FEATURES

1. Ultra-wide 85 - 305VAC and 100 - 430VDC input voltage range
2. Operating ambient temperature range: -40°Cto +85°C
3. Up to 87% efficiency
4. No-load power consumption 0.1W
5. 5000m altitude application
6. Plastic case meets UL94V-0 flammability
7. EMI performance meets CISPR32/EN55032 CLASS B, EN55014
8. IEC/EN62368, EN60335, EN61558 safety approval
9. Design to meet UL62368, IEC/EN60601-1/ANSI/AAMI ES60601-1 standards (2xMOPP)

RoHS CE 3 years Warranty

Selection Guide

Part No.	Output Power	Peak Power	Nominal Output Voltage and Current (Vo/Io)	Peak Current	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
RAD15-23B03R2-M	13.2W	14.85W	3.3V/4000mA	4500mA	81	8000
RAD15-23B05R2-M	15W	20W	5V/3000mA	4000mA	85	8000
RAD15-23B09R2-M			9V/1670mA	2200mA	85	5400
RAD15-23B12R2-M			12V/1250mA	1670mA	86	4000
RAD15-23B15R2-M			15V/1000mA	1330mA	87	3000
RAD15-23B24R2-M			24V/625mA	830mA	87	1000

Note: The product picture is for reference only. For details, please refer to the actual product.

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	–	%/℃
Short Circuit Protection		Hiccup, continuous, self-recover			
Over-current Protection		⩾110%Io, self-recover			
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	–	–	MΩ
Operating Temperature				-40	–	+85	℃
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				Meet IEC/EN/BS EN62368-1, EN61558-2-16, EN60335-1 Safety; Design refer to IEC/EN60601-1/ANSI/AAMI ES60601-1, UL62368-1			
Safety Class				CLASS I I			
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

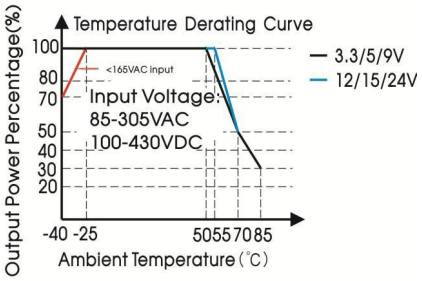
Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	52.40 x 27.20 x 24.00 mm
Weight	55g (Typ.)
Cooling method	Free air convection

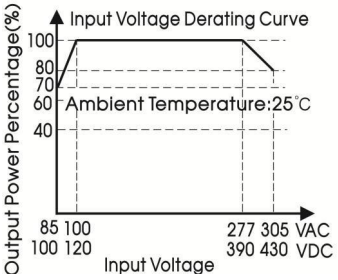
Electromagnetic Compatibility (EMC)

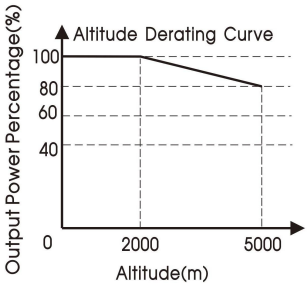
Emissions	CE	CISPR32/EN55032 CLASS B
		CISPR11/EN55011 CLASS B
		EN55014-1

	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

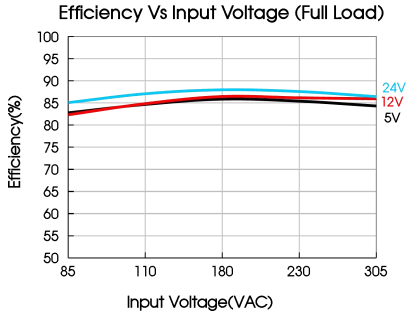
Typical Characteristic Curves

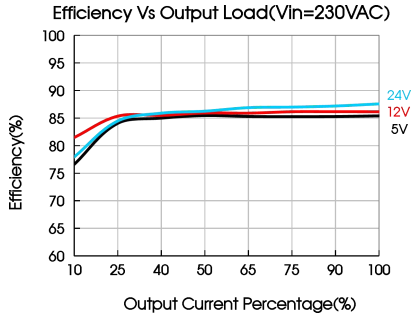






Note: ①The product takes peak power (20W) as the starting point for derating.
②With an AC input between 85-100V/277-305VAC and a DC input between 100-120V/390-430VDC, the output power must be derated as per temperature derating curves;
③This product is suitable for applications using natural air cooling





Design Reference

1. Typical application

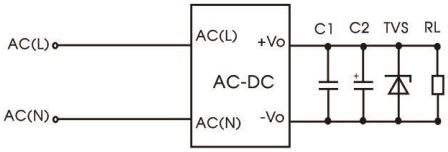


Fig. 1: Typical circuit diagram

Part No.	C1	C2	TVS
RAD15-23B03R2-M	1UF/50V	10uF/16V	SMBJ7.0A
RAD15-23B05R2-M		10uF/16V	SMBJ7.0A
RAD15-23B09R2-M		10uF/25V	SMBJ12A
RAD15-23B12R2-M		10uF/25V	SMBJ20A

RAD15-23B15R2-M		10uF/25V	SMBJ20A
RAD15-23B24R2-M		10uF/35V	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

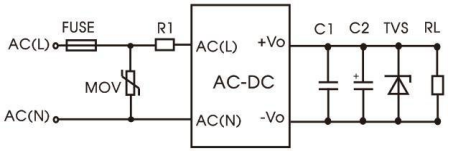
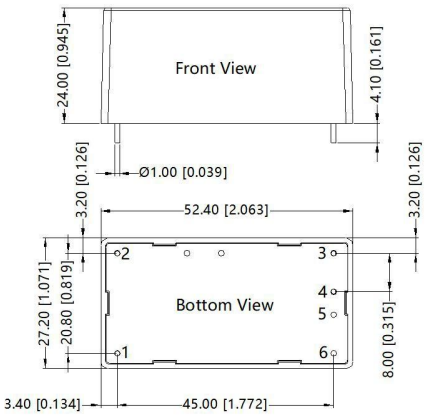


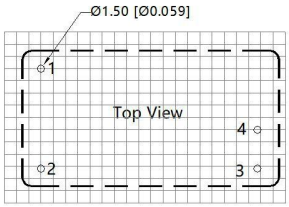
Fig. 2: EMC application circuit with higher requirements

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

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	AC(L)
2	AC(N)
3	-Vo
4	+Vo
5	No Pin
6	No Pin

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

Notes & Instructions

1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
2. The maximum capacitive load is tested under the input voltage range and full load condition;
3. Unless otherwise stated, all indexes in this manual are measured at Ta=25℃, humidity <75%RH, nominal input voltage and rated output load;
4. All index testing methods in this manual are based on the enterprise standards of the company;
5. Our company can provide product customization, specific needs can directly contact our technical staff;

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