Data International Co., Ltd.

DATAVISION

APPROVAL SHEET

Customer	:	
Part Name	:	**LCD MODULE**
Model No.	:	**DGF-12232-S1FBLY**
Drawing No.	:	
Approved by	:	
Date	:	

Approved	Checked	Prepared	Sheet Code:
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CONTENTS

1. SCOPE

This specification covers the engineering requirements for the DGF-12232-S1FBLY liquid crystal module.

2. PRODUCT SPECIFICATIONS

2.1 General

- 122 × 32 dot matrix LCD
- STN (Yellow-green) , Positive mode LCD panel
- Transflective , Normal temperature type
- 6 o'clock
- Back-light : LED , Yellow-green
- Multiplexing driving : 1/32duty, 1/6bias
- RoHS compliant

2.2 Mechanical Characteristics

Item	Characteristic
Dot configuration	122 × 32
Dot dimensions(mm)	0.4 × 0.45
Dot spacing (mm)	0.04
Module dimensions (Horizontal × Vertical × Thickness, mm)	84.0 × 44.0 × 10.5max.
Viewing area (Horizontal × Vertical, mm)	60.5 × 18.5
Active area (Horizontal × Vertical, mm)	53.64 × 15.64

2.3 IC Absolute Maximum Ratings (Without LED back-light)

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Standard	Unit
Supply voltage (1)	V_{SS}	–8.0 ~ +0.3	V
Supply voltage (2)	V_5	–16.5 ~ +0.3	V
Supply voltage (3)	V_1, V_4 V_2, V_3	V_5 ~ +0.3	V
Input voltage	V_{IN}	V_{SS} – 0.3 ~ +0.3	V
Output voltage	V_O	V_{SS} – 0.3 ~ +0.3	V
Allowable loss	P_D	250	mW
Operating temperature	T_{OPR}	–30 ~ +85	°C
Storage temperature	T_{STG}	–65 ~ +150	°C
Soldering temperature/time	T_{SOLDER}	260/10 (at leads)	°C/Sec

Notes:

1. All voltages are based on VDD = 0V.
2. The following condition must always hold true with voltages V_1, V_2, V_3, V_4 and V_5:
   $V_{DD} \geq V_1 \geq V_2 \geq V_3 \geq V_4 \geq V_5$
3. The LSI may be permanently damaged if used with any value in excess of the absolute maximum ratings. During normal operation, the LSI should preferably be used within the specified electrical characteristics. Failure to meet them can cause the LSI to malfunction or lose its reliability.
4. Generally, flat package LSIs may have moisture resistance lowered when solder dipped. In mounting LSIs on a board, it is recommended to use a method which is least unlikely to give thermal stress on the package resin.

2.4 IC Electrical Characteristics (Without LED back-light)

DC CHARACTERISTICS

V_{DD} = 0V, Ta = –20 ~ 75°C

Parameter		Symbol	Condition		Min.	Typ.	Max.	Unit	Applicable pin
Operating voltage (1)*1	Recommended	V_{SS}			–5.5	–5.0	–4.5	V	V_{SS}
	Allowable				–7.0		–2.4		
Operating voltage (2)	Recommended	V_5			–13.0		–3.5	V	V_5 *10
	Allowable				–13.0				
	Allowable	V_1, V_2			0.6 × V_5		V_{DD}	V	V_1, V_2
	Allowable	V_3, V_4			V_5		0.4 × V_5	V	V_3, V_4
High level input voltage		V_{IHT}			V_{SS} + 2.0		V_{DD}	V	*2 *3
		V_{IHC}			0.2 × V_{SS}		V_{DD}		
Low level input voltage		V_{ILT}			V_{SS}		V_{SS} + 0.8	V	*2 *3
		V_{ILC}			V_{SS}		0.8 × V_{SS}		
High level output voltage		V_{OHT}	I_{OH} = –3.0mA		V_{SS} + 2.4			V	*4 *5 OSC2
		V_{OHC1}	I_{OH} = –2.0mA		V_{SS} + 2.4				
		V_{OHC2}	I_{OH} = –120µA		0.2 × V_{SS}				
Low level output voltage		V_{OLT}	I_{OL} = 3.0mA				V_{SS} + 0.4	V	*4 *5 OSC2
		V_{OLC1}	I_{OL} = 2.0mA				V_{SS} + 0.4		
		V_{OLC2}	I_{OL} = 120µA				0.8 × V_{SS}		
Input leakage current		I_{LI}			–1.0		1.0	µA	*6
Output leakage current		I_{LO}			–3.0		3.0	µA	*7
LCD driver ON resistor		R_{ON}	Ta = 25°C	V_5 = –5.0V		5.0	7.5	KΩ	SEG 0 – 79 *11 COM 0 – 15
				V_5 = –3.5V		10.0	50.0		
Static current dissipation		I_{DDQ}	$\overline{CS}$ = CL = V_{DD}			0.05	1.0	µA	V_{DD}
Dynamic current dissipation		$I_{DD\ (1)}$	During display V_5 = –5.0V	f_{CL} = 2KHz		2.0	5.0	µA	V_{DD} *12 *13 *14
				Rf = 1MΩ		9.5	15.0		
				f_{CL} = 18KHz		5.0	10.0		
		$I_{DD\ (2)}$	During access t_{CYC} = 200KHz			300	500	µA	*8
Input pin capacitance		C_{IN}	Ta = 25°C f = 1MHz			5.0	8.0	pF	All input pins

(Continued)

V_{DD} = 0V, Ta = –20 ~ 75°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Applicable pin
Oscillation frequency	f_{OSC}	Rf = 1.0MΩ ± 2% V_{SS} = –5.0V	15	18	21	KHz	*9
		Rf = 1.0MΩ ± 2% V_{SS} = –3.0V	11	16	21		
Reset time	t_R		1.0		1000	µs	$\overline{RES}$

2.5 LCD Optical Characteristics Absolute maximum ratings

Item	Symbol	Rating	Unit
Operating temperature range	Top	-20~60	°C
Storage temperature range	Tst	-30~70	°C

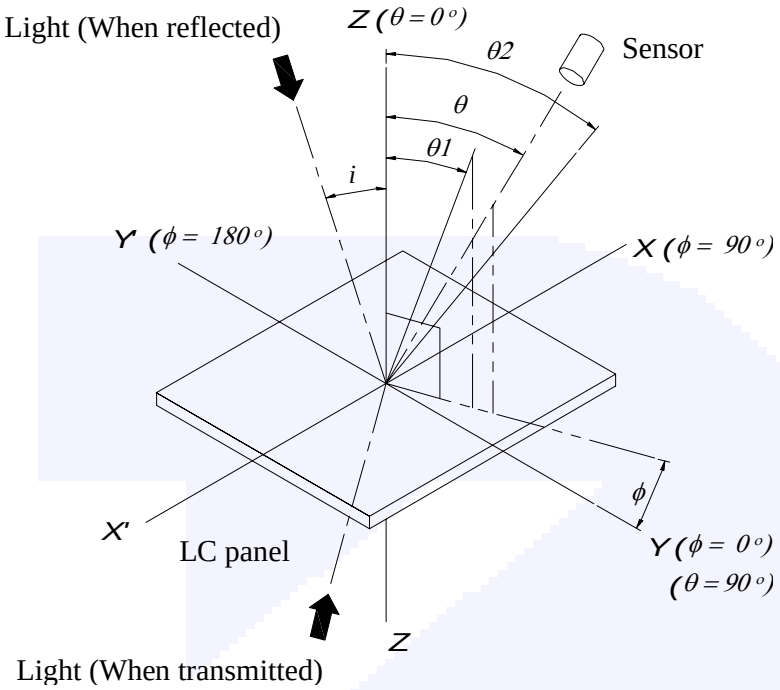
2.6 LCD Optical Characteristics

1/32 duty, 1/6 bias

Item	Symbol	Temp.	Min.	Typ.	Max.	Unit
Driving voltage	Vop	0 °C	6.10	6.50	6.90	V
		20 °C	5.90	6.30	6.70	
		50 °C	5.70	6.10	6.50	
Contrast	K	θ=0° ϕ=0°	1.23	5.79	5.87	--
Frame freq.	fF	--	32	64	128	Hz
Response time	t_{on}	20 °C	--	32	250	ms
	t_{off}		--	87	250	
Viewing Angle	θ2-θ1	20 °C	30	82	--	Deg.
	φ		60	81	--	

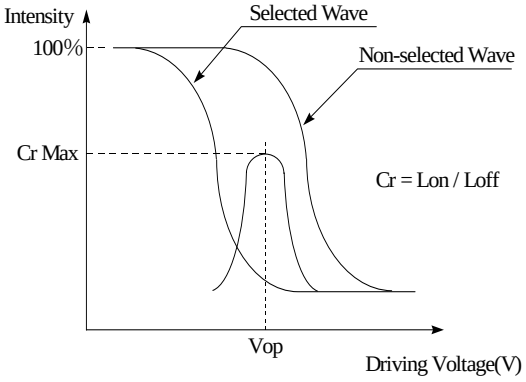
2.6.1 Definition of optical characteristics

* Definition of angles ϕ and θ



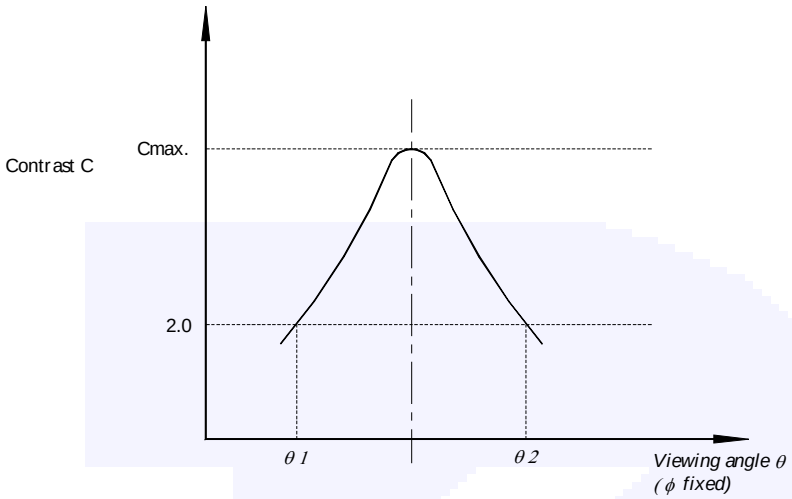
*Definition of contrast C

$$\text{Positive type } Cr = \frac{\text{Brightness of unselected portion(Bus)}}{\text{Brightness of selected portion(Bs)}}$$



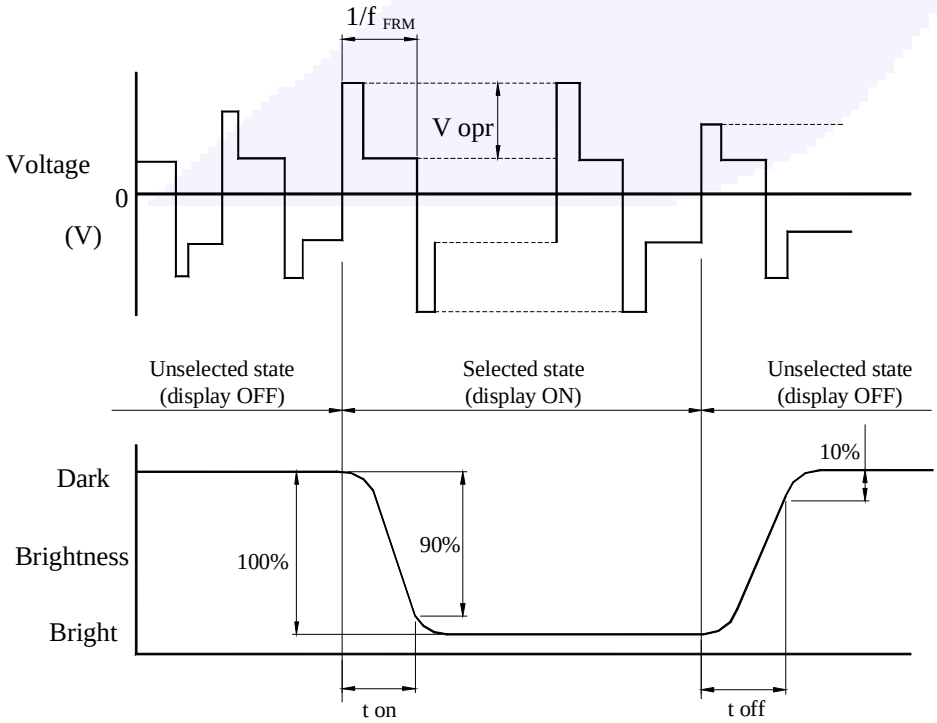
[positive type]

* Definition of viewing angles θ1 and θ2



Note : Optimum vision with the naked eye and viewing angle θ at Cmax above are not always the same.

* Definition of response time



Vopr : Operating voltage (V)
fFRM : Frame frequency (Hz)
ton : Response time (rsie) (ms)
toff : Response time (fall) (ms)

2.7 LED Backlight Characteristics

2.7.1 Absolute maximum ratings

Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	V_f	If=130mA, Yellow Green	--	4.1	4.4	V
*Luminous Intensity	I_V	If=130mA, Yellow Green	150	175	205	cd/m²
Peak Emission Wavelength	λP	If=20mA, Yellow Green	570	573	575	nm
Spectrum Radiation Bandwidth	Δλ	If=20mA, Yellow Green	--	30	--	nm

Note: * Measured at the bare LED backlight unit.

2.7.2 LED Maximum Operating Range

Item	Symbol	Yellow Green	Unit
Power Dissipation	P_{AD}	1.07	W
Forward Current	I_F	260	mA
Reverse Voltage	V_R	10	V

3. RELIABILITY

3.1 Reliability

Test item	Test condition	Evaluation and assessment
Operation at high temperature and humidity	40 °C±2 °C 90%RH for 240hours	No abnormalities in functions* and appearance**
Operation at high temperature	60 °C±2 °C for 240 hours	No abnormalities in functions* and appearance**
Heat shock	-20± ~ +60 °C Left for 1 hour at each temperature, transition time 5 min, repeated 10times	No abnormalities in functions* and appearance**
Low temperature	-20±2 °C for 500 hours	No abnormalities in functions* and appearance**
Vibration	Sweep for 1 min at 10 Hz, 55Hz, 10Hz, amplitude 1.5mm 2 hrs each in the X,Y and Z directions	No abnormalities in functions* and appearance**
Drop shock	Dropped onto a board from a height of 10cm	No abnormalities in functions* and appearance**

* dissipation current, contrast and display functions

** Polarizing filter deterioration, other appearance defects

3.2 Liquid crystal panel service life

100,000 hours minimum at 25 °C±10 °C

3.3 definition of panel service life

- Contrast becomes 30% of initial value
- Current consumption becomes three times higher than initial value
- Remarkable alignment deterioration occurs in LCK cell layer
- Unusual operation occurs in display functions

4. Commands

4.0 COMMANDS

Table 3 lists the commands used with the SED1520. This LSI uses a combination of A0, R/W ($\overline{RD}$, $\overline{WR}$) to identify a data bus signal. Interpretation and execution of a command depends not on external clock but on internal timing alone. Therefore, a command can be executed so fast that no busy check is needed.

A detailed description of commands follows.

4.1 DISPLAY ON/OFF

This command forces all display to turn on or off.

	R/W									
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	0	1	0	1	1	1	D

D 0 = Display OFF
1 = Display ON

4.2 DISPLAY START LINE

This command specifies a line address (shown in Fig. 2.3.8.1) thus marking the display line that corresponds to COM0. Display begins with the specified line address and covers as many lines as match the display duty in address ascending order. Dynamic line address change with the Display Start Line command enables column-wise scrolling or page change.

	R/W									
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	1	0	A4	A3	A2	A1	A0

– High-order bits

A4	A3	A2	A1	A0	Line address
0	0	0	0	0	0
0	0	0	0	1	1
		—			—
		—			—
1	1	1	1	1	31

4.3 SET PAGE ADDRESS

This command is used to specify a page address equivalent to a row address for MPU access to the display data RAM. A required bit of the display data RAM can be accessed by specifying its page address and column address. Changing the page address causes no change in display.

	R/W									
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	0	1	1	1	0	A1	A0

A1	A0	Page
0	0	0
0	1	1
1	0	2
1	1	3

4.4 COLUMN ADDRESS

This command specifies a display data RAM column address. The column address is incremented by 1 each time the MPU accesses from the set address to the display data RAM. Thus, it is possible for the MPU to gain continuous access to only the data. This incrementing stops with address 80; the page address is not continuously changed.

	R/W									
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	0	A6	A5	A4	A3	A2	A1	A0

A6	A5	A4	A3	A2	A1	A0	Column address
0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	1
			—				—
			—				—
1	0	0	1	1	1	1	79

4.5 READ STATUS

		R/W								
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	0	1	Busy	ADC	ON/ OFF	Reset	0	0	0	0

BUSY: BUSY being "1" means that system is performing an internal operation or is reset. No command is accepted before BUSY = "0". As long as the cycle time requirement is met, no BUSY check is needed.

ADC: Indicates assignment of column addresses to segment drivers.

0: Inverted (column address 79-n ↔ segment driver n)
1: Forward (column address n ↔ segment driver n)

ON/OFF: Indicates display on or off.

0: Display on
1: Display off

This bit has polarity reverse to the Display ON/OFF command.

RESET: Indicates that system is being initialized by the $\overline{RES}$ signal or the Reset command.

0: Display mode
1: Being reset

4.6 WRITE DISPLAY DATA

This command allows the MPU to write 8 bits of data into the display data RAM. Once the data is written, the column address is automatically incremented by 1; this enables the MPU to write multi-word data continuously.

		R/W								
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
1	1	0	Write data							

4.7 READ DISPLAY DATA

This command allows the MPU to read 8 bits of data from the display data RAM location specified by a column address and a page address. Once the data is read, the column address is automatically incremented by 1; this enables the MPU to read multi-word data continuously.

A dummy read is needed immediately after the column address is set. For details, see 3. (1)–(c).??

R/W

A0	$\overline{RD}$	$\overline{WR}$	D7							D0
1	0	1	Read data							

4.8 SELECT ADC

This command inverts the relation of assignment between display data RAM column addresses and segment driver outputs. In other words, the Select ADC command can software-invert the order of segment driver output pins, reducing the restrictions on the configuration of ICs at LCD module assembly. For details, see Fig. 2.3.8.1.

Incrementing the column address by 1, which takes place after the MPU writing or reading display data, follows the sequence of column addresses specified in Fig. 2.3.8.1.

A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	0	1	0	0	0	0	D

D = 0: Clockwise output (forward)
D = 1: Counterclockwise output (reverse)

4.9 STATIC DRIVE ON/OFF

This command forces all display to be on and, at the same time, all common output to be selected.

R/W

A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	0	1	0	0	1	0	D

D = 0: Static drive off
D = 1: Static drive on

4.10 SELECT DUTY

This command is used to select the duty (degree of multiplexity) of LCD driving. It is valid for the SED1520F (actively operating LSI) only, not valid for the SED1521F (passively operating LSI). The SED1521F operates with any duty determined by the FR signal.

		R/W								
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	0	1	0	1	0	0	D

D = 0: Duty 1/16
D = 1: Duty 1/32

If the system contains both SED1520FOA (internal oscillation) and the SED1521FOA LSIs, they must have the same duty.

4.11 READ MODIFY WRITE

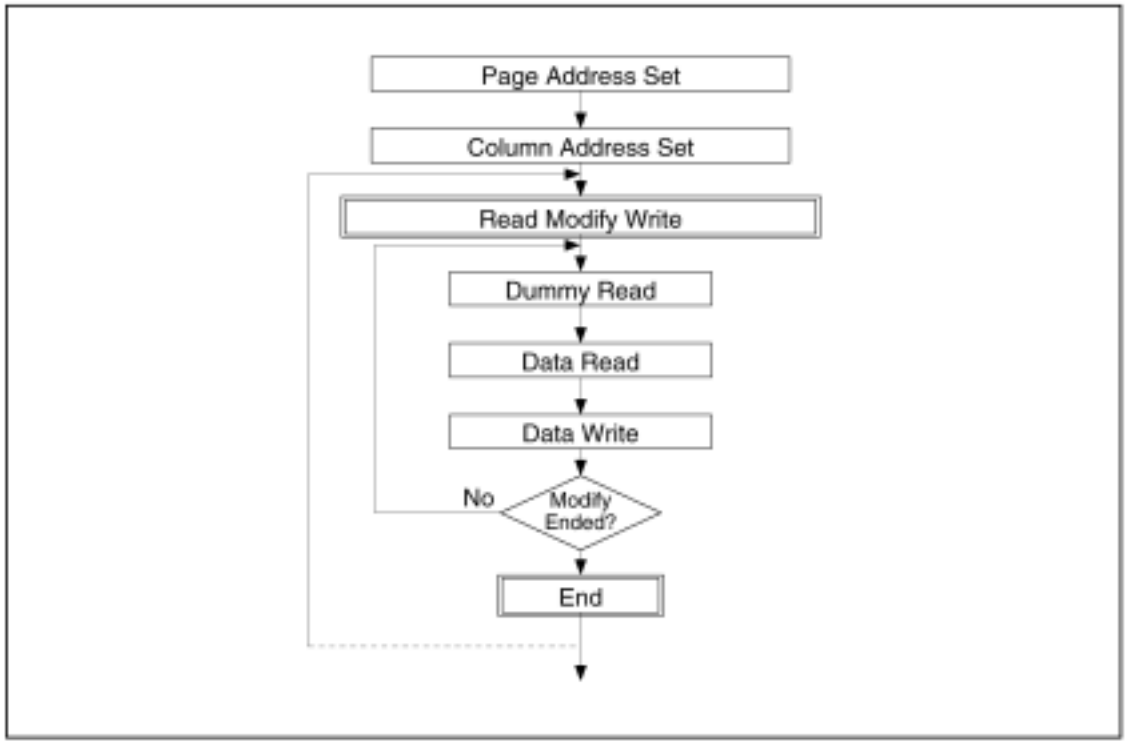
This command is used with the End command in a pair. Once it has been entered, the column address will be incremented not by the Read Display Data command but by the Write Display Data command only. This mode will stay until the End command is entered.

Entry of the End command causes the column address to return to the address which was valid when the Read Modify Write command was entered. This function lessens the load of the MPU when the data in a specific display area are repeatedly updated (as blinking cursor).

		R/W								
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	1	1	0	0	0	0	0

Even in the Read Modify Write mode, any command other than Read/Write Data and Set Column Address may be used.

4.11.1 Cursor Blinking Sequence



4.12 END

This command cancels the Read Modify Write command, returning the column address to the initial mode address.

		R/W								
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	1	1	0	1	1	1	0

4.12.1 End Timing

4.13 RESET

This command initializes the display start line register, column address counter, and page address counter without any effect on the display data RAM. For details, see section 2.3.12.

The reset operation follows entry of the Reset command.

		R/W								
A0	$\overline{RD}$	$\overline{WR}$	D7							D0
0	1	0	1	1	1	0	0	0	1	0

Initialization at power-on is performed not by the Reset command but by a reset signal applied to the $\overline{RES}$ pin.

4.14 SAVE POWER (COMBINED COMMAND)

Static drive going on with display off invokes power-saving mode, reducing current consumption to nearly static current level. During this mode, the SED1520 holds the following conditions:

(a) It stops driving the LCD; the segment and common driver outputs are at VDD level.

(b) Oscillation and external clock input are disabled; OSC2 is in floating condition.

(c) The display data and operational mode are held.

The power-saving mode is cancelled by display on or static drive off.

If an external resistor division circuit is used to give LCD driving voltage level, the current flowing into the resistors must be cut off by the power-save signal.

4.14.1 External Resistor Division Circuit

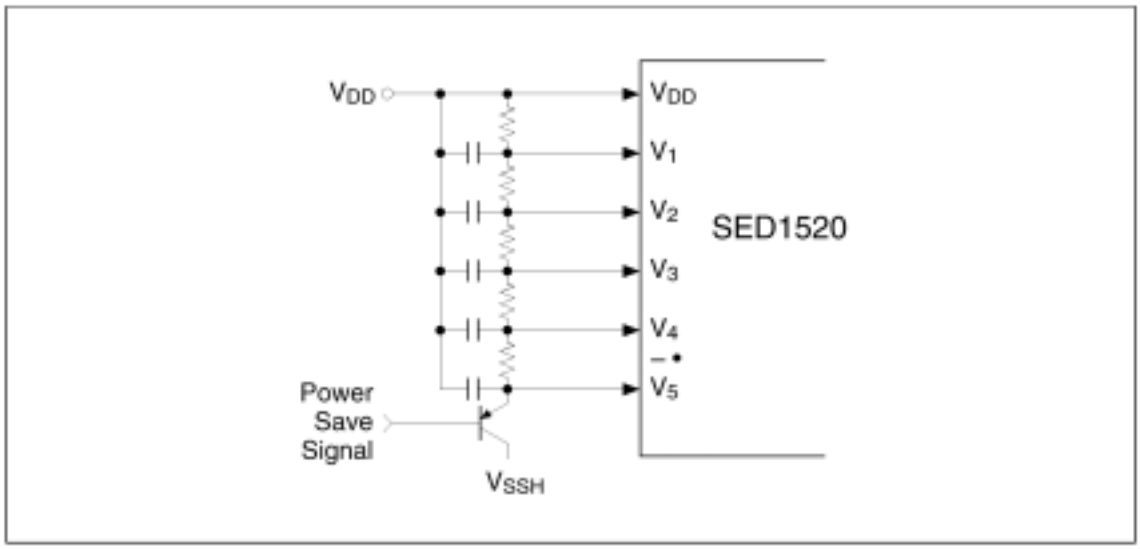


Table 3 Commands

	Command	Code											Function
		A0	RD	WR	D7	D6	D5	D4	D3	D2	D1	D0	
(1)	Display ON/OFF	0	1	0	1	0	1	0	1	1	1	0/1	Turns all display on or off, independently of display RAM data or internal status. 1: ON 0: OFF (Power-saving mode with static drive on)*
(2)	Display start line	0	1	0	1	1	0	Display Start Address (0–31)					Specifies RAM line corresponding to uppermost line (COM0) of display.
(3)	Set page address	0	1	0	1	0	1	1	1	0	Page (0–3)		Sets display RAM page in page address register.
(4)	Set column (segment) address	0	1	0	0	Column Address (0–79)							Sets display RAM column address in column address register.
(5)	Read status	0	0	1	Busy	ADC	ON/OFF	RESET	0	0	0	0	Reads the following status: BUSY 1: Internal operation, 0: Ready ADC 1: CW output (forward), 0: CCW output (reverse) ON/OFF 1: Display off, 0: Display on RESET 1: Being reset, 0: Normal
(6)	Write display data	1	1	0	Write Data								Writes data from data bus into display RAM. Display RAM location whose address has been preset is accessed. After access, the column address is incremented by 1.
(7)	Read display data	1	0	1	Read Data								Reads data from display RAM onto data bus.
(8)	Select ADC	0	1	0	1	0	1	0	0	0	0	0/1	Used to invert relationship of assignment between display RAM column addresses and segment driver outputs. 0: CW output (forward) 1: CCW output (reverse)
(9)	Static drive ON/OFF	0	1	0	1	0	1	0	0	1	0	0/1	Selects normal display or static driving operation. 1: Static drive (power-saving mode) 0: Normal driving
(10)	Select duty	0	1	0	1	0	1	0	1	0	0	0/1	Selects LCD cell driving duty. 1: 1/32 0: 1/16
(11)	Read modify write	0	1	0	1	1	1	0	0	0	0	0	Increments column address counter by 1 when display data is written. (This is not done when data is read.)
(12)	End	0	1	0	1	1	1	0	1	1	1	0	Clears read modify write mode.
(13)	Reset	0	1	0	1	1	1	0	0	0	1	0	Sets display start line register on the first line. Also sets column address counter and page address counter to 0.

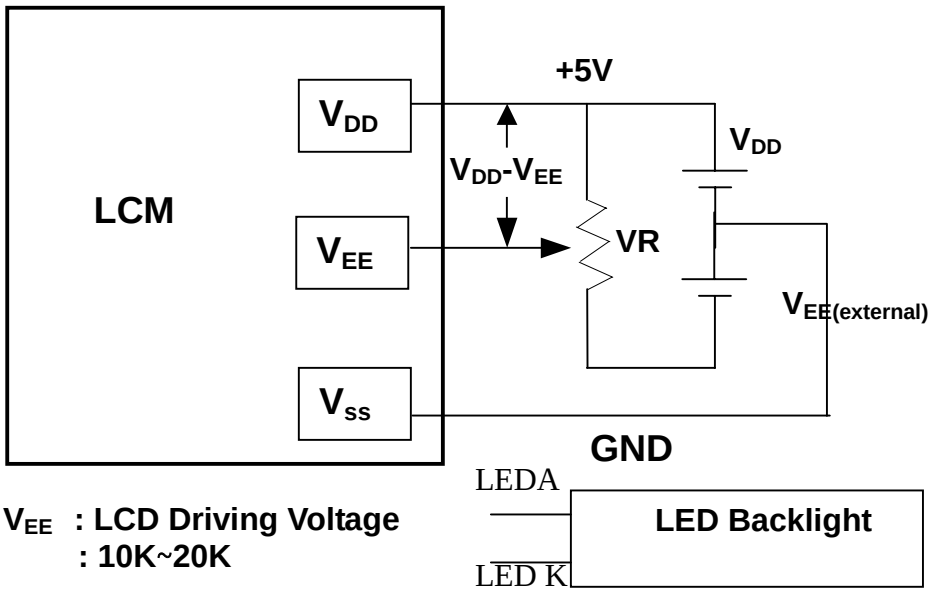
* With display off (command (1)), static drive going on (9) invokes power-saving mode.

5. OPERATING INSTRUCTIONS

5.1 Input signal Function

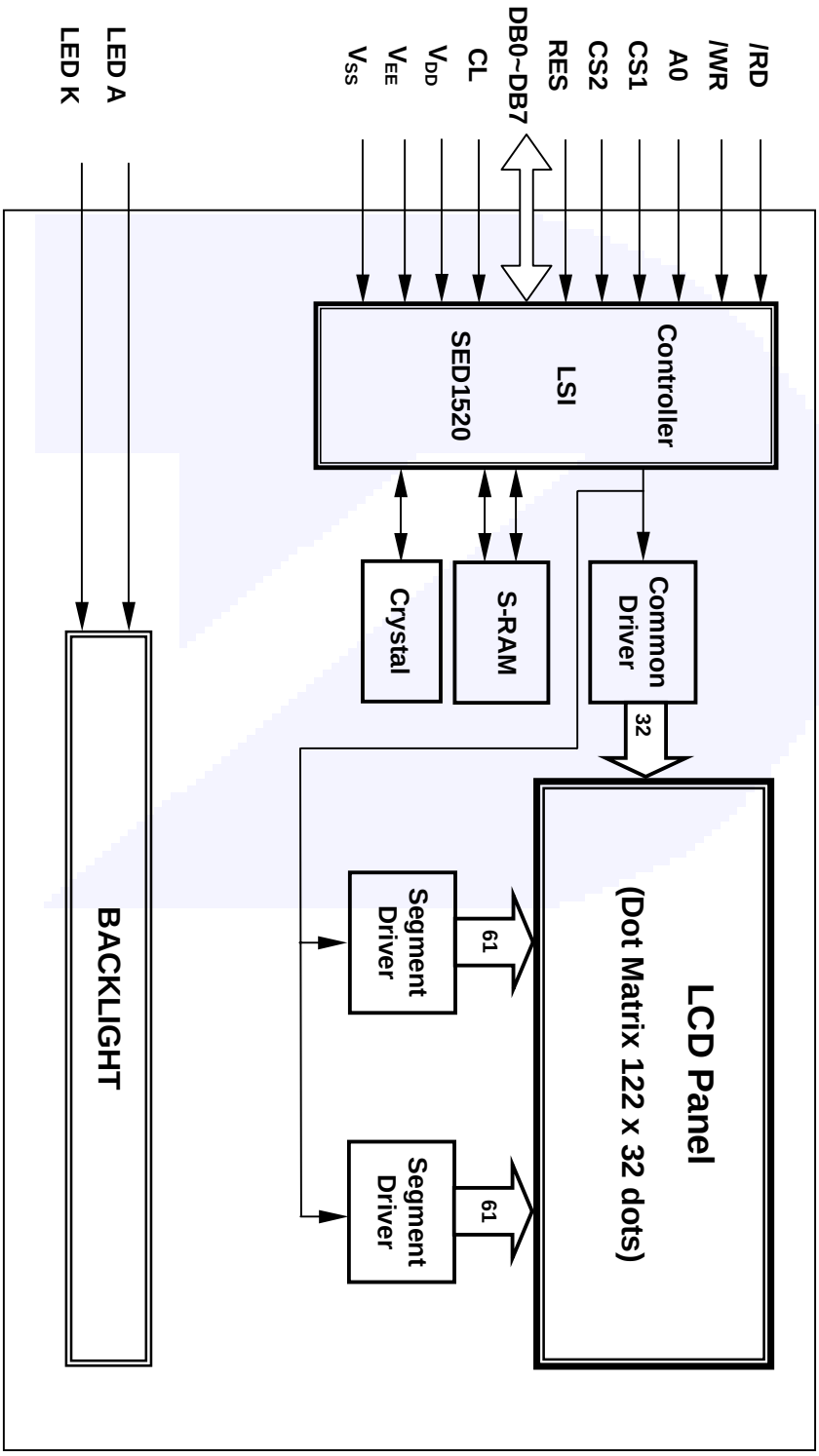
NO.	Symbol	Function
1	VSS	Ground (0V)
2	VDD	Power supply for Logic circuit (+)
3	VEE	LCD Drive Voltage (-)
4	A0	Selects Display DATA(H) or Instructions(L)
5	CS1	Chip1 Enable Active L
6	CS2	Chip2 Enable Active L
7	CL	External Clock
8	/RD	Read Data
9	/WR	Write Data
10~17	DB0~DB7	Data Bus Line
18	/RES	Reset Active “L”
19	LED A	Power supply for LED
20	LED K	Power supply for LED

5.2 Voltage Generator Circuit



$V_{DD} - V_{EE}$: LCD Driving Voltage
VR : 10K~20K

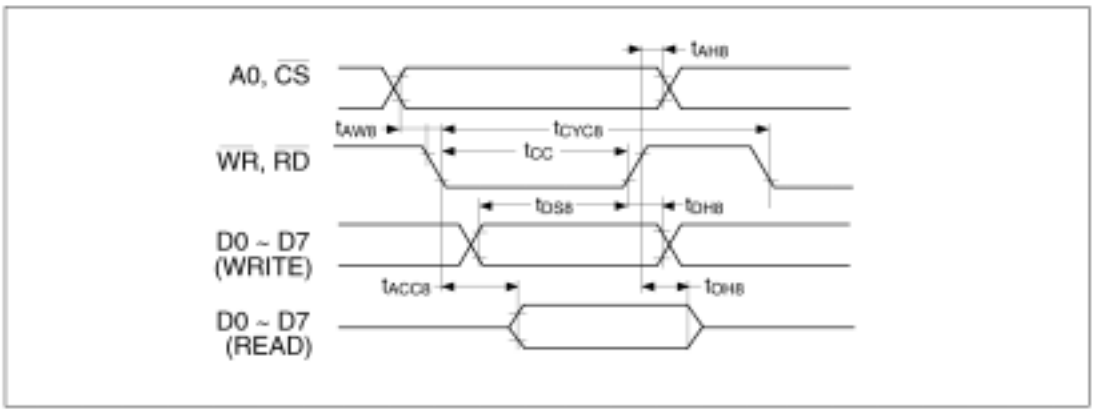
5.3 Circuit Block Diagram



5.4 Timing Characteristics

TIMING CHARACTERISTICS

System Bus Read/Write I (80 Family MPU)

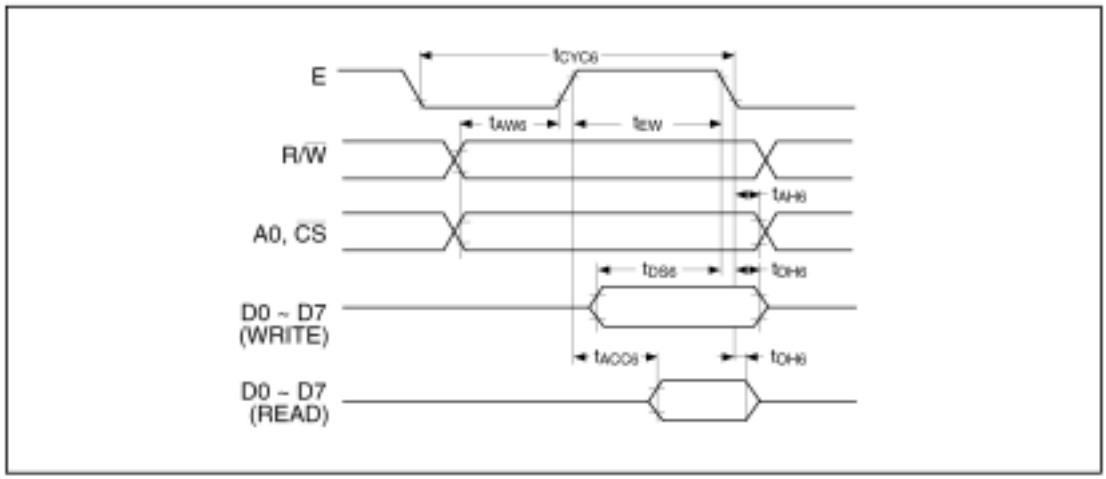


Ta = –20 to 75°C, Vss = –5.0V ± 10%, Unit: ns

Signal	Symbol	Parameter	Min.	Max.	Condition
A0, $\overline{CS}$	t AH8	Address hold time	10		
	t AW8	Address setup time	20		
$\overline{WR}$, $\overline{RD}$	t CYC8	System cycle time	1000		
	t CC	Control pulse width	200		
D0–D7	t DS8	Data setup time	80		
	t DH8	Data hold time	10		
	t ACC8	$\overline{RD}$ access time		90	CL = 100pF
	t OH8	Output disable time	10	60	

*1. Each of the values where Vss = –3.0V is about 200% of that where Vss = –5.0V (i.e., the listed value).
*2. The rise or fall time of input signals should be less than 15 ns.

System Bus Read/Write II (68 Family MPU)

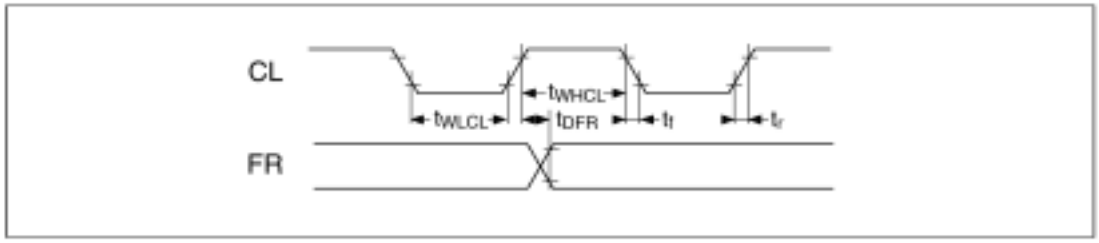


Ta = –20 to 75°C, Vss = –5.0V ± 10%, Unit: ns

Signal	Symbol	Parameter		Min.	Max.	Condition
A0, $\overline{CS}$ R/$\overline{W}$	t CYC6*1	System cycle time		1000		
	t AW6	Address setup time		20		
	t AH6	Address hold time		10		
D0–D7	t DS6	Data setup time		80		
	t DH6	Data hold time		10		
	tOH6	Output disable time		10	60	CL = 100pF
	t ACC6	Access time			90	
E	t EW	Enable pulse width	Read	100		
			Write	80		

*1. t CYC6 indicates the cycle time during which CS•E = "H". It does not mean the cycle time of signal E.
*2. Each of the values where Vss = –3.0V is about 200% of that where Vss = –5.0V (i.e., the listed value).
*3. The rise or fall time of input signals should be less than 15 ns.

Display Control Timing



Input Timing

Ta = –20 to 75°C, Vss = –5.0V ± 10%
Unit: µs (tWLCL, tWHCL, tDFR), ns (tr, tf)

Signal	Symbol	Parameter	Min.	Typ.	Max.	Condition
CL	tWLCL	Low level pulse width	35			
	tWHCL	High level pulse width	35			
	tr	Rise time		30	150	
	tf	Fall time		30	150	
FR	tDFR	FR delay time	–2.0	0.2	2.0	

Output Timing

Ta = –20 to 75°C, Vss = –5.0V ± 10%, Unit: µs

Signal	Symbol	Parameter	Min.	Typ.	Max.	Condition
FR	tDFR	FR delay time		0.2	0.4	CL = 100pF

*1. The listed FR input delay time applies to the SED1521 and SED1520 (slave).
The listed FR output delay time applies to the SED1520 (master).
*2. Each of the values where Vss = –3.0V is about 200% of that where Vss = –5.0V (i.e., the listed value).

6. NOTES

Safety

- If the LCD panel breaks, be careful not to get the liquid crystal in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and plenty of water.

Handling

- Avoid static electricity as this can damage the CMOS LSI.
- The LCD panel is plate glass; do not hit or crush it.
- Do not remove the panel or frame from the module.
- The polarizing plate of the display is very fragile; handle it very carefully

Mounting and Design

- Mount the module by using the specified mounting part and holes.
- To protect the module from external pressure, leave a small gap by placing transparent plates (e.g. acrylic or glass) on the display surface, frame, and polarizing plate
- Design the system so that no input signal is given unless the power-supply voltage is applied.
- Keep the module dry. Avoid condensation, otherwise the transparent electrodes may break.

Storage

- Store the module in a dark place where the temperature is 25 ^{o}C±10 ^{o}C and the humidity below 65% RH.
- Do not store the module near organic solvents or corrosive gases.
- Do not crush, shake, or jolt the module (including accessories).

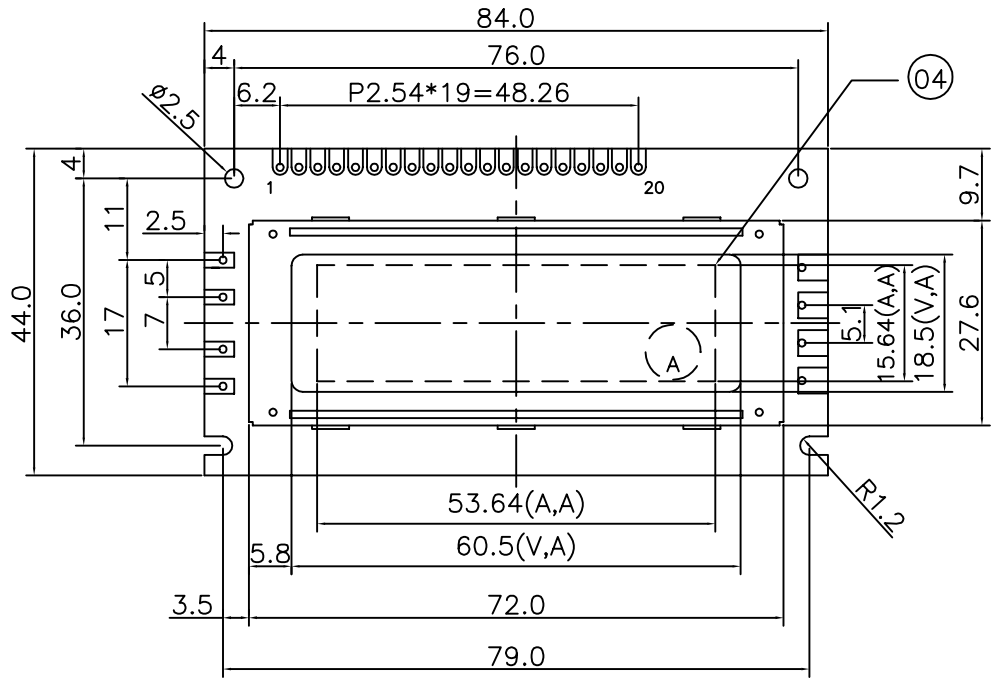
Cleaning

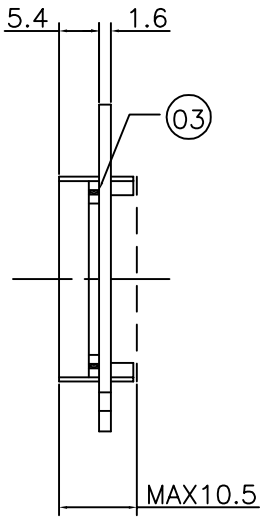
- Do not wipe the polarizing plate with a dry cloth, as it may scratch the surface.
- Wipe the module gently with soft cloth soaked with a petroleum benzine.
- Do not use ketonic solvents (ketone and acetoe) or aromatic solvents (toluene and xylene), as they may damage the polarizing plate.

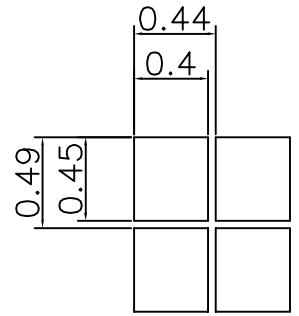
7. OPERATION PRECAUTIONS

Any changes that need to be made in this specification or any problems arising from it will be dealt with quickly by discussion between both companies.

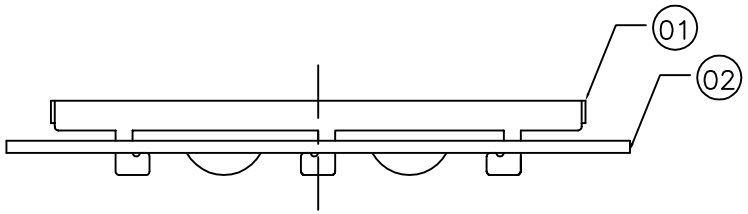
REVISION RECORD		
REV	DATE	DESCRIPTION







A BLOCK



PIN
1. VSS
2. VDD
3. VEE
4. A0
5. CS1
6. CS2
7. CL
8. /RD
9./WR
10.DB0
~
17. DB7
18. RES
19. LED A
20. LED K

TOLERANCE GRADE(±)		
GRADE	A	B
~ 6	0.05	0.1
6 ~ 18	0.08	0.18
18 ~ 50	0.1	0.25
50 ~ 180	0.2	0.4
180 ~	0.3	0.5

NO	PART NO	Q'TY
04	1501223204(ZEBRA)	2
03	1071223261(LCD)	1
02	1701223201(PCB)	1
01	1601223203(BEZEL)	1

DATA INTERNATIONAL CO.,			APPROVED	TITLE: DGF-12232S1FBLY P60-1	
UNLESS OTHERWISE SPECIFIED TOLERANCE ARE "B"GRADE			CHECKED		
DECIMAL	ANGULAR	MATERIAL	DESIGNED	REV	DRAWING NUMBER
			DRAWN: ALEX	00	325-17231-1006
SCALE	THIRD ANGLE PROJECTION	UNIT: ☒ MM ☐ INCH	DATE: 08/05/02'	FINISHED: LCM-ASSY	SHEET 1 OF 1