

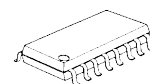
BRUSH LESS DC MOTOR PRE-DRIVER

■GENERAL DESCRIPTION

The **NJM2624A** is a 3-phase brushless DC motor pre-driver which requires external power-transistors suited to drive current of the motor.

The Run Enable function is used as PWM control besides of ON/OFF switched function.

■PACKAGE OUTLINE



NJM2624AM

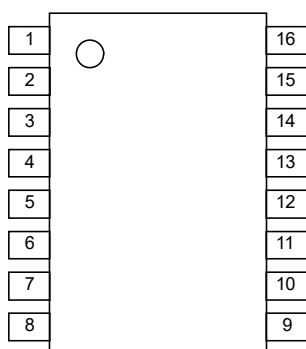


NJM2624AV

■FEATURES

- Operating Voltage (V⁺=4.5V to 18V)
- Low Operating Current (10mA max.)
- Run Enable
- Forward or Reverse Direction
- Output Switch Current (90mA typ.)
- Bipolar Technology
- Package Outline DIP16, DMP16, SSOP16

■PIN CONFIGURATION

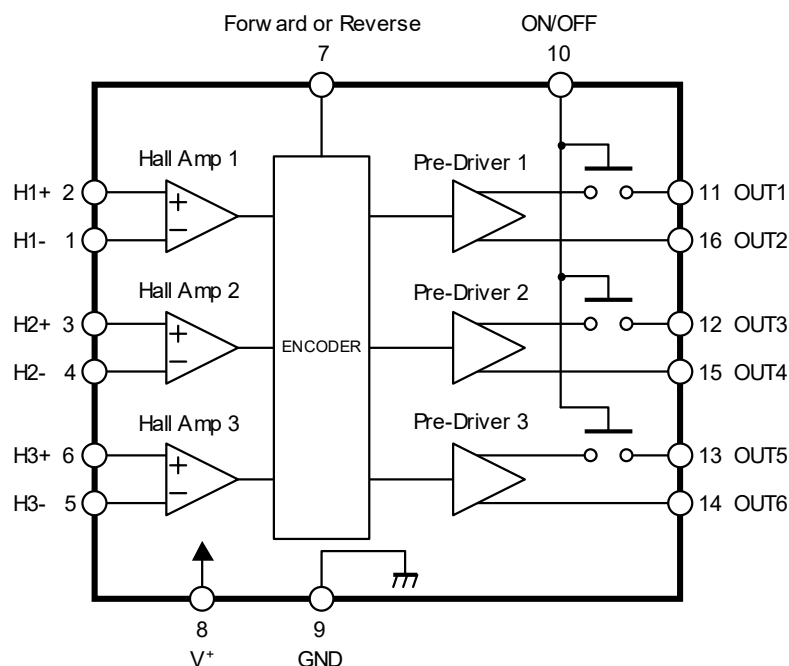


PIN FUNCTION

1.H1-	9.GND
2.H1+	10.ON/OFF
3.H2+	11.OUT1
4.H2-	12.OUT3
5.H3-	13.OUT5
6.H3+	14.OUT6
7.FR	15.OUT4
8.V ⁺	16.OUT2

NJM2624A

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	20	V
Output Current	I _o	100	mA
Power Dissipation	P _D	(DIP16) 700 (DMP16) 350 (SSOP16) 300	mW
Operating Temperature Range	T _{opr}	-25 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +150	°C

■ RECOMMENDED OPERATING CONDITIONS (Ta=25°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Input Common Mode Voltage Range (*1)	V _{ICM}	1.5	-	V ⁺ - 1.5	V

(*1) The input voltage should set within V_{ICM} range in consideration of the peak magnitude.
When the input voltage exceeds V_{ICM} range, unusual operation may be caused.

■ELECTRICAL CHARACTERISTICS (V⁺=12V, Ta=25°C)

Total Device

PARAMETER	SYMBOL	TEST CONDITONS	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V ⁺		4.5	—	18	V
Supply Current	I _{CC}	RL=∞ ON/OFF Terminal=OPEN	—	3.7	10	mA

Hall Sensor Section

Input Offset Voltage	V _{IO}	RL=470Ω	-4.2	—	4.2	mV
Input Common mode Voltage range	V _{ICM}	RL=470Ω	1.5	—	10.5	V
Input Bias Current	I _B		—	—	600	nA

Output Section

Output Voltage 1	V _{OUT1}	RL=470Ω, V ⁺ =12V	8.9	9.5	—	V
Output Voltage 2	V _{OUT2}	RL=470Ω, V ⁺ =5V	—	3.5	—	V
Maximum Output Current 1	I _{OUT1}	RL=100Ω, V ⁺ =12V	50	90	—	mA
Maximum Output Current 2	I _{OUT2}	RL=100Ω, V ⁺ =5V	—	30	—	mA
Output Leak Current	I _{LEAK}		—	—	5	μA

Run Enable Section

Run Enable Voltage	V _{ON}	RL=470Ω	1/2V ⁺ +0.5	—	—	V
Run Disable Voltage	V _{OFF}	RL=470Ω	—	—	1/2V ⁺ -0.5	V
Output Voltage Undefined Area	V _{O-undef}	RL=470Ω	1/2V ⁺ -0.5	1/2V ⁺	1/2V ⁺ +0.5	V
Source Current 1	I _{ON1}	ON/OFF Terminal=GND	—	250	400	μA

Forward or Reverse Direction Section

Forward Direction	V _F	RL=470Ω	1/2V ⁺ +0.5	—	—	V
Reverse Direction	V _R	RL=470Ω	—	—	1/2V ⁺ -0.5	V
F/R Logic Undefined Area	V _{SW-undef}	RL=470Ω	1/2V ⁺ -0.5	1/2V ⁺	1/2V ⁺ +0.5	V
Source Current 2	I _{ON2}	Forward or Reverse Terminal=GND	—	250	400	μA

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■TERMINAL DESCRIPTION

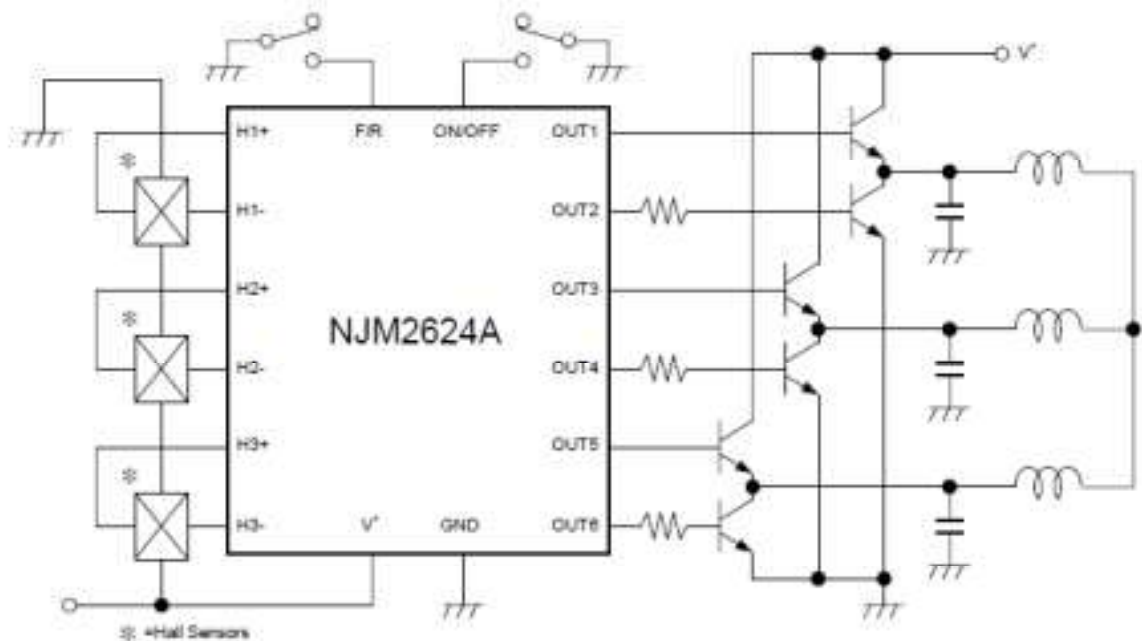
Pin No,	SYMBOL	FUNCTION	INSIDE EQUIVALENT CIRCUIT
2	H1+	Sensor Input 1 Non-Inverting Terminal	
3	H2+	Sensor Input 2 Non-Inverting Terminal	
6	H3+	Sensor Input 3 Non-Inverting Terminal	
1	H1-	Sensor Input 1 Inverting Terminal	
4	H2-	Sensor Input 2 Inverting Terminal	
5	H3-	Sensor Input 3 Inverting Terminal	
7	F/R	Forward or Reverse Direction Terminal	

■ TERMINAL DESCRIPTION

Pin No,	SYMBOL	FUNCTION	INSIDE EQUIVALENT CIRCUIT
8	V ⁺	Power Supply	—
9	GND	Ground	—
10	ON/OFF	Output Run Enable Terminal	
11	OUT1	Internal Switching Transistor Emitter Follower	
16	OUT2		
12	OUT3		
15	OUT4		
13	OUT5		
14	OUT6		

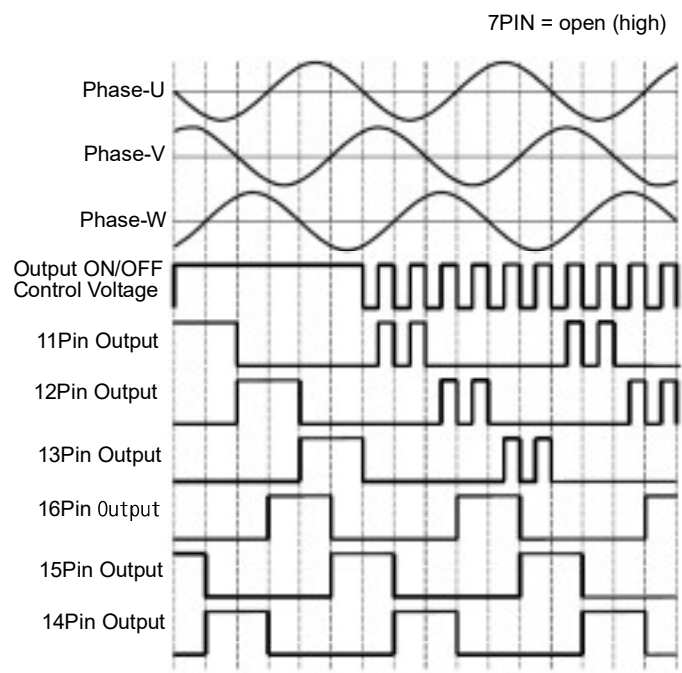
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■ TYPICAL APPLICATION

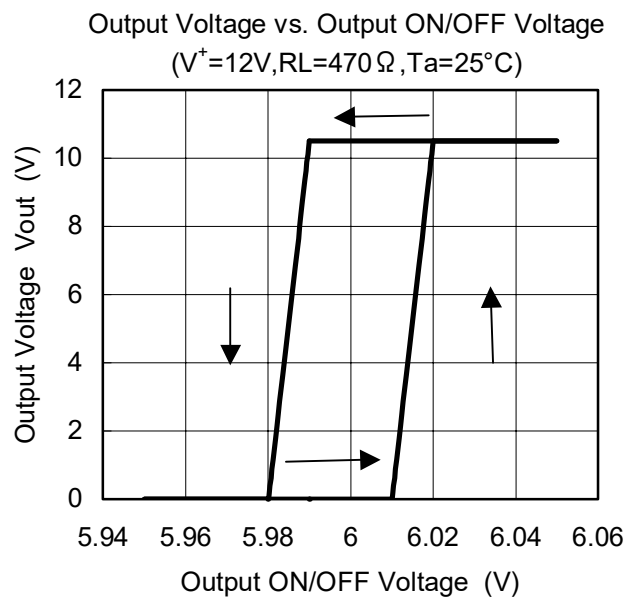
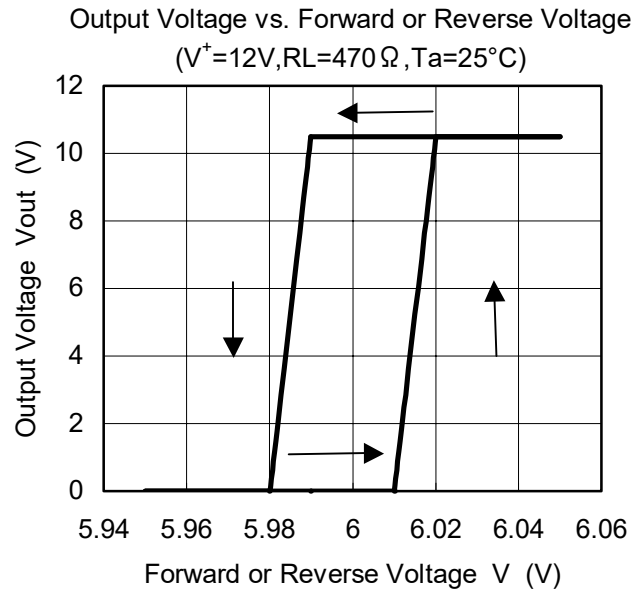
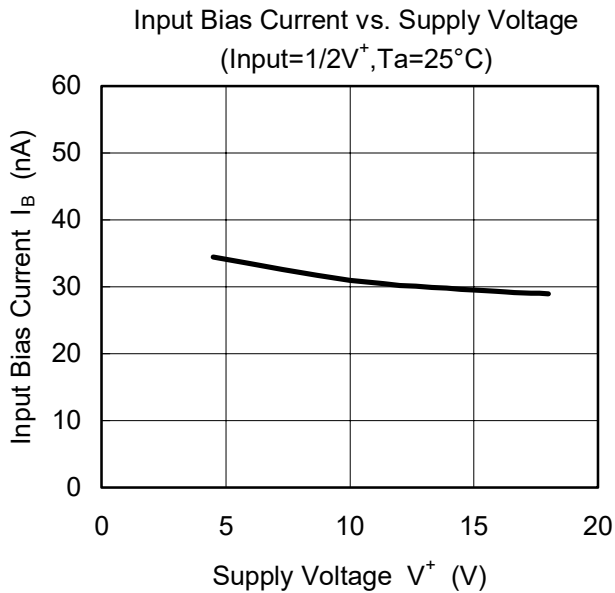
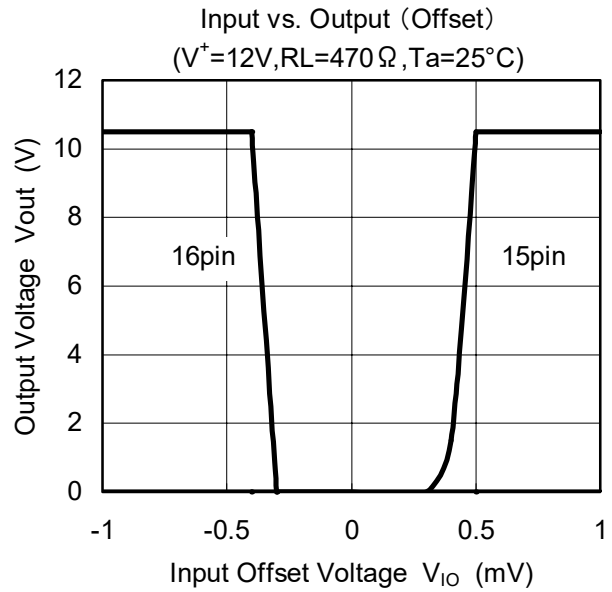
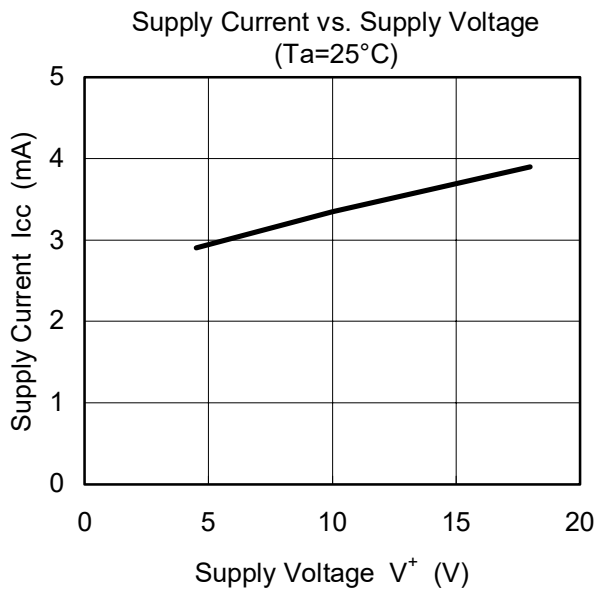


- A rotation direction change must be made after motor stopped completely.
- When PWM duty is extremely small, two or more switching elements can not be driven entirely. In such case, switching elements will generate excess heat and it may cause destruction of the switching devices. Therefore, extensive heat evaluation is necessary for switching device selection particularly in consideration of the area of safety operation (ASO).

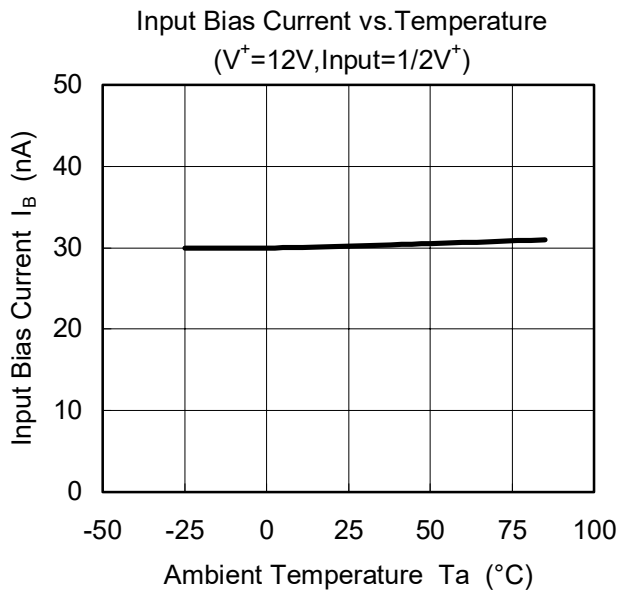
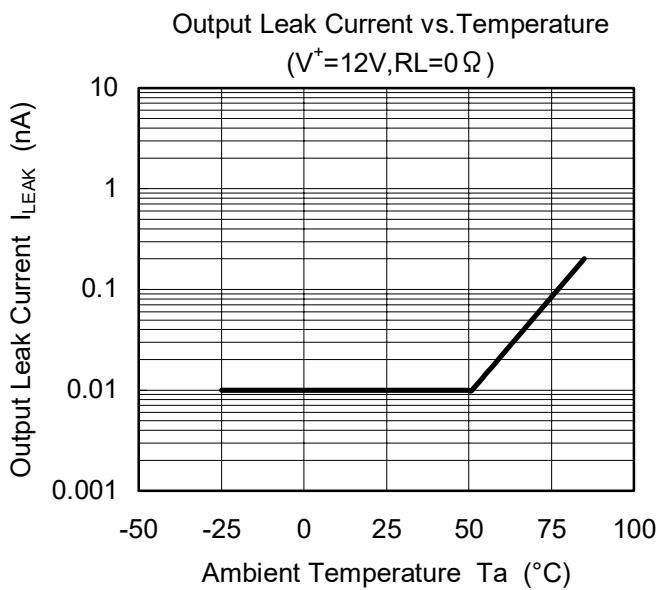
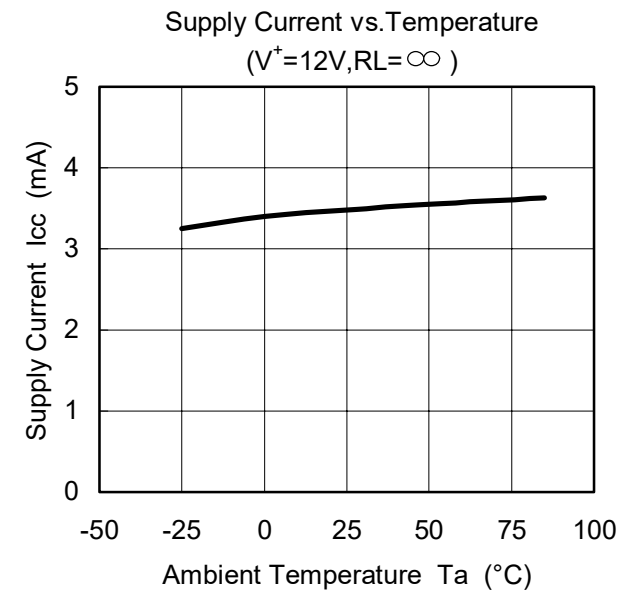
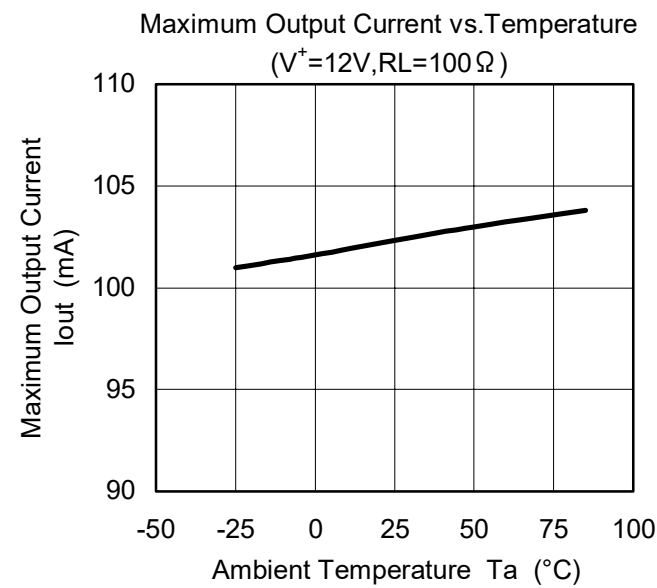
■ TIMING CHART



TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



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8. **Quality Warranty**
 - 8-1. **Quality Warranty Period**
In the case of a product purchased through an authorized distributor or directly from us, the warranty period for this product shall be one (1) year after delivery to your company. For defective products that occurred during this period, we will take the quality warranty measures described in section 8-2. However, if there is an agreement on the warranty period in the basic transaction agreement, quality assurance agreement, delivery specifications, etc., it shall be followed.
 - 8-2. **Quality Warranty Remedies**
When it has been proved defective due to manufacturing factors as a result of defect analysis by us, we will either deliver a substitute for the defective product or refund the purchase price of the defective product.
Note that such delivery or refund is sole and exclusive remedies to your company for the defective product.
 - 8-3. **Remedies after Quality Warranty Period**
With respect to any defect of this product found after the quality warranty period, the defect will be analyzed by us. On the basis of the defect analysis results, the scope and amounts of damage shall be determined by mutual agreement of both parties. Then we will deal with upper limit in Section 8-2. This provision is not intended to limit any legal rights of your company.
9. Anti-radiation design is not implemented in the products described in this document.
10. The X-ray exposure can influence functions and characteristics of the products. Confirm the product functions and characteristics in the evaluation stage.
11. WLCSP products should be used in light shielded environments. The light exposure can influence functions and characteristics of the products under operation or storage.
12. Warning for handling Gallium and Arsenic (GaAs) products (Applying to GaAs MMIC, Photo Reflector). These products use Gallium (Ga) and Arsenic (As) which are specified as poisonous chemicals by law. For the prevention of a hazard, do not burn, destroy, or process chemically to make them as gas or power. When the product is disposed of, please follow the related regulation and do not mix this with general industrial waste or household waste.
13. Please contact our sales representatives should you have any questions or comments concerning the products or the technical information.



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