

Typical Features

- ◆ Input Voltage Range 85-418VAC/110-590VDC
- ◆ No load power consumption $\leq 0.5W$
- ◆ Efficiency 83% (Typ.)
- ◆ Operating Temperature from $-40^{\circ}C$ to $+75^{\circ}C$
- ◆ Switching Frequency 65KHz
- ◆ Short-circuit & Over-current protections
- ◆ Isolation voltage 4000Vac
- ◆ Altitude during operating 4000m Max
- ◆ Conform to CE & RoHS regulation
- ◆ Encapsulated in plastic case, flame class UL94 V-0
- ◆ PCB DIP Mounting



Application Field

DA25-220E1212H2D4 ---- a compact size high efficiency modular power supply with global adapted input voltage range (both AC & DC available), low ripple, low temperature rise, low standby power consumption, high efficiency, high reliability, safety isolated and good EMC performance. This series of products can be widely used in the fields of electric power, industrial, instrument, smart home devices, etc. The additional circuit for EMC is recommended in this data sheet for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Output Specification					Max. Capacitive Load		Ripple & noise (Max) 20MHz		Efficiency@ Full Load, 220Vac (Typ.)
		Power	Voltage 1	Current 1	Voltage 2	Current 2	Vo 1	Vo 2	Vo 1	Vo 2	
		(W)	Vo1 (V)	Io1 (mA)	Vo2 (V)	Io2 (mA)	u F		mVp-p		%
-	DA25-220E1212H2D4	22.8	12	1500	12	400	1000	330	100	100	83

Note 1 - Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

Note 2 - The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 3 - The full load efficiency should be in $\pm 2\%$ of the typical value in this table. The efficiency is calculated by the way that the full output power is divided by the input power.

Note 4 - * marked part has been developed in process.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	85	220	418	VAC
	DC Input	110	310	590	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	115VAC	-	-	0.45	A
	220VAC	-	-	0.25	

Surge Current	115VAC	-	25	-	
	220VAC	-	45	-	
No Load Power Consumption	Input 115VAC	-	-	0.50	W
	Input 230VAC	-	-		
Leakage Current	-	0.5mA TYP/ 230VAC/ 50Hz			
External Fuse Recommend	-	Not required			
Hot Plug	-	Unavailable			
Remote Control	-	Unavailable			

Output Specifications

Item		Operating Condition		Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range Any load	Vo1	-	±2.0	±3.0	%
			Vo2	-	±2.0	±5.0	%
Line Regulation		Rated Load	Vo1	-	-	±1.0	%
			Vo2	-	-	±2.0	
Load Regulation		Nominal input voltage, 20%~100% load	Vo1	-	-	±1.0	%
			Vo2	-	-	±2.0	%
Minimum Load		Dual isolated output		0	-	-	%
		Positive & negative common grounded output		-	-	-	
		Positive & negative Isolated output		-	-	-	
Turn-on Delay Time		Input 115Vac (full load)		-	2000	-	mS
		Input 220Vac (full load)		-	1000	-	
Holde Up Time		Input 115VAC (full load)		-	10	-	mS
		Input 220VAC (full load)		-	60	-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
	Recovery time			-	5.0	-	mS
Output Over-shoot		Full input voltage range		Vo1 ≤10%Vo			%
Short circuit protection				Continuous, Self-recovery			Hiccup
Drift Coefficient		-		-	±0.05%	-	%/°C
Over Current Protection		Input 220VAC		≥120% Io, Self-recovery			Hiccup
Ripple & Noise		Input 220VAC (full load)		-	50	100	mV
		The ripple and noise are tested by the twisted pair method. For details understood, please refer to the following Ripple & Noise Test Instructions.					

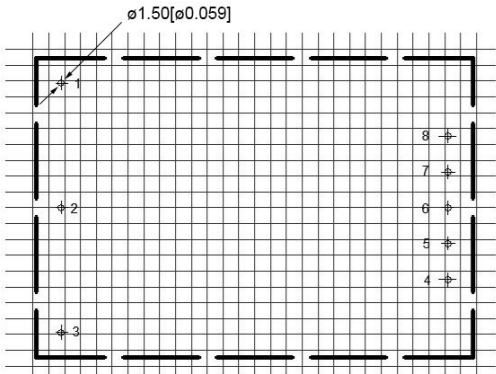
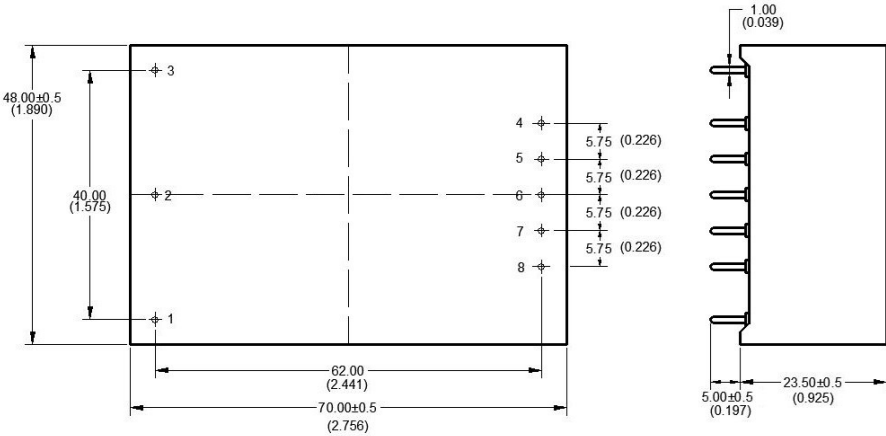
General Specifications

Items		Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		-	-40	-	+75	°C
		Refer to the Temperature Derating Curve				
Storage Temperature		-	-40	-	+85	
Soldering Temperature		Wave-soldering	260±4℃, timing 5-10S			
		Manual-soldering	360±8℃, timing 4-7S			
Relative Humidity		-	10	-	90	%RH
Isolation Voltage	I/P-O/P	1 min, leakage current≤5mA	4000	-	-	VAC
	Vo1-Vo2	1 min, leakage current≤5mA	4000	-	-	VAC
Insulation Resistance	I/P-O/P	@DC500V	100	-	-	MΩ
Safety Standard		-	IEC62368/EN62368/UL62368			
Vibration		-	10-55Hz, 10G, 30 Min, along X, Y, Z			
Safety Class		-	CLASS I			
Flame Class of Case		-	UL94 V-0			
MTBF		-	MIL-HDBK-217F@25℃>300,000H			
Cooling Method		-	Nature air			
Unit Weight		-	145g (TYP)			

EMC Performances

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

Mechanical Dimensions



PCB layout vertical view
Grid 2.54x2.54(0.10x0.10)

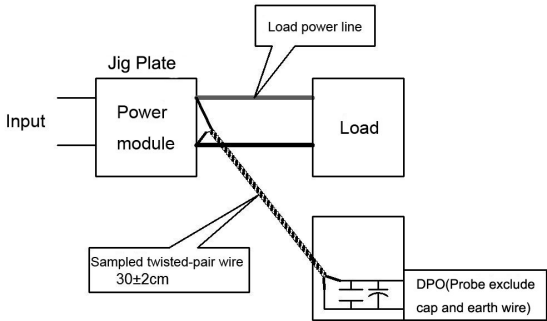
Pin No.	Function
1	FG
2	AC(N)
3	AC(L)
4	+Vo2
5	-Vo2
6	No Pin
7	+Vo1
8	-Vo1

Unit: mm(inch)
Pin diameter tolerance $\pm 0.10(\pm 0.004)$
General tolerance $\pm 0.50(\pm 0.020)$

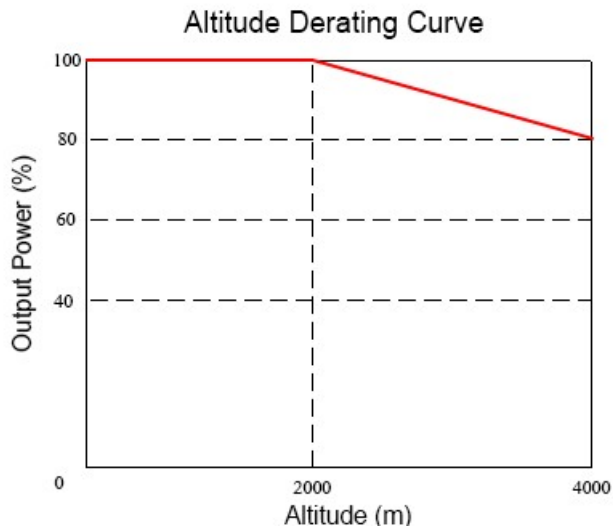
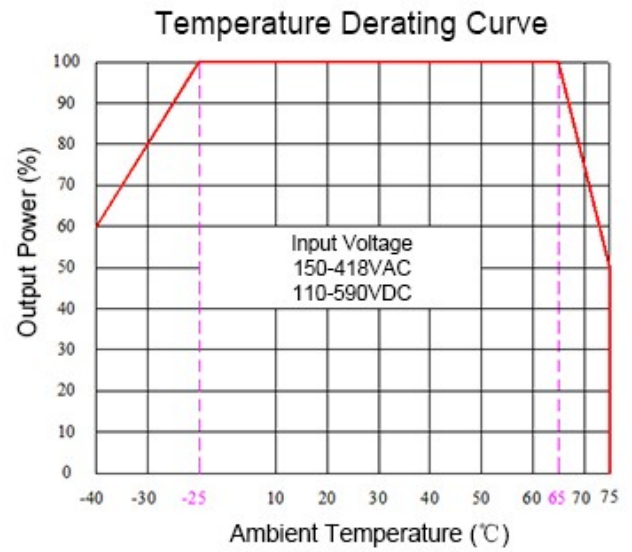
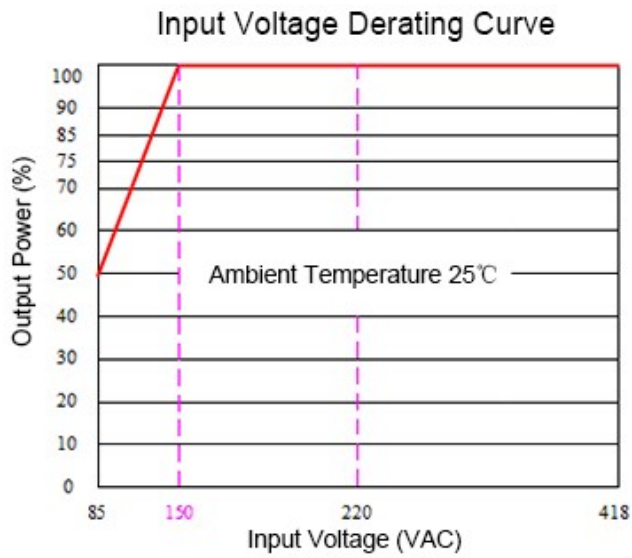
Packaging Code	Dimensions L x W x H	
H2	70.0X 48.0X23.5 mm	2.756X1.890X0.925 inch

Ripple & Noise Test Instructions (Twisted Pair Method, 20MHz Bandwidth)

- 1) The Ripple & noise test need 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.
- 2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length $30\text{cm} \pm 2\text{cm}$) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be started after input power on.



Product Performance Curves

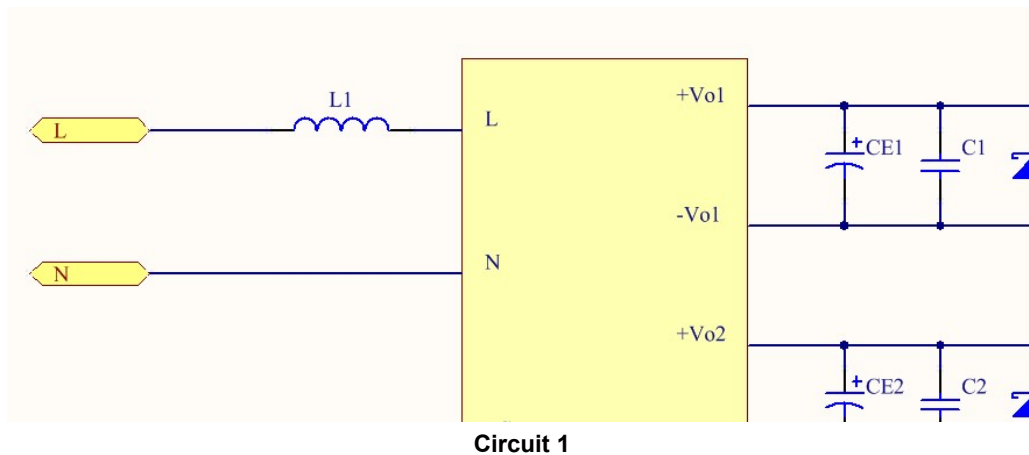


Note 1 - The output power should be derated based on the input voltage derating curve at 85~150VAC/110~212VDC.

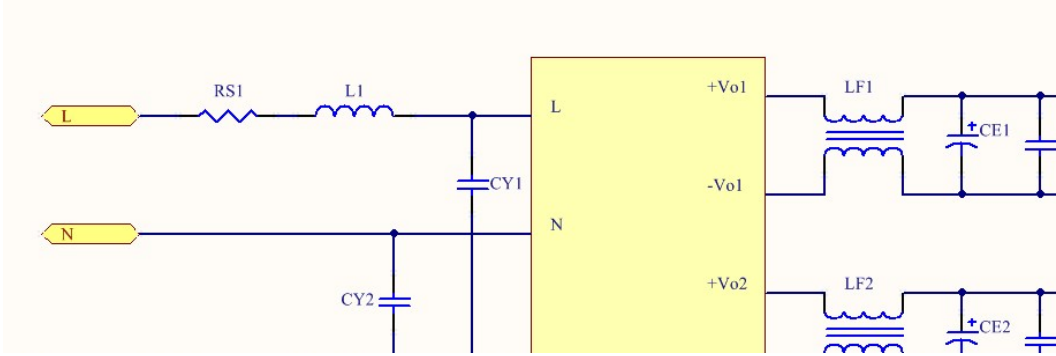
Note 2 - This product should operate at a natural air condition, please contact us if it need be used at a closed space.

Recommended Circuits for Application

1. Typical Application Circuit



2. Recommended Circuit for EMC



Circuit 2

Component No.	Description	Recommended parameter
RS1	Wire-wound resistor	3W/6.8Ω
L1	Drum choke	680uH/1A
CY1, CY2	Y capacitor	Y1/102M/400V
LF1, LF2	Common-mode Choke	Toroidal 150uH/2A
CE1	Electrolytic capacitor	680uF/16V
CE2	Electrolytic capacitor	220uF/16V
C1, C2	Ceramic SMD capacitor	0.1uF/50V
TVS1, TVS2	TVS	SMBJ20.0A

Application Notice

- 1.The products should be used according to the specifications in this datasheet, otherwise it could be permanently damaged.
2. The product performance in this datasheet cannot be guaranteed if it works at a lower load than the minimum load defined.
3. The product performance in this datasheet cannot be guaranteed if it works under over-load condition.
4. Unless otherwise specified, all values or indicators in this datasheet are tested at Ta=25℃, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
5. All values or indicators in this datasheet had been tested based on Aipupower test specifications.
- 6.The specifications are specially for the parts listed in this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
7. Aipupower can provide customization service.

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