

New energy isolation converter with  
Ultra-wide & ultra-high input voltage of 100-1000VDC



## FEATURES

- Input voltage up to 1000VDC
- 10:1 ultra-wide input voltage range: 100 ~ 1000VDC
- Industrial grade operating temperature: -40°C ~ 70°C
- 4000VAC high isolation voltage
- High efficiency, Low ripple & noise
- Output over-voltage, short circuit protection (automatic recovery), Input against reverse protection
- Meet CE certification standards
- High reliability, long life, three years warranty

PVxx-27BxxR2 series are regulated output DC/DC converters with features of 100-1000VDC ultra-wide and ultra-high voltage input, high efficiency and high reliability. They can be widely used in photovoltaic power generation, high-voltage inverter and so on, which provide stable operating voltage to the equipment and improve the power and the load's safety performance with multiple protection when working under abnormal conditions.

## Selection Guide

Certification	Model*	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (200VDC, %/Typ.)	Max. Capacitive Load(μF) (Full load)
CE	PV05-27B05R2	5W	5V/1A	72	6000
	PV10-27B05R2	10W	5V/2A	72	6000
	PV10-27B09R2	10W	9V/1.11A	76	4000
	PV10-27B24R2	10W	24V/0.42A	80	470
	PV15-27B12R2	15W	12V/1.25A	77	2000
	PV15-27B15R2	15W	15V/1A	78	1200
	PV15-27B24R2	15W	24V/0.625A	80	470

Note:\*Part No. with suffix of "A2" means chassis mounting, suffix of "A3" means chassis mounting and suffix of "A4" means DIN-Rail mounting (e.g. PV05-27B05R2A2 means chassis mounting; PV05-27B05R2A3 means chassis mounting; PV05-27B05R2A4 means DIN-Rail mounting), chassis mounting and DIN-Rail mounting don't have CE certification.

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		100	--	1000	VDC
Input Current	PV05 model	200VDC	--	38	mA
		600VDC	--	15	
		1000VDC	--	10	
	PV10 model	200VDC	--	75	
		600VDC	--	25	
		1000VDC	--	16	
PV15 model	200VDC	--	120		
	600VDC	--	40		
	1000VDC	--	22		
Inrush Current	200VDC	--	7	--	A
	600VDC	--	20	--	
	1000VDC	--	30	--	
External Input Fuse(chassis mounting and DIN-Rail mounting package series include fuse)	PV05/ PV10 model	Necessary, 1A Slow fusing			
	PV15 model	Necessary, 2A Slow fusing			
Hot Plug	Unavailable				

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1	±2	%
Line Regulation		--	±0.5	±1	
Load Regulation		--	±0.5	±1	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	100	200	mV
Temperature Drift Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Over-voltage Protection	PVxx-27B05R2	(Feedback-clamp) Voltage limited < 7.5V			
	PVxx-27B09R2	(Feedback-clamp) Voltage limited < 12V			
	PVxx-27B12R2	(Feedback-clamp) Voltage limited < 15V			
	PVxx-27B15R2	(Feedback-clamp) Voltage limited < 19V			
	PVxx-27B24R2	(Feedback-clamp) Voltage limited < 28V			
Min. Load		0	--	--	%
Delay Time	200~1000VDC	--	--	1	s

Note: \* Ripple and noise are measured by "parallel cable" method, please see AC-DC Converter Application Notes for specific operation.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	4000	--	--	VAC
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+105	
Storage Humidity		--	--	95	%RH
Welding Temperature	Wave-soldering	260±5°C; time:5~10s			
	Manual-welding	360±10°C; time:3~5s			
Switching Frequency		--	--	75	kHz
Power Derating	+50°C to +70°C	PV10/15-27BxxR2	2	--	%/°C
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94-V0)				
Dimensions	Horizontal package	70.00*48.00*23.50 mm			
	A2 chassis mounting	96.10*54.00*32.00 mm			
	A3 chassis mounting	99.00*54.00*32.00 mm			
	A4 DIN-Rail mounting	96.10*54.00*36.60 mm			
Weight	Horizontal package / A2 chassis mounting / A3 chassis mounting / A4 DIN-Rail mounting	95g /150 g /150 g /190 g(Typ.)			
Cooling method	Free convection				

EMC Specifications

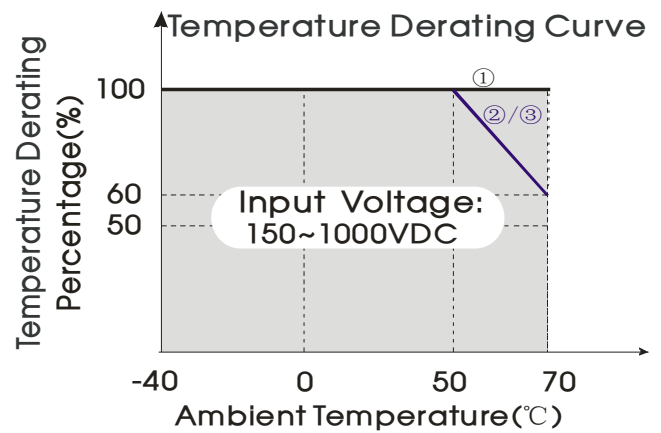
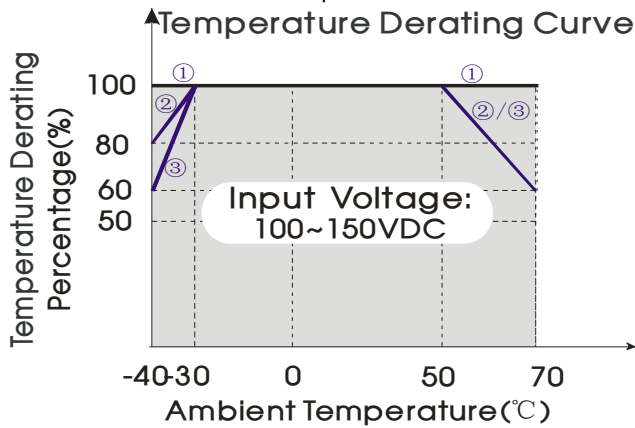
EMI	CE	CISPR22/EN55022, CLASS A(See Fig. 2 for recommended circuit)			
	RE	CISPR22/EN55022, CLASS A(See Fig. 2 for recommended circuit)			
EMS	ESD	IEC/EN61000-4-2	±6KV/±8KV	Perf. Criteria B	
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A	
	EFT	IEC/EN61000-4-4	±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B	
	Surge	IEC/EN61000-4-5	±2KV (See Fig. 2 for recommended circuit)	perf. Criteria B	
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A	
	PFM	IEC/EN61000-4-8	10A/m	perf. Criteria A	

Voltage dips, short interruptions  
and voltage variations immunity

IEC/EN61000-4-11 0%-70%

perf. Criteria B

Product Characteristic Curve

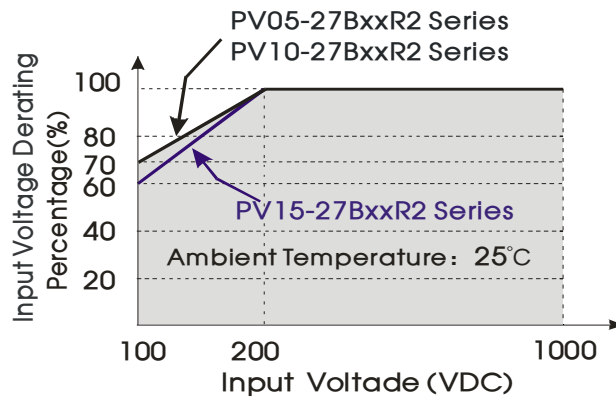


Note:

- For PV05-27BxxR2 Series, derating curve is line①;  
for PV10-27BxxR2 Series, derating curve is line②;  
for PV15-27BxxR2 Series, derating curve is line③.

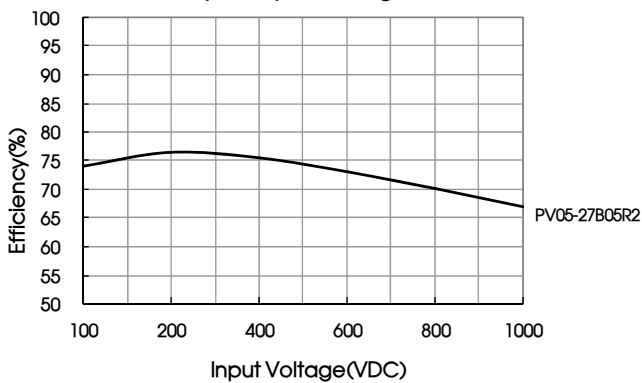
2. This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.

Input Voltage Derating Curve

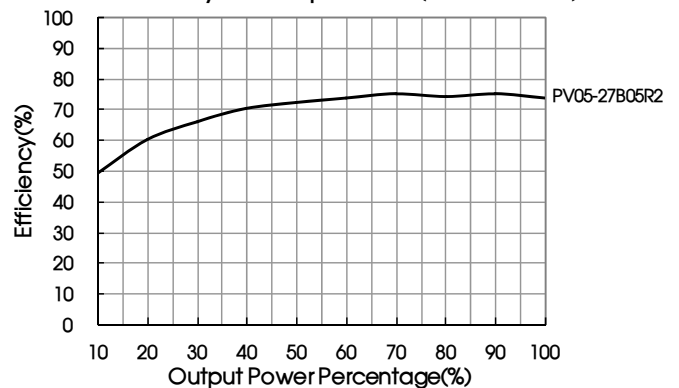


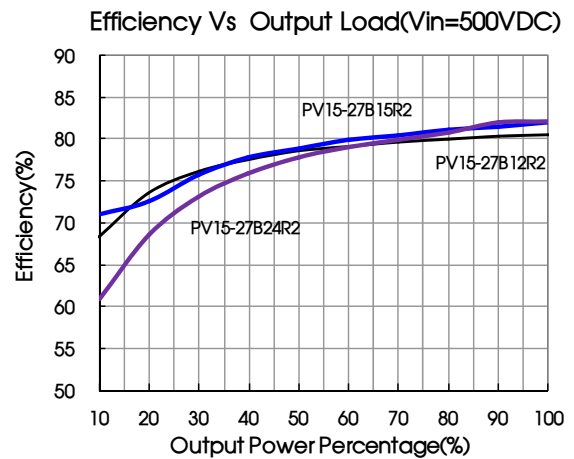
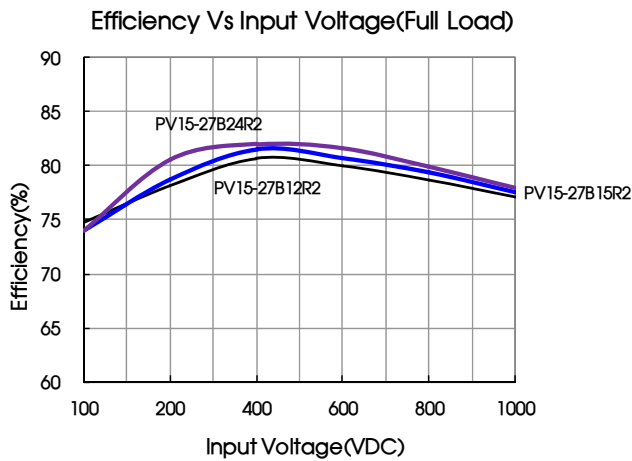
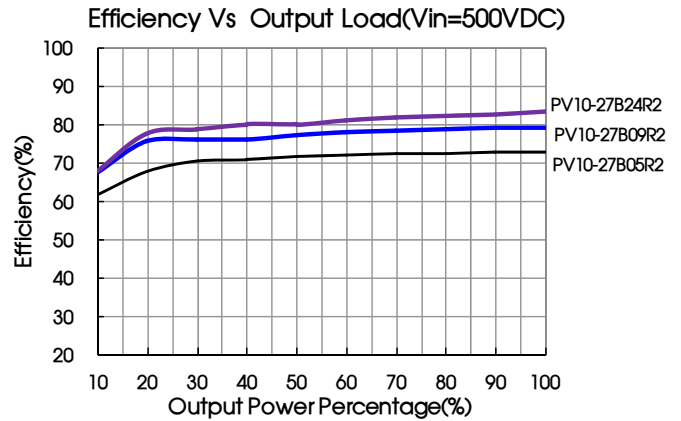
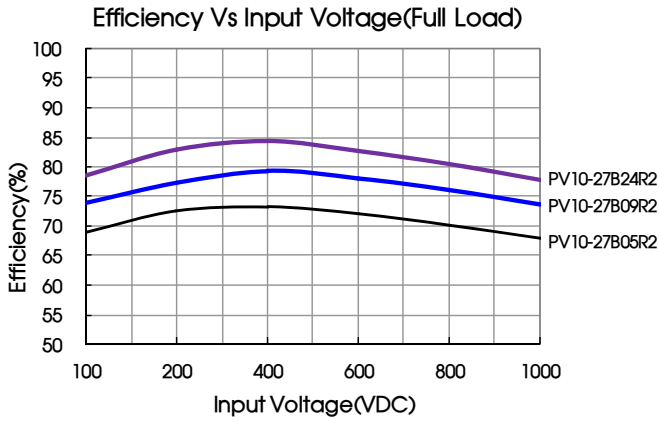
Note: The actual output power = Nominal output power x Temperature derating x Input voltage derating.

Efficiency Vs Input Voltage(Full Load)



Efficiency Vs Output Load(Vin=500VDC)





## Design Reference

### 1. Typical application circuit

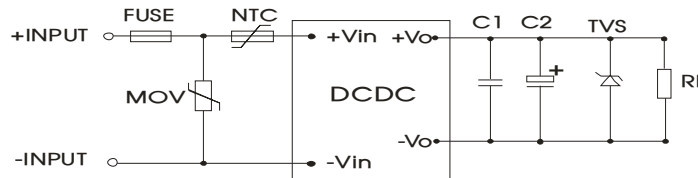


Fig. 1

Model	FUSE	MOV	NTC	C1(μF)	C2(μF)	TVS
PV05-27B05R2	1A slow fusing	TVR14142 (Thinking)	10D-11	1	220	SMBJ7.0A
PV10-27B05R2					220	SMBJ7.0A
PV10-27B09R2					120	SMBJ12A
PV10-27B24R2	2A slow fusing	TVR14142 (Thinking)	10D-11	1	68	SMBJ33A
PV15-27B12R2					120	SMBJ15A
PV15-27B15R2					120	SMBJ20A
PV15-27B24R2					68	SMBJ33A

Note:

Output filtering capacitor C2 is electrolytic capacitor, it is recommended to apply electrolytic capacitor with high frequency and low resistance. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitance withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

### 2. EMC solution-recommended circuit

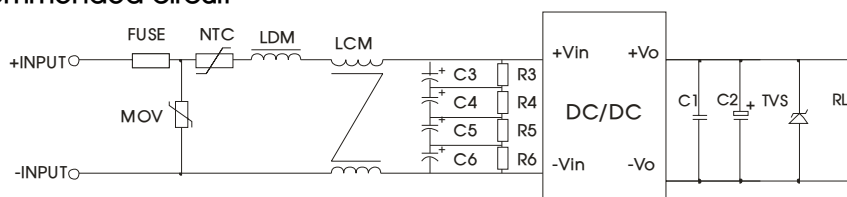


Fig 2(Output external circuit refer to the typical application circuit)

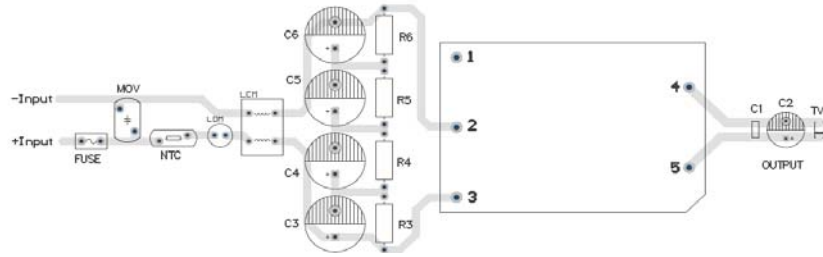


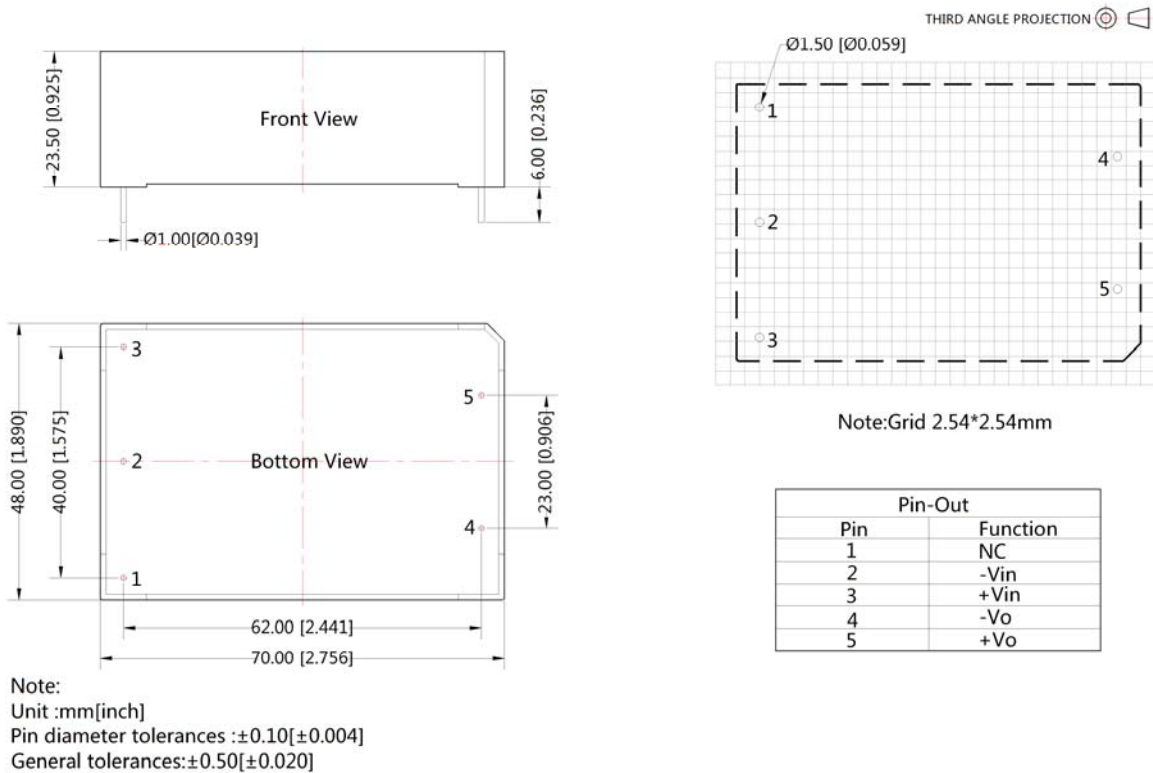
Fig 3

Suggestions for safety regulation and wiring width: wire width  $\geq 3\text{mm}$ , distance between wires  $\geq 6\text{mm}$ , and distance between wire and ground  $\geq 6\text{mm}$

Element model	Recommended value
MOV	TVR14142 (Thinking)
C3, C4, C5, C6	47 $\mu\text{F}$ /400VDC
R3, R4, R5, R6	1M $\Omega$ /2W
NTC	10D-11
LDM	4.7mH/0.5A
LCM	10mH, recommended to use MORNSUN's FL2D-Z5-103
FUSE	1A, necessary (PV05-27BxxR2/ PV10-27BxxR2)
	2A, necessary (PV15-27BxxR2)

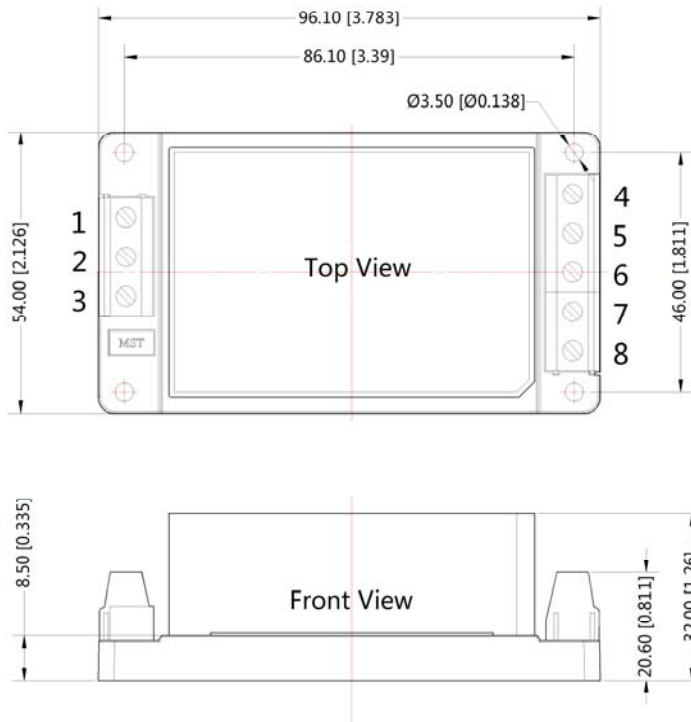
3. For more information please find the application note on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



A2 Chassis mounting Dimensions

THIRD ANGLE PROJECTION

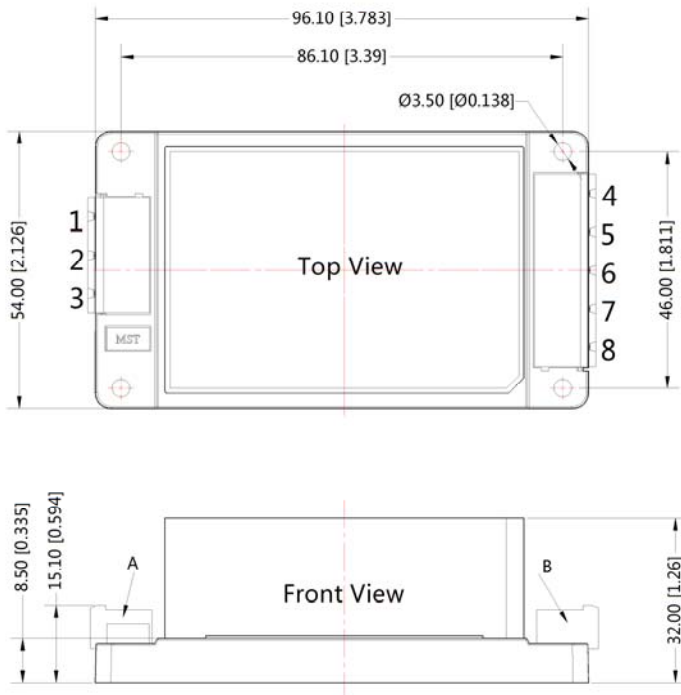


Pin	Function
1	-Vin
2	NC
3	+Vin
4	-Vo
5	NC
6	NC
7	NC
8	+Vo

Note:  
Unit:mm[inch]  
Wire range : 24~12 AWG  
General tolerances:±0.50[±0.020]

A3 Chassis mounting Dimensions

THIRD ANGLE PROJECTION

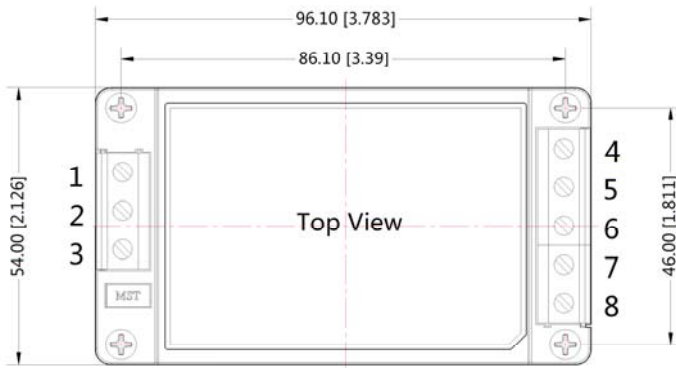


Pin	Function
1	-Vin
2	NC
3	+Vin
4	-Vo
5	NC
6	NC
7	NC
8	+Vo

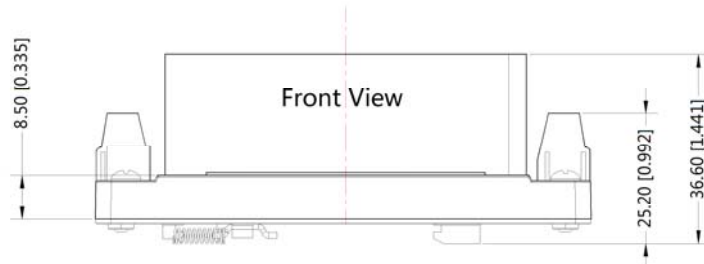
Note:  
Unit:mm[inch]  
General tolerances:±0.50[±0.020]  
A:DEGSON P/N:  
2EDGRC-7.5-03P-14-100A ( H )  
B:DEGSON P/N:  
2EDGRC-7.5-05P-14-100A ( H )

A4 Din-Rail mounting Dimensions

THIRD ANGLE PROJECTION ☉ ◀



Pin	Function
1	-Vin
2	NC
3	+Vin
4	-Vo
5	NC
6	NC
7	NC
8	+Vo



Note:  
Unit:mm[inch]  
Installed on DIN rail TS35  
Wire range : 24~12 AWG  
General tolerances:±0.50[±0.020]

Note:

1. Packing Information please refer to 'Product Packing Information'. The Packing bag number of Horizontal package : 58220006, the Packing bag number of A2/A3/A4 package: 58220010;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.

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