

DUAL OPERATIONAL AMPLIFIER

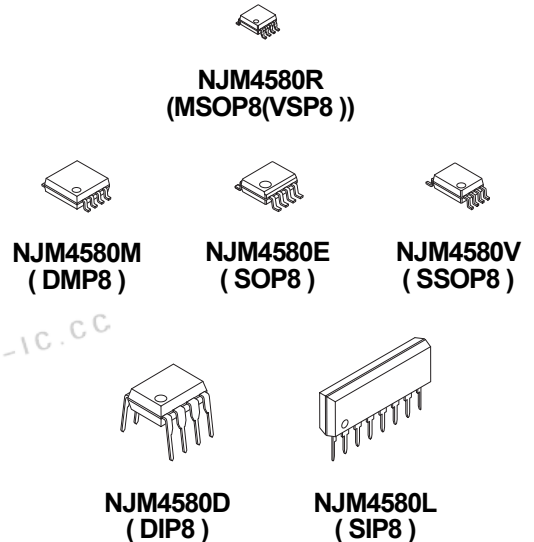
■ GENERAL DESCRIPTION

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

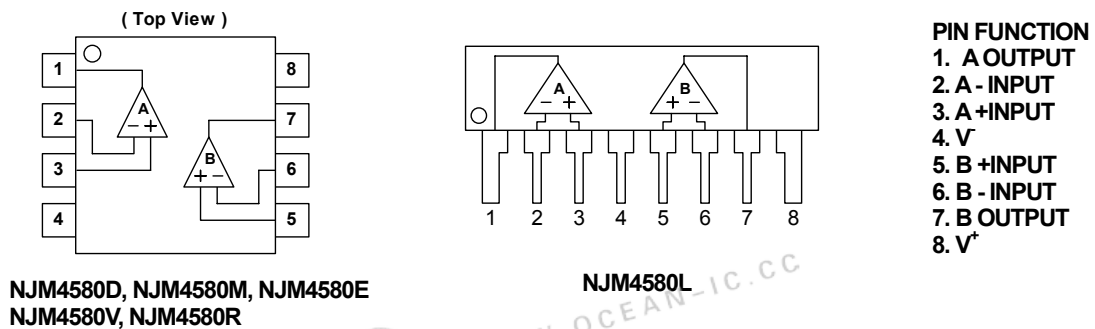


■ FEATURES

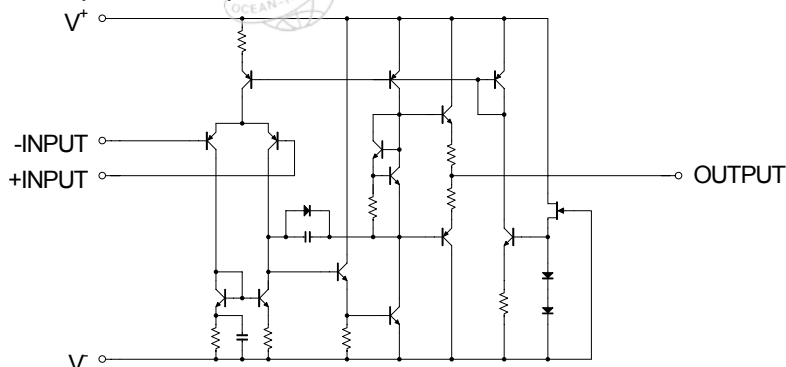
- Operating Voltage $\pm 2V \sim \pm 18V$
- Low Input Noise Voltage $0.8\mu V_{rms}$ typ. (RIAA)
- Wide GBW $15MHz$ typ.
- Low Distortion 0.0005% typ.
- Slew Rate $5V/\mu s$ typ.
- Bipolar Technology
- Package Outline

DIP8, SIP8, DMP8, SSOP8, MSOP8(VSP8) MEET JEDEC MO-187-DA
SOP8 JEDEC 150mil

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT (1/2 Shown)



New Japan Radio Co., Ltd.

NJM4580

■ 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	T_{opr}	-40~+85	°C
Storage Temperature Range	T_{stg}	-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

($V^+ / V^- = \pm 15V$, Ta=25°C, unless otherwise noted.)

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

■ ELECTRICAL CHARACTERISTICS

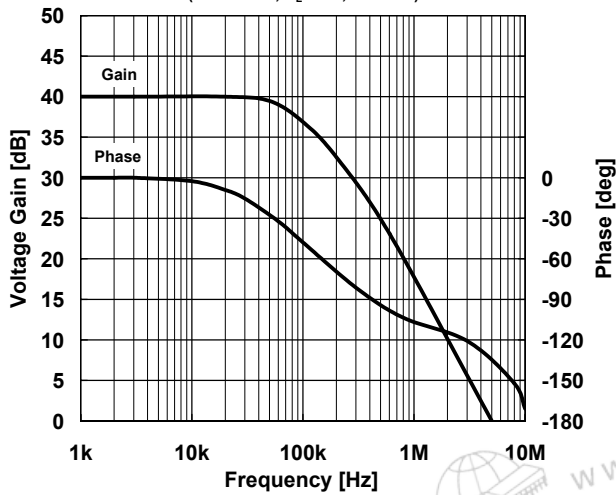
(D-rank type(Note3), $V^+ / V^- = \pm 15V$, Ta=25°C, unless otherwise noted.)

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

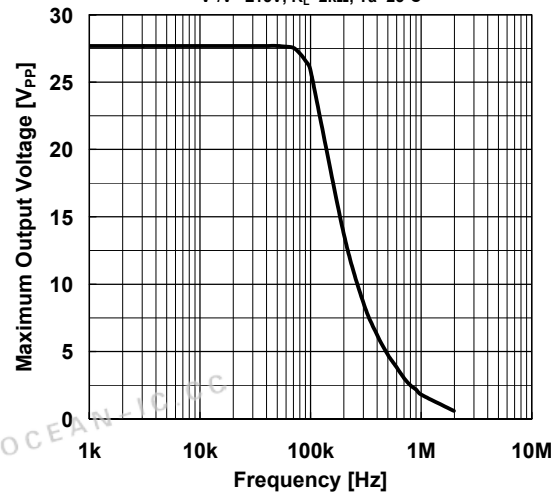
(Note3) D-rank type is a Equivalent Input Noise Voltage selected product. It's only DIP, DMP, SOP and SIP package.

TYPICAL CHARACTERISTICS

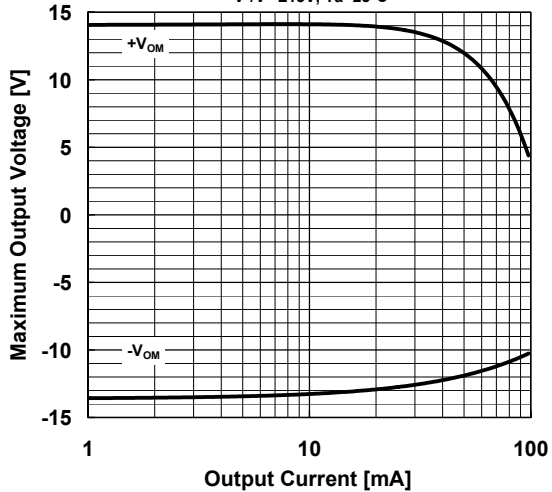
40dB Gain/Phase vs. Frequency
($V^+/V^-=\pm 15V$, $R_L=2k\Omega$, $T_a=25^\circ C$)



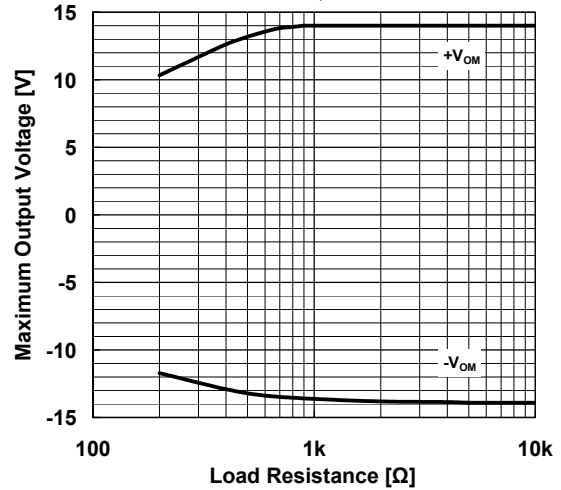
Maximum Output Voltage vs. Frequency
 $V^+/V^-=\pm 15V$, $R_L=2k\Omega$, $T_a=25^\circ C$



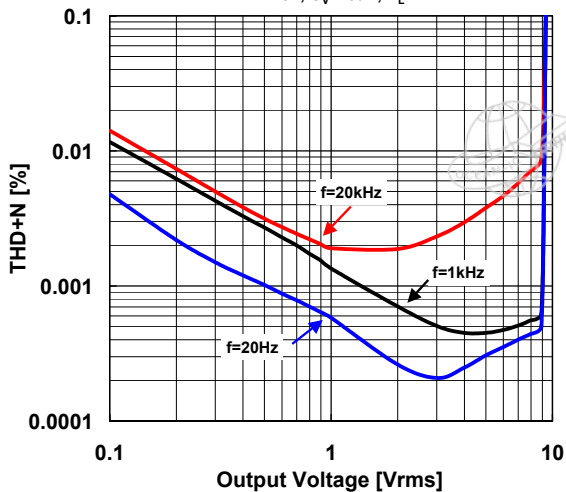
Maximum Output Voltage vs. Output Current
 $V^+/V^-=\pm 15V$, $T_a=25^\circ C$



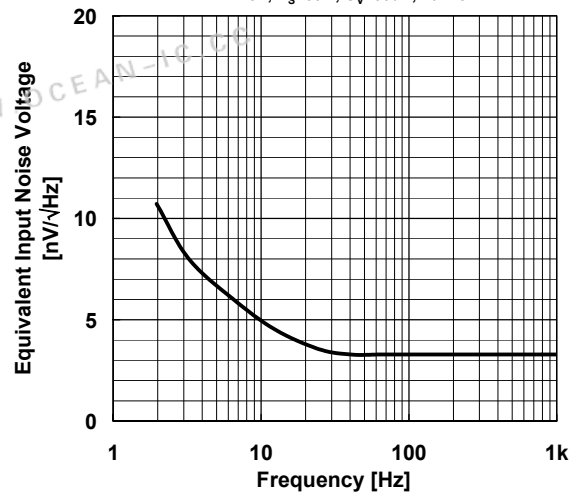
Maximum Output Voltage vs. Load Resistance
 $V^+/V^-=\pm 15V$, $T_a=25^\circ C$



THD+N vs. Output Voltage (Frequency)
 $V^+/V^-=\pm 15V$, $G_v=20dB$, $R_L=2k\Omega$



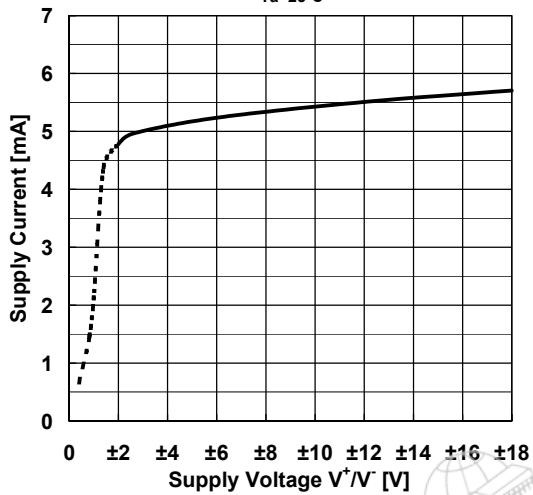
Voltage Noise vs. Frequency
 $V^+/V^-=\pm 15V$, $R_g=50\Omega$, $G_v=60dB$, $T_a=25^\circ C$



■ TYPICAL CHARACTERISTICS

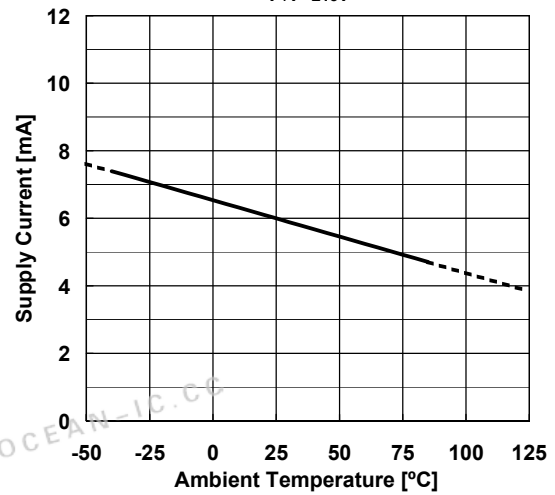
Supply Current vs. Supply Voltage

$T_a=25^\circ\text{C}$



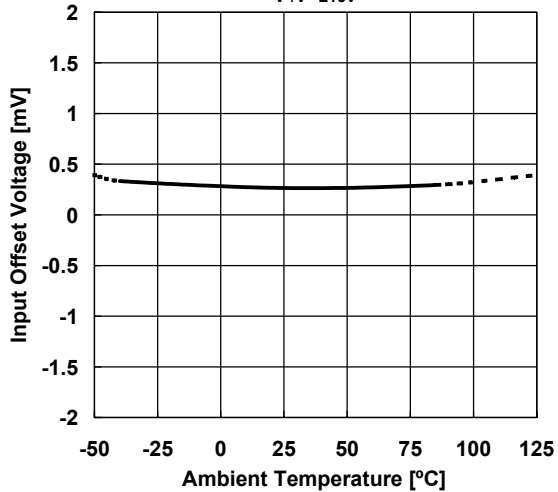
Supply Current vs. Temperature

$V^+/V^-=\pm 15\text{V}$



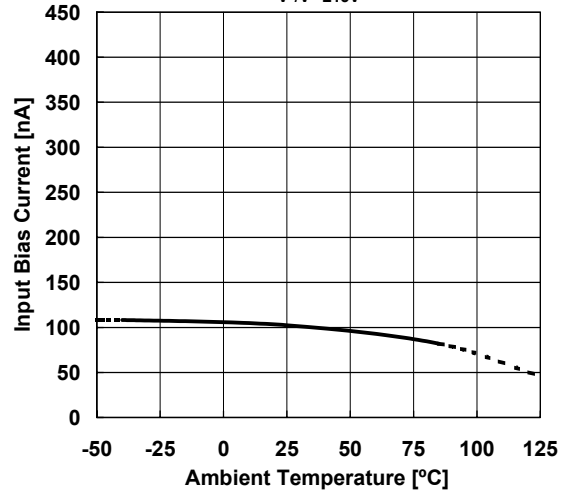
Input Offset Voltage vs. Temperature

$V^+/V^-=\pm 15\text{V}$



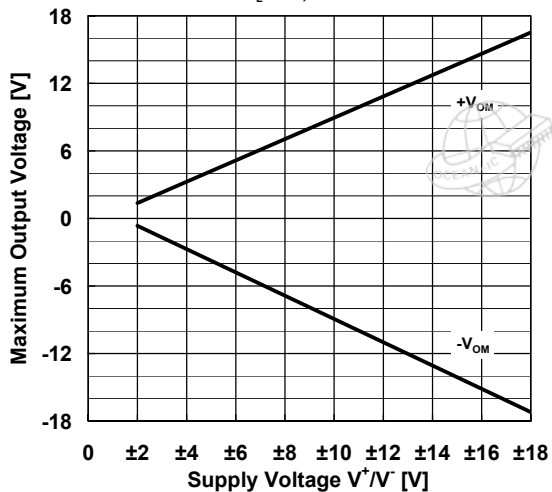
Input Bias Current vs. Temperature

$V^+/V^-=\pm 15\text{V}$



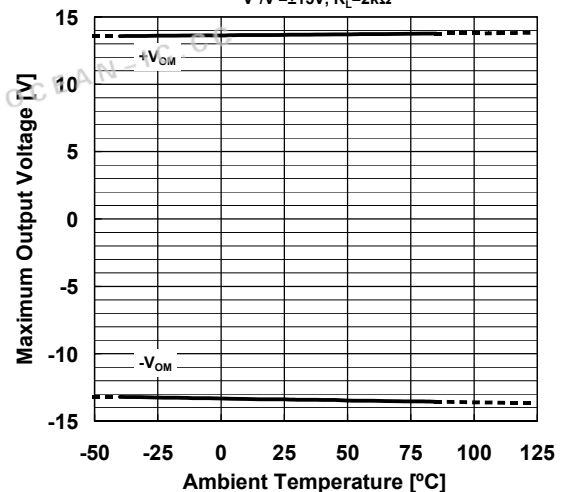
Maximum Output Voltage vs. Supply Voltage

$R_L=2\text{k}\Omega$, $T_a=25^\circ\text{C}$



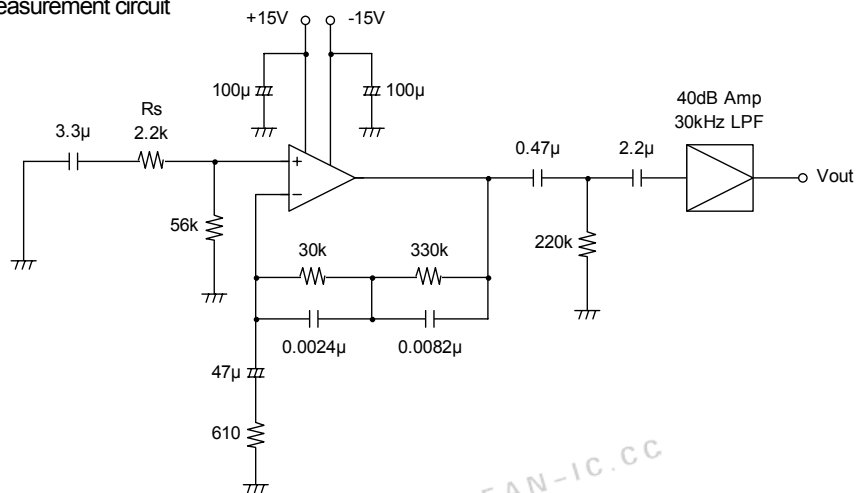
Maximum Output Voltage vs. Temperature

$V^+/V^-=\pm 15\text{V}$, $R_L=2\text{k}\Omega$



■ TEST CIRCUIT

Noise Voltage (RIAA) measurement circuit



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[CAUTION]

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