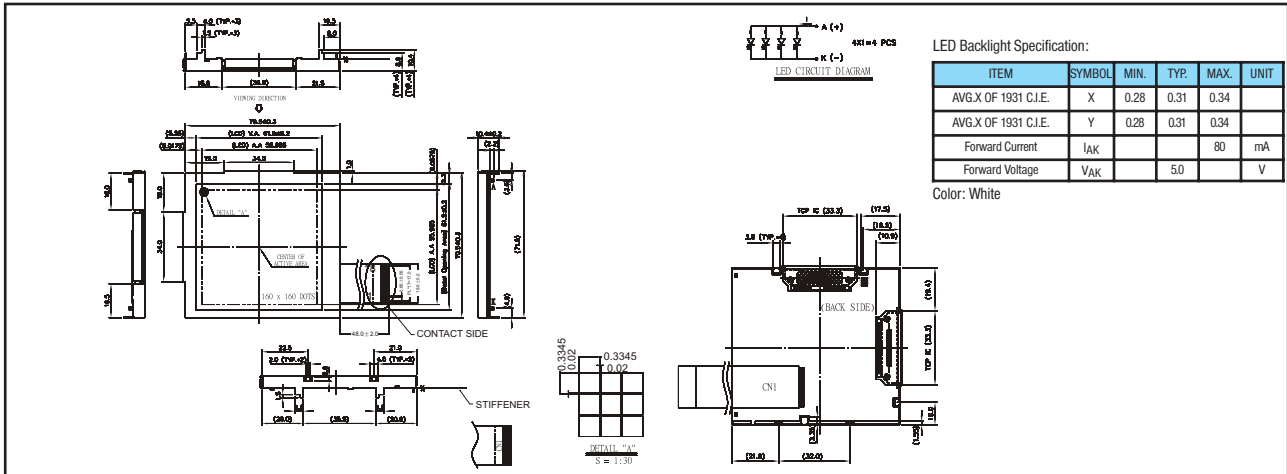


STANDARD TAB MODULES

YMS 160160-02

160 X 160 DOTS, 1/160 DUTY, 1/13 BIAS

EXTERNAL DIMENSION AND DISPLAY PATTERN



MECHANICAL DATA

ITEM	SPECIFICATION	UNIT
Module Size (W x H x T)	75.5 x 70.5 x 10.4	mm
Viewing Area (W x H)	61.5 x 61.5	mm
Number of Dots	160 x 160	dots
Dot Pitch (W x H)	0.3545 x 0.3545	mm
Dot Size (W x H)	0.3345 x 0.3345	mm

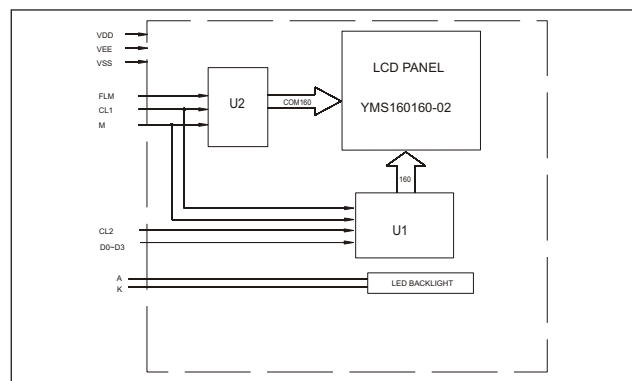
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage Logic	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	SIGNAL DESCRIPTION
1	V _{SS}	Power Supply (0V)
2	FLM (E1 ₀₂)	First Line Mark for Common Scan
3	CL ₁ (LP) V ₀	H → L Data Latch Pulse
4	CL ₂ (XCK)	Clock Pulse for Segment Shift Register
5	M (FR)	H/L Frame Reverse Signal
6	V _{DD}	H/L Supply for Logic (+3.3V)
7	NC	No Connection
8	V _{EE}	Power Supply for LCD
9-12	D ₃ -D ₀	H/L Display Data
13-16	NC	No Connection
17	A	Power Supply for LED Backlight
18	K	Power Supply for LED Backlight

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS, Ta = 25°C

ITEM	SYMBOL	CONDITION	SPEC. VALUE			UNIT
			MIN.	TYP.	MAX.	
Supply Voltage	V _{DD}	V _{DD} = 5.0V		80	120	V
Power Consumption	P _{LED}			400	600	Hz
Luminous			390		405	cd/m ²

ITEM	SYMBOL	CONDITION	SPEC. VALUE			UNIT
			MIN.	TYP.	MAX.	
Supply Voltage (Logic)	V _{DD} - V _{SS}		2.5		5.5	V
Supply Current (Logic)	I _{DD}	V _{DD} = 3.3V		1.5	2.5	mA
Input Voltage	HIGH	V _{IH}	0.8 V _{DD}			V
	LOW	V _{IL}			0.2 V _{DD}	V
Output Voltage	HIGH	V _{OH}	V _{DD} - 0.4			V
	LOW	V _{OL}			0.4	V
LCD Operating Voltage	V _{DD} - V _{EE}	V _{DD} = 3.3V Ta = +25°C		20.0		V
Supply Current LCD Drive	I _{EE}			0.8	1.0	mA

Note (1): Value is high reliability type.

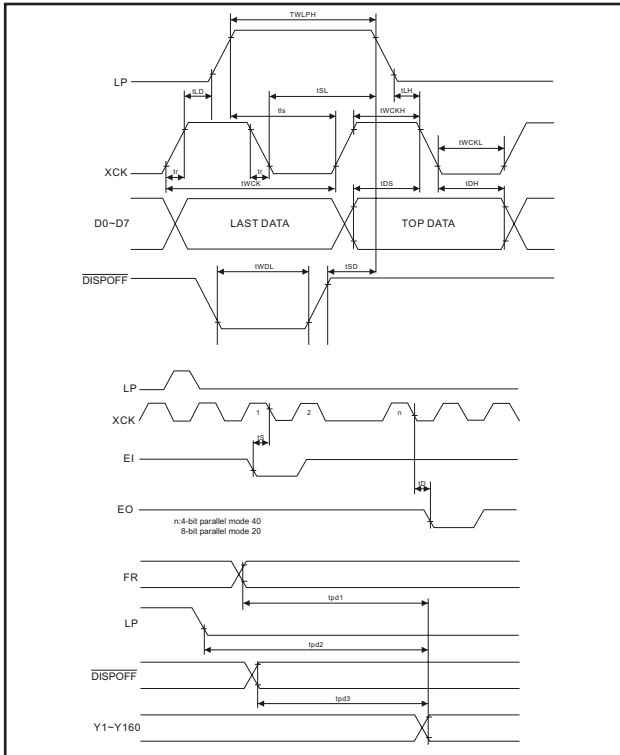
Note (2): Electro-Optical Characteristics: See page 5.

STANDARD TAB MODULES

YMS 160160-02

160 X 160 DOTS, 1/160 DUTY, 1/13 BIAS

TIMING WAVEFORM OF SEGMENT MODE

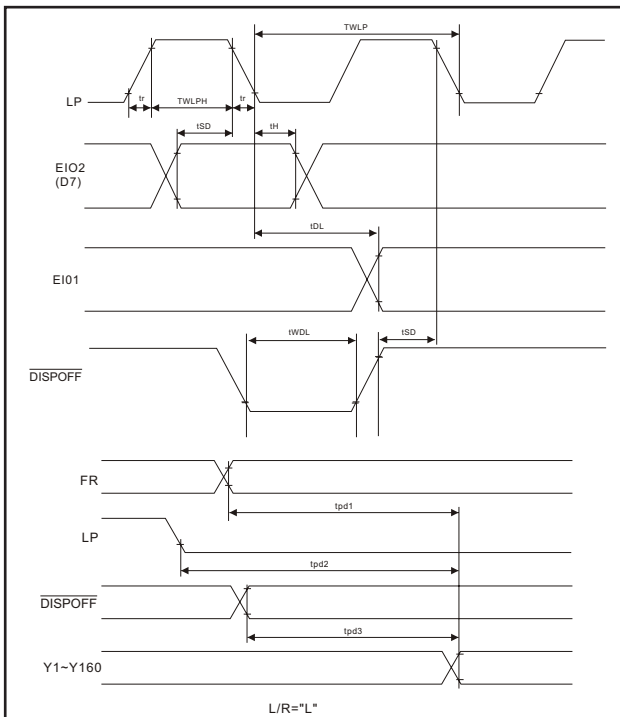


SEGMENT MODE

$V_{SS}=0V$, $V_{DD}=2.5 \sim 4.5$, $V_O=15$ to 30 and $T_a=-20^\circ C$ to $+85^\circ C$, unless otherwise noted.

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Shift Clock Period	t_{WCK}	125			ns	$t_r, t_r \leq 11$ ns Note 1
Shift Clock „H“ Pulse Width	t_{WCKH}	51			ns	
Shift Clock „L“ Pulse Width	t_{WCKL}	51			ns	
Data Setup Time	t_{DS}	30			ns	
Data Hole Time	t_{DH}	40			ns	
Latch Pulse „H“ Pulse Width	t_{WLPH}	51			ns	
Shift Clock Rise to Latch Pulse Rise Time	t_{LD}	0			ns	
Shift Clock Fall to Latch Pulse Fall Time	t_{SL}	51			ns	
Latch Pulse Rise to Shift Clock Rise Time	t_{LS}	51			ns	
Latch Pulse Fall to Shift Clock Fall Time	t_{LH}	51			ns	
Input Signal Rise Time	t_r			50	ns	Note 2
Input Signal Fall Time	t_f			50	ns	Note 2
Enable Setup Time	t_S	36			ns	
/DISPOFF Removal Time	t_{SD}	100			ns	
/DISPOFF Enable Pulse Width	t_{WDL}	1.2			ns	
Output Delay Time (1)	t_D			78	ns	$C_L=15$ pF
Output Delay Time (2)	t_{pd1}, t_{pd2}			1.2	μ s	$C_L=15$ pF
Output Delay Time (3)	t_{pd3}			1.2	μ s	$C_L=15$ pF

TIMING CHARACTERISTICS OF COMMON MODE



COMMON MODE

$V_{SS}=0V$, $V_{DD}=2.5 \sim 5.5$, $V_O=15$ to 30 and $T_a=-20^\circ C$ to $+85^\circ C$, unless otherwise noted.

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Shift Clock Period	t_{WLP}	250			ns	$t_r, t_r \leq 20$ ns Note 1
Shift Clock „H“ Pulse Width	t_{WLPH}	15			ns	$V_{DD}=+5.0V$ $\pm 10\%$
		30			ns	$V_{DD}=+2.5$ $\sim +4.5V$
Data Setup Time	t_{SU}	30			ns	
Data Hole Time	t_H	50			ns	
Input Signal Rise Time	t_r			50	ns	
Input Signal Fall Time	t_f			50	ns	
/DISPOFF Removal Time	t_{SD}	100			ns	
/DISPOFF Enable Pulse Width	t_{WDL}	1.2			ns	
Output Delay Time (1)	t_D			200	ns	$C_L=15$ pF
Output Delay Time (2)	t_{pd1}, t_{pd2}			1.2	μ s	$C_L=15$ pF
Output Delay Time (3)	t_{pd3}			1.2	μ s	$C_L=15$ pF