2S7B2_3UP series

2W - Single/Dual Output DC-DC Converter - Isolated & Unregulated

DC-DC Converter 2 Watt

- SIP7 package
- 3000VDC isolation
- Operating temperature range: -40°C to +105°C
- Up to 90% efficiency
- International standard pin out
- MTBF >3,500,000 hours

Introducing our new 2S7B2_3UP series, a high-performance DC-DC converter in a compact SIP7 package. Designed for reliable operation even under demanding industrial conditions, it provides 3000VDC isolation, operates within a wide temperature range from -40°C to +105°C, and achieves up to 90% efficiency. With an international standard pin-out for easy integration and an impressive MTBF of over 3,500,000 hours, this series delivers outstanding stability and long-term dependability — the ideal choice for applications where performance and endurance matter.

Common specifications

Short circuit protection	Continuous, self recovery
Switching frequency	220 kHz (full load, nominal input voltage)
Operation temperature	-40°C ~+105°C (with derating)
Storage temperature	-55°C ~+125°C
Pin welding can withstand the highest temperature	+300°C (soldering spot is 1.5mm away from case for 10 seconds)
Case temperature rise	25°C (Ta = 25°C, nominal input, output full load)
Storage humidity	95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	>3,500,000 hours
Input filter	Capacitance filter
Hot plug	Unavailable
Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	19.65 x 7.05 x 10.16 mm
Weight	1.79 g (typ.)
Cooling method	Free air convection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/ no load)	5VDC input 9VDC input 12VDC input 15VDC input 24VDC input		506/4 268/4 208/4 167/4 104/4	--/15 --/15 --/15 --/15 --/15	mA
Reflected ripple current			15		mA
Impulse voltage	5VDC input 9VDC input 12VDC input 15VDC input 24VDC input	-0.7 -0.7 -0.7 -0.7 -0.7		9 12 18 21 30	VDC

Example:
2S7B2_2405S3UP
2 = 2Watt; S7 = SIP; B2 = Series; 24 = 24Vin; 05 = 5Vout; S = Single Output;
3 = 3000VDC isolation; U = Unregulated Output; P = Short circuit protection.

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	See envelope curve (figure 1)				
Linear regulation (input voltage variation ±1%)	3.3VDC output Others output		±1.5 ±1.2		%
Load Regulation (10% - 100% load)	3.3VDC output 5VDC output 9VDC output 12VDC output 15VDC output 24VDC output		14 10 9 8 7 6		%
Ripple & noise	20MHz bandwidth (peak-peak)		60	120	mV
Temperature drift coefficient	Full load			±0.03	%/°C

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	3000			VDC
Isolation resistance	Input-output, isolated voltage 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		20		pF

1. The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused ;
2. Unless otherwise specified,the parameters in this datasheet were measured at 25°C, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on our company's standards;

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EMC specifications			
EMI	CE	CISPR32/EN55032 CLASS B (the recommended circuit is shown in figure 4)	
EMI	RE	CISPR32/EN55032 CLASS B (the recommended circuit is shown in figure 4)	
EMS	ESD	IEC/EN61000-4-2 Contact ±8kV	perf. criteria B

Product Selection Guide

Approval	Part number	Input Voltage Nominal (VDC)	Output Voltage (VDC)	Output Current (mA) min.	Output Current (mA) max.	Full Load Efficiency (%) typ.	Capacitive Load max. (µF)
	2S7B2_0303S3UP	3.3	3.3	0	400	82	2400
	2S7B2_0305S3UP	3.3	5	0	400	83	2400
	2S7B2_0309S3UP	3.3	9	0	222	84	1000
	2S7B2_0312S3UP	3.3	12	0	167	85	820
	2S7B2_0503S3UP	5	3.3	0	400	83	2400
	2S7B2_0505S3UP	5	5	0	400	85	2400
	2S7B2_0509S3UP	5	9	0	222	85	1000
	2S7B2_0512S3UP	5	12	0	167	86	820
	2S7B2_0515S3UP	5	15	0	133	87	680
	2S7B2_0524S3UP	5	24	0	83	88	560
	2S7B2_1203S3UP	12	3.3	0	400	84	2400
	2S7B2_1205S3UP	12	5	0	400	85	2400
	2S7B2_1209S3UP	12	9	0	222	86	1000
	2S7B2_1212S3UP	12	12	0	167	87	820
	2S7B2_1215S3UP	12	15	0	133	88	680
	2S7B2_1224S3UP	12	24	0	83	89	560
	2S7B2_2403S3UP	24	3.3	0	400	84	2400
	2S7B2_2405S3UP	24	5	0	400	86	2400
	2S7B2_2409S3UP	24	9	0	222	87	1000
	2S7B2_2412S3UP	24	12	0	167	88	820
	2S7B2_2415S3UP	24	15	0	133	89	680
	2S7B2_2424S3UP	24	24	0	83	90	560

Approval	Part number	Input Voltage Nominal (VDC)	Output Voltage (VDC)	Output Current (mA) min.	Output Current (mA) max.	Full Load Efficiency (%) typ.	Capacitive Load max. (µF)
	2S7B2_0503D3UP	5	±3.3	0	±303	83	1000
	2S7B2_0505D3UP	5	±5	0	±200	85	1000
	2S7B2_0509D3UP	5	±9	0	±111	85	560
	2S7B2_0512D3UP	5	±12	0	±83	86	560
	2S7B2_0515D3UP	5	±15	0	±67	87	220
	2S7B2_1203D3UP	12	±3.3	0	±303	84	1000
	2S7B2_1205D3UP	12	±5	0	±200	85	1000
	2S7B2_1209D3UP	12	±9	0	±111	86	560
	2S7B2_1212D3UP	12	±12	0	±83	87	560
	2S7B2_1215D3UP	12	±15	0	±67	88	220
	2S7B2_2403D3UP	24	±3.3	0	±303	84	1000
	2S7B2_2405D3UP	24	±5	0	±200	86	1000
	2S7B2_2409D3UP	24	±9	0	±111	87	560
	2S7B2_2412D3UP	24	±12	0	±83	88	560
	2S7B2_2415D3UP	24	±15	0	±67	89	220

Typical characteristics

Temperature derating graph

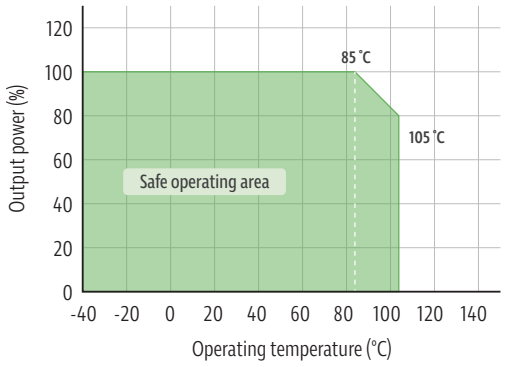


Figure 2

Output regulation curve

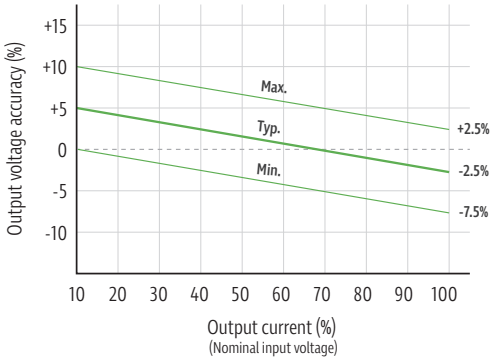


Figure 1.1

Output regulation curve
3.3VDC output

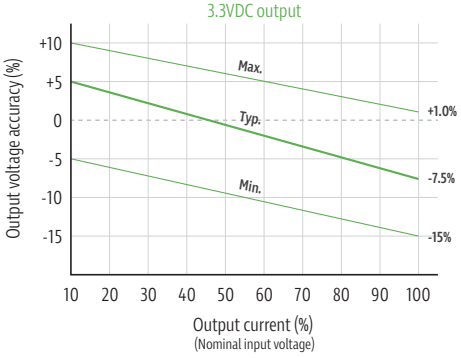
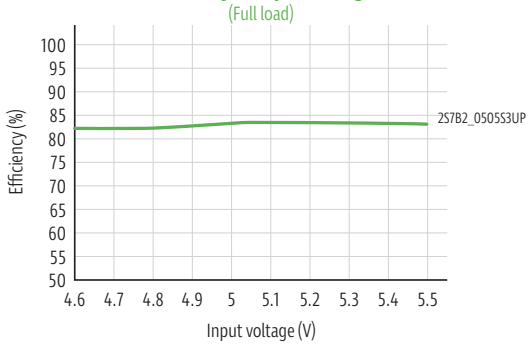
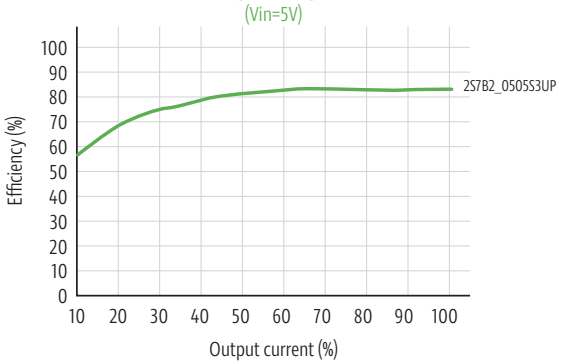


Figure 1.2

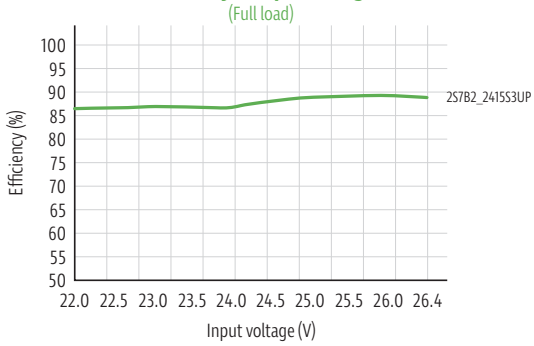
Efficiency vs input voltage
(Full load)



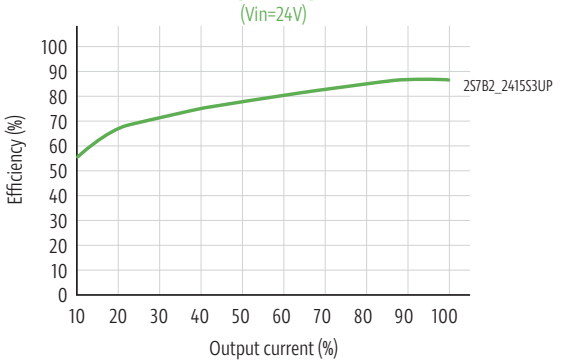
Efficiency vs output load
(Vin=5V)



Efficiency vs input voltage
(Full load)

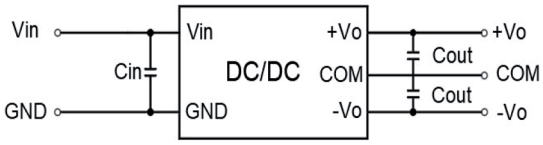


Efficiency vs output load
(Vin=24V)



Typical circuit design and application

Double (Positive and Negative)



Single

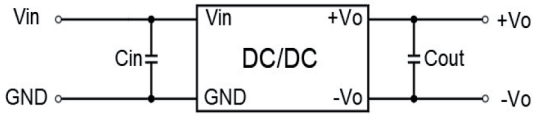


Figure 3

Recommended Capacitive Load Value Table

Vin	Cin	Vo	Cout
5VDC	4.7uF/16V	3.3/5VDC	10μF
9/12VDC	2.2uF/25V	9/12VDC	2.2μF
15VDC	2.2uF/25V	15/24VDC	1.0μF
24VDC	1.0uF/50V	--	--

Recommended EMC circuit diagram

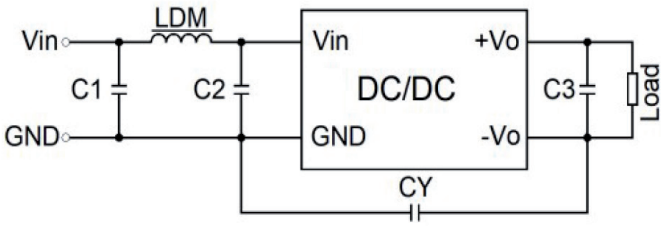


Figure 4

EMI Recommended Parameter Table

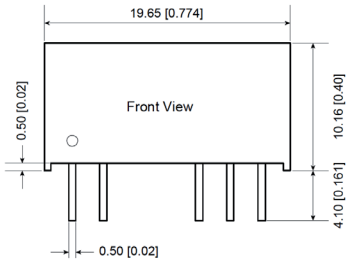
	Input Voltage (VDC)	5/9/12/15	24
EMI	C1/C2	4.7μF /50V	
	CY	1nF/2KV	
	C3	Refer to the Cout parameter in Figure 3	
	LDM	6.8μH	

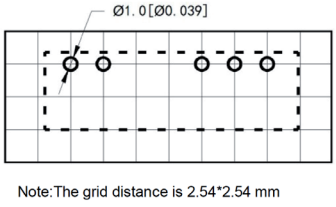
1. Typical applications
To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals.The application circuit is shown in Figure 3. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely to cause start-up problems. For each output, the recommended capacitive load values are shown in "Recommended Capacitive Load Value Table" for safe and reliable operation.

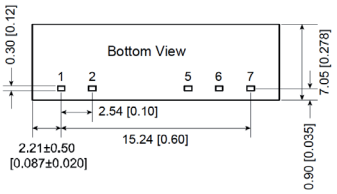
2. EMC typical recommended circuit
See Figure 4

3. Output load requirements
In order to ensure that the module can work efficiently and reliably, the minimum output load should not be less than 10% of the rated load when used. If the power required is really small, connect a resistor in parallel to the output end (the sum of the power consumed by the resistance and the power actually used is greater than or equal to 10% of the rated power).

Mechanical dimensions







Pin Definition Table		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
5	-Vo	-Vo
6	No Pin	COM
7	+Vo	+Vo

NC: Pin to be isolated from circuitry

Note:
Unit: mm [inch]
Pin section tolerances: ±0.10 [±0.004]
General tolerances: ±0.50 [±0.020]