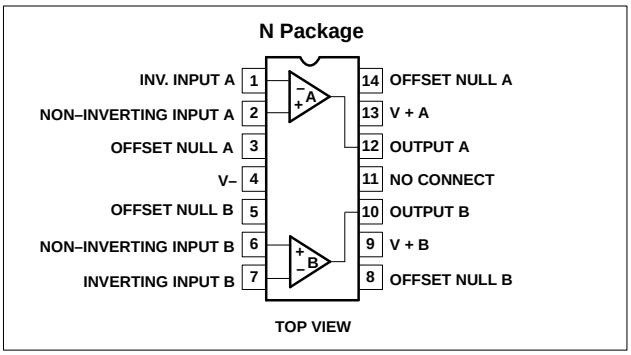
Dual operational amplifier — μA747C

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.

PIN CONFIGURATION



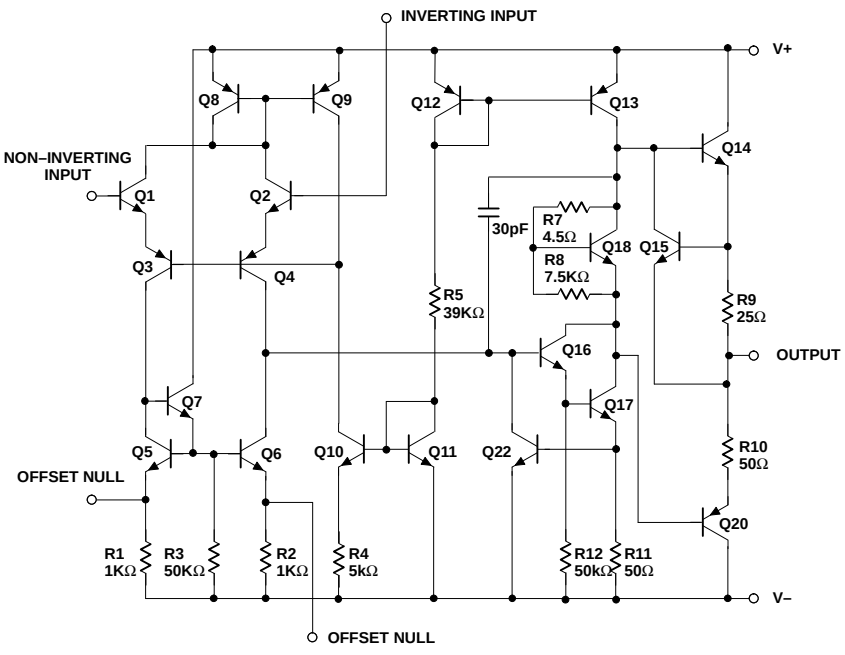
FEATURES

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

ORDERING INFORMATION

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

EQUIVALENT SCHEMATIC



ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V_S	Supply voltage	±18	V
$P_{D\ MAX}$	Maximum power dissipation T_A=25°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	°C
T_A	Operating temperature range	0 to +70	°C
T_{SOLD}	Lead temperature (soldering, 10sec)	300	°C
I_{SC}	Output short-circuit duration	Indefinite	

NOTES:
1. Derate above 25°C at the following rates:
   N package at 12mW/°C
2. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

DC ELECTRICAL CHARACTERISTICS

T_A=25°C, V_{CC} = ±15V unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	μA747C			UNIT
			Min	Typ	Max	
V_{OS}	Offset voltage	R_S≤10kΩ		2.0	6.0	mV
		R_S≤10kΩ, over temp.		3.0	7.5	mV
$\Delta V_{OS}/\Delta T$				10		μV/°C
I_{OS}	Offset current			20	200	nA
		Over temperature		7.0	300	nA
$\Delta I_{OS}/\Delta T$				200		pA/°C
I_{BIAS}	Input current			80	500	nA
		Over temperature		30	800	nA
$\Delta I_B/\Delta T$				1		nA/°C
V_{OUT}	Output voltage swing	R_L≥2kΩ, over temp.	±10	±13		V
		R_L≥10kΩ, 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≤10kΩ, over temp.		30	150	μV/V
A_{VOL}	Large-signal voltage gain (DC)	R_L≥2kΩ, V_{OUT}=±10V	25,000			V/V
		Over temperature	15,000			V/V
CMRR	Common-mode rejection ratio	R_S≤10kΩ, V_{CM}=±12V Over temperature	70			dB

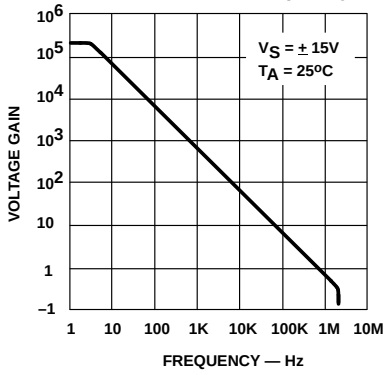
AC ELECTRICAL CHARACTERISTICS

T_A=25°C, V_S = ±15V unless otherwise specified.

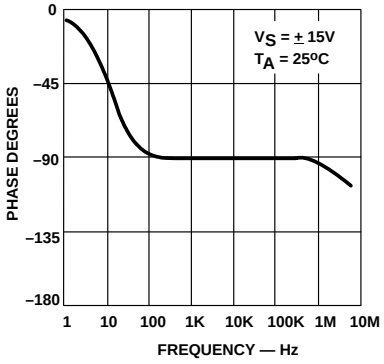
SYMBOL	PARAMETER	TEST CONDITIONS	μA747C			UNIT
			Min	Typ	Max	
	Transient response	V_{IN}=20mV, R_L=2kΩ, C_L<100pF				
t_R	Rise time	Unity gain C_L≤100pF		0.3		μs
	Overshoot	Unity gain C_L≤100pF		5.0		%
SR	Slew rate	R_L>2kΩ		0.5		V/μs

TYPICAL PERFORMANCE CHARACTERISTICS

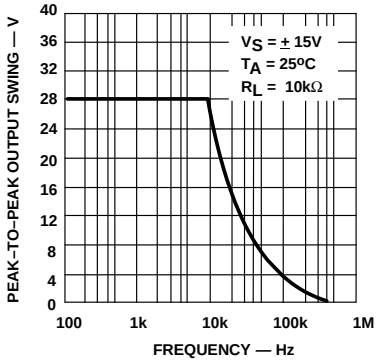
Open–Looped Voltage Gain as a Function of Frequency



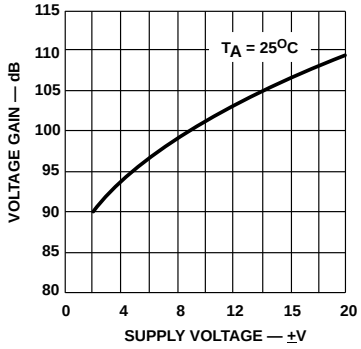
Open–Looped Voltage Response as a Function of Frequency



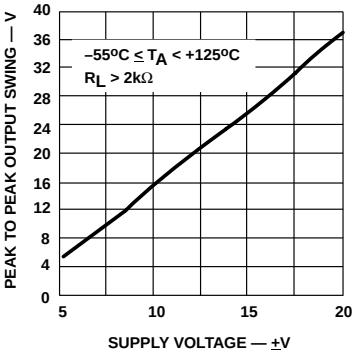
Output Voltage Swing as a Function of Frequency



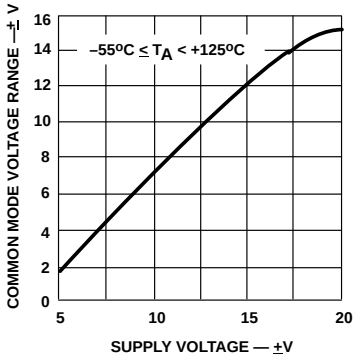
Open–Loop Voltage Gain as a Function of Supply Voltage



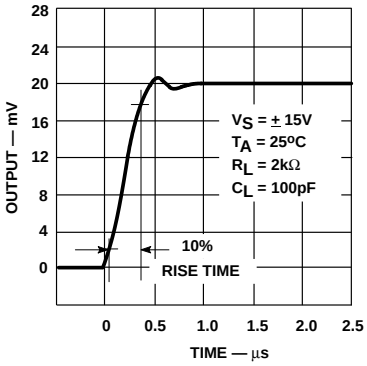
Output Voltage Swing as a Function of Supply Voltage



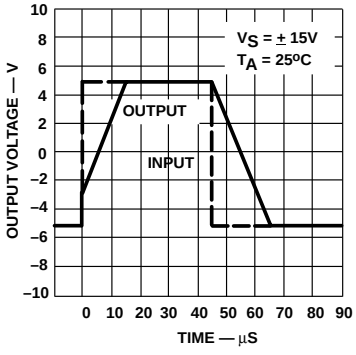
Input Common–Mode Voltage Range as a Function of Supply voltage



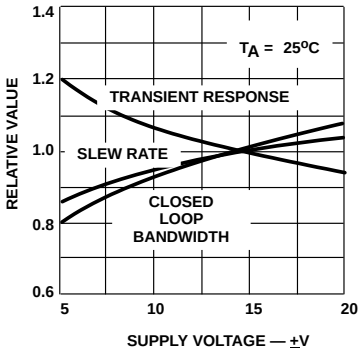
Transient Response



Voltage-follower Large-Signal Pulse Response

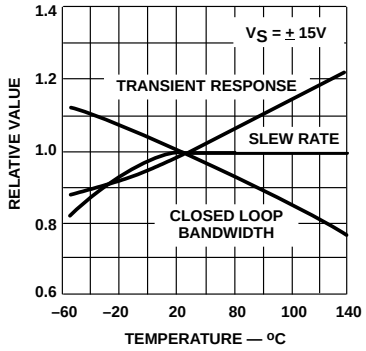


Frequency Characteristics as a Function of Supply Voltage

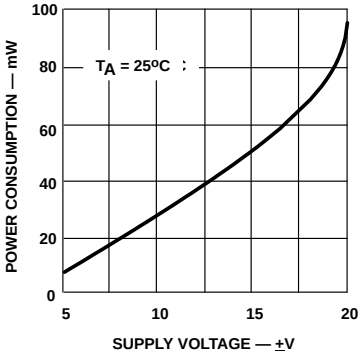


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

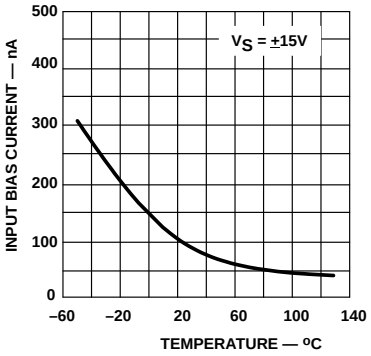
Frequency Characteristics as a Function of Ambient Temperature



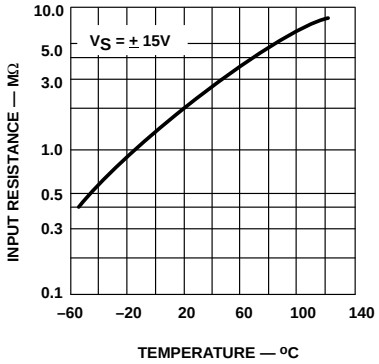
Power Consumption as a Function of Supply Voltage



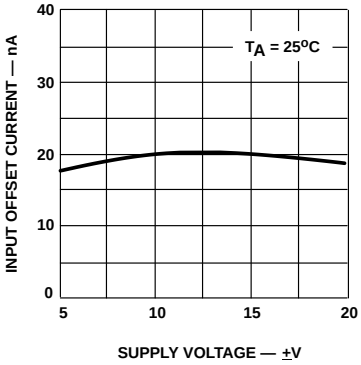
Input Bias Current as a Function of Ambient Temperature



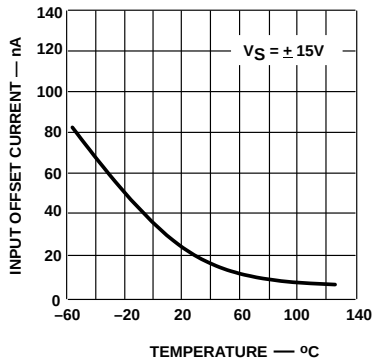
Input Resistance as a Function of Ambient Temperature



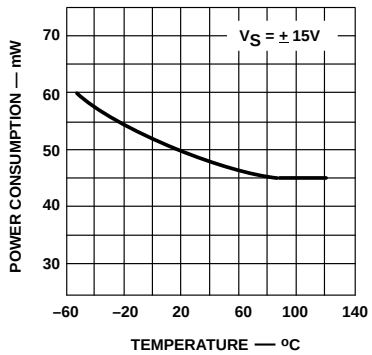
Input Offset Current as a Function of Supply Voltage



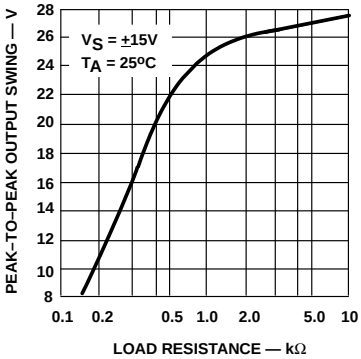
Input Offset Current as a Function of Ambient Temperature



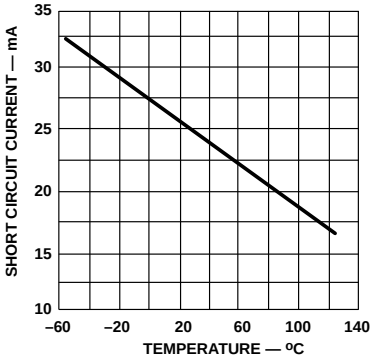
Power Consumption as a Function of Ambient Temperature



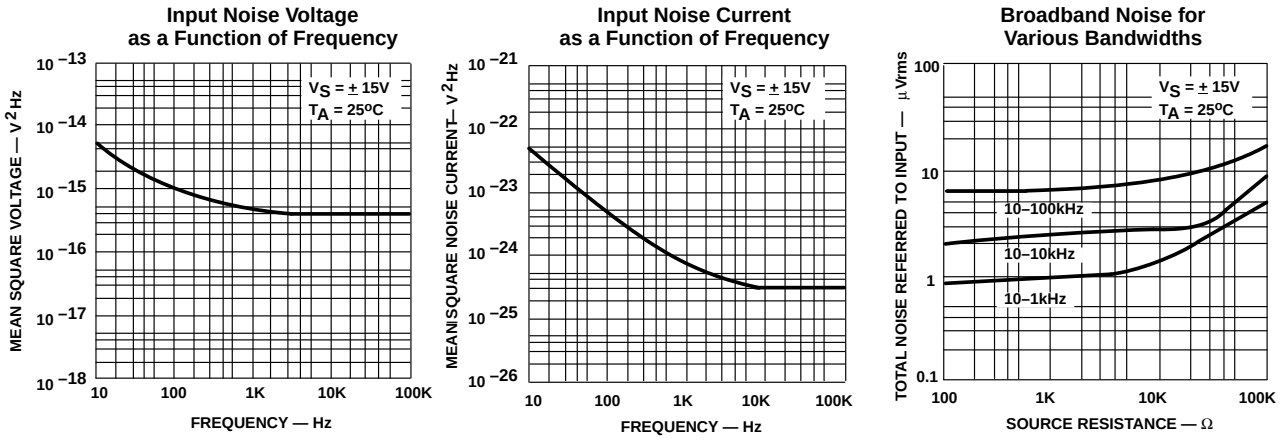
Output Voltage Swing as a Function of Load Resistance



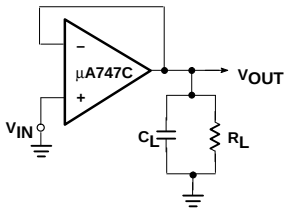
Output Short–Circuit Current as a Function of Ambient Temperature



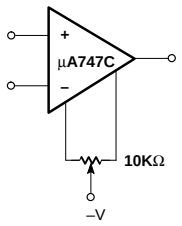
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)



TEST CIRCUITS



Transient Response Test Circuit



Voltage Offset Null Circuit