

## 2 CHANNEL BRIDGE DRIVER IC

### ■ GENERAL DESCRIPTION

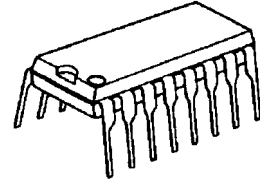
The **NJW4301** is a 2 channel bridge driver for CD, CD-ROM, MO and others. It operates at more than 4V, and then features high output voltage swing.

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.

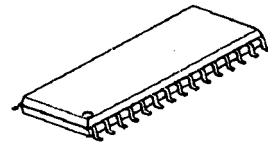
### ■ FEATURES

- Operating Voltage (V<sup>+</sup>=4V to 12V)
- Low Saturation Output (V<sub>sat</sub>=±0.5V<sub>MAX.</sub> at I<sub>O</sub>=300mA)
- Supply Current (35mA MAX.)
- 2 channel BTL Output
- Mute Function
- Bi-MOS Technology
- Package Outline DIP16, SDMP30

### ■ PACKAGE OUTLINE

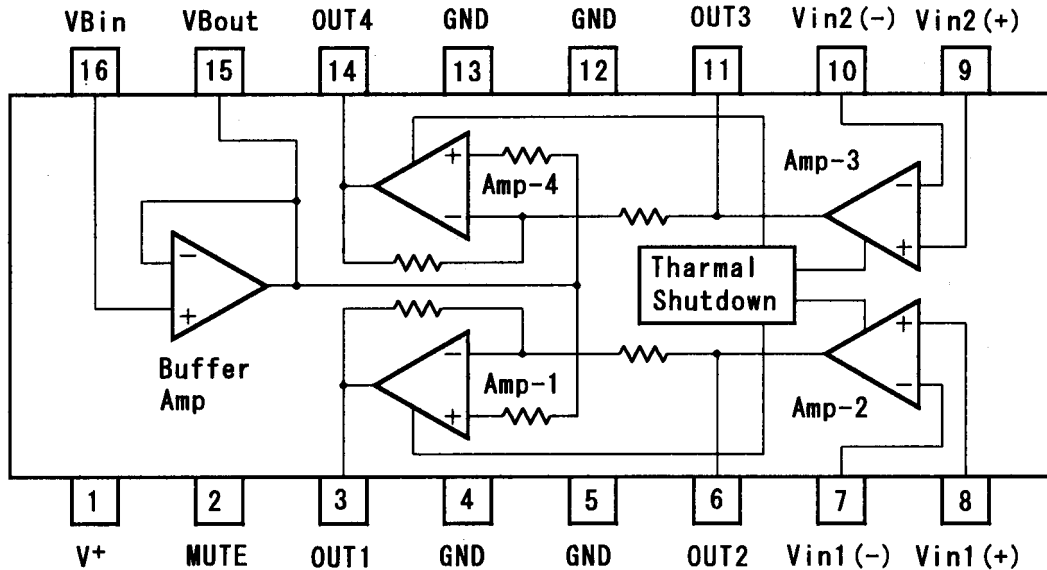


NJW4301D



NJW4301M

### ■ BLOCK DIAGRAM



(Package DIP-16)

# NJW4301

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

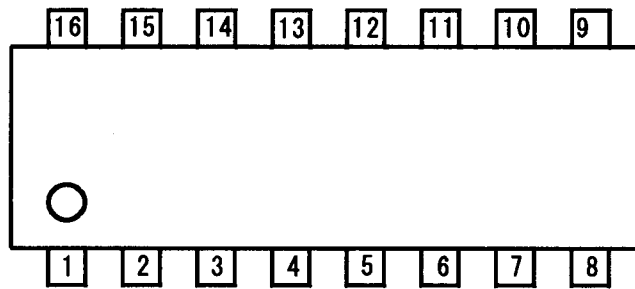
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	15	V
Operating Current	I <sub>o</sub>	1	A
Mute Terminal Current	I <sub>M</sub>	1.0	mA
Power Dissipation	P <sub>D</sub>	(DIP16) 1.9 (SDMP30) 1.8 (note)	W
Operating Temperature Range	T <sub>opr</sub>	-40 to +85	°C
Storage Temperature Range	T 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

(note) At on PC board.

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

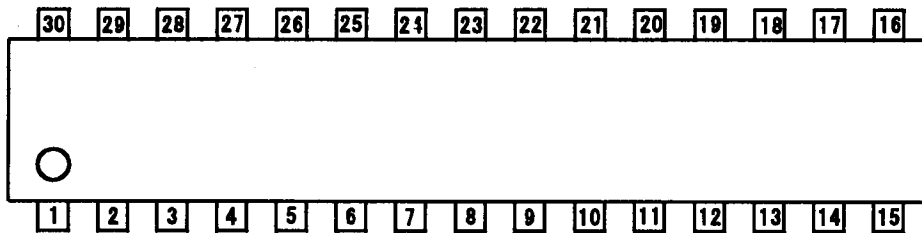
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>【ALL】</b>						
Operating Supply Voltage Range	V <sup>+</sup>		4	5	12	V
Mute OFF Current Dissipation	I <sub>CC1</sub>	V <sub>M</sub> =4.2V, V <sub>IN</sub> =2.5V	-	20	35	mA
Mute ON Current Dissipation	I <sub>CC2</sub>	V <sub>M</sub> =0V, V <sub>IN</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	mV
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>OFF</sub>		3.5	4.2	-	V
Mute ON Voltage	V <sub>ON</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

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## ■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP-16	SDMP-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 AMP4. 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

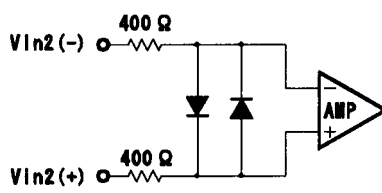
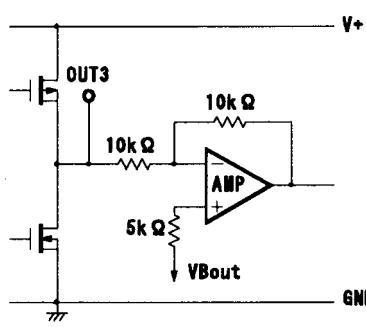
PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP-16	SDMP-30			
15	6	VBout	An buffer amplifier output.	
16	7	VBin	An buffer amplifier input.	
1	9	V <sub>CC</sub>	Supply Voltage.	
2	10	MUTE	An mute input. Pulldown by 50kΩ (TYP.) resistor.	

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## ■ TERMINAL EXPLANATION

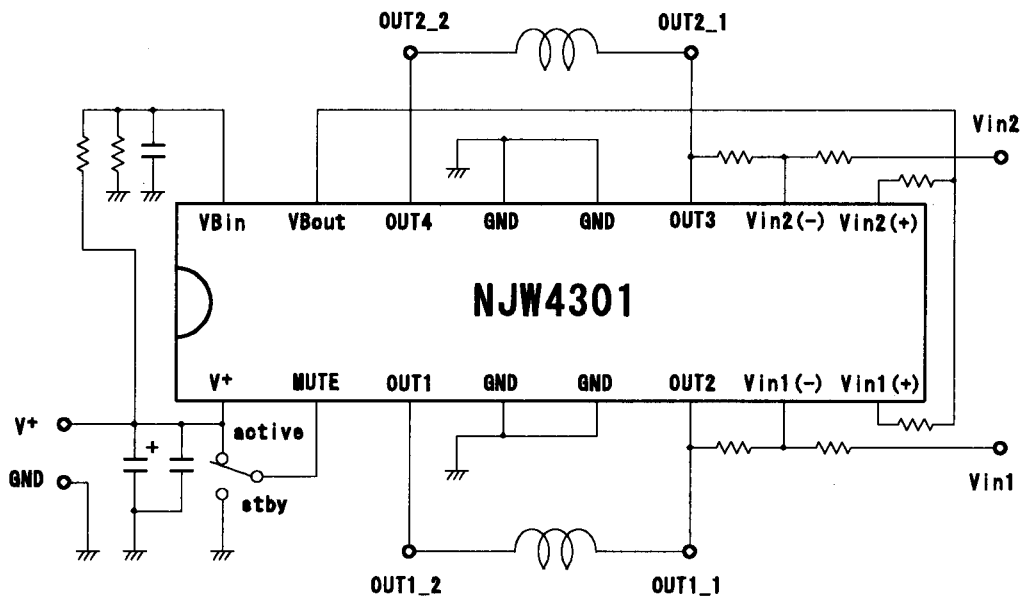
PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP-16	SDMP-30			
3	13	OUT1	Output terminal of AMP.1. OUT1 signal is opposite phase against OUT2.	
6	18	OUT2	Output terminal of AMP.2.	
7	21	Vin1(-)	Inverting input terminal of AMP.2.	
8	22	Vin1(+)	Non-inverting input terminal of AMP.2.	

## ■ TERMINAL EXPLANATION

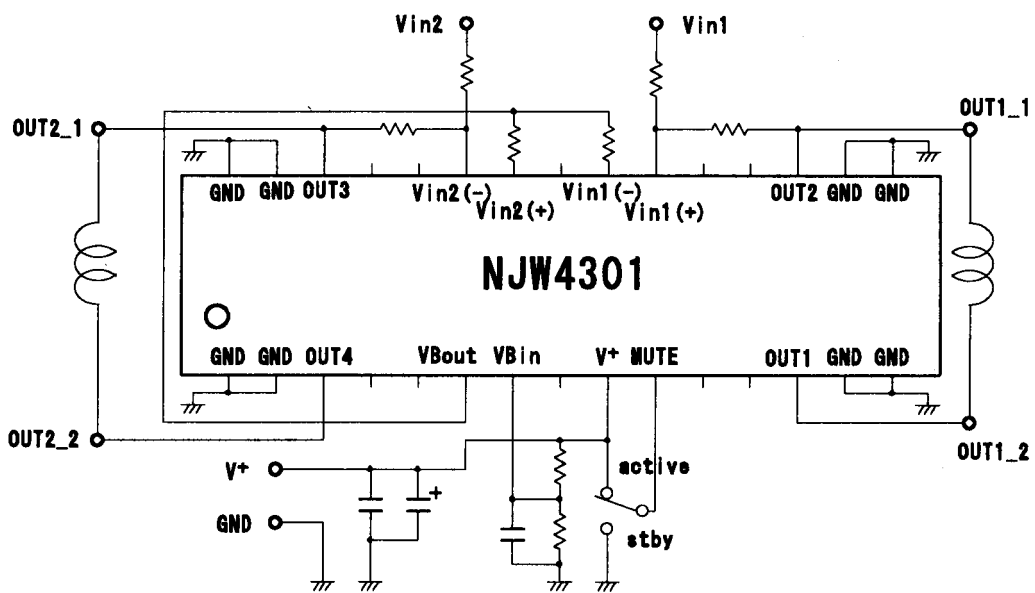
PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP-16	SDMP-30			
9	24	Vin2(+)	Inverting input terminal of AMP.3.	
10	25	Vin2(-)	Non-inverting input terminal of AMP.3.	
11	28	OUT3	Output terminal of AMP.3.	

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## APPLICATION CIRCUITS



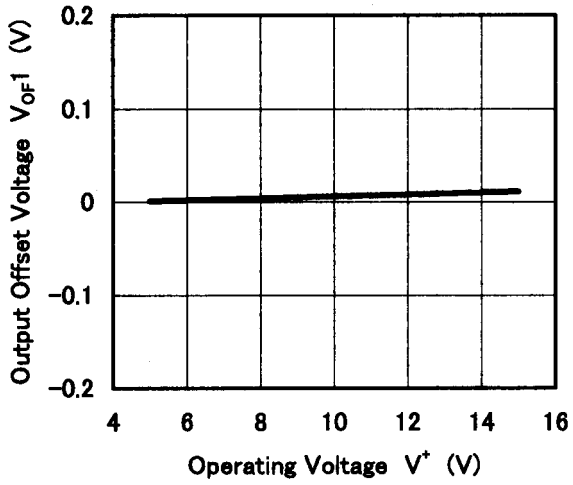
NJW4301 (DIP-16) Application Circuit



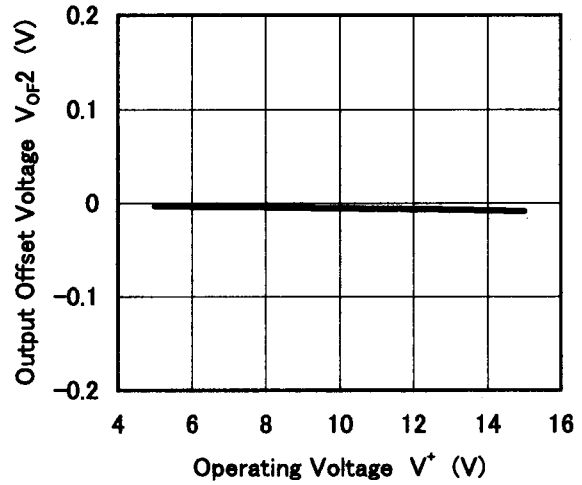
NJW4301 (SDMP-30) Application Circuit

## ■ TYPICAL CHARACTERISTICS

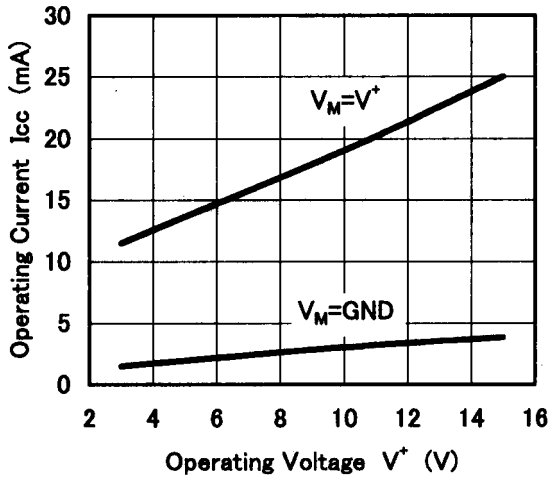
Output Offset Voltage vs. Operating Voltage  
(OUT3-OUT4,  $T_a=25^\circ\text{C}$ )



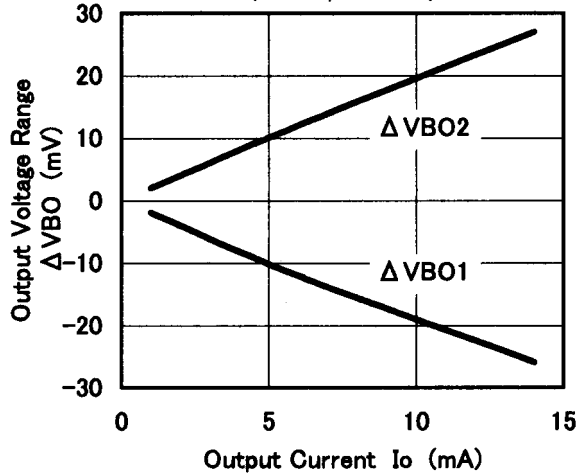
Output Offset Voltage vs. Operating Voltage  
(OUT1-OUT2,  $T_a=25^\circ\text{C}$ )



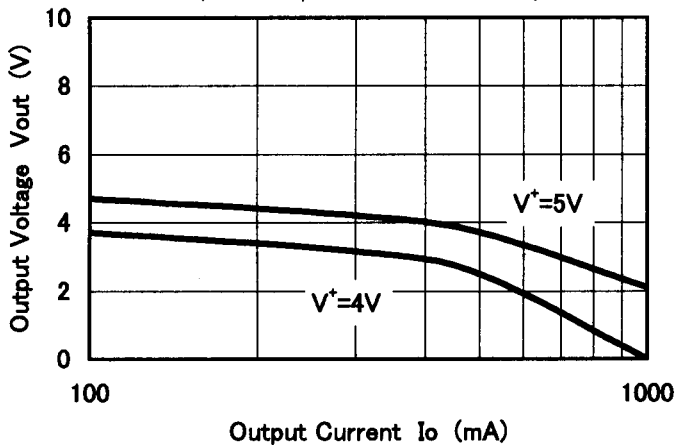
Operating Current vs. Operating Voltage  
( $T_a=25^\circ\text{C}$ )



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



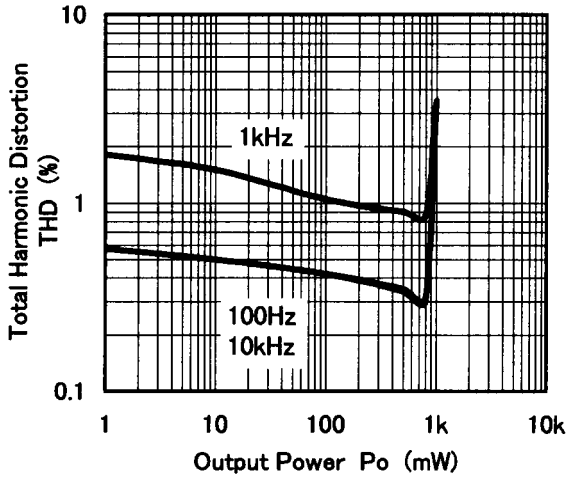
Output Voltage vs. Output Current  
( $T_a=25^\circ\text{C}$ , Pulse Measurement)



## ■ TYPICAL CHARACTERISTICS

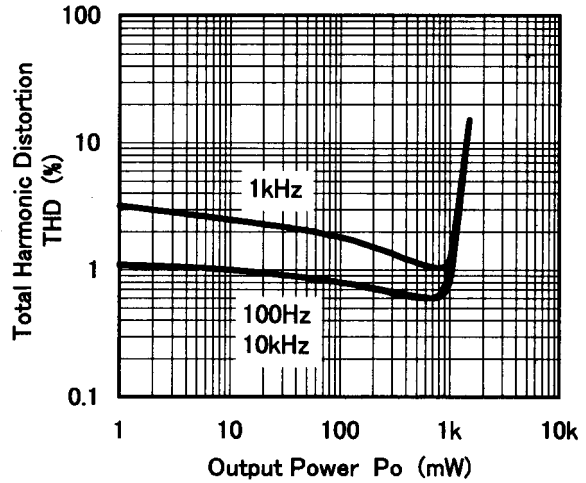
Total Harmonic Distortion vs. Output Power

( $V^+=5V, R_L=8\Omega, T_a=25^\circ C$ )



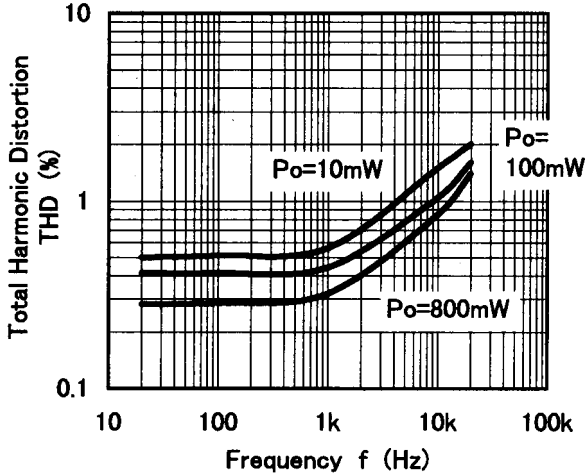
Total Harmonic Distortion vs. Output Power

( $V^+=5V, R_L=4\Omega, T_a=25^\circ C$ )



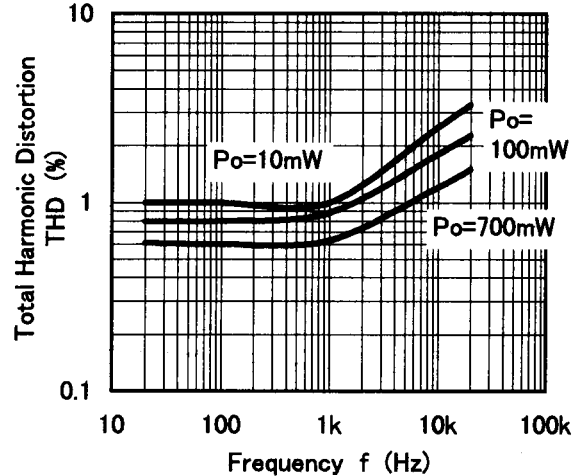
Total Harmonic Distortion vs. Frequency

( $V^+=5V, R_L=8\Omega, T_a=25^\circ C$ )



Total Harmonic Distortion vs. Frequency

( $V^+=5V, R_L=4\Omega, T_a=25^\circ C$ )





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