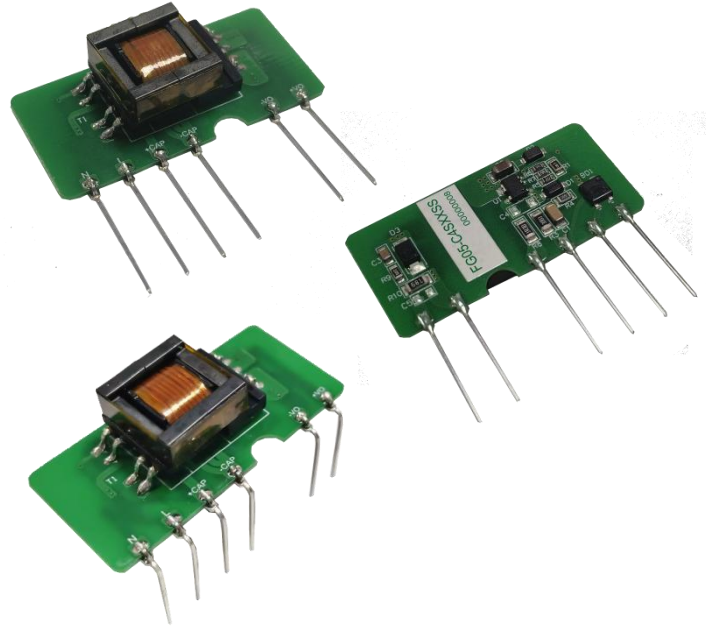


Typical Features

- ◆ Wide input voltage range 85-305VAC/70-430VDC
- ◆ No load power consumption $\leq 0.2W@220VAC$
- ◆ Efficiency up to 79%(Typ.)
- ◆ Operating temperature from $-40^{\circ}C$ to $+85^{\circ}C$
- ◆ Switching frequency 65KHz
- ◆ Output short circuit & over current protections
- ◆ Isolation voltage 3600VAC
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ Complies with CE-LVD, CB, and UL standards.
- ◆ Altitude during operation 3600m Max
- ◆ Mini size open-frame, industrial level design
- ◆ PCB SIP mounting



Application Field

The **FG05-C4SXXSS** series from Aipu is a compact, high-efficiency power module. It features a universal input voltage range (accepting both AC and DC inputs), low ripple, low temperature rise, low power consumption, high reliability, robust safety isolation, and excellent EMC performance. Its EMC and safety specifications comply with international EN55032 and IEC/EN61000 standards. This series is widely used in electric power systems, industrial applications, instrumentation, and smart homes. For operations in harsh EMC environments, please refer to our recommended application circuits.

Selection Guide

Certificate	Part No.	Input Voltage Range		Output Specifications			Max Capacitive Load @220VAC μF	Ripple & Noise @20MHz (Max) mVp-p	Efficiency @full Load 220VAC (Typ.) %	
		Nominal	Range	Power	Voltage	Current				
		(VAC)	(VAC)	P(W)	Vo (VDC)	Io (mA)				
CE	FG05-C4S03SS	220	85 - 305	3.3	3.3	1000	5000	100	70	
	FG05-C4S05SS				5	1000				77
	FG05-C4S09SS				9	556				79
	FG05-C4S12SS				12	416				81
	FG05-C4S15SS				15	333				82
	FG05-C4S24SS				24	208				83

Note 1: Typical output efficiency is measured after 30 minutes of operation at full load (burn-in).

Note 2: The tolerance for typical full-load efficiency (% , Typ.) is $\pm 2\%$. Efficiency is calculated as total output power divided by the module's input power.

Note 3: Due to space constraints, this is only a partial product list. For models or specifications not listed, please contact our Sales Department.

Note 4: SμFfix "-1" denotes the angled-pin (90-degree) model.

Input Specifications					
Item	Test Condition	Min	Typ.	Max	Unit
Input voltage range	AC input	85	220	305	VAC
	DC input	120	310	430	VDC
Input frequency range	-	47	50	63	Hz
Input current	Input 115VAC	-	-	0.15	A
	Input 220VAC			0.10	
Surge current	Input 115VAC	-	-	17	
	Input 220VAC	-	-	21	
Standby power consumption	Input 115VAC	-	-	0.2	W
	Input 220VAC	-	-		
Leakage current	-	0.5mA TYP/230VAC/50Hz			
Recommended external fuse	-	2A/300VAC Slow-blow fuse			
Hot plug	-	NA			
ON/OFF Control	-	NA			

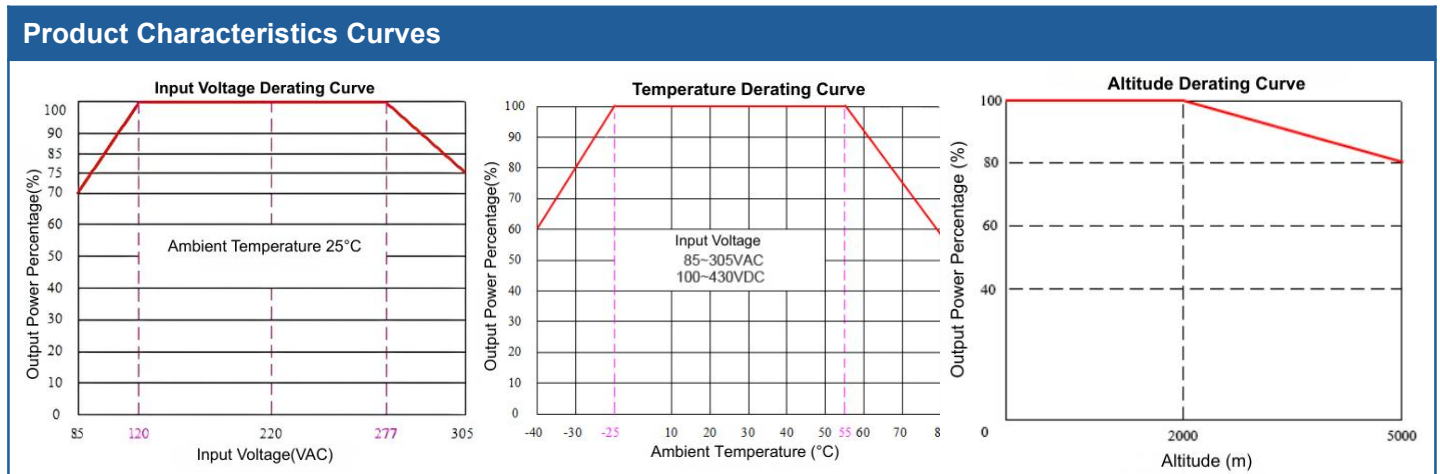
Output Specifications						
Item	Test Condition	Min.	Typ.	Max.	Unit	
Output voltage accuracy	Full input voltage range, 10%-100% load (Stable operation at 0%-10% load)	Vo	-	±2.0	±5.0	%
Line regulation	Rated Load	Vo	-	±1.0	±2.0	
Load regulation	Nominal input voltage, 20%~100% load	Vo	-	±1.0	±5.0	
Ripple & Noise	5%-100% load, 20MHz bandwidth	Vo	-	50	200	mVp-p

Note: The Ripple& Noise is tested by the Parallel-line method, please refer to the following test instruction.

Dynamic response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-	-	5.0	mS
Minimum load	Single Output	10	-	-	%	
Temperature drift coefficient	-	-	-	±0.03	%/°C	
Turn-on delay time	Input 115VAC (full load)	-	-	500	mS	
	Input 220VAC (full load)	-	-			
Power-off hold up time	Input 115VAC (full load)	-	20	-	mS	
	Input 220VAC (full load)	-	100	-		
Output start-up overshoot	Full input voltage range	≤10			%Vo	
Short circuit protection		Continuous, Self-recovery			Hiccup	
Over current protection	Input 220VAC	110%Io	-	200%Io	mA	

General Specifications						
Item	Test Condition		Min	Typ.	Max	Unit
Switching frequency	-		-	65	-	KHz
Operating temperature	Refer to the Temperature Derating Graph		-40	-	+85	°C
Storage temperature	-		-40	-	+105	°C
Soldering temperature	Wave soldering		260±4°C, time 5-10S			
	Manual soldering		360±8°C, time 4-7S			
Relative humidity	-		10	-	90	%RH
Isolation voltage	I/P-O/P	Test 1min, leakage current <5mA	3600	-	-	VAC
Insulation resistance	I/P-O/P	@ DC500V	100	-	-	MΩ
MTBF	MIL-HDBK-217F @25°C		300	-	-	K Hours
Safety standard	-		IEC/EN62368			
Vibration	10-55Hz, 10G, 30 Min, along X, Y, Z					
Safety class	-		CLASS II			
Weight & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H			
		5g	41.0 x 19.0x 12.0 mm	1.614 × 0.748 × 0.472 inch		

EMC Performance				
Items		Test Standard	Performance/Class	
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 2)
		RE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf. Criteria B (with the Recommended Circuit 2-1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf. Criteria B (with the Recommended Circuit 2-1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf. Criteria B (with the Recommended Circuit 2-1)
		Surge	IEC/EN61000-4-5	±1KV Perf. Criteria B (with the Recommended Circuit 2-1)
		EFT	IEC/EN61000-4-4	±2KV Perf. Criteria B (with the Recommended Circuit 2-1)
		Voltage dips & interruptions	IEC/EN61000-4-11	0%~70% Perf. Criteria B(with the Recommended Circuit 2-1)



Note 1: For input voltages of 85-100VAC, 277-305VAC, 120-140VDC, or 390-430VDC, temperature derating must be applied based on the input voltage derating curve.

Note 2: This product is designed for natural convection cooling. Please contact us if it will be used in an enclosed environment.

Recommended Circuits for Application

1. Typical application circuit diagram

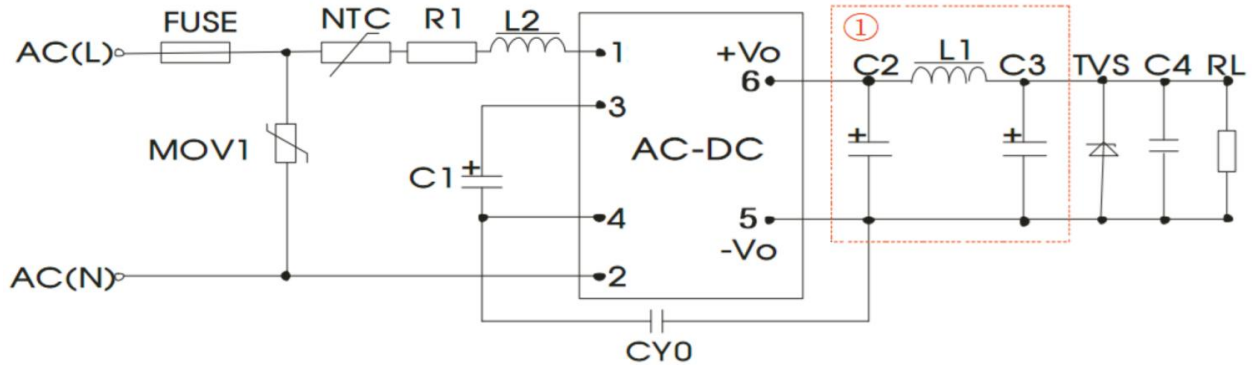


Figure 1(Note: ① is a Pi-type filter circuit.)

Part No.	C1 (*)	C2 (*) Solid-state capacitor	L1 (*)	C3 (*) Solid-state capacitor	C4	L2	NTC	CY0	FUSE (*)	TVS
FG05-C4S03SS	22μF /450V	470μF/10V	2.0uH /2A	100μF/10V	0.1μF/ 50V	2.2mH /0.5A	5D-9	Y1/102M/ 400VAC	2.0A/ 300VAC /Slow-bl ow fuse	SMBJ7.0A
FG05-C4S05SS		470μF/10V		100μF/10V						SMBJ7.0A
FG05-C4S09SS		220μF/16V		220μF/16V						SMBJ20A
FG05-C4S12SS		220μF/16V		68μF/16V						SMBJ20A
FG05-C4S15SS		220μF/35V		68μF/35V						SMBJ30A
FG05-C4S24SS		100μF/35V		47μF/35V						SMBJ30A

Note:

- C1: For AC input, C1 is an input filter electrolytic capacitor (required). The recommended value is 22μF/450V. For DC input, C1 acts as a bulk filter capacitor in the EMC filter (required). The recommended value is 22μF/450V.
- R1: Wire-wound resistor. The recommended value is 6.8 ohms, 3W. (Do not substitute with carbon film or other types of resistors).
- MOV1: Varistor. The recommended model is 10D561K/3500A.

2. Recommended circuit diagram for higher EMC requirements

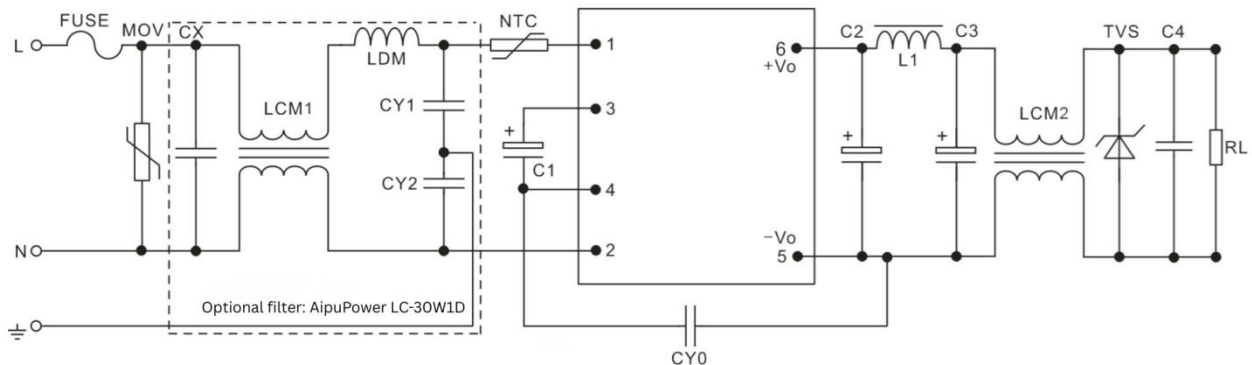
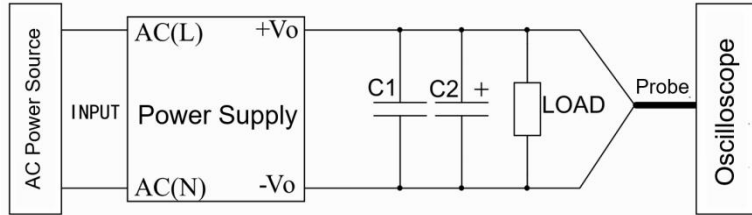


Figure - 2-1

Note: Refer to the typical application circuit for specific recommended component values.

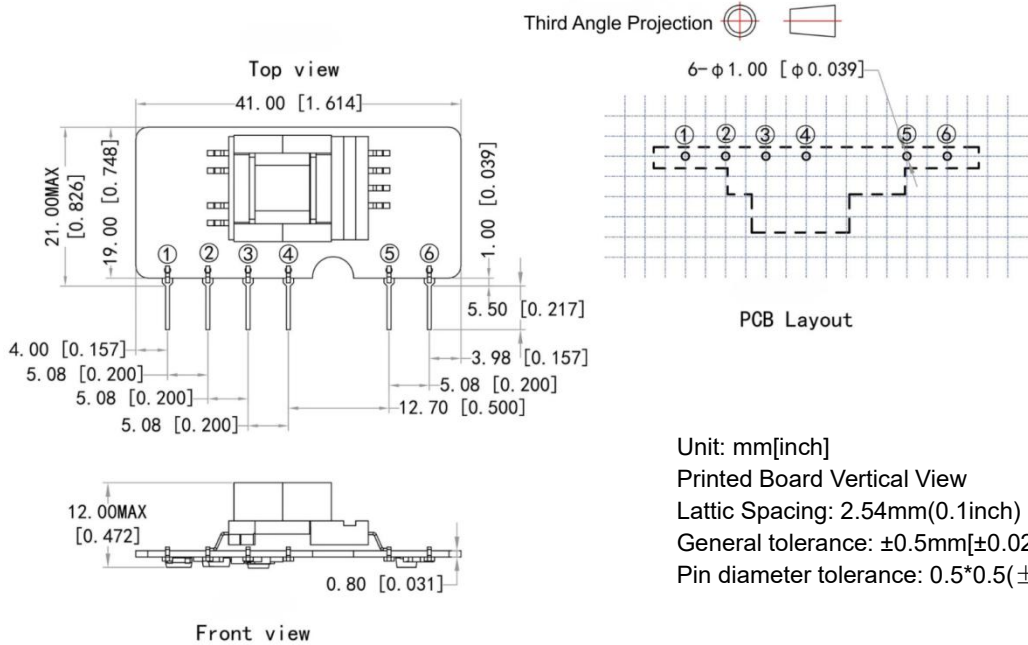
FUSE	2.0A/300VAC, Slow-Blow (*)	R1	6.8Ω/3W, Wire-wound
MOV	10D561K/3500A	CY1, CY2	Y1/102M/400VAC
CX	X2/224K/310VAC	LDM	330uH/0.5A
LCM	40mH/0.5A	-	-

Ripple & Noise Test Instruction (Parallel-line Method, 20MHZ bandwidth)



1. Ripple and noise are measured using the parallel cable method with the oscilloscope bandwidth limited to 100M, 20MHz. Remove the oscilloscope probe cap and ground clip, and connect C1 (0.1μF ceramic capacitor) and C2 (10μF high-frequency low-ESR electrolytic capacitor) in parallel at the probe tip. Set the oscilloscope sampling mode to Sample.
2. Output ripple and noise test setup: Connect the module input to the power supply and the output to the electronic load via a fixture board. Use separate sampling wires directly from the output ports for measurement. Select insulated power cables with an appropriate wire gauge based on the output current.

Mechanical Dimensions

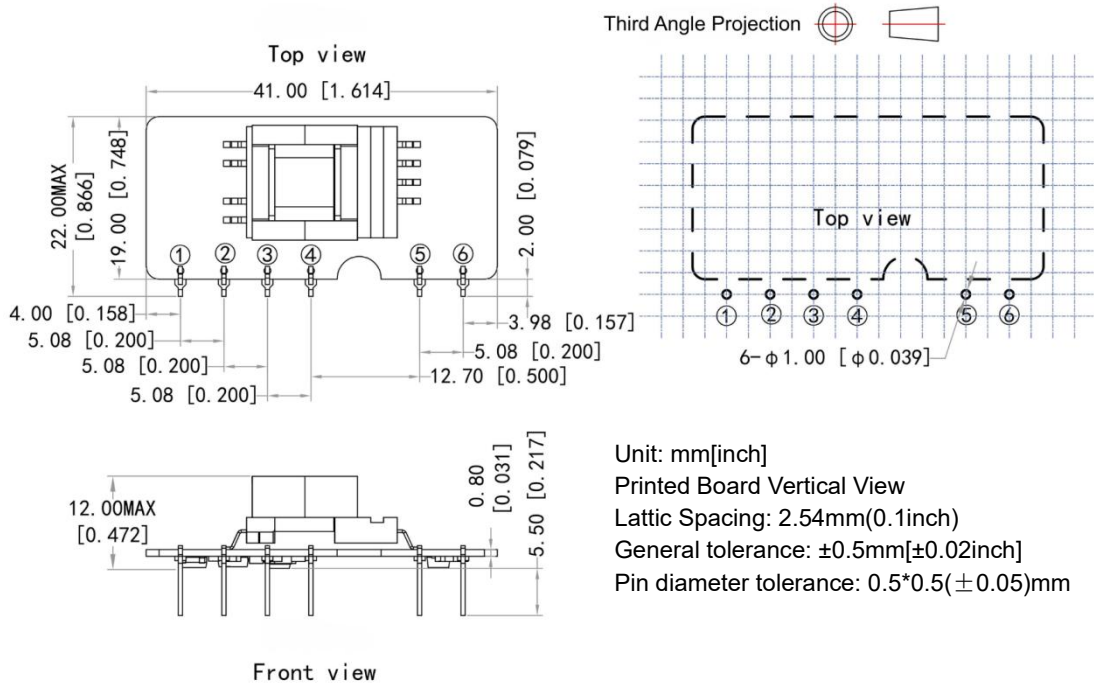


Unit: mm[inch]
 Printed Board Vertical View
 Lattice Spacing: 2.54mm(0.1inch)
 General tolerance: ±0.5mm[±0.02inch]
 Pin diameter tolerance: 0.5*0.5(±0.05)mm

Pin-out Function Description

Pin No.	1	2	3	4	5	6
Symbol	AC(N)	AC(L)	+Vc	-Vc	-Vo	+Vo
Description	AC Neutral	AC Line	Capacitor Positive	Capacitor Negative	Output Negative	Output Positive

Mechanical Dimensions (90° right-angle pin version)



Pin-out Function Description

Pin No.	1	2	3	4	5	6
Symbol	AC(N)	AC(L)	+Vc	-Vc	-Vo	+Vo
Description	AC Neutral	AC Line	Capacitor Positive	Capacitor Negative	Output Negative	Output Positive

Application Notice

- 1.The product must be operated within the specified parameters; otherwise, permanent damage may occur.
- 2.If the product operates below the minimum load requirement, we cannot guarantee that all performance specifications in this manual will be met.
- 3.If the product operates beyond its specified load range, we cannot guarantee that all performance specifications in this manual will be met.
- 4.Unless otherwise specified, all specifications are measured at Ta = 25° C, humidity < 75%, nominal input voltage, and rated output load (resistive load).
- 5.All testing methods for the specifications listed above are based on our corporate standards.
- 6.The specifications listed above apply to the standard models in this manual. Specifications for non-standard or customized models may vary. For specific details, please contact our technical support team.
- 7.Aipupower can offer customized power solutions to meet specific requirements.

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