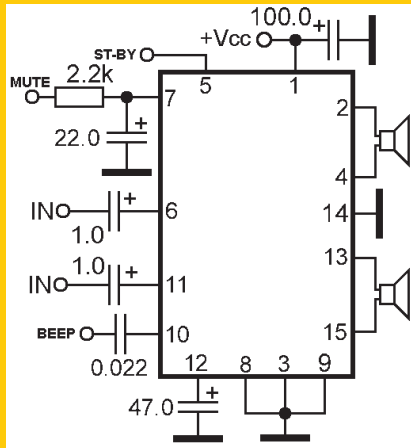


# Audio Amp

A205P... $\mu$ PC2500H

## integrated Audio Amplifier circuits



**Vergleichstabelle**  
**Datenbuch**  
**comparison table**  
**data book**

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# Audio Amp

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## Vorwort

Einer der grundlegenden Bestandteile eines jeden ton-reproduzierenden Systems ist der Leistungsverstärker oder auch Audio-Endverstärker. In Geräten der Consumer-Elektronik und des Professional- oder HighEnd-Bereichs besitzen integrierte Audio-Endverstärker die größte Popularität.

Vorteile von integrierten Endverstärkern sind:

- Man benötigt wenige externe, diskrete Bauelemente.
- Dadurch ergibt sich eine geringere Leiterplattenfläche.
- Es gibt sie für nahezu jede gewünschte Ausgangsleistung.
- Viele sind universell einsetzbar.
- Es gibt sie mit diversen Zusatzfunktionen, wie
  - Bass Boost
  - Stummschaltung
  - Standby
  - Automatic Gain Control
  - I<sup>2</sup>C-Interface usw.

Für den richtigen Einsatz des integrierten Audio-Endverstärkers, unabhängig vom Anwendungsbereich (Entwicklung oder Reparatur), ist es notwendig folgendes zu wissen:

- die Funktion der integrierten Schaltung
- die elektrischen Grunddaten (Betriebsspannung etc.)
- die Anschlussbelegung
- die interne Schaltung
- die Gehäuseform oder
- im Reparaturfall eventuell die Vergleichstypen

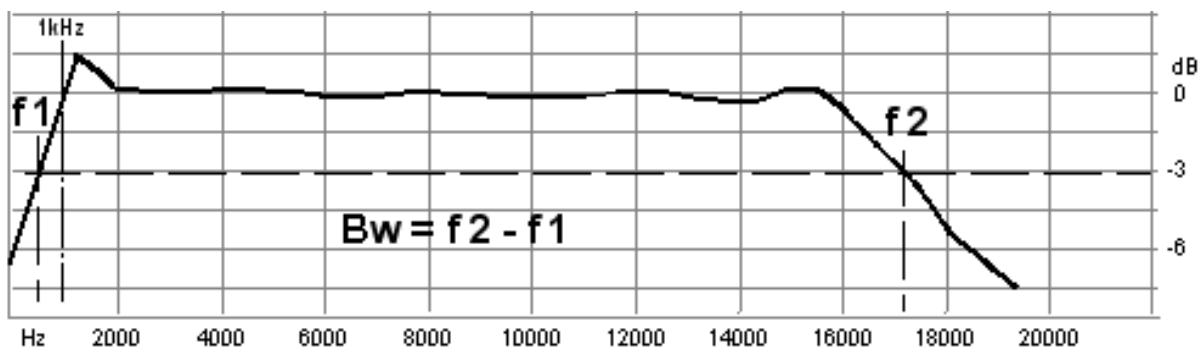
## Kenngroßen von Verstärkern

Die grundlegenden Kenngroßen um einen integrierten Audio-Endverstärker zu beschreiben sind:

- die elektrischen Grenzwerte
- die Ausgangsleistung
- die Verstärkung
- die Bandbreite
- Eingangseigenschaften  
(Widerstand, Strom, Spannung und/oder Leistung, Impedanz der Signalquelle)
- Ausgangseigenschaften (Widerstand, Strom, Spannung und/oder Leistung, Impedanz der Last)
- der Arbeitsbereich/Linearitätsbereich
- der Signal-Rauschabstand, der Klirrfaktor, die THD

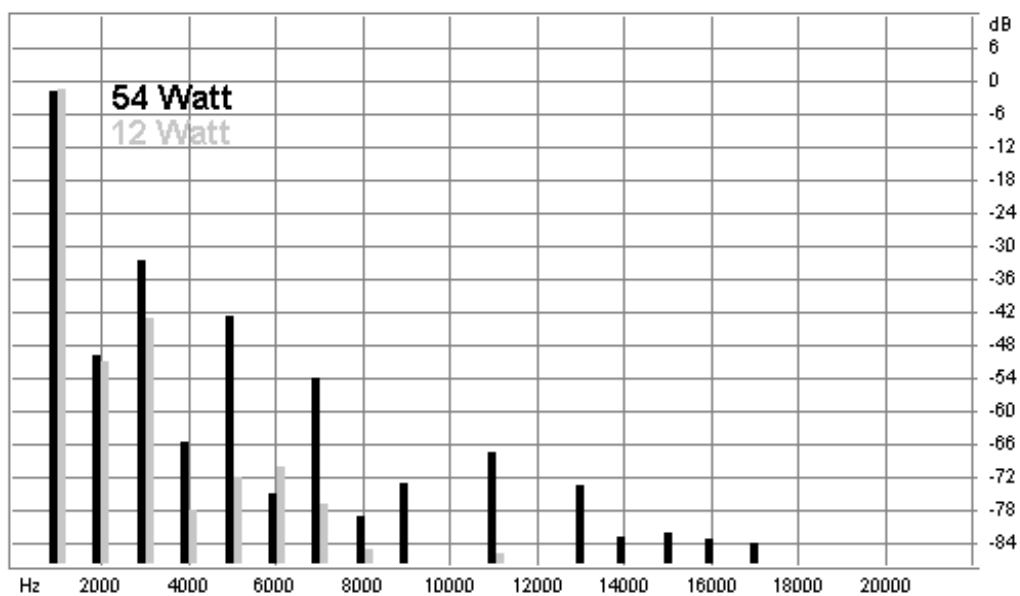
Die **Spannungsverstärkung** (Gain)  $G_v$  stellt das Verhältnis des Ausgangssignals zum Eingangssignal dar. Die Verstärkung  $G_v$  kann als direktes Verhältnis (V/mV oder V/ $\mu$ V) oder als logarithmisches Verhältnis in dB ausgedrückt werden. Die Verstärkung hängt vom Lastwiderstand  $R_L$ , Eingangswiderstand  $R_{in}$ , der Versorgungsspannung  $U_{cc}$  und der Frequenz ab.

Die **Bandbreite** (Bandwidth)  $B_w$  gibt den Frequenzbereich zwischen unterer Grenzfrequenz  $f_1$  und oberer Grenzfrequenz  $f_2$  an. Üblich ist die Angabe der Grenzfrequenzen bei 3dB Dämpfung bezüglich des Ausgangssignals bei einer Frequenz von 1kHz. Manche Hersteller geben die Bandbreite aber auch bei einer Dämpfung von 1dB oder 0,5dB an.



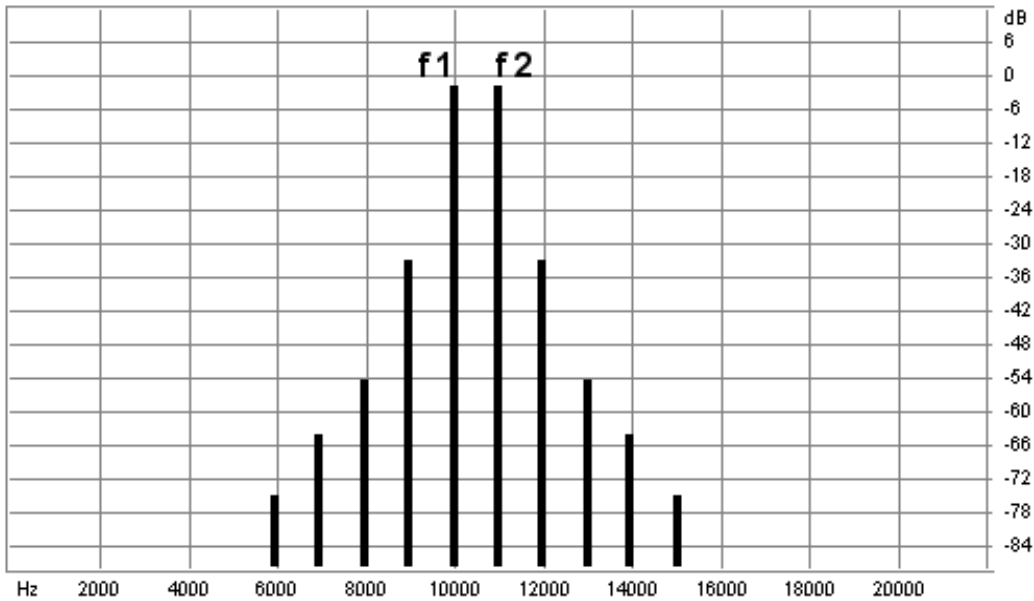
Alle Verstärker verändern Eingangssignale. D.h. sie verstärken die Signale und sie addieren Eigenschaften, die nicht im ursprünglichen Signal vorhanden waren. Diese nicht erwünschten Veränderungen fasst man unter dem Begriff Verzerrung zusammen. Die Verstärkung an sich ist eine gewollte lineare Verzerrung (linear distortion). Übernahmeverzerrungen in Gegentaktendstufen sind unerwünschte, nicht lineare Verzerrungen (non-linear distortions).

Eine grundlegende Art von Verzerrung entsteht durch die Erzeugung von sogenannten Harmonischen (harmonics). Ein reines Sinussignal enthält nur die Signalfrequenz. Jede andere Signalform setzt sich aus der Grundfrequenz und deren Vielfachen in verschiedenen Amplitudenhöhen zusammen. Harmonische Vielfache eines Sinussignals sind Sinussignale mit ganzzahlig vielfacher Frequenz des Originalsignals. Speist man am Eingang eines Verstärkers ein reines Tonsignal mit  $f=1\text{kHz}$  ein, kann man am Ausgang feststellen, dass das Ausgangssignal verändert ist. Messungen mit einem Spectrumanalyser werden zeigen, dass verschiedene Harmonische hinzugefügt wurden. Dies nennt man **harmonische Verzerrung** (harmonic distortion).



Eine weitere wichtige Art der Verzerrungen, welche oft in Datenblättern angegeben werden, sind Intermodulationverzerrungen. **Intermodulationverzerrungen** sind für das menschliche Ohr viel unangenehmer, weil dadurch Nicht-Harmonische erzeugt werden. Nicht-Harmonische sind nicht ganzzahlig Vielfache der Frequenz des Originalsignals bzw. haben keinen direkten Bezug zum Originalsignal.

Speist man zwei reine Töne mit den Frequenzen  $f_1$  und  $f_2$  gleichzeitig am Eingang des Verstärkers ein, wird man am Ausgang neben den harmonischen Vielfachen der Originalsignale auch andere Frequenzen messen können. Diese Frequenzen ergeben sich durch Addition oder Subtraktion der beiden Originalsignale und deren Vielfachen und werden durch Nichtlinearitäten in den Kennlinien der Halbleiterbauelemente erzeugt. Wann immer zwei Signale an einem nichtlinearen System angewendet werden, werden neue Signale zusätzlich zu den Ursprünglichen erzeugt.



Die nichtlinearen Verzerrungen nehmen mit steigendem Eingangssignal zu.

Der **Klirrfaktor k**, in Prozent angegeben, ist ein Maß für die durch nichtlineare Baugruppen erzeugten nichtlinearen Verzerrungen. Der Klirrfaktor k ist das Verhältnis des Oberwellen-Effektivwertes zum Gesamt-Effektivwert einschließlich Grundwellenanteil.

Ein anderes Maß für die durch nichtlineare Baugruppen erzeugten nichtlinearen Verzerrungen ist der Wert von **THD „Total Harmonic Distortion“** eines Verstärkers. Er wird normalerweise bei max. Leistung über ein gegebenes Frequenzband mit einer bestimmten Last angegeben und entspricht dem Effektivwert des Ausgangssignals ohne Grundwellenanteil bezogen auf das Grundsignal in Prozent. Gute Werte für THD sind kleiner 0,5%.

Der **Signal-Rauschabstand SNR** (S/N, signal-to-noise ratio) bzw. das Signal-Rausch-Verhältnis in deziBel (dB) ist definiert als das Verhältnis der vorhandenen mittleren Signal-Leistung zur vorhanden mittleren Rauschleistung, wobei der Ursprung der Rauschleistung nicht berücksichtigt wird.

Die kleinste Eingangsspannung, die bei voller Lautstärke die maximale Ausgangsleistung bewirkt, nennt man **Eingangsempfindlichkeit** (Sensitivity).

Für Verstärker gibt es diverse Leistungsangaben. Sie gelten nur bei Verwendung des angegebenen **Lastwiderstandes** (load impedance) **RI**. Bei Verwendung eines Lastwiderstandes mit anderer Impedanz sinkt die Ausgangsleistung ab, weil keine Leistungsanpassung mehr vorliegt. Bei Verwendung eines zu geringen Lastwiderstandes kann der Verstärker zerstört werden.

**PMPO Peak Music Power Output**, auch **Pulse Maximum Power Output** steht in Leistungsangaben für die theoretisch höchste Leistung, die ein Verstärker erbringen kann ohne sich dabei selbst zu beschädigen oder zu zerstören. Allerdings sagt PMPO nichts darüber aus, wie lange eine solche Maximalbelastung bestehen kann ohne dass die Zerstörung oder Beschädigung eintritt.

Die **Musikleistung** (musical power) ist die kurzzeitig maximal zulässige Ausgangsleistung eines Verstärkers oder einer Endstufe. Sie kann erheblich höher als die Sinusleistung liegen.

Die **Sinusleistung** (sinusoidal power, continuous power, RMS power) kann bei gegebenem Klirrfaktor - im Unterschied zur Musikleistung - beliebig lange gefahren werden ohne dass Störungen oder Leistungseinbußen entstehen und ist daher stets kleiner als die Musikleistung. Nennleistung oder RMS-Leistung sind andere Bezeichnungen für die Sinusleistung.

## Verschiedene Verstärkerarten

Betrachtet man die Möglichkeiten Lautsprecher anzuschließen, kann man zwei Arten von Verstärkern unterscheiden.

An herkömmlichen Verstärkern (**SE, Single- Ended**) findet man jeweils einen Anschluß für Signalausgang und Masse. Dementsprechend wird der Lautsprecher zwischen Ausgang und Masse geschaltet.

An **BTL-Verstärkern (Bridge-Tied Loads)** findet man ebenfalls zwei Anschlüsse pro Kanal. Beide sind aber Verstärker-Ausgänge und dürfen daher normalerweise nicht mit Masse verbunden werden! Es gibt also zwei Verstärker je Kanal. Der eine wird mit dem Originalsignal und der andere mit dem invertierten Signal gespeist. Da der Lautsprecher zwischen beiden Verstärkerausgängen angeschlossen wird, ergibt sich also der doppelte Spannungshub im Vergleich zum herkömmlichen Verstärker.

**Class-D Verstärker** verwenden eine Technik, welche Pulsbreitenmodulation genannt wird (manchmal kombiniert mit Pulsfrequenzmodulation). Das Eingangssignal wird in eine Folge von Impulsen umgewandelt, deren Breite zur Amplitude des Signals proportional ist. Die Frequenz der Impulse ist gewöhnlich dreißig mal höher als die höchste zu übertragende Frequenz des Eingangssignals. Die Hauptvorteile eines Class-D Verstärkers sind Wirkungsgrad und Einfachheit. 80% bis 90% Wirkungsgrad sind durchaus möglich. Im Gegensatz zu herkömmlichen analogen Verstärkern fällt an den Schaltelementen (MOSFETs) des Class-D Verstärkers kaum Verlustleistung an. Denn entweder sind sie gesperrt und es fließt kein Strom oder sie sind leitend und es fällt kaum Spannung ab. Daher entsteht auch kaum Verlustleistung bzw. Abwärme.

## Sie suchen ein bestimmtes Bauteil ?

In diesem Buch finden Sie Daten zu ungefähr 3500 derzeit aktueller integrierter Audio-Verstärker und Audio-Leistungsverstärker. Es gibt jeweils eine Gehäusezeichnung, eine Innenbeschaltung und falls vorhanden ähnliche Typen mit gleicher Innenbeschaltung. Die Kontaktadressen und Logos der Hersteller sind ebenfalls aufgeführt.

Verschiedene Indizes erlauben Ihnen die Suche, entweder nach einer Typenbezeichnung (Kapitel 6 „Index“ oder Kapitel 2 „Technische Daten“) oder nach der Funktion (Kapitel 4 „Funktionsübersicht“).

Im Kapitel 2 „Technische Daten“ finden Sie neben den wichtigsten Daten auch die Verweise auf die Seite mit der Innenbeschaltung und eventuell vergleichbaren Bauteiltypen.

Die in den Tabellen angegebenen Gehäusezeichnungen finden sie übersichtlich sortiert im Kapitel 5 „Gehäusezeichnungen“.

## Introduction

One of the basic components of any sound-reproducing system is the power audio amplifier. With reference to consumer and professional electronic equipments the integrated power audio amplifiers do have the greatest popularity.

The most important advantages are:

- Only few external electronic devices are needed.
- Thus results a smaller printed circuit board surface.
- A large amount with a large range of output power values is available.
- Many of them are universally applicable.
- Many of them have additional options like
  - Bass Boost
  - Mute
  - Standby
  - Automatic Gain Control
  - I<sup>2</sup>C-Interface etc.

For a correct usage it is necessary to know following:

- the function of the integrated circuit
- the main electrical characteristics
- the pin out
- the internal structure
- the package type
- equivalents, replacements

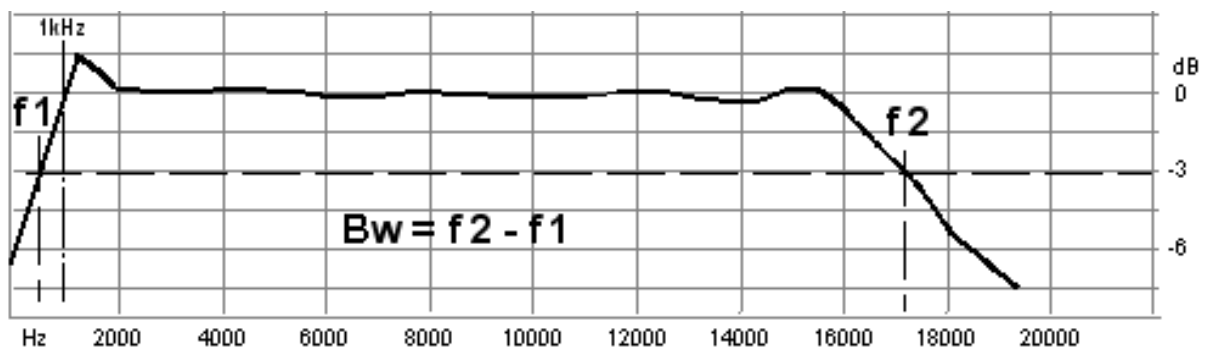
## Main electrical characteristics of amplifiers

To describe a amplifier the main electrical characteristics are:

- the maximum ratings
- the output power
- the gain
- the bandwidth
- the input characteristics (impedance, current, voltage and/or power, source impedance)
- the output characteristics (impedance, current, voltage and/or power, load impedance)
- the dynamic range
- the signal-to-noise ratio, THD "Total Harmonic Distortion"

The **Gain G<sub>v</sub>** represents the signal output to signal input ratio of a amplifier. The gain G<sub>v</sub> can be expressed as a direct ratio (V/mV or V/μV) or as a logarithmic relation in decibels (dB). The gain depends on load impedance R<sub>L</sub>, input impedance R<sub>in</sub>, supply voltage V<sub>cc</sub> and signal frequency f.

The range between frequency f<sub>1</sub> up to frequency f<sub>2</sub> is called **bandwidth B<sub>w</sub>**. It is the range within the attenuation increases not more than 3dB, concerning gain measured at a signal frequency of f=1KHz. Sometimes manufacturers also specify their amplifiers bandwidth at 1dB or 0,5dB attenuation.

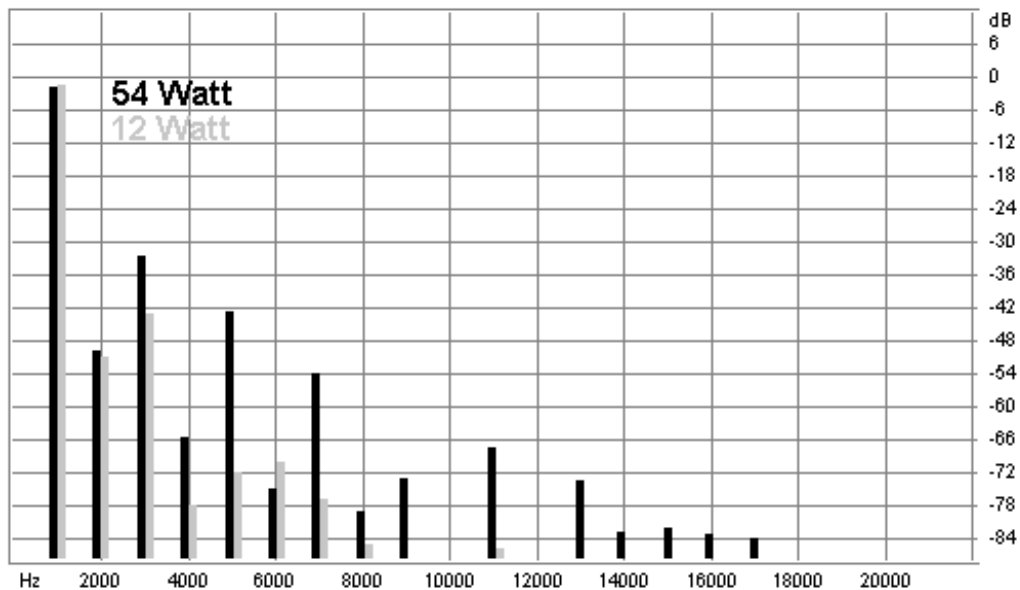


All amplifiers alter input signals. I.e. they amplify them and they add characteristics which did not exist in the original signal. All these unwanted modifications together are called distortion. Amplifying is a wanted linear

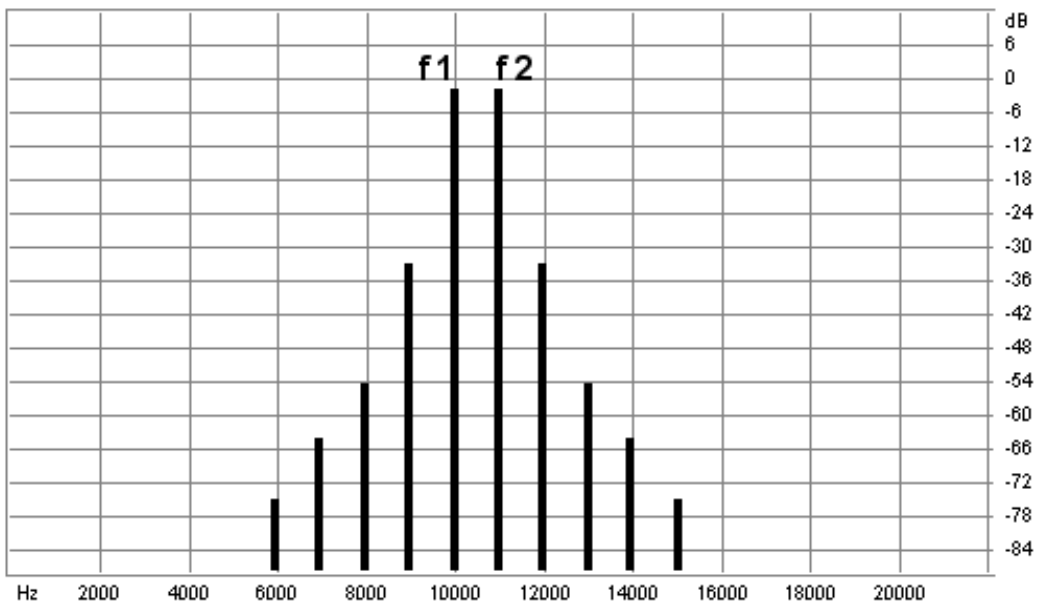


distortion. Crossover distortion in push-pull-amplifiers is a unwanted non-linear distortion.

A basic type of distortion occurs by generating harmonics. Harmonics are signals with frequencies related to the original by an integer number. For example: sinusoidal signals with 2kHz, 3kHz, 4kHz etc. are harmonics of a sinusoidal signal with  $f=1\text{kHz}$ . A pure sinus curve contains no harmonics. Every other signal form consists of basic frequency and their multiples with various amplitudes. Even if a pure sinusoidal signal is applied to the amplifier input one can measure that the amplifier output signal is no longer pure sinusoidal. Measurements with a spectrum analyzer will demonstrate, that several new frequencies are added to the original one. This is called **harmonic distortion**.



**Intermodulation distortion** is the second basic type of distortion, that often is specified in datasheets. Intermodulation distortion is much more objectionable to human ear, because it generates non-harmonics. Non-harmonics are signals with frequencies not related to the original or with frequencies related to the original by a non-integer number. After simultaneously applying two pure sinusoidal signals to the amplifier input measurements with a spectrum analyzer at the amplifier output will demonstrate, that there are several harmonics and some other frequencies added. These new frequencies are called “sum and difference” frequencies and are the result of interaction between these two pure tones within the amplifier because of nonlinearity in characteristic curves. Whenever two signals are applied to a nonlinear system, new signals in addition to the original two are generated.



Higher input signals cause more non-linear distortion.

The **distortion factor k** in percent is a measure for the intensity of nonlinear distortions. It is the rate of harmonic RMS value to total RMS value including fundamental wave.

The value of **Total Harmonic Distortion THD** is another measure of a signals distortion content and is specified as a percentage of the signal amplitude usually at full power output over a given frequency band with a particular load. THD is defined as the RMS value remaining when the fundamental wave is removed.

**Signal-to-noise ratio**, abbreviated **S/N** or **SNR**, is a measure of signal strength relative to background noise. The ratio is usually measured in decibels (dB).

The **dynamic range** specifies the ratio between noise and the greatest undistorted signal.

**Sensitivity** is the lowest input voltage to get maximum output power.

There are many different power specifications for amplifiers. They only apply on using the indicated load resistance  $R_L$  (matching efficiency). Using other loads than the specified will lower output power. Load impedances less than the specified may damage the amplifier.

**PMPO Peak Music Power Output** or **Peak Maximum Power Output** is a specification for the theoretically highest output power, which amplifiers can stand without being damaged or destroyed. However PMPO does not say anything about how long the amplifier stands such a maximum power.

**Musical power** is the highest tolerable short-time output power of an amplifier or an output stage. That's why musical power values are much higher than the RMS power values.

The **sinusoidal power, continuous power** or **RMS power** is the highest tolerable permanent output power of an amplifier or an output stage and is therefore always lower than the musical power value.

## Different kinds of amplifiers

Depending on the kind of loudspeakers connection there are two kinds of amplifiers.

**Single-Ended (SE)** amplifiers do have one connector for signal out and one for signal ground. So the loudspeaker is connected between output and ground.

**BTL-amplifiers (Bridge Tied Loads)** even do have two connectors per channel. But both are outputs and normally may not be connected with ground! Thus there are two amplifiers for each channel. The first one is connected with the original input signal. The second one is connected with the inverted input signal. Since the loudspeaker is connected between both amplifiers, thus results double output amplitude in comparison to conventional single-ended amplifiers.

Due to improvements in speed, power capacity and efficiency of modern semiconductor devices the Class-D amplifiers recently have received broad applying. **Class-D amplifiers** use a technique called pulse width modulation sometimes combined with pulse frequency modulation. The input signal is converted to a sequence of pulses, whose width is proportional to the amplitude of the signal. The puls frequency is typically thirty or more times the highest frequency of interest in the input signal. The main advantages of Class-D amplifiers are efficiency and simplicity. Efficiencies about 80% to 90% are possible. Having fixed output pulses amplitudes, the switching elements (usually MOSFETs) are switched either on or off, rather than operated in linear mode. This means, very little power is dissipated by transistors during the very short interval between on- and off-state. The wasted power is low, because the instantaneous power dissipated in the transistor is the product of voltage and current, and one or the other is almost always close to zero.

## Searching a specific device ?

This book offers a short, but full summary of most up to date integrated audio amplifiers and audio power amplifiers. About 3500 devices are listed. There are case drawings, circuit schematics (internal structure), schematic diagramms and also short specifications and basic electrical characteristics for each type of device. Similar types of devices with equivalent internal structure are listed. Even a list of contact infos to all relevant manufacturers with logos is included.

Various indices permit you the search, either a device (chapter 6 "index" or chapter 2 "technical data") or according to the function (chapter 4 "function overview").

In addition to most relevant datas chapter 2 "technical data" also contains references to pages with circuit schematics and listings of similar devices.

Chapter 5 "case drawings" offers a quick overview about all in this book listed case drawings.



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Demo pages at <http://www.eca.de> in the "download" section.



## **Manufacturers**

Logos, contact and web-adresses of the manufacturers

## **Hersteller**

Logos, Kontakt und Internetadressen der Hersteller



**AD - Analog Devices**

One Technology Way, Norwood, MA 02062, USA  
Phone: 781/329-4700  
<http://www.analog.com>



**Allg - Allegro MicroSystems Inc.**

115 Northeast Cutoff, Box 15036 Worcester, MA 01615, USA  
Phone: +1-508-853-5000  
<http://www.allegromicro.com>



**Ang - Angstrom**

Moscow, Zelenograd, 103460, Russia, Phone: (095) 531-49-06  
<http://www.angstrom.ru>



**Apx - Apex Microtechnology Corp.**

5980 North Shannon Road, Tucson, Arizona 85741, USA, Phone: 1 (800) 546-2739  
<http://www.apexmicrotech.com>



**Ban - Baneasa SA**

Erou Iancu Nicolae nr.32, sect. 2, Bucuresti, Romania, Phone: 401/230-4050  
<http://www.regisco.ro/mirror/emitenti/baneasa/baneasa.htm>



**BB - Burr-Brown Corp.**

PO Box 11400, 6730 S. Tucson Blvd., Tucson, AZ 85706 USA, Phone: 520/746-7365  
<http://www.burr-brown.com>



**Dae - Daewoo Semiconductor**

60-8 Kasan-Dong, Kumchun-Gu, Seoul Korea, Phone: +02-818-9652  
<http://www.daewoo.co.kr>



**Ecg - E C G**

A Philips (USA) subdivision. 1025 Westminster Drive, Williamsport, PA 17701 USA  
<http://www.ecgproducts.com>



**Exr - Exar Corporation**

48720 Kato Road Fremont, CA 94538, USA, Phone: +1-510-668-7000  
<http://www.exar.com>



**F- Fairchild Semiconductor Corp.**

333 Western Avenue, South Portland ME 04106, USA, Phone: 207/775-8100  
<http://www.fairchildsemi.com>



**Fuj- Fujitsu Microelectronics, Inc.**

3545 North First Street, San Jose, CA 95134, USA  
Phone: 408/922-9000  
<http://www.fujitsumicro.com>



**GE - General Electric Semiconductor**

Electronics Park Bldg. 7 Syracuse, NY 13221, USA, Phone: 315/456-3606  
<http://www.ge.com>



**Gen - Gennum Corp.**

Box 489, Station A, 970 Fraser Drive, Burlington, Ontario, Canada, L7R 3Y3  
Phone: +1-905-632-2996  
<http://www.gennum.com>



**Hit - Hitachi America Ltd.**

2000 Sierra Point Parkway, MS 080 Brisbane, CA 94005, USA  
Phone: +1-800-285-1601, +1-800-448-2244  
<http://www.hitachi.com>



**Holt - Holtek Semiconductor Inc.**

No.3, Creation Rd. II, Science Park, Hsinchu, Taiwan, Phone: 886-3-563-1999  
<http://www.holtek.com.tw>



**Isl - Intersil Inc.**

10600 Ridgeview Ct. Cupertino, CA 95014, USA, Phone: 408-995-5000  
<http://www.intersil.com>



**KEC - Korea Electronics Co. LTD**

9F Shamber Bldg, 45, 4-Ka Namadaemum-RO, Chung-Ku C.P.O. 4896 Seoul, Korea  
<http://www.kec.co.kr>

**Knw - Kenwood**

- Not the manufacturer of ICs; will use custom IC with Kenwood marking



**LG - (Lucky Goldstar) Electron Co, Ltd.**

(Fused by Hynix), 942, Daeshi-Dong Kangnam-Gu, Seoul Korea, Phone: +82-2-528-2884  
<http://www.lgeus.com>



**Linf - LinFinity Microelectronics INC.**

11861 Western Avenue, Garden Grove, CA. 92841, USA, Phone: 714-898-8121  
<http://www.linfinity.com>



**Lnd - Linear Dimensions, Inc.**

445 East Ohio Street, Chicago IL 60611 USA, Phone: 312-321-1810  
<http://www.lineardimensions.com>



**Mag - Magnatec (Semelab Subdivision)**

Semelab Plc. Coventry Road, Lutterworth, UK, Phone: +44-1455-552505  
<http://www..semelab.co.uk>



**Mat - Matsushita (Panasonic) Electronics Corp.**

1 Kotari-Yakemashi, Nagaokakyo, Kyoto 617, Japan, Phone: 075/921-8151  
<http://www.mec.panasonic.co.jp>

**Max - Maxim Integrated Products**

120 San Gabriel Sunnyvale, CA 94086, USA, Phone: +1-800-998-8800  
<http://www.maxim-ic.com>

**Mit - Mitsubishi Electric Co. Ltd.**

2-3 Marunouchi, 2-chome J 100 Chiyoda-Ku, Tokyo, Japan, Phone: +81-3-3218-2863  
<http://www.mitsubishichips.com>

**Mot - Motorola Inc.**

6501 William Cannon Drive W Austin, TX 78735 USA, Phone: +1-512-891-2000  
<http://www.motorola.com>

**MSK - M.S.Kennedy Corp.**

4707 Dey Road Liverpool, N.Y. 13088 USA, Phone (315) 701-6751  
[www.mskennedy.com](http://www.mskennedy.com)

**Mts - Mitsumi Electric Co. Ltd.**

8-8-2, Kokuryo-cho, Chofu-chi, Tokyo 182-8557, Japan, Phone: (03)3489-5333  
<http://www.mitsumi.co.jp>

**Mul - Mullard LTD**

(Is not a current ICs manufacturer)  
New Road Mitcham, Surrey England CR4 4XY, Telex: 264341

**Nec - NEC Electronics Inc. (Nippon Electrical Company)**

NEC Building 7-1, Shiba 5-chome, Minato-ku Tokyo, Japan, Phone: +81-3-3454-1111  
<http://www.ic.nec.co.jp>

**Njr - New Japan Radio Co., Ltd.**

Arvco Tower 17F, 1-8-1, Shimomeguro, Meguro-ku, Tokyo 153, Japan,  
Phone: +81-3-5434-8335  
<http://www.njr.com>

**Nsc - National Semiconductor Corp.**

North America PO Box 7643 Mount Prospect, IL 60056-7643, USA,  
Phone: +1-800-628-7364, ext 305  
<http://www.national.com>

**Nte - NTE Electronics Inc.**

44 Farrand Street, Bloomfield, NJ 07003, USA, Phone: 800-631-1250  
<http://www.nteinc.com>

**Oki - Oki Semiconductor Inc.**

785 N Mary Avenue Sunnyvale, CA 94086, USA, Phone: +1-408-720-1900  
<http://www.okisemi.com>

**Omn - Omnirel**

(Acquired by International Rectifier), 205 Crawford Street, Leominster, MA 01453 USA  
Phone: (508) 534-5776  
<http://www.omnirel.com>





**Ons - ON Semiconductor (Motorola semiconductors subdivision)**

Japan Customer Focus Center 4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan  
Phone: 81-3-5740-2745  
<http://onsemi.com>



**Phi - Philips GmbH**

Hammerbrookstrasse 69 D-20097 Hamburg, Germany, Phone: +49-40-23536-0  
<http://www.philips.com>



**Pnr - Pioneer**

- Not the manufacturer of ICs; will use custom IC with Pioneer type marking



**Rca - RCA Corporation**

(Is not a current ICs manufacturer) Route 202, Sommerville, NJ 08876, USA  
Phone: 201/685-6423  
<http://www.rca.com>



**Rhm - Rohm Co. Ltd.**

21 Saiin Mizosaki-cho, Ukyo-ku, Kyoto 615 Japan, Phone: +81-75-311-2121  
<http://www.rohm.co.jp>



**Sak - Sanken Electric**

1-22-8 Nishi-Ikebukuro, Toshima-ku, Tokyo, Japan, Phone: 81 (3) 986-8637  
<http://www.sanken-ele.co.jp>



**Sam - Samsung Electronics**

8/10FL. Samsung Main Bld. 250, 2-KA, Taepyung-Ro Chung-Ku, Seoul, Korea, Box 8233  
Phone: +82-2-751-2114  
<http://www.korea.samsungsemi.com>



**San - Sanyo Electric Co.Ltd**

15-13-6 Chome Tokyo 113 Japan, Phone: +81-3-3835-1474  
<http://www.sanyo.co.jp>



**Sgs - SGS-ATES**

(Fused by Thomson and renamed SGS-Thomson; Is not a current manufacturer)



**Sha - Sharp Microelectronics Corp.**

Sharp Plaza, Mahwah, NJ07430 USA, Phone: +1-201-259-8200  
<http://www.sharp.co.jp>



**Sie - Siemens AG**

Postfach 2352 90713 Fuerth-Bislohe, Germany, Phone: +49-911-3001-220  
<http://www.siemens.de>



**Soy - Sony**

10-18 Takanawa 4 Chome, Minato-ku, Tokyo, 108 Japan, Phone: +81-3-448-3426  
<http://www.sony.co.jp>



**Ste - SGS-Thomson Microelectronics**

Technoparc du Pays de Gex, 01630 Saint Genis Pouilly, France, Phone: +33-50402640  
<http://www.st.com>



**Tce - Thomson Consumer Electronics**

(There is no accessible padding information)



**Tcs - Thomson CSF**

Z.I. Orlytech 2, allée Maryse Bastii 91781 Wissous Cedex - France,  
Phone: +33 (0)1 49-75-96-00  
(Is not a current integrated circuits manufacturer)



**Ti - Texas Instruments**

13500 N Central Expwy PO Box 655474 Dallas, TX 72265, USA, Phone: 214/995-2011  
<http://www.ti.com>



**Tfk- Telefunken Semiconductors**

(Now owner of Temic Telefunken microelectronics GmbH), A Geschäftsbereich Halbleiter  
7100 Heilbronn, Germany, Phone: +1-408-988-8000



**Tok - Toko America, Inc.**

1250 Feehanville Drive Mt. Prospect, IL 60056, USA , Phone: (847) 297-0070  
<http://www.tokoam.com>



**Tos - Toshiba Corporation**

1-1 Shibaura 1-Chome J 105 Tokyo Japan, Phone: +813-3457-3495  
<http://www.toshiba.com>



**TRIPATH Trp - Tripath Technology, Inc.**

3900 Freedom Circle, Suite 200 Santa Clara, California 95054, Phone: 408-567-3000  
<http://www.tripath.com>



**Tsl - Tesla**

756 61 Roznow Pod Radhostem, Cehia, Phone: 651/56-65-95  
<http://www.tesla-vimperk.cz>



**Unr - Unitra SA**

Ul. Nowogrodzka 50, 00-950 Warszawa, Poland, Phones: (+48 22) 628 94 11  
<http://www.unitra.pl>



**Utc - UTC Unisonic Technologies Co., Ltd.**

4F-2, No. 16, Lane 609, Sec. 5, Chung-shin Rd, San-Chung City, Taipei Hsien, Taiwan  
Phone: 886-2-29995013  
<http://www.unisonic.com.tw>

## **Characteristics**

data table audio amplifler

## **Datentabelle**

Datentabelle der Audio Verstärker

## Erläuterung zum Tabellenaufbau

<b>Spalte</b>	<b>Erklärung</b>
Type	Typenbezeichnung des jeweiligen Bauteils
Case	Gehäuseform, siehe Sektion 5
$U_{cc\_min}$	Minimale Versorgungsspannung
$U_{cc\_max}$	Maximale Versorgungsspannung
$P_{out\_max}$	Maximale Ausgangsleistung
RI	Lastwiderstand
$I_{cc\_0}$	Minimale Stromaufnahme
$I_{out\_max}$	Maximaler Ausgangsstrom
$B_w$	Bandbreite
$R_{in}$	Eingangswiderstand
THD	“Total Harmonic Distortion”, siehe Vorwort
$G_v$	Spannungsverstärkung, siehe Vorwort
Mnf	Herstellerabkürzung, siehe Sektion 1
Pg.	Verweis auf die angegebene Seite in der Sektion 3.

## Explanation concerning the table

<b>Column</b>	<b>Explanation</b>
Type	Type name
Case	Case, see “section 5”
$U_{cc\_min}$	Minimal supply voltage
$U_{cc\_max}$	Maximal supply voltage
$P_{out\_max}$	Maximal output power
RI	Load resistance
$I_{cc\_0}$	Minimal circuit current
$I_{out\_max}$	Maximal output current
$B_w$	Bandwidth, see “Introduction”
$R_{in}$	Input resistance
THD	Total Harmonic Distortion, see “Introduction”
$G_v$	Gain, see “Introduction”
Mnf	Manufacturer, see “section 1”
Pg.	The application and the pin-out is on the named page in “section 3”.

Type	Case	U <sub>cc,min</sub>	U <sub>cc,max</sub>	P <sub>out,max</sub>	R <sub>i</sub>	I <sub>cc0</sub>	I <sub>out,max</sub>	B <sub>w</sub>	R <sub>in</sub>	THD	G <sub>v</sub>	Mnf.	Pg.
μA706A	TABS6-14	6V	14V	2,2W	4Ω	16mA	-	30Hz-18KHz	3MΩ	10%	46dB	Frch	150
μA706B	TABS6-14	6V	16V	5,5W	4Ω	18mA	-	30Hz-18KHz	3MΩ	10%	46dB	Frch	150
μA7307	DIP8	3V	16V	1,6W	8Ω	4mA	-	40Hz-18KHz	-	-	-	Frch	150
μA759	TO220-5	±9V	±15V	2W	8Ω	12mA	-	40Hz-18KHz	-	-	-	Frch	150
μA783	TABST-12	4V	20V	7W	4Ω	12mA	2,5A	40Hz-20KHz	5MΩ	0,3%	37dB	Frch	6
μPC1001H	SIP2-10A	7V	20V	4,5W	4Ω	28mA	2,5A	30Hz-18KHz	-	0,3%	50dB	NEC	50
μPC1020H	SIP6-10	9V	17V	5,2W	4Ω	28mA	2,5A	30Hz-20KHz	-	0,4%	51,5dB	NEC	51
μPC1025H	SIP6-10	9V	17V	4,8W	4Ω	28mA	2,5A	30Hz-18KHz	-	0,6%	51,5dB	NEC	51
μPC1030H	SIP6-10	9V	17V	5,8W	4Ω	35mA	2,5A	30Hz-20KHz	-	0,4%	55dB	NEC	52
μPC1154H	SIP6-10	9V	17V	4,8W	4Ω	32mA	2,5A	30Hz-20KHz	-	0,3%	52dB	NEC	151
μPC1155H	SIP6-10	9V	17V	5,5W	4Ω	30mA	2,5A	30Hz-20KHz	-	0,5%	51,2dB	NEC	52
μPC1156H	SIP6-10	9V	17V	5,8W	4Ω	30mA	-	30Hz-20KHz	-	-	-	NEC	52
μPC1177H	SIL-12	3,5V	10V	2x1W	4Ω	32mA	-	30Hz-18KHz	-	-	-	NEC	151
μPC1181H3	SIP2-7	9,5V	18V	5,8W	4Ω	45mA	4,5A	30Hz-20KHz	-	0,3%	54dB	NEC	53
μPC1182H3	SIP2-7	9,5V	18V	5,8W	4Ω	45mA	4,5A	30Hz-20KHz	-	0,3%	54dB	NEC	53
μPC1185H2	SIP1-12	9,5V	18V	2x5,8W	4Ω	80mA	-	20Hz-20KHz	-	0,3%	54dB	NEC	151
μPC1188H	SIP4-10	±22V	25V	20W	8Ω	50mA	-	20Hz-20KHz	-	0,15%	52dB	NEC	61
μPC1212C	TABS10-8	3,5V	9V	1W	4Ω	15mA	-	30Hz-18KHz	10kΩ	1,5%	41dB	NEC	46
μPC1213C	TABS10-8	4,5V	11V	2,4W	4Ω	15mA	-	30Hz-18KHz	10kΩ	1,5%	45dB	NEC	46
μPC1218H	SIL-8	1,8V	5V	250mW	8Ω	23mA	-	30Hz-18KHz	-	-	-	NEC	151
μPC1230H2	SIP1-12	9V	16V	20W	4Ω	90mA	-	20Hz-20KHz	-	-	-	NEC	57
μPC1238H	TO220-5Z	±6V	±15V	8W	8Ω	60mA	-	20Hz-20KHz	47kΩ	1%	20dB	NEC	7
μPC1241H	SIP1-8	9V	16V	5,8W	4Ω	45mA	-	30Hz-20KHz	-	0,1%	51dB	NEC	65
μPC1242H	SIP1-8	9V	16V	5,8W	4Ω	45mA	-	30Hz-20KHz	-	0,1%	51dB	NEC	65
μPC1260G	SO20	1,8V	5V	2x40mW	32Ω	8mA	-	20Hz-20KHz	-	-	-	NEC	152
μPC1263C2	SDIP14	3V	16V	2x2W	8Ω	10mA	-	30Hz-20KHz	5MΩ	0,8%	34dB	NEC	64
μPC1274V	SIP1-14	9V	16V	20W	4Ω	90mA	-	20Hz-20KHz	-	-	-	NEC	152
μPC1277H	SIP2-12	5V	16V	2x4,2W	4Ω	45mA	-	30Hz-20KHz	-	-	-	NEC	152
μPC1278H	SIP2-12	5V	16V	2x2,5W	4Ω	43mA	-	30Hz-18KHz	-	-	-	NEC	152
μPC1280V	SIP1-14	9V	16V	20W	4Ω	90mA	-	20Hz-20KHz	50kΩ	0,2%	51dB	NEC	152
μPC1288V	SIP2-14	6V	20V	2x7W	4Ω	23mA	-	20Hz-20KHz	-	-	-	NEC	65
μPC1308V	SIP1-14	9V	16V	18W	4Ω	90mA	-	20Hz-20KHz	45kΩ	0,5%	44dB	NEC	152
μPC131	TABS-T	6V	13V	2x1,8W	4Ω	20mA	-	30Hz-18KHz	-	-	-	NEC	64
μPC1310V	SIP2-14	9V	16V	2x5,8W	8Ω	80mA	-	20Hz-20KHz	-	-	-	NEC	153
μPC1316C	SDIP14	3V	9V	2x2W	8Ω	16mA	-	30Hz-18KHz	5MΩ	1,6%	41dB	NEC	64
μPC1318AV	SIP3-14	9V	16V	16W	4Ω	80mA	-	30Hz-18KHz	45kΩ	0,3%	38dB	NEC	153
μPC1321V	SIP6-15	9V	16V	20W	8Ω	120mA	-	20Hz-20KHz	-	-	-	NEC	153
μPC1331V	SIP2-14	5V	12V	2x2,2W	8Ω	25mA	-	30Hz-18KHz	-	-	-	NEC	153
μPC1332V	SIP2-14	7V	16V	2x4W	8Ω	30mA	-	30Hz-20KHz	-	-	-	NEC	153
μPC1335V	SIP1-14	6V	20V	2x7W	8Ω	23mA	-	20Hz-20KHz	-	-	-	NEC	65
μPC2002	TO220-5	8V	18V	8W	2Ω	45mA	3A	30Hz-20KHz	150kΩ	0,1%	40dB	NEC	40
μPC2005H	SIP1-11	8V	18V	2x10W	2Ω	65mA	3,5A	30Hz-20KHz	70kΩ	1%	50dB	NEC	6
μPC2005V	SIP1-11V	8V	18V	2x10W	2Ω	65mA	3,5A	30Hz-20KHz	70kΩ	1%	50dB	NEC	6
μPC20C	TABS3-14	9V	20V	1,5W	8Ω	4,7mA	-	30Hz-18KHz	60kΩ	3%	42dB	NEC	48
μPC2500H	SIP2-12	9V	16V	15W	4Ω	75mA	-	20Hz-20KHz	20kΩ	0,12%	40dB	NEC	154
μPC563	SIP2-10	4V	20V	6W	4Ω	20mA	-	30Hz-20KHz	-	-	-	NEC	150
μPC571C	SDIP14A	±7V	±15V	6,5W	8Ω	22mA	2A	20Hz-20KHz	20kΩ	10%	46dB	NEC	48
μPC575C2	TABS10-8	9V	17V	2W	8Ω	12mA	1,4A	30Hz-18KHz	-	0,15%	52dB	NEC	45
μPC576H	SIP2-10	9V	24V	3,5W	8Ω	35mA	1,5A	30Hz-18KHz	20kΩ	0,65%	52dB	NEC	52
μPC578C	SDIP14	±9V	±15V	7W	8Ω	22mA	2A	30Hz-20KHz	20kΩ	0,5%	45dB	NEC	151
1468	TO3-8	±10V	±45V	50W	4Ω	25mA	-	20Hz-20KHz	-	0,08%	110dB*	Ins	5
3571	TO3-8	±10V	±40V	50W	4Ω	21mA	-	20Hz-20KHz	-	0,06%	92dB	BB	5
3572	TO3-8	±10V	±45V	60W	4Ω	21mA	-	20Hz-20KHz	-	0,06%	88dB	BB	5
3573	TO3-8	±10V	±50V	50W	4Ω	25mA	-	20Hz-20KHz	-	0,06%	88dB	BB	5
5G31A	TABS1-14	6V	12V	400mW	8Ω	15mA	500mA	40Hz-17KHz	-	10%	-	-	5
5G31B	TABS1-14	6V	15V	700mW	8Ω	20mA	700mA	40Hz-17KHz	-	10%	-	-	5
5G31C	TABS1-14	6V	18V	1W	8Ω	30mA	1A	40Hz-17KHz	-	10%	-	-	5
5G37	TABS2-8	6V	18V	2W	8Ω	30mA	1,2A	40Hz-17KHz	-	10%	-	-	5
8510	TO3-8	±10V	±25V	50W	4Ω	20mA	-	20Hz-20KHz	-	0,06%	113dB*	Ins	5
8515	TO3-8	±10V	±30V	50W	4Ω	20mA	-	20Hz-20KHz	-	0,06%	113dB*	Ins	5
8520	TO3-8	±12V	±50V	60W	4Ω	18mA	-	20Hz-20KHz	-	0,06%	98dB	Ins	5
8530	TO3-8	±12V	±50V	60W	4Ω	18mA	-	20Hz-20KHz	-	0,06%	98dB	Ins	5
A1034P	DIP16	1,6V	6V	2x30mW	32Ω	2mA	-	20Hz-20KHz	-	0,1%	62dB	NEC	5

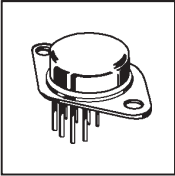
Type	Case	U <sub>cc,min</sub>	U <sub>cc,max</sub>	P <sub>out,max</sub>	R <sub>i</sub>	I <sub>cc0</sub>	I <sub>out,max</sub>	B <sub>w</sub>	R <sub>in</sub>	THD	G <sub>v</sub>	Mnf.	Pg.
A2000V	SIP1-11	3,5V	18V	2x6,25W	2Ω	30mA	3,5A	40Hz-20KHz	70kΩ	0,25%	84dB	RFT	6
A2005V	SIP1-11	3,5V	18V	2x6,5W	2Ω	75mA	3,5A	40Hz-20KHz	70kΩ	0,22%	85dB	RFT	6
A2030H	TO220-5	±6V	±18V	14W	4Ω	60mA	3,5A	10Hz-140KHz	5MΩ	0,5%	30dB	RFT	7
A2030V	TO220-5	±6V	±18V	14W	4Ω	60mA	3,5A	10Hz-140KHz	5MΩ	0,5%	30dB	RFT	7
A205K	TABS3-12	4V	20V	4,5W	4Ω	15mA	-	40Hz-15KHz	-	-	-	RFT	6
A208E	TABS3-12	4V	15V	1,3W	4Ω	15mA	-	40Hz-15KHz	-	-	-	RFT	6
A208K	TABS3-12	4V	20V	5W	4Ω	20mA	-	40Hz-15KHz	-	-	-	RFT	6
A210E	TABS3-12	4V	15V	1,3W	4Ω	15mA	-	40Hz-15KHz	-	-	-	RFT	6
A210K	TABS3-12	4V	20V	5W	4Ω	20mA	-	40Hz-15KHz	-	-	-	RFT	6
AN124	SIP2-9	6V	18V	4,4W	4Ω	20mA	1,2A	50Hz-17KHz	10kΩ	0,3%	-	Mat	7
AN12942B	SOP42	4,5V	5,5V	2x880mW	8Ω	20mA	-	20Hz-20KHz	80kΩ	0,5%	4dB	Mat	27
AN214P	SIP2-9A	6V	18V	4,4W	4Ω	20mA	-	50Hz-17KHz	10kΩ	0,3%	-	Mat	7
AN214Q	SIP2-9A	6V	18V	4,4W	4Ω	20mA	-	50Hz-17KHz	10kΩ	0,3%	-	Mat	7
AN252	SIP2-9A	6V	18V	3W	4Ω	18mA	-	50Hz-17KHz	-	0,5%	46dB	Mat	7
AN272	SDIP10	±6V	±17V	5W	8Ω	20mA	-	40Hz-18KHz	-	0,13%	40dB	Mat	7
AN274	TO-100	6V	16V	1,3W	8Ω	8mA	0,25A	50Hz-17KHz	-	0,15%	40dB	Mat	8
AN313	TABS6-16	12V	20V	2x3W	8Ω	40mA	-	40Hz-18KHz	-	0,15%	42dB	Mat	8
AN315	SIP2-11	9V	18V	5,5W	8Ω	28mA	2,2A	30Hz-18KHz	-	0,1%	53dB	Mat	8
AN374	TO-100	6V	16V	1W	8Ω	8mA	0,25A	50Hz-17KHz	-	0,15%	72dB	Mat	8
AN374P	SIL-7	6V	16V	1W	8Ω	8mA	-	50Hz-17KHz	-	0,15%	72dB	Mat	8
AN5260	SIP2-11	12V	26V	6,6W	8Ω	60mA	-	30Hz-18KHz	-	-	-	Mat	9
AN5265	SIP3-9	12V	26V	2,3W	16Ω	9,5mA	1A	40Hz-18KHz	16kΩ	1,2%	30,5dB	Mat	9
AN5270	SIP3-9	11(13)V	15(24)V	4,3W	8Ω	10(28)mA	2A	20Hz-70KHz	-	0,5%	30dB	Mat	9
AN5272	SIP7-12	12,2V	27,5V	2x4,1W	8Ω	25mA	2A	20Hz-20KHz	-	0,3%	30dB	Mat	9
AN5273	SIP7-12	12,2V	27,5V	2x4,1W	8Ω	25mA	2A	20Hz-20KHz	-	0,3%	30dB	Mat	10
AN5274	SIP7-12	12V	27,5V	2x4,1W	8Ω	25mA	2A	20Hz-20KHz	-	1%	30dB	Mat	10
AN5275	SIP7-12	10V	40V	2x15W	8Ω	100mA	2,5A	15Hz-30KHz	-	0,05%	34dB	Mat	10
AN5276	SIP7-12	10V	24V	2x7W	8Ω	35mA	1,2A	20Hz-20KHz	-	0,2%	34dB	Mat	10
AN5277	SIP7-12	10V	32V	2x10W	8Ω	40mA	2A	20Hz-20KHz	-	0,4%	34dB	Mat	10
AN5278	SIP7-12	10V	26V	4,8W	8Ω	48mA	2,6A	20Hz-20KHz	-	0,4%	30dB	Mat	10
AN5279	SIP3-9	10V	24V	7W	8Ω	25mA	2A	20Hz-20KHz	-	0,2%	34dB	Mat	11
AN7050	SO8	1,6V	6V	2x75mW	32Ω	3,2mA	150mA	20Hz-20KHz	1MΩ	-	26dB	Mat	11
AN7077Z	HZIP015-P	10V	28V	-	-	25mA	8A	-	-	-	0dB	Mat	11
AN7082K	DIP22	1,8V	6V	2x350mW	32Ω	3,5mA	-	20Hz-30KHz	-	-	34dB	Mat	11
AN7082S	SO24	1,8V	6V	2x350mW	32Ω	3,5mA	-	20Hz-30KHz	-	-	34dB	Mat	12
AN7086S	SO24	1,5V	4,5V	2x350mW	32Ω	20mA	0,1A	20Hz-30KHz	-	1%	54dB	Mat	12
AN7102K	SO18	1V	3V	2x7,5mW	32Ω	7mA	-	20Hz-20KHz	-	-	-	Mat	12
AN7102S	DIP18	1V	3V	2x7,5mW	32Ω	7mA	-	20Hz-20KHz	-	-	-	Mat	12
AN7105K	DIP18	1,5V	9,5V	2x380mW	32Ω	13mA	-	20Hz-20KHz	-	-	-	Mat	13
AN7106K	DIP24	1,8V	4,5V	2x140mW	32Ω	20mA	-	20Hz-20KHz	-	-	-	Mat	13
AN7108	DIP16	1,6V	6V	2x30mW	32Ω	2mA	-	20Hz-20KHz	-	0,1%	62dB	Mat	5
AN7110	SIL-9	6V	18V	1,2W	8Ω	20mA	-	40Hz-16KHz	-	0,1%	62dB	Mat	13
AN7111	SIL-9	6V	18V	1,2W	8Ω	17mA	-	40Hz-16KHz	-	0,1%	62dB	Mat	14
AN7112	SIL-9	4V	14V	500mW	8Ω	15mA	-	40Hz-18KHz	-	0,1%	64dB	Mat	14
AN7114	TABS5-14	6V	11V	1W	4Ω	15mA	-	40Hz-17KHz	-	0,15%	62dB	Mat	14
AN7115	TABS5-14	6V	13V	2,1W	4Ω	15mA	-	40Hz-17KHz	-	0,15%	62dB	Mat	14
AN7116	SIL-9	3V	9V	1W	4Ω	13mA	-	40Hz-17KHz	-	-	-	Mat	14
AN7117	SIL-9	2V	9V	1W	4Ω	8mA	-	40Hz-17KHz	-	-	-	Mat	14
AN7118	DIP16	1,5V	4,5V	2x35mW	32Ω	13mA	0,55A	20Hz-20KHz	20kΩ	0,3%	47dB	Mat	15
AN7118S	SO18	1,5V	4,5V	2x35mW	32Ω	13mA	0,55A	20Hz-20KHz	20kΩ	0,3%	47dB	Mat	15
AN7120	TABS5-14	6V	18V	2,1W	4Ω	27mA	-	20Hz-20KHz	-	-	-	Mat	15
AN7124	SIP7-12	6V	18V	2x4,1W	3Ω	19mA	3A	20Hz-20KHz	-	0,5%	47dB	Mat	15
AN7125	SIP7-12	6V	18V	2x13,5W	4Ω	100mA	2,8A	20Hz-20KHz	-	0,4%	40dB	Mat	16
AN7130	SIP3-9	9V	18V	4,2W	4Ω	20mA	-	30Hz-18KHz	-	0,1%	62dB	Mat	13
AN7131	SIP3-9	10V	20V	5W	4Ω	20mA	-	30Hz-18KHz	-	-	-	Mat	14
AN7133	SDIP-24	6V	18V	2x2,1W	4Ω	22mA	-	30Hz-18KHz	-	-	-	Mat	16
AN7133N	SIP7-23Z	6V	24V	2x5,8W	3Ω	30mA	-	20Hz-20KHz	-	-	-	Mat	16
AN7134NR	SIP7-23Z	6V	18V	2x7,5W	4Ω	30mA	2,8A	20Hz-20KHz	-	-	-	Mat	16
AN7135	SIP2-12	5,5V	18V	2x7,5W	3Ω	14mA	3A	20Hz-20KHz	-	0,75%	44,5dB	Mat	17
AN7139	SIP1-12	9V	24V	2x3,5W	4Ω	30mA	-	40Hz-20KHz	-	0,15%	42dB	Mat	17
AN7140	SIP3-9	10V	20V	5W	4Ω	30mA	-	30Hz-18KHz	-	-	-	Mat	13
AN7141N	SIL-9	4V	10V	900mW	4Ω	6mA	-	30Hz-18KHz	-	-	-	Mat	17
AN7142	TABS5-16	5V	18V	2x1W	4Ω	20mA	-	40Hz-20KHz	-	-	-	Mat	18
AN7143	SIP1-12	4,3V	24V	2x2W	4Ω	20mA	-	40Hz-20KHz	-	0,15%	42dB	Mat	17

## **Schematic of Connection**

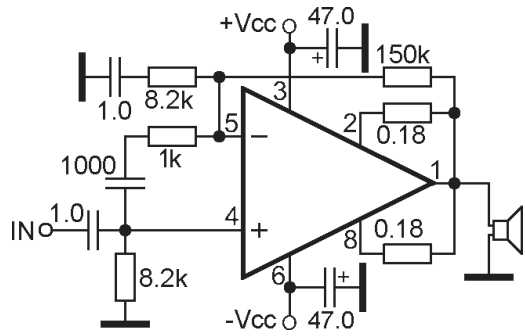
Application and pin-out

## **Anschlußzeichnungen**

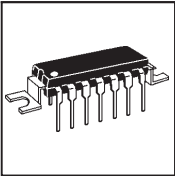
Applikation und Anschlußbelegung (Pin-out)



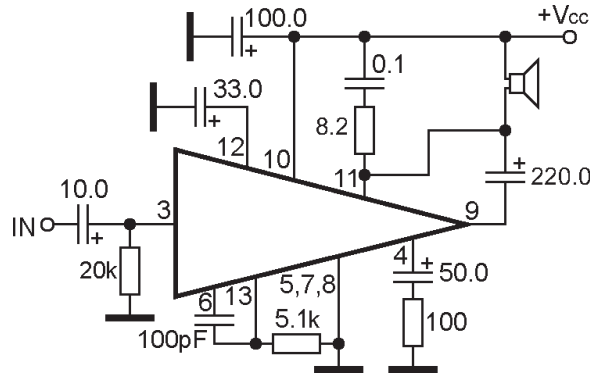
**Power operational/ audio amplifier**



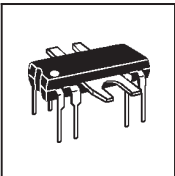
- 1468 OPA512BM
- 3571 OPA512SM
- 3572 PA01
- 3573 PA10
- 8510 PA10A
- 8515 PA12
- 8520 PA12A
- 8530 PA12H
- OPA502BM PA12M
- OPA502SM PA73
- OPA511AM PA73M



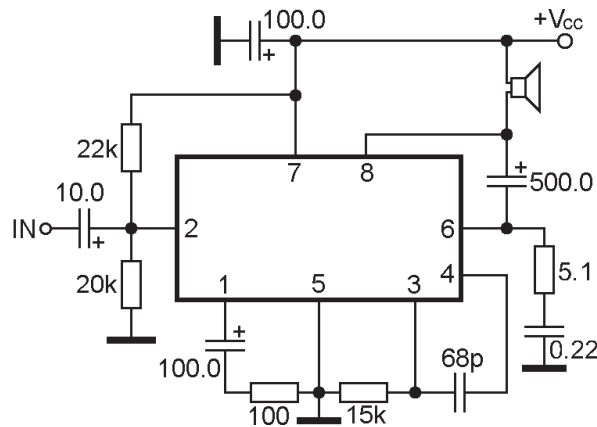
**Power audio amplifier**



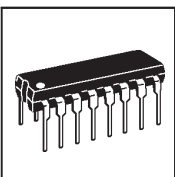
- 5G31A
- 5G31B
- 5G31C



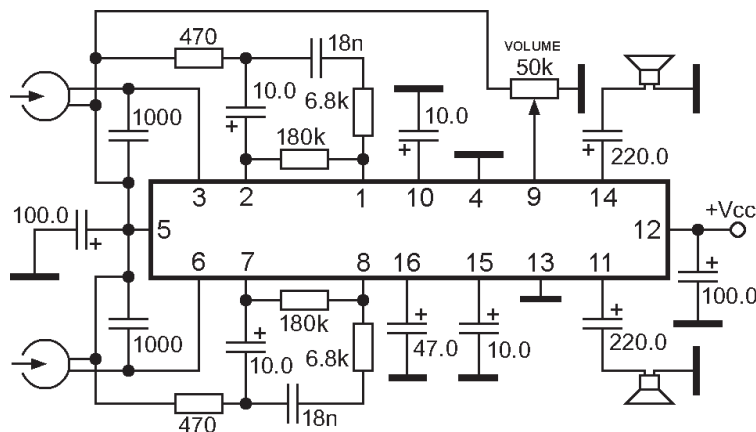
**Power audio amplifier**



- 5G37



**Dual playback preamplifier, volume control, power audio amplifier for headphone**

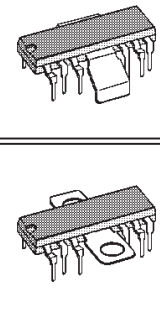
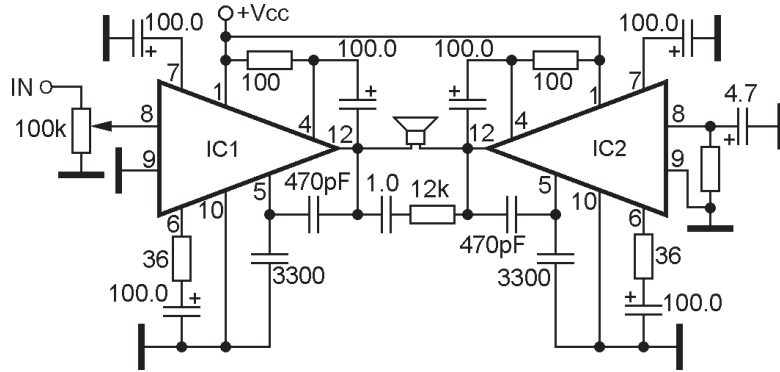
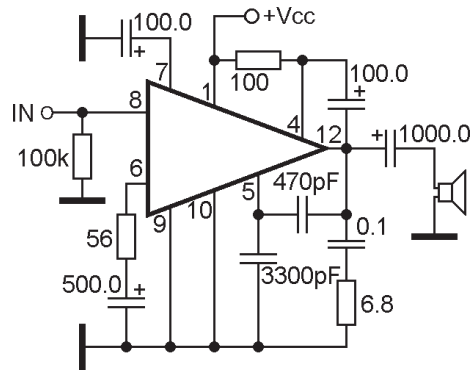


- A1034P
- AN7108
- CXA1005P
- CXA1034M
- CXA1034P
- CXA1634M
- CXA1634P
- KA22132



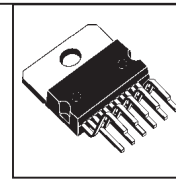
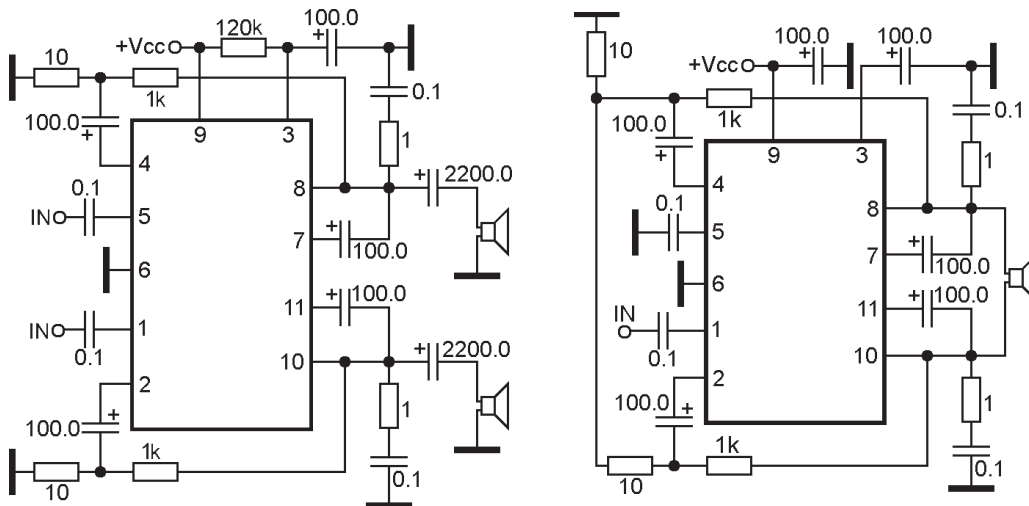
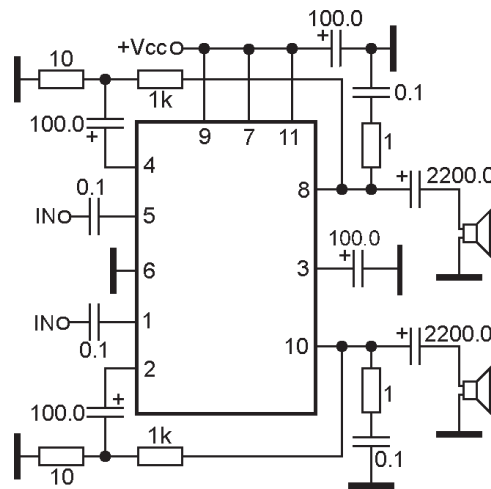
## Power audio amplifier

A205K  
 A208E  
 A208K  
 A210E  
 A210K  
 ECG1115  
 ECG1115A  
 GEIC-278  
 IX1020  
 K174YH7  
 K174YH9  
 $\mu$ A783  
 NTE1115  
 NTE1115A  
 RH-IX1020  
 SK3184  
 SK3917  
 TBA310AS  
 TBA790\*  
 TBA810\*  
 TCA120  
 TCA150\*  
 TCA830\*  
 TCA940\*  
 UL1440T  
 UL1481K



## Dual (stereo) power audio amplifier

A2000V  
 A2005V  
 DBL1032-D  
 ECG1396  
 GL1010  
 K174YH25  
 K174YH27  
 LM2005M  
 LM2005T-M  
 LM2005T-S  
 $\mu$ PC2005H  
 $\mu$ PC2005V  
 NTE1396  
 SK9255  
 TDA2004  
 TDA2004A  
 TDA2005  
 TDA2005M  
 TDA2005S



## **Functional Index**

audio amplifier listed by their function

## **Funktionelles Inhaltsverzeichnis**

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Single < 1W output				
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MAX4336EXT-T	40mW	32	SO6	3-138
LS045	40mW	8	TO-99	3-133
TCA1004	50mW	200	SO8	3-220
LC550	50mW	8	SO10	3-111
LC552	50mW	8	SO14	3-111
LC549	50mW	8	SO8	3-110
LD549	50mW	8	SO8	3-110
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LM4916MM	85mW	32	MINISO10	3-132
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NJU7081RB1	100mW	32	MINISO8	3-163
NJU7081V	100mW	32	MINISO8	3-163
NJU7081M	100mW	32	SO8	3-163
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ULN3718BM	150mW	32	SO8	3-274
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MSC1157RS	178mW	8	DIP8	3-155
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CXA1347N	200mW	32	SO24	3-42
TK10417M	200mW	32	SO8	3-255
TA7331F	200mW	4	DIP16	3-213
TA7331P	200mW	4	SIL-9	3-213
KA8602N	200mW	8	DIP8	3-83
NJU8711V	200mW	8	SO10	3-163
NJU8713V	200mW	8	SO14	3-164
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KIA6419P	250mW	16	DIP8	3-39
KTA6419P	250mW	16	DIP8	3-39
K?1064??2	250mW	16	DIP8	3-39
K?1436??1	250mW	16	DIP8	3-39
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MC34119DTB	250mW	16	MINISO8	3-39
MC3360P	250mW	16	SIL-9	3-149
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KIA6419F	250mW	16	SO8	3-39
KTA6419F	250mW	16	SO8	3-39
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?K?1436??1	250mW	16	SO8	3-39
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NJM2135D	250mW	32	DIP8	3-39
NJM2149D	250mW	32	DIP8	3-39

Single < 1W output				
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NJM2149V	250mW	32	MINISO8	3-39
NJM2113L	250mW	32	SIL-8	3-39
NJM2135L	250mW	32	SIL-8	3-39
NJM2113M	250mW	32	SO8	3-39
NJM2135E	250mW	32	SO8	3-39
NJM2149M	250mW	32	SO8	3-39
U4083B	250mW	32	SO8	3-39
XR-T65119	250mW	32	SO8	3-39
SL630C	250mW	40	TO-100	3-176
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GL386	250mW	8	DIP8	3-46
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LM386N-1	250mW	8	DIP8	3-46
LND386	250mW	8	DIP8	3-46
NJM386D	250mW	8	DIP8	3-46
NTE823	250mW	8	DIP8	3-46
SK9210	250mW	8	DIP8	3-46
LM4882MM	250mW	8	MINISO8	3-129
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NTE1467	250mW	8	SIL-8	3-58
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LM386MM-1	250mW	8	SO8	3-46
NJM386M	250mW	8	SO8	3-46
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MAX4368EBL-T	330mW	32(16)	BGA9	3-138
MAX4366ETA	330mW	32(16)	LPP8	3-121
MAX4366EBL-T	330mW	32(16)	LPP8	3-128
MAX4367ETA	330mW	32(16)	LPP8	3-139
MAX4368ETA	330mW	32(16)	LPP8	3-139
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MAX4367EUA	330mW	32(16)	MINISO8	3-139
MAX4368EUA	330mW	32(16)	MINISO8	3-139
MAX4366EKA-T	330mW	32(16)	SO8	3-121

Single < 1W output				
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MAX4368EKA-T	330mW	32(16)	SO8	3-139
BA546	330mW	8	SIL-9	3-28
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NTE1627	330mW	8	SIL-9	3-28
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LA4167M	350mW	4	SO30	3-92
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LM4819LD	350mW	8	LPP8	3-121
LM4819MM	350mW	8	MINISO8	3-121
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TPA321DGN	350mW	8	MINISO8	3-121
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LM4819M	350mW	8	SO8	3-121
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TS419-4QT	367mW	16	LPP8	3-271
TS419-8QT	367mW	16	LPP8	3-271
TS419QT	367mW	16	LPP8	3-271
TS421-2QT	367mW	16	LPP8	3-271
TS421-4QT	367mW	16	LPP8	3-271
TS421-8QT	367mW	16	LPP8	3-271
TS421QT	367mW	16	LPP8	3-271
TS421IST	367mW	16	MINISO8	3-68
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TS419-8IST	367mW	16	MINISO8	3-271
TS421-2IST	367mW	16	MINISO8	3-271
TS421-4IST	367mW	16	MINISO8	3-271
TS421-8IST	367mW	16	MINISO8	3-271
TS421IDT	367mW	16	SO8	3-68
TS419IDT	367mW	16	SO8	3-121
NJM2770RB1	400mW	8	MINISO8	3-39
SL34	400mW	8	SDIP14	3-175
M51501L	400mW	8	SIL-8	3-135
NJU8719V	400mW	8	SO10	3-164
NJM2770R	400mW	8	SO8	3-39
5G31A	400mW	8	TABS1-14	3-5
BA5210FS	450(2x10)mW	16	SO16	3-37
BA5404	450mW	32	SIL-9	3-37
M51182L	450mW	8	SIL-8	3-58
TK10569M	480mW	8	SO8	3-255
ECG7051	500mW	16	DIP8	3-63
NTE7051	500mW	16	DIP8	3-63
K174??24	500mW	16	SIL-7	3-63
AN7511S	500mW	16	SO8	3-23
AN7513S	500mW	16	SO8	3-24
TDA1015T	500mW	16	SO8	3-222
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MBA915	500mW	20	DIP8	3-149
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TBA915	500mW	20	TO-100	3-219
TBA915K	500mW	20	TO-100	3-219
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NJM2070D	500mW	4	DIP8	3-160

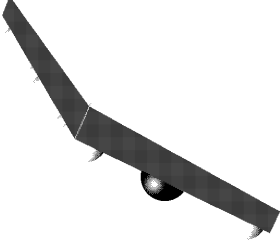



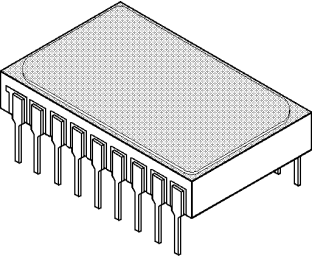
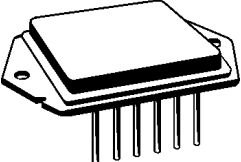
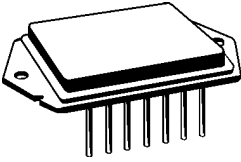
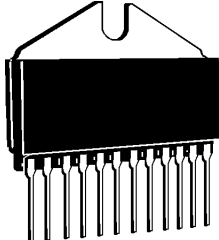
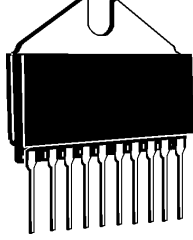
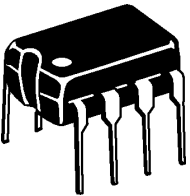
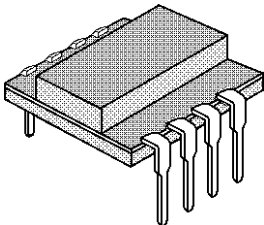
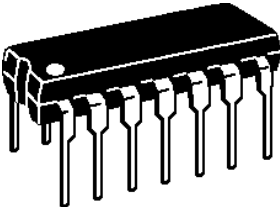
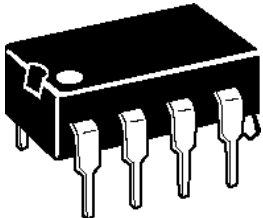
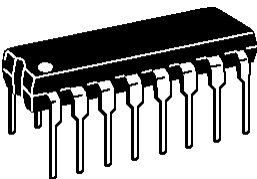
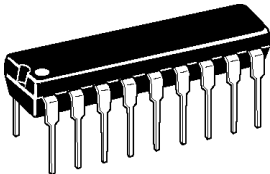
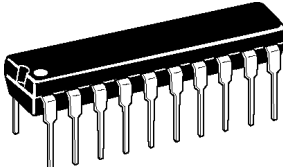
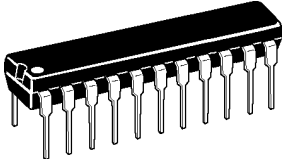
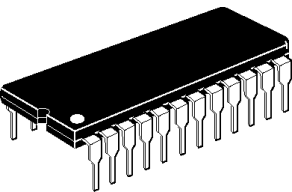
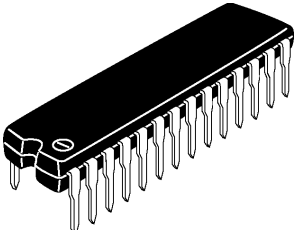
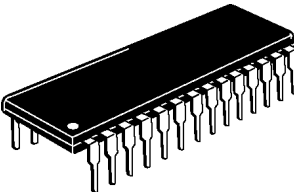
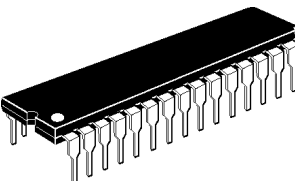
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EA33X8368	500mW	4	TABS-T	3-44
GEIC-273	500mW	4	TABS-T	3-44
HA1310	500mW	4	TABS-T	3-44
MAX9712EBC-T	500mW	8	BGA12	3-140
LM386N-3	500mW	8	DIP8	3-46
SL6310	500mW	8	DIP8	3-176
MAX9712ETB	500mW	8	LPP10	3-140
AN7112	500mW	8	SIL-9	3-14
EA33X8551	500mW	8	SIL-9	3-14
EA33X9559	500mW	8	SIL-9	3-14
ECG1465	500mW	8	SIL-9	3-14
HA12013	500mW	8	SIL-9	3-14
KA2212	500mW	8	SIL-9	3-14
KIA6213S	500mW	8	SIL-9	3-14
KIA7313AP	500mW	8	SIL-9	3-14
LA4140	500mW	8	SIL-9	3-14
LA4142	500mW	8	SIL-9	3-14
MX-3426	500mW	8	SIL-9	3-14
MX-5596	500mW	8	SIL-9	3-14
NTE1465	500mW	8	SIL-9	3-14
TA7313AP	500mW	8	SIL-9	3-14
MAX9712EUB	500mW	8	SO10	3-140
RC4861M	500mW	8	SO8	3-121
ECG1031	500mW	8	TABS-T	3-44
NTE1031	500mW	8	TABS-T	3-44
CA3020	500mW	8*	TO-100	3-40
HA1302	500mW	8*	TO-100	3-40
NTE784	500mW	8*	TO-100	3-40
TDA7052BT	550mW	16	SO8	3-231
TA7628P	600mW	8	DIP16	3-214
M51168AP	600mW	8	SO24	3-135
SFC2790C	600mW	8	TO-100	3-173
UL1490N	650mW	15	SDIP14	3-67
UL1495N	650mW	15	SDIP14	3-67
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KA386	700mW	8	DIP8	3-46
LM386N-4	700mW	8	DIP8	3-46
S1A0386A01-D0B0	700mW	8	DIP8	3-46
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BA516	700mW	8	SIL-9	3-28
BA526	700mW	8	SIL-9	3-28
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NTE1612	700mW	8	SIL-9	3-28

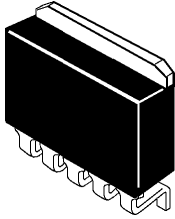
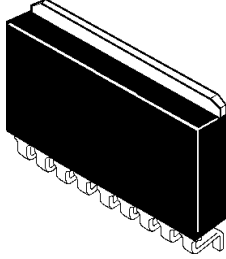
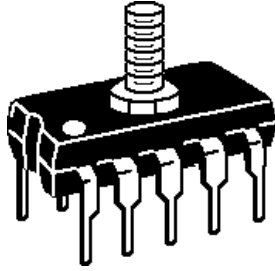
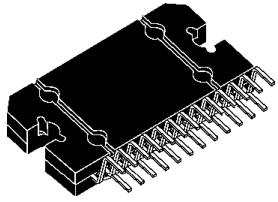
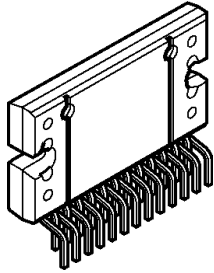
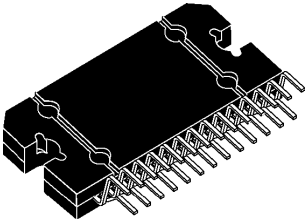
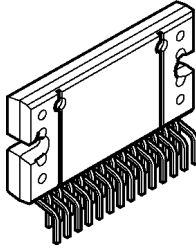
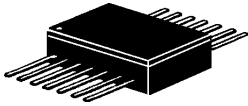
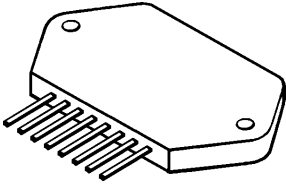
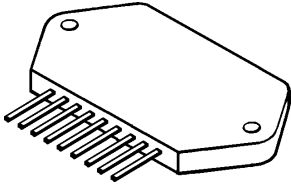
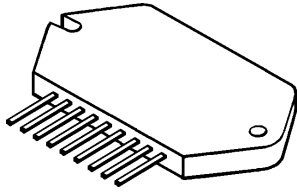
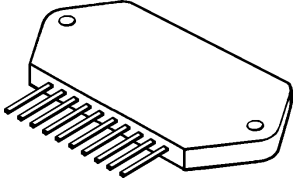
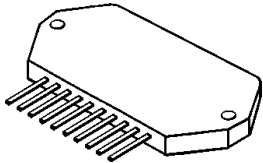
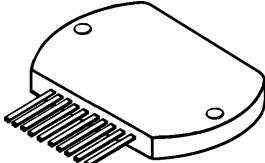
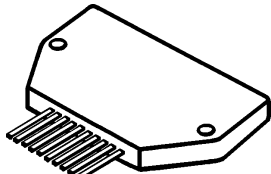
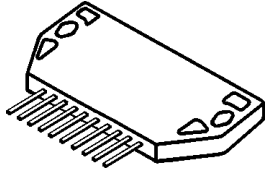
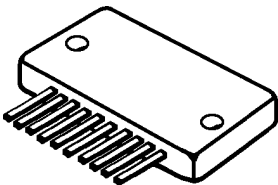
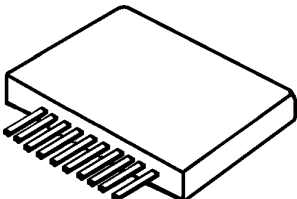
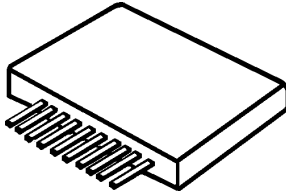
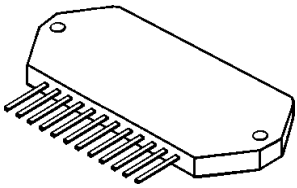
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