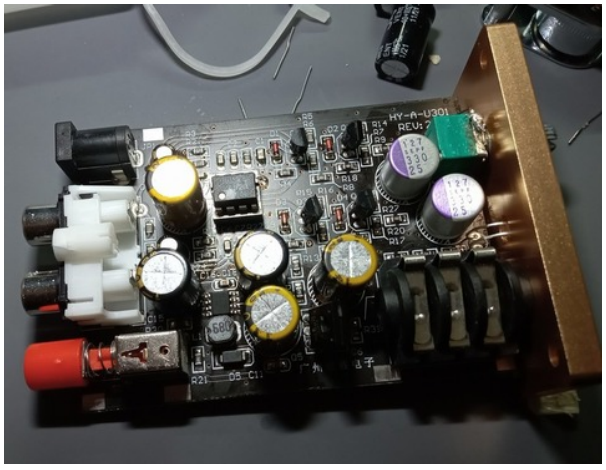
[Discount series] "Douk Audio U3" custom guide

January 2nd, 2023

※2023/1/2 12:53 Something has been corrected.
*2023/1/2 19:50 There was an error in the explanation diagram about the voltage of the capacitor, so I replaced it.
*2023/1/6 3:05 Added more about the voltage of the capacitor.

Happy New Year! It's K-Yama.

When I asked what I was doing over the New Year's Eve in 2022 ... "Ikuro Kururu Holo" instead of work BGM ...



I was working with Handa Gote and Handa Attractioner in one hand to customize this guy. " It feels like a winter vacation."

This golden front panel is impressive, but the name is an amplifier for headphones called "Douk Audio U3", and the price is about 3800yen on Amazon, but ...

It is a “Class A (Class A) amplifier.”

The amplifier has the concept of "class". However, it only represents the "drive method", so please note that it will not be a diagram like "A>B". The method called "Class A" faithfully reproduces the waveform of the sound, but there are weaknesses such as high power consumption and heat easily. However, it is a method that has recently begun to be used in some DAPs and portable amplifiers.
I do not know the audio / electronic circuit, so it is not clear as it is true, but in the product description on Amazon of "Douk Audio U3" this time it is written like that.

Douk Audio U3 Headphone Amplifier Mini Class A Head Amplifier HiFi Desktop Home Stereo Amplifier DC5V
Douk Audio

Gallery









<< January 2023 >>

Day	Moon	Fire	Water	Tree	Gold	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28.
29	30	31				

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When I actually listened to this "self-promotional A-class headphone amplifier" ... it is certainly not bad ... What to say, the feeling of elongation of the treble range is easy to understand, but there was a feeling that "I feel that I am not forced to make various things to make a sound" ... At that time, I started watching the video of the decomposition repair of a certain Kumagoro brother, and the boom of "degrading repair" began to come in me (Watakshi has already started to walk the path of "street junker" ...) There was a time when "condenser replacement" was done in such a repair video.

In the audio world, there is a category called "audio condensers", so I knew that "the sound will be better if you use a good condenser", and this time I felt the dissatisfaction point I felt with "self-proclaimed A-class headphone amplifier" may be improved by condenser replacement ...

However, this "Douk Audio U3" is a minor product, so it is difficult to get information to customize it ... So, this time, as a memorandum that I tried various trials and tried variously, and if you read this article and were interested in "I want to customize myself", or like "I tried to customize information like myself, but there is no page to handle ...", I will post information obtained within my custom range, so I will post information etc. obtained within my custom range.

[Attention]
In addition to the fact that the contents from this point to the end are “unqualified from the manufacturer’s warranty”, in some cases it may lead to accidents such as electric shocks and damage to electronic components. I will try to write about points to be careful as much as possible, but basically, please do custom with “self-responsibility”.

"The Promise."

Now, before disassembling, I will introduce some things that must be prepared for this work.

1. Set with solder
Handa Goteto, Handa, and Handa, which are about 30 to 40W, so that if you can, you can use a solda with "silver" for sound, but if you have a handa of Kodawari, you can use it. I am using Senju Metal Handa, which is said to have been used in SONY's Walkman etc. In addition, it is convenient to have an IPA (isopropanol alcohol) that cleans the base after using flax and flax, and small hake. I'm replacing myself with a make-up hat that was worth a hundred percent.

2. Handa sucker
This is used to remove capacitors, transistors, etc. from the base. It seems that you can not do it even with Handa Gote + Handa Sucking Line, but it is cheap Chinese made, and you can buy it from about 4,000yen on Amazon, and the parts are removed insanely. I will post the information of the handa sucker for the throughhole I am using with the URL.
* The movement of the part that pushes with the spring at the top of the part where the sucked solda accumulates (the part that is pressed with the thumb of the figure below) is bad, and when the slide is better at 5-56, the upper half of that part (above the green release button) flew with the momentum of the spring, so I pasted it together with instant glue. Attention is attention.

YIHUA 929D-V Solder Solder Absorber Vacuum Solder Removal Pump

Business Trip Repair Long Life Easy to Carry (1.0mm 1.2mm) With two nozzles (1.0mm 1.2mm) Automatic solder suction device used in one hand
Guangzhou Yihua Electronic Equipment Co., Ltd.

3. A driver set sold at Daiso for 200yen
This bit (replaceable tip part) contains the bits necessary for this decomposition (especially the bits of the hexagonal), so it is essential for disassembly. If you already have a compatible driver set, you do not need it.

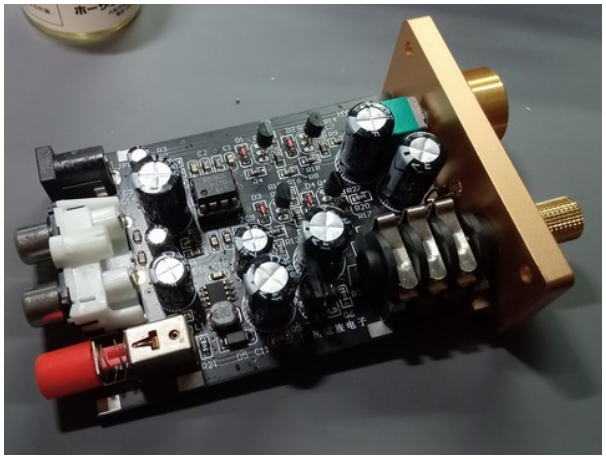
4. Electrical Tester
This is also a 2,000-3,000 yen class on Amazon. I will talk about it later, but it is always necessary for "condenser exchange" and "transistor exchange".

5. Nipper, Radio Pliers, Tweezers
These three are essential for electronic work. The nipper is used to cut off the leftover lead wire of the soldered condenser and transistor, the radio pliers are used to remove the solder sucked parts, and the tweezers are used to fine-tune electronic components through the lead wire to the through ball.

[Decomposition]
Let’s start with the disassembly. To access the base inside...

Roxt screws on the four corners of this front panel and ...

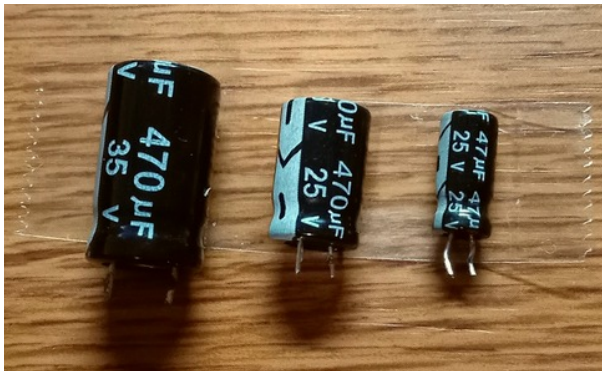
You can access it by removing this large plus screw in the upper center of the back and pulling out the front panel. The base that came out here is here.



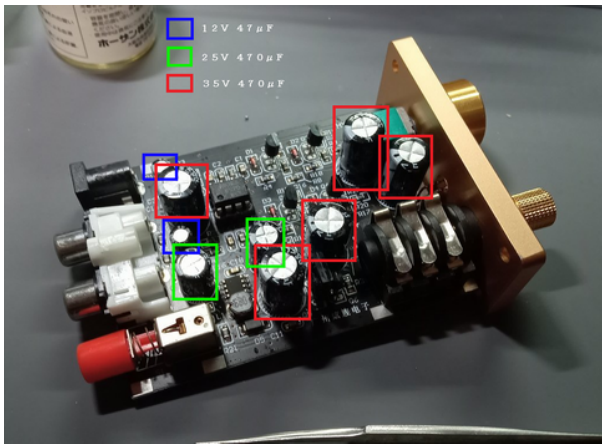
Let's start with "condenser exchange".

[Capital exchange]
This self-proclaimed A-class headphone amplifier uses three types of capacitors (electrolytic capacitors).

1. Diameter 5mmφ Height approx. 1cm 25V 47μF x2
2. Diameter 8mmφ Height approx. 1.2cm 25V 470μF x2
3. Diameter 10mmφ Height 1.7cm 35V 470μF x5



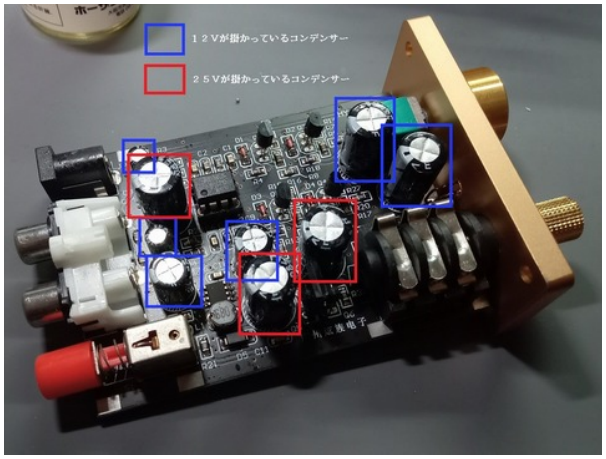
The above three condensers are used in the following places.



The original one is equipped with "JWCO" which is made in China, which is made by 105°C, but just by changing it to an 85°C standard product made in Japan (Rubicon, etc.), the elongation of the sound changes.

Basically, when replacing the condenser, it is safest to “align the same withstand voltage (V) and the same capacitance (μF) as the original one” when replacing the condenser is the safest, but ... As for the withstand voltage, there is also a description that “it is better to have a margin”. When the tester is applied, the voltage actually hanging on the capacitor is as follows.

Note: This self-proclaimed A-class headphone amplifier has a wide power supply voltage from 5 to 20V, but since the power supply I had in my hand was 12V, it may change somewhat if I make it 20V. By the way, the minimum voltage of the power supply is DC5V (jack outer diameter 5.5mm φ, center part 2.5mm), so it is also possible to operate with a mobile battery (actually, USB to DC cable is included in the accessory).



For example, even in places where the withstanding voltage 25V capacitors are installed, for example, even in places where the withstanding voltage 25V is installed, the condensate with withstand voltage of 12V can also be used from 12V to 16V. (*Supplement: The capacitor of the right two 35V470μF capacitors was 12V in silence, but when I looked at the simple oscilloscope, it seems that the final output is about 25V, so it is recommended to have a capacitor of 25V or more.) This "withstand voltage" is very important, and if a higher voltage is applied to the condenser, it leads to the worst damage to the capacitor. In addition, the condenser has "polarity". If you make a mistake, this will lead to the worst damage to the capacitor, so be careful. While energizing with the AC adapter, it is necessary to apply the tester while being careful not to short-circuit strange places and look at the voltage that is polarized.

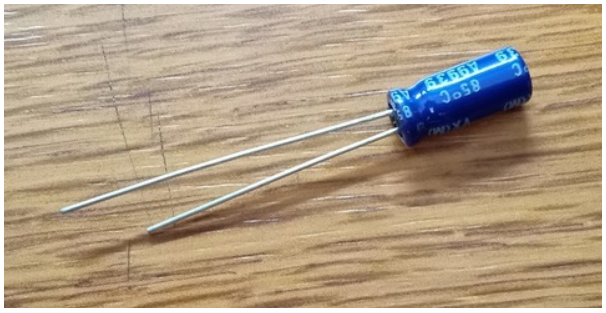
Quote: "The Role and Usage of Capacitors [Ichiken Electronic Basic Series]"

・ Polarity error→near 0:04
・When a voltage higher than the withstand voltage is applied to the condenser → around 6:44

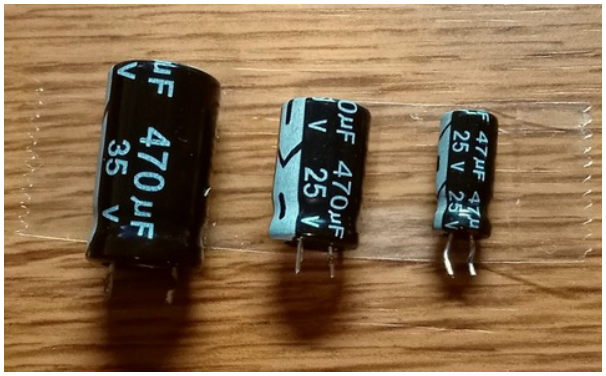
By the way, there are two ways to distinguish the polarity of the condenser.

“The longer the electrode of the new condenser +”
or
“It is better if there is a vertical line of the body of the condenser-”

It will be. Let's be careful. By the way, the polarity of the condenser in the "self-proclaimed A-class headphone amplifier" is "all the right side plus" when viewed in the direction of the above two images.



* Electrolytic capacitors are an example. One leg (lead line) is long, but this is +.



* The white vertical line on the left side of the capacitor's chassis represents the negative side (25V 470μF is easy to understand).

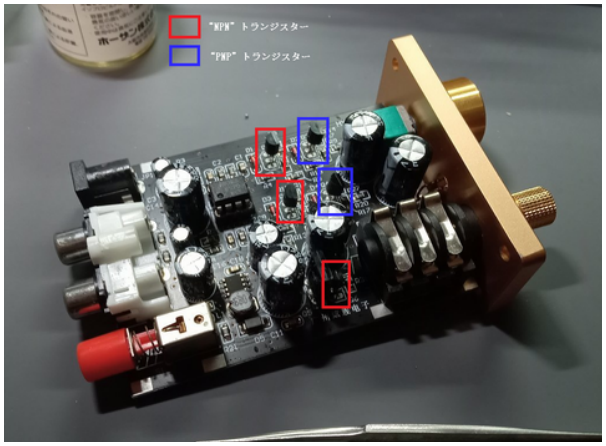
Regarding the capacity of the condenser, there was no particular problem even if you replace 470μF with 33μF as far as I tried, but ... The larger the capacitance, the easier it is to come out with the lower frequency (or rather feel that the limit of the low frequency extends?) I think it’s better to have the same capacity or a little bigger.

By the way, be careful because the convenience of putting the base in the case “capacitalizers over 17cm in height are too high and get caught when you put them in the case”.

I think that it is better to watch the way of exchanging condensers with Youtube videos, etc. ... Since it will come off if you smoke Handa with the "Handa sucker" from the back of the foundation, it will come off, so if there is the aforementioned "Handa sucker" and the work will progress.

[Transistor exchange]
The transistor installed in this "self-proclaimed A-class headphone amplifier" is covered with a flat surface with a rough side with a model number written on it, so I do not know the model number at all, but I probably use cheap Chinese products ... I felt that something was not good, so I decided to change the transistor this time.

The “transistor” of the self-proclaimed A-class headphone amplifier is installed in the following five places, but each is as follows.



I would like you to ask Google Sensei about "NPN" and "PNP" for details, but even transistors with the same shape have different directions for electricity flowing depending on the internal structure. In addition, there are two types of pin-a-signing: "major" and "non-prone", and the condensers used in this "self-proclaimed A-class headphone amplifier" this time will be "non-partner". I looked at the following site for the distinction.

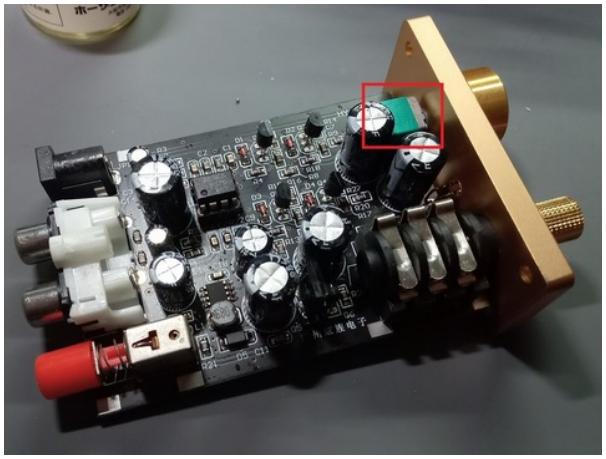
https://tritech.tv/blog/? p=218

There are three pins in transistors, but from the left from the left from the flat side where the model number is specified, the pin arrangement of "Emitters (E), collector (C) and base (B)" is common ...

"Emitter (E), Base (B), Collector (C)"

It's in order, so be careful. If you make a mistake in polarity, you will have heat or damage at worst (when a fragrant smell comes, turn it off immediately). If it is in the correct state, when the base is energized and opened, both NPN and PNP transistors will have a voltage of 12V between the collector and emitter. By the way, since "Base (B)" is an array that comes to the center, if it is a transistor of "Collector (C), Base (B) and Emitter (E)" arrangement from the left, it is possible to substitute by countering the direction to be attached.

[Volume (variable resistance) exchange]
This "self-proclaimed A-class headphone amplifier" seems to be designed for headphones with high impedance, and the volume is large when playing earphones with low impedance ... In addition, the volume installed by default was unstable with a volume with a "click feeling" (I feel the click feeling that the volume has increased, but it is not actually loud, and I feel that the volume is raised one step at a time ... and the volume step is not so good ...). So, I decided to change the volume (variable resistance).



※It is surrounded by the red frame of the above figure.

I was looking for a “double-variable resistor (because there is a voice of 2ch)” that can smooth volume operation, and the next product hit.

uxcell Carbon Membrane Potentiometer Variable Resistor Double Rotary RV097NS 100KΩ 5pcs
uxcell

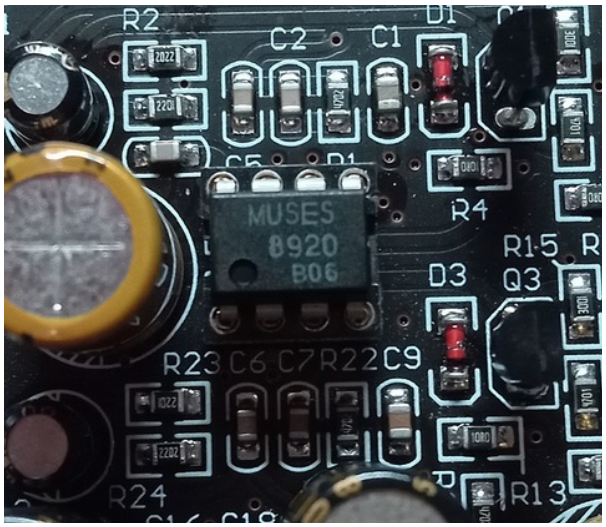
Since the default volume was the aforementioned shape, I changed from the default 10kΩ to 100kΩ to 100kΩ to make it easier to adjust the volume even with low-impedance earphones ... but it is still quite loud. In particular, BA-type earphones can listen to BA music at the last minute in the place where the volume "gang error (the area where you can hear the sound is connected to the left and right of the first)" is resolved, but ... I hope that next time it will be a bigger resistance and it will be easier to adjust the volume.

By the way, when replacing the volume, it is necessary to remove the front panel from the base ...

The hexagonal metal nut part surrounded by the red frame on the left of the above figure is

that it can be removed by turning it around the counterclock with pliers with pliers, etc., and the part of the volume knob can be removed by pulling it in front (although it is hard). After that, as well as the exchange of capacitors and transistors, you can remove it by sucking up solda with a solder sucker (a total of seven places). Also, there is one line to drop from the metal part of this volume to GND, so don't forget to put it on (probably because it is extremely difficult to solder to the stainless steel volume housing, so I firmly degrease the parts of the variable resistance with IPA and stick the Kapton tape without gaps and fix it).

[Opportunity exchange]
This "self-proclaimed A-class headphone amplifier" uses 8DIP's two-circuit op amps (default is TI's NE5532P), so it is possible to change the sound by replacing it with "4558 series" and "MUSES". In the case of a self-proclaimed A-class headphone amplifier, the operational amplifier has a voltage of about 25V, but the spec sheet of the op amp may have a notation such as "±18V", and in that case, if it is "±13V or more", it will work.



So, I hope it will be a reference for those who want to customize "Douk Audio U3" from now on.

Comments 4 things

Other articles without category

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Comments

1. Kamomemaki July 16, 2025 at 09:09 AM

It will be very informative.
I was satisfied with the purchase of U3 and staying in the nest, but I was surprised by the change in sound when I

replaced the op amp with MUSES02, and I searched for more things, and I arrived at this page.
I will try DIY when I receive an additional U3 while referring to it.
Thank you for the valuable information!!

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2. K-Yama 20 July 20, 2025 00:17

>>1
Thanks for the comment. Alien is actually an amateur of the electronic work ... It is the result of playing with interest based on the knowledge gained in a certain junk repair video on Youtube. However, I wrote that this would be a hint for something for the kid, or if you are interested in electronic work, etc., so I am grateful to be able to say that.

1

3. Kamomemaki August 04, 2025 at 13:25 AM

★★★★★

Since the additional U3 arrived, I removed and installed the capacitor on the solder with my brother Kumagoro's eyes. It was the most difficult to remove. :-)
Basically, I replaced it with other parts that can not be obtained with reference to this article.
・Operating Amps MUSE02
・25V47μF Nichiicon FG series x2
・25V470μF TOSHIN UTWE series x2
・35V470μF TOSHIN INDUSTRIES, LTD. UTWE series x3
・OS-CON 35V120μF x2
Capacitors and audio grades were mostly discontinued and only FG was available. If you see the autumn moon later, it may be sold out and you may not get it anymore! ! It's like the current audio industry.

After the modification, the power is turned on safely and there is no problem with operation. It is a change in the essential sound, but I feel that the bass has become sharper as the vocals stretch and the bass has become sharp.

Will the OS-CON individual capacitors and ordinary electrolytic capacitors change the sound trend?
It is fun to search for products while imagining various things(*´艸`)

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4. K-Yama August 05, 2025 22:44

>>3
Thanks for the comment.
Certainly someone may have been told in the comment, but solid condensers such as OS-CON are more effective if they are placed as close to the power supply as possible to eliminate noise ... I tried to make almost all capacitors into OS-CON, but I felt that I understood the reason why it became a rather hard sound, or in other words, it became a slightly tasteless sound.

0

Name

Article evaluation Face Star Memories of information.

Post a comment