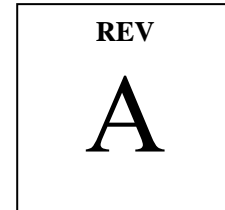


SPECIFICATION
FOR
LCD MODULE



Customer : _____

Product Model: _____ 200A68-C _____

Designed by	Checked by	Approved by
Liujingxiang		

Final Approval by Customer

OK

NG, Problem survey:

Approved By _____

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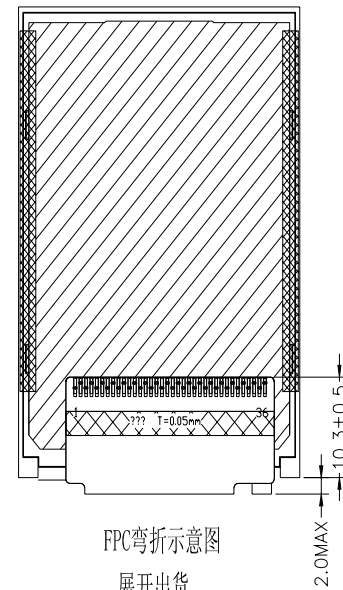
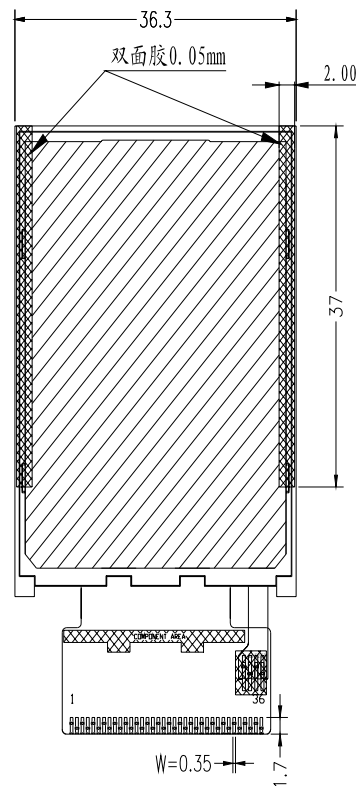
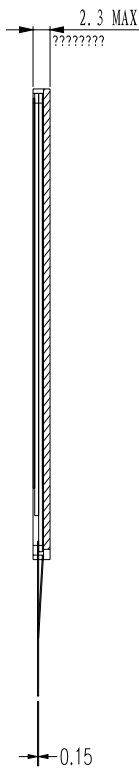
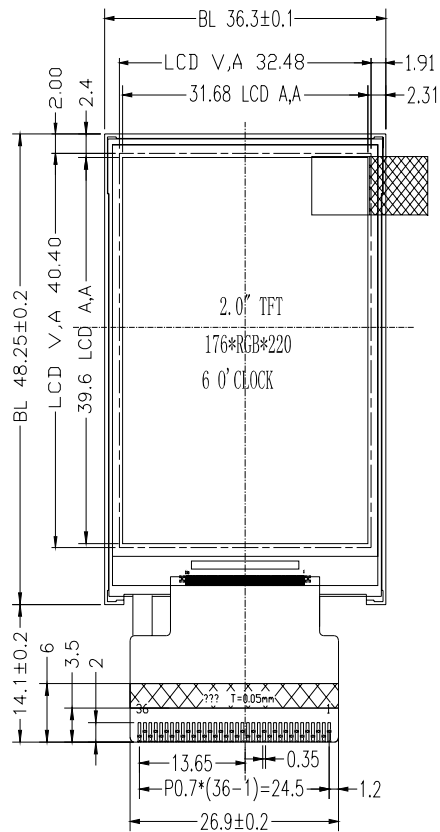
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Item	Contents	Unit	Note
LCD Type	TFT	-	
Display color	262K		1
LCD Duty	-	-	
LCD Bias	-	-	
Viewing Direction	6:00	O'Clock	
Viewing Area(W×H)	-	mm	
Active Area(W×H)	31.68 (H) ×39.60(V) mm	mm	
Number of Dots	176(H) X3(RGB)×220(V) Dots	mm	
Dot Pitch(W×H)	0.18*0.18	mm	
Controller	RM68130	-	
VDD	2.8V	V	
Outline Dimensions	36.3(W) ×48.25 (H)×2.3(D)	mm	
Backlight	LED(white)	-	
Operating Temperature	-20~+70°C	-	
Storage Temperature	-30~+80°C	-	
Weight	TBD	g	2
Data Transfer	8/16bit	-	
Polarizer Mode	Transmissive/Negative	-	

Note 1: Color tune is slightly changed by temperature and driving voltage.

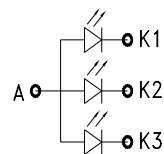
Note 2:TBD- To Be Determined.

Note 3:Requirements on Environmental Protection.



NOTES:

1. VIEWING DIRECTION 6 O'CLOCK
2. POLARIZER MODE : TRANSMISSIVE
3. OPERATING TEMP : -20°C~+70°C
4. STORAGE TEMP : -30°C~+80°C
5. DRIVER IC : **RM68130**
6. CONNECTOR : COG+FPC
7. GENERAL TOLERANCE ±0.2
8. LCD V, A为建议客户机壳开窗尺寸



If=45mA(tpye)
Vf=3.2(max)

PIN:	SYMBLE
1	DB15
2	DB14
3	DB13
4	DB12
5	DB11
6	DB10
7	DB9
8	DB8
9	GND
10	DB7
11	DB6
12	DB5
13	DB4
14	DB3
15	DB2
16	DB1
17	DB0
18	VDD
19	IOVCC
20	/RD
21	/WR
22	/RS
23	CS
24	/RESET
25	IMO
26	GND
27	LED-A
28	LED-K1
29	LED-K2
30	LED-K3
31	NC
32	NC
33	NC
34	NC
35	NC
36	NC

REV	DESCRIPTION	DATE	SCALE:1/1	UNIT:mm	PAGE:1/1	APPROVED	CHECKER	DRAWN
A	依200A15-A改新天马2.0 LCD	2010.12.16						LIUYUZHANG
B	依LCM-200A68-AB改背光	2011.1.7						2011.1.7
PART NO: LCM-200A68-C			EDI	0.1				

A-TOPS ELECTRONICS COMPANY

2. Outline Drawing

200A68-C

3. Absolute Maximum Ratings(Ta=25°C)

Item	Symbol	Min.	Max.	Unit	Remark
Analog power supply	V _{Cl}	-0.3	+4.6	V	
Logic input voltage	V _{DD}	-0.3	+4.6	V	
Operating temperature (Ambient)	T _{opr}	-20	+60	°C	
Storage temperature (Ambient)	T _{stg}	-30	+70	°C	

Note 1: If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also, if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

Note 2: All the measurements should be operated with driver IC and experimental FPC mounted.

4. Electrical Specifications and Instruction Code

4.1 Electrical characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Logic Power supply	V _{DD}	Ta=25°C	2.5	2.8	3.3	V	1
Input Voltage	H	V _{IH}	0.8V _{DD}	-	V _{DD}	V	
	L	V _{IL}	0	0	0.2V _{DD}	V	
Output Voltage	H	V _{OH}	I _{OH} = -1.0mA	0.8V _{DD}	-	V	
	L	V _{OL}	I _{OL} = +1.0mA	-	-	0.2V _{DD}	V
Current Consumption	I _{CC1}	Normal mode	18		23	mA	2
	I _{CC2}	Stand-by mode	-	-	-	mA	3

Note 1: The operations are guaranteed under the recommended operating conditions only. These operations are not guaranteed if a quick voltage change occurs during operation. To prevent noise, a bypass capacitor must be inserted into the line close to the power pin.

Note 2: All the measurements should be operated with driver IC and experimental FPC.

4.2 LED backlight specification

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Forward voltage	V_f	$I_f=30mA$	3.0	3.2	3.4	V	
Reverse voltage	V_r					V	
Forward current	Normal	I_{pn}	2-chip	30		mA	
	Dimming	I_{pd}					
Reverse Current	I_r	$V_r=4V$			15	μA	
Uniformity		$I_f=30mA$	80%	85%			

4.3 Interface Signals

Pin No.	Symbol	I/O	Function
1-8	DB15-DB8	I/O	Data Bit15-Bit8
9	GND	--	POWER GROUND
10-17	DB7-DB0	I/O	Data Bit7-Bit0
18	VDD	--	POWER supply
19	IOVCC	--	POWER supply
20	/RD	--	Read enable clock input pin
21	/WR	--	Write enable clock input pin
22	/RS	I/O	Register select signal pin. L: Command H: Data
23	CS	I/O	Chip select input pin
24	RESET	--	System Reset Pin
25	IM0	--	Data bit select pin L: 16bit H: 8bit.
26	GND	--	POWER GROUND
27	LEDA	--	Back Light +
28-30	LEDK1-K3	I/O	Back Light -
31	NC	--	NO Connection
32	NC	--	NO Connection
33	NC	--	NO Connection
34	NC	--	NO Connection
35	NC	--	NO Connection
36	NC	--	NO Connection

5. Optical Characteristics

Optical specification (Note 1, Note 2, Note 3)

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time (with polarizer)	Rise	Tr	$\theta = 0^\circ$	-	20	35	ms	Note 4, 5
	Fall	Tf		-	15	30	ms	
Contrast ratio (with polarizer)		CR	At optimized Viewing angle	150	300	-		Note 5, 6
Viewing angle (with polarizer)	Top		$CR \geq 10$	40	60	-	degree	Note 5, 7
	Bottom			10	20	-		
	Left			25	35	-		
	Right			25	35	-		
Transmittance (without polarizer)		Tm		17	17.6	-		Typ. 7% with HC polarizer
NTSC coverage		N			60%			
Color Filter coordination		Rx	$\theta = 0^\circ$	0.56	0.60	0.64		Measured by C Light source
		Rv		0.28	0.32	0.36		
		Gx		0.27	0.31	0.35		
		Gv		0.57	0.61	0.65		
		Bx		0.11	0.15	0.19		
		By		0.04	0.08	0.12		
		Wx		0.26	0.30	0.34		
		Wy		0.27	0.31	0.35		

6. Reliability

No.	Test Item	Test condition	Criterion
1	High Temperature Storage	80°C±2°C 96H Restore 4H at 25°C	1. After testing, cosmetic defects should not happen. 2. Total current consumption should not be over 10% of initial value.
2	Low Temperature Storage	-30°C±2°C 96H Restore 4H at 25°C	
3	High Temperature Operation	70°C±2°C 48H Restore 4H at 25°C	
4	Low Temperature	-20°C±2°C 48H Restore 4H at 25°C	
5	High Temperature /Humidity Storage	40°C±2°C 90%RH 48H	
6	Temperature Cycle	$-30^{\circ}\text{C} \longleftrightarrow 25^{\circ}\text{C} \longleftrightarrow 80^{\circ}\text{C}$ 5min 30min $\longleftrightarrow 25^{\circ}\text{C}$, 5min after 10cycle, Restore 4H at 25°C	
7	Vibration Test (package state)	10Hz~150Hz, 100m/s ² , 120min	Not allowed cosmetic and electrical defects.
8	Shock Test (package state)	Half- sine wave, 300m/s ² , 18ms	
9	Atmospheric Pressure Test	25kPa 16H Restore 2H	

7. Precautions for Use of LCD Modules

7.1 Handling Precautions

7.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

7.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

7.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

7.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

7.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

— Isopropyl alcohol

— Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer.

Especially, do not use the following:

— Water

— Ketone

— Aromatic solvents

7.1.6 Do not attempt to disassemble the LCD Module.

7.1.7 If the logic circuit power is off, do not apply the input signals.

7.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

- a. Be sure to ground the body when handling the LCD Modules.
- b. Tools required for assembly, such as soldering irons, must be properly ground.
- c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
- d. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

7.2 Storage precautions

7.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

7.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0°C ~ 40°C

Relatively humidity: ≤80%

7.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

7.3 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.