

Product Typical Features

- ◆ Wide input voltage range 4:1, Output Power 20W
- ◆ Transfer Efficiency up to 89%
- ◆ Stand-by Power Consumption as low as 0.2W
- ◆ Output super-fast start up
- ◆ Continuous Short Circuit protection, Self-recovery
- ◆ Input under voltage, output over voltage, short circuit, over current protection
- ◆ Switching Frequency 300KHz
- ◆ Isolation Voltage 1500VDC
- ◆ Operating Temperature: -40°C~+85°C
- ◆ Good EMI performance
- ◆ International standard pin-out



FD20-XXSXXB1C2 is a new designed DIP 2X1 packed, 20W output power DC DC Converter with ultra wide input voltage 4:1, low stand by power consumption, super-fast start up, isolated& regulated output function DC/DC Converter, could be widely used for industrial control, instrument, communication, power electricity, internet of things field. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

Typical Product List

Certificate	Part No	Input Voltage Range (VDC)		Output Voltage/Current(Vo/Io)		Input Current (mA) (Nominal Voltage)		Max. Capacitive Load u F	Ripple & Noise 20MHz		Efficiency (%)	
		Normal	Range	Voltage(V)	Current(mA)	Full load (mA)	No Load (mA)		mVp-p		Min	Typ
									Typ	Max		
--	*FD20-18S3V3B1C2	24	9-36	3.3	4000/0	650	50	8000	50	100	82	84
	FD20-18S05B1C2	24	9-36	5	4000/0	934	57	6000	50	100	85	87
	*FD20-18S09B1C2	24	9-36	9	2222/0	936	30	2000	50	100	87	89
	FD20-18S12B1C2	24	9-36	12	1667/0	940	5	500	50	100	86	88
	FD20-18S15B1C2	24	9-36	15	1333/0	928	7	1000	50	100	87	89
	FD20-18S18B1C2	24	9-36	18	1111/0	940	5	500	50	100	87	89
	FD20-18S24B1C2	24	9-36	24	833/0	926	2	500	50	100	88	90
	*FD20-18S28B1C2	24	9-36	28	714/0	950	8	500	50	100	87	89

1. "*" are models being developing; Suffix "C" is with CTRL function; "N" is without control function.
2. 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;
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 with 15% load or above 470uF high frequency low resistance electrolytic capacitor, otherwise the output ripple will rise;



Input Specification

Stand-by Consumption	0.2 W(TYP)		
Input Filter	Pi filter		
Input Under-Voltage Protection	5~9VDC	FD20-18SXXB1C2 Input	
	11~18VDC	FD20-36SXXB1C2 Input	
CTRL*	Module turn-on	Suspended or connect to High level(2.5V-12VDC)	
	Module turn-off	Connect to GND or connect to low level (0-1.2VDC)	
	Input current when switched off	5mA(Typ)	

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

Output Specification

Output Voltage Accuracy	Full voltage full load	Vo	±2.0%
Line Voltage Regulation	Nominal load, full voltage range	Vo	±0.5%
Load Regulation	10% ~ 100% nominal load	Vo	±0.5%
Ripple & Noise	Nominal load, nominal voltage Twisted pair method, 20MHz bandwidth	≤ 15% load	5%Vo mVp-p typ
		≥ 15% load	50mVp-p typ, 100mVp-p max
Output Over-voltage Protection	110%~200%Vo		
Output over-load protection	110%~200% Io		
Output Short circuit Protection	Hiccup, continuous, self-recovery		
Dynamic Response	25% nominal load step change $\Delta V_o / \Delta t$	3.3V、5V output	±3% typ , ±8% max /500us
		Other output	±3% typ , ±5% max /500us
Output Voltage Adjustment	N/A		
Turn-on delay time	Typical	150ms	
O/P startup overshoot voltage	--	≤ 10%Vo	

Note: *Ripple& noise is tested by twisted pair method.

General Specification

Switching Frequency	Typical	300KHz
Operating Temperature	Refer to Temperature Derating Curve	-40℃ ~ +85℃
Storage Temperature	-	-55℃ ~ +125℃
Max Case Temperature	Within Operating Curve	+105℃
Relative Humidity	No condensing	5%~95%
Case Material	-	Aluminum Metal Case
Cooling method	--	Free air convection

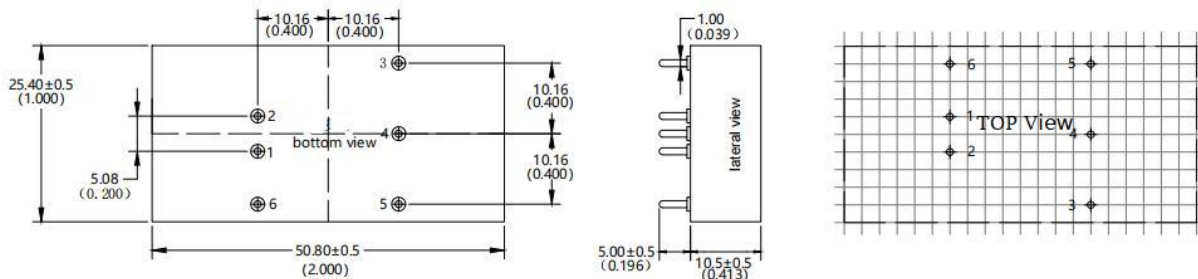
Isolation Voltage	Input to Output	1500Vdc ≤ 0.5mA / 1min
Meantime Between Failure	MIL-HDBK-217F@25°C	2X10 ⁵ Hrs
Product Weight	Average	30g

EMC Characteristics

Total Items		Sub Items	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55022	CLASSB (see recommended circuit photo②)
		RE	CISPR22/EN55022	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 ±4KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B (see recommended circuit photo 1)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (see recommended circuit photo 1)
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

B1 Package Dimension

Unit:mm
 Printed board vertical view
 Grid space:2.54mm(0.1inch)
 General tolerance:±0.5mm
 Pin tolerance:±0.10mm



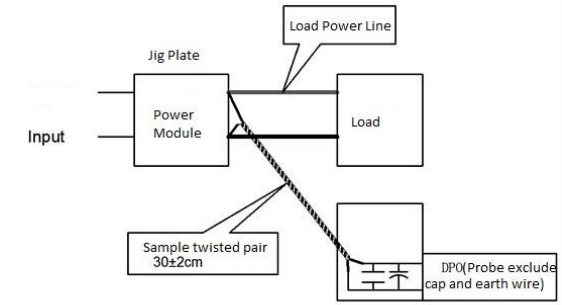
Packing Code	L x W x H
B1C2	50.80X25.40X10.5mm

	1	2	3	4	5	6
Single(S) C2 Pin	-Vin	+Vin	+Vout	NP	GND	CTRL
Single(S) C2 Pin	-Vin	+Vin	+Vout	NP	GND	NP

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

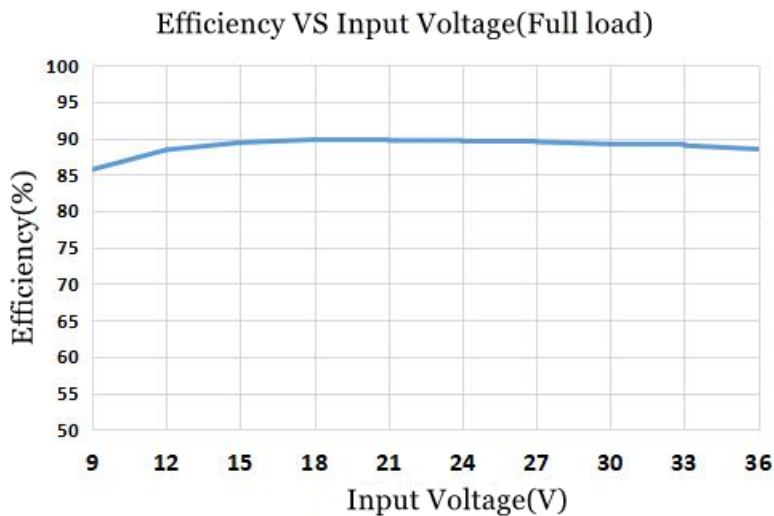
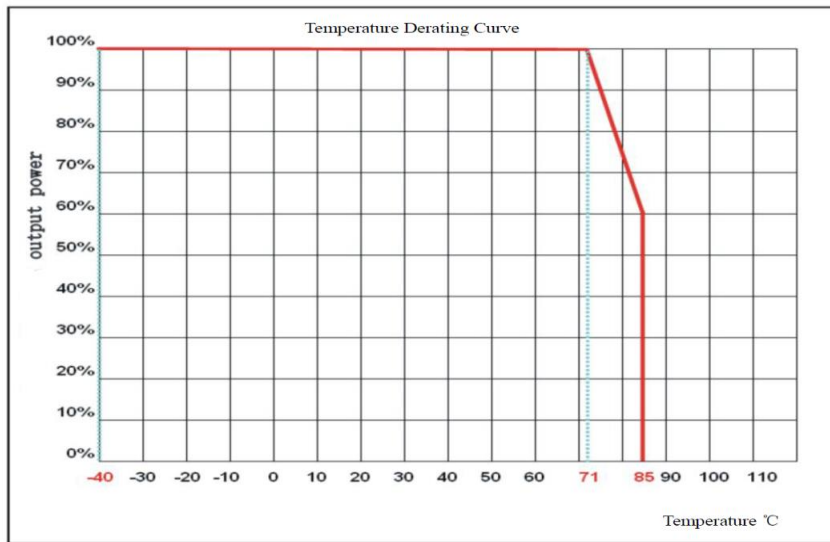
1. 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

2. Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.

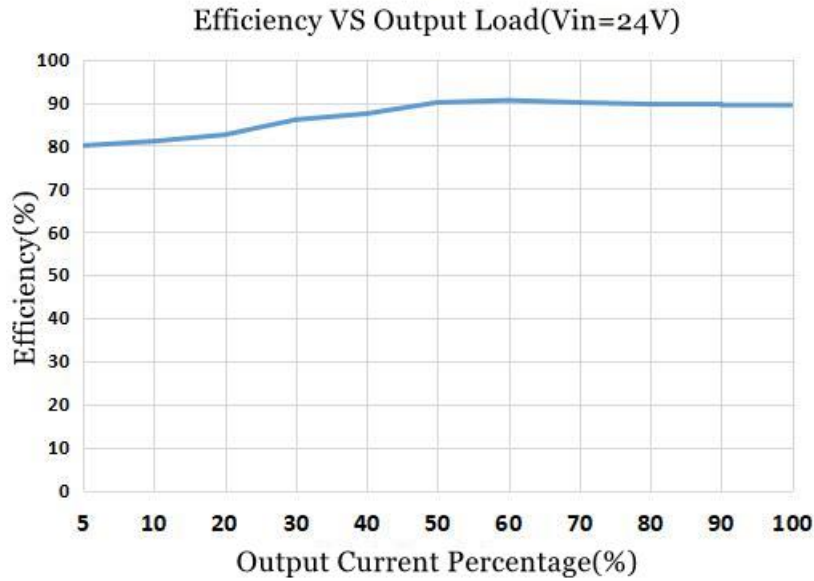


1. It is recommended to output a minimum 15% load or connect an electrolytic capacitor with a high-frequency resistance above 470uF, otherwise the output voltage ripple will increase;
2. It is recommended that the load unbalance of dual output products be less than ±5%;

Product Characteristic Curve



FD20-18S28B1C2



FD20-18S28B1C2

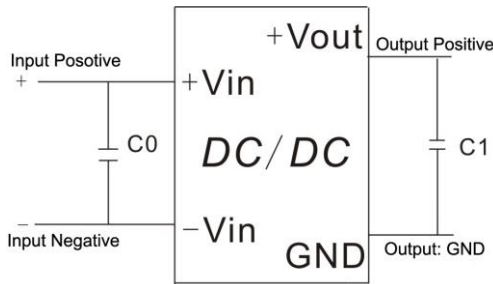
Design and Application Reference

Recommended circuit

① DC/DC test circuit:

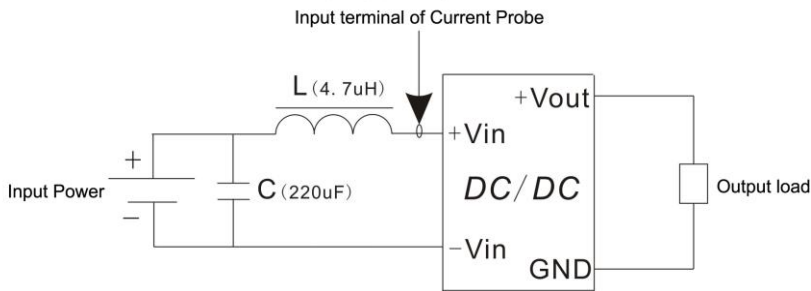
Normal recommended capacitors:

C0:47-100uF; C1:330uF.

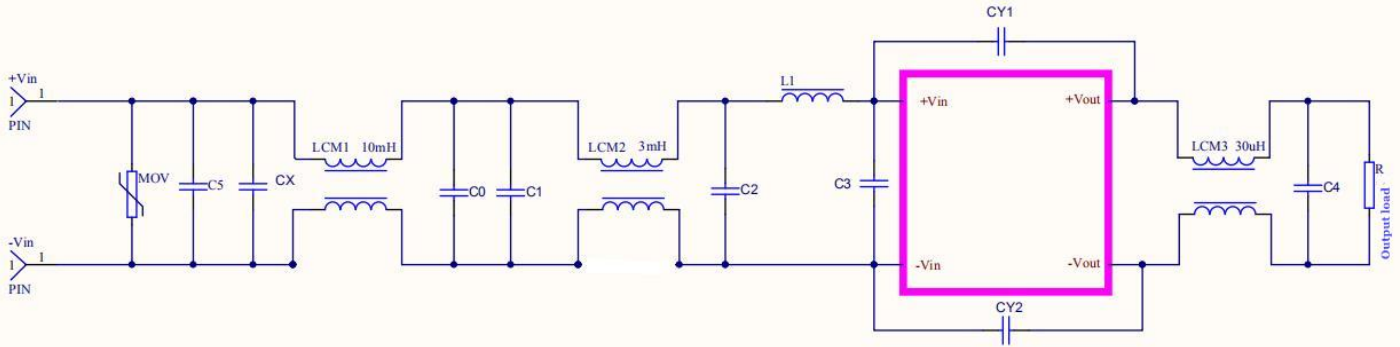


② Input reflecting ripple current test circuit:

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



① EMC recommended external circuit



Recommended circuit:

Components	FD20-18SXXB1C2 Input	FD20-36SXXB1C2 Input
FUSE	According to customer's request	
MOV	14D560K	14D101K
CX	0.47uF	0.47uF
LCM1	10mH	10mH
LCM2	1mH	1mH
C0	1uF/50V	1uF/100V
C1, C5	220uF/50V	220uF/100V
C2, C3	1uF/50V	1uF/100V
LCM3	50uH	30uH
C4	10uF/50V	10uF/50V
CY1,CY2	2.2nF/2000V	

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.