Application Notes

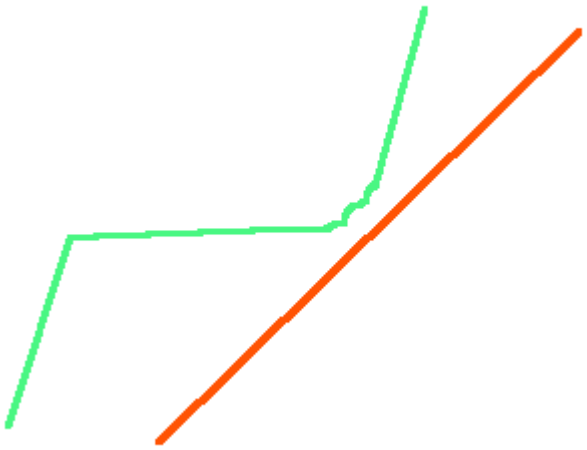
Application Note 126

Interpreting ASA fault locator results

Fault findingPCBs requires detective work and skill, ASA or Nodal impedance faultfinding can give you clues to point you in the direction of the fault.

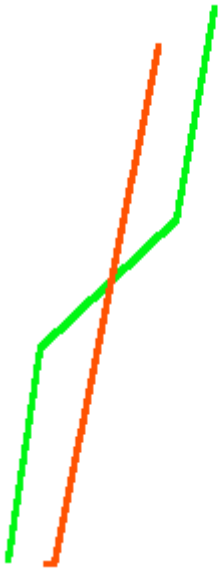
When fault finding you need to interpret fault locator results with care. Nodal impedance test or ASA will show you ALL the differences between good and faulty boards, your skill and experience is required to interpret those results and locate the fault with minimum effort..

Its important to note that a FAIL means the signatures are not the same, this means you need to look at the signature and decide if it needs further investigation or whether it can be ignored.



Test the whole board, once you have tested all the components run down the list and have a look at those where the comparison fails - You need to ask yourself:

- Is this board the same revision as the known good board?
- Is the difference caused by an IC from a different vendor ? (see also AP101)
- Are all switches and variable resistors in the same position as the known good board?
- Only once you are sure of the answers to the above questions should you suspect a faulty component and search further.
- Remember also that an ASA tester sees the impedance of each device attached to each pin of the device under test. - Look for other components with similar fault signatures - they are possibly on the same net.



Signatures showing differences such as in the example above are typical of faults,

- Look for an absence of sharp curves that signify protection diodes are damaged.
- Also look for Fail results that are vertical lines (shorts)
- Horizontal lines (opens)
- The first time you look through the list of "fail" results ignore the small differences look for the obvious faults such as listed above first.

The example on the right shows a Gallium arsenide FET in a GSM phone base station the trace in red is the same device with static damage

Where should you look first?
If you are in a service department where the boards you are repairing have already worked, then its always a good idea to look for faults on edge connectors or power supplies. Also check that socketed components have all their pins correctly plugged in.

If you are in manufacturing and the board has never functioned, then you should look for missing, reversed, or short circuited components. Always remember that some components are not tested by ATE, - are all pins present in an edge connector? Did the test programmer comment out some tests on the in circuit tester to speed up throughput? Were some areas untested because access was not possible on a fixture?

Never rule out the unexpected...
Have you found faults like this? - these are all examples that our customers have told us about.

- The good board was faulty
- A whole batch of boards populated with 1K resistors instead of 0.1u caps
- Why? A well meaning operator ran out of caps and changed the bar code label from the empty reel to a reel of resistors so the placement machine would accept it.
- A chip resistor is accidentally trapped and soldered under a QFP - invisible to a vision system
- A board that has worked for 6 months has a broken turned pin socket making a connection that only lasted until surface corrosion made the joint open circuit
- Do you have an example to share?

Remember "Pass" means the signatures are a similar shape, "Fail" does not mean the component is faulty, if the comparison fails you need to use your skill to find out why!

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