

# Genuine Power Amplifier

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# Prejudice/Preconceived idea

- There is prejudice.
- Do you know the Power Amplifier?
- It it 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?

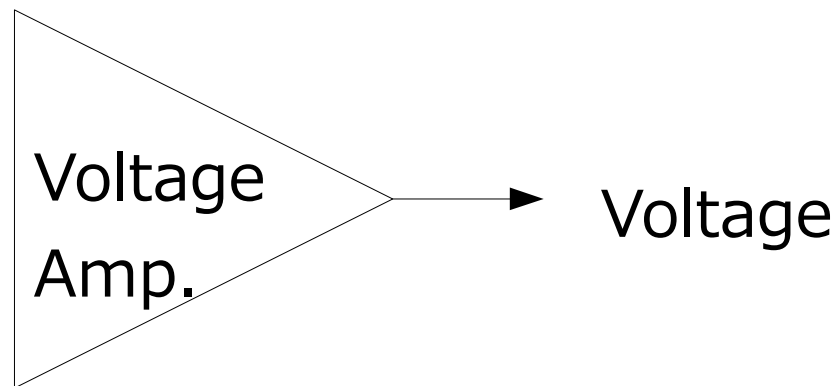
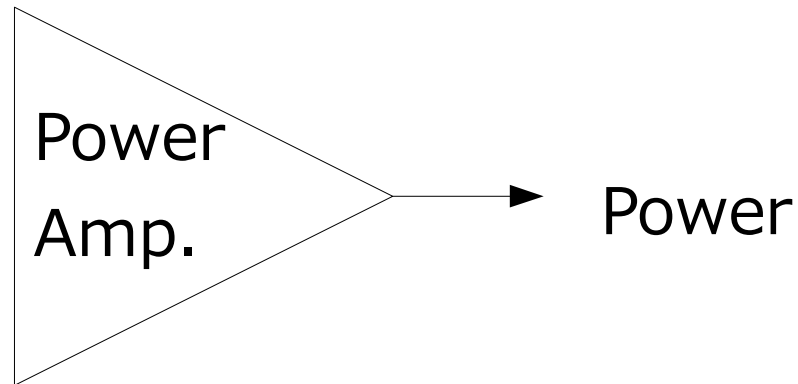
- That outputs power.
- This is a scientific fact.
- The purpose is power output.

# 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.

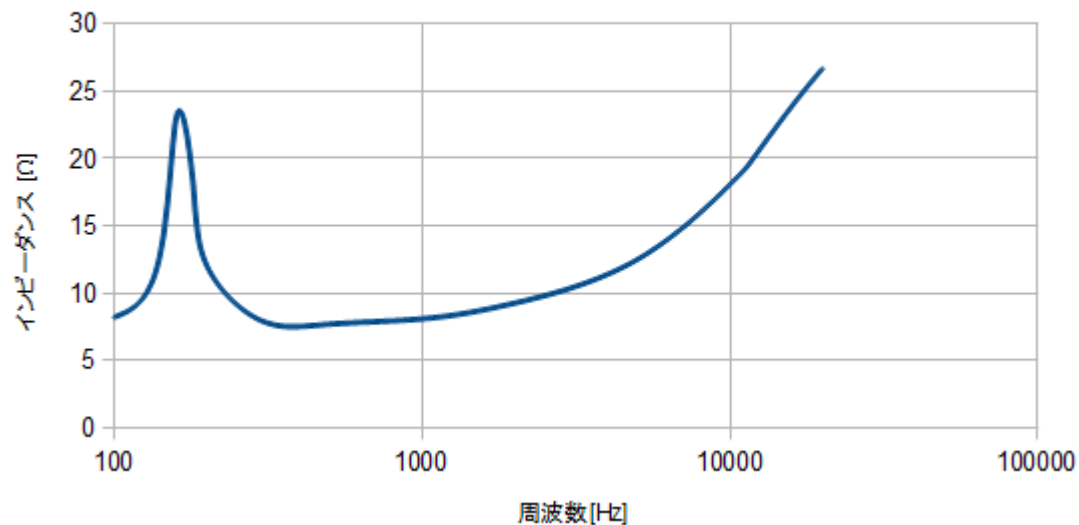
- Voltage Amplifier is NOT Power Amplifier.
- Voltage Amplifier bases on fixed impedance.
- When R was fixed, Voltage Amplifier could work as Power Amplifier.
- But ...



# Impedance of loud speaker

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

スピーカーのインピーダンス特性



# 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
  - Patent

# 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.

