



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-HV-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

MGLS-24064-C-HV-G-LED3G

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

JULY/2002.

PAGE3OF10

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 V _{dd} AGAINST V _O	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)orequivalentLCDcommondriers.
- 8KbytedisplaySRAM.
- Yellow-greenLED03backlight.
- Connector:10pinsx2rowsmaleconnector.
- Connectorassembly.

2. Mechanical Specifications

The mechanical detail is shown in Fig. 1 and summarized in Table 1 below.

Table 1

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

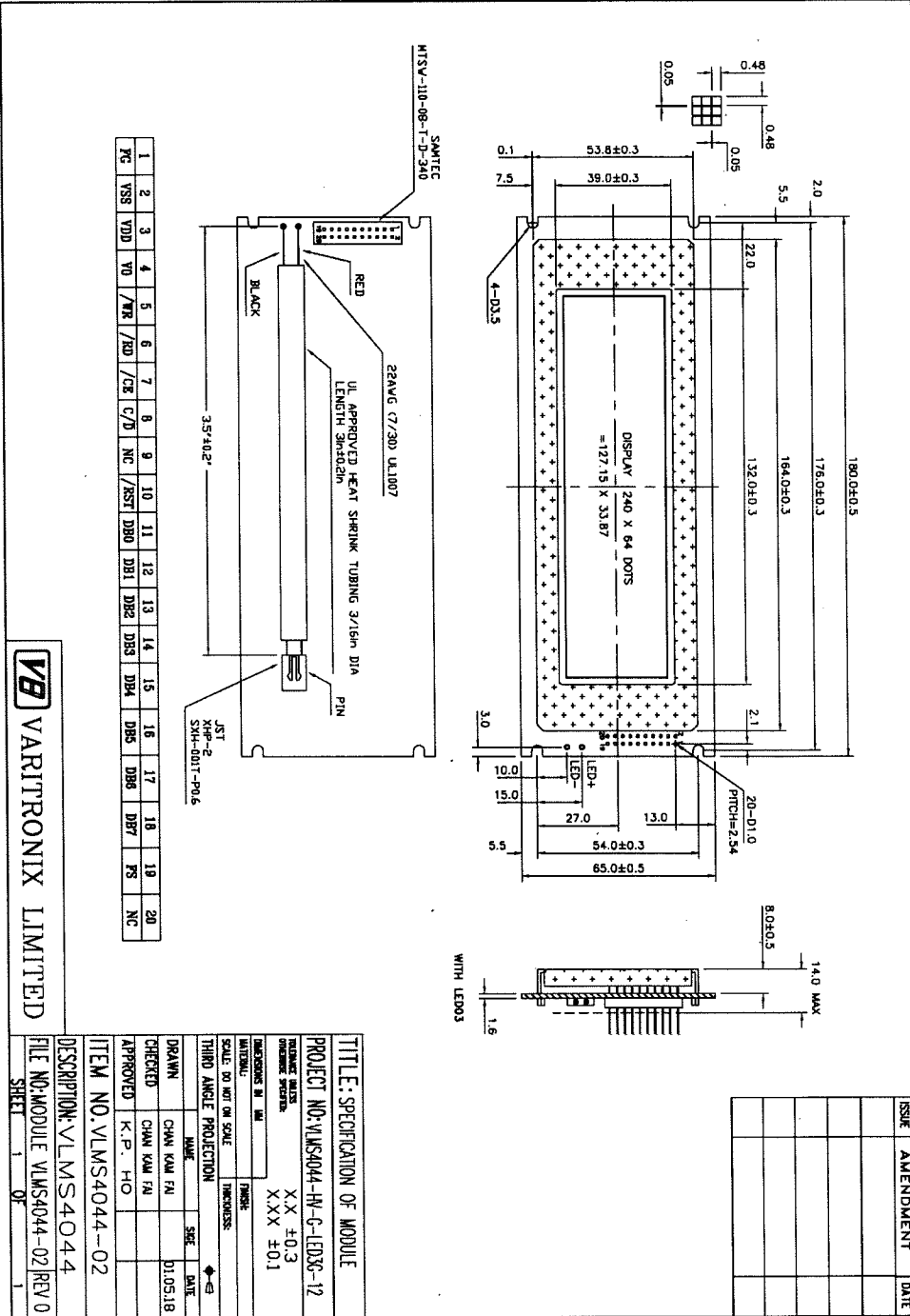
VL-FS-VLMS4044-02REV.B
(VLMS4044-ZEBRAVERSION)

JULY/2002.

PAGE5OF10

MGLS-24064-C-HV-G-LED3G

MGLS-24064-C-HV-G-LED3G



VARITRONIX LIMITED

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.

TITLE: SPECIFICATION OF MODULE	
PROJECT NO: VLMS4044-HV-G-LED3G-12	
REVISED BY: XXX ±0.3	
DESIGNED BY: XXX ±0.1	
DATE: / /	
SCALE: DO NOT ON SCALE	
THIRD ANGLE PROJECTION	
DRAWN: CHAN KAM FUI	DATE: 01.05.18
CHECKED: CHAN KAM FUI	
APPROVED: K.P. HO	
ITEM NO: VLMS4044-02	
DESCRIPTION: VLMS4044	
FILE NO: MODULE VLMS4044-02 REV 0	
SHEET 1 OF 1	

Figure 1: Specification of VLMS4044-ZEBRAVERSION module.

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@vie.com
Varitronix



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 (IEC68-2-6) 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 (IEC68-2-27) 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 PAGE 7 OF 10
MGLS-24064-G-HV-LED3G

4. Electrical Specifications

4.1. Interfacesignals

Table 4

PinNo.	Symbol	Description
1	FG	Frameground(see note 1)
2	Vss	Ground(0V).
3	VDD	Powersupplyforlogic(+5V)
4	V0	PowersupplyforLCDdrive
5	/WR	Datawrite. Writedata to controller T6963C when "L".
6	/RD	Data read. Read data from controller T6963C when "L".
7	/CE	Chip enable of controller when "L".
8	— C/D	Command/Data read/write. "H" for command read/write and "L" for data read/write.
9	NC	Not connected
10	/RST	Controller reset when "L".
11	DB0	Data input/output (LSB)
12	DB1	Data input/output
13	DB2	Data input/output
14	DB3	Data input/output
15	DB4	Data input/output
16	DB5	Data input/output
17	DB6	Data input/output
18	DB7	Data input/output (MSB)
19	FS	Font select. "H" for 6x8 font & "L" for 8x8 font
20	NC	Not connected
-	LED(+)	Anode of LED backlight
-	LED(-)	Cathode of LED backlight

Note1: This pin is electrically connected to the metal bezel (frame).
User can choose to connect this pin to VSS or leave it open.



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-VSS}		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 =22x10 =220mA NumberofLED chips =22x2 =44	3.9	4.1	4.3	V

Note(1):

ThereistoleranceinoptimumLCDdrivingvoltagegduringproductionanditwillbewithin
thespecifiedrange.



4.3 Timing Specifications

At $T_a = 0^\circ\text{C}$ to $+50^\circ\text{C}$, $V_{DD} = 5\text{V} \pm 5\%$, $V_{SS} = 0\text{V}$

Refer to Fig. 2, the bus timing diagram.

Table 6

Parameter	Symbol	Min.	Max.	Unit
C/ \bar{D} Set-up time	t_{CDS}	100	-	ns
C/ \bar{D} Hold Time	t_{CDH}	10	-	ns
/CE, /RD, /WR Pulse Width	t_{CE}, t_{RD}, t_{WR}	80	-	ns
Data Set-up Time	t_{DS}	80	-	ns
Data Hold Time	t_{DH}	40	-	ns
Access Time	t_{ACC}	-	150	ns
Output Hold Time	t_{OH}	10	50	ns

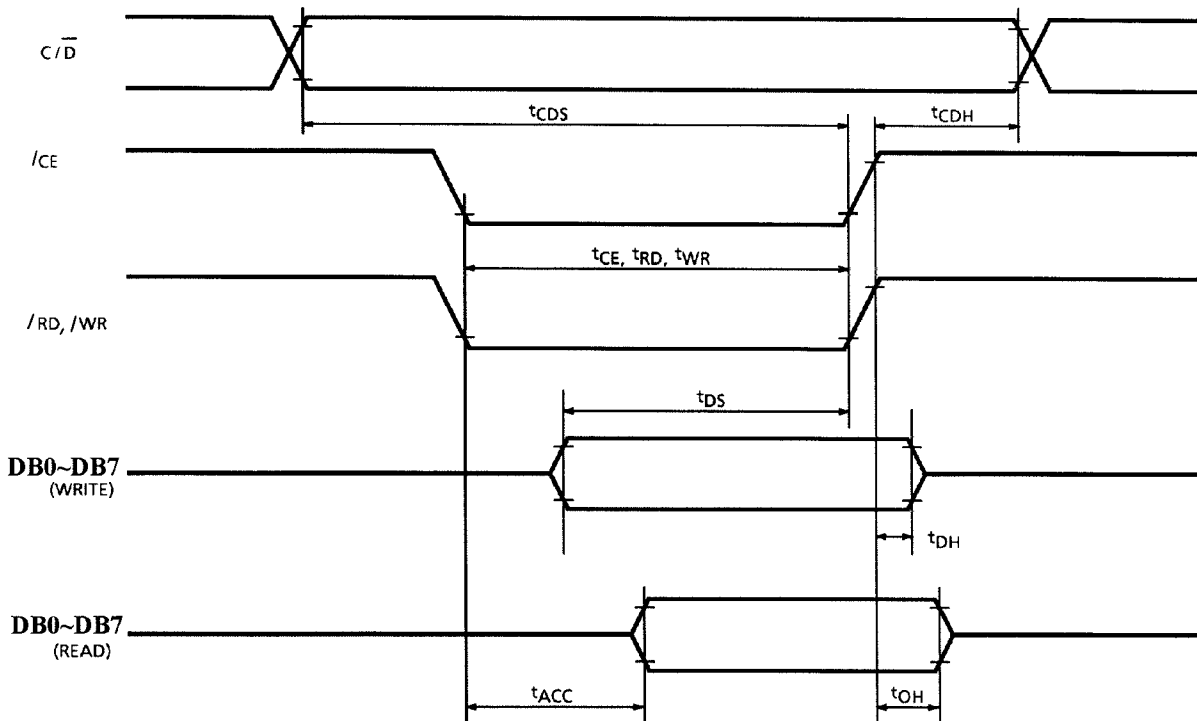


Figure 2: Bus Timing Diagram



VARITRONIX

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.

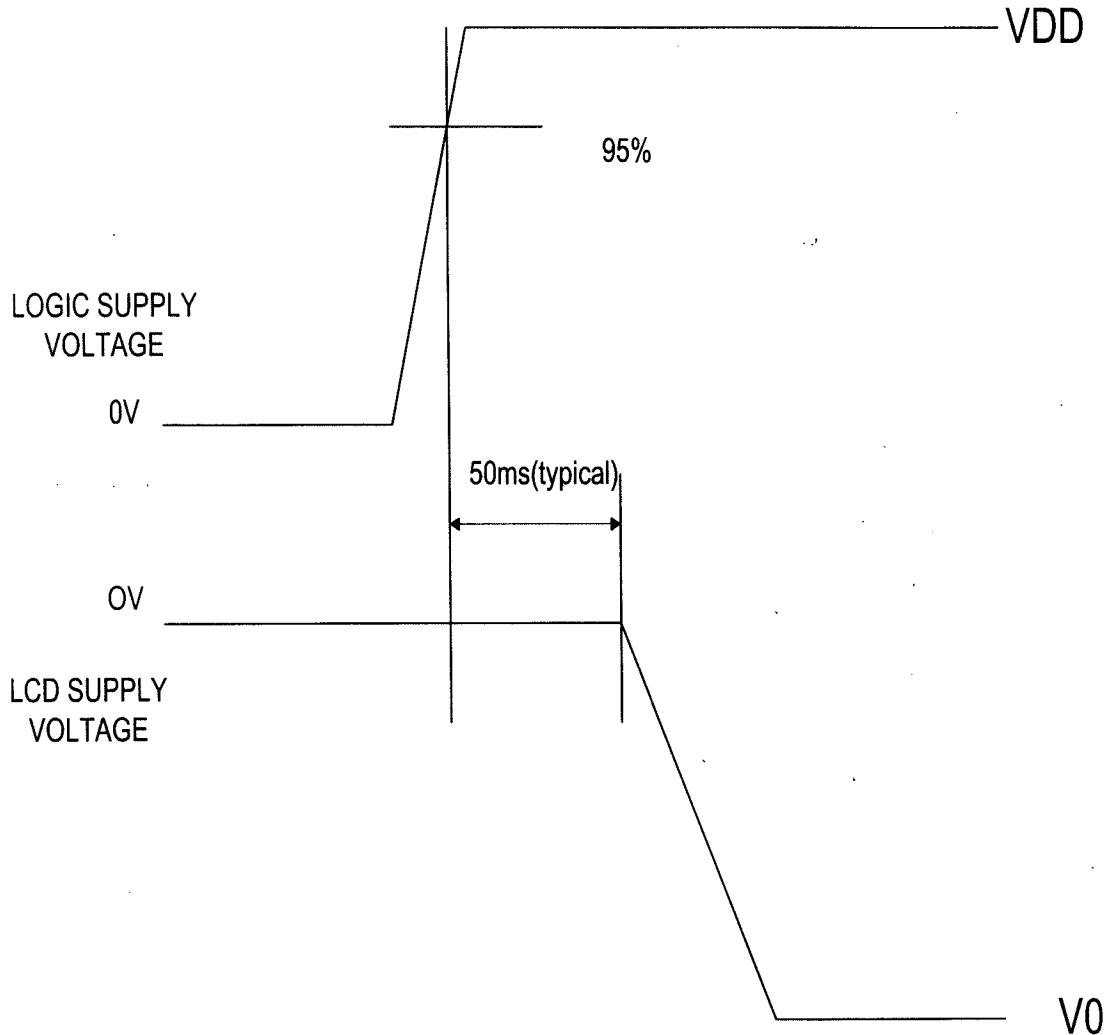


Figure 3: Timing Diagram of VDD Against V0.

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

FAX: (852) 2343-9555.

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

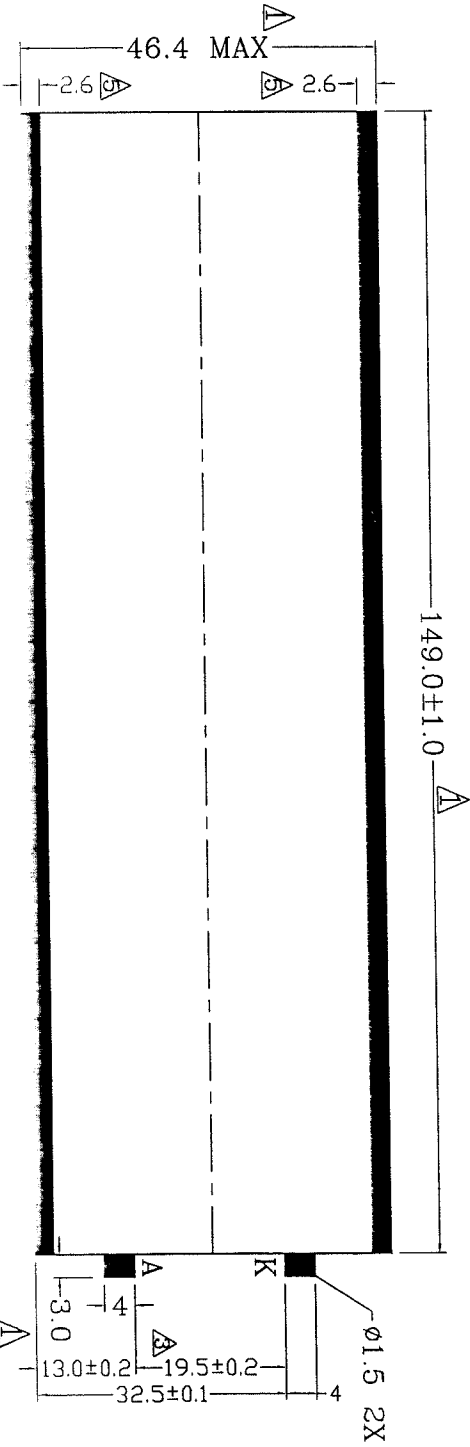
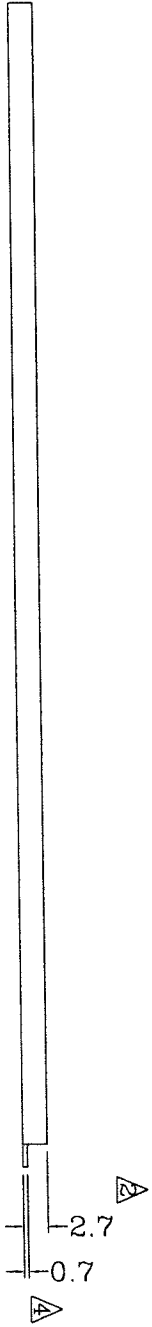


VL Electronics

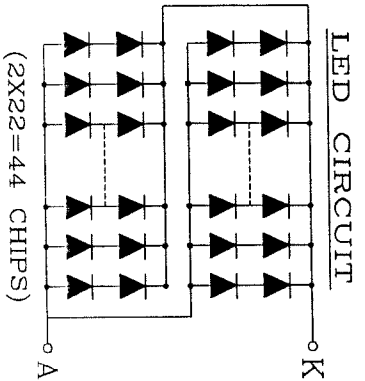
a subsidiary of Varitronix International Group
3250 Wilshire Blvd, suite 1901 • Los Angeles • CA 90010-1502
Voice: (213) 738-8700 • Fax: (213) 738-5340 • E-mail: sales@vle.com

Varitronix

LED BACKLIGHT FOR MGLS-24064
LED3G-24064



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



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

LED COLOR: YELLOW-GREEN



VL Electronics

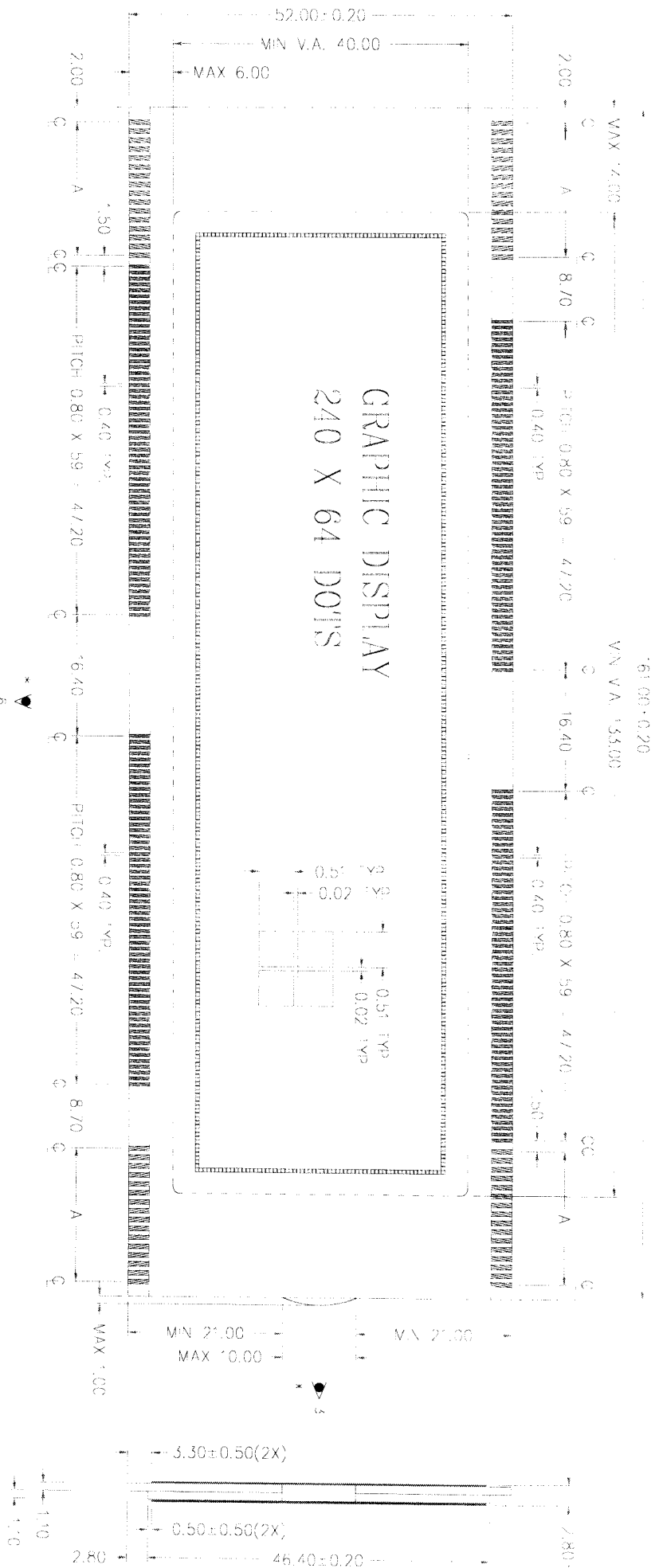
a subsidiary of Varitronix International Group
3280 Wilshire Blvd, suite 1901 • Los Angeles • CA 90010-1502
Voice: (213) 738-8700 • Fax: (213) 738-5340 • E-mail: sales@vlc.com



VARITRONIX LIMITED

TITLE: BACKLIGHT			
PROJECT NO: MGLS24064			
TOLERANCE UNLESS OTHERWISE SPECIFIED:	X.X ±0.3		
DIMENSIONS IN MM	X.XX ±0.1		
MATERIAL:	FINISH:		
SCALE: DO NOT ON SCALE	THICKNESS:		
THIRD ANGLE PROJECTION			
DRAWN	NAME	SIZE	DATE
CHECKED	CHAN KAM FAI		98.4.16
APPROVED	ANDY LEUNG		
ITEM NO. LBL-MGL24064-3G1P			
DESCRIPTION: LBL-MGL24064(LED03G1P)			
FILE NO: WAI 3P24064		REV 5	
SHEET 1	OF 1		

LCD GLASS MECHANICAL DRAWING



REF: VAKS 1) * REF: 10.30V & 2A0
 2) A --- PITCH: 1.20 X 1.5 (8.00 & 2A) WIDTH = 0.60 (YP)
WARRTRONIX LTD.
 Dimensions mm
 10 310 11 SPECIFY 31 17 SCALE DRAWING 379 ANTI REFLECTIVE
 REV DRAWN BY VIN STA
 C CHECKED BY SUTTO SVA
 Date 2001-04-11
 Date

