Having a trouble using the opto 4N35

Discussion in 'General Electronics Chat' started by sonaiko, Jun 18, 2005.

Jun 18, 2005 #1

sonaiko
New Member

Joined:	Aug 5, 2004
Messages:	123
Likes:	0

I connected a 4.5v between terminals 1 and 2 [diode terminals].
i connected a 680ohm resistor between terminals 6 and the ground [emitter and the ground]
i connected a 5v to terminal 5 [collector].
I connected a 4.8Kohm resistor between terminal 4 and the ground [base and the ground]

GUYS NOTHING HAPPENS!!
when i turn on the Voltage source, or i turn it off i still get the same voltage readings on both of the resistors!!!

what did i do wrong? may anyone help?

subzero... wins..

Jun 18, 2005 #2

Nigel Goodwin
Super Moderator
Most Helpful Member

Joined:	Nov 17, 2003
Messages:	38,280
Likes:	555
Location:	Derbyshire, UK

> **sonaiko said:**
>
> *I connected a 4.5v between terminals 1 and 2 [diode terminals].*
> *i connected a 680ohm resistor between terminals 6 and the ground [emitter and the ground]*
> *i connected a 5v to terminal 5 [collector].*
> *I connected a 4.8Kohm resistor between terminal 4 and the ground [base and the ground]*
>
> *Click to expand...*

If you connected 4.5V directly to the LED, with no current limiting, then you have probably blown the LED instantly!.

PIC programmer software, and PIC Tutorials at:
http://www.winpicprog.co.uk

Jun 18, 2005 #3

sonaiko
New Member

Joined:	Aug 5, 2004
Messages:	123
Likes:	0

alright. i have used a new opto and added a limiting resistor. Still the same problem.

subzero... wins..

Dec 11, 2014 #3.1415

Recent Posts

Joined: Jan 12, 1997
Messages: -
Likes: 0

Jun 18, 2005 #4

k7elp60
Active Member

Joined: Oct 21, 2003
Messages: 1,130
Likes: 14
Location: Utah

If you have everything connected correctly you should measure a little less than 5 volts across the 4.8k resistor from pin 4 to ground.

I am assuming that the 4.5 volts in series with the current limiting resistor is connected + to pin 1 and - to pin 2. That the + 5 volts is connected to pin5 and the - of the 5 volt supply is connected to the ground and/or the the other end of the resistors on pins 5 and 6.

The transistor should be in saturation, which means the voltage between emitter and collector is about 0.3 volts.

The great thing about electronics is unlimited ways to do the job. The only limit is one\'s imagination. I generally think my way is best.
Show me a different way. I have an open mind.

Jun 18, 2005 #5

williB
New Member

Joined: Aug 30, 2004
Messages: 2,217
Likes: 3
Location: New Jersey

> *I connected a 4.8Kohm resistor between terminal 4 and the ground [base and the ground]*

isnt the base being driven by the led ??
try disnonnecting the resistor to base..

Jun 18, 2005 #6

sonaiko
New Member

Joined: Aug 5, 2004
Messages: 123
Likes: 0

i disconnected the resistor. Guys it worked, but after i raised the biasing voltage up to 13v!!! why it didnt work on 5v biasing?! weird!

subzero... wins..

Jun 18, 2005 #7

eblc1388
New Member

Joined: Jan 25, 2005
Messages: 2,225
Likes: 18
Location: UK

> **sonaiko said:**
>
> *I connected a 4.5v between terminals 1 and 2 [diode terminals].*
> *i connected a 680ohm resistor between terminals 6 and the ground [emitter and the ground]*
> *i connected a 5v to terminal 5 [collector].*
> *I connected a 4.8Kohm resistor between terminal 4 and the ground [base and the ground]*
>
> *Click to expand...*

Look at the diagram of the 4N35 and see which pin is the base and emitter.

File size: 3.7 KB
Views: 1,329

L.Chung

Jun 18, 2005 #8

sonaiko
New Member

Joined:	Aug 5, 2004
Messages:	123
Likes:	0

> **eblc1388 said:**
>
> *Look at the diagram of the 4N35 and see which pin is the base and emitter.*

ya, i dloaded the data sheet just before i begin my work.

It worked now, but after raising the biasing voltage to 13v. why is that?

subzero... wins..

Jun 18, 2005 #9

Styx
Active Member

Joined:	Dec 19, 2003
Messages:	1,744
Likes:	9
Location:	UK

biasing voltage?
are you saying you are using a voltage-divider to "bias" the output BJT and that voltage is at 13V!!!

I would suspect something is wrong with the opto, or it is not being drive/loaded correctly.

I am using some CNY75's on some of my gatedrivers and the only way to get the propogation delay down (4us the best I can get and that is no where good enough, but it is what it is).

Now I have a 56R burn resistor to the photo-diode - but that is being supplied from a 3V source (line reciever output).
On the secondary side I have ~1k pull-up and ~9k1 from the base to GND.
I say aproximately since each opto had to be calibrated, some needed 910R pullup (some downto 620R) equally the base needed 8k5 sometimes...

What exactly is the cct associated with the opto:
Including what is being used drive the opto. It might be what is being used has a low-current output and you are collapsing the voltage - I had that problem until I changed my line reciever to one that could source upto.

So if you could suppy that info I am sure we can figure it all out

Nothing is impossible.
Once a problem is realised, the rest is just details

Jun 18, 2005 #10

k7elp60
Active Member

Joined:	Oct 21, 2003
Messages:	1,130
Likes:	14
Location:	Utah

I just realized why the original circuit would not work with the 680 ohm resistor from base to ground. When the emitter voltage got to about 0.7V the transistor went into cutoff because the with the emitter + the base is effectively negative.
If the 680 ohm resistor on the base is connected between the base and the emitter it would always work. As an alternate remove the 680 resistor, as for normal switching it would not be needed anyway.

The great thing about electronics is unlimited ways to do the job. The only limit is one\'s imagination. I generally think my way is best.
Show me a different way. I have an open mind.

audioguru
Well-Known Member
Most Helpful Member

Joined:	Mar 16, 2004
Messages:	31,634
Likes:	870
Location:	Canada, of course!

Sonaiko doesn't say what is the value of his current-limiting resistor for his LED, so maybe it is too high. With a 4.5V "biasing voltage" feeding the LED and its current limiting resistor, for the opto-transistor to conduct well into its 4.8k load resistor with a 5V supply, the value of the current-limiting resistor should be about 3.5K. If he used 12k or more, then a "biasing voltage" of about 13V will be needed to supply enough LED current. :lol:

Uncle $crooge

Jun 18, 2005 **#12**

sonaiko
New Member

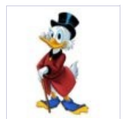
Joined:	Aug 5, 2004
Messages:	123
Likes:	0

> **audioguru said:**
>
> *The 4N35 has a minimum transfer ratio of 100%.*

can u explain more about the transfer ratio?

subzero... wins..

Jun 18, 2005 **#13**



audioguru
Well-Known Member
Most Helpful Member

Joined:	Mar 16, 2004
Messages:	31,634
Likes:	870
Location:	Canada, of course!

Hi Sonaiko,
The transfer ratio for an optocoupler is how well the current in the LED causes the transistor to conduct collector current. With your 4.8k emitter resistor and a 5V supply, the max collector current is about 0.94mA. With its minimum transfer ratio of 100%, the LED current must also be at least 0.94mA. Its forward voltage is about 1.2V, so with 4.5V feeding the current-limiting resistor and LED then 3.3V will be across the resistor and its value will be 3.3/0.94m= 3.5k. :lol:

Uncle $crooge

Jun 19, 2005 **#14**

sonaiko
New Member

Joined:	Aug 5, 2004
Messages:	123
Likes:	0

> **audioguru said:**
>
> *Hi Sonaiko,*
> *The transfer ratio for an optocoupler is how well the current in the LED causes the transistor to conduct collector current. With your 4.8k emitter resistor and a 5V supply, the max collector current is about 0.94mA. With its minimum transfer ratio of 100%, the LED current must also be at least 0.94mA. Its forward voltage is about 1.2V, so with 4.5V feeding the current-limiting resistor and LED then 3.3V will be across the resistor and its value will be 3.3/0.94m= 3.5k. :lol:*

thanx dude! :wink:

subzero... wins..

(You must log in or sign up to reply here.)