



PA3211

CMOS IC

RAIL TO RAIL I/O, HIGH-SLEW-RATE OP AMP

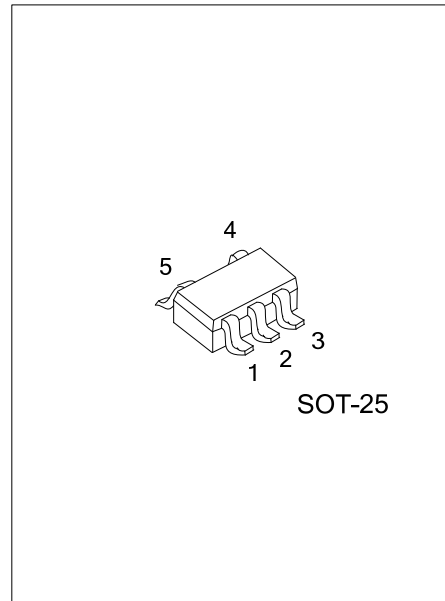
DESCRIPTION

The UTC **PA3211** is an input/output rail-to-rail operational amplifier. This device can be operated on either a single supply varying from +3V to +5.5V or dual supply ranging from ±1.5V to ±2.75V.

The UTC **PA3211** has a perfect AC performance with 6.5MHz bandwidth, 5.23V/μs slew rate.

The supply current for each amplifier of the UTC **PA3211** is only 500μA that makes it suitable for low current consumption applications to control high current loads. Applications include audio amplification for computers, sound ports, sound cards and set-top boxes.

The UTC **PA3211** is generally applied in portable equipment, headphone driver, multimedia audio, battery-powered equipment, ASIC input or output amplifier, sensor amplifier, and low power/low voltage device.



FEATURES

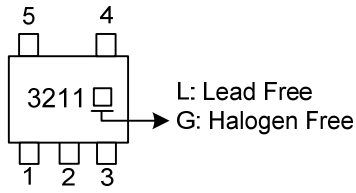
- * Single-Supply Operation: +3V ~ +5.5V
- * Input / Output Rail-to-Rail
- * Low Quiescent Current: 500μA @ 5V
- * With Low Input Current
- * 5.23V/μs High Slew Rate
- * High Output Driving Capacity
- * 6.5MHz High Gain-Bandwidth Product
- * 70dB High PSRR

ORDERING INFORMATION

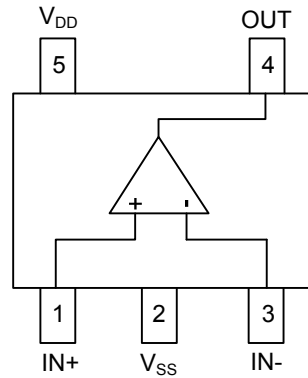
Ordering Number		Package	Packing
Lead Free	Halogen Free		
PA3211L-AF5-R	PA3211G-AF5-R	SOT-25	Tape Reel

<p>PA3211G-AF5-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) AF5: SOT-25</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



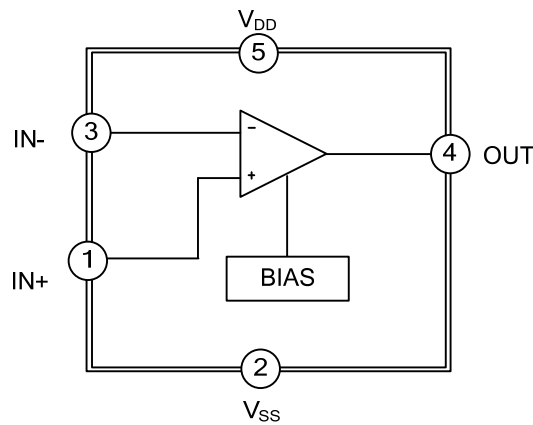
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	IN+	Positive differential input
2	V _{SS}	Ground
3	IN-	Negative differential input
4	OUT	Output
5	V _{DD}	Positive analog supply of the cell

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
All Other Pins		$V_{SS}-0.3 \sim V_{DD}+0.3$	V
Supply Voltage	$V_{DD} \sim V_{SS}$	6.5	V
Power Dissipation ($T_A=25^\circ\text{C}$)	P_D	520	mW
Junction Temperature	T_J	+150	$^\circ\text{C}$
Operating Temperature	T_{OPR}	-40 ~ +85	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 ~ +160	$^\circ\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	240	$^\circ\text{C/W}$

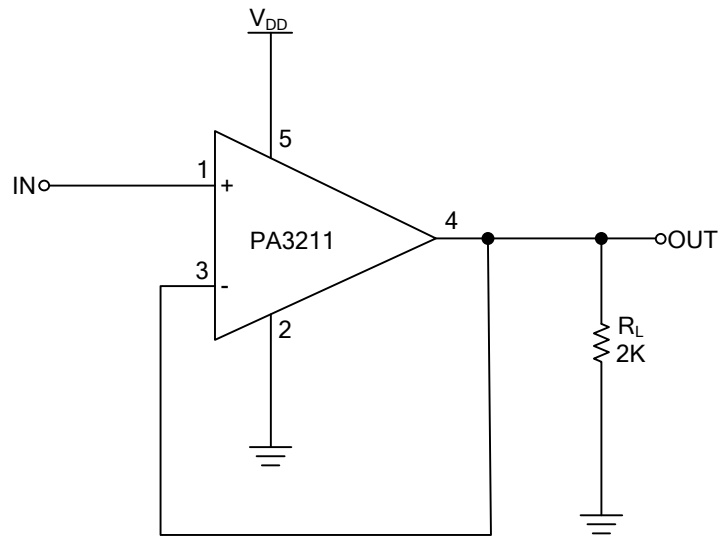
■ ELECTRICAL CHARACTERISTICS

($V_{DD}=5\text{V}$, $V_{SS}=0\text{V}$, $T_A=25^\circ\text{C}$, $C_L=10\text{pF}$, $R_L=1\text{k}\Omega \sim V_{DD}/2$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supplies						
Supply Voltage Range (Note)	V_{DD}		3		5.5	V
Supply Current	I_{DD}	No load		0.5	0.7	mA
Total Power Dissipation	P_{TOT}	No load		0.25	0.35	mW
DC Characteristics						
Input Offset Voltage	$V_{I(OS)}$			± 1.5	± 10	mV
Common Mode Voltage	V_{CM}	Inferred from CMRR test	0		5	V
Input Bias Current	I_B			± 1.5	± 20	nA
Input Bias Current Offset	I_{OS}			± 1.5	± 20	nA
Input Resistance	R_{IN}			1000		$\text{M}\Omega$
Open Loop Gain	A_V		85	95		dB
Maximum Output Current	I_O	$V_{OUT}=\pm V_{IN} \times 90\%$	55	± 66		mA
Output Voltage Swing High	V_{OH}	$R_L=2\text{k}\Omega$	4.96	4.99		V
Output Voltage Swing Low	V_{OL}	$R_L=2\text{k}\Omega$		0.012	0.04	V
Power Supply Rejection Ratio	PSRR	$3\text{V} \leq V_{DD} \leq 5.5\text{V}$	45	70		dB
Common-Mode Rejection Ratio	CMRR	$V_{SS} \leq V_{CM} \leq V_{DD}$	45	65		dB
AC Characteristics						
Gain-Bandwidth Product	GBWP	Open-loop, No load		6.5		MHz
Slew-Rate	SR	Measured from 10%~90% of $4V_{P-P}$ step, $R_L=1\text{k}\Omega$, $C_L=10\text{pF}$		5.23		$\text{V}/\mu\text{s}$
Phase Margin	PM			60		deg
Maximum Output Power	I_O	THD<0.1%, $R_L=16\Omega$		100		mA

Note: Guaranteed by the Power-Supply Rejection Ratio (PSRR) test.

■ TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.