AZ DISPLAYS, INC.

COMPLETE LCD SOLUTIONS

SPECIFICATIONS FOR LIQUID CRYSTAL DISPLAY

PART NUMBER: **AGM1264N SERIES**
DATE: **MAR. 7, 2007**

1. General Specifications

1-1.Features

A. Drive Method: 1/65 Duty, 1/9 Bias

B. The Module Operating Voltage: 3V;

C. The LCD Operating Voltage : 9.0V;

D. Viewing Direction: 12:00

E. Operating Temperature: 0℃~50℃

F. Storage Temperature: -20℃~70℃

G. Display type: STN or FSTN / Positive or Negative

1-2.Mechanical Data:

(1) Module Size ---------- 70.0 w * 43.0 h mm

(2) Viewing Area ---------- 59.0 w * 30.5 h mm

(3) Dot Size ---------- 0.39 w * 0.39 h mm

(4) Number of Dots ---------- 128 * 64 Dots

(5) Outline Dimensions---------- See Attached Drawing

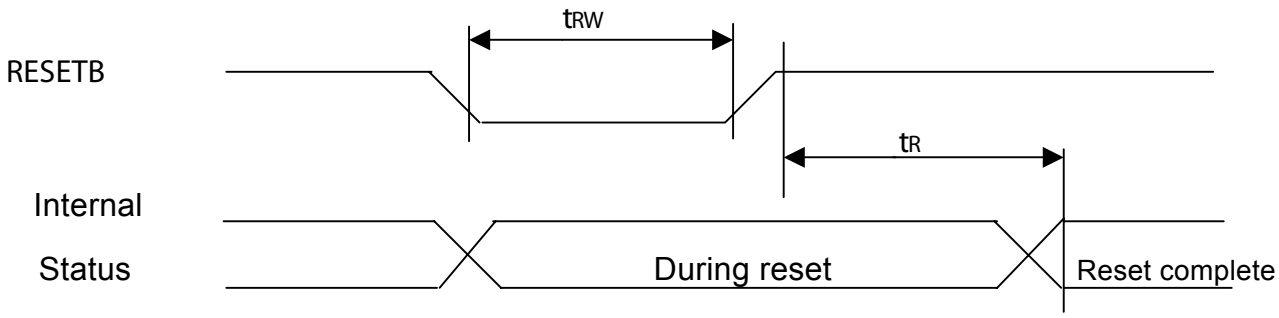
1-3.Pin Connections:

Pin No.	Symbol	Function
1	NC	No Connect
2	V0	LCD driver supply voltages
3	V4	LCD driver supply voltages
4	V3	LCD driver supply voltages
5	V2	LCD driver supply voltages
6	V1	LCD driver supply voltages
7	C2-	Capacitor 2- connection pin for voltage converter
8	C2+	Capacitor 2+connection pin for voltage converter
9	C1+	Capacitor 1+ connection pin for voltage converter
10	C1-	Capacitor 1- connection pin for voltage converter
11	C3+	Capacitor 3+connection pin for voltage converter
12	Vout	Voltage converter input/ output pin
13	VSS	Ground
14	VDD	Power supply
15	SI	Serial input data
16	SCL	Serial input clock
17	RS	Register select input pin
18	/RES	Reset input pin
19	/CS1	Chip select input pins
20	NC	No Connect

1-4. Absolute Maximum Ratings:

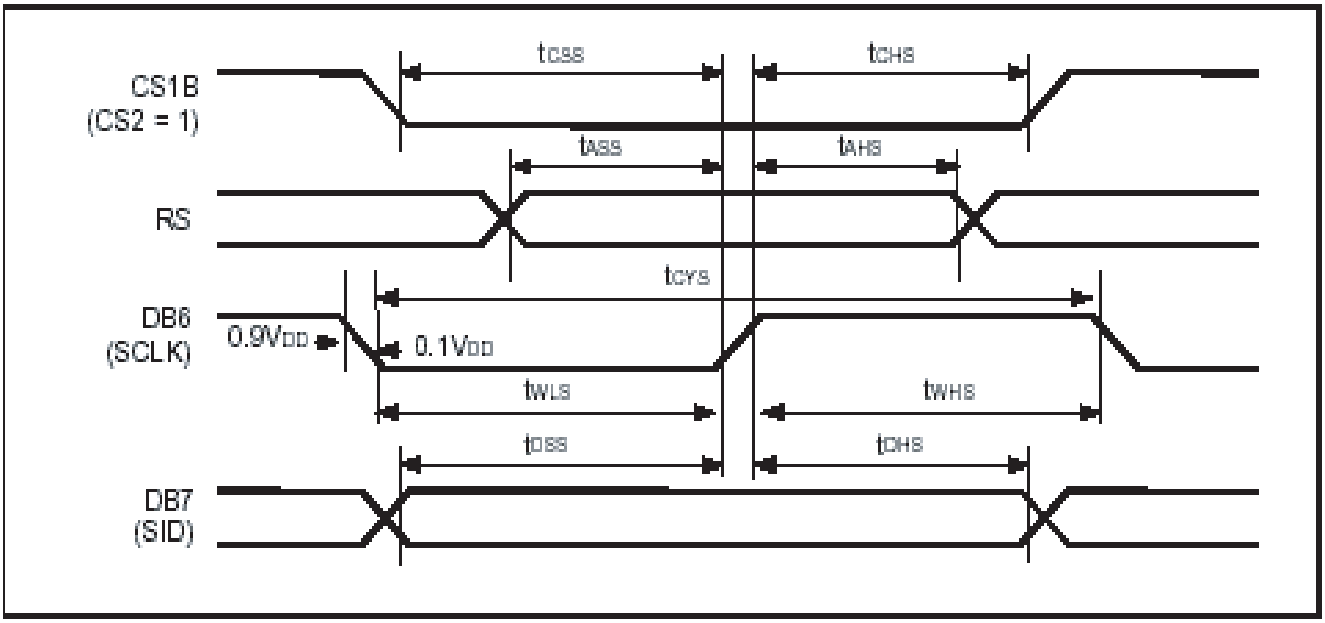
Characteristics	Symbol	Ratings
Supply Voltage	VDD	-0.3V to +7.0V
Supply Voltage	VLCD	-0.3V to +17.0V
Input Voltage	V_{IN}	-0.3V to Vdd+0.3V

1-5. Reset Input Timing:



Item	Signal	Symbol	Min.	Typ.	Max.	Unit
Reset low pulse width	RESETB	tRW	1.0	-	-	us
Reset time	-	tR	-	-	1.0	us

1-6. Serial Interface Characteristics



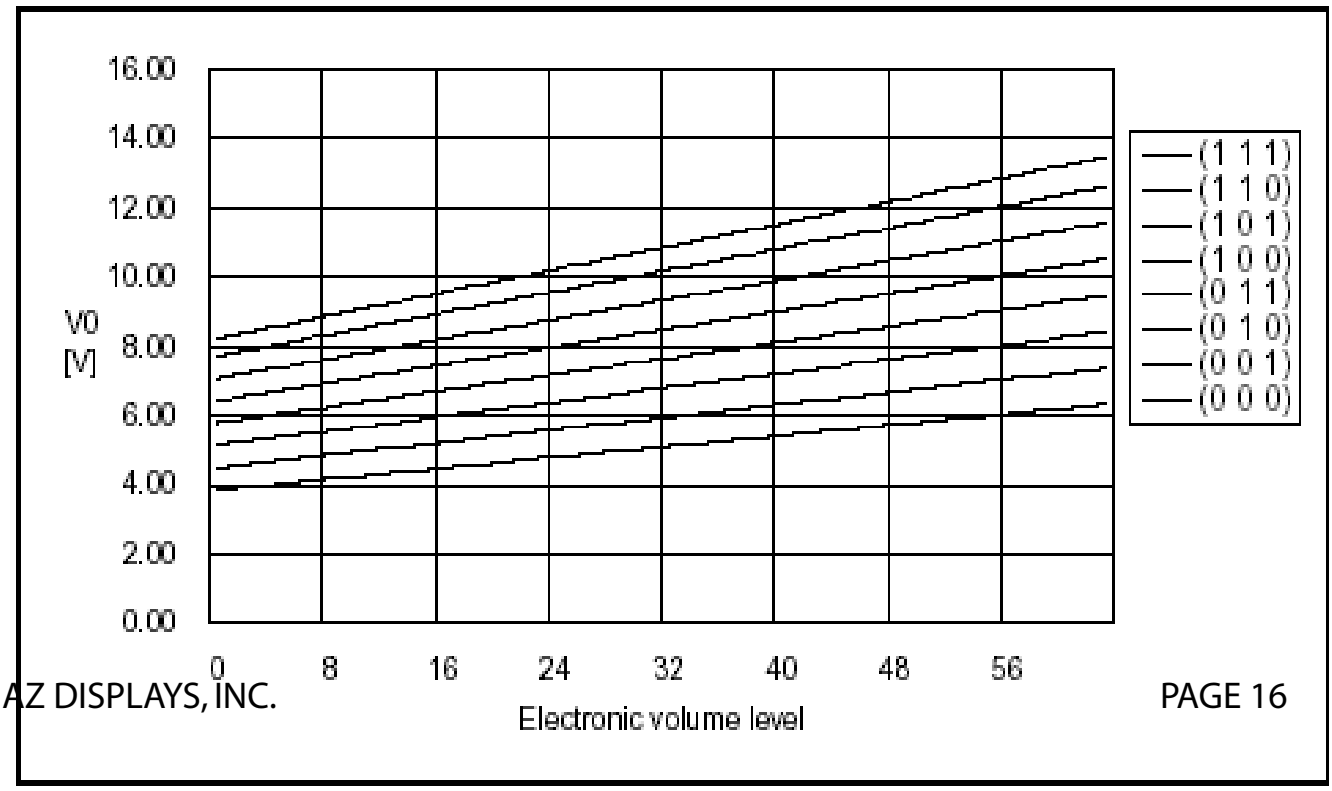
Item	Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Serial clock cycle SCLK high pulse width SCLK low pulse width	DB6 (SCLK)	tCYS tWHS tWLS	250 100 100	- - -	- - -	ns	
Address setup time Address hold time	RS	tASS tAHS	150 150	- -	- -	ns	
Data setup time Data hold time	DB7 (SID)	tDSS tDHS	100 100	- -	- -	ns	
CS1B setup time CS1B hold time	CS1B	tCSS tCHS	150 150	- -	- -	ns	

1-7. Instruction Table

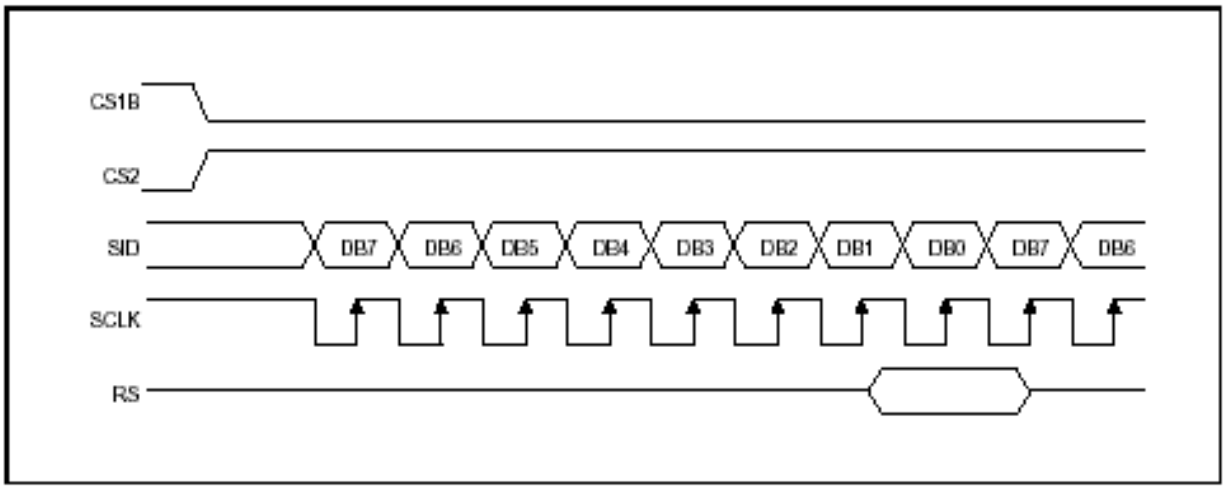
Instruction	RS	RW	BD7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Description
Display ON/OFF	0	0	1	0	1	0	1	1	1	DON	Turn on/off LCD panel when DON=0: display OFF when DON=1: display ON
Initial display line	0	0	0	1	ST5	ST4	ST3	ST2	ST1	ST0	Specify DDRAM line for COM0
Set page address	0	0	1	0	1	1	P3	P2	P1	P0	Set page address
Set column address MSB	0	0	0	0	0	1	Y7	Y6	Y5	Y4	Set column address MSB
Set column address LSB	0	0	0	0	0	0	Y3	Y2	Y1	Y0	Set column address LSB
Read status	0	1	BUSY	ADC	ONOFF	RESETB	0	0	0	0	Read the internal status
Write display data	1	0	Write data								Write data into DDRAM
Read display data	1	1	Read data								Read data from DDRAM
ADC select	0	0	1	0	1	0	0	0	0	ADC	Select SEG output direction When ADC=0: normal direction(SEG0-SEG131) When ADC=1: reverse direction (SEG131-SEG0)
Reverse display ON/OFF	0	0	1	0	1	0	0	1	1	REV	Select normal/reverse display When REV=0: normal display When REV=1: reverse display
Entire display ON/OFF	0	0	1	0	1	0	0	1	0	EON	Select normal/entire display ON When EON=0: normal display When EON=1: entire display ON
LCD bias select	0	0	1	0	1	0	0	0	1	BIAS	Select LCD bias
Set modify-read	0	0	1	1	1	0	0	0	0	0	Set modify-read mode
Reset modify-read	0	0	1	1	1	0	1	1	1	0	Release modify-read mode
Reset 0		0	1	1	1	0	0	0	1	0	Initialize the internal functions
SHL select	0	0	1	1	0	0	SHL	*	*	*	Select COM output direction When SHL=0: normal direction(COM0-COM63) When SHL=1: reverse direction (COM63-COM0)
Power control	0	0	0	0	1	0	1	VC	VR	VF	Control power circuit operation
Regulator resistor select	0	0	0	0	1	0	0	R2	R1	R0	Select internal resistance ratio of the regulator resistor
Set reference voltage mode	0	0	1	0	0	0	0	0	0	1	Set reference voltage mode
Set reference voltage register	0	0	*	*	SV5	SV4	SV3	SV2	SV1	SV0	Set reference voltage register
Set static indicator mode	0	0	1	0	1	0	1	1	0	SM	Set static indicator mode
Set static indicator register	0	0	*	*	*	*	*	*	S1	S0	Set static indicator register
Power save											Compound instruction of display OFF and entire display ON
NOP 0		0	1	1	1	0	0	0	1	1	Non-Operation command
Test instruction-1	0	0	1	1	1	1	*	*	*	*	Don't use this instruction
Test instruction-2	0	0	1	0	0	1	*	*	*	*	Don't use this instruction

1-8. Electronic Volume Level

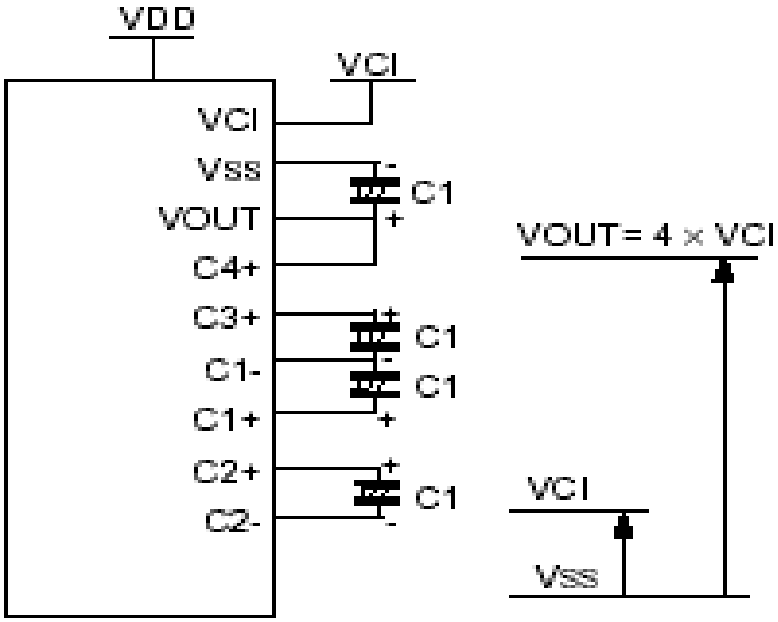
The following figure shows V0 voltage measured by adjusting internal regulator resistor ratio (Rb / Ra) and 6-bit electronic volume registers for each temperature coefficient at Ta = 25 °C.



1-9.Serial Interface Timing



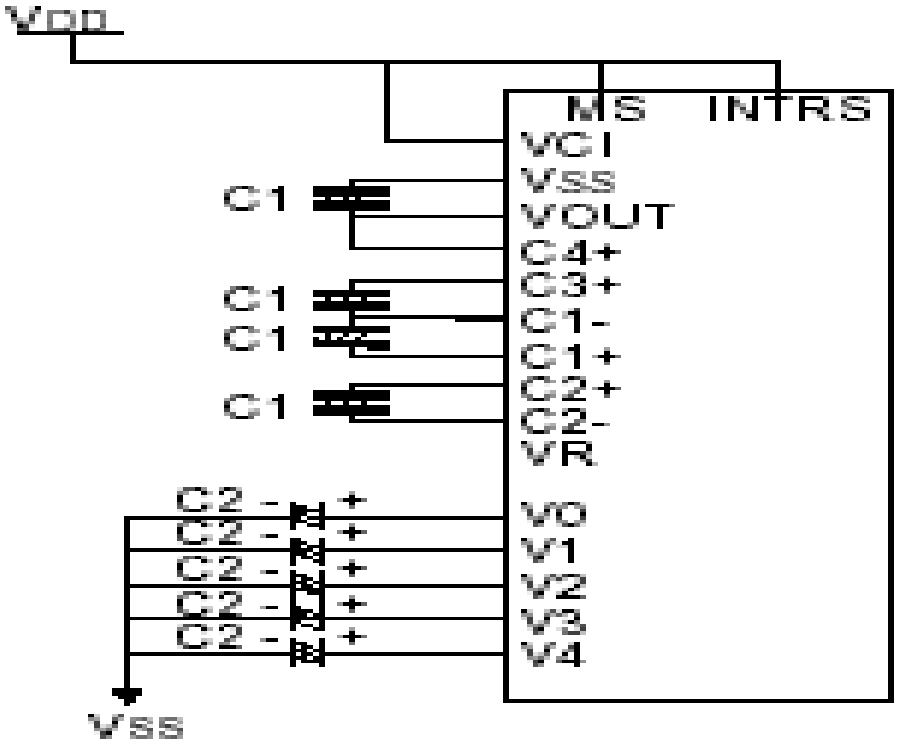
1-10. Voltage Converter Circuits



Times Boosting Circuit C1=1.0~4.7 uF

1-11. Reference Circuit

Using internal regulator resistors



2.The Characteristics and The Reliability T est

1.Electro-Optic Characteristics:

Condition:TEMP=(23±3)℃

NO	Item		Symbol	Min	Typ.	Max	Unit	Condition
1	Supply Voltage(Logic)		Vdd-Vss		3.0		V	
2	LCD Operating Voltage		Vdd-V_0		9.2		V	0℃
					9.0		V	25℃
					8.8		V	50℃
3	Response Time		Ton		112		ms	
			Toff		80		ms	
4	Contrast		CR	3				
5	Viewing Angel	12H	θ 1		70		Deg.	(CR≧3.0)
		6H	θ 2		59			
		3H	θ 3		60			
		9H	θ 4		60			
6	LCD Threshold Voltage		Vth		7.01		V	25℃

:

2. Characteristics of backlight (LED unit)

(1).Absolute Maximum Ratings:

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward Current	IFM		60	120	mA	Ta=25℃
Reverse Voltage	VR		10		V	Ta=25℃
Power Dissipation	PD		0.27		W	Ta=25℃

(2).Electrical-optical Characteristics:

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward Voltage	VF		4.5		V	
Reverse current	IR		0.6		mA	
Luminous LV			50		cd/m^2	VF=4.5V
Color	YELLOW-GREEN OR WHITE					

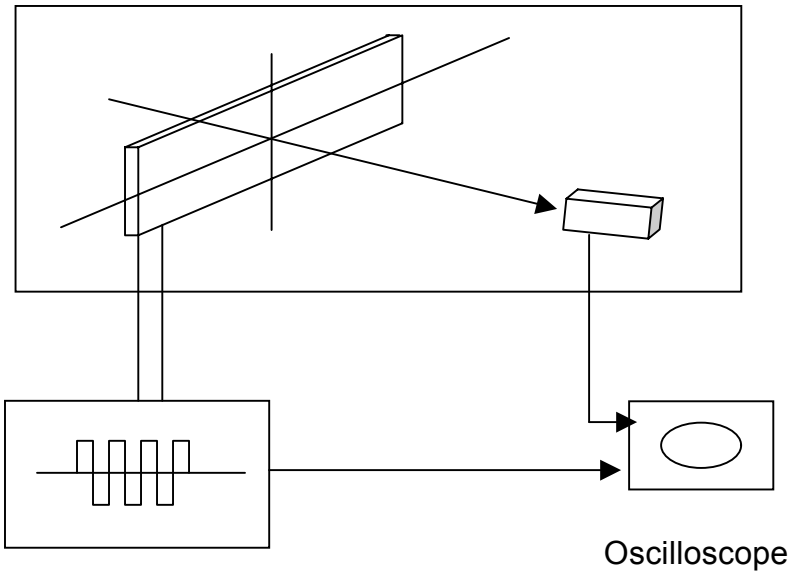
WARNING:

A BACKLIGHT IS A KIND OF CURRENT DEVICE,IT MUST CONNECT A RESISTANCE FOR LIMITING CURRENT ,OR IT WILL BE DAMAGED.

3.The LCD Measuring Method and Equipment

1. Threshold Voltage and Response Time Measuring

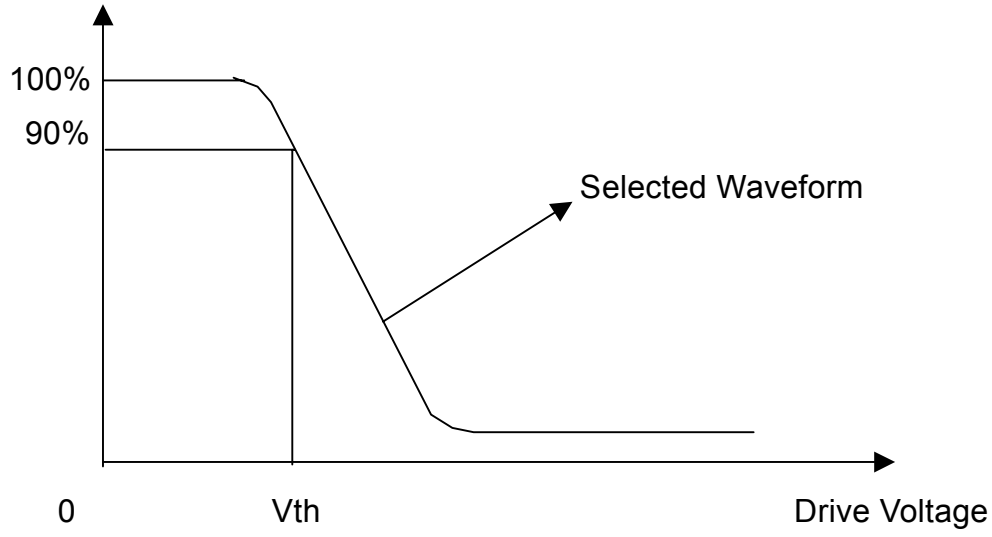
(1) Equipment



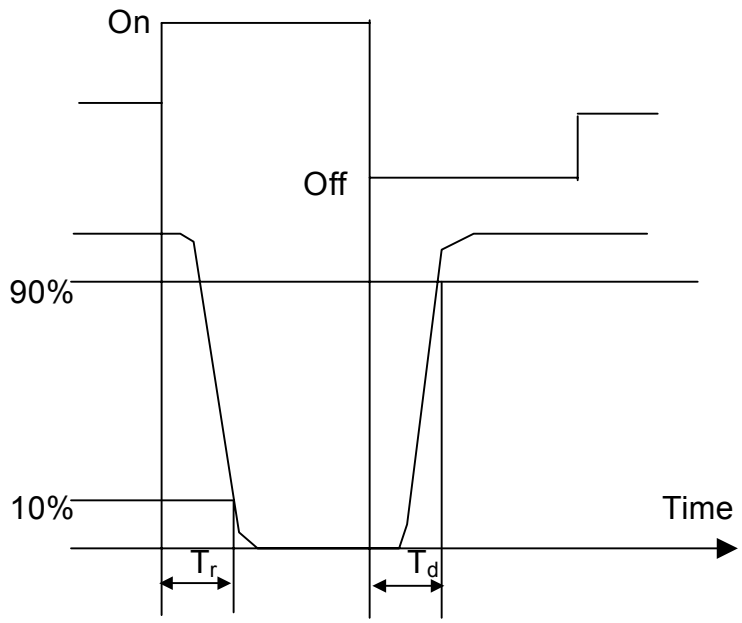
(2) Definition

A. Threshold Voltage (Vth)

Brightness

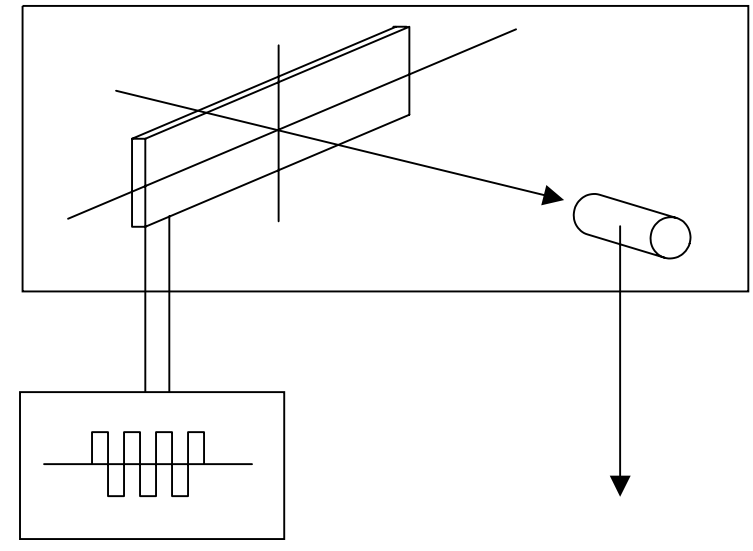


B. Response Time



2. Contrast Measuring

(1) Equipment

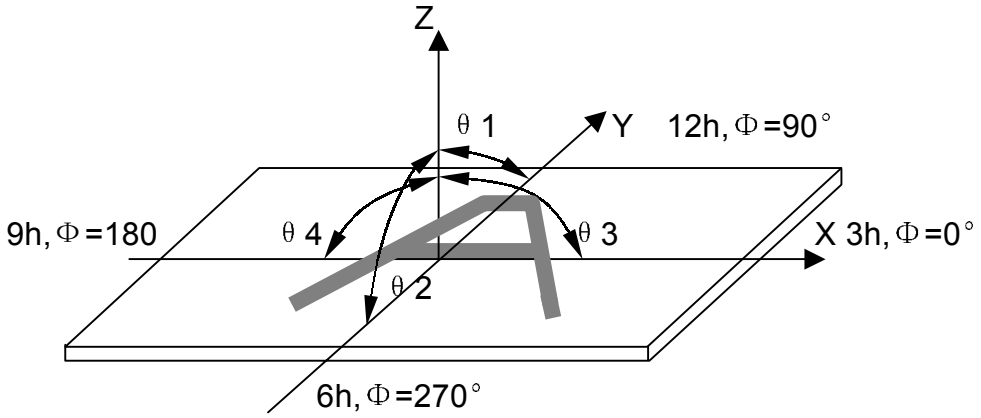


Spectrophotometer

Waveform Generator

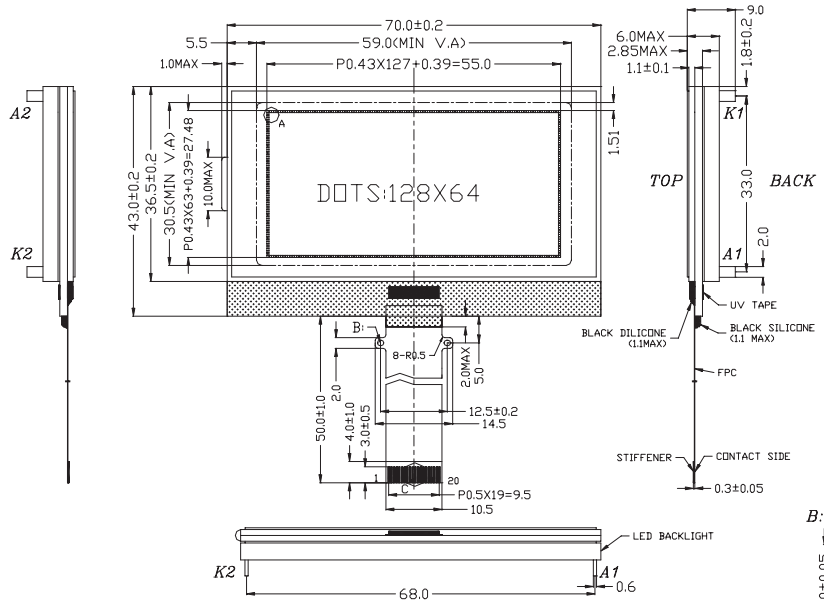
(2)Definition:

A.Viewing Angle:

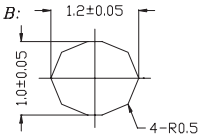


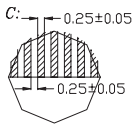
B. Contrast Ratio (Positive)

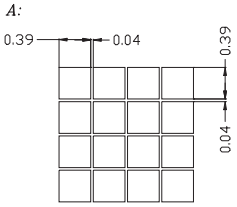
$$CR = \frac{\text{Brightness of non-selected wave-form}}{\text{Brightness of selected wave-form}}$$



PIN	SYMBOL	PIN	SYMBOL
1	NC	11	C3+
2	V0	12	VOUT
3	V4	13	VSS
4	V3	14	VDD
5	V2	15	SI
6	V1	16	SCL
7	C2-	17	RS
8	C2+	18	/RES
9	C1+	19	/CS1
10	C1-	20	NC







Note:

1. *Display Type: STN/FSTN*
2. *Polarizer Mode: Transflective or Transmissive/Positive or Negative*
3. *Drive Method: 1/65Duty, 1/9 Bias*
4. *Viewing Direction: 12:00*
5. *Operating Temp: 0°C~50°C*
   Storage Temp: -20°C~70°C
6. *Controller: S6B0724A01-B0CY*
7. *Resolution: 128X64 Dots*
8. *Logic Voltage: 3.0V*
   LCD Operating Voltage: 9.0V
9. *Backlight: LED Yellow-Green or white ; VOLTAGE: 4.5V*
10. *Unmarked Tolerances: ±0.3*