DIFFERENTIAL AMPLIFIER

MC1529G
MC1429G

. . . designed for high-gain applications. Features built-in temperature compensated current source for excellent temperature stability.

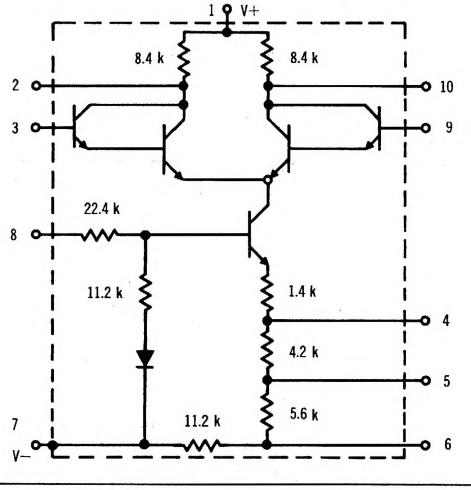
CASE 71

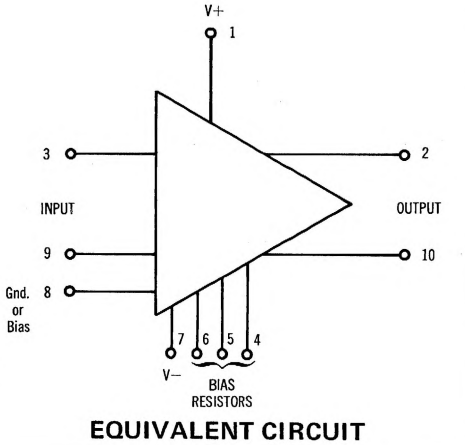
Lead 7 connected to case

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Power Supply Voltage	V	+14	Vdc
Power Supply Voltage	V	-14	Vdc
Differential Input Signal	V_{in}	± 5	Vdc
Operating Temperature Range MC1529G MC1429G	T_A	 -55 to 125 0 to 75	°C
Storage Temperature Range	T_{stg}	-65 to 150	°C
Power Dissipation (Package Limitation) Derate above T_A = 25°C)	P_D	680 4.6	mW mW/°C

CIRCUIT SCHEMATICS

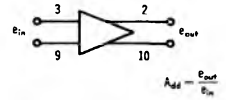
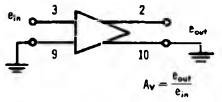
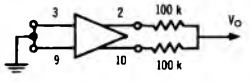
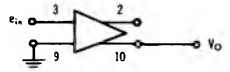
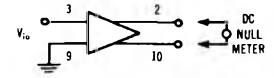
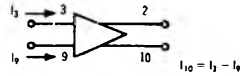
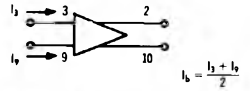
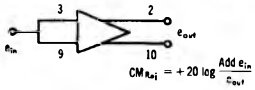
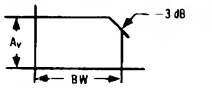
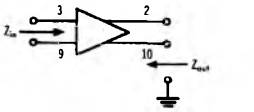




EQUIVALENT CIRCUIT

ELECTRICAL CHARACTERISTICS

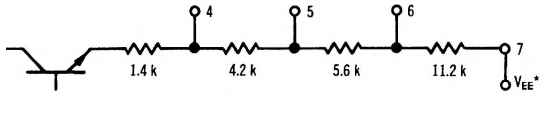
(V+ = +12 Vdc; V- = -12 Vdc; V_B = 0 Vdc; T_A = 25°C unless otherwise noted)
Connect pin 4 to pin 6 and pin 5 to pin 7 for all tests.

Characteristic Definitions*	Characteristic	Symbol	Min	Typ	Max	Unit
 $A_{dd} = \frac{e_{out}}{e_{in}}$	Differential Voltage Gain MC1529G MC1429G	A_{dd}	50 34 45 33	75 — 75 —	110 41 — —	V/V dB V/V dB
 $A_v = \frac{e_{out}}{e_{in}}$	Single Ended Voltage Gain MC1529G MC1429G	A_v	25 26 22 27	— — — —	55 35 — —	V/V dB V/V dB
	Output Voltage, Common Mode MC1529G MC1429G	$V_{o(CM)}$	6.5 5.5	7.0 7.0	8.5 8.5	Vdc
	Maximum Output Swing Both Types	V_o	5.0	—	—	$V_{(p-p)}$
	Input Offset Voltage MC1529G MC1429G	V_{io}	— —	— —	9.0 12.0	mVdc
 $I_{io} = I_3 - I_9$	Input Offset Current MC1529G MC1429G	I_{io}	— —	— —	2.0 3.0	μAdc
 $I_b = \frac{I_3 + I_9}{2}$	Input Bias Current MC1529G MC1429G	I_{in}	— —	— —	4.0 4.0	μAdc
 $CMR_{Adj} = +20 \log \frac{Add\ e_{in}}{e_{out}}$	Common Mode Rejection Both Types	CM_{Rej}	70	—	—	dB
	Bandwidth MC1529G MC1429G	BW	200 150	300 250	— —	kHz
	Differential Input Impedance MC1529G MC1429G Single Ended Output Impedance MC1529G MC1429G	Z_{in} Z_{out}	40 30 — —	— — — —	— — 12 15	kΩ kΩ

*All definitions imply linear operation.

BIASING ARRANGEMENT

In the emitter of the current source transistor of each of the differential amplifiers, there are four resistors of different values which may be connected in seven ways. The resultant effective resistance in conjunction with a given V_{EE} makes provision for different current levels. For convenience, the seven methods together with their effective resistances are tabulated below.



*Pin 7 is connected to the substrate and must be connected to the V_{EE} supply for proper circuit operation.

METHOD	1	2	3	4	5	6	7
PIN CONNECTIONS	4-7	4-6, 5-7	4-5, 6-7	4-6	4-5	5-6	4,5,6 OPEN
EFFECTIVE RESISTANCE	1.4 k	3.37 k	7.0 k	12.6 k	18.2 k	16.8 k	22.4 k

EFFECT OF TEMPERATURE ON CHARACTERISTICS

FIGURE 1 — DIFFERENTIAL MODE GAIN

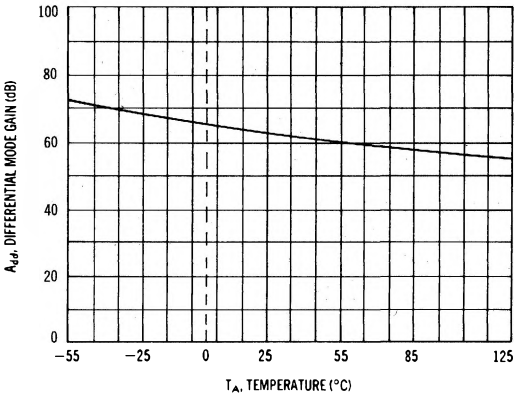


FIGURE 2 — OUTPUT VOLTAGE-COMMON MODE

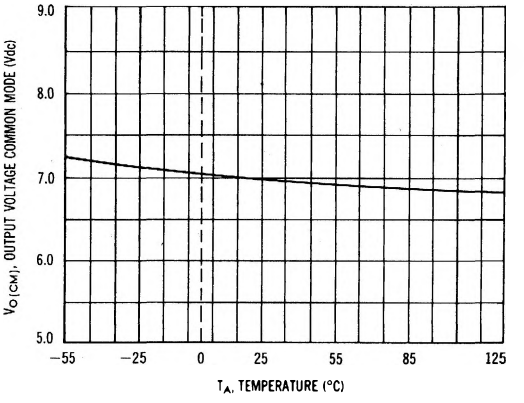


FIGURE 3 — INPUT OFFSET VOLTAGE

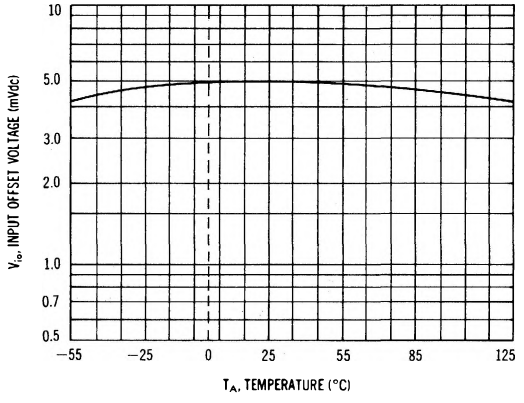


FIGURE 4 — INPUT OFFSET CURRENT

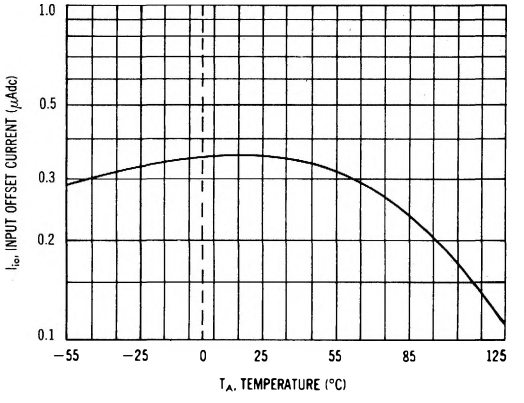


FIGURE 5 — COMMON MODE REJECTION

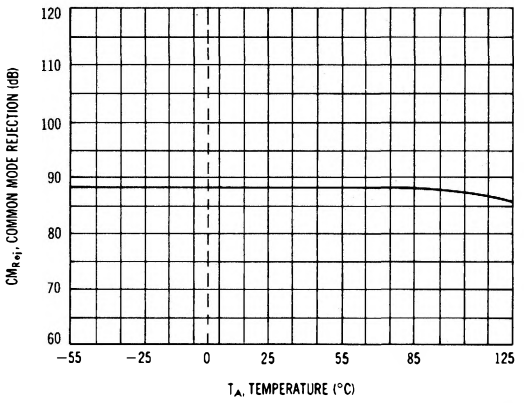


FIGURE 6 — INPUT CURRENT