

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



58.9×40.4×6.99mm³

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 _{limit} /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 _{limit} /SHDN: ≥0.1V

Table 2 electrical characteristics

No.	Character	Conditions -55°C ≤ T _c ≤ 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 _s =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 _{out} =0	-	-	80	mA
13	+Vs power current	No load	-	-	50	mA
14	I _{limit} /shutoff threshold	-	3.9	-	-	mV
15	Operating Temperature	-	-55	-	+125	°C

	(shell temperature)					
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5 Lead function descriptions

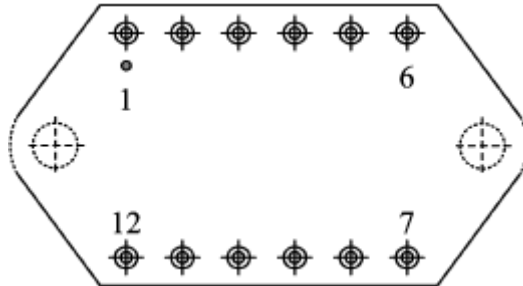


Fig 2 upward view

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

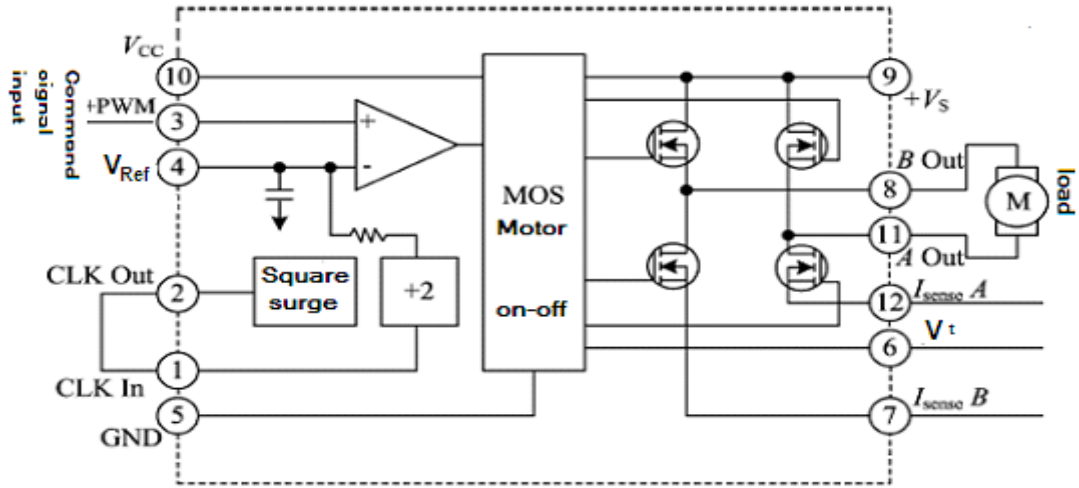
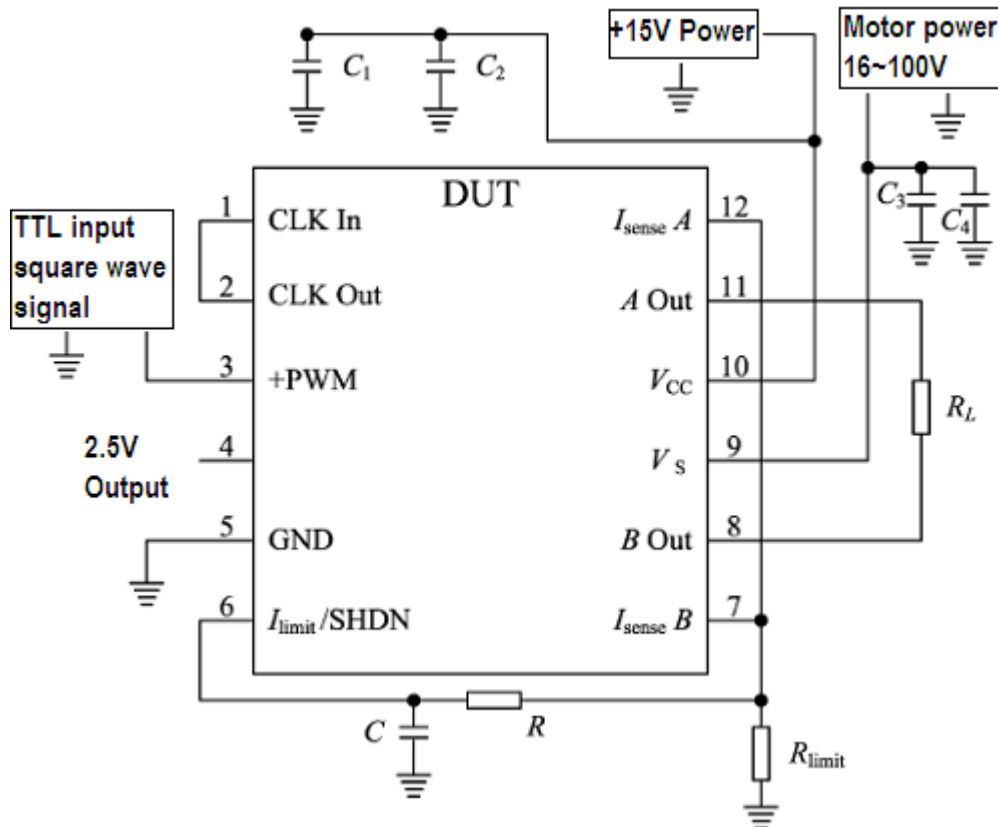


Fig 3 Circuit block diagram

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

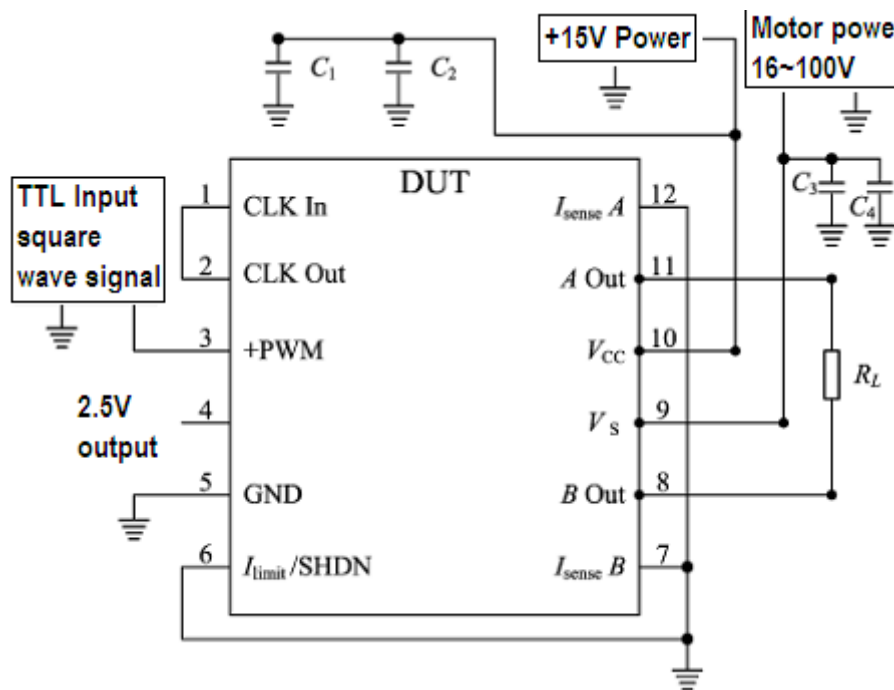


Fig 5 unprotected circuit typical connection diagram

8. Package Specifications

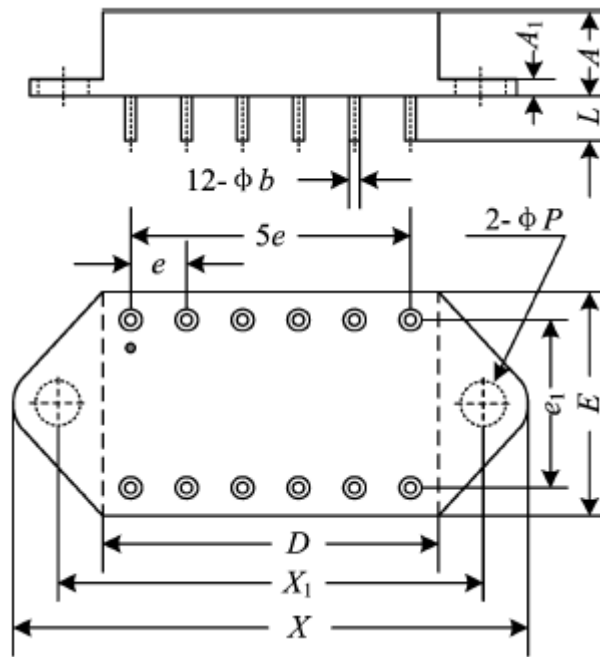


Fig6 package outline drawing

Form 4 Package Outline

Symbol	Data/mm		
	Min	Typical	Min
A	-	-	6.99
A_1	2.28	-	2.44
ϕb	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
ϕP	3.80	-	4.20

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

