

FEATURES

- ▶ Smallest Encapsulated 30W Converter
- ▶ Ultra-compact 1"x1" Package
- ▶ Ultra-wide 4:1 Input Voltage Range
- ▶ Fully Regulated Output Voltage
- ▶ Excellent Efficiency up to 90%
- ▶ I/O Isolation 1500 VDC
- ▶ Operating Ambient Temp. Range -40°C to +80°C
- ▶ No Min. Load Requirement
- ▶ Very low no load power consumption
- ▶ Under-voltage, Overload/Voltage and Short Circuit Protection
- ▶ Remote On/Off Control, Output Voltage Trim
- ▶ Shielded Metal Case with Insulated Baseplate
- ▶ UL/cUL/IEC/EN 62368-1 Safety Approval & CE Marking

NEW

PRODUCT OVERVIEW

The MINMAX MJWI30 series is the latest range of a new generation of 30Watt isolated DC-DC power modules with ultra-wide input range of 9-36 / 18-75Vin and 14 models available for 3.3/5/12/15/24/±12/±15VDC tightly output voltage in a highest power density 75W/in³ and ultra-compact size with dimensions of just 1.0"x1.0"x0.4" shielded and encapsulated package. Key performance featuring high efficiency up to 90%, operating ambient temp. range of -40 °C to +80 °C, no min. load requirement, very low no-load power consumption, remote on/off, output voltage trim, build-in fault condition protection include under-voltage, overload, over voltage and short circuit protection

The MJWI30 series has been intensely qualified to safety approval UL/cUL/IEC/EN 62368-1 with CB report and CE marking which offer a solution for the applications where wide input voltage range, high efficiency for wide operating ambient temp. range, isolated power with fault condition protection, shield and encapsulated package and very board space limited / critical are required.

Model Selection Guide

Model Number	Input Voltage (Range)	Output Voltage	Output Current	Input Current		Over Voltage Protection	Max. capacitive Load	Efficiency (typ.)
				Max.	@Max. Load			@No Load
			VDC	VDC	mA			mA(typ.)
MJWI30-24S033	24 (9 ~ 36)	3.3	7000	1106	10	3.9	10000	87
MJWI30-24S05		5	6000	1420	10	6.2	7200	88
MJWI30-24S12		12	2500	1420	10	15	1250	88
MJWI30-24S15		15	2000	1420	10	18	800	88
MJWI30-24S24		24	1250	1420	10	30	330	88
MJWI30-24D12		±12	±1250	1420	10	±15	680#	88
MJWI30-24D15		±15	±1000	1404	10	±18	470#	89
MJWI30-48S033	48 (18 ~ 75)	3.3	7000	553	8	3.9	10000	87
MJWI30-48S05		5	6000	702	8	6.2	7200	89
MJWI30-48S12		12	2500	702	8	15	1250	89
MJWI30-48S15		15	2000	702	8	18	800	89
MJWI30-48S24		24	1250	694	8	30	330	90
MJWI30-48D12		±12	±1250	694	8	±15	680#	90
MJWI30-48D15		±15	±1000	694	8	±18	470#	90

For each output

Input Specifications						
Parameter	Conditions / Model	Min.	Typ.	Max.	Unit	
Input Surge Voltage (100ms max.)	24V Input Models	-0.7	---	50	VDC	
	48V Input Models	-0.7	---	100		
Start-Up Threshold Voltage	24V Input Models	---	---	9		
	48V Input Models	---	---	18		
Start Up Time (Power On)	Nominal Vin and Constant Resistive Load	---	---	30	ms	
Input Filter	All Models	Internal Pi Type				

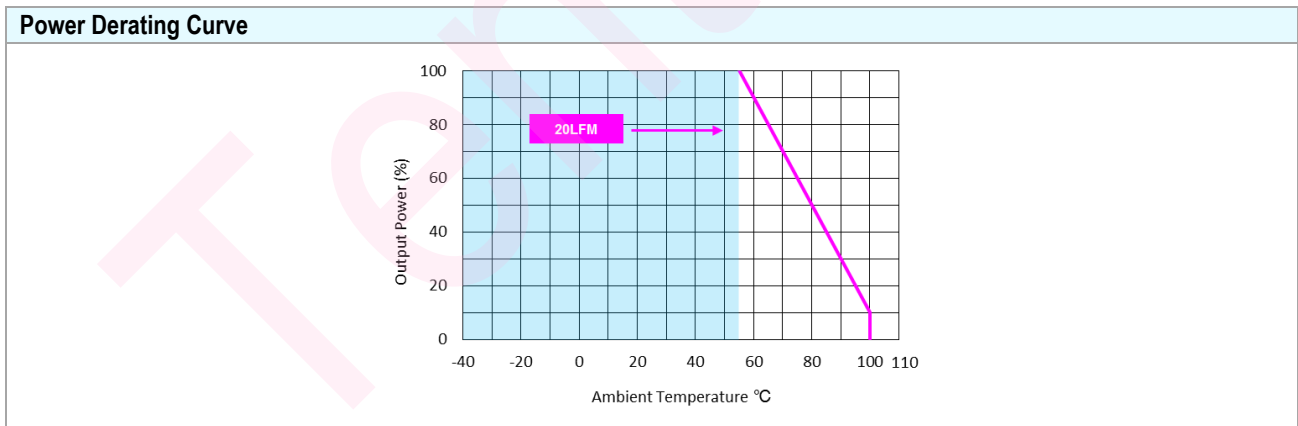
Remote On/Off Control						
Parameter	Conditions	Min.	Typ.	Max.	Unit	
Converter On	3.5V ~ 12V or Open Circuit					
Converter Off	0V ~ 1.2V or Short Circuit					
Control Input Current (on)	Vctrl = 5.0V	---	---	0.5	mA	
Control Input Current (off)	Vctrl = 0V	---	---	-0.5	mA	
Control Common	Referenced to Negative Input					
Standby Input Current	Nominal Vin	---	2	---	mA	

Output Specifications						
Parameter	Conditions / Model	Min.	Typ.	Max.	Unit	
Output Voltage Setting Accuracy		---	---	±1.0	%Vnom.	
Output Voltage Balance	Dual Output, Balanced Loads	---	---	±2.0	%	
Line Regulation	Vin=Min. to Max. @Full Load	Single Output	---	---	±0.2	%
		Dual Output	---	---	±0.5	%
Load Regulation	Io=0% to 100%	Single Output	---	---	±0.2	%
		Dual Output	---	---	±1.0	%
Cross Regulation (Dual)	Asymmetrical Load 25% / 100% FL	---	---	±5.0	%	
Minimum Load	No minimum Load Requirement					
Ripple & Noise (measured with output capacitors ₍₃₎)	20 MHz Bandwidth	3.3 & 5 Vo Models	---	---	75	mV _{P-P}
		12 & 15 & 24 Vo Models	---	---	75	mV _{P-P}
		Dual Output Models	---	---	75	mV _{P-P}
Transient Recovery Time	25% Load Step Change	---	250	---	µsec	
Transient Response Deviation		---	±3	±5	%	
Temperature Coefficient		---	---	±0.02	%/°C	
Trim Up / Down Range	% of Nominal Output Voltage					
Over Load Protection	Hiccup					
Over Voltage Protection	Zener Diode Clamp					
Short Circuit Protection	Continuous, Automatic Recovery (Hiccup Mode 0.6Hz typ.)					

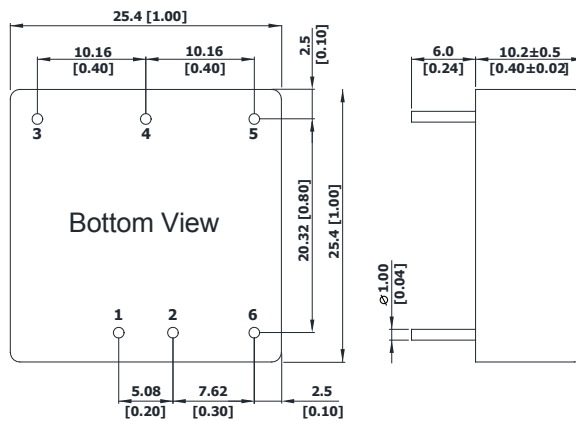
General Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Unit	
I/O Isolation Voltage	60 Seconds	1500	---	---	VDC	
	1 Second	1800	---	---	VDC	
Isolation Voltage Input/Output to case	60 Seconds	1000	---	---	VDC	
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ	
I/O Isolation Capacitance	100kHz, 1V	---	---	1500	pF	
Switching Frequency	3.3 Vo Models	---	175	---	kHz	
	5 Vo Models	---	248	---	kHz	
	12 & 15 & 24 & Dual Vo Models	---	285	---	kHz	
MTBF(calculated)	MIL-HDBK-217F@25°C, Ground Benign	TBD	---	---	Hours	
Safety Approvals(Pending)	UL/cUL 62368-1 recognition (UL certificate), IEC/EN 62368-1					

Environmental Specifications				
Parameter	Min.	Max. without Heatsink	with Heatsink	Unit
Operating Ambient Temperature Range (See Power Derating Curve)	-40	55	TBD	°C
Case Temperature	---	+105		°C
Storage Temperature Range	-55	+125		°C
Humidity (non condensing)	---	95		% rel. H
Lead Temperature (1.5mm from case for 10 sec.)	---	260		°C

EMC Specifications				
Parameter	Standards & Level		Performance	
EMI	Conduction	EN 55032, FCC part 15	Class A ₍₆₎	
EMS	EN 55035			
	ESD	Direct discharge	Indirect discharge HCP & VCP	
		EN61000-4-2 Air ± 8kV, Contact ± 6kV	Contact ± 6kV	
	Radiated immunity	EN 61000-4-3 10V/m		A
	Fast transient ₍₇₎	EN 61000-4-4 ±2kV		A
	Surge ₍₇₎	EN 61000-4-5 ±2kV		A
	Conducted immunity	EN 61000-4-6 10Vrms		A
	PFMF	EN61000-4-8 100A/m Continuous; 1000A/m 1sec.		A



Notes	
1	Specifications typical at Ta=+25°C, resistive load, nominal input voltage, 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	Ripple & Noise measurement with a 0.1µF MLCC and a 47µF MLCC.
4	We recommend to protect the converter by a slow blow fuse in the input supply line.
5	Other input and output voltage may be available, please contact factory.
6	The standard module meets EN 55032 Class A with external components. For further information, please contact MINMAX.
7	To meet EN 61000-4-4 & EN 61000-4-5 an external capacitor across the input pins is required, please contact MINMAX.
8	Specifications are subject to change without notice.

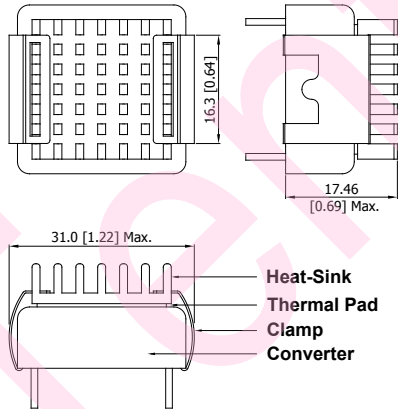
Package Specifications
Mechanical Dimensions

Pin Connections

Pin	Single Output	Dual Output
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Common
5	-Vout	-Vout
6	Remote On/Off	Remote On/Off

- ▶ All dimensions in mm (inches)
- ▶ Tolerance: X.X±0.5 (X.XX±0.02)
X.XX±0.25 (X.XXX±0.01)
- ▶ Pin diameter \varnothing 1.00 ±0.05 (0.04±0.002)

Physical Characteristics

Case Size	: 25.4x25.4x10.2mm (1.0x1.0x0.4 inches)
Case Material	: Copper
Base Material	: FR4 PCB (flammability to UL 94V-0 rated)
Pin Material	: Tinned Copper
Weight	: 25g

Heatsink (Option -HS)
Mechanical Dimensions


Heatsink Material: Aluminum
Finish: Anodic treatment (black)
Weight: 2g

▶ The advantages of adding a heatsink are:

1. To improve heat dissipation and increase the stability and reliability of the DC-DC converters at high operating temperatures.
2. To increase operating temperature of the DC-DC converter, please refer to Derating Curve.

Order Code Table	
Standard	With heatsink
MJWI30-24S033	MJWI30-24S033-HS
MJWI30-24S05	MJWI30-24S05-HS
MJWI30-24S12	MJWI30-24S12-HS
MJWI30-24S15	MJWI30-24S15-HS
MJWI30-24S24	MJWI30-24S24-HS
MJWI30-24D12	MJWI30-24D12-HS
MJWI30-24D15	MJWI30-24D15-HS
MJWI30-48S033	MJWI30-48S033-HS
MJWI30-48S05	MJWI30-48S05-HS
MJWI30-48S12	MJWI30-48S12-HS
MJWI30-48S15	MJWI30-48S15-HS
MJWI30-48S24	MJWI30-48S24-HS
MJWI30-48D12	MJWI30-48D12-HS
MJWI30-48D15	MJWI30-48D15-HS

External Output Trimming

Output can be externally trimmed by using the method shown below

