



10S8W4_2.25RP series

10W - Single Output DC-DC Converter - Isolated & Regulated

DC-DC Converter

10 Watt

- ⊕ Wide input voltage range (4:1)
- ⊕ Transfer efficiency up to 88%
- ⊕ Stand-by power consumption as low as 0.05W
- ⊕ SIP8 converter
- ⊕ Continuous short circuit protection, self-recovery
- ⊕ Isolation voltage 2250VDC
- ⊕ Protections: input under voltage, output short circuit, over current
- ⊕ Switching frequency 450KHz
- ⊕ Operating temperature: -40°C~+85°C
- ⊕ Good EMI performance
- ⊕ International standard pin-out

Introducing our latest 10S8W4_2.25RP series: a versatile converter with a wide 4:1 input voltage range and transfer efficiency up to 88%. With stand-by power consumption as low as 0.05W and super-fast start-up, this converter offers continuous short circuit protection with self-recovery. It features an isolation voltage of 2250VDC and comprehensive protections, including input under voltage, output short circuit, and over current. Operating at a switching frequency of 450KHz and within a temperature range of -40°C to +85°C, it ensures reliable performance. Additionally, it boasts good EMI performance and an international standard pin-out for easy integration.



Common specifications	
Short circuit protection	Self-recovery after release of short circuit
Over-load protection	110%~230%
Switching frequency	450KHz (Typ.)
Operating temperature	-40°C - +85°C (Refer to Temperature Derating Curve)
Storage temperature	-55°C - +125°C
Max case temperature	+105°C (Within Operating Curve)
Relative humidity	5~95% RH (No condensing)
Case material	Black flame-retardant and heat-resistant plastic
Cooling method	Natural cooling
MTBF (MIL-HDBK-217F@25°C)	2x10 ⁵ Hours
Weight	5g (Average)

Input specifications					
Item	Operating condition	Min	Typ	Max	Units
Stand-by consumption			0.05		W
Input filter	Capacitor filter				
Input under-voltage Protection	5~9VDC @ FK10-18SXXE2 input				
Ctrl*	Module turn-on			CTRL suspended or TTL high level (3.5-12VDC)	
	Module turn-off			CTRL 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 GND pin.

Example:
10S8W4_2405S2.25RP
 10 = 10Watt; S8 = SIP8; W4 = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 2.25 = 2.25kVDC; R = Regulated Output; P = Short Circuit Protection

Output specifications					
Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Full voltage full load - Vo		±2.0		%
Line regulation	Nominal load, full voltage range - Vo		±0.5		%
Load regulation	10% ~ 100% nominal load Vo		±1.0		%
Ripple & Noise	Nominal load, nominal voltage, Twisted Pair Test Method, 20M Hz Bandwidth		100	150	mVp-p
Dynamic Response*	3.3V/5V Output		±5	±8	% / 500us
	Other voltage output		±3	±5	
Voltage Adjustment	No adjustment				
Turn-on delay time			100		ms
Turn-on Overshoot Voltage			≤10		%Vo

Note: *T25% nominal load step $\Delta V_o / \Delta t$

Isolation specifications					
Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input to Output			2250VDC	≤0.5mA / 1min

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. The product specification may be changed at any time without prior notice. Please pay attention to the latest manual published on our official website.

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EMC specifications					
EMC	EMI	CE	CISPR22/EN55032	CLASS B	(see recommended circuit photo2)
EMC	EMI	RE	CISPR22/EN55032	CLASS B	(see recommended circuit photo2)
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria B (see recommended circuit photo2)
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria B (see recommended circuit photo2)
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV	Perf.Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5	±2KV	Perf.Criteria B (see recommended circuit photo1)
EMC	EMS	EFT	IEC/EN61000-4-4	±2KV	Perf.Criteria B (see recommended circuit photo1)
EMC	EMS	Voltage dips, short	IEC/EN61000-4-11	0%~70%	Perf.Criteria B

Product Selection Guide

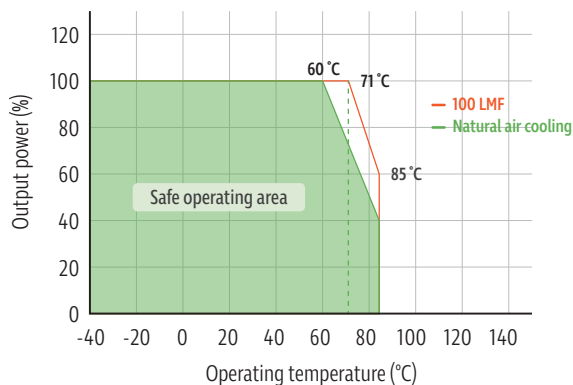
Approval	Model	Input Voltage Range (VDC) Nominal	Input Voltage Range (VDC) Range	Output Voltage Vo(VDC)	Output Current Io(mA)	Input Current (mA) (Nominal Voltage) Full Load typ.	Input Current (mA) (Nominal Voltage) No Load typ.	Max. Capacitive Load (uF)	Ripple & Noise (mVp-p) Typ.	Ripple & Noise (mVp-p) Max.	Efficiency (%) output full load, I/P nominal voltage (Min.)	Efficiency (%) output full load, I/P nominal voltage (Typ.)
	10S8W4_2403S2.25RP	24	9-36	3.3	2400	478	33	2200	100	150	82	84
	10S8W4_2405S2.25RP	24	9-36	5	2000	467	40	2200	100	150	85	87
	10S8W4_2409S2.25RP	24	9-36	9	1111	473	10	680	100	150	85	87
	10S8W4_2412S2.25RP	24	9-36	12	834	474	10	470	100	150	86	88
	10S8W4_2415S2.25RP	24	9-36	15	667	479	10	330	100	150	86	88
	10S8W4_2418S2.25RP	24	9-36	18	556	479	10	330	100	150	86	88
	10S8W4_2424S2.25RP	24	9-36	24	416	468	10	220	100	200	86	88
	10S8W4_4803S2.25RP	48	18-72	3.3	2400	478	33	2200	100	150	82	84
	10S8W4_4805S2.25RP	48	18-72	5	2000	467	40	2200	100	150	85	87
	10S8W4_4809S2.25RP	48	18-72	9	1111	473	10	680	100	150	85	87
	10S8W4_4812S2.25RP	48	18-72	12	834	474	10	470	100	150	86	88
	10S8W4_4815S2.25RP	48	18-72	15	667	479	10	330	100	150	86	88
	10S8W4_4824S2.25RP	48	18-72	24	416	468	10	220	100	200	86	88

Note:

1. The maximum capacitive load refers to the capacity of the capacitor that is allowed to be connected when the power supply is fully loaded. If the capacity is exceeded, the power supply may not be able to start;
2. In order to reduce the no-load power consumption and improve the light-load efficiency, the IC works in the state of frequency jitter at no-load and light-load, and the output cannot be no-load. At least an electrolytic capacitor with a 10% load or a high-frequency resistance above 470uF is required, otherwise Will cause the output voltage ripple to increase;
3. With „C“, it has control pin function;

Product characteristic curve

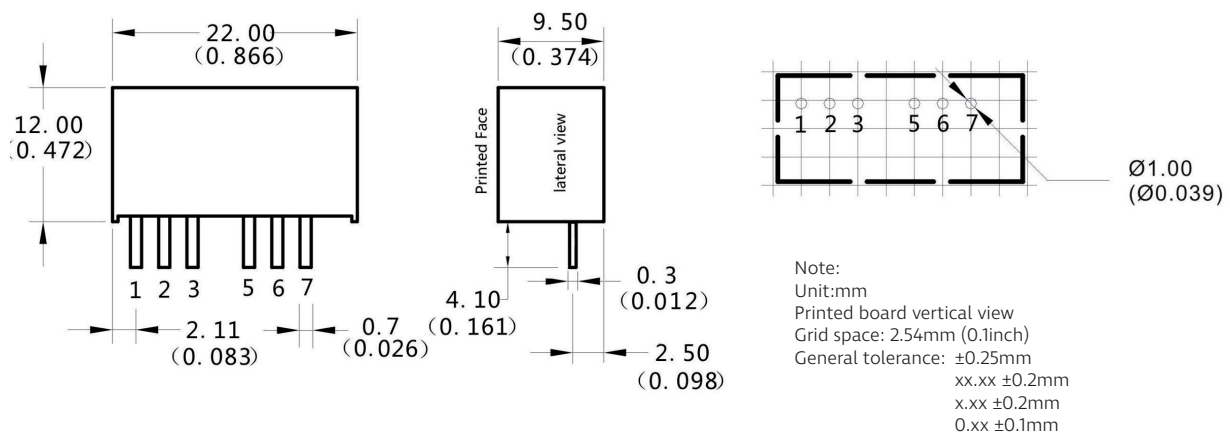
Temperature derating graph



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Dimensions and recommended layout

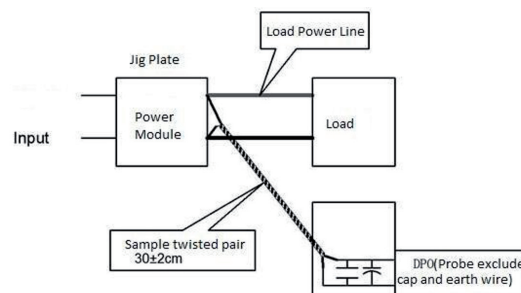


Pin	1	2	3	5	6	7
Single	-Vin	+Vin	CTRL	NC	+Vout	GND

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

Test Method:

- 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.
- Output Ripple& Noise Test Method: 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.



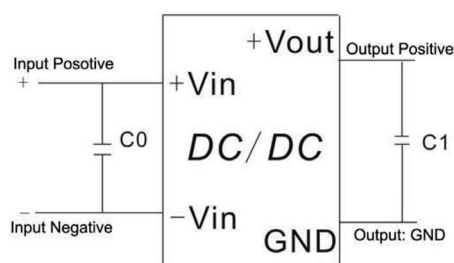
Application reference:

1. It is recommended to output a minimum of 10% load or connect an electrolytic capacitor with a high-frequency resistance above 470uF, otherwise it will increase the output voltage ripple;
2. It is recommended that the load imbalance of dual output products is less than±5%;
3. The maximum capacitive load is the result of the pure resistance full load condition test

Recommended circuit

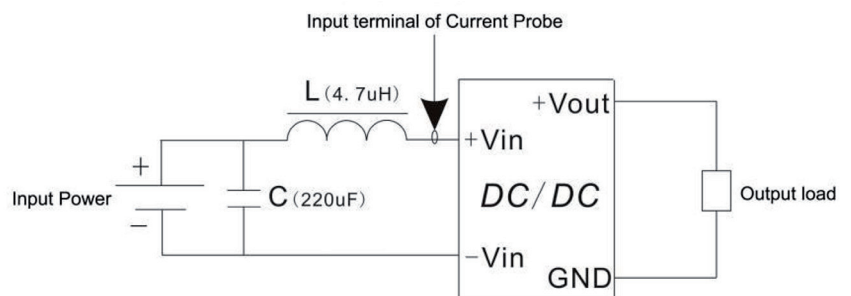
DC-DC test circuit:

Normal recommended capacitors:C0:100-220uF; C1:470uF.



Input reflecting ripple current test circuit:

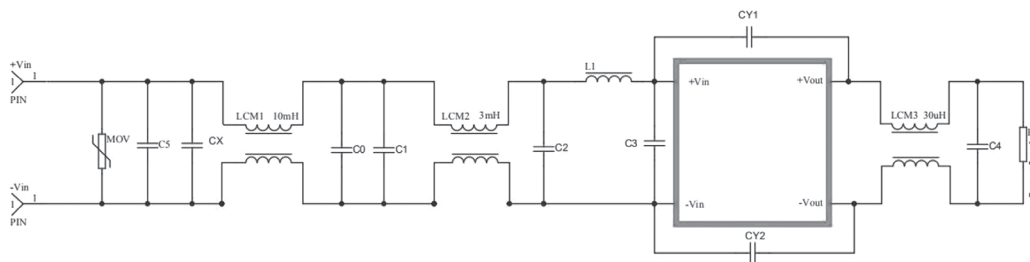
Capacitor C choose low ESR ones, withstand voltage value should be bigger than max input voltage;



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EMC external recommended circuit:



Component	10S8W4_xxyy2.25RP Input
FUSE	According to customer's request
MOV	14D560K
CX	0.47uF
LCM1	10mH
LCM2	3~5mH
C5	1000uF/50V
C0	1uF/100V
C1	220uF/50V
C2,C3	1uF/100V
L1	4.7uH
LCM3	30uH
C4	47uF/50V
CY1,CY2	2.2nF/2000V

EMC recommended circuit (Used Under high EMC requirement)

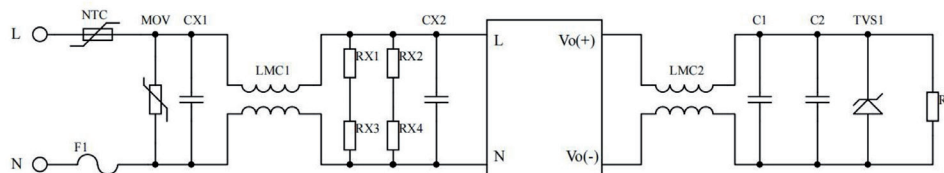


Photo 2

Note:

- 1) FUSE, recommended type is 2A~250VAC slow-break, square type.
- 2) MOV is a varistor, the recommended model is 14D561K.
- 3) NTC is a thermistor, recommended model: 10D-11, to protect the module from damage in the event of a lightning surge.
- 4) LMC1, LCM2 are common mode inductors, LCM1 recommended inductance 30mH, LCM2 recommended inductance 40uH.
- 5) CX1 is X-capacitor, the recommended model is 0.22uF/275VAC; CX2 is X-capacitor, the recommended model is 0.1uF/275VAC.
- 6) RX1, RX2, RX3, RX4 are chip resistors, the recommended model is 1206, 1MΩ.
- 7) C1 is a high-frequency, low-impedance electrolytic capacitor with a capacitance value less than that of the capacitive load, and the withstand voltage is more than 1.5 times the output voltage.
- 8) C2 is a 0.1uF ceramic chip capacitor with a withstand voltage of more than 1.5 times the output voltage.
- 9) TVS1 is TVS tube; 5V output recommended: SMBJ7.0A, 9V output recommended: SMBJ12.0A, 12V output recommended: SMBJ20A, 15V output recommended: SMBJ20A, 24V output recommended: SMBJ30.0A, 48V output recommended: SMBJ64A.

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