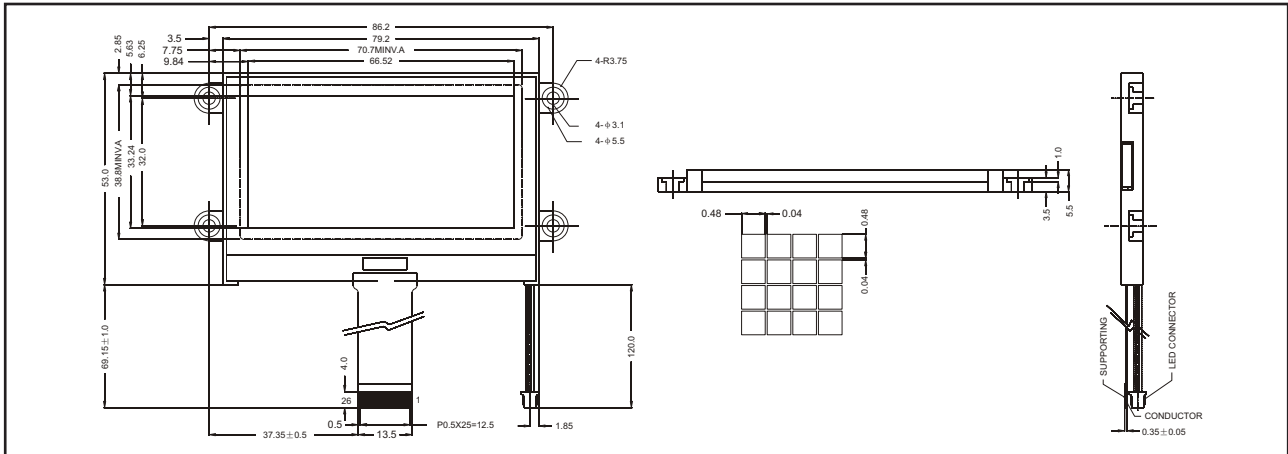


STANDARD COG MODULES

YMS 12864-15

128 X 64 DOTS, 1/65 DUTY, 1/9 BIAS

EXTERNAL DIMENSION AND DISPLAY PATTERN



MECHANICAL DATA

ITEM	SPECIFICATION	UNIT
Module Size (W x H x T)	93.7 x 53.0 x 5.5	mm
Viewing Area (W x H)	70.7 x 38.8	mm
Number of Dots	128 x 64	dots
Dot Pitch (W x H)	0.52 x 0.52	mm
Dot Size (W x H)	0.48 x 0.48	mm

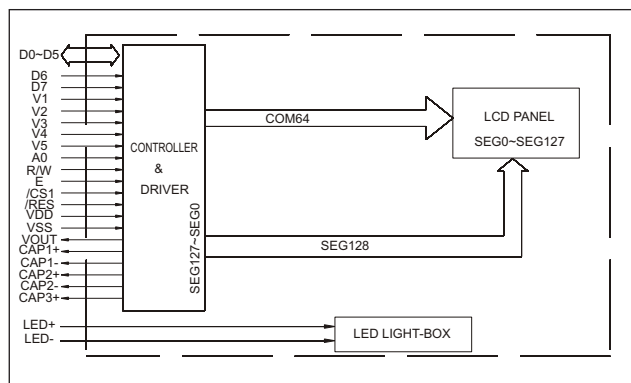
ABSOLUTE MAXIMUM RATINGS

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	17.0	V
Input Voltage	V_{IN}	-0.3	$V_{DD} + 0.3$	V
Operating Temperature	See page 8			
Storage Temperature				

PIN CONFIGURATION

PIN	SYMBOL	SIGNAL DESCRIPTION
1	/CS ₁	Chip Select Signal
2	/RES	Reset Signal
3	A ₀	Register Select Signal
4	R/W	Read / Write Execution Control
5	E	Enable Signal
6-13	DB ₀ -DB ₇	Data Bus Line
14	V _{DD}	Power Signal
15	V _{SS}	Ground
16	V _{OUT}	Voltage Converter Input / Output
17	CAP ₃₋	Capacitor 3 Negative Connection Pin for oltage Converter
18	CAP ₁₊	Capacitor 1 Positive Connection Pin for oltage Converter
19	CAP ₁₋	Capacitor 1 Negative Connection Pin for oltage Converter
20	CAP ₂₋	Capacitor 2 Negative Connection Pin for oltage Converter
21	CAP ₂₊	Capacitor 2 Positive Connection Pin for oltage Converter
22	V ₁	LCD Driver Supply Voltage
23	V ₂	LCD Driver Supply Voltage
24	V ₃	LCD Driver Supply Voltage
25	V ₄	LCD Driver Supply Voltage
26	V ₅	LCD Driver Supply Voltage

BLOCK DIAGRAM



STANDARD COG MODULES

YMS 12864-15

128 X 64 DOTS, 1/65 DUTY, 1/9 BIAS

ELECTRICAL CHARACTERISTICS, Ta = 25°C

ITEM	SYMBOL	CONDITION	SPEC. VALUE			UNIT
			MIN.	TYP.	MAX.	
Supply Voltage (Logic)	V _{DD} - V _{SS}		2.4	3.0	5.5	V
Supply Current (Logic)	I _{DD}	V _{DD} = 3V	1.0		3.0	mA
Input Voltage	HIGH	V _{IH}	0.8 V _{DD}		V _{DD}	V
	LOW	V _{IL}	V _{SS}		0.2 V _{DD}	V
Output Voltage	HIGH	V _{OH}	I _{OH} = 0.5mA	0.8 V _{DD}		V
	LOW	V _{OL}	I _{OL} = 0.5mA	V _{SS}		0.2 V _{DD}
LCD Operating Voltage	V _{DD} - V _{EE}	V _{DD} = 3V Ta = +25°C		8.5		V
Supply Current LCD Drive	I _{EE}		0.8		1.6	mA

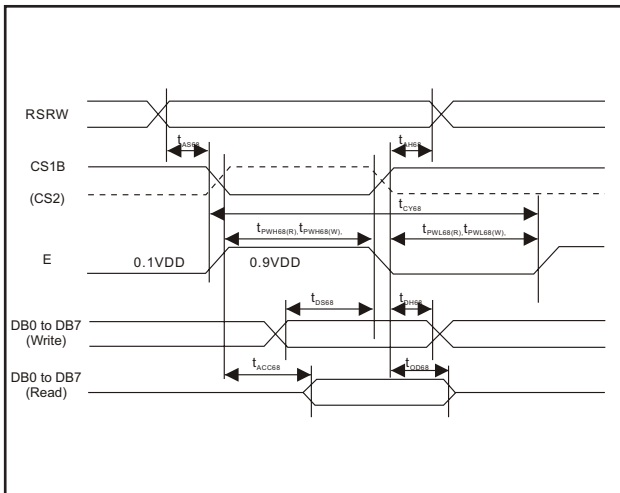
Note (1): Value is high reliability type.

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

BACKLIGHTING CHARACTERISTICS, Ta = 25°C, LED

ITEM	SYMBOL	CONDITION	SPEC. VALUE			UNIT
			MIN.	TYP.	MAX.	
Supply Voltage	V _{EL}	I _F = 135mA	3.2	3.5	3.8	V
Power Consumption	P _{LED}			472.5		mW
Luminous	I _v					cd/m ²

INTERFACE TIMING CHARACTERISTICS



Condition: t_{PWH68(W)} and t_{PWH68(R)} is specified in the overlapped period when CS_{1B} is low (CS₂ is high) and E is high.

PARAMETER	SIGNAL	SYMBOL	MIN.	MAX.	UNIT
Address Hold Time	RS, RW	t _{AH68}	0		ns
Address Setup Time	RS, RW	t _{AS68}	0		ns
E Cycle Time	E	t _{CY68}	166		ns
Enable Pulse High Width Read	E	t _{PWH68(R)}	70		ns
Enable Pulse High Width Write	E	t _{PWH68(W)}	30		
Enable Pulse Low Width Read	E	t _{PWL68(R)}	30		ns
Enable Pulse Low Width Write	E	t _{PWL68(W)}	30		
Data Setup Time		t _{DS68}	30		ns
Data Hold Time		t _{DH68}	10		
Access Time, C _L = 100pF	DB ₇ -DB ₀	t _{ACC68}		70	ns
Output Disable Time, C _L = 100pF		t _{OD68}	10	50	ns

Condition: V_{DD} = 4.5 to 5.5V ±10%, Ta = -40°C to +85°C