## GENERAL DESCRIPTION

The RM1556/RC1556 are high performance, high gain operational amplifiers. Each amplifier is internally compensated and fabricated on a single silicon chip by the planar epitaxial process.

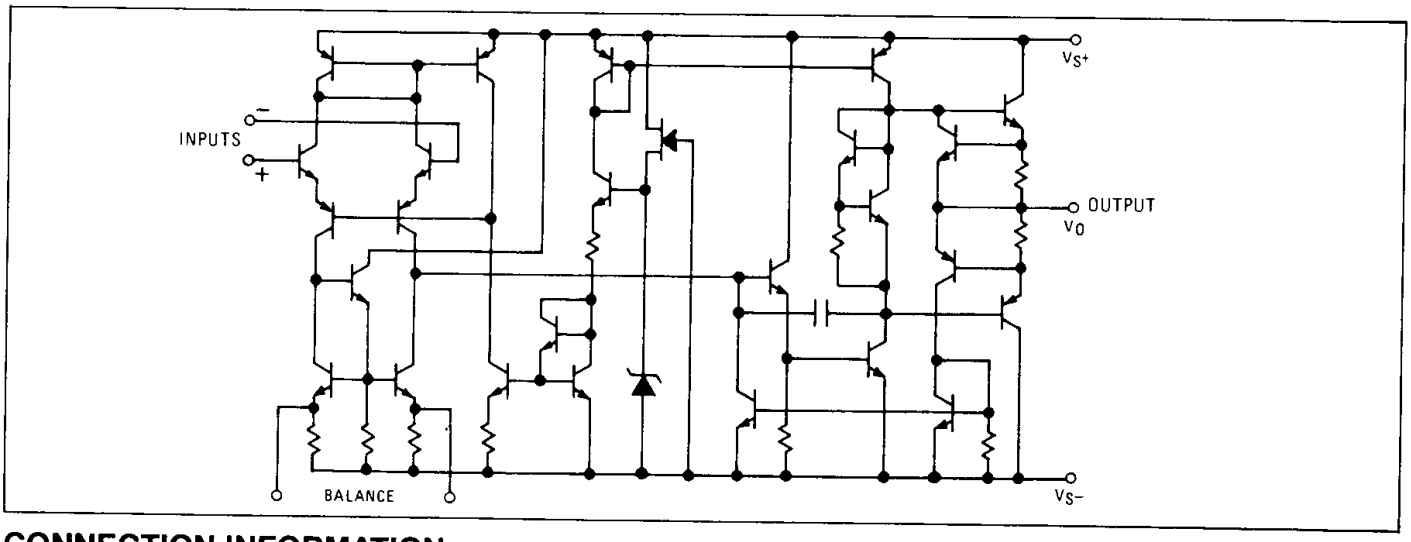
These amplifiers feature high common-mode and differential voltage range, very low input bias current, optimum performance over a wide range of supply voltage, and freedom from "latch-up." They are ideal for use as voltage followers, comparators, integrators, summing and general purpose amplifiers.

The RM types operate over a temperature range of -55°C to +125°C. The RC types operate from 0°C to +70°C.

## DESIGN FEATURES

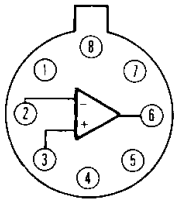
- Input Bias Current 15nA Maximum
- Input Offset Current 2nA Maximum
- Input Offset Voltage 4mV Maximum
- At ±15V Current Drain 1.0mA
- Offset Voltage Nulling (10k pot)
- Slew Rate 2.0V/μs
- Unity Gain Bandwidth 4MHz
- Gain Variation 3dB from ±3V to ±20V
- Open Loop Voltage Gain 106dB

## SCHEMATIC DIAGRAM



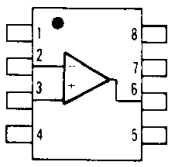

## CONNECTION INFORMATION

**TE (TO-99)**
**Metal Can Package**
(Top View)




Order Part Nos.:
RM1556T, RC1556T

**NB Dual In-line**
**Plastic Package**
(Top View)




Order Part No.:
RC1556NB

| PIN | FUNCTION |
|---|---|
| 1 | BAL |
| 2 | -INPUT |
| 3 | +INPUT |
| 4 | $V^-$ |
| 5 | BAL |
| 6 | OUTPUT |
| 7 | $V^+$ |
| 8 | NC |

## ABSOLUTE MAXIMUM RATINGS

Supply Voltage . . . . . RM1556: ±22V
RC1556: ±18V
Internal Power Dissipation (Note 1) . . . . . 500mW
Differential Input Voltage . . . . . ±30V
Input Voltage (Note 2) . . . . . ±15V
Storage Temperature Range . . . . . −65°C to +150°C

Operating Temperature Range
RM1556 . . . . . −55°C to +125°C
RC1556 . . . . . 0°C to +70°C
Lead Temperature (Soldering, 60s) . . . . . 300°C
Output Short-Circuit Duration (Note 3) . . . . . Indefinite

## RM1556 AND RC1556 ELECTRICAL CHARACTERISTICS

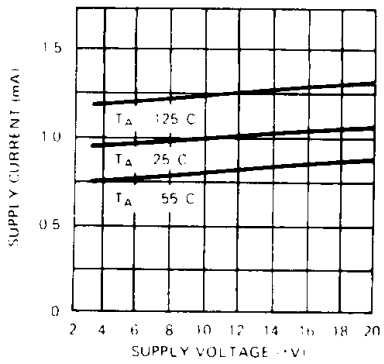
(RM1556: $-55°C \leq T_A \leq 125°C$; RC1556: $0°C \leq T_A \leq 70°C$; $V_S = \pm 15V$ unless otherwise specified)

| PARAMETER | CONDITIONS | RM1556 | | | RC1556 | | | UNITS |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Input Offset Voltage | $T_A = 25°C$, $R_S \leq 50k\Omega$ | | 2.0 | 4.0 | | 5.0 | 10 | mV |
| Input Offset Current | $T_A = 25°C$ | | 1.0 | 2.0 | | 5.0 | 10 | nA |
| Input Bias Current | $T_A = 25°C$ | | 8.0 | 15 | | 15 | 30 | nA |
| Input Resistance | $T_A = 25°C$ | | 5.0 | | | 3.0 | | MΩ |
| Supply Current | $T_A = 25°C$ | | 1.0 | 1.5 | | 1.3 | 3.0 | mA |
| Large Signal Voltage Gain | $T_A = 25°C$<br>$V_{OUT} = \pm 10V$, $R_L > 2k\Omega$ | 100 | 200 | | 70 | 100 | | V/mV |
| Input Offset Voltage | $R_S \leq 50k\Omega$ | | | 6.0 | | | 14 | mV |
| Input Offset Current | +25°C to $T_H$ | | | 3.0 | | | 14 | nA |
| | $T_L$ to +25°C | | | 5.0 | | | 14 | |
| Input Bias Current | | | | 30 | | | 40 | nA |
| Supply Current | | | | 1.9 | | | 3.5 | mA |
| Slew Rate (Unity Gain) | $T_A = 25°C$, $R_L \geq 2k\Omega$ | | 2.0 | | | 2.0 | | V/μs |
| Bandwidth (Unity Gain) | $T_A = 25°C$, $R_L \geq 2k\Omega$ | | 4 | | | 4 | | MHz |
| Large Signal Voltage Gain | $R_L \geq 2k\Omega$, $V_{OUT} = \pm 10V$ | 40 | | | 40 | | | V/mV |
| Output Voltage Swing | $T_A = 25°C$, $R_L \geq 2k\Omega$, | ±12 | ±13 | | ±11 | ±12 | | V |
| Input Voltage Range | | ±12 | ±13 | | ±11 | ±12 | | V |
| Input Noise Voltage | $R_S = 10k\Omega$, f = 1.0kHz,<br>AV = 100, BW = 1.0Hz | | 25 | | | 25 | | $nV/\sqrt{Hz}$ |
| Common-Mode Rejection Ratio | $R_S \leq 50k\Omega$ | 80 | 110 | | 70 | 110 | | dB |
| Supply Voltage Rejection Ratio | $R_L \leq 50k\Omega$ | 80 | 86 | | 74 | 83 | | dB |

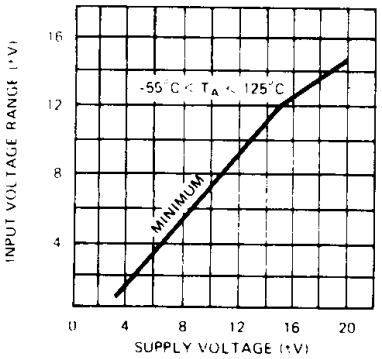
**NOTES:**
1. For operating at elevated temperatures, the device must be derated based on 150°C for RM1556; 100°C for RC1556 maximum junction temperature and a thermal resistance of 150°C/W junction to ambient or 45°C/W junction to case.
2. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
3. Short-circuit to ground rating applies to +125°C case temperature or +75°C ambient temperature for RM1556.

## TYPICAL ELECTRICAL DATA

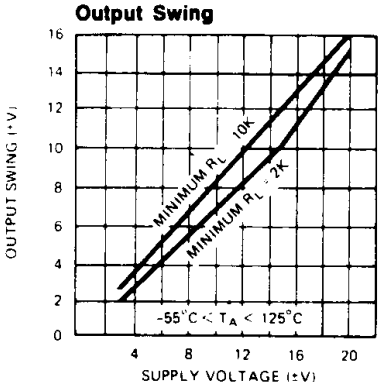
### Supply Current



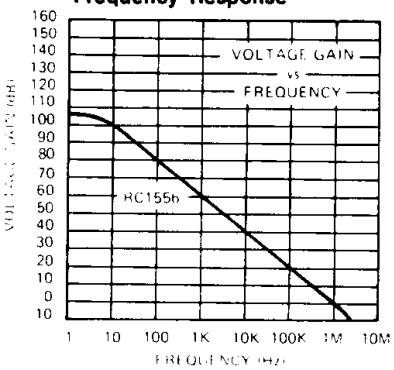

### Input Voltage Range



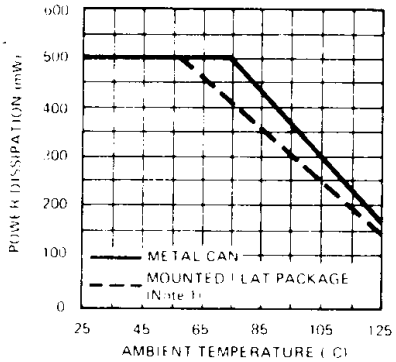

### Output Swing



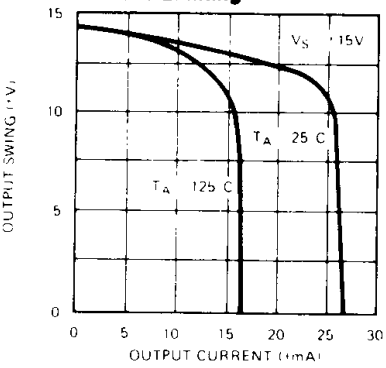

### Open Loop Frequency Response



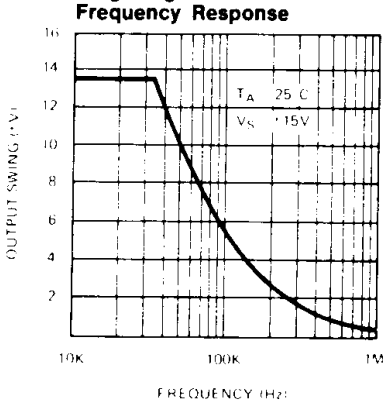

### Maximum Power Dissipation



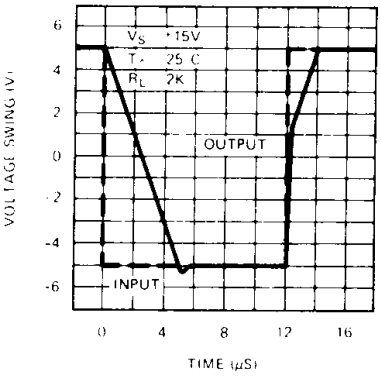

### Current Limiting



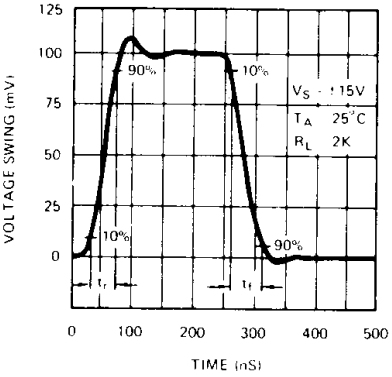

### Large Signal Frequency Response



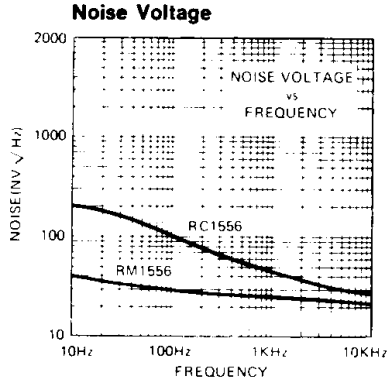

### Voltage Follower Large Pulse Response



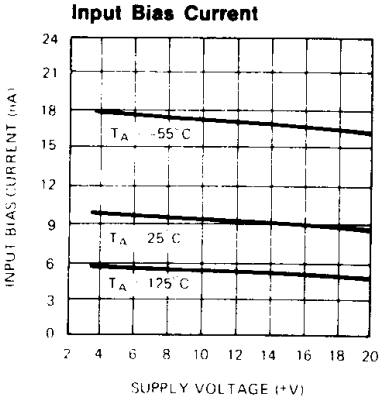

### Voltage Follower Small Pulse Response




### Noise Voltage




### Input Bias Current




### Voltage Gain