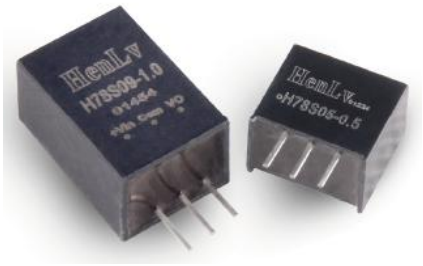
1. Review



1.1 Product Selection:

H78 S XX – XW

① ② ③ ④

① H78: Wide voltage input, Input&output NO.are Non-Isolated (H:Henlv Power ,78:Three Terminal Voltage Regulator)

② Output voltage Form

S: Single output

③ Input Voltage No.

××:Any voltage value within 1VDC～48VDC（Eg：05VDC Means output Voltage is 5VDC）

④ Output watt :

Eg: 25W means MAX load power watt

1.2 Product Feature

- Fixed voltage input
- Typical Efficiency Value> 90%
- Operating Temperature：Industrial Grade -25℃～+55℃, Military Grade-40℃～+85℃
- DIP package &Filter Welding
- International Standard Pin Show
- Metal shell retardant Package
- RoHS
- Natural Cooling
- Anti-interference performance, electromagnetic compatibility, output over current and short circuit protection, over heat protection, and restart automatic.

1.3 Application Field

Industrial control and remote DC power supply system, switching system, A/D and D/A, railway communication, communication interface converter, cellphone, semiconductor laser, display screens, monitoring equipment, petrochemical, portable instrument, medical instruments, automatic control device, burglar alarm, handhold instrument, digital circuit, IC card power meter, air conditioning computer controller, etc.

2. Electrical Characteristics

Unless otherwise specified, Input = Vi, converter electrical characteristic should confirm to Table 1, and apply to full temperature range（-25℃≤Tc≤55℃）

Table 1 Electrical Characteristics

Parameter	Symbol	Condition Unless otherwise specified, Vi ,-25℃≤Tc≤55℃	Limit		Unit
			Min	Max	
Output voltage	Vo1	Full load	Vo1-2%	Vo1+2%	V
Max output current	Io	-	-	Po/Vo	A

Output Ripple voltage	Vp-p	Full load，Vi，BW=20MHz，Normal Temperature	-	50	mV
load regulation	Si	Vi，Io=(10%~100%)Iomax	-	2	%
Efficiency	η	Vi，full load，Normal temperature	75. 00	-	%
General characteristic					
EMC	Magnetic susceptibility test GB6833.2-87、 electrostatic discharge Sensitivity Test GB6833.3-87、 Radiosensitivity Test GB6833.5-87、 Conducted susceptibility Test GB6833.6-87、				
Drift	0.02%/℃				
Frequency	270K～350K HZ				
Humidity	95% (max)				
MTBF	>2,000,00H				

3．Mechanical Dimensions & Recommended Footprint Details

3.1 configuration & footprint as Figure 1

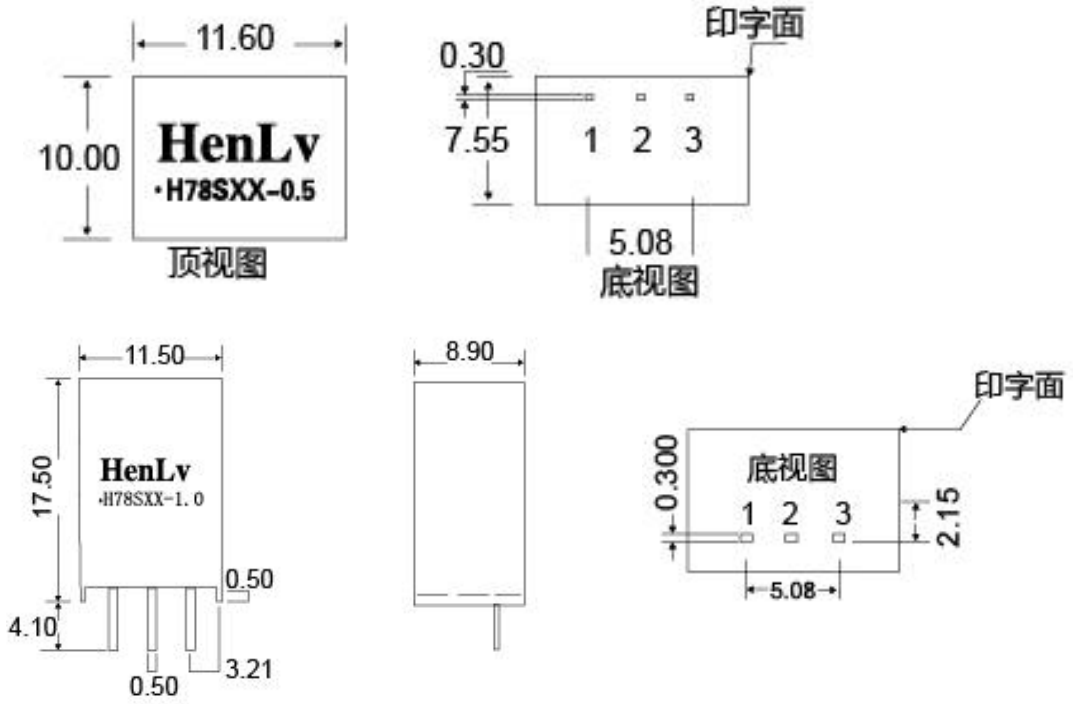
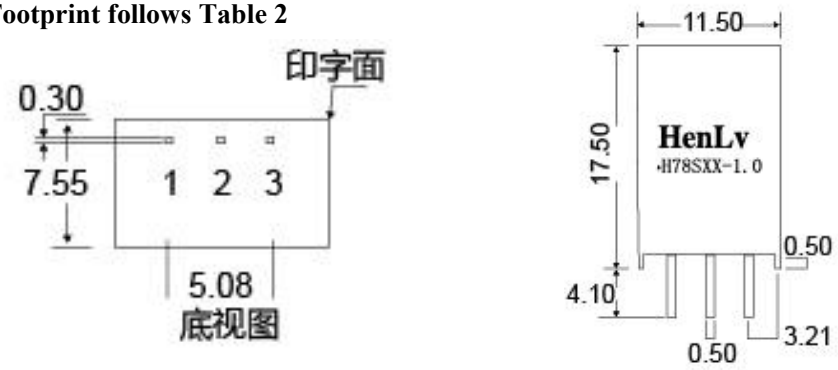


Table 1

Note: Unit mm, dimensions without labeling tolerance follows level m of GB/1804－2000

3.2 Footprint follows Table 2



SIP封装引脚定义

500mA的尺寸图:L*H*W 11.60*10.00*7.55			
引脚	1	2	3
封装	Vin	GND&0V	Out

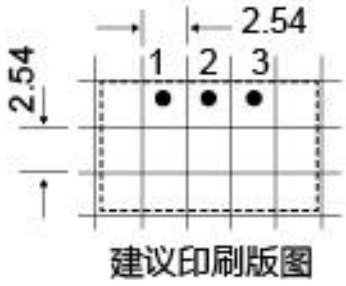
SIP封装引脚定义

1000mA的尺寸图:L*H*W 11.50*8.90*17.50			
引脚	1	2	3
封装	Vin	GND&0V	Out

Table 2 Output End

Note: XXVDC means otuput voltage No.XX V

3.3 Recommended Footprint



NOte: mm[inch] as unit

4. Function Flowchart

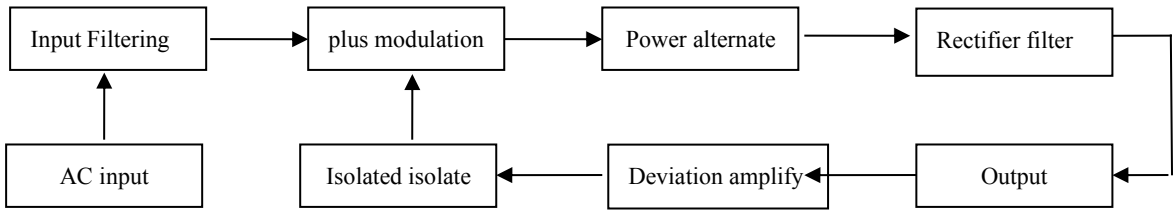


Table 3

5. Burned in test.

Burned in test wiring diagram as Figure 4

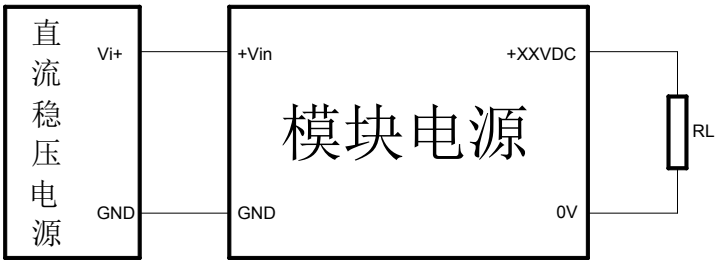


Table 4

Note: during burned in, $RL = \frac{U^2}{P_O}$ Ω （±3%）

6. Test Method

6.1 Purpose

Stipulating the test principle and method of the converter.

6.2 Testing device and instrument

Test needed devices and instruments as follow: stabilized voltage supply, digital multimeter, oscilloscope, signal source, test fixture and insulation resistance tester, etc.

6.3 Test schematic diagram

Test schematic diagram as Figure 5

Note:Full load $RL=\frac{U^2}{P_o}$ Ω （±3%），Half load $RL=2\frac{U^2}{P_o}$ Ω （±3%）

Table 5

6.4 Electric parameters test

6.4.1 Output Voltage Vo

Multimeter read at nominal Vin, full load is output voltage, should meet the rules in table 1

6.4.2 Max Output Current Iomax

Multimeter read at nominal Vin, full load, circuit in series is output current, or use other way to test (Resistance sampling method)

6.4.3 Output Ripple & Noise Vp-p

At nominal Vin, full load, stated bandwidth, the peak AC value of oscilloscope read on output pin is the Vp-p

6.4.4 Load Regulation Si

At nominal Vin, 50% full load, the output voltage is V_{OH}; at full load, the output voltage is V_O, so:

$$Si=\frac{|V_{OH}-V_O|}{Vo}\times 100\%$$

6.4.5 Efficiency η

At full load, output current I_O, test output voltage is V_O, at same time, the input voltage is Vi, input current is Ii, so:

$$\eta=\frac{Vo\times Io}{Vi\times Ii}\times 100\%$$

6.4.6 High voltage test

Test between the negative input and output ground by high voltage tester 1000V-6000V DC mode, read after 3 second,

While high voltage test, first short out all input and all output pins, then test high voltage between input pins and output pins 1000V-6000V DC /1 Minute.

Note: no flashover and spark caused by loose contact while testing.

7. H78SXX-XW Series Technical Parameter

Model	Input Voltage (V)	Output Voltage (V±2%)	Output Current (mA)	Efficiency	Weight (g) ±0.5	Package	Certificate
H78 S3.3-0.5	4.75~28	3.3VDC	0.5	≥78%	14	SIP	RoHS
H78 S3.3-1.0			1	≥80%	14	SIP	
H78S05-0.5	6.5-32	5VDC	0.5	≥80%	14	SIP	
H78S05-1.0			1	≥82%	14	SIP	
H78 S6.5-0.5	9.0-32	6.5VDC	0.5	≥81%	14	SIP	
H78 S6.5-1.0			1	≥83%	14	SIP	
H78 S09-0.5	12-32	9VDC	0.5	≥84%	14	SIP	
H78 S09-1.0			1	≥86%	14	SIP	
H78 S12-0.5	16-32	12VDC	0.5	≥80%	14	SIP	
H78 S12-1.0			1	≥87%	14	SIP	

Note: Customized DC-DC converter with any input/output is available, please contact sales if special requirement needed.

8. Temperature curve 、Tolerance envelop curve

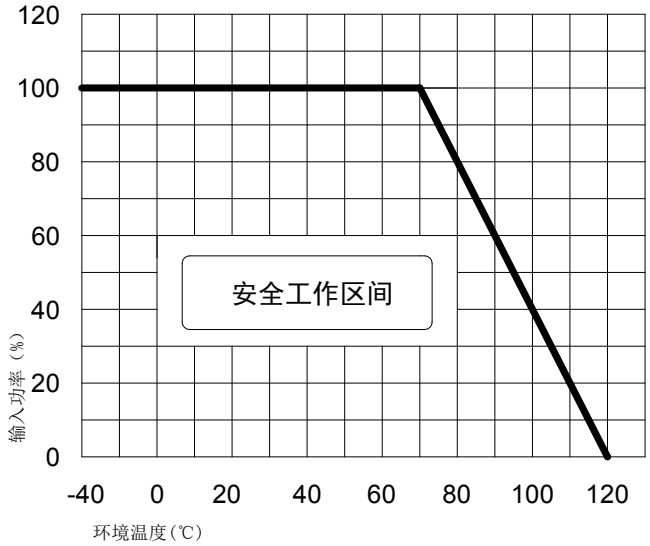


图6 温度曲线图

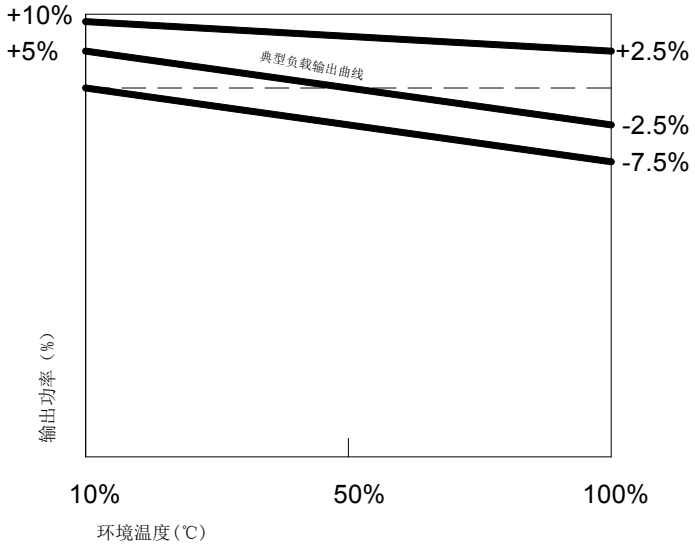


图7 误差包络曲线图

Typical Efficiency curve

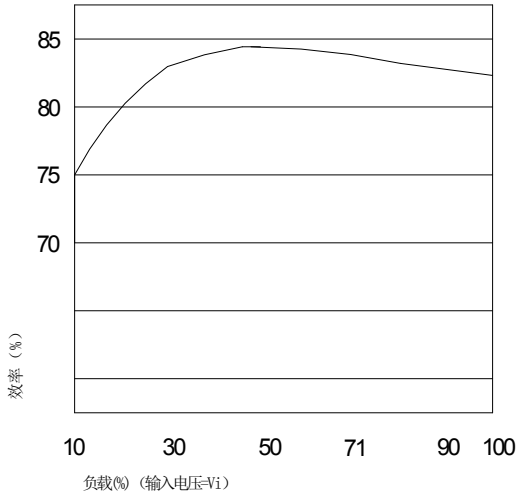


图8 效率/负载曲线图

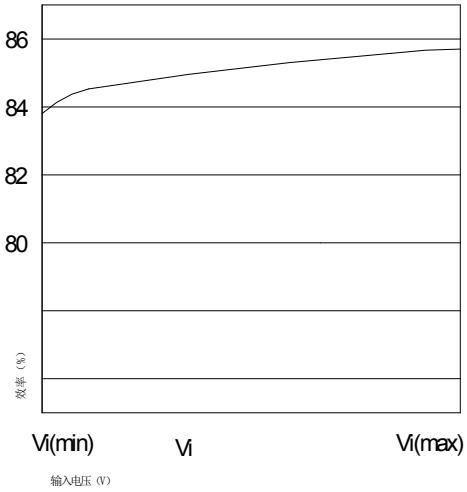
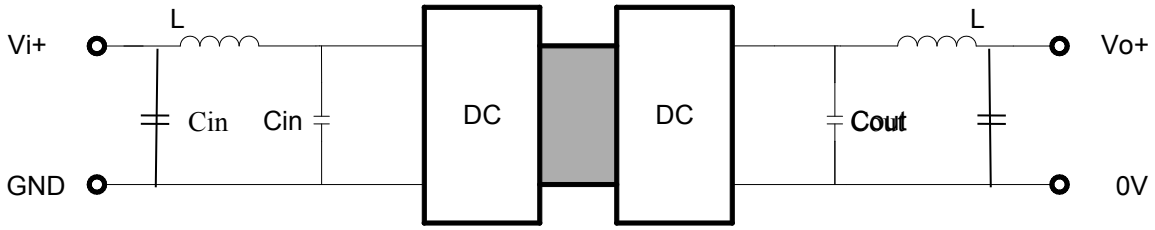


图9 效率/输入电压曲线图

9. Typical Application



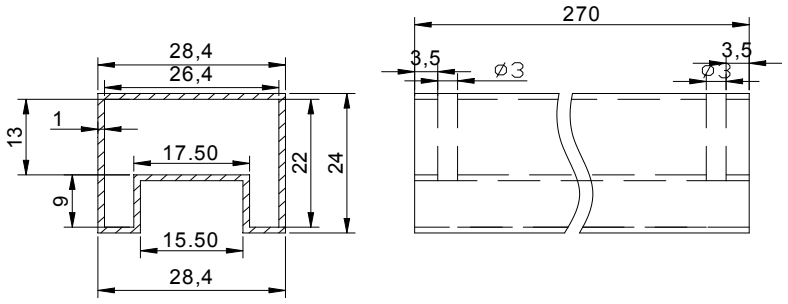
Filter: in some circuit sensitive to noise and ripple, a filter capacitor should be put between DC/DC input and output, to reduce the ripple affection to the system. But the value of filter capacitor should be proper, or it might cause the start issue if the capacitor is too big. For each output, in the condition to ensure safety, the max capacitance of filter capacitor can consult the external capacitance meter. In order to get a extremely low ripple, an input external LC filter is recommended between input and output of the DC-DC converter, so the filter effect will be better. Meanwhile, the inductance value and frequency of LC filter should stagger the DC/DC converter frequency, to avoid interference.

Input Voltage (Vi+)	Input capacitance Cin	Output voltage (Vout)	Output capacitance Cout
5V	1μF	3.3	4.7μF
12V	4.7μF	9	2.2μF
24V	1μF	15	0.47μF
48V	1μF	24	0.47μF
-	-	48	0.47μF

10. Attention

10.1 Package

The package for this series is static free packaging tube for electronic products



Note:mm unit Unmarked tolerance ±0.5mm

10.2 Shipping

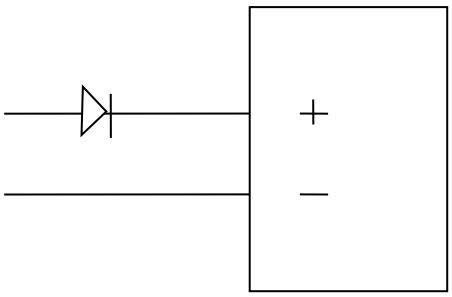
The package for module is allowed to transport by any transportation facilities, direct rain/snow pouring, and mechanical damage should be avoided.

10.3 Storage

The module converter should be kept in the storehouse with environment temperature -10℃~ 40℃, relative humidity less than 80%, acid free, alkali free and non harmful gas.

10.4.1 load power of all fixed voltage input series must be over 10%

2. Input of converter is forbidden to connect reversely. while adjustment test, a diode can be connect in series, as a anti-reverse protection, as shown in Figure 10.5



Figue 10.5 anti-reverse circuit

Above all is the performance specification of the product series in this handbook, for non standard product, the specification might exceed above requirement. Please contact us if you have special need.

Prepared by: _____ Audit by: _____ Approved by: _____