Giantplus
Technology

.

Specification of LCD Module

Product No.: **GPG11063WE1**

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1. GENERAL DESCRIPTION

The GPG11063WE1 is a 112*64 dot-matrix LCD module. It has an FSTN panel composed of 112 segments and 64 commons. The LCM can be easily accessed by microcontroller via 8080 interface.

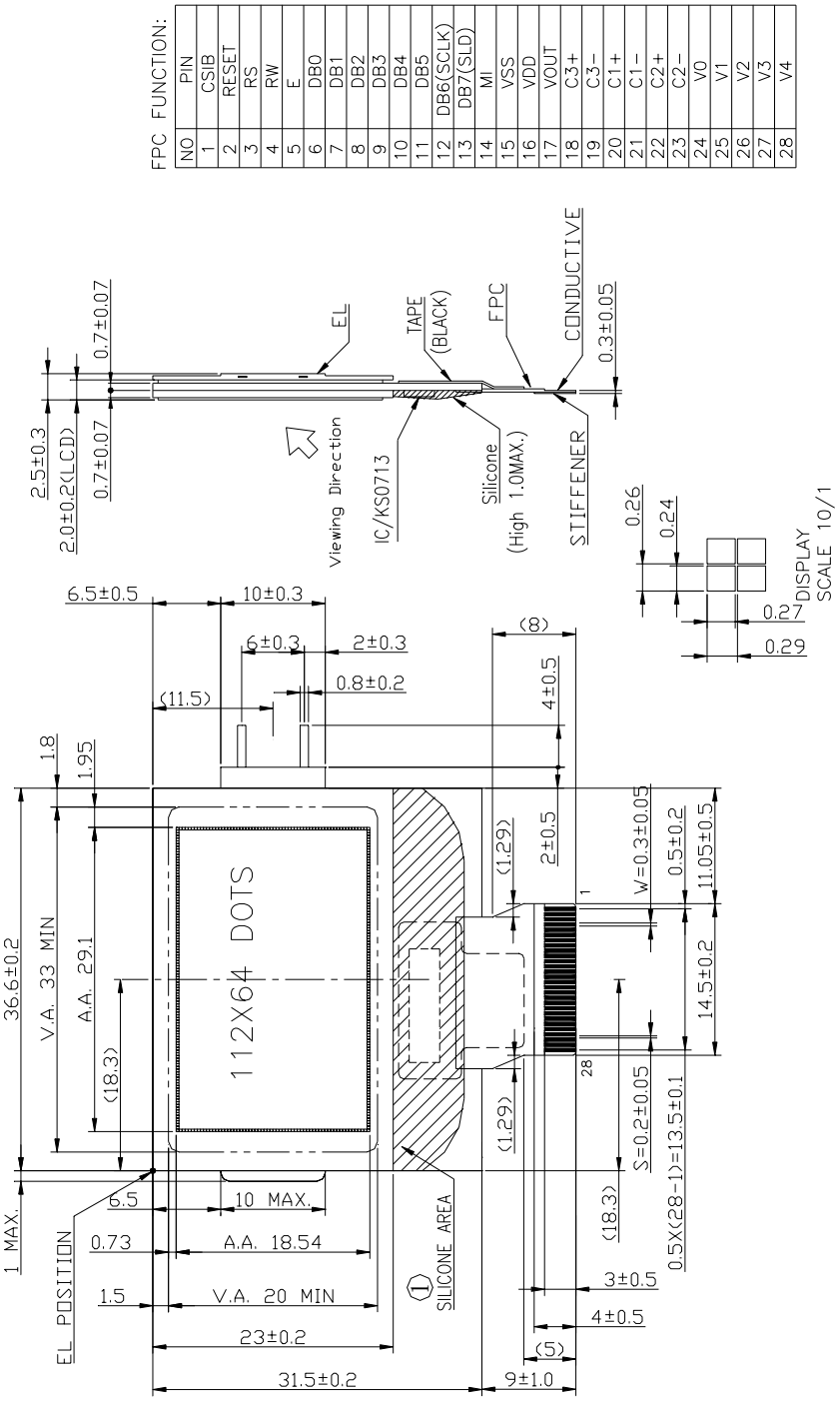
2. FEATURES

Display Mode	Transflective and positive type
	Black and white Mode FSTN LCD
Display Format	Graphic 112*64Dot-matrix
Input Data	6800 OR 8080 interface
Multiplexing Ratio	1/65 Duty
Viewing Direction	12 O'clock
Driver	KS0713
Backlight Type	EL
Backlight color	Indigo-Blue

3. MECHANICAL SPECIFICATION

Item	Specifications	Unit
Dimensional outline	36.6(W)×31.5(H)×2.5(D)	mm
Resolution	112 (W)× 64(H)	dots
Active area	29.1 (W) × 18.54 (H)	mm
Dots pitch	0.26 (W) × 0.29 (H)	mm
Dots size	0.24 (W) × 0.27 (H)	mm

4. MECHANICAL DIMENSION



5. MAXIMUM RATINGS

Item	Symbol	Min	Max	Unit	Note
Supply voltage	V_{DD}	-0.3	7	V	
	V_{LCD}	-0.3	17	V	
Input Voltage	V_{IN}	-0.3	VDD+0.3	V	
Operating temperature	T_{OPR}	0	50	℃	
Storage temperature	T_{STR}	-10	60	℃	
Humidity	-	-	90	%RH	

6. ELECTRICAL CHARACTERISTICS

6.1.ELECTRICAL CHARACTERISTICS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	Logic	V_{DD}	-	2.7	3.0	3.3	V
Input Voltage	H level	V_{IH}	-	$0.8V_{DD}$	-	V_{DD}	V
	L level	V_{IL}		V_{SS}	-	$0.2V_{DD}$	
Current Consumption		I_{DD}	With internal V_{LCD} generation; V_{DD1}=3.0V; T_{amb}=25℃;	-	0.2	0.5	mA
LCD Driving Voltage		V_{LCD}	Bias=1/9	8.7	9.0	9.3	V

6.2.E/L BACKLIGHT SPECIFICATION

ITEM	UNIT	STANDARD VALUE			CONDITION
		MIN.	TYP.	MAX.	
SUPPLY VOLTAGE	Vrms	-	100	-	
LAMP FREQUENCY	Hz	-	400	-	
CURRENT	mA/cm^2	-	0.15	-	AC 60V 180Hz
INITIAL BRIGHTNESS	cd/m²	20	30	-	
COLOR	-	Indigo-Blue			
OPERATING TEMP.	℃	-0℃~50℃			AC100Vrms 400Hz sin wave
STORAGE TEMP.	℃	-10℃~60℃			

7. MODULE FUNCTION DESCRIPTION

7.1. PIN DESCRIPTION

PIN NO	SYMBOL	FUNCTIONS
28-24	V4-V0	LCD BIAS VOLTAGE
23	C2-	CAPACITOR CONNECTOR FOR THE INTERNAL VOLTAGE CONVERTER
22	C2+	CAPACITOR CONNECTOR FOR THE INTERNAL VOLTAGE CONVERTER
21	C1-	CAPACITOR CONNECTOR FOR THE INTERNAL VOLTAGE CONVERTER
20	C1+	CAPACITOR CONNECTOR FOR THE INTERNAL VOLTAGE CONVERTER
19	C3-	CAPACITOR CONNECTOR FOR THE INTERNAL VOLTAGE CONVERTER
18	C3+	CAPACITOR CONNECTOR FOR THE INTERNAL VOLTAGE CONVERTER
17	VOUT	VOLTAGE CONVERTER OUTPUT
16	VDD	POWER SUPPLY FOR LOGIC
15	VSS	GROUND
14	MI	6800 OR 8080 SERIES
13-6	DB7-DB0	DATA BIT
5	E	ENABLE
4	RW	READ/WRITE
3	RS	REGISTER SELECT INPUT
2	RESET	RESET
1	CS1B	CHIP SELECT INPUTS

7.2.TIMING CHARACTERISTICS

Read / Write Characteristics (8080-series MPU)

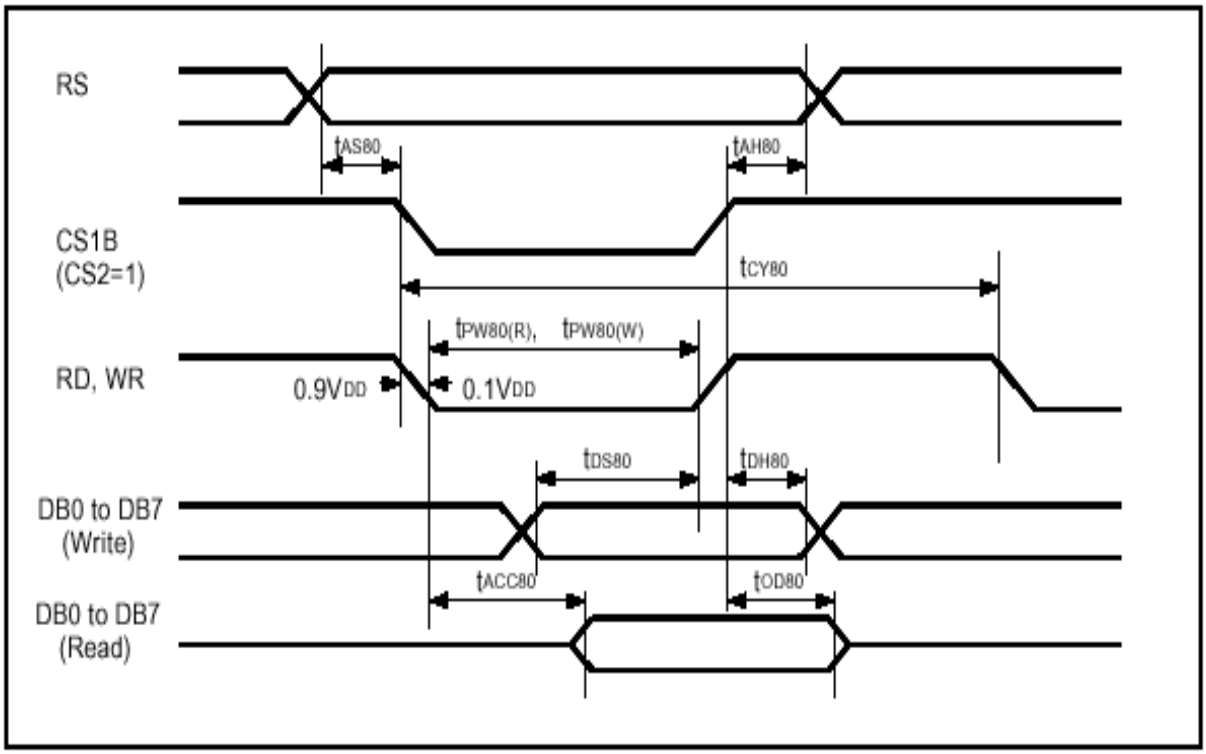


Figure 34. Read / Write Characteristics (8080-series MPU)

(V_{DD} = 2.4 to 3.6V, Ta = -40 to +85°C)

Item	Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Address setup time Address hold time	RS	tAS80 tAH80	13 17	-	-	ns	
System cycle time	RS	tCY80	400	-	-	ns	
Pulse width (WR)	RW_WR	tPW80 (W)	55	-	-	ns	
Pulse width (RD)	E_RD	tPW80 (R)	125	-	-	ns	
Data setup time Data hold time	DB7 to DB0	tDS80 tDH80	35 13	-	-	ns	
Read access time Output disable time		tACC80 tOD80	- 10	-	125 90	ns	C_L = 100 pF

Reset Input Timing

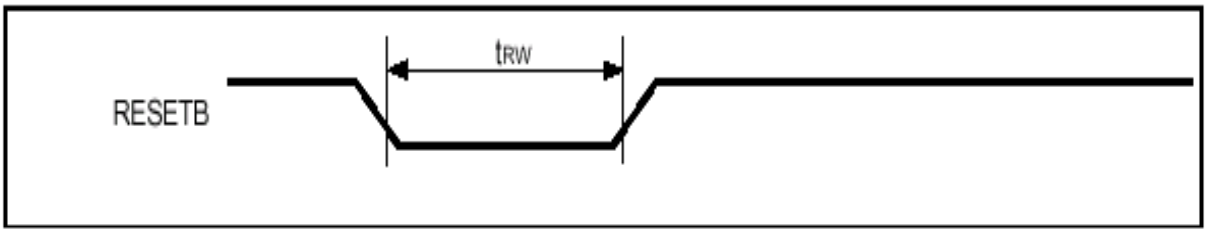


Figure 37. Reset Input Timing

(V_{DD} = 2.4 to 3.6V, Ta = -40 to +85°C)

Item	Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Reset low pulse width	RESETB	t_{RW}	900	-	-	ns	

Display Control Output Timing

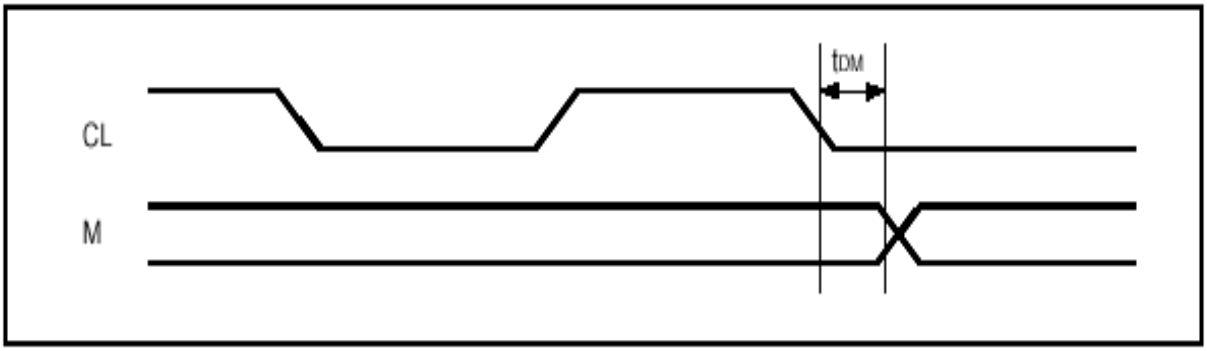
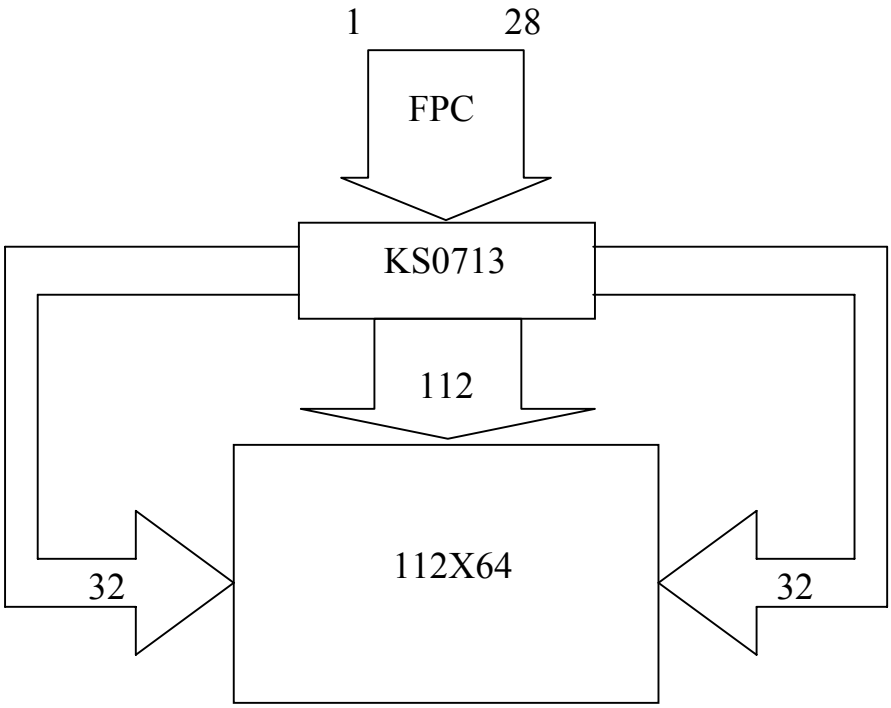


Figure 38. Display Control Output Timing

(V_{DD} = 2.4 to 3.6V, Ta = -40 to +85°C)

Item	Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
M delay time	M	t_{DM}	-	13	70	ns	

7.3.BLOCK DIAGRAM OF LCM



7.4.APPLICATION OF LCM

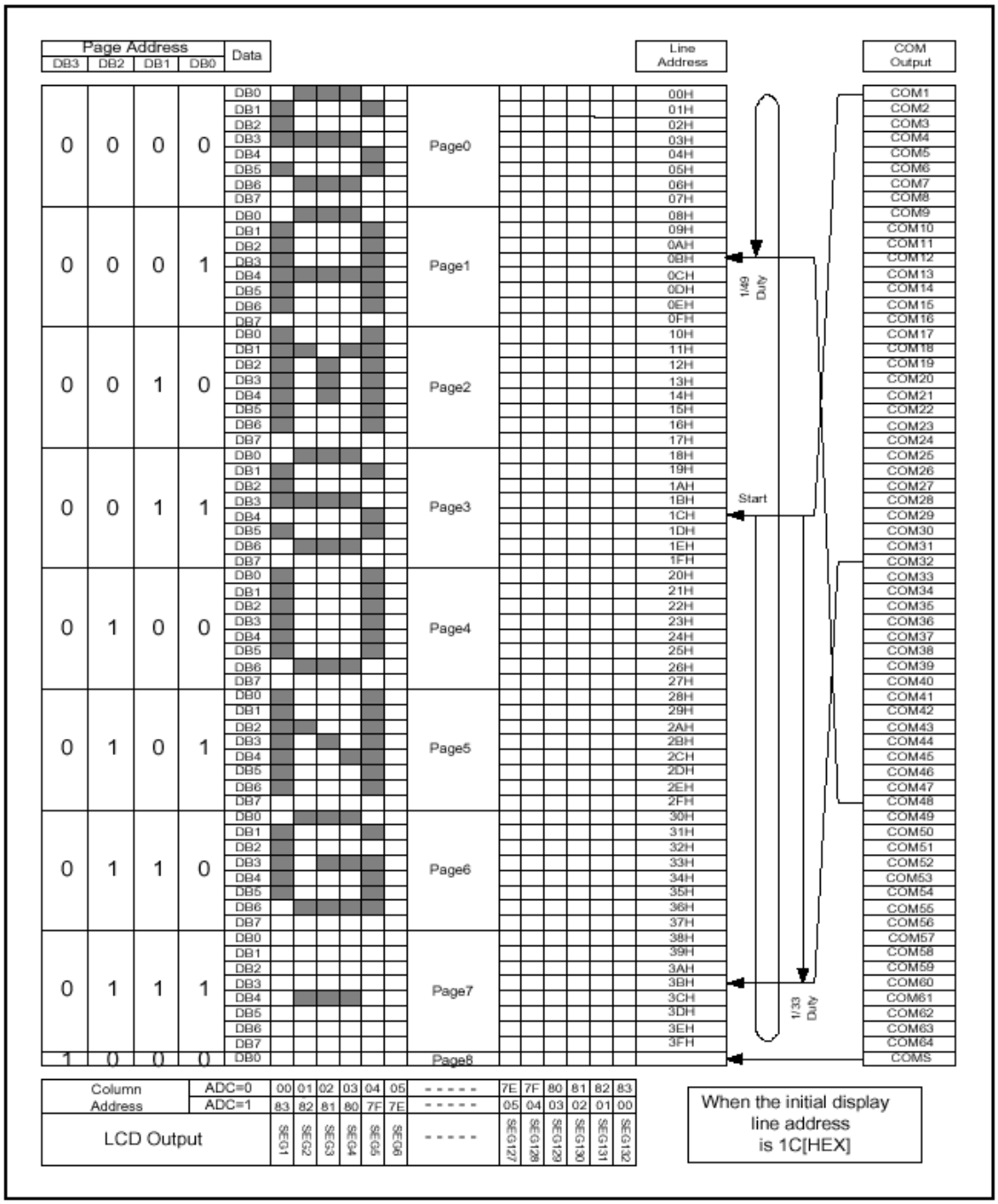


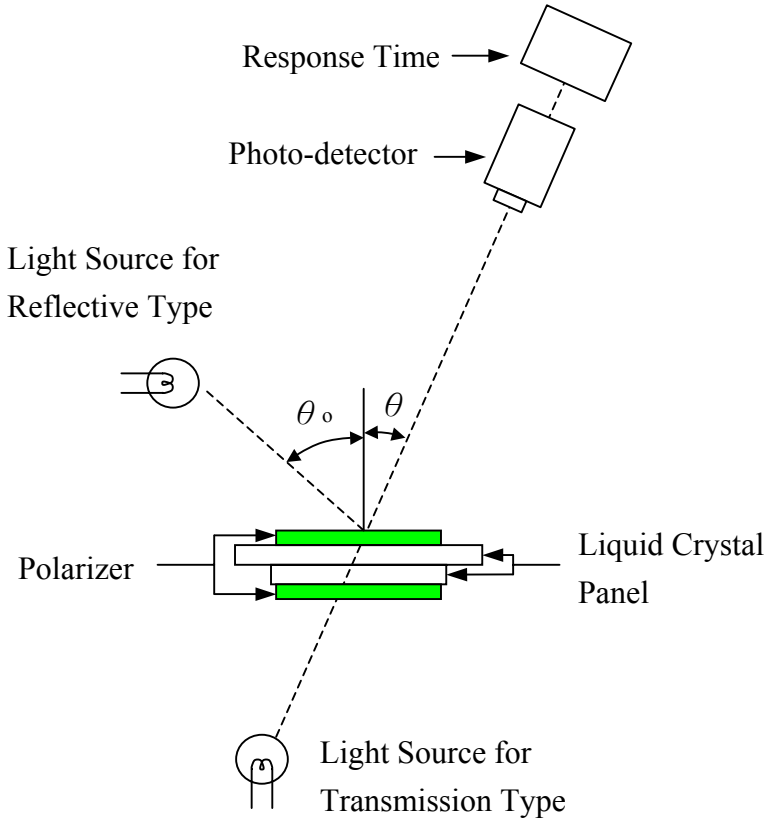
Figure 8. Display Data RAM Map

8. ELECTRO-OPTICAL CHARACTERISTICS

Electro-Optical Characteristics								
Item	Symbol	Condition	Temp	Min	Typ	Max	Units	Note
LCD driving Voltage(recommended voltage)	Vlcd	$\theta = \phi = 0$	-20℃	----	---	----	V	Note1
			25℃	8.7	9.0	9.3		
			70℃	----	---	----		
Response Time	Rise Time (Tr)	$\theta = \phi = 0$	-20℃	----	---	---	msec	Note2
	Decay Time (Td)			----	---	---		
	Rise Time (Tr)		25℃	----	180	270		
	Decay Time (Td)			----	200	300		
	Rise Time (Tr)		70℃	----	----	----		
	Decay Time (Td)			----	----	----		
Contrast Ratio	CR	$\theta = \phi = 0$	25℃	3.1	6.2	----	---	Note4

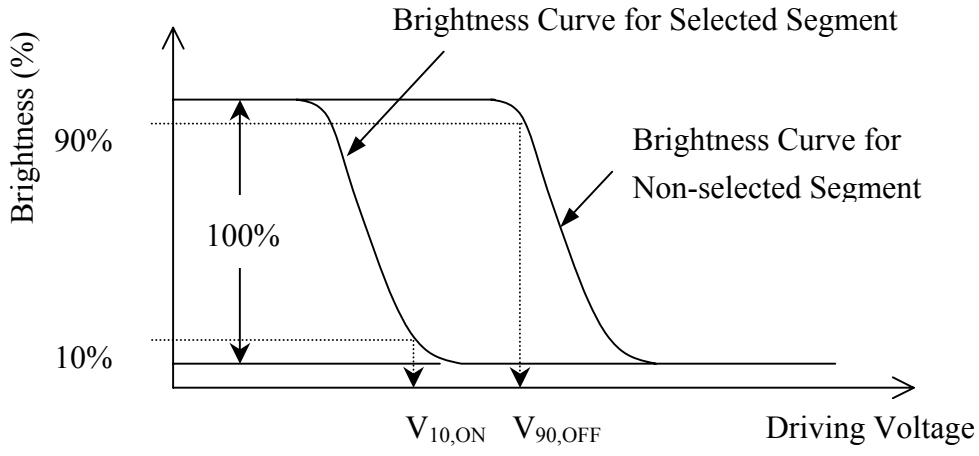
Viewing Angle Range	ϕ=0° (6")	ϕ=90° (3")	ϕ=180° (12")	ϕ=270° (9")	備註
θ (25°C) CR≧2	30	35	30	30	Deg Note3

• Electro-Optical Characteristics Test Method :

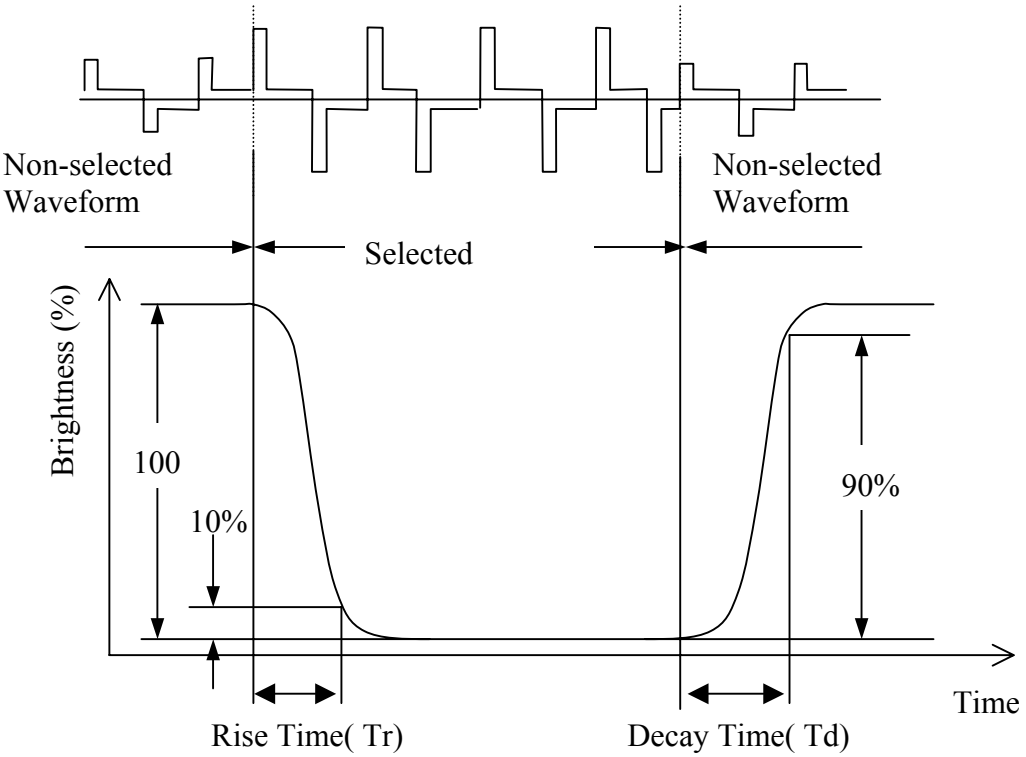


• Note 1. Definition of Driving Voltage(Vlcd) :

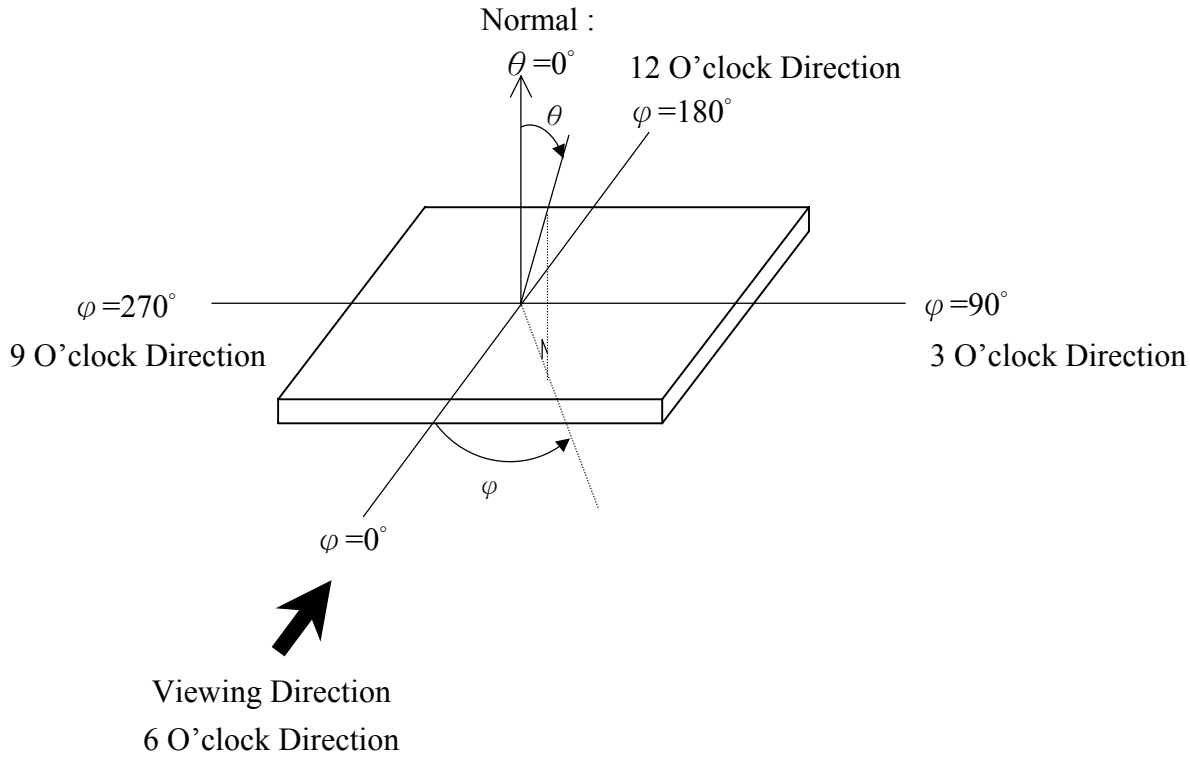
$$Vlcd = (V_{10,ON} + V_{90,OFF})/2$$



• Note 2. Definition of Optical Response Time :



• Note 3. Definition of Viewing Angle θ and ϕ :



• Note 4. Definition of Contrast ratio(CR) :

$$CR = \frac{\text{Brightness of Non-selected Segment (B2)}}{\text{Brightness of Selected Segment (B1)}}$$