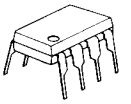
NJM2073

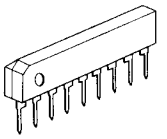
The NJM2073 is a monolithic integrated circuit in 8 lead dual-in-line package, which is designed for dual audio power amplifier in portable radio and handy cassette player.

■ Package Outline



NJM 2073 D

NJM 2073 M



NJM 2073 S

■ Features

- Supply Voltage V^+=1.8~15V
- Low Crossover Distortion
- Low Supply Current
- Bridge or Stereo Configuration
- No Turn-on Noise

■ Absolute Maximum Ratings (Ta=25°C)

Supply Voltage	V^+	15V
Output Peak Current	I_{OP}	1A
Power Dissipation	P_D (D-Type)	700mW
	(S-Type)	700mW
	(M-Type)	300mW
Input Voltage Range	V_{IN}	±0.4V
Operating Temperature Range	T_{opr}	−20~75°C
Storage Temperature Range	T_{stg}	−40~125°C

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■ Typical Application & Test Circuit

Fig.1 BTL Configuration

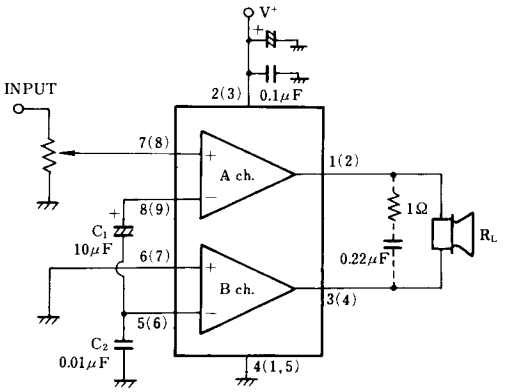
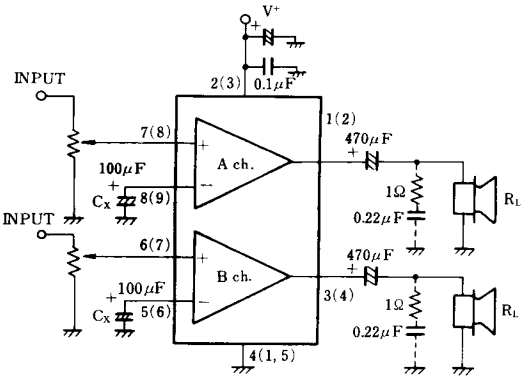


Fig.2 Stereo Configuration



note: pin No. to D,M-Type
( ) to S-Type

■ Electrical Characteristics D,S-Type (Ta=25°C)

(1) BTL Configuration (Test Circuit Fig. 1)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Supply Voltage	V^+		1.8	—	15	V
Supply Current	I_{cc}	$R_L=\infty$	—	6	9	mA
Output Offset Voltage	ΔV_o	$R_L=8\Omega$	—	10	50	mV
(Between the Outputs)						
Input Bias Current	I_B		—	100	—	nA
Output Power		THD=10%, f=1kHz				
	P_o	$V^+=9V$, $R_L=16\Omega$ (Note)	—	2.0	—	W
	P_o	$V^+=6V$, $R_L=8\Omega$ (Note)	0.9	1.2	—	W
	P_o	$V^+=4.5V$, $R_L=8\Omega$	—	0.6	—	W
	P_o	$V^+=4.5V$, $R_L=4\Omega$ (Note)	—	0.8	—	W
	P_o	$V^+=3V$, $R_L=4\Omega$	200	300	—	mW
	P_o	$V^+=2V$, $R_L=4\Omega$	—	80	—	mW
		THD=1%, f=40Hz~15kHz				
	P_o	$V^+=6V$, $R_L=8\Omega$	—	1.0	—	W
	P_o	$V^+=4.5V$, $R_L=4\Omega$	—	0.6	—	W
Total Harmonic Distortion	THD	$P_o=0.5W$, $R_L=8\Omega$, f=1kHz	—	0.2	—	%
Close Loop Voltage Gain	A_v	f=1kHz	41	44	47	dB
Input Impedance	Z_{IN}	f=1kHz	100	—	—	kΩ
Equivalent Input Noise Voltage	$V_{NI}1$	$R_s=10k\Omega$, A Curve	—	2	—	μV
	$V_{NI}2$	$R_s=10k\Omega$, B=22Hz~22kHz	—	2.5	—	μV
Ripple Rejection	RR	f=100Hz	—	40	—	dB
Cutoff Frequency	f_H	$A_v=-3dB$ from f=1kHz, $R_L=8\Omega$, $P_o=1W$	—	130	—	kHz

(Note) At on PC Board

(2) Stereo Configuration (Test Circuit Fig. 2)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Supply Voltage	V^+		1.8	—	15	V
Output Voltage	V_o		—	2.7	—	V
Supply Current	I_{cc}	$R_L=\infty$	—	6	9	mA
Input Bias Current	I_B		—	100	—	nA
Output Power (Each Channel)		THD=10%, f=1kHz				
	P_o	$V^+=6V$, $R_L=4\Omega$ (Note)	0.5	0.65	—	W
	P_o	$V^+=4.5V$, $R_L=4\Omega$	—	0.32	—	W
	P_o	$V^+=3V$, $R_L=4\Omega$	—	120	—	mW
	P_o	$V^+=2V$, $R_L=4\Omega$	—	30	—	mW
		THD=1%, f=1kHz				
	P_o	$V^+=6V$, $R_L=4\Omega$	—	500	—	mW
	P_o	$V^+=4.5V$, $R_L=4\Omega$	—	250	—	mW
Total Harmonic Distortion	THD	$P_o=0.4W$, $R_L=4\Omega$, f=1kHz	—	0.25	—	%
Voltage Gain	A_v	f=1kHz	41	44	47	dB
Channel Balance	ΔA_v		—	—	±1	dB
Input Impedance	Z_{IN}	f=1kHz	100	—	—	kΩ
Equivalent Input Noise Voltage	$V_{NI}1$	$R_s=10k\Omega$, A Curve	—	2.5	—	μV
	$V_{NI}2$	$R_s=10K\Omega$, B=22Hz~22kHz	—	3	—	μV
Ripple Rejection	RR	f=100Hz, $C_X=100\mu F$	24	30	—	dB
Cutoff Frequency	f_H	$A_v=-3dB$ from f=1kHz	—	200	—	kHz
		$R_L=8\Omega$, $P_o=250mW$				

(Note) At on PC Board

■ Electrical Characteristics M-Type (Ta=25°C)

(1) BTL Configuration (Test Circuit Fig. 1)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
OperatingSupply Voltage	V^+		1.8	—	15	V
Supply Current	I_{CC}	$R_L=\infty$	—	6	9	mA
Output Offset Voltage (Between the Outputs)	ΔV_O	$R_L=8\Omega$	—	10	50	mV
Input Bias Current	I_B		—	100	—	nA
Output Power		THD=10%, f=1kHz				
	P_O	$V^+=6V$, $R_L=16\Omega$ (Note)	—	0.8	—	W
	P_O	$V^+=4V$, $R_L=8\Omega$ (Note)	350	460	—	mW
	P_O	$V^+=3V$, $R_L=4\Omega$ (Note)	200	300	—	mW
	P_O	$V^+=2V$, $R_L=4\Omega$	—	80	—	mW
		THD=1%, f=40Hz~15kHz				
	P_O	$V^+=4V$, $R_L=8\Omega$	—	380	—	mW
Total Harmonic Distortion	THD	$V^+=4V$, $R_L=8\Omega$, $P_O=200mW$, f=1kHz	—	0.2	—	%
Close Loop Voltage Gain	A_V	f=1kHz	41	44	47	dB
Input Impedance	Z_{IN}	f=1kHz	100	—	—	kΩ
Equivalent Input Noise Voltage	V_{NI1}	$R_S=10k\Omega$, A Curve	—	2	—	μV
	V_{NI2}	$R_S=10k\Omega$, B=22Hz~22kHz	—	2.5	—	μV
Ripple Rejection	RR	f=100Hz	—	40	—	dB
Cutoff Frequency	f_H	$A_V=-3dB$ from f=1kHz,	—	130	—	kHz
		$R_L=16\Omega$, $P_O=0.5W$				

(Note) At on PC Board

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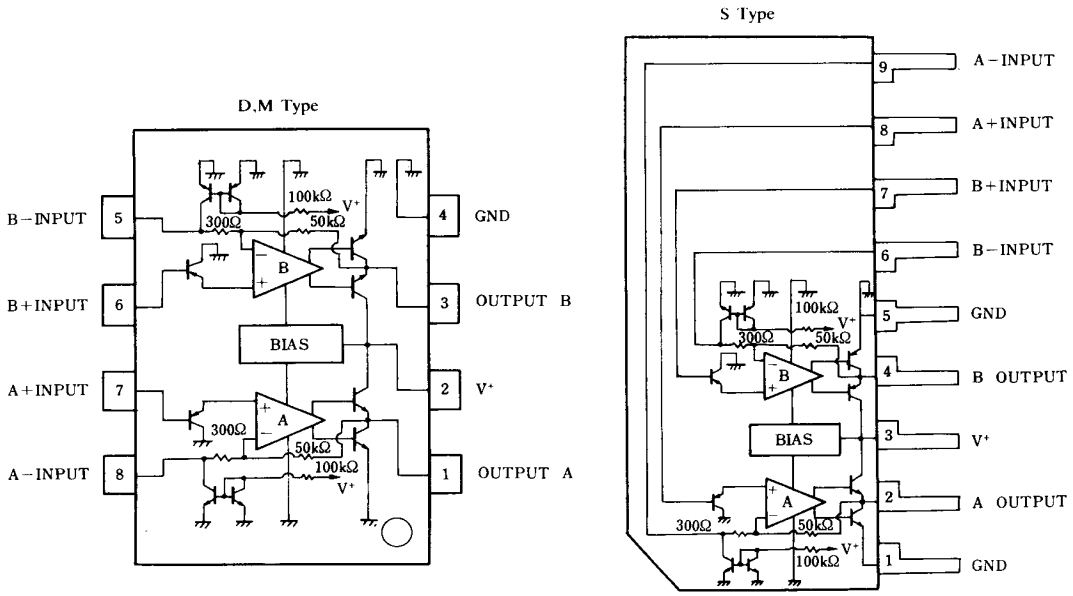
(2) Stereo Configuration (Test Circuit Fig. 2)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Supply Voltage	V^+		1.8	—	15	V
Output Voltage	V_O		—	2.7	—	V
Supply Current	I_{CC}	$R_L=\infty$	—	6	9	mA
Input Bias Current	I_B		—	100	—	nA
Output Power (Each Channel)		THD=10%, f=1kHz				
	P_O	$V^+=6V$, $R_L=16\Omega$	—	240	—	mW
	P_O	$V^+=5V$, $R_L=8\Omega$ (Note)	—	270	—	mW
	P_O	$V^+=4V$, $R_L=4\Omega$ (Note)	180	250	—	mW
	P_O	$V^+=3V$, $R_L=4\Omega$	—	120	—	mW
	P_O	$V^+=2V$, $R_L=4\Omega$	—	30	—	mW
		THD=1%, f=1kHz				
	P_O	$V^+=4V$, $R_L=4\Omega$	—	180	—	mW
Total Harmonic Distortion	THD	$V^+=4V$, $R_L=4\Omega$, $P_O=150mW$, f=1kHz	—	0.25	—	%
Voltage Gain	A_V	f=1kHz	41	44	47	dB
Channel Balance	ΔA_V		—	—	±1	dB
Input Inpedance	Z_{IN}	f=1kHz	100	—	—	kΩ
Equivalent Input Noise Voltage	V_{NI1}	$R_S=10k\Omega$, A Curve	—	2.5	—	μV
	V_{NI2}	$R_S=10k\Omega$, B=22Hz~22kHz	—	3	—	μV
Ripple Rejection	RR	f=100Hz, Cx=100μF	24	30	—	dB
Cutoff Frequency	f_H	$A_V=-3dB$ from f=1kHz	—	200	—	kHz
		$R_L=16\Omega$, $P_O=125mW$				

(Note) At on PC Board

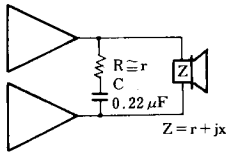
■ Block Diagram & Connection Diagram



■ Circuit for Prevent from Parasitic Oscillation

Put 1Ω + 0.22μF on parallel to load, if the load is speaker. Recommend putting 0.1μF and more than 100μF capacitors with good high frequency characteristics in to near ground and supply voltage pins.

In BTL operation of less than 2V supply voltage, parasitic oscillation may be occurred with R = 1Ω. And so recommended R to be the same valve of pure resistance(r) when it is lower than 3V.



■ Muting Circuit

When Mute ON, OUTPUT level saturates to GND side.

Fig.3 BTL Configuration

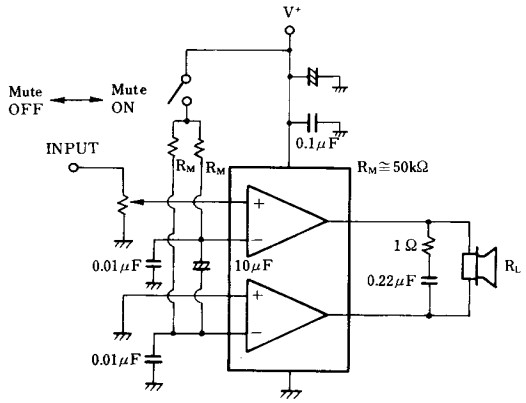
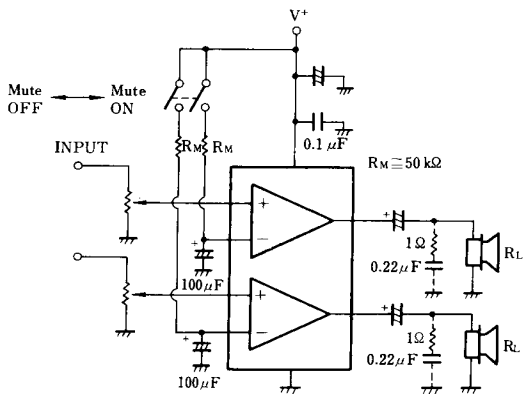
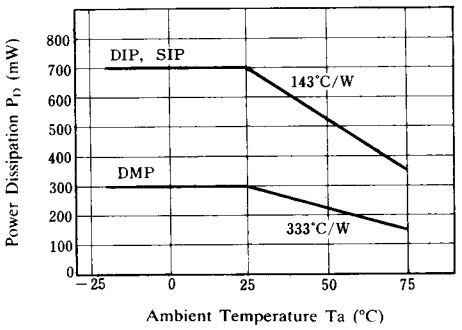


Fig.4 Stereo Configuration

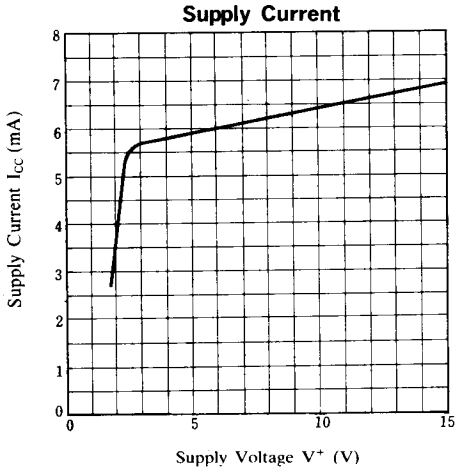


■ Typical Characteristics

Power Dissipation

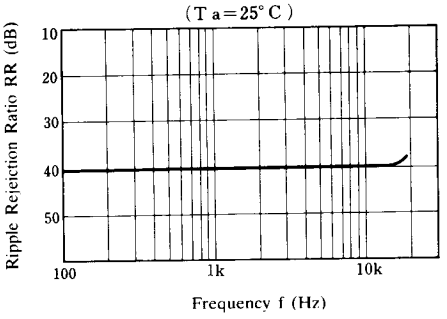


Supply Current



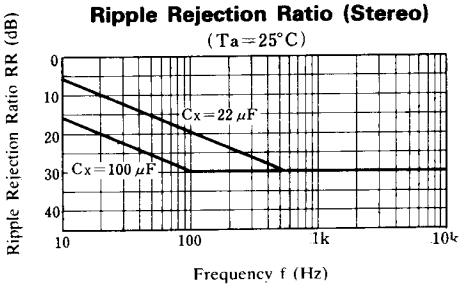
Ripple Rejection Ratio (BTL)

(Ta=25°C)



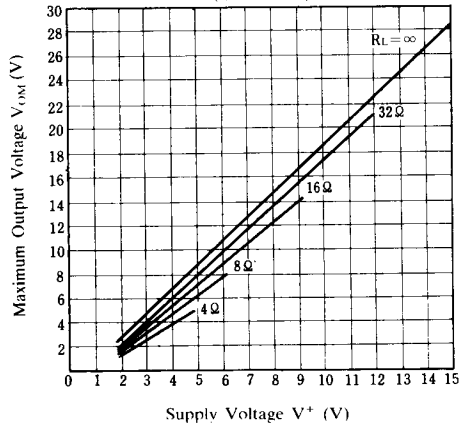
Ripple Rejection Ratio (Stereo)

(Ta=25°C)



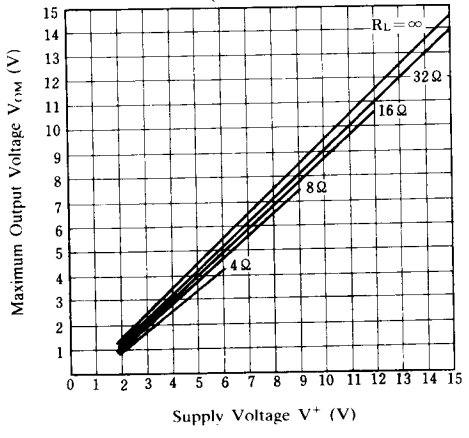
Maximum Output Voltage (BTL)

(Ta=25°C)



Maximum Output Voltage (Stereo)

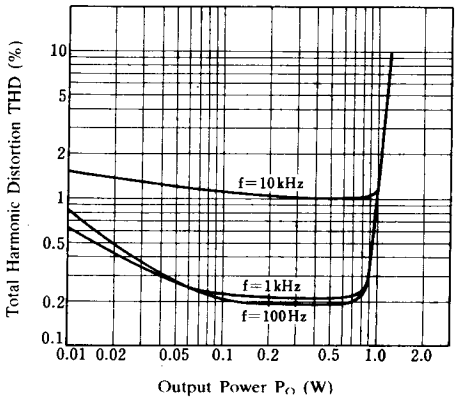
(Ta=25°C)



■ **Typical Characteristics**

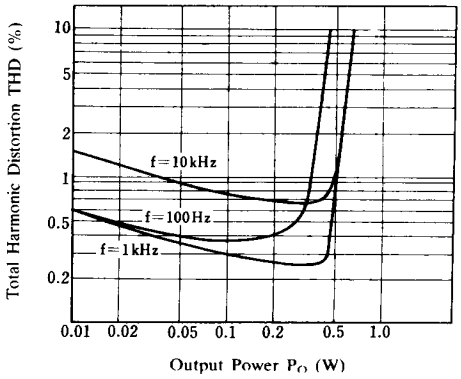
Total Harmonic Distortion (BTL)

(V^+=6V, R_L=8Ω)



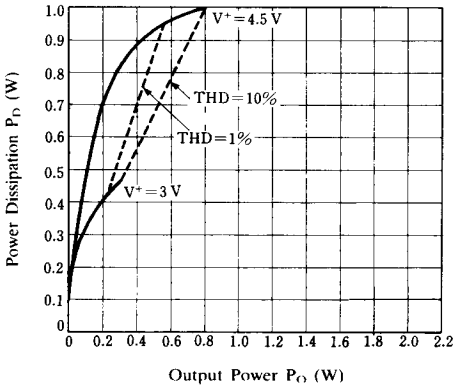
Total Harmonic Distortion (Stereo)

(V^+=6V, R_L=4Ω)



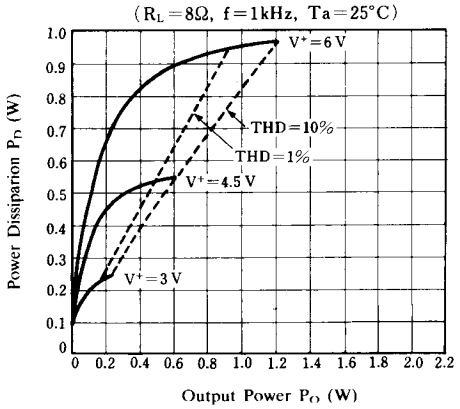
Power Dissipation vs. Output Power (BTL)

(R_L=4Ω, f=1kHz, Ta=25°C)



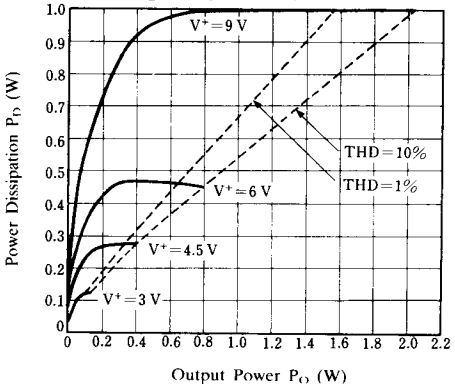
Power Dissipation vs. Output Power (BTL)

(R_L=8Ω, f=1kHz, Ta=25°C)



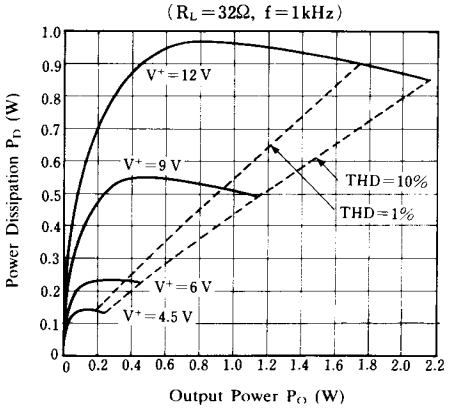
Power Dissipation vs. Output Power (BTL)

(R_L=16Ω, f=1kHz, Ta=25°C)



Power Dissipation vs. Output Power (BTL)

(R_L=32Ω, f=1kHz)



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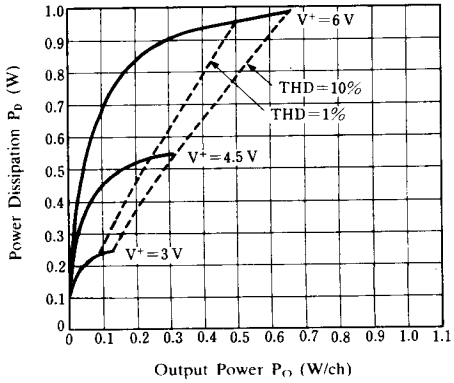
■ **Typical Characteristics**

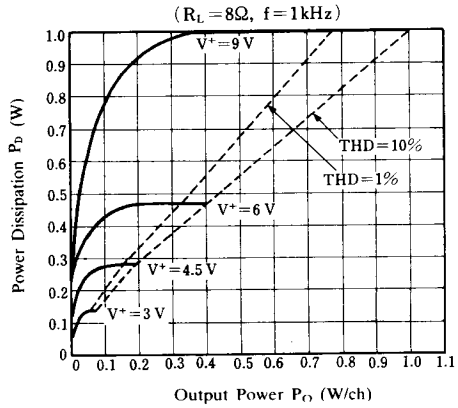
Power Dissipation vs. Output Power (Stereo)

(R_L=4Ω, f=1kHz)



Power Dissipation Output Power (Stereo) vs.

(R_L=8Ω, f=1kHz)



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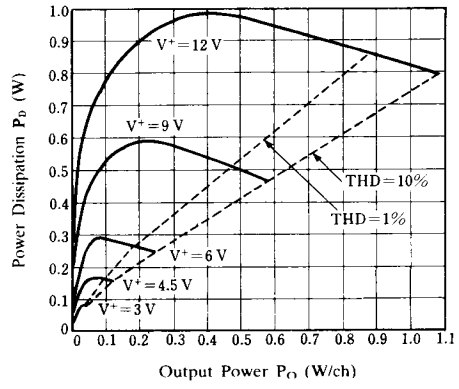
Power Dissipation vs. Output Power (Stereo)

(R_L=16Ω, f=1kHz)



Power Dissipation vs. Output Power (Stereo)

(R_L=32Ω, f=1kHz)