ORDERING INFORMATION

Device	Temperature Range	Package
MC1410G	0°C to +75°C	Metal Can
MC1510G	−55°C to +125°C	Metal Can

MC1410
MC1510

WIDEBAND VIDEO AMPLIFIER

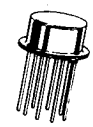
. . . designed for use as a high-frequency differential amplifier with operating characteristics that provide a flat frequency response from dc to 40 MHz.

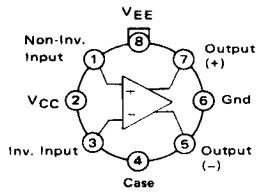
- High Gain Characteristics
  A_V = 93 typ
- Wide Bandwidth — dc to 40 MHz typ
- Large Output Voltage Swing
  4.5 Vp-p typical @ ±6.0 V Supply
- Low Output Distortion
  THD ≤ 1.5% typ

VIDEO AMPLIFIER

SILICON MONOLITHIC INTEGRATED CIRCUIT

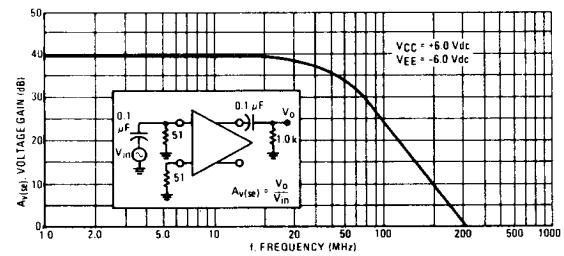
G SUFFIX
METAL PACKAGE
CASE 601





(Top View)

FIGURE 1 – VOLTAGE GAIN versus FREQUENCY



REPRESENTATIVE CIRCUIT SCHEMATIC

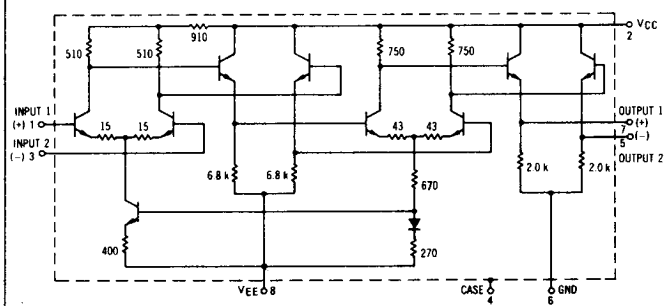
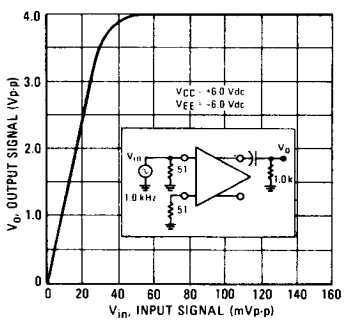


FIGURE 2 – LIMITING CHARACTERISTICS @ 1.0 kHz



8

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

Rating	Symbol	Value	Unit
Power Supply Voltage	V_{CC} V_{EE}	+8.0 -8.0	Vdc
Differential Input Voltage Range	V_{IDR}	±5.0	Volts
Common Mode Input Voltage Range	V_{ICR}	±6.0	Volts
Load Current	I_L	10	mA
Output Short Circuit Duration	t_s	5.0	s
Power Dissipation (Package Limitation) Metal Can Derate above T_A = +25°C	P_D	 680 4.6	 mW mW/°C
Operating Temperature Range MC1410 MC1510	T_A	 0 to +75 -55 to +125	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = +6.0 Vdc, V_{EE} = -6.0 Vdc, R_L = 5.0 kΩ, T_A = +25°C unless otherwise noted.)

		MC1510			MC1410			
Characteristic	Symbol	Min	Typ	Max	Min	Typ	Max	Unit
Single Ended Voltage Gain	$A_{v(se)}$	75	93	110	60	90	120	V/V
Output Impedance (f = 20 kHz)	Z_o	–	35	–	–	35	–	Ω
Input Impedance (f = 20 kHz)	Z_i	–	6.0	–	–	6.0	–	kΩ
Bandwidth (-3.0 dB)	BW	–	40	–	–	40	–	MHz
Output Voltage Swing (Single Ended) (f = 100 kHz)	V_o	–	4.0	–	–	4.0	–	Vp-p
Single Ended Output Distortion (e_{in} < 0.2% Distortion)	THD	–	1.5	5.0	–	2.0	–	%
Input Common Mode Voltage Range	V_{ICR}	–	±1.0	–	–	±1.0	–	V
Common Mode Voltage Gain (V_{in} = 0.3 V rms, f = 100 kHz)	AV_{CM}	-30	-45	–	-20	-40	–	dB
Common Mode Rejection Ratio	CMRR	–	85	–	–	85	–	dB
Input Bias Current $\left(I_{IB}=\frac{I_1+I_2}{2}\right)$, Differential Output = 0	I_{IB}	–	20	80	–	50	100	μA
Input Offset Current ($I_{IO} = I_1 - I_2$)	I_{IO}	–	3.0	20	–	5.0	30	μA
Output Offset Voltage Differential Mode (V_{in} = 0) Common Mode (Differential Output = 0)	$V_{OO(DM)}$ $V_{OO(CM)}$	– 2.6	0.5 3.1	1.3 3.5	– 2.0	0.5 3.0	2.0 4.0	Vdc
Step Response	t_{THL} t_{PHL},t_{PLH} t_{TLH}	– – –	9.0 9.0 9.0	12 – 12	– – –	10 9.0 10	15 – 15	ns
Average Temperature Coefficient of Input Offset Voltage (R_S = 50 Ω, T_A = T_{low}* to T_{high}**) ($R_S \leq$ 10 k Ω, T_A = T_{low} to T_{high})	$\Delta V_{IO}/\Delta T$	 – –	 ±3.0 ±6.0	 – –	 – –	 ±3.0 ±6.0	 – –	μV/°C
DC Power Consumption (Power Supply = ±6.0 V)	V_C	–	150	220	–	165	220	mW
Equivalent Average Input Noise Voltage (f = 10 Hz to 500 kHz, R_S = 0)	V_n	–	5.0	–	–	5.0	–	μV

*T_{low} = 0°C for MC1410 or −55°C for MC1510

**T_{high} = +75°C for MC1410 or +125°C for MC1510

8

TYPICAL CHARACTERISTICS

(V_{CC} = +6.0 Vdc, V_{EE} = -6.0 Vdc, T_A = +25°C unless otherwise noted.)

FIGURE 3
POWER DISSIPATION versus SUPPLY VOLTAGE

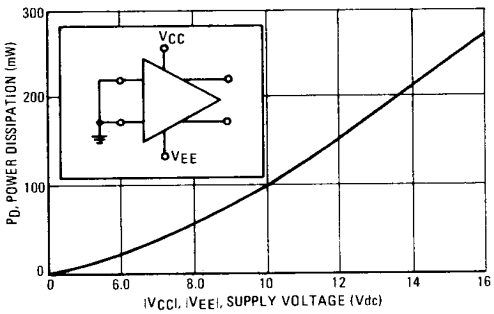


FIGURE 4
VOLTAGE GAIN versus SUPPLY VOLTAGE

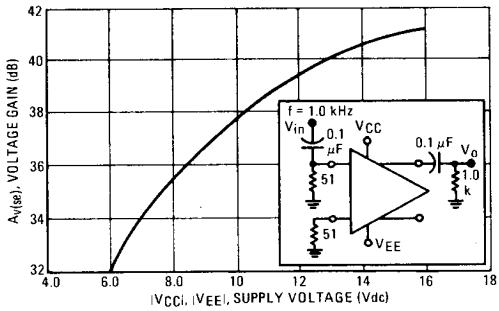


FIGURE 5
VOLTAGE GAIN versus TEMPERATURE

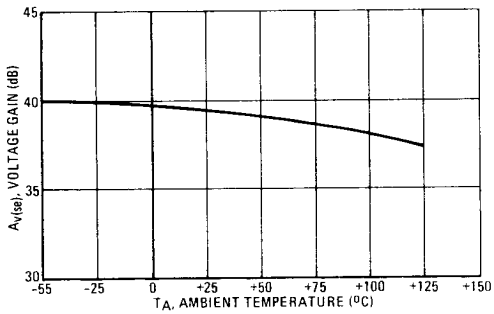


FIGURE 6
DC OUTPUT VOLTAGE versus TEMPERATURE

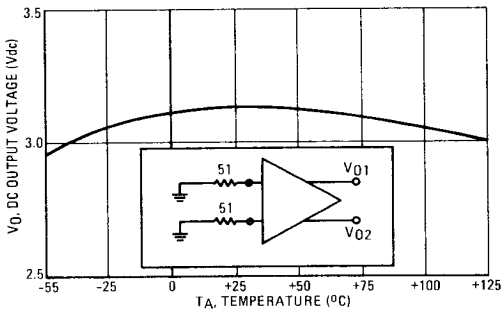


FIGURE 7
INPUT BIAS CURRENT versus TEMPERATURE

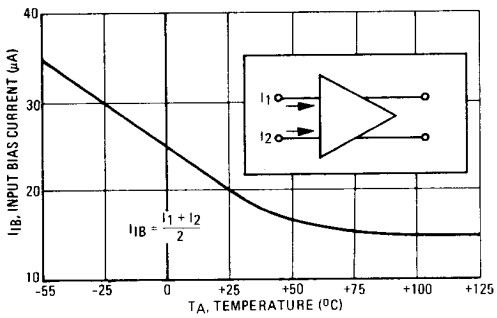
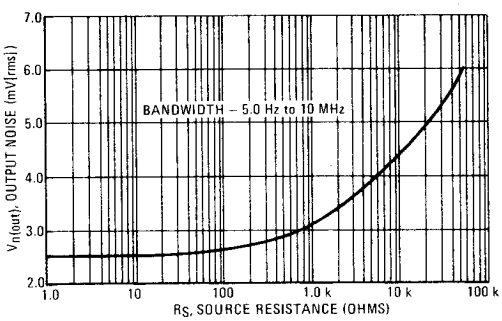


FIGURE 8
OUTPUT NOISE VOLTAGE versus SOURCE IMPEDANCE



8

TYPICAL CHARACTERISTICS

FIGURE 9
LIMITING CHARACTERISTICS @ 30 MHz

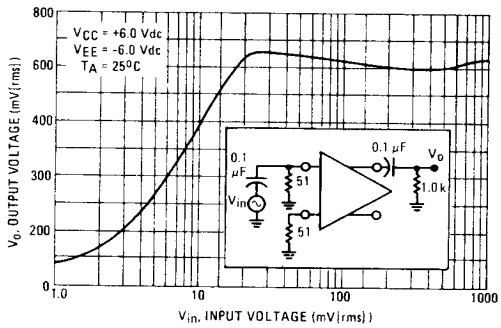
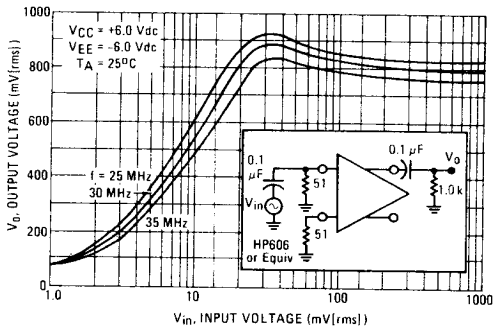


FIGURE 10
LIMITING CHARACTERISTICS versus FREQUENCY



TYPICAL APPLICATIONS

FIGURE 11
ENVELOPE DETECTOR

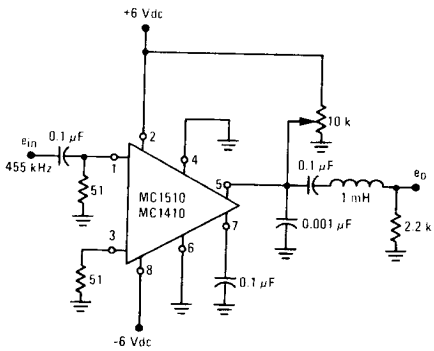


FIGURE 12
SINGLE STAGE WIDEBAND AMPLIFIER

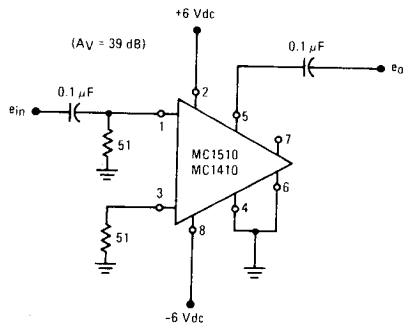
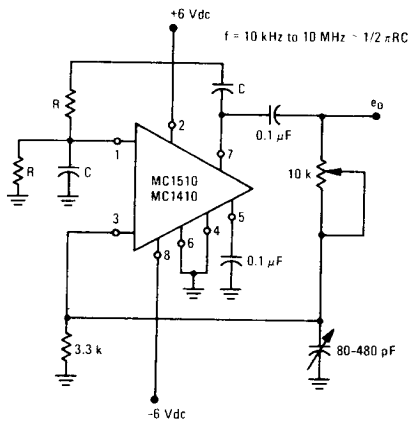


FIGURE 13
WEIN BRIDGE OSCILLATOR



8