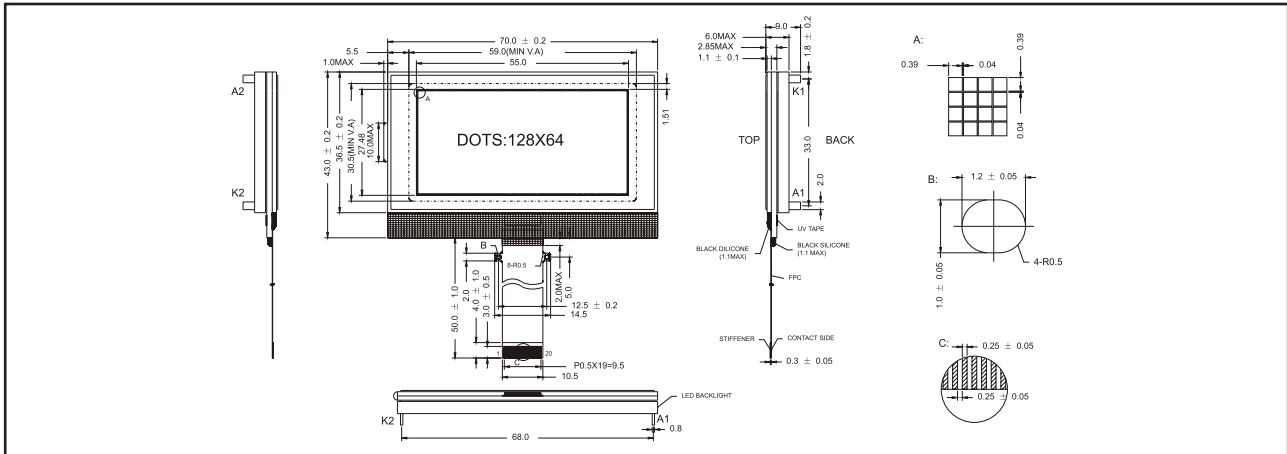


STANDARD COG MODULES

YMS 12864-06

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

EXTERNAL DIMENSION AND DISPLAY PATTERN



MECHANICAL DATA

ITEM	SPECIFICATION	UNIT
Module Size (W x H x T)	70.0 x 43.0 x 9.0	mm
Viewing Area (W x H)	59.0 x 30.5	mm
Number of Dots	128 x 64	dots
Dot Pitch (W x H)	0.43 x 0.43	mm
Dot Size (W x H)	0.39 x 0.39	mm

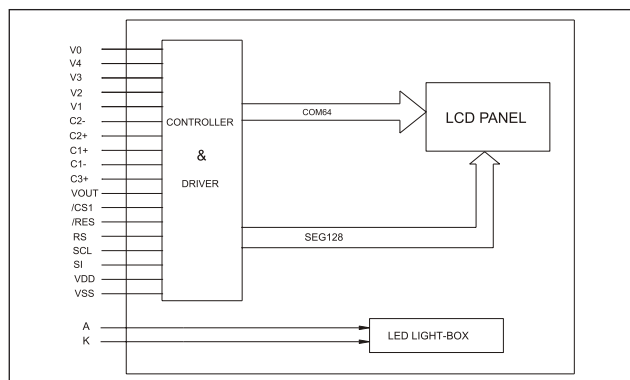
ABSOLUTE MAXIMUM RATINGS

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	18.0	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	NC	No Connection
2	V_0	LCD Driver Supply Voltage
3	V_4	LCD Driver Supply Voltage
4	V_3	LCD Driver Supply Voltage
5	V_2	LCD Driver Supply Voltage
6	V_1	LCD Driver Supply Voltage
7	C_{2-}	Capacitor 2 Negative Connection Pin for Voltage Converter
8	C_{2+}	Capacitor 2 Positive Connection Pin for Voltage Converter
9	C_{1+}	Capacitor 1 Positive Connection Pin for Voltage Converter
10	C_{1-}	Capacitor 1 Negative Connection Pin for Voltage Converter
11	C_{3+}	Capacitor 3 Positive Connection Pin for Voltage Converter
12	V_{OUT}	Voltage Converter Input / Output Pin
13	V_{SS}	Ground
14	V_{DD}	Power Supply
15	SI	Serial Input Clock
16	SCL	Serial Input Data
17	RS	Register Select Input Pin
18	/RES	Reset Signal
19	/CS	Chip Select Signal
20	NC	No Connection

BLOCK DIAGRAM



STANDARD COG MODULES

YMS 12864-06

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

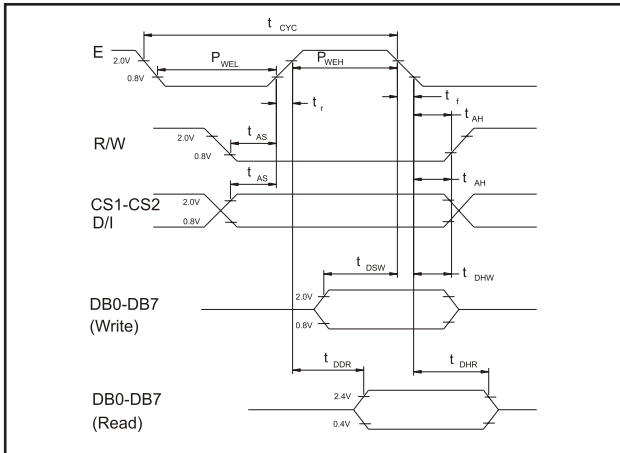
ELECTRICAL CHARACTERISTICS, Ta = 25°C

ITEM	SYMBOL	CONDITION	SPEC. VALUE			UNIT
			MIN.	TYP.	MAX.	
Supply Voltage (Logic)	$V_{DD} - V_{SS}$		2.7	3.0	3.3	V
Supply Current (Logic)	I_{DD}	$V_{DD} = 3V$		1.0	1.2	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	$V_{DD} - V_{EE}$	$V_{DD} = 3V$ $T_a = +25^\circ C$		9.0		V
Supply Current LCD Drive	I_{EE}			0.8	1.0	mA

Note (1): Value is high reliability type.

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

INTERFACE TIMING CHARACTERISTICS



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

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