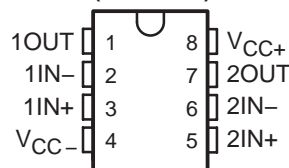


# RC4560 DUAL AUDIO OPERATIONAL AMPLIFIER

SLOS457 – JANUARY 2005

- Operating Voltage . . .  $\pm 2\text{ V}$  to  $\pm 18\text{ V}$
- Low Noise Voltage . . .  $1.2\ \mu\text{Vrms}$  (Typ)
- Wide GBW . . .  $15\text{ MHz}$  (Typ)
- Low THD . . .  $0.05\%$  (Typ)
- Slew Rate . . .  $5.5\text{V}/\mu\text{sec}$  (Typ)
- Suitable for Applications Such as Audio Preamplifier, Active Filter, Headphone Amplifier, Industrial Measurement Equipment

D (SOIC), DGK (VSSOP/MSOP), P (PDIP),  
OR PW (TSSOP) PACKAGE  
(TOP VIEW)



## description/ordering information

The RC4560 is a high-gain, wide-bandwidth, dual operational amplifier capable of driving 20 V peak-to-peak into 400- $\Omega$  loads. The RC4560 combines many of the features of the RC4558, but with wider bandwidth and higher slew rate, making this device ideal for active filters, data and telecommunications, and many instrumentation applications.

## ORDERING INFORMATION

T <sub>A</sub>	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
-40°C to 85°C	MSOP/VSSOP (DGK)	Reel of 2500	RC4560IDGKR	PREVIEW
		Reel of 250	RC4560IDGKT	
	PDIP (P)	Tube of 50	RC4560IP	RC4560IP
	SOIC (D)	Tube of 75	RC4560ID	R4560I
		Reel of 2500	RC4560IDR	
	TSSOP (PW)	Tube of 150	RC4560IPW	R4560I
Reel of 2000		RC4560IPWR		

† 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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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS  
INSTRUMENTS**

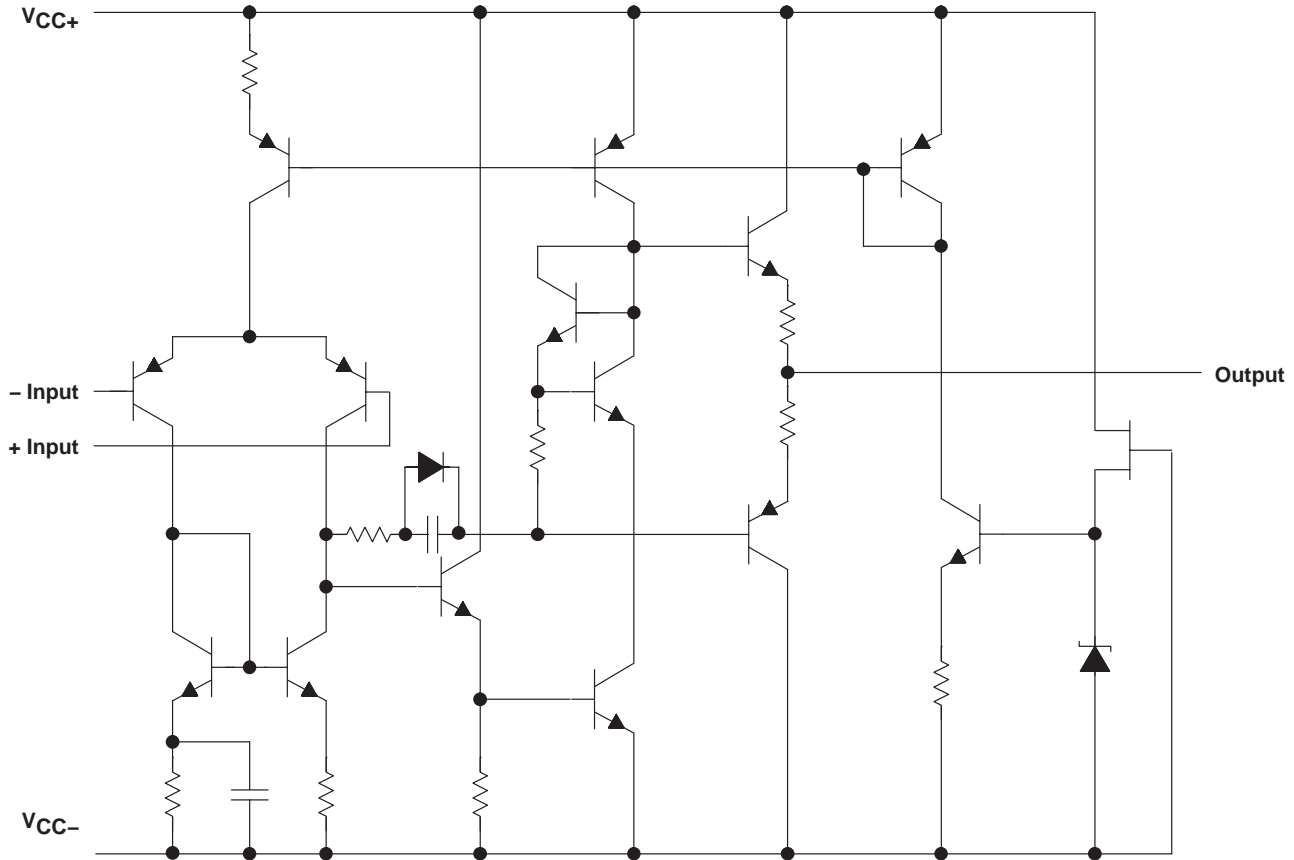
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# RC4560 DUAL AUDIO OPERATIONAL AMPLIFIER

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## equivalent circuit



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

Supply voltage, $V_{CC\pm}$	±18 V
Input voltage (any input)	±15 V
Output current	±50 mA
Package thermal impedance, $\theta_{JA}$ (see Notes 1 and 2):	
D package	97°C/W
DGK package	172°C/W
P package	85°C/W
PW package	149°C/W
Operating virtual junction temperature, $T_J$	150°C
Storage temperature range, $T_{stg}$	-60°C to 125°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES: 1. 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.  
2. The package thermal impedance is calculated in accordance with JESD 51-7.

# RC4560 DUAL AUDIO OPERATIONAL AMPLIFIER

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## recommended operating conditions

		MIN	MAX	UNIT
V <sub>CC+</sub>	Supply voltage	2	16	V
V <sub>CC-</sub>		-2	-16	
V <sub>ID</sub>	Differential input voltage		±30	V
V <sub>ICR</sub>	Input common mode range	-14	14	V
T <sub>A</sub>	Operating free-air temperature range	-40	85	°C

## electrical characteristics, V<sub>CC±</sub> = ±15 V, T<sub>A</sub> = 25°C (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
V <sub>IO</sub>	Input offset voltage	R <sub>S</sub> ≤ 10 kΩ		0.5	6	mV
I <sub>IO</sub>	Input offset current			5	200	nA
I <sub>IB</sub>	Input bias current			40	500	nA
A <sub>VD</sub>	Large-signal differential voltage amplification	R <sub>L</sub> ≥ 2 kΩ, V <sub>O</sub> = ±10 V	86	100		dB
r <sub>i</sub>	Input resistance		0.3	5		MΩ
V <sub>O</sub>	Output voltage swing	R <sub>L</sub> ≥ 2 kΩ I <sub>O</sub> = 25 mA	±12 ±10	±14 ±12.5		V
V <sub>ICR</sub>	Common-mode input voltage range		±12	±14		V
CMRR	Common-mode rejection ratio	R <sub>S</sub> ≤ 10 kΩ	70	90		dB
k <sub>SVR</sub> †	Supply-voltage rejection ratio	R <sub>S</sub> ≤ 10 kΩ	76.5	90		dB
I <sub>CC</sub>	Supply current (all amplifiers)			4.3	5.7	mA

† Measured with V<sub>CC±</sub> differentially varied simultaneously from ±4 V to ±15 V

## operating characteristics, V<sub>CC±</sub> = ±15 V, T<sub>A</sub> = 25°C (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
SR	Slew rate at unity gain			5.5		V/μs
GBW	Gain bandwidth product			15		MHz
THD	Total harmonic distortion	V <sub>O</sub> = 5 V, R <sub>L</sub> = 2 kΩ, f = 1 kHz, A <sub>VD</sub> = 20 dB		0.05		%
V <sub>n</sub>	Equivalent input noise voltage	RIAA, R <sub>S</sub> ≤ 2 kΩ, 30 kHz LPF		1.2		μVrms



P (R-PDIP-T8)

PLASTIC DUAL-IN-LINE

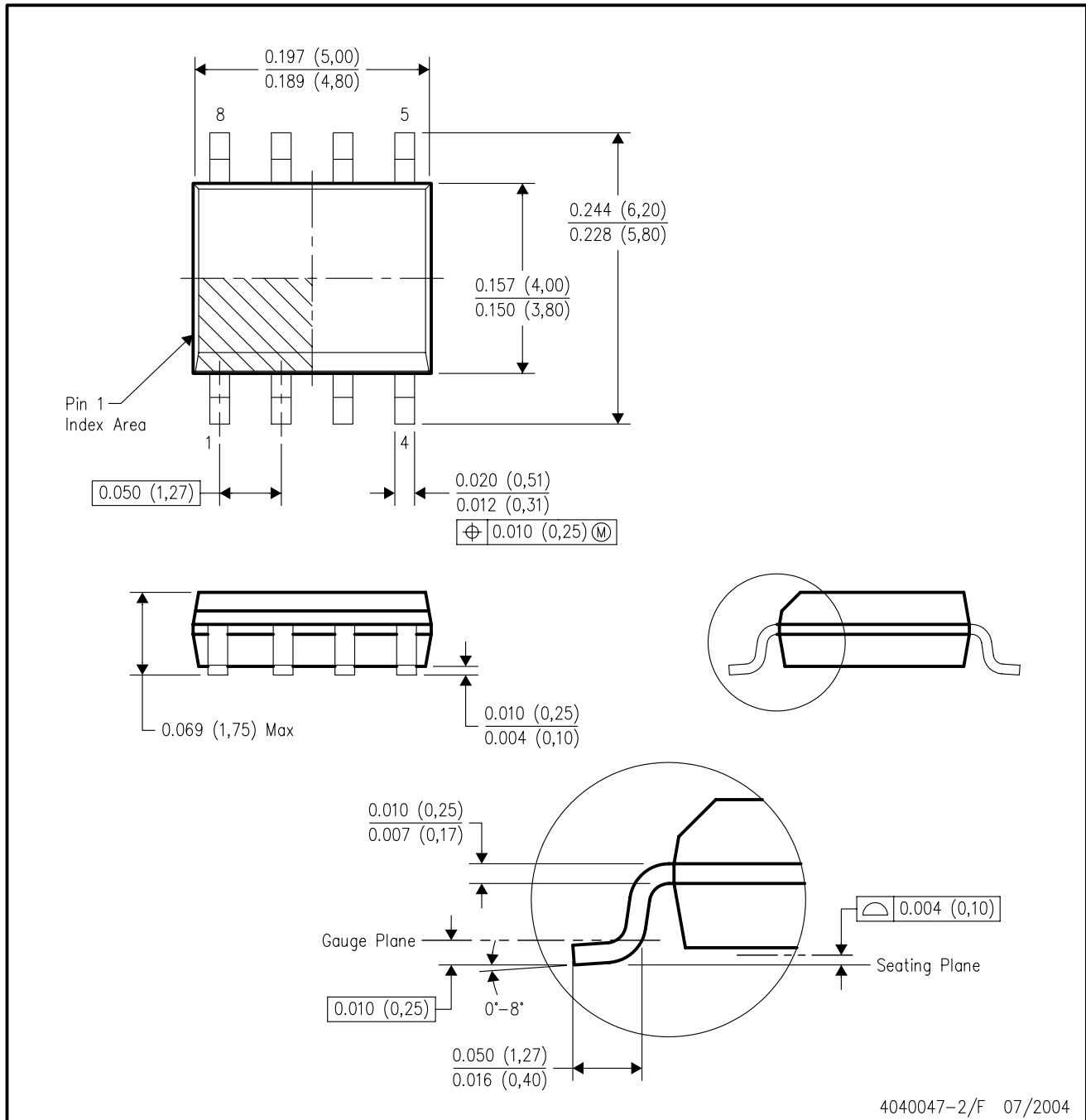


- NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.  
 C. Falls within JEDEC MS-001

For the latest package information, go to [http://www.ti.com/sc/docs/package/pkg\\_info.htm](http://www.ti.com/sc/docs/package/pkg_info.htm)

D (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
  - D. Falls within JEDEC MS-012 variation AA.

PW (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



4040064/F 01/97

- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.  
 D. Falls within JEDEC MO-153

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