CPFD15-XXDXXA3(C)2(-T)(-TS) Series
DC/DC Converter

Typical Features

- Wide input voltage range (4:1), Output Power 15W
- Transfer Efficiency up to 90%
- Stand-by Power Consumption as low as 0.1W
- Output fast start up
- Continuous Short Circuit protection, Self-recovery
- Input under voltage, output over voltage, short circuit, over current protection
- Isolation Voltage 1500VDC
- Operating Temperature: -40°C~+85°C
- Good EMI performance
- International standard pin-out

Application Field

CPFD15-XXDXXA3(C)2 *is a newly designed DIP 1X1 packed,15W output power, ultra wide input range 4:1, low stand-by power consumption, isolated regulated output DC-DC converter, could be widely used for industrial control, instrument, communication, power electricity, internet of things field ect. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.*

Typical Product List

Certification	Part no.	Input Voltage Range (VDC)		Output Voltage/Current(Vo/Io)		Input Current (mA) (Nominal Voltage)		Max. Capacitive Load	Ripple & Noise		Full load Efficiency (%)	
		Nominal	Range	Voltage(VDC)	Current (mA)MAX./Min	Full load typ.	No Load typ.	uF	mVp-p Typ.	mVp-p Max.	Min	Typ
-	CPFD15-18D05A3(C)2	24	9-36	±5	1500/0	718	33	5000	100	200	85	87
-	CPFD15-18D09A3(C)2	24	9-36	±9	833/0	698	5	2000	100	200	86	88
-	CPFD15-18D12A3(C)2	24	9-36	±12	625/0	694	5	1000	100	200	88	90
-	CPFD15-18D15A3(C)2	24	9-36	±15	500/0	694	5	800	100	200	88	90
-	CPFD15-18D24A3(C)2	24	9-36	±24	313/0	710	5	500	100	200	86	88
-	CPFD15-36D05A3(C)2	48	18-75	±5	1500/0	363	17	5000	100	200	84	86
-	CPFD15-36D09A3(C)2	48	18-75	±9	833/0	355	5	2000	100	200	84	86
-	CPFD15-36D12A3(C)2	48	18-75	±12	625/0	351	5	1000	100	200	87	89
-	CPFD15-36D15A3(C)2	48	18-75	±15	500/0	351	5	800	100	200	87	89
-	CPFD15-36D24A3(C)2	48	18-75	±24	313/0	347	5	500	100	200	88	90

Note 1: C means only with control function, N means without control function;

Note 2: Suffix “-H” is with heatsink, “-TH” for chassis mounting with heatsink, -TSH” for DIN-Rail mounting with heatsink, DIN-Rail width is: 35mm;

Note 3: Max capacitive load is, when the power supply is fully loaded, the max capacity could be connected to output, if exceed, the power supply cannot start-up;

Note 4: To reduce no load power consumption and improve efficiency of light-load, IC will be flitter frequency under no-load and light-load operating, output cannot be no load, at least with 10% load or above 470uF high frequency low resistance electrolytic capacitor, otherwise the output ripple will rise;

Note 5: Due to limited space, the above is only a partial product list. If you need products outside the list, please contact our sales department.

Input Specification

Item	Condition	Min.	Typ.	Max.	Unit
Stand-by Consumption	Input voltage range	/	0.1	/	W
Input Under-Voltage Protection	24V nominal input	5	/	9	VDC
	48V nominal input	11	/	18	
Hot Plug	/	Unavailable			
Input Filter	/	π filter			
CTRL*	Module turn-on	CTRL suspended or TTL high level (2.5-12VDC)			
	Module turn-off	CTRL connect to -Vin or low level (0-1.2VDC)			
	Input current when switched off	2mA (TYP)			

Note: *The voltage of CTRL pin is relative to -Vin pin.

Output Specification

Item	Condition		Min.	Typ.	Max.	Unit
Output voltage accuracy	Input voltage range	Vo1	/	±1	±2	%
		Vo2	/	±1.5	±3	%
Cross Regulation	Vo1：50%load；Vo2：10~100%load		/	±3	±5	%
Voltage Regulation	Full voltage range, full load		/	±0.2	±0.5	%
Load Regulation	10%-100% load		/	±0.5	±1	%
Ripple & Noise	15%-100% load，20MHz bandwidth		/	100	200	mVp-p
Dynamic Recovery Time	25% of nominal load step, nominal input voltage	/	/	300	500	us
Dynamic Response Deviation		5V output	/	±5	±8	%
		Other output	/	±3	±5	%
Turn-on delay time	Input nominal voltage		/	10	/	ms
Output voltage adjustable (Trim)	Input voltage range		Unavailable			
Output Over-voltage Protection			120	160	200	%Vo
Output Over-current Protection			110	160	220	%Io
Output Start-up Overshoot Voltage			/	/	10	%Vo

Short Circuit Protection		Continuous, self-recovery

Note: 0% -15% load ripple & noise is less than or equal to 5%Vo; the ripple & noise test adopts the twisted pair test method, see the ripple & noise test instructions for details.

General Specification

Item	Condition	Min.	Typ.	Max.	Unit
Switching Frequency	Working mode (PWM)	/	280	/	KHz
Operating Temperature	Refer to Temperature Derating Curve	-40	/	+85	℃
Storage Temperature	/	-55	/	+125	
Max Case Temperature	Within Operating Curve	/	/	+105	
Max shell temperature	Distance to shell is 1.5mm, 10 seconds	/	/	300	
Relative Humidity	No condensing	5	/	95	%RH
Isolation Voltage	I/P-O/P, test for 1min, leakage current is less than 0.5mA	1500	/	/	VDC
	Input/output to housing, test for 1min, leakage current is less than 0.5mA	1000	/	/	VDC
Insulation Resistance	Input-output, insulation voltage 500VDC	1000	/	/	MΩ
Isolation Capacitance	Typical	/	1000	/	pF
Meantime Between Failure	MIL-HDBK-217F@25℃	1000	/	/	K hours
Cooling Method	Free air convection				
Case Material	Aluminum Metal Case				

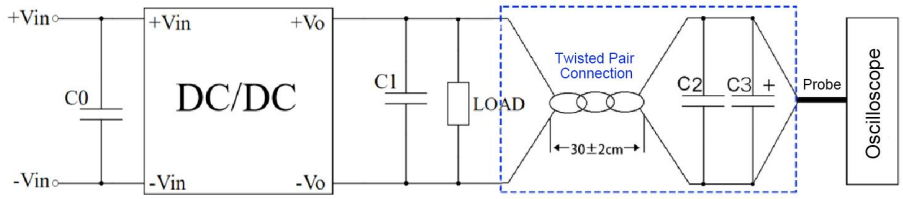
Weight/ Dimension	Part No.	Weight Typ.	L x W x H	
	CPFD15-XXDXXA3(C)2	18g	25.4 X 25.4 X 12.5 mm	1.00 X 1.00 X 0.492 inch
	CPFD15-XXDXXA3(C)2-H	21g	25.4 X 25.4 X 18.0 mm	1.00 X 1.00 X 0.708 inch
	CPFD15-XXDXXA3(C)2-T	39g	76.0 X 31.5 X 21.3 mm	2.99 X 1.24 X 0.838 inch
	CPFD15-XXDXXA3(C)2-TH	42g	76.0 X 31.5 X 26.0 mm	2.99 X 1.24 X 1.023 inch
	CPFD15-XXDXXA3(C)2-TS	59g	76.0 X 31.5 X 26.0 mm	2.99 X 1.24 X 1.023 inch
	CPFD15-XXDXXA3(C)2-TSH	62g	76.0 X 31.5 X 30.8 mm	2.99 X 1.24 X 1.212 inch

EMC Characteristics

Total Items		Sub Items	Test Standard	Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (EMC Recommended Circuit)
		RE	CISPR32/EN55032	CLASS B (EMC Recommended Circuit)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (EMC Recommended Circuit)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (EMC Recommended Circuit)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B (EMC Recommended Circuit)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (EMC Recommended Circuit)

		Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B

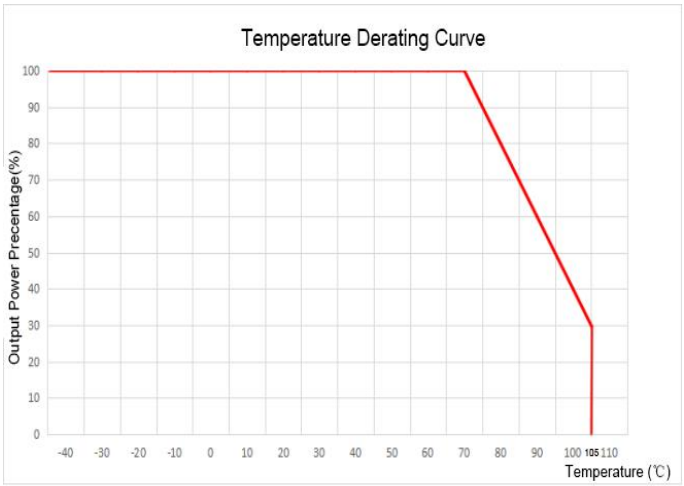
Ripple & Noise Test Description (Twisted Pair Method 20MHz Bandwidth)



Test conditions:

1. Ripple noise is connected using 12# twisted pair cable, oscilloscope sampling uses sampling mode, oscilloscope bandwidth is set to 20MHz, 100M bandwidth probe is used, probe cap and ground clip are removed; and C2 (0.1uF) polypropylene capacitor and C3 (10uF) high-frequency low-resistance electrolytic capacitor are connected in parallel at the probe end of the twisted pair cable, and the capacitance values of C0 and C1 refer to the design application circuit data;
2. Ripple noise test: The module input end (INPUT) is connected to the input power supply, and the power output is connected to the electronic load (LOAD) through the power line. The test is sampled from the power output port with a 30±2 cm twisted pair cable alone, and connected to the oscilloscope probe according to polarity.
3. It is recommended to output a minimum load of 15% or connect an electrolytic capacitor with a high-frequency resistance of more than 470uF, otherwise the output voltage ripple will increase;
4. It is recommended that the load imbalance of dual-channel output products is less than ±5%.

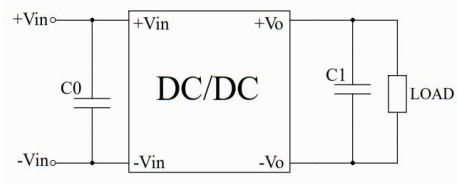
Product Characteristic Curve



Design Application

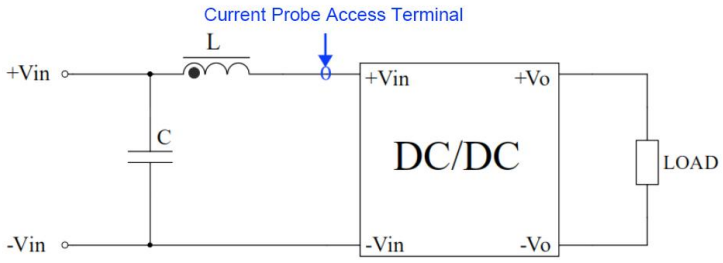
Recommended circuit

1. This series of module power supplies are tested according to this peripheral circuit before leaving the factory. Increasing the capacity of C0 or C1 can reduce the output ripple, but the output capacity must be less than the maximum capacitive load;



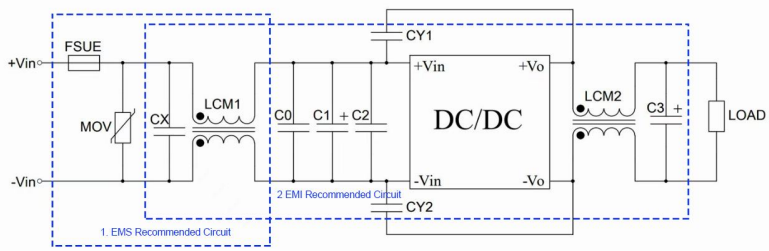
Component	Parameter
C0	47-100uF/100V
C1	100uF/100V

2. Input reflected ripple current test peripheral circuit:



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

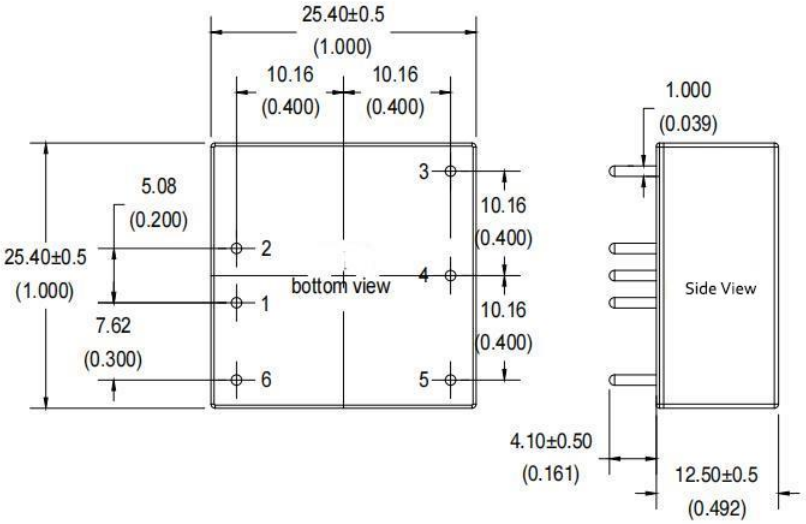
3. Recommended EMC peripheral circuits:

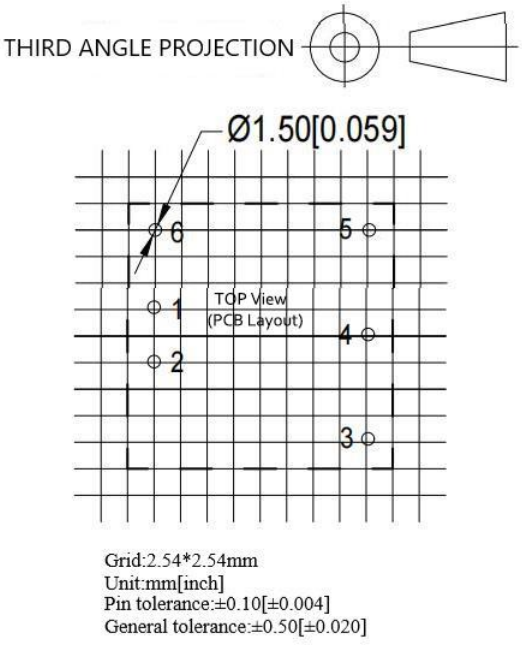


Component	Vin:24VDC	Vin:48VDC
FUSE	Choose according to customer needs	
MOV	14D560K	14D101K
CX	0.47uF	0.47uF
LCM1	10mH	10mH
C0	1uF/50V	1uF/100V
C1	220uF/50V	220uF/100V
C2	1uF/50V	1uF/100V
LCM2	30uH	30uH
C3	47uF/100V	47uF/100V
CY1,CY2	2.2nF/2000V	

Note: Part 1 in the figure is for EMS testing, and part 2 in the figure is for EMI filtering, which can be adjusted according to the situation.

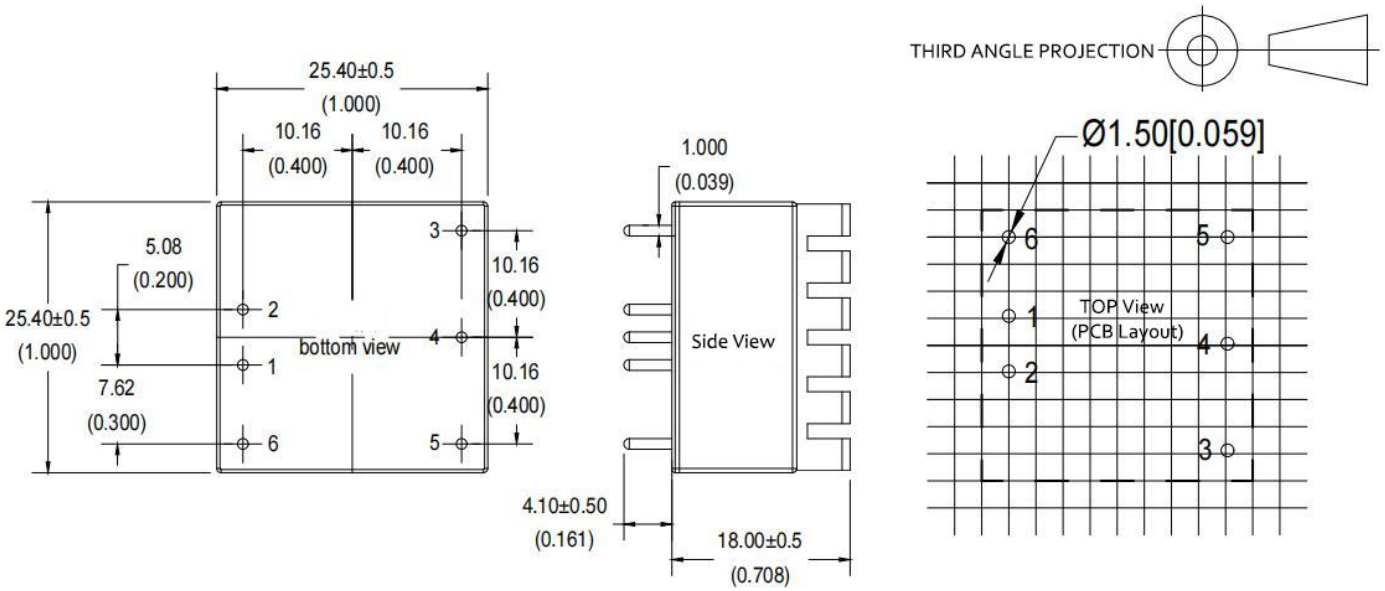
A3 Packing Dimension (Without heat sink)





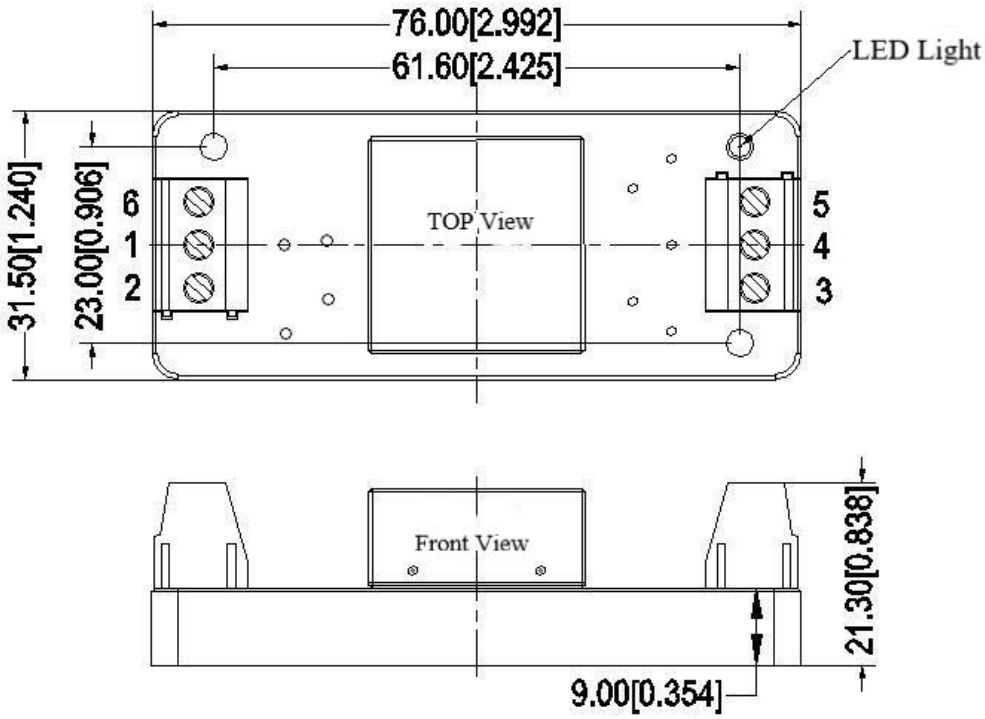
Pin	1	2	3	4	5	6
CPFD15-XXDXXA3C2	-Vin	+Vin	+Vo	COM	-Vo	Ctrl

A3-H Packing Dimension (With heat sink)



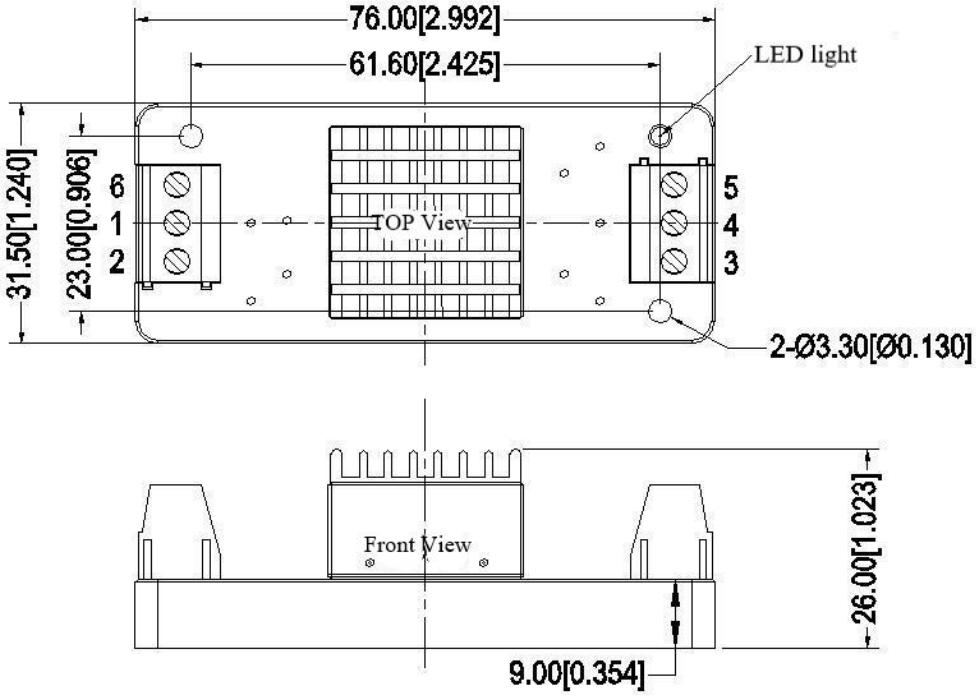
Pin	1	2	3	4	5	6
CPFD15-XXDXXA3C2	-Vin	+Vin	+Vo	COM	-Vo	Ctrl

A3-T Packing Dimension (Without heat sink)



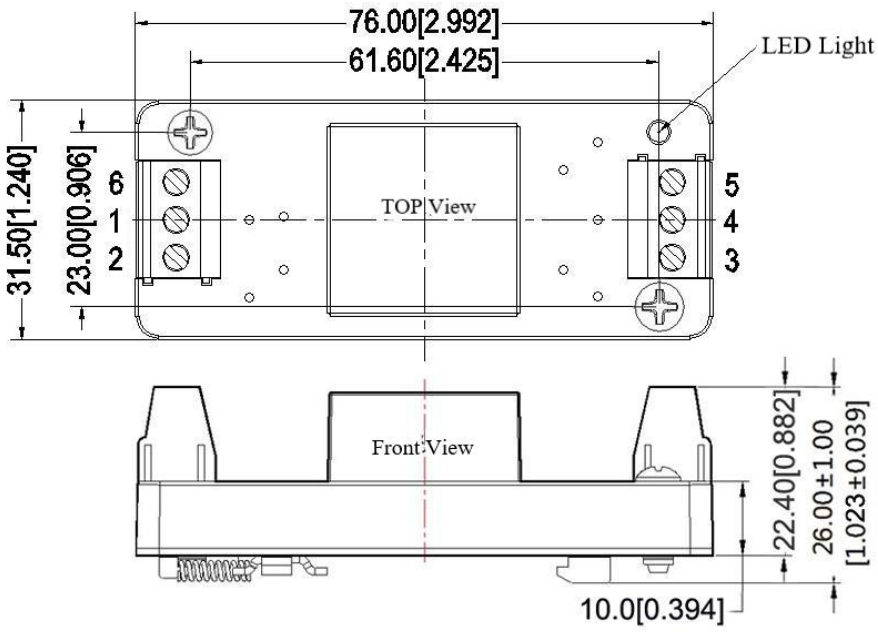
Pin	1	2	3	4	5	6
CPFD15-XXDXXA3C2	-Vin	+Vin	+Vo	COM	-Vo	Ctrl

A3-TH Packing Dimension (With heat sink)



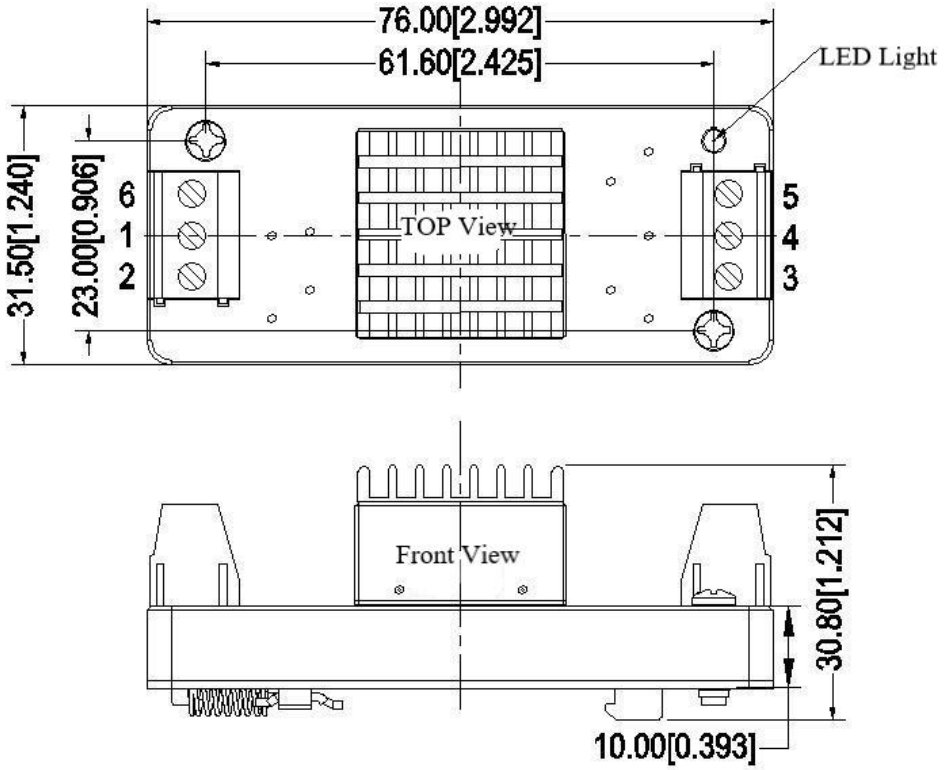
Pin	1	2	3	4	5	6
CPFD15-XXDXXA3C2	-Vin	+Vin	+Vo	COM	-Vo	Ctrl

A3-TS Packing Dimension (Without heat sink)



Pin	1	2	3	4	5	6
CPFD15-XXDXXA3C2	-Vin	+Vin	+Vo	COM	-Vo	Ctrl

A3-TSH Packing Dimension (With heat sink)



Pin	1	2	3	4	5	6
CPFD15-XXDXXA3C2	-Vin	+Vin	+Vo	COM	-Vo	Ctrl

Pin out Specifications

Pin	1	2	3	4	5	6
CPFD15-XXDXXA3N2	-Vin	+Vin	+Vo	COM	-Vo	NP

Note:
1. The product should be used within the specification range, otherwise it will cause permanent damage to the product;
2. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
3. If the product works beyond the product load range, it cannot be guaranteed that the product performance meets all the performance indicators in this manual;
4. Unless otherwise specified, the above data are measured at Ta=25℃, humidity<75%, input nominal voltage and output rated load (pure resistance load);
5. All the above index test methods are based on our company's standards;
6. The above are the performance indicators of the product models listed in this manual. Some indicators of non-standard model products will exceed the above requirements. For specific circumstances, please contact our technical personnel directly;
7. Our company can provide product customization;
8. Product specifications are subject to change without prior notice. Please pay attention to the latest manual published on our official website.