

MKW40 Series

40W, Wide Input Range, Single & Dual Output DC/DC Converters

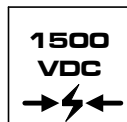


Key Features

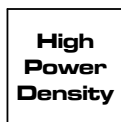
- 40 Watts Maximum Output Power
- Output Current Up To 8 A
- Very High Efficiency up to 92%
- 2" x 1" x 0.4" Shielded Metal Package
- 1500VDC I/O Isolation Voltage
- 2:1 Wide Input Voltage Range
- Complies with EN55022 Class A
- Remote On/Off Control
- Soft Start
- Over Voltage Protection



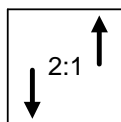
EN55022



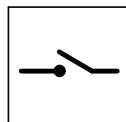
I/O Isolation



More Power



Wide Range



Remote on/off



Protection

Minmax's MKW40 series, comprising 18 different models, specially addressing data communication equipments, mobile battery driven equipments, distributed power systems, telecommunication equipments, mixed analog/digital subsystems, process/machine control equipments, computer peripheral systems and industrial robot systems.

Packing up to 40W of power into a 2x1x0.4 inch package, with efficiency as high as 91%, the MKW40 has wide input ranges of 9–18VDC, 18–36VDC and 36–75VDC and is available in output voltages of 3.3V, 5V, 12V, 15V, $\pm 12V$ and $\pm 15VDC$.

Other features include over temperature and short circuit protection, overvoltage protection, remote on/off, six-sided shielded case, and EN55022 Class A conducted noise compliance minimize design-in time, cost and eliminate the need for external filtering.

Absolute Maximum Ratings

Parameter		Min.	Max.	Unit
Input Surge Voltage (1000 mS)	12VDC Input Models	-0.7	25	VDC
	24VDC Input Models	-0.7	50	VDC
	48VDC Input Models	-0.7	100	VDC
Lead Temperature (1.5mm from case for 10 Sec.)		---	260	°C

Exceeding the absolute maximum ratings of the unit could cause damage. These are not continuous operating ratings.

Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit
Operating Temperature	Ambient	-40	+55	°C
Operating Temperature	Case	-40	+105	°C
Storage Temperature		-50	+125	°C
Humidity		---	95	%
Cooling	Free-Air Convection			
RFI	Six-Sided Shielded, Metal Case			
Conducted EMI	EN55022 Class A			

Model Selection Guide

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current	Over Voltage Protection	Efficiency
			Max.	Min.	@Max. Load	@No Load			@Max. Load
	VDC	VDC	mA	mA	mA (Typ.)	mA (Typ.)	mA (Typ.)	VDC	% (Typ.)
MKW40-12S033	12 (9 ~ 18)	3.3	8000	0	2472	120	50	3.9	89
MKW40-12S05		5	8000	0	3745	160		6.2	89
MKW40-12S12		12	3333	0	3745	160		15	89
MKW40-12S15		15	2666	0	3703	150		18	90
MKW40-12D12		±12	±1666	±145	3786	70		±15	88
MKW40-12D15		±15	±1333	±110	3787	60		±18	88
MKW40-24S033	24 (18 ~ 36)	3.3	8000	0	1222	75	30	3.9	90
MKW40-24S05		5	8000	0	1832	80		6.2	91
MKW40-24S12		12	3333	0	1831	85		15	91
MKW40-24S15		15	2666	0	1831	75		18	91
MKW40-24D12		±12	±1666	±145	1872	50		±15	89
MKW40-24D15		±15	±1333	±110	1872	45		±18	89
MKW40-48S033	48 (36 ~ 75)	3.3	8000	0	611	40	20	3.9	90
MKW40-48S05		5	8000	0	916	50		6.2	91
MKW40-48S12		12	3333	0	906	50		15	92
MKW40-48S15		15	2666	0	906	50		18	92
MKW40-48D12		±12	±1666	±145	936	65		±15	89
MKW40-48D15		±15	±1333	±110	936	65		±18	89

Capacitive Load

Models by Vout	3.3V	5V	12V	15V	±12V #	±15V #	Unit
Maximum Capacitive Load	21000	13600	2360	1510	1200	750	uF

For each output

Input Fuse Selection Guide

12V Input Models	24V Input Models	48V Input Models
8000mA Slow – Blow Type	4000mA Slow – Blow Type	2000mA Slow – Blow Type

Input Specifications

Parameter	Model	Min.	Typ.	Max.	Unit
Start-Up Voltage	12V Input Models	---	---	9	VDC
	24V Input Models	---	---	18	
	48V Input Models	---	---	36	
Shutdown Voltage	12V Input Models	---	8.3	---	
	24V Input Models	---	16.5	---	
	48V Input Models	---	33	---	
Input Filter	All Models	Pi Filter			

Output Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		----	----	±1.0	%	
Output Voltage Balance	Dual Output, Balanced Loads	----	----	±2.0	%	
Line Regulation	Vin=Min. to Max.	----	----	±0.5	%	
Load Regulation	Min. Load to Full Load	Single Output	----	----	±0.5	%
		Dual Output	----	----	±1.0	%
Ripple & Noise (20MHz)	3.3V & 5V Models	----	100	----	mV P-P	
Ripple & Noise (20MHz)	12V & 15V Models	----	150	----	mV P-P	
Ripple & Noise (20MHz)	Dual Output Models	----	150	----	mV P-P	
Over Power Protection		----	----	150	%	
Transient Recovery Time	25% Load Step Change	----	250	----	uS	
Temperature Coefficient		----	----	±0.02	%/°C	
Output Short Circuit	Hiccup Automatic Recovery					

General Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage Rated	60 Seconds	1500	----	----	VDC
Isolation Voltage Test	Flash Tested for 1 Second	1650	----	----	VDC
Isolation Resistance	500VDC	1000	----	----	MΩ
Isolation Capacitance	100KHz, 1V	----	----	1500	pF
Switching Frequency		----	320	----	KHz
MTBF	MIL-HDBK-217F @ 25°C, Ground Benign	328	----	----	K Hours

Remote On/Off Control

Parameter	Conditions	Min.	Typ.	Max.	Unit
DC/DC On	3.5V ~ 12V or Open Circuit				
DC/DC 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	----	2.5	----	mA

Output Voltage Trim

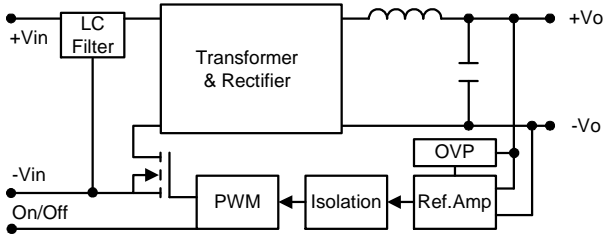
Parameter	Conditions	Min.	Typ.	Max.	Unit
Trim Up / Down Range	% of nominal output voltage	±10	----	----	%

Notes :

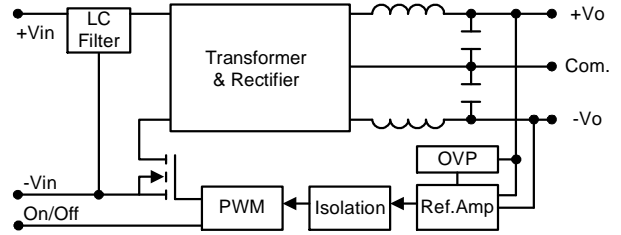
1. Specifications typical at Ta=+25°C, resistive load, nominal input voltage, rated output current unless otherwise noted.
2. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
3. Ripple & Noise measurement bandwidth is 20 MHz, measured with a 1uF M/C and a 10uF T/C.
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. To order the converter with heatsink, please add a suffix H.
7. Specifications subject to change without notice.

Block Diagram

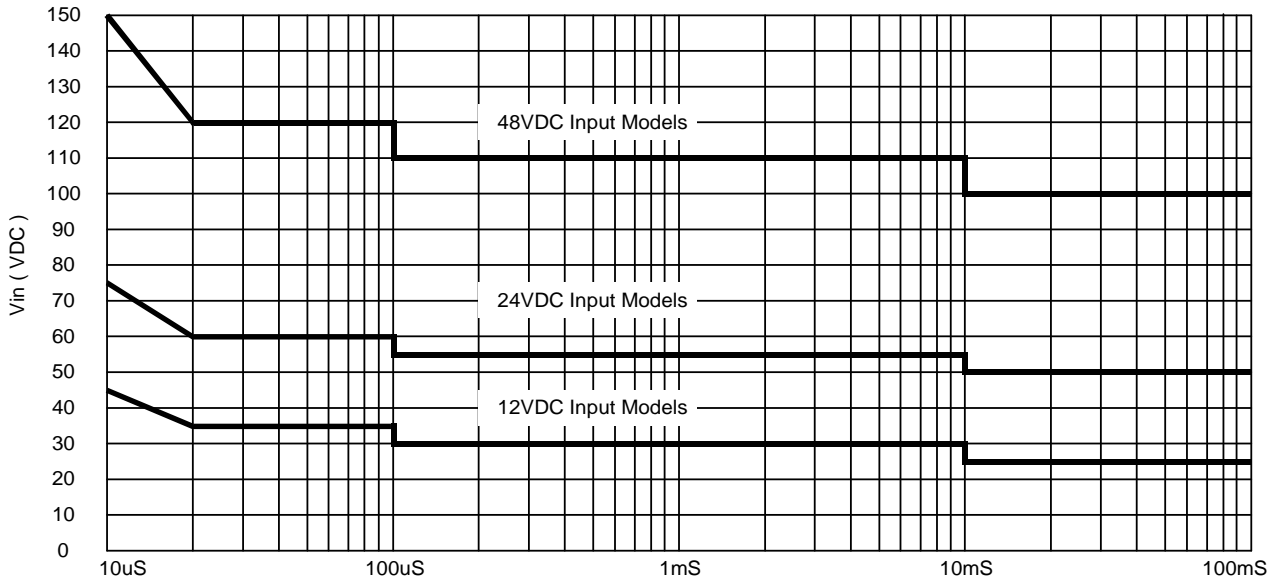
Single Output

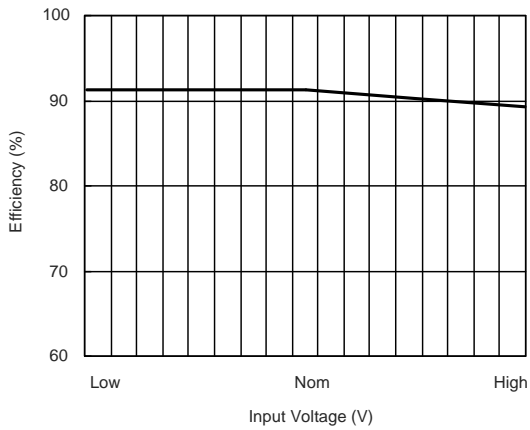


Dual Output

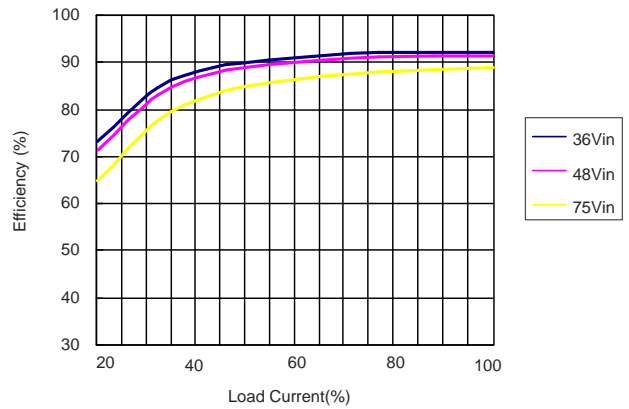


Input Voltage Transient Rating

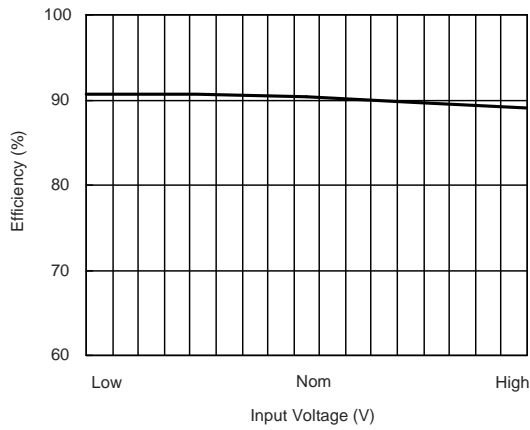




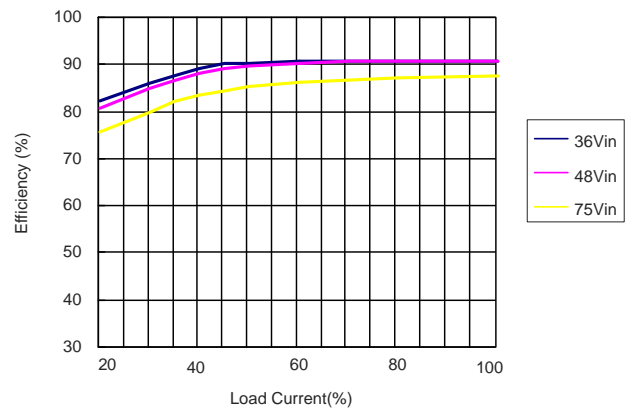
Efficiency vs Input Voltage (MKW40-48S05)



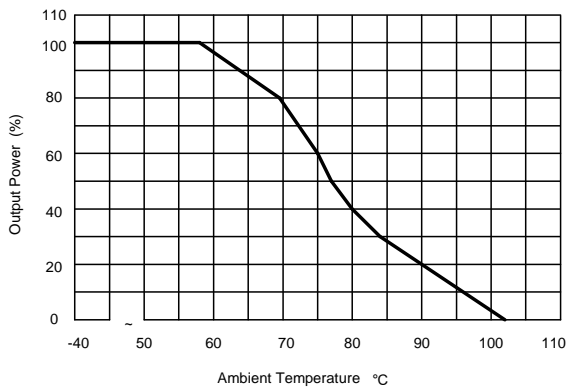
Efficiency vs Output Load (MKW40-48S05)



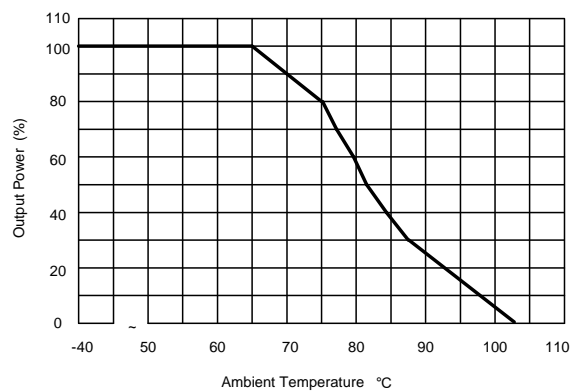
Efficiency vs Input Voltage (MKW40-48D15)



Efficiency vs Output Load (MKW40-48D15)

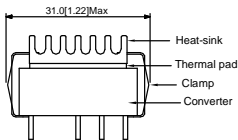
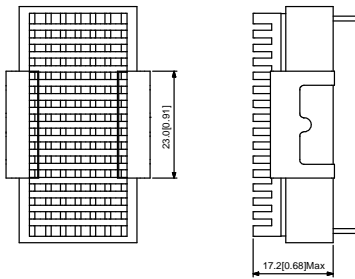
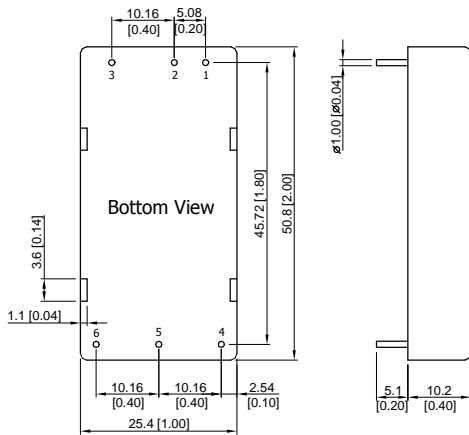


Derating Curve without Heatsink (MKW40-48S05)



Derating Curve with Heatsink (MKW40-48S05H)

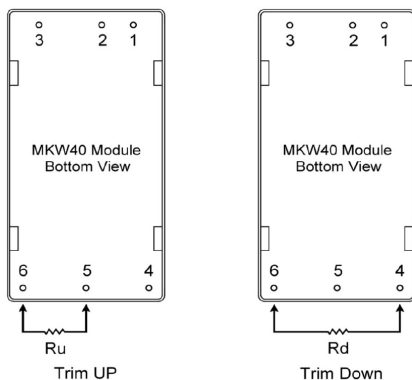
Mechanical Dimensions



Tolerance	Millimeters	Inches
	X.X±0.25	X.XX±0.01
	X.XX±0.13	X.XXX±0.005
Pin	±0.05	±0.002

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below



Physical Characteristics

Case Size	: 50.8×25.4×10.2 mm 2.0×1.0×0.4 inches
Case Material	: Metal With Non-Conductive Baseplate
Weight	: 30g
Flammability	: UL94V-0

Heatsink Material : Aluminum

Finish : Anodic treatment (black)

Weight : 2g

*The advantages of adding a heatsink are:

1. To help heat dissipation and increase the stability and reliability of DC/DC converters at high operating temperature atmosphere.
2. To upgrade the operating temperature of DC/DC converters, please refer to Derating Curve.

Pin Connections

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