



SPEAKER ELEVATION AUDIO PROCESSOR with A/V Focus Filter

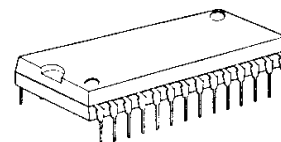
■ GENERAL DESCRIPTION

The **NJM2184** is a speaker elevation audio processor with A/V Focus Filter, based on SRS Focus technology. It is capable of raising sound image.

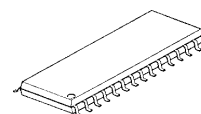
In addition, the **NJM2184** includes the A/V Focus Filter to reduce harsh sound when the speakers are directly put on hard-surface floor.

The **NJM2184** is suitable for almost all car audio, Projection TV, radio cassette, and then.

■ PACKAGE OUTLINE



NJM2184L



NJM2184M

■ FEATURES

- Operating Voltage (4.7 to 13V)
- Low Operating Current (7.0mA typ.)
- Low Output Noise (15 μ Vrms typ.)
- Adjusted by LF Elevation, HF Elevation, and Bass Compensation Volume
- Internal A/V Focus Filter
- Bipolar Technology
- Package Outline SDIP28,SDMP30

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SRS Labs requires that all users of the NJM2184 must enter into a license agreement directly with SRS Labs if the royalty is not included in the purchase price. SRS Labs also requires any users to comply with all rules and regulations as outlined in the SRS Trademark Usage Manual.

For further information, please contact:

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■ ABSOLUTE MAXIMUM RATING (Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V ⁺	15	V
Power Dissipation	P _D	(SDIP28)700 (SDMP30)700	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)

PARAMETER	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Operating Voltage	V ⁺			4.7	12.0	13.0	V
Supply Current	I _{CC}	No Signal		-	7.0	10.5	mA
Reference Voltage	V _{REF}	V ⁺ /2		5.8	6.0	6.2	V
Maximum Input Voltage	V _{INMAX}	f=1kHz at T.H.D.=3%	Bypass Mode	7.79 (2.45)	11.8 (3.88)	-	dBV (Vrms)
			Focus Mode	-4.71 (0.58)	-1.21 (0.87)	-	
			A/V Focus Mode	-5.21 (0.55)	-1.71 (0.82)	-	
		f=70Hz at T.H.D.=3% Controls ∞	Bypass Mode	-	11.8 (3.88)	-	
			Focus Mode	-	0.77 (1.1)	-	
			A/V Focus Mode	-	0.77 (1.1)	-	
		f=10kHz at T.H.D.=3% Controls ∞	Bypass Mode	-	11.8 (3.88)	-	
			Focus Mode	-	-8.71 (0.37)	-	
			A/V Focus Mode	-	-8.71 (0.37)	-	
Output Noise	V _{NOISE}	Vin=V _{REF} A-weight Controls ∞	Focus Mode	-	-94.0 (20.0)	-88.0 (40.0)	dBV (μVrms)
			A/V Focus Mode	-	-94.0 (20.0)	-88.0 (40.0)	
		Vin=V _{REF} A-weight Controls Center	Focus Mode	-	-96.5 (15.0)	-	
			A/V Focus Mode	-	-96.5 (15.0)	-	
		Vin=V _{REF} A-weight Controls 0	Focus Mode	-	-96.5 (15.0)	-	
			A/V Focus Mode	-	-96.5 (15.0)	-	

■ ELECTRICAL CHARACTERISTICS($V^+=12V, T_a=25^\circ C$)

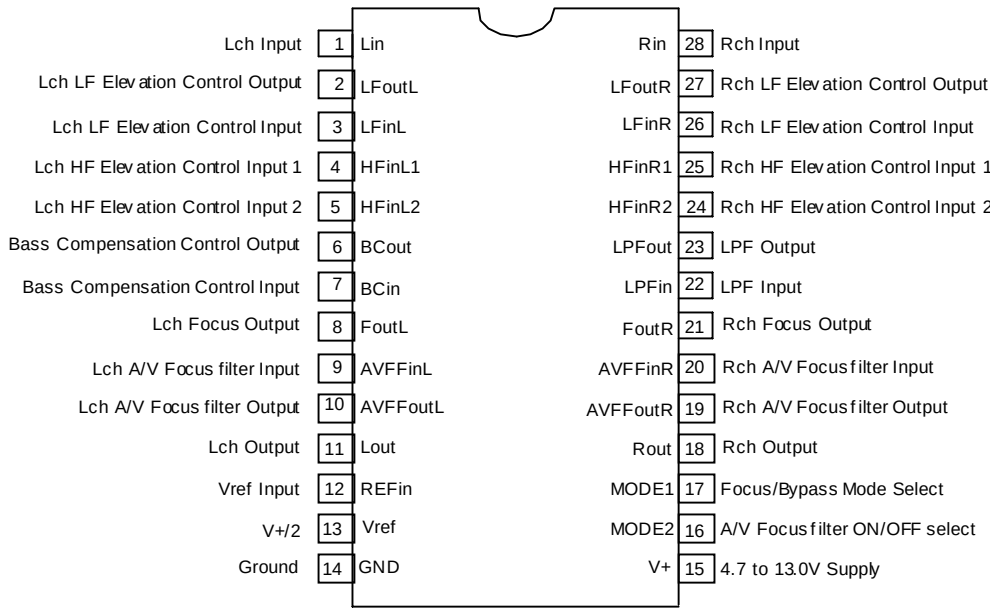
PARAMETER	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Noise	V_{NOISE}	$V_{in}=V_{REF}$ DIN-AUDIO Controls ∞	Focus Mode	-	-90.1 (30.0)	-	dBV (μV_{rms})
			A/V Focus Mode	-	-90.1 (30.0)	-	
		$V_{in}=V_{REF}$ DIN-AUDIO Controls Center	Focus Mode	-	-94.0 (20.0)	-	
			A/V Focus Mode	-	-94.0 (20.0)	-	
		$V_{in}=V_{REF}$ DIN-AUDIO Controls 0	Focus Mode	-	-94.0 (20.0)	-	
			A/V Focus Mode	-	-96.5 (15.0)	-	
Channel Balance	CH_{BAL}	$V_{in}=-17.2dBV$ $f=1kHz$ Controls ∞	Focus Mode	-1.0	0.0	1.0	dB
			A/V Focus Mode	-1.0	0.0	1.0	
Total Harmonic Distortion	THD	$V_{in}=-17.2dBV$ Lch $f=1kHz$ Controls ∞	Focus Mode	-	0.05	0.20	%
			A/V Focus Mode	-	0.09	0.30	
BYPASS Gain	G_{BYP}	$V_{in}=-17.2dBV$ $f=1kHz$	Bypass Mode	-1.0	0.0	1.0	dB
FOCUS Gain1	G_{FOC1}	$V_{in}=-17.2dBV$ $f=70Hz$ Controls ∞	Focus Mode	8.5	10.5	12.5	dB
FOCUS Gain2	G_{FOC2}	$V_{in}=-17.2dBV$ $f=20kHz$ Controls ∞	Focus Mode	19.0	21.0	23.0	dB
AVF Gain	G_{AVF}	$V_{in}=-17.2dBV$ $f=800Hz$ Controls 0	A/V Focus Mode	-12.0	-10.0	-8.0	dB
MODE Select Control Voltage	V_{MODE}	$V_{in}= \text{High Level}$		2.0	-	V^+	V
		$V_{in}= \text{Low Level}$		0.0	-	0.7	

■ MODE Switch

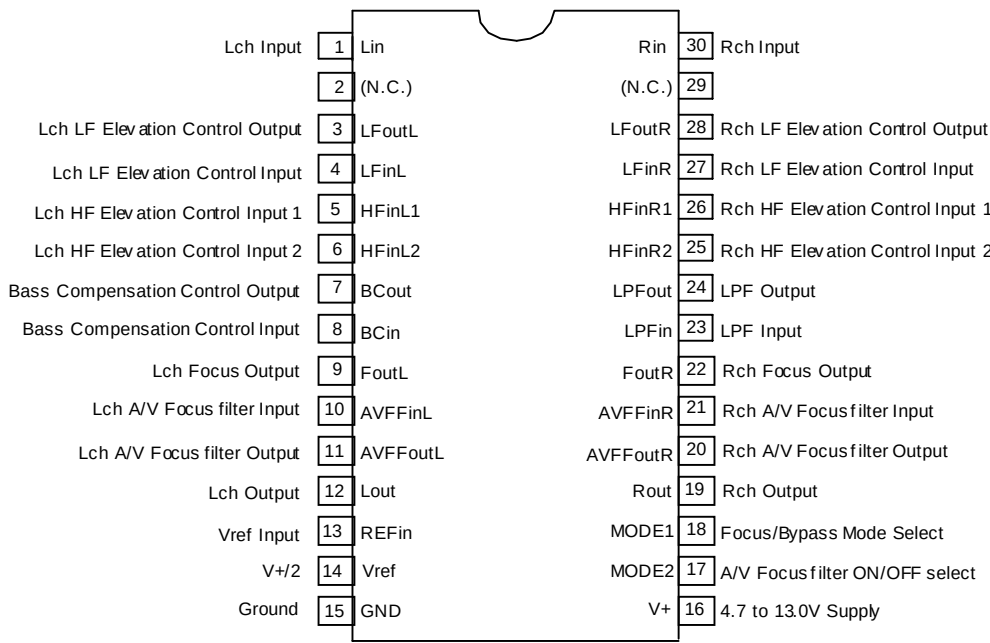
	MODE1	MODE2
Bypass Mode	L	-
Focus Mode	H	L
A/V Focus Mode	H	H

PIN FUNCTION

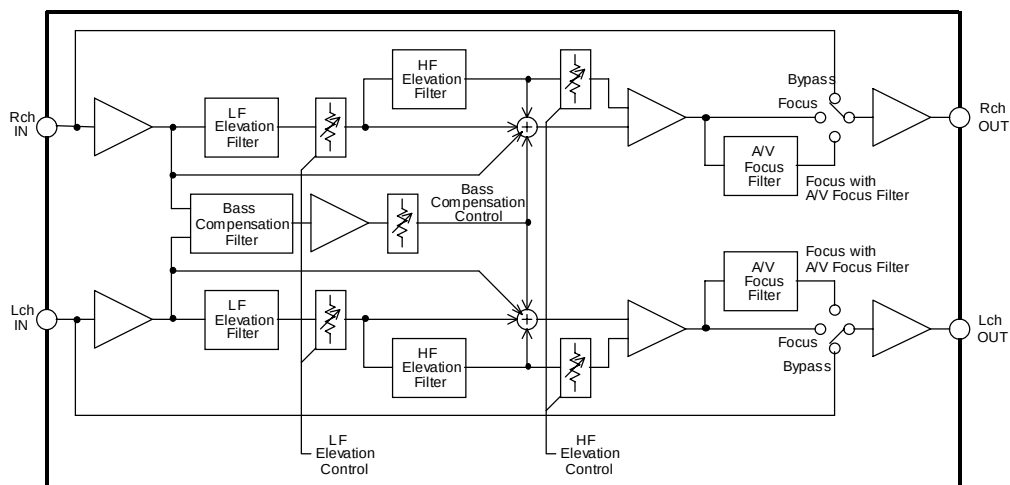
SDIP28



SDMP30

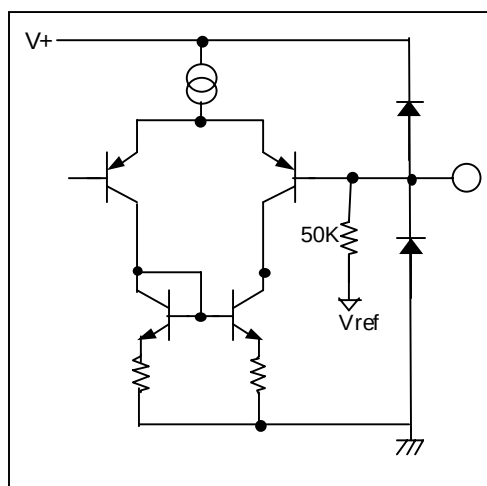


■ BLOCK DIAGRAM

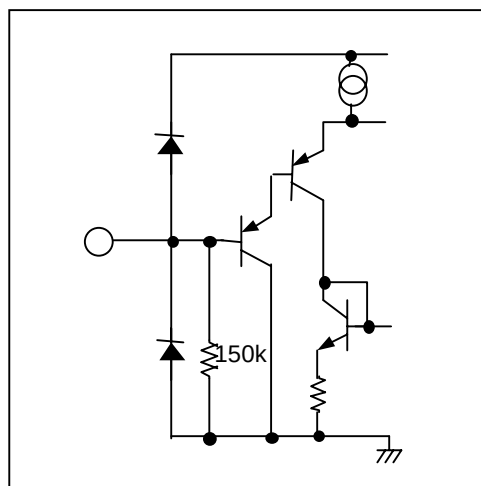


■ PIN DESCRIPTION

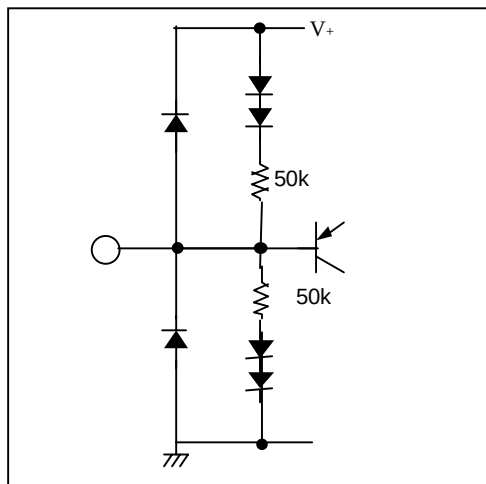
Lin,Rin



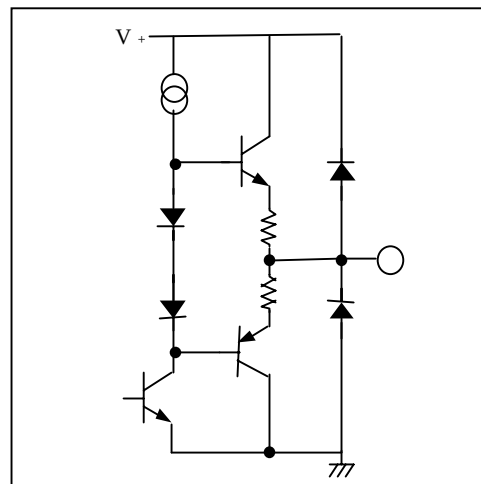
MODE1, MODE2



REFin



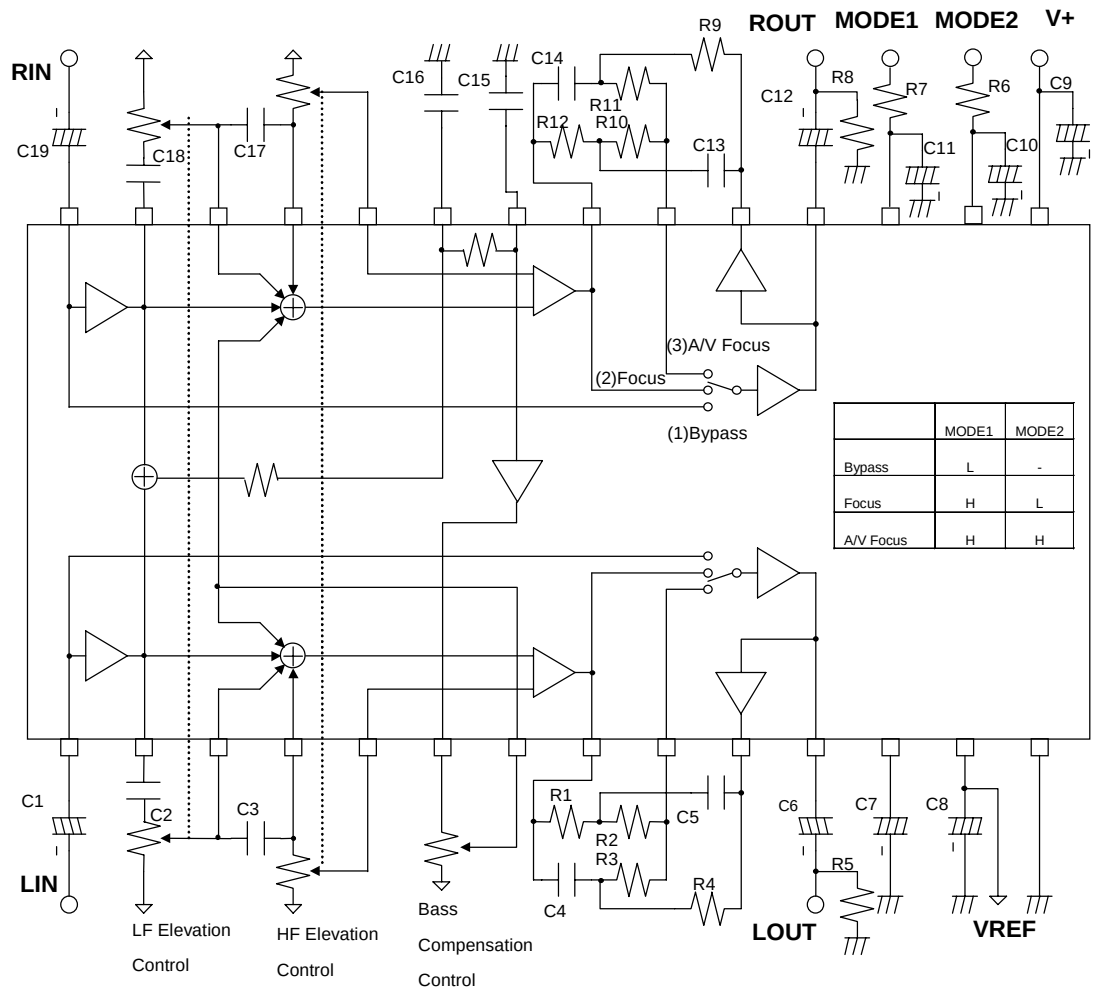
Lout,Rout,Vref





APPLICATION CIRCUIT

SDIP28

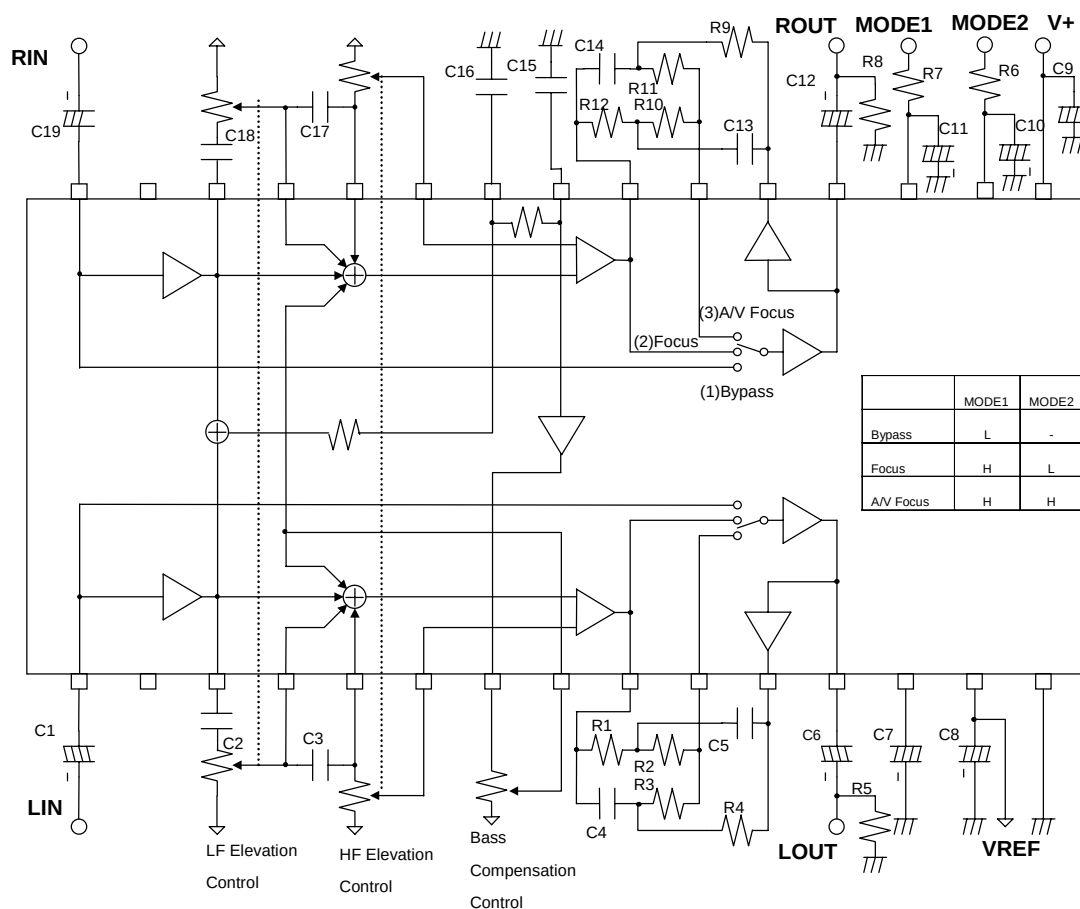


PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1,C6,C7	10uF		R5,R6,R8	10kΩ	
C10,C11,C12,C19	10uF		R1,R12	1.8kΩ	±5%
C8	33uF		R2,R3,R7,R10,R11	22kΩ	±5%
C9	100uF		R4,R9	5.6kΩ	±5%
C2,C18	0.22uF	±5%			
C3,C17	3900pF	±5%			
C4,C14,C15	0.01uF	±5%			
C5,C13	0.47uF	±5%			
C16	0.1uF	±5%			

- LF Elevation Control: 1kB Single-shaft Dual-unit
- HF Elevation Control: 10kB Single-shaft Dual-unit
- Bass Compensation Control: 1kB Single-shaft Single-unit

APPLICATION CIRCUIT

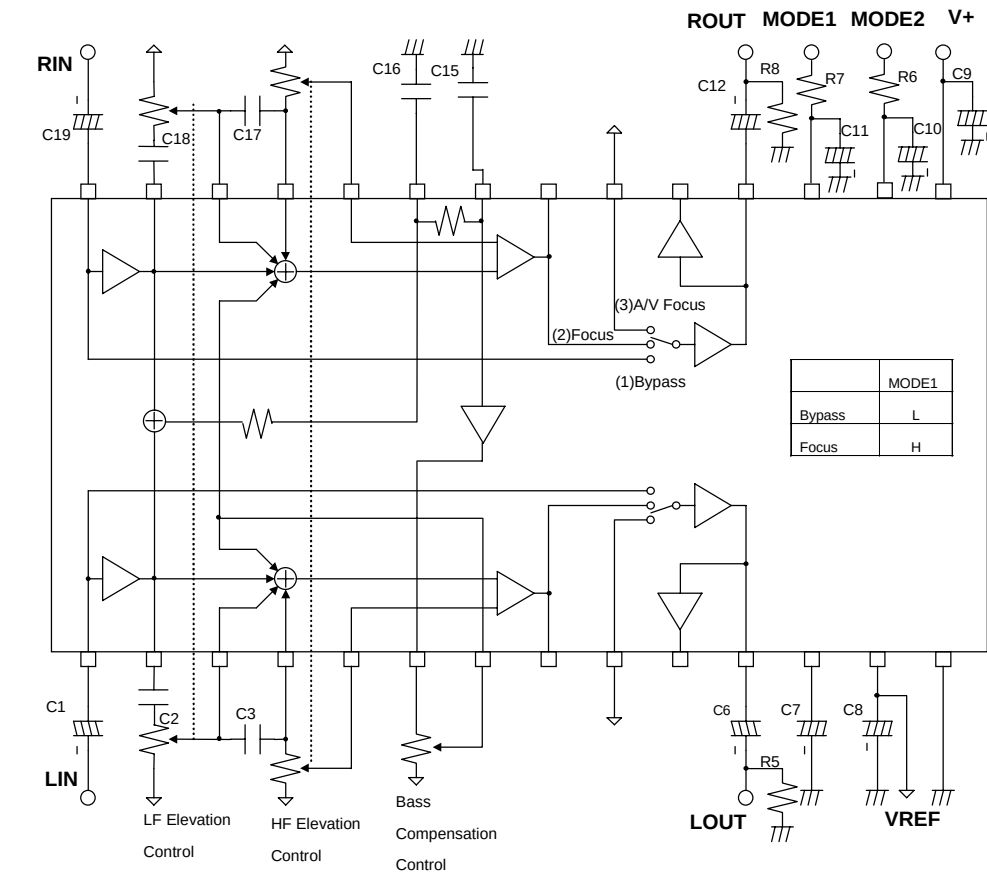
SDMP30



PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1,C6,C7	10uF		R5,R6,R8	10kΩ	
C10,C11,C12,C19	10uF		R1,R12	1.8kΩ	±5%
C8	33uF		R2,R3,R7,R10,R11	22kΩ	±5%
C9	100uF		R4,R9	5.6kΩ	±5%
C2,C18	0.22uF	±5%			
C3,C17	3900pF	±5%			
C4,C14,C15	0.01uF	±5%			
C5,C13	0.47uF	±5%			
C16	0.1uF	±5%			

- LF Elevation Control: 1kB Single-shaft Dual-unit
- HF Elevation Control: 10kB Single-shaft Dual-unit
- Bass Compensation Control: 1kB Single-shaft Single-unit

■APPLICATION CIRCUIT(Without A/V Focus Filter)
SDIP28

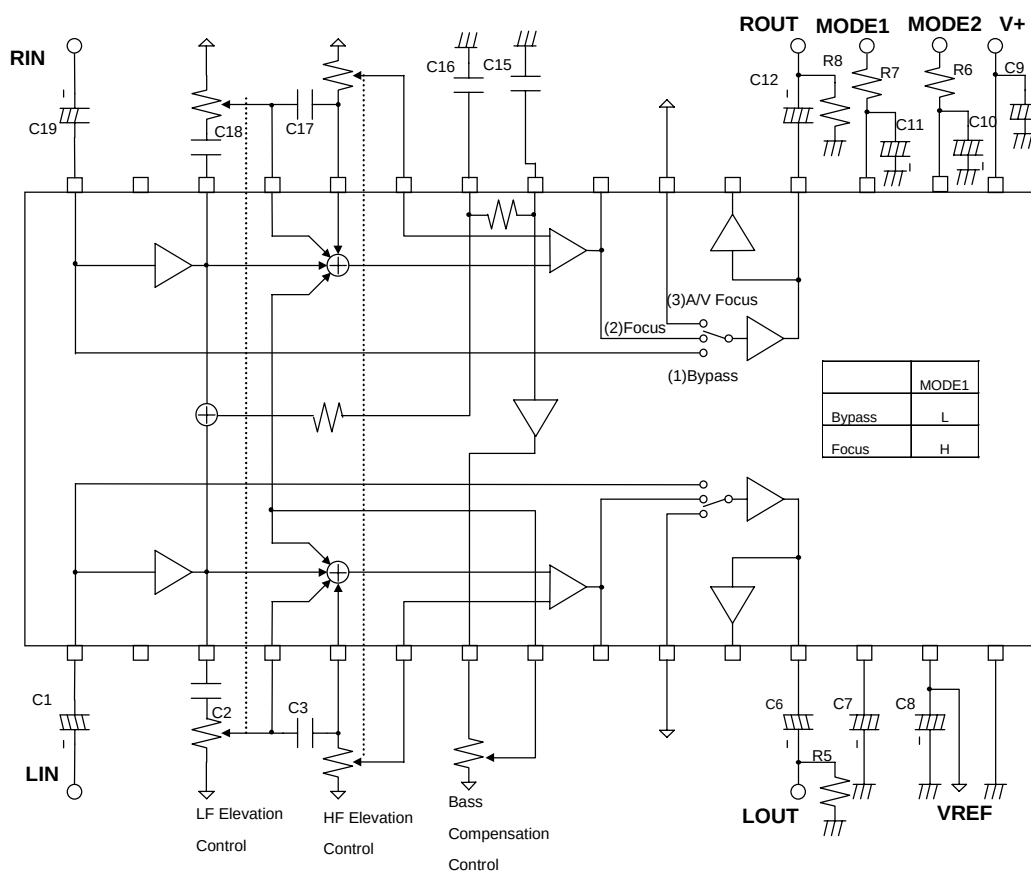


PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1,C6,C7	10uF		R5,R6,R8	10kΩ	
C10,C11,C12,C19	10uF		R7	22kΩ	±5%
C8	33uF				
C9	100uF				
C2,C18	0.22uF	±5%			
C3,C17	3900pF	±5%			
C15	0.01uF	±5%			
C16	0.1uF	±5%			

- LF Elevation Control: 1kB Single-shaft Dual-unit
- HF Elevation Control: 10kB Single-shaft Dual-unit
- Bass Compensation Control: 1kB Single-shaft Single-unit

APPLICATION CIRCUIT(Without A/V Focus Filter)

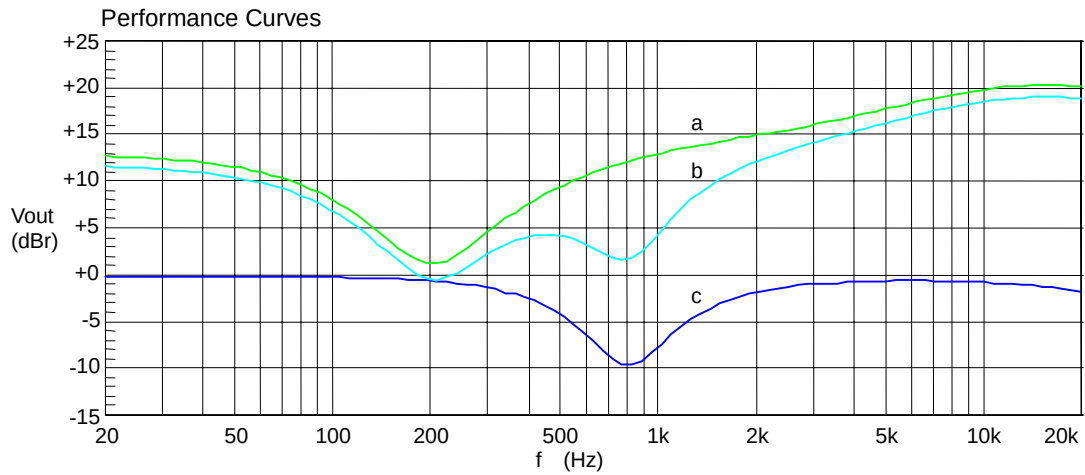
SDMP30



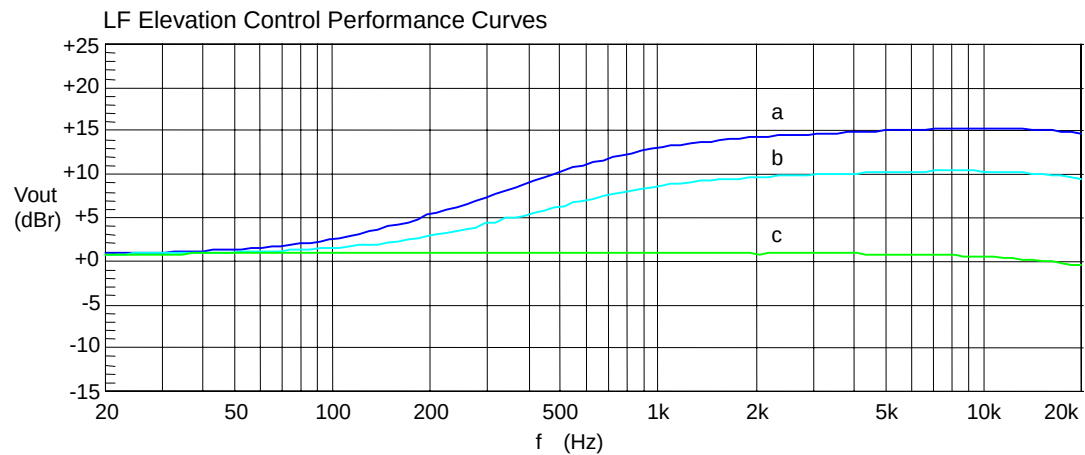
PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1,C6,C7	10uF		R5,R6,R8	10kΩ	
C10,C11,C12,C19	10uF		R7	22kΩ	±5%
C8	33uF				
C9	100uF				
C2,C18	0.22uF	±5%			
C3,C17	3900pF	±5%			
C15	0.01uF	±5%			
C16	0.1uF	±5%			

- LF Elevation Control: 1kB Single-shaft Dual-unit
- HF Elevation Control: 10kB Single-shaft Dual-unit
- Bass Compensation Control: 1kB Single-shaft Single-unit

CHARACTERISTICS



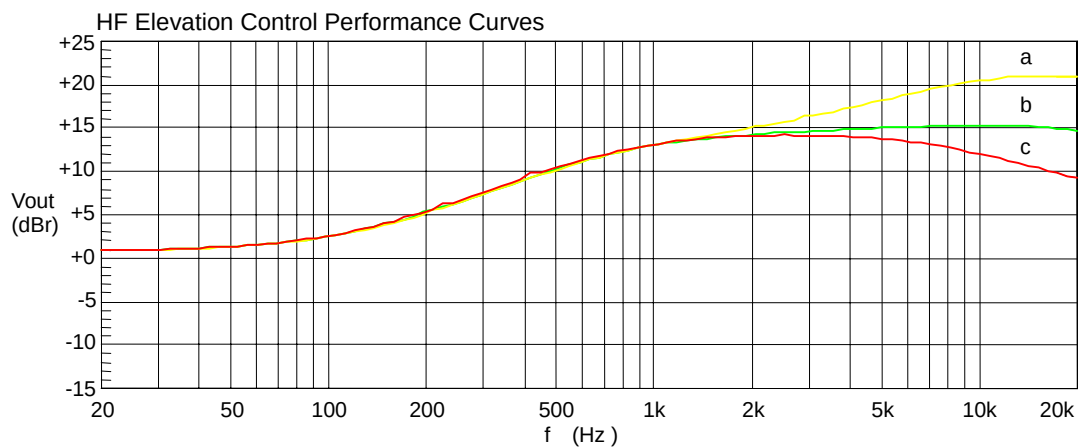
V+=12V Vin=-20dBV(=0dBr) Left in Left Out
a: Focus Mode (Controls Maximum) (HF:10kΩ LF:1kΩ BC:1kΩ) *
b: A/V Focus Mode (Controls Maximum) (HF:10kΩ LF:1kΩ BC:1kΩ)
c: A/V Focus Filter Curve (A/V Focus Mode Controls 0) (HF:0Ω LF:0Ω BC:0Ω)



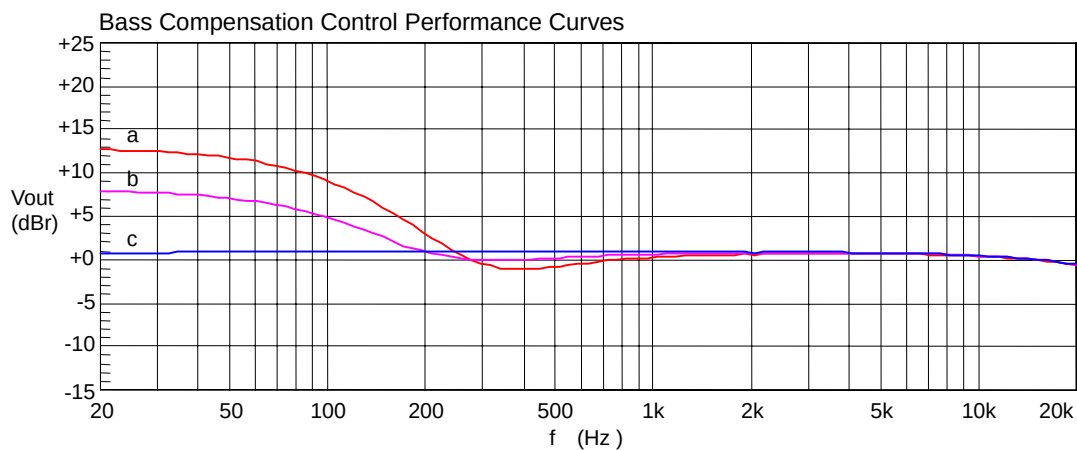
V+=12V Vin=-20dBV(=0dBr) Left in Left Out
Focus Mode Bass Compensation : Minimum (0Ω) HF Elevation : Center (5kΩ)
a: LF Elevation Control Maximum (1kΩ)
b: LF Elevation Control Center (0.5kΩ)
c: LF Elevation Control Minimum (0Ω)

*HF: HF Elevation
LF: LF Elevation
BC: Bass Compensation

■CHARACTERISTICS

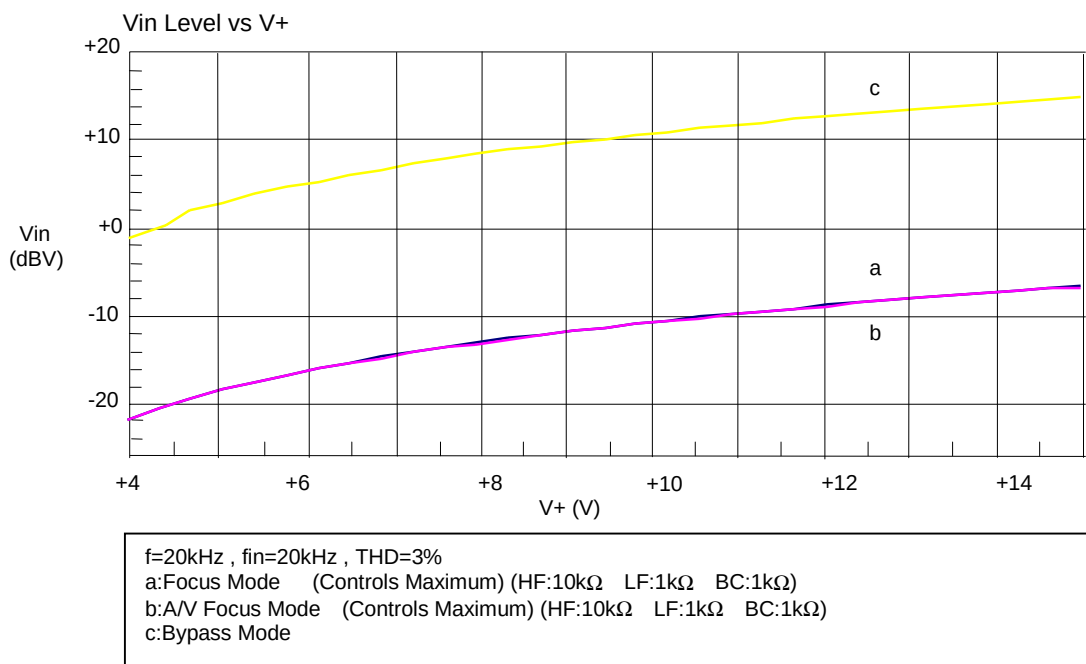
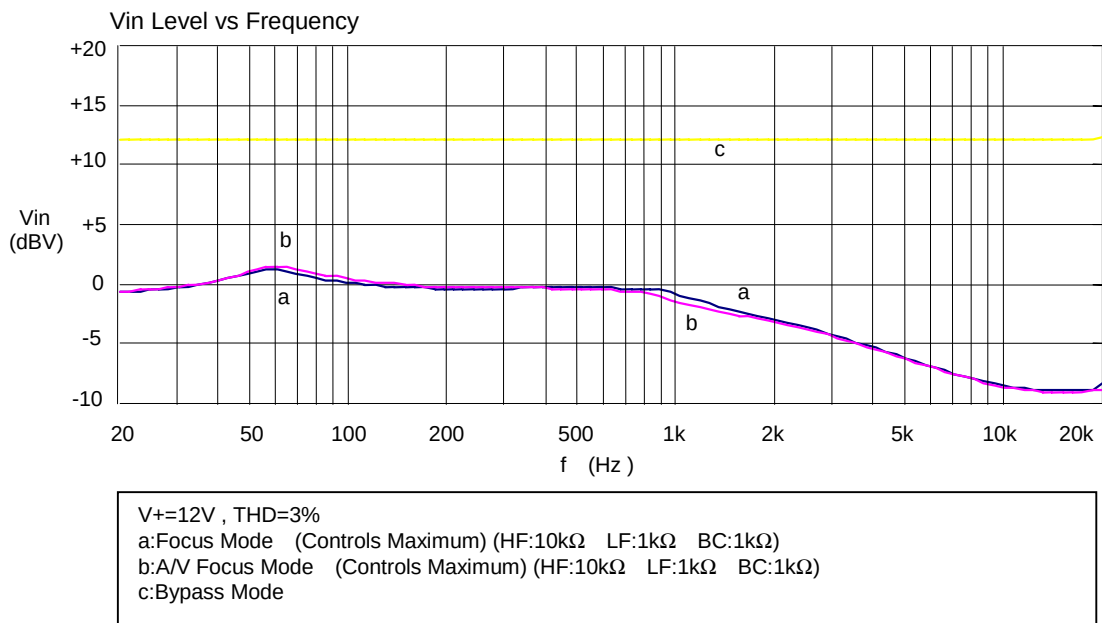


$V_{+}=12V$ $V_{in}=-20dBV(=0dBr)$ Left in Left Out
 Focus Mode bass Compensation : Minimum (0Ω) LF Elevation : Maximum ($1k\Omega$)
 a:HF Elevation Control Maximum ($10k\Omega$)
 b:HF Elevation Control Center ($5k\Omega$)
 c:HF Elevation Control Minimum (0Ω)



$V_{+}=12V$ $V_{in}=-20dBV(=0dBr)$ Left in Left Out
 Focus Mode LF Elevation : Minimum (0Ω)
 a:Bass Compensation Control Maximum ($1k\Omega$)
 b:Bass Compensation Control Center ($0.5k\Omega$)
 c:Bass Compensation Control Minimum (0Ω)

CHARACTERISTICS



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