

## Low Noise, Bipolar Input Dual, Audio Operational amplifier

### DESCRIPTION

NJM4585 is a low noise bipolar input dual audio operational amplifier featuring 3.5nV/√Hz at 1 kHz.

The NJM4585 features Low distortion, high slew rate, wide bandwidth and high open-loop gain. In addition, unity-gain stable allows voltage-follower operation. These features make NJM4585 ideal for audio pre amplifier, microphone amplifier, line amplifier and other audio applications. NJM4585 operate over a wide temperature range of -40°C to +125°C, making this IC ideal for use in industrial measurement instruments. The NJM4585 is available in the 8-pin DMP8 packages.

### PACKAGE OUTLINE



NJM4585M  
(DMP8)

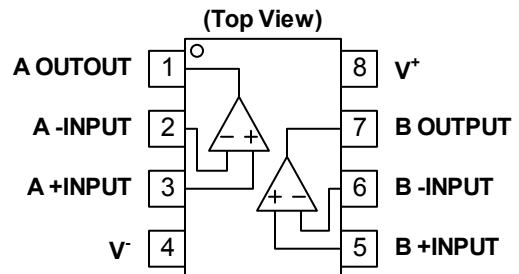
### FEATURES

- Designed for High-Quality Sound
- Low Noise (f=1kHz) 3.5nV/√Hz
- Low Distortion 0.001%
- Slew Rate 6.8V/μs
- Gain Bandwidth Product (f=100kHz) 19MHz
- Open-Loop Voltage Gain 120dB
- Unity-Gain stable
- Bipolar Input
- Supply Voltage ±4V to ±18V
- Operating Temperature -40°C to +125°C
- Supply Current (All Amplifiers) 5mA typ.
- Package DMP8

### APPLICATIONS

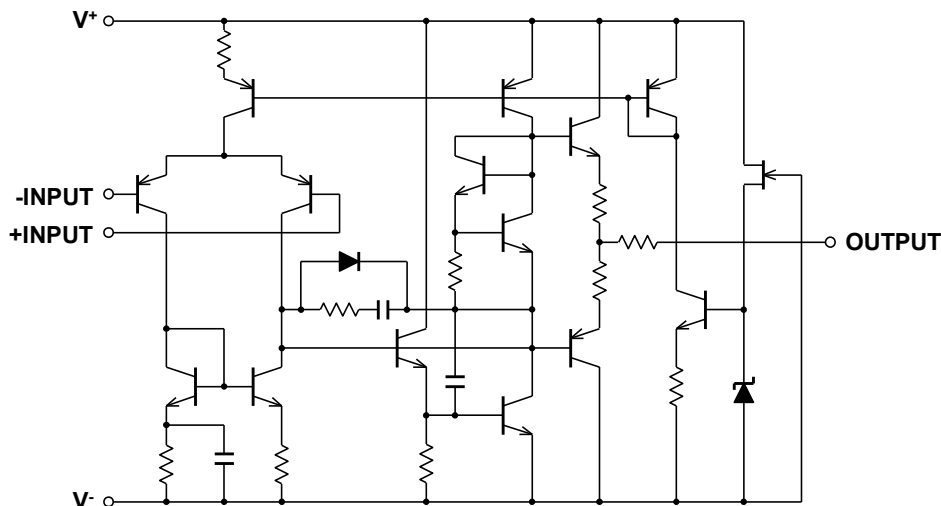
- Professional Audio sets
- Audio pre/microphone amplifiers
- Analog/Digital mixer
- AV Receiver
- Car Audio
- Industrial Measurement Instruments

### PIN CONFIGURATION



Package	Product Name
DMP8	NJM4585M

### EQUIVALENT CIRCUIT



**■ ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	$V^+ / V^-$	$\pm 18$	V
Differential Input Voltage <sup>(1)</sup>	$V_{ID}$	$\pm 36$	V
Input Voltage <sup>(2)</sup>	$V_{IN}$	$V^- - 0.3$ to $V^+ + 36$	V
Output Terminal Input Voltage	$V_O$	$V^- - 0.3$ to $V^+ + 0.3$	V
Power Dissipation <sup>(3)</sup> DMP8	$P_D$	(2-layer / 4-layer) 470 / 600	mW
Operating Temperature Range	$T_{opr}$	-40 to +125	°C
Storage Temperature Range	$T_{stg}$	-65 to +150	°C

(1) Differential voltage is the voltage difference between +INPUT and -INPUT.

(2) Input voltage is the voltage should be allowed to apply to the input terminal independent of the magnitude of  $V^+$ .  
The normal operation will establish when any input is within the Common Mode Input Voltage Range of electrical characteristics.

(3) Power dissipation is the power that can be consumed by the IC at  $T_a=25^\circ\text{C}$ , and is the typical measured value based on JEDEC condition. When using the IC over  $T_a=25^\circ\text{C}$  subtract the value  $[\text{mW}/^\circ\text{C}] = P_D / (T_{stg}(\text{MAX}) - 25)$  per temperature.

2-layer: EIA/JEDEC STANDARD Test board (76.2x114.3x1.6mm, 2layers, FR-4) mounting

4-layer: EIA/JEDEC STANDARD Test board (76.2x114.3x1.6mm, 4layers, FR-4) mounting

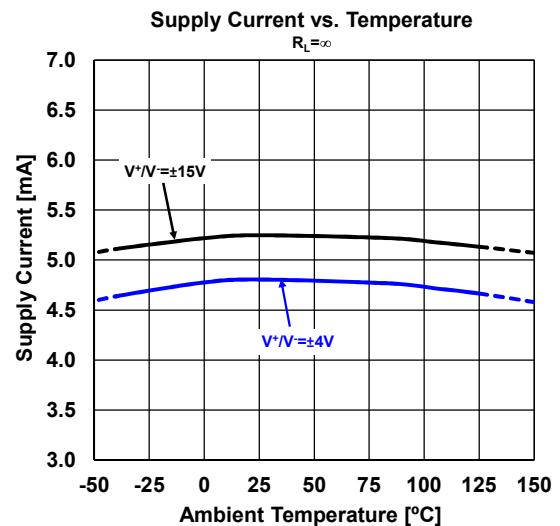
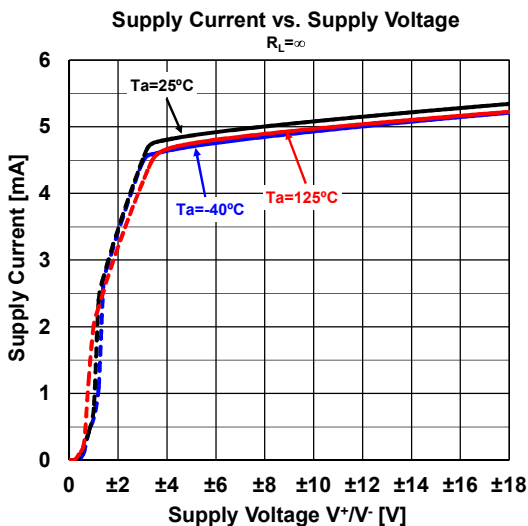
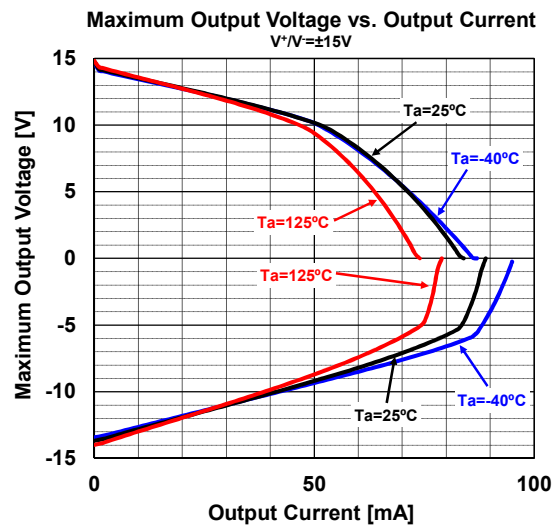
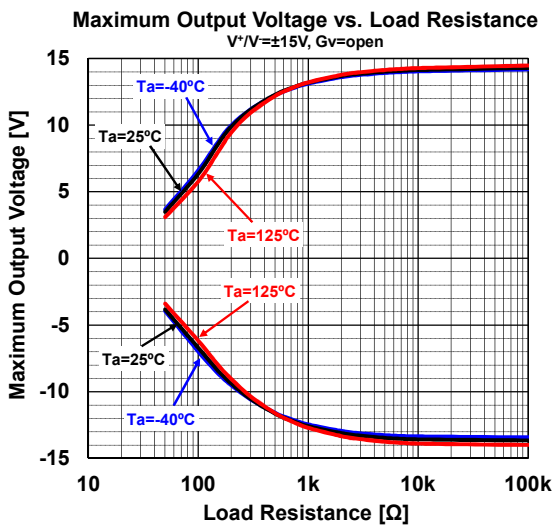
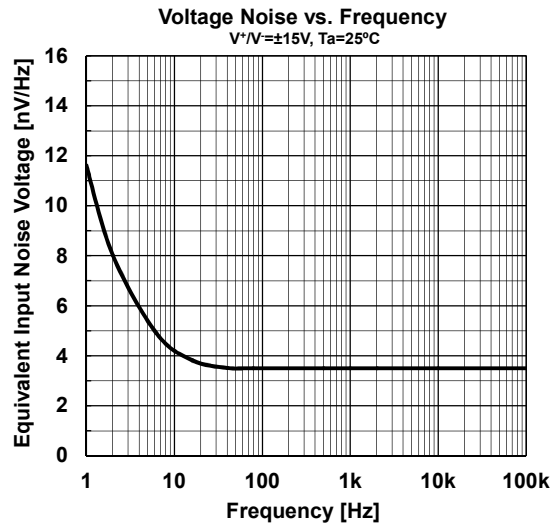
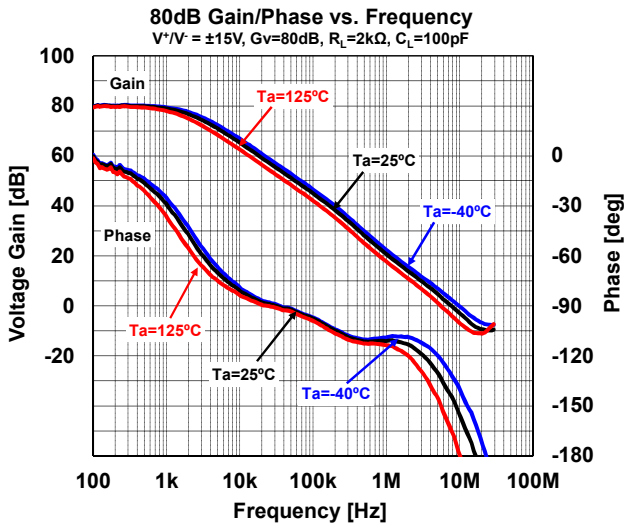
**■ RECOMMENDED OPERATING CONDITIONS ( $T_a=25^\circ\text{C}$ )**

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	$V^+ / V^-$		$\pm 4$	-	$\pm 18$	V

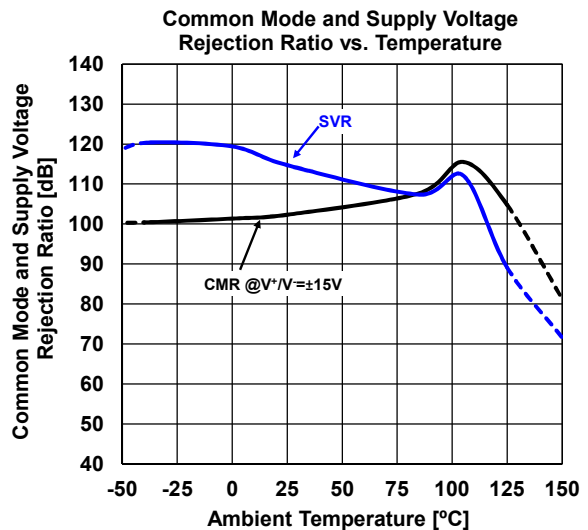
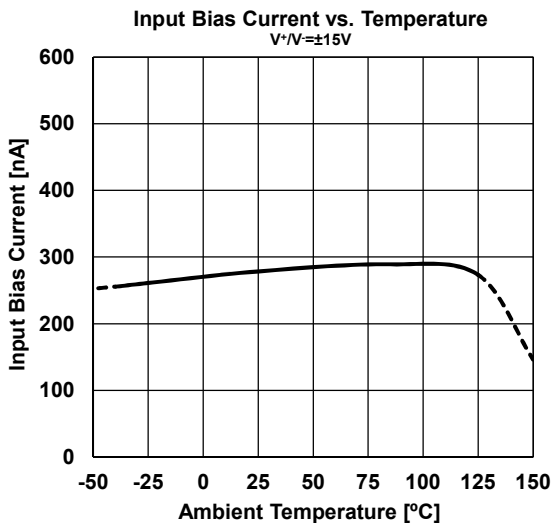
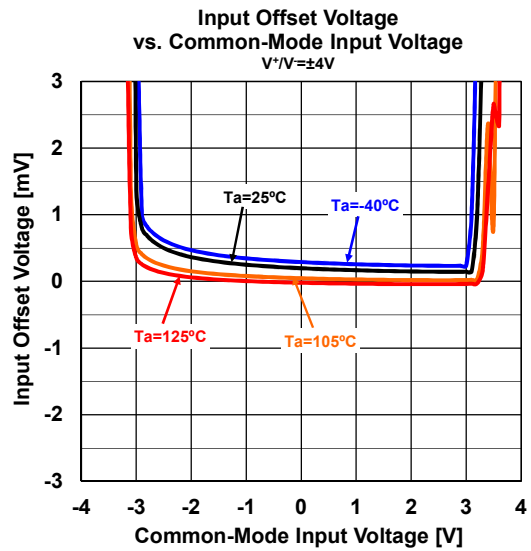
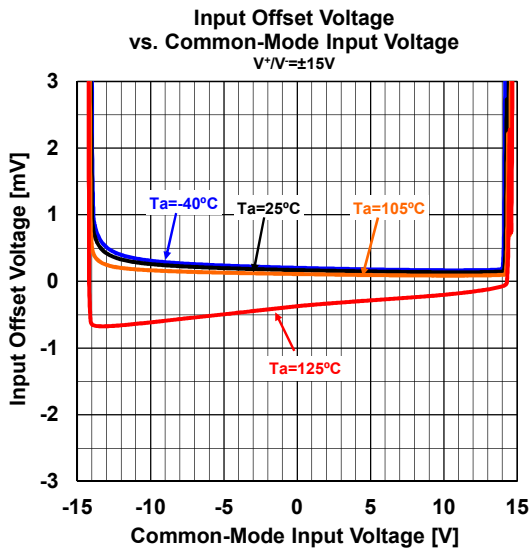
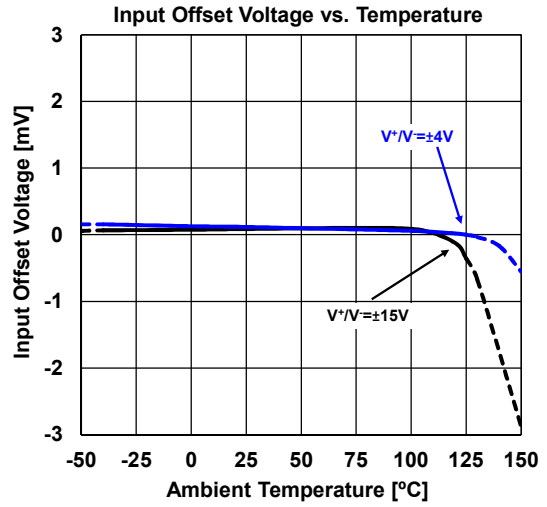
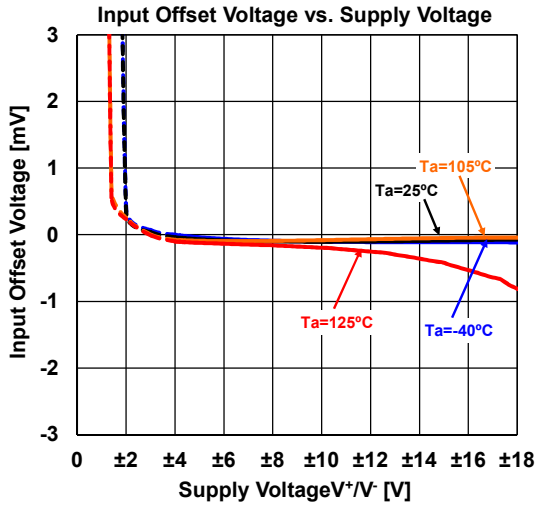
**■ ELECTRICAL CHARACTERISTICS ( $V^+ / V^- = \pm 15\text{V}$ ,  $T_a=25^\circ\text{C}$ , unless otherwise noted.)**

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>INPUT/OUTPUT CHARACTERISTICS</b>						
Input Offset Voltage	$V_{IO}$	$R_S \leq 10\text{k}\Omega$	-	0.3	3	mV
Input Bias Current	$I_B$		-	260	1000	nA
Input Offset Current	$I_{IO}$		-	5	200	nA
Open Loop Voltage Gain	$A_V$	$R_L = 2\text{k}\Omega$ , $V_O = \pm 10\text{V}$	90	120	-	dB
Common-Mode Rejection Ratio	CMR		80	110	-	dB
Input Resistance	$R_{IN}$		50	300	-	k $\Omega$
Common-Mode Input Voltage Range	$V_{ICM}$		$\pm 12$	$\pm 13.5$	-	V
Maximum Output Voltage	$V_{OM}$	$R_L \geq 2\text{k}\Omega$	$\pm 12$	$\pm 13.5$	-	V
<b>POWER SUPPLY</b>						
Supply Current(All Amplifiers)	$I_Q$		-	5	8	mA
Supply Voltage Rejection Ratio	SVR		80	120	-	dB
<b>AC PERFORMANCE</b>						
Gain Bandwidth Product	GBW	$f=100\text{kHz}$	-	19	-	MHz
Unity Gain Frequency	$f_T$	$G_v=0\text{dB}$	-	7.5	-	MHz
Slew Rate	SR	$R_L \geq 2\text{k}\Omega$	-	6.8	-	V/ $\mu\text{s}$
<b>NOISE, DISTORTION</b>						
Equivalent Input Noise Voltage	$e_n$	$f=1\text{kHz}$	-	3.5	-	nV/ $\sqrt{\text{Hz}}$
		FLAT, $f=20\text{Hz} \sim 20\text{kHz}$	-	0.5	0.7	$\mu\text{Vrms}$
Total Harmonic Distortion	THD		-	0.001	-	%
Channel Separation	CS		-	120	-	dB

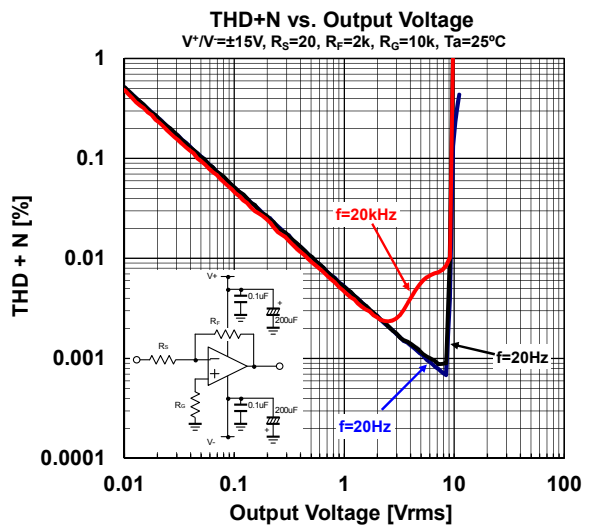
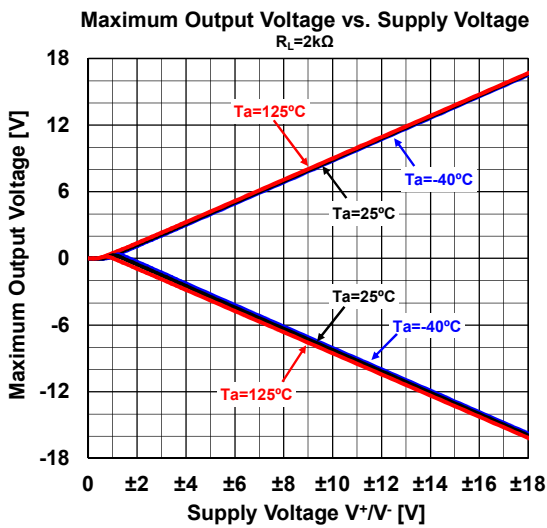
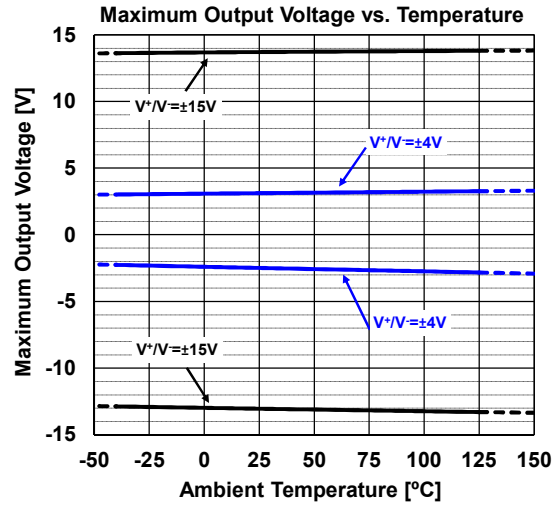
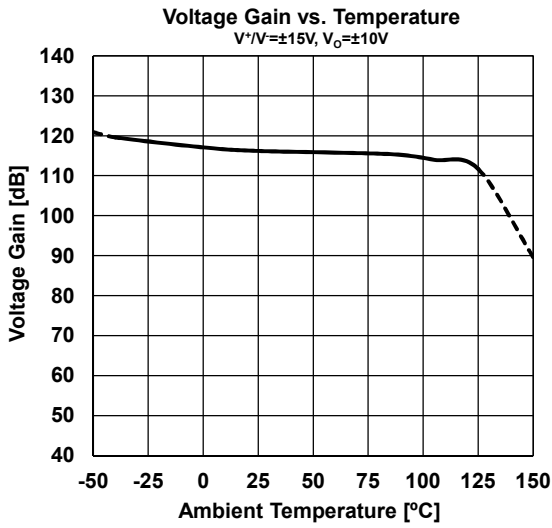
■ TYPICAL CHARACTERISTICS



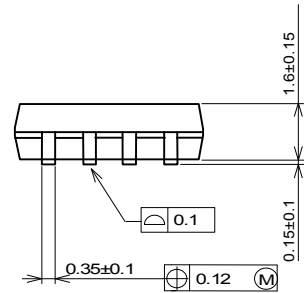
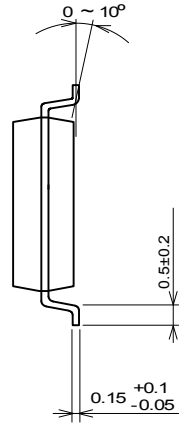
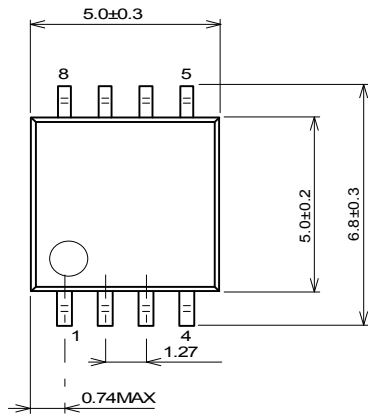
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



■ PACKAGE DIMENSIONS



Unit: mm

DMP8 Package

[CAUTION]  
 The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.