

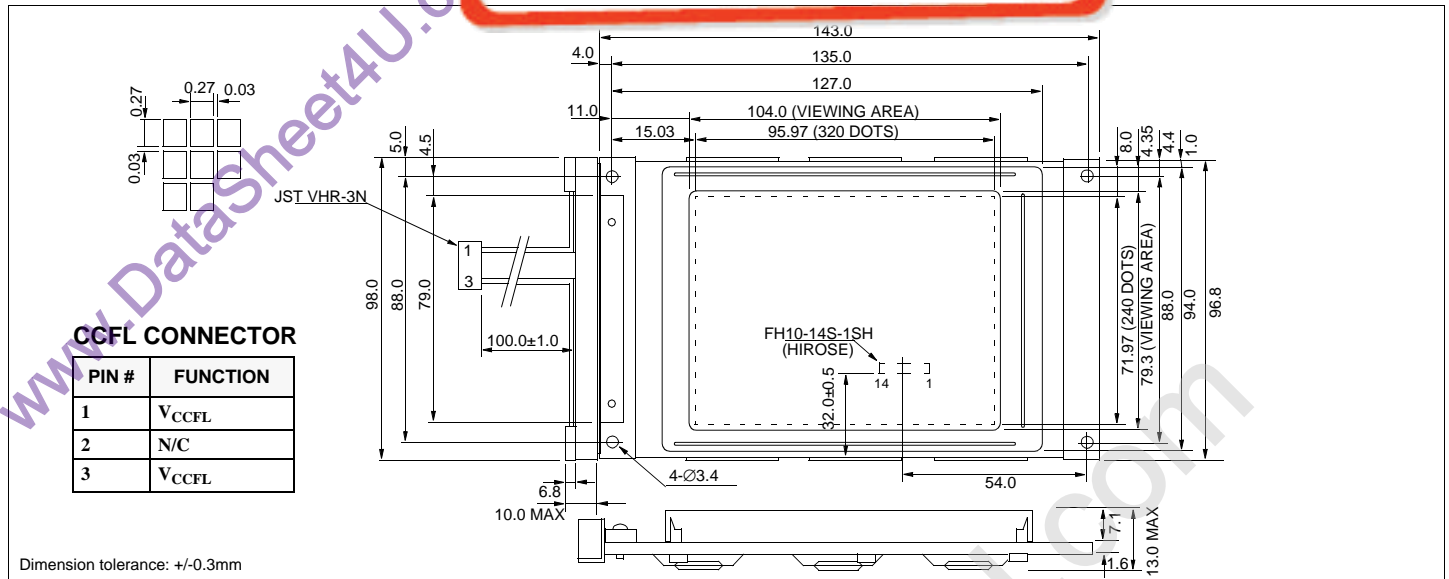
# HDM 3224

## Dimensional Drawing

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[Http://www.lcdfriends.com](http://www.lcdfriends.com)

320 X 240

ots Graphic CCFL Backlight



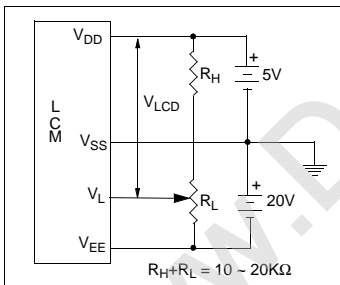
### Features

Backlight.....CCFL  
 Options.....STN/Black and White FSTN  
 Built-in Controller.....None

### Physical Data

Module Size.....143.0W x 96.8H x 13.0T mm  
 Viewing Area Size.....104.0W x 79.3H mm  
 Dot Pitch.....0.30W x 0.30H mm  
 Dot Size.....0.27W x 0.27H mm  
 Weight.....220g

### Power Supply



### Pin Connections

PIN NO.	SYMBOL		FUNCTION
1	FLM	H/L	Frame signal
2	N/C	-	No connection
3	LP	H/H→L	Data latch signal
4	XSCL	H/H→L	Serial shift clock
5	DISPOFF	L	Display off
6	DB0	H/L	Data bus
7	DB1	H/L	
8	DB2	H/L	
9	DB3	H/L	
10	V <sub>DD</sub>	5V	Power supply for logic
11	V <sub>SS</sub>	0V	Ground
12	V <sub>EE</sub>	-	Power supply voltage for LC
13	V <sub>L</sub>	-	Operating voltage for LC
14	FG	-	Frame ground

### 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	28.5	V
INPUT VOLTAGE	V <sub>IN</sub>	-	7.0	V
OPERATING TEMPERATURE	T <sub>OP</sub>	0	50	°C
STORAGE TEMPERATURE	T <sub>STG</sub>	-20	70	°C
CCFL OPERATING VOLTAGE	V <sub>FL</sub>	-	1500	Vrms
CCFL OPERATING CURRENT	I <sub>FL</sub>	-	10	mA
CCFL OPERATING FREQUENCY	f <sub>FL</sub>	20	80	kHz

### Electrical Characteristics (V<sub>DD</sub>=5.0±0.25V 25°C)

PARAMETER	SYM	CONDITION	MIN	TYP	MAX	UNIT
INPUT HIGH VOLTAGE	V <sub>IH</sub>	-	0.7 V <sub>DD</sub>	-	-	V
INPUT LOW VOLTAGE	V <sub>IL</sub>	-	-	-	0.3 V <sub>DD</sub>	V
OUTPUT HIGH VOLTAGE	V <sub>OH</sub>	I <sub>OH</sub> =0.4mA	V <sub>DD</sub> -0.4	-	-	V
OUTPUT LOW VOLTAGE	V <sub>OL</sub>	I <sub>OL</sub> =0.4mA	-	-	0.4	V
SUPPLY VOLTAGE	V <sub>DD</sub>	-	4.5	5.0	5.5	V
	-V <sub>EE</sub>	-	19.5	18.5	17.5	V
POWER SUPPLY CURRENT	I <sub>DD</sub>	V <sub>DD</sub> =5.0V	-	8.0	16	mA
	-I <sub>EE</sub>	V <sub>EE</sub> =-18.5V	-	7.0	14.0	mA
POWER SUPPLY FOR LCD	V <sub>DD</sub> -V <sub>L</sub>	T <sub>A</sub> =25°C	-	23.5	-	V
CCFL OPERATING VOLTAGE	V <sub>FL</sub>	I <sub>FL</sub> =5mArms	-	300	-	Vrms
CCFL OPERATING CURRENT	I <sub>FL</sub>	V <sub>FL</sub> =300Vrms	-	5.0	-	mArms
CCFL OPERATING FREQ.	f <sub>FL</sub>	-	25	45	-	kHz
FRAME FREQUENCY	f <sub>FP</sub>	-	65	72	80	Hz
BRIGHTNESS	L	I <sub>FL</sub> =5mArms	40	55	-	cd/m <sup>2</sup>
DRIVE METHOD			1/240 DUTY			