

Typical Feature

- ◆ 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
- ◆ Switching Frequency 350KHz
- ◆ Isolation Voltage 3000VDC
- ◆ Operating Temperature: -40°C~+85°C
- ◆ Good EMI performance
- ◆ International Standard pin-out



FD30-XXDXXB3C3 is 30W, ultra wide 4:1 input voltage, low stand by power consumption, high isolation regulated dual output, DIP package 2X1inch DC/DC Converter. It widely used for industrial control, instrumentation, telecommunication, power, IoT field. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

Typical Product List

Part No	Input Voltage Range (VDC)		Output Voltage/Current (Vo/Io)		Input Current (mA) (Nominal Voltage)		Max. Capacitive Load uF	Ripple & Noise (Nominal Load)		Full load Efficiency (%)	
	Nominal	Range	Voltage (VDC)	u F	Full load (Typ)	No Load (Typ)		mVp-p		Min	Typ.
							Typ	Max			
*FD30-18D3V3B3C3	24	9-36	±3.3	±3000/0	959	40	4000	50	100	84	86
FD30-18D05B3C3	24	9-36	±5.0	±3000/0	1388	40	2000	50	100	87	89
FD30-18D09B3C3	24	9-36	±9.0	±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	±5.0	±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
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1. Suffix "C" is with CTRL function; Suffix "-H" means with heatsink; "-T(H)" suffix for chassis mounting(with heatsink), "-TS(H)" suffix for DIN-Rail mounting(with heatsink), DIN-Rail width is: 35mm;
2. Max capacitive load is, when the power supply is fully loaded, the max capacity could be connected to output, positive output and negative output of same capacitance, if exceed, the power supply cannot start-up;
3. 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 15% rated load.
4. FD30-18DXXB3C3, input 30VDC~36VDC, and FD30-36DXXB3C3, input 67VDC~75VDC, it will not self recover when output is short circuit situation, re-starting the circuit could operate normal.
5. "*" are models under developing.

Input Specification

Standby power consumption	0.10W(TYP)		
Input Filter	Pi filter		
Input Under-Voltage protection	7~9VDC	FD30-18DXXB3C Input	
	15~18VDC	FD30-36DXXB3C Input	
CTRL *	Module turn-on	Suspended or connect to High level (2.5V-12VDC)	
	Module turn-off	Connect to GND or low level (0-1.2VDC)	
	Input current when switched off	5mA(Typ.)	

Note: *The voltage of CTRL pin is relative to input GND pin.

Output Specification

Main circuit Output Voltage Accuracy	Full voltage full load	Vo	±2.0%
Auxiliary Circuit Output Voltage Accuracy	Full voltage full load	Vo	±3.0%
Line Regulation	Nominal load, full voltage range	Vo	Main circuit ≤±0.5%; auxiliary circuit ≤±1.0%
Load Regulation	10% ~ 100% nominal load	Vo	Main circuit ≤±1.0%; auxiliary circuit ≤±1.5%
Ripple & Noise	Nominal load, nominal voltage	50mVp-p typ, 100mVp-p max (20MHz bandwidth)	
Output Over-voltage Protection	120%~160%Vo		
Output over-load protection	105%~240%Io		
Output Short circuit Protection	Hiccup, continuous, self-recovery		
Dynamic Response	25% nominal load step change ΔVo/Δt	3.3V,5V output	±3% typ., ±8%/500μs
		Other output	±3% typ., ±5%/500μs



Output voltage adjustment	Not available	
Start-up delay time	Typical	150ms
Output Turn-on Overshoot Voltage		$\leq 10\%V_o$

Note: ripple & noise is tested under parallel pair method;

General Specification

Switching Frequency	Typical	350KHz
Operating Temperature	Refer to Temperature Derating Curve	-40°C ~ +85°C
Storage Temperature	-	-55°C ~ +125°C
Max Case Temperature	Within Operating Curve	+105°C
Relative Humidity	No condensing	5%~95%
Case Material	-	Aluminum Metal Case
Cooling method	-	Free air convection
Isolation Voltage	Input to Output	3000Vdc $\leq 0.5mA / 1min$
MTBF	MIL-HDBK-217F@25°C	2X10 ⁵ Hrs
Product Weight	Average	18g

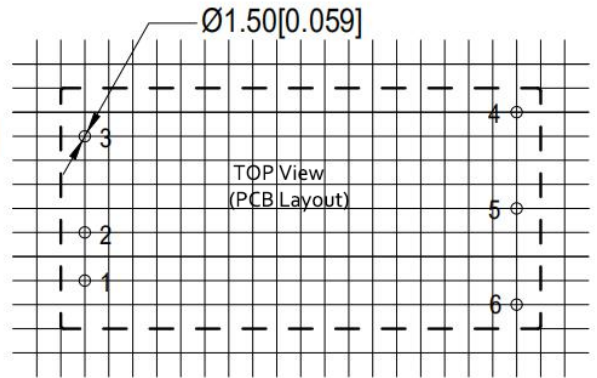
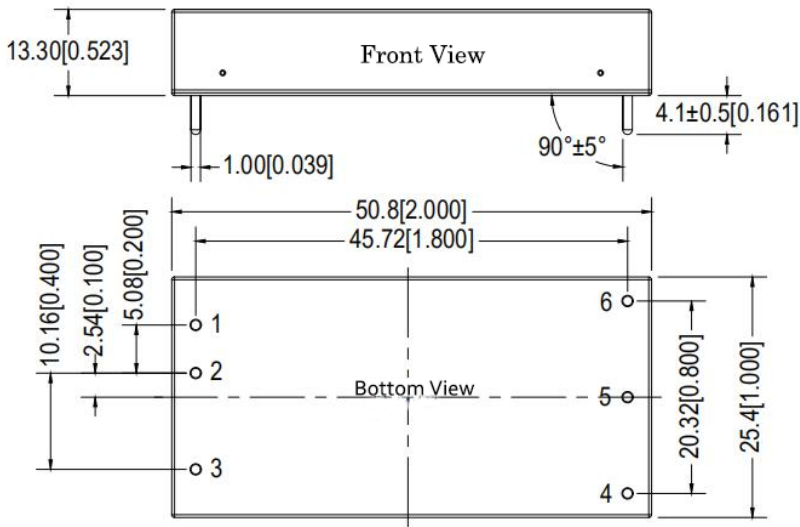
EMC Characteristics

EMI	CE	CISPR22/EN55032 CLASSB (see recommended circuit Photo②)	
	RE	CISPR22/EN55032 CLASSB (see recommended circuit Photo②)	
EMS	RS	IEC/EN61000-4-3 10V/m	perf.Criteria B (see recommended circuit Photo 2)
	CS	IEC/EN61000-4-6 3Vr.m.s	perf.Criteria B (see recommended circuit Photo 2)
	ESD	IEC/EN61000-4-2 Contact $\pm 4KV$	perf.Criteria B
	Surge	IEC/EN61000-4-5 $\pm 2KV$	perf.Criteria B(see recommended circuit Photo 1)
	EFT	IEC/EN61000-4-4 $\pm 2KV$	perf.Criteria B(see recommended circuit Photo 1)
	Voltage dips and interruptions	IEC/EN61000-4-11 0%-70%	perf.Criteria B

B3C3 Package Dimension



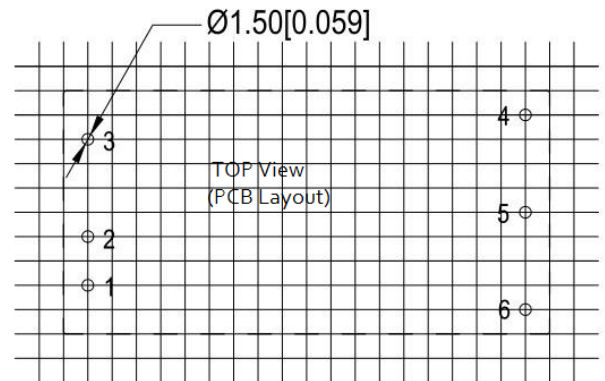
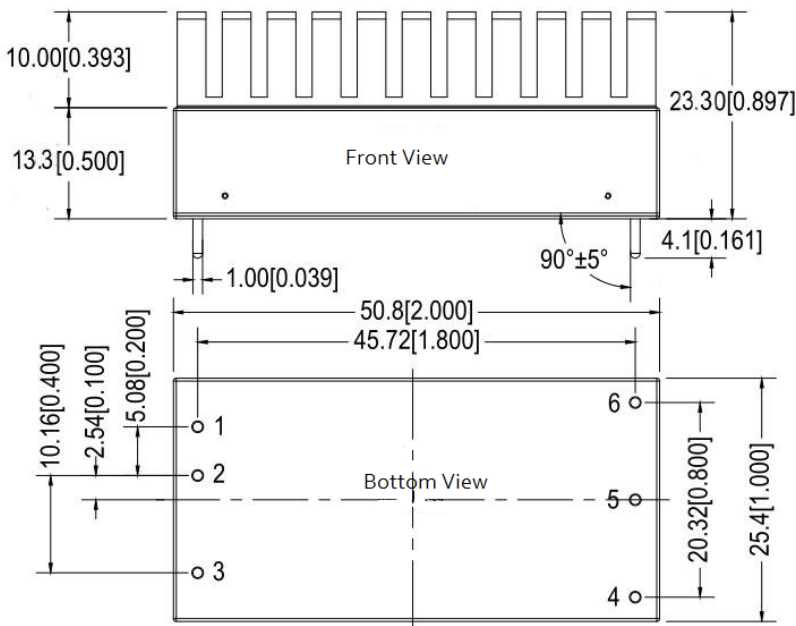
THIRD ANGLE PROJECTION



Note:
Grid 2.54*2.54mm
Unit:mm[inch]
Pin tolerance:±0.10[±0.004]
General tolerance:±0.50[±0.020]

B3C3-H Package(with Heat-sink) Dimension

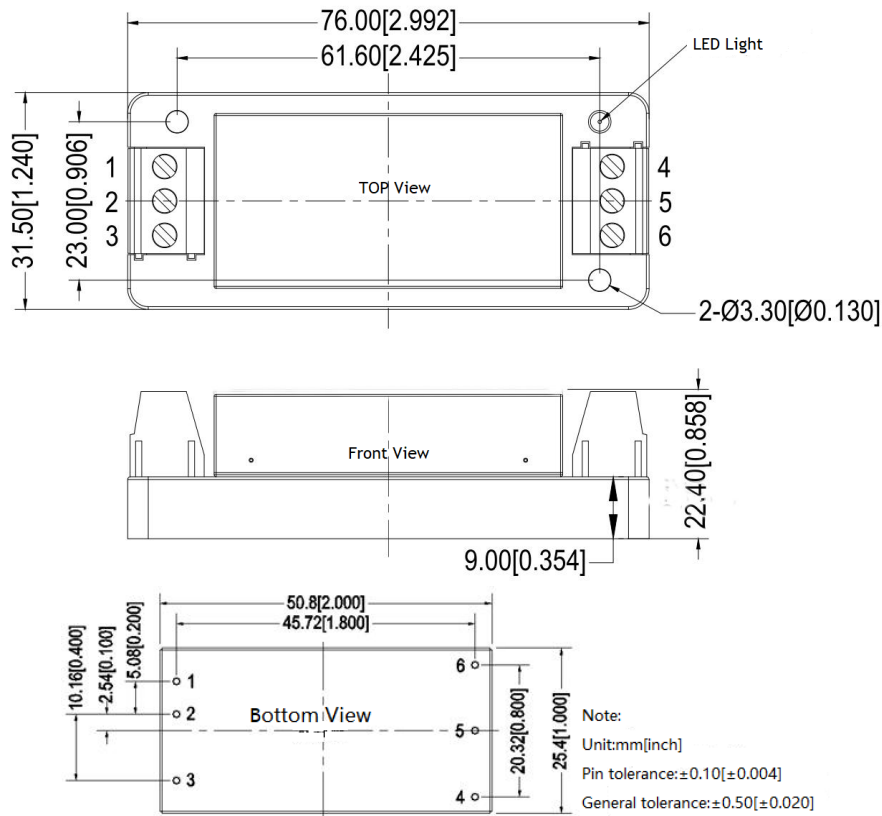
THIRD ANGLE PROJECTION



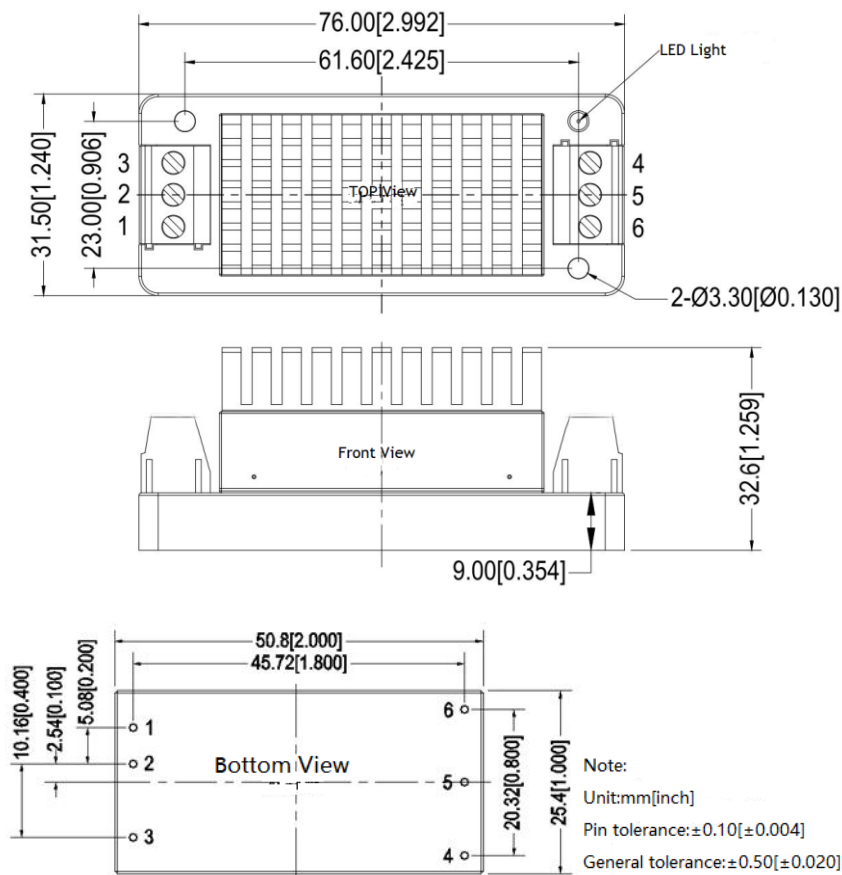
Note:
Grid 2.54*2.54mm
Unit:mm[inch]
Pin tolerance:±0.10[±0.004]
General tolerance:±0.50[±0.020]



B3C3-T Package Dimension

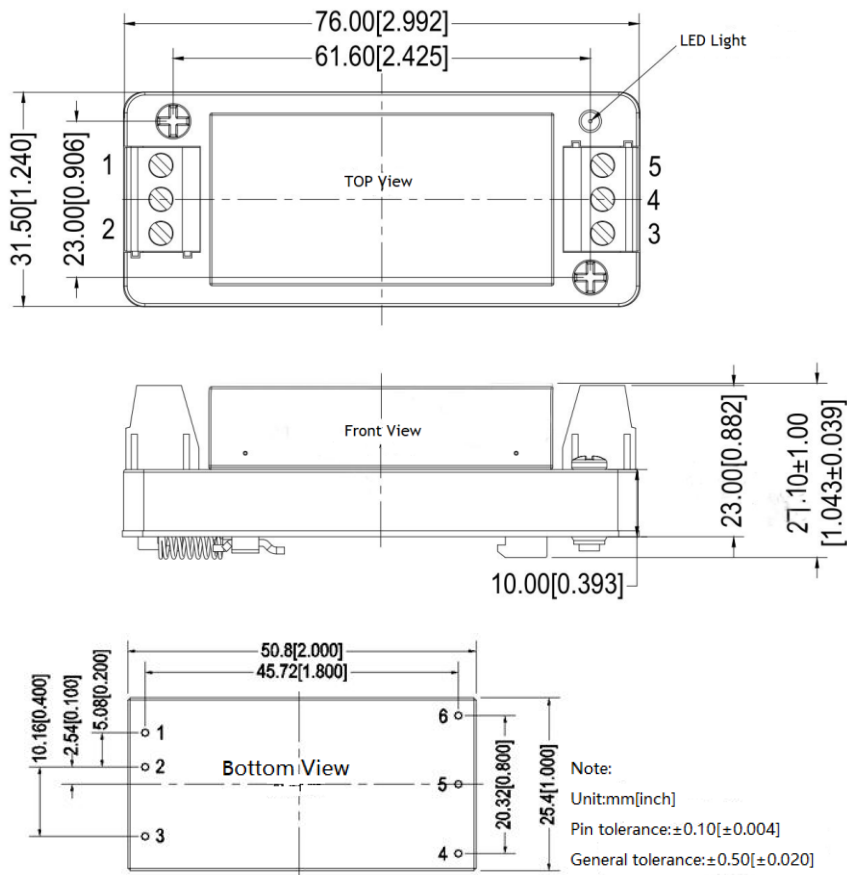


B3C3-TH(with heat-sink) Package Dimension and Pin Function

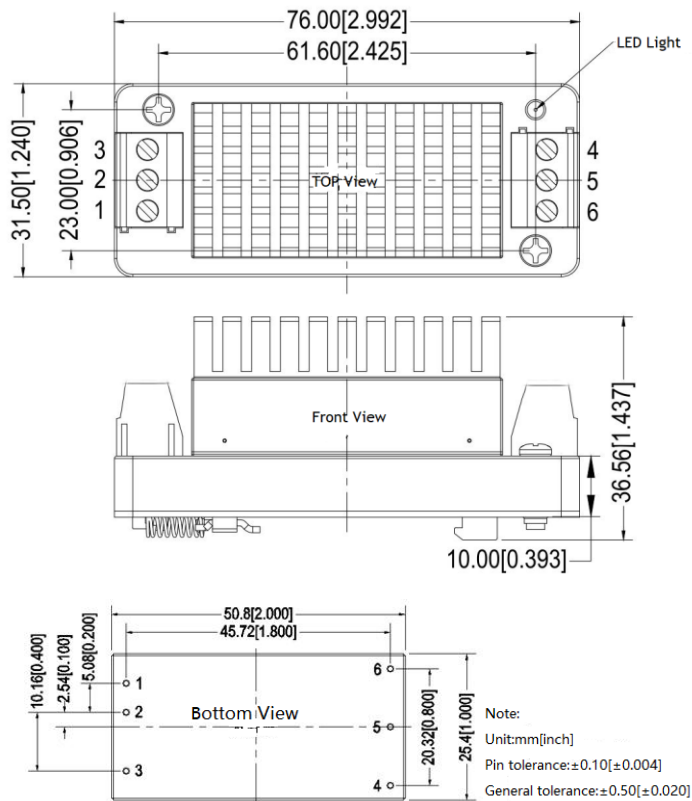




B3C3-TS Package Dimension



B3C3-TSH(with heat-sink) Package Dimension

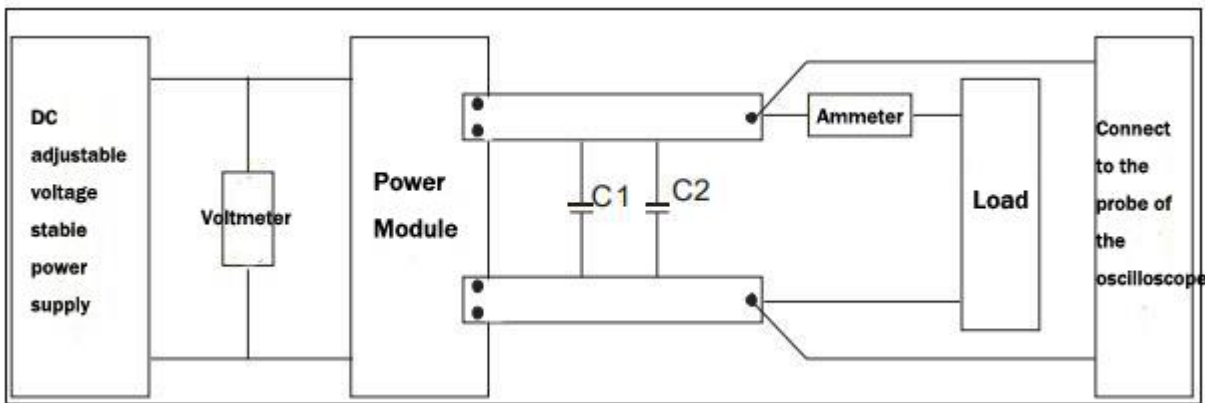


Packing Code	L x W x H	
B3C3(without Heat Sink)	50.80X25.40X13.3mm	2.000X1.000X0.511inch
B3C3-H (with Heat Sink)	50.80X25.40X23.3mm	2.000X1.000X0.905inch
B3C3-T(without Heat Sink)	76X31.5X22.3mm	2.99X1.24X0.877inch
B3C3-TH(with Heat Sink)	76X31.5X32.5mm	2.99X1.24X1.279inch
B3C3-TS(without Heat Sink)	76X31.5X27mm	2.99X1.24X1.063inch
B3C3-TSH(with Heat Sink)	76X31.5X37.2mm	2.99X1.24X1.464inch

Dual Output(D)	1	2	3	4	5	6
	+Vin	-Vin	CTRL	-Vout	COM	+Vout

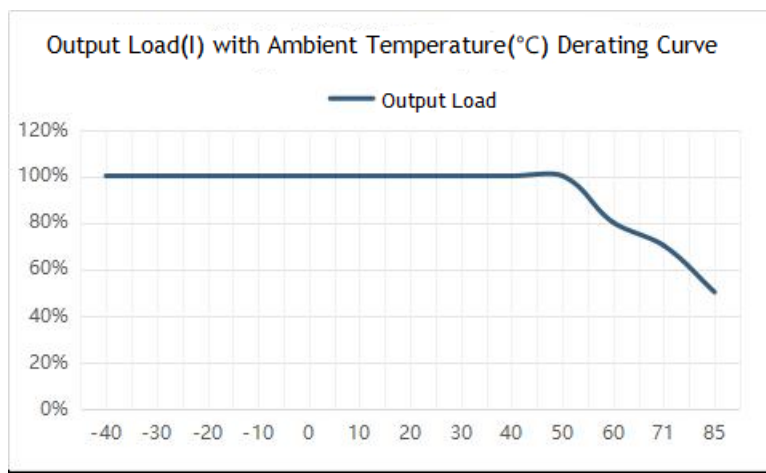
Ripple & Noise Test (Parallel pair method 20MHz bandwidth)

Test Method:

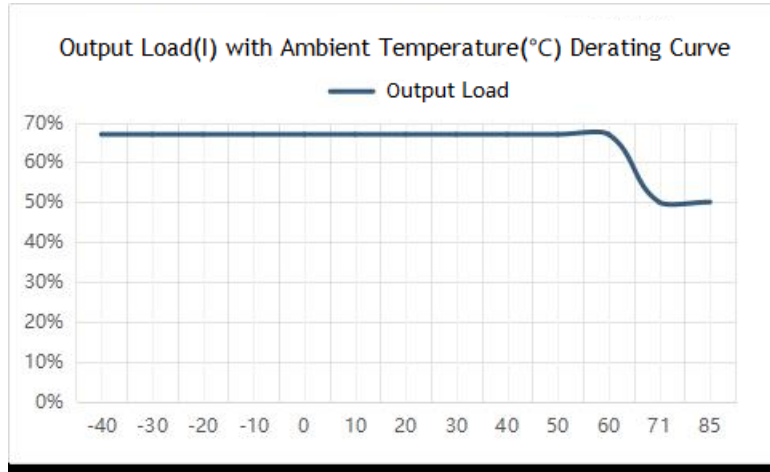


Note: C1=1uF;C2=10uF; the withstand value of the capacitor should be bigger the output voltage of the module.

Product Characteristic Curve



Above curve is tested at 12V-36VDC (FD30-18DXXB3C3) and FD30-36DXXB3C3 in windy conditions. . (at 65 °C -85 °C a minimum wind speed of 20LFM is required.)



Above curve is tested under 9V-12VDC (FD30-18DXXB3C3) windy conditions (minimum wind speed 20LFFM is required at 50 °C -85 °C)

Recommended Circuit

Recommended circuit

1. DC/DC test circuit:

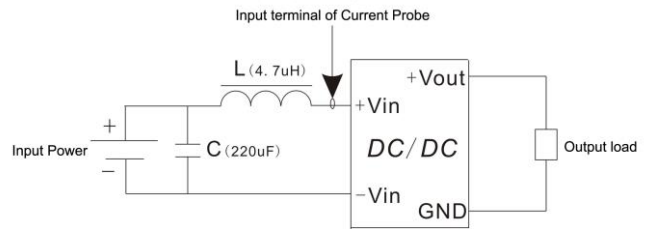
Normal recommended capacitors:

Cin:47-100uF; Cout:100-470uF.

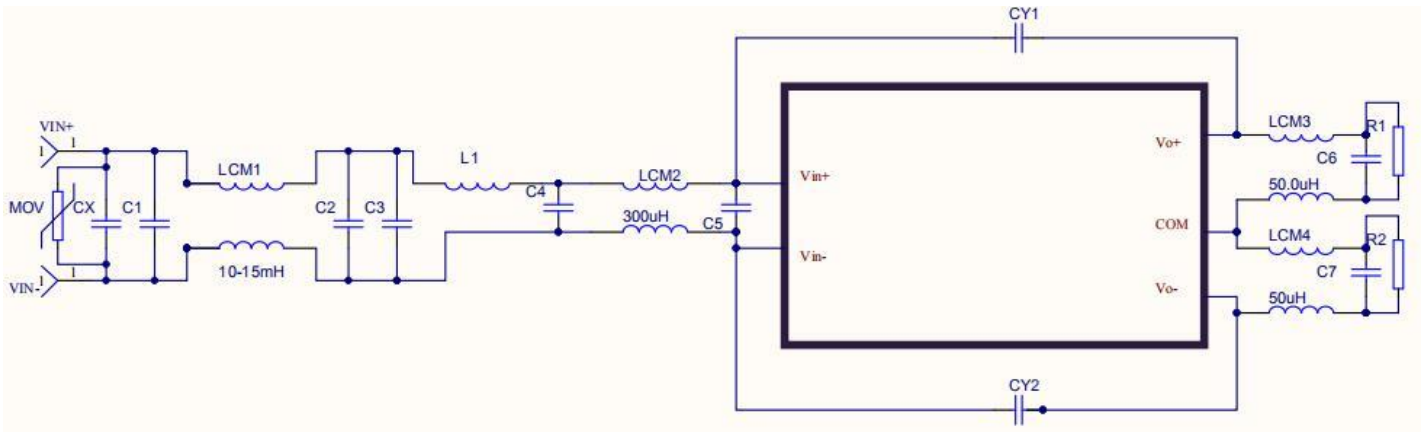


2. Input reflecting ripple current test circuit:

Capacitor C choose low ESR ones, withstand voltage value should be bigger than max input voltage;



3. EMC External recommended circuit



Recommended Specs:

Components	FD30-18DXXB3C3 Input	FD30-36DXXB3C3 Input
MOX	14D560K	14D101K
CX	0.47uF	
LCM1(Common mode inductor)	10~15mH	
C1,C2(high frequency electrolytic capacitor)	470uF/50V	470uF/100V
C3, C4, C5(1206 chip capacitor)	1uF/50V	1uF/100V
LCM2(common mode inductor)	300uH	
C6, C7(high frequency electrolytic capacitor)	47uF/50V	
CY1, CY2 (Y capacitor)	2.2nF/250V	
L1(differential mode inductor)	4.7uH, CD53 (CD43)	
LCM3, LCM4(Common mode inductor)	50~300uH(according to real situation)	

Note:

1. The product should be used under the specification range, otherwise it will cause permanent damage to it.
2. If the product worked beyond the load range or below the minimum load, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
3. Unless otherwise specified, data in this datasheet should be tested under conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load(pure resistance load);
4. All index testing methods in this datasheet are based on our Company's corporate standards
5. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
6. We can provide customized product service;
7. The product specification may be changed at any time without prior notice.