

PRELIMINARY DATA SHEET

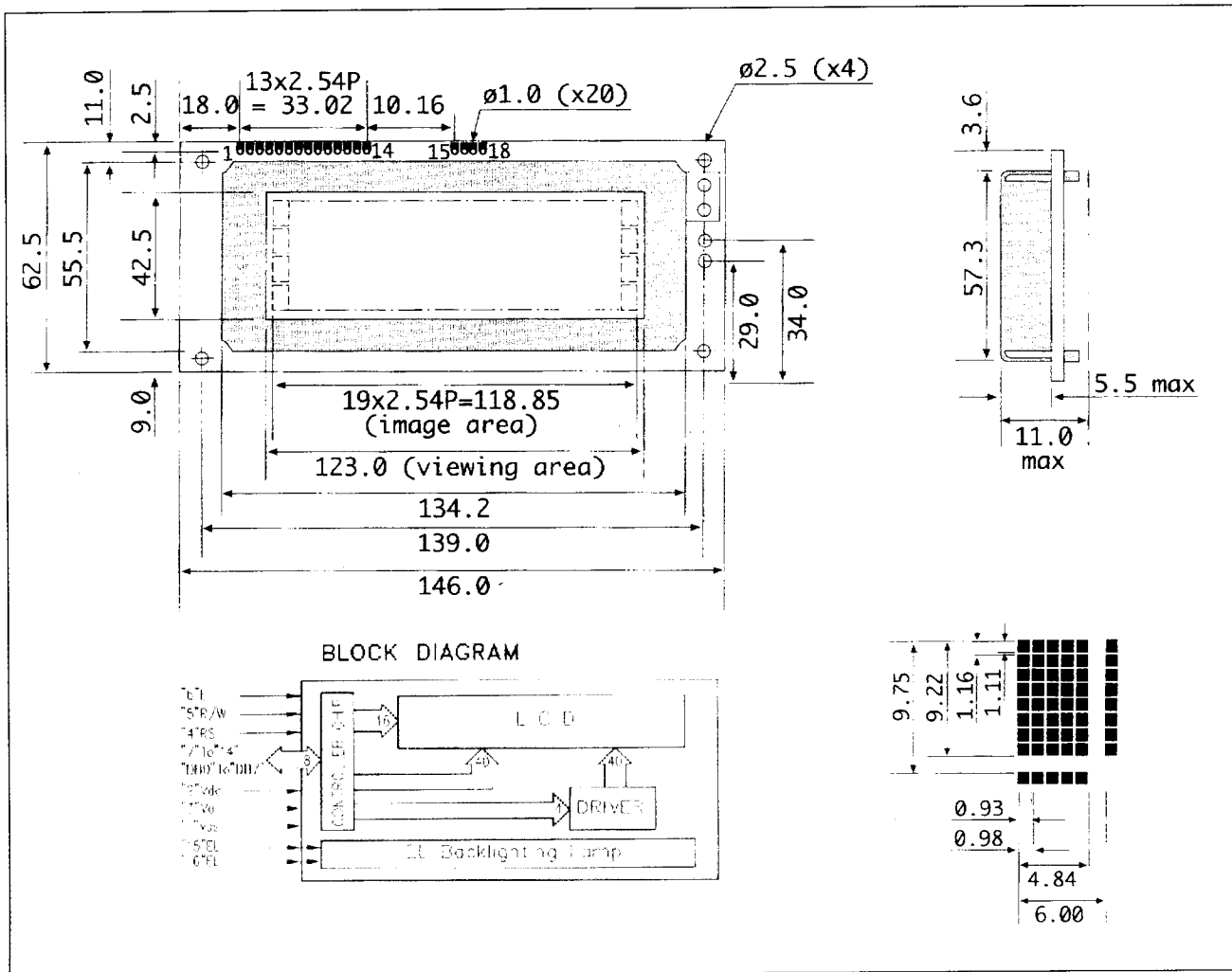
**VK2355**  
**4x20 ALPHANUMERIC DOT**  
**MATRIX DISPLAY**  
**MODULE WITH BUILT-IN**  
**LED BACKLIGHT.**

**FEATURES:**

- Small outline low profile package.
- Low Power CMOS Circuitry.
- Wide Temperature Option.
- Suitable for interface to 8 bit or 4 bit Microprocessors.
- On board or external contrast control.
- Single +5V Power Supply

**Tabulated Data**

Display format Line x Char	Font Matrix W x H (mm)	Duty	Dot Size W x H (mm)	Character size W x H (mm)	Viewing Area W x H (mm)	PCB size W x H (mm)
4 x 20	5 x 8	1/16	0.05 x 0.55	4.84 x 9.22	123.0 x 42.5	146.0 x 62.5



## DEFINITION OF TERMINALS

PIN NO.	SYMBOL	FUNCTION
1	VSS	Ground terminal for module
2	VDD	Supply terminal for module, +5V.
3	VO	Power supply for Liquid Crystal Drive.
4	RS	Register select. RS = 0...Instruction register. RS = 1...Data register.
5	R/W	R / W = 1...Read ; R / W = 0...Write
6	E	Enable
7 ~ 14.	DB0 ~ DB7	Bi-directional Data Bus. Data transfer is performed once thru DB0 - DB7, twice thru DB4-DB7 if interfaced to 4-bit Data Length Bus. Upper 4 bits first then lower 4 bits.
15	LAMP- (L-)	LED or EL lamp power supply terminal
16	LAMP- (L+)	LED or EL lamp power supply terminal

## ELECTRICAL CHARACTERISTICS

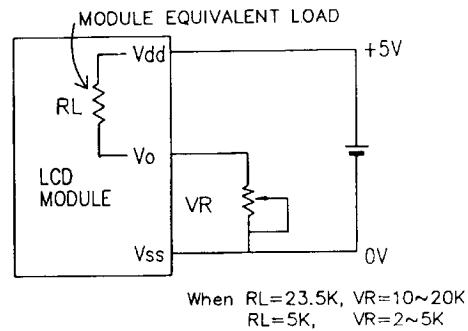
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Supply voltage	$V_{DD}$		4.5	5	5.5	V
LCD Drive Voltage Normal temp (TN/STN)	$V_{DD}-V_O$ ( $V_{LCD}$ )		4.2	4.5*	4.8	V
Wide temp (TN)			4.4	4.7*	5.0	V
Wide temp (STN)			6.4	6.8*	7.5	V
Supply Current <sup>1</sup> 1x16 2x16 1x20 , 2x20 , 2x24 4x20 , 2x40 , 1x40 4x16	$I_{DD}$	$V_{DD} = 5V$ $V_O = 0V$ min	-	1.0	2.0	mA
			-	1.0	3.0	mA
			-	1.5	3.0	mA
			-	2.5	4.0	mA
			-	4.5	5.5	mA
Input Voltage <sup>2</sup>	$V_{IL}$ $V_{IH}$		0 2.2	- -	0.6 $V_{DD}$	V V
Output Voltage <sup>3</sup>	$V_{OL}$ $V_{OH}$	$I_{OL} = 1.6$ mA $I_{OH} = 0.2$ mA	- 2.4	- -	0.4 -	V V
LED Current <sup>4</sup> 1x16 , 2x16 2x24 , 2x20 1x20 , 1x40 , 2x40 4x20	$I_{LED}$	L+ - L- = 5V	-	40	60	mA
			-	60	80	mA
			-	150	250	mA
			-	-	-	-

### NOTES:

- Applies to DB0 - DB7, E, RS and R/W
- Applies to DB0 - DB7.
- Supply current may slightly exceed Maximum rating if Samsung controller is used without pull-up resistor for DB0-DB7
- For VK2011 - VK2014, an external limiting resistor of  $6.8\Omega$  to  $10\Omega$  is required.

## POWER SUPPLY REQUIREMENTS

- Wide temperature range version.
- Standard
- Super-Twist display Version



This circuit shows the typical power supply connection for all dot matrix modules.

The display voltage ( $V_{LCD}$ ) is slightly different for different versions (e.g. standard, wide temperature and super twist). The use of a variable resistor as shown in the diagram is recommended for optimum  $V_{LCD}$  ( $V_{DD} - V_O$ ). Adjust to obtain best display contrast and viewing angle

Drive Voltage ( $V_{LCD}$ ) is not identical for all LCD modules. Acceptable results can be obtained by adjusting  $V_{LCD}$ . If this does not work, Vikay can modify display to meet customer needs.

## OPERATING SPECIFICATIONS

	STANDARD TEMP.	WIDE TEMP.
Operating Temperature Range	0°C to +50°C	-20°C to +70°C
Storage Temperature Range	-40°C to +70°C	-40°C to +85°C

ALL LED BACKLIGHT MODELS HAVE A BUILT-IN LIMITING RESISTOR EXCEPT VK2011, VK2014

"These modules are fitted with Hitachi"compatible" controller/driver IC's which are supplied in either SMT or COB format."