

資料：「新日本無線 NJM4580D」と「National Semiconductor LF356B」のデータシート(一部抜粋)
 パラメータはすべて「typical」値で答えること



NJM4580

DUAL OPERATIONAL AMPLIFIER

GENERAL DESCRIPTION

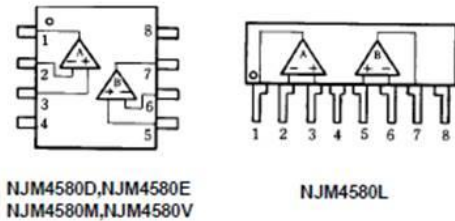
NJM4580 is the dual operational amplifier, specially designed for improving the tone control, which is most suitable for the audio application.

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.

FEATURES

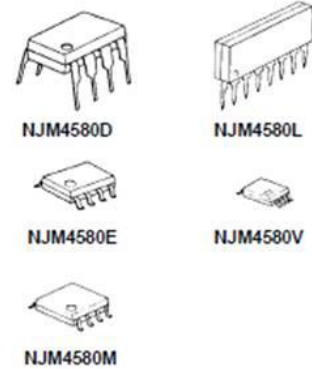
- Operating Voltage (±2V~±18V)
- Low Input Noise Voltage (0.8μVrms typ.)
- Wide Gain Bandwidth Product (15MHz typ.)
- Low Distortion (0.0005% typ.)
- Slew Rate (5V/μs typ.)
- Package Outline DIP8, SIP8, EMP8, SSOP8, DMP8
- Bipolar Technology

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⁺

PACKAGE OUTLINE



ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	±18	V
Input Voltage	V _{IC}	±15 (note)	V
Differential Input Voltage	V _{ID}	±30 (note)	V
Output Current	I _O	±50	mA
Power Dissipation	P _D	(DIP8) 800 (SIP8) 800 (DMP8) 300 (EMP8) 300 (SSOP8) 250	mW
Operating Temperature Range	T _{OP}	-40~+85	°C
Storage Temperature Range	T _{STG}	-40~+125	°C

ELECTRICAL CHARACTERISTICS

(Ta=25°C, V⁺=±15V)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V _{IO}	R _C ≤10kΩ	-	0.5	3	mV
Input Offset Current	I _{IO}		-	5	200	nA
Input Bias Current	I _B		-	100	500	nA
Large Signal Voltage Gain	A _V	R _L ≥2kΩ, V _O =±10V	90	110	-	dB
Output Voltage Swing	V _{OM}	R _L ≥2kΩ	±12	±13.5	-	V
Input Common Mode Voltage Range	V _{ICM}		±12	±13.5	-	V
Common Mode Rejection Ratio	CMR	R _C ≤10kΩ	80	110	-	dB
Supply Voltage Rejection Ratio	SVR	R _C ≤10kΩ	80	110	-	dB
Operating Current	I _{CC}		-	6	9	mA
Slew Rate	SR	R _L ≥2kΩ	-	5	-	V/μs
Gain Bandwidth Product	GB	f=10kHz	-	15	-	MHz
Total Harmonic Distortion	THD	A _V =20dB, V _O =5V, R _L =2kΩ, f=1kHz	-	0.0005	-	%
Input Noise Voltage	V _{NI}	RIAA, R _S =2.2kΩ, 30kHz LPF	-	0.8	-	μVrms



LF155/LF156/LF256/LF257/LF355/LF356/LF357 JFET Input Operational Amplifiers



N Package

General Description

These are the first monolithic JFET input operational amplifiers to incorporate well matched, high voltage JFETs on the same chip with standard bipolar transistors (BI-FET™ Technology). These amplifiers feature low input bias and offset currents/low offset voltage and offset voltage drift, coupled with offset adjust which does not degrade drift or common-mode rejection. The devices are also designed for high slew rate, wide bandwidth, extremely fast settling time, low voltage and current noise and a low 1/f noise corner.

- Logarithmic amplifiers
- Photocell amplifiers
- Sample and Hold circuits

Common Features

- Low input bias current: 30pA
- Low Input Offset Current: 3pA
- High input impedance: 10¹²Ω
- Low input noise current: 0.01 pA/√Hz
- High common-mode rejection ratio: 100 dB
- Large dc voltage gain: 106 dB

Features

Advantages

- Replace expensive hybrid and module FET op amps
- Rugged JFETs allow blow-out free handling compared with MOSFET input devices
- Excellent for low noise applications using either high or low source impedance—very low 1/f corner
- Offset adjust does not degrade drift or common-mode rejection as in most monolithic amplifiers
- New output stage allows use of large capacitive loads (5,000 pF) without stability problems
- Internal compensation and large differential input voltage capability

Applications

- Precision high speed integrators
- Fast D/A and A/D converters
- High impedance buffers
- Wideband, low noise, low drift amplifiers

Uncommon Features

	LF155/ LF355	LF156/ LF256/ LF356	LF257/ LF357 (A _V =5)	Units
Extremely fast settling time to 0.01%	4	1.5	1.5	μs
Fast slew rate	5	12	50	V/μs
Wide gain bandwidth	2.5	5	20	MHz
Low input noise voltage	20	12	12	nV/√Hz

DC Electrical Characteristics (Continued)

(Note 3)

Symbol	Parameter	Conditions	LF155/6			LF256/7 LF356B			LF355/6/7			Units
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I _B	Input Bias Current	T _J =25°C, (Notes 3, 5) T _J ≤T _{HIGH}		30	100		30	100		30	200	pA nA
R _{IN}	Input Resistance	T _J =25°C		10 ¹²			10 ¹²			10 ¹²		Ω
A _{VOL}	Large Signal Voltage Gain	V _S =±15V, T _A =25°C V _O =±10V, R _L =2k Over Temperature	50	200		50	200		25	200		V/mV V/mV
V _O	Output Voltage Swing	V _S =±15V, R _L =10k V _S =±15V, R _L =2k	±12	±13		±12	±13		±12	±13		V V
V _{CM}	Input Common-Mode Voltage Range	V _S =±15V	±11	+15.1 -12		±11	+15.1 -12		+10	+15.1 -12		V V
CMRR	Common-Mode Rejection Ratio		85	100		85	100		80	100		dB
PSRR	Supply Voltage Rejection Ratio	(Note 6)	85	100		85	100		80	100		dB

AC Electrical Characteristics

T_A = T_J = 25°C, V_S = ±15V

Symbol	Parameter	Conditions	LF155/355	LF156/256/ 356B	LF156/256/356/ LF356B	LF257/357	Units
			Typ	Min	Typ	Typ	
SR	Slew Rate	LF155/6: A _V =1, LF357: A _V =5	5	7.5	12		V/μs V/μs
GBW	Gain Bandwidth Product		2.5		5	20	MHz
t _s	Settling Time to 0.01%	(Note 7)	4		1.5	1.5	μs
e _n	Equivalent Input Noise Voltage	R _S =100Ω f=100 Hz f=1000 Hz	25		15	15	nV/√Hz nV/√Hz
i _n	Equivalent Input Current Noise	f=100 Hz f=1000 Hz	0.01		0.01	0.01	pA/√Hz pA/√Hz
C _{IN}	Input Capacitance		3		3	3	pF

- Power Dissipation 670mW (N Package)