DUAL OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM4580 is a dual operational amplifier, specially designed for improving the tone control, which is most suitable for the audio application.

Featuring noiseless, higher gain bandwidth, high output current and low distortion ratio, and it is most suitable not only for acoustic electronic parts of audio pre-amp and active filter, but also for the industrial measurement tools. It is also suitable for the head phone amp at higher output current, and further more, it can be applied for the handy type set operational amplifier of general purpose in application of low voltage single supply type which is properly biased of the low voltage source.

The D-Rank type products(NJM4580DD/LD/MD/ED) have specified maximum limits for equivalent input noise voltage.

■ PACKAGE OUTLINE



NJM4580R
(MSOP8(VSP8))



NJM4580M
(DMP8)



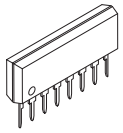
NJM4580E
(SOP8)



NJM4580V
(SSOP8)



NJM4580D
(DIP8)

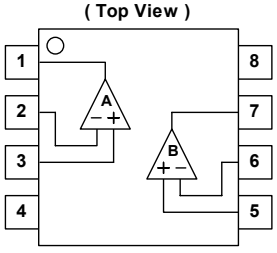


NJM4580L
(SIP8)

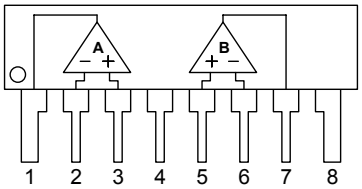
■ FEATURES

- Operating Voltage ±2V~±18V
- Low Input Noise Voltage 0.8μVrms typ. (RIAA)
- Wide GBW 15MHz typ.
- Low Distortion 0.0005% typ.
- Slew Rate 5V/μs typ.
- Bipolar Technology
- Package Outline DIP8, SIP8, DMP8, SSOP8, MSOP8(VSP8) MEET JEDEC MO-187-DA
  SOP8 JEDEC 150mil

■ PIN CONFIGURATION



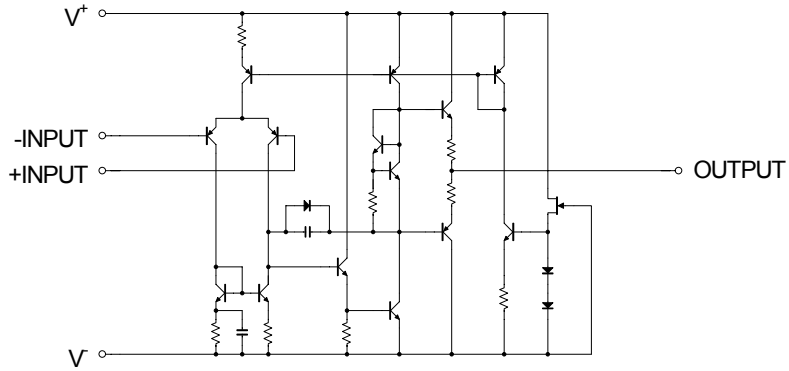
NJM4580D, NJM4580M, NJM4580E
NJM4580V, NJM4580R



NJM4580L

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

■ EQUIVALENT CIRCUIT (1/2 Shown)



■ABSOLUTE MAXIMUM RATINGS (Ta=25°C, unless otherwise noted.)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V^+/V^-	±18	V
Input Voltage	V_{ICM}	±15 (Note1)	V
Differential Input Voltage	V_{ID}	±30 (Note1)	V
Power Dissipation	P_D	DIP8, SIP8 : 800 DMP8, SOP8 : 300 SSOP8 : 250 MSOP8(VSP8) : 400 (Note2)	mW
Operating Temperature Range	Topr	-40~+85	°C
Storage Temperature Range	Tstg	-40~+125	°C

(Note1) For supply voltage less than ±15V, the absolute maximum input voltage is equal to supply voltage.

(Note2) On the PCB "EIA/JEDEC (114.3×76.2×1.57mm, 2 layers, FR-4)"

■ RECOMMENDED OPERATING CONDITIONS (Ta=25°C)

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V^+/V^-		±2	-	±18	V

■ ELECTRICAL CHARACTERISTICS (V^+/V^-=±15V, Ta=25°C, unless otherwise noted.)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	R_S≤10kΩ	-	0.3	3	mV
Input Offset Current	I_{IO}		-	5	200	nA
Input Bias Current	I_B		-	100	500	nA
Voltage Gain	A_V	R_L≥2kΩ,V_O=±10V	90	110	-	dB
Maximum Output Voltage	V_{OM}	R_L≥2kΩ	±12	±13.5	-	V
Common Mode Input Voltage Range	V_{ICM}		±12	±13.5	-	V
Common Mode Rejection Ratio	CMR	R_S≤10kΩ	80	110	-	dB
Supply Voltage Rejection Ratio	SVR	R_S≤10kΩ	80	110	-	dB
Supply Current	I_{CC}		-	6	9	mA
Slew Rate	SR	R_L≥2kΩ	-	5	-	V/μs
Gain Bandwidth Product	GB	f=10kHz	-	15	-	MHz
Total Harmonic Distortion	THD	A_V=20dB,V_O=5V,R_L=2kΩ,f=1kHz	-	0.0005	-	%
Equivalent Input Noise Voltage	V_{NI}	RIAA,R_S=2.2kΩ,30kHz LPF	-	0.8	-	μVrms

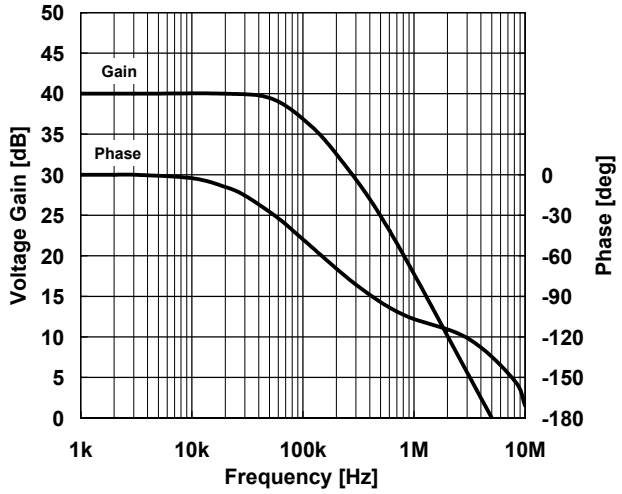
■ ELECTRICAL CHARACTERISTICS (D-rank type(Note3), V^+/V^-=±15V, Ta=25°C, unless otherwise noted.)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Equivalent Input Noise Voltage	V_{NI}	RIAA,R_S=2.2kΩ	-	-	1.4	μVrms

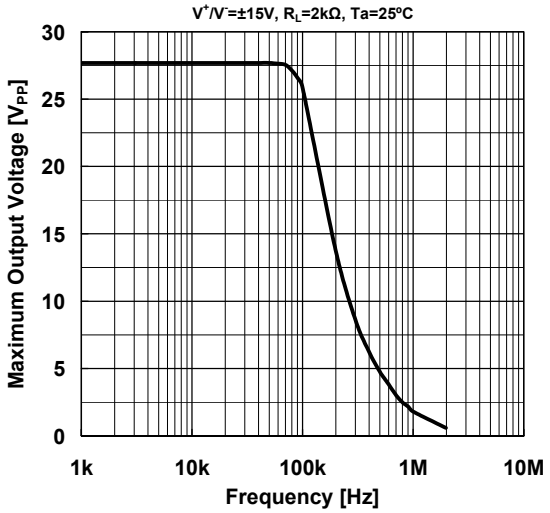
(Note3)D-rank type is a Equivalent Input Noise Voltage selected product. It s only DIP, DMP, SOP and SIP package.

■ TYPICAL CHARACTERISTICS

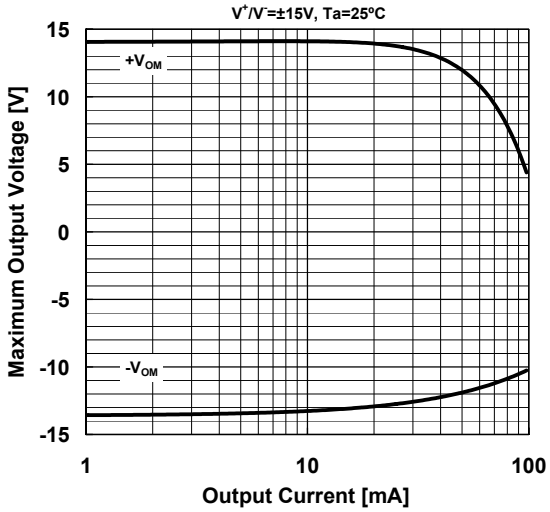
40dB Gain/Phase vs. Frequency
(V^+/V^-=±15V, R_L=2kΩ, Ta=25ºC)



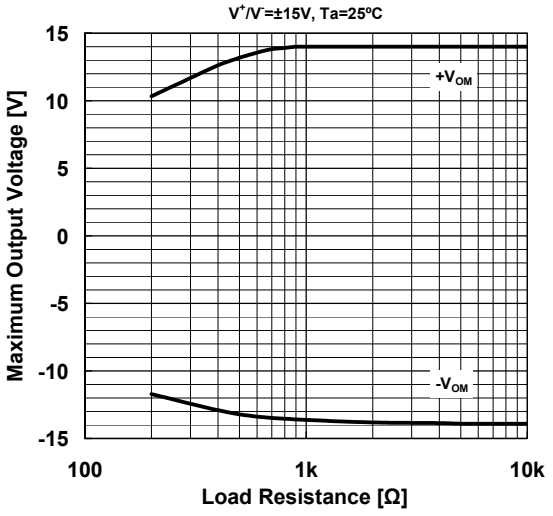
Maximum Output Voltage vs. Frequency
V^+/V^-=±15V, R_L=2kΩ, Ta=25ºC



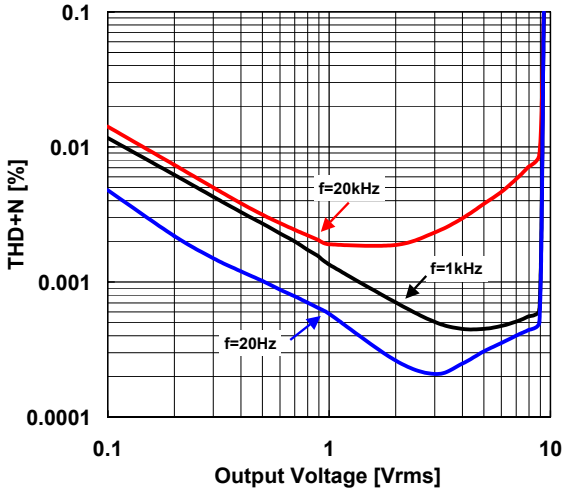
Maximum Output Voltage vs. Output Current
V^+/V^-=±15V, Ta=25ºC



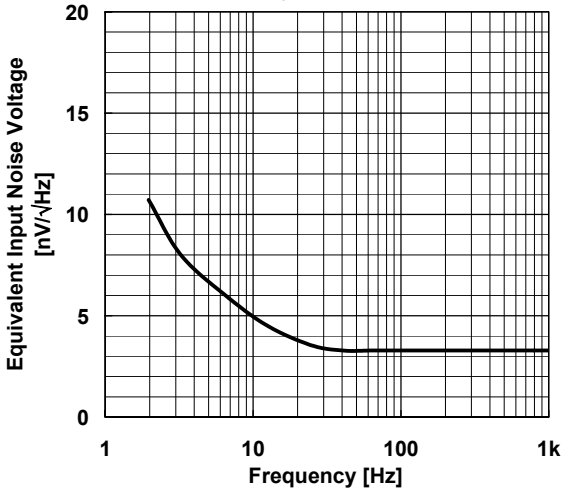
Maximum Output Voltage vs. Load Resistance
V^+/V^-=±15V, Ta=25ºC



THD vs. Output Voltage (Frequency)
V^+/V^-=±15V, G_V=20dB, R_L=2kΩ

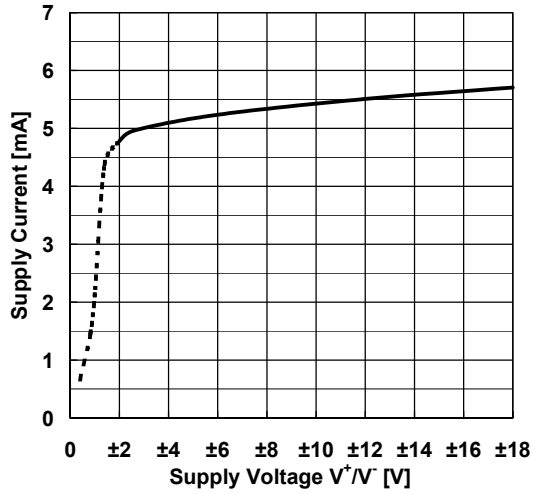


Voltage Noisevs. Frequency
V^+/V^-=±15V, R_S=50Ω, G_V=60dB, Ta=25ºC

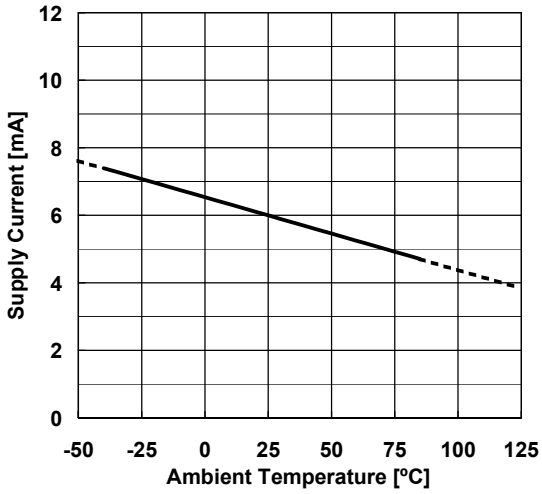


■ TYPICAL CHARACTERISTICS

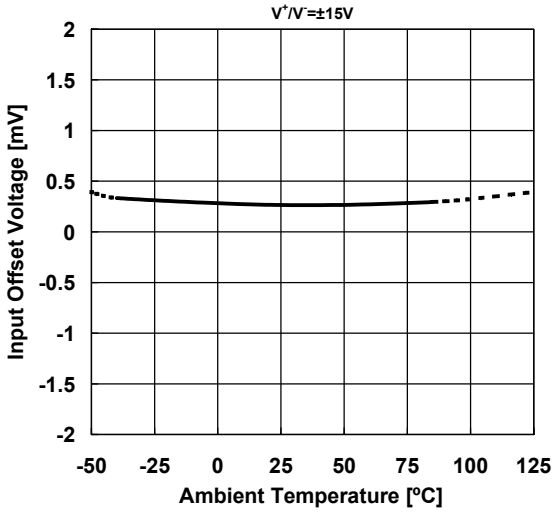
Supply Current vs. Supply Voltage
Ta=25ºC



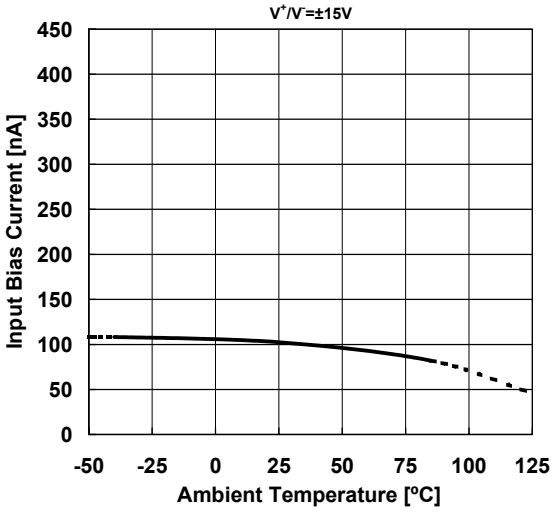
Supply Current vs. Temperature
V+/V-=±15V



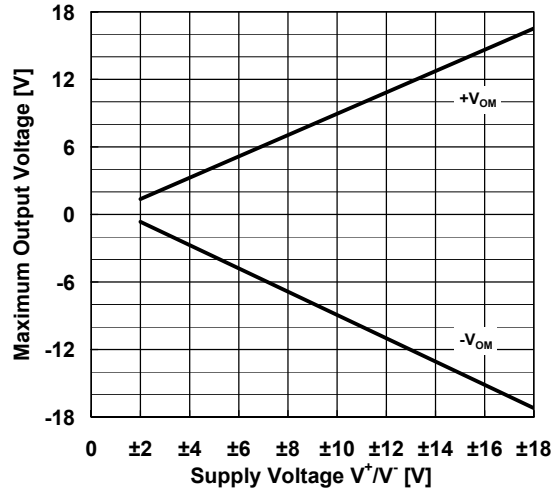
Input Offset Voltage vs. Temperature
V+/V-=±15V



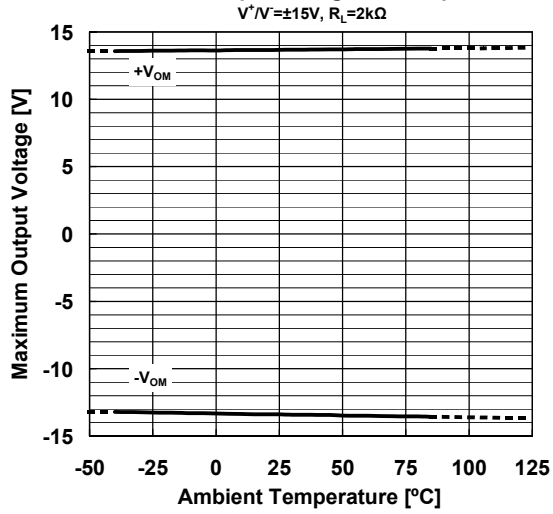
Input Bias Current vs. Temperature
V+/V-=±15V



Maximum Output Voltage vs. Supply Voltage
RL=2kΩ, Ta=25ºC

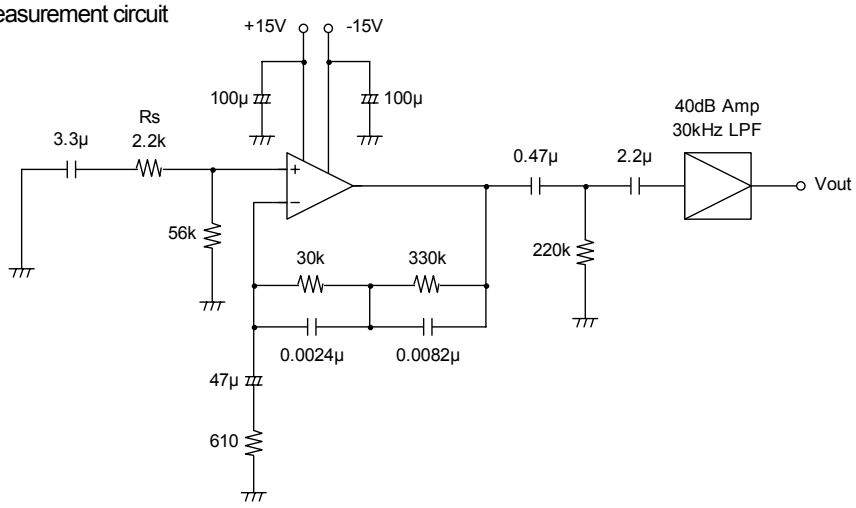


Maximum Output Voltage vs. Temperature
V+/V-=±15V, RL=2kΩ



■ TEST CIRCUIT

Noise Voltage (RIAA) measurement circuit



[CAUTION]
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