

DCMB_YD-20W Series



CE Report

RoHS



FEATURES

- Wide voltage range input (2:1)
- Wide operating temperature range : -40°C to +105°C
- Up to 91% efficiency
- Isolation voltage : 1.5K VDC
- Output short circuit, overcurrent, overload protection
- Input under-voltage protection
- International standard pins compatible
- 3 Years Warranty

DESCRIPTION

DC-DC module power supply, Wide voltage input, Power 20W, Isolated, Regulated, Single output, DIP packaging

MODEL NUMBERING

DCMBxxxxYD-20W



SELECTION GUIDE

Product Model	Input Voltage Standard Value(range)	Output Voltage (Vdc)	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (μF)
DCMB1203YD-20W	12VDC (9-18)	3.3	5000/0	84/86	10000
DCMB1205YD-20W		5	4000/0	87/89	10000
DCMB1212YD-20W		12	1667/0	87/89	1600
DCMB1215YD-20W		15	1333/0	88/90	1000
DCMB1224YD-20W		24	833/0	88/90	500

DC-DC CONVERTERS

20 WATTS

Product Model	Input Voltage Standard Value(range)	Output Voltage (Vdc)	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (μF)
DCMB2403YD-20W	24VDC (18-36)	3.3	5000/0	86/88	10000
DCMB2405YD-20W		5	4000/0	88/90	10000
DCMB2412YD-20W		12	1667/0	88/90	1600
DCMB2415YD-20W		15	1333/0	88/90	1000
DCMB2424YD-20W		24	833/0	89/91	500
DCMB4803YD-20W	48VDC (36-75)	3.3	5000/0	86/88	10000
DCMB4805YD-20W		5	4000/0	88/90	10000
DCMB4812YD-20W		12	1667/0	89/91	1600
DCMB4815YD-20W		15	1333/0	89/91	1000
DCMB4824YD-20W		24	833/0	89/91	500

INPUT CHARACTERISTICS

Parameter	Conditions		Min.	Typ.	Max.	Units
Input Current (rated load /no load)	Nominal voltage Input 12VDC	3.3V Output	--	1599/40	1637/70	mA
		5V Output	--	1873/45	1916/70	mA
		12V Output	--	1873/7	1916/20	mA
		15V Output	--	1852/7	1894/20	mA
		24V Output	--	1852/12	1894/20	mA
	Nominal voltage Input 24VDC	3.3V Output	--	782/30	800/50	mA
		5V Output	--	926/35	947/55	mA
		12V Output	--	926/6	947/15	mA
		15V Output	--	916/6	937/15	mA
		24V Output	--	916/10	937/20	mA

Parameter	Conditions		Min.	Typ.	Max.	Units
Input Current (rated load /no load)	Nominal voltage Input 48VDC	3.3V Output	--	391/15	400/30	mA
		5V Output	--	463/20	474/30	mA
		12V Output	--	458/3	469/15	mA
		15V Output	--	458/3	469/15	mA
		24V Output	--	458/4	469/15	mA
Reflected Ripple Current			--	30	--	mA
Input impulse voltage (1sec. max.)	Nominal voltage input 12VDC		-0.7	--	25	VDC
	Nominal voltage input 24VDC		-0.7	--	50	VDC
	Nominal voltage input 48VDC		-0.7	--	100	VDC
Starting voltage	Nominal voltage input 12VDC		--	--	9	VDC
	Nominal voltage input 24VDC		--	--	18	VDC
	Nominal voltage input 48VDC		--	--	36	VDC
Under voltage protect	Nominal voltage input 12VDC		5.5	6.5	--	VDC
	Nominal voltage input 24VDC		12	15.5	--	VDC
	Nominal voltage input 48VDC		26	30	--	VDC
Start Time			--	10	--	ms
Remote control foot (Ctrl*) (Some models are applicable)	Module On		Ctrl pin open or pulled high (TTL 3.5-12VDC)			
	Module Off		Ctrl connected to GND or low level (0-1.2VDC)			
	Input current when off		--	2	7	mA
Input filter			PI filter			

Remarks: This product does not support hot plug

Note: *The Ctrl pin voltage is referenced to input GND

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Output voltage accuracy	0% -100% Load	--	±1	±3	%
Line regulation rate	Input voltage variation +/- 1%	--	±0.2	±0.5	%
Load regulation rate	5%-100% load	--	±0.5	±1	%
Temperature drift coefficient	100% load	--	--	±0.03	%

Parameter	Conditions		Min.	Typ.	Max.	Units
Dynamic response recovery time	25% load step change, nominal input voltage		--	300	500	μs
Dynamic response step deviation		3.3V, 5V Output	--	±5	±8	%
		Others	--	±3	±5	%
Ripple & Noise	20MHz bandwidth, 5%-100% load		--	50	100	mVp-p
Trim	Full voltage range input		90	--	110	%Vo
Output over voltage protection			110	--	160	%Vo
Output over current protection	Full voltage range input		110	150	190	%Io
Short circuit protection			Sustainable, Self-healing			

Note: The Testing Method For Ripple And Noise Is The Parallel Line Testing Method.

GENERAL CHARACTERISTIC

Parameter	Conditions		Min.	Typ.	Max.	Units
Isolation voltage	Input output, test time 1 minute, Leakage current less than 1 mA		1500	--	--	VDC
	Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max		1000	--	--	VDC
Insulation resistance	Input output, Insulation voltage 500VDC		1000	--	--	MΩ
Isolation capacitance	Input output, 100KHz/0.1V		--	2000	--	pF
Working temperature	See Fig. 1	3.3V, 5V output	-40	--	+95	°C
		Others	-40	--	+105	°C
Storage temperature			-55	--	+125	°C
Storage humidity	Non condensing		5	--	95	%RH
Soldering temperature resistance of pins	Soldering spot is 1.5mm away from case for 10 seconds		--	--	300	°C
	Wave soldering, 10 seconds		255	260	265	°C
Switching frequency	PWM mode	3.3V, 5V output	--	300	--	kHz
		Others	--	270	--	kHz
MTBF	MIL HDBK-217F@25°C		1000	--	--	kHours
Vibration			10-150Hz, 5G, 0.75mm. along X, Y & Z			

PHYSICAL CHARACTERISTICS

Parameter	Conditions
Housing material	Aluminum alloy
Overall dimensions	25.40 × 25.40 × 11.70mm
Weight	15g (Typ.)
Cooling mode	Natural air cooling

EMC CHARACTERISTICS

Parameter	Category	Content		
EMI	CE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)		
	RE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)		
EMS	ESD	IEC/EN61000-4-2	Contact ±6kV, Air ±8kV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV (see Fig.3-① for recommended circuit)	perf. Criteria A
	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig.3-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

PRODUCT CHARACTERISTIC CURVE

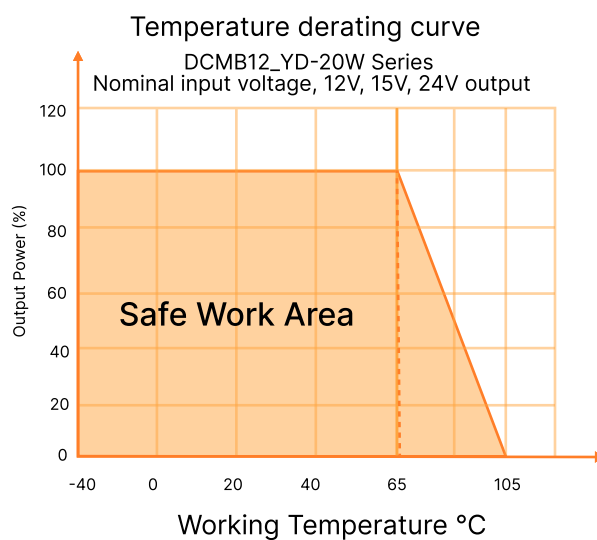
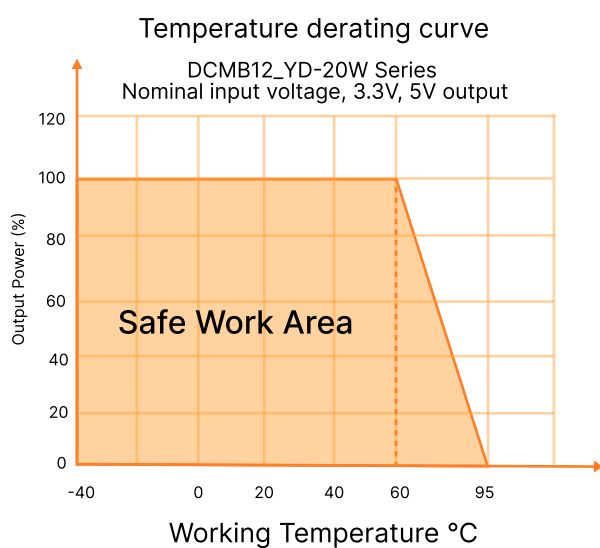
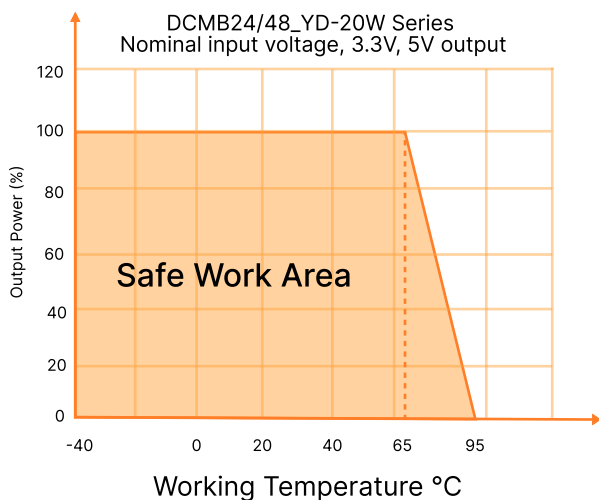


Fig.1

Temperature derating curve



Temperature derating curve

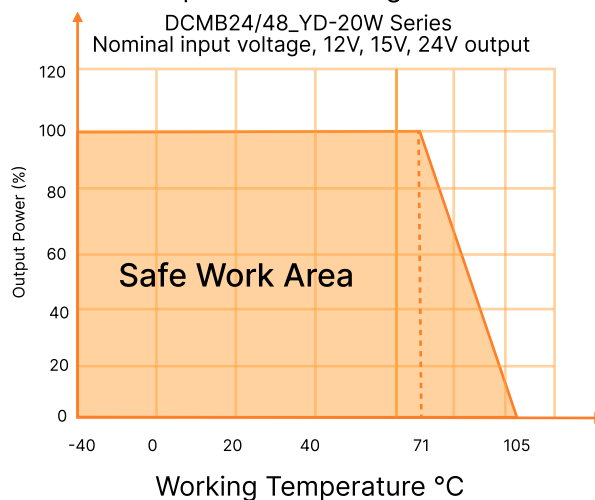
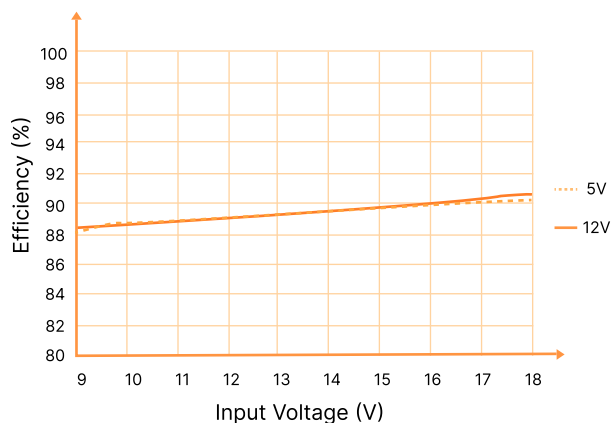
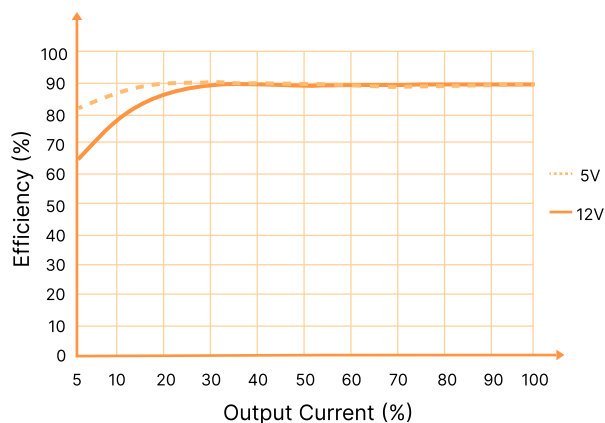


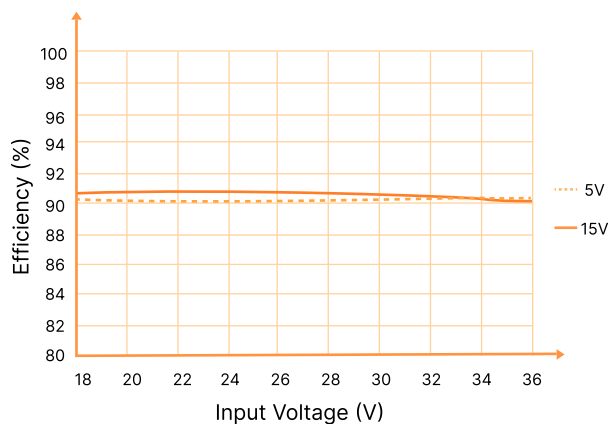
Fig.1



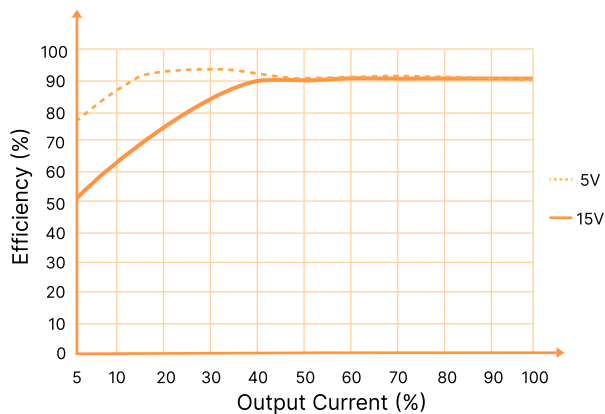
Efficiency Vs Input Voltage (Full Load)



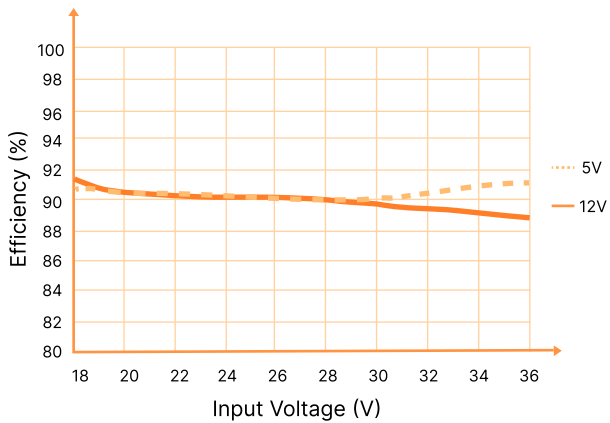
Efficiency Vs Output Load (Vin=12V)



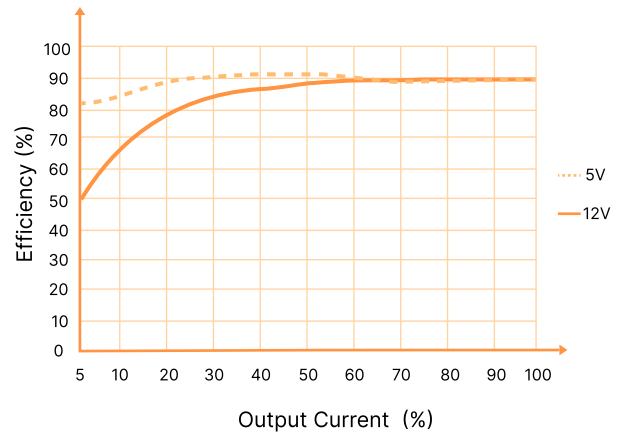
Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Voltage (Vin=48V)



Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Current (Vin=48V)

CIRCUIT DESIGN AND APPLICATION

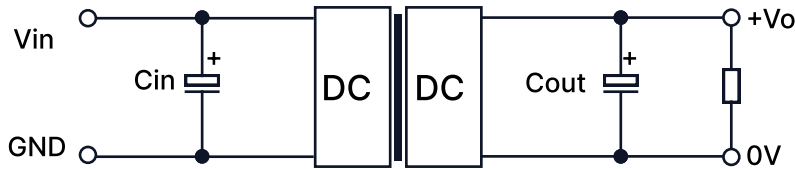


Fig 2: Application circuit

Vin (VDC)	Vout (VDC)	Cin	Cout
12	3.3/5	100μF/50V	100μF/16V
	12/15		100μF/25V
	24		47μF/50V
24	3.3/5	100μF/50V	100μF/16V
	12/15		100μF/25V
	24		47μF/50V
48	3.3/5	100μF/100V	100μF/16V
	12/15		100μF/25V
	24		47μF/50V

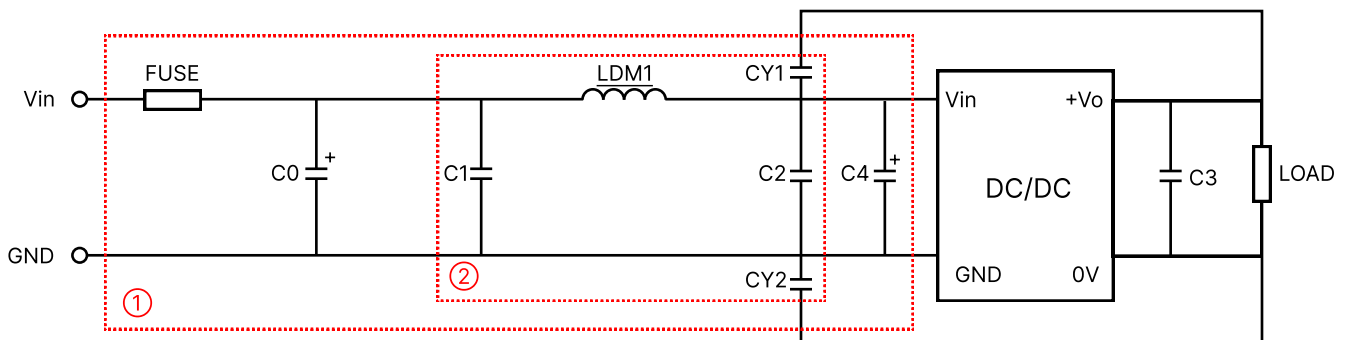
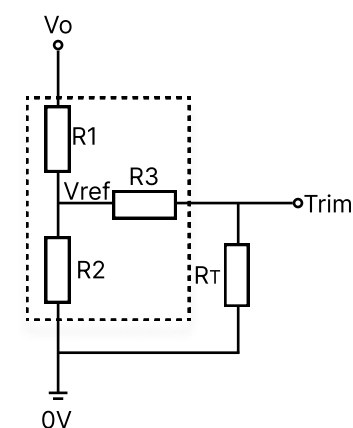


Fig 3: EMC Typical Recommended Circuits

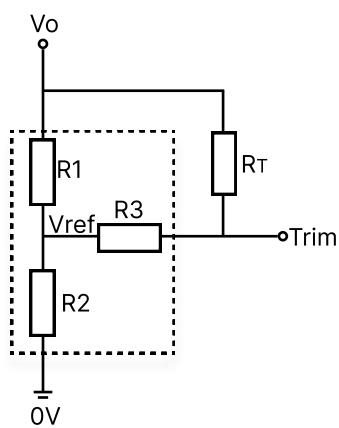
Note: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Vin (VDC)	Vin: 12VDC/24VDC		Vin: 48VDC
FUSE	Select fuse value based on actual input current		
C0, C4	330μF/50V		330μF/100V
C1, C2	4.7μF/50V		4.7μF/100V
C3	Refer to the Cout in Fig.2		
LDM1	2.2μH/4A		2.2μH/2A
CY1/CY2	1nF/2kV		

Trim Function for Output Voltage Adjustment (open if unused)



Trim up



Trim Down

The Calculation formula for trim resistance

$$\text{Trim up: } R_T \frac{aR_2}{R_2-a} - R_3 \quad a = \frac{V_{ref}}{V_o' - V_{ref}} R_1$$

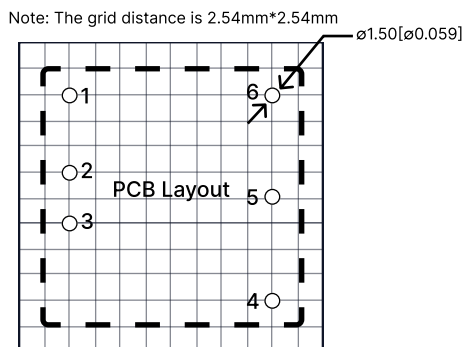
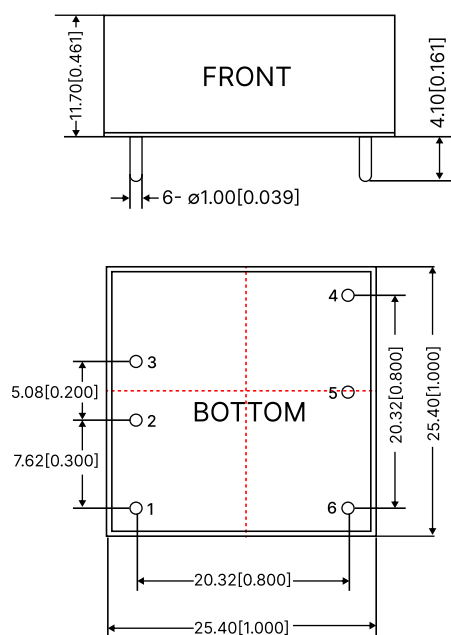
$$\text{Trim down: } R_T \frac{aR_1}{R_1-a} - R_3 \quad a = \frac{V_o' - V_{ref}}{V_{ref}} R_2$$

R_T is Trim resistance
 a = self-defined parameter;
 V_o' = desired output voltage

TRIM resistor connection (dashed ine shows internal resistor network)

Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	4.775	2.87	15	1.25
5	2.894	2.87	10	2.5
12	11.000	2.87	17.4	2.5
15	14.494	2.87	17.4	2.5
24	24.872	2.87	20	2.5

OVERALL DIMENSIONS AND PIN FUNCTIONS



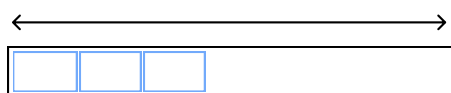
Note:
Dimensions in mm
PIN 1/2/3/4/5/6: $\varnothing$ 1.0mm
Pin diameter tolerances: $\pm$ 0.10 [$\pm$ 0.004]
General tolerances: $\pm$ 0.50 [$\pm$ 0.020]

Pin Function Table

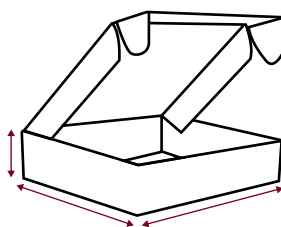
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V

Fig. 4 Overall dimensions

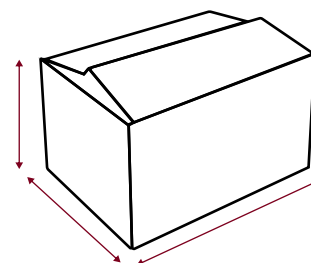
PACKAGING METHOD



50 Pieces/Tube



100 Pieces/Inner box



500 Pieces/Outer box

NOTES & INSTRUCTIONS

- 1.The input voltage shall not exceed the specified range value, otherwise permanent and unrecoverable damage maybe 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 belongs to RHENXV.