

Genuine Power Amplifier

- Yasuyuki Onodera
- <http://einstlab.web.fc2.com>

Prejudice/Preconceived idea

- There is prejudice.
- Do you know the Power Amplifier?
- It is true that you believe your Power Amplifier?
- Really?

Sound volume and Power

- The sound volume of loud speaker is given in proportion to electric power.
- This is a scientific fact.
- The loud speaker works to make a sound.
- Therefore power amplifier is needed to drive the loud speaker.

What is the Power Amplifier?

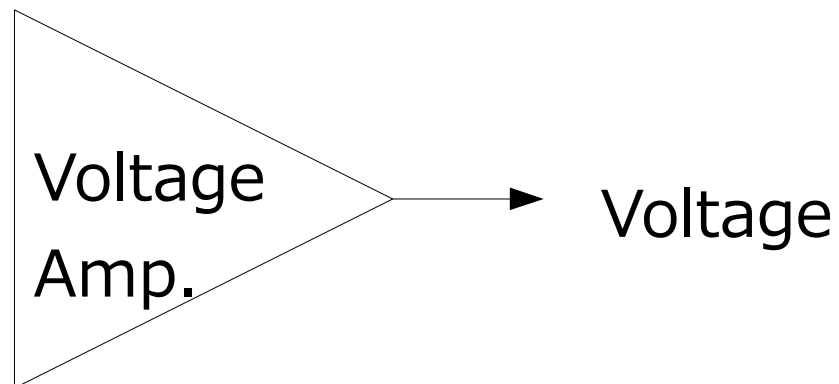
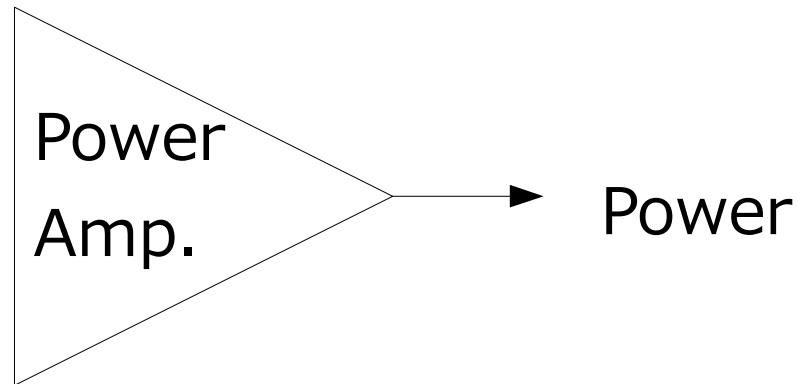
- That outputs power.
- This is a scientific fact.
- The purpose is power output.

Now sold Amplifier

- Question:What is the now sold Amplifier?
- Answer:That is a Voltage Amplifier not Power Amplifier.
- The Voltage Amplifier gets voltage input and puts voltage output.
- The purpose is voltage output.

Power Amp. vs. Voltage Amp.

- The difference is what is output.



Power means electric power

- P=electric power

$$P = IV = \frac{V^2}{R}$$

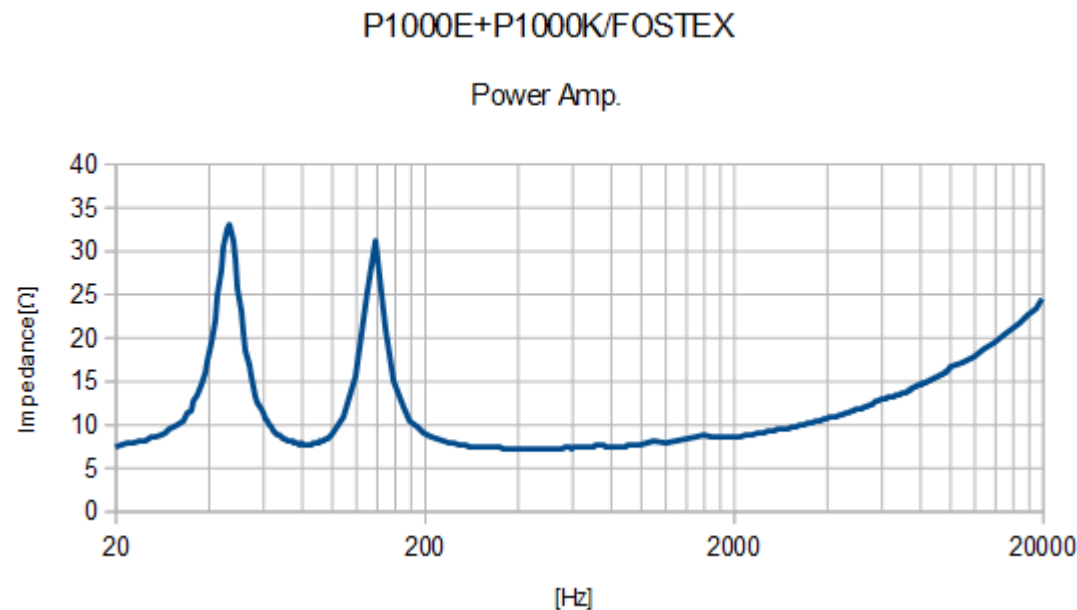
- For example
 - where $V=2.83[V]$
 - where impedance of loud speaker $R=8[\Omega]$
 - $P=2.83 \times 2.83 \div 8 = 1[W]$

Power Amp. \neq Voltage Amp.

- Voltage Amplifier is NOT Power Amplifier.
- Voltage Amplifier bases on fixed impedence.
- If R were fixed, Voltage Amplifier could work as Power Amplifier.
- But ...

Impedance of loud speaker

- But the impedance of loud speaker changes in accordance with frequency.
- R is not fixed.
 - $P=2.83 \times 2.83 \div R$



Using Voltage Amplifier

- For example
 - $R=23\Omega$ at 160Hz
 - $R=8\Omega$ at 1KHz
 - $R=27\Omega$ at 20KHz
- What is $P=V \times V \div R$, where $V=2.83[V]$
 - $P=0.35[W]$ at 160Hz
 - $P=1[W]$ at 1KHz
 - $P=0.3[W]$ at 20KHz
- The power changes even if the input is fixed.
 - Bad power causes bad sound.

Power base

- The loud speaker characteristic are based on power.
- on condition that 1[W],1[m]
- You can see how to measure it.
- IEC 60268-5

Innovation

- Welcome to new era.
 - from Voltage Amplifier(substitution) to Power Amplifier(genuineness)
- Would you like to enjoy the genuine sound?

Genuine Power Amplifier

- The genuine Power Amplifier puts right power output regardless of impedance changes.
- Right volume and right sound
- LIE technology
 - Load Impedance Independent Engine

Headphone Amplifier

- Here are headphone amplifiers with LIIE
 - AD00031(kit)
 - AD00032(assembled)



- <http://btoshop.jp/2014/06/24/ad00032/>
- or you can find it in amazon

Headphone Amplifier

- The output power response with headphone(MDR-XD150/SONY) where input voltage is fixed.
 - You can see flat power of AD0003x
 - The other voltage amplifier has bad characteristic.

