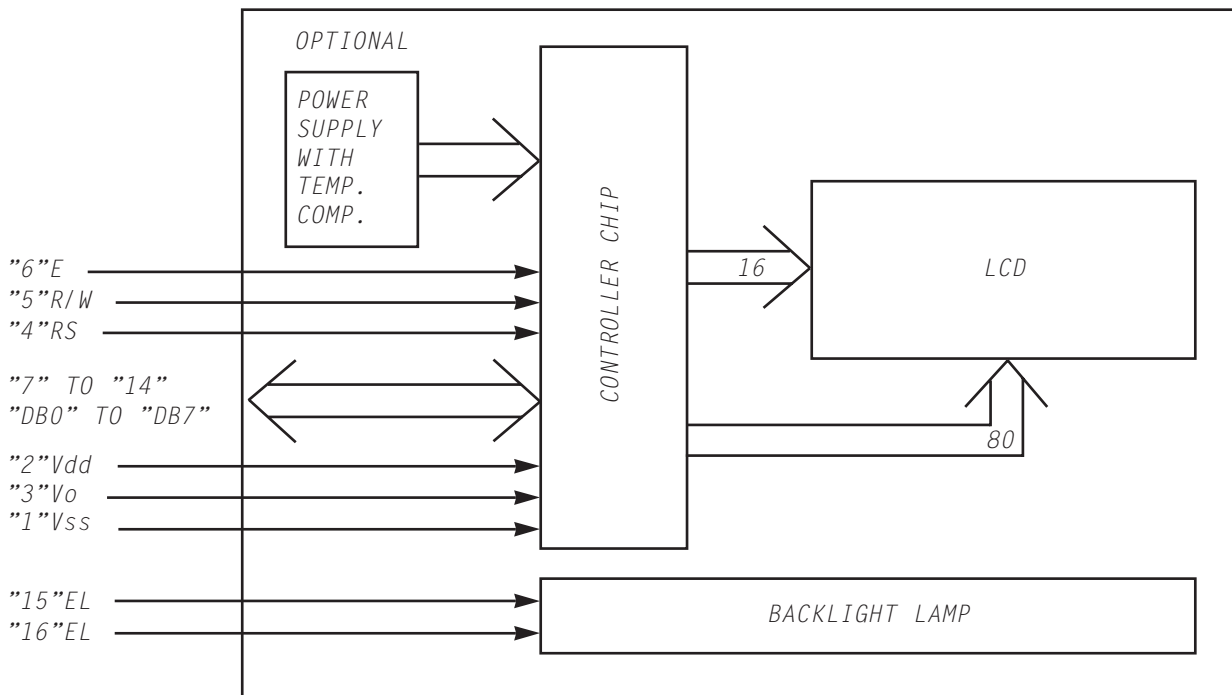
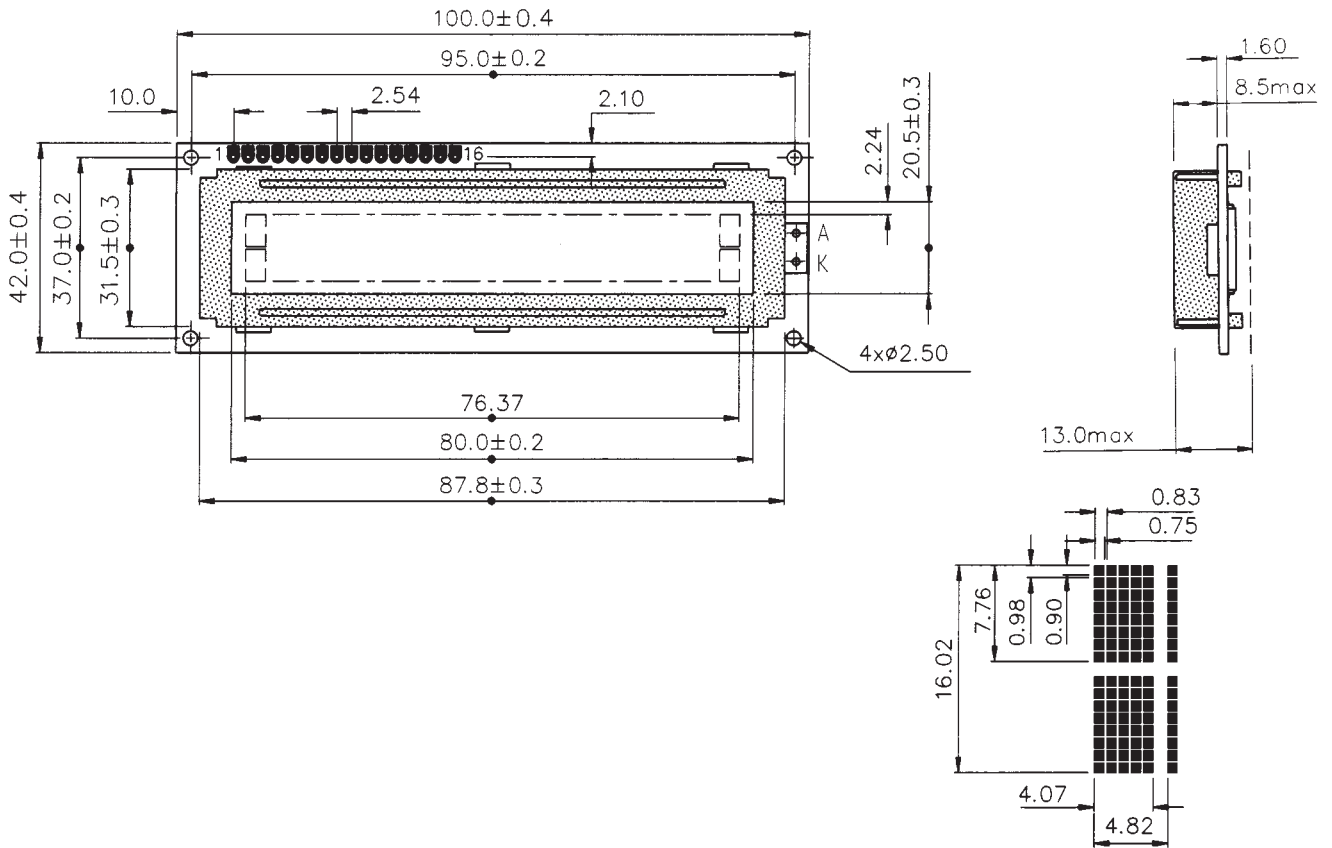


DEM 16214 SYH-LY/L
 DEM 16214 SY-LY/L

ALPHANUMERIC DOT MATRIX MODULES

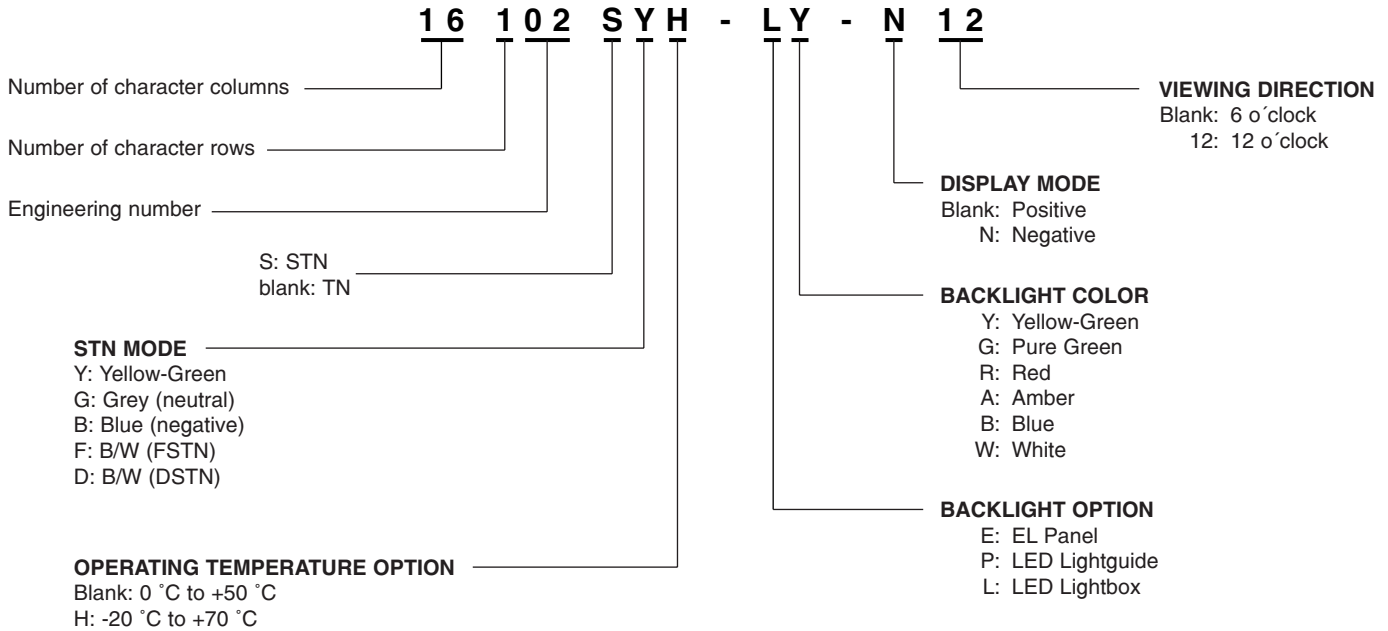


DEM 16214 SYH-LY/L

DEM 16214 SY-LY/L

ALPHANUMERIC DOT MATRIX MODULES

ORDERING INFORMATION



MODULES: ORDER LIST

-: UNAVAILABLE
/: AVAILABLE
0: STANDARD CONFIGURATION
H: WIDE TEMPERATURE
C: BUILT-IN CONVERTOR
WB: WITHOUT BACKLIGHT
LB: LED LIGHT BOX DESIGN

TN: TWISTED NEMATIC DISPLAY VERSION
STN: SUPERTWISTED NEMATIC DISPLAY VERSION
TV: TOP VIEW
BV: BOTTOM VIEW
D: BUILT-IN INVERTOR
LP: LED LIGHT PIPE DESIGN
EL: EL PANEL

No.	MODEL	FORMAT	TN	STN	H	TV	BV	WB	LB	LP	EL	D	C	WIDE TEMP. RANGE TYPE
1	DEM08171	1x8	-	0	/	/	0	-	-	0	-	/	-	A
2	DEM08172	1x8	-	0	/	/	0	0	0	0	-	/	-	A
3	DEM16101	1x16	0	/	/	/	0	0	0	-	-	/	-	A
4	DEM16102	1x16	-	0	/	/	0	0	0	0	-	/	-	A
5	DEM16211	2x16	-	0	/	/	0	0	0	0	-	/	-	A
6	DEM16212	2x16	-	0	/	/	0	0	0	0	-	/	-	A
7	DEM16213	2x16	-	0	/	-	0	0	0	-	-	/	-	A
8	DEM16214	2x16	-	0	/	/	0	0	0	-	-	-	/	A
9	DEM16215	2x16	-	0	/	/	0	-	0	-	-	/	-	A
10	DEM16216	2x16	-	0	/	/	0	0	0	0	-	/	-	B
11	DEM16217	2x16	-	0	/	/	0	0	0	0	-	/	-	A
12	DEM16219	2x16	-	0	/	/	0	-	-	0	-			A
13	DEM16481	2x16	-	0	/	/	0	-	0	-	-			A
14	DEM20121	1x20	-	0	/	/	0	-	-	0	-	/	/	B
15	DEM20231	2x20	-	0	/	/	0	-	-	0	-	/	-	A
16	DEM20232	2x20	-	0	/	/	0	-	0	-	-	-	/	B
17	DEM20485	4x20	-	0	/	/	0	0	0	-	-	/	-	A
18	DEM20486	4x20	-	0	/	/	0	-	0	-	-	-	/	A
19	DEM24251	2x24	-	0	/	/	0	-	-	0	-			A
20	DEM40271	2x40	-	0	/	-	0	-	0	-	-	-	/	A

*Type A: requires V_{EE} (negative voltage to V_{DD})

Type B: for 5 Volt driving (V_{DD}) only

DEFINITION OF TERMINALS

PIN NO.	SYMBOL	FUNCTION
1	Vss	Ground terminal of module
2	Vpp	Supply terminal of module +5
3	Va	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-direction 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 16	L- L+	LED or EL lamp power supply terminals.

OPERATING SPECIFICATIONS

	STANDARD TEMP
Operating temperature range	0 °C to +50 °C
Storage temperature range	-10 °C to +60 °C
Operating relative humidity	90% max
WIDE TEMP	
Operating temperature range	-20 °C to +70 °C
Storage temperature range	-30 °C to +75 °C
Operating relative humidity	90% max

ELECTRICAL CHARACTERISTICS (To = +25 °C)

PARAMETR	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply voltage	V _{DD}		4.5	5.0	5.5	V
LCD Drive Voltage						
Normal Temp Model (TN/STN)	V _{DD} -V ₀		4.2	4.5	4.8	V
Wide Temp Model (STN)	(V _{LCD})		6.4	6.8	7.5	V
Supply Current ¹						
1x16DMM	I _{DD}	V _{DD} = 5V V ₀ = 0V min	-	1.0	2.0	mA
2x16DMM			-	1.0	2.0	mA
1x20, 2x20DMM			-	1.5	3.0	mA
4x20, 2x40DMM			-	2.5	4.0	mA
Input voltage ²	V _{IL} V _{IH}		0 2.0	- -	0.6 V _{DD}	V V
Output voltage ³	V _{OL} V _{OH}	I _{OL} = 1.6 mA I _{OH} = 0.2 mA	- 2.4	- -	0.4 -	V V
LED Lightpipe Current	I _{LED}	L+ - L- = 5V				
1x8, 1x16, 2x15DMM			20		60	mA
2x20DMM			40		80	mA
LED Lightbox Current						
1x8, 1x16DMM			40		100	mA
2x16DMM			40		250	mA
1x20, 2x20, 4x20DMM			150		300	mA

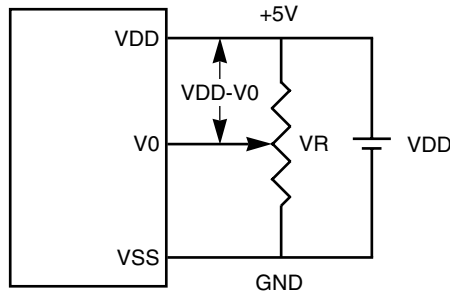
DRIVE VOLTAGE (V_{lcd}) IS NOT IDENTICAL FOR LCD MODULES MANUFACTURES. ACCEPTABLE RESULTS CAN BE OBTAINED BY ADJUSTING V_{LCD}. IF THIS DOES NOT WORK, HITECH CAN MODIFY DISPLAY TO MEET CUSTOM NEEDS.

- Note:
1. Applies to DB0 - DB7, E, RS and R/W
 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

POWER SUPPLY REQUIREMENTS

Standard Temperature Range

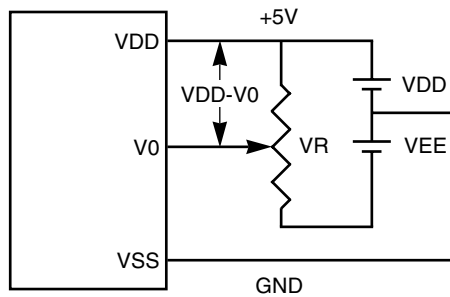
- Only 5 Volt (V_{DD})



$V_{DD}-V_0$ LCD Driving Voltage
 V_r 10K - 20K

Wide Temperature Range Type A

- Requires V_{EE} (negative Voltage to V_{DD})



$V_{DD}-V_0$ LCD Driving Voltage
 V_r 10K - 20K

Wide Temperature Range Type B

- Only 5 Volt Type (V_{DD})

- Contrast adjustment and Temp. Compensation on Board

