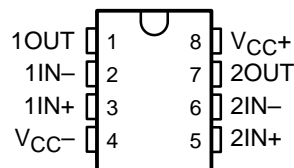


# RC4558 DUAL GENERAL-PURPOSE OPERATIONAL AMPLIFIER

SLOS073B – MARCH 1976 – REVISED OCTOBER 2002

- Continuous-Short-Circuit Protection
- Wide Common-Mode and Differential Voltage Ranges
- No Frequency Compensation Required
- Low Power Consumption
- No Latch-Up
- Unity-Gain Bandwidth . . . 3 MHz Typ
- Gain and Phase Match Between Amplifiers
- Low Noise . . . 8 nV/√Hz Typ at 1 kHz
- Designed To Be Interchangeable With Raytheon RC4558 Device

D, P, PS, OR PW PACKAGE  
(TOP VIEW)



## description/ordering information

The RC4558 device is a dual general-purpose operational amplifier, with each half electrically similar to the  $\mu$ A741, except that offset null capability is not provided.

The high common-mode input voltage range and the absence of latch-up make this amplifier ideal for voltage-follower applications. The device is short-circuit protected and the internal frequency compensation ensures stability without external components.

## ORDERING INFORMATION

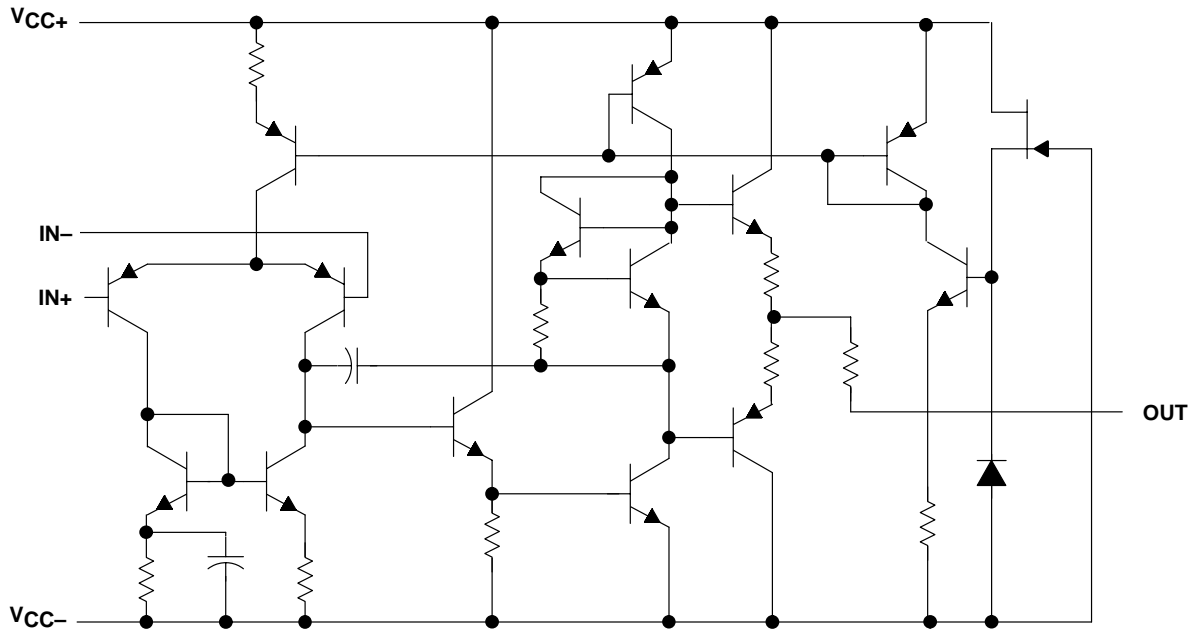
T <sub>A</sub>	V <sub>IO</sub> MAX AT 25°C	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	6 mV	PDIP (P)	Tube	RC4558P	RC4558P
		SOIC (D)	Tube	RC4558D	RC4558
			Tape and reel	RC4558DR	
		SOP (PS)	Tape and reel	RC4558PSR	R4558
		TSSOP (PW)	Tube	RC4558PW	R4558
			Tape and reel	RC4558PWR	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).

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## schematic (each amplifier)



## absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage, $V_{CC+}$ (see Note 1)	18 V
Supply voltage, $V_{CC-}$ (see Note 1)	-18 V
Differential input voltage, $V_{ID}$ (see Note 2)	$\pm 30$ V
Input voltage, $V_I$ (any input, see Notes 1 and 3)	$\pm 15$ V
Duration of output short circuit to ground, one amplifier at a time (see Note 4)	Unlimited
Operating virtual junction temperature, $T_J$	150°C
Package thermal impedance, $\theta_{JA}$ (see Notes 5 and 6):	
D package	97°C/W
P package	85°C/W
PS package	95°C/W
PW package	149°C/W
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds	260°C
Storage temperature range, $T_{stg}$	-65°C to 150°C

- NOTES: 1. All voltage values, unless otherwise noted, are with respect to the midpoint between  $V_{CC+}$  and  $V_{CC-}$ .
2. Differential voltages are at IN+ with respect to IN-.
3. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15 V, whichever is less.
4. Temperature and/or supply voltages must be limited to ensure that the dissipation rating is not exceeded.
5. Maximum power dissipation is a function of  $T_J(\max)$ ,  $\theta_{JA}$ , and  $T_A$ . The maximum allowable power dissipation at any allowable ambient temperature is  $P_D = (T_J(\max) - T_A)/\theta_{JA}$ . Operating at the absolute maximum  $T_J$  of 150°C can affect reliability.
6. The package thermal impedance is calculated in accordance with JESD 51-7.

## recommended operating conditions

		MIN	MAX	UNIT
$V_{CC+}$	Supply voltage	5	15	V
$V_{CC-}$		-5	-15	
$T_A$	Operating free-air temperature	0	70	°C



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# RC4558 DUAL GENERAL-PURPOSE OPERATIONAL AMPLIFIER

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**electrical characteristics at specified free-air temperature,  $V_{CC+} = 15\text{ V}$ ,  $V_{CC-} = -15\text{ V}$**

PARAMETER		TEST CONDITIONS†	MIN	TYP	MAX	UNIT
$V_{IO}$	Input offset voltage	$V_O = 0$	25°C	0.5	6	mV
			Full range		7.5	
$I_{IO}$	Input offset current	$V_O = 0$	25°C	5	200	nA
			Full range		300	
$I_{IB}$	Input bias current	$V_O = 0$	25°C	150	500	nA
			Full range		800	
$V_{ICR}$	Common-mode input voltage range	25°C	±12	±14		V
$V_{OM}$	Maximum output voltage swing	$R_L = 10\text{ k}\Omega$	25°C	±12	±14	V
		$R_L = 2\text{ k}\Omega$	25°C	±10	±13	
		$R_L \geq 2\text{ k}\Omega$	Full range	±10		
$A_{VD}$	Large-signal differential voltage amplification	$R_L \geq 2\text{ k}\Omega$ , $V_O = \pm 10\text{ V}$	25°C	20	300	V/mV
			Full range	15		
$B_1$	Unity-gain bandwidth	25°C		3		MHz
$r_i$	Input resistance	25°C	0.3	5		M $\Omega$
CMRR	Common-mode rejection ratio	25°C	70	90		dB
$k_{SVS}$	Supply-voltage sensitivity ( $\Delta V_{IO}/\Delta V_{CC}$ )	$V_{CC} = \pm 15\text{ V}$ to $\pm 9\text{ V}$	25°C	30	150	$\mu\text{V/V}$
$V_n$	Equivalent input noise voltage (closed loop)	$A_{VD} = 100$ , $R_S = 100\ \Omega$ , $f = 1\text{ kHz}$ , $BW = 1\text{ Hz}$	25°C	8		$\text{nV}/\sqrt{\text{Hz}}$
$I_{CC}$	Supply current (both amplifiers)	$V_O = 0$ , No load	25°C	2.5	5.6	mA
			$T_A(\text{min})$	3	6.6	
			$T_A(\text{max})$	2.3	5	
$P_D$	Total power dissipation (both amplifiers)	$V_O = 0$ , No load	25°C	75	170	mW
			$T_A(\text{min})$	90	200	
			$T_A(\text{max})$	70	150	
$V_{O1}/V_{O2}$	Crosstalk attenuation	Open loop $A_{VD} = 100$	$R_S = 1\text{ k}\Omega$ , $f = 10\text{ kHz}$	25°C	85	dB
					105	

† All characteristics are measured under open-loop conditions with zero common-mode input voltage, unless otherwise specified. Full range is 0°C to 70°C.  $T_A(\text{min})$  is 0°C.  $T_A(\text{max})$  is 70°C.

**operating characteristics,  $V_{CC+} = 15\text{ V}$ ,  $V_{CC-} = -15\text{ V}$ ,  $T_A = 25^\circ\text{C}$**

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
$t_r$	Rise time	$V_I = 20\text{ mV}$ , $R_L = 2\text{ k}\Omega$ , $C_L = 100\text{ pF}$			0.13		ns
	Overshoot				5		%
SR	Slew rate at unity gain	$V_I = 10\text{ V}$ ,	$R_L = 2\text{ k}\Omega$ ,	$C_L = 100\text{ pF}$	1.1	1.7	V/ $\mu\text{s}$



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