



K280QCNN-R04

Product

Standard LCD Module
240 x RGB x 320 Dots
2.8" 262K TFT LCD
Wide temperature
With white LED backlight
With resistive touch screen



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1. Document revision history :

DOCUMENT REVISION	DATE	DESCRIPTION	CHANGED BY	CHECKED BY
01	2014.04.19	First Release.	XW Lee	



2. General Description

- 2.8”(diagonal), 240 x RGB x 320 dots, 262k colors, Transmissive, TFT LCD module.
- Viewing Direction: 12 o’clock.
- Driving IC: ILI9341 or equivalent TFT controller/driver.
- 16-bits or 8-bit data bus (I80 system interface).
- Logic voltage: 2.8V (typ.).

3. Mechanical Specifications

The mechanical detail is shown in Fig. 1 and summarized in Table 1 below.

Parameter		Specifications	Unit
Outline dimensions		50.0(W) x 69.2(H) x3.65(D) (Exclude FPC, cables of backlight)	mm
Color TFT 240xRGBx320	TP view area	44.8(W) x 63.1(H)	mm
	TP active area	44.2(W) x 62.5(H)	mm
	LCD active area	43.2(W) x 57.6(H)	mm
	Display format	240 x RGB x 320	dots
	Color configuration	RGB stripes	-
	Dot pitch	0.18(RGB)(W) x 0.18(H)	mm
Weight		TBD	grams



Figure 1: Outline Drawing



4. Interface signals

Pin No.	Symbol	Description
1	DB1	Bi-directional data bus [1]
2	DB2	Bi-directional data bus [2]
3	DB3	Bi-directional data bus [3]
4	DB4	Bi-directional data bus [4]
5	GND	Ground for the logic
6	VCC	Power supply (VCC = 2.5 ~ 3.3V)
7	CS	Chip select signal. 0: chip can be accessed; 1: chip cannot be accessed.
8	RS	Register Select Signal (H: Data, L: Instruction)
9	WR	Write signal and writes data at the rising edge.
10	RD	Read signal and reads data at the low level.
11	IM0	IM0=1: 80 MCU 8-bit bus interface (use DB[17:10], fix DB[8:1] to GND) IM0=0: 80 MCU 16-bit bus interface (use DB[17:10], DB[8:1])
12	X+(L)	Terminal of touch panel
13	Y+(T)	
14	X-(R)	
15	Y-(B)	
16	LEDA	Anode of LED backlight.
17	LEDK4	Cathode of LED backlight.
18	LEDK3	
19	LEDK2	
20	LEDK1	
21	NC	No connection
22	DB5	Bi-directional data bus [5].
23	DB10	Bi-directional data bus [10].
24	DB11	Bi-directional data bus [11].
25	DB12	Bi-directional data bus [12].
26	DB13	Bi-directional data bus [13].
27	DB14	Bi-directional data bus [14].
28	DB15	Bi-directional data bus [15].
29	DB16	Bi-directional data bus [16].
30	DB17	Bi-directional data bus [17].
31	/RESET	Reset pin. Setting either pin low initializes the LSI.
32	VCC	Power supply (VCC = 2.5 ~ 3.3V)
33		
34	GND	Ground for the logic and analog circuit.
35	DB6	Bi-directional data bus [6].
36	DB7	Bi-directional data bus [7].
37	DB8	Bi-directional data bus [8].



5. Absolute Maximum Ratings

5.1 Electrical Maximum Ratings – for IC Only

Item	Symbol	Unit	value	Notes
Power supply voltage (1)	Vcc, IOVcc	V	-0.3 ~ +4.5	1, 2
Power supply voltage (2)	Vci – AGND	V	-0.3 ~ +4.5	1, 3
Power supply voltage (3)	DDVDH – AGND	V	-0.3 ~ +8.0	1, 4
Power supply voltage (4)	AGND – VCL	V	-0.3 ~ +4.5	1
Power supply voltage (5)	DDVDH – VCL	V	-0.3 ~ +8.0	1, 5
Power supply voltage (6)	VGH – AGND	V	-0.3 ~ +18	1, 6
Power supply voltage (7)	AGND – VGL	V	-0.3 ~ +18	1, 7
Input voltage	Vt	V	-0.3~IOVcc+0.3	1
Operating temperature	Topr	°C	-40 ~ +85	1, 8
Storage temperature	Tstg	°C	-55 ~ +125	1

Note:

1.Vcc, GND must be maintained.

2.The modules may be destroyed if they are used beyond the absolute maximum ratings.

5.2 Environmental Condition

Item	Operating temperature (Topr)		Storage temperature (Tstg) (Note 1)		Remark
	Min.	Max.	Min.	Max.	
Ambient temperature	-10°C	+60°C	-20°C	+70°C	Dry
Humidity (Note 1)	80% max. RH for Ta ≤ 40°C < 50% RH for 40°C < Ta ≤ Maximum operating temperature				No condensation

Note 1: Product cannot sustain at extreme storage conditions for long time.

6. Electrical Specifications

At Ta = 25 °C, VCC = 2.8V, GND=0V.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage (logic)	VCC-GND		2.5	2.8	3.3	V
Supply current (Logic & LCD)	ICC	VDD=2.8V	-	-	25	mA
Supply voltage of white LED backlight	VLED =V(LED A)- V(LED K)	Number of LED dies = 4	3.0	3.2	3.4	V
Supply current (LED)			-	60	80	mA



7. Optical Characteristics

Items	Symbol	Condition	Specifications			Unit
			Min.	Typ.	Max.	
Contrast Ratio	CR		-	250	-	-
Response Time	$T_{R+} + T_F$		-	50	70	ms
Chromaticity	Red	X_R	-	0.633	-	-
		Y_R	-	0.329	-	-
	Green	X_G	-	0.297	-	-
		Y_G	-	0.577	-	-
	Blue	X_B	-	0.133	-	-
		Y_B	-	0.129	-	-
White	X_W	-	0.294	-	-	
	Y_W	-	0.334	-	-	
Viewing angle	Hor.	$\phi 1(3 \text{ o'clock})$	40	45	-	deg.
		$\phi 2(9 \text{ o'clock})$	40	45	-	
	Ver.	$\theta 2(12 \text{ o'clock})$	30	35	-	
		$\theta 1(6 \text{ o'clock})$	10	15	-	
Brightness	IV		-	150	-	Cd/m^2
Uniformity			80	85		%

Note

Note 1: Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L63 / L0$$

L63: Luminance of gray level 63

L0: Luminance of gray level 0

$$\text{CR} = \text{CR} (10)$$

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):

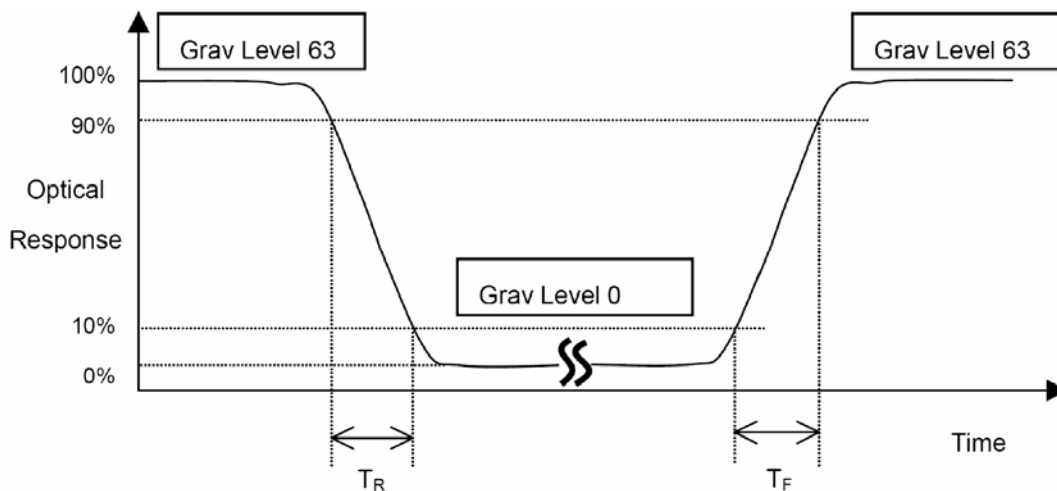


Figure 3



Note 3: Viewing Angle

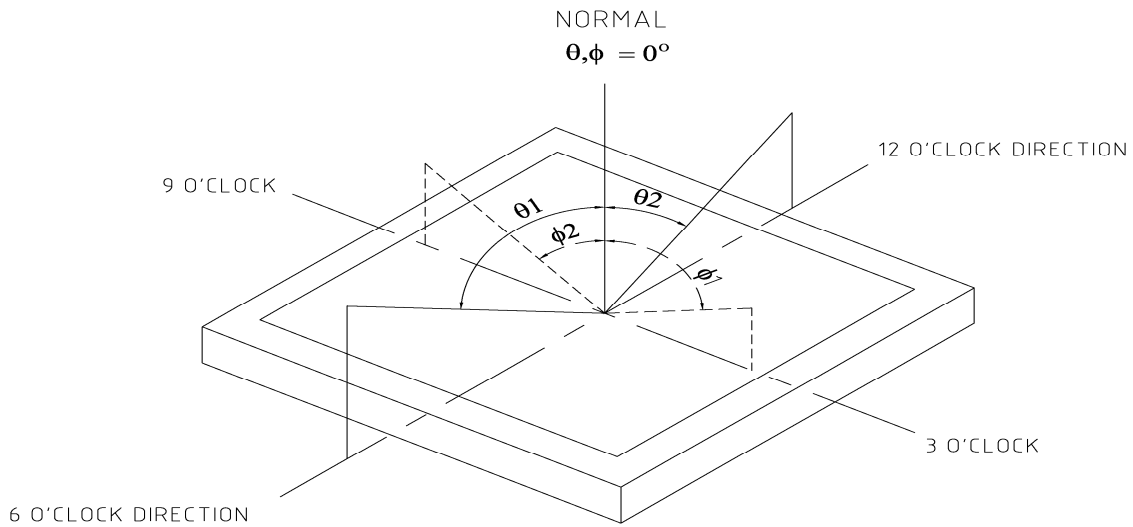


Figure 4

The above “Viewing Angle” is the measuring position with Largest Contrast Ratio; not for good image quality. View Direction for good image quality is 12 O’clock. Module maker can increase the “Viewing Angle” by applying Wide View Film.

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.

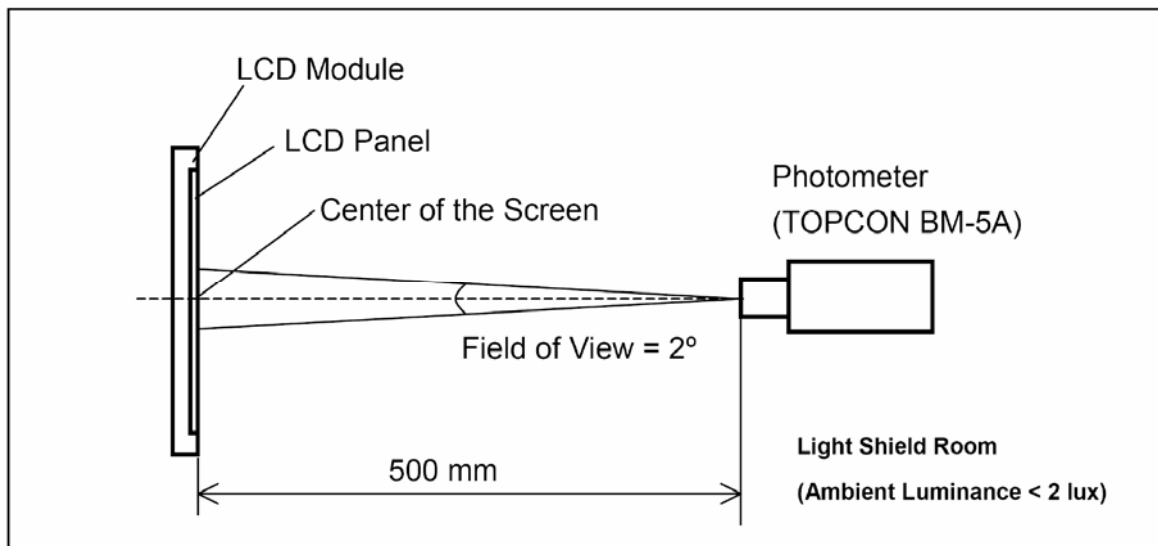


Figure 5



8. Timing Characteristics

Please refer ILI9341 datasheet.

9. Reliability Test Item

Test Item	Test Condition	Test result determinant gist
High temperature storage	70±3℃; 12H	the inspection of appearance and function character.
Low temperature storage	-20±3℃; 12H	
High temperature /humidity storage	40℃±3℃, 90%±3%RH; 12H	
High temperature operation	60±3℃; 12H	no objection of the function character; no fatal objection of the appearance.
Low temperature operation	-10±3℃; 12H	
High temperature /humidity operation	40℃±3℃, 90%±3%RH; 96H	
Temperature Shock	-20±3℃, 30min→70±3℃, 30min; 10cycle	inspect the objections appearance、function & the whole structure

10. Suggestions for using LCD modules

10.1 Handling of LCM

1. The LCD screen is made of glass. Don't give excessive external shock, or drop from a high place.
2. If the LCD screen is damaged and the liquid crystal leaks out, do not lick and swallow. When the liquid is attach to your hand, skin, cloth etc, wash it off by using soap and water thoroughly and immediately.
3. Don't apply excessive force on the surface of the LCM.
4. If the surface is contaminated ,clean it with soft cloth. If the LCM is severely contaminated , use Isopropyl alcohol/Ethyl alcohol to clean. Other solvents may damage the polarizer . The following solvents is especially prohibited: water , ketone Aromatic solvents etc.
5. Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
6. Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.
7. Don't disassemble the LCM.
8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
 - Be sure to ground the body when handling the LCD modules.
 - Tools required for assembling, such as soldering irons, must be properly grounded.
 - To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions.
 - The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
9. Do not alter, modify or change the the shape of the tab on the metal frame.



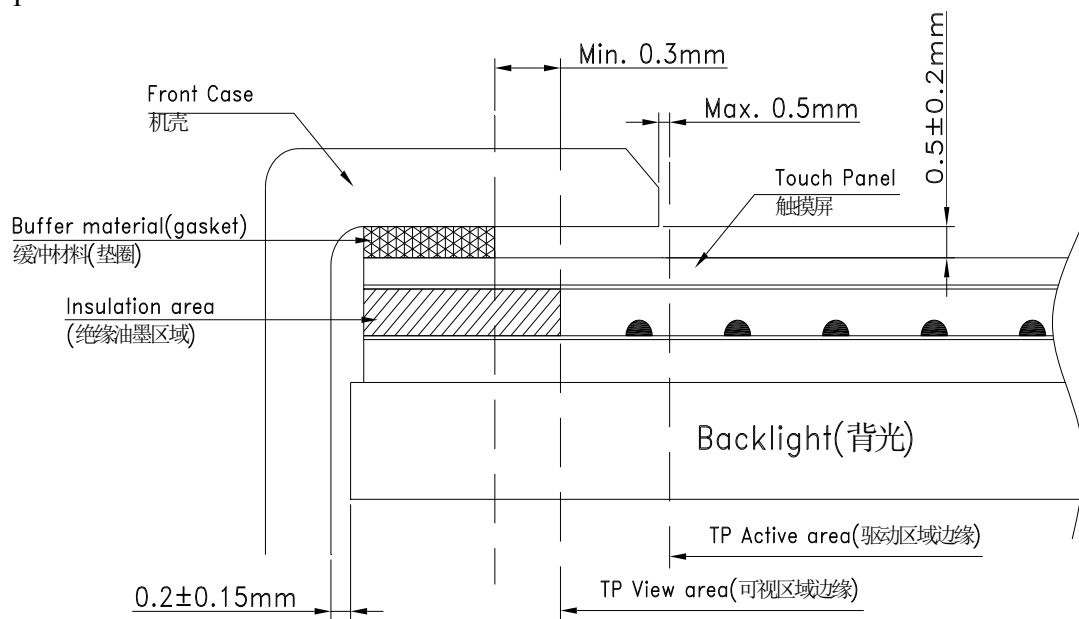
10. Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
11. Do not damage or modify the pattern writing on the printed circuit board.
12. Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector
13. Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
14. Do not drop, bend or twist LCM.

10.2 Storage

1. Store in an ambient temperature of 5 to 45 °C, and in a relative humidity of 40% to 60%. Don't expose to sunlight or fluorescent light.
2. Storage in a clean environment, free from dust, active gas, and solvent.
3. Store in antistatic container.

10.3 Cautions for installing and assembling if the module has Touch Panel

1. Use a buffer material (Gasket) between the touch panel and Front-case to protect damage and wrong operating. The dimension of the buffer material's edge between the TP V.A. edge is Min. 0.3mm.
2. We recommend to design a case that it can't over the boundary of the active area Max. 0.5mm in order to prevent an operation at outside of the active area which can't guarantee the specified durability, because operation at the outside of the active area cause serious damage of a transparent.
3. When design case for installing Module, you would consider give a distance about $0.2 \pm 0.15\text{mm}$ between the module edge to case inside.
4. The corners of the product are not chamfered. When positioning and fixing the product on the case, we suggest that you would provide a R part on the corner of the case so as not to apply load on the corner of the transparent module.



12. Packing (T.B.D.)