DC/DC Converter
FD30-XXDXXB3C3 Series

Typical Features

- Wide input voltage range 4:1, Output Power 30W
- Transfer Efficiency up to 90%
- Stand-by Power Consumption as low as 0.10W
- Super-fast start up
- Continuous Short Circuit protection, Self-recovery
- Input under voltage, output over voltage, short circuit, over current protection
- Isolation Voltage 3000VDC
- Operating Temperature: -40°C~+85°C
- Good EMI performance
- International Standard pin-out

FD30-XXDXXB3C3 Series ----- is a newly developed DIP standard 2X1 package, 30W output power, ultra-wide voltage 4:1 input range, ultra-low standby power consumption, high isolation voltage regulated positive and negative dual output, DC-DC module power supply, which can be widely used in industrial control, instrumentation, communication, power, Internet of Things and other fields. When the product is used in an environment with relatively harsh electromagnetic compatibility, please refer to the application circuit provided by our company.

Typical Product List

Part No	Input Voltage Range (VDC)		Output Voltage/Current (Vo/Io)		Input Current (mA) @ Nominal Voltage		Max. Capacitive Load	Ripple & Noise (mVp-p)		Full Load Efficiency (%)	
	Nominal	Range	Voltage (VDC)	Current (mA) Max./ Min.	Full load (Typ.)	No Load (Typ.)	u F	Typ.	Max.	Min.	Typ.
*FD30-18D3V3B3C3	24	9-36	±3.3	±3000/0	959	40	4000	50	100	84	86
FD30-18D05B3C3	24	9-36	±5	±3000/0	1388	40	2000	50	100	87	89
FD30-18D09B3C3	24	9-36	±9	±1667/0	1388	40	1250	50	100	87	89
FD30-18D12B3C3	24	9-36	±12	±1250/0	1388	3	1250	50	100	87	89
FD30-18D15B3C3	24	9-36	±15	±1000/0	1388	3	680	50	100	87	89
FD30-18D24B3C3	24	9-36	±24	±625/0	1410	3	470	50	100	86	88
*FD30-36D3V3B3C3	48	18-75	±3.3	±3000/0	480	40	4000	50	100	84	86
FD30-36D05B3C3	48	18-75	±5	±3000/0	700	40	2000	50	100	87	89
FD30-36D09B3C3	48	18-75	±9	±1667/0	695	40	1250	50	100	88	90
FD30-36D12B3C3	48	18-75	±12	±1250/0	700	3	1250	50	100	87	89
FD30-36D15B3C3	48	18-75	±15	±1000/0	700	3	680	50	100	87	89
FD30-36D24B3C3	48	18-75	±24	±625/0	704	3	470	50	100	87	89

Note 1: "*" indicates a model under development;

Note 2: C is with control pin, -H is with heat sink, -T(H) is wiring package (with heat sink), -TS(H) is rail package (with heat sink), rail width is 35mm;

Note 3: The maximum capacitive load refers to the capacitance capacity that the output is allowed to connect when the power supply starts at full load. If the capacity is exceeded, the power supply may not start;

Note 4: In order to reduce no-load power consumption and improve light-load efficiency, the IC works in a jitter state when no-load and light-load, and the output cannot be no-loaded, with a minimum of 15% of the rated load.

Note 5: When Vin=24V is input at 30VDC~36VDC and Vin=48V is input at 67VDC~75VDC, the output will not be able to recover automatically when it is short-circuited, and it can operate normally after restarting the circuit;

Note 6: Due to limited space, the above is only a partial list of products. If you need products outside the list, please contact our sales department.

Input Specification

Item	Working conditions	Min	Typ.	Max	Unit
Standby power consumption	Input voltage range	/	0.1	/	W
Input under voltage protection	24Vdc Normal Input	7	/	9	VDC
	48Vdc Normal Input	15	/	18	VDC
Start-up voltage	/	/	/	10	%Vo
Input filter	π filter				
CTRL	Module is turned on		CTRL is left floating or connected to high level（2.5V-12VDC）		
	Module shutdown		CTRL connected to-Vin or low level（0-1.2VDC）		
	Input current at shutdown		5mA (TYP)		

*Ctrl controls the voltage on the pin relative to the input -Vin pin.

Output Specification

Items	Test Conditions		Min	Typ.	Max	Unit
Output Voltage Accuracy	Input voltage range, nominal load	Vo1	/	±1	±2	%
		Vo2	/	±1	±3	%
Voltage Regulation	Full voltage range, nominal load	Vo1	/	±0.3	±0.5	%
		Vo2	/	±0.5	±1	%
Load Regulation	10%~100% load	Vo1	/	±0.5	±1	%
		Vo2	/	±0.5	±1.5	%
Ripple & Noise	100%-100%load, 20MHz bandwidth		/	50	100	mVp-p
Dynamic Response	25% of nominal load step, nominal input voltage	/	/	200	500	us
Dynamic response deviation		5V output	/	±5	±8	%
		other output	/	±3	±5	
Start delay time	Input nominal voltage		/	150	/	ms
Output voltage adjustable (Trim)	Input voltage range		Unavailable			
Output over-voltage Protection			120	140	160	%Vo
Output over-current Protection			105	160	240	%Io
Output Short circuit Protection			Continuous, self-recovery			

General Specification

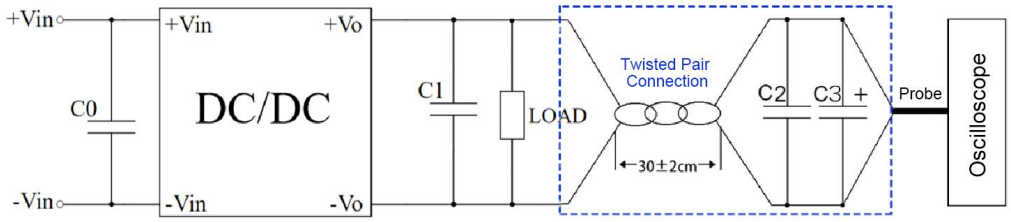
Items	Test Conditions	Min	Typ.	Max	Unit
Switching Frequency	Operating mode（PWM）	/	350	/	KHz
Operating Temperature	Refer to temperature derating curve	-40	/	+85	℃
Storage Temperature	/	-55	/	+125	
Max Case Temperature	Refer to product characteristic curve	/	/	+105	
Pin resistance soldering temperature	The distance between the soldering point and the shell is 1.5mm, 10 seconds	/	/	300	
Relative Humidity	No condensation	5	/	95	%RH
Isolation Voltage	I/P-O/P, test for 1min, leakage current is less than 0.5mA	3000	/	/	VDC
MTBF	MIL-HDBK-217F@25℃	1000	/	/	K Hrs
Cooling method	Natural air cooling				
Shell material	Metal Aluminum				

Weight/ Dimension	Model No.	Weight (Typ)	L x W x H	
	FD30-XXDXXB3C3	18g	50.80X25.40X13.3mm	2.00X1.00X0.511inch
	FD30-XXDXXB3C3-H	30g	50.80X25.40X23.3mm	2.00X1.00X0.905inch
	FD30-XXDXXB3C3-T	39g	76X31.5X22.3mm	2.99X1.24X0.877inch
	FD30-XXDXXB3C3-TH	51g	76X31.5X32.5mm	2.99X1.24X1.279inch
	FD30-XXDXXB3C3-TS	59g	76X31.5X27mm	2.99X1.24X1.063inch
	FD30-XXDXXB3C3-TSH	71g	76X31.5X36.6mm	2.99X1.24X1.437inch

EMC Characteristics

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 ±4KV 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 and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B	

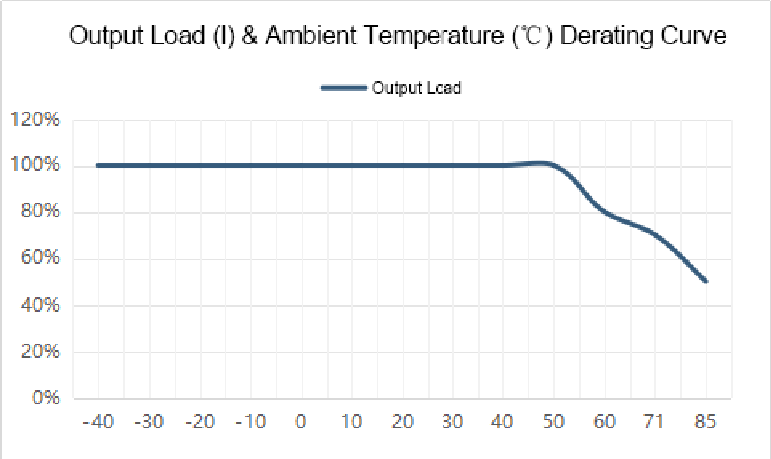
Ripple & Noise Test (Twisted Pair Method)



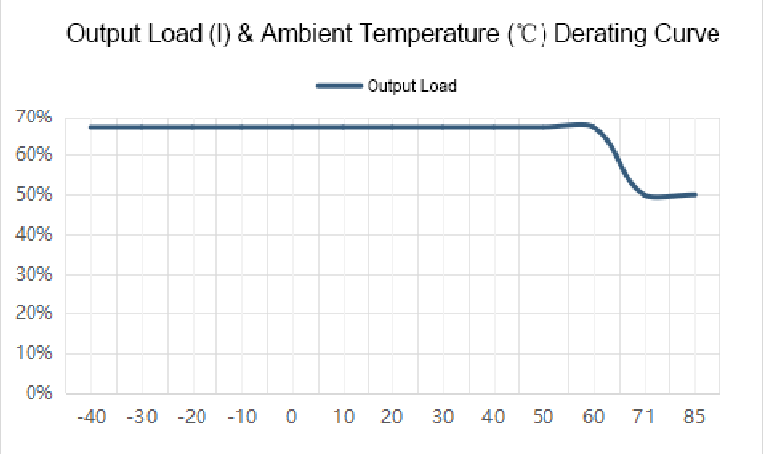
Test conditions:

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 supply output is connected to the electronic load (LOAD) through the power line. The test is sampled from the power supply output port using a 30±2 cm twisted pair cable alone, and connected to the oscilloscope probe according to polarity.
3. Dual-channel output product with balanced load test;

Characteristic Curve



This curve is the temperature derating curve tested under windy conditions for 12V-36VDC (FD30-18DXXB3C3) and FD30-36DXXB3C3. (Minimum wind speed 20LFM is required at 65℃-85℃).

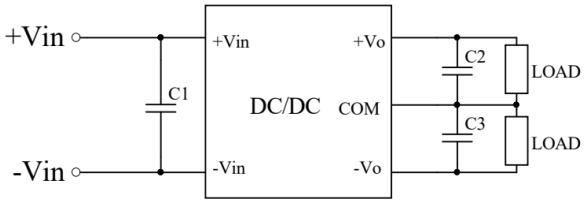


This curve is the temperature derating curve tested under windy conditions at 9V-12VDC (FD30-18DXXB3C3) (minimum wind speed 20LFFM is required at 50℃-85℃).

Design and Application Reference

Recommended Circuit

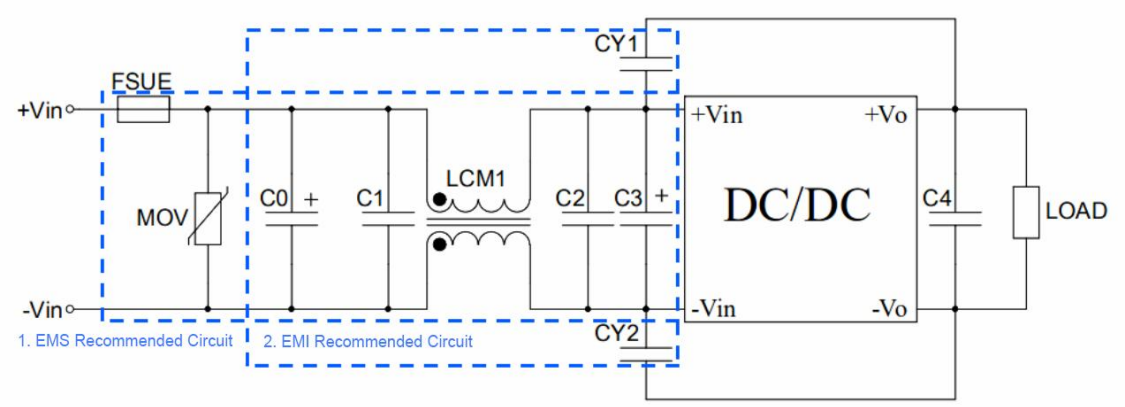
1. This series of module power supplies are tested according to this peripheral circuit before leaving the factory. Increasing the capacity of C2 and C3 can reduce the output ripple, but the output capacity must be less than the maximum capacitive load.



Parameter Description:

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

2. Recommended EMC peripheral circuits:



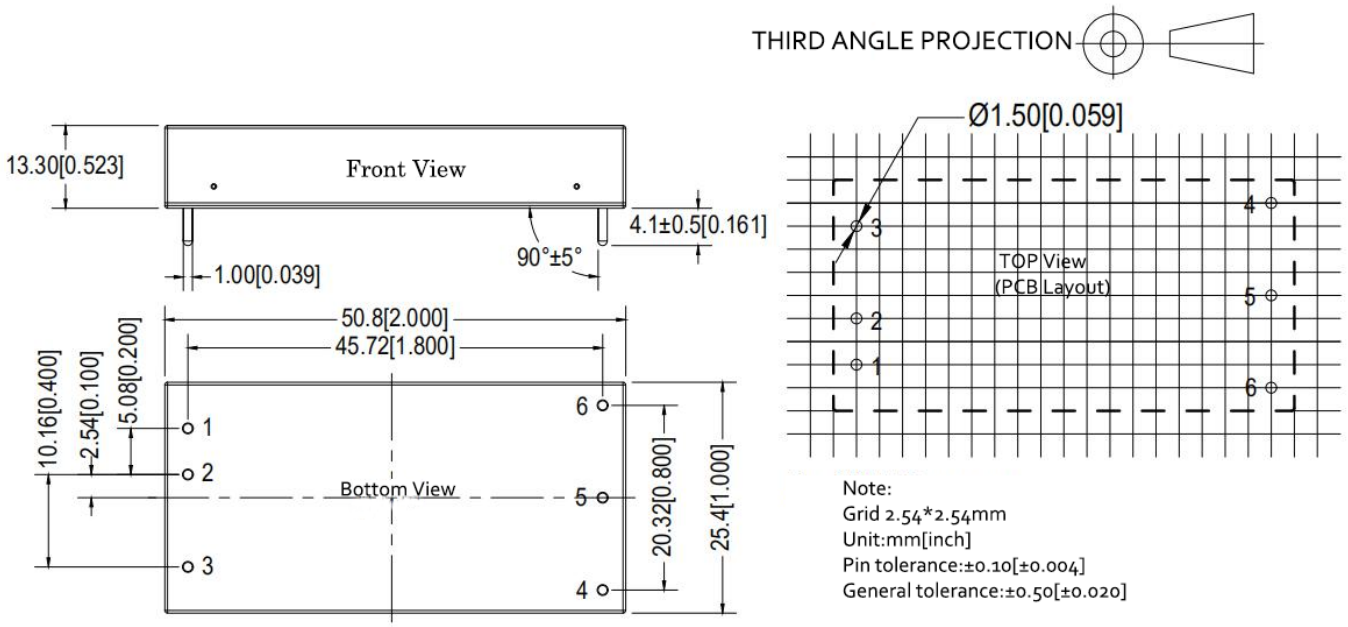
EMC Recommended Circuit

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.

Parameter Description:

Components	Vin:24VDC	Vin:48VDC
MOV	14D560K	14D101K
CX	0.47uF	0.47uF
LCM1	10~15mH	10~15mH
C0,C1	470uF/50V	470uF/100V
C2，C3，C4	1uF/50V	1uF/100V
LCM2	300uH	300uH
C5，C6	47uF/50V	47uF/50V
CY1,CY2	2.2nF/250V	2.2nF/250V
LDM1	4.7uH	4.7uH
LCM3，LCM4	50~300uH	50~300uH

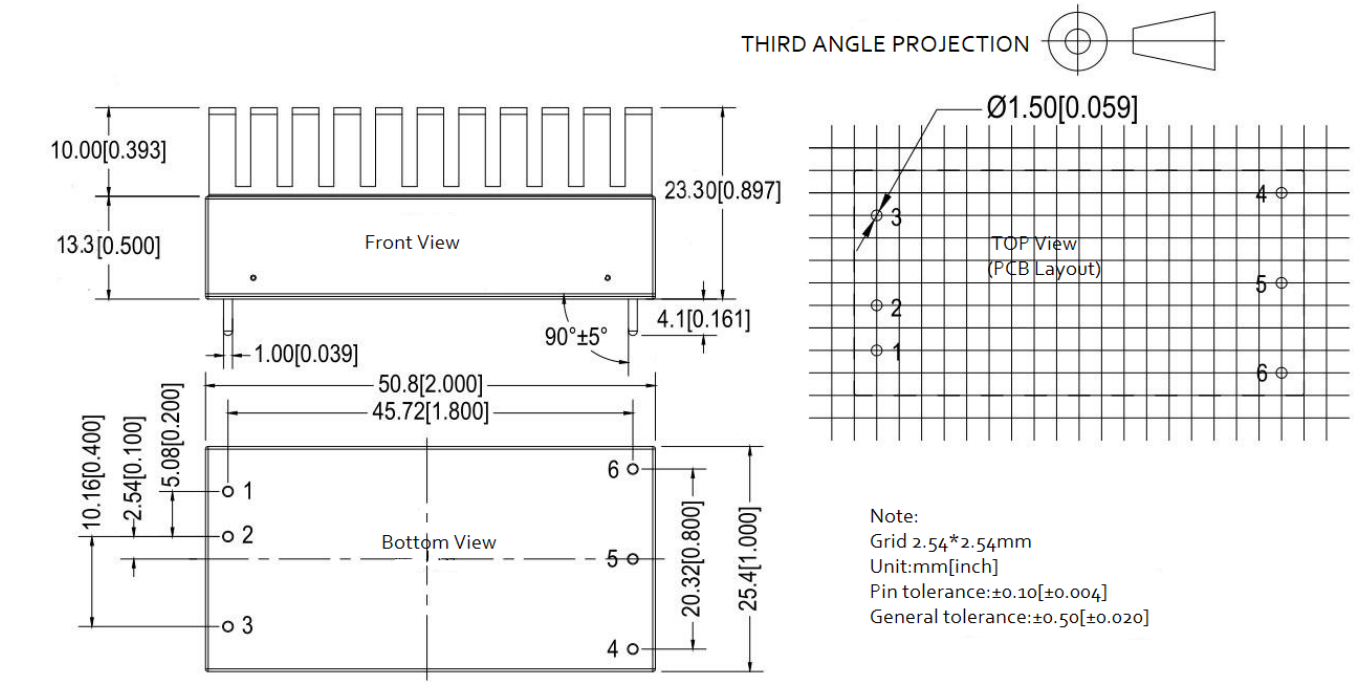
B3C3 Package Dimension



Pin Definition

FD30-XXDXXB3C3	1	2	3	4	5	6
	+Vin	-Vin,	CTRL	-Vout	COM	+Vout

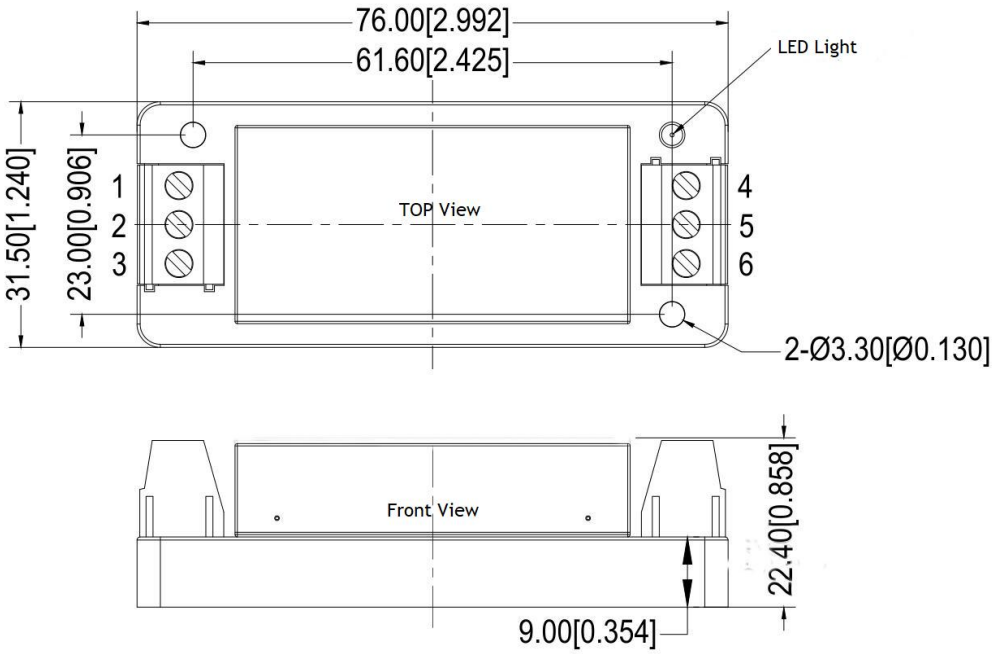
B3C3-H Package(with Heat-sink) Dimension



Pin Definition

FD30-XXDXXB3C3	1	2	3	4	5	6
	+Vin	-Vin,	CTRL	-Vout	COM	+Vout

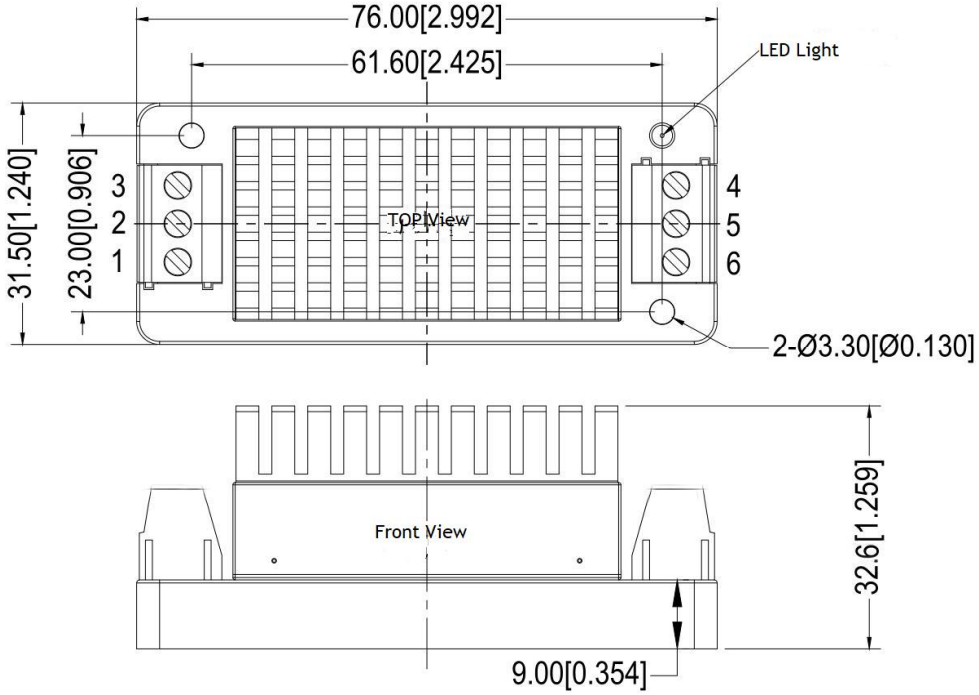
B3C3-T Package Dimension



Pin Definition

FD30-XXDXXB3C3	1	2	3	4	5	6
	+Vin	-Vin,	CTRL	-Vout	COM	+Vout

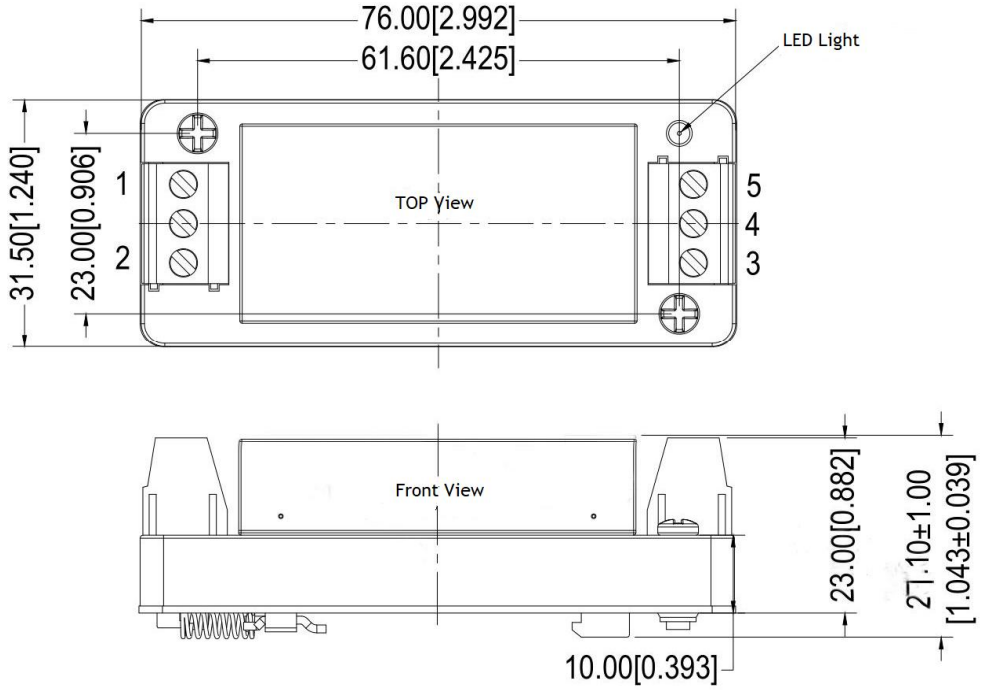
B3C3-TH(with heat-sink) Package Dimension and Pin Function



Pin Definition

FD30-XXDXXB3C3	1	2	3	4	5	6
	+Vin	-Vin,	CTRL	-Vout	COM	+Vout

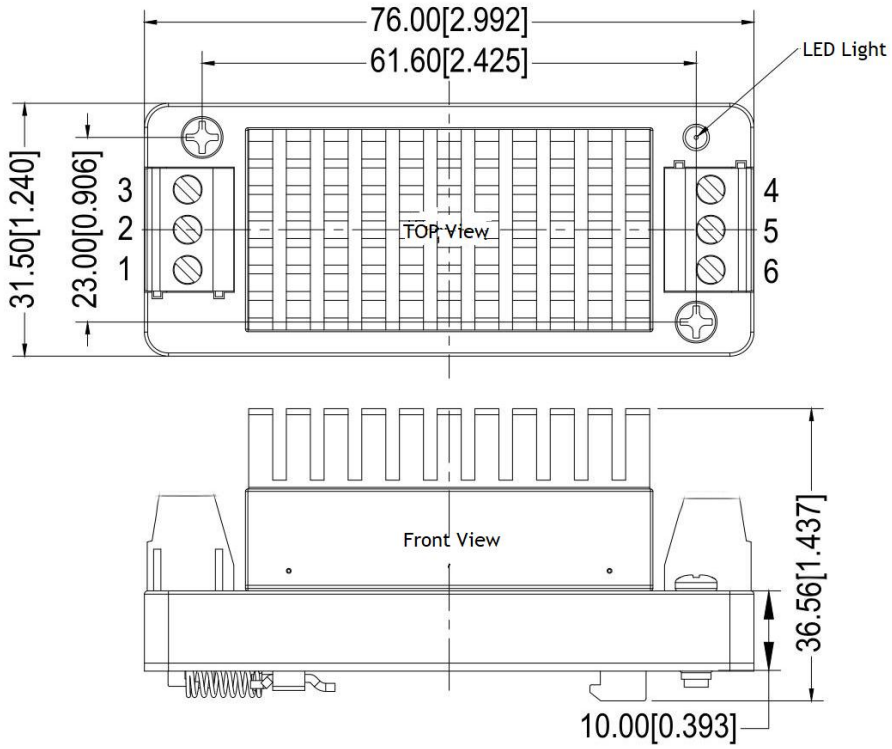
B3C3-TS Package Dimension



Pin Definition

FD30-XXDXXB3C3	1	2	3	4	5	6
	+Vin	-Vin,	CTRL	-Vout	COM	+Vout

B3C3-TSH(with heat-sink) Package Dimension



Pin Definition

FD30-XXDXXB3C3	1	2	3	4	5	6
	+Vin	-Vin,	CTRL	-Vout	COM	+Vout

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.

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