

HSA03-A High Power Pulse Width Modulation Amplifier

1 Features

- Compatible with APEX SA03 and MSK MSK4205
- Widely motor input voltage range: 16V~100V
- Analog signal circuit input
- Max Continuous output current : 30A
- Overheat Current-limiting protection function



58.9×40.4×6.99mm³

Weight: 55g

Fig 1 HSA03-A External view

2 Scope of application

Motor controlling with brush

Drive reactive load

3 Descriptions

HSA03-A 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 control signal of the input circuit is the DC level signal of 3v-7v. The internal output 45KHZ TTL wave signal, the output width of the square wave signal frequency is 22.5KHZ. 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: 0~+11V Input voltage -PWM: 0~+11V Input voltage , Ilimit/SHDN: 0~+10V Internal power loss : 380W Storage temperature (10s): -65°C~150°C Operating Temperature (Tc): -55°C~125°C	Supply voltage +Vs: 100V Supply voltage +Vcc: 15V Input voltage +PWM: +3V~+7V Input voltage Ilimit/SHDN: 0.1V

Table 2 electrical characteristics

No	Character	Conditions -55°C ≤ Tc ≤ 125°C	HSA03-A			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 center voltage	-	-	5	-	V
5	triangular wave peak -peak voltage	-	-	4	-	V
6	Switching operation frequency	-	-	22.5	-	KHZ
7	output efficiency	Vs=100V, output current 10A	-	97	-	%
8	Continuous working current	Below 60°C	-	-	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 _o =0	-	-	80	mA
13	+Vs power current	No load	-	-	50	mA
14	I _{limit} / Shutoff threshold	-	90	-	110	mV
15	Operating Temperature (shell temperature)	-	-55	-	+125	°C

5 Lead function descriptions

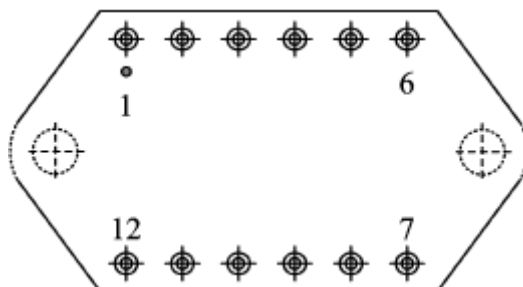


Fig 2 upward view

Table 3 Pin Designation

No	symbol	Designation	No	symbol	Designation
1	CLK IN	Clock input	7	$I_{sense\ B}$	Load current sensing terminal
2	CLK Out	Clock output	8	B_{out}	Output B
3	+PWM	+PWM input signal	9	$+V_s$	motor power
4	-PWM/RAMP	-PWM input signal/ or internal triangular wave output	10	$+V_{cc}$	+15V power
5	GND	Ground	11	A_{out}	output A
6	$I_{limit}/SHDN$	current limiter/ shut off	12	$I_{sense\ A}$	Load current sensing terminal A

6 Circuit block diagram

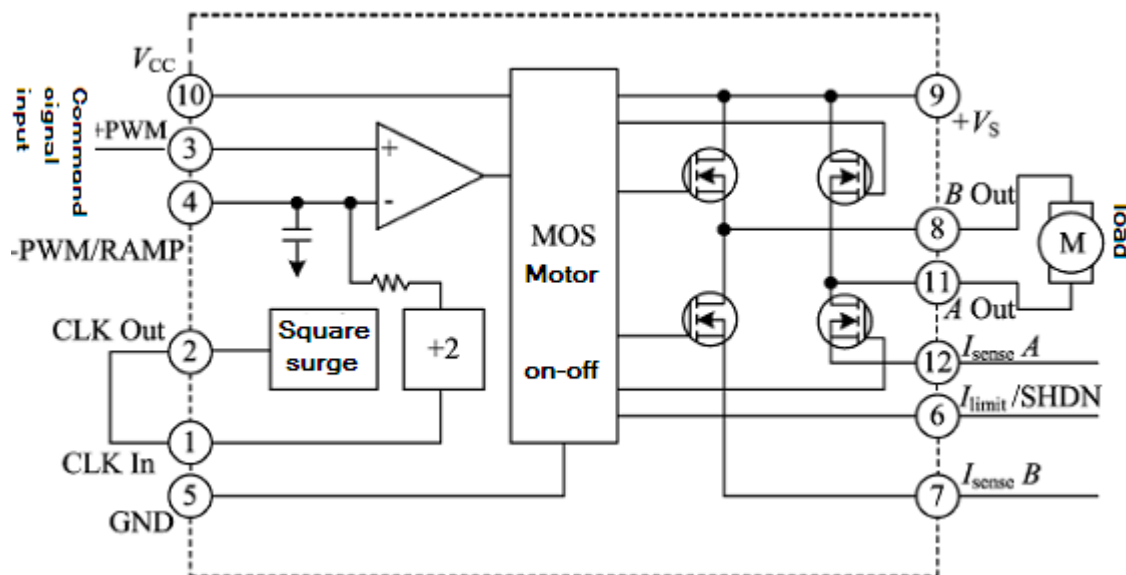


Fig 3 Circuit block diagram

7. Typical Connection Diagram

HSA03-A 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 V_{CC} 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..

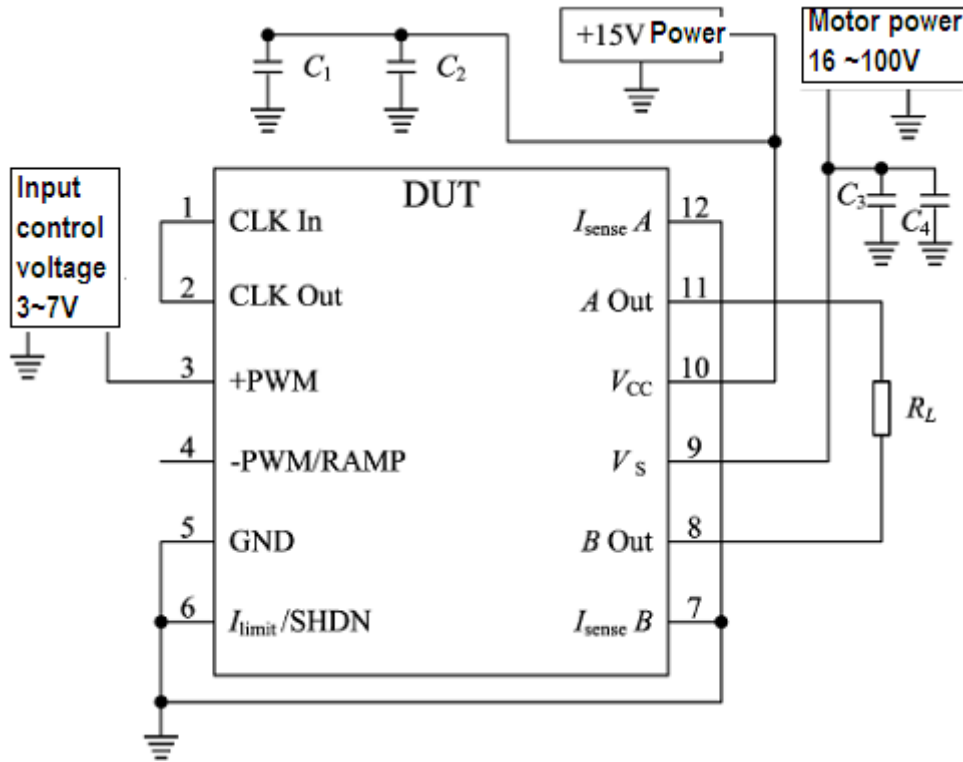


Fig 4 HSA03-A Typical connection diagram

Power supply bypass

Power supply should have plenty of bypass to ensure its correct operation, the motor power supply V_S should add a $1\ \mu\text{F}$ ceramic capacitor, and then in parallel with a low ESR value of the bypass capacitor, the capacitance should be at least $10\mu\text{F} / \text{A}$.for V_{CC} the same , a $0.1\ \mu\text{F}$ - $0.47\mu\text{F}$ ceramic capacitor and a low ESR value of $6.8\mu\text{F}$ - $10\mu\text{F}$ bypass capacitor. All bypass capacitors should be connected as close as possible to the corresponding root of power port.

8. Package Specifications

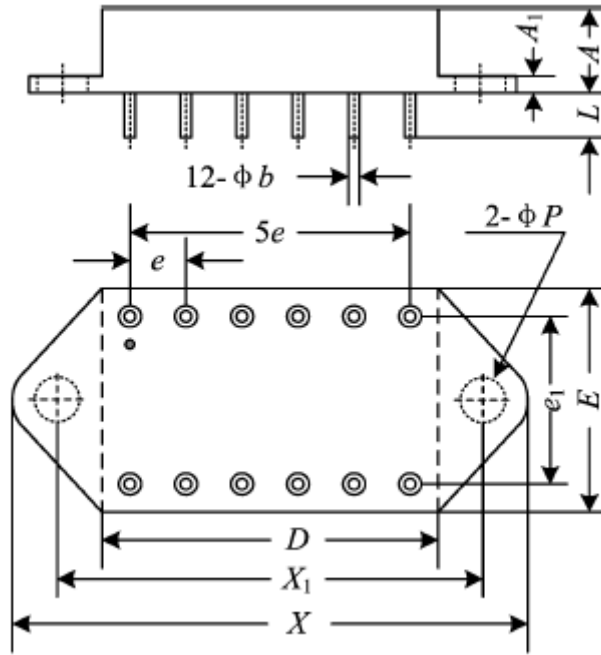


Fig5 package outline drawing

Form 4 Package Outline

Symbol	Data/mm		
	Min	Typical	Min
A	-	-	6.99
A_i	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