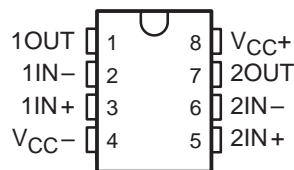


RC4558, RM4558 DUAL GENERAL-PURPOSE OPERATIONAL AMPLIFIERS

SLOS073A – MARCH 1976 – REVISED JUNE 1999

- **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 $\sqrt{\text{Hz}}$ Typ at 1 kHz**
- **Designed To Be Interchangeable With Raytheon RC4558 and RM4558 Devices**

**D, JG, P, OR PS PACKAGE
(TOP VIEW)**



description

The RC4558 and RM4558 devices are dual general-purpose operational amplifiers with each half electrically similar to the $\mu\text{A}741$ except that offset null capability is not provided.

The high common-mode input voltage range and the absence of latch-up make these amplifiers ideal for voltage-follower applications. The devices are short-circuit protected and the internal frequency compensation ensures stability without external components.

The RC4558 is characterized for operation from 0°C to 70°C, and the RM4558 is characterized for operation over the full military temperature range of –55°C to 125°C.

AVAILABLE OPTIONS

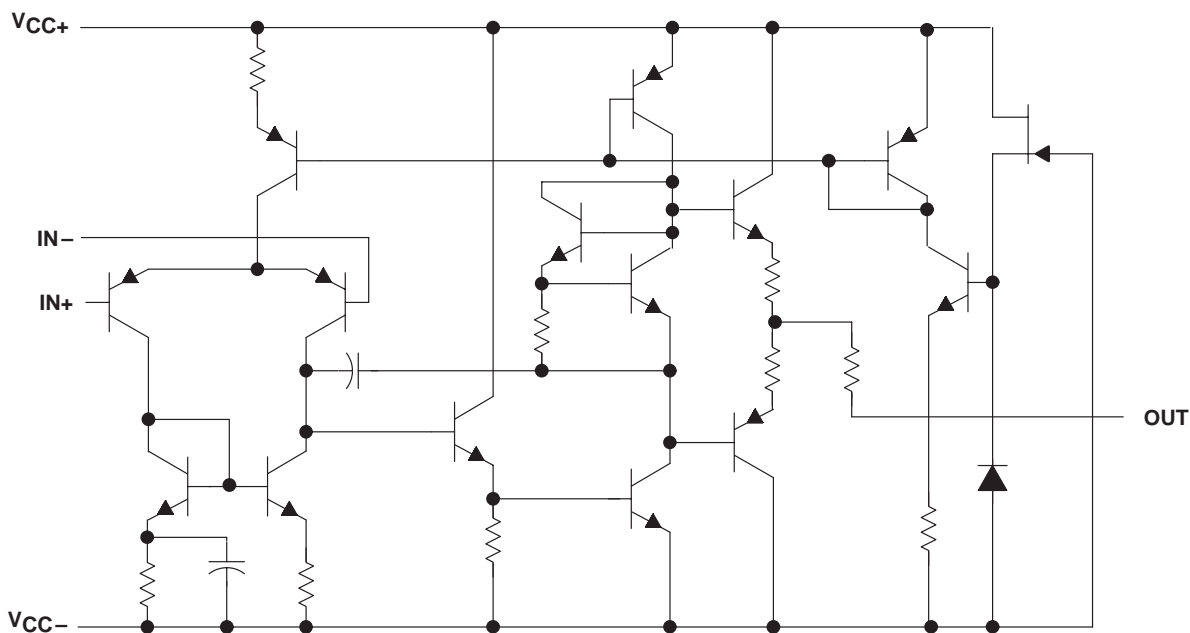
T _A	V _{IO} MAX AT 25°C	PACKAGED DEVICES				
		SMALL OUTLINE (D)	SSOP (DBR)	CERAMIC DIP (JG)	PLASTIC DIP (P)	SOP (PSR)
0°C to 70°C	6 mV	RC4558D	RC4558DBR	—	RC4558P	RC4558PSR
–55°C to 125°C	6 mV	—	—	RM4558JG	—	—

The D package is available taped and reeled. Add the suffix R to the device type (e.g., RC4558DR).

RC4558, RM4558 DUAL GENERAL-PURPOSE OPERATIONAL AMPLIFIERS

SLOS073A – MARCH 1976 – REVISED JUNE 1999

schematic (each amplifier)



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

		RC4558	RM4558	UNIT
Supply voltage (see Note 1)	V _{CC+}	18	22	V
	V _{CC-}	-18	-22	
Differential input voltage (see Note 2)		±30	±30	V
Input voltage (any input, see Notes 1 and 3)		±15	±15	V
Duration of output short circuit to ground, one amplifier at a time (see Note 4)		unlimited	unlimited	
Package thermal impedance, θ _{JA} (see Note 5)	D package	197		°C/W
	P package	104		
	PS package	163		
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: JG package			300	°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: D or P package		260		°C
Storage temperature range, T _{stg}		-65 to 150	-65 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. The package thermal impedance is calculated in accordance with JESD 51, except for through-hole packages, which use a trace length of zero.

recommended operating conditions

		MIN	MAX	UNIT
Supply voltage	V _{CC+}	5	15	V
	V _{CC-}	-5	-15	
Operating free-air temperature, T _A	RC4558	0	70	°C
	RM4558	-55	125	



POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

RC4558, RM4558 DUAL GENERAL-PURPOSE OPERATIONAL AMPLIFIERS

SLOS073A – MARCH 1976 – REVISED JUNE 1999

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

PARAMETER		TEST CONDITIONS†		RC4558			RM4558			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
V_{IO}	Input offset voltage	$V_O = 0$	25°C	0.5	6		0.5	5	mV	
			Full range		7.5		6			
I_{IO}	Input offset current	$V_O = 0$	25°C	5	200		5	200	nA	
			Full range		300		500			
I_{IB}	Input bias current	$V_O = 0$	25°C	150	500		140	500	nA	
			Full range		800		1500			
V_{ICR}	Common-mode input voltage range		25°C	±12	±14		±12	±14	V	
V_{OM}	Maximum output voltage swing	$R_L = 10\text{ k}\Omega$	25°C	±12	±14		±12	±14	V	
			$R_L = 2\text{ k}\Omega$	25°C	±10	±13		±10		±13
			$R_L \geq 2\text{ k}\Omega$	Full range	±10			±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		50	350	V/mV	
			Full range	15			25			
B_1	Unity-gain bandwidth		25°C	3			2	3.5	MHz	
r_i	Input resistance		25°C	0.3	5		0.3	5	MΩ	
$CMRR$	Common-mode rejection ratio		25°C	70	90		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		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			8		$\text{nV}/\sqrt{\text{Hz}}$	
I_{CC}	Supply current (both amplifiers)	$V_O = 0$, No load	25°C	2.5	5.6		2.5	5.6	mA	
			$T_A(\text{min})$	3	6.6		3	6.6		
			$T_A(\text{max})$	2.3	5		2	5		
P_D	Total power dissipation (both amplifiers)	$V_O = 0$, No load	25°C	75	170		75	170	mW	
			$T_A(\text{min})$	90	200		90	200		
			$T_A(\text{max})$	70	150		60	150		
V_{O1}/V_{O2}	Crosstalk attenuation	Open loop	$R_S = 1\text{ k}\Omega$, $f = 10\text{ kHz}$	25°C	85		85		dB	
		$A_{VD} = 100$			105		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 for RC4558 and -55°C to 125°C for RM4558. $T_A(\text{min})$ is 0°C for RC4558 and -55°C for RM4558. $T_A(\text{max})$ is 70°C for RC4558 and 125°C for RM4558.

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/ μs



IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

CERTAIN APPLICATIONS USING SEMICONDUCTOR PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE ("CRITICAL APPLICATIONS"). TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS. INCLUSION OF TI PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE CUSTOMER'S RISK.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.