

# Single-phase DC Brushless Motor Driver IC

## ■ GENERAL DESCRIPTION

The NJU7342 is a single-phase DC brushless motor driver IC for small and high power fan-motor applications.

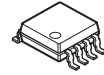
It incorporates MOS-FET transistors in output stage which can provide an ultra low saturation output voltage in high current operation. It also incorporates high slew rate amplifiers and feed-back resistors to provide optimized output wave for low noise motor driving.

The NJU7342 is available in small and thin surface mount packages MSOP8 (VSP8) and MSOP8 (TVSP8) which provide downsizing and thinning in high power motor applications.

## ■ PACKAGE OUTLINE



**NJU7342R**  
(MSOP8(VSP8))

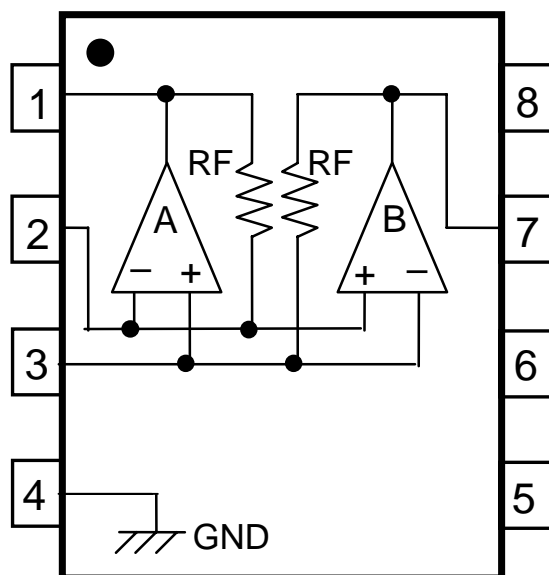


**NJU7342RB1**  
(MSOP8(TVSP8))

## ■ FEATURES

- Operating Voltage  $V_{DD}=2.4$  to  $5.5V$
  - Low Operating Current
  - Low Saturation Output Voltage  
 $V_{sat}=\pm 0.35V$  @  $I_o=\pm 250mA$
  - C-MOS Technology
  - Package Outline MSOP8 (VSP8)\*  
MSOP8 (TVSP8)\*\*
- \*MEET JEDEC MO-187-DA  
\*\*MEET JEDEC MO-187-DA / THIN TYPE

## ■ BLOCK DIAGRAM



## ■ PIN FUNCTION

- 1: AOUT
- 2: AMP-IN
- 3: AMP+IN
- 4: GND
- 5: NC
- 6: NC
- 7: BOUT
- 8: V<sub>DD</sub>

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	RATINGS	SYMBOL (unit)	NOTE
Supply Voltage	+7	V <sub>DD</sub> (V)	
Input Voltage	-0.3 ~ V <sub>DD</sub> +0.3	V <sub>ID</sub> (V)	
Operating Temperature Range	-40 ~ +85	T <sub>opr</sub> (°C)	
Storage Temperature Range	-50 ~ +150	T <sub>stg</sub> (°C)	
Power Dissipation	400	P <sub>D</sub> (mW)	Device itself

## ■ RECOMMENDED OPERATING CONDITIONS

V<sub>DD</sub>=2.4V to 5.5V

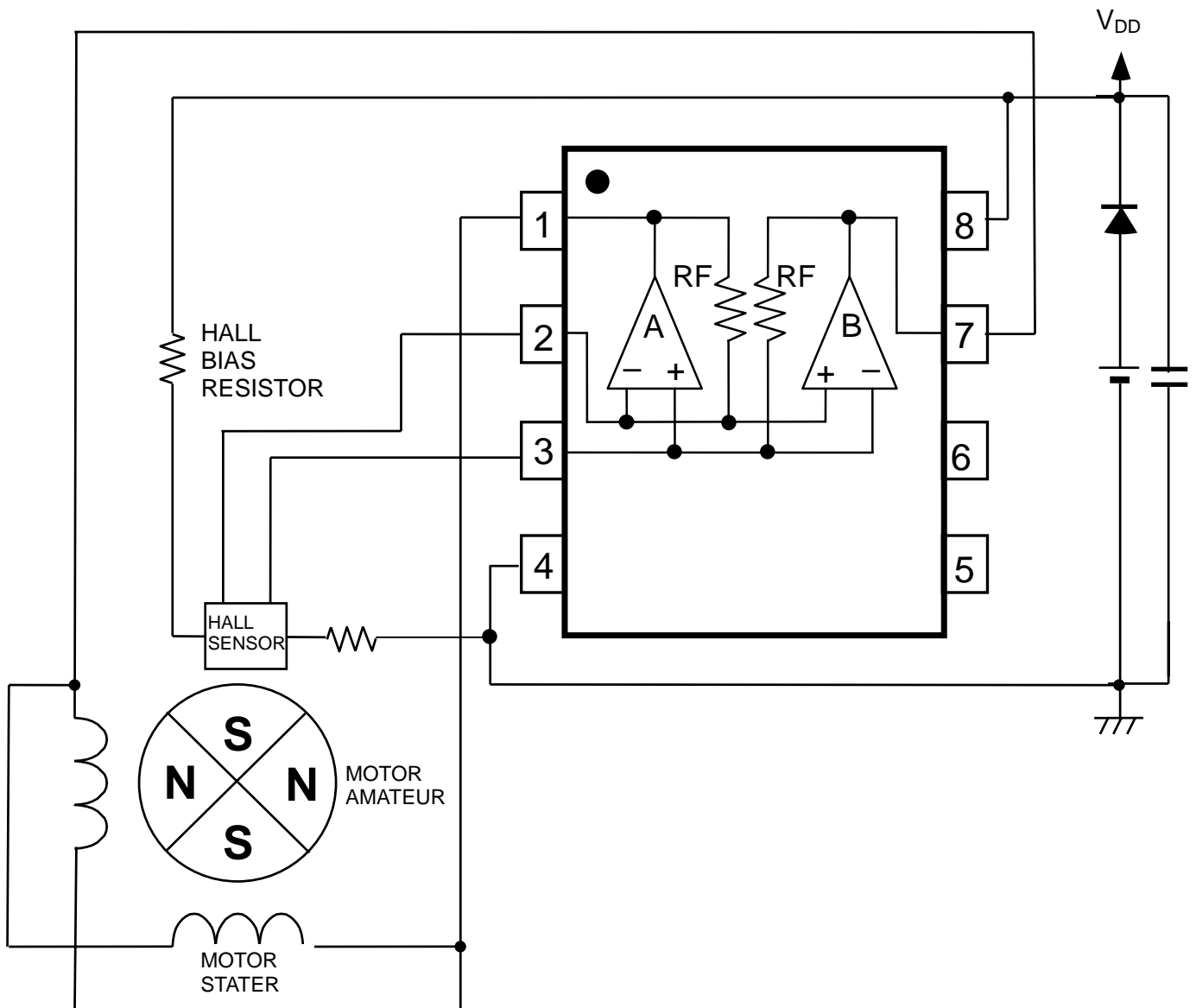
## ■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V<sub>DD</sub>=5V)

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V <sub>IO</sub>	-	-5	-	5	mV
Input Common Mode Voltage Range	V <sub>ICM</sub>	-	0.4 to 4.0	-	-	V
Maximum Output Voltage Range	V <sub>OM+</sub>	I <sub>o</sub> =+250mA	4.55	4.65	-	V
	V <sub>OM-</sub>	I <sub>o</sub> = -250mA	-	0.35	0.45	V
Operating Current	I <sub>DD</sub>	-	-	3.0	4.0	mA
Feedback Resistance	R <sub>F</sub>	-	22.0	27.5	33.0	kΩ

(Note) The oscillation comes to happen easily in the state that there is no load of current and gain is low.  
In this case, please adjust the stray capacity of the output terminal to 100pF or less.

■ APPLICATION CIRCUIT



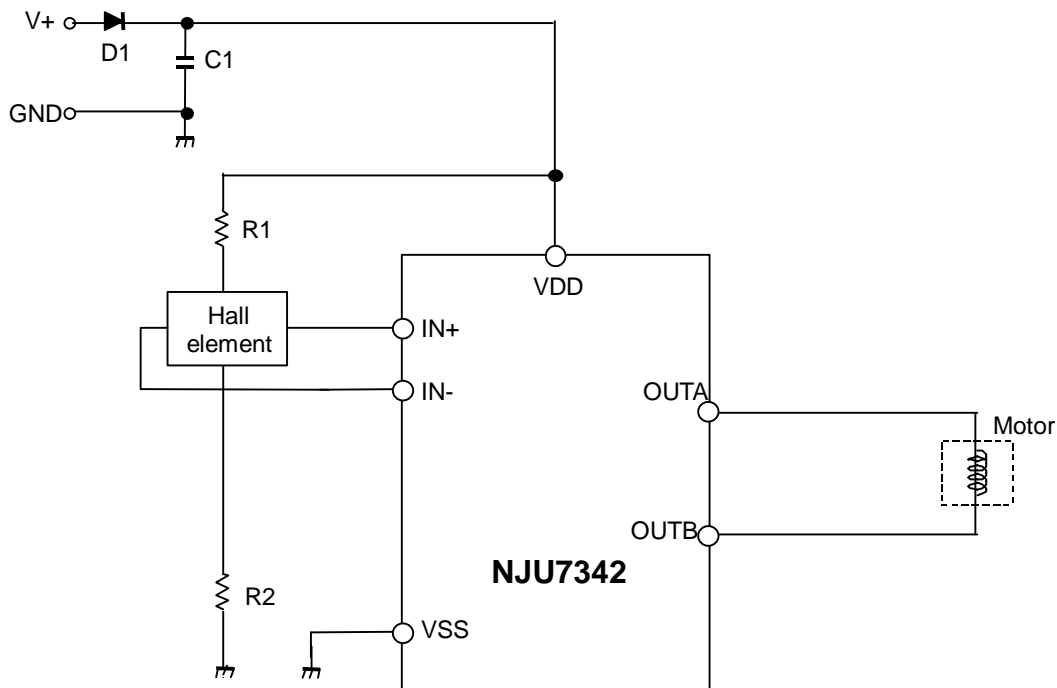
# NJU7342

## ■ APPLICATION NOTE

The NJU7342 is a single-phase DC brushless motor driver IC in small MSOP8 (VSP8) / MSOP8 (TVSP8) packages.

With minimal external components, that can drive up to 250mA of motor current for small fan application.

[Application Circuit Example]



[Design Notes]

Above application example is designed for 5V operation.  
It uses the following components:

Hall elements: HW101A (AKE)

### 1. Selection of C1 and D1:

C1 is used for a noise reduction purpose. A typical value is 0.1 $\mu$ F.  
Optimize the value in actual operating conditions if necessary. D1 is a diode for protection against reverse voltage supply. Silicon rectifier diode (WO3C, 10D1 and equivalent) is appropriate.

### 2. Design of hall element bias resistance (R1 and R2)

Hall amplifier is a differential amplifier.

The common-mode input voltage is between 0.4V and VDD-1V and the input signal must be within the range.

Non-excitation hall bias voltage is to be set at a half of VDD for effective use of common-mode input voltage range. Therefore the same value of hall bias resistors is selected for R1 and R2.

Given that the bias current is set to be 5mA by HW101A datasheet, R1 and R2 can be determined as follows:

$$R1 + R2 + Rin = \frac{VDD}{I_{bias}} = \frac{5}{5 \times 10^{-3}} = 1.0k\Omega$$

$$R1 = R2 = 300\Omega$$

The output voltage of hall elements is influenced by the bias current and magnetic flux density of hall elements.

The optimum input voltage of NJU7342 is 100mVp-p and higher. With such input voltage, the highest efficiency can be obtained.

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