CHEFREE

Chefree Technology Corp.

TFT COLOR LCD MODULE

MODEL: CH084OLEL-003
(Complied with RoHS)

LVDS interface

Version: P01

Customer : _____

Approved By : _____

Date: _____

CHEFREE		
APPROVAL	**CHECKER**	**PREPARE**
Tim	Mark	Jacky

C O N T E N T S

1. RECORD OF REVISION

| Rev	DATE	PAGE	SUMMARY
P01	2022.08.11	ALL	Preliminary specification was first issued.

2. MECHANICAL SPECIFICATIONS

(1)	Number of Pixel	800 X RGB X 600
(2)	Module Size(mm)	203.0(H) X 145.9(V) X 5.7(D)
(3)	Active Area(mm)	170.4(H) X 127.8(V)
(4)	Pixel Pitch(mm)	0.213 (H) X 0.213(V)
(5)	LCD / Polarizer Model	TFT , Transmissive , Normally White, Anti-Glare
(6)	Display Color	262K
(7)	Viewing Direction(typ.)	6 O'clock
(8)	Electrical Interface	LVDS Interface
(9)	Color Configuration	R.G.B Stripe
(10)	Module Weight(g)	205±5%

Note 1: Viewing direction for best image quality is different from TFT definition, there is the 180 degrees shift.

3. OUTLINE DIMENSIONS
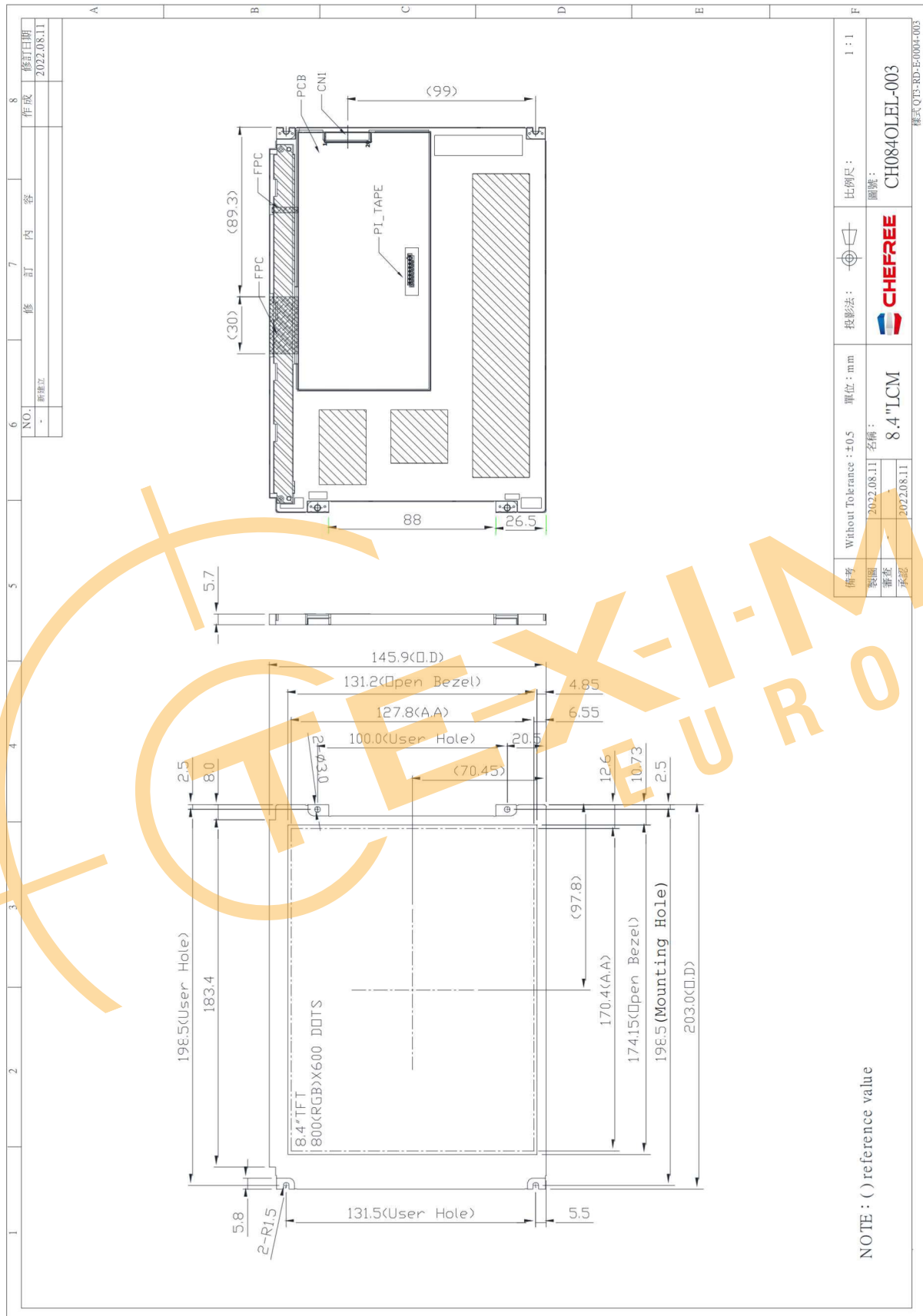
4. INTERFACE PIN CONNECTION

4.1 LCM PINS

CN1 Connector：STM MSB24013P20 or equivalent

Mating Connector：STM P24013P20 or equivalent.

PIN No.	SIGNAL	I/O	FUNCTION	REMARK
1	VDD	P	Power Supply	
2	VDD	P	Power Supply	
3	U/D	I	Vertical Display Mode Select Signal Up / Down Scan Control Input.	Note1
4	L/R	I	Horizontal Display Mode Select Signal Left / Right Scan Control Input.	Note1
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	RxCLK-	I	Negative LVDS differential Clock Input	
15	RxCLK+	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	PWM	I	Brightness control signal	

Note: "P" Stands for Power; "I" stands for Input.

Note 1:
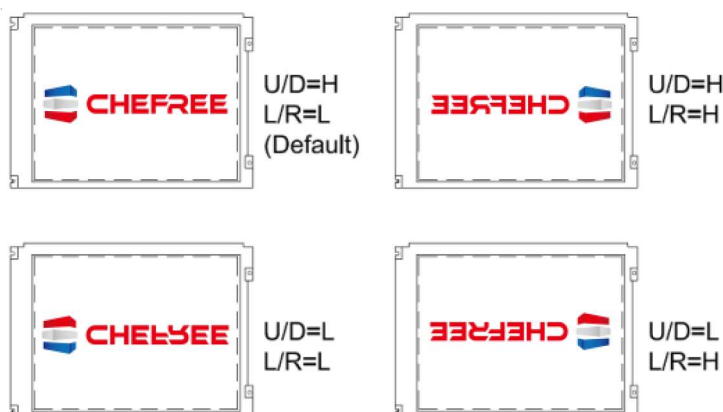
5. BLOCK DIAGRAM
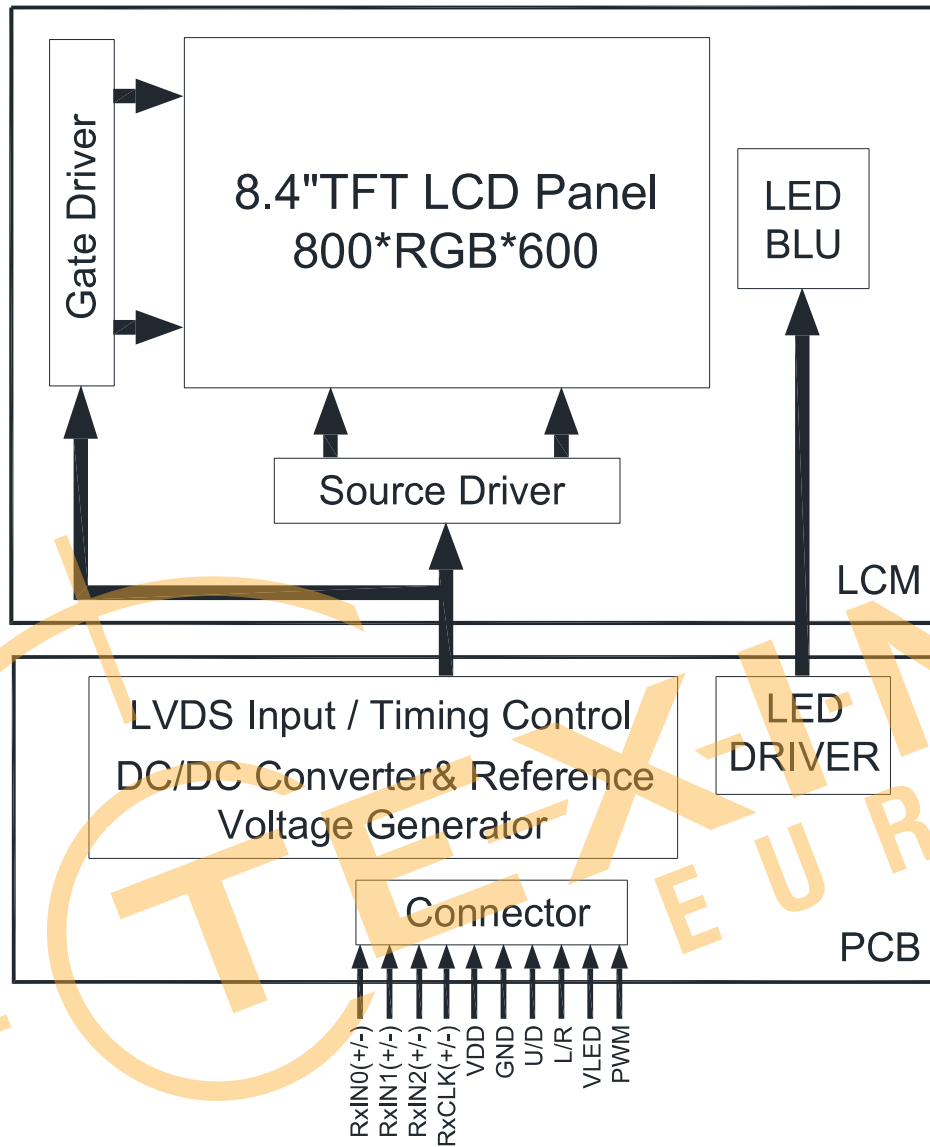
6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Supply Voltage	VDD	-0.5	+3.96	V	
LED Driving Voltage	V_{LED}	-0.3	+6.0	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(℃)	-20	70	-30	80	Note 1,2
Humidity(% RH)	-		-		Note 3

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 : Storage Ta=60℃ & RH=90% ≦240Hrs.

7. ELECTRICAL CHARACTERISTICS

7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25℃

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VDD	3.0	3.3	3.6	V	
	IDD	-	210	230	mA	Note 1
Input signal voltage	VIH	0.7VCC	-	VCC	V	
	VIL	0		0.3VCC		

Note 1：Test condition：VDD =3.3V；Test Pattern：All Black.

7.2 ELECTRICAL CHARACTERISTICS OF BACKLIGHT

Ta=25℃

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Voltage	V_{LED}	4.5	5	5.5	V	
	I_{LED}		660	720	mA	
PWM Level	High Level	1.2	3.3	-	V	
	Low Level	-	-	0.4	V	
PWM frequency	-	200	-	1000	Hz	
LED life time	Ta=25℃60~70%RH	30,000	50,000	-	Hrs	

8. OPTICAL CHARACTERISTICS

Ta=25℃

| ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	Viewing Normal Angle Θx=Θy=0°	450	600	-	-	Note 1
Response Time		TR+TF		-	25	35	ms	Note 2
Chromaticity	White	W$_X$		0.247	0.297	0.347	-	Note 4
		W$_Y$		0.267	0.324	0.367	-	
Viewing Angle	Hor.	θx+	Viewing Angle Θx=Θy=0° CR≧10	65	75	-	Deg.	Note 3
		θx -		65	75	-		
	Ver.	θy+		60	70	-		
		θy -		50	60	-		
Luminance		L	PWM Duty =100%	700	800	-	cd/m2	
Uniformity		YU		70	80	-	%	Note 5

Note 1：Definition of Contrast Ratio (CR)：

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63/L0

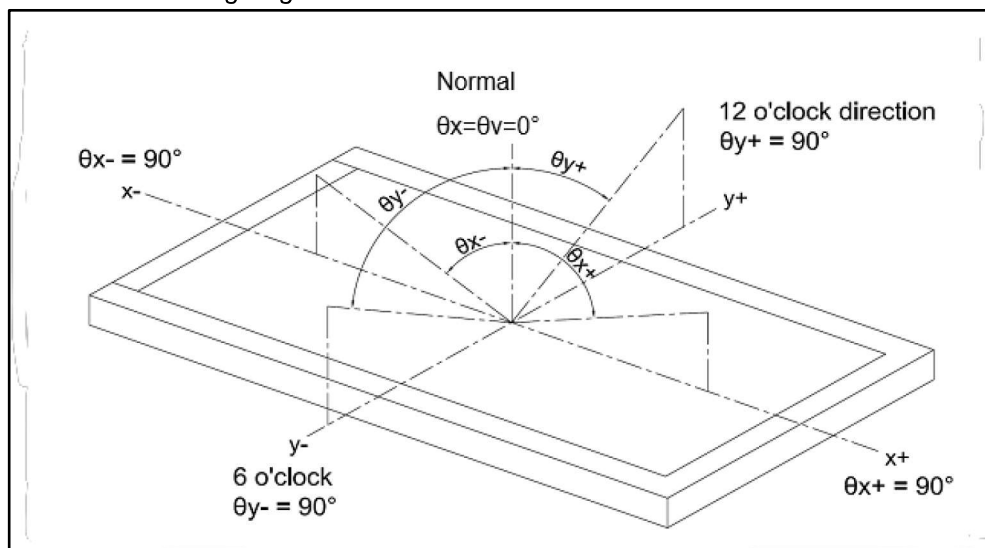L63：Luminance of gray level 63 / L0：Luminance of gray level 0 / CR = CR(5)

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)
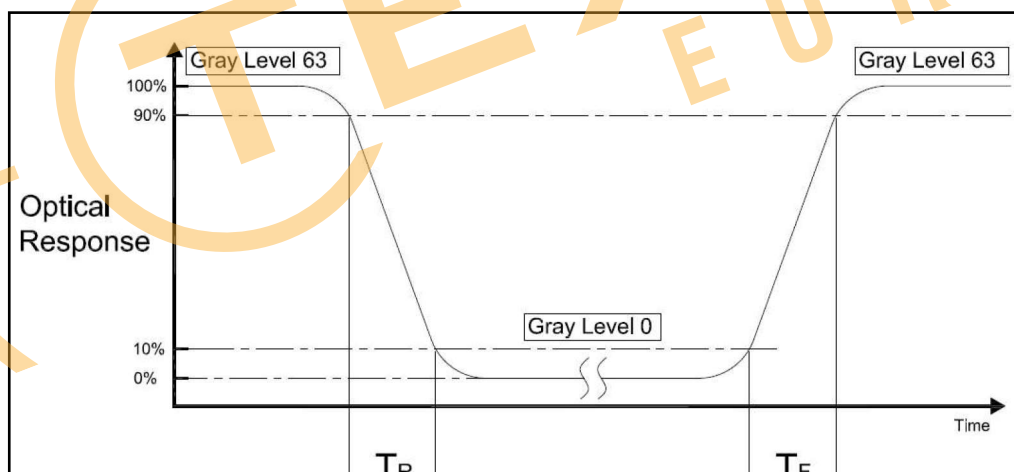
Note 3：Definition of Viewing Angle

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 :

$$\left[1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right] \times 100\% = YU$$
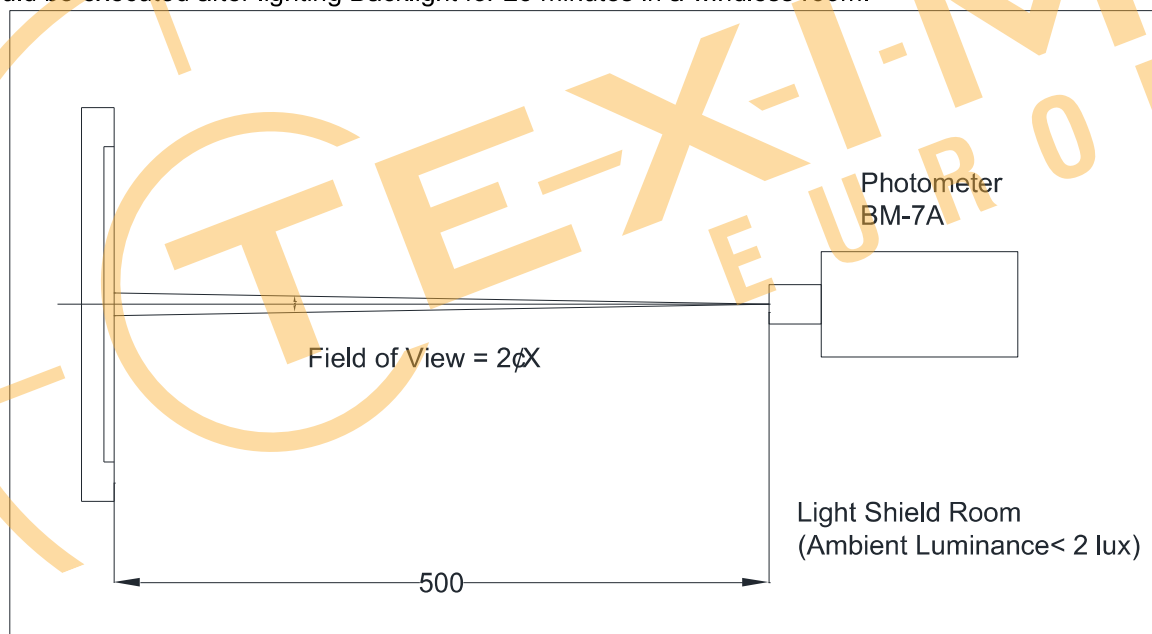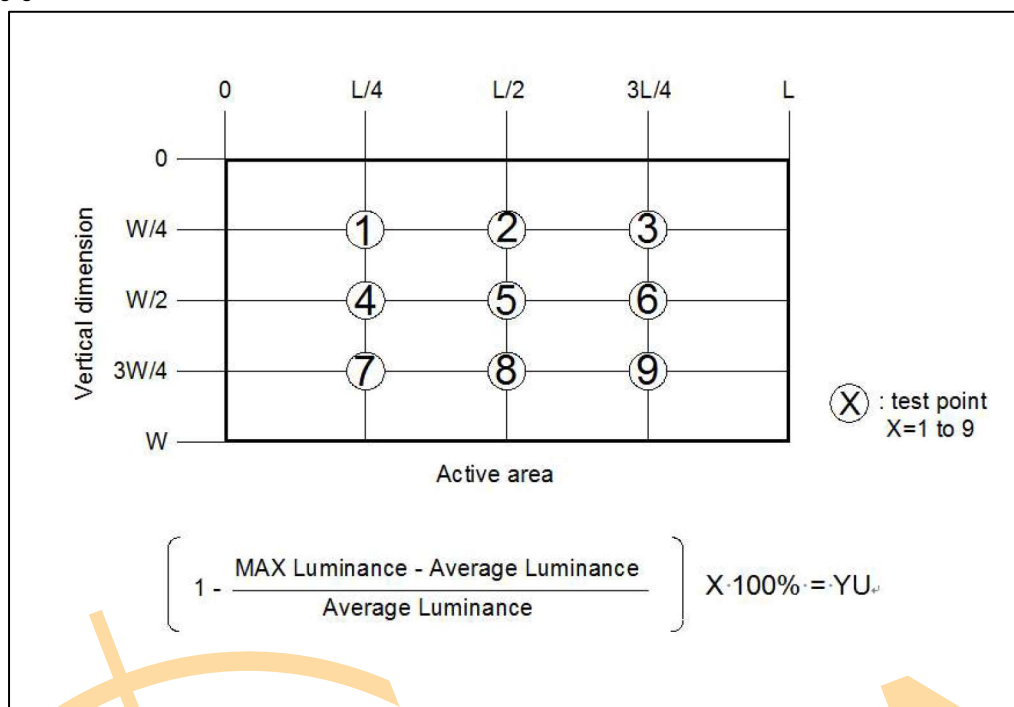
9. TIMING SPECIFICATIONS

9.1 LVDS mode DC electrical characteristics

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Differential input high Threshold voltage	RXVTH	-	-	+0.1	V	RXVCM=1.2V
Differential input Low Threshold voltage	RXVTL	-0.1	-	-	V	-
Input voltage range (singled-end)	RXVIN	0	-	VDD-1.2+ |VID|/2	V	-
Differential input common Mode voltage	RXVCM	|VID|/2	-	VDD-1.2	V	-
Differential input voltage	| VID |	0.2	-	0.6	V	-
Differential input leakage Current	RVXIiz	-10	-	+10	µA	-
LVDS Digital Operating Current	Iddlvds	-	15	30	mA	Fclk=65MHz, VDD=3.3V
LVDS Digital Stand-by Current	Istlvds	-	10	50	µA	Clock & all Functions are stopped

Single-end signals
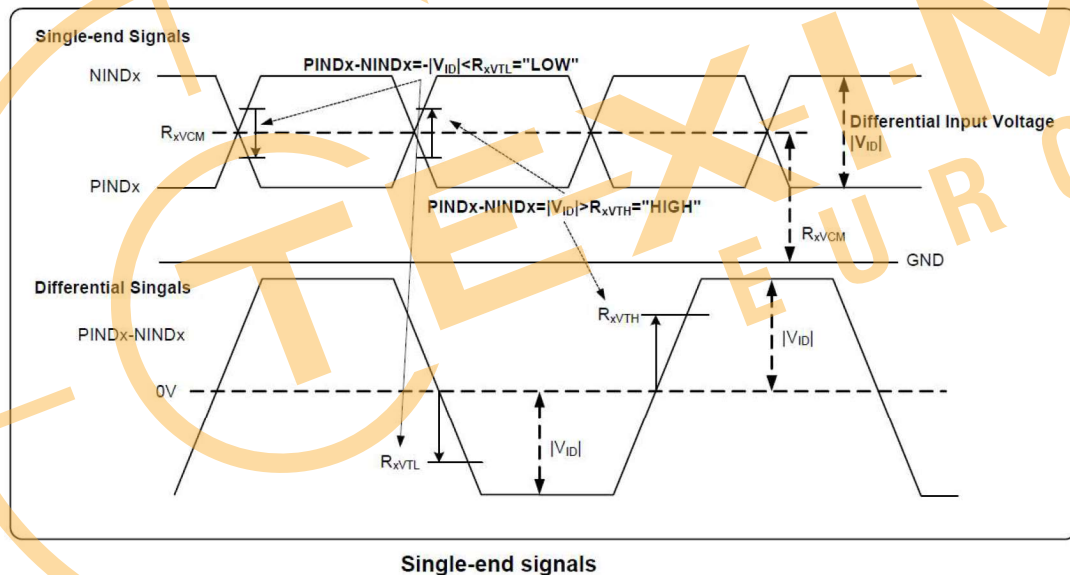
9.2 Input Clock and Data Timing Diagram

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	32.6	39.6	62.4	MHz
Horizontal Display Area	thd		800		DCLK
HSD Period	th	890	1000	1300	DCLK
HSD Blanking	thb+ thfp	90	200	500	DCLK
Vertical Display Area	tvd		600		T_H
VSD Period	tv	610	660	800	T_H
VSD Blanking	tvbp+tvfp	10	60	200	T_H

9.3 LVDS Data Input Format
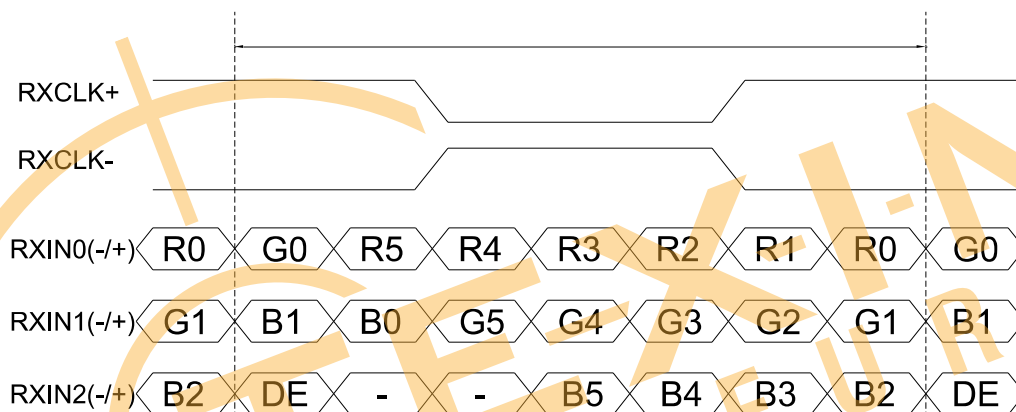
9.4 POWER ON/OFF SEQUENCE

To prevent a latch-up or DC operation of LCD module, the power on/off sequence should follow the conditions shown in the following diagram.
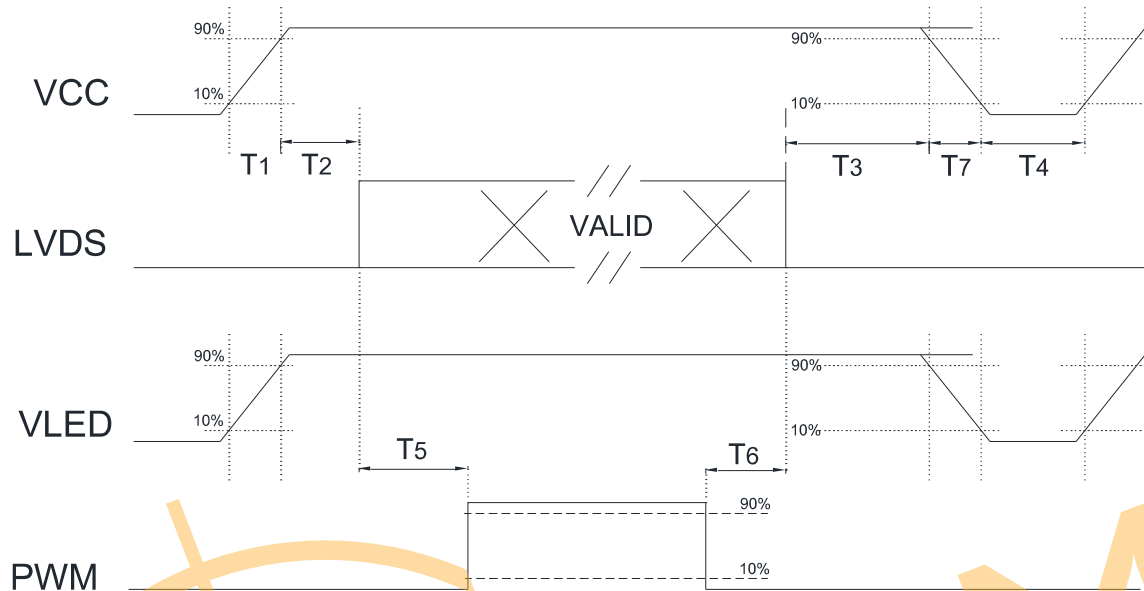
Note 1：Please avoid floating state of interface signal at invalid period.

Note 2：When the interface signal is invalid, be sure to pull down the power supply of LCD VDD to 0 V.

Note 3：The Backlight converter power must be turned on after the power supply for the logic and the interface signal is valid. The Backlight converter power must be turned off before the power supply for the logic and the interface signal is invalid.

Parameter	Value			Units
	Min.	Typ.	Max.	
T1	0.5	-	10	ms
T2	0	-	50	ms
T3	0	-	50	ms
T4	500	-	-	ms
T5	200	-	-	ms
T6	200	-	-	ms
T7	10	-	100	ms

10. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	Ta=80℃	240Hrs	Note 1,3
2	Low Temperature Storage	Ta=-30℃	240Hrs	Note 1,3
3	High Temperature Operation	Ts=70℃	240Hrs	Note 1,3
4	Low Temperature Operation	Ta=-20℃	240Hrs	Note 2,3
5	Temperature Cycle	-30℃←25℃→80℃ (30min) (5min) (30min)	100Cycle	Note 1,3
6	High Temperature Humidity Storage	60℃ ,90%RH	240Hrs	Note 2,4

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.

Note 1：Ta is the ambient temperature of samples.

Note 2：Ts is the temperature of panel's surface.

Note 3：Before cosmetic and function test, the product must have enough recovery time, at least 24 hours at room temperature.

Note 4：Start with cold temperature and end with high temperature.

11. LCM INSPECTION STANDARD

Inspection specifications refer CHEFREE TECHNOLOGY CORP. LCM INSPECTION STANDARD Document.

Document Number : QT3-QC-A-I003

12. PACKAGE INFORMATION

LCM Model	LCM Qty. in the box	Outer box Size (mm)	Weight (Kg)
CH084OLEL-003	50PCS/Box	530*430*220	13±10%

13. PRECAUTIONS FOR USE

13.1 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.

13.2 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.

13.3 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.

13.4 WARRANTY

(1)Acceptance inspection period. The period is within one month after the arrival of contracted commodity at the buyer's factory site.

(2)Applicable warrant period. The period is within 12 months since the date of shipping out under normal using and storage conditions.

Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Texim Europe B.V. its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Texim"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Texim makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product.

It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application.

Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time.

All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.

Texim Europe - contact details
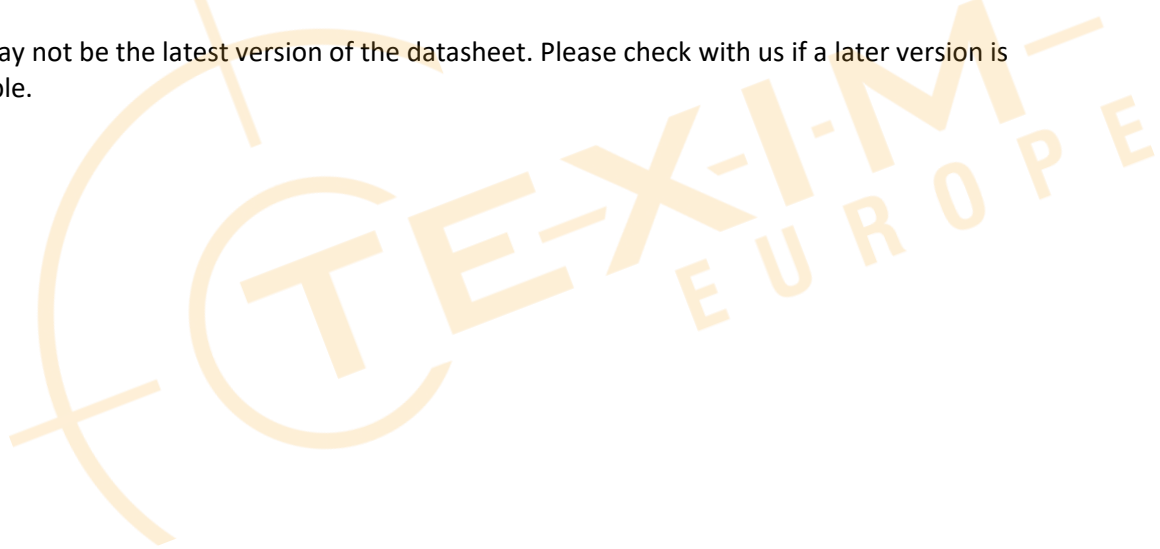
Headquarters & Warehouse

Elektrostraat 17
NL-7483 PG Haaksbergen
The Netherlands

T: +31 (0)53 573 33 33
E: info@texim-europe.com
Homepage: www.texim-europe.com

The Netherlands

Elektrostraat 17
NL-7483 PG Haaksbergen

T: +31 (0)53 573 33 33
E: nl@texim-europe.com

Belgium

Zuiderlaan 14, box 10
B-1731 Zellik

T: +32 (0)2 462 01 00
E: belgium@texim-europe.com

UK & Ireland

St Mary's House, Church Lane
Carlton Le Moorland
Lincoln LN5 9HS

T: +44 (0)1522 789 555
E: uk@texim-europe.com

Germany - North

Bahnhofstrasse 92
D-25451 Quickborn

T: +49 (0)4106 627 07-0
E: germany@texim-europe.com

Germany - South

Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
E: muenchen@texim-europe.com

Austria

Warwitzstrasse 9
A-5020 Salzburg

T: +43 (0)662 216 026
E: austria@texim-europe.com

Nordic

Søndre Jagtvej 12
DK-2970 Hørsholm

T: +45 88 20 26 30
E: nordic@texim-europe.com

Italy

Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
E: italy@texim-europe.com

A **TKH** TECHNOLOGY COMPANY