

HSA03-B High Power Pulse Width Modulation Amplifier

1 Features

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



58.9×40.4×6.99mm₃

Weight: 55g

Fig1 HSA03-B External view

2 Scope of application

Motor controlling with brush

Drive reactive load

3 Descriptions

HSA03-B 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: 120V Supply voltage +Vcc: 17V Control voltage V_{+PWM} : 7V Forbidden voltage V_{SI} : 7V Lead resistance welding temperature :300°C Storage temperature (10s) : -65°C~150°C Junction temperature (T_c) : 150°C | Supply voltage+Vcc: 15V±1V Supply voltage+Vs: 16V~100V, typical value 60V Control voltage V_{+PWM} : TTL width square wave (high level 5V) Operating temperature range, H class: -55°C~125°C |

Table 2 electrical characteristics

| No | Character | Conditions -55°C≤Tc≤125°C | HSA03-B | | | Symbol |
|----|---|------------------------------|---------|---------------|------|--------|
| | | | min | Typical value | max | |
| 1 | Power +Vs | - | 16 | - | 100 | V |
| 2 | Power +Vcc | - | 14 | 15 | 16 | V |
| 3 | +Vcc static current | $I_o=0$ | - | - | 80 | mA |
| 4 | Input clock high level | - | 4.8 | - | 5.3 | V |
| 5 | Input clock low level | - | 0 | - | 0.4 | V |
| 6 | clock input frequency | - | 42 | 45 | 48 | 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 | I_{limit} /shutoff threshold | - | 90 | - | 110 | mV |
| 11 | Operating Temperature (shell temperature) | - | -55 | - | +125 | °C |

5 Lead function descriptions

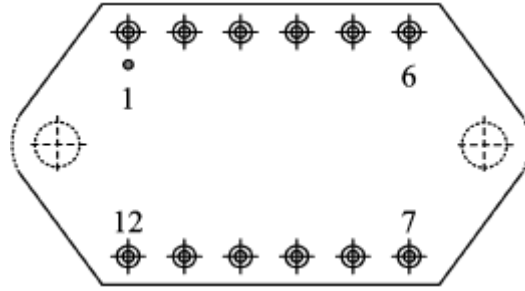


Fig 2 upward view

Table 3 Pin Designations

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

6 Circuit block diagram

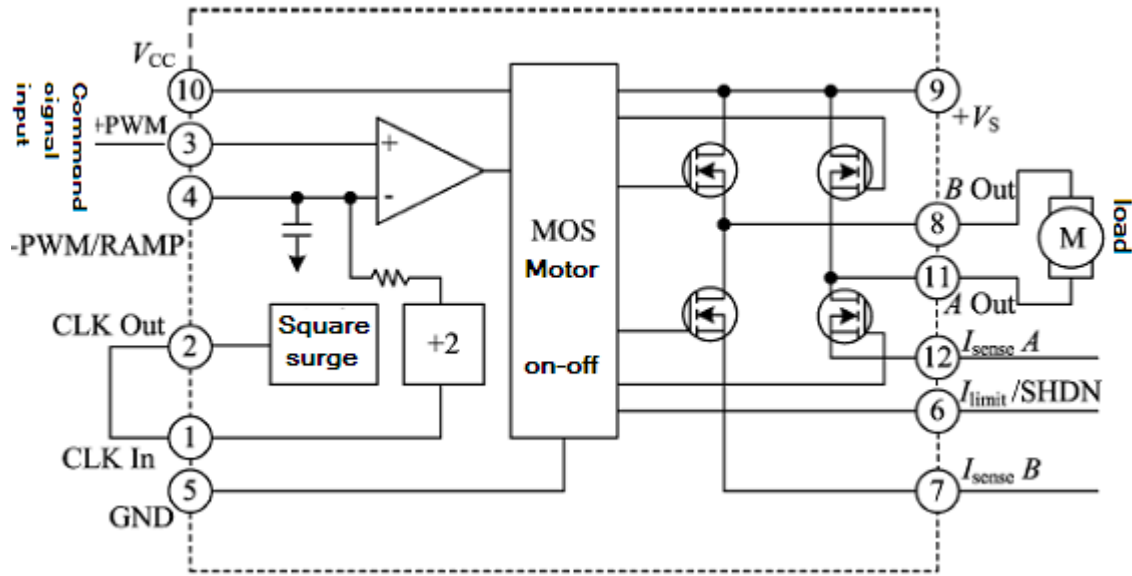


Table 3 Circuit block diagram

7. Typical Connection Diagram

HSA03-B 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 Table 4.

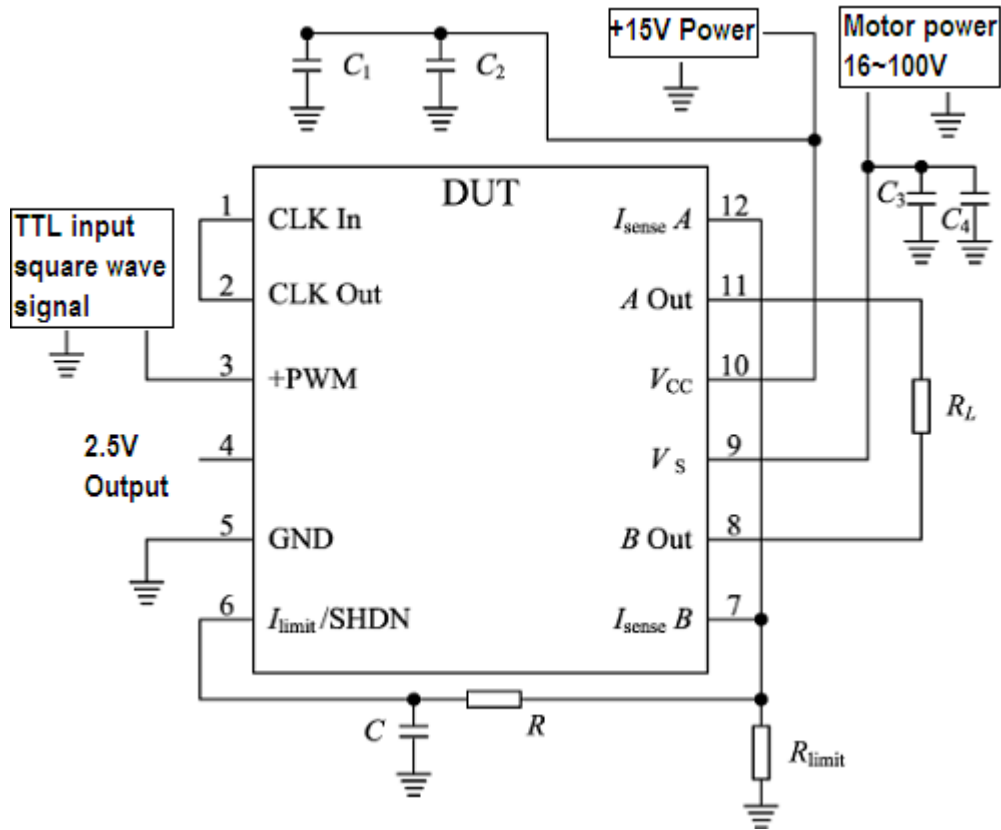


Table 4 typical connection diagram

7.1 Power supply bypass

HSA03-B power supply should have plenty of bypass to ensure its correct operation, the motor power supply should add a ceramic capacitor C3, and then in parallel with a low ESR value of the bypass capacitor C4, the capacitance should be at least $10\mu F / A$. for V_{CC} the same, a $0.1 \mu F - 0.47\mu F / 50V$ ceramic capacitor C1 and a low ESR value of $6.8\mu F - 10\mu F / 50V$ bypass capacitor C2. 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.

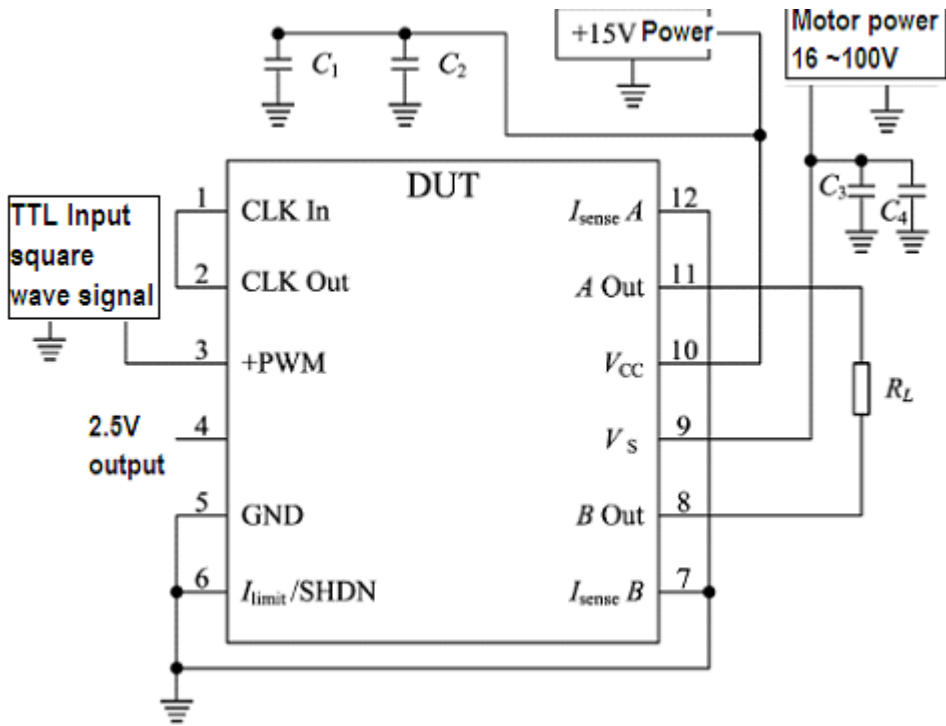


Fig 5 unprotected circuit typical connection diagram

8. Package Specifications

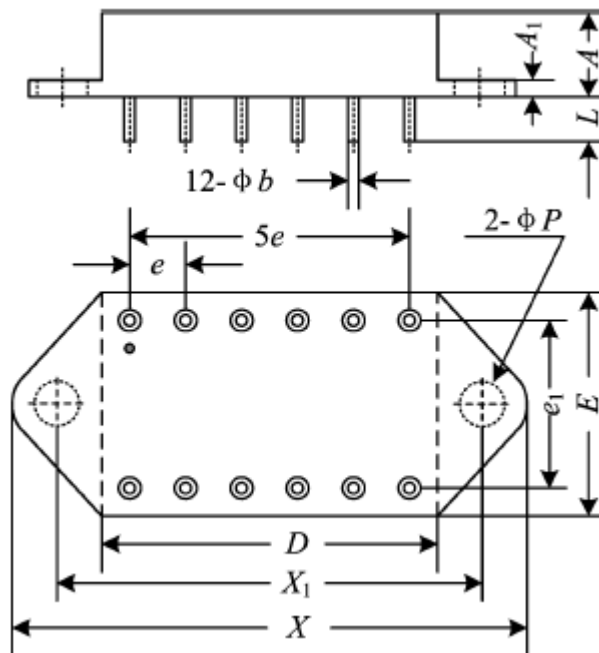


Fig6 package outline drawing

Form 4 Package Outline

| Symbol | Data/mm | | |
|----------------------|---------|---------|-------|
| | Min | Typical | Min |
| <i>A</i> | - | - | 6.99 |
| <i>A_t</i> | 2.28 | - | 2.44 |
| ϕb | 1.47 | - | 1.57 |
| <i>D</i> | - | - | 40.40 |
| <i>E</i> | - | - | 40.40 |
| <i>e</i> | - | 5.08 | - |
| <i>eI</i> | - | 30.48 | - |
| <i>L</i> | 11.43 | - | 12.70 |
| <i>XI</i> | 49.56 | - | 49.96 |
| <i>X</i> | - | - | 58.90 |
| ϕP | 3.80 | - | 4.20 |

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