1D8W_1.5RP series

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



DC-DC Converter 1 Watt

- Wide input range (2:1)
- Ultra compact DIP package
- 1.5kVDC isolation
- High efficiency up to 80%
- RoHS Compliance
- Short circuit protection (SCP)
- Operating temperature range: -40°C ~ +85°C
- International standard pinout
- No external component required
- EN62368, UL62368 approved

The 1D8W_1.5RP Series is specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:
1) Where the voltage of the input power supply is wide range (voltage range ≤2:1);
2) Where isolation is necessary between input and output (Isolation Voltage ≤1500VDC);
3) Where the regulation of the output voltage and the output ripple noise are demanded.

The ultra-small volume design makes the converters an ideal solution for communications, instrumentation and industrial electronics applications.

UL-62368-1 (E347551)

Common specifications

Short circuit protection:	Continuous
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
Storage temperature:	-55°C~+125°C
Storage humidity range:	< 95% non-condensing
Pin soldering resistance temperature:	300°C MAX, 1.5mm away from case for 10s.
Reflow soldering temperature:	Peak temperature ≤245°C, duration ≤60s max. over 217°C. see also IPC/ JEDEC J-STD-020D.1.
Case material:	Black flame-retardant, heat-resistant plastic
MTBF (MIL-HDBK-217F@25°C):	>1,000,000 hours
Weight:	2.2g
Dimensions:	14.00 × 14.00 × 9.00 mm

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage accuracy	5%-100% load, input voltage range		±1	±3	%
No load output voltage accuracy	input voltage range • 3.3VDC output • others		 ±5 ±1.5	 ±7 ±5	 % %
Line regulation	Input voltage from low to high @full load		±0.2	±0.5	%
Load regulation	5%-100% load		±0.5	±1	%
Temperature drift	100% full load			±0.03	%/°C
Transient recovery time	25% load step change		1	3	ms
Transient response deviation	25% load step change		±2.5	±5	%
Switching frequency	Full load, nominal input		100		KHz

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	• 12VDC • 24VDC		111/15 55/6	114/30 57/10	mA
Reflected ripple current	• 12VDC • 24VDC		40 55		mA
Surge voltage (1sec. max)	• 12VDC • 24VDC	-0.7 -0.7		25 50	VDC VDC
Start-up voltage	• 12VDC • 24VDC			9 18	VDC VDC
Input Filter	Capacitance filter				
Hot plug	unavailable				

EMC specifications

EMI	CE	CISPR32/EN55032 CLASS B (See EMC recommended circuit, ②)		
EMI	RE	CISPR32/EN55032 CLASS B (See EMC recommended circuit, ②)		
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4 (External Circuit Refer to recommended circuit, ①)	±2KV	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5 (External Circuit Refer to recommended circuit, ①)	line to line ±2KV	perf. Criteria B
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output electric Strength test for 1 min. with a leakage current of 1mA max.	1500			VDC
Isolation resistance	500VDC	1000			MΩ
Isolation capacitance	100KHz/0.1V		100		pF

Example:
1D8W_1205S1.5RP
1 = 1Watt; D8 = DIP8; W = Wide input; 12Vin; 5Vout; S = Single output; 1.5 = 1.5kVDC; R = Regulated output; P = Short circuit protection (SCP)

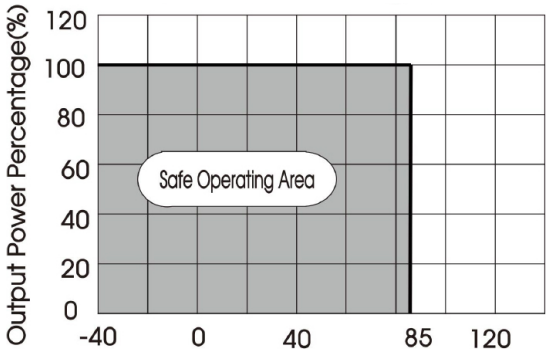
Note:
1. Unless otherwise specified, data in this data sheet should be tested under the conditions of Ta = 25°C, nominal input voltage and rated output current;
2. The maximum capacitive load offered was tested at input voltage range and full load;
3. All index testing methods in this datasheet are based on our Company's corporate standards.
4. We can provide product customization service, please contact our technicians directly for specific information.

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Specifications subject to change without notice.

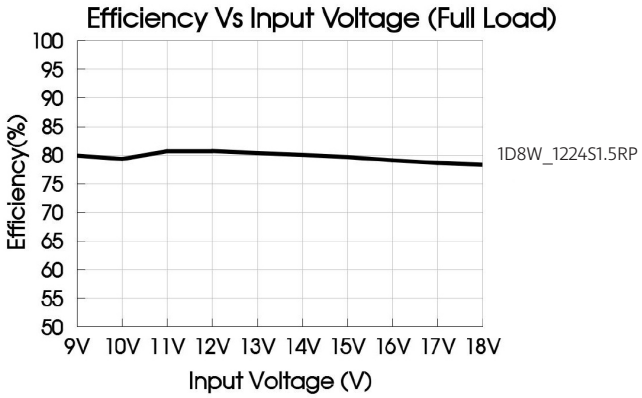
Part Number	Input Voltage Range [V]	Output Voltage [VDC]	Output current [mA, max/min]	Ripple & Noise [mVp-p; typ/max]	Efficiency [%; min/typ]	Capacitive load [µF]
1D8W_1203S1.5RP	9-18	3.3	303/15	100/150	73/75	2700
1D8W_1205S1.5RP	9-18	5	200/10	100/150	75/77	2200
1D8W_1212S1.5RP	9-18	12	83/4	100/150	77/79	1000
1D8W_1215S1.5RP	9-18	15	67/3	100/150	78/80	680
1D8W_1224S1.5RP	9-18	24	42/2	100/150	74/76	470
1D8W_2403S1.5RP	18-36	3.3	303/15	50/100	73/75	2700
1D8W_2405S1.5RP	18-36	5	200/10	50/100	75/77	2200
1D8W_2412S1.5RP	18-36	12	83/4	50/100	76/78	1000
1D8W_2415S1.5RP	18-36	15	67/3	50/100	76/78	680
1D8W_2424S1.5RP	18-36	15	42/2	50/100	75/77	470

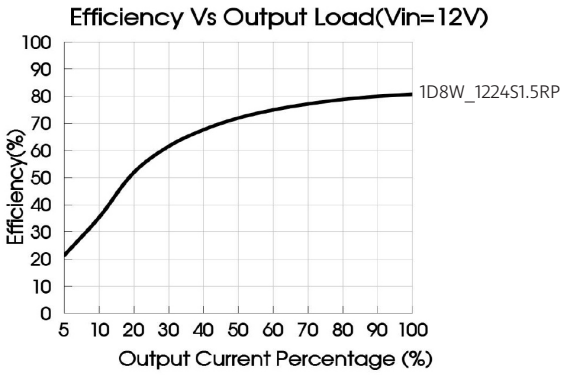
Typical characteristics

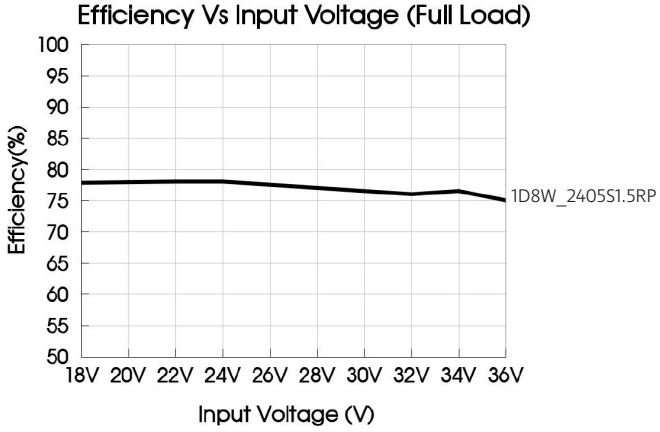
Temperature derating graph

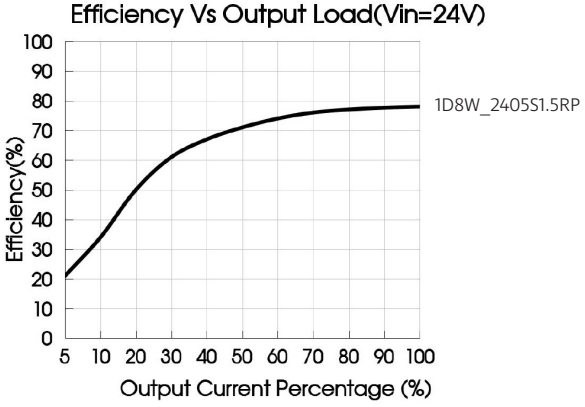


Efficiency









Recommended circuit

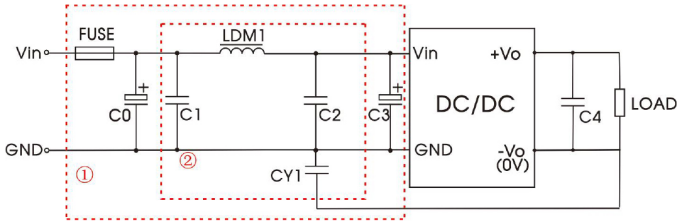
All the DC/DC converters of this series are tested before delivery using the recommended circuit shown below. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout, connecting a "Y" capacitor between input "GND" and output "0V", and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.



Vin(VDC)	12	24
Cin	47uF/25V	47uF/50V

Vo(VDC)	3.3, 5	12, 15, 24
Cout	100uF/6.3V	27uF/35V

EMC compliance circuit

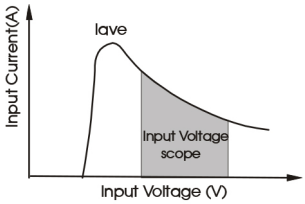


Part	12VDC	24VDC
FUSE	slow blow, choose according to actual input current	
C0	1000μF/25V	680μF/50V
C1	4.7μF/50V	
LDM1	15μH	
C2	4.7μF/50V	
C3	330μF/50V	
CY1	1nF/2KV	
C4	Refer to the Cout in recommended circuit	

Input current

When the electricity is provided by the unstable power supply, please make sure that the range of the output voltage fluctuation and the ripple voltage of the power supply do not exceed the indicators of the modules. Input current of power supply should afford the flash startup current of this kind of DC/DC module(see Fig. on the right).

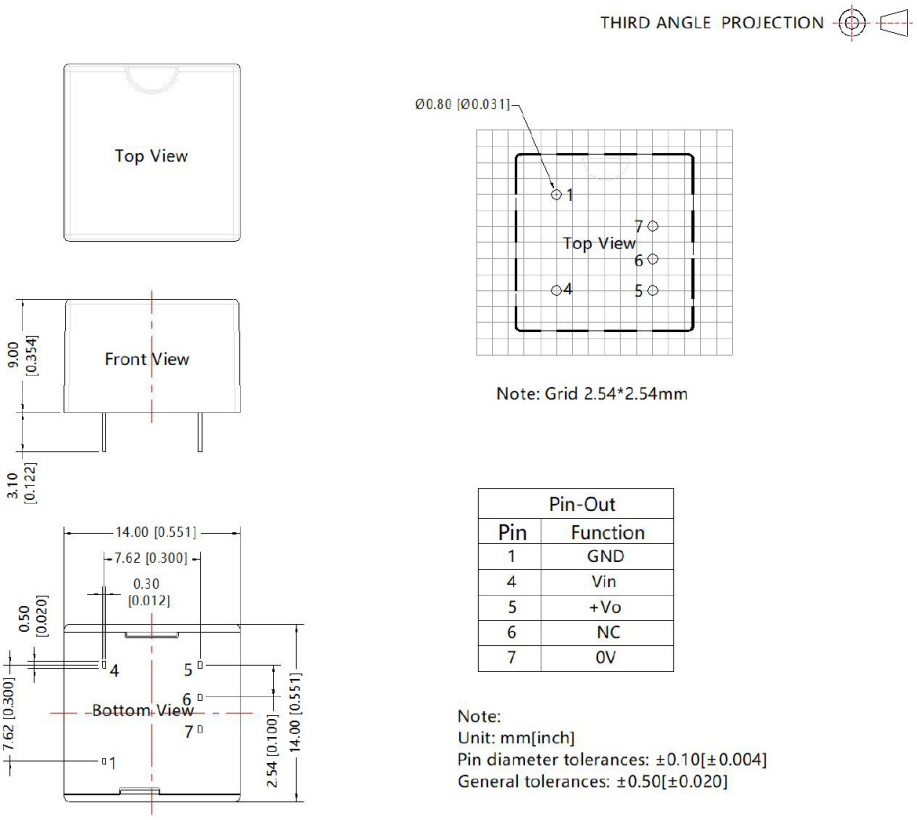
Generally: Vin=12V series lave =205mA
Vin=24V series lave =104mA



Output load requirements

When using, the minimum load of the module output should not be less than 5% of the nominal load. In order to meet the performance parameters of this datasheet, please connect a 5% dummy load in parallel at the output end, the dummy load is generally a resistor, please note that the resistor needs to be used in derating.

Mechanical dimensions



Pin-Out	
Pin	Function
1	GND
4	Vin
5	+Vo
6	NC
7	0V

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