mode AC electrical characteristics



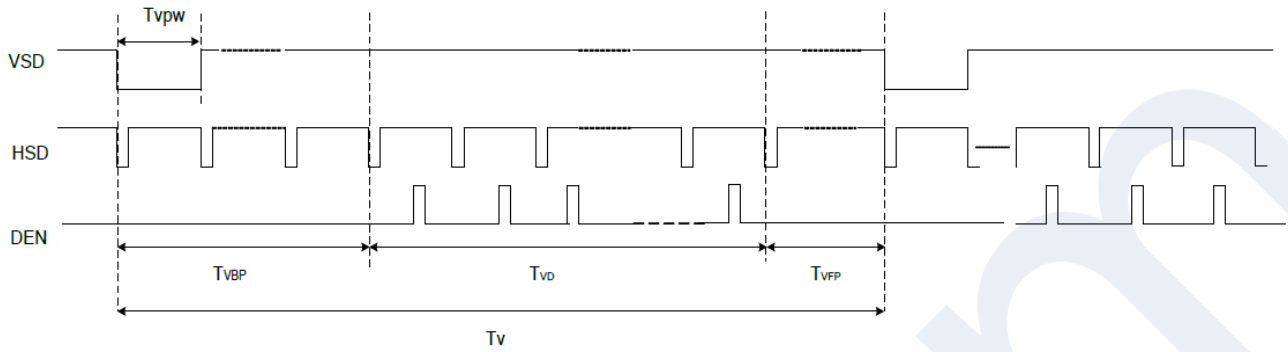
LVDS INPUT TIMING TABLE

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60Hz (LVDS)	F_{DCLK}	69.7	75	80.9	MHz
Horizontal display area	T_{HD}	1280			DCLK
HSYNC period time	T_H	1380	1440	1500	DCLK
HSYNC blanking	$T_{HBP}+T_{HFP}$	100	160	220	DCLK
Vertical display area	T_{VD}	800			H
VSYNC period time	T_V	842	838	872	H
VSYNC blanking	$T_{VBP}+T_{VFP}$	24	38	72	H

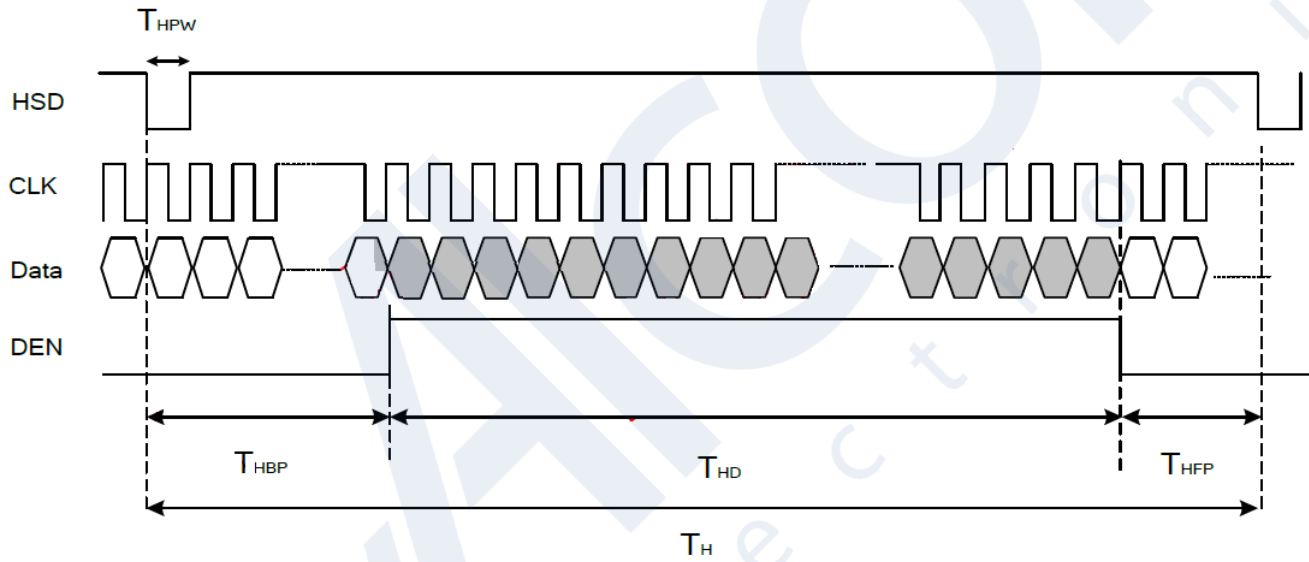


8-bit LVDS input

VERTICAL TIMING



HORIZONTAL TIMING



OPTICAL CHARACTERISTICS

Item	Symbol	Condition.	Min	Typ.	Max.	Unit	Remark	
Response time	Tr+ Tf	$\theta=0^\circ$ 、 $\Phi=0^\circ$	-	25	35	.ms	Note 3	
Contrast ratio	CR	At optimized viewing angle	800	1000	-	-	Note 4	
Color Chromaticity	White	Wx	$\theta=0^\circ$ 、 $\Phi=0$	0.272	0.322	0.372	-	Note 2,6,7
		Wy		0.294	0.344	0.394	-	
Viewing angle	Hor.	Θ_R	CR \geq 10	70	80	-	Deg.	Note 1
		Θ_L		70	80	-		
	Ver.	Φ_T		70	80	-		
		Φ_B		70	80	-		
Brightness	-	-	1000	1100	-	cd/m ²	Center of display	
Uniformity	(U)	-	70	-	-	%	Note 5	

Ta=25±2°C

Note 1: Definition of viewing angle range

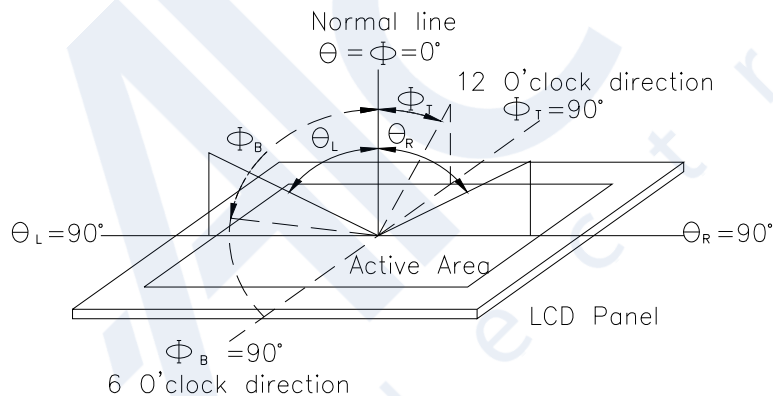


Fig. 7.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

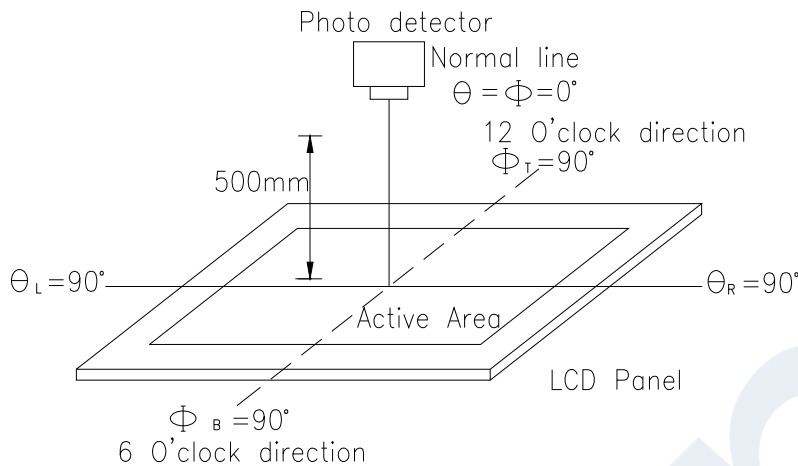


Fig. 7.2. Optical measurement system setup

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%

Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

Note 5: White $V_i = V_{i50} \pm 1.5V$

Black $V_i = V_{i50} \pm 2.0V$

“±” means that the analog input signal swings in phase with VCOM signal.

“±” means that the analog input signal swings out of phase with VCOM signal.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

Note 6: Definition of color chromaticity (CIE 1931)

Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

PINOUT

CONNECTOR

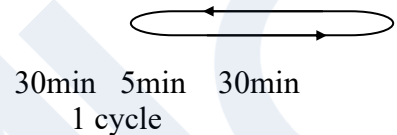
A 40pin connector is used for the module electronics interface. The recommended model is F62240-H1210B manufactured by Vigorconn.

Pin No.	Symbol	I/O	Function	Remark
1	NC	-	No connection	
2	VDD	P	Power Supply	
3	VDD	P	Power Supply	
4	NC	-	No connection	
5	NC	-	No connection	
6	NC	-	No connection	
7	GND	P	Ground	
8	Rxin0-	I	-LVDS Differential Data Input	R0-R5,G0
9	Rxin0+	I	+LVDS Differential Data Input	
10	GND	P	Ground	
11	Rxin1-	I	-LVDS Differential Data Input	G1G5,B0,B1
12	Rxin1+	I	+LVDS Differential Data Input	
13	GND	P	Ground	
14	Rxin2-	I	-LVDS Differential Data Input	B2-B5,HS,VS, DE
15	Rxin2+	I	+LVDS Differential Data Input	
16	GND	P	Ground	
17	RxCLK-	I	-LVDS Differential Clock Input	LVDS CLK
18	RxCLK+	I	+LVDS Differential Clock Input	
19	GND	P	Ground	
20	Rxin3-	I	-LVDS Differential Data Input	R6,R7,G6,G7, B6,B7
21	Rxin3+	I	+LVDS Differential Data Input	
22	GND	P	Ground	
23	NC	-	No connection	
24	NC	-	No connection	
25	GND	P	Ground	
26	NC	-	No connection	
27	NC	-	No connection	
28	NC	-	No connection	
29	NC	-	No connection	
30	GND	P	Ground	
31	NC	-	No connection	
32	NC	-	No connection	
33	NC	-	No connection	
34	NC	-	No connection	
35	VGL	P	Gate OFF Voltage	
36	NC	-	No connection	
37	NC	-	No connection	
38	VGH	P	Gate ON Voltage	
39	NC	-	No connection	
40	NC	-	No connection	

I: input, O: output, P: Power

RELIABILITY

Content of Reliability Test (Wide temperature, -20°C~70°C)

Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70°C 200hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20°C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60 °C, 90%RH max	60°C, 90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation <div style="text-align: center;">  <p>30min 5min 30min 1 cycle</p> </div>	-20°C/+70°C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z; 15 minutes each	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±600V(contact), ±800v(air), RS=330Ω CS=150pF 10 times	—

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

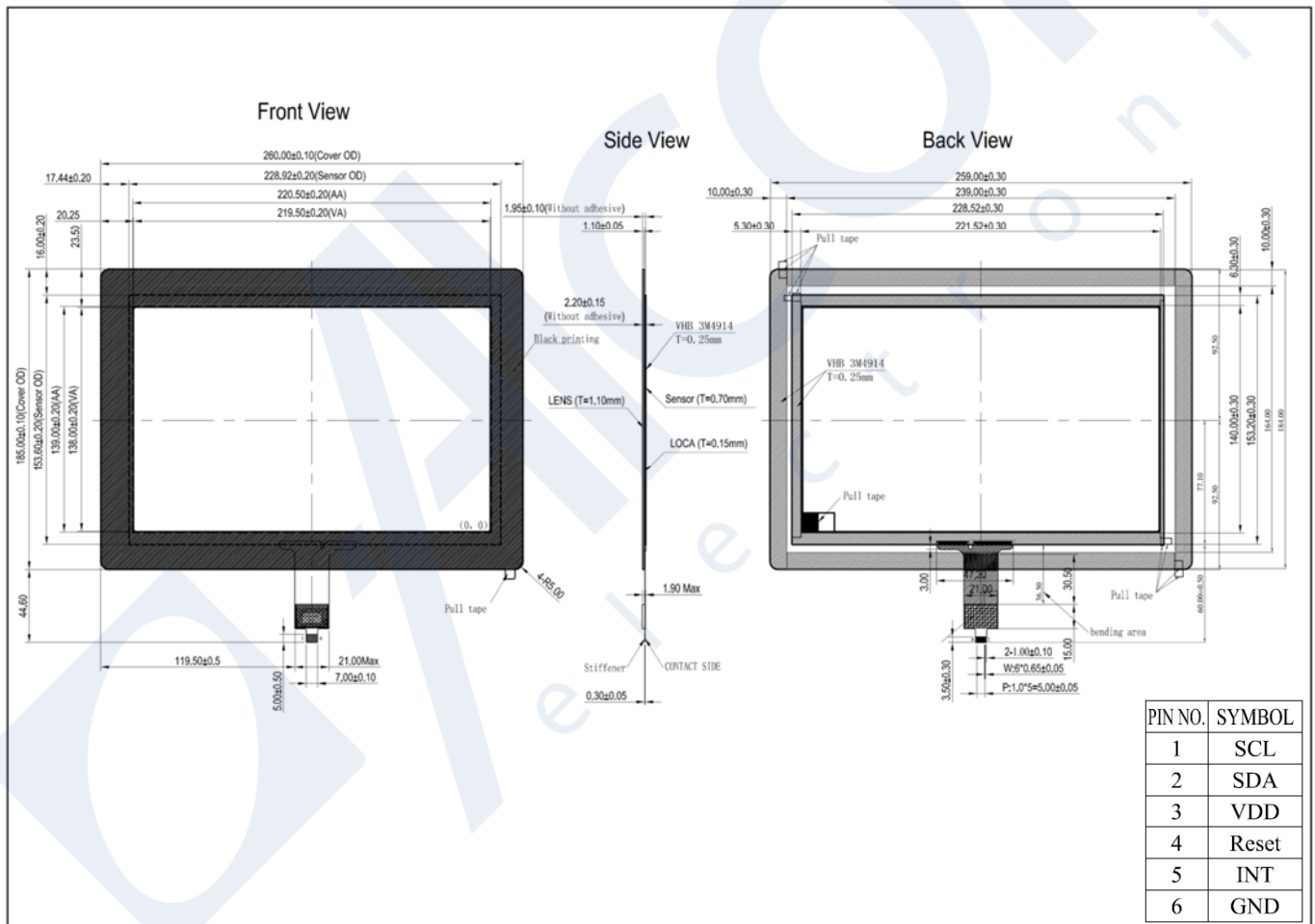
Note3: The packing have to including into the vibration testing.

TOUCHPANEL

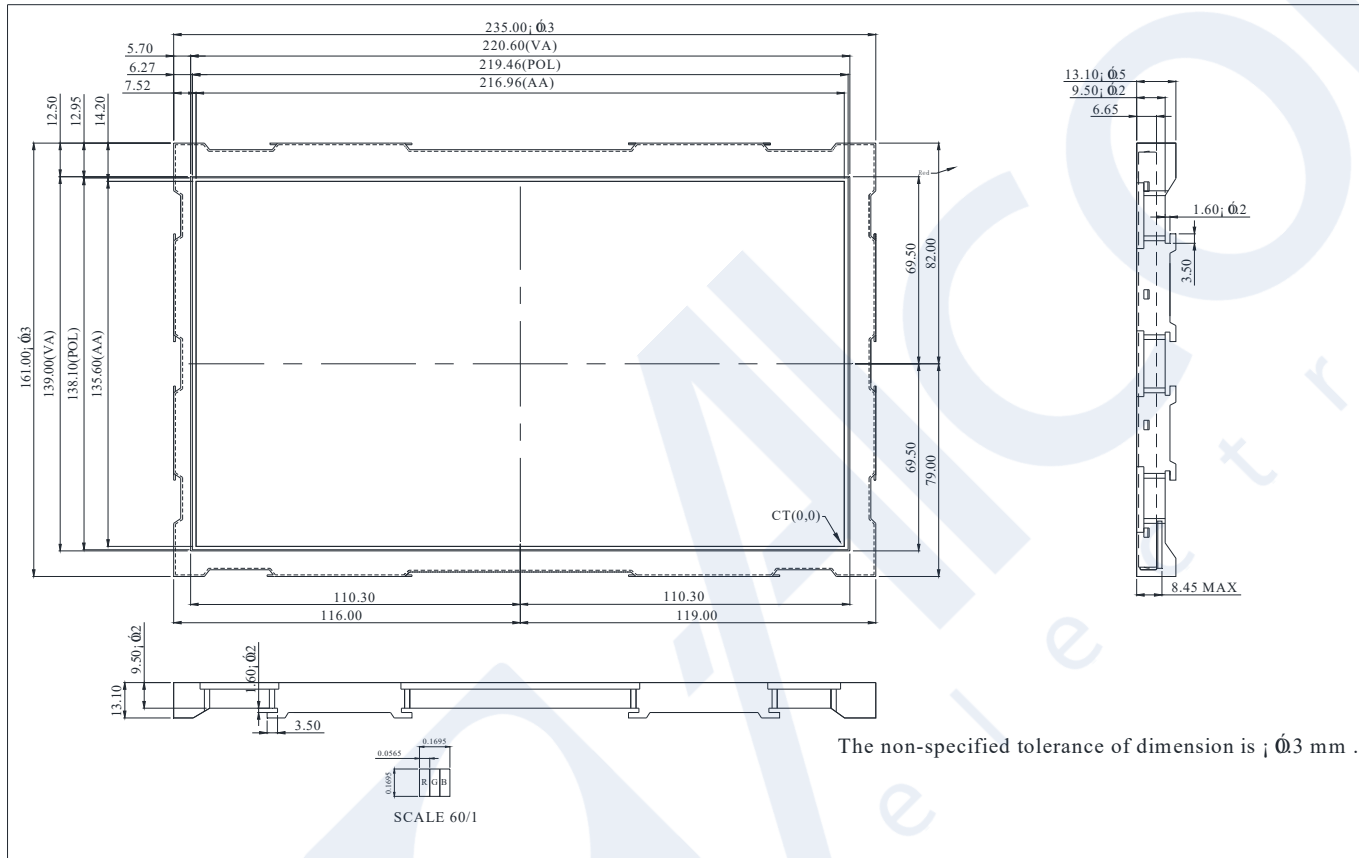
The Touchpanel EA TOUCH1280-101C1 is a projected capacitive touchpanel (PCAP). It comes with an integrated touch panel controller GT928 with I²C bus interface. The surface is finished with an anti-fingerprint coating. The rear side is equipped with a double side adhesive.

As an accessory there's a ZIFF connector available: EA WF100-06S.

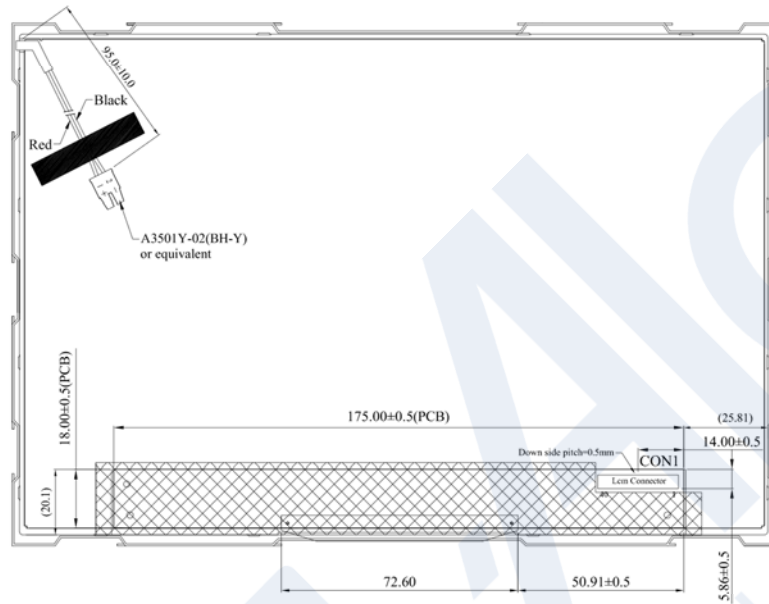
	Condition	Min.	Typ.	Max.	Unit
Resolution	1280x800				dots
Controller	GT928				
Touch points				5	
Hardness		6			H
Operating temp.		-20		+70	°C
I ² C bus	INT high		0x28/0x29		
	INT low		0xBA/0xBB		



CONTOUR DRAWING



REAR SIDE



B/L

PIN NO	SYMBOL
1(Red)	LED+
2(Black)	LED-

CON1

PIN NO.	SYMBOL	PIN NO.	SYMBOL
1	NC	21	Rxin3+
2	VCC	22	GND
3	VCC	23	NC
4	NC	24	NC
5	NC	25	GND
6	NC	26	NC
7	GND	27	NC
8	Rxin0-	28	NC
9	Rxin0+	29	NC
10	GND	30	GND
11	Rxin1-	31	NC
12	Rxin1+	32	NC
13	GND	33	NC
14	Rxin2-	34	NC
15	Rxin2+	35	VGL
16	GND	36	NC
17	RxCLK-	37	NC
18	RxCLK+	38	VGH
19	GND	39	NC
20	Rxin3-	40	NC