AC/DC Converter

LO20-26D1212-04-C

MORNSUN®

State Grid TTU dedicated power supply
high isolated, ultra wide input voltage range
AC-DC converter for electric meters

RoHS

3 years Warranty

FEATURES

- Designed for intelligent distribution and transformer terminals, the main technical indicators meet the national network standards
- Ultra wide input voltage range: 165-480VAC/230-680VDC
- High I/O isolation test voltage up to 4000VAC
- EFT, Surge: ±4KV Perf. Criteria B
- Output short circuit, over-current, over-voltage protections
- High efficiency, high reliability
- Low output ripple & noise, low standby power consumption
- Input anti-double rated voltage, normal over-voltage output

LO20-26D1212-04-C----State Grid TTU dedicated switching power supply. The AC-DC converter is a three-phase four-wire power dedicated switching power supply designed for intelligent distribution terminal, intelligent power distribution detection terminal, etc. According to the latest national grid company enterprise standard and operates over a very wide input voltage range: 165-480VAC or 230-680VDC. It meets the three-phase three wire or four-wire rated voltage. So it is a design solution for electric-meter application sourced from a three-phase AC supply with the requirement of high isolation voltage and rigorous EMC, 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 230VAC (%) Typ.	Capacitive Load (μF) Max.
		Vo1/Io1	Vo2/Io2		
LO20-26D1212-04-C	18W	12VDC/1500mA	No Pin*	80	4000
Note: * If the second road is empty, you can customize the second 12V/400mA on this model.					

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	165	--	480	VAC
	DC input	230	--	680	VDC
Input Frequency		47	--	63	Hz
Input Current	165VAC	--	--	0.7	A
	230VAC	--	--	0.4	
Inrush Current	230VAC	--	40	--	
Input Apparent Power	220VAC input, output power Po=10W	--	--	18	VA
Power Factor	220VAC input, full load	PF≥0.8			
Input Over-voltage Protection	Input double 380/220 VAC (three-phase four-wire), testing time 1S, interval 10S	Normal Output			
Recommended External Input Fuse	Three-phase four-wire input	3.15A/250V slow-blow required			
	Any phase input	3.15A/500V slow-blow required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±2	--	%
Line Regulation	Full load	--	±0.5	--	
Load Regulation	0%-100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	--	100	mV
Temperature Coefficient		--	±0.02	--	%/℃
Stand-by Power Consumption	230VAC	--	--	0.5	W

Short Circuit Protection		Hiccup, continuous, self-recovery				
Over-current Protection		≥150%Io, self-recovery				
Over-voltage Protection	12VDC output	≤20VDC (Output voltage clamp or hiccup)				
Minimum Load		0	--	--	%	
Hold-up Time	230VAC	--	10	--	ms	
Note: * The "parallel cable" method is used for ripple and noise test, please refer to AC-DC 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
Operating Temperature			-40	--	+70	℃
Storage Temperature			-40	--	+85	
Storage Humidity			--	--	95	%RH
Soldering Temperature		Wave-soldering	260 ± 5℃; time: 5 - 10s			
		Manual-welding	360 ± 10℃; time: 3 - 5s			
Switching Frequency			--	65	--	KHz
Power Derating		-40℃ to -25℃	2.0	--	--	%/℃
		+50℃ to +70℃	1.5	--	--	
Safety Class			CLASS II			
MTBF			MIL-HDBK-217F@25℃ > 300,000 h			

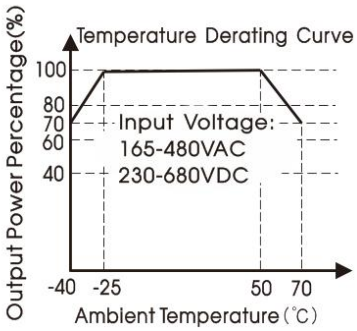
Mechanical Specifications

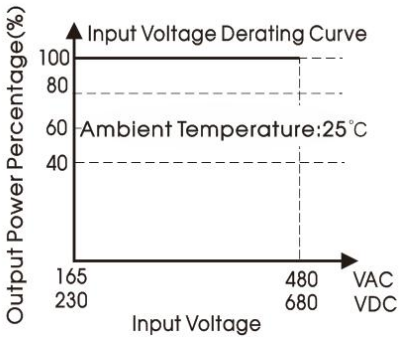
Dimension	76.20 x 50.80 x 30.00 mm
Weight	65g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

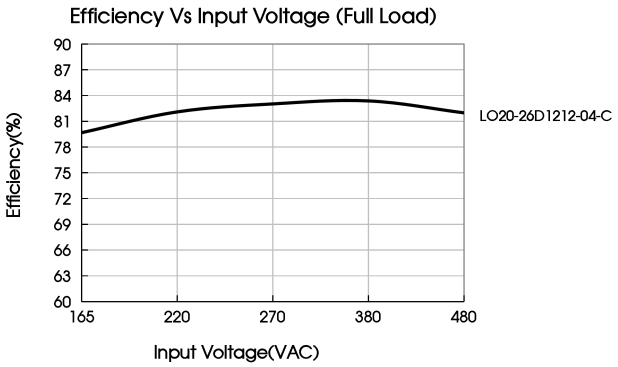
Immunity	ESD	IEC/EN61000-4-2 Contact ±8KV/ Air ±15KV (Air discharge matching machine test)	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	perf. Criteria B
	Surge	IEC/EN61000-4-5 Line to line ±2KV	perf. Criteria B
		IEC/EN61000-4-5 Line to line ±4KV (See Fig.2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
	Voltage dips, short interruption and voltage variations	IEC/EN61000-4-11 0%, 70%	perf. Criteria B

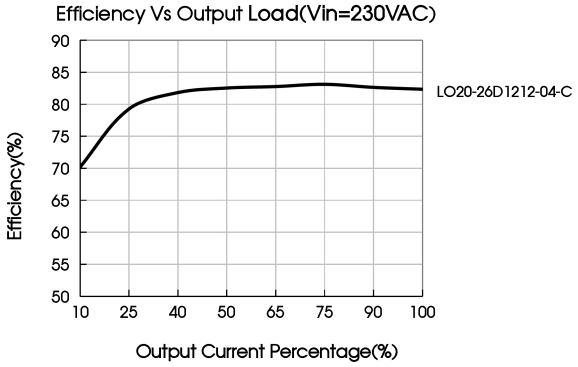
Product Characteristic Curve





Note: ①This 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. Typical application

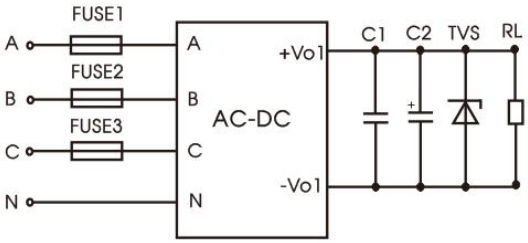


Fig.1: Typical circuit diagram

Part No.	FUSE1/FUSE2/FUSE3	C1(μF)	C2(μF)	TVS
LO20-26D1212-04-C	3.15A, slow-blow, required	1	100	SMBJ20A

Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2(refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

2. EMC compliance recommended circuit

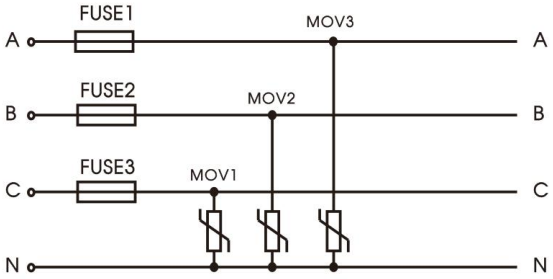
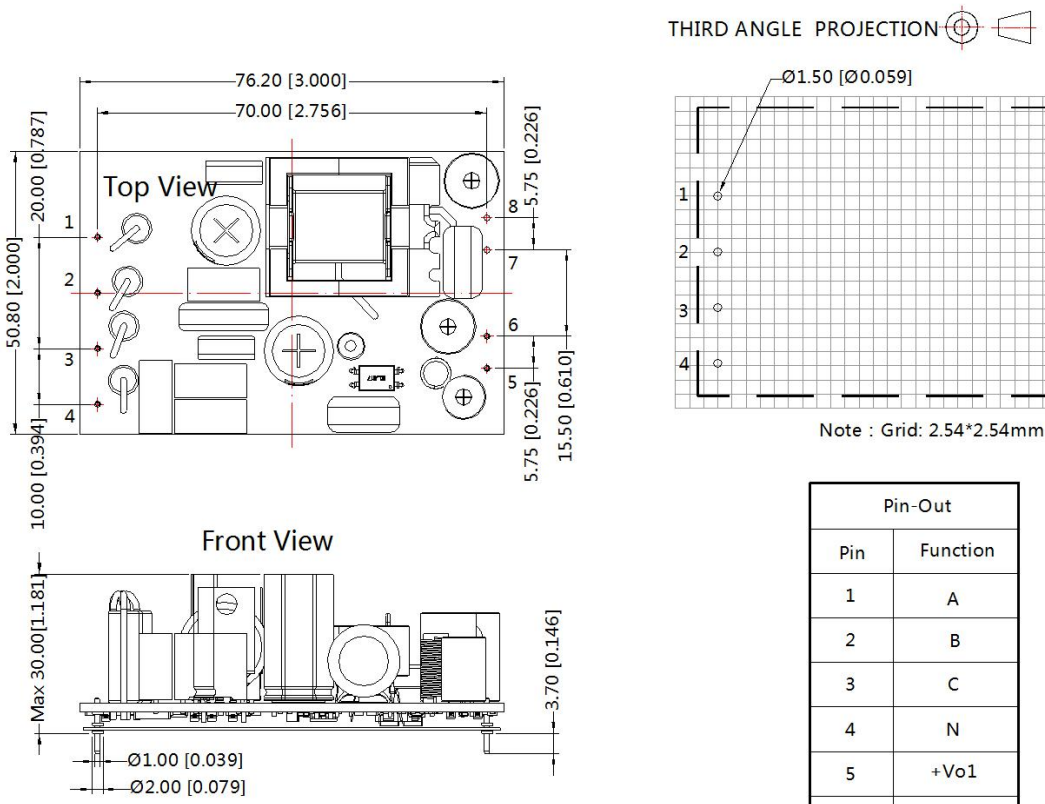


Fig 2: EMC circuit for harsh requirements

Component	Recommended value
MOV1/MOV2/MOV3	S20K510
FUSE1/FUSE2/FUSE3	3.15A, slow-blow, required

3. For additional information please refer to application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Pin-Out	
Pin	Function
1	A
2	B
3	C
4	N
5	+Vo1
6	-Vo1
7	No Pin
8	No Pin

Note :
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]
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: 58220060;
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 corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. 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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