

Typical Features

- ◆ Wide input voltage range 80-750VDC
- ◆ No load power consumption $\leq 1.2W@500VDC$
- ◆ Efficiency up to 85% (Typ.)
- ◆ Switching frequency 65KHz
- ◆ Input anti-reverse connection & under voltage protections
Output over voltage, short circuit & over current protections
- ◆ Isolation voltage 4000VAC
- ◆ With UL certificate (UL1741 E532422)
- ◆ With CE certificate (EN62109-1)
- ◆ Enclosed plastic case, flame class UL94-V0
- ◆ Altitude during operation 5000m Max



Application Field

DD50-380SXXG2N4 series --- Compact size, high efficiency DC/DC modular converters with both UL1741& EN62109 certificates, and wide input voltage range, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safety isolated and good EMC performance. This series of products can be widely used in the fields of Solar power generation, Home energy storage and so on. The multi-protection functions can keep the power supply and load safer when the unit operates under abnormal condition. The additional circuit diagram for EMC is recommended for the application with higher EMC requirement.

Typical Product List

Certificate	Part No	Output Specifications			Max. Capacitive Load (uF)	Ripple & Noise @20MHz (Max) mVp-p	Efficiency @full load/300VDC (Typ.) %
		Power (W)	Voltage Vo(V)	Current Io(mA)			
		UL&CE	DD50-380S12G2N4	50			
UL&CE	DD50-380S24G2N4	50	24	2083	820	200	85

Note 1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 2: 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 3: The ripple and noise is tested by the twisted pair method, please refer to the Ripple & Noise test instruction.

Note 4: Please contact Aipu sales for other output voltages requirement in this series but not in this table.

Input Specifications

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	DC Input	80	300	750	VDC
Input Current	Input 150VDC	-	-	0.50	A
	Input 750VDC	-	-	0.08	
Surge Current	Input 750VDC	-	80	-	
No Load Power Consumption	Input 500VDC	-	-	1.2	W

Under Voltage Protection	Start protection	35	-	45	VDC
	Protection recovery	70	-	80	
Recommended External Fuse	-	3A/1000VDC necessary			
Hot Plug	-	N/A			

Output Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		Full input voltage range, any load	-	±2.0	-	%
Line Regulation		Rated load	-	±1.0	-	
Load Regulation		Nominal input voltage, 0%~100% load	-	±2.0	-	
Minimum Load		Single output	0	-	-	%
Turn-on Delay Time		Input 300VDC	-	-	3000	mS
Power-off Hold Up Time		Input 750VDC	-	10	-	mS
Dynamic Response	Overshoot Range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery Time	50%~75%~50%	-5.0	-	+5.0	mS
Output Overshoot		Full input voltage range	≤10%Vo			%
Short Circuit Protection			Continuous, self-recovery			Hiccup
Drift Coefficient		-	-	±0.02%	-	%/°C
Over Current Protection		Full input voltage range	≥110% Io, self-recovery			Hiccup
Over Voltage Protection		Output 12VDC	≤20			V
		Output 24VDC	≤32			

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		Refer to the temperature derating graph	-40	-	+70	°C
Storage Temperature		-	-40	-	+85	
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 ≤10mA	4000	-	-	VAC
Insulation Resistance	I/P-O/P	@ DC500V	50	-	-	MΩ
Safety Standard		-	EN62109-1, UL1714			
Vibration		-	10-55Hz, 10G, 30 Min, along X,Y,Z			
Safety Class		-	CLASS II			
Case Flame Class		-	UL94-V0			
MTBF		MIL-HDBK-217F 25°C	>300,000H			

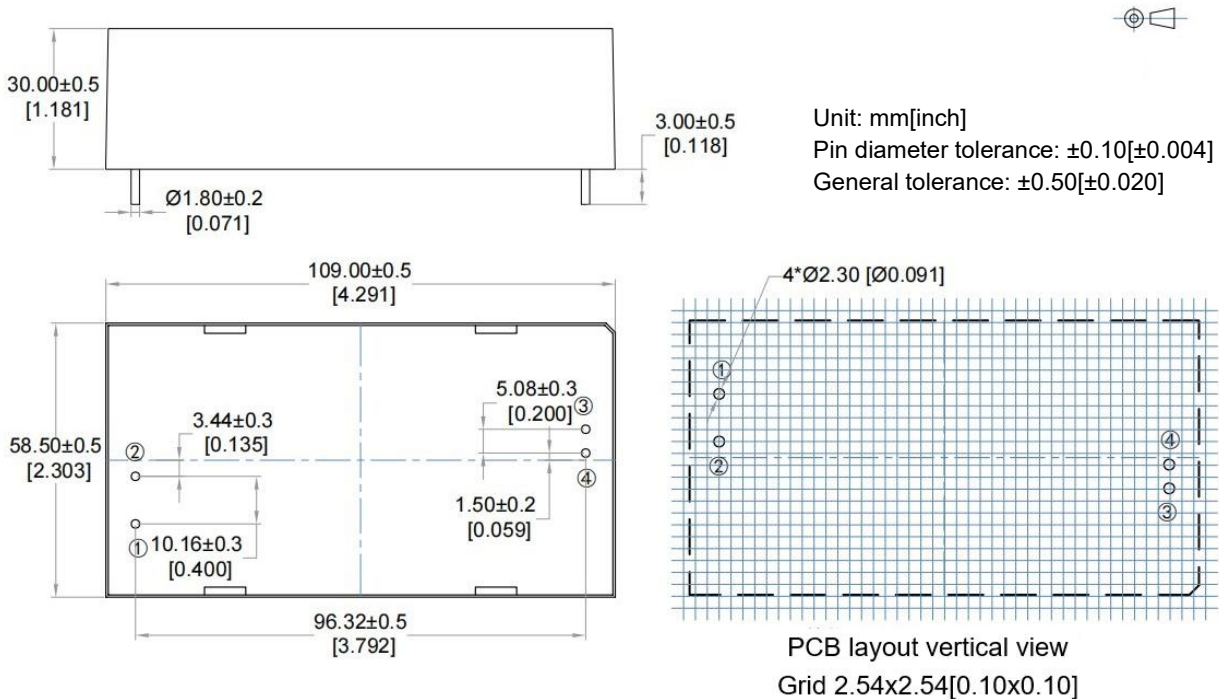
Physical Characteristics

Case Material		Plastic in Black, flame class UL94-V0
Dimensions	Horizontal Package	109.00x 58.50 x 30.00 mm
Unit Weight		260g (TYP)
Cooling Method		Natural air

EMC Performance

Total-item	Sub-item	Standard	Performance/Class	
EMC	EMI	CE	CISPR22/EN55032 CLASS A	
		RE	CISPR22/EN55032 -	
	EMS	RS	IEC/EN61000-4-3	10V/m perf.Criteria A
		CS	IEC/EN61000-4-6	10Vr.m.s perf.Criteria A
		ESD	IEC/EN61000-4-2	Contact ±6KV/ Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	Line to line ±1KV, line to ground ±2KV Perf.Criteria B (With the recommended circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B

Mechanical Dimensions



Package Code	Dimensions L x W x H	
G2	109.00 x 58.50 x 30.00 mm	4.291x 2.303x1.181 inch

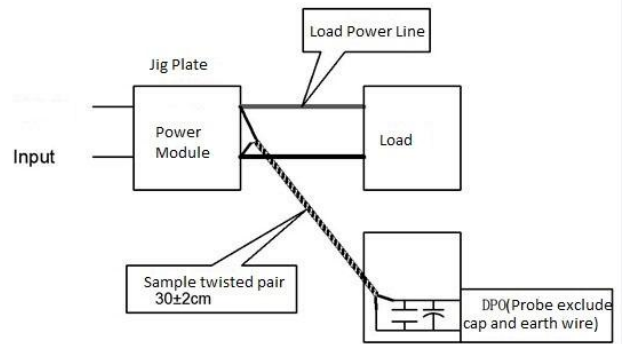
Pin-out Function Description

Pin No.	1	2	3	4
Single(S)	-Vin	+Vin	-Vo	+Vo

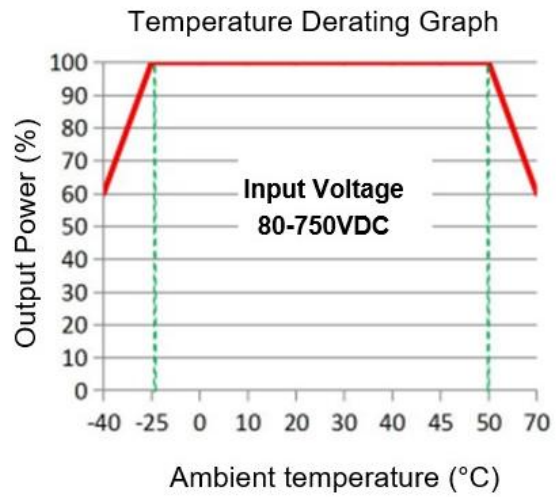
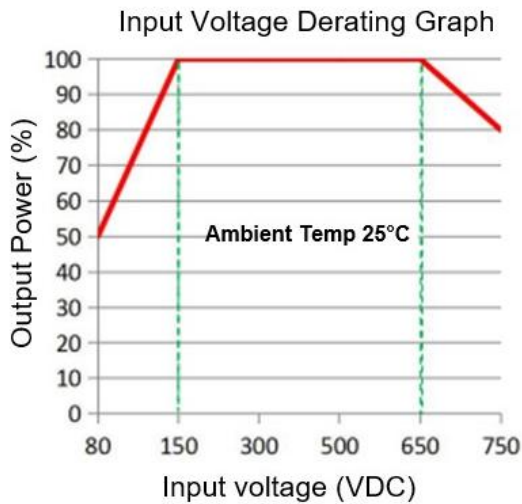
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz bandwidth)

1) The Ripple & noise test needs 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 30cm±2 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 start after input power on.



Product Characteristics Graphs



Note 1: The output power should be derated based on the input voltage derating graph at 80~150VDC & 650~750VDC.

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

Note 3: The temperature derating should work together with the input voltage derating.

Recommended Circuits for Application

1. Typical application circuit diagram

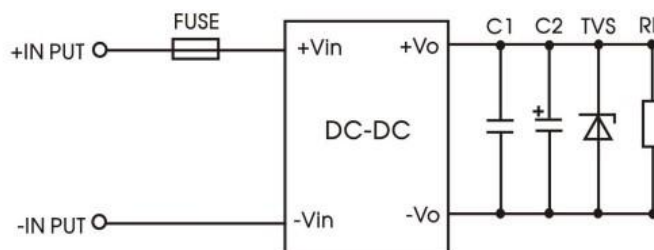


Figure – Circuit 1

Part No.	FUSE	C1	C2	TVS
DD50-380S12G2N4	3A /1000VDC Necessary	1uF/25V	10uF/25V	SMBJ20A
DD50-380S24G2N4	3A /1000VDC Necessary	1uF/50V	10uF/35V	SMBJ30A

2. Recommended EMC circuit diagram

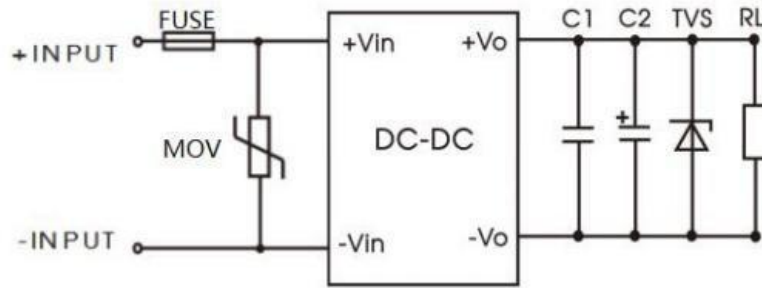


Figure - Circuit 2

Part No.	FUSE	C1	C2	TVS	MOV
DD50-380S12G2N4	3A /1000VDC Necessary	1UF/25V	10UF/25V	SMBJ20A	14D102K/6000A Necessary
DD50-380S24G2N4	3A /1000VDC Necessary	1UF/50V	10UF/35V	SMBJ30A	14D102K/6000A Necessary

Note: UL approved VPR/MLV=4000V Surge protection device is recommended at input for actual application

Application Notice

1. The products should be used according to the specifications in this datasheet, otherwise it could be permanently damaged.
2. A fuse should be connected at input.
3. The product performance in this datasheet cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance in this datasheet cannot be guaranteed if it works at over-load condition.
5. Unless otherwise specified, all values or indicators in this datasheet are tested at Ta=25°C, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
6. All values or indicators in this datasheet had been tested based on Aipupower test specifications.
7. 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.
8. Aipupower can provide customization service.

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