 Mute This Topic (<https://groups.io/g/HP-Agilent-Keysight-equipment/ft/94160120?csrf=5513314409256117711&mute=1&p=Created%2C%2C%2C20%2C2%2C0%2C0>)

## E4402B RF Section CLIP required

Date  (<https://groups.io/g/HP-Agilent-Keysight-equipment/topic/94160120?p=Created%2C%2C%2C20%2C2%2C0%2C0>)



Tony G1HMO

Oct 6  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/130006>)

Morning, would anyone be able to let me have a copy of a good quality scan of the CLIP for the RF section in an Agilent E4402B analyser? I have purchased the Artek manual which has the CLIP information, but the readability of the RF section is not brilliant, I cannot for example easily read the IC numbers.  
Or, perhaps if I describe the symptoms someone may have had the same issue and can give me some pointers as where to look first!

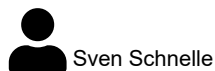
My analyser fails alignment, it shows the LO unlock message, but only on the lower frequencies, for example, if I sweep between 800Mhz and 3GHz, it doesn't throw the error, but if I go below 800MHz, it does.  
On the RF section at the bottom beneath the large screening can, there are two red LED's in the rear right corner next to U55, marked DS2 and DS1.  
Above 800MHz, both are off, but below 800MHz, DS2 gradually starts to flicker, until at 700MHz, it is lit brightly, and the unlock message is displayed.  
From what I can see in the CLIP, the LEDS are in the YTO unlock detector, which makes sense as the LO is unlocked.

I've checked the obvious, such as power supply rails, Reference oscillator, the 600mhz oscillator is fine, unfortunately I do not have access to another analyser at present that goes up above 3GHz so I am a bit stuck!

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Oct 6 <https://groups.io/g/HP-Agilent-Keysight-equipment/message/130018>

"Tony G1HMO" <tonyg1hmo@gmail.com> writes:

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I've checked the obvious, such as power supply rails, Reference oscillator, the 600mhz oscillator is fine, unfortunately I do not have access to another analyser at present that goes up above 3GHz so I am a bit stuck!

Check the frequency divider for the PLL - and watch

<https://www.youtube.com/watch?v=gb1QMJtwumQ> (<https://www.youtube.com/watch?v=gb1QMJtwumQ>)

I had a similar problem with a E4407B where the LO was only unlock for frequencies below 1.5 GHz.

Regards  
Sven

Reply Like More



Mark Bielman (</g/HP-Agilent-Keysight-equipment/profile/502679>)

Oct 6 <https://groups.io/g/HP-Agilent-Keysight-equipment/message/130020>

Yes! I have actually repaired two units by replacing that same IC!  
(divide by 4 or something)  
W/o another analyzer it's difficult to troubleshoot these.

Mark

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Tony G1HMO


Oct 6 <https://groups.io/g/HP-Agilent-Keysight-equipment/message/130021>

I had watched that video earlier today, but because the schematic isn't actually that readable in terms of the component overlay and IC numbers, I am unsure what the particular IC actually is, or which side of the RF pcb it is located on.  
I guess i'll watch it again, and see if I can deduce anything further from it.

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Sven Schnelle

Oct 6  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/130022>)

"Tony G1HMO" <tonyg1hmo@gmail.com> writes:

I had watched that video earlier today, but because the schematic isn't actually that readable in terms of the component overlay and IC numbers, I am unsure what the particular IC actually is, or which side of the RF pcb it is located on. I guess i'll watch it again, and see if I can deduce anything further from it.

Which version of RF deck do you have? There's the older version which has a 4/8 switchable divider (if i remember correct) and a /2 divider. I don't know from the top of my head what the types used there are.


My unit has a much newer RF deck, which uses the 1GC1-4210 divider. As that one is unobtainium i used the 1GC1-4210 replacement module from Leo Bodnar which works fine. My RF deck even had Keysight printed on the chips, which is interesting because i thought that the E44xxB was already End-of-Sale when Keysight was created. But maybe they produced replacment PCBs.

/Sven

 Reply

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Mark Bielman ([/g/HP-Agilent-Keysight-equipment/profile/502679](https://groups.io/g/HP-Agilent-Keysight-equipment/profile/502679))Oct 6  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/130026>)

Tony,

The part of the video you want is close to the end. (at 1:49:40)  
As Sven said, only applies to the older board. In fact, the CLIP (at least the one I have) does not cover the newer board at all.

Mark

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 Reply

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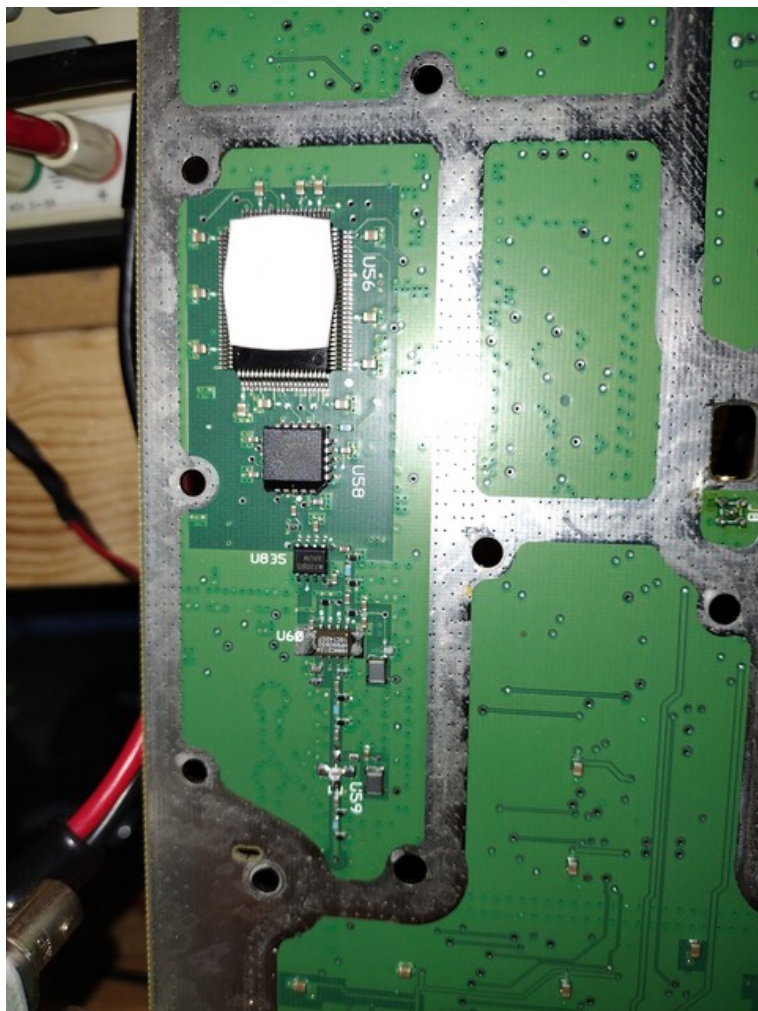
 More



Tony G1HMO

Oct 6 <https://groups.io/g/HP-Agilent-Keysight-equipment/message/130027>

I watched the video again, and I can see the IC in question is on the back of the PCB, so I need to remove it fully from the chassis to check. Board removed, and I can see it is the same devices as the Clip I had from Artek, here is a photo of the divider section on the back of the PCB.



The fact that several people have had this IC go faulty and show similar symptoms, I am going to try and get hold of one and replace it. Mark, when you removed your IC did you use hot air? I'd like to keep the IC if I can get it off without damage just in case the replacement doesn't fix it at least I'd have it as a spare just in case. Normally, I'd use a scalpel blade to slice the IC legs off at the body of the device, then remove each leg using wick and a fine iron, but doing it that way would destroy the IC obviously.

Tony.

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Hans Eriksen

Oct 6 <https://groups.io/g/HP-Agilent-Keysight-equipment/message/130028>

Look at the HMC365S8GE from Analog devices

Do take care when removing the old chip as it has an exposed pad underneath I removed mine with hot air rework and a hotplate below to pre heat the board

Best regards  
Hans Eriksen

Den fredag den 7. oktober 2022 kl. 05.54.00 CEST skrev Tony G1HMO <tonyg1hmo@gmail.com>:

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Tony.

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Tony G1HMO

1:28am <https://groups.io/g/HP-Agilent-Keysight-equipment/message/130030>

Hi Hans,

Well I don't have a hot plate unfortunately, I may just end up slicing the IC legs off and doing it that way, I would hate to damage the actual PCB by overheating it and causing any de-lamination between the internal layers. I am fine taking normal SMD IC's off with hot air, but never done any IC's with a thermal pad on, so I can imagine that they require vast amounts of heat. I've ordered a replacement device, hopefully it'll actually arrive from Mouser and not be affected by the worldwide chip shortage, they are showing as in stock so we'll see.

Tony.

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Michael Kellett

1:59am <https://groups.io/g/HP-Agilent-Keysight-equipment/message/130031>

I've found the best way to remove chips like this is to apply hot air to the bottom of the board and get the top side up to 100 - 120 C near the chip (measured by cheap IR thermometer). (By top side I mean the side the chip you are removing is on.) Unless you get the whole board pretty hot it's almost impossible to get the under chip pad hot enough to flow the solder - especially if it's soldered to a ground plane. Heat the board up slowly because you don't want the bottom side to get too hot. Then use hot air gun (ideally with a nozzle shaped to suit the chip) to heat up the chip. I had to change some chips on a board worth several £k so I splashed out £500 on a Metcal PCT-100-21 with a fancy frame to hold the board. Its £346 from Farenll/Newark without the frame. Saved the board and has been used several times since so I don't regret the money.

MK

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Tony G1HMO

3:03am (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/130032>)

I can borrow a 853B+ rework station from my friend,

<https://www.circuitspecialists.eu/csi-853b-digital-preheater-station-with-hot-air-rework-option> (<https://www.circuitspecialists.eu/csi-853b-digital-preheater-station-with-hot-air-rework-option>)

I have just him remove several IC's using that, it uses a ceramic heater to heat the back of the PCB, he says he has used it to change components on mobile phones and laptops with great success.

What temp do I need to get the back of the PCB up to?, I think my friend set the lower heat to 150 and the hot air to 380 degrees C and the ceramic heater to 150 degrees C and he seemed to easily remove SO8 devices from a scrap pcb earlier would those temps seem about right?

Tony.

Reply

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hardyhansendk

3:56am (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/130033>)

Tony et al.

I have done this several times with E4402B and there were no thermal pad to consider at all-and all were atest boards.I would simply desolder without considering reuse.

Regards

Hardy

**Fra:** HP-Agilent-Keysight-equipment@groups.io [mailto:HP-Agilent-Keysight-equipment@groups.io] **På vegne af** Tony G1HMO

**Sendt:** 7. oktober 2022 12:03

**Til:** HP-Agilent-Keysight-equipment@groups.io

**Emne:** Re: [HP-Agilent-Keysight-equipment] E4402B RF Section CLIP required

I can borrow a 853B+ rework station from my friend,

<https://www.circuitspecialists.eu/csi-853b-digital-preheater-station-with-hot-air-rework-option> (<https://www.circuitspecialists.eu/csi-853b-digital-preheater-station-with-hot-air-rework-option>)

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Tony.



([http://www.avg.com/email-signature?utm\\_medium=email&utm\\_source=link&utm\\_campaign=sig-email&utm\\_content=emailclient](http://www.avg.com/email-signature?utm_medium=email&utm_source=link&utm_campaign=sig-email&utm_content=emailclient))

Virusfri.[www.avg.com](http://www.avg.com) ([http://www.avg.com/email-signature?utm\\_medium=email&utm\\_source=link&utm\\_campaign=sig-email&utm\\_content=emailclient](http://www.avg.com/email-signature?utm_medium=email&utm_source=link&utm_campaign=sig-email&utm_content=emailclient))

Reply

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Tony G1HMO

4:38am (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/130034>)

Hi Hardy,

I'll give it a go, just had the email from Mouser to say the device I ordered earlier has been dispatched, so fingers (and toes!) crossed that will be the issue and replacing the IC will get me back up and running.

Tony.

Reply

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Ken Eckert (/g/HP-Agilent-Keysight-equipment/profile/1866426)

7:15am [🔗 \(https://groups.io/g/HP-Agilent-Keysight-equipment/message/130035\)](https://groups.io/g/HP-Agilent-Keysight-equipment/message/130035)

It depends on how big of a ground plane that pad is connecting to.

You could take a regular iron you would use for clothing flip it upside down set and measure the temp and use that to preload the board with some heat. Or if you have a flat cooktop on your stove you could do the same thing. (Barring any evil glances from one's better half! :) )

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hardyhansendk

7:24am [🔗 \(https://groups.io/g/HP-Agilent-Keysight-equipment/message/130036\)](https://groups.io/g/HP-Agilent-Keysight-equipment/message/130036)

Tony  
Most ESA with lock problems only shows it with higher center frequency.  
Hardy

**Fra:** HP-Agilent-Keysight-equipment@groups.io [mailto:HP-Agilent-Keysight-equipment@groups.io] **På vegne af** Tony G1HMO  
**Sendt:** 7. oktober 2022 13:38  
**Til:** HP-Agilent-Keysight-equipment@groups.io  
**Emne:** Re: [HP-Agilent-Keysight-equipment] E4402B RF Section CLIP required

Hi Hardy,

I'll give it a go, just had the email from Mouser to say the device I ordered earlier has been dispatched, so fingers (and toes!) crossed that will be the issue and replacing the IC will get me back up and running.

Tony.



[http://www.avg.com/email-signature?utm\\_medium=email&utm\\_source=link&utm\\_campaign=sig-email&utm\\_content=emailclient](http://www.avg.com/email-signature?utm_medium=email&utm_source=link&utm_campaign=sig-email&utm_content=emailclient)

Virusfri.[www.avg.com](http://www.avg.com) ([http://www.avg.com/email-signature?utm\\_medium=email&utm\\_source=link&utm\\_campaign=sig-email&utm\\_content=emailclient](http://www.avg.com/email-signature?utm_medium=email&utm_source=link&utm_campaign=sig-email&utm_content=emailclient))

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Mark Bielman (/g/HP-Agilent-Keysight-equipment/profile/502679)

7:28am [🔗 \(https://groups.io/g/HP-Agilent-Keysight-equipment/message/130037\)](https://groups.io/g/HP-Agilent-Keysight-equipment/message/130037)

Yes, I used hot air for both removal and application (with solder paste).  
Don't forget to remove pins 2 & 6!

I was also concerned about the supply rail being too high. (6V?) To be safe, I removed the ferrite and replaced with a diode for a 0.6V voltage drop.

Mark

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hardyhansendk

7:40am [🔗 \(https://groups.io/g/HP-Agilent-Keysight-equipment/message/130038\)](https://groups.io/g/HP-Agilent-Keysight-equipment/message/130038)

Hi Mark

Do you think the too high supply cause the problem?..please could you give a scratch of your solution.

Regards

Hardy

**Fra:** HP-Agilent-Keysight-equipment@groups.io [mailto:HP-Agilent-Keysight-equipment@groups.io] **På vegne af** Mark Bielman

**Sendt:** 7. oktober 2022 16:29

**Til:** HP-Agilent-Keysight-equipment@groups.io

**Emne:** Re: [HP-Agilent-Keysight-equipment] E4402B RF Section CLIP required

Yes, I used hot air for both removal and application (with solder paste).

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Mark



(http://www.avg.com/email-signature?utm\_medium=email&utm\_source=link&utm\_campaign=sig-email&utm\_content=emailclient)

Virusfri.www.avg.com (http://www.avg.com/email-signature?utm\_medium=email&utm\_source=link&utm\_campaign=sig-email&utm\_content=emailclient)

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Mark Bielman (/g/HP-Agilent-Keysight-equipment/profile/502679)

7:56am [🔗 \(https://groups.io/g/HP-Agilent-Keysight-equipment/message/130039\)](https://groups.io/g/HP-Agilent-Keysight-equipment/message/130039)

Hardy,

No. I'm sure the original part was intended to use 6V but the replacement part is 5V.

Shahriar did NOT add the diode and as far as I know, this has not been a problem for him.

Mark

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John Annison (/g/HP-Agilent-Keysight-equipment/profile/1777617)

10:53am [🔗 \(https://groups.io/g/HP-Agilent-Keysight-equipment/message/130040\)](https://groups.io/g/HP-Agilent-Keysight-equipment/message/130040)

I have repaired 3 units with the problem. So far the 5 volt rating has not been a problem.

As far as removal.....cut the leads off the old part, twist off the part (it is soldered to the ground plane as a heat sink).

When installing I used a little low temperature solder on the heat sink area first which helps the regular solder flow quickly. This way you do not overheat the whole board, and as pointed out....remove pins 2 & 6.

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← (https://groups.io/g/HP-Agilent-Keysight-equipment/topic/94136867?p=%2C%2C%2C20%2C0%2C0%2C0%3A%3A%2C%2C%2C0%2C0%2C0%2C94136867)





