

AN5835, AN5836

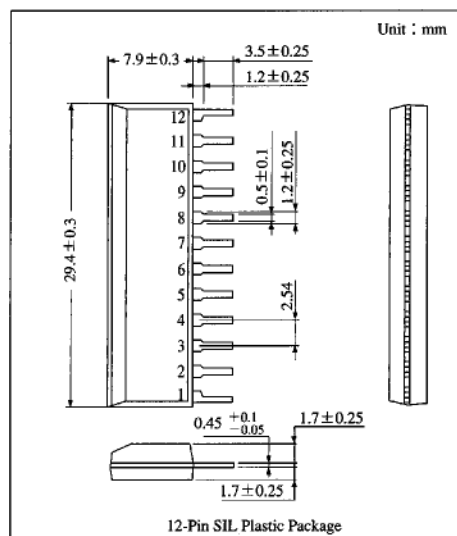
DC Volume, Tone Control IC

Overview

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

Features

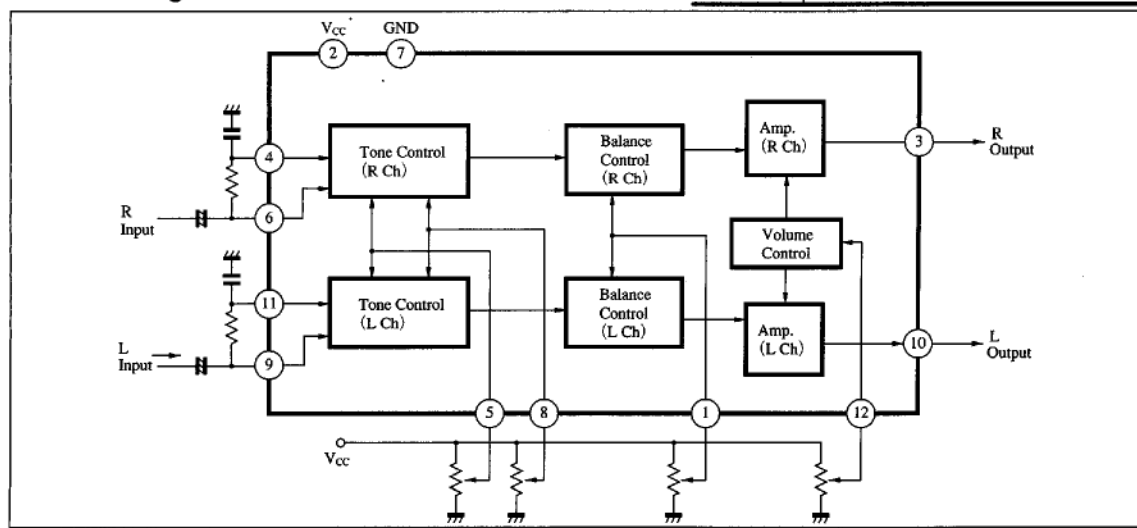
- Easier compact set design
- 2-Ch Bass and Treble control available
- Balance control circuit built-in
- DC volume control circuit (AN5836) with linear audibility.
- DC control for all functions



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 ($T_a=25^{\circ}\text{C}$)

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 , I ₁₀	-40	—	mA
Power dissipation (Ta=70℃)		P _D	920		mW
Temperature	Operating ambient temperature	T _{opr}	-20 to +70		℃
	Storage temperature	T _{stg}	-55 to +150		℃

Electrical Characteristics ($V_{CC}=12, T_a=25^{\circ}\text{C}$)

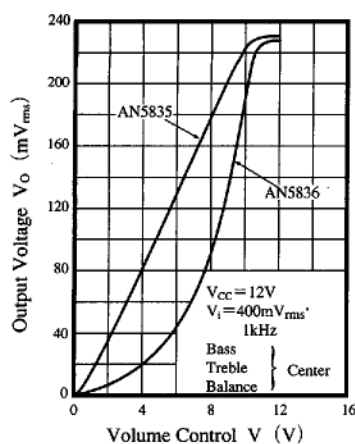
Parameter	Symbol	Condition	min	typ	max	Unit
Circuit current	I_{tot}	$V_{CC}=12\text{V}$	24	38	50	mA
Circuit voltage	$V_{3, 10-7}$	$V_i=\text{No signal}, V_{12}=V_{CC}/2, V_1=V_5=V_8=V_{CC}/2$	8.0	8.4	8.8	V
Volume circuit	Max. output	$f=1\text{kHz}, V_i=400\text{mV}_{rms}$	190	230	270	mV_{rms}
	Channel balance *1	$V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$	—	+0.2	± 1.0	dB
	Volume-start voltage *2	$f=1\text{kHz}, V_i=400\text{mV}_{rms}$ $V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$	AN5835: 0.30 AN5836: 0.40	0.45	0.70	V
	Residual-tone level (Volume Min.)	$f=1\text{kHz}, V_i=400\text{mV}_{rms}$ $V_{12}=0\text{V}, V_1=V_5=V_8=V_{CC}/2$	—	25	50	μV_{rms}
Balance control circuit	Attenuation (R-ch) *3	$f=1\text{kHz}, V_i=400\text{mV}_{rms}, V_{12}=V_{CC}, V_5=V_8=V_{CC}/2, V_{OR1}: V_1=(5.5/12) \cdot V_{CC} (VR-1), V_{OR2}: V_1=0\text{V}$	-32	-45	—	dB
	Attenuation (L-ch) *4	$f=1\text{kHz}, V_i=400\text{mV}_{rms}, V_{12}=V_{CC}, V_5=V_8=V_{CC}/2, V_{OL1}: V_1=(6.5/12) \cdot V_{CC} (VR-1), V_{OL2}: V_1=V_{CC}$	-32	-45	—	dB
Tone control circuit	Low freq. boost control characteristics	$V_{1k}: f=1\text{kHz}, V_i=400\text{mV}_{rms}$ Output voltage at $V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$ $V_{40}: f=40\text{Hz}, V_i=400\text{mV}_{rms}$ Output voltage at $V_{12}=V_{CC}, V_5=V_8=V_{CC}$	8	10	12	dB
	Low freq. cut control characteristics	$V_{1k}: f=1\text{kHz}, V_i=400\text{mV}_{rms}$ Output voltage at $V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$ $V_{40}: f=40\text{Hz}, V_i=400\text{mV}_{rms}$ Output voltage at $V_{12}=V_{CC}, V_5=V_8=0\text{V}$	-7.5	-12	-16	dB
	High freq. boost control characteristics	$V_{1k}: f=1\text{kHz}, V_i=400\text{mV}_{rms}$ Output voltage at $V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$ $V_{15k}: f=15\text{kHz}, V_i=400\text{mV}_{rms}$ Output voltage at $V_{12}=V_{CC}, V_5=V_8=V_{CC}$	7.5	10	13	dB
	High freq. cut control characteristics	$V_{1k}: f=1\text{kHz}, V_i=400\text{mV}_{rms}$ Output voltage at $V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$ $V_{15k}: f=15\text{kHz}, V_i=400\text{mV}_{rms}$ Output voltage at $V_{12}=V_{CC}, V_5=V_8=0\text{V}$	-7.5	-12	-18	dB
Crosstalk	CT	$f=1\text{kHz}, V_i=400\text{mV}_{rms}$ $V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$	-65	-80	—	dB
Output noise voltage	V_{no}	$V_i=\text{No signal}, V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$	—	80	120	μV_{rms}
Distortion rate	THD	$f=1\text{kHz}, V_i=400\text{mV}_{rms}$ $V_{12}=V_{CC}, V_1=V_5=V_8=V_{CC}/2$	—	0.2	0.5	%
Input resistance	$R_{i(6),(9)}$	$f=1\text{kHz}$	8.2	11.0	13.5	k Ω
	$R_{i(4),(11)}$		11.0	16.0	22.0	k Ω
Output resistance	$R_{O(3),(10)}$	$f=1\text{kHz}$	60	110	160	Ω

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

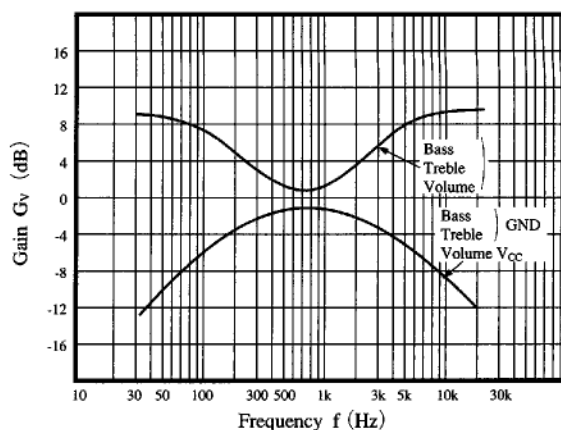
*2 (AN5835 : V_{12} voltage when output voltage is 1mV_{rms}
AN5836 : V_{12} voltage when output voltage is 0.1mV_{rms} *3, 4 ($A_{nBR} : V_{OR2}/V_{OR1}$
 $A_{nBL} : V_{OL2}/V_{OL1}$

ICs for TV

Volume Control Characteristics



Frequency Characteristics



Note : The output voltage at $f_{in} = 1kHz, 400mV_{rms}$, (Bass, Treble control : $V_{CC}/2$) (Volume : V_{CC})

is regarded as 0dB

Application Circuit

