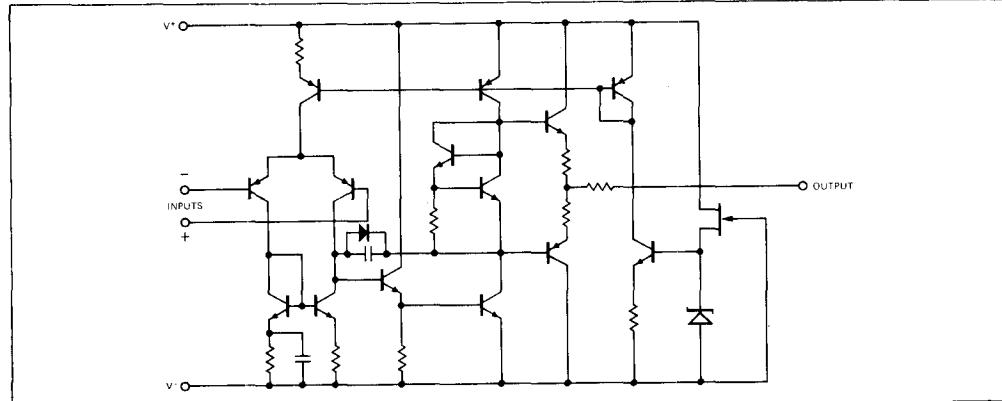


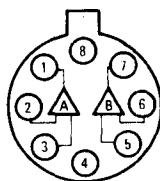
**GENERAL DESCRIPTION**

The 4558 integrated circuit is a dual high gain operational amplifier internally compensated and constructed on a single silicon chip using the planar epitaxial process.

Combining the features of the 741 with the close parameter matching and tracking of a dual device on a monolithic chip results in unique performance characteristics. Excellent channel separation allows the use of the dual device in single 741 operational amplifier applications providing the highest possible packaging density. It is especially well suited for applications in differential-in, differential-out as well as in potentiometric amplifiers and where gain and phase matched channels are mandatory.

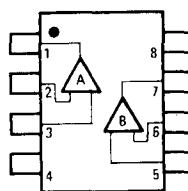
**SCHEMATIC DIAGRAM** (1/2 Shown)**CONNECTION INFORMATION**

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



Order Part Nos.:  
RC4558T, RM4558T

**DE and NB**  
. Dual In-line Packages  
(Top View)



Order Part Nos.:  
RC4558NB, RV4558NB  
RC4558DE, RV4558DE  
RM4558DE

PIN	FUNCTION
1	A OUTPUT
2	A -INPUT
3	A +INPUT
4	V-
5	B +INPUT
6	B -INPUT
7	B OUTPUT
8	V+

# Dual High-Gain Operational Amplifier

4558

## ABSOLUTE MAXIMUM RATINGS

Supply Voltage	RM4558: $\pm 22V$ RC4558: $\pm 18V$	Operating Temperature Range ..	RM4558: $-55^{\circ}C$ to $+125^{\circ}C$ RV4558: $-40^{\circ}C$ to $+85^{\circ}C$
Internal Power Dissipation (Note 1)	500mW	RC4558:	$0^{\circ}C$ to $+70^{\circ}C$
Differential Input Voltage	$\pm 30V$	Lead Temperature (Soldering, 60s)	$300^{\circ}C$
Input Voltage (Note 2)	$\pm 15V$	Output Short-Circuit Duration (Note 3)	Indefinite
Storage Temperature Range	$-65^{\circ}C$ to $+150^{\circ}C$		

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

PARAMETER	CONDITIONS	RM4558			RV/RC4558			UNITS
		MIN	Typ	MAX	MIN	Typ	MAX	
Input Offset Voltage	$R_S \leq 10k\Omega$		1.0	5.0		2.0	6.0	mV
Input Offset Current			5.0	200		30	200	nA
Input Bias Current			40	500		200	500	nA
Input Resistance		0.3	1.0		0.3	1.0		M $\Omega$
Large-Signal Voltage Gain	$R_L \geq 2k\Omega$ $V_{out} = \pm 10V$	50,000	300,000		20,000	300,000		
Output Voltage Swing	$R_L \geq 10k\Omega$ $R_L \geq 2k\Omega$	$\pm 12$ $\pm 10$	$\pm 14$ $\pm 13$		$\pm 12$ $\pm 10$	$\pm 14$ $\pm 13$		V
Input Voltage Range		$\pm 12$	$\pm 13$		$\pm 12$	$\pm 13$		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	$\mu V/V$
Power Consumption (All Amplifiers)	$R_L = \infty$		100	170		100	170	mW
Transient Response (unity gain)	$V_{IN} = 20mV$ $R_L = 2k\Omega$ $C_L \leq 100pF$							
Risetime Overshoot			0.3 15.0			0.3 15.0		$\mu s$ %
Slew Rate (unity gain)	$R_L \geq 2k\Omega$		0.5			0.5		V/ $\mu s$
Channel Separation (Gain = 100)	$f = 10kHz$ $R_S = 1k\Omega$		90			90		dB
Unity Gain Bandwidth (Gain = 1)		2.5	3.0		2.0	3.0		MHz

The following specifications apply for  $-55^{\circ}C \leq T_A \leq +125^{\circ}C$  for RM4558,  $0^{\circ}C \leq T_A \leq +70^{\circ}C$  for RC4558,  
 $-40^{\circ}C \leq T_A \leq +85^{\circ}C$  for RV4558

Input Offset Voltage	$R_S \leq 10k\Omega$		6.0		7.5	mV	
Input Offset Current			500		300/500*	nA	
Input Bias Current			1500		800/1500	nA	
Large-Signal Voltage Gain	$R_L \geq 2k\Omega$ $V_{out} = \pm 10V$	25,000		15,000			
Output Voltage Swing	$R_L \geq 2k\Omega$	$\pm 10$		$\pm 10$		V	
Power Consumption	$V_S = \pm 15V$ $T_A = +125^{\circ}C$ $T_A = -55^{\circ}C$	90 120	150 200		90 120	150 200	mW

\*RV4558

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

PARAMETER	CONDITIONS	RM4558 Typ	RC4558 Typ	UNITS
Voltage Gain	$R_L \geq 2k\Omega$	$\pm .5$	$\pm 1.0$	dB
Input Bias Current		$\pm 15$	$\pm 15$	nA
Input Offset Current		$\pm 7.5$	$\pm 7.5$	nA
Input Offset Voltage	$R_S \geq 10k\Omega$	$\pm .1$	$\pm .2$	mV

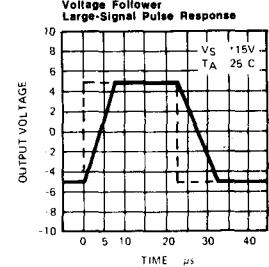
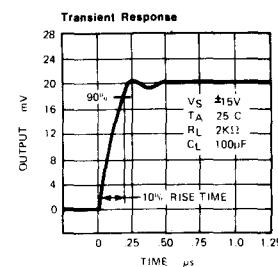
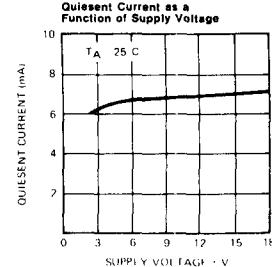
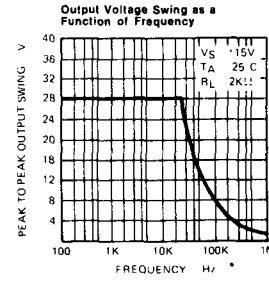
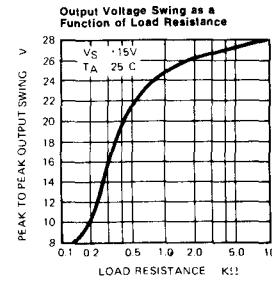
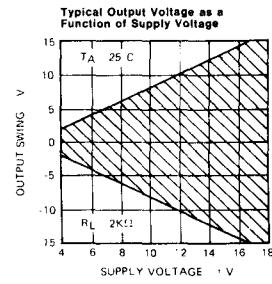
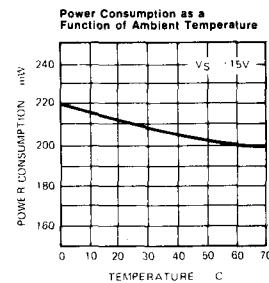
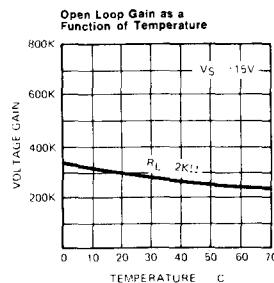
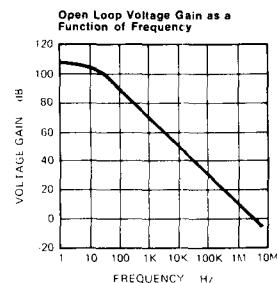
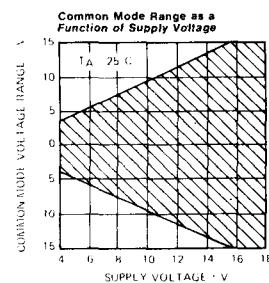
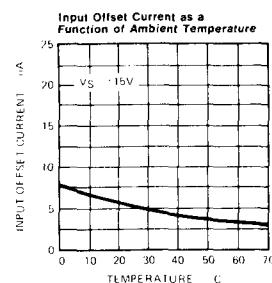
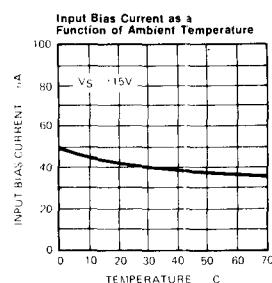
NOTE 1: Rating applies for case temperatures to  $125^{\circ}C$ , derate linearly at  $6.5mW/^{\circ}C$  for ambient temperatures above  $+75^{\circ}C$  for RM4558.

NOTE 2: For supply voltages less than  $\pm 15V$ , the absolute maximum input voltage is equal to the supply voltage.

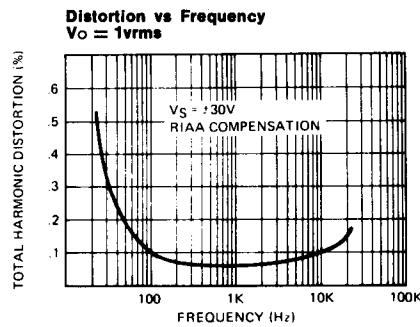
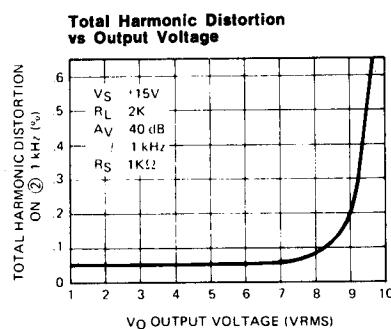
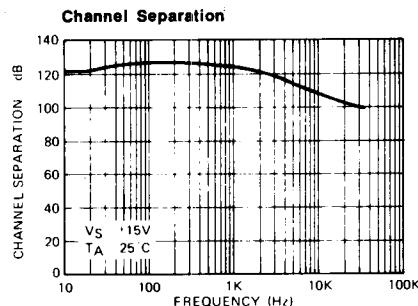
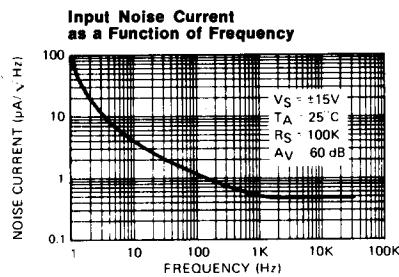
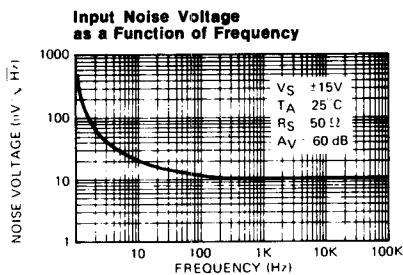
NOTE 3: Short circuit may be to ground on one amp only. Rating applies to  $+125^{\circ}C$  case temperature or  $+75^{\circ}C$  ambient temperature for RC4558 and to  $+85^{\circ}C$  ambient temperature for RV4558.



## TYPICAL ELECTRICAL DATA



## TYPICAL ELECTRICAL DATA





	SYMBOL	RM/RC4558			RM/RC4559			RC4739			UNIT
<b>Maximum Ratings</b>		$\pm 4$ to			$\pm 4$ to			$\pm 4$ to			
Supply Voltage Range	V <sub>CC</sub>	$\pm 18$			$\pm 18$			$\pm 18$			V
Differential Input Voltage	V <sub>ID</sub>	$\pm 30$			$\pm 30$			$\pm 30$			V
Input Voltage		$\pm 15$			$\pm 15$			$\pm 15$			V
Power Dissipation	P <sub>D</sub>	500			500			500			mW
<b>Electrical Characteristics</b>	@ 25°C	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Test Conditions	V <sub>CC</sub>		$\pm 15$			$\pm 15$			$\pm 15$		V
Input Offset Voltage	V <sub>ID</sub>		1.0 2.0*	5.0 6.0*		1.0 2.0*	5.0 6.0*		2.0	6.0	mV
Input Offset Current	I <sub>IO</sub>		5.0	200		5.0	200		5.0	200	nA
Input Bias Current	I <sub>IB</sub>		40/200*	500		40/200*	500		40	500	nA
Input Common Mode Voltage Range	V <sub>ICR</sub>	$\pm 12$	$\pm 14$		$\pm 12$	$\pm 14$		$\pm 12$	$\pm 14$		V
Supply Current	I <sub>D</sub>		3.5	5.6		3.5	5.6		3.5	5.6	mA
Open Loop Voltage Gain	A <sub>VOL</sub>	50/20*	300		50/20*	300		20	300		V/mV
Output Voltage Swing	V <sub>OR</sub>	$\pm 12$	$\pm 14$		$\pm 12$	$\pm 14$		$\pm 12$	$\pm 14$		V
Common Mode Rejection Ratio	CMRR	70	100		70	100		70	100		dB
Power Supply Rejection Ratio	PSSR		10	150		10	150		10	150	$\mu$ V/V
Unity Gain Bandwidth	BW	2.5/2.0*	3.0		3	4			3.0		MHz
Slew Rate	SR		0.5		1.5	2.0			1.0		V/ $\mu$ s
Channel Separation			-90			-90			-125		dB
Noise Voltage	V <sub>N</sub>		10		2.0†	1.4†			2.5†		nV/(Hz) $^{1/2}$
Operating Temperature Range	TA	-55 0	RM RC	+125 70	-55 0	RM RC	+125 70	0		70	°C
Package:	Hermetic TO-5 Hermetic Dip Plastic Dip	TE DE NB			TE DE NB			DB			

\*Commercial temp range device.

†Broad Band noise voltage -20 Hz to 20 kHz ( $\mu$ VRMS).