



HISA01 Isolated Military Pulse Width Modulation Amplifier

1 Features of HISA01 Isolated Military Pulse Width Modulation Amplifier

- Wide input voltage range: 16V~100V
- Continuous output voltage: 10A
- Peak output current: 20A
- Direction control input signal
- Isolated between the input signal and output signal



58.9×40.4×6.99mm³

Weight: 55g

2 Scope of application of HISA01 Isolated Military Pulse Width Modulation Amplifier

DC motor drive control

Drive the reactive load

3 Descriptions of HISA01 Isolated Military Pulse Width Modulation Amplifier

HISA01 isolated pulse width modulation amplifier works in switching mode, it can provide 300W of transmission power for the load; Products need two power supplies +5V for small control circuit power supply; 30V motor power supplies power to the internal H Bridge. There are two input control signals one is TTL level wide square wave input signal; the other is the DIR direction input signal that controls the direction of rotation of the power. The signal input is isolated from the power output



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

4 Technical Specifications of HISA01 Isolated Military Pulse Width Modulation Amplifier

Form 1: Rated conditions and Operating conditions

Absolute maximum rating	Operating conditions
Supply voltage V_{cc} : 7V Supply voltage V_s : 40V Storage temperature: $-60\sim+150^{\circ}\text{C}$ Lead welding temperature (10S) T_h : 300°C Peak drive current: I_{OP} : 10A Junction Temperature T_j : 150°C	Supply voltage V_{cc} : $5V \pm 0.25V$ Supply voltage V_s : $30V \pm 2V$ Operating Temperature (Case) T_c : $-55\sim+125^{\circ}\text{C}$

Form 2 electrical characteristics

No	Character	Conditions $V_{cc}=5V \pm 0.25V$ $V_s=30V \pm 0.3V$ $-55^{\circ}\text{C} \leq T_c \leq 125^{\circ}\text{C}$ $R_L=10\Omega \pm 2\Omega$	HISA01		Symbol
			Min	Max	
1	Switching frequency	Input PWM square wave signal, DIR direction signal connect "0" or "1"	9.6	-	KHZ
2	Continuous output current	Adjusting R_L (load resistor) to input PWM square wave signal (The duty cycle is 100% high), DIR direction signal connect "0" or "1"	3	-	A
3	Output square wave voltage amplitude	Input PWM square wave signal, DIR=0, Output positive unipolar square wave	26	30	V
		Input PWM square wave signal, DIR=1, Output negative unipolar square wave	26	30	V

4	Efficiency	Input PWM square wave signal (The duty cycle is 100% high), DIR direction signal connect “0” or “1”	95	-	%
5	Static power consumption	$V_{in}=5V \pm 0.25V$ $V_s=30V \pm 0.3V$, Without load R_L	-	4	W

5 Lead function descriptions of HISA01 Isolated Military Pulse Width Modulation Amplifier

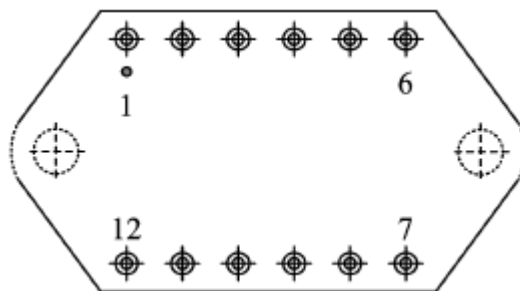


Fig 2 upward view

Form 3 Pin Designation

No	symbol	Designation	No	symbol	Designation
1	GND1	Input signal Ground	7	SENB	Load current sensing terminal B
2	PWM	Input PWM signal	8	OUTB	Output B
3	VCC	+5V power supply	9	VS	Power Supply
4	DIR	Input direction control signal	10	NC	NC
5	GND	Output Ground	11	OUTA	Output A
6	NC	NC	12	SENA	Load current sensing terminal A

6 Circuit principle frame diagram of HISA01 Isolated Military Pulse Width Modulation Amplifier

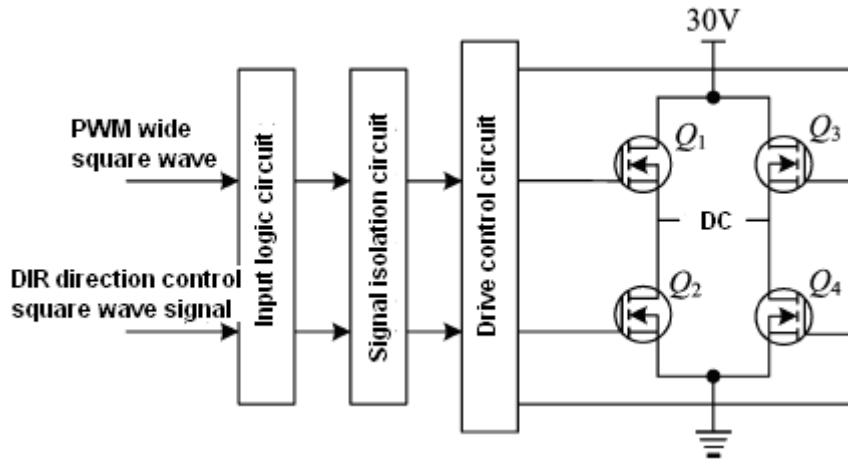


Fig 3 pin function diagram

7. Typical Connection Diagram of HISA01 Isolated Military Pulse Width Modulation Amplifier

HISA01 built-in error amplifier can provide gain for brush motor control in applications such as speed ring, the typical connection is shown as below figure

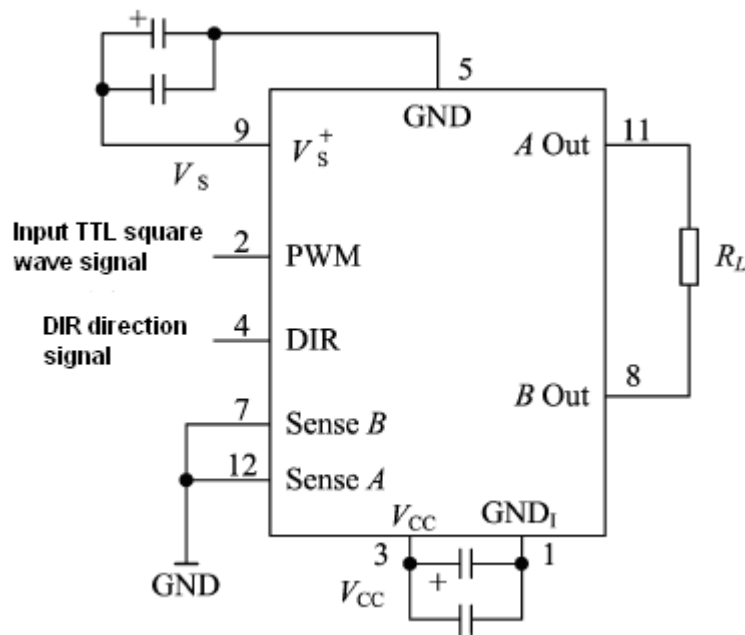


Fig 4 HISA01 Typical connection Diagram

7.1 Power supply bypass:

Power supply VS should have sufficient bypass capacitors to ensure proper operation, otherwise it may be unstable and reduce efficiency, and the output may be oscillated. VS power supply should connect with a 1MF at least ceramic capacitor paralleled with a low



ESR value bypass capacitor. The capacitance should be at least $10\mu\text{F}/\text{A}$. for V_{CC} also requires a $0.1\mu\text{F}\sim 0.47\mu\text{F}$ ceramic capacitor and a low ESR value of $6.8\mu\text{F}\sim 10\mu\text{F}$ parallel bypass capacitor, All bypass capacitors should be connected as close as possible to the corresponding power supply root.

7.2 The signal input is isolated from the power output

Input PWM(Pulse Width Modulation) square wave signal ground and DIR direction control signal ground and small signal power supply V_{CC} power ground should be common connected. Separate form the GND of the Vs to ensure that the signal input is isolated from the power output and that the output is stable and reliable.

7.3 DIR direction control signal input

DIR direction control signal is TTL level signal, to control the direction of the current between the Out_A and Out_B of the output, thereby controlling the direction of rotation of the motor. The working status of the motor is shown in the form below.

Form 4 working value

PWM wide square wave signal (TTL level)	DIR direction control signal (TTL level)	Out_A	Out_B	DC motor working condition
1	0	1	0	Forward
1	1	0	1	Reversal
0	0	0	0	Stop
0	1	0	0	Stop

8. Package Specifications of HISA01 Isolated Military Pulse Width Modulation Amplifier

Circuit package outlines is shown in the Fig 5

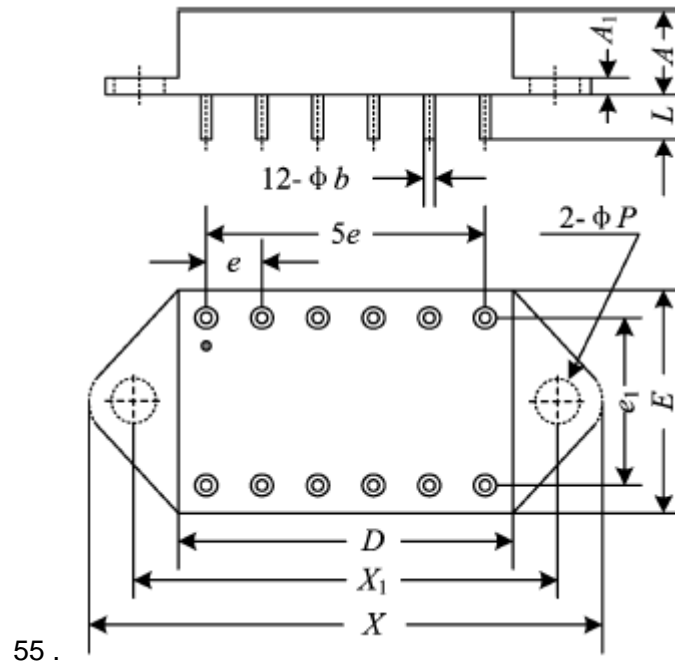


Fig 5 upward view

Form 4 Package Outline

Symbol	Data /mm		
	Min	Typical	Min
<i>A</i>	-	-	7.9
<i>AI</i>	1.9	-	2.7
ϕb	0.87	-	1.13
<i>D</i>	-	-	38.80
<i>E</i>	-	-	41.90
<i>e</i>	-	5.08	-
<i>ei</i>	-	30.08	-
<i>L</i>	11.0	-	-
<i>X_I</i>	49.26	-	50.26
<i>X</i>	-	-	59.15
ϕP	3.70	-	4.30

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