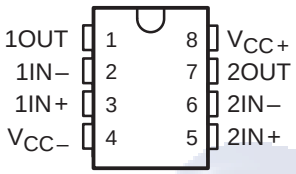
www.agelectronica.com

LF353
JFET-INPUT
DUAL OPERATIONAL AMPLIFIER

SLOS012B – MARCH 1987 – REVISED AUGUST 1994

- **Low Input Bias Current . . . 50 pA Typ**
- **Low Input Noise Current 0.01 pA/$\sqrt{Hz}$ Typ**
- **Low Input Noise Voltage . . . 18 nV/$\sqrt{Hz}$ Typ**
- **Low Supply Current . . . 3.6 mA Typ**
- **High Input Impedance . . . 10^{12} Ω Typ**
- **Internally Trimmed Offset Voltage**
- **Gain Bandwidth . . . 3 MHz Typ**
- **High Slew Rate . . . 13 V/μs Typ**

D OR P PACKAGE
(TOP VIEW)



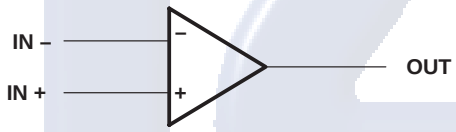
description

This device is a low-cost, high-speed, JFET-input operational amplifier with very low input offset voltage. 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 LF353 can be used in applications such as high-speed integrators, digital-to-analog converters, sample-and-hold circuits, and many other circuits.

The LF353 is characterized for operation from 0°C to 70°C.

symbol (each amplifier



AVAILABLE OPTIONS

T_A	V_{IO}max AT 25°C	PACKAGE	
		SMALL OUTLINE (D)	PLASTIC DIP (P)
0°C to 70°C	10 mV	LF353D	LF353P

The D packages are available taped and reeled. Add the suffix R to the device type (ie., LF353DR).

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, V_I (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 10 seconds . . . . . 260°C

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

 www.agelectronica.com

recommended operating conditions

	MIN	MAX	UNIT
Supply voltage, V_{CC+}	3.5	18	V
Supply voltage, V_{CC-}	–3.5	–18	V

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

PARAMETER		TEST CONDITIONS		T_A†	MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	V_{IC} = 0,	R_S = 10 kΩ	25°C		5	10	mV
				Full range			13	
α_{VIO}	Average temperature coefficient of input offset voltage	V_{IC} = 0,	R_S = 10 kΩ			10		µV/°C
I_{IO}	Input offset current‡	V_{IC} = 0		25°C		25	100	pA
				70°C			4	nA
I_{IB}	Input bias current‡	V_{IC} = 0		25°C		50	200	pA
				70°C			8	nA
V_{ICR}	Common-mode input voltage range				±11	–12 to 15		V
V_{OM}	Maximum peak output voltage swing	R_L = 10 kΩ			±12	±13.5		V
A_{VD}	Large-signal differential voltage	V_O = ±10 V,	R_L = 2 kΩ	25°C	25	100		V/mV
				Full range	15			
r_i	Input resistance	T_J = 25°C				10^{12}		Ω
CMRR	Common-mode rejection ratio	R_S ≤ 10 kΩ			70	100		dB
k_{SVR}	Supply-voltage rejection ratio	See Note 2			70	100		dB
I_{CC}	Supply current					3.6	6.5	mA

† Full range is 0°C to 70°C.
‡ 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.

operating characteristics, $V_{CC\pm}$ = ±15 V, T_A = 25°C

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{O1}/V_{O2}	Crosstalk attentuation	f = 1 kHz		120		dB
SR	Slew rate		8	13		V/µs
B_1	Unity-gain bandwidth			3		MHz
V_n	Equivalent input noise voltage	f = 1 kHz, R_S = 20 Ω		18		nV/√Hz
I_n	Equivalent input noise current	f = 1 kHz		0.01		pA/√Hz

 www.agelectronica.com

www.agelectronica.com

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

CERTAIN APPLICATIONS USING SEMICONDUCTOR PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE ("CRITICAL APPLICATIONS"). TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS. INCLUSION OF TI PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE CUSTOMER'S RISK.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.

www.agelectronica.com
www.agelectronica.com