

## 典型性能 Features

- ◆ 20~25 瓦功率输出 (20~25 Watts of Output Power)
- ◆ 单 双 叁路输出 (Singles Dual Triple Outputs)
- ◆ 宽电压输入 (Wide Range Input)
- ◆ 长期短路保护, 自恢复 (Short Circuit Protection ,Automatic Recovery)
- ◆ 小型化封装 (Small Package)
- ◆ 高隔离电压 (Small Package)



## 电气特性 Electrical Specifications

输入特性 Input	Min	Type	Max	Notes
输入电压范围 Input Voltage Range	165Vac	220Vac	265Vac	
	85Vac	220Vac	265Vac	
输入频率 Hz Input Frequency	45Hz	50/60Hz	65Hz	
输出特性 Output	Min	Type	Max	Notes
输出电压精度 Set point Accuracy			±1%	Vo1
			±4%	Vo2
			±4%	Vo3
负载效应 Load Regulation			±0.5%	Vo1
			±4%	Vo2
			±4%	Vo3
源效应 Line Regulation			±0.2%	Vo1
			±1.5%	Vo2
			±1.5%	Vo3
输出电压调节 TRIM Range			±10%	Vo1/Vo2/Vo3
纹波噪声(注 1) Ripple and Noise			50mV 100mV 200mV	Vo≤5V Other Vo≥36V
动态响应 Dynamic Response	4%Vo Pk deviation 400μs settling time			50~75% Load 50~25% Load
温度系数 Temperature Regulation		±0.2%/°C		
短路保护 Short-Circuit Protection	长期短路自恢复 Continuous, Automatic Recovery			
综合特性 General	Min	Type	Max	Notes
隔离电压(注 2) Isolation Voltage			3000Vac	输入与输出 Input-Output
			1500Vac	输入与壳 Input-Case
			500Vac	输出与壳 Output-Case
			1500Vac	输入与输出 金属壳封装 Input-Output Metal Case
开关频率 Switching Frequency	50KHz		150KHz	

平均故障间隔时间 MTBF			3×10 <sup>5</sup> Hrs		Mil HDBK 217F Tc=25℃
工作壳温 Case Temperature	工业级	-40℃		+85℃	
	AD、AG 级	-40℃		+90℃	
	AHII	-55℃		+100℃	
储存温度 Storage Temperature		-55℃		+105℃	
相对湿度 Relative Humidity		10%		90%	
管脚焊接温度 Pin Solder Temperature				250℃	Wave Solder <10S
手工焊接时间 Hand Soldering Time				5S	Iron Temperature 425℃
传导 Conducted Emission	GB9254/CISPR22/EN55022 Class B (推荐电路见图)				
静电放电 Electrostatic Discharge	GB17626/EN61000-4-2 Contact ±4KV				
浪涌抗扰度 Surge Immunity	GB17626/EN61000-4-5 ±2KV (推荐电路见图) perf. Criteria B				
脉冲群抗扰度 Electrical Fast Transient	GB17626/EN61000-4-4 ±2KV (推荐电路见图) perf. Criteria B				

注 1: 纹波噪声采用 20MHz 带宽、平行线法测试;

注 2: 交流电压测试漏电流为 5mA, 直流电压测试漏电流为 0.5mA;

注 3: 若符合相关行业 EMI 标准, 需增加外围推荐电路或者滤波器;

## 产品型号列表 Product Model List

型号 Models	输入电压范围 (Vac) Input Voltage Range	输出电压 (Vdc) Output Voltage	输出电流 (A) Output current	纹波噪声 (mv) Ripple and noise	典型效率 Efficiency	容性负载 (μF) Max.Capacitor Load
WAN20S3V3	165~265Vac	3.3	4.5	50	74%	4700
WAN20S5	165~265Vac	5.05	4	50	78%	4700
WAN20S9	165~265Vac	9	2.22	100	81%	4700
WAN20S12	165~265Vac	12	1.67	100	83%	1000
WAN20S15	165~265Vac	15	1.33	100	84%	1000
WAN20S18	165~265Vac	18	1.11	100	84%	1000
WAN20S24	165~265Vac	24	0.83	100	85%	1000
WAN20S28	165~265Vac	28	0.71	100	85%	1000
WAN20S36	165~265Vac	36	0.56	100	86%	470
WAN20S48	165~265Vac	48	0.42	200	87%	220

WAN20D5	165~265Vac	+5.05/-5.05	+2/-2	50/50	75%	2200/2200
WAN20D9	165~265Vac	+9/-9	+1.11/-1.11	50/50	75%	2200/2200
WAN20D12	165~265Vac	+12/-12	+0.83/-0.83	100/100	82%	1000/1000
WAN20D15	165~265Vac	+15/-15	+0.67/-0.67	100/100	83%	1000/1000
WAN20D18	165~265Vac	+18/-18	+0.56/-0.56	100/100	83%	1000/1000
WAN20D24	165~265Vac	+24/-24	+0.42/-0.42	100/100	84%	470/470
WAN20D28	165~265Vac	+28/-28	+0.36/-0.36	100/100	84%	470/470
WAN20D5-5I	165~265Vac	5/5	3/1	50/50	74%	2200/2200
WAN20D5-12I	165~265Vac	5/12	2.1/0.8	50/100	75%	2200/470
WAN20D5-15I	165~265Vac	5/15	2.2/0.6	50/100	76%	2200/470
WAN20D5-24I	165~265Vac	5/24	2.6/0.3	50/100	77%	2200/220
WAN20T5-5I	165~265Vac	5/+5/-5	2.4/+0.8/-0.8	50/50/50	74%	2200/2200/2200
WAN20T5-12I	165~265Vac	5/+12/-12	2.1/+0.4/-0.4	50/100/100	75%	2200/470/470
WAN20T5-15I	165~265Vac	5/+15/-15	2.2/+0.3/-0.3	50/100/100	76%	2200/470/470
WAN20T5-24I	165~265Vac	5/+24/-24	2/+0.2/-0.2	50/100/100	77%	2200/220/220
WAW20S3V3	85~265Vac	3.3	4.5	50	74%	4700
WAW20S5	85~265Vac	5.05	4	50	78%	4700
WAW20S9	85~265Vac	9	2.22	100	81%	4700
WAW20S12	85~265Vac	12	1.67	100	83%	1000
WAW20S15	85~265Vac	15	1.33	100	84%	1000
WAW20S18	85~265Vac	18	1.11	100	84%	1000
WAW20S24	85~265Vac	24	0.83	100	85%	1000
WAW20S28	85~265Vac	28	0.71	100	85%	1000
WAW20S36	85~265Vac	36	0.56	100	86%	470
WAW20S48	85~265Vac	48	0.42	200	87%	220
WAW20D5	85~265Vac	+5.05/-5.05	+2/-2	50/50	75%	2200/2200
WAW20D9	85~265Vac	+9/-9	+1.11/-1.11	50/50	75%	2200/2200
WAW20D12	85~265Vac	+12/-12	+0.83/-0.83	100/100	82%	1000/1000
WAW20D15	85~265Vac	+15/-15	+0.67/-0.67	100/100	83%	1000/1000
WAW20D18	85~265Vac	+18/-18	+0.56/-0.56	100/100	83%	1000/1000

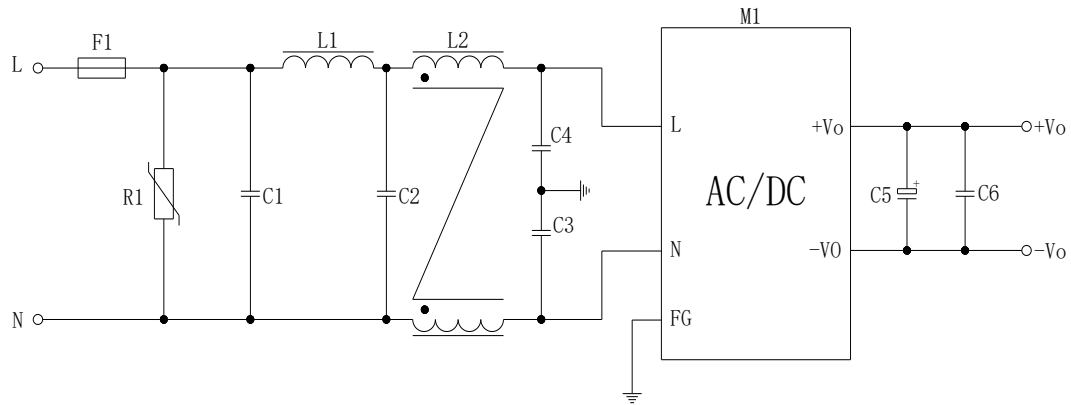
WAW20D24	85~265Vac	+24/-24	+0.42/-0.42	100/100	84%	470/470
WAW20D28	85~265Vac	+28/-28	+0.36/-0.36	100/100	84%	470/470
WAW20D5-5I	85~265Vac	5/5	3/1	50/50	74%	2200/2200
WAW20D5-12I	85~265Vac	5/12	2.1/0.8	50/100	75%	2200/470
WAW20D5-15I	85~265Vac	5/15	2.2/0.6	50/100	76%	2200/470
WAW20D5-24I	85~265Vac	5/24	2.6/0.3	50/100	77%	2200/220
WAW20T5-5I	85~265Vac	5/+5/-5	2.4/+0.8/-0.8	50/50/50	74%	2200/2200/2200
WAW20T5-12I	85~265Vac	5/+12/-12	2.1/+0.4/-0.4	50/100/100	75%	2200/470/470
WAW20T5-15I	85~265Vac	5/+15/-15	2.2/+0.3/-0.3	50/100/100	76%	2200/470/470
WAW20T5-24I	85~265Vac	5/+24/-24	2/+0.2/-0.2	50/100/100	77%	2200/220/220
WAN20S5M	165~265Vac	5.05	4	50	78%	4700
WAN20S9M	165~265Vac	9	2.22	100	81%	4700
WAN20S12M	165~265Vac	12	1.67	100	83%	1000
WAN20S15M	165~265Vac	15	1.33	100	84%	1000
WAN20S18M	165~265Vac	18	1.11	100	84%	1000
WAN20S24M	165~265Vac	24	0.83	100	85%	1000
WAN20S28M	165~265Vac	28	0.71	100	85%	1000
WAN20S36M	165~265Vac	36	0.56	100	86%	470
WAN20S48M	165~265Vac	48	0.42	200	87%	220
WAW20S9M	85~265Vac	9	2.22	100	81%	4700
WAW20S12M	85~265Vac	12	1.67	100	83%	1000
WAW20S15M	85~265Vac	15	1.33	100	84%	1000
WAW20S18M	85~265Vac	18	1.11	100	84%	1000
WAW20S24M	85~265Vac	24	0.83	100	85%	1000
WAW20S28M	85~265Vac	28	0.71	100	85%	1000
WAW20S36M	85~265Vac	36	0.56	100	86%	1000
WAW20S48M	85~265Vac	48	0.42	200	87%	220
WAN25S3V3	165~265Vac	3.3	6	50	74%	4700
WAN25S5	165~265Vac	5.05	5	50	78%	4700
WAN25S9	165~265Vac	9	2.78	100	81%	4700

WAN25S12	165~265Vac	12	2.08	100	83%	1000
WAN25S15	165~265Vac	15	1.67	100	84%	1000
WAN25S18	165~265Vac	18	1.39	100	84%	1000
WAN25S24	165~265Vac	24	1.04	100	85%	470
WAN25S28	165~265Vac	28	0.89	100	85%	470
WAN25S36	165~265Vac	36	0.69	100	86%	470
WAN25S48	165~265Vac	48	0.52	200	87%	220
WAN25D5	165~265Vac	+5.05/-5.05	+2.5/-2.5	50/50	75%	2200/2200
WAN25D12	165~265Vac	+12/-12	+1.04/-1.04	100/100	82%	1000/1000
WAN25D15	165~265Vac	+15/-15	+0.83/-0.83	100/100	83%	1000/1000
WAN25D5-5I	165~265Vac	5/5	3.5/1.5	50/50	74%	2200/2200
WAN25D5-12I	165~265Vac	5/12	3/1	50/100	75%	2200/470
WAN25D5-15I	165~265Vac	5/15	3.5/0.5	50/100	76%	2200/470
WAN25D5-24I	165~265Vac	5/24	3.5/0.3	50/100	77%	2200/220
WAN25T5-5I	165~265Vac	5/+5/-5	3.4/+0.8/-0.8	50/50/50	74%	2200/2200/2200
WAN25T5-12I	165~265Vac	5/+12/-12	3.1/+0.4/-0.4	50/100/100	75%	2200/470/470
WAN25T5-15I	165~265Vac	5/+15/-15	2.6/+0.4/-0.4	50/100/100	76%	2200/470/470
WAN25T5-24I	165~265Vac	5/+24/-24	2.6/+0.25/-0.25	50/100/100	77%	2200/220/220
WAW25S3V3	85~265Vac	3.3	6	50	74%	4700
WAW25S5	85~265Vac	5.05	5	50	78%	4700
WAW25S9	85~265Vac	9	2.78	100	81%	4700
WAW25S12	85~265Vac	12	2.08	100	83%	1000
WAW25S15	85~265Vac	15	1.67	100	84%	1000
WAW25S18	85~265Vac	18	1.39	100	84%	1000
WAW25S24	85~265Vac	24	1.04	100	85%	470
WAW25S28	85~265Vac	28	0.89	100	85%	470
WAW25S36	85~265Vac	36	0.69	100	86%	470
WAW25S48	85~265Vac	48	0.52	200	87%	220
WAW25D5	85~265Vac	+5.05/-5.05	+2.5/-2.5	50/50	75%	2200/2200
WAW25D9	85~265Vac	+9/-9	+1.39/-1.39	50/50	75%	2200/2200

WAW25D12	85~265Vac	+12/-12	+1.04/-1.04	100/100	82%	1000/1000
WAW25D15	85~265Vac	+15/-15	+0.83/-0.83	100/100	83%	1000/1000
WAW25D5-5I	85~265Vac	5/5	3.5/1.5	50/50	74%	2200/2200
WAW25D5-12I	85~265Vac	5/12	3/1	50/100	75%	2200/470
WAW25D5-15I	85~265Vac	5/15	3.5/0.5	50/100	76%	2200/470
WAW25D5-24I	85~265Vac	5/24	3.5/0.3	50/100	77%	2200/220
WAW25T5-5I	85~265Vac	5/+5/-5	3.4/+0.8/-0.8	50/50/50	74%	2200/2200/2200
WAW25T5-12I	85~265Vac	5/+12/-12	3.1/+0.4/-0.4	50/100/100	75%	2200/470/470
WAW25T5-15I	85~265Vac	5/+15/-15	2.6/+0.4/-0.4	50/100/100	76%	2200/470/470
WAW25T5-24I	85~265Vac	5/+24/-24	2.6/+0.25/-0.25	50/100/100	77%	2200/220/220
WAN25S5M	165~265Vac	5.05	5	50	76%	4700
WAN25S9M	165~265Vac	9	2.78	100	81%	4700
WAN25S12M	165~265Vac	12	2.08	100	83%	1000
WAN25S15M	165~265Vac	15	1.67	100	84%	1000
WAN25S18M	165~265Vac	18	1.39	100	84%	1000
WAN25S24M	165~265Vac	24	1.04	100	85%	470
WAN25S28M	165~265Vac	28	0.89	100	85%	470
WAN25S36M	165~265Vac	36	0.69	100	86%	470
WAN25S48M	165~265Vac	48	0.52	200	86%	220
WAW25S5M	85~265Vac	5.05	5	50	76%	4700
WAW25S9M	85~265Vac	9	2.78	100	81%	4700
WAW25S12M	85~265Vac	12	2.08	100	83%	1000
WAW25S15M	85~265Vac	15	1.67	100	84%	1000
WAW25S18M	85~265Vac	18	1.39	100	84%	1000
WAW25S24M	85~265Vac	24	1.04	100	85%	470
WAW25S28M	85~265Vac	28	0.89	100	85%	470
WAW25S36M	85~265Vac	36	0.69	100	86%	470
WAW25S48M	85~265Vac	48	0.52	200	86%	220

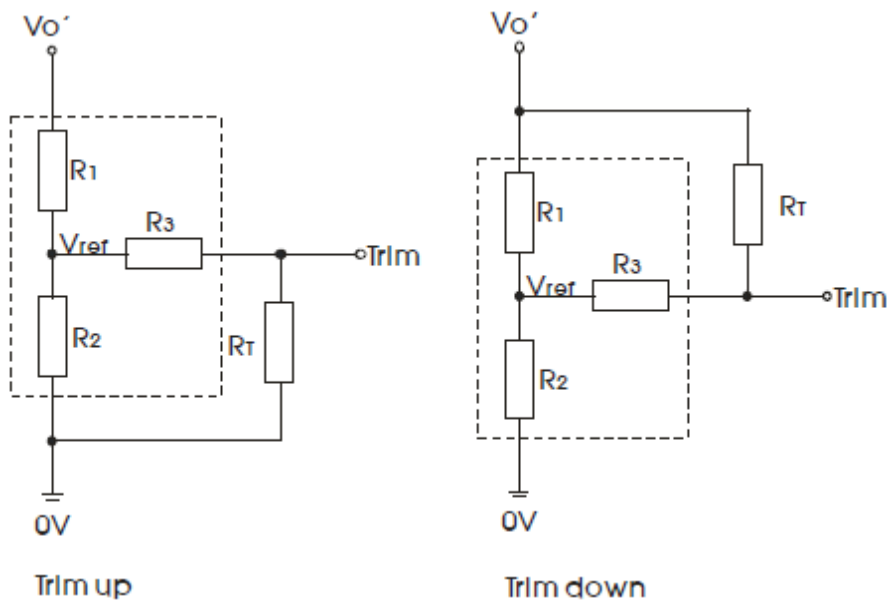
注 5: 未列出型号, 可联系销售定制;

## 电磁兼容应用 (EMC)



型号	输出电压 5V	输出电压 9V/12V/15V	输出电压 18V/24V
F1(保险丝)	3.15A 慢熔		
R1(压敏电阻)	471KD14		
C1/C2(X 电容)	0.1μF/275Vac		
C3/C4(Y 电容)	2.2nF/250Vac		
L1(差模电感)	4.7μH/2A		
L2(共模电感)	10mH		
C5(电解电容)	470μF/16V	220μF/25V	100μF/50V
C6(陶瓷电容)	1μF/50V		

## 输出调节应用 (TRIM Function)



Trim 的使用电路(虚线框为产品内部)

$$up: R_T = \frac{TR_2}{R_2 - T} - R_3$$

$$T = \frac{V_{ref}}{V_{o'} - V_{ref}} \cdot R_1$$

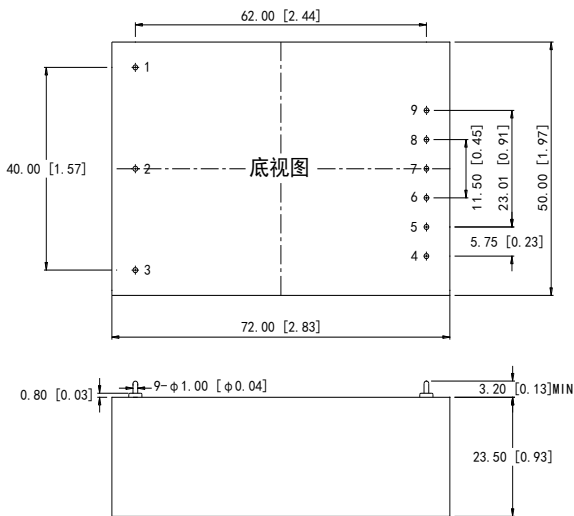
$R_T$  为 Trim 电阻

$$\text{down} : R_T = \frac{TR_1}{R_1 - T} - R_3 \quad T = \frac{Vo' - V_{ref}}{V_{ref}} \cdot R_2$$

T 为自定义参数，无实际含义

Vout (V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	3.32	2.0	8.2	1.24
5	2.55	2.49	8.2	2.5
12	9.53	2.49	12	2.5
15	12.5	2.49	15	2.5
24	21.5	2.49	20	2.5

## 机械图及管脚说明 (Mechanical Chart、Pins) (Unit: mm/ inch)



标准型

72.0\*50.0\*23.5 (mm)

### 1) 单路输出电源管脚定义 (如 WAN25S12) :

项目	输入端			输出端					
	1	2	3	4	5	6	7	8	9
管脚	1	2	3	4	5	6	7	8	9
定义	L	N	FG	TRIM	-Vo2	NP	NP	NP	+Vo
说明	火线	零线	地线	输出电压可调	输出负	无此管脚			输出正
备注	不区分零火线, 建议外接保险丝								

### 2) 双路对称输出电源管脚定义(如 WAN25D15):

项目	输入端			输出端					
	1	2	3	4	5	6	7	8	9
管脚	1	2	3	4	5	6	7	8	9
定义	L	N	FG	NP	-Vo2	NP	COM	NP	+Vo1
说明	火线	零线	地线	无此管脚	二路输出负	无此管脚	输出公共地	无此管脚	一路输出正
备注	不区分零火线, 建议外接保险丝								

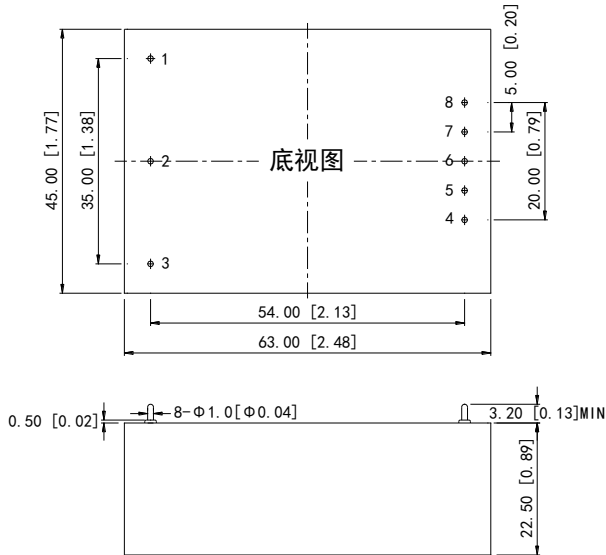
### 3) 双路非均载输出电源管脚定义(如 WAN25D5-5I):

项目	输入端			输出端					
	1	2	3	4	5	6	7	8	9
管脚	1	2	3	4	5	6	7	8	9
定义	L	N	FG	NP	-Vo1	+Vo1	NC	-Vo2	+Vo2
说明	火线	零线	地线	无此管脚	一路输出负	一路输出正	无连接空管脚	二路输出负	二路输出正
备注	不区分零火线, 建议外接保险丝								

### 4) 叁路输出电源管脚定义(如 WAN25T5-5I):

项目	输入端			输出端					
	1	2	3	4	5	6	7	8	9
管脚	1	2	3	4	5	6	7	8	9
定义	L	N	FG	NP	-Vo1	+Vo1	-Vo3	COM	+Vo2
说明	火线	零线	地线	无此管脚	一路输出负	一路输出正	叁路输出负	输出公共地	二路输出正
备注	不区分零火线, 建议外接保险丝								

### MINI 型: 机械图及管脚说明 (Mechanical Chart、Pins) (Unit: mm/ inch)



金属壳尺寸 63.0\*45.0\*22.5 (mm)

项目	输入端			输出端				
	1	2	3	4	5	6	7	8
管脚	1	2	3	4	5	6	7	8
定义	L	N	FG	-Vo	NP	NP	NP	+Vo
说明	火线	零线	地线	输出负	无此管脚			输出正
备注	不区分零火线, 建议外接保险丝							

注: 安装定位尺寸公差按 GB/T1804-2000 F 级标准、外型尺寸公差按 GB/T1804-2000 C 级标准。