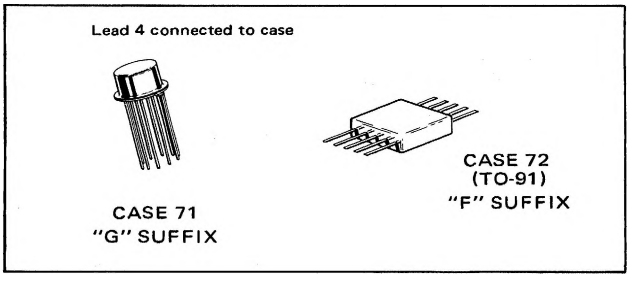
MC1530
MC1531

. . . designed for use as a summing amplifier, integrator, or amplifier with operating characteristics as a function of the external feedback components.



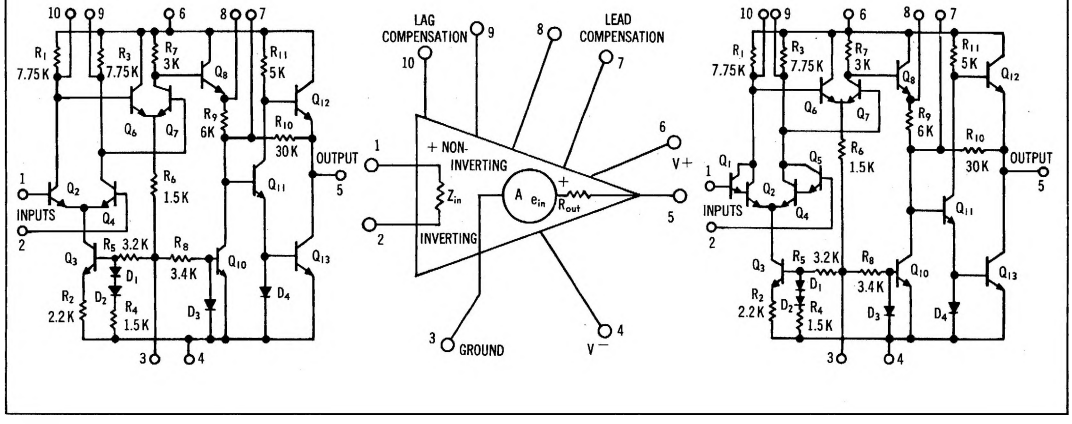
Typical Amplifier Features:

- Excellent Open Loop Gain Characteristics
  A_{VOL} = 74 dB typical
  A_{VOL} stability = ±1.5 dB from -55°C to +125°C
- Low Temperature Drift — ±3.0 μV/°C
- Large Output Voltage Swing — Typically ±5.0 V @ ±6.0 V Supply
- Low Output Impedance — Z_{out} = 25 ohms typical
- High Slew Rate — typically 4.5 V/μs @ A_V = 10

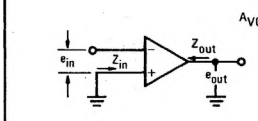
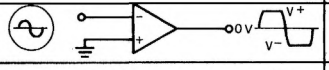
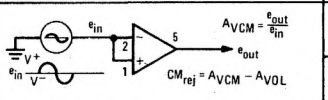
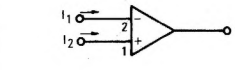
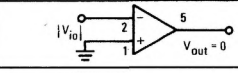
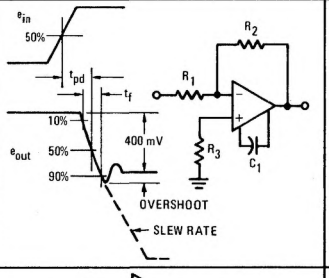
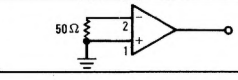
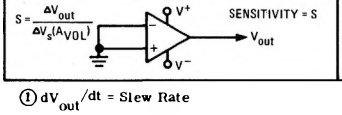
MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Power Supply Voltage	V+	+9.0	Vdc
Power Supply Voltage	V-	-9.0	Vdc
Differential Input Signal	V_{in}	±5.0	Vdc
Load Current	I_L	10	mA
Power Dissipation (Package Limitation)	P_D		
Metal Can		680	mW
Derate above 25+ C		4.6	mW/°C
Flat Package		500	mW
Derate above 25° C		3.3	mW/°C
Operating Temperature Range	T_A	-55 to + 125	°C
Storage Temperature Range	T_{stg}	-65 to + 175	°C

MC1530 (STANDARD INPUT) **EQUIVALENT CIRCUIT (BOTH TYPES)** **MC1531 (DARLINGTON INPUT)**



ELECTRICAL CHARACTERISTICS (V^+ = +6.0Vdc, V^- = −6.0Vdc, T_A = 25°C unless otherwise noted)

Characteristic Definitions (linear operations)	Characteristic		Symbol	Min	Typ	Max	Unit
	Open Loop Voltage Gain (T_A = -55 to + 125° C)	MC1530 MC1531	A_{VOL}	4500 2500	5000 3500	12500 7000	V/V
		MC1530 MC1531		73 68	74 71	82 77	dB
	Output Impedance (f = 20 Hz)	MC1530 MC1531	Z_{out}	-	25	50	ohms
	Input Impedance (f = 20 Hz)	MC1530 MC1531	Z_{in}	10k 1.0M	20k 2.0M	- -	ohms
	Output Voltage Swing (R_L = 1.0 k ohm)	MC1530 MC1531	V_{out}	±4.5	±5.2	-	V_{peak}
	Input Common Mode Voltage Swing	MC1530 MC1531	CMV_{in}	±2.0 ±2.0	±2.7 ±2.4	- -	V_{peak}
	Common Mode Rejection Ratio	MC1530 MC1531	CM_{rej}	70 65	75 65	- -	dB
	Input Bias Current ($I_b=\frac{I_1+I_2}{2}$)	MC1530 MC1531	I_b	- -	3.0 0.025	10 0.150	µA
	Input Offset Current $I_{io}=I_1-I_2$	MC1530 MC1531	I_{io}	- -	0.200 0.003	2.0 0.025	µA
	Input Offset Voltage	MC1530 MC1531	$\lvert V_{io}\rvert$	- -	1.0 3.0	5.0 10	mV
	Step Response Gain = 100, 0% overshoot R_1 = 1.0 k ohm R_2 = 100 k ohm R_3 = 1.0 k ohm C_1 = 1800 pF		t_f t_{pd} dV_{out}/dt ①	- - -	0.60 0.30 17	- - -	µs µs V/µs
	Gain = 10, 10% overshoot R_1 = 10 k ohm R_2 = 100 k ohm R_3 = 10 k ohm C_1 = 6800 pF		t_f t_{pd} dV_{out}/dt ①	- - -	0.24 0.18 4.5	- - -	µs µs V/µs
	Gain = 1.0, 5.0% overshoot R_1 = 10 k ohm R_2 = 10 k ohm R_3 = 5.0 k ohm C_1 = 33,000 pF		t_f t_{pd} dV_{out}/dt ①	- - -	0.20 0.16 1.0	- - -	µs µs V/µs
	Input Noise Voltage (Open Loop, 50 ohm source, BW_{OL} = 5.0 MHz)	MC1530 MC1531	$V_{n(in)}$	- -	10 20	- -	μV_{rms}
	Average Temperature Coefficient of Input Offset Voltage 25°C to + 125° C -55° C to + 25° C 25°C to + 125° C -55° C + 25° C	MC1530 MC1531 	TC_{Vio}	- - - -	3.8 8.0 11 20	- - - -	µV/°C
	D. C. Power Dissipation (Power Supply = ±6.0 V, V_{out}= 0)		P_D	-	110	150	mW
	Positive Supply Sensitivity (V^- constant)		S^+	-	100	-	µV/V
	Negative Supply Sensitivity (V^+ constant)		S^-	-	100	-	µV/V

① dV_{out}/dt = Slew Rate

TYPICAL OUTPUT CHARACTERISTICS

(V^+ = +6.0 Vdc, V^- = −6.0 Vdc, T_A = 25°C)

FIGURE 1 – TEST CIRCUIT

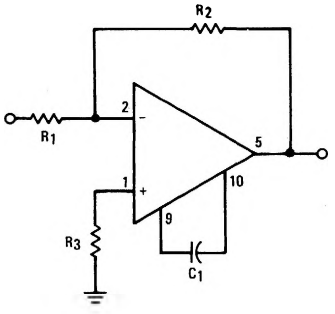


FIG. NO.	CURVE NO.	VOLTAGE GAIN	DEVICE	TEST CONDITIONS				OUTPUT NOISE (mV rms)
				R_1 (Ω)	R_2 (Ω)	R_3 (Ω)	C_1 (pF)	
2	1	100	MC1530	1.0 k	100 k	1.0 k	1800	3.5
		100	MC1531	1.0 k	100 k	1.0 k	1800	3.4
	2	10	MC1530	10 k	100 k	10 k	6800	4.8
		10	MC1531	10 k	100 k	10 k	6800	4.8
	3	1.0	MC1530	10 k	10 k	5.0 k	33000	3.4
		1.0	MC1531	10 k	10 k	5.0 k	33000	7.0
3	1	100	MC1530	1.0 k	100 k	1.0 k	1800	3.5
		100	MC1531	1.0 k	100 k	1.0 k	1800	3.4
	2	10	MC1530	10 k	100 k	10 k	6800	4.8
		10	MC1531	10 k	100 k	10 k	6800	4.8
	3	1.0	MC1530	10 k	10 k	5.0 k	33000	3.4
		1.0	MC1531	10 k	10 k	5.0 k	33000	7.0
4	1	A_{VOL}	MC1530	0	∞	0	1800	7.6
		A_{VOL}	MC1531	0	∞	0	1800	19.0
	2	A_{VOL}	MC1530	0	∞	0	6800	5.5
		A_{VOL}	MC1531	0	∞	0	6800	15.0
	3	V_{VOL}	MC1530	0	∞	0	33000	5.0
		A_{VOL}	MC1531	0	∞	0	33000	11.0

FIGURE 2 – LARGE SIGNAL SWING versus FREQUENCY

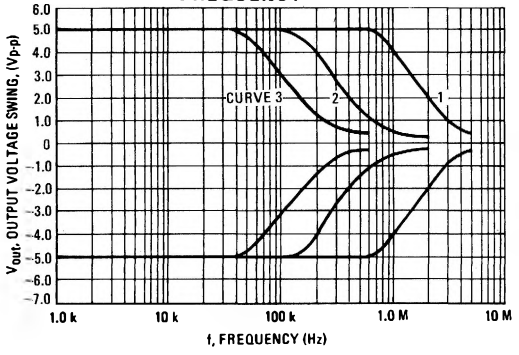


FIGURE 3 – VOLTAGE GAIN versus FREQUENCY

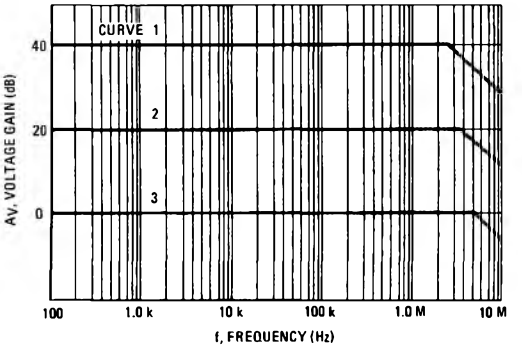


FIGURE 4 – OPEN LOOP VOLTAGE GAIN versus FREQUENCY

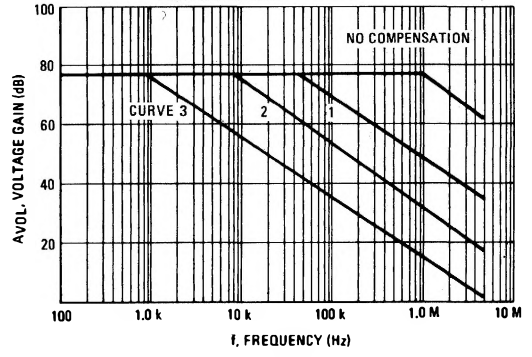


FIGURE 5 – SLEW RATE versus ROLLOFF CAPACITANCE

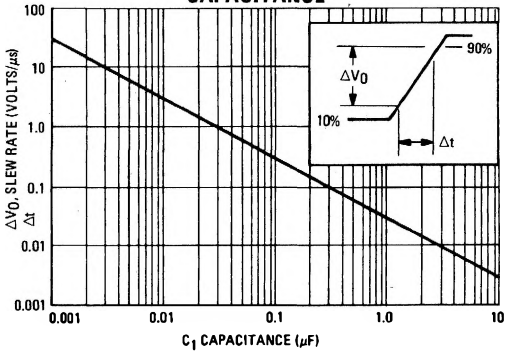


FIGURE 6 – VOLTAGE GAIN versus POWER SUPPLY VOLTAGE

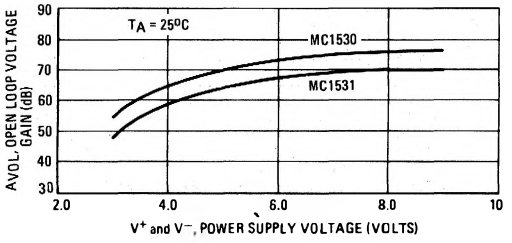


FIGURE 7 – COMMON MODE SWING versus POWER SUPPLY VOLTAGE

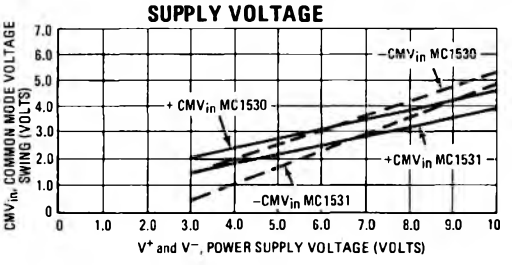


FIGURE 8 – POWER DISSIPATION versus POWER SUPPLY VOLTAGE

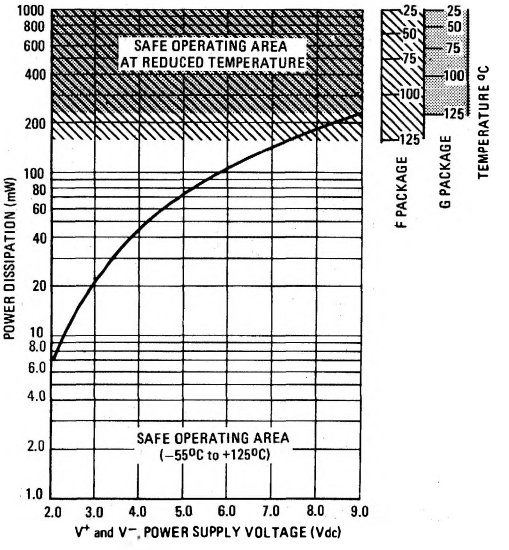
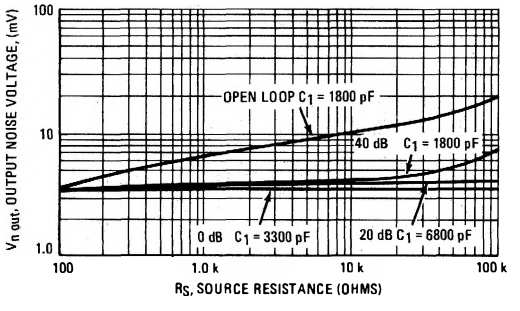


FIGURE 9 – OUTPUT NOISE VOLTAGE versus SOURCE RESISTANCE



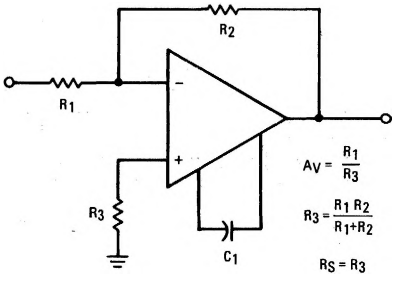


FIGURE 10 – OUTPUT VOLTAGE SWING versus LOAD RESISTANCE