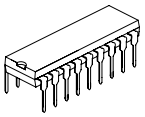
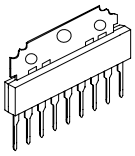
2×6W AUDIO POWER AMPLIFIER

DESCRIPTION

SA7454 is a Class AB dual audio power amplifier. It adopts HSIP-9 or DIP-18IH-300-2.54 package.



DIP-18IH-300-2.54



HSIP - 9

FEATURES

* High output power: 6 + 6W @ THD=10%, RL=4Ω,VCC=14.4V
* Fixed gain
* Good power supply ripple rejection
* Standby and Mute functions
* Low ON/OFF POPO noise
* Few external components
* Short circuit protection
* Inverting polarity protection
* Thermal protection

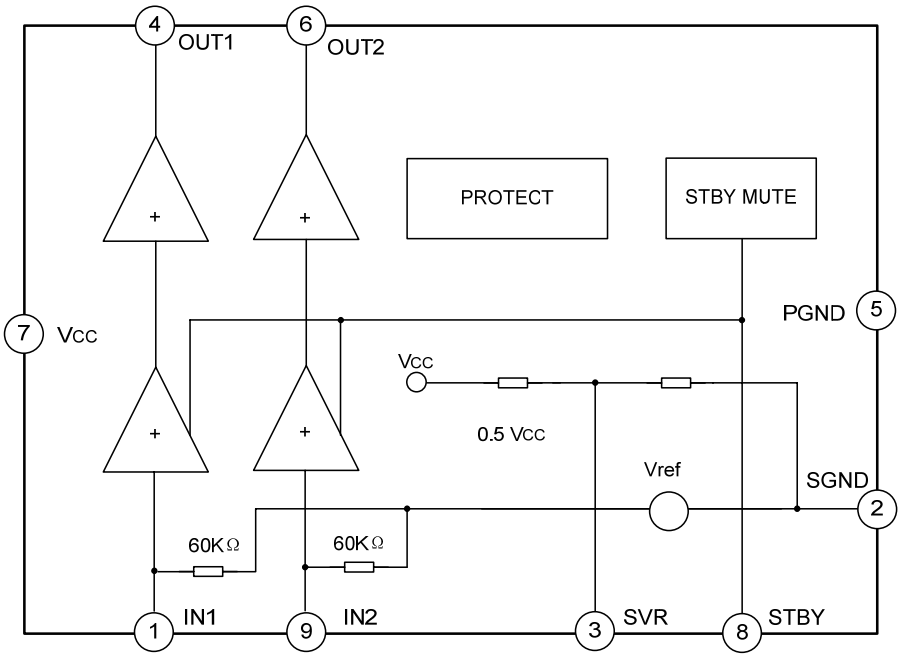
ORDERING INFORMATION

Device	Package
SA7454	DIP-18IH-300-2.54
SA7454H	HSIP-9

APPLICATIONS

* Multimedia system
* LCD-TV

BLOCK DIAGRAM



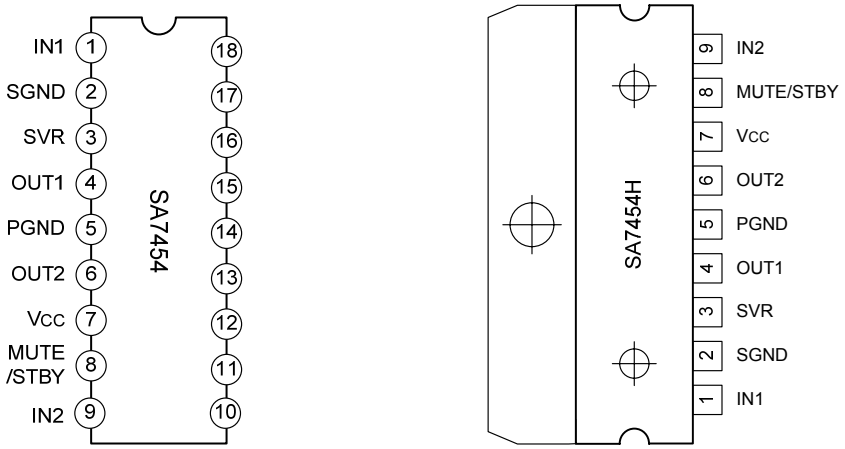
ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Conditions	Rating	Unit
Power Supply	Vs	Operating state	18	V
		No signal	20	
Max. Voltage of Inverting Polarity	Vs(r)		6	V
Output Pin Endurance Capability	ERGo	Vs=0V	200	mJ
Output Peak Current	Iosm	No repeat	4	A
	Iorm	Repeat	2.5	
Total Power Dissipation	Ptot		15	W
Storage Temperature	Tstg		-55~+150	°C
Operating Ambient Temperature	Tamb		-40~+85	°C
Junction Temperature	Tj		+150	°C
Thermal Resistance from Junction to Case	Rth(j-c)	SA7454H	8	°C/W
		SA7454	15	

ELECTRICAL CHARACTERISTICS (Unless otherwise specified, Vs=14.4V; RL=4Ω; f=1KHz; Tamb=25°C)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Power Supply	Vs		8.5	14.4	18.0	V
Total Quiescent Current	Iq		--	40	80	mA
Output DC Level	Vo		--	7.00	--	V
Output Power	Po	THD=0.5%	4	4.7	--	W
		THD=10%	5.5	6.0	--	
Total Harmonic Distortion	THD	Po=1W	--	0.1	--	%
Low Cut-Off Frequency	flr	-3dB	--	45	--	Hz
High Cut-Off Frequency	fhr	-1dB	20	--	--	kHz
Closed Loop Gain	Gv		19	20	21	dB
Supply Voltage Ripple Rejection Ratio	SVRR	Operating	48	--	--	dB
		Mute	48	--	--	
		Stand-by	80	--	--	
Input Resistance	Zi		50	60	75	kΩ
Output Noise	Vno	Operating, Rs=0Ω	--	50	--	μV
		Operating, Rs=10Ω	--	70	100	
		Mute	--	50	--	
Channel Separation	CS	Rs=0Ω	40	--	--	dB
Channel Balance	CB		--	0.1	1	dB
Thermal Protection	Tp			150		°C
Mute Function						
Mute/Play Threshold	VTMUTE		3.3	--	6.4	V
Output DC Level When Mute	Vo		--	--	2	mV
Stand-By Function						
Stand-By/Mute Threshold	VTST-BY		0	--	2.0	V
Stand-By Quiescent Current	Iq ST-BY		--	3.0	100	μA
Stand-By Bias Current	Ib ST-BY		--	15	40	μA

PIN CONFIGURATION



PIN DESCRIPTIONS

Pin No.	Pin Name	I/O	Pin Description
1	IN1	I	Non inverting input 1
2	SGND	--	Signal ground
3	SVR	O	Supply voltage ripple rejection pin
4	OUT1	O	Output 1
5	PGND	--	Power ground
6	OUT2	O	Output 2
7	Vcc	--	Power supply
8	MUTE/STBY	I	Standby and mute pin
9	IN2	I	Non inverting input 2

FUNCTION DESCRIPTION

Stand-by and mute function

The MUTE/STBY controls the amplifier state by different voltages.

- When MUTE/STBY is 0 -2V, the amplifier is in standby mode, and the circuit is in power down mode;
- When MUTE/STBY is 3.3 -6.4V, the amplifier is in mute mode;
- When MUTE/STBY is higher than 8.5V, the amplifier is in operating mode.

Power Dissipation and Heat Sinking

When the load is a resistor, the maximum average power that SA7454 will be required to dissipate is approximately:

$$PD(MAX)=Vs^2/\pi^2RL+PQ$$

Where Vs is the power supply, RL is the load resistance, PQ is the quiescent power dissipation. The above equation is only an approximation which assume SA7454 an “ideal” class B output stage and power dissipation in all other parts of the circuit is constant. As an example, if the SA7454 is operated on a 14.4V power supply with a resistive load of 4Ω, it can develop up to 6W of internal power dissipation. If the die temperature is to remain below 150°C for ambient temperatures up to 50°C, the total junction-to-ambient thermal resistance must be less

than:

(150°C－50°C)/6W＝16.7°C/W

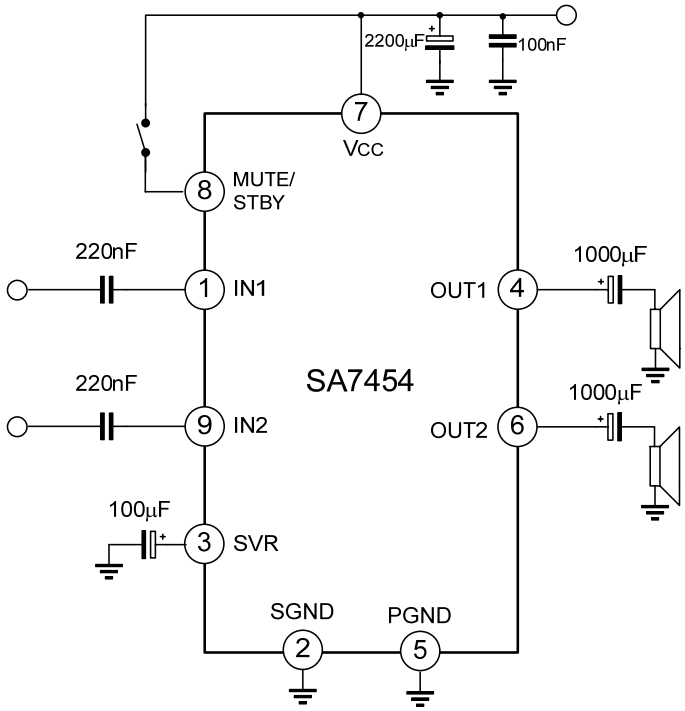
For HSIP-9 package, the die-to-package thermal resistance is Rth(j-c) = 8°C/W，then the package-to-ambient thermal resistance should be lower than 8.7°C/W. So we need heat sink to reduce the package-to-ambient thermal resistance.

For DIP-18IH-300-2.54 package, the die-to-package thermal resistance is Rth(j-c) = 15°C/W，then the package-to-ambient thermal resistance should be lower than 1.7°C/W，that will make heat sinking difficult, in addition, DIP-18IH-300-2.54 can not add effective heat sink, so we need to reduce the power dissipation by reducing load. For example, with a 8Ω load, it can develop up to 3W of internal power dissipation, and the package-to-ambient thermal resistance should be lower than:

(150°C－50°C)/3W－15°C/W＝18.3°C /W

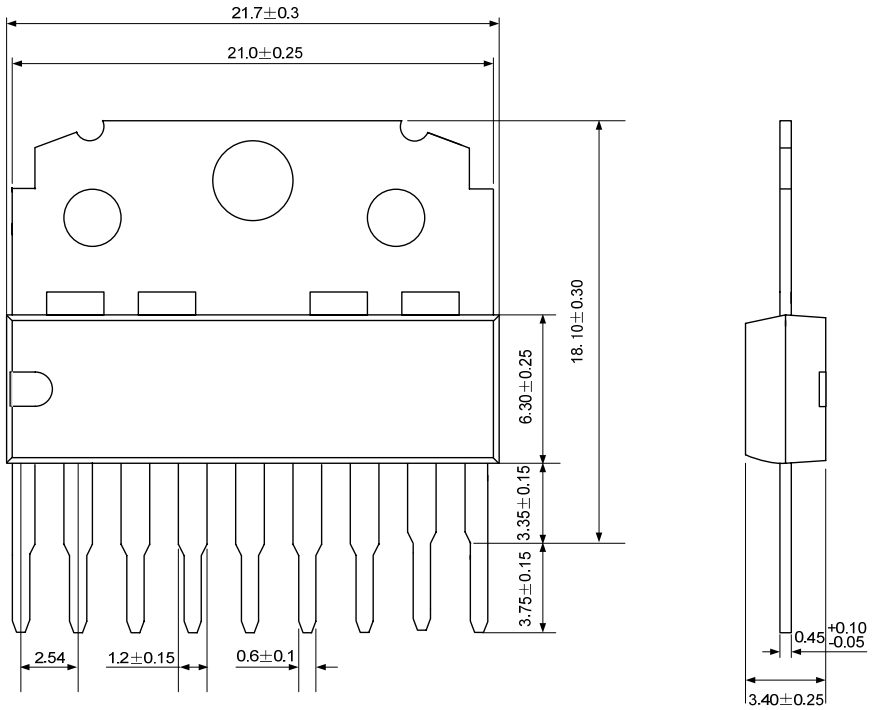
The thermal requirements can become more difficult when SA7454 is driving a reactive load. As a general rule, the power dissipation of an amplifier driving a 60º reactive load (usually considered to be a worst-case loudspeaker load) will be roughly that of the same amplifier driving the resistive part of that load. For example, a loudspeaker may at some frequency have an impedance with a magnitude of 8Ω and a phase angle of 60º. The real part of this load will then be 4Ω, and the amplifier power dissipation equal to the power dissipation with a 4Ω load.

TYPICAL APPLICATION CIRCUIT

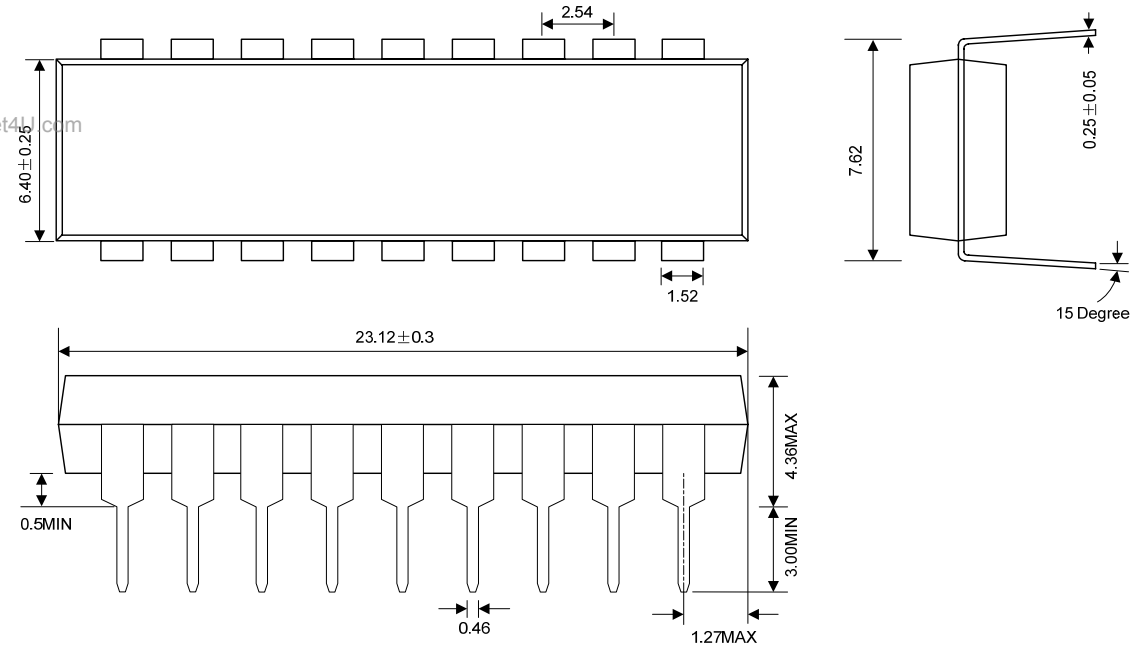


PACKAGE OUTLINE

HSIP-9 Unit: mm



DIP-18IH-300-2.54 Unit: mm



Note: Silan reserves the right to make changes without notice in this specification for the improvement of the design and performance. Silan will supply the best possible product for customers.