

## 典型性能 Features

- ◆ 450 瓦功率输出 (450 Watts of Output Power)
- ◆ 超宽电压输入 (2:1 Wide Range Input)
- ◆ 长期短路保护, 自恢复 (Short Circuit Protection ,Automatic Recovery)
- ◆ 小型化封装 (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	9V	12V	18V	
	18V	24V	36V	9-36V输入范围尾缀加W
	36V	48V	72V	18-72V输入范围尾缀加W
	66V	110V	160V	43-160V输入范围尾缀加W
控制功能 ON/OFF Control	正逻辑	ON		CNT 悬空或接TTL高电平 CNT pin left open or CNT pin connected to TTL logic high
		OFF		CNT 与-Vin 相连 CNT pin is at a logic low
	负逻辑尾缀 P	ON		CNT 与-Vin 相连 CNT pin is at a logic low
		OFF		悬空或接TTL高电平 CNT pin left open or CNT pin connected to TTL logic high
逻辑低 Logic Low			1.2 V	
输入欠压保护 Input. Under-voltage Lockout	6V		9V	12V 输入
	13V		18V	24V 输入
	30V		36V	48V 输入
	55V		66V	110 输入
启动延时时间 Start-up Delay Time		10mS		
输出特性 Output	Min	Type	Max	Notes
输出电压精度 Set point Accuracy			±1%	
负载效应 Load Regulation			±0.5%	

源效应 Line Regulation			±0.2%		
输出电压调节 TRIM Range			±10%	尾缀S为正逻辑型	
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			
输出过流保护 Current Limit Threshold	110%		160%		
输出过压保护 Over-voltage Protection	110%		140%		
短路保护 Short-Circuit Protection	长期短路自恢复 Continuous, Automatic Recovery				
<b>综合特性 General</b>	<b>Min</b>	<b>Type</b>	<b>Max</b>	<b>Notes</b>	
隔离电压 Isolation Voltage	1500Vdc			Input to Output	
	1000 Vdc			Input to Case	
	500Vdc			Output to Case	
开关频率 Switching Frequency		300KHz			
平均故障间隔时间 MTBF		2×10 <sup>6</sup> Hrs		Mil HDBK 217F Tc=25°C	
工作壳温 Case Temperature	工业级	-40°C		+95°C	
	AD、AG级	-40°C		+100°C	需散热器
	AHII级	-55°C		+105°C	需散热器
储存温度 Storage Temperature	-55°C		+125°C		
相对湿度 Relative Humidity	10%		90%		
管脚焊接温度 Pin Solder Temperature			250°C	Wave Solder <10S	
手工焊接时间 Hand Soldering Time			5S	Iron Temperature 425 °C	
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 Air ±8KV				
浪涌抗扰度 Surge Immunity	GB17626/EN61000-4-5 ±2KV (推荐电路见图) perf. Criteria A				
脉冲群抗扰度 Electrical Fast Transient	GB17626/EN61000-4-4 ±2KV (推荐电路见图) perf. Criteria A				

型号 Models	输入电压范围 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
WDH50-12S3V3	9-18V	3.3	10	100	89%	10000
WDH50-12S5	9-18V	5.05	10	100	89%	10000
WDH50-12S12	9-18V	12	4.17	150	87%	2200
WDH50-12S15	9-18V	15	3.33	150	87%	2200
WDH50-12S24	9-18V	24	2.08	150	87%	1000
WDH50-12S28	9-18V	28	1.79	150	87%	1000
WDH50-12S48	9-18V	48	1.04	400	87%	470
WDH50-24S3V3	18-36V	3.3	10	100	90%	10000
WDH50-24S5	18-36V	5.05	10	100	90%	10000
WDH50-24S9	18-36V	9.0	5.55	150	88%	2200
WDH50-24S12	18-36V	12	4.17	150	90%	2200
WDH50-24S13V8	18-36V	13.8	3.62	150	90%	2200
WDH50-24S15	18-36V	15	3.33	150	90%	2200
WDH50-24S24	18-36V	24	2.08	150	88%	1000
WDH50-24S28	18-36V	28	1.79	150	88%	1000
WDH50-24S48	18-36V	48	1.04	400	88%	470
WDH50-48S3V3	36-72V	3.3	10	100	90%	10000
WDH50-48S5	36-72V	5.05	10	100	90%	10000
WDH50-48S9	36-72V	9.0	5.55	150	88%	2200
WDH50-48S12	36-72V	12	4.17	150	88%	2200
WDH50-48S15	36-72V	15	3.33	150	88%	2200
WDH50-48S24	36-72V	24	2.08	150	88%	1000
WDH50-48S28	36-72V	28	1.79	150	88%	1000
WDH50-48S48	36-72V	48	1.04	400	88%	470
WDH50-110S5	66-160V	5.05	10	100	90%	10000
WDH50-110S12	66-160V	12	4.17	150	88%	2200
WDH100-110S13V8	66-160V	13.8	3.62	150	90%	2200
WDH50-110S15	66-160V	15	3.33	150	90%	2200

WDH50-110S24	66-160V	24	2.08	150	88%	1000
WDH50-110S48	66-160V	48	1.04	400	88%	470
WDH75-12S3V3	9-18V	3.3	15	100	89%	10000
WDH75-12S5	9-18V	5.05	15	100	89%	10000
WDH75-12S12	9-18V	12	6.25	150	87%	2200
WDH75-12S15	9-18V	15	5	150	87%	2200
WDH75-12S24	9-18V	24	3.13	150	87%	1000
WDH75-12S28	9-18V	28	2.68	150	87%	1000
WDH75-12S48	9-18V	48	1.56	400	87%	470
WDH75-24S3V3	18-36V	3.3	15	100	90%	10000
WDH75-24S5	18-36V	5.05	15	100	90%	10000
WDH75-24S9	18-36V	9.0	8.33	150	88%	2200
WDH75-24S12	18-36V	12	6.25	150	88%	2200
WDH75-24S13V8	18-36V	13.8	5.43	150	90%	2200
WDH75-24S15	18-36V	15	5	150	89%	2200
WDH75-24S24	18-36V	24	3.13	150	90%	1000
WDH75-24S28	18-36V	28	2.68	150	90%	1000
WDH75-24S48	18-36V	48	1.56	400	88%	470
WDH75-48S3V3	36-72V	3.3	15	100	90%	10000
WDH75-48S5	36-72V	5.05	15	100	90%	10000
WDH75-48S9	36-72V	9.0	8.33	150	88%	2200
WDH75-48S12	36-72V	12	6.25	150	88%	2200
WDH75-48S15	36-72V	15	5	150	88%	2200
WDH75-48S24	36-72V	24	3.13	150	88%	1000
WDH75-48S28	36-72V	28	2.68	150	88%	1000
WDH75-48S48	36-72V	48	1.56	400	88%	470
WDH75-110S5	66-160V	5.05	15	100	90%	10000
WDH75-110S12	66-160V	12	6.25	150	88%	2200
WDH75-110S13V8	66-160V	13.8	5.43	150	90%	2200
WDH75-110S15	66-160V	15	5	150	89%	2200

WDH75-110S24	66-160	24	3.13	150	88%	1000
WDH75-110S48	66-160	48	1.56	400	88%	470
WDH100-12S3V3	9-18V	3.3	20	100	89%	10000
WDH100-12S5	9-18V	5.05	20	100	89%	10000
WDH100-12S12	9-18V	12	8.33	150	87%	2200
WDH100-12S15	9-18V	15	6.67	150	87%	2200
WDH100-12S24	9-18V	24	4.17	150	87%	1000
WDH100-12S28	9-18V	28	3.57	150	87%	1000
WDH100-12S48	9-18V	48	2.08	400	87%	470
WDH100-24S3V3	18-36V	3.3	20	100	90%	10000
WDH100-24S5	18-36V	5.05	20	100	90%	10000
WDH100-24S9	18-36V	9.0	11.1	150	88%	2200
WDH100-24S12	18-36V	12	8.33	150	88%	2200
WDH100-24S13V8	18-36V	13.8	7.25	150	90%	2200
WDH100-24S15	18-36V	15	6.67	150	89%	2200
WDH100-24S24	18-36V	24	4.17	150	90%	1000
WDH100-24S28	18-36V	28	3.57	150	90%	1000
WDH100-24S48	18-36V	48	2.08	200	88%	470
WDH100-48S3V3	36-72V	3.3	20	100	90%	10000
WDH100-48S5	36-72V	5.05	20	100	90%	10000
WDH100-48S9	36-72V	9.0	11.1	150	88%	2200
WDH100-48S12	36-72V	12	8.33	150	88%	2200
WDH100-48S15	36-72V	15	6.67	150	89%	2200
WDH100-48S24	36-72V	24	4.17	150	90%	1000
WDH100-48S28	36-72V	28	3.57	150	90%	1000
WDH100-48S48	18-36V	48	2.08	200	88%	470
WDH100-110S5	66-160V	5.05	20	100	90%	10000
WDH100-110S12	66-160V	12	8.33	150	89%	2200
WDH100-110S13V8	66-160V	13.8	7.25	150	90%	2200
WDH100-110S15	66-160V	15	6.67	150	90%	2200

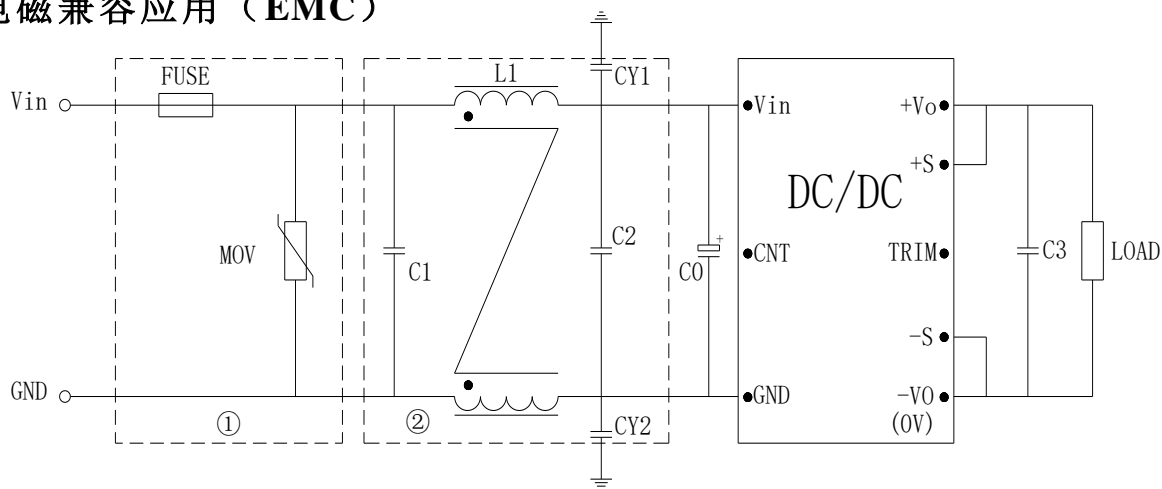
WDH100-110S24	66-160V	24	4.17	150	88%	1000
WDH100-110S48	66-160V	48	2.08	200	88%	470
WDH150-12S3V3	9-18V	3.3	30	100	88%	10000
WDH150-12S5	9-18V	5.05	30	100	88%	10000
WDH150-12S12	9-18V	12	12.5	150	87%	2200
WDH150-12S15	9-18V	15	10	150	87%	2200
WDH150-12S24	9-18V	24	6.25	150	87%	1000
WDH150-12S28	9-18V	28	5.36	150	87%	1000
WDH150-12S48	9-18V	48	3.13	400	87%	470
WDH150-24S3V3	18-36V	3.3	30	100	90%	10000
WDH150-24S5	18-36V	5.05	30	100	90%	10000
WDH150-24S9	18-36V	9.0	16.6	150	88%	2200
WDH150-24S12	18-36V	12	12.5	150	89%	2200
WDH150-24S13V8	18-36V	13.8	10.87	150	90%	2200
WDH150-24S15	18-36V	15	10	150	90%	2200
WDH150-24S24	18-36V	24	6.25	150	88%	1000
WDH150-24S28	18-36V	28	5.36	150	88%	1000
WDH150-24S48	18-36V	48	3.13	200	88%	470
WDH150-48S3V3	36-72V	3.3	30	100	92%	10000
WDH150-48S5	36-72V	5.05	30	100	92%	10000
WDH150-48S9	36-72V	9.0	16.6	150	88%	2200
WDH150-48S12	36-72V	12	12.5	150	88%	2200
WDH150-48S15	36-72V	15	10	150	89%	2200
WDH150-48S24	36-72V	24	6.25	150	90%	1000
WDH150-48S28	36-72V	28	5.36	150	90%	1000
WDH150-48S48	36-72V	48	3.13	150	88%	1000
WDH150-110S5	66-160V	5.05	30	100	90%	10000
WDH150-110S12	66-160V	12	12.5	150	88%	2200
WDH150-110S13V8	66-160V	13.8	10.87	150	90%	2200
WDH150-110S15	66-160V	15	10	150	89%	2200

WDH150-110S24	66-160V	24	6.25	150	90%	1000
WDH150-110S48	66-160V	48	3.13	150	88%	1000
WDH200-12S3V3	9-18V	3.3	40	100	88%	10000
WDH200-12S5	9-18V	5.05	40	100	88%	10000
WDH200-12S12	9-18V	12	16.67	150	87%	2200
WDH200-12S15	9-18V	15	13.33	150	87%	2200
WDH200-12S24	9-18V	24	8.33	150	87%	1000
WDH200-12S28	9-18V	28	7.14	150	87%	1000
WDH200-12S48	9-18V	48	4.17	400	87%	470
WDH200-24S3V3	18-36V	3.3	40	100	89%	10000
WDH200-24S5	18-36V	5.05	40	100	89%	10000
WDH200-24S9	18-36V	9.0	22.2	150	88%	2200
WDH200-24S12	18-36V	12	16.67	150	87%	2200
WDH200-24S13V8	18-36V	13.8	14.49	150	90%	2200
WDH200-24S15	18-36V	15	13.33	150	87%	2200
WDH200-24S24	18-36V	24	8.33	150	87%	1000
WDH200-24S28	18-36V	28	7.14	150	87%	1000
WDH200-24S48	18-36V	48	4.17	200	88%	470
WDH200-48S3V3	36-72V	3.3	40	100	90%	10000
WDH200-48S5	36-72V	5.05	40	100	90%	10000
WDH200-48S9	36-72V	9.0	22.2	150	88%	2200
WDH200-48S12	36-72V	12	16.67	150	88%	2200
WDH200-48S15	36-72V	15	13.33	150	89%	2200
WDH200-48S24	36-72V	24	8.33	150	90%	1000
WDH200-48S28	36-72V	28	7.14	150	90%	1000
WDH200-48S48	18-36V	48	4.17	150	88%	1000
WDH200-110S5	66-160V	5.05	40	100	90%	10000
WDH200-110S12	66-160V	12	16.67	150	88%	2200
WDH200-110S13V8	66-160V	13.8	14.49	150	90%	2200
WDH200-110S15	66-160V	15	13.33	150	90%	2200

WDH200-110S24	66-160V	24	8.33	150	88%	1000
WDH200-110S48	66-160V	48	4.17	150	88%	1000
WDH150-24S24W	9-36V	24	6.25	150	88%	1000
WDH150-24S28W	9-36V	28	5.36	150	88%	1000
WDH200-24S24W	9-36V	24	8.33	150	88%	1000
WDH200-24S28W	9-36V	28	7.14	150	88%	1000
WDH350-48S28	36-72V	28	12.5	200	92%	2200
WDH350-48S24	36-72V	24	14.58	200	92%	2200
WDH450-48S24	36-72V	24	18.75	200	93%	2200
WDH450-48S28	36-72V	28	16.07	200	93%	2200
WDH300-110S13V8	66-160V	13.8V	21.7	200	90%	2200

■说明：仅列出典型型号，其它型号，请确定功率，输入电压及输出电压，致电我公司。

## 电磁兼容应用（EMC）



型号	VIN:12V	Vin: 24V	Vin: 48V	VIN:110V
FUSE	根据具体电源模块型号电流选择			
MOV	14D101K	14D101K	14D101K	14D201K
C0	470μF/25V	220μF/50V	100μF/100V	100μF/250V
C1、C2	10μF/25V	4.7μF/50V	2.2μF/100V	1μF/250V
C3	100μF			
LCM	3mH	5mH		5 mH
CY1、CY2	4.7nF Y2 安规电容			

**FUSE:**推荐采用慢熔型的产品，FUSE 电流选择要考虑高温降额和冲击电流的影响。

**MOV:**压敏电阻，MOV 可以和保险丝串联应用，防止 MOV 失效。也可以两只 MOV 串联，增加可靠性。



C0 C3:高频电解电容

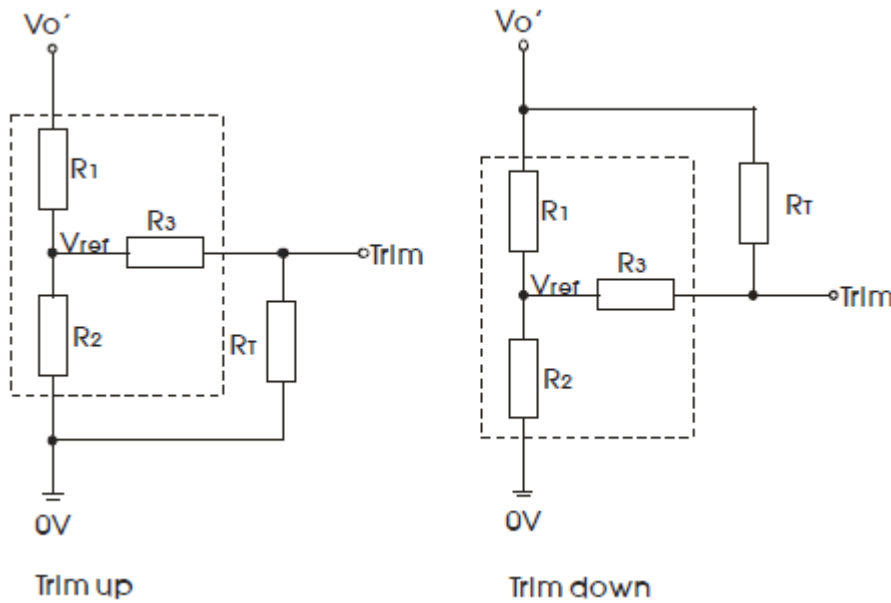
C1 C2:高频独石电容或者薄膜电容。

LCM:共模电感。具体型号请咨询销售人员。

CY1 CY2:安规 Y2 电容

输出调节应用 (TRIM Function)

负逻辑 TRIM:

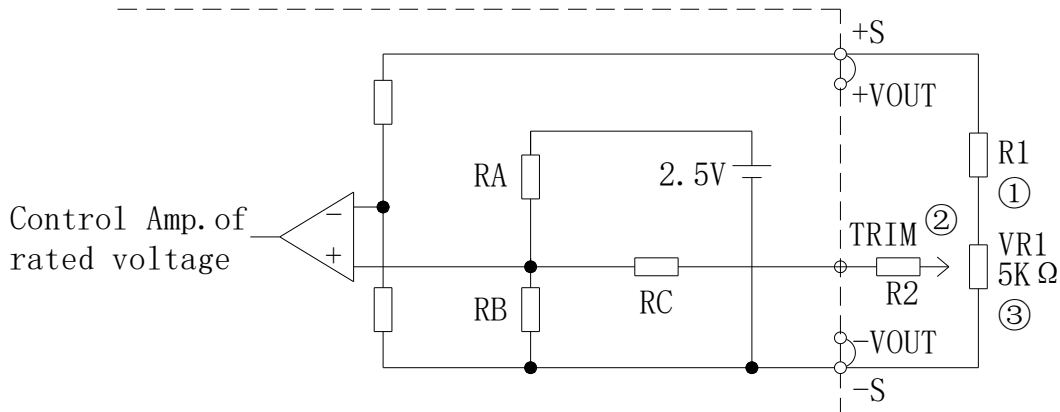


$$up: R_T = \frac{TR_2}{R_2 - T} - R_3 \quad T = \frac{V_{ref}}{V_{o'} - V_{ref}} \cdot R_1 \text{ (调高电压)}$$

$$down: R_T = \frac{TR_1}{R_1 - T} - R_3 \quad T = \frac{V_{o'} - V_{ref}}{V_{ref}} \cdot R_2 \text{ (调低电压)}$$

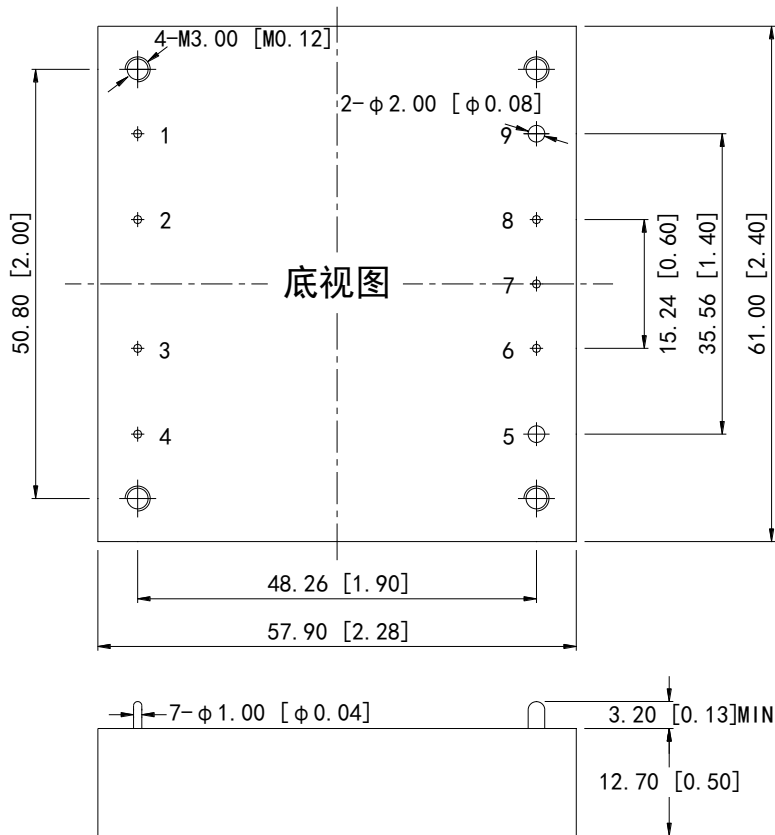
Vout (V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	3.32	2.0	8.2	1.24
5	2.55	2.49	8.2	2.5
9	6.49	2.49	10	2.5
12	9.53	2.49	12	2.5
13.8	11.1	2.49	12	2.5
15	12.5	2.49	15	2.5
24	21.5	2.49	20	2.5
28	25.5	2.49	20	2.5
48	45.3	2.49	20	2.5

正逻辑 TRIM(尾缀加 S 产品):



N0.	VOUT	Adjustable range			
		VOUT±5%		VOUT±10%	
		R1	R2	R1	R2
1	1.8V	1.8KΩ	6.2KΩ	1.6KΩ	3.6KΩ
2	2.5V	2.7KΩ	7.5KΩ	2.4KΩ	4.7KΩ
3	3.3V	2.4KΩ	11 KΩ	2.4KΩ	6.8KΩ
4	5V	5.6KΩ		5.6KΩ	
5	12V	18KΩ		18KΩ	
6	15V	24KΩ		24KΩ	
7	24V	43KΩ		39KΩ	
8	28V	51KΩ		47KΩ	
9	32V	56KΩ		56KΩ	
10	48V	82KΩ		82KΩ	

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



管脚 Pin	1	2	3	4	5	6	7	8	9
功能 Function	-Vin	CASE	CNT	+Vin	+Vo	+S	TRIM	-S	-Vo

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。