

APPLICATION NOTE

VACUUM FLUORESCENT DISPLAY MODULE

GRAPHIC DISPLAY MODULE

GP1152A01A

GENERAL DESCRIPTION

FUTABA GP1152A01A is a graphic display module using a FUTABA 240×36 VFD.

It consists of a driver, a control and power source.

The module can be connected directly to the bus line of the host system CPU.

Important Safety Notice

Please read this note carefully before using the product.

Warning

- The module should be disconnected from the power supply before handling.
- The power supply should be switched off before connecting or disconnecting the power or interface cables.
- The module contains electronic components that generate high voltages which may cause an electrical shock when touched.
- Do not touch the electronic components of the module with any metal objects.
- The VFD used on the module is made of glass and should be handled with care. When handling the VFD, it is recommended that cotton gloves be used.
- The module is equipped with a circuit protection fuse.
- Under no circumstances should the module be modified or repaired. Any unauthorized modifications or repairs will invalidate the product warranty.
- The module should be abolished as the factory waste.

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1. FEATURES

- 1-1. High quality and long life can be achieved with FUTABA VFD.
- 1-2. Built-in power supply circuit (DC/DC converter) enables operation with the 5V power supply.
- 1-3. Driven through a simple interface.
- 1-4. High speed 8 bits data write-in capability.

2. GENERAL SPECIFICATIONS

2-1. DIMENSIONS, WEIGHT (Refer to FIGURE-1)

Table-1

Item	Specification	Unit
Outer Dimensions	(L) 205.2±1	mm
	(W) 62.0±1	
	(T) 30 Max.	
Weight	approx. 200	g

2-2. SPECIFICATIONS OF THE DISPLAY PANEL

Table-2

Item	Specification	Unit
Display Area	149.8 × 28.6	mm
Number of Dots	240 × 36	Dot
Dot Pitch (H×W)	0.61 × 0.8	mm
Color Illumination	Green ($\lambda_p=505\text{nm}$)	—
Luminance	700 Typ.	cd/m ²

Note) By using a filter, uniform color range from blue to orange (including white) can be obtained.

2-3. ENVIRONMENT CONDITIONS

Table-3

Item	Symbol	Min.	Max.	Unit
Operation Temperature	<i>T_{opr}</i>	0	+60	°C
Storage Temperature	<i>T_{stg}</i>	-20	+70	°C
Operating Humidity	<i>H_{opr}</i>	20	80	%
Storage Humidity	<i>H_{stg}</i>	20	90	%
Vibration (10 ~ 55Hz)	—	—	4	G
Shock	—	—	40	G

Note) Avoid operations and or storage in moist environmental conditions.

2-4. ABSOLUTE MAXIMUM RATINGS

Table-4

Item	Symbol	Min.	Max.	Unit
Supply Voltage	V_{CC}	-0.3	7.0	Vdc
Input Signal Voltage	V_{IS}	-0.3	$V_{CC}+0.3$	V

2-5. RECOMMEND OPERATING CONDITIONS

Table-5

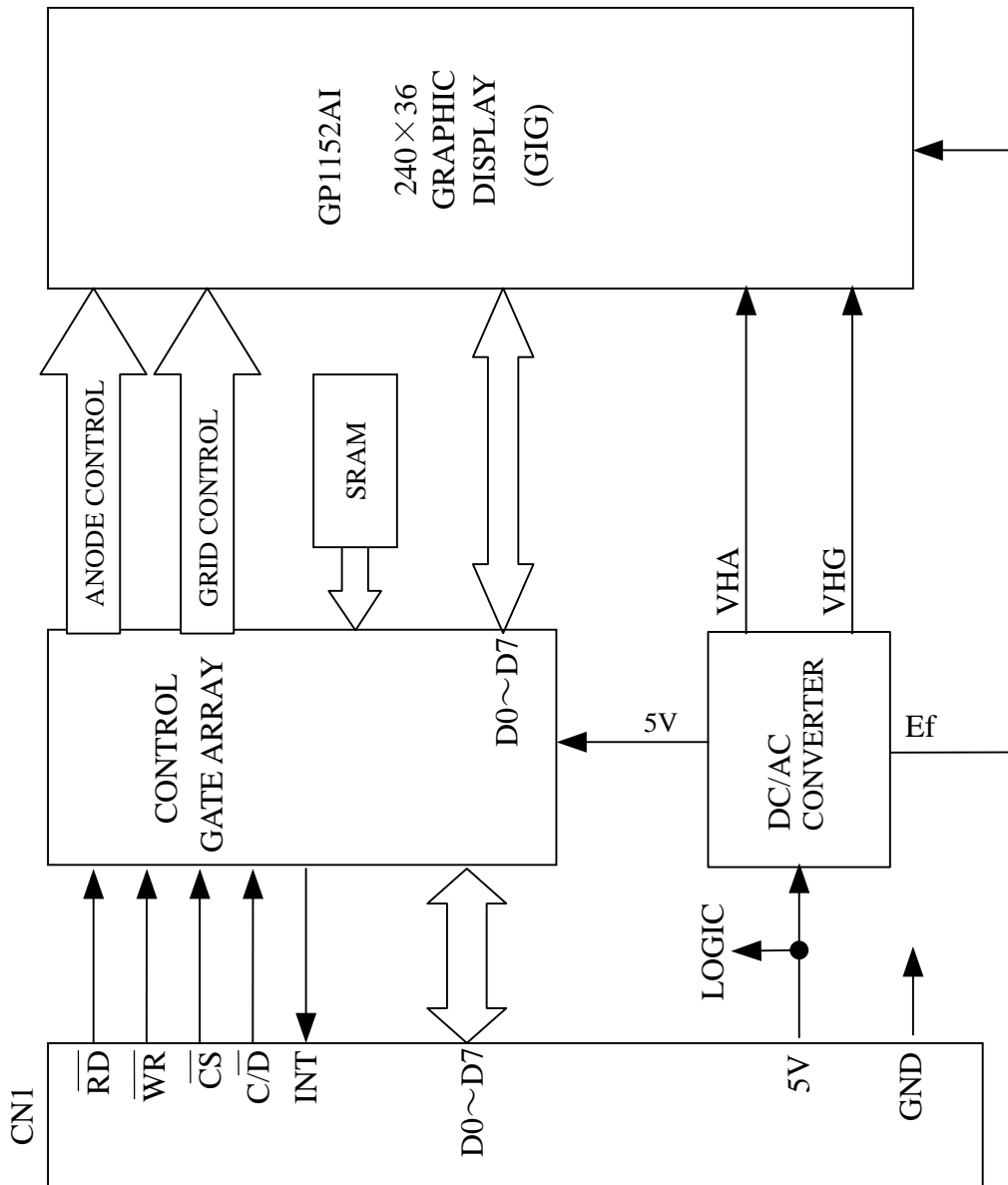
Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	4.5	5.00	5.5	Vdc
H-Level Input Voltage	V_{IH}	2.4	—	—	V
L-Level Input Voltage	V_{IL}	—	—	0.6	V

2-6. ELECTRICAL CHARACTERISTICS

Table-6

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Current (Note1)	I_{CC}	$V_{CC}=5.0Vdc$ All on	—	1.0	2.0	A
Power Consumption	—		—	5	10	W
Luminance	L		350	700	—	cd/m ²
H-Level Output Voltage	V_{OH}	$V_{CC}=4.75Vdc$ $I_{OH}=-2mA$	4	—	—	V
L-Level Output Voltage	V_{OL}	$V_{CC}=4.75Vdc$ $I_{OL}=3.2mA$	—	—	0.4	V

Note) The surge current can be approx. 5 times the specified supply current at power on.



6. WARRANTY

This display module is guaranteed for 1 year after the shipment from FUTABA.

7. CAUTIONS FOR DETERMINING AND EXPORTING REGULATED GOODS OR SERVICES

This product does not correspond to the goods or services regulated by Japan's Foreign Exchange and Foreign Trade Law. If this product is combined with other products in order to make equipment, whether this product is regulated or not is judged by such newly made equipment. We ask you to determine by yourself whether the equipment corresponds to the regulated goods when this product is incorporated in the equipment.

We also ask you to confirm that this product will not be incorporated in any weapon or used for manufacturing any weapon.

If you export or re-export this product, we recommend you to adopt measures for appropriate export procedures, if any.

8. CAUTIONS FOR OPERATION

8-1. Since VFD are made of glass material.

Avoid applying excessive shock or vibration beyond the specification for the module.
Careful handling is essential.

8-2. Applying lower voltage than the specified may cause non activation for selected pixels.

Conversely, higher voltage may cause may non-selected pixel to be activated.
If such a phenomenon is observed, check the voltage level of the power supply.

8-3. DC/DC converter is equipped on the module, the surge current may be approximately 5 times the specified supply current at the power on.

8-4. Avoid using the module where excessive noise interface is expected.

Noise affects the interface signal and cause improper operation.

Keep the length of the interface cable less than 50cm.

(When the longer cable is required, please confirm there is no noise affection.)

8-5. The fuse is mounted on the module as circuit protection.

If the fuse blown, the problem shall be solved first and change the fuse.

8-6. When fixed pattern is displayed for a long time, you may see uneven luminance.

It is recommended to change the display patterns sometimes in order to keep best display quality.

REMARKS :

The specification is subject to change without prior notice.

Your consultation with FUTABA sales office is recommended for the use of this module.