Broke my TDS3000B

Martin (/g/TekScopes/profile/@musaeum) 5:51am (https://groups.io/g/TekScopes/message/180243)

> I've no idea what I should be looking for and those pins are mighty small
> and close together.

Oh yes, thats not easy.

I was thinking about checking if the lines are totally stuck or are looking normal, i.e. change state every now and then.
Or if a line is moving a little when you switch below 400us... things like that, to confirm or not if the ASIC really has a problem.

cheers
Martin

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David C. Partridge (/g/TekScopes/profile/@perdrix) 5:35am (https://groups.io/g/TekScopes/message/180242)

Eight of them - I've checked everything now using the stereo microscope.

D.

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David C. Partridge (/g/TekScopes/profile/@perdrix)

5:34am (https://groups.io/g/TekScopes/message/180241)

I've no idea what I should be looking for and those pins are mighty small
and close together.

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5:28am (https://groups.io/g/TekScopes/message/180240)

Martin (/g/TekScopes/profile/@musaeum)

Just one more thing... (Columbo)

Can you check the suspect lines with a another scope?
Do they look stuck? Is there any correlation with good/bad behaviour of the TDS?

cheers
Martin

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5:19am (https://groups.io/g/TekScopes/message/180239)

Martin (/g/TekScopes/profile/@musaeum)

How many Tantalums did you replace on that board?
How sure are you that there is no problem with a solder joint on or around one of these?

cheers
Martin

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David C. Partridge (/g/TekScopes/profile/@perdrix)

4:19am (https://groups.io/g/TekScopes/message/180238)

I have no clue as the IC's in question are custom ASICs.

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Martin (/g/TekScopes/profile/@musaeum) 3:28am (https://groups.io/g/TekScopes/message/180237)

Hi David,

were you able to verify the type of pin that you shorted, or presumably shorted? I mean if its a supply line (low impedance), or inputs or 3 state or whatever? In my experience digital logic is rather robust and it was rare to cook a chip just by shorting one of its pins to another, even to GND or VCC.

cheers
Martin

Reply Like More


David C. Partridge (/g/TekScopes/profile/@perdrix)

3:26am (https://groups.io/g/TekScopes/message/180236)

And the bad news is - it's still broken ☹

D.

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David C. Partridge (/g/TekScopes/profile/@perdrix)

2:20am (https://groups.io/g/TekScopes/message/180234)

I went in and checked over and partially redid the cleanup under the microscope yesterday pm. Still need to put back together and test.

D.

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John Miles 12:04am (https://groups.io/g/TekScopes/message/180233)

> I've since removed the splatter but now any horizontal sweep rate faster

the

> 400uS breaks up into a mess, and autoset doesn't work right. I'm thinking
> I've probably killed it >:(

Are you sure you got *all* the solder?

-- john, KE5FX

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David C. Partridge (/g/TekScopes/profile/@perdrix)

Mar 11 (https://groups.io/g/TekScopes/message/180230)

All channels equally impacted. Yes I was referring to the big National Semi IC. Sweep rates of 400us and slower are just fine. Anything faster is a total mess. I see the MPC860 now - right next to the ethernet connector (J910) at the other end of the board.

Is it OK to operate this beastie with covers off for any length of time - loath to inflict further damage that way.

D.

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David C. Partridge (/g/TekScopes/profile/@perdrix)

Mar 11 (https://groups.io/g/TekScopes/message/180229)

Up-hack is discussed on EEVBLOG.

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Mar 11 (https://groups.io/g/TekScopes/message/180227)

durechenew@...

On Thu, Mar 11, 2021 at 11:43 AM, David C. Partridge wrote:

> up-hacked to TDS3064B

Hi Dave,
Worked long ago with 3054, loved that scope (some people don't like Tek, I do). Unfortunately I never looked inside one so far (seen something on you tube) and I'm afraid I could be of no help here. It would be interesting though to read if you posted somewhere information about how you "...up-hacked to TDS3064B".
All the good luck (you'll need a lot)
TT

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Mar 11 (https://groups.io/g/TekScopes/message/180223)

maxim.vlasov@...

TDS3000B are built on the MPC860 PowerQUICC. This is the main CPU. So, it has no boot ROM or the full fledged custom secure bootloader (too old), which is a great advantage for repairman. So, this thing can be sourced and replaced, IMHO.

Are you referring to the big PQFP240 National Semi thingy, right? IMHO, this is not the CPU, it's the ASIC DPO emulator with the ADC/RAM/etc crossbar, ADC clock generator PLL and DMA functionality.

Could you, please, check at which sampling rates you have a garbled response? If you run in X/Y mode, do you have the same stuff? Is it the same when running from the external trigger? Are all the traces garbled or just a subset of channels? Try to remove all the plug-ins and extension cartridges.
Also it could be the SRAM too (just two chips next to the ASIC). How about the linear power regulators in the vicinity of the tantalum cap? Are they OKAY?
Try to go around the o-scope and check the logic levels around the SRAM and National Semi ASIC. Maybe you can find a burned buffer or something. If it breaks below 400us, it could be the PLL.
I would go around and note the voltages and levels and post it to the forum.
Also the thermal image would be a good indication of something awkward.
You said that built-in self test runs OKAY. But how about running the calibration and service routines, would these fail?

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David C. Partridge (/g/TekScopes/profile/@perdrix)

Mar 11 (https://groups.io/g/TekScopes/message/180217)

A bit ago I reported a problem with ripple on calibrator trace of my TDS3014B (up-hacked to TDS3064B): https://www.eevblog.com/forum/testgear/tds3000b-trace-ripple/msg3492464/#msg (https://www.eevblog.com/forum/testgear/tds3000b-trace-ripple/msg3492464/#msg) 3492464

I replaced the tantalum caps on the main board and that problem is gone, but I've broken it - I got a bit of solder splatter on a few pins of what I suspect is the main CPU (the one marked EX388/ADG360C/MM9595-AUW/156-7644-01) and on two pins of one of four ICs marked ES336AC/ADG361D/MM9916-VJG/156-7645-01 which I failed to notice and powered it on in that state.

I've since removed the splatter but now any horizontal sweep rate faster the 400uS breaks up into a mess, and autoset doesn't work right. I'm thinking I've probably killed it >:(

Of course it happily passes the self test.

Before I put on my scrap pile and weep over the loss of a nice scope has anyone any thoughts - I've carefully re-checked for any further solder bridges - none found.

D.

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(https://groups.io/g/TekScopes/topic/80209050?p=,,,20,0,0,0::,,,0,0,0,80209050)

(https://groups.io/g/TekScopes/topic/81280731?p=,,,20,0,0,0::,,,0,0,0,81280731)

1 - 15 of 15 1