

Specifications for Approval

Customer: _____

Model name: JLX12864A-1 **VER:** V 1.0

ISSUE	QC DEPT	APPROVAL

Customer Approval

Accept **Reject**

Comment:

Approval by:

JLX12864A-1 LCD Module

(Graphic Type)

■FEATURES

- Module: graphic LCD arranged as 128 x 64 dots with LED Back-light*(Yellow/Green)
- Glass Type: STN
- Viewing Direction : 6 'clock (bottom view)
- Display color: Green
- Background color: Yellow
- Polarizer mode: Positive, Reflective/Transflective
- Driving Method: 1/64Duty Cycle, 1/9 Bias
- Glass to PCB: ZEBRA CONNECTOR
- Dot Size : 0.48x 0.48 mm
- Dot Pitch : 0.52 x 0.52 mm

■ABSOLUTE MAXIMUM

Item	Symbol	Standard value	Unit
Power Supply Voltage	Vdd	-0.3 ~ +7.0	V
Power supply for LCD Drive	Vlcd	Vdd-19.0 ~ Vdd+0.3	V
Input Voltage	Vin	-0.3 ~ Vdd+0.3	V
Operating Temperature	Top	0 ~ +50	°C
Storage Temperature	Tstg	-10 ~ +60	°C

■ELECTRICAL CHARACTERISTICS

AC characteristics (Vdd=5V±10%,Vss=0V Ta=25°C)

Characteristic	Symbol	Min.	Max.	Unit
E Cycle	Tcyc	1000	--	
E High Level Width	Pweh	450	--	
E Low Level Width	Pwel	450	--	
E Rise Time	Tr	--	25	
E Fall Time	Tf	--	25	
Address Set-Up Time	Tas	140	--	ns
Address Hold Time	Tah	10	--	
Data Set-Up Time	Tdsw	200	--	
Data Delay Time	Tddr	--	320	
Data Hold Time(Write)	Tdhw	10	--	
Data Hold Time(Read)	Tdhr	20	--	

DC Characteristics(Ta==25°C;Vdd=5.0V±10%)

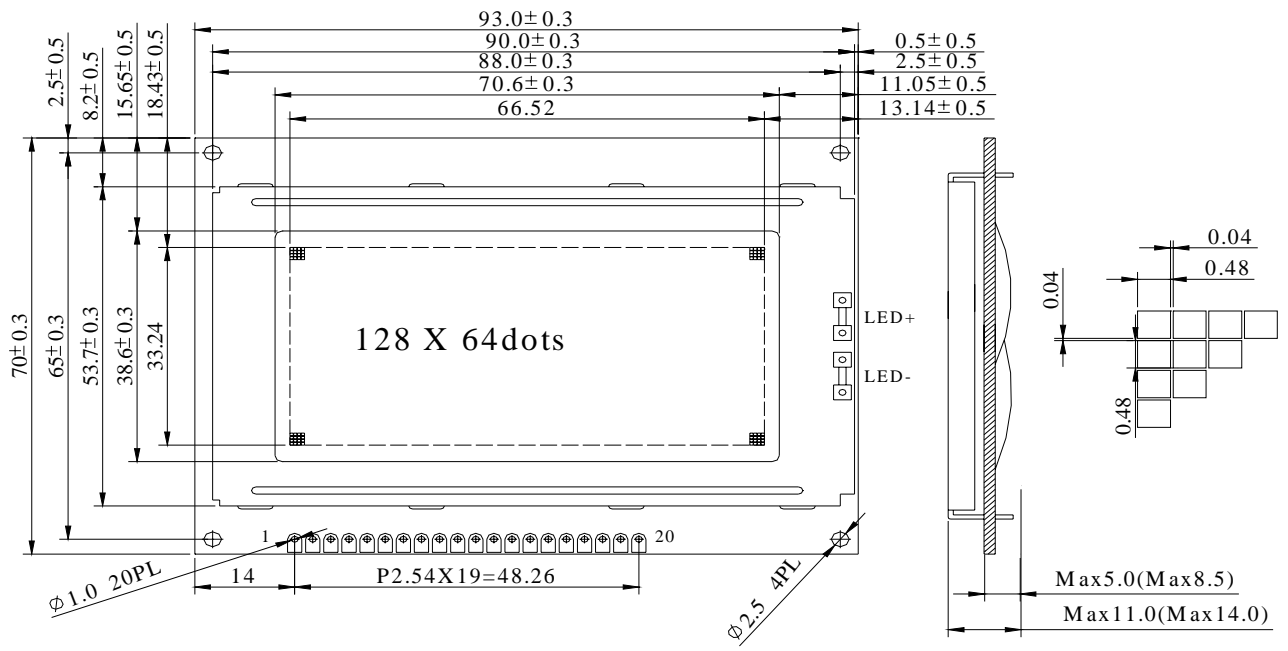
PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Operating	VDD		4.5	5.0	5.5	V

Voltage(1)							
Input	High	Vih	E,R/W,D/I,DB0~DB7	2.0	--	VDD	V
Voltage	Low	Vil	Terminals	0	--	0.8	
Output	High	Voh	DB0~DB7,	2.4	--	--	V
Voltage	Low	Vol	Terminal	--	--	0.4	
Operating Current		Idd	During Display	--	--	2750	uA

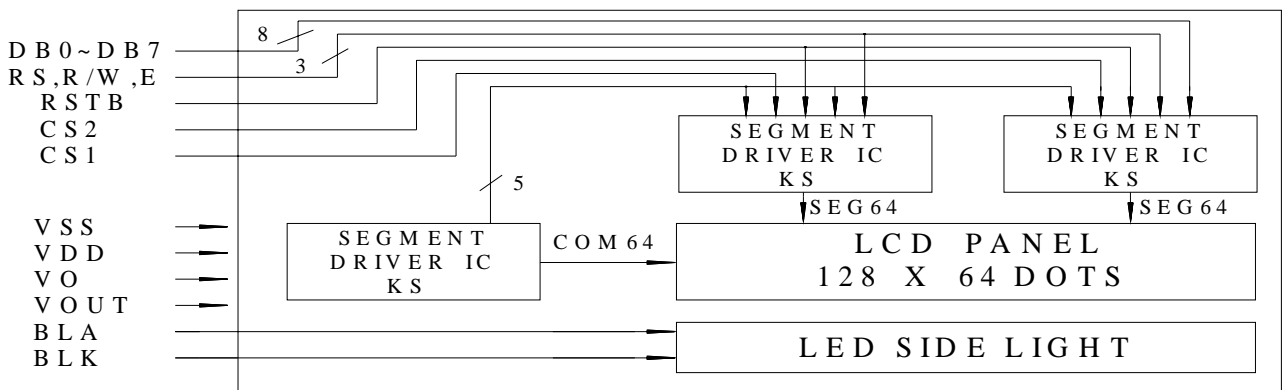
MECHANICAL PARAMETER

Item	Description	Unit
PCB Dimension	93.0 x 70.0 x 1.6	mm
LCD Dimension	84.0 x 51.0 x 2.6	mm
View Dimension	70.6 x 38.6	mm
Outline Dimension	93 x 70.0 x 8.0/13.5*	mm

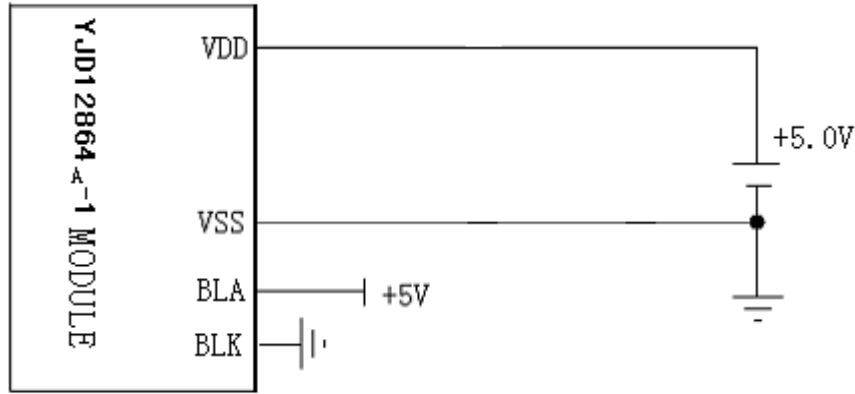
EXTERNAL DIMENSIONS



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VSS	VDD	VO	D/I	R/W	E	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7	CS1	CS2	RSTB	VOUT	BLA	BLK



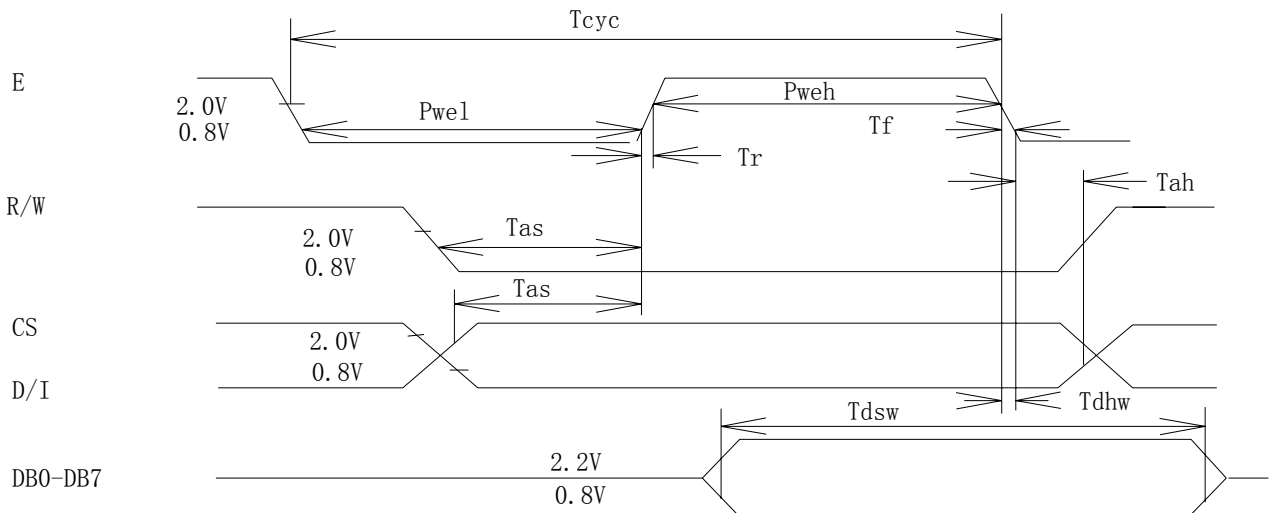
POWER SUPPLY BLOCK DIAGRAM



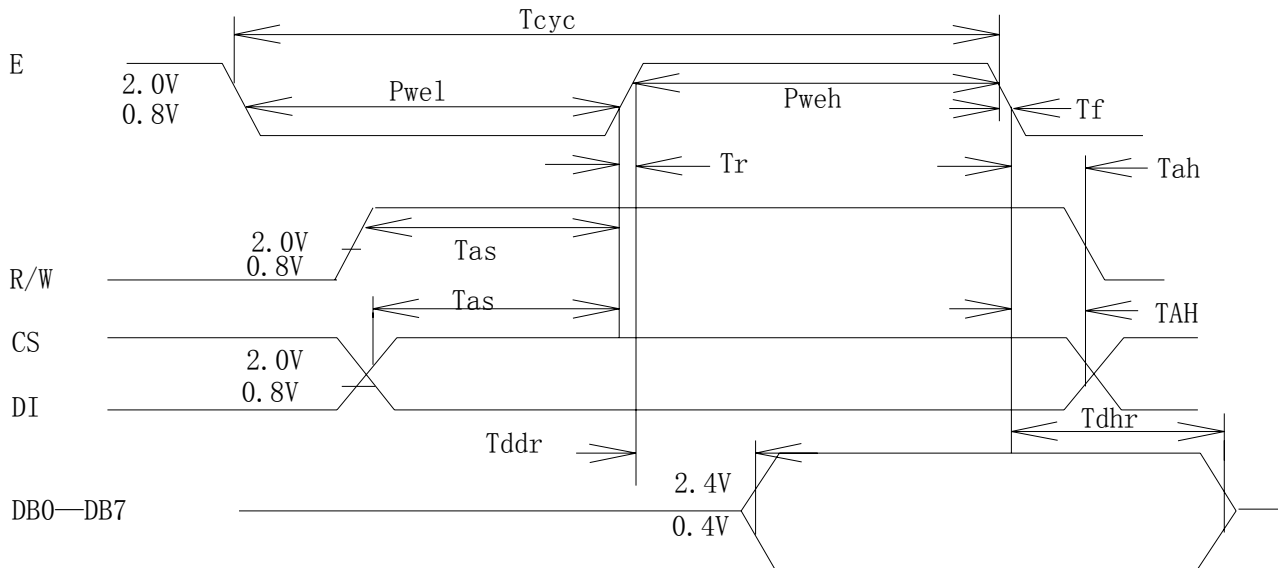
■PIN ASSIGNMENT

Pin NO.	Symbol	Level	Function
1	VSS	0V	Power Ground
2	VDD	+5V	Power supply
3	VO	--	For LCD drive voltage(variable)
4	D/I	H/L	H: Display Data, L:Display Instruction
5	R/W	H/L	H: Read Signal, L: Write Signal
6	E		Enable Signal
7-14	DB0-DB7	H/L	Date bus
15	CSA	H/L	Select chip
16	CSB	H/L	Select chip
17	/RES	H/L	Reset Signal
18	VEE	-15V	Negative voltage(-15V)to LCD
19	LED(+)	--	Power (+)for LED Backlight
20	LED(-)	--	Power (-)for LED Backlight

Writing timin



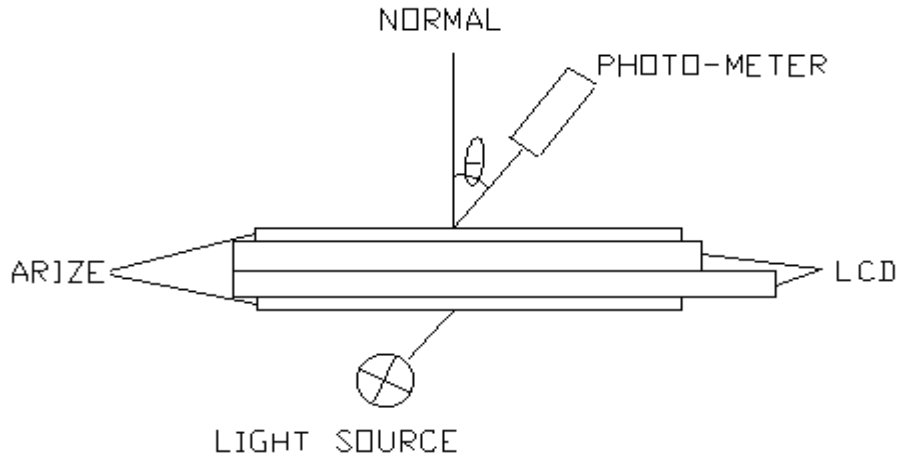
Reading Timing



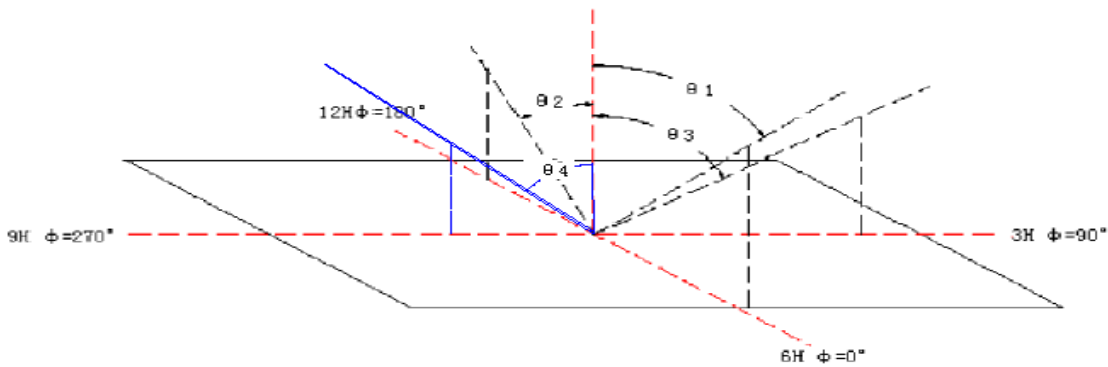
■CONTROL and DISPLAY COMMAND

Instruction	R/W	D/I	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Function	
Display on/off	L	L	L	L	H	H	H	H	H	L/H	Controls the display on or off. Internal status and display RAM data is not affected. L:OFF,H:ON	
Set Address	L	L	L	H	Y address (0~63)						Sets the Y address in the Y address counter.	
Set Page (X Address)	L	L	H	L	H	H	H			page (0~7)	Sets the X address at the X address register.	
Display Start Line	L	L	H	H	Display start line (0~63)						Indicates the display data RAM display at the top of the screen	
Status read	H	L	B U S Y	L	O N / O F F	R E S E T	L	L	L	L	Read the status : busy 1:working,0:ready ADC 1:clockwise output 0:counterclockwise ON/OFF 1:disp off 0:disp on RESET 1:reset 0:normal	
Write Display Data	L	H	Write Data									Write data (DB0:7) into display data RAM. After writing instruction, Y address is increased by 1 automatically.
Read Display Data	H	H	Read Data									Read data (DB0:7) from display data RAM to the data bus

■OPTICAL MEASUREMENT SYSTEM



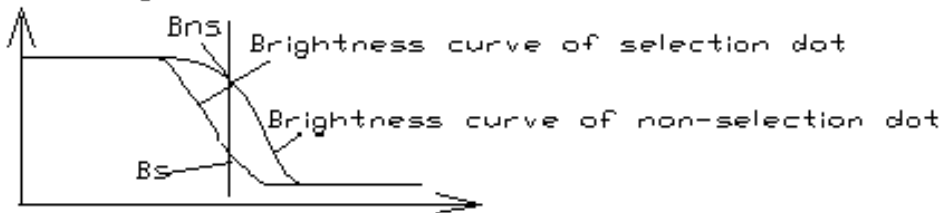
.DEFINITION OF θ AND ϕ



.DEFINITION OF CONTRAST RATIO C_r

DEFINITION:

$$C_r = \frac{\text{Brightness of non-selection dot (} \rho_{ns} \text{)}}{\text{Brightness of selection dot (} \rho_s \text{)}}$$



.DEFINITION OF OPTICAL RESPONSE TIME

