

AN5835, AN5836

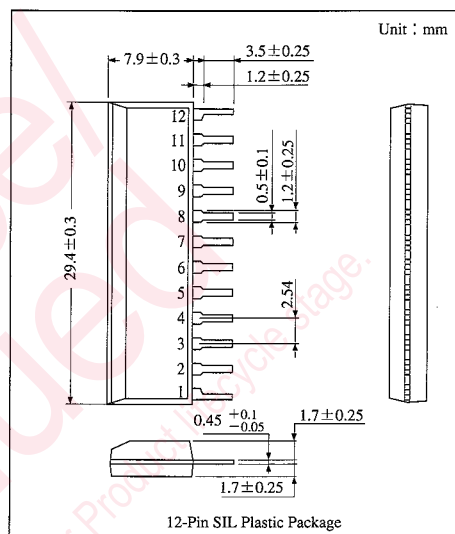
DC Volume, Tone Control IC

Overview

The AN5835 and the AN5836 are the integrated circuits designed for 2-channel volume and tone control circuits.

Features

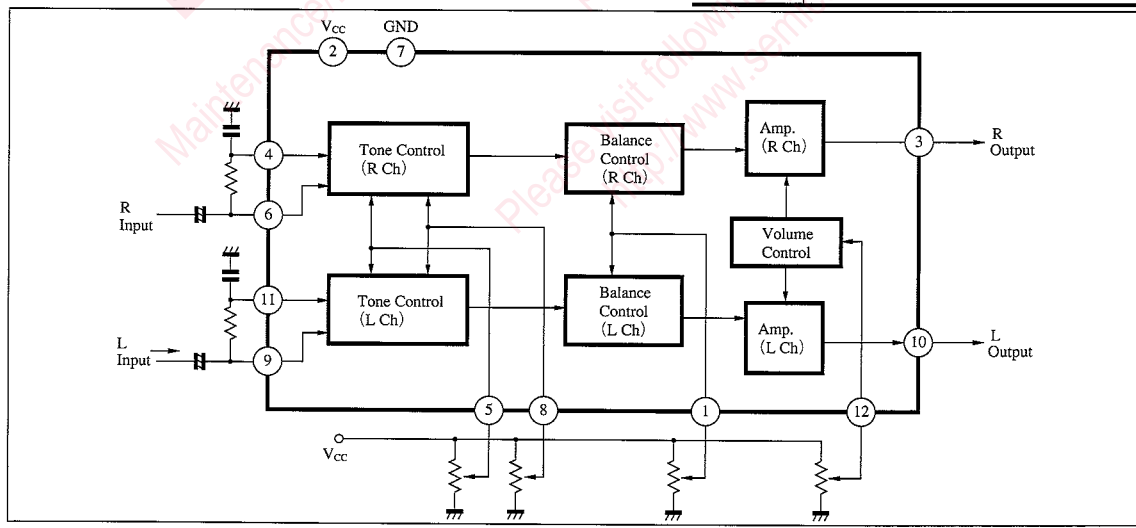
- Easier compact set design
- 2-Ch Bass and Treble control available
- Balance control circuit built-in
- DC volume control circuit (AN5836) with linear audibility.
- DC control for all functions



Pin Descriptions

Pin No.	Pin name
1	Balance control
2	V _{CC}
3	R Ch. output
4	R Ch. low freq. input
5	Bass control
6	R Ch. input
7	GND
8	Treble control
9	L Ch. input
10	L Ch. output
11	L Ch. low freq. input
12	Volume control

Block Diagram



Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating		Unit
Voltage	Supply voltage	V _{CC}	14.4		V
	Circuit voltage	V _{1, 4, 5, 6-7} V _{8, 9, 11, 12-7}	0	V ₂₋₇	V
Current	Supply current	I ₂	60		mA
	Circuit current	I _{3, I10}	-40	—	mA
Power dissipation (Ta=70°C)		P _D	920		mW
Temperature	Operating ambient temperature	T _{opr}	-20 to +70		°C
	Storage temperature	T _{stg}	-55 to +150		°C

Electrical Characteristics (V_{CC}=12, Ta=25°C)

Parameter		Symbol	Condition	min	typ	max	Unit
Circuit current		I _{tot}	V _{CC} =12V	24	38	50	mA
Circuit voltage		V _{3, 10-7}	V _i =No signal, V ₁₂ =V _{CC} /2, V ₁ =V ₅ =V ₈ =V _{CC} /2	8.0	8.4	8.8	V
Volume circuit	Max. output	V _{omax.}	f=1kHz, V _i =400mV _{rms}	190	230	270	mV _{rms}
	Channel balance *1	CB	V ₁₂ =V _{CC} , V ₁ =V ₅ =V ₈ =V _{CC} /2	—	+0.2	±1.0	dB
	Volume-start voltage *2	V _(st)	f=1kHz, V _i =400mV _{rms} V ₁₂ =V _R , V ₁ =V ₅ =V ₈ =V _{CC} /2	AN5835 0.30	0.45	0.70	V
	Residual-tone level (Volume Min.)	V _{min.}	f=1kHz, V _i =400mV _{rms} V ₁₂ =0V, V ₁ =V ₅ =V ₈ =V _{CC} /2	—	25	50	μV _{rms}
Balance control circuit	Attenuation (R-ch) *3	A _{ttBR}	f=1kHz, V _i =400mV _{rms} , V ₁₂ =V _{CC} , V ₅ =V ₈ =V _{CC} /2, V _{OR1} : V ₁ =(5.5/12) · V _{CC} (V _R -1), V _{OR2} : V ₁ =0V	-32	-45	—	dB
	Attenuation (L-ch) *4	A _{ttBL}	f=1kHz, V _i =400mV _{rms} , V ₁₂ =V _{CC} , V ₅ =V ₈ =V _{CC} /2, V _{OL1} : V ₁ =(6.5/12) · V _{CC} (V _R -1), V _{OL2} : V ₁ =V _{CC}	-32	-45	—	dB
Tone control circuit	Low freq. boost control characteristics	V ₄₀ /V _{1k}	V _{1k} : f=1kHz, V _i =400mV _{rms} Output voltage at V ₁₂ =V _{CC} , V ₁ =V ₅ =V ₈ =V _{CC} /2 V ₄₀ : f=40Hz, V _i =400mV _{rms} Output voltage at V ₁₂ =V _{CC} , V ₅ =V ₈ =V _{CC}	8	10	12	dB
	Low freq. cut control characteristics	V ₄₀ /V _{1k}	V _{1k} : f=1kHz, V _i =400mV _{rms} Output voltage at V ₁₂ =V _{CC} , V ₁ =V ₅ =V ₈ =V _{CC} /2 V ₄₀ : f=40Hz, V _i =400mV _{rms} Output voltage at V ₁₂ =V _{CC} , V ₅ =V ₈ =0V	-7.5	-12	-16	dB
	High freq. boost control characteristics	V _{15k} /V _{1k}	V _{1k} : f=1kHz, V _i =400mV _{rms} Output voltage at V ₁₂ =V _{CC} , V ₁ =V ₅ =V ₈ =V _{CC} /2 V _{15k} : f=15kHz, V _i =400mV _{rms} Output voltage at V ₁₂ =V _{CC} , V ₅ =V ₈ =V _{CC}	7.5	10	13	dB
	High freq. cut control characteristics	V _{15k} /V _{1k}	V _{1k} : f=1kHz, V _i =400mV _{rms} Output voltage at V ₁₂ =V _{CC} , V ₁ =V ₅ =V ₈ =V _{CC} /2 V _{15k} : f=15kHz, V _i =400mV _{rms} Output voltage at V ₁₂ =V _{CC} , V ₅ =V ₈ =0V	-7.5	-12	-18	dB
Crosstalk		CT	f=1kHz, V _i =400mV _{rms} V ₁₂ =V _{CC} , V ₁ =V ₅ =V ₈ =V _{CC} /2	-65	-80	—	dB
Output noise voltage		V _{no}	V _i =No signal, V ₁₂ =V _{CC} , V ₁ =V ₅ =V ₈ =V _{CC} /2	—	80	120	μV _{rms}
Distortion rate		THD	f=1kHz, V _i =400mV _{rms} V ₁₂ =V _{CC} , V ₁ =V ₅ =V ₈ =V _{CC} /2	—	0.2	0.5	%
Input resistance	R _{i(6),(9)}	f=1kHz		8.2	11.0	13.5	kΩ
	R _{i(4),(11)}			11.0	16.0	22.0	kΩ
Output resistance		R _{O(3),(10)}	f=1kHz	60	110	160	Ω

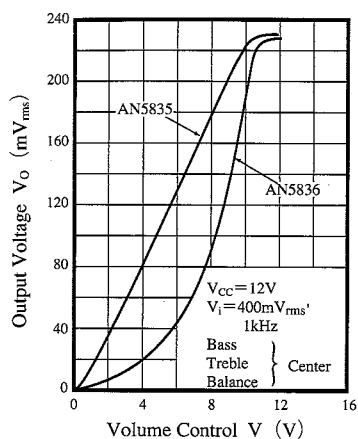
*1 Deviation between R and L-ch at max. output

*3, 4 (A_{ttBR}: V_{OR2}/V_{OR1}

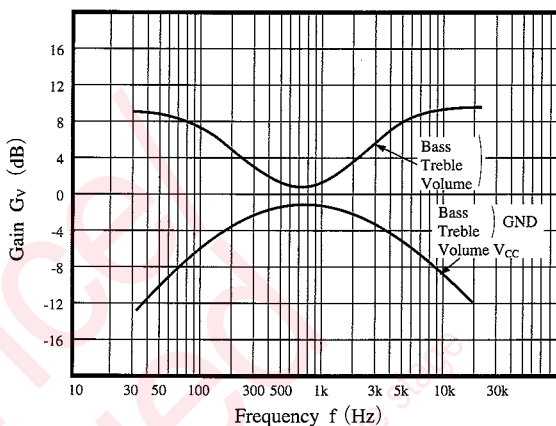
*2 (AN5835: V₁₂ voltage when output voltage is 1mV_{rms}
AN5836: V₁₂ voltage when output voltage is 0.1mV_{rms}

(A_{ttBL}: V_{OL2}/V_{OL1}

Volume Control Characteristics

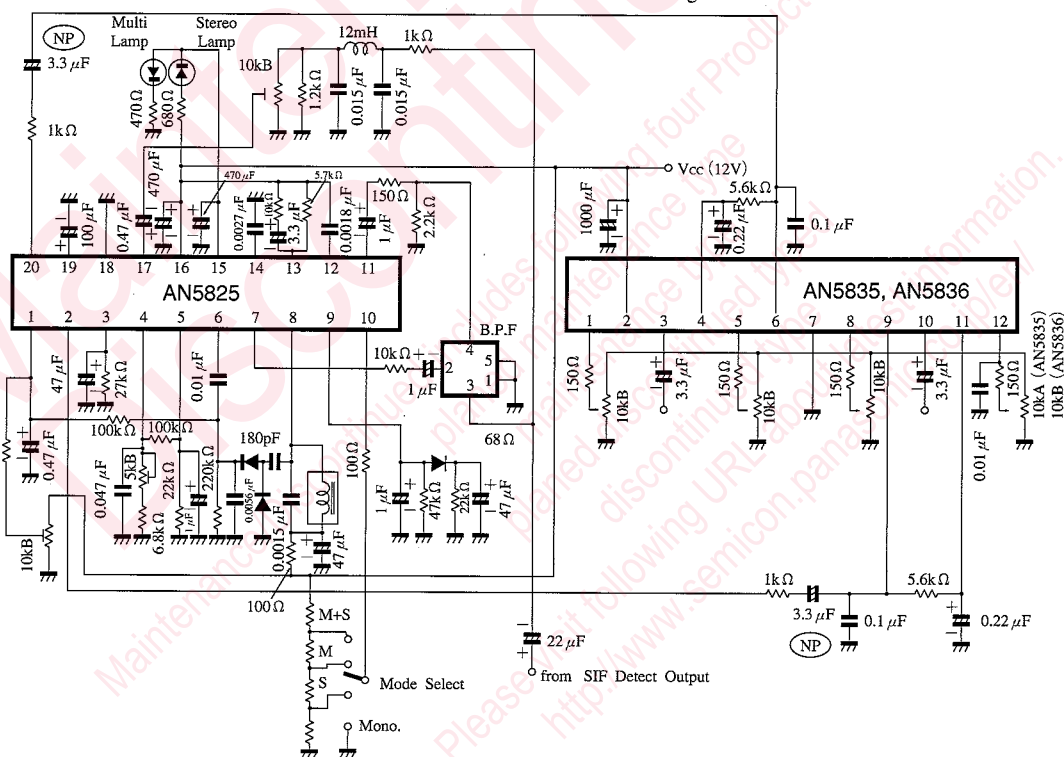


Frequency Characteristics



Note : The output voltage at $f_{in} = 1\text{kHz}$, $400\text{mV}_{\text{rms}}$, (Bass, Treble control : $V_{CC}/2$) (Volume : V_{CC}) is regarded as 0dB

■ Application Circuit



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