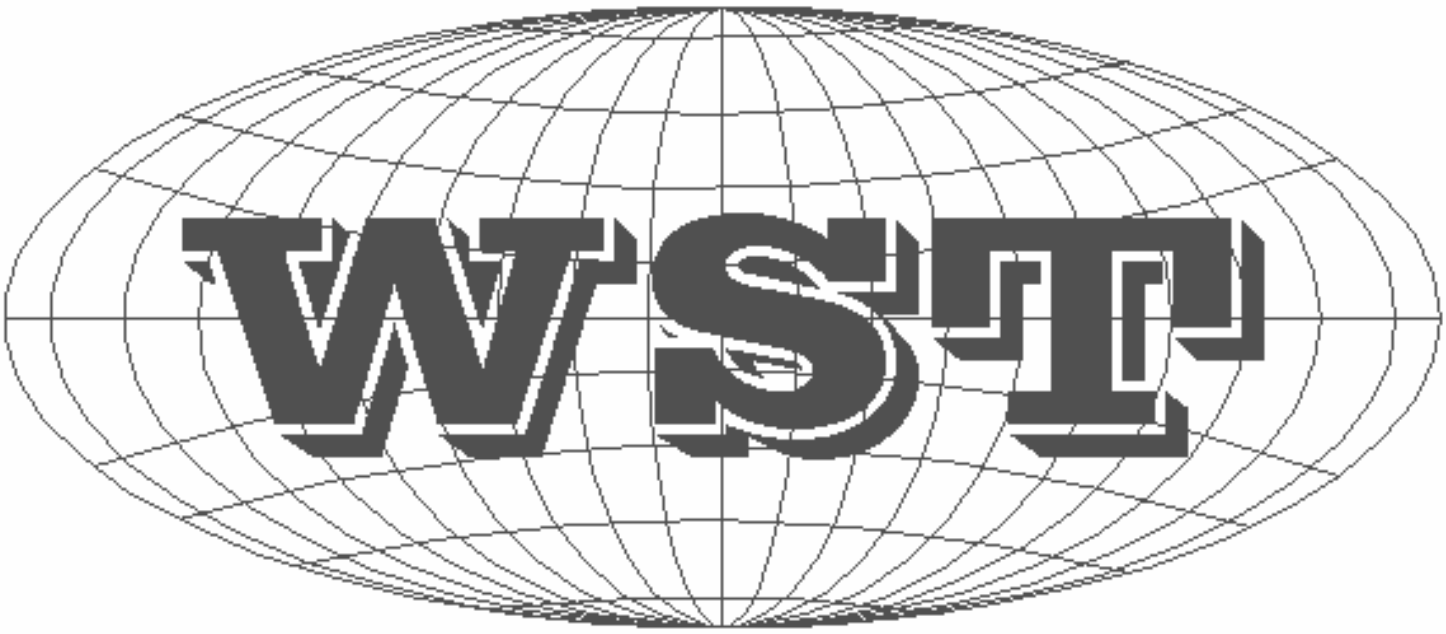
WGM-240128A 技术资料



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目　　录

制作部门：技术部

部门经理：

制作人：

制作日期：

1 Display Specification

1.1 Display type: STN

1.2 Display color

Display color: Gray or Yellow-Green

1.3 Polarizer mode: Positive

Reflective

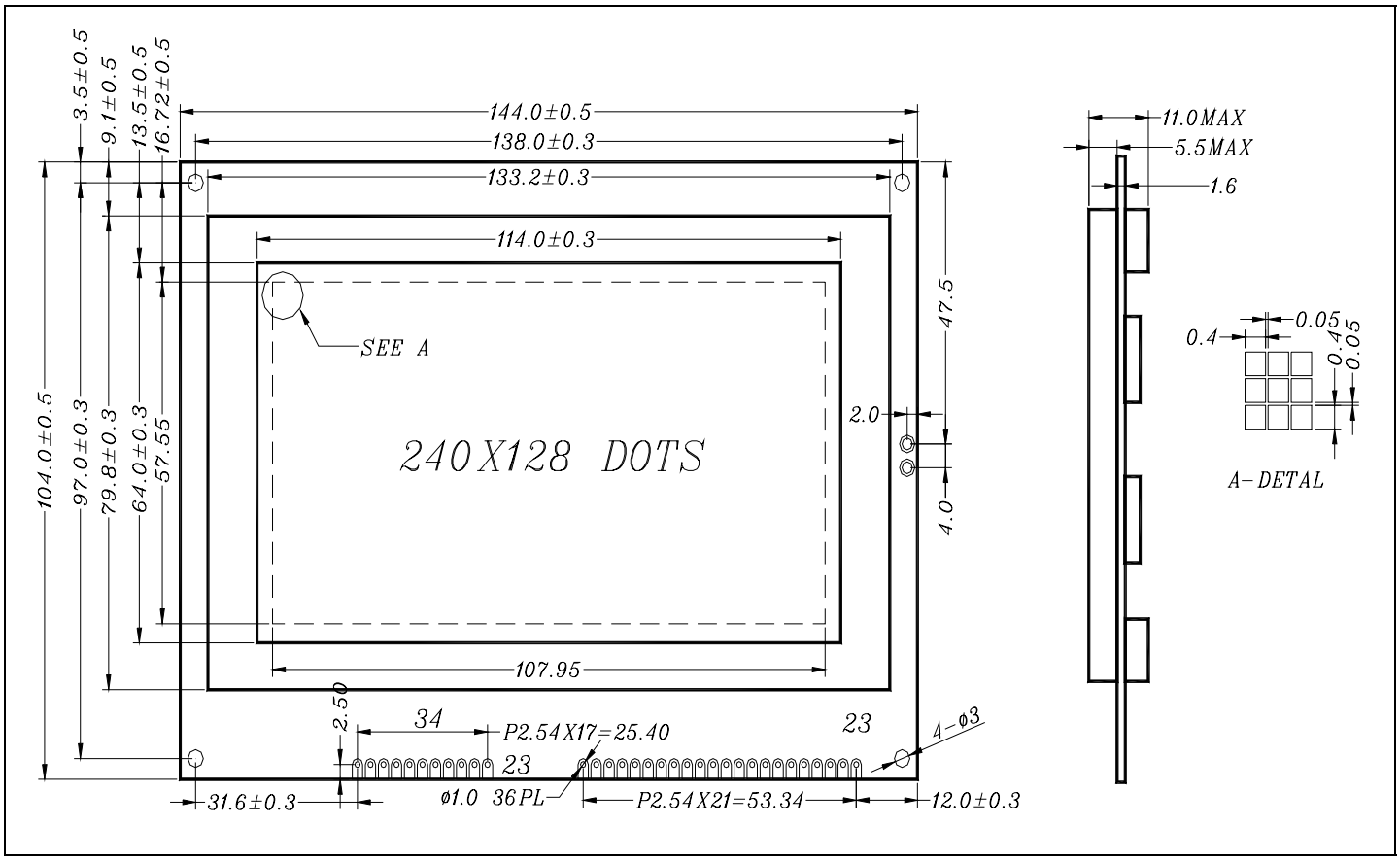
1.4 Viewing Angle: 6:00

1.5 Driving Duty: 1/128

1.6 Operating Temperature Range Top -30℃--80℃

Storage Temperature Range Tst -40℃--90℃

2 Mechanical Specifications



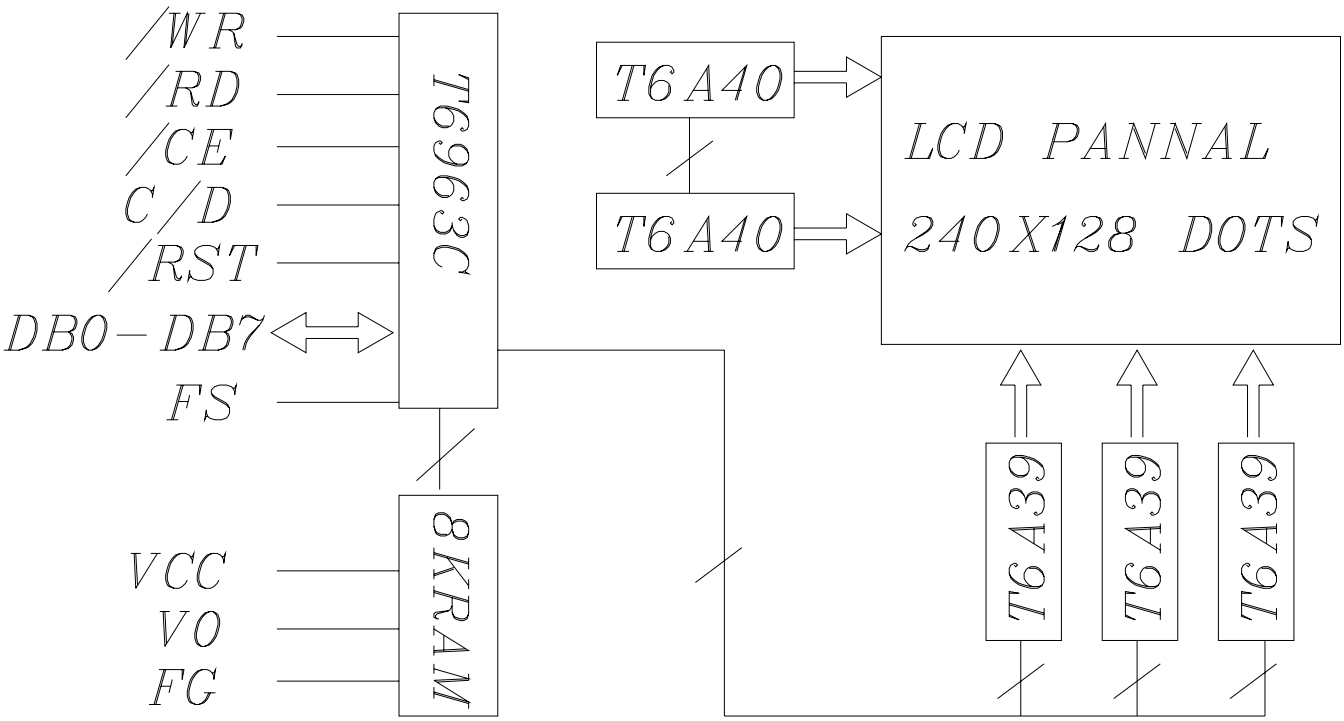
2.1 Outline Dimensions

2.2 Dot Matrix: 240×128

2.3 Dot size: 0.40×0.40(mm)

2.4 Dot pitch: 0.45×0.45(mm)

3 Circuit Block Diagram



4 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Remark
Power Supply Voltage	VDD-VSS	0	7.0	V	
LCD Driving Voltage	VDD-VEE	---	28.0		
Operating Temperature Range	Top	-30	80	℃	NO Condensation
Storage Temperature Range	Tst	-40	90		

5 Electrical Specifications and Instruction Code

5.1 Electrical Characteristics

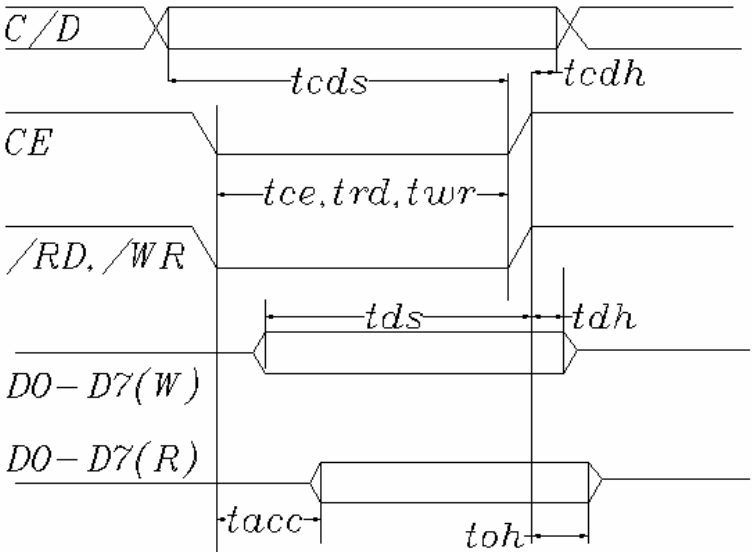
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
Supply Voltage(logic)		VDD-VSS	4.5	5.0	5.5	V	
Supply Voltage(LCD Drive)		VDD-VEE	---	18.5	---	V	
Input Signal Voltage	“H”Level	VIN	VDD-2.2	---	VDD	V	
	“L”Level	VIL	0	---	0.8	V	
Supply current(logic)		IDD	---	24	---	mA	
Supply rrent(LCD Drive)		IEE	---	2.0	---	mA	

5.2 Interface Signals

PIN NO	SYMBOL	LEVEL	DESCRIPTION
1	FG	0V	Frame Grand
2	VSS	0V	Grand
3	VDD	+5V	Supply Voltage for Logic and LCD
4	V0	-13.5	Operating Voltage for LCD (variable)
5	/WR	L	Write Signal
6	/RD	L	Read Signal
7	/CE	L	Chip Enable Signal
8	C/D	H/L	H: Instruction Code,L:Data code
9	NC	---	No Connection
10	/RES	H,H →L	Reset signal
11-18	D0-D7	H/L	Data bit0→Data bit7
19	FS	H/L	Font Select Signal(H:6X8Dots, L:8X8Dots)
20	VOUT	-16	Power Supply Voltage for LCD
21	NC		
22	NC		

PIN NO	SYMBOL	PIN NO	SYMBOL	PIN NO	SYMBOL
23	ED	27	HSCP	31	YV0
24	CDATA	28	NC	32	VOUT
25	FR	29	VDD	33	A
26	LP	30	VSS	34	K

5.3 Interface Timing Chart:



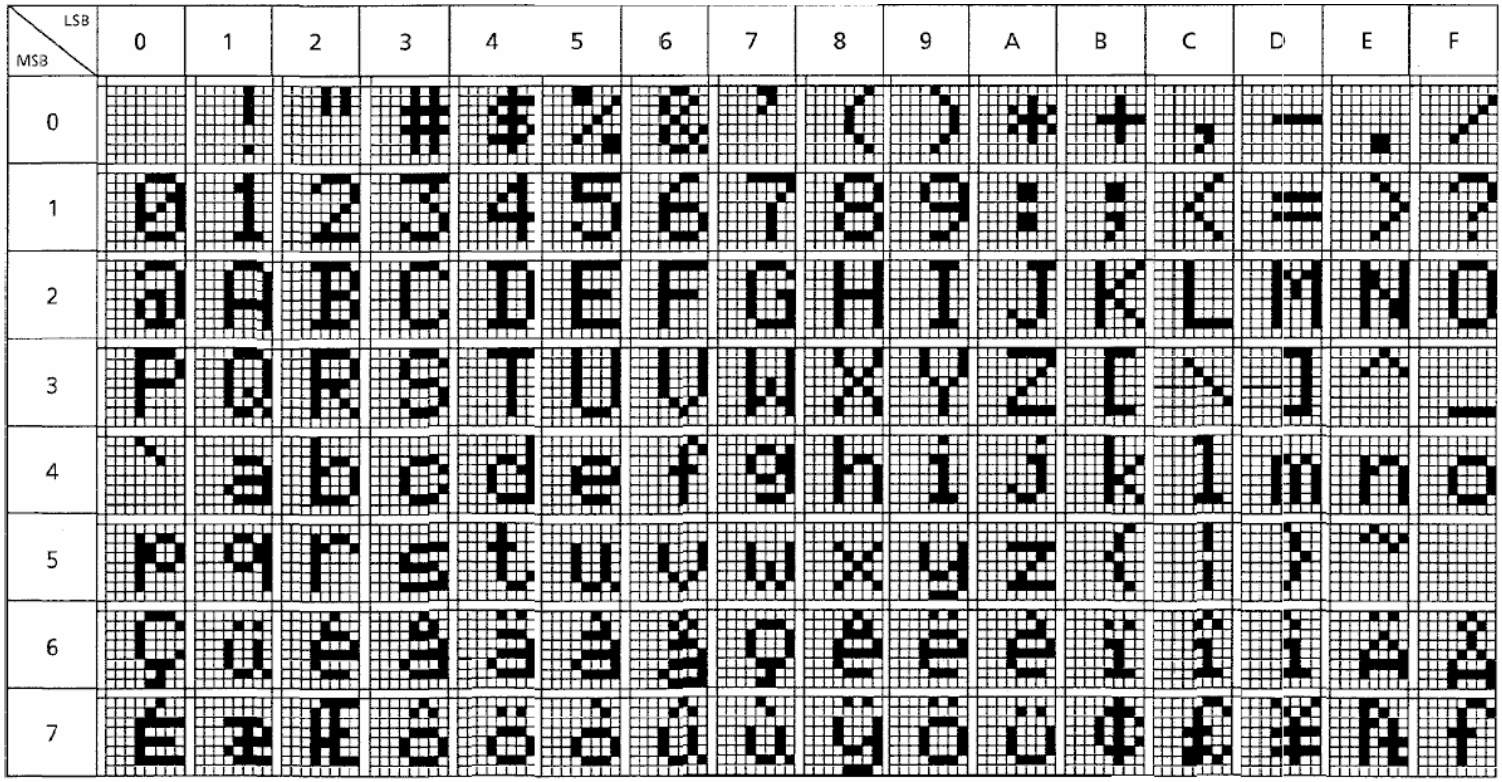
Unless otherwise specified, VDD=5.0±10%, VSS=0V,Ta=-10~70℃

Item	Symbol	Test Condition	Min.	Mix.	Unit
C/D Set up Time	Tcds		100	--	ns
C/D Hold Time	Tcdh		10	--	ns
CE,RD,WR Width	Tce,trd,twr		80	--	ns
Data Set up Time	Tds		80	--	ns
Data Hold Time	Tdh		40	--	ns
Access Time	Tacc		--	150	ns
Output Hold Time	Toh		10	50	ns

5.4 Instruction Code

COMMAND	CODE	D1	D2	FUNCTION
REGISTERS	00100001	X address	Y address	Set Cursor Pointer
	00100010	Data	00H	Set Offset Register
SETTING	00100100	Low address	High address	Set Address Pointer
	01000000	Low address	High address	Set Text Home Address
SET CONONTROL	01000001	Columns	00H	Set Text Area
WORD	01000010	Low address	High address	Set Graphic Home Address
	01000011	Columns	00H	Set Graphic Area
	1000x000	--	--	OR mode
	1000x001	--	--	EXOR mode
MODE SET	1000x011	--	--	AND mode
	1000x100	--	--	Text Attribute mode
	10000xxx	--	--	Internal CG ROM mode
	10001xxx	--	--	External CG RAM mode
	10010000	--	--	Display off
	1001xx10	--	--	Cursor on, blink off
	1001xx11	--	--	Cursor on, blink on
DISPLAY MODE	100101xx	--	--	Text on, graphic off
	100110xx	--	--	Text off, graphic on
	100111xx	--	--	Text on, graphic on
	10100000	--	--	1- line cursor
	10100001	--	--	2- line cursor
	10100010	--	--	3- line cursor
CURSOR	10100011	--	--	4- line cursor
PATTERN ELECT	10100100	--	--	5- line cursor
	10100101	--	--	6- line cursor
	10100110	--	--	7- line cursor
	10100111	--	--	8- line cursor
DATA AUTO	10110000	--	--	Set Data Auto Write
	10110001	--	--	Set Data Auto Read
READ/WRITE	10110010	--	--	Auto Reset
	11000000	D[0..7]	--	Data Write and Increment
	11000001	D[0..7]	--	Data Read and Increment
DATA	11000010	D[0..7]	--	Data Write and Decrement
READ/WRITE	11000011	D[0..7]	--	Data Read and Decrement
	11000100	D[0..7]	--	Data Write and Non variable
	11000101	D[0..7]	--	Data Read and Non variable
SCREEN PEEK	11100000	--	--	Screen Peek
SCREEN COPY	11101000	--	--	Screen Copy
	11110xxx	--	--	Bit reset
	11111xxx	--	--	Bit set
	1111x000	--	--	Bit0(LSB)
	1111x001	--	--	Bit1
BIT SET/RESET	1111x010	--	--	Bit2
	1111x011	--	--	Bit3
	1111x100	--	--	Bit4
	1111x101	--	--	Bit5
	1111x110	--	--	Bit6
	1111x111	--	--	Bit7(MSB)

5.5 Character Code Map



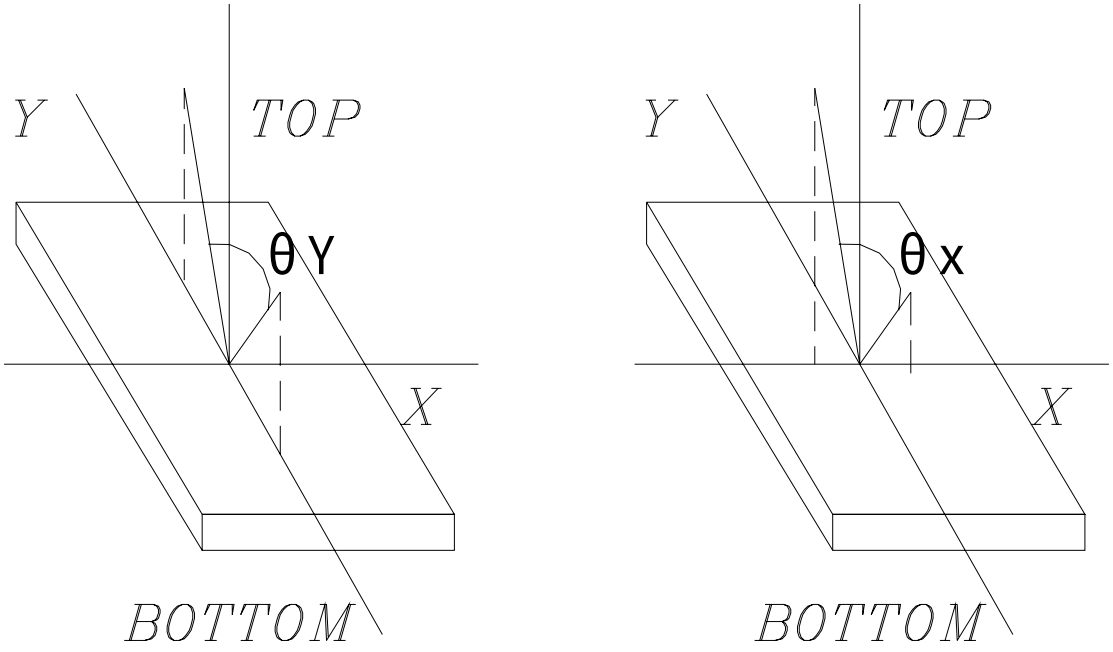
6 Optical Characteristics

6.1 Optical Characteristics Ta=25℃

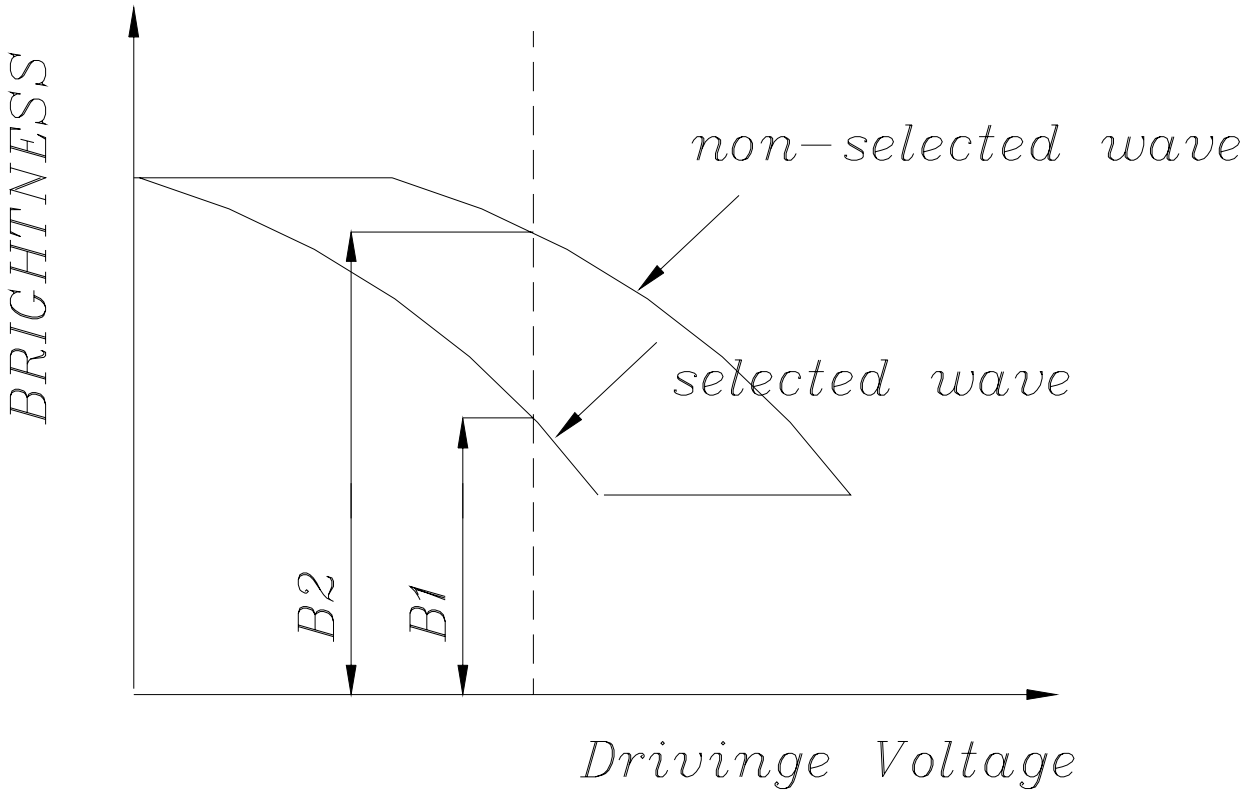
Item		Symbol	Condition		Min.	Typ.	Max.	Unit	Remark
Viewing angle		θ x	Cr	θ y=0	-20 ---- 20			deg	
		θ y	＞	θ x=0	-25 ---- -25				
Contrast Ratio		Cr	θ x=0 ° θ y=15 °		3				
Response Time	Turn On	Ton	θ x=0 °				200	ms	
	Turn off	Toff	θ y=0 °				360		

6.2 Definition of optical characteristics

6.2.1 Definition of viewing Angle(see fig.as follow)



6.2.2 Definition of Contrast Ratio(see fig.as follow)

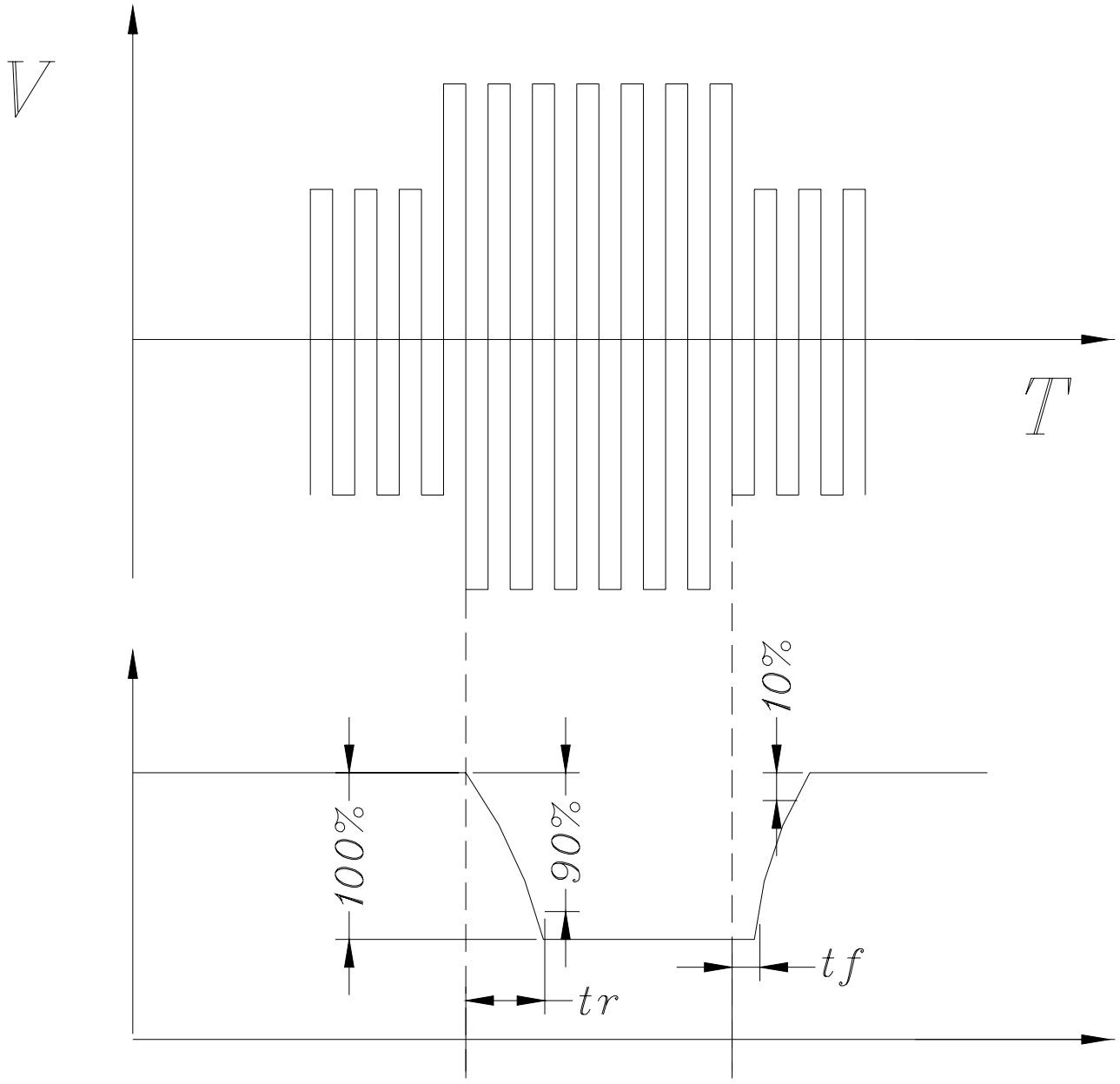


Contrast Ration(K)=B2/B1 $\frac{\text{non-selected state brightness}}{\text{Selected state brightness}}$

Measuring Conditions:

1) Ambient Temperature: 25℃; 2)Frame freguency: 32Hz

6.2.3 Definition of Response time (see fig.as follow)



7 Reliability

7.1 Content of Reliablity Test

NO.	Test Item	Content of Test	Test condition
1	High Temperature Storage	Endurance test applying the high Storage temperature for a long time	60℃ 96H
2	Low Temperature Storang	Endurance test applying the low Storage temperature for a long time	50℃ 96H
3	High Temperature Operation	Endurancd test applying the Temperature electric stress (voltage &current) and the thermal stress to the element for a long time	50℃ 96H
4	High Temperature Operation	Endurancd test applying the Temperature electric stress (voltage &current) and the thermal stress to the element for a long time	0℃ 96H
5	High Temperature /Humidity Storage	Endurance test applying the high Temperature and high humidity Storage for a long time	40℃ 90%RH 96H
6	Temperature Cycle	Endurance test applying the low and High temperature cycle 10 cycle -20℃--25℃--60℃--25℃ 30min 5min 30min 5min 1cycle	-20℃/60℃
7	Vibration Test (package state)	Endurance test applying the vibration during transportation	10Hz~55Hz ~10Hz 1. 5mmP-P,1.5g X.Y.-5mm
8	Shock Test (package state)	Endurance test applying the shock During transportation	Drop a product form a height of 79cm to a solid unbending and horizontal plane
9	Atmospheric Pressure Test	Endurance test applying the Atmospheric prssure during Transportation by air	40kPa 24H

7.2 Failure Judgment Criterion

Criterion Item	Test Item NO.									Failure Judgement Criterion
	1	2	3	4	5	6	7	8	9	
Basic Specification	0	0	0	0	0	0	0	0	0	Out of the basic Specification
Electrical Specification	0	0	0	0	0					Out of the Electrical specification
Mechanical Specification						0	0	0		Out of the Mechanical specification
Optical Characteristic	0	0	0	0	0	0				Out of the Optical specification
Remark	Basic specification = Display specification + Mechanical Specification									

8. Precautions for use of LCD Modules

8.1 Handling Precautions

8.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by droping it from a high place, etc.

8.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

8.1.3 Do not apply excessive force to the display surface or the adjoining areas since thix may cause the color tone to vary.

8.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

8.1.5 If the display surface become contaminated, breathe on the surface and gently wibe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

-----Isopropyl alcohol

-----Ethyl alcohol

Solvents other than those mentioned above may damage the Polarizer. Especially, see the following:

-----Water

-----Ketone

-----Aromatic solvents

8.1.6 Do not attempt to disassemble the LCD Module

8.1.7 NC terminal should be open. Do not connect anything

8.1.8 If the logic circuit power is off, do not apply the input signals

8.1.9 To prevent destruction of the elemnts by electricity, be carejul to maintain am optimun work environment

a. Be sure to ground the body when handing the LCD Modules
b. Tllos required for assembly, such as soldering
c. Irons, must be properly ground
d. To reduce the amount of static electricity generated do not conduct assembly and other work under dry conditions
e. The LCD Module is coated with a film to protect the display sruface. Be care when peeling off this protective film since static electricity may be generated.