



1S4A_1.5UP Series

1W - Single Output - Fixed Input - Isolated & Unregulated
 MINIATURE SIP PACKAGE

DC-DC Converter

1 Watt

- ⊕ Efficiency up to 80%
- ⊕ Miniature SIP package
- ⊕ Single Output Voltage
- ⊕ 1500VDC Isolation
- ⊕ Temperature Range: -40°C~+105°C
- ⊕ Industry Standard Pinout
- ⊕ Short circuit protection (SCP)
- ⊕ RoHS Compliance
- ⊕ No External Component Required
- ⊕ PCB Mounting

The 1S4A_1.5UP series are specially designed for applications where an isolated voltage is required in a distributed power supply system.

These products apply to:

- 1) Where the voltage of the input power supply is stable (voltage variation: $\pm 10\%$ Vin);
- 2) Where isolation between input and output is necessary (isolation voltage ≤ 1500 VDC);
- 3) Where the output voltage regulation and the ripple & noise of the output voltage is not strictly required.

Typical application: digit circuit condition; normal low-frequency artificial circuit condition; relay drive circuit and data switching circuit condition, etc.



Common specifications

Short circuit protection*:	1S4A_24xxS1.5U/1S4A_0524S1.5U: 1s Others: Continuous, automatic recovery
Temperature rise at full load:	25°C TYP (Ta=25°C)
Cooling:	Free air convection
Operation temperature range:	-40°C – +105°C
Storage temperature range:	-55°C – +125°C
Lead temperature	300°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Case material:	Plastic [UL94-V0]
MTBF:	>3,500,000 hours
Weight:	1.3g

* Supply voltage must be discontinued at the end of short circuit duration for models 1S4A_24xxS1.5U and 1S4A_0524S1.5U.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current voltage (1sec. max.)	• 3.3VDC input		404/30	-70	mA
	• 5VDC input		277/20	-60	mA
	• 12VDC input		115/15	+50	mA
	• 15VDC input		83/10	-35	mA
	• 24VDC input		57/17	-30	mA
Reflected ripple current			15		mA
Input surge voltage (1sec. max.)	• 3.3VDC input	-0.7		5	VDC
	• 5VDC input	-0.7		9	VDC
	• 12VDC input	-0.7		18	VDC
	• 15VDC input	-0.7		21	VDC
	• 24VDC input	-0.7		30	VDC
Input filter	Filter capacitor				
Hot plug	Unavailable				

EMC specifications

EMI	CE	CISPR22/EN55022 CLASS B (External Circuit Refer to EMC recommended circuit)
EMI	RE	CISPR22/EN55022 CLASS B (External Circuit Refer to EMC recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Contact ± 8 KV perf. Criteria B

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	See tolerance envelope curve				
Line regulation	For Vin change of $\pm 1\%$			± 1.5	%
		• 3.3VDC output			± 1.2
Load regulation	10% to 100% load				
		• 3.3VDC output		18	%
		• 5VDC output		12	%
		• 9VDC output		8	%
		• 12VDC output		7	%
		• 15VDC output		6	%
• 24VDC output		5	%		
Temperature coefficient	100% full load			± 0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		60	150	mVp-p
Switching frequency	Full load, nominal input		100		KHz

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at DC-DC application notes.

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-Output, tested for 1 minute and leakage current less than 1mA	1500			VDC
Isolation resistance	Input-Output, test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		20		pF

Model selection:

WCTP**_xxyyN##O

W= Watt; C= Case; T= Type; P= Pinning; **= Voltage Variation (omitted $\pm 10\%$); xx= Vin; yy= Vout; N= Numbers of Output; ##= Isolation (kVDC); O= output regulation

Example:

1S4A_0505S1.5UP

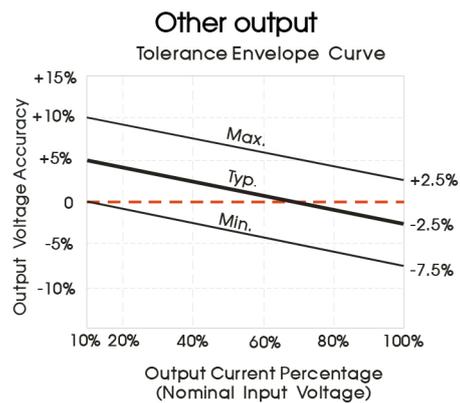
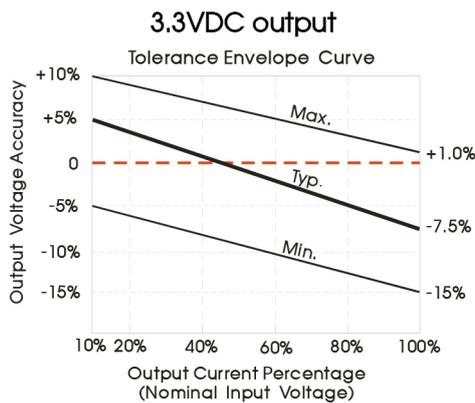
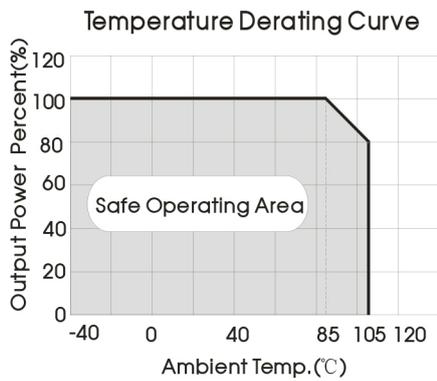
1= 1 Watt; S4= SIP4; A= Pinning; 5Vin; 5Vout; S=Single Output; 1.5= 1,5KVDC; U= Unregulated Output; P= Short Circuit Protection (SCP)

1S4A_1.5UP Series

1W - Single Output - Fixed Input - Isolated & Unregulated
 MINIATURE SIP PACKAGE

Part Number	Input voltage [V]	Output voltage [VDC]	Output current [mA]	Max. capacitive load [μ F]	Efficiency [%, typ]
1S4A_0303S1.5UP	3.3	3.3	303	220	72
1S4A_0305S1.5UP	3.3	5	200	220	76
1S4A_0312S1.5UP	3.3	12	84	220	80
1S4A_0503S1.5UP	5	3.3	303	220	72
1S4A_0505S1.5UP	5	5	200	220	80
1S4A_0509S1.5UP	5	9	111	220	80
1S4A_0512S1.5UP	5	12	84	220	80
1S4A_0515S1.5UP	5	15	67	220	80
1S4A_0524S1.5U	5	24	42	220	80
1S4A_1203S1.5UP	12	3.3	303	220	72
1S4A_1205S1.5UP	12	5	200	220	80
1S4A_1209S1.5UP	12	9	111	220	80
1S4A_1212S1.5UP	12	12	84	220	80
1S4A_1215S1.5UP	12	15	67	220	80
1S4A_1224S1.5UP	12	15	67	220	80
1S4A_1505S1.5UP	15	5	200	220	80
1S4A_1512S1.5UP	15	12	84	220	80
1S4A_1515S1.5UP	15	15	67	220	80
1S4A_2403S1.5U	24	3.3	303	220	72
1S4A_2405S1.5U	24	5	200	220	80
1S4A_2409S1.5U	24	9	111	220	80
1S4A_2412S1.5U	24	12	84	220	80
1S4A_2415S1.5U	24	15	67	220	80
1S4A_2424S1.5U	24	24	42	220	80

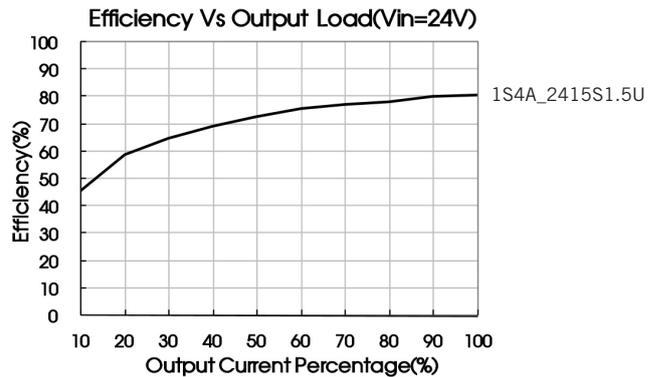
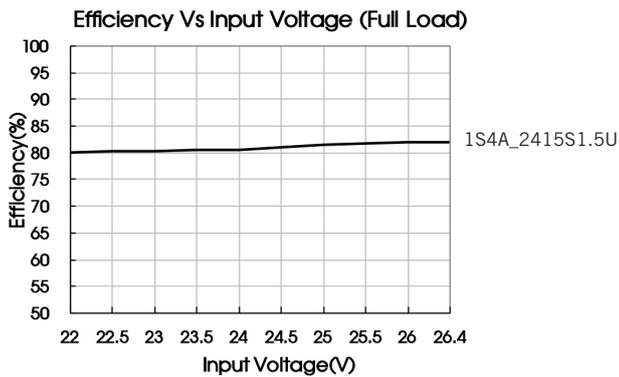
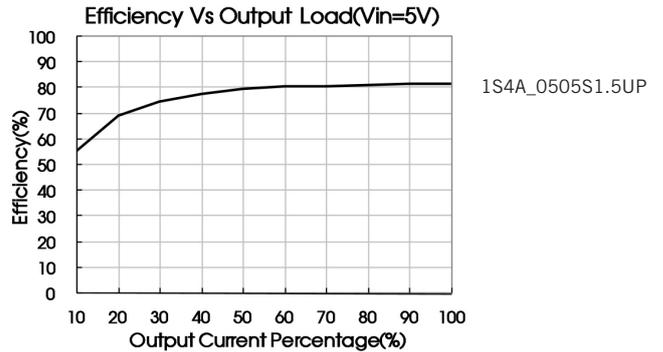
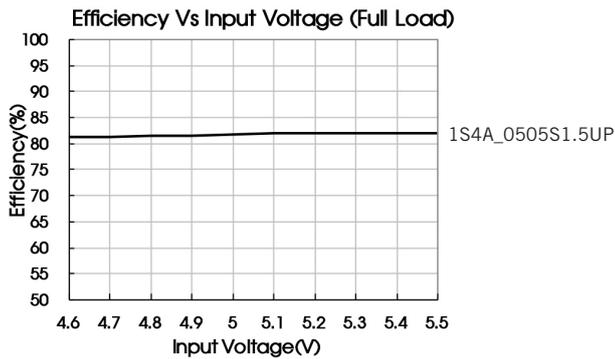
Typical characteristics



1S4A_1.5UP Series

1W - Single Output - Fixed Input - Isolated & Unregulated
 MINIATURE SIP PACKAGE

Efficiency



Typical application circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see circuit below. Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in table on the right.



Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)
3.3/5	4.7	3.3/5	10
12	2.2	9	4.7
15	1	12	2.2
24	1	15	1
-	-	24	0.47

EMC solution-recommended circuit



Figure 1

Input voltage (VDC)	3.3/5/12/15/24	
EMI	C1	4.7μF /50V
	C2	Refer to the Cout in Fig.1
LDM	6.8μH	

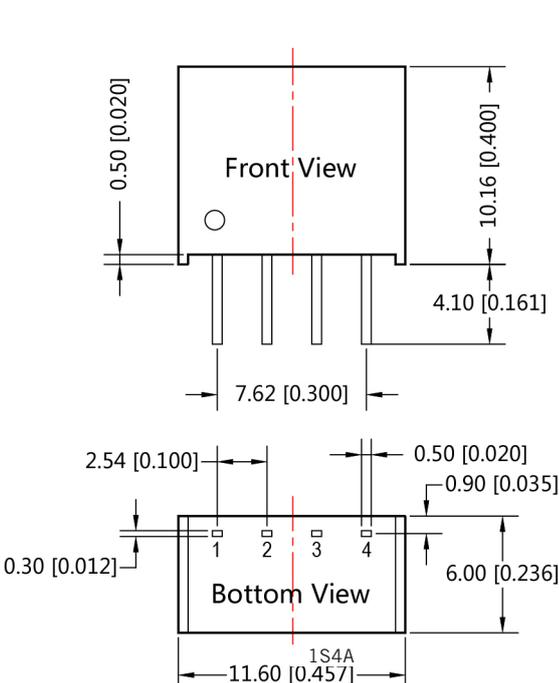
Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (the sum of the efficient power and resistor consumption power is not less than 10%).

1S4A_1.5UP Series

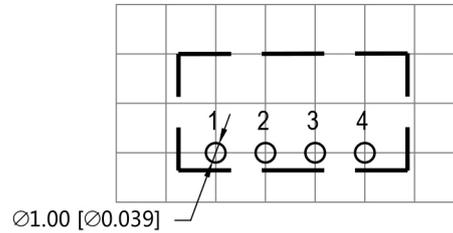
1W - Single Output - Fixed Input - Isolated & Unregulated
 MINIATURE SIP PACKAGE

Mechanical dimensions and recommended footprint



Note:
 Unit :mm[inch]
 Pin section tolerances :±0.10[±0.004]
 General tolerances:±0.25[±0.010]

THIRD ANGLE PROJECTION



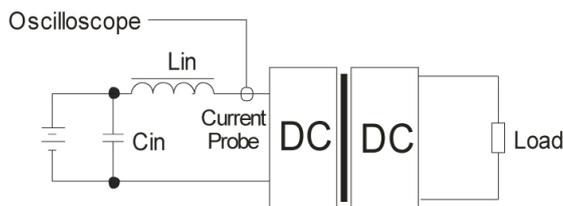
Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
3	0V
4	+Vo

Test configurations

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor L_{in} and Capacitor C_{in} to simulate source impedance.



$L_{in}(4.7\mu H)$ $C_{in}(220\mu F, ESR < 1.0\Omega \text{ at } 100 \text{ KHz})$

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specifications.
2. Max. Capacitive Load is tested at nominal input voltage and full load.
3. Unless otherwise noted, All specifications are measured at $T_a=25^\circ C$, humidity<75%, nominal input voltage and rated output load.
4. In this datasheet, all test methods are based on our corporate standards.
5. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more detail.
6. Please contact our technical support for any specific requirement.
7. Specifications of this product are subject to changes without prior notice.