



LCM Specification

PRODUCT TYPE:	4.3TFT SerialModule
PRODUCT P/N:	DXD043IR00-C01-SPEC
VERSION:	V00

Customer（客户）		
INSPECTIONRESULT 检测结果	TESTED BY 检测人	APPROVED BY 确认人

Supplier(屏厂)		
DESIGNED BY	CHECKED BY	APPROVED BY



Revision History

Date	Rev.	Reason
2023.10.18	V00	NEW ISSUE



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GENERAL DESCRIPTION

DXD043IR00-C01-SPEC is a TFT dot matrix LCD module. It is composed of a PCBA, color-LCD panel driver IC, BZL, CTP, FPC and a backlight unit. The module display area contains **480x272** pixels. This product accords with RoHS environmental criterion.

LCM PARAMETER

Item	Contents	Unit	Notes
LCD Type	TFT TRANSMISSIVE	/	/
Viewing direction	6:00	O' Clock	/
PCBA Outside	121.90(W)*73.20(H)*17.50(T)	mm	/
LCM Outside Dimensions	105.50(W)*67.20(H)*3.00(T)	mm	/
Active Area (WxH)	95.04(W)*53.86(H)	mm	/
Number of Dots	480x272	/	/
Driver IC	LT168B	/	Vcc=3.3V
Colors	16.7M	/	/
Touch Type	CTP	/	/
Backlight Type	7*1=7LEDS / White	/	Vbl=21.0V
Backlight Luminance	350	cd/m2	/
Interface Type	TBD TTL UART (RS232/485)	/	8PIN (2.5)
Input Voltage	TBD 12V (5.0V: LP2 to LP1)	V	2A

SERIAL CHARACTERISTIC

Item	MIN	Typical	MAX	Unit	Notes
Operating Voltage	11.5	12.0	12.5	V	VDD
Operating Current	---	120	---	mA	12V Power
Operating Temperature	-20	25	70	° C	/
Storage Temperature	-30	25	80	° C	/
Serial Baud rate	2400	9600	115200	bps	Standards
Serial Output Leve	3.0	3.2	3.3	V	H
Serial Input Leve	2.0	3.3	5.0	V	H
Extend Flash	64M	128M	2G	bits	Nor/Nand
Display RAM	---	128M	---	Bytes	MCU
FlashMemory	---	512K	---	Bytes	MCU
SRAMMemory	---	256K	---	Bytes	MCU
MCU Frequency	---	150M	---	Hz	MCU



■ ABSOLUTE MAXIMUM RATINGS(TFT,非PCBA)

Parameter	Symbol	Min	Max	Unit
Power for Circuit Driving	VCC	-0.3	4.6	V
Power for Circuit Logic	IOVCC	-0.3	4.6	V
Input voltage	Vin	-0.3	VCC + 0.3	V
Operating temperature	Top	-20	70	°C
Storage temperature	Tst	-30	80	°C
Humidity	RH	/	90%(Max60°C)	RH

■ ELECTRICAL SPECIFICATIONS(TFT,非PCBA)

Parameter	Symbol	Min	Typ	Max	Unit
Power for analog/logic	Vcc -GND	2.65	3.3	3.6	V
I/O power supply	IOVCC	1.65	3.3	3.6	V
Input Current	Idd	TBD	TBD	TBD	mA
Input voltage ' H ' level	Vih	0.7IOVCC	/	IOVCC	V
Input voltage ' L ' level	Vil	GND	0	0.3IOVCC	V
Output voltage ' H ' level	Voh	0.8IOVCC	/	IOVCC	V
Output voltage ' L ' level	Vol	GND	0	0.2IOVCC	V

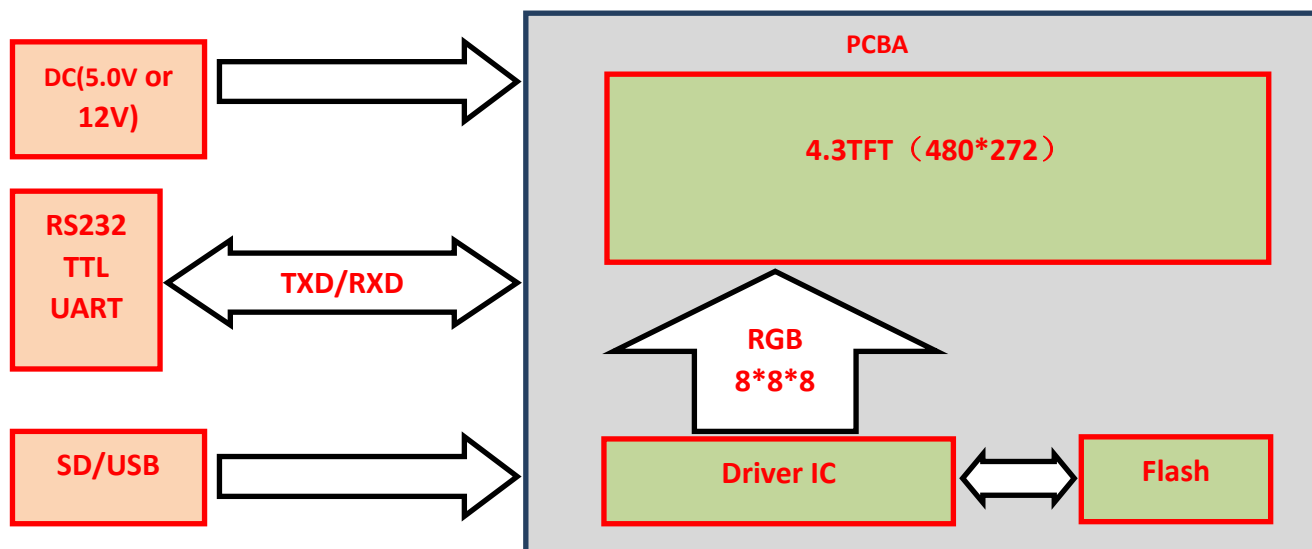
■ BACKLIGHT CHARACTERISTICS

Using condition: constant current driving method (If=20mA(+/-10%))

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	Vf	19.2	21.0	22.8	V	If=20mA
Luminance with LCD	Lv	--	350	--	cd/m2	/
Number of LED	/	7*1 = 7			Pcs	/
Connection mode	S	7 Serial 1 Parallel			/	/



■ BLOCK DIAGRAM



■ PIN DESCRIPTION

CN1: RS232/485 or TTL UART (5PIN-2.0mm Use)

Pin.No	Symbol	DESCRIPTION
1	VDD	12V Power Supply Voltage(Use 5.0V Change LP2 to LP1)
2	BUSY	Not Defined
3	TXD	RS232/485 or TTL UART transmit data output
4	RXD	RS232/485 or TTL UART receiving data input
5	GND	Ground

CN2: RS232/485 or TTL UART (NC)

Pin.No	Symbol	DESCRIPTION
1	VDD	12V Power Supply Voltage(Use 5.0V Change LP2 to LP1)
2	VDD	12V Power Supply Voltage(Use 5.0V Change LP2 to LP1)
3	BUSY	Not Defined
4	Dout	RS232 or TTL UART transmit data output
5	Din	RS232 or TTL UART receiving data input
6	Din	RS232 or TTL UART receiving data input
7	GND	Ground
8	GND	Ground

**CN3: RTP (4PIN)**

Standard (NC)

CN4: CTP (10PIN)

Standard Use

CN5: TFT (40PIN)

Standard Use

CN6: SD Upgrade (Standard Use)

Pin.No	Symbol	DESCRIPTION
1	DATD2	Data2
2	DATD3 (SS3)	Chip selection signal
3	CMD (MOSI3)	Data output signal
4	VCC	SD Power Supply Voltage (3.3V+/-0.3V)
5	CLK	Clock Signal
6	VSS	Ground
7	DAT0 (MISO3)	Data input signal
8	DAT1	Data1
9	ON/OFF (SD_IN)	Wake-up input

CN7: USB Upgrade (Standard No use)

Pin.No	Symbol	DESCRIPTION
1	VDD	Power Supply Voltage (5.0V+/-0.3V)
2	DM	USB Data Terminal (Positive)
3	DP	USB Data Terminal (Negative)
4	GND	Ground
5	GND	Ground

CN8: Audio Speaker interface (2PIN)

Standard (No use)

J1: MCU Debug (2PIN)

Standard (BUSY and GND short)

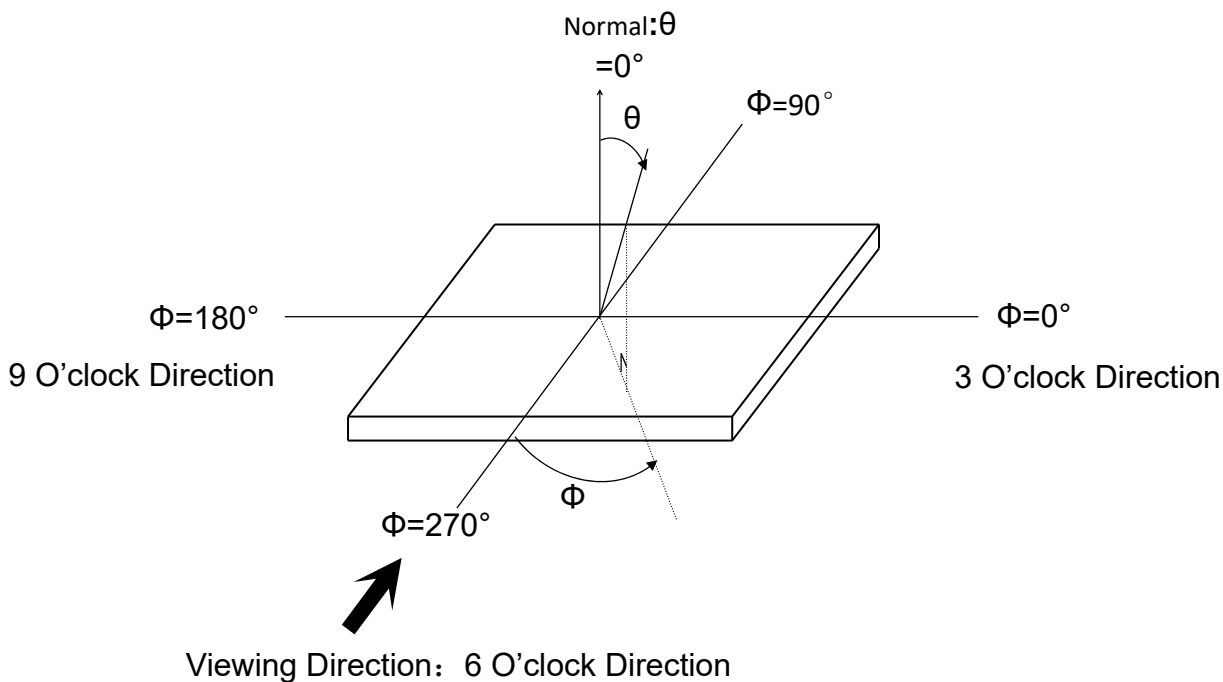
J2: WIFI Reserve (4PIN)

Standard (No use)

■ OPTICAL SPECIFICATIONS

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Response time	Tr+Tf	$\theta=0^\circ$ $\Phi=0^\circ$ $T_a=25^\circ\text{C}$	-	20	40	ms	/
Contrast ratio	Cr		-	500	-	-	/
Luminanceuniformity	δ WHITE		80	-	-	%	/
Viewing angle range	θ	$\Phi=0^\circ$	-	60	-	deg	/
		$\Phi=90^\circ$	-	40	-	deg	
		$\Phi=180^\circ$	-	60	-	deg	
		$\Phi=270^\circ$	-	50	-	deg	
CIE(x,y) chromaticity	Red	x	-	0.610	-	/	/
		y	-	0.329	--		
	Green	x	-	0.299	-		
		y	-	0.567	-		
	Blue	x	-	0.143	-		
		y	-	0.111	-		
	White	x	-	0.308	-		
		y	-	0.327	-		

Definition of Viewing Angle θ and Φ





■ TIMING CHARACTERISTICS

TBD

■ TFT serial screen protocol table without master terminal

Refer to the UI_Editor_II user manual



■ INSPECTION CRITERION

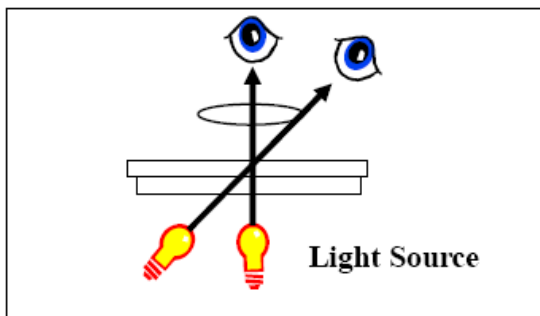
Sampling Method

Unless otherwise agreed upon in writing, the sampling inspection shall be applied to the Customer's incoming inspection.

- 1 Lot size: Quantity per shipment lot
- 2 Sampling type: Normal inspection , single sampling
- 3 Inspection level: II
- 4 Sampling table: MIL-STD-105D
- 5 Acceptable Quality Level(AQL): Major=0.65 Minor=1.5

Inspection Method

- 1) Ambient Condition:
 - a. Temperature: Room temperature $25 \pm 5^{\circ}\text{C}$
 - b. Illumination: Single fluorescent lamp non-directive(300 to 700 Lux)
- 2) Viewing distance
The distance between the LCD and the inspector' s eyes shall be at least 30-50cm.
- 3) Viewing Angle
The inspection shall be conducted within normal viewing angle range.

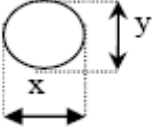
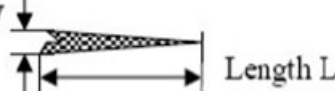


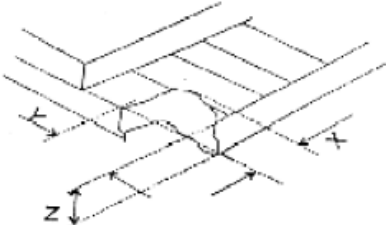
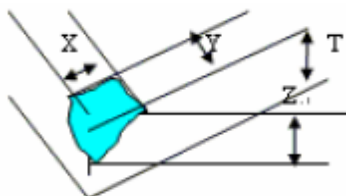
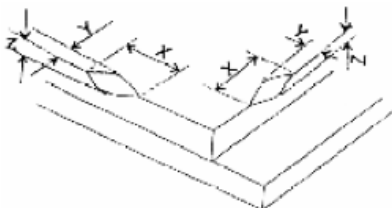
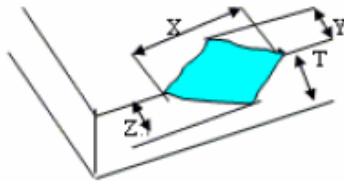
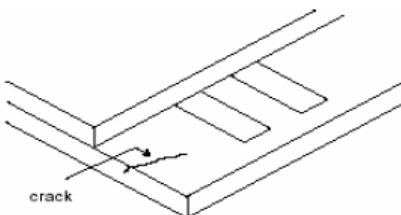
Major Defect

No	Items	Inspection Standard	Classification of defects
1	All functional defects	1.No display 2.Display abnormally 3.Missing vertical, horizontal segment 4.Short circuit 5. Back-light no lighting, flickering and abnormal lighting.	Major
2	Missing	Missing component	
3	Outline dimension	Overall outline dimension beyond the drawing is not allowed.	
4	linearity	No more than 1.5%	



Cosmetic Defect

No	Items	Inspection Standard		Classification of defects
1	Clear Spot, Black Spot, white Spot, defect Pinhole, Foreign Particle, polarizer Dirt TP Dirt	For dark/white spot, size Φ is defined as $\Phi=(x+y)/2$ 		Minor
		Size(mm)	Acceptable Qty	
		$\Phi \leq 0.15$	Ignore	
		$0.15 < \Phi \leq 0.20$	2	
		$0.20 < \Phi \leq 0.30$	1	
		$\Phi > 0.30$	0	
2	(line defect) Black and White line Polarizer scratch	Define: 		Minor
		Width(mm)	Length(mm);Acceptable Qty	
		$W \leq 0.03$	Ignore	
		$0.03 < W \leq 0.05$	$L \leq 3.0$; $N \leq 2$	
		$0.05 < W \leq 0.1$	$L \leq 2.0$; $N \leq 2$	
		$0.1 < W$	Define as spot defect	
3	Dim Spots Circle shaped and dim edged defects	/		Minor
		Size(mm)	Acceptable Qty	
		$\Phi \leq 0.2$	Ignore	
		$0.20 < \Phi \leq 0.40$	2	
		$0.40 < \Phi \leq 0.60$	1	
		$\Phi > 0.60$	0	

No	Items	Inspection Standard	Classification of defects						
4	Glass defect TP defect	(1) Chips on corner (A:LCD Glass defect)	Minor						
		 <table><tr><td>X(mm)</td><td>Y(mm)</td><td>Z(mm)</td></tr><tr><td>≤2.0</td><td>≤S</td><td>Disregard</td></tr></table> <p>Notes: S=contact pad length Chips on the corner of terminal shall not be allowed to extend into the ITO pad or expose perimeter seal.</p>		X(mm)	Y(mm)	Z(mm)	≤2.0	≤S	Disregard
		X(mm)		Y(mm)	Z(mm)				
		≤2.0		≤S	Disregard				
		(2) Chips on corner (TP Glass defect)							
 <table><tr><td>X(mm)</td><td>Y(mm)</td><td>Z(mm)</td></tr><tr><td>≤3.0</td><td>≤3.0</td><td>Disregard</td></tr></table>	X(mm)	Y(mm)	Z(mm)	≤3.0	≤3.0	Disregard			
X(mm)	Y(mm)	Z(mm)							
≤3.0	≤3.0	Disregard							
(3) Usual surface cracks (LCD Glass defect)									
 <table><tr><td>X(mm)</td><td>Y(mm)</td><td>Z(mm)</td></tr><tr><td>≤3.0</td><td><Inner border line of the seal</td><td>Disregard</td></tr></table>	X(mm)	Y(mm)	Z(mm)	≤3.0	<Inner border line of the seal	Disregard			
X(mm)	Y(mm)	Z(mm)							
≤3.0	<Inner border line of the seal	Disregard							
(4) Usual surface cracks (TP Glass defect)									
 <table><tr><td>X(mm)</td><td>Y(mm)</td><td>Z(mm)</td></tr><tr><td>≤6.0</td><td><2.0</td><td>Disregard</td></tr></table>	X(mm)	Y(mm)	Z(mm)	≤6.0	<2.0	Disregard			
X(mm)	Y(mm)	Z(mm)							
≤6.0	<2.0	Disregard							
(5) Crack (Cracks tend to break are not allowed.)									
									



■ RELIABILITY

NO.	TEST ITEM	CONDITIONS
1	High Temperature Storage	80℃; 72hrs
2	Low Temperature Storage	-30℃; 72hrs
3	HighTemperature Operation	70℃; 72hrs
4	Low Temperature Operation	-20℃; 72hrs
5	High Temperature and HighHumidity Operation	50℃, 90% RH; 120 hrs
6	Thermal shock(Storage)	-20℃(0.5Hr)→70℃(0.5Hr) 100 Cycles

NOTE:

1. All judgement of display are performed after temperature of panel return to room temperature.
2. Display function should be no change under normal operating condition.
3. Under no condensation of dew.
4. WE only guarantee the above 6 test items, and without guarantee the others.

■ PRECAUTIONS

Handling Precautions

- (1) The display panel is made of glass and polarizer. As glass is fragile, it tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.
- (2) If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.
- (3) Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).
- (4) The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming is contacting with room temperature air.
- (5) If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents
 - Isopropyl alcohol
 - Ethyl alcoholDo not scrub hard to avoid damaging the display surface.
- (6) Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.
 - Water



- Ketone
- Aromatic solvents

Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contacting oil and fats.

(7) 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.

(8) 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.

(9) Do not attempt to disassemble or process the LCD module.

(10) NC terminal should be open. Do not connect anything.

(11) If the logic circuit power is off, do not apply the input signals.

(12) Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.

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

Storage Precautions

When storing the LCD modules, the following precaution is necessary.

(1) Store them in a sealed polyethylene bag. If properly sealed, there is no need for the dessicant.

(2) Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0° C and 35° C.

(3) The polarizer surface should not come in contact with any other objects. (We advise you to store them in the container in which they were shipped).

Others

Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.

If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability. To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.

- Exposed area of the printed circuit board.
- Terminal electrode sections.