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DOCUMENT NUMBER AND REVISION

VL-FS-MGLS240128TAZ-01 REV. A

(MGLS240128TAZ-HT-HV-FSTN-LED03G WITH CONSIGNED CONNECTOR)

DOCUMENT TITLE:

SPECIFICATION
OF
LCD MODULE TYPE
MODEL NO.: MGLS240128TAZ-01

DEPARTMENT	NAME	SIGNATURE	DATE
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Specification
of
LCD Module Type
Model No.: MGLS240128TAZ-01

1. General Description

- 240 x 128 dots FSTN Positive Black & White Transflective LCD graphic module.
- Driving scheme: 1:128 multiplexed drive, 1/12.4 bias.
- Viewing direction: 6 O'clock.
- 'TOSHIBA' T6963C flat pack or equivalent LCD controller.
- 'TOSHIBA' T6A39 flat pack or equivalent LCD segment drivers.
- 'TOSHIBA' T6A40 flat pack or equivalent LCD common drivers.
- 8 K byte display SRAM.
- Yellow-green LED03 backlight.
- Connector: 20 pins x 1 row (Consigned by customer).

2. Mechanical Specifications

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

Table 1

Parameter	Specifications	Unit
Outline dimensions	144.0(W) x 104.0(H) x 15.0 MAX.(D) (Excluded connector) 144.0(W) x 104.0(H) x 20.4(D) (Included connector)	mm
Viewing area	114.0(W) x 64.0(H)	mm
Active area	107.95(W) x 57.55(H)	mm
Display format	240 (Horizontal) x 128 (Vertical)	dots
Dot size	0.40(W) x 0.40(H)	mm
Dot spacing	0.05(W) x 0.05(H)	mm
Dot Pitch	0.45(W) x 0.45(H)	mm
Weight	TBD	grams

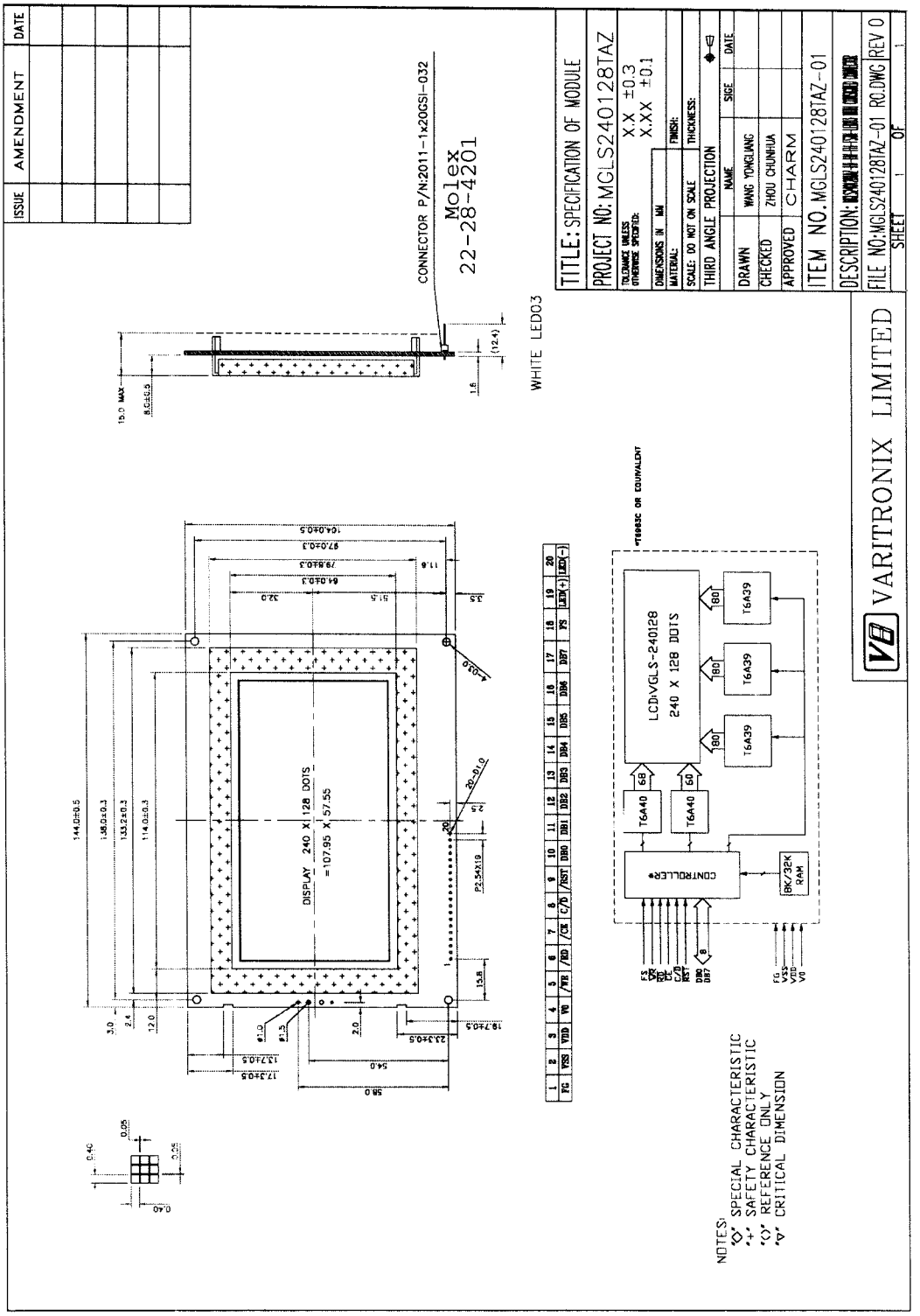

Figure 1: Outline Drawing

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3. Absolute Maximum Ratings

3.1 Electrical Maximum Ratings(Ta = 25 °C)

Table 2

Parameter	Symbol	Min.	Max.	Unit
Supply voltage (Logic)	VDD - VSS	-0.3	+7.0	V
Supply voltage (LCD drive)	VLCD=VDD – V0	-0.3	+30.0	V
Input voltage	Vin	-0.3	VDD +0.3	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 Environmental Condition

Table 3

Item	Operating Temperature (Topr)		Storage Temperature (Tstg)		Remark
	Min.	Max.	Min.	Max.	
Ambient Temperature	-20°C	+70°C	-30°C	+80°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

4. Electrical Specifications

4.1 Interface signals

Table 4

Pin No.	Symbol	Description
1	FG	Frame Ground (see note 1)
2	VSS	Ground
3	VDD	Power supply for logic (+5V)
4	V0	Power supply for LCD drive
5	/WR	Command/Data write to module when "L"
6	/RD	Command/Data read from module 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	/RST	Controller reset when "L"
10	DB0	Data input/output (LSB)
11	DB1	Data input/output
12	DB2	Data input/output
13	DB3	Data input/output
14	DB4	Data input/output
15	DB5	Data input/output
16	DB6	Data input/output
17	DB7	Data input/output (MSB)
18	FS	Font select. "H" for 6 x 8 font & "L" for 8 x 8 font
19	LED(+)	Anode of LED backlight
20	LED(-)	Cathode of LED backlight

Note 1: This pin is electrically connected to the metal bezel(frame).
User can choose to connect this pin to VSS or leave it open.

4.2 Typical Electrical Characteristics

At Ta = 25 °C, VDD = 5V±5%,VSS = 0V.

Table 5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage (Logic)	VDD –VSS		4.75	5.00	5.25	V
Supply voltage (LCD)	VLCD =VDD –V0	VDD = 5V,Note 1	19.8	20.3	20.8	V
Input signal voltage	VIN	"H" level	VDD -2.2	-	VDD	V
		"L" level	0	-	0.8	V
Supply current (Logic & LCD)	IDD	Character mode, VDD = 5V, Note 1	-	11.3	17.0	mA
		Checker board mode, VDD = 5V, Note 1	-	12.2	18.3	mA
Supply current (LCD)	I0	Character mode, VDD = 5V, Note 1	-	4.8	7.2	mA
		Checker board mode, VDD = 5V, Note 1	-	5.5	8.3	mA
Supply voltage of yellow-green LED03 backlight	VLED	Forward current =200mA Number of LED chips =2x20 =40	4.0	4.1	4.2	V

Note 1: There is tolerance in optimum LCD driving voltage during production and it will be within the specified range.

4.3 Timing Specifications

At Ta = -20°C To +70°C, VDD = 5V±5%,VSS=0V

Refer to Fig. 2, the bus timing diagram.

Table 6

Parameter	Symbol	Min.	Max.	Unit
C/D Set-up time	t_{CDS}	100	-	ns
C/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

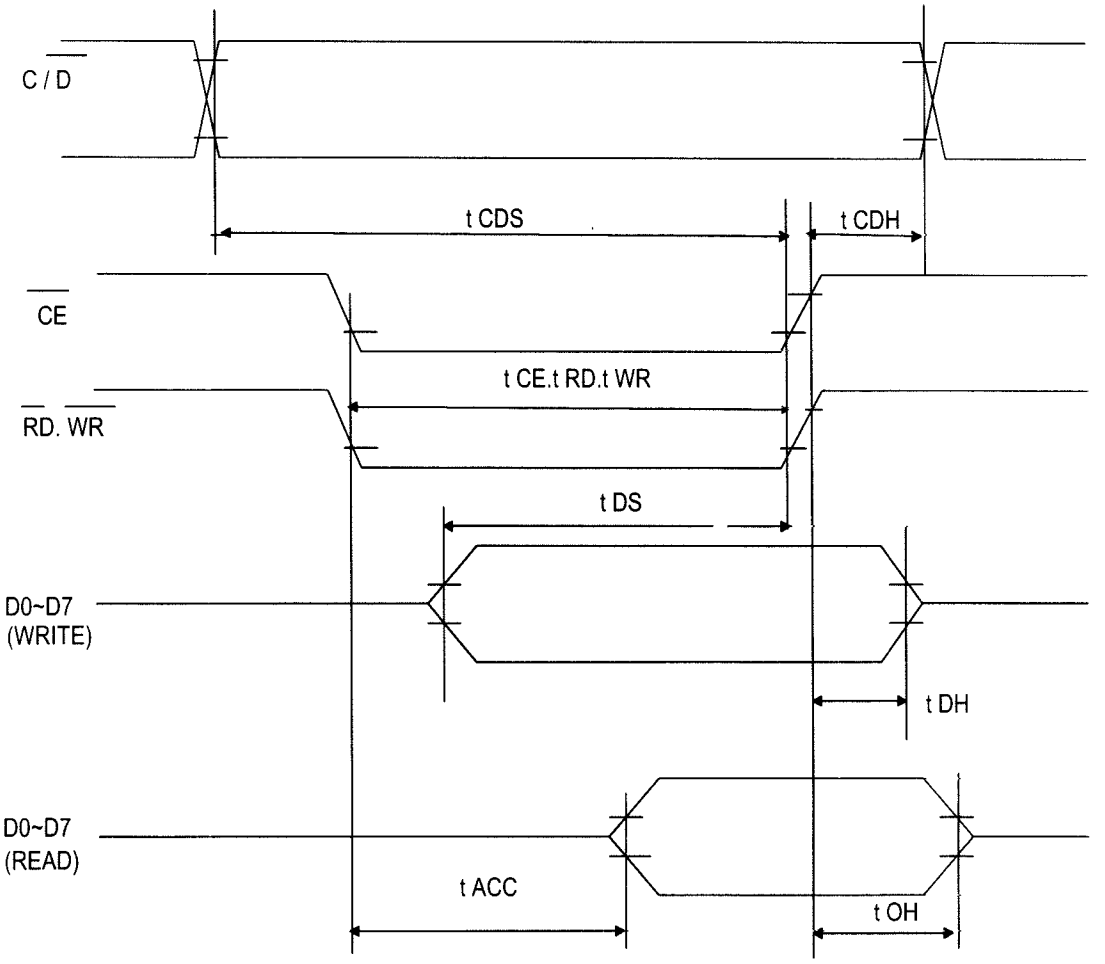

Figure 2: Bus Timing Diagram

4.4 Timing Diagram of VDD Against V0.

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

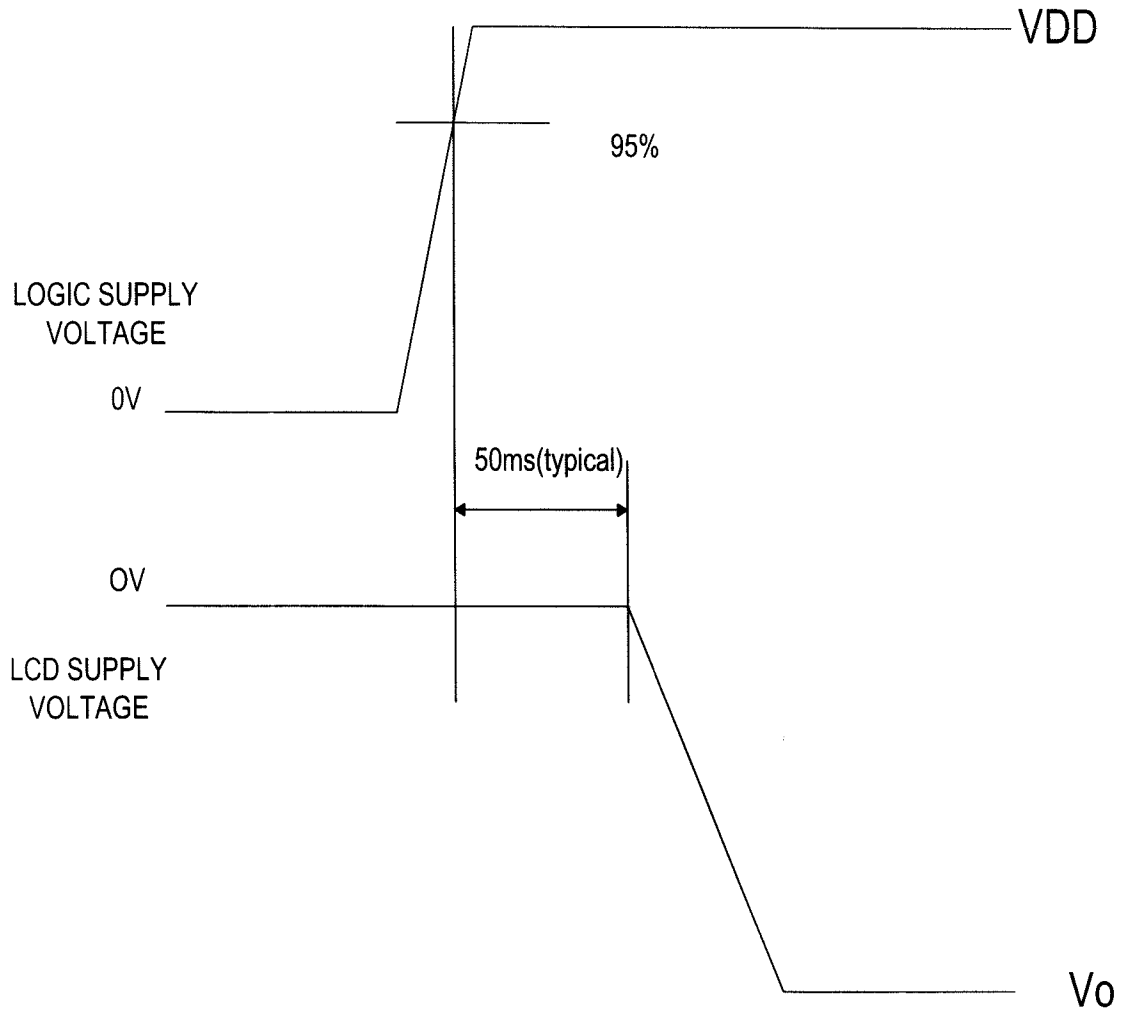

Figure 3: Timing Diagram of VDD Against V0.

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LED3-240128 LED BACKLIGHT FOR MGLS-240128TAZ-01

VARITRONIX LED Backlight drawing LBL-L240128-3G1P (Rev. 6, 2004.02.10),

Backlight specification

2.1 Color of LED backlight: Yellow-green.

2.2 Number of LED chips = 2x20 = 40.

2.3 Conditions for the following parameters:

Ta=25 Deg. C,

Forward current = 300mA.

Forward voltage = 4.0V(min.), 4.1V(typ.), 4.2V(max.)

Peak wave length=568nm (typ.).

Luminance =18cd/m2 (min.), and 24cd/m2 (typ.)