

FEATURES

- ► Ultra compact SMD Package
- ► Wide 2:1 Input Range
- ► Fully regulated Outputs
- ► Low Ripple and Noise
- ► Operating Temp. Range -40°C to +85°C
- ► I/O-isolation Voltage 1500VDC
- ► Continuous Short-circuit Protection
- ► Remote On/Off Control
- ► Qualified for Lead-free Reflow Process
- ► CSA/UL/IEC/EN 60950-1 (Approval pending)
- > 3 Years Product Warranty









PRODUCT OVERVIEW

The MSCW01 series is a family of compact 1W dc/dc-converters with wide 2:1 input voltage ranges and tightly regulated output voltages.

They work with high efficiency over the full load range and come with a remote On/Off control input.

High efficiency to 82% allows operating temperatures up to +75°C without power derating. The very small footprint of these converters make them an ideal solution for many space critical applications in communication equipment, instrumentation and many other battery operated applications.

Model Selection G	uide							
Model Number	Input Voltage	·		urrent	Max. capacitive	Reflected Ripple	Efficiency (typ.)	
	(Range)		Max.	@Max. Load	@No Load		current	@Max. Load
	VDC	VDC	mA	mA(typ.)	mA(typ.)	μF	mA (typ.)	%
MSCW01-05S05		5	200	256		1680	80	78
MSCW01-05S12	_	12	83	252	40	820		79
MSCW01-05S15	5	15	67	248		680		81
MSCW01-05D12	(4.5 ~ 9)	±12	±42	255		470#		79
MSCW01-05D15		±15	±33	248		330#		80
MSCW01-12S05		5	200	105	20	1680	40	79
MSCW01-12S12	40	12	83	105		820		79
MSCW01-12S15	12 (9 ~ 18)	15	67	102		680		82
MSCW01-12D12	(9 ~ 10)	±12	±42	104		470#		81
MSCW01-12D15		±15	±33	103		330#		80
MSCW01-24S05		5	200	53		1680		79
MSCW01-24S12	04	12	83	51		820		82
MSCW01-24S15	24 (18 ~ 36)	15	67	51	10	680	30	82
MSCW01-24D12	(16 ~ 30)	±12	±42	51		470#		82
MSCW01-24D15		±15	±33	50		330#		82
MSCW01-48S05		5	200	26		1680		79
MSCW01-48S12	48	12	83	26		820		80
MSCW01-48S15		15	67	26	7	680	20	80
MSCW01-48D12	(36 ~ 75)	±12	±42	26		470#		81
MSCW01-48D15		±15	±33	25		330#		81

For each output



DC/DC CONVERTER 1W, SMD Package

Input Specifications					
Parameter	Model	Min.	Тур.	Max.	Unit
	5V Input Models	-0.7		15	
Innut Surge Valtage (1 and may)	12V Input Models	-0.7		25	
Input Surge Voltage (1 sec. max.)	24V Input Models	-0.7		50	
	48V Input Models	-0.7		100	\/DC
	5V Input Models			4.5	VDC
Chart I In Thursday I Valters	12V Input Models			9	
Start-Up Threshold Voltage	24V Input Models			18	
	48V Input Models			36	
Internal Filter Type	All Models	Capacitor			

Output Specifications						
Parameter	Co	Conditions			Max.	Unit
Output Voltage Setting Accuracy	At 50% Loa	At 50% Load and Nominal Vin			±1.0	%Vnom.
Line Regulation	Vin=N	Vin=Min. to Max.			±0.2	%
	Min I and to Full I and	Single Output			±1.0	%
Load Danidation	Min. Load to Full Load	Dual Output			±1.0	%
Load Regulation	Io=10% to 90%	Single Output			±0.5	%
		Dual Output			±0.8	%
Min.Load		No minimum L				
Ripple & Noise (20MHz)				30		mV _{P-P}
Transient Recovery Time	25% Loa	25% Load Step Change				μsec
Temperature Coefficient					±0.02	%/°C
Short Circuit Protection	Continuous					

General Specifications						
Parameter	Conditions	Min.	Тур.	Max.	Unit	
I/O Isolation Voltage (rated)	60 Seconds	1500			VDC	
I/O Isolation Resistance	500 VDC	1000			ΜΩ	
I/O Isolation Capacitance	100KHz, 1V			50	pF	
Switching Frequency			220		KHz	
MTBF(calculated)	MIL-HDBK-217F@25°C, Ground Benign	2,800,000			Hours	
Safety Approvals(pending)	CSA 60950-1 recognition.IEC/EN 60950-1(CB-scheme)					

Input Fuse			
5V Input Models	12V Input Models	24V Input Models	48V Input Models
500mA Slow-Blow Type	250mA Slow-Blow Type	120mA Slow-Blow Type	60mA Slow-Blow Type

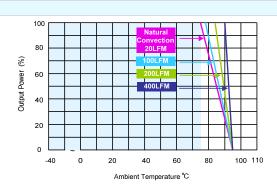
Remote On/Off Control						
Parameter	Conditions	Min.	Тур.	Max.	Unit	
Converter On	Open or high impedance					
Converter Off	2~4mA current applied via 1Kohm resistor					
Standby Input Current	Supply Off & Nominal Vin 2.5				mA	

Environmental Specifications						
Parameter	Conditions	Min.	Max.	Unit		
Operating Ambient Temperature Range (See Power Derating Curve)	Natural Convection	-40	+85	°C		
Case Temperature			+95	°C		
Storage Temperature		-55	+125	°C		
Humidity (non condensing)			95	% rel. H		
Lead Temperature (1.5mm from case for 10Sec.)			260	°C		

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DC/DC CONVERTER 1W, SMD Package

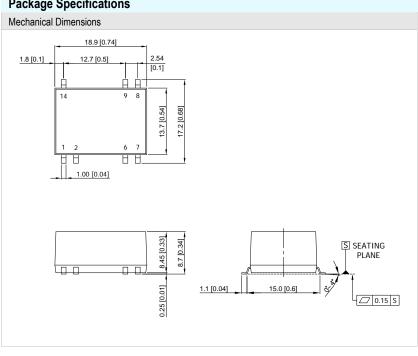
Power Derating Curve

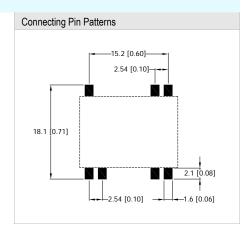


Notes

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

Package Specifications





- ► All dimensions in mm (inches)
- ► Tolerance: X.X±0.5 (X.XX±0.02)

X.XX±0.25 (X.XXX±0.01)

ightharpoonup Pins $\pm 0.05(\pm 0.002)$

Pin Connec	tions	
Pin	Single Output	Dual Output
1	-Vin	-Vin
2	Remote On/Off	Remote On/Off
6	NC	Common
7	NC	-Vout
8	+Vout	+Vout
9	-Vout	Common
14	+Vin	+Vin

Physical Characteristics		
Case Size	:	18.9x13.7x8.45mm (0.74x0.54x0.33 inches)
Case Material	:	Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Pin Material	:	Phosphor bronze
Weight	:	4.5g

NC: No Connection

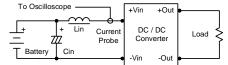
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DC/DC CONVERTER 1W. SMD Package

Test Setup

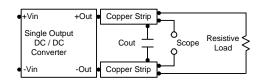
Input Reflected-Ripple Current Test Setup

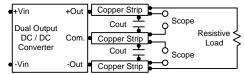
Input reflected-ripple current is measured with a inductor Lin (4.7μH) and Cin (220μF, ESR < 1.0Ω at 100 KHz) to simulate source impedance. Capacitor Cin, offsets possible battery impedance. Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500 KHz.



Peak-to-Peak Output Noise Measurement Test

Use a Cout 0.47µF 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

Remote On/Off

Negative logic remote on/off turns the module off during a logic high voltage on the remote on/off pin, and on during a logic low. To turn the power module on and off, the user must supply a switch to control the voltage between the on/off terminal and the -Vin terminal. The switch can be an open collector or equivalent. A logic high is 2~4mA current applied via 1Kohm resistor. A logic low is open circuit or high impedance.

Maximum Capacitive Load

The MSCW01 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. The maximum capacitance can be found in the data sheet.

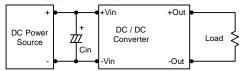
Overcurrent Protection

To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure current limiting for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally once the output current is brought back into its specified range.

Input Source Impedance

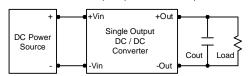
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup.

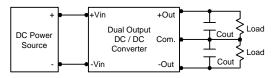
Capacitor mounted close to the power module helps ensure stability of the unit, it is commended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100 KHz) capacitor of a 8.2μ F for the 5V input device, a 3.3μ F for the 12V input devices and a 1.5μ F for the 24V and 48V devices.



Output Ripple Reduction

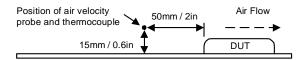
A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 3.3µF capacitors at the output.





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 95°C. The derating curves are determined from measurements obtained in a test setup.



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