



SPEAKER ELEVATION AUDIO PROCESSOR with A/V Focus Filter

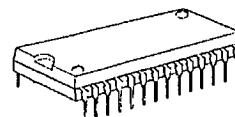
■ GENERAL DESCRIPTION

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.

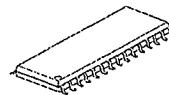
In addition, the NJM2184 includes the A/V Focus Filter to reduce harsh sound when the speakers are directly put on hard-surface floor.

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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The A/V Focus technology incorporated in the NJM2184 is owned by SRS Labs, a US Corporation. The A/V Focus technology is protected under U.S. Patent No. xxxx, No. xxxx, No. xxxx with numerous additional issued and pending foreign patents. The trademarks "SRS", "the SRS symbol" are registered in the U.S. and selected foreign countries.

In order to purchase and implement the NJM2184, all customers must enter into a license agreement directly with SRS Labs for the payment of royalties and to ensure proper trademark usage. Neither the purchase of the NJM2184, nor the corresponding sale of audio enhancement equipment conveys the right to commercialized recordings made with the A/V Focus.

For further information, please contact:
 SRS Labs, Inc. • 2909 Daimler Street • SantaAna, CA92705 USA
 Tel 714-442-1070 Fax 714-852-1099 <http://www.srslabs.com>.

■ ABSOLUTE MAXIMUM RATING ($T_a=25^\circ C$)

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

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% Controls ∞	Bypass Mode Focus Mode A/V Focus Mode	7.79 (2.45) -4.71 (0.58) -5.21 (0.55)	11.8 (3.88) -1.21 (0.87) -1.71 (0.82)	— — —
		f=70Hz at T.H.D.=3% Controls ∞	Bypass Mode Focus Mode A/V Focus Mode	— — —	11.8 (3.88) 0.77 (1.1) 0.77 (1.1)	— — —
		f=10kHz at T.H.D.=3% Controls ∞	Bypass Mode Focus Mode A/V Focus Mode	— — —	11.8 (3.88) -8.71 (0.37) -8.71 (0.37)	— — —
Output Noise	V_{NOISE}	$V_{in}=V_{REF}$ A-weight Controls ∞	Focus Mode A/V Focus Mode	— —	-94.0 (20.0) -94.0 (20.0)	-88.0 (40.0) -88.0 (40.0)
		$V_{in}=V_{REF}$ A-weight Controls Center	Focus Mode A/V Focus Mode	— —	-96.5 (15.0) -96.5 (15.0)	— —
		$V_{in}=V_{REF}$ A-weight Controls 0	Focus Mode A/V Focus Mode	— —	-96.5 (15.0) -96.5 (15.0)	— —

dBV
(Vrms)dBV
(μ Vrms)

■ 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)	—
			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 I Balance	G_{BAL}	$V_{in} = -17.2 \text{dBu}$ f=1kHz Controls ∞	Focus Mode	-1.0	0.0	1.0
			A/V Focus Mode	-1.0	0.0	1.0
Total Harmonic Distortion	THD	$V_{in} = -17.2 \text{dBu}$ Lch f=1kHz Controls ∞	Focus Mode	—	0.05	0.20
			A/V Focus Mode	—	0.09	0.30
BYPASS Gain	G_{BYP}	$V_{in} = -17.2 \text{dBu}$ f=1kHz	Bypass Mode	-1.0	0.0	1.0
FOCUS Gain1	G_{FOC1}	$V_{in} = -17.2 \text{dBu}$ f=70Hz Controls ∞	Focus Mode	8.5	10.5	12.5
FOCUS Gain2	G_{FOC2}	$V_{in} = -17.2 \text{dBu}$ f=20kHz Controls ∞	Focus Mode	19.0	21.0	23.0
AVF Gain	G_{AVF}	$V_{in} = -17.2 \text{dBu}$ f=800Hz Controls 0	A/V Focus Mode	-12.0	-10.0	-8.0
MODE Select Control Voltage	V_{MODE}	High Level	2.0	—	V^+	V
		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

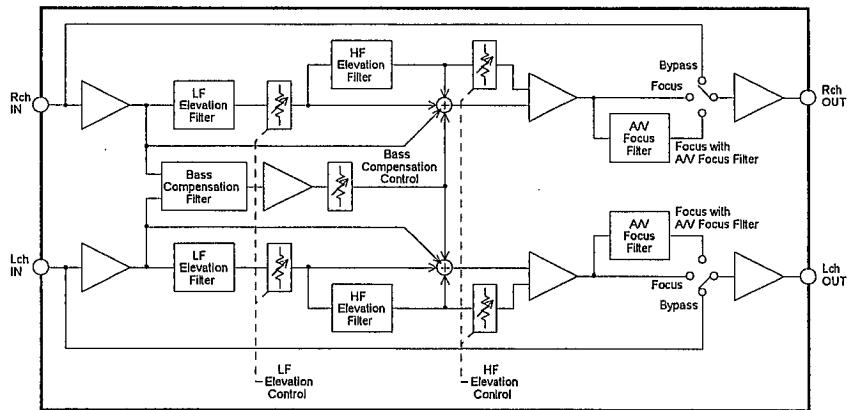
SDIP28

Lch Input	1	Lin	Rin	28	Rch Input
Lch LF Elevation Control Output	2	LFoutL	LFoutR	27	Rch LF Elevation Control Output
Lch LF Elevation Control Input	3	LFinL	LFinR	26	Rch LF Elevation Control Input
Lch HF Elevation Control Input 1	4	HFinL1	HFinR1	25	Rch HF Elevation Control Input 1
Lch HF Elevation Control Input 2	5	HFinL2	HFinR2	24	Rch HF Elevation Control Input 2
Bass Compensation Control Output	6	BCout	LPFout	23	LPF Output
Bass Compensation Control Input	7	BCin	LPFin	22	LPF Input
Lch Focus Output	8	FoutL	FoutR	21	Rch Focus Output
Lch A/V Focus filter Input	9	AVFFinL	AVFFinR	20	Rch A/V Focus filter Input
Lch A/V Focus filter Output	10	AVFFoutL	AVFFoutR	19	Rch A/V Focus filter Output
Lch Output	11	Lout	Rout	18	Rch Output
Vref Input	12	REFin	MODE1	17	Focus/Bypass Mode Select
V+/2	13	Vref	MODE2	16	A/V Focus filter ON/OFF select
Ground	14	GND	V+	15	4.7 to 13.0V Supply

SDMP30

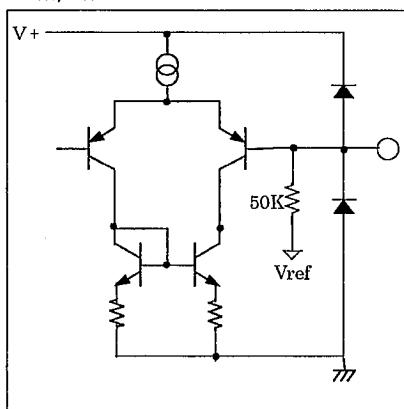
Lch Input	1	Lin	Rin	30	Rch Input
	2	(N.C.)		(N.C.)	28
Lch LF Elevation Control Output	3	LFoutL	LFoutR	28	Rch LF Elevation Control Output
Lch LF Elevation Control Input	4	LFinL	LFinR	27	Rch LF Elevation Control Input
Lch HF Elevation Control Input 1	5	HFinL1	HFinR1	26	Rch HF Elevation Control Input 1
Lch HF Elevation Control Input 2	6	HFinL2	HFinR2	25	Rch HF Elevation Control Input 2
Bass Compensation Control Output	7	BCout	LPFout	24	LPF Output
Bass Compensation Control Input	8	BCin	LPFin	23	LPF Input
Lch Focus Output	9	FoutL	FoutR	22	Rch Focus Output
Lch A/V Focus filter Input	10	AVFFinL	AVFFinR	21	Rch A/V Focus filter Input
Lch A/V Focus filter Output	11	AVFFoutL	AVFFoutR	20	Rch A/V Focus filter Output
Lch Output	12	Lout	Rout	19	Rch Output
Vref Input	13	REFin	MODE1	18	Focus/Bypass Mode Select
V+/2	14	Vref	MODE2	17	A/V Focus filter ON/OFF Select
Ground	15	GND	V+	16	4.7 to 13.0V Supply

■ BLOCK DIAGRAM

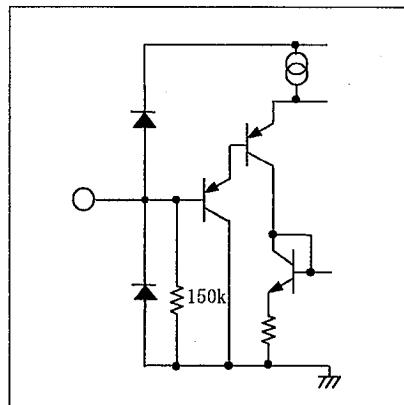


■ PIN DESCRIPTION

Lin, Rin

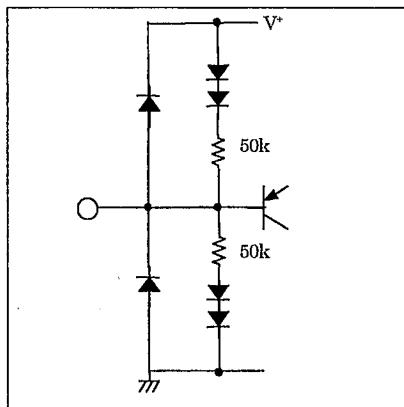


MODE1, MODE2

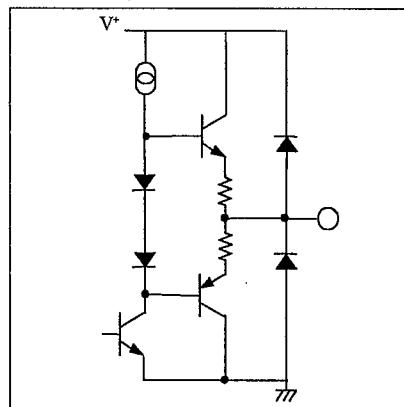


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REFin

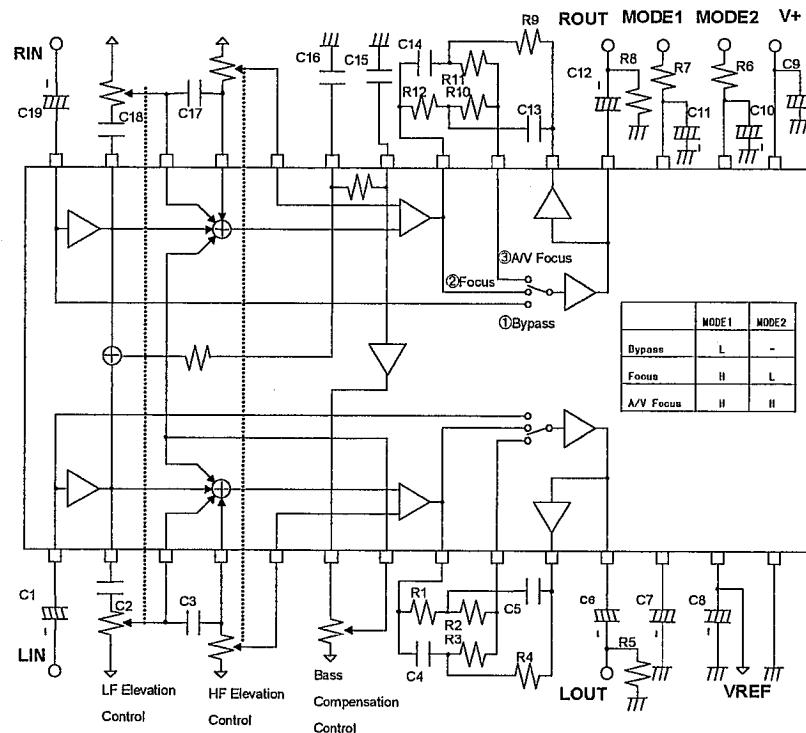


Lout, Rout, Vref



■APPLICATION CIRCUIT

SDIP28

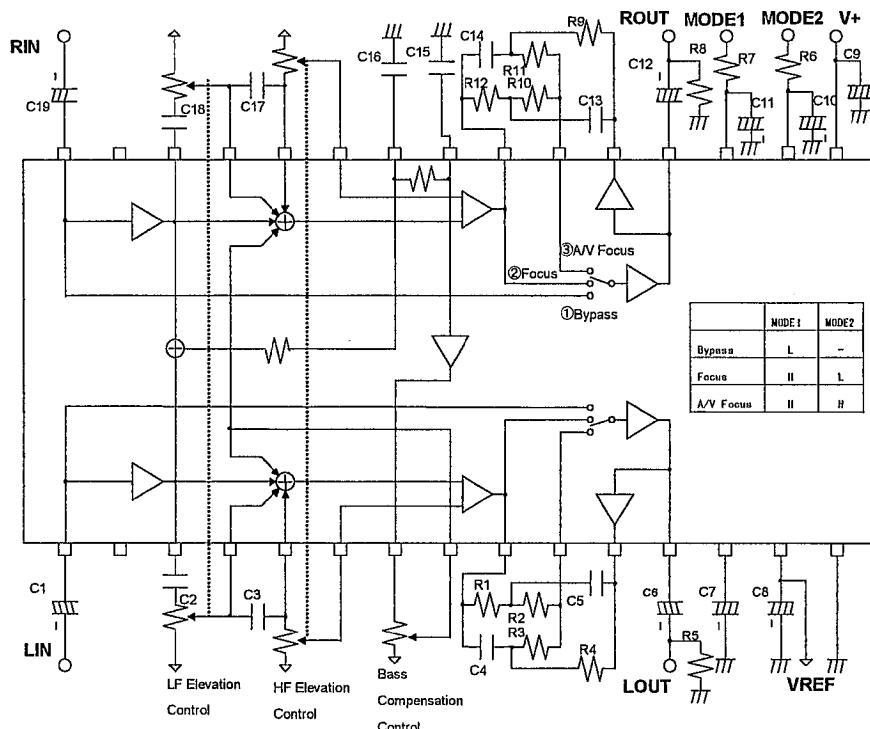


PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1, C6, C7	10 μ F		R5, R6, R8	10k Ω	
C10, C11, C12, C19	10 μ F		R1, R12	1. 8k Ω	$\pm 5\%$
C8	33 μ F		R2, R3, R7, R10, R11	22k Ω	$\pm 5\%$
C9	100 μ F		R4, R9	5. 6k Ω	$\pm 5\%$
C2, C18	0. 22 μ F	$\pm 5\%$			
C3, C17	3900pF	$\pm 5\%$			
C4, C14, C15	0. 01 μ F	$\pm 5\%$			
C5, C13	0. 47 μ F	$\pm 5\%$			
C16	0. 1 μ F	$\pm 5\%$			

- 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

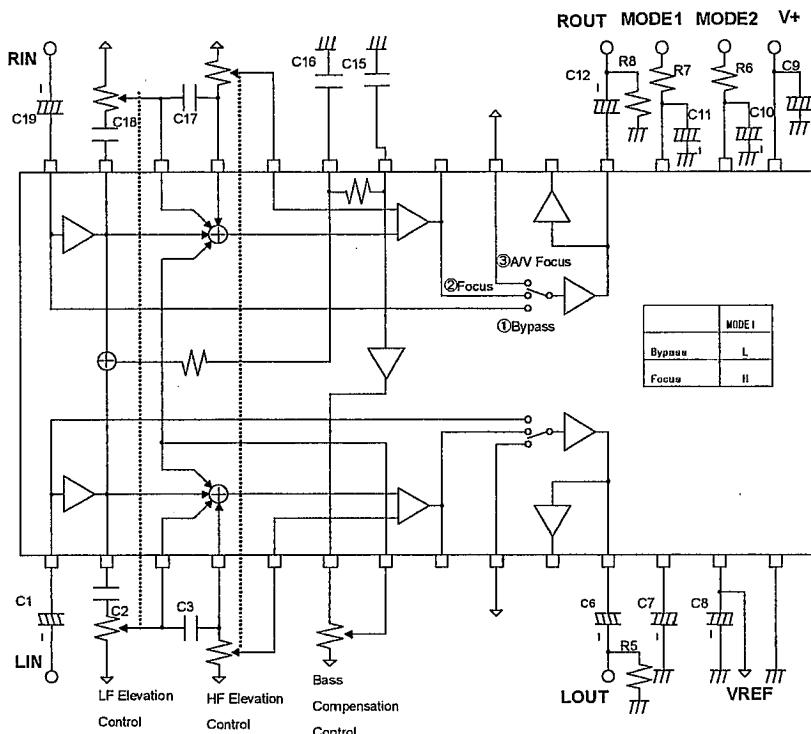


PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1, C6, C7	10 μ F		R5, R6, R8	10k Ω	
C10, C11, C12, C19	10 μ F		R1, R12	1.8k Ω	$\pm 5\%$
C8	33 μ F		R2, R3, R7, R10, R11	22k Ω	$\pm 5\%$
C9	100 μ F		R4, R9	5.6k Ω	$\pm 5\%$
C2, C18	0.22 μ F	$\pm 5\%$			
C3, C17	3900pF	$\pm 5\%$			
C4, C14, C15	0.01 μ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

- 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)

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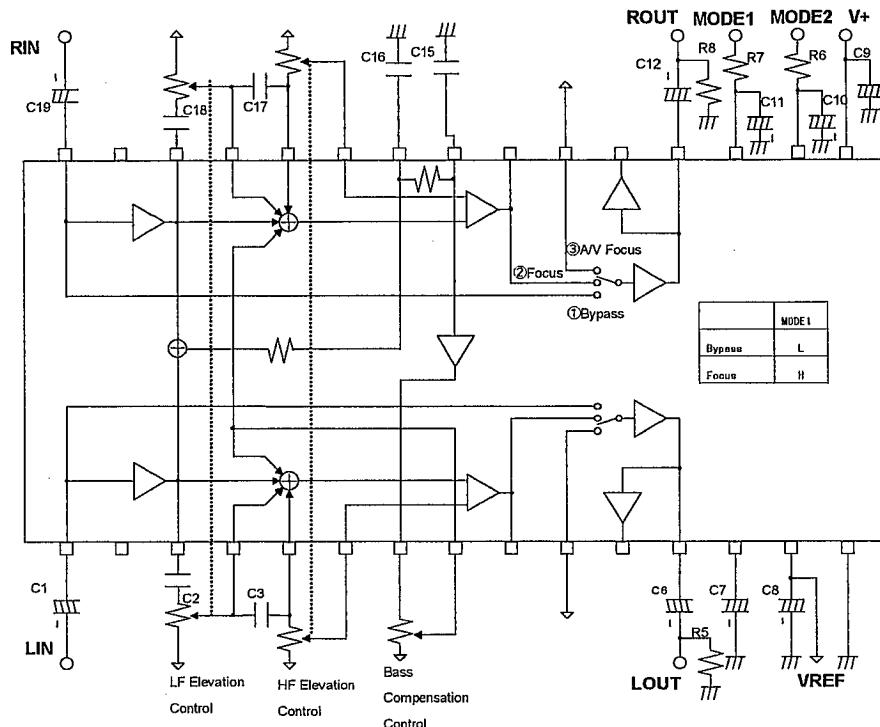


PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1, C6, C7	10 μ F		R5, R6, R8	10k Ω	
C10, C11, C12, C19	10 μ F		R7	22k Ω	$\pm 5\%$
C8	33 μ F				
C9	100 μ F				
C2, C18	0.22 μ F	$\pm 5\%$			
C3, C17	3900pF	$\pm 5\%$			
C15	0.01 μ F	$\pm 5\%$			
C16	0.1 μ F	$\pm 5\%$			

- 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)

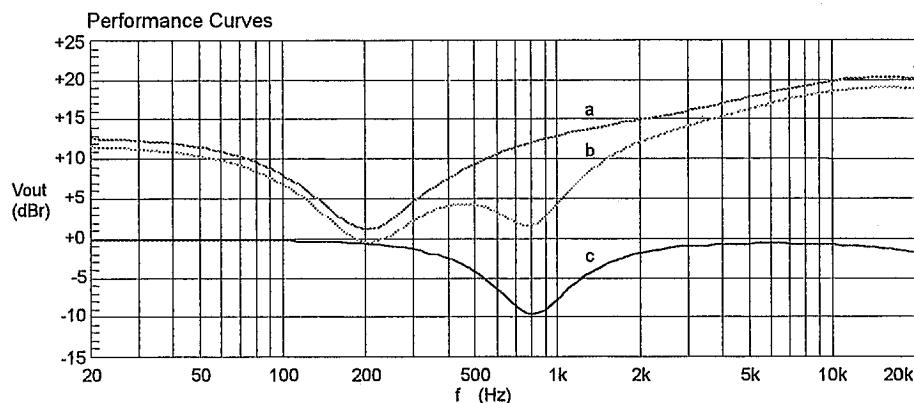
SDMP30



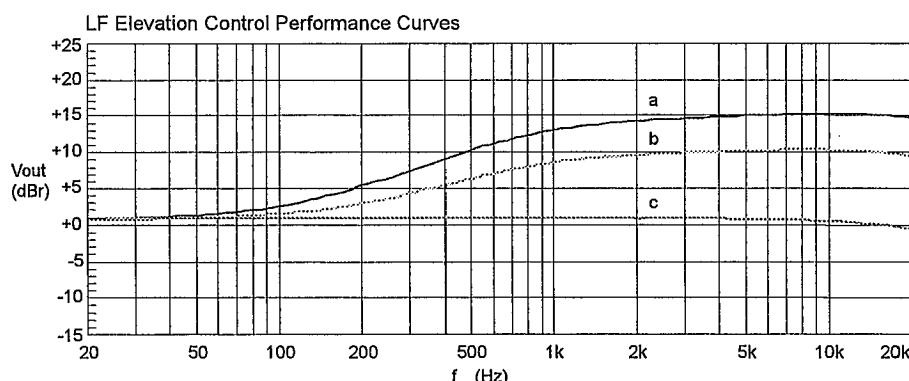
PART No.	VALUE	Tolerance	PART No.	VALUE	Tolerance
C1, C6, C7	10 μ F		R5, R6, R8	10k Ω	
C10, C11, C12, C19	10 μ F		R7	22k Ω	$\pm 5\%$
C8	33 μ F				
C9	100 μ F				
C2, C18	0.22 μ F	$\pm 5\%$			
C3, C17	3900pF	$\pm 5\%$			
C15	0.01 μ F	$\pm 5\%$			
C16	0.1 μ F	$\pm 5\%$			

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

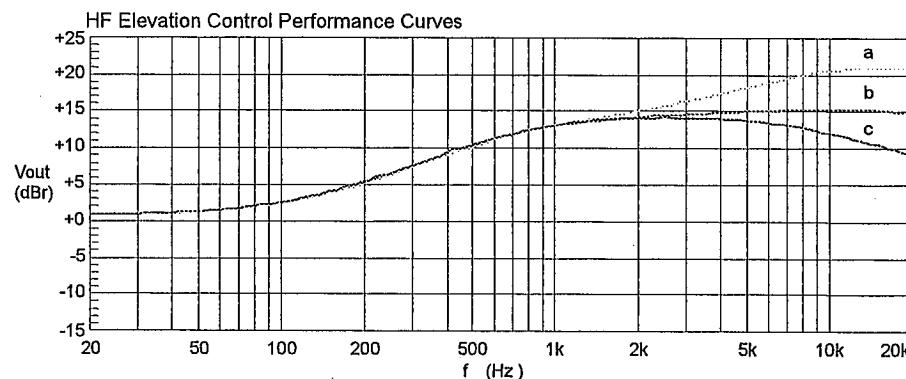
■ CHARACTERISTICS



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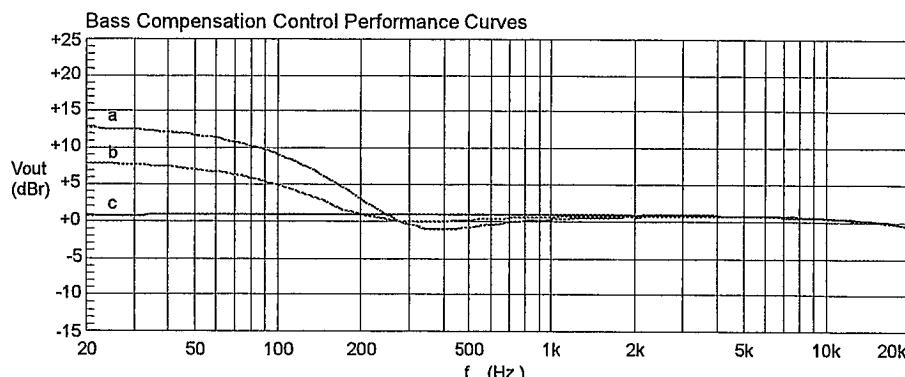


■ CHARACTERISTICS



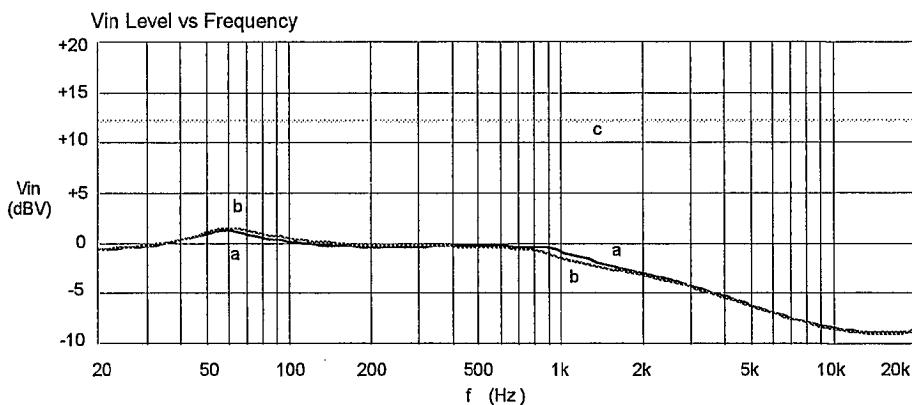
$V_+=12V$ $V_{in}=-20dBV(=0dB)$ Left in Left Out
 Focus Mode bass Compensation : Minimum (0Ω) LF Elevation : Maximum ($1k\Omega$)
 a:HF Elevation Control Maximum ($10k\Omega$)
 b:HF Elevation Control Center ($5k\Omega$)
 c:HF Elevation Control Minimum (0Ω)

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$V_+=12V$ $V_{in}=-20dBV(=0dB)$ 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)

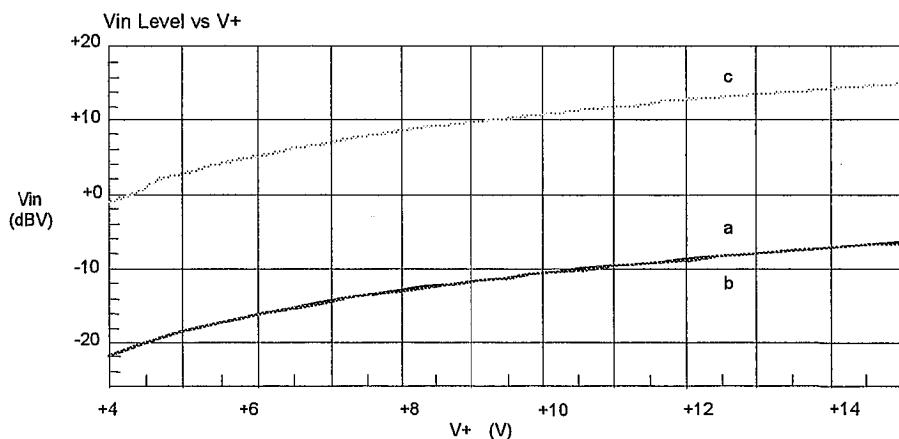
■ CHARACTERISTICS



V+=12V , THD=3%

- a:Focus Mode (Controls Maximum) (HF:10k Ω LF:1k Ω BC:1k Ω)
- b:A/V Focus Mode (Controls Maximum) (HF:10k Ω LF:1k Ω BC:1k Ω)
- c:Bypass Mode

4



f=20kHz , THD=3%

- a:Focus Mode (Controls Maximum) (HF:10k Ω LF:1k Ω BC:1k Ω)
- b:A/V Focus Mode (Controls Maximum) (HF:10k Ω LF:1k Ω BC:1k Ω)
- c:Bypass Mode

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

MEMO

[CAUTION]

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