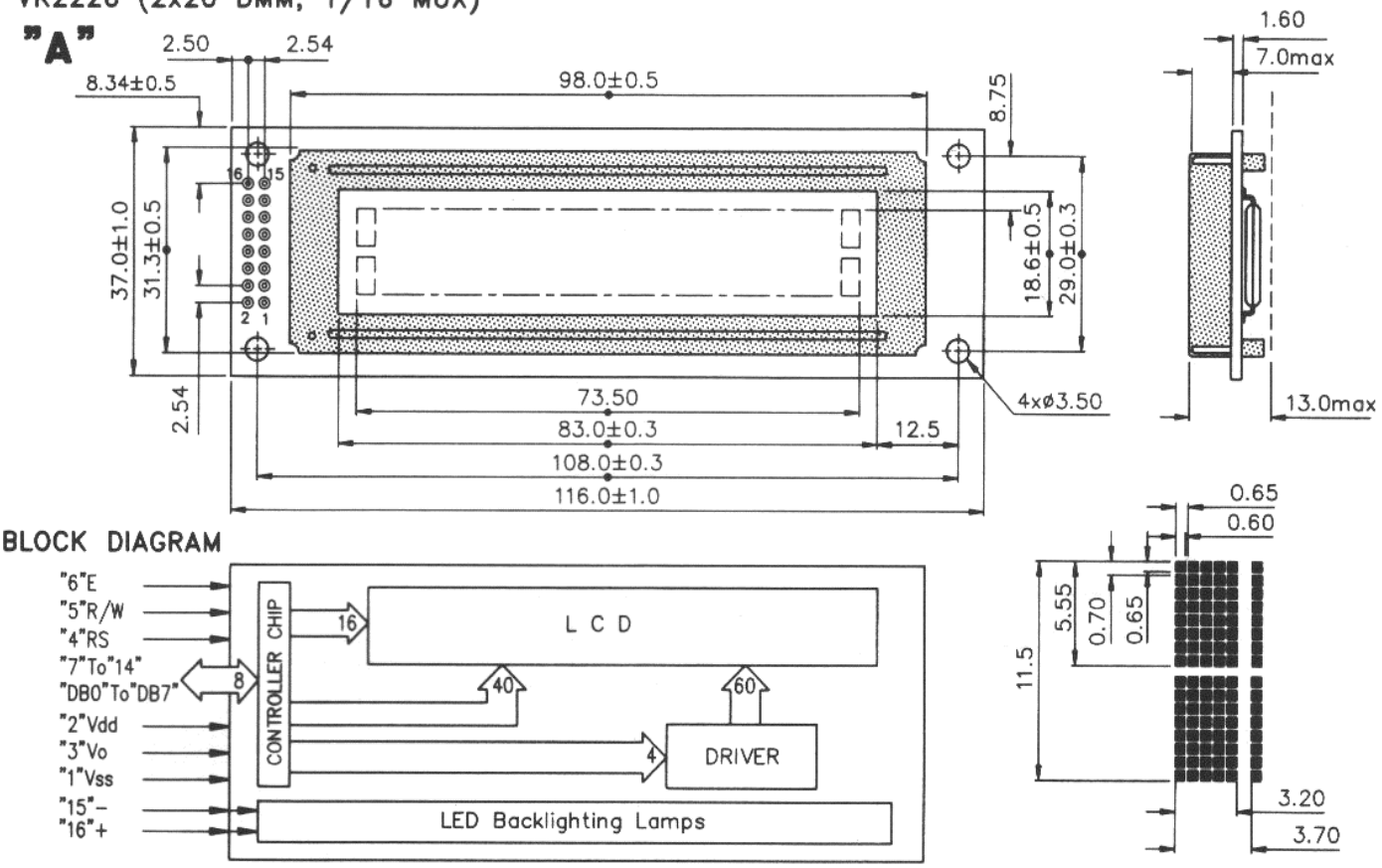
MODULE DIMENSIONS

DIMENSION IN MM

VK2220 (2x20 DMM, 1/16 MUX)

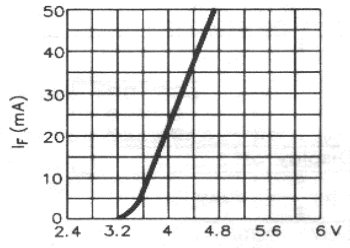


BLOCK DIAGRAM

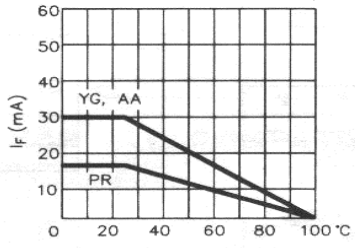
LIGHT EMITTING DIODE BACKLIGHTING

FEATURES

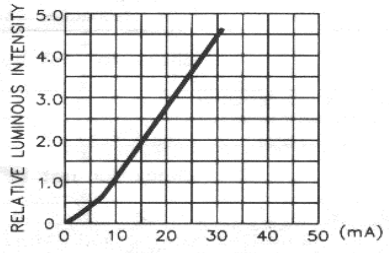
- NO NOISE INTERFERENCE.
- LONG LIFE, TYPICAL 100,000 HOURS.
- LOW VOLTAGE DC DRIVE–5V (10 VOLT OPTIONAL ON SOME MODULES)
- YELLOW–GREEN BACKLIGHTING STANDARD (PURE RED AND AMBER OPTIONAL)



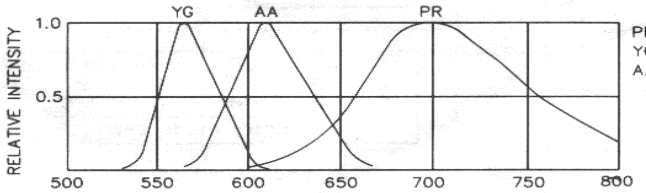
Forward Voltage V_F(V)
FORWARD CURRENT VS. FORWARD VOLTAGE.
(2 LED IN SERIES)



Ambient Temperature
FORWARD CURRENT DERATING CURVE



Forward Current IF
RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



RELATIVE INTENSITY VS. WAVELENGTH

PR : PURE RED
YG : YELLOW–GREEN
AA : AMBER

WAVELENGTH NANOMETERS
T_A=25°C

NOTE : SENSITIVITY OF EYE IS MAXIMUM AT 550nm.

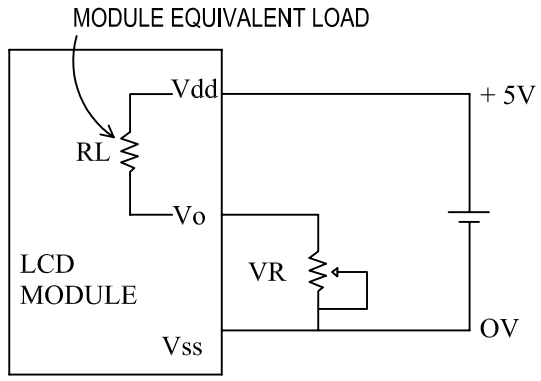
DEFINITION OF TERMINALS		
PIN NO	**SYMBOL**	**FUNCTION**
1.	V_{SS}	Ground terminal of module
2.	V_{dd}	Supply terminal of module, +5V
3.	V_o	Power supply for Liquid Crystal Drive
4.	RS	Register Select RS = θ … Instruction Register RS = 1 … Data Register
5.	R/W	Read/Write R/W = 1 … Read R/W = θ … Write
6.	E	Enable
7~14.	DBθ ~ DB7	Bi-directional Data Bus. Data transfer is performed once, thru DBθ-DB7, in the case of interface data length is 8-bits; and twice, thru DB4-DB7, in the case of interface data length is 4-bits. Upper four bits first then lower four bits
15.	LAMP- (L-)	LED or EL lamp power supply terminals
16.	LAMP+ (L+)	LED or EL lamp power supply terminals

*ALL LED BACKLIGHT MODELS HAVE A BUILT-IN LIMITING RESISTOR

OPERATING SPECIFICATIONS		
	STANDARD TEMP	**WIDE TEMP**
Operating temperature range	0°C to +50°C	-20°C to +70°C
Storage temperature range	-20°C to +70°C	-40°C to +85°C
Operating relative humidity	90% MAX	90% MAX

POWER SUPPLY REQUIREMENTS

- ♦ WideTemperature Range Version
- ♦ Standard
- ♦ Super-Twist Display Version



When RL=23.5K, VR=10~20K
RL=5K, VR=2~5K

This circuit shows the typical power supply connection for all dot matrix module. The display Voltage (V_{LCD}) is slightly different for different version (eg. standard, wide temp and supertwist.). Recommend end user to use **VARIABLE RESISTOR** as shows in the circuit for optimum V_{LCD} (V_{dd} - V_o) adjustment to obtain best display contrast and viewing angle.

ELECTRICAL CHARACTERISTICS (Ta = +25°C)						
PARAMETER	**SYMBOL**	**CONDITION**	**MIN**	**TYP**	**MAX**	**UNIT**
Supply Voltage	VDD		4.5	5.0	5.5	V
LCD Drive Voltage Normal Temp Model (TN-STN) Wide Temp Model (TN) Wide Temp Model (STN)	VDD-V_O (V_{LCD})		 4.2 4.4 6.4	 4.5* 4.7 6.8	 4.8 5.0 7.5	 V V V
Supply Current[1]	IDD	VDD = 5V V_O = 0V MIN	-	1.5	3.0	mA
Input Voltage[2]	VIL VIH		0 2.2	- -	0.6 VDD	V V
Output Voltage[3]	VOL VOH	10L = 1.6 mA 10H = 0.2 mA	- 2.4	- -	0.4 -	V V
LED Current	I_{LED}	L+ - L- = 5V	-	60	80	mA

** DRIVE VOLTAGE (V_{LCD}) IS IDENTICAL FOR LCD MODULES MANUFACTURES. ACCEPTABLE RESULTS CAN BE OBTAINED BY ADJUSTING V_{LCD}. IF THIS DOES NOT WORK, VIKAY CAN MODIFY DISPLAY TO MEET CUSTOM NEEDS CONSULT FACTORY*

NOTE:
1. *Applies to DBθ - DB7, E, RS and R/W*
2. *Applies to DBθ - DB7*
3. *Supply current may slightly exceed MAX. Rating if SAMSUNG controller is used without pull-up resistor for DBθ - DB7*