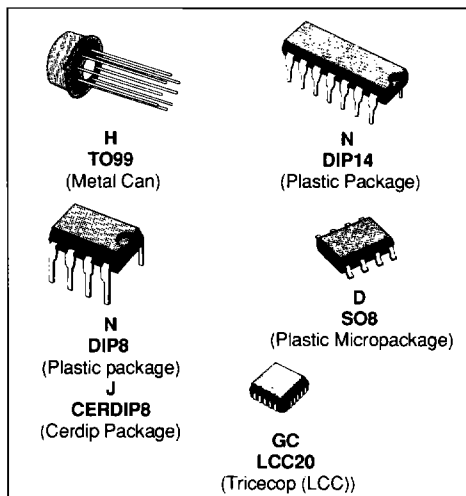


GENERAL-PURPOSE SINGLE OP-AMPS

- LARGE INPUT VOLTAGE RANGE
- NO LATCH-UP
- HIGH GAIN
- SHORT-CIRCUIT PROTECTION
- NO FREQUENCY COMPENSATION REQUIRED
- SAME PIN CONFIGURATION AS THE UA709


DESCRIPTION

The UA741 is a high performance monolithic operational constructed on a single silicon chip. It is intended for a wide range of analog applications.

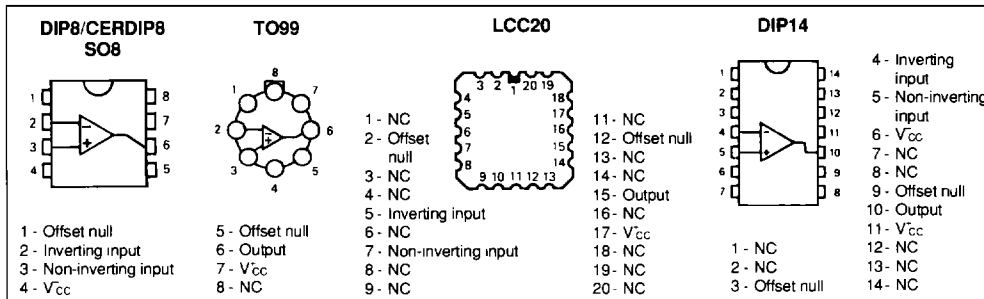
- Summing amplifier
- Voltage follower
- Integrator
- Active filter
- Function generator.

The high gain and wide range of operating voltages provides superior performance integrator, summing amplifier, and general feedback applications. the internal compensation network (6 dB/octave) insures stability in closed loop applications.

ORDER CODES

Part Number	Temperature Range	Package					
		H	J	GC	N	N 14	D
UA741C/E	0 °C to + 70 °C	•	•		•	•	•
UA741I	-40 °C to + 105 °C	•			•	•	
UA741M/A	-55 °C to + 125 °C	•	•	•			

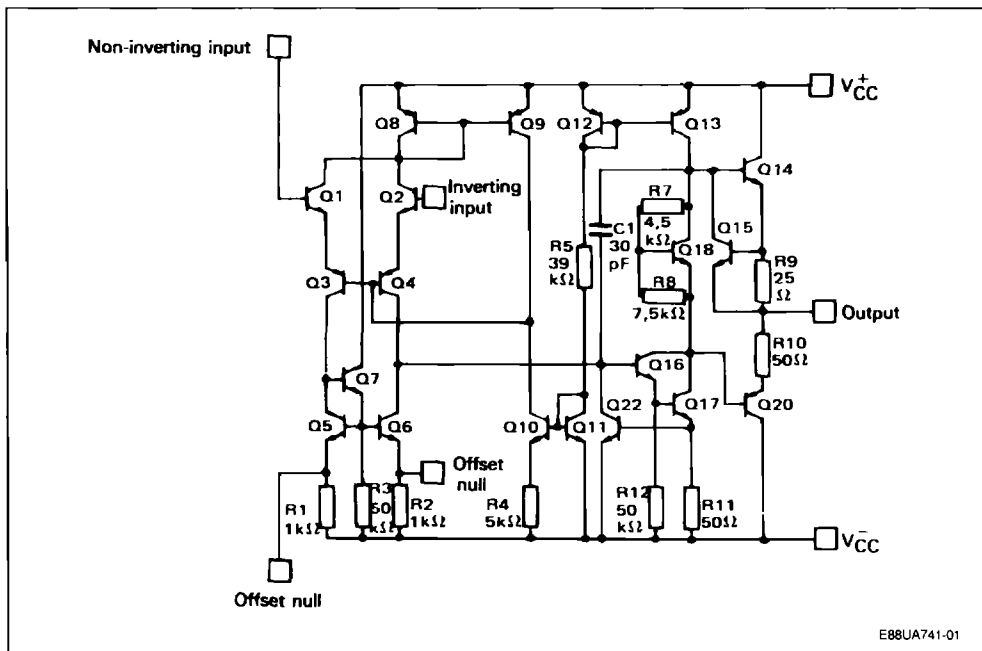
Note : Hi-Rel Versions Available
Examples : UA741CN, UA741IH

PIN CONNECTIONS (top views)


ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		UA741M, A	UA741I	UA741C, E	
V _{CC}	Supply Voltage	± 22	± 22	± 22	V
V _i	Input Voltage	± 15	± 15	± 15	V
V _{id}	Differential Input Voltage	± 30	± 30	± 30	V
P _{tot}	Power Dissipation	500	500	500	mW
	Output Short-circuit Duration	Infinite			
T _{oper}	Operating Free-air Temperature Range	- 55 to + 125	- 40 to + 105	0 to + 70	°C
T _{stg}	Storage Temperature Range	- 65 to 150	- 65 to 150	- 65 to 150	°C

SCHEMATIC DIAGRAM



E88UA741-01

Case	Offset Null	Inverting Input	Non-inverting Input	V _{CC}	V _{CC}	Output	N.C.
TO99/DIP8/CERDIP8/SO8	1, 5	2	3	4	7	6	8
DIP14	3, 9	4	5	6	11	10	*
LCC20	2, 12	5	7	10	17	15	*

* TO116, LCC20 : Other pins are not connected.

ELECTRICAL CHARACTERISTICS

UA741M/A : - 55 °C ≤ T_{amb} ≤ + 125 °C, V_{CC} = ± 15 V

UA741I : - 40 °C ≤ T_{amb} ≤ + 105 °C, V_{CC} = ± 15 V

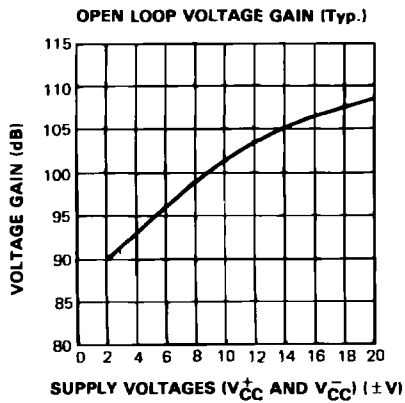
UA741C/E : 0 °C ≤ T_{amb} ≤ + 70 °C, V_{CC} = ± 15 V

(unless otherwise specified)

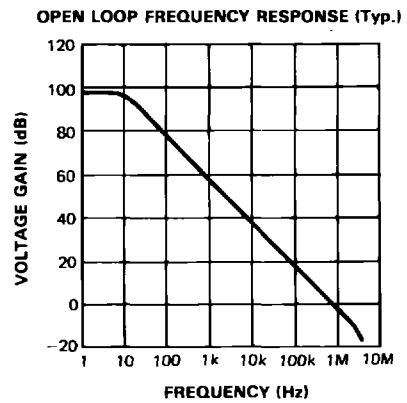
Symbol	Parameter	UA741C, E, I, M, A			Unit
		Min.	Typ.	Max.	
V _{IO}	Input Offset Voltage R _S ≤ 10 kΩ T _{amb} = 25 °C		1	5	mV
	T _{min} ≤ T _{amb} ≤ T _{max} UA741E, A		1	6 2 4	
I _{IO}	Input Offset Current T _{amb} = 25 °C T _{min} ≤ T _{amb} ≤ T _{max}		2	20 40	nA
I _{IB}	Input Bias Current T _{amb} = 25 °C T _{min} ≤ T _{amb} ≤ T _{max}		10	100 200	nA
A _{VD}	Large Signal Voltage Gain (V _O = ± 10 V, R _L = 2 kΩ) T _{amb} = 25 °C T _{min} ≤ T _{amb} ≤ T _{max}	50 25	200		V/mV
SVR	Supply Voltage Rejection Ratio (R _S ≤ 10 kΩ) T _{amb} = 25 °C T _{min} ≤ T _{amb} ≤ T _{max}	77 77	90		dB
I _{CC}	Supply Current, no Load T _{amb} = 25 °C T _{min} ≤ T _{amb} ≤ T _{max}		1.7	2.8 3.3	mA
V _I	Input Voltage Range T _{amb} = 25 °C T _{min} ≤ T _{amb} ≤ T _{max}	- 12 - 12		+ 12 + 12	V
CMR	Common Mode Rejection Ratio (R _S ≤ 10 kΩ) T _{amb} = 25 °C T _{min} ≤ T _{amb} ≤ T _{max}	70 70	90		dB
I _{OS}	Output Short-circuit Current T _{amb} = 25 °C	10	25	40	mA
± V _{OPP}	Output Voltage Swing T _{amb} = 25 °C R _L = 10 kΩ R _L = 2 kΩ T _{min} ≤ T _{amb} ≤ T _{max} R _L = 10 kΩ R _L = 2 kΩ	12 10 12 10	14 13		V
S _{VO}	Slew-rate (V _I = ± 10 V, R _L = 2 kΩ, C _L ≤ 100 pF, T _{amb} = 25 °C, unity gain)	0.25	0.5		V/μs
t _r	Rise Time (V _I = ± 20 mV, R _L = 2 kΩ, C _L ≤ 100 pF, T _{amb} = 25 °C, unity gain)		0.3		μs
K _{OV}	Overshoot (V _I = ± 20 mV, R _L = 2 kΩ, C _L ≤ 100 pF, T _{amb} = 25 °C, unity gain)		5		%
R _I	Input Resistance, T _{amb} = 25 °C	0.3	2		mΩ

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	UA741C, E, I, M, A			Unit
		Min.	Typ.	Max.	
GPB	Gain Bandwidth Product ($V_I = 10\text{ mV}$, $R_L = 2\text{ k}\Omega$, $C_L \leq 100\text{ pF}$, $f = 100\text{ kHz}$, $T_{amb} = 25\text{ }^\circ\text{C}$)	0.7	1	1.6	MHz
THD	Total Harmonic Distortion ($f = 1\text{ kHz}$, $A_V = 20\text{ dB}$, $R_L = 2\text{ k}\Omega$, $V_O = 2\text{ V}_{pp}$, $C_L \leq 100\text{ pF}$, $T_{amb} = 25\text{ }^\circ\text{C}$)		0.06		%
V_N	Equivalent Input Noise Voltage ($f = 1\text{ kHz}$, $R_G = 100\text{ }\Omega$)		23		nV/ $\sqrt{\text{Hz}}$
	Phase Margin		50		Degrees

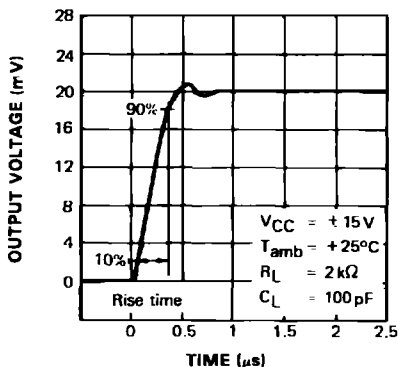


E88UA741-02



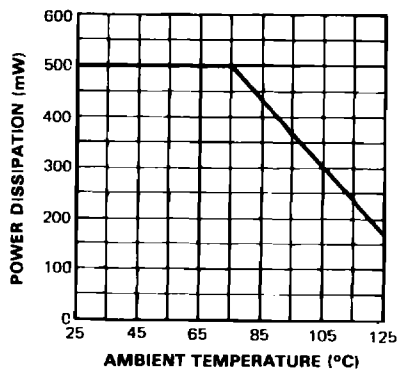
E88UA741-03

TRANSIENT RESPONSE (Typ.)



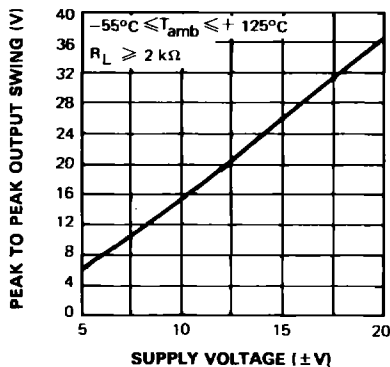
E88UA741-04

ABSOLUTE MAXIMUM POWER DISSIPATION



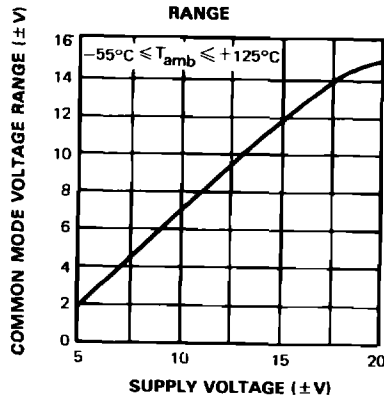
E88UA741-05

OUTPUT VOLTAGE SWING



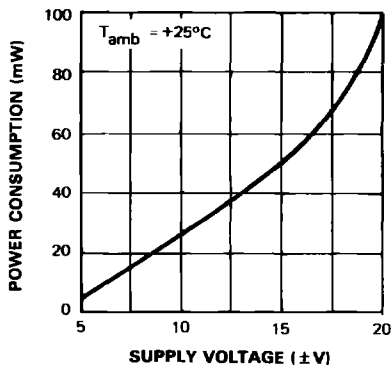
E88UA741-06

INPUT COMMON MODE VOLTAGE RANGE



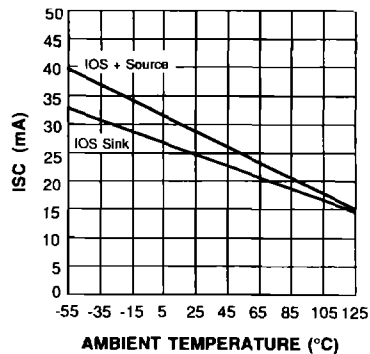
E88UA741-07

POWER CONSUMPTION

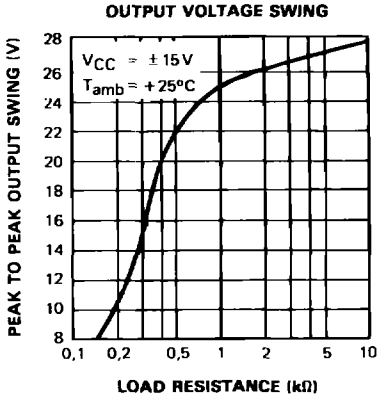


E88UA741-08

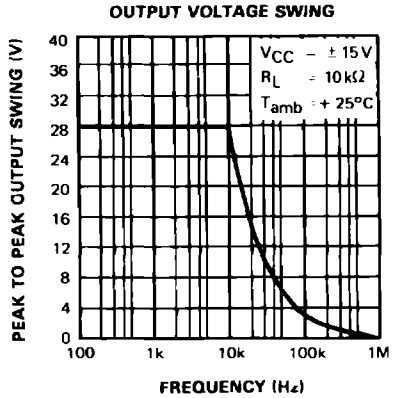
OUTPUT CURRENT vs AMBIENT TEMPERATURE



E88UA741-09

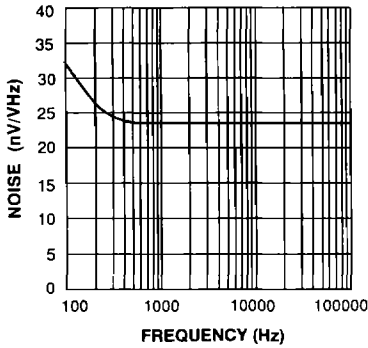


E88UA741-10

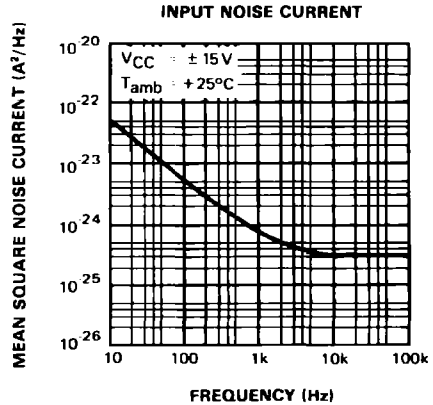


E88UA741-11

EQUIVALENT INPUT NOISE vs FREQUENCY
 $R_g = 100 \Omega$

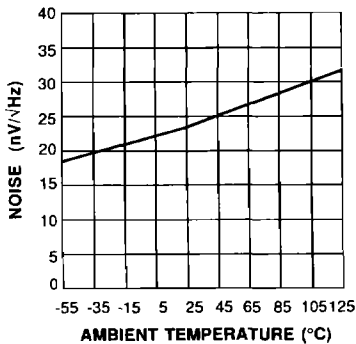


E88UA741-12



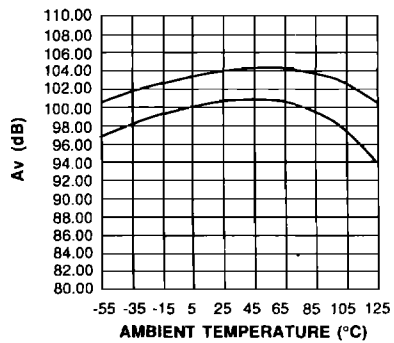
E88UA741-13

EQUIVALENT INPUT NOISE vs AMBIENT TEMPERATURE



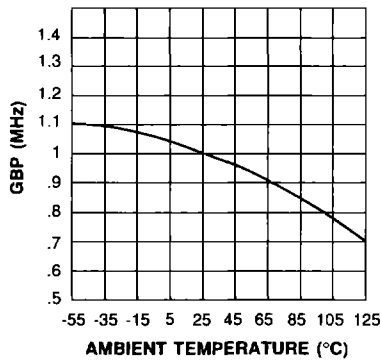
E88UA741-14

LARGE SIGNAL VOLTAGE GAIN vs AMBIENT TEMPERATURE



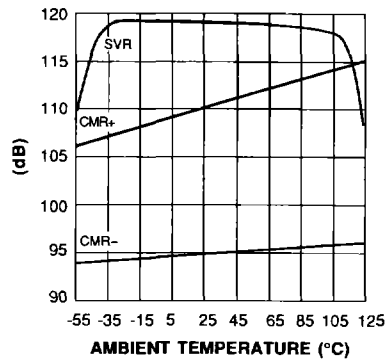
E88UA741-15

GAIN BANDWIDTH PRODUCT vs AMBIENT TEMPERATURE



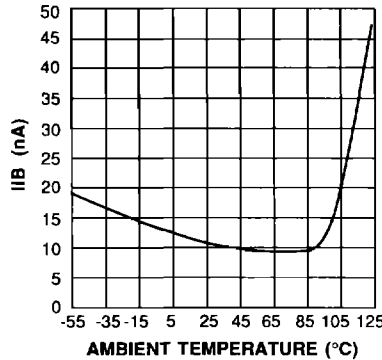
E88UA741-16

POWER SUPPLY & COMMON MODE REJECTION RATIO vs AMBIENT TEMPERATURE



E88UA741-17

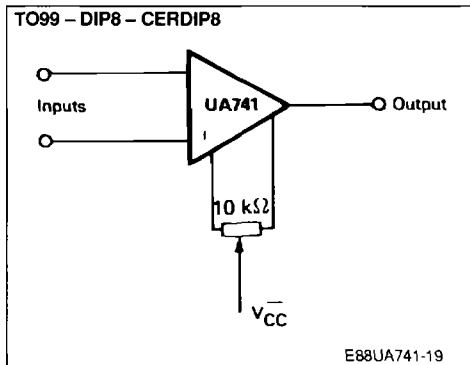
INPUT BIAS CURRENT vs AMBIENT TEMPERATURE



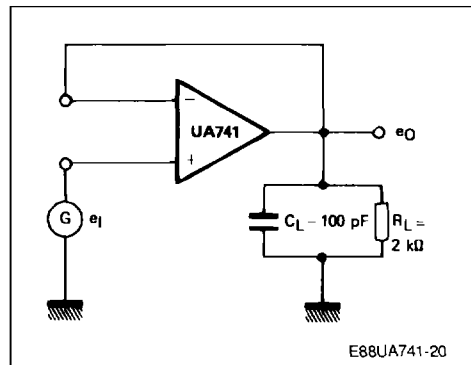
E88UA741-18

MEASUREMENT DIAGRAMS

VOLTAGE OFFSET NULL CIRCUIT

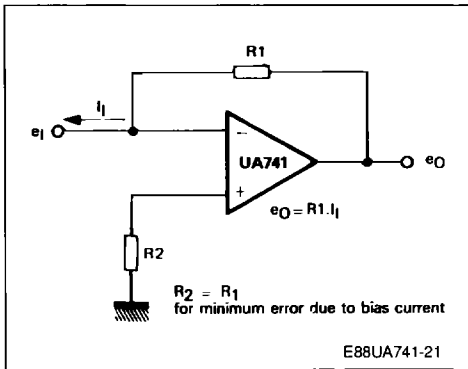


TRANSIENT RESPONSE TEST CIRCUIT

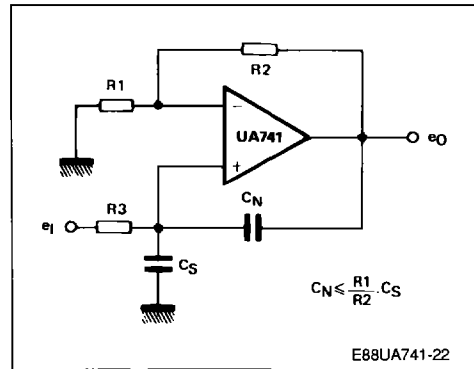


MEASUREMENT DIAGRAMS (continued)

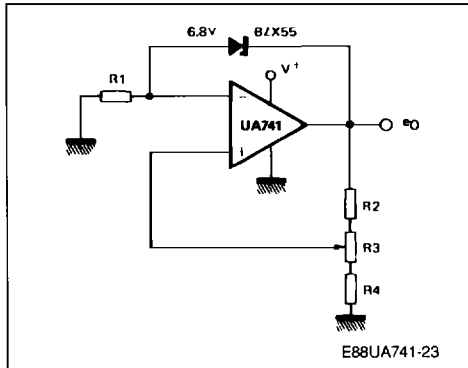
CURRENT TO VOLTAGE CONVERTER



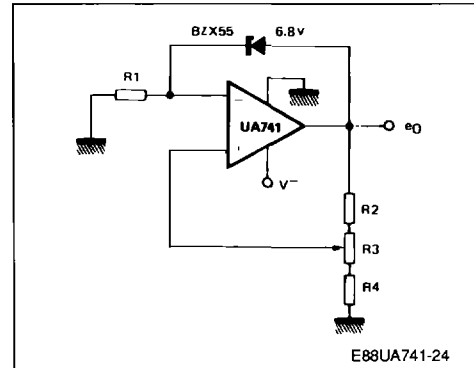
NEUTRALIZING INPUT CAPACITANCE TO OPTIMIZE RESPONSE TIME



POSITIVE VOLTAGE REFERENCE

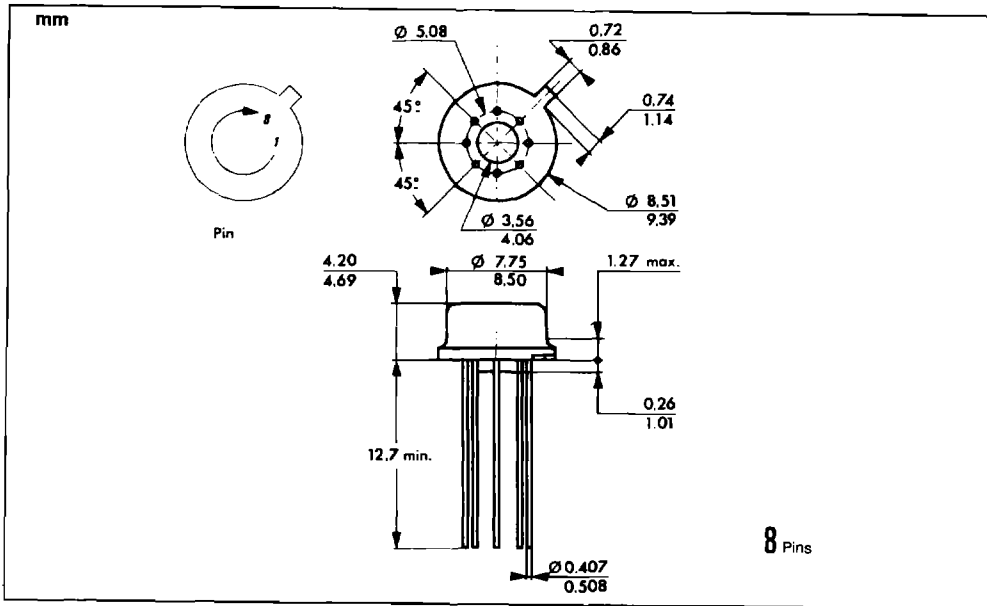


NEGATIVE VOLTAGE REFERENCE

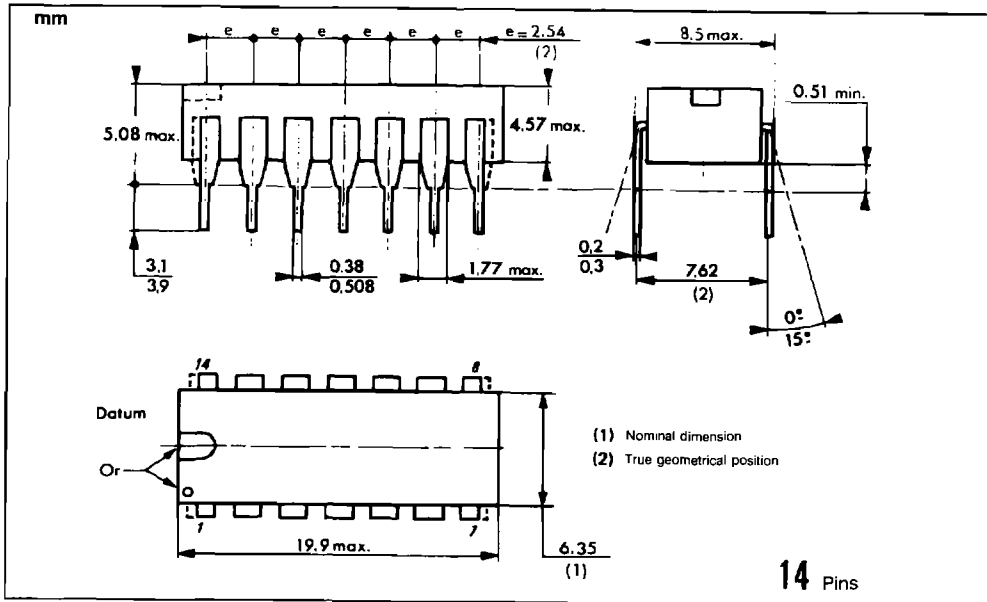


PACKAGE MECHANICAL DATA

8 PINS – TO99 – METAL CAN

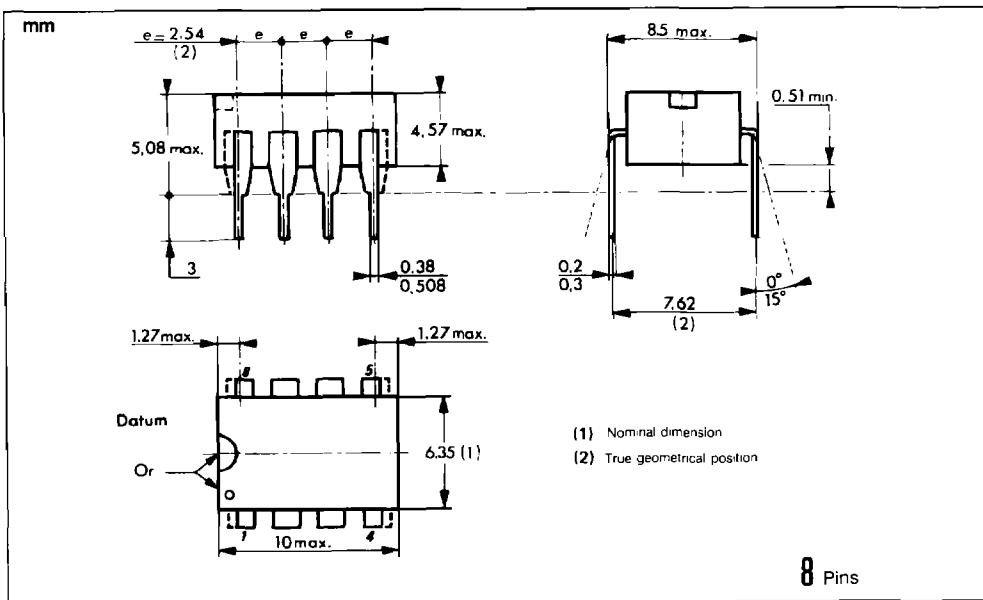


14 PINS – PLASTIC DIP

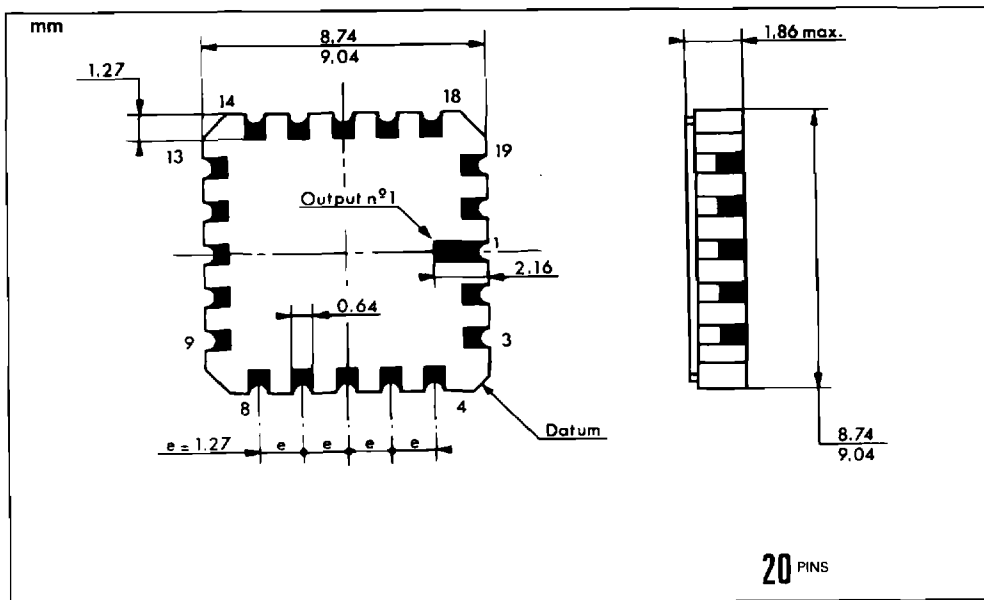


PACKAGE MECHANICAL DATA (continued)

8 PINS – PLASTIC DIP OR CERDIP



20 PINS – TRICECOP (LCC)



PACKAGE MECHANICAL DATA (continued)

8 PINS – PLASTIC MICROPACKAGE (SO)

