

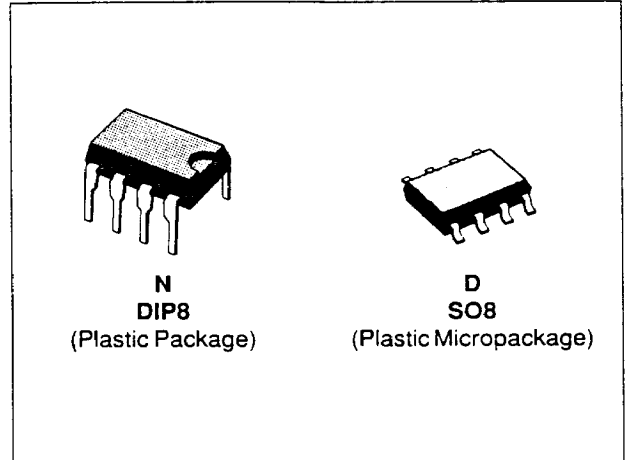
**LOW POWER DUAL BIPOLAR OP AMPS**

**PRELIMINARY DATA**

- GOOD CONSUMPTION/SPEED RATIO:  
ONLY 200  $\mu$ A/Amp FOR 1.8 MHz, 2.1 V/ $\mu$ s
- SINGLE (OR DUAL) SUPPLY OPERATION  
FROM +4V TO +44V ( $\pm$ 2V TO  $\pm$ 22V)
- WIDE INPUT COMMON MODE VOLTAGE  
RANGE INCLUDING  $V_{CC-}$
- LOW LEVEL OUTPUT VOLTAGE CLOSE TO  
 $V_{CC-}$ : 100mV TYPICAL
- ESD INTERNAL PROTECTION
- PIN TO PIN COMPATIBLE WITH STANDARD  
DUAL OP AMPS

**DESCRIPTION:**

The MC33172 series are dual bipolar operational amplifiers offering both low consumption (200 $\mu$ A/Amp) and good speed (1.8MHz, 2.1V/ $\mu$ s). Moreover the Input Common Mode Range extends down to the lower supply rail, allowing single supply operation from +4V to +44V.

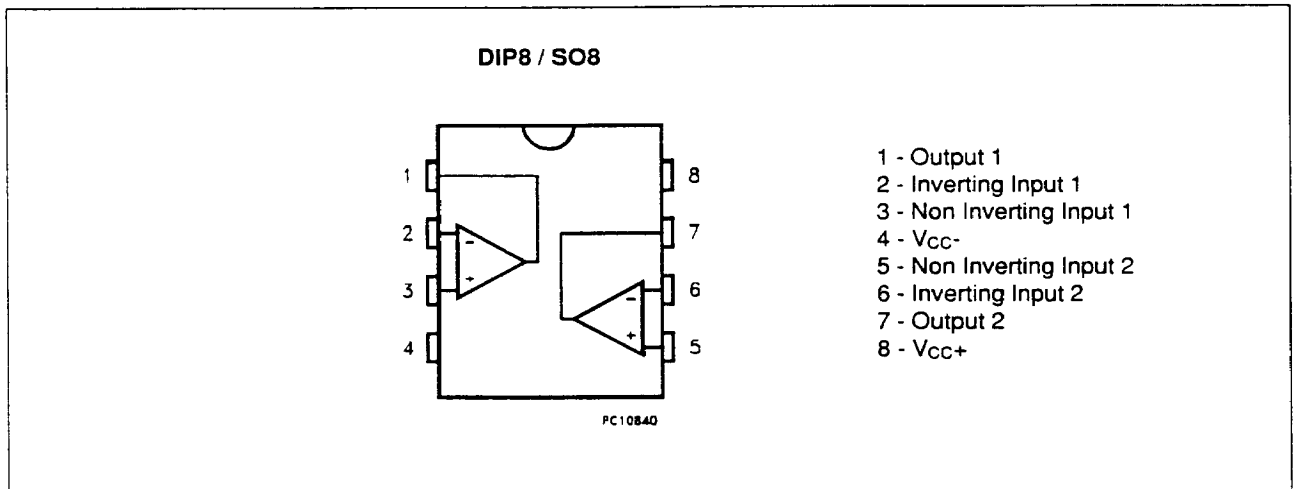


**ORDER CODES**

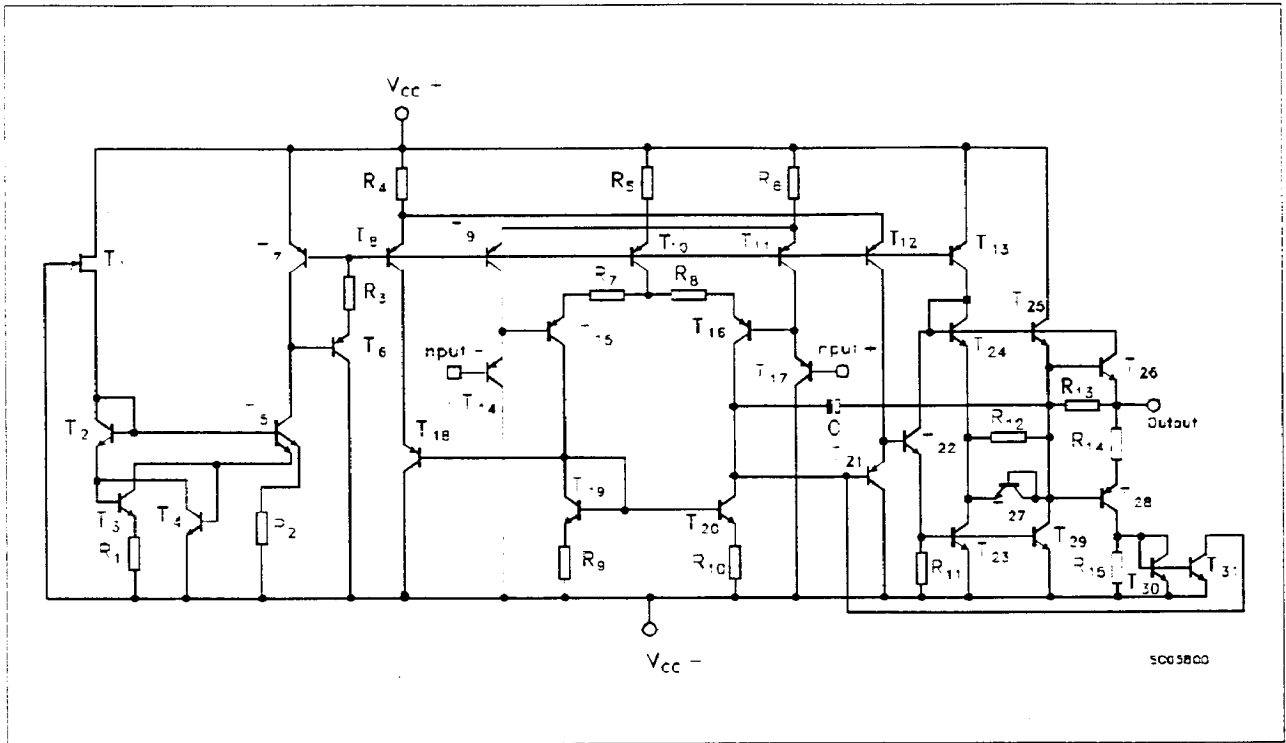
Part Number	Temperature Range	Package	
		N	D
MC33172	- 40°C to + 105°C	•	•
MC34172	0°C to + 70°C	•	•
MC35172	- 55°C to +125°C	•	•

**Example: MC33172N**

**PIN CONNECTION (Top View)**



**SCHEMATIC DIAGRAM** (for 1/2 MC33172)



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Supply Voltage	±22	V
V <sub>id</sub>	Differential Input Voltage	(Note 1)	V
V <sub>i</sub>	Input Voltage	(Note 1)	V
	Output Short Circuit Duration	Indefinite	s
T <sub>oper</sub>	Operating Temperature Range	MC33172	-40 to 105 °C
		MC34172	0 to 70 °C
		MC35172	-55 to 125 °C
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-65 to 150	°C

Note 1: Either or both input voltages must not exceed the magnitude of V<sub>CC</sub>

**OPERATING CONDITIONS**

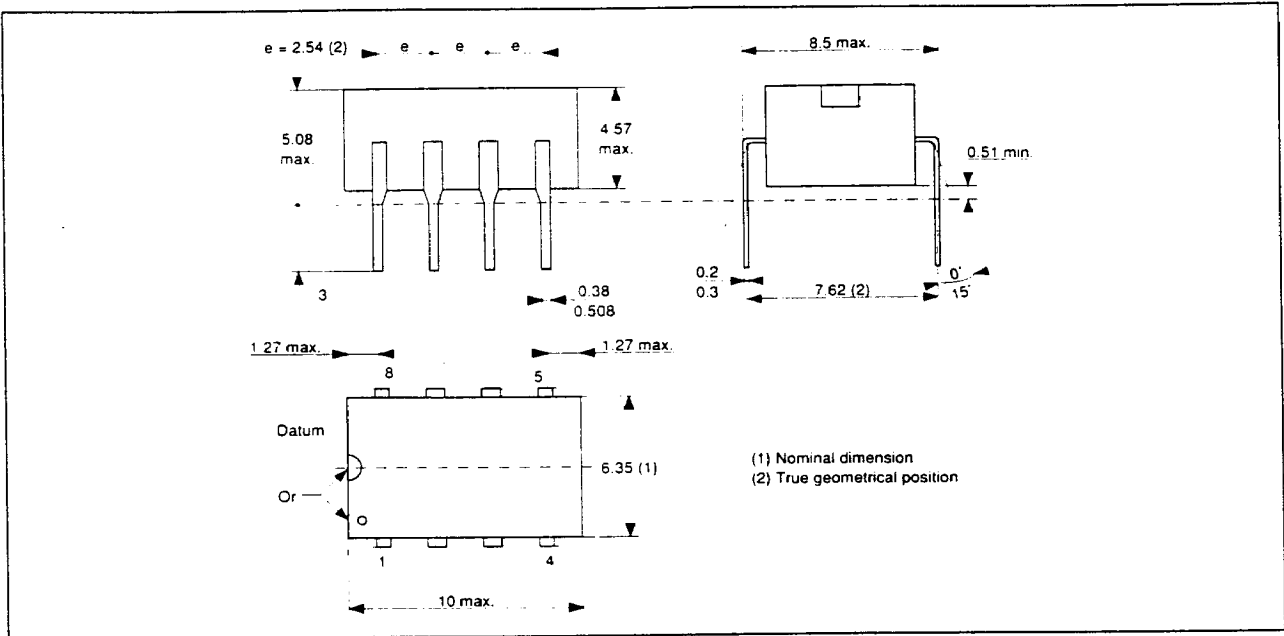
Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Supply Voltage Range	±2 to ±15	V

**ELECTRICAL CHARACTERISTICS** ( $V_{CC} = \pm 15V$ ,  $R_L$  connected to Ground,  $T_{amb} = 25^\circ C$  unless otherwise specified)

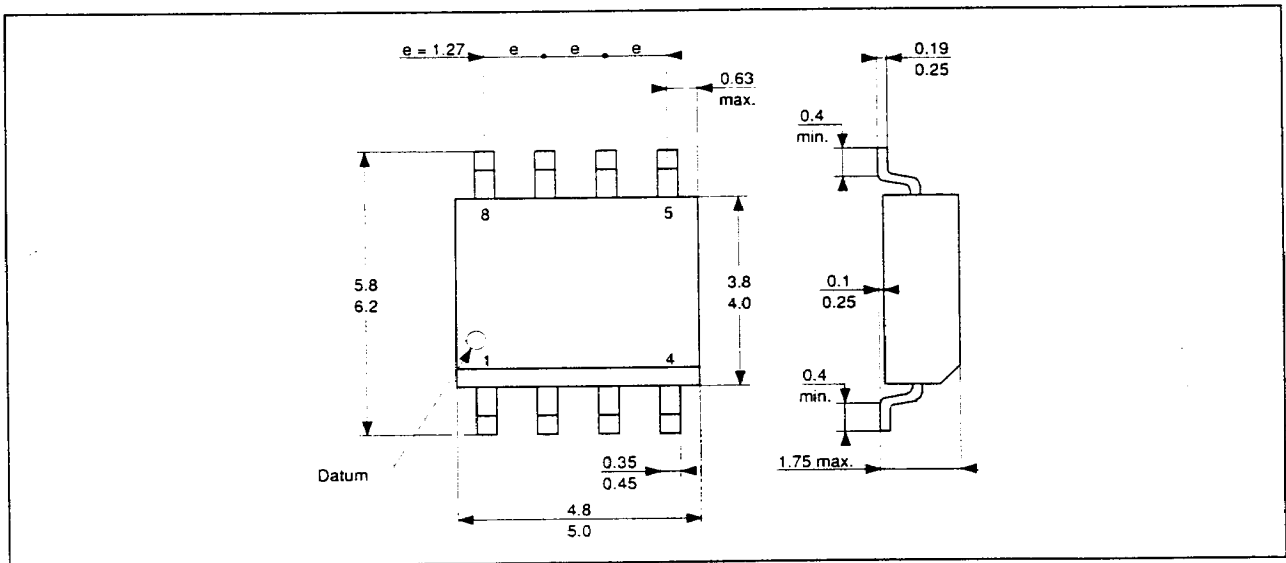
Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{io}$	Input Offset Voltage $V_{CC} = \pm 15V$ $V_{cm} = 0V$ $V_{CC+} = 5V$ $V_{CC-} = 0V$ $V_{c-} = 0V$		1 1	4.5 5	mV
$DV_{io}$	Input Offset Voltage Drift		10		$\mu V/^\circ C$
$I_{io}$	Input Offset Current ( $V_{cm} = 0V$ )		4	20	nA
$I_{ib}$	Input Bias Current ( $V_{cm} = 0V$ )		15	100	nA
$A_{vd}$	Large Signal Voltage Gain ( $R_L = 10 K\Omega$ $V_O = \pm 10V$ )	50	100		V/mV
$V_{OH}$	High Level Output Voltage $V_{CC+} = 5V$ $V_{CC-} = 0V$ $R_L = 10 K\Omega$ $V_{CC} = \pm 15V$ $R_L = 10 K\Omega$	3.5 13.6	4.2 14.2		V
$V_{OL}$	Low Level Output Voltage $V_{CC+} = 5V$ $V_{CC-} = 0V$ $R_L = 10 K\Omega$ $V_{CC} = \pm 15V$ $R_L = 10 K\Omega$		0.1 -14	0.15 -13.6	V
$I_{sc}$	Output Short Circuit Current ( $V_o = 1V$ $V_o = 0V$ ) Source Sink	3 15	9 27		mA
$V_{icm}$	Input Common Mode Voltage Range	0 to $V_{CC}-1.8$			V
CMR	Common Mode Rejection Ratio ( $V_i = V_{icm min}$ )	80	100		dB
SVR	Supply Voltage Rejection Ratio ( $V_{CC} = \pm 5$ to $\pm 15V$ )	80	100		dB
$I_{cc}$	Supply Current (Per Amplifier) $V_{CC+} = 5V$ $V_{CC-} = 0V$ no load $V_{CC} = \pm 15V$ no load		200 230	250 250	$\mu A$
$S_{VO}$	Slew Rate ( $V_i = \pm 10V$ $R_L = 10 K\Omega$ $C_L = 100 pF$ )	1.6	2		V/ $\mu s$
GBP	Gain Bandwidth Product ( $R_L = 10 K\Omega$ $C_L = 100 pF$ $f = 100 KHz$ )	1.4	2.1		MHz
$\phi_m$	Phase Margin ( $R_L = 10 K\Omega$ $C_L = 100 pF$ )		45		degrees
$V_n$	Equivalent Input Noise Voltage ( $f = 1 KHz$ )		29		nV/ $\sqrt{Hz}$
THD	Total Harmonic Distortion		0.05		%
	Channel Separation		120		dB

**PACKAGE MECHANICAL DATA**

**8 PINS - PLASTIC DIP**



**8 PINS - PLASTIC MICROPACKAGE (SO)**



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