Typical Features

- Wide input voltage range (4:1), output power 6W
- Efficiency up to 88% (Typ.)
- Fast start-up
- Standby power consumption 0.2W (Typ.)
- Continuous short circuit protection, self-recovery
- Input under voltage protection
- Output over voltage & over current protections
- Isolation voltage 3000VDC
- Operating temperature from -40°C to +85°C
- Good EMC performance
- Standard pin-out alignment

Application Field

DD6-XXDXXE3(C)3 Series ---- DC-DC modular converters with 6W output power, isolation voltage 3000VDC, input under voltage protection, output over voltage, short circuit & over current protections. This series of products can be widely used in the fields of Industrial control, Instrumentation, Communications, Electric power and IoT, etc. Additional EMC circuit diagram is recommended for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Input Voltage		Output Voltage/Current (Vo/Io)		Input Current (mA) Typ. @Nominal volt		Max Capacitive Load	Efficiency (%) @Full load, nominal volt.	
		Nominal (VDC)	Range (VDC)	Vo (VDC)	Io (mA) Max/Min	Full load	No load	(uF)	Min	Typ.
-	DD6-18D05E3(C)3	24	9-36	±5	±600/0	305	5	1000	80	82
-	DD6-18D12E3(C)3			±12	±250/0	294	5	680	83	85
-	DD6-18D15E3(C)3			±15	±200/0	291	5	680	86	88
-	DD6-18D24E3(C)3			±24	±125/0	291	5	470	84	86
-	DD6-36D05E3(C)3	48	18-75	±5	±600/0	151	4	1000	81	83
-	DD6-36D12E3(C)3			±12	±250/0	144	4	680	85	87
-	DD6-36D15E3(C)3			±15	±200/0	142	4	680	86	88
-	DD6-36D24E3(C)3			±24	±125/0	145	4	470	84	86

Note 1: The part number letter C indicates the part with ON/OFF Control function, N indicates NO Control function.

Note 2: The maximum capacitive load is the capacitance allowed to be used when the power supply starts at full load. The converter may not start if the capacitor exceeds this value.

Note 3: Please contact Aipu sales for other output voltages requirements of this series but not listed in this table.

Input Specifications

Item	Test Conditions	Min	Typ.	Max	Unit
Standby power consumption	Full input voltage range	/	0.2	/	W
Input current	Full input voltage range	/	0.9	/	A
Start-up voltage	Nominal input 24V series	/	/	9	VDC
	Nominal input 48V series	/	/	18	
Under voltage protection	Nominal input 24V series	/	6.5	/	VDC
	Nominal input 48V series	/	13	/	
Input inrush voltage (1sec.max)	Nominal input 24V series	-0.7	/	50	VDC
	Nominal input 48V series	-0.7	/	100	
Reflected ripple current	Nominal input voltage	/	20	/	mA
Hot-plug	/	NA			
Input filter	/	Pi type filter			
ON/OFF control (Ctrl)	Turn ON the converter	No connection or connected to high level (3.3-12VDC)			
	Turn OFF the converter	Connected to -Vin or the low level (0-1.2VDC)			
	The current for switching OFF	/	2	/	mA
Note: The voltage of Ctrl is relative with the input -Vin.					

Output Specifications

Item	Test Conditions		Min	Typ.	Max	Unit
Output voltage accuracy	0% - 100% load	+Vo	/	±1	±3	%
		-Vo	/	±1	±3	
Cross regulation	+Vo with 50% load, -Vo with 10-100% load		/	±3	±5	%
Line regulation	Full input voltage range, full load	+Vo	/	±0.3	±0.5	%
		-Vo	/	±0.5	±1	
Load regulation	10% - 100% load	+Vo	/	±0.5	±1	%
		-Vo	/	±0.5	±1.5	
Ripple & Noise	25% - 100% load, 20MHz bandwidth		/	50	100	mVp-p
Dynamic response deviation	25% rated load step, nominal input voltage	5V output	/	±5	±8	%
		Others	/	±3	±5	
Dynamic response time	25% rated load step, full input voltage range		/	300	500	uS
Temperature drift coefficient	/		/	/	±0.03	%/℃
Turn-on delay time	Nominal input voltage		/	10	/	mS
Output overshoot	Full input voltage range		/	/	10	%Vo
Over voltage protection			120	160	200	%Vo
Over current protection			110	160	280	%Io
Short circuit protection			Continuous, Self-recovery			
Note: Ripple & Noise ≤5%Vo at 0%-25% load, it is tested by the Parallel-line method (please refer to the following test instruction).						

General Specifications

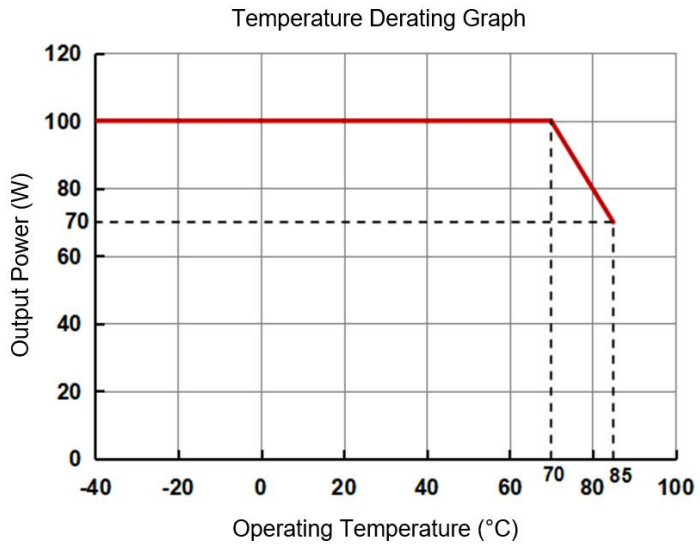
Item	Test Conditions		Min	Typ.	Max	Unit
Switching frequency	Operating Mode (PWM)		/	330	/	KHz
Operating temperature	Refer to Temperature Derating Graph		-40	/	+85	℃
Storage temperature	/		-55	/	+125	℃
Case temperature Max	Within the operating derating range		/	/	+105	℃
Pin soldering temperature	1.5mm from the case, soldering time 10S		/	/	300	℃
Relative humidity	No condensing		5	/	95	%RH
Isolation voltage	I/P-O/P	Test 1min, leakage current <1mA	3000	/	/	VDC
Insulation resistance	I/P-O/P	@ 500VDC	1000	/	/	MΩ
MTBF	MIL-HDBK-217F@25℃		1000	/	/	K hours
Cooling method	Nature air					
Vibration	10-150Hz, 5G, 0.75mm, along X, Y and Z					
Case material	Aluminum					

Weight/Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H	
	DD6-XXDXXE3(C)3	22g	31.80×20.30×11.60 mm	1.252×0.799×0.457 inch

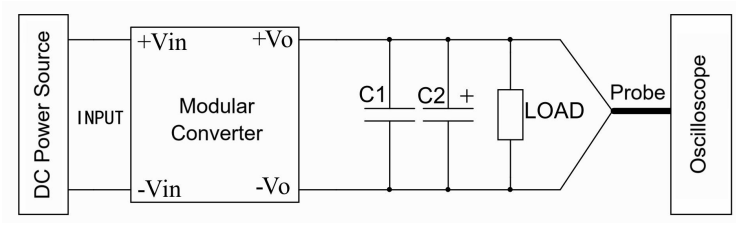
EMC Performances

Item			Test standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended EMC Circuit)
		RE	CISPR32/EN55032	CLASS B (with the Recommended EMC Circuit)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf. Criteria B
		CS	IEC/EN61000-4-6	3V r.m.s Perf. Criteria B
		ESD	IEC/EN61000-4-2	Contact ±4KV Perf. Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf. Criteria B (with the Recommended EMC Circuit)
		EFT	IEC/EN61000-4-4	±2KV Perf. Criteria B (with the Recommended EMC Circuit)

Temperature Derating Graph



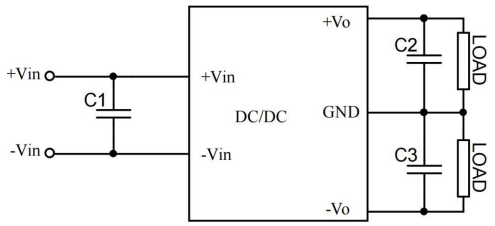
Ripple & Noise Test Instruction (Parallel-line Method, 20MHz Bandwidth)



1. The Ripple & Noise test needs the cables in parallel, an oscilloscope that should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. One polypropylene capacitor C1(0.1uF) and one high frequency low impedance electrolytic capacitor C2(10uF) are connected in parallel with the probe.
2. Refer to the test diagram, 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 test can start at the converter output terminals after the input power on.
3. Balanced loads are needed for the dual outputs test.
4. The maximum capacitive load is tested at full load (pure resistance load).

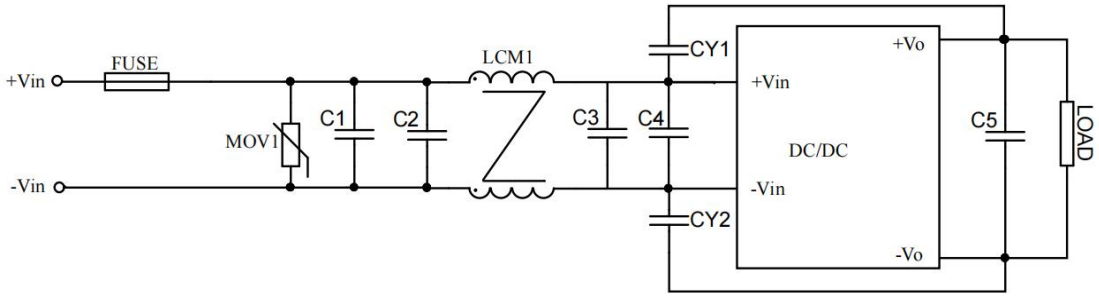
Recommend Circuits for Application

1. All this series of converters will be tested according to below circuit diagram, increasing the capacitances of C2 & C3 can decrease the output ripple, but they must be less than the Maximum capacitive loads defined.



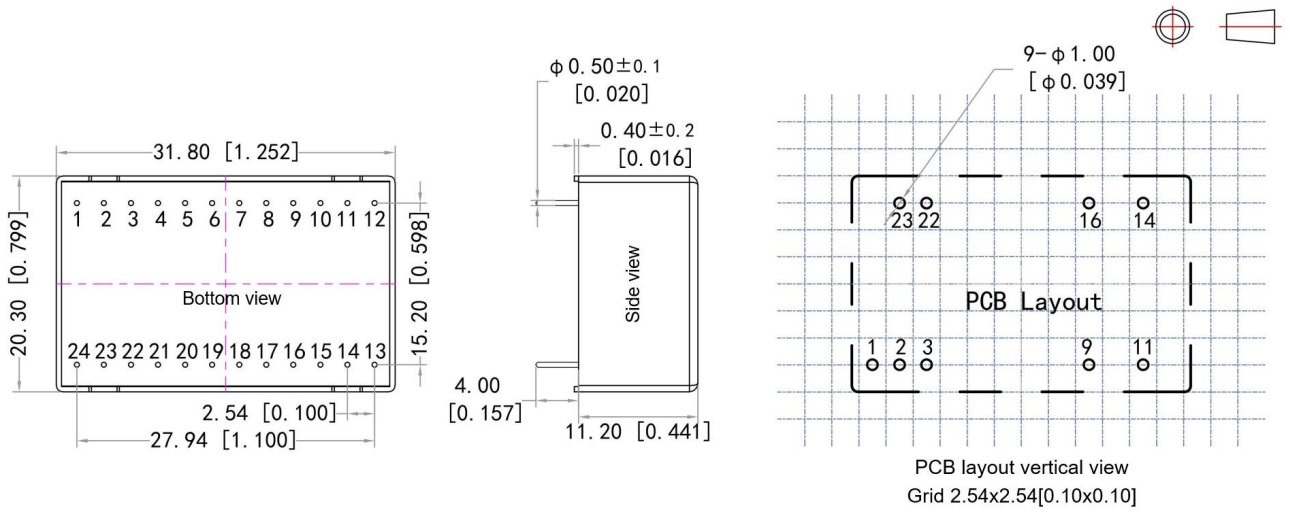
Components	Parameters
C1	100uF/100V
C2, C3	100uF/50V

2. Recommended EMC circuit diagram



Components	DD6-18DXXE3C3	DD6-36DXXE3C3
FUSE	TBD by the customer	
MOV1	14D470K	14D101K
C1, C4	330uF/50V	330uF/100V
LCM1	5mH	
C2, C3	10uF/50V	10uF/100V
C5	100uF/50V	
CY1, CY2	1nF/3000V	

Mechanical Dimensions



PCB layout vertical view
Grid 2.54x2.54[0.10x0.10]

Unit: mm [inch]
General tolerance: ±0.50 [±0.020]
Pin diameter tolerance: ±0.10 [±0.004]

Pin-out Function Description

Pin No.	1	2	3	9	11	14	16	22	23
DD6-XXDXXE3C3	Ctrl	-Vin	-Vin	GND	-Vo	+Vo	GND	+Vin	+Vin
DD6-XXDXXE3N3	No Pin	-Vin	-Vin	GND	-Vo	+Vo	GND	+Vin	+Vin

Application notice

1.The product should be used according to the specifications, otherwise it could be permanently damaged.

2. The product performance cannot be guaranteed if it works at a lower load than the minimum load defined.

3. The product performance cannot be guaranteed if it works under over-load condition.

4. Unless otherwise specified, all values or indicators on this datasheet are tested at Ta=25℃, humidity<75%RH, nominal input voltage and rated load (pure resistance load).

5. All values or indicators on this datasheet have been tested based on Aipupower test specifications.

6.The specifications are specially for the parts listed on 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.

8. The product should operate under the condition of nature air, please contact us if it could be used at a closed space.

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