Total Power International, Inc.

MAU100 SERIES

DC/DC CONVERTER 1W, SIP-Package

FEATURES

- SIP Package with Industry Standard Pinout
- Package Dimension:
  19.5 x 10.2 x 6.1 mm (0.77"x 0.4"x 0.24") 5V&12V Models
  19.5 x 10.2 x 7.1 mm (0.77"x 0.4"x 0.28") 15V&24V Models
- Single and Dual Output Models
- I/O-Isolation 1000 VDC
- Operating Temp. Range -40°C to +85°C
- 3 Years Product Warranty

PRODUCT OVERVIEW

The MAU100 series is a range of 1W DC/DC converters in a small SIP Package featuring I/O-isolation of 1000VDC.
An excellent efficiency allows an operating temperature range of –40°C to +85°C.
These converters offer an economical solution for many applications where a voltage has to be isolated i.e for noise reduction, ground loop elimination, digital interfaces or for board level power distribution.

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			@Max. Load
	VDC	VDC	mA	mA	mA(typ.)	mA(typ.)	% (max.)	μF	%
MAU101	5 (4.5 ~ 5.5)	3.3	260	5	235	30	10	220	73
MAU102		5	200	4	281		10		71
MAU103		9	110	2	260		8		76
MAU104		12	84	1.5	258		7		78
MAU105		15	67	1	258		7		78
MAU106		±5	±100	±2	278		10	100#	72
MAU107		±9	±56	±1	262		8		77
MAU108		±12	±42	±0.8	258		7		78
MAU109		±15	±34	±0.7	258		7		79
MAU111	12 (10.8 ~ 13.2)	3.3	260	5	96	12	8	220	74
MAU112		5	200	4	114		8		73
MAU113		9	110	2	106		5		78
MAU114		12	84	1.5	105		5		80
MAU115		15	67	1	104		5		80
MAU116		±5	±100	±2	113		8	100#	74
MAU117		±9	±56	±1	106		5		79
MAU118		±12	±42	±0.8	104		5		81
MAU119		±15	±34	±0.7	105		5		81
MAU151	15 (13.5 ~ 16.5)	5	200	4	93	11	8	220	72
MAU152		12	84	1.5	85		5		79
MAU153		15	67	1	85		5		79
MAU154		±5	±100	±2	93		8	100#	72
MAU155		±12	±42	±0.8	85		5		80
MAU156		±15	±34	±0.7	85		5		80
MAU121	24 (21.6 ~ 26.4)	3.3	260	5	49	7	8	220	73
MAU122		5	200	4	59		8		71
MAU123		9	110	2	54		5		76
MAU124		12	84	1.5	54		5		78
MAU125		15	67	1	53		5		79
MAU126		±5	±100	±2	58		8	100#	72
MAU127		±9	±56	±1	55		5		76
MAU128		±12	±42	±0.8	53		5		79
MAU129		±15	±34	±0.7	53		5		80

For each output

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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	
	15V Input Models	13.5	15	16.5	
	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	
	15V Input Models	-0.7	---	18	
	24V Input Models	-0.7	---	30	
Reverse Polarity Input Current	All Models	---	---	0.3	A
Internal Filter Type		Internal Capacitor			
Internal Power Dissipation		---	---	450	mW

Output Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage 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=20% to 100%	See Model Selection Guide			
Ripple & Noise	max. 20MHz Bandwidth	---	50	75	mV_{P-P}
Temperature Coefficient		---	±0.01	±0.02	%/℃
Short Circuit Protection		0.5 Second Max.			

General Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage (rated)	60 Seconds	1000	---	---	VDC
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ
I/O Isolation Capacitance	100KHz, 1V	---	60	100	pF
Switching Frequency		70	100	120	KHz
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign	2,000,000	---	---	Hours

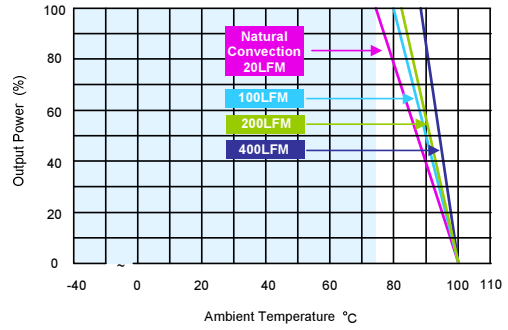
Input Fuse

5V Input Models	12V Input Models	15V Input Models	24V Input Models
500mA Slow-Blow Type	200mA Slow-Blow Type	150mA Slow-Blow Type	100mA Slow-Blow Type

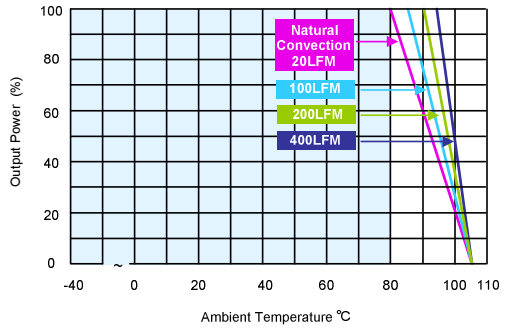
Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit
Operating Ambient Temperature Range (See Power Derating Curve)	Natural Convection	-40	+85	℃
Case Temperature		---	+90	℃
Storage Temperature Range		-50	+125	℃
Humidity (non condensing)		---	95	% rel. H
Cooling	Free-Air convection			
Lead Temperature (1.5mm from case for 10Sec.)		---	260	℃

Power Derating Curve



(3.3V, 5V & ±5V}



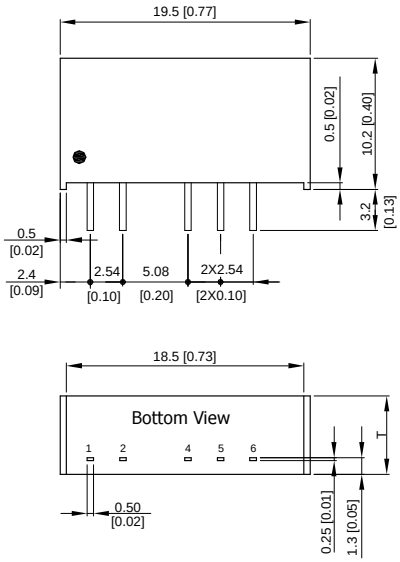
(all other output)

Notes

1. Specifications typical at Ta=+25°C, resistive load, nominal input voltage and rated output current unless otherwise noted.
2. Ripple & Noise measurement bandwidth is 0-20MHz.
3. 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.
4. All DC/DC converters should be externally fused at the front end for protection.
5. Other input and output voltage may be available, please contact factory.
6. That "natural convection" is about 20LFM but is not equal to still air (0 LFM).
7. Specifications are subject to change without notice.

Package Specifications

Mechanical Dimensions



Pin Connections

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

T: 6.1mm(0.24 inch) for 5V&12V Input Models

T: 7.1mm(0.28 inch) for 15V&24V Input Models

- All dimensions in mm (inches)
- Tolerance: X.X±0.25 (X.XX±0.01)
  X.XX±0.13 (X.XXX±0.005)
- Pins ±0.05 (±0.002)

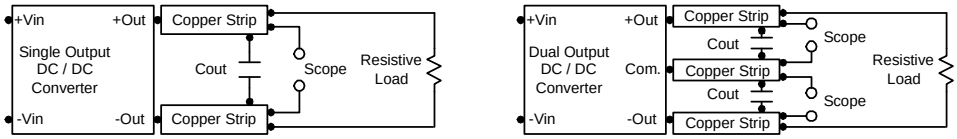
Physical Characteristics

Case Size (5V&12V Input)	:	19.5x6.1x10.2mm (0.77x0.24x0.40 inches)
Case Size (15V&24V Input)	:	19.5x7.1x10.2mm (0.77x0.28x0.40 inches)
Case Material	:	Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Pin Material	:	Alloy 42
Weight (5V&12V Input)	:	2.2g
Weight (15V&24V Input)	:	2.6g

Test Setup

Peak-to-Peak Output Noise Measurement Test

Use a Cout 0.33μF ceramic capacitor. Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20 MHz. Position the load between 50 mm and 75 mm from the DC/DC Converter.



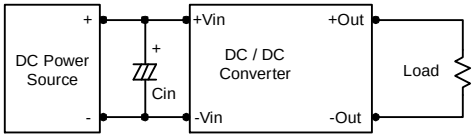
Technical Notes

Maximum Capacitive Load

The MAU100 series has limitation of maximum connected capacitance at the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the startup time. For optimum performance we recommend 100μF maximum capacitive load for dual outputs and 220μF capacitive load for single outputs. The maximum capacitance can be found in the data sheet.

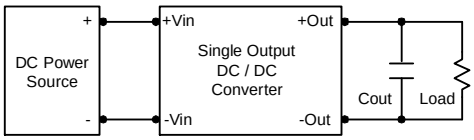
Input Source Impedance

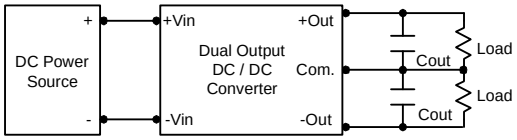
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup.
Capacitor mounted close to the power module helps ensure stability of the unit, it is commended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100 KHz) capacitor of a 2.2μF for the 5V input devices, a 1.0μF for the 12V,15V input devices and a 0.47μF for the 24V devices.



Output Ripple Reduction

A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 1.0μF capacitors at the output.





Thermal Considerations

Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 90°C. The derating curves are determined from measurements obtained in a test setup.