PRODUCT　　　**:** LCD MODULE
MODEL NO .　**:** QDTFT2201
SUPPLIER　　**:**QDtech
DATE　　　　**:**March28,2018

SPECIFICATION

Revion:1.1

QDTFT2201

For Customer's Acceptance	
Approved by	**Comment**

	Signature	**Date**
Prepared by		
Checked by		
Approved by		

Contents

1 General Description

QDTFT2201   is a transmissive type a-Si TFT-LCD (amorphous silicon thin film transistor liquid crystal display) module, which is composed of a TFT-LCD panel, a driver circuit a backlight unit, The panel size is 2.2inch and thresolution is 240x320. High image quality a-Si TFT LCD module. Partial-screen display function is available. Sleep and Stand-by modes are

available for power saving.

1.1 Features

No	Item	Specification	Remark
1	Display Mode	High Resolution & Wide View	
2	Screen Size	2.2inch (diagonal)	
3	Resolution	240XRGBX320	
4	Color Number	262K TFT	
5	Color Arrangement	RGB-stripe	
6	Driver IC	ILI9341V	
7	Back Light	White LED*4	
8	Viewing Direction	6 O'clock	
9	Interface	4 线串口.	
10	Surface Treatment	UV Cut	
11	touch panel	N/A	

1.2 Application
◆ Mobile phone.
◆ Portable multimedia device.

2 Outline Dimension

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

Parameter	Specifications	Unit
Outline dimensions	40.1(W) x55.2(H) x 2.35(D)+-0.1 (LCM,no include FPC)	mm
Active area	33.84(W) x45.12(H)	mm
Resolution	240(H)RGBx320(V) dots	-
Dot size	0.141x0.141	mm
Module brightness	260	cd/㎡

QDTECH
深圳市全动电子技术有限公司

NOTES:
1.DISPLAY TYPE：2.2"TFT
2.VIEWING DIRECTION: 12:00
3.LCD DRIVE IC: TM+ILI9341V
4.POLARIZER MODE: TRANSMISSIVE/POSITIVE
5.OPERATING TEMP.：－10℃～+60℃
6.STORAGE TEMP.：－20℃～+70℃
7.UNMARKER TOLERANCE：±0.20
8.REQUIREMENTS ON ENVIRONMENTAL
PROTECTION: RoHS

TFT 2.2"
240xRGBx320 DOTS
0.141(H)X0.141(V)
6 O'CLOCK

pin Description	
PIN	Symbol
1	GND
2	RESET
3	SCL
4	D/CX
5	CSX
6	SDI
7	SDO
8	GND
9	VCC
10	LED-A
11	LED-K1
12	LED-K2
13	LED-K3
14	LED-K4

BL CIRCUIT DIAGRAM

A
K1
K2
K3
K4

MODEL.	QDTFT2201	REV.	3.0	UNIT	mm	SIZE	A4
TITLE.	LCM OUTLINE						(3)

深圳市全动电子技术有限公司
SHENZHEN QD ELECTRONIC TECHNOLOGY CO., LTD

REVISION RECORD		
NEW		
1.0	NEW RELEASE	
2.0	修改排线	
3.0	背光源定位柱数量由3个更改为2个	

	Date	Name
	2017-06-22	JMF
	2017-06-24	JMF
	2017-07-12	JMF

DRG DATE	2017-07-12	DRAWING	CHECK	APPROVE

Figure 1:   Module specification of the module

3 Electrical Characteristics

3.1 TFT-LCD Module

Parameter	Symbol	Condition	Specification			Unit	Related Pins
			MIN.	TYP.	MAX.		
Power & Operation Voltage							
System Voltage	VDD	Operating voltage	2.5	2.75	3.3	V	
Interface Operation Voltage	VDDI	I/O Supply Voltage	1.65	1.8	3.3	V	
Gate Driver High Voltage	VGH		10		15	V	
Gate Driver Low Voltage	VGL		-12.4		-7.5	V	
Gate Driver Supply Voltage		| VGH-VGL |	17.5		27.4	V	
Input / Output							
Logic-High Input Voltage	VIH		0.8VDDI		VDDI	V	Note 1
Logic-Low Input Voltage	VIL		VSS		0.2VDDI	V	Note 1
Logic-High Output Voltage	VOH	IOH = -1.0mA	0.8VDDI		VDDI	V	Note 1
Logic-Low Output Voltage	VOL	IOL = +1.0mA	VSS		0.2VDDI	V	Note 1
Logic-High Input Current	IIH	VIN = VDDI			1	uA	Note 1
Logic-Low Input Current	IIL	VIN = VSS	-1			uA	Note 1
Input Leakage Current	IIL	IOH = -1.0mA	-0.1		+0.1	uA	Note 1
VCOM Voltage							
VCOM amplitude	VCOM		-2		-0.425	V	
Source Driver							
Source Output Range	VSout		GVCL		GVDD	V	
Gamma Reference Voltage(Positive)	GVDD		3.15		4.7	V	
Gamma Reference Voltage(Negative)	GVCL		-4.7		-3.15	V	
Source Output Settling Time	Tr	Below with 99% precision			20	us	Note 2
Output Offset Voltage	VOFFSET				35	mV	Note 3

Table 2 Basic DC Characteristics

3.2 Back-Light Unit

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Current	IF	45	60	80	mA	
Forward voltage	VF	2.9	3.2	3.5	V	IF=60mA IF=3.2V
Chroma	X	0.250		0.30		
	Y	0.250		0.30		
Brightness	L	3000			Cd/m2	
Uniformity	UBL	80			%	

● 4 LEDs multiple circuit

● The luminous intensity of LED is strongly dependent on the driving current.

● It is recommended the input of backlight to be constant current rather than constant voltage.

4   TFT-LCM Interface Specification

Pin No	Symbol	Description
1	GND	Ground
2	RESET	Reset signal input Pin
3	SCL	-In SPI mode, it serves as a synchronous clock (SCL).
4	D/C	A register select signal. Low: select an index or status register High: select a control register
5	CS	-Chip selection pin Low enable. High disable..
6	SDI	In the 24-bit 4 wires serial peripheral interface, this pin is used as input pin. In the 8/9-bit serial peripheral interface, this pin is used as bi-directional data pin.
7	SDO	Serial output signal.
8	GND	Ground
9	VCC	Power supply input for LCM:2.8V
10	LEDA	Power supply Anode input for backlight
11~14	LED-K	Power supply Cathode input for backlight

5.Environment Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit	Remark
Operation temperature range	Top	-20	70	℃	Ambient
Storage temperature range	Tst	-30	80	℃	Ambient

● Corrosive gas environment is not acceptable.

● TFT-LCD color will change slightly depending on environment temperature. This phenomenon is reversible. Current reduction rate of LED backlight is according to the graph indicated below:

Ambient Temperature (℃)
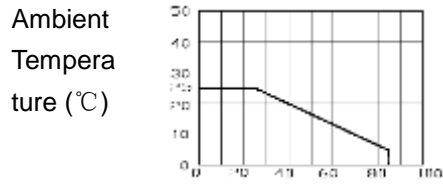
Allowable Forward Current (mA)

6　Reliability Test Items

Item	Test Condition		Criterion
High Temperature Storage	80 ℃, 240 hrs		There should be no change which might affect the practical display function when the display quality test is conducted under normal operating condition.
Low Temperature Storage	-30 ℃, 240 hrs		
High Temp. & High Humidity Storage	60 ℃, 90％ RH, 240 hrs		
Vibration Test (Non-operating)	Freq.:10~55~10 Hz, Amp.:1.5mm 1 hr for each direction of X, Y, Z		
Electrostatic Discharge Test (Non-operating)	Terminals	150 pF, 0 Ω, ±300 V, Contact	
	Panel	150 pF, 330 Ω, ±8 KV, Air	
Thermal Shock (Static)	-30℃, 30 min /80℃, 30 min, 20 cycles		
High Temperature Operation	70 ℃, 240 hrs		
Low temperature Operation	-20 ℃, 240 hrs		
High Temperature & High Humidity (Operating)	50 ℃, 90％ RH, 240 hrs		
FPC Peeling Strength Test	Pull speed: 50 mm/min, +90 °;		> 400gf/cm

7　Inspection Standard

This standard apply to TFT module specification.
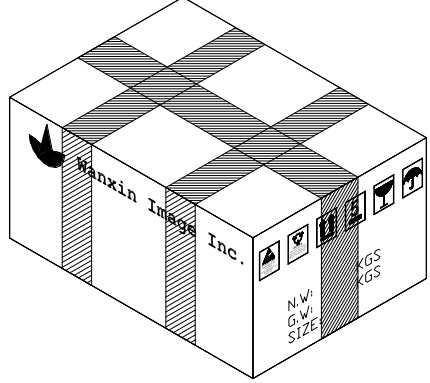
1. Inspection condition:
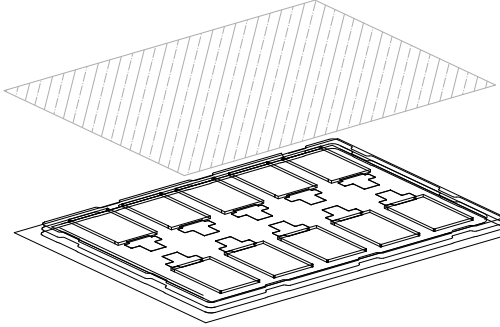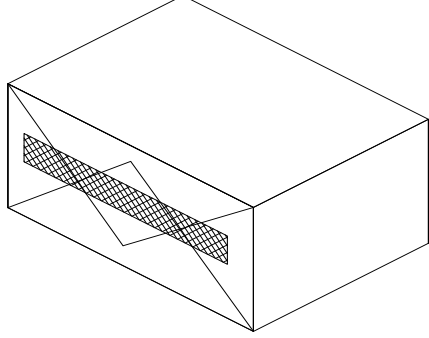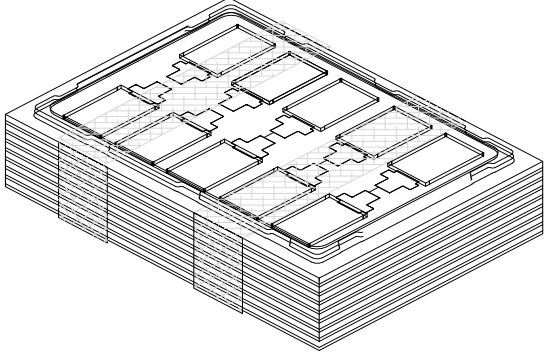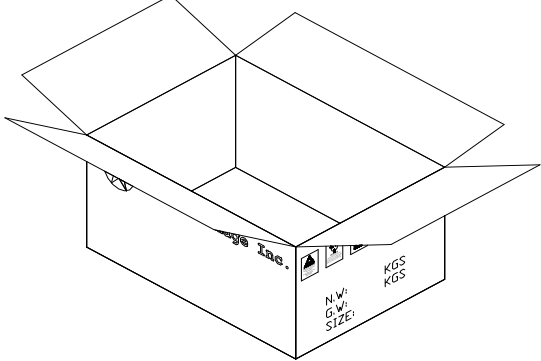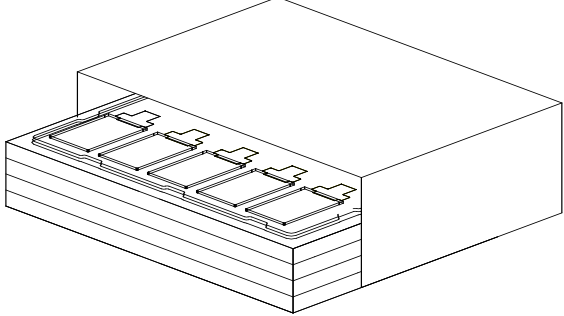
   Under daylight lamp 20～40W，product distance inspector'eye 30cm.incline degree 30°．

30 degree
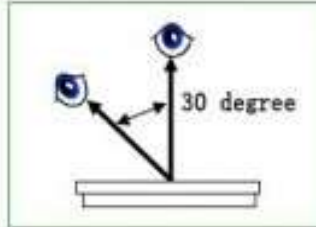
2. Inspection standard

NO.	Item	Inspection standard	Rate
2.1	Dot	Case of Dot defect is below ① Bright Dot (whit spot) : "0" ② Dark Dot (black spot) : "0" (In case of Dark Dot on Main TFT LCD) - NG if there's full Dot defect. - Damaged less than the size of sub-pixel is not counted as defect 　- Dots darker than the size of sub-pixel are not defined as bright dot defect (see table below)	minor
2.2	line	(see table below)	

Dot table (2.1):

size（mm）　area	Acceptable number
Φ≤0.10	ignore
0.10<Φ≤0.15	3
0.15<Φ≤0.20	2
0.25<Φ≤0.25	1
0.25<Φ	0

line table (2.2):

Size（mm）		Acceptable number
ignore	W≤0.03	ignore
L≤4.0	0.03<W≤0.04	2
L≤4.0	0.04<W≤0.05	1
	0.05<W	Treat with dot non-conformance

8 Package

1	4
10 pcs per tray + 1 cover (EPE)	Packing bag
2	5
15 trays + 1 dummy tray = 150 ps	Putting bag into carton Protected by 2 pieces of cushion EPE sheet
3	6
Putting trays into anti-electrostatic bag	Packing carton with sealing tape Carton outline size: 400×295×145 (mm)

10 Precautions

Please pay attentions to the followings as using the LCD module.

10.1 Handling

(a) Do not apply strong mechanical stress like drop, shock or any force to LCD module. It may cause improper operation, even damage.

(b) Because the polarizer is very fragile and easy to be damaged, do not hit, press or rub the display surface with hard materials.

(c) Do not put heavy or hard material on the display surface, and do not stack LCD modules.

(d) If the display surface is dirty, please wipe the surface softly with cotton swab or clean cloth.

(e) Avoid using Ketone type materials (e.g. Acetone), Toluene, Ethyl acid or Methyl chloride to clean the display surface. It might damage the touch panel surface permanently. The recommended solvents are water and Isopropyl alcohol.

(f) Wipe off water droplets or oil immediately.

(g) Protect the LCD module from ESD. It will damage the LSI and the electronic circuit.

(h) Do not touch the output pins directly with bare hands.

(i) Do not disassemble the LCD module.

(j) Do not lift the FPC of Touch Panel.

10.2 Storage

(a) Do not leave the LCD modules in high temperature, especially in high humidity for a long time.

(b) Do not expose the LCD modules to sunlight directly.

(c) The liquid crystal is deteriorated by ultraviolet. Do not leave it in strong ultraviolet ray for a long time.

(d) Avoid condensation of water. It may cause improper operation.

(e) Please stack only up to the number stated on carton box for storage and transportation. Excessive weight will cause deformation and damage of carton box.

10.3Operation

(a) When mounting or dismounting the LCD modules, turn the power off.

(b) Protect the LCD modules from electric shock.

(c) The Driver IC control algorithms stated above should always obeyed to avoid damaging the LSI and electronic circuit.

(d) Be careful to avoid mixing up the polarity of power supply for backlight.

(e) Absolute maximum rating specified above has to be always kept in any case. Exceeding it may cause non-recoverable damage of electronic components or, nevertheless, burning.

(f) When a static image is displayed for a long time, remnant image is likely to occur.

(g) Be sure to avoid bending the FPC to an acute shape, it might break FPC.

(h) Most of the touch screens have air vent to equalize the inside air pressure to the outside one. The air vent must be open and liquid contact must be avoided as the liquid may be absorbed if the liquid is accumulated near the air vent.

(i) For the fragility of ITO film, it should avoid to use too tapering pen as the input material.

10.4Touch Panel Mounting Notes

(a) If a cushion is used between bezel/housing and film must be choose as free as enough to absorb the expansion and contraction to avoid the distortion of film.

(b) The cushion must be placed out of the Viewing Area.

(c) Bezel/Housing edge must be posited between Key Area and Viewing Area. The edge enters the Key Area may cause unexpected input if the gap is too narrow or foreign particles like dusts exist between Bezel/Housing and ITO film.

(d) Mounting example:

Bezel / Housing
Cushion
ITO Film
ITO Glass
0.2 ~ 0.5mm (Recommend)
TP Active Area
TP Viewing Area
0.5 mm
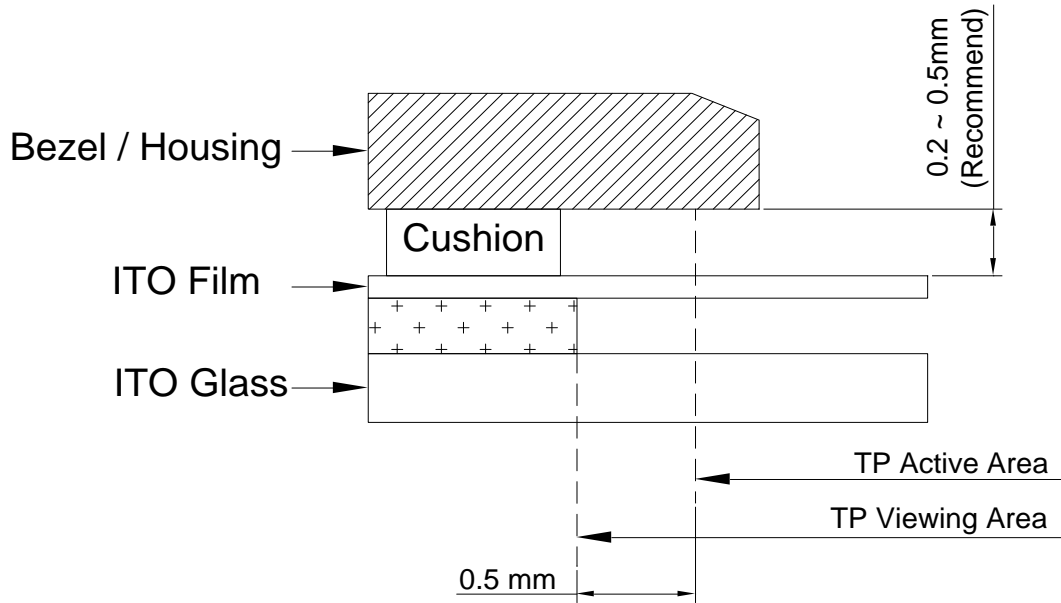
The corner part has conductivity. Do not touch any metal part after mounting.

10.5   Others

a) If the liquid crystal leaks from the panel, it should be kept away from the eyes or mouth.

b) For the fragility of polarizer, it is recommended to attach a transparent protective plate over the display surface.

c) It is recommended to peel off the protection film on the polarizer slowly so that the electrostatic charge can be minimized.

11 Records of Version

Version	Revise Date	Page	Content
A	2017-11-21	All	New released