

AN7191K, AN7191Z

Dual 20W BTL Low Frequency Power Amplifier IC for Output

Overview

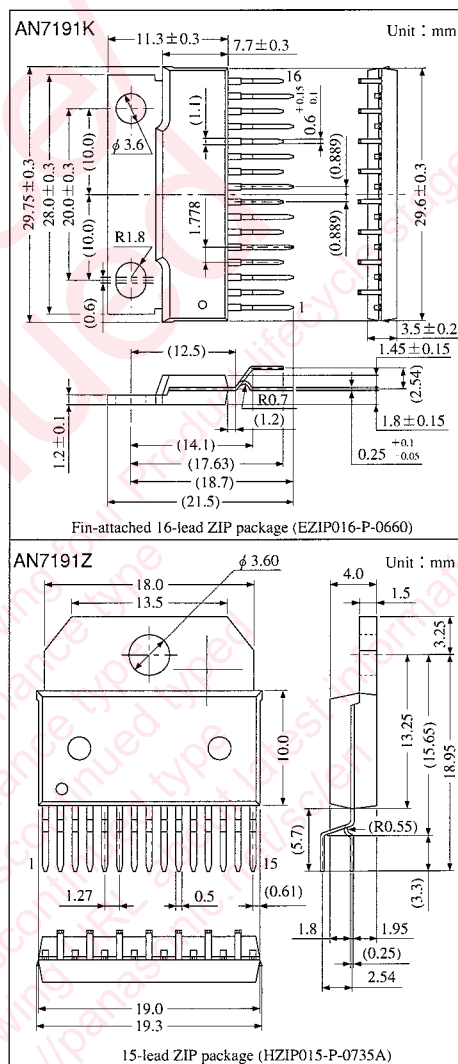
The AN7191K and AN7191Z are audio power ICs developed for sound output of car audio (20W×2ch.).

High density mounting is possible and they can contribute to cost reduction, because they require fewer external components. It incorporates various protective circuits to provide high reliability and breakage resistance. Particularly, it has realized the supply surge withstand voltage of 100V (typ.).

The AN7191Z enable realize the saved space design with small package.

Features

- Improved breakage resistance performance
 - Supply surge withstand voltage : 80V (typ. 100V)
 - Short-circuit breakage withstand voltage : 25V
- Fewer external components required
 - Electrolytic capacitors for NF (Negative Feedback), BS (Boot-strap) and input coupling not required
- With stand-by function
- With beep sound input pin
- Various protective circuits built-in
 - Protection from atmospheric and ground faults, load short-circuit, over-voltage and -current, and temperature protection



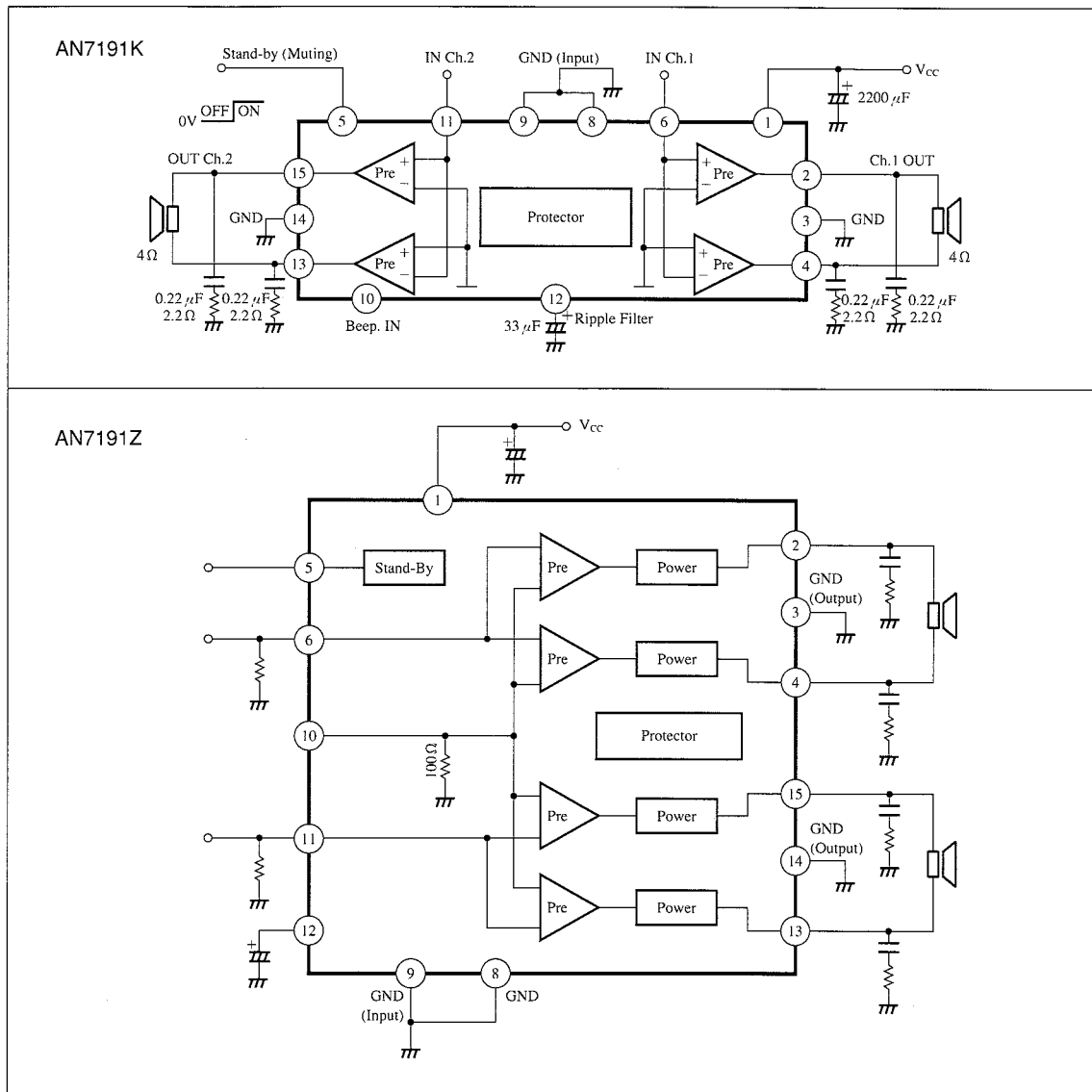
Pin Name

Pin No.	Pin Name	Pin No.	Pin Name
1	V _{CC}	9	GND (Input)
2	Ch.1 Output (+)	10	Beep Sound Input
3	GND (Output Ch.1)	11	Ch.2 Input
4	Ch.1 Output (-)	12	Ripple Filter
5	Stand-by	13	Ch.2 Output (-)
6	Ch.1 Input	14	GND (Output Ch.2)
7	NC	15	Ch.2 Output (+)
8	GND (Substrate)	16	NC (AN7191K)

Note 1) Do not apply voltage or current to NC pin from outside.

Note 2) The AN7191K is 16-Pin package and the AN7191Z is 15-Pin package.

Block Diagram



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Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating		Unit
Supply Voltage ^{Note 1)}	V _{CC}	25		V
Peak Supply Voltage ^{Note 2)}	V _{surge}	80		V
Supply Current	I _{CC}	9		A
Power Dissipation ^{Note 3)}	P _D	AN7191K	32.5	W
		AN7191Z	59.1	
Operating Ambient Temperature	T _{opr}	-30 ~ +85		°C
Storage Temperature	T _{stg}	-55 ~ +150		°C

Note 1) At no signals

Note 2) t=0.2s

Note 3) Ta=85°C

■ Recommended Operating Range ($T_a = 25^\circ\text{C}$)

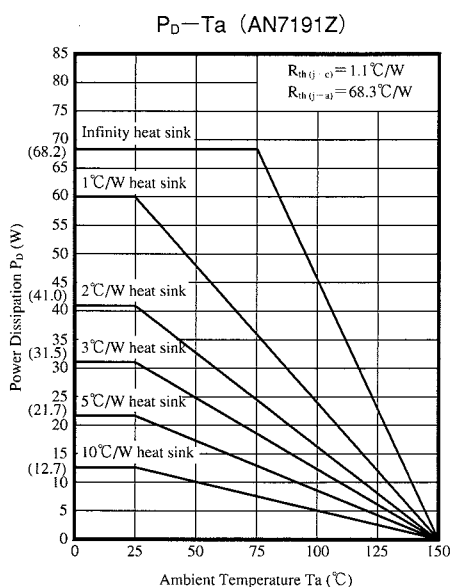
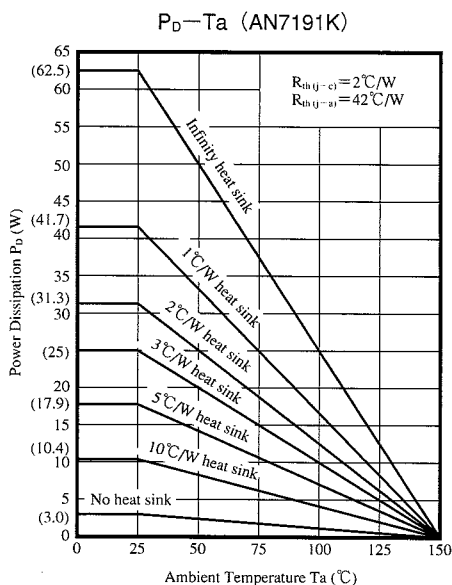
Parameter	Symbol	Range
Operating Supply Voltage Range	V_{CC}	8.0V ~ 18.0V

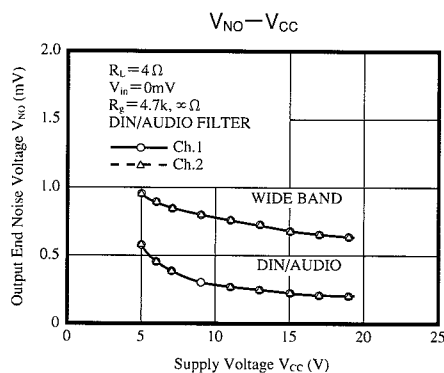
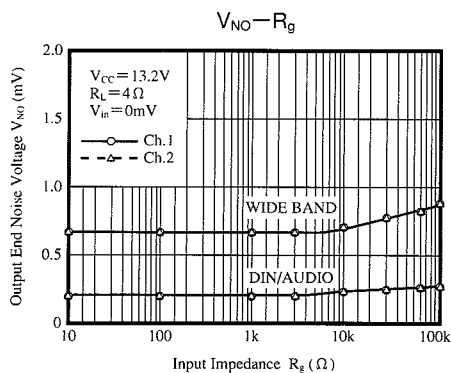
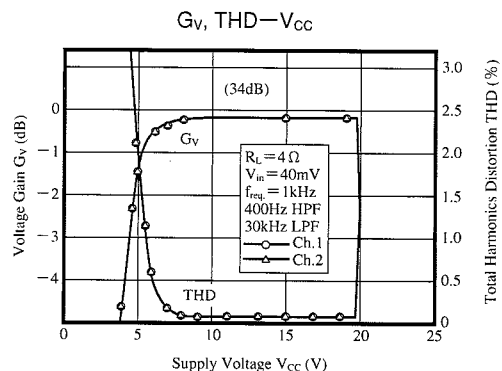
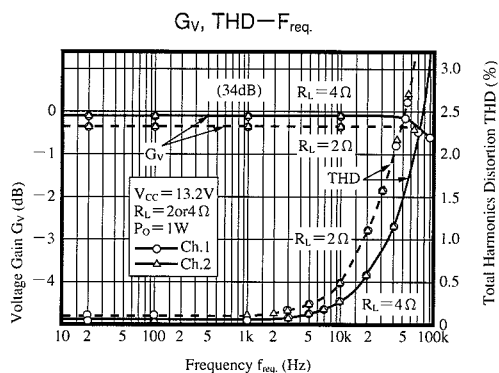
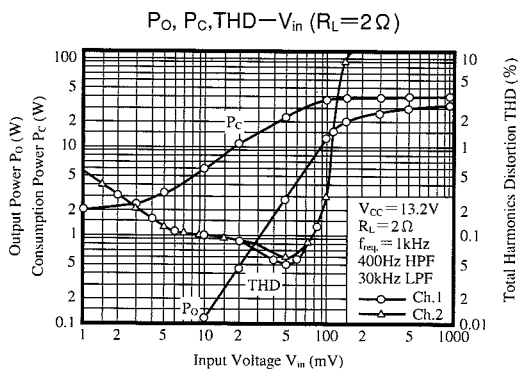
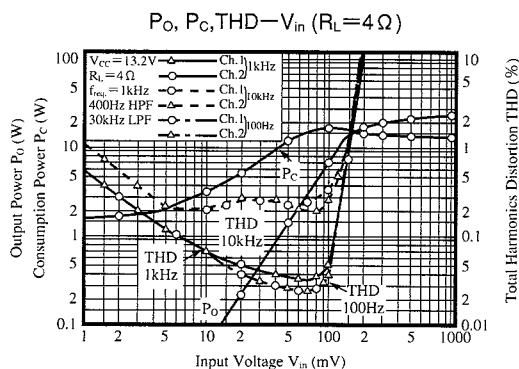
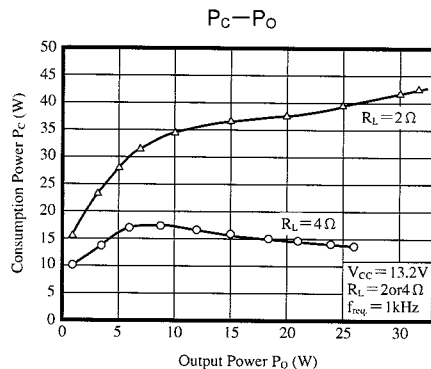
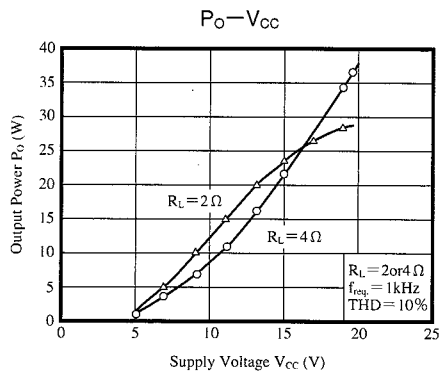
■ Electrical Characteristics ($V_{CC} = 13.2\text{V}$, $f_{\text{req.}} = 1\text{kHz}$, $T_a = 25^\circ\text{C} \pm 2^\circ\text{C}$)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Quiescent Current	I_{CQ}	$V_{IN} = 0\text{mV}$, $R_L = 4\Omega$	—	150	250	mA
Stand-by Current	I_{STB}	$V_{IN} = 0\text{mV}$, $R_L = 4\Omega$	—	1	10	μA
Output Noise Voltage ^{Note 1)}	V_{NO}	$R_g = 4.7\text{k}\Omega$, $R_L = 4\Omega$	—	0.22	0.5	mVrms
Voltage Gain 1	G_{V1}	$V_{IN} = 40\text{mV}$, $R_L = 4\Omega$	32	34	36	dB
Total Harmonics Distortion 1	THD1	$V_{IN} = 40\text{mV}$, $R_L = 4\Omega$	—	0.05	0.4	%
Max. Output Power 1	P_{O1}	THD = 10%, $R_L = 4\Omega$	15	17	—	W
Ripple Rejection Ratio ^{Note 1)}	RR	$R_L = 4\Omega$, $R_g = 0\Omega$, $V_r = 1\text{Vrms}$, $f_r = 120\text{Hz}$	55	70	—	dB
Channel Balance	CB	$V_{IN} = 40\text{mV}$, $R_L = 4\Omega$	—	0	1	dB
Crosstalk ^{Note 1)}	CT	$V_{IN} = 40\text{mV}$, $R_L = 4\Omega$, $R_g = 4.7\text{k}\Omega$	55	70	—	dB
Output Offset Voltage	V_{off}	$R_g = 4.7\text{k}\Omega$, $R_L = 4\Omega$	-250	0	250	mV
Input Impedance	Z_i	$V_{IN} = \pm 0.3\text{V}_{DC}$	25	30	36	$\text{k}\Omega$
Voltage Gain 2	G_{V2}	$V_{IN} = 40\text{mV}$, $R_L = 2\Omega$	32	34	36	dB
Total Harmonics Distortion 2	THD2	$V_{IN} = 40\text{mV}$, $R_L = 2\Omega$	—	0.08	0.8	%
Max. Output Power 2	P_{O2}	THD = 10%, $R_L = 2\Omega$	15	20	—	W

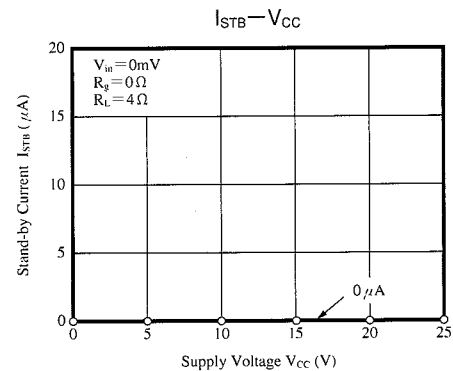
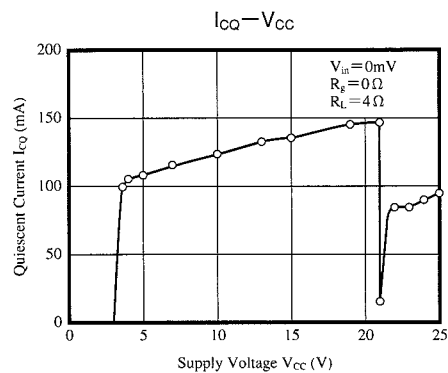
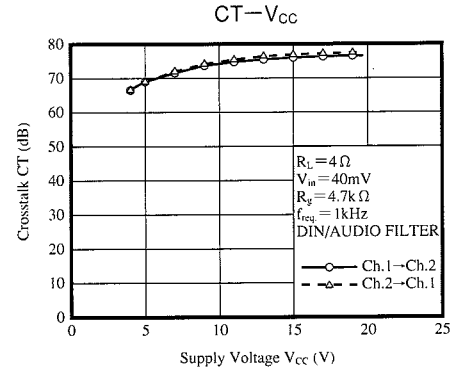
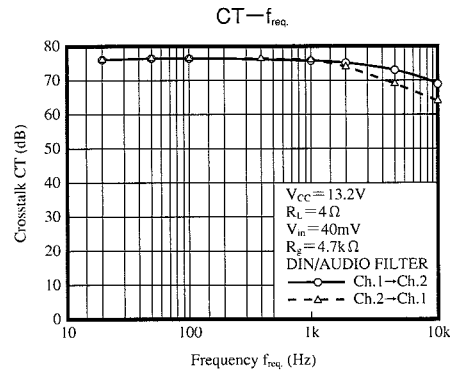
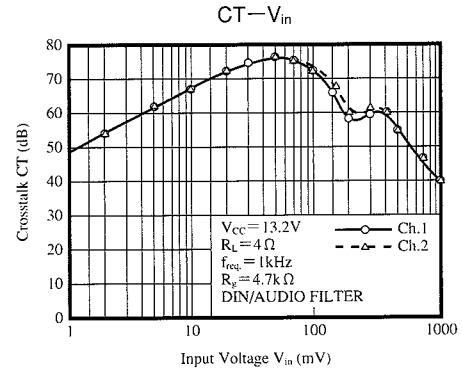
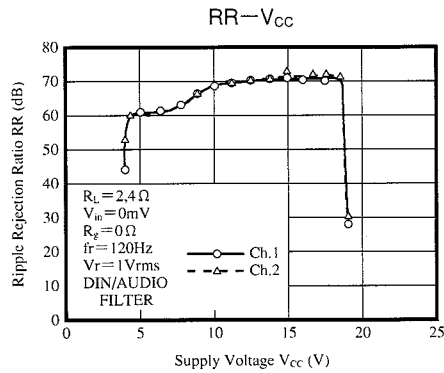
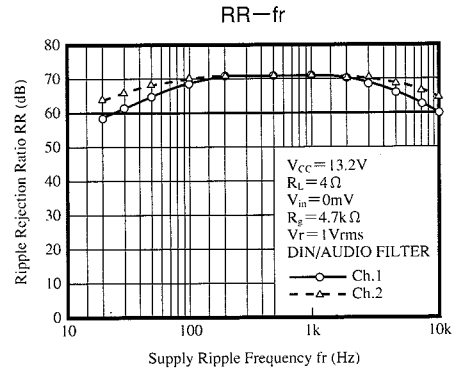
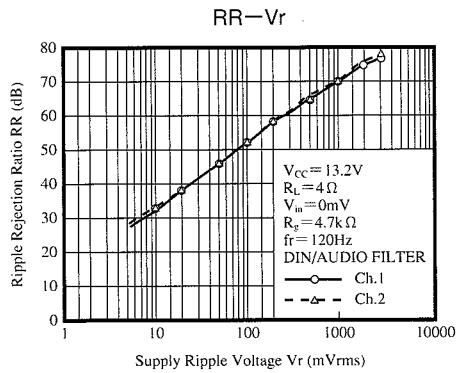
Note 1) Measured through 15Hz to 30kHz (12dB/OCT) filter

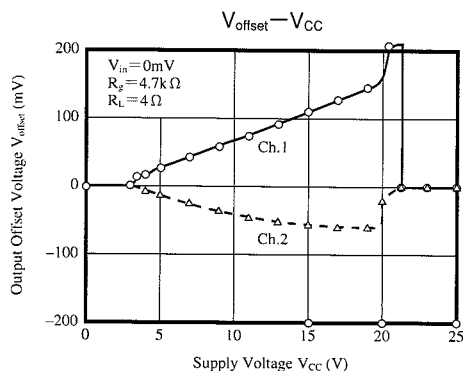
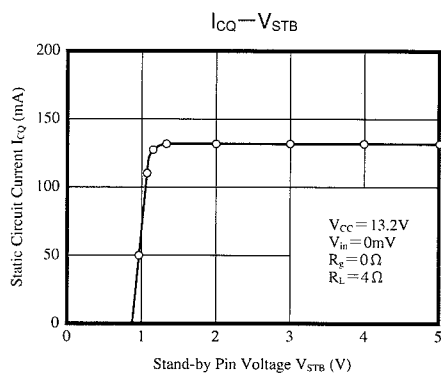
■ Characteristic Curve





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■ Precautions on use

1. Always attach an outside heat sink to use the chip. In addition, the outside heat sink must be fastened onto a chassis for use.
2. Connect the radiation fin to the GND potential.
3. Prevent atmospheric and ground faults, and load short-circuit.
4. The temperature protective circuit gets actuated when $T_j = \text{approx. } 150^\circ\text{C}$, but it is automatically reset when the chip temperature drops below the above set level.
5. The overvoltage protective circuit starts the protective operation at $V_{CC} = \text{approx. } 20V$.
6. Take into consideration the heat radiation design particularly when V_{CC} is set high or when the load is 2Ω .
7. When the beep sound function is not used, connect the beep sound input pin (Pin⑩) with Pin⑨.

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