MR2S Series

FAVOTEK

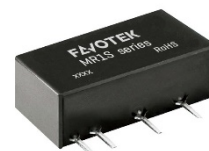## 2W, Regulated Output, 1.5KV Isolation, SIP7 Package DC/DC Converters

Features

- ► Rated power: 2W Max
- ► Input voltage range ±5%
- ► Regulated output
- ► High efficiency up to 84%
- ► Isolation voltage 1.5KVDC
- ► Operating temperature range: -40 ~ +85°C ambient

- ► RoHS compliant
- ► Compact SIP7 package
- ► Continuous short circuit protection
- ► Meet IEC/EN/UL 62368-1
- ► 3 year warranty

Overview

The MR2S series are SIP7 package DC/DC converters with tightly regulated single output, and 1.5KVDC isolation. These converters feature high efficiency, low ripple and noise, short circuit protection, and wide operating temperature range. They are widely used in distributed power system in industrial applications where isolation and voltage converting is needed.

Model Numbers

Model Number	Input Voltage [VDC] ±5%	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF] Max.
			Max.	Min.		
MR2S-0503	5	3.3	400	40	67	2400
MR2S-0505	5	5	400	40	70	2400
MR2S-1203	12	3.3	400	40	69	2400
MR2S-1205	12	5	400	40	72	2400
MR2S-2403	24	3.3	400	40	70	2400
MR2S-2405	24	5	400	40	73	2400

* Only typical models are listed. Other models may be available upon request.

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Electrical Specifications

Unless otherwise indicated, specifications are measured at T_A=25°C, nominal input voltage, full load after warm up.

Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Input current Full load	V_{IN}=5V V_{IN}=12V V_{IN}=24V	-	260 110 57	-	mA	
Input current No load	V_{IN}=5V V_{IN}=12V V_{IN}=24V	-	15 8 4	-	mA	
Reflected ripple current		-	15	-	mA	
Output voltage accuracy		-	±3	-	%	
Line regulation For V_{IN} change of ±1%		-	±0.25	-	%	
Load regulation I_{OUT}=10% to 100% of $I_{OUT, rated}$	V_{OUT}=3.3V Others	-	±3 ±2	-	%	
Temperature coefficiency	Full load	-	-	±0.02	%/°C	
Output ripple and noise 20MHz bandwidth	V_{OUT}=24V Others	-	50 30	100 75	mVp-p	
Output short circuit protection		Continuous, automatic recovery				
Input filter		Capacitor				
Hot plug		None				

* Operating with less than 10% of rated load will not cause permanent damage to the converters, but the performances data may not fall into the specifications, and reliable operating is not assured.

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General Specifications

| Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Isolation voltage 1 minute, leakage current 1mA max	Input to Output	1500	-	-	VDC	
Isolation resistance 500VDC	Input to Output	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	Input to Output	-	20	-	pF	
Operating temperature	See "Derating Curve"	-40	-	+85	°C	
Storage temperature		-55	-	+125	°C	
Temperature rise at full load		-	25	-	°C	
Storage humidity		-	-	95	%RH	
Switching frequency Full load		-	250	-	KHz	
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	300	°C	
Case material		Black plastic UL94-V0				
Cooling method		Free air convection				
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z				
Design based on standards		IEC/EN/UL 62368-1				
Safety certifications		IEC/EN 62368-1				
EMC	Emissions Immunity	CISPR32, EN55032 Class B* IEC/EN61000-4-2				
MTBF	MIL-HDBK-217F	>3,500,000 Hours, T_A=25°C				
Size & Weight		19.65 x 7.05 x 10.16 mm, 2.4g Typ.				

Characteristic Curves

Derating Curve

Output vs Ambient Temperature
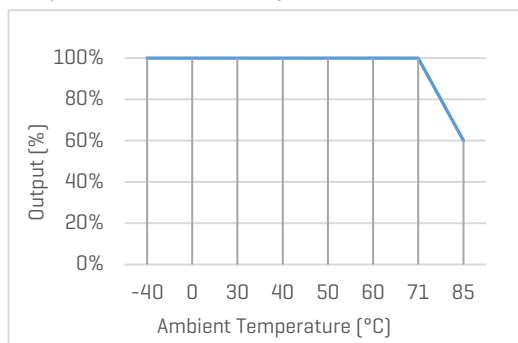
Efficiency Curves

Efficiency vs Input Voltage

Full load
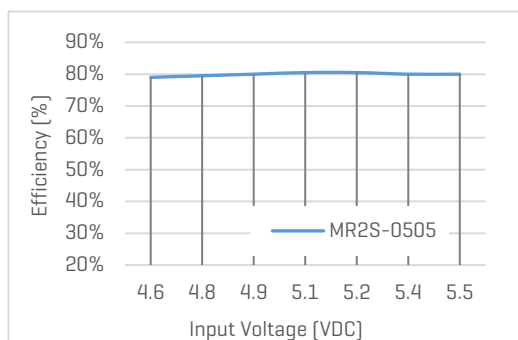
Efficiency vs Load

Nominal input voltage

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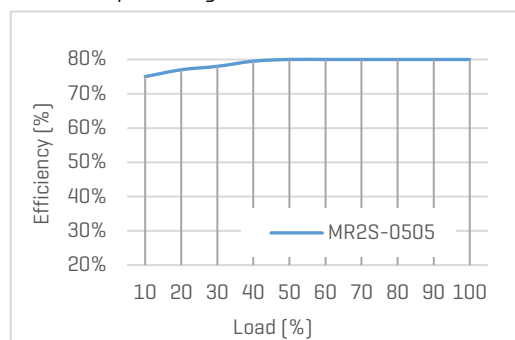
Recommended External Circuit

Typical Application Circuit

*Typical application circuit is to further lower the input and output ripple. It is not required for general use.

*Recommended component specifications are typical values. Excessive external capacitive load may cause startup problem.

Figure 1. Typical external circuit

[Table 1] Recommended component spec

Input voltage	5V	12V	24V
C_{IN}	4.7uF, 16V	2.2uF, 25V	0.47uF, 50V

[Table 2] Recommended component spec

Output voltage	3.3, 5V
C_{OUT}	10uF, 16V

EMC Enhancement for EN55032 Class B
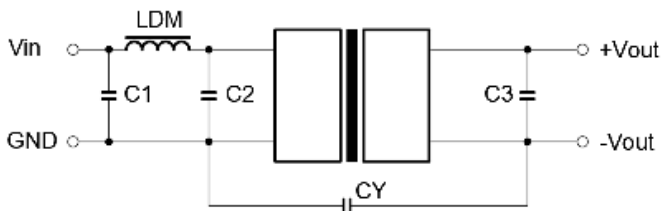
Figure 2. Circuit for EMC enhancement

[Table 3] Recommended component spec

Component	LDM	C1, C2	CY
V_{OUT}=3.3, 5V	6.8uH	4.7uF, 25V	100pF, 2KV

*C3 refer to C_{OUT} in [Table 2]

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Mechanical Specifications

Front view
- 19.65 [0.774]
- 10.16 [0.400]
- 0.50 [0.020]
- 4.00 [0.157]
- 0.50 [0.020]
- 2.54 [0.100]

Bottom view
- 7.05 [0.278]
- 0.90 [0.035]
- 2.21 [0.087]
- 0.30 [0.012]
- 1 2 4 6

PCB Layout
- Ø1.00 [Ø0.039]
- 1 2 4 6
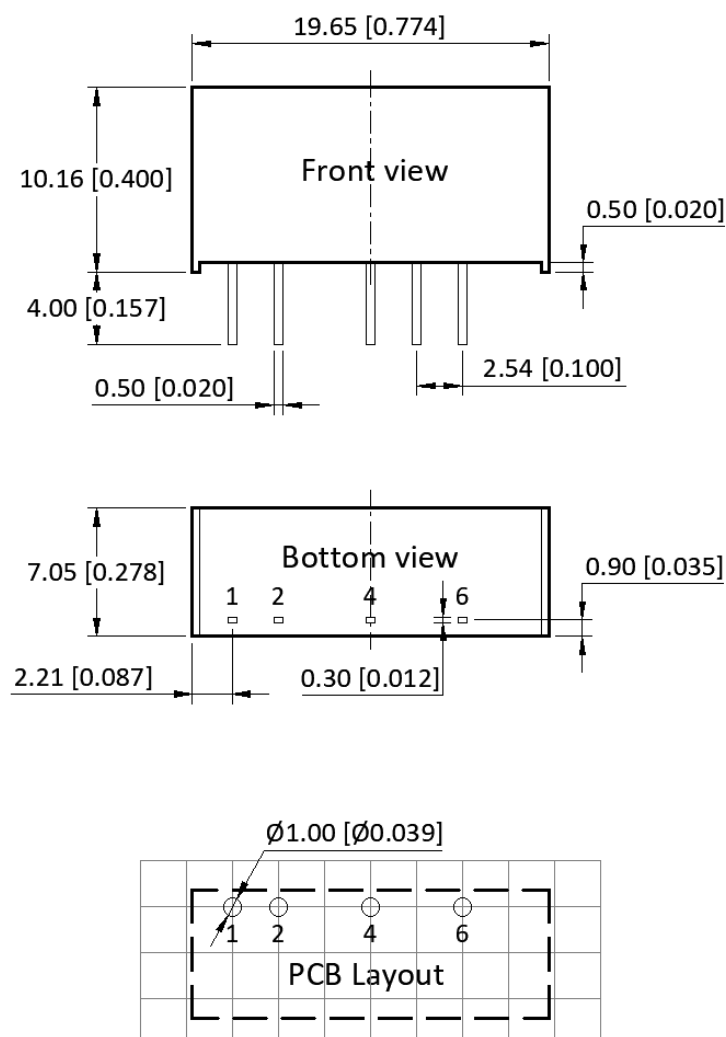
Pin Definition

Pin #	Single Out
1	V_{IN}
2	GND
4	0V
6	$+V_{OUT}$

* Unless otherwise specified unit: mm [inch]
* General tolerance: ±0.50 [±0.020]
* Pin thickness: ±0.10 [±0.004]
* Footprint grid 2.54 x 2.54 mm

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