

## SRS WOW AUDIO PROCESSOR

## ■GENERAL DESCRIPTION

The **NJM2195** is a SRS WOW audio processor, based on the technology of SRS Labs, Inc.

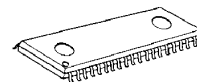
It includes SRS 3D Stereo regenerating 3D surround sound with stereo input, TruBass providing rich bass sound and FOCUS improving sound orientation.

The **NJM2195** is suitable for audio application such as TV, CD radio-cassette, Car Audio, speaker system for PC and others.

## ■PACKAGE OUTLINE



NJM2195L



NJM2195GK1



NJM2195FJ1

## ■FEATURES

- Operating Voltage 4.7 to 13V
- WOW Function
- Punch Control for TruBass effect
- LF Elevation Control for FOCUS effect
- Width Control for SRS 3D Stereo effect
- Bypass Function (Through)
- Internal Mode Switch
- Bipolar Technology
- Package Outline SDIP42, SOP40, QFP48

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SRS Labs requires all set makers to comply with all rules and regulations as outlined in the SRS Trademark Usage Manual separately provided.

For further information, please contact:

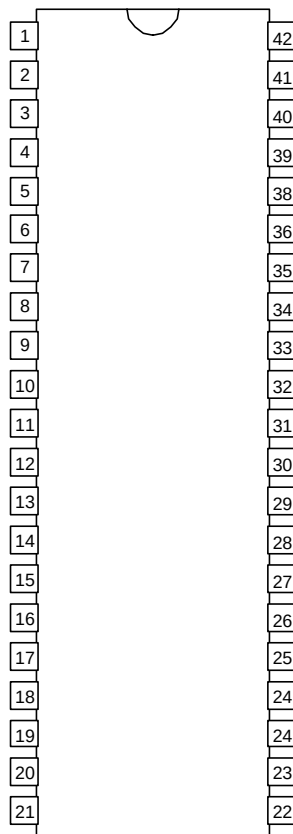
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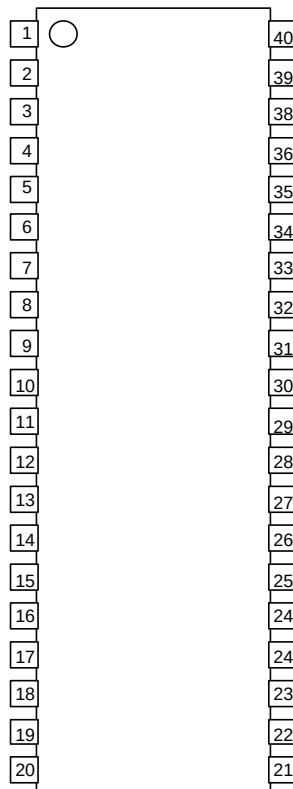
# NJM2195

## ■PIN FUNCTION (SDIP42)



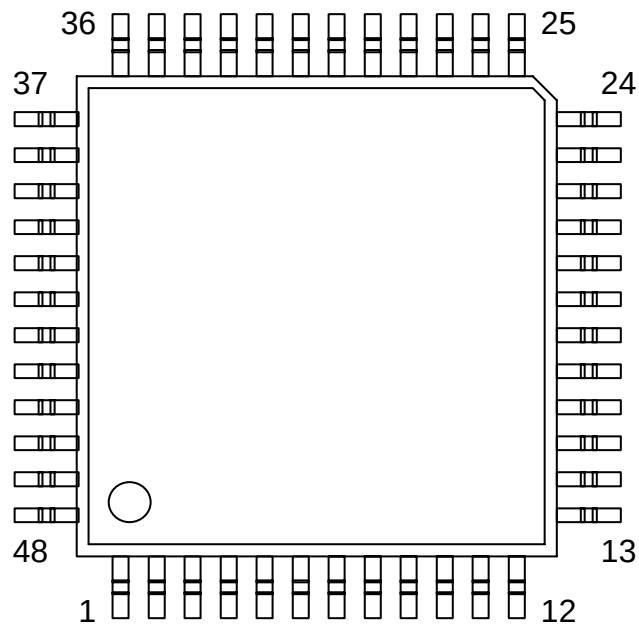
- |           |            |             |
|-----------|------------|-------------|
| 1. C3     | 15. C2     | 29. BASSOUT |
| 2. C4     | 16. SFIL1  | 30. OUTR    |
| 3. FILOUT | 17. SFIL2  | 31. OUTL    |
| 4. FIL1   | 18. SFIL3  | 32. NC      |
| 5. FIL2   | 19. SVOL2  | 33. TP2     |
| 6. FIL3   | 20. SVOL1  | 34. FFR3    |
| 7. FIL4   | 21. GND    | 35. FFR2    |
| 8. FIL5   | 22. V+     | 36. FFR1    |
| 9. FIL6   | 23. VREFIN | 37. TP3     |
| 10. FIL7  | 24. VREF   | 38. FFL3    |
| 11. NC    | 25. MODE3  | 39. FFL2    |
| 12. PCOUT | 26. MODE2  | 40. FFL1    |
| 13. PCIN  | 27. MODE1  | 41. INR     |
| 14. C1    | 28. TP1    | 42. INL     |

## ■PIN FUNCTION (SOP40)



- |           |             |          |
|-----------|-------------|----------|
| 1. C3     | 15. SFIL1   | 29. OUTR |
| 2. C4     | 16. SFIL2   | 30. OUTL |
| 3. FILOUT | 17. SFIL3   | 31. TP2  |
| 4. FIL1   | 18. SVOL2   | 32. FFR3 |
| 5. FIL2   | 19. SVOL1   | 33. FFR2 |
| 6. FIL3   | 20. GND     | 34. FFR1 |
| 7. FIL4   | 21. V+      | 35. TP3  |
| 8. FIL5   | 22. VREFIN  | 36. FFL3 |
| 9. FIL6   | 23. VREF    | 37. FFL2 |
| 10. FIL7  | 24. MODE3   | 38. FFL1 |
| 11. PCOUT | 25. MODE2   | 39. INR  |
| 12. PCIN  | 26. MODE1   | 40. INL  |
| 13. C1    | 27. TP1     |          |
| 14. C2    | 28. BASSOUT |          |

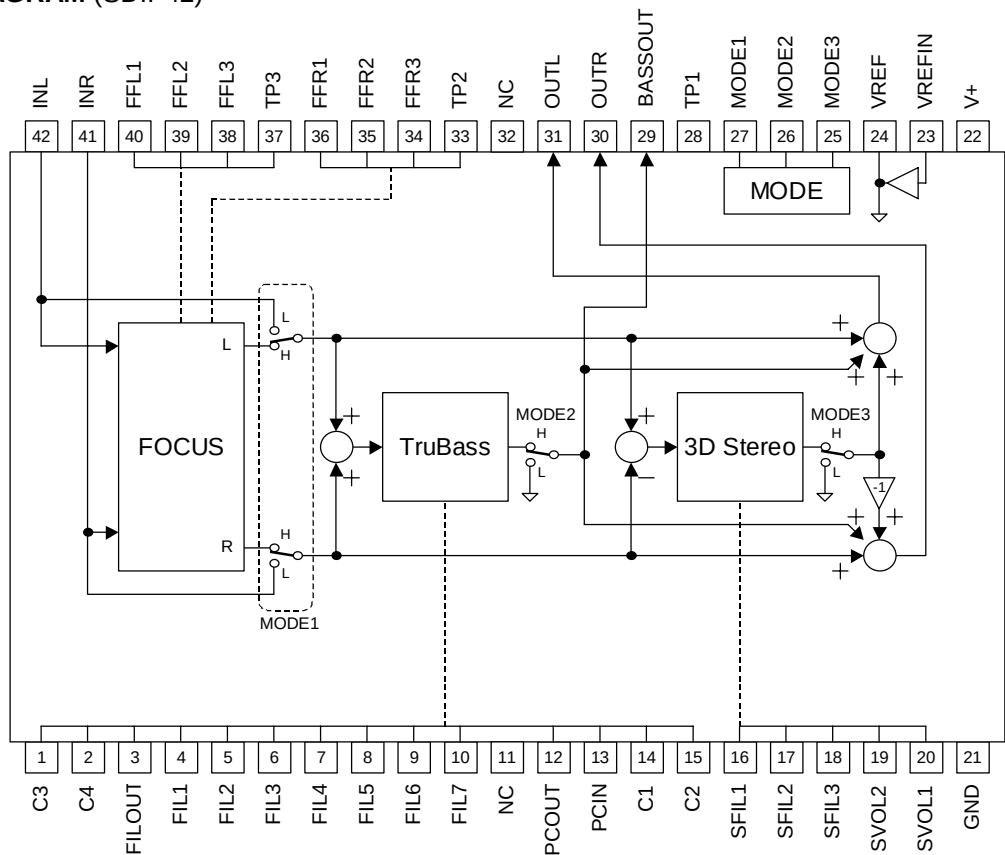
## ■PIN FUNCTION (QFP48)



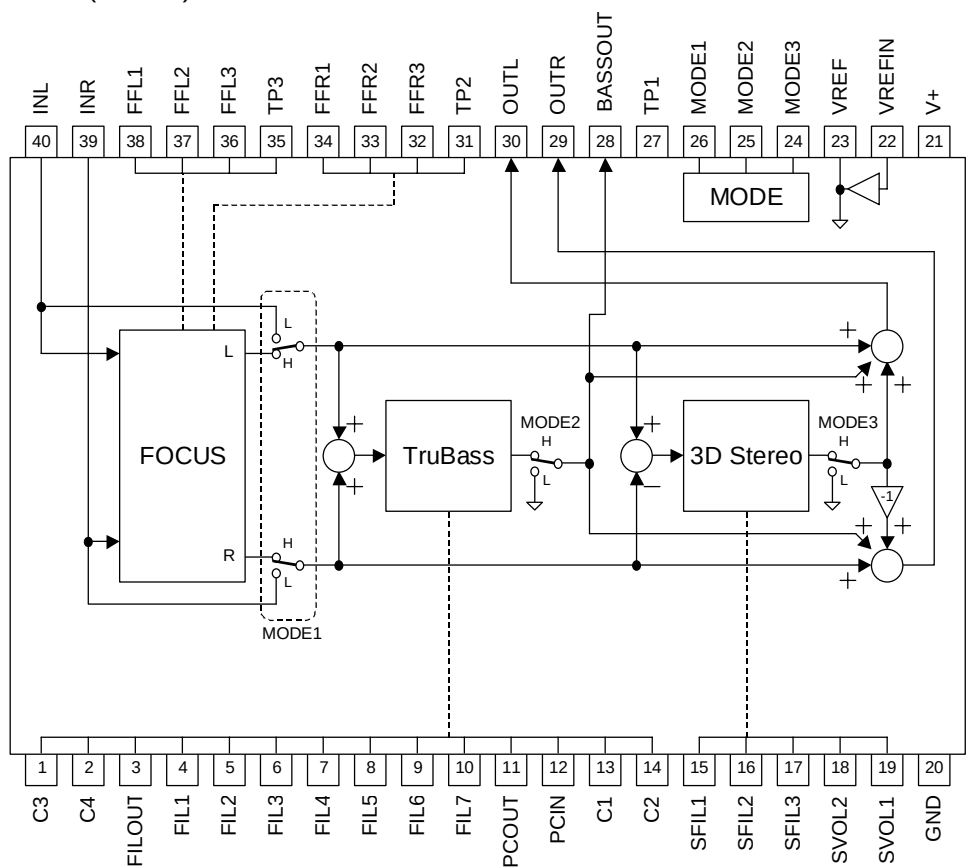
|           |             |            |
|-----------|-------------|------------|
| 1. NC     | 17. SVOL1   | 33. FFR2   |
| 2. FIL3   | 18. GND     | 34. FFR1   |
| 3. FIL4   | 19. V+      | 35. TP3    |
| 4. FIL5   | 20. VREFIN  | 36. NC     |
| 5. FIL6   | 21. VREF    | 37. NC     |
| 6. FIL7   | 22. MODE3   | 38. FFL3   |
| 7. PCOUT  | 23. MODE2   | 39. FFL2   |
| 8. PCIN   | 24. NC      | 40. FFL1   |
| 9. C1     | 25. NC      | 41. INR    |
| 10. C2    | 26. MODE1   | 42. INL    |
| 11. SFIL1 | 27. TP1     | 43. C3     |
| 12. NC    | 28. BASSOUT | 44. C4     |
| 13. NC    | 29. OUTR    | 45. FILOUT |
| 14. SFIL2 | 30. OUTL    | 46. FIL1   |
| 15. SFIL3 | 31. TP2     | 47. FIL2   |
| 16. SVOL2 | 32. FFR3    | 48. NC     |

# NJM2195

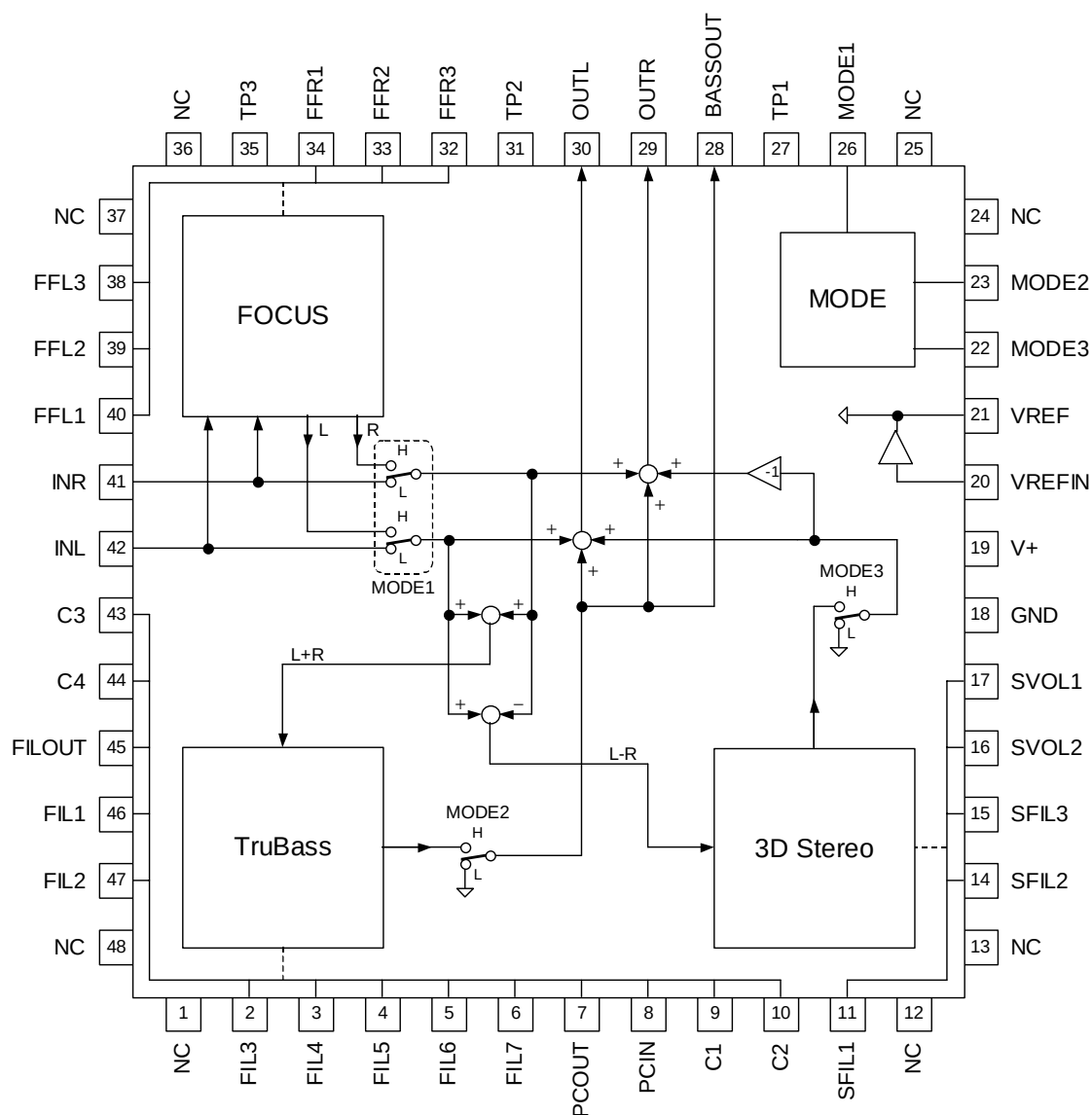
## ■BLOCK DIAGRAM (SDIP42)



## ■BLOCK DIAGRAM (SOP40)



## ■BLOCK DIAGRAM (QFP48)



# NJM2195

## ■ABSOLUTE MAXIMUM RATING (Ta=25°C)

| PARAMETER                   | SYMBOL           | RATING                               | UNIT |
|-----------------------------|------------------|--------------------------------------|------|
| Supply Voltage              | V <sup>+</sup>   | 15                                   | V    |
| Power Dissipation           | P <sub>D</sub>   | (SDIP) 700<br>(SOP) 700<br>(QFP) 450 | mW   |
| Operating Temperature Range | T <sub>opr</sub> | -40 to +85                           | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -40 to +125                          | °C   |

## ■ELECTRICAL CHARACTERISTICS (V<sup>+</sup>=12V, Ta=25°C, V<sub>IN</sub>=-20dBV (=0.1Vrms), Speaker Size :Medium)

| PARAMETER             | SYMBOL           |                     | TEST CONDITION                     |                                      |         |           |          |          |       | MIN             | TYP             | MAX          | UNIT           |
|-----------------------|------------------|---------------------|------------------------------------|--------------------------------------|---------|-----------|----------|----------|-------|-----------------|-----------------|--------------|----------------|
|                       |                  |                     | INPUT                              |                                      | OUT PUT | MODE      | PUNCH VR | WIDTH VR | LF VR |                 |                 |              |                |
|                       |                  |                     | L                                  | R                                    |         |           |          |          |       |                 |                 |              |                |
| Operating Voltage     | V <sup>+</sup>   |                     | -                                  | -                                    | -       | -         | -        | -        | -     | 4.7             | 12.0            | 13.0         | V              |
| Operating Current     | I <sub>CC</sub>  | No Signal           | -                                  | -                                    | -       | BYPASS    | -        | -        | -     | 8.7             | 17.4            | 26.1         | mA             |
|                       |                  |                     | -                                  | -                                    | -       | WOW       | -        | -        | -     | 8.7             | 17.4            | 26.1         |                |
| Reference Voltage     | V <sub>REF</sub> | V <sup>+</sup> /2   | -                                  | -                                    | -       | -         | -        | -        | -     | 5.8             | 6.0             | 6.2          | V              |
| Maximum Input Voltage | V <sub>IM</sub>  | f=1kHz<br>THD=3%    | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>                 | L<br>R  | BYPASS    | -        | -        | -     | 10.0<br>(32)    | 12.0<br>(40)    | -            | dBV<br>(Vrms)  |
|                       |                  | f=100Hz<br>THD=3%   | V <sub>IN</sub><br>V <sub>IN</sub> | V <sub>IN</sub><br>V <sub>IN</sub>   | L<br>R  | TruBass   | MAX      | -        | -     | -               | -2.7<br>(0.73)  | -            |                |
|                       |                  | f=125Hz<br>THD=3%   | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>                 | L<br>R  | 3D-STEREO | -        | MAX      | -     | -               | 0.5<br>(1.1)    | -            |                |
|                       |                  | f=125Hz<br>THD=3%   | V <sub>IN</sub><br>V <sub>IN</sub> | -V <sub>IN</sub><br>-V <sub>IN</sub> | L<br>R  | 3D-STEREO | -        | MAX      | -     | -               | -5.5<br>(0.53)  | -            |                |
|                       |                  | f=10kHz<br>THD=3%   | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>                 | L<br>R  | FOCUS     | -        | -        | MAX   | -               | -0.8<br>(0.91)  | -            |                |
|                       |                  | f=10kHz<br>THD=3%   | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>                 | L<br>R  | WOW       | MAX      | MAX      | MAX   | -12.0<br>(0.25) | -10.0<br>(0.32) | -            |                |
|                       |                  | f=100Hz<br>THD=3%   | V <sub>IN</sub><br>V <sub>IN</sub> | V <sub>IN</sub><br>V <sub>IN</sub>   | L<br>R  | WOW       | MAX      | MAX      | MAX   | -5.0<br>(0.56)  | -3.0<br>(0.71)  | -            |                |
|                       |                  | f=10kHz<br>THD=3%   | V <sub>IN</sub><br>V <sub>IN</sub> | -V <sub>IN</sub><br>-V <sub>IN</sub> | L<br>R  | WOW       | MAX      | MAX      | MAX   | -17.0<br>(0.14) | -15.0<br>(0.18) | -            |                |
| Output Noise          | V <sub>NO</sub>  | Rg=0Ω<br>A-Weighted | 0                                  | 0                                    | L<br>R  | BYPASS    | -        | -        | -     | -               | -110<br>(3)     | -100<br>(10) | dBV<br>(μVrms) |
|                       |                  | Rg=0Ω<br>A-Weighted | 0                                  | 0                                    | L<br>R  | TruBass   | MAX      | -        | -     | -               | -80<br>(100)    | -            |                |
|                       |                  | Rg=0Ω<br>A-Weighted | 0                                  | 0                                    | L<br>R  | 3D-STEREO | -        | MAX      | -     | -               | -95<br>(18)     | -            |                |
|                       |                  | Rg=0Ω<br>A-Weighted | 0                                  | 0                                    | L<br>R  | FOCUS     | -        | -        | MAX   | -               | -92<br>(25)     | -            |                |
|                       |                  | Rg=0Ω<br>A-Weighted | 0                                  | 0                                    | L<br>R  | WOW       | MAX      | MAX      | MAX   | -               | -75<br>(180)    | -69<br>(350) |                |

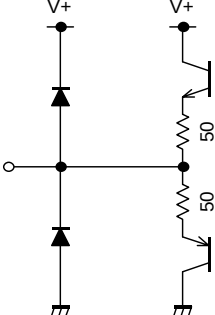
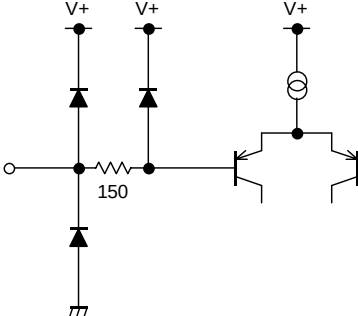
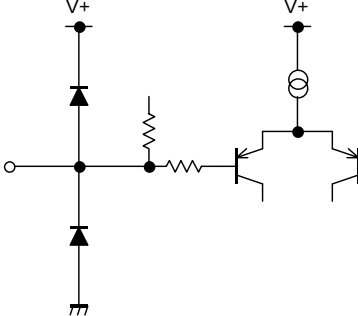
**■ELECTRICAL CHARACTERISTICS** (  $V^+=12V$ ,  $T_a=25^\circ C$ ,  $V_{IN}=-20dBV$  ( $=0.1V_{rms}$ ), Speaker Size :Medium)

| PARAMETER                   | SYMBOL            | TEST CONDITION                     |                                    |                                    |        |           |          |       |     | MIN  | TYP   | MAX            | UNIT |
|-----------------------------|-------------------|------------------------------------|------------------------------------|------------------------------------|--------|-----------|----------|-------|-----|------|-------|----------------|------|
|                             |                   | INPUT                              |                                    | OUT PUT                            | MODE   | PUNCH VR  | WIDTH VR | LF VR |     |      |       |                |      |
|                             |                   | L                                  | R                                  |                                    |        |           |          |       |     |      |       |                |      |
| Total Harmonic Distortion   | THD               | f=1kHz                             | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | BYPASS    | -        | -     | -   | -    | 0.005 | 0.01           | %    |
|                             |                   | f=100Hz                            | V <sub>IN</sub><br>V <sub>IN</sub> | V <sub>IN</sub><br>V <sub>IN</sub> | L<br>R | TruBass   | MAX      | -     | -   | -    | 0.1   | -              |      |
|                             |                   | f=1kHz                             | V <sub>IIN</sub><br>-              | -<br>V <sub>IN</sub>               | L<br>R | 3D-STEREO | -        | MAX   | -   | -    | 0.1   | -              |      |
|                             |                   | f=1kHz                             | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | FOCUS     | -        | -     | MAX | -    | 0.1   | -              |      |
|                             |                   | f=1kHz                             | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | WOW       | MAX      | MAX   | MAX | -    | 0.1   | 1.0            |      |
| BYPASS Gain                 | G <sub>VBYP</sub> | f=1kHz                             | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | BYPASS    | -        | -     | -   | -1.0 | 0.0   | 1.0            | dB   |
| SRS Gain                    | G <sub>SRS</sub>  | f=100Hz                            | V <sub>IN</sub><br>V <sub>IN</sub> | V <sub>IN</sub><br>V <sub>IN</sub> | L<br>R | TruBass   | MAX      | -     | -   | 12.8 | 14.8  | 16.8           | dB   |
|                             |                   | f=100Hz                            | V <sub>IN</sub><br>V <sub>IN</sub> | V <sub>IN</sub><br>V <sub>IN</sub> | L<br>R | TruBass   | MIN      | -     | -   | -2.3 | 1.7   | 5.7            |      |
|                             |                   | f=125Hz                            | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | 3D-STEREO | -        | MAX   | -   | 9.4  | 11.4  | 13.4           |      |
|                             |                   | f=125Hz                            | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | 3D-STEREO | -        | MIN   | -   | -1.5 | 0.5   | 2.5            |      |
|                             |                   | f=10kHz                            | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | FOCUS     | -        | -     | MAX | 10.7 | 12.7  | 14.7           |      |
|                             |                   | f=100Hz                            | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | WOW       | MAX      | MAX   | MAX | 13.8 | 15.8  | 17.8           |      |
|                             |                   | f=10kHz<br>V <sub>IN</sub> =-35dBV | V <sub>IN</sub><br>-               | -<br>V <sub>IN</sub>               | L<br>R | WOW       | MAX      | MAX   | MAX | 19.7 | 21.7  | 23.7           |      |
| MODE Select Control Voltage | V <sub>MODE</sub> | V <sub>IN</sub> =High Level        |                                    |                                    |        |           |          |       |     | 2.0  | -     | V <sup>+</sup> | V    |
|                             |                   | V <sub>IN</sub> =Low Level         |                                    |                                    |        |           |          |       |     | 0.0  | -     | 0.7            |      |

**■MODE SELECT FUNCTION**

| MODE      | MODE1 | MODE2 | MODE3 |
|-----------|-------|-------|-------|
| BYPASS    | L     | L     | L     |
| TruBass   | L     | H     | L     |
| 3D-STEREO | L     | L     | H     |
| FOCUS     | H     | L     | L     |
| WOW       | H     | H     | H     |

PIN DESCRIPTION

| No.                                 |                                     |                                    | SYMBOL                                                 | FUNCTION                                                                               | EQUIVALENT CIRCUIT                                                                   | NOTE |
|-------------------------------------|-------------------------------------|------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------|
| SDIP42                              | SOP40                               | QFP48                              |                                                        |                                                                                        |                                                                                      |      |
| 11<br>32                            | -                                   | 1                                  | NC                                                     | Non Connect                                                                            |   | -    |
|                                     |                                     | 12                                 | NC                                                     | Non Connect                                                                            |                                                                                      |      |
|                                     |                                     | 13                                 | NC                                                     | Non Connect                                                                            |                                                                                      |      |
|                                     |                                     | 24                                 | NC                                                     | Non Connect                                                                            |                                                                                      |      |
|                                     |                                     | 25                                 | NC                                                     | Non Connect                                                                            |                                                                                      |      |
|                                     |                                     | 36                                 | NC                                                     | Non Connect                                                                            |                                                                                      |      |
|                                     |                                     | 37                                 | NC                                                     | Non Connect                                                                            |                                                                                      |      |
|                                     |                                     | 48                                 | NC                                                     | Non Connect                                                                            |                                                                                      |      |
| 6<br>7<br>9<br>12<br>20<br>34<br>38 | 6<br>7<br>9<br>11<br>19<br>32<br>36 | 2<br>3<br>5<br>7<br>17<br>32<br>38 | FIL3<br>FIL4<br>FIL6<br>PCOUT<br>SVOL1<br>FFR3<br>FFL3 | Filter<br>Filter<br>Filter<br>PUNCH Control VR<br>WIDTH Control VR<br>Filter<br>Filter |  | V+/2 |
| 8<br>10                             | 8<br>10                             | 4<br>6                             | FIL5<br>FIL7                                           | Filter<br>Filter                                                                       |  | V+/2 |
| 13<br>1                             | 12<br>1                             | 8<br>43                            | PCIN<br>C3                                             | PUNCH Control VR<br>Filter                                                             |  | V+/2 |



## PIN DESCRIPTION

| No.            |                |                | SYMBOL                  | FUNCTION                             | EQUIVALENT CIRCUIT | NOTE |
|----------------|----------------|----------------|-------------------------|--------------------------------------|--------------------|------|
| SDIP42         | SOP40          | QFP48          |                         |                                      |                    |      |
| 14             | 13             | 9              | C1                      | Filter                               |                    | 0V   |
| 15             | 14             | 10             | C2                      | Filter                               |                    | 0V   |
| 16<br>17<br>18 | 15<br>16<br>17 | 11<br>14<br>15 | SFIL1<br>SFIL2<br>SFIL3 | Filter<br>Filter<br>Filter           |                    | V+/2 |
| 19<br>2<br>5   | 18<br>2<br>5   | 16<br>44<br>47 | SVOL2<br>C4<br>FIL2     | WIDTH Control VR<br>Filter<br>Filter |                    | V+/2 |

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## PIN DESCRIPTION

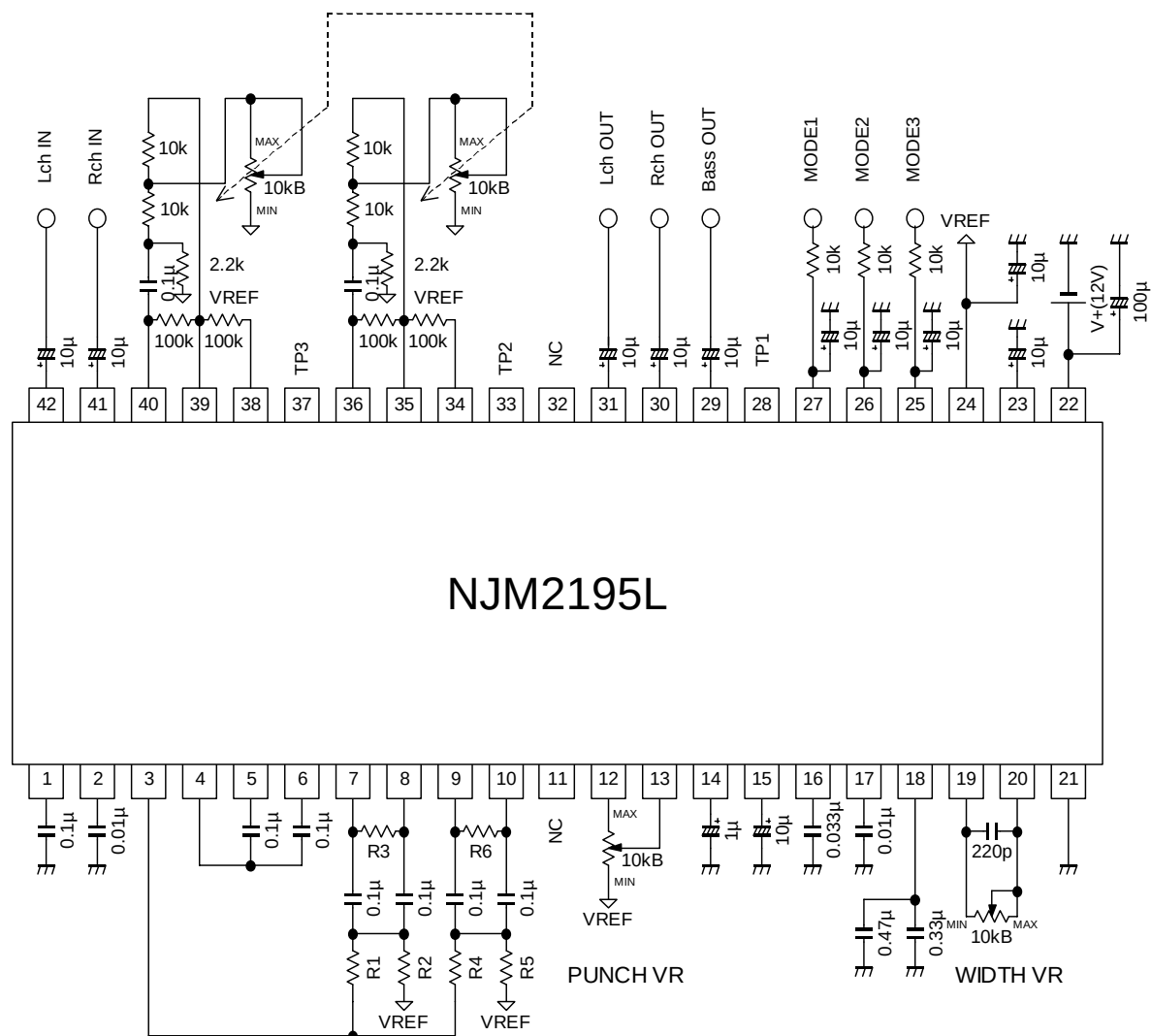
| No.                                   |                                       |                                        | SYMBOL                                                    | FUNCTION                                                                                             | EQUIVALENT CIRCUIT | NOTE |
|---------------------------------------|---------------------------------------|----------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------|------|
| SDIP42                                | SOP40                                 | QFP48                                  |                                                           |                                                                                                      |                    |      |
| 21                                    | 20                                    | 18                                     | GND                                                       | GND                                                                                                  |                    | 0V   |
| 22                                    | 21                                    | 19                                     | V+                                                        | Power Supply                                                                                         |                    | V+   |
| 23                                    | 22                                    | 20                                     | VREFIN                                                    | Reference Voltage Input                                                                              |                    | V+/2 |
| 24<br>29<br>30<br>31<br>36<br>40<br>3 | 23<br>28<br>29<br>30<br>34<br>38<br>3 | 21<br>28<br>29<br>30<br>34<br>40<br>45 | VREF<br>BASSOUT<br>OUTR<br>OUTL<br>FFR1<br>FFL1<br>FILOUT | Reference Voltage Output<br>TruBass Output<br>Rch Output<br>Lch Output<br>Filter<br>Filter<br>Filter |                    | V+/2 |
| 25<br>26<br>27                        | 24<br>25<br>26                        | 22<br>23<br>26                         | MODE3<br>MODE2<br>MODE1                                   | Mode3 SW<br>Mode2 SW<br>Mode1 SW                                                                     |                    | 0V   |

## PIN DESCRIPTION

| No.            |                |                | SYMBOL              | FUNCTION                     | EQUIVALENT CIRCUIT | NOTE |
|----------------|----------------|----------------|---------------------|------------------------------|--------------------|------|
| SDIP42         | SOP40          | QFP48          |                     |                              |                    |      |
| 28<br>35<br>39 | 27<br>33<br>37 | 27<br>33<br>39 | TP1<br>FFR2<br>FFL2 | Test Pin<br>Filter<br>Filter |                    | V+/2 |
| 33<br>37       | 31<br>35       | 31<br>35       | TP2<br>TP3          | Test Pin<br>Test Pin         |                    | -    |
| 41<br>42       | 39<br>40       | 41<br>42       | INR<br>INL          | Rch Input<br>Lch Input       |                    | V+/2 |
| 4              | 4              | 46             | FIL1                | Filter                       |                    | V+/2 |

# NJM2195

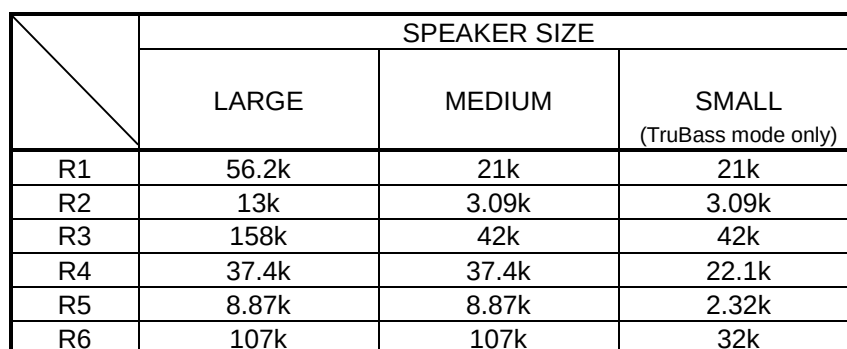
## APPLICATION CIRCUIT (SDIP42)



|    | SPEAKER SIZE |        |                              |
|----|--------------|--------|------------------------------|
|    | LARGE        | MEDIUM | SMALL<br>(TruBass mode only) |
| R1 | 56.2k        | 21k    | 21k                          |
| R2 | 13k          | 3.09k  | 3.09k                        |
| R3 | 158k         | 42k    | 42k                          |
| R4 | 37.4k        | 37.4k  | 22.1k                        |
| R5 | 8.87k        | 8.87k  | 2.32k                        |
| R6 | 107k         | 107k   | 32k                          |

The standard setting of speaker size is as follows.(Reference)

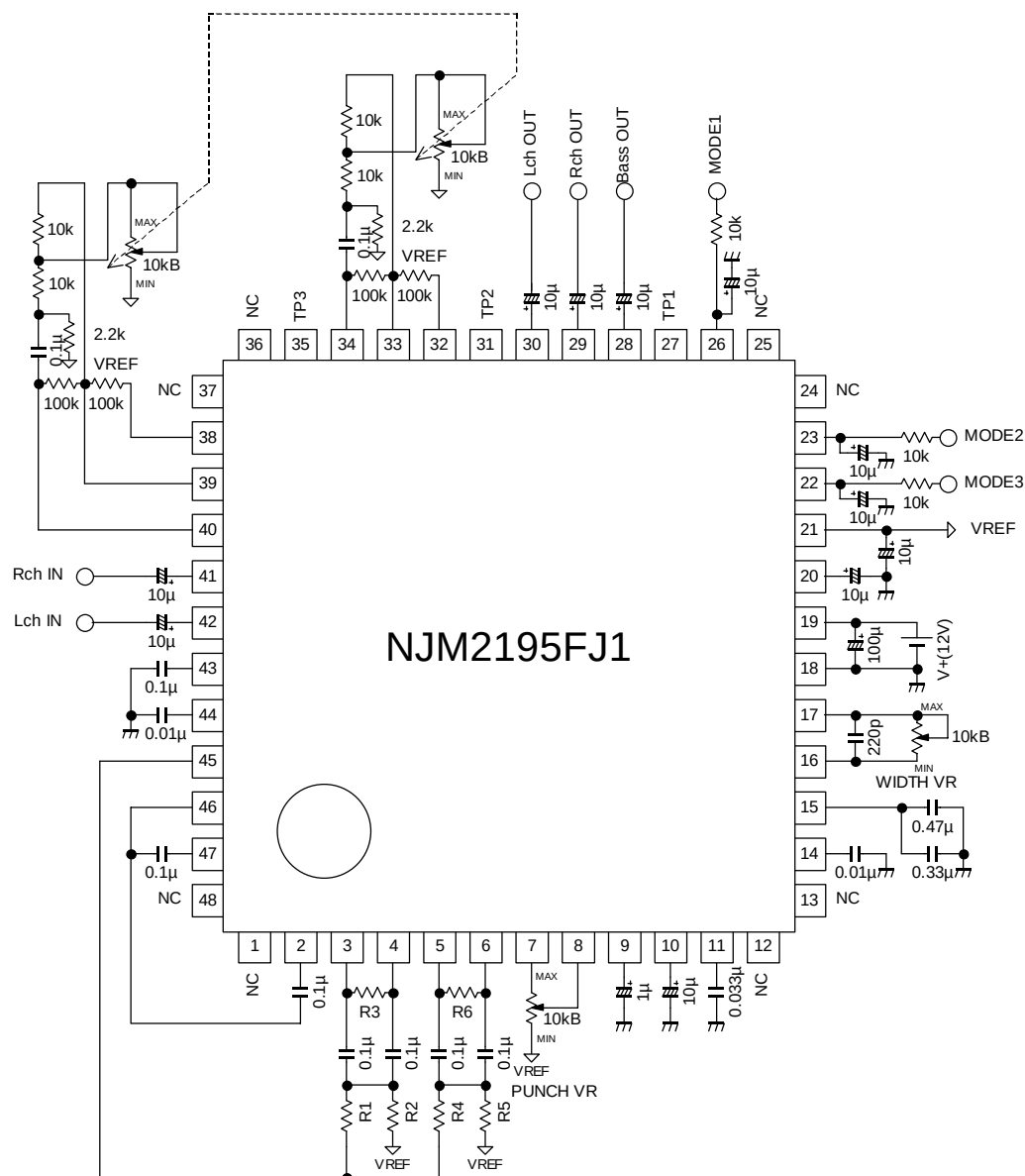
- Large Mode :  $f_o \leq 80\text{Hz}$
- Medium Mode :  $80\text{Hz} < f_o \leq 150\text{Hz}$
- Small Mode :  $150\text{Hz} < f_o \leq 250\text{Hz}$



- Large Mode :  $f_0 \leq 80\text{Hz}$
- Medium Mode :  $80\text{Hz} < f_0 \leq 150\text{Hz}$
- Small Mode :  $150\text{Hz} < f_0 \leq 250\text{Hz}$

# NJM2195

## APPLICATION CIRCUIT (QFP48)



|    | SPEAKER SIZE |        |                              |
|----|--------------|--------|------------------------------|
|    | LARGE        | MEDIUM | SMALL<br>(TruBass mode only) |
| R1 | 56.2k        | 21k    | 21k                          |
| R2 | 13k          | 3.09k  | 3.09k                        |
| R3 | 158k         | 42k    | 42k                          |
| R4 | 37.4k        | 37.4k  | 22.1k                        |
| R5 | 8.87k        | 8.87k  | 2.32k                        |
| R6 | 107k         | 107k   | 32k                          |

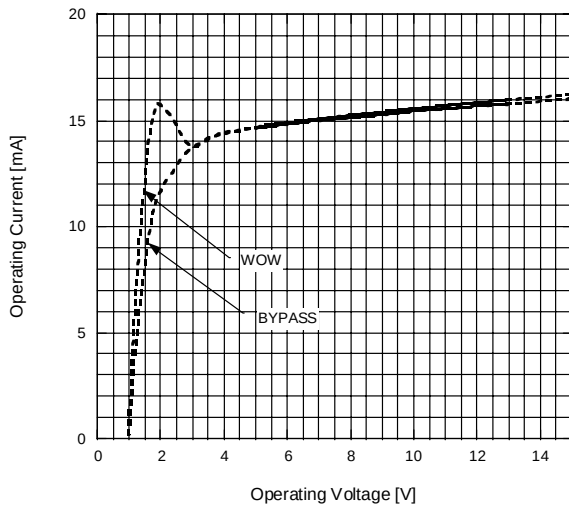
The standard setting of speaker size is as follows.(Reference)

- Large Mode :  $f_o \leq 80\text{Hz}$
- Medium Mode :  $80\text{Hz} < f_o \leq 150\text{Hz}$
- Small Mode :  $150\text{Hz} < f_o \leq 250\text{Hz}$

## TYPICAL CHARACTERISTICS

**Operating Current vs. Operating Voltage**

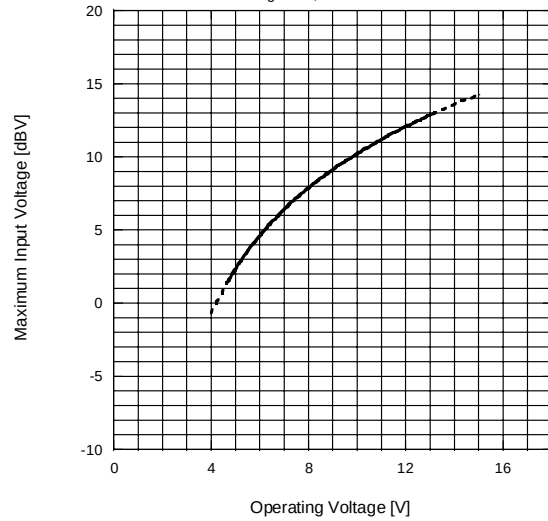
$V_+ = 1$  to 15V,  $T_a = 25^\circ\text{C}$



**Maximum Input Voltage vs. Operating Voltage (BYPASS)**

$V_{in} = Lch, V_{out} = Lch, f = 1\text{kHz}, R_L = 4.7\text{k}\Omega$

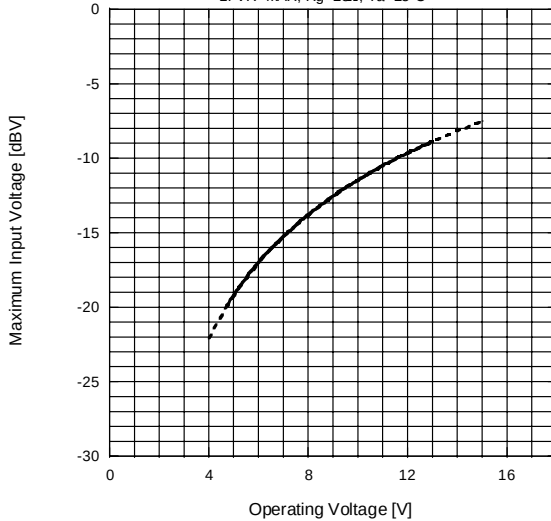
$R_g = 25\Omega, T_a = 25^\circ\text{C}$



**Maximum Input Voltage vs. Operating Voltage (WOW)**

$V_{in} = Lch, V_{out} = Lch, f = 10\text{kHz}, R_L = 4.7\text{k}\Omega$

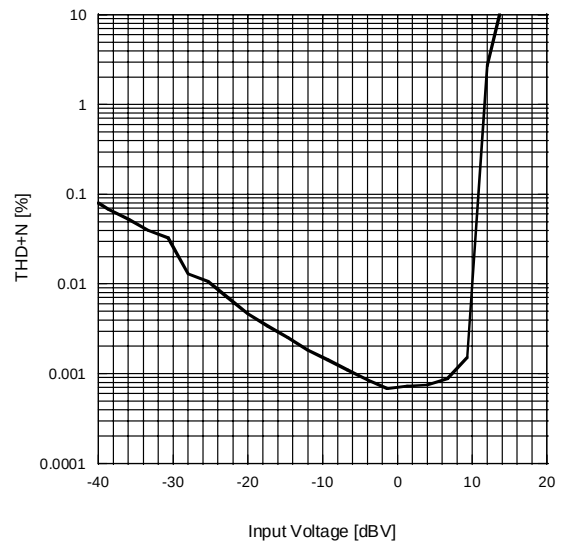
$LFVR = \text{MAX}, R_g = 25\Omega, T_a = 25^\circ\text{C}$



**Total Harmonic Distortion vs. Input Voltage (BYPASS)**

$V_+ = 12\text{V}, V_{in} = Lch, V_{out} = Lch, f = 1\text{kHz}, R_L = 4.7\text{k}\Omega$

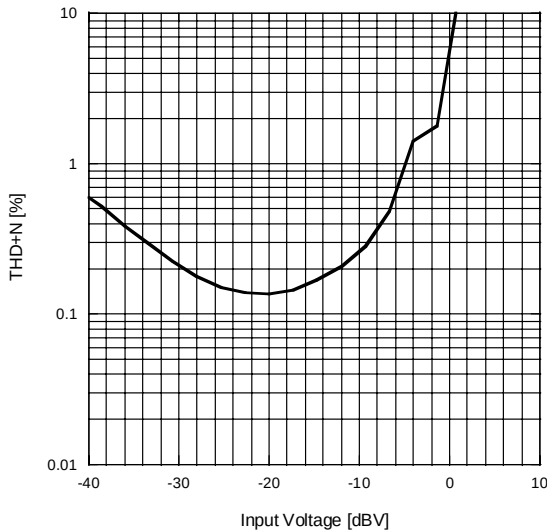
$R_g = 25\Omega, BW = 10\text{-}80\text{kHz}$



**Total Harmonic Distortion (TruBass)**

$V_+ = 12\text{V}, V_{in} = L+Rch, V_{out} = Lch, f = 100\text{Hz}, R_L = 4.7\text{k}\Omega$

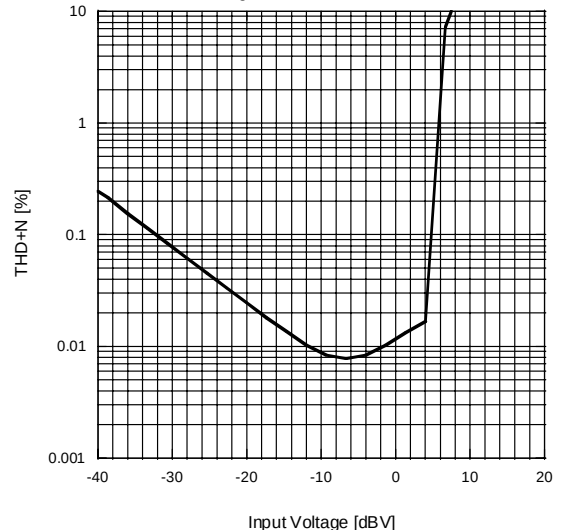
$R_g = 25\Omega, BW = 10\text{-}80\text{kHz}$



**Total Harmonic Distortion vs. Input Voltage (3D Stereo)**

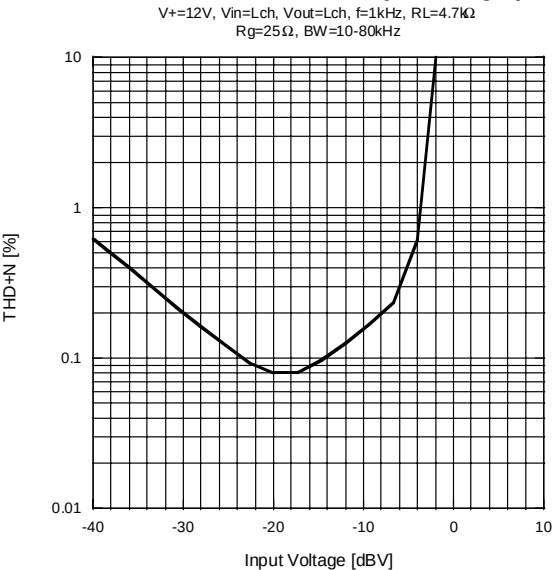
$V_+ = 12\text{V}, V_{in} = Lch, V_{out} = Lch, f = 1\text{kHz}, R_L = 4.7\text{k}\Omega$

$R_g = 25\Omega, BW = 10\text{-}80\text{kHz}$

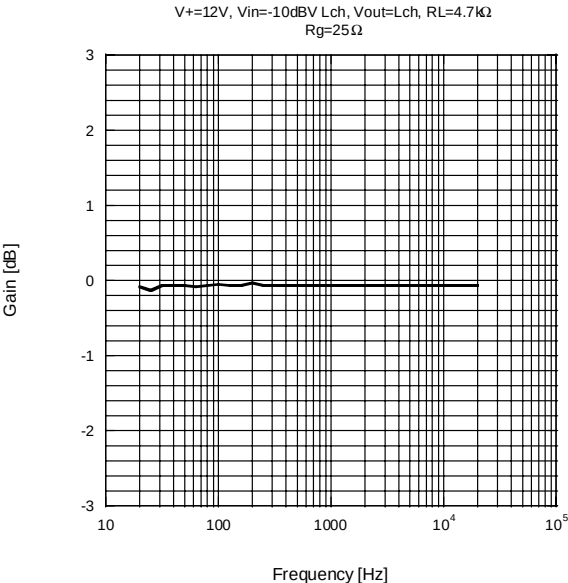


■TYPICAL CHARACTERISTICS

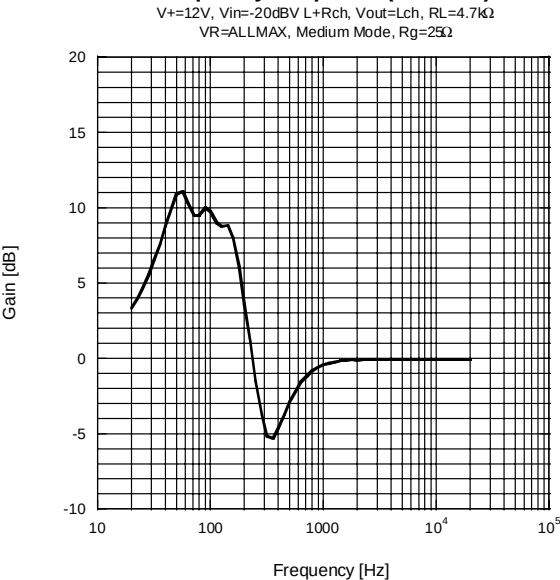
Total Harmonic Distortion vs. Input Voltage (WOW)



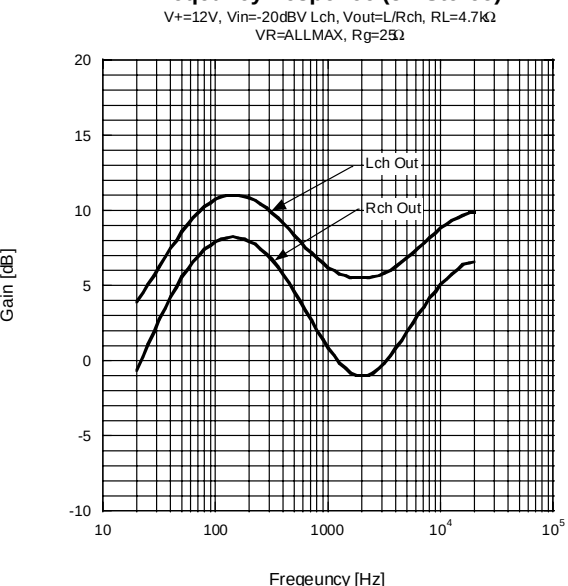
Frequency Response (BYPASS)



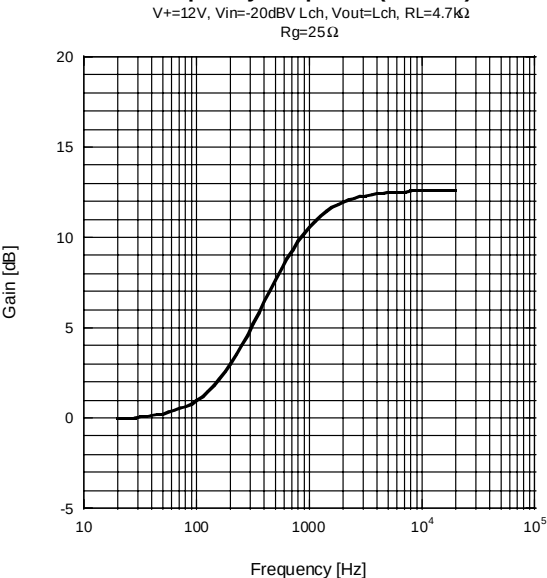
Frequency Response (TruBass)



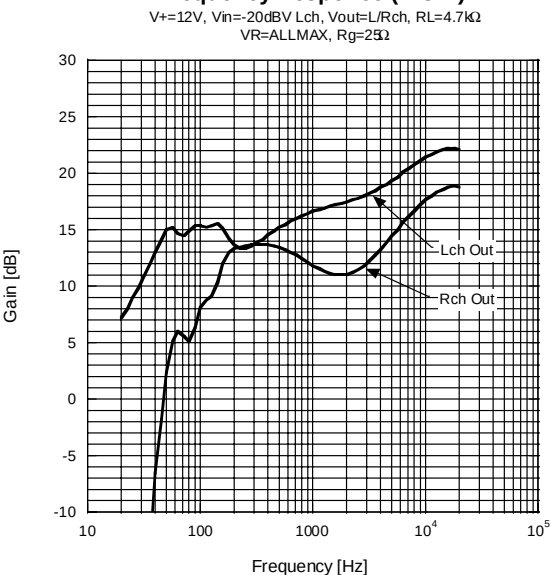
Frequency Response (3D Stereo)



Frequency Response (FOCUS)



Frequency Response (WOW)





[CAUTION]

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