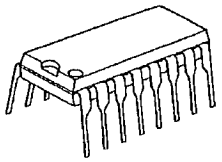
2 CHANNEL BRIDGE DRIVER IC

■ GENERAL DESCRIPTION

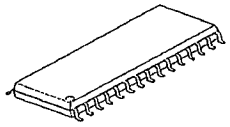
The NJW4301 is a 2 channel bridge driver for CD, CD-ROM, MO and others. It operates at more than 4V, and then features high output voltage swing.

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.

■ PACKAGE OUTLINE



NJW4301D

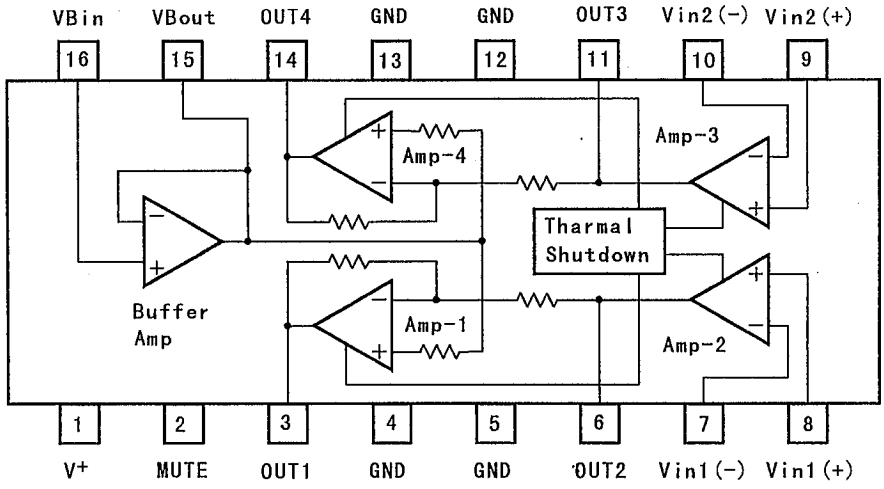


NJW4301M

■ FEATURES

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

■ BLOCK DIAGRAM



(Package DIP-16)

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■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	15	V
Operating Current	I_O	1	A
Mute Terminal Current	I_M	1.0	mA
Power Dissipation	P_D	(DIP16) 1.9 (SDMP30) 1.8 (note 1)	W
Operating Temperature Range	T_{opr}	-40～+85	℃
Storage Temperature Range	T_{stg}	-40～+150	℃

(note 1) At on PC board.

■ ELECTRICAL CHARACTERISTICS (V^+=5V, Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
【ALL】						
Operating Supply Voltage Range	V^+		4	5	12	V
Mute OFF Current Dissipation	$I_{CC}1$	V_M=4.2V, V_{IN}=2.5V	-	20	35	mA
Mute ON Current Dissipation	$I_{CC}2$	V_M=0V, V_{IN}=2.5V	-	2	3.5	mA
【POWER AMPLIFIER】						
Output Offset Voltage	V_{OF}	OUT1-OUT2, GAIN=1 OUT4-OUT3, GAIN=1	-50	-	50	mV
Input Common Mode Voltage Range	V_{ICM}	AMP2 AMP3	0	-	V^+	V
Input Bias Current	I_B	AMP2 AMP3	-	-	300	nA
Maximum Output Voltage 1	V_O1	OUT1-OUT2, I_L=300mA OUT4-OUT3, I_L=300mA	4.0	4.2	-	V
Maximum Output Voltage 2	V_O2	OUT1-OUT2, I_L=500mA OUT4-OUT3, I_L=500mA	3.0	3.5	-	V
Open Loop Voltage Gain	A_V	AMP2, R_L=2kΩ, V_{IN}=2.5V AMP3, R_L=2kΩ, V_{IN}=2.5V	35	50	-	dB
【BUFFER AMPLIFIER】						
Input Output Potential Difference	V_{BIO}		-30	0	30	mV
Input Voltage Range	V_{BICM}		1.5	2.5	3.5	V
Output Voltage Range	ΔV_{BO}	V_{IN}=2.5V, I_L=-5mA V_{IN}=2.5V, I_L=+5mA	-	-	-50	mV
【MUTING】						
Mute OFF Voltage	V_{MH}		3.5	4.2	-	V
Mute ON Voltage	V_{ML}		-	0.8	1.0	V
Mute Sink Current	I_M	V_M=5V	70	100	130	μA

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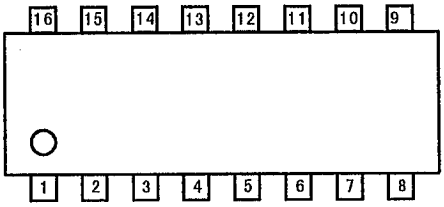
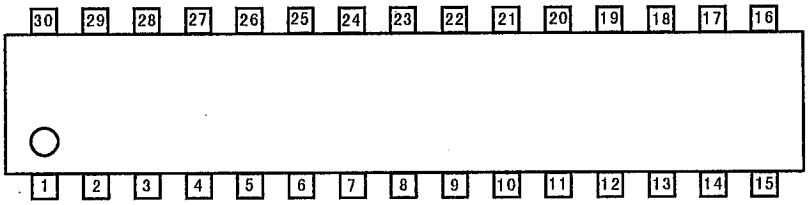
■ PIN CONFIGURATION



DIP−16

1 : V^+	9 : Vin2 (+)
2 : MUTE	10 : Vin2 (−)
3 : OUT1	11 : OUT3
4 : GND	12 : GND
5 : GND	13 : GND
6 : OUT2	14 : OUT4
7 : Vin1 (−)	15 : VBout
8 : Vin1 (+)	16 : VBin



SDMP−30

1 : GND	16 : GND
2 : GND	17 : GND
3 : OUT4	18 : OUT2
4 : NC	19 : NC
5 : NC	20 : NC
6 : VBout	21 : Vin1 (−)
7 : VBin	22 : Vin1 (+)
8 : NC	23 : NC
9 : V^+	24 : Vin2 (+)
10 : MUTE	25 : Vin2 (−)
11 : NC	26 : NC
12 : NC	27 : NC
13 : OUT1	28 : OUT3
14 : GND	29 : GND
15 : GND	30 : GND

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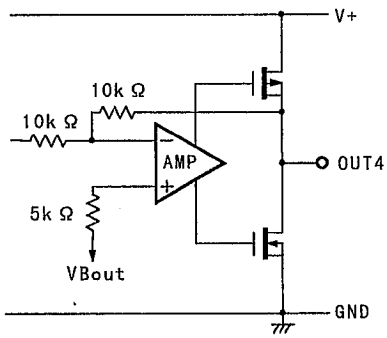
■ TERMINAL EXPLANATION

PIN NO. DIP −16	PIN NO. SDMP −30	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
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.	

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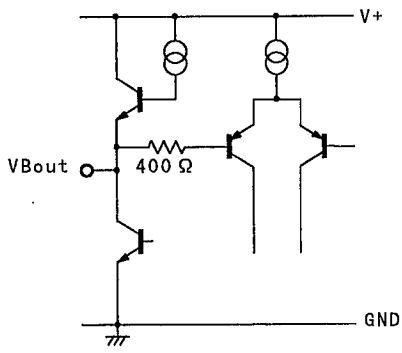
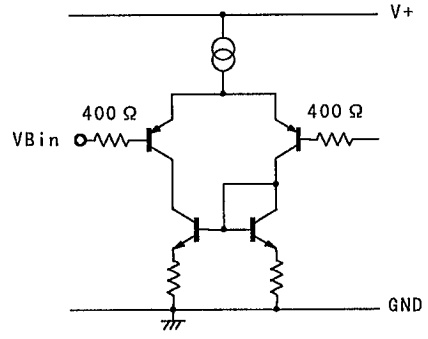
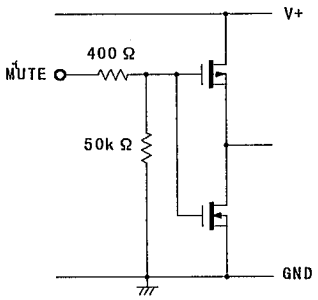
■ TERMINAL EXPLANATION

PIN NO. DIP −16	PIN NO. SDMP −30	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
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.	

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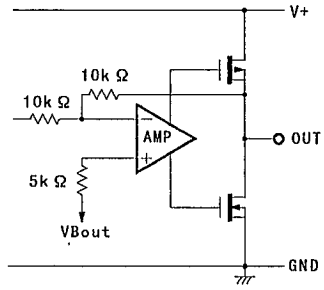
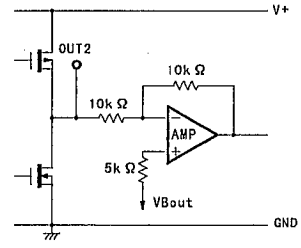
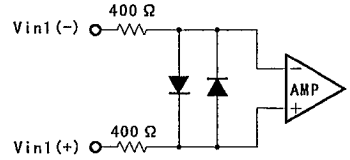
■ TERMINAL EXPLANATION

PIN NO. DIP −16	PIN NO. SDMP −30	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
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.	

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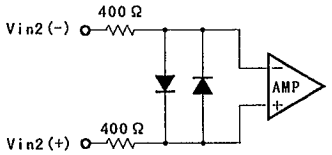
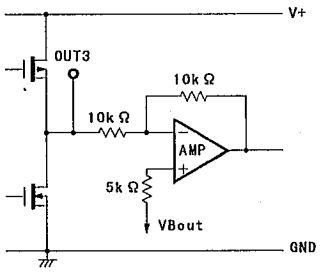
■ TERMINAL EXPLANATION

PIN NO. DIP −16	PIN NO. SDMP −30	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
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.	

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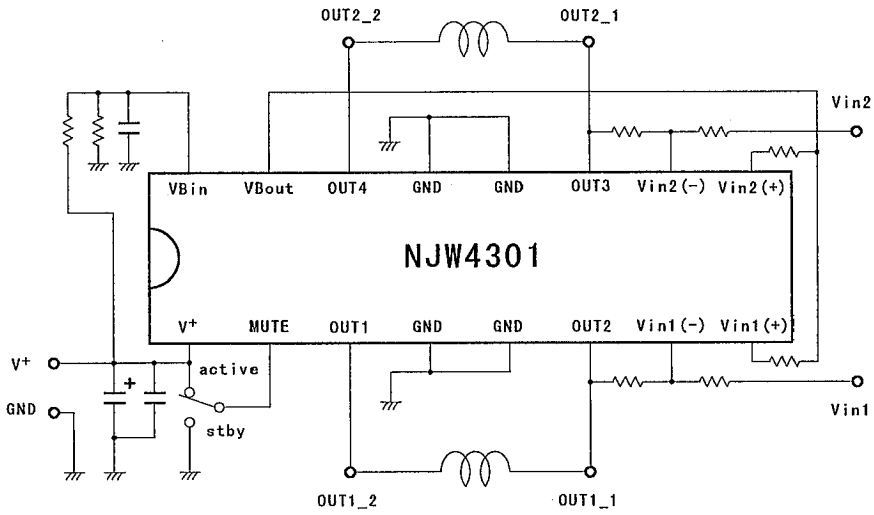
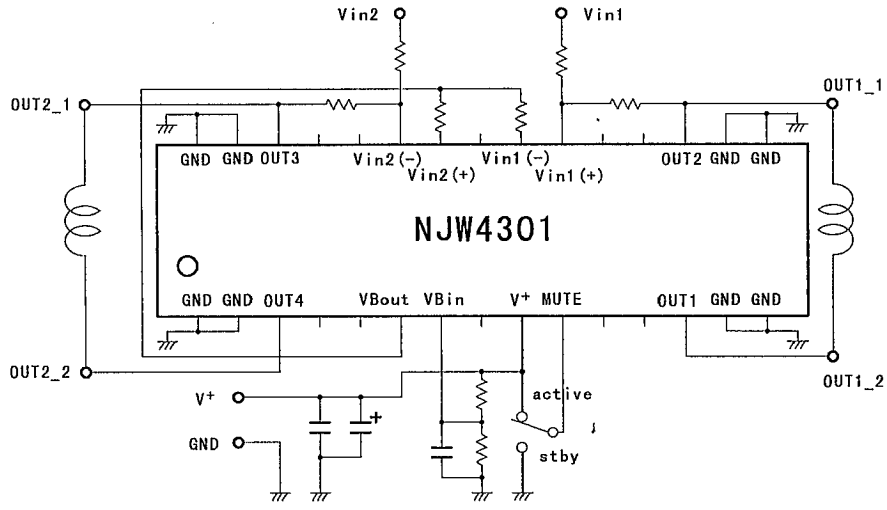
■ APPLICATION CIRCUITS



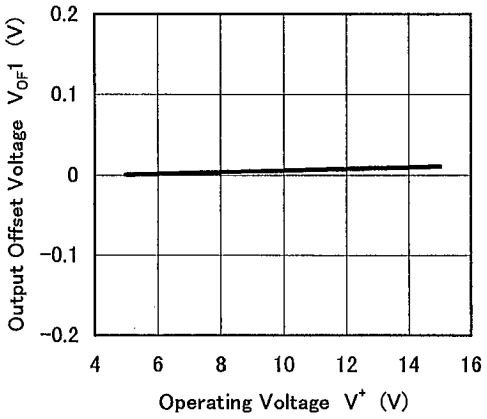
NJW4301(DIP-16) Application Circuit



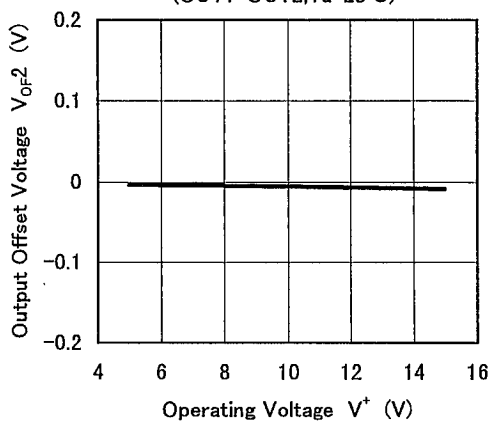
NJW4301(SDMP-30) Application Circuit

■ TYPICAL CHARACTERISTICS

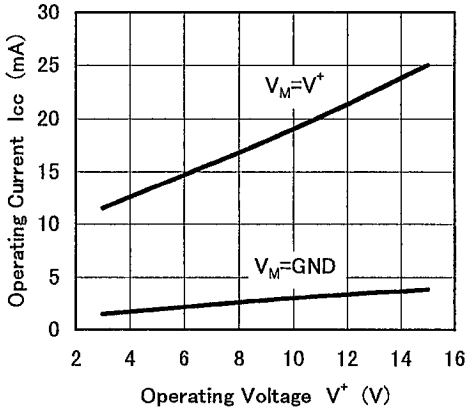
Output Offset Voltage VS. Operating Voltage
(OUT3-OUT4,Ta=25°C)



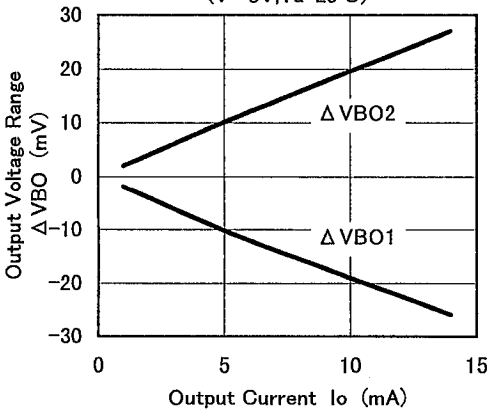
Output Offset Voltage VS.
Operating Voltage
(OUT1-OUT2,Ta=25°C)



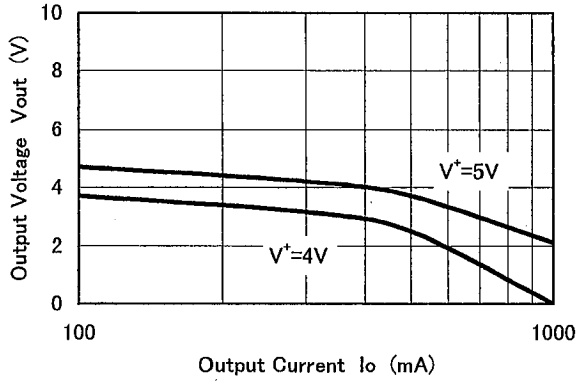
Operating Cuurrent VS. Operating Voltage
(Ta=25°C)



Output Voltage Range VS. Output Current
(V^+=5V,Ta=25°C)



Output Voltage VS. Output Current
(Ta=25°C, Pulse Measurement)



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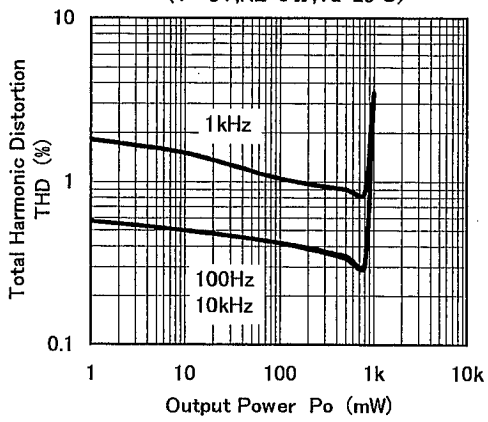
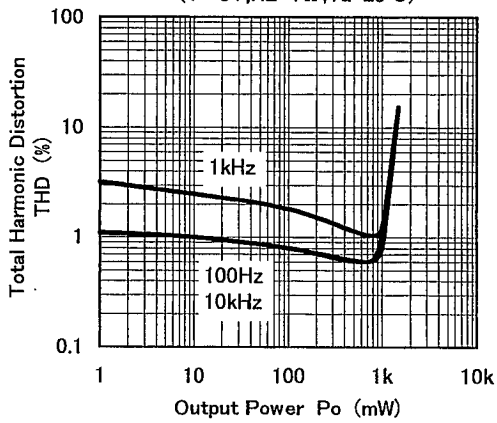
■ TYPICAL CHARACTERISTICS

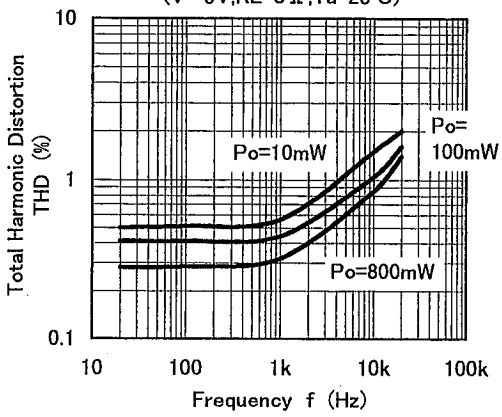
Total Harmonic Distortion VS. Output Power
(V^+=5V,RL=8Ω,Ta=25°C)



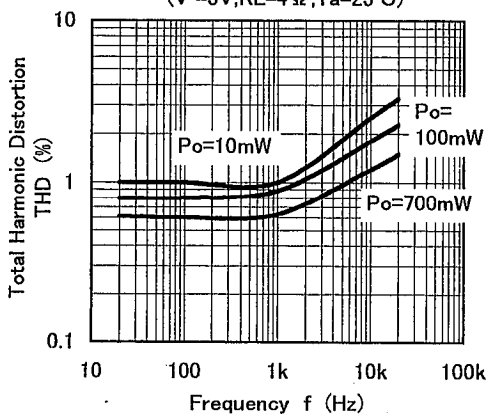
Total Harmonic Distortion VS. Output Power
(V^+=5V,RL=4Ω,Ta=25°C)



Total Harmonic Distortion VS. Frequency
(V^+=5V,RL=8Ω,Ta=25°C)



Total Harmonic Distortion VS. Frecuency
(V^+=5V,RL=4Ω,Ta=25°C)



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MEMO