



# Operational Amplifiers

LM741/LM741C

## LM741/LM741C operational amplifiers

### general description

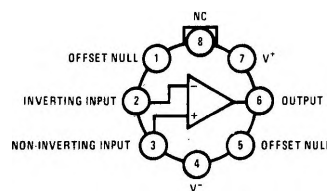
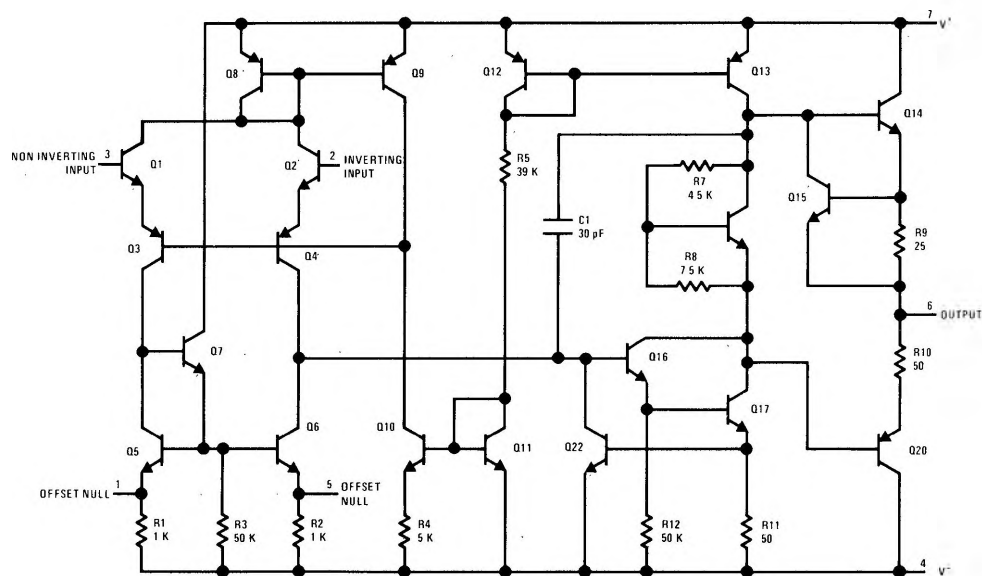
The LM741 and LM741C are general purpose operational amplifiers which feature improved performance over industry standards like the LM709. They are direct, plug-in replacements for the 709C, LM201, MC1439 and 748 in most applications.

The offset voltage and offset current are guaranteed over the entire common mode range. The amplifiers also offer many features which make

their application nearly foolproof: overload protection on the input and output, no latch-up when the common mode range is exceeded, as well as freedom from oscillations.

The LM741C is identical to the LM741 except that the LM741C has its performance guaranteed over a 0°C to 70°C temperature range, instead of -55°C to 125°C.

### schematic and connection diagrams



TOP VIEW

NOTE: Pin 4 connected to case.

## absolute maximum ratings

Supply Voltage	LM741	±22V
	LM741C	±18V
Power Dissipation (Note 1)		500 mW
Differential Input Voltage		±30V
Input Voltage (Note 2)		±15V
Output Short-Circuit Duration		Indefinite
Operating Temperature Range	LM741	-55°C to 125°C
	LM741C	0°C to 70°C
Storage Temperature Range		-65°C to 150°C
Lead Temperature (Soldering, 10 sec)		300°C

## electrical characteristics (Note 3)

PARAMETER	CONDITIONS	LM741			LM741C			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$T_A = 25^\circ\text{C}$ , $R_S < 10\text{ k}\Omega$		1.0	5.0		1.0	6.0	mV
Input Offset Current	$T_A = 25^\circ\text{C}$		30	200		30	200	nA
Input Bias Current	$T_A = 25^\circ\text{C}$		200	500		200	500	nA
Input Resistance	$T_A = 25^\circ\text{C}$	0.3	1.0		0.3	1.0		M $\Omega$
Supply Current	$T_A = 25^\circ\text{C}$ , $V_S = \pm 15\text{V}$		1.7	2.8		1.7	2.8	mA
Large Signal Voltage Gain	$T_A = 25^\circ\text{C}$ , $V_S = \pm 15\text{V}$ $V_{OUT} = \pm 10\text{V}$ , $R_L > 2\text{ k}\Omega$	50	160		25	160		V/mV
Input Offset Voltage	$R_S < 10\text{ k}\Omega$			6.0			7.5	mV
Input Offset Current				500			300	nA
Input Bias Current				1.5			0.8	$\mu\text{A}$
Large Signal Voltage Gain	$V_S = \pm 15\text{V}$ , $V_{OUT} = \pm 10\text{V}$ $R_L > 2\text{ k}\Omega$	25			15			V/mV
Output Voltage Swing	$V_S = \pm 15\text{V}$ , $R_L = 10\text{ k}\Omega$ $R_L = 2\text{ k}\Omega$	±12 ±10	±14 ±13		±12 ±10	±14 ±13		V V
Input Voltage Range	$V_S = \pm 15\text{V}$	±12			±12			V
Common Mode Rejection Ratio	$R_S < 10\text{ k}\Omega$	70	90		70	90		dB
Supply Voltage Rejection Ratio	$R_S < 10\text{ k}\Omega$	77	96		77	96		dB

**Note 1:** The maximum junction temperature of the LM741 is 150°C, while that of the LM741C 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 case.

**Note 2:** For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

**Note 3:** These specifications apply for  $\pm 15\text{V} \leq V_S \leq \pm 22\text{V}$  and  $-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$ , unless otherwise specified. With the LM741C, however, all specifications are limited to  $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$  and  $\pm 5\text{V} \leq V_S \leq \pm 18\text{V}$ .