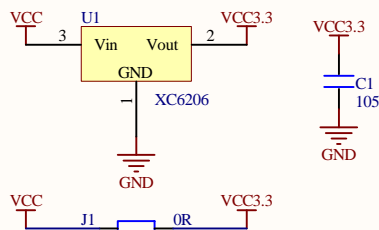


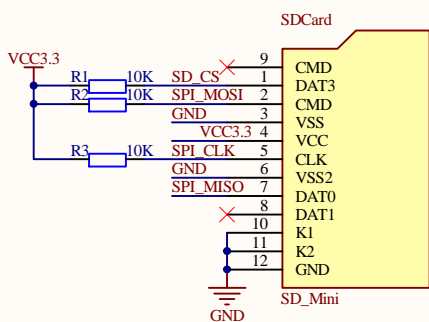
背光控制电路 (可IO或者PWM控制)

TFT_BL 高电平使能

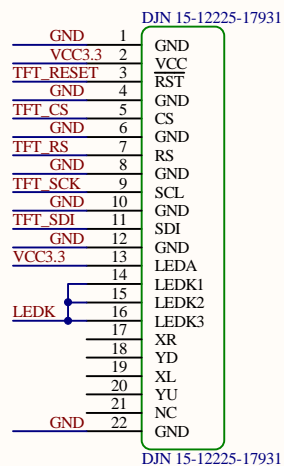


供电电源选择：

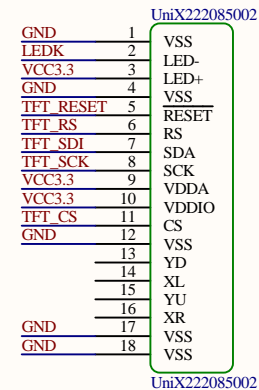
外部VCC输入5V时，J1断开
外部VCC输入3.3V时，J1短接



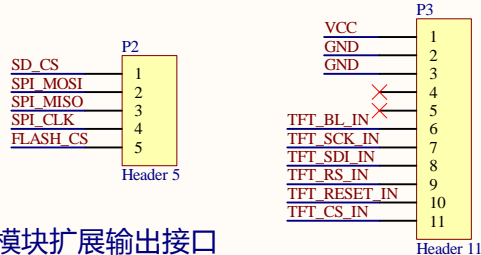
SD卡接口电路



液晶屏22Pin接口



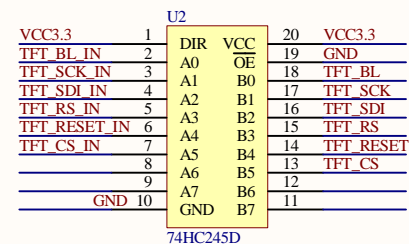
液晶屏18Pin接口



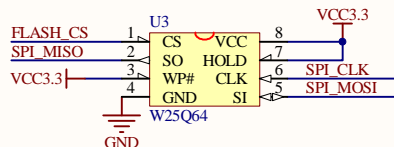
模块扩展输出接口

扩展输出排针默认不焊接

液晶屏模块接口



74HC245电平转换电路



SPI_FLASH接口电路(不焊接)

深圳市全动电子有限公司

ShenZhen QDtech Co.,LTD

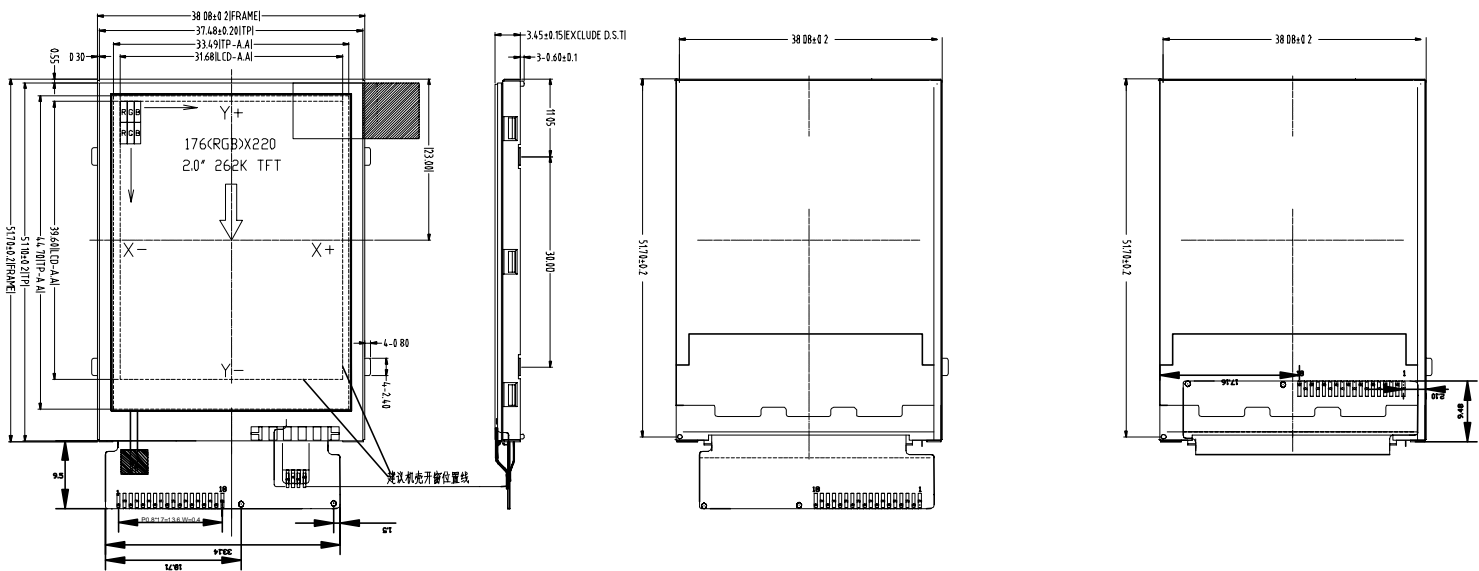
www.QDtech.net

因为专注，所以专业

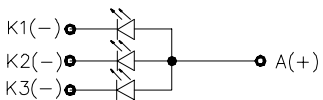
Title		
Size	Number	Revision
A4		
Date:	2014/1/6	Sheet of
File:	D:\学习\TFT_TM022HDH26.SchDoc	Drawn By:

n EXTERNAL DIMENSIONS

Customer No.:



PIN NO.	SYMBOL
1	VSS
2	LED-
3	LED+
4	VSS
5	/RESET
6	A0
7	SDA
8	SCK
9	VDDA
10	VDDI0
11	CS
12	VSS
13	YD
14	XL
15	YU
16	XR
17	VSS
18	VSS



NOTES:

1. DISPLAY TYPE:
MAIN LCD: 262K TFT, TRANSMISIVE
2. OPERATING TEMP: -10°C~60°C
3. STORAGE TEMP : -20°C~70°C
4. MAIN LCD DRIVER:
5. BACKLIGHT:3CHIP-WHITE LED,PARALLEL CONNECTION
6. ROHS COMPLIANCY

CUSTOMER APPROVE		AMEND		液晶显示模块			
Mechanical	Electrical			TOLERANCE	PRODUCT NO.	DRAW NO.	REV
		△		DECIMAL	TFT-GG1N4154UTSW-W-TP-E	CSZMDS3992	B
		△		.x ± .30	DWN 郑马强	DSN 郑马强	
		⚠	NEW RELEASE	.xx ± .20	CHKD 黄英群	APPD 陈向阳	
		⚠	20080219	± 1/4°	NOT IN SCALE UNIT mm SHEET:		
		NO.	CONTENT	DATE			
			20070816				

n GENERAL INFORMATION

Item	Contents	Unit
LCD Type	TFT TRANSMISSIVE	/
Viewing direction	12:00	O' Clock
Glass area (W × H)	35.68×47.33	mm ²
Active area (W×H)	31.68×39.60	mm ²
Number of Dots	176(RGB) ×220	/
Driver IC	ILI9225G	/
Colors	262K	/
Backlight Type	LED	/
Module Power consumption	174	mw
Interface Type	System parallel interface	/
Input voltage	2.8	V

n ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Supply voltage for logic	V _{DD}	-0.3	4.6	V
Input voltage	V _{IN}	-0.3	V _{DD} + 0.3	V
Operating temperature	T _{OP}	-10	60	°C
Storage temperature	T _{ST}	-20	70	°C
Humidity	RH	-	90% (Max60°C)	RH

n ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage for logic	V _{DD} -V _{SS}	2.7	2.8	2.9	V
Input Current	I _{dd}	-	6.90	10.35	mA
Input voltage 'H' level	V _{IH}	0.8V _{DD}	-	V _{DD}	V
Input voltage 'L' level	V _{IL}	-0.3	0	0.2V _{DD}	V
Output voltage 'H' level	V _{OH}	0.8V _{DD}	-	V _{DD}	V
Output voltage 'L' level	V _{OL}	0	0	0.2V _{DD}	V

n TIMING OF POWER SUPPLY

PLEASE REFER TO THE DRIVER IC SPECIFICATION.

n BACKLIGHT CHARACTERISTICS

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	V _f	3.0	3.2	3.4	V	If=45mA
Luminance	L _v	3200	3700	4200	cd/m ²	
Number of LED	-	3			Piece	-
Connection mode	P	parallel			-	-

nELECTRO-OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Min	Typ	Max	Unit	Remark	Note
Response time	Tr +Tf	$\theta=0^\circ$ $\Delta E=0^\circ$ $T_a=25^\circ\text{C}$	---	27.8	41.7	ms	Fig.1	4
Contrast ratio	Cr		229	458	---	---	FIG 2.	1
Luminance uniformity	d WHITE		83	93	---	%	FIG 2.	3
Surface Luminance	Lv		138	173	---	cd/m ²	FIG 2.	2
Viewing angle range	q	$\Delta E = 90^\circ$	60	70	---	deg	FIG 3.	6
		$\Delta E = 270^\circ$	18	28	---	deg	FIG 3.	
		$\Delta E = 0^\circ$	33	43	---	deg	FIG 3.	
		$\Delta E = 180^\circ$	35	45	---	deg	FIG 3.	
CIE (x, y) chromaticity	Red	x	0.543	0.593	0.643	FIG 2.	5	
		y	0.292	0.342	0.392			
	Green	x	0.311	0.361	0.411			
		y	0.510	0.560	0.610			
	Blue	x	0.099	0.149	0.199			
		y	0.057	0.107	0.157			
	White	x	0.266	0.316	0.386			
		y	0.269	0.319	0.389			

Note 1. Contrast Ratio(CR) is defined mathematically as For more information see FIG 2.:

$$\text{Contrast Ratio} = \frac{\text{Average Surface Luminance with all white pixels (P}_1, P_2, P_3, P_4, P_5)}{\text{Average Surface Luminance with all black pixels (P}_1, P_2, P_3, P_4, P_5)}$$

Note 2. Surface luminance is the LCD surface from the surface with all pixels displaying white. For more information see FIG 2.

$$L_v = \text{Average Surface Luminance with all white pixels (P}_1, P_2, P_3, P_4, P_5)$$

Note 3. The uniformity in surface luminance, d WHITE is determined by measuring luminance at each test position 1 through 5, and then dividing the maximum luminance of 5 points luminance by minimum luminance of 5 points luminance. For more information see FIG 2.

$$d \text{ WHITE} = \frac{\text{Minimum Surface Luminance with all white pixels (P}_1, P_2, P_3, P_4, P_5)}{\text{Maximum Surface Luminance with all white pixels (P}_1, P_2, P_3, P_4, P_5)}$$

Note 4. Response time is the time required for the display to transition from White to black(Rise Time, Tr) and from black to white(Decay Time, Tf). For additional information see FIG 1. The test equipment is Autronic-Melchers's ConoScope. series

Note 5. CIE (x, y) chromaticity, The x,y value is determined by measuring luminance at each test position 1 through 5, and then make average value

Note 6. Viewing angle is the angle at which the contrast ratio is greater than 2. For TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 3.

Note 7. For Viewing angle and response time testing, the testing data is base on Autronic-Melchers's

FIG. 1 The definition of Response Time

The response time is defined as the following figure and shall be measured by switching the input signal for “black” and “white”.

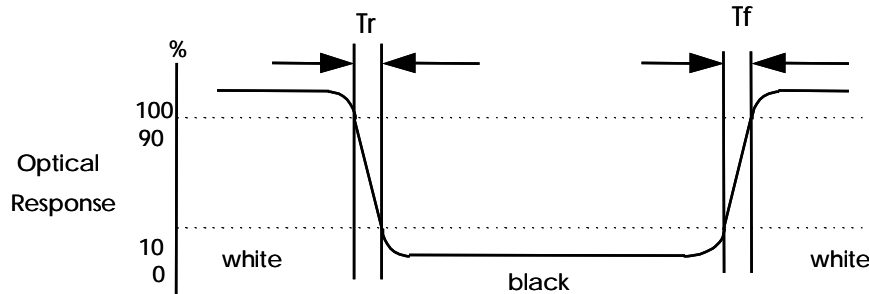


FIG. 2 Measuring method for Contrast ratio, surface luminance, Luminance uniformity , CIE (x, y) chromaticity

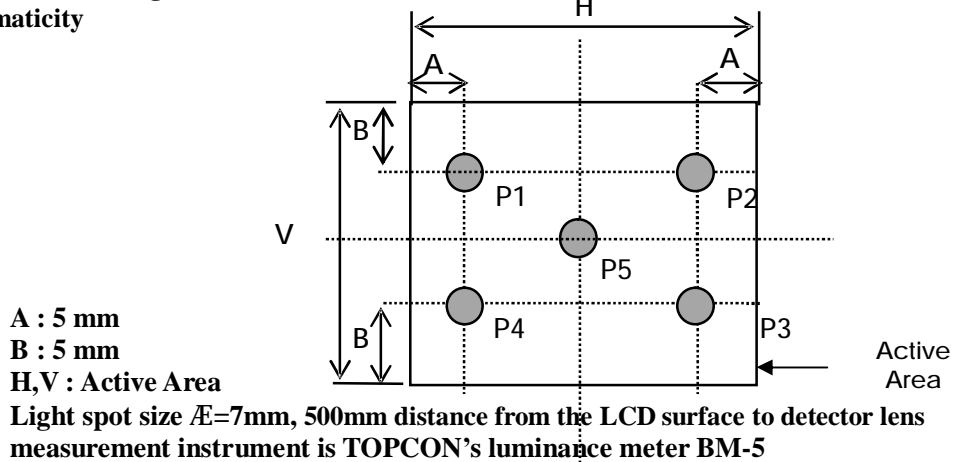
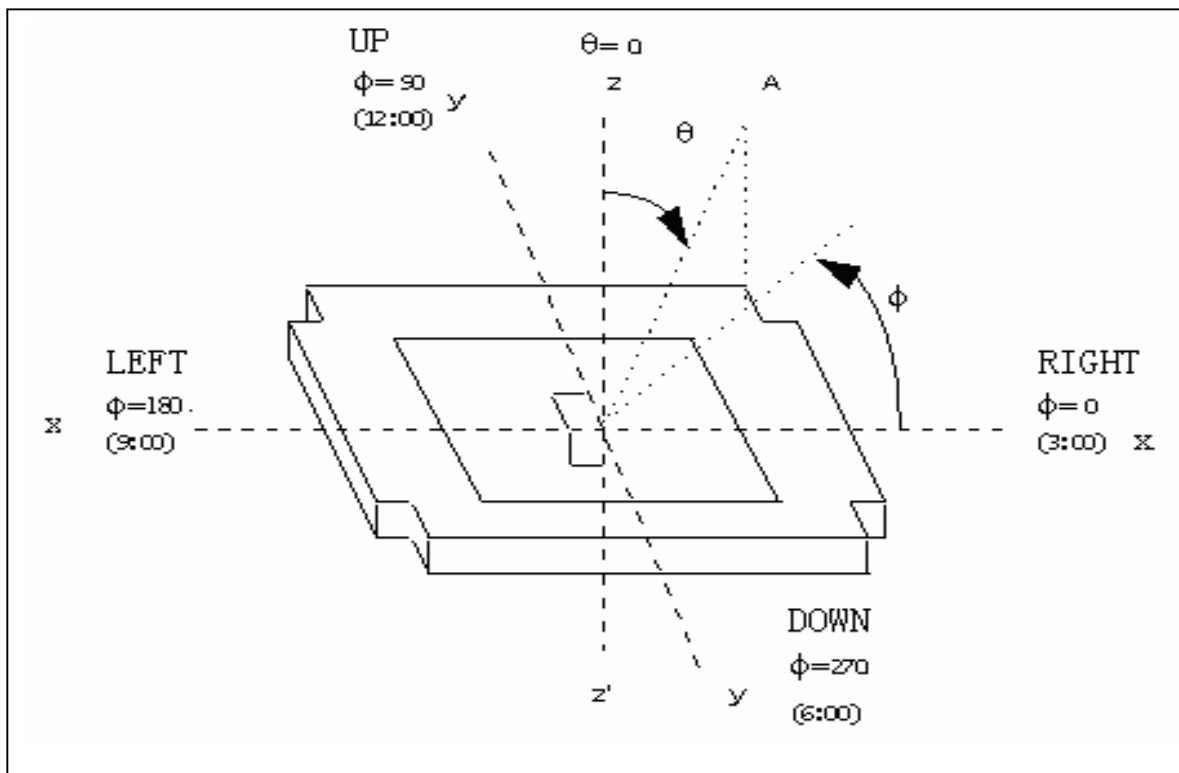


FIG. 3 The definition of viewing angle



n RELIABILITY TEST

No.	Test Item	Test Condition	Inspection after test
1	High Temperature Storage	70±2°C/200 hours	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 1.Air bubble in the LCD; 2.Sealleak; 3.Non-display; 4.missing segments; 5.Glass crack; 6.Current Idd is twice higher than initial value.
2	Low Temperature Storage	-20±2°C/200 hours	
3	High Temperature Operating	60±2°C/120 hours	
4	Low Temperature Operating	-10±2°C/120 hours	
5	Temperature Cycle	-10±2°C~25~70±2°C×10cycles (30min.) (5min.) (30min.)	
6	Damp Proof Test	50°C±5°C×90%RH/120 hours	
7	Vibration Test	Frequency: 10Hz~55Hz~10Hz Amplitude: 1.5mm, X, Y, Z direction for total 3hours (Packing condition)	
8	Dropping test	Drop to the ground from 1m height, one time, every side of carton. (Packing condition)	
9	ESD test	Voltage:±8KV R: 330Ω C: 150pF Air discharge, 10time	

Remark:

- 1.The test samples should be applied to only one test item.
- 2.Sample size for each test item is 5~10pcs.
- 3.For Damp Proof Test, Pure water(Resistance>10MΩ) should be used.
- 4.In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part.
Using ionizer(an antistatic blower) is recommended at working area in order to reduce electro-static voltage.
When removing protection film from LCM panel, peel off the tag slowly(recommended more than one second) while blowing with ionizer toward the peeling face to minimize ESD which may damage electrical circuit.
- 5.EL evaluation should be excepted from reliability test with humidity and temperature: Some defects such as black spot/blemish can happen by natural chemical reaction with humidity and Fluorescence EL has.
- 6.Please use automatic switch menu(or roll menu) testing mode when test operating mode