

FEATURES

- ▶ Industrial Standard SIP-7 Package
- ▶ I/O Isolation 3000VDC
- ▶ Operating Ambient Temp. Range -40°C to +90°C
- ▶ Overload and Short Circuit Protection
- ▶ UL/cUL/IEC/EN 62368-1 (60950-1) Safety Approval (Pending)
& CE Marking


NEW


PRODUCT OVERVIEW

The MINMAX MAPU01H series is a new range of isolated 1W DC/DC converter modules in SIP-7 package which feature a high I/O isolation voltage rated for 3000VDC and there are 32 models available for 3.3, 5, 12 or 24VDC input.

Advanced circuit topology provides continuous overload, short circuit protection and a high efficiency up to 82% which allows operating ambient temperatures range of -40°C to +85°C without power derating.

These converters offer a cost-effective solution for all applications where a high I/O isolation and 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.	Min.	@Max. Load	@No Load			
			mA	mA	mA(typ.)	mA(typ.)		μF	%
MAPU01-033S033H	3.3 (2.97 ~ 3.63)	3.3	300	6	390	45	15	220	77
MAPU01-033S05H		5	200	4	394		12		77
MAPU01-033S09H		9	110	2.2	385		12		78
MAPU01-033S12H		12	84	1.68	382		10		80
MAPU01-033S15H		15	67	1.34	386		10	100#	79
MAPU01-033D05H		±5	±100	±2	394		11		77
MAPU01-033D12H		±12	±42	±0.84	387		9		79
MAPU01-033D15H		±15	±33	±0.66	380		9		79
MAPU01-05S033H	5 (4.5 ~ 5.5)	3.3	300	6	261	30	12	220	76
MAPU01-05S05H		5	200	4	256		10		78
MAPU01-05S09H		9	110	2.2	247		8		81
MAPU01-05S12H		12	84	1.68	246		8		82
MAPU01-05S15H		15	67	1.34	241		8	100#	83
MAPU01-05D05H		±5	±100	±2	247		10		81
MAPU01-05D12H		±12	±42	±0.84	249		8		81
MAPU01-05D15H		±15	±33	±0.66	244		9		81
MAPU01-12S033H	12 (10.8 ~ 13.2)	3.3	300	6	104	17	10	220	79
MAPU01-12S05H		5	200	4	104		8		80
MAPU01-12S09H		9	110	2.2	101		7		82
MAPU01-12S12H		12	84	1.68	99		7		84
MAPU01-12S15H		15	67	1.34	100		7	100#	83
MAPU01-12D05H		±5	±100	±2	103		7		81
MAPU01-12D12H		±12	±42	±0.84	102		6		82
MAPU01-12D15H		±15	±33	±0.66	102		6		82
MAPU01-24S033H	24 (21.6 ~ 26.4)	3.3	300	6	54	10	10	220	76
MAPU01-24S05H		5	200	4	51		8		81
MAPU01-24S09H		9	110	2.2	52		8		79
MAPU01-24S12H		12	84	1.68	51		8		82
MAPU01-24S15H		15	67	1.34	51		9	100#	82
MAPU01-24D05H		±5	±100	±2	52		8		80
MAPU01-24D12H		±12	±42	±0.84	52		8		81
MAPU01-24D15H		±15	±33	±0.66	52		8		80

For each output

Input Specifications

Input Specifications					
Parameter	Model	Min.	Typ.	Max.	Unit
Input Voltage Range	3.3V Input Models	2.97	3.3	3.63	VDC
	5V Input Models	4.5	5	5.5	
	12V Input Models	10.8	12	13.2	
	24V Input Models	21.6	24	26.4	
Input Surge Voltage (1 sec. max.)	3.3V Input Models	-0.7	---	6	
	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		---	±1.0	±3.0	%
Output Voltage Balance	Dual Output, Balanced Loads	---	±0.1	±1.0	%
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	---	65	100	mV _{P-P}
Temperature Coefficient		---	±0.01	±0.02	%/°C
Over Load Protection	Normal Vin at 25°C	---	160	---	%
Short Circuit Protection	Continuous, Automatic Recovery				

General Specifications

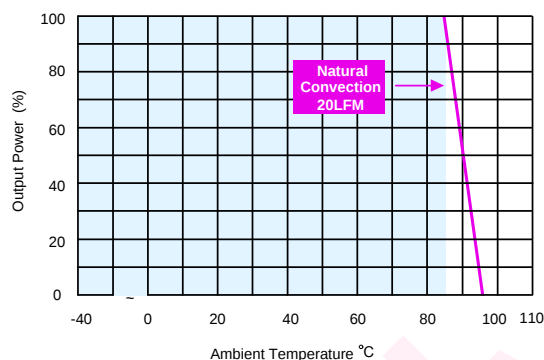
Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage	60 Seconds	3000	---	---	VDC
I/O Isolation Resistance	500 VDC	10	---	---	GΩ
I/O Isolation Capacitance	100KHz, 1V	---	20	---	pF
Switching Frequency		40	75	110	KHz
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign	TBD	---	---	Hours
Safety Approvals (Pending)	UL/cUL 60950-1 recognition (UL certificate), IEC/EN 60950-1 (CB-report)				
	UL/cUL 62368-1 recognition (UL certificate), IEC/EN 62368-1 (CB-report)				

Environmental Specifications

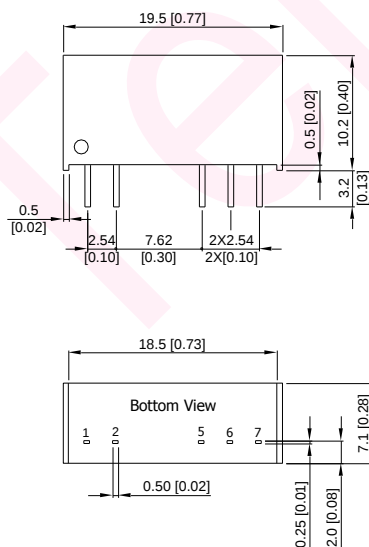
Parameter	Conditions	Min.	Max.	Unit
Operating Ambient Temperature Range (See Power Derating Curve)	Natural Convection	-40	+90	°C
Case Temperature		---	+95	°C
Storage Temperature Range		-50	+125	°C
Humidity (non condensing)		---	95	% rel. H
Cooling	Natural Convection			
Lead Temperature (1.5mm from case for 10Sec.)		---	260	°C

EMC Specifications

Parameter	Standards & Level		Performance
EMI	Conduction	EN55022, FCC part 15	Class A ⁽⁵⁾
EMS	EN55024		
	ESD	EN61000-4-2 Air ± 8kV, Contact ± 6kV	A
	Radiated immunity	EN61000-4-3 10V/m	A
	Fast transient ⁽⁶⁾	EN61000-4-4 ±2kV	A
	Surge ⁽⁶⁾	EN61000-4-5 ±1kV	A
	Conducted immunity	EN61000-4-6 10Vrms	A
	PFMF	EN61000-4-8 3A/m	A

Power Derating Curve

Notes

- 1 Specifications typical at $T_a = +25^\circ\text{C}$, 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 slow blow fuse in the input supply line.
- 4 Other input and output voltage may be available, please contact factory.
- 5 To meet EN55022 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. Suggested capacitor: TBD.
- 7 That "natural convection" is about 20LFM but is not equal to still air (0 LFM).
- 8 Specifications are subject to change without notice.

Package Specifications
Mechanical Dimensions

Pin Connections

Pin	Single Output	Dual Output
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

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

Physical Characteristics

Case Size	: 19.5x7.1x10.2mm (0.77x0.28x0.40 inches)
Case Material	: Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Pin Material	: Tinned Copper
Weight	: 3.1g