

## HIGH SPEED SINGLE SUPPLY OPERATIONAL AMPLIFIER

### ■ GENERAL DESCRIPTION

The **NJM2742** is a high speed single supply operational amplifier. The low  $V_{OL}$  enables to treat small output signal on a single supply.

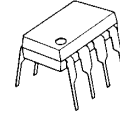
It has wide supply voltage range, +3 to +32 volt and high slew rate.

The **NJM2742** is suitable for power supply and motor driver units.

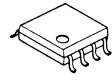
### ■ FEATURES

- Single Supply
- Operating Voltage (3 to 32V)
- Low Saturation Output Voltage ( $V_{OL} = 0.2V$  typ. at  $R_L = 2k\Omega, V^+ = 5V$ )
- High Slew Rate (10V/ $\mu s$  typ.)
- Bipolar Technology
- Package Outline DIP8, DMP8, SSOP8, TVSP8

### ■ PACKAGR OUTLINE



**NJM2742D**



**NJM2742M**

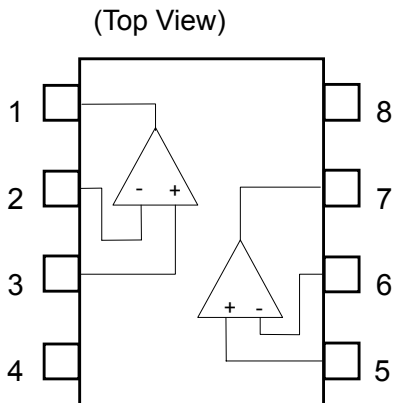


**NJM2742V**



**NJM2742RB1**

### ■ PIN CONFIGURATION



### PIN FUNCTION

- 1.A OUTPUT
- 2.A -INPUT1
- 3.A +INPUT1
- 4.V<sup>-</sup>
- 5.B +INPUT2
- 6.B -INPUT2
- 7.B OUTPUT2
- 8.V<sup>+</sup>

# NJM2742

## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	+36	V
Differential Input Voltage	V <sub>ID</sub>	±36	V
Common Mode Input Voltage	V <sub>IC</sub>	-0.3 to +36	V
Power Dissipation	P <sub>D</sub>	500 (DIP8) 300 (DMP8) 250 (SSOP8) 320 (TVSP8)	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-40 to +150	°C

## ■ RECOMMENDED OPERATING CONDITION (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Operating Voltage Range	V <sup>+</sup>		3.0	-	32	V

## ■ DC CHARACTERISTICS (V<sup>+</sup>/V<sup>-</sup>=±15V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Operating Current	I <sub>CC</sub>	No Signal	-	4.3	5.5	mA
Input Offset Voltage	V <sub>IO</sub>		-	1.0	12	mV
Input Bias Current	I <sub>B</sub>		-	80	400	nA
Input Offset Current	I <sub>IO</sub>		-	5	75	nA
Open Loop Voltage Gain	A <sub>v</sub>	R <sub>L</sub> >2kΩ	80	110	-	dB
Common Mode Rejection	CMR	-15V < V <sub>IC</sub> < 12.5V	55	75	-	dB
Supply Voltage Rejection	SVR	3V < V <sup>+</sup> < 32V	70	90	-	dB
Maximum Output Voltage 1	V <sub>OM1</sub>	R <sub>L</sub> >10kΩ	+13.7 /-13.7	+14 /-14.8	-	V
Maximum Output Voltage 2	V <sub>OM2</sub>	R <sub>L</sub> >2kΩ	+13.5 /-13.5	-	-	V
Source Output Current	I <sub>SOURCE</sub>	V <sub>IN+</sub> =1V, V <sub>IN-</sub> =0V, V <sub>O</sub> =0V	10	30	-	mA
Sink Output Current	I <sub>SINK</sub>	V <sub>IN+</sub> =0V, V <sub>IN-</sub> =1V, V <sub>O</sub> =0V	10	30	-	mA
Input Common Mode Voltage Range	V <sub>ICM</sub>	CMR > 55dB	-15	-	12.5	V

## ■ AC CHARACTERISTICS (V<sup>+</sup>/V<sup>-</sup>=±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 <sub>NI</sub>	f=1kHz	-	40	-	nV/ √Hz
Capacitive Load Tolerance	CL		-	1000	-	pF

## ■ TRANSIENT CHARACTERISTICS (V<sup>+</sup>/V<sup>-</sup>=±15V, Ta=25°C)

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

## ■ DC CHARACTERISTICS

(V<sup>+</sup>=+5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Operating Current	I <sub>CC</sub>	No Signal	-	3.3	4.5	mA
Input Offset Voltage	V <sub>IO</sub>		-	1.0	12	mV
Input Bias Current	I <sub>B</sub>		-	80	400	nA
Input Offset Current	I <sub>IO</sub>		-	5	75	nA
Open Loop Voltage Gain	A <sub>v</sub>	R <sub>L</sub> >2kΩ	80	110	-	dB
Common Mode Rejection	CMR	0V < V <sub>IC</sub> < 2.8V	50	60	-	dB
Supply Voltage Rejection	SVR	3V < V <sup>+</sup> < 32V	70	90	-	dB
Maximum Output Voltage	V <sub>OH</sub>	R <sub>L</sub> =2kΩ	3.7	4.0	-	V
	V <sub>OL</sub>	R <sub>L</sub> =2kΩ	-	0.1	0.2	
Source Output Current	I <sub>SOURCE</sub>	V <sub>IN+</sub> =1V, V <sub>IN-</sub> =0V, V <sub>O</sub> =2.5V	10	30	-	mA
Sink Output Current	I <sub>SINK</sub>	V <sub>IN+</sub> =0V, V <sub>IN-</sub> =1V, V <sub>O</sub> =2.5V	10	30	-	mA
Input Common Mode Voltage Range	V <sub>ICM</sub>	CMR > 50dB	0	-	2.8	V

## ■ AC CHARACTERISTICS

(V<sup>+</sup>=+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 <sub>NI</sub>	f=1kHz	-	40	-	nV/ √Hz
Capacitive Load Tolerance	CL		-	1000	-	pF

## ■ TRANSIENT CHARACTERISTICS

(V<sup>+</sup>=+5V, Ta=25°C)

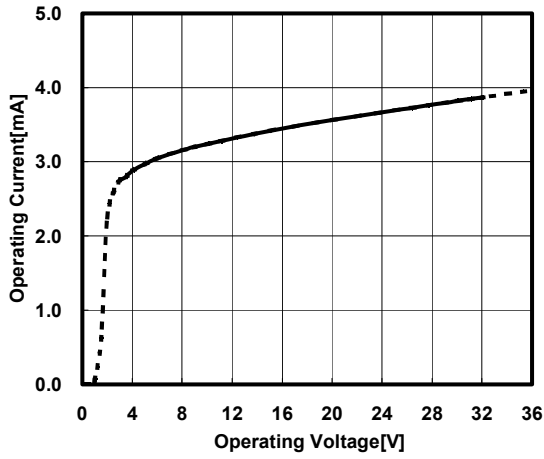
PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Slew Rate	SR		-	7	-	V/μs

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

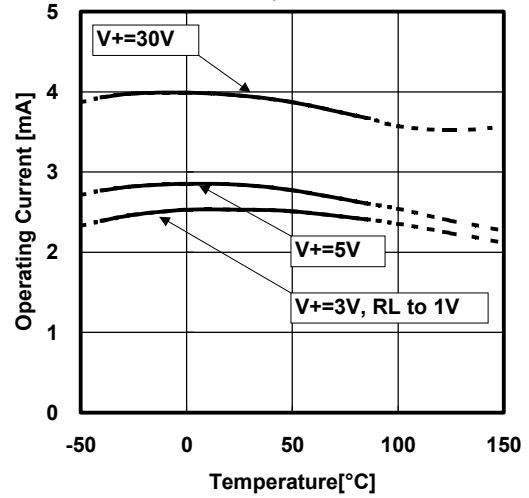
Operating Current vs. Operating Voltage

$V_{in}=0V, T_a=25^\circ C$



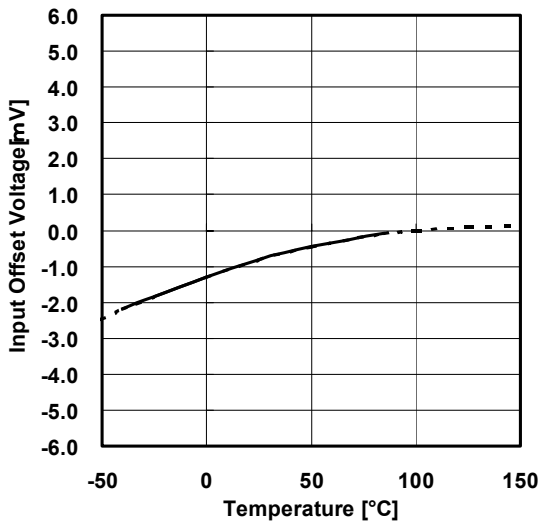
Operating Current vs. Temperature

$V_{in}=0V$



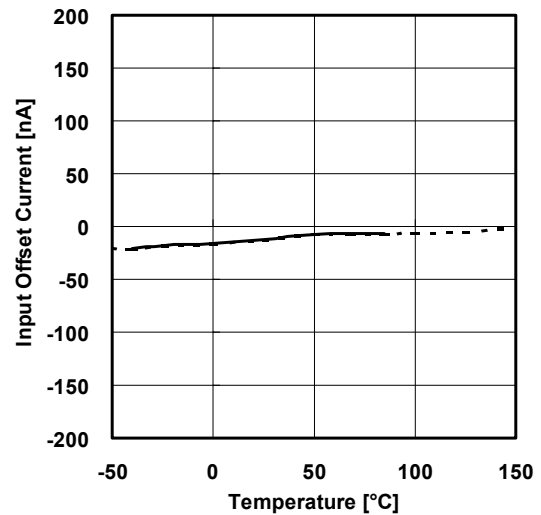
Input Offset Voltage vs. Temperature

$V+=5V$



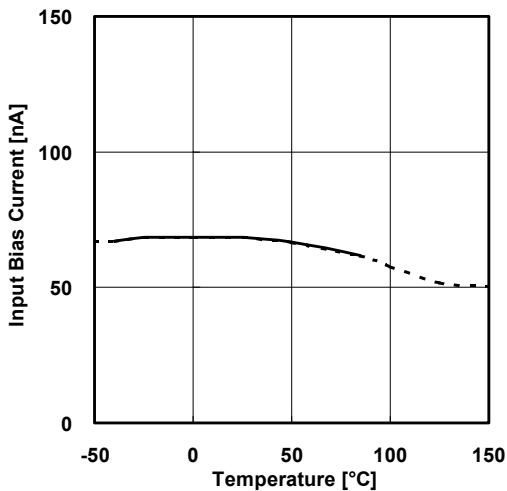
Input Offset Current vs. Temperature

$V+=5V$



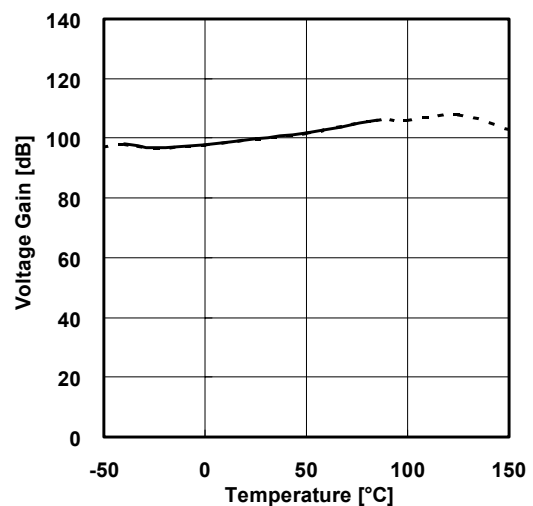
Input Bias Current vs. Temperature

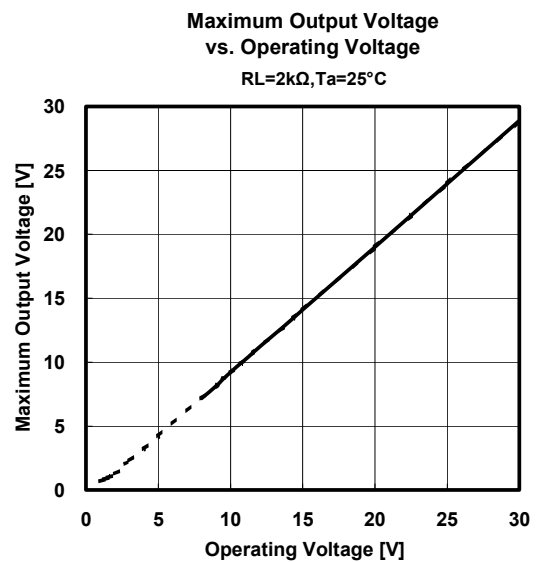
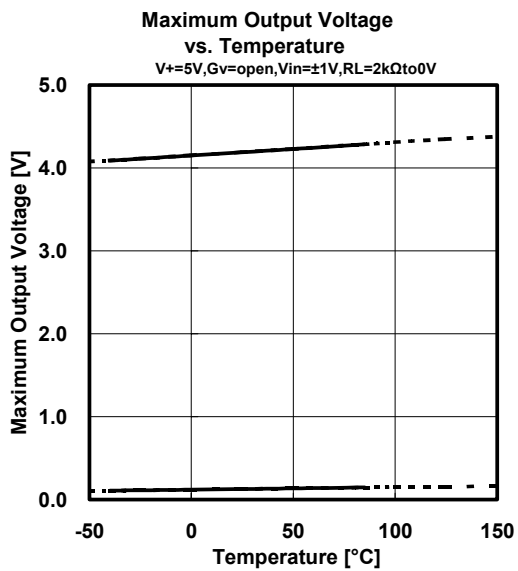
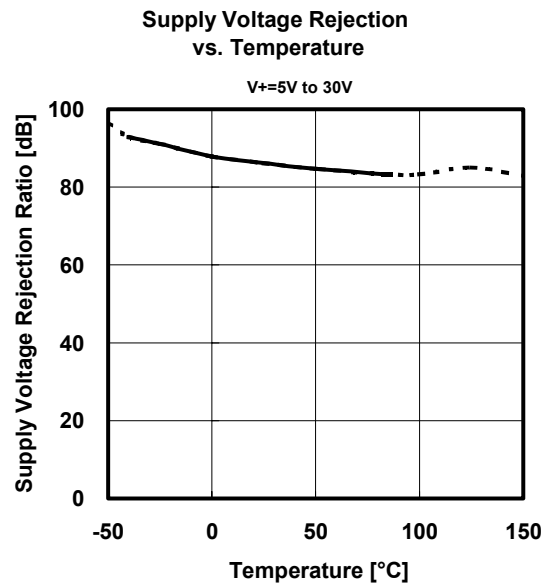
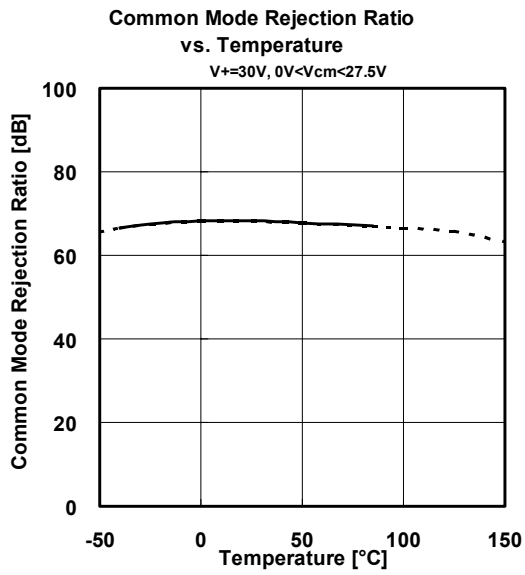
$V+=5V$



Voltage Gain vs. Temperature

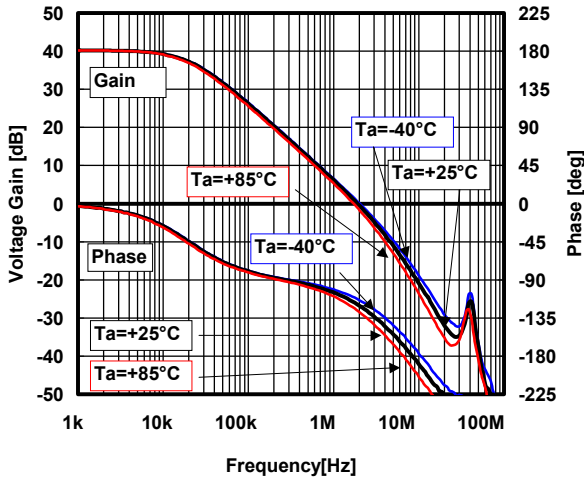
$V+=5V$





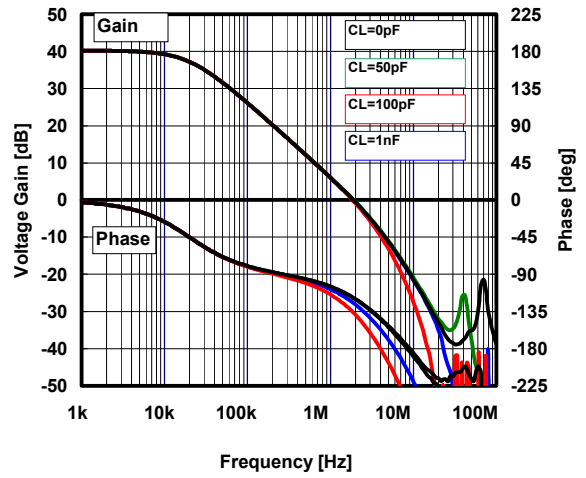
## Voltage Gain & Phase vs. Frequency

V+=5V, VIN=0.02Vpp, GV=40dB, RT=50Ω, RF=1.98kΩ, RG=20Ω, CF=0, RL=2kΩ, CL=50pF



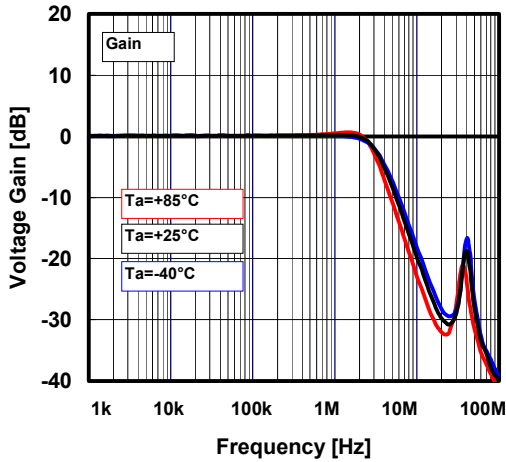
## Voltage Gain & Phase vs. Frequency

V+=5V, VIN=0.01Vpp, GV=40dB, RT=50Ω, RF=1.98kΩ, RG=20Ω, RL=10kΩ, Ta=+25°C



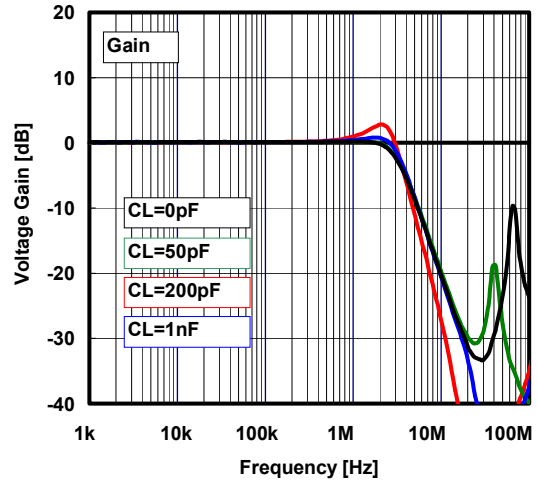
## Peak Gain of Voltage Follower

V+=5V, VIN=0.02Vpp, GV=0dB, RT=50Ω, RF=0Ω, RG=open, CL=50pF, RL=1kΩ



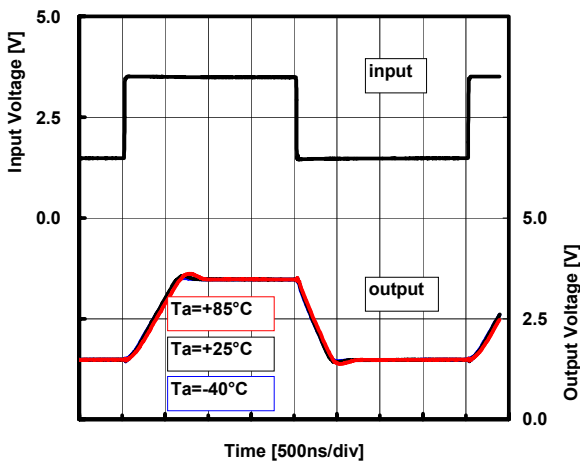
## Peak Gain of Voltage Follower

V+=5V, VIN=0.02Vpp, GV=0dB, RT=50Ω, RF=0Ω, RG=open, RL=1kΩ, Ta=+25°C



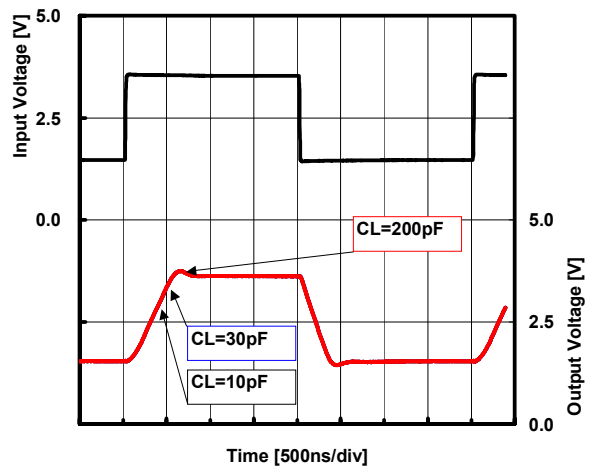
## Pulse Response

V+=5V, f=250kHz, VO=4VPP, GV=0dB, RT=50Ω, RF=0Ω, CL=10pF, RG=open, RL=10kΩ, Ta=25°C

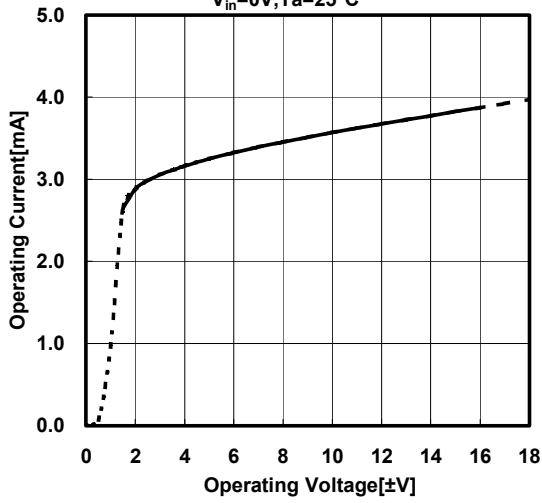


## Pulse Response

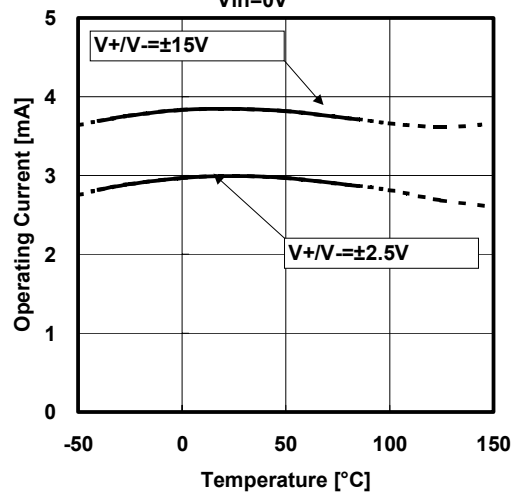
V+=5V, f=250kHz, VO=4VPP, GV=0dB, RT=50Ω, RF=0Ω, CF=0, RG=open, RL=2kΩ, Ta=25°C



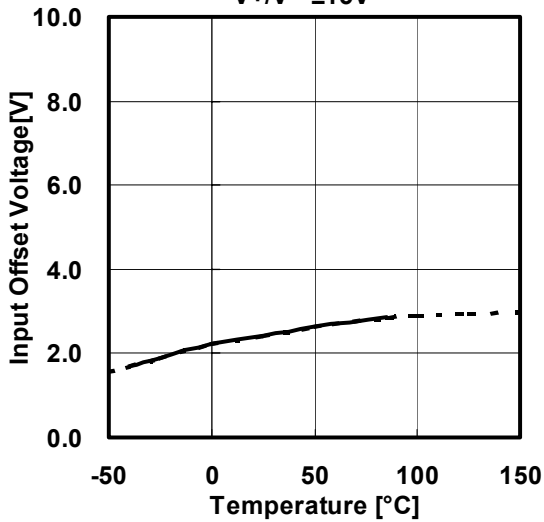
**Operating Current vs. Operating Voltage**  
 $V_{in}=0V, T_a=25^{\circ}C$



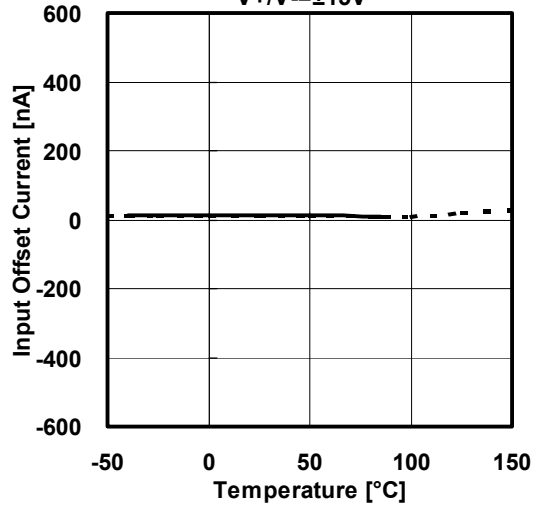
**Operating Current vs. Temperature**  
 $V_{in}=0V$



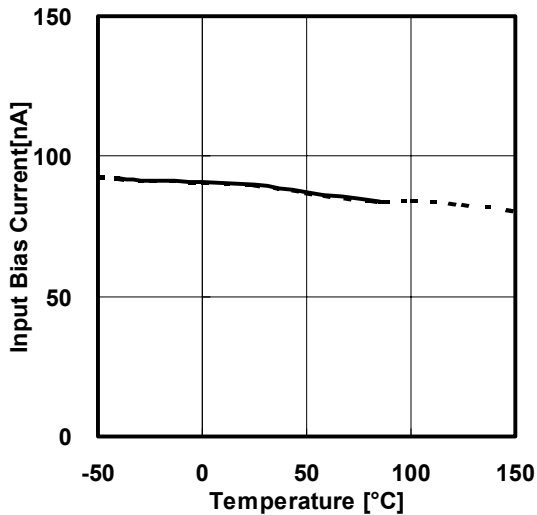
**Input Offset Voltage vs. Temperature**  
 $V+/V- = \pm 15V$



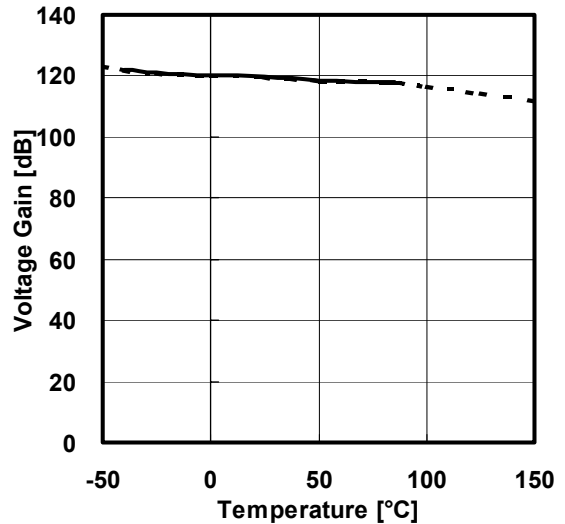
**Input Offset Current vs. Temperature**  
 $V+/V- = \pm 15V$



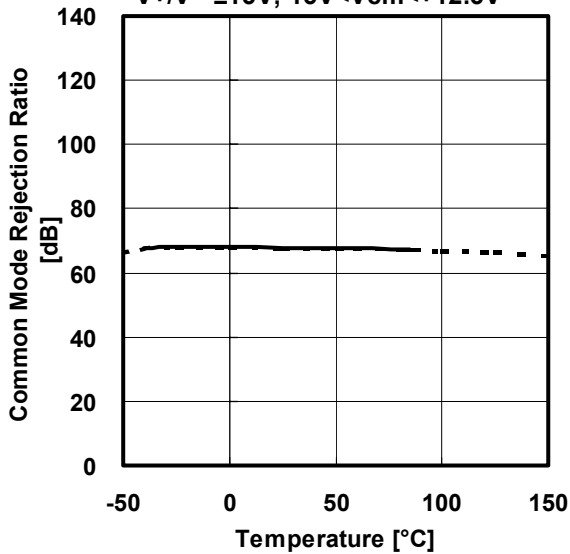
**Input Bias Current vs. Temperature**  
 $V+/V- = \pm 15V$



**Voltage Gain vs. Temperature**  
 $V+/V- = \pm 15V, R_L = 2k\Omega$

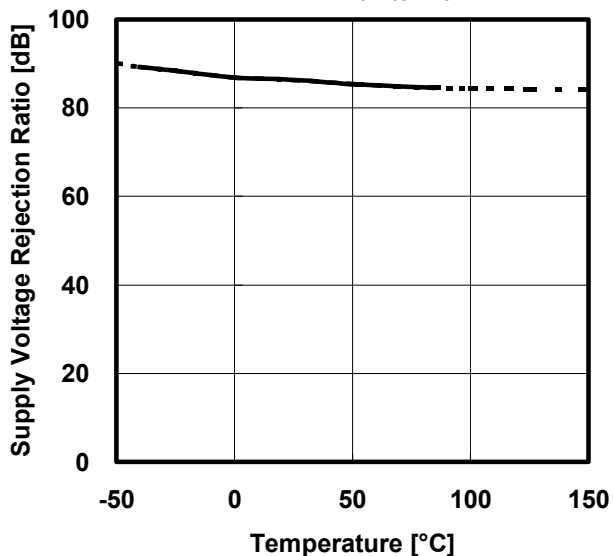


**Common Mode Rejection Ratio vs. Temperature**  
 $V_+/V_- = \pm 15V, -15V < V_{cm} < +12.5V$



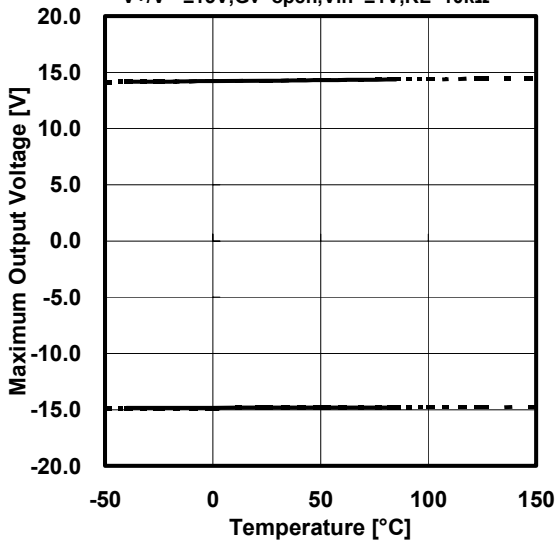
**Supply Voltage Rejection Ratio vs. Temperature**

$V_+/V_- = \pm 2.5V$  to  $\pm 15V$



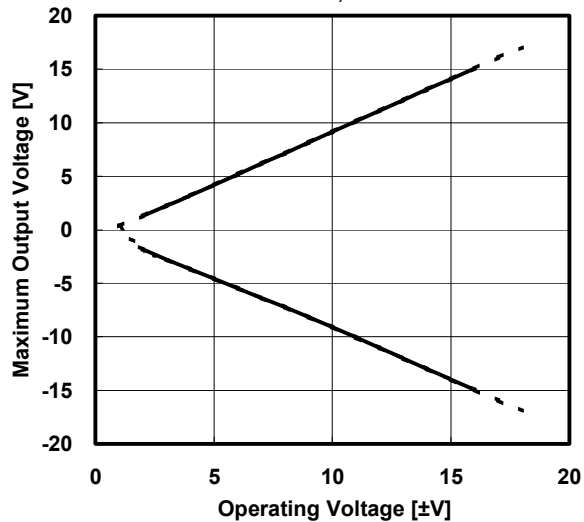
**Maximum Output Voltage vs. Temperature**

$V_+/V_- = \pm 15V, G_v = \text{open}, V_{in} = \pm 1V, R_L = 10k\Omega$



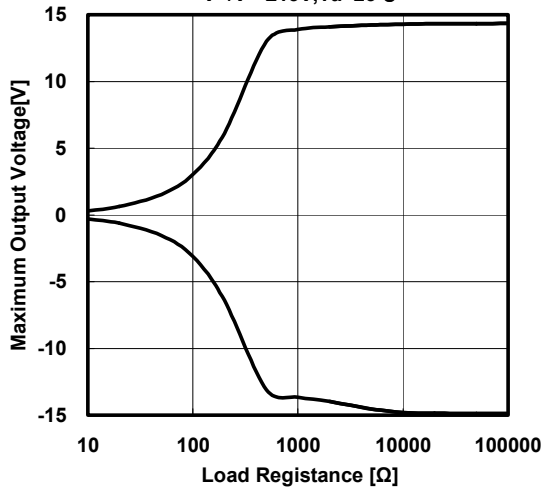
**Maximum Output Voltage vs. Operating Voltage**

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



**Maximum Output Voltage vs. Operating Current**

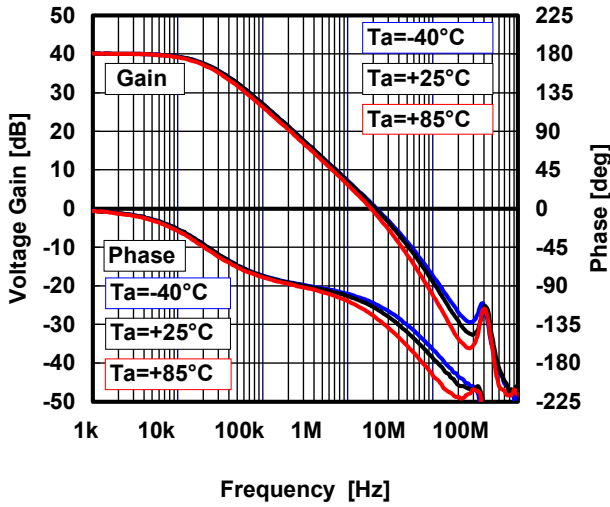
$V_+/V_- = \pm 15V, T_a = 25^\circ C$





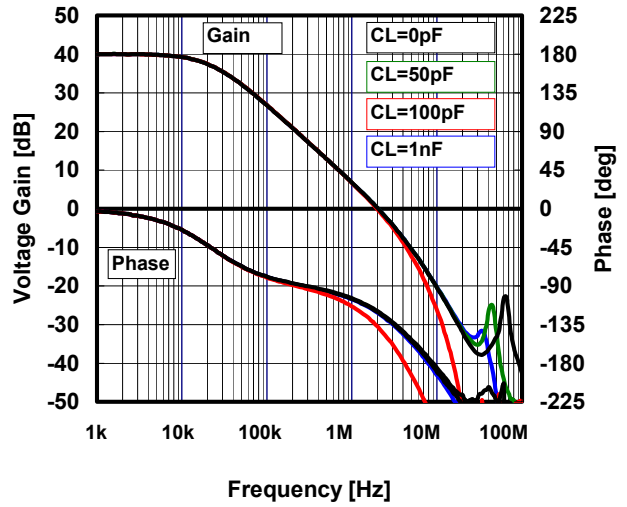
**Voltage Gain & Phase vs. Frequency**

V+/V- = ±15V, VIN = 0.02Vpp, GV = 40dB, RT = 50Ω, RF = 1.98kΩ, RG = 20Ω, CF = 0, RL = 2kΩ, CL = 50pF



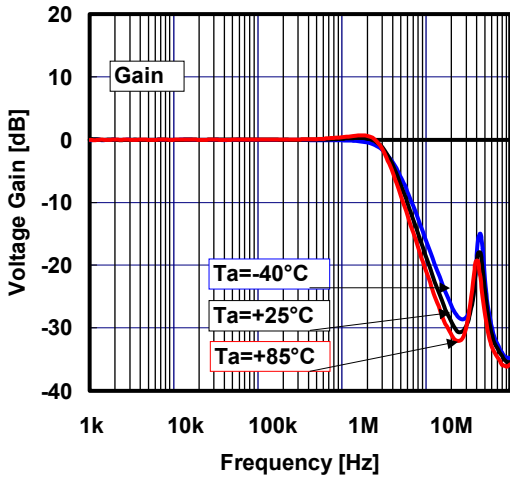
**Voltage Gain & Phase vs. Frequency**

V+/V- = ±15V, VIN = 0.01Vpp, GV = 40dB, RT = 50Ω, RF = 1.98kΩ, RG = 20Ω, RL = 10kΩ, Ta = +25°C



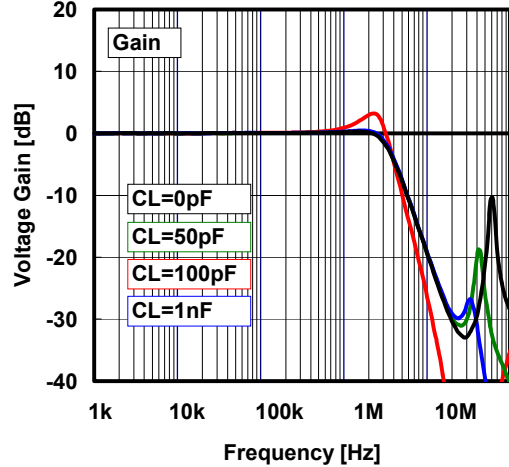
**Peak Gain of Voltage Follower**

V+/V- = ±15V, VIN = 0.02Vpp, GV = 0dB, RT = 50Ω, RF = 0Ω, RG = open, CF = 0, RL = 2kΩ, CL = 50pF



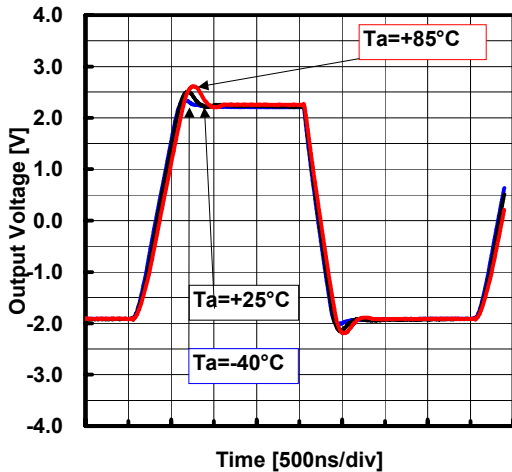
**Peak Gain of Voltage Follower**

V+/V- = ±15V, VIN = 0.02Vpp, GV = 0dB, RT = 50Ω, RF = 0Ω, RG = open, RL = 10kΩ, Ta = +25°C



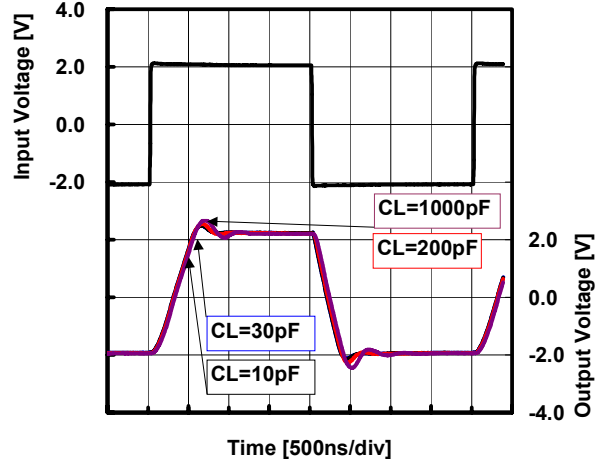
**Pulse Response**

V+/V- = ±15V, f = 250kHz, VO = 4VPP, GV = 0dB, RT = 50Ω, RF = 0Ω, CF = 0, RG = open, CL = 50pF, RL = 10kΩ



**Pulse Response**

V+/V- = ±15V, f = 250kHz, VO = 4VPP, GV = 0dB, RT = 50Ω, RF = 0Ω, CF = 0, RG = open, RL = 10kΩ, Ta = 25°C



**[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.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[NJR:](#)

[NJM2742RB1-TE1](#) [NJM2742V-TE1](#) [NJM2742M](#) [NJM2742D](#)

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### 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](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9