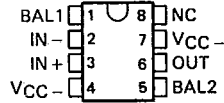


LF411C
JFET-INPUT OPERATIONAL AMPLIFIER

D2997, MARCH 1987—REVISED MAY 1988

- **Low Input Bias Current**
Typically 50 pA
- **Low Input Noise Current**
Typically 0.01 pA/√Hz
- **Low Supply Current . . .** Typically 2.0 mA
- **High Input Impedance**
Typically 10¹² Ω
- **Low Total Harmonic Distortion**
- **Low 1/f Noise Corner . . .** Typically 50 Hz

D, JG, OR P PACKAGE *T-79-15*
(TOP VIEW)



NC—No internal connection

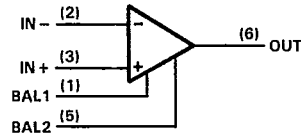
description

This device is a low-cost, high-speed, JFET-input operational amplifier with very low input offset voltage and a maximum input offset voltage drift. It requires low supply current yet maintains a large gain-bandwidth product and a fast slew rate. In addition, the matched high-voltage JFET input provides very low input bias and offset currents.

The LF411C can be used in applications such as high-speed integrators, digital-to-analog converters, sample-and-hold circuits, and many other circuits.

The LF411C is characterized for operation from 0°C to 70°C.

symbol



AVAILABLE OPTIONS

T _A	V _{IO} MAX AT 25°C	PACKAGE		
		SMALL-OUTLINE (D)	CERAMIC DIP (JG)	PLASTIC DIP (P)
0°C to 70°C	2 mV	LF411CD	LF411CJG	LF411CP

D package is available taped and reeled. Add "R" suffix to device type. (e.g. LF411CDR)

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Operational Amplifiers

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LF411C
JFET-INPUT OPERATIONAL AMPLIFIER

T-79-15

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC+}	18 V
Supply voltage, V_{CC-}	-18 V
Differential input voltage, V_{ID}	± 30 V
Input voltage (see Note 1)	± 15 V
Duration of output short circuit	Unlimited
Continuous total power dissipation	500 mW
Operating temperature range	0°C to 70°C
Storage temperature range	-65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds, JG package	300°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds, D or P package	260°C

NOTE 1: Unless otherwise specified, the absolute maximum negative input voltage is equal to the negative power supply voltage.

electrical characteristics over operating free-air temperature range, $V_{CC+} = 15$ V, $V_{CC-} = -15$ V (unless otherwise specified)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{IO} Input offset voltage	$V_{IC} = 0$, $R_S = 10$ k Ω , $T_A = 25^\circ\text{C}$		0.8	2	mV
αV_{IO} Average temperature coefficient of input offset voltage	$V_{IC} = 0$, $R_S = 10$ k Ω		10	20 [†]	$\mu\text{V}/^\circ\text{C}$
I_{IO} Input offset current [‡]	$V_{IC} = 0$	$T_J = 25^\circ\text{C}$	25	100	pA
		$T_J = 70^\circ\text{C}$		2	nA
I_{IB} Input bias current [‡]	$V_{IC} = 0$	$T_J = 25^\circ\text{C}$	50	200	pA
		$T_J = 70^\circ\text{C}$		4	nA
V_{ICR} Common-mode input voltage range		± 11	-11.5 to 14.5		V
V_{OM} Maximum peak output voltage swing	$R_L = 10$ k Ω	± 12	± 13.5		V
AVD Large-signal differential voltage	$V_O = \pm 10$ V, $R_L = 2$ k Ω	$T_A = 25^\circ\text{C}$	25	200	V/mV
		Full range	15	200	
r_i Input resistance	$T_J = 25^\circ\text{C}$		10^{12}		Ω
CMRR Common-mode rejection ratio	$R_S \leq 10$ k Ω		70	100	dB
k_{SVR} Supply voltage rejection ratio	See Note 2		70	100	dB
I_{CC} Supply current			2	3.4	mA

operating characteristics, $V_{CC+} = 15$ V, $V_{CC-} = -15$ V, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SR Slew rate		8	13		V/ μs
B_1 Unity-gain bandwidth		2.7	3		MHz
V_n Equivalent input noise voltage	$f = 1$ kHz, $R_S = 100$ Ω		18		nV/ $\sqrt{\text{Hz}}$
I_n Equivalent input noise current	$f = 1$ kHz		0.01		pA/ $\sqrt{\text{Hz}}$

[†] At least 90% of the devices meet this limit for αV_{IO} .

[‡] Input bias currents of a FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive. Pulse techniques must be used that will maintain the junction temperatures as close to the ambient temperature as possible.

NOTE 2: Supply voltage rejection ratio is measured for both supply magnitudes increasing or decreasing simultaneously.

Operational Amplifiers

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