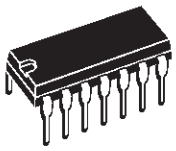
SGS-THOMSON MICROELECTRONICS

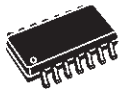
MC33174 - MC35174

LOW POWER QUAD BIPOLAR OPERATIONAL AMPLIFIERS

- GOOD CONSUMPTION/SPEED RATIO : ONLY 200µA/Amp FOR 2.1MHz, 2V/µs
- SINGLE (OR DUAL) SUPPLY OPERATION FROM +4V TO +44V (±2V TO ±22V)
- WIDE INPUT COMMON MODE VOLTAGE RANGE INCLUDING V_{CC}^-
- LOW LEVEL OUTPUT VOLTAGE CLOSE TO V_{CC}^-: 100mV TYPICAL
- PIN TO PIN COMPATIBLE WITH STANDARD QUAD OP AMPs
- ESD PROTECTION



N
DIP14
(Plastic Package)



D
SO14
(Plastic Micropackage)

DESCRIPTION

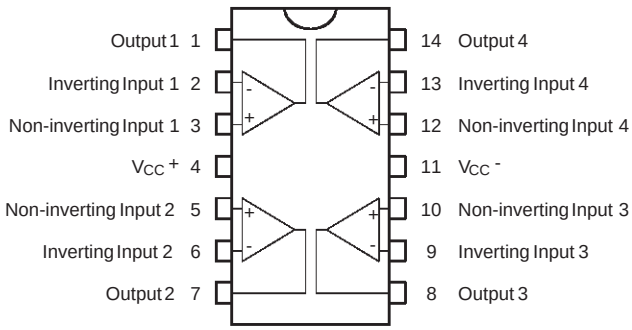
The MC33174 series are quad bipolar operational amplifiers offering both low consumption (200µA/Amp) and good speed (2.1MHz, 2V/µs).

Moreover the Input Common Mode Range extends down to the lower supply rail, allowing single supply operation from +4V to +44V.

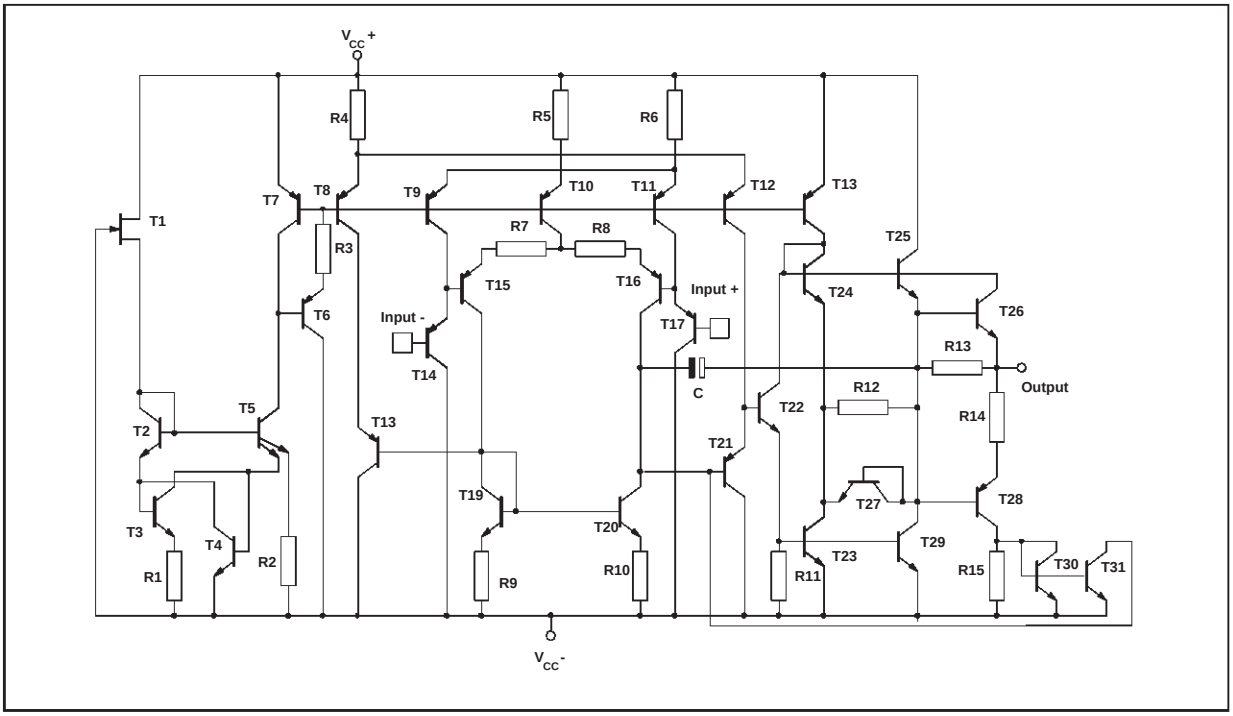
ORDER CODES

Part Number	Temperature Range	Package	
		N	D
MC33174	-40°C, +105°C	•	•
MC35174	-55°C, +125°C	•	•
Example: MC33174N			

PIN CONNECTIONS (top view)



SCHEMATIC DIAGRAM (for 1/4 MC33174)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{CC}	Supply Voltage		±22	V
V_{id}	Differential Input Voltage		(Note 1)	V
V_i	Input Voltage		(Note 1)	V
	Output Short Circuit Duration		Indefinite	s
T_{oper}	Operating Temperature Range	MC33174 MC35174	-40 to 105 -55 to 125	°C
T_j	Junction Temperature		150	°C
T_{stg}	Storage Temperature		-65 to 150	°C

Note 1: Either or both input voltages must not exceed the magnitude of V_{CC}.

OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage Range	±2 to ±22	V

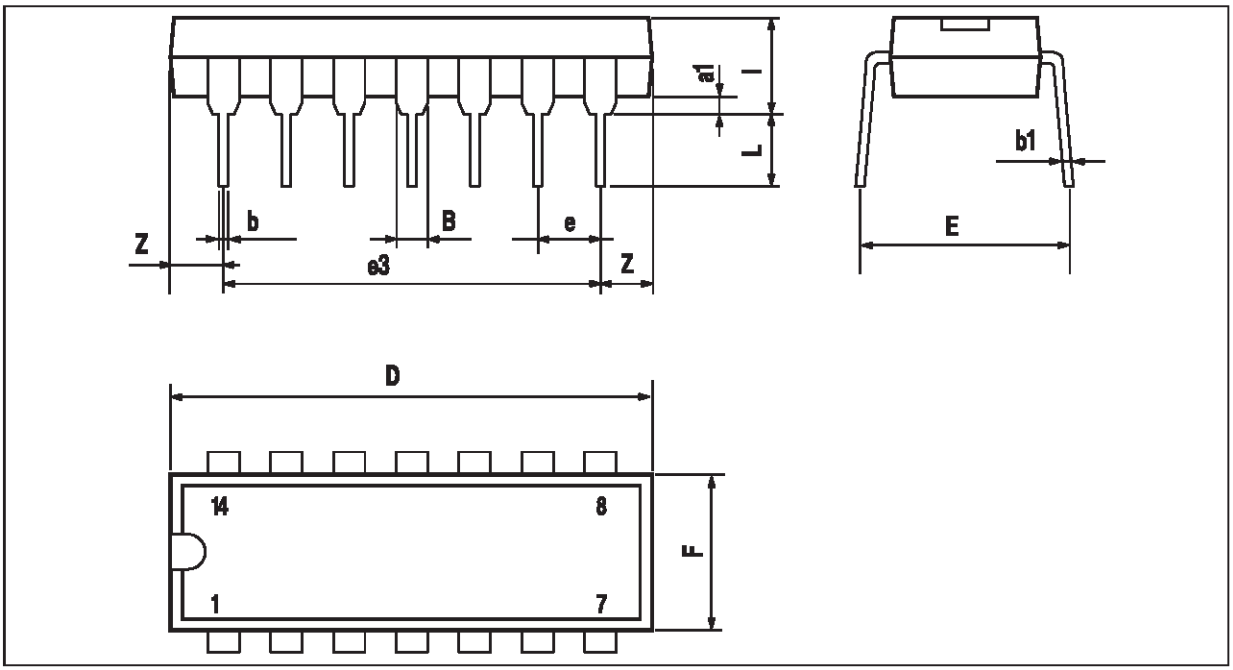
ELECTRICAL CHARACTERISTICS

V_{CC}^+ = +15V, V_{CC}^- = -15V, R_L connected to Ground, T_{amb} = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{io}	Input Offset Voltage V_{CC}^+ = +15V, V_{CC}^- = -15V, V_{ic} = 0V V_{CC}^+ = 5V, V_{CC}^- = 0V, V_{ic} = 0V, V_o = 1.4V V_{CC}^+ = +15V, V_{CC}^- = -15V, V_{ic} = 0V, $T_{min.} \le T_{amb} \le T_{max.}$		 1 1	 4.5 5 6.5	mV
DV_{io}	Input Offset Voltage Drift		10		µV/°C
I_{io}	Input Offset Current (V_{ic} = 0V) $T_{min.} \le T_{amb} \le T_{max.}$		5	20 40	nA
I_{ib}	Input Bias Current (V_{ic} = 0V) $T_{min.} \le T_{amb} \le T_{max.}$		20	100 200	nA
A_{vd}	Large Signal Voltage Gain (R_L = 10kΩ, V_O = ±10V) $T_{min.} \le T_{amb} \le T_{max.}$	50 25	100		V/mV
V_{OH}	High Level Output Voltage V_{CC}^+ = 5V, V_{CC}^- = 0V, R_L = 10kΩ V_{CC}^+ = +15V, V_{CC}^- = -15V, R_L = 10kΩ V_{CC}^+ = +15V, V_{CC}^- = -15V, R_L = 10kΩ, $T_{min.} \le T_{amb} \le T_{max.}$	 3.5 13.6 13.3	 4.2 14.2		V
V_{OL}	Low Level Output Voltage V_{CC}^+ = 5V, V_{CC}^- = 0V, R_L = 10kΩ V_{CC}^+ = +15V, V_{CC}^- = -15V, R_L = 10kΩ V_{CC}^+ = +15V, V_{CC}^- = -15V, R_L = 10kΩ, $T_{min.} \le T_{amb} \le T_{max.}$		 0.1 -14	 0.15 -13.6 -13.3	V
I_{sc}	Output Short Circuit Current (V_{id} = ±1V, V_O = 0V) Source Sink	 3 15	 6 27		mA
V_{icm}	Input Common Mode Voltage Range $T_{min.} \le T_{amb} \le T_{max.}$	V_{CC}^- to (V_{CC}^+ - 1.8) V_{CC}^- to (V_{CC}^+ - 2.2)			V
CMR	Common Mode Rejection Ratio (V_i = $V_{icm\ min.}$)	80	100		dB
SVR	Supply Voltage Rejection Ratio (V_{CC} = ±5 to ±15V)	80	100		dB
I_{CC}	Supply Current (per amplifier) V_{CC}^+ = 5V, V_{CC}- = 0V, no load V_{CC}^+ = +15V, V_{CC}^- = -15V, no load V_{CC}^+ = +15V, V_{CC}^- = -15V, no load, $T_{min.} \le T_{amb} \le T_{max.}$		 200 220	 250 250 300	µA
SR	Slew Rate (V_i = ±10V, R_L = 10kΩ, C_L = 100pF)	1.6	2		V/µs
GBP	Gain Bandwidth Product (R_L = 10kΩ, C_L = 100pF, f = 100kHz)	1.4	2.1		MHz
∅m	Phase Margin (R_L = 10kΩ, C_L = 100pF)		45		Degrees
e_n	Equivalent Input Noise Voltage (f = 1kHz)		29		$\frac{nV}{\sqrt{Hz}}$
THD	Total Harmonic Distortion		0.05		%
V_{O1}/V_{O2}	Channel Separation		120		dB

PACKAGE MECHANICAL DATA

14 PINS - PLASTIC DIP

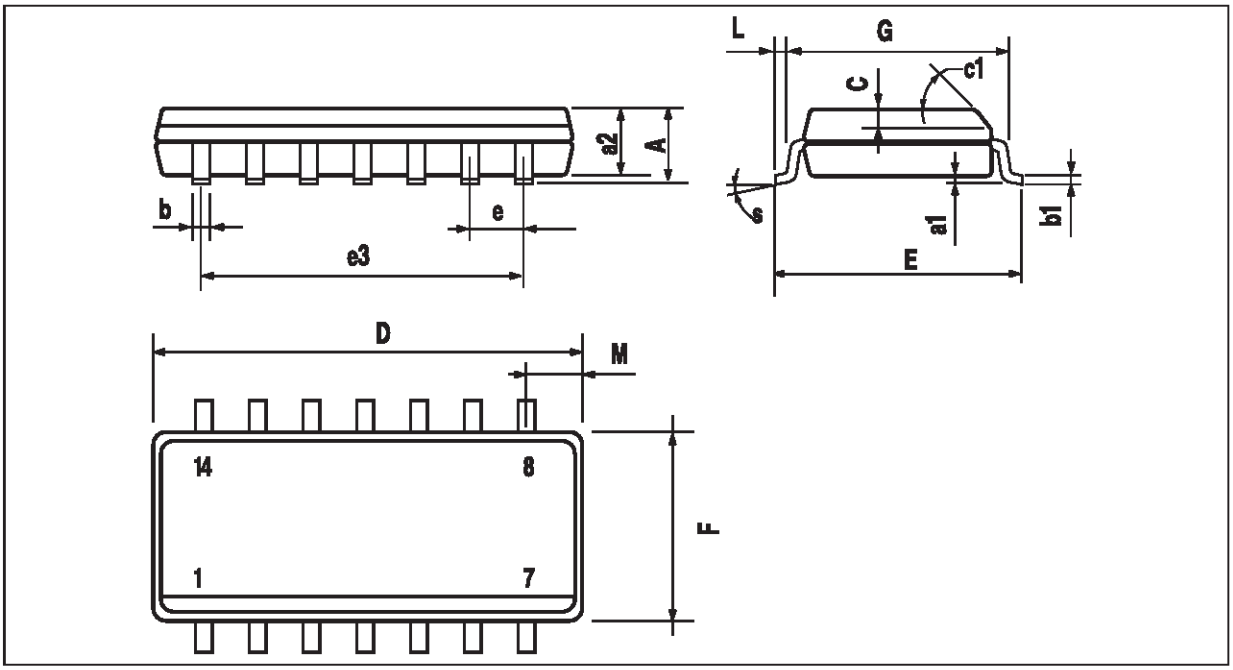


Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	1.39		1.65	0.055		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		15.24			0.600	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z	1.27		2.54	0.050		0.100

DIP14.TBL

PACKAGE MECHANICAL DATA

14 PINS - PLASTIC MICROPACKAGE (SO)



PM-DIP14.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.2	0.004		0.008
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45^o (typ.)					
D	8.55		8.75	0.336		0.334
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.150		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.020		0.050
M			0.68			0.027
S	8^o (max.)					

SO14.TBL

ORDER CODE :