

**PA3211**

Preliminary

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 $\pm 1.5V$ to $\pm 2.75V$.

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

The supply current for each amplifier of the UTC **PA3211** is only 500 μ A 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.

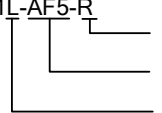
The UTC **PA3211** is generally applied in portable equipment, headphone driver, multimedia audio, battery-powered equipment, ASIC input or output amplifier, sensor amplifier, and low power/low voltage device.

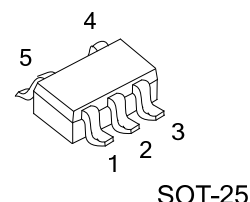
FEATURES

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

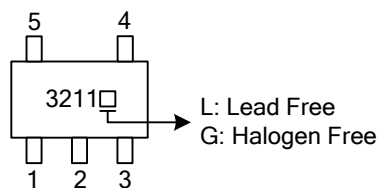
ORDERING INFORMATION

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

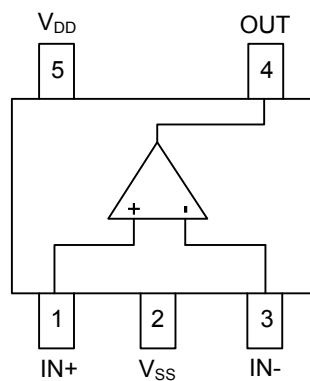
PA3211L-AF5-R 		(1) Packing Type (2) Package Type (3) Lead Free
		(1) R: Tape Reel (2) AF5: SOT-25 (3) G: Halogen Free, L: Lead Free



MARKING INFORMATION



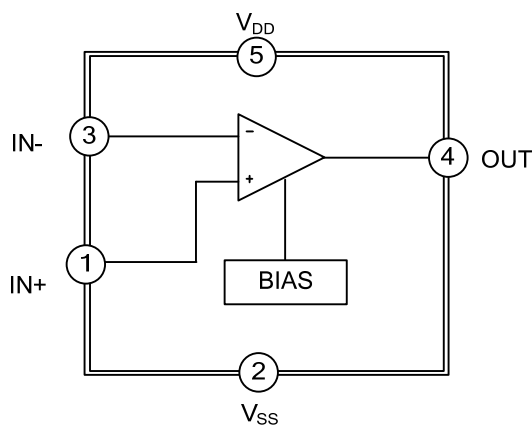
PIN CONFIGURATION



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}	$-40 \sim +85$	$^\circ\text{C}$
Storage Temperature	T_{STG}	$-65 \sim +160$	$^\circ\text{C}$

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	$^\circ\text{C/W}$

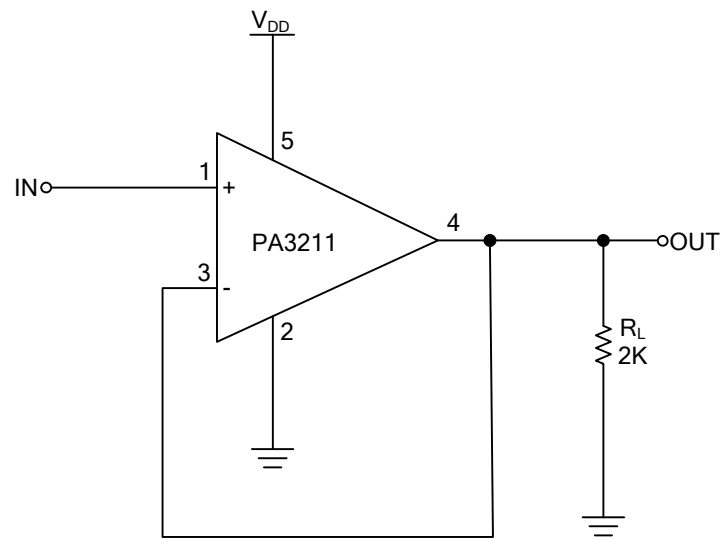
■ ELECTRICAL CHARACTERISTICS

($V_{DD}=5\text{V}$, $V_{SS}=0\text{V}$, $T_A=25^\circ\text{C}$, $C_L=10\text{pF}$, $R_L=1\text{k}\Omega \sim V_{DD}/2$, 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	$V_{I(OS)}$			± 15	± 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		M Ω
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		V/ μs
Phase Margin	PM			60		deg
Maximum Output Power	I_O	THD<0.1%, $R_L=16\Omega$		100		mA

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

■ TYPICAL APPLICATION CIRCUIT



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