

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 400 μS 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				
综合特性 General	Min	Type	Max	Notes	
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 ⁶ 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 ±6KV 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

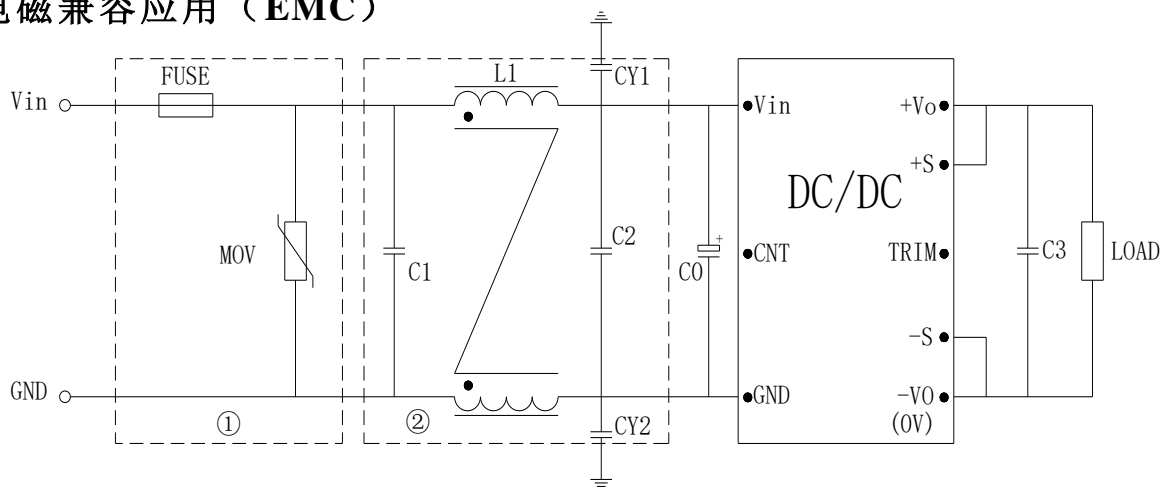
WDH100-110S24	66-160V	24	4.17	150	88%	1000
WDH100-110S48	66-160V	48	2.08	200	88%	470
WDH150-12S3V3	9-18V	3.3	30	100	88%	10000
WDH150-12S5	9-18V	5.05	30	100	88%	10000
WDH150-12S12	9-18V	12	12.5	150	87%	2200
WDH150-12S15	9-18V	15	10	150	87%	2200
WDH150-12S24	9-18V	24	6.25	150	87%	1000
WDH150-12S28	9-18V	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

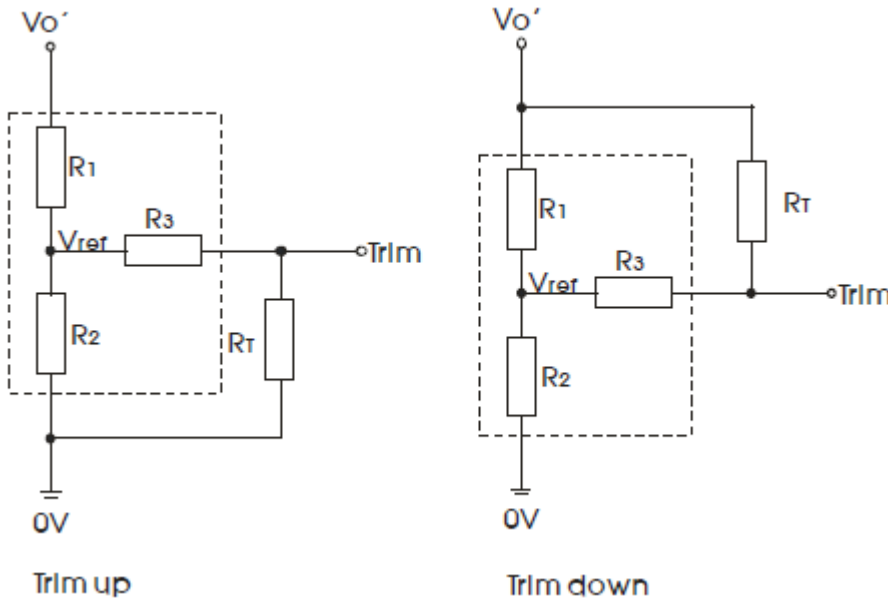
C1 C2:高频独石电容或者薄膜电容。

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:



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

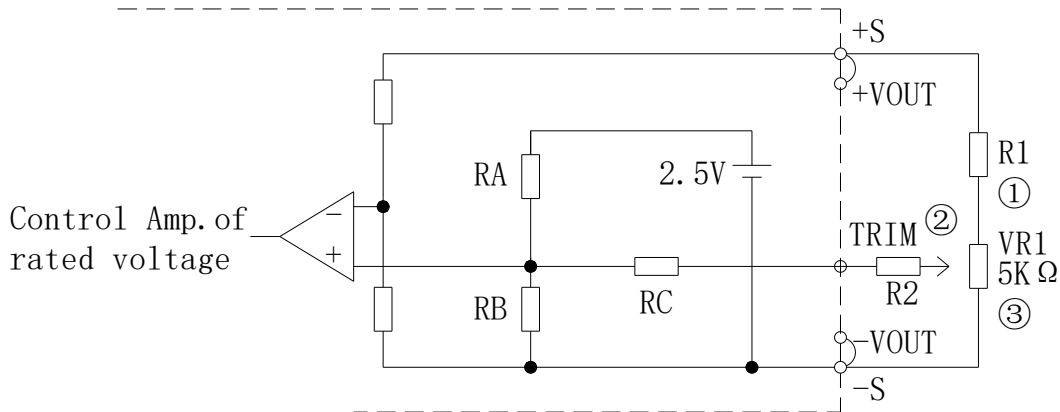
$$T = \frac{V_{ref}}{V_{o'} - V_{ref}} \cdot R_1 \text{ (调高电压)}$$

$$down : R_T = \frac{TR_1}{R_1 - T} - R_3$$

$$T = \frac{V_{o'} - V_{ref}}{V_{ref}} \cdot R_2 \text{ (调低电压)}$$

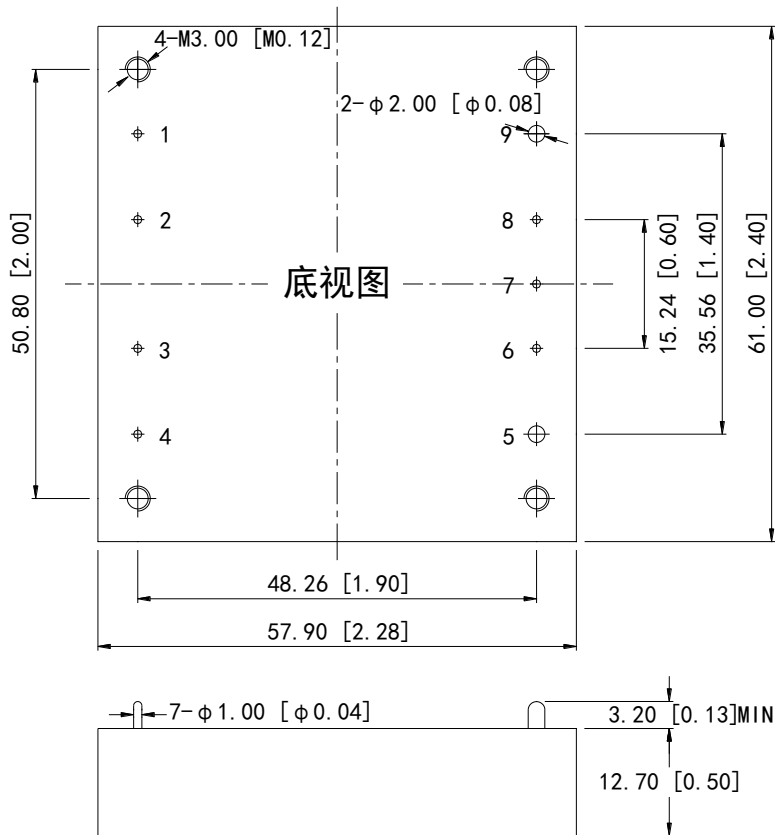
Vout (V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	3.32	2.0	8.2	1.24
5	2.55	2.49	8.2	2.5
9	6.49	2.49	10	2.5
12	9.53	2.49	12	2.5
13.8	11.1	2.49	12	2.5
15	12.5	2.49	15	2.5
24	21.5	2.49	20	2.5
28	25.5	2.49	20	2.5
48	45.3	2.49	20	2.5

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。