

Typical Characteristics

- Fixed-voltage input, isolated, unregulated output, 1W power
- Isolation voltage: 6000VDC
- Low no-load power consumption: 0.025W(Typ.)
- Efficiency: up to 90%
- Working ambient temperature: -40℃~+85℃
- MTBF≥3.5 million hours (3500000Hrs)
- Output short-circuit protection: continuous short-circuit protection, automatic recovery
- Compact SIP package, plastic housing
- Industry standard pin-out
- Ripple/noise (20MHz bandwidth): 30mVp-p(Typ.)

1W, fixed-voltage input, isolated, unregulated, single-output DC/DC power module



Over-temperature protection & continuous output short-circuit protection
RoHS

H_S-1WR3 Series is a compact, high-efficiency, low-power, fixed-input-voltage, isolated, non-regulated, single-output DC/DC module power supply designed by Huizhi Electronics for its customers; This product series is specifically designed for applications in on-board power supply systems that require the generation of a voltage isolated from the input power source.

This product is suitable for:

- Applications where the input voltage is relatively stable (voltage variation range: $\pm 10\% V_{in}$);
- Applications requiring isolation between the input and output (isolation voltage ≤ 6000 VDC);
- Applications where output voltage stability is not a critical requirement;
- Typical applications: pure digital circuits, general low-frequency analog circuits, relay driver circuits, data switching circuits, etc.

Model Number Description

H	xx	xx	S	-	1W	R3	
							.Suffix (3rd-generation product)
							:Rated output power (1W)
							:Package type (Single In-line Package, SIP)
							:Output voltage (rated)
							:Input voltage (rated)
							.Product series (6000V isolated single output)

Product selection table

Cer tif ica tio n	Model number	Input voltage range (Vdc)	Output Voltage/Current		Ripple and Noise	Efficiency @ Full load	Max. capacitive load
		Rated value ^② (Range)	Output V (Vdc)	Output I (mA) (Max. Min.)	Full Load (mVp-p) Typ. /Max.	% (Min. / Typ.)	μF

	H0303S-1WR3	3.3 (2.97~3.03)	3.3	303/30	50/100	76/80	2400
	H0305S-1WR3		5	200/20	50/100	80/84	2400
	H0312S-1WR3		12	84/9	50/100	84/86	560
	H0503S-1WR3	5 (4.5~5.5)	3.3	303/30	50/100	71/75	2200
	H0505S-1WR3		5	200/20	50/100	76/80	2200
	H0509S-1WR3		9	111/12	50/100	76/80	1000
	H0512S-1WR3		12	84/9	50/100	77/81	470
	H0515S-1WR3		15	67/7	50/100	77/81	470
	H0524S-1WR3		24	42/4	50/100	77/81	220
	H1203S-1WR3	12 (10.8~13.2)	3.3	303/30	50/100	72/76	2200
	H1205S-1WR3		5	200/20	50/100	75/79	2200
	H1209S-1WR3		9	111/12	50/100	77/81	680
	H1212S-1WR3		12	84/9	50/100	79/83	470
	H1215S-1WR3		15	67/7	50/100	79/83	470
	H1224S-1WR3		24	42/4	50/100	78/82	220
	H1503S-1WR3	15 (13.5~16.5)	3.3	303/30	50/100	76/80	2400
	H1505S-1WR3		5	200/20	50/100	86/88	2400
	H1509S-1WR3		9	111/12	50/100	87/89	1000
	H1512S-1WR3		12	84/9	50/100	87/89	560
	H1515S-1WR3		15	67/7	50/100	87/89	560
	H1524S-1WR3		24	42/4	50/100	87/89	220
	H2403S-1WR3	24 (21.6~26.4)	3.3	303/30	50/100	76/80	2400
	H2405S-1WR3		5	200/20	50/100	72/76	2200
	H2409S-1WR3		9	111/12	50/100	72/76	680
	H2412S-1WR3		12	84/9	50/100	72/76	470
	H2415S-1WR3		15	67/7	50/100	72/76	470
	H2424S-1WR3		24	42/4	50/100	72/76	220

Note: 1. Due to space limitations, the above is only a list of representative products. For products not included in this list, please contact our Sales Department.

2. The maximum capacitive load indicates the maximum capacitive load that can be connected to +Vo or -Vo. If this value is exceeded, the product will not start properly.

Test Conditions: Unless otherwise specified, all parameter measurements were taken at the nominal input voltage, with a purely resistive rated load, and at an ambient temperature of 25° C.

Input characteristics

Items	Working conditions	Min.	Typ.	Max.	Unit
Input Current (Full Load/No Load)	3.3VDC input series	--	378/6	--/12	mA
	5VDC input series	--	250/14	282/--	
	12VDC input series	--	106/10	116/--	
	15VDC input series	--	90/10	100/--	
	24VDC input series	--	56/12	59/--	

Reflected ripple current		--	15	--	
Impulse voltage (I sec. max)	3.3VDC input series	-0.7	--	5	VDC
	5VDC input series	-0.7	--	9	
	12VDC input series	-0.7	--	18	
	15VDC input series	-0.7	--	21	
	24VDC input series	-0.7	--	30	
Input filter type		Capacitor filtering			
Hot swap		Not supported			

Output characteristics

Items	Operating and test conditions		Min.	Typ.	Max.	Unit
Output load	Load percentage		10	--	100	%
Output voltage accuracy	See the error envelope curve		--	--	±15.0	%
Line Regulation	Input voltage variation: ±1%	3.3V output	--	--	±1.5	%
		Others	--	--	±1.2	%
Load Regulation	10%~100% load	3.3VDC output	--	18	--	%
		5VDC output	--	12	--	%
		9VDC output	--	8	--	%
		12VDC output	--	7	--	%
		15VDC output	--	6	--	%
		24VDC output	--	5	--	%
Ripple & Noise	Pure resistive load, 20 MHz bandwidth, peak-to-peak value	3.3V output	--	100	150	mVp-p
		Other output	--	80	120	
Temperature drift coefficient	Full load		--	--	±0.03	%/° C
Output short-circuit protection	Sustainable short-circuit protection, automatic recovery					

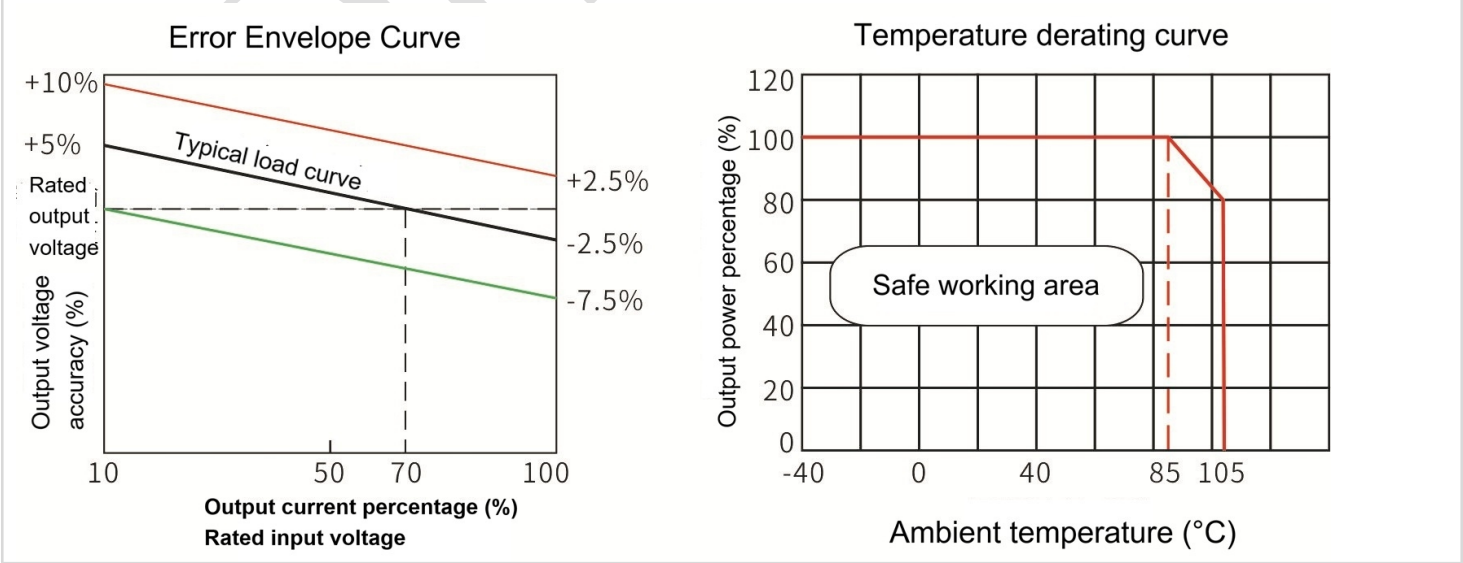
Note: ① Test method for ripple and noise: Twisted-pair test method.

General characteristics

Items	Working conditions	Min.	Typ.	Max.	Unit
Insulation voltage	Input-output, test duration: 1 minute, leakage current less than 1 mA.	6000	--	--	VDC

Insulation resistance	Input-output, insulation voltage 500 VDC.	1000	--	--	MΩ
Isolation capacitor	Input-Output, 100 kHz/0.1 V	--	20	--	pF
Operating temperature	Use the reference temperature derating curve	-40	--	+85	℃
Storage temperature		-40	--	+125	
Maximum operating case temperature		--	25	--	
Storage humidity	No condensation	5	--	95	%RH
Pin soldering temperature resistance	The solder joint is 1.5 mm from the housing; 10 seconds	--	--	+300	℃
Switching frequency	Full load, rated voltage input	--	100	--	KHz
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z			
Housing material		Black flame-retardant, heat-resistant plastic (UL94 V-0)			
Minimum mean time between failures	MIL-HDBK-217F@25℃	3.5X10 ⁶	--	--	Hrs

Product Performance Curve

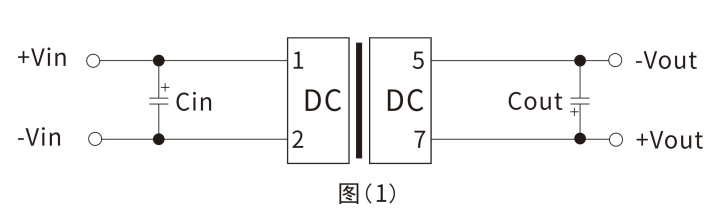


Typical Application Reference Circuit (Recommended Parameters)

1. General applications:

If further reduction of input and output ripple is required, a capacitor filter network can be connected across the input and output terminals; the circuit is shown in Figure 1.

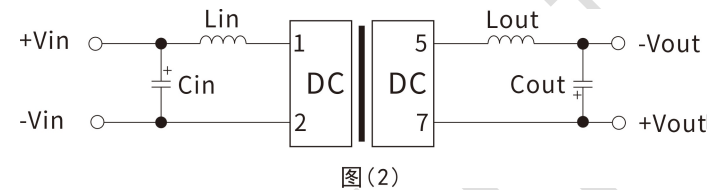
However, care must be taken to select an appropriate filter capacitor. If the capacitor is too large, it is likely to cause startup issues. For each output channel, the recommended capacitive load values—which ensure safe and reliable operation—are listed in Table 1.



Recommended capacitive load values (Table 1)

Vin (Vdc)	Cin (u F)	Vo (Vdc)	Cout (u F)
3.3/5	4.7	3.3/5	10
12	2.2	9	4.7
15	2.2	12	2.2
24	1	15	1
—	—	24	0.47

2. Typical EMI application circuits



Recommended EMI reference circuit values (Table 2)

Vin (Vdc)	3.3/5/12/15/24
Cin	4.7u F/50V
Cout	See table 1
Lin	4.7uH
Lout	4.7uH

3. Output load requirements

To ensure that this module operates efficiently and reliably, the minimum output load must not be less than 10% of the rated load during use. If your power requirement is indeed very low, please connect a resistor in parallel between the positive and negative terminals of the output (the total power rating of the resistor must be greater than or equal to 10% of the rated power, and the selected resistor's power rating must be at least 5 times greater than the actual power drawn; otherwise, the resistor will become excessively hot).

Application Precautions

1. Input Requirements: Ensure that the output voltage fluctuation range of the power supply does not exceed the input requirements of the DC/DC module itself; the output power of the input power supply must be greater than the output power of the DC/DC module.
2. Recommended Circuit 1: For applications with general ripple and noise requirements, a filter capacitor can be connected in parallel at both the input and output terminals. The external circuit is shown in Figure (1) below; refer to Table (1). Output Load Requirements: Avoid operating under no-load conditions whenever possible. When the actual power consumption of the load is less than 10% of the module's rated output power or no-load conditions occur, it is recommended to connect a dummy load to the output. The dummy load (resistor) can be calculated based on 5-10% of the module's rated power, where the resistance value = $U_{out} / (1W \times R3 \times 10\%)$;
3. Overload Protection: Under normal operating conditions, the product's output circuit does not provide overload protection. Prolonged overload will trigger over-temperature protection, causing the output to shut down;
4. The output features continuous short-circuit protection with automatic recovery.
5. The capacitance of the external capacitor connected to the output should not be too large, as this may cause overcurrent or poor startup during module startup;
6. If the product operates below the minimum required load, performance compliance with all specifications in this manual cannot be guaranteed;
7. Maximum capacitive loads are tested within the input voltage range and under full-load conditions;
8. Unless otherwise specified, all specifications in this manual are measured at $T_a=25^{\circ}\text{C}$, humidity $<75\%$ RH, nominal input voltage, and rated output load;
9. All test methods for the specifications in this manual are based on our company's standards;
10. We offer product customization; please contact our technical or sales staff directly for details;
11. Product specifications are subject to change without notice.

Contact

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