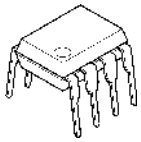
HIGH SPEED SINGLE SUPPLY OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

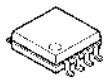
The NJM2742 is a single supply dual operational amplifier with a wide operation voltage range from 3V to 32V and high slew rate of 10v/μs. Further it has a low side output swing close to ground (VOL= 0.2V typ. at RL=2kΩ, V+=5V). The combination of these characteristics makes it well-suited for power supply units, motor driving units and others.

The NJM2742 is available in a wide variety of packages 8-lead DIP, and 8-lead surface-mount packages of SOP (DMP), SSOP and MSOP (TVSP).

■ PACKAGR OUTLINE



NJM2742D
(DIP8)



NJM2742M
(DMP8)



NJM2742V
(SSOP8)



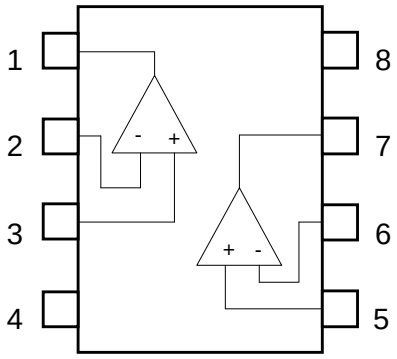
NJM2742RB1
(MSOP8 (TVSP8))

■ FEATURES

- Single Supply
- Operating Voltage — 3V to 32V
- Low Saturation Output Voltage — V_{OL}= 0.2V typ. (at R_L=2kΩ, V^+=5V)
- High Slew Rate — 10V/μs typ.
- Bipolar Technology
- Package Outline — NJM2742D: DIP8,
  NJM2742M: DMP8
  NJM2742V: SSOP8,
  NJM2742RB1: MSOP8 (TVSP8)MEET JEDEC MO-187-DA / THIN TYPE

■ PIN CONFIGURATION

(Top View)



NJM2742D, NJM2742M
NJM2742V, NJM2742RB1

PIN FUNCTION

1.A OUTPUT
2.A -INPUT
3.A +INPUT
4.GND(V^-)
5.B +INPUT
6.B -INPUT
7.B OUTPUT
8.V^+

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	+36	V
Differential Input Voltage	V_{ID}	±36	V
Common Mode Input Voltage	V_{IC}	-0.3 to +36	V
Power Dissipation	P_D	500 (DIP8) 300 (DMP8) 250 (SSOP8) 320 (MSOP8 (TVSP8))	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-50 to +150	°C

■ RECOMMENDED OPERATING CONDITION (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Operating Voltage Range	V^+		3.0	-	32	V

■ DC CHARACTERISTICS (V^+/V^-=±15V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Operating Current	I_{CC}	No Signal	-	4.3	5.5	mA
Input Offset Voltage	V_{IO}		-	1	12	mV
Input Bias Current	I_B		-	80	400	nA
Input Offset Current	I_{IO}		-	5	75	nA
Open Loop Voltage Gain	Av	R_L ≥2kΩ to 0V	80	110	-	dB
Common Mode Rejection	CMR	-15V ≤ V_{ICM} ≤ 12.5V	55	75	-	dB
Supply Voltage Rejection	SVR	3V ≤ V^+ ≤ 32V	70	90	-	dB
Maximum Output Voltage 1	V_{OM1}	R_L ≥10kΩ to 0V	+13.7 /-13.7	+14 /-14.8	-	V
Maximum Output Voltage 2	V_{OM2}	R_L ≥2kΩ to 0V	+13.5 /-13.5	-	-	V
Source Output Current	I_{SOURCE}	$V_{IN}+$=1V, $V_{IN}-$=0V, V_O=0V	10	30	-	mA
Sink Output Current	I_{SINK}	$V_{IN}+$=0V, $V_{IN}-$=1V, V_O=0V	10	30	-	mA
Input Common Mode Voltage Range	V_{ICM}	CMR ≥ 55dB	-15	-	12.5	V

■ AC CHARACTERISTICS (V^+/V^-=±15V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gain Bandwidth product	GB	f=10kHz	-	2	-	MHz
Equivalent Input Noise Voltage	V_{NI}	f=1kHz	-	40	-	nV/√Hz
Capacitive Load Tolerance	CL		-	1000	-	pF

■ TRANSIENT CHARACTERISTICS (V^+/V^-=±15V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Slew Rate	SR		-	10	-	V/μs

■ DC CHARACTERISTICS

(V^+=+5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Operating Current	I_{CC}	No Signal	-	3.3	4.5	mA
Input Offset Voltage	V_{IO}		-	1	12	mV
Input Bias Current	I_B		-	80	400	nA
Input Offset Current	I_{IO}		-	5	75	nA
Open Loop Voltage Gain	Av	R_L=2kΩ to 0V	80	110	-	dB
Common Mode Rejection	CMR	0V ≤ V_{ICM} ≤ 2.8V	50	60	-	dB
Supply Voltage Rejection	SVR	3V ≤ V^+ ≤ 32V	70	90	-	dB
Maximum Output Voltage	V_{OH}	R_L=2kΩ to 0V	3.7	4.0	-	V
	V_{OL}	R_L=2kΩ to 0V	-	0.1	0.2	
Source Output Current	I_{SOURCE}	V_{IN}+=1V, V_{IN}-=0V, V_O=2.5V	10	30	-	mA
Sink Output Current	I_{SINK}	V_{IN}+=0V, V_{IN}-=1V, V_O=2.5V	10	30	-	mA
Input Common Mode Voltage Range	V_{ICM}	CMR ≥ 50dB	0	-	2.8	V

■ AC CHARACTERISTICS

(V^+=+5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gain Bandwidth product	GB	f=10kHz	-	2	-	MHz
Equivalent Input Noise Voltage	V_{NI}	f=1kHz	-	40	-	nV/√Hz
Capacitive Load Tolerance	CL		-	1000	-	pF

■ TRANSIENT CHARACTERISTICS

(V^+=+5V, Ta=25°C)

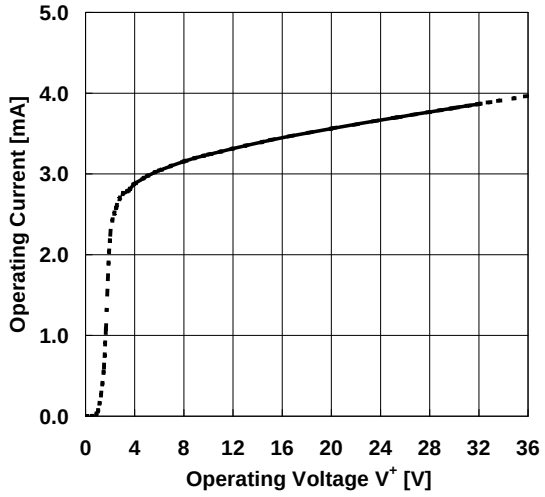
PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Slew Rate	SR		-	7	-	V/μs

Note: The common mode input voltage range of NJM2742 is shifted toward the V^- for single supply use. At the low operating voltage, the center potential of the V^+ and V^- may be out of the common mode voltage range. In this case, shift the common mode input voltage toward the V^-.

■ TYPICAL CHARACTERISTICS

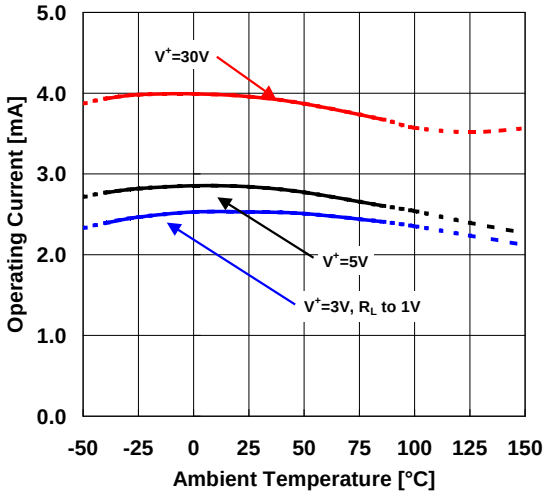
Operating Current vs. Operating Voltage

V_{IN}=0V, Ta=25°C



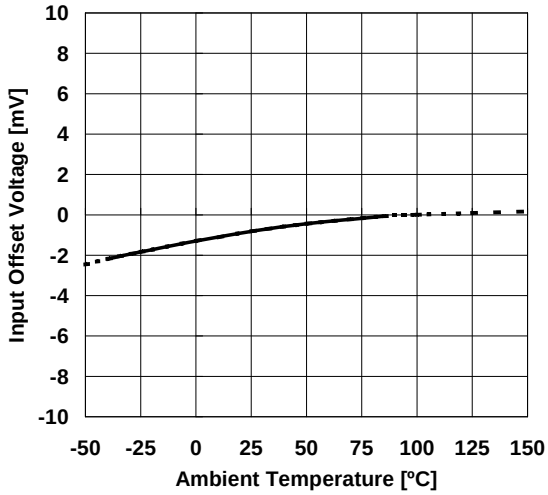
Operating Current vs. Ambient Temperature

V_{IN}=0V



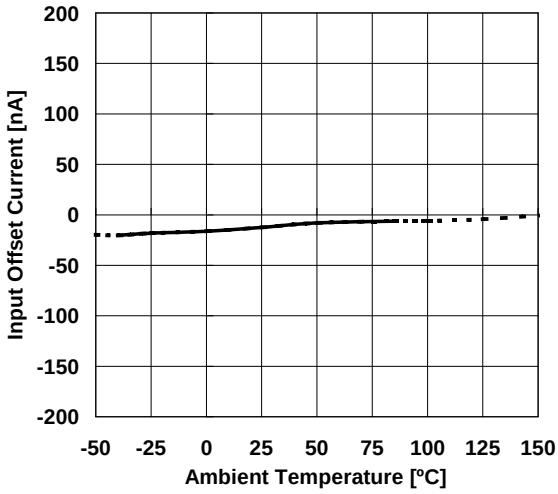
Input Offset Voltage vs. Ambient Temperature

V^+=5V



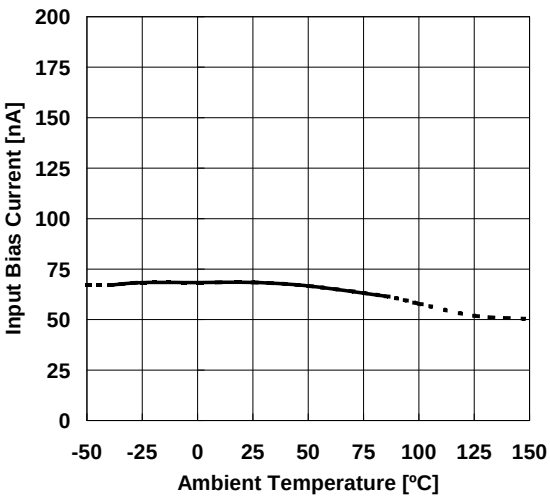
Input Offset Current vs. Ambient Temperature

V^+=5V



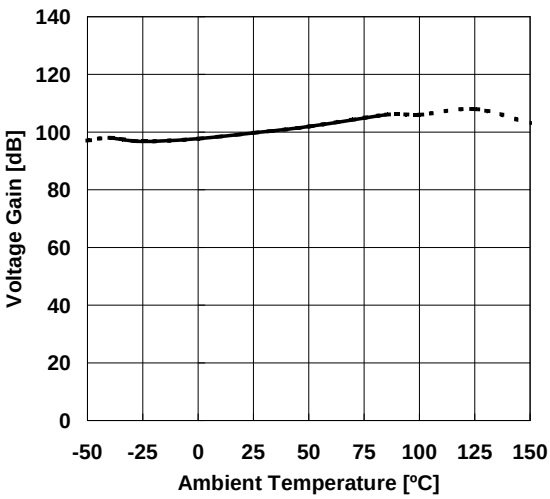
Input Bias Current vs. Ambient Temperature

V^+=5V



Voltage Gain vs. Ambient Temperature

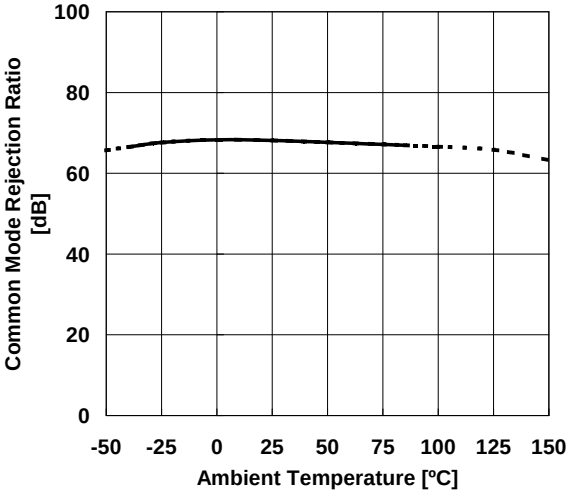
V^+=5V, R_L=2kΩ



■ TYPICAL CHARACTERISTICS

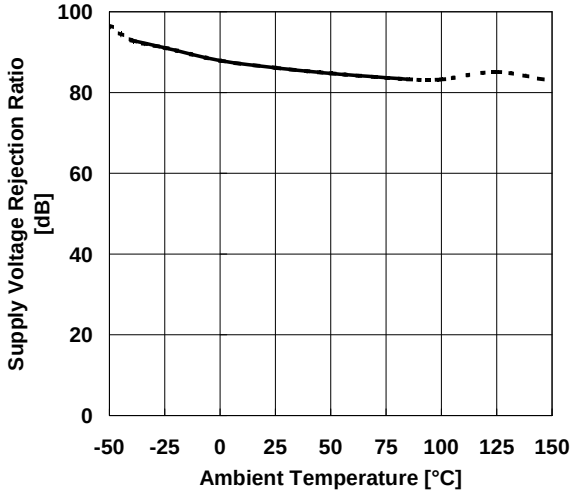
Common Mode Rejection Ratio vs. Ambient Temperature

V^+=30V, 0V<V_{ICM}<27.5V



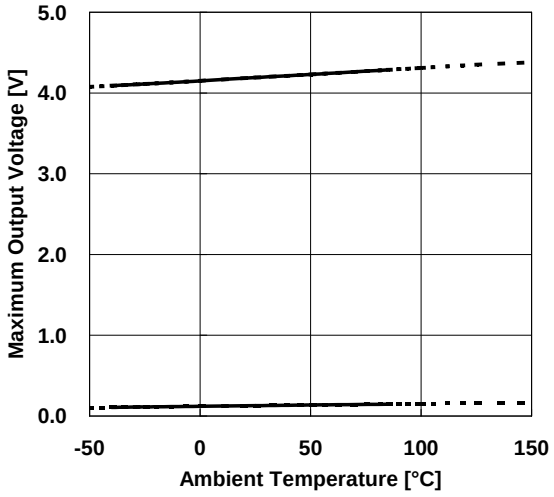
Supply Voltage Rejection Ratio vs. Ambient Temperature

V^+=5V to 30V



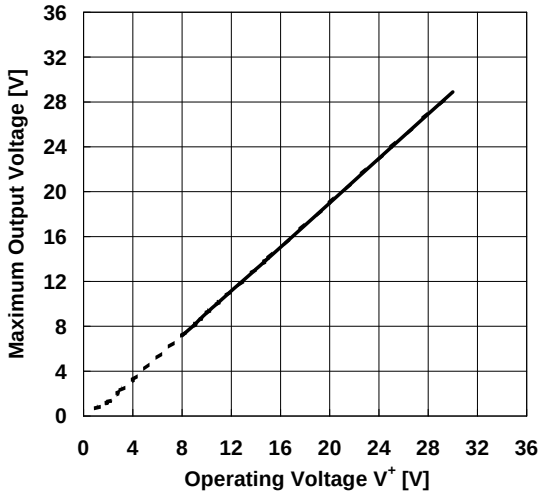
Maximum Output Voltage vs. Ambient Temperature

V^+=5V, Gv=open, V_{IN}=±1V, R_L=2kΩ to 0V



Maximum Output Voltage vs. Operating Voltage

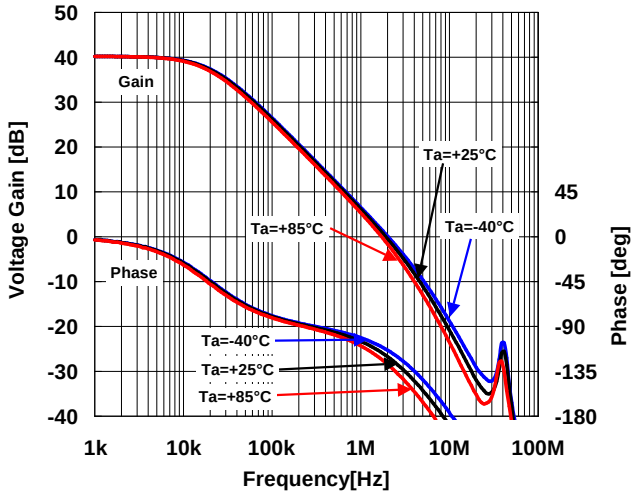
R_L=2kΩ, Ta=25°C



■ TYPICAL CHARACTERISTICS

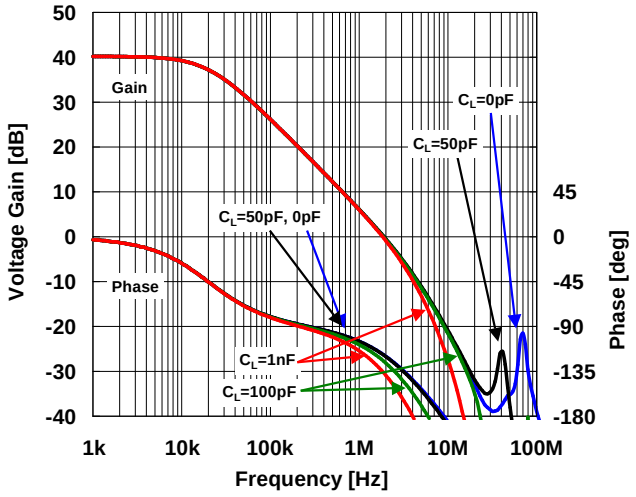
40dB Voltage Gain & Phase vs. Frequency

V^+=5V, V_{IN}=0.02Vpp, G_V=40dB, R_T=50Ω, R_F=1.98kΩ, R_G=20Ω, C_F=0, R_L=2kΩ, C_L=50pF



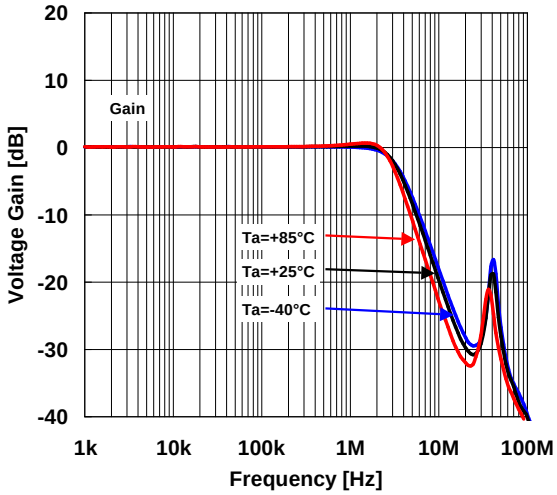
40dB Voltage Gain & Phase vs. Frequency

V^+=5V, V_{IN}=0.01Vpp, G_V=40dB, R_T=50Ω, R_F=1.98kΩ, R_G=20Ω, R_L=10kΩ, Ta=+25°C



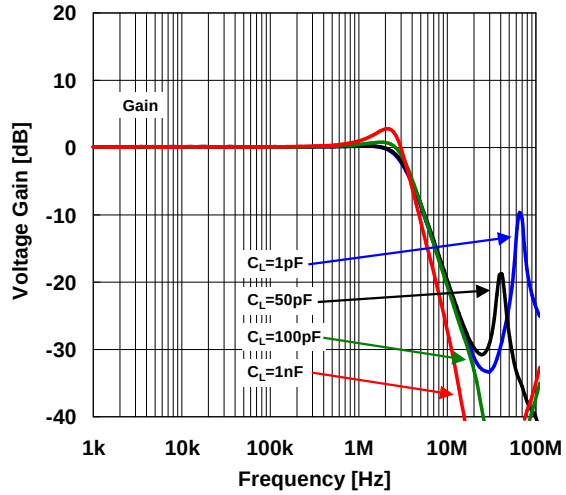
Peak Gain of Voltage Follower

V^+=5V, V_{IN}=0.02Vpp, G_V=0dB, R_T=50Ω, R_F=0Ω, R_G=open, C_L=50pF, R_L=1kΩ



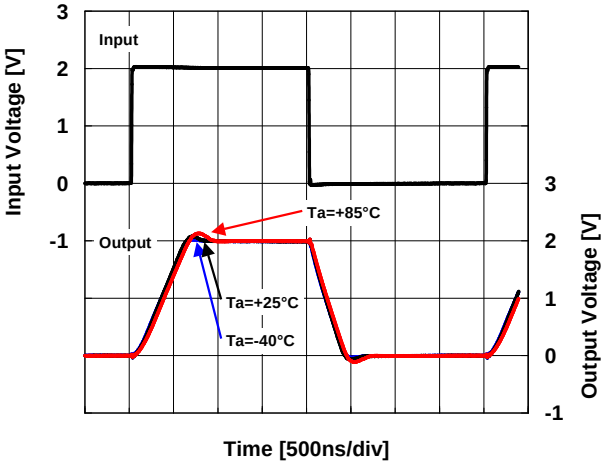
Peak Gain of Voltage Follower

V^+=5V, V_{IN}=0.02Vpp, G_V=0dB, R_T=50Ω, R_F=0Ω, R_G=open, R_L=1kΩ, Ta=+25°C



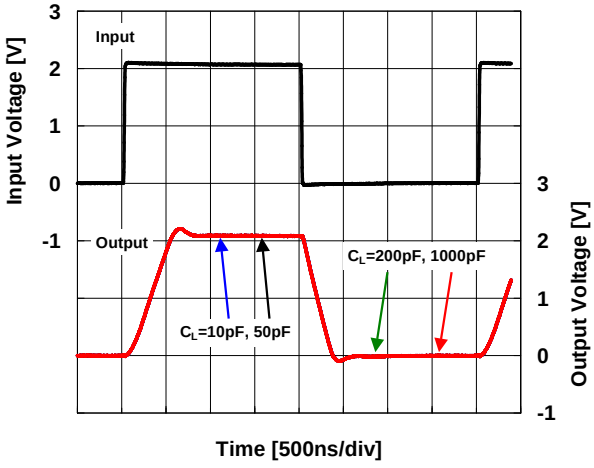
Pulse Response

V^+=5V, f=250kHz, V_O=2V_{PP}, G_V=0dB, R_T=50Ω, R_F=0Ω, C_L=10pF, R_G=open, R_L=10kΩ, Ta=25°C



Pulse Response

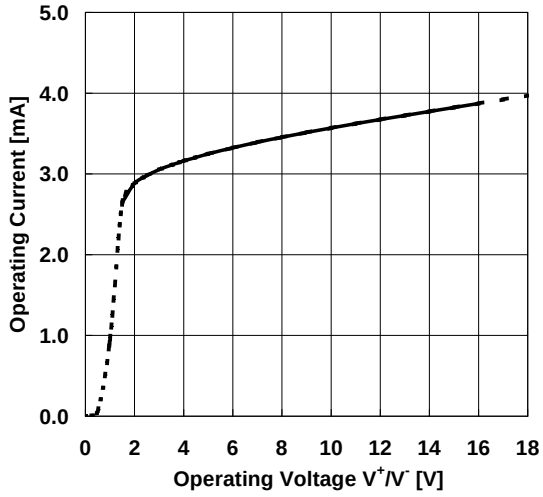
V^+=5V, f=250kHz, V_O=2V_{PP}, G_V=0dB, R_T=50Ω, R_F=0Ω, C_F=0, R_G=open, R_L=2kΩ, Ta=25°C



■ TYPICAL CHARACTERISTICS

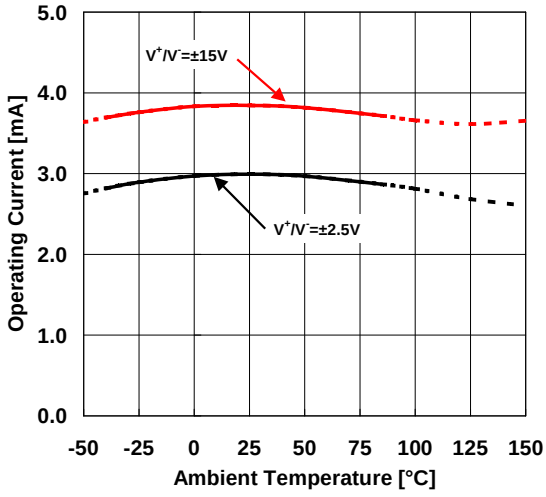
Operating Current vs. Operating Voltage

V_{IN}=0V, Ta=25°C



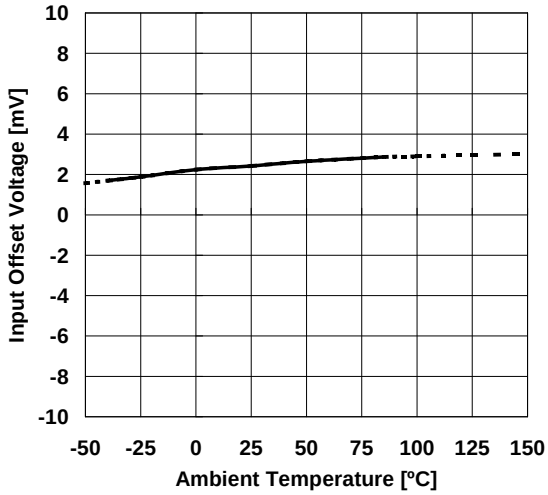
Operating Current vs. Ambient Temperature

V_{IN}=0V



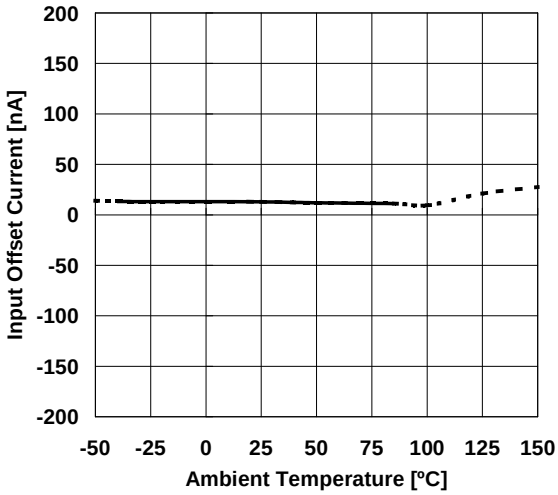
Input Offset Voltage vs. Ambient Temperature

V^+/V^-=±15V



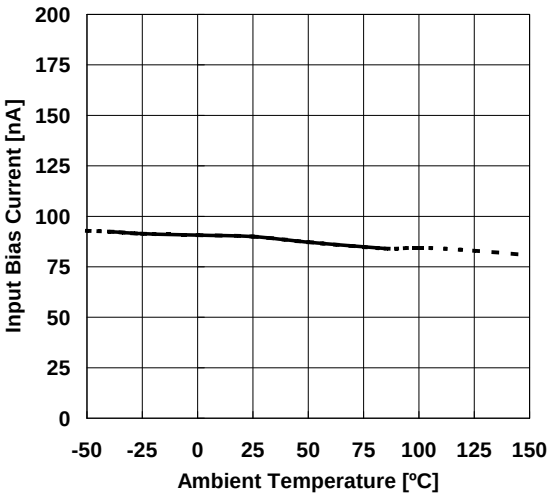
Input Offset Current vs. Ambient Temperature

V^+/V^-=±15V



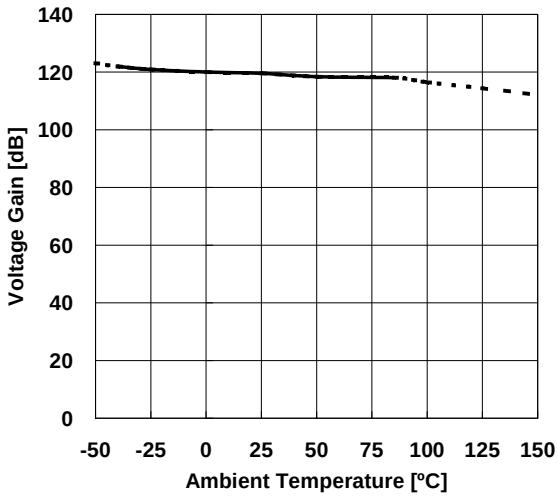
Input Bias Current vs. Ambient Temperature

V^+/V^-=±15V



Voltage Gain vs. Ambient Temperature

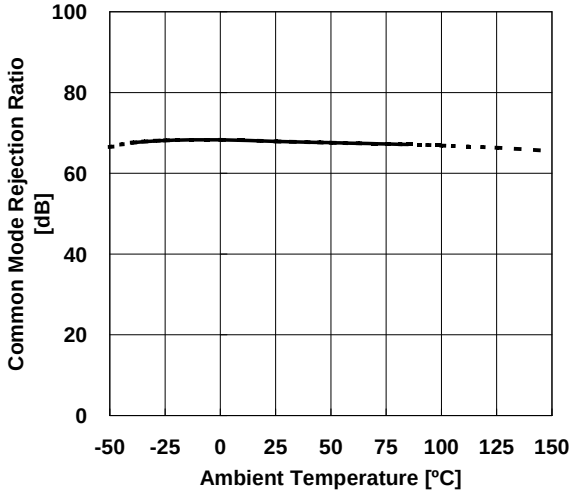
V^+/V^-=±15V, R_L=2kΩ



■ TYPICAL CHARACTERISTICS

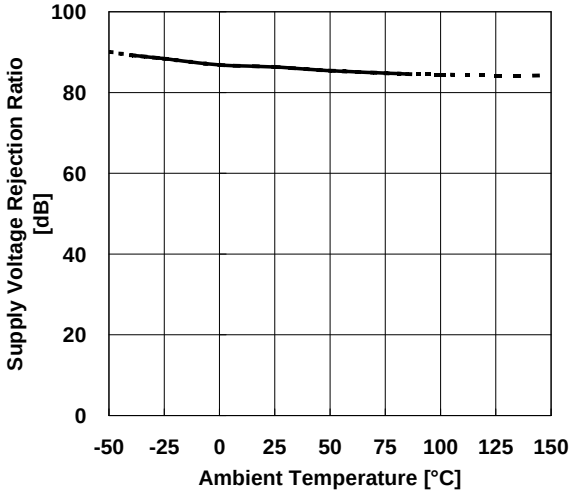
Common Mode Rejection Ratio vs. Ambient Temperature

V^+/V^-=±15V, -15V<V_{ICM}<+12.5V



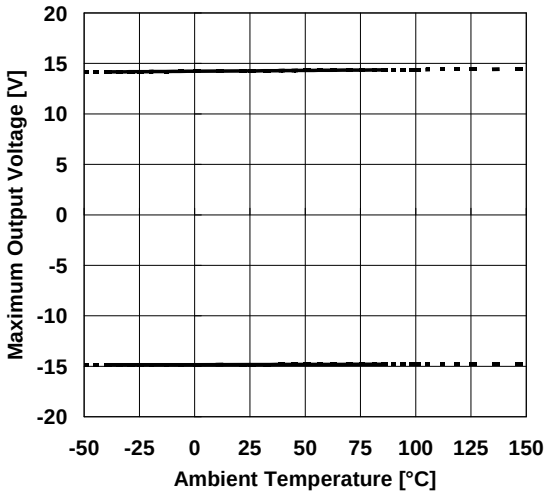
Supply Voltage Rejection Ratio vs. Ambient Temperature

V^+/V^-=±2.5V to ±15V



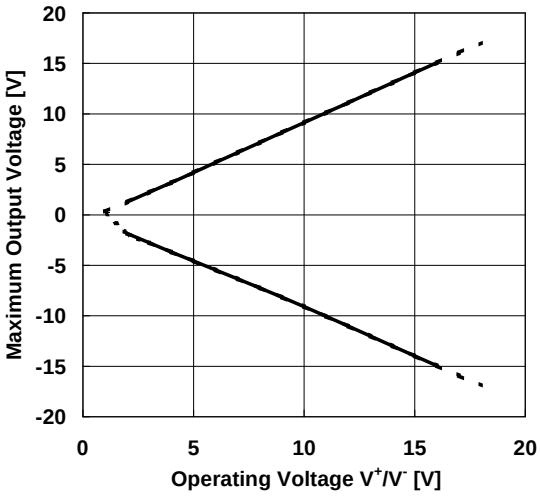
Maximum Output Voltage vs. Ambient Temperature

V^+/V^-=±15V, Gv=open, V_{IN}=±1V, R_L=10kΩ



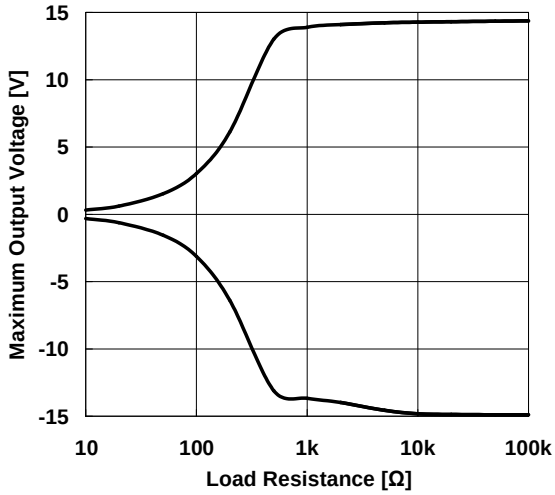
Maximum Output Voltage vs. Operating Voltage

R_L=2kΩ, Ta=25°C



Maximum Output Voltage vs. Load Resistance

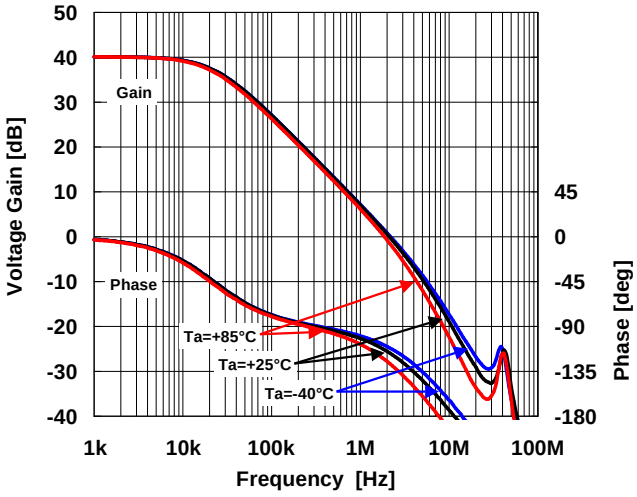
V^+/V^-=±15V, Ta=25ºC



■TYPICAL CHARACTERISTICS

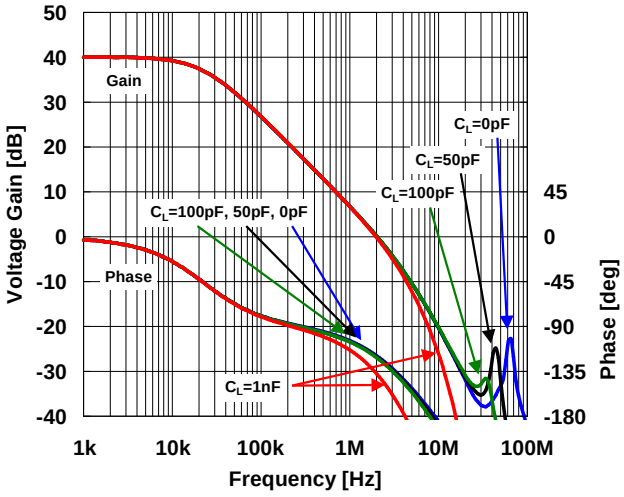
40dB Voltage Gain & Phase vs. Frequency

V^+/V^-=±15V, V_{IN}=0.02Vpp, G_V=40dB, R_T=50Ω,
R_F=1.98kΩ, R_G=20Ω, C_F=0, R_L=2kΩ, C_L=50pF



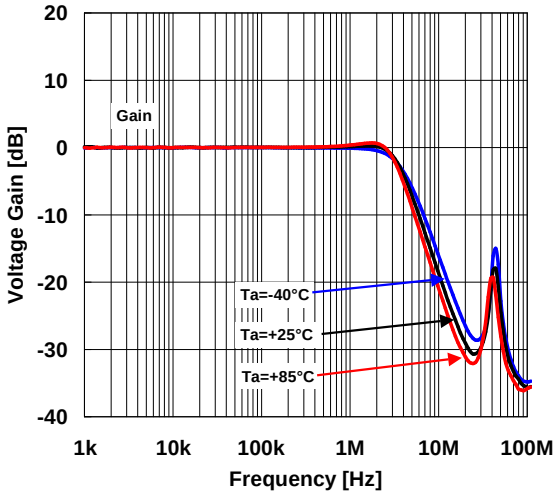
Voltage Gain & Phase vs. Frequency

V^+/V^-=±15V, V_{IN}=0.01Vpp, G_V=40dB, R_T=50Ω,
R_F=1.98kΩ, R_G=20Ω, R_L=10kΩ, Ta=+25°C



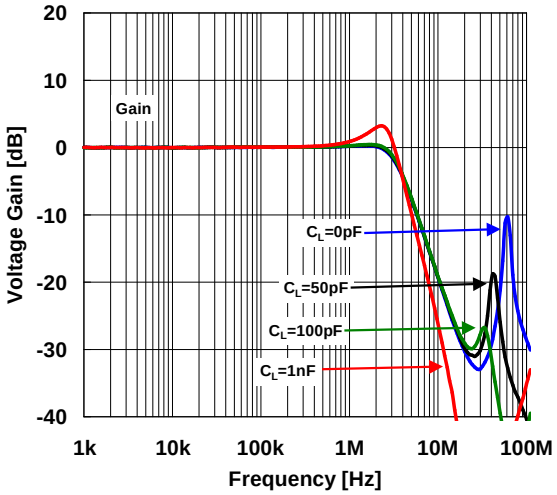
Peak Gain of Voltage Follower

V^+/V^-=±15V, V_{IN}=0.02Vpp, G_V=0dB, R_T=50Ω,
R_F=0Ω, R_G=open, C_F=0, R_L=2kΩ, C_L=50pF



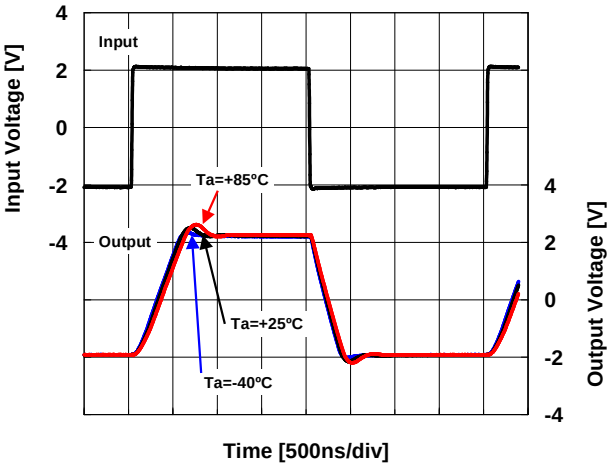
Peak Gain of Voltage Follower

V^+/V^-=±15V, V_{IN}=0.02Vpp, G_V=0dB, R_T=50Ω,
R_F=0Ω, R_G=open, R_L=10kΩ, Ta=+25°C



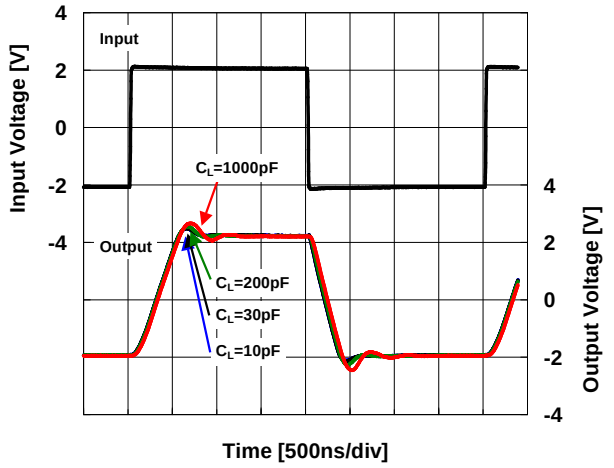
Pulse Response

V^+/V^-=±15V, f=250kHz, V_O=4V_{PP}, G_V=0dB,
R_T=50Ω, R_F=0Ω, C_F=0F, R_G=open, C_L=50pF, R_L=10kΩ



Pulse Response

V^+/V^-=±15V, f=250kHz, V_O=4V_{PP}, G_V=0dB, R_T=50Ω,
R_F=0Ω, C_F=0F, R_G=open, R_L=10kΩ, Ta=25°C



■NOTE

[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.

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