DC/DC Switching Power Supply

PV60-27D1215-13

MORNSUN®

60W Isolation DC-DC Converter with Ultra-wide , ultra-high 200 -1100VDC input for Renewable Energy

3 years Warranty

RoHS

FEATURES

- Ultra-wide input voltage range of 200 - 1100VDC
- Industrial grade operating temperature -40℃ to +70℃
- High I/O isolation test voltage of 4000VAC, high Vo1/Vo2 isolation test voltage of 4000VAC
- Meets reinforced insulation
- High efficiency, low ripple & noise
- High reliability, long lifespan
- Input reverse polarity and undervoltage protection, output short circuit, overcurrent and overvoltage protection
- Meets 5000m altitude requirements

PV60-27D1215-13 is a regulated DC-DC converter with an ultra-wide and ultra-high DC input of 200-1100VDC, which design based on standard of CSA-C22.2 No.107.1, UL/EN62109. The products feature high efficiency, high reliability, high insulation and a high level of safety protection. This type of power supply is widely used in renewable energy industries such as photovoltaic solar tracking system (15V mainly for IGBT drive part of the power supply), photovoltaic, power generation, energy storage, inverters and high-voltage DC conversions. The converters provide multiple protection features and guarantee stable and safe operating environments even under abnormal working conditions. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current (Vo/Io)		Efficiency at 600VDC(%) Typ.	Capacitive Load (μF) Max.	
		Vo1/Io1	Vo2/Io2		Vo1	Vo2
PV60-27D1215-13	60W	12V/3A	15V/1.33A	85	1000	400

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range		200	--	1100	VDC
Input Current	300VDC	--	--	0.4	A
	600VDC	--	--	0.2	
Inrush Current	600VDC	--	100	--	
	1100VDC	--	200	--	
Undervoltage Protection		Lockout activation range: 145 - 175VDC Lockout deactivation range:175 - 200VDC			
Reverse Polarity Protection		Support			
External Input Fuse		3A/1000VDC, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range	Vo1	--	±2	--	%
		Vo2	--	±10	--	
Line Regulation	Full load	Vo1	--	±1	--	
		Vo2	--	±5	--	
Load Regulation	10% - 100% load	Vo1	--	±2	--	
		Vo2	--	±5	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	Vo1	--	--	200	mV
		Vo2	--	--	200	
Temperature Coefficient			--	±0.02	--	%/℃
Short Circuit Protection			Hiccup, continuous, self-recovery			
Overcurrent Protection			≥110% Io, Hiccup, self-recovery			

Overvoltage Protection	Vo1		≤20VDC (Output voltage clamp or hiccup)			
	Vo2		≤25VDC (Output voltage clamp or hiccup)			
Minimum Load			10	--	--	%
Hold-up Time	Room temperature, Full load	600VDC input	5	--	--	ms
Delay Time	200 - 1100VDC		--	--	3	s
Note: * The " Tip and barrel method" is used for Ripple and noise test, please refer to PV Converter Application Notes for specific information.						

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Test	Input - output	Electric Strength Test for 1min., leakage current ≤5mA	4000	--	--	VAC
	Vo1-Vo2		4000	--	--	
Insulation Resistance	Input - output	500VDC	≥50x10⁶			Ω
Operating Temperature			-40	--	+70	°C
Storage Temperature			-40	--	+85	
Storage Humidity			--	--	95	%RH
Power Derating		-40°C to -25°C	1.33	--	--	%/°C
		+60°C to +70°C	6.0	--	--	
		200 - 300VDC	0.5	--	--	%/VDC
		1000 - 1100VDC	0.5	--	--	
		2000m - 5000m	6.67	--	--	%/Km
Safety Standard			CSA-C22.2 No.107.1, UL/EN62109			
Switching Frequency			--	65	--	kHz
Altitude			--	--	5000	m
MTBF			MIL-HDBK-217F@25° C≥ 100,000 h			

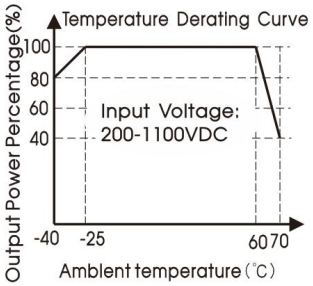
Mechanical Specifications

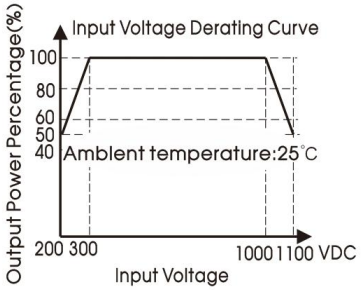
Dimensions	162.00 x 69.00 x 32.00 mm
Weight	260g (Typ.)
Cooling method	Free air convection

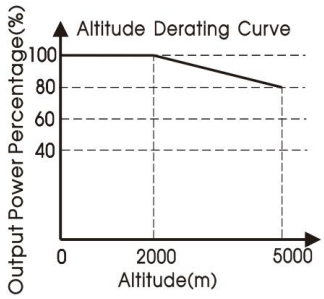
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A (See Fig. 1 for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A (See Fig. 1 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±8KV/Air ±15KV (See Fig. 1 for recommended circuit)	Perf. Criteria B
	RS	IEC/EN61000-4-3	30V/m (See Fig.1 for recommended circuit)	perf. Criteria B
	EFT	IEC/EN61000-4-4	±4KV (See Fig. 1 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV/ line to ground ±4KV (See Fig. 1 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s (See Fig. 1 for recommended circuit)	perf. Criteria B

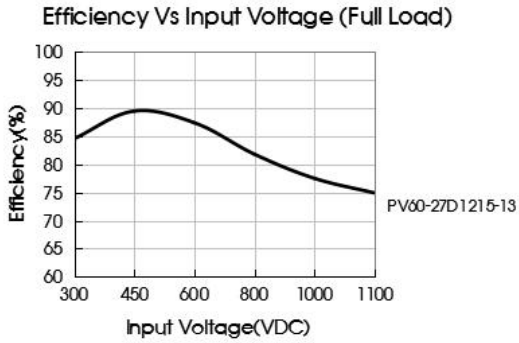
Product Characteristic Curve

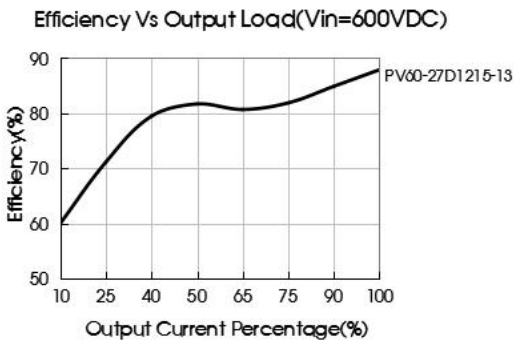






Note:
① With an input between 200 - 300VDC / 1000 -1100VDC, the output power of PV60-27D1215-13 parts must be derated as per temperature derating curves;
② For operation of this converter series in an altitude between 2000 - 5000m above sea level, the output power must be derated as per the altitude derating curve;
③ This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.





Design Reference

1. EMC compliance recommended circuit

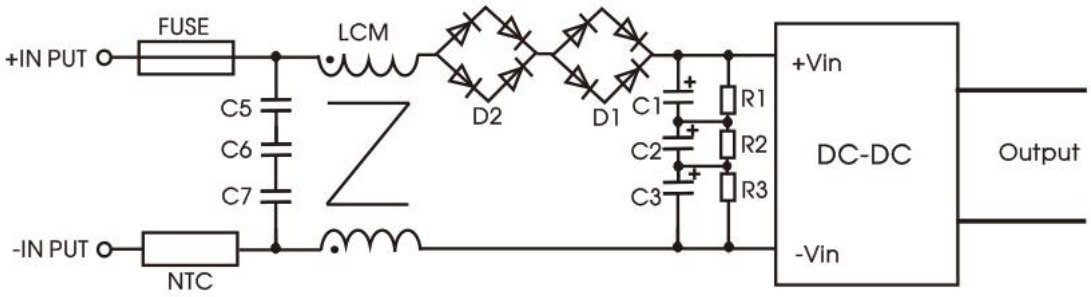


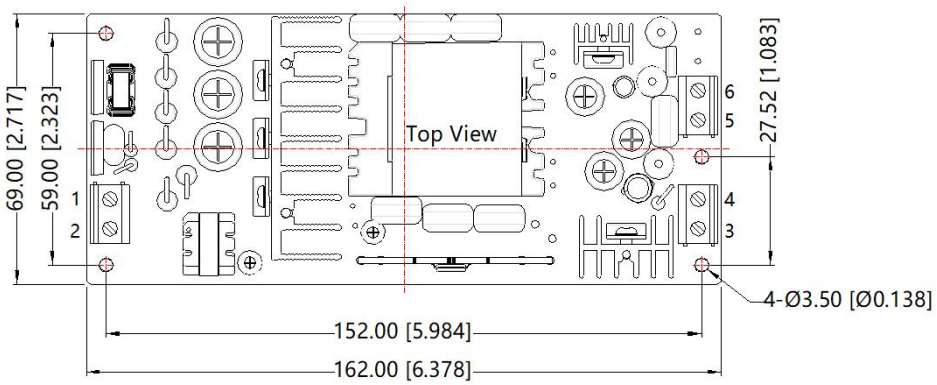
Fig. 1

Model	Recommended value
C1, C2, C3	10uF/450V
R1, R2, R3	1MΩ/2W
C5, C6, C7	225K/450V
LCM	10mH
FUSE	3A/1000VDC, slow-blow, required
NTC	5D-11
D1, D2	4A/1000V

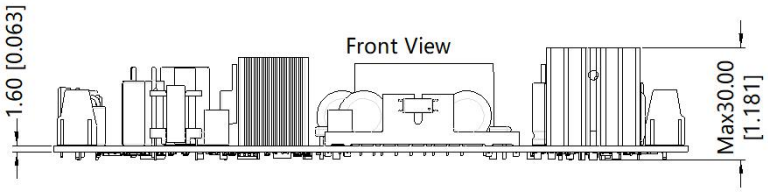
2. For more information Please find the application notes on www.mornsun-power.com

Dimensions Layout

THIRD ANGLE PROJECTION



Pin-Out	
Pin	Function
1	+Vin
2	-Vin
3	-Vo1
4	+Vo1
5	-Vo2
6	+Vo2



Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]
The layout of the device is for reference only , please refer to the actual product

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220069;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. In order to improve the efficiency at light load, there will be audible noise generated, but it does not affect product performance and reliability;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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