DUAL OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

NJM4580C is the dual operational amplifier, specially designed for improving the tone control, which is 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.

■ PACKAGE OUTLINE

NJM4580CG
(SOP8)

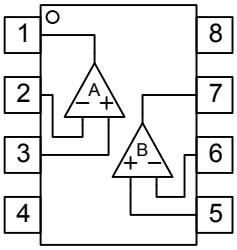
NJM4580CV
(SSOP8)

■ FEATURES

- Operating Voltage ±2V to ±18V
- Low Input Noise Voltage 5nV/√ Hz typ. at f=1kHz
- Gain Bandwidth Product 15MHz typ.
- Low Distortion 0.0005% typ.
- Slew Rate 5V/μs typ.
- Bipolar Technology
- Package Outline SOP8, SSOP8
- Internal ESD protection
  Human body model (HBM) ±2000V typ.

■ PIN CONFIGURATION

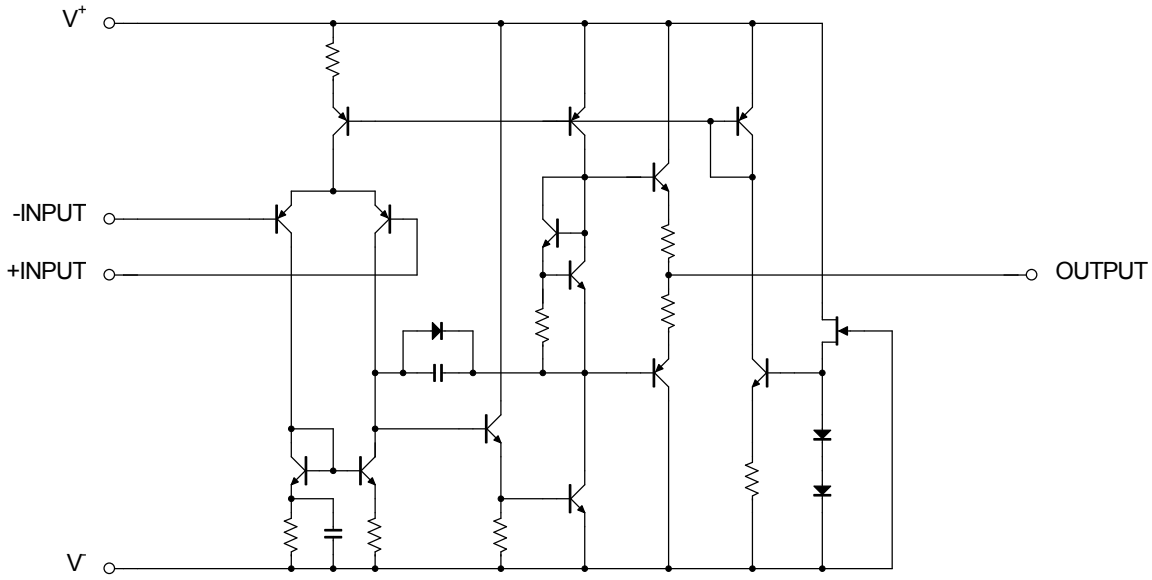
(Top View)



NJM4580CG
NJM4580CV

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=25ºC, unless otherwise noted.)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V^+/V^-	±18	V
Differential Input Voltage (Note1) (Note2)	V_{ID}	±36	V
Input Voltage (Note2)	V_{IC}	±18	V
Power Dissipation	P_D	SOP : 550 (Note3) 820(Note4) SSOP : 350 (Note3) 440(Note4)	mW
Operating Temperature Range	Topr	- 40~+85	ºC
Storage Temperature Range	Tstg	- 65~+125	ºC

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

(Note2) For supply voltage less than ±15V, the absolute maximum rating is equal to the supply voltage.
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=25ºC)

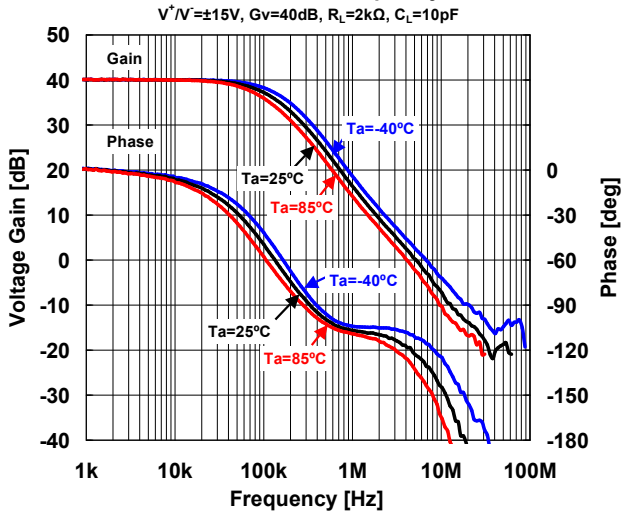
PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V^+/V^-		±2	-	±18	V

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

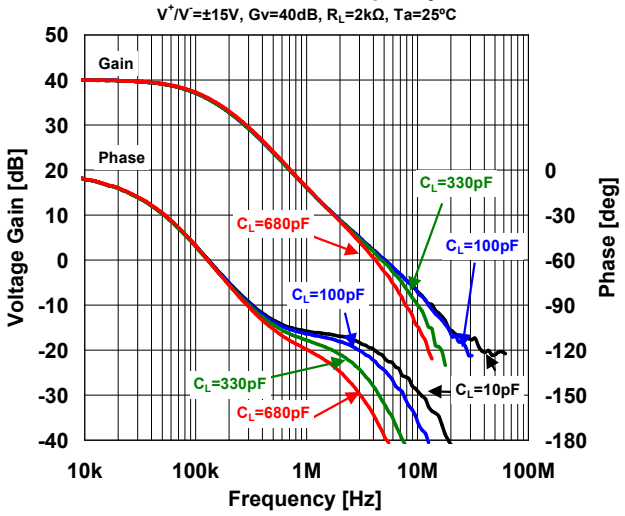
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	R_S≤10kΩ	-	0.3	3	mV
Input Offset Current	I_{IO}		-	5	200	nA
Input Bias Current	I_B		-	100	500	nA
Input Resistance	R_{IN}		-	0.5	-	MΩ
Large Signal Voltage Gain	A_V	R_L≥2kΩ, V_O=±10V	90	110	-	dB
Maximum Output Voltage	V_{OM}	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 Voltage1	V_{NI}	RIAA, R_S=2.2kΩ, 30kHz LPF	-	0.8	-	μVrms
Equivalent Input Noise Voltage2	e_n	f=1kHz	-	5	-	nV/√Hz

■ TYPICAL CHARACTERISTICS

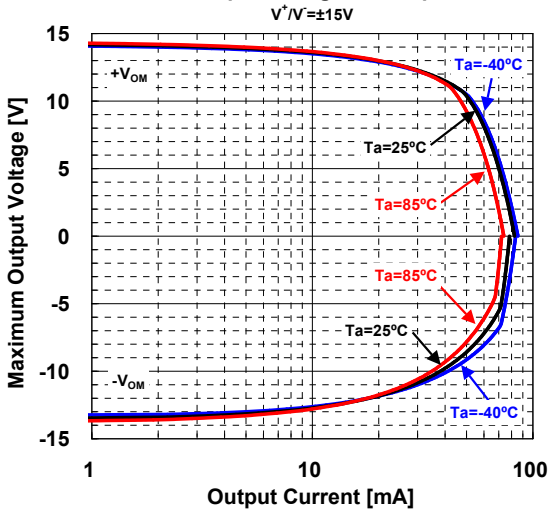
Gain/Phase vs. Frequency
V+/V-=±15V, Gv=40dB, RL=2kΩ, CL=10pF



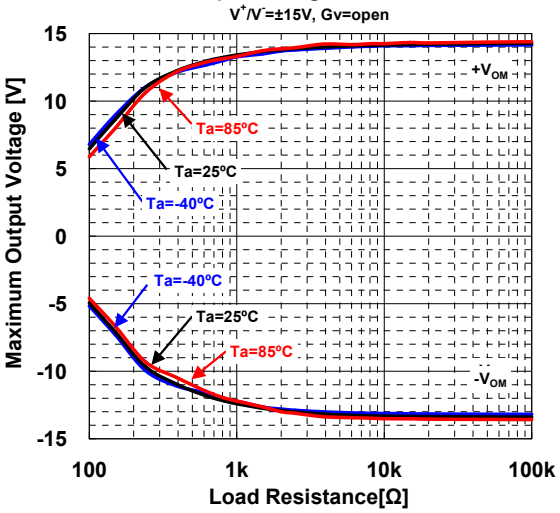
Gain/Phase vs. Frequency
V+/V-=±15V, Gv=40dB, RL=2kΩ, Ta=25°C



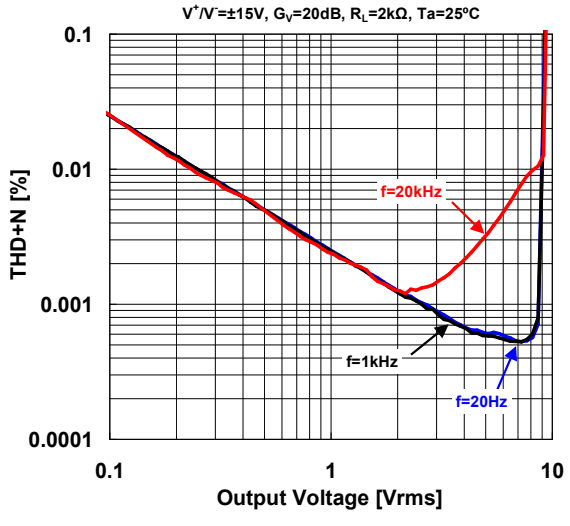
Maximum Output Voltage vs. Output Current
V+/V-=±15V



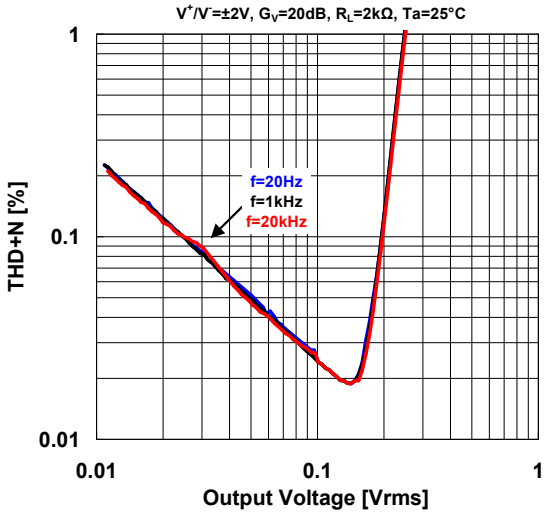
Maximum Output Voltage vs. Load Resistance
V+/V-=±15V, Gv=open



THD+N vs. Output Voltage
V+/V-=±15V, GV=20dB, RL=2kΩ, Ta=25°C

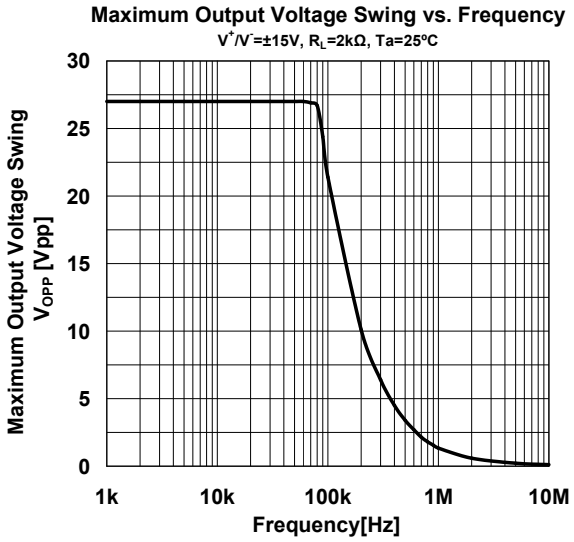


THD+N vs. Output Voltage
V+/V-=±2V, GV=20dB, RL=2kΩ, Ta=25°C

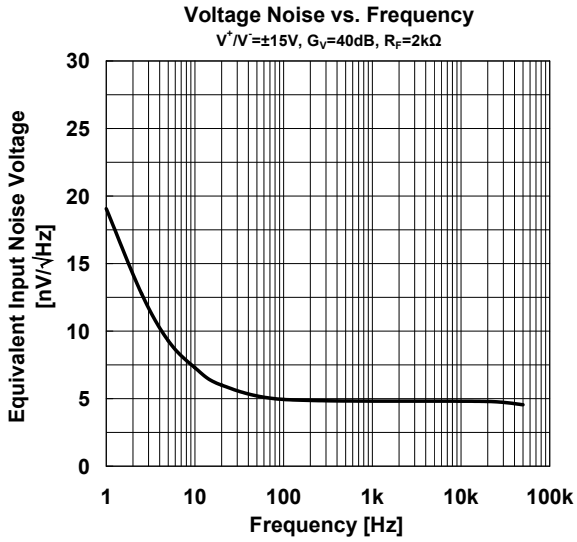


■ TYPICAL CHARACTERISTICS

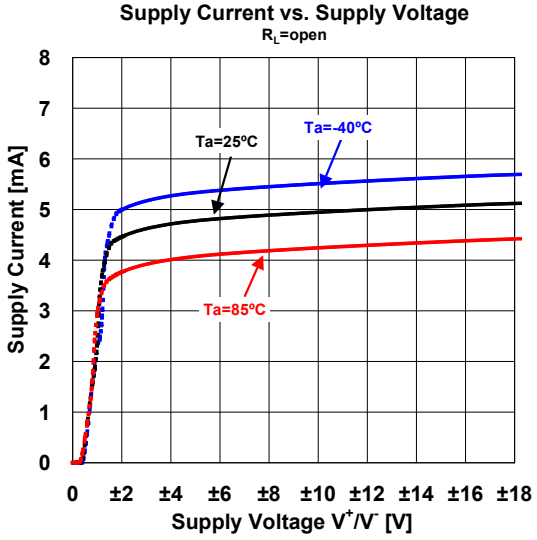
Maximum Output Voltage Swing vs. Frequency



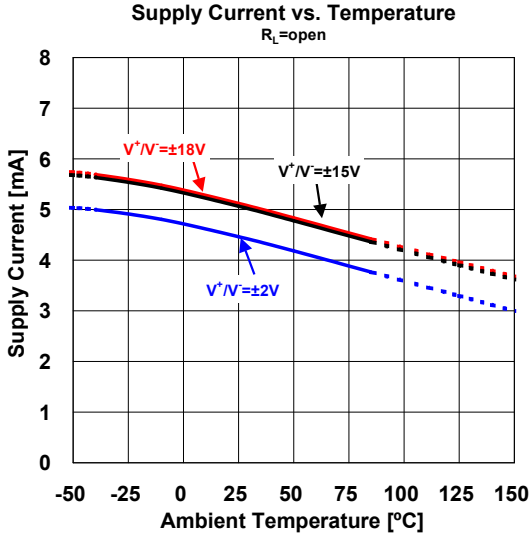
Voltage Noise vs. Frequency



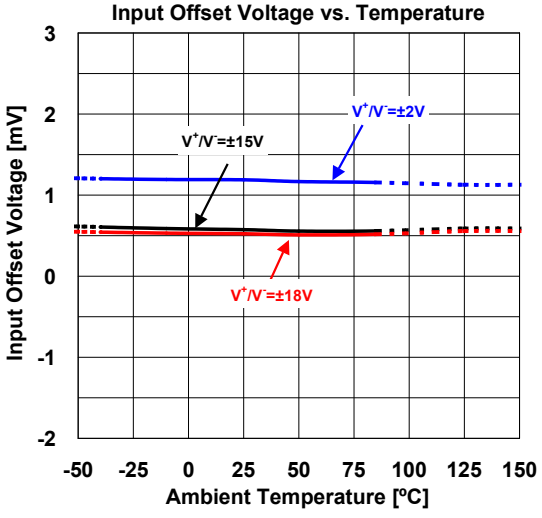
Supply Current vs. Supply Voltage



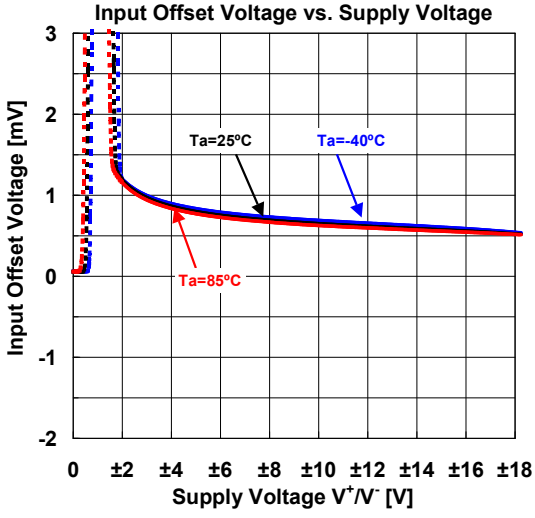
Supply Current vs. Temperature



Input Offset Voltage vs. Temperature

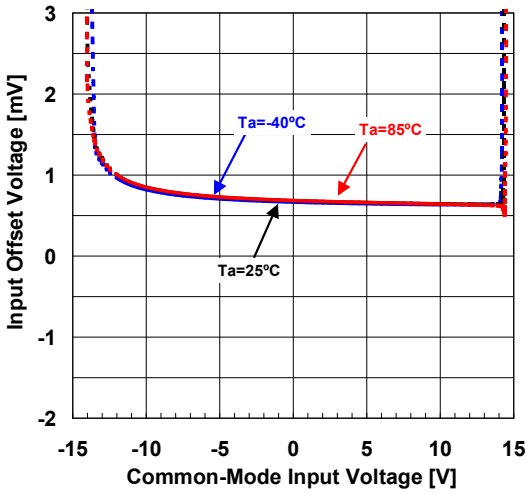


Input Offset Voltage vs. Supply Voltage

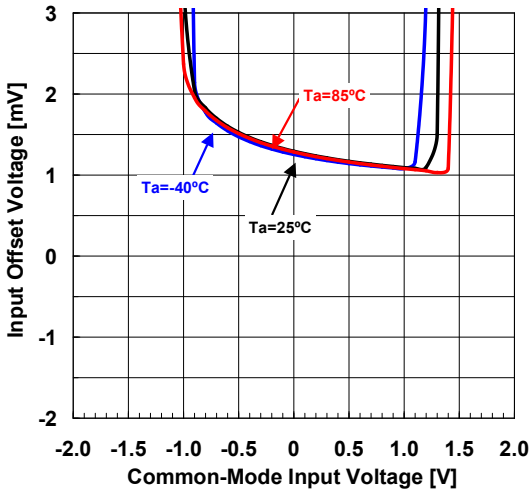


■ TYPICAL CHARACTERISTICS

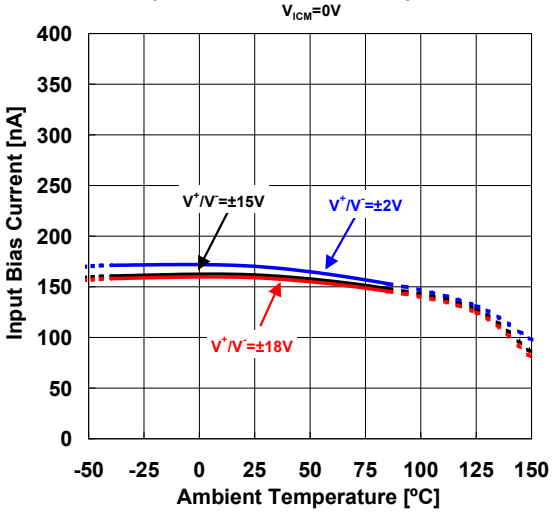
Input Offset Voltage
vs. Common-Mode Input Voltage
V^+/V^-=±15V



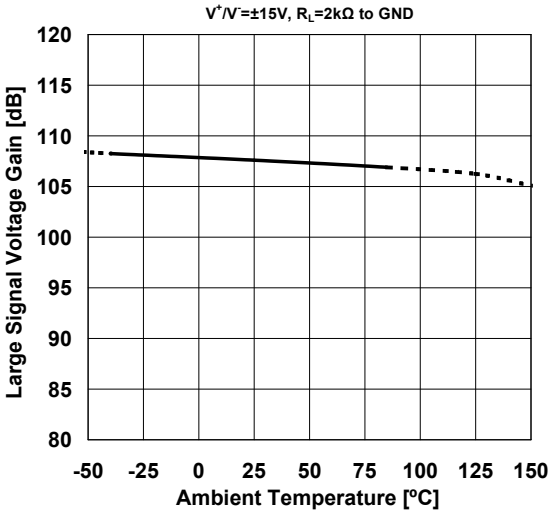
Input Offset Voltage
vs. Common-Mode Input Voltage
V^+/V^-=-±2V



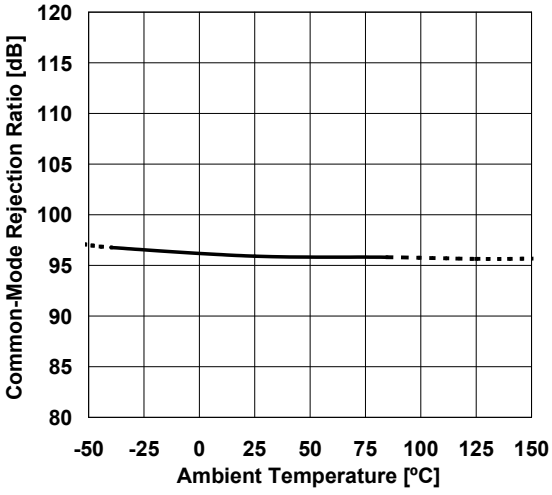
Input Bias Current vs. Temperature
V_{ICM}=0V



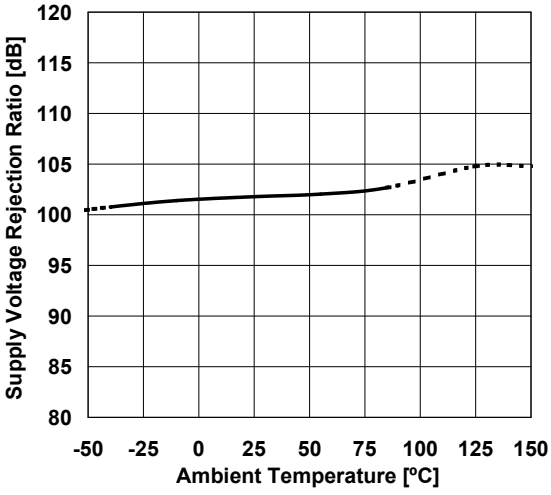
Large Signal Voltage Gainvs. Temperature
V^+/V^-=±15V, R_L=2kΩ to GND



CMR vs. Temperature
V^+/V^-=±15V, V_{CM}=-12.2V~12.2V



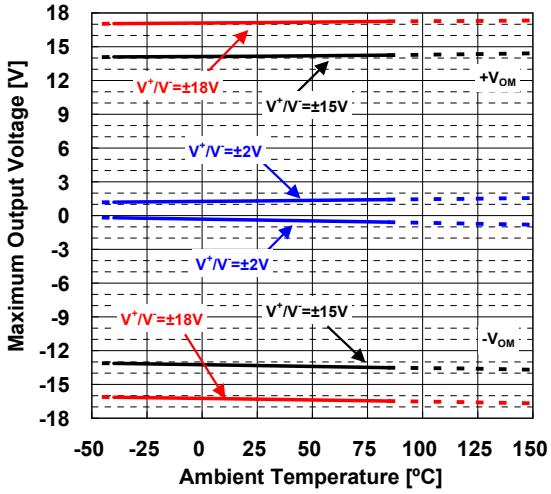
SVR vs. Temperature
V^+/V^-=±9V→±18V



■ TYPICAL CHARACTERISTICS

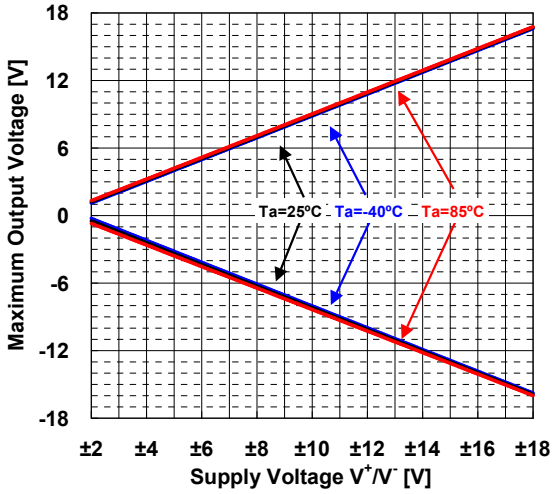
Maximum Output Voltage vs. Temperature

Gv=open, R_L=2kΩ, R_L to GND



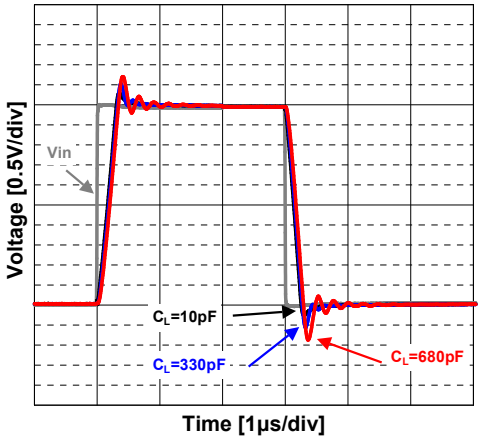
Maximum Output Voltage vs. Supply Voltage

R_L=2kΩ to GND



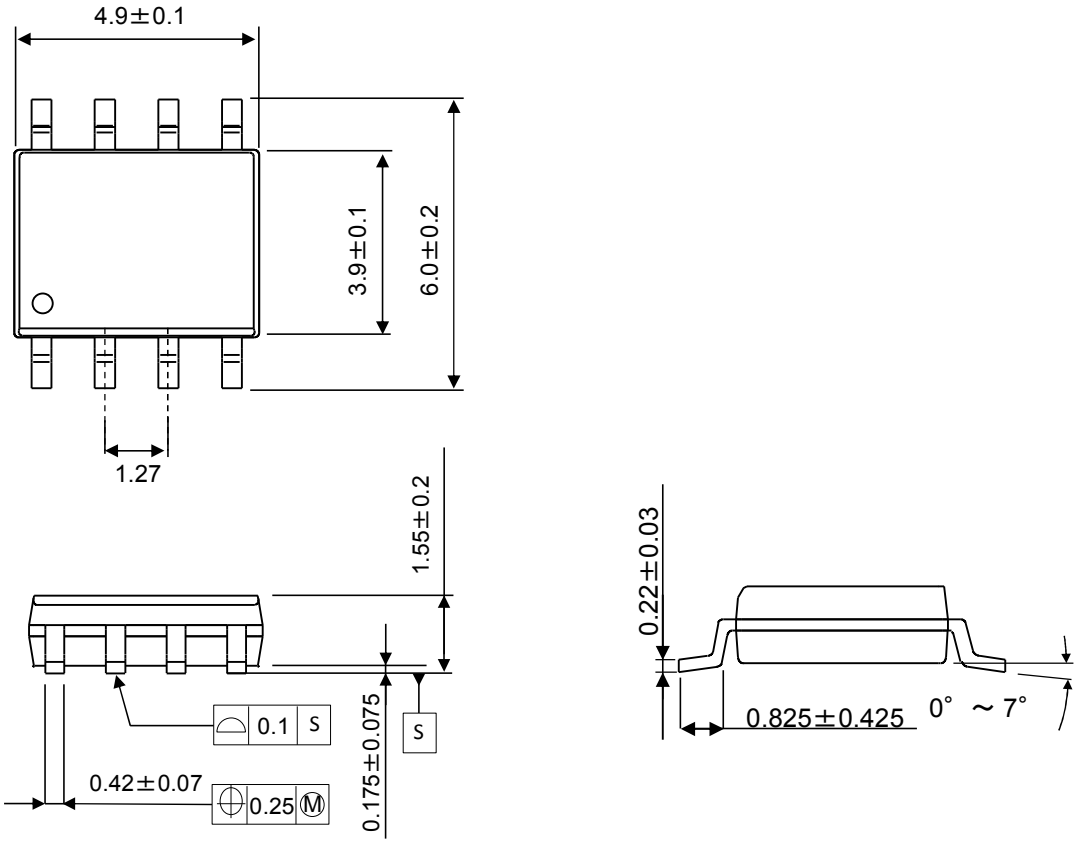
Pulse Response

V^+/V^-=±15V, R_L=2kΩ, Ta=25ºC



■**PACKAGE OUTLINE UNIT : mm**

SOP8



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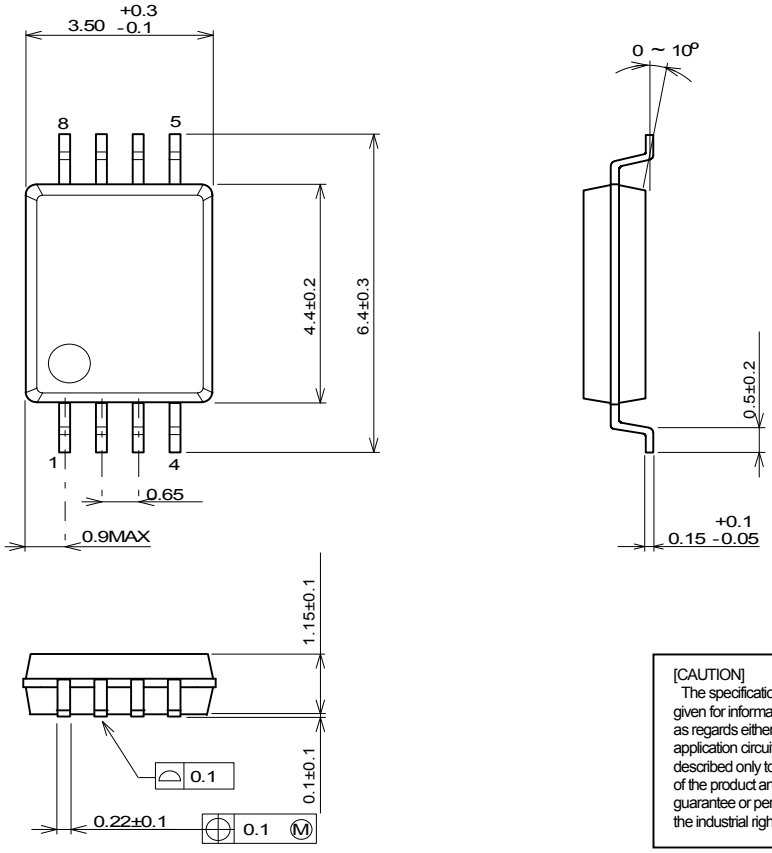

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9