

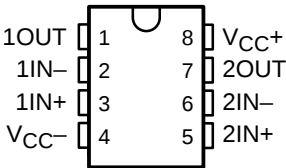
RC4558

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 μ 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

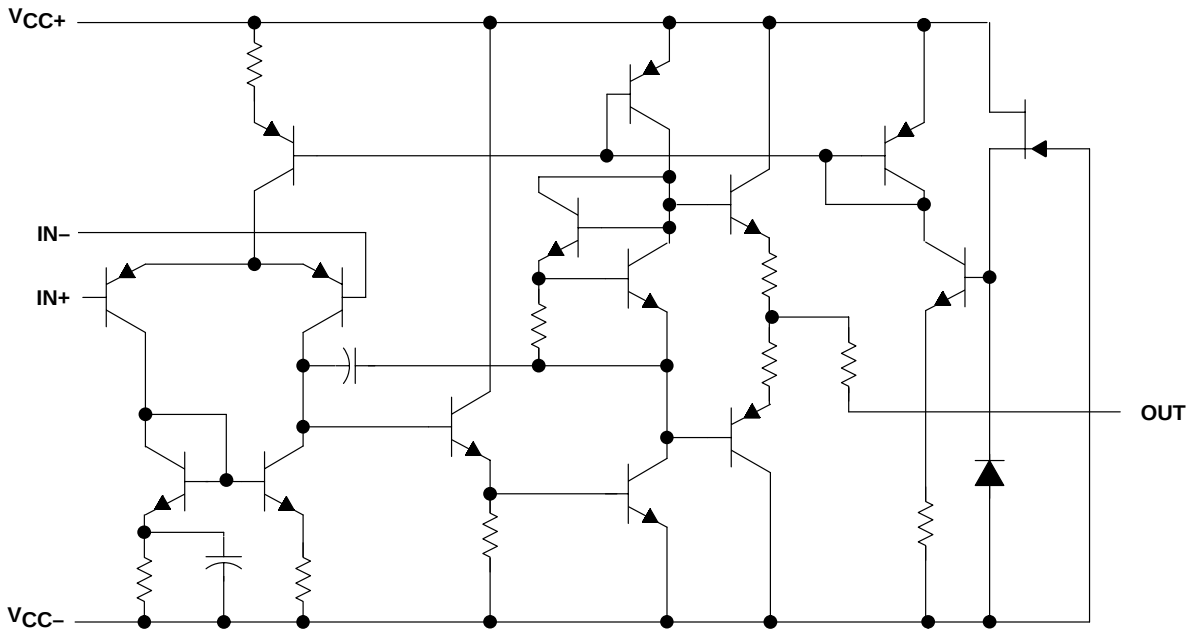
T _A	V _{IO} MAX AT 25°C	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	6 mV	PDIP (P)	Tube	RC4558P	RC4558P
		SOIC (D)	Tube	RC4558D	RC4558
			Tape and reel	RC4558DR	
		SOP (PS)	Tape and reel	RC4558PSR	R4558
		TSSOP (PW)	Tube	RC4558PW	R4558
			Tape and reel	RC4558PWR	

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

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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)	± 30 V
Input voltage, V_I (any input, see Notes 1 and 3)	± 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, θ_{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 $T_J(max)$, θ_{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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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 Ω
$CMRR$	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)	$A_{VD} = 100$, $R_S = 100\text{ }\Omega$, $f = 1\text{ kHz}$, $BW = 1\text{ Hz}$	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	$R_S = 1\text{ k}\Omega$, $f = 10\text{ kHz}$	25°C	85		dB
		$A_{VD} = 100$			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	5		ns
	Overshoot						
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/ μs



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RC4558, Dual General-Purpose Operational Amplifier
DEVICE STATUS: ACTIVE

PARAMETER NAME	RC4558
Number of Channels	2
Available Channels	D
Shutdown	No
Vs (max) (V)	30
Vs (min) (V)	10
IQ per channel (max) (mA)	2.8
GBW (typ) (MHz)	3
Slew Rate (typ) (V/us)	1.7
VIO (25 deg C) (max) (mV)	6
IIB (max) (pA)	500000
CMRR (min) (dB)	70
Vn at 1kHz (typ) (nV/rtHz)	8
Single Supply	No

FEATURES

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DESCRIPTION

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TECHNICAL DOCUMENTS

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To view the following documents, [Acrobat Reader 4.0](#) is required.
To download a document to your hard drive, right-click on the link and choose 'Save'.

DATASHEET

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Full datasheet in Acrobat PDF: [rc4558.pdf](#) (60 KB,Rev.B) (Updated: 10/17/2002)

APPLICATION NOTES

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View Application Notes for [Operational Amplifiers \(Less than equal to 100MHz\)](#)

- [Analog Applications Journal \(Rev. A\)](#) (SLYT010A - Updated: 03/17/2000)
- [Op Amps for Everyone Design Guide \(Rev. B\)](#) (SLOD006B - Updated: 08/22/2002)

MORE LITERATURE

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- [Enhanced Plastic Portfolio Brochure](#) (SGZB004, 387 KB - Updated: 08/19/2002)
- [QML Class V Space Products Military Brief \(Rev. A\)](#) (SGZN001A, 257 KB - Updated: 10/07/2002)
- [Understanding Basic Analog - Active Devices \(Rev. A\)](#) (SLOA026A, 61 KB - Updated: 04/06/2000)
- [Understanding Basic Analog - Circuit Equations \(Rev. A\)](#) (SLOA025A, 89 KB - Updated: 04/06/2000)
- [Understanding Basic Analog Passive Devices](#) (SLOA027, 56 KB - Updated: 06/25/1999)

USER GUIDES

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- [Universal Op Amp Single, Dual, Quad \(SOIC\) Evaluation Module With Shutdown \(Rev. A\)](#) (SLOU061A, 457 KB - Updated: 03/20/2001)
- [Universal Operational Amplifier EVM \(Rev. A\)](#) (SLVU006A, 387 KB - Updated: 03/22/1999)
- [Universal Operational Amplifier Evaluation Module Selection Guide \(Rev. B\)](#) (SLOU060B, 20 KB - Updated: 03/20/2001)
- [Universal Operational Amplifier Single, Dual, Quad \(MSOP/TSSOP\)](#) (SLOU055, 1196 KB - Updated: 10/22/1999)
- [Universal Operational Amplifier Single, Dual, Quad \(PDIP\) \(Rev. A\)](#) (SLOU062A, 513 KB - Updated: 03/20/2001)

SAMPLES

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ORDERABLE DEVICE	PACKAGE INDUSTRY (TI)	PINS	TEMP (°C)	STATUS	PRODUCT CONTENT	SAMPLES
RC4558D	SOIC (D)	8	0 TO 70	ACTIVE	View Product Content	Request Samples
RC4558P	PDIP (P)	8	0 TO 70	ACTIVE	View Product Content	Request Samples
RC4558PSR	SOP (PS)	8	0 TO 70	ACTIVE	View Product Content	Request Samples
RC4558PWR	TSSOP (PW)	8		ACTIVE	View Product Content	Request Samples

PRICING / AVAILABILITY / PKG

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DEVICE INFORMATION Updated Daily							TI INVENTORY STATUS As Of 09:00 AM GMT, 17 Apr 2003			REPORTED DISTRIBUTOR INVENTORY As Of 09:00 AM GMT, 17 Apr 2003		
ORDERABLE DEVICE	STATUS	PACKAGE TYPE PINS	TEMP (°C)	PRODUCT CONTENT	BUDGETARY PRICING QTY \$US	STD PACK QTY	IN STOCK	IN PROGRESS QTY DATE	LEAD TIME	DISTRIBUTOR COMPANY REGION	IN STOCK	PURCHASE
RC4558D	ACTIVE	SOIC (D) 8	0 TO 70	View Contents	1KU 0.26	75	2145*	2055 21 Apr	4 WKS	Arrow Americas	> 1k	BUY NOW
								4099 25 Apr		EBV Electronik Europe	> 1k	BUY NOW
								1625 30 Apr		Avnet-SILICA Europe	> 1k	BUY NOW
								> 10k 06 May		Avnet Americas	> 1k	BUY NOW
										Abacus Polar Europe	440	BUY NOW
										DigiKey Americas	69	BUY NOW
										Insight Americas	63	BUY NOW

RC4558DR	ACTIVE	SOIC (D)	8	0 TO 70	View Contents	1KU 0.26	2500	>10k*	>10k 28 Apr	2 WKS	Avnet Americas	>1k	BUY NOW
											Arrow Americas	>1k	BUY NOW
											DigiKey Americas	>1k	BUY NOW
RC4558P	ACTIVE	PDIP (P)	8	0 TO 70	View Contents	1KU 0.26	50	3000*	>10k 28 Apr	2 WKS	Avnet Americas	>1k	BUY NOW
											EBV Electronik Europe	>1k	BUY NOW
											Arrow Americas	>1k	BUY NOW
											DigiKey Americas	>1k	BUY NOW
											Newark Electronics Americas	>1k	BUY NOW
											Abacus Polar Europe	1k	BUY NOW
											Insight Americas	88	BUY NOW
RC4558PSLE	OBSOLETE	SOP (PS)	8	0 TO 70	View Contents	1KU		0*		Call**	None Reported View Distributors		
RC4558PSR	ACTIVE	SOP (PS)	8	0 TO 70	View Contents	1KU 0.26	2000	0*	468 21 Apr	4 WKS	DigiKey Americas	958	BUY NOW
									>10k 22 Apr				
RC4558PW	ACTIVE	TSSOP (PW)	8		View Contents	1KU 0.21	150	0*	1050 16 Apr	4 WKS	None Reported View Distributors		
									84 21 Apr				
									>10k 08 May				
RC4558PWLE	OBSOLETE	TSSOP (PW)	8	0 TO 70	View Contents	1KU		0*		Call**	None Reported View Distributors		
RC4558PWR	ACTIVE	TSSOP (PW)	8		View Contents	1KU 0.26	2000	0*	>10k 08 May	4 WKS	Avnet Americas	>1k	BUY NOW
											DigiKey Americas	>1k	BUY NOW
RC4558Y	OBSOLETE	(Y)	0		View Contents	1KU		0*		Call**	None Reported View Distributors		

DEVELOPMENT TOOLS		▲Back to Top
Tool Part Number	Tool Title	Tool Type
OPAMPEVM-SOT23	Universal EVM for Single/Dual OpAmps without Shutdown in MSOP/SOIC/SOT-23 Packages	Development Boards/EVMs
UNIV-OPAMP-GUIDE	Universal EVM Selection Guide	Development Boards/EVMs

RELATED SOFTWARE

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- [FilterPro MFB and Sallen-Key Design Program \(Rev. A\)](#) (SLVC003A, 4314 KB, ZIP - Updated: 02/27/2002)

MODELS

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- [RC4558 Spice Macromodel](#) (SLOJ053, 0 KB, ZIP - Updated: 01/10/2002)

Table Data Updated on: 4/17/2003