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.

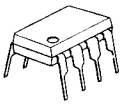
This makes the device especially suitable for application in high quality and professional audio equipment, instrumentation, control circuits, and telephone channel amplifiers. The op amp is internally compensated for gains equil to one If very low noise is of prime importance, version be used which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

2

■ Features

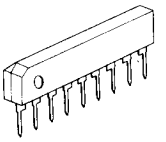
- Small signal bandwidth — 10MHz
- Output drive capability — 600Ω, 10Vrms
- Input noise voltage — 5nV/$\sqrt{Hz}$
- DC voltage gain — 100dB
- AC voltage gain — 67dB at 10kHz
- Power bandwidth — 140kHz
- Slew rate — 8V/μS
- Large supply voltage range — ±3 to ±20V

■ 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 ($V^+/V^-=\pm15V$, 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	$R_L \geqq 2k\Omega$, $V_O=\pm10V$	88	100	—	dB
Large Signal Voltage Gain 2	A_V 2	$R_L \geqq 600\Omega$, $V_O=\pm10V$	83.5	94	—	dB
Maximum Output Voltage Swing 1	V_{OM1}	$R_L \geqq 600\Omega$	±12	±13	—	V
Maximum Output Voltage Swing 2	V_{OM2}	$R_L \geqq 600\Omega$, $V^+/V^-=\pm18V$	±15	±16	—	V
Input Resistance	R_{IN}		30	300	—	kΩ
Short Circuit Current	I_{OS}		—	38	—	mA

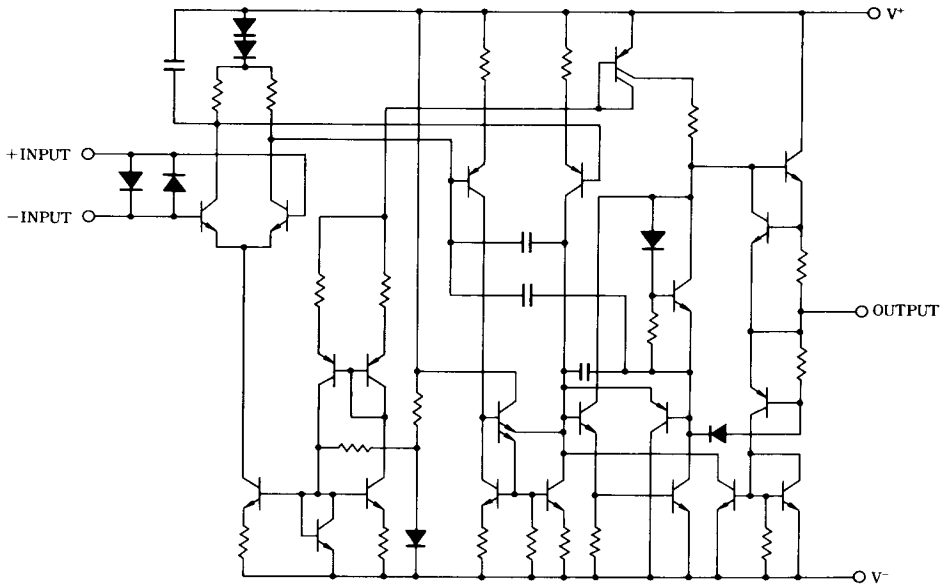
■ Electrical Characteristics ($V^+/V^-=\pm15V$, Ta=25°C)

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}	$V_O=\pm10V$	—	140	—	kHz
Power Bandwidth	W_{PG}	$V_O=\pm14V$, R_L=600Ω, $V^+/V^-=\pm18V$	—	100	—	kHz
Equivalent Input Noise Voltage	V_{NI}	f_O=30Hz	—	8	—	$nV/\sqrt{Hz}$
Equivalent Input Noise Voltage	V_{NI}	f_O=1kHz	—	5	—	$nV/\sqrt{Hz}$
Equivalent Input Noise Current	i_{NI}	f_O=30Hz	—	2.7	—	$pA/\sqrt{Hz}$
Equivalent Input Noise Current	i_{NI}	f_O=1kHz	—	0.7	—	$pA/\sqrt{Hz}$
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.)

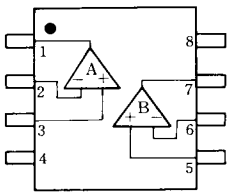
■ Equivalent Circuit (½ Shown)



2

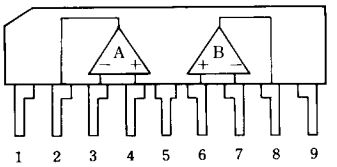
■ Connection Diagram

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⁺

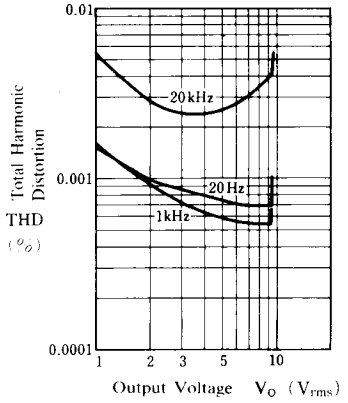
S-Type



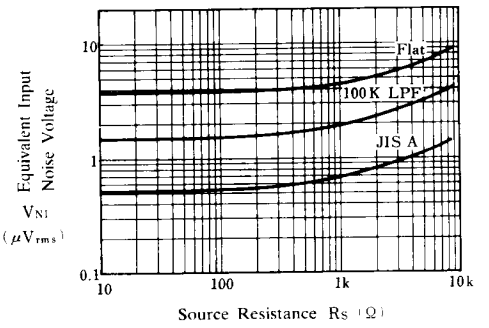
PIN FUNCTION
1. V⁻
2. A OUTPUT
3. A−INPUT
4. A+INPUT
5. V
6. B+INPUT
7. B−INPUT
8. B OUTPUT
9. V⁺

■ Typical Characteristics

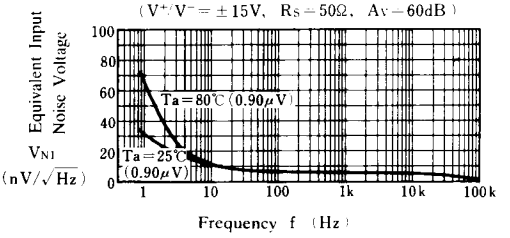
Total Harmonic Distortion
($V^+/V^-=\pm15V$, $R_L=10k\Omega$, Gain=20dB, Ta=25℃)



Equivalent Input Noise Voltage
($V^+/V^-=\pm15V$, Ta=25℃)

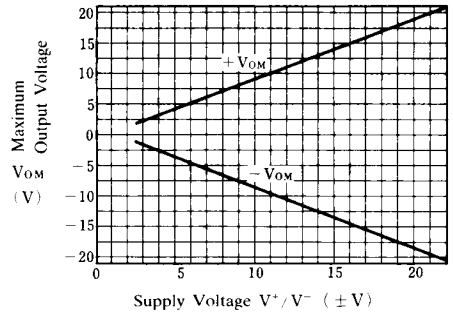


Equivalent Input Noise Voltage
($V^+/V^-=\pm15V$, $R_S=50\Omega$, Av=60dB)



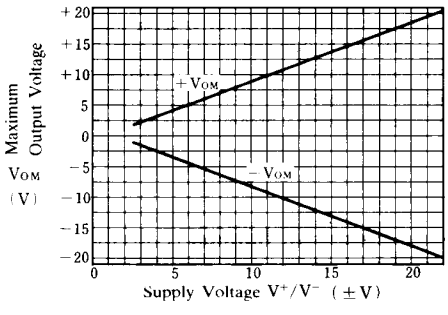
Maximum Output Voltage

(R_L=2kΩ, Ta=25°C)



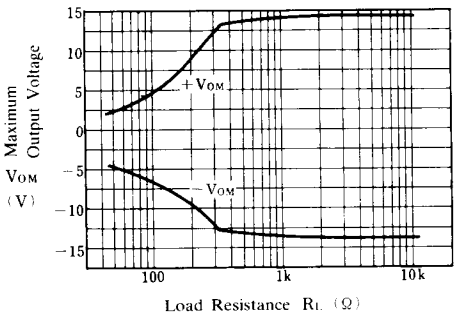
Maximum Output Voltage

(R_L=600Ω, Ta=25°C)



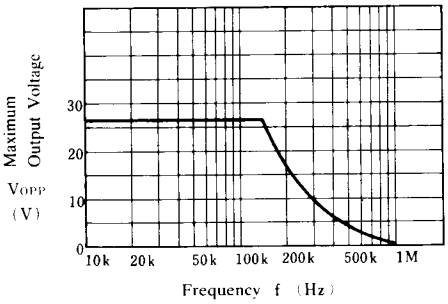
Maximum Output Voltage

(V^+/V^-=±15V, Ta=25°C)



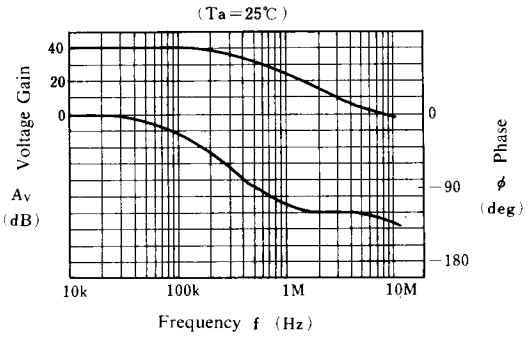
Maximum Output Voltage

(V^+/V^-=±15V, Ta=25°C)



Voltage Gain, Phase vs. Frequency

(Ta=25°C)



■ Notice

When used in voltage follower circuit, put a current limit resister in to non-inverting input terminal to avoid inside input diode destruction when the power supply is turned on.