

# AN7178

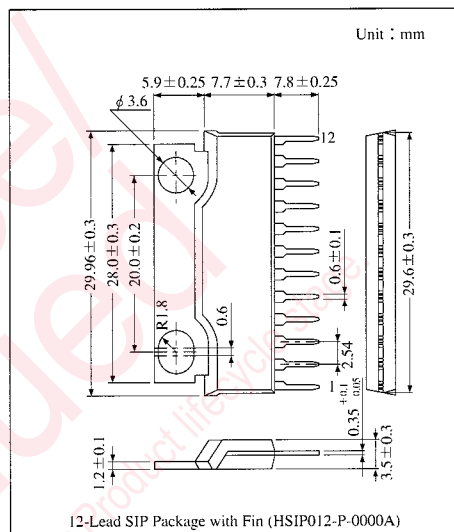
## Dual 5.7W Audio Power Amplifier Circuit

### Overview

The AN7178 is an integrated circuit designed for audio with low distortion, low noise and low dissipation of 5.7W (13.2V, 4Ω) output. Stereo operation is enabled due to incorporating two amplifiers. 12-pin SIP package enables compact and high integrated set. Thermal protection, short protection and excessive current protection circuits are built in.

### Features

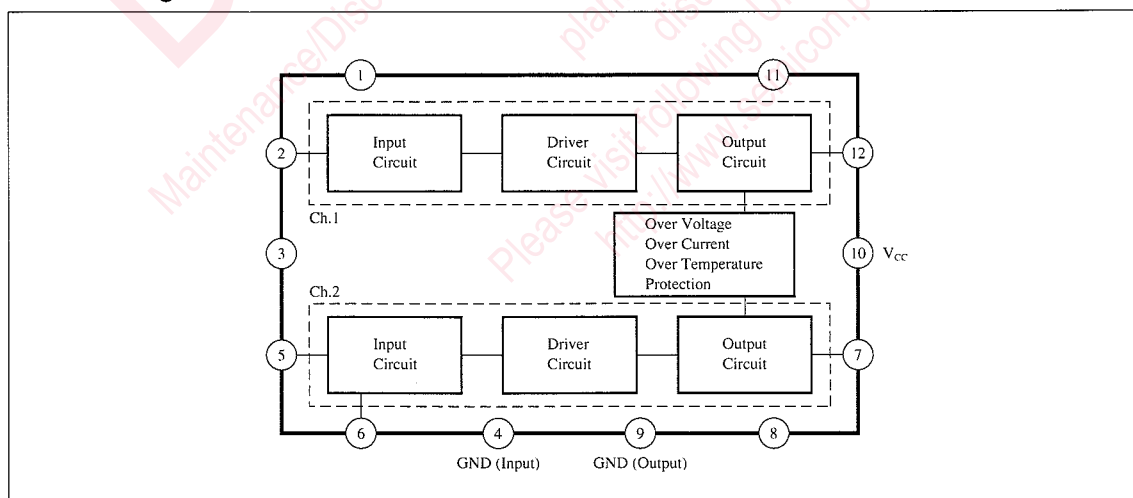
- Highly stable operation
- Low distortion
- Low quiescent current
- Low noise
- Low shock noise from power ON/OFF operation
- Built-in muting circuit
- Fewer external components
- Incorporating protection circuits



### Pin Descriptions

Pin No.	Pin Name	Pin No.	Pin Name
1	NFB Ch.1	7	Output Ch.2
2	Input Ch.1	8	Bootstrap Ch.2
3	Ripple Filter	9	GND (Output)
4	GND (Input)	10	V <sub>CC</sub>
5	Input Ch.2	11	Bootstrap Ch.1
6	NFB Ch.2	12	Output Ch.1

### Block Diagram

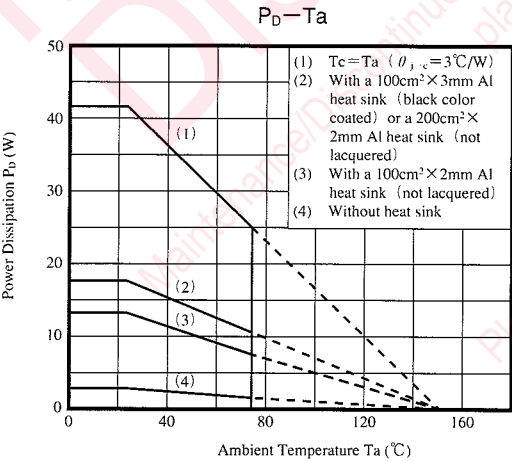


■ Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

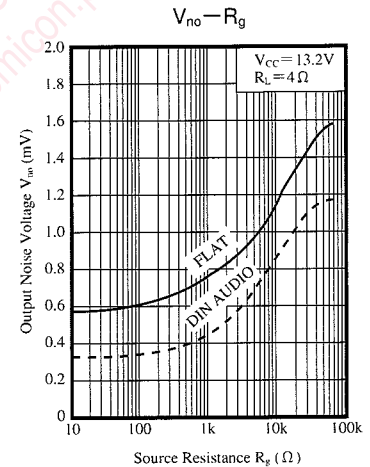
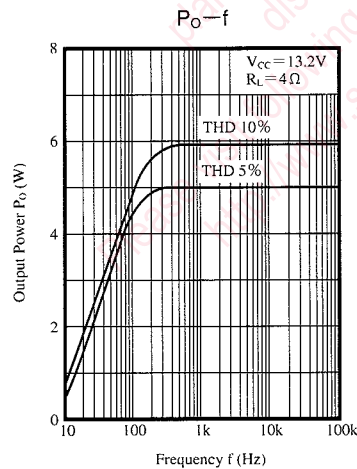
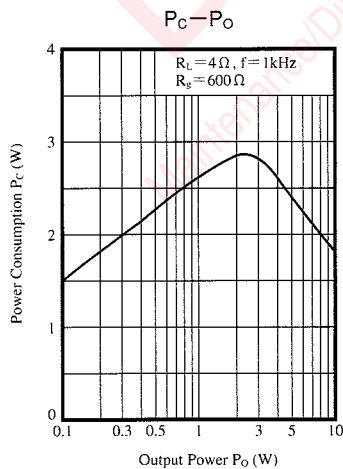
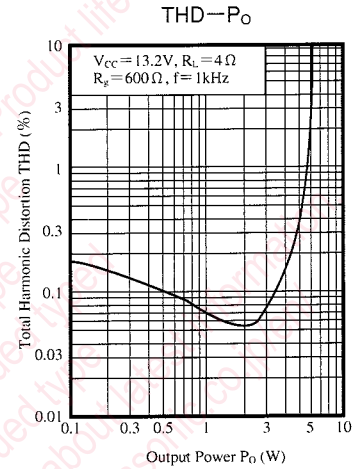
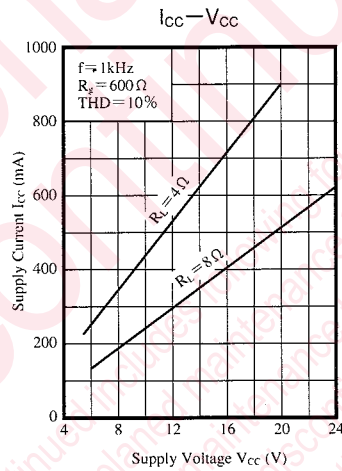
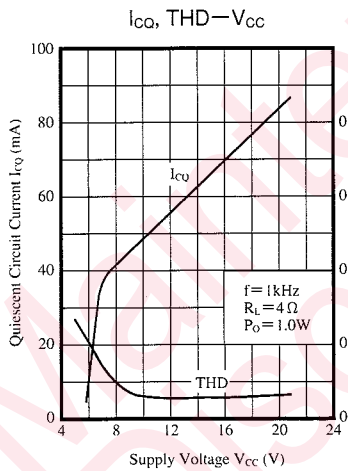
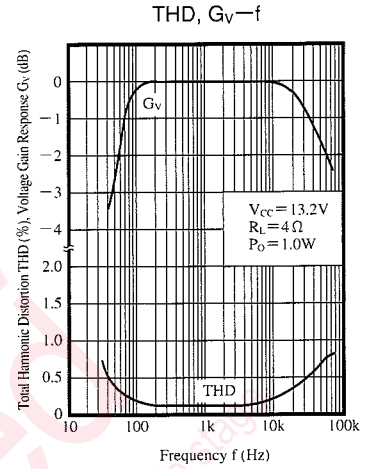
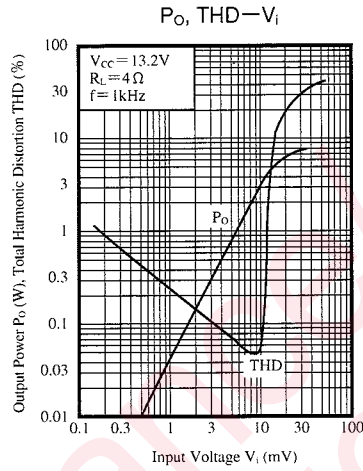
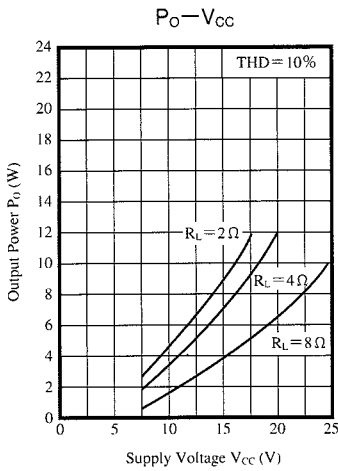
Parameter	Symbol	Rating	Unit
Supply Voltage	$V_{CC}$	18	V
Supply Current	$I_{CC}$	4.0	A
Power Dissipation	$P_D$	41.7	W
Operating Ambient Temperature	$T_{opr}$	$-30 \sim +75$	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	$-55 \sim +150$	$^\circ\text{C}$

■ Electrical Characteristics ( $V_{CC} = 12\text{V}$ ,  $R_C = 3\ \Omega$ ,  $f = 1\text{kHz}$ ,  $T_a = 25^\circ\text{C}$ )

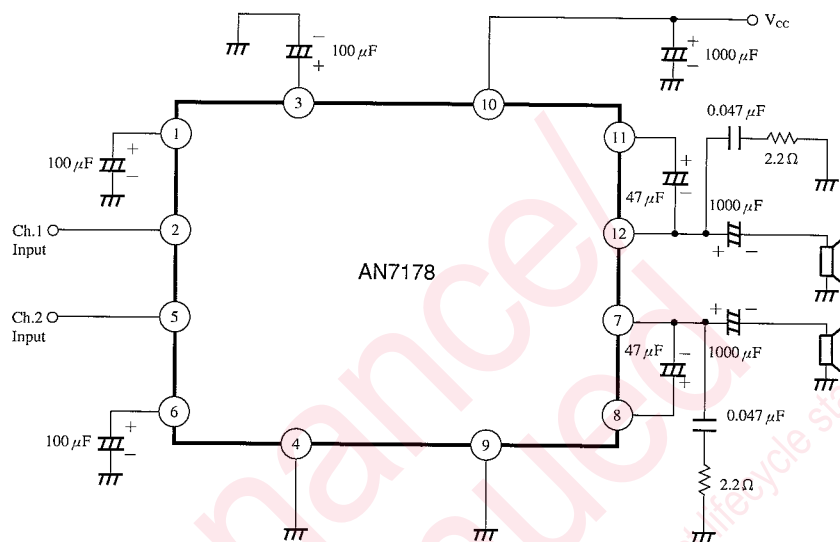
Parameter	Symbol	Condition	min.	typ.	max.	Unit
Quiescent Circuit Current	$I_{CQ}$	$V_i = 0\text{mV}$	30	55	100	mA
Voltage Gain	$G_v$	$P_O = 0.5\text{W}$	52	54	56	dB
Total Harmonic Distortion	THD	$P_O = 0.5\text{W}$	—	0.1	0.5	%
		$P_O = 0.5\text{W}$ , $f = 100\text{Hz}$	—	0.1	—	
		$P_O = 0.5\text{W}$ , $f = 10\text{kHz}$	—	0.2	—	
		THD = 10%	5.0	5.7	—	
Maximum Output	$P_O$	THD = 10%, $R_L = 2\ \Omega$	—	8.9	—	W
		THD = 10%, $R_L = 8\ \Omega$	—	3.1	—	
		THD = 10%	5.0	5.7	—	
Output Noise Voltage	$V_{no}$	$R_g = 10\text{k}\ \Omega$ , 1000pF, $f = 15\text{Hz} \sim 30\text{kHz}$ , 12dB/OCT	—	0.8	1.5	mV
		$R_g = 10\text{k}\ \Omega$ , 1000pF, Without Filter	—	1.1	—	
Channel Balance	CB	$P_O = 0.5\text{W}$	—	0	1.0	dB
Channel Separation	CS	$P_O = 0.5\text{W}$	40	50	—	dB
Ripple Rejection Ratio	RR	$P_O = 0.5\text{W}$ , $R_g = 10\text{k}\ \Omega$ , $V_{\text{ripple}} = 280\text{mV}_{\text{rms}}$ , $f_{\text{ripple}} = 12\text{Hz}$ Sine wave	35	41	—	dB
Offset Voltage	$V_{O(\text{offset})}$	$V_i = 0\text{mV}$	—	0	200	mV



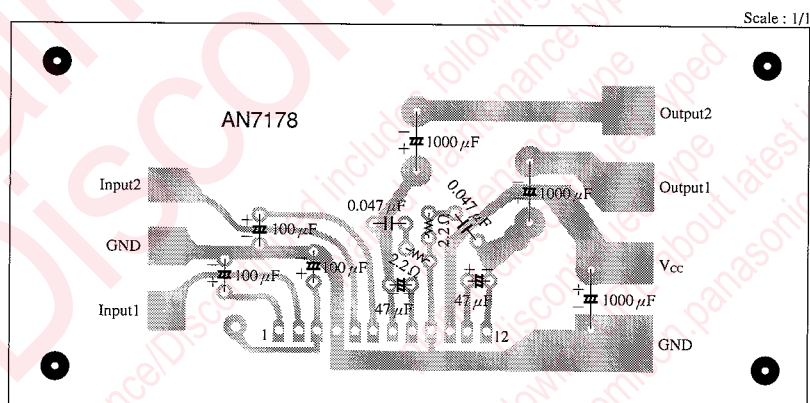
ICs for  
Audio  
Common  
Use



# Application Circuit



# Printed Circuit Board Layout



ICs for  
Audio  
Common  
Use

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