

<b>SANYO</b>	No.2667A	<b>LA4538M</b>
	Ripple Filter-Provided Stereo Power Amp 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 amp section
  - Output power 8mW typ ( $V_{CC}=1.5V, R_L=16\Omega, f=1kHz, THD=10\%$ )
  - Ripple rejection 46dB typ ( $V_{CC}=1.0V, V_R=-30dBm, f_R=100Hz$ )
  - On-chip muting function
- 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 function.

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

Maximum Supply Voltage	V <sub>CC</sub> max	Quiescent	4.5	V	unit
Maximum Output Current	I <sub>o7</sub>	Pin 7 flow-out current	5.0	mA	
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  $T_a=25^\circ C$**

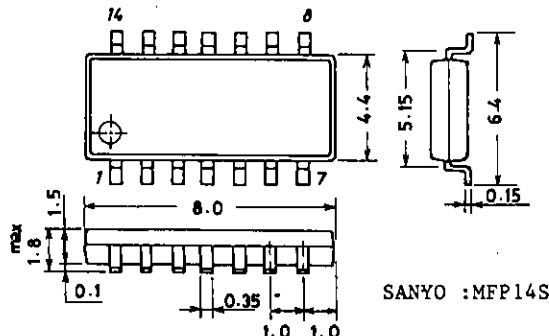
Recommended Operating Voltage	V <sub>CC</sub>		1.5	V	unit
Operating Voltage Range	V <sub>CC</sub> op		0.9 to 4.0	V	
Recommended Load Resistance	R <sub>L</sub>		16 to 32	Ω	

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

			min	typ	max	unit
Quiescent Current	I <sub>CCO(1)</sub>	V <sub>CC</sub> =1.20V, quiescent, R <sub>L3</sub> →OFF	4.5	7.0		mA
	I <sub>CCO(2)</sub>	V <sub>CC</sub> =2.50V, pin 14→GND, R <sub>L3</sub> →OFF	1.5	2.5		mA
	I <sub>CCO(3)</sub>	V <sub>CC</sub> =2.50V, pin 1→GND, R <sub>L3</sub> →OFF		1.0		μA
Voltage Gain	VG	V <sub>CC</sub> =0.90V, f=1kHz, V <sub>o</sub> =-20dBm	27.5	29	31.5	dB
Voltage Gain Difference	ΔVG	V <sub>CC</sub> =0.90V, f=1kHz, V <sub>o</sub> =-20dBm			1.0	dB
Total Harmonic Distortion	THD	V <sub>CC</sub> =1.20V, f=1kHz, P <sub>o</sub> =0.5mW		0.9	1.5	%
Output Power	P <sub>o</sub>	V <sub>CC</sub> =1.50V, f=1kHz, THD=10%	5	8		mW

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**Package Dimensions 3111-M14SIC**  
(unit: mm)

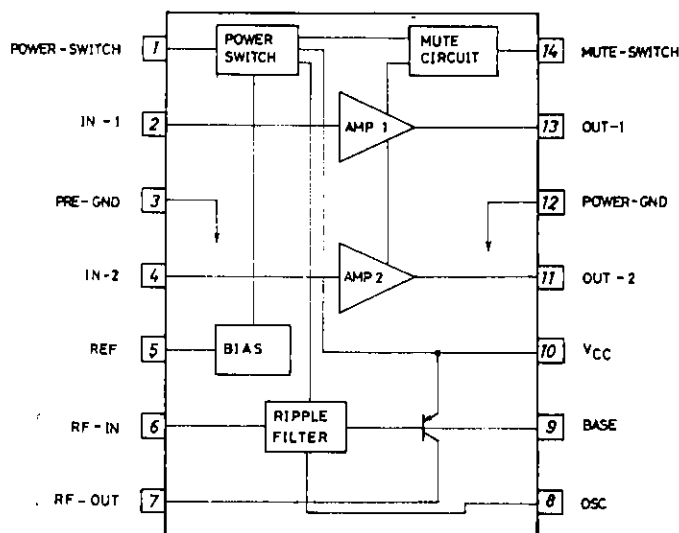


# LA4538M

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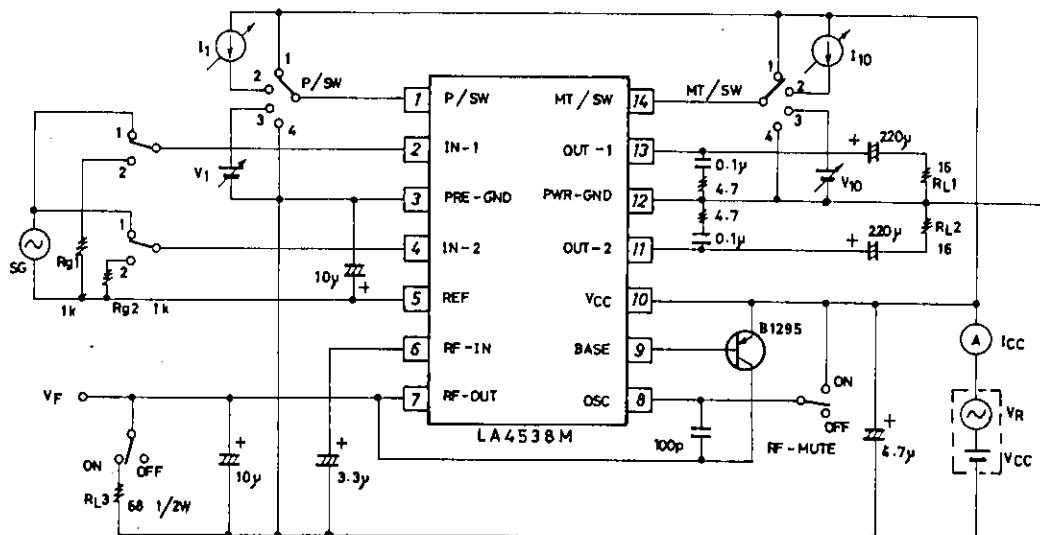
			min	typ	max	unit
Crosstalk	CT	$V_{CC} = 1.20V, f = 100Hz, R_g = 1k\Omega, V_o = -20dBm$	40	45		dB
Ripple Rejection (Amp Section)	SVRR(1)	$V_{CC} = 1.00V, f = 100Hz, R_g = 1k\Omega, V_R = -30dBm, BPF = 100Hz$	40	46		dB
Ripple Rejection (Filter Section)	SVRR(2)	$V_{CC} = 1.00V, f = 100Hz, V_R = -35dBm$	34	39		dB
Output Noise Voltage	$V_{NO}$	$V_{CC} = 2.50V, R_g = 1k\Omega, BPF = 20Hz$ to 20kHz		55	80	$\mu V$
Power ON-State Current Sensitivity	$I_{1(ON)}$	$V_{CC} = 0.85V, V_{pin5} \cong 0.5V$		0.1	1.0	$\mu A$
Power OFF-State Voltage Sensitivity	$V_{1(OFF)}$	$V_{CC} = 0.85V, V_{pin5} \leq 0.1V$	0.5	0.6		V
Muting ON-State Current Sensitivity	$I_{14(ON)}$	$V_{CC} = 0.85V, V_{pin5} \cong 0.5V$		0.1	1.0	$\mu A$
Muting OFF-State Voltage Sensitivity	$V_{14(OFF)}$	$V_{CC} = 0.85V, V_{pin5} \leq 0.1V$	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



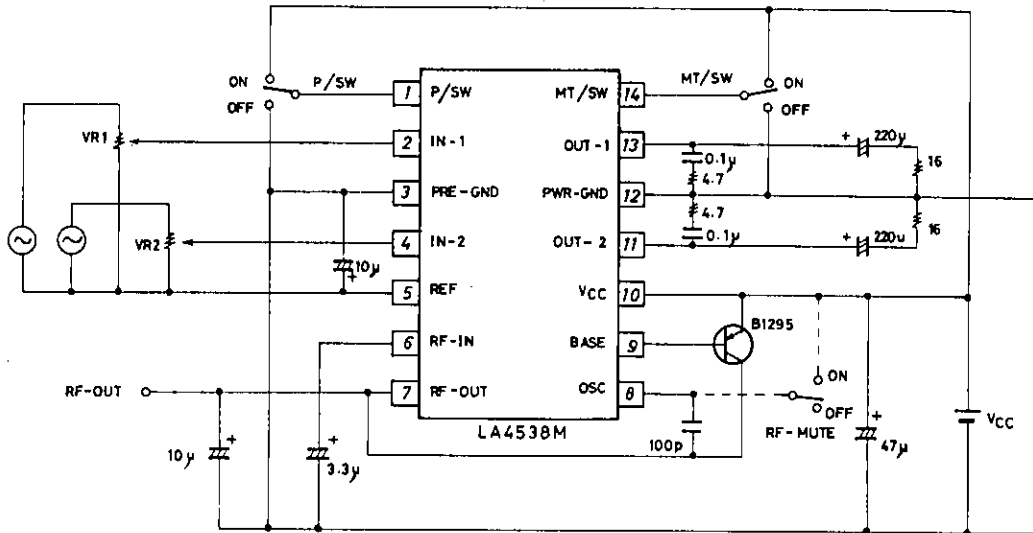
## Test Circuit

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



# LA4538M

## Sample Application Circuit



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

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