

## 2 CHANNEL BRIDGE DRIVER IC

### ■ GENERAL DESCRIPTION

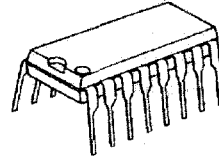
The NJW4301 is a 2 channel bridge driver for CD, CD-ROM, MO and others. It operates at more than 4V, and then features high output voltage swing.

Its output circuit consists of MOS-FET. The MOS-FET type output realizes lower consumption than bipolar type output, so that radiation design becomes simple and total costs are reduced.

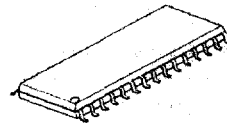
### ■ FEATURES

- Operating Voltage ( $V^+ = 4V \sim 12V$ )
- Low Saturation Output ( $V_{sat} = \pm 0.5V_{MAX.}$  at  $I_o = 300mA$ )
- Supply Current (35mA MAX.)
- 2 channel BTL Output
- Mute Function
- Bi-MOS Technology
- Package Outline DIP16, SDMP30

### ■ PACKAGE OUTLINE

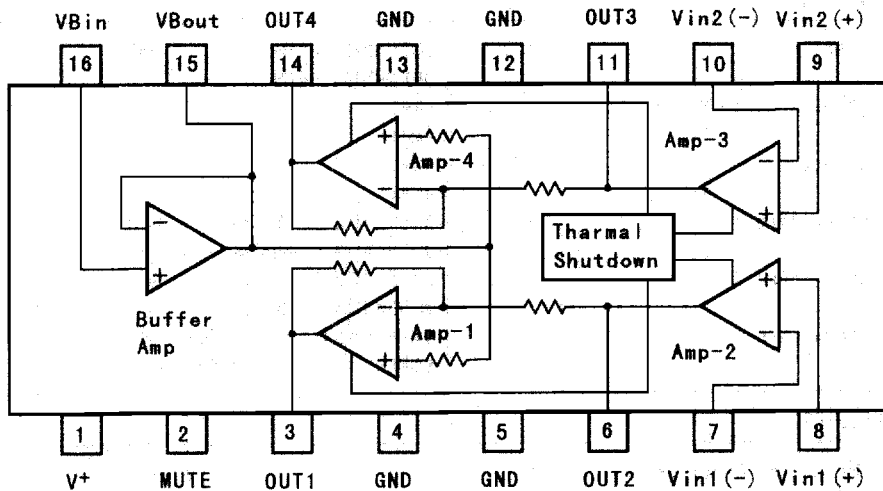


NJW4301D



NJW4301M

### ■ BLOCK DIAGRAM



(Package DIP-16)

# NJW4301

## ■ ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub> = 25°C)

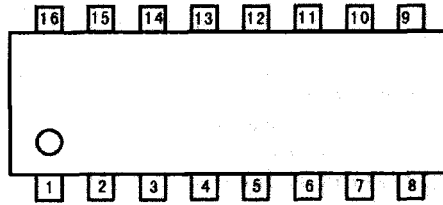
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	15	V
Operating Current	I <sub>o</sub>	1	A
Mute Terminal Current	I <sub>M</sub>	1.0	mA
Power Dissipation	P <sub>D</sub>	(DIP16) 1.9 (SDMP30) 1.8 (note 1)	W
Operating Temperature Range	T <sub>OPR</sub>	-40~+85	°C
Storage Temperature Range	T <sub>STG</sub>	-40~+150	°C

(note 1) At on PC board.

## ■ ELECTRICAL CHARACTERISTICS (V<sup>+</sup> = 5V, T<sub>a</sub> = 25°C)

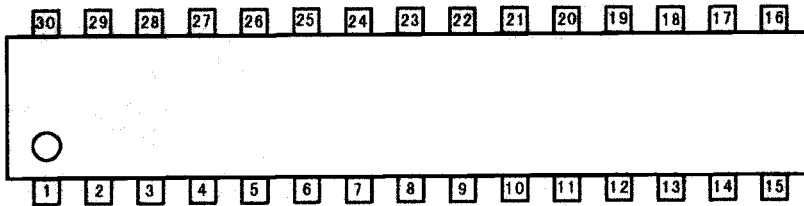
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>[ALL]</b>						
Operating Supply Voltage Range	V <sup>+</sup>		4	5	12	V
Mute OFF Current Dissipation	I <sub>CC1</sub>	V <sub>M</sub> =4.2V, V <sub>IN</sub> =2.5V	-	20	35	mA
Mute ON Current Dissipation	I <sub>CC2</sub>	V <sub>M</sub> =0V, V <sub>IN</sub> =2.5V	-	2	3.5	mA
<b>[POWER AMPLIFIER]</b>						
Output Offset Voltage	V <sub>OF</sub>	OUT1-OUT2, GAIN=1 OUT4-OUT3, GAIN=1	-50	-	50	mV
Input Common Mode Voltage Range	V <sub>ICM</sub>	AMP2 AMP3	0	-	V <sup>+</sup>	V
Input Bias Current	I <sub>B</sub>	AMP2 AMP3	-	-	300	nA
Maximum Output Voltage 1	V <sub>O1</sub>	OUT1-OUT2, I <sub>L</sub> =300mA OUT4-OUT3, I <sub>L</sub> =300mA	4.0	4.2	-	V
Maximum Output Voltage 2	V <sub>O2</sub>	OUT1-OUT2, I <sub>L</sub> =500mA OUT4-OUT3, I <sub>L</sub> =500mA	3.0	3.5	-	V
Open Loop Voltage Gain	A <sub>V</sub>	AMP2, R <sub>L</sub> =2kΩ, V <sub>IN</sub> =2.5V AMP3, R <sub>L</sub> =2kΩ, V <sub>IN</sub> =2.5V	35	50	-	dB
<b>[BUFFER AMPLIFIER]</b>						
Input Output Potential Difference	V <sub>BIO</sub>		-30	0	30	mA
Input Voltage Range	V <sub>BICM</sub>		1.5	2.5	3.5	V
Output Voltage Range	ΔV <sub>BO</sub>	V <sub>IN</sub> =2.5V, I <sub>L</sub> =-5mA V <sub>IN</sub> =2.5V, I <sub>L</sub> =+5mA	-	-	-50	mA
<b>[MUTING]</b>						
Mute OFF Voltage	V <sub>MH</sub>		3.5	4.2	-	V
Mute ON Voltage	V <sub>ML</sub>		-	0.8	1.0	V
Mute Sink Current	I <sub>M</sub>	V <sub>M</sub> =5V	70	100	130	μA

■ PIN CONFIGURATION



DIP-16

- |                          |                           |
|--------------------------|---------------------------|
| 1 : V <sup>+</sup>       | 9 : V <sub>in2</sub> (+)  |
| 2 : MUTE                 | 10 : V <sub>in2</sub> (-) |
| 3 : OUT1                 | 11 : OUT3                 |
| 4 : GND                  | 12 : GND                  |
| 5 : GND                  | 13 : GND                  |
| 6 : OUT2                 | 14 : OUT4                 |
| 7 : V <sub>in1</sub> (-) | 15 : V <sub>Bout</sub>    |
| 8 : V <sub>in1</sub> (+) | 16 : V <sub>Bin</sub>     |



SDMP-30

- |                       |                           |
|-----------------------|---------------------------|
| 1 : GND               | 16 : GND                  |
| 2 : GND               | 17 : GND                  |
| 3 : OUT4              | 18 : OUT2                 |
| 4 : NC                | 19 : NC                   |
| 5 : NC                | 20 : NC                   |
| 6 : V <sub>Bout</sub> | 21 : V <sub>in1</sub> (-) |
| 7 : V <sub>Bin</sub>  | 22 : V <sub>in1</sub> (+) |
| 8 : NC                | 23 : NC                   |
| 9 : V <sup>+</sup>    | 24 : V <sub>in2</sub> (+) |
| 10 : MUTE             | 25 : V <sub>in2</sub> (-) |
| 11 : NC               | 26 : NC                   |
| 12 : NC               | 27 : NC                   |
| 13 : OUT1             | 28 : OUT3                 |
| 14 : GND              | 29 : GND                  |
| 15 : GND              | 30 : GND                  |

## ■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP	SDMP			
-16	-30			
4 5 12 13	1 2 14 15 16 17 29 30	GND	Recommend expanding the island in order to heat radiation properties.	
14	3	OUT4	Output terminal of AMP. 4. OUT4 signal is opposite phase against OUT3.	
-	4 5 8 11 12 19 20 23 26 27	NC	Non-connection terminal. Recommend connecting to GND.	

■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP	SDMP			
-16	-30			
15	6	VBout	An buffer amplifier output.	
16	7	VBin	An buffer amplifier input.	
1	9	Vcc	Supply Voltage.	
2	10	MUTE	An mute input. Pulldown by 50kΩ (TYP) resistor.	

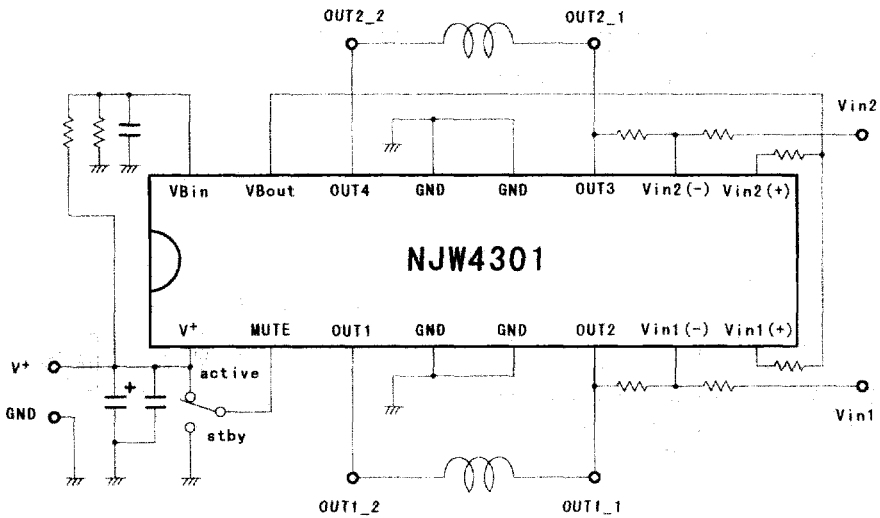
## ■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP	SDMP			
-16	-30			
3	13	OUT1	Output terminal of AMP. 1. OUT1 signal is opposite phase against OUT2.	
6	18	OUT2	Output terminal of AMP. 2.	
7	21	Vin1(-)	Inverting input terminal of AMP. 2.	
8	22	Vin1(+)	Non-inverting input terminal of AMP. 2.	

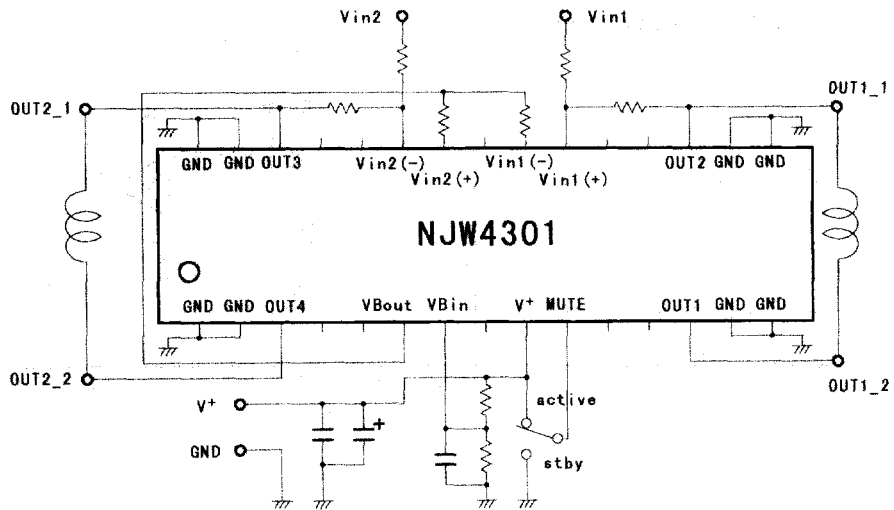
■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP -16	SDMP -30			
9	24	Vin2(+)	Inverting input terminal of AMP. 3.	
10	25	Vin2(-)	Non-inverting input terminal of AMP. 3.	
11	28	OUT3	Output terminal of AMP. 3.	

## ■ APPLICATION CIRCUITS



NJW4301 (DIP-16) Application Circuit

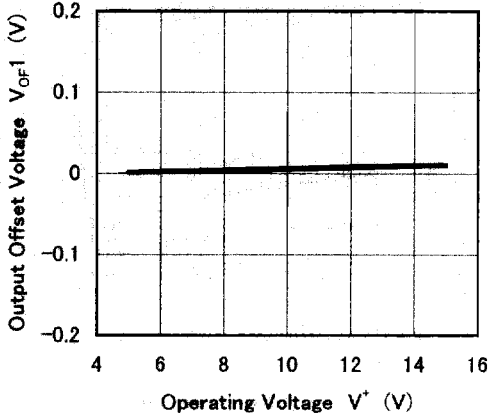


NJW4301 (SDMP-30) Application Circuit

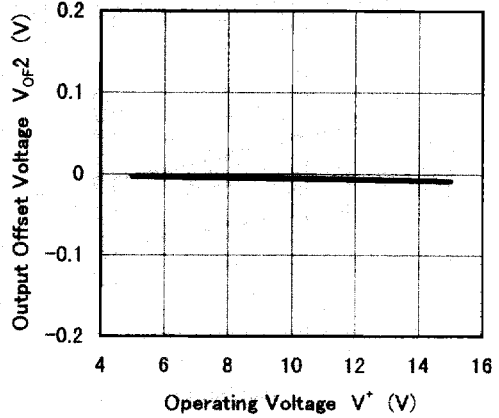


■ TYPICAL CHARACTERISTICS

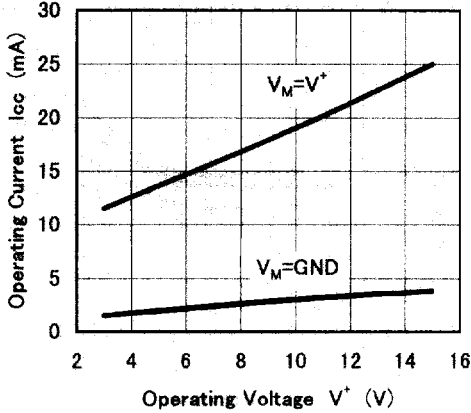
Output Offset Voltage VS. Operating Voltage  
(OUT3-OUT4,  $T_a=25^\circ\text{C}$ )



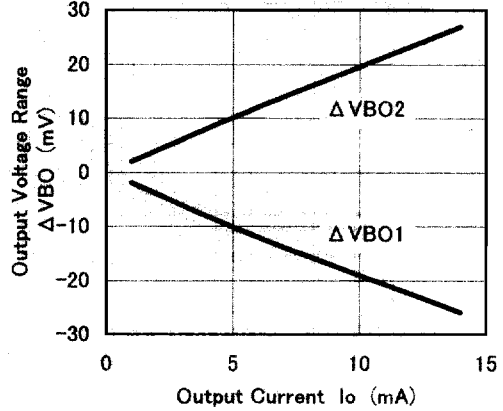
Output Offset Voltage VS. Operating Voltage  
(OUT1-OUT2,  $T_a=25^\circ\text{C}$ )



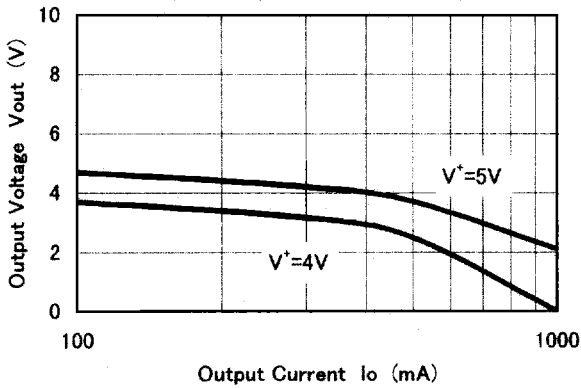
Operating Current VS. Operating Voltage  
( $T_a=25^\circ\text{C}$ )



Output Voltage Range VS. Output Current  
( $V^*=5\text{V}, T_a=25^\circ\text{C}$ )



Output Voltage VS. Output Current  
( $T_a=25^\circ\text{C}$ , Pulse Measurement)



7

## TYPICAL CHARACTERISTICS

