

**NJM2192A****PRELIMINARY**

SRS TruBass Bass Enhancement Processor

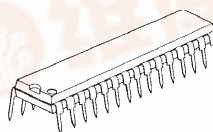
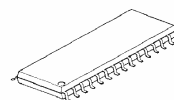
■GENERAL DESCRIPTION

The **NJM2192A** is a Bass Enhancement Processor, based on SRS TruBass technology.

The **NJM2192A** eliminates the need for large speakers to create low frequency fundamental tones, and it enhances and complements subwoofer performance.

The **NJM2192A** is suitable for audio applications which are speaker system for mini components, CD radio cassette, multimedia speaker systems, TV and others.

■PACKAGE OUTLINE

**NJM2192AL****NJM2192AM**

■FEATURES

- Operating Voltage 4.7 to 13V
- Punch Control
- Internal Bass Gain Control Switch
- Bypass Function (Through)
- Internal Mode Switch
- External Adjustment for Speaker Size (Small, Medium, Large)
- Bipolar Technology
- Package Outline SDIP30, SDMP30

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For further information, please contact:

SRS Labs, Inc.

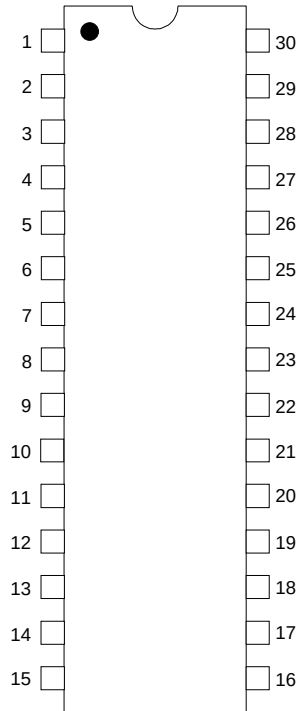
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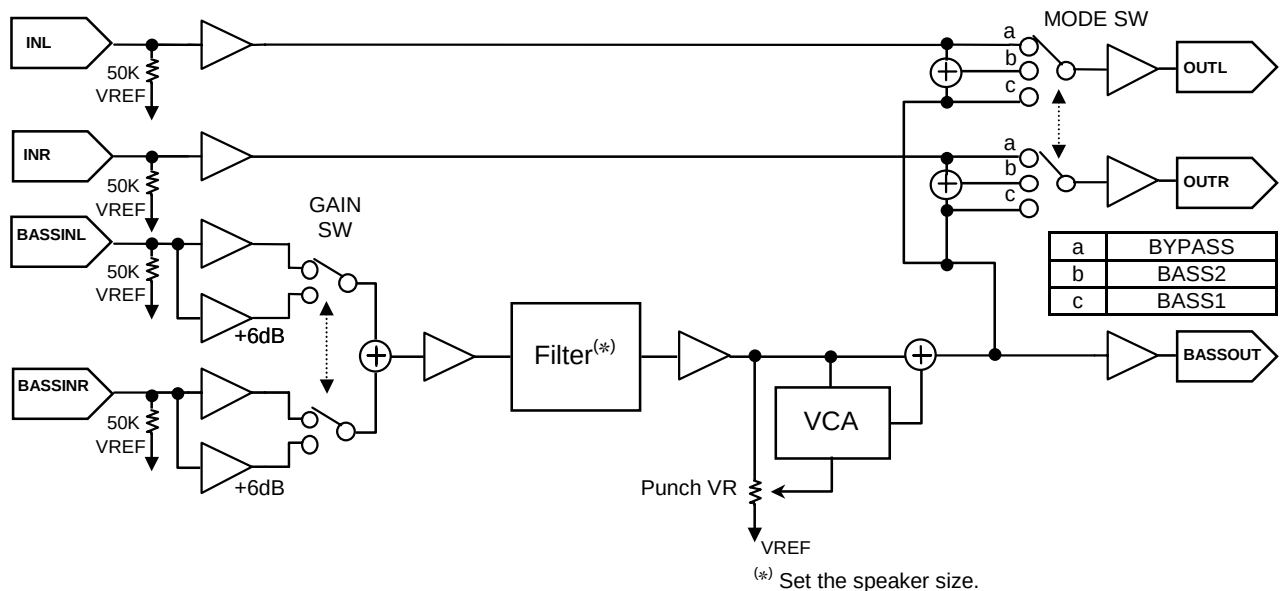
NJM2192A

PIN CONFIGURATION



- | | |
|-----------|-------------|
| 1. FILOUT | 16. V+ |
| 2. FIL1 | 17. VREFOUT |
| 3. FIL2 | 18. VREFIN |
| 4. FIL3 | 19. GAINSW |
| 5. FIL4 | 20. MODE2 |
| 6. FIL5 | 21. MODE1 |
| 7. FIL6 | 22. BASSOUT |
| 8. FIL7 | 23. OUTR |
| 9. PCOUT | 24. OUTL |
| 10. PCIN | 25. BASSINR |
| 11. FIL8 | 26. INR |
| 12. FIL9 | 27. BASSINL |
| 13. C1 | 28. INL |
| 14. C2 | 29. C3 |
| 15. GND | 30. C4 |

TruBass BLOCK DIAGRAM



SPEAKER SIZE SETTING

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

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

Set the speaker size by TruBass effect of your application.

■ELECTRICAL CHARACTERISTICS ($V^+=12V$, $T_a=25^\circ C$, $V_N=-20dBV(100mV_{rms})$, Speaker Size : Medium)

NJM2192A

■ELECTRICAL CHARACTERISTICS ($V^+=12V$, $T_a=25^\circ C$, $V_N=-20dBV(100mVrms)$, Speaker Size : Medium)

PARAMETER	SYMBOL		TEST CONDITION					MIN.	TYP.	MAX.	UNIT
			IN		OUT	MODE	PUNCH VR				
BASS Gain	GV _{BASS}	f=100Hz Gain “L”	V _{IN}	V _{IN}	L	BASS1	MAX	11.2	13.2	15.2	dB
			V _{IN}	V _{IN}	R						
		f=100Hz Gain “L”	V _{IN}	V _{IN}	L	BASS1	MIN	-18.4	-14.4	-10.4	
			V _{IN}	V _{IN}	R						
		f=100Hz Gain “H”	V _{IN}	V _{IN}	L	BASS1	MAX	15.7	17.7	19.7	
			V _{IN}	V _{IN}	R						
		f=100Hz Gain “L”	V _{IN}	V _{IN}	L	BASS2	MAX	12.8	14.8	16.8	
			V _{IN}	V _{IN}	R						
		f=100Hz Gain “H”	V _{IN}	V _{IN}	L	BASS2	MAX	16.6	18.6	20.6	
			V _{IN}	V _{IN}	R						
Switch Control Voltage	V _{IH}	19,20,21pin	-	-	-	-	-	2.0	-	V ⁺	V
	V _{IL}	19,20,21pin	-	-	-			0.0	-	0.7	

■MODE SWITCH FUNCTION

	MODE1	MODE2	NOTES
BYPASS (a)	L	-	Input Through
BASS1 (c)	H	L	Low Frequency Content of TruBass ⁽¹⁾
BASS2 (b)	H	H	TruBass Mode ⁽²⁾

(1) BASS1: The output signal is low frequency content of TruBass derived from the stereo audio signal.

(2) BASS2: TruBass Mode.

■BASS INPUT AMP GAIN SWITCH FUNCTION

To Increase the TruBass effect with the GAIN Switch.

	GAIN	NOTES
Gain Low	L	Normal Position
Gain High	H	Gain +6dB

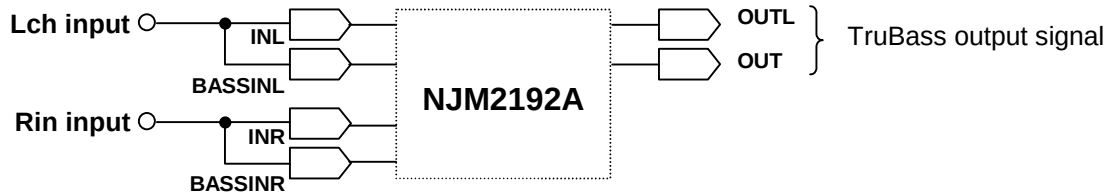
NJM2192A

INPUT TERMINAL OPERATING INSTRUCTION

NJM2192As input equip 4 terminals INL(28pin), INR(26pin), BASSINL(27pin) and BASSINR(25pin).

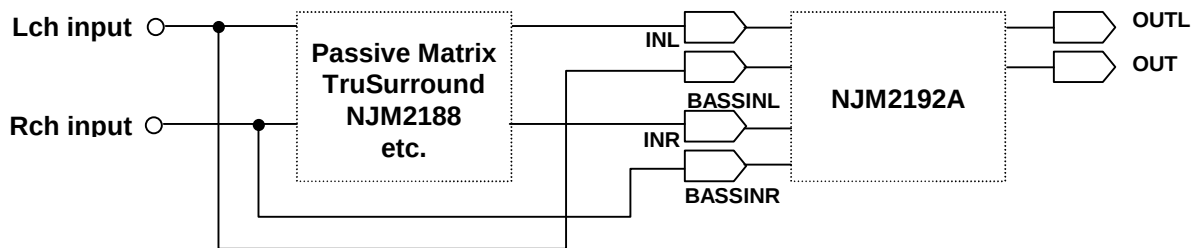
“Normal Setting”

Short INL and BASSINL, INR and BASSINR at the normal TruBass mode.



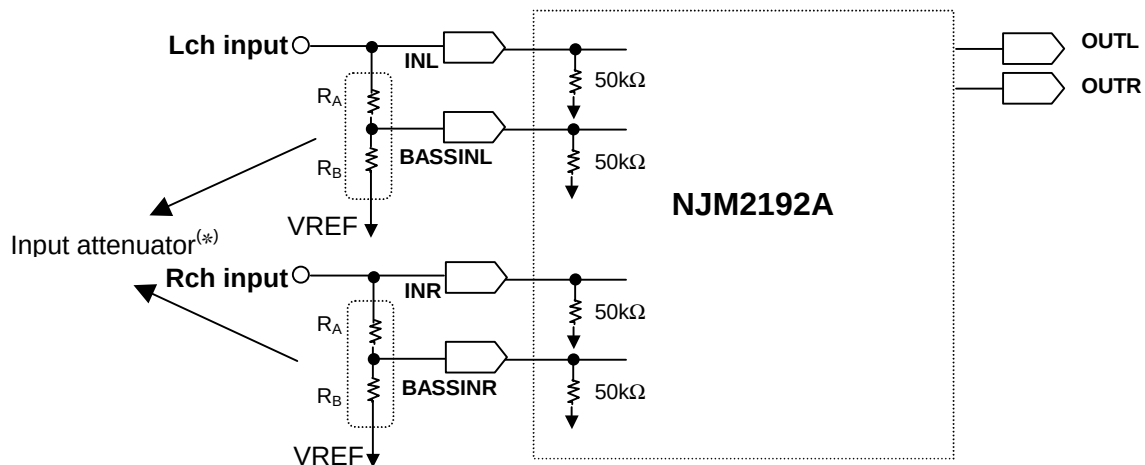
“Connect to the other surround ICs(TruSurround, SRS, etc.)”

If NJM2192A is used with the other surround ICs, the low frequency signal is possible to be amplified by the other surround ICs. Then the audio stereo signal input into the BASSIN L/R, and the other surround signal input into INL/R.



“Adjust TruBass effect”

Insert an attenuator before the BASSIN L/R if necessary.



(*) Set the attenuator : $(R_A + R_B) \geq 50k\Omega$

NJM2192A

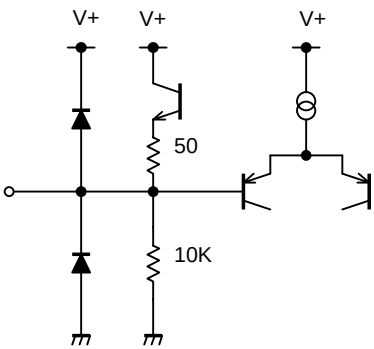
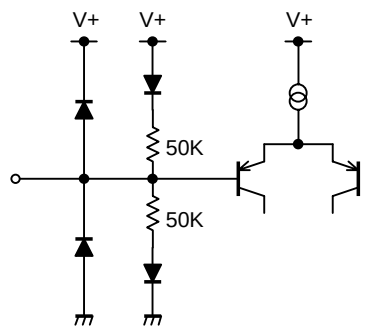
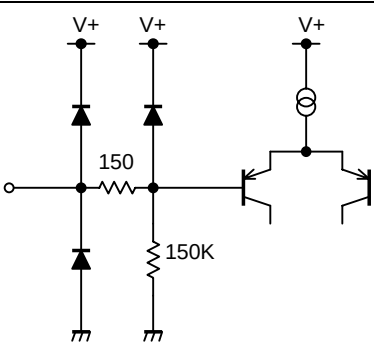
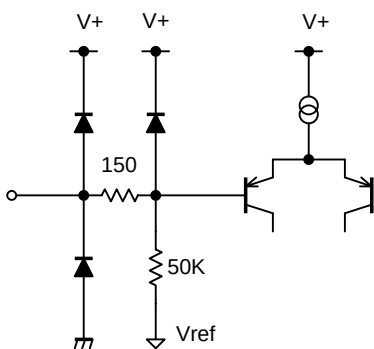
PIN DESCRIPTION

NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
10 29	PCIN C3	PUNCH Control VR Filter Input		$V+/2$
3 30	FIL2 C4	Filter Input		$V+/2$
1 17 22 23 24	FILOUT VREFOUT BASSOUT OUTR OUTL	Filter Output Vref Output TruBass Output (Low Frequency Content) Rch Audio Output Lch Audio Output		$V+/2$
2	FIL1	Filter Input		$V+/2$

NJM2192A

NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
4 5 7	FIL3 FIL4 FIL6	Filter Input		$V+/2$
6 8 11	FIL5 FIL7 FIL8	Filter Input		$V+/2$
9 12	PCOUT FIL9	PUNCH Control VR Filter Output		$V+/2$
13	C1	Filter Input		0V

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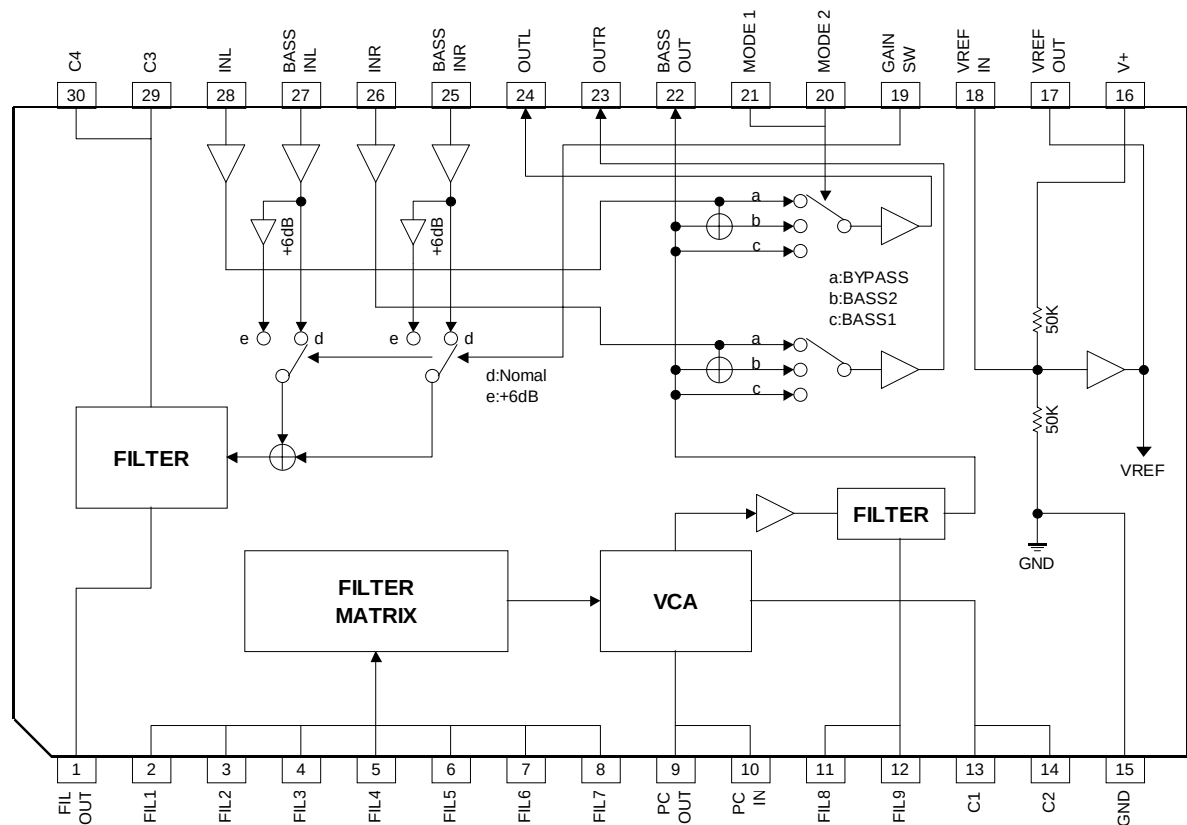
NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
14	C2	Filter Input		0V
18	VREFIN	Vref Input		V+/2
19 20 21	GAINSW MODE2 MODE1	Gain SW MODE2 SW MODE1 SW		0V
25 26 27 28	BASSINR INR BASSINL INL	Audio Input		V+/2

NJM2192A

NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
15	GND	GND		0V
16	V+	V+		V+

NJM2192A

■BLOCK DIAGRAM



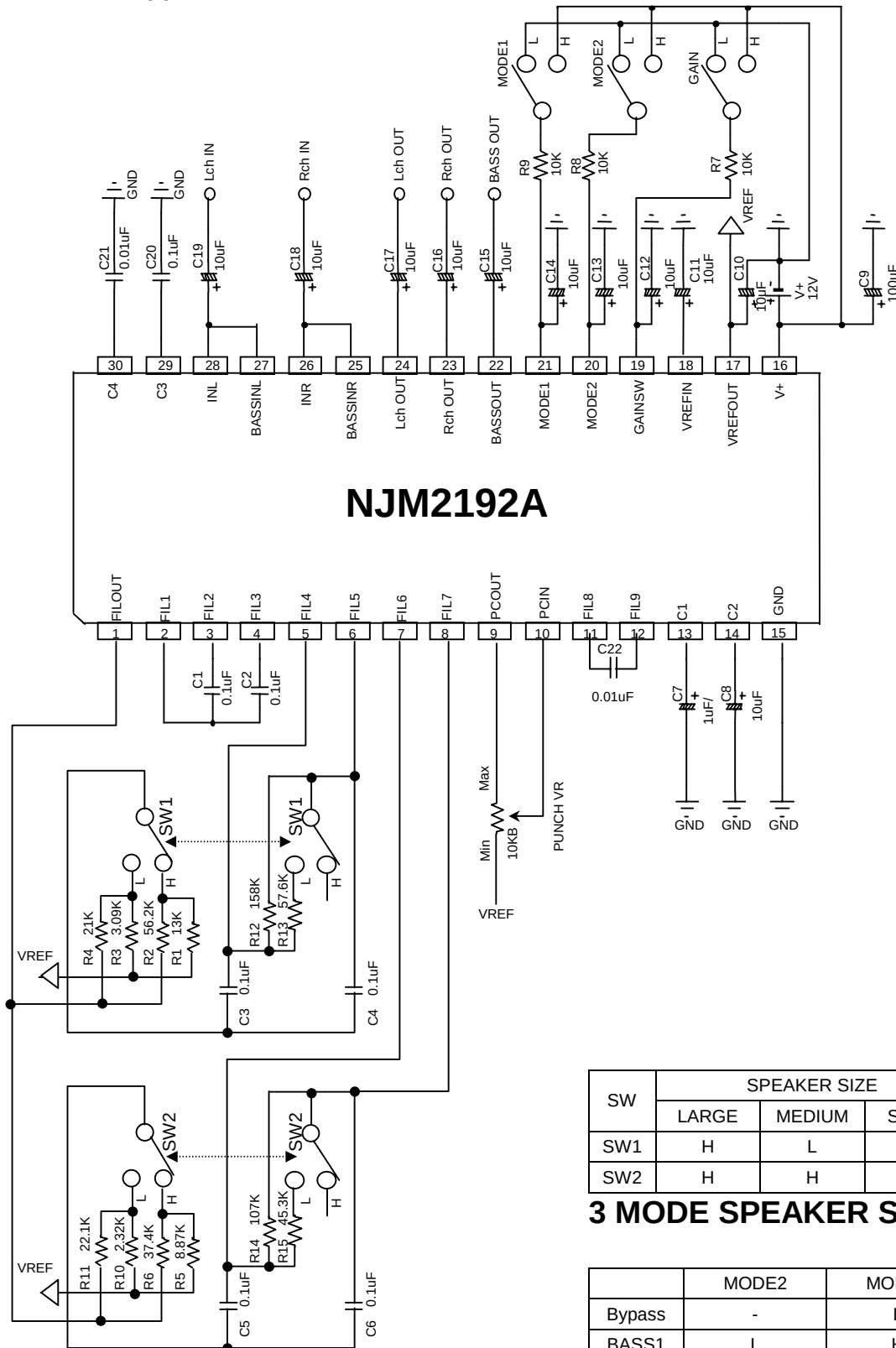
No.	SYMBOL	FUNCTION	No.	SYMBOL	FUNCTION
1	FILOUT	Filter Output	16	V+	Supply Voltage
2	FIL1	Filter Input	17	VREFOUT	$V^+/2$ Output
3	FIL2	Filter Input	18	VREFIN	$V^+/2$ Input
4	FIL3	Filter Input	19	GAINSW	Gain Switch
5	FIL4	Filter Input	20	MODE2	MODE2 Switch
6	FIL5	Filter Input	21	MODE1	MODE1 Switch
7	FIL6	Filter Input	22	BASSOUT	TruBass Output (Low Frequency Content) ⁽¹⁾
8	FIL7	Filter Input	23	OUTR	Rch Output
9	PCOUT	Punch Control VR	24	OUTL	Lch Output
10	PCIN	Punch Control VR	25	BASSINR	TruBass Input ⁽²⁾
11	FIL8	Filter Input	26	INR	Rch Input
12	FIL9	Filter Output	27	BASSINL	TruBass Input ⁽³⁾
13	C1	Filter Input	28	INL	Lch Input
14	C2	Filter Input	29	C3	Filter Input
15	GND	GND	30	C4	Filter Input

(1) The BASSOUT is low frequency signal derived from the stereo audio signal.

(2),(3) Refer to “■INPUT TERMINAL OPERATING INSTRUCTION”

NJM2192A

APPLICATION CIRCUIT(1)



SW	SPEAKER SIZE		
	LARGE	MEDIUM	SMALL
SW1	H	L	L
SW2	H	H	L

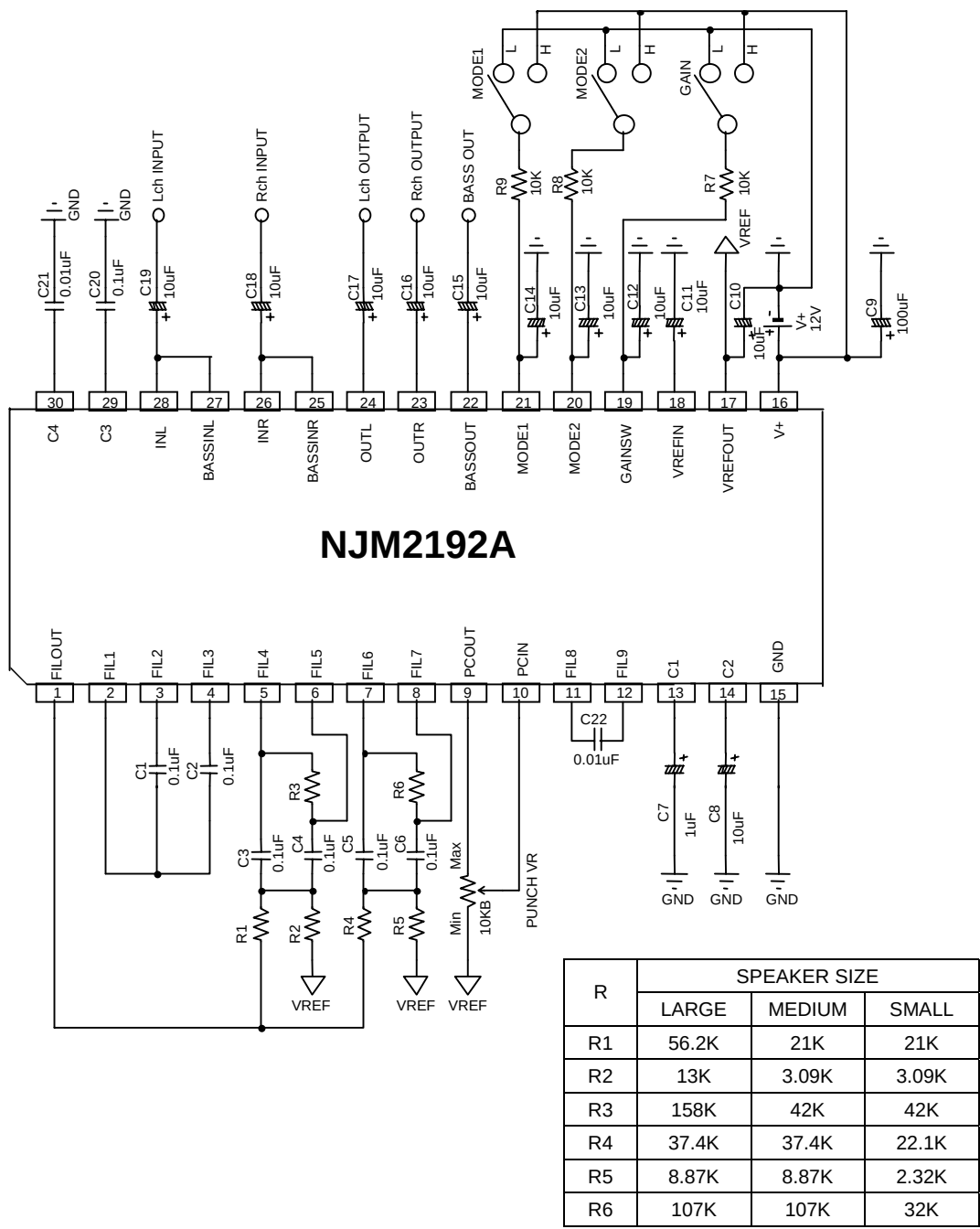
3 MODE SPEAKER SIZE

	MODE2	MODE1
Bypass	-	L
BASS1	L	H
BASS2	H	H

FUNCTION SETTING

NJM2192A

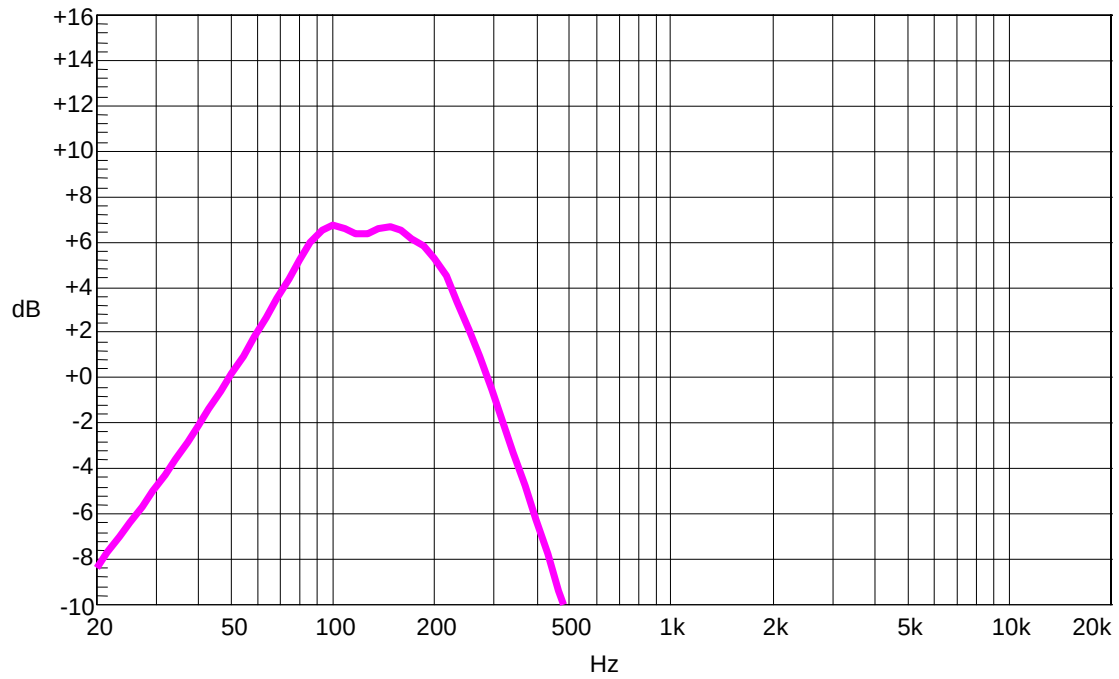
APPLICATION CIRCUIT(2)



■BASS1 MODE TYPICAL CHARACTERISTICS

NJM2192(TruBass) GAIN STRUCTURE

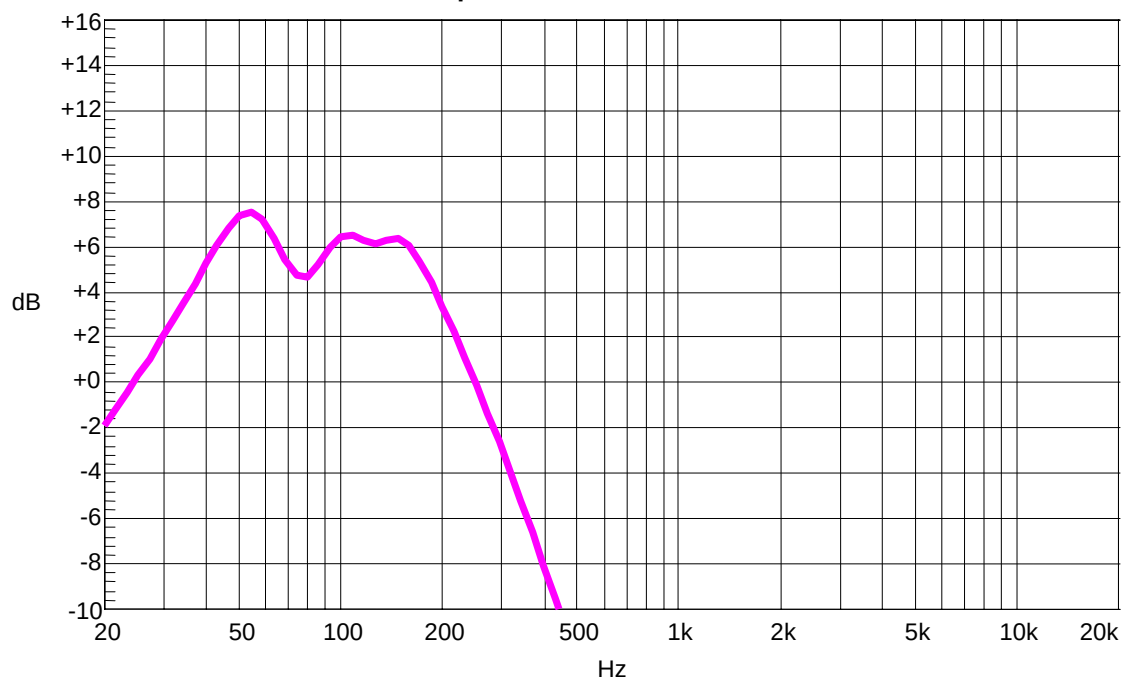
“Speaker Size : Small”



Vin=-12.2dBV(245mVrms), Lch In → Lch Out, Punch VR : MAX
V+ = 12V

NJM2192(TruBass) GAIN STRUCTURE

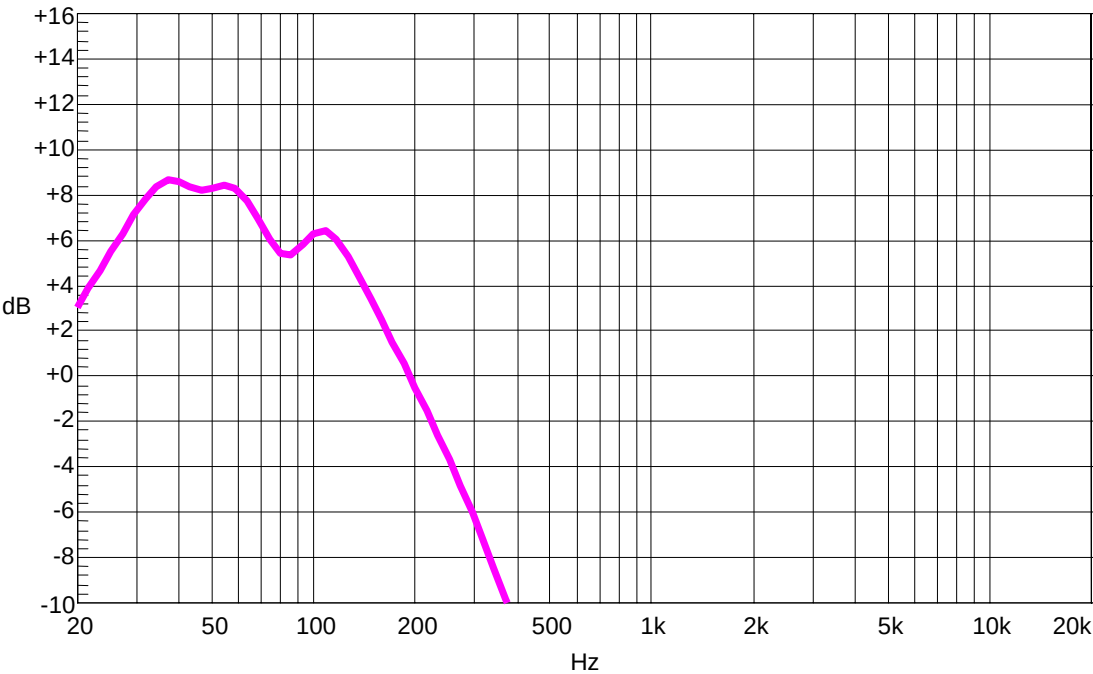
“Speaker Size : Medium”



Vin=-12.2dBV(245mVrms), Lch In → Lch Out, Punch VR : MAX
V+ = 12V

NJM2192A

NJM2192(TruBass) GAIN STRUCTURE
“Speaker Size : Large”

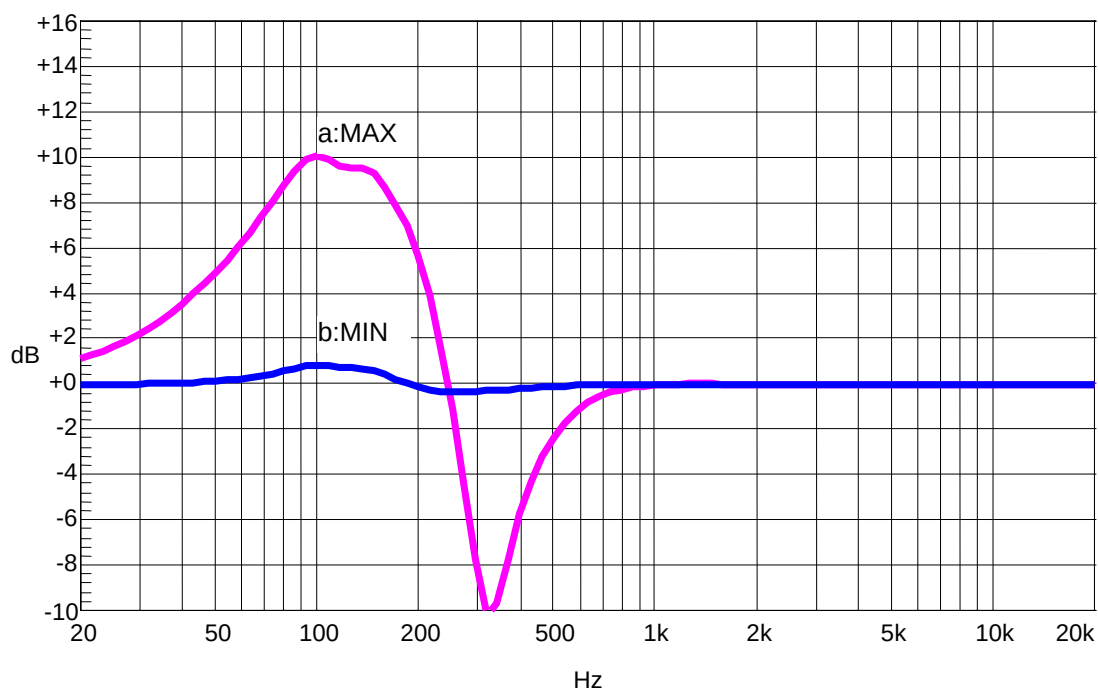


Vin=-12.2dBV(245mVrms), Lch In → Lch Out, Punch VR : MAX
V+ = 12V

■BASS2 MODE TYPICAL CHARACTERISTICS

NJM2192(TruBass) GAIN STRUCTURE

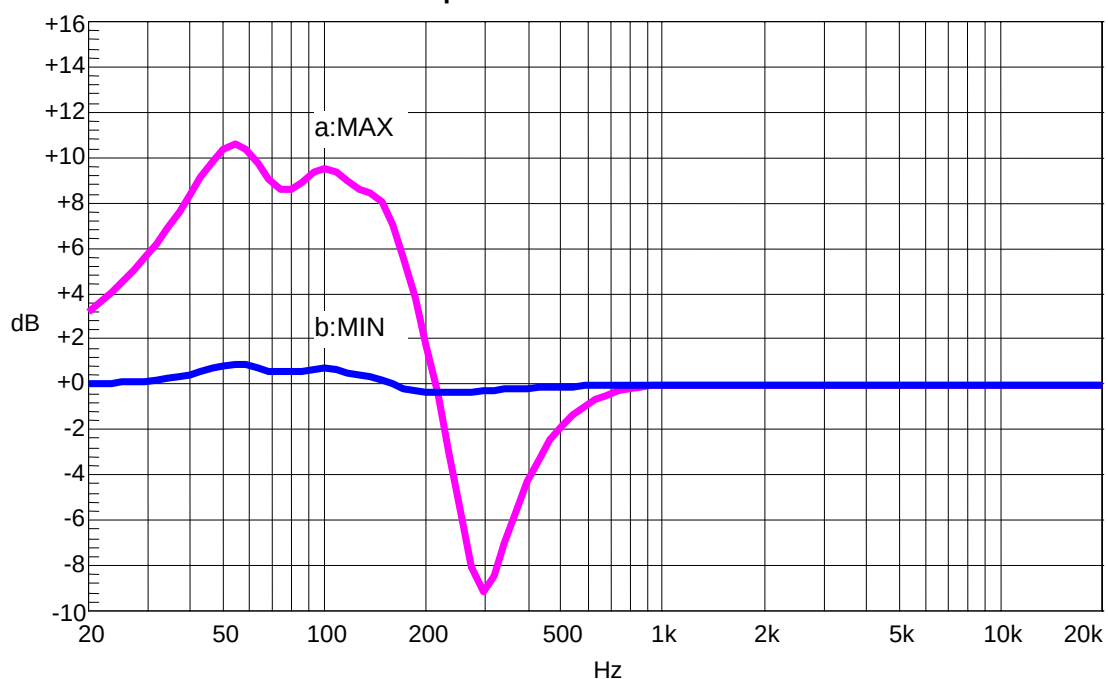
“Speaker Size : Small”



Vin=-12.2dBV(245mVrms), Lch In → Lch Out, Punch VR a:MAX, b:MIN
V+ = 12V

NJM2192(TruBass) GAIN STRUCTURE

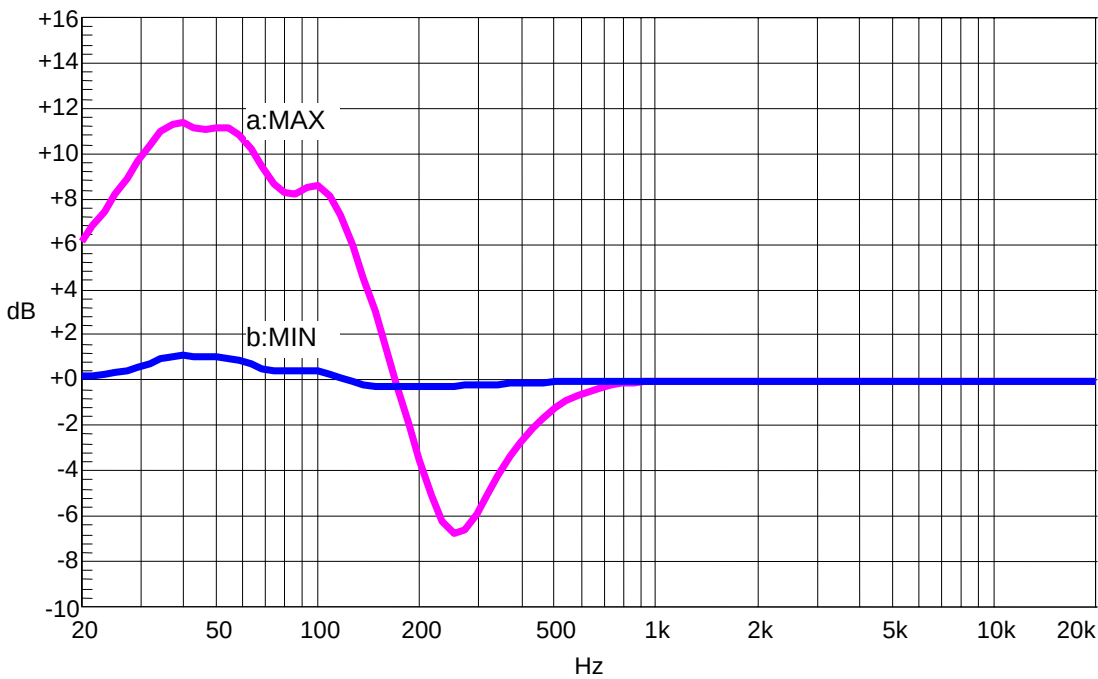
“Speaker Size : Medium”



Vin=-12.2dBV(245mVrms), Lch In → Lch Out, Punch VR a:MAX, b:MIN
V+ = 12V

NJM2192A

NJM2192(TruBass) GAIN STRUCTURE
“Speaker Size : Large”



Vin=-12.2dBV(245mVrms) Lch In → Lch Out, Punch VR a:MAX, b:MIN
V+ = 12V

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