

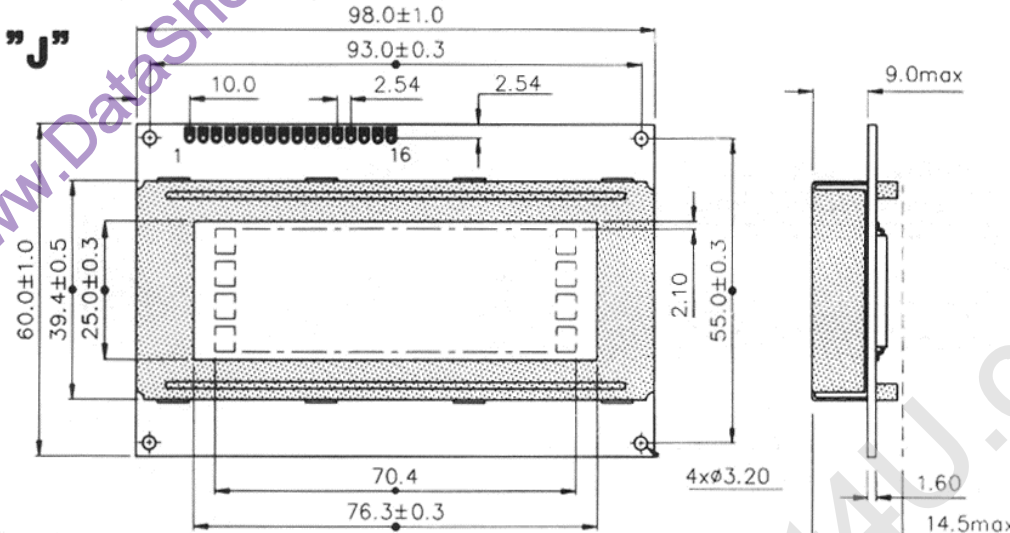
MODULE DIMENSIONS

VK2024 (4x20 DMM, 1/16 MUX)

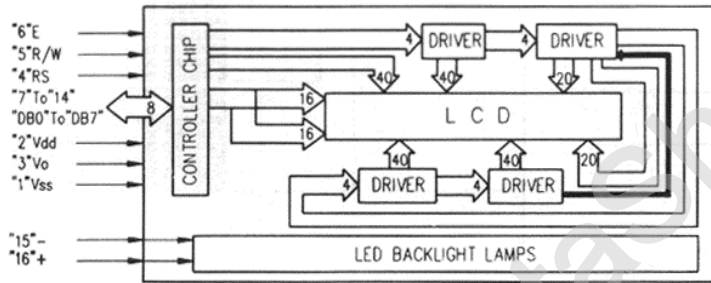
DIMENSION IN MM

NOTE:

VK2024-10 : LED BACKLIGHT IS POWERED BY 10 TO 15V SUPPLY.



BLOCK DIAGRAM



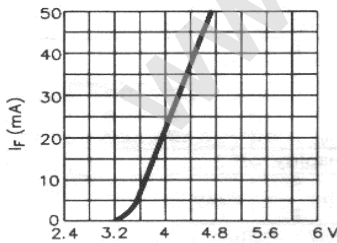
LED PIN-OUT OPTION

OPTION		15	16	REMARK
OPT PADS				
SHORT	2 & 4	+	-	A
	5 & 7			
	2 & 3	-	+	VK-STD
	5 & 6			

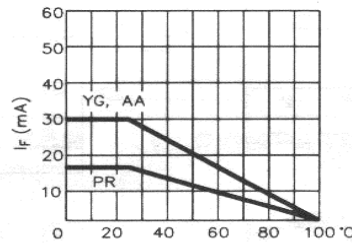
LIGHT EMITTING DIODE BACKLIGHTING

FEATURES

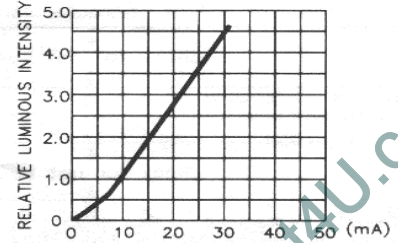
- NO NOISE INTERFERENCE.
- LONG LIFE, TYPICAL 100,000 HOURS.
- LOW VOLTAGE DC DRIVE-5V (10 VOLT OPTIONAL ON SOME MODULES)
- YELLOW-GREEN BACKLIGHTING STANDARD (PURE RED AND AMBER OPTIONAL)



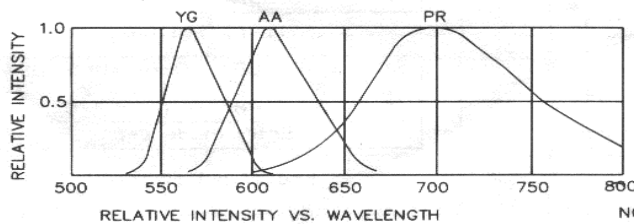
FORWARD CURRENT VS. FORWARD VOLTAGE.
(2 LED IN SERIES)



FORWARD CURRENT DERATING CURVE



RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



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

WAVELENGTH NANOMETERS
 $T_A = 25^\circ\text{C}$

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 = 0 ... Instruction Register RS = 1 ... Data Register
5.	R/W	Read/Write 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, 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

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)	VDD-V _o		4.2	4.5*	4.8	V
Wide Temp Model (TN)	(V _{LCD})		4.4	4.7	5.0	V
Wide Temp Model (STN)			6.4	6.8	7.5	V
Supply Current ¹	IDD	VDD = 5V V _o = 0V MIN	-	2.5	4.0	mA
Input Voltage ²	VIL		0	-	0.6	V
	VIH		2.2	-	VDD	V
Output Voltage ³	VOL	10L = 1.6 mA	-	-	0.4	V
	VOH	10H = 0.2 mA	2.4	-	-	V
LED Current	I _{LED}	L+ - L- = 5V	-	150	250	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

POWER SUPPLY REQUIREMENTS

- ◆ Wide Temperature Range Version
- ◆ Standard
- ◆ Super-Twist Display Version

MODULE EQUIVALENT LOAD

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.

NOTE: 1. Applies to DB0 - DB7, E, RS and RW
2. Applies to DB0 - DB7
3. Supply current may slightly exceed MAX. Rating if SAMSUNG controller is used without pull-up resistor for DB0 - DB7