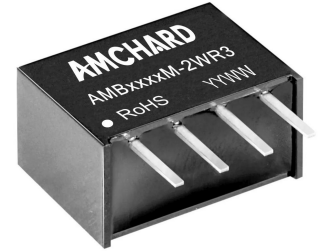


Features

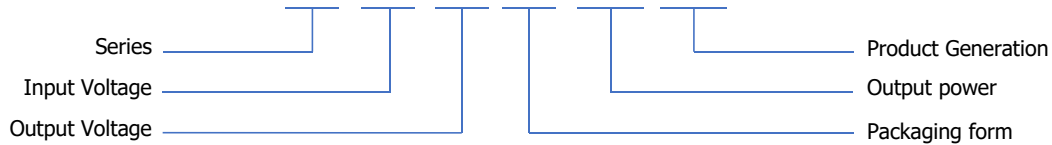
1. Wide operating temperature range: -40°C to +105°C
2. Up to 85% efficiency
3. No load current as low as 5mA
4. Ripple as low as 30mVp-p
5. Sustainable short-circuit protection
6. Isolation:1500VDC
7. Fixed voltage input, Output 2W, Isolated, Non Stabilized voltage, Single Output, SIP package.



3 years
Warranty

Model Numbering

AMBxxxM-2WR3



Selection Guide

Product model	Input Voltage Standard value(range)	Output Voltage	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (µF)
AMB0303M-2WR3	3.3VDC (2.97-3.63)	3.3	400/40	74/79	2400
AMB0305M-2WR3		5	400/40	79/85	2400
AMB0309M-2WR3		9	222/22	79/85	1000
AMB0312M-2WR3		12	167/17	79/85	560
AMB0315M-2WR3		15	133/13	81/86	560
AMB0324M-2WR3		24	83/8	81/86	220

Product model	Input Voltage Standard value(range)	Output Voltage	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (μ F)
AMB0503M-2WR3	5VDC (4.5-5.5)	3.3	400/40	74/79	2400
AMB0505M-2WR3		5	400/40	79/85	2400
AMB0509M-2WR3		9	222/22	79/85	1000
AMB0512M-2WR3		12	167/17	79/85	560
AMB0515M-2WR3		15	133/13	81/86	560
AMB0524M-2WR3		24	83/8	81/86	220
AMB0903M-2WR3	9VDC (8.1-9.9)	3.3	400/40	74/79	2400
AMB0905M-2WR3		5	400/40	79/85	2400
AMB0909M-2WR3		9	222/22	79/85	1000
AMB0912M-2WR3		12	167/17	79/85	560
AMB0915M-2WR3		15	133/13	81/86	560
AMB0924M-2WR3		24	83/8	81/86	220
AMB1203M-2WR3	12VDC (10.8-13.2)	3.3	400/40	74/79	2400
AMB1205M-2WR3		5	400/40	79/85	2400
AMB1209M-2WR3		9	222/22	79/85	1000
AMB1212M-2WR3		12	167/17	79/85	560
AMB1215M-2WR3		15	133/13	81/86	560
AMB1224M-2WR3		24	83/8	81/86	220
AMB1503M-2WR3	15VDC (13.5-16.5)	3.3	400/40	74/79	2400
AMB1505M-2WR3		5	400/40	79/85	2400
AMB1509M-2WR3		9	222/22	79/85	1000
AMB1512M-2WR3		12	167/17	79/85	560
AMB1515M-2WR3		15	133/13	81/86	560
AMB1524M-2WR3		24	83/8	81/86	220
AMB2403M-2WR3	24VDC (21.6-26.4)	3.3	400/40	74/79	2400
AMB2405M-2WR3		5	400/40	79/85	2400
AMB2409M-2WR3		9	222/22	79/85	1000
AMB2412M-2WR3		12	167/17	79/85	560
AMB2415M-2WR3		15	133/13	81/86	560
AMB2424M-2WR3		24	83/8	81/86	220

Input Characteristics

Parameter	Conditions		Min.	Typ.	Max.	Units
Input current (Rated Load)	Nominal voltage input@3.3VDC	3.3VDC Output	--	770	790	mA
		5VDC/7.2VDC Output	--	750	770	mA
		9VDC/12VDC Output	--	740	760	mA
		15VDC/24VDC Output	--	730	750	mA
	Nominal voltage input@5VDC	3.3VDC Output	--	535	565	mA
		5VDC/7.2VDC Output	--	475	500	mA
		9VDC/12VDC Output	--	470	495	mA
		15VDC/24VDC Output	--	465	490	mA
	Nominal voltage input@12VDC	3.3VDC Output	--	220	240	mA
		5VDC/7.2VDC Output	--	205	215	mA
		9VDC/12VDC Output	--	200	210	mA
		15VDC/24VDC Output	--	165	175	mA
	Nominal voltage input@15VDC	3.3VDC Output	--	165	175	mA
		5VDC/7.2VDC Output	--	155	165	mA
		9VDC/12VDC Output	--	150	160	mA
		15VDC/24VDC Output	--	125	135	mA
	Nominal voltage input@24VDC	3.3VDC Output	--	110	120	mA
		5VDC/7.2VDC Output	--	105	115	mA
		9VDC/12VDC Output	--	100	110	mA
		15VDC/24VDC Output	--	95	105	mA
Input current (No-load)			--	5	20	mA
Reflected ripple current			3	15	20	mA
Input impulse voltage	1sec. max.	3.3VDC/5VDC Input	-0.7	--	9	VDC
		9VDC Input	-0.7	--	12	VDC
		12VDC Input	-0.7	--	18	VDC
		15VDC Input	-0.7	--	21	VDC
		24VDC Input	-0.7	--	30	VDC
Input filter	Capacitive filtering					
Remarks: This product does not support hot plug						

Output Characteristic

Parameter	Conditions	Min.	Typ.	Max.	Units	
Output voltage accuracy		See Figure 3 (envelope curve)				
Linear regulation rate	Input voltage variation +/- 1%	3.3VDC Output	--	--	+/-1.5	%
		Other outputs	--	--	+/-1.2	%
Load regulation rate	10% to 100% load	3.3VDC Output	8	12	20	%
		5VDC Output	5	10	15	%
		9VDC Output	3	8	10	%
		12VDC Output	3	7	10	%
		15VDC Output	3	6	10	%
		24VDC Output	2	5	10	%
Ripple & Noise	20MHz bandwidth	--	30	100	mVp-p	
Temperature drift coefficient	100% load	--	+/-0.03	--	%/°C	
Short circuit protection	Sustainable, Self-healing					
Note: The testing method for ripple and noise is the parallel line testing method.						

General Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Input-output, Test time 1 minute, Leakage current less than 1 mA	1500	--	--	VDC
Insulation resistance	Input-output, Insulation voltage 500VDC	1000	--	--	MΩ
Isolation capacitance	Input-output, 100KHz/0.1V	--	20	50	pF
Working temperature	Temperature ≥ 85 °C for derating (See Figure 4)	-40	--	+105	°C
Storage temperature		-55	--	+125	°C
Storage humidity	Non condensing	--	--	95	%RH

Parameter	Conditions	Min.	Typ.	Max.	Units
Housing temperature rise during operation	Ta=25 °C, Nominal input, Full output	--	15	25	°C
Soldering temperature resistance of pins	The distance from the welding spot to the shell is 1.5mm, 10 seconds	--	--	300	°C
	REFLOW: Peak temperature Tc ≤ 245 °C, maximum time above 217 °C for 60 seconds.	--	--	245	°C
Switching frequency	Full load, Nominal input voltage	100	270	--	kHz
Mean time between failures 【MTBF】	MIL-HDBK-217F@25°C	3500	--	--	kHours

Physical Characteristics

Parameter	Content
Housing material	Black flame retardant and heat-resistant plastic (UL94V-0)
Overall dimensions	19.65 x 7.05 x 10.16mm
Weight	2.4g(Typ.)
Cooling mode	Natural air cooling

EMC Characteristics

Parameter	Category	Content
EMI	Conductive disturbance	CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 2)
	Radiation disturbance	CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 2)
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact ±4KV perf. Criteria B

Circuit Design and Application

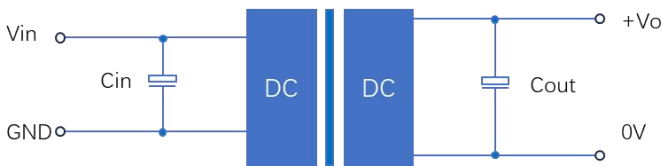


Figure 1: Application circuit

Table 1: Recommended Capacitive Load Values

Vin(VDC)	Cin(μF)	Vo(VDC)	Cout(μF)
Nominal voltage	1-10	Nominal voltage	2.2-22

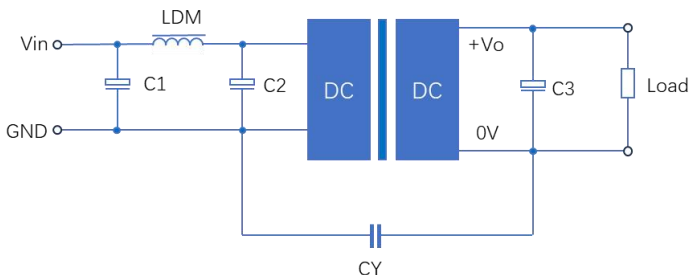


Figure 2: EMC Typical Recommended Circuits

Table 2: Recommended Circuit Parameter Values

Category	Component	Value
EMI	C1	4.7μF /50V
	C2	4.7μF /50V
	C3	2.2-22μF /50V
	CY	270pF/2kV
	LDM	6.8μH

1. Typical application: If further reduction of input and output ripple is required, a capacitor filter network can be connected at the input and output ends. The application circuit is shown in Figure 1. However, suitable filter capacitors should be selected. If the capacitance is too large, it may cause overcurrent or poor startup of the power supply. For each output, while ensuring safe and reliable operation, the recommended capacitance load values are shown in Table 1.
2. EMC requirements: For situations with high EMC requirements, a typical EMC recommended circuit is shown in Figure 2.
3. Input requirements: Ensure that the fluctuation range of the input voltage does not exceed the upper and lower limits of the input voltage specified in this data sheet, and the input power must be greater than the output power specified in this data sheet. For situations with a 24V input voltage, it is recommended to connect a TVS tube between the positive and negative input pins for protection (recommended parameters for TVS tubes: 30V, bidirectional, SOD-123 packaging).
4. Output load requirements: Try to avoid using it without load as much as possible; When the actual power of the load is less than 10% of the rated output power in this data sheet, or when it needs to be used in no-load situations, it is recommended to connect a load resistor externally at the output end. The load resistor can be calculated according to 5-10% of the rated power in this data sheet. The calculation formula for the load resistor value is $R_L = U_{out}^2 / (P_{out} * 10\%)$.
5. Overload protection: Under normal working conditions, the output circuit of this product has no protection function for overload situations. The simplest method is to connect a self recovery fuse in series at the input end, or add a circuit breaker outside the circuit; Or during design and selection, the actual power of the circuit should be around 60-80% of the rated power in this data sheet.

Product Characteristic Curve

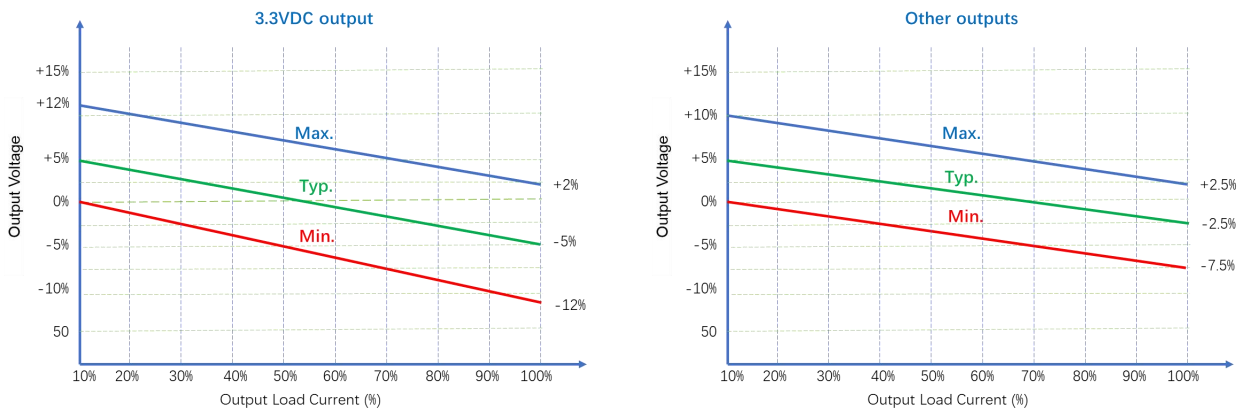


Figure 3: Voltage tolerance envelope

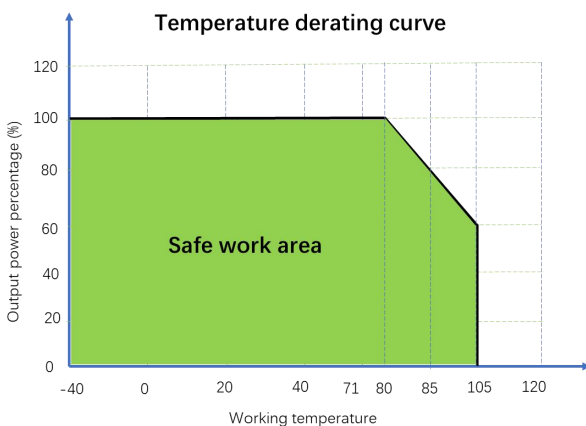


Figure 4: Temperature Derating Curve

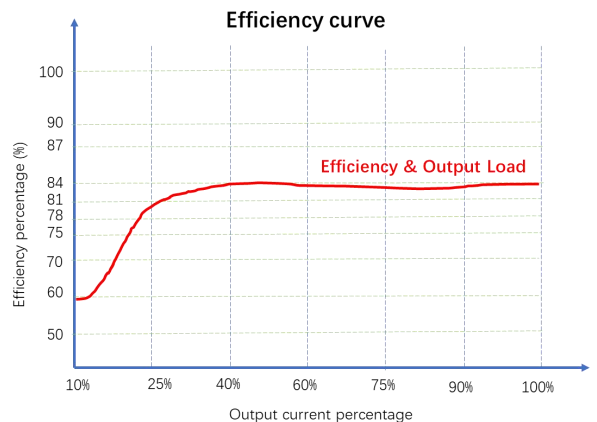


Figure 5: Efficiency VS Output Load (Nominal Voltage Input)

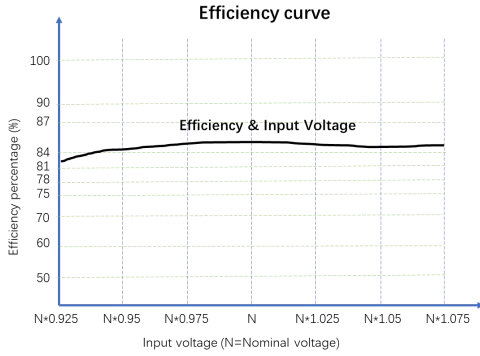


Figure 6: Efficiency VS Input Voltage (100% Load)

Overall Dimensions and Pin Functions

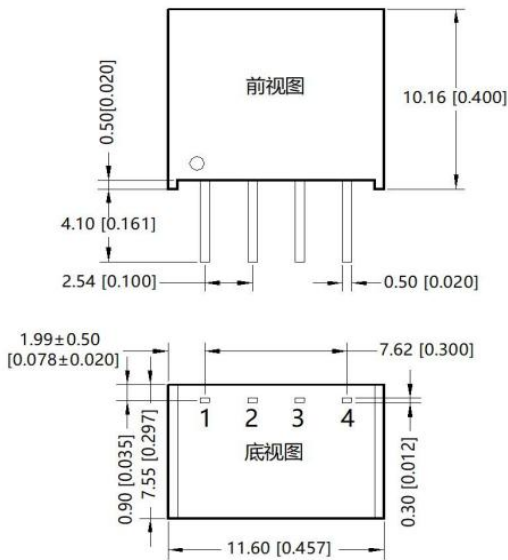


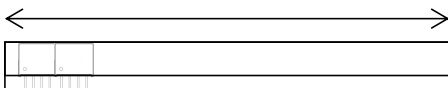
Table 3: Pin Function Table

Pin	Function
1	Vin
2	GND
3	0V
4	+Vo

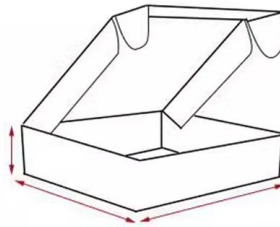
Note:
 Dimensions in mm[inch]
 Terminal diameter tolerance: +/-0.10mm
 Undeclared tolerance: +/-0.50mm

Figure 7: Overall dimensions

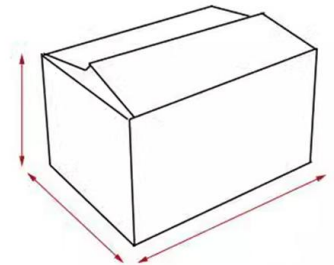
Packaging Method



30 Pieces/Tube



1500 Pieces/Inner box



7500 Pieces/Outer box

Notes & Instructions

1. The input voltage shall not exceed the specified range value, otherwise permanent and unrecoverable damage may be caused;
2. Unless otherwise specified, the parameters in this manual are measured at 25 °C, 40%~75% humidity, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on the company's enterprise standards.
4. The copyright and the final interpretation right of the product belong to AMCHARD.

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