Typical Features

- Wide input voltage range (2:1)
- Efficiency up to 84% (Typ.)
- Standby power consumption 0.075W (Typ.)
- Operating temperature from -40°C to +85°C
- Input under voltage protection
- Output short circuit, over current & over voltage protections
- Isolation voltage 3000VDC
- Standard pin-out alignment

Application Field

DD3-XXSXXE3(C)3 Series ---- DC-DC modular converters with 3W output power, isolation voltage 3000VDC, with output over voltage, short circuit & over current protections, operating temperature range from -40°C to +85°C and ON/OFF control function. 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 voltage		Max Capacitive Load	Ripple & Noise (mVp-p)		Efficiency @Full load, nominal voltage	
		Nom. (VDC)	Range (VDC)	Vo (VDC)	Io (mA) Max/Min	Full load	No load	(uF)	Typ	Max	Min (%)	Typ. (%)
-	*DD3-05S05E3(C)3	5	4.5 - 9	5	600/0	741	15	2000	50	100	78	80
-	DD3-05S12E3(C)3			12	250/0	714	15	1000	50	100	81	83
-	*DD3-05S15E3(C)3			15	200/0	714	15	680	50	100	81	83
-	*DD3-05S24E3(C)3			24	125/0	706	15	470	50	100	83	84

Note 1: The * marked parts have been developed in process. The part number letter C indicates the part with ON/OFF Control function, N indicates NO Control function.

Note 2: The typical value of efficiency is tested at nominal input voltage and rated load.

Note 3: 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 4: The chip could work at lower frequency at no load or low load to decrease the no load power and improve the efficiency.

Note 5: 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	/	0.075	/	W
Input inrush voltage (1sec.max)	Nominal input 5V series	-0.7	/	15	VDC
Start-up voltage		/	/	4.5	
Under voltage protection		3.4	3.7	/	

Reflected ripple current	Nominal input voltage, with the recommended external circuit	/	20	/	mA
Hot-plug	/	NA			
Input filter	/	Pi type filter			

Output Specifications

Item	Test Conditions	Min	Typ.	Max	Unit
Output voltage accuracy	Funn input voltage range, 0% - 100% load	/	±1	±3	%
Line regulation	Full input voltage range, full load	/	±0.2	±0.5	%
Load regulation	5% - 100% load	/	±0.5	±1	%
Ripple & Noise	5% - 100% load, 20MHz bandwidth	/	50	100	mVp-p
Dynamic response deviation	25% rated load step change	/	±3	±5	%
Dynamic response time	25% rated load step, full input voltage range	/	300	500	uS
Temperature drift coefficient	Full load	/	/	±0.03	%/℃
Turn-on delay time	Nominal input voltage, constant resistance load	/	10	/	mS
Output overshoot	Full input voltage range	/	/	10	%Vo
Over voltage protection		110	/	160	%Vo
Over current protection		110	150	260	%Io
Short circuit protection		Continuous, Self-recovery			
Note: Ripple & Noise ≤5%Vo at 0%-5% load, it is tested by the Parallel-line method (please refer to the following test instruction).					

General Specifications

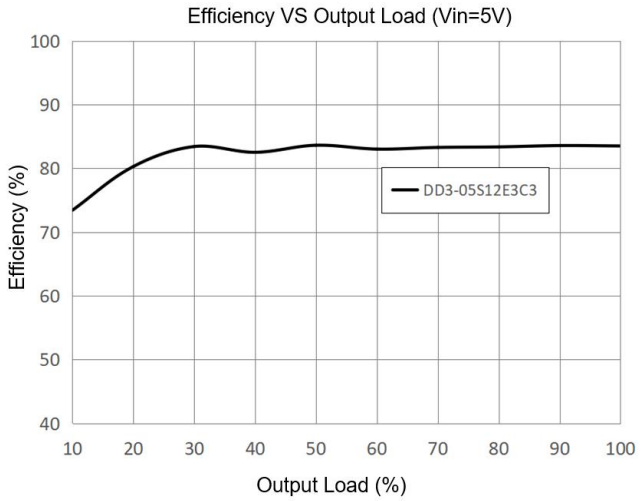
Item	Test Conditions		Min	Typ.	Max	Unit
Switching frequency	Operating Mode (PWM)		/	300	/	KHz
Operating temperature	Refer to Temperature Derating Graph		-40	/	+85	℃
Storage temperature	/		-55	/	+125	℃
Pin soldering temperature	1.5mm from the case, soldering time 10S		/	/	300	℃
Relative humidity	No condensing		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					
Case material	Aluminum					

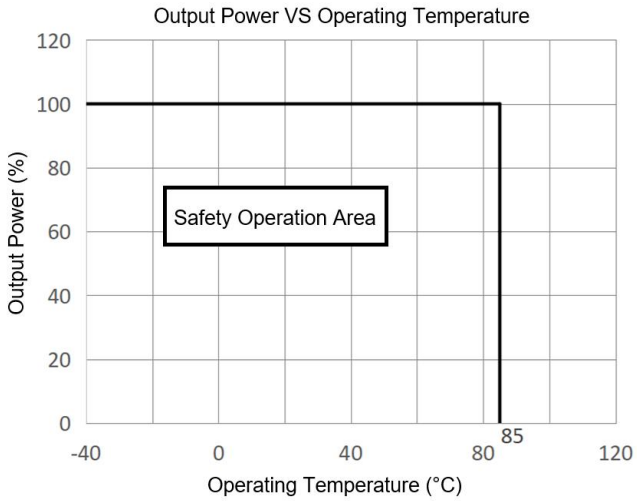
Weight/Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H	
	DD3-XXSXXE3(C)3	15g	31.80×20.30×11.60 mm	1.252×0.799×0.457 inch

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 A
		CS	IEC/EN61000-4-6	3V r.m.s Perf. Criteria A
		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)
		Voltage dips & interruptions	IEC/EN61000-4-11	0%~70% Perf. Criteria A

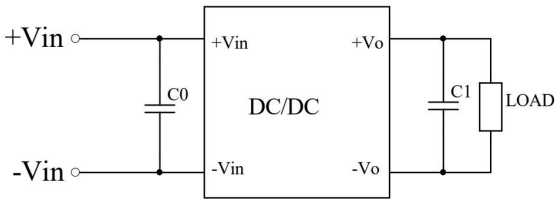
Product Characteristics Graphs





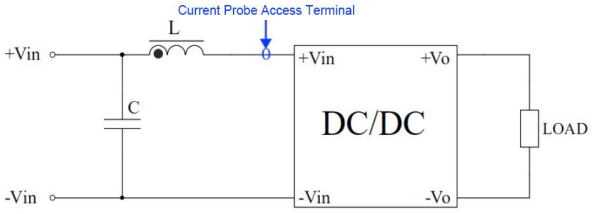
Recommend Circuits for Application

1. All this series of converters will be tested according to below circuit diagram, increasing the capacitance of C1 can decrease the output ripple, but it must be less than the Maximum capacitive load defined.



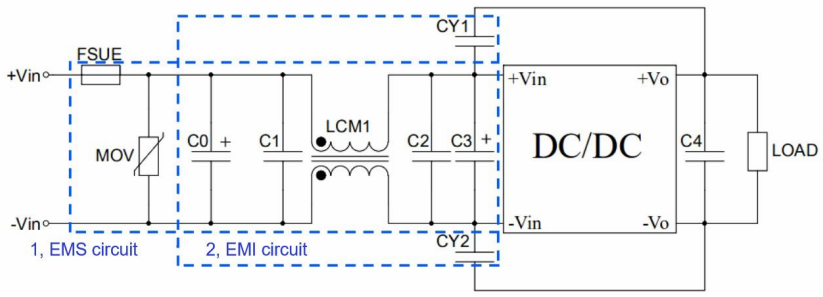
Components	Parameters
C0	100uF/25V
C1	10uF/25V

2. Input reflected ripple current test circuit diagram



Components	Parameters
C	100uF/25V
L	4.7uH

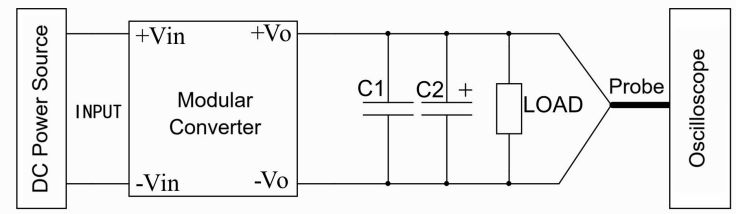
3. Recommended EMC circuit diagram



Components	5VDC input
FUSE	TBD by customer
MOV	10D470K
C0, C3	330uF/50V
C1, C2, C4	10uF/50V
LCM1	10mH
CY1, CY2	2.2nF/3KV

Note: Part 1 circuit is for EMS test, part 2 for EMI filtering, both can be adjusted according to the actual situation.

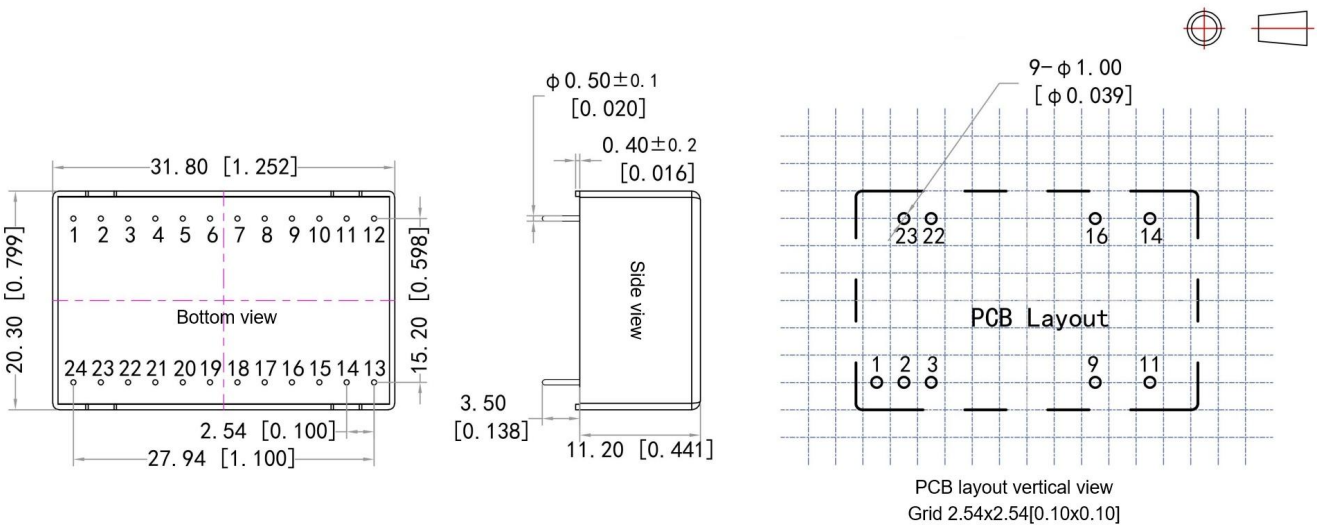
Ripple & Noise Test Instruction (Parallel-line Method, 20MHz Bandwidth)



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.

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
DD3-XXSXXE3C3	Ctrl	-Vin	NP	NC	+Vo	GND	+Vin
DD3-XXSXXE3N3	NP	-Vin	NP	NC	+Vo	GND	+Vin

Note: NP means No Pin, NC means No Connection

Application notice

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

2. The product is not available to be used in parallel to increase the output power.

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

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

5. 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).

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

7.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.

8. Aipupower can provide customization service.

9. 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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