

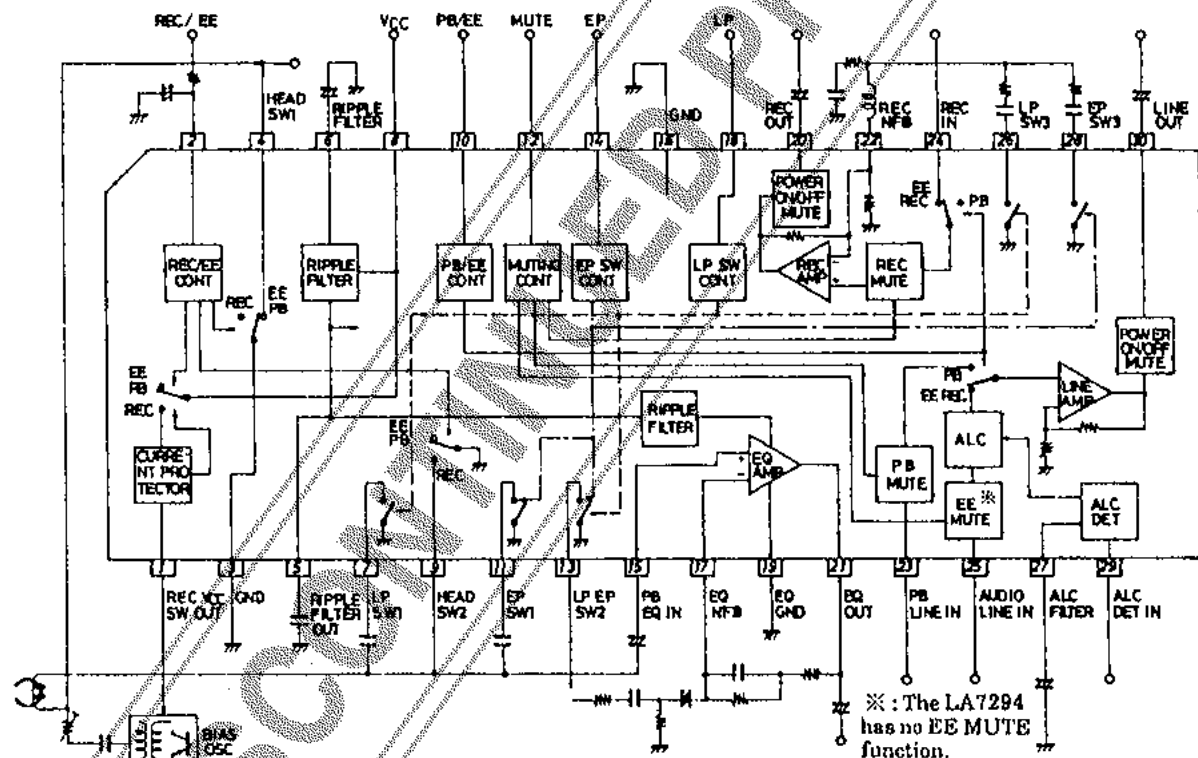
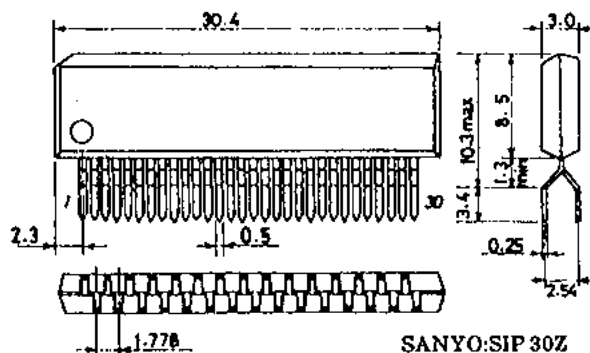
**SANYO****SANYO Semiconductors****DATA SHEET**

Monolithic Linear IC

**LA7295 Series — VTR Audio Signal Recording / Playback Processor****Features**

- Single-chip ICs that provide various functions (including two tape head select switches, a power supply switch for the OSC bias circuit, and five equalizer select switches (LP, EP) required for VTR audio signal recording / playback)
- High merit in space because of SIP package
- Minimum number of external parts required

|        |                                                   |
|--------|---------------------------------------------------|
| LA7295 | ... $V_{CC}=12V$ , PB "Hi"                        |
| LA7294 | ... $V_{CC}=12V$ , PB "Hi", no EE muting function |
| LA7296 | ... $V_{CC}=12V$ , PB "Lo"                        |
| LA7297 | ... $V_{CC}=9V$ , PB "Hi"                         |

**Block Diagram**Package Dimensions 3117  
(unit:mm)

SANYO:SIP 30Z

Specifications and information herein are subject to change without notice.

**SANYO Electric Co.,Ltd. Semiconductor Company**

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30193TS/ 5208YT, TA 8-2944, 45, 46, 47 No.2767-1/5

LA7294,7295,7296,7297

| Maximum Ratings at Ta = 25°C                                                              |                     |                                 | LA7294/95/96   | LA7297       | unit            |      |
|-------------------------------------------------------------------------------------------|---------------------|---------------------------------|----------------|--------------|-----------------|------|
| Maximum Supply Voltage                                                                    | V <sub>CC</sub> max |                                 | 14             | 11           | V               |      |
| Allowable Power Dissipation                                                               | P <sub>d</sub> max  | Ta = 65°C                       | 600            | 600          | mW              |      |
| Operating Temperature                                                                     | T <sub>opg</sub>    |                                 | -10 to +65     | -10 to +65   | °C              |      |
| Storage Temperature                                                                       | T <sub>stg</sub>    |                                 | -55 to +125    | -55 to +125  | °C              |      |
| Operating Conditions at Ta = 25°C                                                         |                     |                                 | LA7294/95/96   | LA7297       | unit            |      |
| Recommended Supply Voltage                                                                | V <sub>CC</sub>     |                                 | 12.0           | 9.0          | V               |      |
| Operating Voltage Range                                                                   | V <sub>CC</sub> op  |                                 | 11.25 to 12.75 | 8.25 to 9.75 | V               |      |
| Operating Characteristics at Ta = 25°C, V <sub>CC</sub> = 12V(9V), f = 1kHz, 0dBv:1.0Vrms |                     |                                 |                |              |                 |      |
|                                                                                           |                     |                                 | min            | typ          | max             | unit |
| Current Dissipation (EE)                                                                  | I <sub>CCE</sub>    | Quiescent                       | 11.0           | 15.0         | 20.0            | mA   |
| Current Dissipation (PB)                                                                  | I <sub>CCP</sub>    | Quiescent                       | 12.0           | 16.0         | 21.0            | mA   |
| Current Dissipation (REC)                                                                 | I <sub>CCR</sub>    | Quiescent                       | 9.0            | 13.0         | 18.0            | mA   |
| Overall Gain at PB Mode                                                                   | V <sub>G</sub> PB   | EQ IN to LINE OUT, Vo = -5dBv   | 67.0           | 68.0         | 69.0            | dB   |
| [Equalizer Amp]                                                                           |                     |                                 |                |              |                 |      |
| Open-Loop Voltage Gain                                                                    | V <sub>G</sub> OE   | Vo = -5dBv                      | 67.0           | 72.0         |                 | dB   |
| Equivalent Input Noise Voltage                                                            | V <sub>N</sub> IE   | Rg = 2.2kΩ, DIN audio filter    |                | 1.0          | 1.8μVrms        |      |
| Input Resistance                                                                          | r <sub>ie</sub>     |                                 |                | 130          |                 | kΩ   |
| [Line Amp]                                                                                |                     |                                 |                |              |                 |      |
| Voltage Gain (PB Input)                                                                   | V <sub>G</sub> LP   | Vo = -5dBv                      | 32.0           | 33.0         | 34.0            | dB   |
| Voltage Gain (EE, REC Input)                                                              | V <sub>G</sub> LR   | Vo = -5dBv                      | 32.0           | 33.0         | 34.0            | dB   |
| Total Harmonic Distortion                                                                 | THD <sub>L</sub>    | Vo = -5dBv                      |                | 0.15         | 0.40            | %    |
| Output Noise Voltage                                                                      | V <sub>N</sub> OL   | DIN audio filter                |                | -70.0        | -64.0           | dBv  |
| Input Resistance (PB Input)                                                               | r <sub>i1</sub>     |                                 |                | 30.0         |                 | kΩ   |
| Input Resistance (EE, REC Input)                                                          | r <sub>i2</sub>     |                                 |                | 30.0         |                 | kΩ   |
| Maximum Output Voltage                                                                    | V <sub>OM</sub> L   | THD = 1%                        | 1.5            | 2.2          |                 | Vrms |
| Output Voltage at ALC Mode                                                                | V <sub>OA</sub>     | V <sub>IN</sub> = -35dBv        | -6.5           | -5.0         | -3.5            | dBv  |
| ALC Effect                                                                                | ALC                 | V <sub>IN</sub> = -35 to -10dBv |                | 1.0          | 3.0             | dB   |
| Total Harmonic Distortion at ALC Mode                                                     | THD <sub>A</sub>    | V <sub>IN</sub> = -35dBv        |                | 0.2          | 0.6             | %    |
| [Recording Amp]                                                                           |                     |                                 |                |              |                 |      |
| Voltage Gain (Open Loop)                                                                  | V <sub>G</sub> OR   | Vo = -5dBv                      | 51.0           | 57.0         |                 | dB   |
| Voltage Gain (Closed Loop)                                                                | V <sub>G</sub> CR   | Vo = -5dBv                      | 13.5           | 14.5         | 15.5            | dB   |
| Total Harmonic Distortion                                                                 | THD <sub>R</sub>    | Vo = -5dBv                      |                | 0.1          | 0.3             | %    |
| Input Resistance                                                                          | r <sub>ir</sub>     |                                 |                | 30.0         |                 | kΩ   |
| Maximum Output Voltage                                                                    | V <sub>OM</sub> R   | THD = 1%                        | 1.5            | 2.2          |                 | Vrms |
| [Muting Circuit]                                                                          |                     |                                 |                |              |                 |      |
| ON-State Voltage                                                                          | V <sub>MON</sub>    | Pin 12 DC                       | 3.3            |              | V <sub>CC</sub> | V    |
| OFF-State Voltage                                                                         | V <sub>MOFF</sub>   | Pin 12 DC                       | 0              |              | 1.0             | V    |
| Muting Attenuation (PB, EE)                                                               | M <sub>P, ME</sub>  | LA7294 : No EE required         | 85.0           | 90.0         |                 | dB   |
| Muting Attenuation (REC)                                                                  | M <sub>R</sub>      |                                 | 73.0           | 78.0         |                 | dB   |
| [PB/EE Select Circuit]                                                                    |                     |                                 |                |              |                 |      |
| PB Mode Hold Voltage (LA7296 EE mode)                                                     | V <sub>PP</sub>     | Pin 10 DC                       | 3.3            |              | 6.0             | V    |
| EE Mode Hold Voltage (LA7296 PB mode)                                                     | V <sub>PE</sub>     | Pin 10 DC                       | 0              |              | 1.0             | V    |
| [REC/EE Select Circuit]                                                                   |                     |                                 |                |              |                 |      |
| REC Mode Hold Voltage                                                                     | V <sub>RR</sub>     | Pin 2 DC                        | 3.8            |              | 6.0             | V    |
| EE Mode Hold Voltage                                                                      | V <sub>RE</sub>     | Pin 2 DC                        | 0              |              | 1.0             | V    |

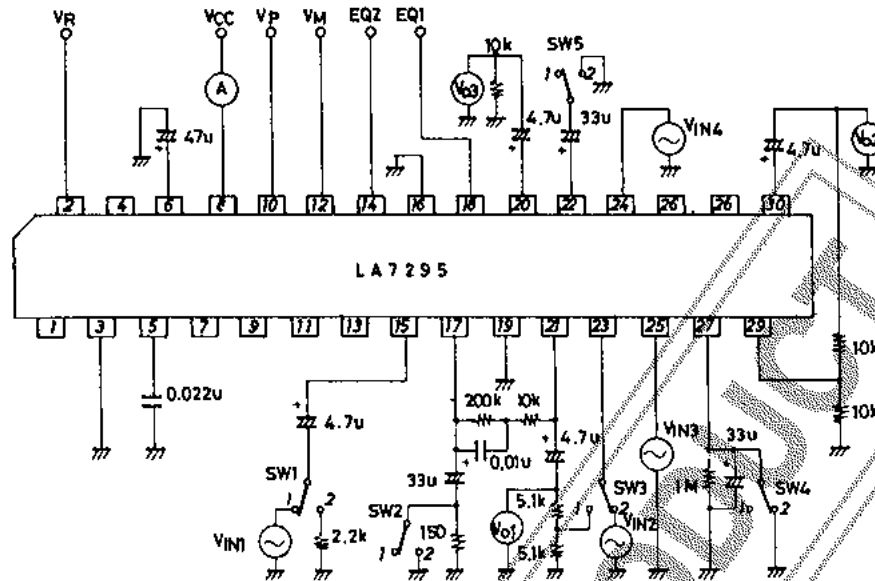
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|                                        |            |                                                                              | min  | typ  | max      | unit     |
|----------------------------------------|------------|------------------------------------------------------------------------------|------|------|----------|----------|
| [Equalizer Select Circuit]             |            |                                                                              |      |      |          |          |
| Switch ON-State Voltage                | $V_{EON}$  | Pins 14,18 DC                                                                | 3.0  |      | 6.0      | V        |
| Switch OFF-State Voltage               | $V_{EOFF}$ | Pins 14,18 DC                                                                | 0    |      | 0.8      | V        |
| [Head Select Switch]                   |            |                                                                              |      |      |          |          |
| Pin 4 ON-State Resistance              | $R_{ON4}$  | $I_4 = \pm 1\text{mA}$                                                       |      | 10   | 20       | $\Omega$ |
| Pin 9 ON-State Resistance              | $R_{ON9}$  | $I_9 = \pm 1\text{mA}$                                                       |      | 5    | 10       | $\Omega$ |
| Pin 4 Input Voltage                    | $V_{IN4}$  | $T_a = 65^\circ\text{C}, f = 80\text{kHz}(\sin)$<br>$I_{LK} = 10\mu\text{A}$ |      |      | $\pm 40$ | V        |
| [REC $V_{CC}$ Switch]                  |            |                                                                              |      |      |          |          |
| Pin 1 Output Voltage<br>(LA7294/95/96) | $V_{RO}$   | Pin 1 load current 100mA                                                     | 10.5 | 10.8 |          | V        |
| Pin 1 Output Voltage<br>(LA7297)       | $V_{RO}$   | Pin 1 load current 100mA                                                     | 7.5  | 7.8  |          | V        |

DISCONTINUED PRODUCT

## Test Circuit



(Switch Operating Table)

| Item (Symbol)                         | SW1 | SW2 | SW3 | SW4 | SW5 | V <sub>M</sub> | V <sub>P</sub> | V <sub>R</sub> | Input            | 't'est |
|---------------------------------------|-----|-----|-----|-----|-----|----------------|----------------|----------------|------------------|--------|
| I <sub>CCE</sub>                      | 2   | 1   | 1   | 2   | 1   | GND            | GND            | GND            |                  | A      |
| I <sub>CCP</sub>                      | 2   | 1   | 1   | 2   | 1   | GND            | 5V             | GND            |                  | A      |
| I <sub>CCR</sub>                      | 2   | 1   | 1   | 2   | 1   | GND            | GND            | 5V             |                  | A      |
| V <sub>GpB</sub>                      | 1   | 1   | 1   | 2   | 1   | GND            | 5V             | GND            | V <sub>IN1</sub> | Vo2    |
| V <sub>GpE</sub>                      | 1   | 2   | 2   | 2   | 1   | GND            | 5V             | GND            | V <sub>IN1</sub> | Vo1    |
| V <sub>NIE</sub>                      | 2   | 1   | 2   | 2   | 1   | GND            | 5V             | GND            |                  | Vo1    |
| V <sub>GLP,THD<sub>L</sub>,VOML</sub> | 2   | 1   | 2   | 2   | 1   | GND            | 5V             | GND            | V <sub>IN2</sub> | Vo2    |
| V <sub>GLR</sub>                      | 2   | 1   | 1   | 2   | 1   | GND            | GND            | GND            | V <sub>IN3</sub> | Vo2    |
| V <sub>NOL</sub>                      | 2   | 1   | 2   | 2   | 1   | GND            | GND            | GND            |                  | Vo2    |
| V <sub>OA,ALC,THDA</sub>              | 2   | 1   | 2   | 1   | 1   | GND            | GND            | GND            | V <sub>IN3</sub> | Vo2    |
| V <sub>GOR</sub>                      | 2   | 1   | 2   | 2   | 2   | GND            | GND            | GND            | V <sub>IN4</sub> | Vo3    |
| V <sub>GCR,THDR,VOMR</sub>            | 2   | 1   | 2   | 2   | 1   | GND            | GND            | GND            | V <sub>IN4</sub> | Vo3    |
| M <sub>P</sub>                        | 1   | 1   | 1   | 2   | 1   | 5V             | 5V             | GND            | V <sub>IN1</sub> | Vo2    |
| M <sub>R</sub>                        | 2   | 1   | 1   | 2   | 1   | 5V             | GND            | GND            | V <sub>IN4</sub> | Vo3    |
| M <sub>E</sub>                        | 2   | 1   | 2   | 2   | 1   | 5V             | GND            | GND            | V <sub>IN2</sub> | Vo2    |

For the LA7294 that has no EE MUTE function, the ME test is not required.

## ALC Output Level Setting

The ALC output level depends on the value of the resistor connected to the detector input (pin 29) as shown below

## ALC Operation Start Output Level vs. ALC Input Resistance

