



Winstar Display Co., LTD

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Backlight Information

1. Description

The Backlight for Winstar in using, We have classified Backlight to 3 parts according to light source,

1. CCFL
2. EL Backlight
3. LED Backlight

Their characteristics will be showed as below:

1. CCFL (Cold Cathode Fluorescent Lamps)

CCFL Backlight must be driven by using AC Power(Normally at AC450V/70KHz); The high-voltage

Must be transferred by using DC-AC inverter (CCFL Inverter).

2. EL Backlight(Electro Luminescent)

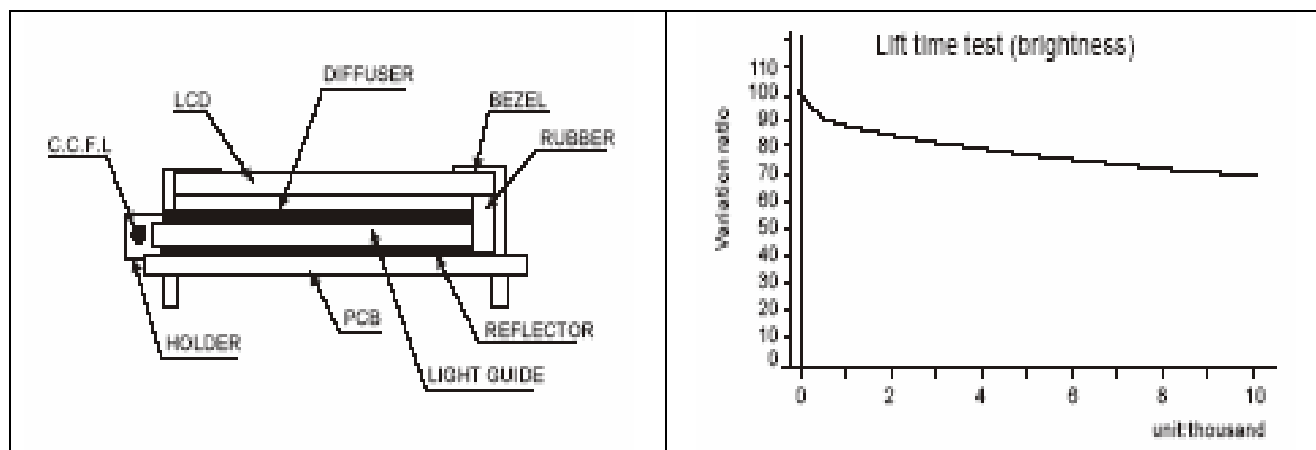
EL Backlight is always driven on A,K pad directly (At left side or right side of PCB), You have using AC110V/400Hz to turn on the backlight. By providing the AC power, you have to use EL inverter to convert DC Power to AC power(EL Inverter).

3.LED Backlight(Light Emittted Diode)

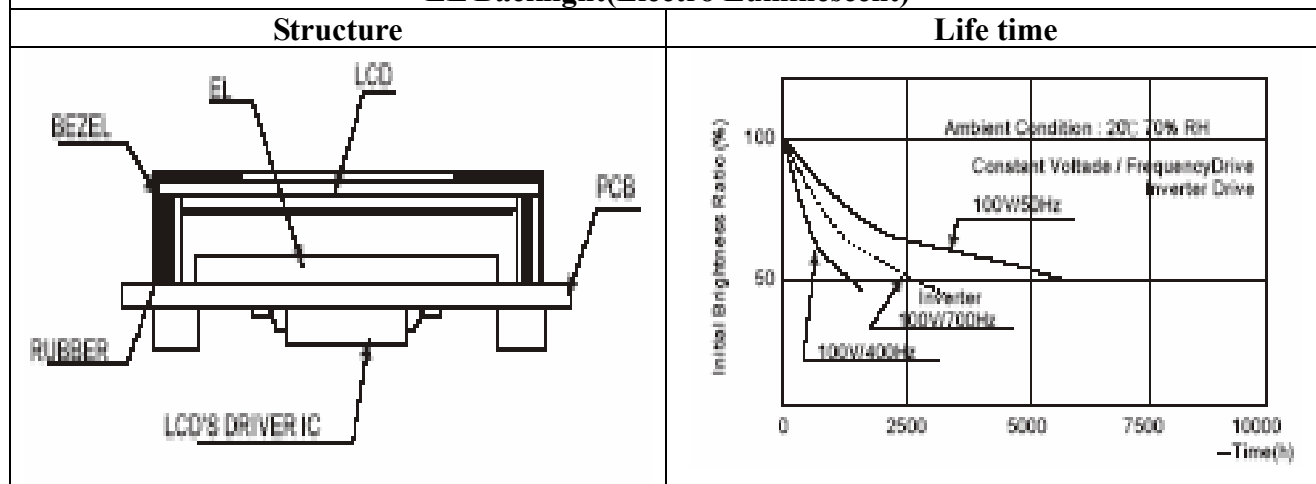
- (1) This backlight is drive by DC Power
- (2) User can drive backlight from interface or A,K pad.
- (3) The best way for driving LED is providing 16~20mA current for each LED lamp.

2. Construction

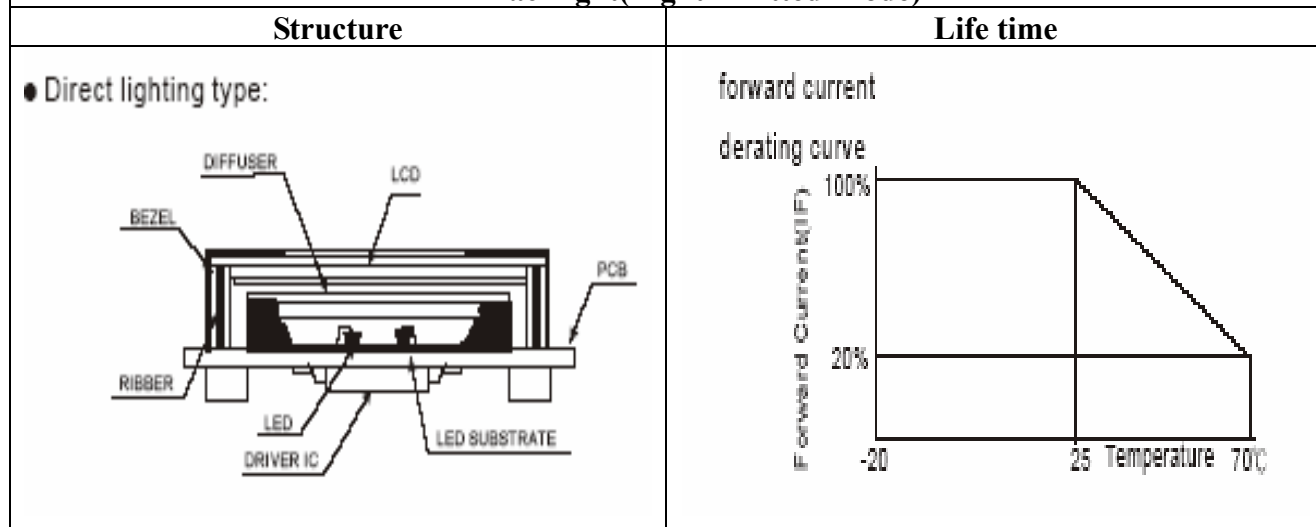
CCFL (Cold Cathode Fluorescent Lamps)	
Structure	Life time



EL Backlight(Electro Luminescent)



LED Backlight(Light Emitted Diode)



3. Characteristic

B/L Type	LED	EL	CCFL
Life time	100,000Hr (White 50,000Hr)	3,000 ~ 8,000Hr	15,000~25,000Hr(*note1)
Drive Method	DC power drive (DC1.9V~DC4.2V)	AC power drive (AC110V/400Hz)	AC power drive (AC450V/70KHz)

Drive Voltage	DC2.1V, DC4.2V DC3.5V(white only)	AC110V/400Hz	AC1000V/80KHz(MAX)
Thickness	Direct type: 5.0±1mm Edge type: 1.6 ~ 3.5mm	0.3mm~0.7mm	Direct type: 5.0±1mm Edge type: 1 ~ 3mm
Emitted Color	Yellow/Green, Green, Blue, Amber, White, Red(*note2)	Green, White, Blue	White
Luminous	LED Only: 30~600 cd/m2 Module: 5~100 cd/m2	EL Only:40~150 cd/m2 Module:10~30 cd/m2	CCFL Only :500~1600 cd/m2 Module:50~100 cd/m2

Note: 1. The CCFL life time is 50% luminous than initial.

2. LED B/L can be used for Edge type just only for “White”, “Blue” “Green“ and “Red”.

4. Tri-color LED Backlight

For the RGB B/L being used on the **Character type LCM**, the characteristic is showed in following table.

PARAMETER	SYMBOL		MIN	TYP	MAX	UNIT	TEST CONDITION
Supply Voltage	V		4.9	5.0	5.1	V	—
Reverse Voltage	VR		—	7.0	—	V	—
Luminous Intensity	IV	R	32	40	—	CD/M ²	ILED(red)=12mA each LED
		G	140	180			ILED(green)=15mA each LED
		B	22	28			ILED(blue)=15mA each LED
Wave Length	λ	R	620	625	630	nm	—
		G	515	520	525		
		B	465	470	475		
Life Time	R		80K	100K		Hr.	ILED≤15mA(*Note1) For each LED Lamp
	G		40K	50K			
	B		40K	50K			
Color	Red, Green, Blue						

Note:1. owing the operating temperature of LED lamp, Winstar set the passing current for each LED Lamp for avoiding the chips decaying too fast.

2. The LED B/L of “triple color” is designed for voltage driving, user have to follow

The drive voltage that can make driving current in safety range (current between minimum and maximum).

3. Owing to having 3 chips in one LED lamp, which caused many combinations of different wave length. This situation will caused wave length shifting while driving 2 colors or more in the same time.
4. The luminous intensity is measured on B/L surface only.

4.1 Driving Method

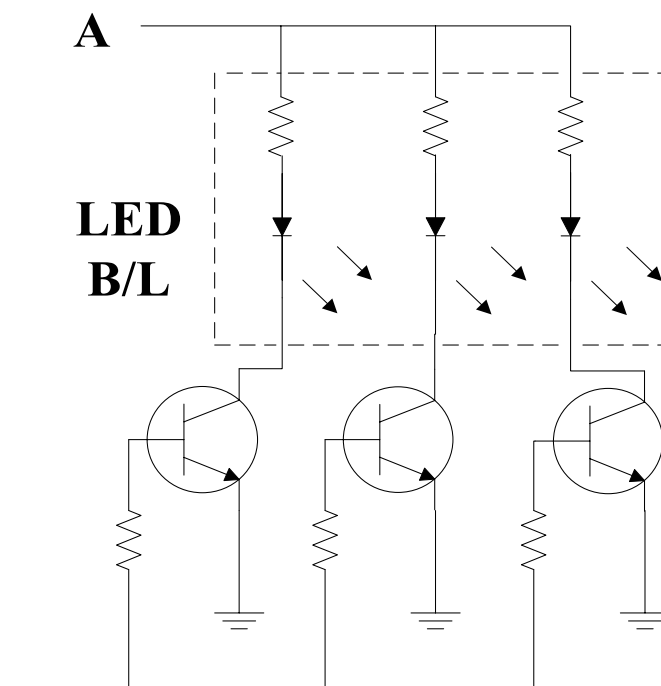


Fig 4-1 Driving circuit

Owing the led lamp being packed in common anode type ,so driving circuit of suggestion is showed as above, owing to B/L being designed In parallel mode, so user can use transistor 、FET or TRIC to control.

About the White LED B/L, it is designed in parallel mode, then the driving method is same As Fig4-1.