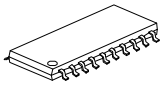
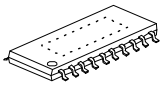
PA4867

CMOS IC

DUAL 2.1W AUDIO AMPLIFIER PLUS STEREO HEADPHONE FUNCTION



TSSOP-20



HTSSOP-20

■ 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 topolopy 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~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

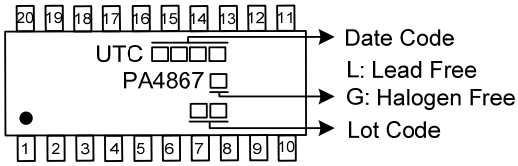
■ ORDERING INFORMATION

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

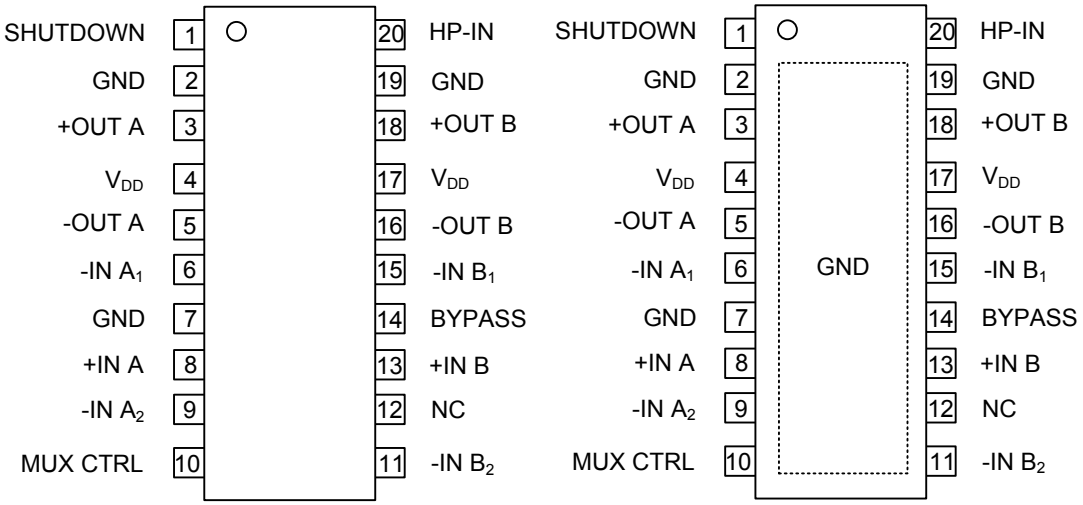
PA4867G-N20-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel, T: Tube
(2) N20: HTSSOP-20, P20: TSSOP-20
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION



TSSOP-20

HTSSOP-20
(Top View)

■ PIN DESCRIPTION

PIN NO.		PIN NAME	I/O	PIN DESCRIPTION
TSSOP-20	HTSSOP-20			
1	1	SHUTDOWN	I	Entire IC into the shutdown mode when this pin connected to the V_{DD}
2, 7, 19	2, 7, 19	GND		Ground
3	3	+OUTA	O	Channel A + output in BTL mode, high impedance in SE mode
4, 17	4, 17	V_{DD}		Supply voltage
5	5	-OUTA	O	Channel A - output in BTL mode, + output in SE mode
6	6	-INA_1	I	Inverting input of channel A_1
8	8	+INA	I	Non-inverting input of channel A, connected to BYPASS pin inside the IC
9	9	-INA_2	I	Inverting input of channel A_2
10	10	MUX CTRL		
11	11	-INB_2	I	Inverting input of channel B_2
12	12	NC		No Connection
13	13	+INB	I	Non-inverting input of channel B, connected to BYPASS pin inside the IC
14	14	BYPASS		Internal mid-supply bias reference bypassing
15	15	-INB_1	I	Inverting input of channel B_1
16	16	-OUTB	O	Channel B - output in BTL mode, + output in SE mode
18	18	+OUTB	O	Channel B + output in BTL mode, high impedance in SE mode
20	20	HP-IN	I	Output mode select, connected to the V_{DD} for SE mode or GND for BTL mode
-	Exposed Pad	GND		Connect exposed pad to GND.

■ 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, A_{VD}=2	R_L =4Ω, P_{OUT} =2W		0.3		%
			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 THD+N = 1%, f = 1kHz, R_L = 16Ω THD+N = 1%, f = 1kHz, R_L = 32Ω			180 165 88		mW
		THD+N = 10%, f = 1kHz, R_L = 16Ω THD+N = 10%, f = 1kHz, R_L = 32Ω			208 114		mW
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

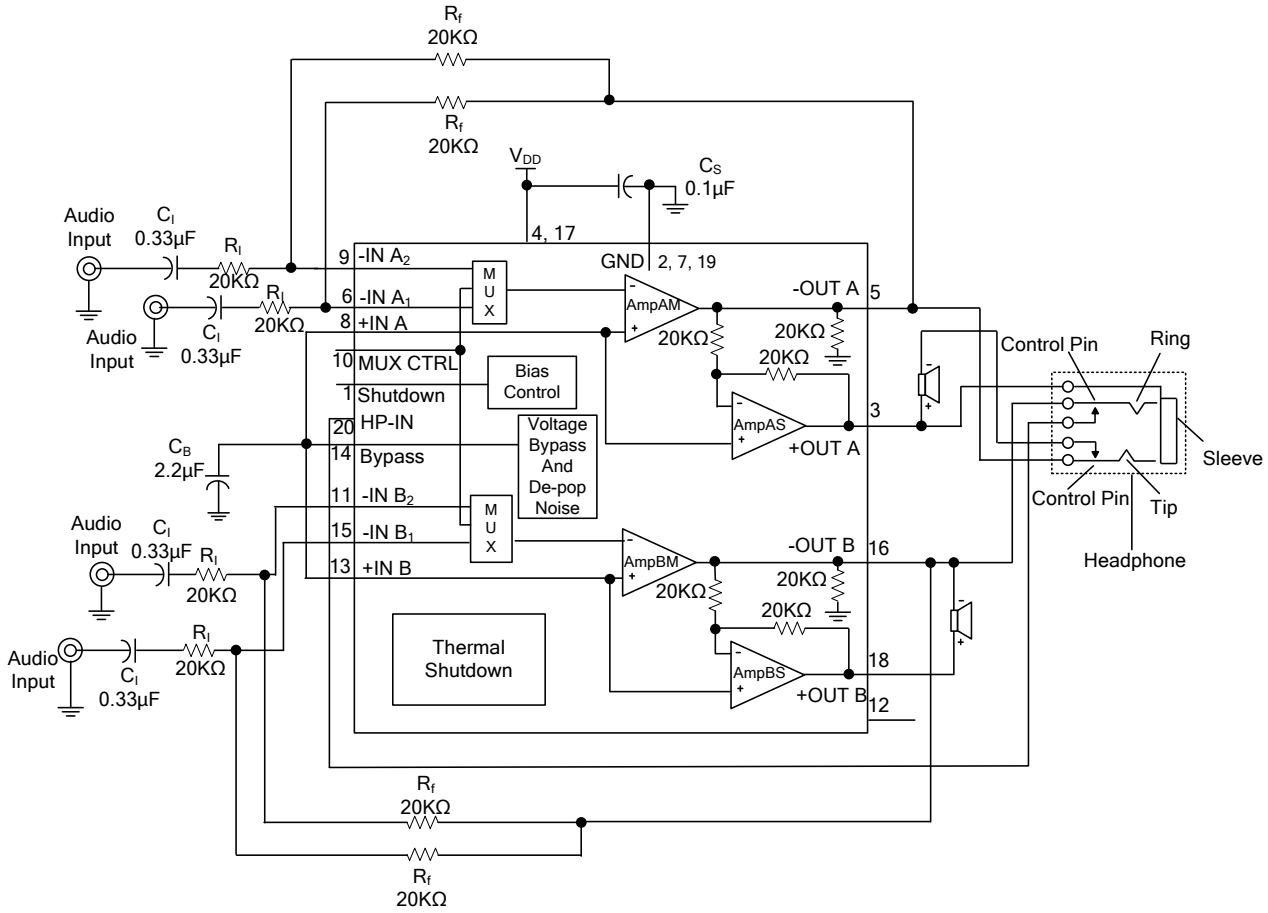
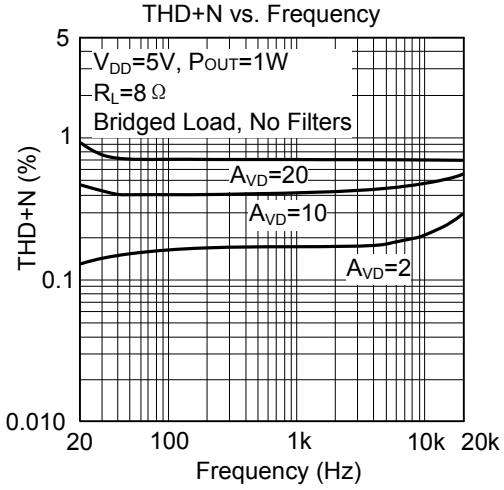


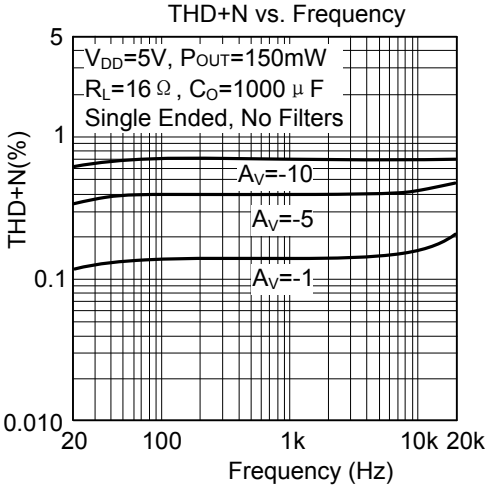
Figure 1. Typical Audio Amplifier Application Circuit

■ TYPICAL CHARACTERISTICS

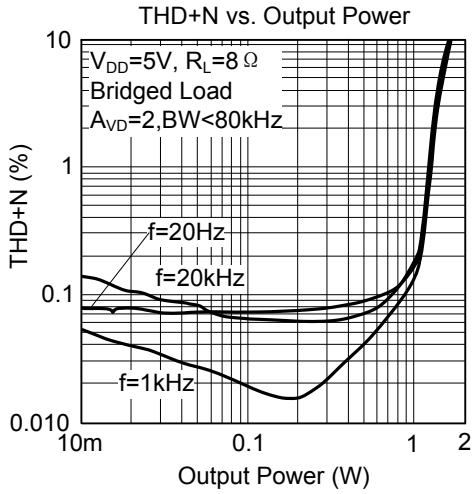
THD+N vs. Frequency



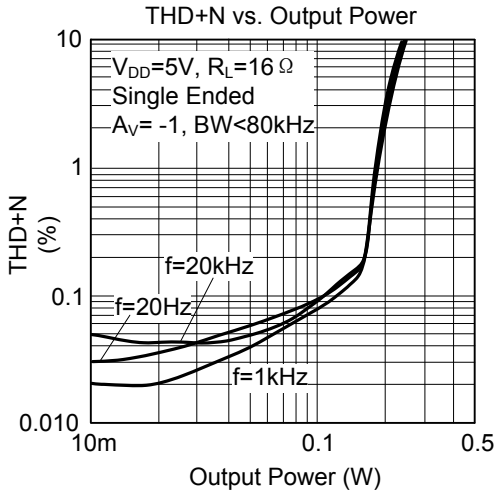
THD+N vs. Frequency



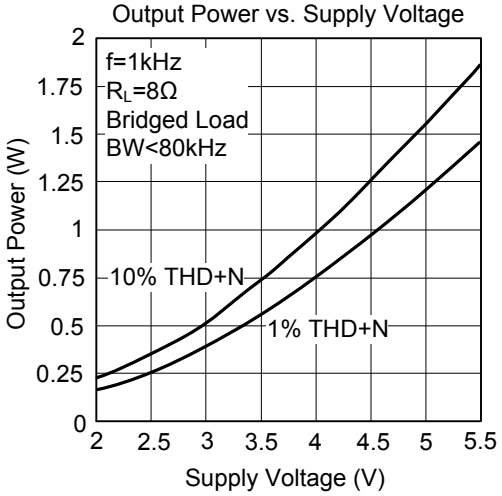
THD+N vs. Output Power



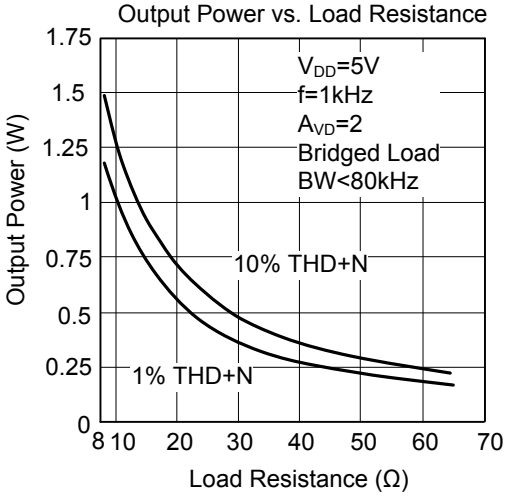
THD+N vs. Output Power



Output Power vs. Supply Voltage

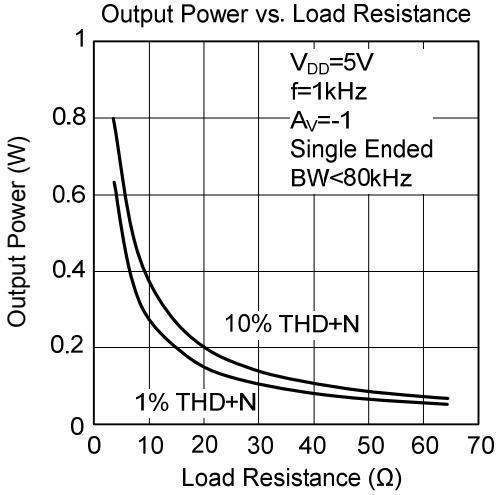


Output Power vs. Load Resistance

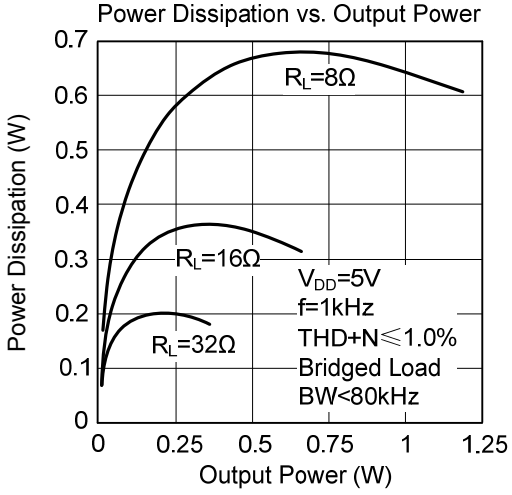


■ TYPICAL CHARACTERISTICS (Cont.)

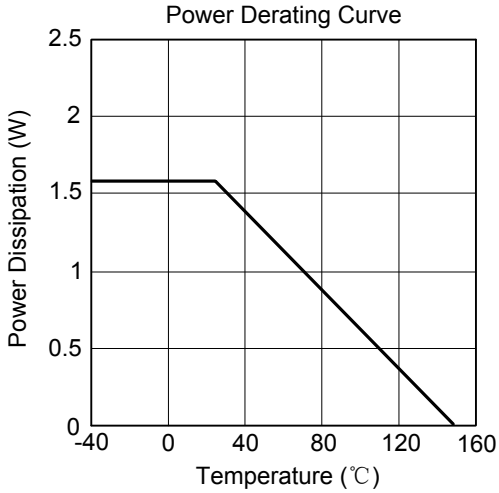
Output Power vs. Load Resistance



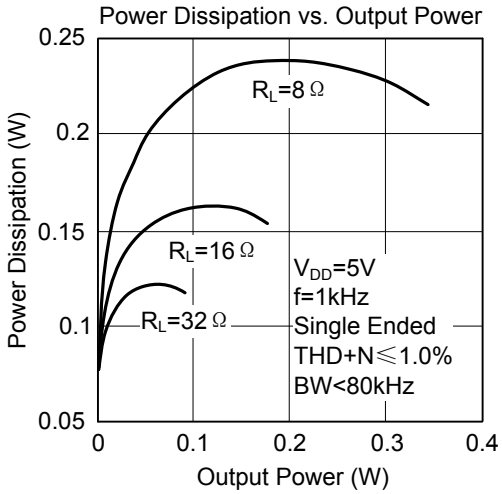
Power Dissipation vs. Output Power



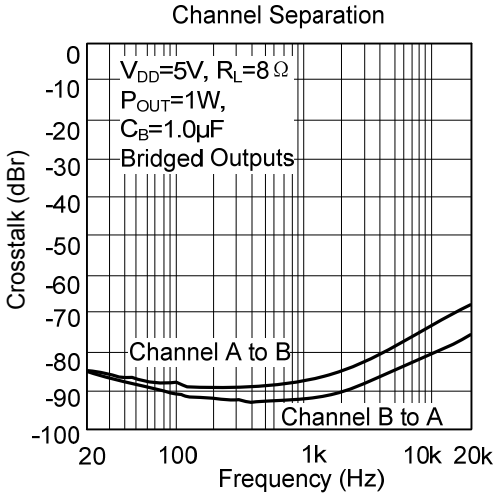
Power Derating Curve



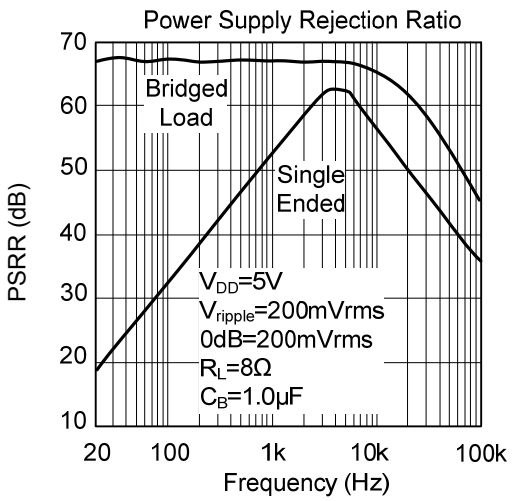
Power Dissipation vs. Output Power



Channel Separation



Power Supply Rejection Ratio



■ TYPICAL CHARACTERISTICS (Cont.)