

# HSA03-C High Power Pulse Width Modulation Amplifier

## 1 Features

- Widely motor input voltage range : 16V~100V
- TTL square wave signal input
- Maximum Continuous output current : 30A
- Overheat Current-limiting protection function



58.9×40.4×6.99mm<sup>3</sup>

Weight: 55g

Fig1 HSA03-C External view

## 2 Scope of application

Motor controlling with brush

Drive reactive load

## 3 Descriptions

HSA03-C is a pulse width modulation type power amplifier which operates in the switching mode, it can provide 3KW maximum transmission power for the load; the product needs two power supplies, + 15v for the small signal control circuit power supply; 16v-100v motor the power supply for the internal H bridge. The input signal of the input circuit is 50KH TTL TTL signal; the key input can turn off the four drive tubes of the H bridge circuit.

The series of the products are made of thick film hybrid integrated process, metal sealed shell package. Product design and manufacturing to meet the MIL-STD and detailed specifications of the product requirements, the quality level is H-class.

## 4 Technical Specifications

Table 1: Rated conditions and Recommended operating conditions

Absolute maximum rating	Recommended operating conditions
Supply voltage +Vs: 100V Supply voltage +Vcc: 16V Input voltage +PWM: 0V~11V Input voltage -PWM: 0V~11V Input voltage , I <sub>limit</sub> /SHDN: 0~+10V Internal power loss : 380W  Storage temperature (10s) : -65°C~150°C Operating temperature: -55°C~125°C	Supply voltage +Vcc: 15V Supply voltage +Vs: 100V Input voltage +PWM: +3V~+7V Input voltage, I <sub>limit</sub> /SHDN: ≥0.1V

Table 2 electrical characteristics

No.	Character	Conditions -55°C ≤ T <sub>c</sub> ≤ 125°C	HSA03-C			Symbol
			min	Typical value	max	
1	Output clock high level	-	4.8	-	5.3	V
2	Output clock low level	-	0	-	0.4	V
3	clock output frequency	-	42	45	48	KHZ
4	triangular wave center voltage	-	-	5	-	V
5	triangular wave peak -peak voltage	-	-	4	-	V
6	switching operation frequency	-	-	22.5	-	KHZ
7	output efficiency	V <sub>s</sub> =100V, output current 10A	-	97	-	%
8	Continuous working current	Below 60°C (case temperature)	-	-	30	A
9	Peak working current	-	-	-	40	A
10	Power +Vs	-	16	-	100	V
11	Power +Vcc	-	14	15	16	V
12	+Vcc static current	I <sub>out</sub> =0	-	-	80	mA
13	+Vs power current	No load	-	-	50	mA
14	I <sub>limit</sub> /shutoff threshold	-	3.9	-	-	mV
15	Operating Temperature	-	-55	-	+125	°C

	(shell temperature)					
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## 5 Lead function descriptions

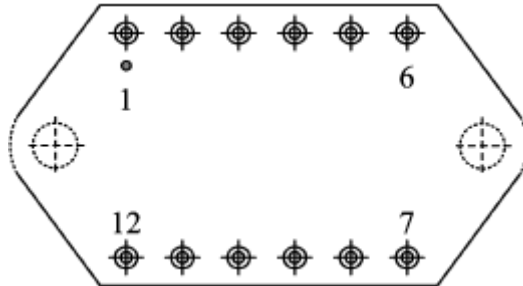


Fig 2 upward view

Table 3 Pin Designation

No	symbol	Designation	No	symbol	Designation
1	CLK IN	Clock input	7	$I_{SENSEB}$	Load current inductor B
2	CLK Out	Clock output	8	Bout	Output B
3	+PWM	TTL PWM square wave	9	+Vs	motor power
4	$V_{Ref}$	2.5V	10	+Vcc	+15V power
5	GND	Ground	11	A out	output A
6	I limit/SHDN	Current limiter/shut off	12	$I_{SenseA}$	Load current inductor A

## 6 Circuit block diagram

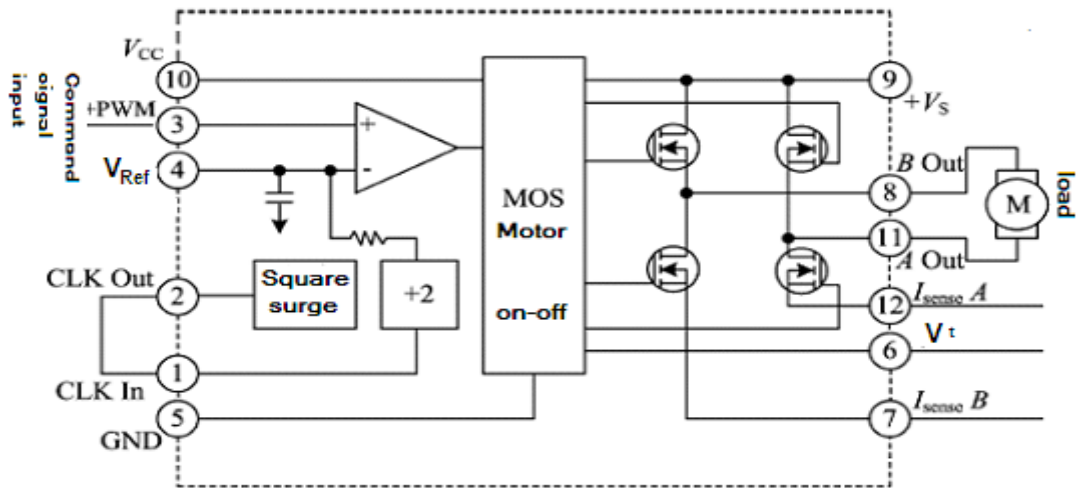
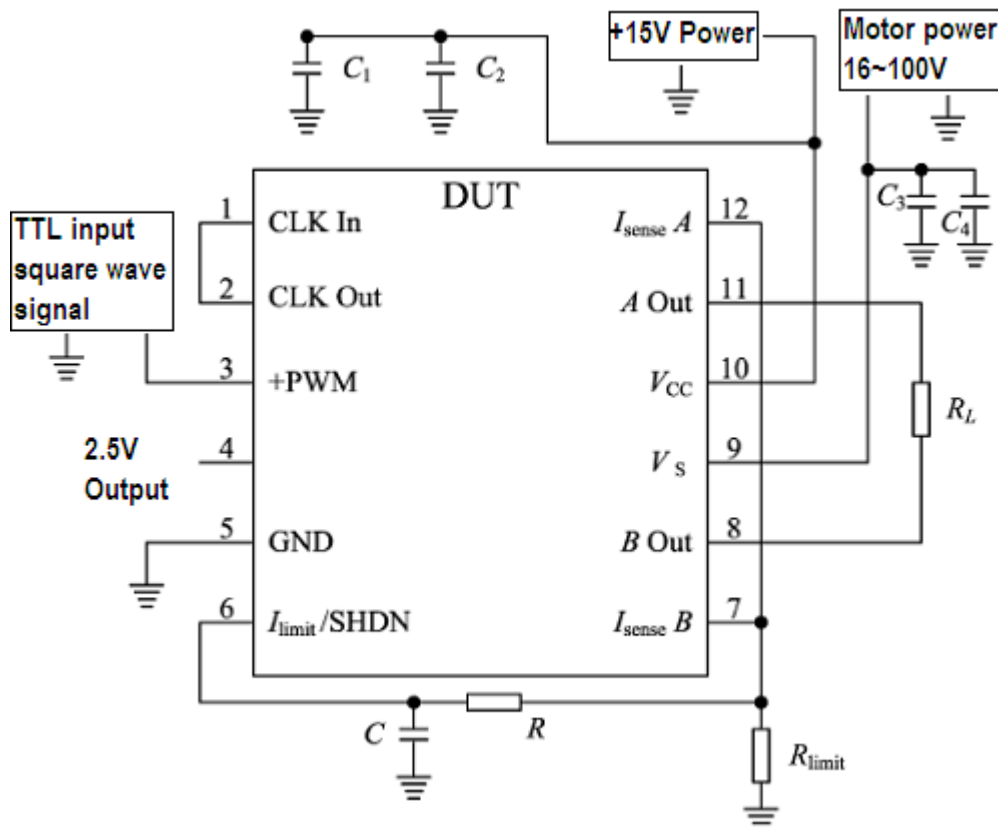


Fig 3 Circuit block diagram

## 7. Typical Connection Diagram

HSA03-C Power supply has two current sampling end  $I_{SENSE A}$  and  $I_{SENSE B}$ . The two terminals shall be shorted when using voltage control model. The typical connection diagram as shown in Fig 4.



### 7.1 Power supply bypass

HSA03-C power supply should have plenty of bypass to ensure its correct operation, the motor power supply should add a ceramic capacitor  $C_3$ , and then in parallel with a low ESR value of the bypass capacitor  $C_4$ , the capacitance should be at least  $10\mu\text{f} / \text{A}$  .for VCC the same , a  $0.1\mu\text{F}$  - $0.47\mu\text{F} / 50\text{V}$  ceramic capacitor  $C_1$  and a low ESR value of  $6.8\mu\text{F}$  - $10\mu\text{F} / 50\text{V}$  bypass capacitor  $C_2$ . All bypass capacitors should be connected as close as possible to the corresponding root of power port.

### 7.2 Unprotected circuit typical connection diagram

If the system does not need current limiting protection circuit, you can connect as in Figure 5

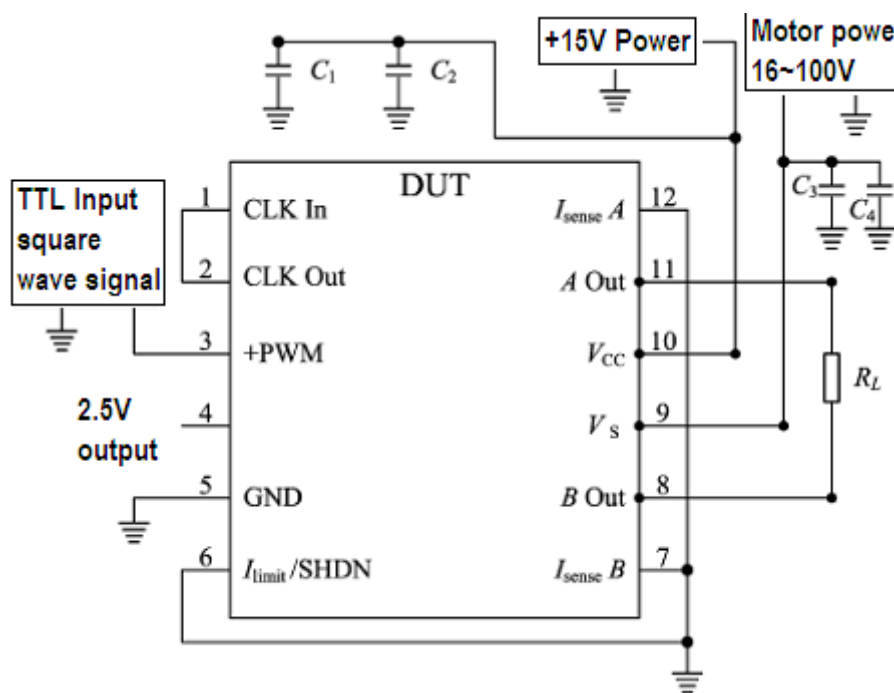


Fig 5 unprotected circuit typical connection diagram

## 8. Package Specifications

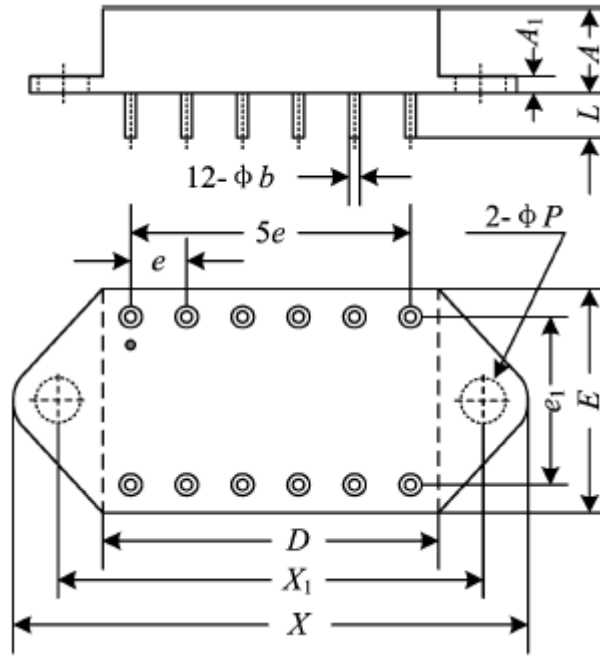


Fig6 package outline drawing

Form 4 Package Outline

Symbol	Data/mm		
	Min	Typical	Min
$A$	-	-	6.99
$A_1$	2.28	-	2.44
$\phi b$	1.47	-	1.57
$D$	-	-	40.40
$E$	-	-	40.40
$e$	-	5.08	-
$e_1$	-	30.48	-
$L$	11.43	-	12.70
$X_1$	49.56	-	49.96
$X$	-	-	58.90
$\phi P$	3.80	-	4.20

Application notes please refer to the appendix, must read it carefully

