

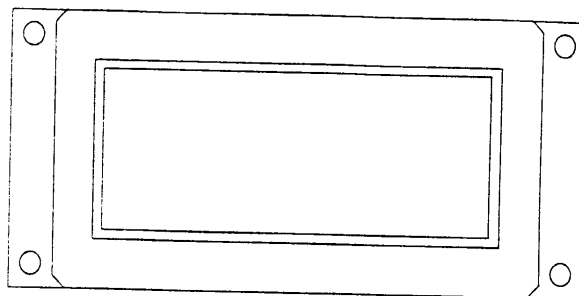
481-701

BATRON DOT MATRIX LCD DISPLAY MODULE

BT100032STYC - 70C

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MICRO MINATURE CONSTRUCTION
100 x 32 DOT MATRIX



FEATURES

- Single 5v Supply
- Low Power LED Backlight
- Extensive Command Set
- Compact Single Board Construction
- SBE Supertwist Technology

APPLICATION Readout for computer systems, communication terminal, automatic instruments and Portable Equipment.

CONSTRUCTION Single board graphics display module consisting of 100 by 32 dot matrix LCD, SED1520 Driver/Controller and Yellow LED Backlight.

MECHANICAL SPECIFICATIONS

Matrix Format	100 x 32 dot matrix
PCB Dimensions	65 x 28.4 mm (XxY)
Display Area	46 x 18.4 mm (XxY)
Dot Size	0.38 x 0.43 mm (XxY)
Dot Pitch	0.43 x 0.48 mm (XxY)

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	0 to + 50°C
Storage Temperature	-20 to + 60°C
Operating Humidity	≥ 40 to 95%RH

OPTICAL CHARACTERISTICS

Viewing Angle	60° Min.
Contrast Ratio	8 Min. 20 Typ.
Colour of Illumination	Black on Greenish Yellow

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Description
Logic Supply Voltage	VDD	0 VDC to 8.0 VDC VDD (VDD - VSS)
LCD Supply Voltage	VEE	0 VDC to 16.5 VDC VEE (VDD - V0)
Input Voltage	VI	0 VDC to 8.0 VDC VSS Minimum. VDD Maximum.

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Logic High Input	VINH	2.0	---	---	VDC	VCC = 5.0V
Logic Low Input	VINL	---	---	0.8	VDC	VCC = 5.0V
Logic High Output	VOH	2.4	---	---	VDC	
Logic Low Output	VOL	---	---	0.4	VDC	
Logic Supply Current	IDD	---	1.0	---	mADC	
Supply Current (LCD Driver)	IO	---	0.5	---	mADC	
Supply Voltage (LED)	VCC	3.8	4.1	4.4	VDC	
Supply Current (LED)	ICC	---	40	70	mADC	at 25°C
LED Segments	---	---	4	---	Pcs	

Note: Power On rise time for VCC should be less than 10ms.

DEFAULT SETTINGS

Display Attributes (Power On Reset)	<ul style="list-style-type: none"> • Display off • ADC : Forward (ADC : D0="0") • Static drive off • Duty : 1/32 	<ul style="list-style-type: none"> • Column address counter : 0 • Page address register : 0 • Display start line register : 0 • Read-modify-write off
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DISPLAY CONNECTOR OPTION

Part No.	Description
BT100032	

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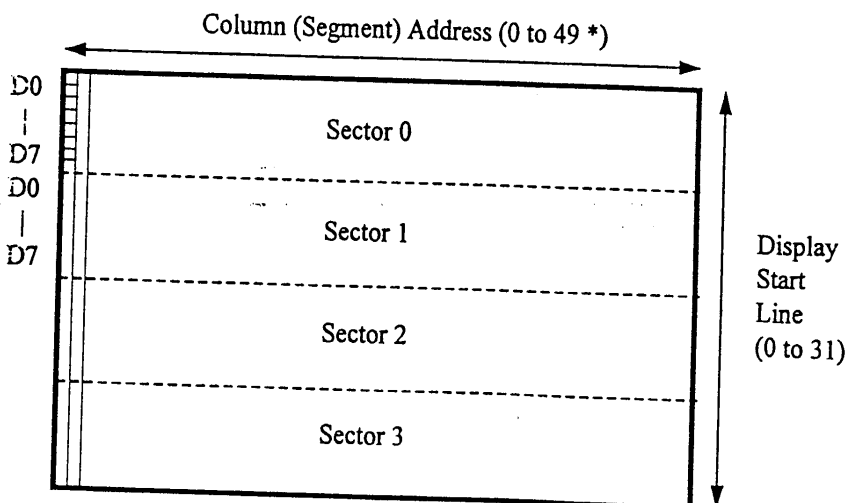
SOFTWARE COMMANDS

The module uses two drive IC's with common data (D0 to D7), A0 and R/\bar{W} interface to control the left and right halves of the display. Each IC is clocked by separate enable lines - E1 for the left and E2 for the right side.

Command	A0	R/W	D7	D6	D5	D4	D3	D2	D1	D0	Function	
Display On/Off	0	0	1	0	1	0	1	1	1	0/1	Turns Display on (1) or off (0).	
Display Start Line	0	0	1	1	0	Display start address (0 to 31)				0/1	Sets line to be top line of display.	
Set Sector Address	0	0	1	0	1	1	1	0	Sector (0 to 3)		Sets display sector in sector address register.	
Set column address	0	0	0	Column address (0 to 49)								Sets display column address in column address register.
Read status	0	1	Busy	ADC	On/Off	Reset	0	0	0	0	Reads the following status : BUSY 1:Busy 0:Ready ADC * 1:Clockwise 0:Anticlockwise ON/OFF 1:Display Off 0:Display On RESET 1:Being reset 0:Normal	
Write Display Data	1	0	Write data									Writes data from data bus into display RAM & increments the column address register by one.
Read Display Data	1	1	Read data									Reads data from display RAM onto data bus & increments the column address register by one.
Select ADC	0	0	1	0	1	0	0	0	0	0/1	* 0: Clockwise, 1:Anticlockwise	
Read-modify-write	0	0	1	1	1	0	0	0	0	0	Turns read-modify-write ON, which stops the automatic increment after data reads.	
End	0	0	1	1	1	0	1	1	1	0	Turns read-modify-write OFF.	
Reset	0	0	1	1	1	0	0	0	1	0	Clears display start line register, column address counter and sector address register. Does not affect display RAM.	

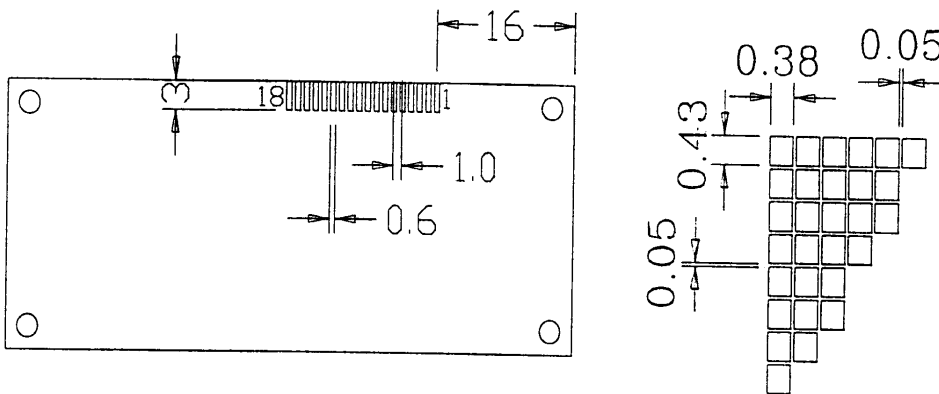
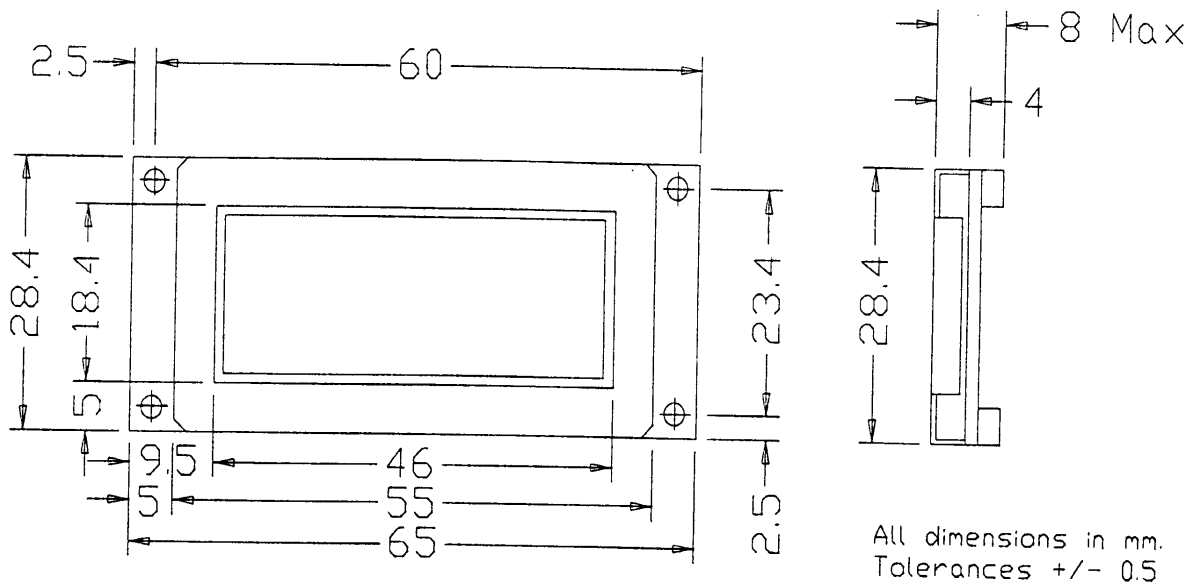
Note: After a new address is loaded into the column address register, a dummy read is required before valid data is obtained.
 * When ADC is set to Anticlockwise (1), column address 0 is on the right, and 49 is on the left (reversed)

DISPLAY MEMORY MAP (E1 and E2)



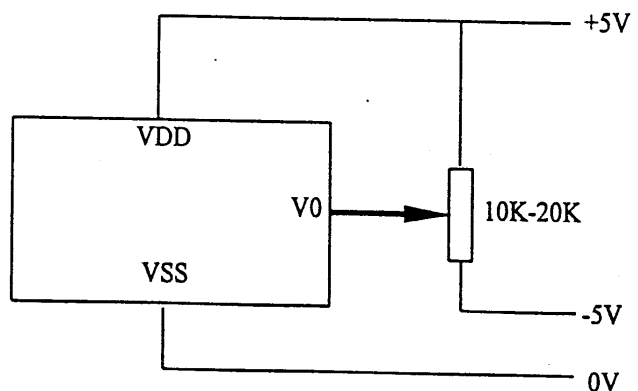
The area shown as is the actual display area of one half of the screen. E1 and E2 must be programmed...

MECHANICAL DRAWING

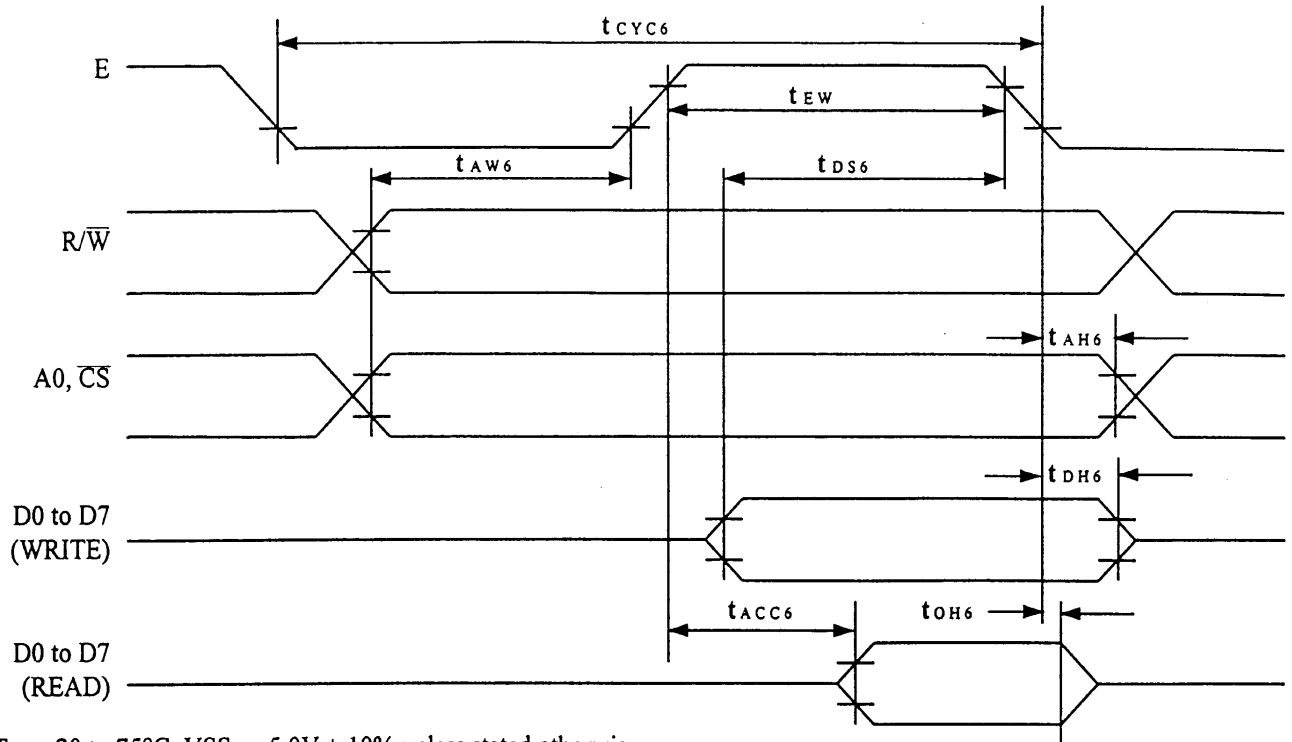


SUPPLY VOLTAGE CIRCUIT FOR LCD MODULE

Pin No	Function
1	GND
2	Power Supply 5V
3	Supply Voltage (LCD Driver)
4	Register Select
5	Read / Write
6	Enable E1
7	Enable E2
8	Not Connected
9	D0
10	D1
11	D2
12	D3
13	D4
14	D5
15	D6
16	D7
17	Anode of LED Unit
18	Cathode of LED Unit



TIMING DIAGRAM

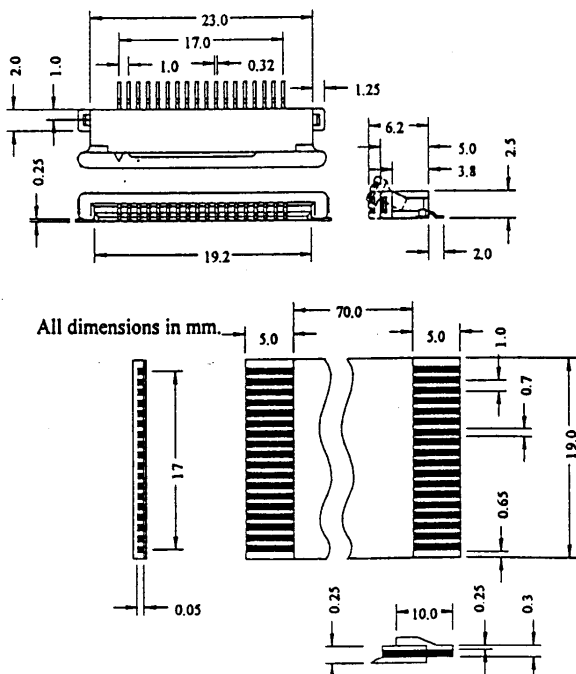


Ta = -20 to 75°C, VSS = -5.0V ± 10% unless stated otherwise

MPU Bus Read/Write

Parameter	Symbol	Condition	Min	Max	Unit	Signal
System cycle time	tCYC6		1000	---	n sec	A0, CS, R/W
Address setup time	tAW6		20	---	n sec	A0, CS, R/W
Address hold time	tAH6		10	---	n sec	A0, CS, R/W
Data setup time	tDS6		80	---	n sec	D0 to D7
Data hold time	tDH6		10	---	n sec	D0 to D7
Output disable time	tOH6	CL=100pF	10	60	n sec	D0 to D7
Access time	tACC6	CL=100pF	---	90	n sec	D0 to D7
Enable pulsewidth	tCC		100	---	n sec	E
Enable pulsewidth	tCC		8	---	n sec	E

Notes: Increase parameter values by 200% when VSS = -3.0V. All inputs must have a rise and fall time < 15 n secs.



HANDLING PRECAUTIONS

- * Do not alter, modify or change the shape of the clips on the metal frame.
- * Do not drill holes in the printed circuit board, modify its shape or change the positions of components.
- * Do not damage or modify the pattern wiring on the printed circuit board.
- * Absolutely do not modify or change the internal connector (conductive rubber) or touch it with any other object.
- * Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
- * Do not drop, bend or twist LCM.

Please contact your sales office before returning modules.
Possible repairs of such modules will be invoiced.