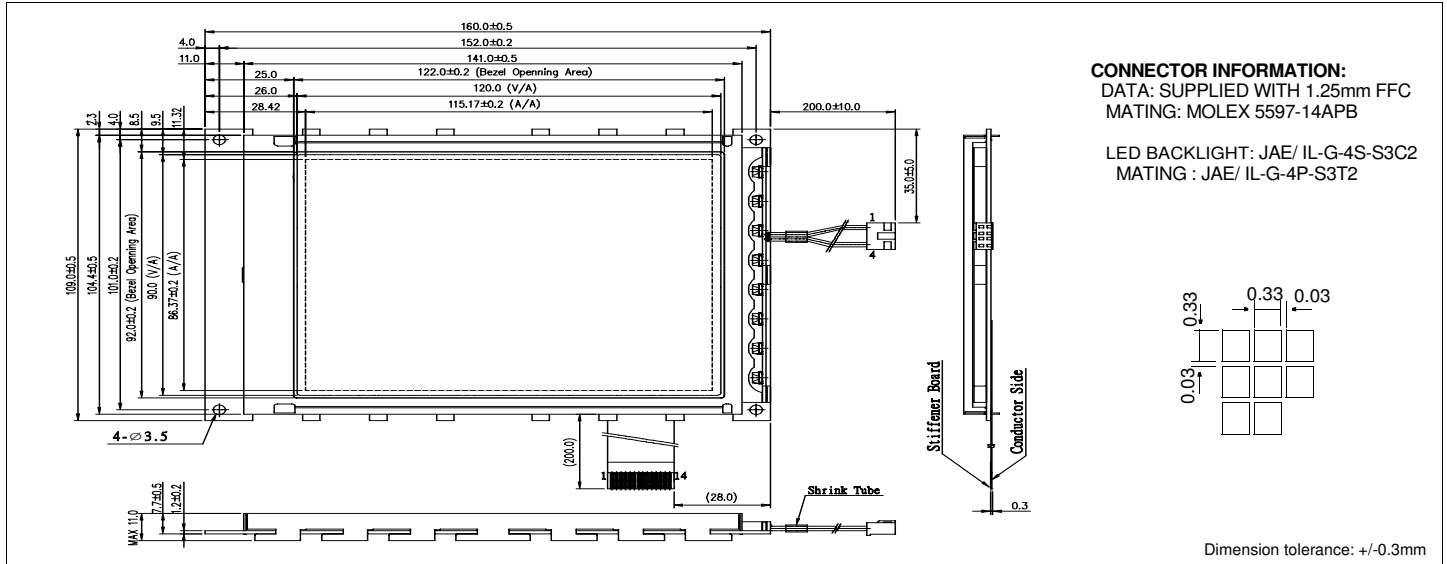


# HDM 3224L-1

## Dimensional Drawing

320 X 240 Dots Graphic LED Backlight



### Features

- Backlight.....White LED
- Options.....STN/ Black and White FSTN  
Normal/Extended Temperature  
Bottom / Top Viewing
- Built-in Controller.....None

### 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

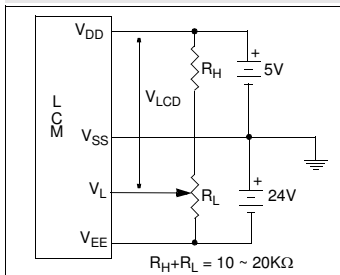
### Electrical Characteristics (VDD=5.0±0.25V 25°C)

PARAMETER	SYM	CONDITION	MIN	TYP	MAX	UNIT
SUPPLY VOLTAGE	$V_{DD}$	-	4.5	5.0	5.5	V
	$V_{LCD}$	-	22.8	23.1	23.4	V
SUPPLY CURRENT	$I_{DD}$	FLM= 70Hz $V_{LCD}= 23.1V$	-	4.51	6.77	mA
	$I_{EE}$	-	-	3.85	5.78	mA
BRIGHTNESS	L	All Dots on	-	4.51	6.77	cd/m <sup>2</sup>
		All Dots off	-	3.85	5.78	
LED FORWARD VOLTAGE	$V_{AK}$	$I_{AK}= 150mA$	4.6	5	5.4	V
LED FORWARD CURRENT	$I_{AK}$	$V_{AK}= 5V$	-	150	160	mA
DRIVE METHOD	1/240 DUTY					

### Pin Connections

PIN NO.	SYMBOL	LEVEL	FUNCTION
<b>DATA CONNECTOR</b>			
1	D0	H/L	Display Data
2	D1		
3	D2		
4	D3		
5	DISPOFF	H/L	H= On, L= Off
6	FRAME	H	First Line Marker
7	NC	-	No Connection
8	LOAD	H/L	Data Latch
9	CP	H/L	Data shift
10	$V_{DD}$	5V	Power supply for logic
11	$V_{SS}$	0V	Ground
12	$V_{EE}$	-22V	Power supply for LCD
13	$V_L$	-	Operating voltage for LC
14	FGND	-	Front panel ground
<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	$V_{DD}-V_{SS}$	0	7.0	V
SUPPLY VOLTAGE FOR LCD	$V_{DD}-V_{EE}$	0	30.0	V
INPUT VOLTAGE	$V_{IN}$	-	$V_{DD}+ 0.3$	V
OPERATING TEMPERATURE	$T_{OP}$	0	50	°C
STORAGE TEMPERATURE	$T_{STG}$	-20	70	°C