Re: Vbe stuff

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2006−10/msg03165.html

- *From*: Jonathan Kirwan <jkirwan@xxxxxxxxxxxxxx>
- *Date*: Sun, 15 Oct 2006 20:14:56 GMT

On Sun, 15 Oct 2006 12:09:17 −0700, Jim Thompson
<To−Email−Use−The−Envelope−Icon@xxxxxxxxxxxxxxx> wrote:

> On Sun, 15 Oct 2006 17:50:26 GMT, Jonathan Kirwan
> <jkirwan@xxxxxxxxxxxxxx> wrote:
>
>> On Sun, 15 Oct 2006 09:51:18 −0700, Jim Thompson
>> <To−Email−Use−The−Envelope−Icon@xxxxxxxxxxxxxxx> wrote:
>>
>>> On Sun, 15 Oct 2006 16:24:30 GMT, Fred Bloggs
>>> <nospam@xxxxxxxxxx>
>>> wrote:
>>>
>>>> Jim Thompson wrote:
>>>>
>>>>> Density has nothing to do
>>>>> with vbe change per decade
>>>>> _provided_ you're
>>>>> not into where resistance is
>>>>> affecting the measurement.
>>>>>
>>>>> ...Jim Thompson
>>>>
>>>> I suppose it has more to do with a design
>>>> goal minimizing conduction
>>>> losses in the high current diode thereby
>>>> prohibiting the use of very
>>>> large ratios of majority doping material
>>>> density as with the transistor.
>>>> This will cause a departure from the
>>>> simplified minority carrier density
>>>> at the transition region boundaries as a
>>>> function of forward bias

because the minority carrier density on both
sides of the transition
region change significantly with a coupled
dependence.

As someone else pointed out, the 1N4xxx devices are also
very lightly
doped (almost PIN−diode−like) to get the "high−voltage"
performance.

But, Fred, your dissertation sounds just like that...
dissertation out
of the mouth of some _twisted_ PhD ;−)

All the same, it makes some sense to me. Shockley's equation develops
from an assumption that the forward current is entirely due to
minority carrier diffusion in neutral regions, I think. I need to
think more about it, but on first cut it sounds like the right
direction.

Jon

Large ratios of doping level are precluded by (primarily) breakdown
voltage and forward resistance considerations.

But isn't forward resistance a valid part of this measurement being
discussed?

Jon
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