

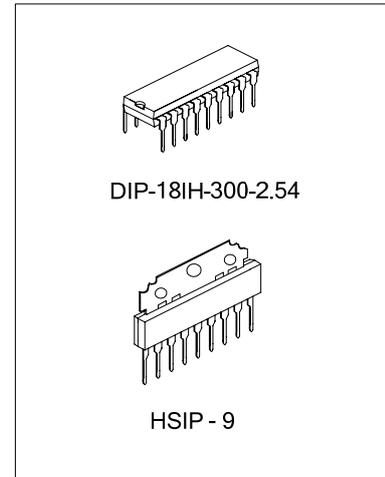
2×6W AUDIO POWER AMPLIFIER

DESCRIPTION

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

FEATURES

- * High output power: 6 + 6W @ THD=10%, $R_L=4\Omega$, $V_{CC}=14.4V$
- * 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



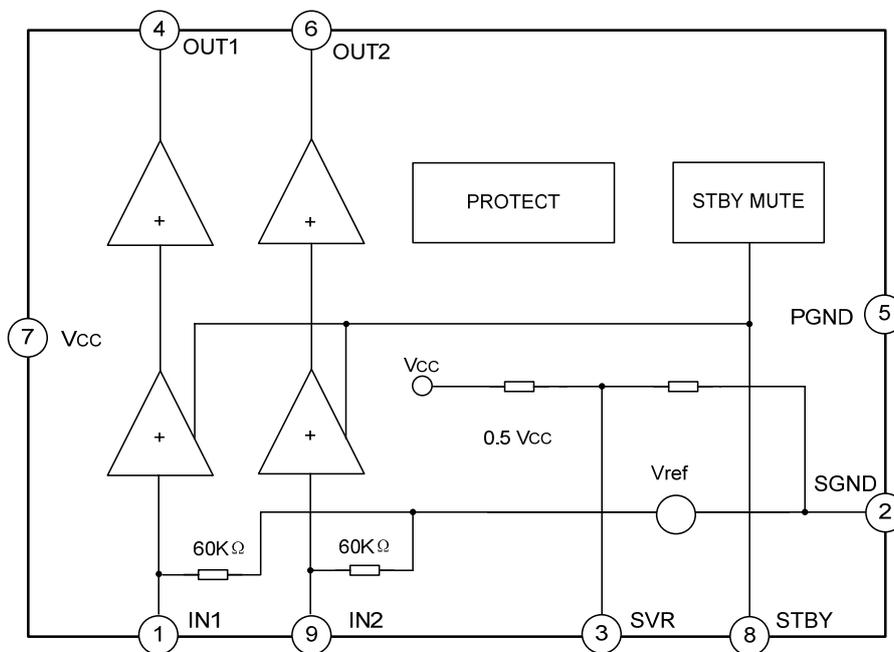
APPLICATIONS

- * Multimedia system
- * LCD-TV

ORDERING INFORMATION

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

BLOCK DIAGRAM

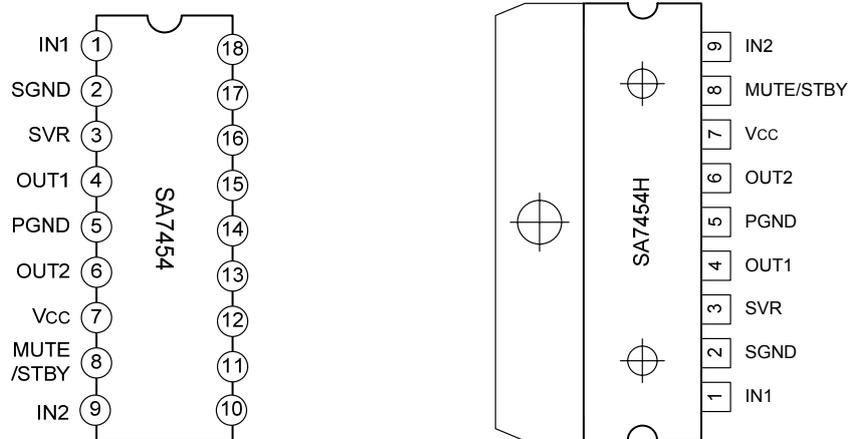


ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Conditions	Rating	Unit
Power Supply	V _s	Operating state	18	V
		No signal	20	
Max. Voltage of Inverting Polarity	V _{s(r)}		6	V
Output Pin Endurance Capability	ERGo	V _s =0V	200	mJ
Output Peak Current	I _{osm}	No repeat	4	A
		Repeat	2.5	
Total Power Dissipation	P _{tot}		15	W
Storage Temperature	T _{stg}		-55~+150	°C
Operating Ambient Temperature	T _{amb}		-40~+85	°C
Junction Temperature	T _j		+150	°C
Thermal Resistance from Junction to Case	R _{th(j-c)}	SA7454H	8	°C/W
		SA7454	15	

ELECTRICAL CHARACTERISTICS (Unless otherwise specified, V_s=14.4V; R_L=4Ω; f=1KHZ; T_{amb}=25°C)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Power Supply	V _s		8.5	14.4	18.0	V
Total Quiescent Current	I _q		--	40	80	mA
Output DC Level	V _o		--	7.00	--	V
Output Power	P _o	THD=0.5%	4	4.7	--	W
		THD=10%	5.5	6.0	--	
Total Harmonic Distortion	THD	P _o =1W	--	0.1	--	%
Low Cut-Off Frequency	f _{lr}	-3dB	--	45	--	Hz
High Cut-Off Frequency	f _{hr}	-1dB	20	--	--	kHz
Closed Loop Gain	G _v		19	20	21	dB
Supply Voltage Ripple Rejection Ratio	SVRR	Operating	48	--	--	dB
		Mute	48	--	--	
		Stand-by	80	--	--	
Input Resistance	Z _i		50	60	75	kΩ
Output Noise	V _{no}	Operating, R _s =0Ω	--	50	--	μV
		Operating, R _s =10Ω	--	70	100	
		Mute	--	50	--	
Channel Separation	CS	R _s =0Ω	40	--	--	dB
Channel Balance	CB		--	0.1	1	dB
Thermal Protection	T _p			150		°C
Mute Function						
Mute/Play Threshold	VTMUTE		3.3	--	6.4	V
Output DC Level When Mute	V _o		--	--	2	mV
Stand-By Function						
Stand-By/Mute Threshold	VTST-BY		0	--	2.0	V
Stand-By Quiescent Current	I _q ST-BY		--	3.0	100	μA
Stand-By Bias Current	I _b 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:

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

Where V_s is the power supply, R_L 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:

$$(150^{\circ}\text{C} - 50^{\circ}\text{C})/6\text{W} = 16.7^{\circ}\text{C/W}$$

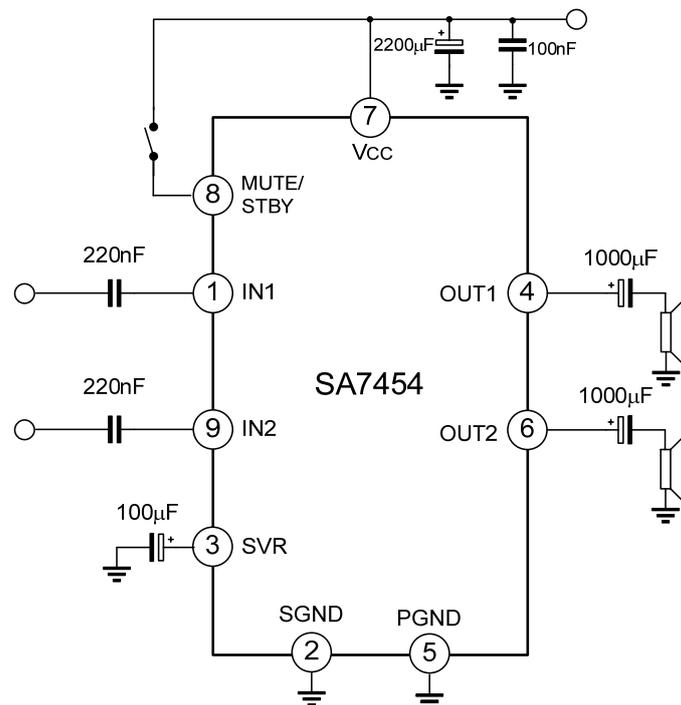
For HSIP-9 package, the die-to-package thermal resistance is $R_{th(j-c)} = 8^{\circ}\text{C/W}$, then the package-to-ambient thermal resistance should be lower than 8.7°C/W . So we need heat sink to reduce the package-to-ambient thermal resistance.

For DIP-18IH-300-2.54 package, the die-to-package thermal resistance is $R_{th(j-c)} = 15^{\circ}\text{C/W}$, 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:

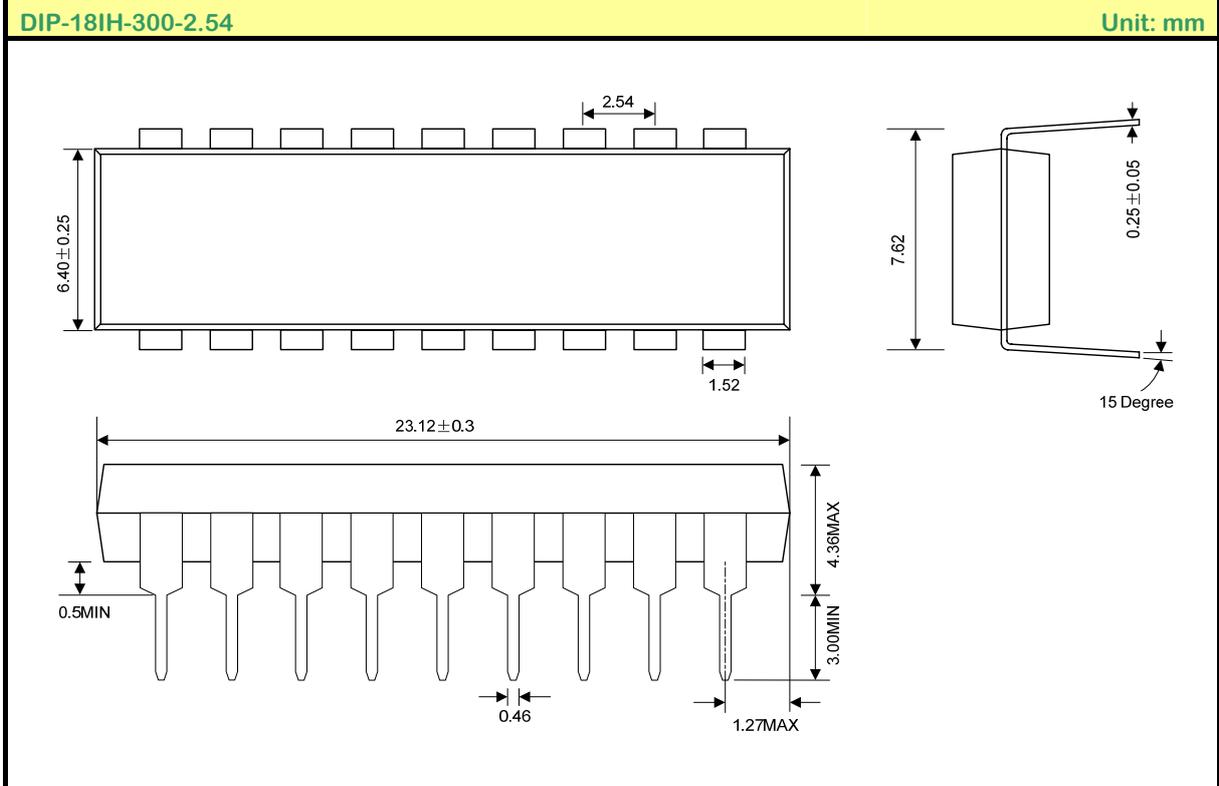
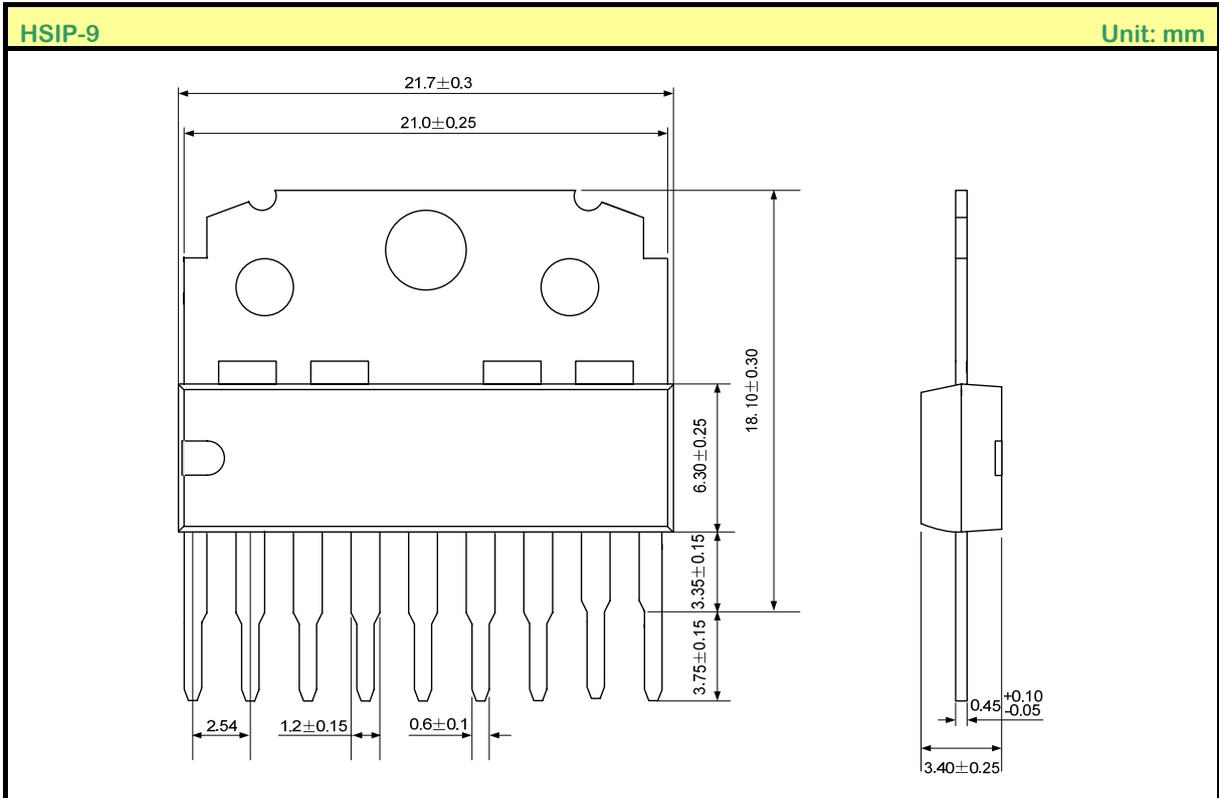
$$(150^{\circ}\text{C} - 50^{\circ}\text{C})/3\text{W} - 15^{\circ}\text{C/W} = 18.3^{\circ}\text{C/W}$$

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 60° 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 60° . 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



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.