

**GENERAL DESCRIPTION**

The RM4531 and RC4531 are high slew rate operational amplifiers intended for applications requiring slew rates up to 30V/ $\mu$ s while keeping the DC performance of the 741.

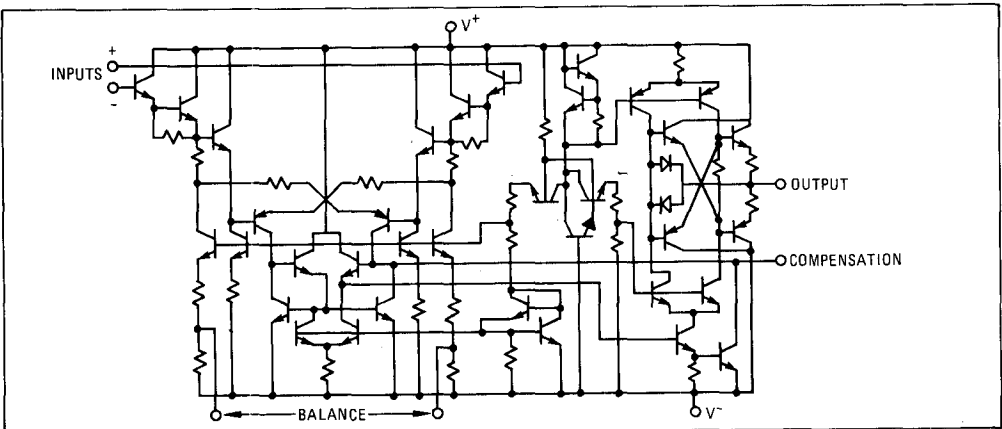
The RM4531 military version operates over a temperature range from  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ . The RC4531 operates from  $0^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ .

High slew rates are achieved through use of an improved input stage which tends to retain small signal characteristics when subjected to large differential input signals. Advanced integrated circuit layout techniques are used to eliminate thermal feedback. The RM4531 and RC4531 feature offset null capability, high gain, and each can be compensated with an external 100pF capacitor connected between the output and compensation terminals.

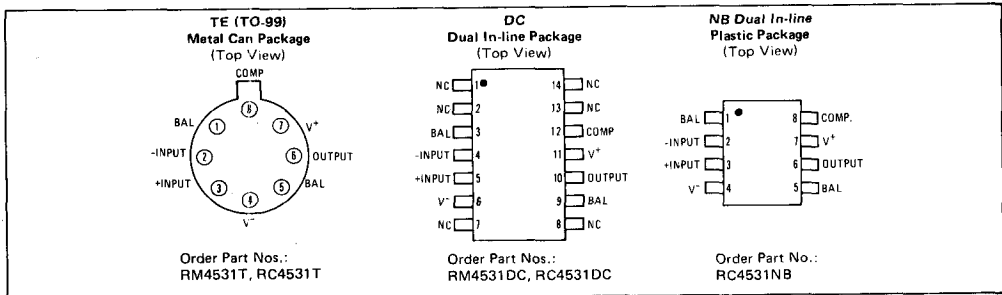
**DESIGN FEATURES**

- Slew Rate 35V/ $\mu$ s
- Small Signal Bandwidth 1MHz
- Large Signal Bandwidth 500kHz
- Supply Voltage  $\pm 6\text{V}$  to  $\pm 18\text{V}$
- Pin-for-Pin Replacement for 709, LM101A, 741
- Low Drift Offset-Null Circuitry
- Compensated with Single Capacitor

**SCHEMATIC DIAGRAM**



**CONNECTION INFORMATION**



## ABSOLUTE MAXIMUM RATINGS

Supply Voltage	RM4531: $\pm 22V$ RC4531: $\pm 18V$	Operating Temperature Range	RM4531: $-55^{\circ}C$ to $+125^{\circ}C$ RC4531: $0^{\circ}C$ to $+70^{\circ}C$
Internal Power Dissipation (Note 1)	500mW	Lead Temperature (Soldering, 60s)	$300^{\circ}C$
Differential Input Voltage	$\pm 15V$	Output Short-Circuit Duration (Note 3)	Indefinite
Input Voltage (Note 2)	$-12.5V, +15V$		
Storage Temperature Range	$-65^{\circ}C$ to $+150^{\circ}C$		

## ELECTRICAL CHARACTERISTICS ( $V_S = \pm 15V, T_A = 25^{\circ}C$ unless otherwise specified)

PARAMETER	CONDITIONS	RM4531			RC4531			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$R_S \leq 10k\Omega$		2.0	5.0		2.0	6.0	mV
Input Offset Current			30	200		50	200	nA
Input Bias Current			300	500		400	1500	nA
Input Resistance		0.3	20		0.3	20		M $\Omega$
Large-Signal Voltage Gain	$R_S \geq 2k\Omega, V_{out} = \pm 10V$	50,000	100,000		20,000	60,000		V/V
Input Voltage Range (Note 2)		$\pm 10$			$\pm 10$			V
Common Mode Rejection Ratio	$R_S \leq 10k\Omega$	70	100		70	100		dB
Supply Voltage Rejection Ratio	$R_S \leq 10k\Omega$		10	150		10	150	$\mu V/V$
Output Resistance			75			75		$\Omega$
Supply Current			5.5	7.0		5.5	10	mA
Power Consumption			165	210		165	300	mW
Setting Time, 1%	$A_V = +1, V_{IN} = \pm 10V$		1.5			1.5		$\mu s$
Setting Time, .01%	$A_V = +1, V_{IN} = \pm 10V$		2.5			2.5		$\mu s$
Large Signal Overshoot	$A_V = +1, V_{IN} = \pm 10V$		2.0			2.0		%
Small Signal Risetime	$A_V = +1, V_{IN} = 400mV$		300			300		ns
Small Signal Overshoot	$A_V = +1, V_{IN} = 400mV$		5.0			5.0		%
Slew Rate	$A_V = 100$		35			35		V/ $\mu s$
	$A_V = 10$		35			35		V/ $\mu s$
	$A_V = 1$ (non-inv.)		30			30		V/ $\mu s$
	$A_V = 1$ (inv.)		35			35		V/ $\mu s$

The following specifications apply for  $-55^{\circ}C \leq T_A \leq +125^{\circ}C$  for RM4531;  $0^{\circ}C \leq T_A \leq +70^{\circ}C$  for RC4531.

Input Offset Voltage	$R_S \leq 10k\Omega$			6.0			7.5	mV
Input Offset Current	$T_A = T_{min}$			500			300	nA
	$T_A = T_{max}$			200			200	nA
Input Bias Current	$T_A = T_{min}$			1.5			2.0	$\mu A$
	$T_A = T_{max}$			0.5			1.5	$\mu A$
Large-Signal Voltage Gain	$R_L \geq 2k\Omega, V_{out} = \pm 10V$	25,000				15,000		
Output Voltage Swing	$R_L \geq 2k\Omega$	$\pm 10$	$\pm 13$			$\pm 10$	$\pm 13$	V
Common Mode Rejection Ratio	$R_S \leq 10k\Omega$	70	90					dB
Supply Voltage Rejection Ratio	$R_S \leq 10k\Omega$		10	150				$\mu V/V$
Supply Current	$T_A = T_{max}$		4.5	5.5		4.5	5.5	mA

### NOTES:

- Rating applies for case temperatures to  $+125^{\circ}C$ ; derate linearly at 6.5 mW/ $^{\circ}C$  for ambient temperatures above  $+75^{\circ}C$  for RM4531.
- For supply voltages less than  $\pm 15V$ , the absolute maximum positive input voltage is equal to the supply voltage. The absolute maximum negative input voltage decreased by 1 volt for every 1 volt decrease in the negative supply voltage.
- Short-circuit may be to ground or to either supply. Rating applies to  $+125^{\circ}C$  case temperature or  $+75^{\circ}C$  ambient temperature for RM4531.