



CLOVER DISPLAY LTD.

LCD MODULE SPECIFICATION

Model : CV640200A - _ _ - _ _ - _ _ - _ _

Revision	01
Engineering	TIMMY KWAN
Date	18 November 2008
Our Reference	X4944

ADDRESS : ROOM 1006, 10/F WESTIN CENTRE, 26 HUNG TO ROAD, KWUN TONG,
KOWLOON, HONG KONG.

TEL : (852) 2341 3238 (SALES OFFICE) (852) 2342 8228 (GENERAL OFFICE)

FAX : (852) 2357 4237 (SALES OFFICE) (852) 2341 8785 (GENERAL OFFICE)

E-MAIL : cdl@cloverdisplay.com

URL : <http://www.cloverdisplay.com>

MODE OF DISPLAY

Display mode	Display condition	Viewing direction
STN : Yellow green	Reflective type	6 O' clock
Grey	Transflective type	12 O' clock
Blue (negative)	Transmissive type	3 O' clock
FSTN positive	Others	9 O' clock
FSTN negative		

LCD MODULE NUMBER NOTATION:

CV640200A- MY - S F - N 6 - T

| | | | | | | |

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

* (1)---Model number of standard LCD Modules

* (2)---Backlight type

N – No backlight
 E – EL backlight
 L – Side-lited LED backlight
 M – Array LED backlight
 C – CCFL

* (3)---Backlight color

N – No backlight
 A – Amber
 B – Blue
 O – Orange
 W – White
 Y – Yellow green

* (4)---Display mode

T – TN
 V – TN (Negative)
 S – STN Yellow green
 G – STN Grey
 B – STN Blue (Negative)
 F – FSTN
 N – FSTN (Negative)

* (5)---Rear polarizer type

R – Reflective
 F – Transflective
 T – Transmissive

* (6)---Temperature range

N – Normal
 W – Extended

* (7)---Viewing direction

6 – 6 O'clock
 2 – 12 O'clock
 3 – 3 O'clock
 9 – 9 O'clock

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

(Can be omitted if not used)

T – Touch panel (Analog)
 P – Touch panel (Digital)

GENERAL DESCRIPTION

Display mode	:	640 x 200 dots, graphic LCD module
Interface	:	4-bit data transfer
Driving method	:	1/200 duty, 1/15 bias
Driver IC	:	AVANT SDN8080G or equivalent For the detailed information, please refer to the IC specifications.

MECHANICAL DIMENSIONS

Item	Dimension		Unit	Item	Dimension		Unit
Outline Dimension	256.29(L)x128.02(W)x(H1/H2)		mm	Dot Pitch	0.35(L)x0.49(W)		mm
Viewing Area	232.16(L)x106.17(W)		mm	Dot Size	0.30(L)x0.44(W)		mm
No Backlight (N)	H1	4.48	mm	Side Backlight (L)	H1	-	mm
	H2	10.0 Max	mm		H2	-	mm
EL Backlight (E)	H1	-	mm	Array Backlight (M)	H1	-	mm
	H2	-	mm		H2	-	mm
CCFL Backlight (C)	H1	8.0	mm	-	-	-	-
	H2	13.5 Max	mm		-	-	-

CONNECTOR PIN ASSIGNMENT**CN1**

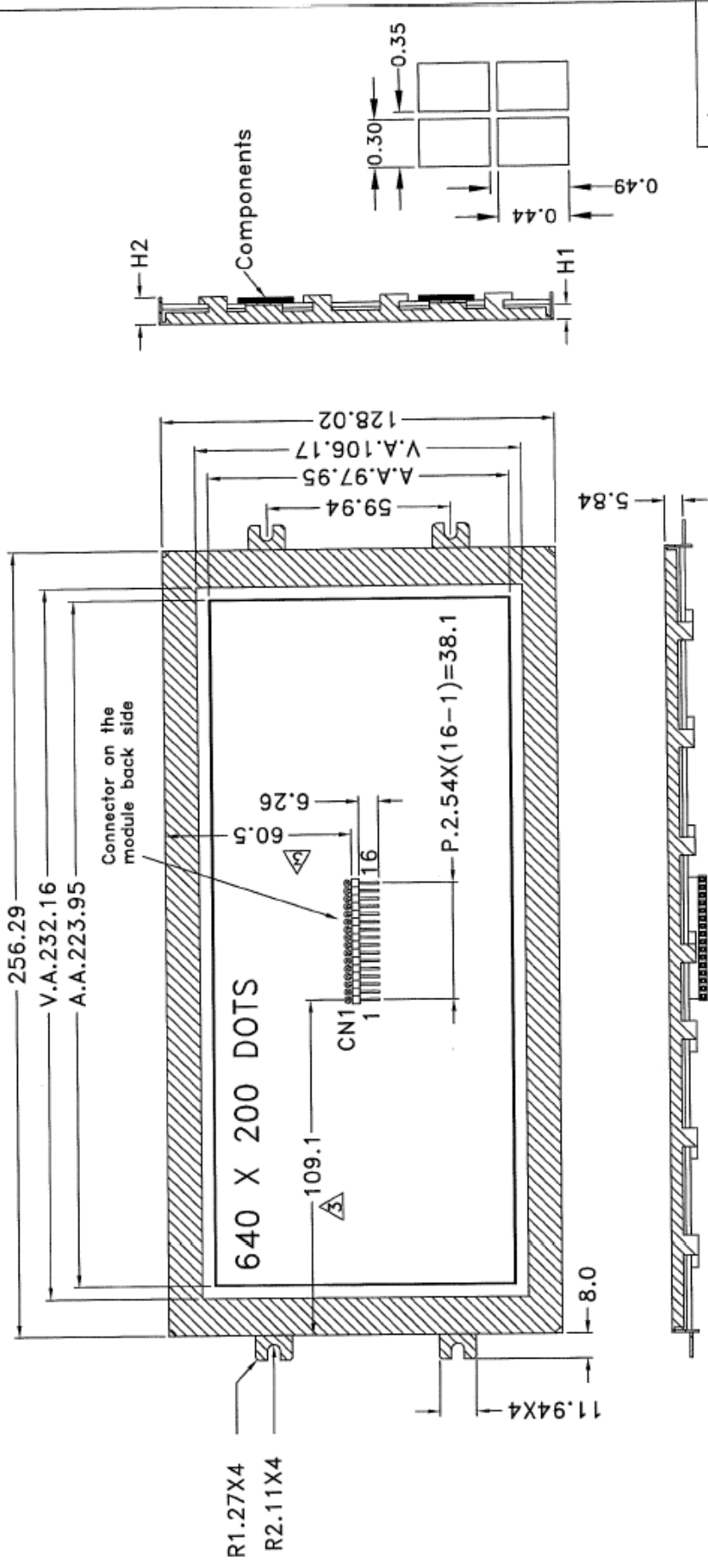
Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	FLM	First line marker	10	D1	Display Data Signal
2	CLK1	Data Latch Signal	11	D2	
3	CLK2	Data Input Clock Signal	12	D3	
4	M	DC Alternating Waveform Signal	13	/DISPOFF	Display Off
5	VO	Contrast Adjust	14	NC	No Connection
6	VDD	Logic Supply Voltage	15	TSENSE	Optional Temperature Sensor Output
7	VSS	Ground	16	VSS	Ground
8	VEE	LCD Supply Voltage (-)			
9	D0	Display Data Signal			

CN2

Pin No.	Symbol	Function
1	CFL HV	Supply voltage for backlight (CCFL HV)
2	NC	No connection
3		
4	CFL GND	Supply voltage for backlight (CCFL GND)

COUNTER DRAWING OF MODULE DIMENSION

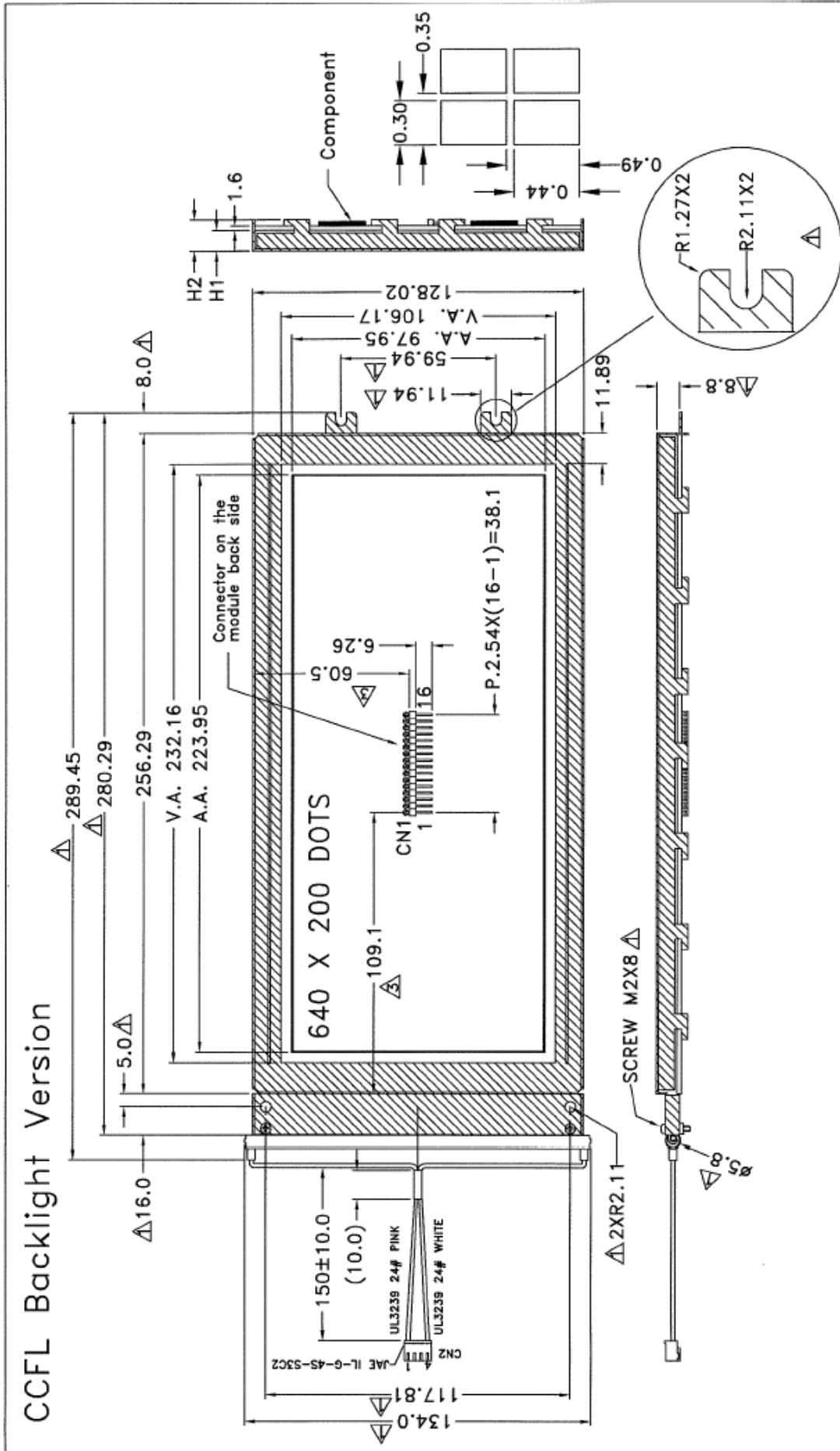
MARK	REASON	PREPARED	DATE
△	Remove FFC, EL backlight and Add side backlight, pin out and modify dimension	Brian	11 JUN 03
△	Update version	Roger	13 MAR 06
△	Change driver IC & CN1 location	Timmy	18 NOV 08



REV.	REVISION RECORD	SCALE	N.T.S.	UNIT IN mm	DATE	APPROVED	MODEL NO.	SHEET
00	1st ISSUE				23 SEP 04	CUSTOMER	CV640200A	1 OF 4
01	Change design of the backlight, bezel and pin header				23 OCT 05	AGENT	TITLE: MODULE DIMENSION WITH NO BACKLIGHT	
02	Update version				13 MAR 06		DRAWN BY: Timmy	DATE: 18 NOV 08
03	Change driver IC & CN1 location				18 NOV 08		CHECKED BY: <i>[Signature]</i>	DATE: 18/11/08
							APPROVED BY: <i>[Signature]</i>	DATE: 18/11/08
							OUR REF. X4944	
							CUSTOMER REF.	

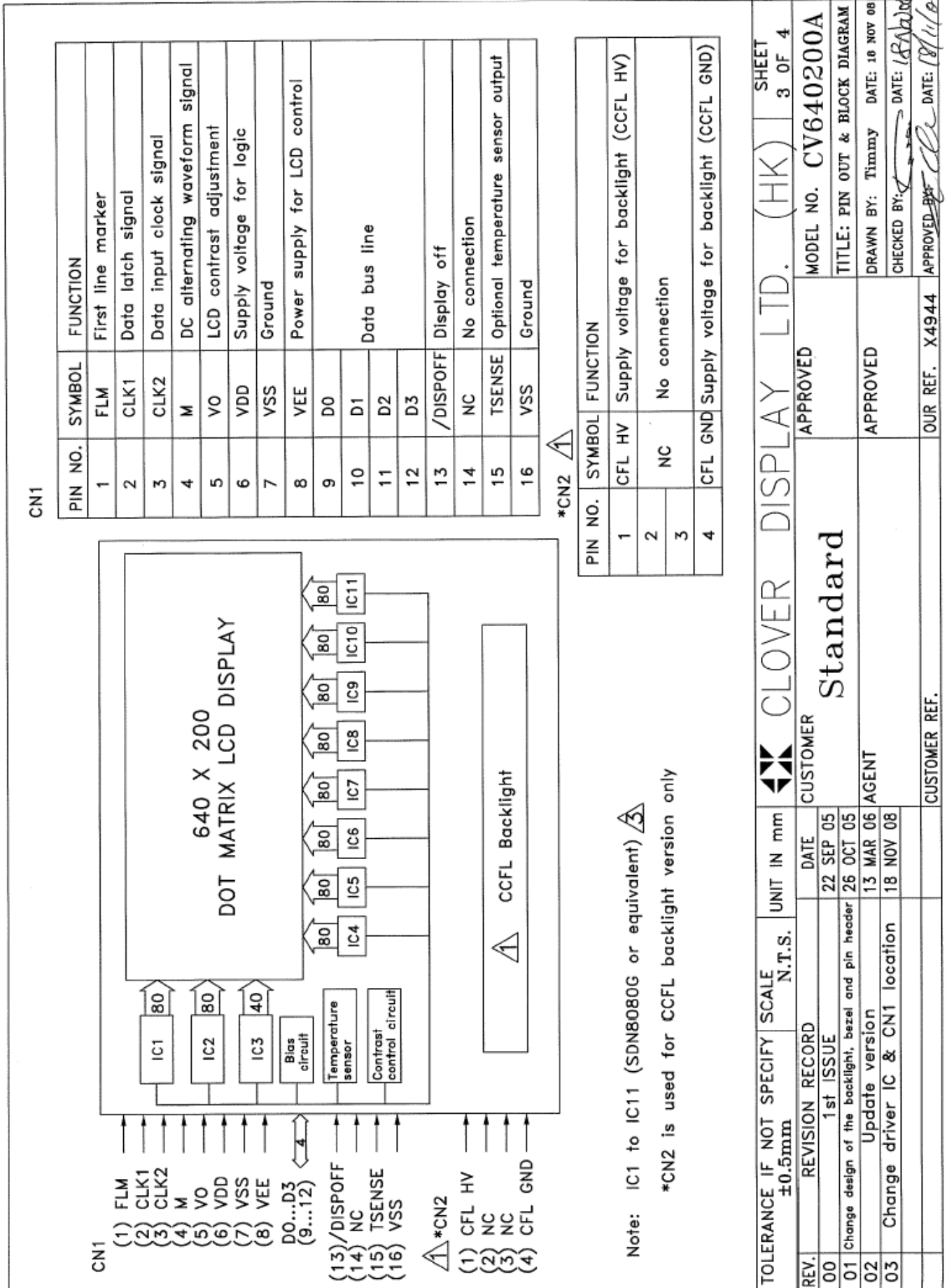
COUNTER DRAWING OF MODULE DIMENSION

(WITH CCFL BACKLIGHT VERSION)



TOLERANCE IF NOT SPECIFY ±0.5mm		SCALE N.T.S.	UNIT IN mm	CLOVER DISPLAY LTD. (HK)		SHEET 2 OF 4
REV.	REVISION RECORD	DATE	DATE	CUSTOMER	APPROVED	MODEL NO. CV640200A
00	1st ISSUE	22 SEP 05	22 SEP 05	Standard		TITLE: MODULE DIMENSION WITH CCFL BACKLIGHT
01	Change design of the backlight, bezel and pin header	26 OCT 05	26 OCT 05	AGENT	APPROVED	DRAWN BY: Timmy DATE: 18 NOV 08
02	Update version	13 MAR 06	13 MAR 06			CHECKED BY: DATE: 18/11/08
03	Change driver IC & CN1 location	18 NOV 08	18 NOV 08			APPROVED BY: DATE: 18/11/08
				CUSTOMER REF.	OUR REF. X4944	

COUNTER DRAWING OF PINOUT & BLOCK
DIAGRAM



ELECTRICAL CHARACTERISTICS

Conditions: VSS=0V, @Ta=25

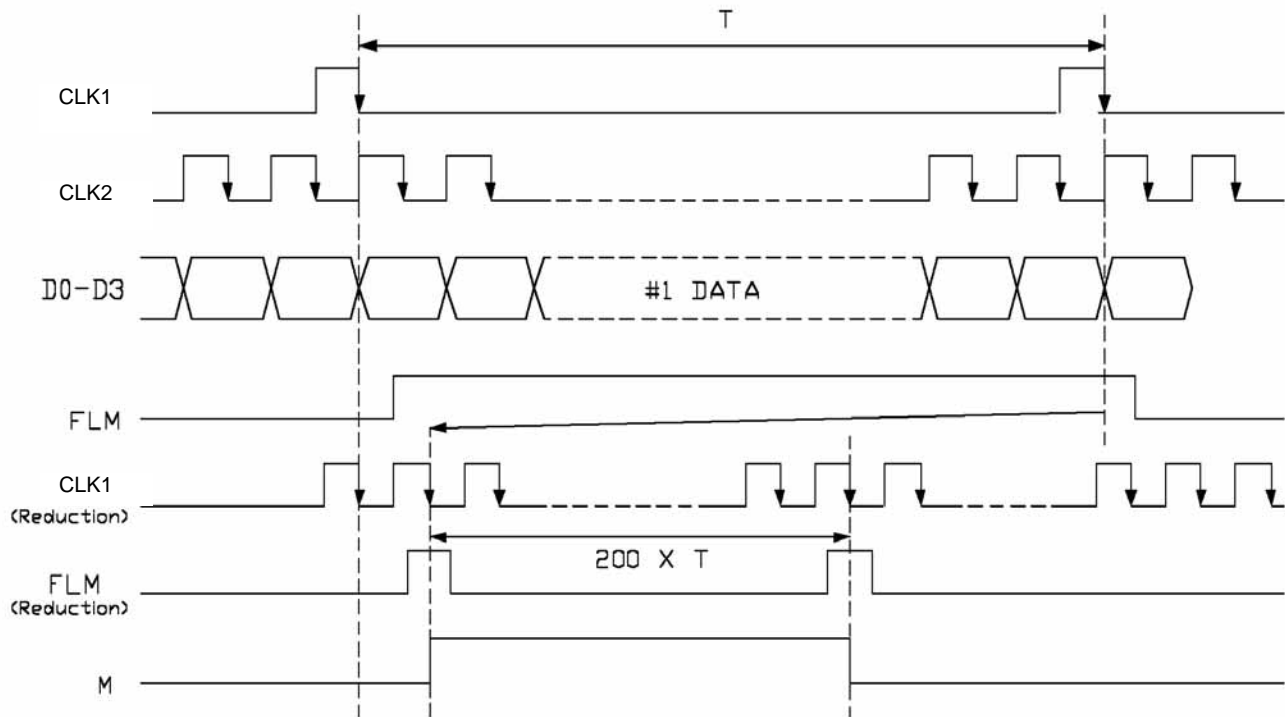
Item	Symbol	MIN.	TYP.	MAX.	Unit	Item	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage	VDD	4.50	5.00	5.50	V	“H”Level Input Voltage	VIH	0.8 VDD	-	VDD	V
Supply Current	IDD	-	9.35	-	mA	“L”Level Input Voltage	VIL	0.0	-	0.2 VDD	V
LCD Power supply	VEE	-19.00	-	-24.00	V	Contrast Adjust	VO	0.0	+2.1	+5.0	V
Backlight Voltage						Backlight Current					
EL (@ Frequency 400Hz)	VEL	-	-	-	V	-	-	-	-	-	-
Side-lited LED						Side-lited LED					
Blue	VBL	-	-	-	V	Blue	IBL	-	-	-	mA
Yellow Green	VBL	-	-	-	V	Yellow Green	IBL	-	-	-	mA
Array LED						Array LED					
Yellow Green	VBL	-	-	-	V	Yellow Green	IBL	-	-	-	mA
Amber	VBL	-	-	-	V	Amber	IBL	-	-	-	mA
Orange	VBL	-	-	-	V	Orange	IBL	-	-	-	mA
Soft Orange	VBL	-	-	-	V	Soft Orange	IBL	-	-	-	mA
CCFL						CCFL					
White	VBL	-	300	-	V _{rms}	White	IBL	-	5.0	-	mA _{rms}

ABSOLUTE MAXIMUM RATINGS

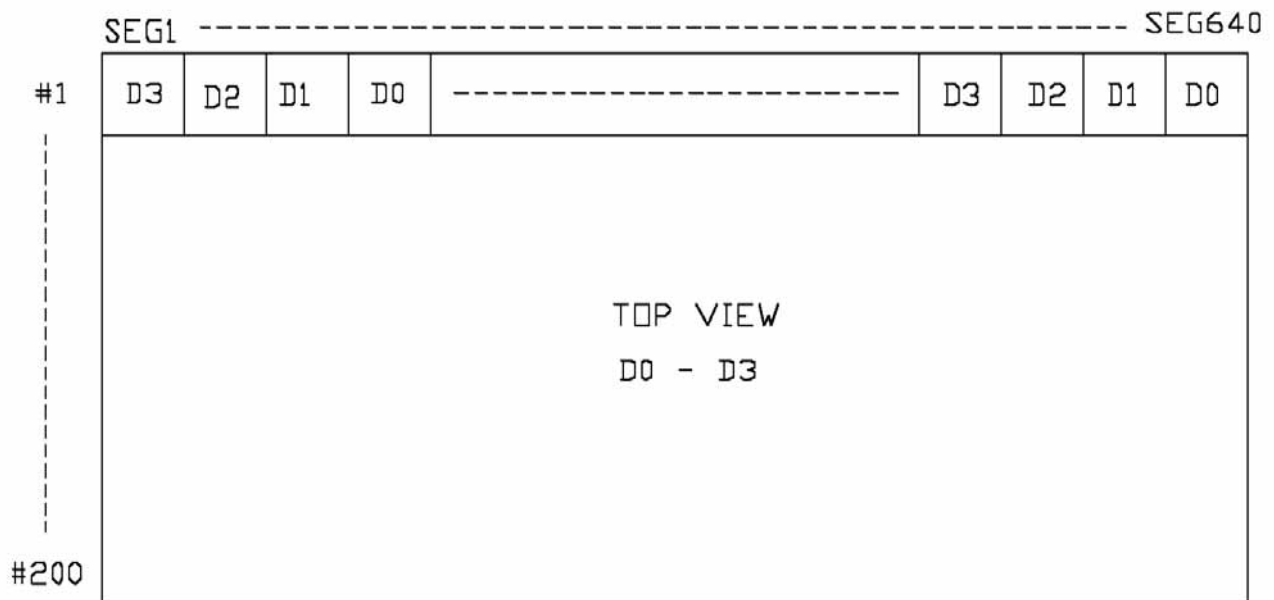
Please make sure not to exceed the following maximum rating values under the worst application conditions

Item	Symbol	Rating (for normal temperature)	Rating (for wide temperature)	Unit
Supply Voltage	VDD	-0.3 to 7.0	-0.3 to 7.0	V
Input Voltage	VT	-0.3 to VDD+0.3	-0.3 to VDD+0.3	V
Operating Temperature	T _{opr}	0 to 50	-20 to 70	
Storage Temperature	T _{stg}	-10 to 60	-30 to 80	

TIMING CHART



DISPLAY AND DATA

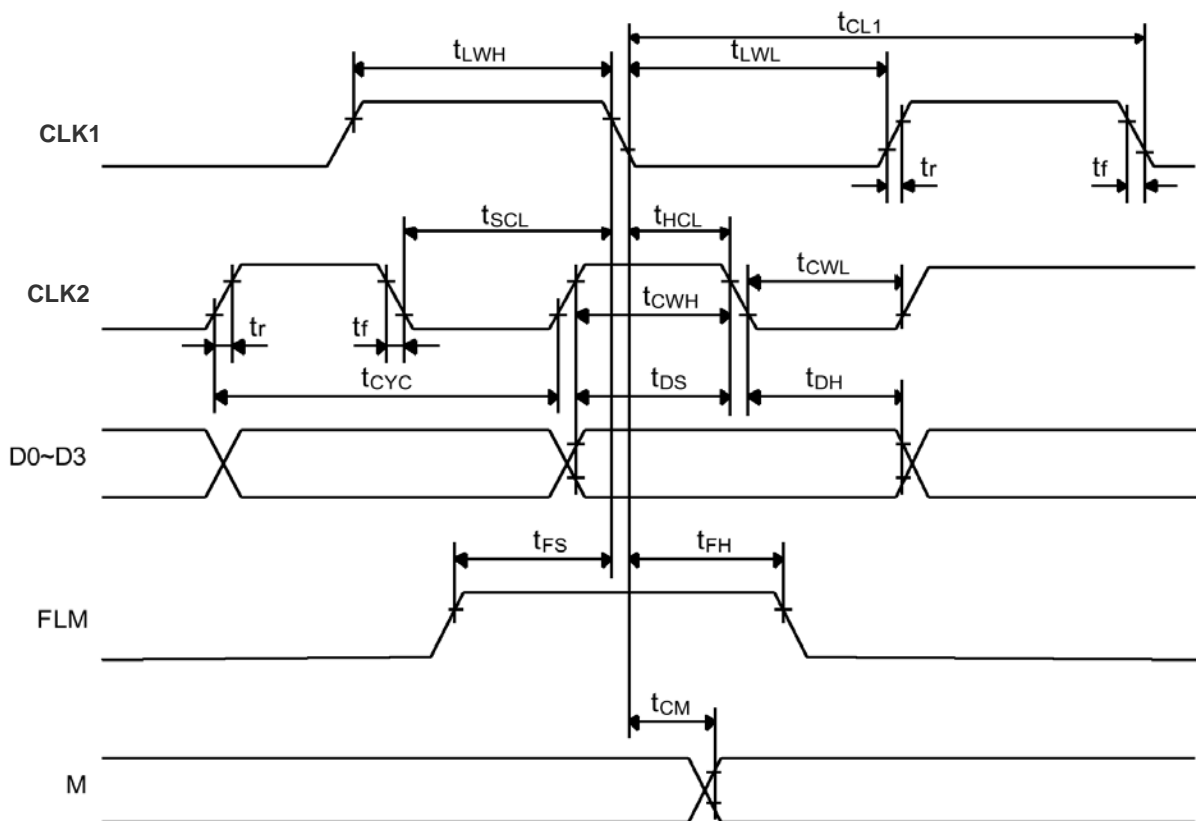


AC CHARACTERISTICS

Parameter	Symbol	Min.	Max.	Units
Clock Pulse Cycle Time	t_{CYC}	167	-	ns
Clock Pulse High Level Width	t_{CWH}	50	-	ns
Clock Pulse Low Level Width	t_{CWL}	50	-	ns
Clock Pulse Setup Time	t_{SCL}	80	-	ns
Clock Pulse Hold Time	t_{HCL}	80	-	ns
Clock Pulse Rise/Fall Time	t_r, t_f	-	50	ns
LP High Level Width	t_{LWH}	50	-	ns
LP Low Level Width	t_{LWL}	50	-	ns
LP Cycle Time	t_{CL1}	250	-	ns
Data Setup Time	t_{DS}	30	-	ns
Data Hold Time	t_{DH}	30	-	ns
FLM Data Setup Time	t_{FS}	100	-	ns
FLM Data Hold Time	t_{FH}	100	-	ns
M Phase Difference	t_{CM}	-	250	ns

Note : Please satisfy the following conditions (1), (2) in the same time.

- (1) $t_r, t_f < (t_{CYC} - t_{CWH} - t_{CWL}) / 2$
- (2) $t_r, t_f \leq 50$



ELECTRO-OPTICAL CHARACTERISTICS

MEASURING CONDITION: POWER SUPPLY = $V_{OP} / 64 \text{ Hz}$
 TEMPERATURE = $23 \pm 5 \text{ }^\circ\text{C}$
 RELATIVE HUMIDITY = $60 \pm 20\%$

ITEM	SYMBOL	UNIT	TYP.
RESPONSE TIME	Ton	ms	370
	Toff	ms	470
CONTRAST RATIO	Cr	-	7
VIEWING ANGLE (6 O'clock) (Cr \geq 2)	V3:00	$^\circ$	40
	V6:00	$^\circ$	50
	V9:00	$^\circ$	40
	V12:00	$^\circ$	30

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

RELIABILITY OF LCD MODULE

ITEM	TEST CONDITION FOR NORMAL TEMPERATURE	TEST CONDITION FOR WIDE TEMPERATURE	TIME
High temperature operating	50 $^\circ\text{C}$	70 $^\circ\text{C}$	240 hours
Low temperature operating	0 $^\circ\text{C}$	-20 $^\circ\text{C}$	240 hours
High temperature storage	60 $^\circ\text{C}$	80 $^\circ\text{C}$	240 hours
Low temperature storage	-10 $^\circ\text{C}$	-30 $^\circ\text{C}$	240 hours
Temperature-humidity storage	40 $^\circ\text{C}$ 90% R.H.	60 $^\circ\text{C}$ 90% R.H.	96 hours
Temperature cycling	-10 $^\circ\text{C}$ to 60 $^\circ\text{C}$ 30 Min Dwell	-30 $^\circ\text{C}$ to 80 $^\circ\text{C}$ 30 Min Dwell	5 cycle
Vibration Test at LCM Level	Freq 10-55 Hz Sweep rate: 10-55-10 at 1 min Sweep mode Linear Displacement: 2 mm p-p 1 Hour each for X, Y, Z	Freq 10-55 Hz Sweep rate: 10-55-10 at 1 min Sweep mode Linear Displacement: 2 mm p-p 1 Hour each for X, Y, Z	—

QUALITY STANDARD OF LCD MODULE

1.0	Sampling Method Sampling Plan : MIL STD 105 E Class of AQL : Level II/Single Sampling Critical : 0.25% Major 0.65% Minor 1.5%		
2.0	Defect Group Critical Defect 0.25%(AQL)	Failure Category Malfunction	Failure Reasons Open Short Burnt or dead component Missing part/improper part P.C.B. Broken
	Major Defect 0.65%(AQL)	Poor Insulation	Potential short High current Component damage or scratched or Lying too close improper coating
		Poor Conduction	Damage joint Wrong polarity Wrong spec. part Uneven/intermittent contact Loose part Copper peeling Rust or corrosion or dirt's
Minor Defect 1.5%(AQL)	Cosmetic Defect	Minor scratch Flux residue Thin solder Poor plating Poor marking Crack solder Poor bending Poor packing Wrong size	

HANDLING PRECAUTIONS

(1) CAUTION OF LCD HANDLING & CLEANING

The polarizing plate on the surface of the panel is made from organic substances. Be very careful for chemicals not to touch the plate or it leads the polarizing plate to deteriorate.

If the use of a chemical is unavoidable, wipe the panel lightly with soft materials, such as gauze and absorbent cotton, soaked in a solvent.

*Usable solvent: Alcohol (ethanol, IPA and the like)

*Appropriate solvent: Ketones, ethyl alcohol

Avoid wiping with a dry cloth, since it could damage the surface of the polarizing plate and others.

(2) CAUTION AGAINST STATIC CHARGE

The LCD modules use CMOS LSI drivers, so customers are recommended that any unused input terminal would be connected to V_{DD} or V_{SS} , do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

(3) PACKAGING

Avoid intense shock and falls from a height and do not operate or store them exposed to direct sunshine or high temperature/humidity for long periods.

(4) CAUTION FOR OPERATION

The viewing angle can be adjusted by varying the LCD driving voltage V_O .

Driving voltage should be kept within specified range, excess voltage shortens display life.

Response time increases with decrease in temperature.

Display may turn black or dark Blue at temperature above its operational range; this is however not destructive and the display will return to normal once the temperature falls back to range.

Mechanical disturbance during operation (such as pressing on the viewing area) may cause the segments to appear "fractured". They will recover once the display is turned off.

Condensation at terminals will cause malfunction and possible electrochemical reaction. Relative humidity of the environment should therefore be kept below 60%.

(5) SAFETY

Liquid crystal may leak out of a damaged LCD, it is recommended to wash off the liquid crystal by using solvents such as acetone or ethanol and should be burned up later.

If any liquid leaks out of a damaged glass cell comes in contact with your hands, wash it off with soap and water immediately.

WARRANTY

CLOVER will replace or repair any of her LCD module in accordance with her LCD specification for a period of one year from date of shipment. The warranty liability of Clover is limited to repair and/or replacement. Clover will not be responsible for any subsequent or consequential event.