

DUAL OPERATIONAL AMPLIFIER

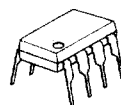
■ GENERAL DESCRIPTION

The NJM4565 integrated circuit is a high-gain, wide-bandwidth, dual low noise operational amplifier capable of driving 20V peak-to-peak into 400 Ω load. The NJM4565 is good characteristics compared to the NJM4560.

■ FEATURES

- Operating Voltage ($\pm 4V \sim \pm 18V$)
- Wide Gain Bandwidth Product (4MHz typ.)
- Slew Rate ($4V/\mu s$ typ.)
- Package Outline DIP8, DMP8, SSOP8, SIP8
- Bipolar Technology

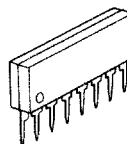
■ PACKAGE OUTLINE



NJM4565D



NJM4565M

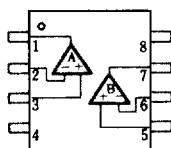


NJM4565L

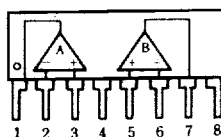


NJM4565V

■ PIN CONFIGURATION



NJM4565D
NJM4565M
NJM4565V

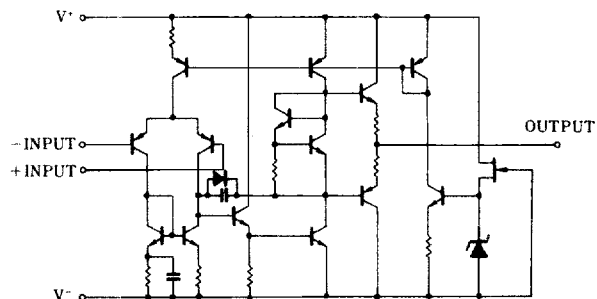


NJM4565L

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=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺ /V ⁻	±18	V
Differential Input Voltage	V _{ID}	±30	V
Input Voltage	V _I	±15 (note)	V
Power Dissipation	P _D	(DIP8) 500	mW
		(DMP8) 300	mW
		(SSOP8) 250	mW
		(SIP8) 800	mW
Operating Temperature Range	T _{opr}	-20 ~ +75	°C
Storage Temperature Range	T _{stg}	-40 ~ +125	°C

(note) For supply voltage less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

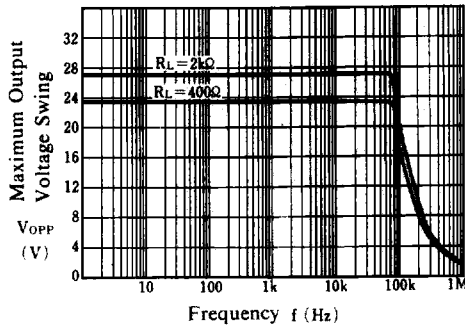
(Ta=25°C, V⁺/V⁻=±15V)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V _{IO}	R _S ≤ 10kΩ	—	0.5	3.0	mV
Input Offset Current	I _{IO}		—	2	50	nA
Input Bias Current	I _B		—	50	200	nA
Input Resistance	R _{IN}		0.3	5	—	MΩ
Large Signal Voltage Gain	A _V	R _L ≥ 2kΩ, V _O = ±10V	86	100	—	dB
Maximum Output Voltage 1	V _{OM1}	R _L ≥ 2kΩ	±12	±14	—	V
Maximum Output Voltage 2	V _{OM2}	I _O = 25mA	±10	±11.5	—	V
Input Common Mode Voltage Range	V _{ICM}		±12	±14	—	V
Common Mode Rejection Ratio	CMR	R _S ≤ 10kΩ	70	90	—	dB
Supply Voltage Rejection Ratio	SVR	R _S ≤ 10kΩ	76.5	90	—	dB
Operating Current	I _{CC}		—	4.5	7	mA
Slew Rate	SR		—	4	—	V/μs
Gain Bandwidth Product	GB		—	10	—	MHz
Equivalent Input Noise Voltage	V _{NI}	RIAA, R _S = 2.2kΩ, 30kHz LPF	—	1.2	—	μV

■ TYPICAL CHARACTERISTICS

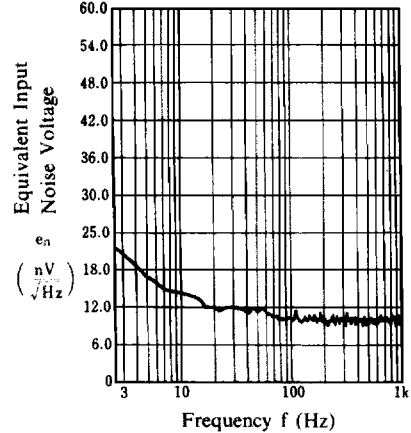
Maximum Output Voltage Swing vs. Frequency

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



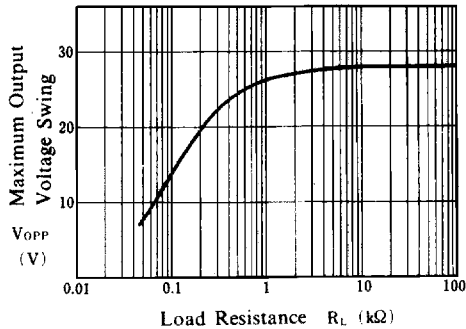
Equivalent Input Noise Voltage vs. Frequency

($V^+/V^- = \pm 15V$, $R_s = 1k\Omega$, $T_a = 25^\circ C$)



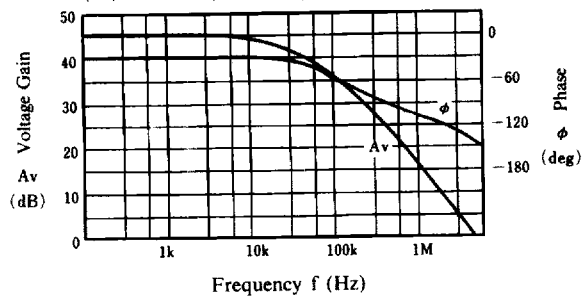
Maximum Output Voltage Swing vs. Load Resistance

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



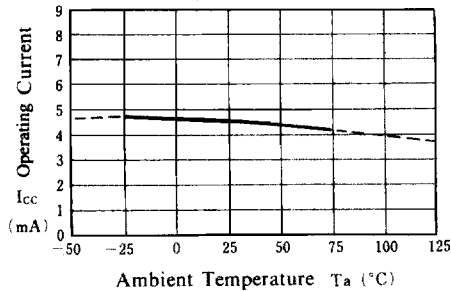
Voltage Gain Phase vs. Frequency

($V^+/V^- = \pm 15V$, $R_L = 2k\Omega$, 40dBamp, $T_a = 25^\circ C$)



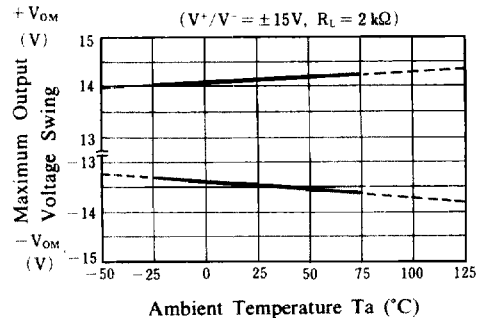
Operating Current vs. Temperature

($V^+/V^- = \pm 15V$)



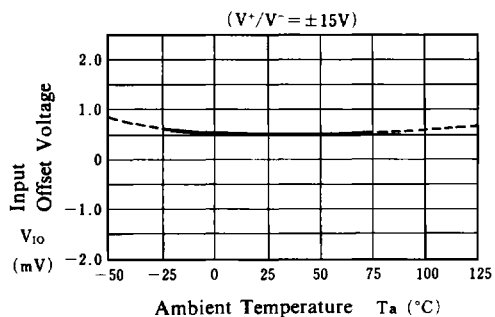
Maximum Output Voltage Swing vs. Temperature

($V^+/V^- = \pm 15V$, $R_L = 2k\Omega$)

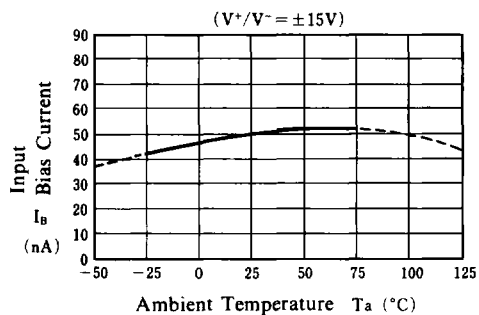


TYPICAL CHARACTERISTICS

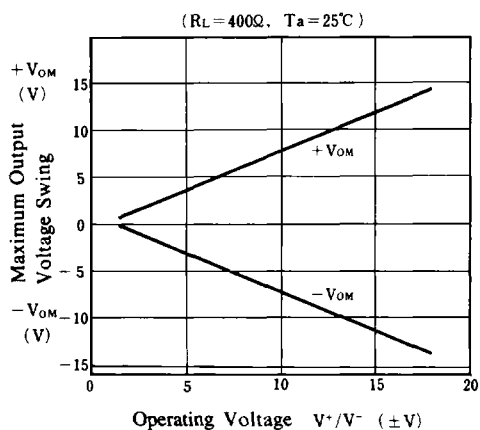
Input Offset Voltage vs. Temperature



Input Bias Current vs. Temperature



Maximum Output Voltage Swing vs. Operating Voltage



Operating Current vs. Operating Voltage

