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Graphic Display Module

Part Number:

G160100A-FTW-GS63

Overview:

- 160x100 dots
- Module Size: 66.70 x 67.0 mm
- Viewing Area: 58.0 x 36.97 mm
- FSTN Positive Transflective
- Special Temp

- Viewing Direction: 6 o'clock
- 3V Operating Voltage
- Controller: ST7528-G
- RoHS Compliant
- Parallel

Graphic LCD Features

Resolution: 160x100 dots

Interfaces: 8-bit parallel

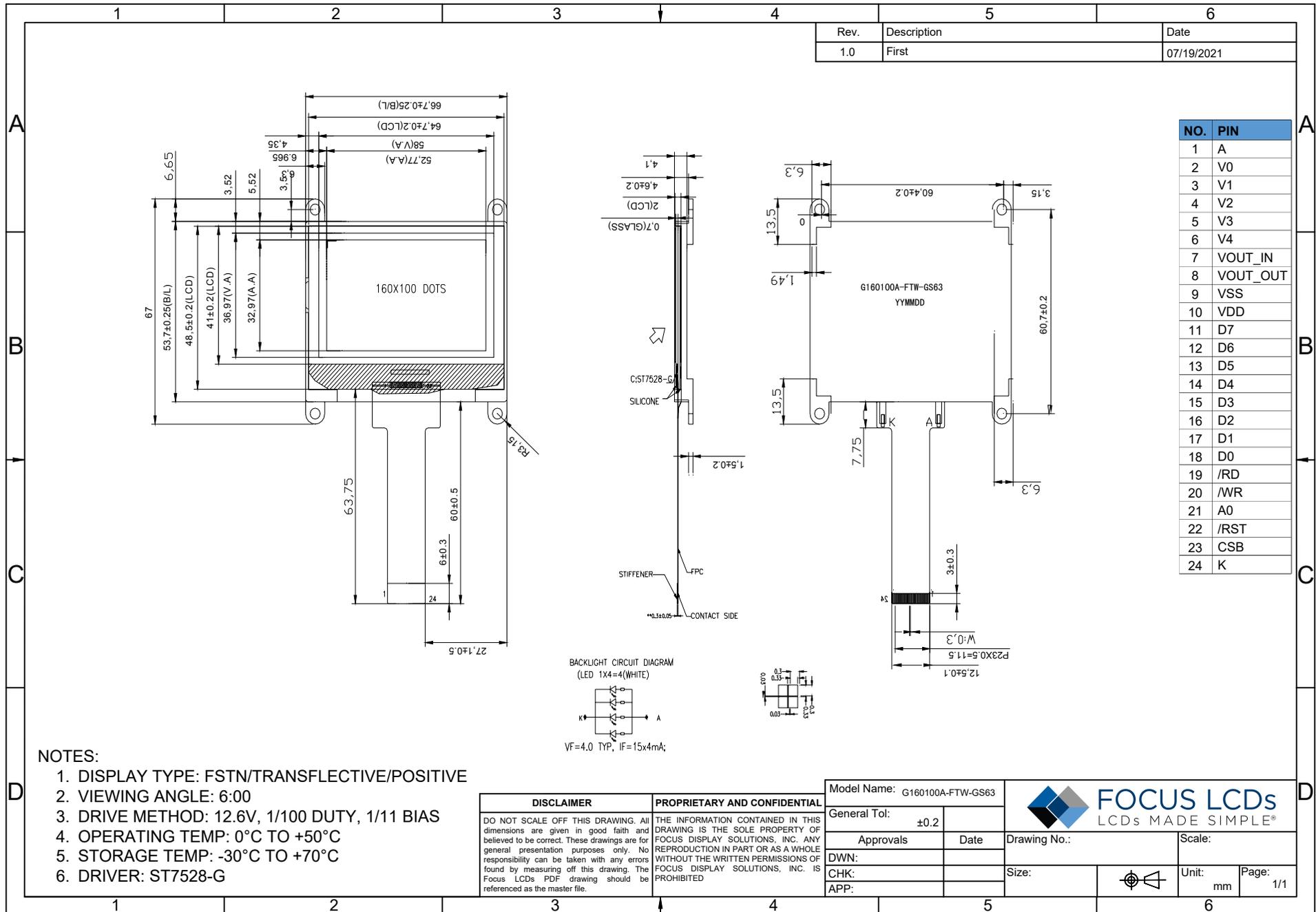Built in IC Controller: ST7528-G

RoHS Compliant

General Information Items	Specification Main Panel	Unit	Note
Viewing Area	58.0(L) x 36.97(W)	mm	-
LCD Type	FSTN positive	-	-
Viewing Direction	6:00	o'clock	-
Rear Polarizer	Transflective	-	-
Number of Pixels	160x100	dots	-
Backlight Color	White	-	-
Controller IC	ST7528-G	-	-
Interfaces	8-bit parallel	-	-
Operating temperature	0～+50	℃	-
Storage temperature	-30～+70	℃	-

Mechanical Information

Item		Min	Typ.	Max	Unit	Note
Module size	Length (L)		66.7		mm	-
	Width (W)		67.0		mm	-
	Height (H)		4.1		mm	-

1. Outline Dimensions

Rev.	Description	Date
1.0	First	07/19/2021

160X100 DOTS

G160100A-FTW-GS63
YYMMDD

C:ST7528-G
SILICONE

STIFFENER — FPC
CONTACT SIDE

BACKLIGHT CIRCUIT DIAGRAM
(LED 1X4=4(WHITE))

VF=4.0 TYP, IF=15x4mA;

NO.	PIN
1	A
2	V0
3	V1
4	V2
5	V3
6	V4
7	VOUT_IN
8	VOUT_OUT
9	VSS
10	VDD
11	D7
12	D6
13	D5
14	D4
15	D3
16	D2
17	D1
18	D0
19	/RD
20	/WR
21	A0
22	/RST
23	CSB
24	K

NOTES:
1. DISPLAY TYPE: FSTN/TRANSFLECTIVE/POSITIVE
2. VIEWING ANGLE: 6:00
3. DRIVE METHOD: 12.6V, 1/100 DUTY, 1/11 BIAS
4. OPERATING TEMP: 0°C TO +50°C
5. STORAGE TEMP: -30°C TO +70°C
6. DRIVER: ST7528-G

DISCLAIMER	**PROPRIETARY AND CONFIDENTIAL**
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Model Name: G160100A-FTW-GS63

General Tol: ±0.2

Approvals	Date
DWN:	
CHK:	
APP:	

Drawing No.:

Size:

Scale:

Unit: mm

Page: 1/1

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3. Input Terminal Pin Assignment

Recommended Connector: TF31-24S-0.5SH(800)

NO.	Symbol	Description
1	A	Backlight LED Positive Power Supply
2-6	V0-V4	LCD Driver Supply Voltage
7	VOUT_IN	An external Vout supply voltage can be supplied using the Vout_in pad
8	VOUT - OUT	If internal Vout voltage generator is used, the Vout_in & Vout_out must be connected together
9	VSS	Ground
10	VDD	Power Supply
11-18	D7-D0	8-bit bi-directional data bus that is connected to the standard 8 bit microprocessor data bus
19	/RD	Read/Write execution control pin
20	/WR	Read/Write execution control pin
21	A0	Register select input pin
22	/RST	Reset input pin
23	CSB	Chip select input pins
24	K	Backlight LED positive power supply

4. LCD Optical Characteristics

4.1 Optical Specifications

FSTN Type Display Module

Item		Symbol	Condition	Min	Typ.	Max	Unit	Note
Contrast Ratio		CR		3	5	--	--	
Response Time	Rising	TR	Ta=25˚C	--	150	225	ms	
	Falling	TF		--	220	330		
Viewing Angle		Φ1,Φ2,Φ3,Φ4	CR >= 2	25,35,25,35	30,40,30,40	--	degree	

5. Electrical Characteristics

5.1 Absolute Maximum Rating (Ta=25 ˚C, VSS=0V)

Characteristics	Symbol	Min	Max	Unit
Power Supply Voltage	VDD	-0.5	+3.6	V
Power Supply Voltage	VDD2	-0.5	+3.6	V
External Reference Voltage	VEXT	2.0	3.3	V
Power supply voltage	V0	3.5	15	V
Power supply voltage	VOUT_IN	-0.5	+20	V
Power supply voltage	V1,V2,V3,V4	0.3	VOUT_IN	V
Input voltage	VIN	-0.5	VDD+0.5	V
Output voltage	VO	-0.5	VDD+0.5	V

NOTE: If the absolute maximum rating of the above parameters is exceeded, even momentarily, the quality of the product may be degraded. Absolute maximum ratings specify the values which the product may be physically damaged if exceeded. Be sure to use the product within the range of the absolute maximum ratings.

5.2 DC Electrical Characteristics

Characteristics	Symbol	Condition	Min	Typ.	Max	Unit
Operating Voltage (1)	VDD	--	1.8	--	3.3	V
Operating Voltage (2)	VDD2	--	4.5	5.0	5.5	V
Input Signal Voltage	V-ih	"H" level	0.7VDD	--	VDD	V
	V-il	"L" level	VSS	--	0.3VDD	V
Output Signal Voltage	V-oh	"H" level	0.7VDD	--	VDD	V
	V-ol	"L" level	VSS	--	0.3VDD	V

6. Signal Timing Characteristics

6.1 MPU Characteristics

Parameter	Signal	Symbol	Min	Max	Unit	Note
Address hold time		t_{AH8}	0	--	ns	
Address setup time	A0	t_{AW8}	0	--	ns	
System cycle time		t_{CYC8}	240	--	ns	
Enable L pulse width (Write)	WR	t_{CCLW}	80	--	ns	
Enable H pulse width (Write)		t_{CCHW}	80	--	ns	
Enable L pulse width (Read)	RD	t_{CCLR}	140	--	ns	
Enable H pulse width (Read)		t_{CCHR}	80	--	ns	
Write Data Setup Time		t_{DS8}	40	--	ns	
Write Data Hold Time	DB0-DB7	t_{DH8}	10	--	ns	
Read Access Time		t_{ACC8}	--	70	ns	CL=100pF
Read Output Disable Time		t_{OH8}	5	50	ns	CL=100pF
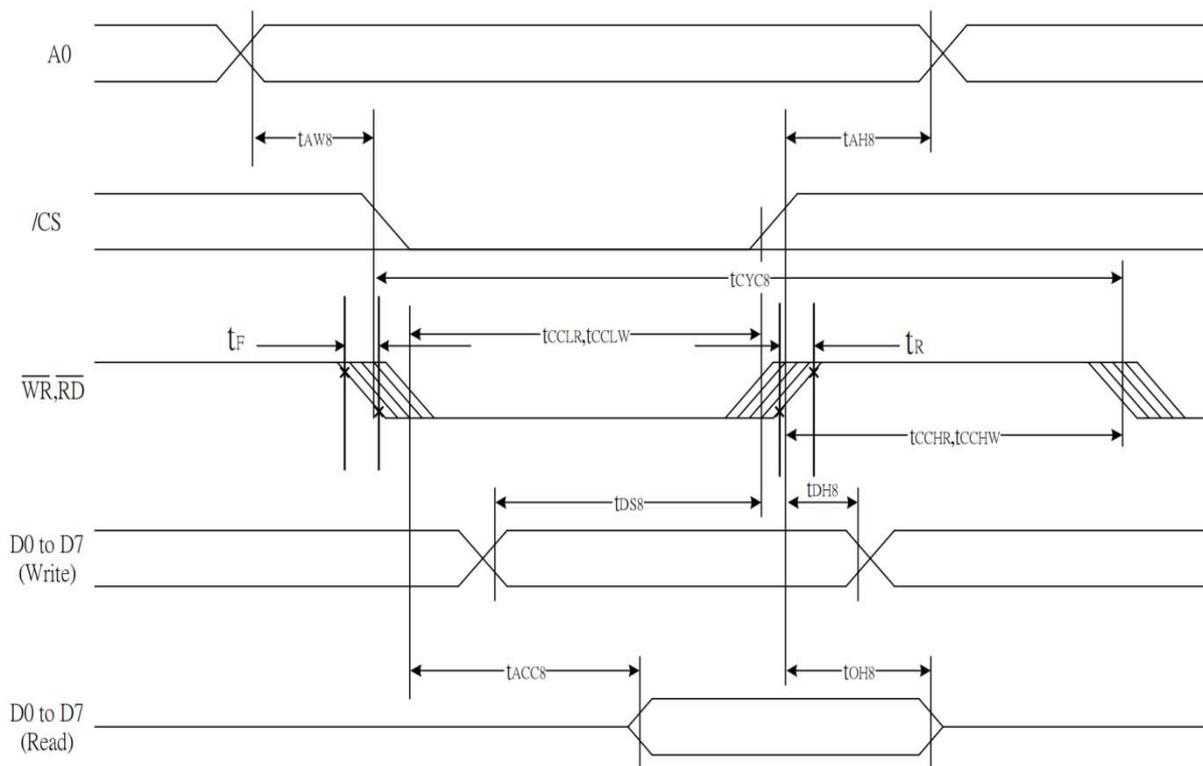
6.2   Reset Timing
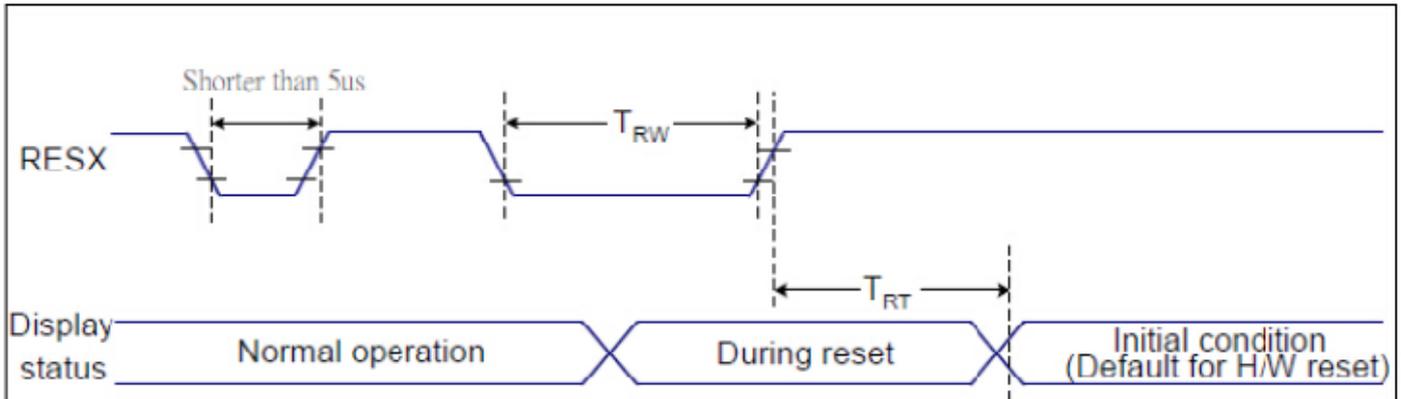
Related Pins	Symbol	Parameter	Min	Max	Unit
RESX	TRW	Reset pulse duration	1	-	us
	TR	Reset cancel	-	-	us
			-	1	us

Notes:

1. The reset cancel includes also required time for loading ID bytes, VCOM setting and other settings from NVM (or similar device) to registers. This loading is done every time when there is HW reset cancel time (tRT) within 5ms after a rising edge of RESX.

2. Spike due to an electrostatic discharge on RESX line does not because irregular system reset according to the table below:

RESX Pulse	Action
Shorter than 5us	Reset Rejected
Longer than 9us	Reset
Between 5us and 9 us	Reset starts

3. During the resetting period, the display will be blanked (the display is entering blanking sequence, which maximum time is 120ms, when reset starts in Sleep Out mode. The display remains the blank state in Sleep in mode) and then return to Default condition for Hardware Reset.

4. Spike Rejection also applies during a valid reset pulse as shown below:
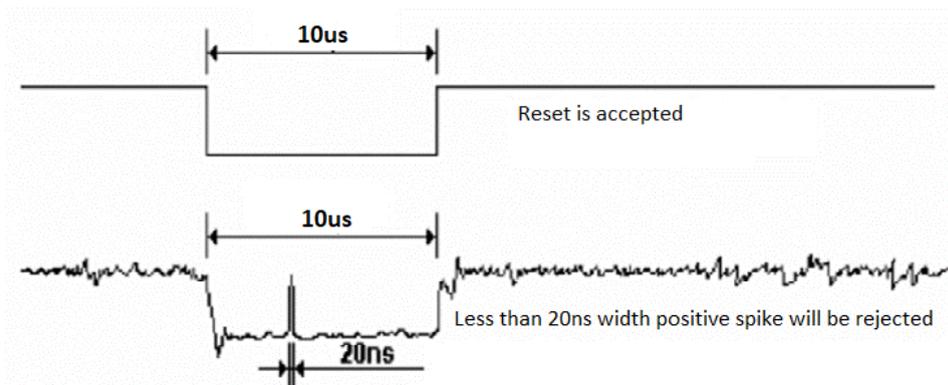
5. When Reset applied during Sleep In Mode.
6. When Reset applied during Sleep Out Mode.
7. It is necessary to wait 5ms after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120ms.

7. Cautions and Handling Precautions

7.1 Handling and Operating the Module

1. When the module is assembled, it should be attached to the system firmly. Do not warp or twist the module during assembly work.
2. Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.
3. Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.
4. Do not allow drops of water or chemicals to remain on the display surface. If you have the droplets for a long time, staining and discoloration may occur.
5. If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.
6. The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane. Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
7. If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs, or clothes, it must be washed away thoroughly with soap.
8. Protect the module from static, it may cause damage to the CMOS ICs.
9. Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
10. Do not disassemble the module.
11. Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
12. Pins of I/F connector shall not be touched directly with bare hands.
13. Do not connect, disconnect the module in the "Power ON" condition.
14. Power supply should always be turned on/off by the item Power On Sequence & Power Off Sequence.

7.2 Storage and Transportation

1. Do not leave the panel in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35 ℃ and relative humidity of less than 70%
2. Do not store the Graphic LCD module in direct sunlight.
3. The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.
4. It is recommended that the modules should be stored under a condition where no condensation is allowed. Formation of dewdrops may cause an abnormal operation or a failure of the module. In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.
5. This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.