



VPM-110004-001

Surge Protector



TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C unless otherwise noted

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	Compatible with 72/96/ 110V nominal battery voltage	43	110	160	VDC
Start up voltage				30	VDC
Transient voltage	1 second, max.			165	VDC
	100 ms, max.			176	VDC
	20 ms, max.			385	VDC
Brownout	100 ms, max.	36			VDC

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output voltage			Vin-2	Vin-1	VDC
Clamping voltage	Input transient voltage mode		168		VDC
Output power range		21		150	W

GENERAL SPECIFICATIONS

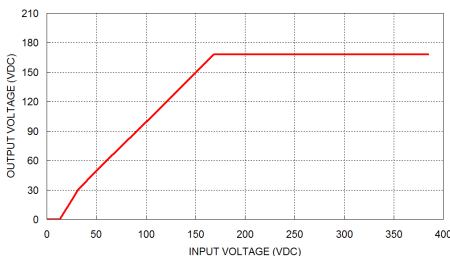
Parameter	Conditions	Min.	Typ.	Max.	Unit
Standard meets					RIA12 Surge Susceptibility NF F 01-510 Surge Susceptibility
Case material					Non-conductive black plastic
Base material					Non-conductive black plastic
Potting material					Silicone (UL94 V-0)
Weight					22g (0.78oz)

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		105	°C
Maximum case temperature				+105	°C
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

CAUTION: This power module is not internally fused. An input line fuse must always be used.

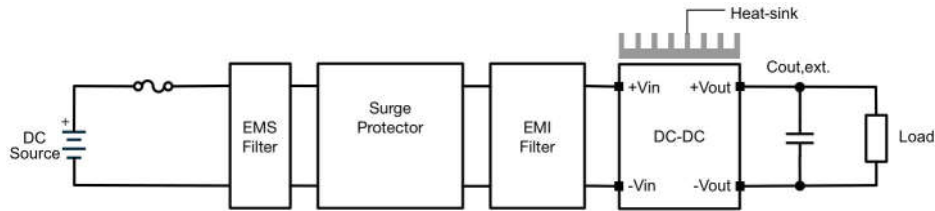
CHARACTERISTIC CURVE



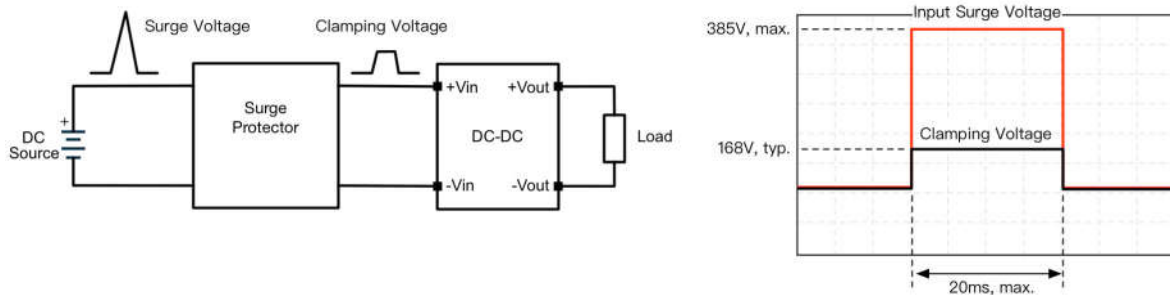
Transfer Function

TYPICAL APPLICATION

The schematic for typical application is shown as below.



Surge protector clamps over-voltage to a safe value in order to protect the power module from damaging. According to RIA12, the module should keep working during input surge occurs.



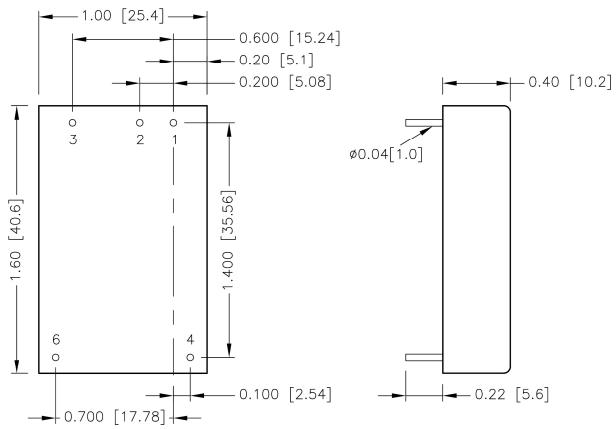
This surge protector can be used for 72V · 96V and 110V battery system of railway application. Input range of DC-DC converter also has to meet 72V · 96V and 110V system input range.

Nominal Input	EN50155 Standard			RIA12 Standard			
	Permanent Input range (0.7-1.25 Vin)	Brownout 100ms (0.6xVin)	Transient 1s (1.4xVin)	Permanent Input range (0.7-1.25 Vin)	Brownout 100ms (0.6xVin)	Transient 1s (1.5xVin)	Transient 20ms (3.5xVin)
72V	50.4 – 90V	43.2V	100.8V	50.4 – 90V	43.2V	112.5V	252V
96V	67.2 – 120V	57.6V	134.4V	67.2 – 120V	57.6V	144V	336V
110V	77 – 137.5V	66V	154V	77 – 137.5V	66V	165V	385V

Nominal Input	NF F 01-510 Standard		
	Permanent Input range	Brownout 100ms (0.5xVin)	Transient 100ms
72V	50 – 90V	36V	115V
96V	/	/	/
110V	77 – 137V	55V	176V



MECHANICAL DRAWING



BOTTOM VIEW

PIN CONNECTION

PIN	DEFINE
1	+Input
2	NC
3	- Input
4	+Output
6	- Output

1. All dimensions in inch [mm]
2. Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Pin dimension tolerance ±0.004[0.10]