

FEATURES

- ▶ Smallest Encapsulated 15W Converter
- ▶ Industrial Standard DIP-16 Package
- ▶ Wide 2:1 Input Voltage Range
- ▶ Fully Regulated Output Voltage
- ▶ I/O Isolation 1500 VDC
- ▶ Operating Ambient Temp. Range -40°C to +85°C
- ▶ Low No Load Power Consumption
- ▶ No Min. Load Requirement
- ▶ Under-voltage, Overload and Short Circuit Protection
- ▶ Shielded Metal Case with Insulated Baseplate
- ▶ Conducted EMI EN 55032 Class A Approved
- ▶ UL/cUL/IEC/EN 62368-1 Safety Approval & CE Marking

NEW

PRODUCT OVERVIEW

The MDW15 series gives designers the flexibility to match the choice of converter to specific application requirements. The high power density of MDW15 series, at 74W/in³, is expected to make it popular with manufacturers of industrial, transportation and renewable energy equipment where space-constrained is critical. This product offers a full 15 Watt isolated DC-DC converter within a small encapsulated DIP-16 package which occupied only 0.5in² of PCB space. There are 18 models available for 12, 24 & 48VDC with wide 2:1 input voltage range. Further features included under-voltage protection, overload protection, short circuit protection, very low no load power consumption, no min. load requirement and conducted EMI class A approved as well. High efficiency allows operating temperatures range of -40°C to 85°C. All models have been qualified per the CB scheme with safety approvals to UL/cUL/IEC/EN 62368-1.

Model Selection Guide

Model Number	Input Voltage (Range) VDC	Output Voltage VDC	Output Current Max. mA	Input Current		Max. capacitive Load μF	Efficiency (typ.)
				@Max. Load mA(typ.)	@No Load mA(typ.)		@Max. Load %
MDW15-12S051	12 (9 ~ 18)	5.1	2940	1453	20	1800	86
MDW15-12S12		12	1250	1437		820	87
MDW15-12S15		15	1000	1437		820	87
MDW15-12S24		24	625	1437		270	87
MDW15-12D12		±12	±625	1437		#560	87
MDW15-12D15		±15	±500	1437		#270	87
MDW15-24S051	24 (18 ~ 36)	5.1	2940	726	10	1800	86
MDW15-24S12		12	1250	718		820	87
MDW15-24S15		15	1000	718		820	87
MDW15-24S24		24	625	718		270	87
MDW15-24D12		±12	±625	718		#560	87
MDW15-24D15		±15	±500	718		#270	87
MDW15-48S051	48 (36 ~ 75)	5.1	2940	363	7	1800	86
MDW15-48S12		12	1250	359		820	87
MDW15-48S15		15	1000	359		820	87
MDW15-48S24		24	625	359		270	87
MDW15-48D12		±12	±625	359		#560	87
MDW15-48D15		±15	±500	359		#270	87

For each output

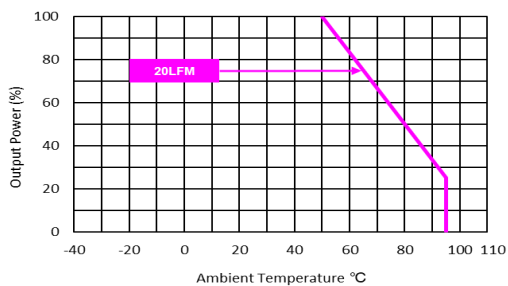
Input Specifications							
Parameter	Conditions / Model	Min.	Typ.	Max.	Unit		
Input Surge Voltage (1 sec. max.)	12V Input Models	-0.7	---	25	VDC		
	24V Input Models	-0.7	---	50			
	48V Input Models	-0.7	---	100			
Start-Up Threshold Voltage	12V Input Models	---	---	9			
	24V Input Models	---	---	18			
	48V Input Models	---	---	36			
Under Voltage Shutdown	12V Input Models	---	8	---			
	24V Input Models	---	16	---			
	48V Input Models	---	34	---			
Start Up Time (Power On)	Nominal Vin and Constant Resistive Load	---	30	---	mS		
Input Filter	All Models	Internal Pi Type					

Output Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Setting Accuracy		---	---	±1.0	%Vnom.	
Output Voltage Balance	Dual Output, Balanced Loads	---	±1.0	±2.0	%	
Line Regulation	Vin=Min. to Max. @Full Load	---	±0.2	±0.8	%	
Load Regulation	Io=0% to 100%	---	---	±1.0	%	
Load Cross Regulation (Dual Output Models)	Asymmetrical Load 25/100% Full Load	---	---	±5.0	%	
Minimum Load	No minimum Load Requirement					
Ripple & Noise	0-20 MHz Bandwidth	Measured with a 2.2µF/50V MLCC	---	70	---	mV _{P-P}
Transient Recovery Time	25% Load Step Change		---	---	500	µsec
Transient Response Deviation			---	±3	±5	%
Temperature Coefficient			---	±0.01	±0.02	%/°C
Over Load Protection	Hiccup	110	160	---	%	
Short Circuit Protection	Continuous, Automatic Recovery (Hiccup Mode 0.3Hz typ.)					

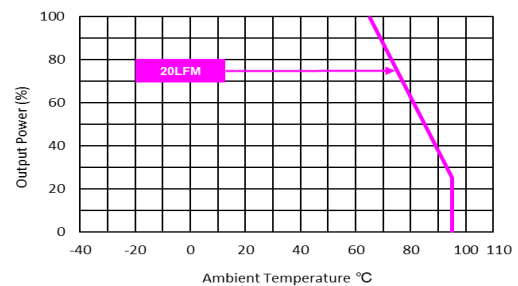
General Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Unit	
I/O Isolation Voltage	60 Seconds	1500	---	---	VDC	
	1 Second	1800	---	---	VDC	
Isolation Voltage Input/Output to case		1000	---	---	VDC	
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ	
I/O Isolation Capacitance	100kHz, 1V	---	---	2200	pF	
Switching Frequency		---	480	---	kHz	
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign	2,157,075	---	---	Hours	
Safety Approvals	UL/cUL 62368-1 recognition(UL certificate), IEC/EN 62368-1(CB report)					

EMC Specifications				
Parameter	Standards & Level			Performance
EMI	Conduction	EN 55032	Without external components	Class A ⁽⁵⁾
	Radiation		With external components	
EMS	EN 55024, EN 55035			
	ESD	Direct discharge	Indirect discharge HCP & VCP	A
		EN 61000-4-2 Air ± 8kV, Contact ± 6kV		
	Radiated immunity	EN 61000-4-3 20V/m		A
	Fast transient ⁽⁶⁾	EN 61000-4-4 ±2kV		A
	Surge ⁽⁶⁾	EN 61000-4-5 ±2kV		A
	Conducted immunity	EN 61000-4-6 10Vrms		A
PFMF	EN 61000-4-8 30A/m		A	

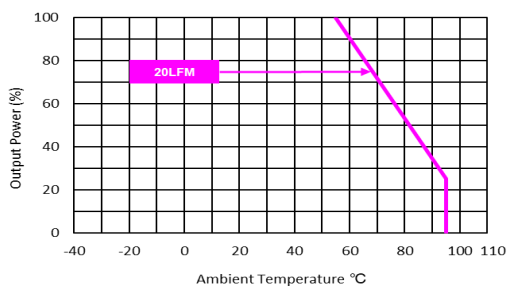
Environmental Specifications					
Parameter	Model	Min.	Max.		Unit
			without Heatsink	with Heatsink	
Operating Temperature Range Nominal Vin, Load 100% Inom. (for Power Derating see relative Derating Curves)	MDW15-12S051, MDW15-24S051, MDW15-48S051	-40	+50	+65	°C
	MDW15-12S12, MDW15-12S15, MDW15-12S24, MDW15-12D12, MDW15-12D15, MDW15-24S12, MDW15-24S15, MDW15-24S24, MDW15-24D12, MDW15-24D15, MDW15-48S12, MDW15-48S15, MDW15-48S24, MDW15-48D12, MDW15-48D15		+55	+70	
Case Temperature		---	+110		°C
Storage Temperature Range		-50	+125		°C
Humidity (non condensing)		---	95		% rel. H
Lead Temperature (1.5mm from case for 10Sec.)		---	260		°C

Power Derating Curve


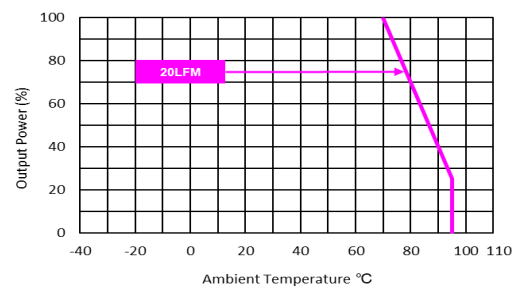
MDW15-12S051, MDW15-24S051, MDW15-48S051
Derating Curve without Heatsink



MDW15-12S051, MDW15-24S051, MDW15-48S051
Derating Curve with Heatsink



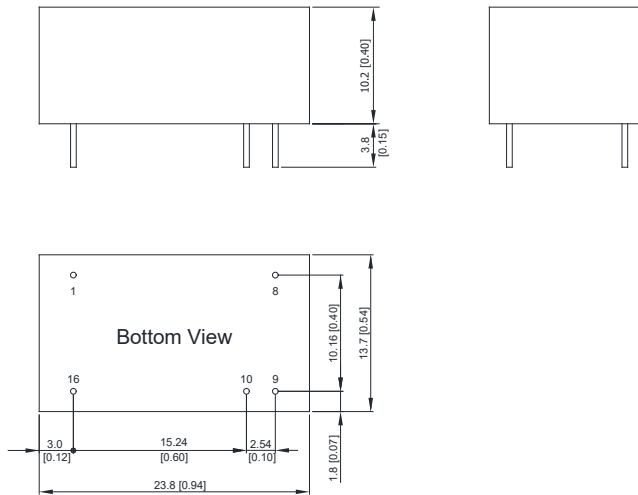
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MDW15-12D12, MDW15-12D15, MDW15-24S12,
MDW15-24S15, MDW15-24S24, MDW15-24D12,
MDW15-24D15, MDW15-48S12, MDW15-48S15,
MDW15-48S24, MDW15-48D12, MDW15-48D15
Derating Curve without Heatsink



MDW15-12S12, MDW15-12S15, MDW15-12S24,
MDW15-12D12, MDW15-12D15, MDW15-24S12,
MDW15-24S15, MDW15-24S24, MDW15-24D12,
MDW15-24D15, MDW15-48S12, MDW15-48S15,
MDW15-48S24, MDW15-48D12, MDW15-48D15
Derating Curve with Heatsink

Notes

- 1 Specifications typical at Ta=+25°C, resistive load, nominal input voltage and rated output current unless otherwise noted.
- 2 Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
- 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 MINMAX.
- 5 To meet EN 55032 Class A with 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

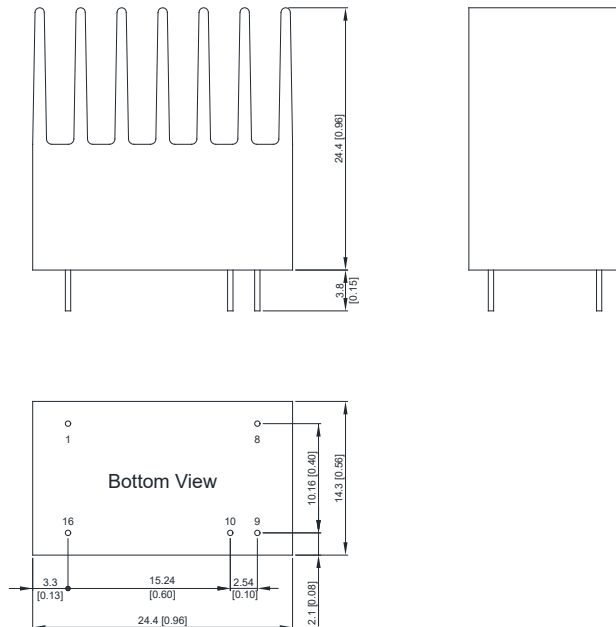
Pin	Single Output	Dual Output	Diameter mm (inches)
1	-Vin	-Vin	Ø 0.5 [0.02]
8	NC	Common	Ø 0.5 [0.02]
9	+Vout	+Vout	Ø 0.5 [0.02]
10	-Vout	-Vout	Ø 0.5 [0.02]
16	+Vin	+Vin	Ø 0.5 [0.02]

NC: No Connection

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

Physical Characteristics

Case Size	: 23.8x13.7x10.2 mm (0.94x0.54x0.40 inches)
Case Material	: Metal With Non-Conductive Baseplate
Pin Material	: Copper Alloy
Weight	: 8.77g

Heatsink (Option -HC7)

Physical Characteristics

Heatsink Material	: Aluminum
Finish	: Black Anodized Coating
Weight	: 14.2g

Order Code Table	
Standard	With heatsink
MDW15-12S051	MDW15-12S051-HC7
MDW15-12S12	MDW15-12S12-HC7
MDW15-12S15	MDW15-12S15-HC7
MDW15-12S24	MDW15-12S24-HC7
MDW15-12D12	MDW15-12D12-HC7
MDW15-12D15	MDW15-12D15-HC7
MDW15-24S051	MDW15-24S051-HC7
MDW15-24S12	MDW15-24S12-HC7
MDW15-24S15	MDW15-24S15-HC7
MDW15-24S24	MDW15-24S24-HC7
MDW15-24D12	MDW15-24D12-HC7
MDW15-24D15	MDW15-24D15-HC7
MDW15-48S051	MDW15-48S051-HC7
MDW15-48S12	MDW15-48S12-HC7
MDW15-48S15	MDW15-48S15-HC7
MDW15-48S24	MDW15-48S24-HC7
MDW15-48D12	MDW15-48D12-HC7
MDW15-48D15	MDW15-48D15-HC7