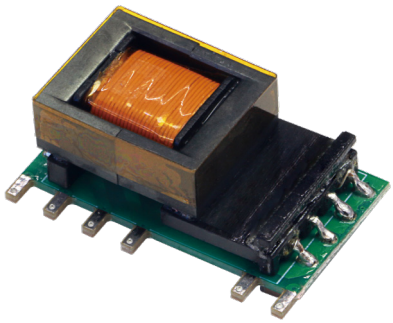
TPS-AWS10/1523S Series
AC/DC Converter



Product Feature

- Universal Input: 85-305VAC/100-430VDC
- Package Type: SIP
- Operating temperature range: -40°C - +85°C
- Isolation voltage: 4000VAC
- High efficiency up to: 85%(Type)
- Design in compliance with IEC/EN61558 and IEC/EN60335 standards
- Output short-circuit protection, Overcurrent protection, Overvoltage protection mechanism.

Selection Guide

Part No.	Input Voltage (VAC)	Output Power (W)	Output Voltage (VDC)	Output Current Max. (mA)	Full Load Efficiency% (Typ)	Capacity Load Max (μF)
TPS-AWS1023S03	85-305	6.6	3.3	2000	74	1500
TPS-AWS1023S05	85-305	10	5	2000	78	1500
TPS-AWS1023S09	85-305	10	9	1100	79	1000
TPS-AWS1023S12	85-305	10	12	840	83	680
TPS-AWS1023S15	85-305	10	15	670	83	470
TPS-AWS1023S24	85-305	10	24	420	84	330
TPS-AWS1523S03	85-305	10	3.3	3000	75	5000
TPS-AWS1523S05	85-305	14	5	2800	78	5000
TPS-AWS1523S09	85-305	15	9	1670	80	4000
TPS-AWS1523S12	85-305	15	12	1250	84	2000
TPS-AWS1523S15	85-305	15	15	1000	84	1000
TPS-AWS1523S24	85-305	15	24	625	85	680

Note:
1.Output voltage--It refers to the voltage value of the load side after adding the peripheral application circuit;
2.In order to use it safer, it is recommended to use this product in addition to welding and fixing, and dispensing and fixing.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input voltage	AC input	85	--	305	VAC
	DC input	100	--	430	VDC
Input currenton	110VAC	--	--	0.40	A
	230VAC	--	--	0.25	
Input frequency		47	--	63	Hz
Fuse		1A, slow-blow, required			
Hot plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	10%-100% Load		--	± 1	± 3	%
Linear Regulation	Rated load	3.3VDC Output	--	± 2.5	--	
		Other voltages	--	± 1.5	--	
Load Regulation	10%-100%load		--	± 3	--	
Ripple & Noise	20MHz bandwidth,10%-100%load		--	80	150	mV
Temperature Coefficient			--	± 0.15	--	%/°C
Stand-by Power Consumption	230VAC		--	0.10	0.25	W
Min. Load			0	--	--	%Io
Over Current Protection			110	--	--	%Io
Short-Circuit Protection			Continuous, Self-Recovery			
Hold-up Time	115VAC		--	8	--	ms
	230VAC		--	40	--	

General Specifications

Item	Working Conditions		Min.	Typ.	Max.	Unit
Isdlation Voltage	Input-output, test time 1 minute, leakagecurrent less than 5mA		4000	--	--	VAC
Power Derating	+55°C-+85°C	AWS10	2.5	--	--	%°C
	+55°C-+85°C	AWS15	3.00	--	--	
	85VAC-100VAC	AWS10	1.00	--	--	%/VAC
		AWS15	2.66	--	--	
	277VAC-305VAC	AWS10	0.72	--	--	
		AWS15	2.66	--	--	
Operating Temperature			-40	--	+85	°C
Storage Temperature			-40	--	+85	
Soldering Profile	Wave-soldering		260 ± 5°C; time: 5-10s			
	Manual-welding		360 ± 5°C; time: 3-5s			
Safety Standard	IEC/UL62368-1、IEC/EN60335-1、IEC/EN61558-1					
Safety Class			CLASS II			
MTBF	MIL-HDBK-217F@25°C		>1000Kh			

Mechanical Specification

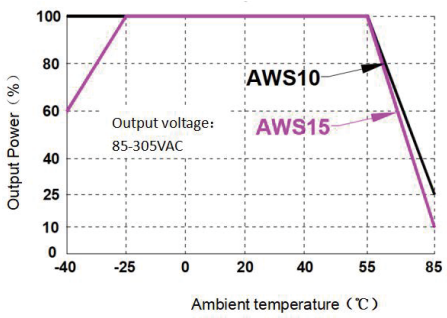
Package Dimensions	32.00 x 14.50 x 20.00mm
Weight	10.2g (Typ.)
Cooling Method	Free air convection

EMC Characteristic

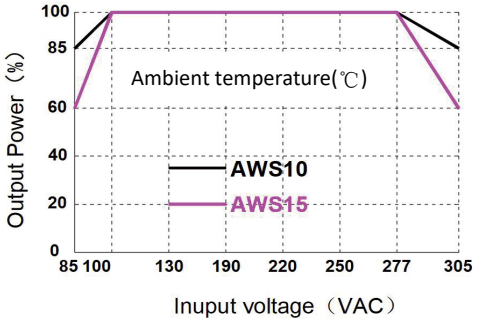
EMI	CE	CISPR32/EN55032 CLASS A(Application circuit)	
		CISPR32/EN55032 CLASS B(Recommended circuit)	
	RE	CISPR32/EN55032 CLASS A(Application circuit)	
		CISPR32/EN55032 CLASS B(Recommended circuit)	
EMS	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 +2KV(Application circuit 1、2)	perf. Criteria B
		IEC/EN61000-4-4 +4KV(Application circuit 3、4)	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line +1KV(Application circuit 1、2)	perf. Criteria B
		IEC/EN61000-4-5 line to line 2KV(Application circuit 3、4)	perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
	ESD	IEC/EN61000-4-2 Contact +6KV	perf. Criteria B

Typical characteristic curves

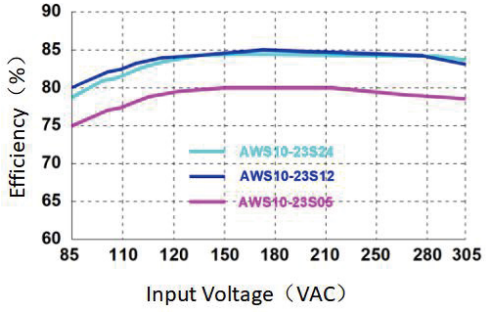
Input voltage derating curve



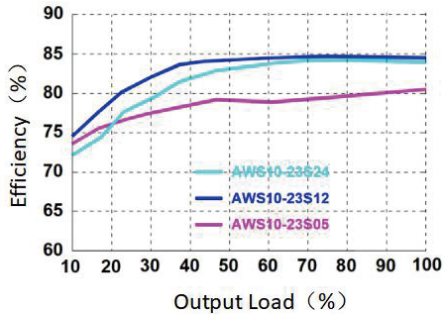
Temperature derating curve



Efficiency VS Input voltage curve (full load)

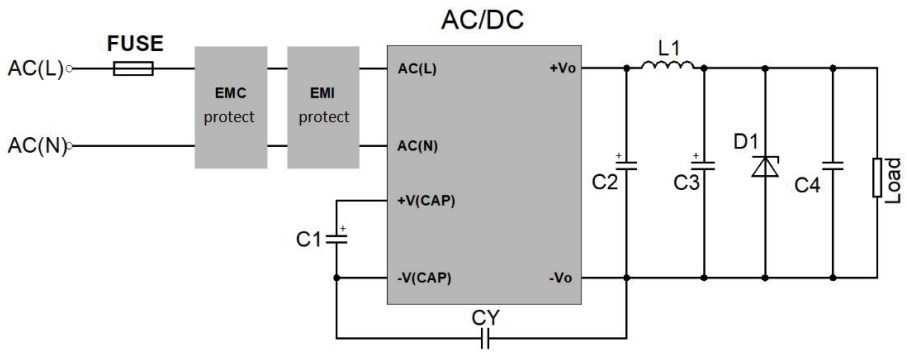


Efficiency VS Output load curve (Vin = 230 VAC)



Typical circuit design and application

Application circuit



Reference table for the selection of peripheral devices

Output voltage	C1*	C2*	L1*	C3*	C4	CY*	D1
3.3/5VDC 10W	22uF/450V	820uF/16V (Solid state capacitor)	2.2uH 6.5A 15m Ω MAX	150uF/25V	0.1uF/50V	1nF/400VAC	D1 is a TVS transistor that can protect the down-stream circuit in case of module abnormalities. It is recommended to choose a model that is 1.2 times the output voltage
9/12VDC 10W	22uF/450V	470uF/25V (Solid state capacitor)	2.2uH 6.5A 15m Ω MAX	150uF/25V	0.1uF/50V	1nF/400VAC	
15/24VDC 10W	22uF/450V	470uF/35V	3.3uH 5A 25m Ω MAX	100uF/35V	0.1uF/50V	1nF/400VAC	
3.3/5VDC 15W	33uF/450V	1000uF/16V (Solid state capacitor)	2.0uH 6.5A 15m Ω MAX	470uF/25V	0.1uF/50V	2.2nF/400VAC	
9/12VDC 15W	33uF/450V	470uF/25V (Solid state capacitor)	2.0uH 6.5A 15m Ω MAX	220uF/25V	0.1uF/50V	1nF/400VAC	
15/24VDC 15W	33uF/450V	470uF/35V	3.3uH 5A 25m Ω MAX	150uF/35V	0.1uF/50V	1nF/400VAC	

Note:

1.* Must be connected.

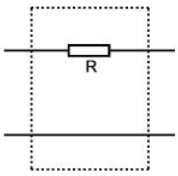
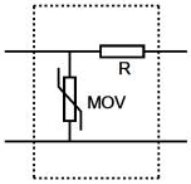
2. FUSE, EMC protection, and EMI protection are selected based on actual application needs;

3. C1 is a filtering electrolytic capacitor, which is a required component. It is recommended to use ripple current> 400mA@100KHz Electrolytic capacitors.

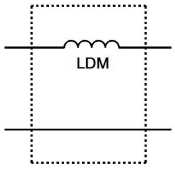
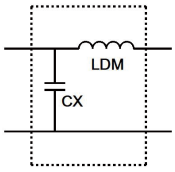
4. C2, C4, and L1 form a Pi type filtering circuit, and it is recommended to use high-frequency low resistance electrolytic capacitors or solid-state capacitors.

5. When selecting L1, ripple requirements can be considered, while paying attention to current and internal resistance values.

EMS protection circuit design reference

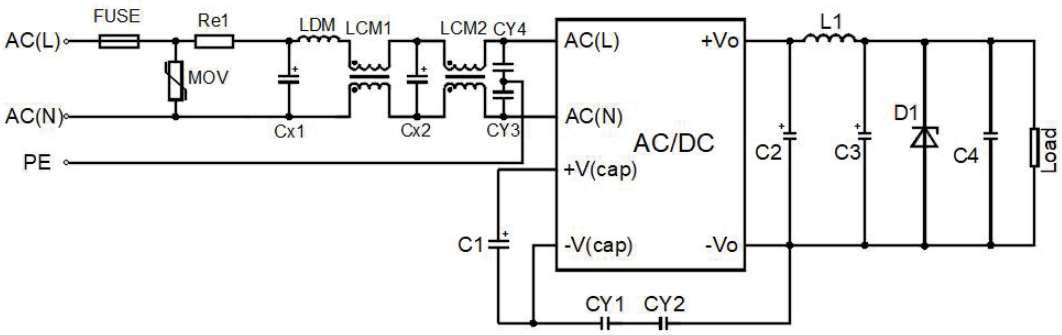
III level	IV level
	

EMI protection circuit design reference

Class A level	Class B level
	

EMC Solutions -Recommended circuits

Recommended circuit

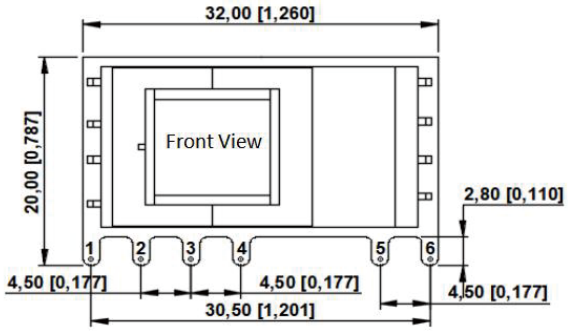


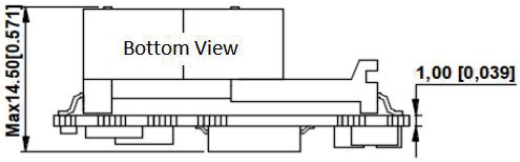
EMC Recommended Circuit Device Selection Reference Table

Components	Parameter
FUSE(Must be connected.)	2A/300V, Slow melting
R1	6.8Ω/3W (Winding resistance, Must be connected.)
MOV	14D561
LDM1	2.2mH/Max: 4Ω/Min:0.24A
LCM1	200uH 0.8A
LCM2	12.6mH/MIN 0.5A
Cx1,Cx2	0.1uF/310VAC
CY1,CY2,CY3	1nF/400VAC

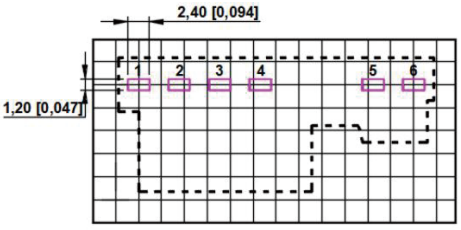
Dimensions and Recommended Layout

Dimensions





PCB Printing Layout



Grid size: 2.54*2.54mm

Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[+0.004]
General tolerances: +0.50[+0.020]

Pin Function Table

Pin	1	2	3	4	5	6
Function	AC(L)	AC(N)	+V(CAP)	-V(CAP)	-Vo	+Vo

Note:

- The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- Suggested dual output module load imbalance: ≤ ± 5%. If it exceeds ± 5%, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
- The maximum capacitive load is tested within the input voltage range and under full load conditions;
- Unless otherwise specified, all indicators in this manual are measured at Ta=25°C, humidity<75% RH, nominal input voltage, and output rated load;
- All indicator testing methods in this manual are based on our company's corporate standards;
- Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
- Product specifications are subject to change without prior notice.