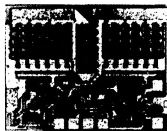


MC1554G MC1454G

POWER AMPLIFIER

MONOLITHIC 1-WATT POWER AMPLIFIERS

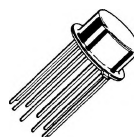


... designed to amplify signals to 300-kHz with 1-Watt delivered to a direct coupled or capacitively coupled load.

- Low Total Harmonic Distortion — 0.4% (Typ) @ 1 Watt
- Low Output Impedance — 0.2 Ohm
- Excellent Gain — Temperature Stability

1-WATT POWER AMPLIFIER INTEGRATED CIRCUIT

MONOLITHIC
SILICON EPITAXIAL PASSIVATED



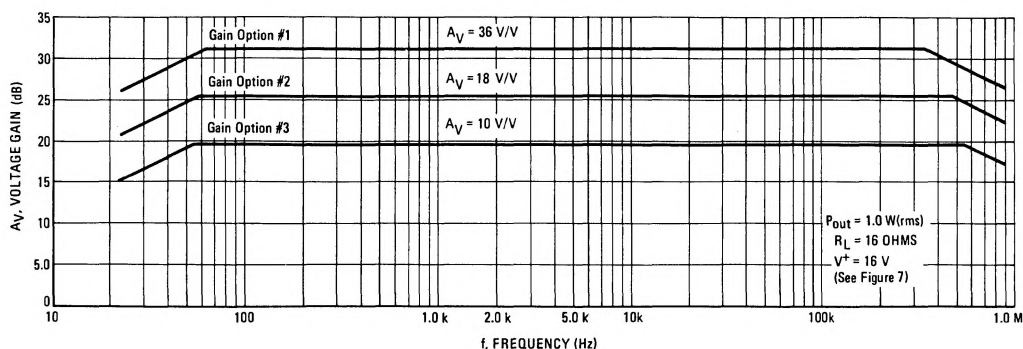
METAL PACKAGE
CASE 602B



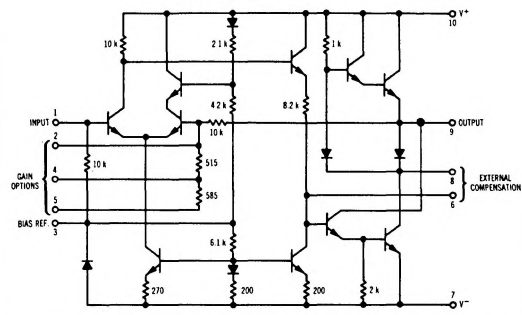
(bottom view)

Pin 7 connected to case

VOLTAGE GAIN versus FREQUENCY ($R_L = 16 \text{ OHMS}$)

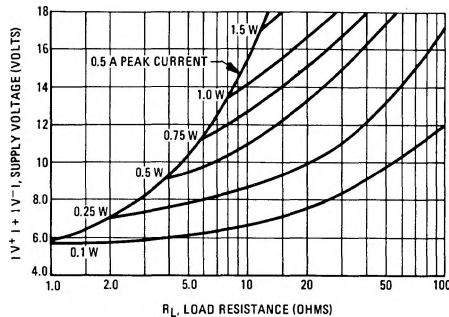


CIRCUIT SCHEMATIC



See Packaging Information Section for outline dimensions.

MAXIMUM AVAILABLE OUTPUT POWER (SINE WAVE)



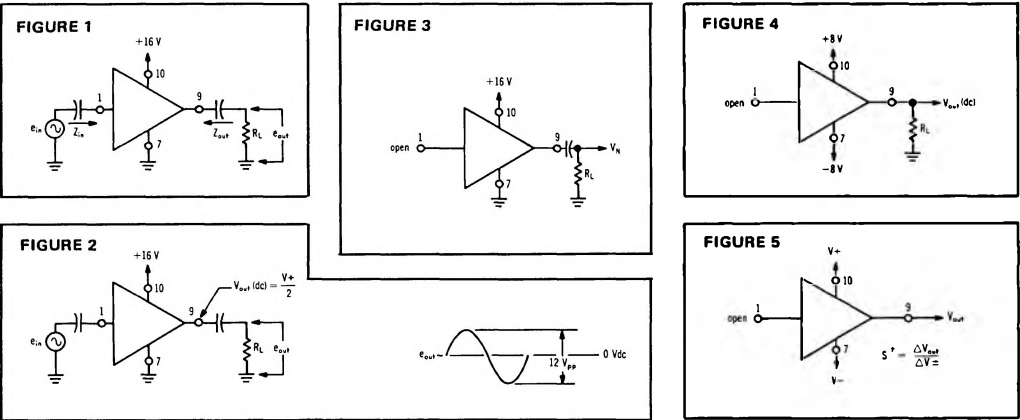
MC1554G, MC1454G (continued)

ELECTRICAL CHARACTERISTICS (T_C = +25°C unless otherwise noted)
Frequency compensation shown in Figures 6 and 7.

Characteristic	Figure	R _L (Ohms)	Gain Option*	Symbol	MC1554 (-55 to +125°C)			MC1454 (0 to +70°C)			Unit
					Min	Typ	Max	Min	Typ	Max	
Output Power (for e _{out} < 5.0% THD)	1	16	—	P _{out}	1.0	1.1	—	—	1.0	—	Watt
Power Dissipation (@ P _{out} = 1.0 W)	1	16	—	P _D	—	0.9	1.2	—	0.9	—	Watt
Voltage Gain	1	16	10	A _V	8.0	10	12	—	10	—	V/V
		16	18		—	18	—	—	18	—	
		16	36		—	36	—	—	36	—	
Input Impedance	1	—	10	Z _{in}	7.0	10	—	3.0	10	—	kΩ
Output Impedance	1	—	10	Z _{out}	—	0.2	—	—	0.4	—	Ω
Power Bandwidth (for e _{out} < 5.0% THD)	2	16	10		—	270	—	—	270	—	kHz
		16	18		—	250	—	—	250	—	
		16	36		—	210	—	—	210	—	
Total Harmonic Distortion (for e _{in} < 0.05% THD, f = 20 Hz to 20 kHz)	2	16	10	THD	—	0.4	—	—	0.4	—	%
P _{out} = 1.0 Watt (sinewave)		16	10		—	0.5	—	—	0.5	—	
P _{out} = 0.1 Watt (sinewave)		16	10		—	0.5	—	—	0.5	—	
Zero Signal Current Drain	3	∞	—	I _D	—	11	15	—	11	20	mAdc
Output Noise Voltage	3	16	10	V _n	—	0.3	—	—	0.3	—	mV(rms)
Output Quiescent Voltage (Split Supply Operation)	4	16	—	V _{out} (dc)	—	±10	±30	—	±10	—	mVdc
Positive Supply Sensitivity (V ⁻ constant)	5	∞	—	S ⁺	—	-40	—	—	-40	—	mV/V
Negative Supply Sensitivity (V ⁺ constant)	5	∞	—	S ⁻	—	-40	—	—	-40	—	mV/V

*To obtain the voltage gain characteristic desired, use the following pin connections: Voltage Gain Pin Connection
10 Pins 2 and 4 open, Pin 5 to ac ground
18 Pins 2 and 5 open, Pin 4 to ac ground
36 Pin 2 connected to Pin 5, Pin 4 to ac ground

Characteristic Definitions
(Linear Operation)



MC1554G, MC1454G (continued)

MAXIMUM RATINGS ($T_C = +25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Total Power Supply Voltage	$ V^+ + V^- $	18	Vdc
Peak Load Current	I_{out}	0.5	Ampere
Audio Output Power	P_{out}	1.8	Watts
Power Dissipation (package limitation) $T_A = +25^\circ\text{C}$ Derate above 25°C $T_C = +25^\circ\text{C}$ Derate above 25°C	P_D $1/\theta J_A$ P_D $1/\theta J_C$	600 4.8 1.8 14.4	mW mW/ $^\circ\text{C}$ Watts mW/ $^\circ\text{C}$
Operating Temperature Range MC1454 MC1554	T_A	0 to $+70$ -55 to $+125$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to $+150$	$^\circ\text{C}$

TYPICAL CONNECTIONS

FIGURE 6 – SPLIT SUPPLY OPERATION VOLTAGE
GAIN (A_V) = 10, $f_{LOW} \approx 25$ Hz

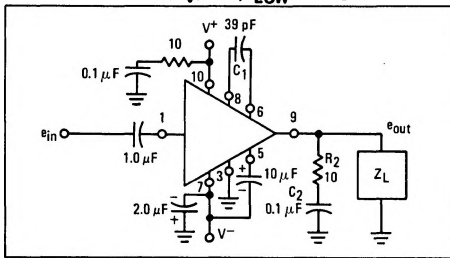
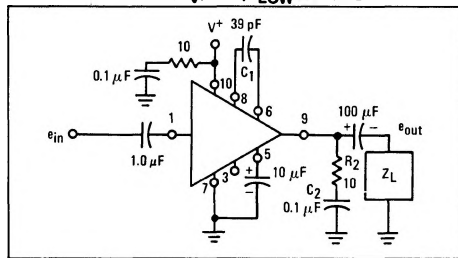


FIGURE 7 – SINGLE SUPPLY OPERATION VOLTAGE
GAIN (A_V) = 10, $f_{LOW} \approx 100$ Hz



RECOMMENDED OPERATING CONDITIONS

In order to avoid local VHF instability, the following set of rules must be adhered to:

1. An R-C stabilizing network (0.1 μF in series with 10 ohms) should be placed directly from pin 9 to ground, as shown in Figures 6 and 7, using short leads, to eliminate local VHF instability caused by lead inductance to the load.
2. Excessive lead inductance from the V^+ supply to pin 10 can cause high frequency instability. To prevent this, the V^+ by-pass capacitor should be connected with short leads from the V^+ pin to ground. If this capacitor is remotely located a series R-C network (0.1 μF and 10 ohms) should be used directly from pin 10 to ground as shown in Figures 6 and 7.

3. Lead lengths from the external components to pins 7, 9, and 10 of the package should be as short as possible to insure good VHF grounding for these points.

Due to the large bandwidth of the amplifier, coupling must be avoided between the output and input leads. This can be assured by either (a) use of short leads which are well isolated, (b) narrow-banding the overall amplifier by placing a capacitor from pin 1 to ground to form a low-pass filter in combination with the source impedance, or (c) use of a shielded input cable. In applications which require upper band-edge control the input low-pass filter is recommended.

TYPICAL CHARACTERISTICS

FIGURE 8 – TOTAL HARMONIC DISTORTION
versus LOAD RESISTANCE

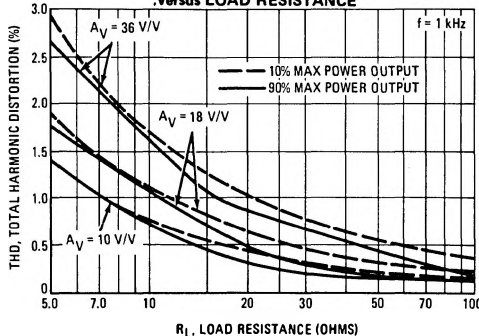
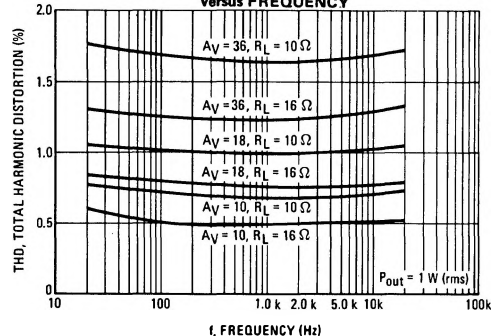


FIGURE 9 – TOTAL HARMONIC DISTORTION
versus FREQUENCY



TYPICAL CHARACTERISTICS (continued)

FIGURE 10 – VOLTAGE GAIN versus TEMPERATURE

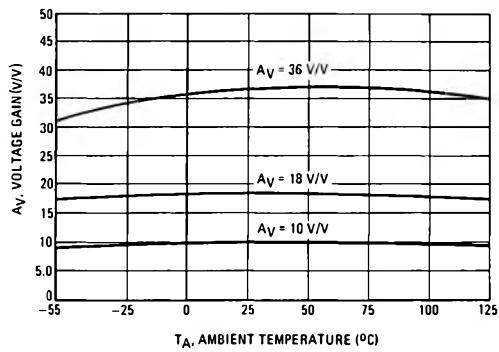


FIGURE 11 – OUTPUT VOLTAGE CHANGE

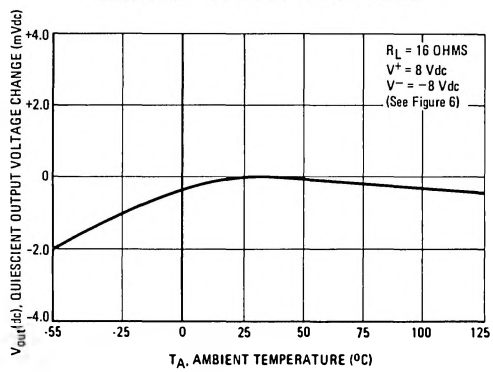


FIGURE 12 – VOLTAGE GAIN versus FREQUENCY ($R_L = \infty$)

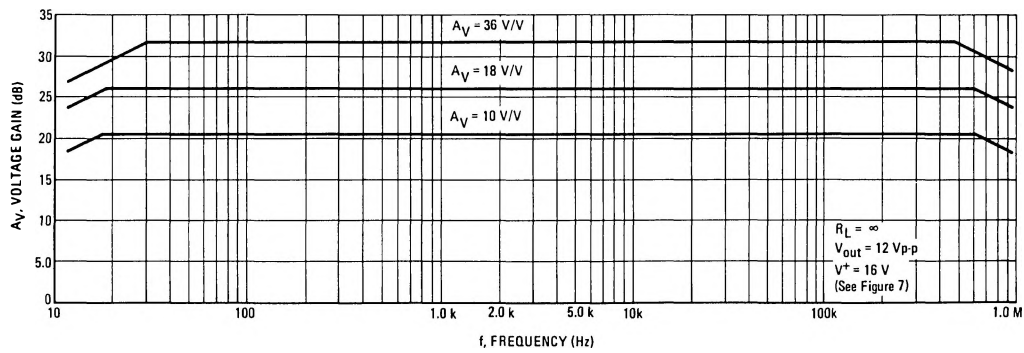


FIGURE 13 – MAXIMUM DEVICE DISSIPATION (SINE WAVE)

