AN7511

1-W BTL audio power amplifier

■ Overview

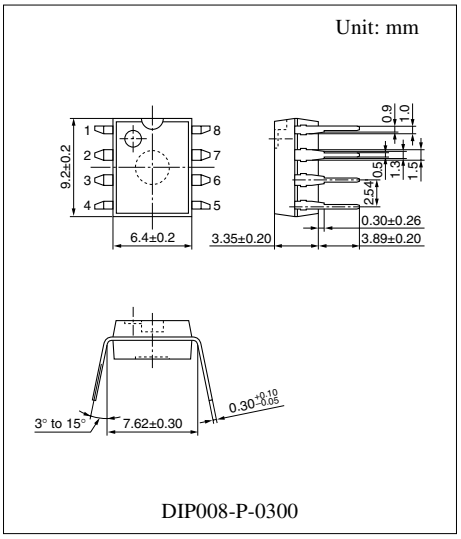
The AN7511 is an audio power amplifier IC with 1-ch output. The BTL (Balanced Transformer-Less) method can provide fewer external parts and more easy design for applications.

■ Features

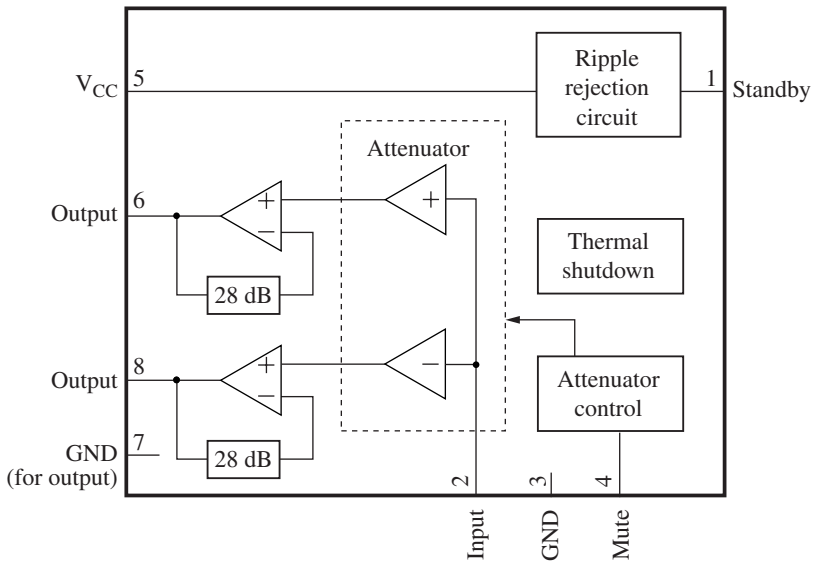
- 1-W output (8 Ω) with supply voltage of 5 V
- On-chip standby function
- On-chip muting function

■ Applications

- Televisions, radios, and personal computers



■ Block Diagram



■ Pin Descriptions

Pin No.	Description
1	Standby (standby state if this pin is open.)
2	Input
3	Ground (for input)
4	Muting (muting on 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	541	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

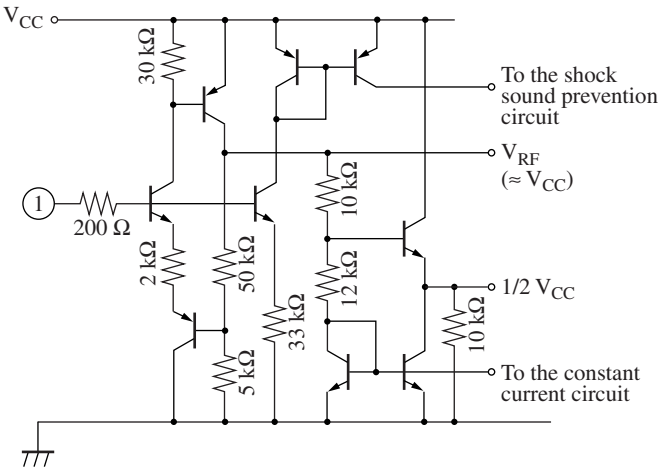
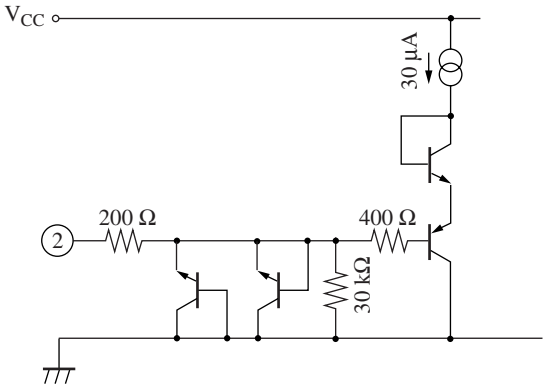
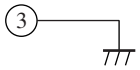
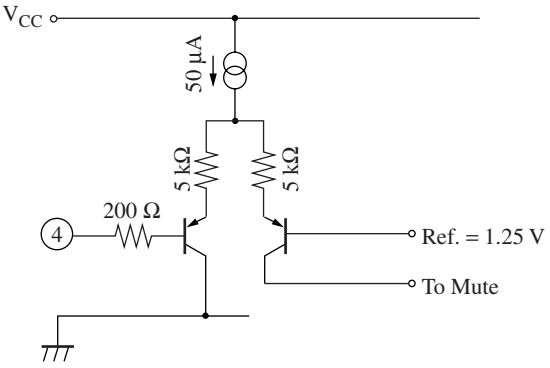
Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	3.5 to 13.5	V

■ Electrical Characteristics at V_{CC} = 5.0 V, R_L = 8 Ω, f = 1 kHz, T_a = 25°C ± 2°C

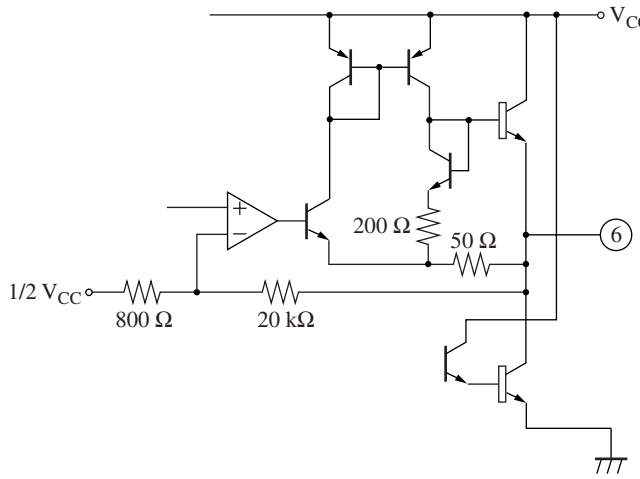
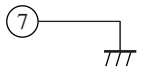
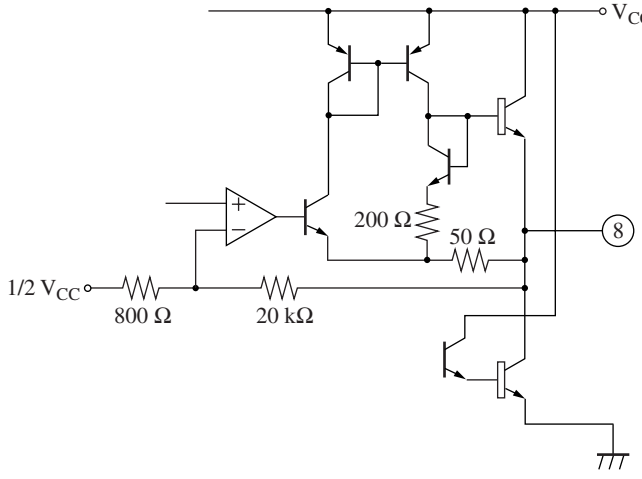
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Quiescent circuit current	I_{CQ}	V_{IN} = 0 mV	—	30	60	mA
Standby current	I_{STB}	V_{IN} = 0 mV	—	1	10	µA
Output noise voltage *	V_{NO}	R_g = 10 kΩ	—	0.14	0.4	mV[rms]
Voltage gain	G_V	P_O = 0.25 W	32	34	36	dB
Total harmonic distortion	THD	P_O = 0.25 W	—	0.05	0.5	%
Maximum output power	P_{O1}	THD = 10%	0.8	1.1	—	W
Ripple rejection ratio *	RR	R_g = 10 kΩ, V_R = 0.5 V[rms], f_R = 120 Hz	30	50	—	dB
Output offset voltage	V_{OFF}	R_g = 10 kΩ	–300	0	300	mV
Muting effect *	MT	P_O = 0.25 W	70	86	—	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		—
3	GND		0 V
4	Muting 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

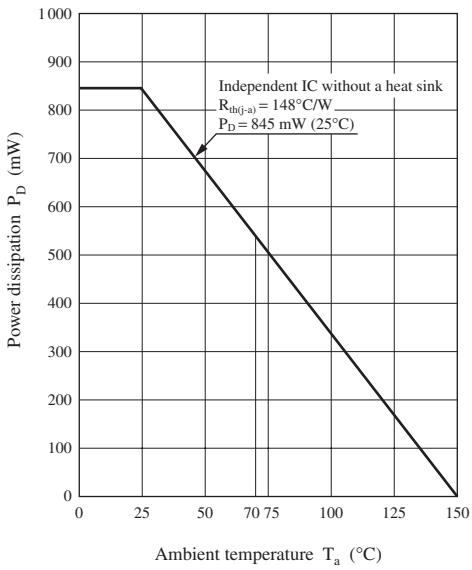
■ Usage Notes

- Please avoid the short circuit to V_{CC} , ground, or load short circuit.
- Please connect the cooling fin with the GND potential.
- 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.

■ Technical Data

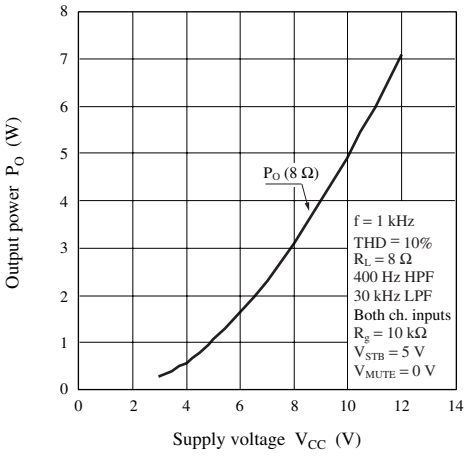
1. Package power dissipation

P_D — T_a

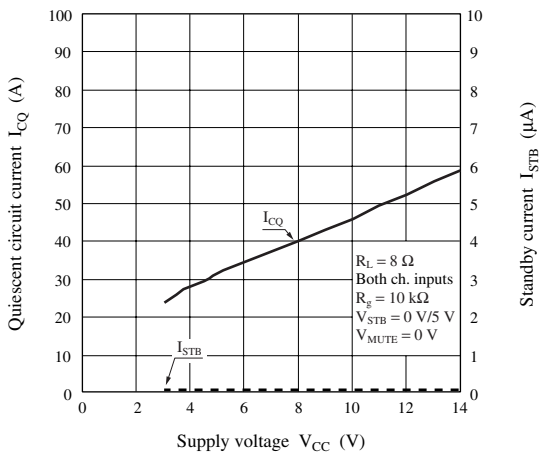


2. Main characteristics

P_O — V_{CC}



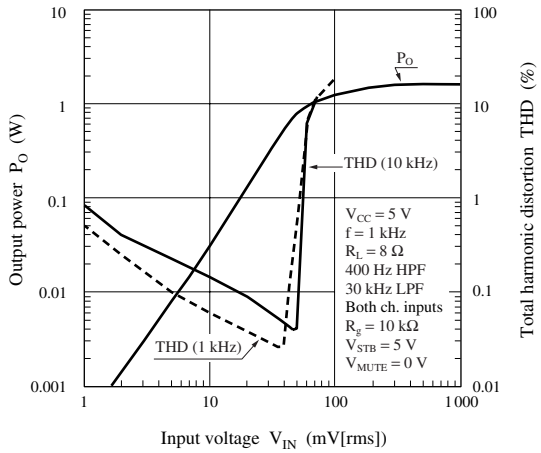
I_{CQ} , I_{STB} — V_{CC}



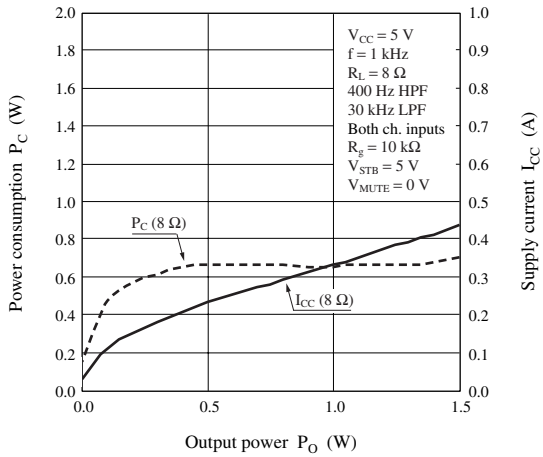
■ Technical Data (continued)

2. Main characteristics (continued)

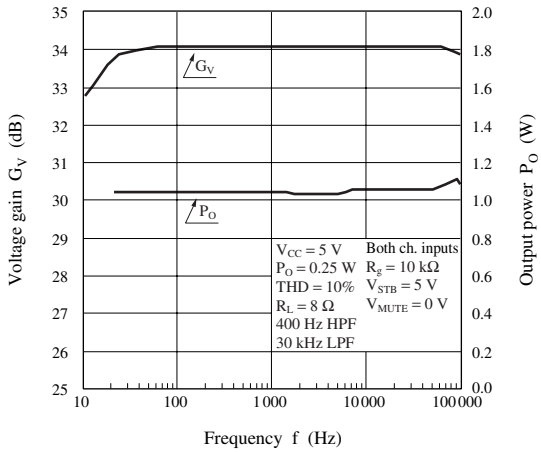
P_O , THD — V_{IN}



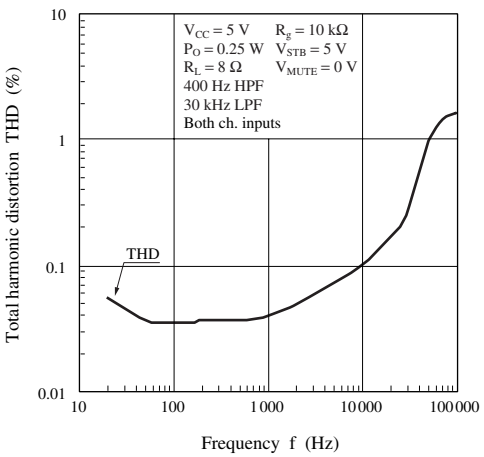
P_C , I_{CC} — P_O



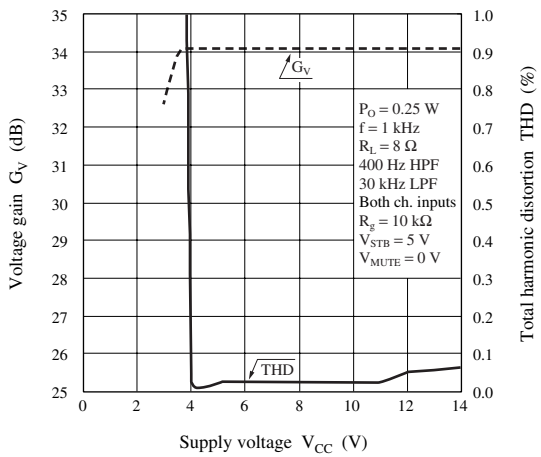
G_V , P_O — f



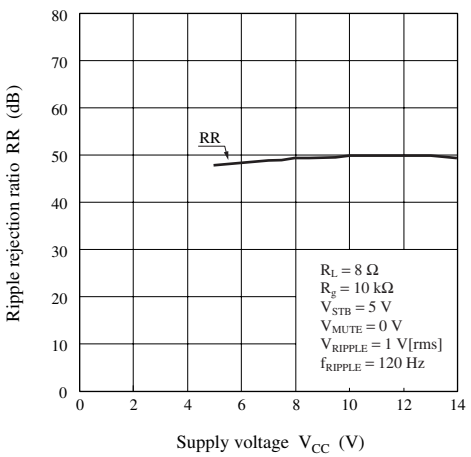
THD — f



G_V , THD — V_{CC}



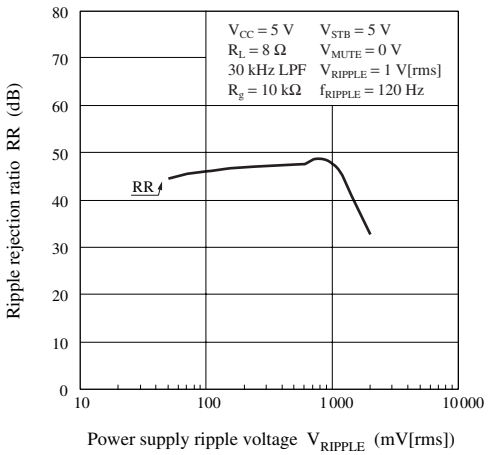
RR — V_{CC}



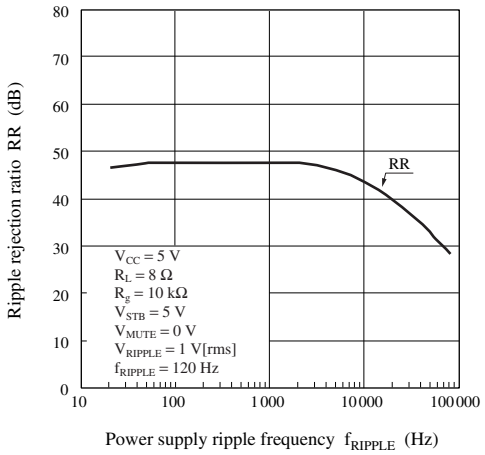
■ Technical Data (continued)

2. Main characteristics (continued)

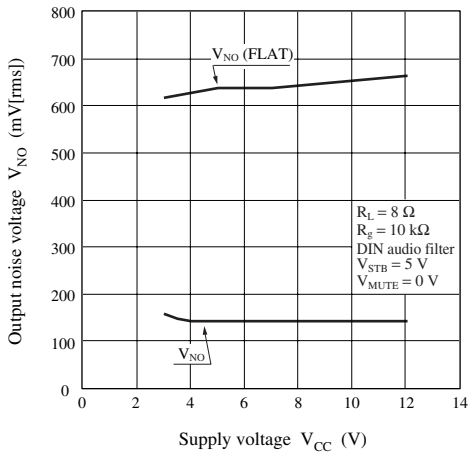
RR — V_{RIPPLE}



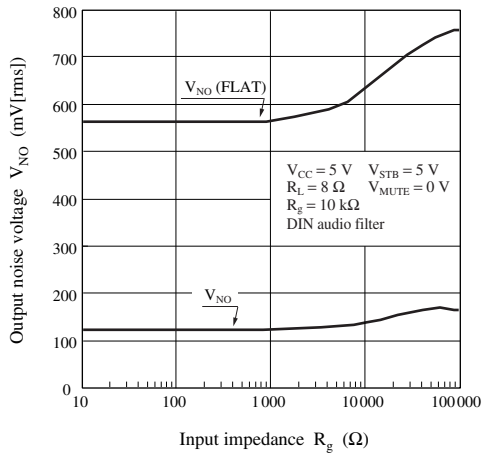
RR — f_{RIPPLE}



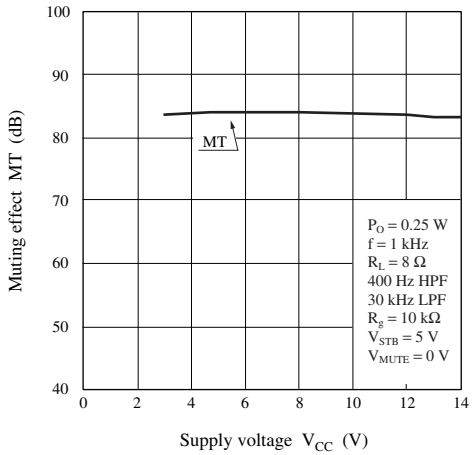
V_{NO} — V_{CC}



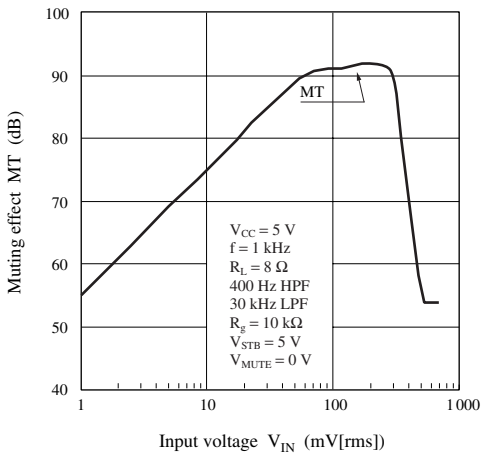
V_{NO} — R_g



MT — V_{CC}



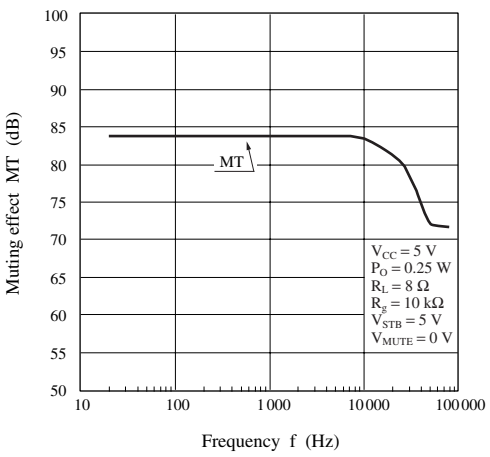
MT — V_{IN}



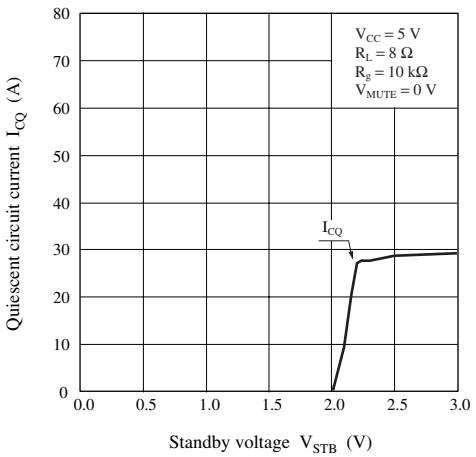
■ Technical Data (continued)

2. Main characteristics (continued)

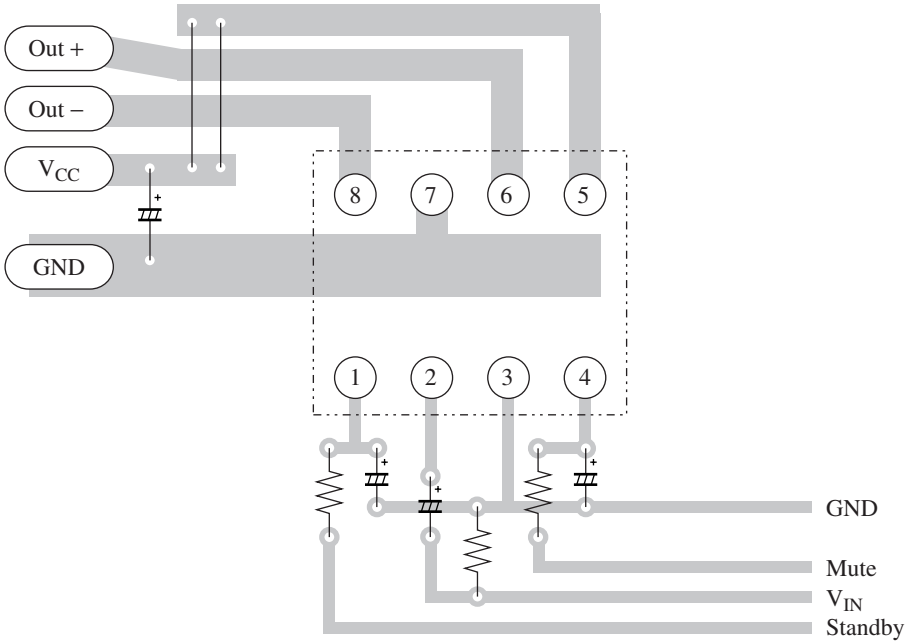
MT — f



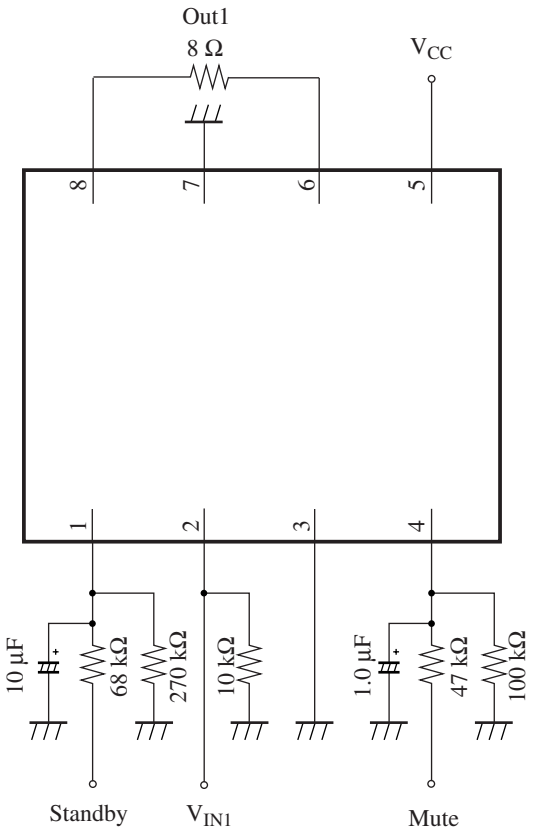
I_{CQ} — V_{STB}



3. Example of PCB pattern



■ Application Circuit Example



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