

TFT-Display Datenblatt

Modell OT104ZSDDLV-05

Kurzdaten

Hersteller	ONation
Diagonale	10,4" / 26,4 cm
Format	4:3
Auflösung	800 x 600
Backlight	LED / 1000 cd/m ²
Interface	LVDS
Touchscreen	nein
Temperatur	-20... +70°C (Betrieb)



ONation Corporation

CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: OT104ZSDDL V-05
(Complied with RoHS)

CUSTOMER: _____

Version: P0.1

C O N T E N T S

ISSUE:MAR.25.2013

Spec Condition: preliminary

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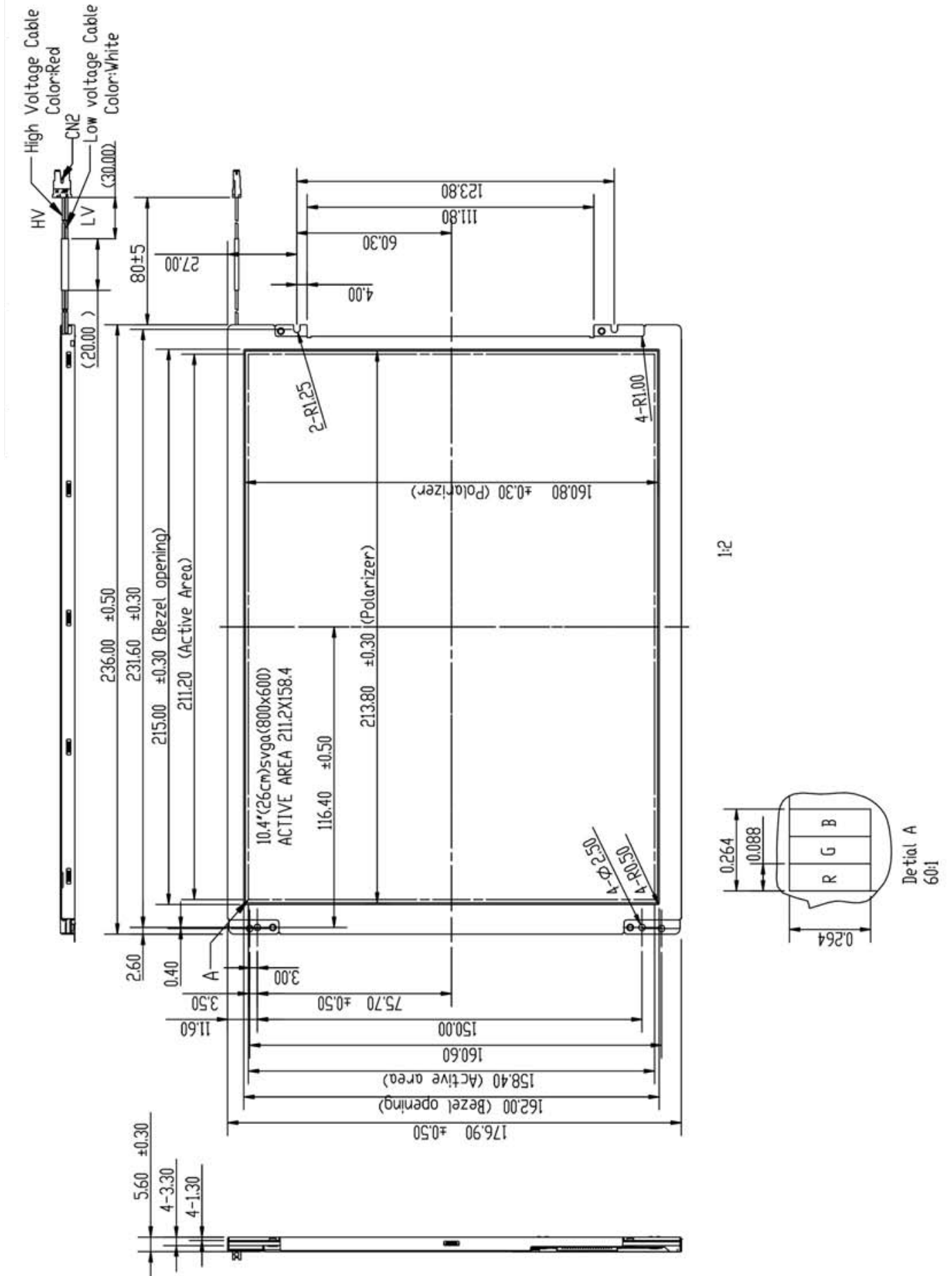
CUSTOMER	ONATION		
APPROVAL	APPROVAL	CHECKER	PREPARE
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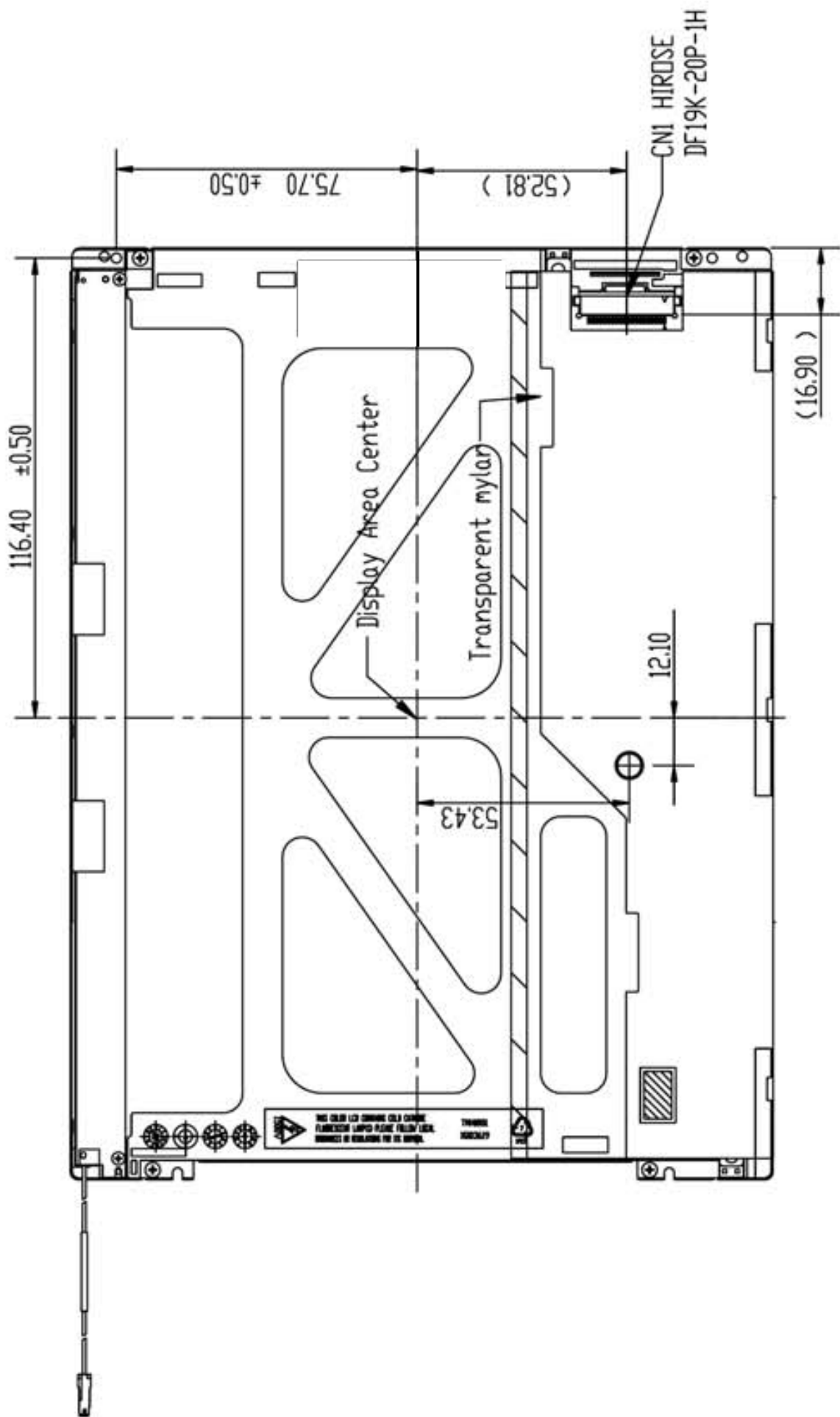
3.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 600
(2)	Module Size(mm)	236.0(W) X 176.9(H) X 5.6(D)
(3)	Active Area(mm)	211.2(H) X 158.4(V)
(4)	Pixel Pitch(mm)	0.264 (H) X 0.264(V)
(5)	LCD Model	TFT , Transmissive, Normally/White
(6)	Polarizer Model	Anti-glare(3H)
(7)	LED Backlight Color	White
(8)	Viewing Direction	12 O'clock
(9)	Gray Scale Inversion Direction	6 O'clock
(10)	Color Configuration	R.G.B Stripe
(11)	Module Weight(g)	TBD

**Viewing direction for best image quality is different from TFT definition, there is the 180 degrees shift.

4. OUTLINE DIMENSIONS





5. INTERFACE PIN CONNECTION

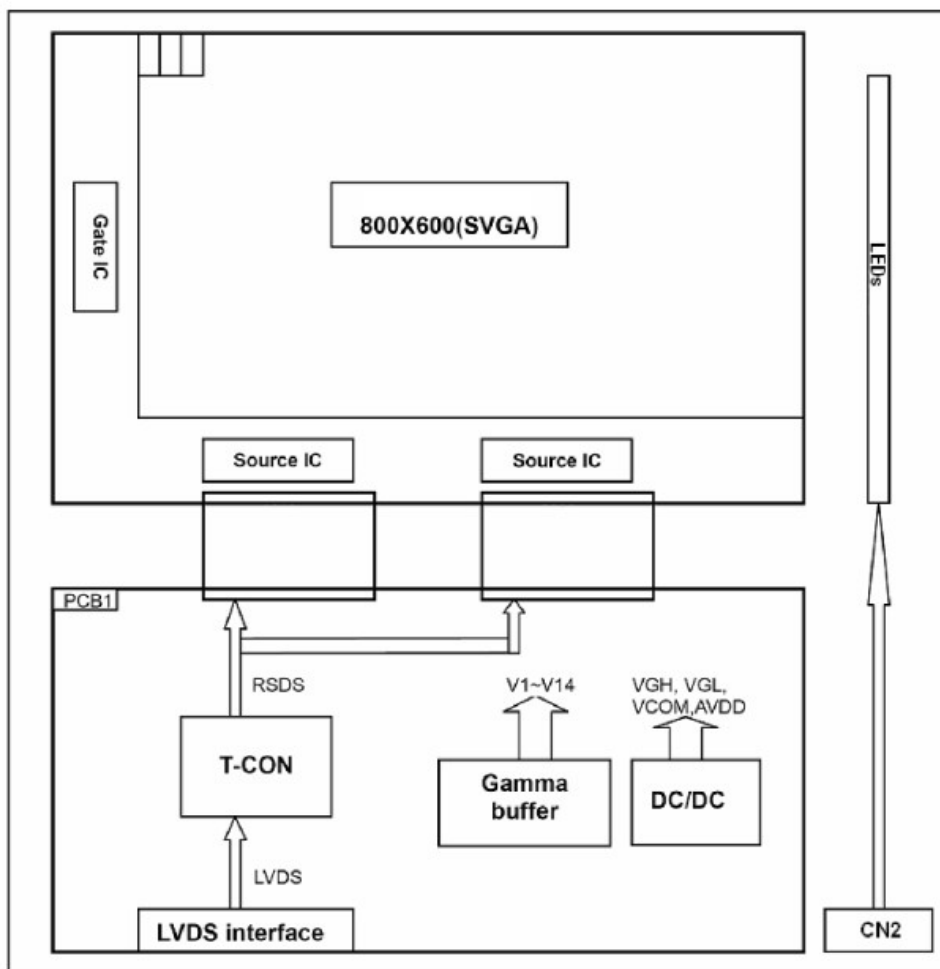
5.1 LCM PANEL DRIVING SECTION (Matching connector of Hirose DF19K-20P-1H(56))

PIN NO	SYMBOL	FUNCTION	REMARK
1	VDD	Power Supply	
2	VDD	Power Supply	
3	GND	Ground	
4	GND	Ground	
5	IN0-	LVDS receiver negative signal channel 0(G0,R5~R0)	
6	IN0+	LVDS receiver positive signal channel 0(G0,R5~R0)	
7	GND	Ground	
8	IN1-	LVDS receiver negative signal channel 1(B1,B0,G5~G1)	
9	IN1+	LVDS receiver positive signal channel 1(B1,B0,G5~G1)	
10	GND	Ground	
11	IN2-	LVDS receiver negative signal channel 2(DE,VS,HS,B5~B2)	
12	IN2+	LVDS receiver positive signal channel 2(DE,VS,HS,B5~B2)	
13	GND	Ground	
14	CLK-	LVDS receiver negative signal clock	
15	CLK+	LVDS receiver positive signal clock	
16	GND	Ground	
17	NC	No connection	
18	NC	No connection	
19	GND	Ground	
20	GND	Ground	

5.2 BACKLIGHT SECTION Recommend CNT:JST BHSR-02VS-1

PIN NO	SYMBOL	FUNCTION	REMARK
1	LEDA	LED Anode	White
2	LEDK	LED Cathode	Black

6. BLOCK DIAGRAM



7. ABSOLUTE MAXIMUM RATINGS

7.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Voltage	V_{IN}	-0.3	3.6	V	
LED Current	I_{A-K}	-	360	mA	

7.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN	MAX	MIN	MAX	
Ambient Temperature($^{\circ}C$)	-20	70	-30	80	Note 1,2,3
Humidity(% RH)	-	90	-	90	Note 4

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 : Operation $T_a=70^{\circ}C$ & $-20^{\circ}C \leq 240$ Hrs.

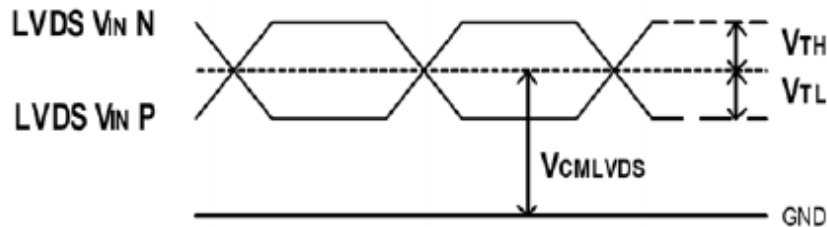
Note 4 : Storage $T_a=50^{\circ}C$ & $H=90\% \leq 240$ Hrs.

8. ELECTRICAL CHARACTERISTICS

8.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For Digital	VDD	3.0	3.3	3.6	V	
	IDD	-	260	380	mA	Note 2
Logic Input Voltage (LVDS: IN+, IN-)	V _{CMLVDS}	VID /2	-	1.4- (VID /2)	V	
	VID	0.1	-	0.6	V	
	V _{TH}	-	-	+100	mV	V _{CMLVDS} =1.2V
	V _{TL}	-100	-	-	mV	V _{CMLVDS} =1.2V
Input current	I _{IN}	-10	-	10	uA	
Common Electrode Driving Signal	VCOM	-	4.36	-	V	Note 1
Sync Frequency	FVD	-	60	70	Hz	

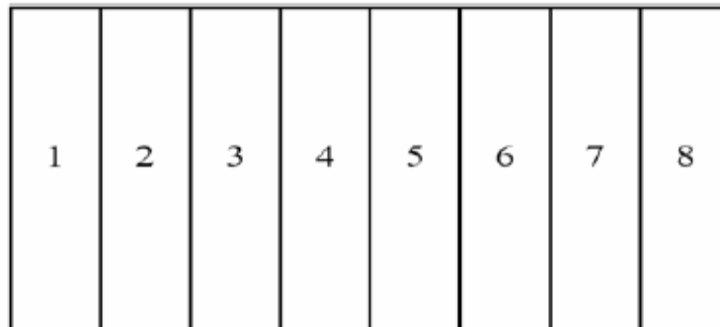


LVDS DC timing diagram

Note1: The value may be different for different LCM.

Note2: To test the current dissipation, using the “color bar” testing pattern shown as below:

1. White
2. Yellow
3. Cyan
4. Green
5. Magenta
6. Red
7. Blue
8. Black

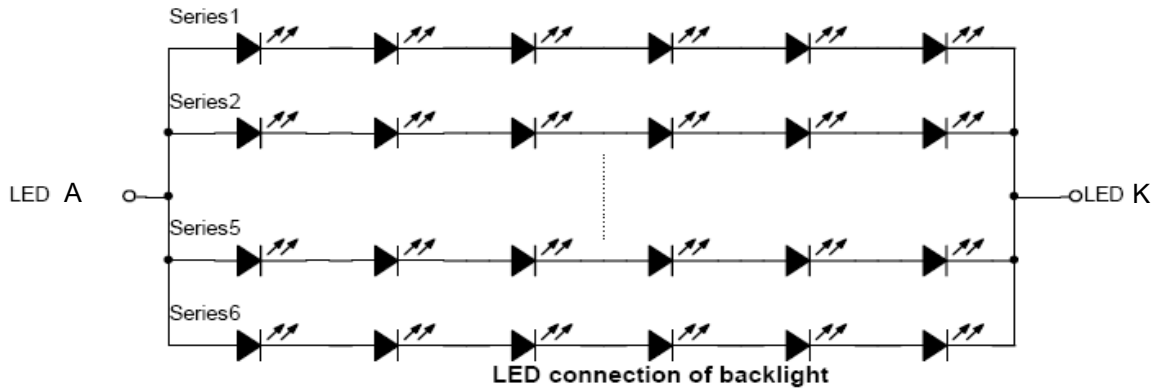


Current dissipation testing pattern

8.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Forward Current	I_{A-K}	-	270	-	mA	
Forward Current Voltage	V_{A-K}	18.5	-	19.9	V	
Backlight Power Consumption	P_{A-K}	-	5346	-	mW	Note 1
LED Life Time	-	-	30,000	-	Hr	Note 2,3



Note 1: The LED driving condition is defined for LED module (36 LED). The Voltage range will be 18.5V to 19.9V based on suggested driving current set as 270mA.

Note 2: Define “LED Lifetime”: brightness is decreased to 50% of the initial value. LED Lifetime is restricted under normal condition, ambient temperature = 25°C and LED light bar current = 270mA.

Note 3: If it uses larger LED light bar current more than 270mA, it maybe decreases the LED lifetime.

9. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing	300	400	-	-	Note (1)
Response Time	T _R	Normal	-	10	15	ms	Note (2)
	T _F	Angle	-	15	25	ms	
Chromaticity	White	x	(0.281)	(0.311)	(0.341)	-	Note (4)
		y	(0.300)	(0.330)	(0.360)		
Viewing Angle	Hor.	Θ _{X+}	55	65	-	Deg.	Note (3)
		Θ _{X-}	55	65	-		
	Ver.	Θ _{Y+}	35	45	-		
		Θ _{Y-}	55	65	-		
Luminance	L		(800)	(1000)	-	cd/m ²	
Luminance uniformity	YU	I _{A-K} =270mA	70	75	-	%	Note (5)

*Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{63} / L_0$$

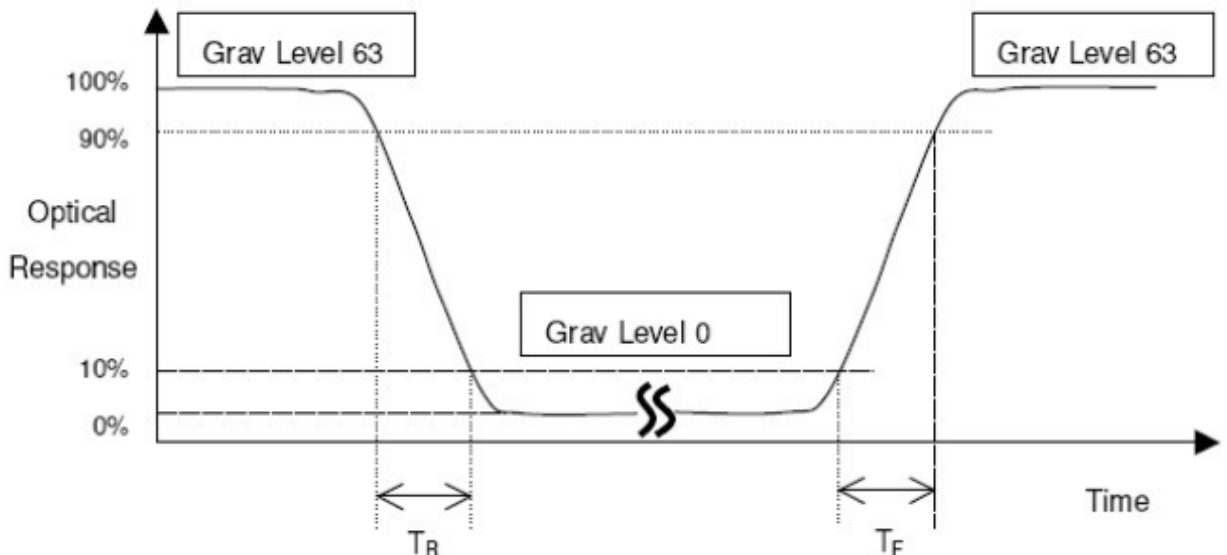
L₆₃: Luminance of gray level 63

L₀: Luminance of gray level 0

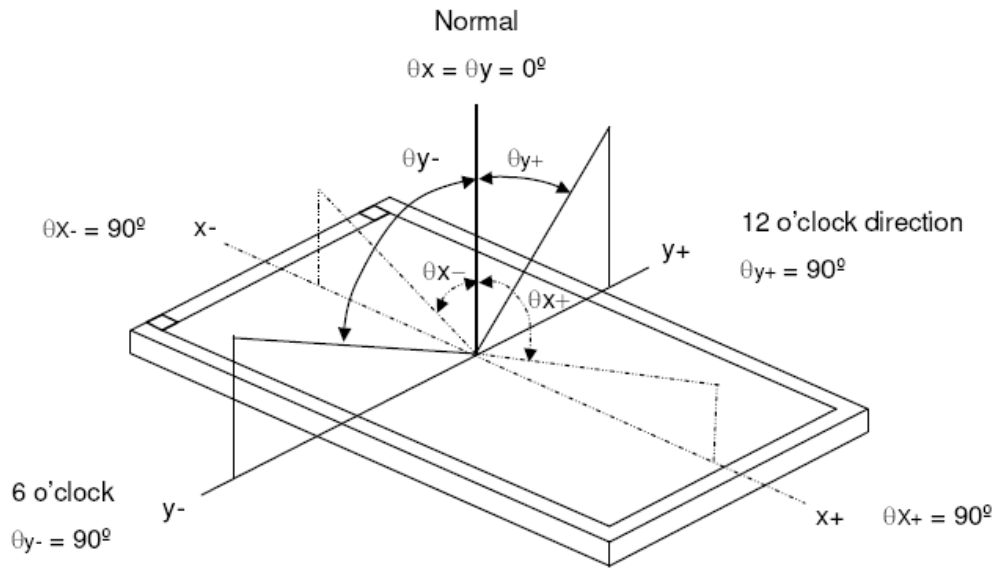
$$CR = CR (5)$$

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

*Note (2) Definition of Response Time (T_R, T_F):

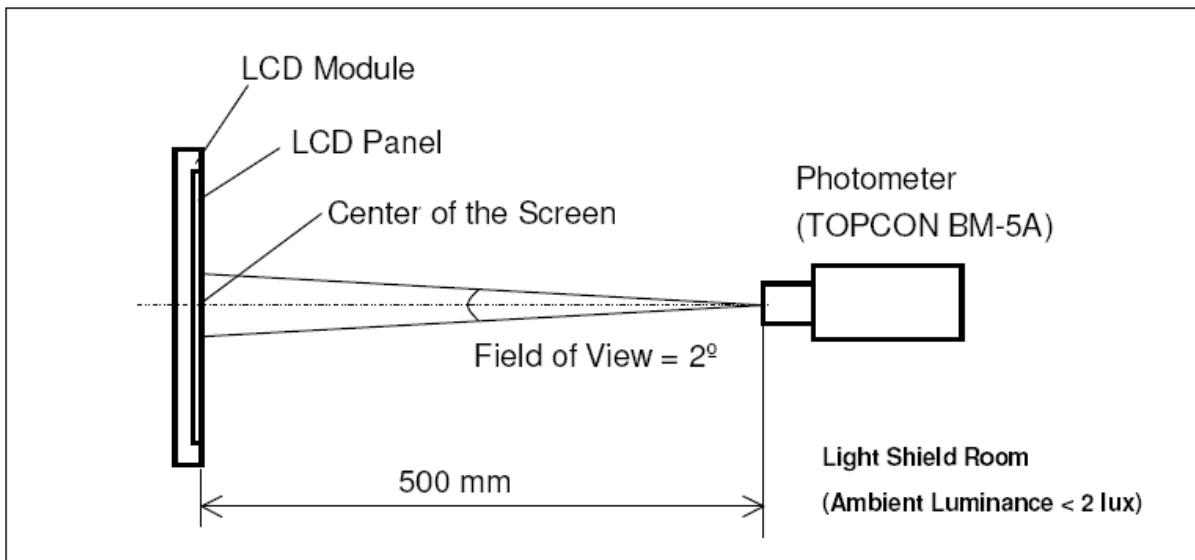


*Note(3) Definition of Viewing Angle

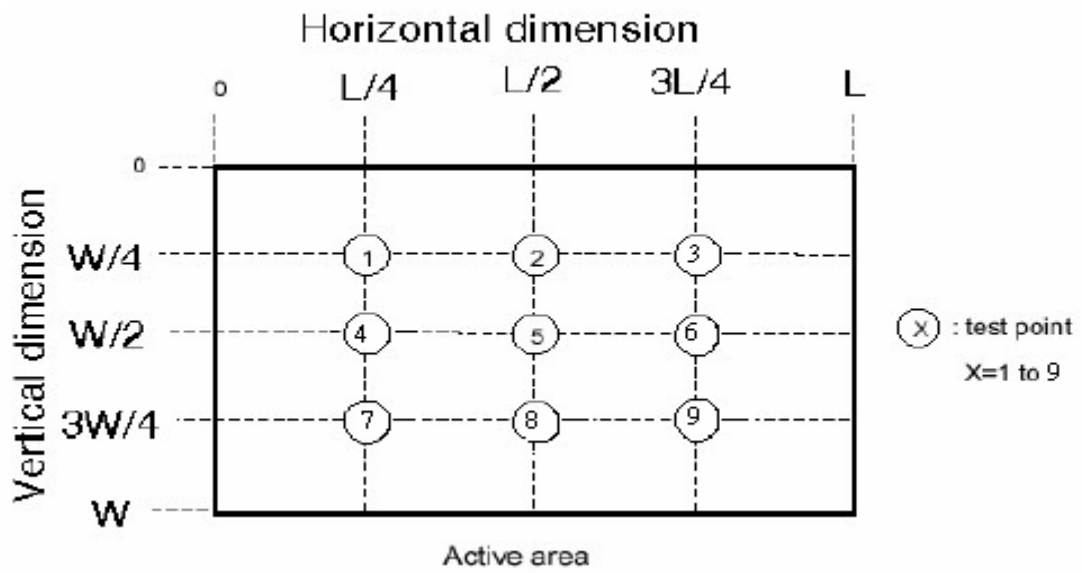


*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



*Note (5)

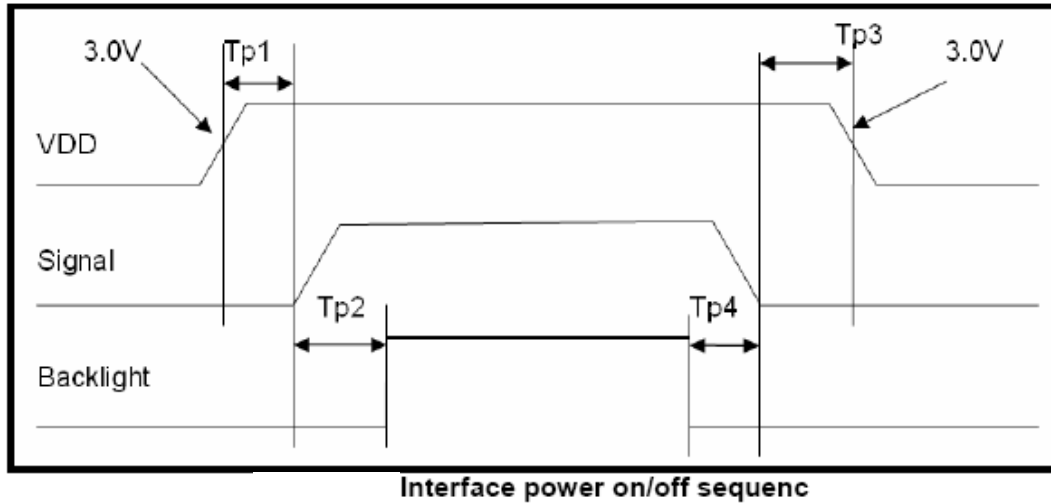


$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right) \times 100\% > 70\%$$

10. TIMING SPECIFICATIONS

10.1 POWER ON/OFF SEQUENCE

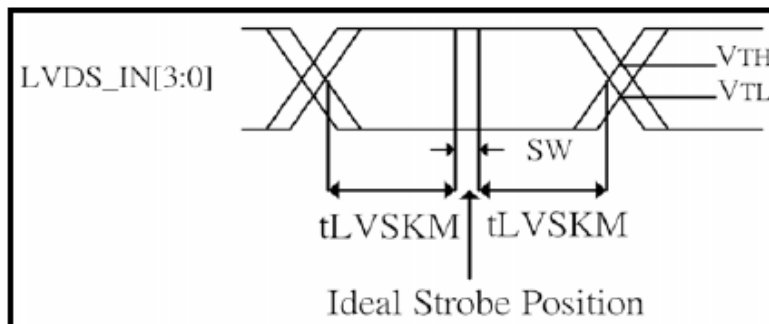
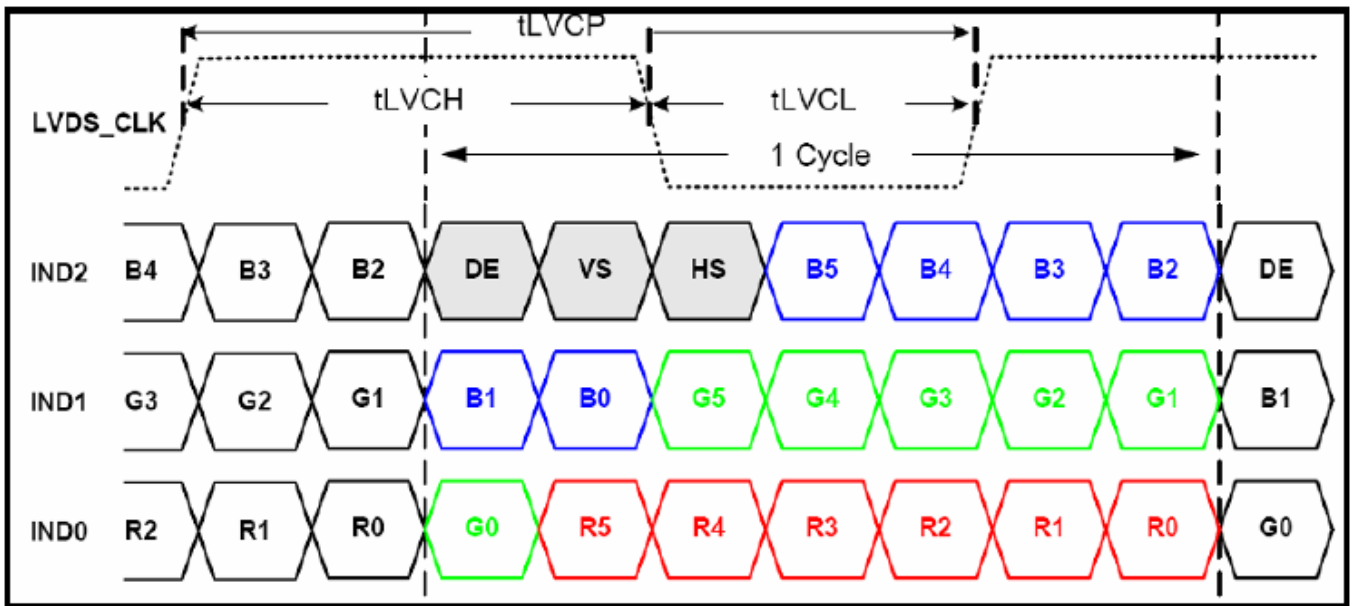
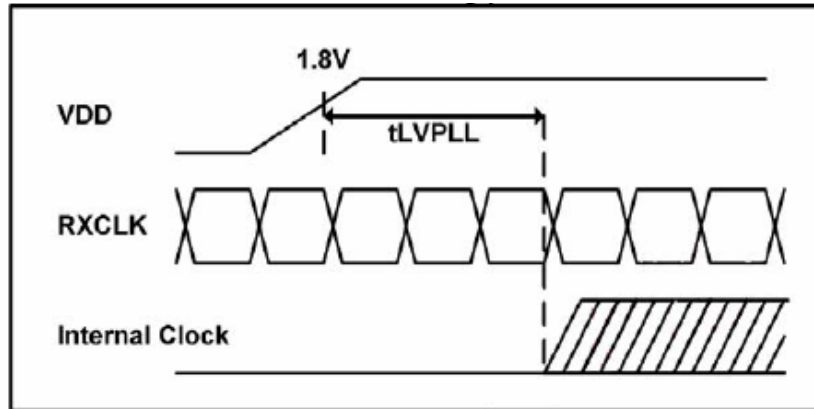
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
VDD 3.0V to signal starting	Tp1	0	-	50	ms	
Signal starting to backlight on	Tp2	150	-	-	ms	
Signal off to VDD 3.0V	Tp3	0	-	50	ms	
Backlight off to signal off	Tp4	150	-	-	ms	



10.2 TIMING PARAMETER

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Clock period	tLVCP	20.0	25	31.25	ns	
Clock high time	tLVCH	-	14.29	-	ns	
Clock low time	tLVCL	-	10.71	-	ns	
PLL wake-up time	tLVPLL	-	-	1	ms	
Input skew margin	tLVSKM	400	-	-	ps	f=85MHz

timing parameter



SW: Setup and Hold time
Input signal data timing

11. RELIABILITY TEST

Ta = 25°C

Environmental Test				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	240HRS	
2	Low Temperature Storage	-30°C	240HRS	
3	High Temperature Humidity Storage	50°C 90%RH	240HRS	NOTE(2)
4	High Temperature Operation	70°C	240HRS	NOTE(2)
5	Low Temperature Operation	-20°C	240HRS	NOTE(2)
6	Temperature Cycle	-20°C ← 25°C → 60°C (30min) (5min) (30min)	100CYCLE	NOTE(2)

NOTE (1): a. THE MODULE SHOULD WORK PROPERLY.

b. BEFORE AND AFTER FUNCTION TEST, THE DIFFERENCE OF CONSUMPTIVE CURRENT SHOULD BE WITHIN 10%

NOTE (2): a. THE MODULE SHOULD WORK PROPERLY.

b. THE MODLUE WON'T BE DEFORMATIVE, COLOR CHANGEABLE OR BROKEN.

c. THE MODULES CAN'T BE APART.

NOTE (3): BEFORE COSMETIC AND FUNCTION TEST, THE PRODUCT MUST HAVE ENOUGH RECOVERY TIME, AT LEAST 2 HOURS AT ROOM TEMPERATURE.