

SRS WOW AUDIO PROCESSOR

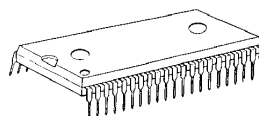
■GENERAL DESCRIPTION

The **NJM2700** is a SRS WOW audio processor, based on the technology of SRS Labs, Inc.

The **NJM2700** reproduces wide and clear sound. In addition, it provides rich bass sound.

The **NJM2700** is suitable for speaker system for personal computer, TV, CD radio-cassette, portable audio equipment, and others.

■PACKAGE OUTLINE



NJM2700L



NJM2700G



NJM2700FJ1

■FEATURES

- Operating Voltage 4.7 to 13V
- WOW Function
- Punch Control for TruBass 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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For further information, please contact:

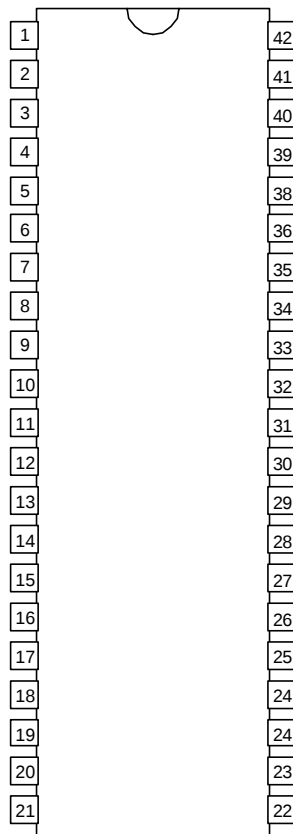
SRS Labs, Inc.

2909 Daimler Street. Santa Ana, CA 92705 USA

Tel:914-442-1070 Fax:914-852-1099 <http://www.srslabs.com>

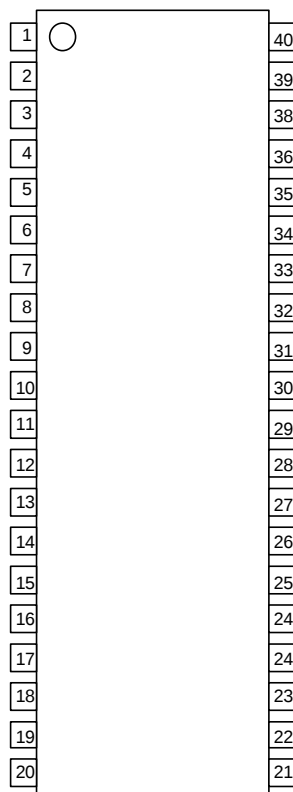
NJM2700

■PIN FUNCTION (SDIP42)



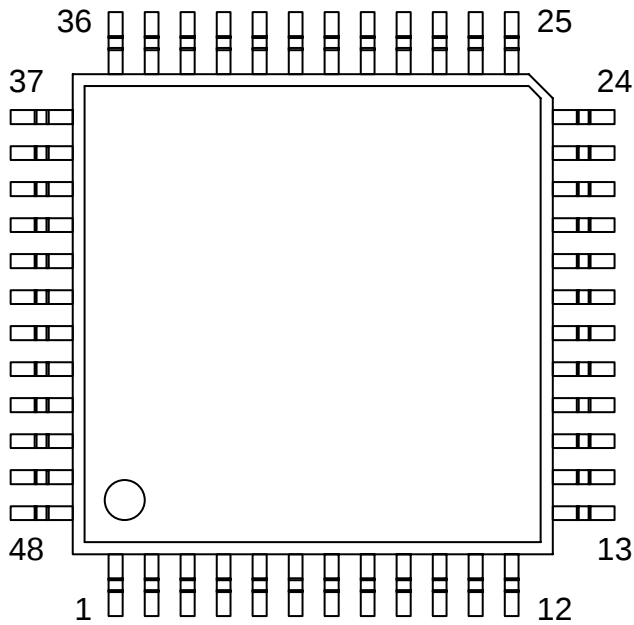
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2. C4	16. SFIL1	30. OUTR
3. FILOUT	17. SFIL2	31. OUTL
4. FIL1	18. SFIL3	32. TP3
5. FIL2	19. SVOL2	33. FFR4
6. FIL3	20. SVOL1	34. FFR3
7. FIL4	21. GND	35. FFR2
8. FIL5	22. V+	36. FFR1
9. FIL6	23. VREFIN	37. FFL4
10. FIL7	24. VREF	38. FFL3
11. TP1	25. MODE3	39. FFL2
12. PCOUT	26. MODE2	40. FFL1
13. PCIN	27. MODE1	41. INR
14. C1	28. TP2	42. INL

■PIN FUNCTION (SOP40)



1. C3	15. SEL1	29. OUTR
2. C4	16. SFIL2	30. OUTL
3. FILOUT	17. SFIL3	31. FFR4
4. FIL1	18. SVOL2	32. FFR3
5. FIL2	19. SVOL1	33. FFR2
6. FIL3	20. GND	34. FFR1
7. FIL4	21. V+	35. FFL4
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. MODE2	40. INL
13. C1	27. TP2	
14. C2	28. BASSOUT	

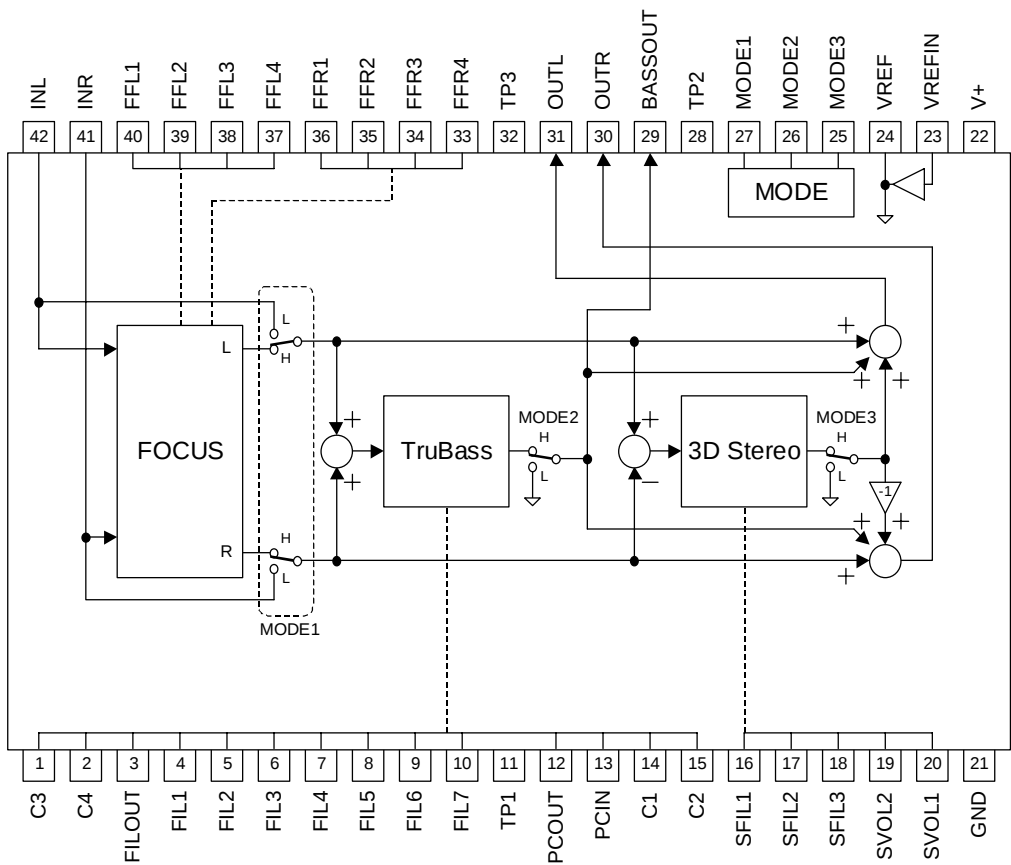
■PIN FUNCTION (QFP48)



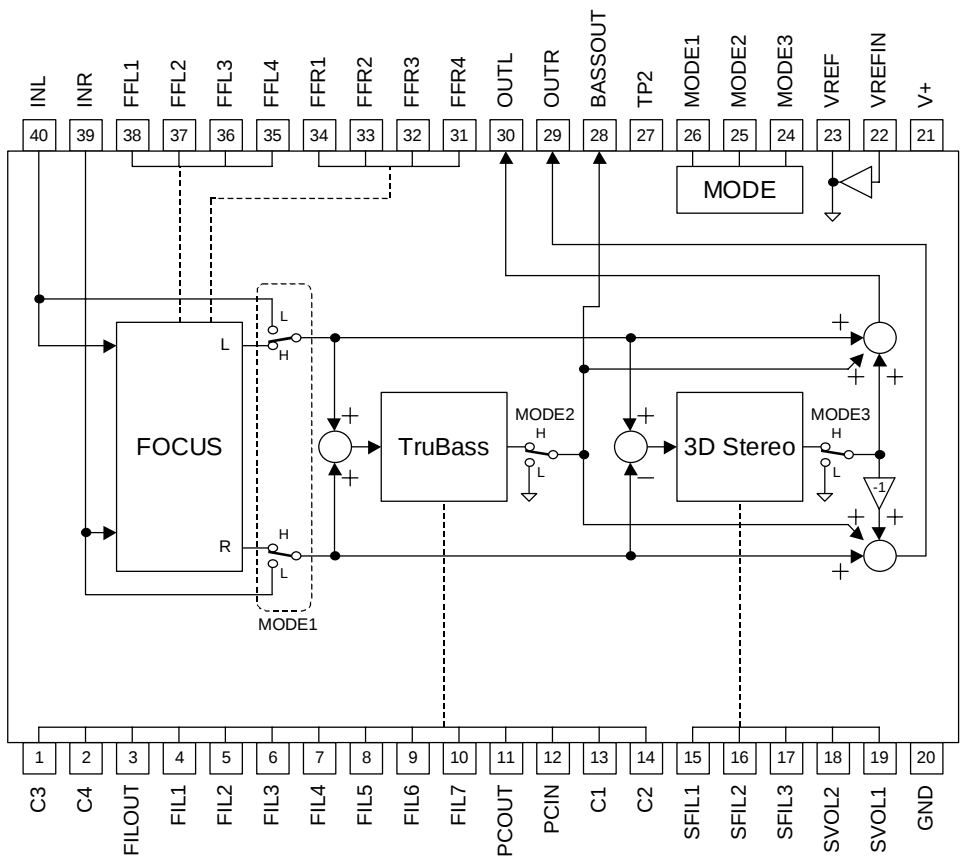
1. NC	17. SVOL1	33. FFR2
2. FIL3	18. GND	34. FFR1
3. FIL4	19. V+	35. FFL4
4. FIL5	20. VREFIN	36. NC
5. FIL6	21. VREF	37. NC
6. FIL7	22. MODE3	38. FFL3
7. PCOUT	23. MODE2	39. FFL2
8. PCIN	24. NC	40. FFL1
9. C1	25. NC	41. INR
10. C2	26. MODE1	42. INL
11. SFIL2	27. TP2	43. C3
12. NC	28. BASSOUT	44. C4
13. NC	29. OUTR	45. FILOUT
14. SFIL2	30. OUTL	46. FIL1
15. SFIL3	31. FFR4	47. FIL2
16. SVOL2	32. FFR3	48. NC

NJM2700

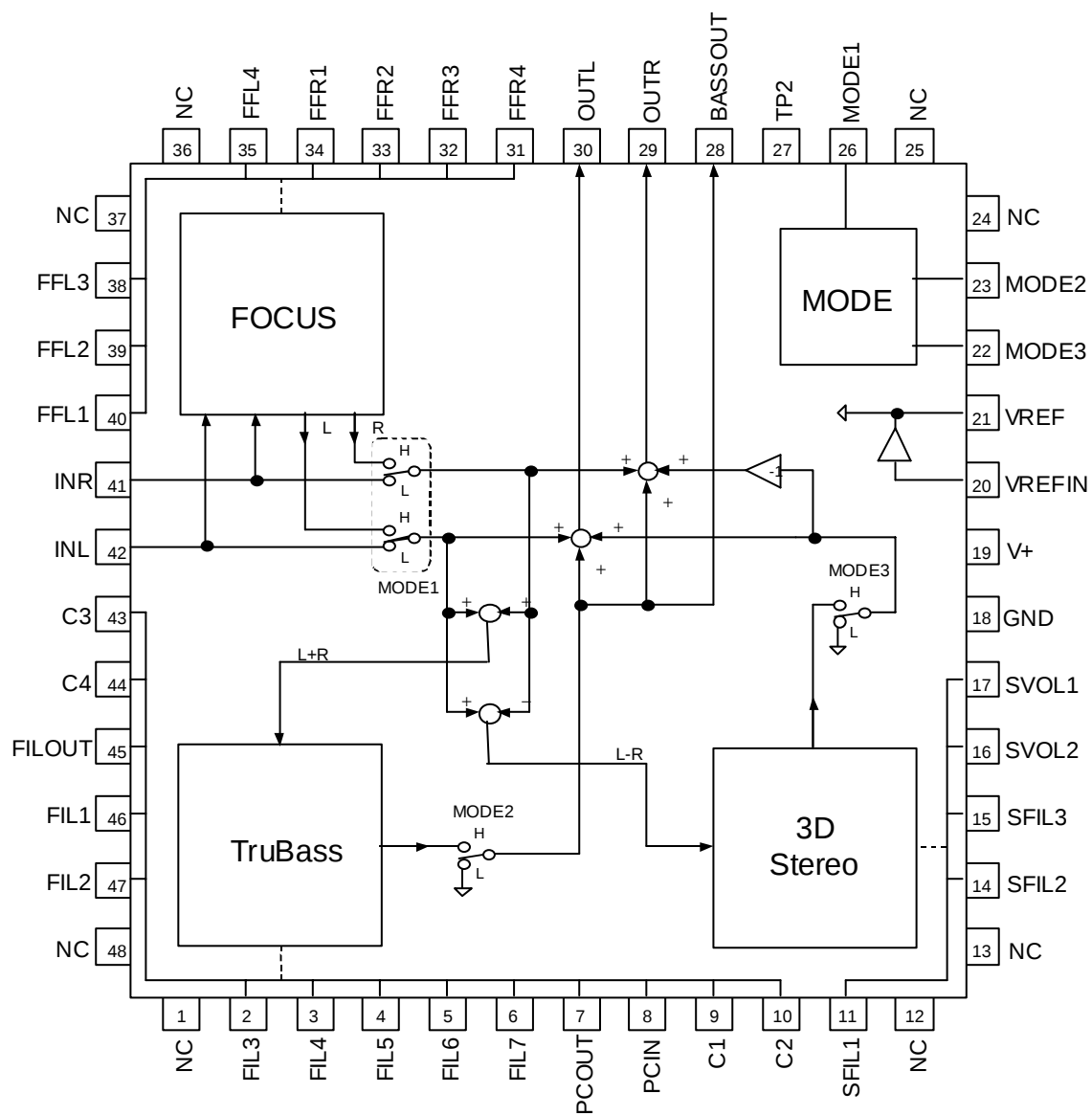
■BLOCK DIAGRAM (SDIP42)



■BLOCK DIAGRAM (SOP40)



■BLOCK DIAGRAM (QFP48)



NJM2700

■ABSOLUTE MAXIMUM RATING (Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V ⁺	15	V
Power Dissipation	P _D	(SDIP42) 700 (SOP40) 700 (QFP48) 450	mW
Operating Temperature Range	T _{opr}	-40 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

■ELECTRICAL CHARACTERISTICS (V⁺=12V, Ta=25°C, V_{IN}=-20dBV (=0.1Vrms), Speaker Size :Medium)

PARAMETER	SYMBOL		TEST CONDITION						MIN	TYP	MAX	UNIT
			INPUT		OUTPUT	MODE	PUNCH VR	WIDTH VR				
			L	R								
Operating Voltage	V ⁺		-	-	-	-	-	-	4.7	12.0	13.0	V
Operating Current	I _{CC}	No Signal	-	-	-	BYPASS	-	-	8.7	17.4	26.1	mA
			-	-	-	WOW	-	-	8.7	17.4	26.1	
Reference Voltage	V _{REF}	V ⁺ /2	-	-	-	-			5.8	6.0	6.2	V
Maximum Input Voltage	V _{IM}	f=1kHz THD=3%	V _{IN} -	- V _{IN}	L R	BYPASS	-	-	10.0 (32)	12.0 (40)	-	dBV (Vrms)
		f=100Hz THD=3%	V _{IN} V _{IN}	V _{IN} V _{IN}	L R	TruBass	MAX	-	-	-2.7 (0.73)	-	
		f=125Hz THD=3%	V _{IN} -	- V _{IN}	L R	3D- STEREO	-	MAX	-	0.5 (1.1)	-	
		f=125Hz THD=3%	V _{IN} V _{IN}	-V _{IN} -V _{IN}	L R	3D- STEREO	-	MAX	-	-5.5 (0.53)	-	
		f=10kHz THD=3%	V _{IN} -	- V _{IN}	L R	WOW	MAX	MAX	-5.8 (0.51)	-3.8 (0.65)	-	
		f=100Hz THD=3%	V _{IN} V _{IN}	V _{IN} V _{IN}	L R	WOW	MAX	MAX	-5.0 (0.56)	-3.0 (0.71)	-	
		f=10kHz THD=3%	V _{IN} V _{IN}	-V _{IN} -V _{IN}	L R	WOW	MAX	MAX	-10.9 (0.29)	-8.9 (0.36)	-	
Output Noise	V _{NO}	R _G =0Ω A-Weighted	0	0	L R	BYPASS	-	-	-	-110 (3)	-100 (10)	dBV (μVrms)
		R _G =0Ω A-Weighted	0	0	L R	TruBass	MAX	-	-	-80 (100)	-	
		R _G =0Ω A-Weighted	0	0	L R	3D- STEREO	-	MAX	-	-95 (18)	-	
		R _G =0Ω A-Weighted	0	0	L R	WOW	MAX	MAX	-	-80 (100)	-75 (180)	

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

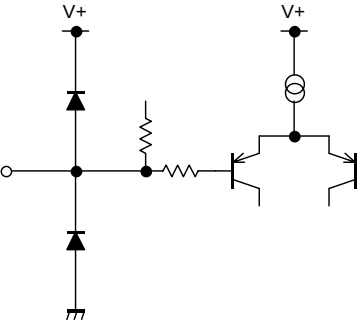
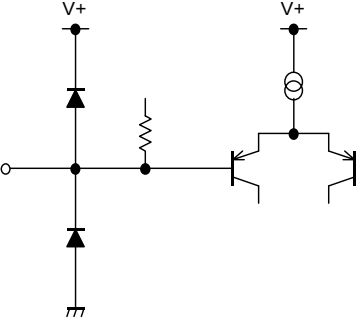
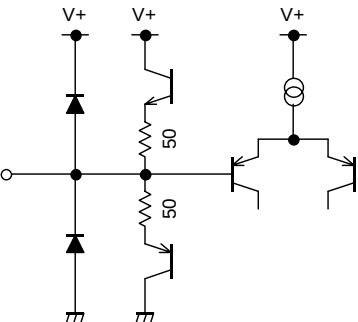
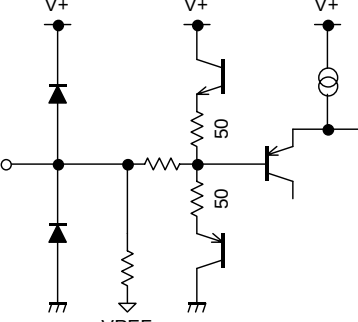
PARAMETER	SYMBOL	TEST CONDITION							MIN	TYP	MAX	UNIT
		INPUT		OUTPUT	MODE	PUNCH VR	WIDTH VR					
		L	R									
Total Harmonic Distortion	THD	f=1kHz	V _{IN} -	- V _{IN}	L R	BYPASS	-	-	-	0.005	0.01	%
		f=100Hz	V _{IN} V _{IN}	V _{IN} V _{IN}	L R	TruBass	MAX	-	-	0.1	-	
		f=1kHz	V _{IIN} -	- V _{IN}	L R	3D-STEREO	-	MAX	-	0.1	-	
		f=1kHz	V _{IN} -	- V _{IN}	L R	WOW	MAX	MAX	-	0.1	1.0	
BYPASS Gain	G _{VBYP}	f=1kHz	V _{IN} -	- V _{IN}	L R	BYPASS	-	-	-1.0	0.0	1.0	dB
SRS Gain	G _{SRS}	f=100Hz	V _{IN} V _{IN}	V _{IN} V _{IN}	L R	TruBass	MAX	-	12.8	14.8	16.8	dB
		f=100Hz	V _{IN} V _{IN}	V _{IN} V _{IN}	L R	TruBass	MIN	-	-2.3	1.7	5.7	
		f=125Hz	V _{IN} -	- V _{IN}	L R	3D-STEREO	-	MAX	9.4	11.4	13.4	
		f=125Hz	V _{IN} -	- V _{IN}	L R	3D-STEREO	-	MIN	-1.5	0.5	2.5	
		f=100Hz	V _{IN} -	- V _{IN}	L R	WOW	MAX	MAX	13.8	15.8	17.8	
		f=10kHz	V _{IN} -	- V _{IN}	L R	WOW	MAX	MAX	13.9	15.9	17.9	
MODE Select Control Voltage	V _{MODE}	V _{IN} =High Level							2.0	-	V ⁺	V
		V _{IN} =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
WOW	H	H	H

NJM2700

PIN DESCRIPTION

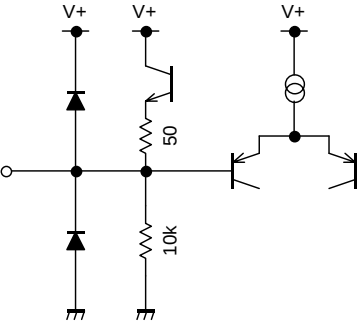
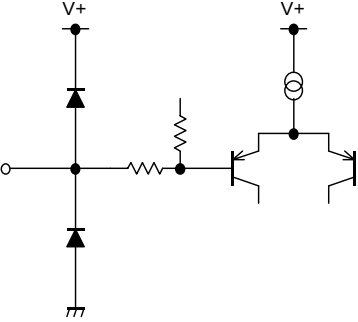
No.		SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
SDIP42	SOP40				
1 13 34 38	1 12 32 36	C3 PCIN FFR3 FFR1	Filter PUNCH Control VR Filter Filter		V+/2
2 5 19	2 5 18	C4 FIL2 SVOL2	Filter Filter WIDTH Control VR		V+/2
3 24 29 30 31 36 40	3 23 28 29 30 34 38	FILOUT VREF BASSOUT OUTR OUTL FFR1 FFL1	Filter Reference Voltage Output TruBass Output Rch Output Lch Output Filter Filter		V+/2
4	4	FIL1	Filter		V+/2

PIN DESCRIPTION

No.		SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
SDIP42	SOP40				
6 7 9 12 20 33 37	6 7 9 11 19 31 35	FIL3 FIL4 FIL5 PCOUT SVOL1 FFR4 FFL4	Filter Filter Filter PUNCH Control VR WIDTH Control VR Filter Filter		V+/2
8 10	8 10	FIL5 FIL7	Filter Filter		V+/2
11 28 32	- 27 -	TP1 TP2 TP3	Test Pin Test Pin Test Pin		-
14	13	C1	Filter		0V

NJM2700

PIN DESCRIPTION

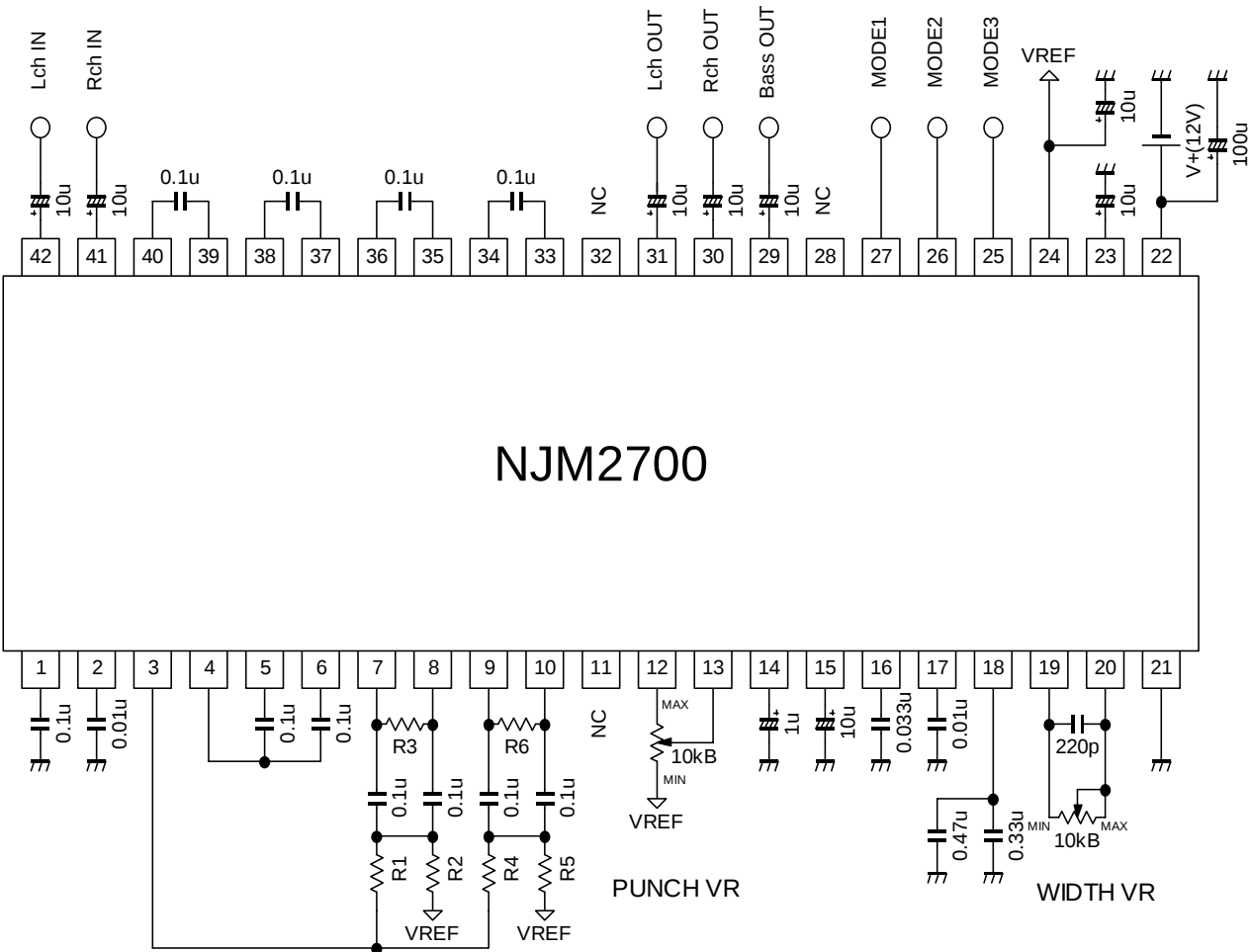
No.		SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
SDIP42	SOP40				
15	14	C2	Filter		0V
16 17 18	15 16 17	SFIL1 SFIL2 SFIL3	Filter Filter Filter		V+/2
21	20	GND	GND		0V
22	21	V+	Power Supply		V+

PIN DESCRIPTION

No.		SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
SDIP42	SOP40				
23	22	VREFIN	Reference Voltage Input		$V+/2$
25 26 27	24 25 26	MODE3 MODE2 MODE1	Mode3 SW Mode2 SW Mode1 SW		0V
35 39	33 37	FFR2 FFL2	Filter Filter		$V+/2$
41 42	39 40	INR INL	Rch Input Lch Input		$V+/2$

NJM2700

APPLICATION CIRCUIT (SDIP42)

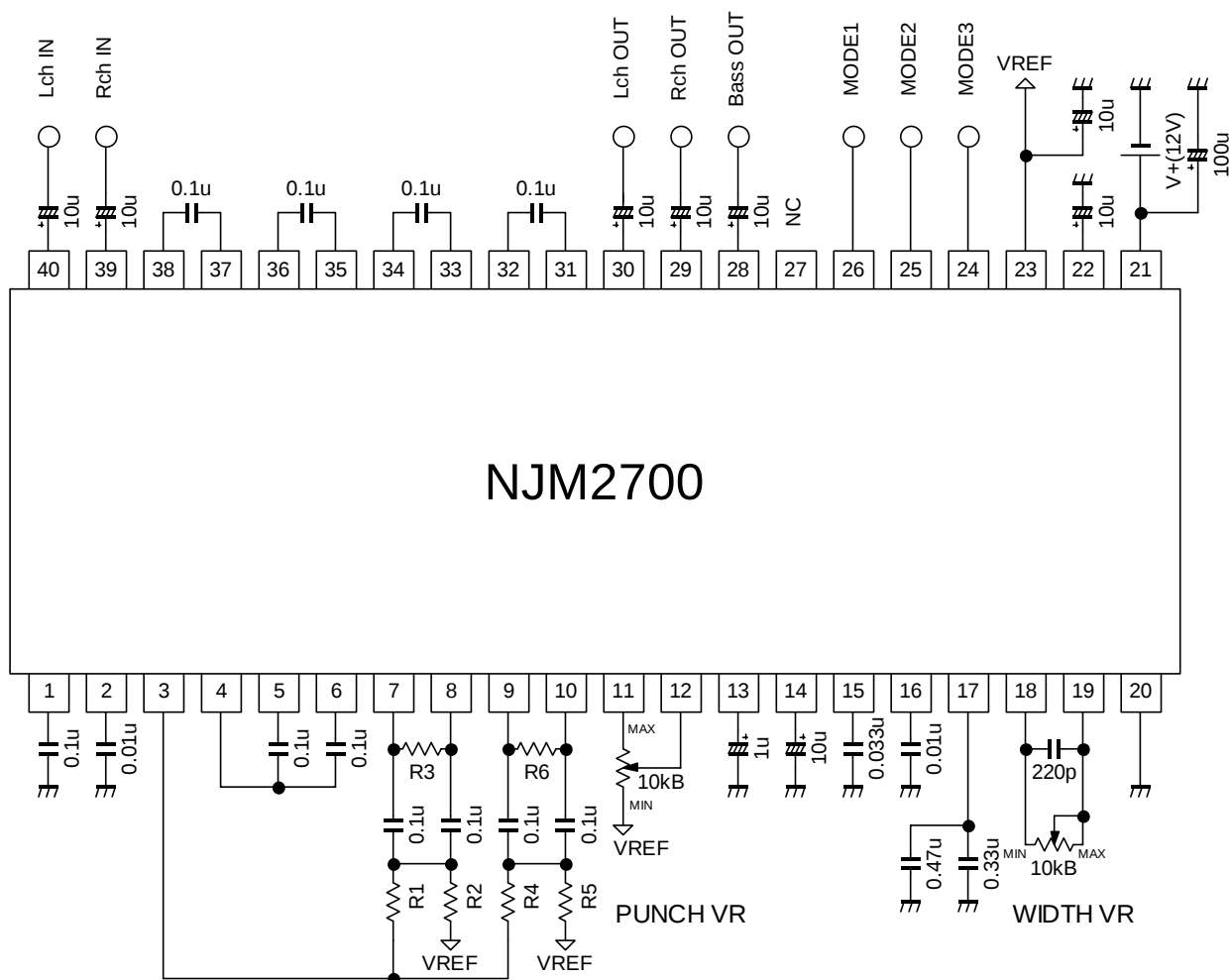


	SPEAKER SIZE		
	LARGE	MEDIUM	SMALL (TruBass mode only)
R1	56.2k	21k	21k
R2	13k	3.09k	3.09k
R3	158k	42k	42k
R4	37.4k	37.4k	22.1k
R5	8.87k	8.87k	2.32k
R6	107k	107k	32k

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 : $150\text{Hz} < f_o \leq 250\text{Hz}$

APPLICATION CIRCUIT (SOP40)



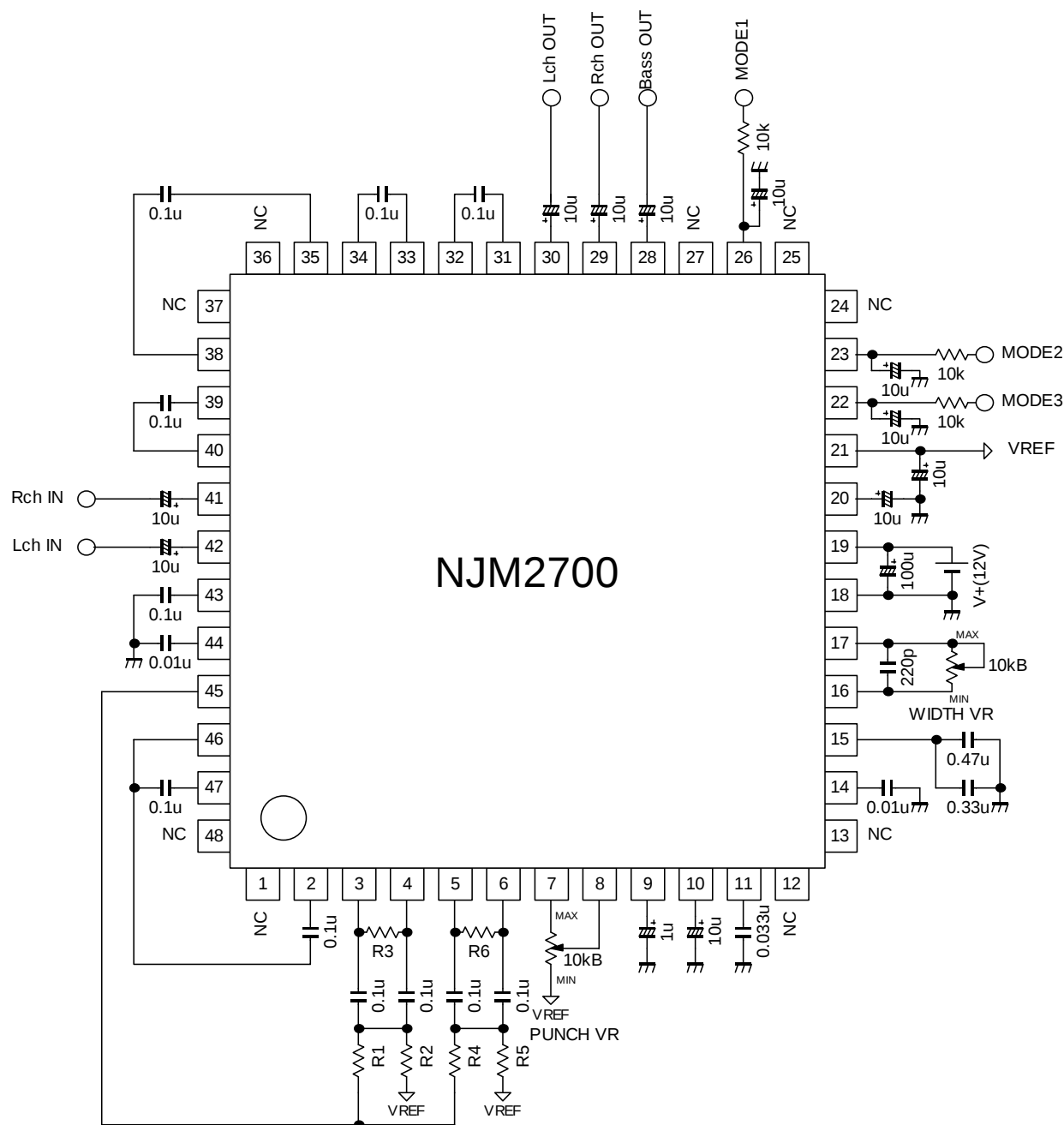
	SPEAKER SIZE		
	LARGE	MEDIUM	SMALL (TruBass mode only)
R1	56.2k	21k	21k
R2	13k	3.09k	3.09k
R3	158k	42k	42k
R4	37.4k	37.4k	22.1k
R5	8.87k	8.87k	2.32k
R6	107k	107k	32k

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

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

NJM2700

APPLICATION CIRCUIT (QFP48)

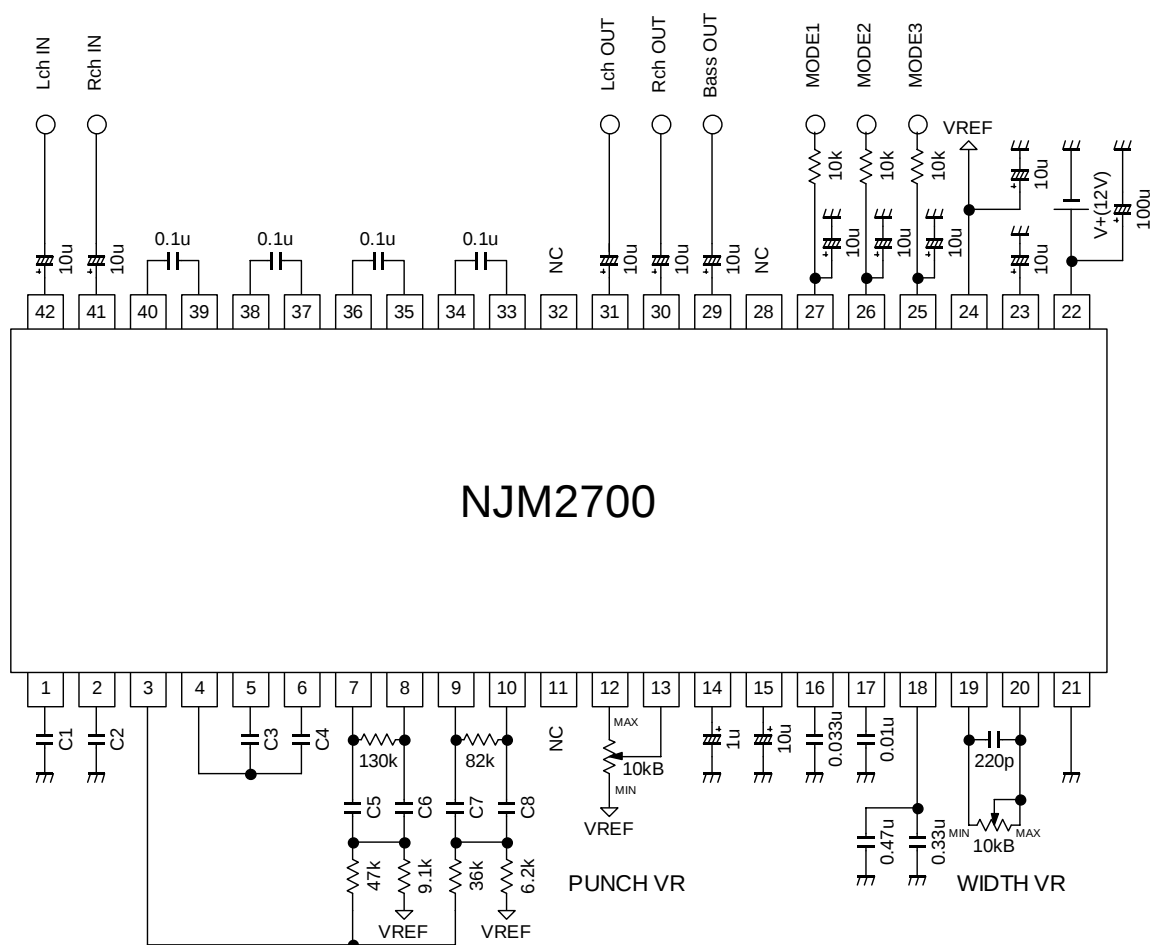


	SPEAKER SIZE		
	LARGE	MEDIUM	SMALL (TruBass mode only)
R1	56.2k	21k	21k
R2	13k	3.09k	3.09k
R3	158k	42k	42k
R4	37.4k	37.4k	22.1k
R5	8.87k	8.87k	2.32k
R6	107k	107k	32k

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 : $150\text{Hz} < f_o \leq 250\text{Hz}$

APPLICATION CIRCUIT 2 (SDIP42)



	C1	C2	C3 to C8
40Hz Setting	0.22	0.022	0.12
60Hz Setting	0.15	0.015	0.082
100Hz Setting	0.1	0.01	0.047
150Hz Setting	0.068	0.0068	0.033
200Hz Setting	0.047	0.0047	0.027
250Hz Setting	0.039	0.0039	0.022
300Hz Setting	0.033	0.0033	0.018
400Hz Setting	0.022	0.0022	0.012

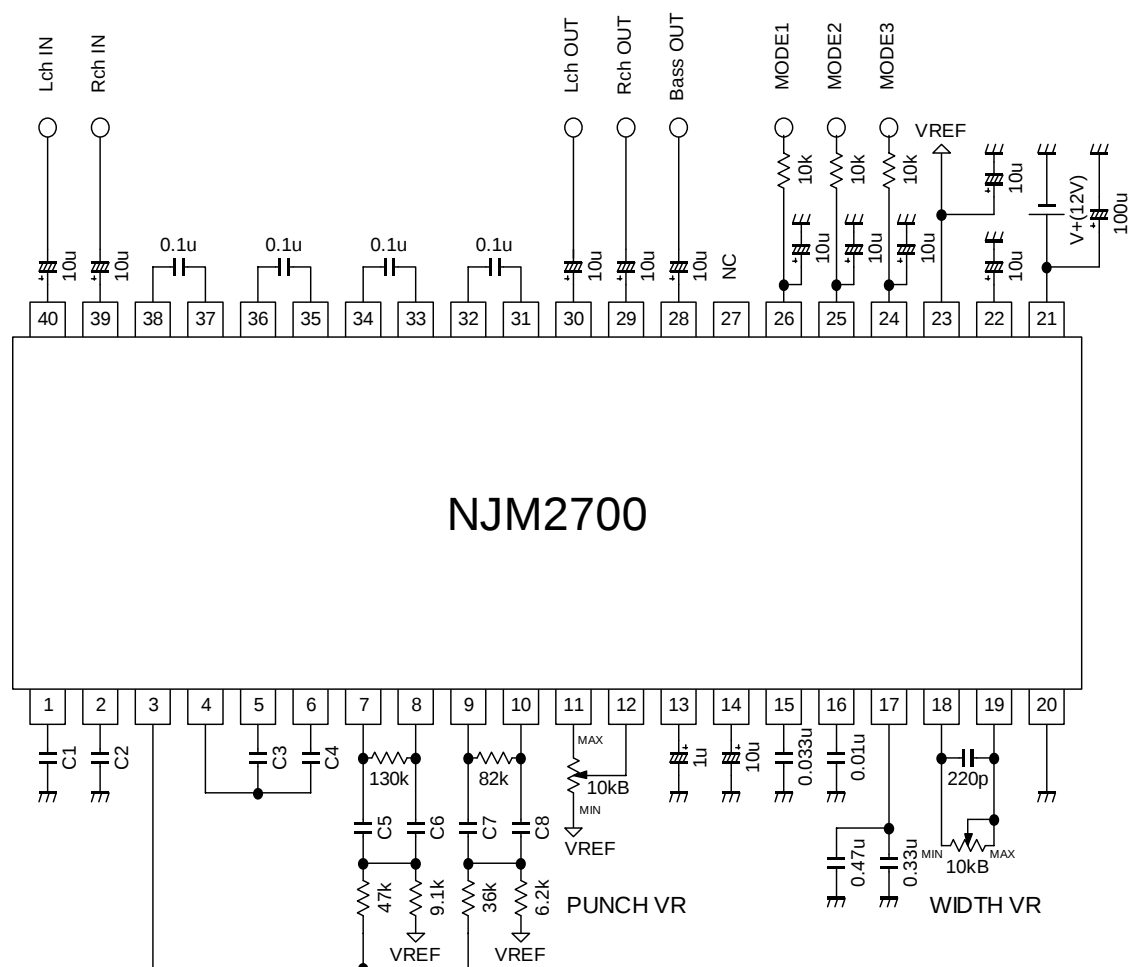
Unit: μF

•Speaker Size Setting

Choose speaker size in accordance with f_o of the speaker.
 (EX.) In the case of $f_o = 250\text{Hz}$: 250Hz Setting.
 Decide it after you confirm effect with the actual application.

NJM2700

APPLICATION CIRCUIT 2 (SOP40)

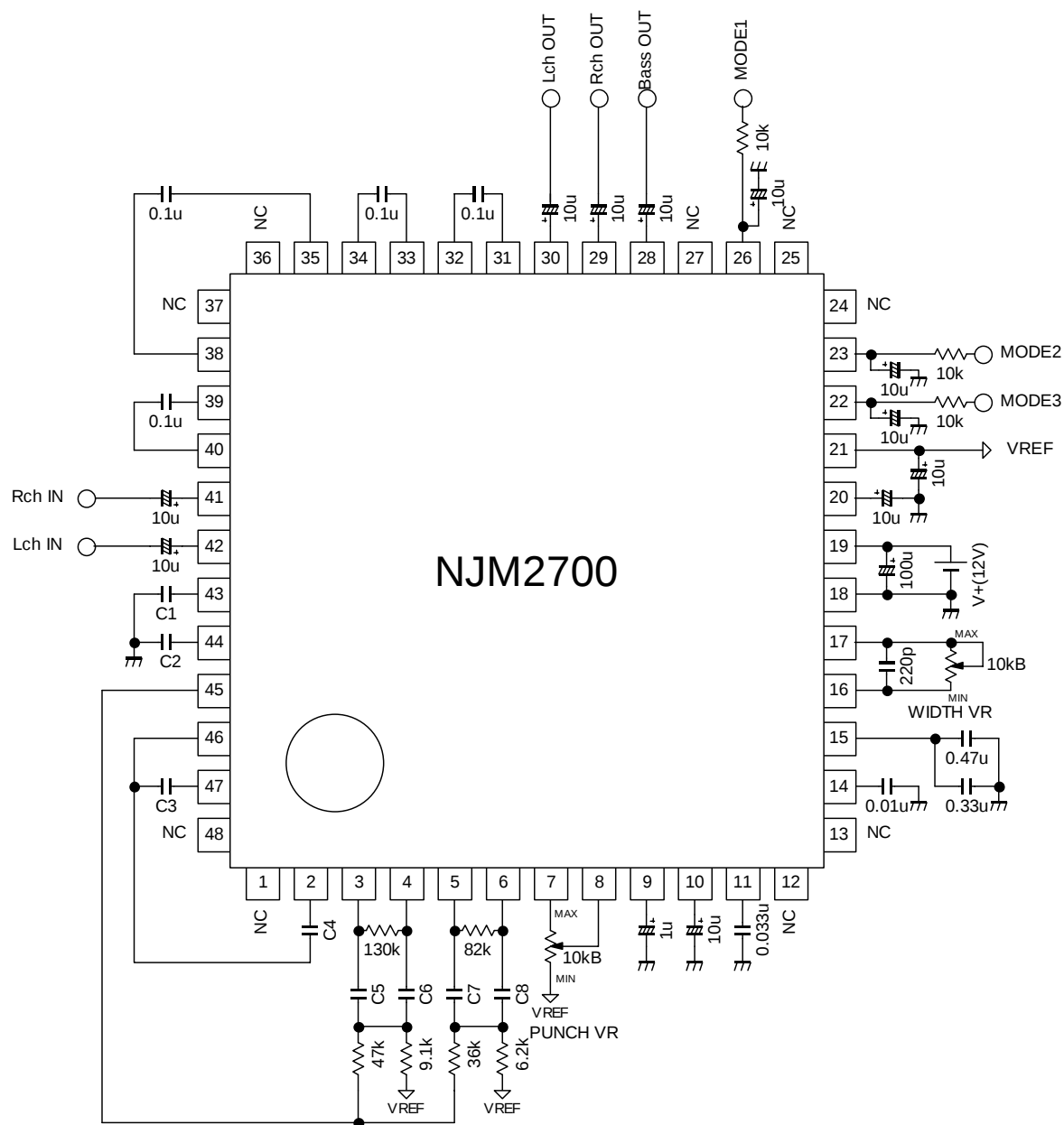


	C1	C2	C3 to C8
40Hz Setting	0.22	0.022	0.12
60Hz Setting	0.15	0.015	0.082
100Hz Setting	0.1	0.01	0.047
150Hz Setting	0.068	0.0068	0.033
200Hz Setting	0.047	0.0047	0.027
250Hz Setting	0.039	0.0039	0.022
300Hz Setting	0.033	0.0033	0.018
400Hz Setting	0.022	0.0022	0.012

Unit: μF

- Speaker Size Setting
Choose speaker size in accordance with f_0 of the speaker.
(EX.) In the case of $f_0 = 250\text{Hz}$: 250Hz Setting.
Decide it after you confirm effect with the actual application.

APPLICATION CIRCUIT 2 (QFP48)



	C1	C2	C3 to C8
40Hz Setting	0.22	0.022	0.12
60Hz Setting	0.15	0.015	0.082
100Hz Setting	0.1	0.01	0.047
150Hz Setting	0.068	0.0068	0.033
200Hz Setting	0.047	0.0047	0.027
250Hz Setting	0.039	0.0039	0.022
300Hz Setting	0.033	0.0033	0.018
400Hz Setting	0.022	0.0022	0.012

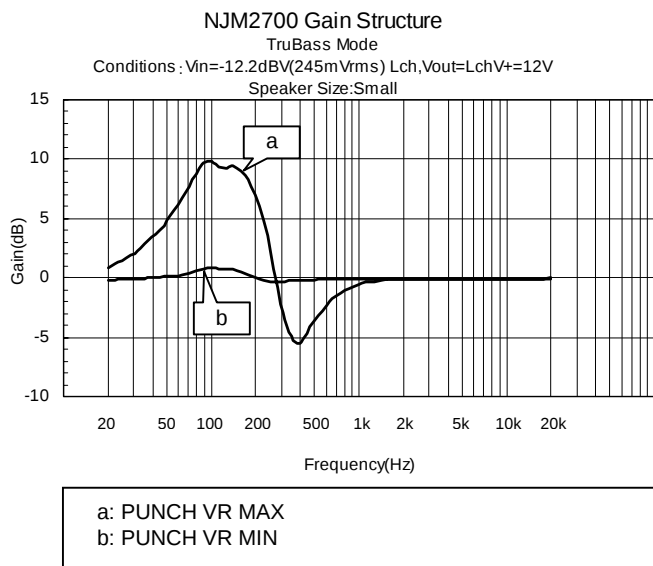
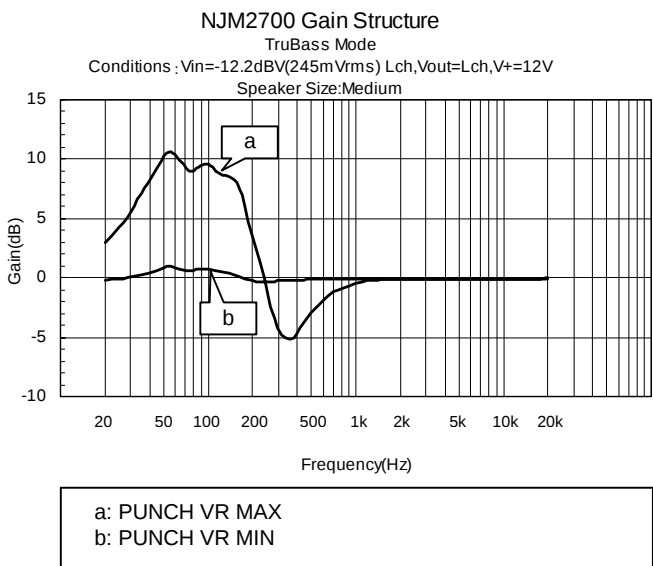
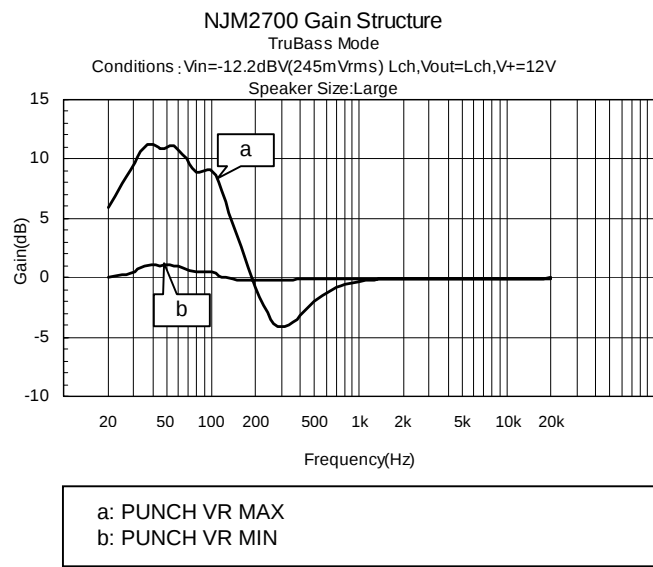
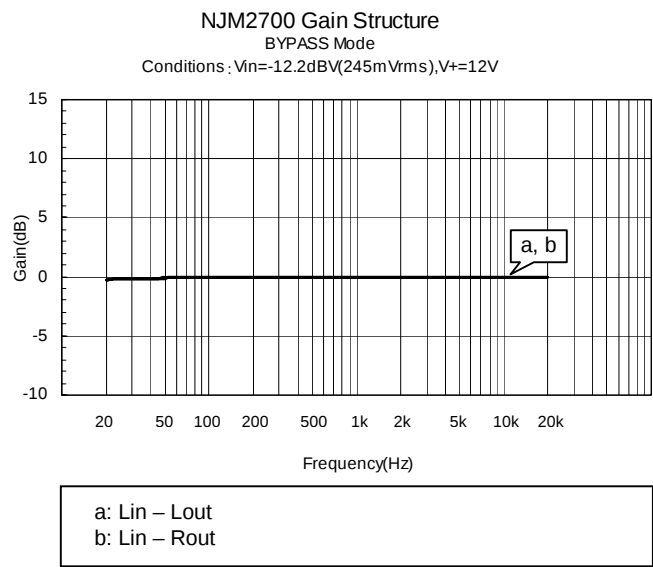
Unit: μF

•Speaker Size Setting

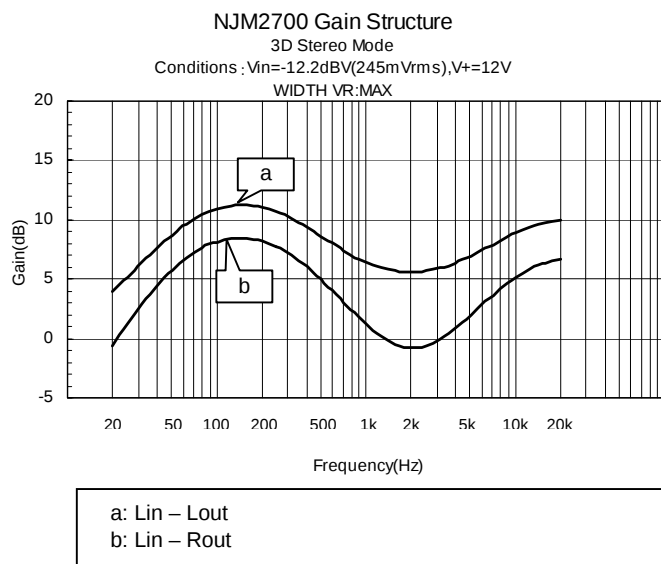
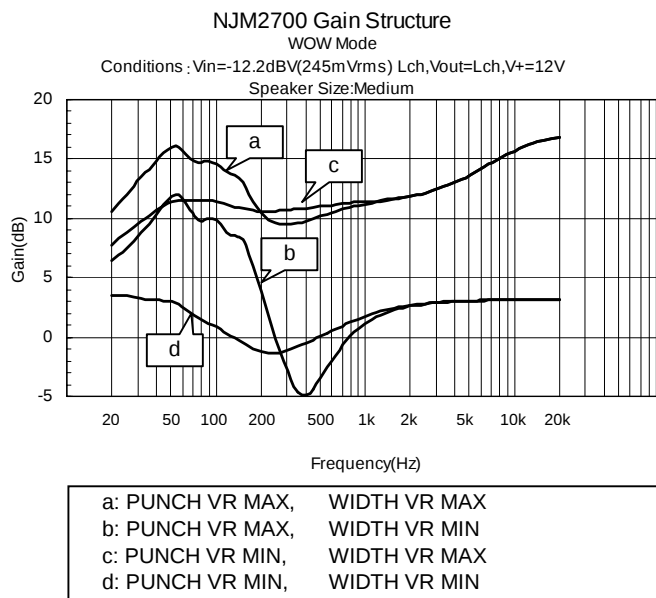
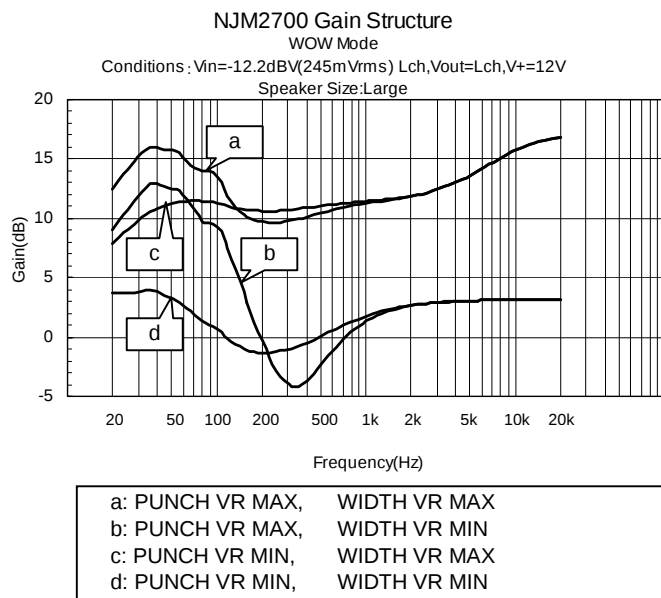
Choose speaker size in accordance with f_0 of the speaker.
 (EX.) In the case of $f_0 = 250\text{Hz}$: 250Hz Setting.
 Decide it after you confirm effect with the actual application.

NJM2700

TYPICAL CHARACTERISTICS



■TYPICAL CHARACTERISTICS



[CAUTION]

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