



# TEA6420

## BUS-CONTROLLED AUDIO MATRIX SWITCH

- 5 Stereo Inputs
- 4 Stereo Outputs
- Gain Control 0/2/4/6dB/Mute for each Output
- cascadable (2 different addresses)
- Serial Bus Controlled
- Very low Noise
- Very low Distorsion

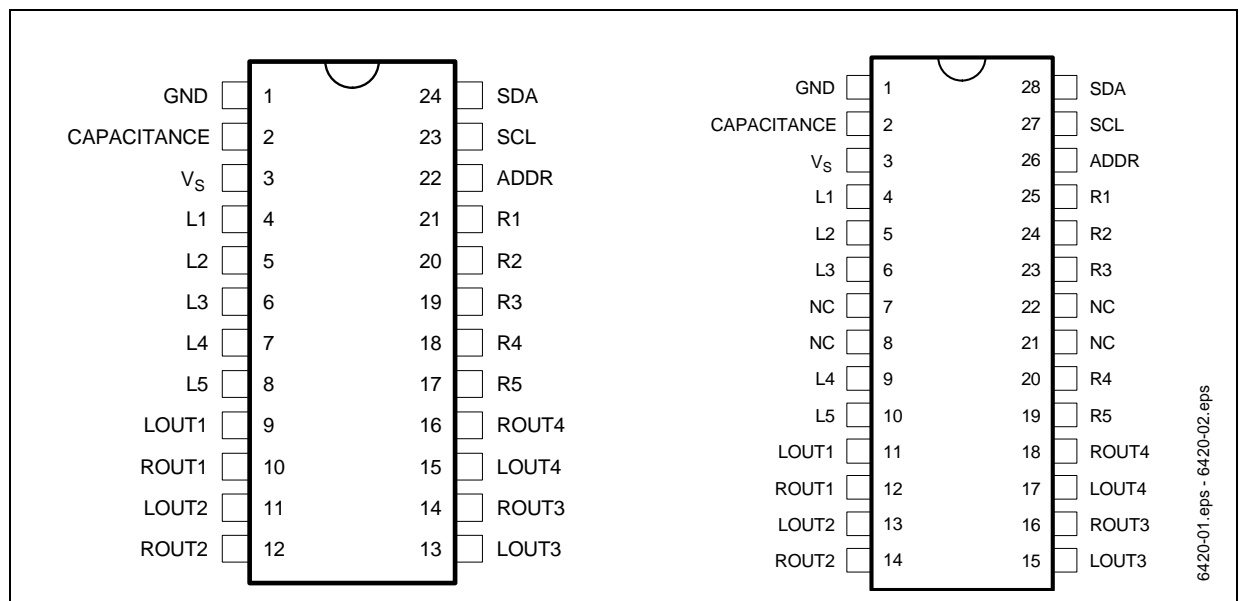
### DESCRIPTION

The TEA6420 switches 5 stereo audio inputs on 4 stereo outputs.

All the switching possibilities are changed through the I<sup>2</sup>C bus.

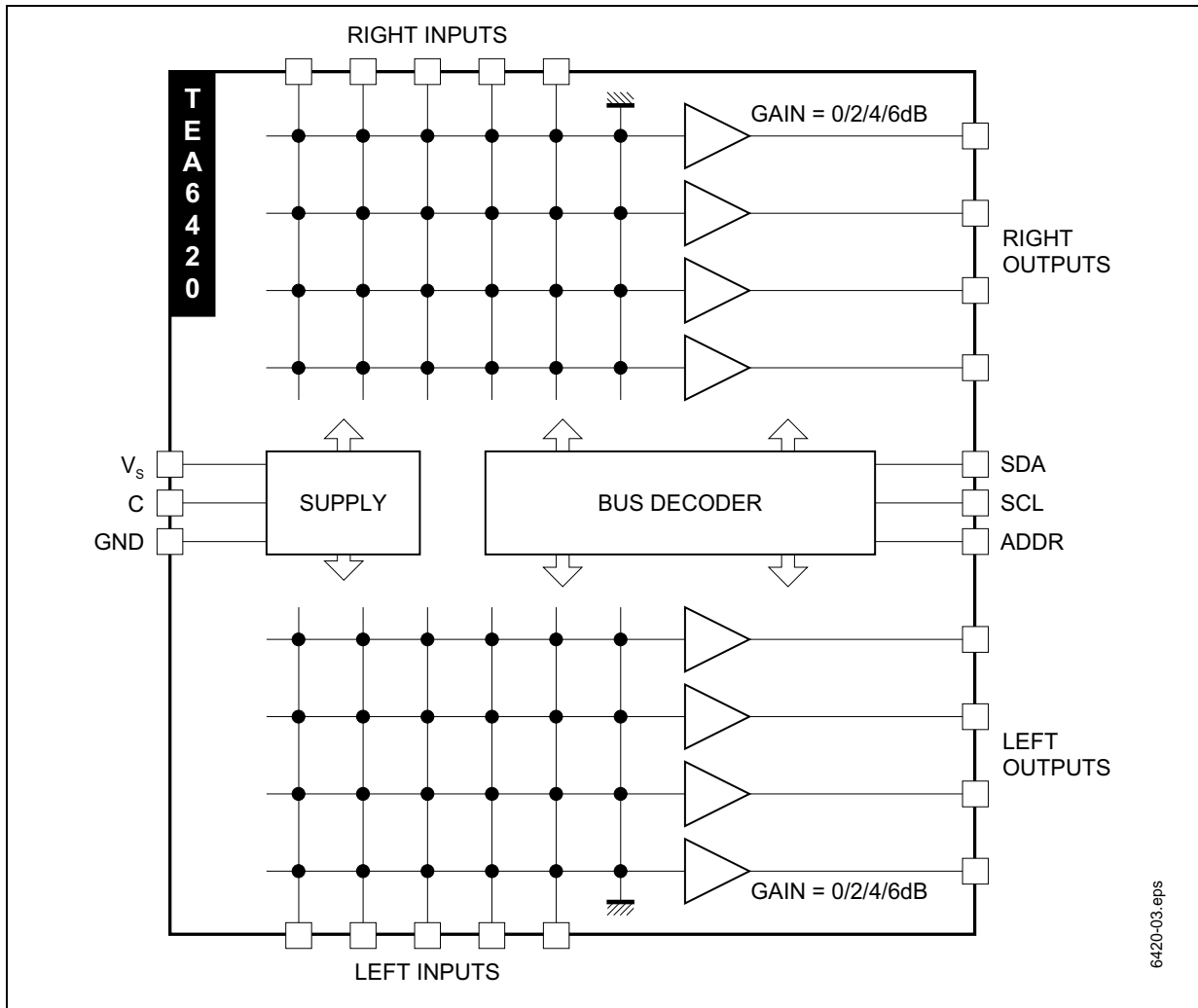


Figure 1. PIN CONNECTIONS



# TEA6420

Figure 2. BLOCK DIAGRAM



6420-03.eps

**ABSOLUTE MAXIMUM RATINGS**

| Symbol            | Parameter                           | Value       | Unit |
|-------------------|-------------------------------------|-------------|------|
| V <sub>CC</sub>   | Supply Voltage (Pin 9)              | 12          | V    |
| T <sub>OPER</sub> | Operating Ambient Temperature Range | 0 to +70    | °C   |
| T <sub>stg</sub>  | Storage Temperature Range           | -20 to +150 | °C   |

**THERMAL DATA**

| Symbol               | Parameter+                          | Value                      | Unit |
|----------------------|-------------------------------------|----------------------------|------|
| R <sub>th(j-a)</sub> | Junction-Ambient Thermal Resistance | SDIP24<br>75<br>SO28<br>75 | °C/W |

**ELECTRICAL CHARACTERISTICS**

T<sub>A</sub> = 25°C, V<sub>S</sub> = 10V, R<sub>L</sub> = 10kΩ, R<sub>G</sub> = 600Ω, f = 1kHz (unless otherwise specified)

| Symbol               | Parameter              | Test Conditions   | Min. | Typ. | Max. | Unit             |
|----------------------|------------------------|---|------|------|------|------------------|
| <b>SUPPLY</b>        |                        |   |      |      |      |                  |
| V <sub>S</sub>       | Supply Voltage         |   | 8    | 9    | 10.2 | V                |
| I <sub>S</sub>       | Supply Current         |   |      | 5    | 8    | mA               |
| SVR                  | Ripple Rejection       | V <sub>IN</sub> = 500mV <sub>RMS</sub> , BW = 20 - 20kHz              | 70   | 80   |      | dB               |
| <b>MATRIX</b>        |                        |   |      |      |      |                  |
| V <sub>IN</sub>      | Input DC Level         |   | 4.5  | 5    | 5.5  | V                |
| R <sub>I</sub>       | Input Resistance       |   | 30   | 50   | 100  | kΩ               |
| C <sub>S</sub>       | Channel Separation     | V <sub>IN</sub> = 2V <sub>RMS</sub> Gain = 0dB<br>f = 1kHz Gain = 6dB | 80   | 90   |      | dB               |
|                      |                        |   | 70   | 82   |      | dB               |
| <b>OUTPUT BUFFER</b> |                        |   |      |      |      |                  |
| V <sub>OUT</sub>     | Output DC Level        |   | 4.5  | 5    | 5.5  | V                |
| R <sub>OUT</sub>     | Output Resistance      |   |      | 70   | 200  | W                |
| e <sub>NI</sub>      | Input Noise            | BW = 20 - 20kHz, flat   |      | 3    |      | μV               |
| S/N                  | Signal to Noise Ratio  | V <sub>IN</sub> = V <sub>OUT</sub> = 1V <sub>RMS</sub>                |      | 110  |      | dB               |
| G <sub>min</sub>     | Min. Gain              |   | -1   | 0    | +1   | dB               |
| G <sub>max</sub>     | Max. Gain              |   | 5    | 6    | 7    | dB               |
| d                    | Distortion             | V <sub>IN</sub> = V <sub>OUT</sub> = 1V <sub>RMS</sub>                |      | 0.01 | 0.05 | %                |
| V <sub>CL</sub>      | Clipping Level         | d = 0.3%  | 2    | 2.5  |      | V <sub>RMS</sub> |
| R <sub>L</sub>       | Output Load Resistance |   | 2    |      |      | kΩ               |
| <b>BUS INPUT</b>     |                        |   |      |      |      |                  |
| V <sub>IL</sub>      | Input Low Voltage      |   |      |      | 1.5  | V                |
| V <sub>IH</sub>      | Input High Voltage     |   | 3    |      |      | V                |
| I <sub>I</sub>       | Input Current          |   | -10  |      | 10   | μA               |
| V <sub>O</sub>       | Output Voltage         | I <sub>O</sub> = 3mA ; SDA Acknowledge pin                            |      |      | 0.4  | V                |
| R <sub>pu</sub>      | ADDR Pullup Resistor   | Note  | 40   | 50   |      | kΩ               |

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## SOFTWARE SPECIFICATION

### 1. Chip address

| Address   | HEX | ADDR |
|-----------|-----|------|
| 1001 1000 | 98  | 0    |
| 1001 1010 | 9A  | 1    |

### 2. Data bytes

| Output select |                  |                  |                  |                  |                            |                            |                            |   |
|---------------|------------------|------------------|------------------|------------------|----------------------------|----------------------------|----------------------------|---|
| X             | 0<br>0<br>1<br>1 | 0<br>1<br>0<br>1 | G <sub>1</sub>   | G <sub>0</sub>   | I <sub>2</sub>             | I <sub>1</sub>             | I <sub>0</sub>             | Output 1<br>Output 2<br>Output 3<br>Output 4                |
| Input select  |                  |                  |                  |                  |                            |                            |                            |   |
| X             | Q <sub>1</sub>   | Q <sub>0</sub>   | G <sub>1</sub>   | G <sub>0</sub>   | 0<br>0<br>0<br>0<br>1<br>1 | 0<br>0<br>1<br>1<br>0<br>0 | 0<br>1<br>0<br>1<br>0<br>1 | Input 1<br>Input 2<br>Input 3<br>Input 4<br>Input 5<br>Mute |
| Gain select   |                  |                  |                  |                  |                            |                            |                            |   |
| X             | Q <sub>1</sub>   | Q <sub>0</sub>   | 0<br>0<br>1<br>1 | 0<br>1<br>0<br>1 | I <sub>2</sub>             | I <sub>1</sub>             | I <sub>0</sub>             | Gain = 6 dB<br>Gain = 4 dB<br>Gain = 2 dB<br>Gain = 0 dB    |

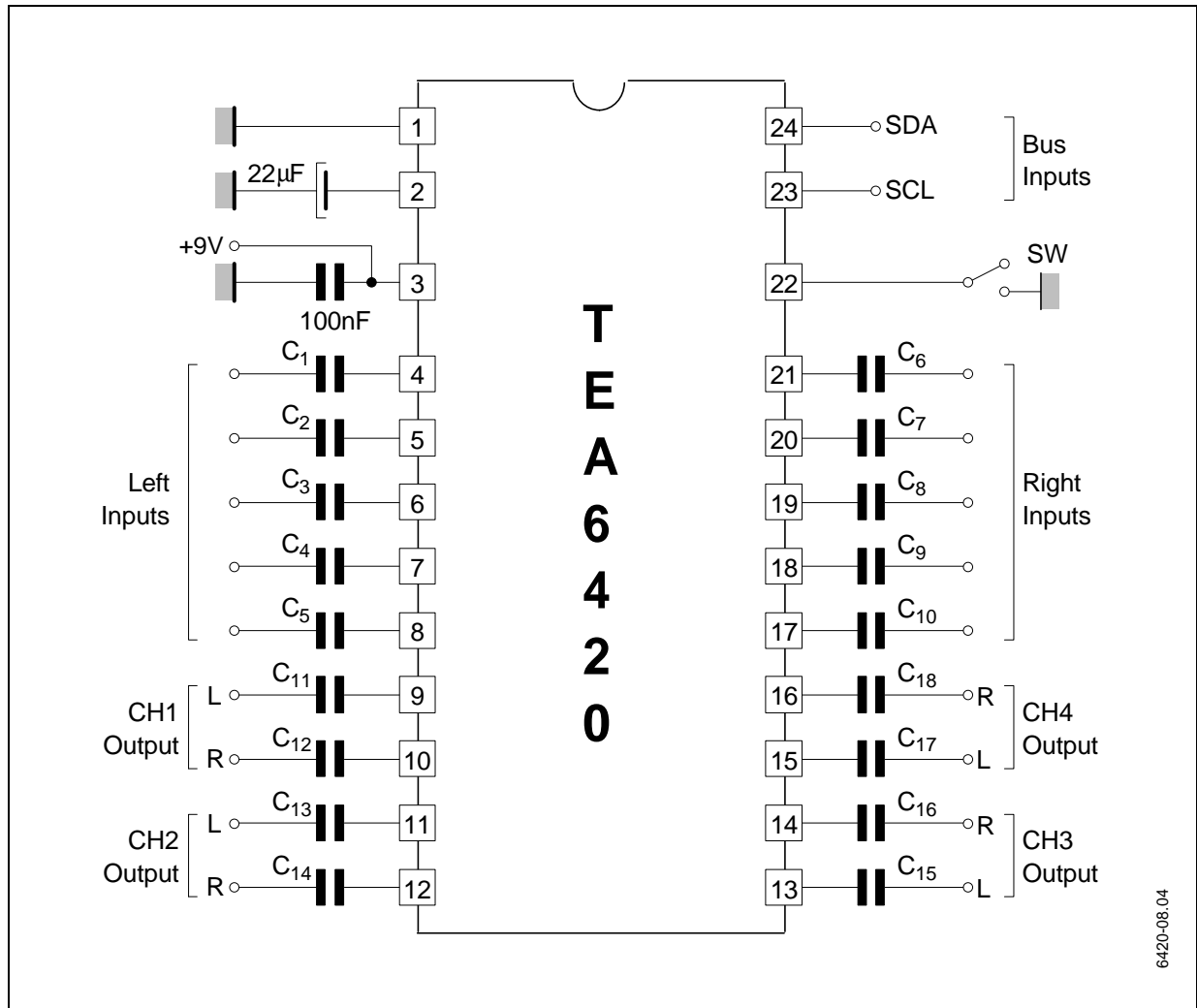
X = don't care - MSB is transmitted first

**Example :** X1001100 connects output 3 with input 5 at a gain of 4dB

The following are selected after power-on reset : input 5 selected for all outputs ; gain = 0dB.

## TYPICAL APPLICATION

Figure 3.

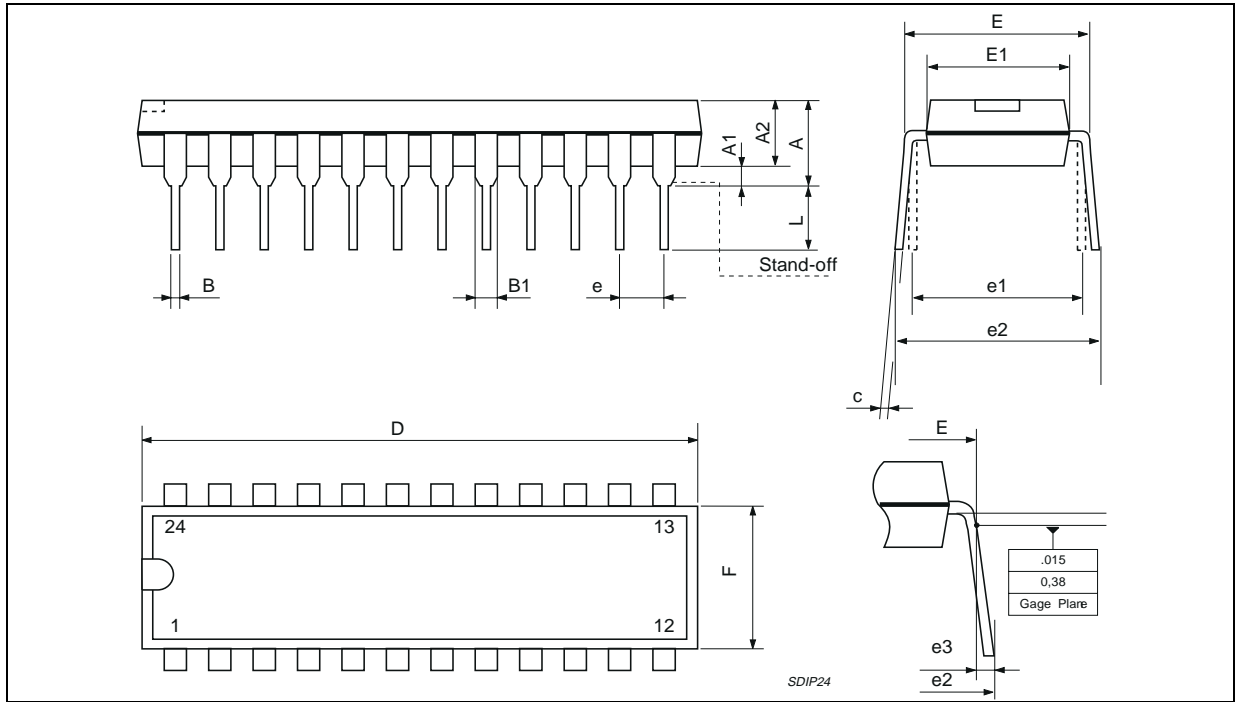


**TEA6420**

**PACKAGE MECHANICAL DATA**

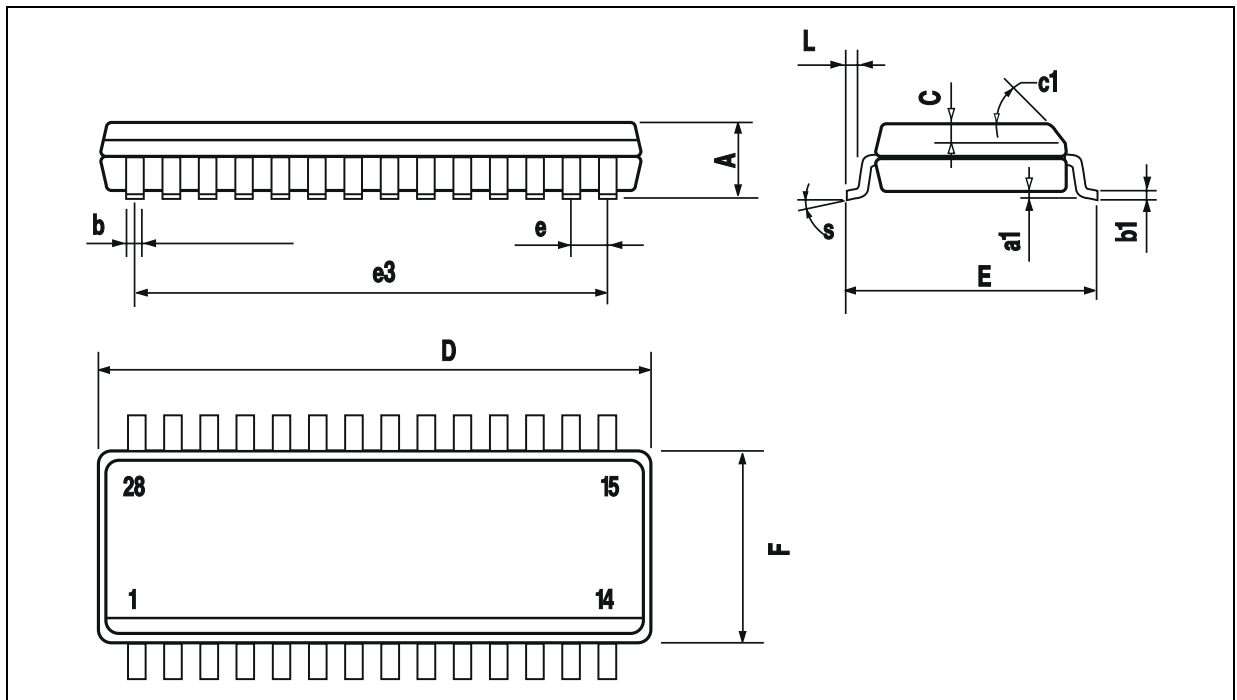
24 PINS - PLASTIC DIP

**Figure 4. 24-Pin Package**



28 PINS - PLASTIC SO

**Figure 5. 28-Pin Package**



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