Product Feature

1.Universal Input :85-305VAC/100-430VDC

2.Package Type: DIP

3.Operating Temperature Range : -40℃-+85℃

4.Isolation Voltage:4000VAC

5.Full Load Efficiency:87%

6.Input undervoltage protection

7.Output short circuit protection and over current protection

8.Meet safety standards: IEC/EN61558、IEC/EN60335

RoHS CE 3 years Warranty

Selection Guide

Part No.	Input Voltage (VAC)	Output Power (W)	Output Voltage (VDC)	Output Current Max.(mA)	Full Load Efficiency (230VAC,Typ)	Capacitive Load(μF) Max.
QM20-23B03R2	85-305	14.85	3.3	4000	81	8000
QM20-23B05R2	85-305	20	5	4000	85	8000
QM20-23B09R2	85-305	20	9	2200	84	5400
QM20-23B12R2	85-305	20	12	1670	85	4000
QM20-23B15R2	85-305	20	15	1330	87	3000
QM20-23B24R2	85-305	20	24	830	87	1000

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage	AC Input	85	--	305	VAC
	DC Input	100	--	430	VDC
Input Current	110VAC	--	--	0.3	A
	230VAC	--	--	0.25	
Input Frequency		47	--	63	Hz
Fuse		3.15A/300V, slow-blow, required			
Leakage Current	230VAC/50Hz	0.1mA RMS MAX.			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±2	--	%
Linear Regulation Rate	Vin=Min. to Max. @Full Load	--	±0.5	--	%
Load Regulation Rate	0%-100% load	--	±1.0	--	%
Ripple Noise	20MHz bandwidth,5%-100% load	--	100	150	mV
Temperature Drift Coefficient		--	±0.02	--	%/℃
Stand-by Power Consumption	230VAC	--	0.1	--	W
Min. Load		0	--	--	%
Over Current Protection		110	--	--	%Io
Short-Circuit Protection		Continuous, Self-Recovery			
Hold-up Time	230VAC	--	55	--	ms

General Specifications

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Insulation 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	-40℃ - -25℃	Input voltage	85-165VAC	2.0	--	--	%℃
	+50℃ - +85℃	Output voltage	3.3V/5V/9V	2.8	--	--	
	+50℃ - +85℃		12V/15V/24V	3.3	--	--	
	85VAC - 100VAC			2.0	--	--	%/VAC
	277VAC - 305VAC			0.7			
Operating Temperature				-40	--	+85	℃
Storage Temperature				-40	--	+85	℃
Storage Humidity				--	--	95	%RH
Soldering Profile	Wave-soldering			260 ± 5℃; time: 5 - 10s			
	Manual-welding			360 ± 10℃; time: 3 - 5s			
Safety Standard				IEC/UL62368-1			
Safety Class				CLASS II			
MTBF	MIL-HDBK-217F@25℃			>1,500,000h			

Mechanical Specifications

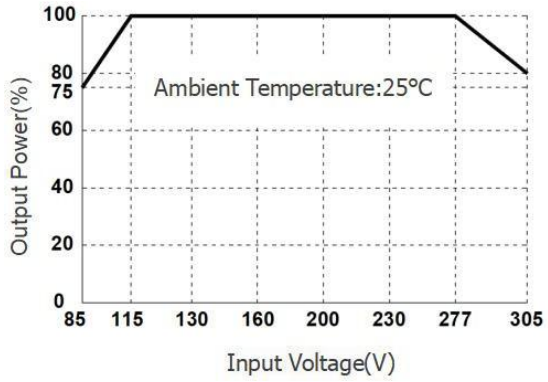
Case Material	Black plastic; flame-retardant and heat-resistant（UL94V-0）
Package Dimensions	52.40 x 27.20 x 24.00mm
Weight	54g（Typ.）
Cooling Method	Free air convection

EMC Specifications

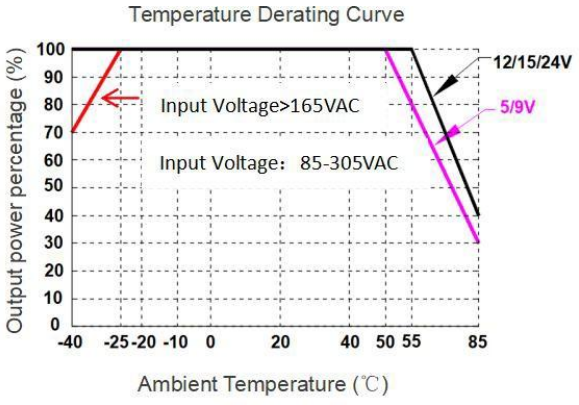
EMI	CE	CISPR32/EN55032 CLASS B		
	RE	CISPR32/EN55032 CLASS B		
EMS	RS	IEC/EN61000-4-3 10V/m	perf. Criteria	A
	EFT	IEC/EN61000-4-4 ±2KV	perf. Criteria	A
		IEC/EN61000-4-4 ±4KV（Figure 2）	perf. Criteria	A
	Surge	IEC/EN61000-4-5 line to line ±1KV	perf. Criteria	A
		IEC/EN61000-4-5 line to line ±2KV（Figure 2）	perf. Criteria	A
	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria	A
	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	perf. Criteria	A

Typical Characteristic Curves

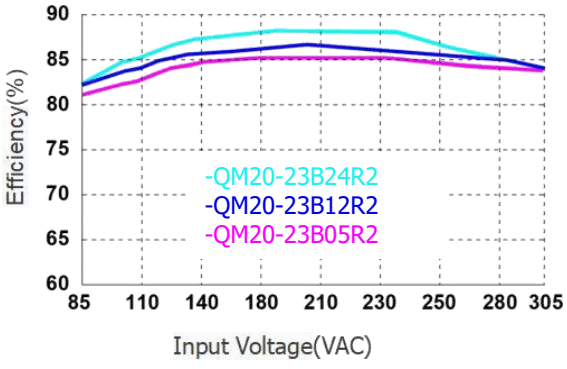
Input Voltage Derating Curve



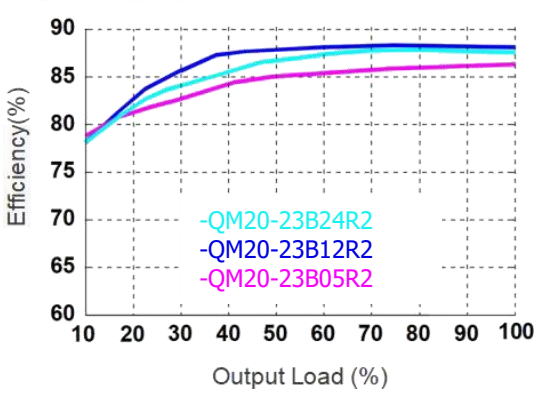
Temperature Derating Curve



Efficiency VS Input Voltage Curve （Full load）

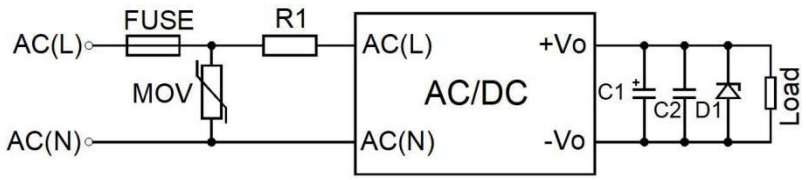


Efficiency VS Output Load Curve （Vin=230VAC）



Typical Circuit Design and Application

Application circuit（Figure 1）



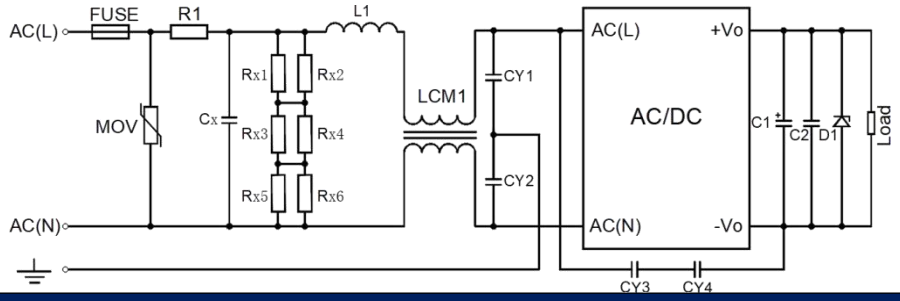
Reference Table for Selection of Peripheral Devices						
Out Voltage	FUSE	MOV	R1	C1	C2	D1
3.3/5VDC	3.15A/300VAC slow-blow, required	14D561K	6.8Ω/3W wire-wound resistor, required	220uF/16V	1uF/25	See Note2
9/12VDC				100uF/25V	1uF/25	
15/24VDC				100uF/35V	1uF/50	

Note：

1. Mov and NTC Can be selected based on actual needs.
2. 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.

EMS Solutions - Recommended Circuitst

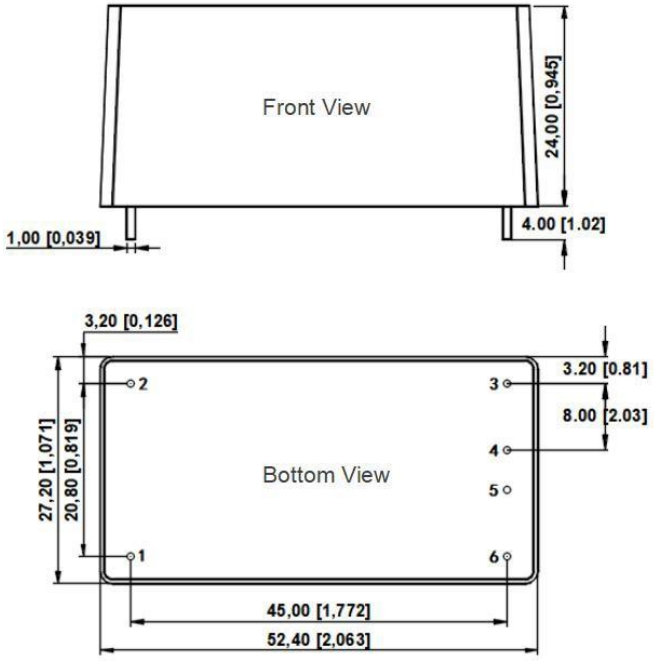
EMS Solutions - Recommended Circuitst（Figure 2）



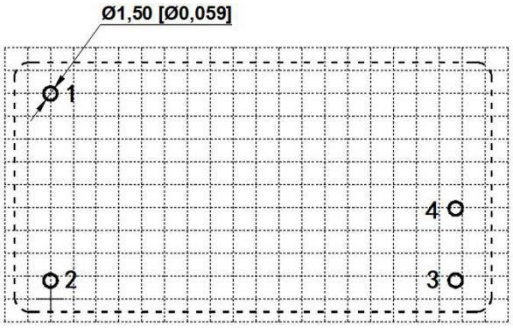
Recommended parameter values for EMC solution circuits	
Model	Recommended value
FUSE	3.15A/300VAC，slow-blow, required
MOV	14D561K
R1	6.8Ω/3W wire-wound resistor, required
Cx	0.33uF/305VAC
L1	1.2mH/0.5A
CY1、CY2	2.2nF/400VAC
CY3、CY4	1.0nF/400VAC
LCM	20mH，Common mode inductance
Rx1,Rx2,Rx3,Rx4,Rx5,Rx6	1.5MΩ/1206

Dimensions and Recommended Layout

Dimensions	PCB Printing Layout



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



Grid size：2.54*2.54mm

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

Note：

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. 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;
3. The maximum capacitive load is tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, all indicators in this manual are measured at Ta=25 ℃, humidity<75% RH, nominal input voltage, and output rated load;
5. All indicator testing methods in this manual are based on our company's corporate standards;
6. Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
7. Product specifications are subject to change without prior notice.