

3. GENERAL SPECIFICATION

Display Format : 16characters (W) × 1lines (H)

Character Size : 3.07 (W) × 6.56 (H) mm

View Area : 65 (W) × 14 (H) mm

General Dimensions : 80 (W) × 36 (H) × 11 (T) mm Max.

Weight : 36 g max.

LCD Type : ☒ STN Gray ☐ STN Yellow ☐ FSTN

Polarizer mode : ☐ Reflective ☒ Transflective

☐ Transmissive ☐ Negative

View Angle : ☐ 6 O'clock ☒ 12 O'clock ☐ Others _____

Backlight : ☒ LED ☐ EL ☐ CCFL

Backlight Color : ☒ Yellow green ☐ Amber ☐ Blue Green

☐ White ☐ Others

Controller / Driver : KS0066

Temperature Range : ☐ Normal ☒ Wide Temperature

Operating	0 to 50°C	Operating	-20 to 70°C
Storage	-20 to 70°C	Storage	-30 to 80°C

R8=35.7K 1%,SHORT= J2,J5,J7,J8

4. ABSOLUTE MAXIMUM RATINGS

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

$V_{SS} = 0V$, $T_a = 25^{\circ}C$

Item	Symbol	Min.	Max.	Unit
Supply Voltage (Logic)	$V_{DD}-V_{SS}$	0	7	V
Supply Voltage (LCD Driver)	$V_{DD}-V_0$	1.5	13.5	V
Input Voltage	V_i	V_{SS}	V_{DD}	V
Operating Temperature	T_{OP}	-20	70	$^{\circ}C$
Storage Temperature	T_{STG}	-30	80	$^{\circ}C$

4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

Item	Operating		Storage		Comment
	(Min.)	Max.)	(Min.)	(Max.)	
Ambient Temp	-20	70	-30	80	Note (1)
Humidity	Note (2)		Note(2)		Without Condensation
Vibration	--	$4.9M/S^2$	--	$19.6M/S^2$	XYZ Direction
Shock	--	$29.4M/S^2$	--	$490M/S^2$	XYZ Direction

Note(1) $T_a = 0^{\circ}C$: 50Hr Max.

Note(2) $T_a \leq 40^{\circ}C$: 90% RH Max.

$T_a \geq 40^{\circ}C$: Absolute humidity must be lower than the humidity of 90% RH at $40^{\circ}C$.

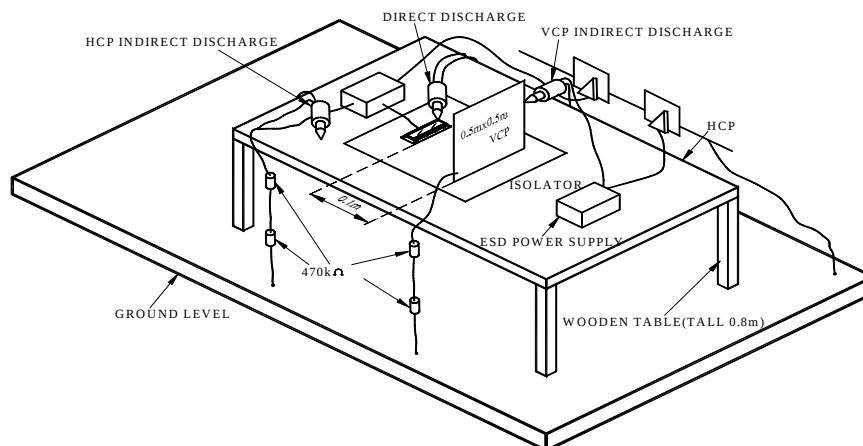
4.3 Electronic Static Discharge maximum rating

ESD test method : IEC1000-4-2

Item	Description	
Testing environment	Ambient temperature :15°C to 35 °C Humidity: 30% to 60 % LCM (E.U.T) : Power up	
Testing equipment	Manufacture: NoiseKen, Model No. ESD-100L	
Testing condition	See drawing 1	
Direct discharge	0 to ± 6 KV	Discharge point, see drawing 2
Indirect discharge	0 to ± 12 KV	Discharge point, see drawing 1
Pass condition	No malfunction of unit. Temporary malfunction of unit which can be recovered by system reset	
Fail condition	Non. Recoverable malfunction of LCM or system	

(1)

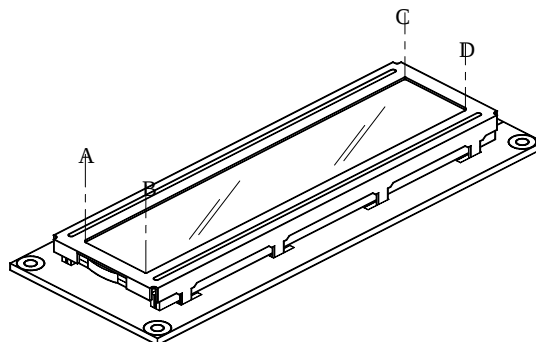
FIG 1 ESD TESTING EQUIPMENT



(2)

DIRECT CONTACT DISCHARGE

CONTACT POINT : A.B.C.D



5. ELECTRICAL CHARACTERISTICS

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage (Logic)	V _{DD} -V _{SS}		2.7	5.0	5.5	V
Supply Voltage (LCD)	V _{DD} -V ₀	-20°C	4.4	4.8	5.0	V
		25°C	4.2	4.5	4.8	
		70°C	3.4	3.7	4.1	
Input Voltage	V _{IH}	--	0.7*V _{DD}	--	V _{DD}	V
	V _{IL}		V _{SS}	--	0.3*V _{DD}	
Logic Supply Current	I _{DD}	V _{DD} -V _{SS} =5V	--	2.0	--	mA

6. ELECTRO-OPTICAL CHARACTERISTICS

ITEM	Symbol	Condition	Min.	Typ.	Max.	Unit	Ref.
Rise Time	Tr	0°C	--	1100	1800	ms	Note (1)
		25°C		420	670		
Fall Time	Tf	0°C	--	210	340	ms	
		25°C		100	300		
Contrast	CR	25°C					Note (3)
View Angle	θ1~θ2	25°C & CR≥3	--	80	--		Note (2)
	∅1, ∅2		--	30	--		
Frame Frequency	Ff	25°C	--	64	--	Hz	

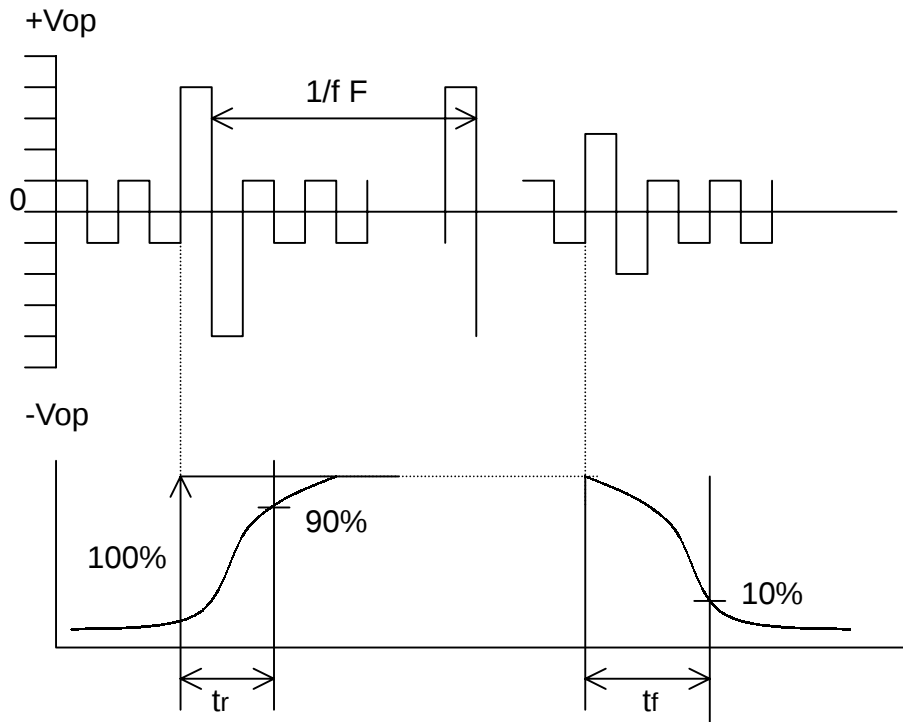
Note (1) & (2) : See next page

Note (3) : Contrast ratio is defined under the following condition:

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

- (a). Temperature ----- 25°C
- (b). Frame frequency ---- 64Hz
- (c). Viewing angle ----- θ= 0°, Ø = 0°
- (d). Operating voltage --- 4.5V

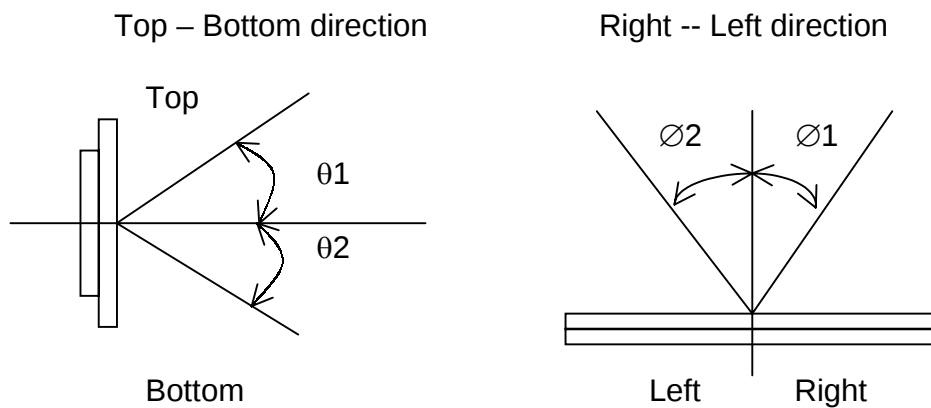
Note (1) Response time is measured as the shortest period of time possible between the change in state of an LCD segment as demonstrated below:



Condition:

- (a) . Temperature ----- 25°C
- (b) . Frame frequency ----- 64Hz
- (c) . View Angle ----- $\theta = 0^{\circ}$, $\phi = 0^{\circ}$
- (d) . Operating voltage ----- 4.5V

Note (2) Definition of View Angle



6.1 LED ELECTRO-OPTICAL CHARACTERISTIC

$T_a = 25^{\circ}\text{C}$

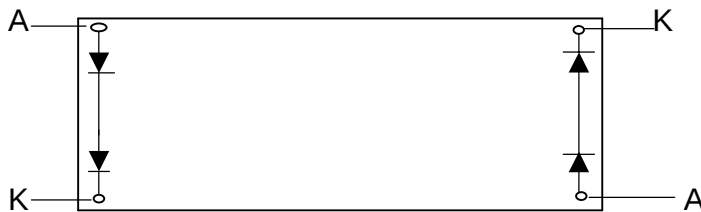
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F = 20\text{mA}$ Yellow Green	--	4.1	4.4	V
Luminous Intensity	I_v	$I_F = 20\text{mA}$ Yellow Green	16	20	--	cd/m^2
Peak Emission	λ_P	$I_F = 20\text{mA}$ Yellow Green	--	570	--	nm
Spectrum Radiation	$\Delta\lambda$	$I_F = 20\text{mA}$ Yellow Green	--	30	--	nm
Reverse Current	I_R	$V_R = 8\text{V}$ Yellow Green	--	--	0.2	mA

Note : Measured at the bared LED backlight unit.

6.2 LED MAXIMUM OPERATING RANGE

Item	Symbol	Yellow Green	Unit
Power Dissipation	P_{AD}	0.22	W
Forward Current	I_{AF}	50	mA
Reverse Voltage	V_R	8	V

6.2.1 EDGE LIGHT LED BLOCK DIAGRAM



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