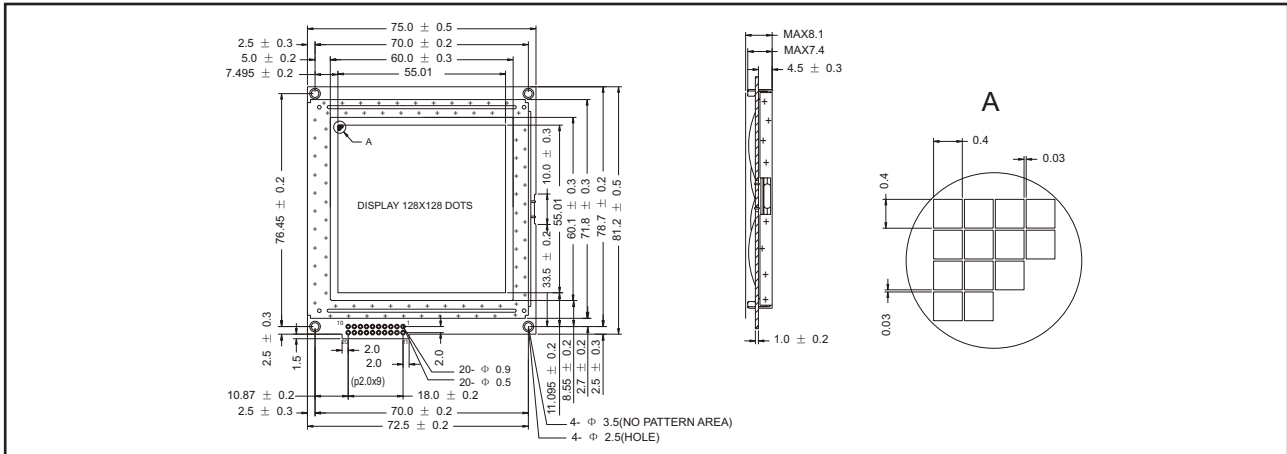


# STANDARD GRAPHIC MODULES

## YMS 128128-01

128 X 128 DOTS, 1/128 DUTY, 1/12 BIAS

### EXTERNAL DIMENSION AND DISPLAY PATTERN



### MECHANICAL DATA

ITEM	SPECIFICATION	UNIT
Module Size (W x H x T)	75.0 x 81.2 x 8.1	mm
Viewing Area (W x H)	60.0 x 60.1	mm
Number of Dots	128 x 128	dots
Dot Pitch (W x H)	0.43 x 0.43	mm
Dot Size (W x H)	0.40 x 0.40	mm

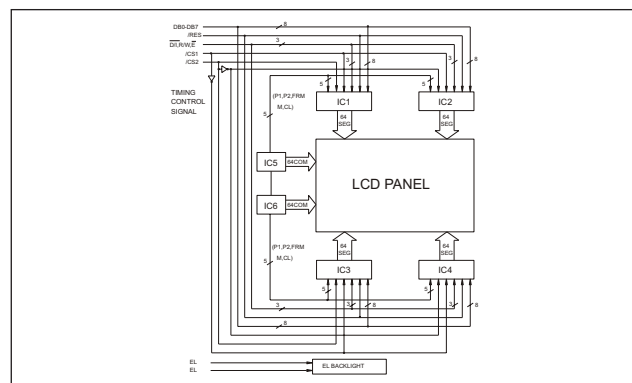
### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage Logic	$V_{DD} (V_{DD} - V_{SS})$	-0.3	7.0	V
Supply Voltage Drive	$V_{DD} - V_{EE}$	-0.3	30.0	V
Input Voltage	$V_{IN}$	-0.3	$V_{DD} + 0.3$	V
Operating Temperature	See page 8			
Storage Temperature				

### PIN CONFIGURATION

PIN	SYMBOL	LEVEL	SIGNAL DESCRIPTION
1	$V_{DD}$	+5V	Supply Voltage for Logic and LCD
2	$V_{SS}$	0V	GND (0 V)
3	$V_{EE}$		Operating Voltage for LCD (variable)
4	$DB_0$	H/L	Data Bit 0
5	$DB_1$	H/L	Data Bit 1
6	$DB_2$	H/L	Data Bit 2
7	$DB_3$	H/L	Data Bit 3
8	$DB_4$	H/L	Data Bit 4
9	$DB_5$	H/L	Data Bit 5
10	$DB_6$	H/L	Data Bit 6
11	$DB_7$	H/L	Data Bit 7
12	$CS_1$	H/L	Chip Select Signal for IC 1
13	$CS_2$	H/L	Chip Select Signal for IC 2
14	/RES	H, H-L	Reset Signal
15	R/W	H, H-L	H: Read (Module-MPU), L: Write (MPU-Module)
16	DL	H/L	H: DATA, L: Instruction Code
17	E	H, H-L	Chip Enable Signal
18	$V_{SS}$	0V	Power Supply Voltage for LCD
19	EL		EL Power
20	EL		

### BLOCK DIAGRAM



# STANDARD GRAPHIC MODULES

## YMS 128128-01

128 X 128 DOTS, 1/128 DUTY, 1/12 BIAS

### ELECTRICAL CHARACTERISTICS, Ta = 25°C

ITEM	SYMBOL	CONDITION	SPEC. VALUE			UNIT
			MIN.	TYP.	MAX.	
Supply Voltage (Logic)	$V_{DD} - V_{SS}$		4.5	5.0	5.5	V
Supply Current (Logic)	$I_{DD}$	$V_{DD} = 5V$		3.0	4.5	mA
Input Voltage	HIGH	$V_{IH}$	$0.7 V_{DD}$		$V_{DD}$	V
	LOW	$V_{IL}$	0		$0.3 V_{DD}$	V
Output Voltage	HIGH	$V_{OH}$	$I_{OH} = 0.205mA$	2.4		V
	LOW	$V_{OL}$	$I_{OL} = 1.6mA$		0.4	V
LCD Operating Voltage	$V_{DD} - V_{EE}$	$V_{DD} = 5V$ $T_a = +25^\circ C$		17.8		V
Supply Current LCD Drive	$I_{EE}$			9.8		mA

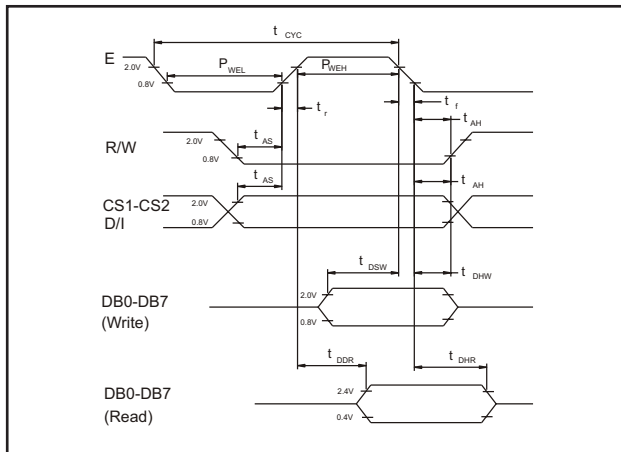
Note (1): Value is high reliability type.

Note (2): Electro-Optical Characteristics: See page 5.

### BACKLIGHTING CHARACTERISTICS, Ta = 25°C, LED

ITEM	SYMBOL	CONDITION	SPEC. VALUE			UNIT
			MIN.	TYP.	MAX.	
Applied Voltage	$V_{EL}$			100	150	V
Applied Frequency	$F_{EL}$			400		Hz
Current	$I_{EL}$	$V_a = 100V$ rms		5.27	7.47	mA
Power Consumption	$P_{EL}$	$F_a = 400$ Hz		527	747	mW
Luminous	$I_v$		45	55		cd/m <sup>2</sup>

### INTERFACE TIMING CHARACTERISTICS



PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Address Hold Time	$t_{AH}$	10		ns
Address Setup Time	$t_{AS}$	140		ns
E Cycle Time	$t_{cyc}$	1000		ns
E High Level Width	$t_{WEH}$	450		ns
E Low Level Width	$t_{WEL}$	450		ns
E Rise Time	$t_r$		25	ns
E Fall Time	$t_f$		25	ns
Data Setup Time	$t_{DSW}$	200		ns
Data Delay Time	$t_{DDR}$		320	
Data Hold Time - Write	$t_{DHW}$	10		ns
Data Hold Time - Read	$t_{DHR}$	20		ns

Condition:  $V_{DD} = +5.0 \pm 10\%$ ,  $V_{SS} = 0V$ ,  $T_a = +25^\circ C$