GCFCA2424S-100 Type DC/DC Converter

1. Overview

The GCFCA2424S-100 is a DC/DC converter with an input voltage range of 18V to 36V, an output voltage of 24V, and a maximum output current of 4.2A. It features a typical efficiency of 88% and an operating temperature range of -20°C to +85°C. Utilizing PCB surface-mount technology, it provides isolation between input and output. It is designed for DC power supply systems to achieve isolated voltage conversion.

Key Features:

- Fixed switching frequency
- Input under-voltage protection
- Enable control function
- Output short-circuit protection
- Parallel Current Sharing

2. Environmental Conditions

Item	Min.	Typ.	Max.	Unit	Remarks
Operating Temperature	-20	25	85	°C	Case Temperature
Storage Temperature	-40	25	85	°C	
Relative Humidity	5	/	85	%	Non-condensing
Lead Soldering Temperature	/	/	300	°C	<8s
Heat Dissipation	Conduction Cooling				

3. Mechanical Dimensions & PIN Definition

The external dimensions should comply with Figure 1 (unit: mm). Dimensions without noted tolerances follow standard GB/T 1804-2000-M.

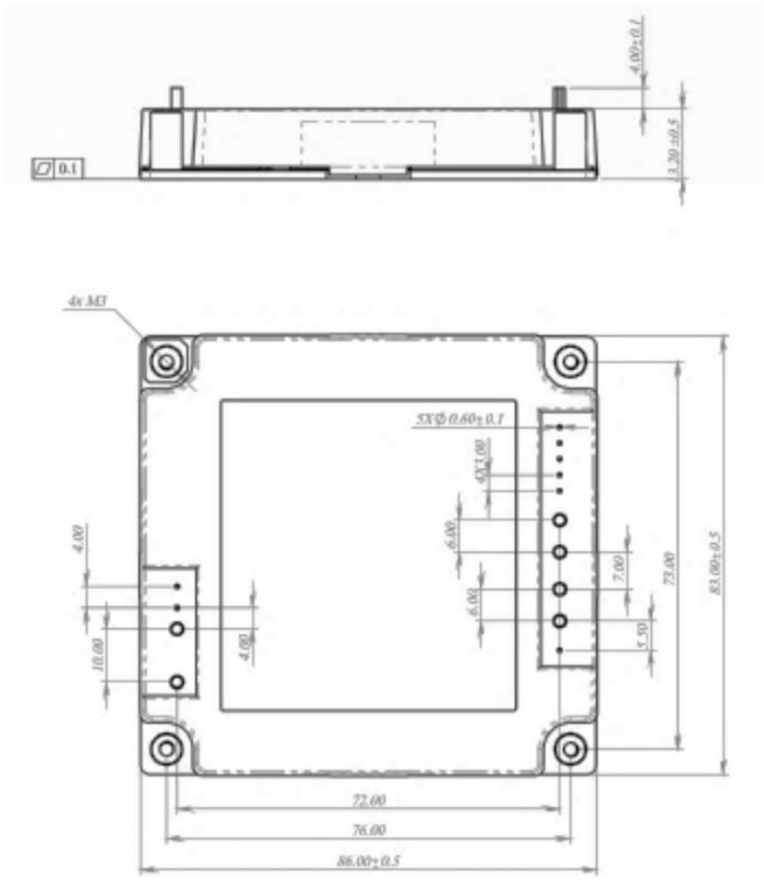


Figure 1. Outline dimensions, with the lead pins pointing upwards

3.1. PIN Definition

Pin#	Symbol	Function	Pin#	Symbol	Function
1	**+VIN**	Input Voltage Positive	8	**TRM**	Output Voltage Adjust
2	**-VIN**	Input Voltage Negative	9	**-S**	Remote Sense Negative
3	**SG**	Signal Ground	10	**-V**	Output Voltage Negative
4	**CNT**	Enable Control	11	**-V**	Output Voltage Negative
5	**AUX**	Auxiliary Power	12	**+V**	Output Voltage Positive
6	**IOG**	IOG Signal	13	**+V**	Output Voltage Positive
7	**PC**	Parallel Current Share	14	**+S**	Remote Sense Positive

4. Electrical Characteristics

Conditions (unless otherwise specified): -20°C ≤ Tc ≤ 85°C, Vi = 24V ±0.5V, Cin = 220μF, Cout = 220μF

Characteristic	Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	Full Load	18	24	36	V
Input UVP – Protection Point	Ta=25°C, Half Load	12.5	–	–	V
Input UVP – Recovery Point		–	–	17.9	V
Enable Low Level (Output ON)	Negative logic, ref. input negative	-0.3	–	0.8	V
Enable High Level or Float (Output OFF)		3.5	–	12.0	V
Output Voltage	Vi=18~36V, full load, Ta=25°C	23.76	24	24.24	V
Output Voltage (over temp)	Vi=18~36V, full load, Tc=85°C / -20°C	23.52	24	24.48	V
Line Regulation	Vi=18~36V, full load	–	–	±0.5	%
Load Regulation	10% load → full load	–	–	±1.0	%
Ripple and Noise	Ta=25°C, full load, BW=20MHz, 10μF + 0.1μF ceramic at output	–	150	240	mVp-p
Output Current	Full voltage	0	–	4.2	A
Efficiency	Ta=25°C, full load	85	88	–	%
Output Voltage Rise Time	10% to 90% Vo, Ta=25°C	–	–	50	ms
Output Voltage Adj. Range	Io≤4.2A, Po≤100W, Ta=25°C	-60	–	+20	%Vo
Temperature Coefficient	Full load	–	–	0.02	%/°C
Output Over-Current Protection	Hiccup mode, auto-recovery, Ta=25°C	105	–	180	%Io
Output Over-Voltage Protection		125	–	145	%Vo
IOG Signal – Output Normal	Low Level				
IOG Signal – Enable Abnormal	High Level				
Output Short-Circuit Protection	Ta=25°C, Hiccup mode, auto-recovery				
Isolation Voltage – Input to Output	1mA/60s, Ta=25°C	–	–	2000	VAC
Isolation Voltage – Input to Baseplate	1mA/60s, Ta=25°C	–	–	2000	VAC
Isolation Voltage – Output to Baseplate	1mA/60s, Ta=25°C	–	–	500	VDC
Insulation Resistance	Between input/output/case, Ta=25°C, 500Vdc	100	–	–	MΩ

a. This parameter is design assured and tested only during qualification and design/process changes.

b. Judgment criteria: The product can withstand continuous short-circuit and recover automatically after the fault is cleared.

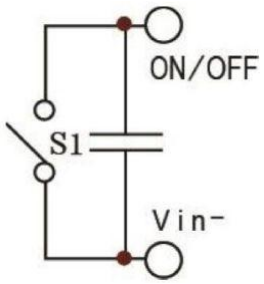
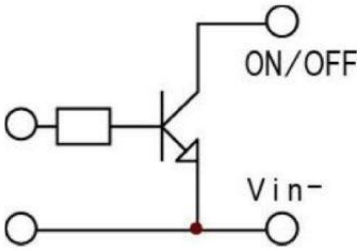
c. Judgment criteria: The module shall show no breakdown or arcing.

5. Typical Applications

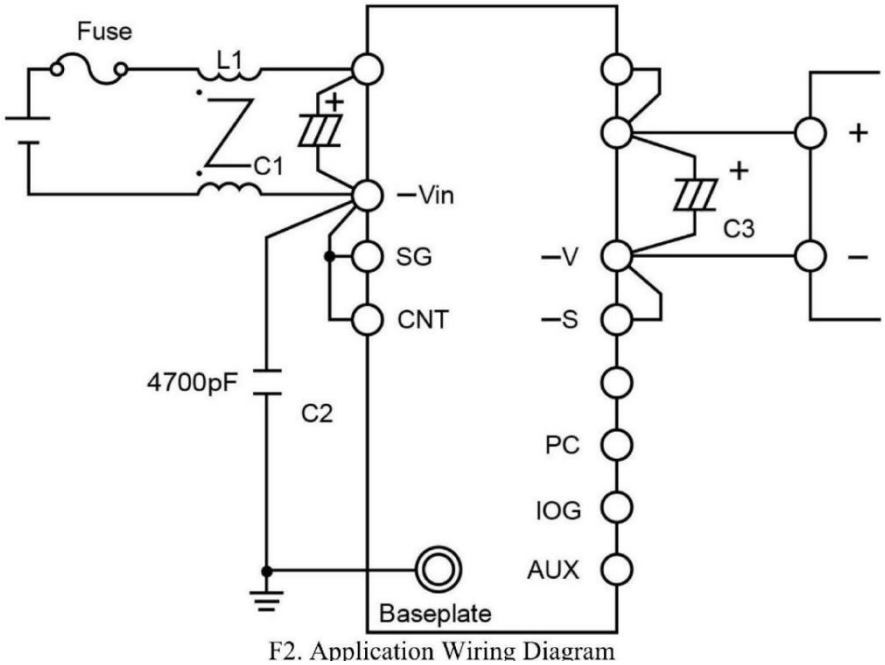
Enable Control

Positive/Negative Enable Logic Function Description:

For positive logic enable, the module operates normally when the control pin is connected to a high level or left floating, and it shuts down when the pin is grounded or at a low level. For negative logic enable, the module operates normally when the control pin is grounded or at a low level, and it shuts down when connected to a high level or left floating. Please note: The enable pin of this specific model uses negative logic; the output is active when the pin is at a low level or connected to the input ground.

Switching Method	Transistor Control Method
	

Application Wiring Diagram



F2. Application Wiring Diagram

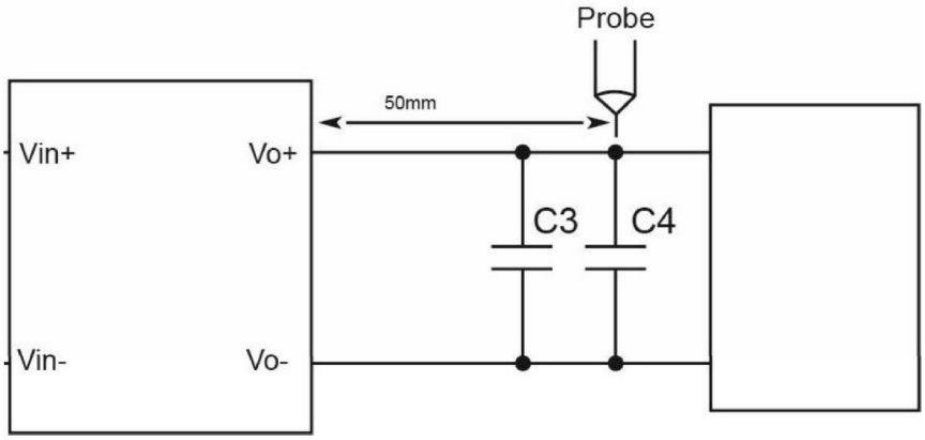
Figure 2. Typical Application Wiring Diagram

Figure 2 illustrates the typical application wiring method for the module. Due to potential variations in the length of input source leads, it is recommended to add an input capacitor near the module's input pins to prevent input oscillation caused by long input lines. Similarly, an output capacitor should be added at the output terminal of the module.

Recommended Parameters

A. Input Capacitor C1	Select a capacitor in the range of 470μF to 1000μF. Multiple capacitors can be used in parallel.
B. Input Capacitor C2	Select a capacitor in the range of 2.2nF to 4.7nF (rated for 2000V AC).
C. Capacitor C3	Select in the range of 220μF to 470μF.
D. Inductor L1	Select L1 common mode inductance greater than 1 mH.

Output Ripple Test Method



Set the oscilloscope bandwidth to 20MHz. Measure at the output using the oscilloscope probe with the ground lead removed, employing the Tip-and-Barrel method (a 10μF ceramic capacitor in parallel with a 1μF ceramic capacitor should be connected at the output terminal of the power board to filter out external interference).

Notes：

- If not specified, the test condition is ambient temperature 25℃, humidity < 75%, input voltage 24VDC and output rated load.
- All parameters listed in the data sheet are tested according to the company's enterprise standards.
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