ICL741HS
High Speed 741 Operational Amplifier

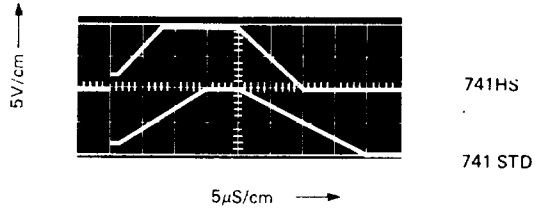
FEATURES

- Pin For Pin and Electrically Equivalent to μA741
- Guaranteed Slew Rate – 0.7V/μs Min.
- Low Cost
- Short Circuit Protection
- Large Common-Mode Input Range
- Guaranteed Drift Characteristics
- No Latch Up
- Internal Frequency Compensation

GENERAL DESCRIPTION

The 741HS high slew rate version of the 741 general purpose operational amplifier is intended for applications where slew rate performance greater than 0.3V/μsec is required. Typical applications are oscillators, active filters, sample and hold and other large signal applications. This device has a guaranteed minimum slew rate of 0.7V/μsec and is identical and equivalent to the standard 741 operational amplifier. It will fill the application void between the 741 and 101A type amplifiers (slew rate = 0.3V/μsec) and the more costly high-speed amplifiers (slew rate = 30V/μsec).

HIGH-SPEED 741 OPERATIONAL AMPLIFIER



ORDERING INFORMATION

8 Pin Plastic DIP	14 Pin CERDIP	TO-99 Can
ICL741CHSPA	ICL741MHSJD	ICL741CHSTY ICL741MHSTY

ABSOLUTE MAXIMUM RATINGS

Supply Voltage . . . . . ±18V
Power Dissipation (Note 1) 500mW
Differential Input Voltage . . . . . ±30V
Input Voltage (Note 2) . . . . . ±15V
Operating Temperature Range . . . . . 0°C to +70°C
Storage Temperature Range . . . . . −65°C to +150°C
Lead Temperature (Soldering at 60 sec.) . . . . . 300°C
Output Short-Circuit Duration (Note 3) . . . . . Indefinite

NOTE 1: The maximum junction temperature of the 741HS is 150°C, while that of the 741CHS is 100°C. For operating at elevated temperatures devices in the TO-5 package must be derated based on a thermal resistance of 150°C/W, junction to ambient or 45°C/W, junction to case. For the flat package, the derating is based on thermal resistance of 185°C/W when mounted on a 1/16-inch-thick epoxy glass board with ten 0.03-inch-wide, 2-ounce copper conductors. The thermal resistance of the dual-in-line package is 100°C/W, junction to ambient.

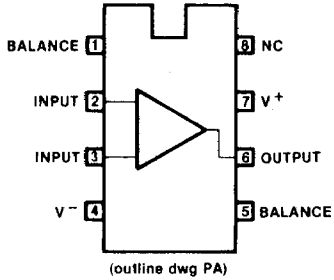
NOTE 2: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage. T_A = 25°C unless otherwise specified.

NOTE 3: Short circuit may be to ground or either supply.

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

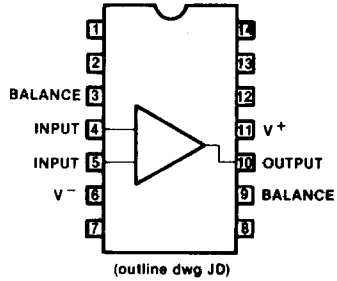
PIN CONFIGURATIONS

NOTE: AVAILABLE IN COMMERCIAL TEMP RANGE ONLY

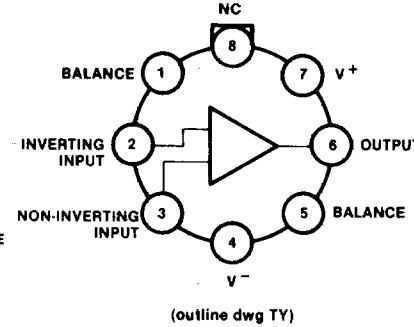


(outline dwg PA)

NOTE: AVAILABLE IN MILITARY TEMP RANGE ONLY



(outline dwg JD)



(outline dwg TY)

ELECTRICAL CHARACTERISTICS

PARAMETER	CONDITIONS	741CHS MIN	741CHS TYP	741CHS MAX	741MHS MIN	741MHS TYP	741MHS MAX	UNITS
Input Offset Voltage	$T_A = 25°C$, $R_S \leq 50k\Omega$		2	6.0		1.0	5.0	mV
Input Offset Current	$T_A = 25°C$		20	200		20	200	nA
Input Bias Current	$T_A = 25°C$		200	500		200	500	nA
Input Resistance	$T_A = 25°C$	0.3	2.0		0.3	1.0		MΩ
Supply Current	$T_A = 25°C$, $V_S = \pm 15V$		1.7	2.8		1.7	2.8	mA
Large Signal Voltage Gain	$T_A = 25°C$, $V_S = \pm 15V$ $V_{OUT} = \pm 10V$, $R_L \geq 2k\Omega$	25	160		50	160		V/mV
Input Offset Voltage	$R_S \leq 50k\Omega$			7.5			6	mV
Slew Rate	$V_{OUT} = \pm 10V$, $R_L \geq 2k\Omega$ $C_L = 50pF$	0.7	1.0		0.7	1.0		V/μsec
Input Offset Current	$T_A = 25°C$			300			500	nA
Input Bias Current				0.8			1.5	μA
Large Signal Voltage Gain	$V_S = \pm 15V$, $V_{OUT} = \pm 10V$ $R_L \geq 2k\Omega$	15			25			V/mV
Output Voltage Swing	$V_S = \pm 15V$, $R_L = 10k\Omega$	±12	±14		±12	±14		V
	$R_L = 2k\Omega$	±10	±13		±10	±13		V
Input Voltage Range	$V_S = \pm 15V$	±12			±12			V
Common Mode Rejection Ratio	$R_S \leq 50k\Omega$	70	90		70	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 50k\Omega$	77	96		77	96		dB

DEFINITION OF TERMS

INPUT OFFSET VOLTAGE: That voltage which must be applied between the input terminals through two equal resistances to obtain zero output voltage.

INPUT OFFSET CURRENT: The difference in the currents into the two input terminals when the output is at zero.

INPUT VOLTAGE RANGE: The range of voltages on the input terminals for which the offset specifications apply.

INPUT BIAS CURRENT: The average of the two input currents.

COMMON MODE REJECTION RATIO: The ratio of the input voltage range to the peak-to-peak change in input offset voltage over this range.

INPUT RESISTANCE: The ratio of the change in input voltage to the change in input current on either input with the other grounded.

SLEW RATE: A measure of the large signal capability of amplifier output to follow the amplifier input. Slew Rate = $2\pi BW_{Large\ Signal} V_{O\text{-}Peak}$.

SUPPLY CURRENT: The current required from the power supply to operate the amplifier with no load and the output at zero.

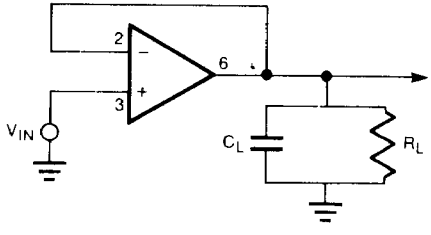
OUTPUT VOLTAGE SWING: The peak output voltage swing, referred to zero, that can be obtained without clipping.

LARGE-SIGNAL VOLTAGE GAIN: The ratio of the output voltage swing to the change in input voltage required to drive the output from zero to this voltage.

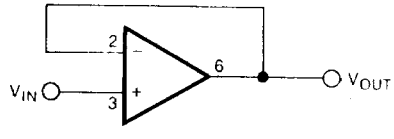
POWER SUPPLY REJECTION: The ratio of the change in input offset voltage to the change in power supply voltages producing it.

TEST CIRCUITS

TRANSIENT RESPONSE TEST CIRCUIT



FAST VOLTAGE FOLLOWER



Power Bandwidth: 1.5kHz
Slew Rate: 1V/μs