MINMAX®

MFSU01 SERIES

DC-DC CONVERTER 1W

FEATURES

- Industrial Standard DIP-8 Package
- Unregulated Output Voltage
- I/O Isolation 1500VDC
- Operating Ambient Temp. Range -40℃ to +85℃
- Short Circuit Protection

PRODUCT OVERVIEW

The MINMAX MFSU01 series is a range of isolated 1W DC-DC converter modules in DIP-8. There are 9 models available for 5,12 or 24VDC input. Advanced circuit topology provides continuous short circuit protection and a high efficiency up to 83% which allows operating ambient temperatures range of -40℃ to +85℃ without power derating. These converters offer a better solution for all applications where fault condition protection are required.

Model Selection Guide

Model Number	Input Voltage (Range)	Output Voltage	Output Current	Input Current		Load Regulation	Max. capacitive Load	Efficiency (typ.)
			Max.	@Max. Load	@No Load			@Max. Load
	VDC	VDC	mA	mA(typ.)	mA(typ.)	% (max.)	μF	%
MFSU01-05S05	5 (4.5 ~ 5.5)	5	200	250	30	11	220	80
MFSU01-05S12		12	84	246		9		82
MFSU01-05S15		15	67	242		8		83
MFSU01-12S05	12 (10.8 ~ 13.2)	5	200	105	17	8	220	79
MFSU01-12S12		12	84	104		8		81
MFSU01-12S15		15	67	102		8		82
MFSU01-24S05	24 (21.6 ~ 26.4)	5	200	53	10	8	220	78
MFSU01-24S12		12	84	53		8		80
MFSU01-24S15		15	67	52		7		81

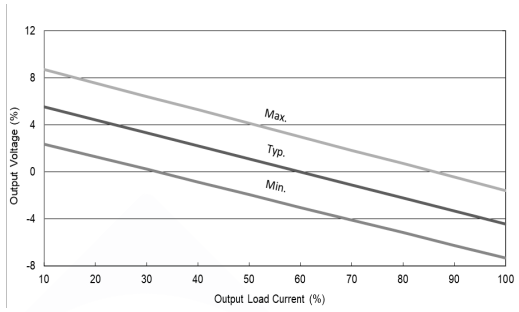
Input Specifications

Parameter	Model	Min.	Typ.	Max.	Unit
Input Voltage Range	5V Input Models	4.5	5	5.5	VDC
	12V Input Models	10.8	12	13.2	
	24V Input Models	21.6	24	26.4	
Input Surge Voltage (1 sec. max.)	5V Input Models	-0.7	---	9	
	12V Input Models	-0.7	---	18	
	24V Input Models	-0.7	---	30	
Input Filter	All Models	Internal Capacitor			

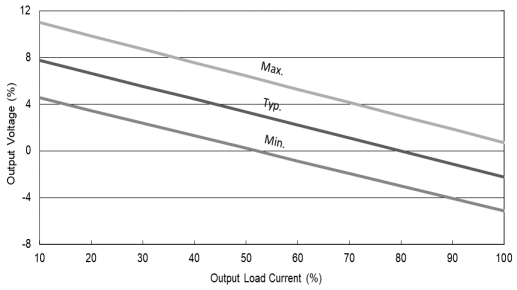
Output Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Setting Accuracy		---	---	±3.0	%Vnom.
Line Regulation	For Vin Change of 1%	---	±1.2	±1.5	%
Load Regulation	Io=10% to 100%	See Model Selection Guide			
Ripple & Noise	0-20 MHz Bandwidth	---	---	100	mV P-P
Temperature Coefficient		---	±0.01	±0.02	%/℃
Short Circuit Protection	Continuous, Automatic Recovery				

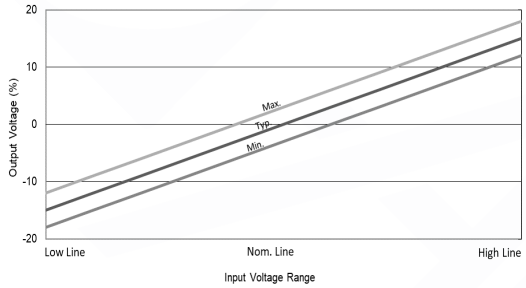
Output Voltage Tolerance



Output Voltage VS Output Load Current
For 5V Output Models



Output Voltage VS Output Load Current
For 12V & 15V Output Models



Output Voltage VS Input Voltage Range

General Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage	60 Seconds	1500	---	---	VDC
	1 Second	1800	---	---	VDC
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ
I/O Isolation Capacitance	100kHz, 1V	---	20	---	pF
Switching Frequency		50	80	110	kHz
MTBF (calculated)	MIL-HDBK-217F@25℃, Ground Benign	5,067,163	---	---	Hours

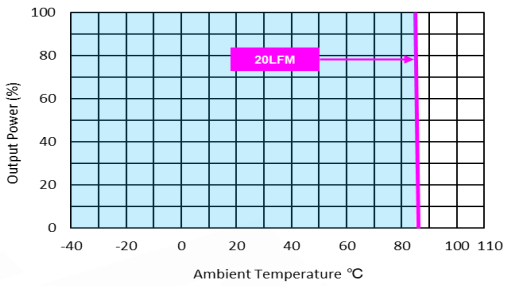
EMC Specifications

Parameter	Standards & Level			Performance
EMI	Conduction / Radiation	EN 55032	With external components	Class A(5)
EMS	EN 55024, EN 55035			
	ESD	Direct discharge: EN61000-4-2 Air ± 8kV	Indirect discharge HCP & VCP: Contact ± 6kV	A
	Radiated immunity	EN 61000-4-3 10V/m		A
	Fast transient (6)	EN 61000-4-4 ±2kV		A
	Surge (6)	EN 61000-4-5 ±1kV		A
	Conducted immunity	EN 61000-4-6 10Vrms		A
	PFMF	EN 61000-4-8 30A/m		A

Environmental Specifications

Parameter	Min.	Max.	Unit
Operating Ambient Temperature Range	-40	+85	℃
Case Temperature	---	+95	℃
Storage Temperature Range	-50	+125	℃
Humidity (non condensing)	---	95	% rel. H
Lead Temperature (1.5mm from case for 10Sec.)	---	260	℃

Power Derating Curve

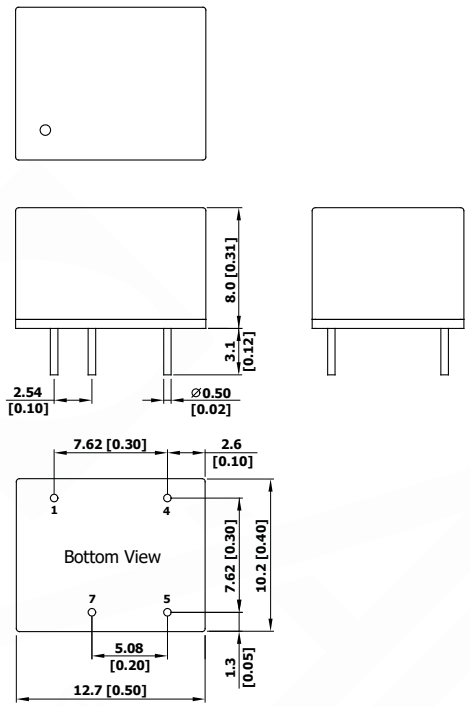


Notes

1 Specifications typical at Ta=+25℃, resistive load, nominal input voltage and rated output current unless otherwise noted.
2 These power converters require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage these modules; however they may not meet all specifications listed.
3 We recommend to protect the converter by a fast blow fuse in the input supply line.
4 Other input and output voltage may be available, please contact MINMAX.
5 To meet EN55032 Class A an external filter, please contact MINMAX.
6 To meet EN61000-4-4 & EN61000-4-5 an external capacitor across the input pins is required, please contact MINMAX.
7 Specifications are subject to change without notice.

Package Specifications

Mechanical Dimensions



Pin Connections

Pin	Function
1	-Vin
4	+Vin
5	+Vout
7	-Vout

- All dimensions in mm (inches)
- Tolerance: X.X±0.5 (X.XX±0.02)
  X.XX±0.25 (X.XXX±0.01)
- Pins ±0.05 (±0.002)

Physical Characteristics

Case Size	:	12.7x8.0x10.2mm (0.50x0.31x0.40 inches)
Case Material	:	Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Pin Material	:	Phosphor Bronze with Tin Plate Over Nickel Subplate
Weight	:	2.1g