NJM5532

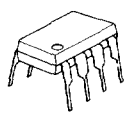
The NJM5532 is a high performance dual low noise operational amplifier. Compared to the standard dual operational amplifiers, such as the NJM1458, it shows better noise performance, improved output drive capability, and considerably higher small-signal and power bandwidths.

This makes the device especially suitable for application in high quality and professional audio equipment, instrumentation, control circuits, and telephone channel amplifiers. The op amp is internally compensated for gains equil to one If very low noise is of prime importance, version be used which has guaranteed NJM5532DD it is recommended that the noise specifications.

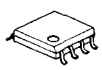
■ Features

- Small signal bandwidth — 10MHz
- Output drive capability — 600Ω, 10Vrms
- Input noise voltage — $5nV/\sqrt{Hz}$
- DC voltage gain — 100dB
- AC voltage gain — 67dB at 10kHz
- Power bandwidth — 140kHz
- Slew rate — 8V/μS
- Large supply voltage range — ±3 to ±20V

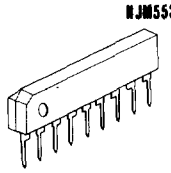
■ Package Outline



NJM5532D



NJM5532M



NJM5532S

■ Absolute Maximum Ratings

Supply Voltage	V^+/V^-	±22V
Input Voltage	V_I	V^+/V^- (V)
Differential Input Voltage	V_{ID}	±0.5V
Power Dissipation	P_D (D,S-Type)	500mW
	(M-Type)	600mW (note)
Operating Temperature Range	T_{opr}	−20~+75°C
Storage Temperature Range	T_{stg}	−40~+125°C

(note) At on a ceramic PCB (10×20×0.635 mm)

■ Electrical Characteristics (V^+/V^-=±15V, Ta=25°C)

DC Electrical Characteristics

Parameter	Symbol	Test Condition	5532			Unit
			Min.	Typ.	Max.	
Input Offset Voltage	V_{IO}		—	0.5	4	mV
Input Offset Current	I_{IO}		—	10	150	nA
Input Bias Current	I_B		—	200	800	nA
Supply Current	I_{CC}		—	9	16	mA
Input Common Mode Voltage Range	V_{ICM}		±12	±13	—	V
Common Mode Rejection Ratio	CMR		70	100	—	dB
Supply Voltage Rejection Ratio	SVR		80	100	—	dB
Large Signal Voltage Gain 1	A_V 1	$R_L \geq 2k\Omega$, V_O=±10V	88	100	—	dB
Large Signal Voltage Gain 2	A_V 2	$R_L \geq 600\Omega$, V_O=±10V	83.5	94	—	dB
Maximum Output Voltage Swing 1	V_{OM1}	$R_L \geq 600\Omega$	±12	±13	—	V
Maximum Output Voltage Swing 2	V_{OM2}	$R_L \geq 600\Omega$, V^+/V^- = ±18V	±15	±16	—	V
Input Resistance	R_{IN}		30	300	—	kΩ
Short Circuit Current	I_{OS}		—	38	—	mA

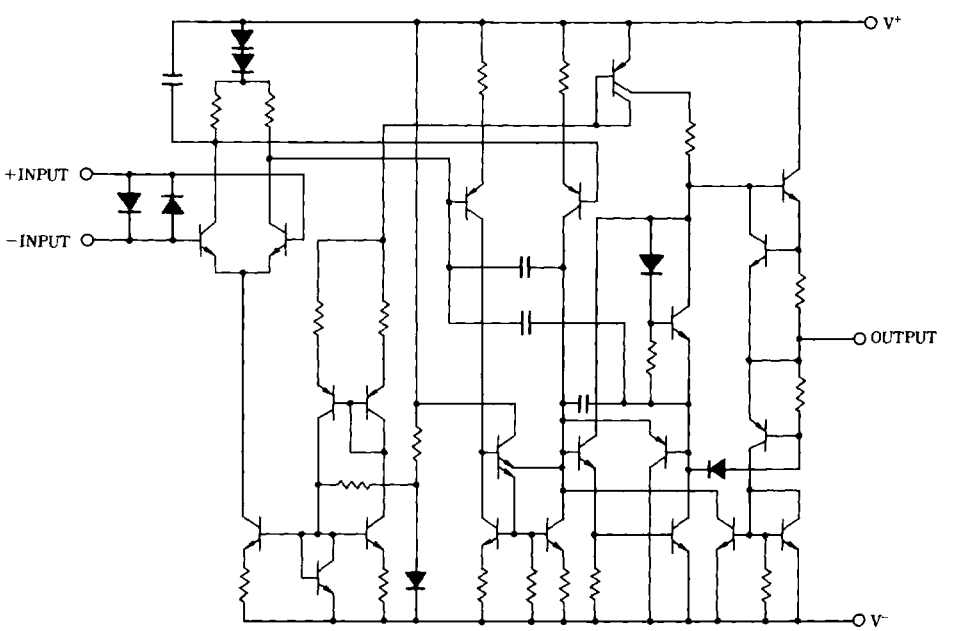
■ Electrical Characteristics ($V^+/V^-=\pm15V$, Ta=25°C)

AC Electrical Characteristics

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Resistance	R_O	A_V=30dB, f=10kHz, R_L=600Ω	—	0.3	—	Ω
Overshoot		A_V=1, V_{IN}=100mV_{P-P}, C_L=100pF, R_L=600Ω	—	10	—	%
Gain	A_V	f=10kHz	—	67	—	dB
Slew Rate	SR		—	8	—	V/μS
Gain Bandwidth Product	GB	C_L 100pF, R_L=600Ω	—	10	—	MHz
Power Bandwidth	W_{PG}	V_O=±10V	—	140	—	kHz
Power Bandwidth	W_{PG}	V_O=±14V, R_L=600Ω, V^+/V^-=±18V	—	100	—	kHz
Equivalent Input Noise Voltage	e_n	f_O=1kHz	—	8	—	
Equivalent Input Noise Voltage	e_n	f_O=1kHz	—	5	—	
Equivalent Input Noise Current	i_n	f_O=30Hz	—	2.7	—	
Equivalent Input Noise Current	i_n	f_o=1kHz	—	0.7	—	
Channel Separation	CS	f=1kHz, R_S=5kΩ	—	110	—	dB

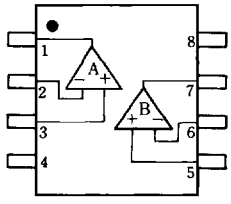
JRC's general selected products D rank are also prepared for the noise standard (R_S=2.2kΩ, RIAA, V_N=1.4μV Max.)

■ Equivalent Circuit (½ Shown)



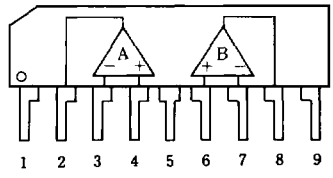
■ Connection Diagram

D,M-Type
(Top View)



PIN FUNCTION
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

S-Type

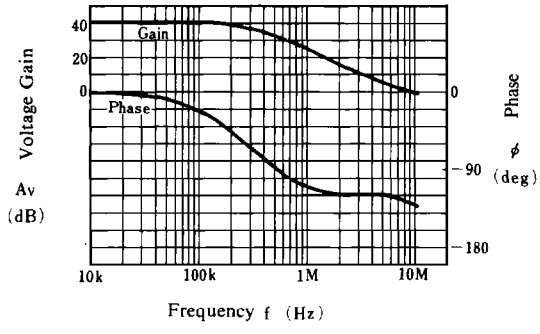


PIN FUNCTION
1. V⁺
2. A OUTPUT
3. A−INPUT
4. A+INPUT
5. V⁻
6. B+INPUT
7. B−INPUT
8. B OUTPUT
9. V⁺

■ Typical Characteristics

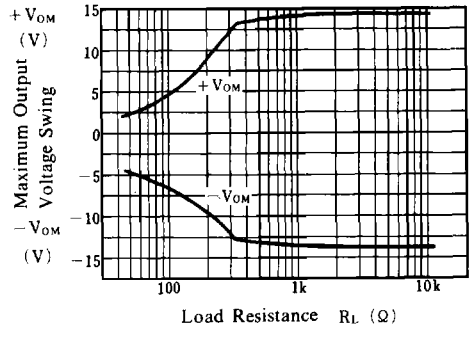
Voltage Gain, Phase vs. Frequency

(Ta=25℃)



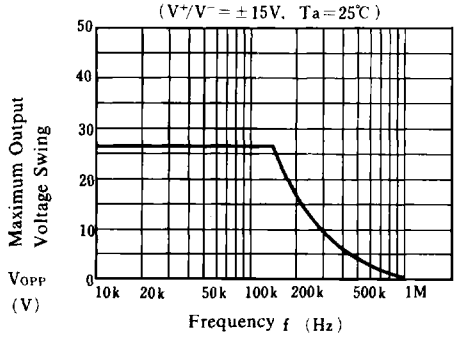
Maximum Output Voltage Swing vs.Load Resistance

(V⁺/V⁻=±15V, Ta=25℃)



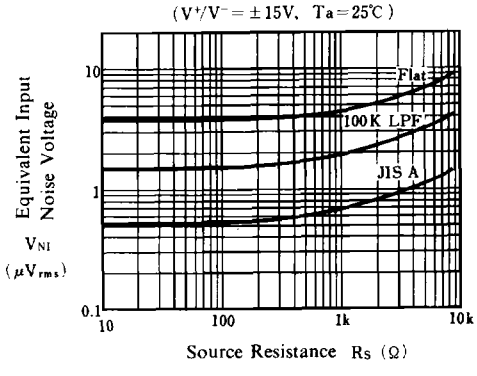
Maximum Output Voltage Swing vs. Frequency

(V⁺/V⁻=±15V, Ta=25℃)



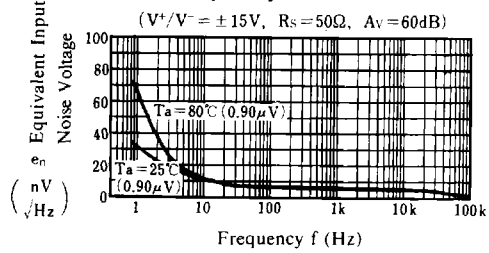
Equivalent Input Noise Voltage vs. Rs

(V⁺/V⁻=±15V, Ta=25℃)

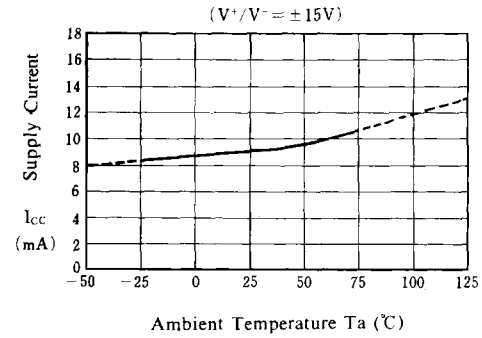


■ Typical Characteristics

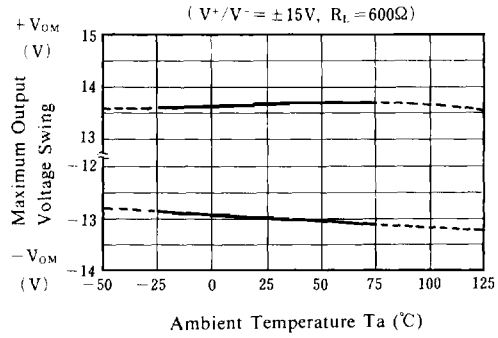
Equivalent Input Noise Voltage vs. Frequency



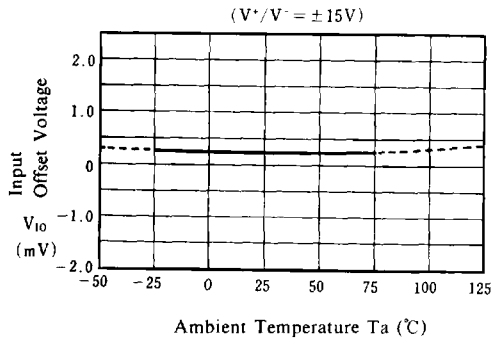
Supply Current vs. Temperature



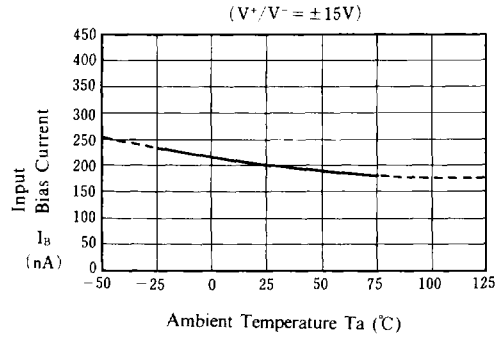
Maximum Output Voltage Swing vs. Temperature



Input Offset Voltage vs. Temperature

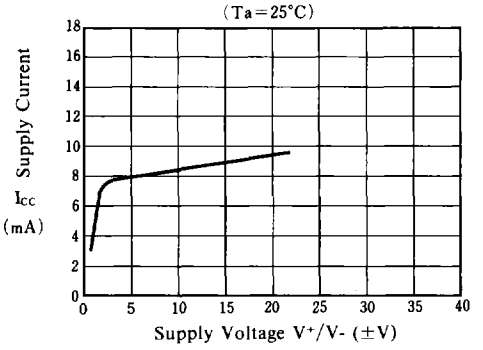


Input Bias Current vs. Temperature

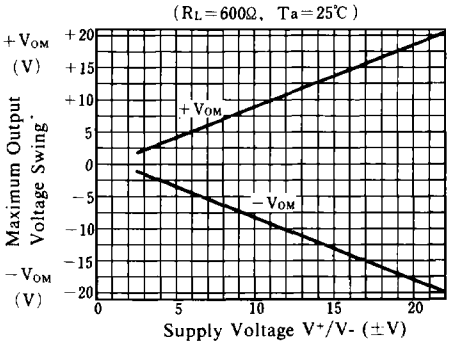


■ Typical Characteristics

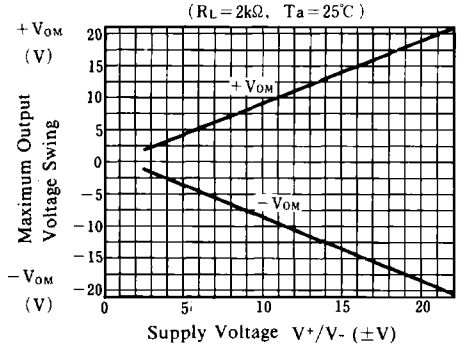
Supply Current vs. Supply Voltage



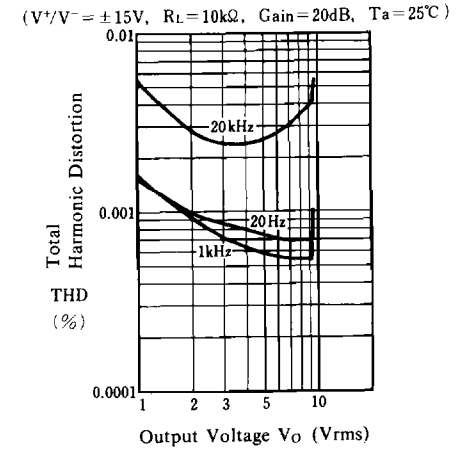
Maximum Output Voltage Swing vs. Supply Voltage



Maximum Output Voltage Swing vs. Supply Voltage



Total Harmomic Distortion vs. Output Voltage



■ Notice

When used in voltage-follower circuit, put a current limit resistor into non-inverting input terminal in order to avoid inside input diode destruction when the power supply is turned on. (ref. Fig. 1)

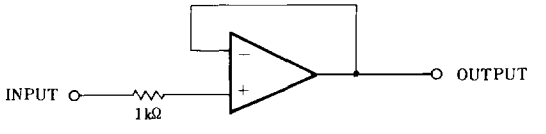


Fig. 1