

# PRODUCT SPECIFICATION

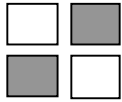
MONOCHROME LCD MODULE

PART NUMBER : FDG192016A

DESCRIPTION : 192x16 Graphic

REVISION : Rev A

	Approval for Specification only		Approval for Sample Only
	Approval for Pre-production	<b>x</b>	Approval for Mass Production



# FDG192016A ( 192 x 16 graphics )

## FEATURES

- ◆ BUILT-IN CONTROLLER (HD66730 OR EQUIVALENT)
- ◆ +5 V POWER SUPPLY
- ◆ 1/16 DUTY CYCLE
- ◆ 8-BIT PARALLEL INTERFACE
- ◆ 4.2 V LED FORWARD VOLTAGE

## MECHANICAL DATA

ITEM	DIMENSIONS	UNIT
Module Size ( W x H x T )	80.0 x 36.0 x 8.8 ( 12.7 LED )	mm
Viewing Area ( W x H )	65.0 x 16.0	mm
Active Area ( W x H )	62.79 x 7.64	mm
Dot Size ( W x H )	0.40 x 0.60	mm
Dot Pitch ( W x H )	0.43 x 0.64	mm

## INTERFACE PIN CONNECTIONS

NO.	SYMBOL	LEVEL	FUNCTION
1	V <sub>SS</sub>	0V	Power Supply Ground
2	V <sub>DD</sub>	5V	Power Supply Voltage
3	V <sub>o</sub>	-	Contrast Adj.
4	RS	H/L	Register Select
5	R/W	H	Read/Write
6	E	H	Enable Signal
7-14	DB0-DB7	H/L	Data Bus Line
15	A	4.2V	LED Power (+)
16	K	0V	LED Power (-)

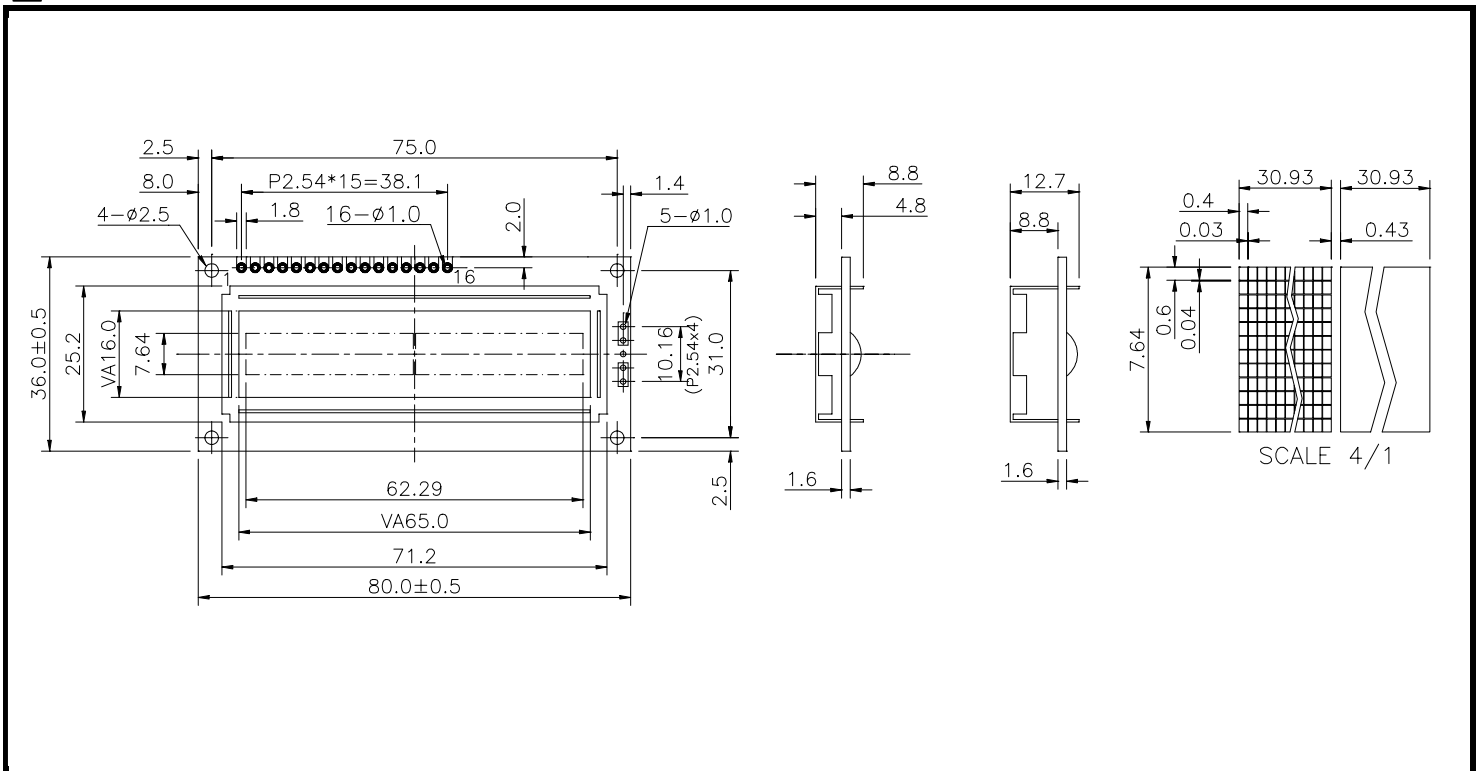
## ABSOLUTE MAXIMUM RATINGS

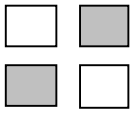
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage For Logic	V <sub>DD</sub> -V <sub>SS</sub>	0	-	7	V
Supply Voltage For LCD Drive	V <sub>DD</sub> -V <sub>o</sub>	0	-	12	V
Input Voltage	V <sub>I</sub>	V <sub>SS</sub>	-	V <sub>DD</sub>	V

## ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Voltage For Logic	V <sub>DD</sub> -V <sub>SS</sub>	-	4.5	5	5.5	V	
Supply Voltage For LCD	V <sub>DD</sub> -V <sub>o</sub>	V <sub>DD</sub> =5V Ta=25°C	4.4	4.8	5.2	V	
Supply Current	I <sub>DD</sub>	V <sub>DD</sub> =5V	-	2.5	4.5	mA	
Input Voltage	"HIGH" Level	V <sub>IH</sub>	-	2.2	-	V <sub>DD</sub>	V
	"LOW" Level	V <sub>IL</sub>	-	-	-	0.6	V
Output Voltage	"HIGH" Level	V <sub>OH</sub>	-	2.4	-	V	V
	"LOW" Level	V <sub>OL</sub>	-	-	-	0.4	V

## EXTERNAL DIMENSIONS





# FDG192016A ( 192 x 16 graphics )

## ■ TIMING CHARACTERISTICS

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT.
E Cycle Time		$t_{CYCE}$	1000	-	-	ns
Enable Pulse Width	"High Level"	$P_{WEH}$	450	-	-	ns
Enable Rise/Fall Time		$t_{ER}, t_{EF}$	-	-	25	ns
Address Set-up Time	RS,R/W to E	$t_{AS}$	60	-	-	ns
Address Hold Time		$t_{AH}$	20	-	-	ns
Data Sep-up Time		$t_{DSW}$	140	-	-	ns
Data delay Time		$t_{DDR}$	-	-	360	ns
Data Hold Time	Write	$t_H$	30	-	-	ns
Data Hold Time	Read	$t_{DHR}$	5	-	-	ns

FIG.1 WRITE OPERATION

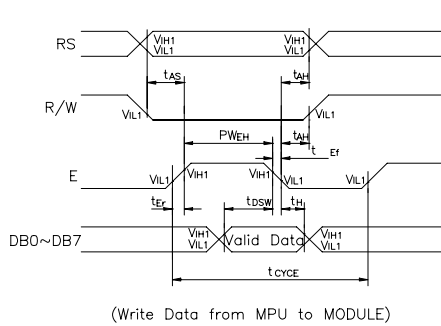
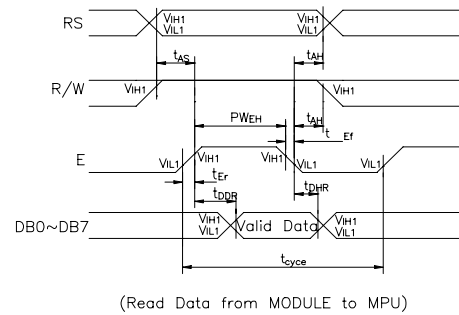
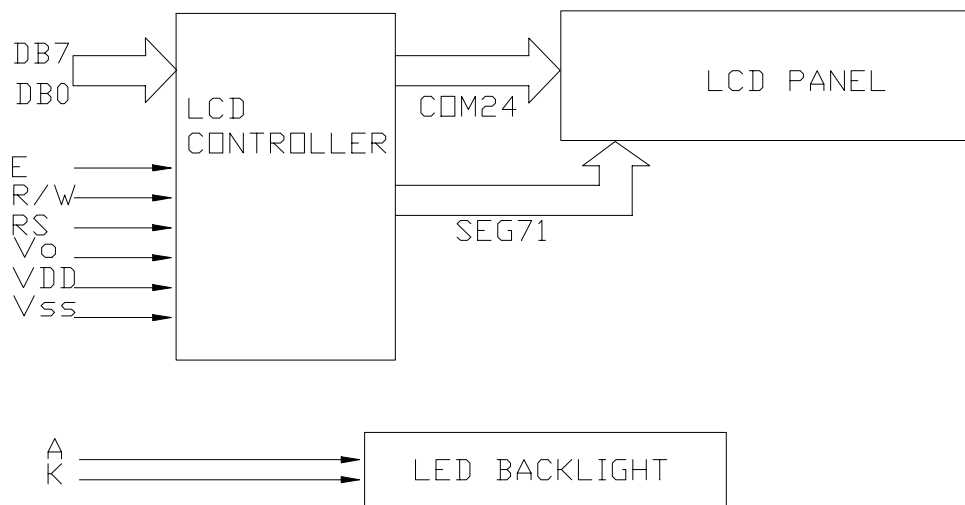


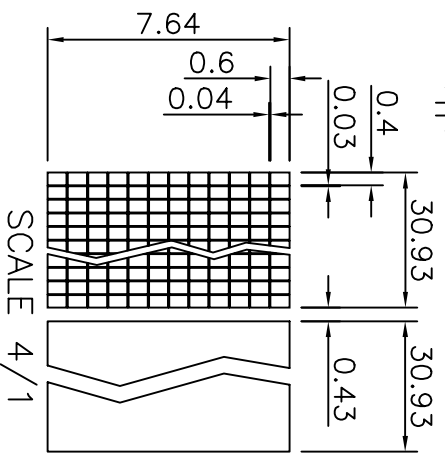
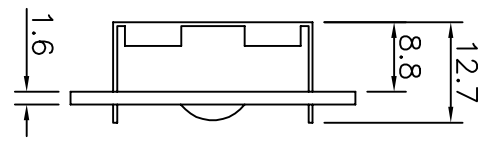
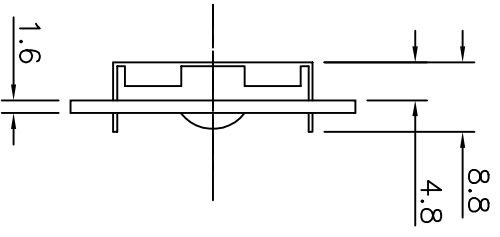
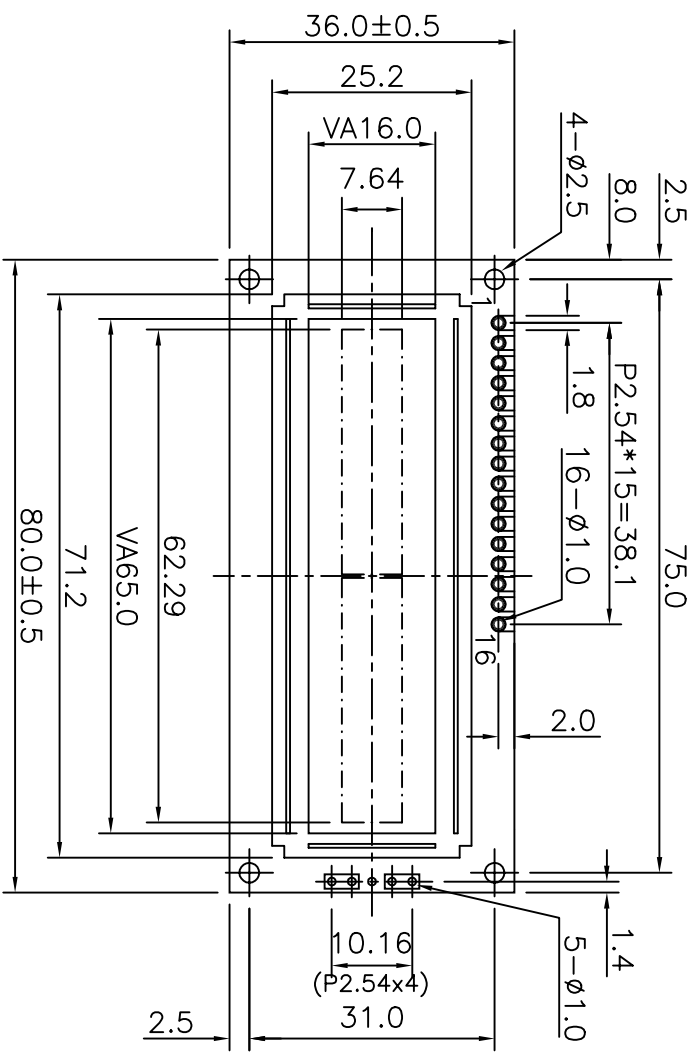
FIG.2 READ OPERATION



## ■ BLOCK DIAGRAM



PIN NO	SIGNAL
1	VSS
2	VDD
3	VO
4	RS
5	R/W
6	E
7	DB0
8	DB1
9	DB2
10	DB3
11	DB4
12	DB5
13	DB6
14	DB7
15	A
16	K



SCALE 4/1

NOTE	ITEM	CONTENT	DATA	REV	TOLERANCE	SCALE	UNIT	DWYN	CUSTOMER	APVL	TITLE	MODEL	DWG NO	PAGE
		CHANGE NUMBER	2004.03.01	0	X. ±0.30 X ±0.20 .XX±0.05	1/1	mm	Gilli	2004.03.01		MODULE	SG1201A	A-A2-0001	1/1
<b>SUNLIKE DISPLAY</b>														