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# APPLICATION NOTE

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VACUUM FLUORESCENT DISPLAY MODULE

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AN-E-3181



## GRAPHIC DISPLAY MODULE

### GP1022A07A INSTRUCTION MANUAL

#### GENERAL DESCRIPTION

FUTABA GP1022A07A is a graphic display module using a FUTABA 264×24 VFD.

It consists of a driver, a control circuit 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.

## 1. FEATURES

1-1. High quality and long life can be achieved with FUTABA VFD.

1-2. Display drivers are used for this module.

1-3. Driven through a simple interface.

1-4. High speed 8bits data write-in capability.

## 2. GENERAL SPECIFICATIONS

### 2-1. DIMENSIONS, WEIGHT (Refer to OUTER SIMENSION)

Table-1

Item	Specification	Unit
Outer Dimensions	(W) 385.0±1	mm
	(H) 62.0±0.4	
	(T) 35.1 Max.	
Weight	approx. 570	g

### 2-2. SPECIFICATIONS OF THE DISPLAY PANEL

Table-2

Item	Specification	Unit
Display Area	316.5×35.7	mm
Number of Dots	264×24	-
Dot Pitch	1.5×1.2	mm
Dot Size	1.2×1.5	mm
Color Illumination	Green( $\lambda_p=505\text{nm}$ )	-
Luminance	350 Typ.	cd/m <sup>2</sup>

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

### 2-3. ENVIRONMENT CONDITIONS

Table-3

Item	Symbol	Min.	Max.	Unit
Operating Temperature	$T_{opr}$	0	60	°C
Storage Temperature	$T_{stg}$	-20	70	°C
Operating Humidity	$H_{opr}$	20	80	%
Storage Humidity	$H_{stg}$	20	90	%
Vibration (10 to 55 Hz)	—		2	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	$V_{cc1}$	-0.5	7.0	Vdc
	$V_{cc2}$	-0.5	28.8	Vdc
Input Signal Voltage	$V_{is}$	-0.5	$V_{cc1}+0.3$	V

## 2-5. RECOMMENDED OPERATING CONDITIONS

Table-5

Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V <sub>cc1</sub>	4.5	5.0	5.5	Vdc
	V <sub>cc2</sub>	21.6	24.0	26.4	Vdc
H-Level Input Voltage	V <sub>IH</sub>	2.2	–	–	V
L-Level Input Voltage	V <sub>IL</sub>	–	–	0.8	V

## 2-6. ELECTRICAL CHARACTERISTICS

Table-6

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Current (Note 1)	I <sub>cc1</sub>	V <sub>cc1</sub> =5Vdc V <sub>cc2</sub> =24Vdc All on	–	0.1	0.15	A
	I <sub>cc2</sub>		–	0.6	0.9	A
Power Consumption	–		–	14.9	22.4	W
Luminance	L		175	350	–	cd/m <sup>2</sup>
H-Level Output Voltage	V <sub>OH</sub>	V <sub>cc1</sub> =4.5V I <sub>OH</sub> =-2mA	3.8	–	–	V
L-Level Output Voltage	V <sub>OL</sub>	V <sub>cc1</sub> =4.5V I <sub>OL</sub> =3.2mA	–	–	0.4	V

Note 1) The surge current can be approx.5 times the specified supply current at power on.



GP1022A07A CIRCUIT BLOCK DIAGRAM

FIGURE-2

