Chefree Technology Corp.

CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: CH070OLDLTH-002
(Complied with RoHS)

CUSTOMER: _____

Version:P0.1

CONTENTS

ISSUE:JUN.06.2019

Spec Condition: Preliminary

CUSTOMER	CHEFREE		
APPROVAL	APPROVAL	CHECKER	PREPARE
	ch lee	kevin	cloud

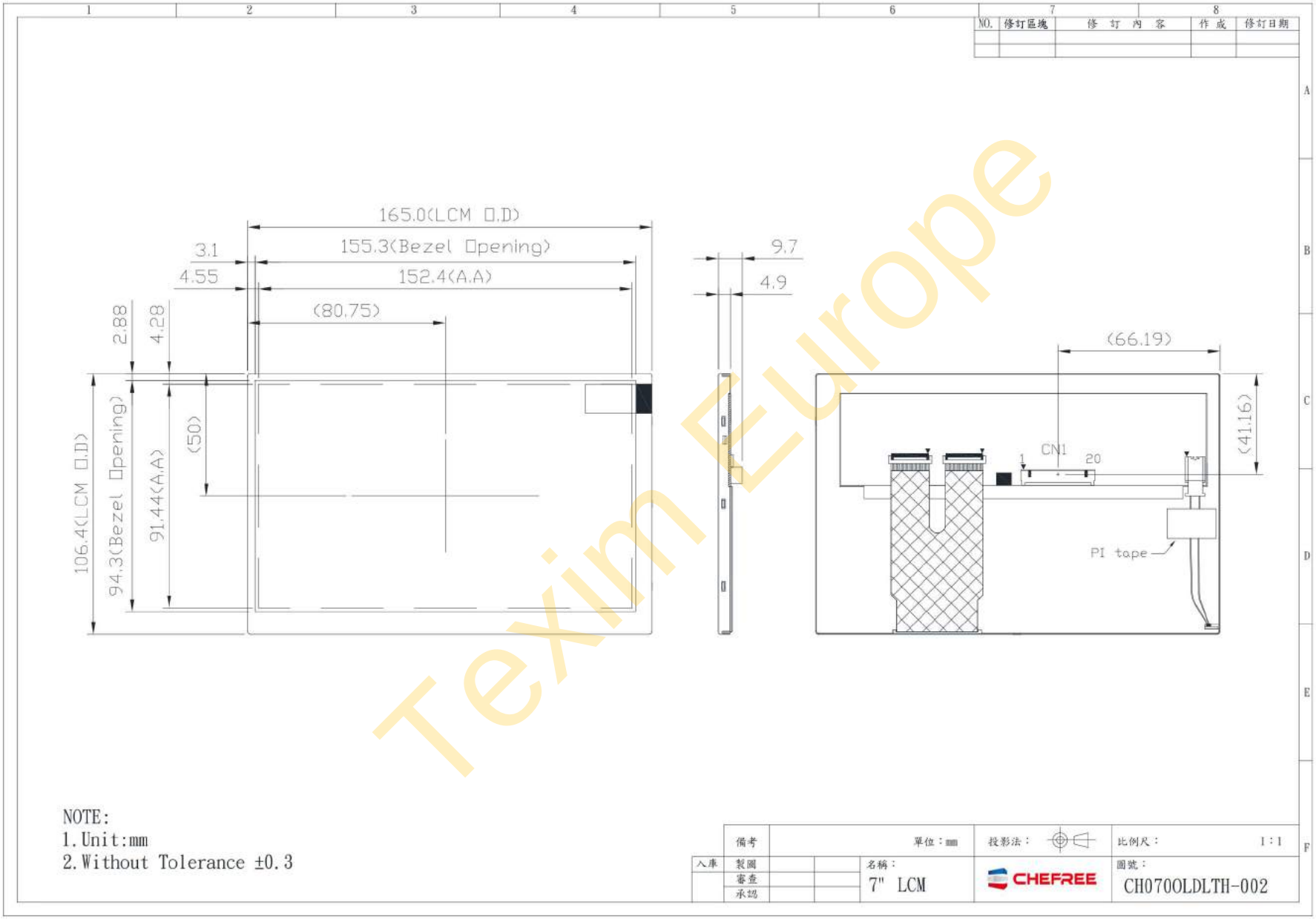
1.RECORD OF REVISION

Rev	DATE	PAGE	SUMMARY
0.1	2019.06.06	ALL	Preliminary specification was first issued.

2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800 X (R.G.B) X 480
(2)	Module Size(mm)	165.0(W) X 106.4(H) X 9.0(D)
(3)	Active Area(mm)	152.4(H) X 91.44(V)
(4)	Pixel Pitch(mm)	0.1905(H) X 0.1905(V)
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally White
(6)	Backlight Color	White LED
(7)	Viewing Direction	6 o'clock
(8)	Electrical Interface	LVDS
(9)	Module Weight	150g±5%

3. OUTLINE DIMENSIONS



4. INTERFACE PIN CONNECTION

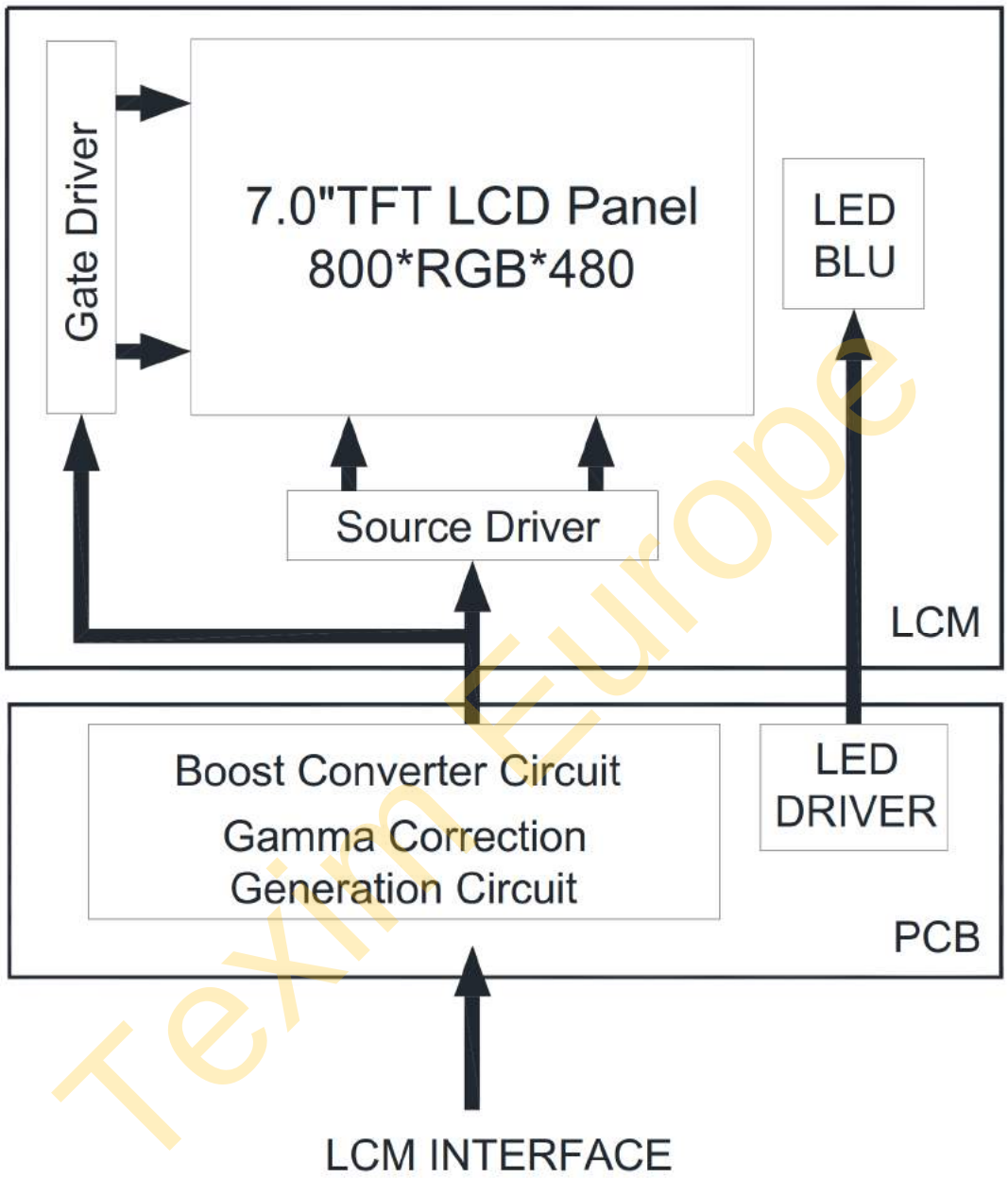
4.1 LCM PANEL DRIVING SECTION

CN1 Connector: STM MS240420 _Rf:G or Equivalent

PIN NO.	SIGNAL	I/O	FUNCTION	REMARK
1	VCC	P	Power Supply For Digital Circuit	
2	VCC	P	Power Supply For Digital Circuit	
3	GND	P	Ground	
4	GND	P	Ground	
5	RxIN0-	I	Negative LVDS differential Data input	
6	RxIN0+	I	Positive LVDS differential Data input	
7	GND	P	Ground	
8	RxIN1-	I	Negative LVDS differential Data input	
9	RxIN1+	I	Positive LVDS differential Data input	
10	GND	P	Ground	
11	RxIN2-	I	Negative LVDS differential Data input	
12	RxIN2+	I	Positive LVDS differential Data input	
13	GND	P	Ground	
14	CKIN-	I	Negative LVDS differential Clock input	
15	CKIN+	I	Positive LVDS differential Clock input	
16	GND	P	Ground	
17	VLED	P	Power Supply for Backlight	
18	VLED	P	Power Supply for Backlight	
19	GND	P	Ground	
20	ADJ	I	Brightness Control Signal	

Note :'P'stand for power , 'I'stand for input , 'O'stand for output

5. BLOCK DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage	VCC	-0.3	+5.0	V	
Logic Output Voltage	V_I	-0.3	VCC+0.3	V	

Note：The absolute maximum rating values of this product not allowed to be exceeded at any times. Should be module be used with any of absolute maximum ratings exceeded. The characteristics of the module may not be recovered, or in an extreme case the module may be permanently destroyed.

6.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature(℃)	Ta=-20	Ts=70	Ta=-30	Ta=80	Note 1,2.
Humidity(% RH)	5~90		5~90		

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 Ta=60℃ & RH=90% ≦ 240Hrs.

7. ELECTRICAL CHARACTERISTICS

7.1 LCM ELECTRICAL CHARACTERISTICS

Ta=25℃

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Power Voltage For LCD	VCC	3.0	3.3	3.6	V	
	ICC	-	TBD	-	mA	VCC=3.3V White Pattern
Input High Voltage	V_{IH}	0.7*VCC	-	VCC	V	
Input Low Voltage	V_{IL}	0	-	0.3*VCC	V	

7.2 BACKLIGHT UNITS

Ta=25℃

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
LED Driving Voltage	V_{LED}	11.5	12.0	12.5	V	
LED Driving Current	I_{LED}	-	TBD		mA	VLED=12V
ADJ Input Voltage	VIH	-	3.3	-	V	
	VIL	0	-	1.0	V	
ADJ Frequency	-	100	-	2000	Hz	
LED Life Time	-	20,000	-	-	Hrs	

Note 1: The "LED dice life time" is defined as the brightness decrease to 50% original brightness that ambient temperature is 25℃

8. OPTICAL CHARACTERISTICS

Ta=25℃

ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	Viewing Normal Angle	300	400	-	-	Note 1
Response Time		T_{ON}		-	5	10	ms	Note 2
		T_{OFF}		-	11	16		
Chromaticity	White	X	θx=θy=0°	0.26	0.31	0.36	-	Note 4
		Y		0.28	0.33	0.38	-	
Viewing Angle	Hor.	θx+	Center CR≧10	65	70	-	Deg.	Note 3
		θx -		65	70	-		
	Ver.	θy+		55	60	-		
		θy -		55	60	-		
Luminance		L	PWM=100%	900	1000	-	cd/m^2	Note 5
Uniformity		YU	θx=θy=0°	-	70	-	%	

Note 1：Definition of Contrast Ratio (CR)：

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63/L0

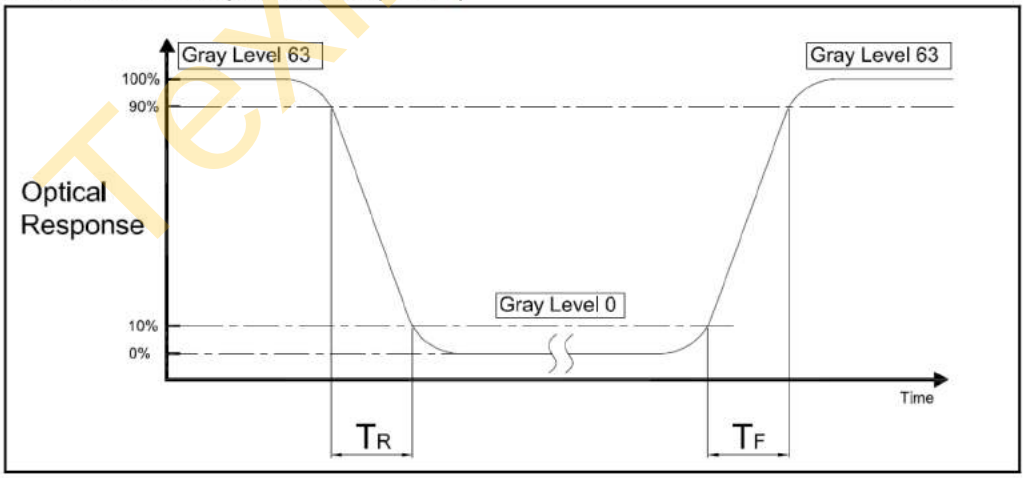
L63：Luminance of gray level 63

L0：Luminance of gray level 0

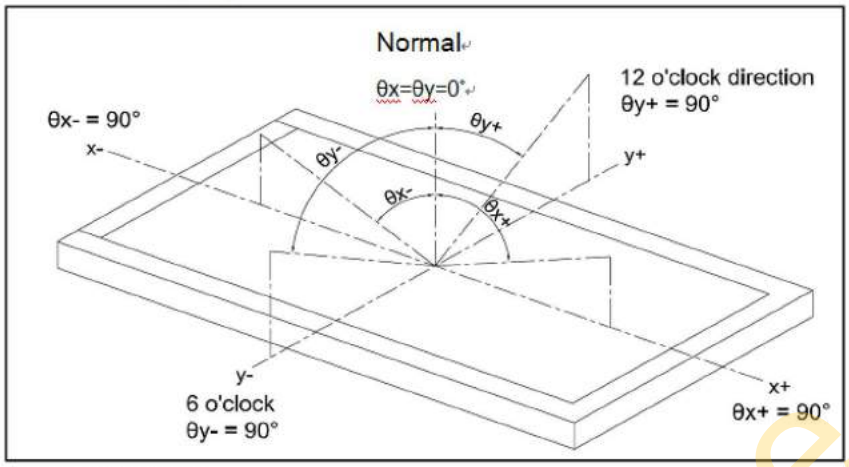
CR = CR(5)

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

Note 2：Definition of Response Time (TR.TF)

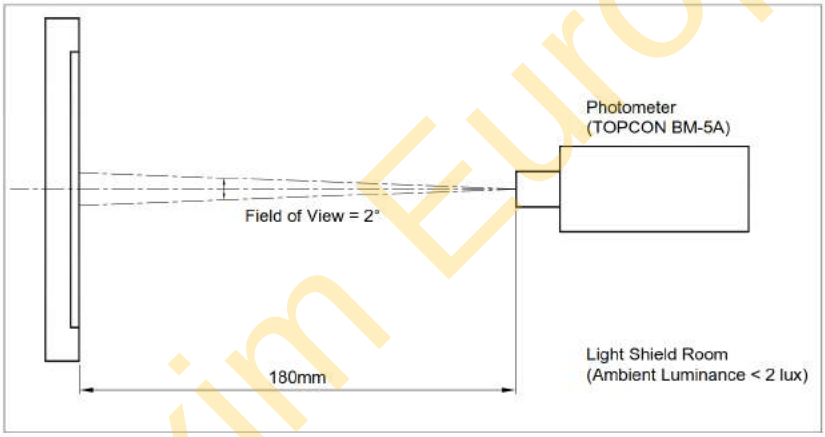


Note 3：Definition of Viewing Angle

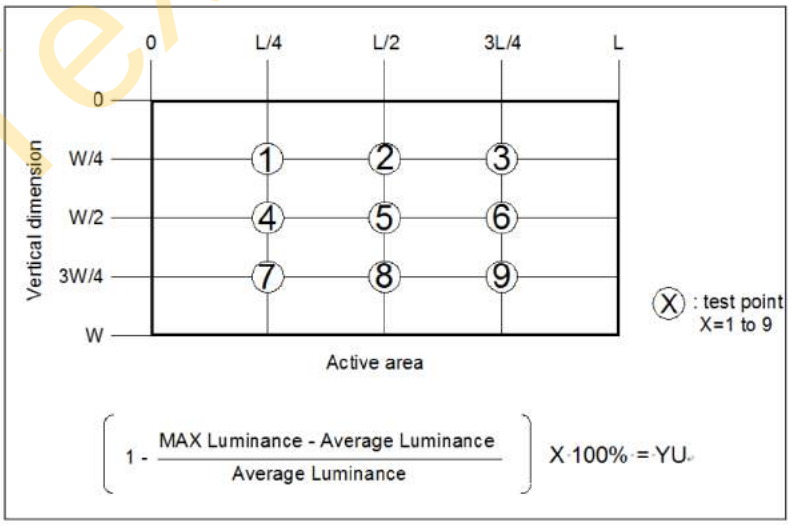


Note 4：Measurement Set-Up:

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



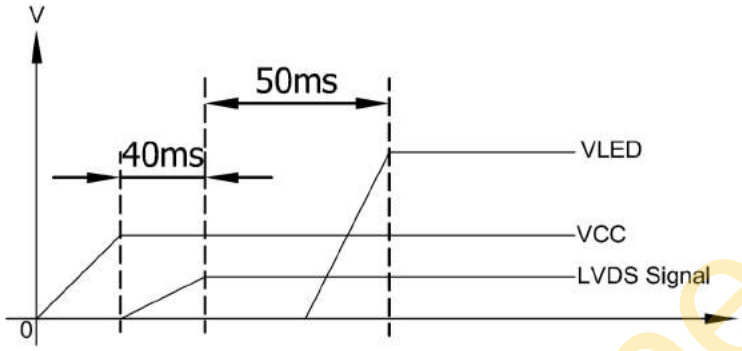
Note 5：



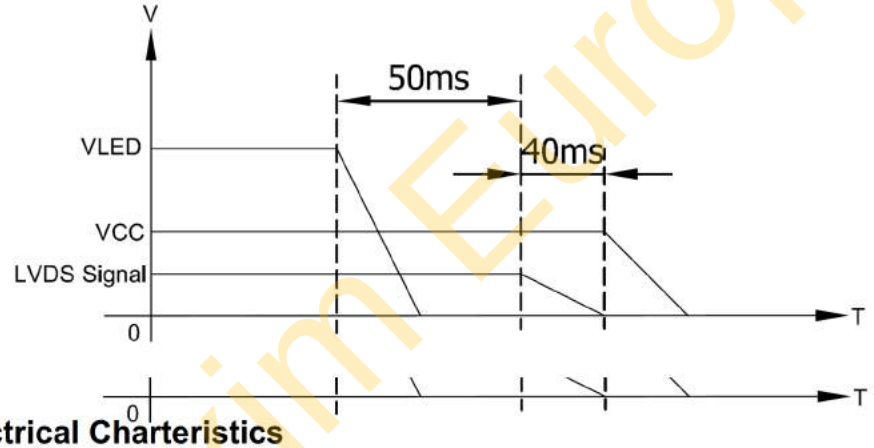
9. TIMING SPECIFICATIONS

9.1 POWER SIGNAL SEQUENCE

• Power ON : VCC→LVDS Signal→VLED



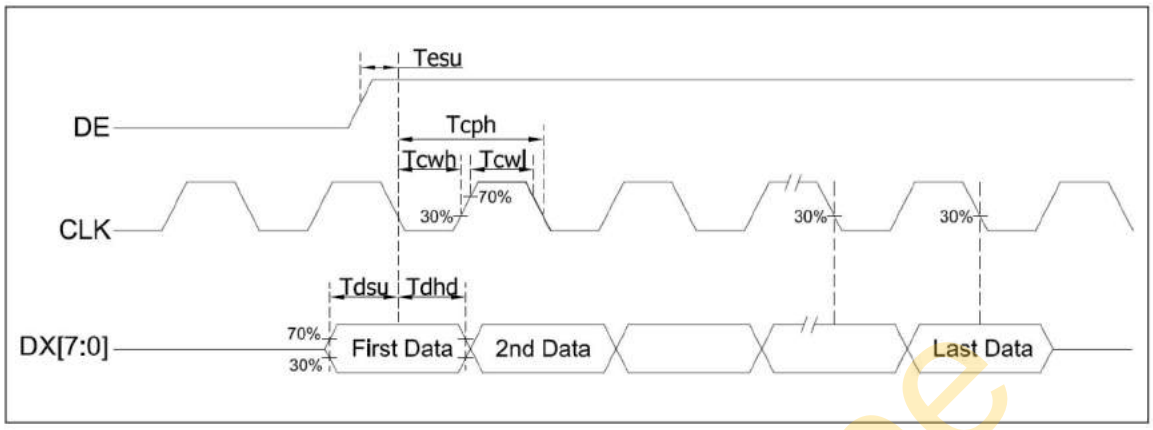
• Power OFF : VLED→LVDS Signal→VCC



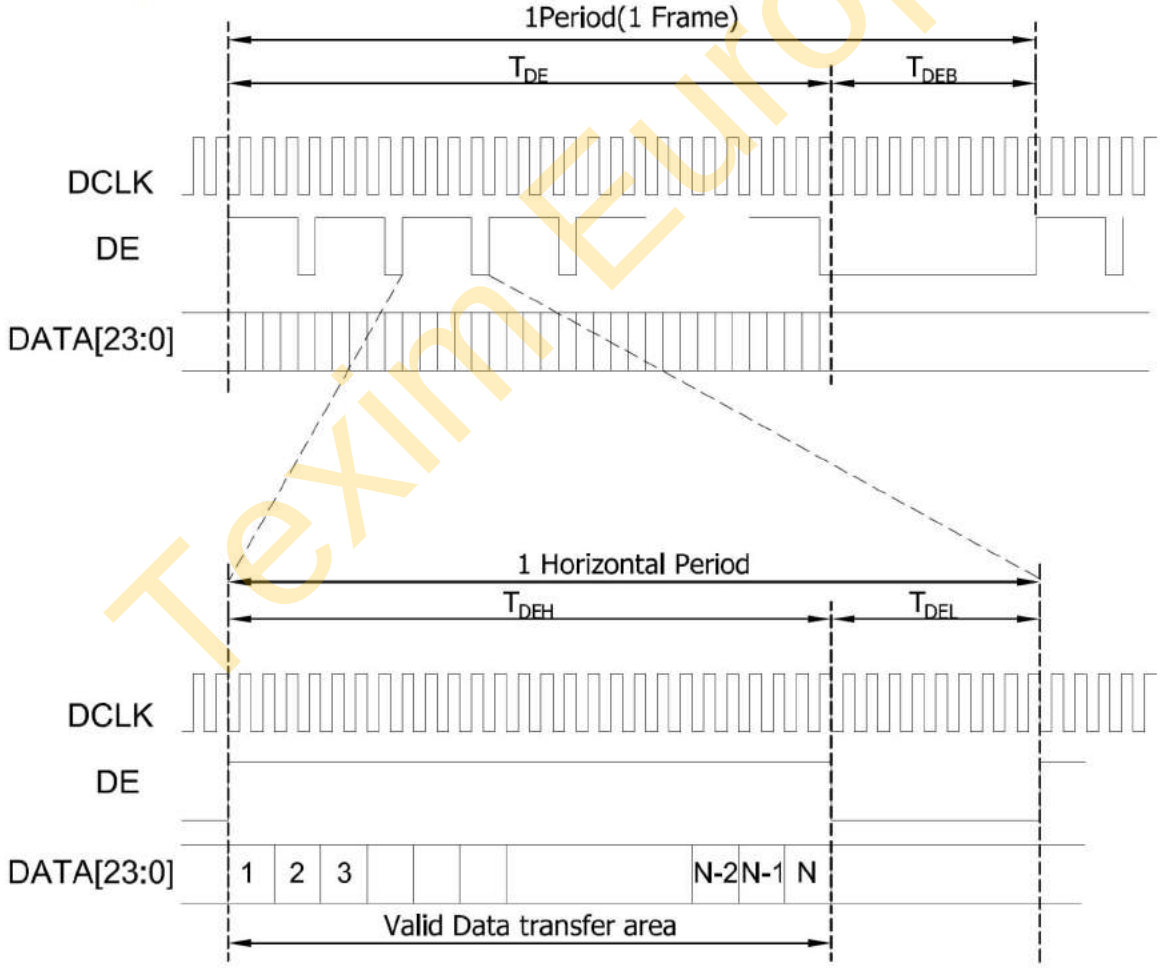
9.2 AC Electrical Charteristics

PARAMETER	SYMBOL	RATING			UNIT
		MIN.	TYP.	MAX.	
Data setup time	Tdsu	6	-	-	ns
Data hold time	Tdhd	6	-	-	ns
DE setup time	Tesu	6	-	-	ns
CLK frequency	F_{CPH}	29.4	33.26	42.48	MHz
CLK period	T_{CPH}	-	30.06	-	Ns
CLK pulse duty	T_{CWH}	40	50	60	%
DE period	$T_{DEH}+T_{DEL}$	1000	1056	1200	T_{CPH}
DE pulse width	T_{DEH}	-	800	-	T_{CPH}
DE frame blanking	T_{DEB}	10	45	1100	$T_{DEH}+T_{DEL}$
DE frame width	T_{DE}	-	480	-	$T_{DEH}+T_{DEL}$

9.3 Timing Controller Timing Chart



9.4 Data Input Format



10.RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	Ta=80℃	240HRS	
2	Low Temperature Storage	Ta=-30℃	240HRS	
3	High Temperature Operation	Ts=70℃	240HRS	
4	Low Temperature Operation	Ta=-20℃	240HRS	
5	Storage Temperature Cycle	Ta=-30℃~ 80℃	1H each cycle 10CYCLE	
6	High Temperature Humidity Operation	60℃ 90%RH	240HRS	

Note1 : Ta is the ambient temperature of samples.
Note2 : Ts is the temperature of panel's surface.
Note3 : In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.
Note4 : Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

11.PRECAUTIONS FOR USE

11.1 SAFETY

(1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
(2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
(3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

11.2 STORAGE CONDITIONS

(1) Store the panel or module in a dark place where the temperature is 23±5°C and the humidity is below 50±20%RH.
(2) Store in anti-static electricity container.
(3) Store in clean environment, free from dust, active gas, and solvent.
(4) Do not place the module near organics solvents or corrosive gases.
(5) Do not crush, shake, or jolt the module.

11.3 HANDLING PRECAUTIONS

(1) Avoid static electricity which can damage the CMOS LSI.
(2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
(3) Do not give external shock.
(4) Do not apply excessive force on the surface.
(5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
(6) Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
(7) Do not operate it above the absolute maximum rating.
(8) Do not remove the panel or frame from the module.
(9) When the module is assembled, it should be attached to the system firmly, Be careful not to twist and bend the module.
(10) Wipe off water droplets or oil immediately . If you leave the droplets for a long time, staining and discoloration may occur.
(11) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

11.4 WARRANTY

(1) Acceptance inspection period.
(2) The period is within one month after the arrival of contracted commodity at the buyer's factory site.
(3) Applicable warrant period
(4) The period is within 12 months since the date of shipping out under normal using and storage conditions.