

- Ultra-wide 85 - 305VAC and 100 - 430VDC input voltage range
- Operating ambient temperature range: -40°C to +85°C
- Up to 87% efficiency
- No-load power consumption 0.1W
- 5000m altitude application
- Plastic case meets UL94V-0 flammability

AST15-23XXD-M



RoHS

3-Year Warranty

Description

AST15-23XXD-M series features ultra-wide AC input and at the same time accepts DC input voltage, low power consumption, low ripple & noise, high efficiency, high reliability, reinforced isolation. It offers good EMC performance compliant to IEC/EN61000-4 and CISPR32/EN55032 and meets IEC/EN/UL62368/EN60335/EN61558/IEC/EN60601-1/ANSI/AAMI ES60601-1 standards. The converters are widely used in industrial, power, medical treatment, home appliances, instrumentation, communication and civil applications. 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	Peak Power	Nominal Output Voltage and Current (Vo/Io)	Peak Current	Efficiency at 230 VAC (%) Typ.	Capacitive Load (uF) Max.
/	AST15-2303D-M	13.3W	14.85W	3.3V/4000mA	4500mA	81	8000
	AST15-2305D-M	15W	20W	5V/3000mA	4000mA	85	8000
	AST15-2309D-M			9V/1670mA	2200mA	85	5400
	AST15-2312D-M			12V/1250mA	1670mA	86	4000
	AST15-2315D-M			15V/1000mA	1330mA	87	3000
	AST15-2324D-M			24V/625mA	830mA	87	1000

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	--	440	Hz
Input Current	115VAC	--	--	0.5	A
	230VAC	--	--	0.3	
Inrush Current	115VAC	--	20	--	
	230VAC	--	45	--	
Leakage Current	277VAC/50Hz	0.1mA RMS Max.			
Built In Fuse		3.15A/300V, slow-blow			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			--	±1.5	--	%
Line Regulation	Full load		--	±0.5	--	
Load Regulation	0%-100% load		--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		--	100	150	mV
Stand-by Power Consumption	230VAC	3.3/5/9/12/15V	--	0.10	--	W
		24V	--	0.12	--	
Temperature Coefficient			--	±0.02	--	%/°C
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-current Protection			≥110%Io, self-recovery			
Over-voltage Protection	3.3/5V output		≤7.5VDC (Output voltage clamp or hiccup)			
	9V output		≤15VDC (Output voltage clamp or hiccup)			
	12/15V output		≤20VDC (Output voltage clamp or hiccup)			
	24V output		≤30VDC (Output voltage clamp or hiccup)			
Minimum Load			0	--	--	%
Hold-up Time	115VAC input		--	8	--	ms
	230VAC input		--	50	--	

Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor, 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., leakage current <5 mA		4000	--	--	VAC
Insulation Resistance	Input - output	At 500VDC		100	--	--	M Ω
Operating Temperature				-40	--	+85	°C
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℃	85VAC-165VAC	2.0	--	--	% /℃
		+50℃ to +70℃	3.3/5/9V	2.5	--	--	
		+55℃ to +70℃	12/15/24V	3.33	--	--	
		+70℃ to +85℃		1.33	--	--	
		85VAC - 100VAC		2.0	--	--	% /VAC
		277VAC - 305VAC		0.71	--	--	
		2000m - 5000m		0.67	--	--	% /Km
Safety Standard				IEC/EN/UL62368/EN60335/EN61558/EN60601			
Safety Certification				UL/EN/IEC62368/EN60335/EN61558			
Safety Class				CLASS II			
MTBF				MIL-HDBK-217F@25℃ > 1500,000 h			
Designed life		230VAC	Ta: 25℃ 100% load	> 130x103 h			
			Ta: 55℃ 100% load	> 16x103 h			
			Ta: 55℃ 80% load	> 27x103 h			

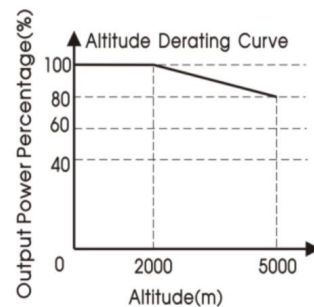
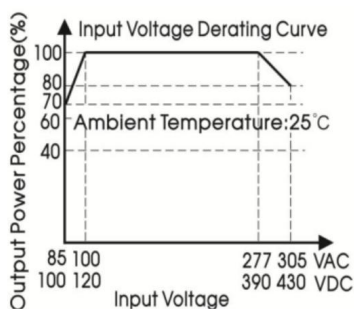
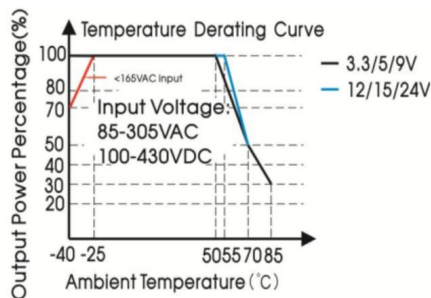
Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	52.40 x 27.20 x 24.00 mm
Weight	55g (Typ.)
Cooling method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B
		CISPR11/EN55011 CLASS B
		EN55014-1
	RE	CISPR32/EN55032 CLASS B
		CISPR11/EN55011 CLASS B
		EN55014-1
Immunity	ESD	IEC/EN 61000-4-2 Contact ±6KV / Air ±8KV Perf. Criteria B
		IEC/EN55014-2 Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m perf. Criteria A
		IEC/EN55014-2 perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV perf. Criteria B
		IEC/EN61000-4-4 ±4KV (See Fig.2 for recommended circuit) perf. Criteria B
		IEC/EN55014-2 perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±1KV perf. Criteria B
		IEC/EN61000-4-5 line to line ±2KV (See Fig.2 for recommended circuit) perf. Criteria B
		IEC/EN55014-2 perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s perf. Criteria A
		IEC/EN55014-2 perf. Criteria A
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%, 70% perf. Criteria B
		IEC/EN55014-2 perf. Criteria B

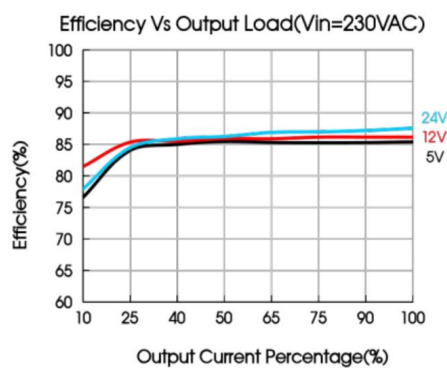
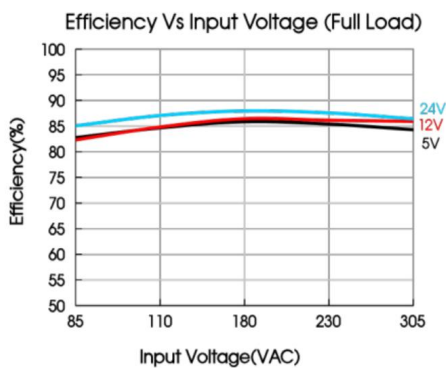
Product Characteristic Curves



Note: ① The product takes peak power (20W) as the starting point for derating.

② With an AC input between 85-100V/277-305VAC and a DC input between 100-120V/390-430VDC, the output power must be derated as per temperature derating curves;

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. Typical application

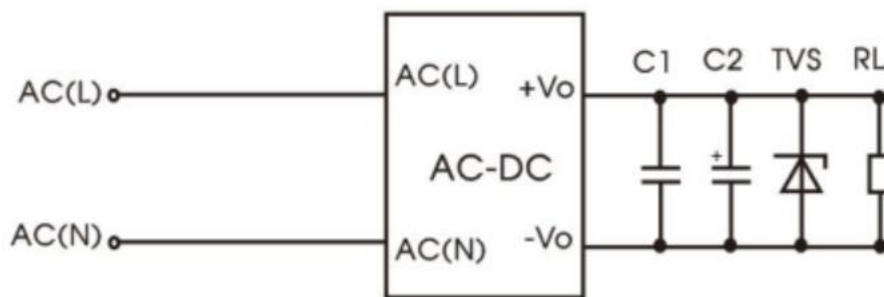


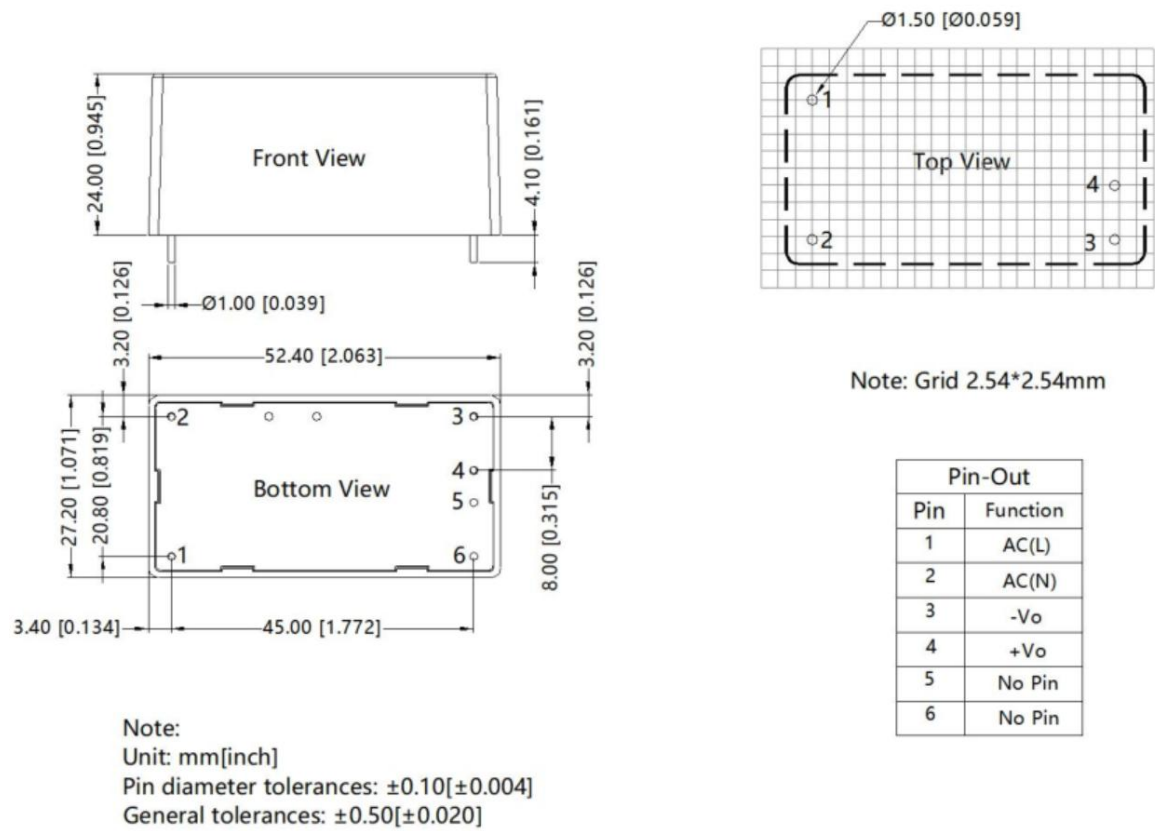
Fig. 1: Typical circuit diagram

Design Reference

Component	Recommended value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
R1	3Ω/3W

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



- Note:
1. 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;
 2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, 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";