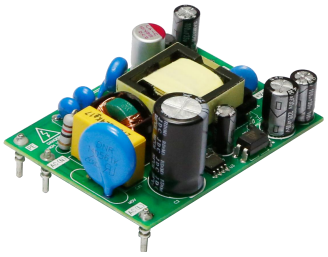
10W, AC/DC Converter



RoHS

FEATURES

- Universal Input: 85 - 305VAC/100 - 430VDC
- Regulated output, high efficiency
- Output short circuit, over-current, over-voltage protection
- Safety Class: CLASS I
- Special designed for power systems

LO10-23D0524-02E is one of Mornsun's dedicated power converter for power systems. It features universal AC input and at the same time accepts DC input voltage, high efficiency, high reliability, reinforced isolation. It offers good EMC performance compliant to UL/EN/IEC62368 standards, surge performance to meet the 4 level standards standards. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current		Efficiency at 230VAC (%) Typ.	Capacitive Load (μF) Max.	
			(Vo1/Io1)	(Vo2/Io2)		Vo1	Vo2
CE	LO10-23D0524-02E	9.8W	5V/1000mA	24V/200mA	78	800	200

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	VAC
	DC input	100	--	430	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	0.26	A
	230VAC	--	--	0.16	
Inrush Current	115VAC	--	10	15	
	230VAC	--	20	25	
Recommended External Input Fuse		2A/300V, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Vo1			--	±2	--	%
	Vo2			--	±10	--	
Line Regulation	Full load	Vo1		--	±0.5	--	
		Vo2		--	±1.5	--	
Load Regulation	10% - 100% load	Isolated and separated twin output (balanced load)	Vo1	--	±3	--	
			Vo2	--	±5	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	Vo1		--	--	100	mV
		Vo2		--	--	200	
Temperature Coefficient	Vo1			--	±0.02	--	%/℃
	Vo2			--	±0.15	--	
Stand-by Power Consumption	Room temperature, 230VAC			--	--	0.3	W
Short Circuit Protection				Continuous, self-recovery			
Over-current Protection				≥110%Io self-recovery			
Over-voltage Protection	5VDC Output			≤7.5VDC			
Minimum Load	Isolated and separated twin output (balanced load)			10	--	--	%
Hold-up Time	115VAC input			10	15	--	ms
	230VAC input			70	80	--	

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	Input-output	Electric Strength Test for 1min.	4000	--	--	VAC
	Input - PE		2000	--	--	
	Vo1 - Vo2		500	--	--	
Operating Temperature			-40	--	+70	℃
Storage Temperature			-40	--	+85	
Storage Humidity		Non condensing environment	--	--	90	%RH
Welding Temperature		Wave-soldering	260 ± 5℃; time: 5 - 10s			
		Manual-welding	360 ± 10℃; time: 3 - 5s			
Power Derating		-40℃ to -10℃	1.0	--	--	%/℃
		+50℃ to +70℃	1.0	--	--	
		85VAC-100VAC	2.0	--	--	%/VAC
		277VAC-305VAC	0.72	--	--	
Safety Standard			Meets UL62368/EN62368/IEC62368			
Safety Certification			EN62368			
Safety Class			CLASS I			
MTBF		MIL-HDBK-217F@25℃	>300,000 h			

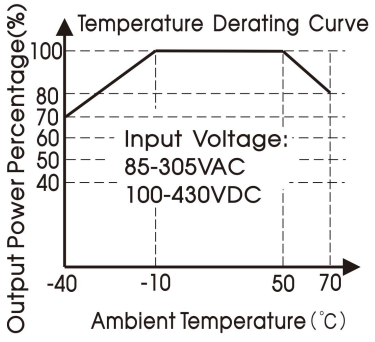
Mechanical Specifications

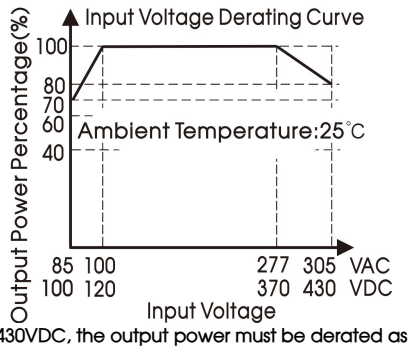
Dimension	61.00 x 45.00 x 28.00 mm
Weight	40 g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

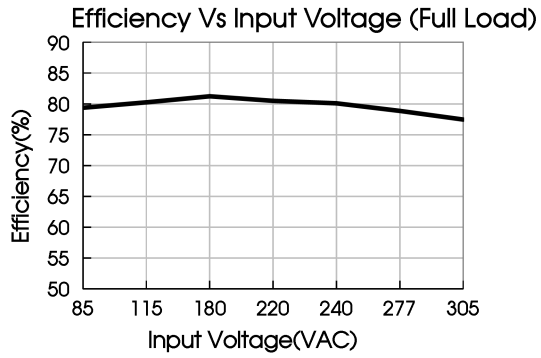
Emissions	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
Immunity	ESD	IEC/EN61000-4-2 Contact ±4KV	Perf. Criteria B
	RS	IEC/EN 61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±2KV/ line to ground ±4KV	perf. Criteria B
		IEC/EN61000-4-5 line to line ±4KV/line to ground ±6KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A

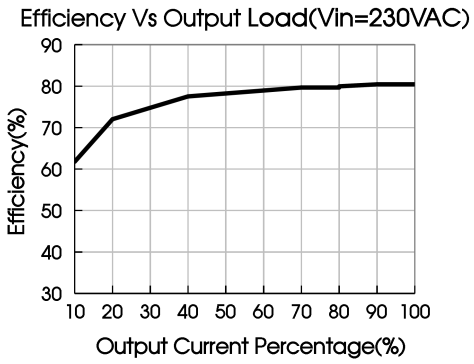
Product Characteristic Curve





Note: ① With an AC input between 85-100V/277-305VAC and a DC input between 100-120V/370-430VDC, the output power must be derated as per temperature derating curves;
② 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. Typical application

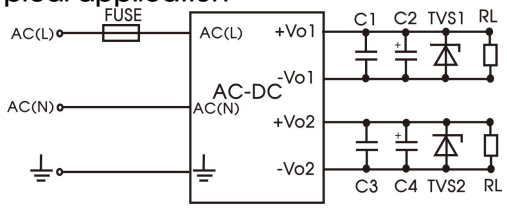


Fig. 1

Model	C2(μF)	C4(μF)	TVS1	TVS2	FUSE
LO10-23D0524-02E	10	10	SMBJ7.0A	SMBJ30A	2A/3000V slow-blow required

Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2, C4 (refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1, C3 are ceramic capacitors used for filtering high-frequency noise, recommended to use 1μF. TVS1/TVS2 are recommended component to protect post-circuits if converter fails.

2. EMC compliance recommended circuit

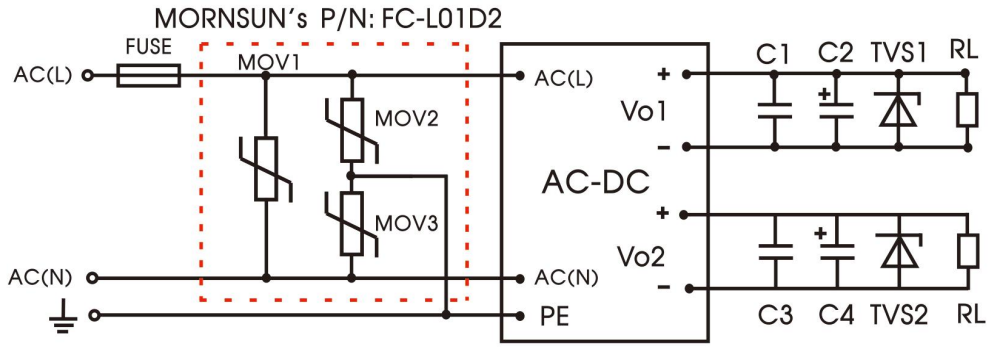


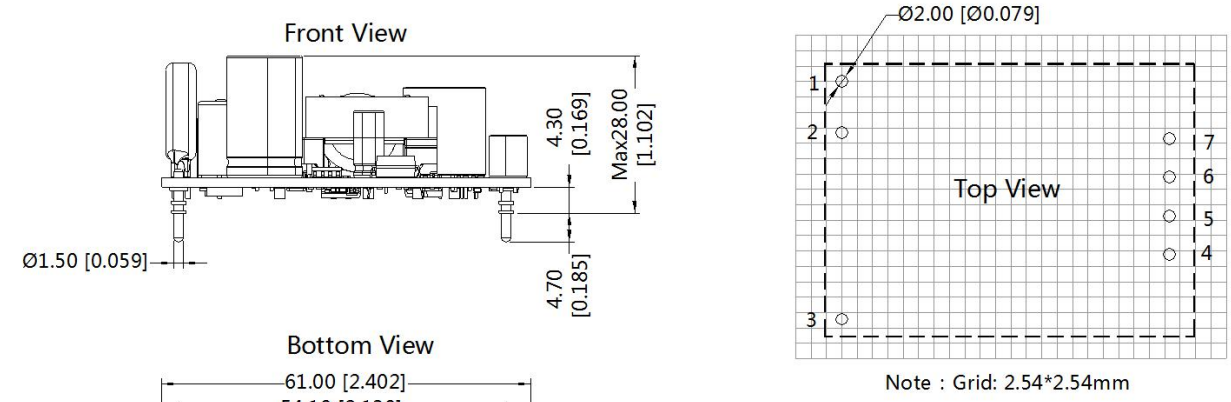
Fig. 2 (Output external circuit refer to the typical application circuit)

Component	Recommended value
MOV1	S20K350
MOV2, MOV3	S14K350
FUSE	2A/300V, slow-blow, required
We recommend using part no. FC-L01D2 (MORNSUN)	

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

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note : Grid: 2.54*2.54mm

Pin-Out	
Pin	Function
1	PE
2	AC(N)
3	AC(L)
4	-VO2
5	+VO2
6	-VO1
7	+VO1

Note:
Unit: mm[inch]
Pin section 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

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220017;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. 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;
5. All index testing methods in this datasheet are based on our company corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Specifications are subject to change without prior notice.

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