

TA2136F, TA2136N



Sound Retrieval System; 3D Sound IC

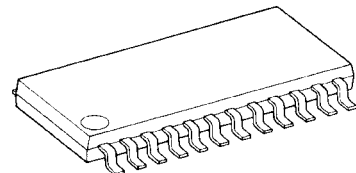
The device incorporated the SRS; Sound Retrieval System under license from SRS Labs, Inc.

The TA2136F/TA2136N is the IC with the Sound Retrieval System to make 3D sound. It supports both stereo and monaural signal inputs. This allows TA2136F/TA2136N to be suitable for various audio systems such as TVs, stereo equipments, radio cassette recorders, video game machines, electronic organs, and PC units.

Features

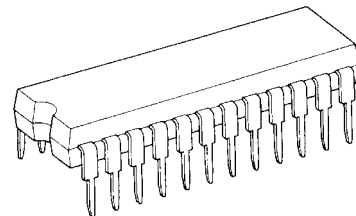
- Incorporates three mode selectors.
 - (1) Monaural mode (SRS 3D mono)
 - (2) Stereo mode (SRS 3D stereo)
 - (3) Bypass mode (bypass mode)
- Center and space controlling functions
- Wide operation supply voltage
 : $V_{CC} (ope.) = 4.5 \text{ to } 12 \text{ V}$ ($T_a = 25^\circ\text{C}$)

TA2136F



SSOP24-P-300-1.00

TA2136N



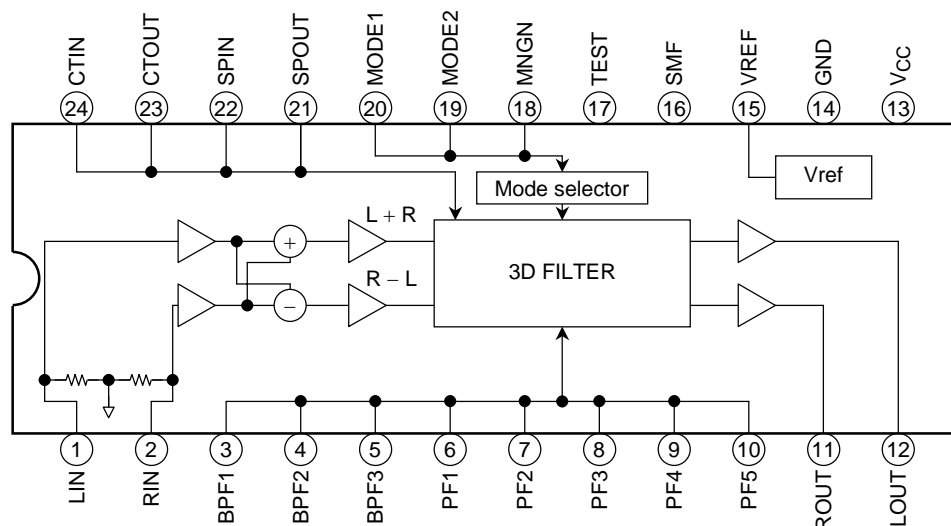
SDIP24-P-300-1.78

Weight

SSOP24-P-300-1.00 : 0.31 g (typ.)

SDIP24-P-300-1.78 : 1.2 g (typ.)

Block Diagram



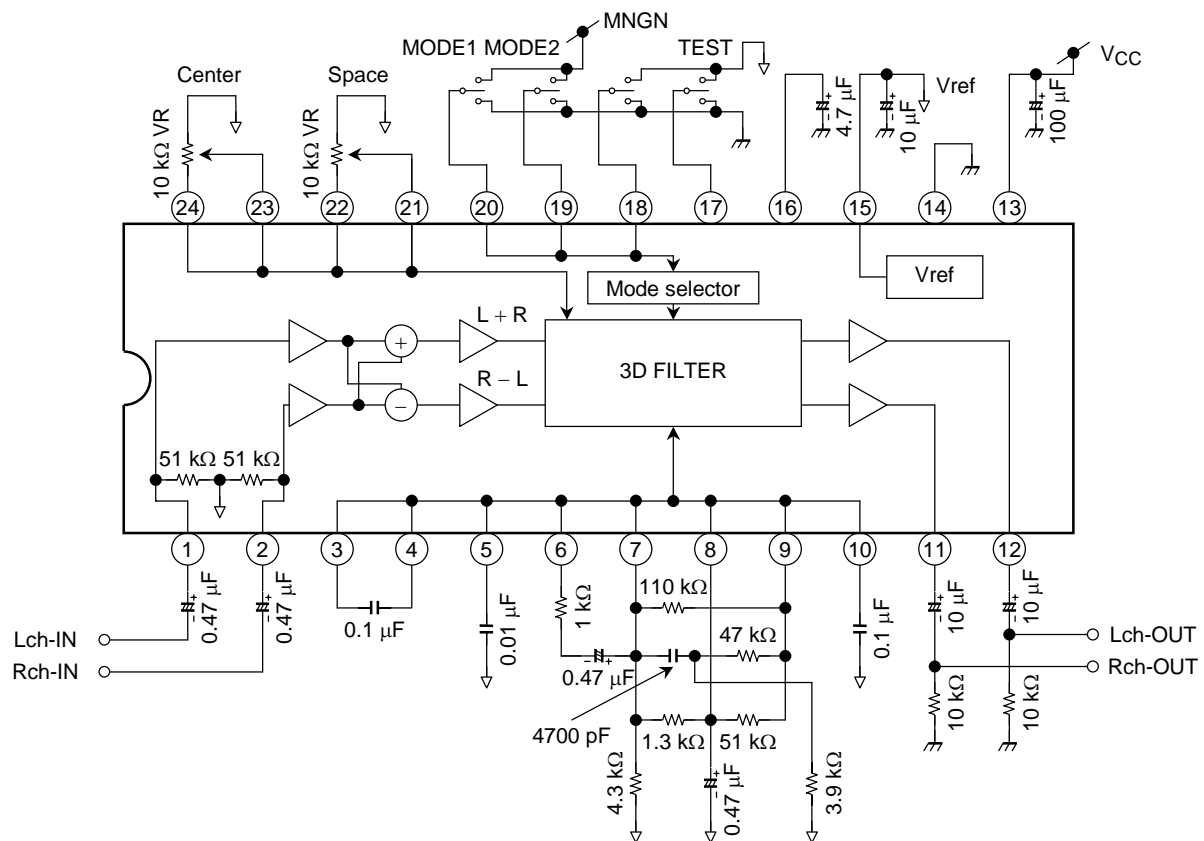
Note 1: This device is vulnerable to surge voltages. Take it into account when using this device in your system.

The SRS; Sound Retrieval System and **SRS** are registered trademarks of SRS Labs, Inc.

Pin Function

| Pin No. | Symbol | I/O | Function | Remarks |
|---------|--------|-----|---|---------|
| 1 | LIN | I | L channel signal input pin. | |
| 2 | RIN | I | R channel signal input pin. | |
| 3 | BPF1 | — | BPF1 pin for band pass filter. | |
| 4 | BPF2 | — | BPF2 pin for band pass filter. | |
| 5 | BPF3 | — | BPF3 pin for band pass filter. | |
| 6 | PF1 | — | PF1 pin for 3D filter. | |
| 7 | PF2 | — | PF2 pin for 3D filter. | |
| 8 | PF3 | — | PF3 pin for 3D filter. | |
| 9 | PF4 | — | PF4 pin for 3D filter. | |
| 10 | PF5 | — | PF5 pin for 3D filter. | |
| 11 | ROUT | O | R channel signal output pin. | |
| 12 | LOUT | O | L channel signal output pin. | |
| 13 | VCC | — | Power supply pin. | |
| 14 | GND | — | Ground pin. | |
| 15 | VREF | I | Reference voltage pin. | |
| 16 | SMF | — | SMF pin for smoothing filter. | |
| 17 | TEST | I | Test pin, normally fixed "L" level. | |
| 18 | MNGN | I | MNGN pin for monoral signal input gain selector. Normally fixed "L" level. | |
| 19 | MODE2 | I | MODE2 pin for mode selector. | |
| 20 | MODE1 | I | MODE1 pin for mode selector. | |
| 21 | SPOUT | O | Output pin for space control. | |
| 22 | SPIN | I | Input pin for space control. | |
| 23 | CTOUT | O | Output pin for center control. | |
| 24 | CTIN | I | Input pin for center control. | |

Application Circuit



| Mode | Mode1 | Mode2 |
|-----------|-------|-------|
| Bypass | L | — |
| 3D mono | H | L |
| 3D stereo | H | H |

| Level | Test (Note 2) | MNGN (Note 3) |
|-------|------------------|------------------|
| L | -3dB | 0dB |
| H | 0dB | -6dB |

Note 2: Usually, it is used by fixing to “L” level.

Note 3: Usually, it is not concerned with an L channel input or L and R channel input, but is used by fixing to “L” level.

Note 4: The Sound Retrieval System (SRS) technology rights incorporated in the TA2136F/N are owned by SRS Labs, a US Corporation and licensed to Toshiba Semiconductor. The Sound Retrieval System (SRS) is protected under US and foreign patents used and/or pending. The Sound Retrieval System (SRS), the (●) and SRS symbol, are trademarks of SRS Labs, Inc. in the United States and selected foreign countries. Neither the purchase of the TA2136F/N, nor the corresponding sale of audio enhancement equipment conveys the right to sell commercialized recordings made with any SRS technology. SRS Labs requires that all users of the TA2136F/N must enter into a license agreement directly with SRS Labs and comply with all rules and regulations as outlined in the SRS Trademark Usage Manual.

Maximum Ratings (Ta = 25°C)

| Characteristics | Symbol | Rating | | Unit |
|-----------------------|------------------|---------------------|-------|------|
| Supply voltage | V _{CC} | 12 | | V |
| Power dissipation | P _d | TA2136F (Note 5) | *400 | mW |
| | | TA2136N (Note 6) | *1200 | |
| Operating temperature | T _{opr} | -40 to 85 | | °C |
| Storage temperature | T _{stg} | -55 to 150 | | °C |

Note 5: Derated above 25°C in the proportion of 3.2 mW/°C

Note 6: Derated above 25°C in the proportion of 9.6 mW/°C

Electrical Characteristics

(unless otherwise specified, V_{CC} = 9 V, f = 1 kHz, R_L = 10 kΩ, V_{in} = -10dBV, R_g = 600 Ω, bypass mode, Ta = 25°C)

| Characteristics | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------|-------------------------|--------------|--|-----|-------|-----------------|-------------------|
| Supply voltage | V _{CC} | — | V _{in} = 0 | 4.5 | 9 | 12 | V |
| Supply current | I _{ccq} (BYP) | — | V _{in} = 0 | — | 4 | 7 | mA |
| | I _{ccq} (SRS) | — | V _{in} = 0, SRS STEREO | — | 8 | 14 | |
| | I _{ccq} (MONO) | — | V _{in} = 0, SRS MONO | — | 8 | 14 | |
| Input resistance | R _{in} | — | — | 40 | 50 | 60 | kΩ |
| Output clipping voltage | V _{OCL} | — | THD = 1% | 1.4 | 1.7 | — | V _{rms} |
| Total harmonic distortion | THD (SRS) | — | SRS STEREO, Space&Center: max | — | 0.15 | — | % |
| | THD (MONO) | — | SRS MONO | — | 0.2 | — | |
| | THD (BYP) | — | SRS BYPASS, TEST = "H" | — | 0.004 | — | |
| Bypass gain | G _V (BYP) | — | — | -5 | -3 | -1 | dB |
| Output noise voltage | V _{ON} (SRS) | — | Input = GND, Space&Center: MID BW = 20 Hz to 20 kHz | — | 35 | 50 | μV _{rms} |
| Mode select control voltage | V _{CH} | — | High level | 2 | — | V _{CC} | V |
| | V _{CL} | — | Low level | GND | — | 1 | |

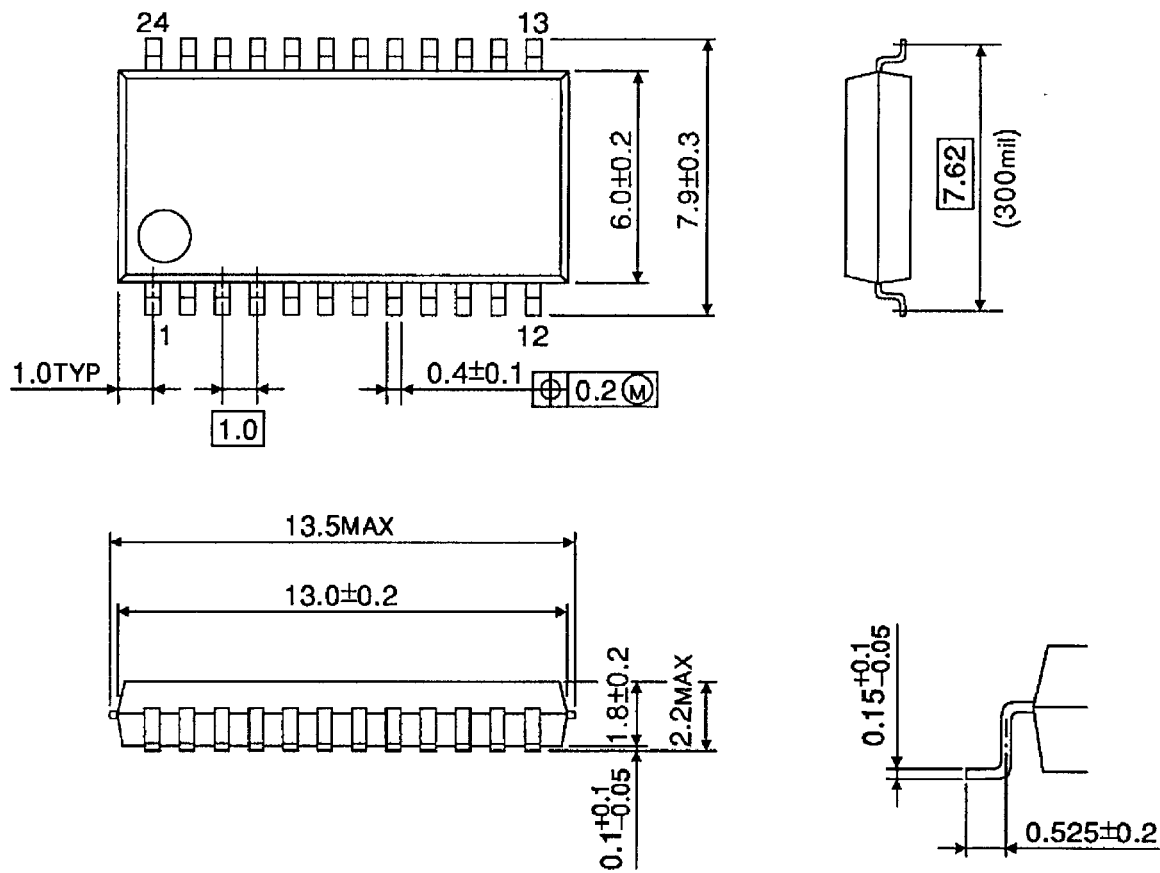
<Mode Select>

| Mode | Mode1 | Mode2 |
|-----------|-------|-------|
| Bypass | L | — |
| 3D stereo | H | H |
| 3D mono | H | L |

Package Dimensions

SSOP24-P-300-1.00

Unit : mm

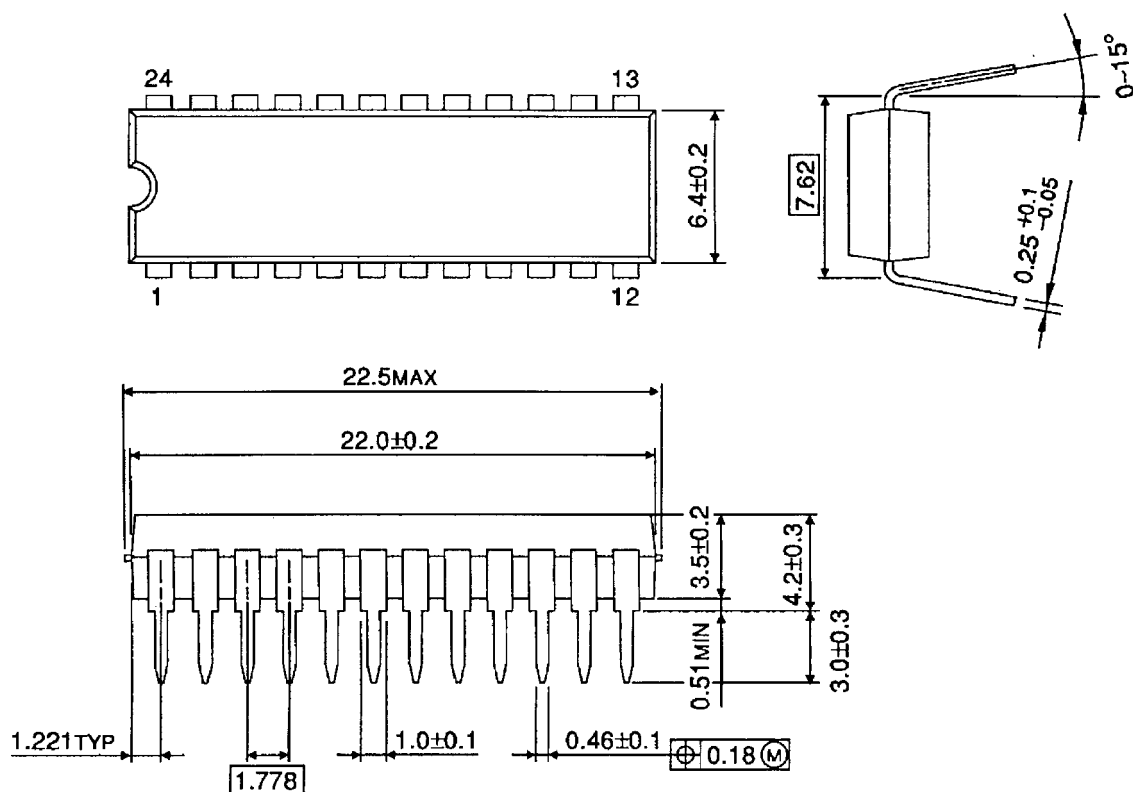


Weight: 0.31 g (typ.)

Package Dimensions

SDIP24-P-300-1.78

Unit : mm



Weight: 1.2 g (typ.)

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