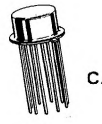
MC1525G
MC1526G

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

MONOLITHIC

MC1525G DIFFERENTIAL AMPLIFIER

MC1526G DARLINGTON INPUT DIFFERENTIAL AMPLIFIER



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	T_A	-55 to +125	°C
Storage Temperature Range	T_{stg}	-65 to +175	°C
Total Power Dissipation, (Package Limitation) Derate above T_A = 25°C	P_D	680 4.6	mW mW/°C

CIRCUIT SCHEMATICS

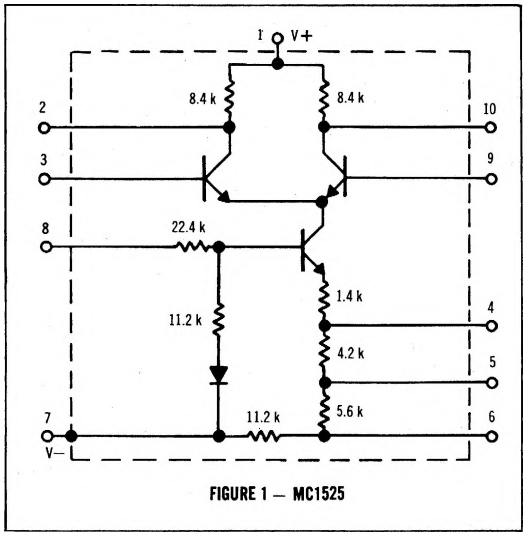


FIGURE 1 – MC1525

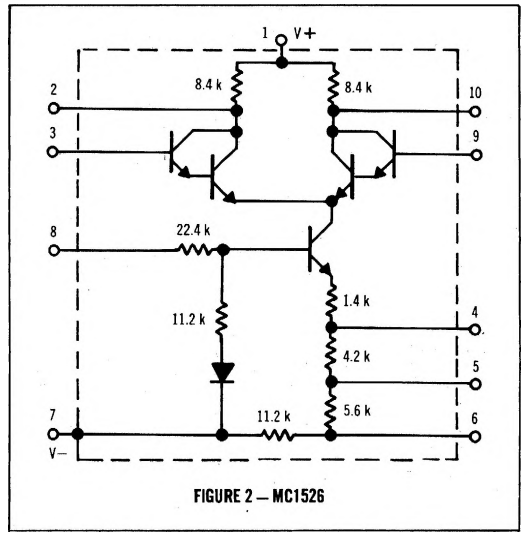


FIGURE 2 – MC1526

ELECTRICAL CHARACTERISTICS ($V+ = +12$ Vdc, $V- = -12$ Vdc, at $T_A = 25°C$ unless otherwise noted)

Characteristic	Fig No	Symbol	Min	Typ	Max	Unit
Differential Voltage Gain MC1525 MC1526	3, 13	A_{dd}	 120 50	 140 65	 160 75	—
Single Ended Voltage Gain MC1525 MC1526	4	A_v	 — —	 75 45	 — —	—
Output Voltage, Common Mode Both Types	5, 14	$V_{o(CM)}$	 6.0	 7.0	 8.0	Vdc
Maximum Output Swing Both Types	6	V_{out}	 7.0	 —	 —	$V_{(p-p)}$
AC Unbalance Both Types	6	U	 —	 —	 300	$mV_{(p-p)}$
Input Offset Voltage MC1525 MC1526	7, 15	V_{io}	 — —	 — —	 5 7	mVdc
Input Offset Current MC1525 MC1526	8, 16	I_{io}	 — —	 — —	 4 2	μAdc
Input Current MC1525 MC1526	8, 18	I_{in}	 — —	 — —	 20 3.5	μAdc
Common Mode Rejection Both Types	9, 17	CM_{Rej}	 80	 —	 —	dB
Bandwidth MC1525 MC1526	10	BW	 1400 500	 — —	 — —	kHz
Differential Input Impedance MC1525 MC1526	11	Z_{in}	 2.0 60	 — —	 — —	kΩ
Single Ended Output Impedance Both Types	12	Z_{out}	 —	 —	 11	kΩ

DC Common Mode Input Voltage Set at: $V_{CM(min)}$ = 5.5 Vdc for MC1526G, $V_{CM(min)}$ = 6.2 Vdc for MC1525G

FIGURE 3 — DIFFERENTIAL VOLTAGE GAIN

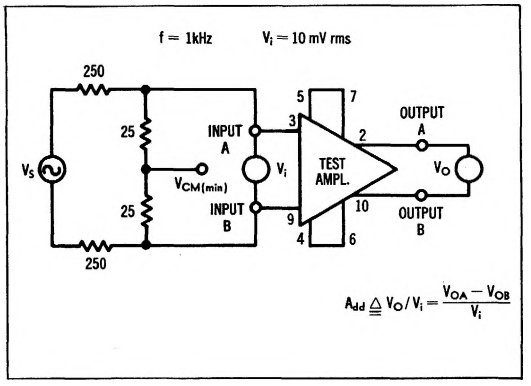


FIGURE 4 — SINGLE-ENDED VOLTAGE GAIN

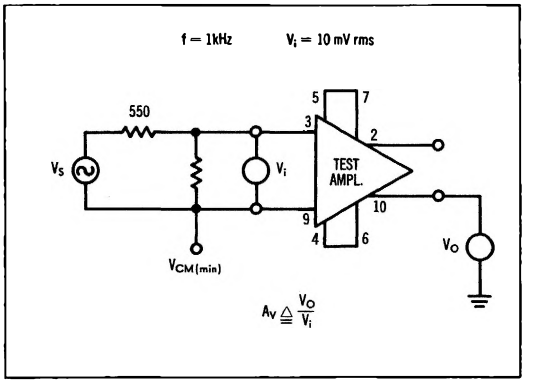


FIGURE 5 — OUTPUT VOLTAGE - COMMON MODE

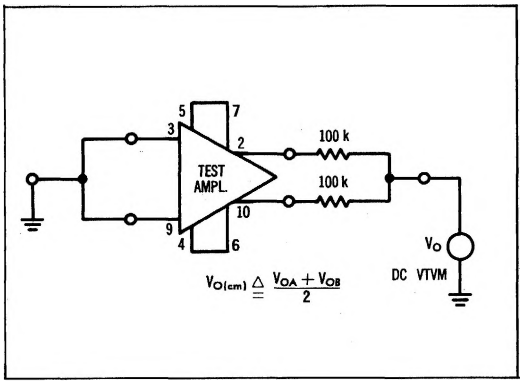


FIGURE 6 — MAXIMUM OUTPUT SWING

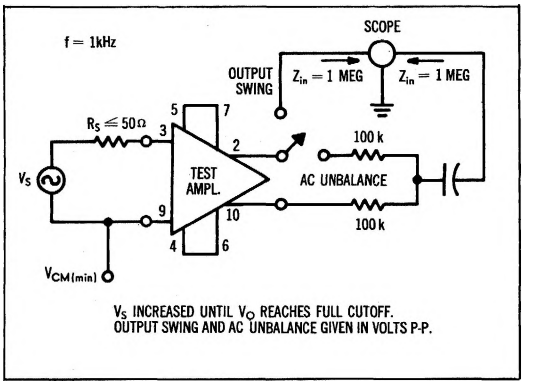


FIGURE 7 — INPUT OFFSET VOLTAGE

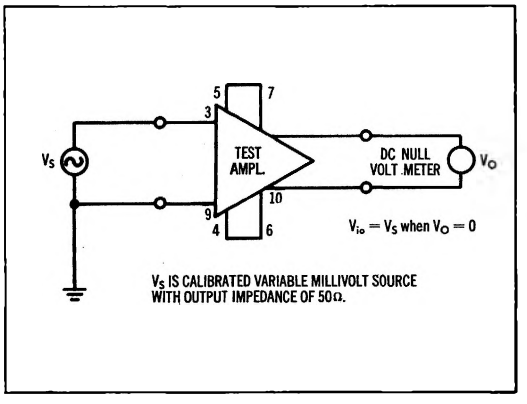
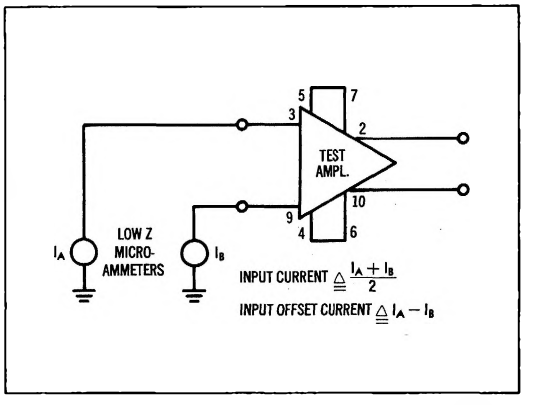
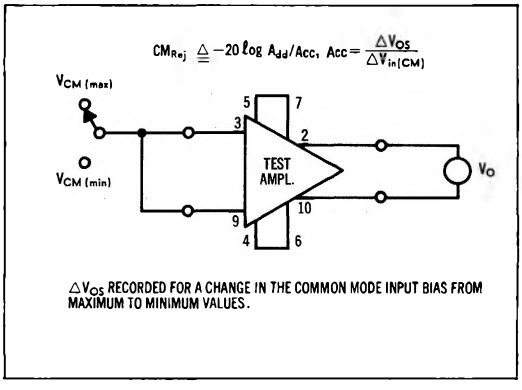


FIGURE 8 — INPUT OFFSET CURRENT and INPUT CURRENT



DC Common Mode Input Voltage Set at: $V_{CM(min)}$ = 5.5 Vdc for MC1526G, $V_{CM(min)}$ = 6.2 Vdc for MC1525G

FIGURE 9 — COMMON MODE REJECTION



ΔV_{OS} RECORDED FOR A CHANGE IN THE COMMON MODE INPUT BIAS FROM MAXIMUM TO MINIMUM VALUES.

FIGURE 10 — BANDWIDTH

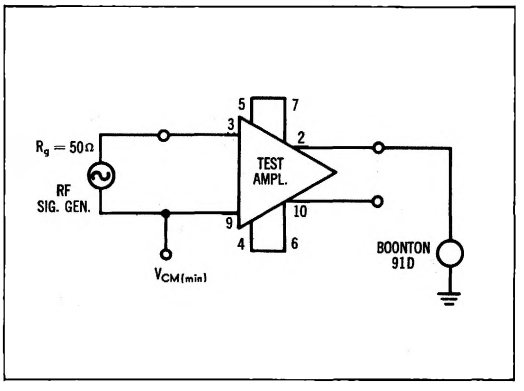
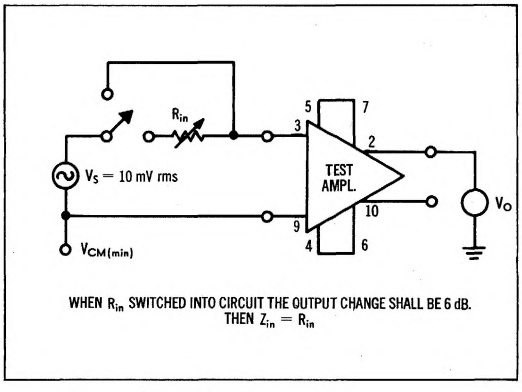
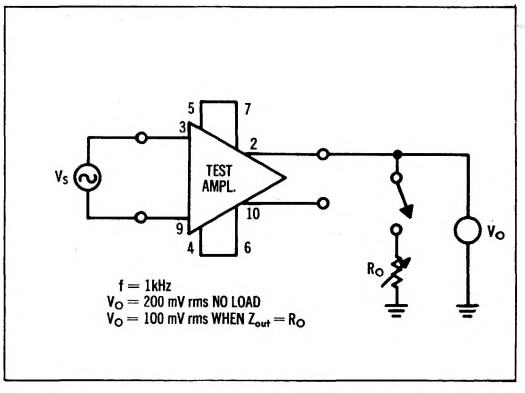


FIGURE 11 — DIFFERENTIAL INPUT IMPEDANCE



WHEN R_{in} SWITCHED INTO CIRCUIT THE OUTPUT CHANGE SHALL BE 6 dB.
THEN $Z_{in} = R_{in}$

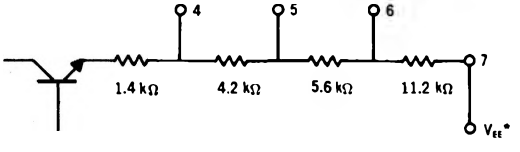
FIGURE 12 — SINGLE-ENDED OUTPUT IMPEDANCE



f = 1kHz
V_O = 200 mV rms NO LOAD
V_O = 100 mV rms WHEN $Z_{out} = R_O$

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	1.4kΩ	3.37 kΩ	7.0 kΩ	12.6kΩ	18.2 kΩ	16.8kΩ	22.4 kΩ

EFFECT OF TEMPERATURE ON CHARACTERISTICS

FIGURE 13 — DIFFERENTIAL MODE GAIN

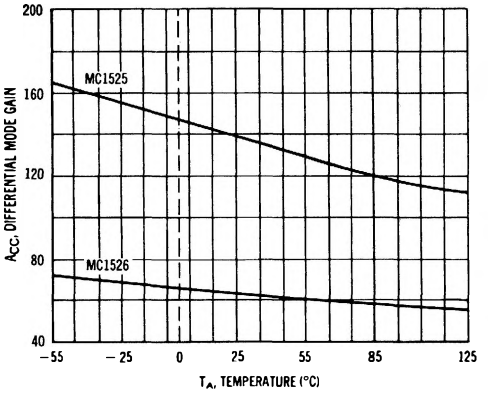


FIGURE 14 — OUTPUT VOLTAGE-COMMON MODE

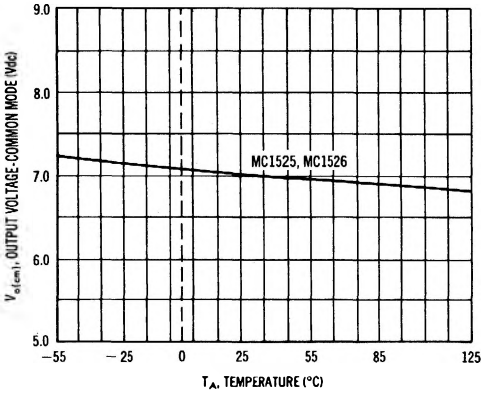


FIGURE 15 — INPUT OFFSET VOLTAGE

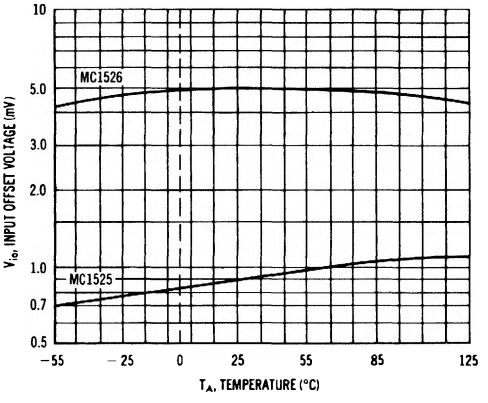


FIGURE 16 — INPUT OFFSET CURRENT

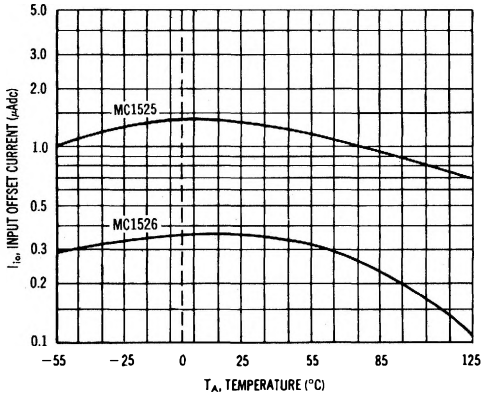


FIGURE 17 — COMMON MODE REJECTION

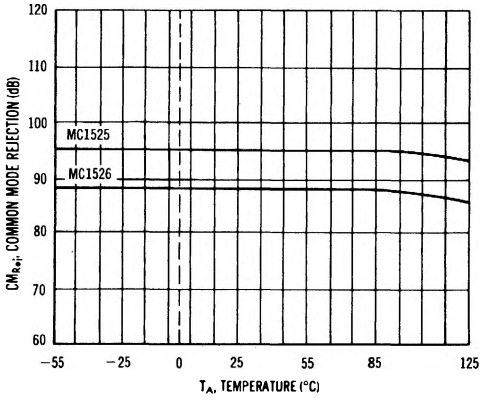


FIGURE 18 — INPUT CURRENT