



PA4867

CMOS IC

DUAL 2.1W AUDIO AMPLIFIER PLUS STEREO HEADPHONE FUNCTION

DESCRIPTION

The UTC **PA4867** is a stereo audio power amplifier capable of delivering typically 2.1W to a 4Ω load or 2.4W to a 3Ω load each channel with less than 1.0% THD+N using a 5V power supply. UTC **PA4867** has a new circuit topology which can eliminate headphone output coupling capacitors. And an internal input MUX allows two sets of stereo inputs to the amplifier.

The UTC **PA4867** has integrated depop circuitry that virtually eliminates transients that cause noise in the speakers during power up and when using the shutdown modes.

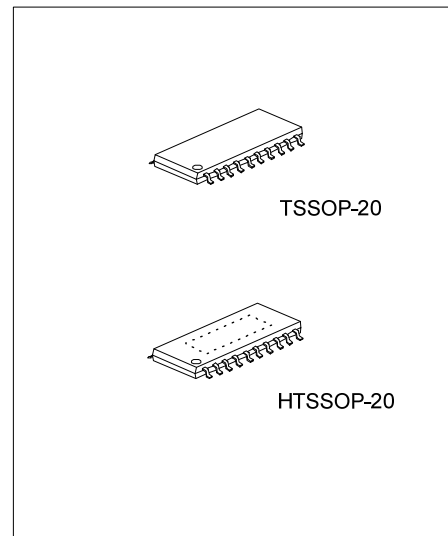
FEATURES

- * Operating voltage range $V_{DD}=2V\sim 5.5V$
- * Output power:
 - 2.4W(typ.)@5V into 3Ω with 1% THD+N max (1kHz)
 - 2.1W(typ.)@5V into 4Ω with 1% THD+N max (1kHz)
- * Eliminates SE-mode output coupling capacitors
- * Shutdown mode available
- * click and pop reduction circuitry
- * Unity-gain stable
- * Thermal-shutdown Protection
- * Input MUX control
- * SE/BTL mode available

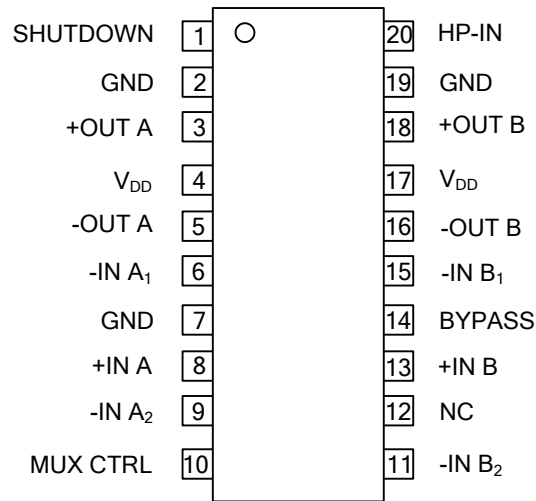
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
PA4867L-N20-R	PA4867G-N20-R	HTSSOP-20	Tape Reel
PA4867L-N20-T	PA4867G-N20-T	HTSSOP-20	Tube
PA4867L-P20-R	PA4867G-P20-R	TSSOP-20	Tape Reel
PA4867L-P20-T	PA4867G-P20-T	TSSOP-20	Tube

<p>PA4867L-N20-T</p>	<p>(1) Packing Type (2) Package Type (3) Lead Free</p> <p>(1) R: Tape Reel, T: Tube (2) N20: HTSSOP-20, P20: TSSOP-20 (3) G: Halogen Free, L: Lead Free</p>
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■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	I/O	PIN DESCRIPTION
1	SHUTDOWN	I	Entire IC into the shutdown mode when this pin connected to the V _{DD}
2, 7, 19	GND		Ground
3	+OUTA	O	Channel A + output in BTL mode, high impedance in SE mode
4, 17	V _{DD}		Supply voltage
5	-OUTA	O	Channel A - output in BTL mode, + output in SE mode
6	-INA ₁	I	Inverting input of channel A ₁
8	+INA	I	Non-inverting input of channel A, connected to BYPASS pin inside the IC
9	-INA ₂	I	Inverting input of channel A ₂
10	MUX CTRL		
11	-INB ₂	I	Inverting input of channel B ₂
12	NC		No Connection
13	+INB	I	Non-inverting input of channel B, connected to BYPASS pin inside the IC
14	BYPASS		Internal mid-supply bias reference bypassing
15	-INB ₁	I	Inverting input of channel B ₁
16	-OUTB	O	Channel B - output in BTL mode, + output in SE mode
18	+OUTB	O	Channel B + output in BTL mode, high impedance in SE mode
20	HP-IN	I	Output mode select, connected to the V _{DD} for SE mode or GND for BTL mode

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage		6.0	V
Input Voltage		-0.3 ~ V _{DD} +0.3	V
Power Dissipation	P _D	Internally Limited	
Junction Temperature	T _J	150	°C
Operating Temperature	T _{OPR}	-40 ~ +85	°C
Storage Temperature	T _{STG}	-65 ~ +150	°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.

■ ELECTRICAL CHARACTERISTICS

The following specifications apply for V_{DD}= 5V unless otherwise specified. Limits apply for T_A= 25°C.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
FOR ENTIRE IC						
Supply Voltage	V _{DD}		2		5.5	V
Quiescent Power Supply Current	I _{DD}	V _{IN} =0V, I _{OUT} =0A, HP-IN=0V		7.5	15	mA
		V _{IN} =0V, I _{OUT} =0A, HP-IN=4V		3.0	6	mA
Shutdown Current	I _{SD}	V _{DD} applied to the SHUTDOWN pin		0.7	2	μA
FOR BRIDGED-MODE OPERATION						
Output Offset Voltage	V _{O(OFF)}	V _{IN} =0V		5	50	mV
Output Power	P _{OUT}	THD=1%, f=1kHz	R _L = 3Ω		2.2	W
			R _L = 4Ω		1.9	W
			R _L = 8Ω	1.0	1.1	W
		THD+N=10%, f=1kHz	R _L = 3Ω		3.0	W
			R _L = 4Ω		2.6	W
			R _L = 8Ω		1.5	W
		THD+N=1%, f=1kHz, R _L =32Ω		0.34	W	
Total Harmonic Distortion+Noise	THD+N	20Hz ≤ f ≤ 20kHz, R _L =4Ω, P _{OUT} =2W		0.3		%
		A _{VD} =2, R _L =8Ω, P _{OUT} =1W		0.3		%
Power Supply Rejection Ratio	PSRR	V _{DD} =5V, V _{RIPPLE} =200mV _{RMS} , R _L =8Ω, C _B =2.2μF		67		dB
Channel Separation	X _{TALK}	f=1kHz, C _B =2.2μF		80		dB
Signal To Noise Ratio	SNR	V _{DD} =5V, P _{OUT} =1.1W, R _L =8Ω		97		dB
FOR SINGLE-ENDED OPERATION						
Output Offset Voltage	V _{O(OFF)}	V _{IN} =0V		5	50	mV
Output Power	P _{OUT}	THD = 0.5%, f = 1kHz, R _L = 32Ω	75	85		mW
		THD+N = 1%, f = 1kHz, R _L = 8Ω		180		
		THD+N = 1%, f = 1kHz, R _L = 16Ω		165		mW
		THD+N = 1%, f = 1kHz, R _L = 32Ω		88		
		THD+N = 10%, f = 1kHz, R _L = 16Ω		208		mW
		THD+N = 10%, f = 1kHz, R _L = 32Ω		114		
Output Voltage Swing	V _{OUT}	THD = 0.05%, R _L = 5kΩ		1		V _{P-P}
Total Harmonic Distortion+Noise	THD+N	A _V =-1, P _{OUT} =75mW 20Hz ≤ f ≤ 20kHz, R _L =32Ω		0.2		%
Power Supply Rejection Ratio	PSRR	C _B =2.2μF, V _{RIPPLE} =200mV _{RMS} f=1kHz		52		dB
Channel Separation	X _{TALK}	f=1kHz, C _B =2.2μF		60		dB
Signal To Noise Ratio	SNR	V _{DD} =5V, P _{OUT} =340mW, R _L =8Ω		95		dB

■ TYPICAL APPLICATION CIRCUIT

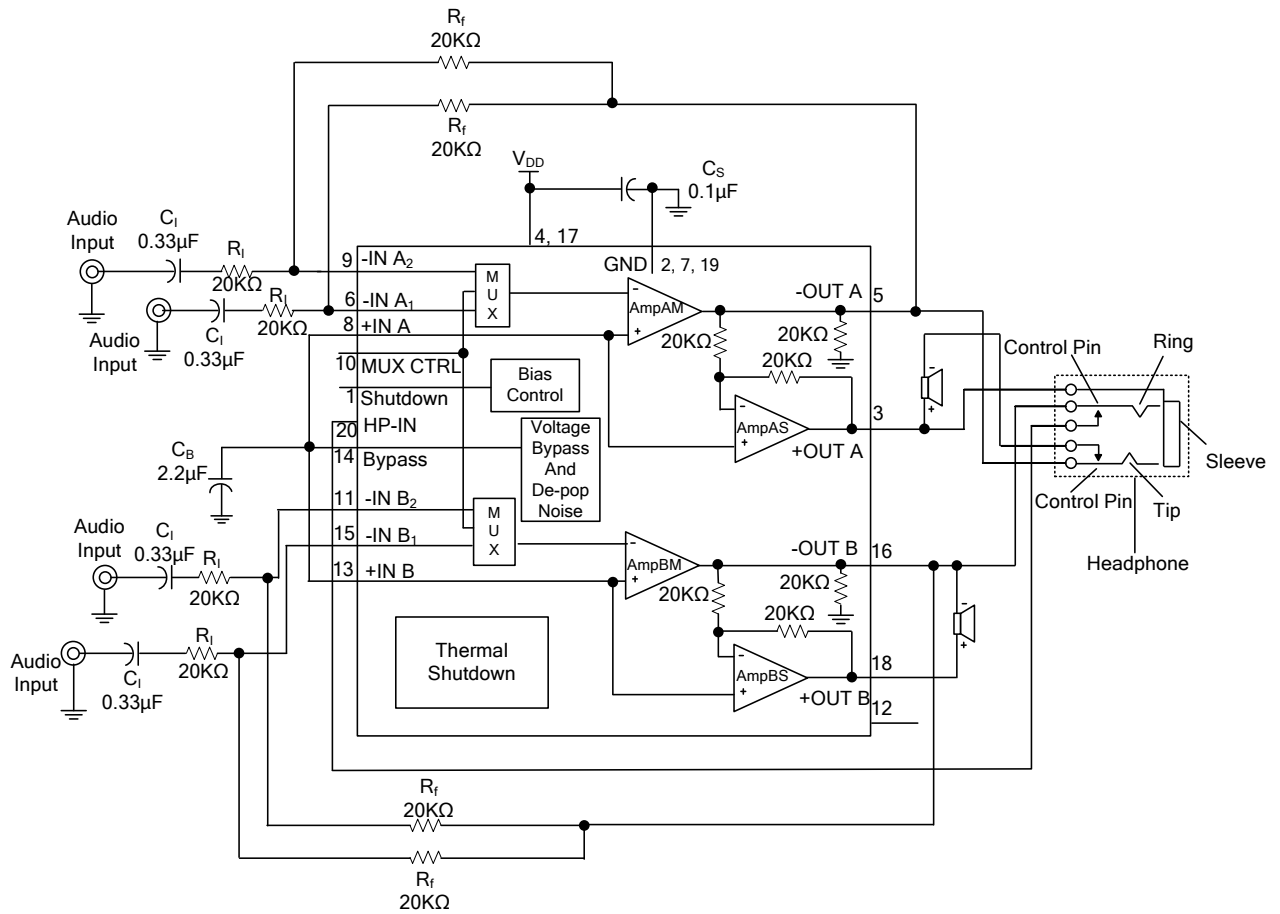
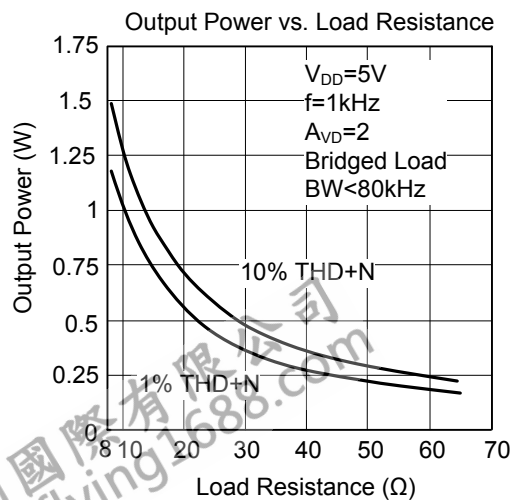
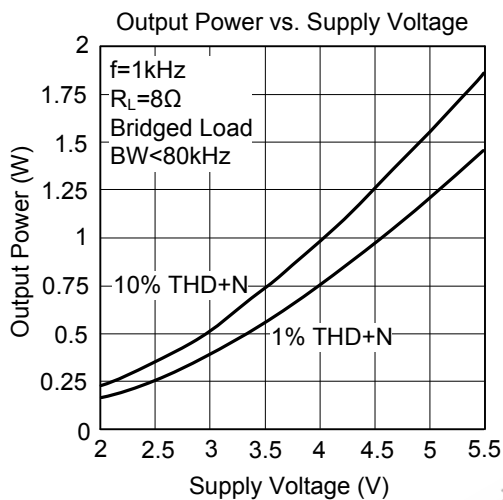
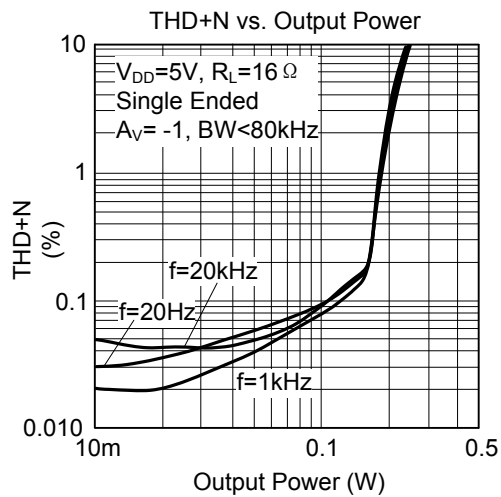
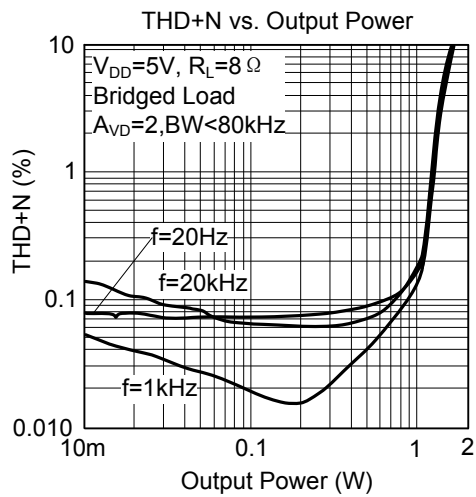
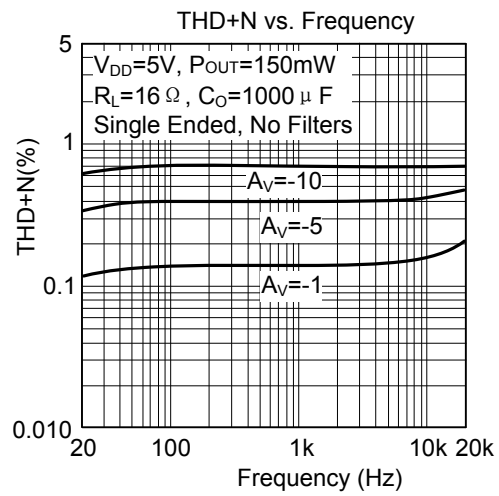
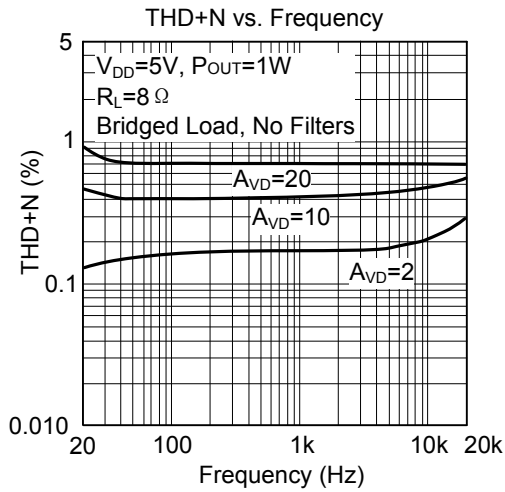
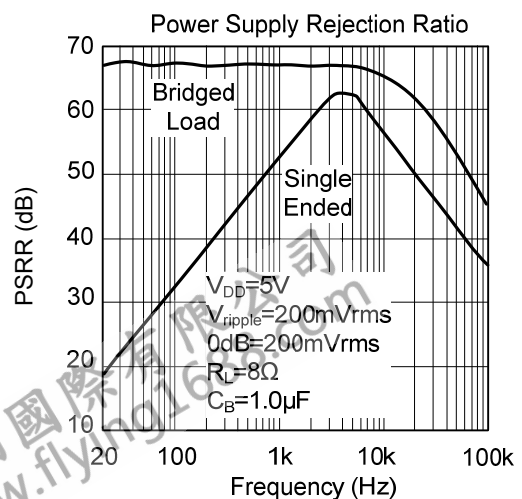
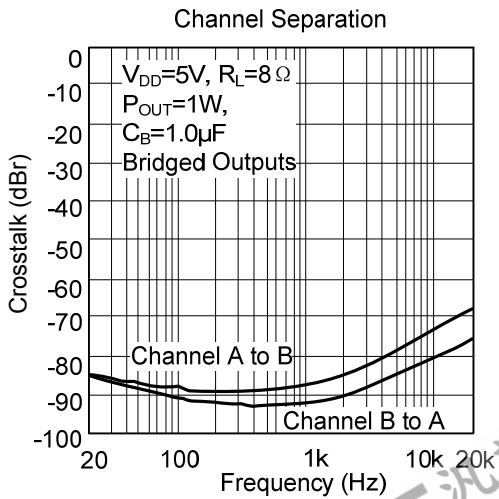
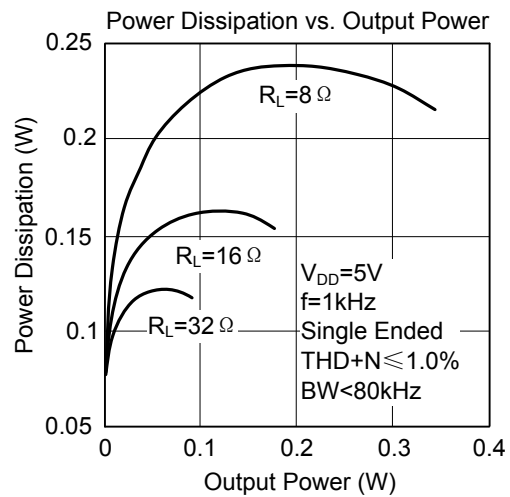
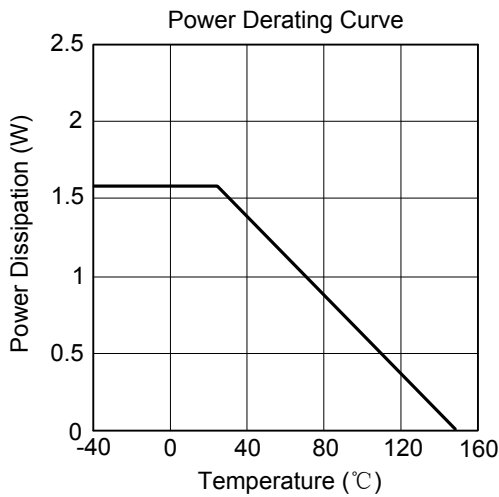
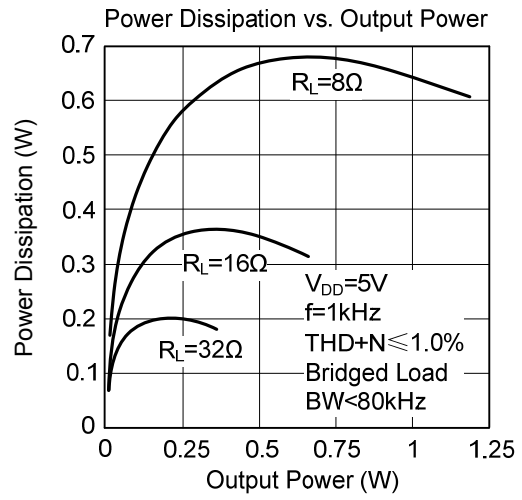
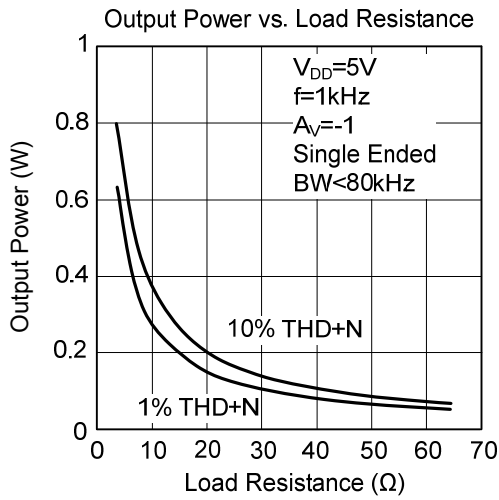


Figure 1. Typical Audio Amplifier Application Circuit

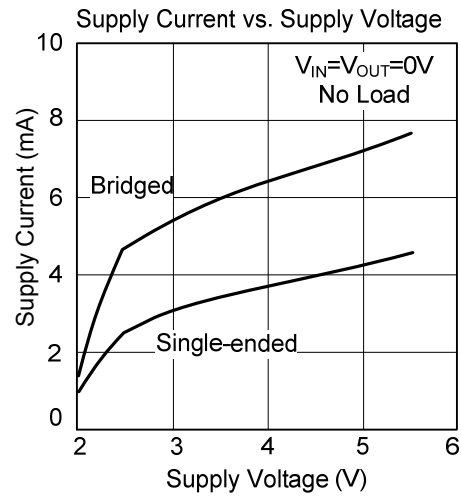
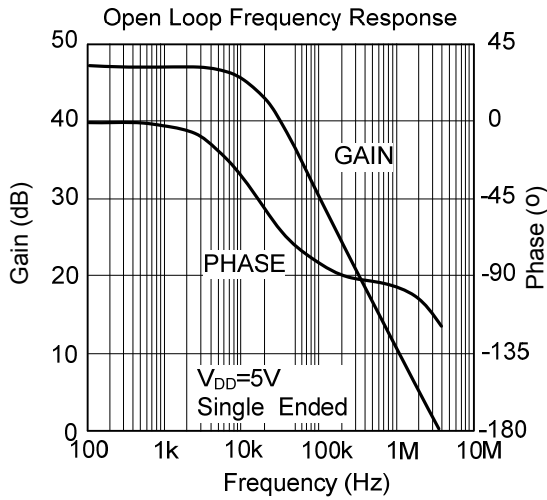
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL CHARACTERISTICS(Cont.)



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