

**DISPLAY Elektronik GmbH**

# DATA SHEET

**LCD MODULE**

**DEM 800480K4 TMH-PW-N  
(A-TOUCH)**

*Product Specification*

*Version:1*

**19.06.2020**



**CONTENTS**

**1. GENERAL SPECIFICATIONS.....2**

**2. EXTERNAL DIMENSIONS .....4**

**3. BLOCK DIAGRAM .....6**

**4. PIN ASSIGNMENT .....7**

**5. OPTICAL CHARACTERISTICS .....9**

**6. ABSOLUTE MAXIMUM RATINGS .....12**

**7. ELECTRICAL CHARACTERISTICS .....12**

**8. TIMING CHARACTERISTICS.....13**

**9. RELIABILITY TEST .....14**

**10. LCD MODULES HANDLING PRECAUTIONS.....15**

**11. OTHERS .....15**

**1. GENERAL SPECIFICATIONS**

<b>ITEM</b>	<b>STANDARD VALUE</b>	<b>UNIT</b>
LCD TYPE	TFT/TN/ NORMALLY WHITE/TRANSMISSIVE	
MODULE SIZE	164.90 x 100.00 x 7.00	mm
ACTIVE AREA	154.08 x 85.92	mm
PIXEL PITCH	0.0642 x 0.1790	
NUMBER OF PIXELS	800 x 480	
DRIVER IC	HX8664B + HX8264E	
INTERFACE TYPE	RGB	
RECOMMEND VIEWING DIRECTION	12	O'CLOCK
GRAY SCALE INVERSION DIRECTION	6	O'CLOCK
COLORS	16.7 MILLION	
BACKLIGHT TYPE	28-DIES WHITE LED	
TOUCH PANEL TYPE	RTP	

**Touch Panel Features:**

Type:	4-Wire Analogy Resistive Touch Panel
Input Mode:	Stylus or Finger
ITO Film:	0.2 mm (T)
ITO Glass:	1.1 mm (T)
Connector:	FPC

**Touch Panel Mechanical Characteristics**

Surface Hardness: 3H or more (according to JIS-K5400).

**Touch Panel Optical Characteristics**

Transmittance: 80% Typical.

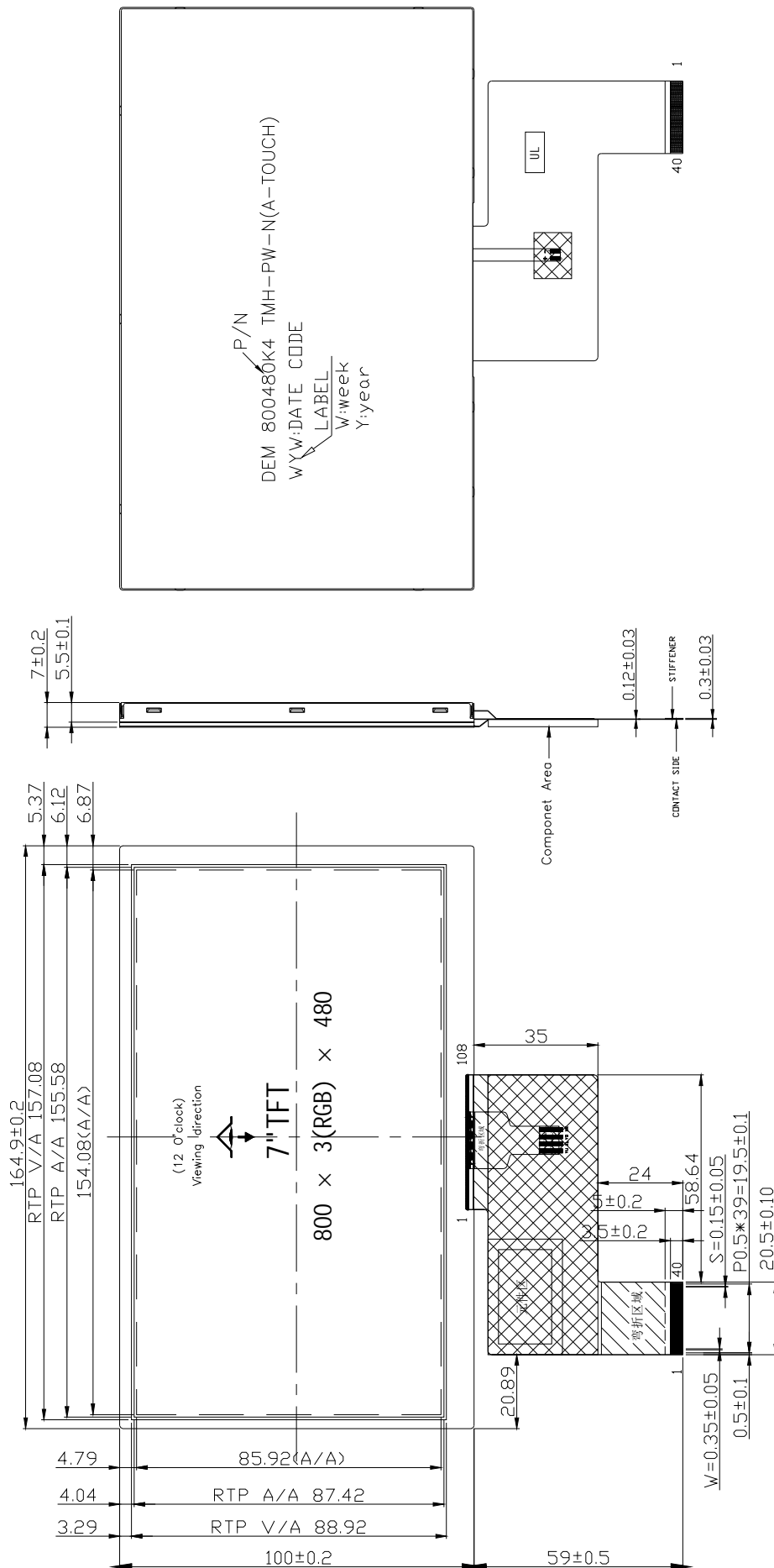
**Touch Panel Rating**

1. Maximum Voltage  
Less than DC 7 volts.
2. Operating Temperature Range  
- 20°C to 70°C (Humidity: 20% RH to 70% RH, No condensation of dew).
3. Storage Temperature Range  
- 30°C to 80°C (Humidity: 20% RH to 80% RH, No condensation of dew).

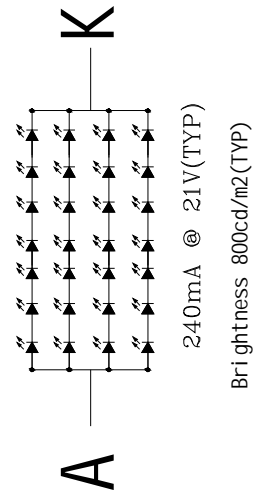
**Electrical Characteristics**

1. Resistance between Terminals  
Direction "X": 440~980Ω  
Direction "Y": 140~310Ω
2. Linearity  
X axis:  $\leq \pm 1.5\%$   
Y axis:  $\leq \pm 1.5\%$
3. Insulation Resistance: 20MΩ or more at DC 25 V.
4. Chattering Time: 10 msec or less at 100kΩ Pull-up.

2. EXTERNAL DIMENSIONS

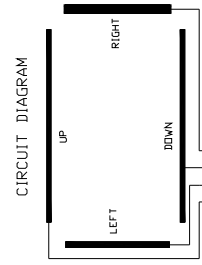
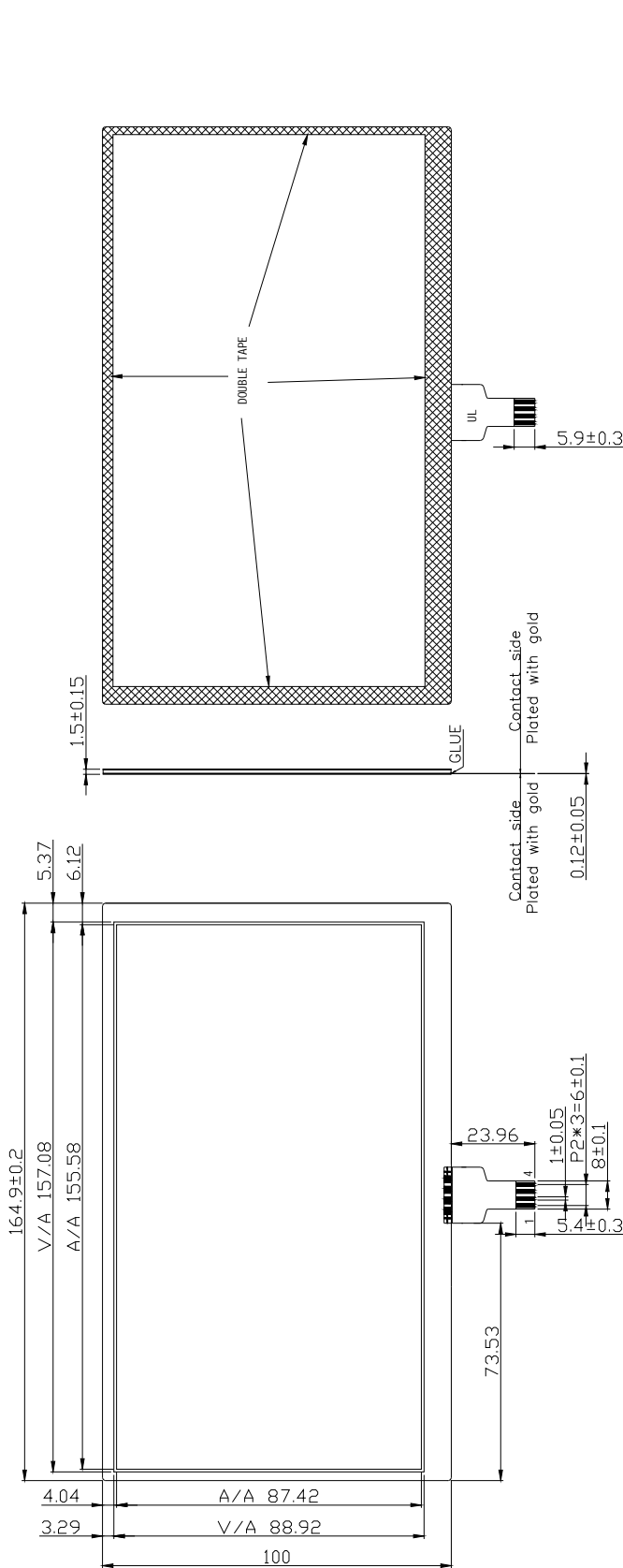


3. Circuit Diagram (LED 4\*7 = 28 SMD) Color: WHITE



- Remark:
1. Unmarked tolerance is  $\pm 0.3$
  2. All materials comply with RoHS
  3.  ....:critical dimension.

## Touch Panel:

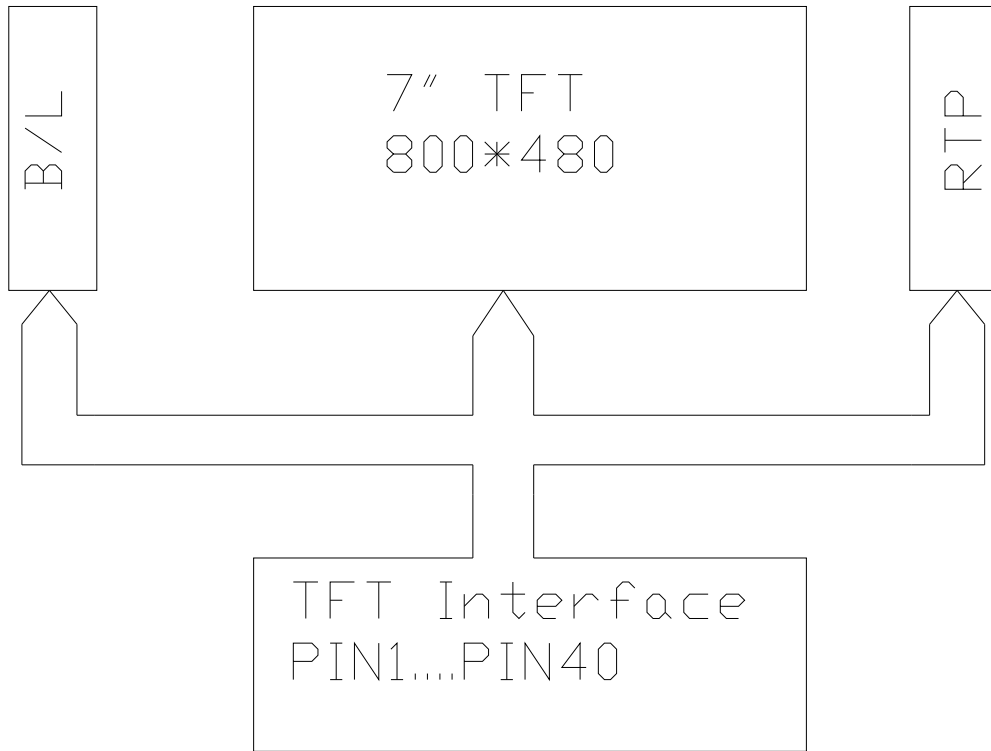


SIGNAL ASSIGNMENT	
PIN	SYMBOL NAME
1	YU UP
2	XL LEFT
3	YD DOWN
4	XR RIGHT

### REMARK:

- Glass THK:1.1mm
- Total THK:1.5±0.15mm
- Linearity:±1.5% or less
- Transmittance:80% Typical
- Resistance  
440<X<980 ohm  
140<Y<310 ohm
- Connector:FPC
- For prevention of detach of FPC from Glass,add taping and gluing(Like LCD module)
- Operating Force:20~100g  
Silicon Rubber Measuring Head Contact Area: φ0.3mm~φ0.8mm
- General Tolerance:±0.3mm.
- All materials comply with RoHs
- 11、 ....critical dimension.

**3. BLOCK DIAGRAM**





**4. PIN ASSIGNMENT**

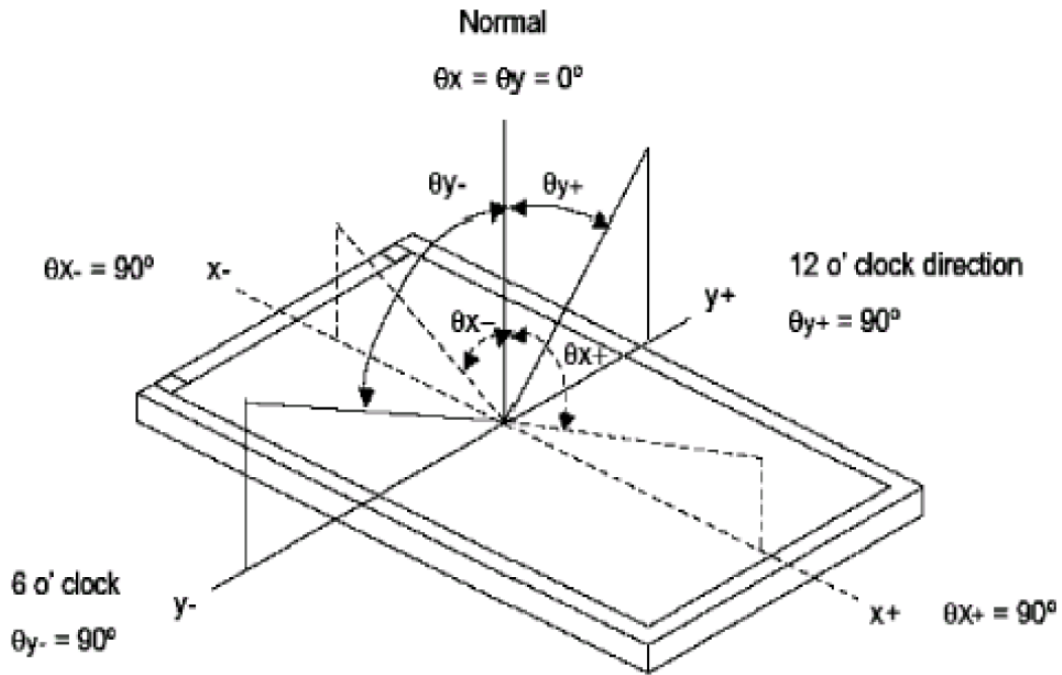
PIN NO.	SYMBOL	DESCRIPTION
1	K	LED Cathode
2	A	LED Anode
3	GND	Power ground
4	VDD	Power supply
5	R0	Red data
6	R1	Red data
7	R2	Red data
8	R3	Red data
9	R4	Red data
10	R5	Red data
11	R6	Red data
12	R7	Red data
13	G0	Power ground
14	G1	Green data
15	G2	Green data
16	G3	Green data
17	G4	Green data
18	G5	Green data
19	G6	Green data
20	G7	Green data
21	B0	Blue data
22	B1	Blue data
23	B2	Blue data
24	B3	Blue data
25	B4	Blue data
26	B5	Blue data
27	B6	Blue data
28	B7	Blue data
29	GND	Power ground
30	CLK	Clock signal
31	STBYB	Standby mode, normally pulled high. STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are High-Z

32	HS	Horizontal sync signal; negative polarity
33	VS	Vertical sync signal; negative polarity
34	DEN	Data input enable
35	NC	Not connection
36	GND	Power ground
37	XR	Touch Panel Pin RIGHT
38	YD	Touch Panel Pin DOWN
39	XL	Touch Panel Pin LEFT
40	YU	Touch Panel Pin UP

**5. OPTICAL CHARACTERISTICS**

ITEM	SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE
			MIN	TYP.	MAX		
Luminance	L		640	800	-	Cd/m <sup>2</sup>	
Contrast Ratio	CR	$\theta = 0^\circ$	400	500			
Response Time	Rising	T <sub>R</sub>	25°C	10	20	ms	
	Falling	T <sub>F</sub>		15	30		
CIE COLOUR COORDINATE	RED	XR	VIEWING NORMAL ANGLE				
		YR					
	GREEN	XG					
		YG					
	BLUE	XB					
		YB					
	WHITE	XW		0.278	0.308	0.338	
		YW		0.297	0.327	0.357	
VIEWING ANGLE	Hor.	$\theta_{x+}$	CR ≥ 10	60	70	Degree	
		$\theta_{x-}$		60	70		
	Ver.	$\theta_{y+}$		40	50		
		$\theta_{y-}$		60	70		

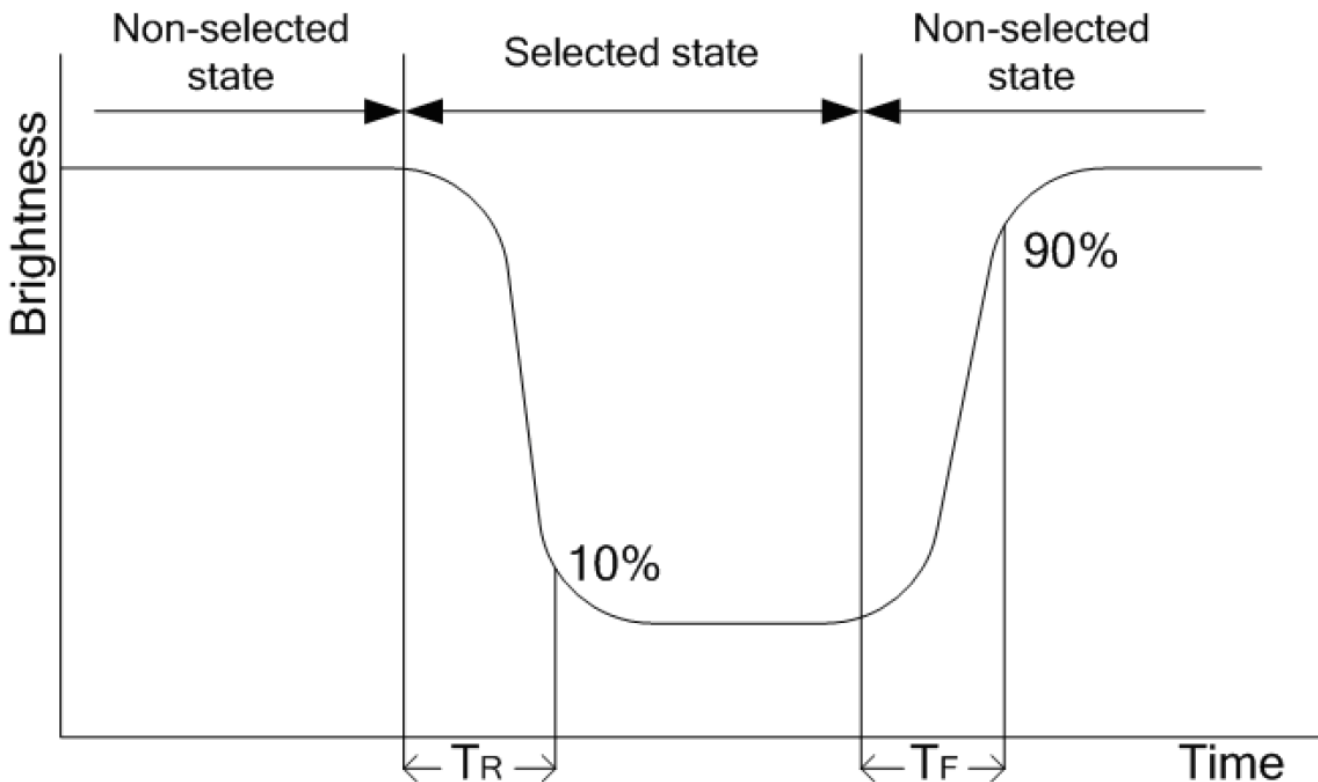
Note 1 : Definition of Viewing Angle  $\theta_x$  and  $\theta_y$  :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Brightness of non-selected dots (white)}}{\text{Brightness of selected dots (black)}}$$

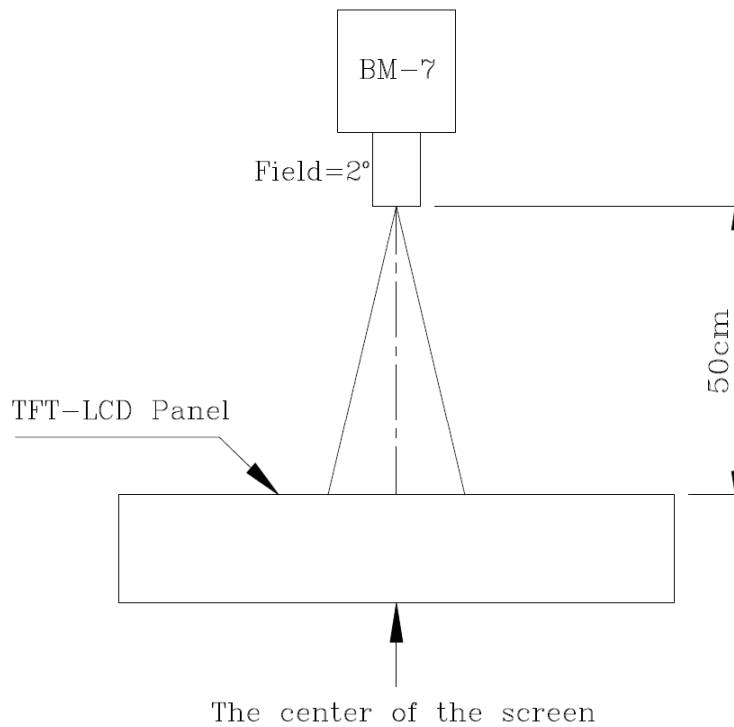
Note 3: Definition of response time ( $T_R$ ,  $T_F$ )



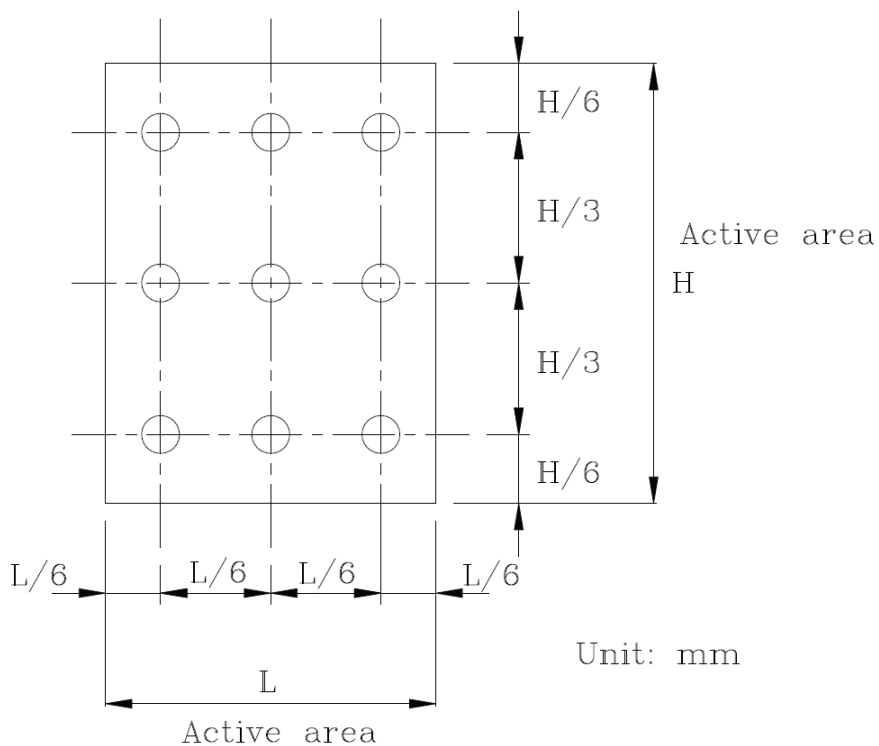
**Note 4: Definition of Luminance**

**①The Brightness Test Equipment Setup**

Field=2° (As measuring “black” image, field=2° is the best testing condition)



**②The Brightness Test Point Setup**



**6. ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	MIN	MAX	UNIT
Power Supply Voltage	VDD	-0.3	5.0	V
Operating Temperature	Top	-20	+70	°C
Storage Temperature	Tst	-30	+80	°C

**7. ELECTRICAL CHARACTERISTICS****7.1 BLACKLIGHT DRIVING CONDITIONS**

ITEM	SYMBOL	SPECIFICATIONS			UNIT	REMARK
		MIN	TYP.	MAX		
Supply Voltage	Vf		21		V	
Supply Current	IL		240		mA	
Power Consumption	P		5.04		W	
LED Lifetime			50,000		H <sub>r</sub>	

**7.2 ELECTRICAL CHARACTERISTICS**

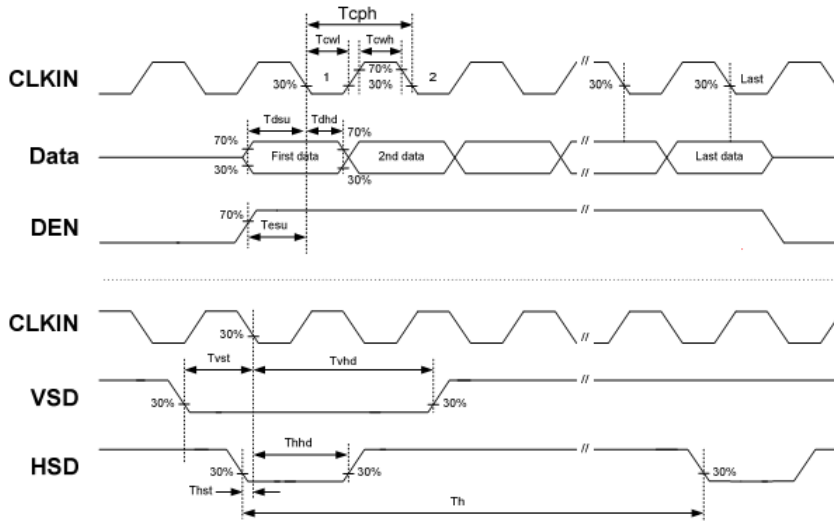
ITEM	SYMBOL	MIN	TYP.	MAX	UNIT
Power Supply	VDD	3.0	3.3	3.6	V
Input Voltage	Vil	GND	-	0.3VDD	V
	Vih	0.7VDD	-	VDD	V

8. TIMING CHARACTERISTICS

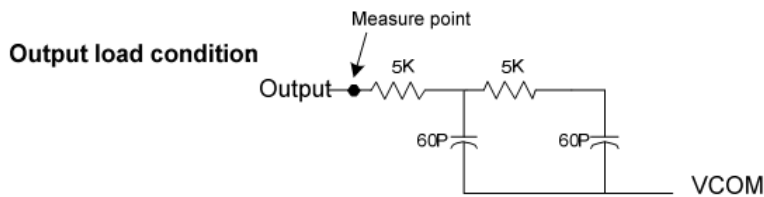
8.1 PARALLEL RGB MODE TIMING DIAGRAM

Timing Diagram

Input Clock and Data Timing Diagram



Source Output



Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLKIN Frequency	Fclk	-	33.3	50	MHz	VDD = 3.0V ~3.6V
CLKIN Cycle Time	Tclk	20	30	-	ns	
CLKIN Pulse Duty	Tcwh	40	50	60	%	Tclk=Tcwh+cwl
	Tcwl	40	50	60	%	
VSD to STV	Tstv	-	24	-	H	HV mode
DEN to STV	Tstv	-	4	-	CLKIN	DE mode
STV pulse width	Twstv	-	0.5	-	H	
STV to CKV	Tckv	-	18	-	CLKIN	
STV to OEV	Toev	-	2	-	CLKIN	
CKV Pulse Width	Twckv	-	66	-	CLKIN	
OEV Pulse Width	Twoev	-	50	-	CLKIN	

**9. RELIABILITY TEST**

<b>NO.</b>	<b>TEST ITEM</b>	<b>CONDITIONS</b>	
1	HIGH TEMPERATURE STORAGE	TA=80°C	240Hr
2	LOW TEMPERATURE STORAGE	TA=-30°C	240Hr
3	HIGH TEMPERATURE OPERATION	TA=70°C	240Hr
4	LOW TEMPERATURE OPERATION	TA=-20°C	240Hr
5	HIGH TEMPERATURE AND HIGH HUMIDITY OPERATION	P+60°C, 90%RH	240Hr
6	THERMAL SHOCK	-30°C → +80°C, 0.5Hr; 100CYCLES; 1H/ CYCLES	



**10. LCD MODULES HANDLING PRECAUTIONS**

- n** The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- n** If the display panel is damaged and the liquid crystal substance inside it leaks out, do not get any in your mouth. If the substance come into contact with your skin or clothes promptly wash it off using soap and water.
- n** Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- n** The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarize carefully.
- n** To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
  - Be sure to ground the body when handling the LCD module.
  - Tools required for assembly, such as soldering irons, must be properly grounded.
  - To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
  - The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
- n** Storage precautions  
When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps. Keep the modules in bags designed to prevent static electricity charging under low temperature / normal humidity conditions (avoid high temperature / high humidity and low temperatures below 0°C).Whenever possible, the LCD modules should be stored in the same conditions in which they were shipped from our company.

**11. OTHERS**

- n** Liquid crystals solidify at low temperature (below the storage temperature range) leading to defective orientation of liquid crystal or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subjected to a strong shock at a low temperature.
- n** If the LCD modules have been operating for a long time showing the same display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. Abnormal operating status can be resumed to be normal condition by suspending use for some time. It should be noted that this phenomena does not adversely affect performance reliability.
- n** To minimize the performance degradation of the LCD modules resulting from caused by static electricity, etc. exercise care to avoid holding the following sections when handling the modules:
  - Exposed area of the printed circuit board
  - Terminal electrode sections.