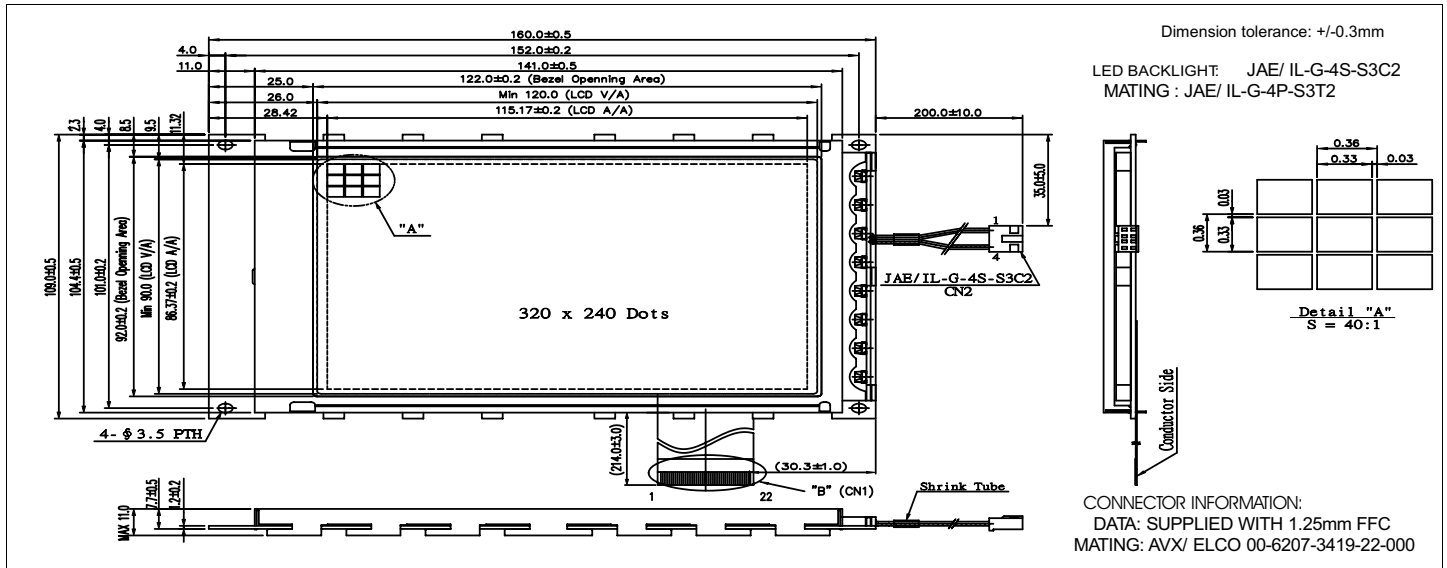


# HDM 3224NL-1

## Dimensional Drawing

## 320 X 240 Dots Graphic LED Backlight



### Features

- Backlight.....White LED
- Options.....STN/ Black and White FSTN
- Extended Temperature
- Bottom / Top Viewing
- Built-in Controller.....SED1335

### Physical Data

- Module Size.....160.0W x 109.0H x 11.0T mm
- Viewing Area Size.....122.0W x 92.0H mm
- Dot Pitch.....0.36W x 0.36H mm
- Dot Size.....0.33W x 0.33H mm
- Weight.....199g

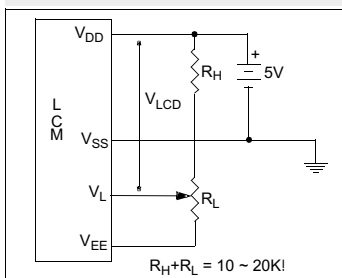
### Electrical Characteristics (VDD=5.0±0.25V 25°C)

PARAMETER	SYM	CONDITION	MIN	TYP	MAX	UNIT
SUPPLY VOLTAGE	V <sub>DD</sub>	-	4.5	5.0	5.5	V
	V <sub>LCD</sub>	-	22.8	23.1	23.4	V
SUPPLY CURRENT	I <sub>DD</sub>	FLM=70Hz V <sub>LCD</sub> =23.1V	-	77	116	mA
	I <sub>EE</sub>	-	-	3.85	5.78	mA
BRIGHTNESS	L	All Dots on	-	133	-	cd/m <sup>2</sup>
		All Dots off	-	23.1	-	
LED FORWARD VOLTAGE	V <sub>AK</sub>	I <sub>AK</sub> =150mA	4.6	5	5.4	V
LED FORWARD CURRENT	I <sub>AK</sub>	V <sub>AK</sub> =5V	-	150	160	mA
DRIVE METHOD	1/240 DUTY					

### Pin Connections

PIN NO.	SYMBOL	LEVEL	FUNCTION
<b>DATA CONNECTOR</b>			
1	V <sub>SS</sub>	0 V	Ground
2	V <sub>DD</sub>	5 V	Power supply for logic
3	V <sub>L</sub>	-	Operating voltage for LC
4	A0	H/L	Data type select
5	WR	L	Write signal
6	RD	L	Read signal
7	D0	H/L	Display Data
8	D1		
9	D2		
10	D3		
11	D4		
12	D5		
13	D6		
14	D7		
15	CS	L	Chip select
16	RES	L	Hardware reset for SED 1335F
17	V <sub>EE</sub>	-24V	Power supply for LC
18	SEL1	L/H	0 FOR 8080 MPU 1 FOR 6080 MPU
19-22	NC	-	No connection
<b>LED Backlight CONNECTOR</b>			
1	A	-	Power supply for LED
2	NC	-	No Connection
3	NC	-	No Connection
4	K	-	Ground

### Power Supply



### Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNIT
SUPPLY VOLTAGE	V <sub>DD</sub> -V <sub>SS</sub>	0	7.0	V
SUPPLY VOLTAGE FOR LCD	V <sub>DD</sub> -V <sub>EE</sub>	0	30.0	V
INPUT VOLTAGE	V <sub>IN</sub>	-	V <sub>DD</sub> +0.3	V
OPERATING TEMPERATURE	T <sub>OP</sub>	-20	+70	°C
STORAGE TEMPERATURE	T <sub>STG</sub>	-30	+80	°C