

Typical Features

- ◆ Wide input voltage range (4:1)
- ◆ Efficiency up to 85% (Typ.)
- ◆ No-load power consumption 0.2W@110VDC
- ◆ Continuous short circuit protection, self-recovery
- ◆ Input under-voltage protection, output short circuit, over current, over voltage protections
- ◆ Operating Temperature from -40°C to +85°C
- ◆ Isolation Voltage 2250VDC
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ Conform to Railway Applications standard EN50155



Application Field

PFD6-110DXXA3(C)3 series ---- Standard size 2"x1" package DC-DC modular converters with wide input voltage range 4:1, isolated & regulated dual outputs 6W. This series of products can be widely used in the fields of Industrial control, Instrument, Communication, Electricity power and IoT, etc. The additional EMC circuit diagram 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		Input Current (mA) Typ. @Nom. Volt.		Capacitive Load	Ripple & Noise (mVp-p)		Full Load Efficiency (%)	
		Nom.	Range	Voltage (VDC)	Current (mA)	Full Load	No Load	(uF) Max	Typ.	Max	Min	Typ.
-	PFD6-110D15A3(C)3	110	40~160	±15	200/0	64	2	100	50	100	83	85

Note 1: In the part numbers C indicates the part with Remote Control function, N indicates with NO Control. The suffix -H indicates the part with Heat sink, -T (H) indicates a kind of chassis package (with heat sink), -TS (H) indicates a kind of package of DIN Rail (with heat sink) which width is 35mm.

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 operates at full load. The converter may not start if the capacitor exceeds this value.

Input Specifications

Item	Test Conditions	Min.	Typ.	Max.	Unit
No-load Power Consumption	Nominal input voltage	/	0.2	/	W
Input Inrush voltage (1sec. Max)	Full input voltage range	-0.7	/	180	VDC
Start-up voltage	/	/	/	40	
Under-voltage Protection	/	26	31	/	
Turn-on Delay	/	/	10	/	mS
Reflected Ripple Current	Full input voltage range	/	25	/	mA
Hot Plug	/	Unavailable			
Input Filter	/	π filter			

*Ctrl	Turn on the Converter	No connection or connect to TTL high level (3.5-12VDC)
	Turn off the Converter	Connects to the GND or low volt. level (0-1.2VDC)
	Current value for switching off	3mA (TYP)

*Note: The Ctrl voltage is relative to input -Vin.

Output Specifications

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full input voltage range, rated load		/	±1	±3	%
Voltage Regulation	Full input voltage range, rated load	Vo1	/	±0.2	±0.5	%
		Vo2	/	±0.5	±1	
Load Regulation	5%-100% load	Vo1	/	±0.5	±1	
		Vo2	/	±1	±1.5	
Cross Regulation	Vo1: 50% load; Vo2: 25%-100% load		/	/	±10	%
Ripple & Noise	5%-100% load, nominal input, 20MHz		/	50	100	mVp-p
Dynamic response deviation	25% of rated load step, nominal input voltage		/	±3	±5	%
Dynamic response Time			/	250	500	uS
Over voltage protection	Full input voltage range, rated load		110	120	160	%Vo
Over current protection			110	150	210	%Io
Short circuit protection			Continuous, self-recovery			

Note: The Ripple & Noise ≤5%Vo at 0% - 5% load, it is tested by the twisted pair method (20MHz bandwidth).

General Specifications

Item	Test Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	Operating Mode (PWM)	/	250	/	KHz
Operating Temperature	Refer to the Temperature Derating Graph	-40	/	+85	°C
Storage Temperature	/	-55	/	+125	
Case Temperature	Within the temperature derating	/	/	+105	
Pin soldering temperature	≥1.5mm from the case, time ≤10S	/	/	300	
Relative Humidity	No condensing	5	/	95	%RH
Isolation Voltage	I/P-O/P, 1 Min, leakage current <1mA	2250	/	/	VDC
	I/P & O/P – Case, 1Min, leakage current <1mA	1600	/	/	VDC
Insulation resistance	I/P-O/P, @ 500VDC	1000	/	/	MΩ
Isolation capacitance	I/P-O/P, @100KHz/0.1V	/	1000	/	pF
MTBF	MIL-HDBK-217F@25°C	1000	/	/	K hours
Cooling Method	Nature air				
Vibration	IEC/EN 61373 Category 1/Body Mounted Class B				
Case Material	Aluminum				

Weight / Dimensions	Part No.	Weight Typ.	Dimensions L x W x H	
	PFD6-110DXXA3(C)3	15g	25.4X 25.4X12.5 mm	1.00X1.00X0.492 inch
	PFD6-110DXXA3(C)3-H	19g	25.4X25.4X18.0 mm	1.00X1.00X0.708 inch
	PFD6-110DXXA3(C)3-T	37g	76.0X31.5X21.3 mm	2.99X1.24X0.838 inch
	PFD6-110DXXA3(C)3-TH	40g	76.0X31.5X26.0 mm	2.99X1.24X1.023 inch
	PFD6-110DXXA3(C)3-TS	57g	76.0X31.5X26.0 mm	2.99X1.24X1.023 inch
	PFD6-110DXXA3(C)3-TSH	60g	76.0X31.5X30.8 mm	2.99X1.24X1.212 inch

EMC Performances				
Total Items		Sub Items	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	CS	IEC/EN61000-4-6	10V r.m.s Perf.Criteria B (with the Recommended EMC Circuit)
		RS	IEC/EN61000-4-3	20V/m Perf.Criteria B (with the Recommended EMC Circuit)
		ESD	IEC/EN61000-4-2	Contact ±6KV, Air±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B (with the Recommended EMC Circuit)
		EFT	IEC/EN61000-4-4	±4KV Perf.Criteria B (with the Recommended EMC Circuit)

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

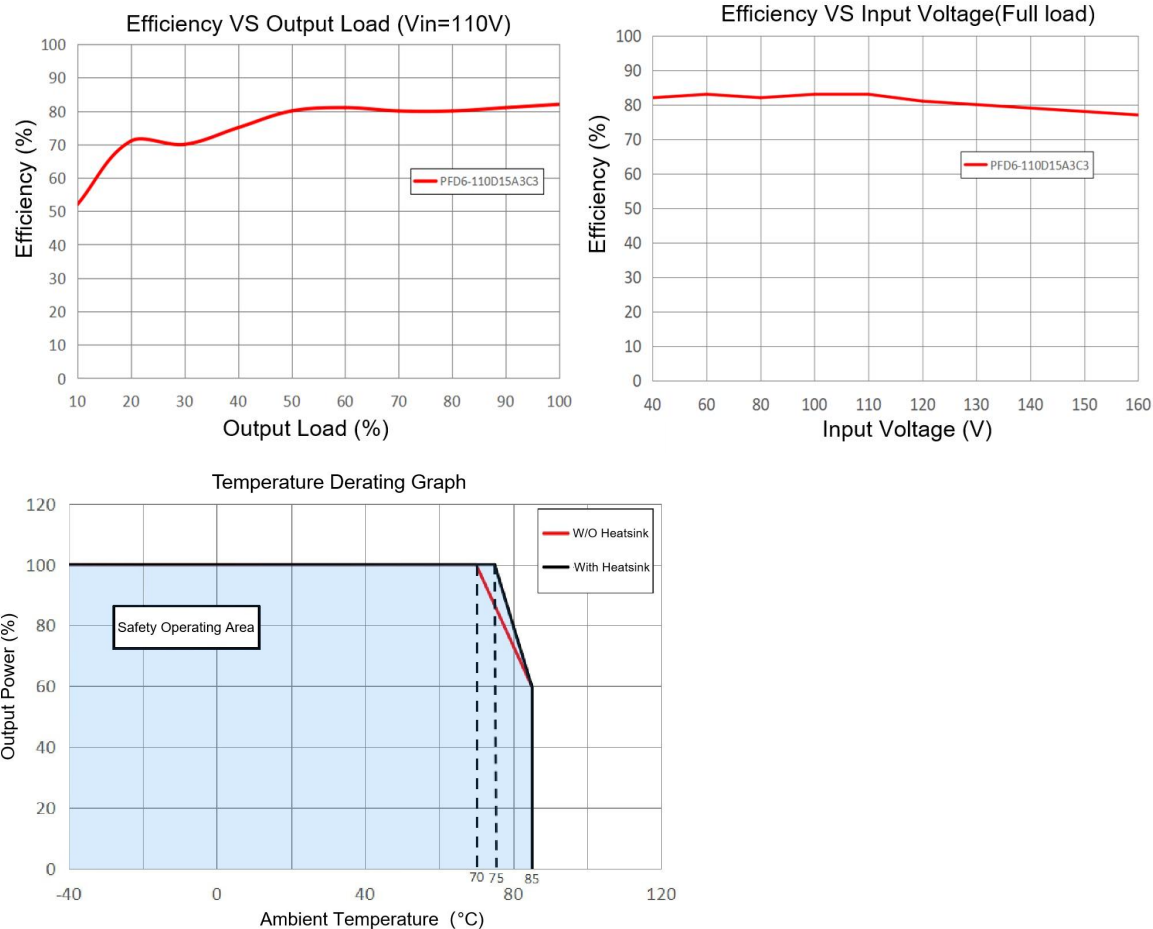
1) The Ripple & noise test need 12# twisted pair cables, an oscilloscope which should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. C2(0.1uF) polypropylene capacitor and C3(10uF) high-frequency low-resistance electrolytic capacitor are connected in parallel 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 start after input power on.

3) It is recommended to connect a ≥5% load or a high-frequency low resistance E-cap(≥470uF) load at output to avoid the output ripple increasing.

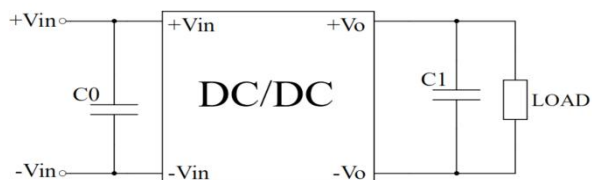
4) It is recommended that the load imbalance of Dual outputs should be less than ±5% deviation.

Product Characteristics Graphs



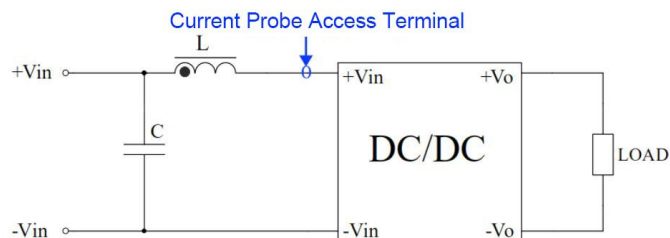
Recommended Circuits Diagrams for Application

1. Typical DC-DC test circuit diagram



Component	Parameter
C0	47-100uF/200V
C1	220uF/25V

2. Input reflected ripple current test circuit diagram

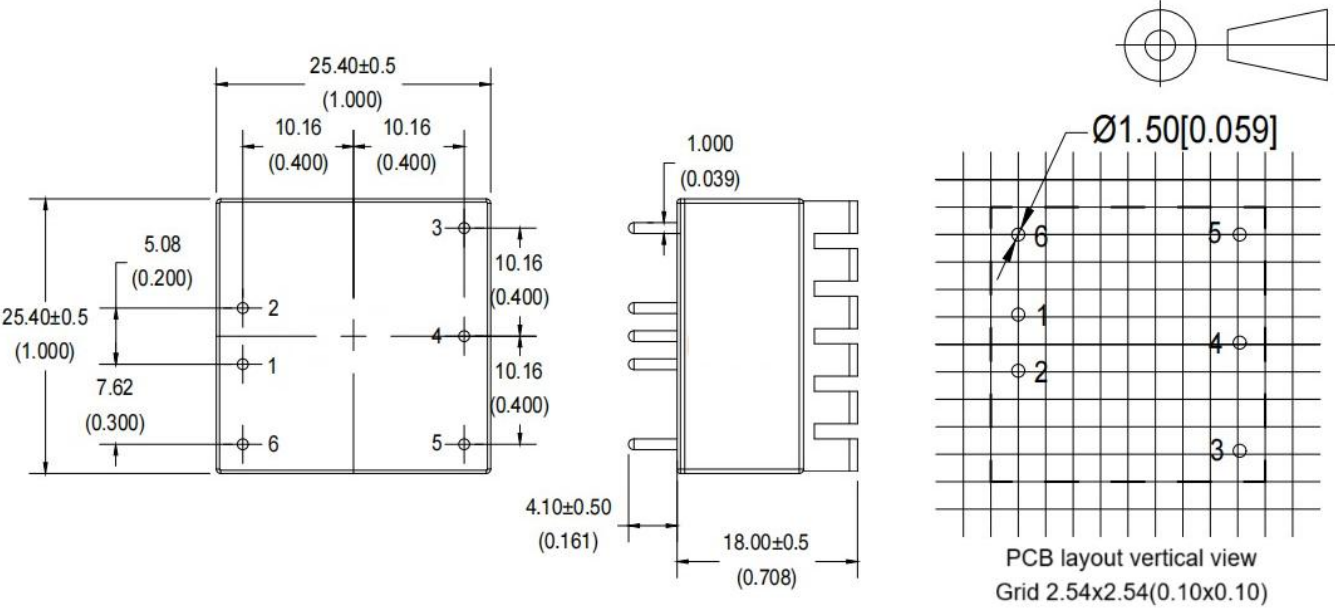


Component	Parameter
C	220uF/100V
L	4.7uH/15A

C should be a low ESR Capacitor which withstand voltage should be more than the Max input voltage.

Component	Vin=110V
FUSE	TBD by customer
MOV	14D201K
C0	100uF/200V
C5	68uF/25V
C6	220uF/25V
C1, C2, C3, C4	0.47uF/200V
LDM1	68uH
CY1, CY2	4.7nF/3KV

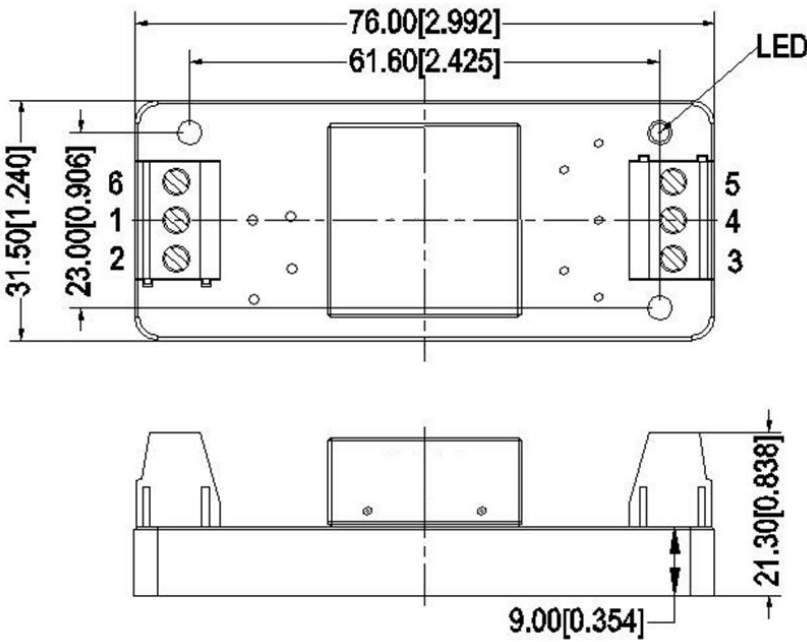
A3C3-H Package Mechanical Dimensions



Unit: mm(inch)
General tolerance: ±0.50(±0.020)
Pin diameter tolerance: ±0.10(±0.004)

Pin No.	1	2	3	4	5	6
PFD6-110DXXA3C3	-Vin	+Vin	+Vout	COM	-Vout	Ctrl

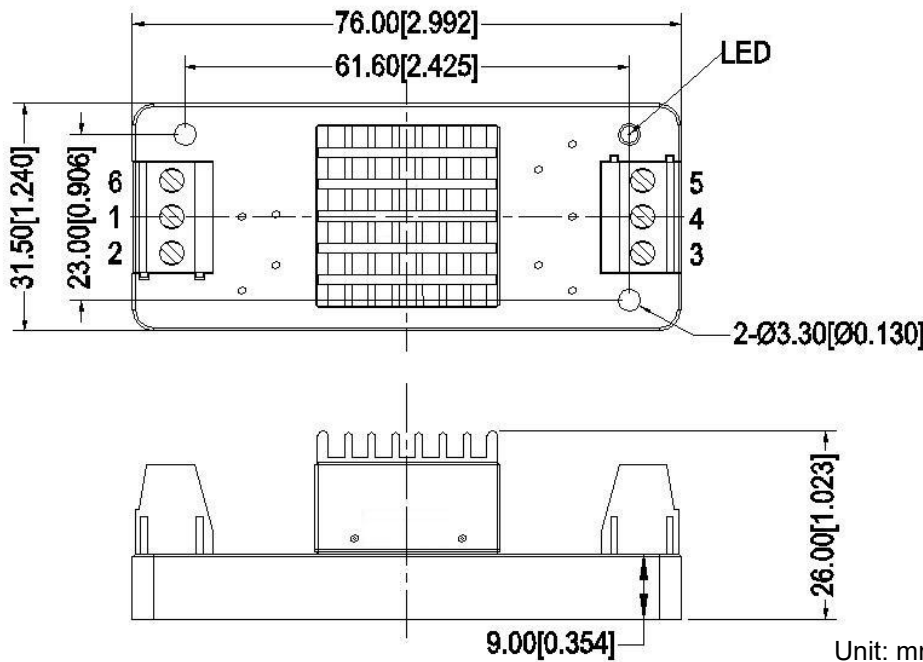
A3C3-T Package Mechanical Dimensions



Unit: mm [inch]
General tolerance: ±1 [±0.04]

Terminal No.	1	2	3	4	5	6
PFD6-110DXXA3C3	-Vin	+Vin	+Vout	COM	-Vout	Ctrl

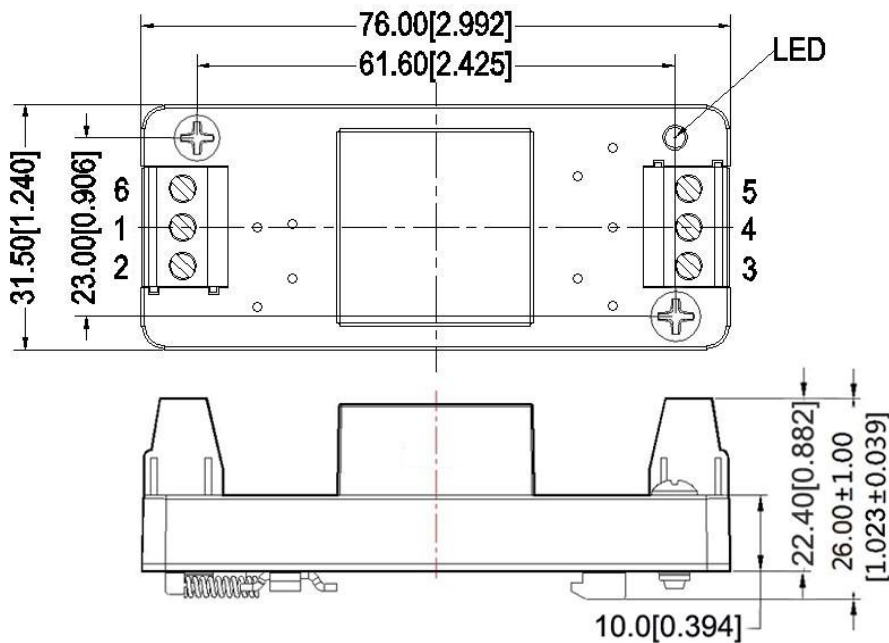
A3C3-TH Package Mechanical Dimensions



Unit: mm [inch]
General tolerance: ± 1 [± 0.04]

Terminal No.	1	2	3	4	5	6
PFD6-110DXXA3C3	-Vin	+Vin	+Vout	COM	-Vout	Ctrl

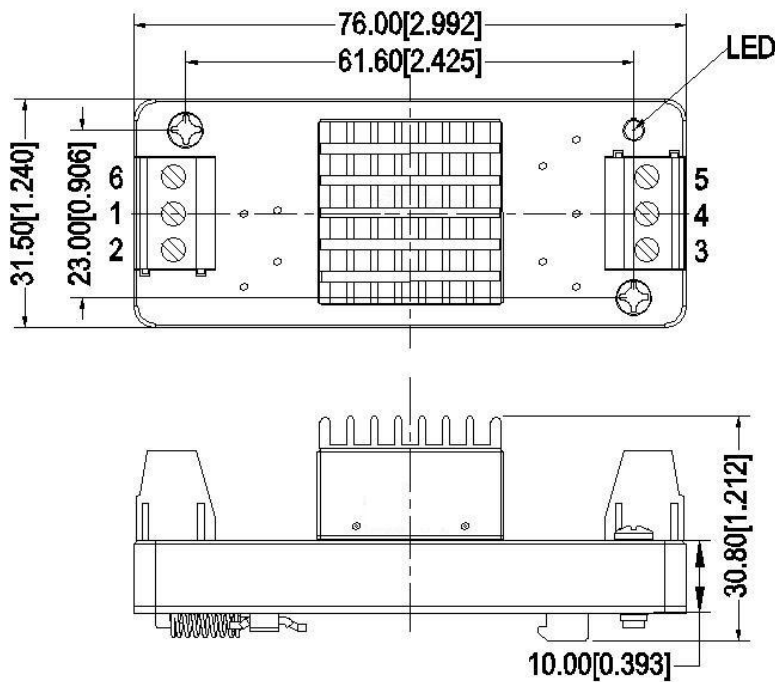
A3C3-TS Package Dimensions



Unit: mm [inch]
General tolerance: ± 1 [± 0.04]

Terminal No.	1	2	3	4	5	6
PFD6-110DXXA3C3	-Vin	+Vin	+Vout	COM	-Vout	Ctrl

A3C3-TSH Package Mechanical Dimensions



Unit: mm [inch]
General tolerance: ± 1 [± 0.04]

Terminal No.	1	2	3	4	5	6
PFD6-110DXXA3C3	-Vin	+Vin	+Vout	COM	-Vout	Ctrl

Other Part numbers Pin function description

Pin/Terminal No.	1	2	3	4	5	6
PFD6-110DXXA3N3	-Vin	+Vin	+Vout	COM	-Vout	No pin

Application Notice

1. The products should be used according to the specifications in this datasheet, otherwise it could be permanently damaged.
2. It is not recommended to connect the converters in parallel to achieve a bigger power output.
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 $T_a=25^{\circ}\text{C}$, humidity $<75\%\text{RH}$, 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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