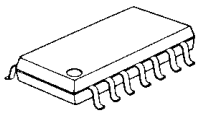
# Sound Enhancement Audio Processor for Compression Audio

## ■GENERAL DESCRIPTION

The NJM2708 is a sound enhancement audio processor designed for compression audio. It includes mode control switch (sound enhancement mode / Bypass mode), standby function and realizes low consumption power design by standby function.

It is suitable for portable audio, car audio & home audio applications.

## ●PACKAGE OUTLINE

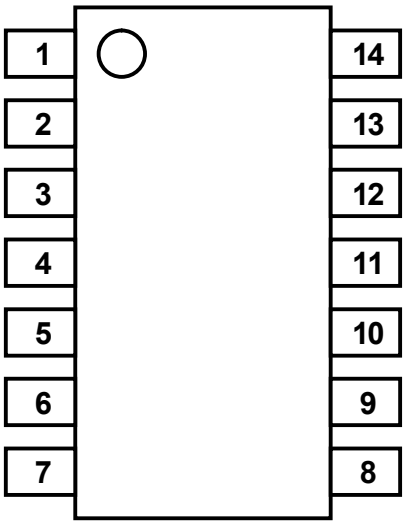


**NJM2708V**

## ■FEATURES

- Operating Voltage +1.8 to +13 V
- Low Operating Circuit 0.75 mA typ.(at Sound enhancement mode VR: Max.)
  0.1μA typ. (at Standby mode)
- Low output noise -100dBV typ.(at Sound enhancement mode VR: Max.)
- Low THD 0.005% typ.
- Variable Surround Effect by external resistor
- Standby function
- Internal Mode Control Switch
- Bipolar Technology
- Package Outline SSOP14

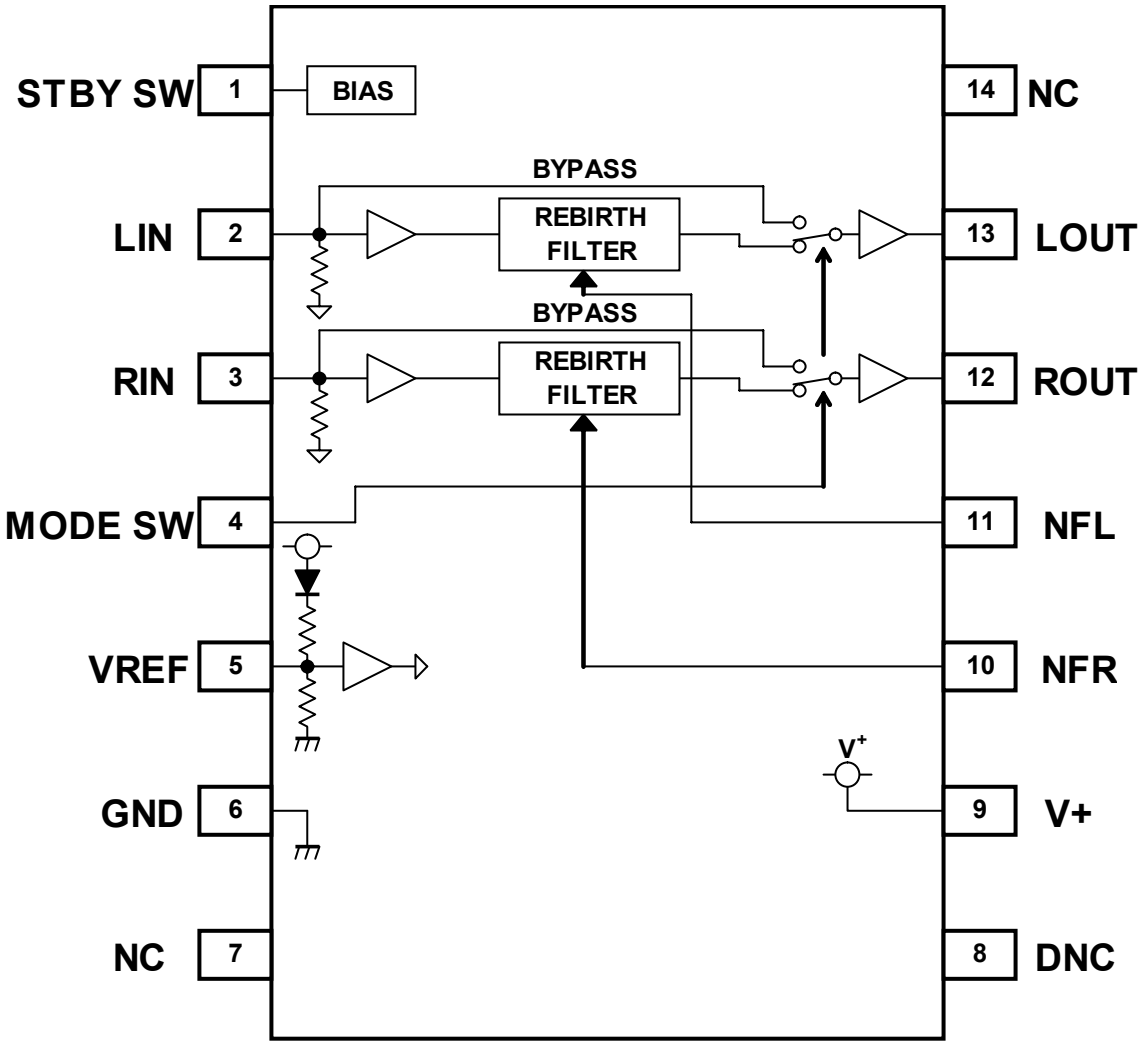
## ■PIN CONFIGURATION




(SSOP14)

1. STANDBY SW
2. LIN
3. RIN
4. MODE SW
5. VREF
6. GND
7. NC
8. DNC
9. V+
10. NFR
11. NFL
12. ROUT
13. LOUT
14. NC

■BLOCK DIAGRAM (SSOP14)



■**ABSOLUTE MAXIMUM RATING** (Ta=25°C)

| PARAMETER | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Power Supply Voltage | $V_+$ | 14 | V |
| Power Dissipation | $P_D$ | 400<br>NOTE: EIA/JEDEC STANDARD Test board (76.2x114.3x1.6mm, 2layer, FR-4) mounting | mW |
| Operating Temperature Range | Topr | -40 ~ +85 | °C |
| Storage Temperature Range | Tstg | -40 ~ +125 | °C |

■**OPERATING VOLTAGE**

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Operating Voltage | $V_+$ | | 1.8 | 9.0 | 13 | V |

■**ELECTRICAL CHARACTERISTICS** (Ta=25°C, $V^+$=9V, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITION | INPUT L | INPUT R | OUTPUT | Mode | VR | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Supply Current | $I_{CC}$ | No Signal | 0 | 0 | - | Active | - | - | 750 | 1300 | μA |
| | | | 0 | 0 | - | Standby | - | - | 0.1 | 1.0 | |
| | | | 0 | 0 | - | eala Rebirth | Max | - | 750 | 1300 | |
| Reference Voltage | $V_{REF}$ | No Signal | 0 | 0 | - | - | - | 3.65 | 4.15 | 4.65 | V |

■**AC CHARACTERISTICS** (Ta=25°C, $V^+$=9V, Vin= 1.5Vrms,f=1kHz,$R_L$=10kΩ,unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITION | INPUT L | INPUT R | OUTPUT | Mode | VR | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum Input Voltage | $V_{IM}$ | f=1kHz THD=1% | $V_{IN}$ | - | L | Bypass | - | 2.2 | 3.0 | - | Vrms |
| | | | - | $V_{IN}$ | R | | | | | | |
| | | f=1kHz THD=1% | $V_{IN}$ | - | L | eala Rebirth | MAX | 1.5 | 2.7 | - | |
| | | | - | $V_{IN}$ | R | | | | | | |
| | | f=10kHz THD=1% | $V_{IN}$ | - | L | Bypass | - | 2.2 | 3.0 | - | |
| | | | - | $V_{IN}$ | R | | | | | | |
| | | f=10kHz THD=1% | $V_{IN}$ | - | L | eala Rebirth | MAX | 1.0 | 1.6 | - | |
| | | | - | $V_{IN}$ | R | | | | | | |
| Output Noise | $V_{NO}$ | Rg=0Ω A-Weighted | 0 | 0 | L | Bypass | - | - | -112 (2.5) | -106 (5.0) | dBV (μVrms) |
| | | | | | R | | | | | | |
| | | Rg=0Ω A-Weighted | 0 | 0 | L | eala Rebirth | MAX | - | -100 (10) | -94 (20) | |
| | | | | | R | | | | | | |
| Total Harmonic Distortion | THD+N | $V_{IN}$=1.5Vrms f=1kHz | $V_{IN}$ | - | L | Bypass | - | - | 0.002 | 0.01 | % |
| | | | - | $V_{IN}$ | R | | | | | | |
| | | $V_{IN}$=0.75Vrms f=10kHz | $V_{IN}$ | - | L | eala Rebirth | MAX | - | 0.1 | - | |
| | | | - | $V_{IN}$ | R | | | | | | |

| PARAMETER | SYMBOL | TEST CONDITION | | | | | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | INPUT | | OUTPUT | Mode | VR | | | | |
| | | | L | R | | | | | | | |
| Bypass Gain | $G_{VBYP}$ | $V_{IN}$=1.5Vrms f=1kHz | $V_{IN}$ | - | L | Bypass | - | -1.0 | 0.0 | 1.0 | dB |
| | | | - | $V_{IN}$ | R | | | | | | |
| eala Rebirth Gain | $G_{eala}$ | $V_{IN}$=0.75Vrms f=10kHz | $V_{IN}$ | - | L | eala Rebirth | MAX | 3.0 | 5.0 | 7.0 | dB |
| | | | - | $V_{IN}$ | R | | | | | | |

**■CONTROL CHARACTERISTICS** (Ta=25°C, $V^+$=9V, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Mode Select Control Voltage | $V_{MODE}$ | $V_{IN}$=High Level | 1.2 | - | $V^+$ | V |
| | | $V_{IN}$=Low Level | 0.0 | - | 0.3 | V |

**■SWITCH FUNCTION**

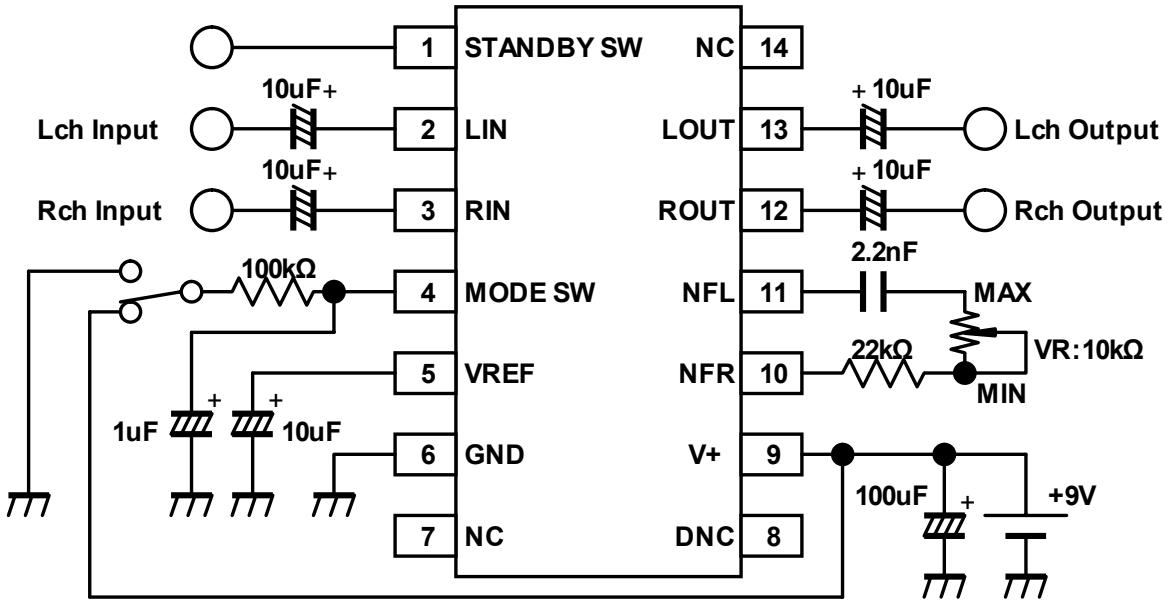
MODE SW

| MODE | SW | NOTES |
|---|---|---|
| Bypass | L, open | Input Through |
| eala Rebirth | H | eala Rebirth(Stereo Input) |

STANDBY SW

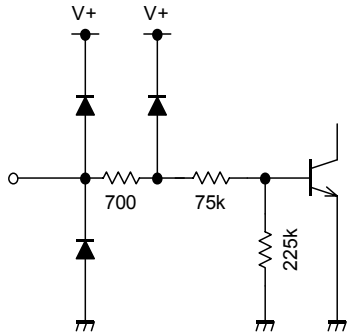
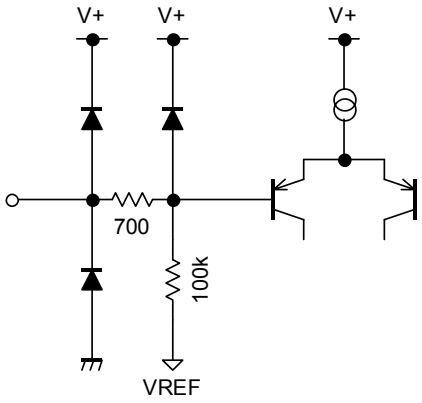
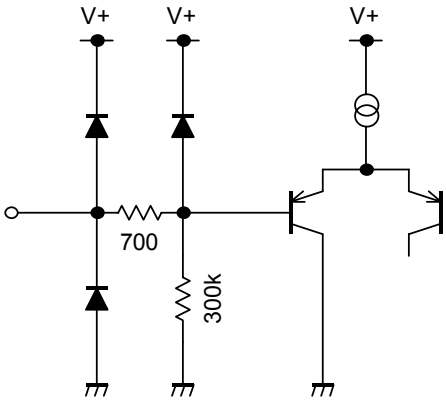
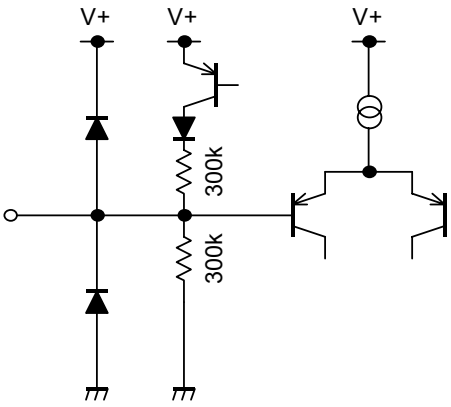
| MODE | SW | NOTES |
|---|---|---|
| Standby | L, open | IC is non-active |
| Active | H | IC is active |

■ APPLICATION CIRCUIT



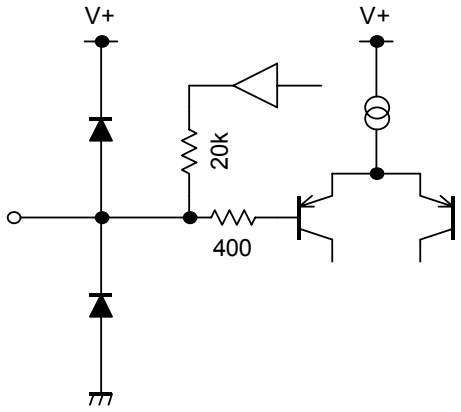
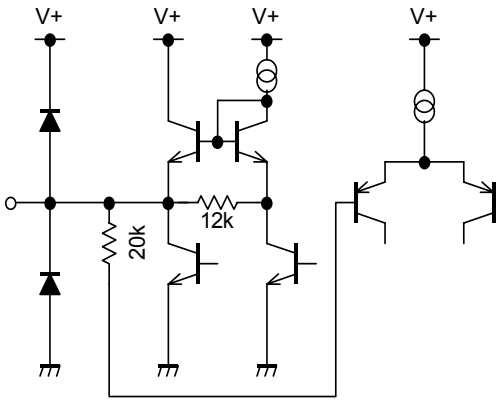
■ **TERMINAL DESCRIPTION**

(Ta=25°C, $V^+$=9V)

| PIN No. | SYMBOL | FUNCTION | EQUIVALENT CIRCUIT | Voltage |
|---|---|---|---|---|
| 1 | STANDBY SW | Standby Switch |  | 0V |
| 2<br>3 | LIN<br>RIN | Lch Input<br>Rch Input |  | 4.15V |
| 4 | MODE SW | Mode Control Switch |  | 0V |
| 5 | VREF | Reference Voltage |  | 4.15V |

■ **TERMINAL DESCRIPTION**

(Ta=25°C, $V^+$=9V)

| PIN No. | SYMBOL | FUNCTION | EQUIVALENT CIRCUIT | Voltage |
|---|---|---|---|---|
| 7<br>14 | NC | No Connect | ——— | - |
| 8 | DNC | Do Not Connect | ——— | - |
| 9 | V+ | Power Supply | ——— | V+ |
| 10<br>11 | NFR<br>NFL | Rch Filter Terminal<br>Lch Filter Terminal |  | 4.15V |
| 12<br>13 | ROUT<br>LOUT | Rch Output<br>Lch Output |  | 4.15V |

[CAUTION]
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