Instructions for checking overvoltage damage

Last modified: January 3, 2024

Contents

Introduction

Before you begin working on the RouterBOARD for your safety please make sure:

- The RouterBOARD is unplugged from the mains outlet.
- To discharge yourself from static electricity by touching a grounded metal surface or by wearing an antistatic wrist strap.
- After unplugging the RouterBOARD, to leave it for at least 15 minutes to allow all the power supply capacitors to discharge (This only applies to boards with built-in power supplies).
- To not touch the internal power supplies (danger of electrical shock)!

INSTRUCTIONS FOR CHECKING OVERVOLTAGE DAMAGE

Over-voltage can be caused by the following reasons: high voltage surge, lightning, electrostatics etc..

You can check if RouterBoard was damaged by over-voltage, by using the following testing methods:

Check Schottky diode

Schottky diode quality can be measured with digital multimeter in diode mode.

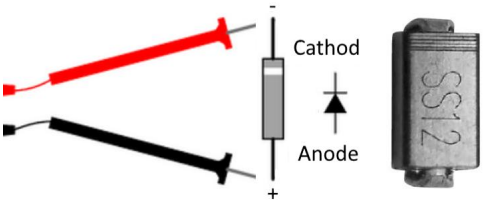
The diode has two terminals - the anode and the cathode. The anode is positive, and the cathode is negative (there is a strip on the diode case), see picture 2.

The diode needs to be checked in reverse switching, when a negative voltage is applied to the anode (multimeter black probe, “COM” probe), and a positive voltage is applied to the cathode (multimeter red probe, positive probe), see picture 2.

When the test probes are connected as shown in the picture 2, then value of measurement should be Open loop, as shown in the picture 1. This indicates that the p-n junction is normal and the current does not flow in the opposite direction.

If Schottky diode will be damaged, measurement will show some other value.

Picture 1

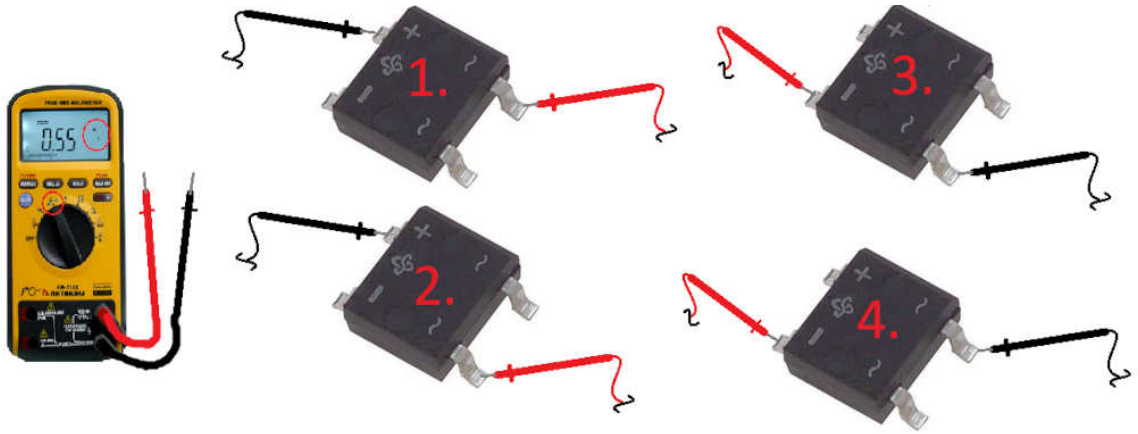


Picture 2

Diode bridge measurement

This measurement is required only in cases where basic test gives uncertain results. This includes readings greater than 1V instead of OL or fluctuating readings.

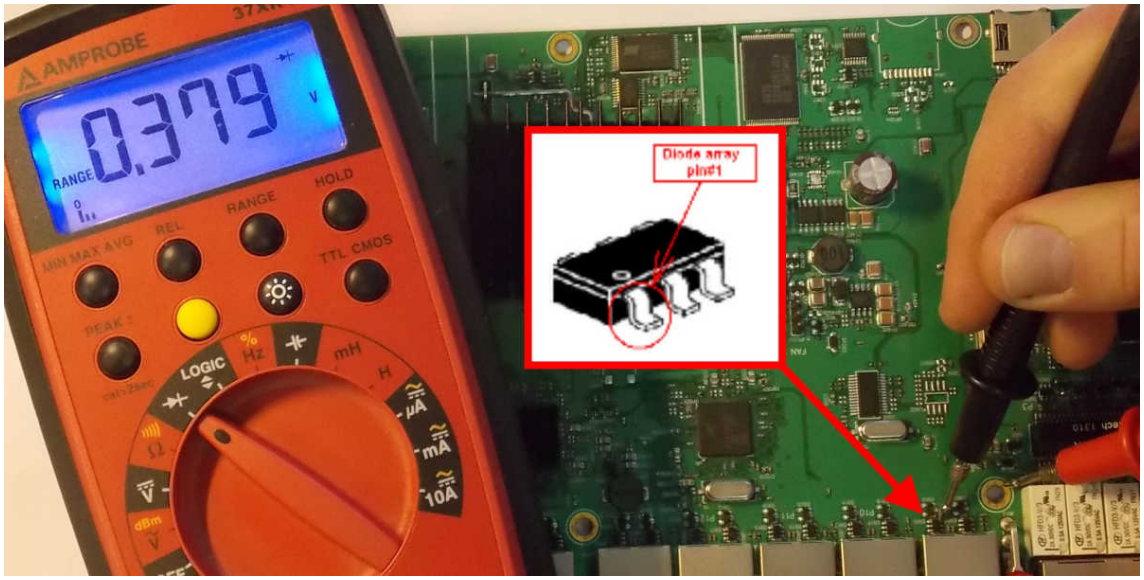
In such cases making sure that each of the bridge diodes have healthy forward voltage (0,45..0,65V) can confirm that there is no damage. In addition, the voltages obtained should not differ significantly (no more than 5%) from each other. This can be done in 4 measurements, by connecting the multi-meter as show in the following picture 3:



Picture 3

Check voltage drop value between diode array pin#1 and Ground

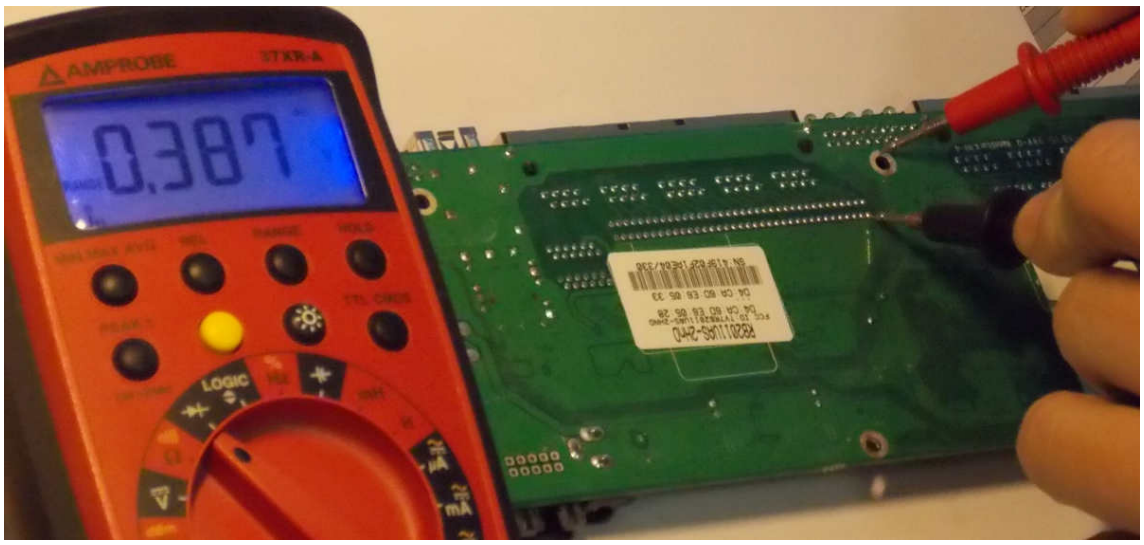
You should measure in diode mode: hold red probe on the Ground and black probe to diode array pin#1. Diode array pin#1 is always marked by dot mark on the diode array case, see picture 4.



Picture 4

Check voltage drop value between Ethernet transformer pins and Ground

You should measure in diode mode: hold red probe on the Ground and black probe to Ethernet transformer pins. In the picture 5 you can see an example of how to correctly measure.



Picture 5

Check termination resistors resistance in RJ-45 connector

For this measurement you should take patch cord and plug it into the routerboard, see picture 6. After that measure resistance of termination resistors by digital multimeter.

Resistance value between Rx and Tx line must be 150 Ohm +/-4

If resistance value is smaller or higher then Tx/Rx line was damaged by high voltage surge.

Picture 6

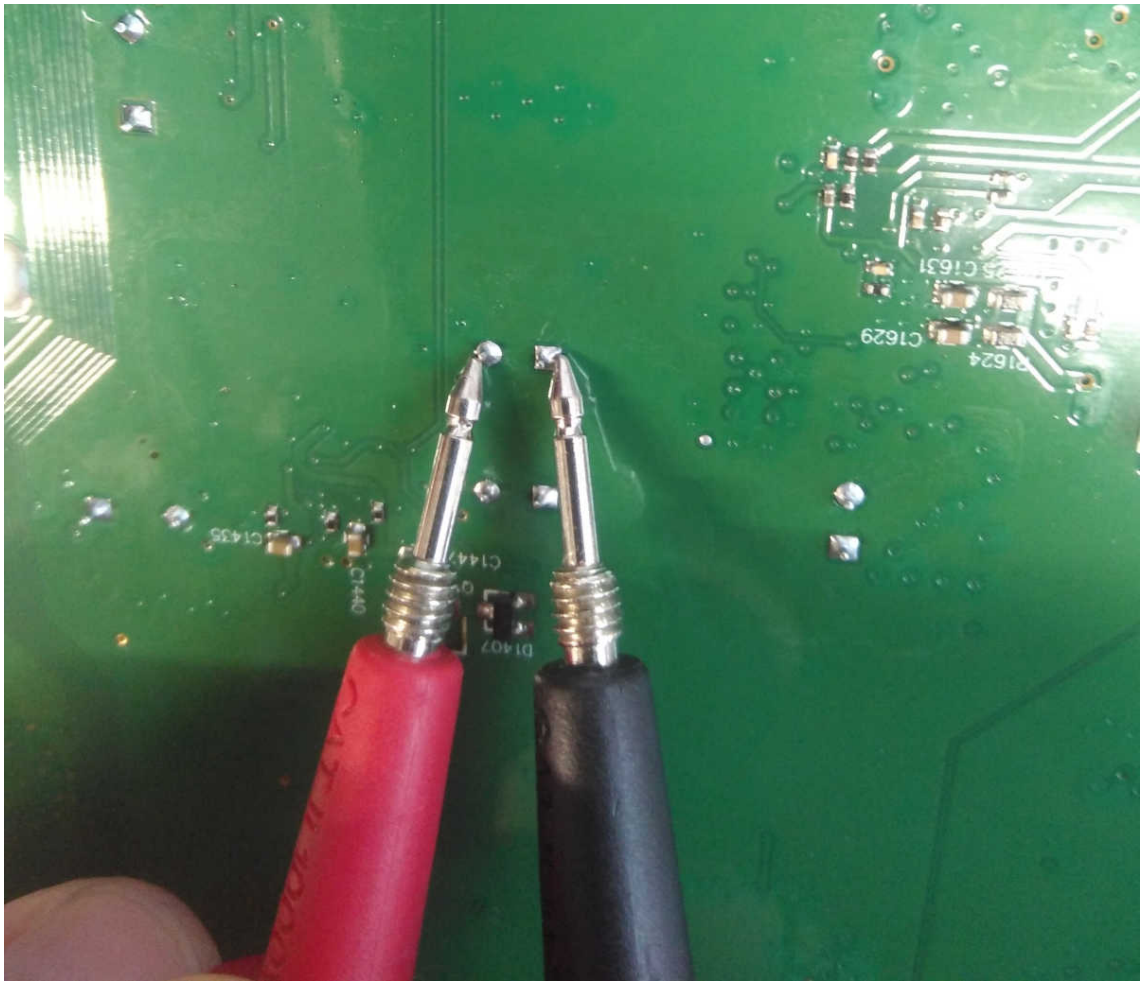
Check resistance on transformer in RJ-45 connector

For this measurement you should take patch cord and plug it into the routerboard, see picture 7. After that measure resistance with digital multimeter. Resistance value for each twisted pair must be smaller than 5 Ohm. If resistance is higher that means line was damaged by high voltage surge.

Picture 7

Fuse check

For this measurement you use your multimeter in resistance mode, if you do not have multimeter with auto range function use lowest resistance setting typically 200 Ohms. With both probes touch the selected fuse leads. Fuse is OK if the multimeter shows very low value (less than 1 Ohm). A display showing OL is a sign of damaged fuse.



Picture 8

PRODUCTS THAT DO NOT HAVE OVERVOLTAGE INSTRUCTIONS

Some low-cost or high-voltage products may not come with overvoltage instructions. These products are listed here:

- MTP250-26V94-OD, MTP250-53V47-OD
- GESP, GESP+POE-IN
- TG-BT5-IN, TG-BT5-OUT
- RBGPOE
- MQS

CLOUD ROUTER SWITCH 100 SERIES ROUTERBOARDS

FiberBox (CRS105-5S-FB)

Picture 9

Disassembling information

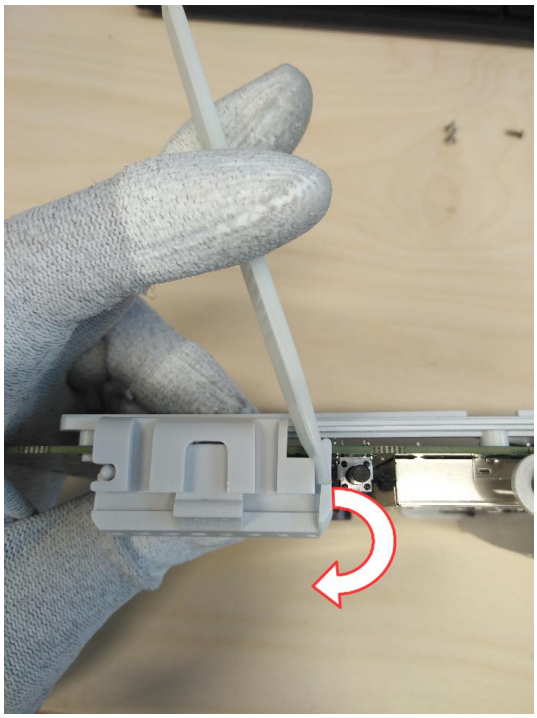
Step 1: Unscrew 3 mounting screws using screwdriver. Location of screws you can see in the picture 10.

Picture 10

Step 2: Gently pull cover the direction arrows are pointing in the following picture 11.

Picture 11

Step 3: To remove LEDs cover make a movement as shown in the following picture 12.

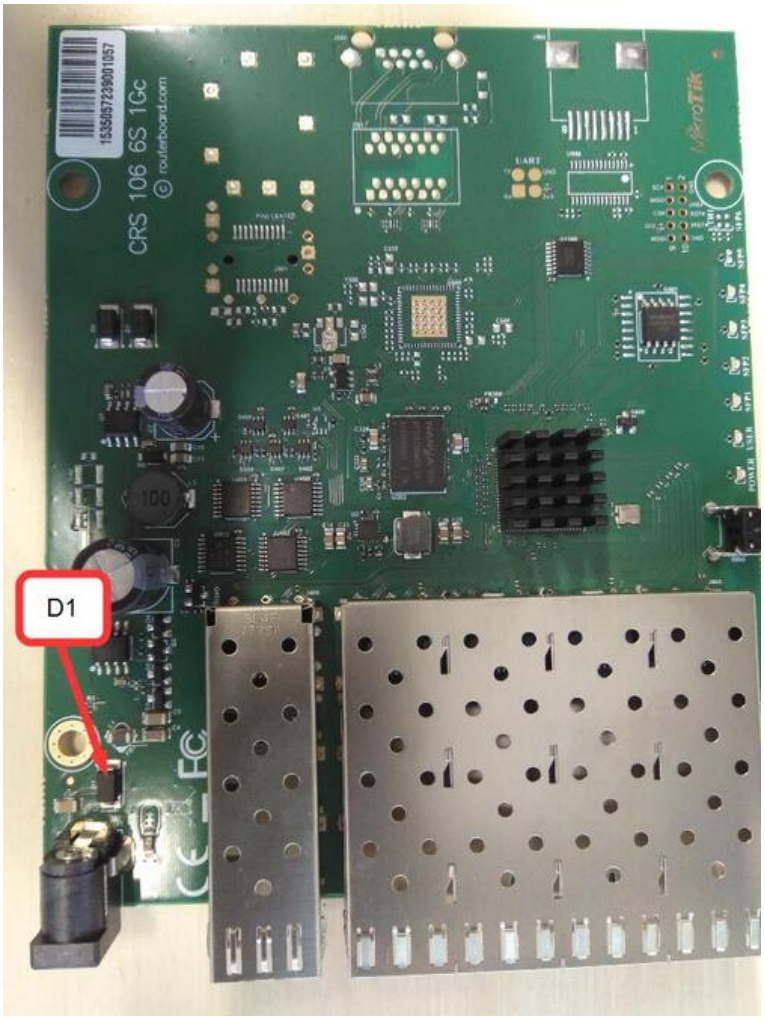


Picture 12

Instructions for checking overvoltage

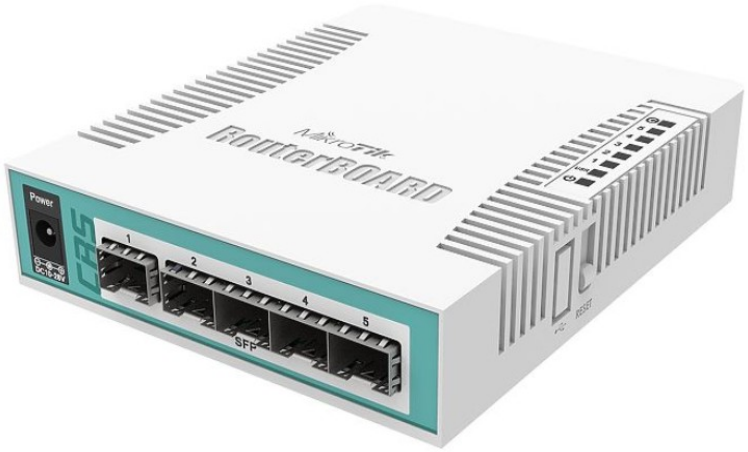
Checking Schottky diode

Check Schottky diode D1. Location of diodes on the board you can see in the picture 13. Schottky diodes quality measurement method is described on page 12.



Picture 13

CRS106-1C-5S



Picture 14

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page 43.

Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D1, D3. Location of diodes on the board you can see in the picture 15. Schottky diodes quality measurement method is described on page 12.

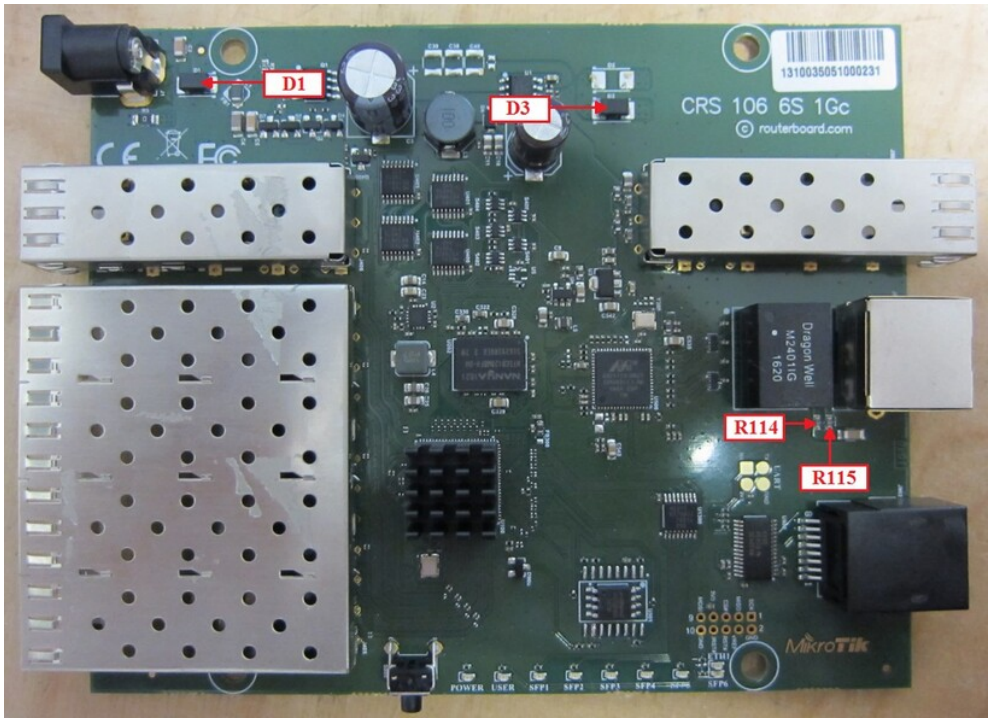
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 16.

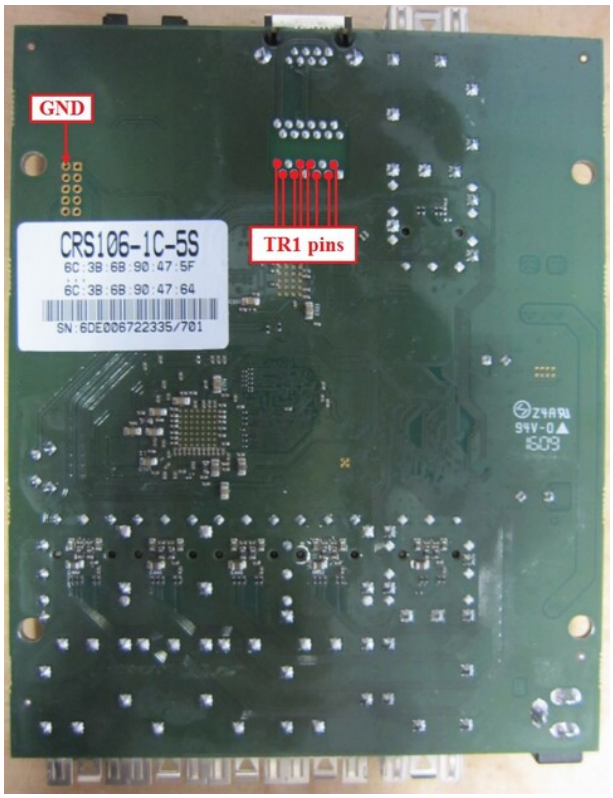
Voltage drop value should be in the range from 0,32V to 0,36V. Voltage drop measurement method is described on page 15.

Checking 75 Ohm termination resistors resistance

Check resistors R114, R115 resistance value. It should be 75 Ohm +/-1%. Location of resistors on the board you can see in the picture 15.



Picture 15



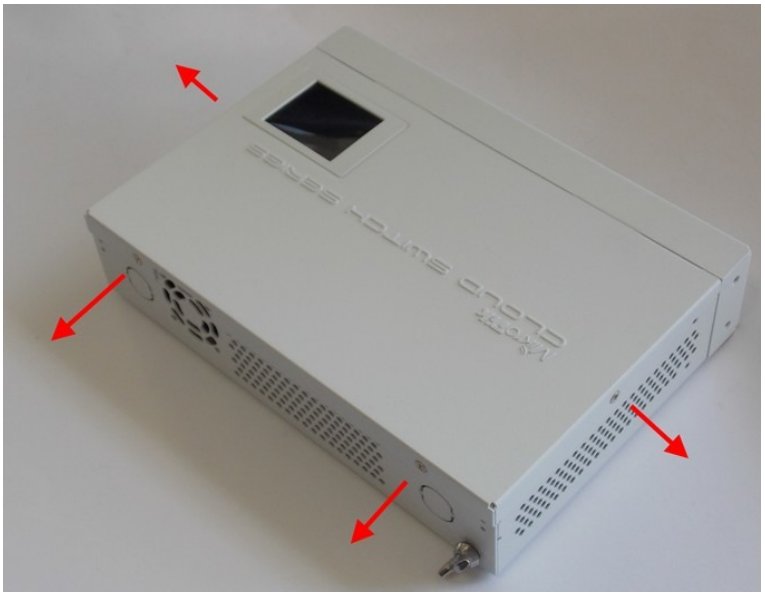
Picture 16

CRS109-8G-1S-2HnD-IN

Picture 17

Disassembling information

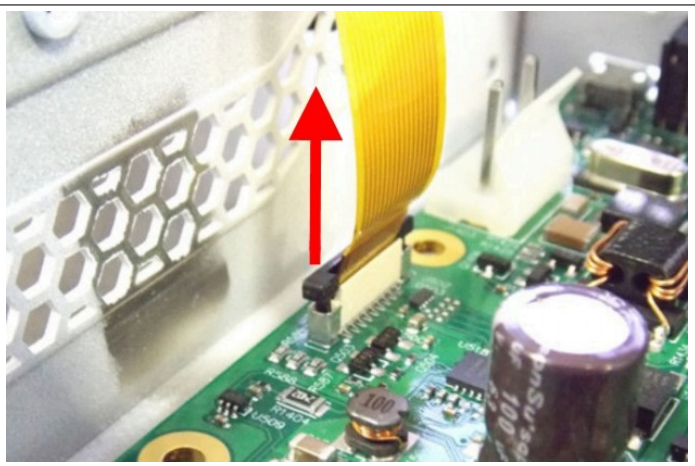
Step 1: Unscrew 4 screws using PH2 screwdriver. Location of screws you can see in the picture 18.



Picture 18

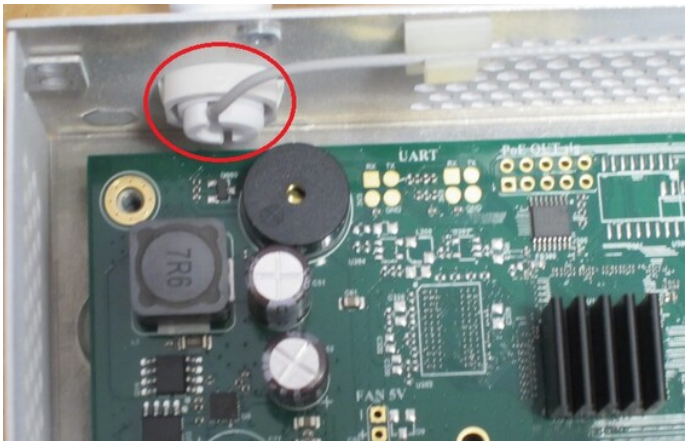
Step 2: Carefully take off the cover. Do not damage the LCD flex cable.

Step 3: Gently lift the latch vertically upward and take out LCD flex cable from FPC connector as showed in the picture 19. Do not damage the FPC connector locking drawer.



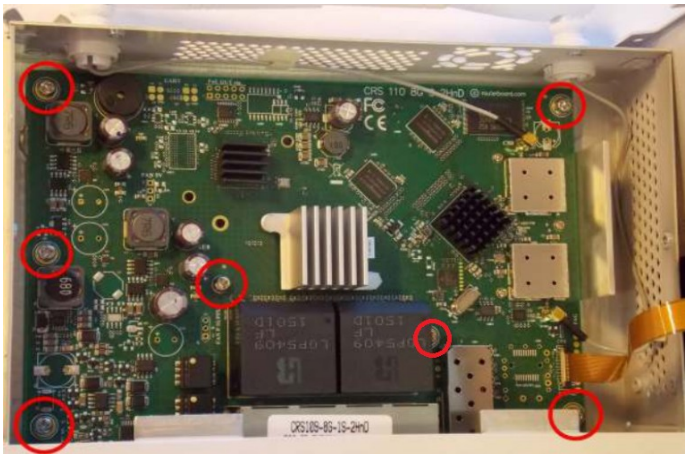
Picture 19

Step 4: Move both antenna cables into a special holes as showed in the picture 20.



Picture 20

Step 5: Unscrew 7 screws which fasten PCB to the case. Location of the screws you can see in the picture 21.



Picture 21

Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D2, D3, D5, D11, D16, D17. Location of diodes on the board you can see in the picture 22. Schottky diodes quality measurement method is described on page 12.

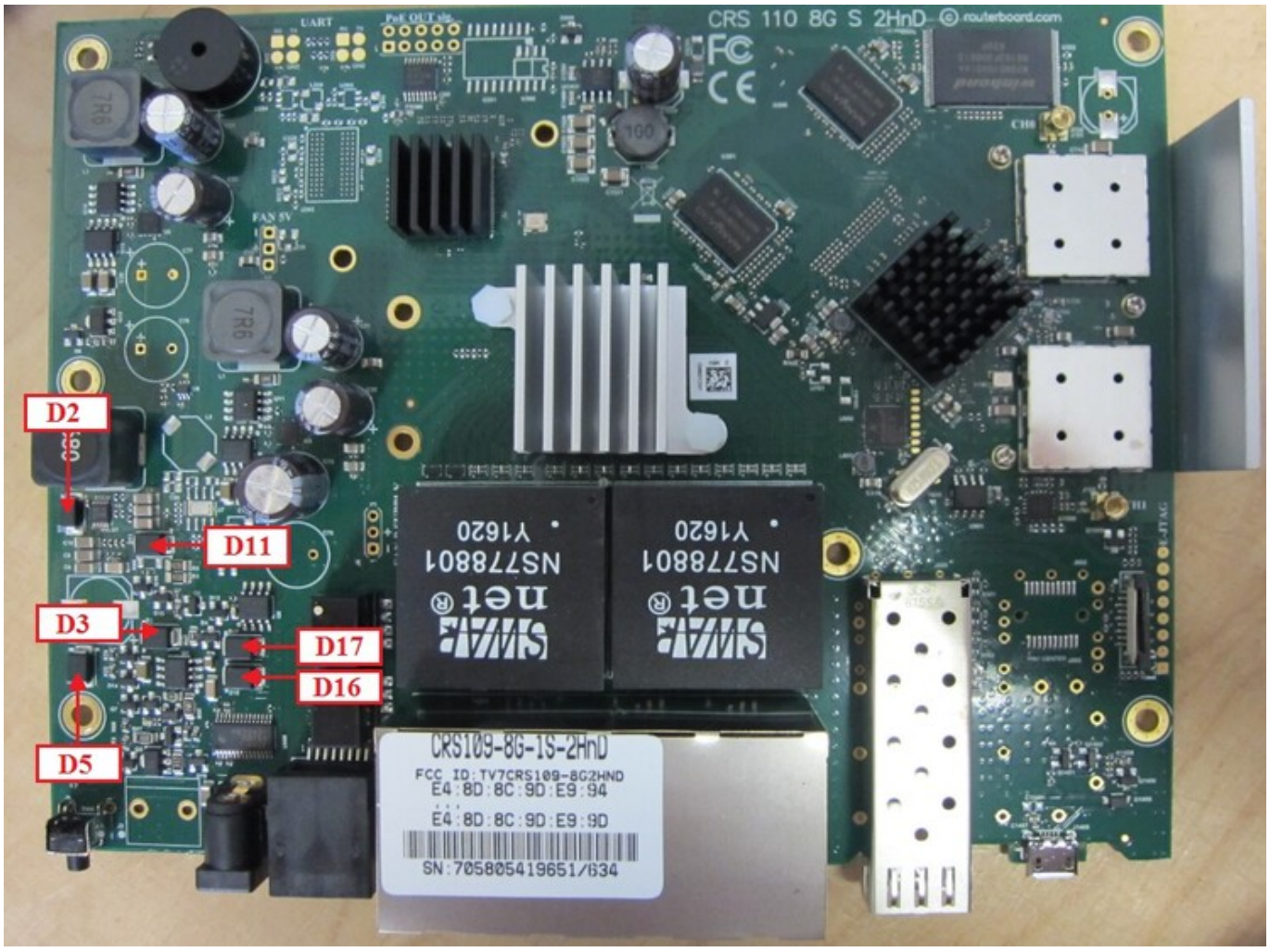
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1200, TR1201 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 23.

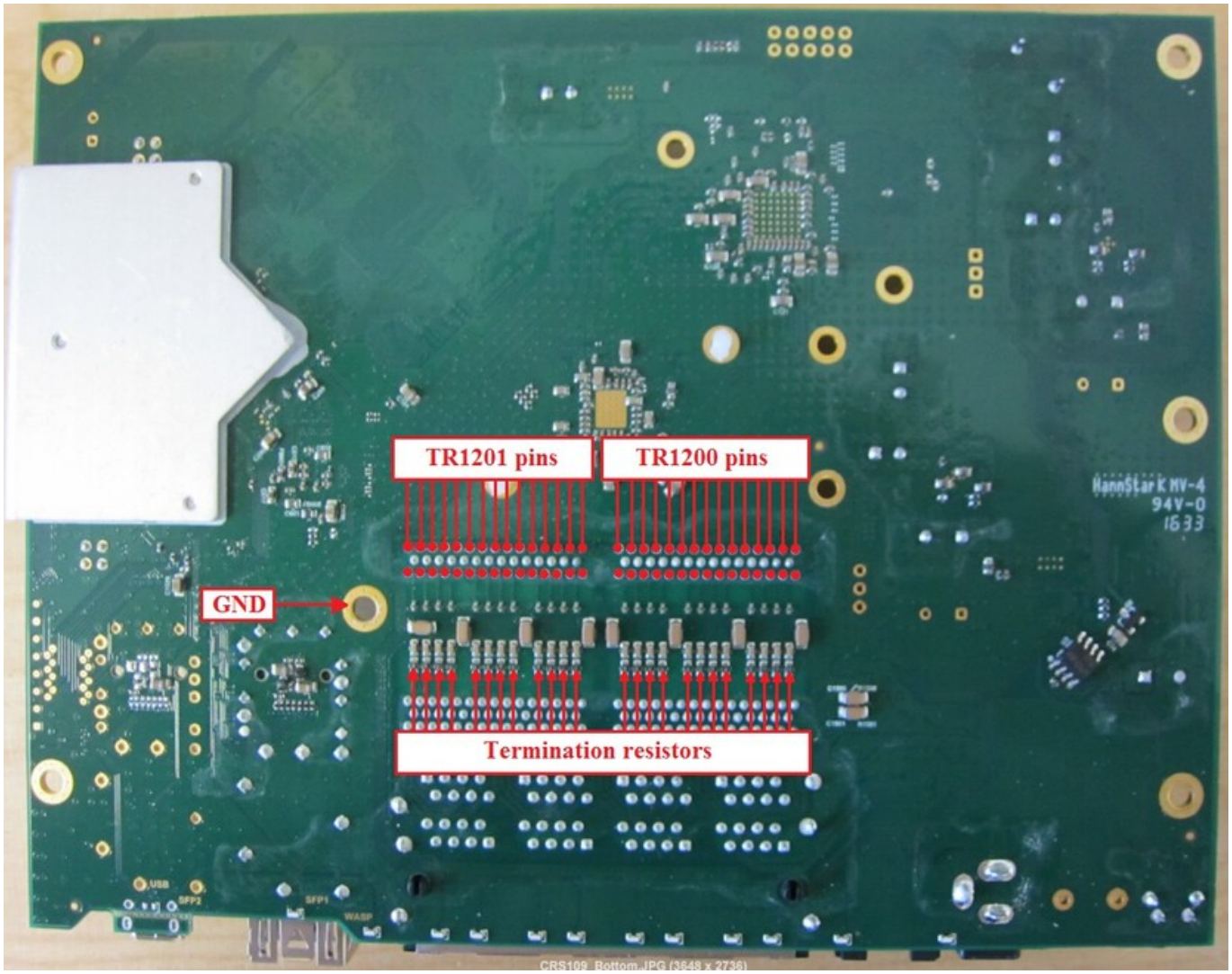
Voltage drop value should be in the range from 0,4V to 0,43V. Voltage drop measurement method is described on page 15.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm +/-1%. Location of resistors on the board you can see in the picture 23.



Picture 22



Picture 23

CRS112-8G-4S-IN

Picture 24

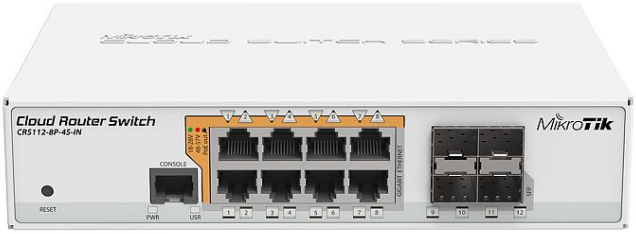
Disassembling information

Disassembly method of the board is the same as the CRS109-8G-1S-2HnD-IN board. Disassembly method is described on page 27.

Instructions for checking overvoltage

Over-voltage testing procedure, the layout of the components on the board and measurement values is the same as for CRS109-8G board, see on page 29.

CRS112-8P-4S-IN



Picture 25

Disassembling information

Disassembly method of the board is the same as the CRS109-8G-1S-2HnD-IN board. Disassembly method is described on page 27.

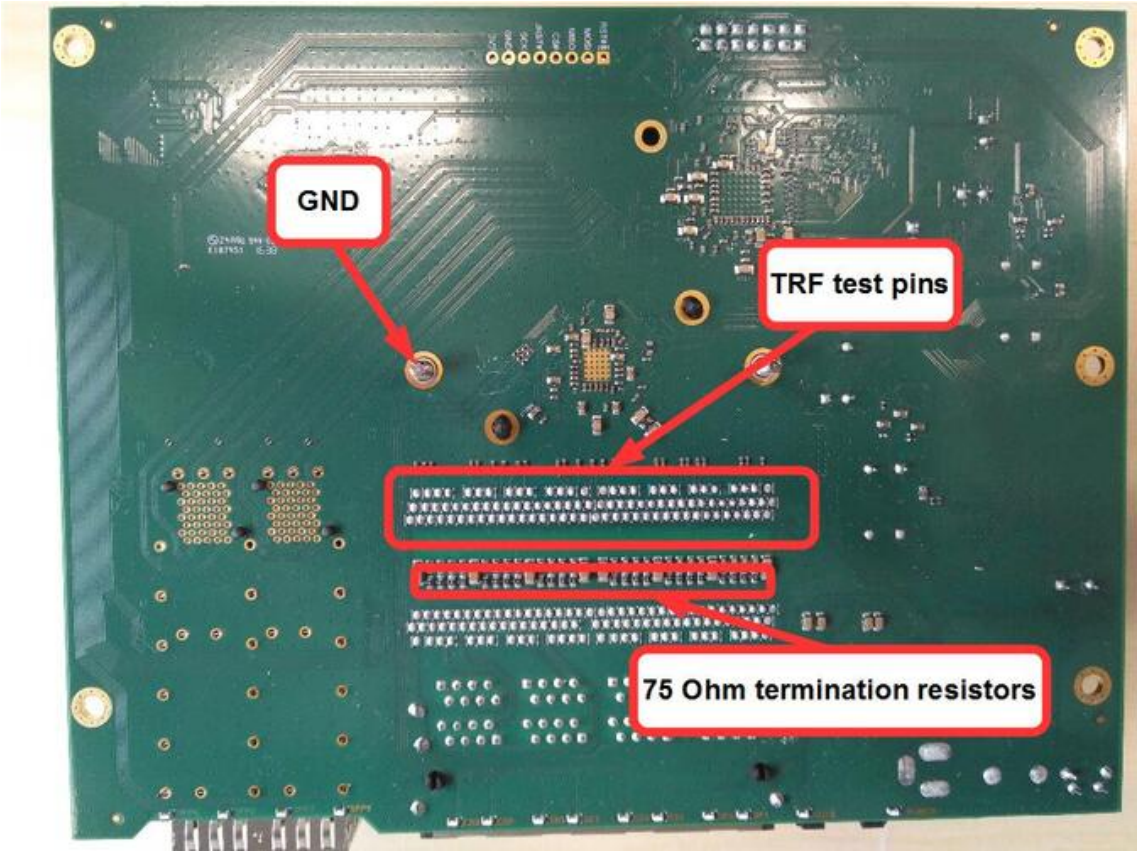
Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformers pins and Ground

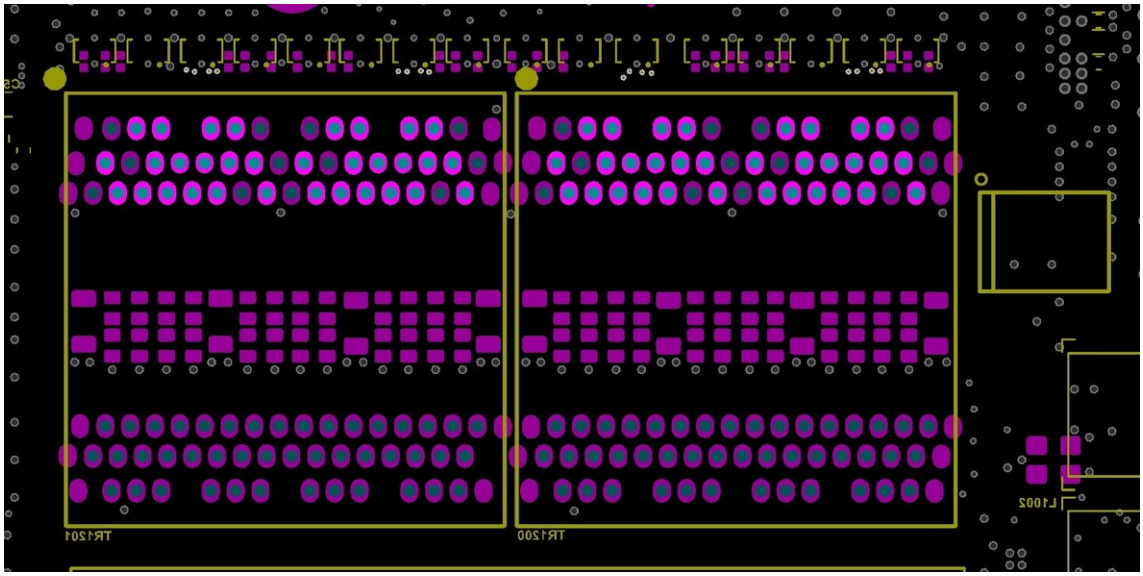
Check voltage drop value between Ethernet transformers TR1200, TR1201 pins and Ground. Test points on the transformers pins are highlighted and can be seen in picture 27. Note that the view for transformer pins are from the bottom for necessary of measurement. Voltage drop value should be in the range from 0,38V to 0,45V. Voltage drop measurement method is described on page 15.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm +/-1%. Location of resistors on the board you can see in the picture 26.



Picture 26



Picture 27

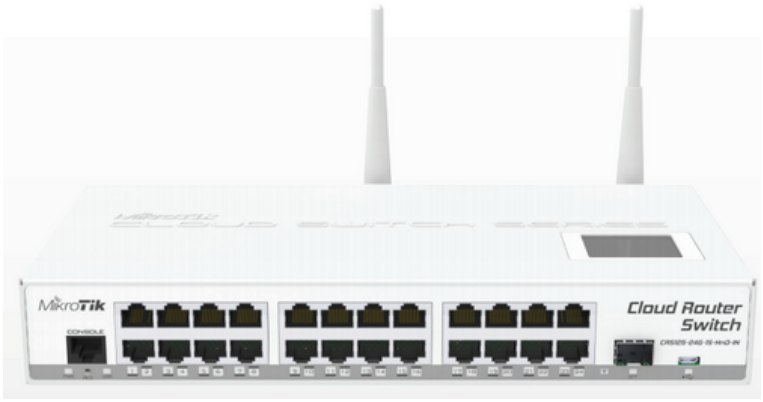
CRS125-24G-1S-IN

Picture 28

CRS125-24G-1S-RM

Picture 29

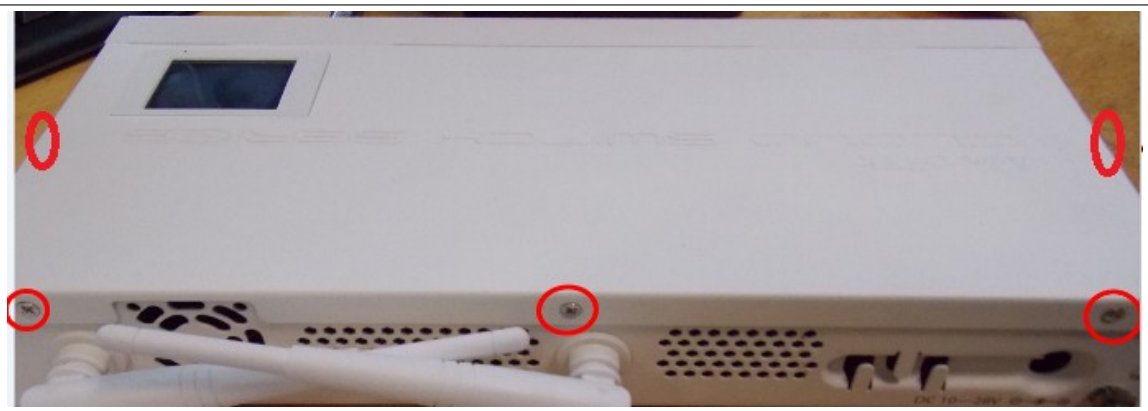
CRS125-24G-1S-2HnD-IN



Picture 30

Disassembling information

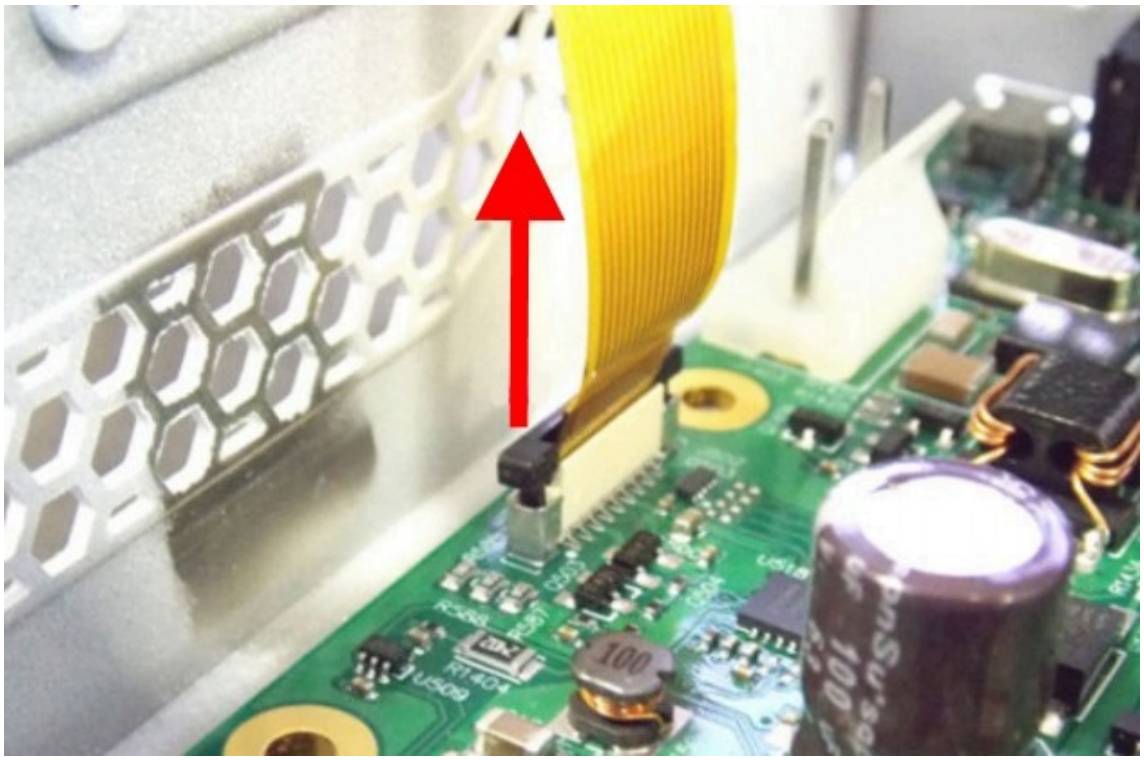
Step 1: Unscrew 5 screws (3 screws behind board case and 1 screw on the side of the board case). Location of the screws you can see in the picture 31.



Picture 31

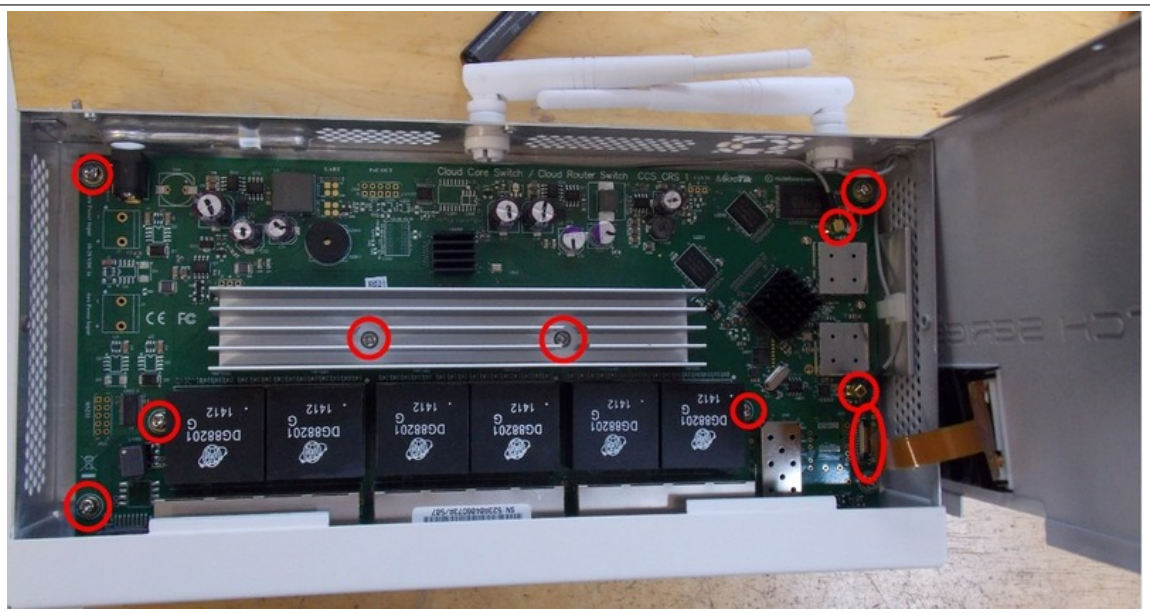
Step 2: Carefully take off the cover. Do not damage the LCD flex cable.

Step 3: Gently lift the latch vertically upward and take out LCD flex cable from FPC connector as showed in the picture 32. Do not damage the FPC connector locking drawer.



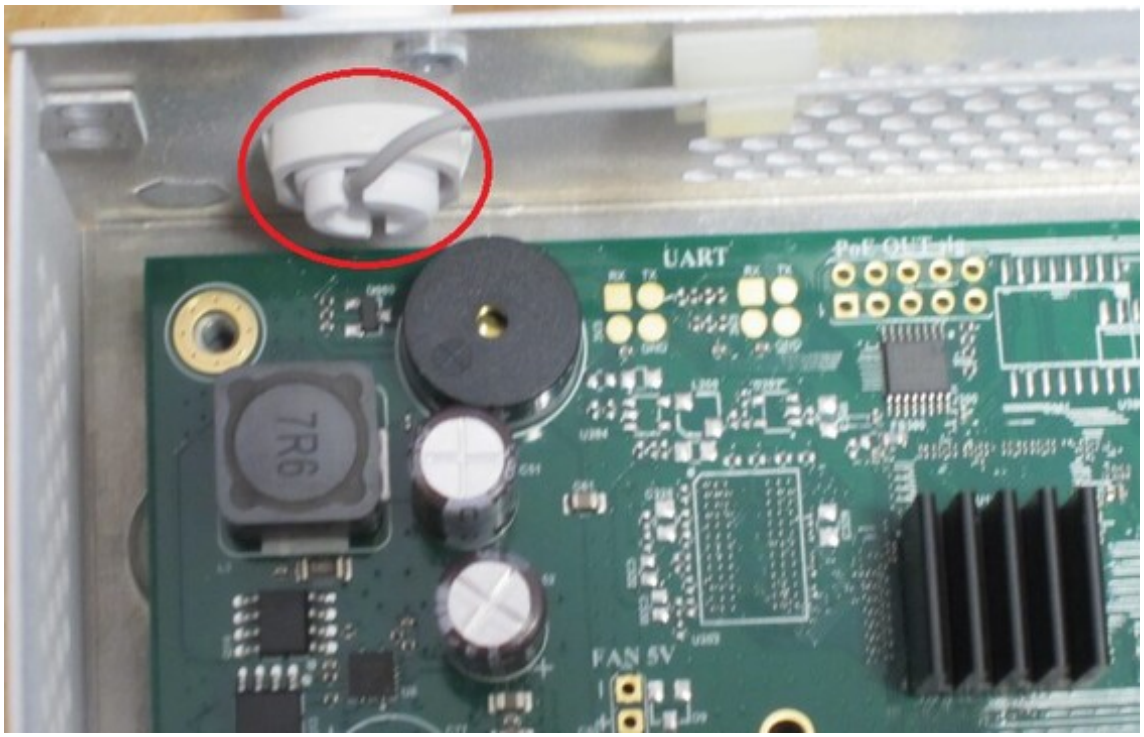
Picture 32

Step 4: Unscrew 8 screws which fasten PCB to the case. Location of the screws see in the picture 33.



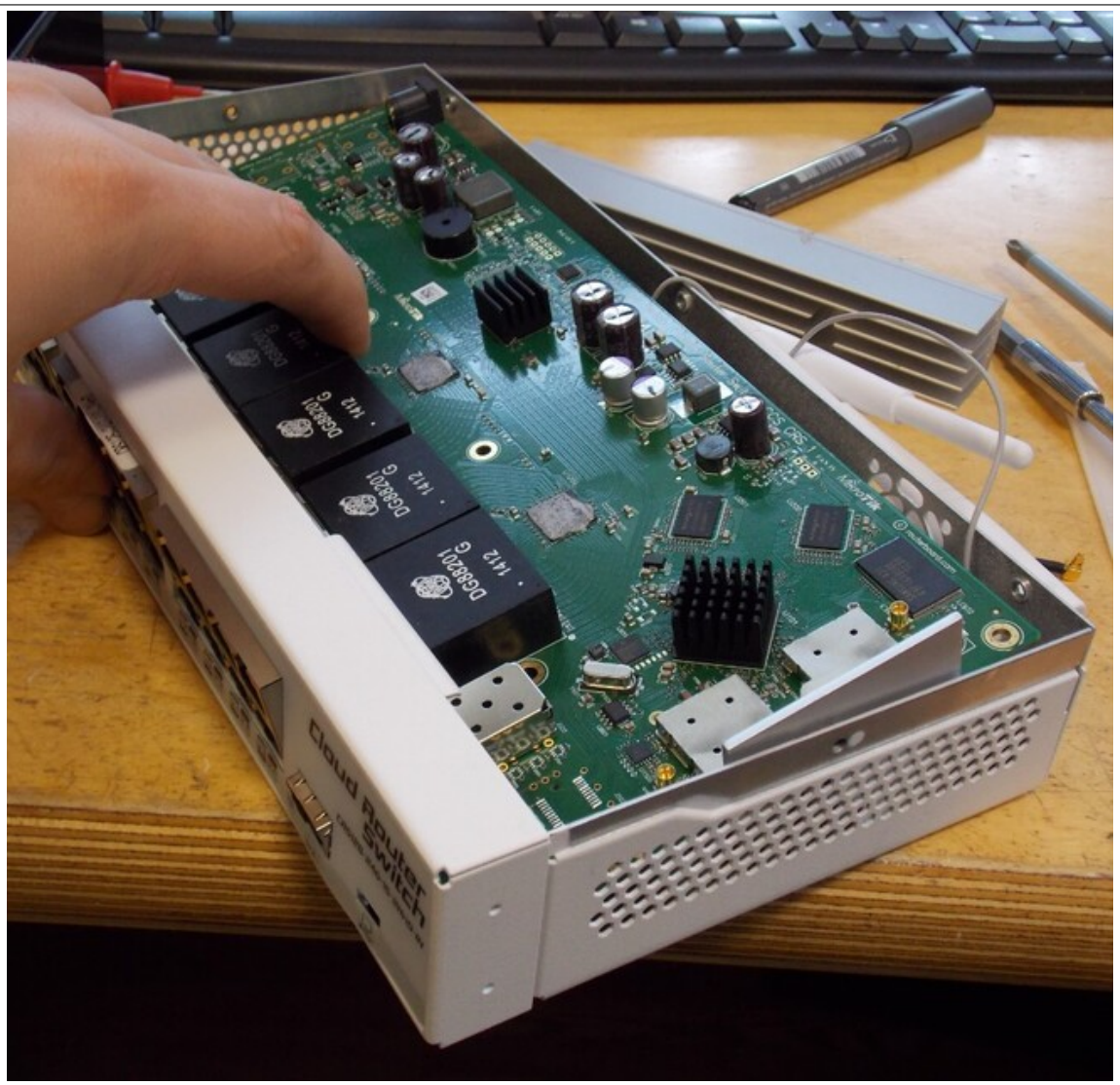
Picture 33

Step 5: Move both antenna cables into a special holes, see picture 34.



Picture 34

Step 6: Move out PCB from the case, see picture 35.



Picture 35

Instructions for checking overvoltage

Checking Schottky diodes

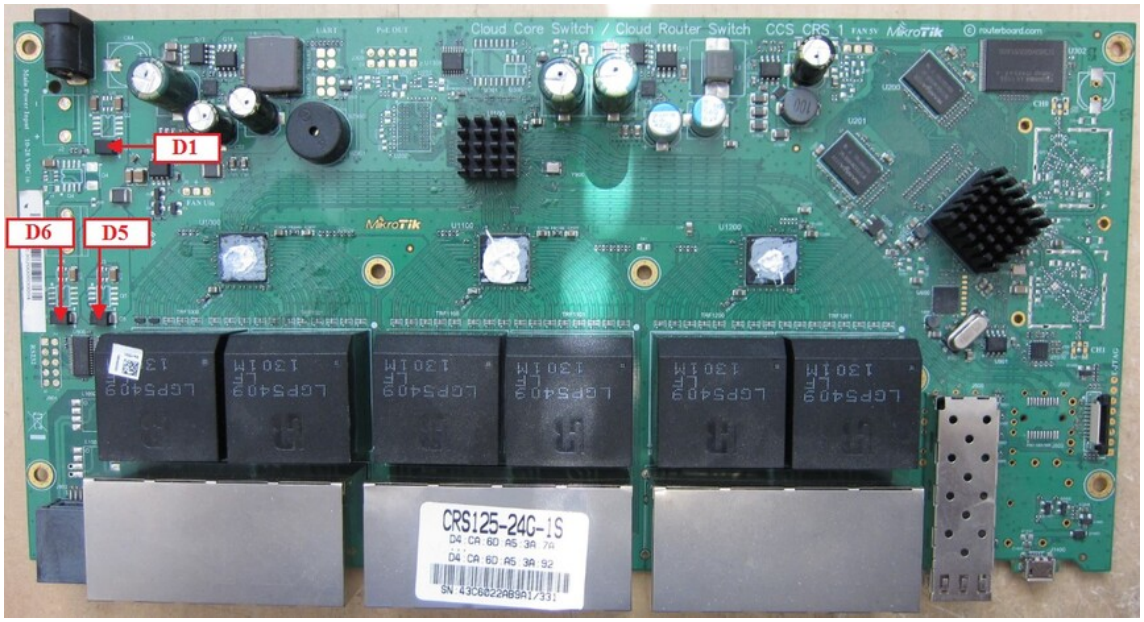
Check Schottky diodes D1, D5, D6 (or D1, D5 for some CRS125 versions). Location of diodes on the board you can see in the picture 36. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformers pins and Ground

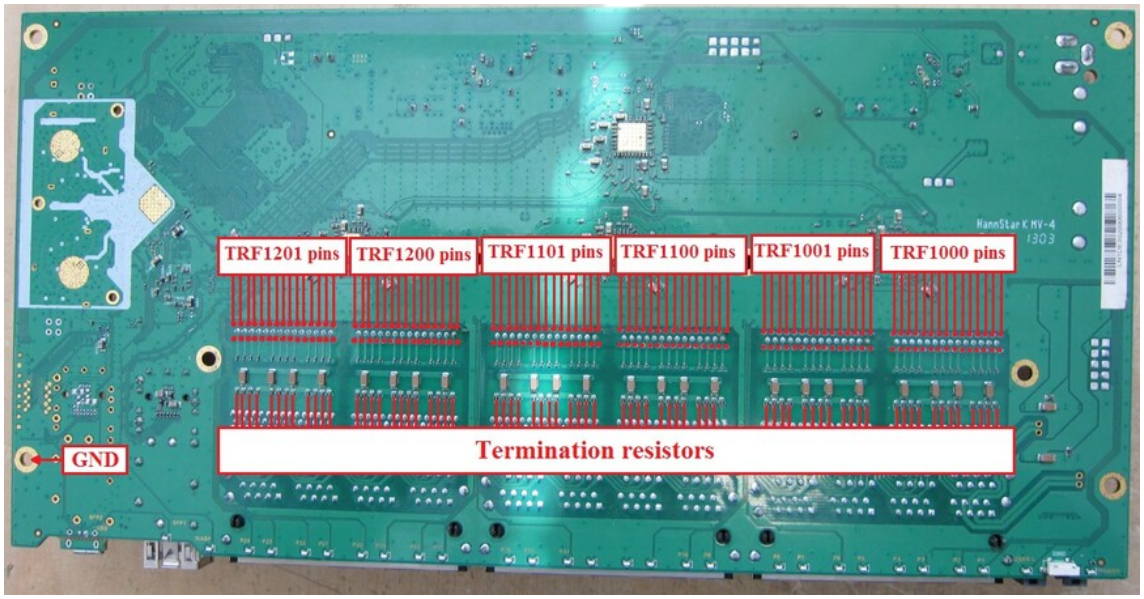
Check voltage drop value between Ethernet transformers TRF1000, TRF1001, TRF1100, TRF1101, TRF1200, TRF1201 pins and Ground. Test points on the transformers pins are marked with red dots, see picture 37. Voltage drop value should be in the range from 0,38V to 0,44V. Voltage drop measurement method is described on page 15.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm +/-1%. Location of resistors on the board you can see in the picture 37.



Picture 36



Picture 37

260 SERIES ROUTERBOARDS

RB260GS

Picture 38

Dissasembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page 43.

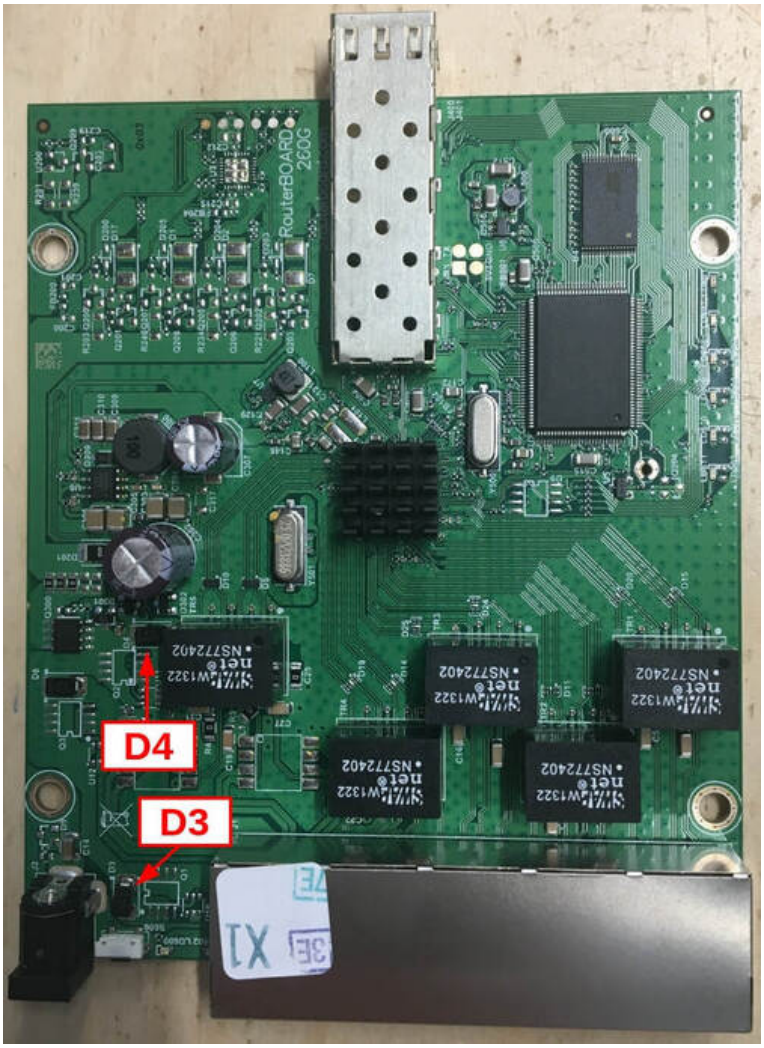
Instructions for checking overvoltage

Checking Schottky diodes

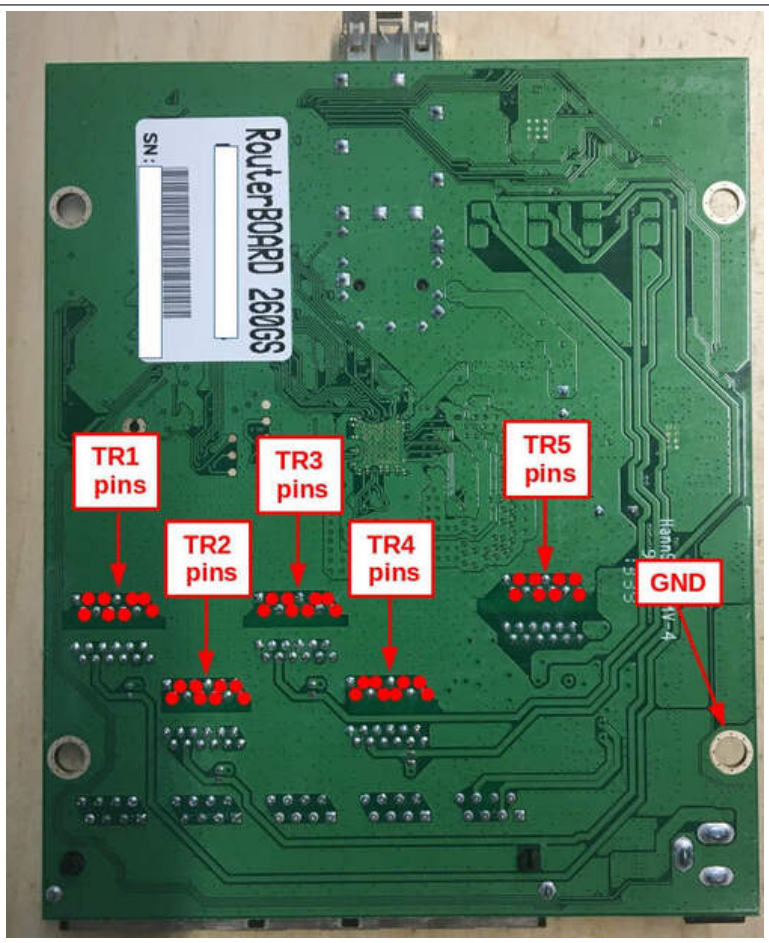
Check Schottky diodes D3, D4. Location of diodes on the board you can see in the picture 39. Schottky diodes quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1-TR5 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 40. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.

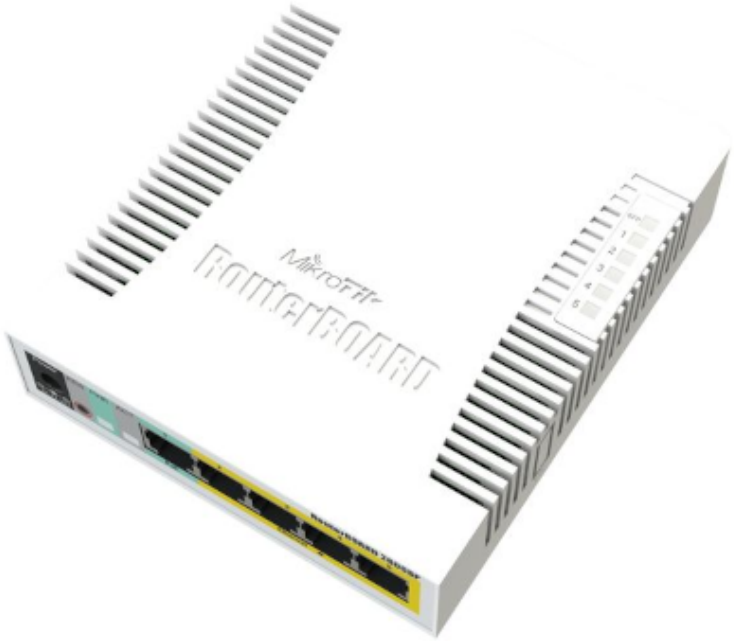


Picture 39


RouterBOARD 260GS
SN:
TR1 pins
TR2 pins
TR3 pins
TR4 pins
TR5 pins
GND

Picture 40

RB260GSP



Picture 41

Dissasembling information

Step 1:
Take off case back sticker as shown in the picture 42.

Picture 42

Step 2:
Take off the cover with a screwdriver as shown in the pictures 43 - 46.

Picture 43

Picture 44

Picture 45

Picture 46

Step 3:
Take out the board as shown in the picture 47.

Picture 47

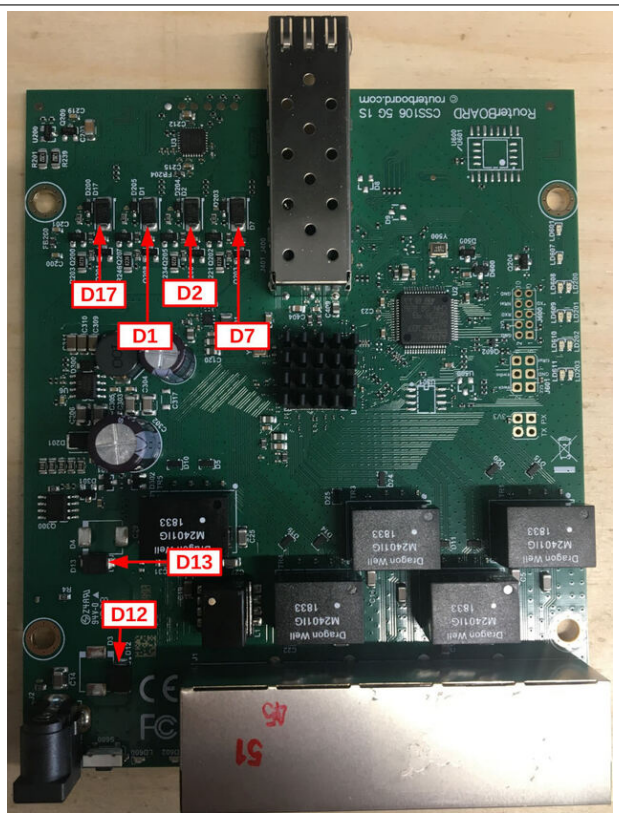
Instructions for checking overvoltage

Checking Schottky diodes

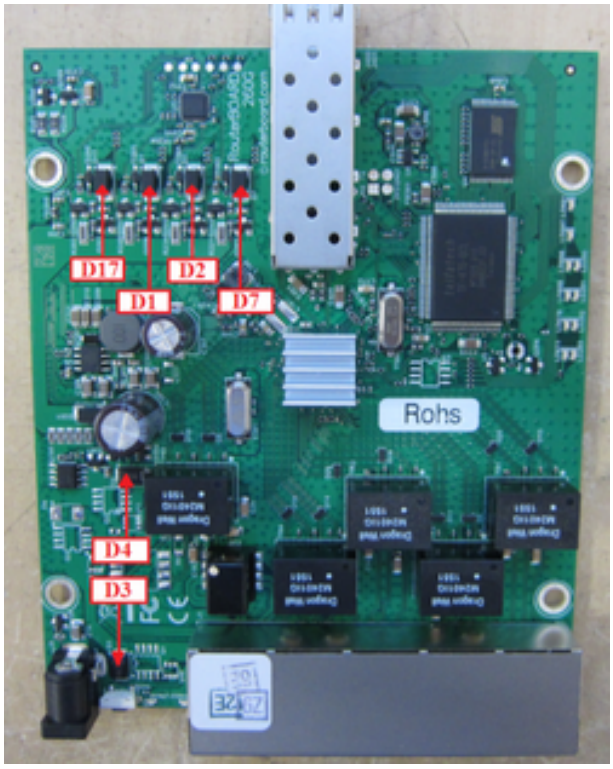
Check Schottky diodes D1-D4, D7, D17. Location of diodes on the board you can see in the picture 49. Schottky diodes quality measurement method is described on page 12.
Some boards may have different PCB layout. If the board does not correspond the PCB in picture 49, then check Schottky diodes D1, D2, D7, D12, D13, D17. Location of diodes on the board you can see in the picture 48. Schottky diodes quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

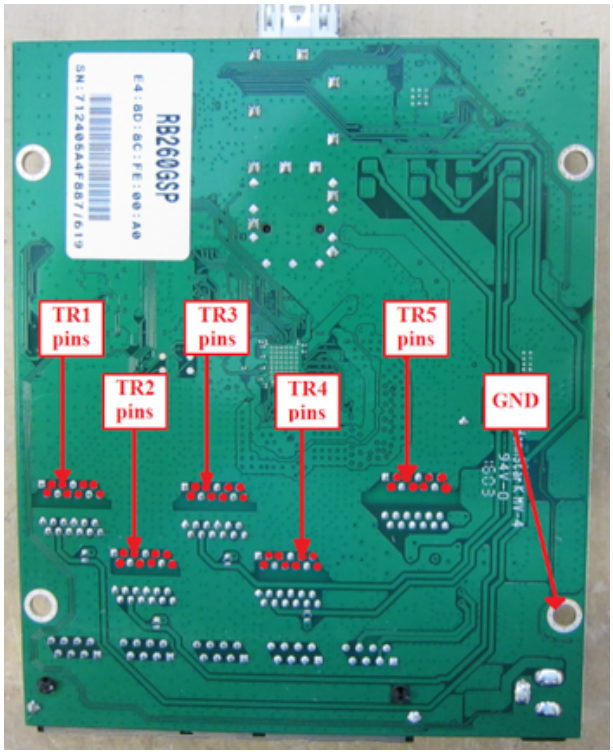
Check voltage drop value between Ethernet transformers TR1-TR5 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 50.
Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.



Picture 48



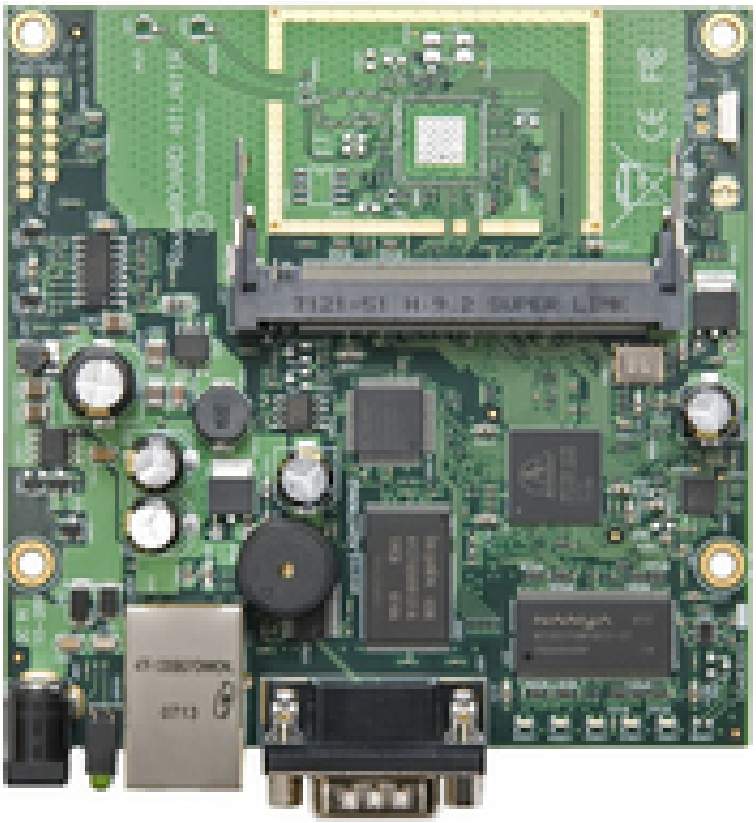
Picture 49



Picture 50

411 SERIES ROUTERBOARDS

RB411AH

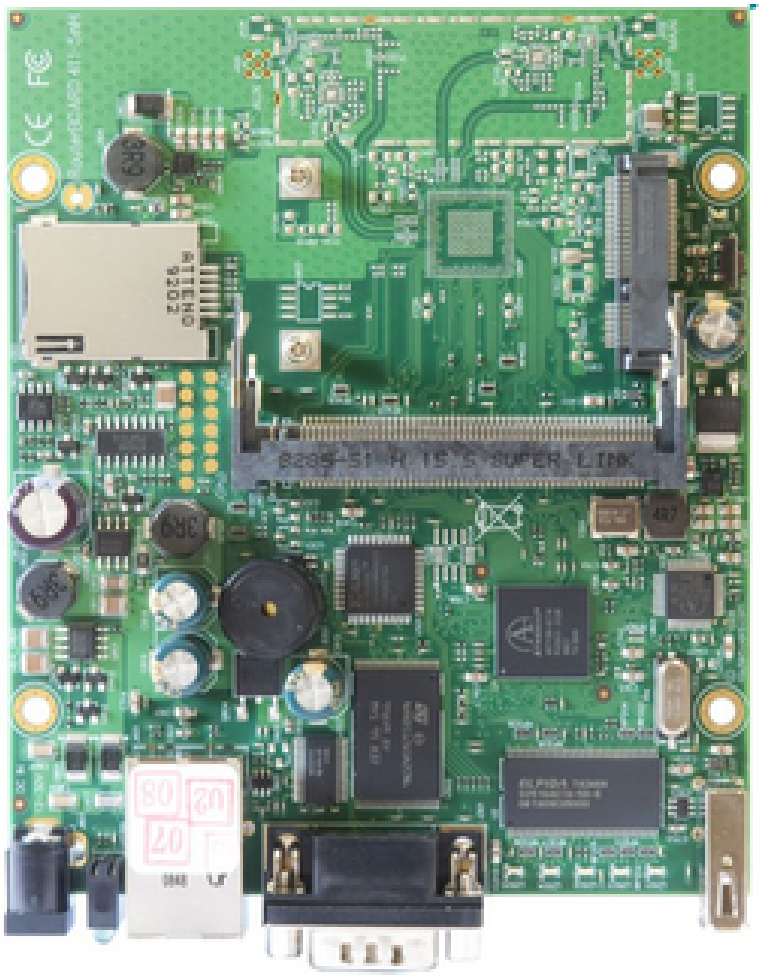


Picture 51

RB411AR

Picture 52

RB411U



Picture 53

Instructions for checking overvoltage

Checking Schottky diodes

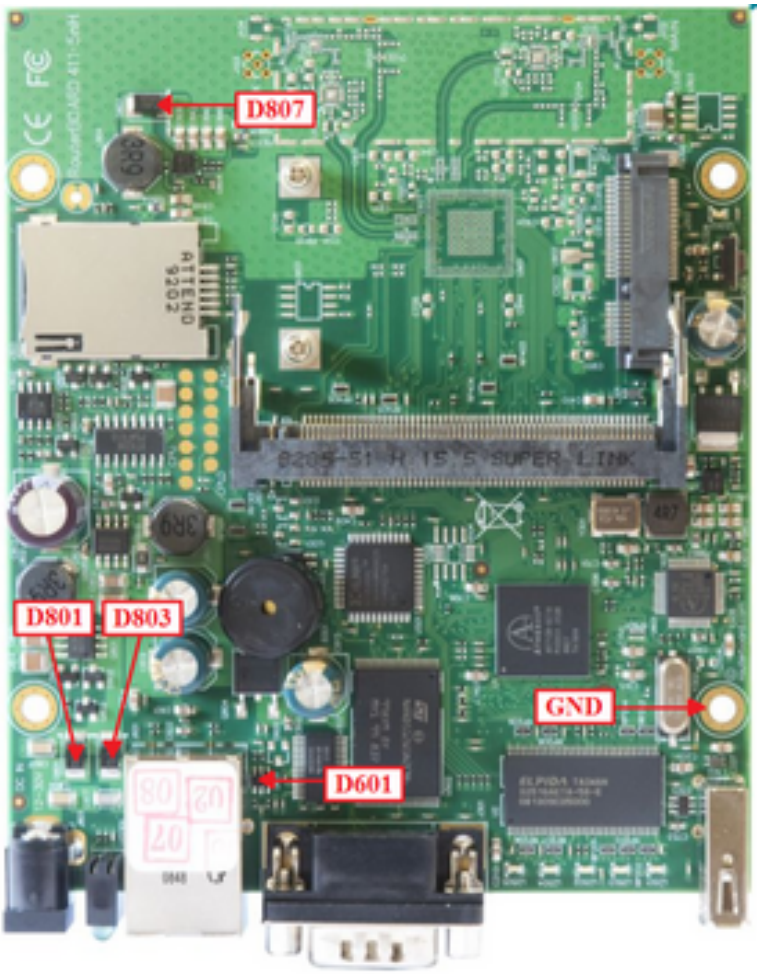
Check Schottky diodes D801, D803. For RB411U you should also check Schottky diode D807. Location of diodes on the board you can see in the picture 54. Schottky diodes quality measurement method is described on page 12.

Checking voltage drop value between diode array pin1 pins and GND

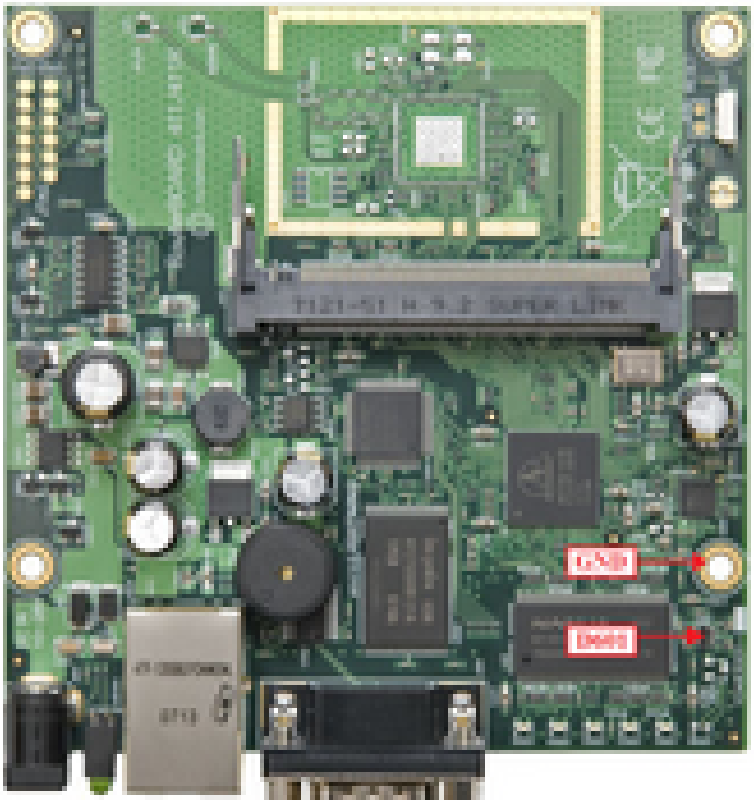
Check voltage drop value between diode array D601 pin1 and Ground. Location of diode array on the boards RB411U, RB411AR you can see in the picture 54, but for RB411AH in the picture 55.
Voltage drop value should be in the range from 0,4V to 0,44V for all mentioned board types. Voltage drop measurement method is described on page 14.

Checking termination resistors in RJ-45 connector

Check termination resistors resistance in J601 connector.
Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page 16.

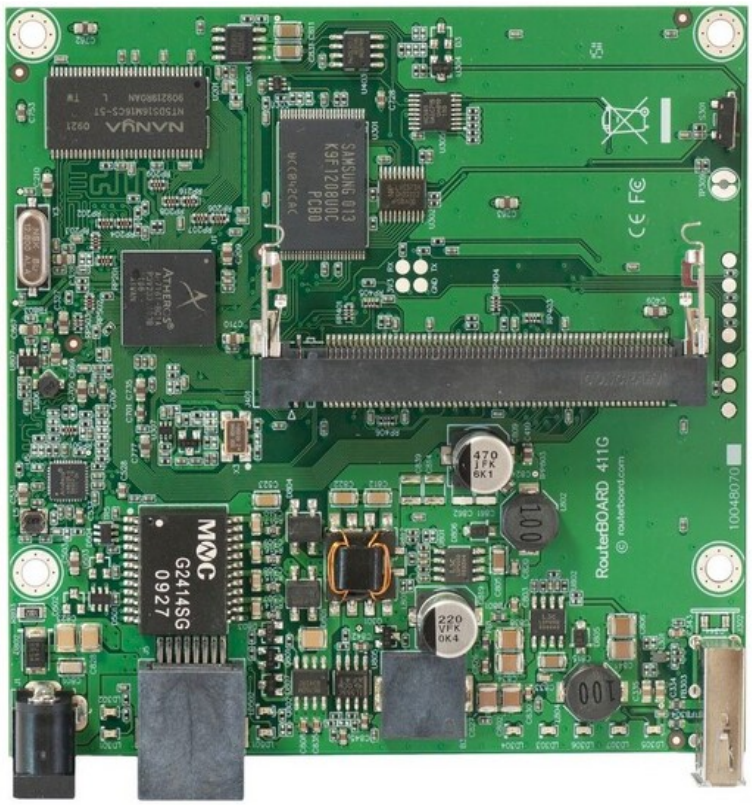


Picture 54



Picture 55

RB411GL



Picture 56

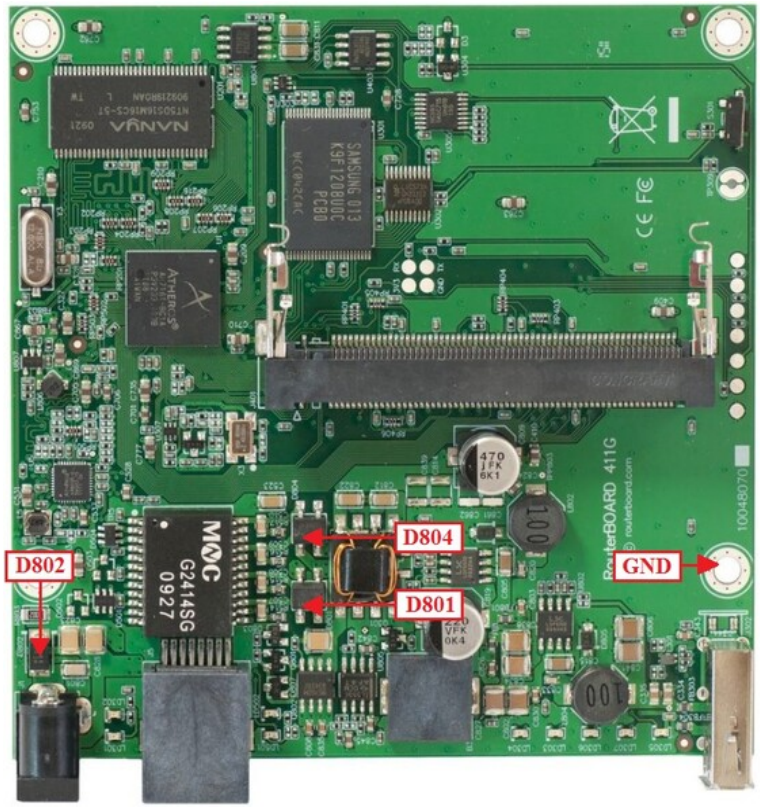
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

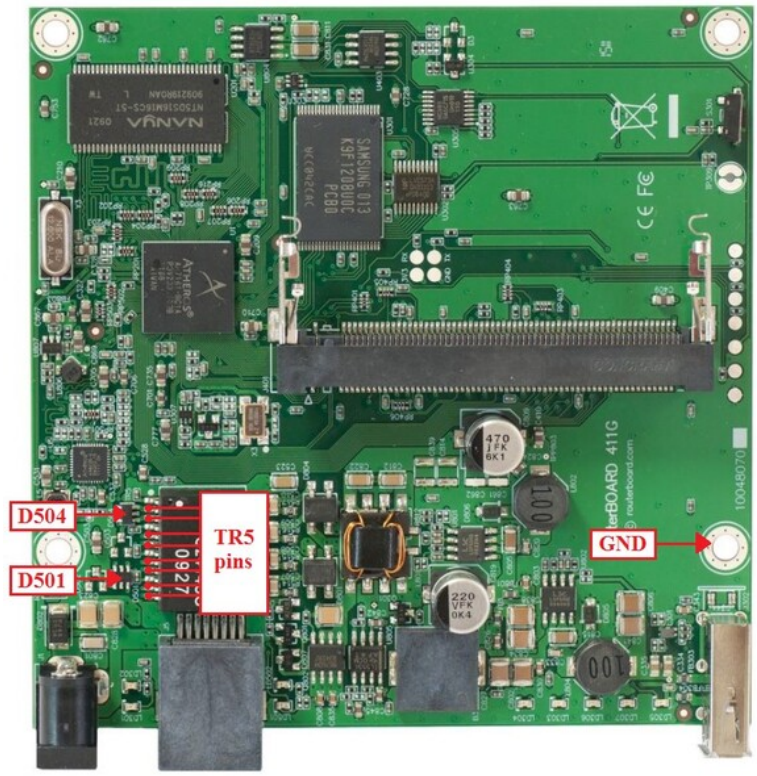
Check Schottky diode D802 and diodes bridges D801, D804. Location of diodes on the board you can see in the picture 57. Diodes quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D501, D504 pin#1 and Ground or check voltage drop value between Ethernet transformer TR5 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 58. Voltage drop value between diode arrays D501, D504 pin#1 and Ground as well as on the transformer TR5 pins and Ground should be in the range from 0,38V to 0,45V. Voltage drop measurement method is described on page 14.

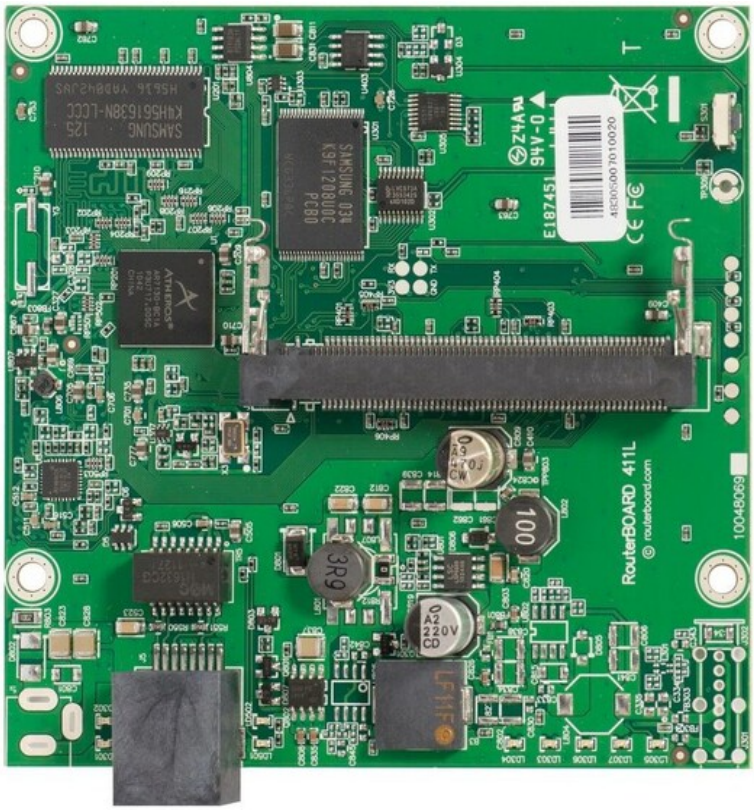


Picture 57



Picture 58

RB411L



Picture 59

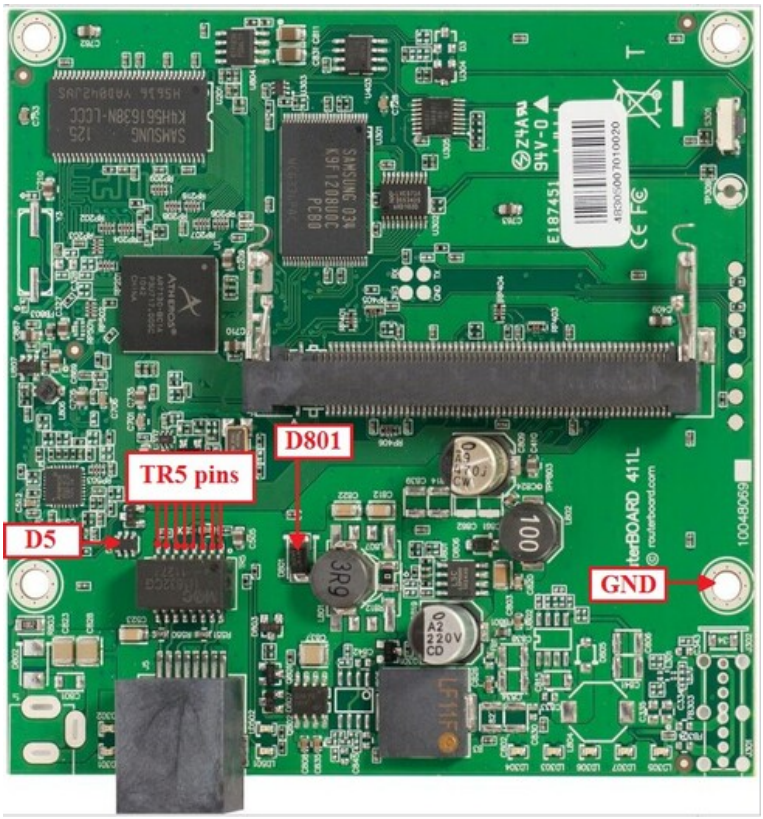
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

Check Schottky diode D801. Location of diode on the board you can see in the picture 60. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode array D5 pin#1 and Ground or check voltage drop value between transformer TR5 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 60. Voltage drop value between diode array D5 pin#1 and Ground as well as on the transformer TR5 pins and Ground should be in the range from 0,38V to 0,45V. Voltage drop measurement method is described on page 14.



Picture 60

433 SERIES ROUTERBOARDS

RB433AH

Picture 61

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

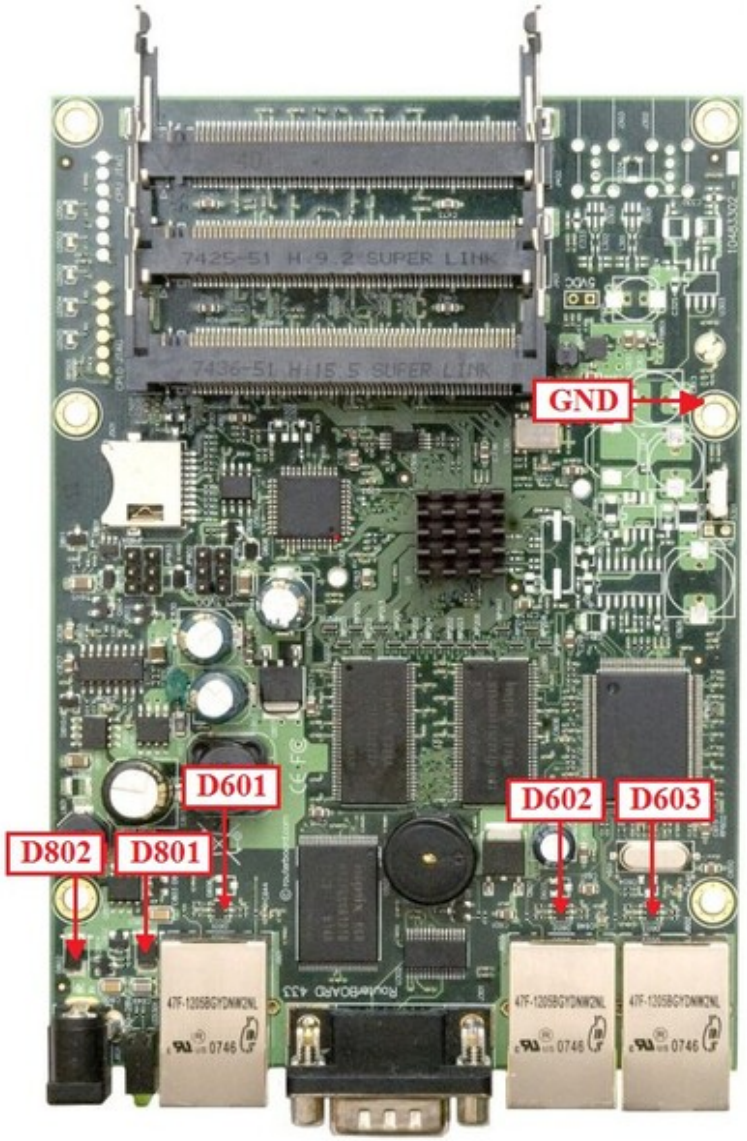
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture 62. Diodes quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D601-D603 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 62. Voltage drop value should be in the range from 0,4V to 0,44V. Voltage drop measurement method is described one page 14.

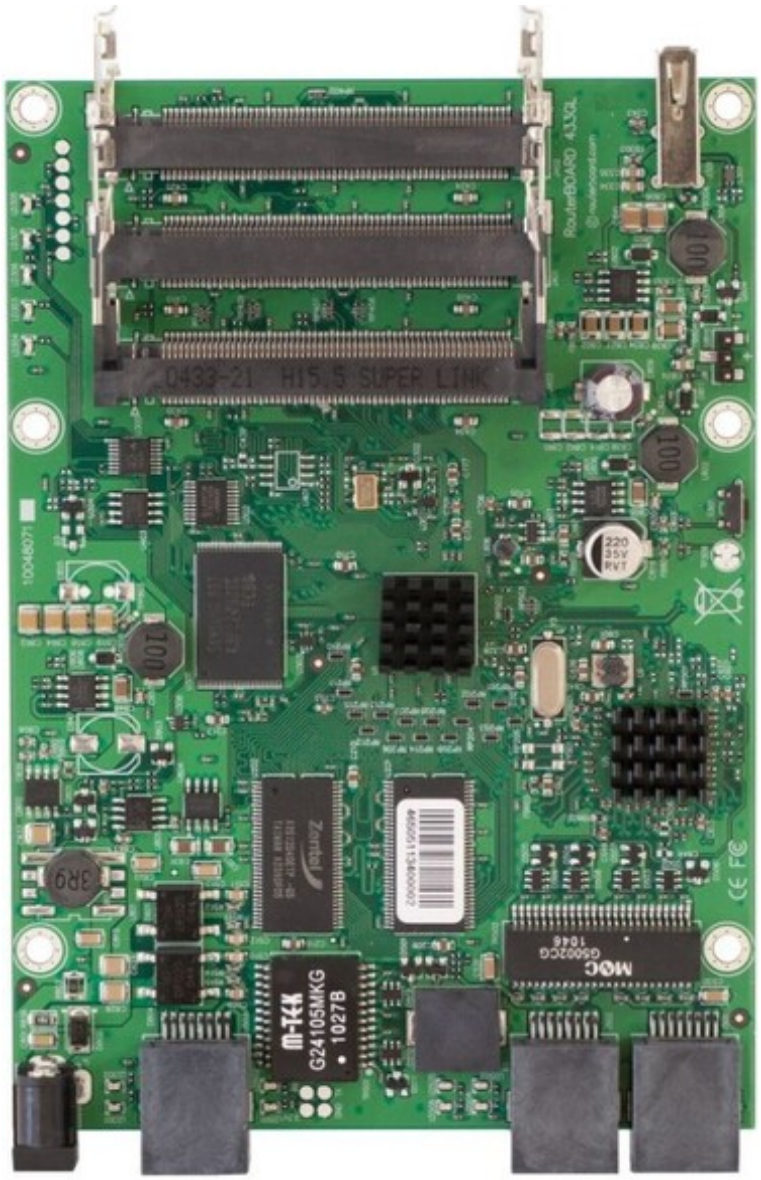
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in each of Ethernet connector J601-J603. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



Picture 62

RB433GL



Picture 63

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

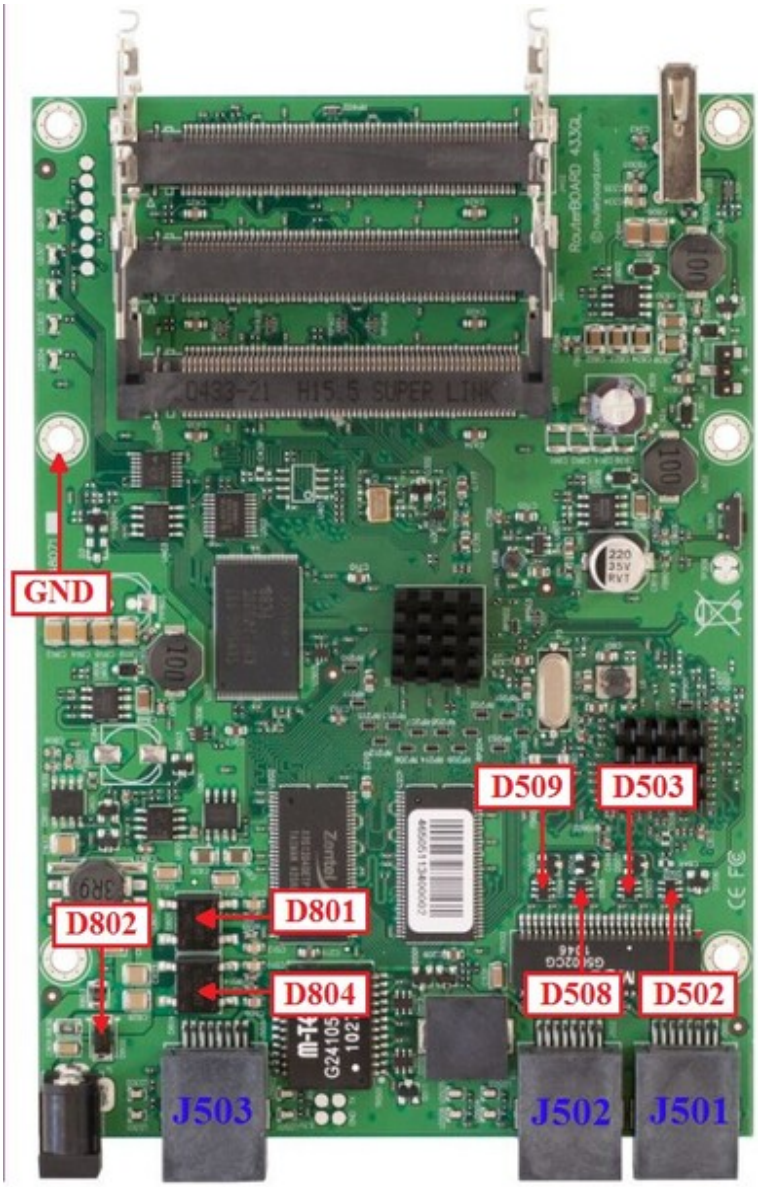
Check Schottky diode D802 and diodes bridges D801, D804. Location of diodes on the board you can see in the picture 64. Diodes quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D502, D503, D508-D510, D512 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 64. Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described one page 14.

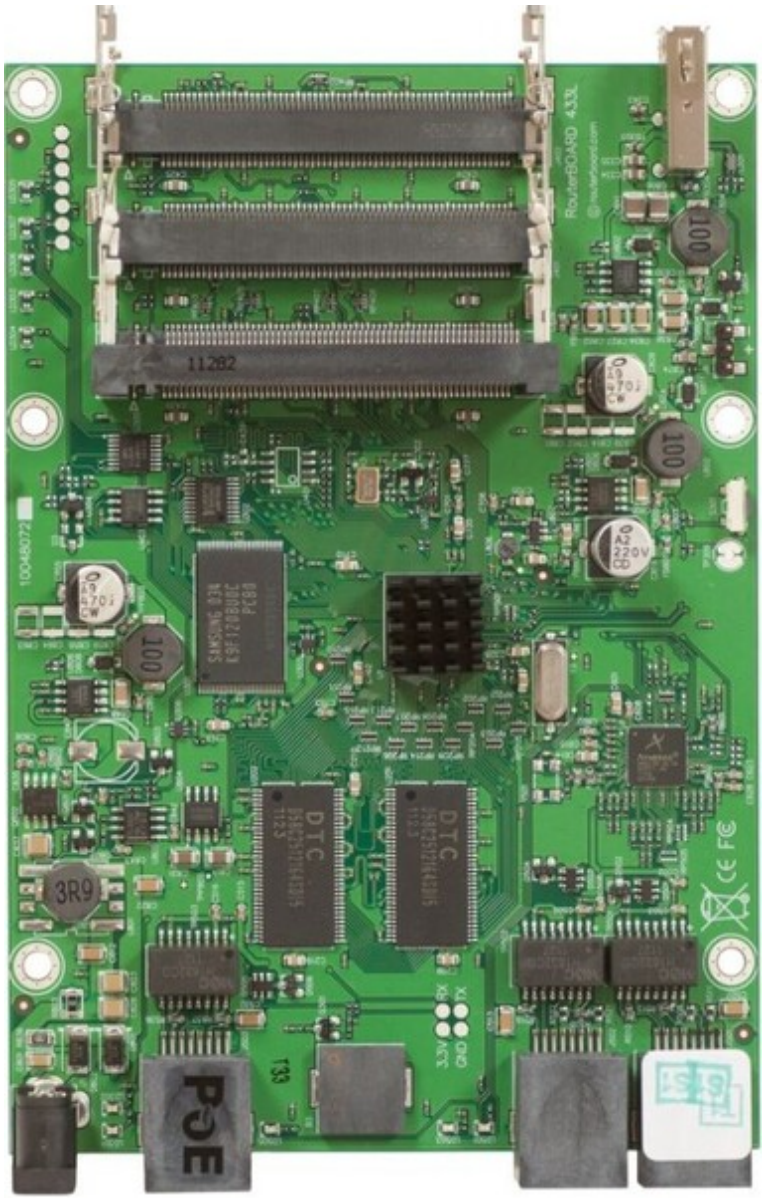
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J501-J503 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



Picture 64

RB433UL



Picture 65

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

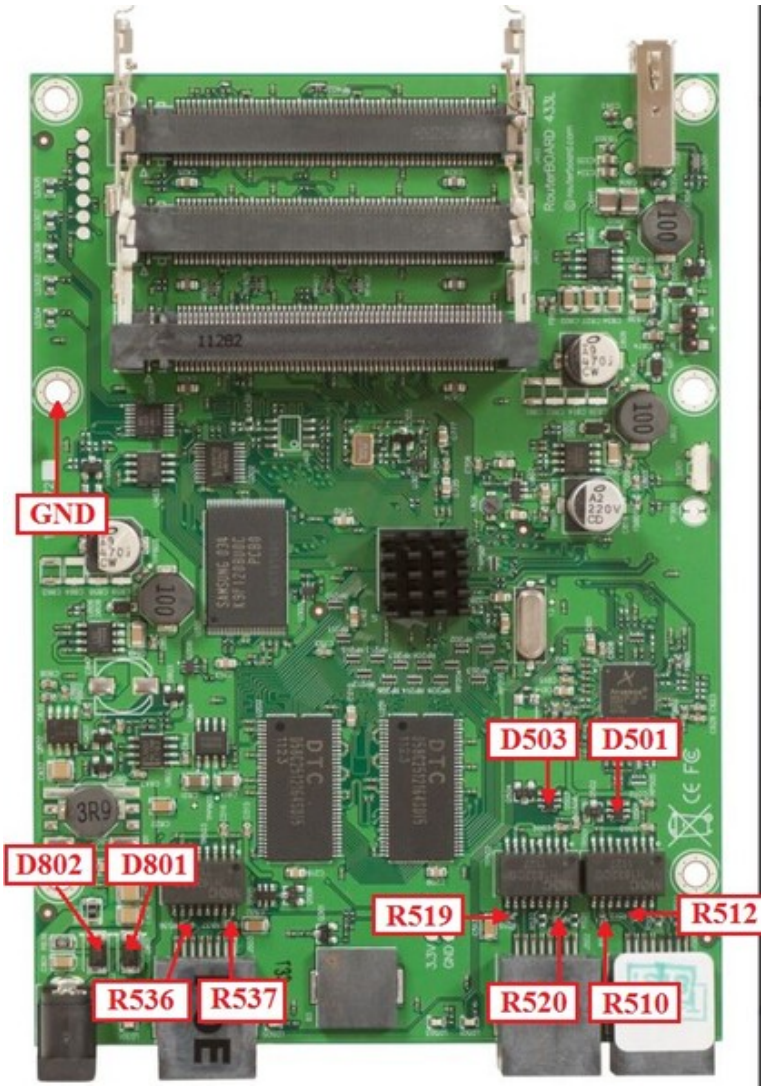
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture 66. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D501, D503, D505 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 66. Voltage drop value should be in the range from 0,32V to 0,36V. Voltage drop measurement method is described on page 14.

Checking 75 Ohm termination resistors resistance

Check resistors R510, R512, R519, R520, R536, R537 resistance value. It should be 75 Ohm +/- 1%. Resistors location on the board you can see in the picture 66.



Picture 66

435 SERIES ROUTERBOARDS

RB435G

Picture 67

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

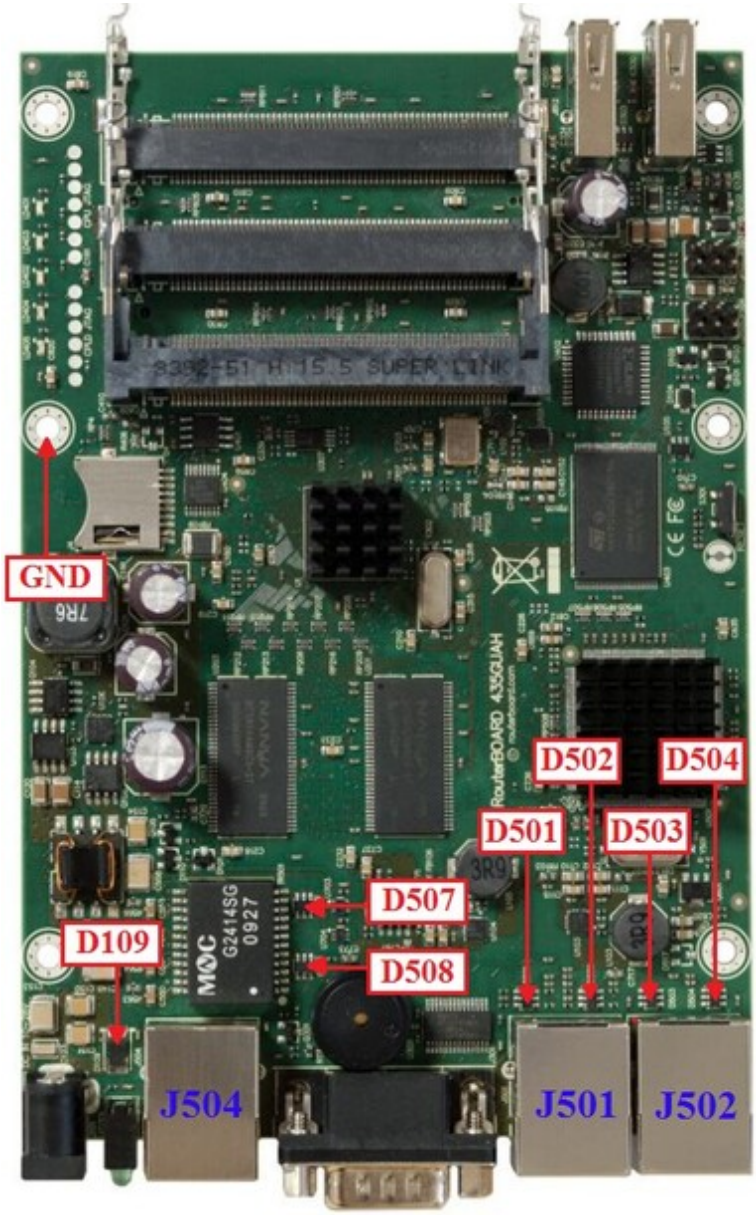
Check Schottky diode D109. Location of diode on the board you can see in the picture 68. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D501-D504, D507, D508 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 68. Voltage drop value should be in the range from 0,2V to 0,24V. Voltage drop measurement method is described on page 14.

Checking termination resistors resistance in RJ-45 connector

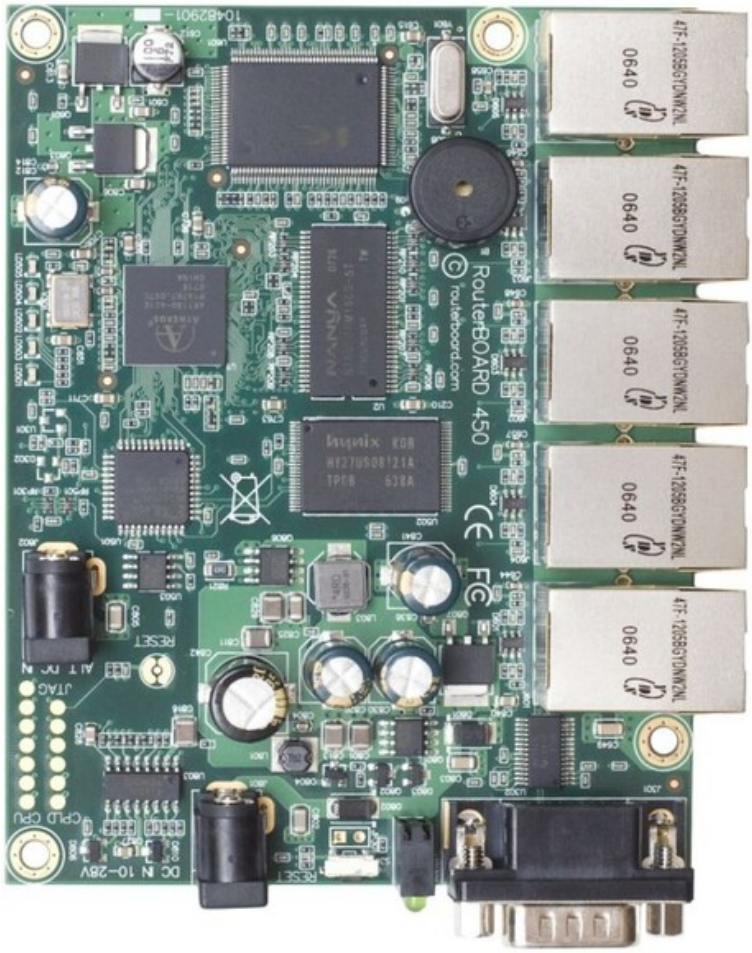
Check termination resistors resistance in J501, J502 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



Picture 68

450 SERIES ROUTERBOARDS

RB450



Picture 69

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

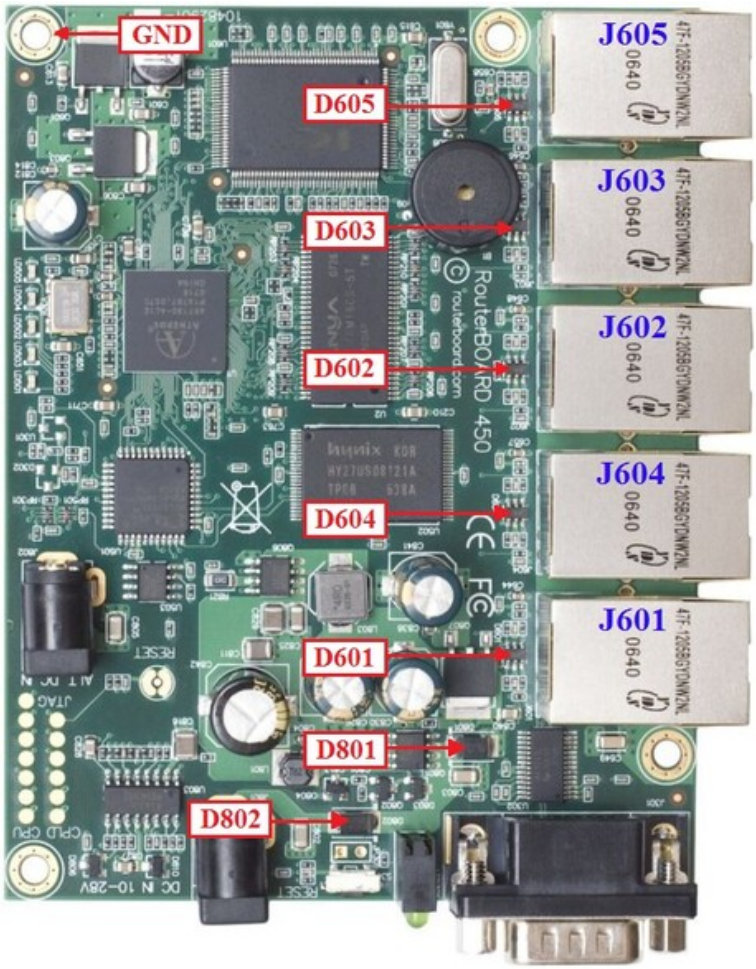
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture 70. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D601-D605 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 70. Voltage drop value should be in the range from 0,4V to 0,44V. Voltage drop measurement method is described on page 14.

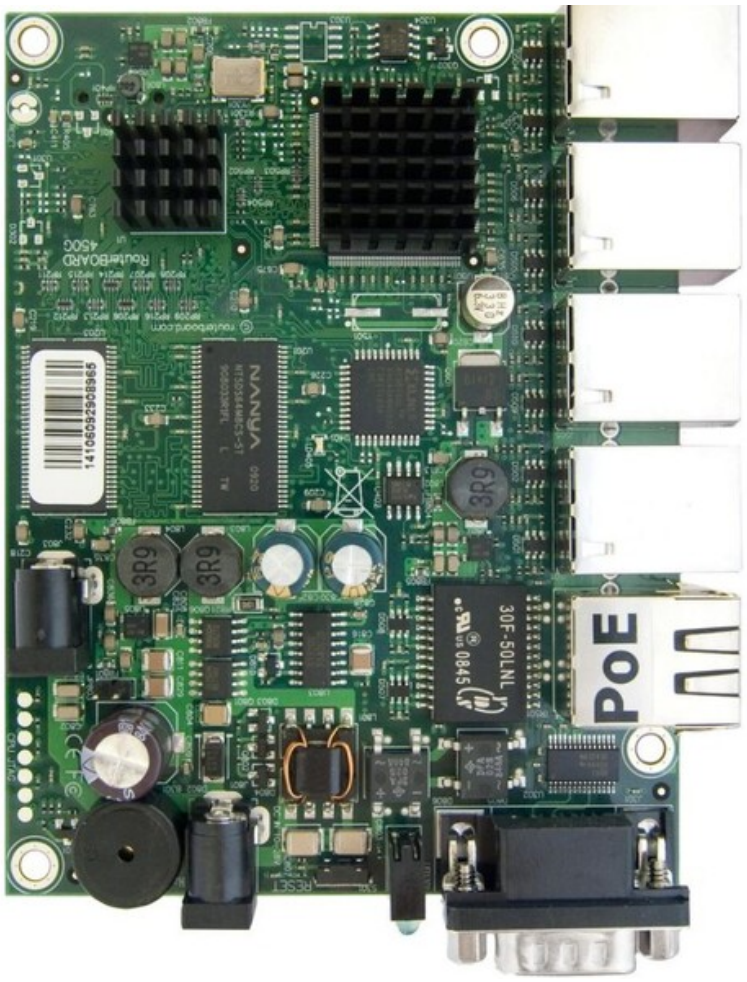
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J601-J605 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



Picture 70

RB450G



Picture 71

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

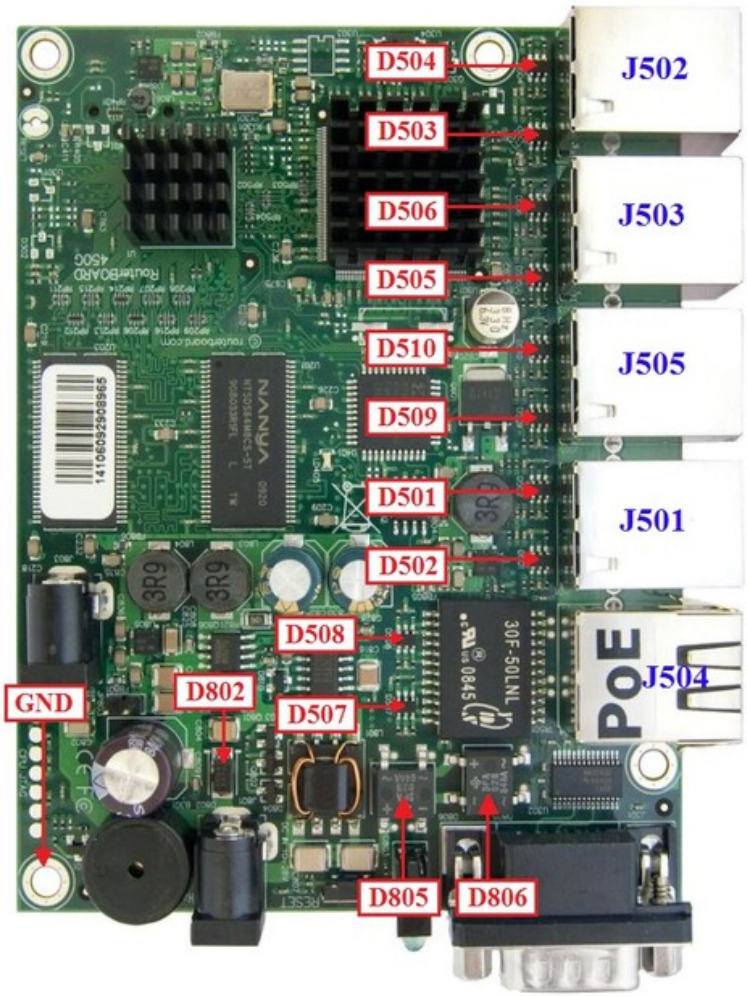
Check Schottky diode D802 and diodes bridges D805, D806. Location of diodes on the board you can see in the picture 72. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D501-D510 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 72. Voltage drop value should be in the range from 0,2V to 0,26V. Voltage drop measurement method is described on page 14.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J501-J503, J505 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



Picture 72

RB450Gx4

Picture 73

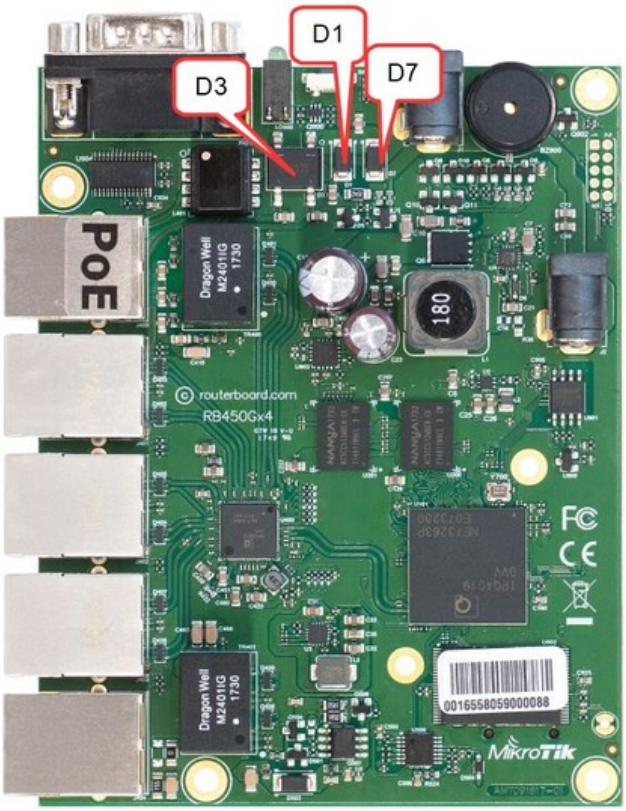
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

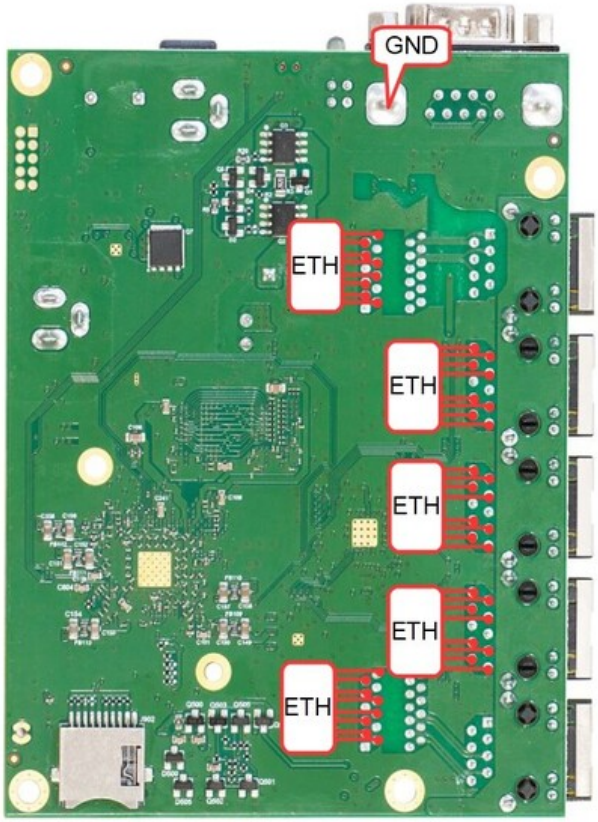
Check Schottky diode D1, D7 and diodes bridges D3. Location of diodes on the board you can see in the picture 74. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between diode array and Ground on RJ45

Check voltage drop value between diode arrays D400-D409. Location of the test points by the name ETH you can see in the picture 75. Voltage drop value should be in the range from 0,36V to 0,43V. Voltage drop measurement method is described on page 15.


D1
D3
D7
PoE
Dragon Wall
M24011G
1730
180
© routerboard.com
RB450Gx4
0016558059000088
MikroTik

Picture 74



Picture 75

493 SERIES ROUTERBOARDS

RB493AH

Picture 76

Instructions for checking overvoltage

Checking Schottky diodes

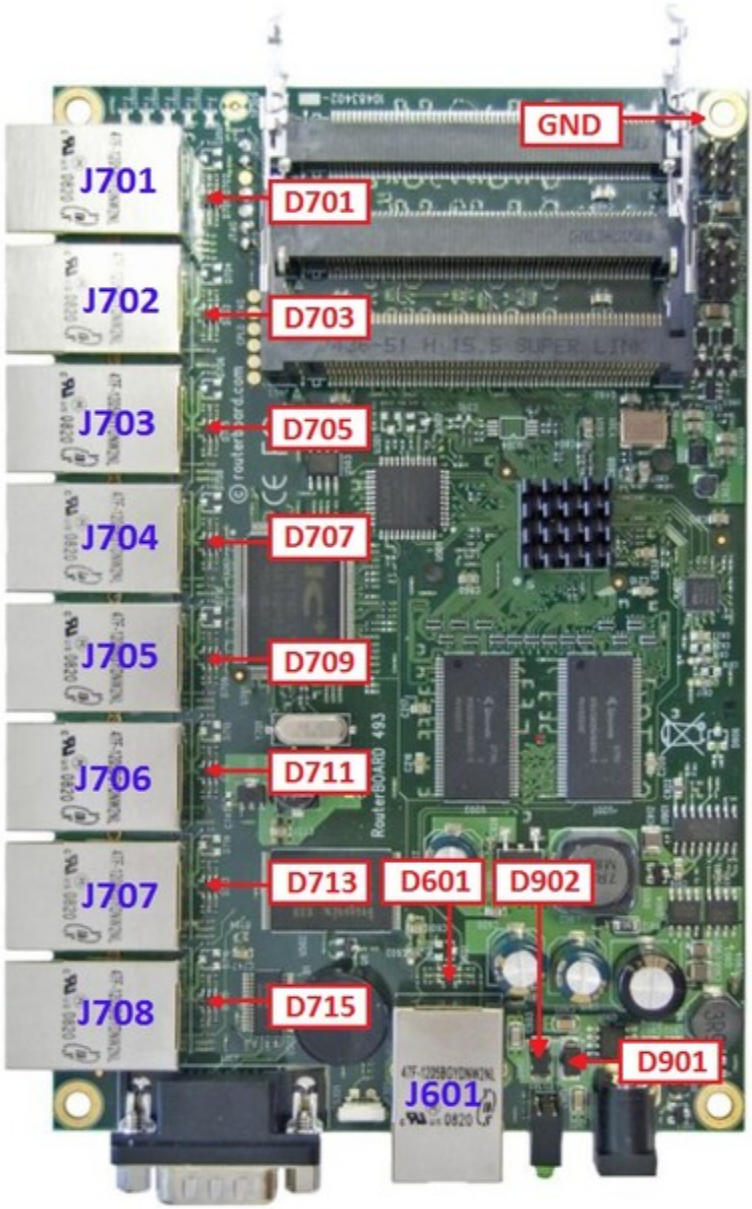
Check Schottky diodes D901, D902. Location of diodes on the board you can see in the picture 77. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D601, D701, D703, D705, D707, D709, D711, D713, D715 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 14.

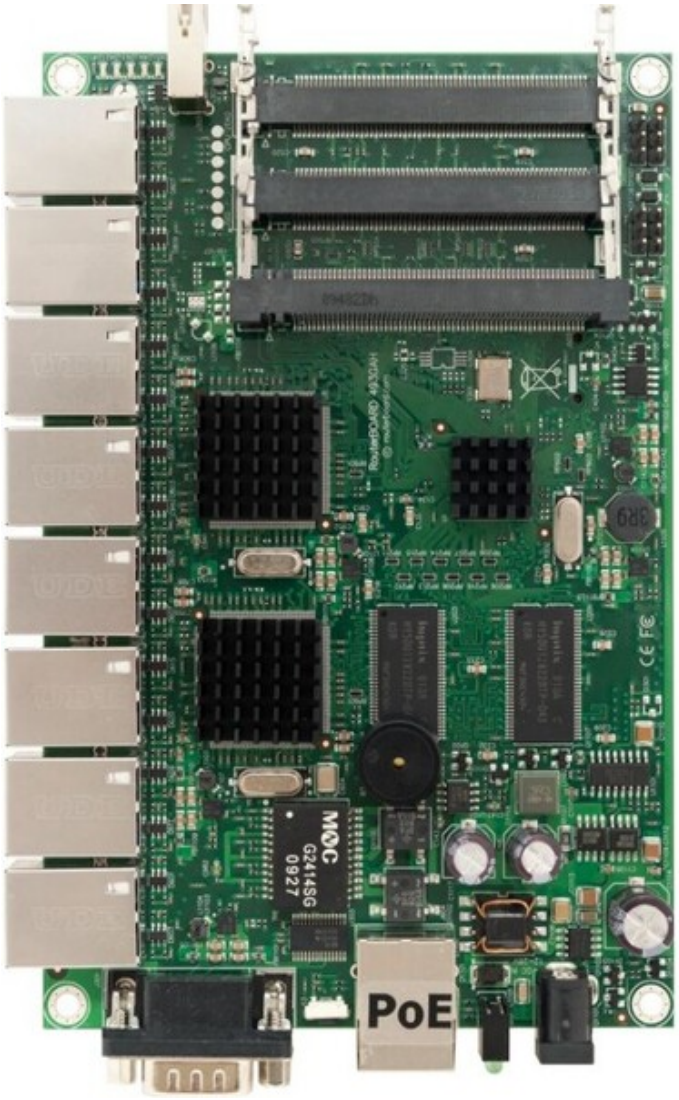
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J601, J701-J708 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



Picture 77

RB493G



Picture 78

Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diode D1101 and diodes bridges D1102, D1105. Location of diodes on the board you can see in the picture 79. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D601, D603, D609, D611, D615, D620, D605, D607, D801, D803, D815, D820, D809, D811, D805, D807 pin#1 and Ground. Location of

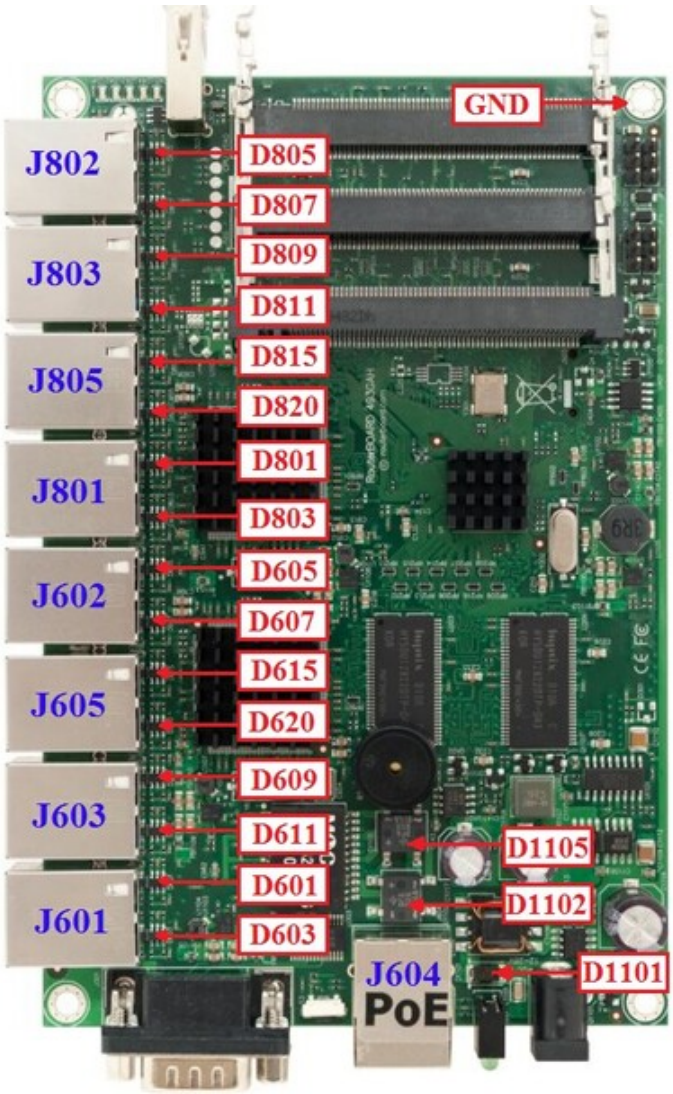
diode arrays on the board you can see in the picture 79. Voltage drop value should be in the range from 0,20V to 0,25V. Voltage drop measurement method is described on page 15.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 79. Voltage drop value should be in the range from 0,2V to 0,25V. Voltage drop measurement method is described on page 15.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J601-J603, J605, JJ801-J803, J805 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 17.



Picture 79

751 SERIES ROUTERBOARDS

RB751U-2HnD

Picture 80

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page 43.

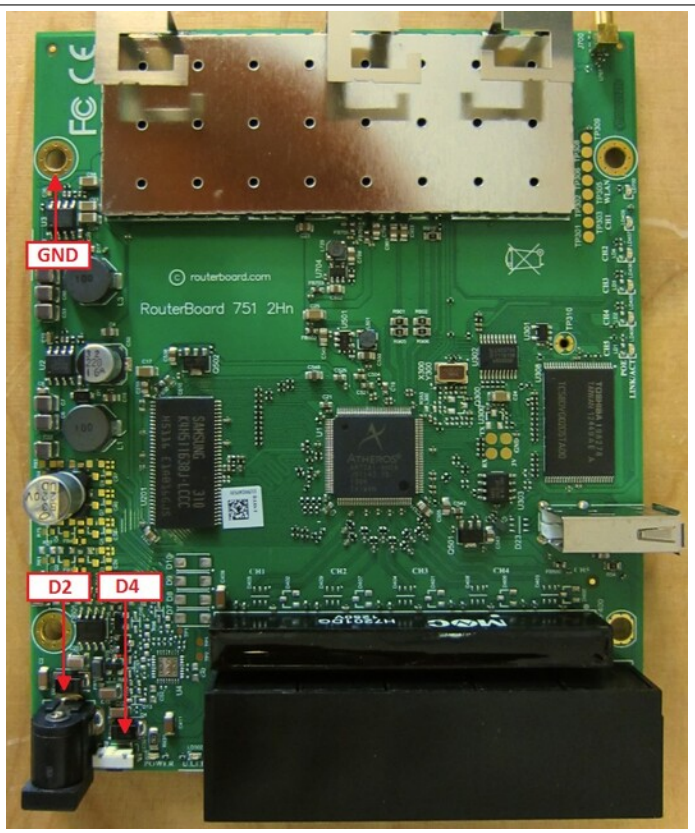
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D2, D4. Location of diodes on the board you can see in the picture 81. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TRF400 pins and Ground. Test points are marked with red dots, see picture 82. Voltage drop value should be in the range from 0,28V to 0,32V. Voltage drop measurement method is described on page 15.



Picture 81

Picture 82

800 SERIES ROUTERBOARDS

RB800

Picture 83

Instructions for checking overvoltage

Checking diodes bridges

Check diodes bridges D17, D21. Location of diodes on the board you can see in the picture 84. Schottky diode quality measurement method is described on page 13.

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D1, D3, D5, D8, D9, D11 pin#1 and Ground also check voltage drop value between Ethernet transformer TR1 pins and Ground. Test points

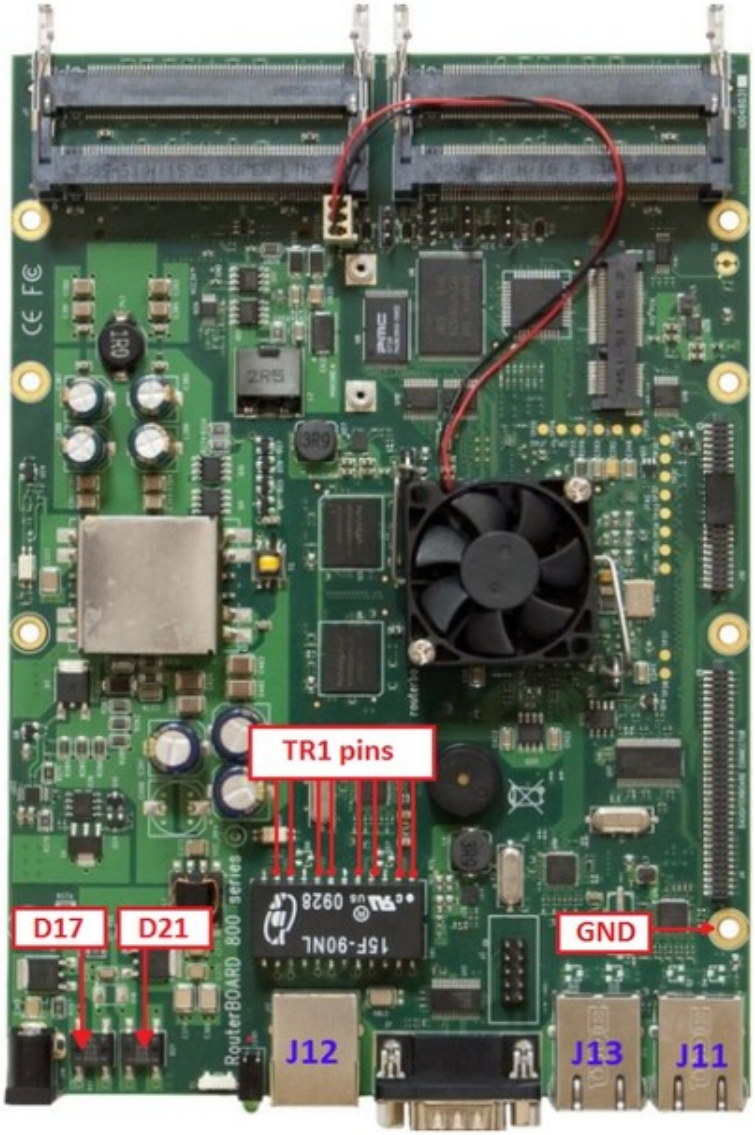
on the transformer pins are marked with red dots, see picture 85. Location of diode arrays on the board you can see in the picture 85. Voltage drop value should be in the range from 0,3V to 0,36V. Voltage drop measurement method is described on page 14.

Checking termination resistors resistance in RJ-45 connector

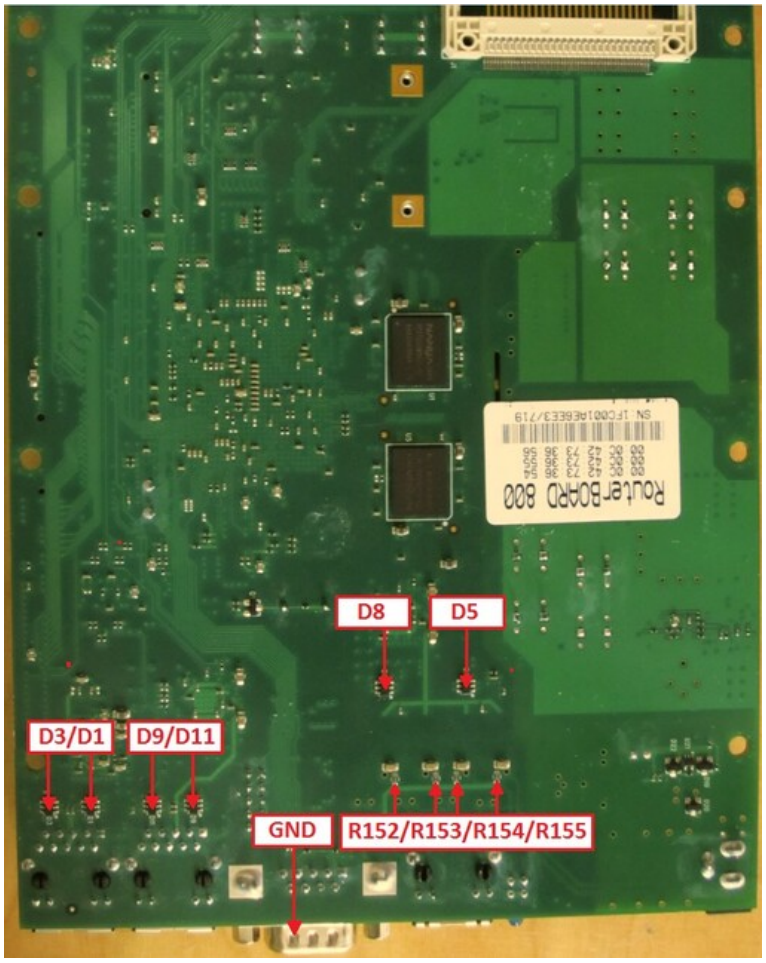
Check termination resistors resistance in J11, J13 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.

Checking 75 Ohm termination resistors resistance

Check resistors R152-R155 resistance value. It should be 75 Ohm +/- 1%. Location of resistors on the board you can see in the picture 85.



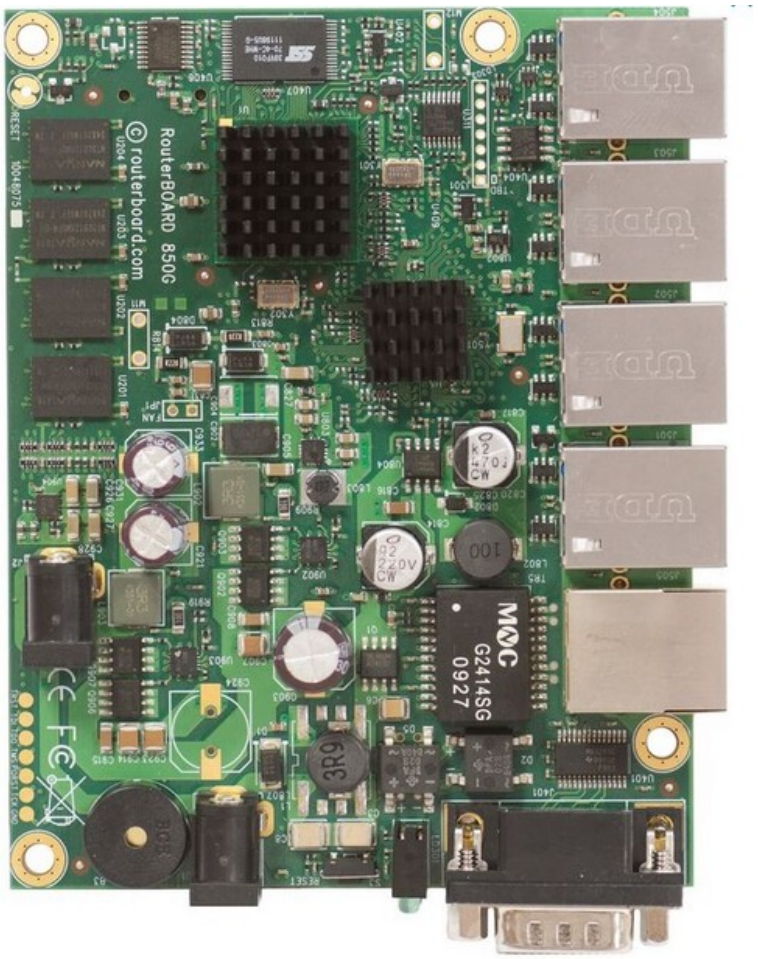
Picture 84



Picture 85

850 SERIES ROUTERBOARDS

RB850Gx2



Picture 86

Instructions for checking overvoltage

Checking Schottky diode and diodes bridges

Check Schottky diode D1 and diodes bridges D2, D5. Location of diodes on the board you can see in the picture 87. Schottky diode quality measurement method is described on page 12 and for diodes bridges 13.

Checking voltage drop value between diode array pin#1 and Ground

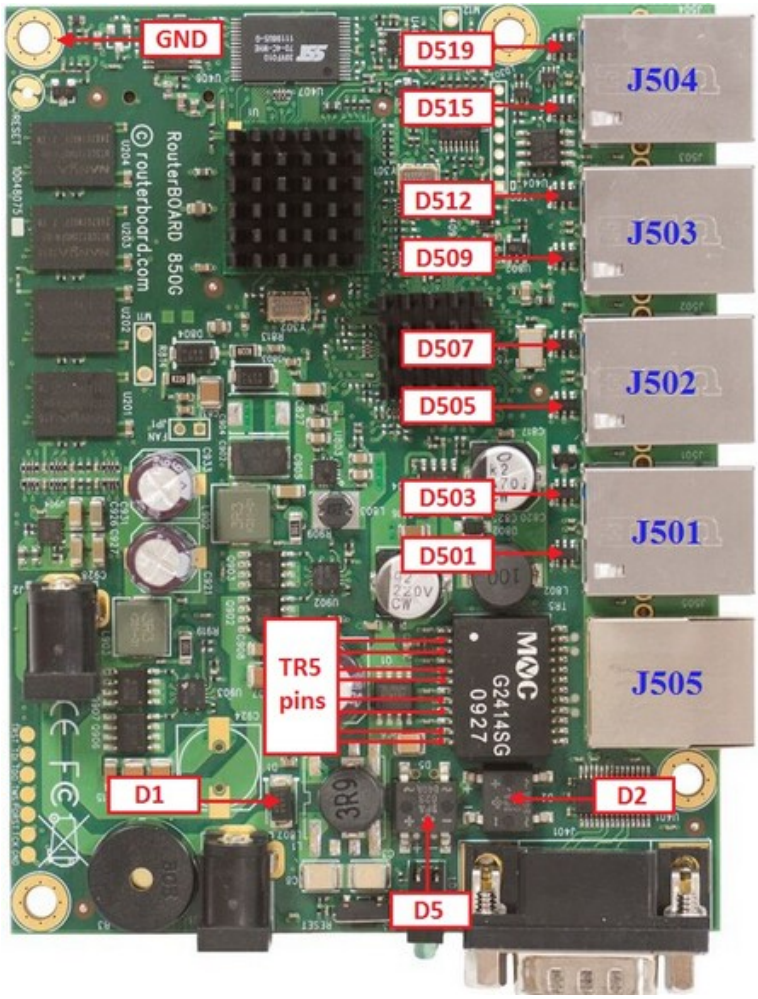
Check voltage drop value between diode arrays D501, D503, D505, D507, D509, D512, D515, D519 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 87. Voltage drop value should be in the range from 0,38 to 0,44V. Voltage drop measurement method is described on page 14.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR5 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 87. Voltage drop value should be in the range from 0,42V to 0,48V. Voltage drop measurement method is described on page 15.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J501-J504 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



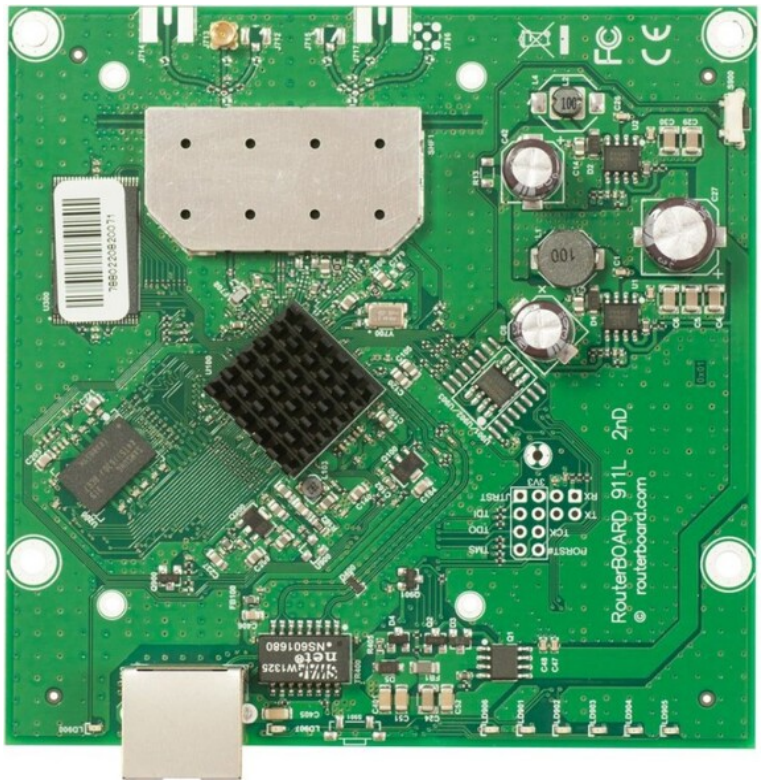
Picture 87

911 SERIES ROUTERBOARDS

911 Lite 2 (RB911-2Hn)

911 Lite 5 (RB911-5Hn)

911 Lite 5 dual (RB911-5HnD)



Picture 88

Instructions for checking overvoltage

Checking Schottky diode

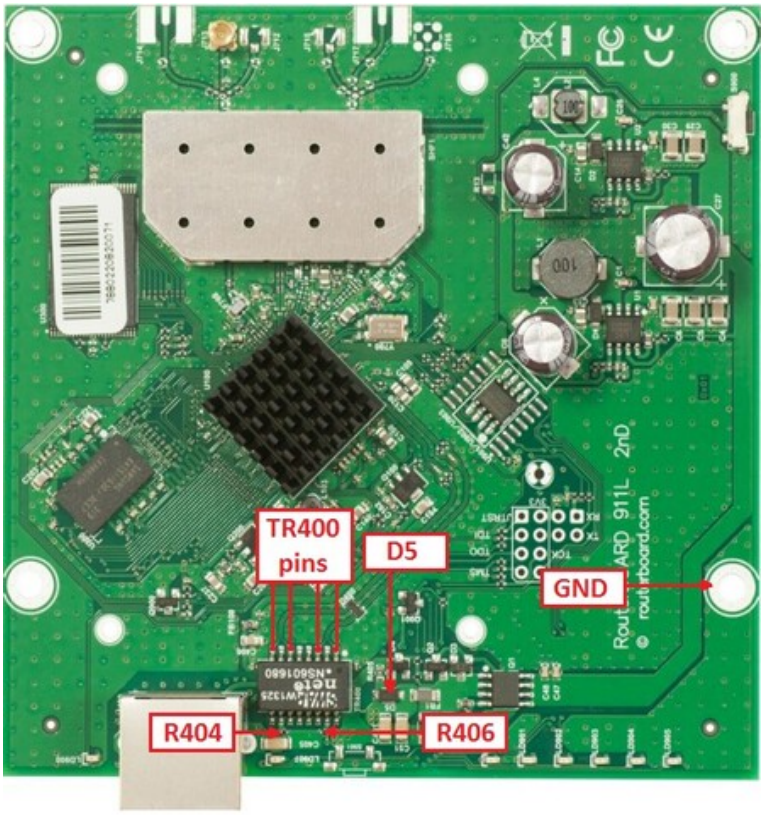
Check Schottky diode D5. Location of diode on the board you can see in the picture 89. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR400 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 89. Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page 15.

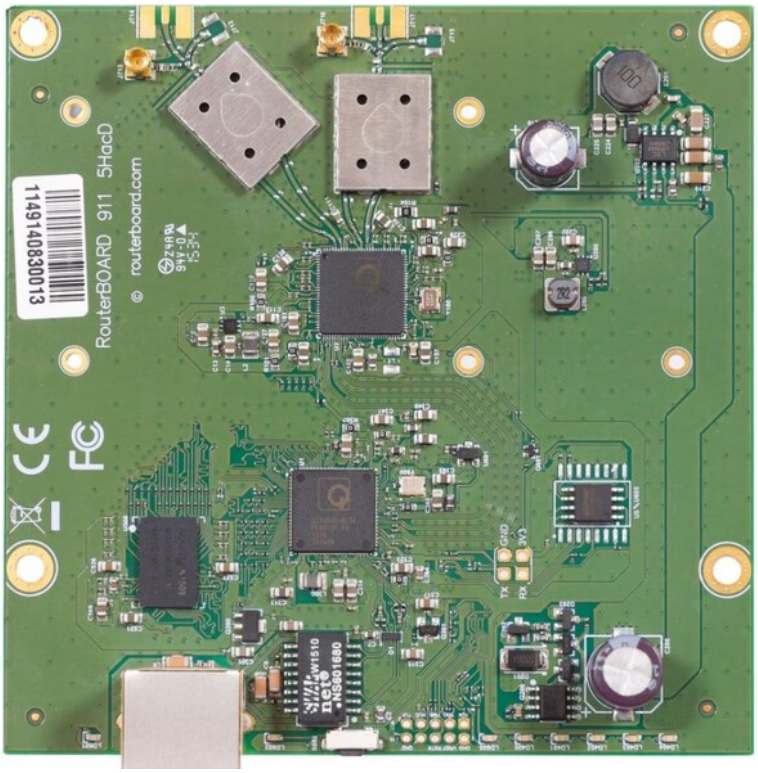
Checking 75 Ohm termination resistors resistance

Check resistors R404, R406 resistance value. It should be 75 Ohm +/- 1%. Location of resistors on the board you can see in the picture 89.



Picture 89

911 Lite 5 ac (RB911-5HacD



Picture 90

Instructions for checking overvoltage

Checking Schottky diode

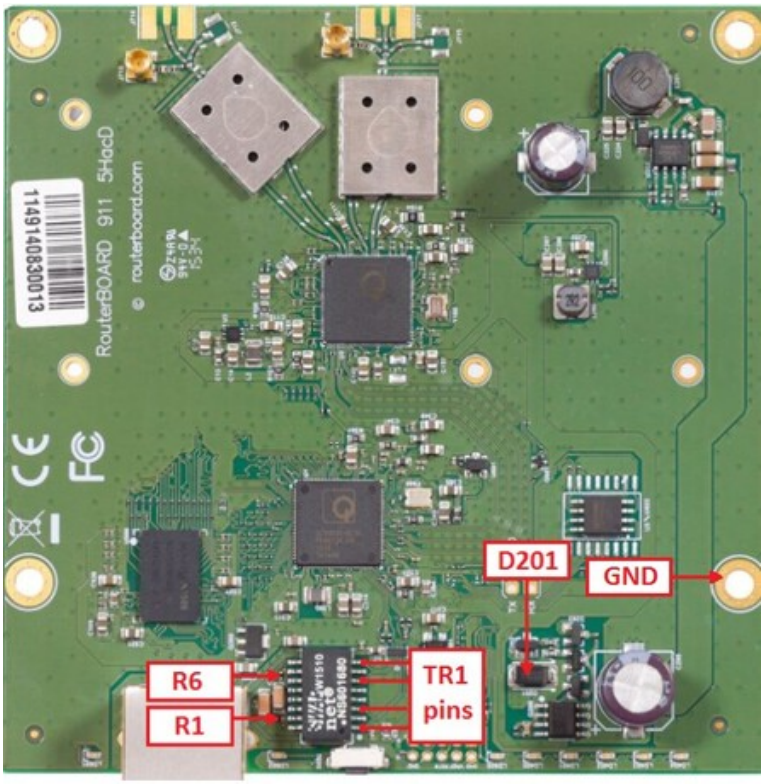
Check Schottky diode D201. Location of diode on the board you can see in the picture 91. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 91. Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described on page 15.

Checking 75 Ohm termination resistors resistance

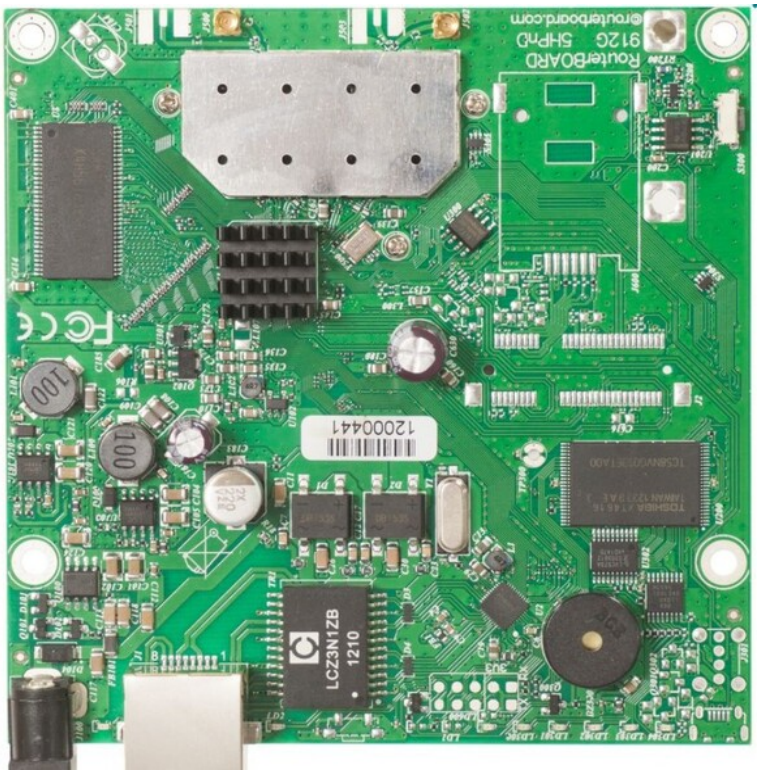
Check resistors R1, R6 resistance value. It should be 75 Ohm +/- 1%. Location of resistors on the board you can see in the picture 91.



Picture 91

RB911G-2HPnD

RB911G-5HPnD



Picture 92

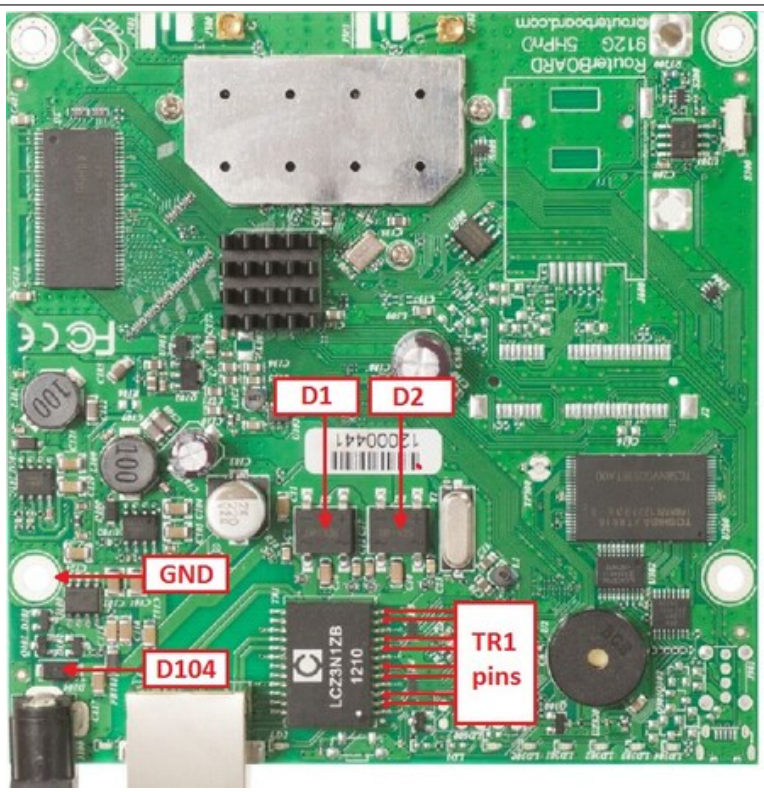
Instructions for checking overvoltage

Checking Schottky diode and diodes bridges

Check Schottky diode D104 and diodes bridges D1, D2. Location of diodes on the board you can see in the picture 93. Schottky diode quality measurement method is described on page 12. Diodes quality measurement method is described on page 13.

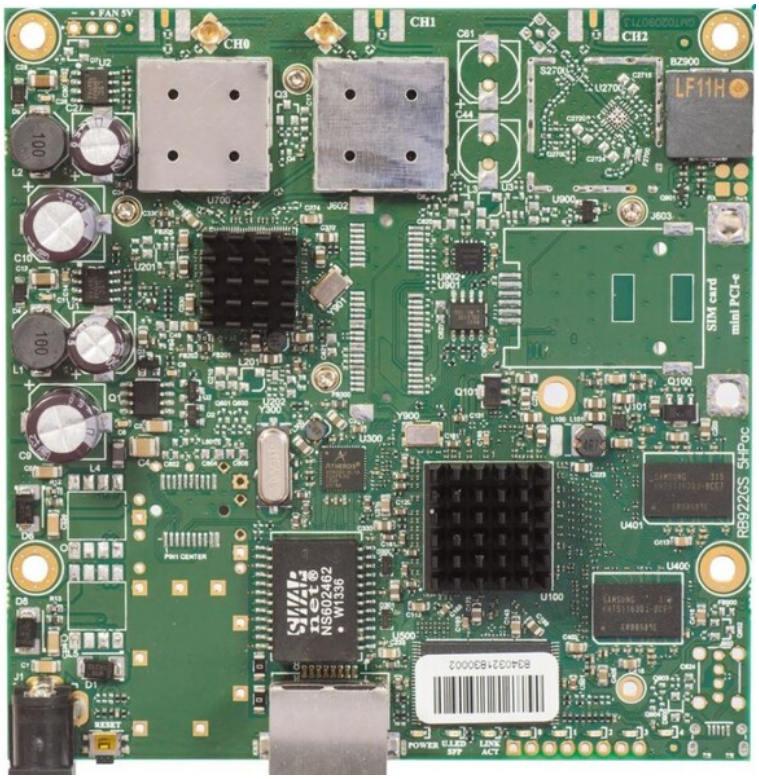
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 93. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.



Picture 93

RB911G-5HPacD



Picture 94

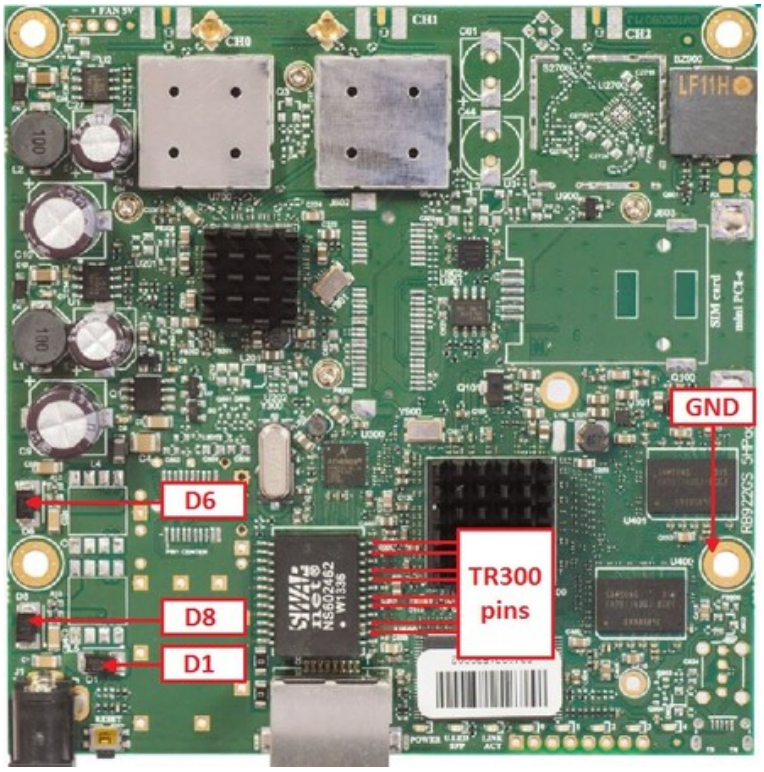
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D1, D6, D8. Please, take note that Netbox has an exception where schottky diode D1 does not have to be measured. Location of diodes on the board you can see in the picture 95. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR300 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 95. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.

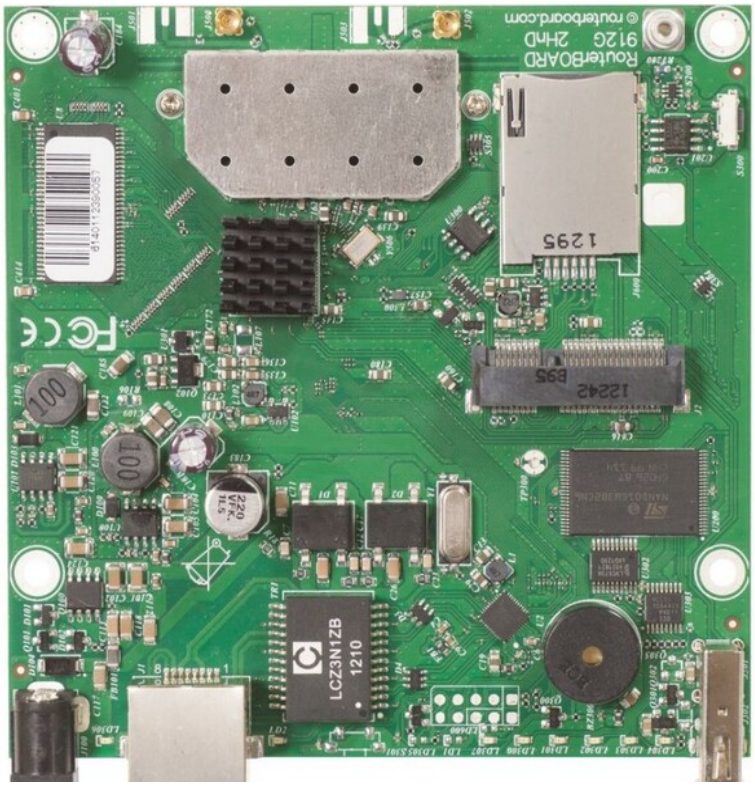


Picture 95

912 SERIES ROUTERBOARDS

RB912UAG-2HPnD

RB912UAG-5HPnD



Picture 96

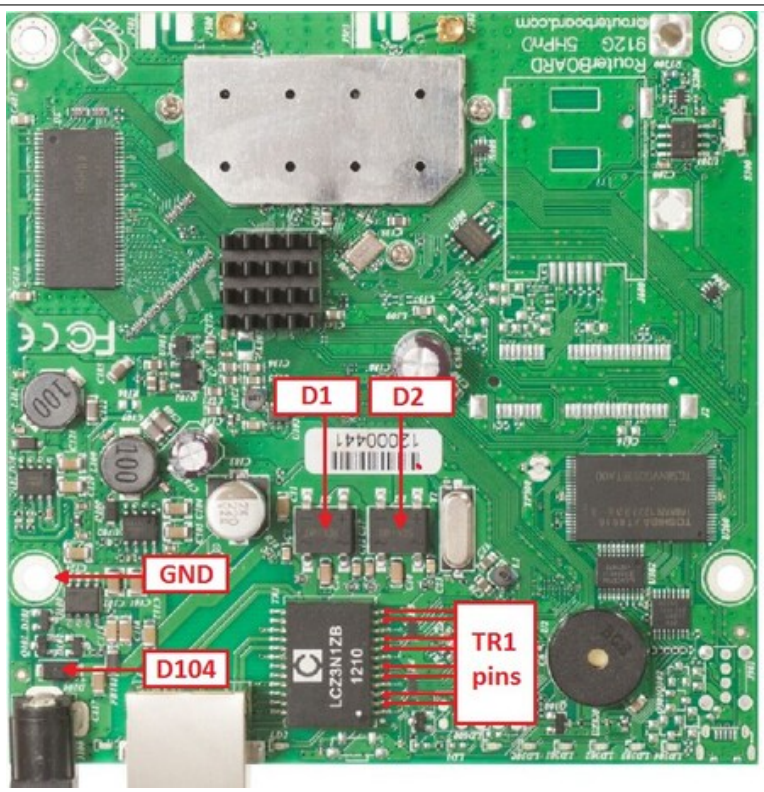
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diode D104 and diodes bridges D1, D2. Location of diodes on the board you can see in the picture 97. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

Checking voltage drop value between Ethernet transformer pins and Ground

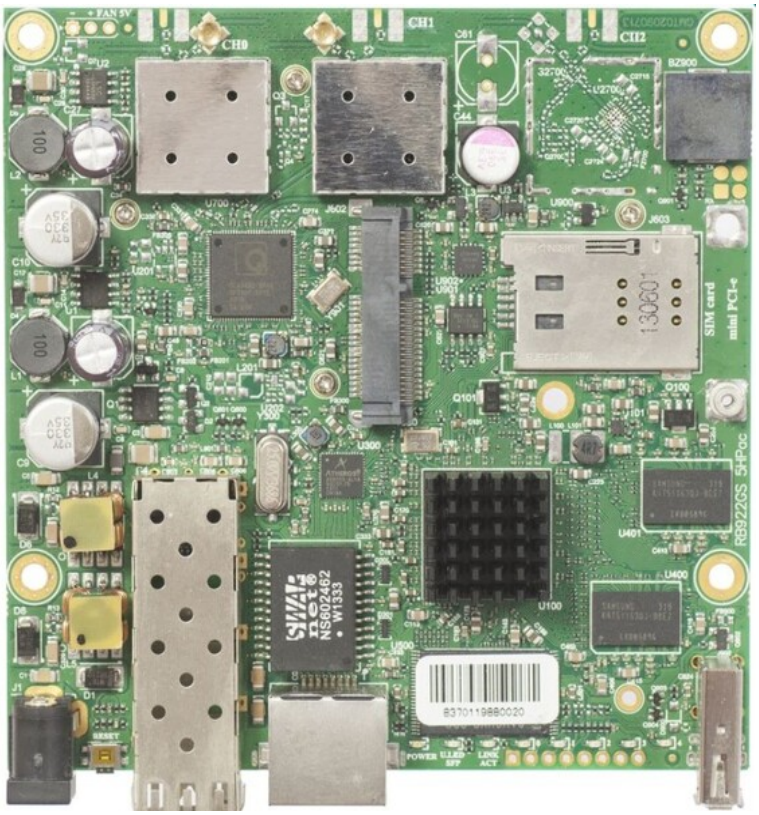
Check voltage drop value between TR1 and Ground. Test points on the transformer pins are marked with red dots, see picture 97. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.



Picture 97

922 SERIES ROUTERBOARDS

RB922UAGS-5HPacD



Picture 98

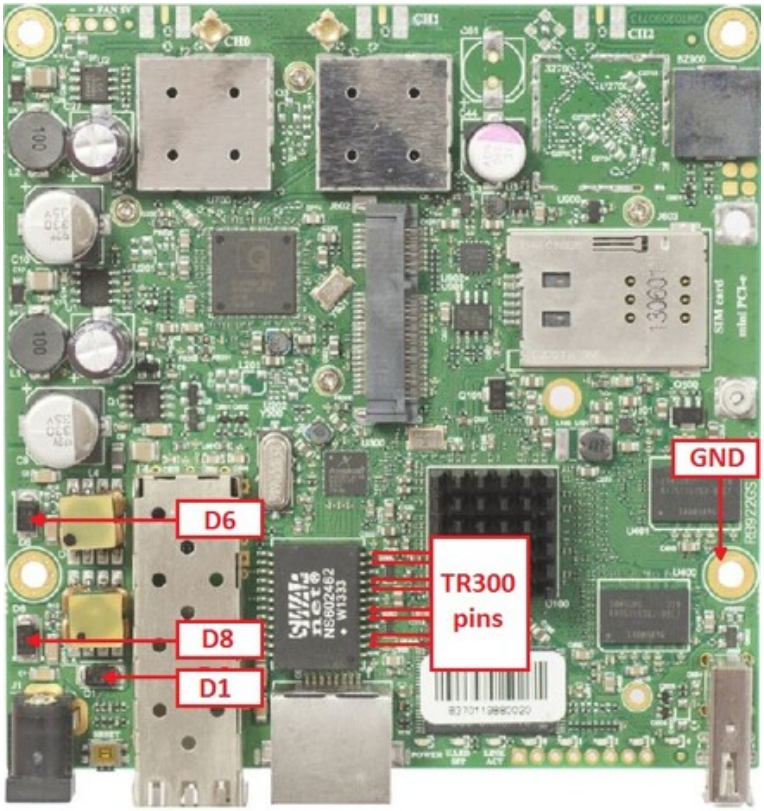
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D1, D6, D8. Diode D6 may not be present on some revisions of the RouterBOARD, if so please ignore it. Location of diodes on the board you can see in the picture 99. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR300 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 99. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.



Picture 99

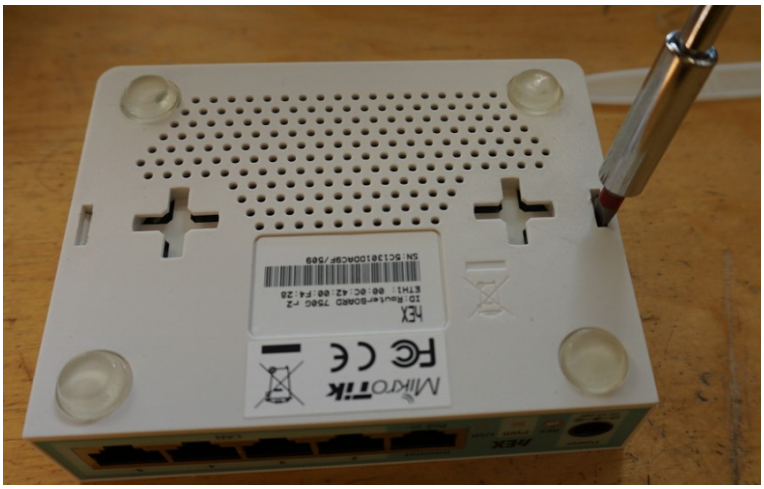
950 SERIES ROUTERBOARDS

RB951-2Hn

Picture 100

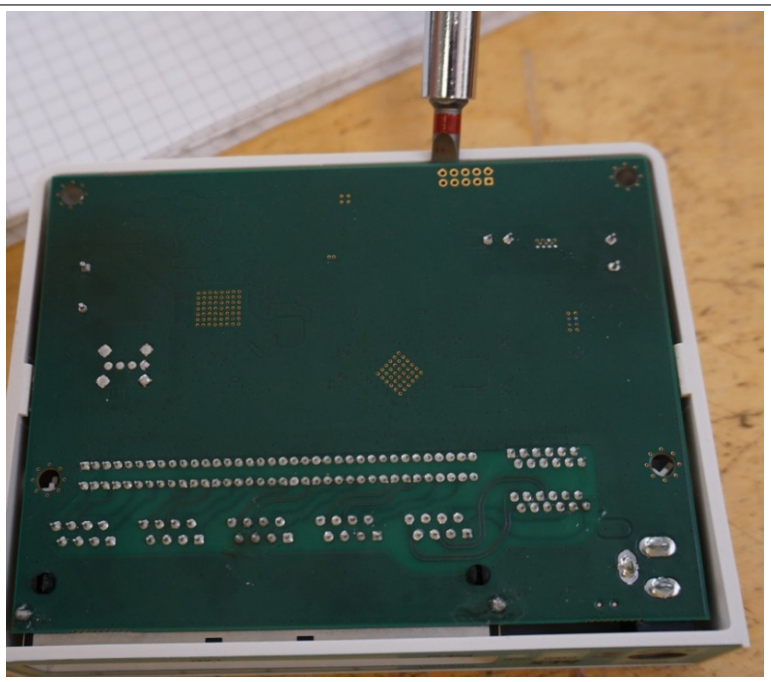
Disassembling information

Step 1: Take off the cover as shown in the picture 101.



Picture 101

Step 2: Take out the board as shown in the picture 102.



Picture 102

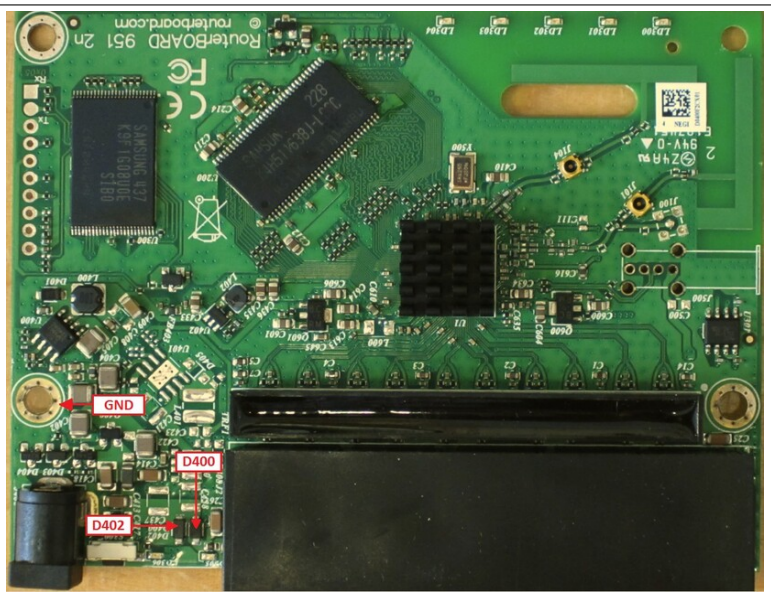
Instructions for checking overvoltage

Checking Schottky diodes

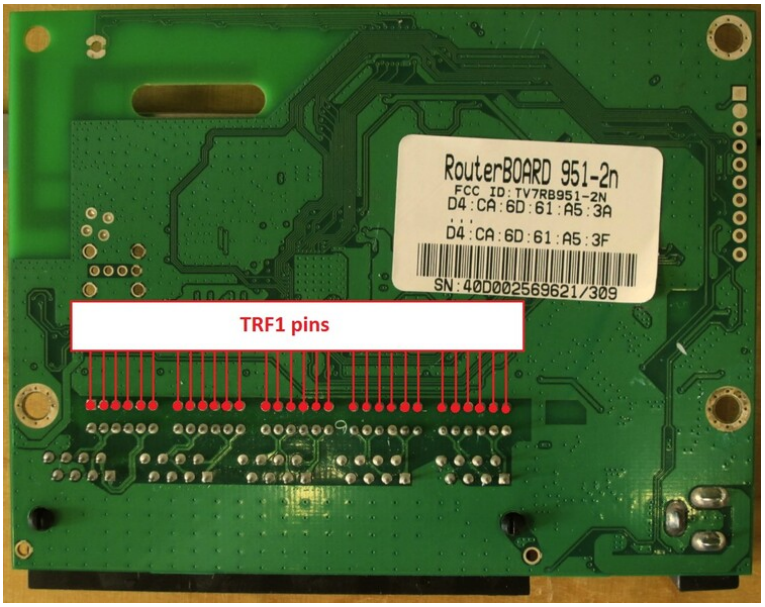
Check Schottky diodes D400, D402. Location of diodes on the board you can see in the picture 103. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet Transformer TRF1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 104. Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page 15.



Picture 103



Picture 104

RB951G-2HnD

Picture 105

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page 43.

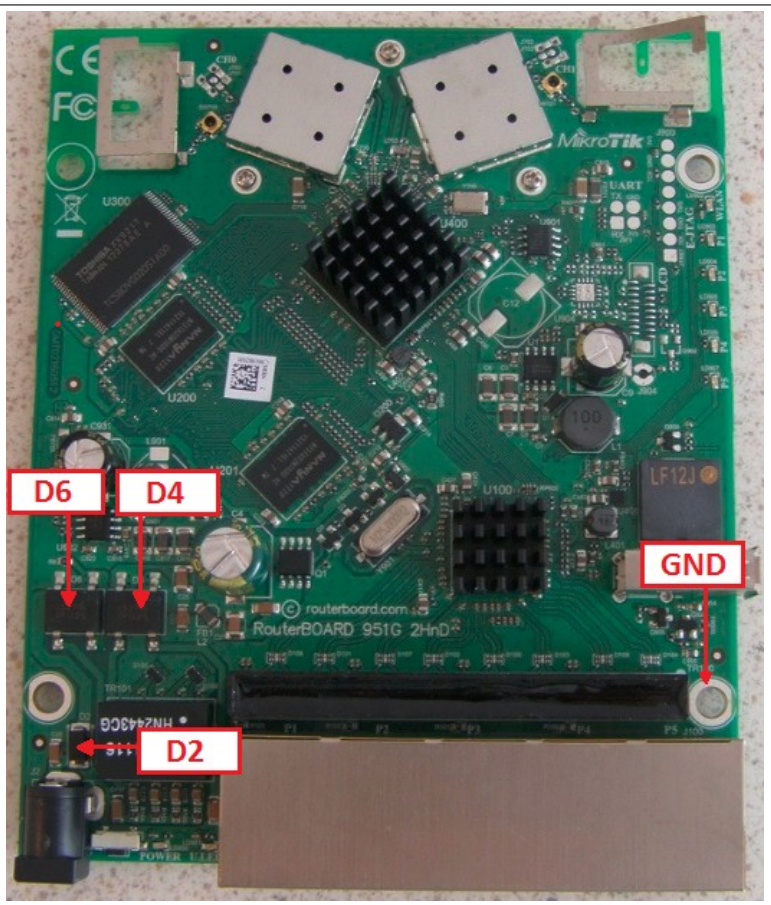
Instructions for checking overvoltage

Checking Schottky diode and diodes bridges

Check Schottky diode D2 and diodes bridges D4, D6. Location of diodes on the board you can see in the picture 106. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR100, TR101 pins and Ground. Test points on the transformers pins are marked with red dots, see picture 107. Voltage drop value between transformer TR100 pins and Ground should be in the range from 0,36V to 0,4V, but between transformer TR101 pins and Ground in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.


D6
D4
GND
D2
MikroTik
RouterBOARD 951G 2HnD
routerboard.com

Picture 106


GND
RB951G-2HnD
RouterBOARD 951G 2HnD
routerboard.com
26%
TR100 pins
TR101 pins
MikroTik

Picture 107

RB951Ui-2HnD

Picture 108

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page 43.

Instructions for checking overvoltage

Checking Schottky diodes

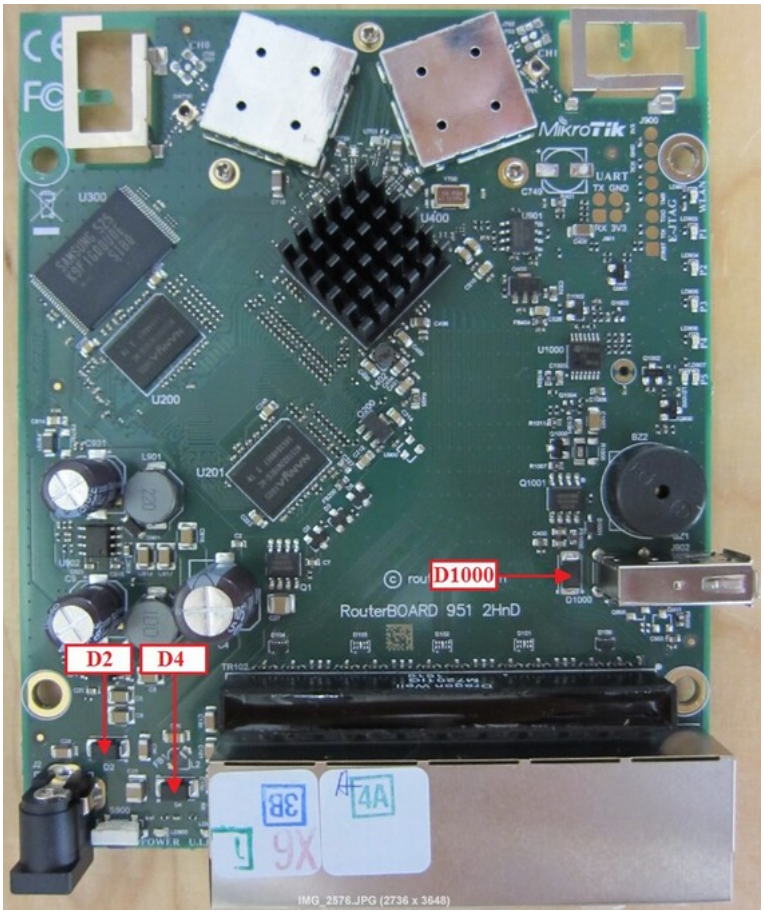
Check Schottky diodes D2, D4, D1000. Location of diodes on the board you can see in the picture 109. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR102 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 110. Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page 15.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J101 connector (in the each Ethernet ports). Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



Picture 109

Picture 110

RB953GS-5HnT

Picture 111

Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D101, D102, D104. Location of diodes on the board you can see in the picture 112. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 113. Voltage drop value should be in the range from 0,42V to 0,48V. Voltage drop measurement method is described on page 15.

Checking termination resistors resistance in RJ-45 connector

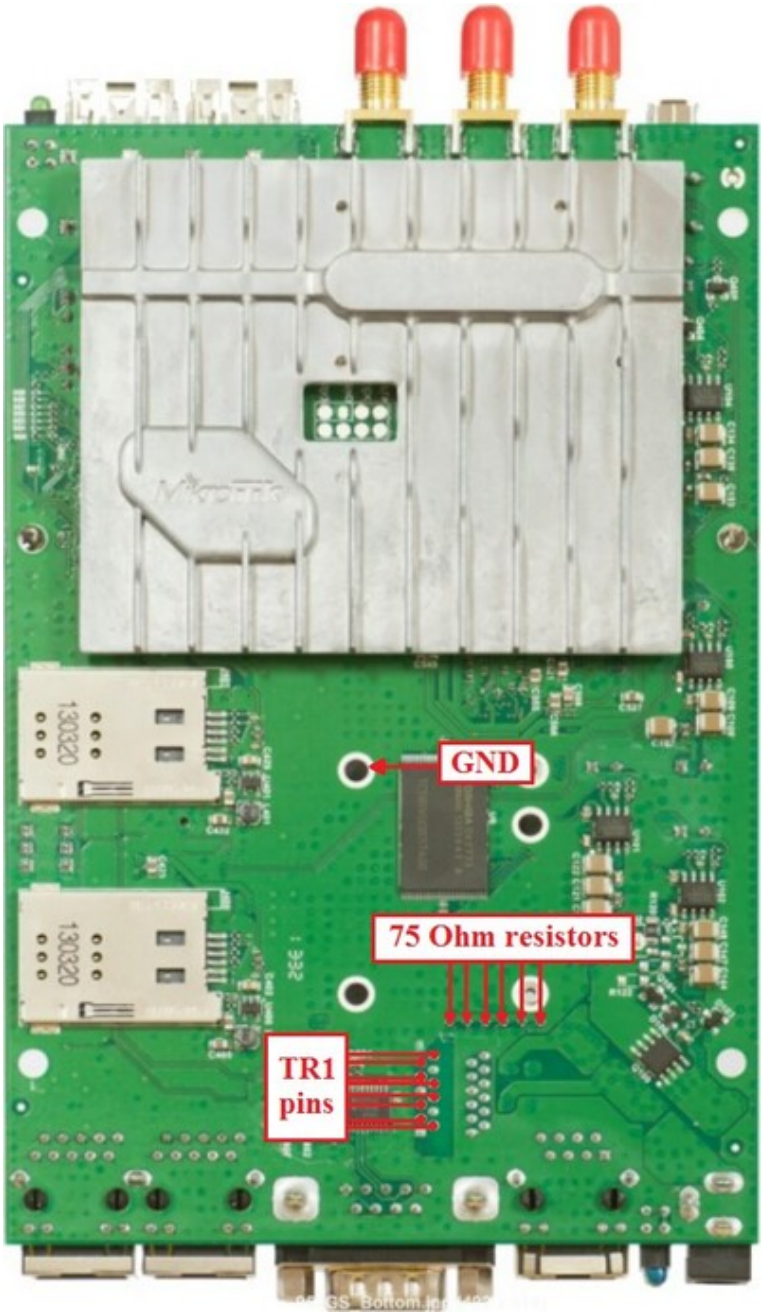
Check termination resistors resistance in J6, J7 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.

Checking 75 Ohm termination resistors resistance

Check resistors R36, R38, R39, R42, R44, R45 resistance value. It should be 75 Ohm +/- 1%. Location of resistors on the board you can see in the picture 113.


D104
D102
D101
PoE
RouterBOARD
953GS-5HPnT
© routerboard.com
1321
1321

Picture 112



Picture 113

CLOUD CORE ROUTER 1009 SERIES ROUTERBOARDS

CCR1009-7G-1C-PC

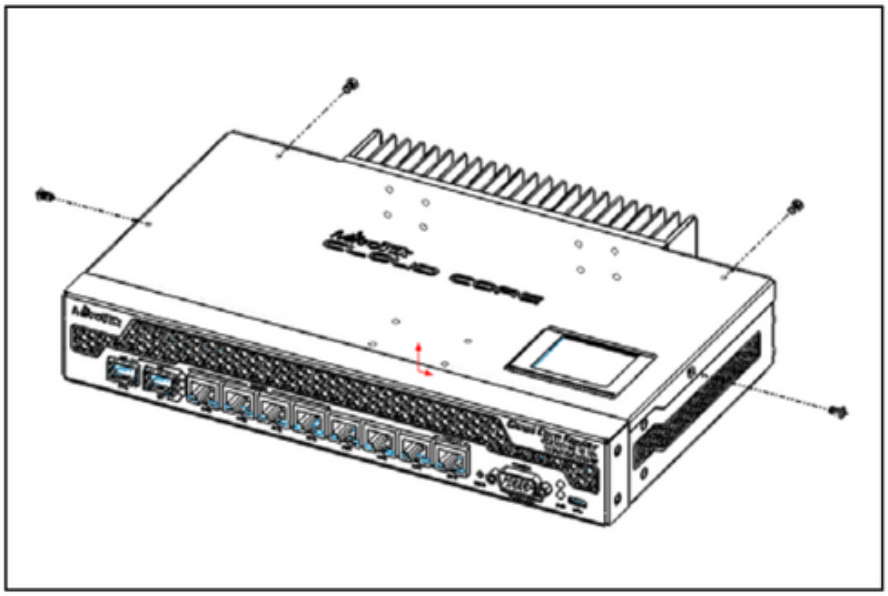
CCR1009-7G-1C-1S+

CCR1009-7G-1C-1S+PC

Picture 114

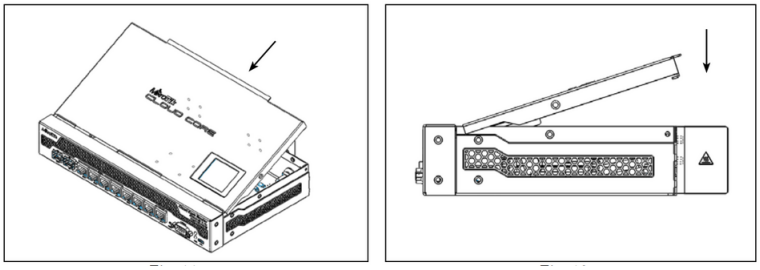
Disassembling information

Step 1: Unscrew 4 screws using PH2 screwdriver. Location of screws you can see in the picture 115.



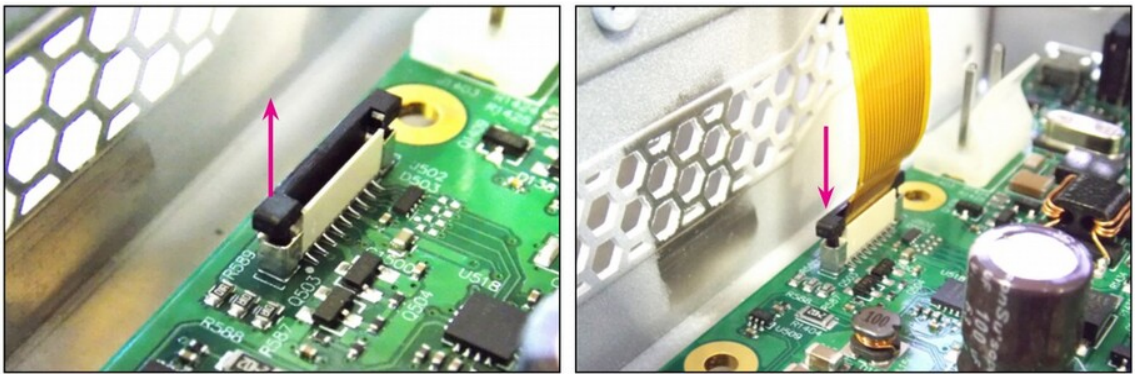
Picture 115

Step 2: Carefully take off the cover as showed in the picture 116. Do not damage the LCD flex cable.



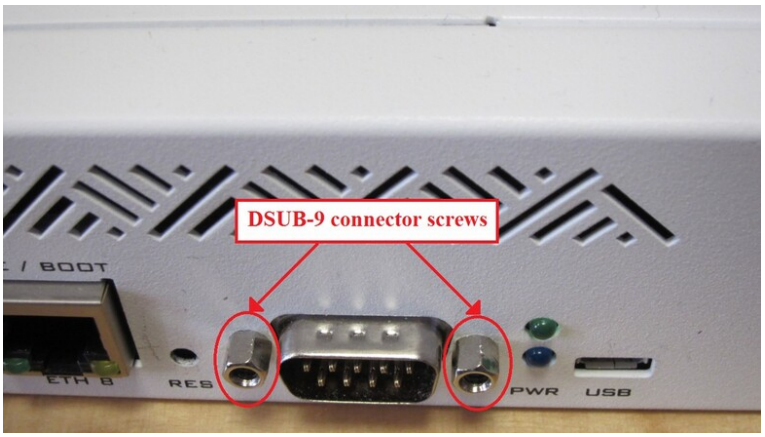
Picture 116

Step 3: Gently lift the latch vertically upward and take out LCD flex cable from FPC connector as showed in the picture 117. Do not damage the FPC connector locking drawer.



Picture 117

Step 4: Detach a male DSUB-9 connector from board case unscrewed 2 screws. Location of the screws you can see in the picture 118.



Picture 118

Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D1401-D1403, D1405. Location of diodes on the board you can see in the picture 119. Schottky diode quality measurement method is described on page 12.

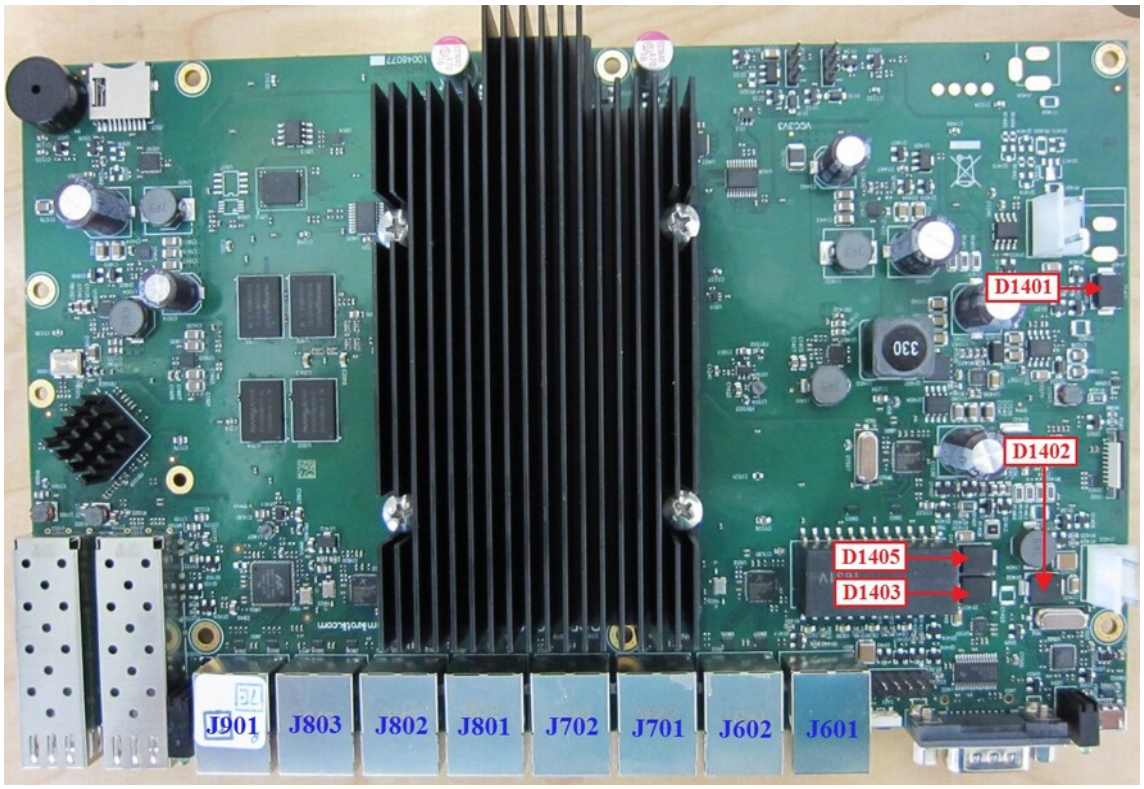
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 120. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.

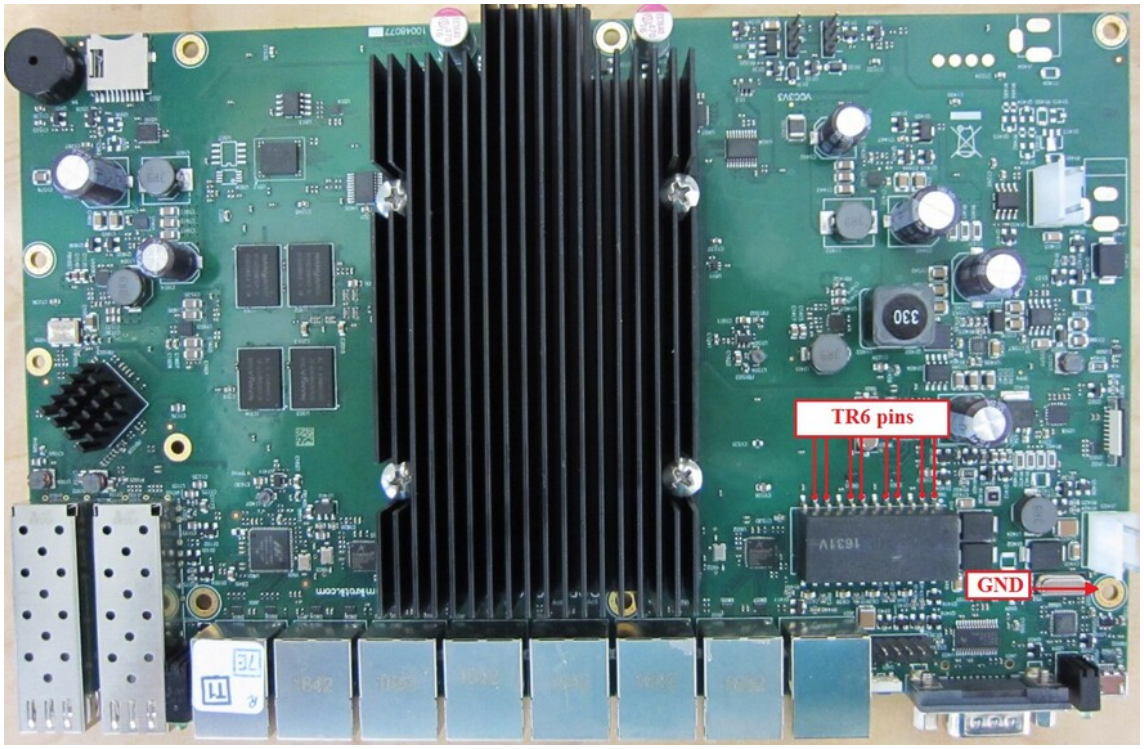
Check voltage drop value between RJ-45 connectors J602, J701, J702, J801, J802, J803 and ground. Test points are shown in picture 121. Voltage drop value should be in the range from 0,36V to 0,40V. Voltage drop measurement method is described on page 15.

Checking termination resistors resistance in RJ-45 connector

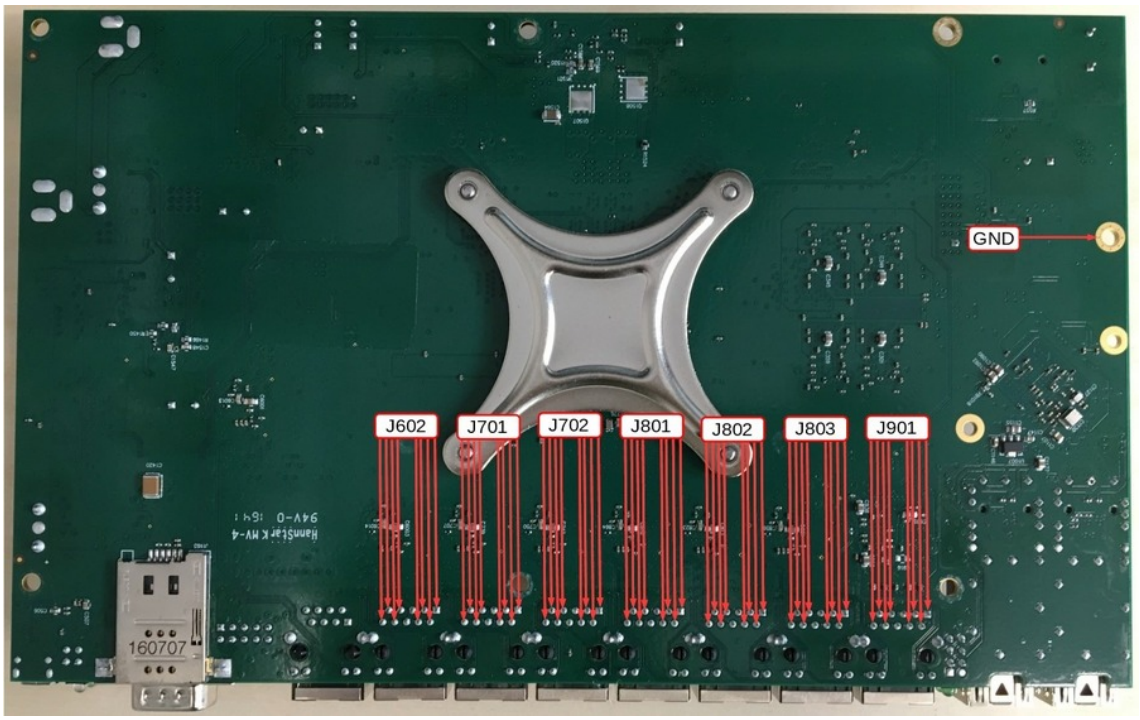
Check termination resistors resistance in J602, J701, J702, J801-J803, J901 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page 16.



Picture 119



Picture 120



Picture 121

CCR1009-8G-1S-1S+

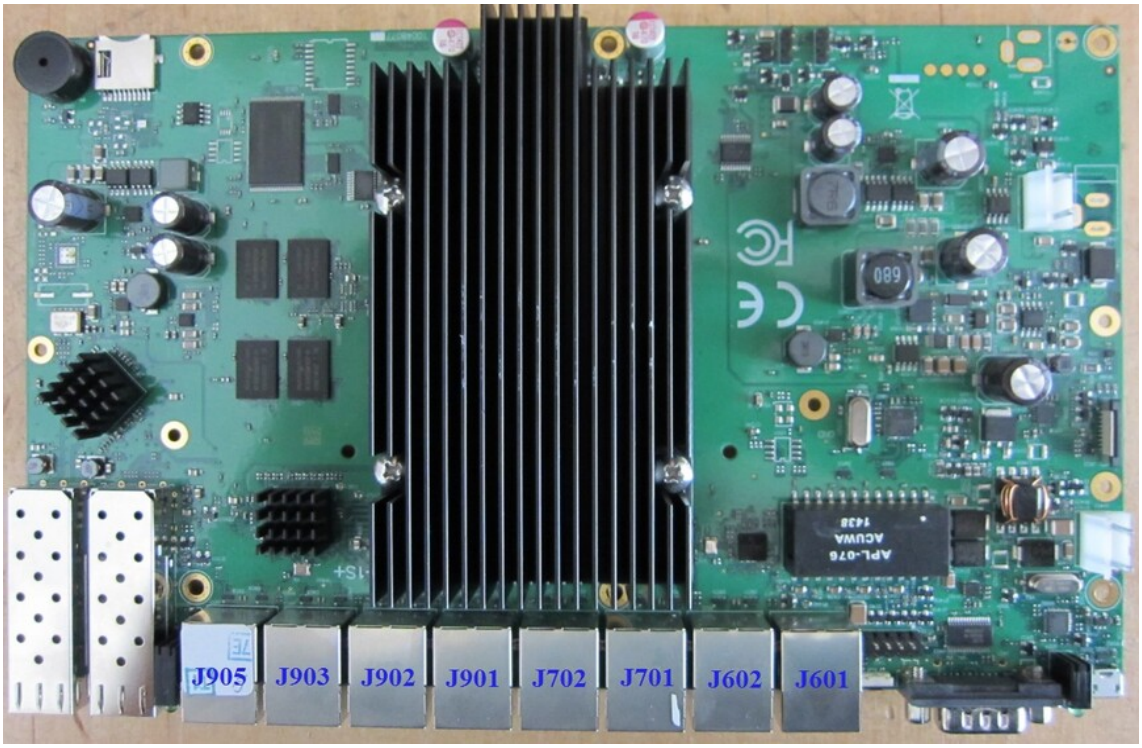
Picture 122

Disassembling information

Disassembly method of the board is the same as the CCR1009-7G board. Disassembly method is described on page 122.

Instructions for checking overvoltage

Over-voltage testing procedure and the layout of the components (with exception of Ethernet ports reference numbers, see picture 123) on the board is the same as for CCR1009-7G boards, see on page 124.



Picture 123

CCR1009-8G-1S

Picture 124

Disassembling information

Step 1: Unscrew 7 screws (5 screws on the board case backside and 1 screw from the each side of board case) using PH2 screwdriver. Location of screws see in the picture 125.

Picture 125

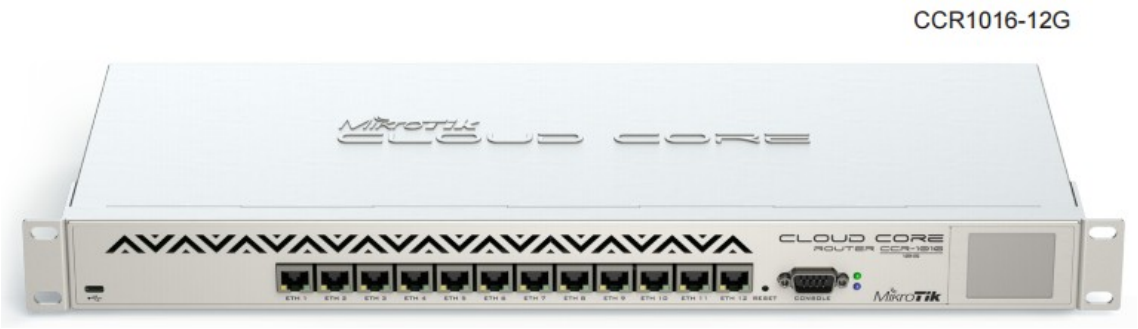
Step 2: Take off the cover.

Instructions for checking overvoltage

Over-voltage testing procedure and the layout of the components (with exception of Ethernet ports reference numbers, see picture 123) on the board is the same as for CCR1009-7G boards, see on page 124.

CLOUD CORE ROUTER 1016 SERIES ROUTERBOARDS

CCR1016-12G



Picture 126

Disassembling information

Disassembly method of the board is the same as the CCR1009-8G-1S board. Disassembly method is described on page 127.

Instructions for checking overvoltage

Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop value between diode arrays D115, D117, D111, D113, D105, D107, D101, D103, D905, D907, D901, D903, D805, D807, D801, D803, D705, D707, D701, D703, D605, D607 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 127.

For diode arrays D601, D603 pin#1 and Ground voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop value should be in the range from 0,36V to 0,4V. Location of diode arrays on the board you can see in the picture 127.

Voltage drop measurement method is described on page 14.

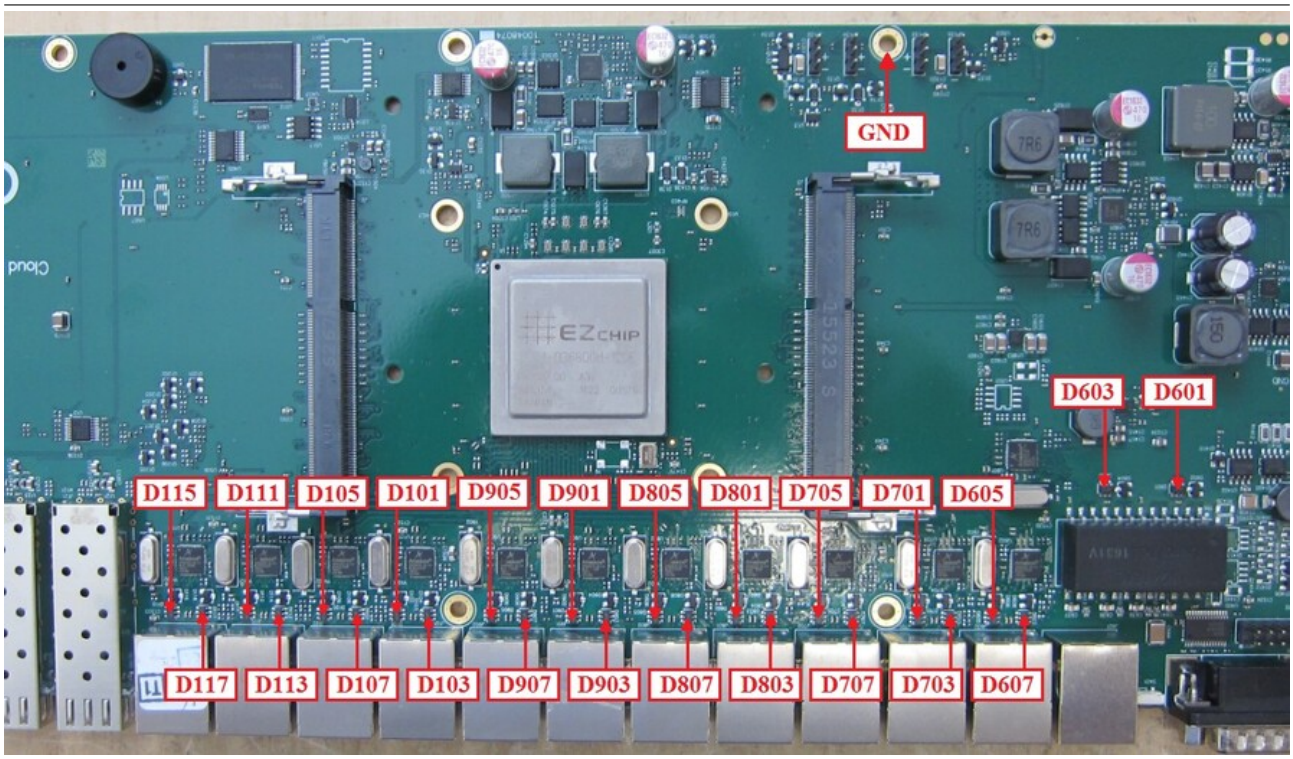
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 128.

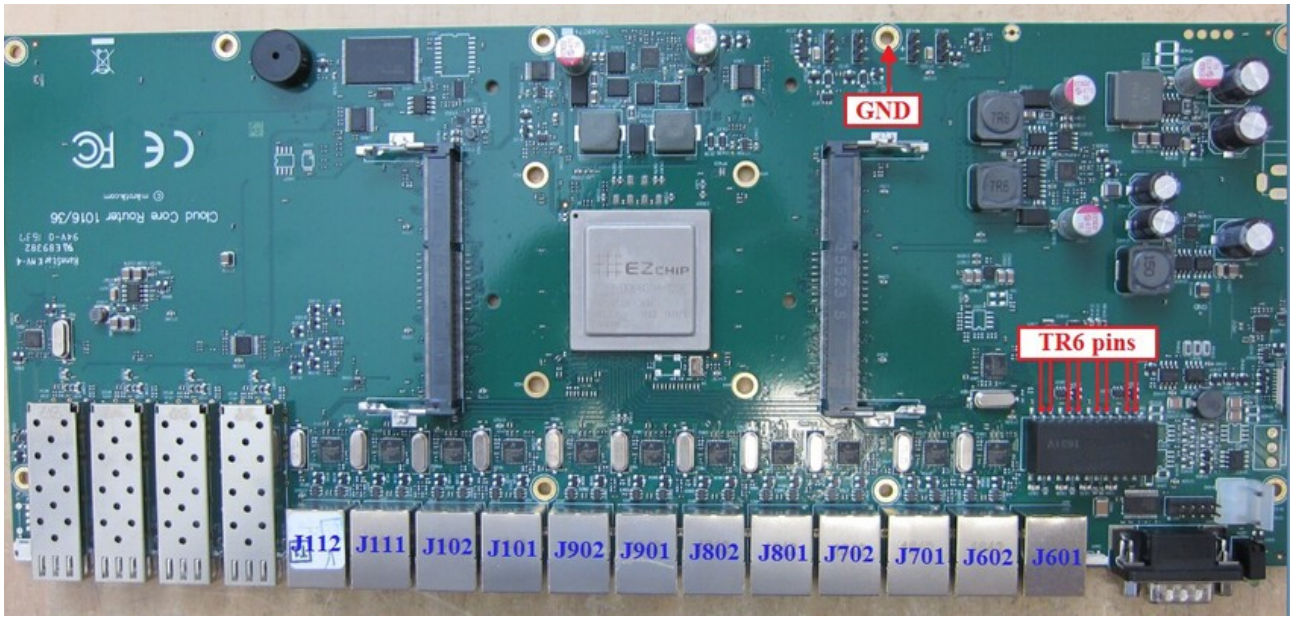
Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J602, J701, J702, J801, J802, J901, J902, J101, J102, J111, J112 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page 16.



Picture 127



Picture 128

CCR1016-12G rev2

Picture 129

Disassembling information

Disassembly method of the board is the same as the CCR1036-8G-2S+ rev2 board. Disassembly method is described on page 138.

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

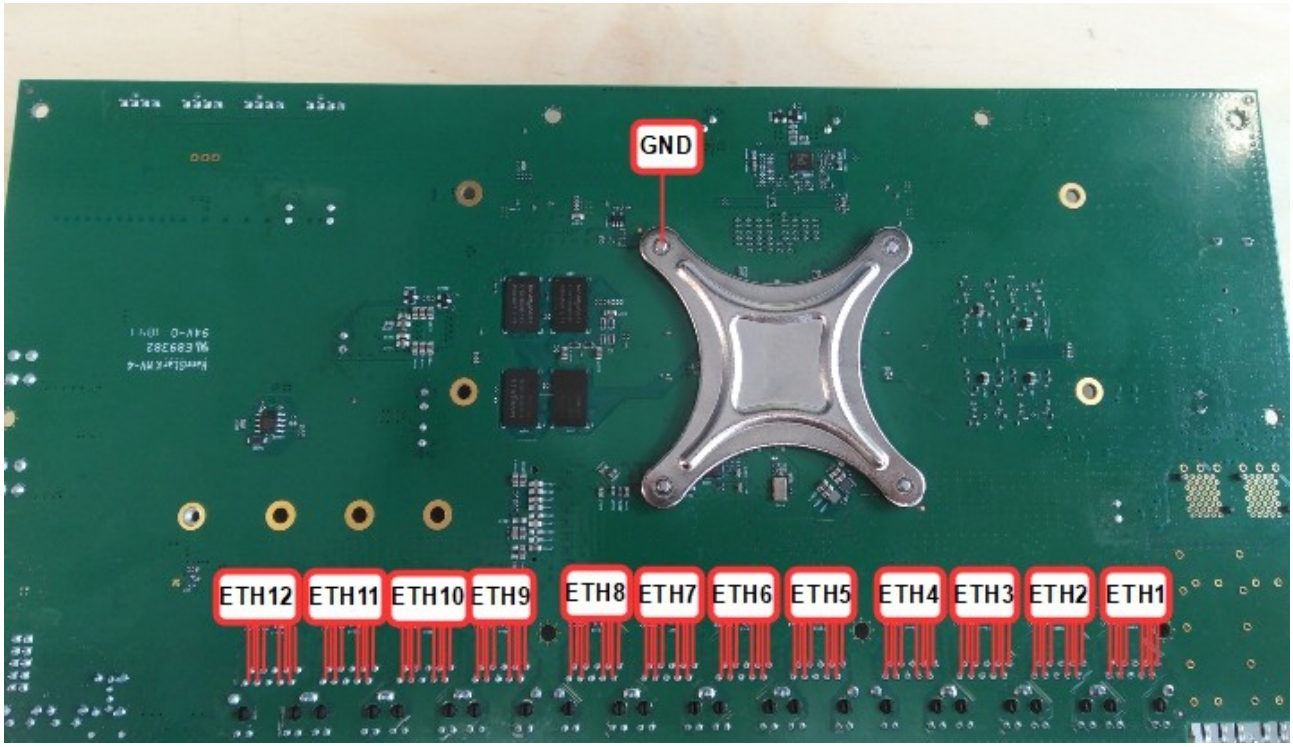
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture 130.

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page 15.

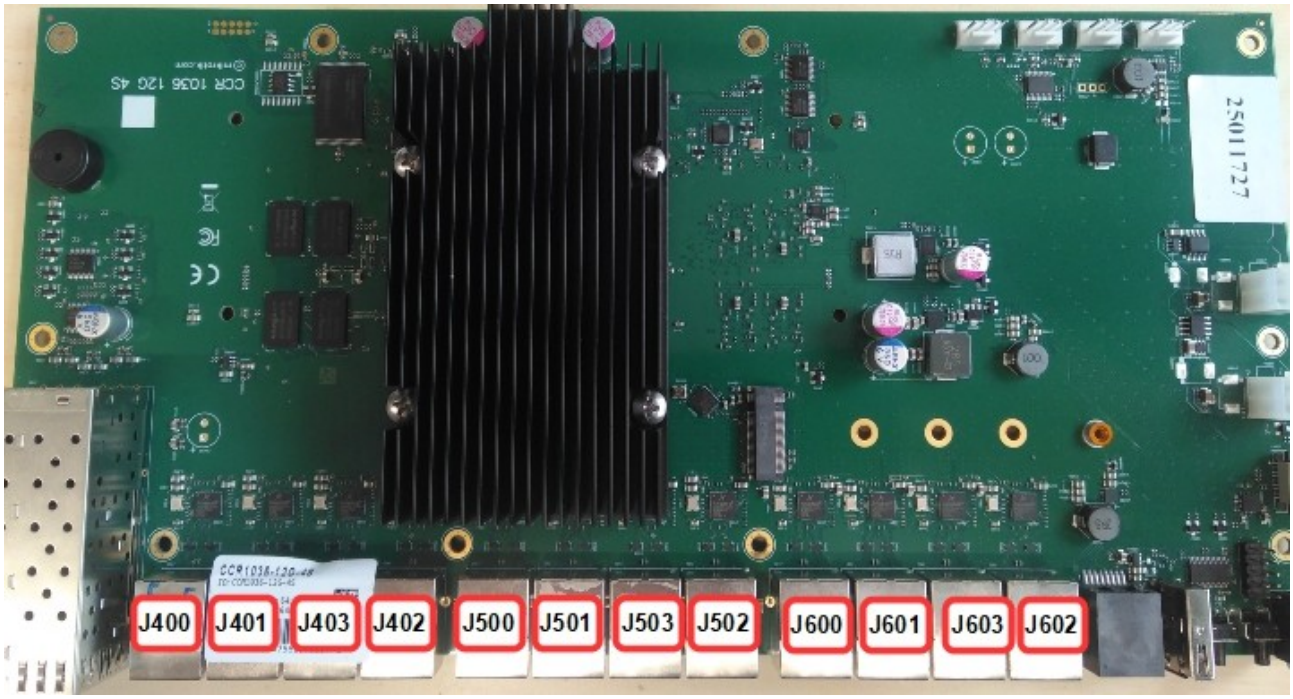
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J400 - J602 connector. RJ-45 placement is shown in picture 131.

Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page 16.



Picture 130



Picture 131

CCR1016-12S-1S+

CCR1016-12S-1S+ rev2

Picture 132

Instructions for checking overvoltage

Not required to do over-voltage test.

CLOUD CORE ROUTER 1036 SERIES ROUTERBOARDS

CCR1036-8G-2S+

CCR1036-8G-2S+EM

Picture 133

Disassembling information

Disassembly method of the board is the same as the CCR1009-8G-1S board. Disassembly method is described on page 127.

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

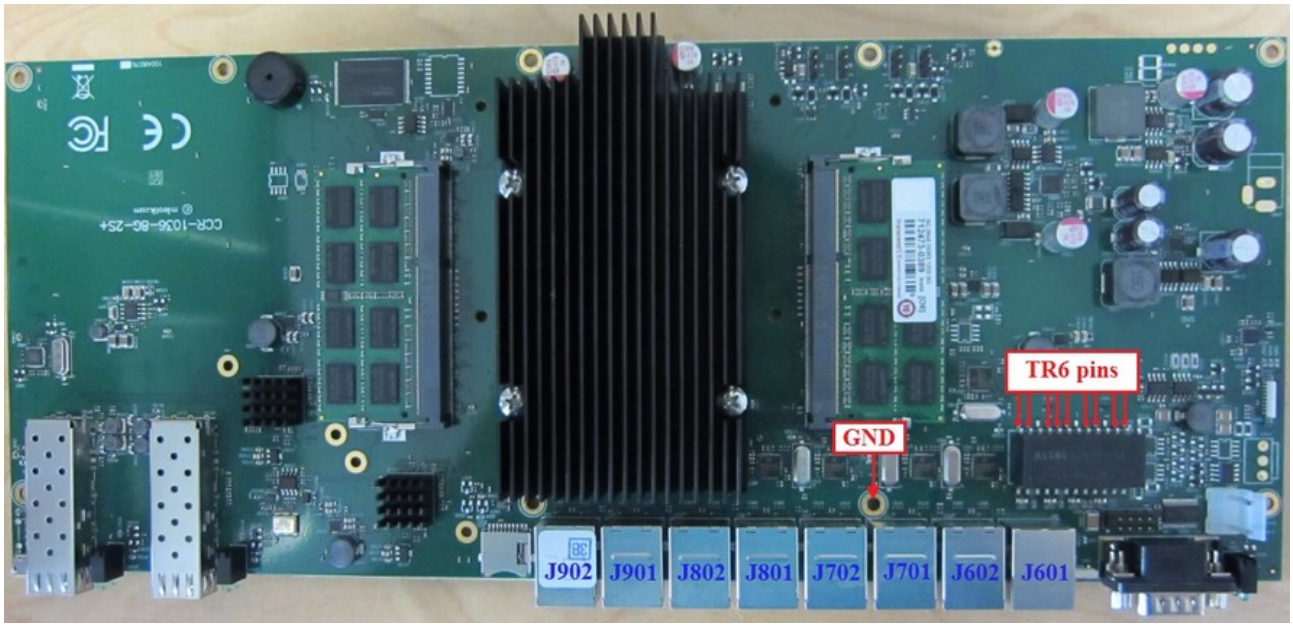
Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 134.

Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J602, J701, J702, J801, J802, J901, J902 connector as shown in the picture 134.

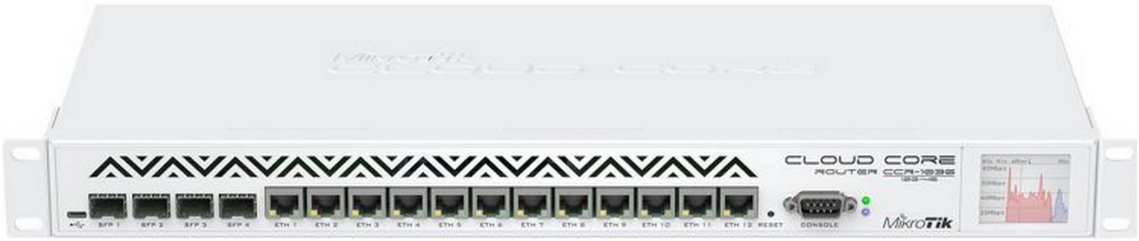
Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page 16.



Picture 134

CCR1036-12G-4S

CCR1036-12G-4S-EM



Picture 135

Disassembling information

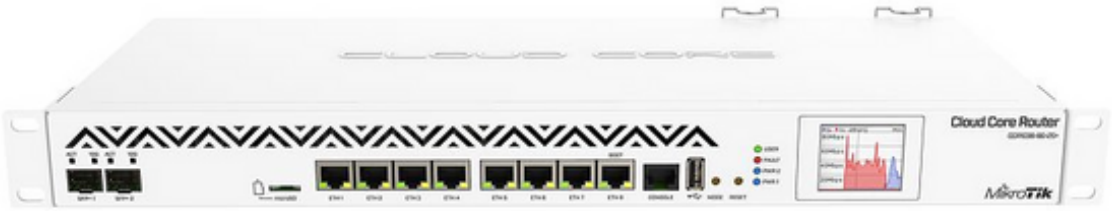
Disassembly method of the board is the same as the CCR1016-12G board. Disassembly method is described on page 129.

Instructions for checking overvoltage

Over-voltage testing procedure, the layout of the components on the board and measurement values is the same as for CCR1016-12G board, see on page 129.

CCR1036-8G-2S+ rev2

CCR1036-8G-2S+EM r2



Picture 136

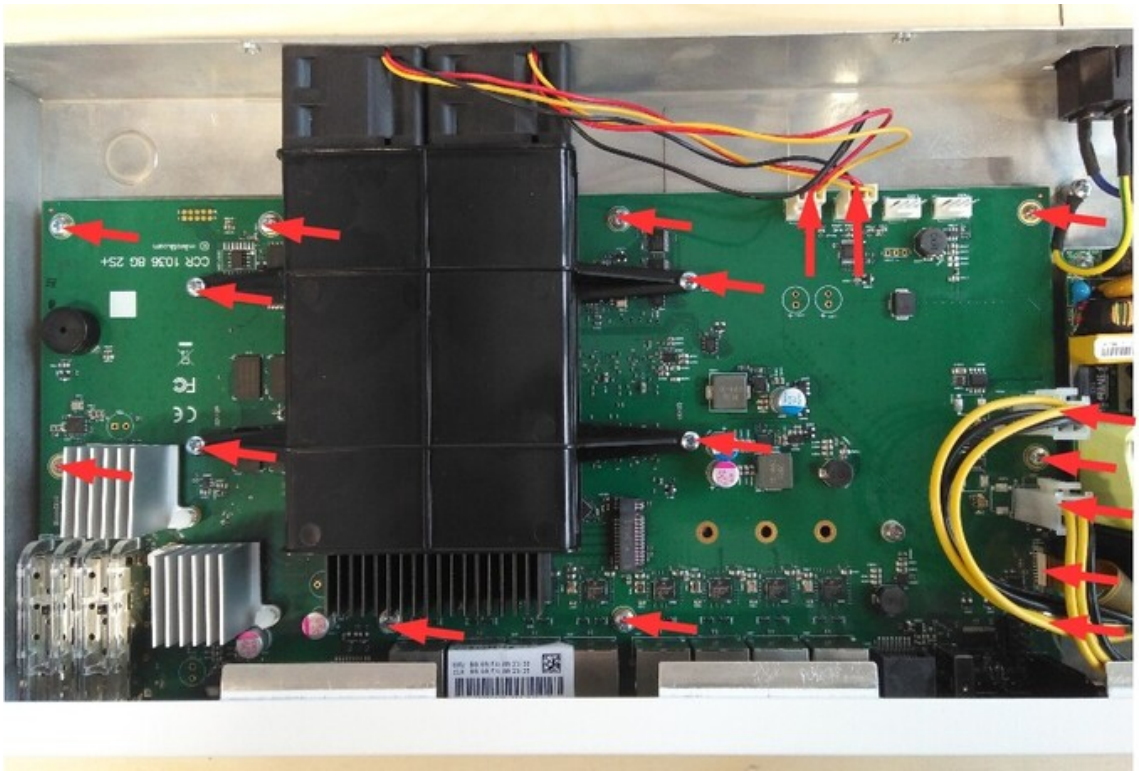
Disassembling information

Step 1: Unscrew 6 screws using PH2 screwdriver. Location of screws you can see in the picture 137.

Picture 137

Step 2: Take off the cover, unscrew all screws using Philips srew driver and unplug FAN, power supply and LCD connectors as showed in the picture 138. Do not damage the LCD flex cable.

Warning! Unplug all AC power cords and wait couple of minutes for open-frame power supply units to discharge their capacitors and then start working on unplugging and undoing screws.



Picture 138

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

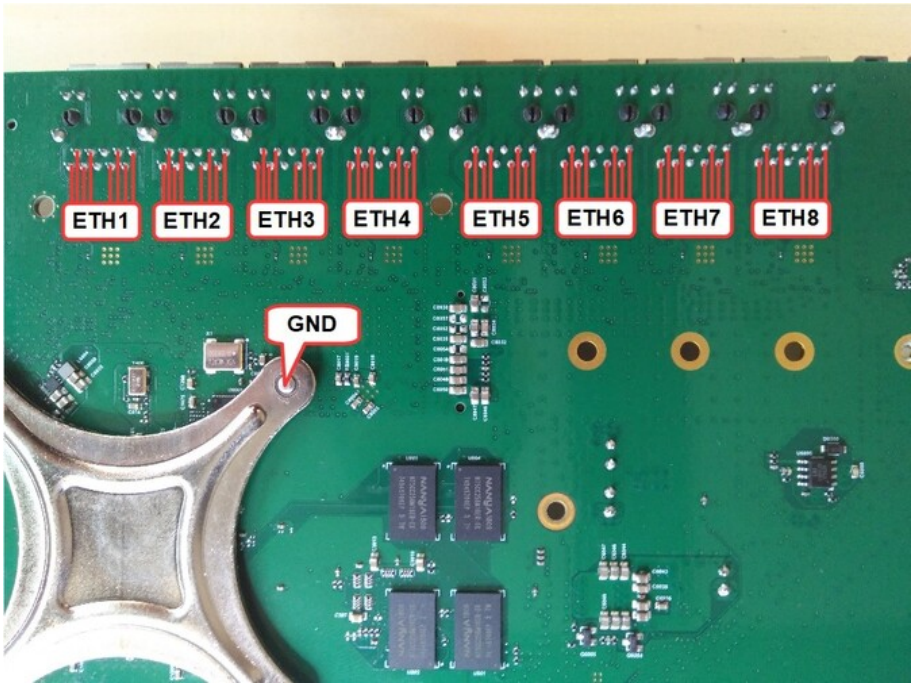
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture 139.

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page 15.

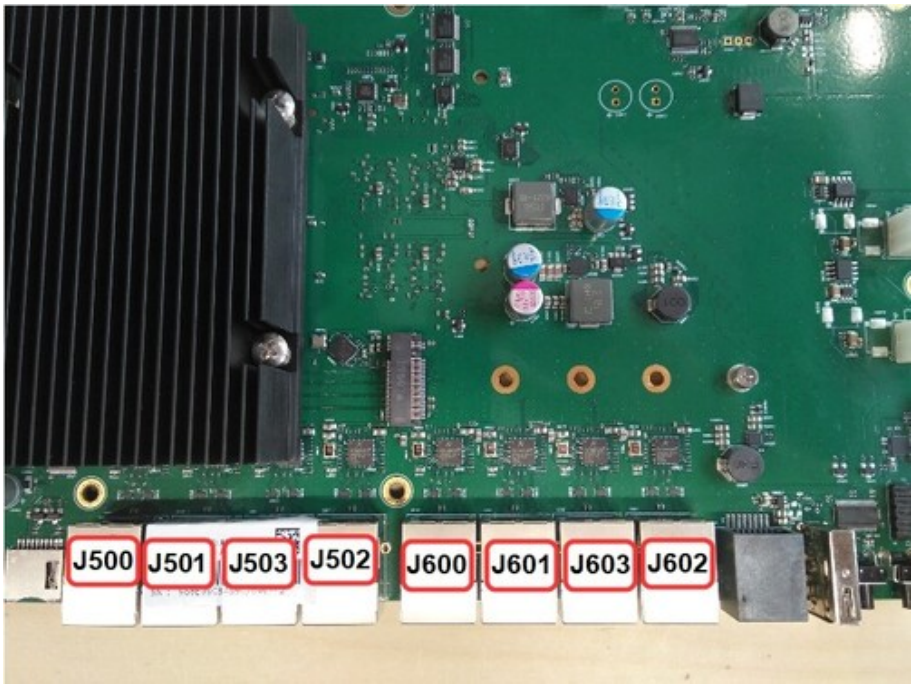
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J500, J501, J502, J503, J600, J601, J602, J603 connector. RJ-45 placement is shown in picture 140.

Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page 16.



Picture 139



Picture 140

CCR1036-12G-4S rev2

CCR1036-12G-4S-EM rev2

Picture 141

Disassembling information

Disassembly method of the board is the same as the CCR1036-8G-2S+ rev2 board. Disassembly method is described on page 138.

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

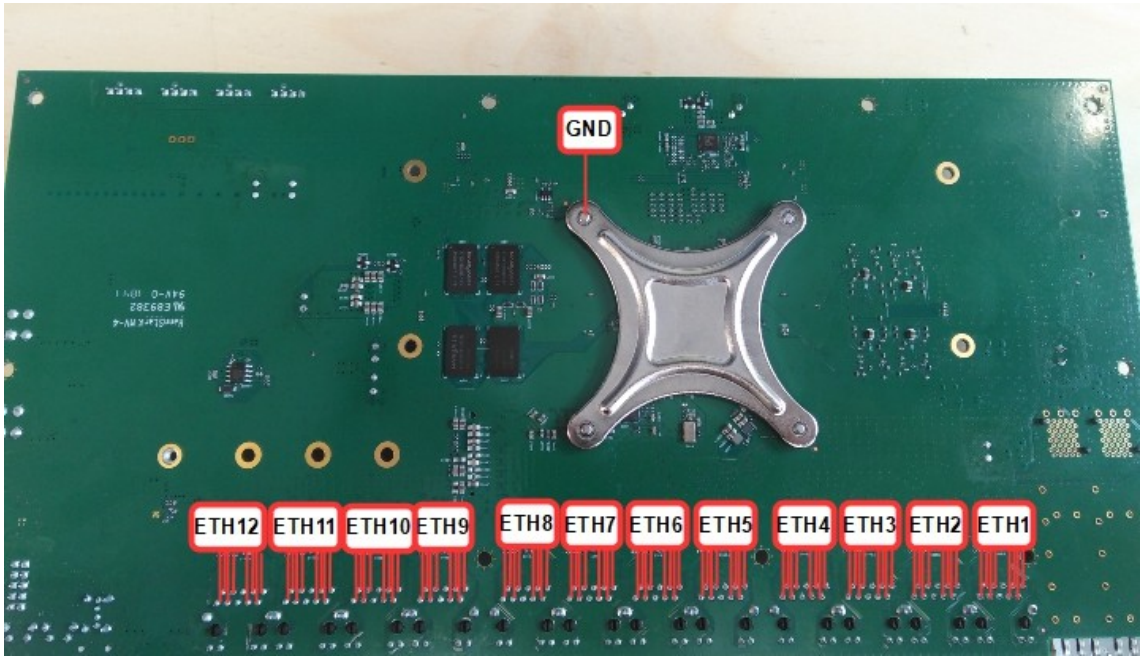
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture 142.

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page 15.

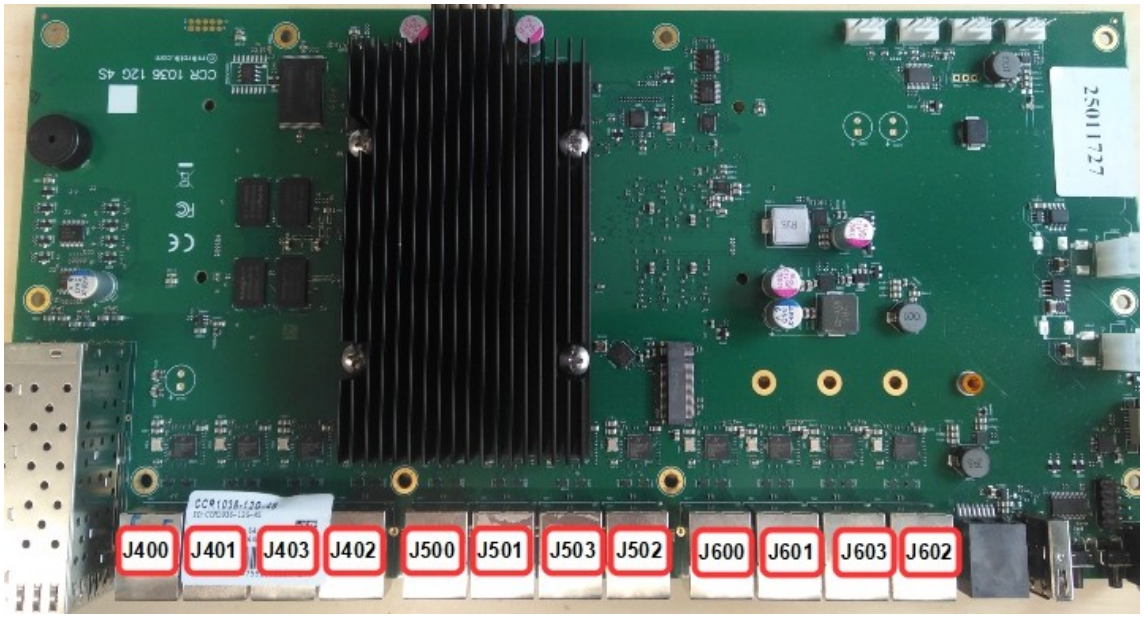
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J400 - J602 connector. RJ-45 placement is shown in picture 143.

Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page 16.



Picture 142



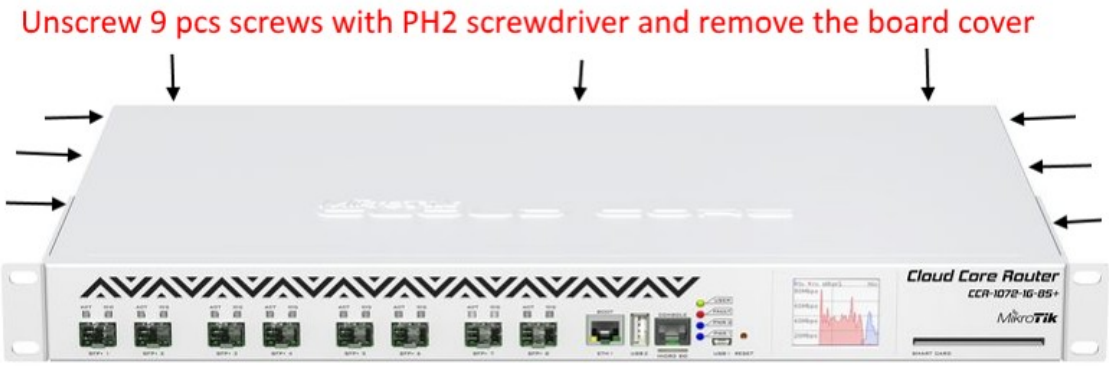
Picture 143

CLOUD CORE ROUTER 1072 SERIES ROUTERBOARDS

CCR1072-1G-8S+

Picture 144

Disassembling information



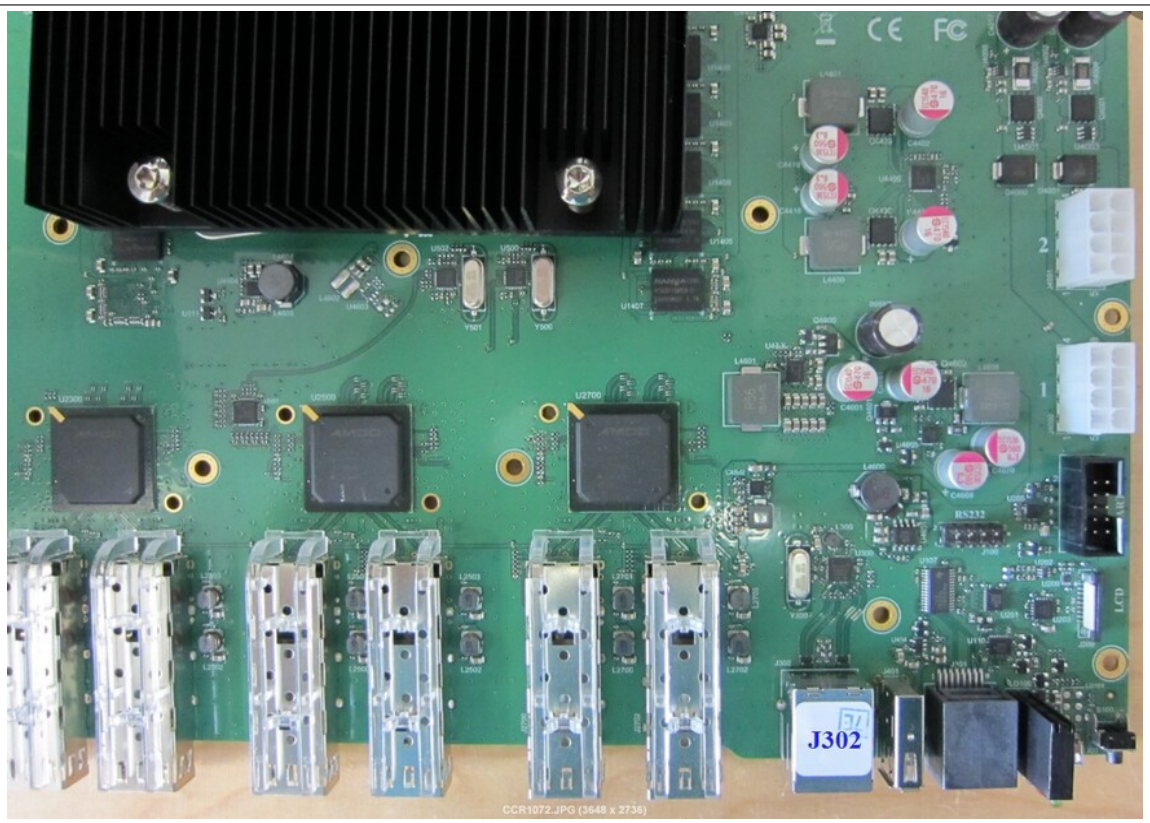
Picture 145

Instructions for checking overvoltage

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J302 connector as shown in the picture 146.

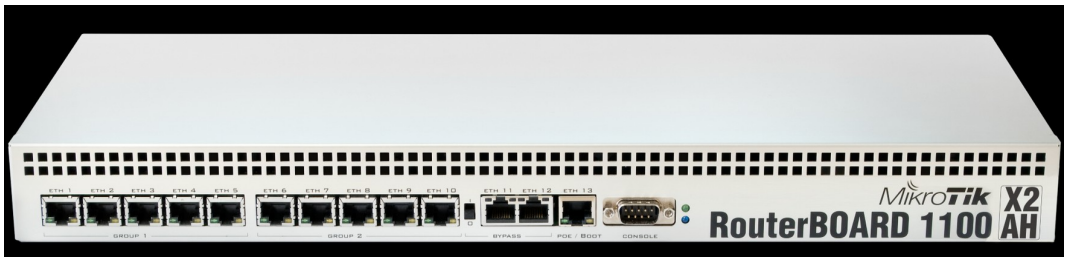
Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page 16.



Picture 146

1100 SERIES ROUTERBOARDS

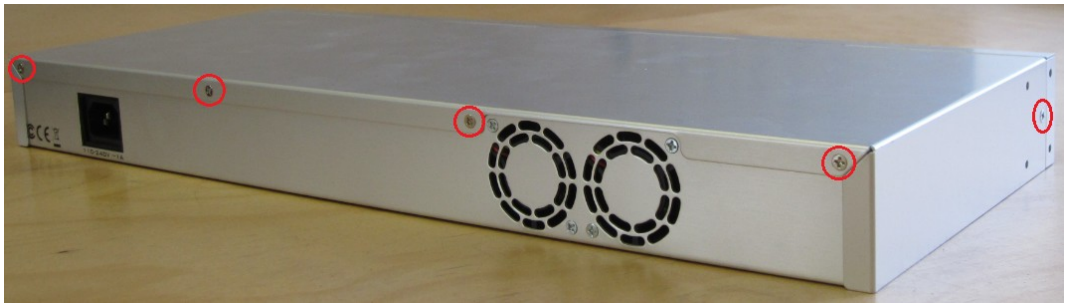
RB1100AHx2



Picture 147

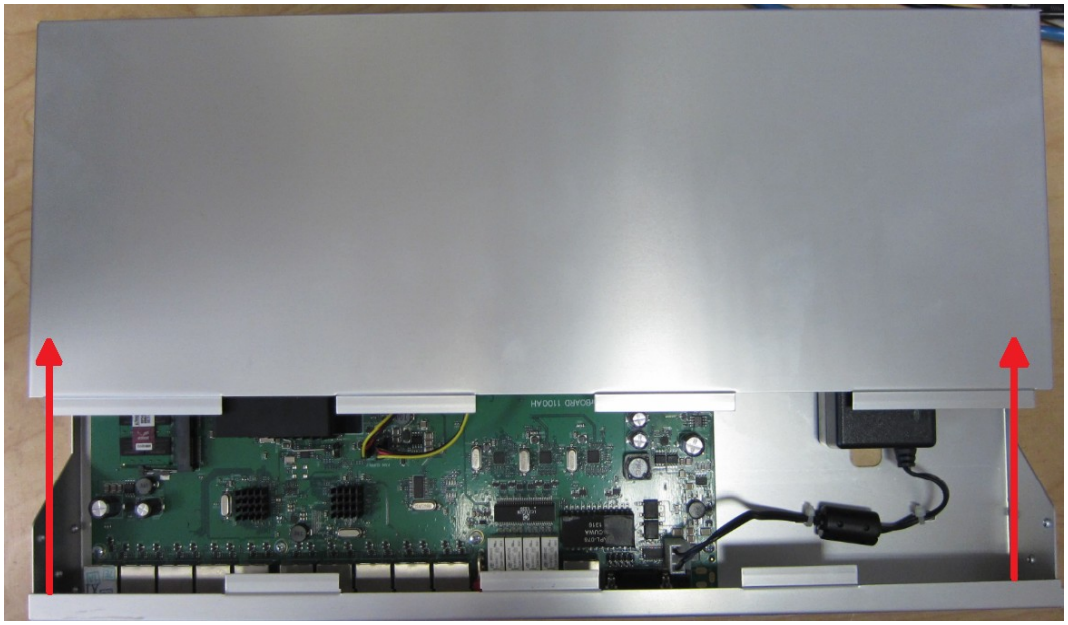
Disassembling information

Step 1: Unscrew 6 screws (4 screws behind of the board case and 1 screw on the each side of the board case) using PH2 screwdriver. Location of the screws you can see in the picture 148.



Picture 148

Step 2: Pull the cover away from you, see picture 149.



Picture 149

Instructions for checking overvoltage

Checking Schottky diode and diodes bridges

Check Schottky diode D1101 and diodes bridges D1102, D1105. Location of diodes on the board you can see in the picture 150. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

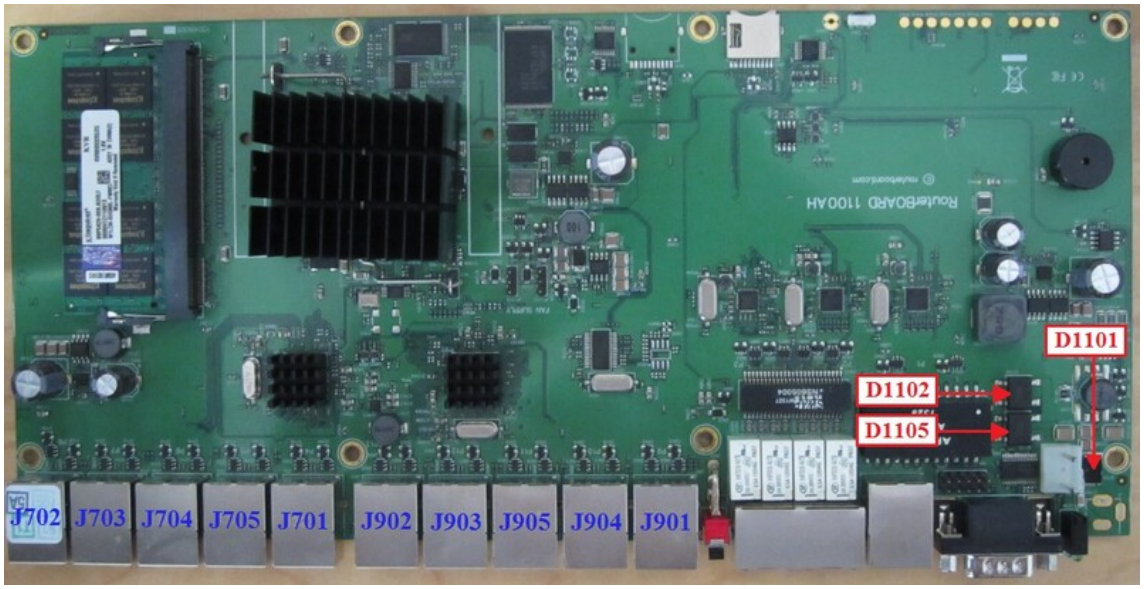
Checking voltage drop value between diode array pin#1 and Ground

Check voltage drop between diode arrays D501, D503, D605, D607 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 151. Voltage drop value should be in the range from 0,3V to 0,34V. Voltage drop measurement method is described on page 14.

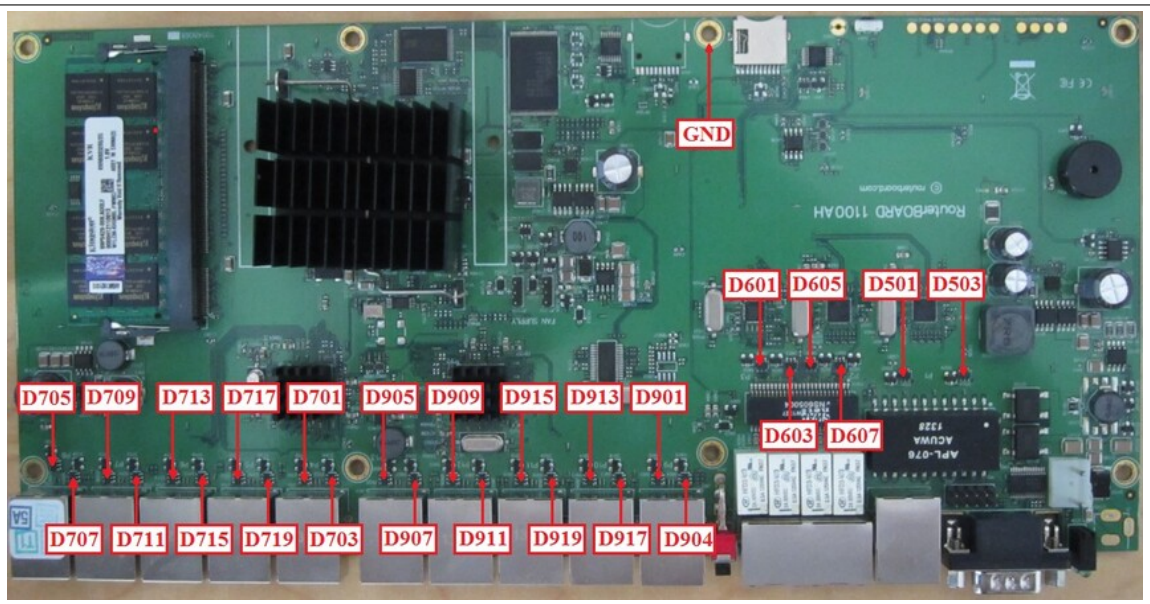
Then check voltage drop value between diode arrays D601, D603, D901, D904, D913, D917, D919, D915, D911, D909, D907, D905, D703, D701, D719, D717, D715, D713, D711, D709, D707, D705 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 151.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J701 - J705, J901 - J905 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 16.



Picture 150


GND
D601
D605
D501
D503
D705
D709
D713
D717
D701
D905
D909
D915
D913
D901
D603
D607
D707
D711
D715
D719
D703
D907
D911
D919
D917
D904

Picture 151

RB1100AHx4 Dude Edition

RB1100AHx4

Picture 152

Disassembling information

Disassembly method of the board is the same as the RB1100AHx2 board. Disassembly method is described on page 147.

Instructions for checking overvoltage

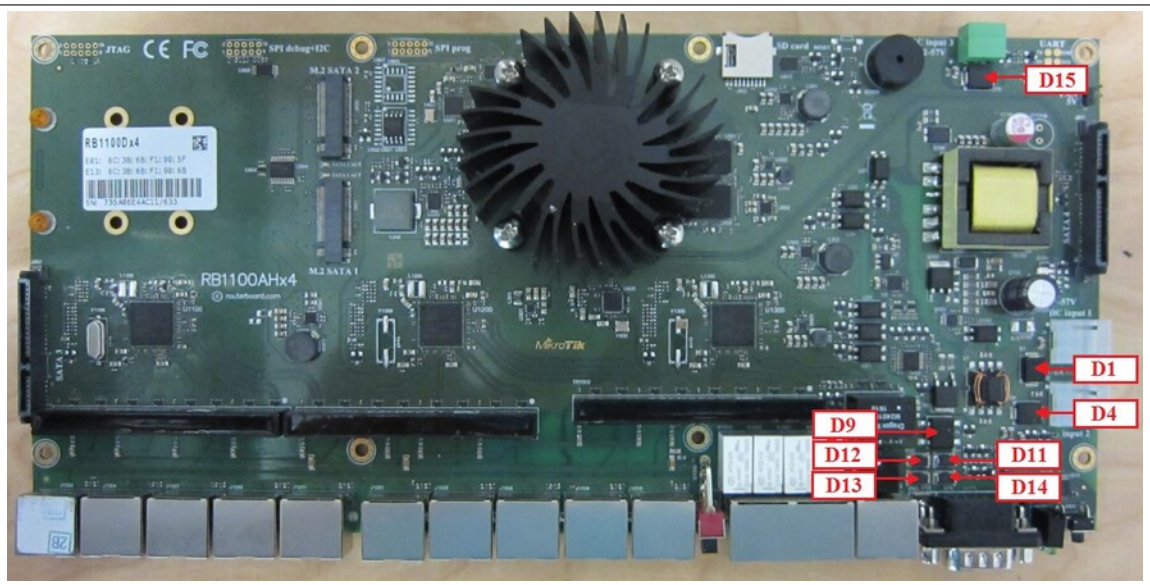
Checking Schottky diode and diodes bridges

Check Schottky diodes D1, D4, D11-D15 and diode bridge D9. Location of diodes on the board you can see in the picture 153. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

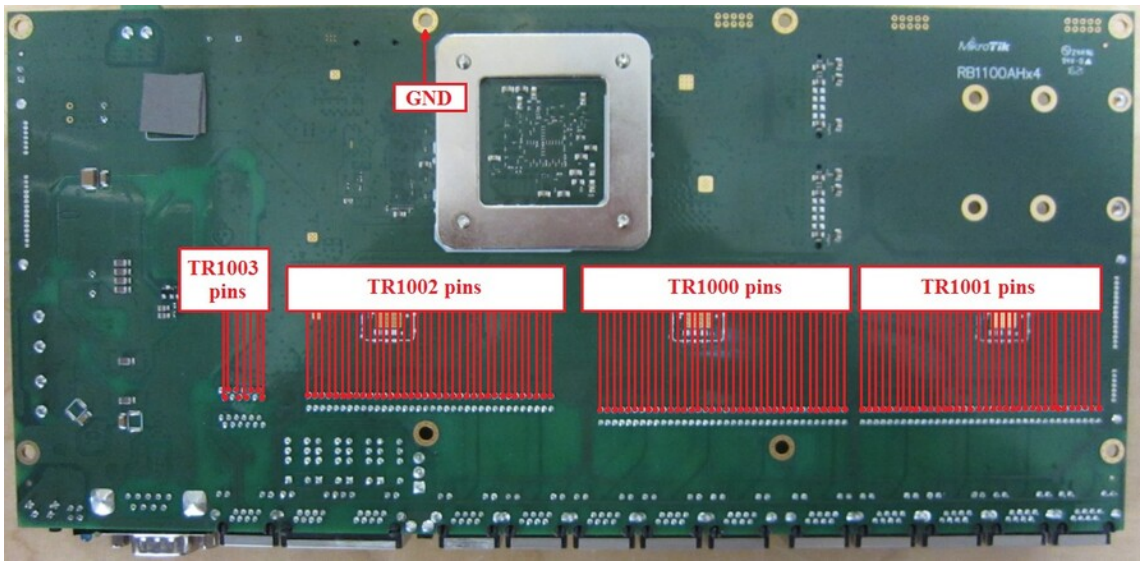
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1000-TR1002 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 153. Voltage drop value should be in the range from 0,36V to 0,4V. Voltage drop measurement method is described on page 15.

Check voltage drop value between transformer TR1003 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 153. Voltage drop value should be in the range from 0,36V to 0,4V. Voltage drop measurement method is described on page 15.



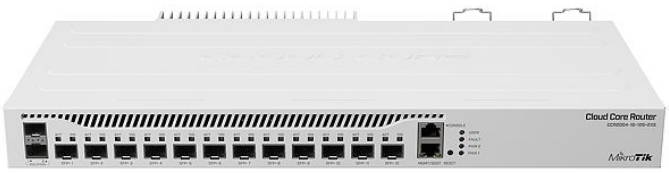
Picture 153



Picture 154

CLOUD CORE ROUTER 2004 SERIES ROUTERBOARDS

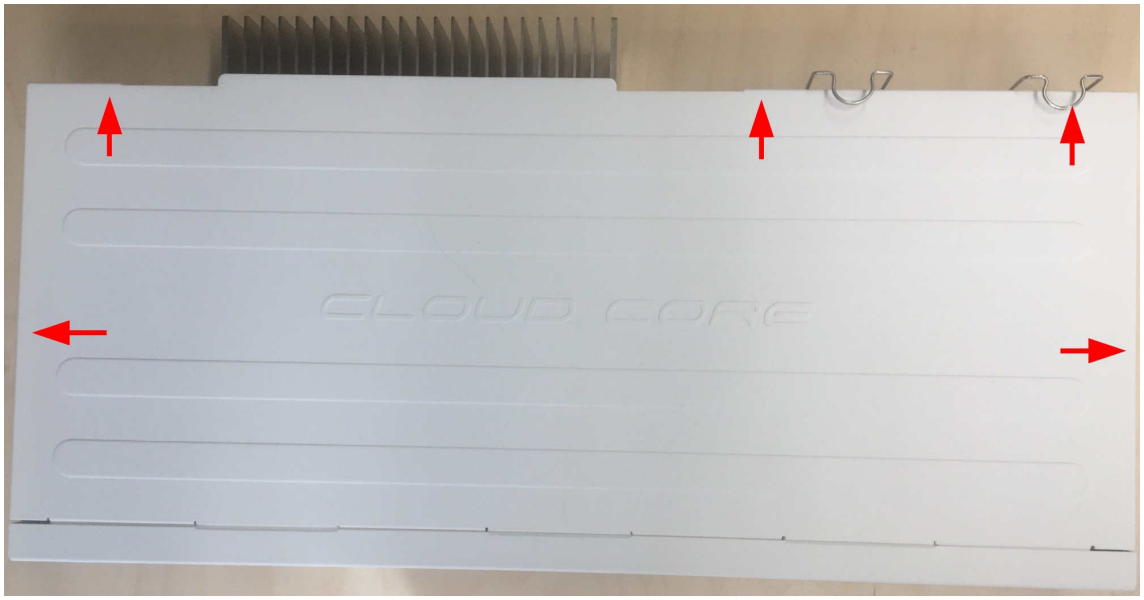
CCR2004-1G-12S+2XS



Picture 155

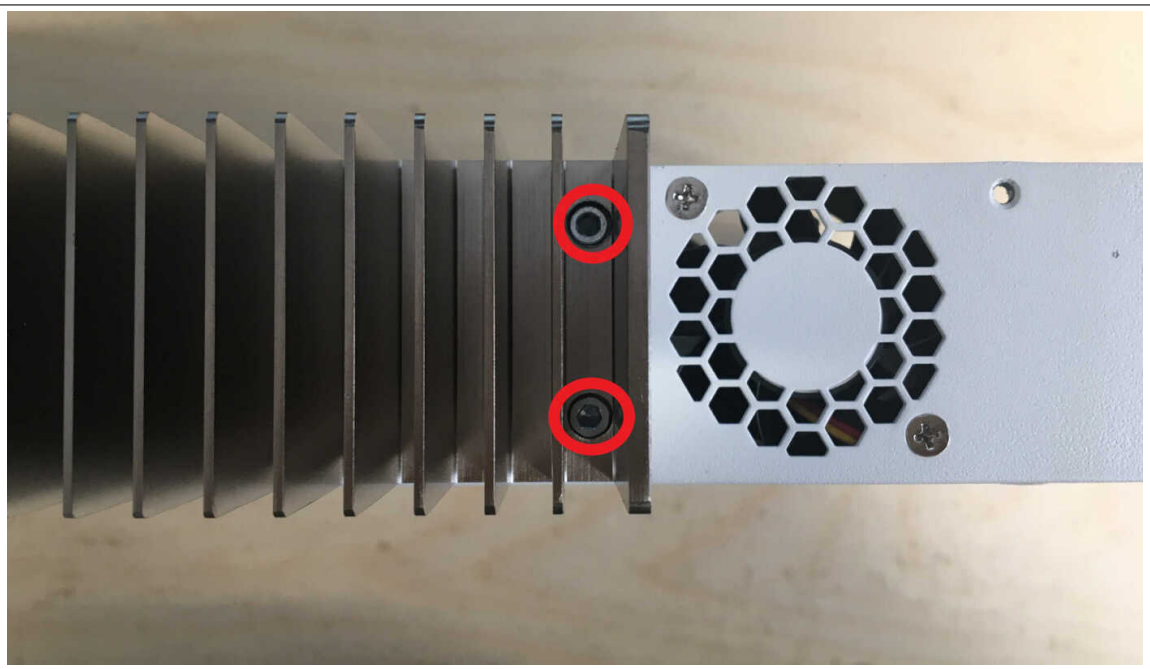
Disassembling information

Step 1: Using Phillips PH2 or similar unscrew all screws shown in picture 156.



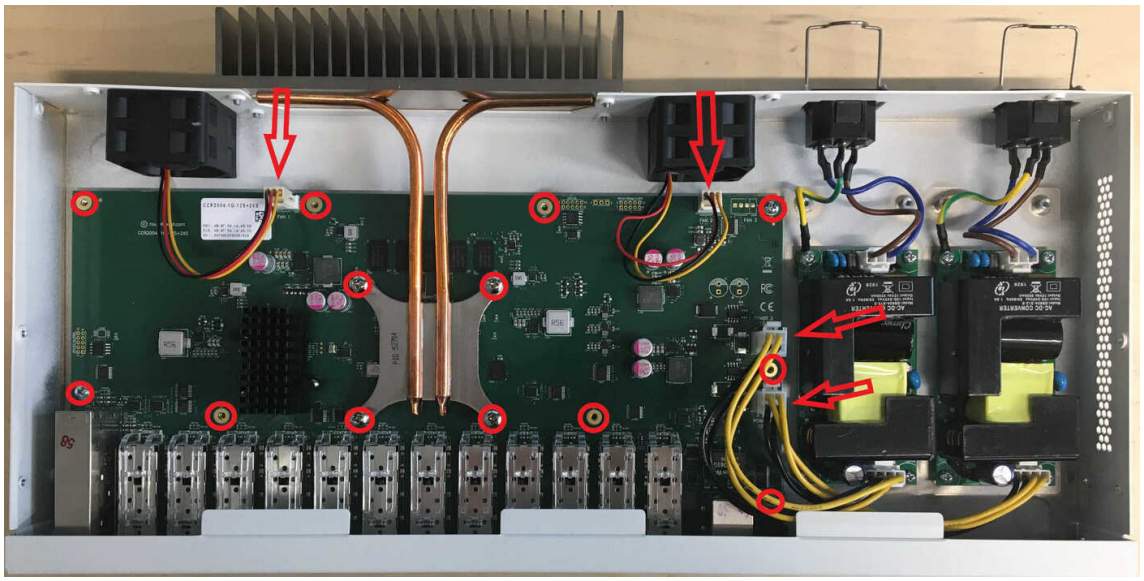
Picture 156

Step 2: Using Torx 10 unscrew a total of 4 bolts to release the heat sink from the case. Location of the bolts is shown in picture reffig:CCR2004-1G-12S+2XS-case-rear.



Picture 157

Step 3: Using Phillips PH1 unscrew all the screws, unplug fans and PSU power cables as shown in picture 158.



Picture 158

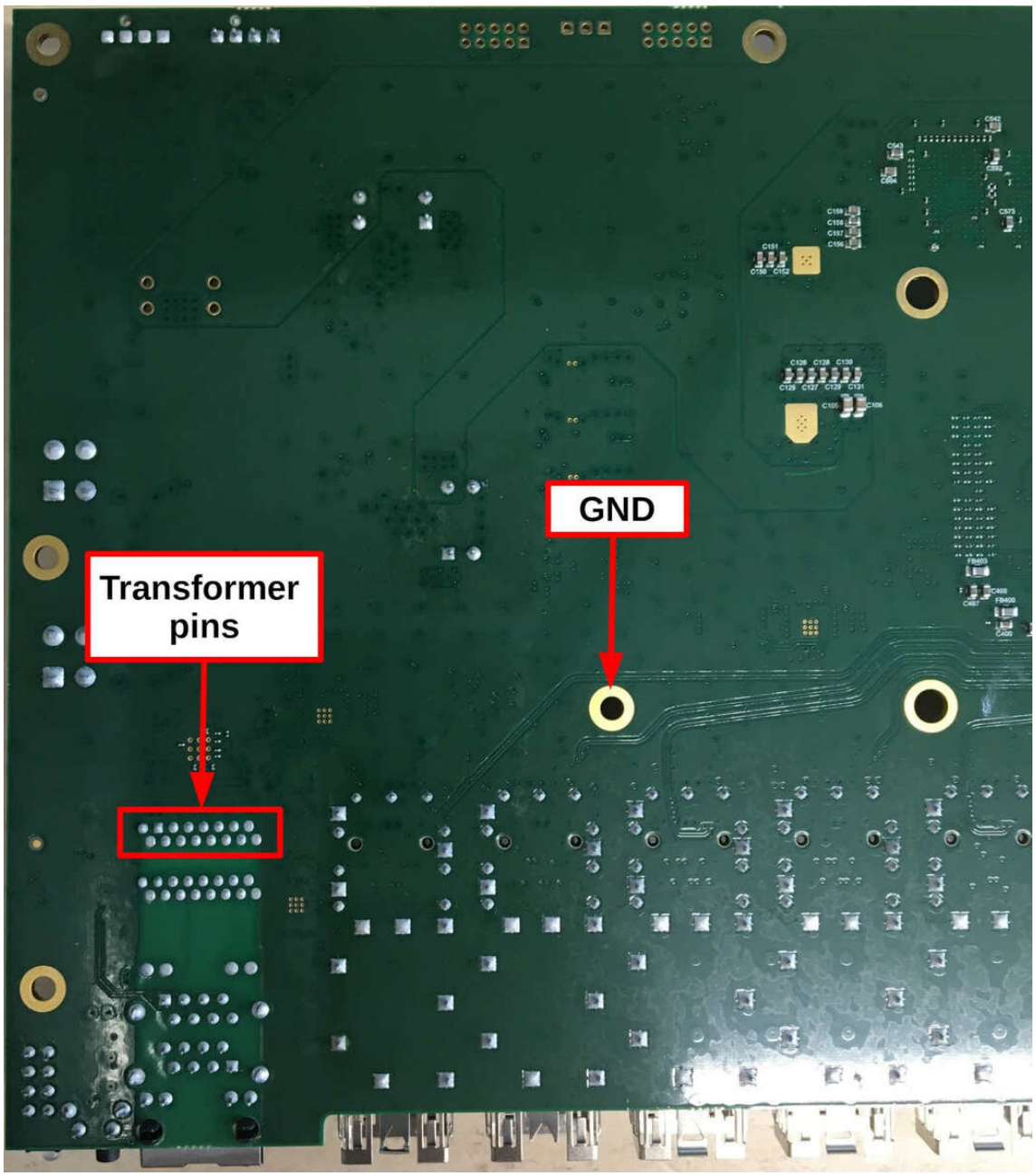
Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

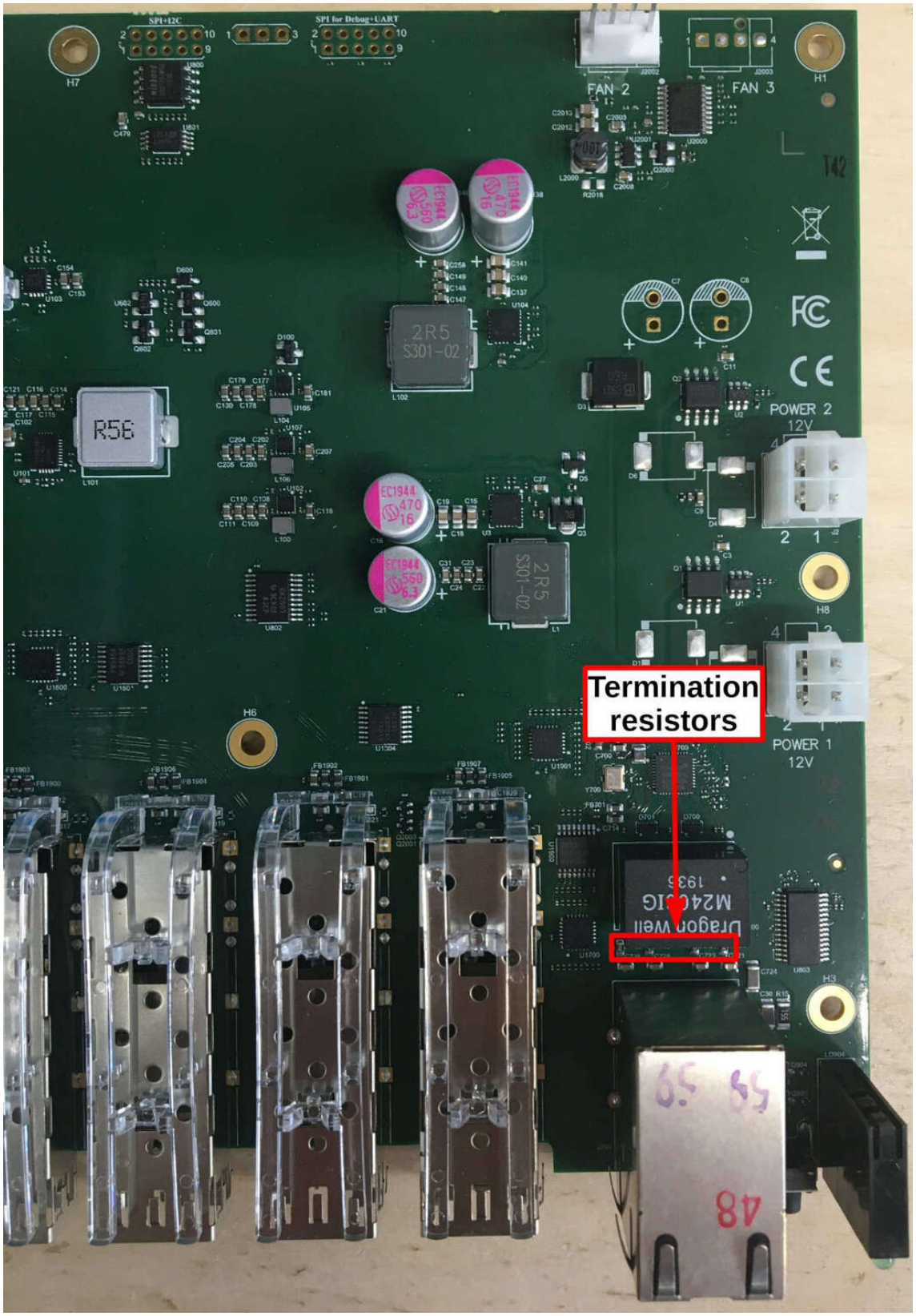
Check voltage drop value between Ethernet transformer pins and GND. Test points are marked in picture 159. Voltage drop value should be in the range from 0,34V to 0,44V. Voltage drop measurement method is described on page 15.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be approximately 75 Ohms. Location of resistors is shown in picture 160.



Picture 159


Termination resistors
FAN 2
FAN 3
POWER 2
12V
POWER 1
12V
H1
H3
H6
H7
H8

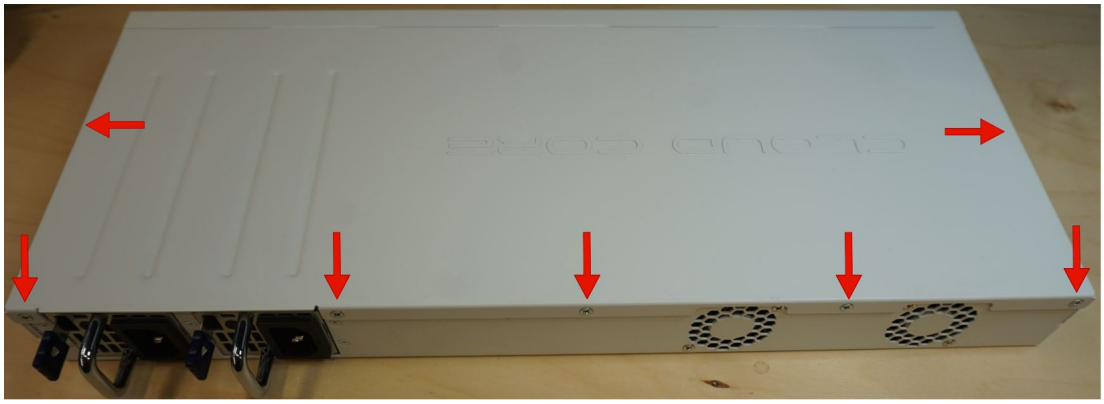
Picture 160

CCR2004-16G-2S+

Picture 161

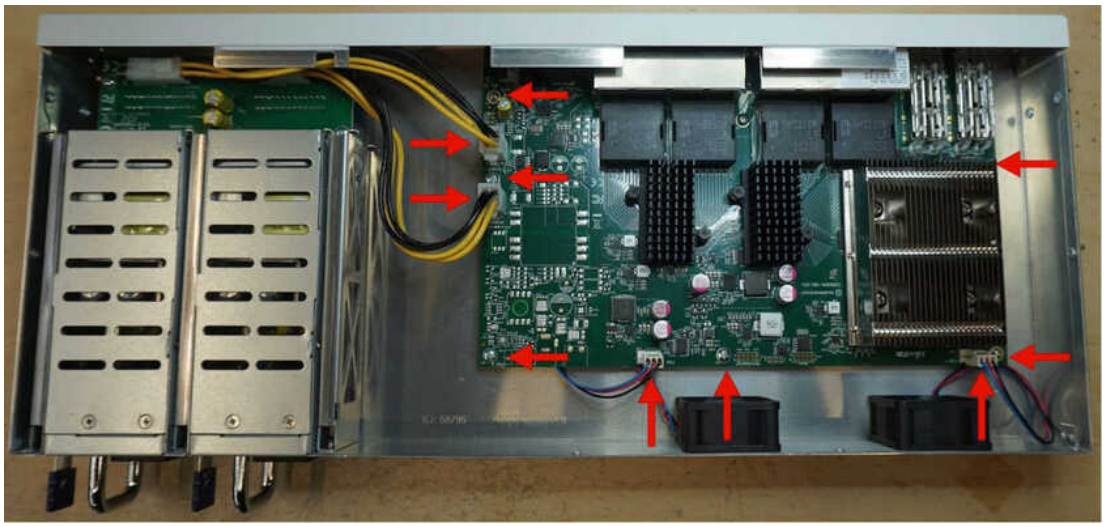
Disassembling information

Step 1: Using Phillips PH2 or similar unscrew all screws shown in picture 162.



Picture 162

Step 2: Take off the cover, unscrew all screws using Philips screw driver, unplug FAN and power supply cables as showed in picture 163.

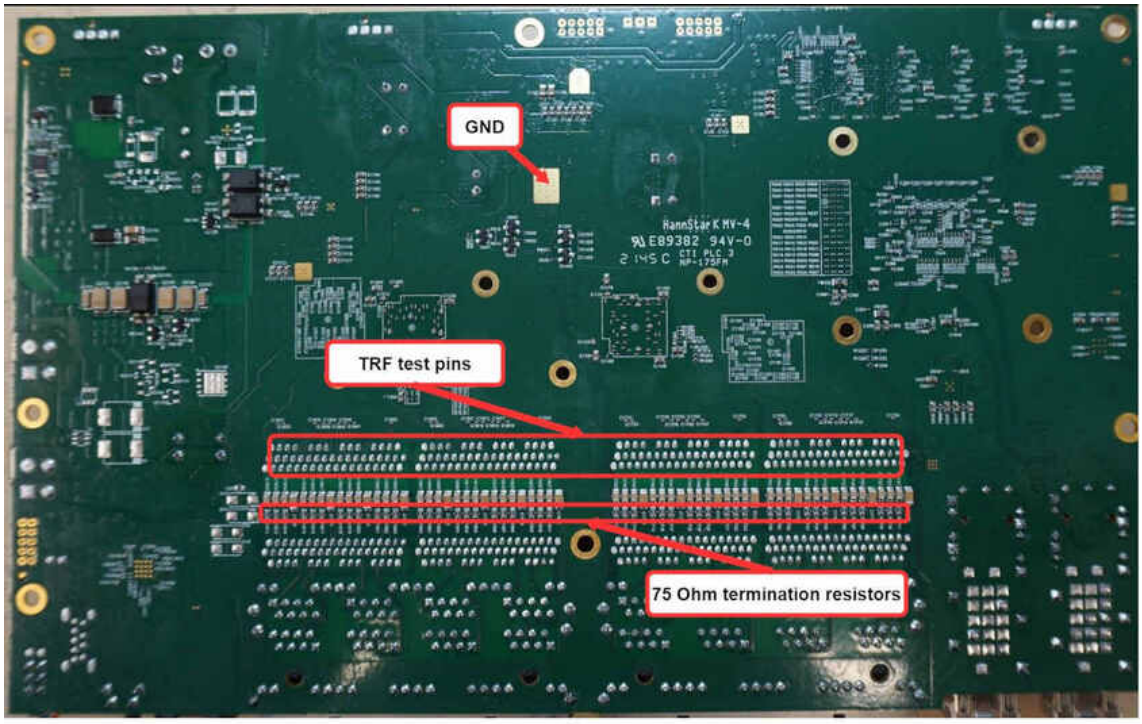


Picture 163

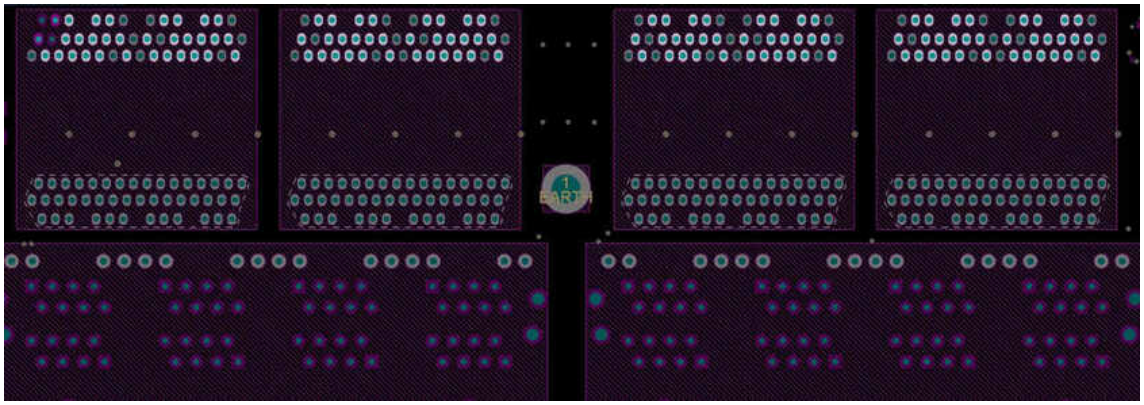
Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1700, TR1701, TR1800, TR1801 pins and GND. Test points are marked in picture 165. Note that the view for transformer pins are from the bottom for necessary of measurement. Voltage drop value should be in the range from 0,34V to 0,45V. Voltage drop measurement method is described on page 15.



Picture 164



Picture 165

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be approximately 75 Ohms. Location of resistors is shown in picture 164.

2011 SERIES ROUTERBOARDS

RB2011iL-IN

RB2011iL-RM

RB2011iLS-IN

RB2011UiAS-IN

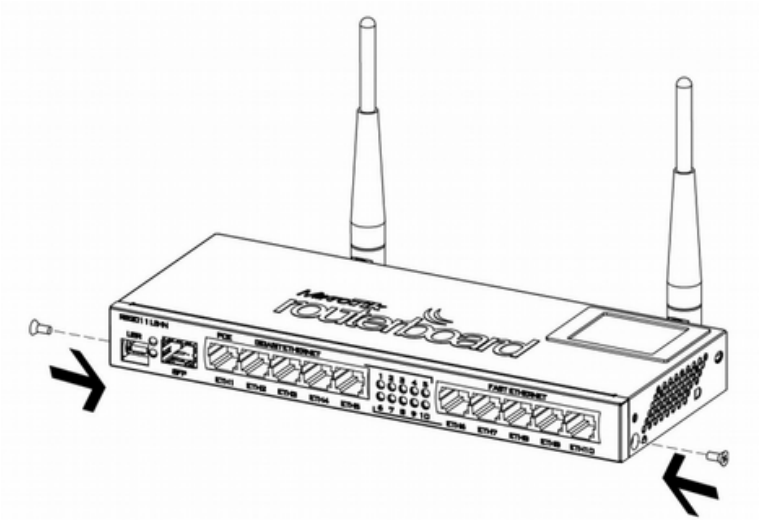
RB2011UiAS-RM

RB2011UiAS-2HnD-IN

Picture 166

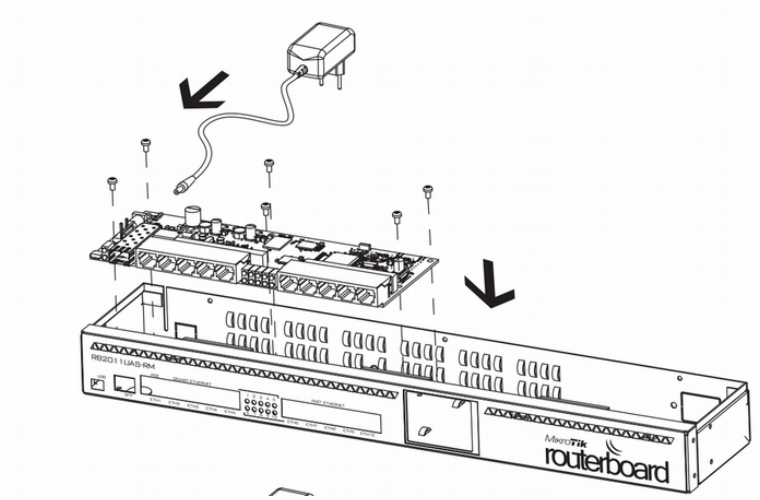
Indoor 2011 series RouterBoard disassembling information

Step 1: Unscrew 2 screws on each side of board case using PH2 screwdriver. Location of the screws you can see in the picture 167.



Picture 167

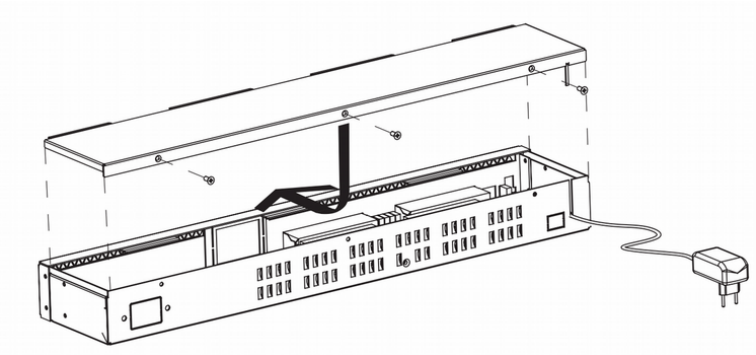
Step 2: Unscrew 6 screws which fasten PCB to routerboard case. Location of the screws you can see in the picture 168.



Picture 168

Rackmount 2011 series RouterBoard disassembling information

Step 1: Unscrew 3 screws from the back of the routerboard case using PH2 screwdriver and then pull the cover towards you. Location of the screws you can see in the picture 169.



Picture 169

Instructions for checking overvoltage

Over-voltage testing procedure, the layout of the components on the board and measurement values is the same for all types of RB2011 boards.

Checking Schottky diode and diodes bridges

Check Schottky diode D2 and diodes bridges D4, D6. Location of diodes on the board you can see in the picture 170. Schottky diode quality measurement method is described on page 12. In rare cases depending on the multimeter used bridges D4 and D6 can give value of 1..2V instead of OL. In such cases the quality of diode bridges can be determined by extended measurements described on page 13.

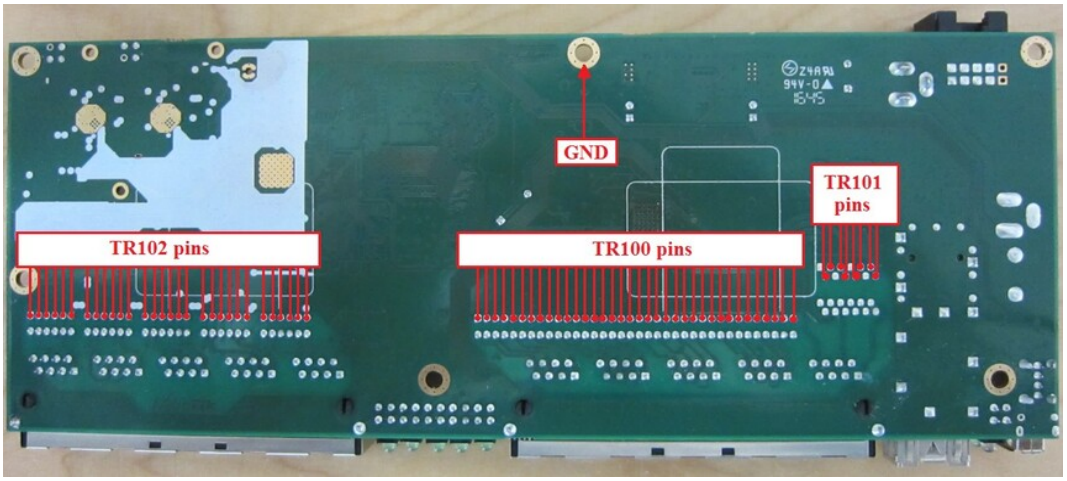
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between transformer TR101 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 171. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.

Check voltage drop value between transformer TR100 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 171. Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described on page 15.

Check voltage drop value between transformer TR102 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 171. Voltage drop value should be in the range from 0,3V to 0,38V. Voltage drop measurement method is described on page 15.

Picture 170



Picture 171

CLOUD CORE ROUTER 2116 SERIES ROUTERBOARDS

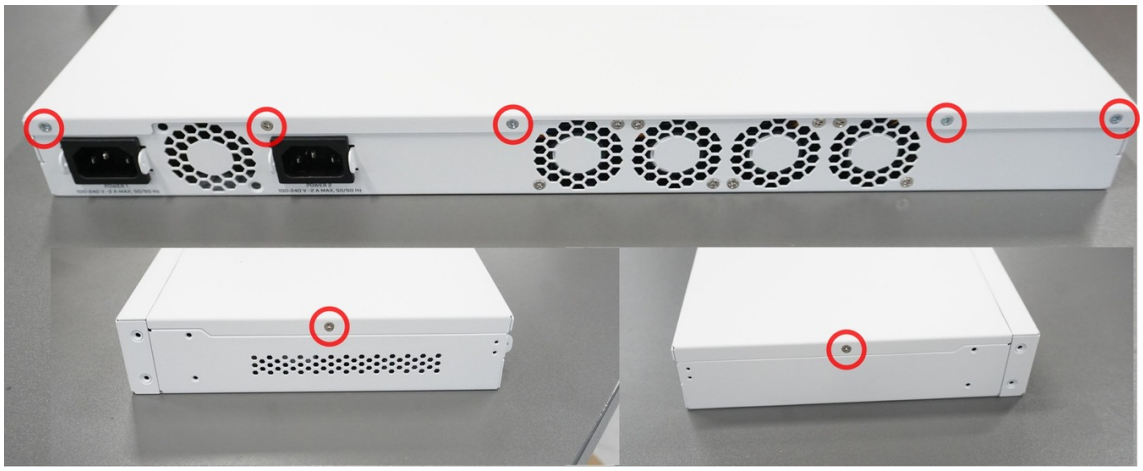
CCR2116-12G-4S+

Picture 172

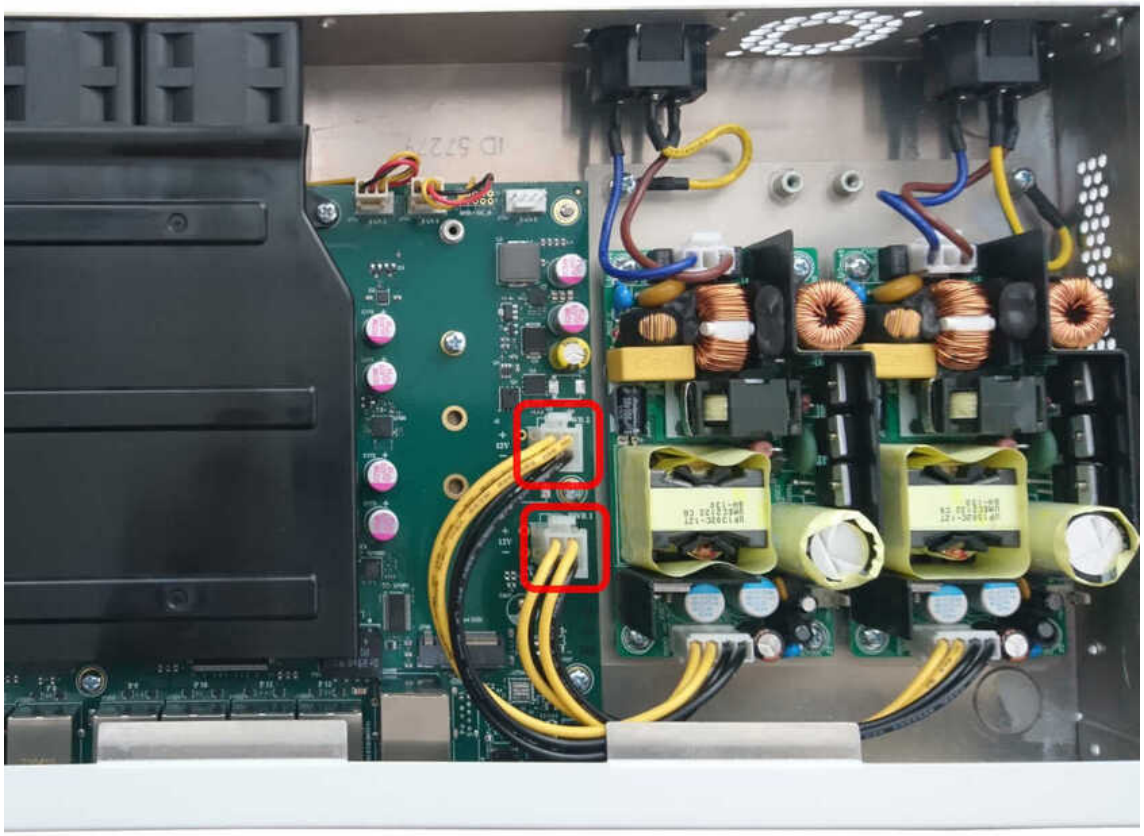
Disassembling information

Step 1: The board contains internal open frame PSUs, before disassembly disconnect the routerboard from mains power and wait about 15min. to allow the PSU capacitors to discharge! Using Phillips PH2 unscrew 7 side screws marked on picture 173 and remove cover. When the cover is removed, disconnect PSUs from the board – PSU connectors are shown on picture 174. Avoid touching any other part of PSU in order to prevent possible electrical shock, board damage or equipment damage!

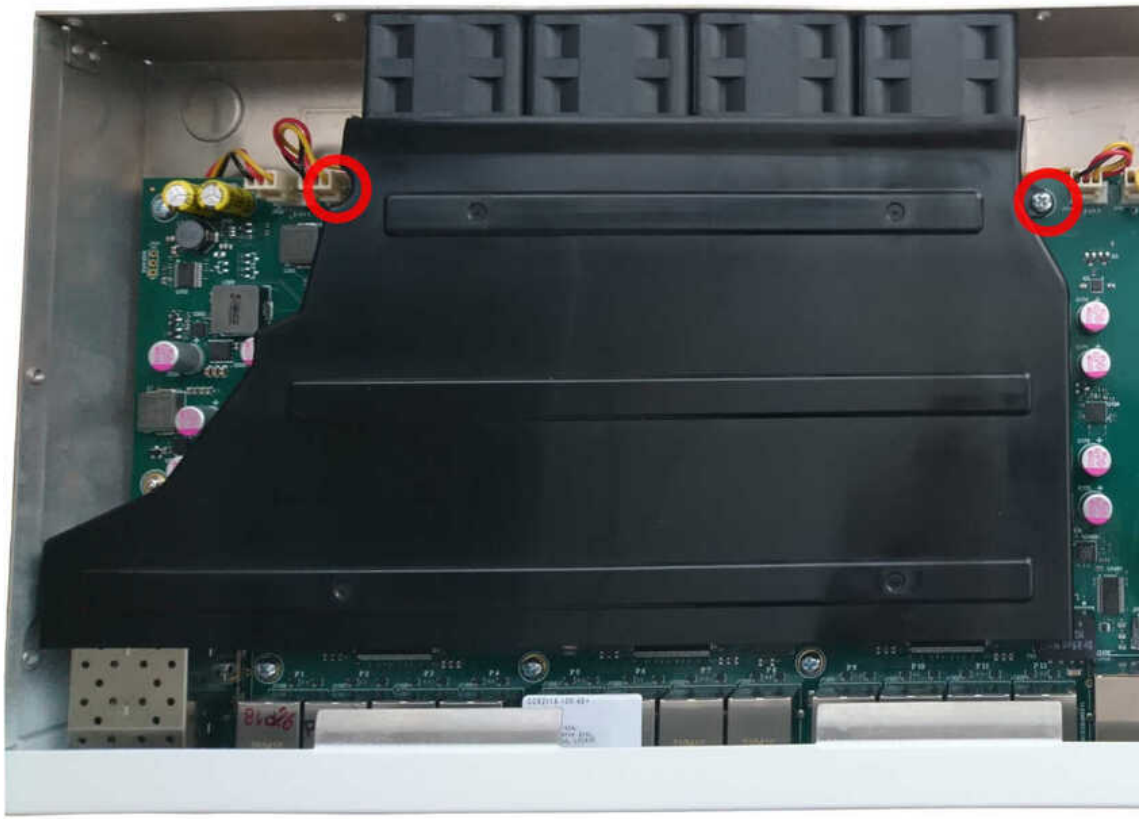
Step 2: Continue the disassembly by removing the wind tunnel, screw placement is shown on picture 175. A screw with a plastic spacer is located on the PSU side of the board, see picture 176. PH1 screwdriver is advised.



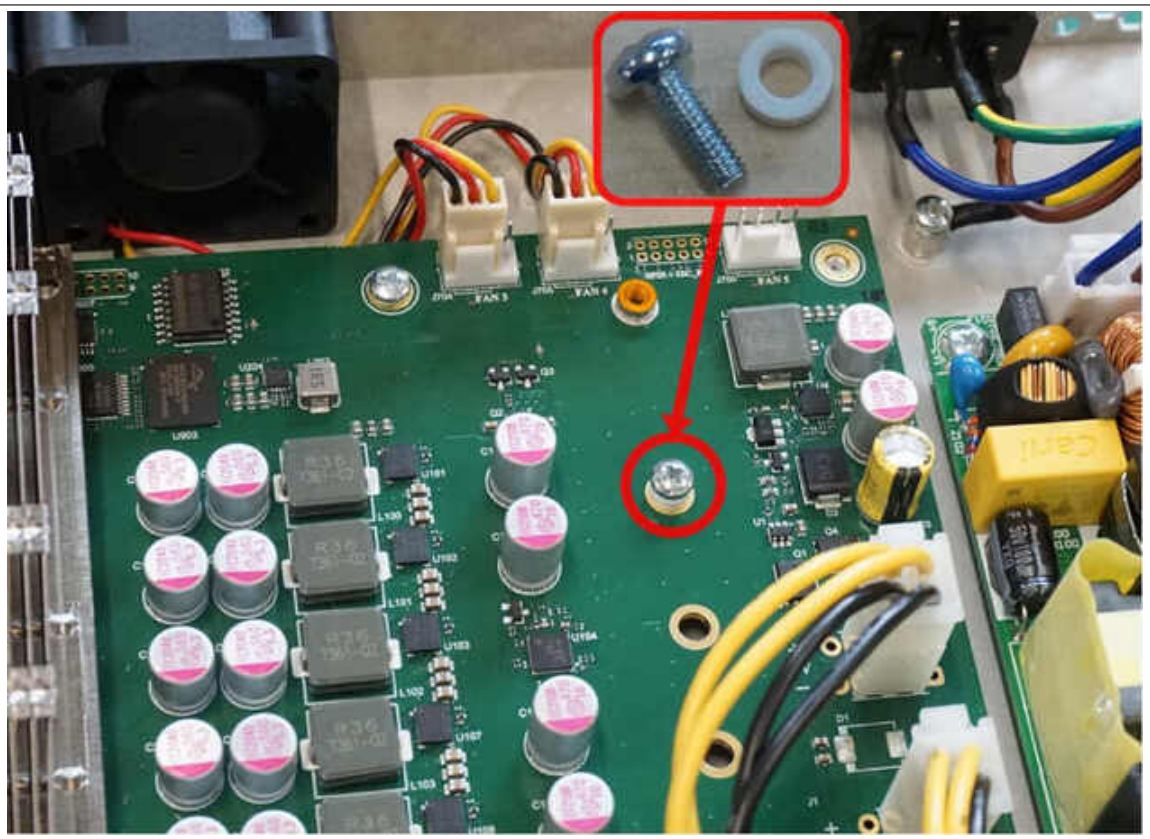
Picture 173



Picture 174

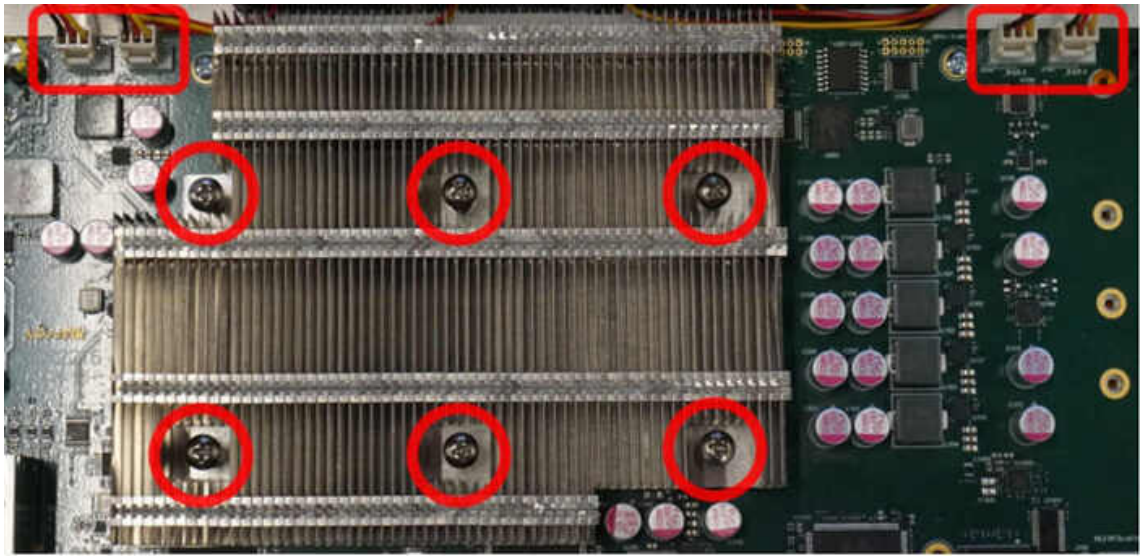


Picture 175



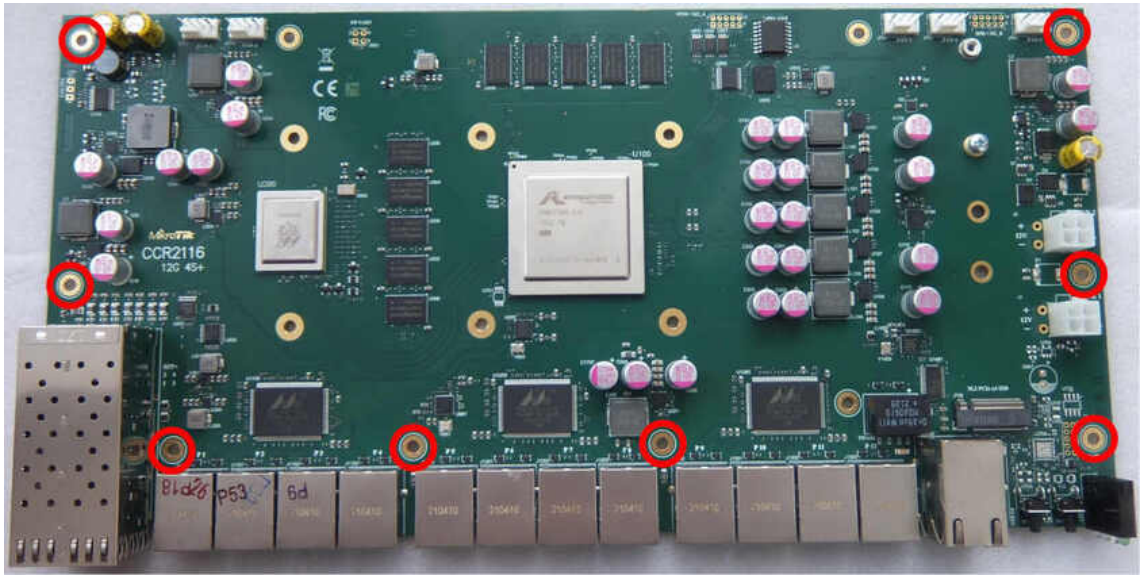
Picture 176

Step 3: Gently remove heatsink (PH2) and fan connectors indicated on picture 177.



Picture 177

Step 4: Using PH1 remove all other screws that are holding the PCB, screws position shown on picture 178.

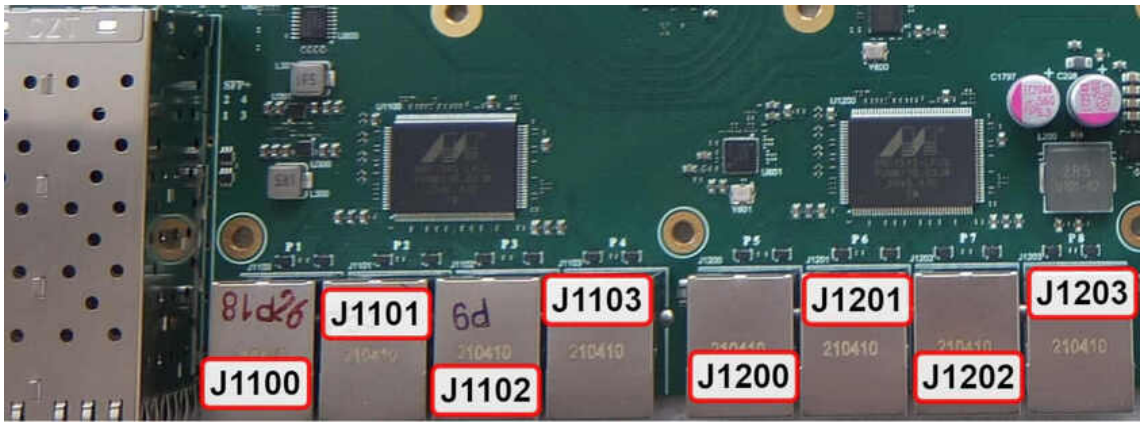


Picture 178

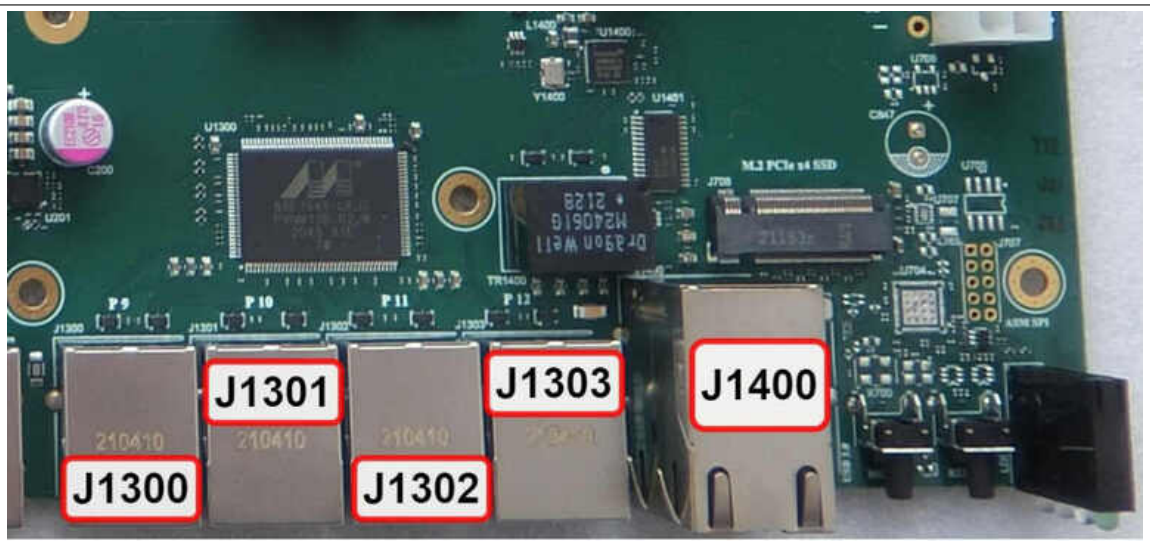
Instructions for checking overvoltage

Checking termination resistors resistance in RJ-45 connector

Check resistance of termination resistors in the following connectors shown on pictures 179 and 180:
J1100, J1102, J1102, J1103, J1200, J1201, J1202, J1203, J1300, J1301, J1302, J1303, J1400.
Resistance value between Rx and Tx line must be 150 Ohm ±4%. Measurement method is described on page 16.



Picture 179



Picture 180

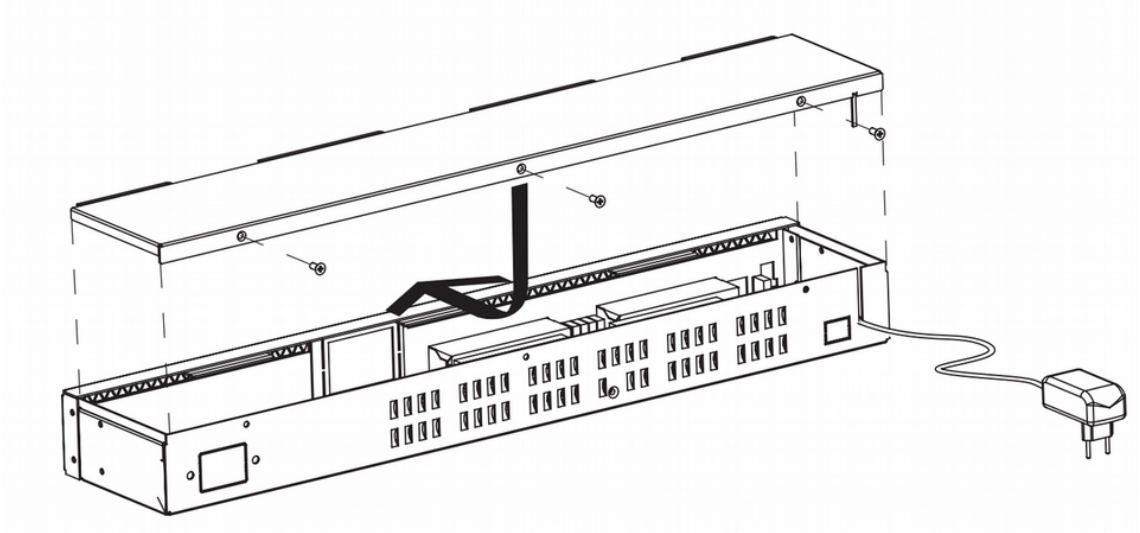
3011 SERIES ROUTERBOARDS

RB3011UiAS-RM

Picture 181

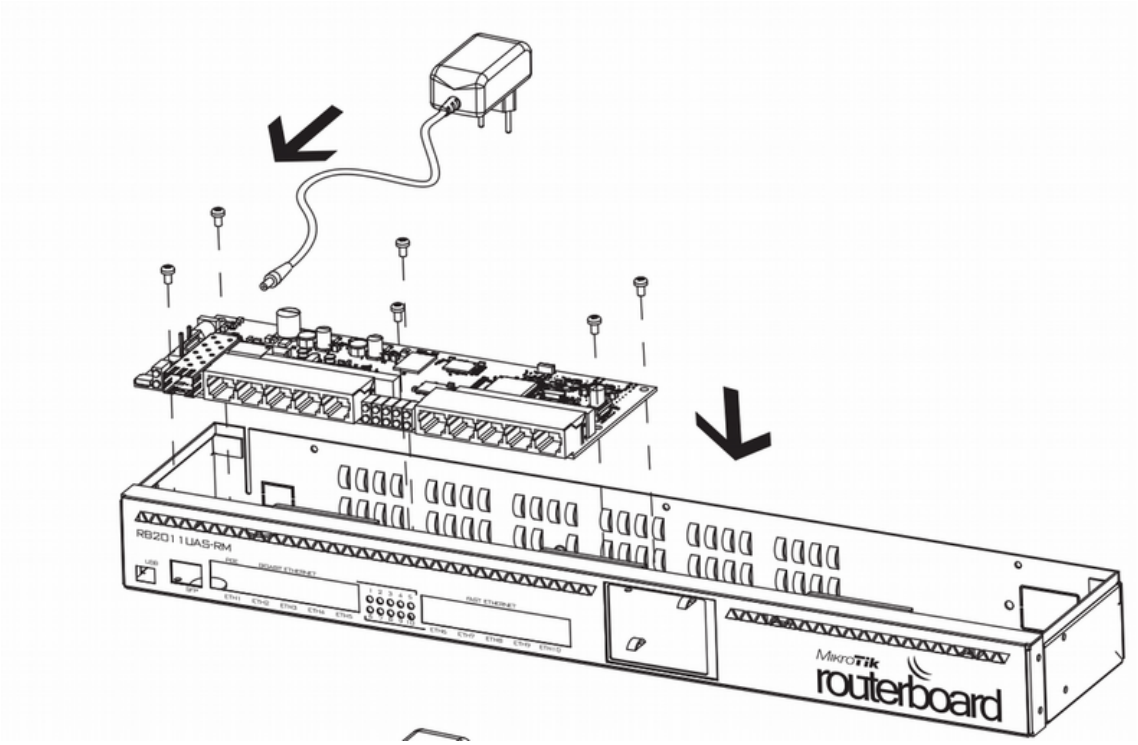
Disassembling information

Step 1: Unscrew 3 screws from the back of the routerboard case using PH2 screwdriver and then pull the cover towards you. Location of the screws you can see in the picture 182.



Picture 182

Step 2: Unscrew 6 screws which fasten PCB to routerboard case. Location of the screws, see picture 183.



Picture 183

Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D2, D6, D600. Location of diodes on the board you can see in the picture 184. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

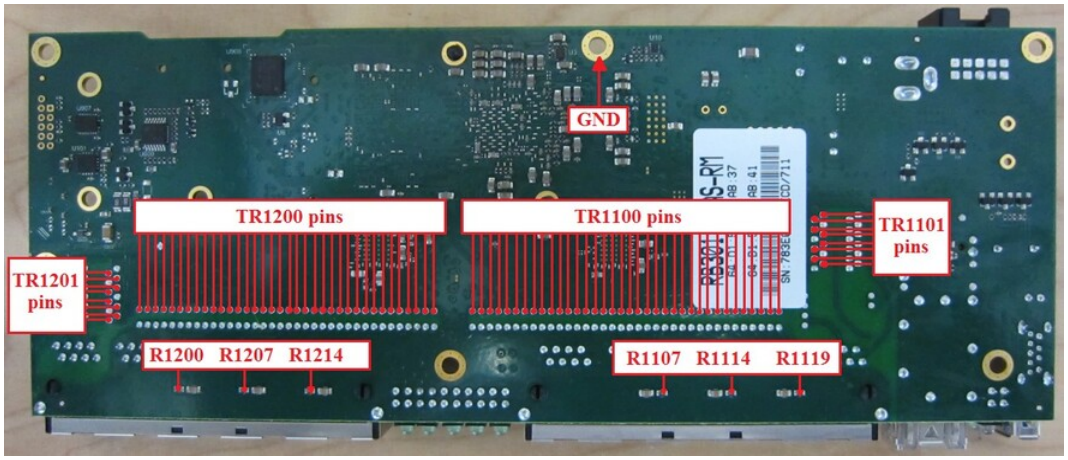
Check voltage drop value between Transformer TR1101 and TR1201 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 185. Voltage drop value should be in the range from 0,4V to 0,46V. Voltage drop measurement method is described on page 15.

Check voltage drop value between transformer TR1100 and TR1200 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 185. Voltage drop value should be in the range from 0,34V to 0,4V. Voltage drop measurement method is described on page 15.

Checking 75 Ohm termination resistors resistance

Check resistors R1200, R1207, R1214, R1107, R1114, R1119 resistance value. It should be 75 Ohm +/- 1%. Location of resistors on the board you can see in the picture 185.

Picture 184



Picture 185

4011 SERIES ROUTERBOARDS

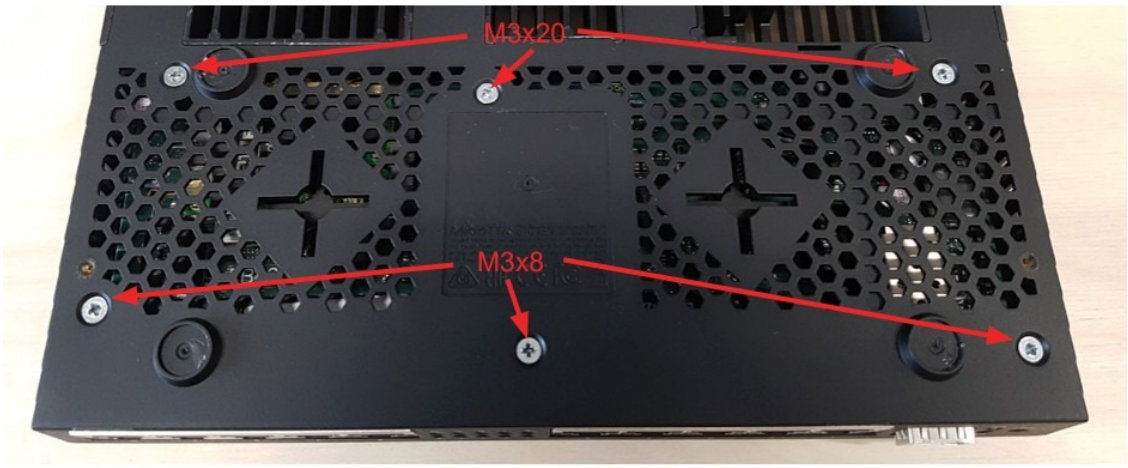
RB4011iGS+RM

RB4011iGS+5HacQ2HnD-IN

Picture 186

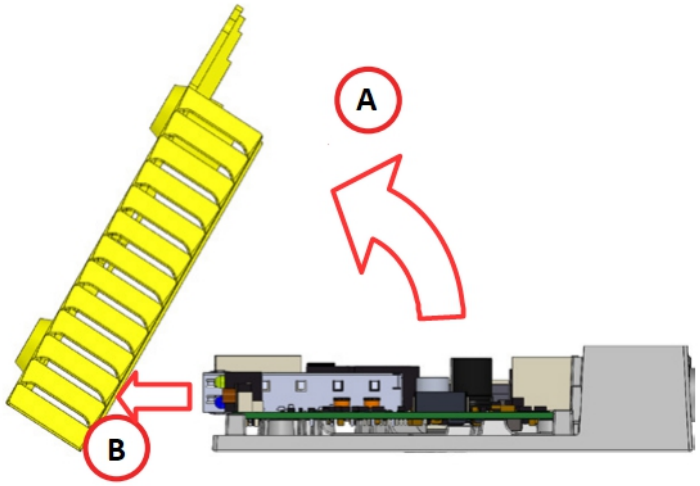
Disassembling information

Step 1: Unscrew 6 screws from the back of the routerboard case using PH2 screwdriver. Location of the screws you can see in the picture 187.



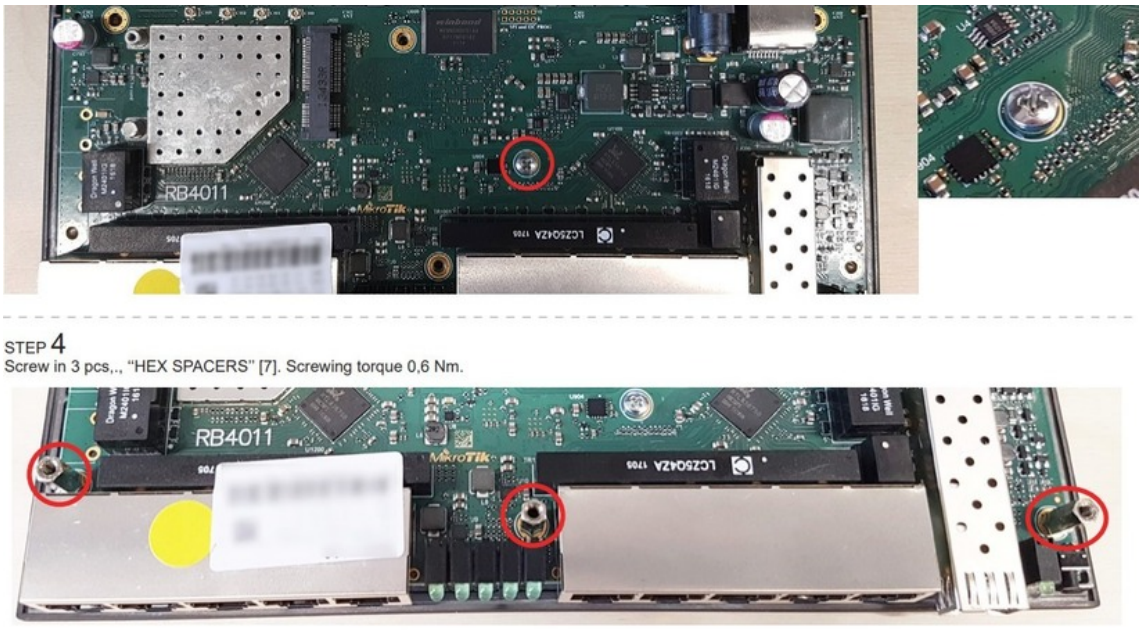
Picture 187

Step 2: Lift the plastic cover according to picture 188.



Picture 188

Step 3: Undo 3 hexagonal threaded spacers and 1 screw according to picture 189.



Picture 189

Instructions for checking overvoltage

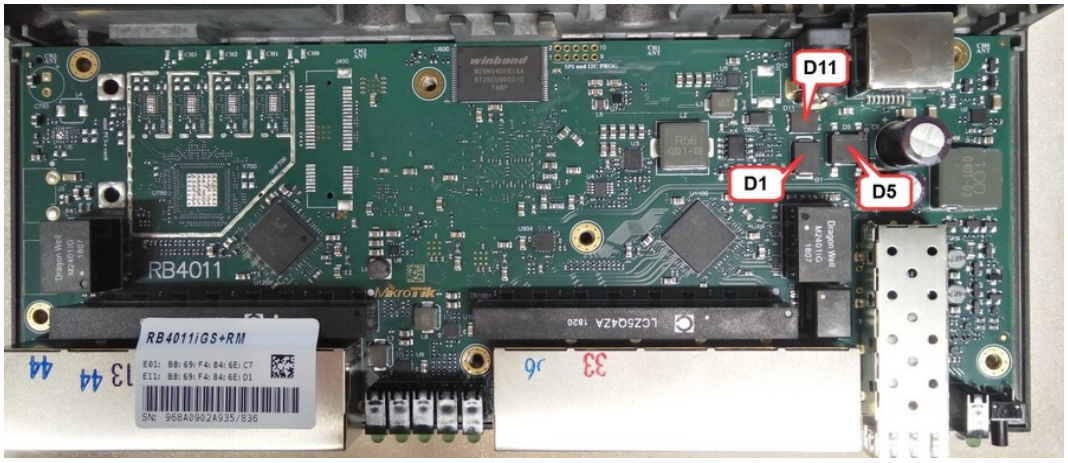
Checking Schottky diode and diodes bridges

Check Schottky diodes D11, D1 and diode bridge D5. Location of diodes on the board you can see in the picture 190. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

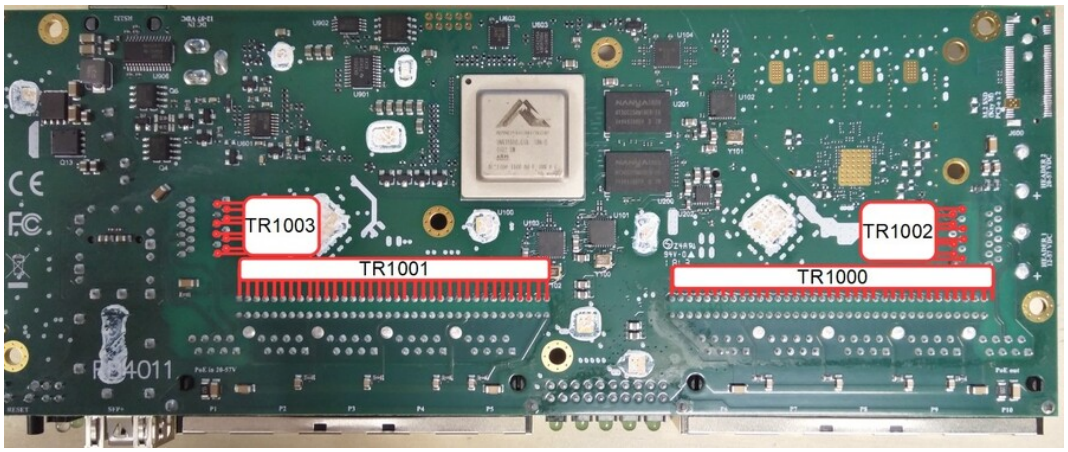
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Transformer TR1003 and TR1002 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 191. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 15.

Check voltage drop value between Transformer TR1001, TR1000 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 191. Voltage drop value should be in the range from 0,34V to 0,4V. Voltage drop measurement method is described on page 15.



Picture 190



Picture 191

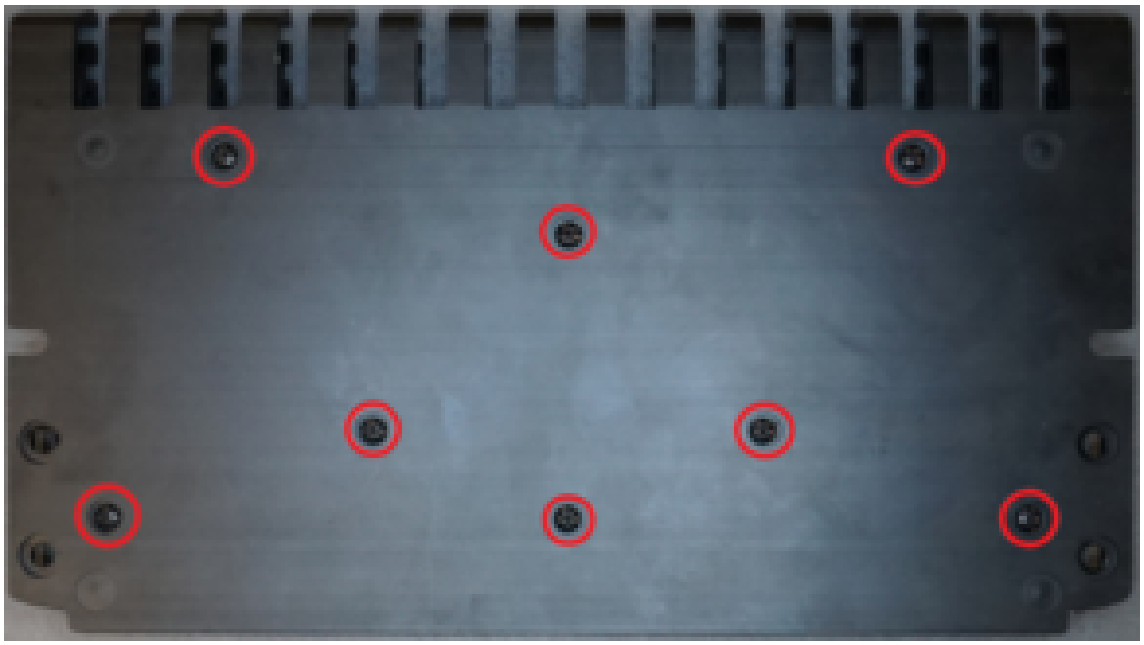
5009 SERIES ROUTERBOARDS

RB5009UG+S+IN

Picture 192

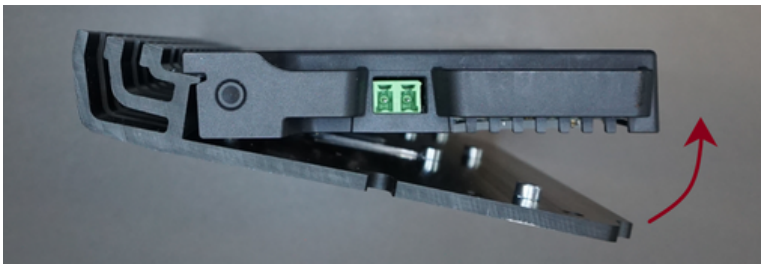
Disassembling information

Step 1: Unscrew 8 M2.5x17 screws from the bottom of the routerboard case using PH1 screwdriver. Location of the screws you can see in the picture 193.



Picture 193

Step 2: Lift the plastic cover according to picture 194.



Picture 194

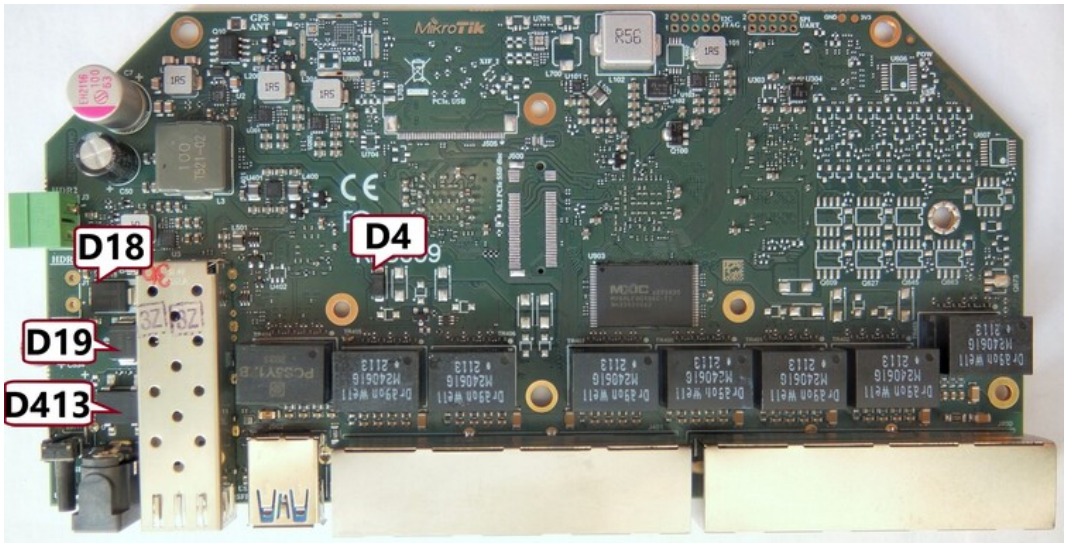
Instructions for checking overvoltage

Checking Schottky diode and diodes bridges

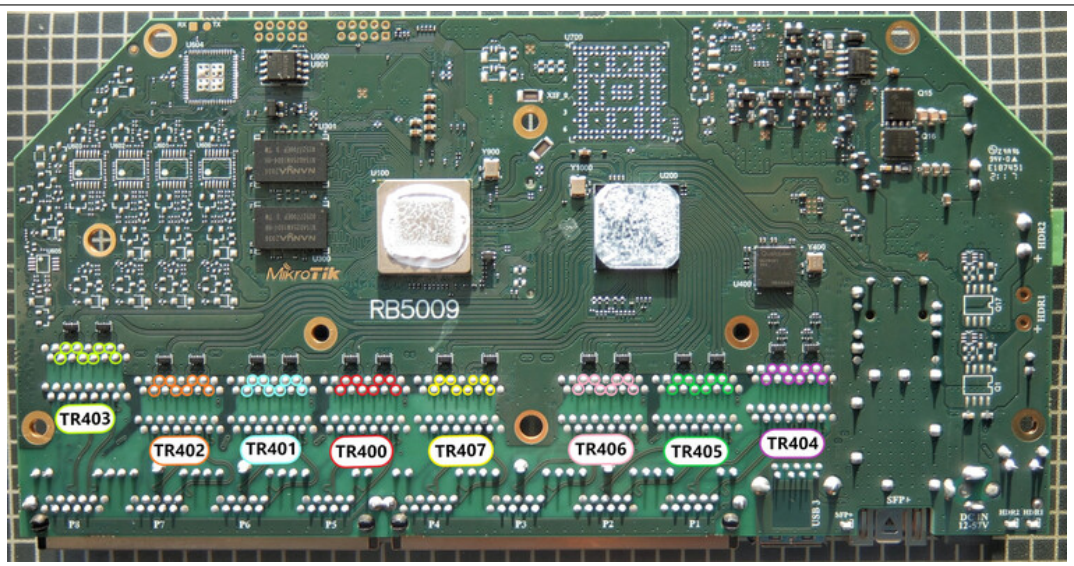
Check Schottky diodes D4, D18, D19 and diode bridge D413. Location of diodes on the board you can see in the picture 195. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

Checking voltage drop value between Ethernet transformer pins and Ground

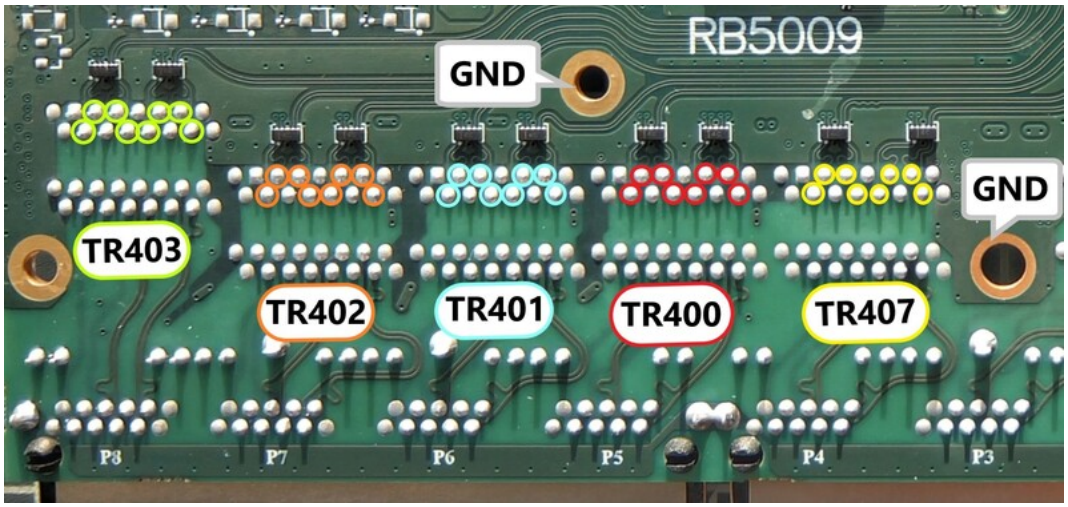
Check voltage drop value between transformers' TR400, TR401, TR402, TR403, TR404, TR405, TR406, TR407 pins and Ground (GND). Test points on the transformers' pins are marked with colored circles, see pictures 196 , 197 , 198. Voltage drop value should be in the range from 0,34V to 0,40V. Voltage drop measurement method is described on page 15.



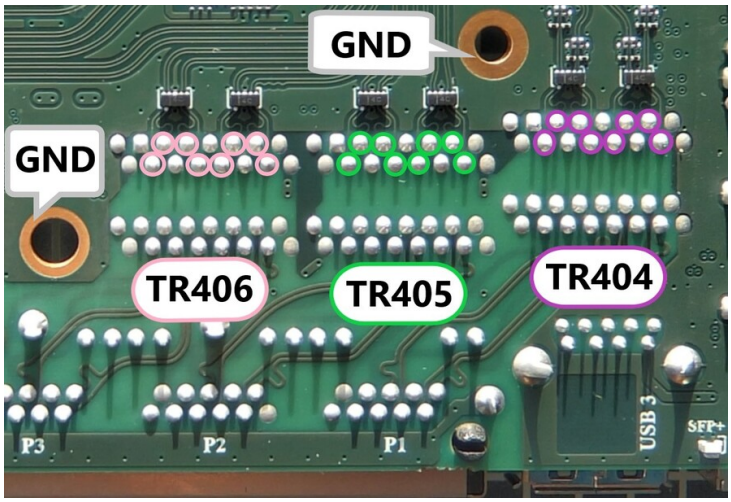
Picture 195



Picture 196



Picture 197



Picture 198

BASEBOX SERIES ROUTERBOARDS

BaseBox 2 (912UAG-2HPnD-OUT)

BaseBox 5 (912UAG-5HPnD-OUT)

Picture 199

Disassembling information

Step 1: Remove the sticker from connector, see picture 200.

Picture 200

Step 2: Unstick 2 screws stickers from the BaseBox case base, see picture 201.

Picture 201

Step 3: Unscrew the case base from the board holder by torque T8 screwdriver. Location of 2 screws you can see in the picture 202.

Picture 202

Step 4: Take out the case base from the board holder, see picture 203.

Picture 203

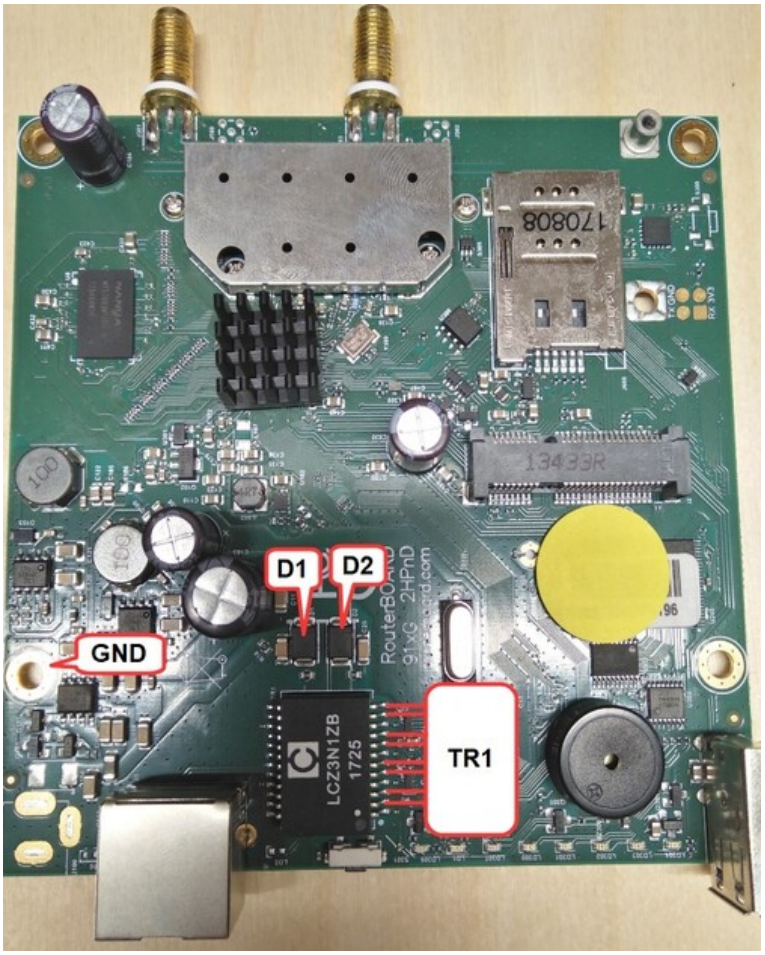
Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D1, D2. Location of diodes on the board you can see in the picture 204. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between TR1 and Ground. Test points on the transformer pins are marked with red dots, see picture 204. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.



Picture 204

BaseBox 6 (RB912UAG-6HPnD-OUT)

Disassembling information

Disassembly method of the board is the same as the BaseBox 2 board. Disassembly method is described on page 183.

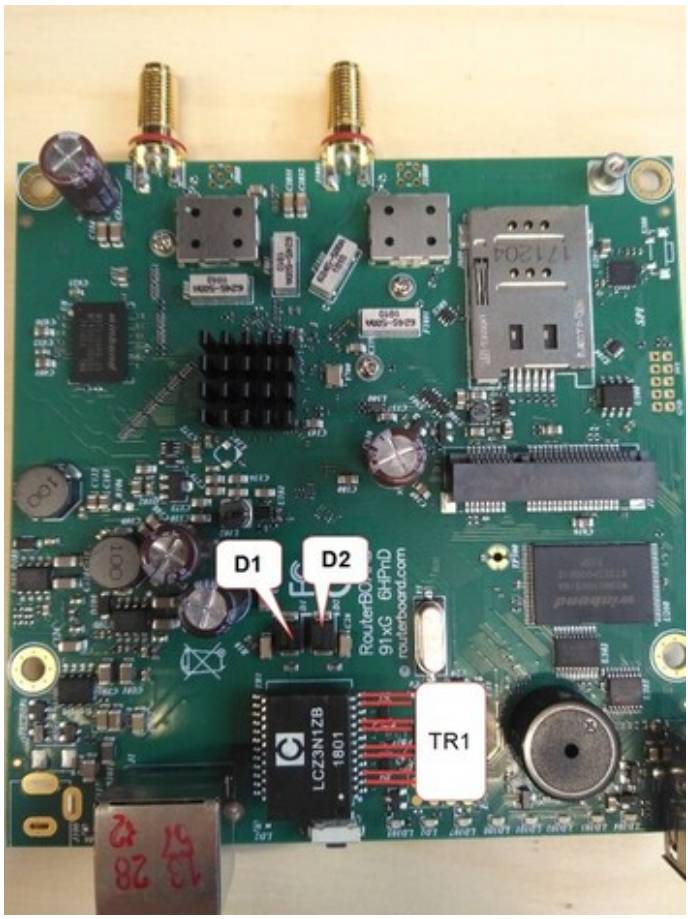
Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diode D1, D2. Location of diodes on the board you can see in the picture 205. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between TR1 and Ground. Test points on the transformer pins are marked with red dots, see picture 205. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 15.



Picture 205

CAP SERIES ROUTERBOARDS

cAP (cAP2nD)

V1

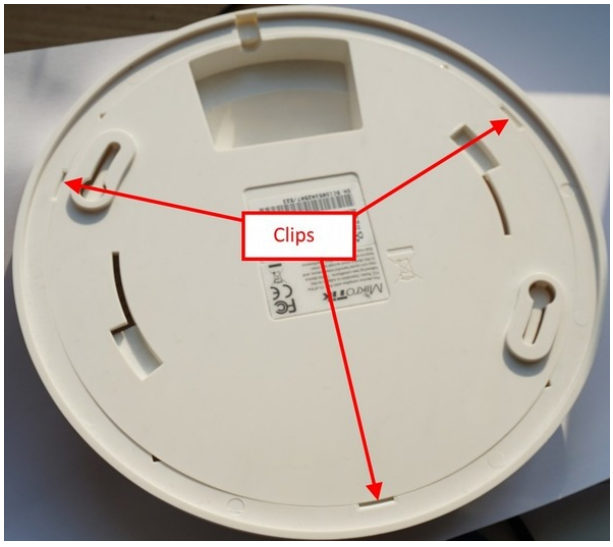
Picture 206

V2

Picture 207

Disassembling information for V1

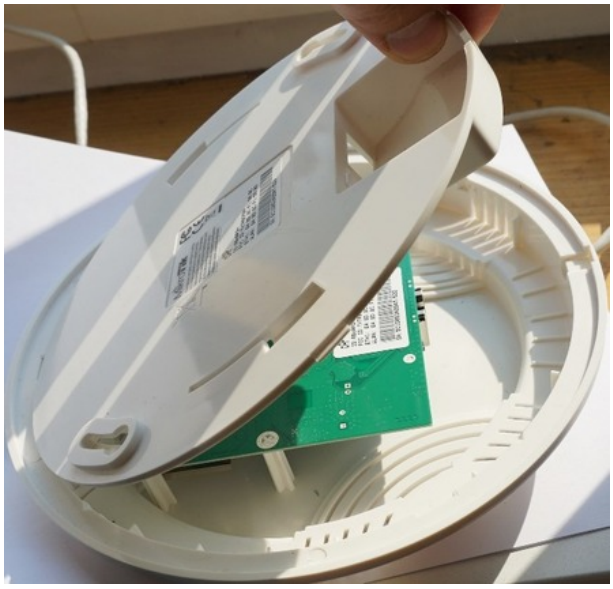
Step 1: Push the router edge around clips to open the case, see pictures 208 - 209.



Picture 208

Picture 209

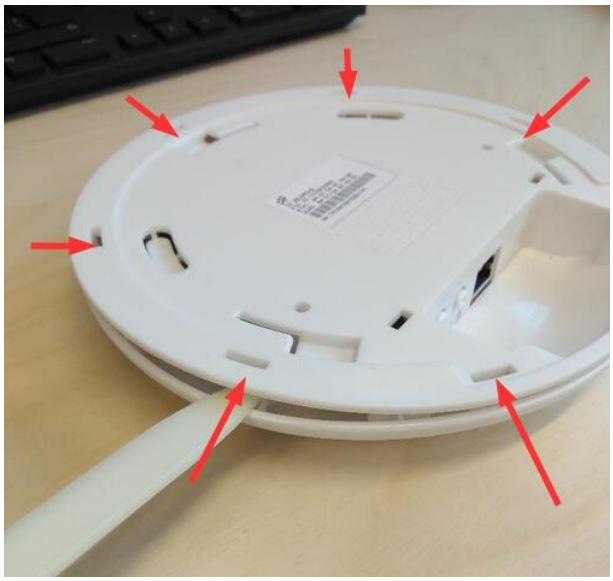
Step 2: Remove cover and take out the board from case, see picture 210.



Picture 210

Disassembling information for V2

Step 1: Push the clips from outside and at the same time lift the case up. Work this way around for all 6 clips as shown in picture 211.



Picture 211

Step 2: Unscrew 2 mounting screws as shown in picture 212.

Picture 212

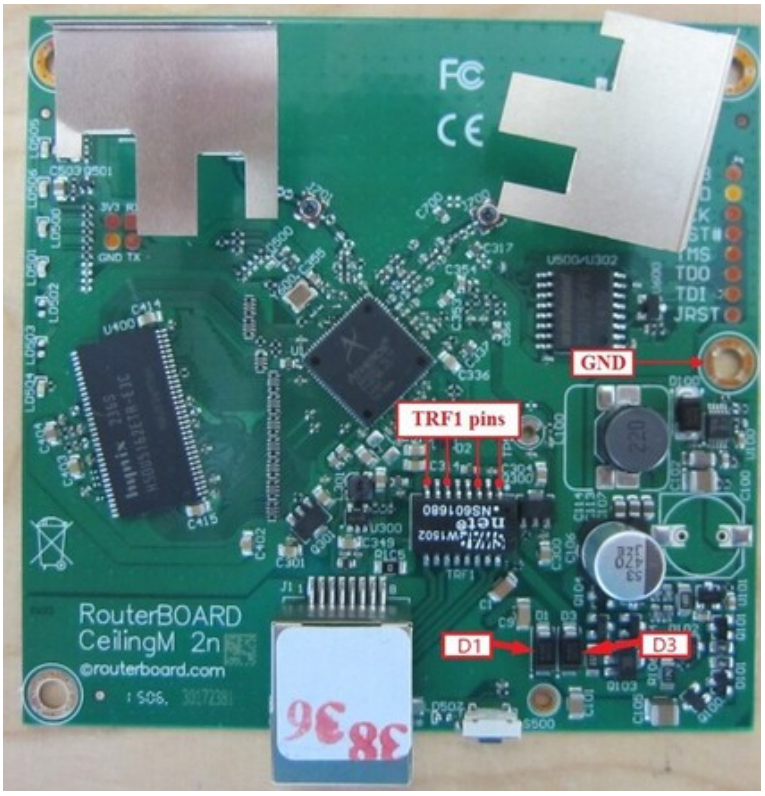
Instructions for checking overvoltage for v1

Checking Schottky diode

Check Schottky diodes D1, D3. Location of diodes on the board you can see in the picture 213. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet Transformer TRF1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 213. Voltage drop value should be in the range from 0,37V to 0,42V. Voltage drop measurement method is described on page 15.



Picture 213

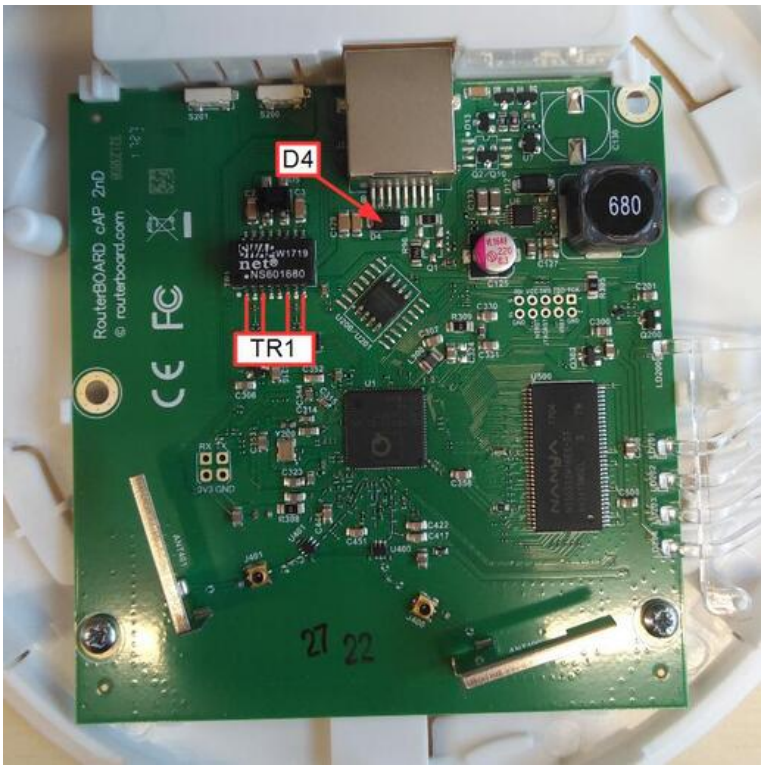
Instructions for checking overvoltage for v2

Checking Schottky diode

Check Schottky diodes D4. Location of diode on the board you can see in the picture 214. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet Transformer TRF1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 214. Voltage drop value should be in the range from 0,37V to 0,40V. Voltage drop measurement method is described on page 15.



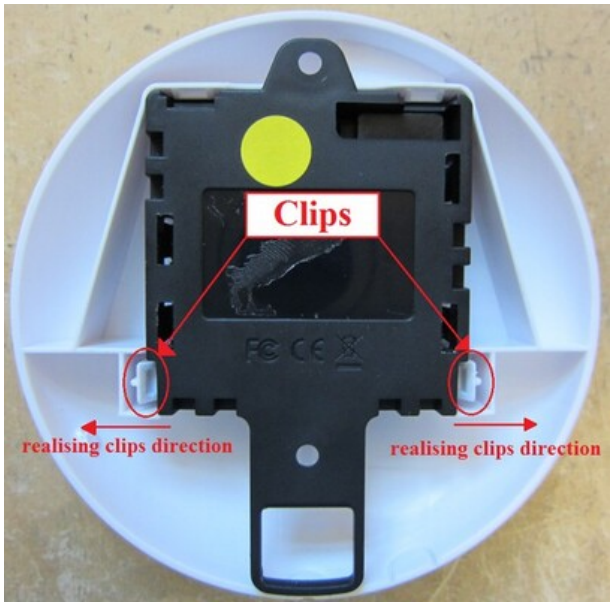
Picture 214

cAP lite (cAP L-2nD)

Picture 215

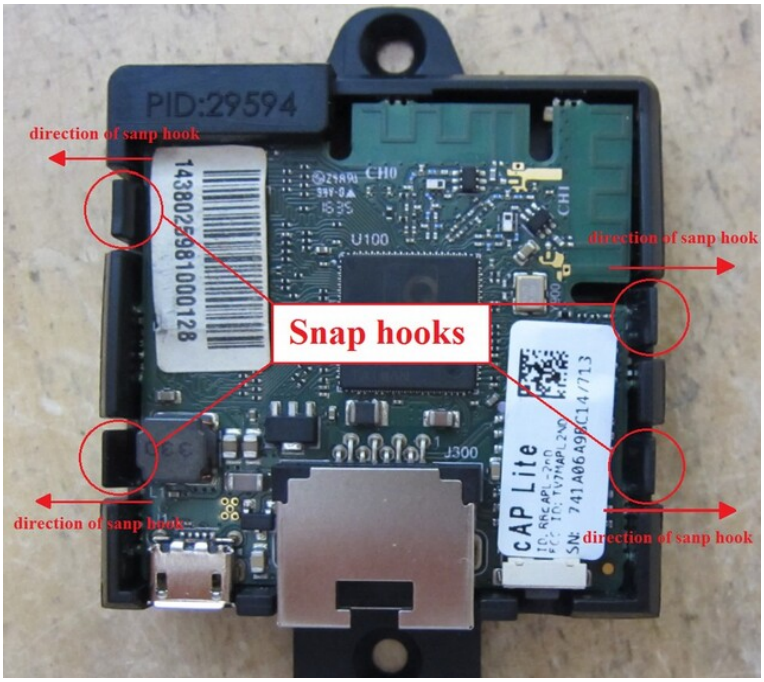
Disassembling information

Step 1: Move the clips in the opposite direction from the fixed board and pull the black plastic housing towards you. Location of the clips you can see in the picture 216.



Picture 216

Step 2: Gently release 4 snap hooks and pull out PCB from the CapL-Base case. Location of the snap hooks you can see in the picture 217.



Picture 217

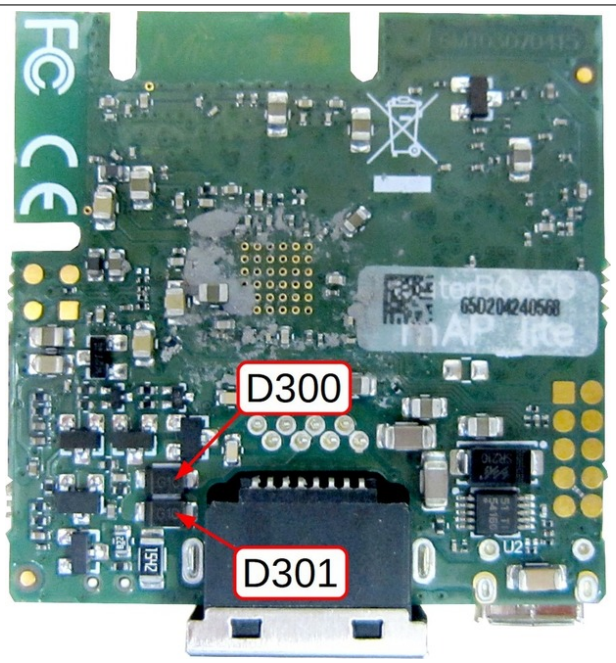
Instructions for checking overvoltage

Checking Schottky diode

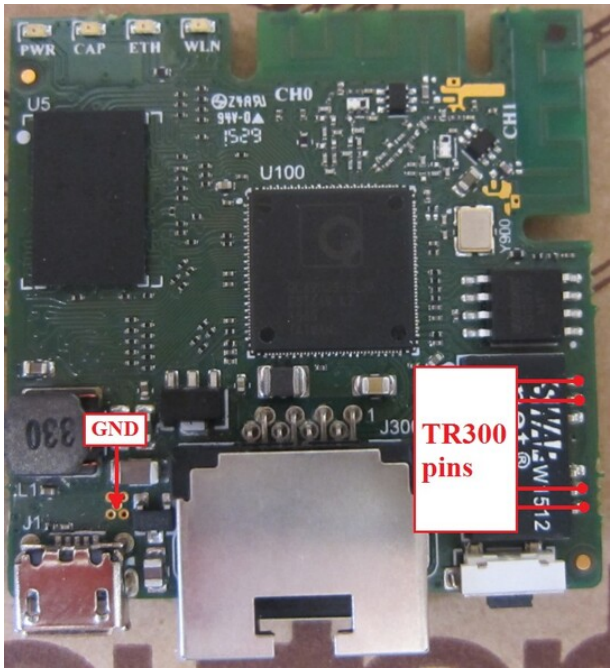
Check Schottky diodes D300, D301 on the board bottom layer, see picture 218. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR300 pins and Ground. Test points on the Ethernet transformer pins are marked with red dots, see picture 219. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 15.



Picture 218



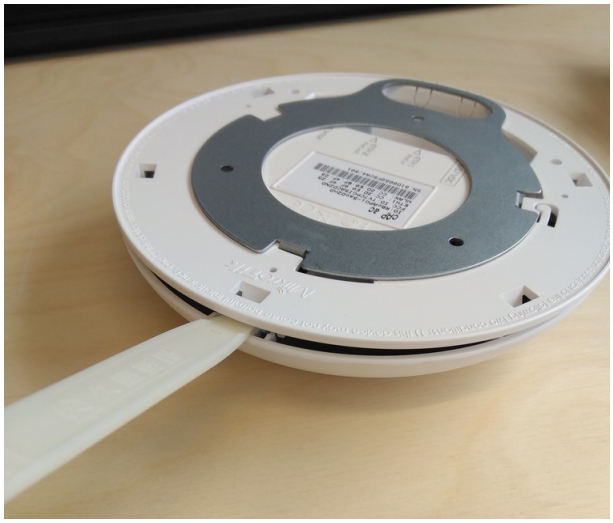
Picture 219

cAP ac (RBcAPGi-5acD2nD)

Picture 220

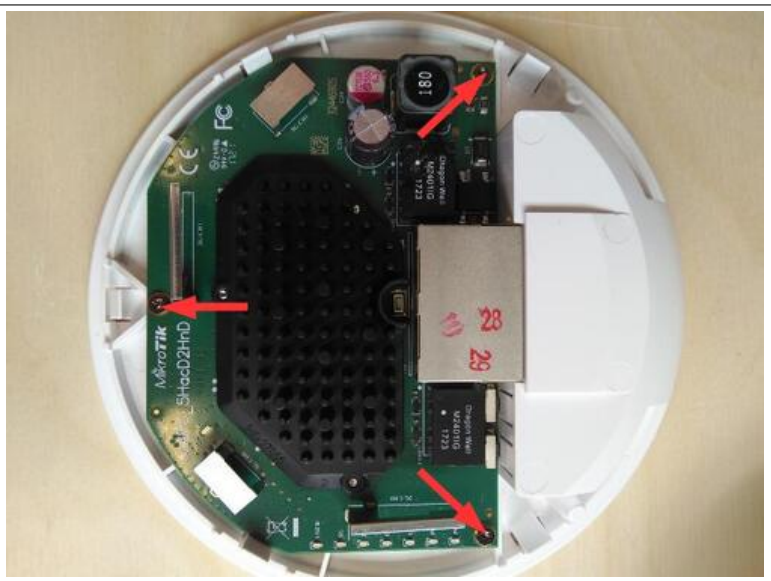
Disassembling information

Step 1: Push the clips from outside and at the same time lift the case up. Work this way around for all 5 clips as shown in picture 221.



Picture 221

Step 2: Unscrew 3 mounting screws as shown in picture 222.



Picture 222

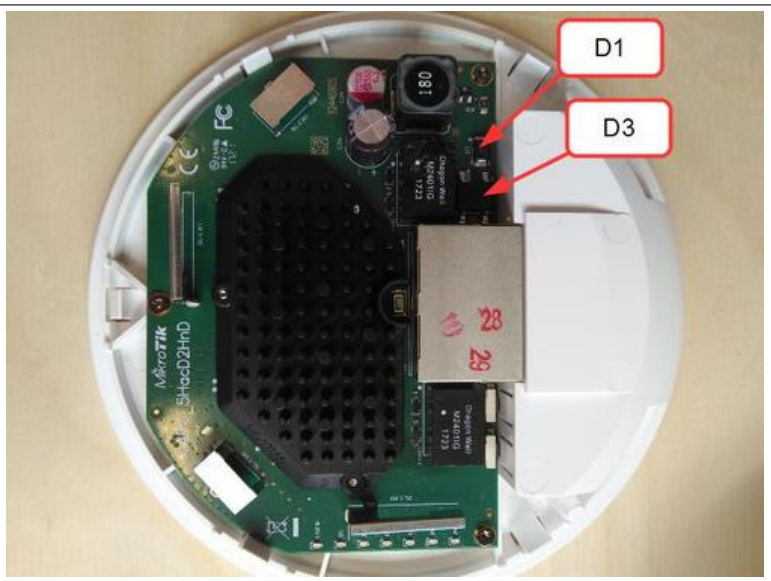
Instructions for checking overvoltage

Checking Schottky diode

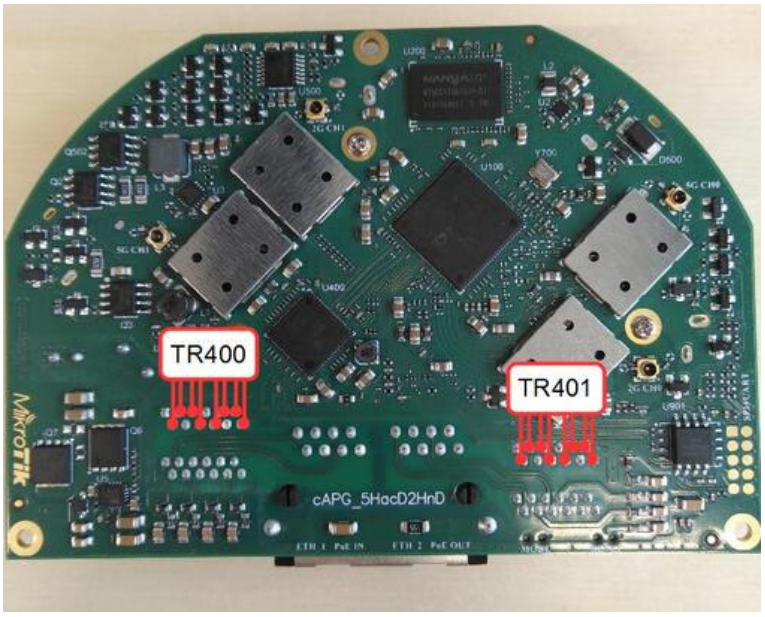
Check Schottky diodes D1 and diode bridge D3. Location of diodes on the board you can see in the picture 223. Schottky diode quality measurement method is described on page 12.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR401, TR400 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 224. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 15.



Picture 223



Picture 224

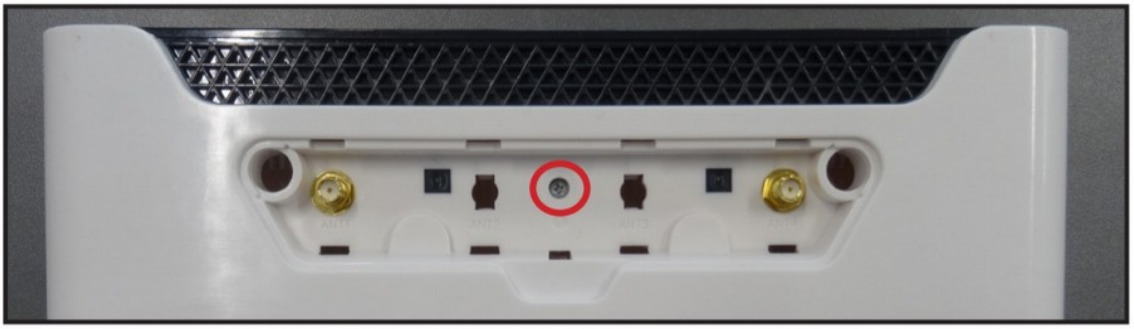
CHATEAU SERIES ROUTERBOARDS

Chateau 5G (D53G-5HacD2HnD-TC&RG502Q, D53G-5HacD2HnD-TC&RG520F)

Picture 225

Disassembling information

Step 1: Tools recommended for the disassembly are plastic prying tools, such as shown on pictures 250 and 240, a PH1 and a T8 screwdriver. Unscrew the central screw (PH1) as shown in the picture 237.



Picture 226

Step 2: The board's cover and base parts are put together using snap fit hooks. Placement of these hooks is shown in picture 238.

Picture 227

Step 3: Plastic prying tools are recommended, because plastic is less likely to leave deformation marks on the case of routerboard. Suggested prying tools are shown on pictures 250 and 240.
The disassembly starts with the lower left snap point: lie the board front side up and place white prying tool's hook between the white and black panels of the case, apply vertical force to release the snap point thereby lifting the white part of the case.
To further minimize the risk of leaving traces of impact a trick can be used, see picture 241 – the white prying tool can be placed in a rubberized ESD glove, the material of the glove will provide a soft medium between two plastic parts (prying tool and case), and the rubberized finish will provide additional grip.
The flat part of the white prying tool can be used to open the case form the flanks.
The blue prying tool is recommended to use in upper and lower parts of the case, see picture

242, here it is advised to insert the blue prying tool with its wide side inside the case, then press on the top of the tool thereby applying vertical force to release this part of the case.
In case dirt marks are appeared on the case it is advised to use microfiber cloth with water for cleaning.

Picture 228

Picture 229

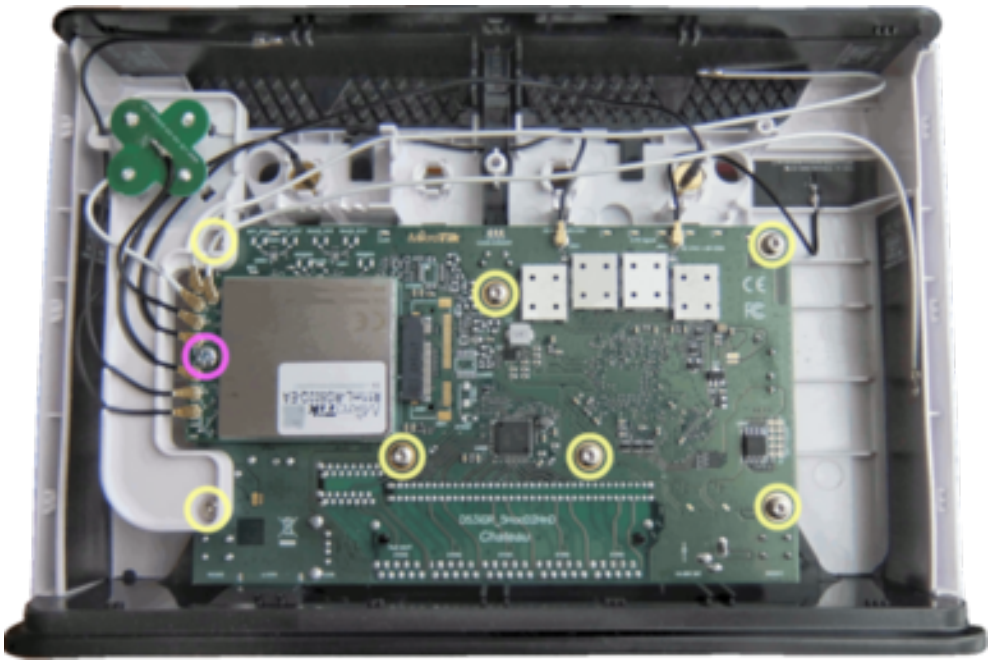
Picture 230

Picture 231

Step 4: Continue to release snap hooks around perimeter as shown in picture 243

Picture 232

Step 5: Gently remove all antenna cables. Unscrew PH1 screw and remove the modem. Unscrew 7x T8 screws, that are holding the PCB. When lifting the PCB proceed with care because the screws were pressing it down to the heatsink. Screw placement is marked on image 233.



Picture 233

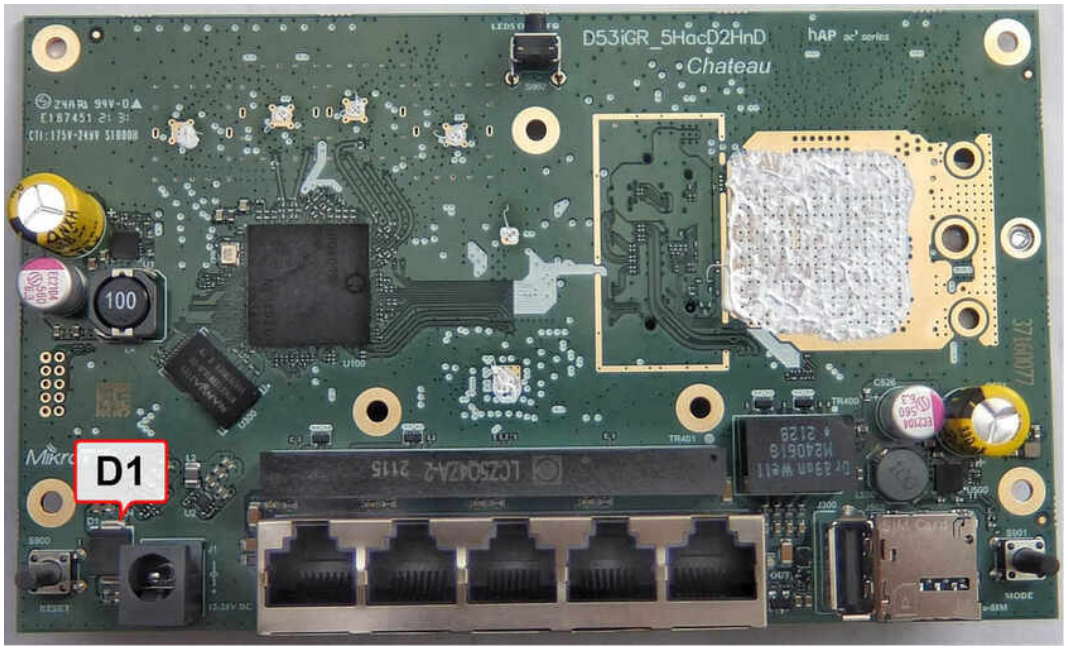
Instructions for checking overvoltage

Checking Schottky diode

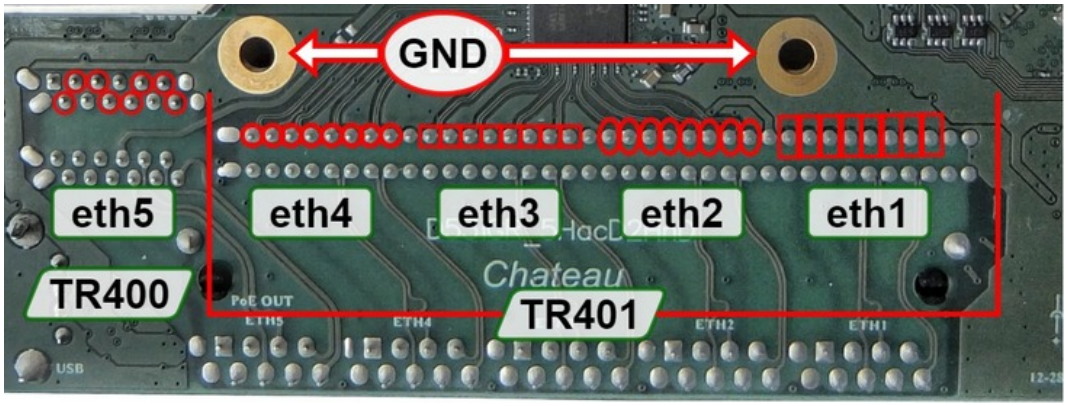
Check Schottky diodes D1. Location of diode on the board is shown in picture 234. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR400 and TR401 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 235. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 15.



Picture 234



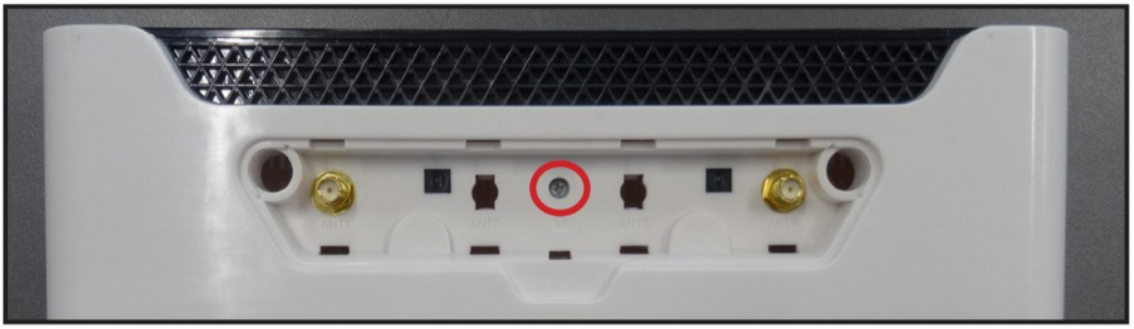
Picture 235

Chateau 5G AX (S53UG+M-5HaxD2HaxD-TC&RG502Q-EA)

Picture 236

Disassembling information

Step 1: Tools recommended for the disassembly are plastic prying tools, such as shown on pictures 250 and 240, a PH1 and a T8 screwdriver. Unscrew the central screw (PH1) as shown in the picture 237.



Picture 237

Step 2: The board's cover and base parts are put together using snap fit hooks. Placement of these hooks is shown in picture 238.

Picture 238

Step 3: Plastic prying tools are recommended, because plastic is less likely to leave deformation marks on the case of routerboard. Suggested prying tools are shown on pictures 250 and 240.
The disassembly starts with the lower left snap point: lie the board front side up and place white prying tool's hook between the white and black panels of the case, apply vertical force to release the snap point thereby lifting the white part of the case.
To further minimize the risk of leaving traces of impact a trick can be used, see picture 241 – the white prying tool can be placed in a rubberized ESD glove, the material of the glove will provide a soft medium between two plastic parts (prying tool and case), and the rubberized finish will provide additional grip.
The flat part of the white prying tool can be used to open the case form the flanks.
The blue prying tool is recommended to use in upper and lower parts of the case, see picture

242, here it is advised to insert the blue prying tool with its wide side inside the case, then press on the top of the tool thereby applying vertical force to release this part of the case.
In case dirt marks are appeared on the case it is advised to use microfiber cloth with water for cleaning.

Picture 239

Picture 240

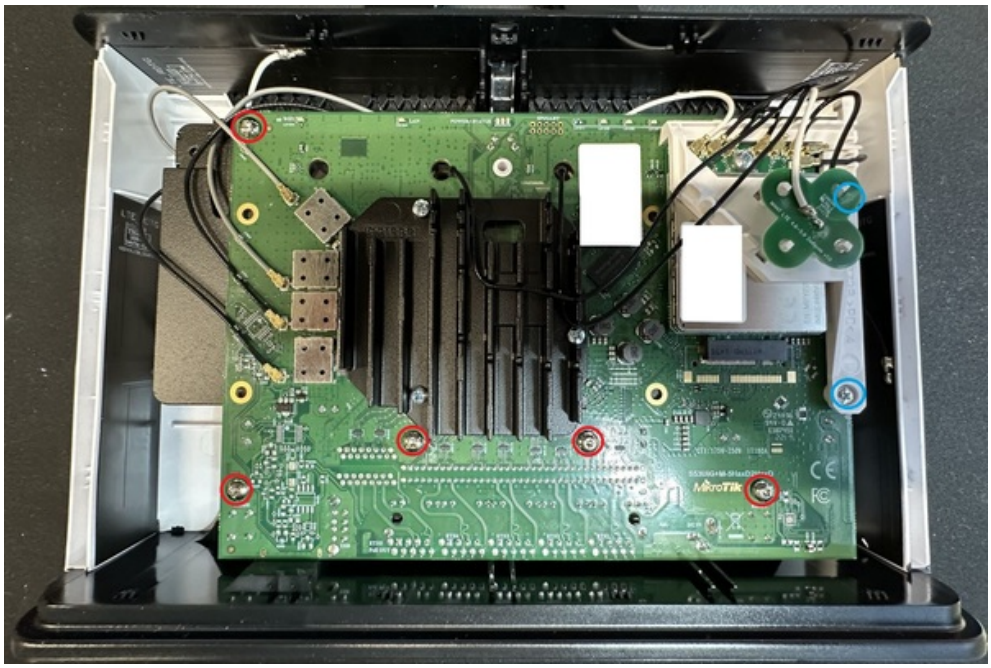
Picture 241

Picture 242

Step 4: Continue to release snap hooks around perimeter as shown in picture 243

Picture 243

Step 5: Gently remove all antenna cables. Unscrew the two PH1 screws and remove the modem plastics. Unscrew 5x T8 screws, that are holding the PCB. When lifting the PCB proceed with care because the screws were pressing it down to the heatsink. Screw placement is marked on image 244.



Picture 244

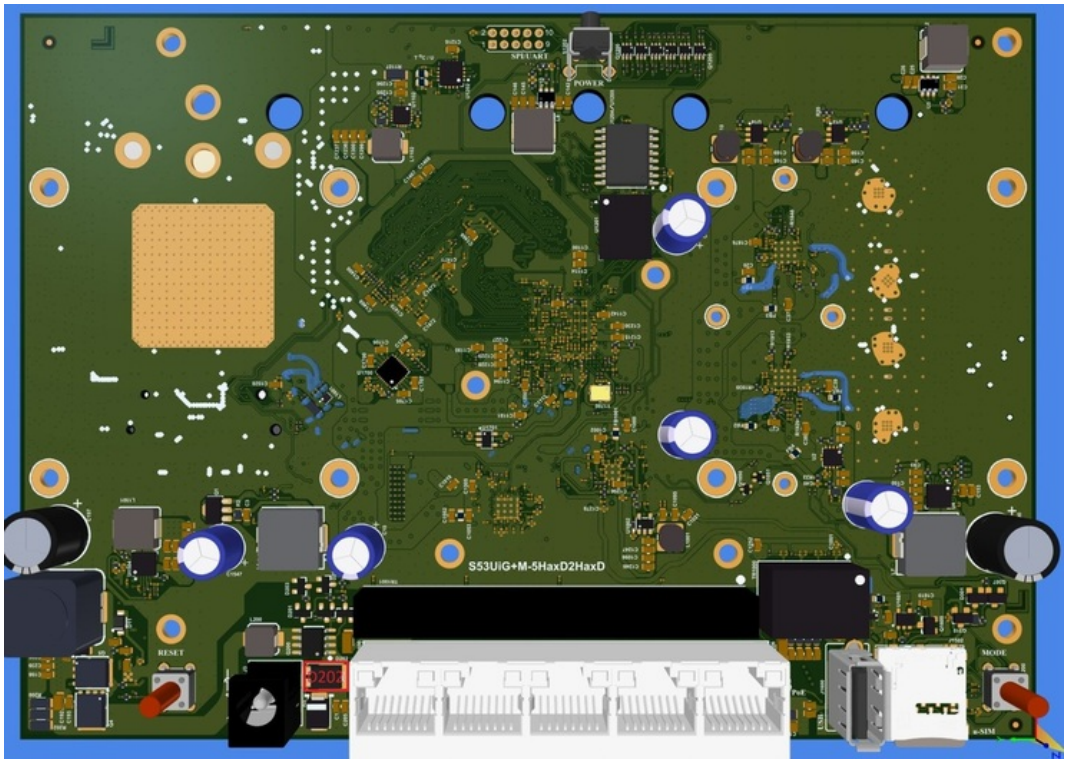
Instructions for checking overvoltage

Checking Schottky diode

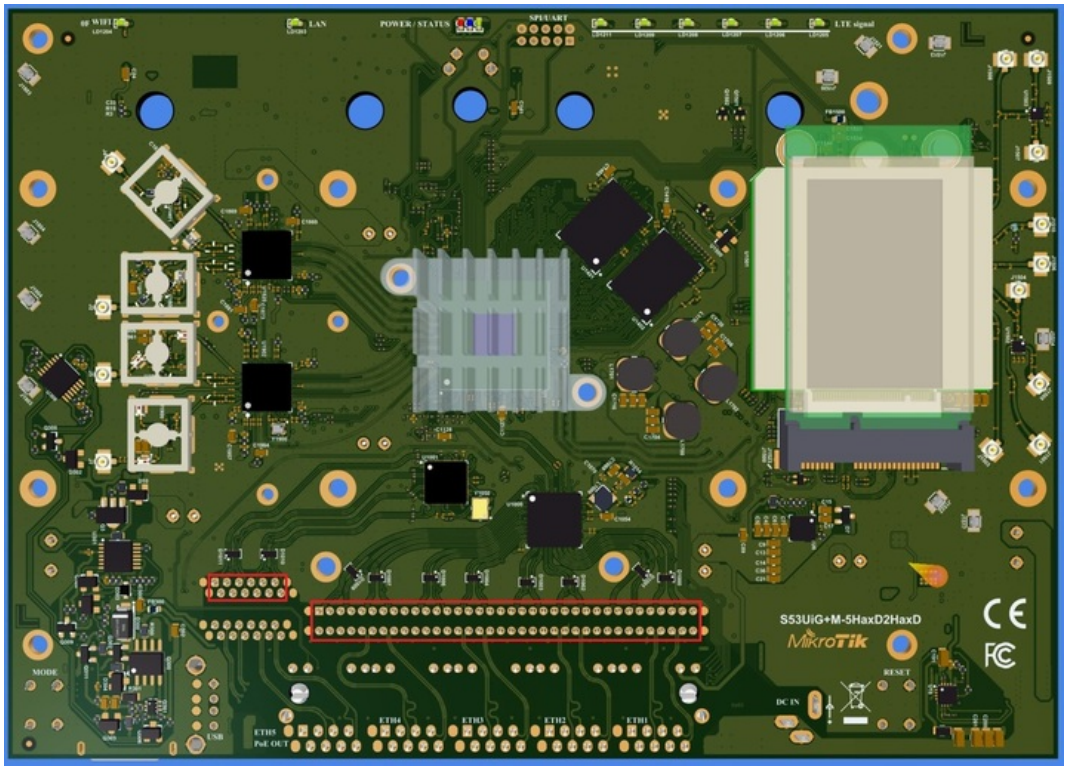
Check Schottky diode D202. Location of diode on the board is shown in picture 245. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR400 and TR401 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 246. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 15.



Picture 245



Picture 246

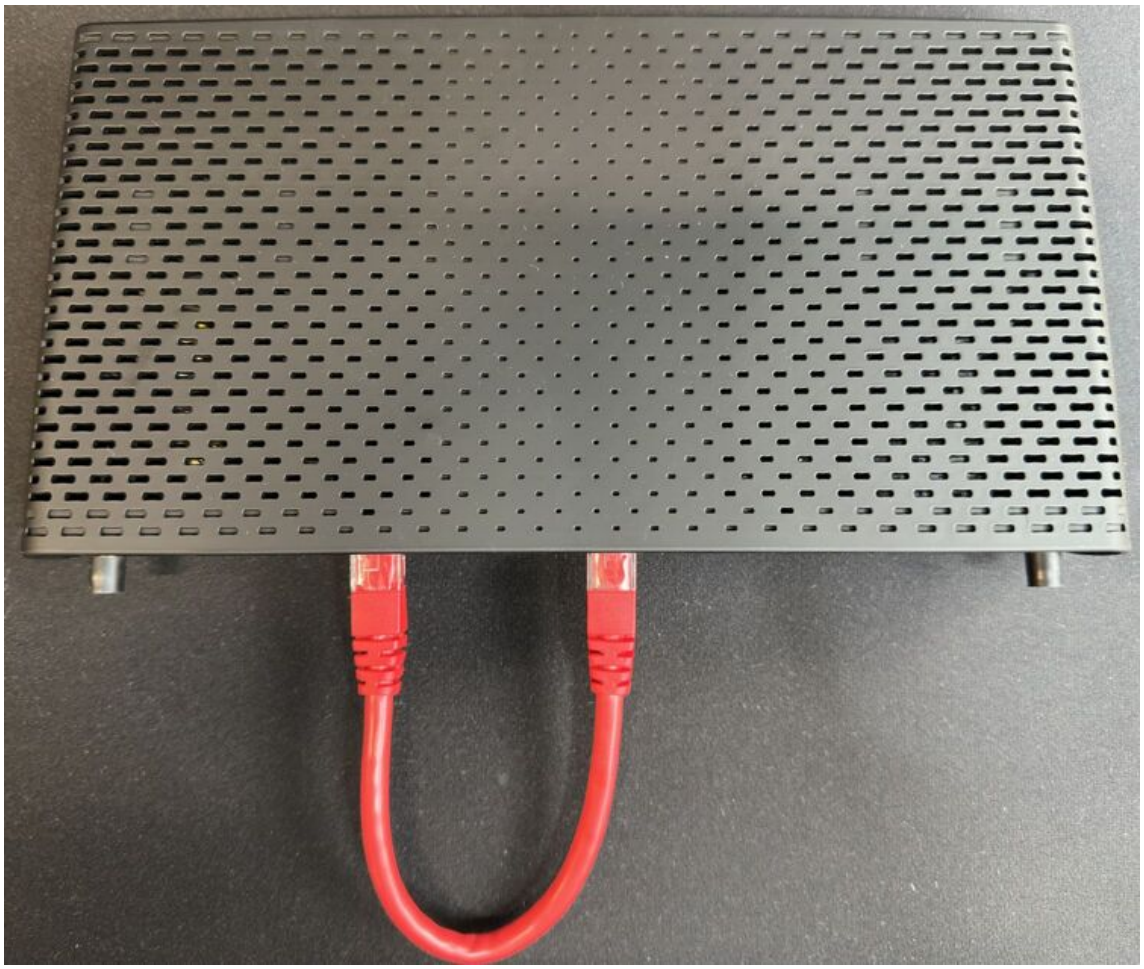
HAP SERIES ROUTERBOARDS

hAP ax3 (C53UiG+5HPaxD2HPaxD)

Picture 247

Disassembling information

Step 1: Tools recommended for the disassembly are plastic prying tools, such as the one shown on picture 250, a PH1 screwdriver and a 0,25M ethernet cable. Plug in an ethernet cable in ethernet ports 1 and 5 as shown in picture 248.



Picture 248

Step 2: The board is held inside the case with snap fit hooks. Placement of these hooks is shown in picture 249.

Picture 249

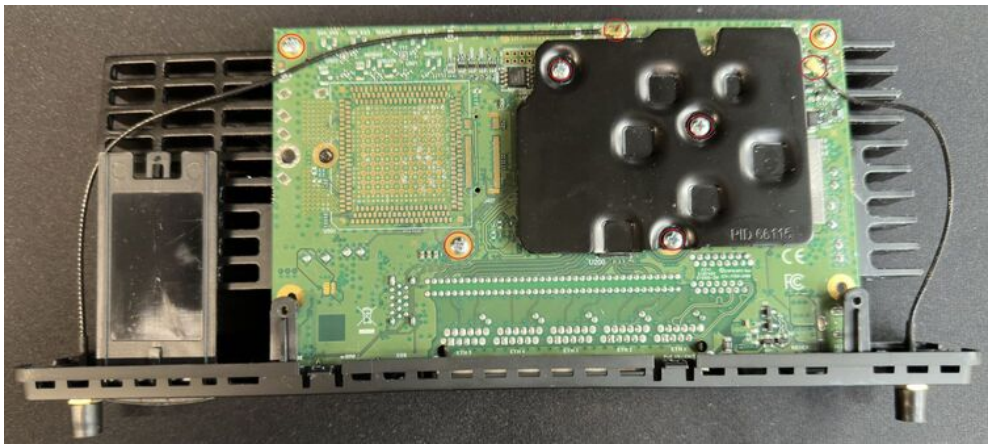
Step 3: Plastic prying tools are recommended, because plastic is less likely to leave deformation marks on the case of the routerboard. Suggested prying tool is shown in picture 250.
The disassembly starts with holding the outer cover and pulling the ethernet cable out of the case, then you must insert a prying tool into the left or right side where the snap fit hook is. Once you undo one side continue with the other side, after that you can undo the top and bottom hooks. Now you can pull the routerboard out of the case.

Picture 250

Step 4: After pulling the routerboard out of the case, unscrew the two screws shown in picture 251

Picture 251

Step 5: Then turn the routerboard to the other side and remove the two antenna connectors and unscrew the 6 screws shown in picture 252.



Picture 252

Step 6: Carefully remove the top, bottom heatsink and the front cover. Now you can begin the overvoltage tests.

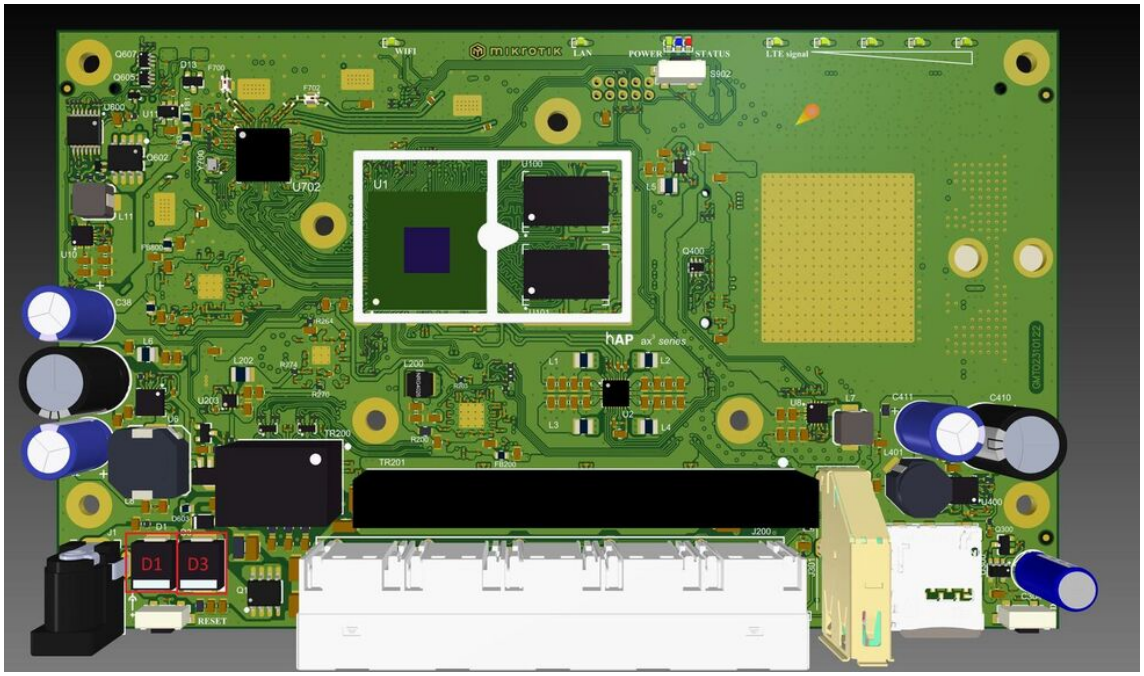
Instructions for checking overvoltage

Checking Schottky diode

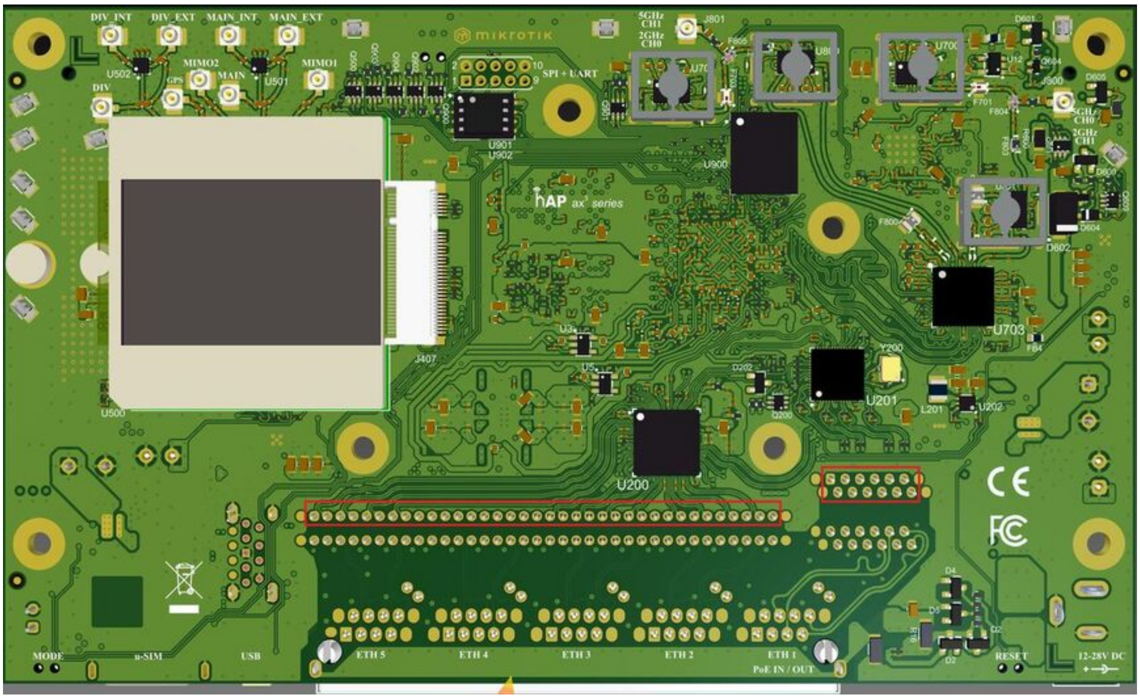
Check Schottky diodes D1 and D3.The location of these diodes on the board is shown in picture 253. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR400 and TR401 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 254. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 15.



Picture 253



DIV_INT
DIV_EXT
MAIN_INT
MAIN_EXT
MIMO2
MAIN
MIMO1
DIV
GPS
SPI + UART
hAP ax series
U200
U201
U703
U900
ETH 5
ETH 4
ETH 3
ETH 2
ETH 1
PoE IN / OUT
MODE
u-SIM
USB
RESET
12-28V DC

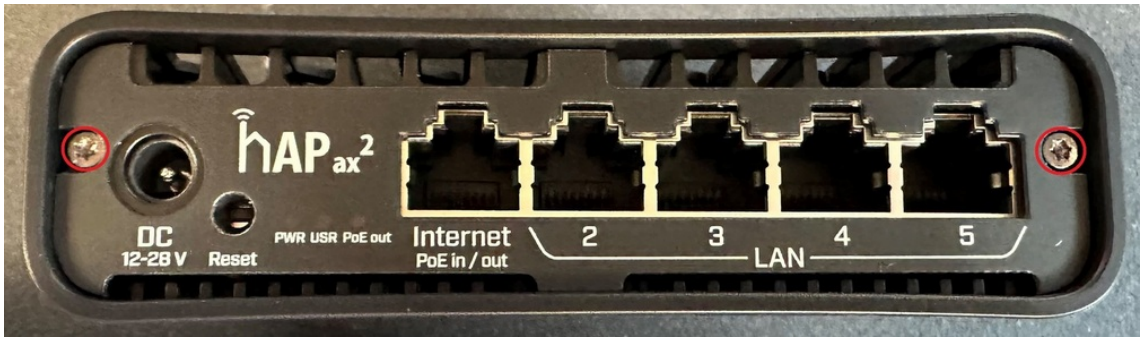
Picture 254

hAP ax2 (C52iG-5HaxD2HaxD-TC)

Picture 255

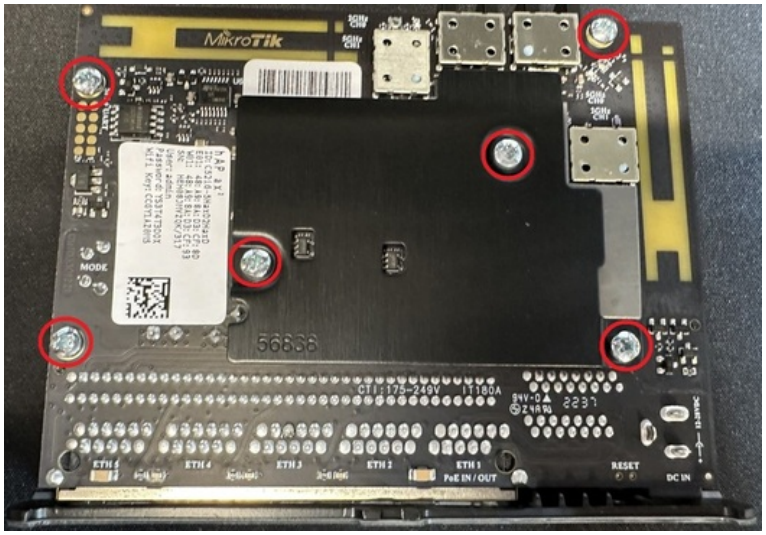
Disassembling information

Step 1: Tools recommended for the disassembly are a PH1 and TR8 screwdriver. First unscrew the two TR8 screws that are shown in picture 256. Then you can slide the board out of the case.



Picture 256

Step 2: Unscrew the six PH1 screws shown in picture 257. Now remove the top and bottom heatsinks and then you can begin the tests for checking overvoltage.



Picture 257

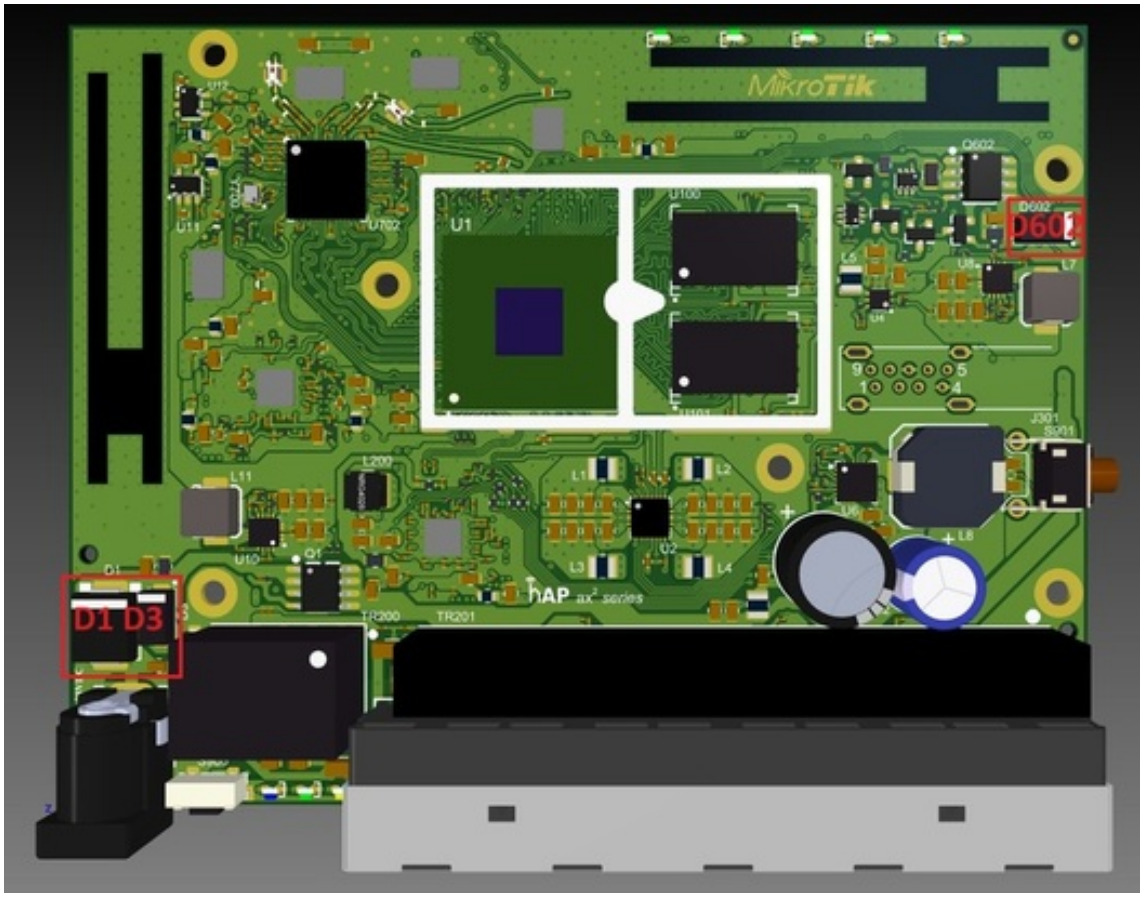
Instructions for checking overvoltage

Checking Schottky diode

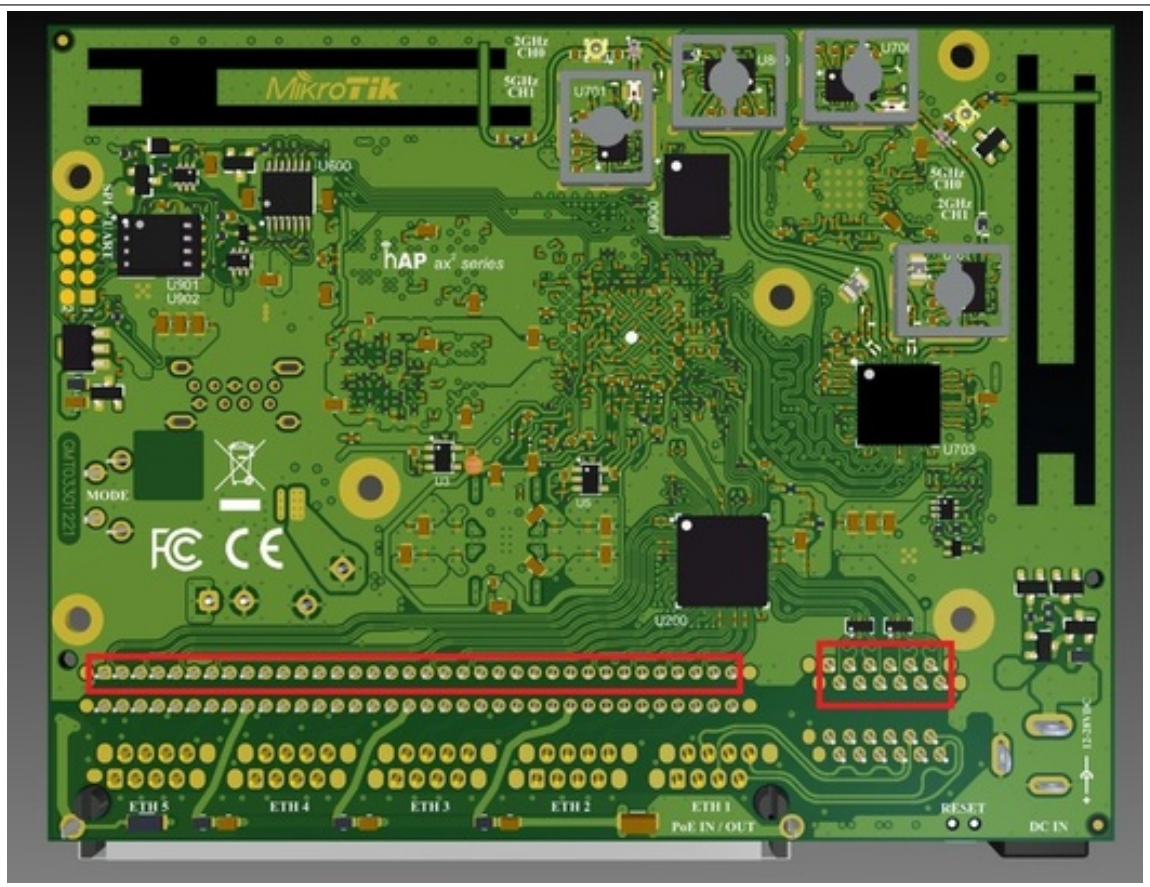
Check Schottky diodes D1, D3 and D602.The location of these diodes on the board is shown in picture 258. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR200 and TR201 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 259. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 15.



Picture 258


MikroTik
hAP ax² series
MODE
ETH 5
ETH 4
ETH 3
ETH 2
ETH 1
PoE IN / OUT
RESET
DC IN

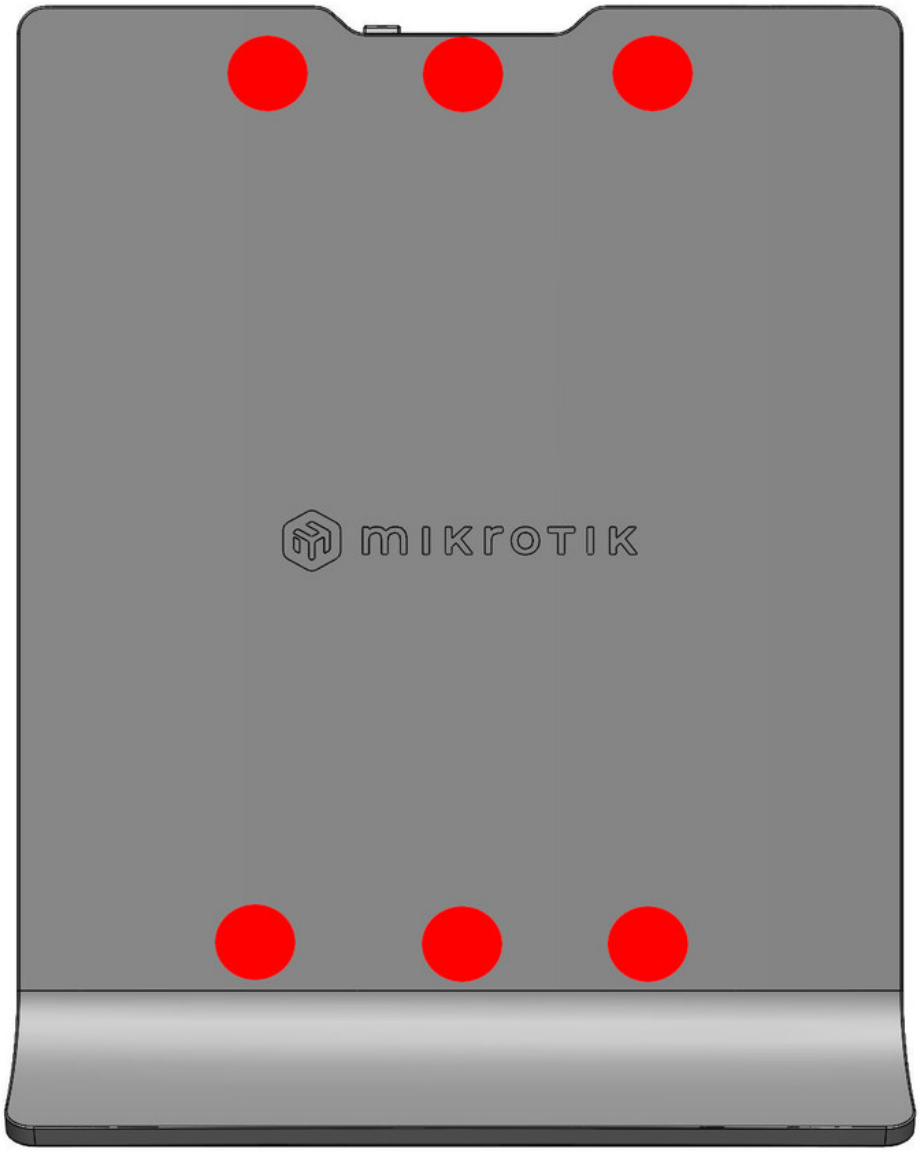
Picture 259

hAP ax lite and hAP ax lite LTE6 (L41G-2axD, L41G-2axD&FG621-EA)

Picture 260

Disassembling information

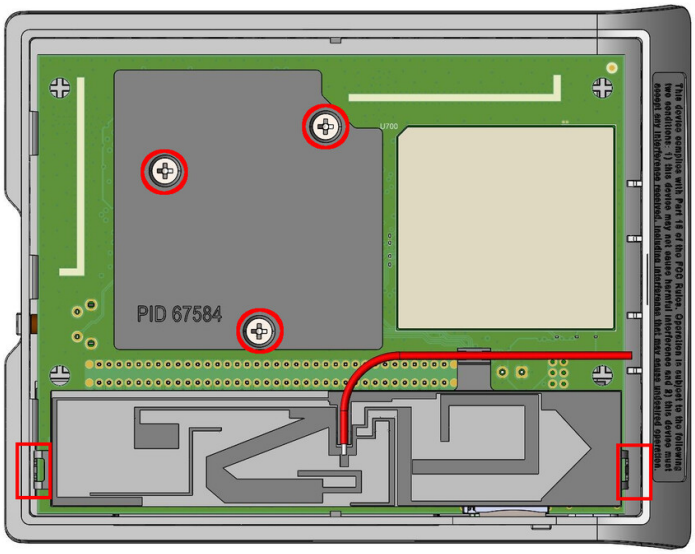
Step 1: Plastic prying tools are recommended, because plastic is less likely to leave deformation marks on the case of the routerboard. Suggested prying tool is shown in picture 262. The disassembly starts undoing six snap fit hooks that are located as shown in picture 261, then you must insert a prying tool into the top left or right corner. Once you undo one side continue with the other side, after that you can undo the top and bottom hooks. Be careful when pulling the routerboard out of the case, because the LTE6 version has a antenna cable that is attached to the chassis.



Picture 261

Picture 262

Step 2: Unscrew the three PH1 screws and remove the LTE antenna (if you have the LTE6 version) which is held on with hooks as shown in picture 263. Now remove the top and bottom heatsinks and then you can begin the tests for checking overvoltage.

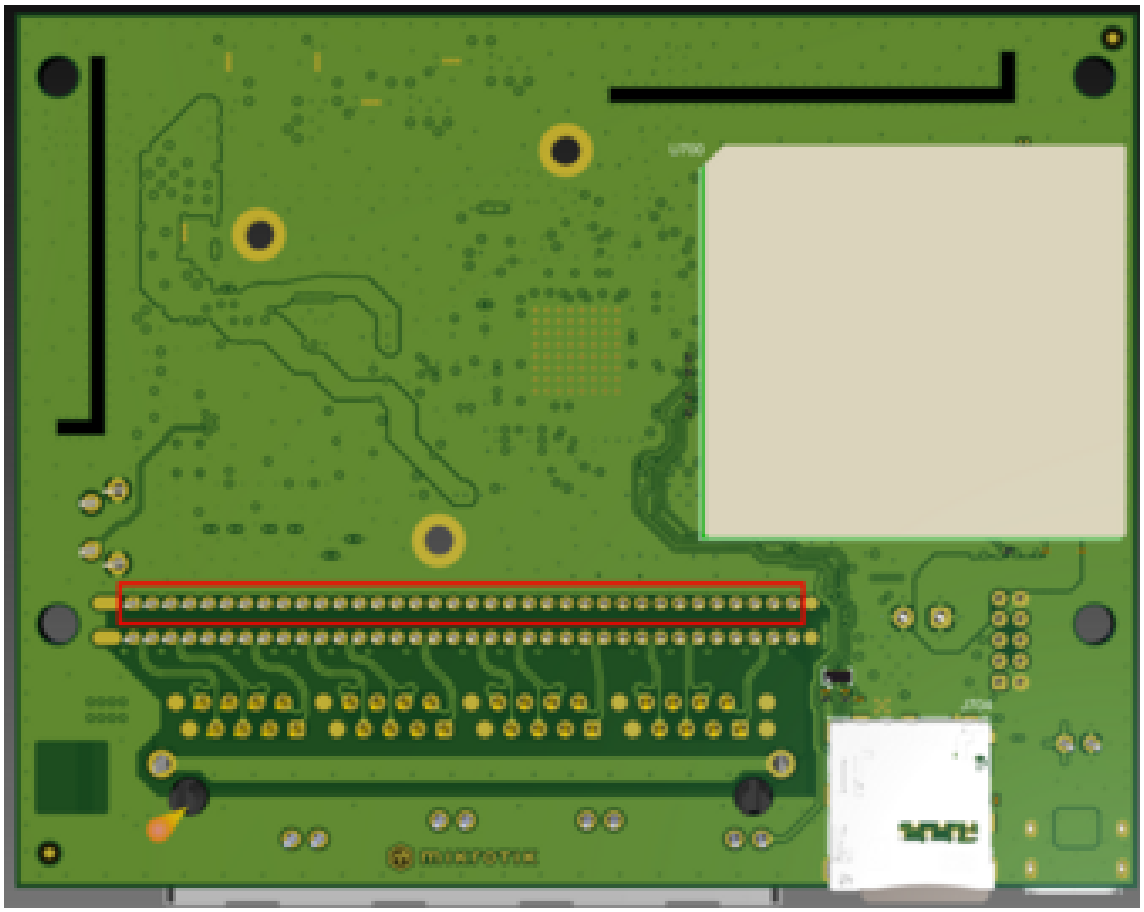


Picture 263

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

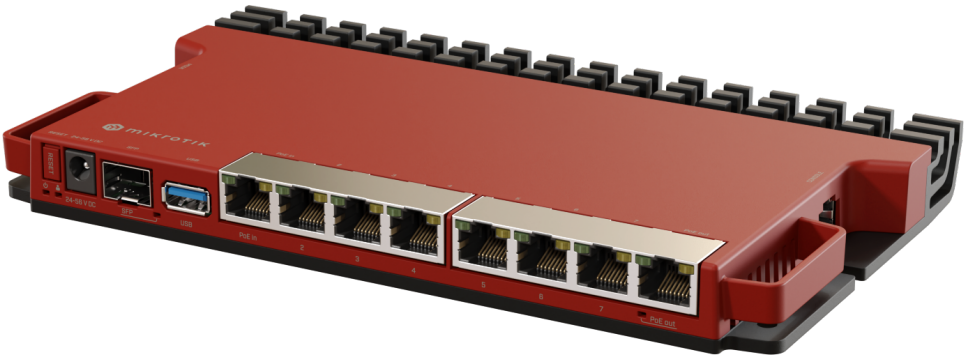
Check voltage drop value between Ethernet transformers TR200 and TR201 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 264. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 15.



Picture 264

L009 SERIES ROUTERBOARDS

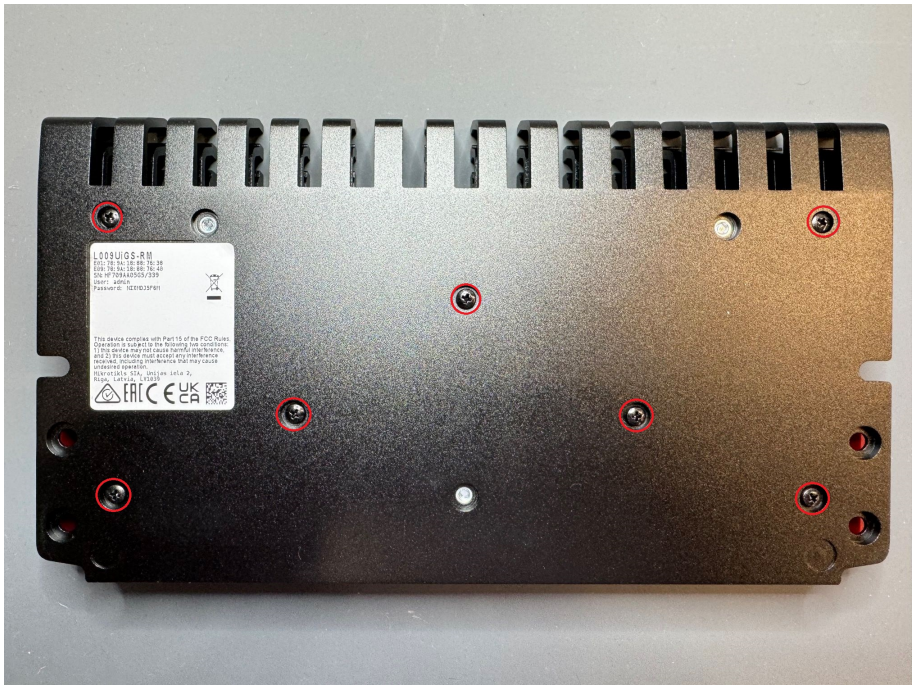
L009UiGS-RM and L009UiGS-2HaxD-IN



Picture 265

Disassembling information

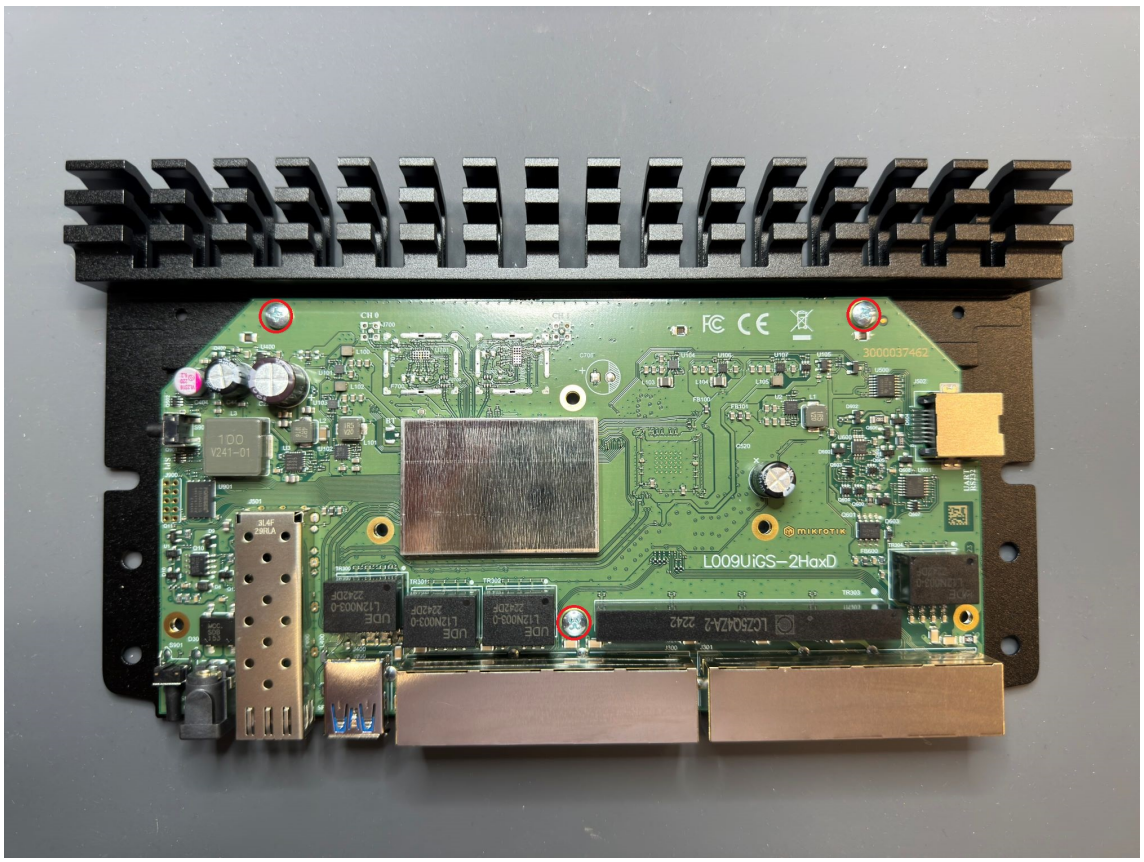
Step 1: To disassemble the RouterBOARD you will need a PH0 screwdriver. To start the disassembly please turn the RouterBOARD black side facing upward and start unscrewing the 7 highlighted screws as shown in picture 266. When you have finished unscrewing the screws turn the RouterBOARD around and remove the red cover as shown in picture 267.



Picture 266

Picture 267

Step 2: After removing the red cover unscrew the 3 screws that are holding the RouterBOARD in place as shown in the picture 268. Now you can remove the PCB and start checking overvoltage.

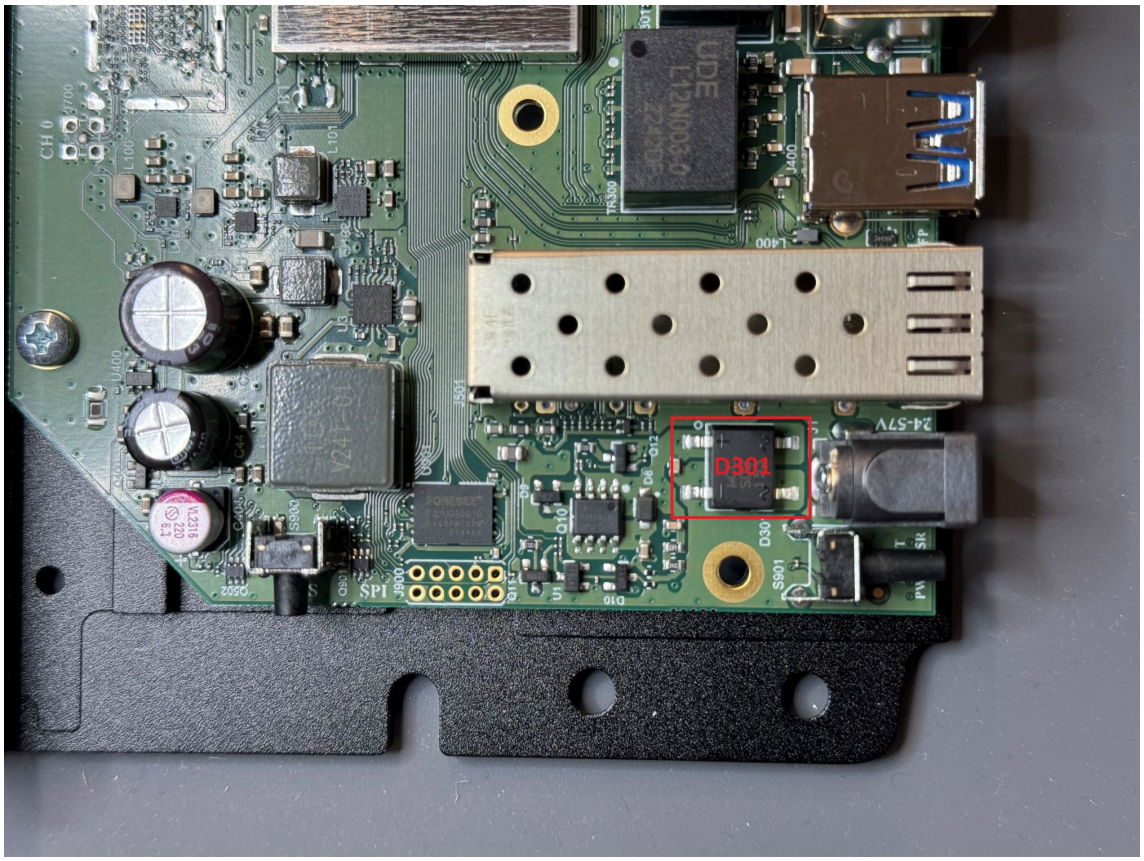


Picture 268

Instructions for checking overvoltage

Checking Schottky diode

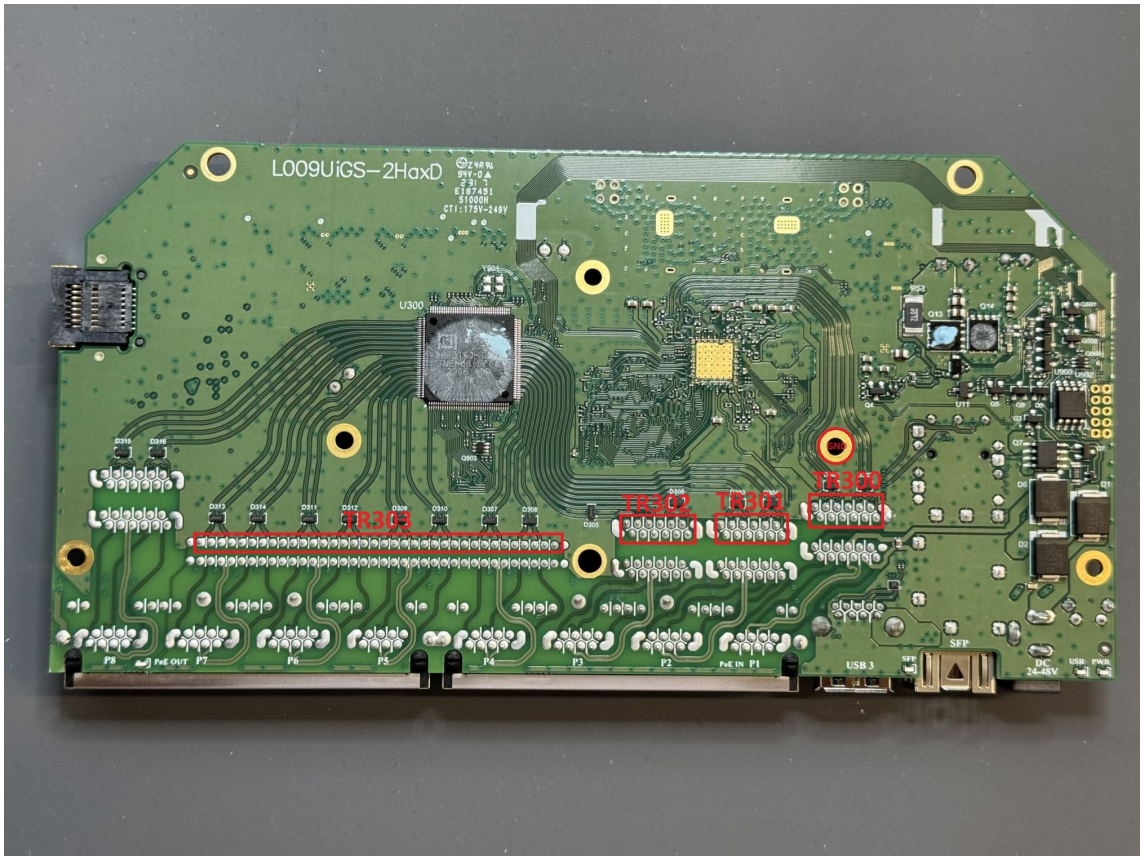
Check diode bridge D301.The location of this diode on the board is shown in picture 269. Schottky diode quality measurement method is described on page 12. Diode bridge quality measurement method is described on page 13.



Picture 269

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR300, TR301, TR302, TR303 pins and Ground. Test points on the transformer pins are highlighted with red squares, see picture 270. Voltage drop value should be in the range from 0,32V to 0,45V. Voltage drop measurement method is described on page 15.



Picture 270