

MPV15215S Series

Ultra Wide Input, Compact Industrial Grade, PV Power DC/DC Converters



Key Features:

- 15W Output Power
- 200 - 1,500 Input Range
- 4,000 VAC Isolation
- Meets EN 62109
- Meets UL 1741
- Wide -40°C to +70°C Oper.
- Reverse Input Volt Prot.
- Output Over Volt Protection
- Compact Case
- >300 kHours MTBF
- Chassis/DIN Rail Options



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Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range		200	800	1,500	VDC
	Transient, 10S 200 VDC Input			1,600 120.0	
Input Current	800 VDC Input			30.0	mA
	1,500 VDC Input			16.0	
Inrush Current	200 VDC Input		30.0		A
	1,500 VDC Input		90.0		
Under-Voltage Protection	Lockout Activation Range	130		175	VDC
	Lockout Deactivation Range	155		200	
Reverse Input Voltage Protection	Available (Contact Factory)				
External Input Fuse Required	4A/1,500 VDC				

Output Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±2.0		%
Line Regulation	V _{IN} = MIN to MAX		±1.0		%
Load Regulation	I _{OUT} = 0% to 100%		±1.0		%
Ripple & Noise (20 MHz)	See Note 1			150	mV P - P
Temperature Coefficient			±0.02	±0.15	%/°C
Over Current Protection	Autorecovery	120			% I _{OUT}
Output Short Circuit	Continuous (Autorecovery)				

General Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	4,000			VAC
Switching Frequency			65		kHz

EMI Characteristics Parameter	Standard	Criteria	Level
Radiated Emissions, See Note 2	EN 55032		Class A
Conducted Emissions, See Note 2	EN 55032		Class A
ESD	EN 61000-4-2	B	±6 kV Contact
			±8 kV Air
RS	EN 61000-4-3	A	10V/m
EFT, See Note 3	EN 61000-4-4	B	±4 kV
Surge, See Note 4	EN 61000-4-5	B	±2 kV L-L
CS	EN 61000-4-6	A	10 Vrms

Environmental Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+70	°C
Storage Temperature Range		-40		+85	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical Parameter	Conditions	Min.	Typ.	Max.	Units
Case Size, Module, Chassis /DIN Rail Mount		See Mechanical Drawings (Starting Page 4)			
Case Material		Black, Flame Retardant, Non-Conductive Plastic (UL94-V0)			
Weight, Module, Chassis /DIN Rail Mount		See Mechanical Drawings (Starting Page 4)			

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	300			kHours

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Lead Temperature, See Note 5	Wave Soldering	255	260	265	°C
	Manual Soldering	350	360	370	

Caution: Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

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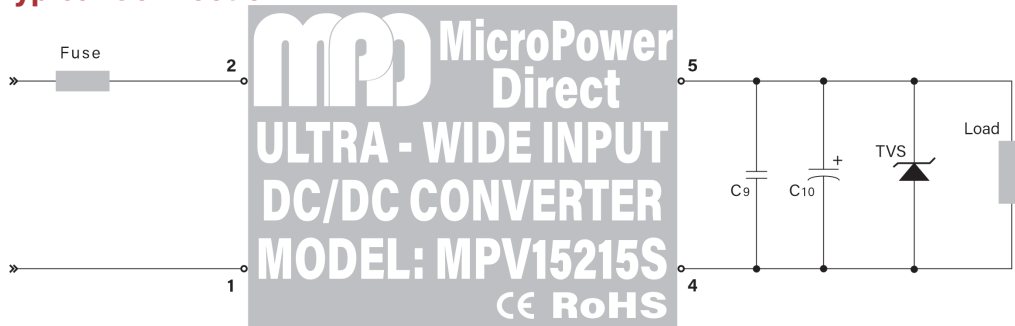
Model Selection Guide

Model Number	Input		Output			Efficiency (% Typ)	Over Voltage Protection (VDC Typ)	Capacitive Load (µF, Max)	Fuse Rating Slow-Blow (A)
	Voltage (VDC)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range							
MPV10215S-05RI4	800	200 - 1,500	5.0	2,000	0.0	64	8.0	6,000	4.0 /1500 VDC
MPV15215S-12RI4	800	200 - 1,500	12.0	1,250	0.0	71	20.0	2,000	4.0 /1500 VDC
MPV15215S-15RI4	800	200 - 1,500	15.0	1,000	0.0	80	20.0	1,200	4.0 /1500 VDC
MPV15215S-24RI4	800	200 - 1,500	24.0	625	0.0	83	30.0	470	4.0 /1500 VDC

Notes:

- To meet the specified ripple and noise levels, external capacitors are required. See the "Simple Connection" diagram below. Recommended values for all external components are given in the table at the bottom of the page. For more information, please contact the factory.
- All units will meet EN 55032 (CE/RE) class A with the input circuit shown in the "EMI Connection" diagram below. Contact the factory for more information.
- All units will meet EN 61000-4-4 (±4 kV) with the input circuit shown in the "EMI Connection" diagram below. Contact the factory for more information.
- All units will meet the requirements of EN 61000-4-5 (±2 kV), with the input circuit shown in the "EMI Connection" diagram below. Contact the factory for more information.
- Lead temperature is measured 1.5 mm from the case.
- Operation at no load will not damage the units, however, they may not meet all specifications.
- It is required that a fuse be used on the input of the power supply. See chart above for the correct value.

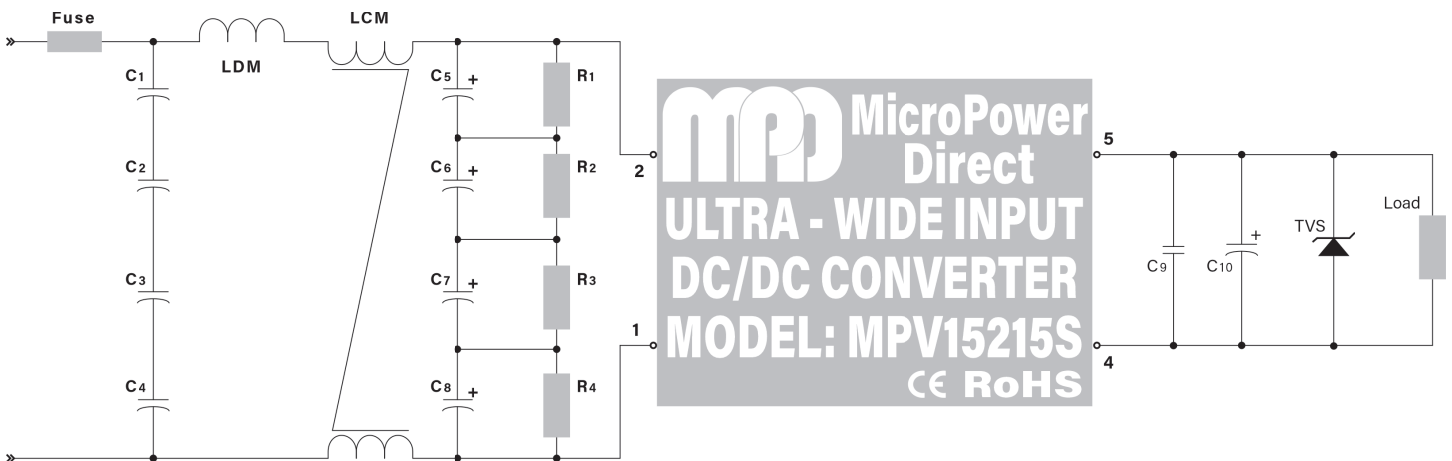
Typical Connection



The diagram at left illustrates a typical connection of the MPV15215 series. Output capacitors C9 and C10 are filtering components. They are required to meet ripple and noise specifications. Capacitor C9 is ceramic and capacitor C10 is a high frequency, low ESR electrolytic.

The recommended fuse (which is required) is a 4A/1500 VDC.

EMC Compliance Connection



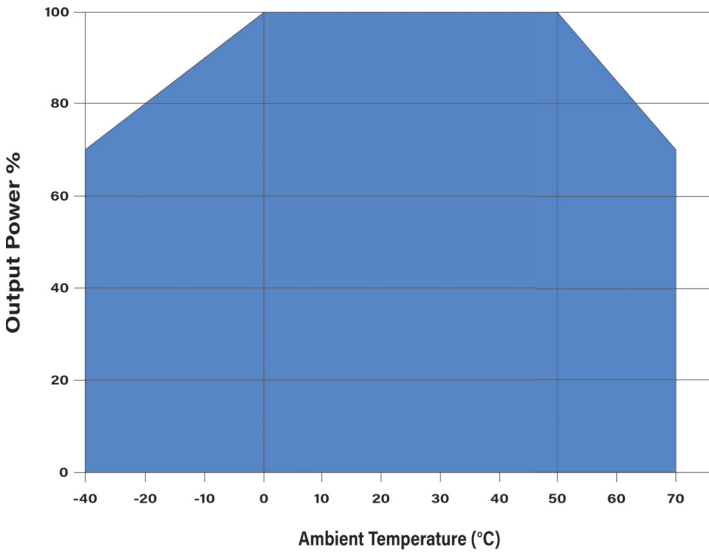
For applications that require meeting higher EMC standards, the circuit shown above is recommended. Some notes on this diagram (starting with the input circuit) are:

- It is required that an external fuse be used. The recommended size is 4A/1,500V.
- Input filter capacitors C1, C2, C3 and C4 are safety capacitors (connected in series to achieve the required capacitance level).
- Capacitors C5, C6, C7 and C8 are also filter capacitors. Resistors R1, R2, R3 and R4 help to balance the current across the capacitors.
- Capacitor C9 is ceramic. This capacitor is used to filter high frequency noise. A recommended value is given in the table below.
- Recommended values for components are:
- Capacitor C10 is an electrolytic. A low ESR, high frequency capacitor should be used. The recommended value is given in the table below.
- The output TVS will help protect system circuitry if the power supply fails. A recommended value is given in the table below.
- Derating on all capacitors should be 80% or more.
- To meet safety regulations, the board trace widths should be ≥3 mm, the distance between traces should be ≥6 mm, and the distance between traces and ground should be ≥6 mm. Contact the factory for more information.

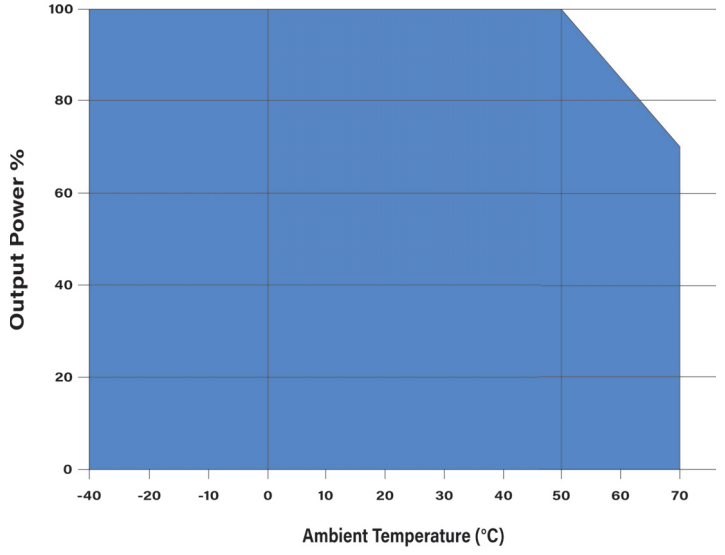
Model Number	Fuse	LDM	LCM	C1, C2, C3, C4	R1, R2, R3, R4	C5	C6	TVS
MPV10215S-05RI4	Required 4A / 1.5 kV	330 µH / 1A	7 mH/1A	Safety Capacitor 104k / 275 VAC	1 MΩ / 2W	1 µF / 35V	120 µF / 35V	SMBJ7.0A
MPV15215S-12RI4								SMBJ20A
MPV15215S-15RI4								SMBJ20A
MPV15215S-24RI4								68 µF / 35V SMBJ30A

Temperature Derating Curves: $V_{IN} = 200$ to 300 VDC

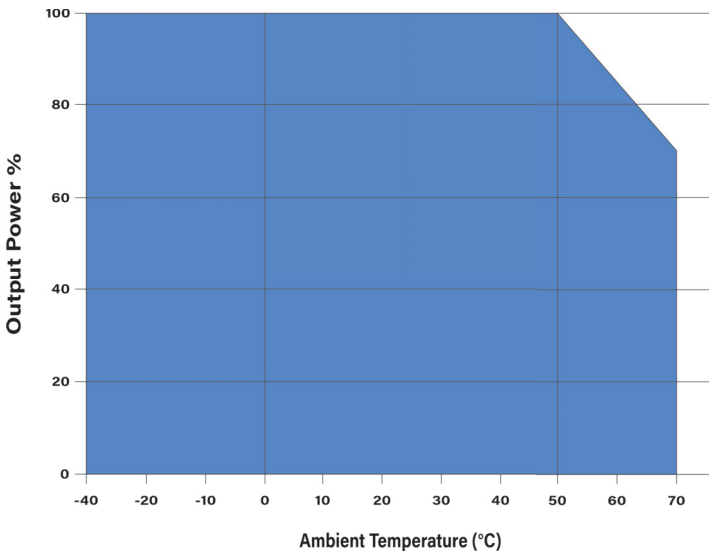
$V_{OUT} = 5, 12, 15$ VDC



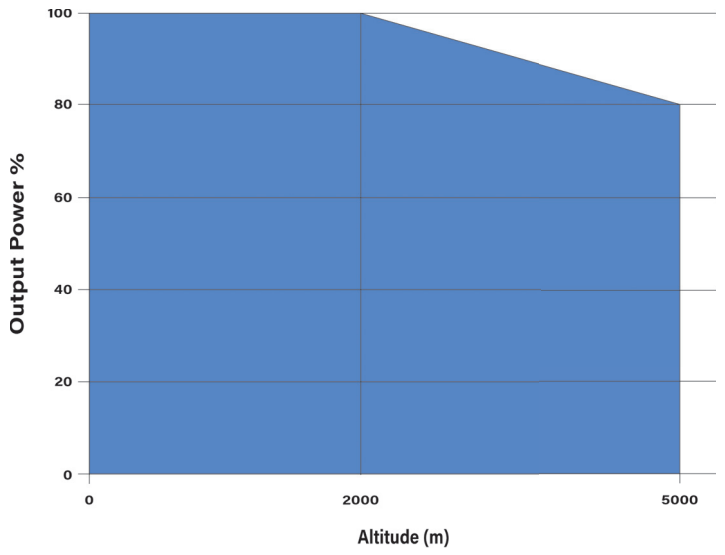
$V_{OUT} = 24$ VDC



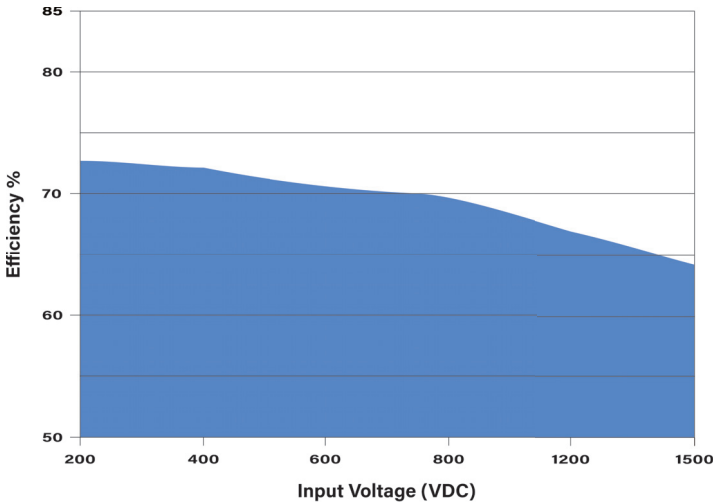
Temperature Derating Curve: $V_{IN} = 300$ to $1,500$ VDC



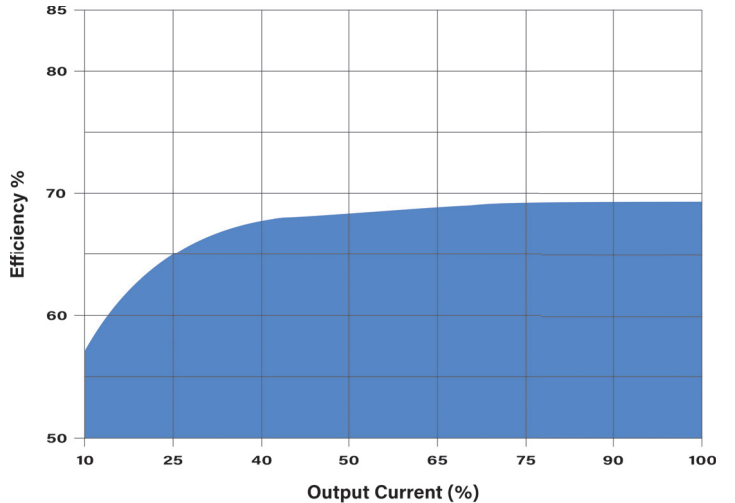
Altitude Derating Curve



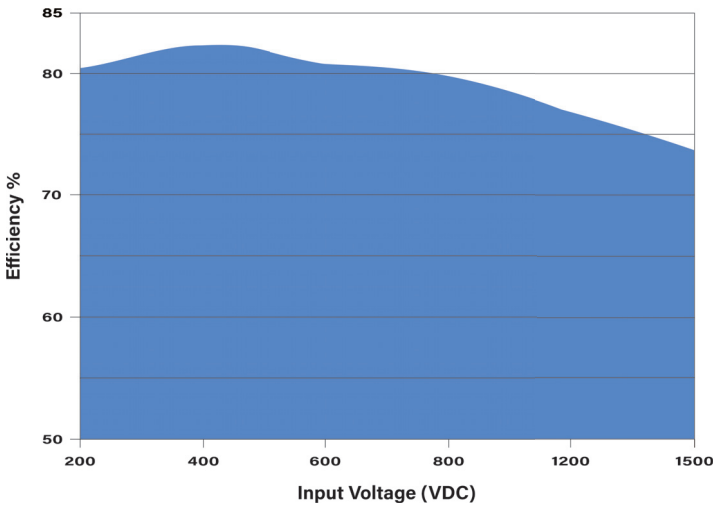
Efficiency vs Input Voltage, 5 VOUT



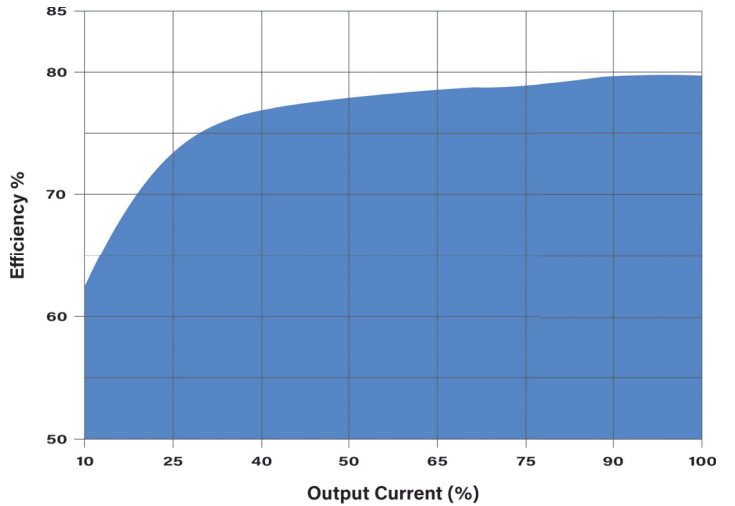
Efficiency vs Output Load, 5 VOUT



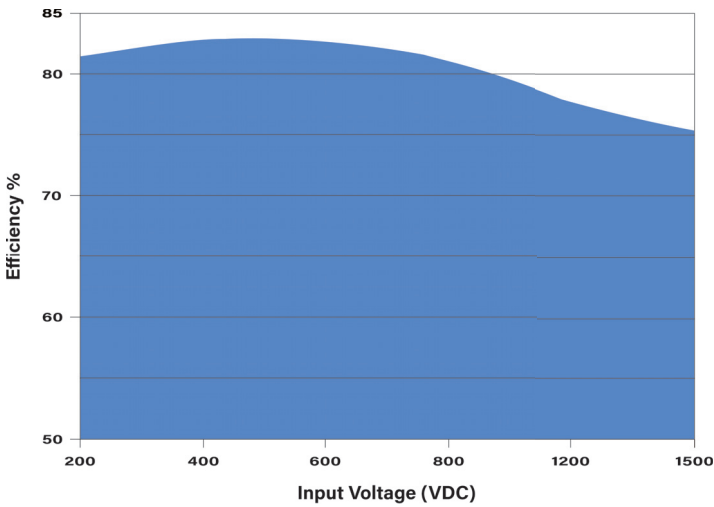
Efficiency vs Input Voltage, 12 VOUT



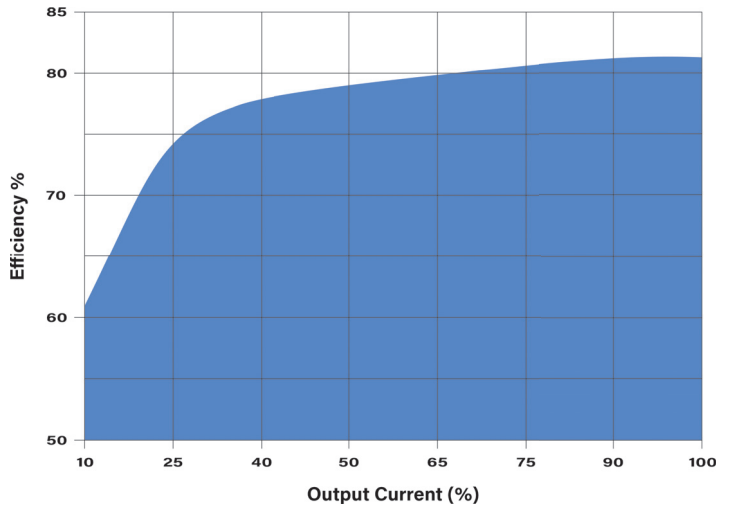
Efficiency vs Output Load, 12 VOUT



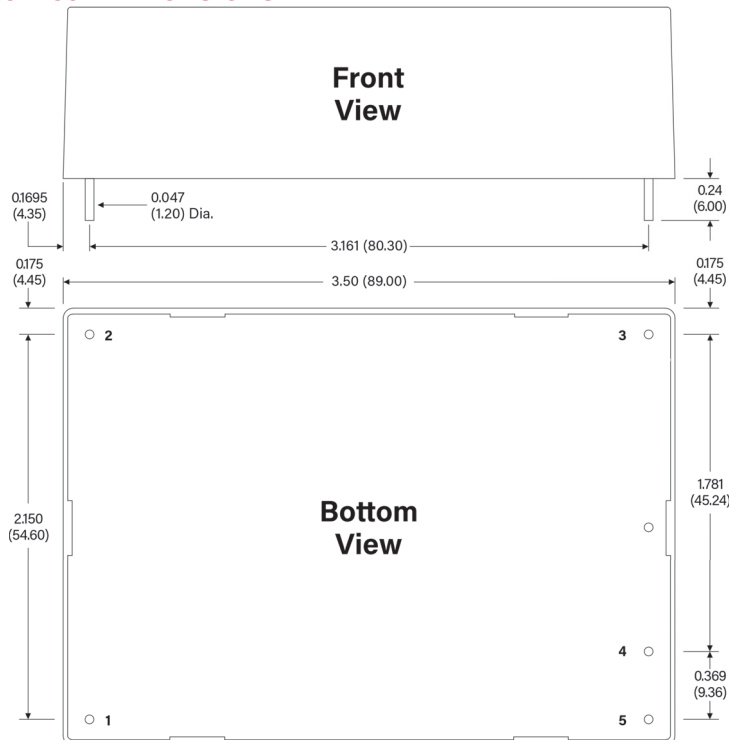
Efficiency vs Input Voltage, 15 VOUT



Efficiency vs Output Load, 15 VOUT



Mechanical Dimensions



Pin Connections

Pin	Function
1	-VIN
2	+VIN
3	No Connection
4	-VOUT
5	+VOUT

Notes:

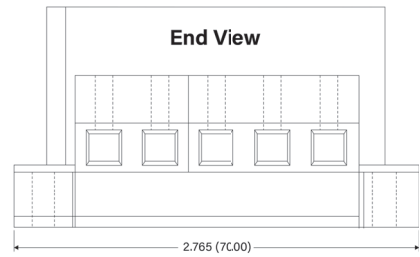
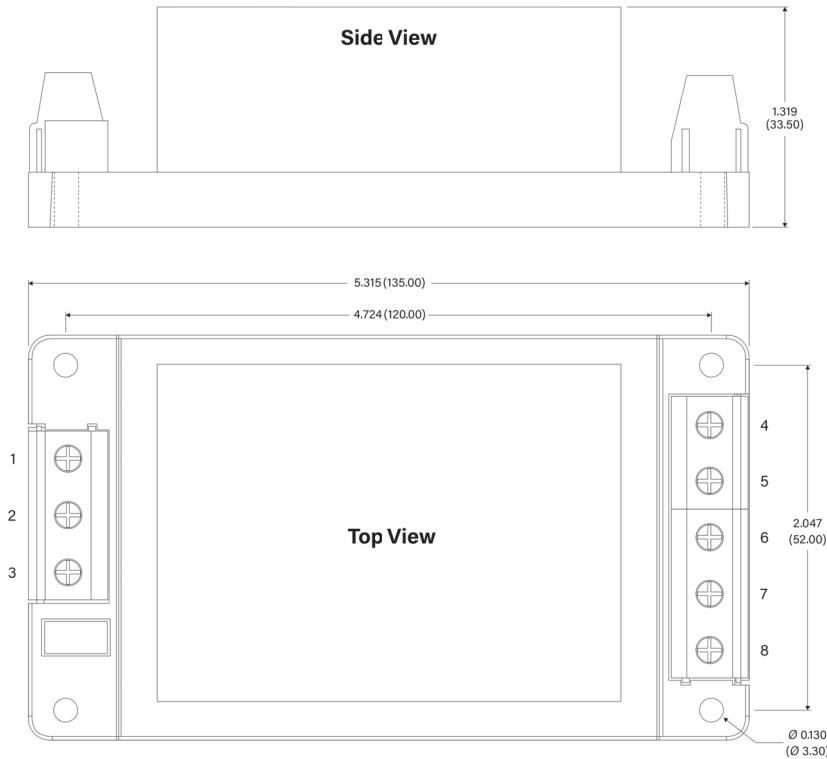
- All dimensions are typical in inches (mm)
- General Dimension Tolerance x.xx = ±0.02 (±0.50)
- Pin Diameter Tolerance x.xxx = ±0.004 (±0.100)
- Weight: 7.05 Oz (200g)

All models of the **MPV15215** series are available assembled on adapter plates for mounting to a chassis or on a DIN rail.

Mechanical dimensions for these adapters are shown in the diagrams below and on the following

page. To order the product assembled on an adapter, add the designation for the adapter to the end of the product number. For example: MPV15215S-12RI4-A2. Please contact the factory for more information.

Mechanical Dimensions, A2 : With Chassis Mount



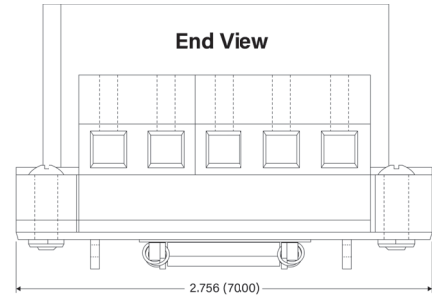
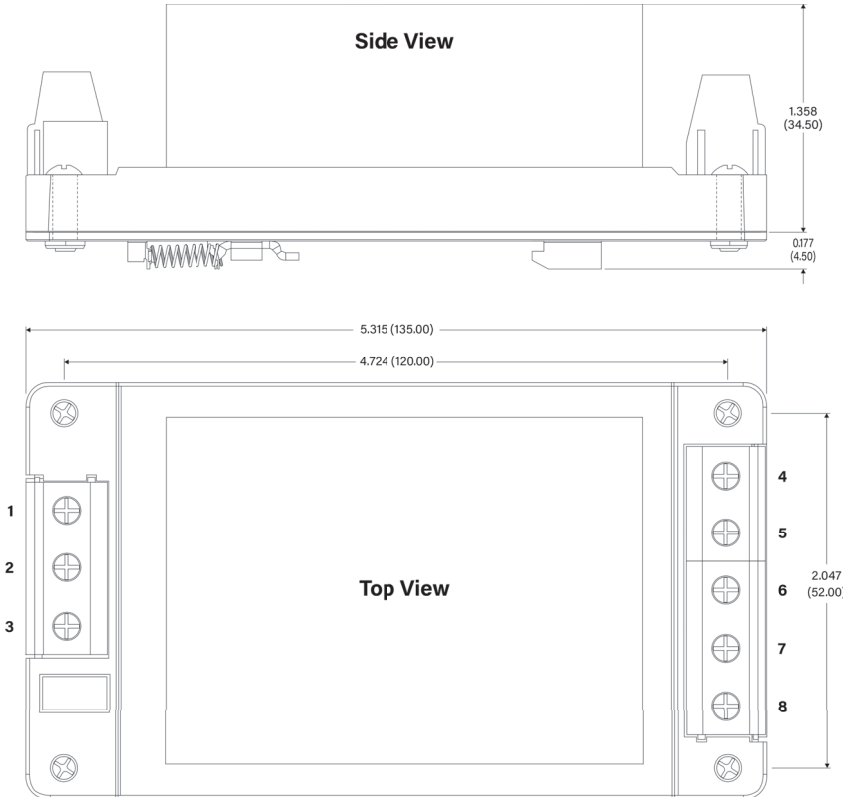
Pin Connections

Pin	Function	Pin	Function
1	-VIN	5	-VOUT
2	No Connection	6	No Connection
3	+VIN	7	No Connection
4	+VOUT	8	No Connection

Notes:

- All dimensions are typical in inches (mm)
- General Dimension Tolerance x.xx = ±0.02 (±0.50)
- Wire Range: 12 to 24 AWG
- Tightening Torque: 0.4 Nm Max
- Weight: 9.87 Oz (280g)

Mechanical Dimensions, A4: With DIN Rail Mount Option



Pin Connections

Pin	Function	Pin	Function
1	-VIN	5	-VOUT
2	No Connection	6	No Connection
3	+VIN	7	No Connection
4	+VOUT	8	No Connection

Notes:

- All dimensions are typical in inches (mm)
- General Dimension Tolerance x.xx = ±0.02 (±0.50)
- Wire Range: 12 to 24 AWG
- Tightening Torque: 0.4 Nm Max
- Weight: 12.34 Oz (350g)
- For use with a TS35 type DIN rail



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