

Re: Will this transistor amplifier work in production?

Source: <http://sci.tech-archive.net/Archive/sci.electronics.design/2004-07/0022.html>

From: Jim Thompson (*thegreatone_at_example.com*)

Date: 06/30/04

Date: Wed, 30 Jun 2004 08:39:34 -0700

On Wed, 30 Jun 2004 11:07:41 -0400, "Tam/WB2TT"
<t-tammaru@c0mca\$t.net> wrote:

```
>
> "The other John Smith" <jocjo-john@yooha.com> wrote in message
> news:_3oEc.18226$w07.3777@newsread2.news.pas.earthlink.net...
>>
>> "The other John Smith" <jocjo-john@yooha.com> wrote in message
>> news:z5mEc.5403$lh4.4654@newsread1.news.pas.earthlink.net...
>>> This circuit works very well on my breadboard...
>>>
>>> +5V
>>> .-----o
>>> ||
>>> .-. .-.
>>> ||||
>>> || 9.1k || 4.7k
>>> ' ' ' '
>>> ||
>>> ||
>>> | o----- OUT
>>> o---. |
>>> |||
>>> |||
>>> \ |||
>>> 2N3904 |-o---Source-----| 2N3904
>>> <| />
>>> ||
>>> ||
>>> |-----'
>>> |
>>> ===
>>> GND
>>> created by Andy's ASCII-Circuit v1.24.140803 Beta www.tech-chat.de
>>>
>>> The source is about 0.6 Hz at 15 mV p-p and has about 500 Ohms internal
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sci.electronics.design: Re: Will this transistor amplifier work in production?

>> > *resistance. The circuit provides a voltage gain of about 80 and feeds a*
>> > *comparator whose reference is about 1/2 the supply voltage. I ran it*
>> *through*
>> > *LT Spice and it seems to work just fine over -40 to 60 C. The resistor*
>> > *values shown are values required by LT Spice to set the output at about*
>> *half*
>> > *the supply voltage with the signal at 0 volts. When I implemented the*
>> > *breadboard, the 9.1k needed to be reduced to about 6k. This got me to*
>> > *wondering if I will have to select resistors during production to keep*
>> *the*
>> > *output voltage at about 1/2 the supply voltage. I know I could use an*
>> *op-amp*
>> > *for this, but now I'm wondering if this is a practical circuit.*
>> >
>> > *Any comments about this circuit will be greatly appreciated.*
>>
>>
>>
>> *Wow! Thanks for all the great replies!*
>>
>> *It looks like I might have a chance with this circuit if I use matched*
>> *pairs. And the component count is the same whether I use an op-amp,*
>> *comparator, or matched transistors in a single package.*
>>
>> *Probably best to stick with the usual op-amp or comparator, though.*
>>
>> *Thanks again for the help.*
>>
>> *John*
>>
>>
> *John,*
>
> *How are you coupling the input signal? I ran LTSPICE on this, capacitively*
> *coupling the signal into the bases through a 10 uf capacitor, and saw about*
> *what you say. Now, put a resistor in series with the input (I used 9.1K),*
> *and the picture changes completely. I think the impedance looking into the*
> *base of the left hand transistor is very low because of the unity inverse*
> *feedback. I wasn't very careful, but the impedance into the amp appears to*
> *be less than 30 Ohms. I think what I am seeing is the re of the left hand*
> *transistor.*
>
> *Tam*
>

John said (and illustrated above) the source as ****between**** the bases.

Use something like a CA3046 and it'll work just ducky.

With a CA3046 it should be possible to make the output very accurately at $V_{cc}/2$ and stable over temperature.

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If I have time this morning I'll doodle up something and post it to either my website or to a.b.s.e

...Jim Thompson

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| James E.Thompson, P.E.                | mens |
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I love to cook with wine. Sometimes I even put it in the food.