DESCRIPTION

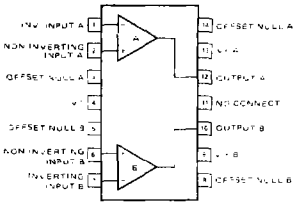
The 747 is a pair of high performance monolithic operational amplifiers constructed on a single silicon chip. High common mode voltage range and absence of "latch-up" make the 747 ideal for use as a voltage follower. The high gain and wide range of operating voltage provides superior performance in integrator, 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**
- **μA747, SA747C Mil std 883A,B,C available**

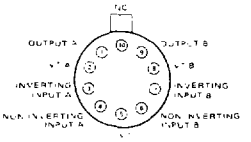
PIN CONFIGURATIONS

F/N PACKAGE



ORDER PART NO.
μA747CN, μA747CF, μA747N,
μA747F, SA747CN, SA747CF

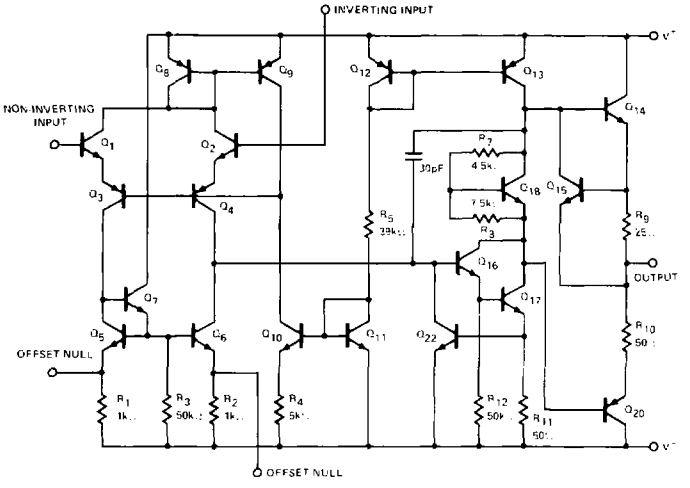
K PACKAGE



ORDER PART NO.
μA747CK, μA747K

EQUIVALENT SCHEMATIC

EQUIVALENT CIRCUIT (EACH SIDE)



ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNIT
Supply voltage		
μA747	±22	V
μA747C	±18	V
SA747C	±18	V
Internal power dissipation		
Metal can	500	mW
DIP	670	mW
Differential input voltage	±30	V
Input voltage	±15	V
Voltage between offset null and V-	±0.5	V
Storage temperature range	-65 to +155	°C
Operating temperature range		
μA747	-55 to +125	°C
μA747C	0 to +70	°C
SA747C	-40 to +85	°C
Lead temperature (soldering, 60 sec)	300	°C
Output short-circuit duration	indefinite	

DC ELECTRICAL CHARACTERISTICS

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

	PARAMETER	TEST CONDITIONS	μA747			μA747C			UNIT
			Min	Typ	Max	Min	Typ	Max	
V_{OS}	Offset voltage	$R_S \leq 10k\Omega$		2.0	5.0		2.0	6.0	mV
V_{OS}	Offset voltage	$R_S \leq 10k\Omega$, over temp		3.0	6.0		3.0	7.5	mV
I_{OS}	Offset current			20	200		20	200	nA
I_{OS}	Offset current	T_A = +125°C		7.0	200				nA
I_{OS}	Offset current	T_A = -55°C		85	500				nA
I_{OS}	Offset current	Over temp					7.0	300	nA
I_{BIAS}	Input current			80	500		80	500	nA
I_{BIAS}	Input current	T_A = 125°C		30	500				nA
I_{BIAS}	Input current	T_A = -55°C		300	1500				nA
I_{BIAS}	Input current	Over temp					30	800	nA
V_{OUT}	Output voltage swing	$R_L \geq 2k\Omega$, over temp	±10	±13		±10	±13		V
		$R_L \geq 10k\Omega$, over temp	±12	±14		±12	±14		V
I_{CC}	Supply current			1.7	2.8		1.7	2.8	mA
		T_A = 125°C		1.5	2.5				mA
		T_A = -55°C		2.0	3.3				mA
		Over temp					2.0	3.3	mA
	Power consumption			50	85		50	85	mW
		T_A = 125°C		45	75				mW
		T_A = -55°C		60	100				mW
		Over temp					60	100	mW
	Input capacitance			1.4			1.4		pF
	Offset voltage adjustment range			±15			±15		V
	Output resistance			75			75		Ω
	Channel separation			120			120		dB
P_{SRR}	Supply voltage rejection ratio	$R_S \leq 10k\Omega$, over temp		30	150		30	150	μV/V
A_{VOL}	Large signal voltage gain (DC)	$R_L \geq 2k\Omega$ V_{OUT} = ±10V	50,000			25,000			V/V

DC ELECTRICAL CHARACTERISTICS $T_A = 25°C$, $V_S = \pm 15V$ unless otherwise specified.

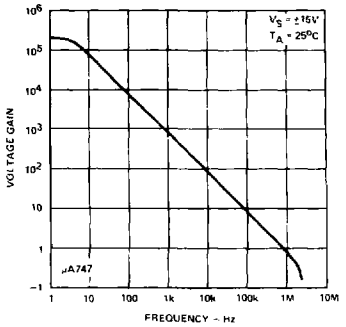
PARAMETER		TEST CONDITIONS	SA747C			UNIT
			Min	Typ	Max	
V_{OS}	Offset voltage	$R_S \leq 10k\Omega$		2.0	6.0	mV
V_{OS}	Offset voltage	$R_S \leq 10k\Omega$, over temp		3.0	7.5	mV
I_{OS}	Offset current			20	200	nA
I_{OS}	Offset current	Over temp			500	nA
I_{BIAS}	Input current				1500	nA
I_{BIAS}	Input current	Over temp			500	nA
V_{OUT}	Output voltage swing	$R_L \geq 2k\Omega$, over temp	±10	±13		V
		$R_L \geq 10k\Omega$, over temp	±12	±14		V
I_{CC}	Supply current			1.7	2.8	mA
		Over temp		2.0	3.3	mA
	Power consumption			50	85	mW
		Over temp		60	100	mW
	Input capacitance			1.4		pF
	Offset voltage adjustment range			±15		V
	Output resistance			75		Ω
	Channel separation			120		dB
P_{SRR}	Supply voltage rejection ratio	$R_S \leq 10k\Omega$, over temp		30	150	μV/V
	Large signal voltage gain (DC)	$R_L \geq 2k\Omega$ $V_{OUT} = \pm 10V$	25,000			V/V

AC ELECTRICAL CHARACTERISTICS $T_A = 25°C$, $V_S = \pm 15V$ unless otherwise specified.

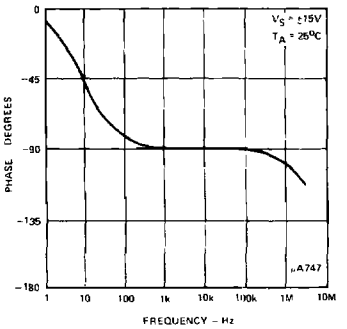
PARAMETER	TEST CONDITIONS	μA747/μA747C/SA747C			UNIT
		Min	Typ	Max	
Transient response	$V_{IN} = 20mV$, $R_1 = 2k\Omega$, $C_1 < 100pf$				
Risetime	Unity gain CL ≤ 100pf		0.3		μs
Overshoot	Unity gain CL ≤ 100pf		5.0		%
Slew rate	RL > 2kΩ		0.5		V/μs

TYPICAL PERFORMANCE CHARACTERISTICS

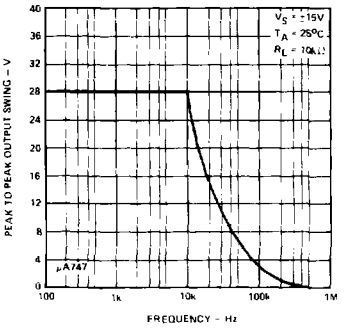
OPEN LOOP VOLTAGE GAIN AS A FUNCTION OF FREQUENCY



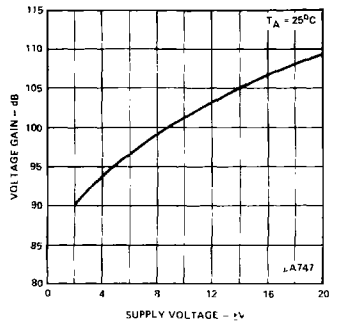
OPEN LOOP PHASE RESPONSE AS A FUNCTION OF FREQUENCY



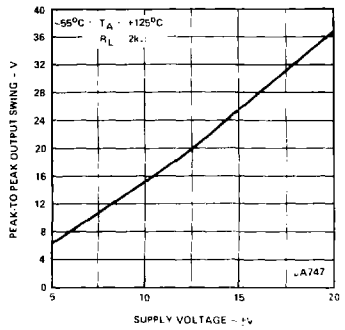
OUTPUT VOLTAGE SWING AS A FUNCTION OF FREQUENCY



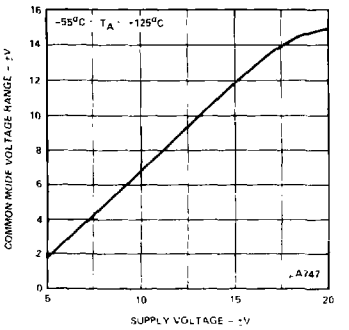
OPEN LOOP VOLTAGE GAIN AS A FUNCTION OF SUPPLY VOLTAGE



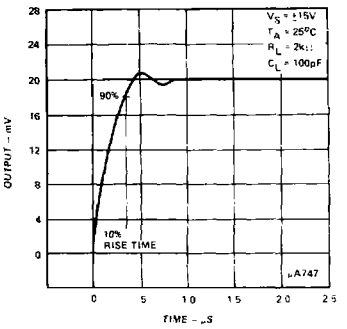
OUTPUT VOLTAGE SWING AS A FUNCTION OF SUPPLY VOLTAGE



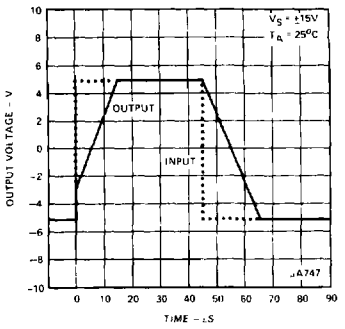
INPUT COMMON MODE VOLTAGE RANGE AS A FUNCTION OF SUPPLY VOLTAGE



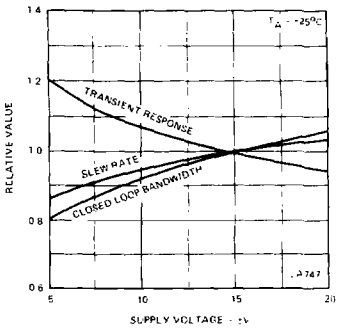
TRANSIENT RESPONSE



VOLTAGE FOLLOWER LARGE SIGNAL PULSE RESPONSE

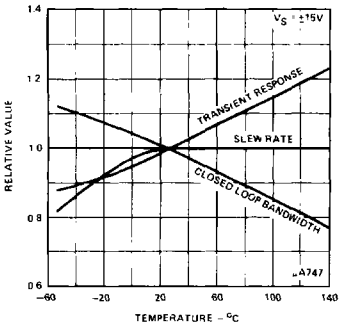


FREQUENCY CHARACTERISTICS AS A FUNCTION OF SUPPLY VOLTAGE

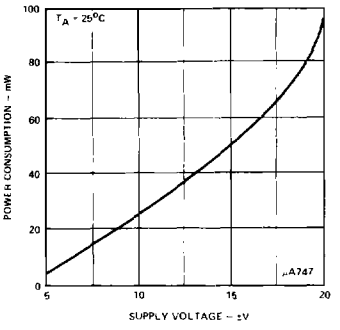


TYPICAL PERFORMANCE CHARACTERISTICS (Cont'd)

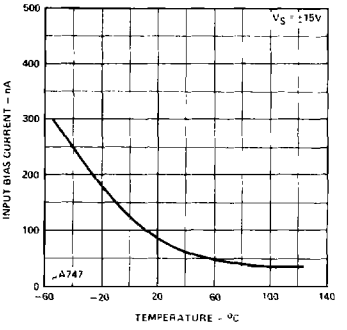
FREQUENCY CHARACTERISTICS AS A FUNCTION OF AMBIENT TEMPERATURE



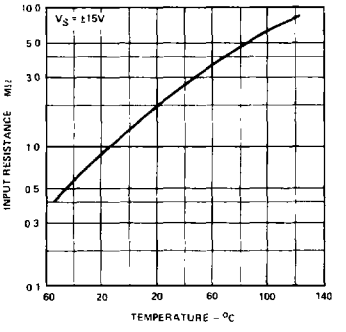
POWER CONSUMPTION AS A FUNCTION OF SUPPLY VOLTAGE



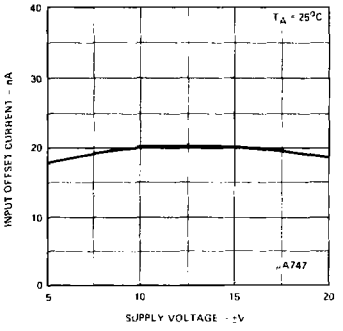
INPUT BIAS CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



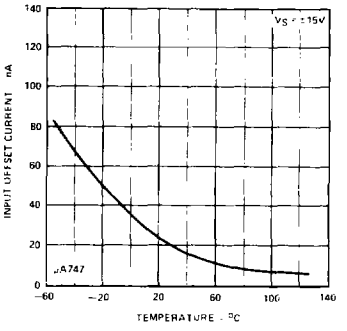
INPUT RESISTANCE AS A FUNCTION OF AMBIENT TEMPERATURE



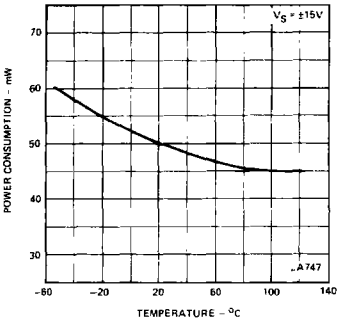
INPUT OFFSET CURRENT AS A FUNCTION OF SUPPLY VOLTAGE



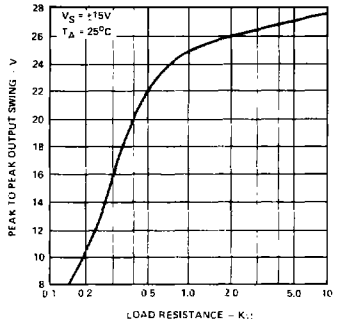
INPUT OFFSET CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



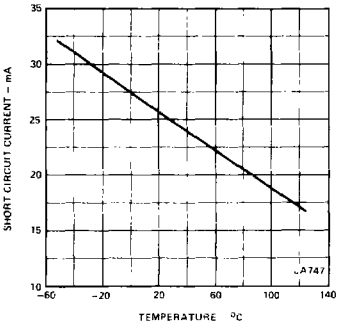
POWER CONSUMPTION AS A FUNCTION OF AMBIENT TEMPERATURE



OUTPUT VOLTAGE SWING AS A FUNCTION OF LOAD RESISTANCE

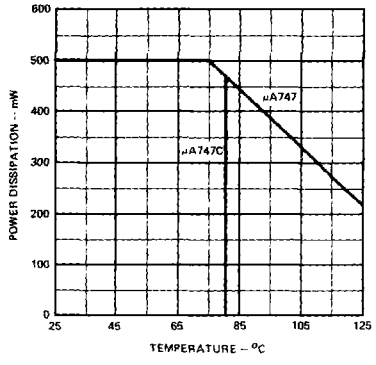


OUTPUT SHORT-CIRCUIT CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE

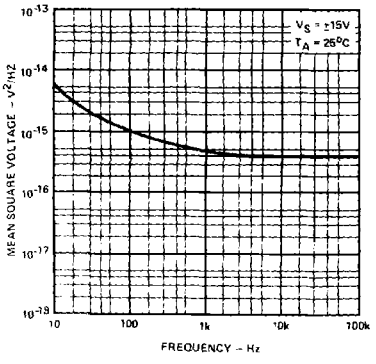


TYPICAL PERFORMANCE CHARACTERISTICS (Cont'd)

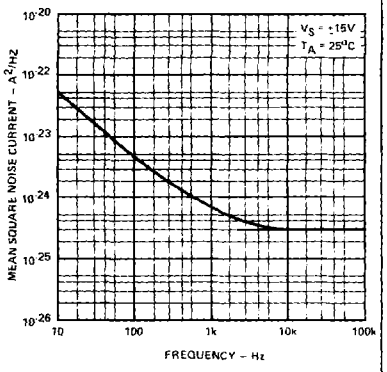
ABSOLUTE MAXIMUM POWER DISSIPATION AS A FUNCTION OF AMBIENT TEMPERATURE



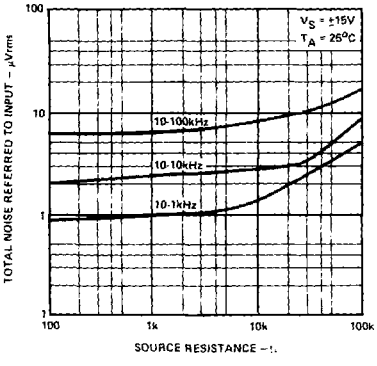
INPUT NOISE VOLTAGE AS A FUNCTION OF FREQUENCY



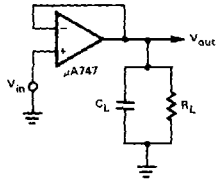
INPUT NOISE CURRENT AS A FUNCTION OF FREQUENCY



BROADBAND NOISE FOR VARIOUS BANDWIDTHS



TRANSIENT RESPONSE TEST CIRCUIT



VOLTAGE OFFSET NULL CIRCUIT