1MS4A1_3UP series

1W - Single output DC-DC converter - Fixed input - Isolated & unregulated

DC-DC Converter 1 Watt

- Microsize SIP4 package
- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temp. range: -40°C to +105°C
- High efficiency up to 87%
- I/O isolation test voltage 3000kVDC
- Unregulated output types
- Industry standard pin-out
- UL/cUL/IEC/EN 62368-1 approved

Introducing our cutting-edge 1MS4A1_3UP series with a microsize SIP4 Package, designed to meet the demanding needs of modern electronic applications. This package offers continuous short-circuit protection, ensuring your devices remain safe and operational under any circumstances. With a no-load input current as low as 5mA, it maximizes efficiency even in standby mode. Our SIP Package operates within a wide ambient temperature range from -40°C to +105°C, making it suitable for various environments and conditions. It boasts an impressive high efficiency of up to 87%, ensuring optimal performance and energy savings.

The isolation test voltage stands at a robust 3kVDC, providing reliable insulation and safety. Adhering to an industry-standard pin-out, our SIP Package integrates seamlessly into your existing designs. It is built to comply with international standards IEC62368, UL62368, and EN62368, ensuring high quality and safety.

SHORT CIRCUIT PROTECTED · 100% RoHS compliant · c UL us UL62368 - E347551

Common specifications

Short circuit protection	Continuous
Operation temperature	-40°C ~ +105°C (with derating)
Storage temperature	-55°C ~ +125°C
Temperature coefficient	±0.03 %/°C @full load
Storage humidity	95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	>3,500,000 hours
Case Material	DAP
Cooling	Free air Convection
Dimensions	11.5 x 6.0 x 7.5 mm
Weight	1.1g typ.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Voltage range (Vo, Io Nom)	3.3V, 5V, 9V 12V, 15V, 24V		±10 ±20		% %
Filter	Capacitor				

Example:
1MS4A1_1205S3UP
1 = 1 Watt; M = Mircosize; S4 = SIP4; A1 = Series; 12 = 12Vin; 05 = 5Vout; S = Single output; 3 = 3kVDC; U = Unregulated output; P = Short circuit protection

Electromagnetic compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS B (see fig. 1 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see fig. 1 for recommended circuit)
EMS	ESD	IEC/EN61000-4-2 air ±8kV , Contact ±6kV perf. criteria B

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	100% load			±5	%
Line regulation	For 1.0% of Vin		1.2		%
Load regulation (10% to 100% fullload)	3.3V 5V 9V 12V 15V 24V		15 10 8 7 6 5	20 15 10 10 10 10	% % % % % %
Ripple & noise BW = DC to 20MHz	@Vo: 3.3V, 5V, 9V, 12V,15V @ Vo: 24V		30 50	75 100	mVp-p mVp-p
Switching frequency	Full load, nominal input @3.3V, 5V Vin		215/370		kHz
Switching frequency	Full load, nominal input @other Vin		250		kHz

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage		3000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/output capacitance 100kHz/0.1V		20		pF

Note:

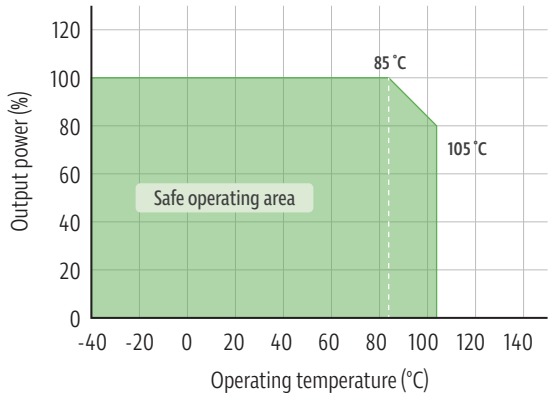
1. If the product is not operated within the specified load range, its performance cannot be guaranteed to meet all the parameters listed in the datasheet.
2. The maximum capacitive load was tested under the full input voltage range and load conditions.
3. Unless otherwise stated, the parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH, with nominal input voltage and rated output load.
4. All testing methods referenced in this datasheet are based on our company's corporate standards.
5. We offer product customization services; please contact our technicians directly for more detailed information.
6. Products are subject to laws and regulations; refer to the "Features" and "EMC" sections for more information.
7. Our products are classified according to ISO14001 and relevant environmental

Product Selection Guide

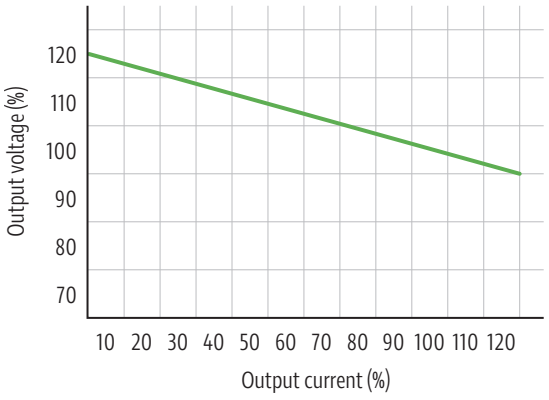
Part Number	Input Voltage [VDC, Nom]	Output Voltage [VDC]	Output Current [mA]	Full Load Efficiency [%, Typ.]	Capacitive Load [µF, Max.]
1MS4A1_0303S3UP	3.3	3.3	303	76	2400
1MS4A1_0305S3UP	3.3	5	200	82	2400
1MS4A1_0309S3UP	3.3	9	112	83	1000
1MS4A1_0312S3UP	3.3	12	84	84	470
1MS4A1_0315S3UP	3.3	15	67	84	330
1MS4A1_0324S3UP	3.3	24	42	85	100
1MS4A1_0503S3UP	05	3.3	303	76	2400
1MS4A1_0505S3UP	05	5	200	82	2400
1MS4A1_0509S3UP	05	9	112	83	1000
1MS4A1_0512S3UP	05	12	84	84	470
1MS4A1_0515S3UP	05	15	67	84	330
1MS4A1_0524S3UP	05	24	42	85	100
1MS4A1_0903S3UP	09	3.3	303	76	2400
1MS4A1_0905S3UP	09	5	200	82	2400
1MS4A1_0909S3UP	09	9	112	83	1000
1MS4A1_0912S3UP	09	12	84	84	470
1MS4A1_0915S3UP	09	15	67	84	330
1MS4A1_0924S3UP	09	24	42	85	100
1MS4A1_1203S3UP	12	3.3	303	78	2400
1MS4A1_1205S3UP	12	5	200	82	2400
1MS4A1_1209S3UP	12	9	112	85	1000
1MS4A1_1212S3UP	12	12	84	85	680
1MS4A1_1215S3UP	12	15	67	87	330
1MS4A1_1224S3UP	12	24	42	85	220
1MS4A1_1503S3UP	15	3.3	303	78	2400
1MS4A1_1505S3UP	15	5	200	82	2400
1MS4A1_1509S3UP	15	9	112	85	1000
1MS4A1_1512S3UP	15	12	84	85	680
1MS4A1_1515S3UP	15	15	67	87	330
1MS4A1_1524S3UP	15	24	42	85	220
1MS4A1_2403S3UP	24	3.3	303	78	2400
1MS4A1_2405S3UP	24	5	200	82	2400
1MS4A1_2409S3UP	24	9	112	85	1000
1MS4A1_2412S3UP	24	12	84	85	680
1MS4A1_2415S3UP	24	15	67	87	330
1MS4A1_2424S3UP	24	24	42	85	220

Typical characteristics

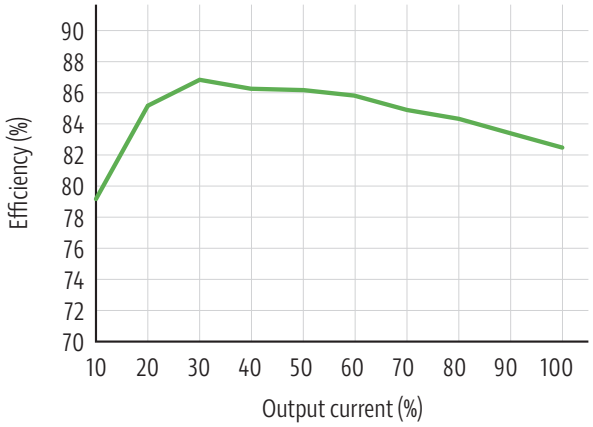
Temperature derating graph



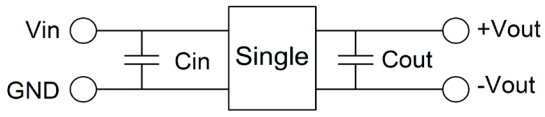
Tolerance envelope graph



Efficiency vs output load



Recommended test circuit



Vin	Cin	Single Vout	Cout
3.3VDC	4.7µF/25V	3.3VDC	10µF/16V
5VDC	4.7µF/25V	5VDC	10µF/16V
9VDC	4.7µF/25V	9VDC	2.2µF/16V
12VDC	2.2µF/25V	12VDC	2.2µF/25V
15VDC	2.2µF/25V	15VDC	1µF/25V
24VDC	1µF/25V	24VDC	1µF/50V

EMC (CLASS B) compliance circuit

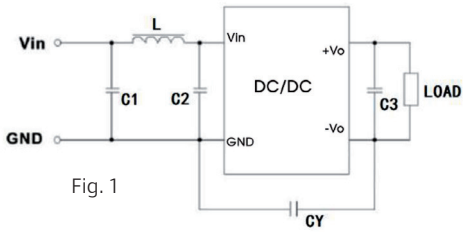
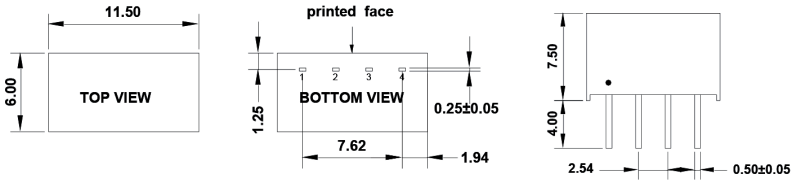


Fig. 1

EMC recommended circuit value table

EMI	C1	4.7µF /50V
EMI	C2	4.7µF /50V
EMI	CY	1nF/4kV
EMI	C3	Recommended test circuit
EMI	L	6.8µH

Mechanical dimensions



Pin-Out	
Pin	Function
1	-Vin
2	+Vin
3	-Vout
4	+Vout

UNIT: mm unless otherwise specified,
all tolerances are ±0.25