

# **SPECIFICATIONS FOR LIQUID CRYSTAL DISPLAY**

**PART NUMBER:**

**MGD12864A-FL-YBS**

**DATE:**

**OCT. 20,2004**

## MGD12864A SERIES LCD MODULE

### 1.0 MECHANICAL SPECS

1. Overall Module Size	93.0mm(W) x 70.0mm(H) x max 13.5mm(D) for LED backlight version
2. Dot Size	0.48mm(W) x 0.48mm(H)
3. Dot Pitch	0.52mm(W) x 0.52mm(H)
4. Duty,Bias	1/32,1/6
5. Controller IC	S6B0108 or Equivalent
6. LC Fluid Options	STN YELLOW GREEN
7. Polarizer Options	Transflective
8. Backlight Options	LED
9. Temperature Range Options	Standard (0°C ~ 50°C), Wide (-20°C ~ 70°C)

### 2.0 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min	Typ	Max	Unit
Operating temperature (Standard)	Top	0	-	50	°C
Storage temperature (Standard)	Tst	-20	-	70	°C
Operating temperature (Wide temperature)	Top	-20	-	70	°C
Storage temperature (Wide temperature)	Tst	-30	-	80	°C
Input voltage	Vin	Vss	-	Vdd	V
Supply voltage for logic	Vdd- Vss	0.3	-	7.0	V
Supply voltage for LCD drive	Vdd- Vo	9.5	10.5	14.0	V

## MGD12864A SERIES LCD MODULE

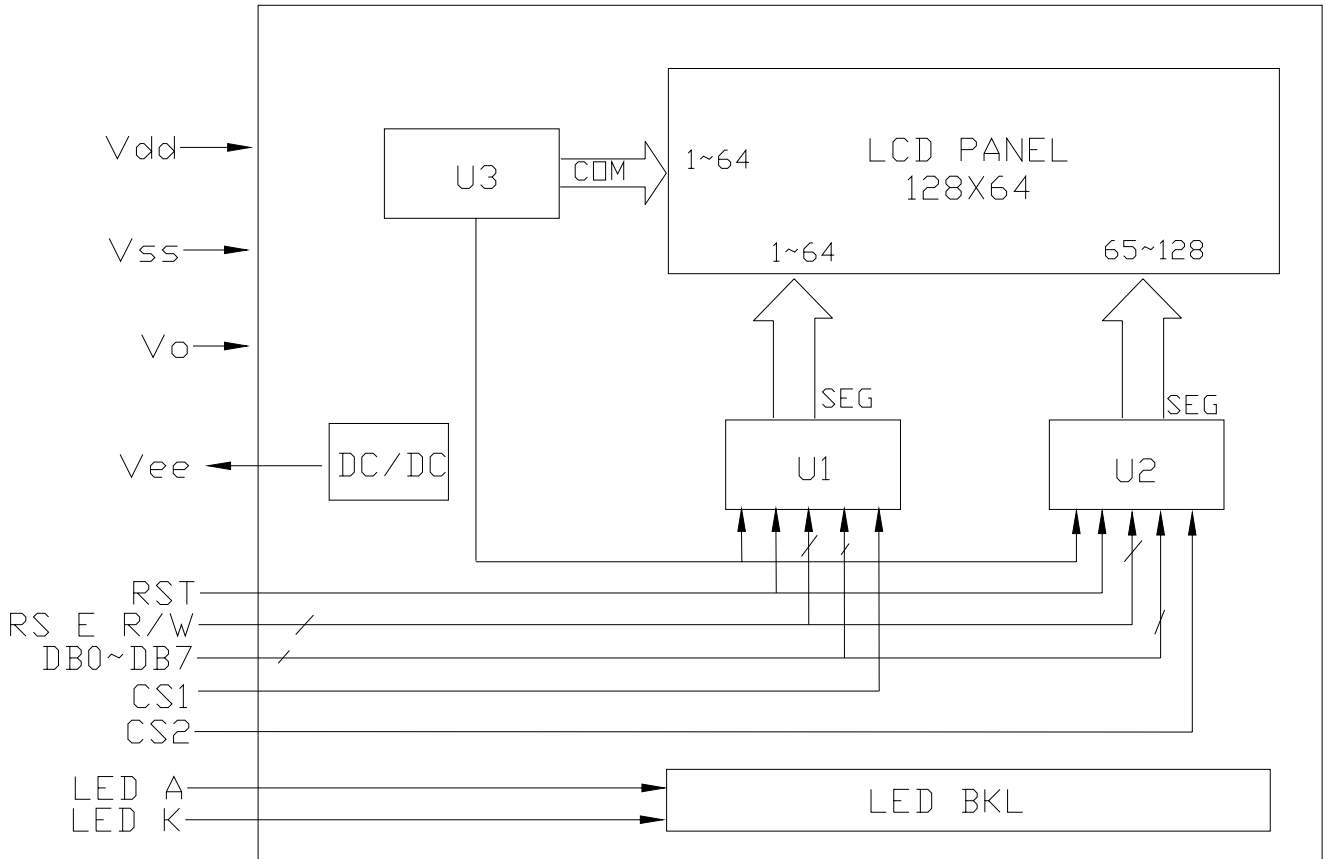
### 3.0 ELECTRICAL CHARACTERISTICS

Item	Symbol	Condition	Min	Typ	Max	Unit
Power Supply Voltage	Vdd	fosc=270kHz	4.5	5.0	5.5	V
Power Supply Current	Idd	Vdd=5.0V, fosc=270kHz	-	0.8	2.0	mA
Recommended LC Driving Voltage (Standard Temp)	Vdd - Vo	0°C	-	11.0	13.5	V
		25°C	9.5	10.5	-	
		50°C	9.0	10.2	-	
Recommended LC Driving Voltage (Wide Temp)	Vdd -Vo	-20°C	-	11.8	14.0	V
		0°C	-	11.0	-	
		50°C	-	10.2	-	
		70°C	-	10.0	-	
LED Power Supply Voltage	Vfled	R=0Ω	-	4.2	-	V
LED Power Supply Current	Ifled	R=0Ω	-	400	-	mA

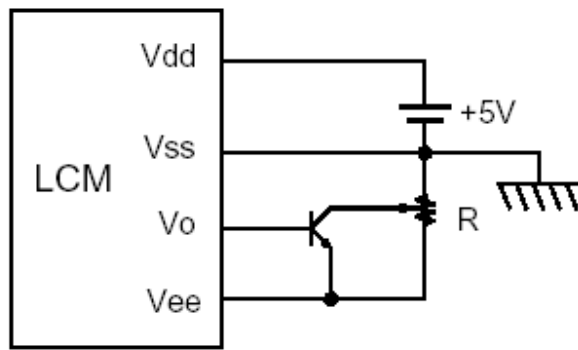
### 4.0 OPTICAL CHARACTERISTICS (Ta=25°C, Vdd= 5.0V±0.25V, STN LC fluid)

Item	Symbol	Condition	Min	Typ	Max	Unit
Viewing angle (horizontal)	θ	Cr ≥ 2.0	-	85	-	deg
Viewing angle (vertical)	φ	Cr ≥ 2.0	-	35	-	deg
Contrast Ratio	Cr	φ=0°, θ=0°	-	3	-	
Response time (rise)	Tr	φ=0°, θ=0°	-	150	280	ms
Response time (fall)	Tf	φ=0°, θ=0°	-	80	150	ms

5.0 BLOCK DIAGRAM



6.0 Power Supply



R=10K~20K

7.0 TIMING CHARACTERISTICS

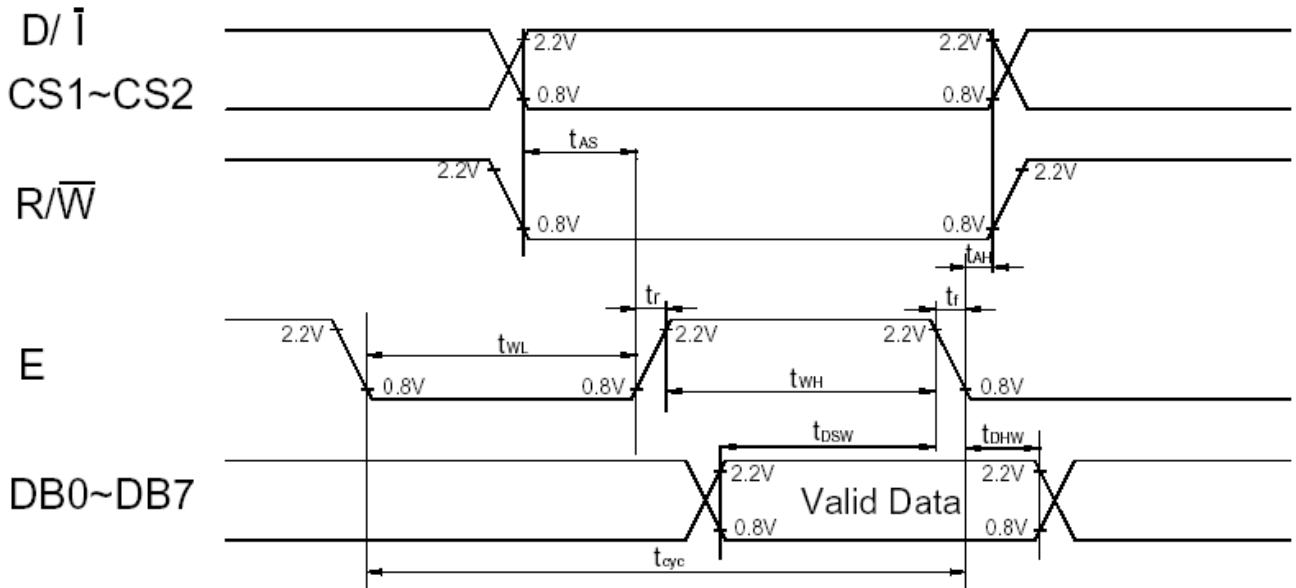


Fig. a Interface timing (data write)

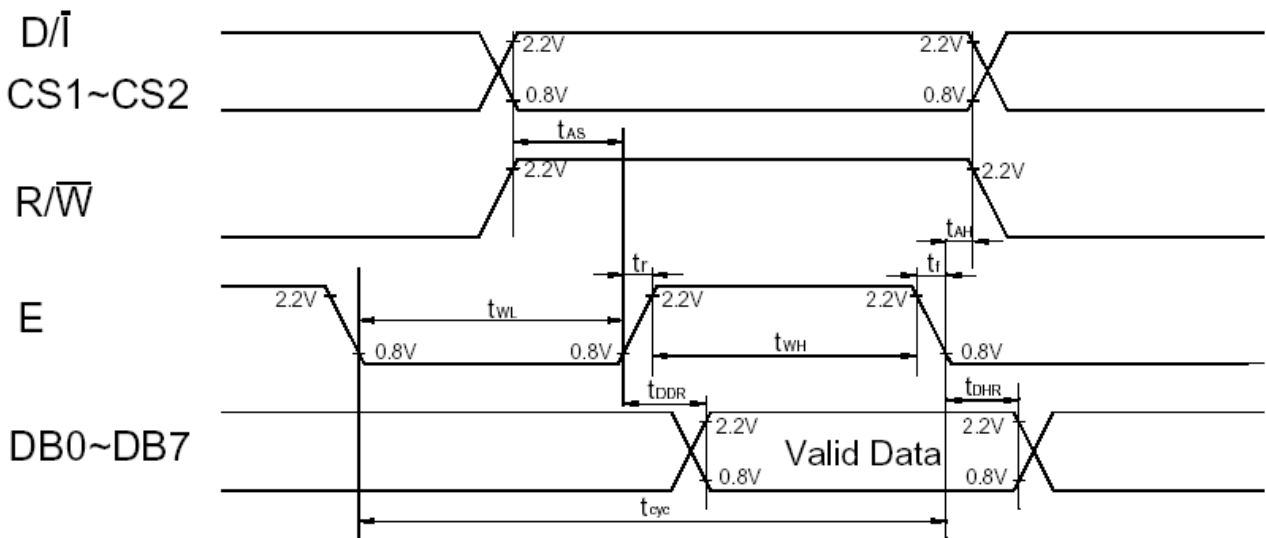
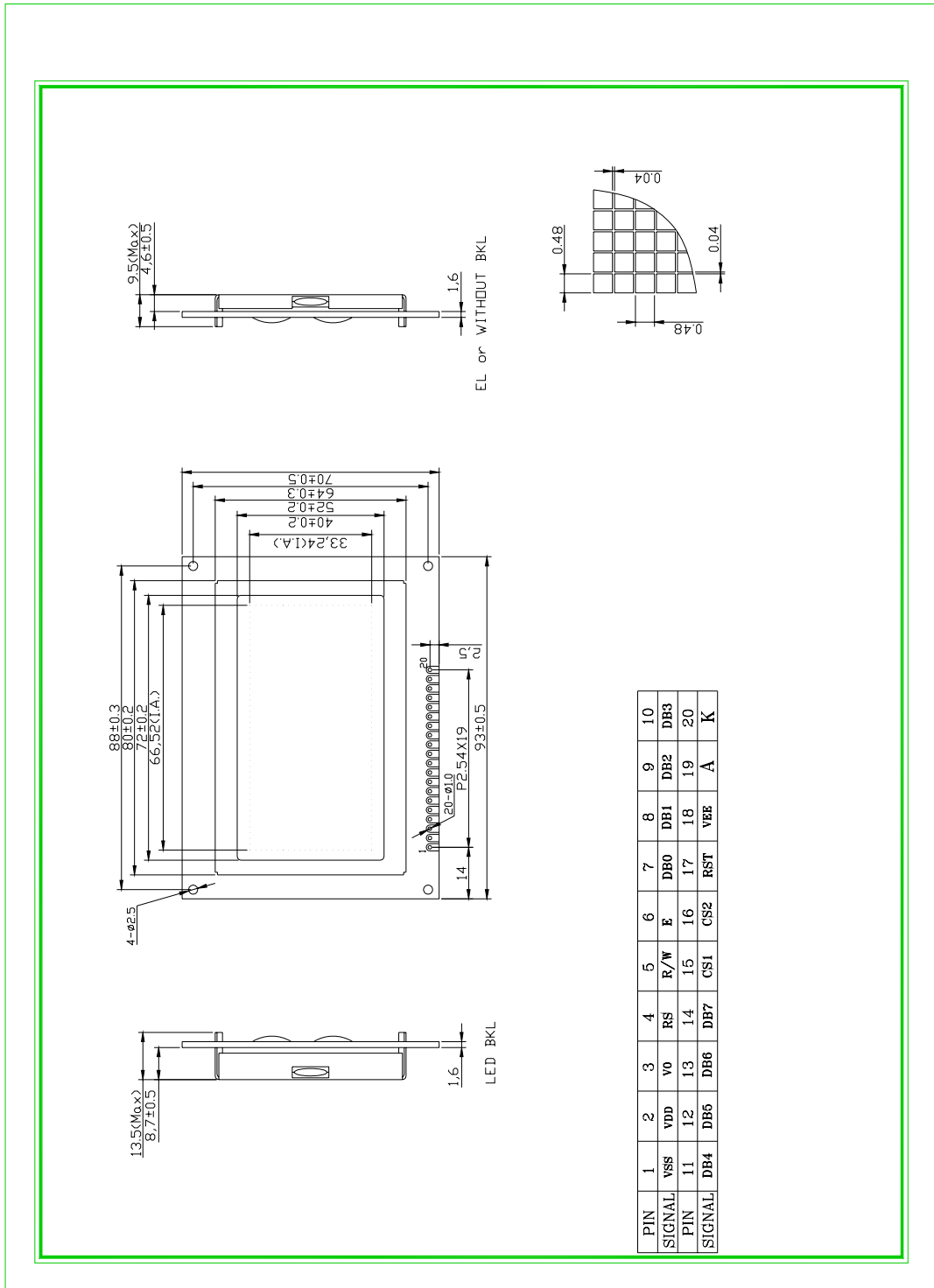


Fig. b Interface timing (data read)

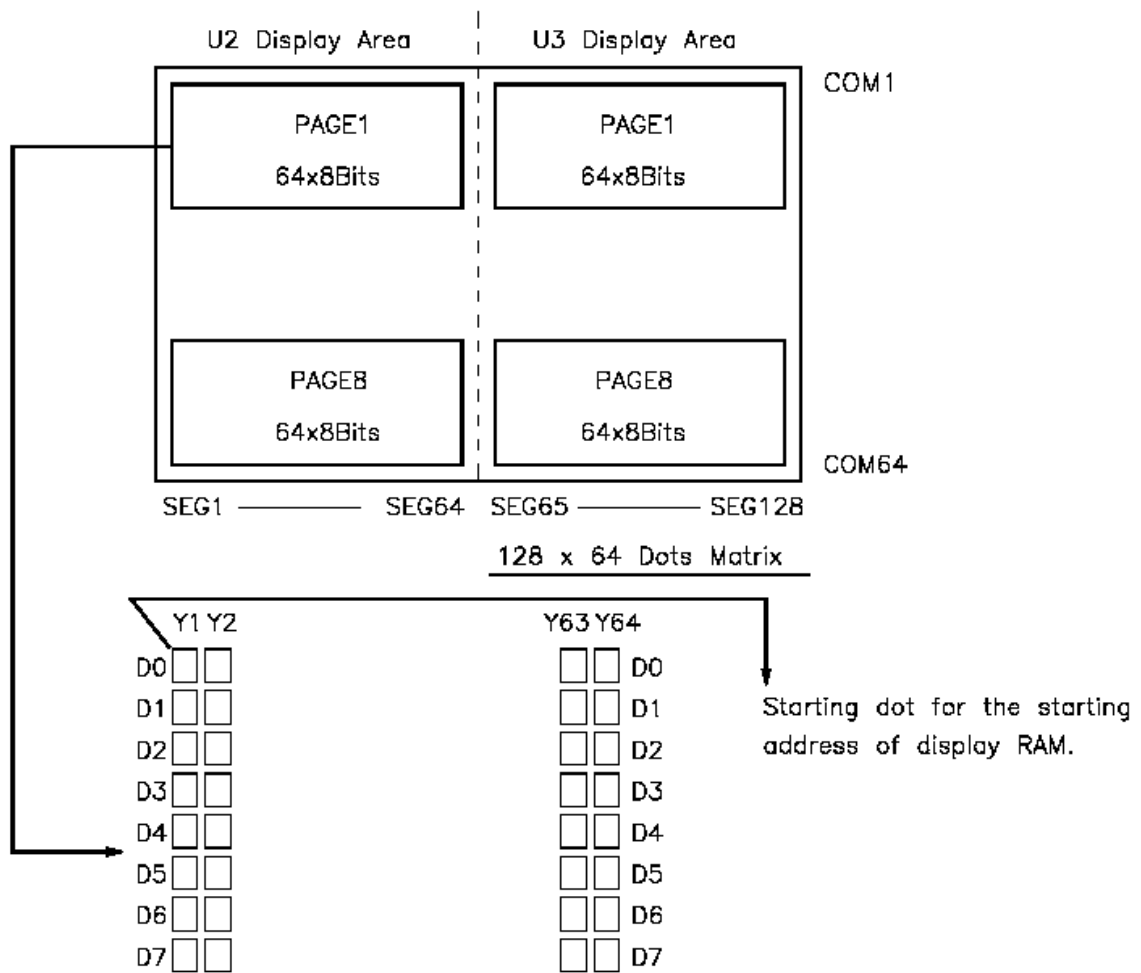
**8.0 PIN ASSIGNMENT**

Pin No.	Symbol	Function
1	VSS	GND (0V)
2	VDD	SUPPLY VOLTAGE FOR LOGIC (+5v)
3	VO	SUPPLY VOLTAGE FOR LCD
4	RS (CS)	H: Data L: Instruction Code (hip Enable for Serial Mode)
5	R/W (SID)	H: Read L: Write (Serial Data for Serial Mode)
6	E (SCLK)	Enable Signal (Serial Clock)
7	DB0	DB0
8	DB1	DB1
9	DB2	DB2
10	DB3	DB3
11	DB4	DB4
12	DB5	DB5
13	DB6	DB6
14	DB7	DB7
15	CS1	Chip(IC1) selection,CS1=1
16	CS2	Chip(IC2) selection,CS2=1
17	RST	Reset signal
18	Vee	Negative Voltage
19	LEDA	Power Supply for BL+
20	LEDK	Power Supply for BL-

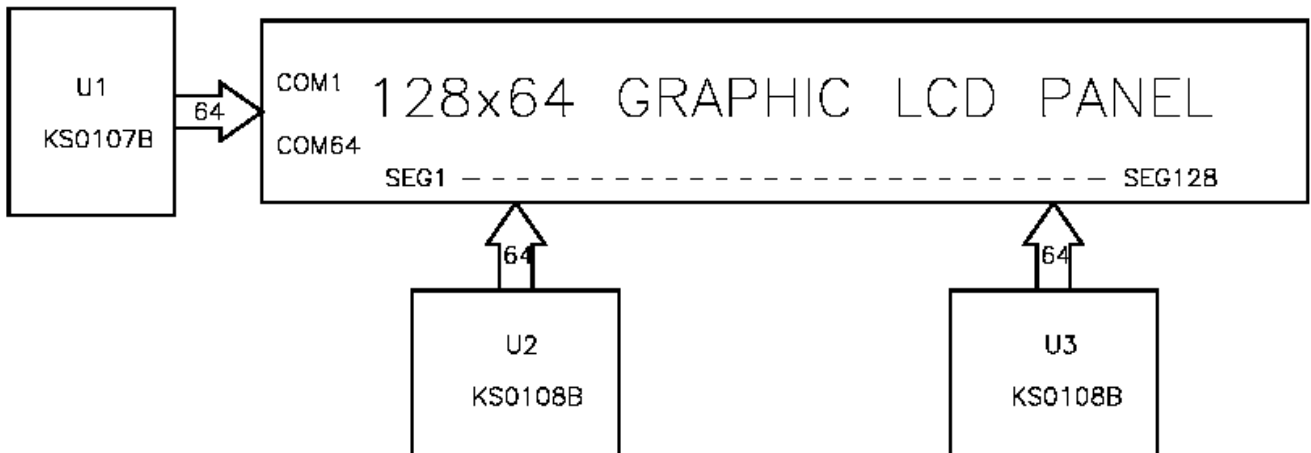
9.0 MECHANICAL DIAGRAM



10.0 RELATION BETWEEN DISPLAY PATTERN AND DRIVERS



Each segment driver has 8 pages RAM, and each page has 64x8 bits RAM.  
 D0~D7 are 8 bits transmitted data, where D0 is LSB and D7 is MSB.





## MGD12864A SERIES LCD MODULE

### 11.0 DISPLAY INSTRUCTION TABLE

INSTRUCTION	RS	RW	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	FUNCTION
Read Display Date	1	1	Read data								Reads data (DB[7:0]) from display data RAM to the data bus.
Write Display Date	1	0	Write data								Writes data (DB[7:0]) into the DDRAM. After writing instruction, Y address is incremented by 1 automatically
Status Read	0	1	Bus y	0	ON/ OFF	Re- set	0	0	0	0	Reads the internal status BUSY 0: Ready 1: In operation ON/OFF 0: Display ON 1: Display OFF RESET 0: Normal 1: Reset
Set Address (Y address)	0	0	0	1	Y address (0~63)						Sets the Y address at the column address counter
Set Display Start Line	0	0	1	1	Display start line (0~63)						Indicates the Display Data RAM displayed at the top of the screen.
Set Address (X address)	0	0	1	0	1	1	1	Page (0~7)			Sets the X address at the X address register.
Display On/off	0	0	0	0	1	1	1	1	1	0/1	Controls the display ON or OFF. The internal status and the DDRAM data is not affected. 0: OFF, 1: ON