VOLTAGE CONTROLLED AMPLIFIER

DESCRIPTION

The SSM 2010 is a precision two quadrant multiplier designed for quality electronic music and P.A. systems. The device offers very low distortion and high signal/noise ratio, a minimum external parts count and a complete on-chip control circuit for simultaneous linear and exponential gain control. Other features include a wide dynamic range and ±5 V to ±18 V operation.

FEATURES

- Simultaneous Linear and Exponential Gain Control.
- Current Input
- Current Output
- 0.05% THD Distortion
- 0.2% IM Distortion
- 90db Signal-to-Noise
- ±5 V to ±18 V Operation
- Minimum External Parts Count

APPLICATIONS

- Voltage Controlled Amplifiers
- Volume Controls
- Automated Equalizers
- Limiters
- Electronic Music Systems
- P.A. Systems

PIN OUT       TOP VIEW     BLOCK DIAGRAM

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### SPECIFICATIONS

**VS** = ± 15 V, **TA** = 25°C (unless otherwise specified).

**STORAGE TEMPERATURE**  
-55 - +125°C

**OPERATING TEMPERATURE**  
0 to 75°C

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Icc</td>
<td>3.0mA</td>
<td>5.0mA</td>
<td>10mA</td>
<td>VS = ± 18 V</td>
</tr>
<tr>
<td>Output offset</td>
<td>-5μA</td>
<td></td>
<td></td>
<td>I_s = 0, V_e = 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I_L = 50μA</td>
</tr>
<tr>
<td>Gain</td>
<td>0.75</td>
<td>1</td>
<td>1.25</td>
<td>I_s = ±100μA</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V_e = 0, I_L = 50μA</td>
</tr>
<tr>
<td>Peak Output</td>
<td>±200μA pp</td>
<td>±300μA pp</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I_s = ±300μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V_e = 0, I_L = 50μA</td>
</tr>
<tr>
<td>Output Leakage</td>
<td>-100nA</td>
<td></td>
<td></td>
<td>I_s = 0, I_L = 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V_e = 0</td>
</tr>
<tr>
<td>Expo Control Sensitivity</td>
<td></td>
<td>-6db/18mV</td>
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</table>

#### Distortion (THD)

For best results, select **R_in** to give a ± 50μA input signal current for the maximum average input signal level.

<table>
<thead>
<tr>
<th>R_in</th>
<th>MAXIMUM INPUT SIGNAL LEVEL</th>
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</thead>
<tbody>
<tr>
<td>50K</td>
<td>± 2.5V</td>
</tr>
<tr>
<td>100K</td>
<td>± 5.0V</td>
</tr>
<tr>
<td>200K</td>
<td>± 10.0V</td>
</tr>
</tbody>
</table>

#### Diagram

- **15V**
- **300K**
- **100μF**
- **1K**
- **54.9K** for -6db/V
- **15.7K** for -20db/V
- **R = 330Ω**
- **LOW NOISE OP AMP: TLC071 OR 5534**
- **FUSE TEL LABS TYPE Q81 FOR MAX. TEMP. STABILITY**