AN7513S

0.5-W BTL audio power amplifier

■ Overview

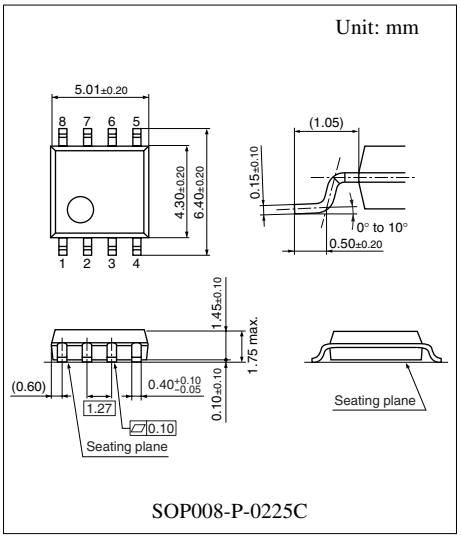
The AN7513S is an audio power amplifier IC with 1-ch output. The BTL (Balanced Transformer-Less) method can provide fewer external parts and more easy design for applications.

■ Features

- 0.5-W output (16 Ω) with supply voltage of 5 V
- On-chip standby function
- On-chip volume function

■ Applications

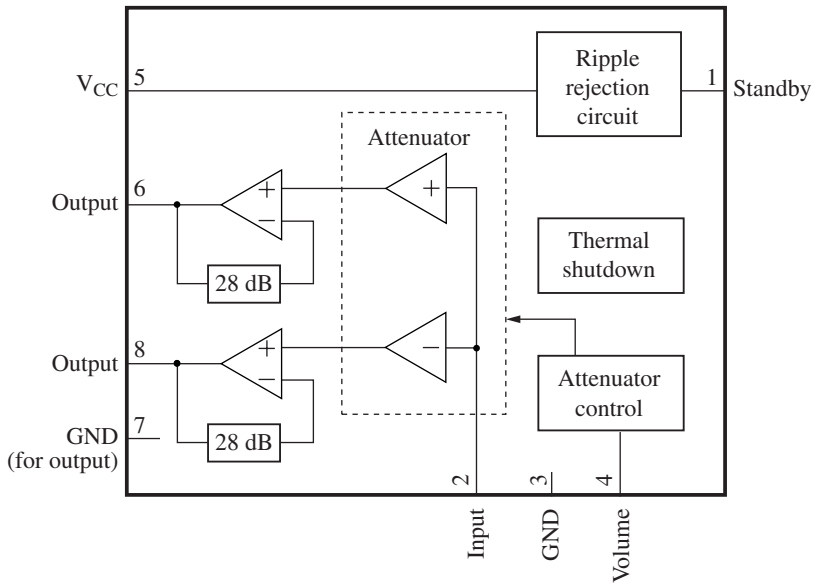
- Televisions, radios, and personal computers



SOP008-P-0225C

Note) The package of this product will be changed to lead-free type (SOP008-P-0225G). See the package dimensions section later of this datasheet.

■ Block Diagram



■ Pin Descriptions

Pin No.	Description
1	Standby (standby state if this pin is open.)
2	Input
3	Ground (for input)
4	Volume (max. volume if this pin is open.)
5	Supply voltage
6	+ Output
7	Ground (for output ch.1)
8	– Output

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage *2	V_{CC}	14	V
Supply current	I_{CC}	1.0	A
Power dissipation *3	P_D	263	mW
Operating ambient temperature *1	T_{opr}	–25 to +70	°C
Storage temperature *1	T_{stg}	–55 to +150	°C

Note) ∗1: Except for the operating ambient temperature and storage temperature, all ratings are for T_a = 25°C.
∗2: At no signal
∗3: The power dissipation shown is the value for T_a = 70°C.

■ Recommended Operating Range

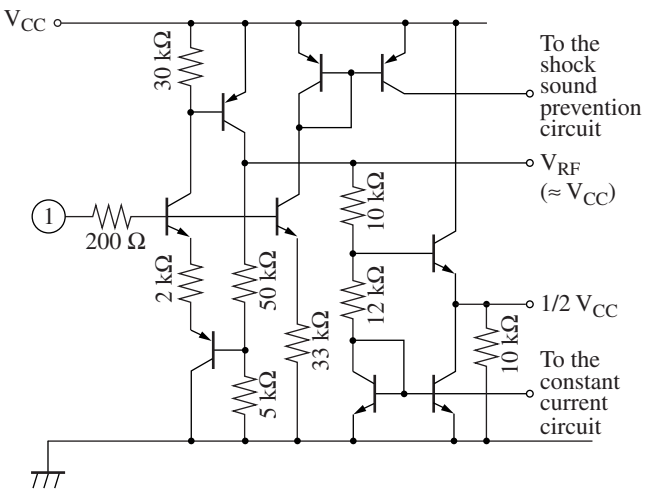
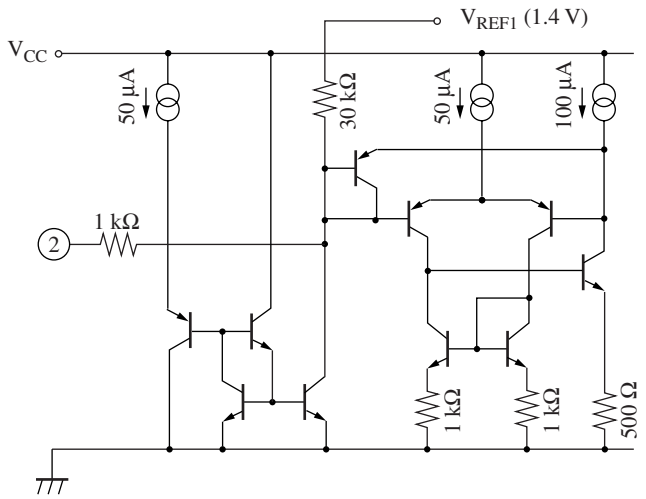
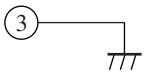
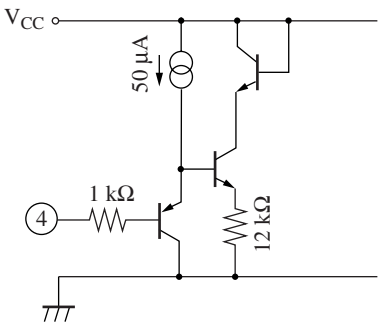
Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.0 to 12.0	V

■ Electrical Characteristics at V_{CC} = 5.0 V, R_L = 16 Ω, f = 1 kHz, T_a = 25°C ± 2°C

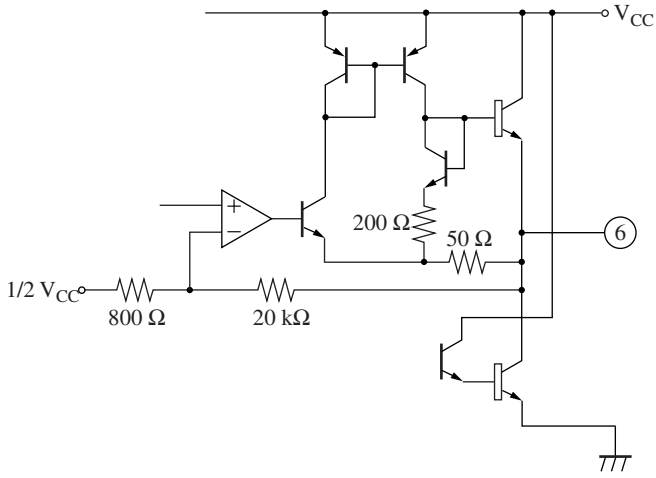
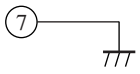
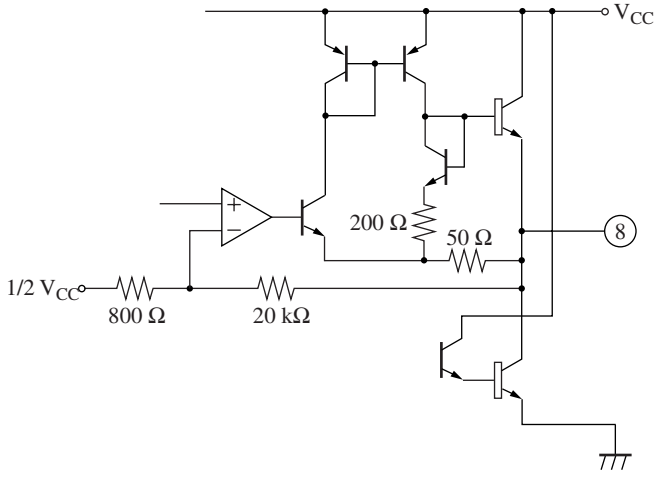
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Quiescent circuit current	I_{CQ}	V_{IN} = 0 mV, Vol. = 0 V	—	20	60	mA
Standby current	I_{STB}	V_{IN} = 0 mV, Vol. = 0 V	—	1	10	µA
Output noise voltage *	V_{NO}	R_g = 10 kΩ, Vol. = 0 V	—	0.10	0.4	mV[rms]
Voltage gain	G_V	P_O = 0.125 W, Vol. = 1.25 V	31	33	35	dB
Total harmonic distortion	THD	P_O = 0.125 W, Vol. = 1.25 V	—	0.10	0.5	%
Maximum output power	P_{O1}	THD = 10%, Vol. = 1.25 V	0.35	0.5	—	W
Ripple rejection ratio *	RR	R_g = 10 kΩ, Vol. = 0 V, V_R = 1 V[rms], f_R = 120 Hz	30	50	—	dB
Output offset voltage	V_{OFF}	R_g = 10 kΩ, Vol. = 0 V	–250	0	250	mV
Volume attenuation rate *	Att	P_O = 0.125 W, Vol. = 0 V	70	85	—	dB
Intermediate voltage gain	G_{VM}	P_O = 0.125 W, Vol. = 0.6 V	20.5	23.5	26.5	dB

Note) ∗: In measuring, the filter for the range of 15 Hz to 30 kHz (12 dB/OCT) is used.

■ Terminal Equivalent Circuits

Pin No.	Pin name	Equivalent circuit	Voltage
1	Standby pin		5 V
2	Input pin		1.4 V
3	GND		0 V
4	Volume pin		—

■ Terminal Equivalent Circuits (continued)

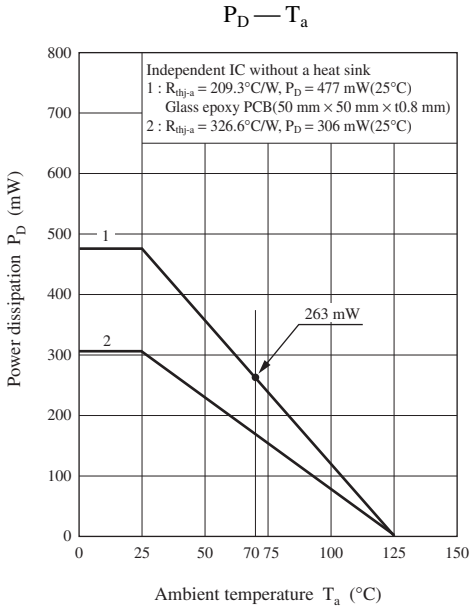
Pin No.	Pin name	Equivalent circuit	Voltage
5	V_{CC}	—	5.0 V
6	+ Output pin		2.15 V
7	GND		0 V
8	– Output pin		2.15 V

■ Usage Notes

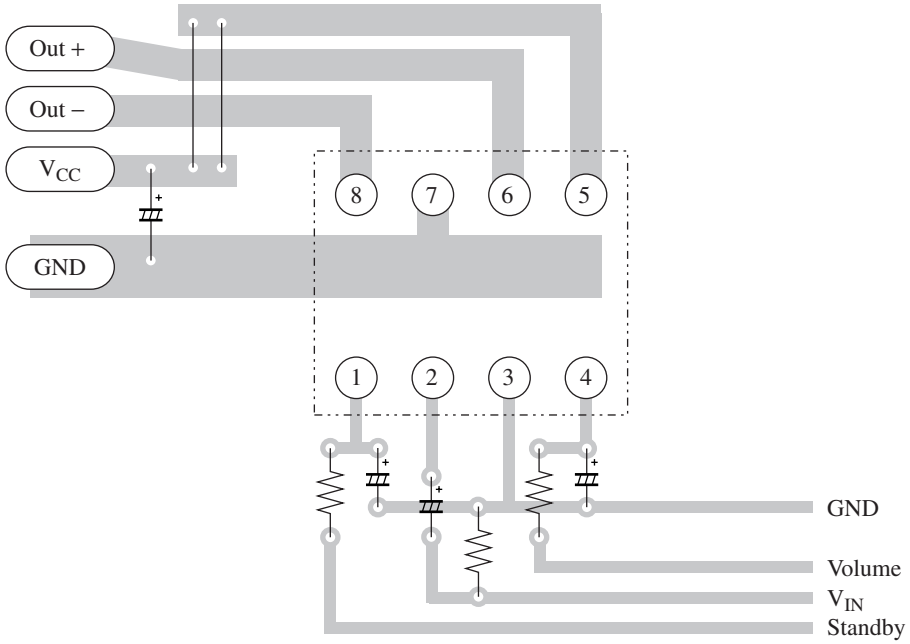
- Please avoid the short circuit to V_{CC} , ground, or load short circuit.
- The thermal shutdown circuit operates at about T_j = 150°C. However, the thermal shutdown circuit is reset automatically if the temperature drops.
- Please carefully design the heat radiation especially when you take out high power at high V_{CC} .
- Please connect only the ground of signal with the signal GND of the amplifier in the previous stage.
- Use a speaker with 16 Ω or more impedance.

■ Technical Data

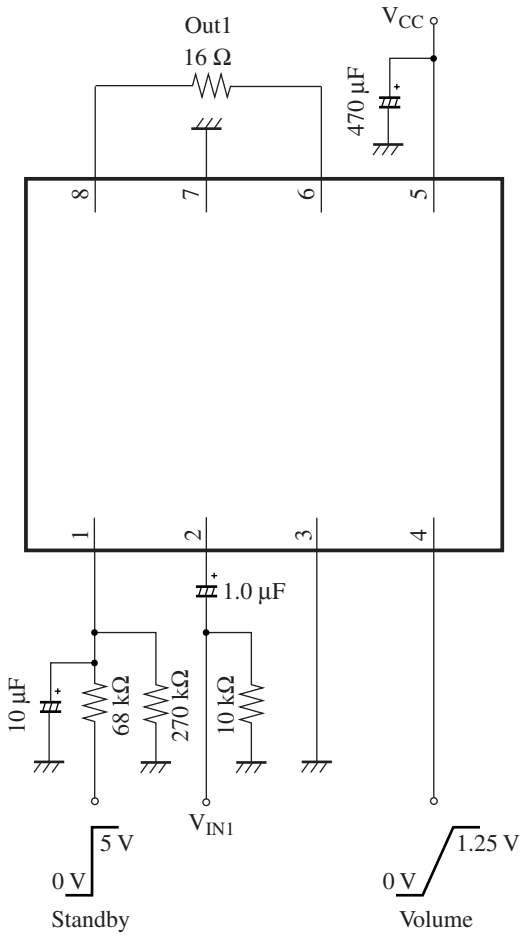
• P_D — T_a curves of SOP008-P-0225C



2. Example of PCB pattern



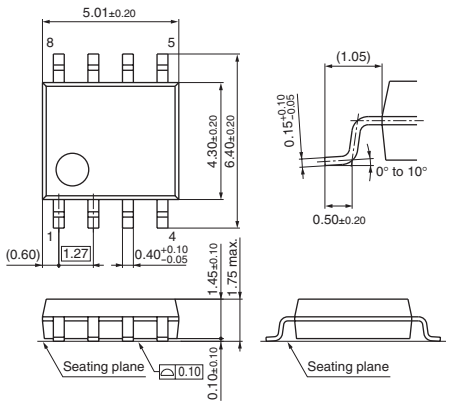
■ Application Circuit Example



Note) The IC is on standby if the STB pin is open.
The IC is in the state of volume minimum if the volume pin is ground.
The IC is in the state of volume maximum if the volume pin is open.

■ New Package Dimensions (Unit: mm)

• SOP008-P-0225G (Lead-free package)



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