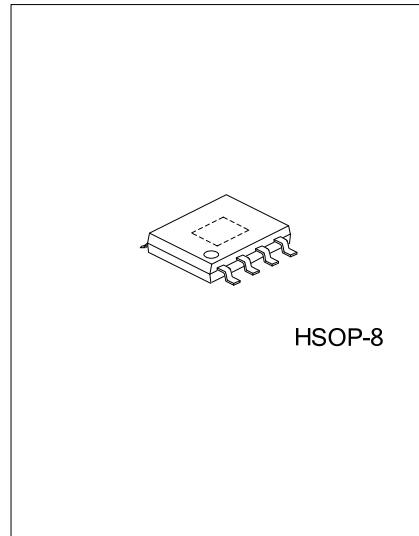




1.25-W MONO FULLY DIFFERENTIAL AUDIO POWER AMPLIFIER



DESCRIPTION

The UTC **PA6203** is a mono fully-differential audio amplifier, capable of delivering 1.25W of continuous average power to an 8-Ω BTL load with less than 1% distortion from a 5V power supply.

The UTC **PA6203** is ideal for PDA/smart phone applications due to features such as -85-dB supply voltage rejection from 90Hz to 5kHz, improved RF rectification immunity and a fast start-up with minimal pop. The device operates from 2.5V to 5.5V, drawing only 1.7mA of quiescent supply current.

FEATURES

- * 1.25W into 8Ω from a 5-V supply at THD=1% (Typ.)
- * 2.5V-5.5V operation
- * Low supply current: 1.7mA typ at 5V
- * Shutdown Control<10μA
- * Only five external components
 - Improved PSRR (90dB) for direct battery operation
 - Fully differential design reduces RF rectification
 - Improved CMRR eliminates two input coupling capacitors
 - C_(BYPASS) is optional due to fully differential design and high PSRR

APPLICATIONS

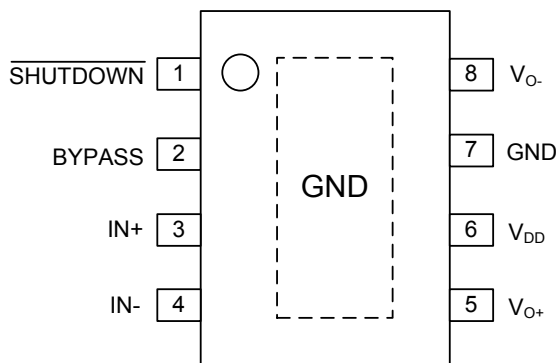
- * Designed for wireless or cellular handsets and PDAs

ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
PA6203L-SH2-T	PA6203G-SH2-T	HSOP-8	Tube
PA6203L-SH2-R	PA6203G-SH2-R	HSOP-8	Tape Reel

<p>PA6203L-SH2-T</p>	<p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Halogen Free</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) SH2: HSOP-8</p> <p>(3) L: Lead Free, G: Halogen Free</p>
----------------------	---	--

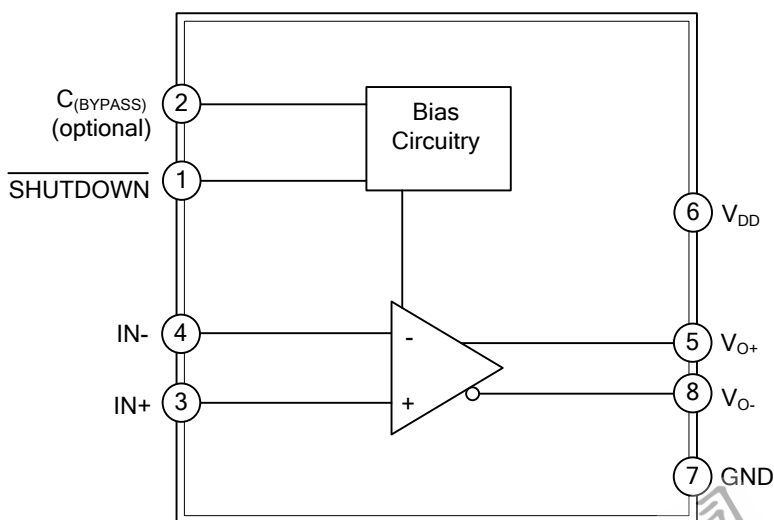
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	SHUTDOWN	Shutdown terminal (active low logic)
2	BYPASS	Mid-supply voltage, adding a bypass capacitor improves PSRR
3	IN+	Positive differential input
4	IN-	Negative differential input
5	VO+	Positive BTL output
6	VDD	Supply voltage terminal
7	GND	High-current ground
8	VO-	Negative BTL output
	Thermal Pad	Connect to ground. Thermal Pad must be soldered down in all applications to properly secure device on the PCB.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (Over operating free-air temperature range, unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.3~6	V
Input Voltage	INx and SHUTDOWN Pins V_I	-0.3~ $V_{DD}+0.3$	V
Continuous Total Power Dissipation	P_D	Internally Limited	
Operating Free-air Temperature	T_A	-40~85	°C
Junction Temperature	T_J	-40~125	°C
Storage Temperature	T_{STG}	-65~150	°C
Lead Temperature From Case For 10 Seconds		260	°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}	42.3	°C/W
Junction to Case	θ_{JC}	12	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PACKAGE	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V_{DD}	2.5		5.5	V
High-Level Input Voltage	SHUTDOWN V_{IH}	2			V
Low-Level Input Voltage	SHUTDOWN V_{IL}			0.8	V
Common-Mode Input Voltage	V=2.5V, 5.5V, CMRR≤-60dB V_{IC}	0.5		$V_{DD}-0.8$	V
Operating Free-Air Temperature	T_A	-40		85	°C
Load Impedance	Z_L	6.4	8		Ω

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, Gain=1V/V, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Offset Voltage (Measured Differentially)	$ V_{OO} $	$V_I=0V$, $V_{DD}=2.5V\sim 5.5V$			9	mV
Power Supply Rejection Ratio	PSRR	$V_{DD}=2.5V\sim 5.5V$		-90	-70	dB
Common Mode Rejection Ratio	CMRR	$V_{DD}=3.6V\sim 5.5V$, $V_{IC}=0.5V\sim V_{DD}-0.8$		-70	-65	dB
		$V_{DD}=2.5V$, $V_{IC}=0.5V\sim 1.7V$		-62	-55	
Low-Level Output Voltage	V_{OL}	$R_L=8\Omega$, $V_{IN+}=V_{DD}$, $V_{IN-}=0V$ or $V_{IN+}=0V$, $V_{IN-}=V_{DD}$	$V_{DD}=5.5V$	0.30	0.46	V
			$V_{DD}=3.6V$	0.22		
			$V_{DD}=2.5V$	0.19	0.26	
High-Level Output Voltage	V_{OH}	$R_L=8\Omega$, $V_{IN+}=V_{DD}$, $V_{IN-}=0V$ or $V_{IN+}=0V$, $V_{IN-}=V_{DD}$	$V_{DD}=5.5V$	4.8	5.12	V
			$V_{DD}=3.6V$	3.28		
			$V_{DD}=2.5V$	2.1	2.24	
High-Level Input Current	$ I_{IH} $	$V_{DD}=5.5V$, $V_I=5.8V$			1.2	μA
Low-Level Input Current	$ I_{IL} $	$V_{DD}=5.5V$, $V_I=-0.3V$			1.2	μA
Supply Current	I_{DD}	SHUTDOWN=2V, $V_{DD}=2.5V\sim 5.5V$, No Load		1.7	2	mA
Supply Current in Shutdown Mode	$I_{DD(SD)}$	SHUTDOWN=0.8V, $V_{DD}=2.5V\sim 5.5V$, No Load		0.01	0.9	μA

■ OPERATING CHARACTERISTICS (T_A=25°C, Gain=1V/V, R_L=8Ω)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Power	P _O	THD+N=1%, f=1kHz	V _{DD} =5V	1.25		W
			V _{DD} =3.6V	0.63		W
			V _{DD} =2.5V	0.3		W
Total Harmonic Distortion Plus Noise	THD+N	V _{DD} =5V, P _O =1W, f=1kHz		0.06		%
		V _{DD} =3.6V, P _O =0.5W, f=1kHz		0.07		
		V _{DD} =2.5V, P _O =200mW, f=1kHz		0.08		
Supply Ripple Rejection Ratio	K _{SVR}	C _(BYPASS) =0.47μF, V _{DD} =3.6V~5.5V, Inputs Ac-Grounded with C _I =2μF	f=217Hz~2kHz, V _{RIPPLE} =200mV _{PP}	-87		dB
		C _(BYPASS) =0.47μF, V _{DD} =2.5V~3.6V, Inputs Ac-Grounded with C _I =2μF	f=217Hz~2kHz, V _{RIPPLE} =200mV _{PP}	-82		dB
		C _(BYPASS) =0.47μF, V _{DD} =2.5V~5.5V, Inputs Ac-Grounded with C _I =2μF	f=40Hz~20kHz, V _{RIPPLE} =200mV _{PP}	≤-74		dB
Signal-To-Noise Ratio	SNR	V _{DD} =5V, P _O =1W		104		dB
Output Voltage Noise	V _N	f=20Hz~20kHz	No Weighting	17		μV _{RMS}
			A Weighting	13		
Common Mode Rejection Ratio	CMRR	V _{DD} =2.5V~5.5V, Resistor Tolerance=0.1%, Gain=4V/V, V _{ICM} =200mV _{PP}	f=20Hz~1kHz	≤-85		dB
			f=20Hz~20kHz	≤-74		dB
Input Impedance	Z _I			2		MΩ
Output Impedance	Z _O	Shutdown Mode	>10k			
Shutdown Attenuation		f=20Hz~20kHz, R _F =R _I =20kΩ		-80		dB

■ TYPICAL APPLICATION CIRCUIT

Table 1. Typical Component Values

COMPONENT	VALUE	UNIT
R_I	10	k Ω
R_F	10	k Ω
$C_{(BYPASS)}$ (Note 1)	0.22	μ F
C_S	1	μ F
C_I	0.22	μ F

Note: 1. $C_{(BYPASS)}$ is optional

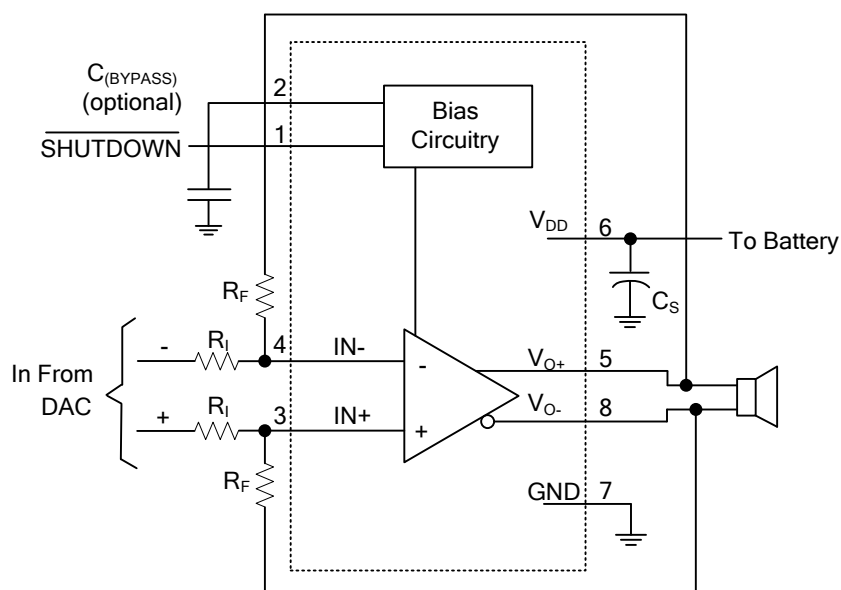


Figure 1. Typical Differential Input Application Schematic

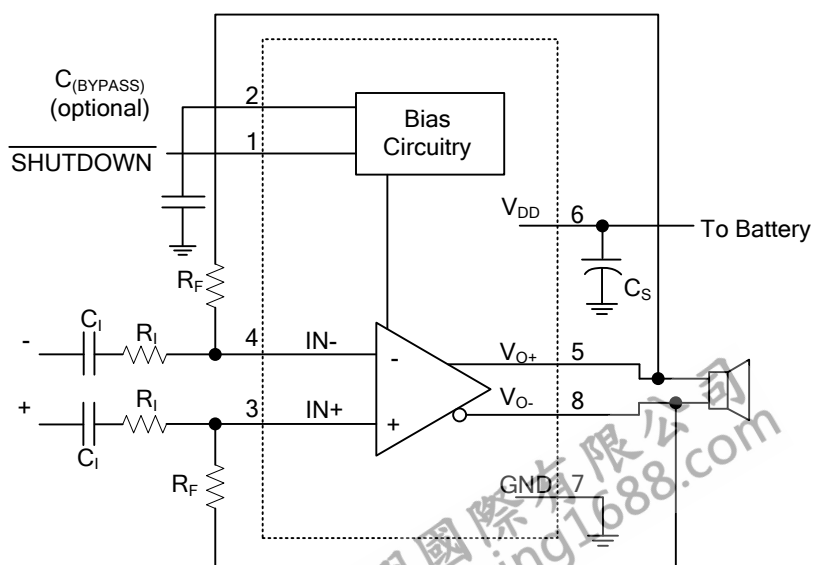


Figure 2. Differential Input Application Schematic Optimized With Input Capacitors

■ TYPICAL APPLICATION CIRCUIT(Cont.)

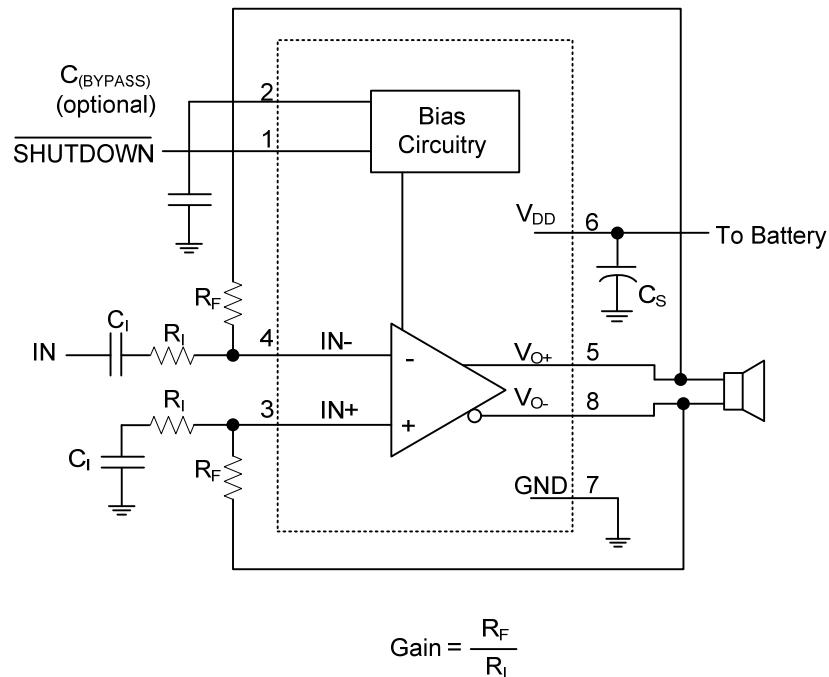


Figure 3. Single-Ended Input Application Schematic

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. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.