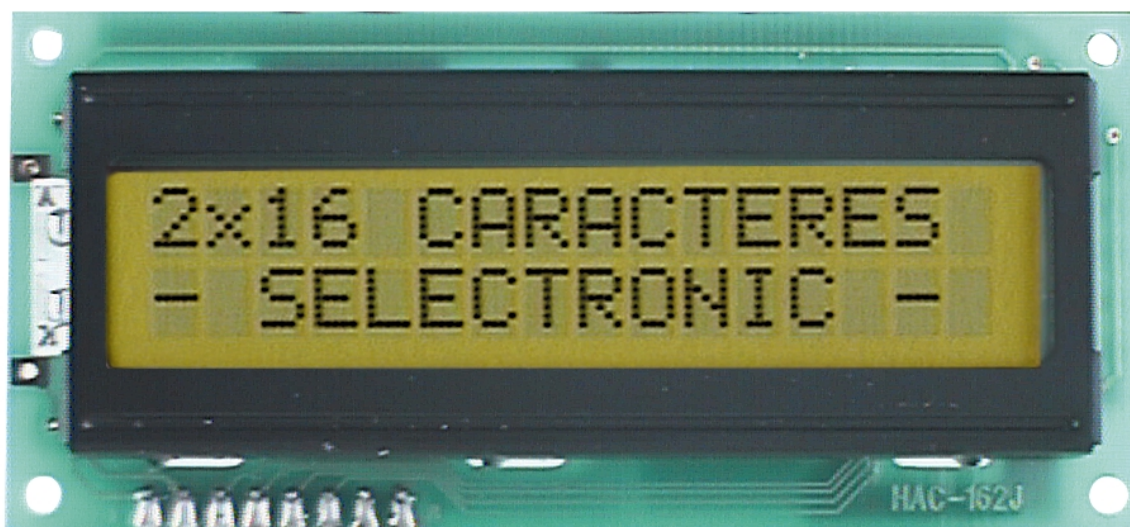


AFFICHEUR LCD à Entrée SERIE
2 X 16 caractères
Référence : 6600



Selectronic

BP 513
59022 LILLE CEDEX

Tel : (0) 328.550.328

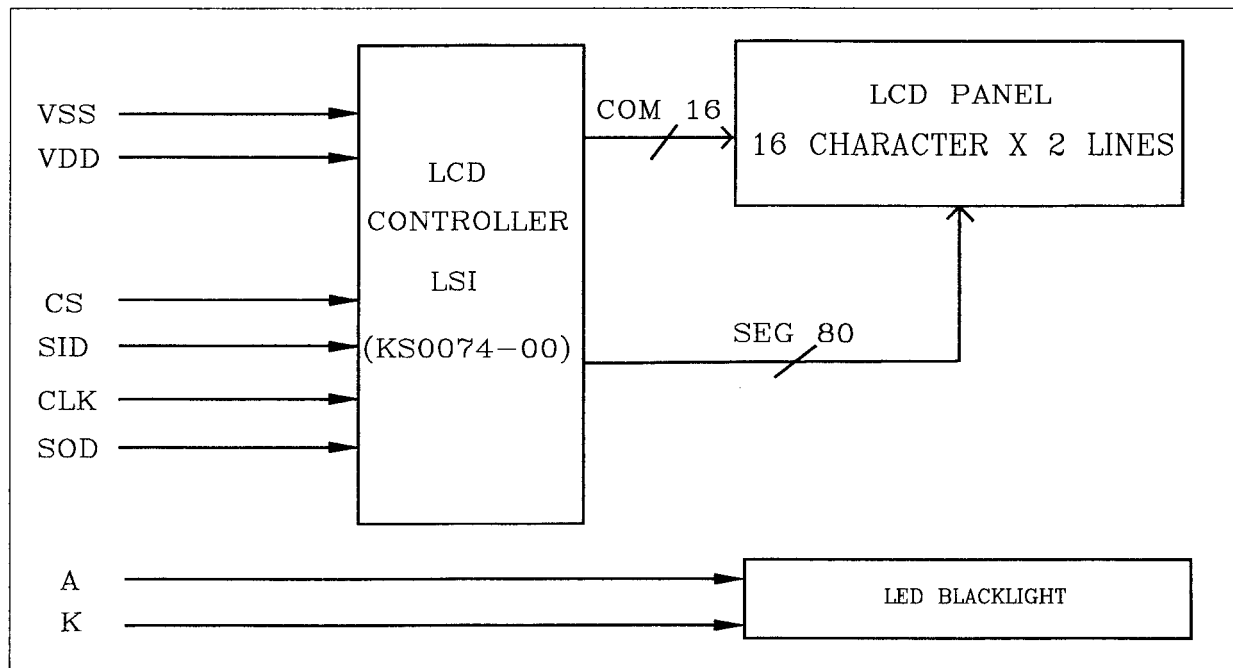
Fax : (0) 328.550.329

- . DISPLAY MODE : STN-YELLOW-GREEN-TRANSFLECTIVE-POSITIVE
- . DISPLAY FORMAT : 16 CHARACTERS X 2 LINES
- . INPUT DATA : SERIAL DATA INPUT FROM A MPU
- . MULTIPLEXING : 1/16 DUTY
- . VIEWING DIRECTION : 6 O' CLOCK
- . DRIVED IC : KS0074-00
- . BLACK LIGHT : LED COLOR: YELLOW-GREEN
- . BEZEL : 0.6T
- . OTHERS :

MECHANICAL SPECIFICATION

ITEM	SPECIFICATIONS	UNIT	REMARK
DIMENSIONAL OUTLINE	80.0(W)×36.0(H) ×14.5MAX.(T)		*REFERENCE
VIEW AREA	64.5(W)×13.8(H)	mm	DIMENSIONAL
EFFECTIVE V/AREA	57.7(W)×9.4(H)		OUTLINE
NUMBER OF CHARACTERS	16 CHARACTERS X 2 LINES	--	
CHARACTER PITCH	3.65(W)×5.05(H)	mm	
CHARACTER SIZE	2.95(W)×4.35(H)	mm	

BLOCK DIAGRAM



TERMINAL FUNCTIONS

PIN NO	SYMBOL	LEVEL	DESCRIPTION
1	VSS	-	GROUND
2	VDD	-	POWER SUPPLY FOR LOGIC AND LCD
3	CS	H/L	CHIP SELECT
4	SID	H/L	SERIAL DATA INPUT
5	CLK	H/L	SERIAL CLOCK
6	SOD	H/L	SERIAL DATA OUTPUT
7	A		POWER SUPPLY FOR LED(+)
8	K		POWER SUPPLY FOR LED(-)

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C VSS = 0V)

PARAMETER	SYMBOL	RATINGS			UNITS
		MIN.	TYP.	MAX.	
POWER SUPPLY FOR LOGIC AND LCD	VDD-VSS	4.7	5.0	5.3	V
INPUT VOLTAGE	VIN	VSS	-	VDD	V
OPERATING TEMPERATURE	Topr	0	-	50	°C
STORAGE TEMPERATURE	Tstg	-10	-	60	°C

ELECTRICAL & OPTICAL CHARACTERISTICS (Ta = 25°C)

ITEM	SYMBOL	CONDITION	MIN	TYPE	MAX.	UNIT
LOGIC CIRCUIT POWER SUPPLY VOLTAGE	V _{DD} -V _{SS}	-- --	4.5	5.0	5.5	V
INPUT VOLTAGE	V _{IH}	-- --	0.7V _{DD}	—	V _{DD}	V
INPUT VOLTAGE	V _{IL}	-- --	V _{SS}	—	0.2V _{DD}	V
LOGIC CIRCUIT POWER SUPPLY CURRENT	I _{DD}	V _{DD} -V _{SS} =5.0V	--	0.5	1.0	mA
RECOMMENDED LCD DRIVING VOLTAGE	V _{DD} -V _{SS} φ=0 θ=0	Ta=25°C	--	5.0	--	V
FRAME FREQUENCY	f _{FLM}	-	-	128	-----	HZ

ELECTRO & OPTICAL CHARACTERISICS (Ta = 25°C VDD = 5.0V VDD - VO = 5.0V)

ITEM	SYMBOL	CONDITION	MIN	TYPE	MAX	UNIT
VIEW ANGLE	•φ	θ=0°, Cr≥2 -90°<φ1, φ2<90°	30	40	—	Deg
CONTRAST	Cr	φ=0°,θ=0°	3	5	—	—
RESPONSE TIME	tr(rise)	φ=0°,θ=0°	—	250	350	ms
	tf(fall)	φ=0°,θ=0°	—	250	350	ms

FUNCTION DESCRIPTION

This LCD module is driven by chip KS7400 - 00. **DDRAM ADDRESS**

Display position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DDRAM	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
Address	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F

It is in 5-dot 1 line display.

CHARACTER FONT TABLE

Standard Character Pattern (KS0074-00)

Upper 4bit Lower 4bit		LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	LHHH	HLLL	HLLH	HLHL	HLHH	HHLL	HHLH	HHHL	HHHH
LLLL	CG RAM (1)																
LLLH	(2)																
LLHL	(3)																
LLHH	(4)																
LHLL	(5)																
LHLH	(6)																
LHHL	(7)																
LHHH	(8)																
HLLL	(1)																
HLLH	(2)																
HLHL	(3)																
HLHH	(4)																
HHLL	(5)																
HHLH	(6)																
HHHL	(7)																
HHHH	(8)																

DIMENSIONAL OUTLINE

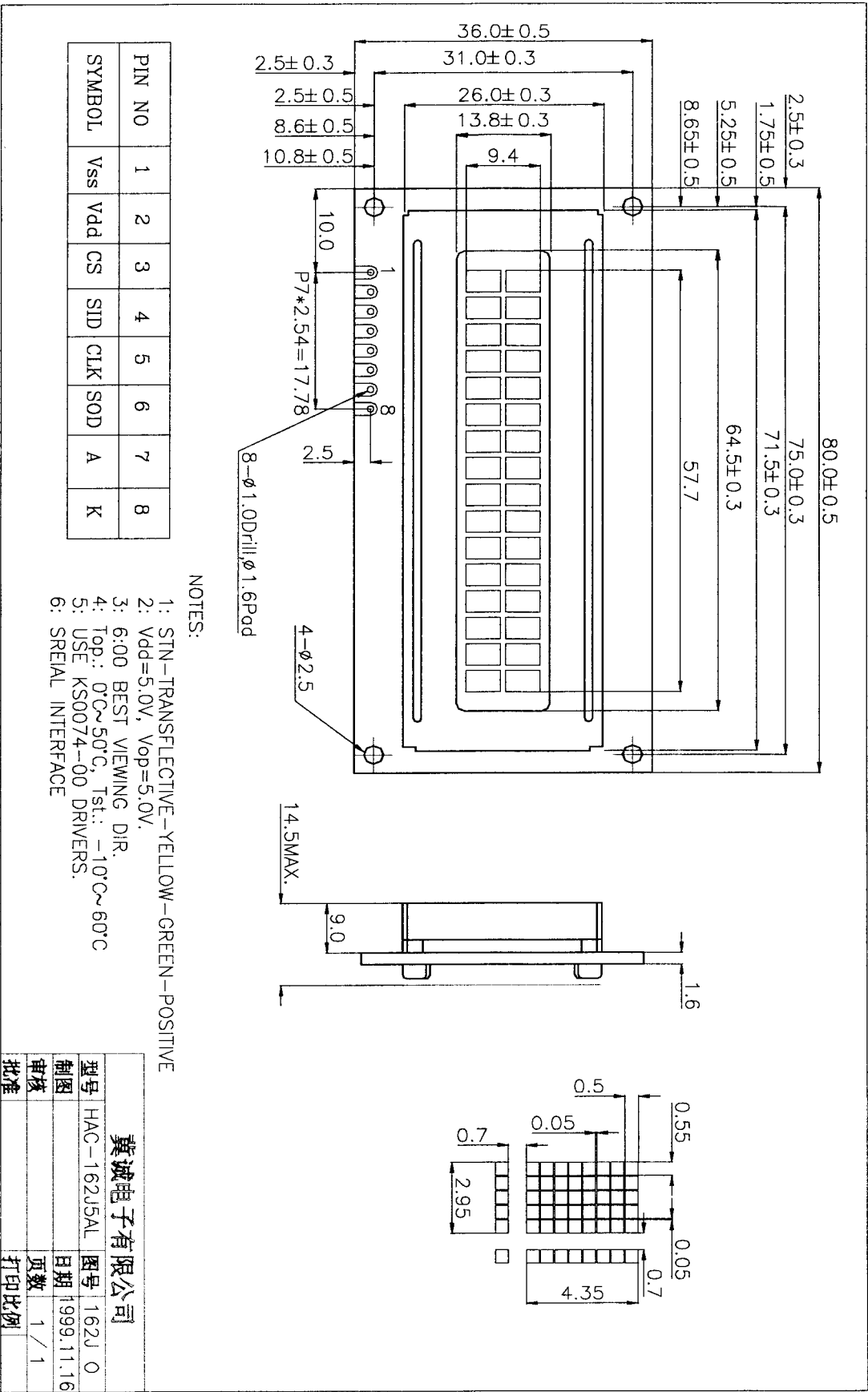
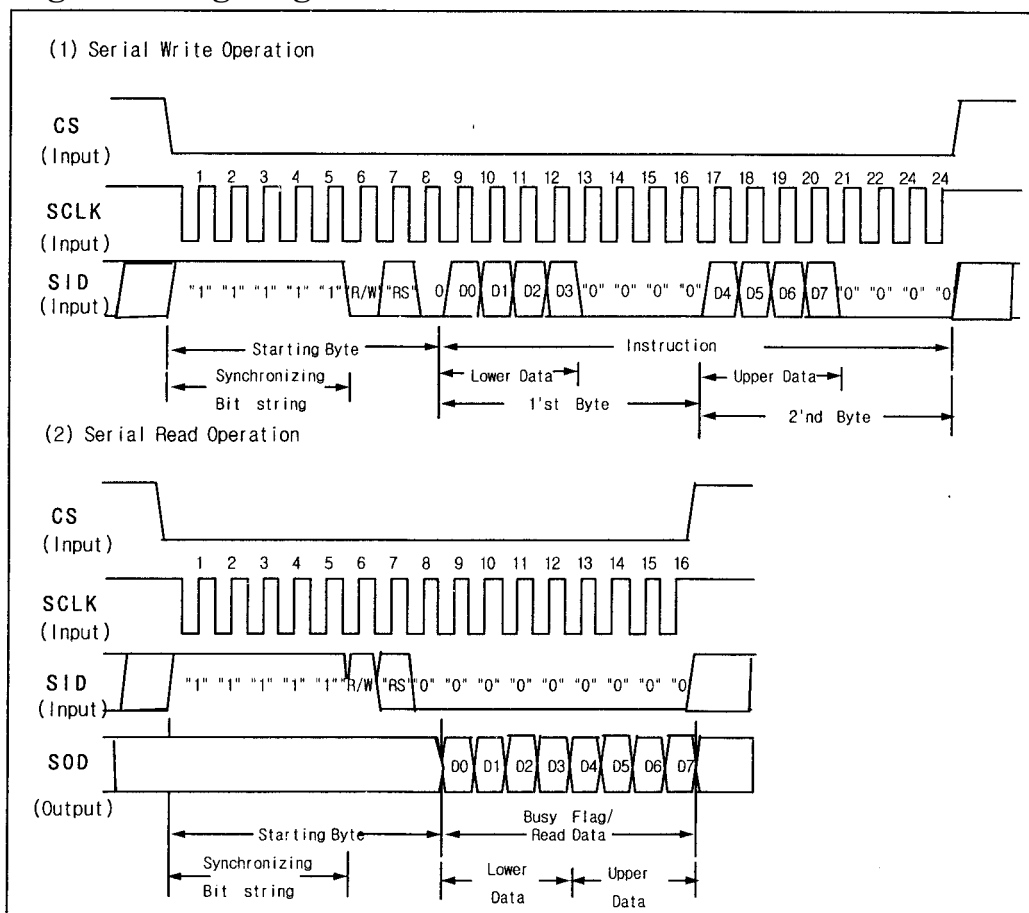
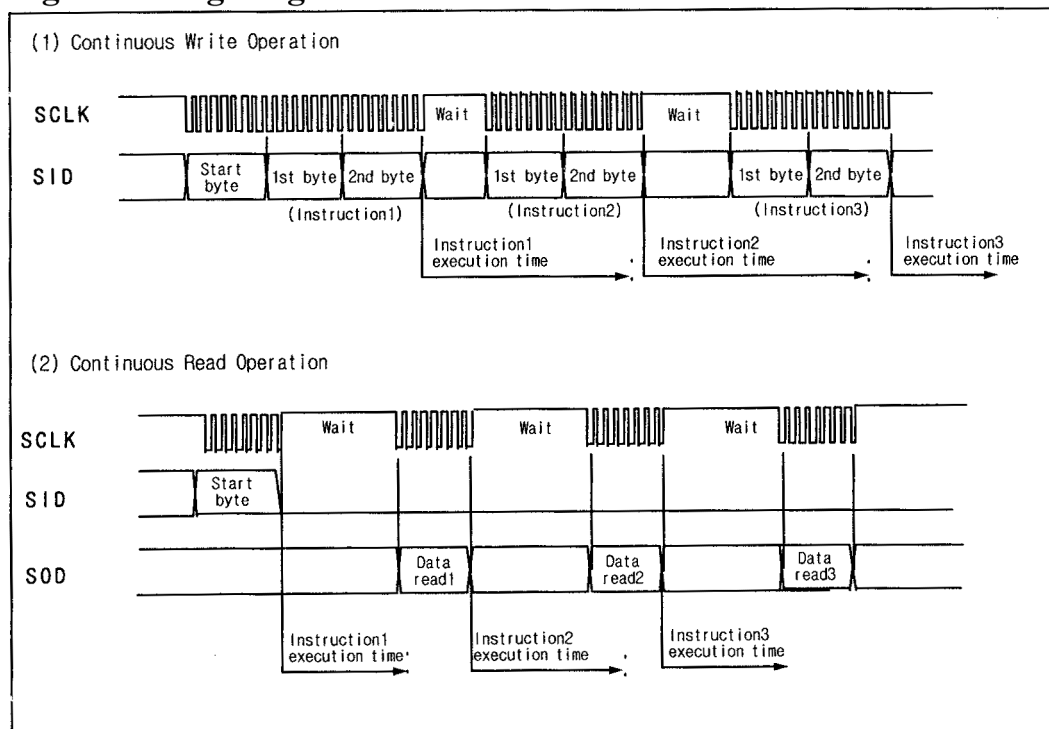


Fig.13 Timing Diagram of Sérial Data Transfert**Fig.14 Timing Diagram of Continuous Data Transfert**

(1) INSTRUCTION DESCRIPTION 1 (IE = "High")

Table 6. Instruction Set 1

Instruction	RE	Instruction Code										Description	Execution Time (fosc = 270 kHz)
		RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0		
Clear Display	X	0	0	0	0	0	0	0	0	0	1	Write "20H" to DDRAM. and set DDRAM address to "00H" from AC.	1.53ms
Return Home	0	0	0	0	0	0	0	0	0	1	X	Set DDRAM address to "00H" from AC and return cursor to its original position if shifted. The contents of DDRAM are not changed.	1.53ms
Power Down Mode	1	0	0	0	0	0	0	0	0	1	PD	Set power down mode bit. PD = "1" : power down mode set, PD = "0" : power down mode disable	39 μ s
Entry Mode Set	0	0	0	0	0	0	0	0	0	1	I/D S	Assign cursor moving direction. I/D = "1" : increment, I/D = "0" : decrement and display shift enable bit. S = "1" : make display shift of the enabled lines by the DS4 - DS1 bits in the Shift Enable instruction. S = "0" : display shift disable	39 μ s
	1	0	0	0	0	0	0	0	0	1	1 BID	Segment bi-direction function. BID = "1" : Seg80 $\rightarrow$ Seg1, BID = "0" : Seg1 $\rightarrow$ Seg80.	
Display ON/OFF Control	0	0	0	0	0	0	0	0	1	D	C B	Set display/cursor/blink on/off D = "1" : display on, D = "0" : display off, C = "1" : cursor on, C = "0" : cursor off, B = "1" : blink on, B = "0" : blink off.	39 μ s
Extended function set	1	0	0	0	0	0	0	0	1	FW	B/W NW	Assign font width, black/white inverting of cursor, and 4-line display mode control bit. FW = "1" : 6-dot font width, FW = "0" : 5-dot font width, B/W = "1" : black/white inverting of cursor enable, B/W = "0" : black/white inverting of cursor disable NW = "1" : 4-line display mode, NW = "0" : 1-line or 2-line display mode.	39 μ s

(Table 6. continued)

Instruction	RE	Instruction Code										Description	Execution Time (fosc = 270 kHz)
		RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0		
Cursor or Display Shift	0	0	0	0	0	0	1	S/C	R/L	X	X	Cursor or display shift. S/C = "1" : display shift, S/C = "0" : cursor shift, R/L = "1" : shift to right, R/L = "0" : shift to left.	39 μ s
Shift Enable	1	0	0	0	0	0	1	DS4	DS3	DS2	DS1	(when DH = "1") Determine the line for display shift . DS1 = "1/0" : 1st line display shift enable/disable DS2 = "1/0" : 2nd line display shift enable/disable DS3 = "1/0" : 3rd line display shift enable/disable DS4 = "1/0" : 4th line display shift enable/disable.	39 μ s
Scroll Enable	1	0	0	0	0	0	1	HS4	HS3	HS2	HS1	(when DH = "0") Determine the line for horizontal smooth scroll. HS1 = "1/0" : 1st line dot scroll enable/disable HS2 = "1/0" : 2nd line dot scroll enable/disable HS3 = "1/0" : 3rd line dot scroll enable/disable HS4 = "1/0" : 4th line dot scroll enable/disable.	39 μ s
Function Set	0	0	0	0	0	1	DL	N	RE(0)	DH	REV	Set interface data length (DL = "1" : 8-bit, DL = "0" : 4-bit), numbers of display line when NW = "0", (N = "1" : 2-line, N = "0" : 1-line), extension register, RE("0"), shift/scroll enable DH = "1" : display shift enable DH = "0" : dot scroll enable. reverse bit REV = "1" : reverse display, REV = "0" : normal display.	39 μ s
	1	0	0	0	0	1	DL	N	RE(1)	BE	0	Set DL, N, RE("1") and CGRAM/SEGRAM blink enable (BE) BE = "1/0" : CGRAM/SEGRAM blink enable/disable	39 μ s

(Table 6. continued)

Instruction	RE	Instruction Code										Description	Execution Time (fosc = 270 kHz)	
		RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0			
Set CGRAM Address	0	0	0	0	1	AC5	AC4	AC3	AC2	AC1	AC0	Set CGRAM address in address counter.	39 μ s	
Set SEGRAM Address	1	0	0	0	0	1	X	X	AC3	AC2	AC1	AC0	Set SEGRAM address in address counter.	39 μ s
Set DDRAM Address	0	0	0	1	AC6	AC5	AC4	AC3	AC2	AC1	AC0	Set DDRAM address in address counter.	39 μ s	
Set Scroll Quantity	1	0	0	1	X	SQ5	SQ4	SQ3	SQ2	SQ1	SQ0	Set the quantity of horizontal dot scroll.	39 μ s	
Read Busy flag and Address	X	0	1	BF	AC6	AC5	AC4	AC3	AC2	AC1	AC0	Can be known whether during internal operation or not by reading BF. The contents of address counter can also be read. BF = "1" : busy state, BF = "0" : ready state.	0 μ s	
Write Data	X	1	0	D7	D6	D5	D4	D3	D2	D1	D0	Write data into internal RAM (DDRAM / CGRAM / SEGRAM).	43 μ s	
Read Data	X	1	1	D7	D6	D5	D4	D3	D2	D1	D0	Read data from internal RAM (DDRAM / CGRAM / SEGRAM).	43 μ s	

* Note : 1. When an MPU program with Busy Flag(DB7) checking is made, 1/2 Fosc (is necessary) for executing the next instruction by the "E" signal after the Busy Flag (DB7) goes to "Low".
2. "X" Don't care