



LA4538M

Ripple Filter-Provided Stereo Power Amplifier for 1.5V Headphone Stereos

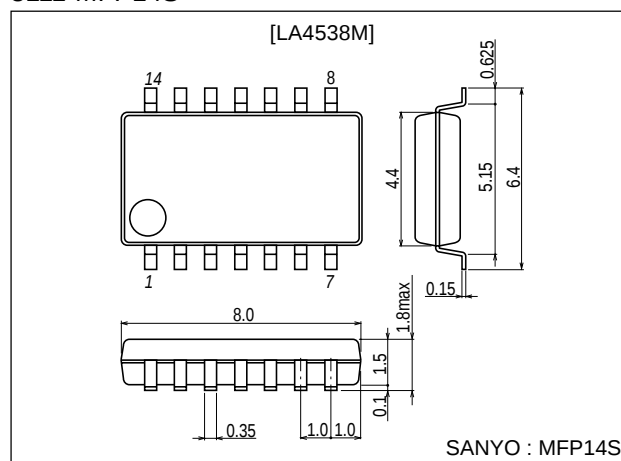
Features

- Low current dissipation.
- Excellent reduced voltage characteristics.
- Minimum number of external parts required.
- On-chip power switch function.
- Power amplifier section
 - Output power 8mW typ ($V_{CC}=1.5V$, $R_L=16\Omega$, $f=1kHz$, THD=10%)
 - Ripple rejection 46dB typ ($V_{CC}=1.0V$, $V_R=-30dBm$, $f_R=100Hz$)
- Ripple filter section
 - Ripple rejection 39dB typ ($V_{CC}=1.0V$, $V_R=-35dBm$, $f_R=100Hz$)
 - Less output voltage loss
 - Pin 8 can be used to perform the muting current.

Package Dimensions

unit:mm

3111-MFP14S



Specifications

Absolute Maximum Ratings at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\ max}$	Quiescent	4.5	V
Maximum output current	I_{O7}	Pin 7 flow-out current	5.0	mA
Allowable power dissipation	$P_d\ max$		300	mW
Operating temperature	T_{opr}		-20 to +75	$^\circ C$
Storage temperature	T_{stg}		-40 to +125	$^\circ C$

Operating Conditions at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended operating voltage	V_{CC}		1.5	V
Operating voltage range	$V_{CC\ op}$		0.9 to 4.0	V
Recommended load resistance	R_L		16 to 32	Ω

Operating Characteristics at $T_a = 25^\circ C$, $R_L=16\Omega$, $R_g=600\Omega$, See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{cc01}	$V_{CC}=1.20V$, quiescent, $R_L 3 \rightarrow OFF$		4.5	7.0	mA
	I_{cc02}	$V_{CC}=2.50V$, pin 14 $\rightarrow GND$, $R_L 3 \rightarrow OFF$		1.5	2.5	mA
	I_{cc03}	$V_{CC}=2.50V$, pin 1 $\rightarrow GND$, $R_L 3 \rightarrow OFF$			1.0	μA
Voltage gain	V_G	$V_{CC}=0.90V$, $f=1kHz$, $V_O=-20dBm$	27.5	29	31.5	dB
Voltage gain difference	ΔV_G	$V_{CC}=0.90V$, $f=1kHz$, $V_O=-20dBm$			1.0	dB

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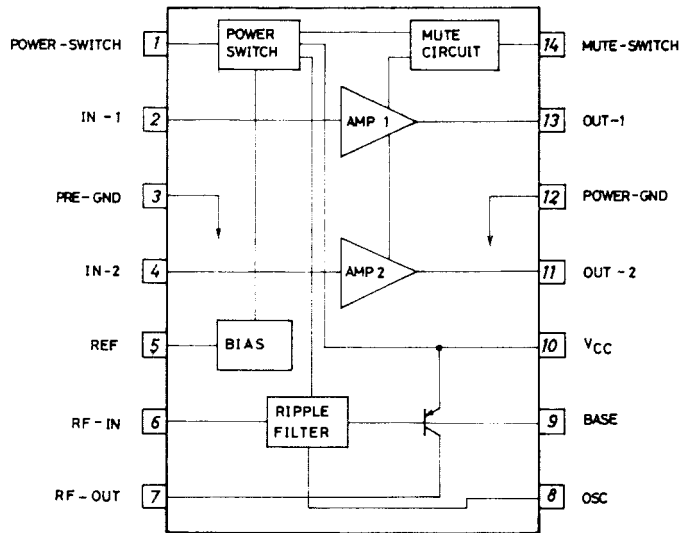
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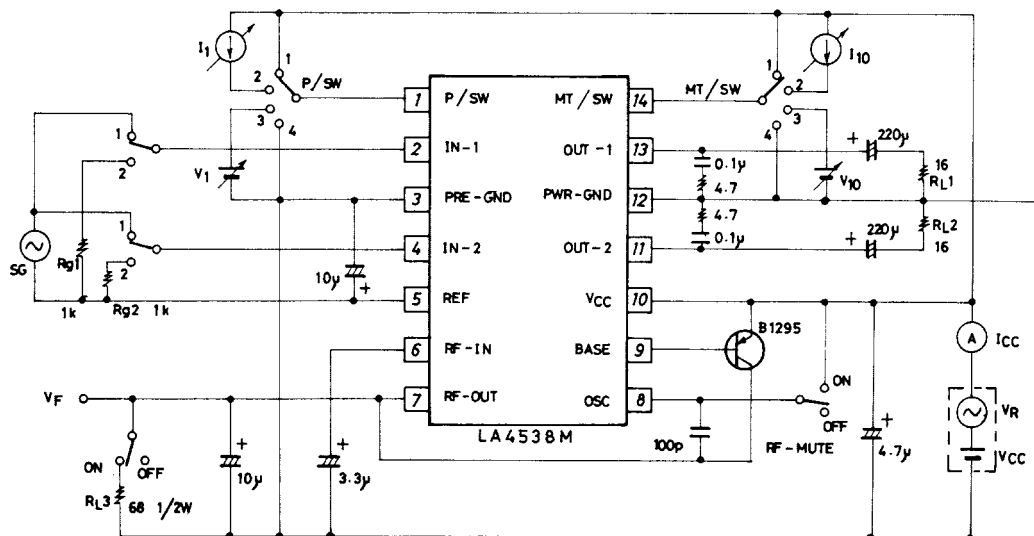
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total harmonic distortion	THD	$V_{CC}=1.20V$, $f=1kHz$, $P_O=0.5mW$		0.9	1.5	%
Output power	P_O	$V_{CC}=1.50V$, $f=1kHz$, THD=10%	5	8		mW
Crosstalk	CT	$V_{CC}=1.20V$, $f=100Hz$, $R_g=1k\Omega$, $V_O=-20dB$	40	45		dB
Ripple rejection (amplifier section)	SVRR1	$V_{CC}=1.00V$, $f=100Hz$, $R_g=1k\Omega$, $V_R=-30dBm$, BPF=100Hz	40	46		dB
Ripple rejection (filter section)	SVRR2	$V_{CC}=1.00V$, $f=100Hz$, $V_R=-35dBm$	34	39		dB
Output noise voltage	V_{NO}	$V_{CC}=2.50V$, $R_g=1k\Omega$, BPF=20Hz to 20kHz		55	80	μV
Power on current sensitivity	$I_{1(on)}$	$V_{CC}=0.85V$, $V_{pin5} \geq 0.5V$		0.1	1.0	μA
Power off voltage sensitivity	$V_{1(off)}$	$V_{CC}=0.85V$, $V_{pin5} \leq 0.1V$	0.5	0.6		V
Muting off current sensitivity	$I_{14(off)}$	$V_{CC}=0.85V$, $V_{pin5} \geq 0.5V$		0.1	1.0	μA
Muting on voltage sensitivity	$V_{14(on)}$	$V_{CC}=0.85V$, $V_{pin5} \leq 0.1V$	0.5	0.6		V
Ripple filter output voltage	V_F	$V_{CC}=1.00V$, $R_L=68\Omega$	0.90	0.94		V

Equivalent Circuit Block Diagram

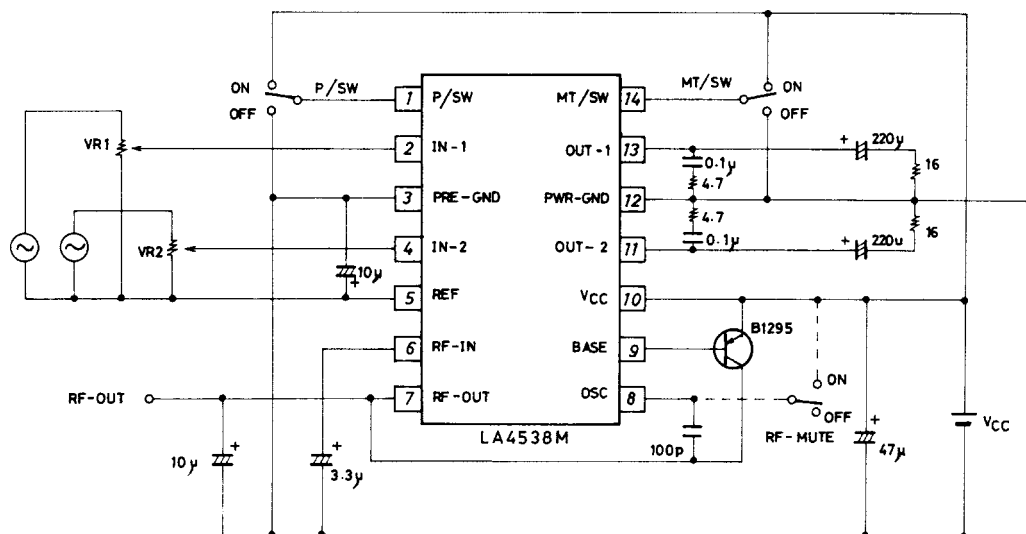


Test Circuit

Unit (resistance: Ω , capacitance: F)



Sample Application Circuit

Unit (resistance: Ω , capacitance: F)

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