



# LA4533M

## Power Amplifier for 3V Headphone Stereos

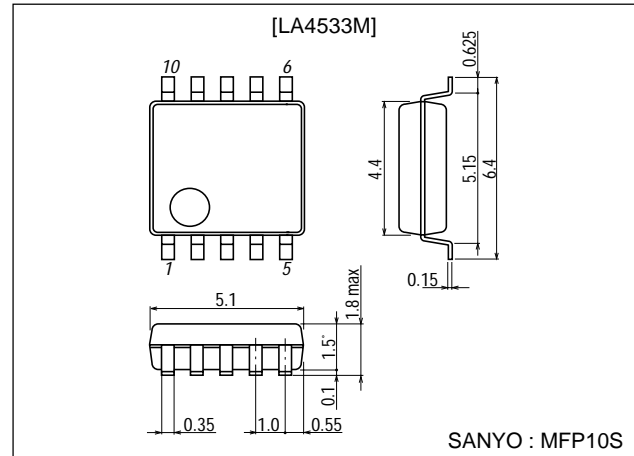
### Features

- Low current consumption.
- 16Ω load drive capability.
- Excellent reduced voltage characteristics.
- Excellent power supply ripple rejection.
- Minimum number of external parts required (no input capacitor, feedback capacitor required).
- Applicable to radio sets because of high voltage gain.
- Less harmonic interference in radio band.
- On-chip power switch function, muting function.

### Package Dimensions

unit:mm

3086A-MFP10S



### Specifications

#### Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max	Quiescent	4.5	V
Allowable power dissipation	P <sub>d</sub> max		300	mW
Operating temperature	T <sub>opr</sub>		-20 to +75	°C
Storage temperature	T <sub>stg</sub>		-40 to +125	°C

#### Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>		3.0	V
Operating voltage range	V <sub>CC</sub> op		1.6 to 4.0	V
Recommended load resistance	R <sub>L</sub>		16 to 32	Ω

#### Operating Characteristics at Ta = 25°C, R<sub>L</sub>=16Ω, R<sub>g</sub>=600Ω, See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I <sub>cco1</sub>	V <sub>CC</sub> =2.4V, quiescent		5.4	10	mA
	I <sub>cco2</sub>	V <sub>CC</sub> =4.5V, pin 10 → GND		1.1	2.0	mA
	I <sub>cco3</sub>	V <sub>CC</sub> =4.5V, pin 1 → GND			1.0	μA
Voltage gain	VG1	V <sub>CC</sub> =2.4V, f=1kHz, V <sub>O</sub> =-10dBm	30	32	34	dB
	VG2	V <sub>CC</sub> =1.6V, f=1kHz, V <sub>O</sub> =-20dBm	29	32	34	dB
Voltage gain difference	ΔVG1	V <sub>CC</sub> =2.4V, f=1kHz, V <sub>O</sub> =-10dBm			1.0	dB
	ΔVG2	V <sub>CC</sub> =1.6V, f=1kHz, V <sub>O</sub> =-20dBm			1.0	dB

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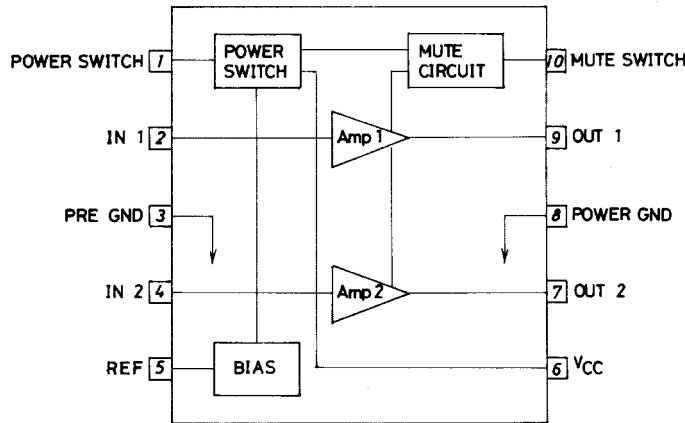
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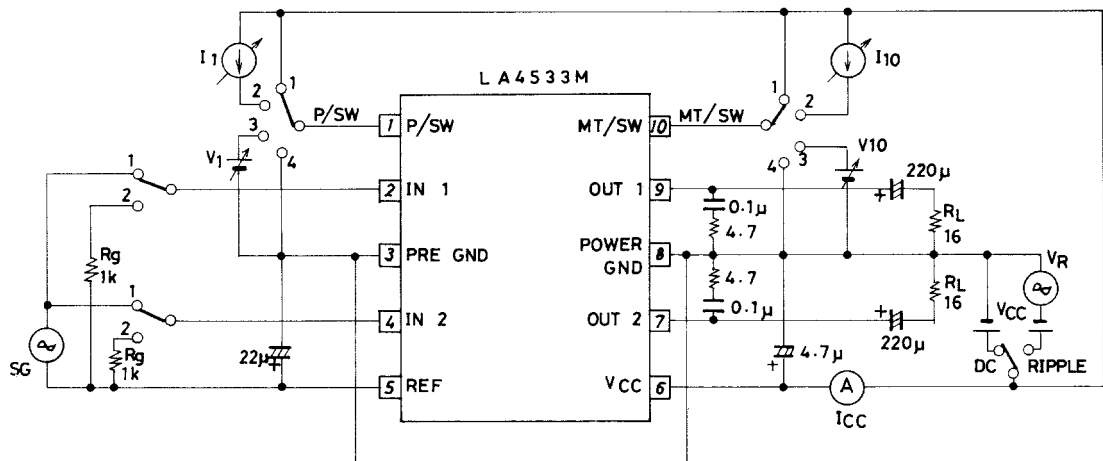
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total harmonic distortion	THD	$V_{CC}=2.0V, f=1kHz, P_O=1mW$		0.5	1.5	%
Output power	$P_O$	$V_{CC}=3.0V, f=1kHz, THD=10\%$	20	40		mW
Crosstalk	CT	$V_{CC}=2.4V, f=100Hz, R_g=1k\Omega, V_O=-10dB$	40	50		dB
Ripple rejection	SVRR	$V_{CC}=1.6V, f=100Hz, R_g=1k\Omega, V_R=-20dBm, BPF=100Hz$	45	60		dB
Output noise voltage	$V_{NO}$	$V_{CC}=4.5V, R_g=1k\Omega, BPF=20Hz \text{ to } 20kHz$		62	100	$\mu V$
Power off effect	$V_O$ (off)	$V_{CC}=1.6V, f=100Hz, \text{pin } 1 \rightarrow GND, V_{IN}=-10dB$			-80	dB
Muting effect	$V_O$ (MT)	$V_{CC}=1.6V, f=100Hz, \text{pin } 10 \rightarrow GND, V_{IN}=-10dB$			-80	dB
Power on current sensitivity	$I_1$ (on)	$V_{CC}=1.5V, V_5 \geq 0.85V$		0.05	1.0	$\mu A$
Power off voltage sensitivity	$V_1$ (off)	$V_{CC}=1.5V, V_5 \leq 0.1V$	0.5	0.6		V
Muting off current sensitivity	$I_{10}$ (off)	$V_{CC}=1.5V, V_5 \geq 0.85V$		0.2	1.0	$\mu A$
Muting on voltage sensitivity	$V_{10}$ (on)	$V_{CC}=1.5V, V_5 \leq 0.1V$	0.5	0.65		V

Note) The quiescent current is represented by the current flowing into pin 6. The respective maximum currents flowing into pin 1 and pin 10 are calculated by  $(\text{pin voltage} - 0.5) / 16 [V/k\Omega]$  and the total current increases by these current values.

## Equivalent Circuit Block Diagram and Application Circuit



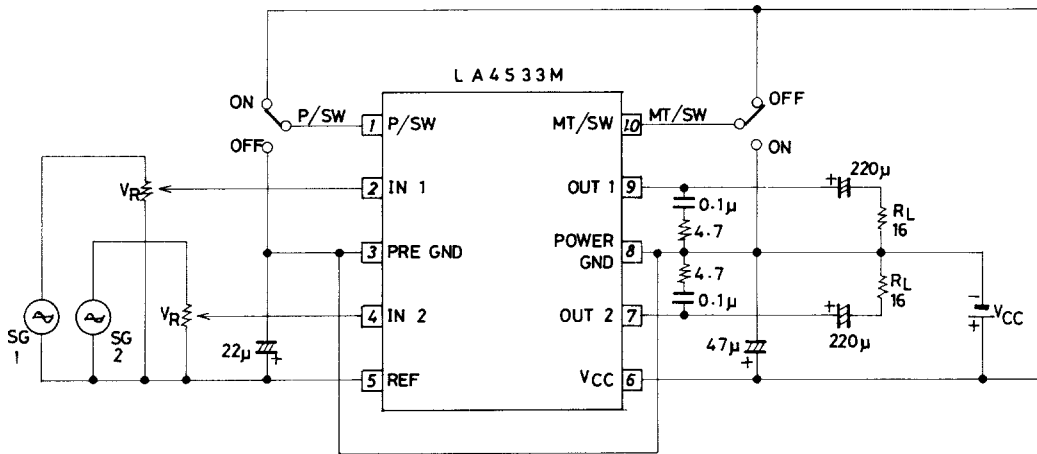
## Test Circuit



Unit (resistance :  $\Omega$ , capacitance : F)

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## Sample Application Circuit



Unit (resistance :  $\Omega$ , capacitance :  $F$ )

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