2S10B1_7UP series

2W - Single Output DC-DC converter - Fixed Input - Isolated & Unregulated

DC-DC Converter 2 Watt

- **Fixed input voltage with isolated and unregulated output, delivering 2W of power**
- **Achieves high transfer efficiency of up to 84%**
- **Provides continuous protection against short circuits**
- **Capable of withstanding a full load impact voltage of 8kV**
- **Features an isolation voltage of 7000VDC with reinforced isolation**
- **Operates efficiently within a temperature range of -40°C to +105°C**
- **Exhibits a low isolation capacitance of 7pF**

Introducing our new 2S10B1_7UP series with fixed input voltage, isolated and unregulated output, and an output power of 2W. This advanced device boasts a high transfer efficiency of up to 84%, ensuring optimal performance. It features continuous short circuit protection, making it a reliable choice for various applications.

The product can withstand a full load 8kV impact voltage and offers reinforced isolation with an impressive isolation voltage of 7000VDC. Designed to operate in a wide temperature range from -40°C to +105°C, it ensures durability and functionality in extreme conditions. Additionally, the isolation capacitance is as low as 7pF, enhancing its efficiency and performance.

Common specifications

Short circuit protection	Continuous short-circuit protection, self-recovery
Switching frequency	260kHz (typ.)
Operating temperature	-40°C - +105°C (with derating)
Storage temperature	-55°C - +125°C
Shell temperature rise during work	25°C (typ.) within derating
Wave soldering temperature	Peak temperature Tc ≤245°C, maximum time above 217°C is 60s
Pin soldering temperature	300°C (max.) distance to case 1.5mm, 10 seconds
Relative humidity	5~95% RH (Non-condensing)
MTBF (MIL-HDBK-217F@25°C)	35 x 10^5 Hours
Hot Plug	N/A
Case material	Black flame-retardant heat-resistant Plastic (UL94 V-0)
Weight	5.3g (typ.)

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input overshoot voltage (1 second max.)	5VDC Input	-0.7		18	VDC
input filter	Capacitor filter				

Example:
2S10B1_1205S7UP
2 = 2Watt; S10 = SIP10; B1 = Pinning; 12 = 12Vin; 05 = 5Vout; S = Single Output; 7 = 7kVDC isolation; U = Unregulated Output; P = Short circuit protection

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Output power		0.2		2	W
Output voltage accuracy	Nominal input, Full load		±3	±5	%
Load regulation (10% ~ 100% nominal load)	5VDC output 12VDC output			±15 ±20	%
Line regulation	Input Voltage Change ±1%			±1.2	%
Ripple & noise*	Nominal input, full load, 20MHz bandwidth		50	150	mVp-p
Temperature drift coefficient	100% Full load			±0.03	%/°C

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

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input to Output, test 1 minute, leakage current <0.5mA	≤7000			VDC
Insulation Resistance	Input-output, isolation voltage 500VDC		1000		MΩ
Isolation capacitor	Input/Output, 100kHz/0.1V		7		pF

1. This product is not suitable for parallel use and does not support hot-plugging.
2. Operating below the minimum required load may result in performance that does not meet all the indicators specified in this manual.
3. The maximum capacitive load is determined under the specified input voltage range and full load conditions.
4. Unless stated otherwise, all performance indicators in this manual are measured at a temperature of 25°C, humidity below 75%RH, with nominal input voltage and rated output load.
5. Testing methods for all indicators in this datasheet are based on our company's corporate standards.
6. Product specifications are subject to change without prior notice.

EMC specifications

EMI	conducted disturbance	CISPR32/EN55032 CLASS B (See EMC recommended circuit diagram)
EMI	radiation harassment	CISPR32/EN55032 CLASS B (See EMC recommended circuit diagram)
EMS	electrostatic discharge	IEC/EN61000-4-2 Air ±8kV, Contact±6kV perf.Criteria B

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Product Selection Guide

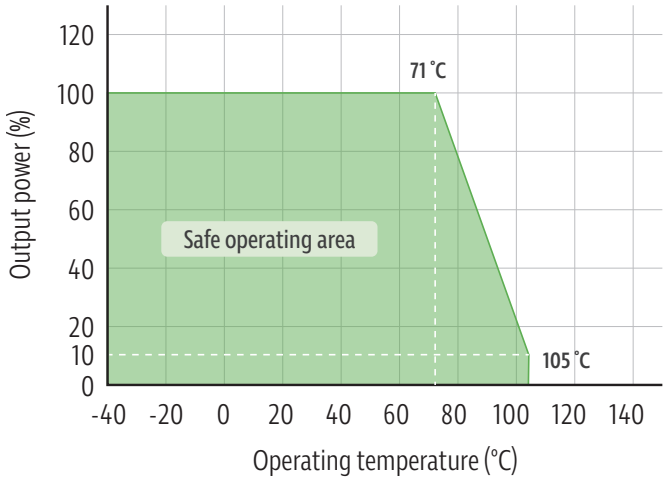
Approval	Series	Input Voltage Nominal (VDC)	Output Voltage (Vo/Io) (VDC)	Output Current (Vo/Io) (mA)	Input Current (mA) Nominal voltage full load (typ.)	Input Current (mA) Nominal voltage no load (typ.)	Max. capacitive Load (uF)	Ripple & noise max. (mVp-p)	Efficiency (%) full load, nominal input voltage (Typ.)
	2S10B1_1205S7UP	12	5	400/40	210	20	1000	150	83
	2S10B1_1212S7UP	12	12	167/17	200	20	470	150	84

Note:

1. To ensure the converter operates reliably and efficiently, the minimum load should be at least 10% of the rated load. If the required power is very low, please connect a resistor in parallel at the output side. The recommended resistance should correspond to 10% of the nominal power.

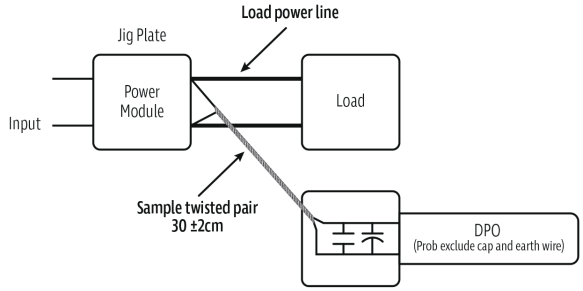
Product characteristic curve

Temperature derating graph



Ripple & noise test: (twisted pair method 20MHz bandwidth)

Twisted pair method (20MHz bandwidth)

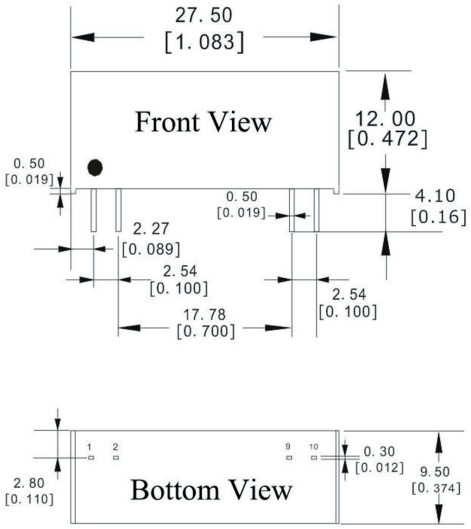


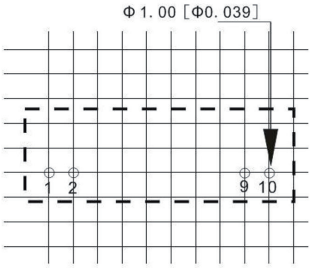
Test Method:

1. Connect the twisted pair, set the oscilloscope bandwidth to 20MHz, use a 100M bandwidth probe, and terminate with a 0.1uF polypropylene capacitor and a 10uF high-frequency low-resistance electrolytic capacitor in parallel. Configure the oscilloscope to sample mode.

2. Connect the input terminal to the power supply and the output terminal to the electronic load using a jig plate. Use a 30cm (±2 cm) sampling line, and select the power line from appropriately insulated wires of the corresponding diameter according to the output current flow.

Standard packing dimensions



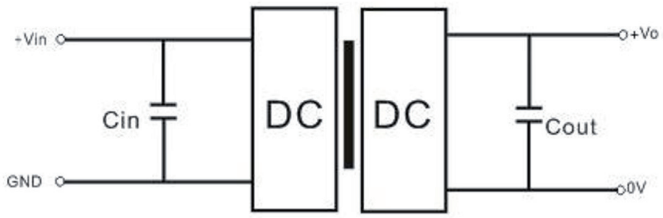


Note:
Grid 2.54x2.54mm
Unit: mm [inch]
Pin tolerance: ±0.10 [±0.004]
General tolerance: ±0.50 [±0.020]

Pin Function	1	2	9	10
Single (S)	Vin	GND	0V	+Vo

Recommended circuit circuit

Single



1. **Output Load Requirements:**

a. To ensure reliable and efficient operation of the converter, the minimum load should be no less than 10% of the rated load. If the required power is very low, connect a resistor in parallel at the output side, with the resistance equal to 10% of the nominal load.
b. The maximum capacitive load is tested under nominal input and full load conditions. It must not exceed the maximum capacitive load of the output terminal during operation, as this can cause startup difficulties and potential damage to the product.

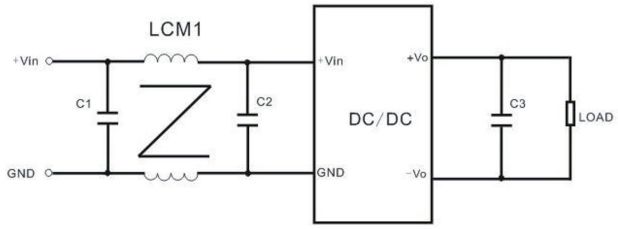
2. R**ecommended Circuit:**

To reduce input/output ripple and noise, a capacitor filter network can be connected to the input and output terminals, as shown in Photo 1. Choosing the appropriate filter capacitor is crucial, as too large a capacitance can cause startup issues. To ensure safe and reliable module operation, refer to the recommended capacitive load values in Table 1.

Reccomended capacitive load value (Table 1)

Vin (VDC)	Cin	Vout (VDC)	Cout
12	4.7μF/25V	5	10μF/16V
12	4.7μF/25V	12	4.7μF/25V

3.EMC typical recommended circuit



Input voltage		12VDC
EMI	C1 and C2	22μF/25V
EMI	C3	Refer to the Cout specs in table
EMI	LCM1	4.7mH