

### GENERAL PURPOSE SINGLE OP-AMPS

The UA748 is a general-purpose operational amplifier built on a single silicon chip. The resulting close match and tight thermal coupling gives low offsets and temperature drift as well as fast recovery from thermal transients.

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

The unity-gain compensation specified makes the circuit stable for all feedback configurations, even with capacitive loads. However, it is possible to optimize compensation for best high frequency performance at any gain. As a comparator the output can be clamped at any desired level to make it compatible with logic circuits. Further, the low power dissipation permits high voltage operation and simplifies packaging in full-temperature range systems.

- Frequency compensation with a single 30 pF capacitor.
- Operation from  $\pm 5$  V to  $\pm 15$  V.
- Low power consumption : 50 mW at  $\pm 15$  V.
- Continuous short-circuit protection.
- Operation as a comparator with differential inputs as high as  $\pm 30$  V.
- No latch-up when common-mode range is exceeded.
- Same pin configuration as the LM101A.

### ORDERING INFORMATION

Hi-Rel versions available - See chapter 14

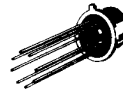
PART NUMBER	TEMPERATURE RANGE	PACKAGE			
		H	DP	GC	FP
UA748C	0°C to + 70°C	•	•		•
UA748M	-55°C to + 125°C	•		•	

Examples : UA748CH, UA748MGC

### GENERAL PURPOSE SINGLE OP-AMPS

#### CASES

CB-11



H SUFFIX  
METAL CAN

CB-98



DP SUFFIX  
PLASTIC PACKAGE  
DG SUFFIX  
CERDIP PACKAGE

CB-342



FP SUFFIX  
PLASTIC  
MICROPACKAGE

CB-705

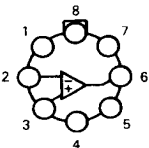


GC SUFFIX  
TRICEOP (LCC)

### PIN ASSIGNMENTS

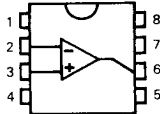
(Top views)

CB-11



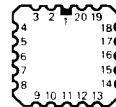
- 1 - Offset null frequency compensation
- 2 - Inverting input
- 3 - Non-inverting input
- 4 -  $V_{CC}$

CB-98  
CB-342



- 5 - Offset null
- 6 - Output
- 7 -  $V_{CC}$
- 8 - Frequency compensation

CB-705



- 1 - NC
- 2 - Offset null frequency compensation
- 3 - NC
- 4 - NC
- 5 - Inverting input
- 6 - NC
- 7 - Non-inverting input
- 8 - NC
- 9 - NC
- 10 -  $V_{CC}$
- 11 - NC
- 12 - Offset null
- 13 - NC
- 14 - NC
- 15 - Output
- 16 - NC
- 17 -  $V_{CC}$
- 18 - NC
- 19 - NC
- 20 - Frequency compensation

### THOMSON SEMICONDUCTORS

Sales headquarters  
45 av. de l'Europe 78140 VELIZY, FRANCE  
Tel. (31) 946 97 19 - Telex 204780 F

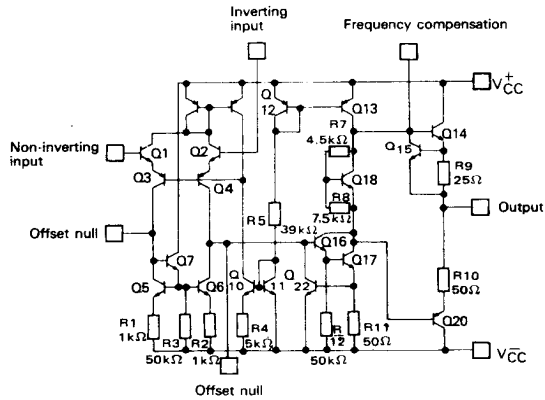
279

**THOMSON**  
COMPONENTS

**MAXIMUM RATINGS**

Rating	Symbol	UA748C	UA748M	Unit
Supply voltage	$V_{CC}$	$\pm 18$	$\pm 22$	V
Differential input voltage	$V_{ID}$	$\pm 30$	$\pm 30$	V
Input voltage	$V_I$	$\pm 15$	$\pm 15$	V
Output short-circuit duration		Indefinite	Indefinite	—
Power dissipation	$P_{tot}$	500 665	500 —	mW
	UA748GC			
Operating free-air temperature range	$T_{oper}$	0 to + 70	-55 to +125	$^{\circ}C$
Storage temperature range	$T_{stg}$			$^{\circ}C$
	CB-11 CB-98, CB-342	-65 to +150 -55 to +125	-65 to +150 -55 to +125	

**SCHEMATIC DIAGRAM**



CASE	Offset null	Non-inverting input	Inverting input	$V_{CC}$	$V_{CC}^+$	Output	Frequency Comp.	Off. null Freq. comp.	N.C.
CB-11/CB-98 CB-342	5	3	2	4	7	6	8	1	—
CB-706*	12	7	5	10	17	15	20	2	*

\* CB-706 : Other pins are not connected

**ELECTRICAL CHARACTERISTICS**

VCC = ± 15 V, C1 = 30 pF

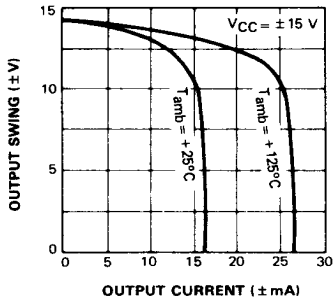
UA748M : - 55°C ≤ Tamb ≤ + 125°C

UA748C : 0°C ≤ Tamb ≤ + 70°C

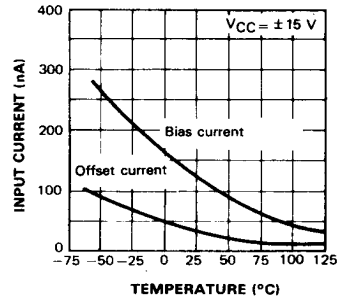
(Unless otherwise specified)

Characteristic	Symbol	UA748C			UA748M			Unit
		Min	Typ	Max	Min	Typ	Max	
Input offset voltage (RS ≤ 10 kΩ) Tamb = + 25°C Tmin ≤ Tamb ≤ Tmax	VIO	-	2	6 7.5	-	1	5 6	mV
Input offset current Tamb = + 25°C Tamb = + 125°C Tamb = - 55°C Tmin ≤ Tamb ≤ Tmax	IIO	-	20	200	-	20	200 200 500	nA
Input bias current Tamb = + 25°C Tamb = + 125°C Tamb = - 55°C Tmin ≤ Tamb ≤ Tmax	IIB	-	80	500	-	80	500 500 1500	nA
Large signal voltage gain (VCC = ± 15 V, RL ≥ 2 kΩ, VO = ± 10 V) Tamb = + 25°C Tmin ≤ Tamb ≤ Tmax	AVD	20 15	150	-	50 25	150	-	V/mV
Supply voltage rejection ratio (RS ≤ 10 kΩ)	SVR	-	30	150	-	30	150	μV/V
Supply current Tamb = + 25°C Tamb = + 125°C Tamb = - 55°C Tmin ≤ Tamb ≤ Tmax	I <sub>CC</sub> <sup>+</sup> , I <sub>CC</sub> <sup>-</sup>	-	1.9	2.8	-	1.8	2.8 2.5 3.3	mA
Input voltage range	VI	± 12	± 13	-	± 12	-	-	V
Common-mode rejection ratio (RS ≤ 10 kΩ)	CMR	70	90	-	70	90	-	dB
Output voltage swing RL ≥ 10 kΩ RL ≥ 2 kΩ	VOPP	± 12 ± 10	± 14 ± 13	-	± 12 ± 10	± 14 ± 13	-	V
Slow rate (Tamb = + 25°C, RL ≥ 2 kΩ, Unity gain)	SVO	-	0.5	-	-	0.5	-	V/μs
Rise time (ei = + 20 mV, CL ≤ 100 pF, RL = 2 kΩ, Tamb = + 25°C, Unity gain)	tr	-	0.3	-	-	0.3	-	μs
Overshoot factor (ei = + 20 mV, CL ≤ 100 pF, RL = 2 kΩ, Tamb = + 25°C, Unity gain)	KOV	-	5	-	-	5	-	%
Output resistance (Tamb = + 25°C)	RO	-	75	-	-	75	-	Ω
Input resistance (Tamb = + 25°C)	RI	0.3	2	-	0.3	2	-	MΩ

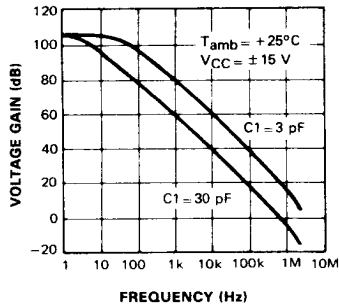
CURRENT LIMITING



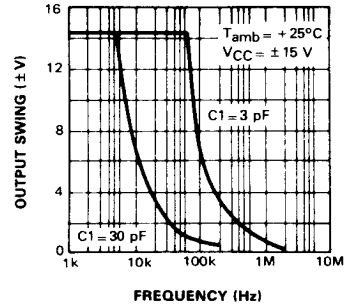
INPUT CURRENT



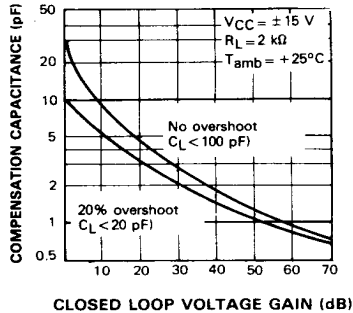
OPEN LOOP FREQUENCY RESPONSE



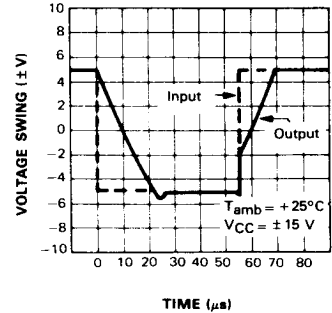
LARGE SIGNAL FREQUENCY RESPONSE

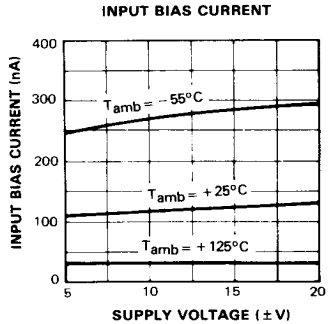
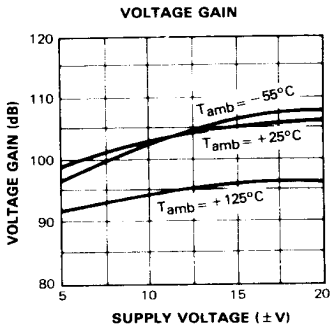
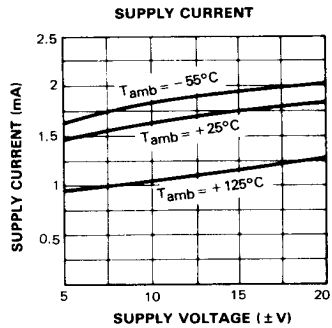
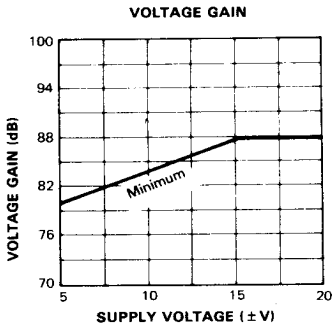
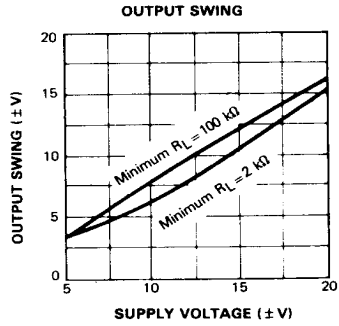
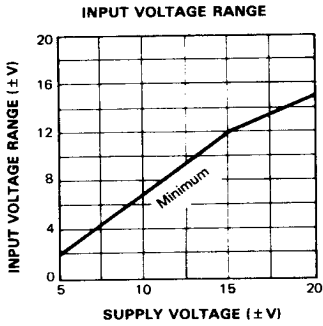


FREQUENCY COMPENSATION



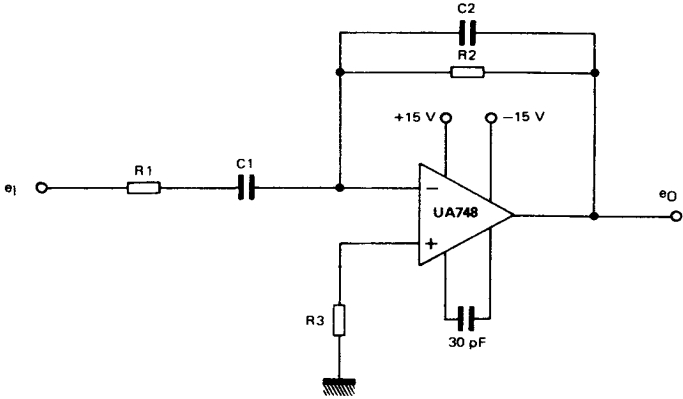
VOLTAGE FOLLOWER PULSE RESPONSE



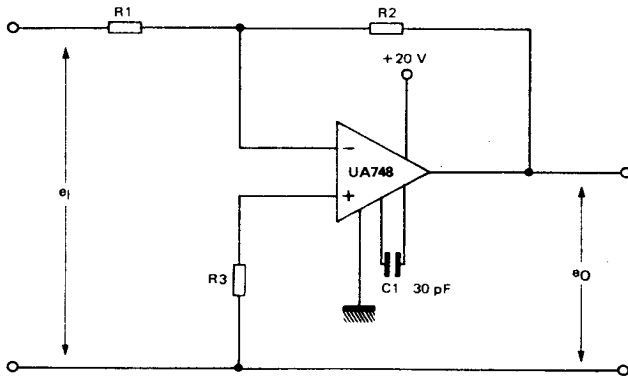


TYPICAL APPLICATIONS

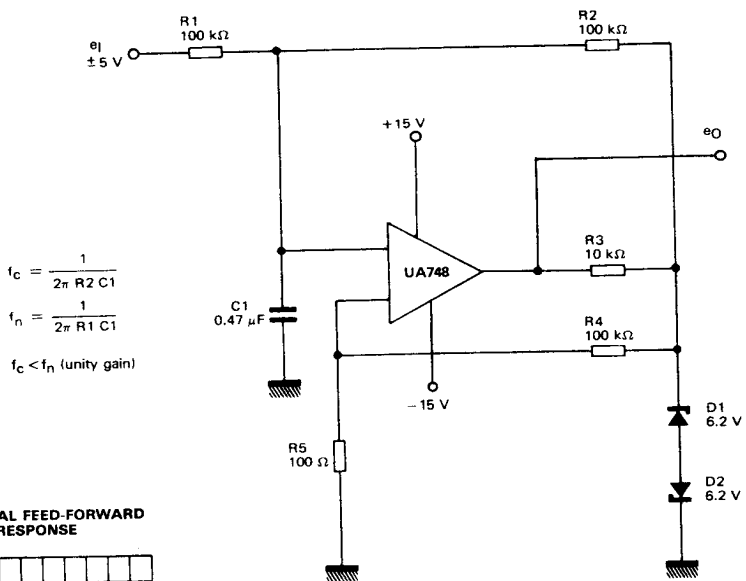
PRACTICAL DIFFERENTIATOR



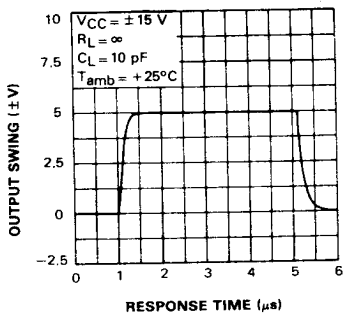
SINGLE SUPPLY OPERATION



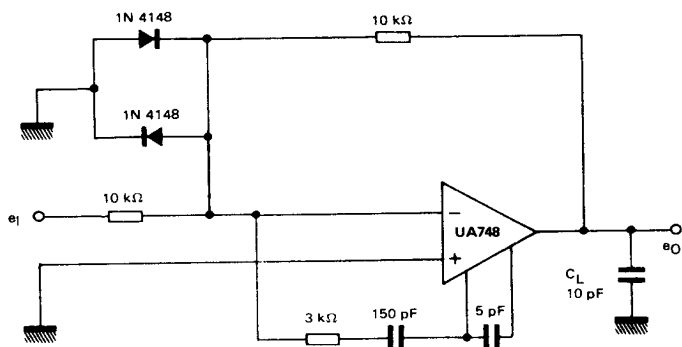
PULSE WIDTH MODULATOR

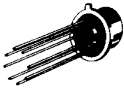
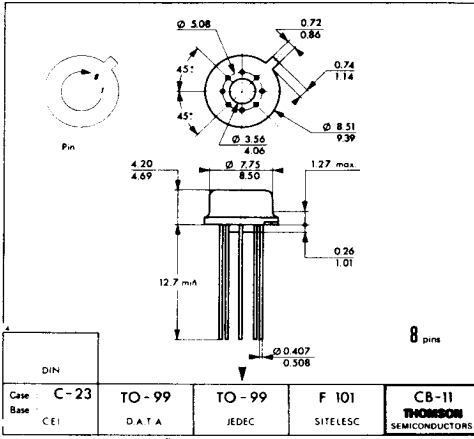


LARGE SIGNAL FEED-FORWARD TRANSIENT RESPONSE

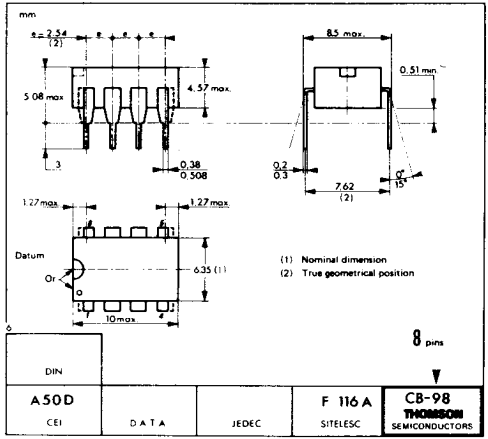


FEED-FORWARD COMPENSATION

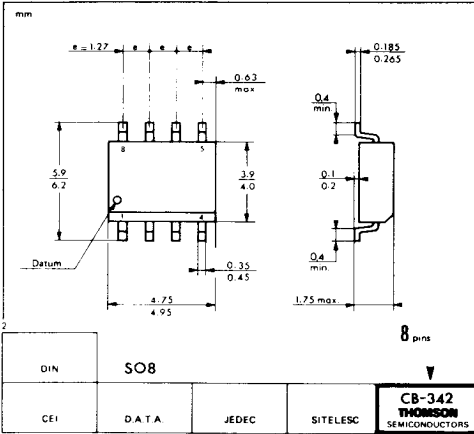




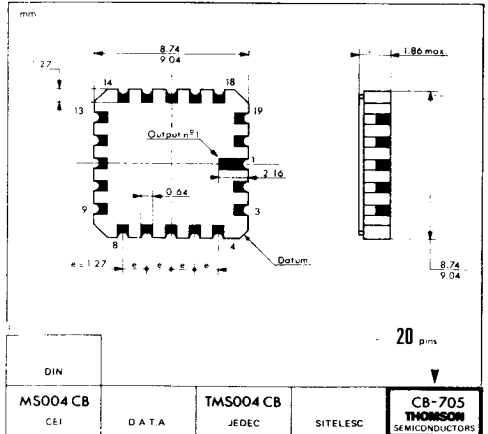
CB-11  
H SUFFIX  
METAL CAN



CB-98  
DP SUFFIX  
PLASTIC PACKAGE  
DG SUFFIX  
CERDIP PACKAGE



CB-342  
FP SUFFIX  
PLASTIC  
MICROPACKAGE



CB-705  
GC SUFFIX  
TRICOP (LCC)

These specifications are subject to change without notice.  
Please inquire with our sales offices about the availability of the different packages.