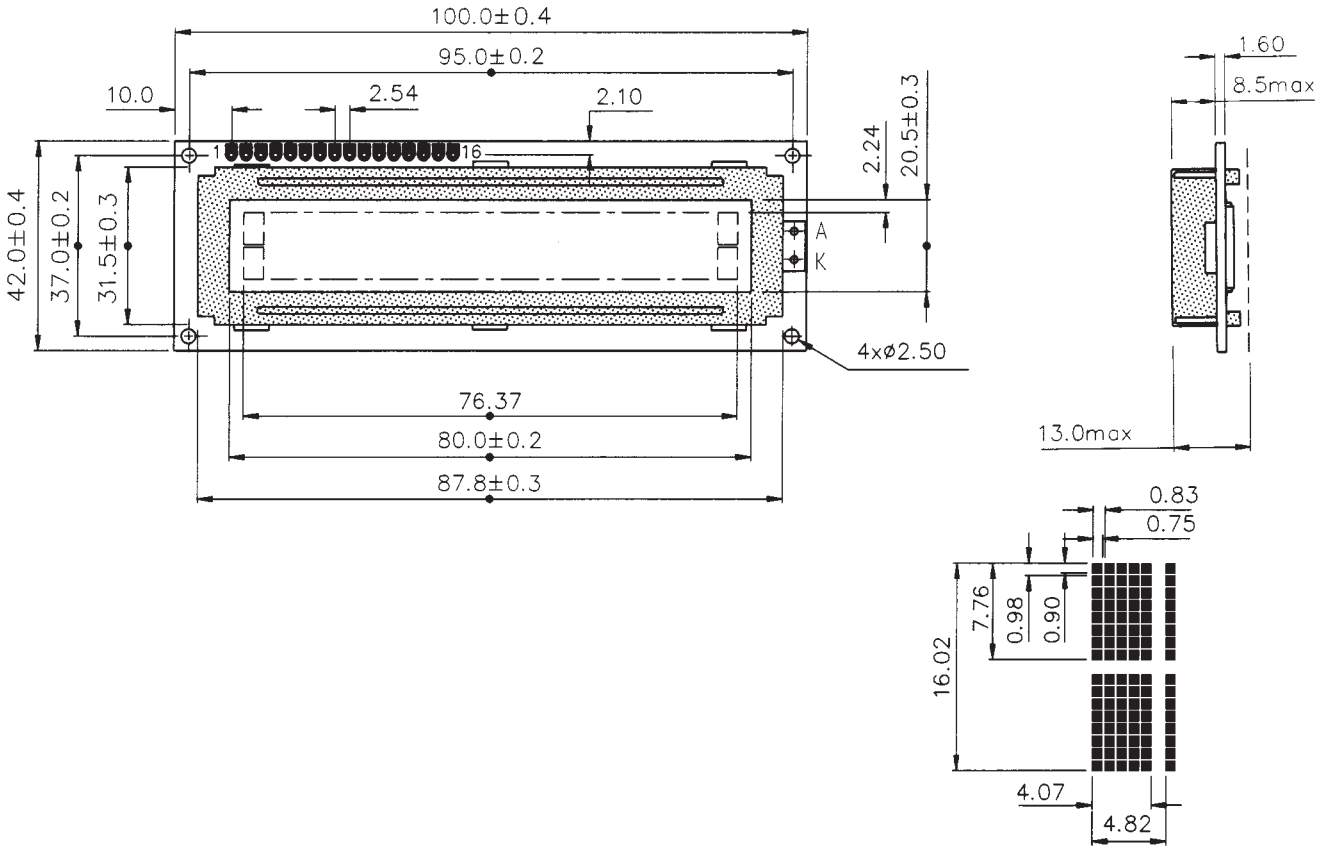
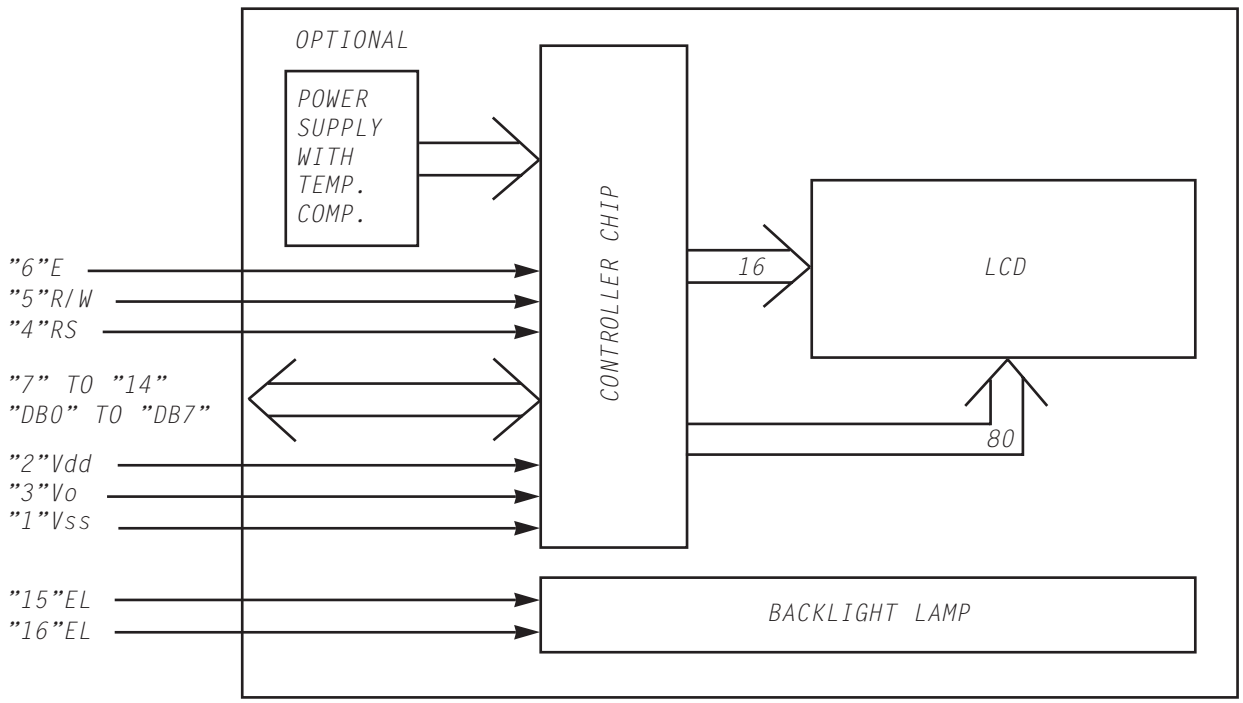
DEM 16214 SYH-LY/L
DEM 16214 SY-LY/L





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

ORDERING INFORMATION

16 102 SYH - LY - N 12

- Number of character columns
- Number of character rows
- Engineering number
- S: STN / blank: TN
- **STN MODE**: Y: Yellow-Green; G: Grey (neutral); B: Blue (negative); F: B/W (FSTN); D: B/W (DSTN)
- **OPERATING TEMPERATURE OPTION**: Blank: 0 ˚C to +50 ˚C; H: -20 ˚C to +70 ˚C
- **BACKLIGHT OPTION**: E: EL Panel; P: LED Lightguide; L: LED Lightbox
- **BACKLIGHT COLOR**: Y: Yellow-Green; G: Pure Green; R: Red; A: Amber; B: Blue; W: White
- **DISPLAY MODE**: Blank: Positive; N: Negative
- **VIEWING DIRECTION**: Blank: 6 o´clock; 12: 12 o´clock

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...Dala 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 or 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)

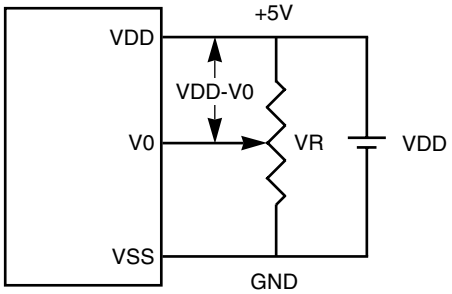
PARAMETR	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply voitage	V_{DD}		4.5	5.0	5.5	V
LCD Drive Voltage Normal Temp Model (TN/STN) Wide Temp Model (STN)	V_{DD}-V_0 (V_{LCD})		 4.2 6.4	 4.5 6.8	 4.8 7.5	 V V
Supply Current[1] 1x16DMM 2x16DMM 1x20, 2x20DMM 4x20, 2x40DMM	I_{DD}	V_{DD} = 5V V_0 = 0V min	 - - - -	 1.0 1.0 1.5 2.5	 2.0 2.0 3.0 4.0	 mA mA mA 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 1x8, 1x16, 2x15DMM 2x20DMM LED Lightbox Current 1x8, 1x16DMM 2x16DMM 1x20, 2x20, 4x20DMM	I_{LED}	L+ – L- = 5V	 20 40 40 40 150		 60 80 100 250 300	 mA mA mA mA mA

DRIVE VOLTAGE (Vlcd) 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

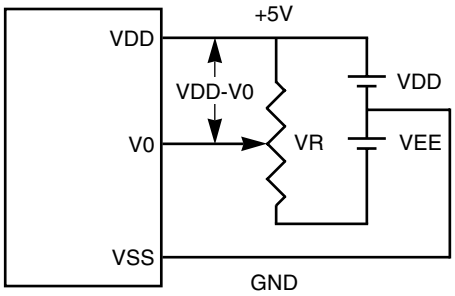
POWER SUPPLY REQUIREMENTS

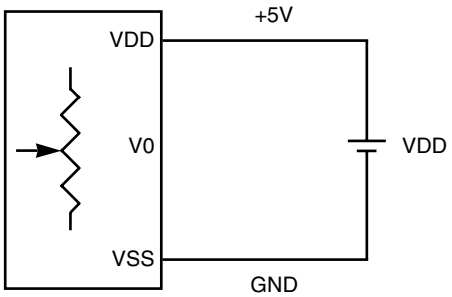
Standard Temperature Range
- Only 5 Volt (V_{DD})



VDD-V0	LCD Driving Voltage
Vr	10K - 20K

Wide Temperature Range Type A
- Requires V_{EE} (negative Voltage to V_{DD})



VDD-V0	LCD Driving Voltage
Vr	10K - 20K

Wide Temperature Range Type B
- Only 5 Volt Type (V_{DD})
- Contrast adjustment and Temp. Compensation on Board