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# SPECIFICATION

## Product Model:WT-H-P156E30-48L01P

### For Customer's Acceptance:

Approved By	Comment		
PREPARED	CHECKED	VERIFIED BY QA DEPT	VERIFIED BY R&D DEPT



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## Records of Revision

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# 1. GENERAL DESCRIPTION

The display WT-H-P156E30-48L01P is a ALL 0 ' clock TFT-LCD (Thin Film Transistor Liquid Crystal Display) module. This model is Composed of a TFT LCD panel , a driving circuit and a back light, and also has a 15.6 inch diagonally measured active display area with FHD(1 horizontal by 1080 vertical pixel) resolution in a stripe arrangement. Display 16M colors by 8 bit R.G.B signal input.

General specifications are summarized in the following table:

## 1.1 General information

Item	Specification	Unit
Outline Dimension	359.50×224.30×3.2 (MAX.)	mm
Display area	344.16(H)×193.59(V)	mm
Number of Pixel	1920RGB(H)×1080(V)	pixels
Pixel pitch	0.179(H)×0.179(V)	mm
Pixel arrangement	RGB Vertical stripe	
Display mode	IPS	
Surface treatment	Hard-Coating with EWV film	colors
Back-light	White LED	
System interface	eDP 1.2	
NTSC	50 (type)	%
Viewing Direction	ALL VIEW	
<b>Power Consumption</b>	TBD	mW

## 2. ABSOLUTE MAXIMUM RATINGS

### 2.1 Electrical Absolute Rating:

Item	Symbol	Min.	Type.	Max.	Unit	NOTE
Supply Voltage	VCC	3.1	3.3	3.4	V	
	VBL	5.0	12.0	21.0	V	
	VI				V	
	VGH	-	-	-	V	
	VGL	-	-	-	V	
VCOM	VCOMin	-	-	-	V	
	V <sub>IH</sub>	0.7 V <sub>CC</sub>	-	V <sub>CC</sub>	V	
	V	0	-	0.3V <sub>CC</sub>	V	

### 2.2 Environment Absolute Rating

Item	Symbol	Min	Max	Unit	Note
Operating Temperature	T <sub>OPA</sub>	-10	50	°C	
Storage Temperature	T <sub>STG</sub>	-20	60	°C	

### 3. OPTICAL CHARACTERISTICS

#### 3.1 Optical specification

ITEM	SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE	
			MIN.	TYP.	MAX.			
Brightness	B	Viewing normal angle	--	300	--	Cd/m	(1) (2) (3) (4) (5)	
Contrast Ratio	CR		700	1000	--	--		
color temperature	CT		--	--	--	--		
Response Time	Tr		--	10	20	msec		
	Tf		--	15	30	msec		
CIE Color coordinate	White		XW		TBD			
			YW		TBD			
	Red		XR		TBD			
			YR		TBD			
	Green		XG		TBD			
		YG		TBD				
Blue	XB		TBD					
			TBD					
Viewing Angle	Hor.	LEFT	--	80	--	Deg.		
		RIGHT	--	80	--			
	Ver.	UP	--	80	--			
		DOWN	--	80	--			
Uniformity	Un		--	75	--	%		

### 3.2 Measuring Condition

A Measuring surrounding: dark room

B Ambient temperature:  $25 \pm 2$  °C

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A Measuring surrounding: dark room

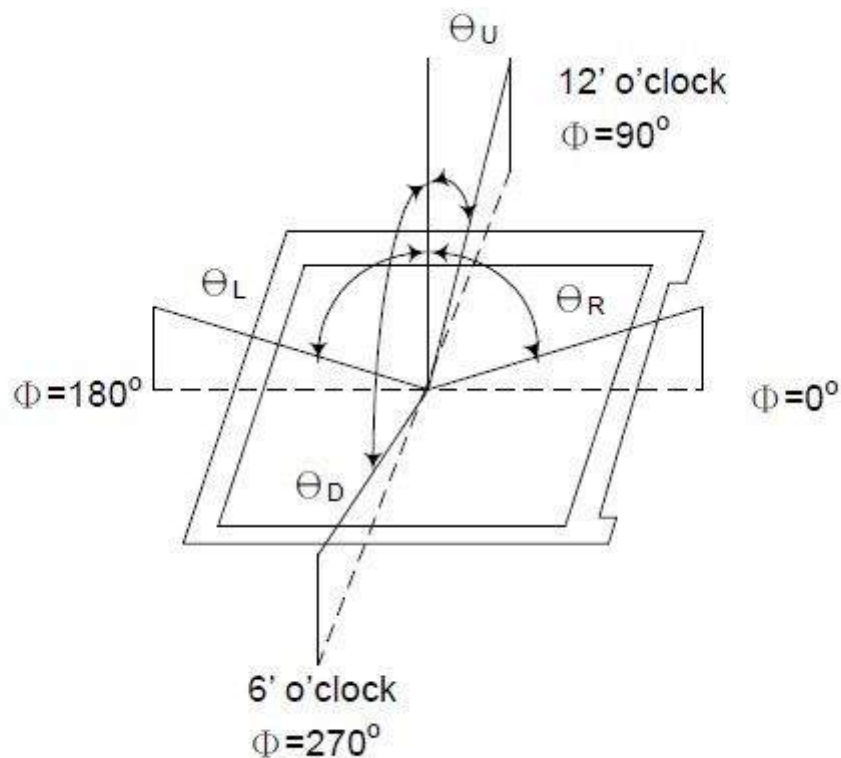
B Ambient temperature:  $25 \pm 2$  °C

### 3.3 Measuring Equipment

A FPM520 of Westar Display technologies, INC., which utilized Sr-3 for Chromaticity and BM-5A for other optical characteristics.

B Measuring spot size: 20-21 mm

**Note (1)** Definition of Viewing Angle :

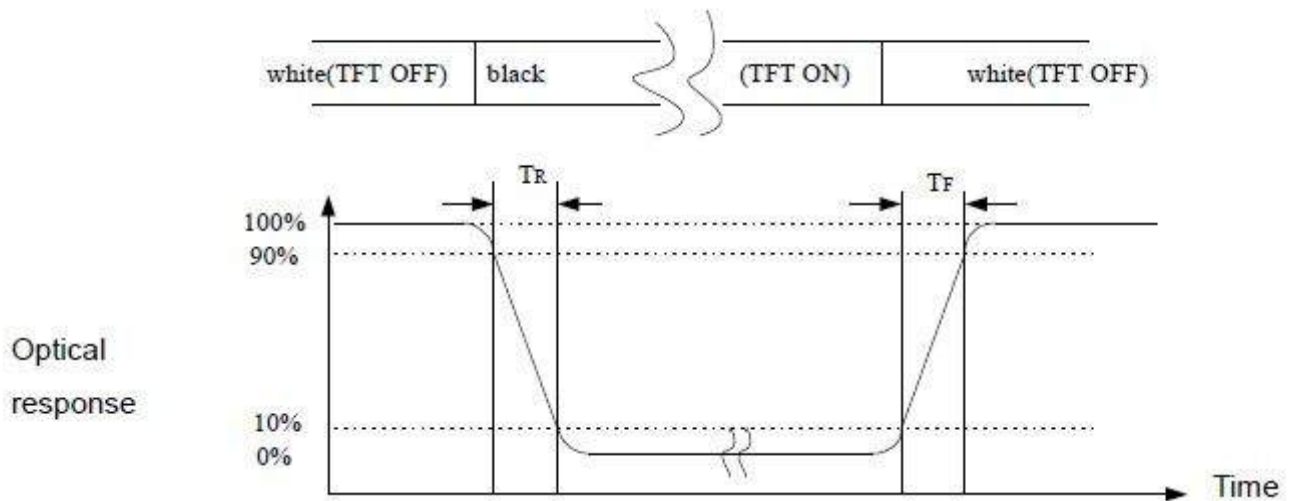


**Note (2)** Definition of Contrast Ratio (CR):

Measured at the center point of panel

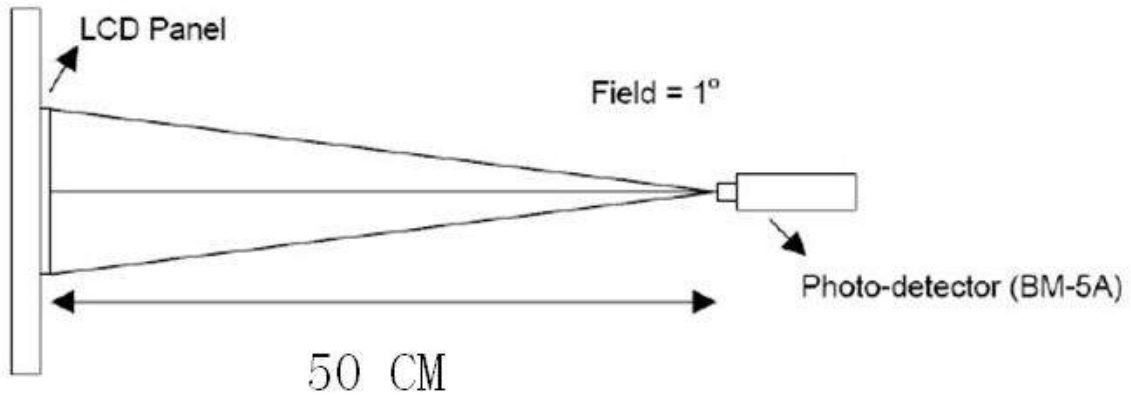
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

**Note (3)** Definition of Response Time: Sum of  $T_R$  and  $T_F$





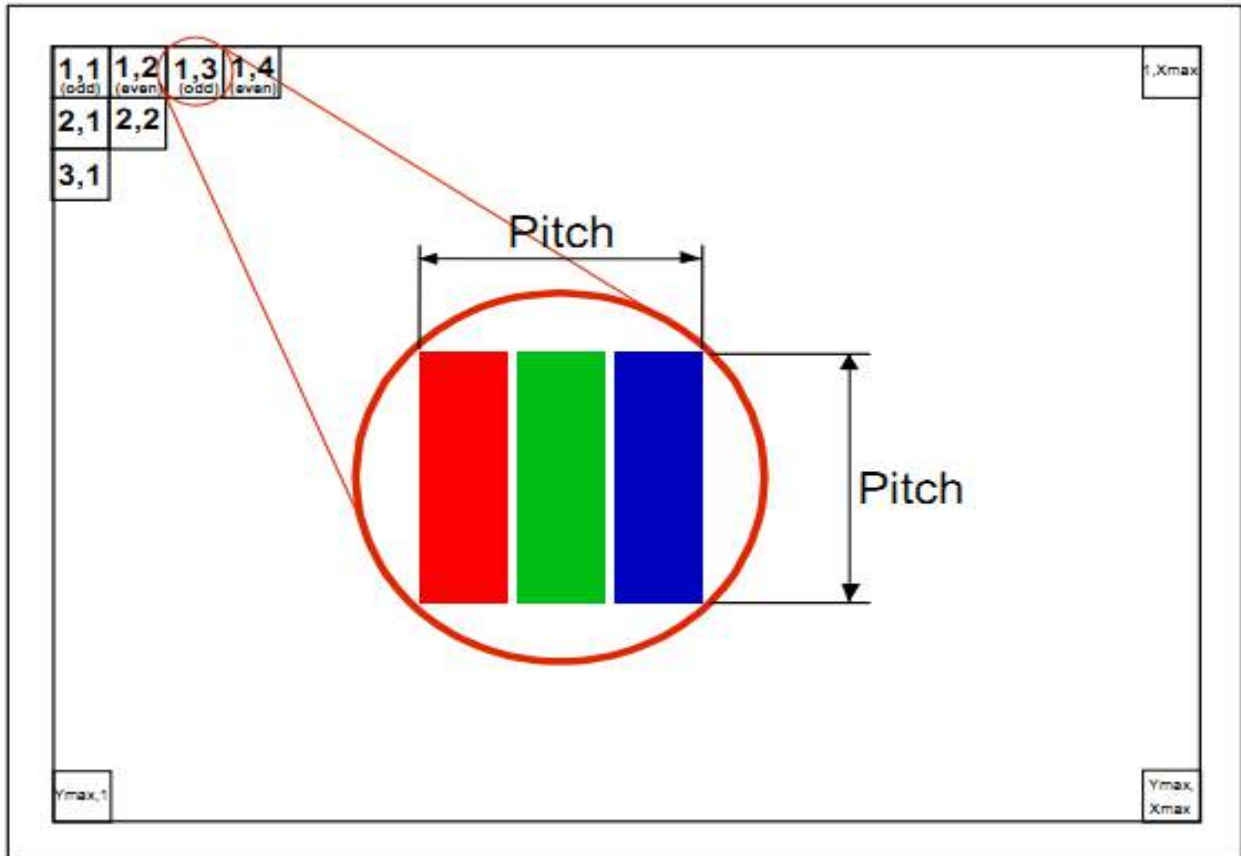
**Note (4)** Definition of optical measurement setup



**Note (5)** Rubbing Direction (The different Rubbing Direction will cause the different optimal view direction.)

## 4. BLOCK DIAGRAM

### 4.1 Pixel Format



## 5. INTERFACE PIN CONNECTION

eDP lane is a differential signal technology for LCD Interface and high speed data transfer device.

PIN NO	Symbol	Function
1	DBC_EN	NC
2	H_GND	High Speed Ground
3	Lane1_N	Complement Signal Link Lane 1
4	Lane1_P	True Signal Link Lane 1
5	H_GND	High Speed Ground
6	Lane0_N	Complement Signal Link Lane 0
7	Lane0_P	True Signal Link Lane 0
8	H_GND	High Speed Ground
9	AUX_CH_P	True Signal Auxiliary Ch.
10	AUX_CH_N	Complement Signal Auxiliary Ch.
11	H_GND	High Speed Ground
12	LCD_VCC	LCD logic and driver power
13	LCD_VCC	LCD logic and driver power
14	BIST	LCD Panel Self Test Enable
15	LCD_GND	LCD logic and driver ground
16	LCD_GND	LCD logic and driver ground
17	HPD	Hot Plug Detection signal pin
18	BL_GND	Backlight_ground
19	BL_GND	Backlight_ground
20	BL_GND	Backlight_ground
21	BL_GND	Backlight_ground
22	BL_Enable	Backlight On / Off
23	BL PWM DIM	System PWM signal Input
24	NC	Reverse for AUO TEST only
25	NC	Reverse for AUO TEST only
26	BL_PWR	Backlight power (5V~21V)
27	BL_PWR	Backlight power (5V~21V)
28	BL_PWR	Backlight power (5V~21V)
29	BL_PWR	Backlight power (5V~21V)
30	COLOR_EN	NC

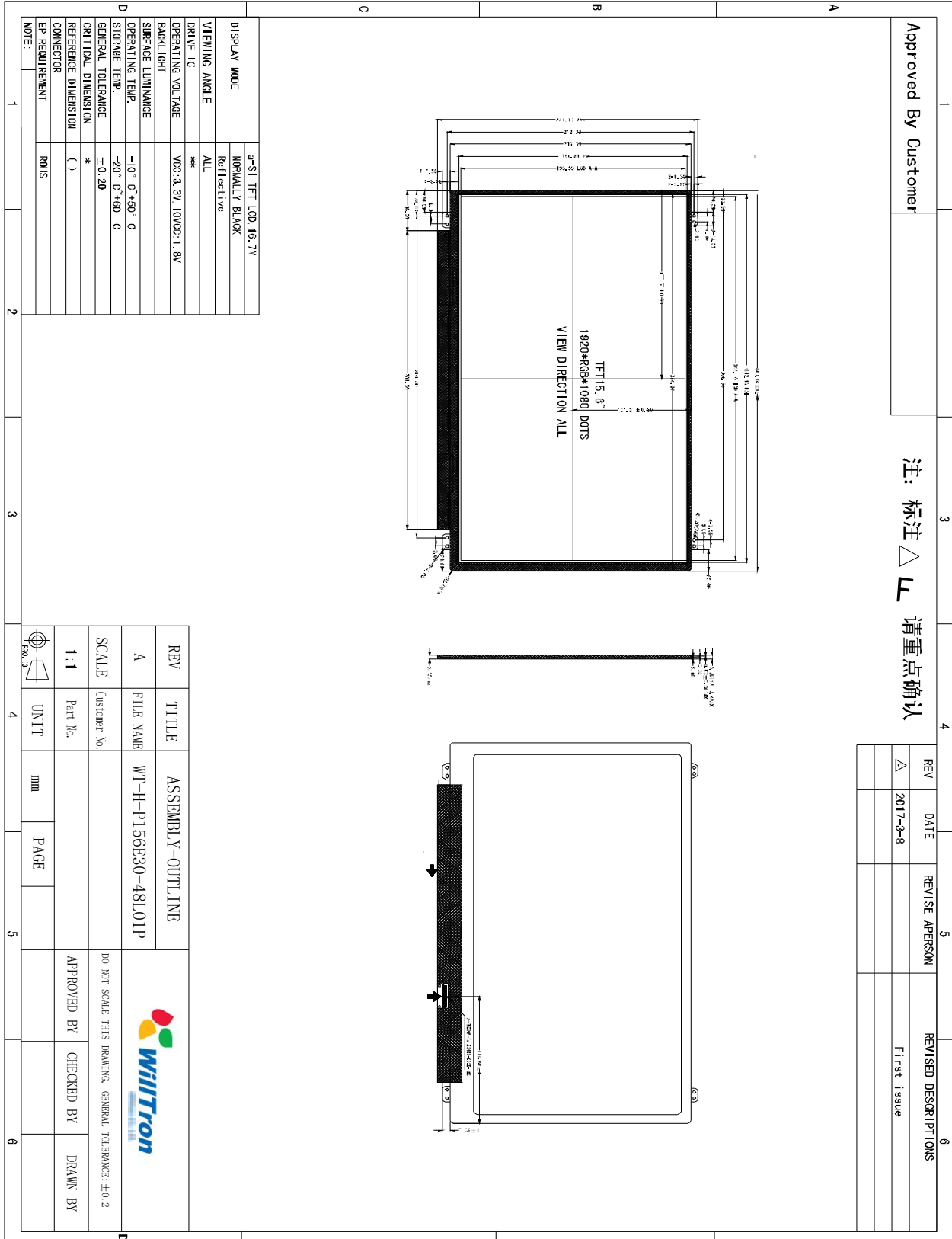
## 6. BACK LIGHT

### 6.1 The Characteristic Of The Back Light

The back-light system is an edge-lighting type with 48 LEDS.  
 The characteristic of the LED is shown in the following tables.

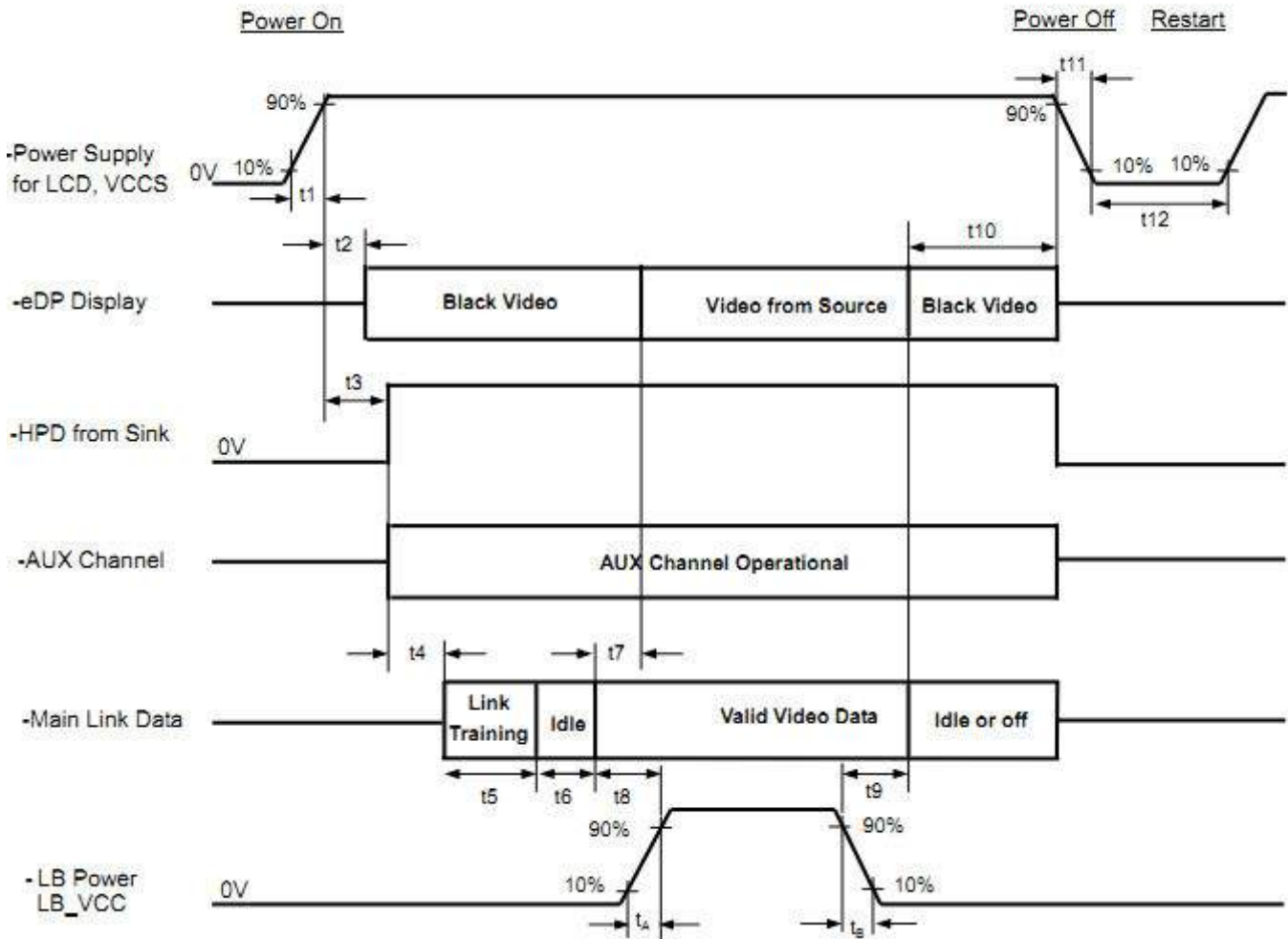
Item	Symbol	Min	Typ.	Max.		Note
LED current	I <sub>F</sub>	-	300		mA	-
	<b>The Backlight driver is on PCB of LCM.</b>					
LED voltage	V	5	12	21	V	-
Brightness Uniformity	I <sub>v-m</sub>	-	75	-	-	-
Backlight lifetime	T	-	15000	-	hrs	25 °C

## 7. OUTLINE DIMENSION



## 8. Power, Signal Sequence

### 4.6 POWER ON/OFF SEQUENCE



**Timing Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark	
Clock	Frequency	1/Tc	132.0	138.5	140.0	MHz	[Note 6-1-1]
Data enable signal	Horizontal period	TH	2020	2080	2400	clock	
	Horizontal period (High)	THd	-	15.02	-	$\mu$ s	
	Vertical period	TV	1090	1111	1200	line	
			-	16.685	-	ms	
Vertical period (High)	TVd	-	1080	-	line		

[Note 6-1-1] In case of using the long vertical period, the deterioration of display quality, flicker, etc, may occur.

