

# SSI2190

## PROCIRCUIT™ 6-INTO-1 VOLTAGE CONTROLLED MIXER\*

The SSI2190 is a six-into-one voltage controlled mixer in a compact 24-lead SSOP package, based on a new-generation Operational Transconductance Amplifier (OTA) developed by Sound Semiconductor. The high-compliance current output allows easy paralleling of multiple SSI2190s.

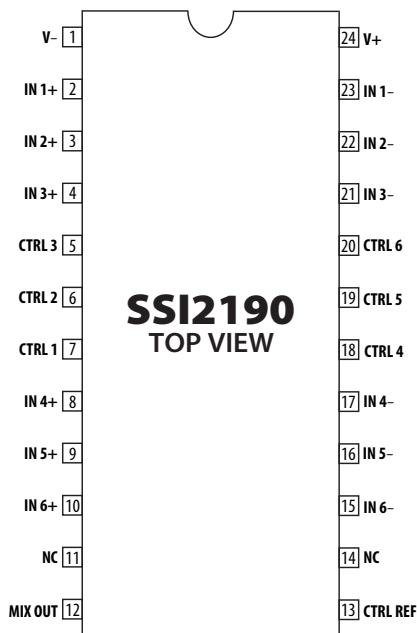
Each input channel has differential voltage inputs and a current-mode linear control input. This combination results in low distortion and control feedthrough, along with wide dynamic range.

The SSI2190 makes mixing of audio signals – as well as control voltages – a simple endeavor. Differential inputs can be used for phase correction, differential signal paths, as well as countless other applications that are only limited to one’s imagination. A minimum of inexpensive external components are required for operation.

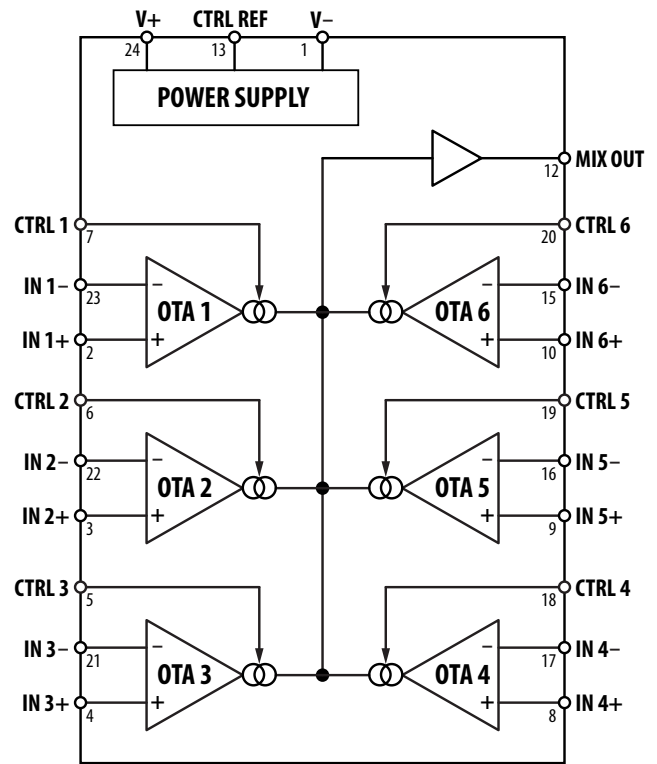
A wide supply voltage range (single or dual) allows use in a variety of audio gear from musical instruments and effects pedals to prosumer systems where large signal handling and headroom are desired.

### FEATURES

- Easy-to-Use Six Input into Single Output Audio Mixer
- Handles Input Signals up to 10V<sub>RMS</sub>
- Linear Control OTA’s
- Very Low Noise: Typical -100dBu
- Low Distortion – Typical 0.02%
- Mute Attenuation of -xxxdB
- ±4V to ±18V Operation
- Very Few External Components Required
- Low Control Feedthrough – Typical -xxdB



**PIN CONNECTIONS**  
24-LEAD SSOP



**FUNCTIONAL BLOCK**  
**DIAGRAM**

\*Patent Pending

The SSI2190 is available exclusively from Sound Semiconductor and its authorized resellers  
PO Box 1587, Arroyo Grande, CA 93421 USA, [www.soundsemiconductor.com](http://www.soundsemiconductor.com)

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**SPECIFICATIONS** ( $V_S = \pm 15V$ ,  $V_{IN} = 0.775V_{RMS}$ ,  $f = 1kHz$ ,  $V_C = 5V$ ,  $T_A = 25^\circ C$ ; using Figure 1 circuit)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>POWER SUPPLY</b> Supply Voltage Range Supply Current - Positive Supply Current - Negative Power Supply Rejection Ratio	$V_S$ $I_{SY+}$ $I_{SY-}$ PSRR	All six channels active All six channels active 60Hz	$\pm 4$	+11.6 -12.3 65	$\pm 18$ +xx -xx	V mA mA dB
<b>CONTROL PORTS</b> Control Current Range Transconductance $g_m$ Tracking Control Feedthrough Maximum Attention*	$I_{CTRL}$ $g_m$	At CTRL pins, mute to full on After 60 seconds  $I_{CTRL} = 0\mu A$ ; $V_{CTRLREF} = -xxmV$	0 xx	8350 xx xx xx	100 xx	$\mu A$ $\mu S$ dB dB dB
<b>SIGNAL INPUTS</b> Maximum Input Voltage Maximum Differential Input Voltage Input Resistance Input Bias Current Input Offset Current Common Mode Rejection	$I_B$ $I_{OS}$ CMRR	At IN+ and IN- pins Between any IN+/IN- pair	$V_- + 2V$	xx 2.0 20 68	$V_+ - 2V$ $\pm 1$	V V k $\Omega$ $\mu A$ nA dB
<b>SIGNAL OUTPUTS</b> Output Compliance Output Offset Current Max Recommended Output Current		$V_{IN} = GND$ THD = 1%	$V_- + 2V$	xx	$V_+ - 2V$ xx	V nA mA
<b>PERFORMANCE</b> Output Noise Headroom Total Harmonic Distortion Channel Separation Slew Rate	HR THD SR	$V_{IN} = GND$ @1% THD ??		-100 xx 0.02 xx xx		dBu dBu % dB $\mu A/\mu s$

\*see Control Reference section for further information

**ABSOLUTE MAXIMUM RATINGS**

Supply Voltage	$\pm 20V$
Maximum Control Current	1mA
Maximum Differential Input Voltage	$\pm 4V$
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	-40°C to +85°C
Lead Temperature (Soldering, 10 sec)	260°C

**ORDERING INFORMATION**

Part Number	Package Type/Container	Quantity
SSI2190SS-TU	24-Lead SSOP* - Tube	58
SSI2190SS-RT	24-Lead SSOP* - Tape and Reel	4000

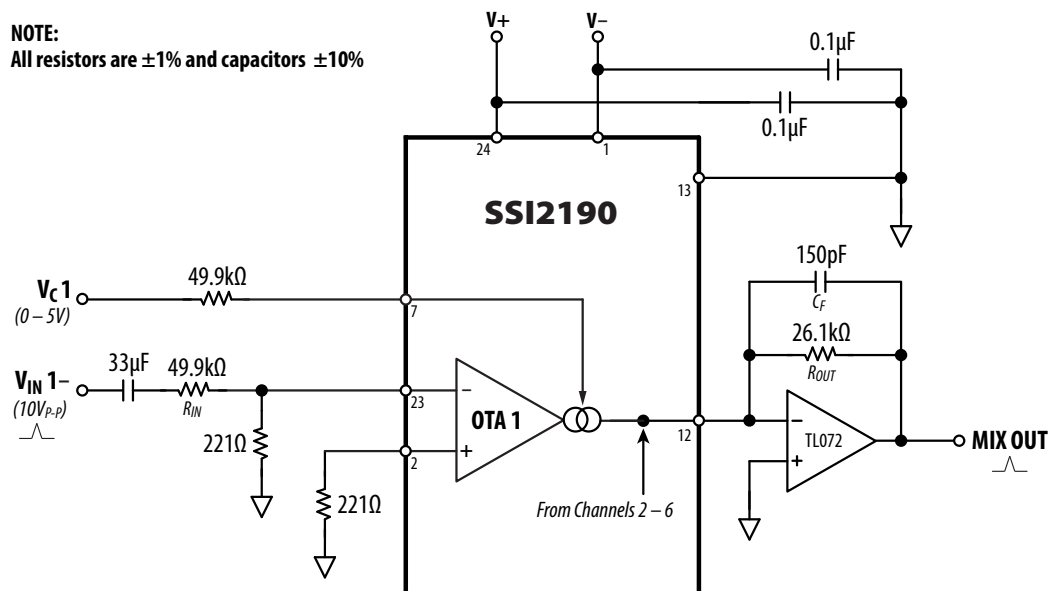
 \*SSI Package ID "PSSL24", compliant with JEDEC MO-137-AE  
 Mechanical drawing available at [www.soundsemiconductor.com](http://www.soundsemiconductor.com)

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**PIN DESCRIPTIONS** ("x" refers to one of the six channels)

Pin(s)	Name	Description
1	V-	Negative supply. Recommend 100nF local decoupling capacitor placed as close to package as possible with a low inductance trace to ground.
2, 3, 4, 8, 9, 10	IN x+	Non-Inverting voltage signal input
5, 6, 7, 18, 19, 20	CTRL x	Control current input referenced to CTRL REF
11, 14	NC	Leave these pins unconnected
12	MIX OUT	High-compliance current output
13	CTRL REF	Common reference for the control inputs. In a bipolar power supply system connect to control ground; if single supply to a pseudo ground. See Control Reference for more information about use of this pin.
15, 16, 17, 21, 22, 23	IN x-	Inverting voltage signal input. Differential input should not exceed $\pm 100\text{mV}$ .
24	V+	Positive supply. Recommend 100nF local decoupling capacitor placed as close to package as possible with a low inductance trace to ground.

**NOTE:**  
All resistors are  $\pm 1\%$  and capacitors  $\pm 10\%$



**Figure 1: Typical Application Circuit**