



# LA7155M

## Audio Switch for PAL 21 Pin Connectors

### Overview

The LA7155M is an audio switch of a stereophonic system for PAL 21 pin connectors.

### Features

- $\pm 5V$  power supply.
- Smaller size allowing for saving space.
- Low distortion factor.

### Functions

- 4 audio switch circuits of 2 inputs and 1 output.
- 2 audio switch circuits of 3 inputs and 1 output.
- 2 audio amplifying circuits of 2dB.
- 2 audio amplifying circuits of 12dB.

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$		$\pm 7$	V
Allowable power dissipation	$P_d \text{ max}$	$T_a \leq 75^\circ C$	300	mW
Operating temperature	$T_{opr}$		-20 to +75	$^\circ C$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ C$

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{CC}$		$\pm 5$	V
Operating voltage range	$V_{CC \text{ op}}$		$\pm 4$ to $\pm 6$	V

\* Both + and - voltages of supply are required.

**Operating Characteristics** at  $T_a = 25^\circ C$ ,  $V_{CC} = \pm 5V$  and  $f = 1kHz$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit drain	$I_{CC}$	No signal	8	11	14	mA
Output voltage 1	$V_{O1}$	$V_{IN} = -18dBV$	-19	-18	-17	dBV
Output voltage 2	$V_{O2}$	$V_{IN} = -6dBV$	-19	-18	-17	dBV
Output voltage 3	$V_{O3}$	$V_{IN} = -6dBV$	-7	-6	-5	dBV
Output voltage 4	$V_{O4}$	$V_{IN} = -8dBV$	-7	-6	-5	dBV
Output voltage 5	$V_{O5}$	$V_{IN} = -18dBV$	-7	-6	-5	dBV

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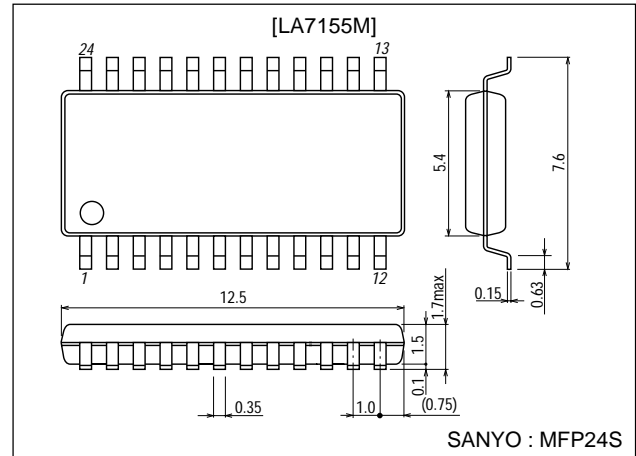
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### Package Dimensions

unit:mm

3112-MFP24S



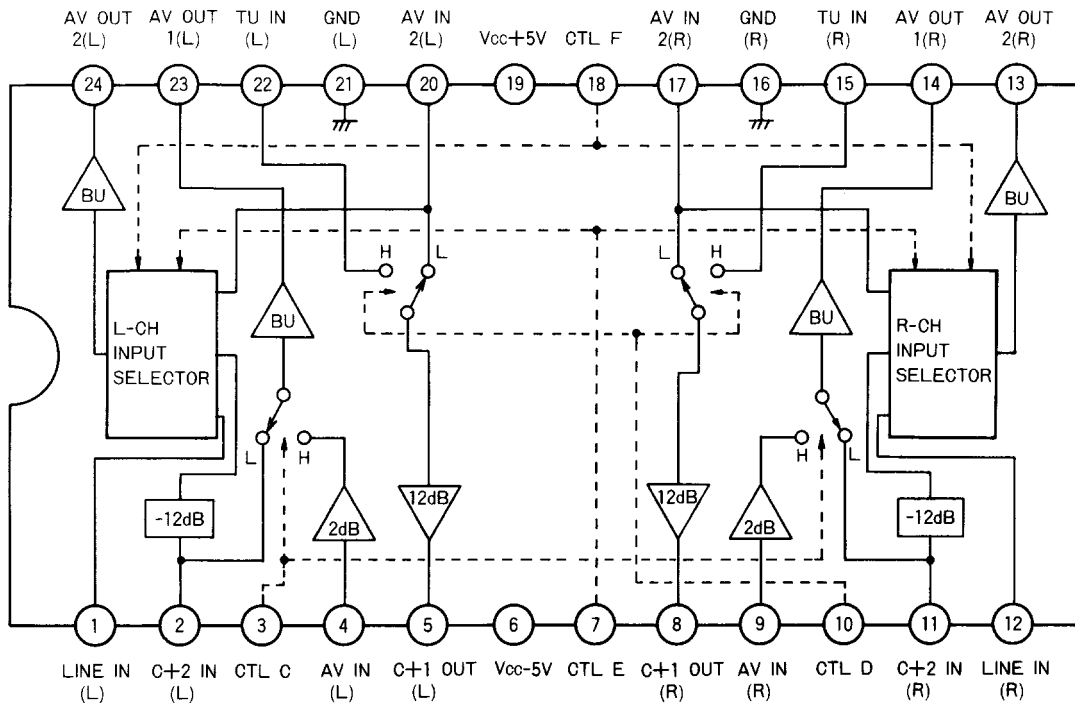
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total harmonic distortion 1	THD <sub>1</sub>	V <sub>IN</sub> =-18dBV		0.005	0.1	%
Total harmonic distortion 2	THD <sub>2</sub>	V <sub>IN</sub> =-6dBV		0.005	0.1	%
Total harmonic distortion 3	THD <sub>3</sub>	V <sub>IN</sub> =-6dBV		0.008	0.1	%
Total harmonic distortion 4	THD <sub>4</sub>	V <sub>IN</sub> =-8dBV		0.01	0.1	%
Total harmonic distortion 5	THD <sub>5</sub>	V <sub>IN</sub> =-18dBV		0.01	0.1	%
Maximum output voltage 1	V <sub>OM1</sub>	THD=1%	5.0	9.0		dBV
Maximum output voltage 2	V <sub>OM2</sub>	THD=1%	-7	-3		dBV
Maximum output voltage 3	V <sub>OM3</sub>	THD=1%	6.0	9.0		dBV
Maximum output voltage 4	V <sub>OM4</sub>	THD=1%	6.0	9.0		dBV
Maximum output voltage 5	V <sub>OM5</sub>	THD=1%	6.0	9.0		dBV
Output noise voltage 1	V <sub>ON1</sub>	No signal, R <sub>g</sub> =600Ω, DIN AUDIO FILTER		-110	-104	dBV
Output noise voltage 2	V <sub>ON2</sub>			-110	-104	dBV
Output noise voltage 3	V <sub>ON3</sub>			-107	-101	dBV
Output noise voltage 4	V <sub>ON4</sub>			-105	-99	dBV
Output noise voltage 5	V <sub>ON5</sub>			-101	-94	dBV
Input separation	V <sub>CR</sub>	V <sub>IN</sub> =-8dBV, Other input, R <sub>g</sub> =600Ω	-80			dB
Switched DC offset	V <sub>DC</sub>	Outputs at pins 13 and 24 no signal	-20	0	+20	mV
H mode hold voltage	V <sub>CHI</sub>	V <sub>3</sub> , V <sub>7</sub> , V <sub>10</sub> , V <sub>18</sub>	3.5		+V <sub>CC</sub>	V
L mode hold voltage	V <sub>CLOW</sub>	V <sub>3</sub> , V <sub>7</sub> , V <sub>10</sub> , V <sub>18</sub>	0		1.0	V

## Block Diagram



### AV OUT 1

Control pin 3	Output L-CH	Output R-CH
L	C+2 IN (L)	C+2 IN (R)
H	AV IN (L)	AV IN (R)

### C+1 OUT

Control pin 10	Output L-CH	Output R-CH
L	AV IN 2 (L)	AV IN 2 (R)
H	TU IN (L)	TU IN (R)

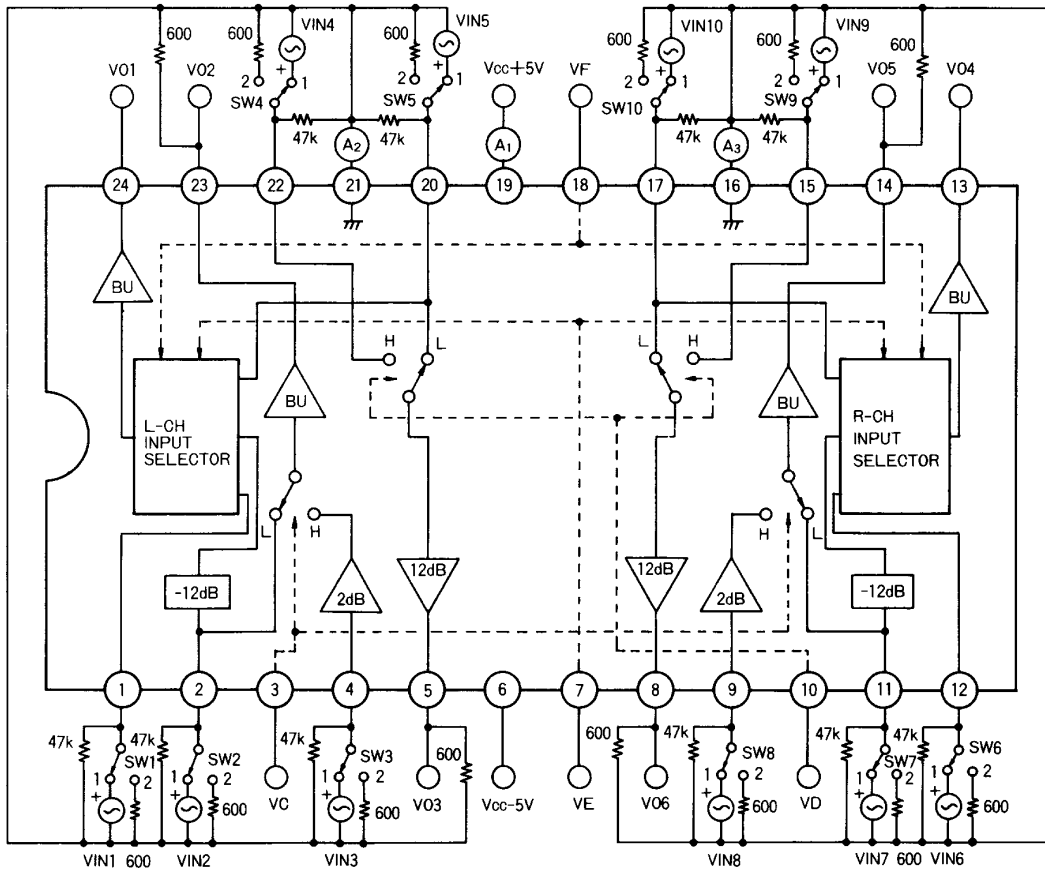
### AV OUT 2

Control pin 7	Control pin 18	Output L-CH	Output R-CH
L	L	AV IN 2 (L)	AV IN 2 (R)
L	H	LINE IN (L)	LINE IN (R)
H	L	C+2 IN (L)	C+2 IN (R)
H	H	LINE IN (L)	LINE IN (R)

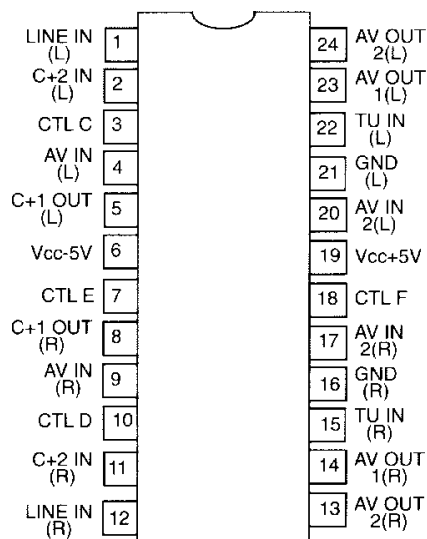
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## Test Circuit

Unit (resistance:  $\Omega$ )



## Pin Assignment



Top view

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**Table of switch operation**

Symbol	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	VC	VD	VE	VF	Measuring point
I <sub>CC</sub>	2	2	2	2	2	2	2	2	2	2	L	L	L	L	A <sub>1</sub> +A <sub>2</sub> +A <sub>3</sub>
V <sub>O1-1L</sub>	1	2	2	2	2	2	2	2	2	2	L	L	L	H	V <sub>O1</sub>
V <sub>O1-1R</sub>	2	2	2	2	2	1	2	2	2	2	L	L	L	H	V <sub>O4</sub>
V <sub>O1-2L</sub>	2	2	2	2	1	2	2	2	2	2	L	L	L	L	V <sub>O1</sub>
V <sub>O1-2R</sub>	2	2	2	2	2	2	2	2	2	1	L	L	L	L	V <sub>O4</sub>
V <sub>O2-1L</sub>	2	1	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O1</sub>
V <sub>O2-1R</sub>	2	2	2	2	2	2	1	2	2	2	L	L	H	L	V <sub>O4</sub>
V <sub>O3-1L</sub>	2	1	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O2</sub>
V <sub>O3-1R</sub>	2	2	2	2	2	2	1	2	2	2	L	L	H	L	V <sub>O5</sub>
V <sub>O4-1L</sub>	2	2	1	2	2	2	2	2	2	2	H	L	H	L	V <sub>O2</sub>
V <sub>O4-1R</sub>	2	2	2	2	2	2	2	1	2	2	H	L	H	L	V <sub>O5</sub>
V <sub>O5-1L</sub>	2	2	2	1	2	2	2	2	2	2	H	H	H	L	V <sub>O3</sub>
V <sub>O5-1R</sub>	2	2	2	2	2	2	2	2	1	2	H	H	H	L	V <sub>O6</sub>
V <sub>O5-2L</sub>	2	2	2	2	1	2	2	2	2	2	H	L	H	L	V <sub>O3</sub>
V <sub>O5-2R</sub>	2	2	2	2	2	2	2	2	2	1	H	L	H	L	V <sub>O6</sub>
THD <sub>1-1L</sub>	1	2	2	2	2	2	2	2	2	2	L	L	L	H	V <sub>O1</sub>
THD <sub>1-1R</sub>	2	2	2	2	2	1	2	2	2	2	L	L	L	H	V <sub>O4</sub>
THD <sub>1-2L</sub>	2	2	2	2	1	2	2	2	2	2	L	L	L	L	V <sub>O1</sub>
THD <sub>1-2R</sub>	2	2	2	2	2	2	2	2	2	1	L	L	L	L	V <sub>O4</sub>
THD <sub>2-1L</sub>	2	1	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O1</sub>
THD <sub>2-1R</sub>	2	2	2	2	2	2	1	2	2	2	L	L	H	L	V <sub>O4</sub>
THD <sub>3-1L</sub>	2	1	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O2</sub>
THD <sub>3-1R</sub>	2	2	2	2	2	2	1	2	2	2	L	L	H	L	V <sub>O5</sub>
THD <sub>4-1L</sub>	2	2	1	2	2	2	2	2	2	2	H	L	H	L	V <sub>O2</sub>
THD <sub>4-1R</sub>	2	2	2	2	2	2	2	1	2	2	H	L	H	L	V <sub>O5</sub>
THD <sub>5-1L</sub>	2	2	2	1	2	2	2	2	2	2	H	H	H	L	V <sub>O3</sub>
THD <sub>5-1R</sub>	2	2	2	2	2	2	2	2	1	2	H	H	H	L	V <sub>O6</sub>
THD <sub>5-2L</sub>	2	2	2	2	1	2	2	2	2	2	H	L	H	L	V <sub>O3</sub>
THD <sub>5-2R</sub>	2	2	2	2	2	2	2	2	2	1	H	L	H	L	V <sub>O6</sub>
V <sub>OM1-1L</sub>	1	2	2	2	2	2	2	2	2	2	L	L	L	H	V <sub>O1</sub>
V <sub>OM1-1R</sub>	2	2	2	2	2	1	2	2	2	2	L	L	L	H	V <sub>O4</sub>
V <sub>OM1-2L</sub>	2	2	2	2	1	2	2	2	2	2	L	L	L	L	V <sub>O1</sub>
V <sub>OM1-2R</sub>	2	2	2	2	2	2	2	2	2	1	L	L	L	L	V <sub>O4</sub>
V <sub>OM2-1L</sub>	2	1	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O1</sub>
V <sub>OM2-1R</sub>	2	2	2	2	2	2	1	2	2	2	L	L	H	L	V <sub>O4</sub>
V <sub>OM3-1L</sub>	2	1	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O2</sub>
V <sub>OM3-1R</sub>	2	2	2	2	2	2	1	2	2	2	L	L	H	L	V <sub>O5</sub>
V <sub>OM4-1L</sub>	2	2	1	2	2	2	2	2	2	2	H	L	H	L	V <sub>O2</sub>
V <sub>OM4-1R</sub>	2	2	2	2	2	2	2	1	2	2	H	L	H	L	V <sub>O5</sub>
V <sub>OM5-1L</sub>	2	2	2	1	2	2	2	2	2	2	H	H	H	L	V <sub>O3</sub>
V <sub>OM5-1R</sub>	2	2	2	2	2	2	2	2	1	2	H	H	H	L	V <sub>O6</sub>
V <sub>OM5-2L</sub>	2	2	2	2	1	2	2	2	2	2	H	L	H	L	V <sub>O3</sub>
V <sub>OM5-2R</sub>	2	2	2	2	2	2	2	2	2	1	H	L	H	L	V <sub>O6</sub>
V <sub>ON1-1L</sub>	2	2	2	2	2	2	2	2	2	2	L	L	L	H	V <sub>O1</sub>
V <sub>ON1-1R</sub>	2	2	2	2	2	2	2	2	2	2	L	L	L	H	V <sub>O4</sub>
V <sub>ON1-2L</sub>	2	2	2	2	2	2	2	2	2	2	L	L	L	L	V <sub>O1</sub>
V <sub>ON1-2R</sub>	2	2	2	2	2	2	2	2	2	2	L	L	L	L	V <sub>O4</sub>
V <sub>ON2-1L</sub>	2	2	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O1</sub>
V <sub>ON2-1R</sub>	2	2	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O4</sub>
V <sub>ON3-1L</sub>	2	2	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O2</sub>
V <sub>ON3-1R</sub>	2	2	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O5</sub>
V <sub>ON4-1L</sub>	2	2	2	2	2	2	2	2	2	2	H	L	H	L	V <sub>O2</sub>
V <sub>ON4-1R</sub>	2	2	2	2	2	2	2	2	2	2	H	L	H	L	V <sub>O5</sub>
V <sub>ON5-1L</sub>	2	2	2	2	2	2	2	2	2	2	H	H	H	L	V <sub>O3</sub>
V <sub>ON5-1R</sub>	2	2	2	2	2	2	2	2	2	2	H	H	H	L	V <sub>O6</sub>
V <sub>ON5-2L</sub>	2	2	2	2	2	2	2	2	2	2	H	L	H	L	V <sub>O3</sub>
V <sub>ON5-2R</sub>	2	2	2	2	2	2	2	2	2	2	H	L	H	L	V <sub>O6</sub>

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Symbol	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	VC	VD	VE	VF	Measuring point
V <sub>CR-1L</sub>	1	2	2	2	2	2	2	2	2	2	L	L	L	H	V <sub>O2, 3, 4, 5, 6</sub>
V <sub>CR-1R</sub>	2	2	2	2	2	1	2	2	2	2	L	L	L	H	V <sub>O1, 2, 3, 5, 6</sub>
V <sub>CR-2L</sub>	2	2	2	2	1	2	2	2	2	2	L	L	L	L	V <sub>O2, 3, 4, 5, 6</sub>
V <sub>CR-2R</sub>	2	2	2	2	2	2	2	2	2	1	L	L	L	L	V <sub>O1, 2, 3, 5, 6</sub>
V <sub>CR-3L</sub>	2	1	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O2, 3, 4, 5, 6</sub>
V <sub>CR-3R</sub>	2	2	2	2	2	2	1	2	2	2	L	L	H	L	V <sub>O1, 2, 3, 5, 6</sub>
V <sub>CR-4L</sub>	2	1	2	2	2	2	2	2	2	2	L	L	H	L	V <sub>O1, 3, 4, 5, 6</sub>
V <sub>CR-4R</sub>	2	2	2	2	2	2	1	2	2	2	L	L	H	L	V <sub>O1, 2, 3, 4, 6</sub>
V <sub>CR-5L</sub>	2	2	1	2	2	2	2	2	2	2	H	L	H	L	V <sub>O1, 3, 4, 5, 6</sub>
V <sub>CR-5R</sub>	2	2	2	2	2	2	2	1	2	2	H	L	H	L	V <sub>O1, 2, 3, 4, 6</sub>
V <sub>CR-6L</sub>	2	2	2	1	2	2	2	2	2	2	H	H	H	L	V <sub>O1, 2, 4, 5, 6</sub>
V <sub>CR-6R</sub>	2	2	2	2	2	2	2	2	1	2	H	H	H	L	V <sub>O1, 2, 3, 4, 5</sub>
V <sub>CR-7L</sub>	2	2	2	2	1	2	2	2	2	2	H	L	H	L	V <sub>O1, 2, 4, 5, 6</sub>
V <sub>CR-7R</sub>	2	2	2	2	2	2	2	2	2	1	H	L	H	L	V <sub>O1, 2, 3, 4, 5</sub>
V <sub>DC-L</sub>	2	2	2	2	2	2	2	2	2	2	L	L	L/H	L/H	V <sub>O1</sub>
V <sub>DC-R</sub>	2	2	2	2	2	2	2	2	2	2	L	L	L/H	L/H	V <sub>O4</sub>
V <sub>CH1-3</sub>	2	2	1	2	2	2	2	2	2	2	-	L	H	L	V <sub>C</sub>
V <sub>CH1-7</sub>	2	1	2	2	2	2	2	2	2	2	L	L	-	L	V <sub>F</sub>
V <sub>CH1-10</sub>	2	2	2	1	2	2	2	2	2	2	H	-	H	L	V <sub>D</sub>
V <sub>CH1-18</sub>	1	2	2	2	2	2	2	2	2	2	L	L	L	-	V <sub>E</sub>
V <sub>CLOW-3</sub>	2	1	2	2	2	2	2	2	2	2	-	L	H	L	V <sub>C</sub>
V <sub>CLOW-7</sub>	2	2	2	2	1	2	2	2	2	2	L	L	-	L	V <sub>F</sub>
V <sub>CLOW-10</sub>	2	2	2	2	1	2	2	2	2	2	H	-	H	L	V <sub>D</sub>
V <sub>CLOW-18</sub>	2	2	2	2	1	2	2	2	2	2	L	L	L	-	V <sub>E</sub>

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