The LA4534M is a low noise, low distortion headphone-stereo power IC designed for use in a portable CD.

Features
- Less current drain.
- Accept 16Ω load drive.
- Excellent voltage reduction characteristic.
- Excellent ripple rejection.
- Power switch function and built-in muting circuit.
- Low noise (7μV), low gain (11dB).

Specifications

Absolute Maximum Ratings at Ta = 25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum supply voltage</td>
<td>VCC max</td>
<td>Quiescent time</td>
<td>4.5</td>
<td>V</td>
</tr>
<tr>
<td>Allowable power dissipation</td>
<td>Pd max</td>
<td></td>
<td>300</td>
<td>mW</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Topr</td>
<td></td>
<td>–20 to +75</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td></td>
<td>–40 to +125</td>
<td>°C</td>
</tr>
</tbody>
</table>

Operating Conditions at Ta = 25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended supply voltage</td>
<td>VCC</td>
<td></td>
<td>3.0</td>
<td>V</td>
</tr>
<tr>
<td>Operating supply voltage range</td>
<td>VCC op</td>
<td></td>
<td>1.6 to 4.0</td>
<td>V</td>
</tr>
<tr>
<td>Recommended load impedance</td>
<td>RL</td>
<td></td>
<td>16 to 32</td>
<td>Ω</td>
</tr>
</tbody>
</table>

Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.
Equivalent Circuit Block Diagram

Note: Quiescent current is the current flowing into pin 6. The current flowing into pin 1 and pin 10 is at the maximum value and calculated from the equation \((V_{pin} - 0.5V) / 16(\text{V/kΩ})\), increasing total current.
Test Circuit

Sample Application Circuit
## Pin Functions (V\textsubscript{CC}=3.0V)

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Symbol</th>
<th>Pin voltage (V)</th>
<th>Equivalent circuit</th>
<th>Pin function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P/SW1</td>
<td></td>
<td><img src="A11155" alt="Diagram" /></td>
<td>• The system turns on when the V\textsubscript{CC} is applied to this pin and turns off by connecting this pin to GND.</td>
</tr>
<tr>
<td>2</td>
<td>IN1</td>
<td>1.1</td>
<td><img src="A11156" alt="Diagram" /></td>
<td>• Input pin connection. Input impedance is 10kΩ.</td>
</tr>
<tr>
<td>4</td>
<td>IN2</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PRE GND</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>REF</td>
<td>1.1</td>
<td><img src="A11157" alt="Diagram" /></td>
<td>• 1.1V fixed bias is applied to this pin.</td>
</tr>
<tr>
<td>6</td>
<td>V\textsubscript{CC}</td>
<td>3.0</td>
<td><img src="A11158" alt="Diagram" /></td>
<td>• Output pin connection.</td>
</tr>
<tr>
<td>7</td>
<td>OUT2</td>
<td>1.1</td>
<td><img src="A11159" alt="Diagram" /></td>
<td>• The muting function turns on when this pin is connected to GND and turns off by applying the V\textsubscript{CC} to this pin.</td>
</tr>
<tr>
<td>9</td>
<td>OUT1</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>POWER GND</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No.4024-4/9
Output power, $P_O$ – mW
Voltage, $V_{DC}$ – V
Ambient temperature, $T_a$ – °C

Voltage gain deviation, $V_G$ – dB

Quiescent current, $I_{CCO}$ – mA

VCC = 1.2V
$V_O = 10$ dBm
$R_L = 16\Omega$ (Dual Ope)
$f = 1$ kHz
THD = 10%

VCC = 2.4V
$V_{CC} = 2.4V$

$V_{IN} = 0$
$R_g = 1k\Omega$

$V_{CC} = 3.0V$

$V_{CC} = 2.4V$

$V_{CC} = 2.0V$

$f = 1$ kHz

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$

$V_{IN} = 0$

$R_g = 1k\Omega$

$V_{CC} = 2.4V$
**Application Notes**

- Poping noise reduction

  The switching sequence shown below can minimize popping noise.

To minimize popping noise, the PWR mute switch should be turned on $t_1$ (about 0.1s) after power-on and turned off $t_2$ (about 0.1s) before power-off. Turn on and off the PWR mute switch by applying $V_{CC}$ with the PWR be in no state.
Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

In the event that any or all SANYO products (including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.

Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.

Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of October, 1998. Specifications and information herein are subject to change without notice.