

DUAL AUDIO OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM8080 is dual operational amplifier designed for audio applications. NJM8080 finely refines to every detail from Si-wafer to circuit layout, stick in a thorough improvement in sound quality. The NJM8080 features high resolution and crispy-clear high frequency sound, which can fully perform the digital sound source with loss-less.

NJM8080 features low noise, wide gain-bandwidth, low distortion and high output current, and various reliabilities and conveniences are improved. NJM8080 can widely be used as the standard audio operational amplifier.

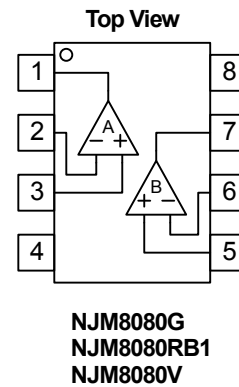
■ FEATURES

- Operating Voltage $\pm 2V$ to $\pm 18V$
 - Low Input Noise Voltage $5nV/\sqrt{\text{Hz}}$ typ. at $f=1\text{kHz}$
 - Wide Gain Bandwidth Product 15MHz typ.
 - Low Distortion 0.0005% typ.
 - Slew Rate $5V/\mu\text{s}$ typ.
 - Bipolar Technology
 - Package Outline
- SOP8,
MSOP8 (TVSP8)*
*MEET JEDEC MO-187-DA/ THIN TYPE
SSOP8
- Internal ESD protection
Human body model (HBM) $\pm 2000V$ typ.
 - Wide temperature range -40°C to $+125^\circ\text{C}$

■ PACKAGE OUTLINE

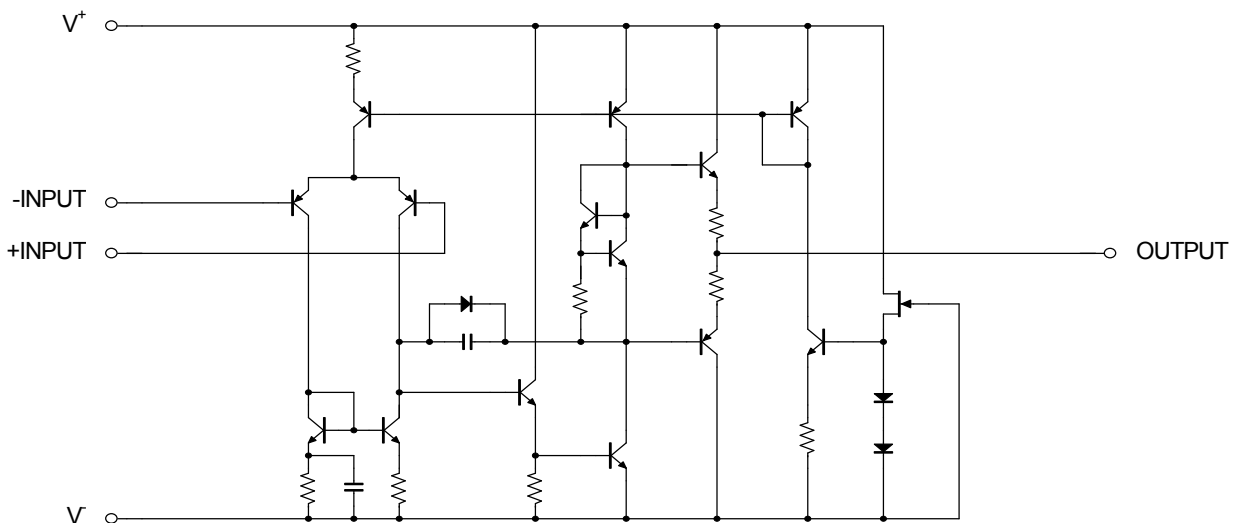


■ PIN CONFIGURATION



- 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)



NJM8080

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

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V ⁺ /V	±18V	V
Differential Input Voltage (Note1)	V _{ID}	±36	V
Input Voltage (Note2)	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	P _D	SOP : 690 (Note3) 1000 (Note4) MSOP : 510 (Note3) 680 (Note4) SSOP : 430 (Note3) 540 (Note4)	mW
Operating Temperature Range	T _{opr}	-40~+125	°C
Storage Temperature Range	T _{stg}	-65~+150	°C

(Note1) Differential voltage is the voltage difference between +INPUT and -INPUT.

(Note2) 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.

(Note3) EIA/JEDEC STANDARD Test board (76.2 x 114.3 x 1.6mm, 2layers, FR-4) mounting

(Note4) EIA/JEDEC STANDARD Test board (76.2 x 114.3 x 1.6mm, 4layers, FR-4) mounting

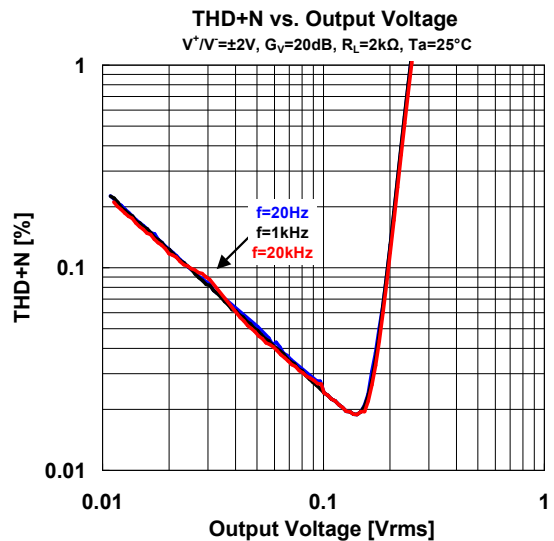
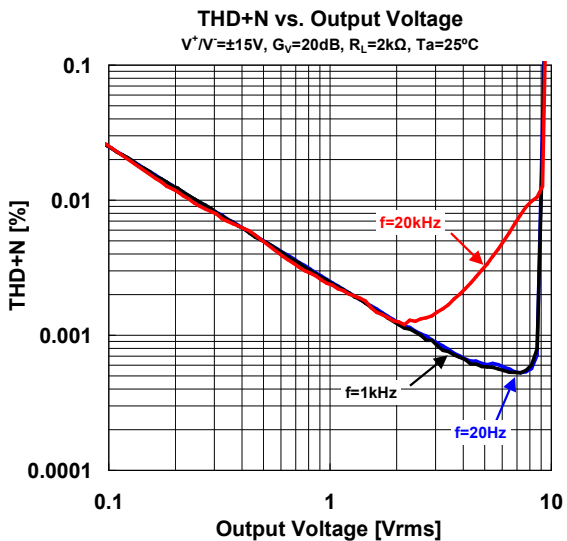
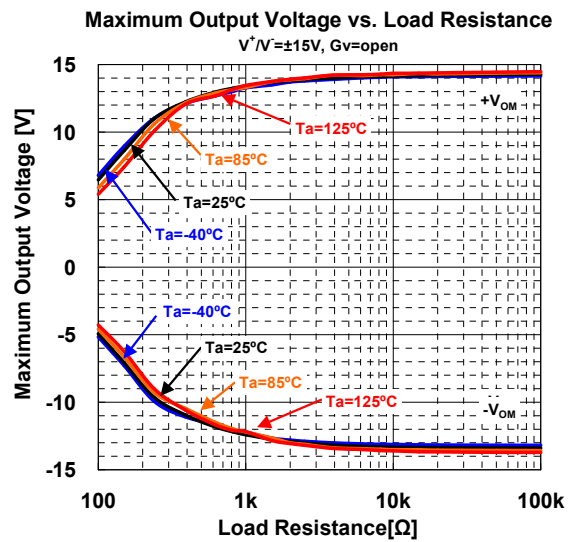
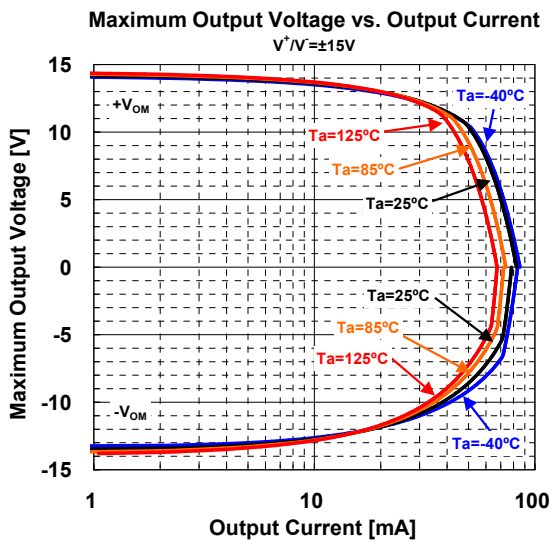
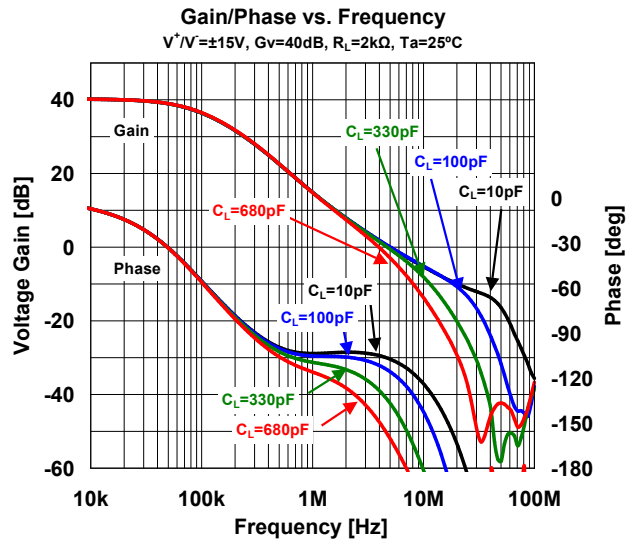
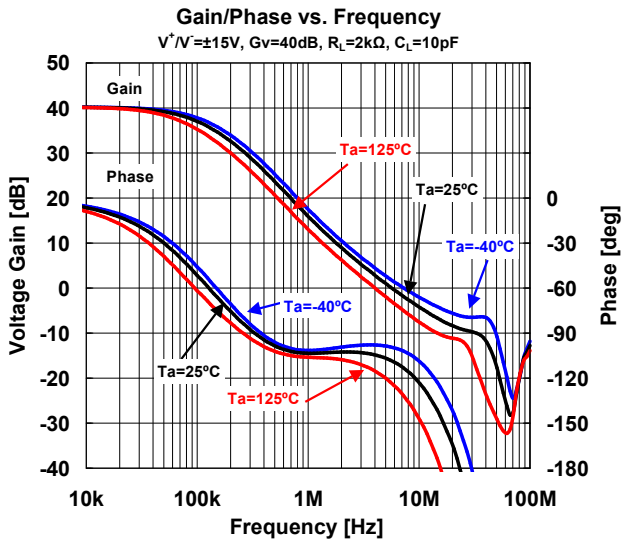
■ RECOMMENDED OPERATING CONDITIONS (Ta=25°C)

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.)

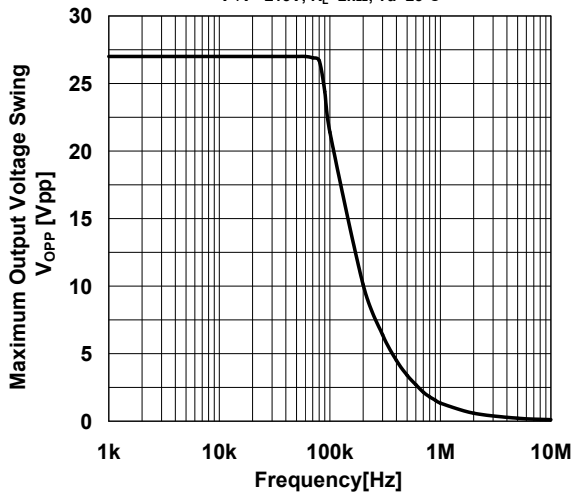
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V _{IO}	R _S ≤10kΩ	-	0.3	3	mV
Input Offset Current	I _{IO}		-	5	200	nA
Input Bias Current	I _B		-	100	500	nA
Input Resistance	R _{IN}		-	0.5	-	MΩ
Large Signal Voltage Gain	A _V	R _L ≥2kΩ, V _O =±10V	90	110	-	dB
Maximum Output Voltage	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	GBP	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 ¹	e _n	f=1kHz	-	5	-	nV/√Hz

■ TYPICAL CHARACTERISTICS

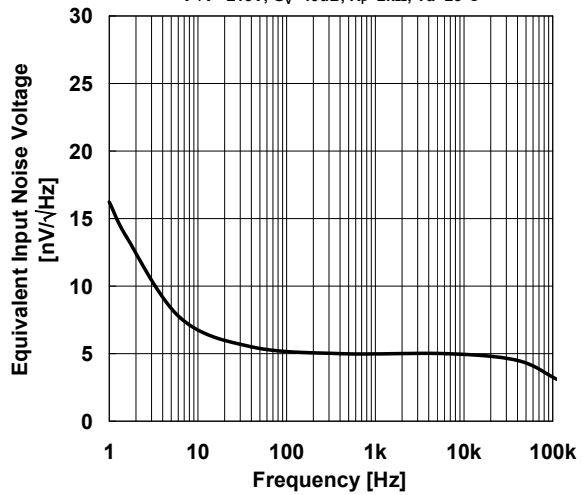


TYPICAL CHARACTERISTICS

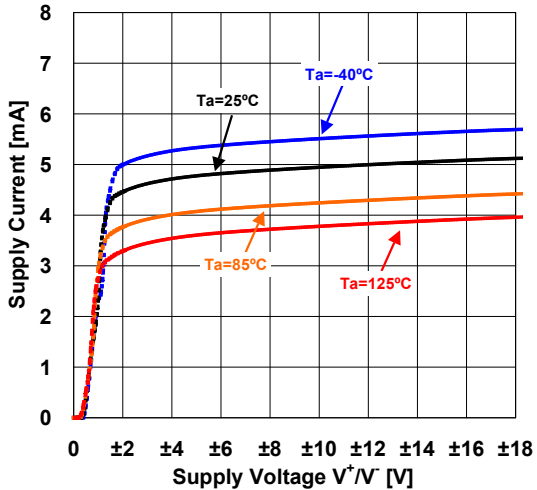
Maximum Output Voltage Swing vs. Frequency
 $V^+/V^- = \pm 15V$, $R_L = 2k\Omega$, $T_a = 25^\circ C$



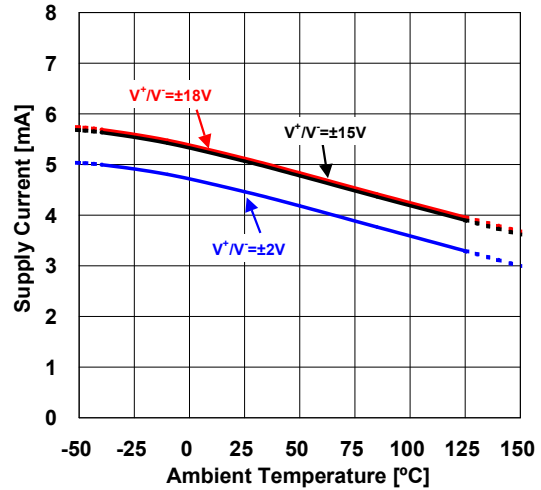
Voltage Noise vs. Frequency
 $V^+/V^- = \pm 15V$, $G_v = 40dB$, $R_F = 2k\Omega$, $T_a = 25^\circ C$



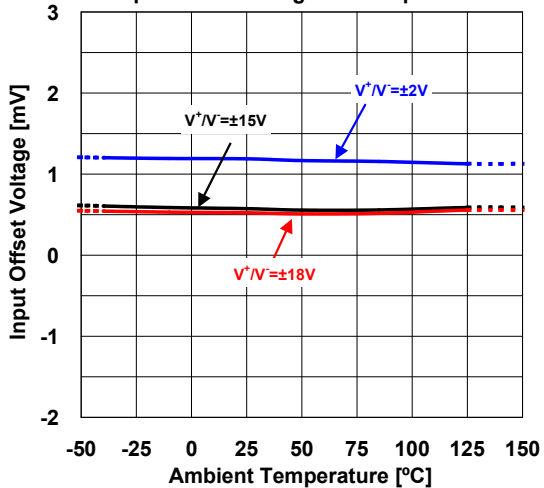
Supply Current vs. Supply Voltage
 $R_L = \text{open}$



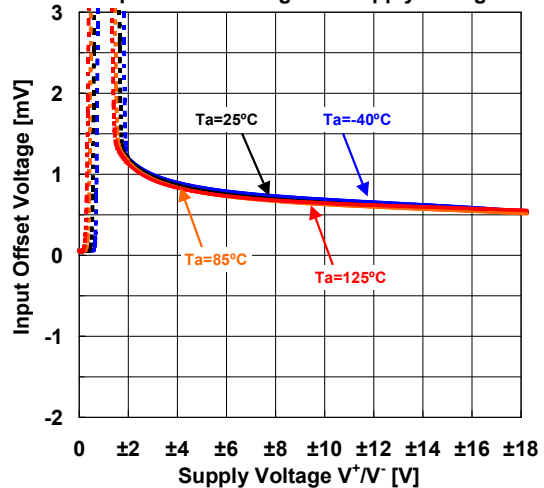
Supply Current vs. Temperature
 $R_L = \text{open}$



Input Offset Voltage vs. Temperature

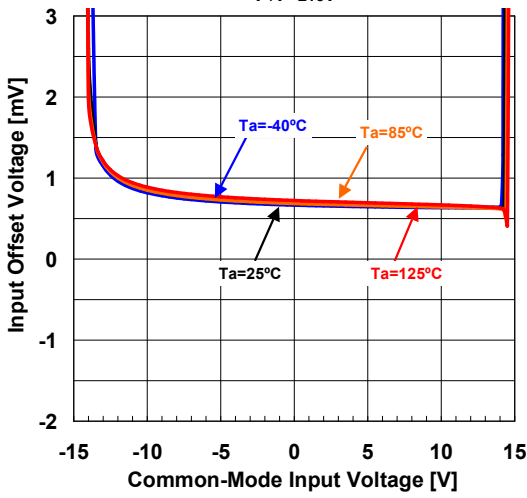


Input Offset Voltage vs. Supply Voltage

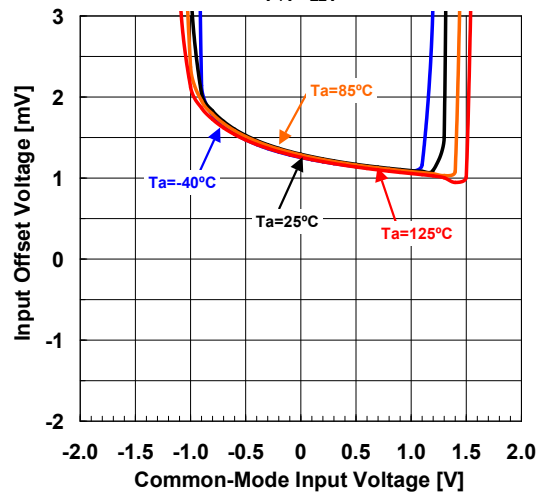


■ TYPICAL CHARACTERISTICS

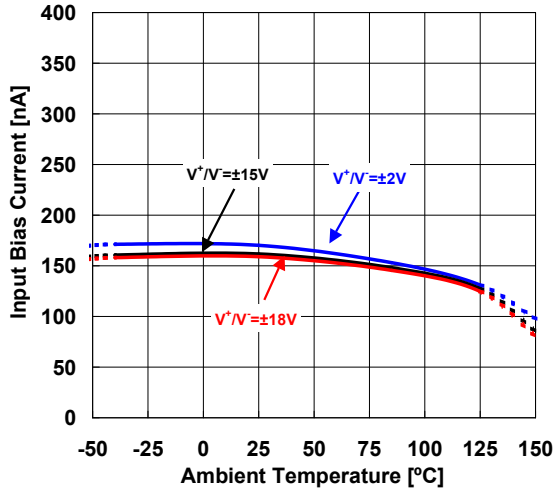
Input Offset Voltage vs. Common-Mode Input Voltage
 $V^+/V^-=\pm 15V$



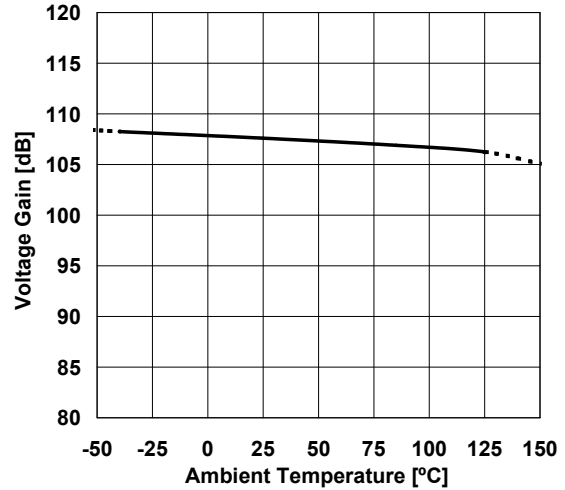
Input Offset Voltage vs. Common-Mode Input Voltage
 $V^+/V^-=\pm 2V$



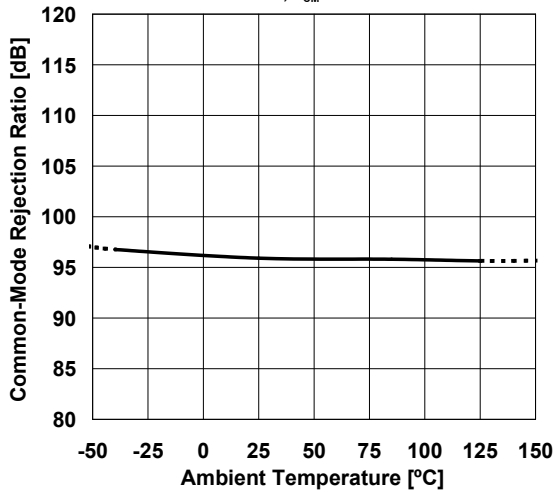
Input Bias Current vs. Temperature
 $V_{ICM}=0V$



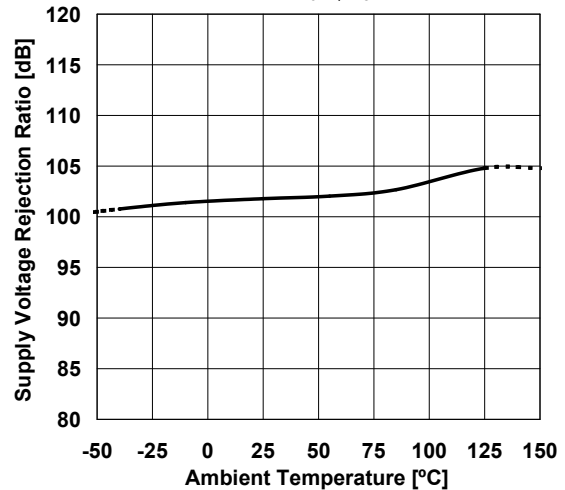
Voltage Gain vs. Temperature
 $V^+/V^-=\pm 15V, R_i=2k\Omega$ to GND



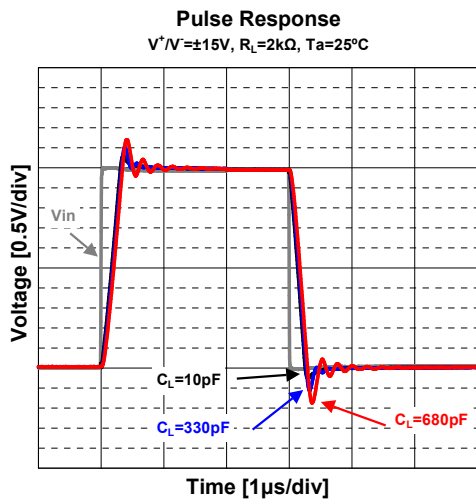
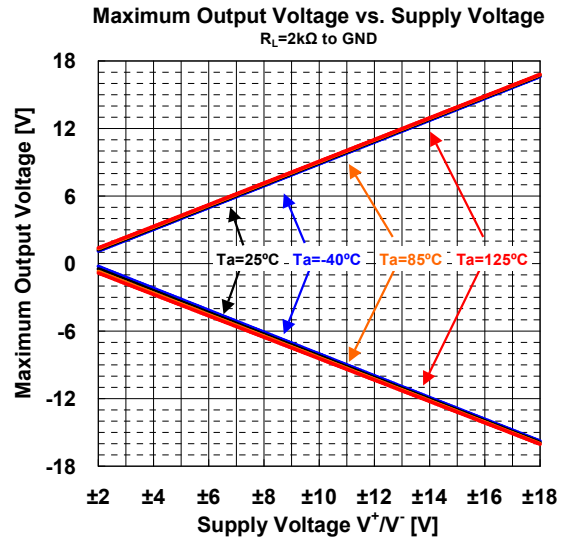
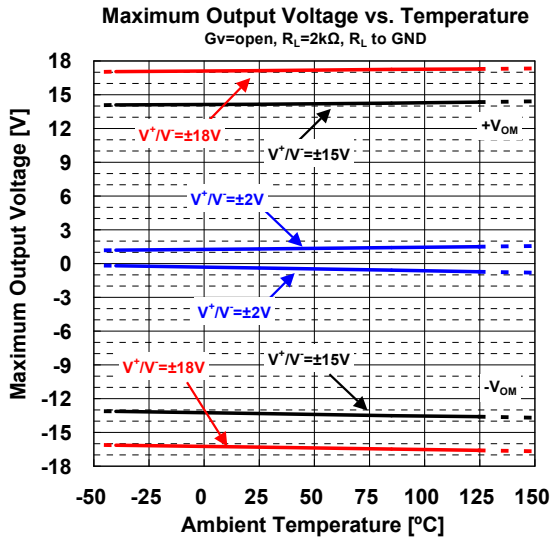
CMR vs. Temperature
 $V^+/V^-=\pm 15V, V_{CM}=-12.2V\sim 12.2V$



SVR vs. Temperature
 $V^+/V^-=\pm 9V \rightarrow \pm 18V$

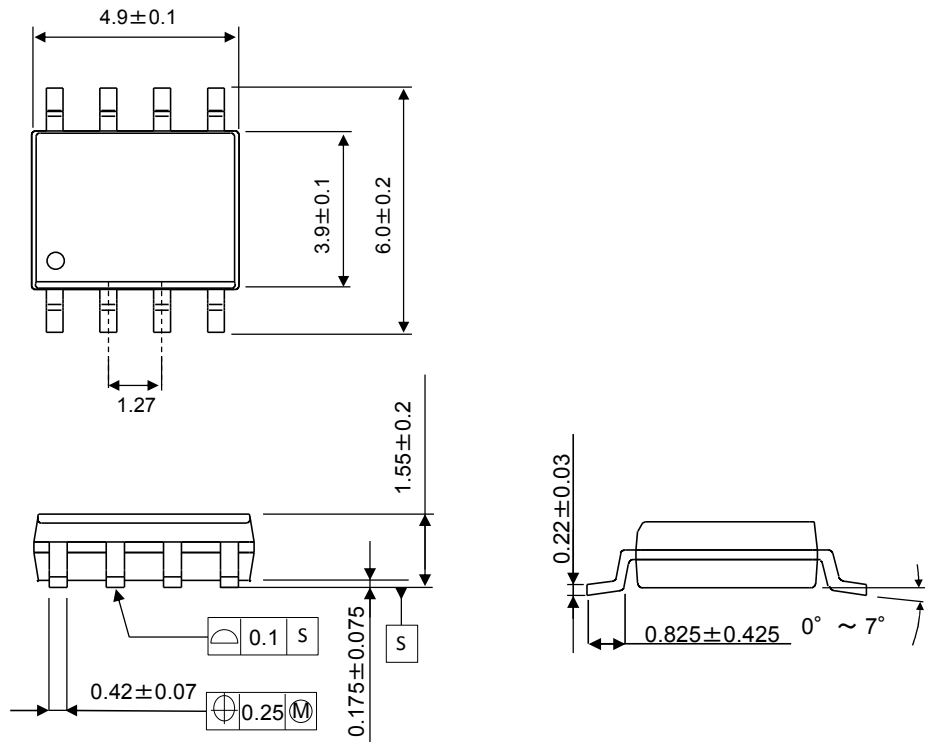


■ TYPICAL CHARACTERISTICS



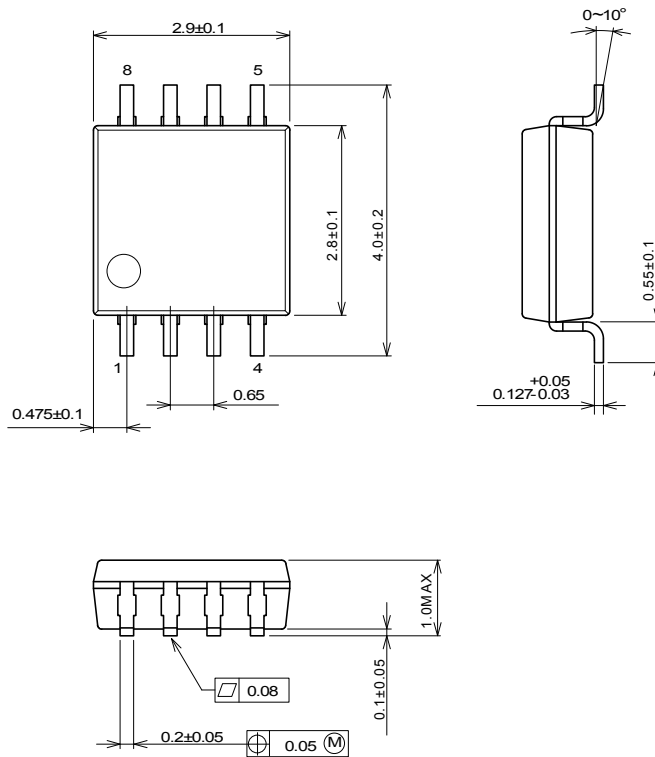
■PACKAGE OUTLINE UNIT : mm

SOP8



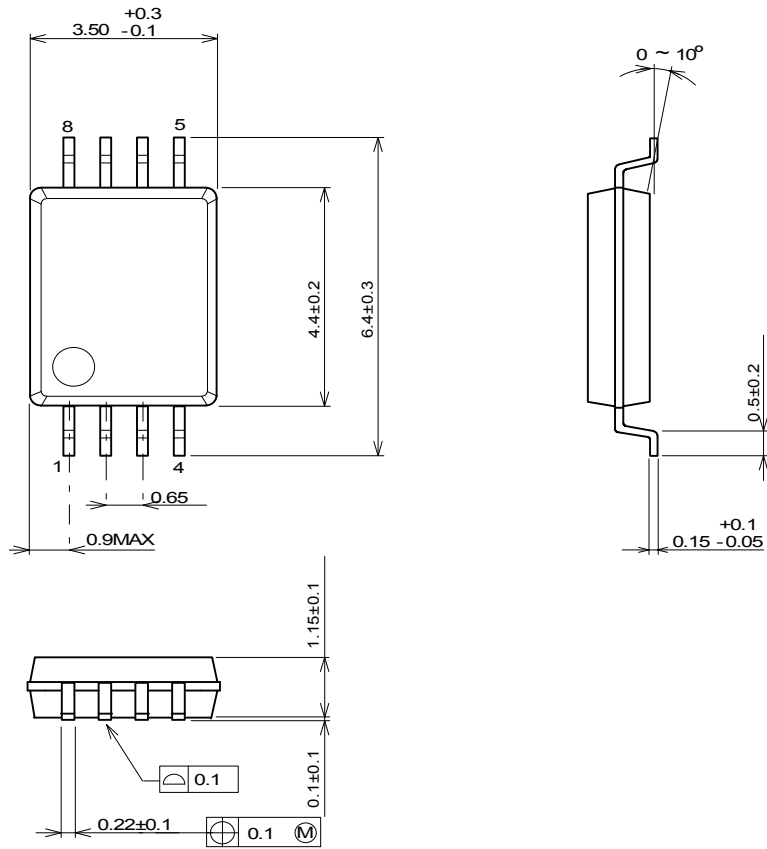
MSOP8 (TVSP8)*

*MEET JEDEC MO-187-DA/ THIN TYPE



NJM8080

SSOP8



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