Product Feature

1. Universal Input：85-305VAC / 100-430VDC
2. Operating temperature range：-40℃ - +85℃
3. Isolation:4000VAC
4. SIP ultra-small size, high power density, flexible application
5. The mechanism has input undervoltage protection, output short circuit protection and over current protection
6. Design meet IEC/EN61558、IEC/EN60335

RoHS CE 3 years Warranty

Selection Guide

Part No.	Input Voltage (VAC)	Out Power（W)	Out Voltage (VDC)	Out Current (mA)MAX	Full Load Efficiency %（Typ.）	Capacitive Load(μF) Max.
QO10-13B03R3	85-305	6.6	3.3	2000	74	15000
QO10-13B05R3		10	5	2000	78	12000
QO10-13B09R3		10	9	1100	79	6000
QO10-13B12R3		10	12	840	83	2000
QO10-13B15R3		10	15	670	83	1500
QO10-13B24R3		10	24	420	84	470
QO15-13B03R3	85-305	9.9	3.3	3000	75	15000
QO15-13B05R3		14	5	2800	78	12000
QO15-13B09R3		15	9	1670	80	6000
QO15-13B12R3		15	12	1250	84	2000
QO15-13B15R3		15	15	1000	84	1500
QO15-13B24R3		15	24	625	85	680

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage	AC Input	85	--	305	VAC
	DC Input	100	--	430	VDC
Input Current	110VAC	--	--	0.30	A
	230VAC	--	--	0.30	
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		--	±5	--	%
Linear Regulation	Rated load	3.3V	--	±2.5	--	
		Other	--	±1.5	--	
Load Regulation	10% - 100%load		--	±3.0	--	
Ripple & Noise	20MHz bandwidth, 10% - 100%load		--	80	100	mV
Temperature Coefficient			--	±0.15	--	%/℃
Stand-by Power Consumption	230VAC		--	0.10	0.25	W
Min. Load			10	--	--	%
Over Current Protection			110	--	--	%Io
Short-Circuit Protection			Continuous, Self-Recovery			
Hold-up Time	115VAC		--	8	--	ms
	230VAC		--	40	--	

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, test time 1 minute, leakage current less than 5mA	4000	--	--	VAC
Insulation Resistance	Input-output, insulated voltage 500VDC	100	--	--	MΩ
Power Derating	+55℃ - +85℃	1.67	--	--	%℃
	85VAC - 100VAC	1.72	--	--	
Operating Temperature		-40	--	+85	℃
Storage Temperature		-55	--	+105	
Soldering Profile	Wave-soldering	260 ± 5℃; time：5 - 10s			
	Manual-welding	360 ± 8℃; time：3 - 5s			
Safety Standard	IEC/UL62368-1、IEC/EN60335-1、IEC/EN61558-1				
Safety Class		CLASS Ⅱ			
MTBF	MIL-HDBK-217F@25℃	>1000Kh			

Mechanical Specification

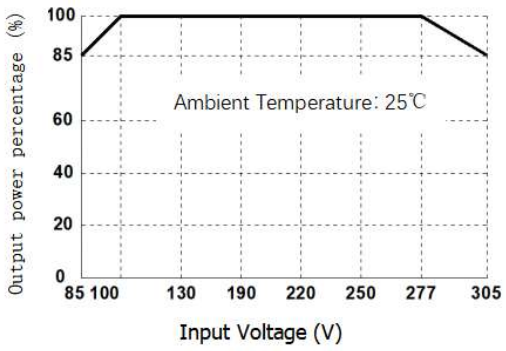
Package Dimensions	32.00 x 17.20 x 15.38 mm
Weight	10.2g (TYP.)
Cooling Method	Free air convection

EMC Specifications

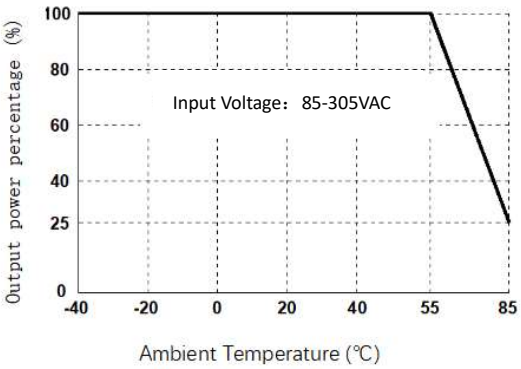
EMI	CE	CISPR32/EN55032 CLASS A（application circuit1，4）	
		CISPR32/EN55032 CLASS B（application circuit2，3）	
	RE	CISPR32/EN55032 CLASS A（application circuit1，4）	
		CISPR32/EN55032 CLASS B（application circuit2，3）	
EMS	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV（application circuit 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

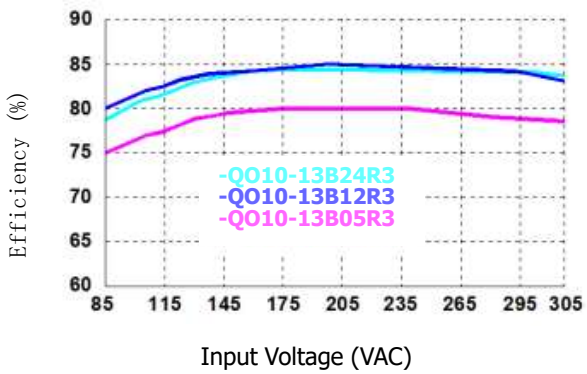
Input voltage Derating Curve



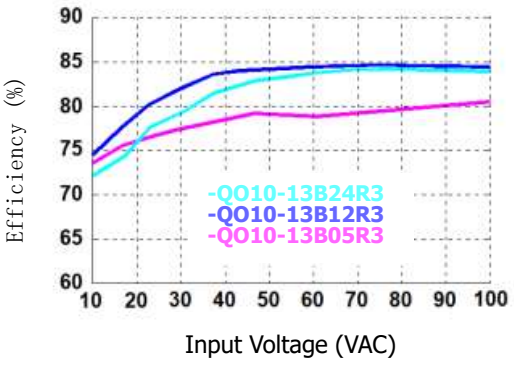
Temperature Derating Curve



Efficiency VS Input Voltage（Full Load）

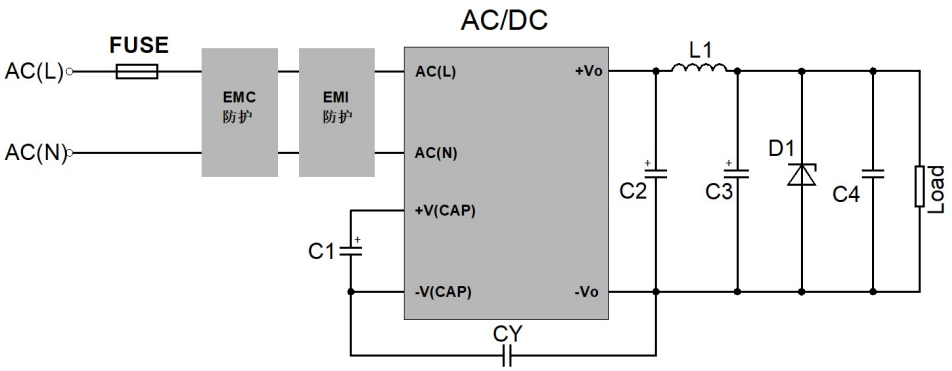


Efficiency VS Output Load （Vin=230VAC）



Typical Circuit Design And Application

Application circuit



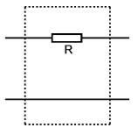
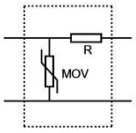
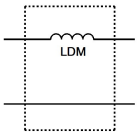
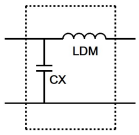
Reference Table for Selection of Peripheral Devices							
Output voltage	C1 (required)	C2 (required)	L1 (required)	C3 (required)	C4	CY (required)	D1
3.3/5VDC 10W	22uF/450V	820uF/16V	2.2uH 6.5A 15mΩMAX	150uF/25V	0.1uF/50V	1nF/400VAC	D1 is a TVS transistor that can protect the downstream circuit in case of module abnormalities. It is recommended to choose a model that is 1.2 times the output voltage
9/12VDC 10W		470uF/25V			0.1uF/50V		
15/24VDC 10W		470uF/35V	3.3uH 5A 25mΩMAX	100uF/35V	0.1uF/50V		
3.3/5VDC 15W	33uF/450V	1000uF/16V	2.0uH 6.5A 15mΩMAX	470uF/25V	0.1uF/50V	2.2nF/400VAC	
9/12VDC 15W		470uF/25V		220uF/25V	0.1uF/50V	1nF/400VAC	
15/24VDC 15W		470uF/35V	3.3uH 5A 25mΩMAX	150uF/35V	0.1uF/50V		

Note:

1. FUSE, EMC protection, and EMI protection are selected based on actual application needs;
2. C1 is a filtering electrolytic capacitor, which is a required component. It is recommended to use ripple current> 400mA@100KHz Electrolytic capacitors.
3. 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.
4. When selecting L1, ripple requirements can be considered, while paying attention to current and internal resistance values.

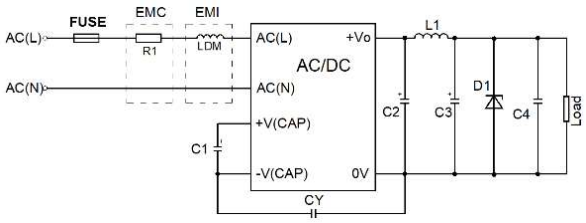
EMS Solutions - Recommended Circuits

Environmental Application - EMC Solution Selection Table						
Recommended circuit	Application environment	Application industry	Input Voltage	Ambient Temperature	EMI	EMS
1	Basic applications	-	85-305VAC	-40℃ - +85℃	Class A	III level
2	Indoor civil	Intelligent household electrical appliance		-25℃ - +55℃	Class B	III level
	Indoor ordinary	Intelligent building		-25℃ - +55℃	Class B	III level
3	Outdoor industry	Manufacturing workshop		-25℃ - +55℃	Class B	IV level
4	Outdoor ordinary	ITS/Charging point/Communication/Security and protection		-40℃ - +85℃	Class A	IV level

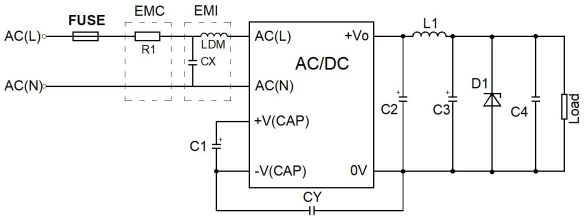
EMS protection circuit design reference		EMI protection circuit design reference	
III level	IV level	Class A	Class B
			

EMC Solutions - Recommended Circuits

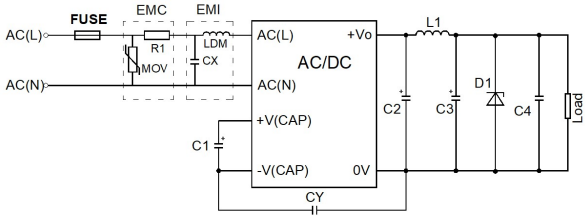
Recommended circuit 1



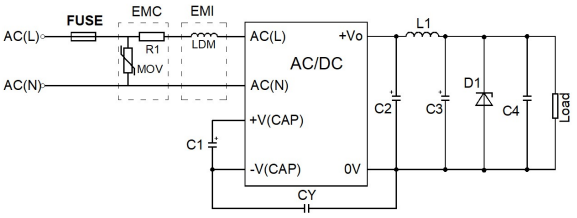
Recommended circuit 2



Recommended circuit 3



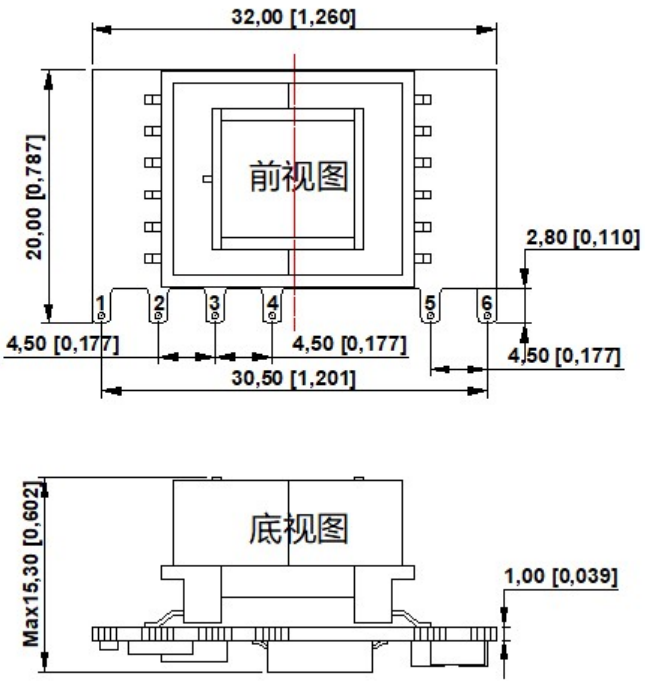
Recommended circuit 4



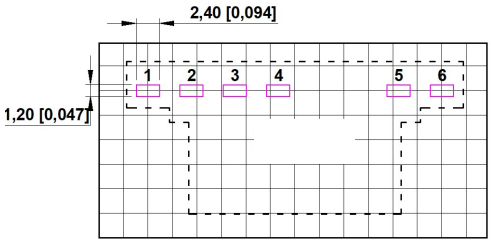
EMC Recommended Circuit Device Selection Reference Table				
Components	Recommended circuit 1	Recommended circuit 2	Recommended circuit 3	Recommended circuit 4
FUSE（required）	1A/300V，Slow melting		2A/300V，Slow melting	
Re1(wire-wound resistor, required)	6.8Ω/3W			
MOV	14D561			
LDM	2.2mH/Max: 4Ω/Min:0.24A			
CX	0.1uF/310VAC			

Dimensions and Recommended Layout

Dimensions	PCB Printing Layout



Grid size：2.54 x 2.54 mm



注:栅格距离尺寸 2.54mm*2.54mm

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

Note:

1. The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused;
2. Unless otherwise specified, the parameters in this datasheet were measured at 25℃, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on our company's enterprise standards.

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