Operational Amplifiers

LM747/LM747C dual operational amplifiers

general description

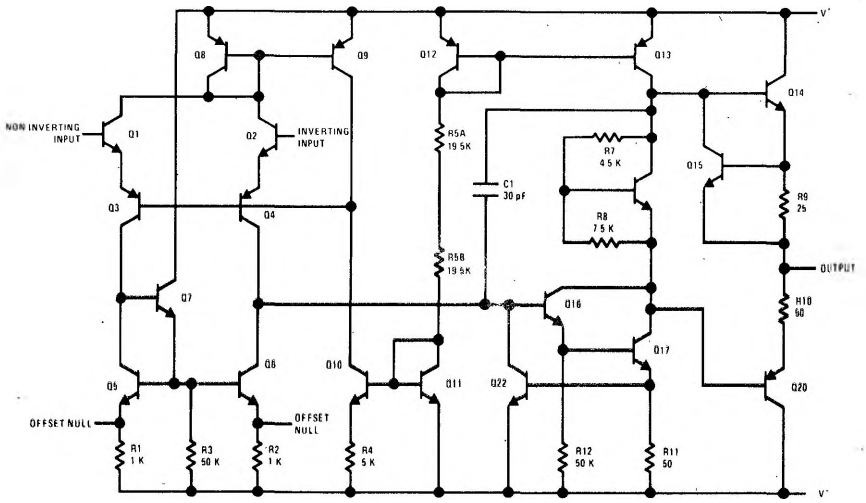
The LM747 and the LM747C are general purpose dual operational amplifiers. The two amplifiers share a common bias network and power supply leads. Otherwise, their operation is completely independent.

Features of the LM747 and LM747C include offset nulling, short circuit protection, internal frequency compensation, wide common mode and differential mode range. Power drain is reduced by sharing bias resistors.

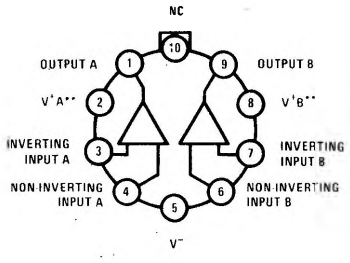
The offset voltage and offset current of the amplifiers are quaranteed over the full common mode range. Additional features of the LM747 and LM747C are: no latch-up when input common mode range is exceeded, freedom from oscillations, and package flexibility.

The LM747C is identical to the LM747 except that the LM747C has its specifications guaranteed over the temperature range from 0°C to 70°C instead of −55°C to +125°C.

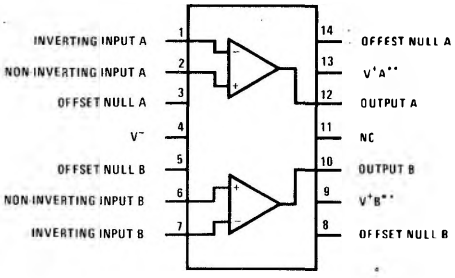
schematic diagram (each amplifier)



connection diagrams



LM747/LM747C



LM747D/LM747CD/LM747CN

**V+A and V+B are internally connected.

absolute maximum ratings

Supply Voltage	LM747	±22V
	LM747C	±18V
Power Dissipation (Note 1)		800 mW
Differential Input Voltage		±30V
Input Voltage (Note 2)		±15V
Output Short-Circuit Duration		Indefinite
Operating Temperature Range	LM747	-55°C to 125°C
	LM747C	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	LM747			LM747C			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$T_A = 25°C$, $R_S < 10\,k\Omega$		1.0	5.0		1.0	6.0	mV
Input Offset Current	$T_A = 25°C$		80	200		80	200	nA
Input Bias Current	$T_A = 25°C$		200	500		200	500	nA
Input Resistance	$T_A = 25°C$	0.3	1.0		0.3	1.0		MΩ
Supply Current Both Amplifiers	$T_A = 25°C$, $V_S = \pm 15V$		3.0	4.0		3.0	4.5	mA
Large Signal Voltage Gain	$T_A = 25°C$, $V_S = \pm 15V$ $V_{OUT} = \pm 10V$, $R_L > 2\,k\Omega$	50	160		50	160		V/mV
Input Offset Voltage	$R_S < 10\,k\Omega$			6.0			7.5	mV
Input Offset Current				500			300	nA
Input Bias Current				1.5			0.8	μA
Large Signal Voltage Gain	$V_S = \pm 15V$, $V_{OUT} = \pm 10V$ $R_L > 2\,k\Omega$	25			25			V/mV
Output Voltage Swing	$V_S = \pm 15V$, $R_L = 10\,k\Omega$	±12	±14		±12	±14		V
	$R_L = 2\,k\Omega$	±10	±13		±10	±13		V
Input Voltage Range	$V_S = \pm 15V$	±12			±12			V
Common Mode Rejection Ratio	$R_S < 10\,k\Omega$	70	90		70	90		dB
Supply Voltage Rejection Ratio	$R_S < 10\,k\Omega$	77	96		77	96		dB

Note 1: The maximum junction temperature of the LM747 is 150°C, while that of the LM747C 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 $\pm 5V \leq V_S \leq \pm 22V$ and $-55°C \leq T_A \leq 125°C$, unless otherwise specified. With the LM747C, however, all specifications are limited to $0°C \leq T_A \leq 70°C$ and $\pm 5V \leq V_S \leq \pm 18V$.