

Size:
0.60 x 0.31 x 0.28 inches
15.3 x 8.0 x 7.1 mm

Weight:
0.08oz (2.2g)

FEATURES

- 1 Watt Output Power
- Single & Dual Outputs
- High I/O Isolation: 3000VDC
- High Accuracy of Pin Planarity
- MTBF > 2,000,000 Hours
- Water-washable process available
- -40°C to +85°C Operating Temperature
- SMT Package with Industry Standard Pin-out
- Qualified for Lead-free Reflow Solder Processes According to IPC/JEDEC J-STD-020D
- Tape & Reel Packaging Available
- Efficiency up to 80%

DESCRIPTION

The DCMSAU1 series of DC/DC converters provides 1 Watt of output power in an SMT package featuring high I/O isolation of 3000VDC. These converters operate over input voltage ranges of 4.5~5.5VDC, 10.8~13.2VDC, and 21.6~26.4VDC. This series also has single and dual output voltages of 5V, 12V, 15V, ±5V, ±12V, and ±15V. The DCMSAU1 series' impressive efficiencies enable these modules to deliver their fully rated output power from –40°C to +85°C without a heatsink or forced-air cooling. The very small footprint of these converters makes them an ideal solution for many applications where a voltage has to be isolated such as for noise reduction, ground loop elimination in digital interfaces, or where a higher I/O isolation is required. These converters are also fully qualified for the higher temperature profile used in lead-free reflow solder processes. These converters can also be supplied in tape & reel packaging for use in automated SMD production lines.

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Load Regulation	Output Power	Efficiency	Maximum Capacitive Load
			Min	Max	No Load	Max Load				
DCMSAU505H-1	5 VDC (4.5 - 5.5 VDC)	5 VDC	4mA	200mA	30mA	281mA	10%	1W	71%	33µF
DCMSAU512H-1		12 VDC	1.5mA	84mA		258mA	7%	1W	78%	4.7µF
DCMSAU515H-1		15 VDC	1mA	67mA		258mA	7%	1W	78%	4.7µF
DCMSAU1205H-1	12 VDC (10.8 - 13.2 VDC)	5 VDC	4mA	200mA	12mA	117mA	8%	1W	71%	33µF
DCMSAU1212H-1		12 VDC	1.5mA	84mA		106mA	5%	1W	79%	4.7µF
DCMSAU1215H-1		15 VDC	1mA	67mA		104mA	5%	1W	80%	4.7µF
DCMSAU2405H-1	24 VDC (21.6 - 26.4 VDC)	5 VDC	4mA	200mA	7mA	58mA	8%	1W	71%	33µF
DCMSAU2412H-1		12 VDC	1.5mA	84mA		53mA	5%	1W	78%	4.7µF
DCMSAU2415H-1		15 VDC	1mA	67mA		43mA	5%	1W	79%	4.7µF

DUAL OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Load Regulation	Output Power	Efficiency	Maximum Capacitive Load
			Min	Max	No Load	Max Load				
DCMSAU505DH-1	5 VDC (4.5 - 5.5 VDC)	±5 VDC	±2mA	±100mA	30mA	277mA	10%	1W	72%	±10µF
DCMSAU512DH-1		±12 VDC	±0.8mA	±42mA		255mA	7%	1W	78%	±2.2µF
DCMSAU515DH-1		±15 VDC	±0.7mA	±34mA		258mA	7%	1W	79%	±2.2µF
DCMSAU1205DH-1	12 VDC (10.8 - 13.2 VDC)	±5 VDC	±2mA	±100mA	12mA	112mA	8%	1W	74%	±10µF
DCMSAU1212DH-1		±12 VDC	±0.8mA	±42mA		105mA	5%	1W	80%	±2.2µF
DCMSAU1215DH-1		±15 VDC	±0.7mA	±34mA		104mA	5%	1W	81%	±2.2µF
DCMSAU2405DH-1	24 VDC (21.6 - 26.4 VDC)	±5 VDC	±2mA	±100mA	7mA	57mA	8%	1W	72%	±10µF
DCMSAU2412DH-1		±12 VDC	±0.8mA	±42mA		53mA	5%	1W	79%	±2.2µF
DCMSAU2415DH-1		±15 VDC	±0.7mA	±34mA		53mA	5%	1W	80%	±2.2µF

NOTES

1. The DCMSAU1 series requires a minimum output loading to maintain specified regulations. Operation under no-load conditions will not damage these devices; however they may not meet all listed specifications.
2. All DC/DC converters should be externally fused at the front end for protection.
3. Other input and output voltages may be available, please contact factory.

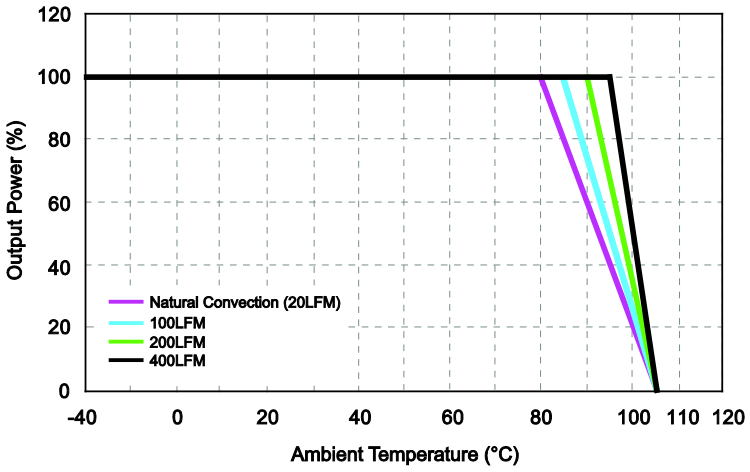
**Due to advances in technology, specifications are subject to change without notice.*

SPECIFICATIONS: DCMSAU1 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
INPUT SPECIFICATIONS					
Input Voltage Range	5VDC nominal input models	4.5	5	5.5	VDC
	12VDC nominal input models	10.8	12	13.2	
	24 VDC nominal input models	21.6	24	26.4	
Input Surge Voltage (1sec, max.)	5VDC nominal input models	-0.7		9	VDC
	12VDC nominal input models	-0.7		18	
	24 VDC nominal input models	-0.7		30	
Reverse Polarity Input Current				0.3	A
Input Current		See Table			
Internal Power Dissipation				550	mW
Input Filter		Internal capacitor			
Input Fuse	5VDC nominal input models	500mA slow-blow type			
	12VDC nominal input models	200mA slow-blow type			
	24 VDC nominal input models	100mA slow-blow type			
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Output Voltage Accuracy			±1.5	±4.0	%
Output Voltage Balance (Dual Outputs)	Balanced loads		±0.1	±1.0	%
Line Regulation	For Vin change of 1%		±1.2	±1.5	%
Load Regulation	20% load to 100% load	See Table			
Output Power				1	W
Output Current		See Table			
Minimum Load	See Note 1	See Table			
Maximum Capacitive Load		See Table			
Ripple & Noise (20MHz)			75	100	mVp-p
	Over line, over load, and over temperature			150	mVp-p
				15	mV rms
Temperature Coefficient			±0.01	±0.02	%/°C
PROTECTION					
Short Circuit Protection	Automatic Recovery			0.5	s
GENERAL SPECIFICATIONS					
Efficiency	Nominal input voltage and full load	See Table			
Switching Frequency		50	100	150	KHz
Isolation Voltage (I/P to O/P)	60 seconds	3000			VDC
Isolation Resistance (I/P to O/P)	500VDC	10			GΩ
Isolation Capacitance (I/P to O/P)	100KHz, 1V		60	100	pF
ENVIRONMENTAL SPECIFICATIONS					
Operating Ambient Temperature	See derating curve	-40		+85	°C
Case Temperature				+90	°C
Storage Temperature		-50		+125	°C
Relative Humidity	Non-condensing			95	% RH
Cooling		Free air convection			
Lead Temperature	1.5mm from case for 10 sec.			300	°C
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D	Level 2			
MTBF	MIL-HDBK-217F at 25°C, ground benign	2,000,000			hours
PHYSICAL SPECIFICATIONS					
Weight		0.08oz (2.2g)			
Dimensions (L x W x H)		0.60 x 0.31 x 0.27 inch (15.3 x 8.0 x 6.75 mm)			
Case Material	Flammability to UL 94V-0 rated	Molding			

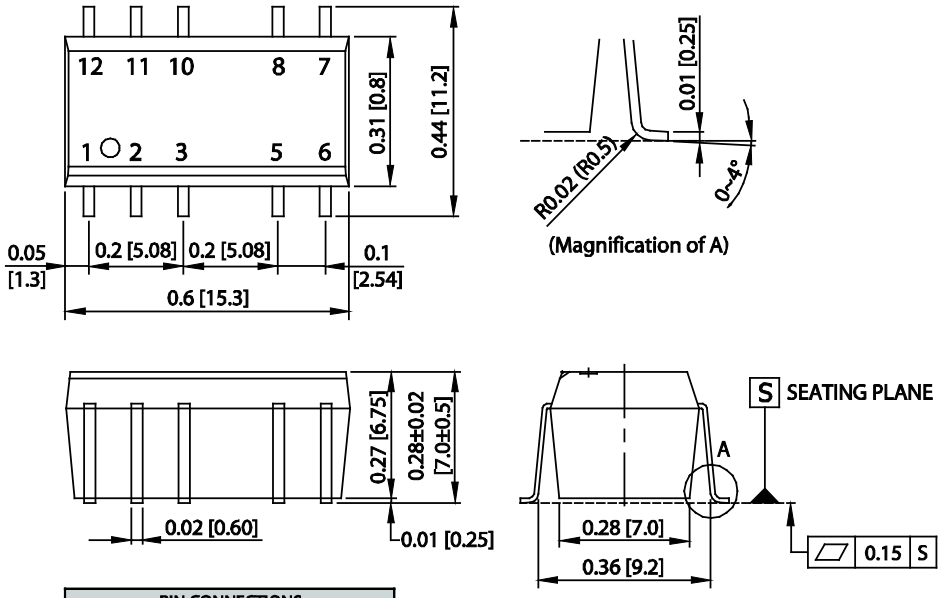
DERATING CURVE



MECHANICAL DRAWING

Mechanical Dimensions

Unit: inches [mm]



PIN CONNECTIONS		
Pin	Single Output	Dual Output
1	-Vin	-Vin
2	+Vin	+Vin
3	NA	NA
5	-Vout	Common
6	NA	-Vout
7	NA	NA
8	+Vout	+Vout
10	NA	NA
11	NA	NA
12	NA	NA

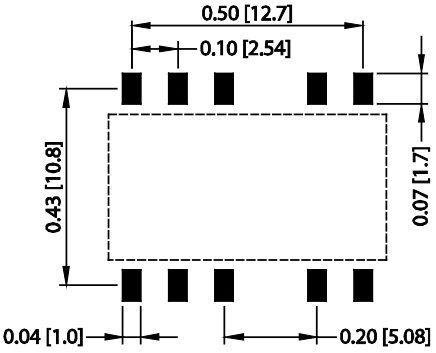
NA: Not available for electrical connection

Notes:

1. Tolerance: X.XX±0.01 [X.X±0.25]
   X.XXX±0.005 [X.XX±0.13]
2. Pin Tolerance: ±0.002 [±0.05]
3. Weight: 0.08oz (2.2g)
4. All dimensions are for reference only

Connecting Pin Patterns

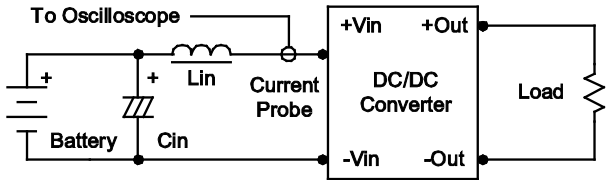
Unit: inches [mm]



DESIGN CONSIDERATIONS

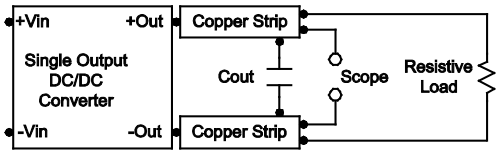
Input Reflected-Ripple Current Test Setup

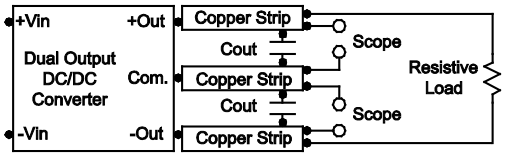
Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR < 1.0Ω at 100 KHz) to simulate source impedance. Capacitor Cin offsets possible battery impedance. Current ripple is measured at the input terminals of the module. Measurement bandwidth is 0-500 KHz.



Peak-to-Peak Output Noise Measurement Test

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





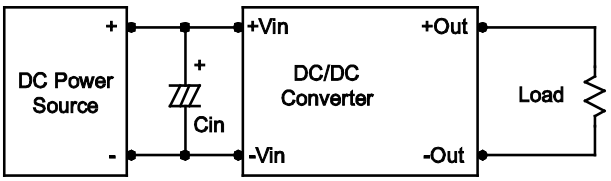
TEST SETUP

Maximum Capacitive Load

The DCMSAU1 series has a limitation of maximum connected capacitance on the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the start-up time. The maximum capacitance can be found in the Model Selection Table.

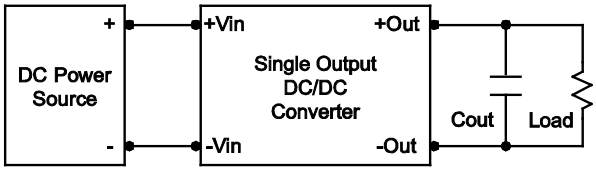
Input Source Impedance

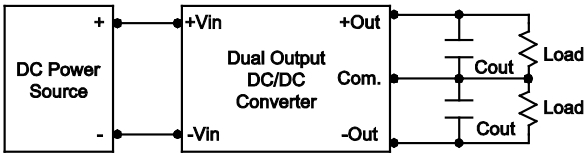
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup.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



Output Ripple Reduction

A good quality low ESR capacitor placed as close as possible across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 1.5µF capacitors at the output.

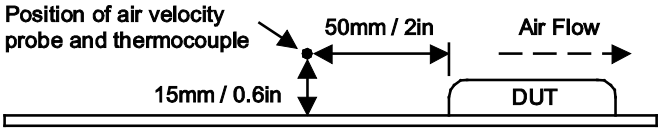




TEST SETUP

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.



COMPANY INFORMATION

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Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

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