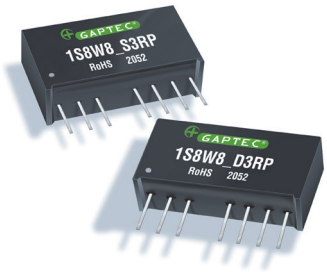
1S8W8_3RP series

1W - Dual/Single Output - Wide Input - Isolated & Regulated DC-DC Converter



DC-DC Converter 1 Watt

- **Ultra-wide input voltage range (8:1)**
- **High efficiency up to 74%**
- **No-load power consumption as low as 0.12W**
- **I/O isolation test voltage 3kVDC**
- **Operating ambient temp. range: -40°C to +105°C**
- **Input under-voltage, output short-circuit , over-current protection**
- **Industry standard pin-out**
- **EN62368 approved**

UL-62368-1 (E347551)

The 1S8W8_3RP series of isolated 1W DC-DC products with an ultra-wide 8:1 input voltage range. They feature efficiencies of up to 74%, 3000VDC input to output isolation, operating ambient temperature range of -40°C to +105°C , input under-voltage protection, output over-current, short circuit protection and they are widely used in applications such as medical care, industrial control, electric power, instruments and communication fields.

Common specifications

Item	Test condition	Min	Typ	Max	Units
Short-circuit Protection		Continuous, self-recovery			
Operating Temperature	See Fig. 1	-40		+105	°C
Storage Humidity	Without condensation	5		95	°C
Storage Temperature		-55		+125	%RH
Pin Soldering Resistance Temperature	soldering spot is 1.5mm away from case for 10s			+300	°C
Vibration	10-150Hz, 5G, 0.75mm. along X, Y and Z				
Switching Frequency *	PWM mode		300		KHz
MTBF	MIL-HDBK-217F@25°C	1000,000			h
Case Material	Black plastic; flame-retardant; heat-resistant (UL94-V0)				
Package Dimensions	22.00 × 9.50 ×12.00 mm				
Weight	4.6g (Typ.)				
Cooling Method	Free air convection				

*Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	• 5V/±5V output • Others		117/10 114/10	123/15 120/15	mA mA
Reflected ripple current			50		VDC
Surge Voltage	(1sec. max.)	-0.7		50	VDC
Start-up Voltage				4.5	VDC
Input Under-voltage Protection		2.5	3.5		VDC
Input filter	Capacitance Filter				
Hot plug	Unavailable				

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output Electric Strength test for 1 minute with a leakage current of 1mA max.	3000			VDC
Isolation resistance	Input-output insulation at 500VDC	1000			MΩ
Isolation capacitance	Input-output capacitance at 100KHz/0.1V		40		pF

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	0% -100% load		±1	±3	%
Line regulation	Full load, the input voltage is from low to high • Vo1 • Vo2			 ±0.5 ±1	 % %
Load regulation	5% -100% load -Vo1 -Vo2			 ±1 ±1.5	 % %
Cross Regulation	Dual outputs, Vo1 load at 50%, Vo2 load at range of 25%-100%			±5	%
Transient recovery time	25% load step change, nominal input voltage • Vo1 • Vo2		300 ±5 ±3	500 ±8 ±5	ms ms ms
Ripple & Noise*	20MHz bandwidth, 5% -100% load		60	100	mVp-p
Over-current Protection	Input voltage range	110		300	%Io

*Ripple & Noise at <5% load is 5%Vo max. The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.

Example:
1S8W8_1205S3RP
1 = 1Watt; S8 = SIP8; W8 = Wide input range: 4,5 - 36Vin (8:1);
12 = 12Vin; 05 = 5Vout; S = Single Output; 3 = 3000VDC isolation;
R = Regulated Output

Note:
1. The maximum capacitive load offered were tested at input voltage range and full load;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.
7. It is not allowed to connect modules output in parallel to enlarge the power

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DC-DC Converter

EMC specifications				
Emissions	CE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)		
Emissions	RE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)		
Immunity	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
Immunity	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
Immunity	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B (see Fig.3-① for recommended circuit)
Immunity	Surge	IEC/EN61000-4-5	line to line ±2KV	perf. Criteria B (see Fig.3-①for recommended circuit)
Immunity	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Selection Guide

Certification	Part Number	Input Voltage [nominal, range, V]	Input Voltage [max.(1), V]	Output Voltage [VDC]	Output Current [mA, max]	Full Load Efficiency(2) [%, min./typ]	Max. Capacative Load(3) [µF]
CE	1S8W8_1205D3RP	12 (4.5-36)	40	±5	±100	69/71	220
CE	1S8W8_1212D3RP	12 (4.5-36)	40	±12	±42	72/74	150
CE	1S8W8_1215D3RP	12 (4.5-36)	40	±15	±33	72/74	68
CE	1S8W8_1205S3RP	12 (4.5-36)	40	5	200	69/71	470
CE	1S8W8_1209S3RP	12 (4.5-36)	40	9	111	69/72	220
CE	1S8W8_1212S3RP	12 (4.5-36)	40	12	83	72/74	330
CE	1S8W8_1215S3RP	12 (4.5-36)	40	15	67	72/74	220

① Exceeding the maximum input voltage may cause permanent damage;
② Efficiency is measured at nominal input voltage and rated output load;
③ The specified maximum capacitive load value for positive and negative output is identical.

Typical characteristics

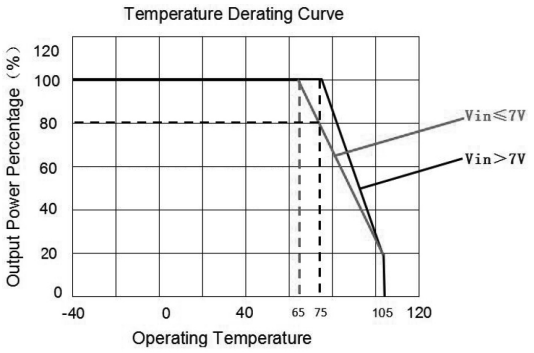


Fig. 1

Typical application

All the DC-DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.
If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

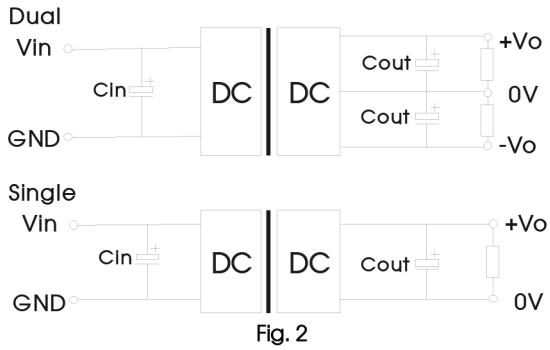


Fig. 2

Parameter description:

Single Vout (VDC)	Cout (µF)	Cin (µF)	Dual Vout (VDC)	Cout (µF)	Cin (µF)
5/9/12/15	22 (25V)	100 (50V)	±5/±12/±15	22 (25V)	100 (50V)

EMC compliance circuit

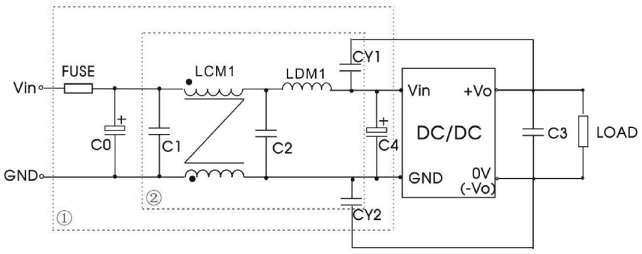


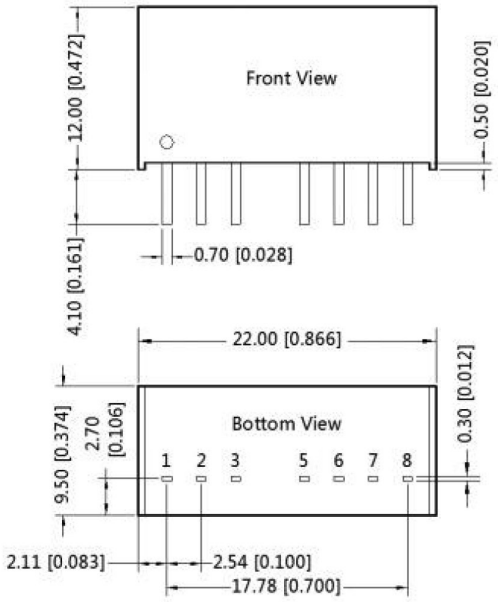
Fig. 3

Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

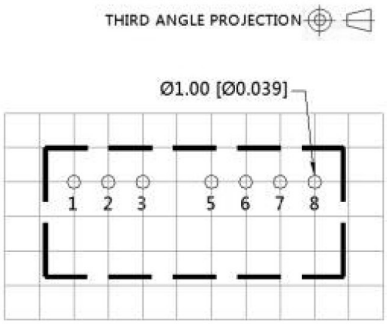
Parameter description:

Model	Vin:12V
FUSE	Select fuse value according to actual input current
C0	1000μF/50V
C4	100μF/50V
C1/C2	4.7μF/50V
C3	22μF/50V
LCM1	2.2mH
LDM	2 4.7μH
CY1/CY2	1nF/3KV

Mechanical dimensions



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



Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	NC	NC
5	NC	NC
6	+Vo	+Vo
7	0V	0V
8	NC	-Vo

NC: Not available for electrical connection