CLOVER DISPLAY LTD.

LCD MODULE SPECIFICATION

Model: CT20C1722A _ - _ _

Revision	01
Engineering	CO Cheng
Date	7 December 2017
Our Reference	

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TFT NUMBER NOTATION:

C T 20 C 1722 A N - 00

| | | | | | | |

(1)(2)(3)(4) (5) (6) (7) (8)

*(1)--- C for Clover

*(2)--- T for TFT

*(3)--- Module size

20 – 2.0”
35 – 3.5”
43 – 4.3”
50 – 5.0”
57 – 5.7”
62 – 6.2”
70 – 7.0”
10 – 10.0”

*(4)--- Display type

M – Mono
C – Color

*(5)--- Resolution

*(6)--- Model

*(7)--- Touch Panel

N – No Touch Panel
C – Capacitive Touch Panel
D – Digital Key Touch Sensors
R – Resistive Touch Panel

*(8)---Special code for other requirements

(Can be omitted if not used)

GENERAL DESCRIPTION

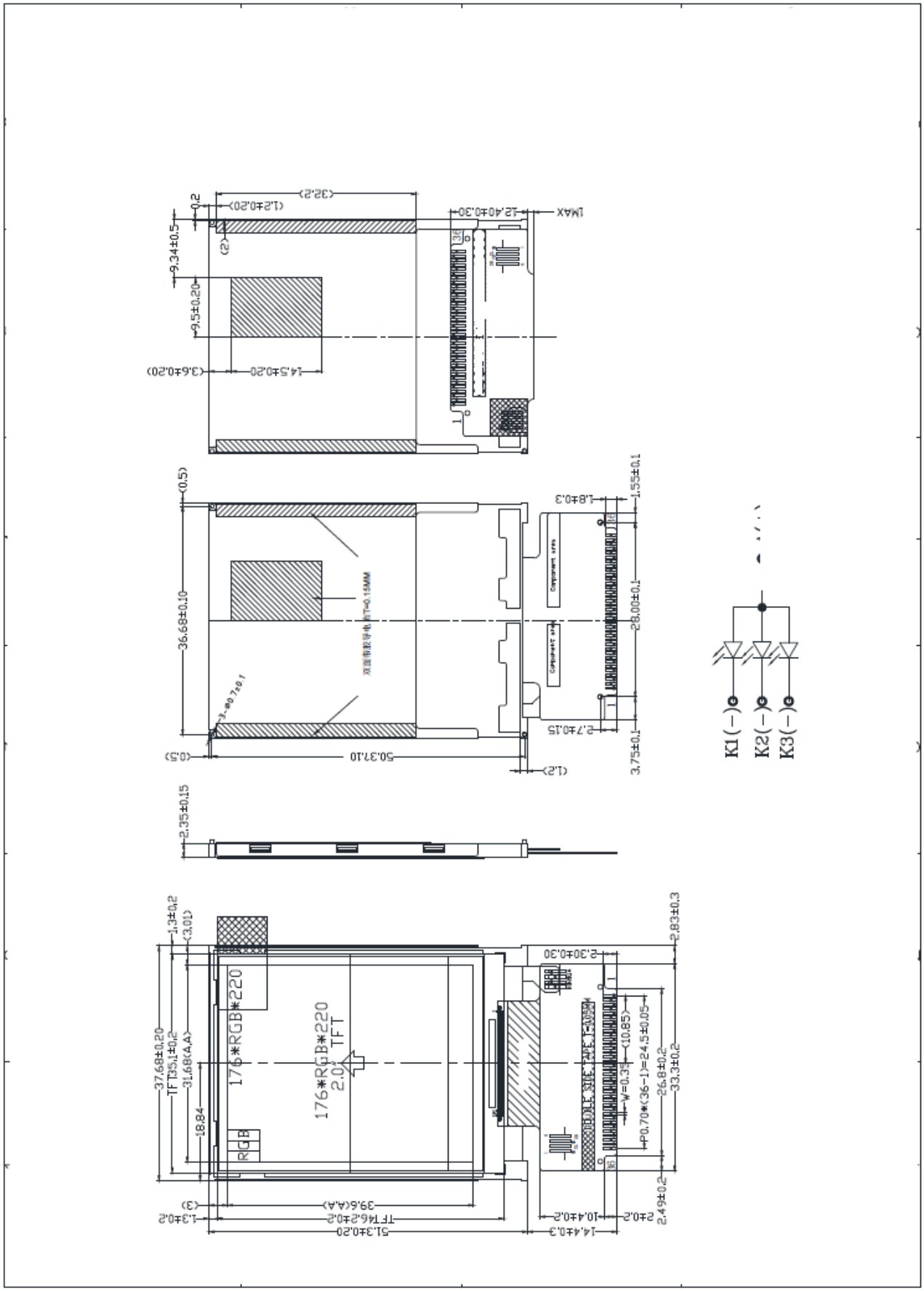
No.	Item	Specification	Unit
1	Panel Size	2.0"	Inch
2	Driver Element	a-Si	Pixels
3	Number of Pixels	176 x 3 (RGB) x 220	Pixels
4	Active Area	31.68(W) x 39.6(H)	mm
5	Pixel Pitch	0.18(W) x 0.18(H)	mm
6	Outline Dimension	37.68(W) x 51.3(H) x 2.35(D)	mm
7	Number of Colors	262K	
8	Display Mode	Normally White	
9	View Direction	6 O'clock	
10	Display Format	RGB Vertical Stripe	
11	Surface Treatment	-	
12	Contrast Ratio	300 (Typ)	
13	Luminance (cd/m^2)	350 (Typ)	cd/m^2
14	Interface	16-bit or 8-bit Parallel CPU	
15	Backlight	White LED	
16	Drive IC	ILI9225G	

CONNECTOR PIN ASSIGNMENT

Pin No.	Symbol	Function
1	DB15	Data bus
2	DB14	Data bus
3	DB13	Data bus
4	DB12	Data bus
5	DB11	Data bus
6	DB10	Data bus
7	DB9	Data bus
8	DB8	Data bus
9	GND	System Ground
10	DB7	Data bus
11	DB6	Data bus
12	DB5	Data bus
13	DB4	Data bus
14	DB3	Data bus
15	DB2	Data bus
16	DB1	Data bus
17	DB0	Data bus
18	IOVCC	A supply voltage to the interface pins (IOVCC = 1.65 ~3.3V)
19	VCC	Logic supply power
20	/RD	Read Signal
21	/WR	Write Signal
22	RS	Register Signal
23	/CS	Chip Signal (low active)
24	/RESET	RESET Signal
25	IM0	Mode Select
26	GND	System Ground
27	LED-A	LED Anode
28	LED-K1	LED Cathode
29	LED-K2	LED Cathode
30	LED-K3	LED Cathode
31	NC(YU)	No Connection
32	NC(YD)	No Connection
33	NC(XR)	No Connection
34	NC(XL)	No Connection
35	NC	No Connection
36	NC	No Connection

IM0	Interface	DB Pin
1	i80-parallel 8bit interface	DB15~08
0	i80-parallel 16bit interface	DB15~00

COUNTER DRAWING OF MODULE DIMENSION



ELECTRICAL CHARACTERISTICS

Conditions: VSS=0V, @Ta=25℃

Item	Symbol	MIN.	TYP.	MAX.	Unit
Power Voltage	VDD	2.5	2.8	3.3	V
Current for Driver	IDD	—	—	—	mA
Input logic high voltage	VIH	0.7IOVCC	—	IOVCC	V
Input logic low voltage	VIL	VSS	—	0.3IOVCC	V

Side BL:

Constant voltage driving:

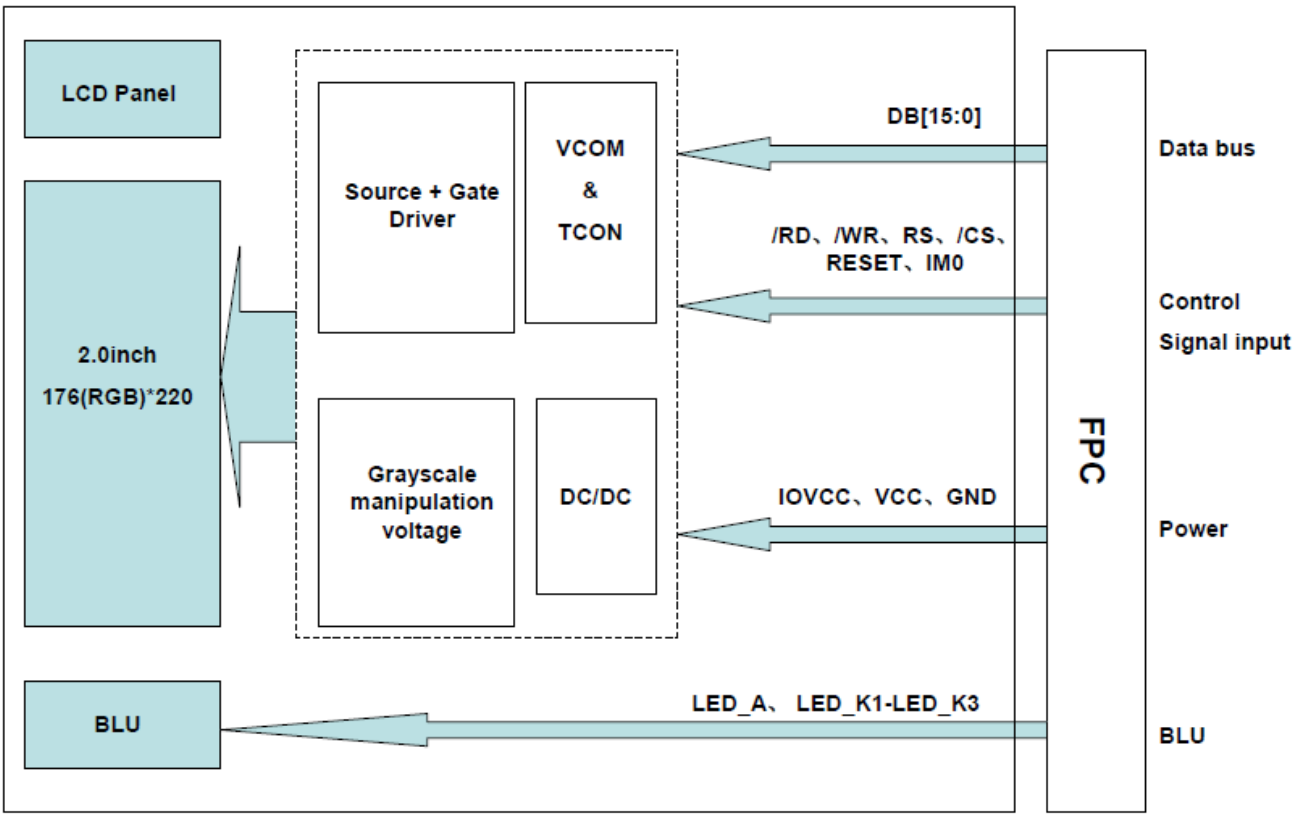
Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
White	I_{BL}	—	45	—	mA	V_{BL} = 3.1V

ABSOLUTE MAXIMUM RATINGS

Please make sure not to exceed the following maximum rating values under the worst application conditions

Item	Symbol	Rating	Unit
Supply Voltage	V_{DD}	-0.3 to 4.6	V
Input Voltage	Vi	-0.3 to 4.6	V
Operating Temperature	T_{opr}	-20 to 70	℃
Storage Temperature	T_{stg}	-30 to 80	℃

Block Diagram and Power Supply

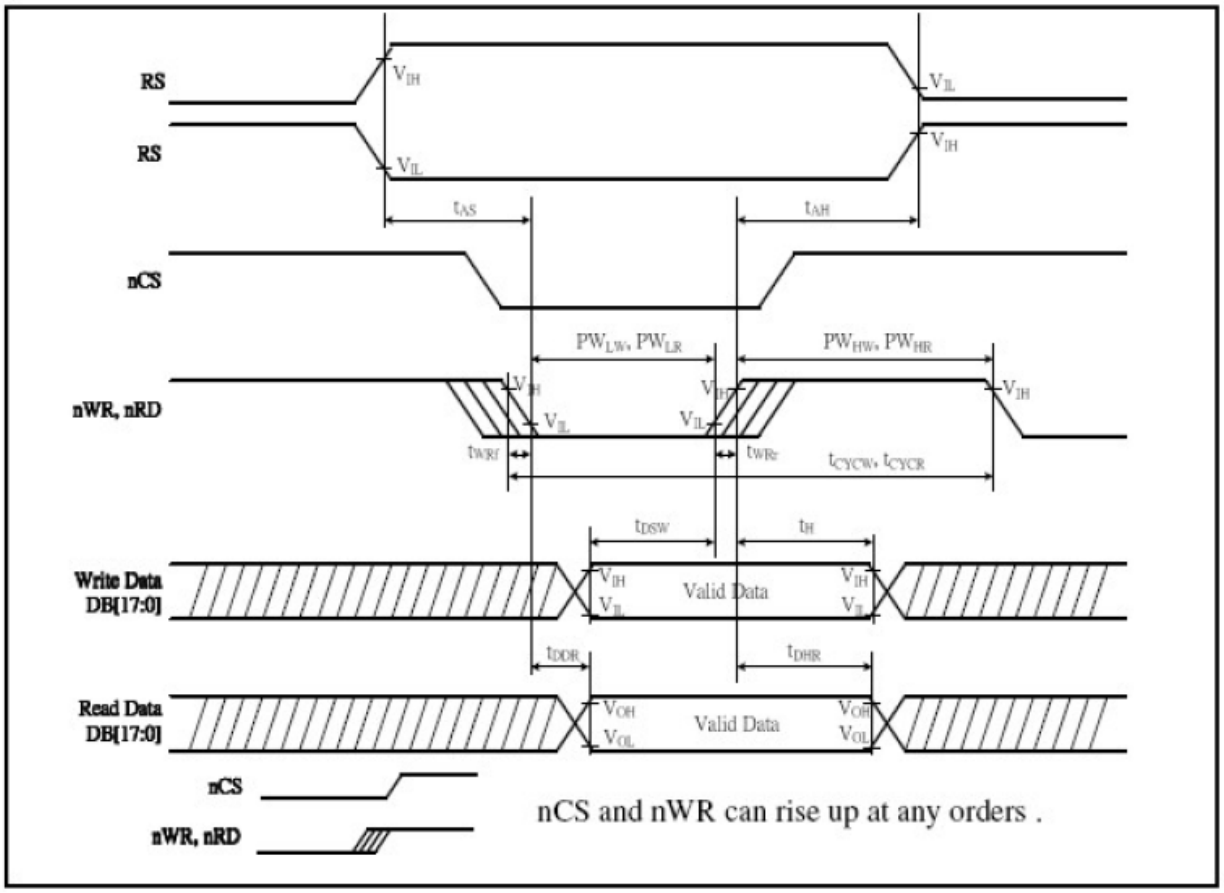


AC Characteristics

80-System Interface Timing Characteristics

Normal Write Mode (IOVCC = 1.65~3.3V, VCI=2.5~3.3V)

Item		Symbol	Unit	Min.	Max.	Test Condition
Bus cycle time	Write	t_{CYCW}	ns	66	-	-
	Read	t_{CYCR}	ns	300	-	-
Write low-level pulse width		PW_{LW}	ns	35	500	-
Write high-level pulse width		PW_{HW}	ns	35	-	-
Read low-level pulse width		PW_{LR}	ns	150	-	-
Read high-level pulse width		PW_{HR}	ns	150	-	
Write / Read rise / fall time		t_{WRr}/t_{WRf}	ns	-	15	
Setup time	Write (RS to nCS, E/nWR)	t_{AS}	ns	10	-	
	Read (RS to nCS, RW/nRD)			5	-	
Address hold time		t_{AH}	ns	5	-	
Write data set up time		t_{DSW}	ns	10	-	
Write data hold time		t_H	ns	15	-	
Read data delay time		t_{DDR}	ns	-	100	
Read data hold time		t_{DHR}	ns	5	-	



ELECTRO-OPTICAL CHARACTERISTICS

ITEM	SYMBOL	UNIT	Value
RESPONSE TIME	Ton	ms	20
	Toff	ms	—
CONTRAST RATIO	Cr	-	300
VIEWING ANGLE (6 O'clock) CR ≥ 10	V3:00	°	45
	V6:00	°	45
	V9:00	°	45
	V12:00	°	20

THE ELECTRO-OPTICAL CHARACTERISTICS ARE MEASURED VALUE BUT NOT GUARANTEED ONES.

RELIABILITY OF LCD MODULE

NO.	Item	TEST CONDITION FOR WIDE TEMPERATURE	TIME
1	High Temperature Storage	80°C	96 hours
2	Low Temperature Storage	-30°C	96 hours
3	High Temperature Operation	70°C	96 hours
4	Low Temperature Operation	-20°C	96 hours
5	High Temperature Humidity Storage	60°C, 90%RH	96 hours
6	Thermal Shock	-20°C/60 min ~ +70°C/60 min for a total 20 cycles	20 cycle
7	Vibration Test	Frequency range : 10~55Hz Stroke: 1.5mm Sweep: 10Hz~55Hz~10Hz	30 min for each direction of X. Y. Z.
8	Package Drop Test	Height : 80cm 1 corner, 3 edges, 6 surfaces	—

SAMPLING METHOD

SAMPLING PLAN: ANSI/ASQ Z1.4

CLASS OF AQL: LEVEL II/ SINGLE SAMPLING
MAJOR-0.65% MINOR – 1.5%

THE ENVIRONMENTAL CONDITION OF INSPECTION

The environmental condition and visual inspection shall be conducted as below.

(1) Ambient temperature : 25+/-5°C
(2) Humidity : 25-75 % RH
(3) Panel visual inspection on the operation condition for cosmetic shall be conducted at the distance 30~40cm or more between the LCD module and eyes of inspector.
Ambient Illumination : 800~1200 Lux for external appearance inspection
Ambient Illumination : 200~500 Lux for light on inspection
(4) The viewing angel:
   a) +/-15 degree to the front surface of display panel in vertical direction.
   b) +/-15 degree to the front surface of display panel in horizontal direction.

INSPECTION CRITERIA

(1) Definition of dot defect induced from the panel inside
   a) Bright dot: Dots appear bright and unchanged in size in which LCD panel is displaying under black pattern.
   b) Dark dot: Dots appear dark and unchanged in size in which LCD panel is displaying under pure red, green, blue picture.
   c) 2 dot adjacent = 1 pair = 2dots

HANDLING PRECAUTIONS

(1) CAUTION OF LCD HANDLING

- The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
- The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
- To avoid contamination on the display surface, do not touch the module surface with bare hands.
- Keep a space so that the LCD panels do not touch other components.
- Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
- Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
- Do not leave module in direct sunlight to avoid malfunction of the ICs.

(2) CAUTION OF LCD CLEANING

- Do not wipe the polarizer with dry cloth. It might cause scratch.
- Only use a soft cloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

(3) CAUTION OF STORAGE

- Store the module in a dark room where must keep at 25+/-10°C and 65%RH or less.
- Do not store the module in surroundings containing organic solvent or corrosive gas.
- Store the module in an anti-electrostatic container or bag.

(4) STATIC ELECTRICITY

- Be sure to ground module before turning on power or operating module.
- Do not apply voltage which exceeds the absolute maximum rating value.

(5) TRANSPORTATION PRECAUTIONS

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

(6) SAFETY

- For crash damage or unnecessary LCD’s, it is recommended to wash off liquid crystal by either of solvents such as acetone and ethanol and should be burned up later.
- When any liquid leaked out of a damage glass cell comes in contact with your hands, wash it off with soap and water.