Specification

For

LCD Module

CCM1620CSL

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CCM1620CSL LCD MODULE

1、FEATURES

- Display Type: STN
- Display Format: 16 Characters x 2 Lines
- Input Data: 4-Bits or 8-Bits interface available
- Display Font: 5 x 8 Dots
- Display Mode: Yellow-Green
- Driving Mode: 1/16 Duty, 1/5 Bias
- Operating Voltage: 5.0V
- Viewing Direction: 6 O'clock
- Backlight: LED, Yellow-Green (4.2V)

2、ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min.	Max.	Unit
Power Supply for Logic	Vdd	-0.3	+7.0	V
Power Supply for LCD Drive	Vlcd	Vdd-13.5	Vdd+0.3	V
Input Voltage	Vi	-0.3	Vdd+0.3	V
Operating Temperature	Topr	0	+50	℃
Storage Temperature	TSgt	-20	+60	℃

3、MECHANICAL PARAMETERS

Item	Description	Unit
LCM Outline Dimension	80.0 x 36.0 x13.0 (MAX)	mm
Viewing Area	64.5 x 13.8	mm
Weight	About 40.0	g

4、SYSTEM BLOCK DIAGRAM

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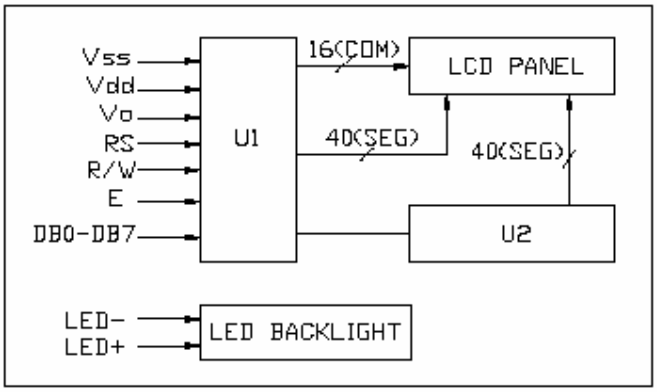

5、DC CHARACTERISTICS (Ta=25℃; Vdd=5.0V±5%,Vss=0V)

Item	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Voltage	Vdd	--	--	5.0	--	V
LCD Voltage	Vlcd	Vdd-Vo	--	5.0	--	V
Operating Current	Idd	Vdd=5.0V	--	1.2	1.8	MA
Input “High” Voltage (1) (Except OSC1)	Vih1	--	2.2	--	Vdd	V
Input “Low” Voltage (1) (Except OSC1)	Vil1	--	-0.3	--	0.6	V
Input “High” Voltage (2) (OSC1)	Vih2	--	Vdd-1.0	--	Vdd	V
Input “Low” Voltage (2) (OSC1)	Vil2	--	-0.2	--	1.0	V
Output “High” Voltage (1) (D0-D7)	Voh1	Ioh=-0.205mA	2.4	--	--	V
Output “Low” Voltage (1) (D0-D7)	Vol1	Iol=1.2mA	--	--	0.4	V

6、 LED Backlight CHARACTERISTICS (Ta=25ºC)

Characteristic	Symbol	Min.	Typ.	Max.	Conditions	Unit
Forward Voltage	Vf	--	4.2	--	If=100mA	V
Forward Current	If	--	--	150	--	mA
Reverse Voltage	Vr	--	--	8	--	V
Reverse Current	Ir	--	--	100	Vr=8V	UA

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Operating temp.	Topr	-20	--	+85	--	^{o}C
Storage temp.	Tstg	-25	--	+85	--	^{o}C

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7、PIN ASSIGNMENT

NO.	Symbol	Level	Function
1	Vss	--	GROUND
2	Vdd	--	POWER SUPPLY FOR LOGIC
3	Vo	--	POWER SUPPLY FOR LCD
4	RS	H/L	Register Select H: Data register L:Instruction register
5	R/W	H/L	H--Read L—Write
6	E	H, H-L	Start enable signal to read or write the data
7	DB0	H/L	Data bus used in 8 bit transfer
8	DB1	H/L	
9	DB2	H/L	
10	DB3	H/L	
11	DB4	H/L	Data bus for both 4 and 8 bit transfer
12	DB5	H/L	
13	DB6	H/L	
14	DB7	H/L	
15	A	--	LED Backlight (+)
16	K	--	LED Backlight (-)

8、AC CHARACTERISTICS (Vdd=5.0V±5%,Vss=0V ,Ta=25℃)

(Write mode)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
E Cycle Time	Tc	500	--	--	ns
E Rise/Fall Time	Tr,Tf	--	--	25	ns
E Pulse Width (High, Low)	Tpw	220	--	--	ns
R/W and RS Set-up Time	Tas	40	--	--	ns
R/W and RS Hold Time	Tah	10	--	--	ns
Data Set-up Time	Tdsw	60	--	--	ns
Data Hold Time	Th	10	--	--	ns

9、AC CHARACTERISTICS (Vdd=5.0V±5%,Vss=0V, Ta=25℃)

(Read mode)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
E Cycle Time	Tc	500	--	--	ns
E Rise/Fall Time	Tr,Tf	--	--	25	ns
E Pulse Width (High, Low)	Tpw	220	--	--	ns
R/W and RS Set-up Time	Tas	40	--	--	ns
R/W and RS Hold Time	Tah	10	--	--	ns
Data Set-up Time	Tddr	--	--	120	ns

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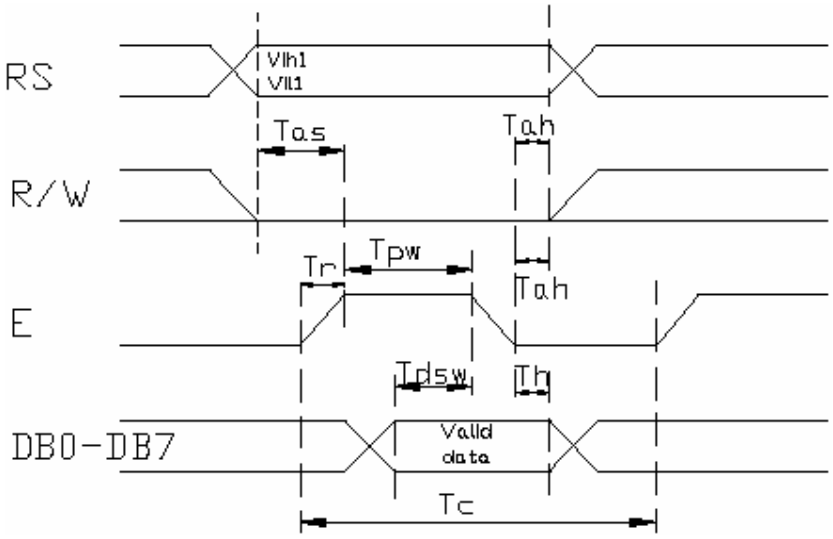
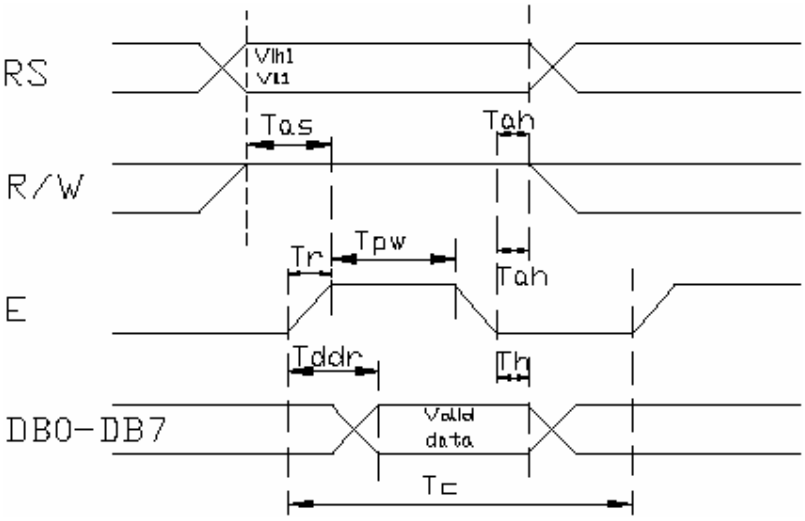
Data Hold Time	Th	20	--	--	Ns

10、WRITE MODE TIMING DIAGRAM



11、READ MODE TIMING DIAGRAM



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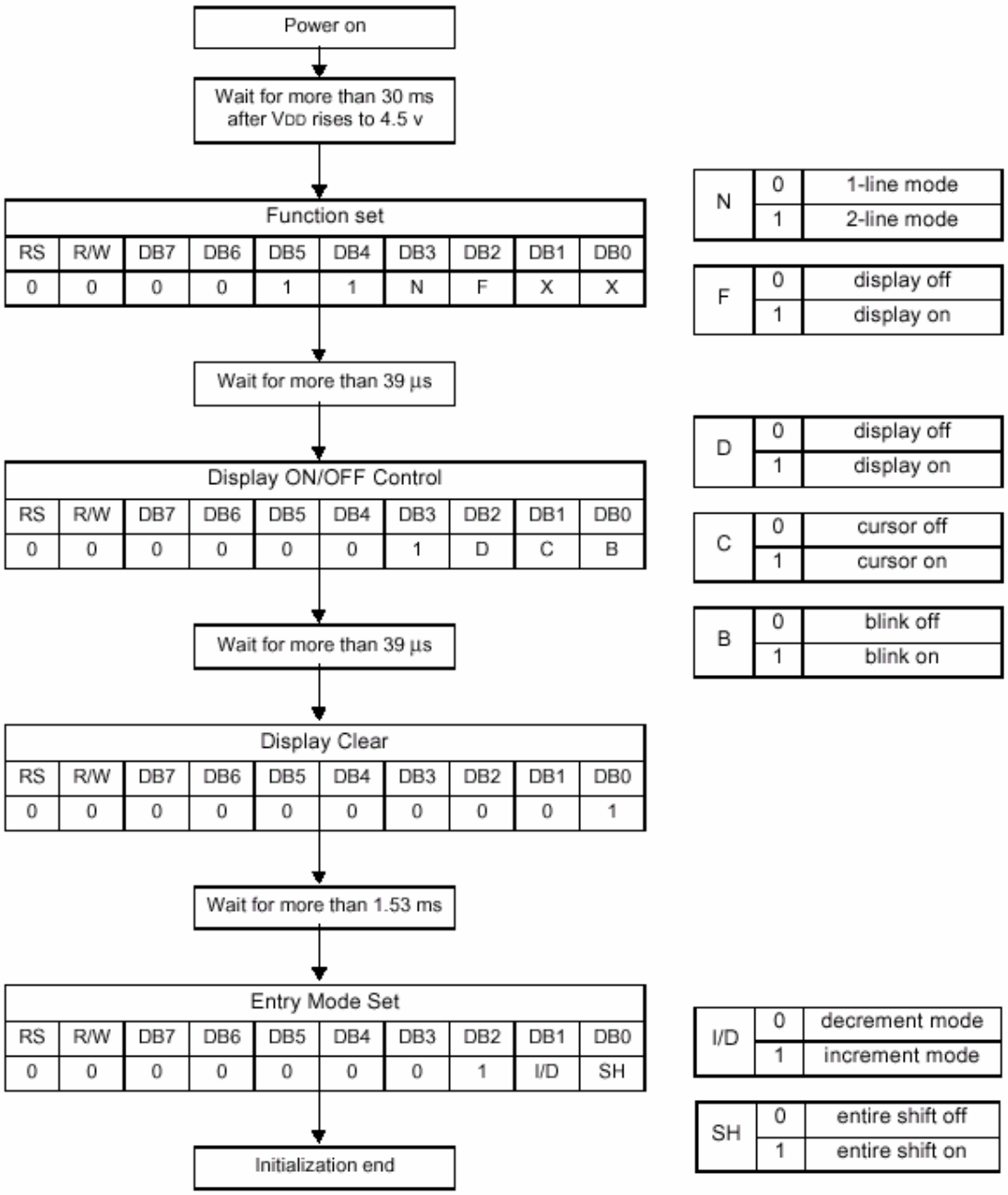
12.INITIALING BY INSTRUCTION

1) 8-bit interface mode (Condition: fosc = 270KHZ)



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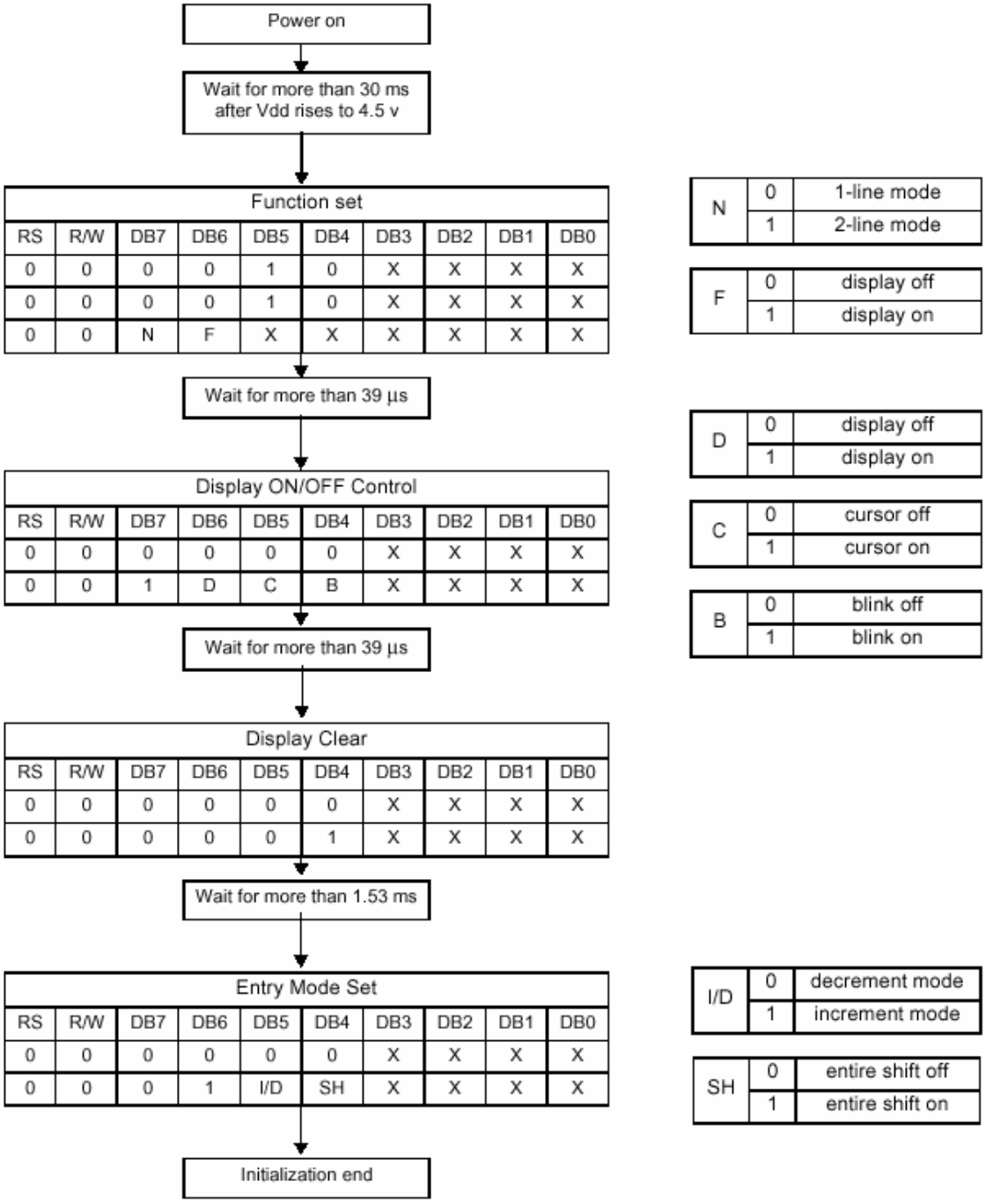
2) 4-bit interface mode (Condition: fosc = 270KHZ)



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13、CONTROLS AND DISPLAY COMMAND

Command	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Remark
Display Clear	L	L	L	L	L	L	L	L	L	H	Write “20H” to DDRAM.and set DDRAM address to “00H” from AC.
Return Home	L	L	L	L	L	L	L	L	H	X	Cursor move to first digit
Entry Mode Set	L	L	L	L	L	L	L	H	I/D	SH	I/D: Set cursor move direction H-Increase L-Decrease SH: Specifies shift of display H-Display is shifted L-Display is not shifted
Display On/Off Control	L	L	L	L	L	L	H	D	C	B	D: Display (H-on, L-off) C: Cursor (H-on, L-off) B: Blinking (H-on, L-off)
Shift	L	L	L	L	L	H	S/C	R/L	X	X	SC:(H-Display shift, L-Cursor move) R/L:(H-Right shift, L-Left shift)
Set Function	L	L	L	L	H	DL	N	F	X	X	DL:(H-8 bits interface, L-4 bits interface) N:(H-2 line display, L-1 line display) F:(H-5 x 10 dots, L-5 x 7 dots)
Set CGRAM Address	L	L	L	H	CG RAM address (Corresponds to address)						CGRAM data is sent and received after this setting
Set DDRAM Address	L	L	H	DD RAM address							DDRAM data is sent and received after this setting
Read Busy Flag & Address	L	H	BF	Address Counter used for Both DD & CGRAM address							BF:(H-Busy, L-Ready) --Reads BF indication Internal operating is being performed --Reads address counter contents
Write Data to RAM	H	L	Write Data								Write data into DDRAM or CGRAM
Read Data from RAM	H	H	Read Data								Read data from DDRAM or CGRAM

“X”: Don’t Care

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14、FONT TABLE

NO.KS0066U-00

b7-b4 / b3-b0	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000	CG RAM (1)															
0001	(2)															
0010	(3)															
0011	(4)															
0100	(5)															
0101	(6)															
0110	(7)															
0111	(8)															
1000	(1)															
1001	(2)															
1010	(3)															
1011	(4)															
1100	(5)															
1101	(6)															
1110	(7)															
1111	(8)															

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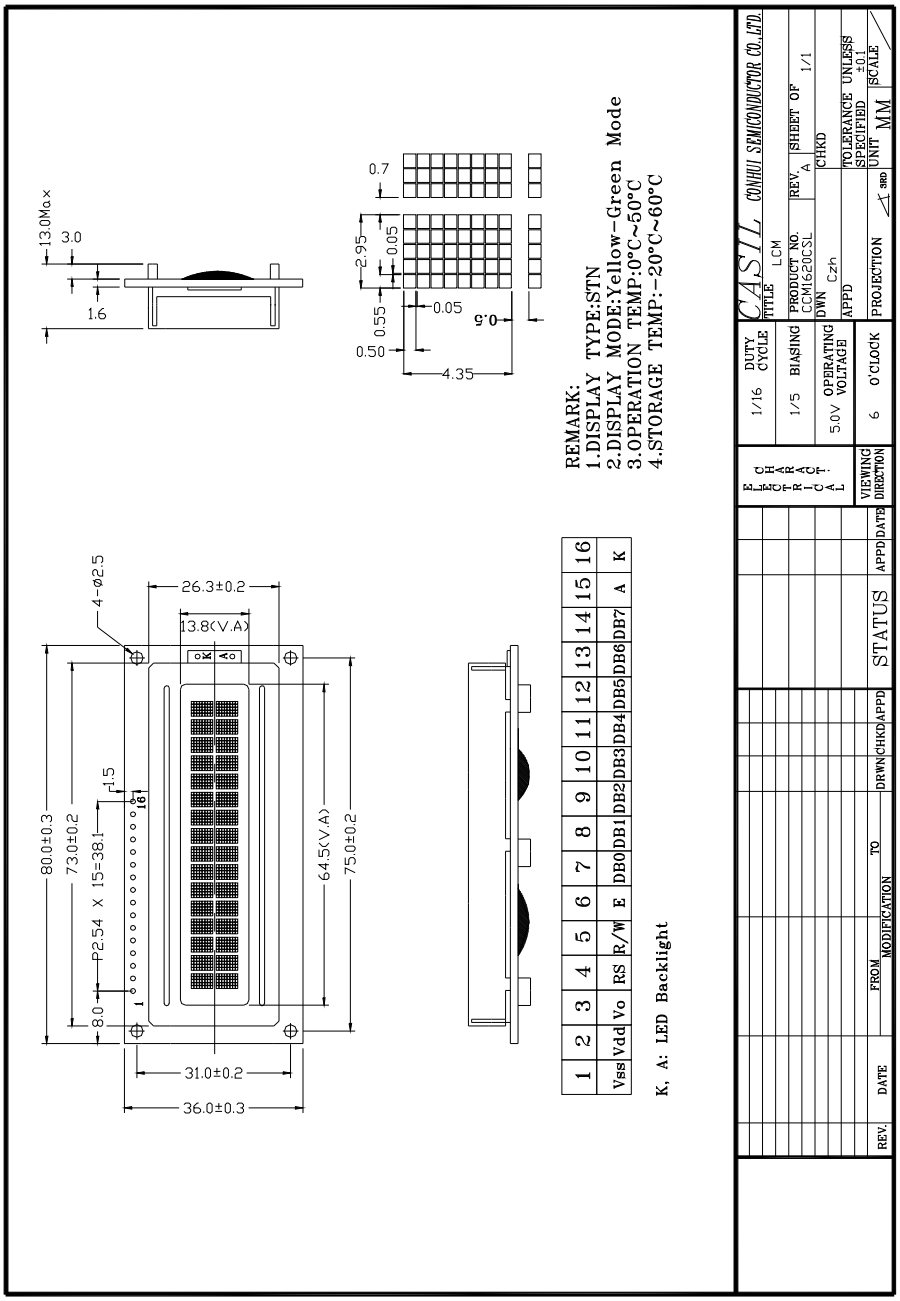
15、ASSEMBLY DIAGRAM



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Vss	Vdd	Vo	RS	R/W	E	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7	A	K