Series AM40W-NZ

40 Watt | DC-DC Converter

FEATURES:

- Super wide 6:1 Input range
- Extremely High Input range up to 1500VDC
- High I/O Isolation of 4000VDC and 4000VAC
- Over current and Over Voltage protection
- No minimum load required
- High efficiency of up to 84%
- Under Voltage Input protection
- Reversed connection protection

Models
Single output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (A)	Isolation (VDC)	Max Capacitive Load(uF)	Efficiency (200VDC) (%)
AM40W-60012S-NZ‡	200-1200	12	3.33	4000	1200	83
AM40W-60015S-NZ‡	200-1200	15	2.67	4000	1000	84
AM40W-60024S-NZ‡	200-1200	24	1.67	4000	680	84
AM40W-80012S-NZ‡‡	200-1500	12	3.33	4000*	3000	76**
AM40W-80015S-NZ‡‡	200-1500	15	2.67	4000*	1500	78**
AM40W-80024S-NZ‡‡	200-1500	24	1.67	4000*	680	80**

* VAC I/O Isolation

** Measured at 800VDC nominal input.

‡ For 600VDC input models add suffix "-ST" for optional screw terminal bottom plate or "-STD" for optional DIN Rail screw terminal bottom plate.

‡‡ For 800VDC input models add suffix "-ST" for optional DIN Rail screw terminal bottom plate with fuse and incorporated EMC filter or "-STF" for optional DIN Rail screw terminal bottom plate with incorporated EMC filter and no fuse or "STS" for an optional DIN Rail screw terminal bottom plate only.

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Input Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage range	600VDC		200-1200	VDC
	800VDC		200-1500	
Input Current	600VDC input models - 200VDC		320	mA
	600VDC input models - 600VDC		100	
	600VDC input models - 1200VDC		55	
	800VDC input models - 200VDC		320	
	800VDC input models 800VDC		80	
	800VDC input models 1500VDC		42	
Inrush current <2ms	600VDC input models 600VDC	60		
	800VDC input models - 200VDC	30		
	800VDC input models 800VDC	80		
	800VDC input models 1500VDC	150		
External fuse	600VDC input models, Slow blow	3.15		A
	800VDC input models, Slow blow	15A/1500VDC		
Input Under voltage lockout	600VDC input models only	175-185		VDC
Input under voltage protection	800VDC input models only, ON		170-185	VDC
	800VDC input models only, OFF		180-195	
Startup time	800VDC		2	s

Isolation Specifications

Parameters	Conditions	Typical	Maximum	Units
Tested I/O voltage 600VDC input models	1 min	4000		VDC
Tested I/O voltage 800VDC input models	1 min	4000		VAC

Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy		±2		%
Line voltage regulation	LL-HL	±1		% of Vin
Load voltage regulation	0-100% load	±1		%
Over voltage protection	Zener diode clamp			
Over current protection	600VDC input models		110	% of Iout
	800VDC input models		120-320	
Short Circuit protection	Continuous			
Short circuit restart	Auto recovery			
Temperature coefficient		±0.02		%/ºC
Ripple & Noise	20MHz Bandwidth, 600VDC input models	100	200	mV p-p
	20MHz Bandwidth, 800VDC input models	150	300	
Hold up time	600VDC	5		ms

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	100% load	65		KHz
Operating temperature	600VDC input models, derating above 50°C	-25 to 70		°C
	800VDC input models, see derating curve	-40 to 70		
Storage temperature	600VDC input models	-25 to 85		°C
	800VDC input models	-40 to 85		
Maximum case temperature			95	°C
Cooling	Natural convection			
Humidity			95	% RH
Case material	Black plastic (UL94-V0)			
Weight	600VDC input models	210 With optional -ST mounting plate: 295 With optional -STD mounting plate: 365		g
	800VDC input models	410 With optional -ST and -STF mounting plate: 610 With optional -STS mounting plate: 470		
Dimensions (L x W x H)	600VDC input models With optional -ST mounting plate: With optional -STD mounting plate:	3.50 x 2.50 x 0.98 inches, 89.00 x 63.50 x 25.00mm 5.31 x 2.95 x 1.32 inches,135.00 x 75.00 x 33.50 mm 5.31 x 2.95 x 1.54 inches,135.00 x 75.00 x 39.00 mm		
	800VDC input models With optional -ST and -STF mounting plate: With optional -STS mounting plate:	4.92 x 2.95 x 1.58 inches, 125.00 x 75.00 x 40.00mm 5.75 x 5.43 x 2.17inches, 146.00 x 138.00 x 55.00mm 5.08 x 4.02 x 1.93 inches, 129.00 x 102.00 x 49.00 mm		
MTBF	>300,000 hrs (MIL-HDBK -217F, Ground Benign, t=+25ºC)			
Maximum soldering temperature	1.5mm from case for 5-10 sec		260	ºC

Safety Specifications

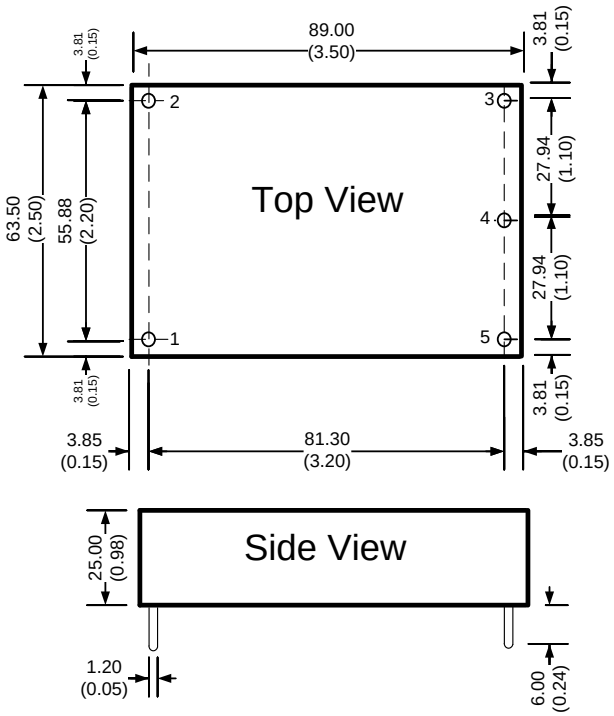
Parameters		
Approvals	CSA, CE (for the following models: AM40W-80012S-NZ, AM40W-80015S-NZ, AM40W-80024S-NZ only)	
Standards	CSA-C22.2 No.107.1-01, UL 1741, EN62109 (for the following models: AM40W-80012S-NZ, AM40W-80015S-NZ, AM40W-80024S-NZ only)	
	EMI - Conducted and radiated emission	EN55022, class A (with the recommended EMC circuit) EN55024: 2010
	Electrostatic Discharge Immunity	IEC 61000-4-2: Contact ±6KV/Air ±8KV, Criteria B
	RF, Electromagnetic Field Immunity	IEC 61000-4-3: 10V/m, Criteria A
	Electrical Fast Transient/Burst Immunity (600VDC Vin)	IEC 61000-4-4: ±4KV, Criteria B
	Electrical Fast Transient/Burst Immunity (800VDC Vin)	IEC 61000-4-4: ±2KV, Criteria B (with the recommended EMC circuit)
	Surge Immunity (600VDC Vin)	IEC 61000-4-5: ±2KV, Criteria B
	Surge Immunity (800VDC Vin)	IEC 61000-4-5: ±1KV, Criteria B (with the recommended EMC circuit)
	RF, Conducted Disturbance Immunity	IEC 61000-4-6: 10Vrms, Criteria A
	Power frequency Magnetic Field Immunity	IEC 61000-4-8: 10A/m, Criteria A

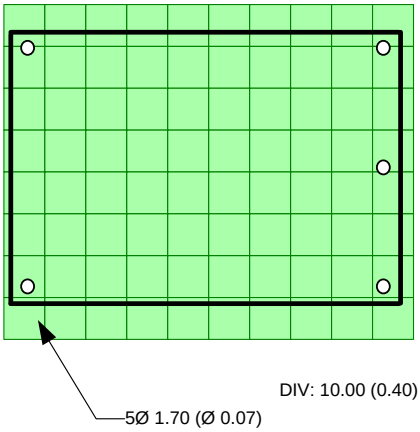
	Voltage dips, Short Interruptions Immunity	IEC 61000-4-11: 0-70%, Criteria B

Pin Out Specifications

Pin	600VDC Input
1	+Vin
2	-Vin
3	+Vout
4	-Vout
5	N.C.

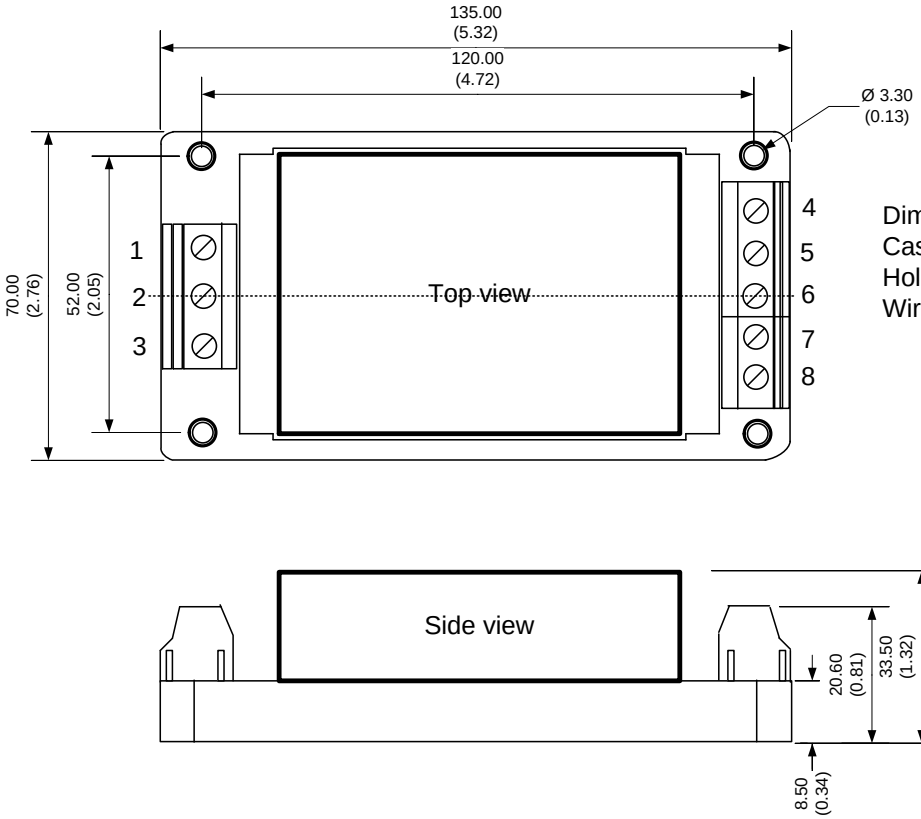
Dimensions
600VDC Input models





Dimensions mm (inch)
Case Tolerance ±0.50 (±0.02)
Pin Diameter ± 0.10 (± 0.004)

600VDC input models with optional -ST bottom plate

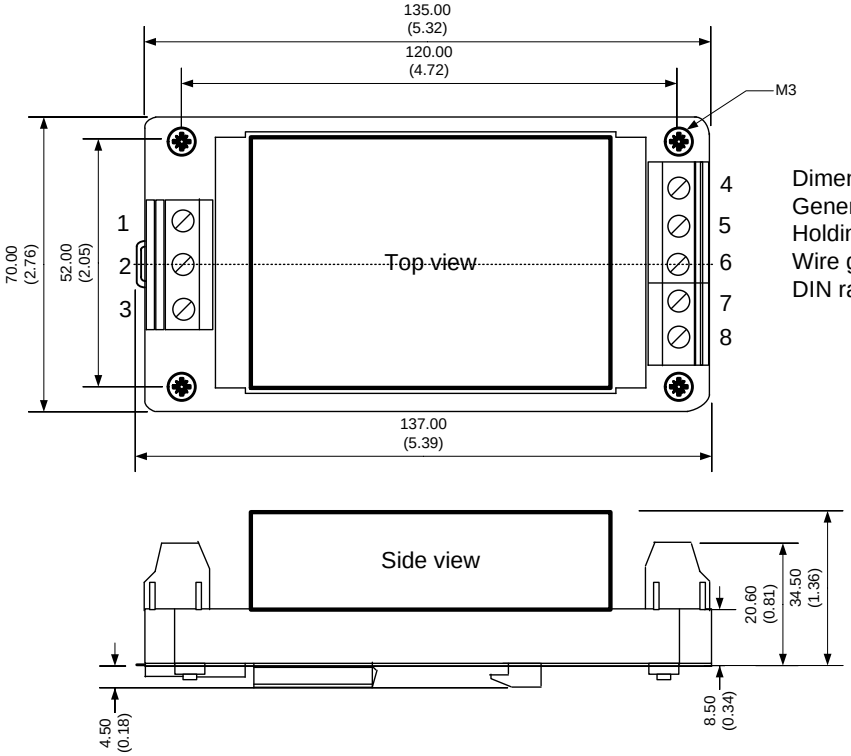


Dimensions: mm (inch)
Case Tolerance: ±1.00 (0.04)
Holding holes tolerance: ±0.20 (0.01)
Wire gauge: 24-12AWG

Pin Out Specifications

Pin	Single
1	-Vin
2	N.C.
3	+Vin
4	+Vout
5	N.C.
6	-Vout
7	N.C.
8	N.C.

600VDC input models with optional -STD bottom plate

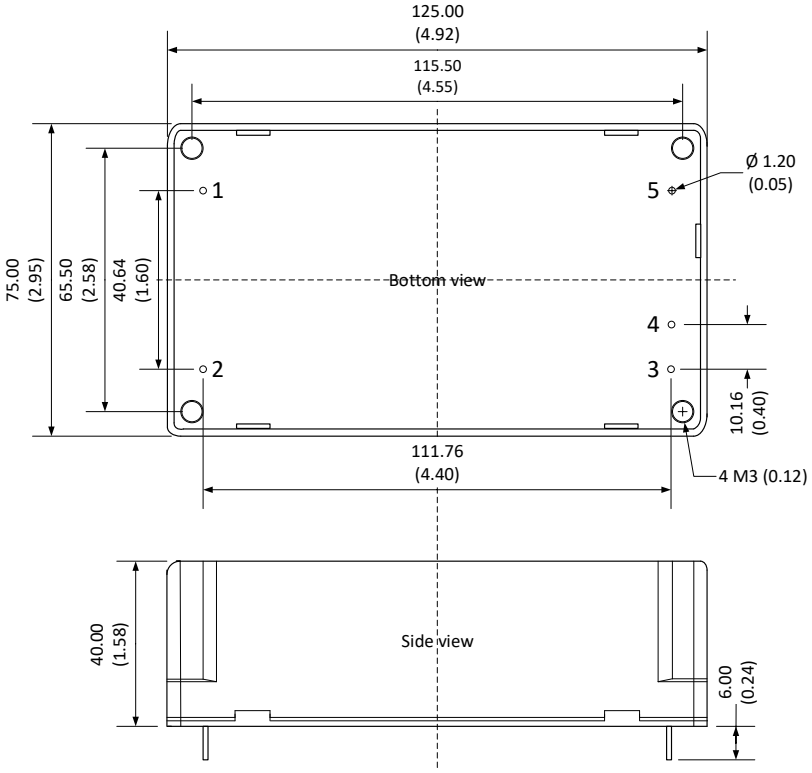


Dimensions: mm (inch)
General Tolerance: ±1.00 (0.04)
Holding holes tolerance: ±0.20 (0.01)
Wire gauge: 24-12AWG
DIN rail type: TS35

Pin Out Specifications

Pin	Single
1	-Vin
2	N.C.
3	+Vin
4	+Vout
5	N.C.
6	-Vout
7	N.C.
8	N.C.

800VDC input models

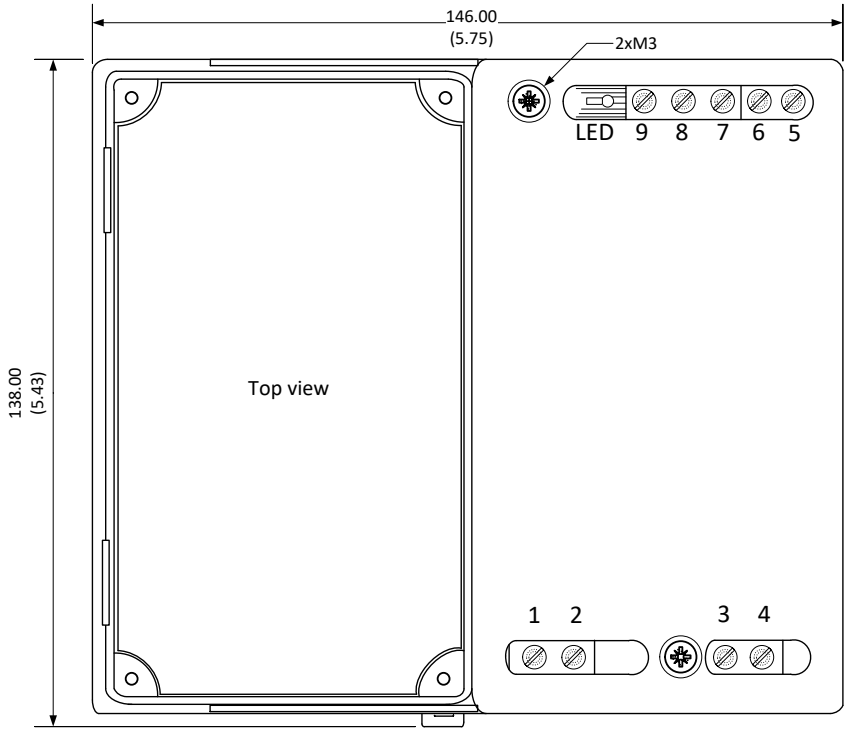


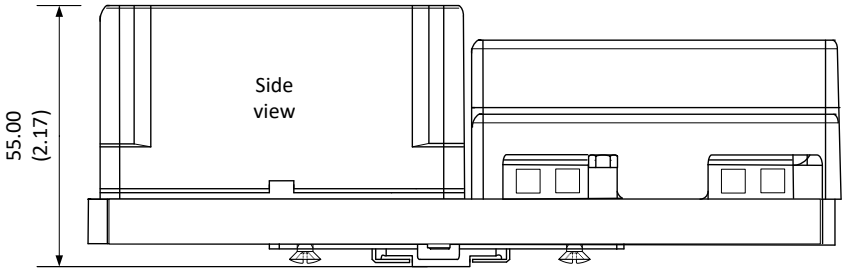
Dimensions mm (inch)
Case Tolerance ±0.50 (±0.02)
Pin Diameter Tolerance ± 0.10 (± 0.004)
Pin Length Tolerance ± 1.50 (± 0.06)

Pin Out Specifications

Pin	800VDC Input
1	+Vin
2	-Vin
3	+Vout
4	-Vout
5	N.C.

800VDC input models with optional -ST or -STF bottom plate





Dimensions mm (inch)

Installed on DIN rail type TS35
Wire: 24-12AWG
Case Tolerance ±0.50 (±0.02)
General Tolerance ± 1.00 (± 0.04)

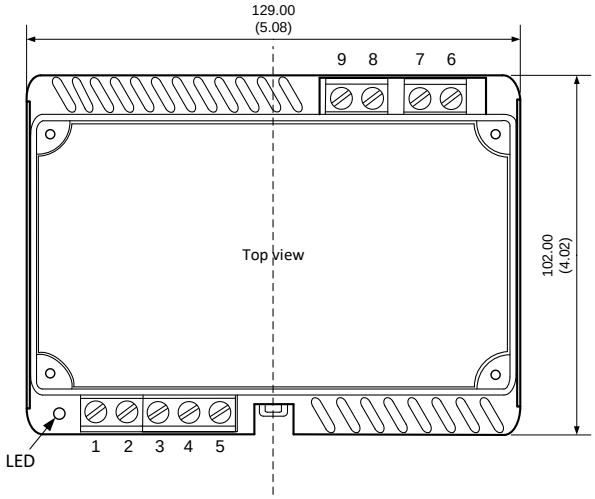
Pin Out Specifications

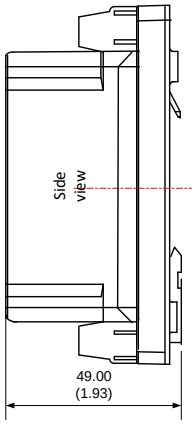
Pin	Single
1	-Vin
2	-Vin
3	+Vin
4	+Vin
5	+Vout
6	-Vout
7	N.C.
8	N.C.
9	N.C.

NOTES:

1. To replace the internal fuse in the models with suffix “-ST”, unscrew the 2 screws on the top side of the plate.
2. DIN rail metal holder needs to be grounded.
3. Horizontal mounting recommended.

800VDC input models with optional -STS bottom plate



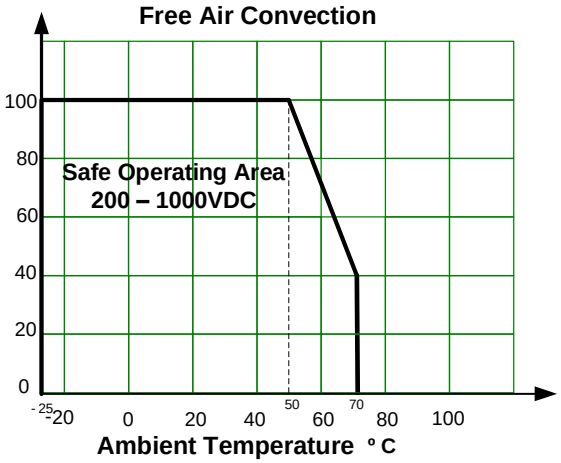


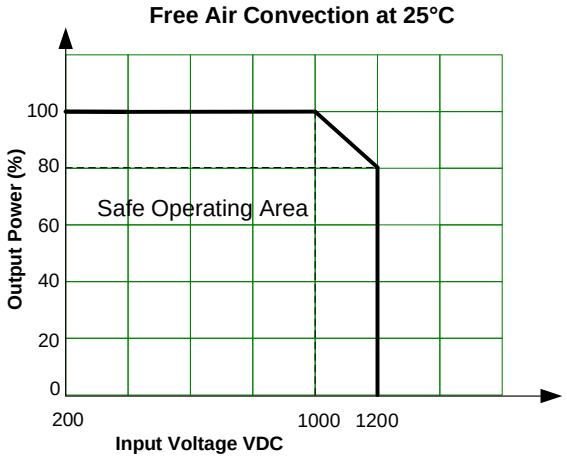
Pin Out Specifications

Pin	Single
1	+V out
2	-V out
3	N.C.
4	N.C.
5	N.C.
6	+V in
7	+V in
8	-V in
9	-V in

Derating

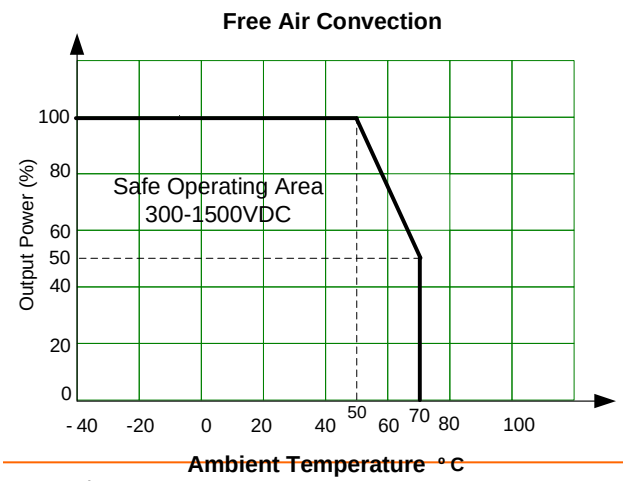
600VDC input models

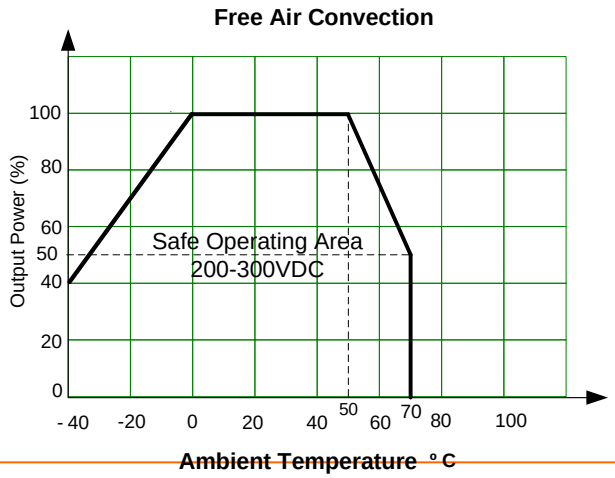


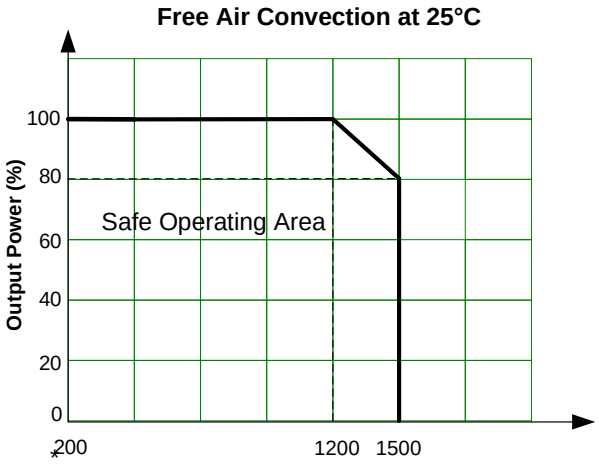


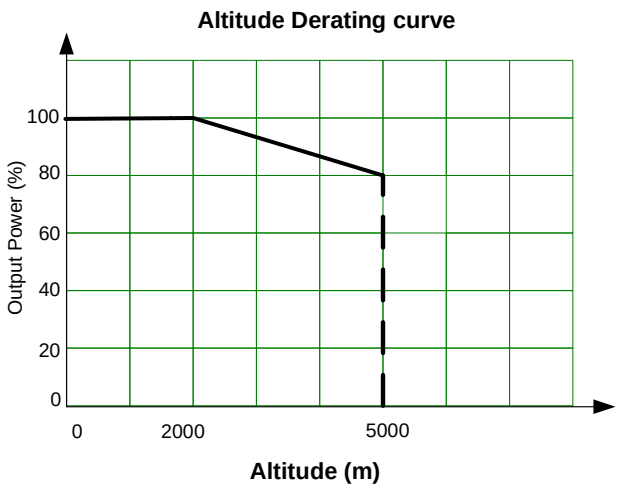
NOTE: 1. For Input Voltage between 1000-1200VDC the derating will depend on the temperature derating.
2. Sufficient air space for natural air flow around must be considered.

800VDC input models*





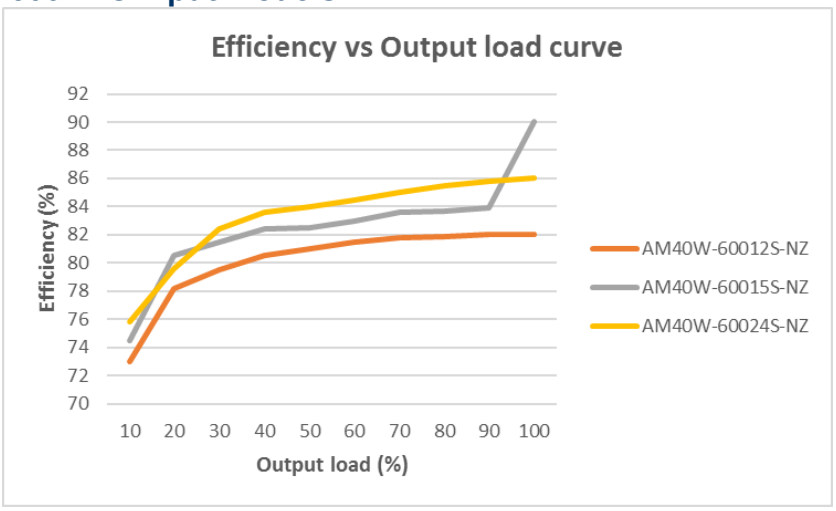




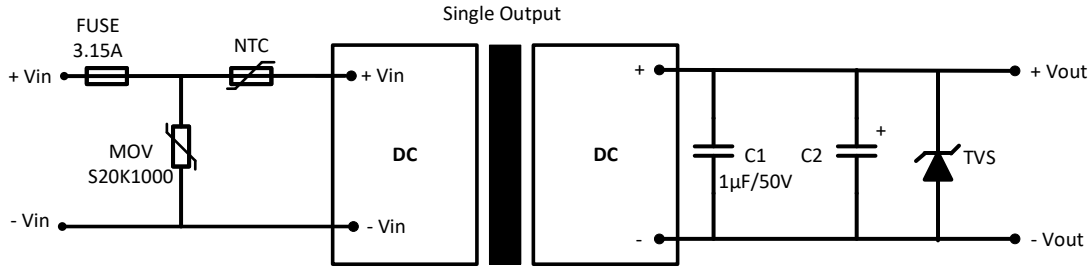
NOTE: 1. Derating is indicated at natural convection. Sufficient air space around is needed.
2. For Input Voltage between 1200-1500VDC the derating will depend on the temperature derating.

Efficiency curves

600VDC input models



Typical Application circuit

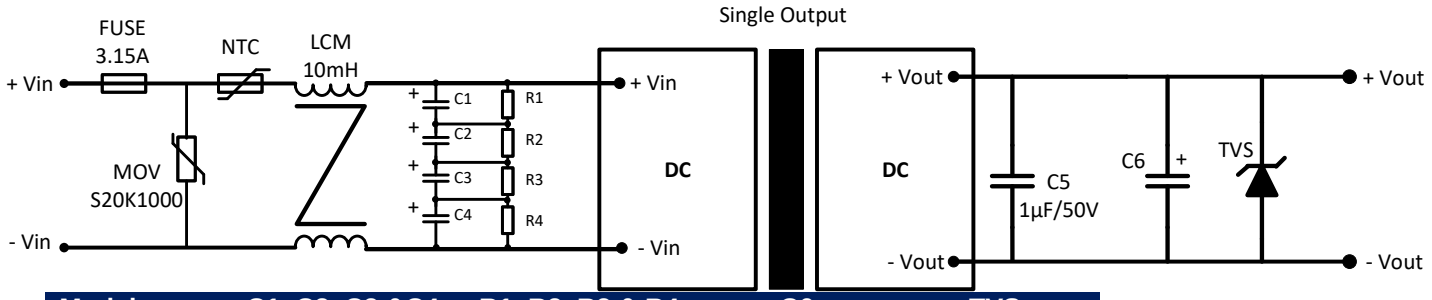


Model	C2	TVS
12 & 15 Vout	220 µF / 35V	20V
24 Vout	120 µF / 35V	30V

*NOTE: For 800VDC Input models NTC and MOV are not needed. For 800VDC input models with suffix “-ST” or “-STF” this external circuit is not needed.

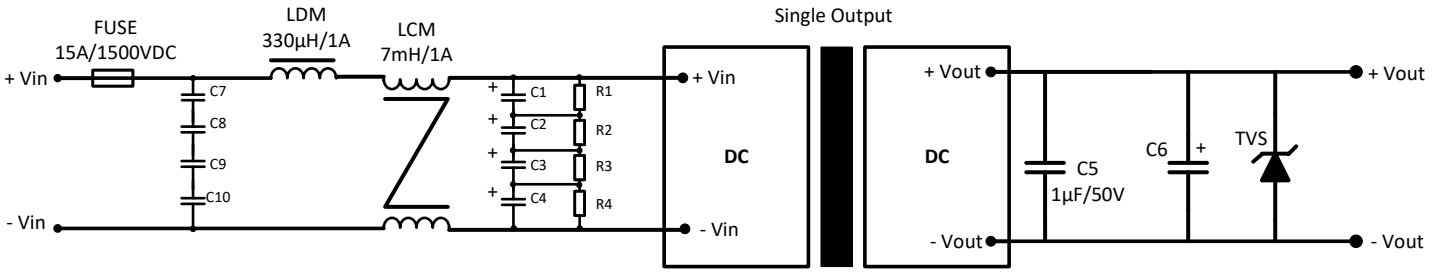
Recommended EMC Circuit

600VDC input models



Model	C1, C2, C3 &C4	R1, R2, R3 & R4	C6	TVS
12 & 15 Vout	47 µF/450V	1MΩ / 2W	220 µF / 35V	20V
24 Vout			120 µF / 35V	30V

800VDC input models



Model	C1, C2, C3 & C4	C7, C8, C9 & C10	R1, R2, R3 & R4	C6	TVS
12 & 15 Vout	47 µF/450V	100 nF/275VAC	1MΩ / 2W	120 µF / 35V	20V
24 Vout				68 µF / 35V	33V

***NOTE: For 800VDC input models with suffix "-ST" or "-STF" this external EMC circuit is not needed.**

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