

Dual operational amplifier

μA747C

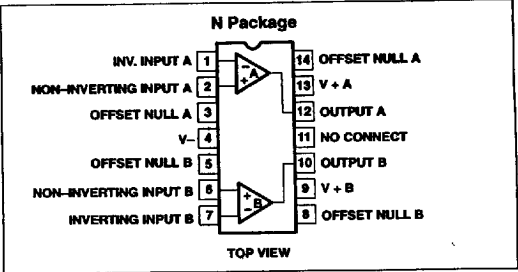
DESCRIPTION

The 747 is a pair of high-performance monolithic operational amplifiers constructed on a single silicon chip. High common-mode voltage range and absence of "latch-up" make the 747 ideal for use as a voltage-follower. The high gain and wide range of operating voltage provides superior performance in integrator, summing amplifier, and general feedback applications. The 747 is short-circuit protected and requires no external components for frequency compensation. The internal 6dB/octave roll-off insures stability in closed-loop applications. For single amplifier performance, see μA741 data sheet.

FEATURES

- No frequency compensation required
- Short-circuit protection
- Offset voltage null capability
- Large common-mode and differential voltage ranges
- Low power consumption
- No latch-up

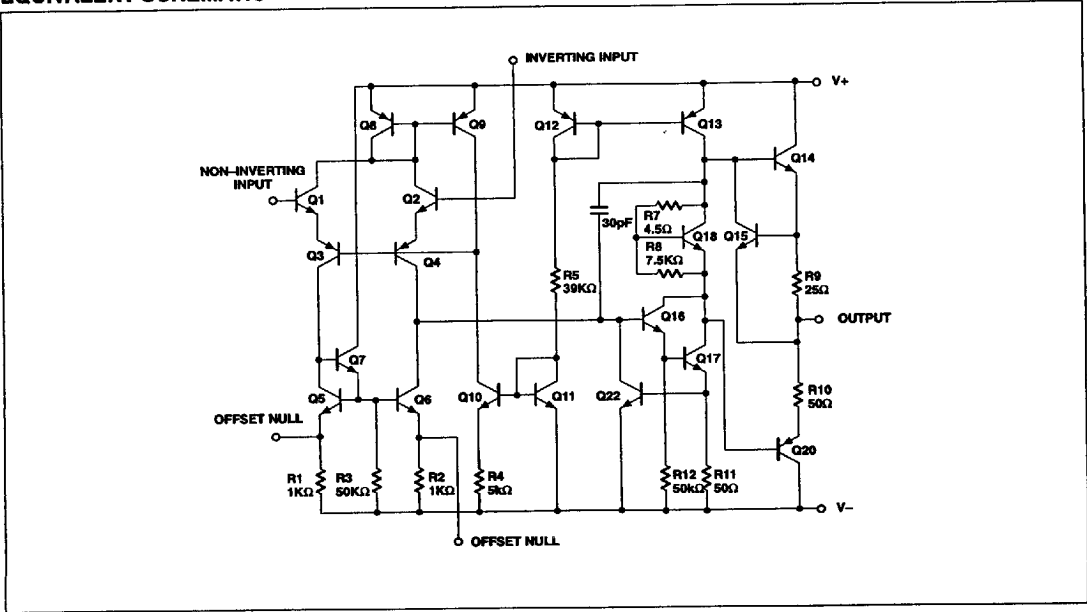
PIN CONFIGURATION



ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
14-Pin Plastic DIP	0°C to 70°C	μA747CN	0405B

EQUIVALENT SCHEMATIC



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ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V_S	Supply voltage	± 18	V
$P_{D\ MAX}$	Maximum power dissipation $T_A=25^\circ\text{C}$ (still air) ¹	1500	mW
V_{IN}	Differential input voltage	± 30	V
V_{IN}	Input voltage ²	± 15	V
	Voltage between offset null and V-	± 0.5	V
T_{STG}	Storage temperature range	-65 to $+150$	$^\circ\text{C}$
T_A	Operating temperature range	0 to $+70$	$^\circ\text{C}$
T_{SOLD}	Lead temperature (soldering, 10sec)	300	$^\circ\text{C}$
I_{SC}	Output short-circuit duration	Indefinite	

NOTES:

- Derate above 25°C at the following rates:
N package at $12\text{mW}/^\circ\text{C}$
- For supply voltages less than $\pm 15\text{V}$, the absolute maximum input voltage is equal to the supply voltage.

DC ELECTRICAL CHARACTERISTICS

 $T_A=25^\circ\text{C}$, $V_{CC}=\pm 15\text{V}$ unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	μA747C			UNIT
			Min	Typ	Max	
V_{OS}	Offset voltage	$R_S \leq 10\text{k}\Omega$		2.0	6.0	mV
		$R_S \leq 10\text{k}\Omega$, over temp.		3.0	7.5	mV
$\Delta V_{OS}/\Delta T$				10		$\mu\text{V}/^\circ\text{C}$
I_{OS}	Offset current			20	200	nA
		Over temperature		7.0	300	nA
$\Delta I_{OS}/\Delta T$				200		$\text{pA}/^\circ\text{C}$
I_{BIAS}	Input current			80	500	nA
		Over temperature		30	800	nA
$\Delta I_B/\Delta T$				1		$\text{nA}/^\circ\text{C}$
V_{OUT}	Output voltage swing	$R_L \geq 2\text{k}\Omega$, over temp.	± 10	± 13		V
		$R_L \geq 10\text{k}\Omega$, over temp.	± 12	± 14		V
I_{CC}	Supply current each side			1.7	2.8	mA
		Over temperature		2.0	3.3	mA
P_d	Power consumption			50	85	mW
		Over temperature		60	100	mW
C_{IN}	Input capacitance			1.4		pF
	Offset voltage adjustment range			± 15		mV
R_{OUT}	Output resistance			75		Ω
	Channel separation			120		dB
PSRR	Supply voltage rejection ratio	$R_S \leq 10\text{k}\Omega$, over temp.		30	150	$\mu\text{V}/\text{V}$
A_{VOL}	Large-signal voltage gain (DC)	$R_L \geq 2\text{k}\Omega$, $V_{OUT}=\pm 10\text{V}$	25,000			V/V
		Over temperature	15,000			V/V
CMRR	Common-mode rejection ratio	$R_S \leq 10\text{k}\Omega$, $V_{CM}=\pm 12\text{V}$	70			dB
		Over temperature				

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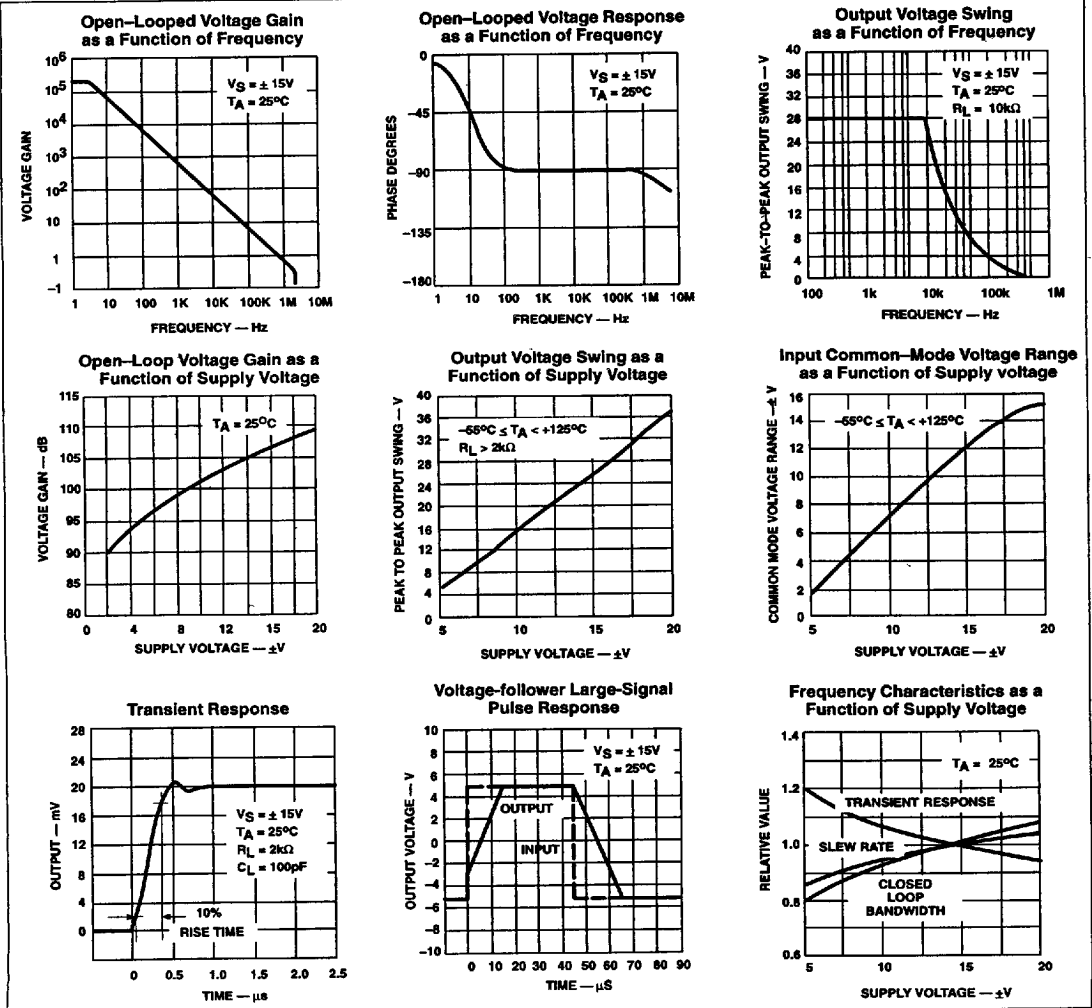
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AC ELECTRICAL CHARACTERISTICS

 $T_A = 25^\circ\text{C}$, $V_S = \pm 15\text{V}$ unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	μA747C			UNIT
			Min	Typ	Max	
t_R	Transient response	$V_{IN} = 20\text{mV}$, $R_L = 2\text{k}\Omega$, $C_L < 100\text{pF}$				
	Rise time	Unity gain $C_L \leq 100\text{pF}$		0.3		μs
	Overshoot	Unity gain $C_L \leq 100\text{pF}$		5.0		%
SR	Slew rate	$R_L > 2\text{k}\Omega$		0.5		$\text{V}/\mu\text{s}$

TYPICAL PERFORMANCE CHARACTERISTICS

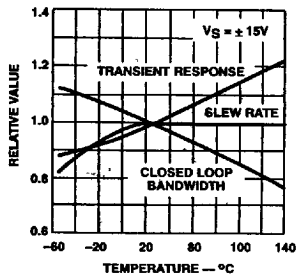


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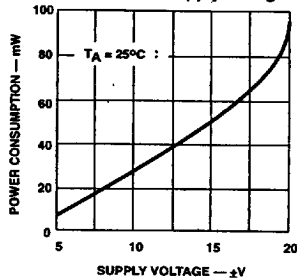
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TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

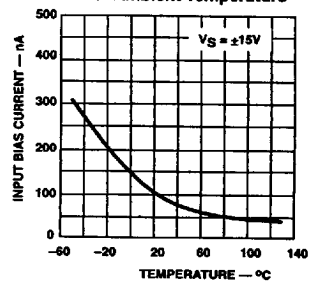
Frequency Characteristics as a Function of Ambient Temperature



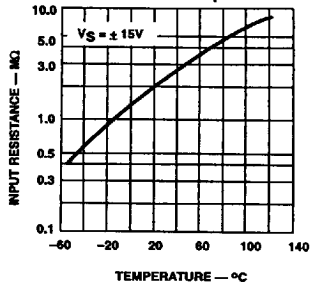
Power Consumption as a Function of Supply Voltage



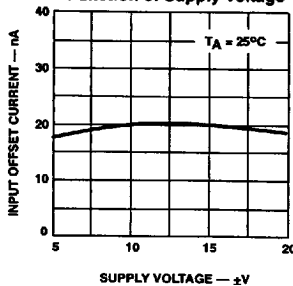
Input Bias Current as a Function of Ambient Temperature



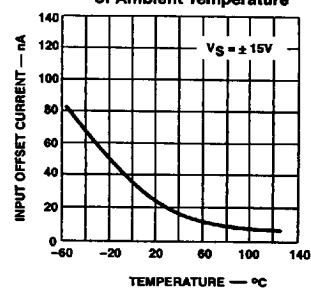
Input Resistance as a Function of Ambient Temperature



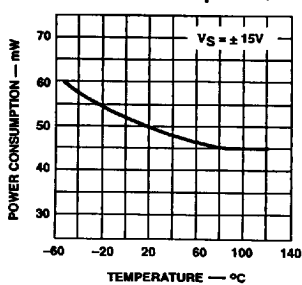
Input Offset Current as a Function of Supply Voltage



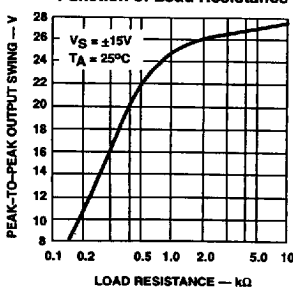
Input Offset Current as a Function of Ambient Temperature



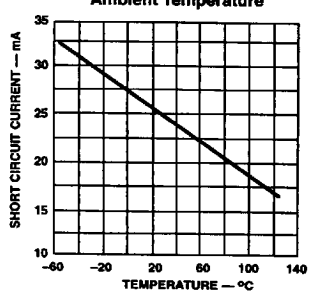
Power Consumption as a Function of Ambient Temperature



Output Voltage Swing as a Function of Load Resistance



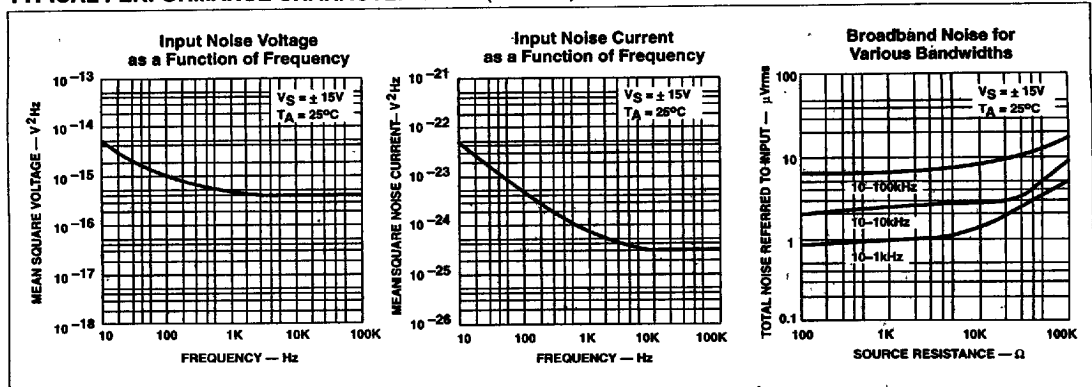
Output Short-Circuit Current as a Function of Ambient Temperature



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TYPICAL PERFORMANCE CHARACTERISTICS (Continued)



TEST CIRCUITS

