



Specification

For

LCD Module

CCM0820CSLS2

CUSTOMER APPROVED:

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PREPARED BY	CHECKED BY	APPROVED BY
GCW	KIMI	CCH



CCM0820CSLS2 LCD MODULE

1、FEATURES

- y LCD Type: STN, Transflective
- y Display Format: 8 Characters x 2 Lines
- y Input Data: 4-Bits or 8-Bits interface available
- y Display Font: 5 x 8 Dots
- y Display Mode: Positive, Yellow-green
- y Driving Mode: 1/16Duty, 1/5Bias
- y Operating Voltage: 5.0V
- y Viewing Direction: 6 O'clock
- y Backlight color: YELLOW GREEN

2、ABSOLUTE MAXIMUM

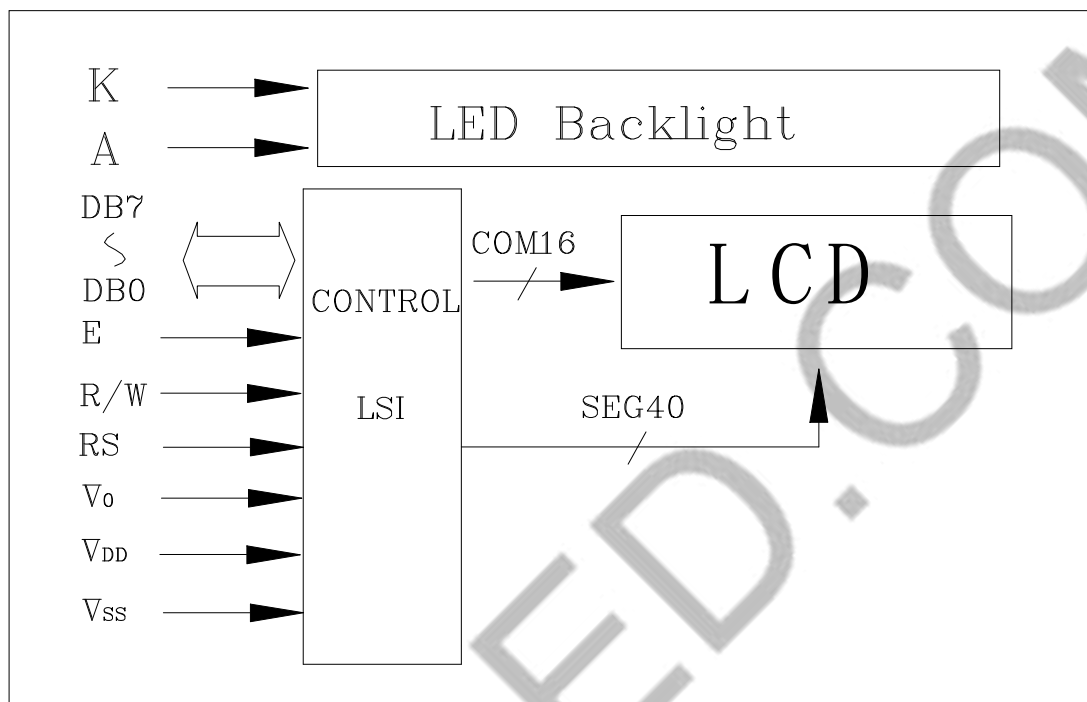
Item	Symbol	Min.	Max.	Unit
Power Supply for Logic	V _{DD}	-0.3	+7.0	V
Power Supply for LCD Drive	V _{LCD}	V _{DD} -15.0	V _{DD} +0.3	V
Input Voltage	V _{IN}	-0.3	V _{DD} +0.3	V
Operating Temperature	T _{OPR}	0	+50	°C
Storage Temperature	T _{STG}	-10	+60	°C

3、MECHANICAL PARAMETERS

Item	Description	Unit
LCM Outline Dimension	58.0 x 32.0 x 13.5	mm
Viewing Area	38.0 x 16.0	mm
Weight	---	g



4、SYSTEM BLOCK DIAGRAM



5、PIN ASSIGNMENT

NO.	Symbol	Level	Function
1	V _{SS}	--	0V
2	V _{DD}	--	+5.0V
3	V ₀	--	For LCD Power Supply
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	Enable Signal
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	



6、DC CHARACTERISTICS (ST7066U-0B, $T_{OPR}=25^{\circ}\text{C}$; $V_{DD}=5\text{V}\pm 5\%$, $V_{SS}=0\text{V}$)

Item	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Voltage	V_{DD}	-	4.75	5.0	5.25	V
LCD Voltage	V_{LCD}	$V_{DD}-V_0$	-	5.0	-	V
Power Supply Current	I_{DD}	$F_{osc}=270\text{kHz}$, $V_{DD}=5.0\text{V}$	-	1.6	2.1	mA
Input High Voltage (except OSC1)	V_{IH1}	-	$0.9 V_{DD}$	-	V_{DD}	V
Input Low Voltage (except OSC1)	V_{IL1}	-	-0.3	-	0.6	V
Input High Voltage (OSC1)	V_{IH2}	-	$V_{DD}-1.0$	-	V_{DD}	V
Input Low Voltage (OSC1)	V_{IL2}	-	-0.2	-	1.0	V
Output High Voltage (DB0-DB7)	V_{OH1}	$I_{OH}=-0.205\text{mA}$	3.9	-	-	V
Output Low Voltage (DB0-DB7)	V_{OL1}	$I_{OL}=1.2\text{mA}$	-	-	0.4	V
Output High Voltage (except DB0-DB7)	V_{OH2}	$I_o=-0.04\text{mA}$	$0.9V_{DD}$	-	-	V
Output Low Voltage (except DB0-DB7)	V_{OL2}	$I_o=0.04\text{mA}$	-	-	$0.1V_{DD}$	V
Voltage Drop	V_{dCOM}	$I_o=\pm 0.1\text{mA}$	-	-	1	V
	V_{dSEG}		-	-	1	V
Input Leakage Current	I_{IKG}	$V_{IN}=0\text{V to }V_{DD}$	-1-	-	1	μA
Input Low Current	I_{IL}	$V_{IN}=0\text{V}, V_{DD}=5\text{V}$ (PULL UP)	-50	-125	-250	μA

7、AC CHARACTERISTICS ($V_{DD}=5\text{V}\pm 5\%$, $V_{SS}=0\text{V}$, $T_{OPR}=25^{\circ}\text{C}$)

(Write mode)

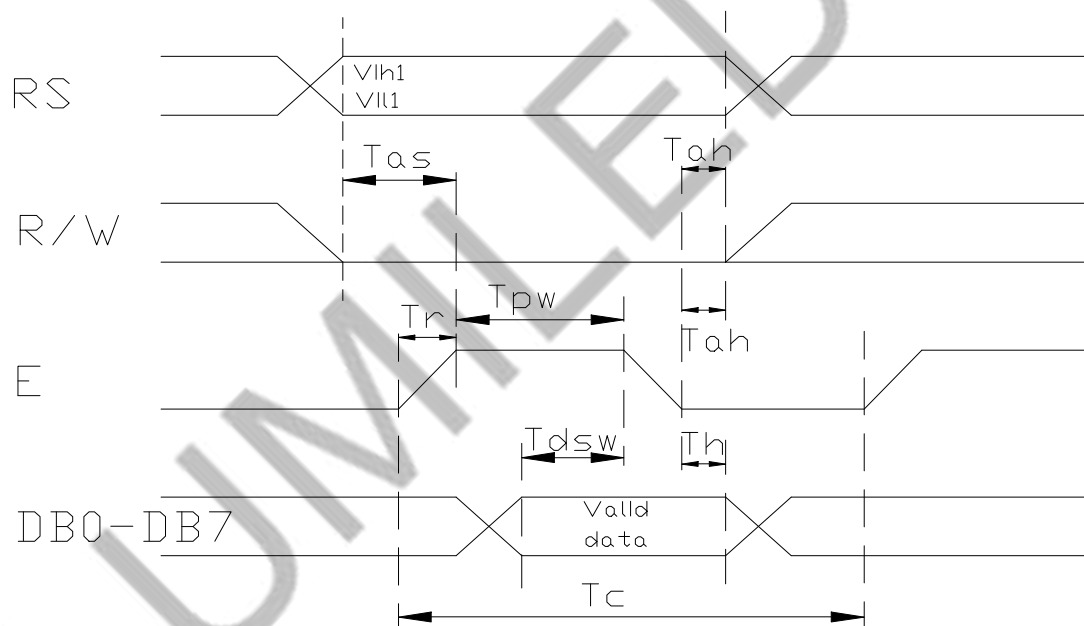
Characteristic	Symbol	Min.	Typ.	Max.	Unit
E Cycle Time	T_c	1200	--	--	ns
E Rise/Fall Time	T_r, T_f	--	--	25	ns
E Pulse Width (High, Low)	T_{pw}	140	--	--	ns
R/W, RS AND E Setup Time	T_{as}	0	--	--	ns
R/W, RS AND E Hold Time	T_{ah}	10	--	--	ns
DB0-DB7 Data Setup Time	T_{dsw}	40	--	--	ns
DB0-DB7 Data Hold Time	T_h	10	--	--	ns



(Read mode)

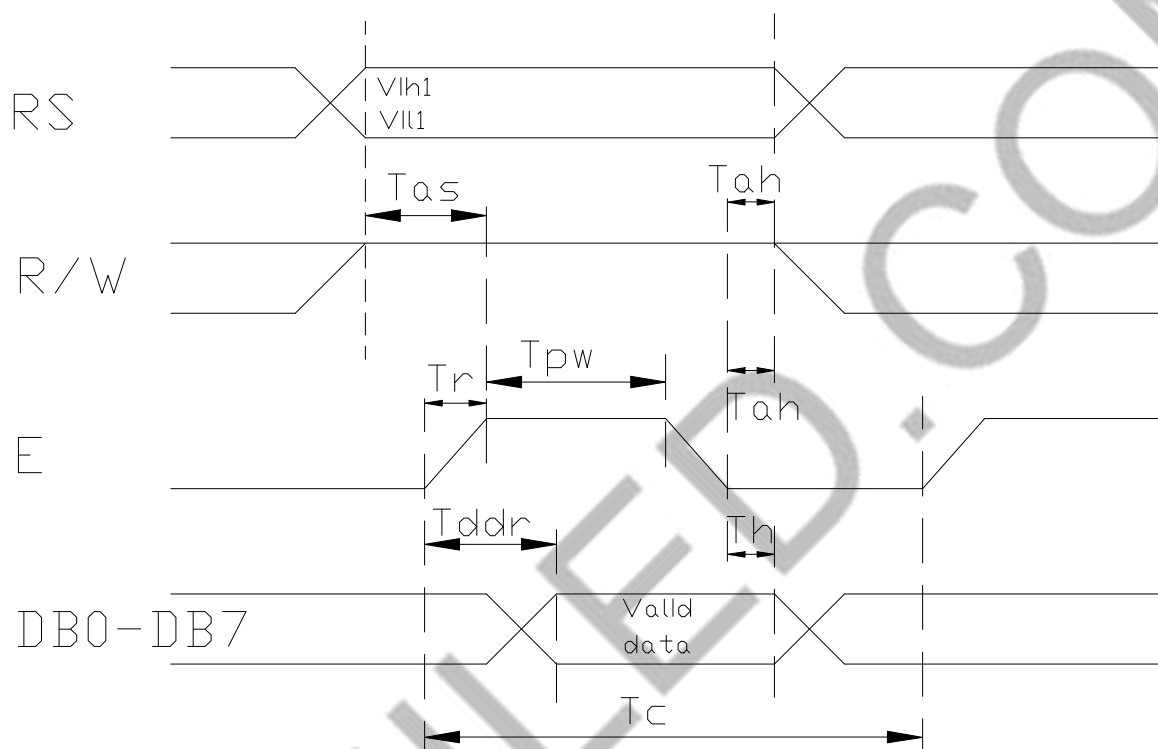
Characteristic	Symbol	Min.	Typ.	Max.	Unit
E Cycle Time	T_c	1200	--	--	ns
E Rise/Fall Time	T_r, T_f	--	--	25	ns
E Pulse Width (High, Low)	T_{pw}	140	--	--	ns
R/W, RS and E Setup Time	T_{as}	0	--	--	ns
R/W, RS and E Hold Time	T_{ah}	10	--	--	ns
Data Output Delay Time	T_{ddr}	--	--	100	ns
Data Hold Time	T_h	10	--	--	ns

8、WRITE MODE TIMING DIAGRAM





9、READ MODE TIMING DIAGRAM





10、CONTROL AND DISPLAY COMMAND

“X”: Don’t Care

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	Set DDRAM address to’00H” from AC and return cursor to it’s original position if shifted. The contents of DDRAM are not changed.
Entry Mode Set	L	L	L	L	L	L	L	H	I/D	SH	Assign cursor moving direction and make shift of entire display enable.
Display On/Off Control	L	L	L	L	L	L	H	D	C	B	Set display (D), cursor (C), and blinking of cursor (B) on/off control bit.
Cursor or Display Shift	L	L	L	L	L	H	S/C	R/L	X	X	Set cursor moving and display shift control bit, and the direction, without changing of DDRAM data.
Set Function	L	L	L	L	H	DL	N	F	X	X	Set interface data length(DL: 4-bit/8bit), numbers of display line(N:1-line/2line), display font type(F:5X8 dots/5X11 dots)
Set CGRAM Address	L	L	L	H	AC5	AC4	AC3	AC2	AC1	AC0	Set CGRAM address in address counter.
Set DDRAM Address	L	L	H	AC6	AC5	AC4	AC3	AC2	AC1	AC0	Set DDRAM address in address counter.
Read Busy Flag & Address	L	H	BF	AC6	AC5	AC4	AC3	AC2	AC1	AC0	Whether during internal operation or not can be known by reading BF. The contents of address counter can also be read.
Write Data to RAM	H	L	D7	D6	D5	D4	D3	D2	D1	D0	Write data into internal DDRAM/CGRAM
Read Data from RAM	H	H	D7	D6	D5	D4	D3	D2	D1	D0	Read data from internal DDRAM/CGRAM.

NOTE: When an MPU program with checking the Busy Flag (DB7) is made, it must be necessary $1/2F_{osc}$ is necessary for executing the next instruction by the falling edge of the ‘E’ signal after the Busy Flag (DB7) goes to “Low”.



11.FONT TABLE

NO.7066-0B

b7-b4 b3-b0		0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000	CG RAM (1)	±		0	0	P	'	P	9	é	á	í	í	í	í	í	í
0001	(2)	≡	!	1	A	Q	a	9	Q	æ	i	í	J	t	y	o	
0010	(3)	7	"	2	B	R	b	r	é	é	ó	°	°	°	°	°	°
0011	(4)	Δ	#	3	C	S	c	s	á	á	ó	°	°	°	°	°	°
0100	(5)	í	\$	4	D	T	d	t	á	á	ó	°	°	°	°	°	°
0101	(6)	í	%	5	E	U	e	u	á	á	ó	°	°	°	°	°	°
0110	(7)	í	&	6	F	V	f	v	á	á	ó	°	°	°	°	°	°
0111	(8)	í	'	7	G	W	g	w	á	á	ó	°	°	°	°	°	°
1000	(1)	í	(	8	H	X	h	x	á	á	ó	°	°	°	°	°	°
1001	(2)	í	)	9	I	Y	i	y	á	á	ó	°	°	°	°	°	°
1010	(3)	í	*	*	J	Z	j	z	á	á	ó	°	°	°	°	°	°
1011	(4)	í	+	;	K	C	k	c	á	á	ó	°	°	°	°	°	°
1100	(5)	=	,	<	L	\	l	l	á	á	ó	°	°	°	°	°	°
1101	(6)	°	-	=	M	I	m	)	á	á	ó	°	°	°	°	°	°
1110	(7)	°	.	>	N	^	n	~	á	á	ó	°	°	°	°	°	°
1111	(8)	°	/	?	O	_	o	Δ	á	á	ó	°	°	°	°	°	°

