



VL-FS-VLMS4044-02 REV. B
(VLMS4044-ZEBRA VERSION)

JULY/2002.

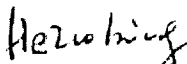
PAGE 1 OF 10

VARITRONIX GRAPHIC LCD MODULE
FORMAT = 240x64

MGLS-24064-C-HV-G-LED3G

Provided with 2-position cable harness pre-assembled for LED Backlight access
Provided with 10x2-position pin-header.

DOCUMENT TITLE:
SPECIFICATION
OF
LCD MODULE TYPE
P.I.D.#/ITEM NO.: VLMS4044-02

DEPARTMENT	NAME	SIGNATURE	DATE
PREPARED BY	PHILIP CHENG		2002.7.4
CHECKED BY	Z.B.HE		7.4.2002
APPROVED BY	CYRUS CHEUNG		2002/7/4



VL Electronics

a subsidiary of Varitronix International Group

3250 Wilshire Blvd, suite 1901 • Los Angeles • CA 90010-1502

Voice: (213) 738-8700 • Fax: (213) 738-5340 • E-mail: sales@vle.com

Varitronix

DISTRIBUTION LIST: MARKETING



VARITRONIX

VL-FS-VLMS4044-02REV.B
(VLMS4044-ZEBRAVERSION)

JULY/2002.

PAGE2OF10

MGLS-24064-C-HW-G-LED3G

DOCUMENT REVISION HISTORY1:

DOCUMENT REVISION FROM TO	DATE	DESCRIPTION	CHANGED BY	CHECKED BY
0.0	2001.06.11	FirstRelease.	PHILIP CHENG	C.M.LUN
0.0 B	2002.07.04	Items1to2wereupdated. 1.)(Wholedocument) Thenumbersofpageswere updated. 2.)(Page8,table5) Minimumvalueandmaximum valueofsupplyvoltage(LED03 backlight)werechangedfrom4.0V and4.2Vto3.9Vand4.3V respectively.	PHILIP CHENG	Z.B.HE



VARITRONIX

VL-FS-VLMS4044-02REV.B
(VLMS4044-ZEBRAVERSION)

JULY/2002.

PAGE3OF10

MGLS-24064-C-HV-G-LED3G

CONTENTS

	PAGE
1. GENERAL DESCRIPTION	4
2. MECHANICAL SPECIFICATION	4
3. ABSOLUTE MAXIMUM RATINGS	6
3.1 ELECTRICAL MAXIMUM RATINGS (Ta = 25°C)	6
3.2 ENVIRONMENTAL CONDITION	6
4. ELECTRICAL SPECIFICATION	7
4.1 INTERFACE SIGNALS	7
4.2 TYPICAL ELECTRICAL CHARACTERISTICS	8
4.3 TIMING SPECIFICATIONS	9
4.4 TIMING DIAGRAM OF Vdd AGAINST V0	10
5. LED BACKLIGHT	11
6. GLASS MECHANICAL LCD ONLY .	12

VARITRONIX GRAPHIC LCD MODULE
FORMAT = 240x64

MGLS-24064-C-HV-G-LED3G

Provided with 2-position cable harness pre-assembled for LED Backlight access
Provided with 10x2-position pin-header.



VARITRONIX LIMITED

Specification**VARITRONIX GRAPHIC LCD MODULE**

FORMAT = 240x64

MGLS-24064-C-HV-G-LED3G

Provided with 2-position cable harness pre-assembled for LED Backlight access

1. Provided with 10x2-position pin-header.

- 240x64dotmatrixSTNSTD2PositiveYellow-GreenTransflectiveLCDGraphicModule.
- Drivingscheme:1/64duty,1/9bias.
- ViewingAngle:6O'clockdirection.
- 'Toshiba'T6963C(flatpack)orequivalentLCDcontroller.
- 'Toshiba'T6A39(flatpack)orequivalentLCDsegmentdrivers.
- 'Toshiba'T6A40(flatpack)orequivalentLCDcommondrivers.
- 8KbytedisplaySRAM.
- Yellow-greenLED03backlight.
- Connector:10pinsx2rowsmaleconnector.
- Connectorassembly.

2. Mechanical Specifications

ThemechanicaldetailisshowninFig.1andsummarizedinTable1below.

Table1

Parameter	Specifications	Unit
Outlinedimensions	180.0(W)x65.0(H)x14.0MAX.(D)(excludedconnectors)	mm
Effectiveviewingarea	32.0(W)x39.0(H)	mm
Activearea	127.15(W)x33.87(H)	mm
Displayformat	240(Horizontal)x64(Vertical)	dots
Dotsize	0.48(W)x0.48(H)	mm
Dotspaceing	0.05(W)x0.05(H)	mm
Dotpitch	0.53(W)x0.53(H)	mm
Weight:	Approx.154.3	grams



VARITRONIX

GRAPHIC LCD MODULE

VL-FS-VLMS4044-02REV.B
(VLMS4044-ZEBRAVERSION)

JULY/2002.

PAGE5OF10

MGLS-24064-C-HV-G-LED3G

MGLS-24064-C-HV-G-LED3G

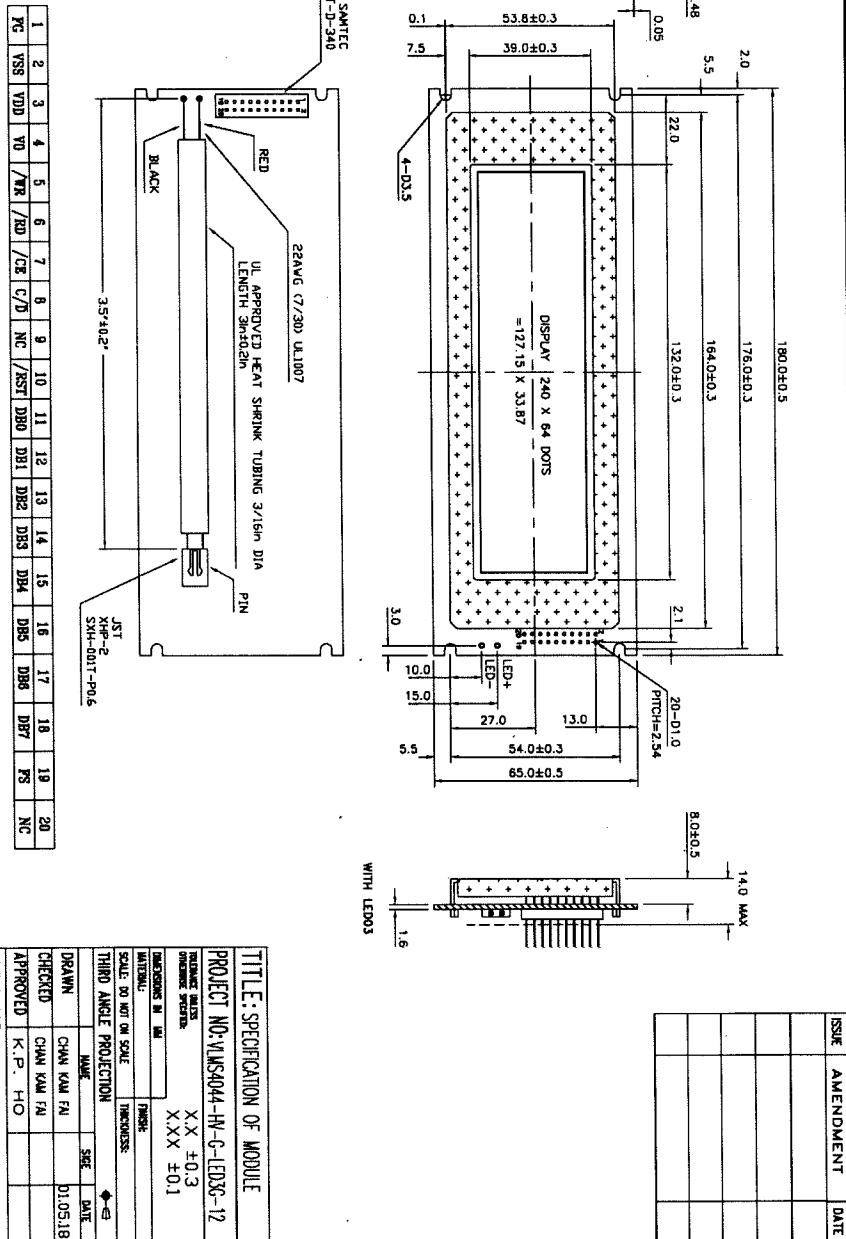


Figure1: Specification of VLMS4044-ZEBRAVERSION module.



VL Electronics

Varitronix

VARITRONIX GRAPHIC LCD MODULE FORMAT = 240X64
MGLS-24064-C-HV-G-LED3G
Provided with 2-position cable harness pre-assembled for LED Backlight access
Provided with 10x2-position pin-header.

a subsidiary of Varitronix International Group
3250 Wilshire Blvd, suite 1901 • Los Angeles • CA 90010-1502
Voice: (213) 738-8700 • Fax: (213) 738-5340 • E-mail: sales@vle.com



3. AbsoluteMaximumRatings

3.1 ElectricalMaximumRatings(Ta=25°C)

Table2

Parameter	Symbol	Min.	Max.	Unit
Supplyvoltage(Logic)	VDD-VSS	0	6.0	V
Supplyvoltage(LCDdrive)	VLCD=VDD-V0	0	28.0	V
Inputvoltage	Vin	0	V _{DD}	V

Note:

The modules may be destroyed if they are used beyond the absolute maximum ratings.

All voltage values are referenced to VSS=0V.

3.2 EnvironmentalCondition

Table3

Item	Operating Temperature (Topr)		Storage Temperature (Tstg)		Remark
	Min.	Max.	Min.	Max.	
Ambient Temperature	0°C	+50 °C	-20 °C	+60 °C	Dry
Humidity	95% max. RH for Ta ≤ 40 °C <95% RH for Ta > 40 °C				no condensation
Vibration (IEC 68-2-6) cells must be mounted on a suitable connector	Frequency: 10 ~ 55 Hz Amplitude: 0.75 mm Duration: 20 cycles in each direction.				3 directions
Shock (IEC 68-2-27) Half-sine pulse shape	Pulse duration: 11 ms Peak acceleration: 981 m/s ² = 100g Number of shocks : 3 shocks in 3 mutually perpendicular axes.				3 directions



VARITRONIX.com

VL-FS-VLMS4044-02REV.B
(VLMS4044-ZEBRAVERSION)

JULY/2002.

MGLS-24064-C-HV-G-LED3G
MGLS-24064-G-HV-LED3G

4. Electrical Specifications

4.1. Interfacesignals

Table4

PinNo.	Symbol	Description
1	FG	Frameground(seenote1)
2	Vss	Ground(0V).
3	VDD	Powersupplyforlogic(+5V)
4	V0	PowersupplyforLCDdrive
5	/WR	Datawrite. Writedata tocontrollerT6963Cwhen"L".
6	/RD	Dataread. ReaddatafromcontrollerT6963Cwhen"L".
7	/CE	Chipenableofcontrollerwhen"L".
8	— C/D	Command/Dataread/write. "H"forcommandread/writeand "L"fordataread/write.
9	NC	Notconnected
10	/RST	Controllerresetwhen"L".
11	DB0	Datainput/output(LSB)
12	DB1	Datainput/output
13	DB2	Datainput/output
14	DB3	Datainput/output
15	DB4	Datainput/output
16	DB5	Datainput/output
17	DB6	Datainput/output
18	DB7	Datainput/output(MSB)
19	FS	Fontselect."H"for6x8font& "L"for8x8font
20	NC	Notconnected
-	LED(+)	AnodeofLEDbacklight
-	LED(-)	CathodeofLEDbacklight

Note1: Thispiniselectricallyconnectedtothemetallbezel(frame).

UsercanchoosetoconnectthispintoVSSorleaveitopen.



VL Electronics

a subsidiary of Varitronix International Group
3250 Wilshire Blvd, suite 1901 • Los Angeles • CA 90010-1502
Voice: (213) 738-8700 • Fax: (213) 738-5340 • E-mail: sales@vle.com

Varitronix



4.2 TypicalElectricalCharacteristics

AtTa=25 °C,VDD=5V ±5%,VSS=0V.

Table5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supplyvoltage (Logic)	$V_{DD}-V_{SS}$		4.75	5.00	5.25	V
Supplyvoltage(LCD)	V_{LCD} $=V_{DD}-V_0$	$V_{DD}=5V$,Note 1	13.9	14.6	15.3	V
Inputsignalvoltage	V_{IN}	“H”level	$V_{DD}-2.2$	-	V_{DD}	V
		“L”level	0	-	0.8	V
Supplycurrent (Logic&LCD)	I_{DD}	$V_{DD}=5V$, Charactermode	-	8.7	13.2	mA
		$V_{DD}=5V$, Checkerboard mode	-	9.1	13.8	mA
Supplycurrent(LCD)	I_0	$V_{DD}=5V$, Charactermode, Note1	-	3.2	4.9	mA
		$V_{DD}=5V$, Checkerboard mode, Note1	-	3.4	5.3	mA
Supplyvoltage (LED03backlight)	V_{LED03}	Forwardcurrent $=22 \times 10$ $=220mA$ NumberofLED chips $=22 \times 2$ $=44$	3.9	4.1	4.3	V

Note(1):

ThereistoleranceinoptimumLCDdrivingvoltage duringproductionanditwillbewithin
thespecifiedrange.



4.3 TimingSpecifications

AtTa=0 °CTo+50 °C,VDD=5V ±5%,VSS=0V

RefertoFig.2,thebustimingdiagram.

Table6

Parameter	Symbol	Min.	Max.	Unit
C/ $\overline{D}$ Set-uptime	t_{CDS}	100	-	ns
C/ $\overline{D}$ HoldTime	t_{CDH}	10	-	ns
/CE,/RD,/WRPulseWidth	t_{CE}, t_{RD}, t_{WR}	80	-	ns
DataSet-upTime	t_{DS}	80	-	ns
DataHoldTime	t_{DH}	40	-	ns
AccessTime	t_{ACC}	-	150	ns
OutputHoldTime	t_{OH}	10	50	ns

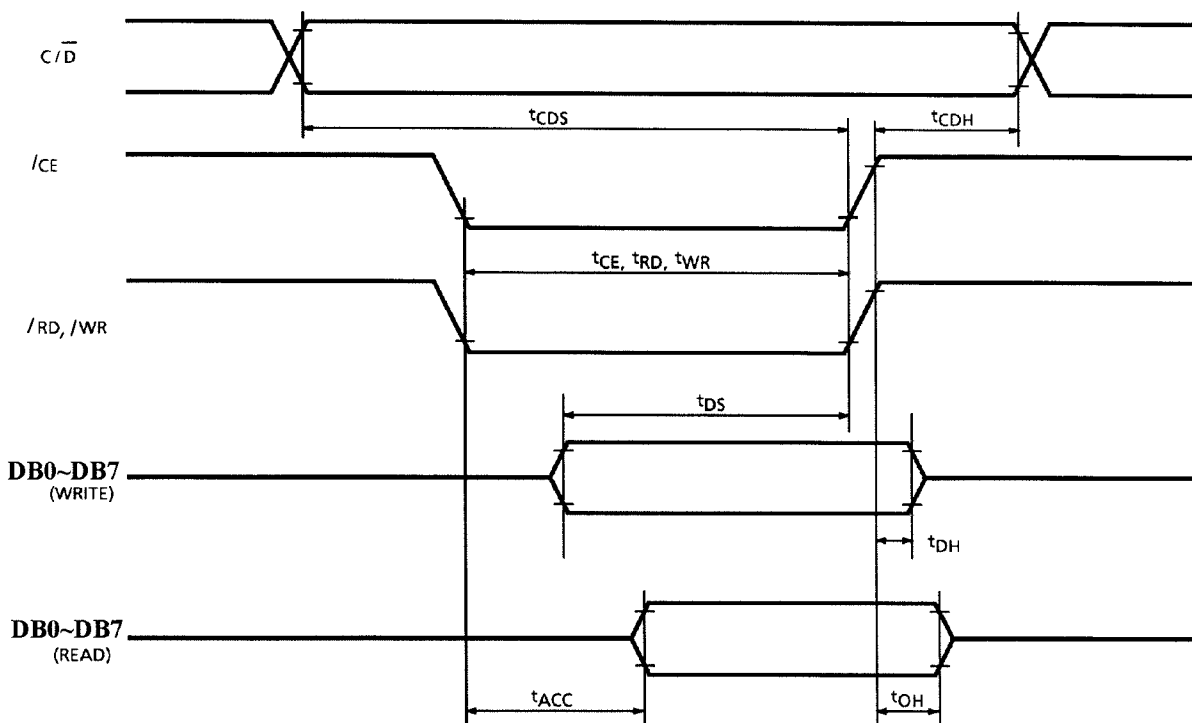


Figure2:BusTimingDiagram



VARITRONIX

VL-FS-VLMS4044-02REV.B
(VLMS4044-ZEBRA VERSION)

JULY/2002.

PAGE10OF10

MGLS-24064-C-HV-G-LED3G

4.4 Timing Diagram of VDD Against V0.

Power on sequences shall meet the requirement of Figure 3, the timing diagram of VDD against V0.

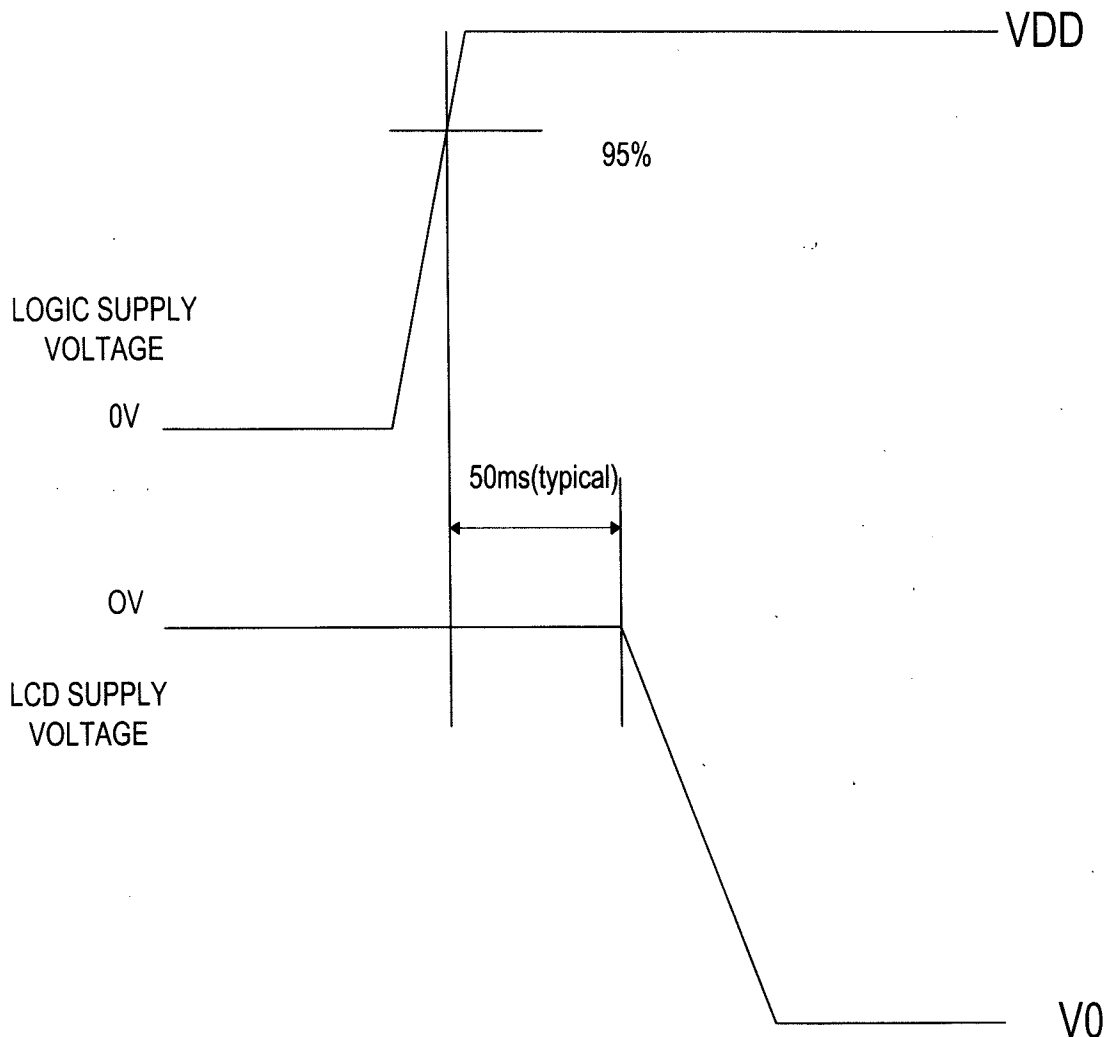


Figure 3: Timing Diagram of VDD Against V0.

“Varitronix Limited reserves the right to change this specification.”

FAX: (852) 2343-9555.

URL: <http://www.varitronix.com>



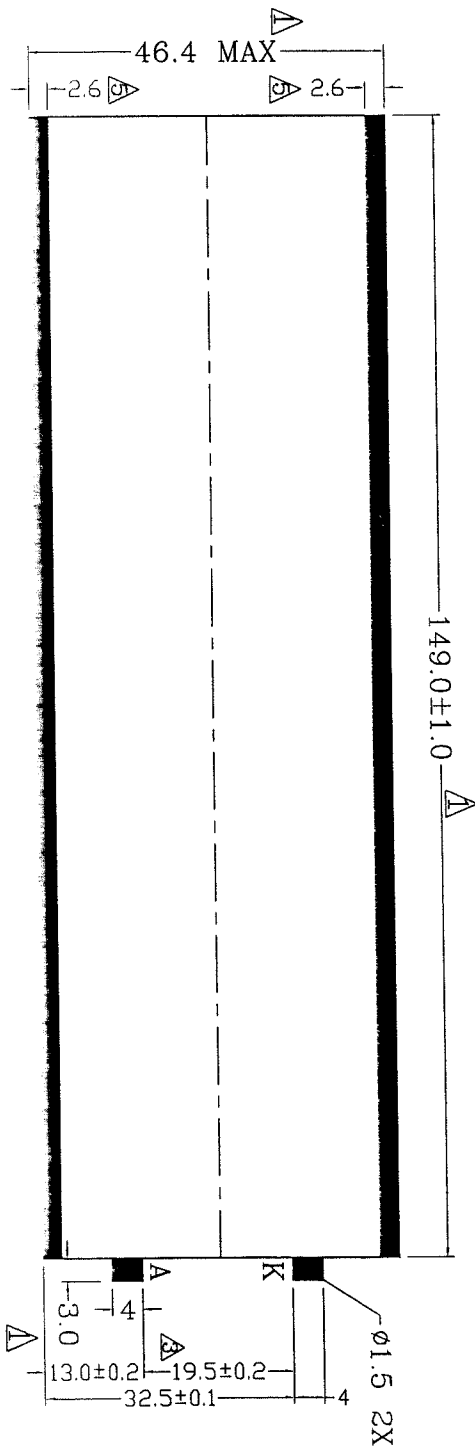
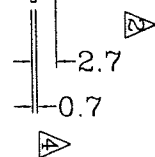
VL Electronics

a subsidiary of Varitronix International Group

3250 Wilshire Blvd, suite 1901 • Los Angeles • CA 90010-1502

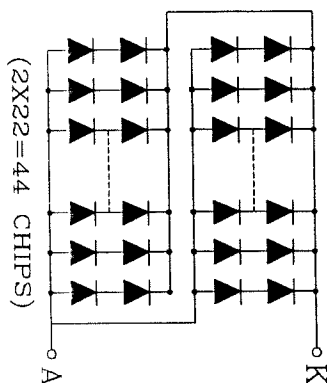
Voice: (213) 738-8700 • Fax: (213) 738-5340 • E-mail: sales@vle.com

Varitronix

LED BACKLIGHT for MGLS-24064
LED3G-24064

ISSUE	AMENDMENT	DATE
1	ADDED TOLERANCE CHANGE DIMENSIONS	9/1/97
2	CHANGE DIMENSIONS	97/4/8
3	CHANGE DIMENSIONS	97/12/9
4	CHANGE DIMENSIONS	98/3/12
5	CHANGE DIMENSIONS	98/4/16

LED CIRCUIT



PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
FORWARD VOLTAGE	TEMPERATURE=+25°C	4.0	4.1	4.2	V
FORWARD CURRENT	TEMPERATURE=+25°C	220mA			

LED COLOR: YELLOW-GREEN

**VL Electronics**

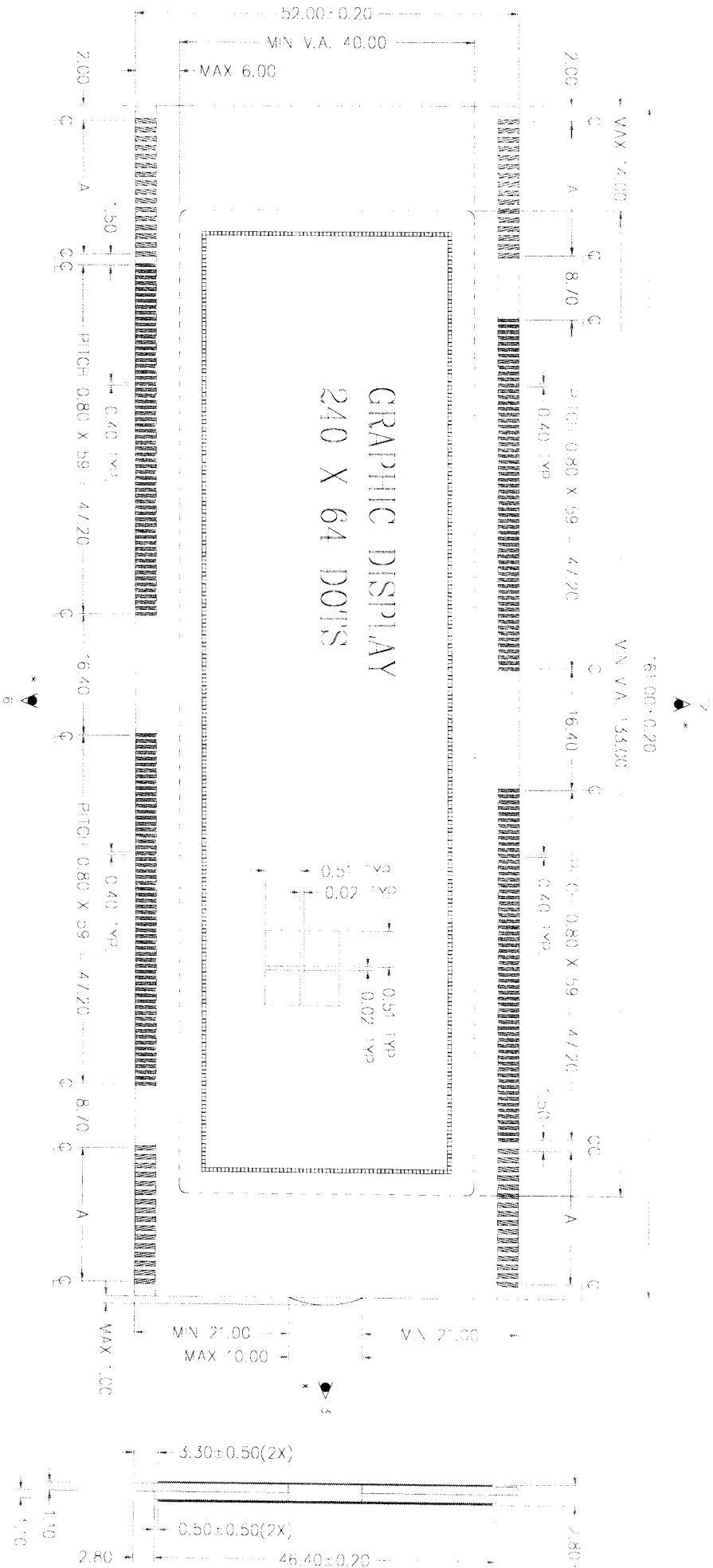
a subsidiary of Varitronix International Group
 3280 Wilshire Blvd, suite 1901 • Los Angeles • CA 90010-1502
 Voice: (213) 738-8700 • Fax: (213) 738-5340 • E-mail: sales@vie.com



VARITRONIX LIMITED

TITLE: BACKLIGHT			
PROJECT NO: MGLS24064			
TOLERANCE UNLESS OTHERWISE SPECIFIED:		X.X ±0.3 X.XX ±0.1	
DIMENSIONS IN MM		FINISH	
SCALE: DO NOT ON SCALE		THICKNESS	
THIRD ANGLE PROJECTION			
DRAWN	NAME	SIG	DATE
CHECKED	CHAN KAM FAI		98.4.16
APPROVED	ANDY LEUNG		
ITEM NO. LBL-MGL24064-3G1P			
DESCRIPTION: LBL-MGL24064(LED03G(P))			
FILE NO: WAI 3P24064	REV 5		
SHEET 1	OF 1		

LCD GLASS MECHANICAL DRAWING



2 WEEKS * RETURN TO: 304-A MAG
 7) A --- PITCH 1.20 X 1.5 (8.00 & 9A) WIDTH = 0.60 I/P.

WARTTRONIX LTD. Dimensions mm -IN-

V(S) - 244/ REV DRAWN BY VN SNA
 0 Dressed by SFTD SNA

DATE PAID
2001-04-11
LIBRARY OF THE
UNIVERSITY OF CALIFORNIA
LIBRARY

