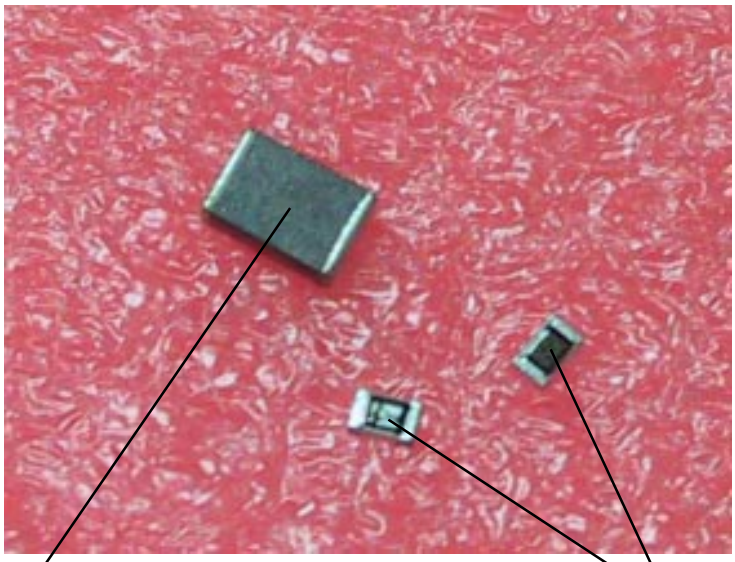
Motherboard Fix

11/20/01 - MrAthlon

Please be careful with your motherboard, as it is possible to damage or destroy it in the process of attempting this fix. This document is supplied as-is with no warranty and can be freely distributed if unmodified.

1) You will need some tools: Get a fine tip soldering iron, some fine rosin core solder and very fine needle nose pliers or tweezers. I also recommend some stong reading glasses to see the tiny parts better.



2) Then you'll need some parts: Get a surface mount ferrite bead or small inductor, and one or two surface mount resistors.

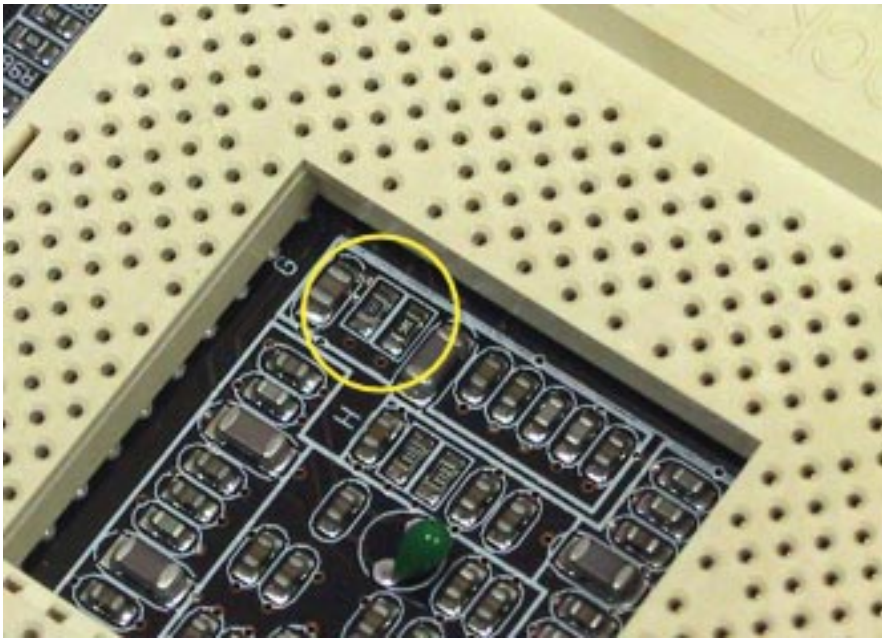
The resistor value should either be 40-45 Ohms (to replace the existing resistor), or 120-200 Ohms (to be placed in parallel with the existing 56 Ohm resistor on the board). Check Radio Shack for parts.

Ferrite Bead

Such as TDK part number HF50ACC453215-T
See http://www.tdk.co.jp/tefe02/e9413_ACC.pdf
Almost any Ferrite bead or RF choke will work.

Resistors

120-200 Ohms should work. ***200 Ohm resistors are recommened for maximum compatibility.***



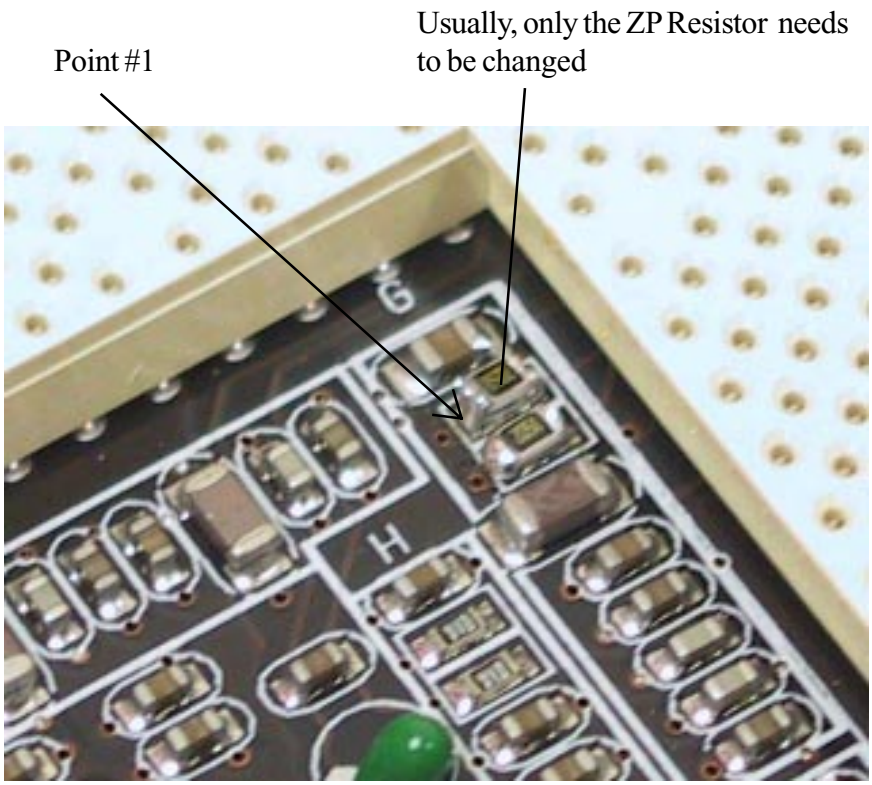
3) Find the two impedance control resistors. They are side by side, right inside the CPU socket, as shown circled in yellow.

4) Resistors marked “59X” are actually 40 Ohms. If presesnt, these do not need to be changed.

If you have resistor(s) marked 560, very carefully solder your resistors on. (See tips below) It is easier to add a 120-200 Ohm resistor on top, as shown. (Normally only the top “ZP” resistor will be 560.)

If you are using 40-45 Ohm resistors, remove the existing resistor(s), then attach yours.

(You can also attach on the CPU socket if you can’t solder in this small area. Download the Athlon Processor Model 4 Datasheet and turn to page 47. Solder your resistor between pin AE 5 and any pin marked VSS.)

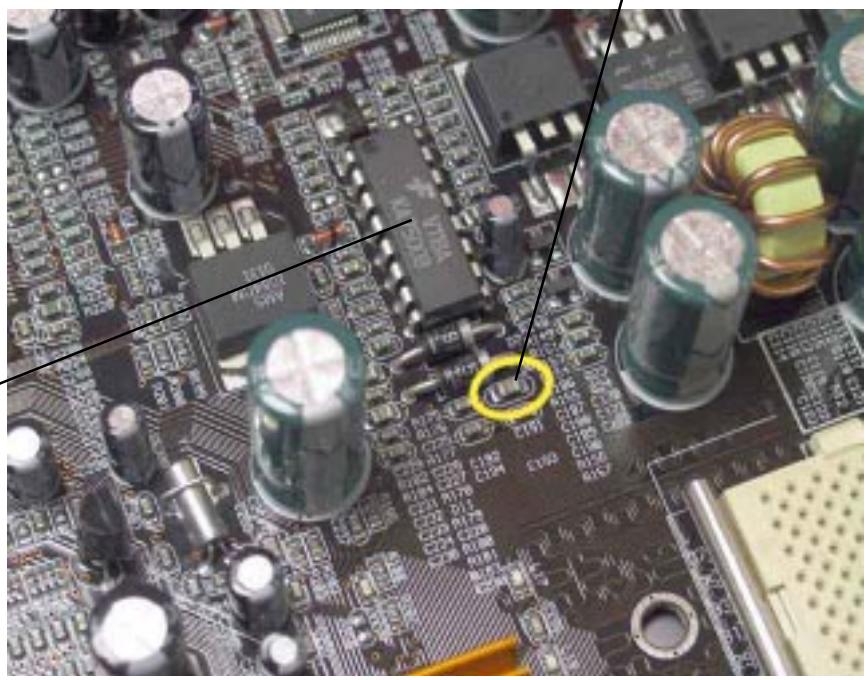


Soldering Tips:

1) Practice soldering a few resistors on a scrap board before trying to solder on your motherboard.
2) Use a small (15W) soldering iron.
3) Keep the soldering iron tip clean with a damp sponge and fresh solder.
4) Point #1 is the hardest to solder because of the copper ground trace around it. Hold the Iron on this point with a drop of solder until it melts into the existing solder on the board.
5) Use the soldering Iron and a bit of fresh solder to make a “point” of solder on each end of each resistor on the motherboard. This will make it easier to add the new resistor on top because there will already be some solder ready to attach.

In most cases, this completes the "fix." But, if you notice continued errors, or other strange problems, you may want to reduce the motherboard noise:

This capacitor allows noise to pass from the switching power supply (on the motherboard) into the 12V power line.

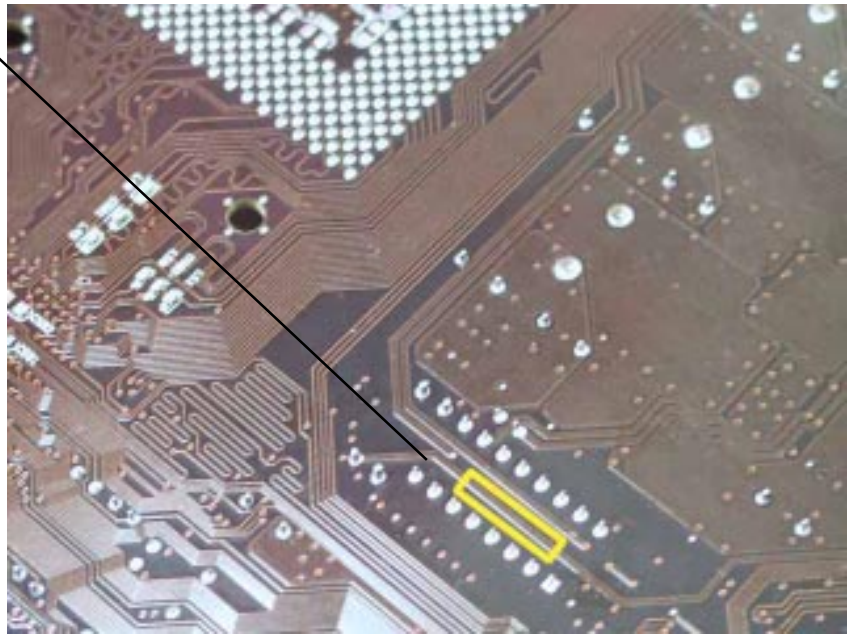


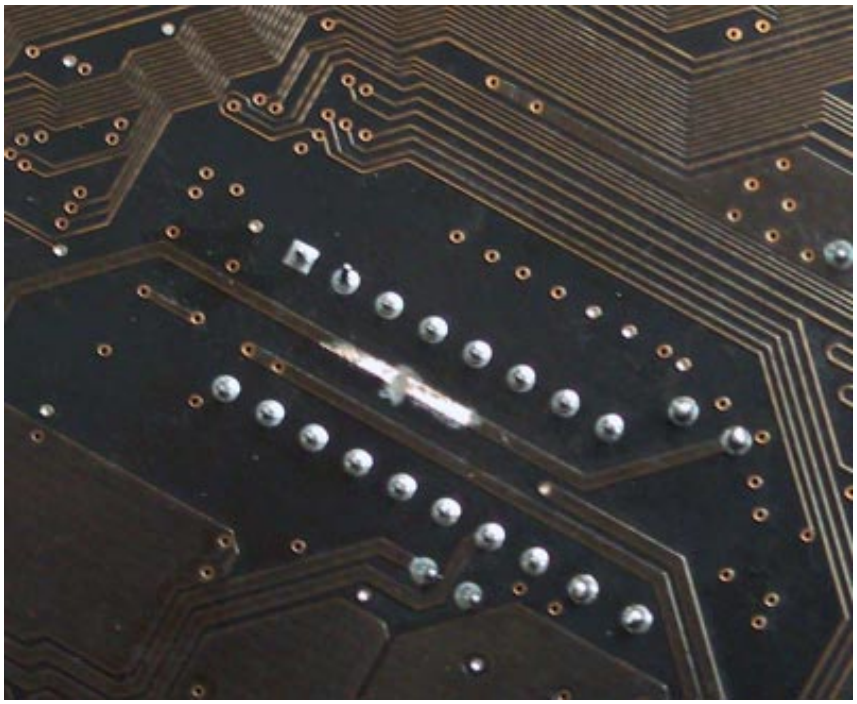
PWM chip

Under PWM chip

To fix this, you need to add a ferrite bead or small inductor.

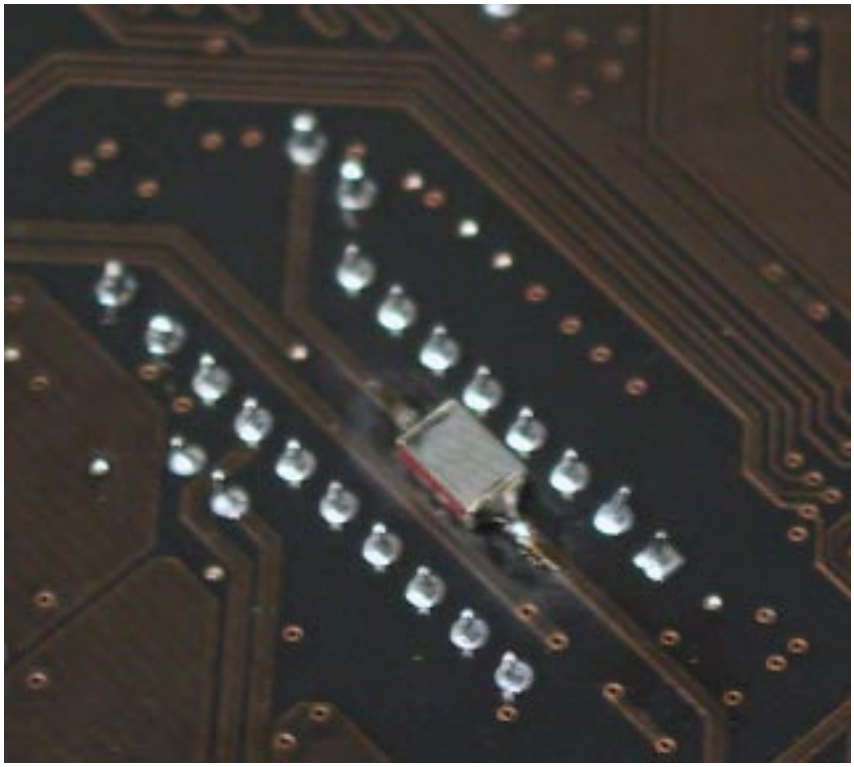
The easiest place to put the ferrite bead is in the middle of a trace on the back of the board, right under the PWM controller chip as shown.





5) The trace on the back must be cleaned and broken as shown. Use a “Dremel” or other grinding tool to make a break in the trace and then clear off the soldermask to expose some copper on each side.

Don’t cut too deep -- there are other traces inside the board.



6) Then, install the ferrite bead across the broken trace. Make sure your solder does not touch any other pins, and make sure you have good contact.

I used a pretty large (high current) ferrite bead here. Much smaller ones should work fine as well.