

220 - 800V Input 11-13.5V Output 1200W DC/DC Converter

Features

- 1200W Output power
- Very wide input range: 220 -800Vdc
- Output voltage 11 – 13.5Vdc adjustable
- High Efficiency >92%
- Wide temperature range -40°C to +85°C
- CAN bus serial interface
- Rugged design
- High reliability
- Small footprint
- Parallel connection of multiple units
- Forced current share
- Output Enable pin
- Input UVLO/OVLO
- Output Reverse Polarity protection
- Output Overvoltage protection
- Output Overcurrent protection
- Over Temperature protection
- 4.25kVdc isolation
- IP67 and IP6K9K rating



The latest isolated DC/DC converter from Sevcon is a 1200W DC/DC converter intended for use in hybrid and electric vehicles for powering low voltage accessories, this is achieved by utilising a high efficiency topology. The very wide input voltage range allows the converter to be used over many different applications. The DC/DC converter is designed to operate over a temperature range of -40°C to +85°C and has many protection features such as input UVLO / OVLO, output reverse polarity protection, output overcurrent protection and over temperature protection. Parallel connection of multiple units with forced current sharing is also possible. A serial CAN bus is available for programming of output voltage and reporting of converter parameters. Also included is a remote power on signal for use when no CAN communication is available.

Electrical Characteristics

All electrical specifications are based on 25°C ambient temperature unless otherwise stated.

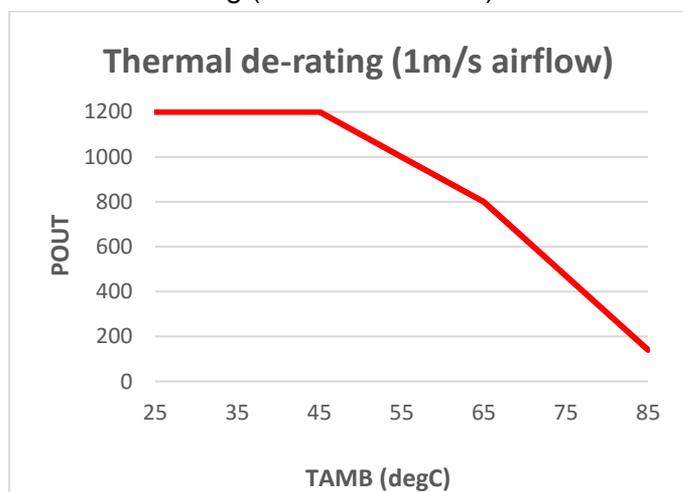
Input characteristics	Min	Typ	Max	Units	Notes
Input voltage range	220	500	800	Vdc	
Input UVLO, turn-on	210	215	220	Vdc	
Input UVLO, turn-off	205	210	215	Vdc	
Turn-On delay			2	sec	Vin Min to Vo = 90% of Nom
Max input current			6.1	Adc	Vin Min, Iout Max
Max off state input current			5	mAdc	Vin Typ, output disabled
Input capacitance		6		uF	

Output characteristics	Min	Typ	Max	Units	Notes
Output power			1200	W	
Output current range	0		100	Adc	
Output voltage set point	11	13.5	13.5	Vdc	Programmable via CAN
Output voltage regulation		+/-3		%	From Vout set point, 0% to 100% load
Output ripple and noise			250	mV	20MHz BW, 100% load. 47uF electrolytic and 1uF ceramic capacitors at measuring point
Output voltage transient regulation		+/-5		%	From Vout set point, Vin typ, 10-50A dynamic, 0.1A/us
Output overshoot			3	%	
Current share accuracy			5	%	20%-100% load. Max of 6 units in parallel.
Over voltage protection	16			Vdc	Auto restart
Over current protection	110			Adc	Auto restart once the fault is removed
Output quiescent current			100	uA	Converter shut down with 12V applied to output
Efficiency (Vout = 13.5)	92			%	50% load, Vin Typ
	92			%	75% load, Vin Typ
	92			%	100% load, Vin Typ

Environmental	Min	Typ	Max	Units
Storage temperature	-40		+85	°C
Operating temperature	-40		+85	°C
Humidity (condensing)	0		95	%RH
Ingress Protection	IP67 and IP6K9K			
Vibration	5G rms,0-500Hz, 3 planes			
Shock	50Gpk, 3 planes			
Weight (Air cooled)	4.4 Kg			

Cooling	Description
Air cooled version	Max power at 45 deg C ambient, with 1m/s airflow. Output power should be de-rated above 45 deg C.

Thermal de-rating (air cooled variant)



Regulatory	Description	Criteria
Isolation	Reinforced: 4.25kV dc	Input to Output
Isolation	Basic: 3.2kV dc	Input to Chassis
EMC Emissions	UN ECE R10 4 th Edition	ESA level
EMC Immunity	UN ECE R10 4 th Edition	ESA level, TEM cell method at 75V/m
BCI	UN ECE R10 4 th Edition	ESA level, 60mArms
ESD	EN 61000-4-2	+/-6kV contact, +/-8kV air. Performance criteria B
EFT	ISO7637-2	Performance criteria B

Electrical tests

Fig 1: Efficiency vs Output load
Vin= 220Vdc, 350Vdc, 500Vdc
Vout = 13.5V

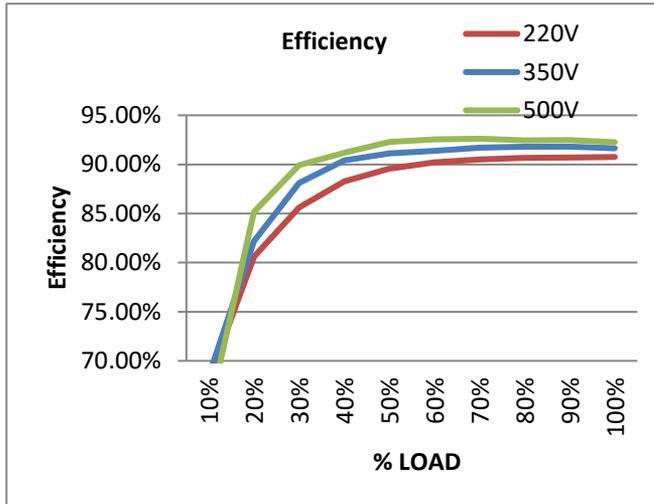


Fig 2: Output ripple and noise
Vin=220V, Iout Max, 20MHz BW
CH1: Vout, 50mV/div 5us/div

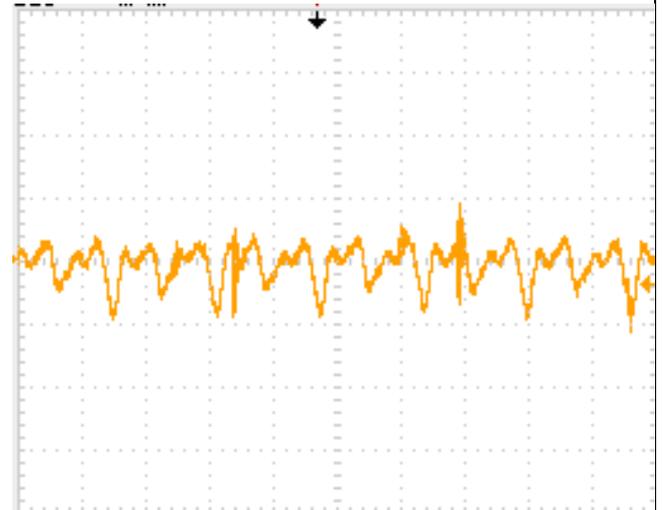


Fig 3: Start-up waveform
Vin=220V, Iout Max
CH1: Vin, 50V/div 200ms/div
CH2: Vout, 2V/div 200ms/div

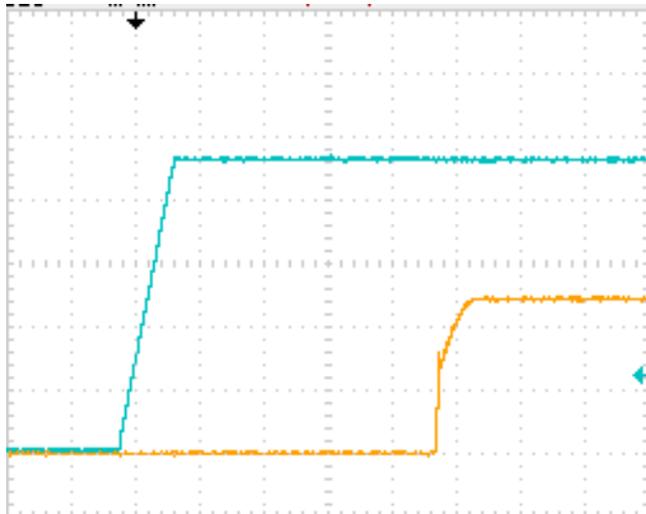
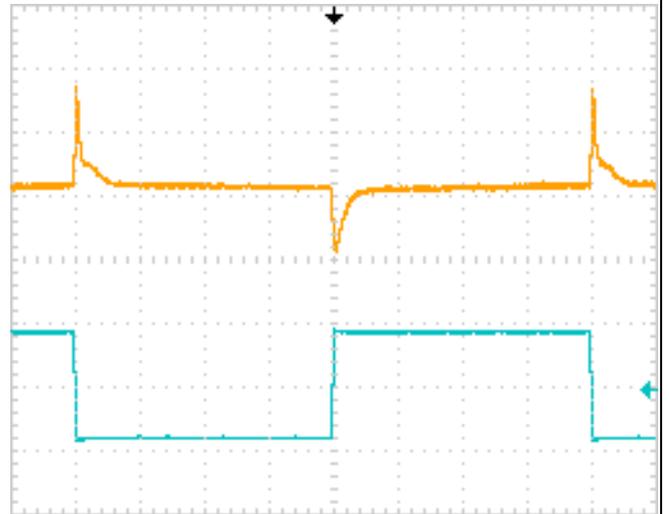


Fig 4: Control Loop Dynamic response
Vin=220V, Iout= 10-50A 0.1A/us
CH1: Vout, 200mV/div, 5ms/div
CH2: Iout, 25A/div 5ms/div



Application Information

Inrush current

Inrush current is controlled by external means; please refer to electrical specification for input capacitance.

PSON input

The DC/DC converter has an enable input which can be used when no CAN serial communication is available. To enable the converter the Enable input should be shorted to Vout negative by an external relay or other means.

PSOK output

The DC/DC converter has a Power OK signal output. Once the converter is powered the Power OK signal will be pulled-up to 3.3V, in the event of any fault condition the Power OK signal will be pulled low. The Power OK signal is referenced to Vout negative.

CAN communication

CAN communication is used to enable the DC/DC, adjust Vout, adjust Iout Max, and for monitoring the DC/DC converter status. CANopen and J1939 are the provided CAN protocols.

Output voltage set point

The output voltage set point is programmable via CAN between 11 to 13.5V. If CAN is not used the default set point is 13.5V at 50% load, other set points can be requested.

Parallel connection of multiple units

The DC/DC converter includes an active current share circuit for paralleling of multiple units. Each unit is connected to the next via the CS signal. Current sharing of units is used for increased system power or for when N+1 redundancy is required.

Reverse polarity protection

In the event that the output is wired incorrectly the DC/DC converter will self-protect. The input connector design ensures that the input cannot be reversed.

Overcurrent protection

In the event that the output is overloaded or shorted, the DC/DC converter will protect itself from excessive stress. The converter will continue to try and power-up, however, if the overload is still applied the output will shut down. Once the fault is removed the converter will power-up.

Thermal considerations

In the event excessive temperatures are reached, the DC/DC converter will shut down, once temperatures are within acceptable limits the converter shall restart.

Fusing

Input and output fusing is not provided. A suitable fuse should be installed in the end application.

Input connector

Input connector is Amphenol PowerLok part # PL082X-61-2.5

Mating connector is Amphenol PowerLok part # PL482X-61-2.5

Input connector HVIL pins are shorted together inside the converter

For pin out please request a full mechanical drawing

Output connector

Output connections are made via the output busbars.

For pin out please request a full mechanical drawing

I/O connector

I/O connector is TE Connectivity part # 1-776280-1

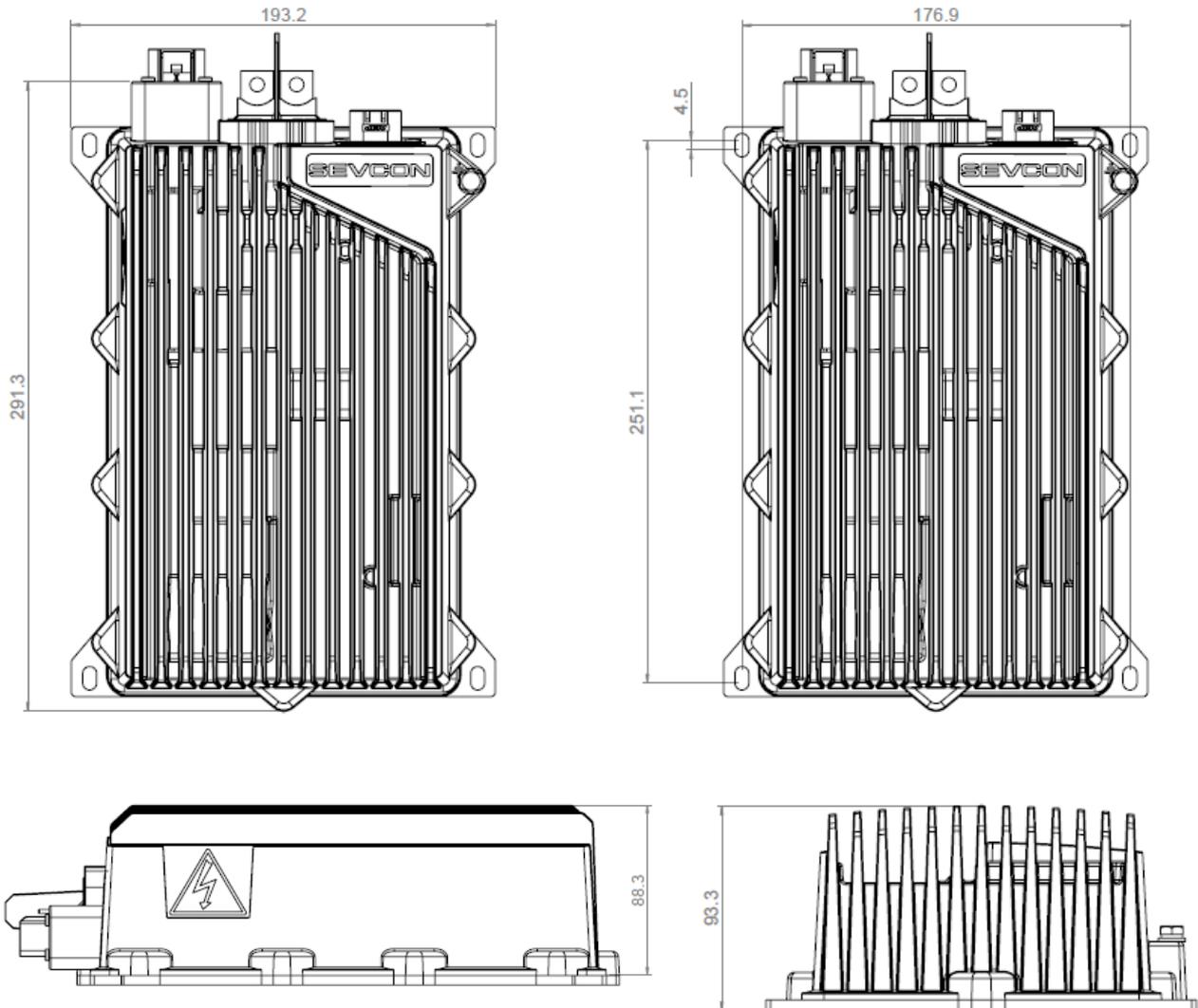
Mating connector is TE Connectivity part # 776286-1

Pin out as follows

Pin #	Name	Description
1	PSON	Active low input
2	PSOK	Active high output
3	CAN_TERM	Connect to CAN_L to use internal 120 Ohm termination resistor
4	VOUT_NEGATIVE	Signal negative
5	CAN_H	CANbus high signal
6	CS	Current share signal. Connect to other units CS signal for parallel operation
7	CAN_GND	Isolated GND for CAN
8	CAN_L	CANbus low signal

Mechanical Drawing

Air cooled variant



Orderable part numbers

Air cooled version

Sevcon Part #	Vin	Vout	Pout	Iout
622/11143	220-800Vdc	11-13.5Vdc	1200W	100A dc

For other output voltage variants please contact your local Sevcon representative