DC/DC Converter
DD10-XXDXXE3(C)2 Series

Typical Features

- ◆ Wide input voltage range (2:1), output power 10W
- ◆ Efficiency 87% (Typ.)
- ◆ Low standby power consumption 0.3W (Typ.)
- ◆ Output fast start-up
- ◆ Continuous short circuit protection, self-recovery
- ◆ Input under-voltage, output over-voltage, short circuit, over-current protections
- ◆ Isolation voltage 1500VDC
- ◆ Operating Temperature from -40℃ to +85℃
- ◆ Good EMC performance
- ◆ Standard pin-out alignment

Application Filed

DD10-XXDXXE3(C)2 Series ----- *10W DC-DC modular converters with isolation voltage 1500VDC between input and output, input under-voltage, output over-voltage, short circuit and over-current protection functions. This series of products can be widely used in the fields of industrial control, instrument, communication, electricity power and IoT, 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.	Input voltage Range (VDC)		Output voltage /Current (Vo/Io)		Input current (mA) Typ. @nominal voltage		Max. Capacitive Load	Ripple & Noise (mVp-p)		Efficiency (%) @full load	
		Nominal	Range	Vo (VDC)	Io(mA) Max/Min	Full Load	No Load	uF	Typ	Max	Min	Typ
-	DD10-12D05E3(C)2	12	9-18	±5	1000/0	1004	25	1000	50	100	81	83
-	DD10-12D15E3(C)2	12	9-18	±15	333/0	958	25	470	50	100	84	86
-	DD10-24D12E3(C)2	24	18-36	±12	416/0	478	12	470	50	100	85	87
-	DD10-48D12E3(C)2	48	36-75	±12	416/0	239	12	470	50	100	85	87
-	DD10-48D15E3(C)2	48	36-75	±15	333/0	239	6	470	50	100	85	87

Note 1 - In the part numbers C indicates the part with remote Control function, N indicates without Control.

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

Note 3 - The typical value of the efficiency is tested at nominal input voltage and rated load.

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

Input Specifications

Item	Test Conditions	Min.	Typ.	Max.	Unit
Standby power consumption	Full input voltage range	/	0.3	/	W
Under-voltage Protection	12V nominal input	/	7	/	VDC
	24V nominal input	/	13	/	VDC

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	48V nominal input	/	24	/	VDC
Start-up overshoot voltage	10%-100% load, dual output balanced	/	/	10	%Vo
Input Filter	/	Pi filter			
Remote control (Ctrl)	Turn-on the converter	No connection or connect to high level (3.3V-12VDC)			
	Shut-off the converter	Connected to -Vin or low level（0-1.2VDC）			
	Current value to shut off the converter	5mA (TYP)			
The voltage of Ctrl is relative to the input -Vin.					

Output Specifications

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full input voltage range, rated load	Vo1	/	±1	±3	%
		Vo2	/	±1	±3	
Voltage Regulation	Full input voltage range, full load	Vo1	/	±0.3	±0.5	
		Vo2	/	±0.5	±1	
Load Regulation	5% ~ 100% load	Vo1	/	±0.5	±1	
		Vo2	/	±0.5	±1.5	
Ripple & Noise	0%-100% load, 20MHz bandwidth		/	50	100	mVp-p
Dynamic Recovery Time	25% of rated load step, nominal input voltage	/	/	200	500	uS
Dynamic Response Deviation		5V output	/	±5	±8	%
		Others	/	±3	±5	
Turn-on delay time	Input nominal voltage		/	100	/	mS
Over-voltage Protection	Full input voltage range		120	160	200	%Vo
Over-current Protection			110	160	280	%Io
Short Circuit Protection			Continuous, Self-recovery			

General Specifications

Item	Test Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	Operating mode (PWM)	/	330	/	KHz
Operating Temperature	Refer to the temperature derating curve	-40	/	+85	℃
Storage Temperature	/	-55	/	+125	
Case temperature	/	/	/	+105	
Pin soldering temperature	1.5mm from the case, 10 seconds	/	/	300	
Relative Humidity	No condensing	5	/	95	%RH
Isolation Voltage	I/P-O/P, test 1min, leakage current ≤1mA	1500	/	/	VDC
Insulation Resistance	I/P-O/P, @ 500VDC	1000	/	/	MΩ
MTBF	MIL-HDBK-217F@25℃	1000	/	/	K hours
Vibration	/	10-150Hz, 5G, 0.75mm, along X, Y, Z			
Cooling Method	Nature air				

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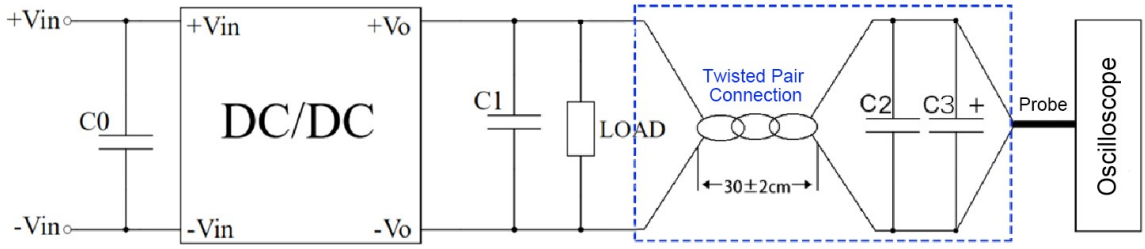
Case Material	Aluminum			
Weight/Dimension	Part No.	Weight (Typ.)	Dimensions L x W x H	
	DD10-XXDXXE3(C)2	22g	31.60×20.30×12.00 mm	1.244×0.799×0.472 inch

EMC Performance

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

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



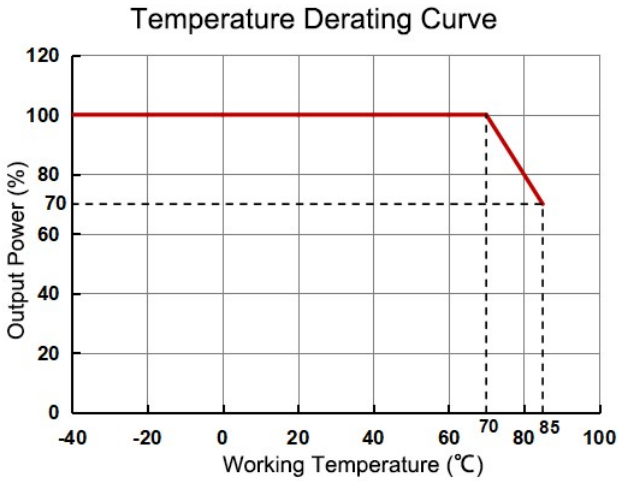
1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. C2(0.1uF) polypropylene capacitor and C3(10uF) high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes and one side of the twisted pair. C0 & C1 refer to the application circuit recommended.

2) The power supply output connects to the load by the cables. The other side of the twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the polarity of the output and the oscilloscope probe should not be reversed. The test can be started after input power on.

3) The balance load is critical for the dual output product.

4) The maximum capacitive load is tested at full load (pure resistance load).

Product Performance Curve



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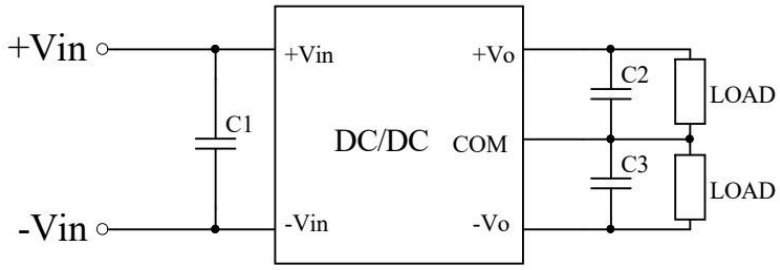
Recommended Circuits for Application

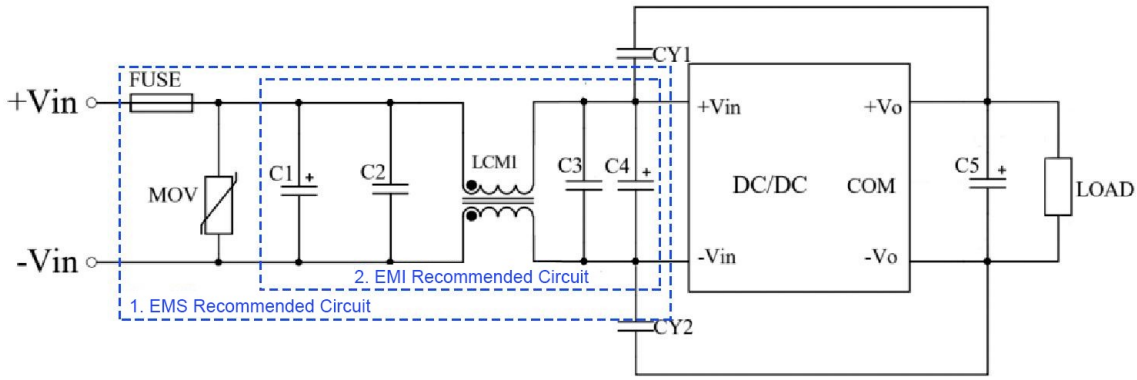
1. DC/DC test circuit

All this series of converters will be tested according to this circuit below before shipping. The output ripple can be decreased with C2 & C3 capacitance increasing, the output capacitance must be less than the maximum capacitive load.



Component	Parameter
C1	100uF/100V
C2, C3	100uF/50V

2. Recommended EMC Circuit



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

Component	Vin=12VDC	Vin=24VDC	Vin=48VDC
FUSE	TBD by customer		
MOV	14D470K	14D470K	14D101K
C1, C4	330uF/50V	330uF/50V	330uF/100V
LCM1	5mH	5mH	5mH
C2, C3	10uF/50V	10uF/50V	10uF/100V
C5	100uF/50V	100uF/50V	100uF/50V
CY1, CY2	2.2nF/2000V		

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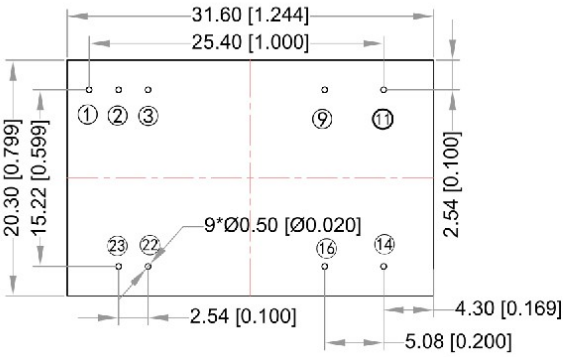
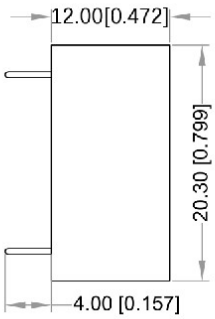
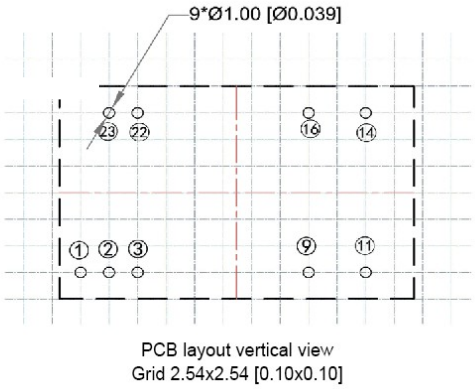
Mechanical Dimensions







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

Pin Function Description

Pin No.	1	2, 3	9	11	14	16	22, 23
DD10-XXDXXE3C2	Ctrl	-Vin	GND	-Vo	+Vo	GND	+Vin
DD10-XXDXXE3N2	No Pin	-Vin	GND	-Vo	+Vo	GND	+Vin

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 at 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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