

## 3-PHASE DC BRUSHLESS MOTOR CONTROL IC

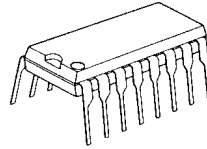
### ■ GENERAL DESCRIPTION

The NJM2627 is a 3-phase DC brush less motor control pre-driver IC.

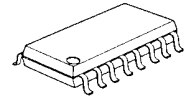
Output pre-driver is optimized to work with external power MOS FET for better power handling.

The NJM2627 can easily implement speed control by input of PWM signal to ON/ OFF terminal.

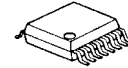
### ■ PACKAGE OUTLINE



NJM2627D



NJM2627M

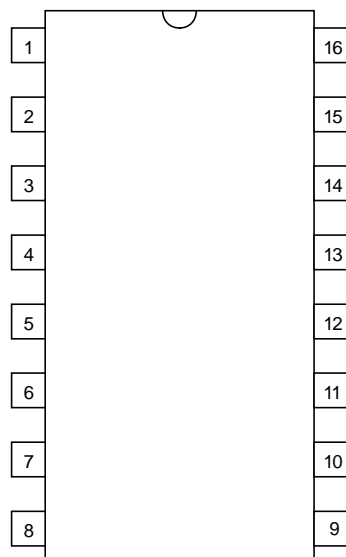


NJM2627V

### ■ FEATURES

- Operating Voltage                    4.5 to 14V
- Pre-driver circuit
  - Lower arm : Totem-pole
  - Upper arm : Open-collector
- Forward or Reverse direction
- Internal ON/OFF Circuit (No-output is Verr pin to GND)
- Bipolar Technology
- Package Outline                      DIP16,DMP16,SSOP16

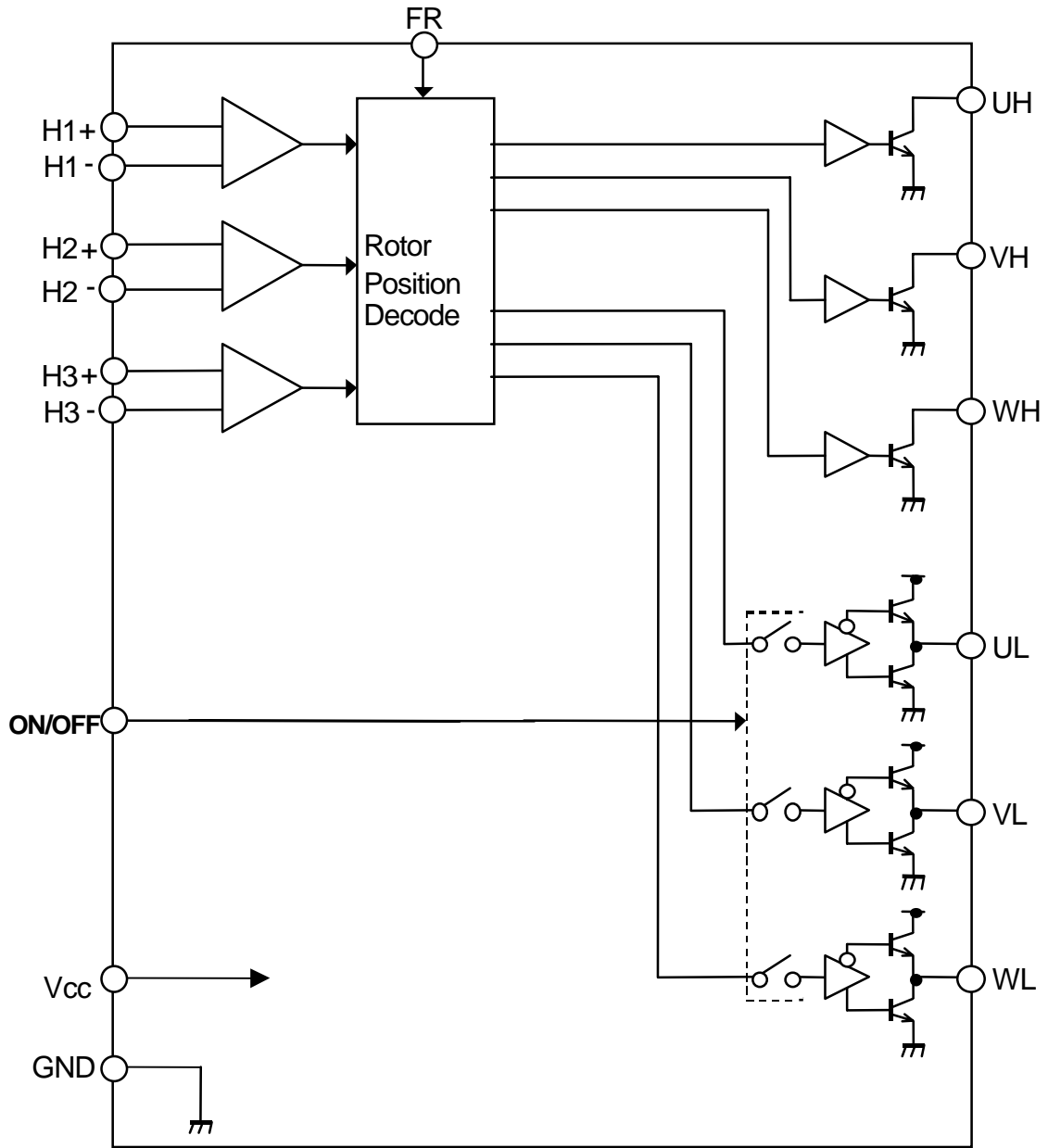
### ■ PIN CONNECTION



NJM2627V

- |       |           |
|-------|-----------|
| 1.H1- | 9.GND     |
| 2.H1+ | 10.ON/OFF |
| 3.H2+ | 11.WL     |
| 4.H2- | 12.VL     |
| 5.H3- | 13.UL     |
| 6.H3+ | 14.WH     |
| 7.FR  | 15.VH     |
| 8.VCC | 16.UH     |

■ BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT	REMARKS
Maximum Supply Voltage	V <sub>CC</sub>	15	V	
Hall Input Differential Voltage	V <sub>IHD</sub>	2	V	
Hall Input Voltage	V <sub>IH</sub>	-0.3~V <sub>DD</sub>	V	
ON/OFF Terminal Input Voltage	V <sub>ON/OFF</sub>	-0.3~V <sub>DD</sub>	V	
F/R Terminal Input Voltage	V <sub>FR</sub>	-0.3~V <sub>DD</sub>	V	
Maximum Output Current	I <sub>out</sub>	30	mA	Under Arm Source Current
		50		Upper Arm Sink Current Under Arm Sink Current
Power Dissipation	P <sub>D</sub>	700 (DIP device itself)	mW	
		350 (DMP device itself)		
		300 (SSOP16 device itself)		
Operating Temperature Range	T <sub>opr</sub>	-40 ~ +85	°C	
Storage Temperature range	T <sub>stg</sub>	-50 ~ +150	°C	

## ■ ELECTRICAL CHARACTERISTICS

(V<sub>CC</sub>=12V, Ta=25°C)

### Total Device

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operation Supply Voltage	V <sub>CC</sub>	-	4.5	-	14.0	V
Supply Current	I <sub>CC</sub>	RL=∞	-	8.0	10.0	mA

### Hall Amplifier Section

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V <sub>ID</sub>	-	-5	-	5	mV
Input Common Mode Voltage Range	V <sub>ICM</sub>	-	1.5	-	10.5	V
Input Bias Voltage	I <sub>B</sub>	-	-	-	600	nA

### Output Section

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Under Arm Output Voltage 1	V <sub>OH-D1</sub>	I <sub>source</sub> =20mA	10	10.3	-	V
Under Arm Output Voltage 2	V <sub>OL-D2</sub>	I <sub>sink</sub> =10mA	-	0.5	0.8	V
Under Arm Output Voltage 3	V <sub>OL-D3</sub>	I <sub>sink</sub> =50mA	-	1.6	2.0	V
Upper Arm Output Voltage	V <sub>OL-U</sub>	I <sub>sink</sub> =10mA	-	0.5	0.8	V
Output Leak Current	I <sub>O-LEAK</sub>		-	-	1.0	uA

### ON/OFF Section

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output ON Voltage	V <sub>ON</sub>	-	1/2V <sub>CC</sub> +0.5	-	-	V
Output OFF Voltage	V <sub>OFF</sub>	-	-	-	1/2V <sub>CC</sub> -0.5	V
Output Voltage Undefined Area	V <sub>O-undef</sub>	-	1/2V <sub>CC</sub> -0.5	1/2V <sub>CC</sub>	1/2V <sub>CC</sub> +0.5	V
Source Current 1	I <sub>ON1</sub>	ON/OFF terminal=GND	-	250	400	μA
Pull-Up Resistance	R <sub>pu-of</sub>	-	-	50	-	kΩ

**Forward or Reverse Direction Section (FR input terminal)**

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Forward Direction	$V_F$	-	$1/2V_{CC}+0.5$	-	-	V
Output Reverse Direction	$V_R$	-	-	-	$1/2V_{CC}-0.5$	V
F/R Logic Undefined Area	$V_{SW-undef}$	-	$1/2V_{CC}-0.5$	$1/2V_{CC}$	$1/2V_{CC}+0.5$	V
Source Current 2	$I_{ON2}$	F/R terminal=GND	-	250	400	$\mu A$
Pull-Up Resistance	$R_{pu-FR}$	-	-	50	-	k $\Omega$

**■ HALL INPUT vs HALL OUTPUT TRUTH TABLE**

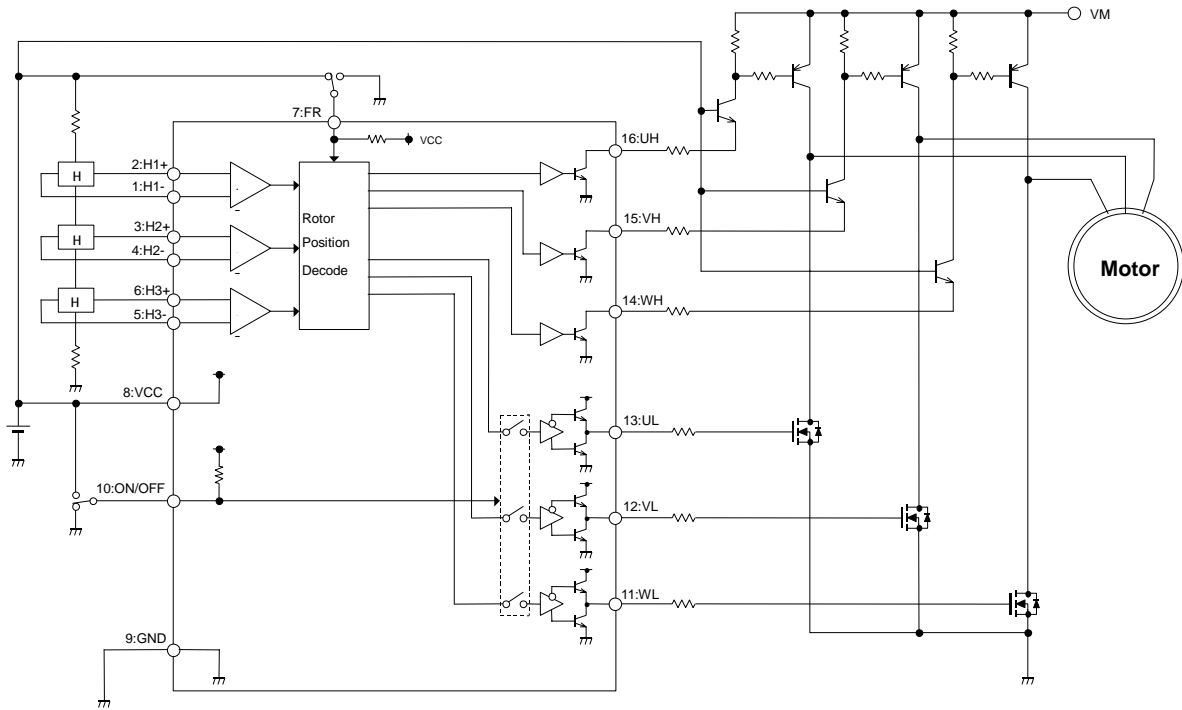
H1:"H"=H1+>H1-,"L"=H1+<H1- H2:"H"=H2+>H2-,"L"=H2+<H2- H3:"H"=H3+>H3-,"L"=H3+<H3-

FR=H			FR=L			ON/ OFF	H:Source,L:Sink,X:Hi-Z					
H1	H2	H3	H1	H2	H3		UH	VH	WH	UL	VL	WL
H	L	H	L	H	L	H	X	L	X	H	L	L
H	L	L	L	H	H	H	X	X	L	H	L	L
H	H	L	L	L	H	H	X	X	L	L	H	L
L	H	L	H	L	H	H	L	X	X	L	H	L
L	H	H	H	L	L	H	L	X	X	L	L	H
L	L	H	H	H	L	H	X	L	X	L	L	H
H	L	H	L	H	L	L	X	L	X	L	L	L
H	L	L	L	H	H	L	X	X	L	L	L	L
H	H	L	L	L	H	L	X	X	L	L	L	L
L	H	L	H	L	H	L	L	X	X	L	L	L
L	H	H	H	L	L	L	L	X	X	L	L	L
L	L	H	H	H	L	L	X	L	X	L	L	L

**■ FR INPUT TERMINAL**

Terminal Voltage	Direction
L input	F
H input	R

■ TYPICAL APPLICATION



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