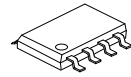


# UTC5532

## DUAL LOW-NOISE OPERATIONAL AMPLIFIERS

### DESCRIPTION

The UTC5532 is high-performance operational amplifiers combining excellent dc and ac characteristics. They feature very low noise, high output-drive capability, high unity-gain and maximum-output-swing bandwidths, low distortion, high slew rate, input-protection diodes, and output short-circuit protection. These operational amplifiers are compensated internally for unity-gain operation. These devices have specified maximum limits for equivalent input noise voltage.

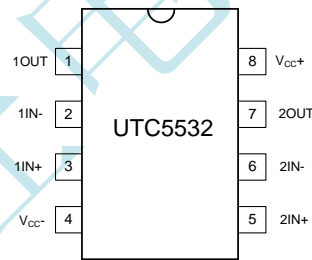


SOP-8-225-1.27

### FEATURE

- \* Equivalent Input Noise Voltage  $5 \text{ nV}/\sqrt{\text{Hz}}$  Typ at 1 kHz
- \* Unity-Gain Bandwidth. . . 10 MHz Typ
- \* Common-Mode Rejection Ratio. . . 100 dB Typ
- \* High dc Voltage Gain. . . 100 V/mV Typ
- \* Peak-to-Peak Output Voltage Swing 32 V Typ With  $V_{CC\pm} = \pm 18\text{V}$  and  $R_L = 600 \Omega$
- \* High Slew Rate...9 V/ $\mu\text{s}$  Typ
- \* Wide Supply-Voltage Range . . .  $\pm 3\text{V}$  to  $\pm 20\text{V}$

### PIN CONFIGURATION AND FUNCTIONS



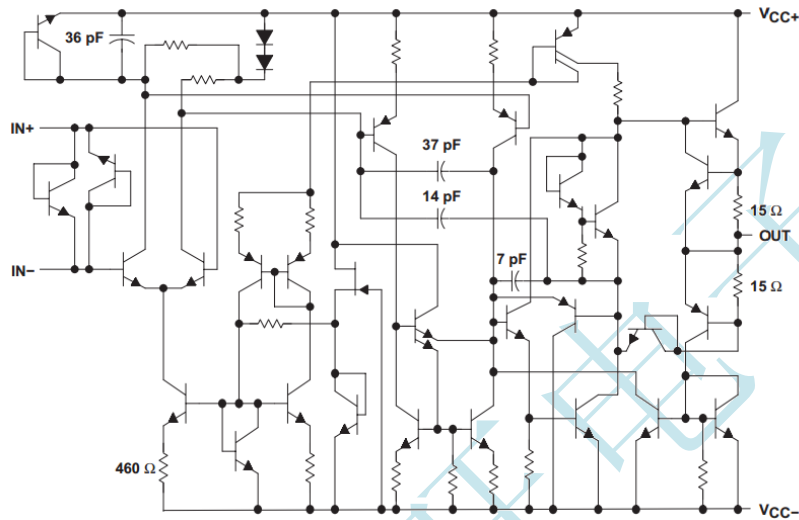
### ORDERING INFORMATION

Ordering Number	Package	Print Number	Free	Packing
UTC5532-SOA-R-T	SOP-8-225-1.27	UTC5532	RoHS	Tube
UTC5532-SOA-R-R	SOP-8-225-1.27	UTC5532	RoHS	Tape Reel

### UTC5532 - SOA - R - T

- Packing Type: T:Tube, R:Tape Reel, K: Bulk, B: Tape Box
- Green Package: R:RoHS
- Package: SOA:SOP-8-225-1.27
- Number

## BLOCK DIAGRAM (each amplifier)



Component values shown are nominal.

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

Supply voltage (see Note 1): $V_{CC+}$ .....	22V
$V_{CC-}$ .....	-22V
Input voltage, either input (see Notes 1 and 2) .....	$V_{CC\pm}$
Input current (see Note 3) .....	$\pm 10\text{mA}$
Duration of output short circuit (see Note 4) .....	Unlimited
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
Operating virtual junction temperature, $T_J$ .....	150°C
Storage temperature range, $T_{\text{sig}}$ .....	-65°C to 150°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. All voltage values, except differential voltages, are with respect to the midpoint between  $V_{CC+}$  and  $V_{CC-}$ .  
 2. The magnitude of the input voltage must never exceed the magnitude of the supply voltage.  
 3. Excessive input current will flow if a differential input voltage in excess of approximately 0.6 V is applied between the inputs, unless some limiting resistance is used.  
 4. The output may be shorted to ground or either power supply. Temperature and/or supply voltages must be limited to ensure the maximum dissipation rating is not exceeded.  
 5. Maximum power dissipation is a function of  $T_J(\text{max})$ ,  $\theta_{JA}$ , and  $T_A$ . The maximum allowable power dissipation at any allowable ambient temperature is  $PD = (T_J(\text{max}) - T_A) / \theta_{JA}$ . 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 <sub>CC+</sub> Supply voltage	5	15	V
V <sub>CC-</sub> Supply voltage	-5	-15	V
T <sub>A</sub> Operating free-air temperature range	0	70	°C

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

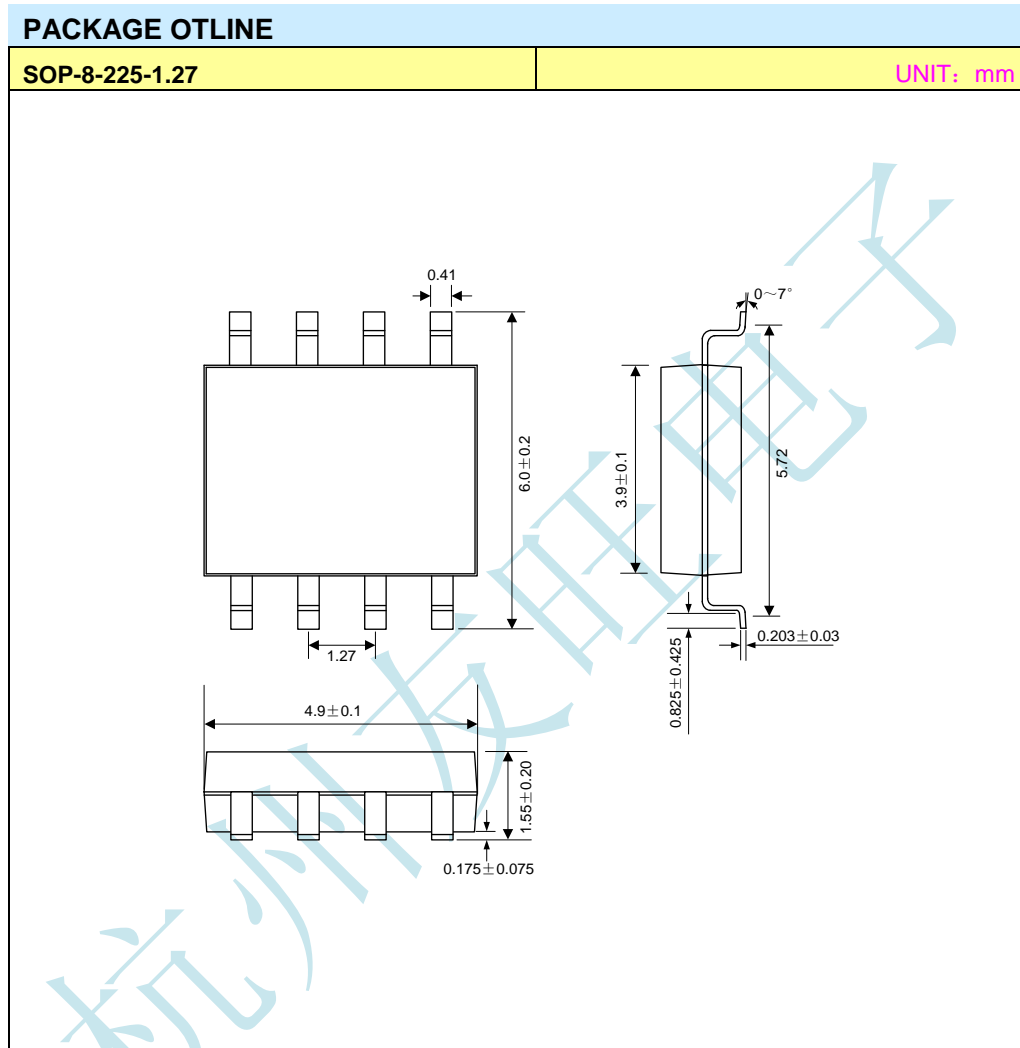
PARAMETER	TEST CONDITIONS(note 1)	MIN	TYP	MAX	UNIT
V <sub>IO</sub> Input offset voltage	V <sub>O</sub> = 0, T <sub>A</sub> = 25°C		0.5	4	mV
I <sub>IO</sub> Input offset current	T <sub>A</sub> = 25°C		10	150	nA
I <sub>IB</sub> Input bias current	T <sub>A</sub> = 25°C		200	800	nA
V <sub>ICR</sub> Common-mode input-voltage range		±12	±13		V
V <sub>OPP</sub> Maximum peak-to-peak output-voltage swing	R <sub>L</sub> ≥ 600 Ω	V <sub>CC±</sub> = ±15V	24	26	V
		V <sub>CC±</sub> = ±18V	30	32	
A <sub>VD</sub> Large-signal differential-voltage amplification	R <sub>L</sub> ≥ 600 Ω, V <sub>O</sub> = ±10V, T <sub>A</sub> = 25°C	15	50	V/mV	
	R <sub>L</sub> ≥ 2kΩ, V <sub>O</sub> = ±10V, T <sub>A</sub> = 25°C	25	100		
A <sub>vd</sub> Small-signal differential-voltage amplification	f = 10 kHz		2.2	V/mV	
B <sub>OM</sub> Maximum-output-swing bandwidth	R <sub>L</sub> = 600 Ω	V <sub>O</sub> = ±10V	140	kHz	
		V <sub>CC±</sub> = ±18V, V <sub>O</sub> = ±14V	100		
B <sub>1</sub> Unity-gain bandwidth	R <sub>L</sub> = 600 Ω, C <sub>L</sub> = 100pF		10	MHz	
r <sub>i</sub> Input resistance		30	300	kΩ,	
Z <sub>O</sub> Output impedance	A <sub>VD</sub> = 30dB, R <sub>L</sub> = 600 Ω, f = 10kHz		0.3	Ω,	
CMRR Common-mode rejection ratio	V <sub>IC</sub> = V <sub>ICR</sub> min	70	100	dB	
kSVR Supply-voltage rejection ratio (ΔV <sub>CC±</sub> /ΔV <sub>IO</sub> )	V <sub>CC±</sub> = ±9V to ±15V, V <sub>O</sub> = 0	80	100	dB	
I <sub>OS</sub> Output short-circuit current		10	38	60	mA
I <sub>CC</sub> Total supply current	V <sub>O</sub> = 0, No load		8	16	mA
Crosstalk attenuation (V <sub>O1</sub> /V <sub>O2</sub> )	V <sub>O1</sub> = 10 V peak, f = 1 kHz		110		dB

note1: All characteristics are measured under open-loop conditions, with zero common-mode input voltage, unless otherwise specified.

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### OPERATING CHARACTERISTICS, $V_{CC\pm} = \pm 15\text{ V}$ , $T_A = 25^\circ\text{C}$

PARAMETER	PARAMETER	UTC5532			UNIT
		MIN	TYP	MAX	
SR	Slew rate at unity gain		9		V/ $\mu$ s
	Overshoot factor		10		%
	$V_I = 100\text{mV}$ , $A_{VD} = 1$ $R_L = 600\ \Omega$ , $C_L = 100\text{pF}$				
$V_n$	Equivalent input noise voltage	$f = 30\text{Hz}$	8		nV/ $\sqrt{\text{Hz}}$
		$f = 1\text{Hz}$	5		
$I_n$	Equivalent input noise current	$f = 30\text{Hz}$	2.7		pA/ $\sqrt{\text{Hz}}$
		$f = 1\text{Hz}$	0.7		



## ELECTROSTATIC DISCHARGE CAUTION



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage handling to prevent electrostatic damage to the device.

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## UTC5532

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Attach

Revision History

Data	REV	Description	Page
2020.01.16	1.0	Original	

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