



**2.4 inch TFT LCD  
with Touch Panel  
SPECIFICATION**

**MODEL NAME: LMCP2024BQN3- 4RA1**

**Date: 2013/ 03 / 21**

<b>Customer Signature</b>		
<b>Customer</b>		
<b>Approved Date</b>	<b>Approved By</b>	<b>Reviewed By</b>

### Revision History

Revision	Date	Originator	Detail	Remarks
1	2013-03-21		First Release	



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## 1. General Description

This display module is a transmissive type color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This module is composed of a TFT LCD module, a driver circuit, and a back-light unit.

The resolution of a 2.4" contains 240 (RGB)X320 dots and can display up to 262k colors.

## 2. Module Parameter

Features	Details	Unit
Display Size(Diagonal)	2.4"	-
LCD type	$\alpha$ -Si TFT	-
Support interface mode	MCU SPI RGB	-
Display Mode	TN/ Normally white	-
Resolution	240 RGB x 320	-
View Direction	12 O'clock	Best image
Grayscale Inversion Direction	6 O'clock	-
Module Outline	42.72(H) x 60.26(V) x 2.2 (T)	mm
TP Outline	42.32(H) x 59.26(V) x 1.0(T)	mm
TP Viewing Area	38.72 (H) x 57.92 (V)	mm
TP Active Area	37.72 (H) x 53.16 (V)	mm
Active Area	36.72 (H) x 48.96(V)	mm
Viewing Area	N/A	mm
Pixel Size	0.153(H) x 0.153 (V)	mm
Pixel Arrangement	Stripe	-
Display Colors	262K	-
Interface	System parallel interface	-
Driver IC	ILI9341	-
Operating Temperature	-20~70	°C
Storage Temperature	-30~80	°C
LCM brightness	210	cd / m <sup>2</sup>
Weight	TBD	g

## 3. Absolute Maximum Ratings

V<sub>SS</sub>=0V, Ta=25°C

Item	Symbol	Min.	Max.	Unit	
Supply Voltage	Power supply	VCC	-0.3	+4.6	V
	Analog	VCI	-	-	V
	IO	IOVCC	-	-	V
Input Voltage	V <sub>i</sub>	-0.3	IOVCC+0.3	V	
Storage temperature	T <sub>stg</sub>	-30	+80	°C	
Operating temperature	T <sub>op</sub>	-20	+70	°C	
Storage humidity	H <sub>stg</sub>	10	Note 1	%RH	
Operating humidity	H <sub>op</sub>	10	Note 1	%RH	

Note 1: 90%RH max, If Ta is below 50°C; 60%RH max, If Ta is over 60°C.



#### 4. DC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	
Supply Voltage	Power supply	VCC	2.5	2.8	3.3	V
	Analog	VCI	2.5	2.8	3.3	V
	IO	IOVCC	1.65	2.8	3.3	V
Logic Low input voltage	$V_{IL}$	0.0	-	0.2*IOVCC	V	
Logic High input voltage	$V_{IH}$	0.7*IOVCC	-	IOVCC	V	
Logic Low output voltage	$V_{OL}$	-	-	0.2*IOVCC	V	
Logic High output voltage	$V_{OH}$	0.8*IOVCC	-	IOVCC	V	
Current Consumption	Normal display	Ivdd	-	-	-	mA
	Standby mode	Ivdd-	-	-	-	uA
Frame Frequency	$f_{FR}$	-	TBD	-	Hz	

#### 5. Backlight Characteristics

##### 5.1. Backlight Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	$V_f$	Ta=25 °C, I <sub>F</sub> =(15*4)mA	3.1	3.2	3.3	V/LED
Forward Current	$I_f$	Ta=25 °C, V <sub>F</sub> =3.2V	-	60	-	mA
Luminance	$L_v$	-	-	3500	-	cd / m <sup>2</sup>
Uniformity	Avg	-	-	-	-	%
CIE	X	-	-	-	-	-
	Y	-	-	-	-	-
Power dissipation	$P_d$	-	-	-	-	mW
Backlight Driving Voltage	V <sub>AK</sub>	-	-	-	-	V
Drive method	Constant current					
LED Configuration	4 White LEDs in Parallel					

**Note:** Test condition  $I_f$  =60mA, Ta=25°C.



## 6. Optical Characteristics

### 6.1. Optical Characteristics

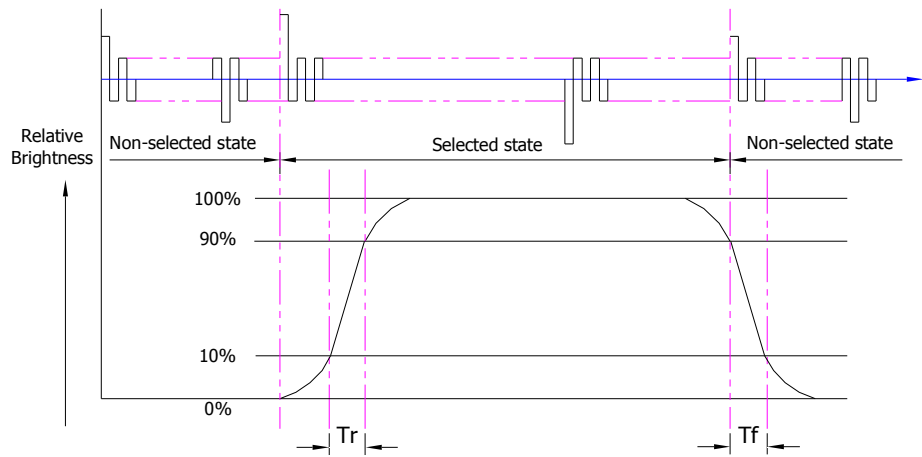
Ta=25°C, VDD=2.8V, TN LC+ Polarizer

	Item		Symbol	Condition	Specification			Unit	
					Min.	Typ.	Max.		
Backlight On (Transmissive Mode)	Luminance on TP surface( $I_f=60\text{mA}$ )		$L_V$	Normally viewing angle	-	-TBD	-	cd/m <sup>2</sup>	
	Contrast ratio(See 6.3)		$CR$	$\theta_x = \theta_y = 0^\circ$	400	500	-	-	
	Response time (See 6.2)		$T_{R+TF}$		-	16	32	ms	
	Chromaticity Transmissive (See 6.5)	Red	$X_R$	-	0.606	0.626	0.646	-	
			$Y_R$		0.314	0.334	0.354	-	
		Green	$X_G$		0.299	0.319	0.339	-	
			$Y_G$		0.537	0.557	0.577	-	
		Blue	$X_B$		0.122	0.142	0.162	-	
			$Y_B$		0.102	0.122	0.142	-	
	White	$X_W$	0.298		0.318	0.338	-		
		$Y_W$	0.317		0.337	0.357	-		
	Viewing Angle (See 6.4)	Horizontal	$\theta_{x+}$		Center CR≥10	-	45	-	Deg.
			$\theta_{x-}$			-	45	-	
		Vertical	$\theta_{y+}$			-	45	-	
$\theta_{y-}$			-			20	-		
NTSC Ratio(Gamut)		-	-	-	TBD	-	%		



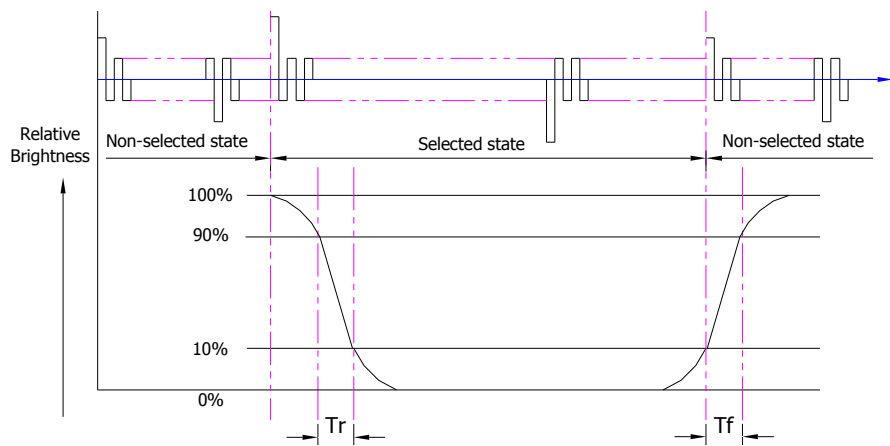
6.2. Definition of Response Time

6.2.1. Normally Black Type (Negative)



$T_r$  is the time it takes to change from non-selected state with relative luminance 10% to selected state with relative luminance 90%;  
 $T_f$  is the time it takes to change from selected state with relative luminance 90% to non-selected state with relative luminance 10%.

6.2.2. Normally White Type (Positive)



$T_r$  is the time it takes to change from non-selected state with relative luminance 90% to selected state with relative luminance 10%;  
 $T_f$  is the time it takes to change from selected state with relative luminance 10% to non-selected state with relative luminance 90%;



**6.3. Definition of Contrast Ratio**

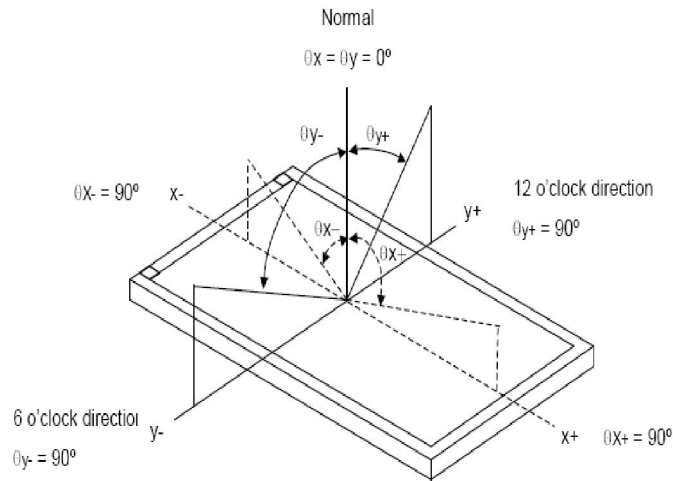
Contrast is measured perpendicular to display surface in reflective and transmissive mode.

The measurement condition is:

Measuring Equipment	BM-7 or EQUI
Measuring Point Diameter	3mm//1mm
Measuring Point Location	Active Area centre point
Test pattern	A: All Pixels white
	B: All Pixel black
Contrast setting	Maximum

Definitions: CR (Contrast) = Luminance of White Pixel / Luminance of Black Pixel

**6.4. Definition of Viewing Angles**



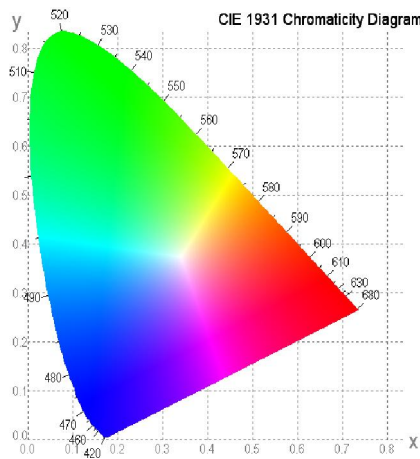
Measuring machine: LCD-5100 or EQUI

**6.5. Definition of Color Appearance**

R,G,B and W are defined by (x, y) on the IE chromaticity diagram

NTSC=area of RGB triangle/area of NTSC triangleX100%

Measuring picture: Red, Green, Blue and White (Measuring machine: BM-7)



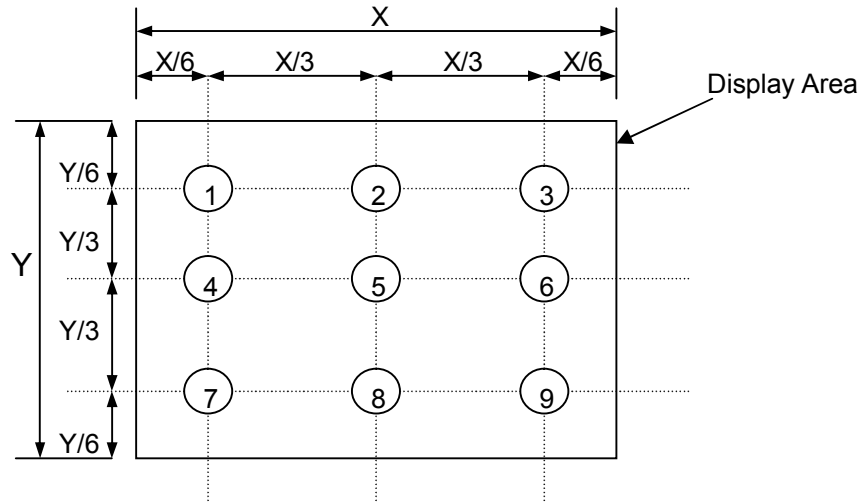


**6.6. Definition of Surface Luminance, Uniformity and Transmittance**

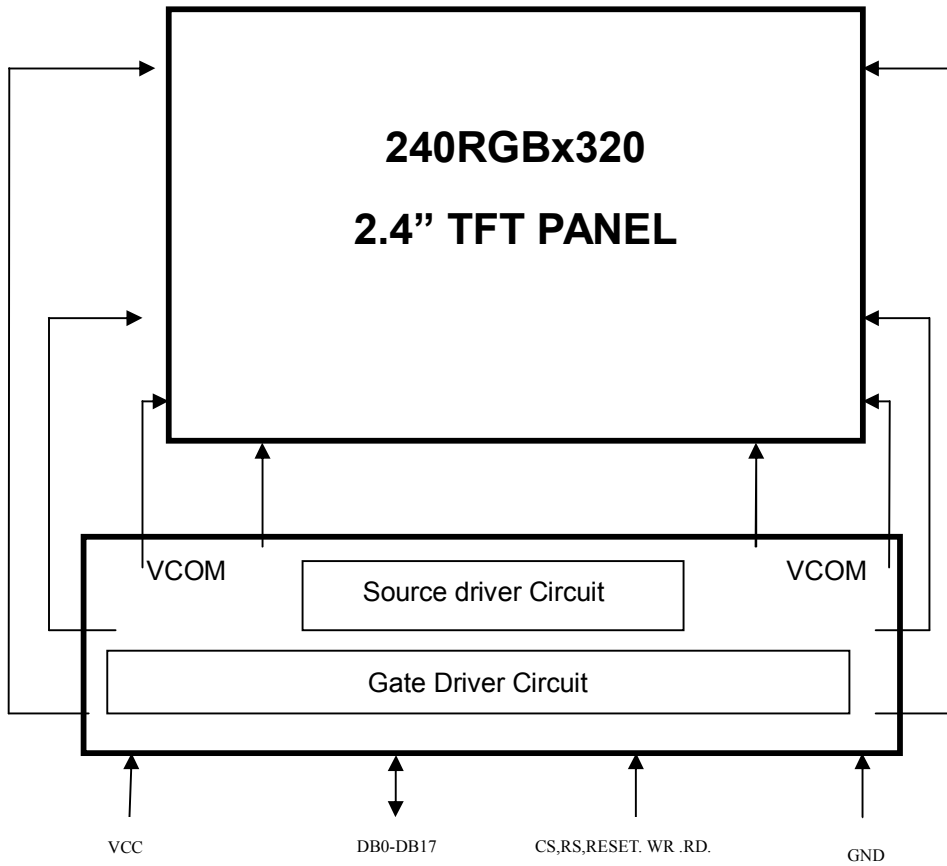
Using the transmissive mode measurement approach, measure the white screen luminance of the display panel and backlight.

- 6.6.1. Surface Luminance:  $L_V = \text{average } (L_{P1}:L_{P9})$
- 6.6.2. Uniformity =  $\text{Minimal } (L_{P1}:L_{P9}) / \text{Maximal } (L_{P1}:L_{P9}) * 100\%$
- 6.6.3. Transmittance =  $L_V \text{ on LCD} / L_V \text{ on Backlight} * 100\%$

Note : Measuring machine: BM-7

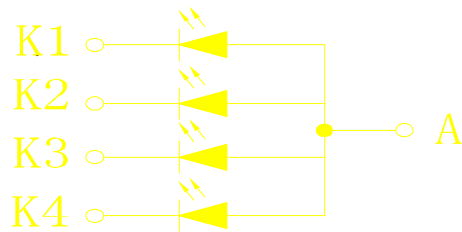


7. Block Diagram and Power Supply



NOTES:

1. LED CIRCUIT DIAGRAM:



## 8. Interface Pins Definition

### 8.1. Module interface

No.	Symbol	I/O	DESCRIPTION
1	VCI	P	Power Supply
2	IOVCC	P	Power supply for IO port
3	IM0	I	Select the MCU interface mode MPU Parallel interface bus and serial interface select If use RGB Interface must select serial interface. (Note1).
4	IM1		
5	IM2		
6	IM3		
7	RESET	I	LCM reset signal
8	VSYNC	I	Frame synchronizing signal for RGB interface operation.
9	HSYNV	I	Line synchronizing signal for RGB interface operation.
10	DOTCLK	I	Dot clock signal for RGB interface operation.
11	ENABLE	I	Data enable signal for RGB interface operation.
12^29	DB17^DB0	I/P	Data bus
30	SDO	I/P	LCD Read for the MPU interface
31	SDI	I	Write control pin for the MPU interface
32	RD	I	LCD Read for the MPU interface
33	WR	I	Write control pin for the MPU interface
34	RS/SCL	I	( Please according to, the IC specification choice model).
35	CS	I	The data is applied on the rising edge of the SCL signal.If not used, fix this pin at VDDI or VSS.
36	GND	P	Ground
37	LEDA	I	LED Anode
38	LEDK1	I	LED Cathode
39	LEDK2		
40	LEDK3		
41	LEDK4		
42	XR	I	TOUCH P ANLE PIN
43	YD		
44	XL		
45	YU		



Note1:

IM3	IM2	IM1	IM0	MCU-Interface Mode	Pins in use	
					Register/Content	GRAM
0	0	0	0	8080 MCU 8-bit bus interface I	D[7:0]	D[7:0],WRX,RDX,CSX,D/CX
0	0	0	1	8080 MCU 16-bit bus interface I	D[7:0]	D[15:0],WRX,RDX,CSX,D/CX
0	0	1	0	8080 MCU 9-bit bus interface I	D[7:0]	D[8:0],WRX,RDX,CSX,D/CX
0	0	1	1	8080 MCU 18-bit bus interface I	D[7:0]	D[17:0],WRX,RDX,CSX,D/CX
0	1	0	1	3-wire 9-bit data serial interface I	SCL,SDA,CSX	
0	1	1	0	4-wire 8-bit data serial interface I	SCL,SDA,D/CX,CSX	
1	0	0	0	8080 MCU 16-bit bus interface II	D[8:1]	D[17:10],D[8:1],WRX,RDX,CSX,D/CX
1	0	0	1	8080 MCU 8-bit bus interface II	D[17:10]	D[17:10],WRX,RDX,CSX,D/CX
1	0	1	0	8080 MCU 18-bit bus interface II	D[8:1]	D[17:0],WRX,RDX,CSX,D/CX
1	0	1	1	8080 MCU 9-bit bus interface II	D[17:10]	D[17:9],WRX,RDX,CSX,D/CX
1	1	0	1	3-wire 9-bit data serial interface II	SCL,SDI,SDO,CSX	
1	1	1	0	4-wire 8-bit data serial interface II	SCL,SDI,D/CX,SDO,CSX	

## 9. AC Characteristics

### 9.1. Reset timing

Please refer to IC datasheet.

### 9.2. interface timing

#### 9.2.1. interface timing requirement 1

Please refer to IC datasheet

## 10. Command Table

Please refer to IC datasheet.



**11. Recommended Setting and Initialization Flow for Reference.**

TBD.

**12. Quality Assurance**

**12.1. Purpose**

This standard for Quality Assurance assures the quality of LCD module products supplied to customer by Inteltronic display.

**12.2. Agreement Items**

Inteltronic and customer shall negotiate if the following situation occurs:

12.4.1 Discrepancies between Inteltronic’s QA standards and customer’s QA standards.

12.4.2 Additional requirement to be added in product specification.

12.4.3 Any other special problem.

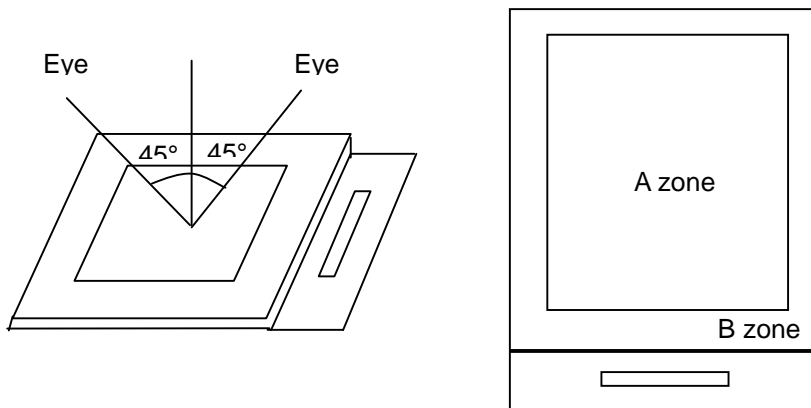
**12.3. Standard of the Product Visual Inspection**

12.3.1 Appearance inspection:

12.3.1.1 The inspection must be under illumination about 1000 – 1500 lx, and the distance of view must be at 30cm ± 2cm.

12.3.1.2 The viewing angle should be 45° from the vertical line without reflection light or follows customer's viewing angle specifications.

12.3.1.3 Definition of area: A Zone: Active Area, B Zone: Viewing Area,

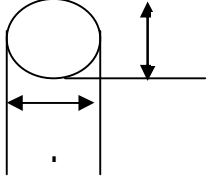
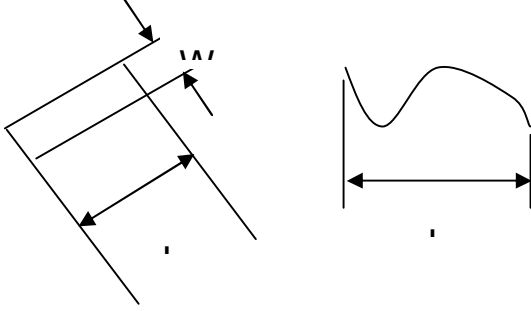


12.3.2 Basic principle:

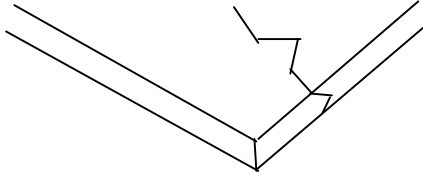
12.3.2.1 A set of sample to indicate the limit of acceptable quality level must be discussed by both Inteltronic and customer when there is any dispute happened.

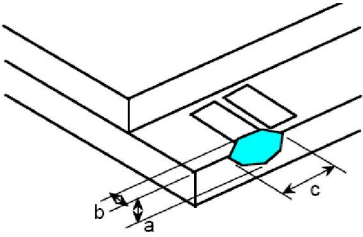
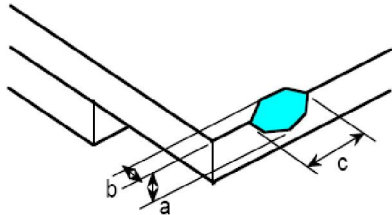
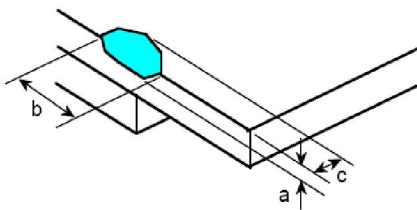


12.4. Inspection Specification

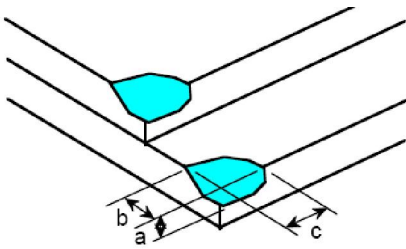
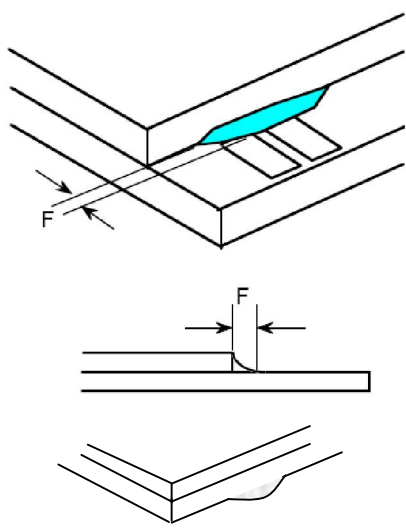
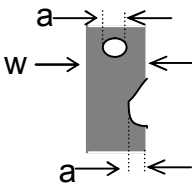
No.	Item	Criteria (Unit: mm)																		
01	Black / White spot Foreign material (Round type) Pinholes Stain Particles inside cell. (Minor defect)	 <table border="1" data-bbox="852 421 1353 757"> <thead> <tr> <th>Size</th> <th>Area</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td><math>\phi \leq 0.10</math></td> <td></td> <td>Ignore</td> </tr> <tr> <td><math>0.10 &lt; \phi \leq 0.20</math></td> <td></td> <td>2</td> </tr> <tr> <td><math>0.20 &lt; \phi \leq 0.25</math></td> <td></td> <td>1</td> </tr> <tr> <td><math>0.25 &lt; \phi</math></td> <td></td> <td>0</td> </tr> <tr> <td>Total</td> <td></td> <td>2 no include <math>\phi \leq 0.10</math></td> </tr> </tbody> </table> <p><math>\phi = (a + b) / 2</math></p> <p>Distance between 2 defects should more than 3mm apart.</p>	Size	Area	Acc. Qty	$\phi \leq 0.10$		Ignore	$0.10 < \phi \leq 0.20$		2	$0.20 < \phi \leq 0.25$		1	$0.25 < \phi$		0	Total		2 no include $\phi \leq 0.10$
Size	Area	Acc. Qty																		
$\phi \leq 0.10$		Ignore																		
$0.10 < \phi \leq 0.20$		2																		
$0.20 < \phi \leq 0.25$		1																		
$0.25 < \phi$		0																		
Total		2 no include $\phi \leq 0.10$																		
02	Black and White line Scratch Foreign material (Line type) (Minor defect)	 <table border="1" data-bbox="673 1330 1295 1594"> <thead> <tr> <th>Length</th> <th>Width</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td>/</td> <td><math>W \leq 0.03</math></td> <td>Ignore</td> </tr> <tr> <td><math>L \leq 2</math></td> <td><math>0.03 &lt; W \leq 0.05</math></td> <td>1</td> </tr> <tr> <td>/</td> <td><math>0.05 &lt; W</math></td> <td>0</td> </tr> <tr> <td colspan="2">Total</td> <td>1</td> </tr> </tbody> </table> <p>Distance between 2 defects should more than 3mm apart.                      Scratches not viewable through the back of the display are acceptable.</p>	Length	Width	Acc. Qty	/	$W \leq 0.03$	Ignore	$L \leq 2$	$0.03 < W \leq 0.05$	1	/	$0.05 < W$	0	Total		1			
Length	Width	Acc. Qty																		
/	$W \leq 0.03$	Ignore																		
$L \leq 2$	$0.03 < W \leq 0.05$	1																		
/	$0.05 < W$	0																		
Total		1																		



03	Glass Crack (Minor defect)	 <p>LCD with extensible crack line is unacceptable(When press the cracked LCD area, the line will expand, we define it is extensible crack line)</p>
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04	Glass Chipping Pad Area: (Minor defect)	 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Length and Width</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td><math>c &lt; 5.0, b &lt; 0.4</math></td> <td>Ignore</td> </tr> <tr> <td colspan="2" style="text-align: center;"><math>a &lt; \text{Glass Thickness}</math></td> </tr> </tbody> </table>	Length and Width	Acc. Qty	$c < 5.0, b < 0.4$	Ignore	$a < \text{Glass Thickness}$					
Length and Width	Acc. Qty											
$c < 5.0, b < 0.4$	Ignore											
$a < \text{Glass Thickness}$												
05	Glass Chipping Rear of Pad Area: (Minor defect)	 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Length and Width</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td><math>c &gt; 3.0, b &lt; 1.0</math></td> <td>1</td> </tr> <tr> <td><math>c &lt; 3.0, b &lt; 1.0</math></td> <td>2</td> </tr> <tr> <td><math>c &lt; 3.0, b &lt; 0.5</math></td> <td>4</td> </tr> <tr> <td colspan="2" style="text-align: center;"><math>a &lt; \text{Glass Thickness}</math></td> </tr> </tbody> </table>	Length and Width	Acc. Qty	$c > 3.0, b < 1.0$	1	$c < 3.0, b < 1.0$	2	$c < 3.0, b < 0.5$	4	$a < \text{Glass Thickness}$	
Length and Width	Acc. Qty											
$c > 3.0, b < 1.0$	1											
$c < 3.0, b < 1.0$	2											
$c < 3.0, b < 0.5$	4											
$a < \text{Glass Thickness}$												
06	Glass Chipping Except Pad Area: (Minor defect)	 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Length and Width</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td><math>c \leq 0.6, b &lt; 5.0</math></td> <td>Ignore</td> </tr> <tr> <td colspan="2" style="text-align: center;"><math>a &lt; \text{Glass Thickness}</math></td> </tr> </tbody> </table>	Length and Width	Acc. Qty	$c \leq 0.6, b < 5.0$	Ignore	$a < \text{Glass Thickness}$					
Length and Width	Acc. Qty											
$c \leq 0.6, b < 5.0$	Ignore											
$a < \text{Glass Thickness}$												



<p>07</p>	<p>Glass Corner Chipping: (Minor defect)</p> 	<table border="1"> <thead> <tr> <th>Length and Width</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td><math>c &lt; 2.0, b &lt; 1.5</math></td> <td>Ignore</td> </tr> <tr> <td><math>c &lt; 1.5, b &lt; 2</math></td> <td>Ignore</td> </tr> <tr> <td colspan="2"><math>a &lt; \text{Glass Thickness}</math></td> </tr> </tbody> </table>	Length and Width	Acc. Qty	$c < 2.0, b < 1.5$	Ignore	$c < 1.5, b < 2$	Ignore	$a < \text{Glass Thickness}$	
Length and Width	Acc. Qty									
$c < 2.0, b < 1.5$	Ignore									
$c < 1.5, b < 2$	Ignore									
$a < \text{Glass Thickness}$										
<p>08</p>	<p>Glass Burr: (Minor defect)</p> 	<table border="1"> <thead> <tr> <th>Length</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td><math>F &lt; 0.5</math></td> <td>Ignore</td> </tr> </tbody> </table> <p>Glass burr don't affect assemble and module dimension.</p>	Length	Acc. Qty	$F < 0.5$	Ignore				
Length	Acc. Qty									
$F < 0.5$	Ignore									
<p>09</p>	<p>FPC Defect: (Minor defect)</p> 	<p>9.1 Dent, pinhole width <math>a &lt; w/3</math>. (w: circuitry width.)</p> <p>9.2 Open circuit is unacceptable.</p> <p>9.3 No oxidation, contamination and distortion.</p>								





10	Bubble on Polarizer (Minor defect)	<table border="1" data-bbox="743 244 1214 416"> <thead> <tr> <th>Diameter</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td><math>\varphi \leq 0.20</math></td> <td>Ignore</td> </tr> <tr> <td><math>0.20 &lt; \varphi \leq 0.30</math></td> <td>2</td> </tr> <tr> <td><math>0.30 &lt; \varphi</math></td> <td>None</td> </tr> </tbody> </table>	Diameter	Acc. Qty	$\varphi \leq 0.20$	Ignore	$0.20 < \varphi \leq 0.30$	2	$0.30 < \varphi$	None
Diameter	Acc. Qty									
$\varphi \leq 0.20$	Ignore									
$0.20 < \varphi \leq 0.30$	2									
$0.30 < \varphi$	None									
11	Dent on Polarizer (Minor defect)	<table border="1" data-bbox="743 483 1214 656"> <thead> <tr> <th>Diameter</th> <th>Acc. Qty</th> </tr> </thead> <tbody> <tr> <td><math>\varphi \leq 0.20</math></td> <td>Ignore</td> </tr> <tr> <td><math>0.20 &lt; \varphi \leq 0.30</math></td> <td>2</td> </tr> <tr> <td><math>0.30 &lt; \varphi</math></td> <td>None</td> </tr> </tbody> </table>	Diameter	Acc. Qty	$\varphi \leq 0.20$	Ignore	$0.20 < \varphi \leq 0.30$	2	$0.30 < \varphi$	None
Diameter	Acc. Qty									
$\varphi \leq 0.20$	Ignore									
$0.20 < \varphi \leq 0.30$	2									
$0.30 < \varphi$	None									
12	Bezel	12.1 No rust, distortion on the Bezel. 12.2 No visible fingerprints, stains or other contamination.								
13	Touch Panel	D: Diameter W: width L: length 13.1 Spot: $D \leq 0.20$ is acceptable $0.20 < D \leq 0.3$ , acceptable QTY, 3 2dots are acceptable and the distance between defects should more than 10 mm. $D > 0.3$ is unacceptable 13.2 Dent: $D > 0.30$ is unacceptable 13.3 Scratch: $W \leq 0.03$ , $L \leq 10$ is acceptable, $0.03 < W \leq 0.10$ , $L \leq 10$ , acceptable QTY, 3 Distance between 2 defects should more than 10 mm. $W > 0.10$ is unacceptable.								
14	PCB	14.1 No distortion or contamination on PCB terminals. 14.2 All components on PCB must same as documented on the BOM/component layout. 14.3 Follow IPC-A-600F.								
15	Soldering	Follow IPC-A-610C standard								
16	Electrical Defect (Major defect)	The below defects must be rejected. 16.1 Missing vertical / horizontal segment, 16.2 Abnormal Display. 16.3 No function or no display. 16.4 Current exceeds product specifications. 16.5 LCD viewing angle defect. 16.6 No Backlight.								



		<p>16.7 Dark Backlight.          16.8 Touch Panel no function.          16.9 Dark Dot –one Allowed.          16.10 Bright Dot – one Allowed.          Remark:          1. A pixel defect is acceptable if one color is none functional and causes a bright dot. The display may have one case where one color is out and cause a dark dot.          2. Bright dot caused by scratch and foreign object accords to item 1.</p>
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Remark: Visual and cosmetic defects are rejectable only if these fall within the LCD viewing area.

**12.5. Classification of Defects**

12.5.1 Visual defects (Except no / wrong label) are treated as minor defect and electrical defect is major.

12.5.2 Two minor defects are equal to one major in lot sampling inspection.

**12.6. Identification/marketing criteria**

Any unit with illegible / wrong /double or no marking/ label shall be rejected.

**12.7. Packing**

12.7.1 There should be no damage of the outside carton box, each packaging box should has label in the correct location per packing drawing requirement.

12.7.2 All direct package materials shall offer ESD protection.



### 13. Reliability Specification

Item	Condition	Cycle Time	Quantity	Remark
Constant Temp. and Constant Humidity Operation Test	+40 ± 3°C, 90 ± 3%RH	120hrs	--	*1
High Temp. Operation Test	+70 ± 3°C	120hrs	--	
Low Temp. Operation Test	-20 ± 3°C	120hrs	--	
Thermal Shock Test	-20 ± 3°C (30min) +70 ± 3°C (30min)	10cycles	--	
ESD Test(end product)	150pF, 330Ω, ±2KV, Contact	10times	--	*2, *3
	150pF, 330Ω, ±6KV, Air			
Vibration Test (for packaging)	Frequency: 10Hz to 55Hz to 10Hz, Swing:1.5mm,time: X,Y,Z each 2H.	6hrs	One inner carton	*4

Note 1. For humidity test, DI water should be used.

Inspection Standard: Inspect after 1-2hrs storage at room temperature, the sample shall be free from the following defects:

- Air bubble in the LCD
- Seal Leakage
- Non-display
- Missing Segment
- Glass Crack
- IDD is greater than twice initial value.
- Others as per QA Inspection Criteria

Note 2. No defect is allowed after testing

The End Product ESD value is only indicative and depends on customer ESD protection design for the whole system

Note 3. ESD should be applied to LCD glass panel, not other areas (such as on IC and so on) IDD should be within twice initial value.

In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

Note 4. Only upon request.



## 14. Precautions and Warranty

### 14.1. Safety

14.1.1 The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

14.1.2 Since the liquid crystal cells are made of glass, do not apply strong impact on them. Handle with care.

### 14.2. Handling

14.2.1 Reverse and use within ratings in order to keep performance and prevent damage.

14.2.2 Do not wipe the polarizer with dry cloth, as it might cause scratch. If the surface of the LCD needs to be cleaned, wipe it swiftly with cotton or other soft cloth soaked with petroleum IPA, do not use other chemicals.

### 14.3. Operation

14.3.1 Do not drive LCD with DC voltage

14.3.2 Response time will increase below lower temperature

14.3.3 Display may change color with different temperature

14.3.4 Mechanical disturbance during operation, such as pressing on the display area, may cause the segments to appear “fractured”.

### 14.4. Static Electricity

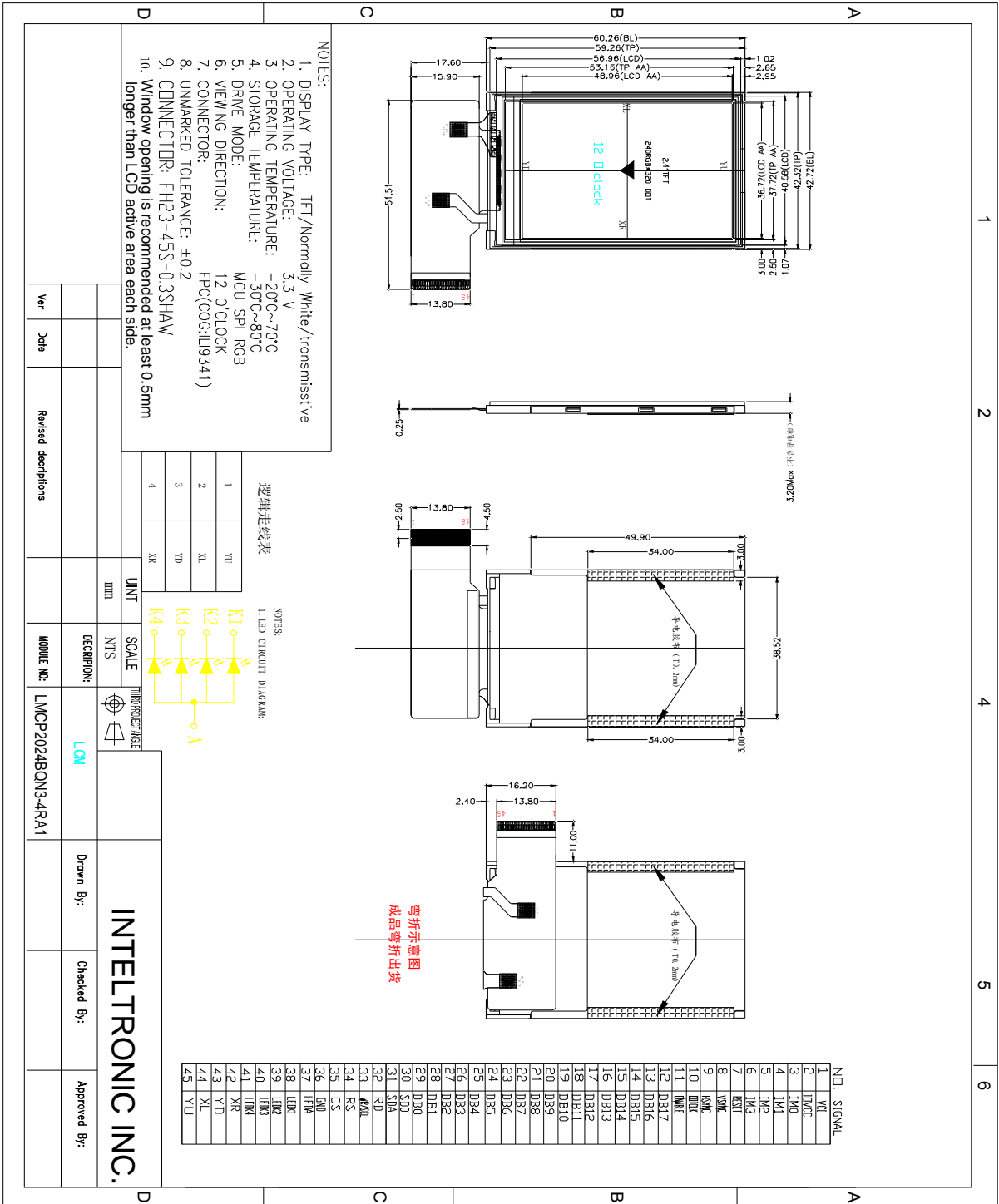
14.4.1 CMOS LSIs are equipped in this unit, so care must be taken to avoid the electro-static charge, by ground human body, etc.

14.4.2 The normal static prevention measures should be observed for work clothes and benches.

14.4.3 The module should be kept into anti-static bags or other containers resistant to static for storage.



16. Assembly Drawing



### Reference

Item	Description	Revision
ILI9341	IC Data sheet	A0
LMCP2024BQN3-4RA1		



## 16 .Inspection Specifications

The buyer (customer) shall inspect the modules within twenty calendar days since the delivery date (the "inspection period") at its own cost. The results of the inspection (acceptance or rejection) shall be recorded in writing, and a copy of this writing will be promptly sent to the seller.

The buyer may, under commercially reasonable reject procedures, reject an entire lot in the delivery involved if, within the inspection period, such samples of modules within such lot show an unacceptable number of defects in accordance with this incoming inspection standards, provided however that the buyer must notify the seller in writing of any such rejection promptly, and not later than within three business days of the end of the inspection period.

Should the buyer fail to notify the seller within the inspection period, the buyer's right to reject the modules shall be lapsed and the modules shall be deemed to have been accepted by the buyer.

## 17. Warranty

Inteltronic Inc. warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

Inteltronic Inc. will be limited to replace or repair any of its module which is found and confirmed defective electrically or visually when inspected in accordance with Inteltronic Inc. general module inspection standard.

This warranty does not apply to any products which have been on customer's production line, repaired or altered by persons other than repair personnel authorized by Inteltronic Inc., or which have been subject to misuse, abuse, accident or improper installation. Inteltronic Inc. assumes no liability under the terms of this warranty as a consequence of such events.

If an Inteltronic Inc. product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. In returning the modules, they must be properly packaged with original package; there should be detailed description of the failures or defect.

## 18. RMA

Products purchased through Inteltronic Inc. and under warranty may be returned for replacement. Contact [support@inteltronicinc.com](mailto:support@inteltronicinc.com) for RMA number and procedures



# Office Locations



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