

Specification

For

LCD Module

CCM1620CSL



CCM1620CSL LCD MODULE

1、FEATURES

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

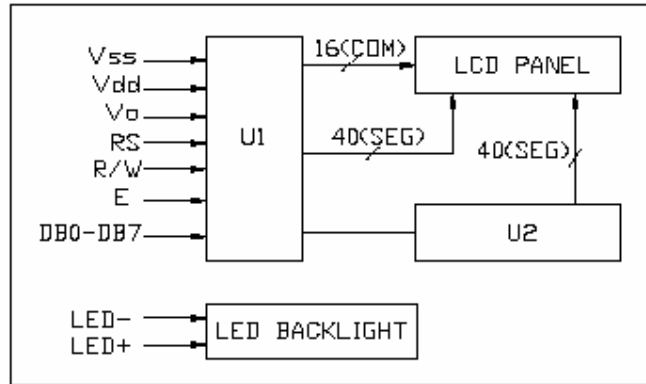
2、ABSOLUTE MAXIMUM RATINGS

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	°C
Storage Temperature	TSgt	-20	+60	°C

3、MECHANICAL PARAMETERS

Item	Description	Unit
LCM Outline Dimension	80.0 x 36.0 x 13.0 (MAX)	mm
Viewing Area	64.5 x 13.8	mm
Weight	About 40.0	g

4、SYSTEM BLOCK DIAGRAM



5、 DC CHARACTERISTICS (Ta=25°C; 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=25°C)

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	--	°C
Storage temp.	Tstg	-25	--	+85	--	°C



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°C)

(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°C)

(Read mode)

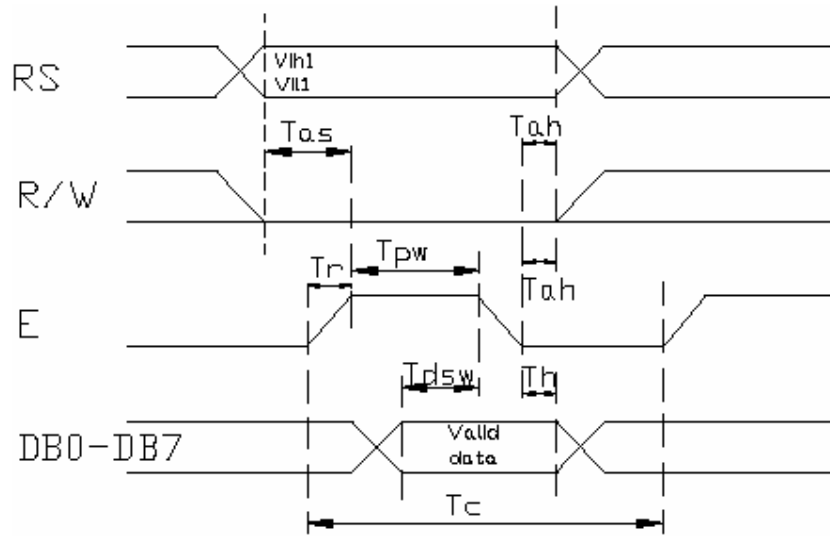
Characteristic	Symbol	Min.	Typ.	Max.	Unit
E Cycle Time	Tc	500	--	--	ns
E Rise/Fall Time	Tr, Tf	--	--	25	ns
E Pulse Width (High, Low)	Tpw	220	--	--	ns
R/W and RS Set-up Time	Tas	40	--	--	ns
R/W and RS Hold Time	Tah	10	--	--	ns
Data Set-up Time	Tddr	--	--	120	ns



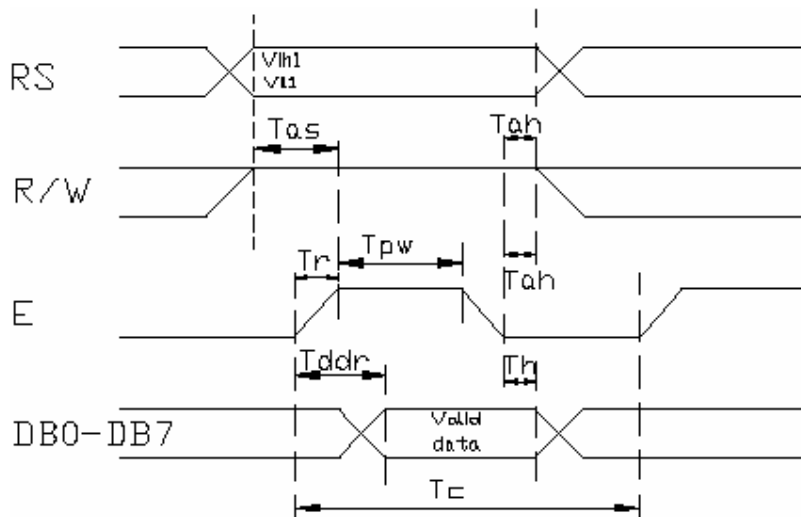
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Data Hold Time	Th	20	--	--	Ns
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10. WRITE MODE TIMING DIAGRAM



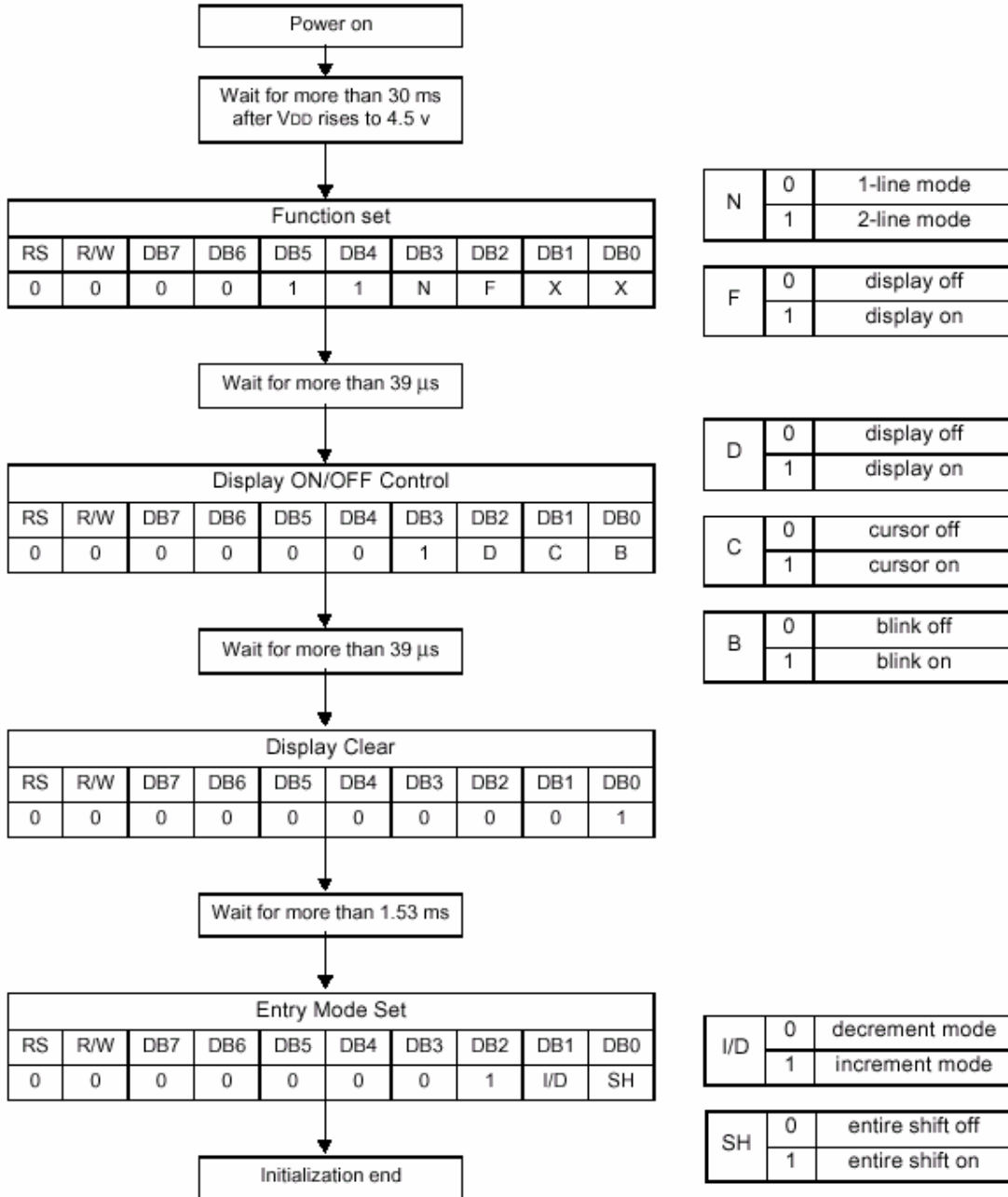
11. READ MODE TIMING DIAGRAM





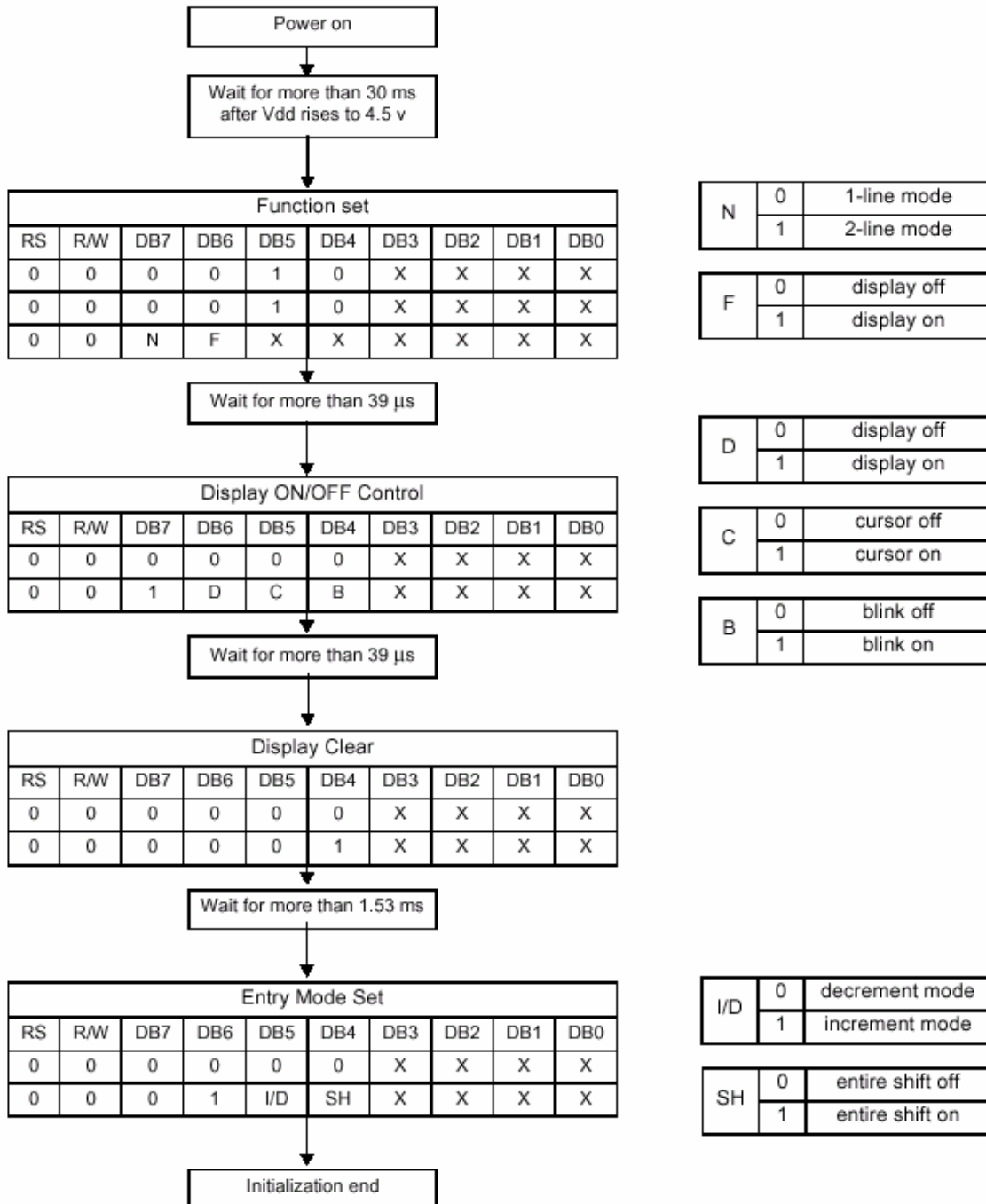
12. INITIALING BY INSTRUCTION

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





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





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



14、FONT TABLE

No. KS0066U-00

b7-b4 b2-b0	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000	CG RAM (1)			0	1	2	3	4				一	夕	ミ	ヨ	ロ
0001	(2)		!	1	A	Q	a	q			■	ア	チ	ク	ニ	グ
0010	(3)		"	2	B	R	b	r			■	イ	ツ	×	フ	ド
0011	(4)		#	3	C	S	c	s			■	ウ	テ	モ	セ	※
0100	(5)		\$	4	D	T	d	t			■	エ	ト	ヤ	ム	ル
0101	(6)		%	5	E	U	e	u			■	オ	ホ	イ	ロ	ウ
0110	(7)		&	6	F	V	f	v			■	カ	ニ	ヨ	ド	シ
0111	(8)		^	7	G	W	g	w			■	キ	ヌ	ラ	グ	ル
1000	(1)		<	8	H	X	h	x			■	ク	ネ	リ	フ	×
1001	(2)		>	9	I	Y	i	y			■	ケ	ル	ル	リ	フ
1010	(3)		*	:	J	Z	j	z			■	コ	ハ	レ	ジ	キ
1011	(4)		+	:	K	L	k	l			■	サ	ヒ	ロ	×	ル
1100	(5)		,	<	L	¥	l	l			■	シ	フ	フ	キ	ル
1101	(6)		-	=	M	I	m	i			■	ヌ	ハ	ラ	モ	ト
1110	(7)		.	>	N	^	n	^			■	セ	ホ	ハ	ル	
1111	(8)		/	?	O	L	o	←			■	ソ	マ	”	〇	■



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15、ASSEMBLY DIAGRAM

REMARK:
 1. DISPLAY TYPE: STN
 2. DISPLAY MODE: Yellow-Green Mode
 3. OPERATION TEMP: 0°C~50°C
 4. STORAGE TEMP: -20°C~60°C

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
V _{SS}	V _{DD}	V ₀	RS	R/W	E	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7	A	K

K, A: LED Backlight