



代号: Q/BHI.LK.731-006

冀雅（廊坊）电子有限公司

JIYA (LANGFANG) ELECTRONICS CO., LTD

模块产品规格书

SPECIFICATION FOR LCD MODULE

产品型号 Product model	JYG-80048015G(R)-KT6L1-VA(JY14A47)	
拟制 Prepared by	审核 Checked by	批准 Approved by
Qiu Weihua	Li Xu Jiang	Jungai Cheng

客户名称 Client name		
客户型号 Client model		
客户确认/Approved signature		
采购/日期 PUR/Date	品质/日期 QC/Date	研发/日期 R&D/Date

公司地址: 中国河北省廊坊经济技术开发区二号路 36 号

邮编: 065001

COMPANY ADDRESS:

No.36, Road No.2 Langfang Economic & Technical Development Zone, Hebei Province, P.R. China

P.C.: 065001

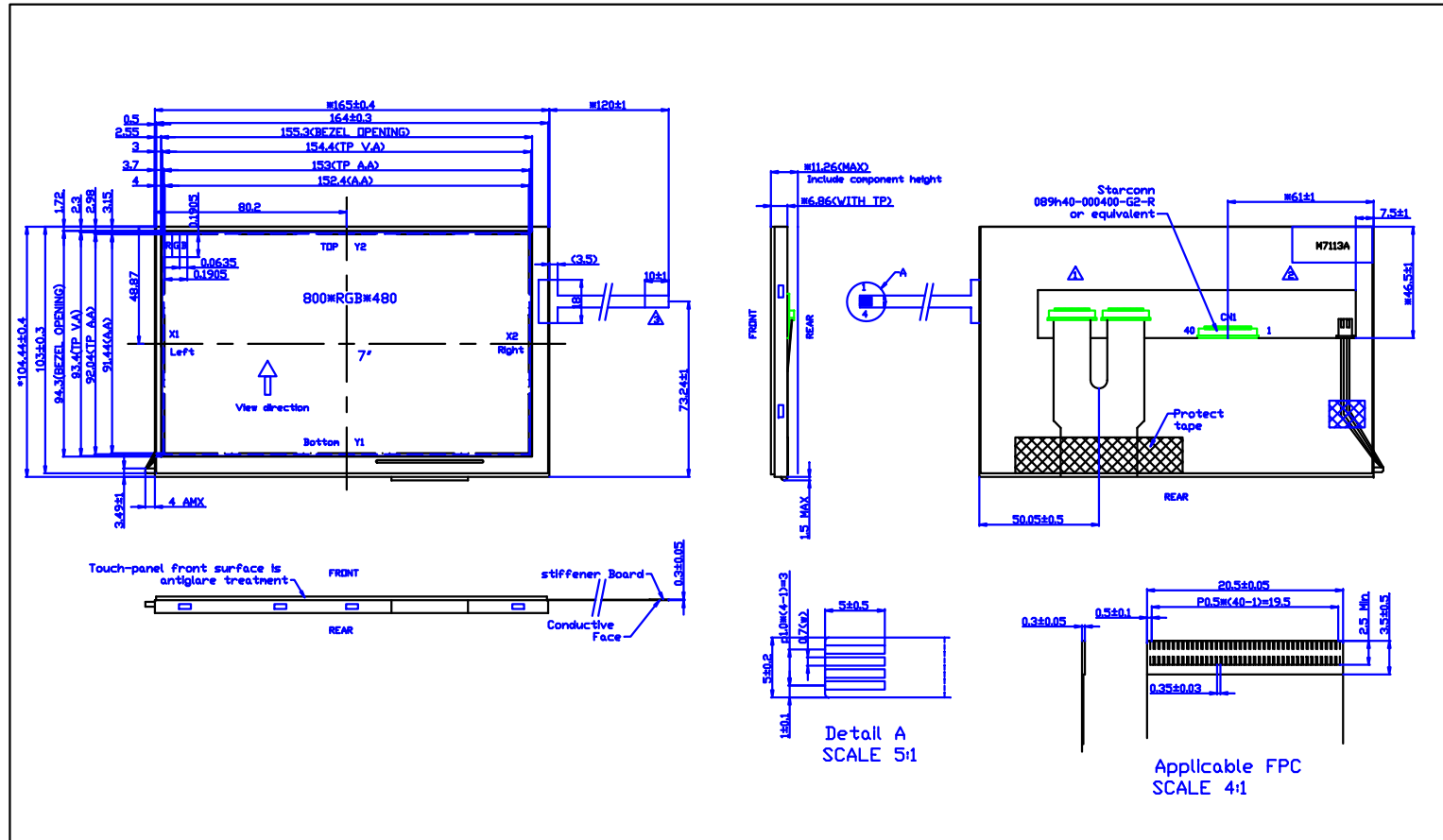
电话/Tel: 86-316-6063731

传真/Fax: 86-316-6063724

CONTENT

- 1. LCM DRAWING**
- 2. GENERAL DESCRIPTION**
- 3. MECHANICAL SPECIFICATIONS**
- 4. ELECTRO-OPTICAL CHARACTERISTICS**
- 5. BLOCK DIAGRAM**
- 6. ELECTRONIC CHARACTERISTICS**
- 7. PINS DESCRIPTION**
- 8. INSTRUCTION DESCRIPTION**
- 9. BACKLIGHT PARAMETERS**
- 10. PRODUCT QUALITY & RELIABILITY**
- 11. PRECAUTIONS IN USING**
- 12. APPLICATION**
- 13. CLASSIFICATION INFORMATION**
- 14. HISTORY OF VERSION**

1.LCM DRAWING



更改记录						设计	审核	工艺	标准化	批准	产品型号	JYG-80048015G(R)-KT6L1-VA
更改标记	日期	更改内容	设计	审核	批准	签名	曹亚昭				文件编号	G80048015G(R)-WX
						日期	14.04.04				分文件号	4
											页数	1-1 单位 mm
						未注公差	± 0.3				冀雅(廊坊)电子有限公司	

2. GENERAL DESCRIPTION

MAIN TECHNICS: COG
 DISPLAY CONTENT: GRAPH
 DISPLAY TYPE: 262K COLORS-TFT-NEGATIVE-TRANSMISSIVE
 Normally white
 DRIVER METHOD: 1/480 DUTY
 VIEWING DIRECTION: 6:00
 CONTROLLER: NC
 BACKLIGHT: LED WHITE
 OPEATING TEMPERATURE: -10°C~+60°C
 STORAGE TEMPERATURE: -20°C~+70°C
 INTERFACE: Digital 18bit RGB INTERFACE
 REFERENCE DOCUMENTS : NC

3. MECHANICAL SPECIFICATIONS

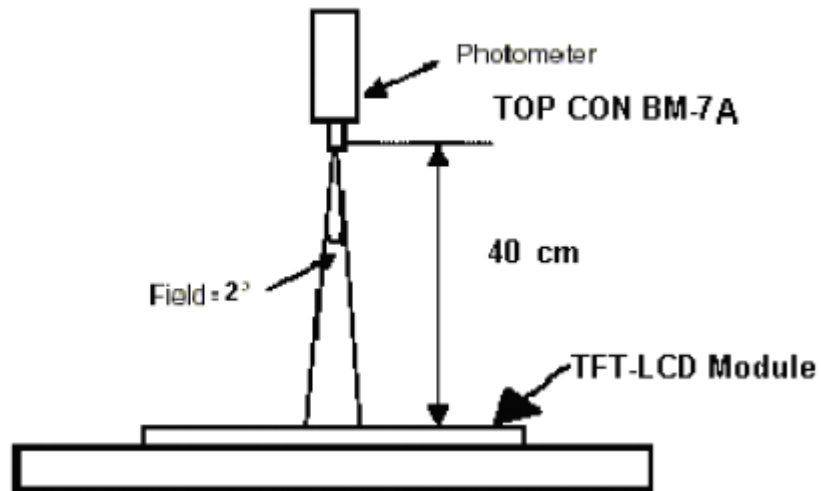
ITEM	CONTENT	UNIT
PIXEL'S NUMBER	800(RGB)*480	PIXEL
MODULE DIMENSION	165.0(w)*104.44(h)*11.26(t) Max	mm
VIEWING AREA(TP)	154.4(w)*93.4(h)	Mm
ACTIVE AREA	152.4(w)*91.44(h)	mm
PIXEL SIZE	0.1905(w)*0.1905(h)	mm

4. ELECTRO-OPTICAL CHARACTERISTICS

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit	Remarks	
Viewing Angle	Horizontal	θ_{x+}	Center CR≥10	65	70	--	deg	Note 1,4
		θ_{x-}		65	70	--		
	Vertical	θ_{y+}		55	60	--		
		θ_{y-}		55	60	--		
Contrast Ratio	CR	at optimized viewing angle	250	400	--		Note 1,3	
Response time	Rise	Tr	Center $\theta_x=\theta_y=0^\circ$	-	5	10	ms	Note 1,6
	Fall	Tf		-	11	16	ms	
Uniformity		B-uni	$\theta_x=\theta_y=0^\circ$	70	80	--	%	Note 1,5
Brightness		L	$\theta_x=\theta_y=0^\circ$	200	250	--	cd/•	Note 1,2
Chromaticity	x_w	Center $\theta_x=\theta_y=0^\circ$	0.26	0.31	0.36		Note 1,7	
	y_w		0.28	0.33	0.38			
	x_R		0.52	0.57	0.62			
	y_R		0.31	0.36	0.41			
	x_G		0.30	0.35	0.40			
	y_G		0.53	0.58	0.63			
	x_B		0.10	0.15	0.20			
	y_B		0.09	0.14	0.19			
Image sticking	tis	2 hours			2	Sec	Note 8	

The following optical specifications shall be measured in a darkroom or equivalent state (ambient luminance ≤ 1 lux, and at room temperature). The operation temperature is $25^\circ\text{C}\pm 2^\circ\text{C}$ and LED Backlight Current $I_L=160\text{mA}$. The measurement method is shown in Note1.

Note1: The method of optical measurement:

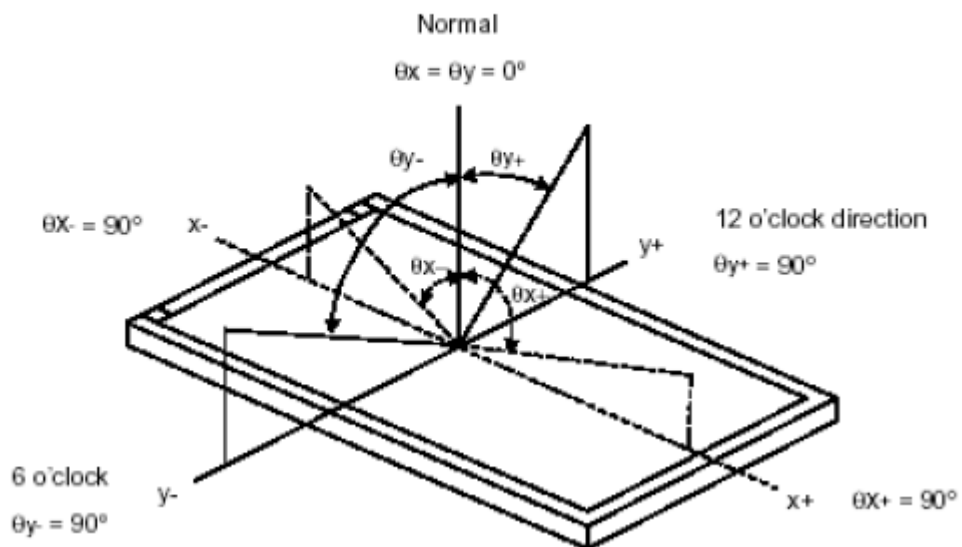


Note2: Measured at the center area of the panel and at the viewing angle of the $\theta_x = \theta_y = 0^\circ$

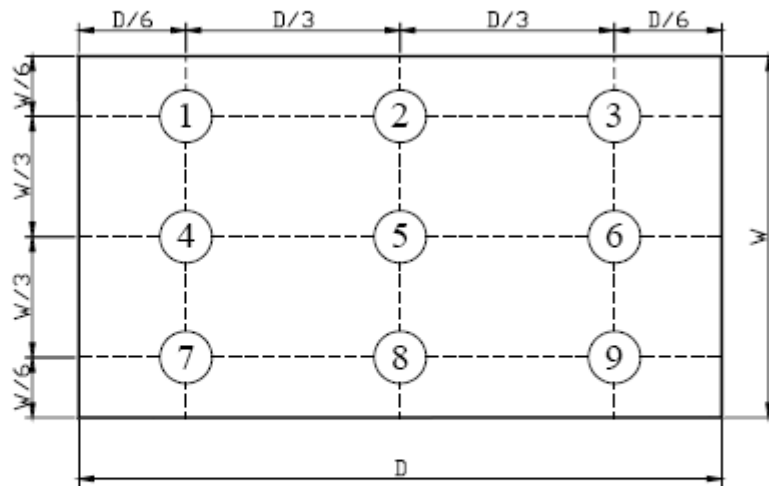
Note3: Definition of Contrast Ratio (CR):

$$CR = \frac{\text{Luminance with all pixels in white state}}{\text{Luminance with all pixels in Black state}}$$

Note4: Definition of Viewing Angle



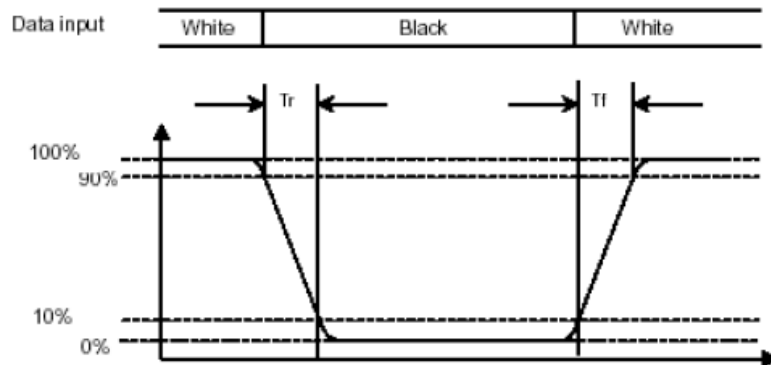
Note 5: Definition of Brightness Uniformity (B-uni):



$$B\text{-uni} = \frac{\text{Minimum luminance of 9 points}}{\text{Maximum luminance of 9 points}} \quad (\text{Note 5}).$$

Note6: Definition of Response Time:

The Response Time is set initially by defining the "Rising Time (T_r)" and the "Falling Time (T_f)" respectively. T_r and T_f are defined as following figure.



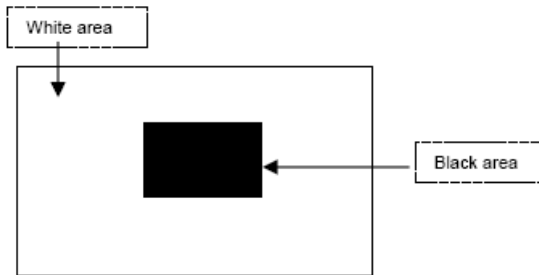
Note 7: Definition of Chromaticity:

The color coordinates (x_w, y_w) , (x_r, y_r) , (x_g, y_g) , and (x_b, y_b) are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

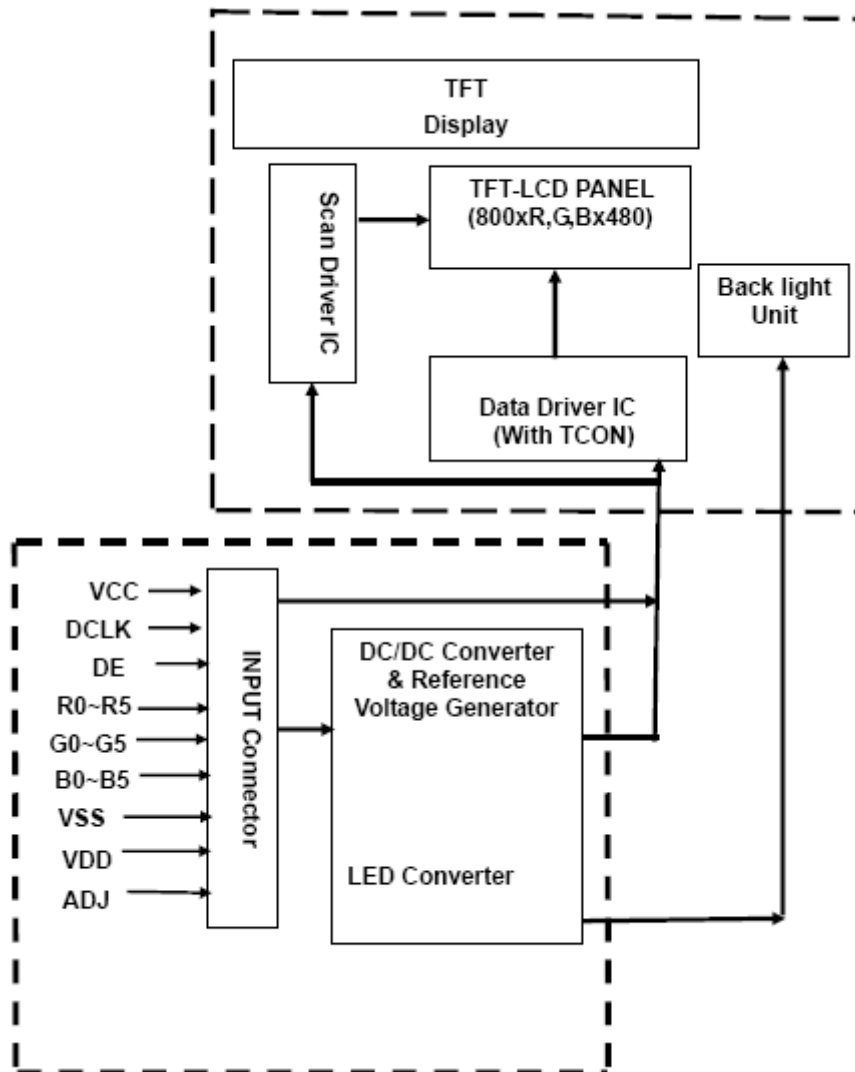
Note 8: Definition of Image sticking (tis):

Continuously display the test pattern shown in the figure below for 2 hours. Then display a completely white screen. The previous image shall not persist more than 2 sec at 25 °C

Image sticking pattern



5.BLOCK DIAGRAM



6. ELECTRONIC CHARACTERISTICS

6.1 MAXIMUM VALUES

ITEM	SYMBOL	STANDARD VALUE		UNIT
		MIN	MAX	
Power supply voltage	V _{CC} , V _{DD}	-0.3	+6.0	V
Logic input voltage	VI	-0.3	V _{CC} +0.3	V
Operating Temperature	Top	-10	+60	°C
Storage Temperature	Tst	-20	+70	°C

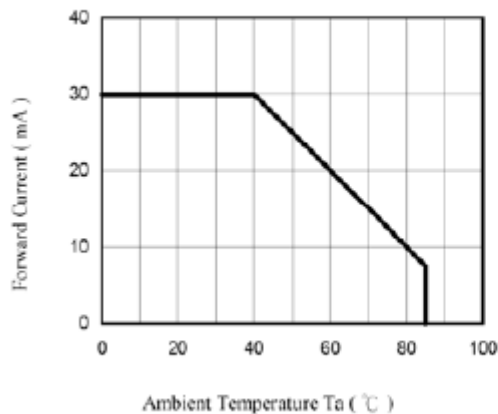
6.2. DC CHARACTERISTICS

f_H=30KHz, f_V=60Hz, f_{CLK}=33.26, MHz, Ta=25°C

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Remark
Power Supply voltage for LCD	V _{CC}	3.0	3.3	3.6	V	
Power Supply Current for LCD	I _{CC}	—	150	200	mA	V _{CC} =3.3V
Power Supply voltage for LED	V _{DD}	3.0	3.3	5.5	V	
Power Supply Current for LED	I _{DD}	-	650	850	mA	V _{DD} =3.3V
		-	400	550		V _{DD} =5.0V
"H" level logical input voltage	V _{IH}	0.7V _{CC}	--	V _{CC}	V	
"L" level logical input voltage	V _{IL}	0	--	0.3V _{CC}	V	
ADJ frequency		19K	20K	21K	Hz	
ADJ input voltage	V _{IH}	3.0	-	3.3	V	
	V _{IL}	0	-	0.3		
LED dice life time			20000		Hr	Note 1,2

Note 1: The "LED dice life time" is defined as the brightness decrease to 50% original brightness that the ambient temperature is 18• +28• and LED dice current=20mA.

Note2: The LED Dice's Ambient Temp. vs. Allowable Forward Current Curve.



6.3 .TIMING CHARACTERISTICS

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Data setup time	T_{dsu}	6	-	-	ns
Data hold time	T_{dhd}	6	-	-	ns
DE setup time	T_{esu}	6	-	-	ns

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
DCLK frequency	F_{CPH}	-	33.26	-	MHz
DCLK period	T_{CPH}	-	30.06	-	ns
DCLK 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	110	$T_{DEH}+T_{DEL}$
DE frame width	T_{DE}	-	480	-	$T_{DEH}+T_{DEL}$

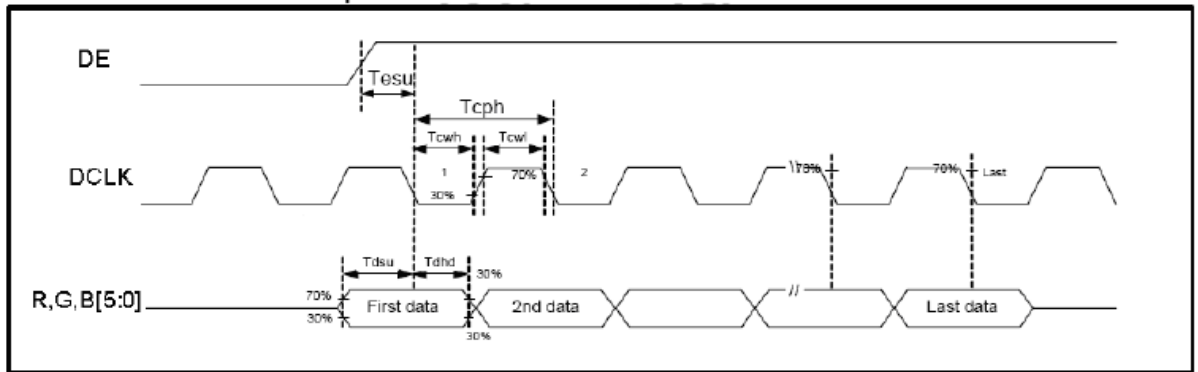
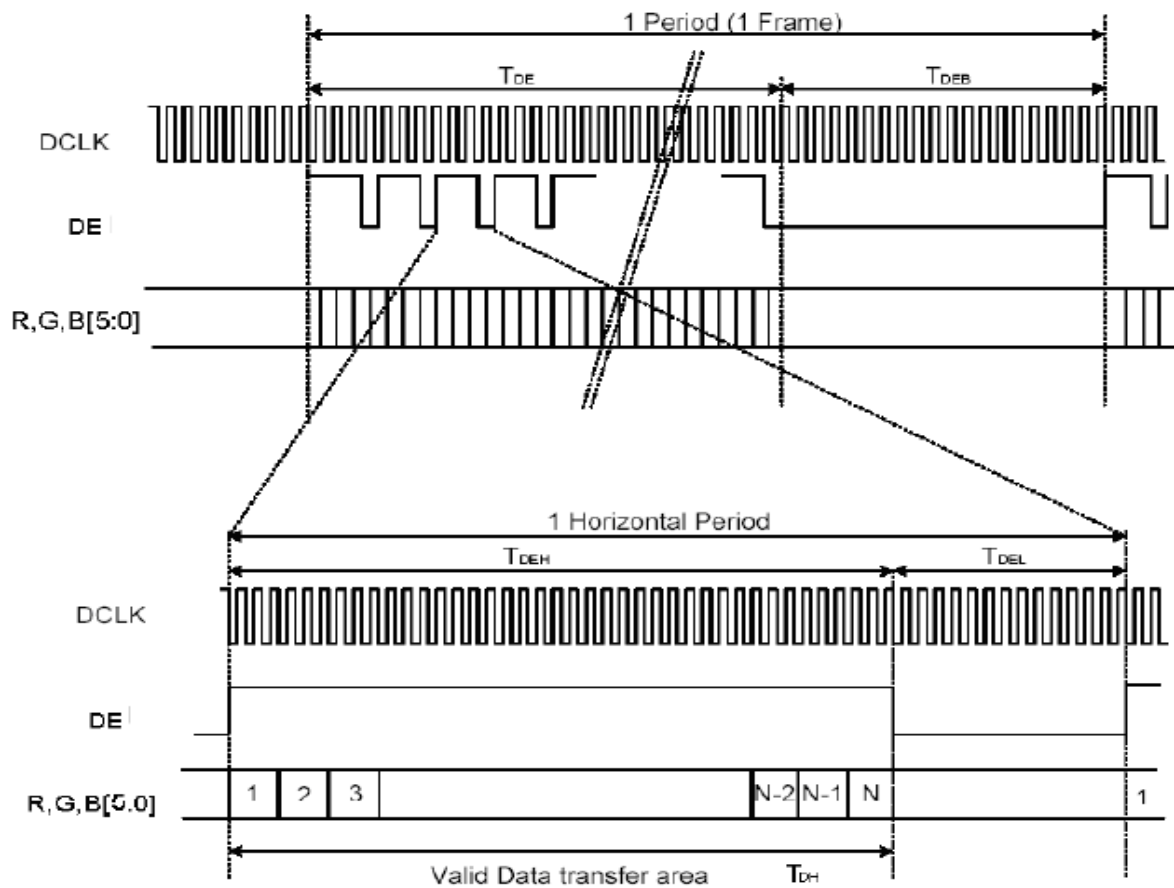


Figure 1 Clock and Data input waveforms.



7. PINS DESCRIPTION

Pin No.	Symbol	Description
1	VSS	Ground
2	VSS	Ground
3	ADJ	Brightness control for LED B/L
4	VDD	Brightness Supply for LED driver
5	VDD	Brightness Supply for LED driver
6	VDD	Brightness Supply for LED driver
7	VCC	Power supply for digital circuit
8	VCC	Power supply for digital circuit
9	DE	Data enable
10	VSS	Ground
11	VSS	Ground
12	VSS	Ground
13	B5	Blue data input (MSB)
14	B4	Blue data input
15	B3	Blue data input
16	VSS	Ground
17	B2	Blue data input
18	B1	Blue data input
19	B0	Blue data input (LSB)
20	VSS	Ground

Pin No.	Symbol	Description
21	G5	Green data input (MSB)
22	G4	Green data input
23	G3	Green data input
24	VSS	Ground
25	G2	Green data input
26	G1	Green data input
27	G0	Green data input (LSB)
28	VSS	Ground
29	R5	Red data input (MSB)
30	R4	Red data input
31	R3	Red data input
32	VSS	Ground
33	R2	Red data input
34	R1	Red data input
35	R0	Red data input (LSB)
36	VSS	Ground
37	VSS	Ground
38	DCLK	Clock Signals; Latch data at the falling edge
39	VSS	Ground
40	VSS	Ground

Touch panel Pin Assignment

Pin No.	Symbol
1	TOP
2	RIGHT
3	BOTTOM
4	LEFT

8. INSTRUCTION DESCRIPTION

NC

9. BACKLIGHT PARAMETERS

9.1 ABSOLUTE MAXIMUM RATINGS

Unless specified, The Ambient temperature Ta=25°C

Item	Symbol	Condition	Rating	Unit
Reverse Voltage	Vr			V
Absolute maximum forward current	Ifm			mA
Peak forward current	Ifp	1 msec plus 10% Duty cycle		mA
Power description	pd			mW
Operating temperature range	Topr		-10~+60	°C
Storage temperature range	Tst		-20~+70	°C

9.2 ELECTRICAL/OPTICAL CHARACTERISTICS

Ta=25°C, Unless specified, The Ambient temperature Ta=25°C

Item	Symbol	min	typ	max	Unit	Condition
Forward Voltage	Vf		9.3	9.9	V	If=160mA
Reverse Current	Ir				uA	Vr=5V
Luminance(LCM)	Lv	200	250		cd/m ²	If=160mA
Color chromaticity	X Y	X=0.26 Y=0.28		X=0.36 Y=0.38		If=160mA

10. Product Quality & Reliability

10.1 Test Condition

10.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : 25±5°C

Humidity : 65±5%

10.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

10.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

10.1.4 Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

10.1.5 Test Method

Reliability Test Item & Level		Test Level	Remark
No.	Test Item		
1	High Temperature Storage Test	T=+70• ;240hrs	IEC68-2-2
2	Low Temperature Storage Test	T=-20• ;240hrs	IEC68-2-1
3	High Temperature Operation Test	T=+60• ;240hrs	IEC68-2-2
4	Low Temperature Operation Test	T=-10• ;240hrs	IEC68-2-1
5	High Temperature and High Humidity (No operation)	T=40• ;90%RH,240hrs	IEC68-2-3
6	Thermal Cycling Test (No operation)	-20• → +25• → +70• ; 100 Cycles 30 min 5 min 30 min	IEC68-2-14
7	Vibration Test (No operation)	Frequency :10 ~ 55 Hz Amplitude :1.5 mm Sweep time : 11 mins Test Period: 6 Cycles for each direction of X, Y, Z	IEC68-2-6
8	ESD Test	Air discharge:±8KV Contact discharge:±8KV	IEC610004-2

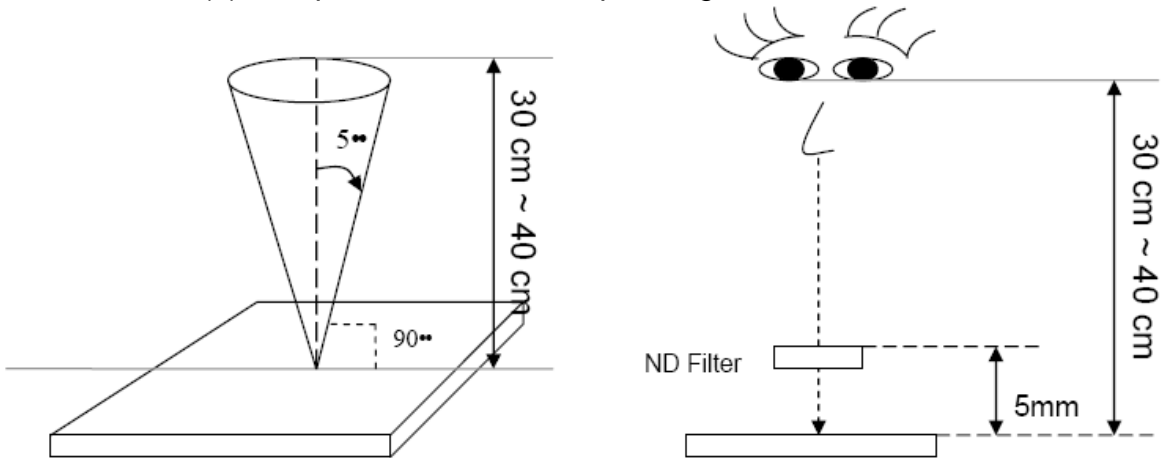
10.2 Inspection condition

10.2.1 Inspection conditions

10.2.1.1 Inspection distance: 35 ± 5 cm

10.2.1.2 View Angle:

- (1) Inspection under operating condition: $\pm 5^\circ$
- (2) Inspection under non-operating condition: $\pm 45^\circ$



10.2.2 Environment conditions:

Ambient Temperature :		25±5℃
Ambient Humidity :		65±5%
Ambient Illumination	Cosmetic Inspection	more than 600 lux
	Functional Inspection	300 ~ 800 lux

10.2.3 Definition of applicable Zones



10.2.4 Inspection Parameters

No.	Parameter	Criteria																		
1	Operating	Display function: No Display malfunction (Major)																		
		Contrast ratio (Black, White): Does not meet specified range in the spec. (Major) (Note:3)																		
		Line Defect: No obvious Vertical and Horizontal line defect in bright, dark and colored. (Major) (Note:1)																		
		Point Defect (Red, green, blue, dark): Active area ≤5dots (Minor)(Note:1)																		
		<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Item</th> <th>Acceptabl e number</th> <th>Total</th> <th>Class Of Defects</th> <th>AQL Level</th> </tr> </thead> <tbody> <tr> <td>Bright</td> <td>2</td> <td rowspan="2">5</td> <td rowspan="4">Minor</td> <td rowspan="4">1.5</td> </tr> <tr> <td>Dark</td> <td>3</td> </tr> <tr> <td>Adjacent Bright</td> <td>0</td> <td>0</td> </tr> <tr> <td>Adjacent Dark</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Item	Acceptabl e number	Total	Class Of Defects	AQL Level	Bright	2	5	Minor	1.5	Dark	3	Adjacent Bright	0	0	Adjacent Dark	1	1
		Item	Acceptabl e number	Total	Class Of Defects	AQL Level														
		Bright	2	5	Minor	1.5														
		Dark	3																	
		Adjacent Bright	0	0																
		Adjacent Dark	1	1																
Non-uniformity: Visible through 6%ND filter white, R, G, B and gray 50%pattern. (Minor)																				
Foreign material in Black or White spots shape (W>1/4L) (Note: 5)																				
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Dimension</th> <th>Acceptabl e number</th> <th>Class Of Defects</th> <th>AQL Level</th> </tr> </thead> <tbody> <tr> <td>D ≤ 0.3</td> <td>*</td> <td rowspan="3">Minor</td> <td rowspan="3">1.5</td> </tr> <tr> <td>0.3 < D ≤ 0.5</td> <td>4</td> </tr> <tr> <td>D > 0.5</td> <td>0</td> </tr> </tbody> </table>	Dimension	Acceptabl e number	Class Of Defects	AQL Level	D ≤ 0.3	*	Minor	1.5	0.3 < D ≤ 0.5	4	D > 0.5	0								
Dimension	Acceptabl e number	Class Of Defects	AQL Level																	
D ≤ 0.3	*	Minor	1.5																	
0.3 < D ≤ 0.5	4																			
D > 0.5	0																			
D = (Long + Short) / 2 * : Disregard																				
Foreign Material in Line or spiral shape (W≤1/4L) (Note: 4)																				
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Dimension</th> <th>Acceptabl e number</th> <th>Class Of Defects</th> <th>AQL Level</th> </tr> </thead> <tbody> <tr> <td>W>0.1mm,L>5mm</td> <td>0</td> <td rowspan="3">Minor</td> <td rowspan="3">1.5</td> </tr> <tr> <td>L• 5mm,0.05mm<W• 0.1mm</td> <td>4</td> </tr> <tr> <td>L• 5mm,W<0.05mm</td> <td>*</td> </tr> </tbody> </table>	Dimension	Acceptabl e number	Class Of Defects	AQL Level	W>0.1mm,L>5mm	0	Minor	1.5	L• 5mm,0.05mm<W• 0.1mm	4	L• 5mm,W<0.05mm	*								
Dimension	Acceptabl e number	Class Of Defects	AQL Level																	
W>0.1mm,L>5mm	0	Minor	1.5																	
L• 5mm,0.05mm<W• 0.1mm	4																			
L• 5mm,W<0.05mm	*																			

L : Length W : Width * : Disregard

2	External Inspection (non-operating)	Dimension: Outline (Major)		
		Bezel appearance: uneven (Minor)		
		Scratch on the polarizer: (Note:2)		
		Dimension	Acceptable number	Class Of Defects
W>0.1mm,L>5mm		0	Minor	1.5
L• 5mm,0.05mm<W• 0.1mm		4		
L• 5mm,W<0.05mm		*		
L : Length W : Width * : Disregard				

Dent and spots shape on the polarizer (Note:2): (Note: 5)			
Dimension	Acceptable number	Class Of Defects	AQL Level
D ≤ 0.3	*	Minor	1.5
0.3 < D ≤ 0.5	4		
D > 0.5	0		
D = (Long + Short) / 2 * : Disregard			

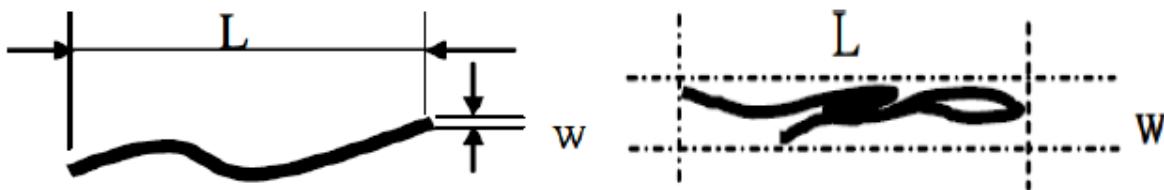
Class of defects	Major	AQL 0.65%	Definition
	Minor	AQL 1.5%	It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function.
			It is a defect that will not result in functioning problem with deviation classified.

- Note:1.(a)Bright point defect is defined as point defect of R,G,B with area >1/2 pixel respectively
 (b)Dark point defect is defined as visible in full white pattern.
 (c)The point defect must under 2% ND Filter visible .

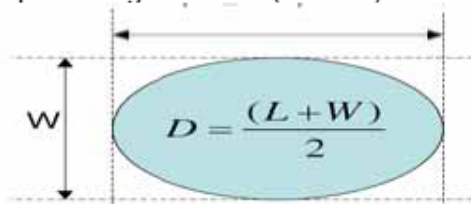
Note:2 The external inspection should be conducted at the distance 30± 5cm between the eyes of inspector and the panel .

Note:3 Luminance measurement for contrast ratio is at the distance 50± 5cm between the detective head and the panel with ambient illuminance less than 1 lux. Contrast ratio is obtained at optimum view angle.

Note:4 W-Width in mm , L-length of Max.(L1,L2) in mm.



Note:5 Spot Foreign Material (W• L/4)



10.3 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.

Lot size: Quantity of shipment lot per model.

Sampling type: normal inspection, single sampling

Sampling table: MIL-STD-105E

Inspection level: Level II

11.PRECAUTIONS IN USING

1. LIQUID CRYSTAL DISPLAY (LCD)

LCD is made up of glass, organic sealant, organic fluid, and polymer based polarizers. The following precautions should be taken when handing,

(1). Keep the temperature within range of use and storage.

Excessive temperature and humidity could cause polarization degradation, polarizer peel off or bubble.

(2). Do not contact the exposed polarizers with anything harder than an HB pencil lead. To clean dust off the display surface, wipe gently with cotton, chamois or other soft material soaked in petroleum benzin.

(3). Wipe off saliva or water drops immediately. Contact with water over a long period of time may cause polarizer deformation or color fading, while an active LCD with water condensation on its surface will cause corrosion of ITO electrodes.

(4). Glass can be easily chipped or cracked from rough handling, especially at corners and edges.

(5). Do not drive LCD with DC voltage.

2. Liquid Crystal Display Modules

2.1 Mechanical Considerations

LCM are assembled and adjusted with a high degree of precision. Avoid excessive shocks and do not make any alterations or modifications. The following should be noted.

- (1). Do not tamper in any way with the tabs on the metal frame.
- (2). Do not modify the PCB by drilling extra holes, changing its outline, moving its components or modifying its pattern.
- (3). Do not touch the elastomer connector, especially insert a backlight panel (for example, EL).
- (4). When mounting a LCM make sure that the PCB is not under any stress such as bending or twisting . Elastomer contacts are very delicate and missing pixels could result from slight dislocation of any of the elements.
- (5). Avoid pressing on the metal bezel, otherwise the elastomer connector could be deformed and lose contact, resulting in missing pixels.

2.2. Static Electricity

LCM contains CMOS LSI's and the same precaution for such devices should apply, namely

- (1). The operator should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads, the copper leads on the PCB and the interface terminals with any parts of the human body.
- (2). The modules should be kept in antistatic bags or other containers resistant to static for storage.
- (3). Only properly grounded soldering irons should be used.
- (4). If an electric screwdriver is used, it should be well grounded and shielded from commutator sparks.

(5) The normal static prevention measures should be observed for work clothes and working benches; for the latter conductive (rubber) mat is recommended.

(6). Since dry air is inductive to statics, a relative humidity of 50-60% is recommended.

2.3 Soldering

(1). Solder only to the I/O terminals.

(2). Use only soldering irons with proper grounding and no leakage.

(3). Soldering temperature : $280^{\circ}\text{C} \pm 10^{\circ}\text{C}$

(4). Soldering time: 3 to 4 sec.

(5). Use eutectic solder with resin flux fill.

(6). If flux is used, the LCD surface should be covered to avoid flux spatters. Flux residue should be removed after wards.

2.4 Operation

(1). The viewing angle can be adjusted by varying the LCD driving voltage V_0 .

(2). Driving voltage should be kept within specified range; excess voltage shortens display life.

(3). Response time increases with decrease in temperature.

(4). Display may turn black or dark blue at temperatures above its operational range; this is (however not pressing on the viewing area) may cause the segments to appear “fractured”.

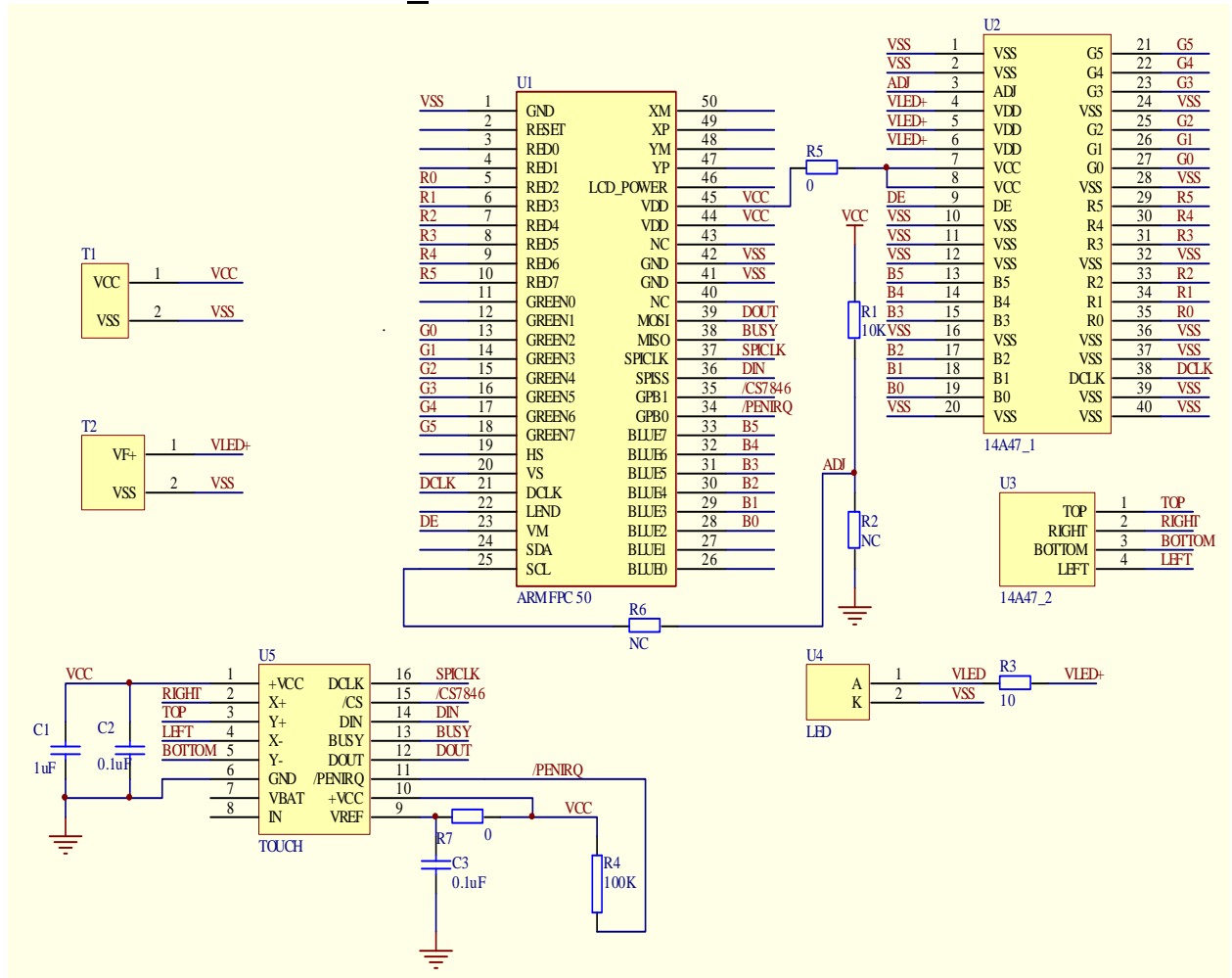
(5). Mechanical disturbance during operation (such as pressing on the viewing area) may cause the segments to appear “fractured”.

2.5 Storage

If any fluid leaks out of a damaged glass cell, wash off any human part that comes into contact with soap and water. Never swallow the fluid. The toxicity is extremely low but caution should be exercised at all the time.

12. APPLICATION

12.1 REFERENCE CIRCUIT



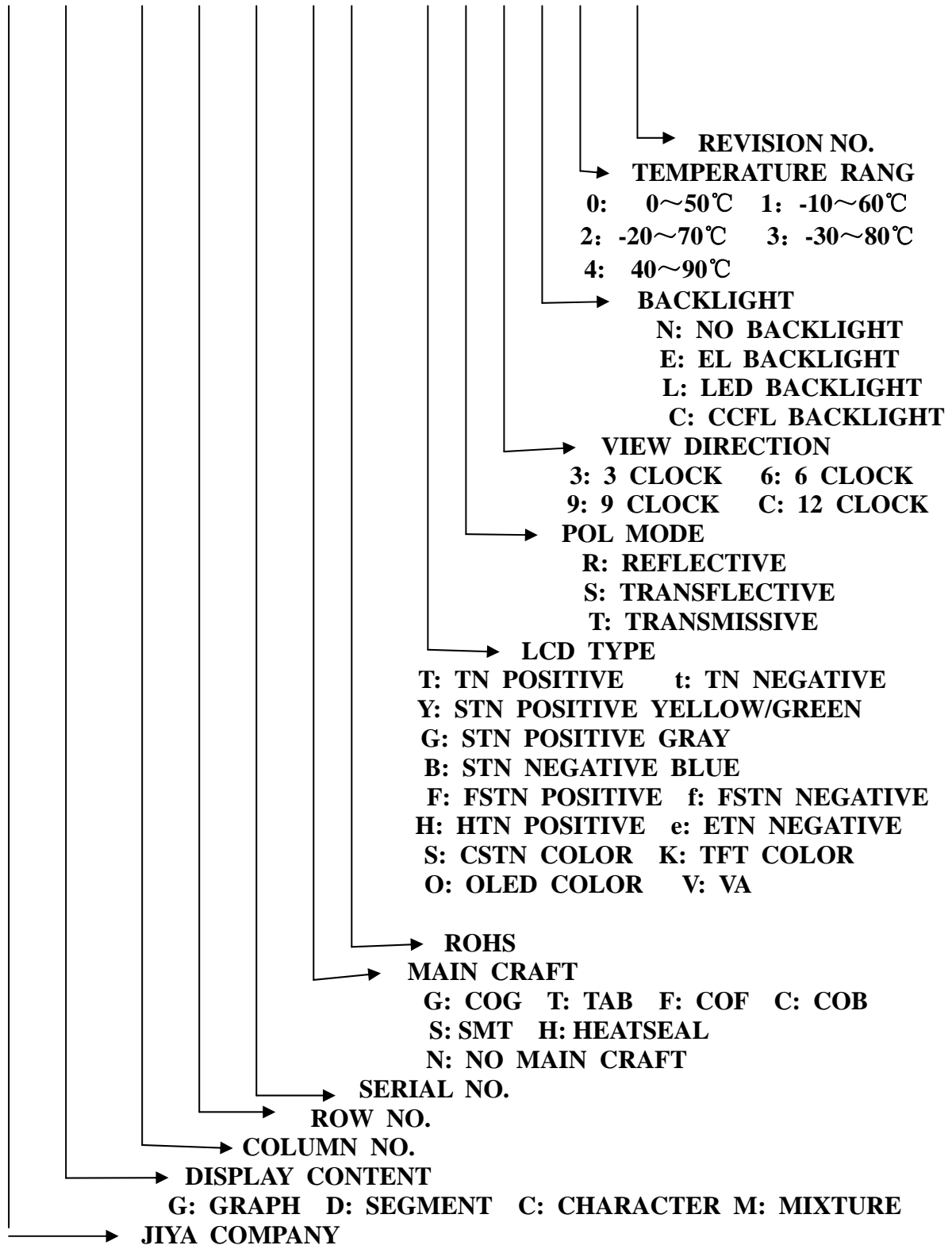
12.2 APPENDIX

INITIALIZATION FOR REFERENCE (MPU: AT89C52):

NC

13. CLASSIFICATION INFORMATION

JY G - 800 480 15 G (R) - K T 6 L 1 - VA



14. HISTORY OF VERSION

REVISIONS					
No.	DATE	DESCRIPTION	ORGANIZED BY	CHECKED BY	APPROVED BY
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					