

AC/DC Converter

AST6-20XXD



RoHS



3-Year Warranty

- Universal 85-264VAC or 100-370VDC input voltage
- Operating ambient temperature range: -40°C to +70°C
- High I/O isolation test voltage up to 4000VAC
- Regulated output, low ripple & noise
- Output short circuit, over-current, over-voltage protection
- High efficiency, high reliability
- Plastic case meets UL94V-0 flammability

Description

AST6-25XXD series features universal AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation. The converters are widely used in industrial, power, 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	Nominal Output Voltage and Current(Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
/	AST6-2003D	6W	3.3V/1250mA	70	4000
	AST6-2005D		5V/1200mA	76	4000
	AST6-2009D		9V/660mA	74	1000
	AST6-2012D		12V/500mA	77	820
	AST6-2015D		15V/400mA	77	820
	AST6-2024D		24V/250mA	80	330

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	264	VAC
	DC input	100	--	370	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	0.15	A
	230VAC	--	--	0.10	
Inrush Current	115VAC	--	10	--	
	230VAC	--	20	--	
Recommended External Input Fuse		1A/250V, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±3	--	%
	Other output	--	±2	--	
Line Regulation	Full load	--	±0.5	--	
Load Regulation	0% -100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	50	100	mV
Temperature Coefficient		--	±0.02	--	%/°C
Output Voltage Accuracy		Hiccup, continuous, self-recovery			
Over-current Protection		≥110%Io, self-recovery			
Over-voltage Protection	3.3/5VDC output	≤ 7.5V			
	9VDC output	≤ 15V			
	12/15 VDC output	≤ 20V			
	24 VDC output	≤ 30V			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Minimum Load		0	--	--	%
Hold-up Time	115VAC input	--	8	--	ms
	230VAC input	--	60	--	

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., leakage current <5mA	4000	--	--	VAC
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+105	
Storage Humidity		--	--	95	%RH
Soldering Temperature	Wave-soldering	260 ± 5°C; time: 5 - 10s			
	Manual-welding	360 ± 10°C; time: 3 - 5s			
Switching Frequency		--	100	--	kHz
Power Derating	-40°C to -25°C	2.66	--	--	
	+55°C to +70°C	2.66	--	--	
	85VAC - 100VAC	1.0	--	--	%/VAC
Safety Standard		IEC/UL62368-1 Safety Approval & EN62368-1 (Report)			
Safety Class		CLASS II			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

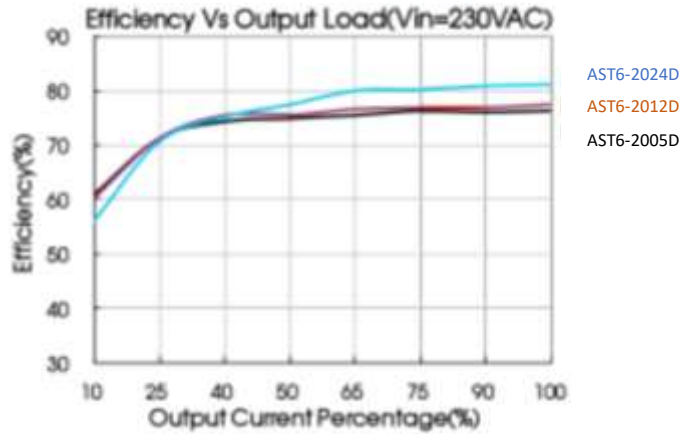
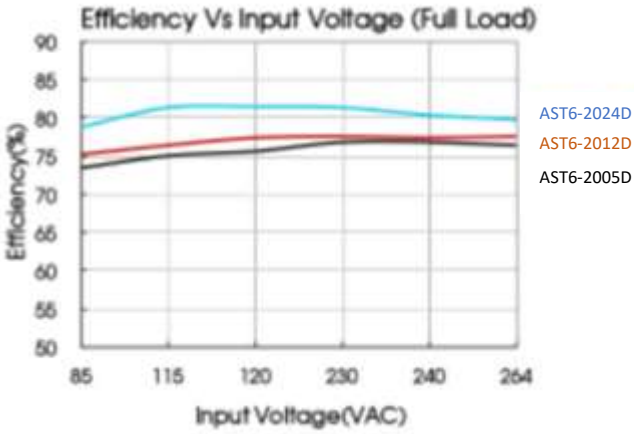
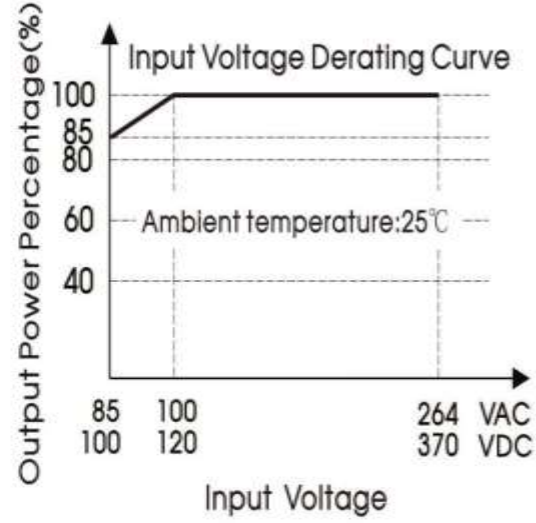
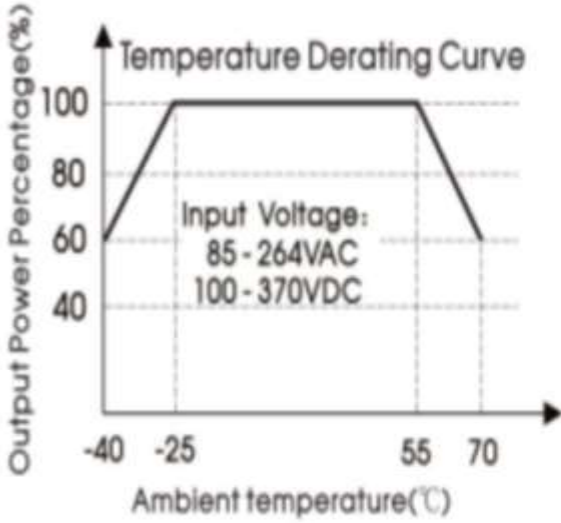
Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension DIP	50.80 x 25.40 x 15.36 mm
Dimension A2S chassis mounting	76.00 x 31.50 x 24.16 mm
Dimension A4S Din-Rail mounting	76.00 x 31.50 x 28.76 mm
Weight DIP	31g (Typ.)
Weight A2S chassis mounting	52g (Typ.)
Weight A4S Din-Rail mounting	70g (Typ.)
Cooling Method	Free air convection

EMC Specifications

Emissions	CE	CISPR32/EN55032 CLASS B
	RE	CISPR32/EN55032 CLASS B
Immunity	ESD	IEC/EN61000-4-2 Contact $\pm 6\text{KV}$ / Air $\pm 8\text{KV}$ perf.Criteria B
	RS	IEC/EN61000-4-3 10V/m perf.Criteria A
	EFT	IEC/EN 61000-4-4 +2KV perf.Criteria B
		IEC/EN 61000-4-4 $\pm 4\text{KV}$ (See Fig. 2 for recommended circuit) perf.Criteria B
	Surge	IEC/EN 61000-4-5 line to line $\pm 1\text{KV}$ perf.Criteria B
		IEC/EN 61000-4-5 line to line +2KV/line to ground +4KV perf.Criteria B (See Fig. 2 for recommended circuit)
	cs	IEC/EN61000-4-6 10Vt.m.s perf.Criteria A
Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%,70% perf.Criteria B	

Product Characteristic Curves



Design Reference

1. Typical application

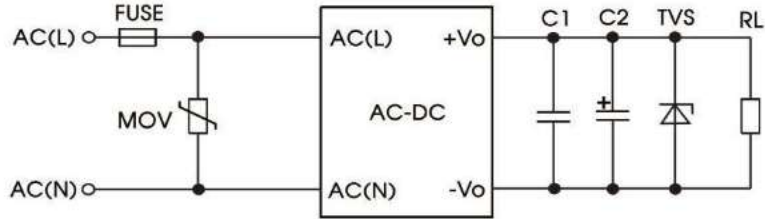


Fig. 1: Typical circuit diagram

Part No.	C1(uF)	C2(uF)	FUSE	MOV	TVS
AST6-2003D	1	220	1A/250V, slow-blow, required	S14K350	SMBJ7.0A
AST6-2005D		220			SMBJ7.0A
AST6-2009D		100			SMBJ12A
AST6-2012D		100			SMBJ20A
AST6-2015D		100			SMBJ20A
AST6-2024D		47			SMBJ30A

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

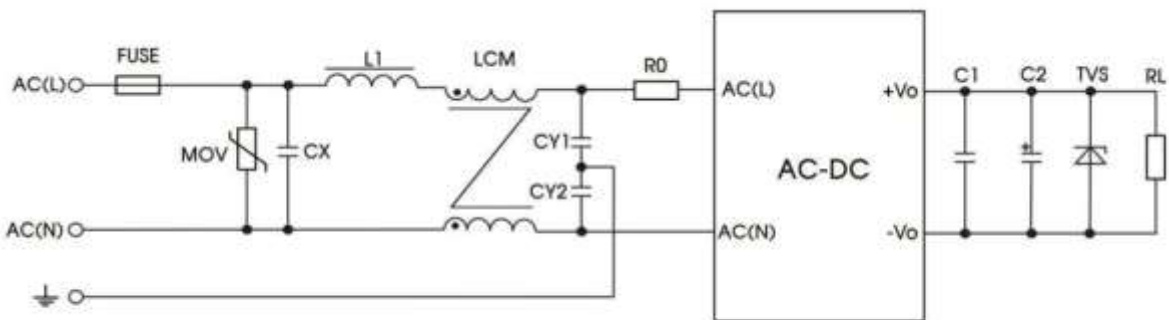


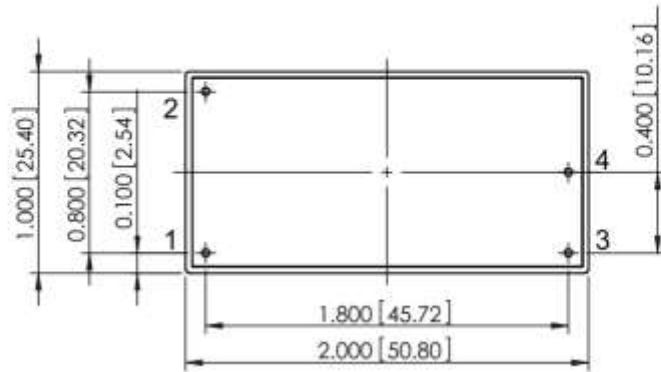
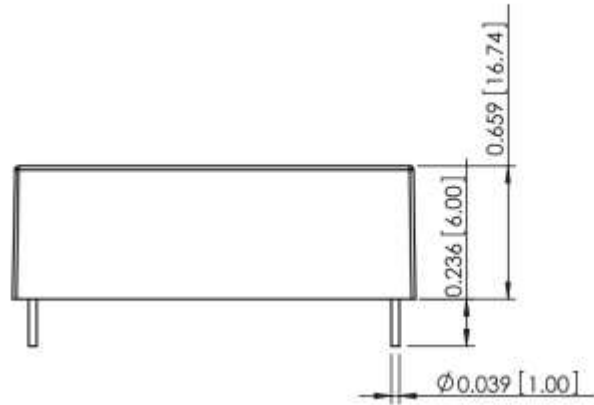
Fig. 2: EMC application circuit with higher requirements

Component	Recommended value
MOV	S14K350
CX	0.1uF/275VAC
L1	4.7uH/2.0A
CY1	1nF/400VAC
CY2	1nF/400VAC
LCM	2.2mH
FUSE	2A/250V, slow-blow, required
R0	33Ω/3W

Dimensions and Recommended Layout

units: inch [mm]
tolerance: X.XXX = ±0.020 [±0.50]

PIN CONNECTIONS	
PIN	Function
1	ACN
2	ACL
3	+Vout
4	-Vout



Note:

1. In order to guarantee product performance and datasheet compliance, the product must be operated within specifications and load range requirement;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on company corporate standards;
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";