



Instructions for checking overvoltage damage

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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.

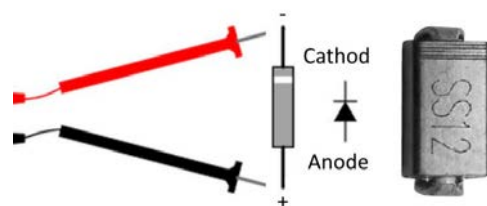
The diode needs to be checked in reverse switching, when a negative voltage is applied to the anode (multimeter black probe, "COM" probe), and a positive voltage is applied to the cathode (multimeter red probe, positive probe), see picture 2.

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.

If there are ports with PoE in or PoE out, then sometimes the diode value may not be Open Loop; in this case, the values can be from 1,5V to 2,3V.



Picture 1

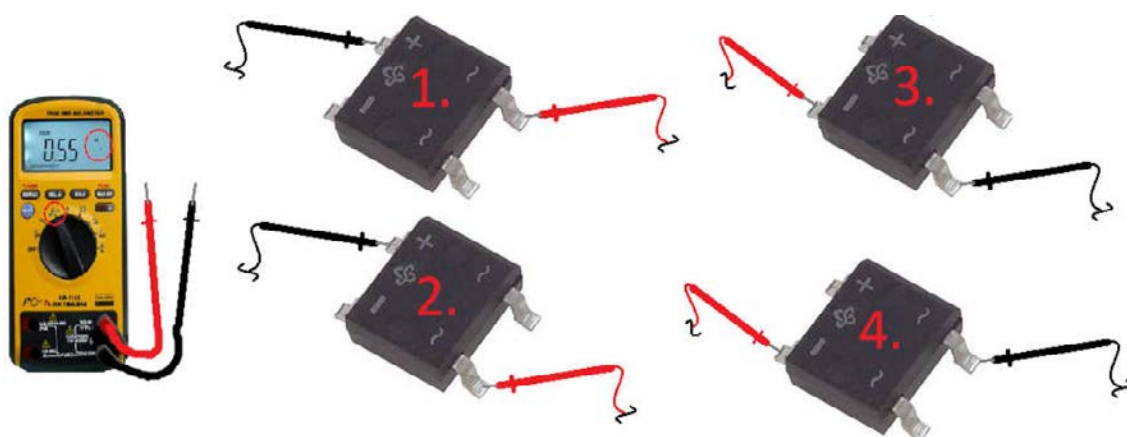


Picture 2

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.

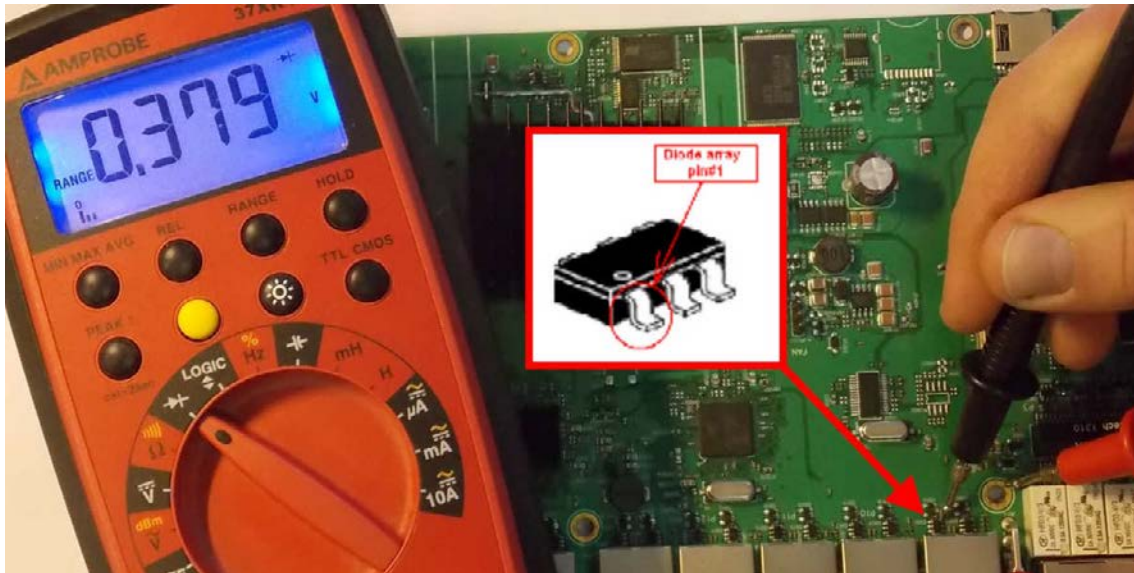
In such cases making sure that each of the bridge diodes have healthy forward voltage (0,45..0,65V) can confirm that there is no damage. In addition, the voltages obtained should not differ significantly (no more than 5%) from each other. This can be done in 4 measurements, by connecting the multi-meter 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 $150\ \Omega \pm 4$

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

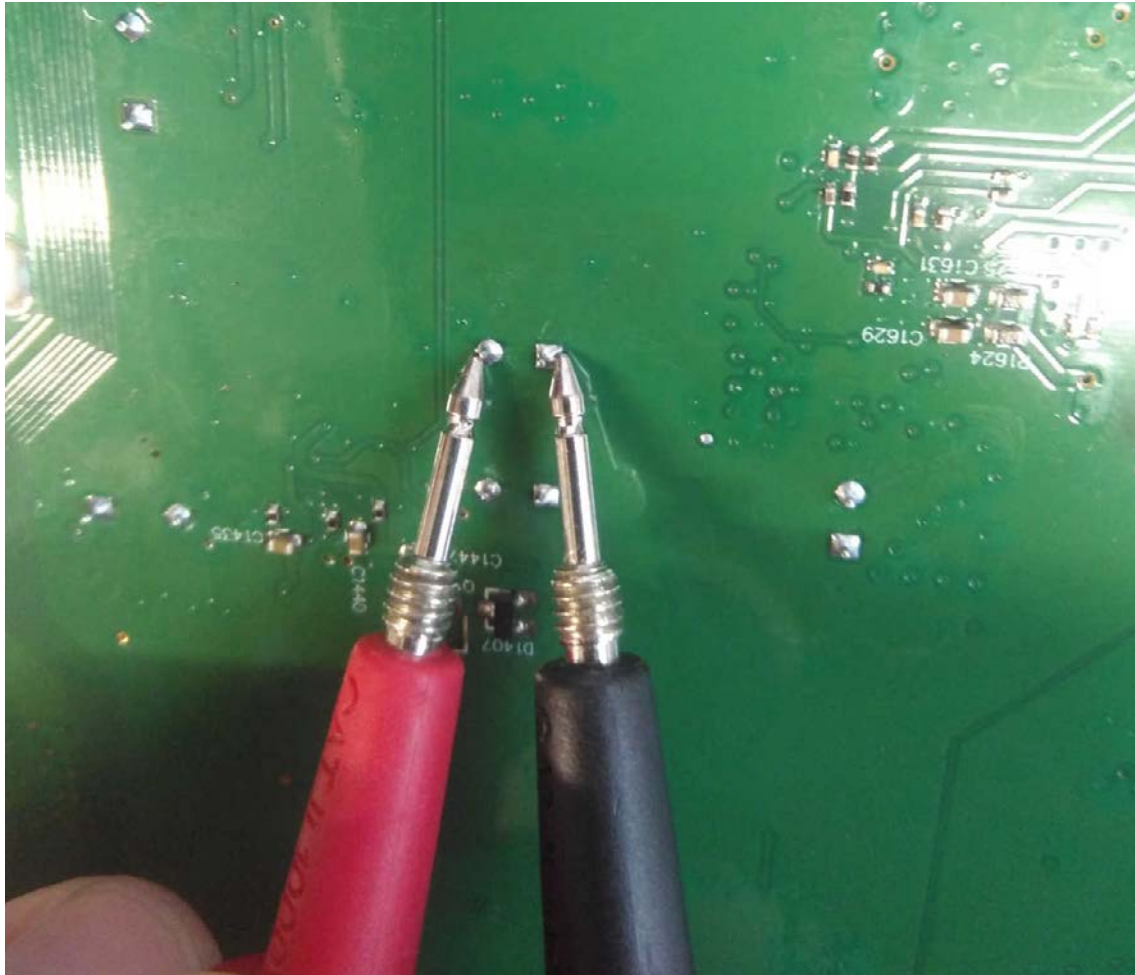
For this measurement you should take patch cord and plug it into the routerboard, see picture 7. After that measure resistance with digital multimeter. Resistance value for each twisted pair must be smaller than 5 Ohm. If resistance is higher that means line was damaged by high voltage surge.



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

ACCESSORIES

FTC11XG



Picture 9

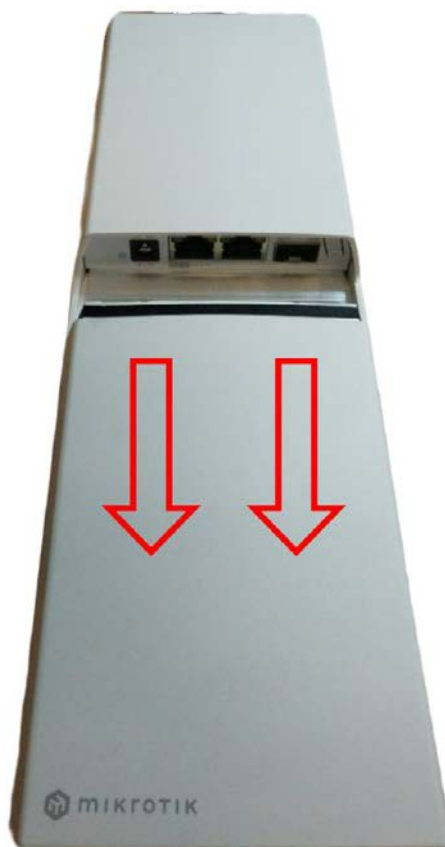
Disassembling information

Step 1: Unscrew 1 screw using PH1 screwdriver. Location of the screw is shown the picture [10](#).



Picture 10

Step 2: Pull the case cover in the direction shown in the picture 11 and lift the cover up.



Picture 11

Step 3: Unscrew 3 screws using TX9 screwdriver. Location of the screws is shown the picture 12.



Picture 12

Step 4: Pull the printed circuit board out of the case as shown in the picture [13](#).



Picture 13

Step 5: Unscrew 4 screws using PH1 screwdriver. Location of the screws is shown the picture [14](#).



Picture 14

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

Check Schottky diodes D7, D200 and diode bridges D1, D2. Location of the diodes on the board you can see in the picture 15. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

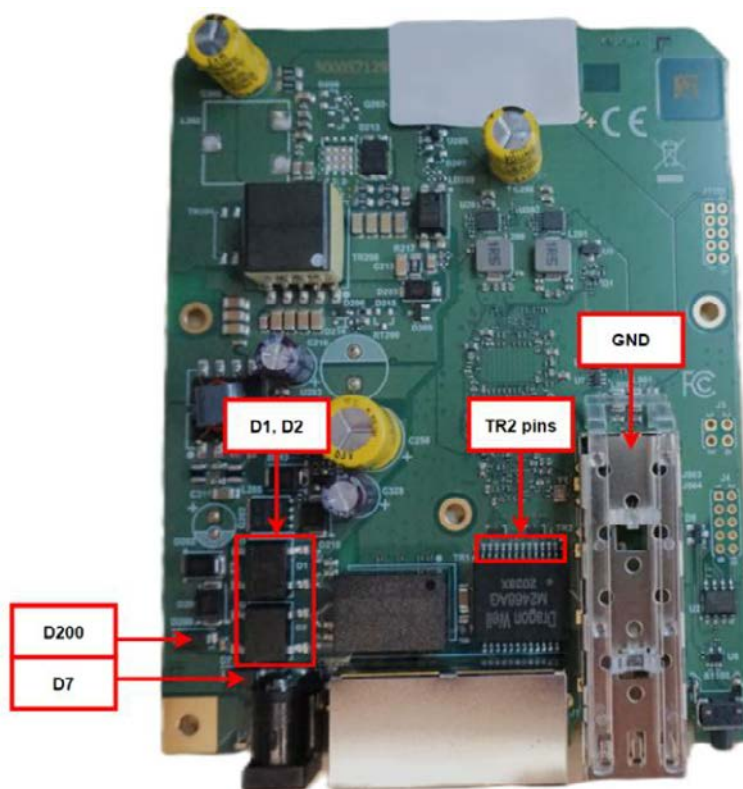
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1 and TR2 pins and Ground, see pictures 15 and 16.

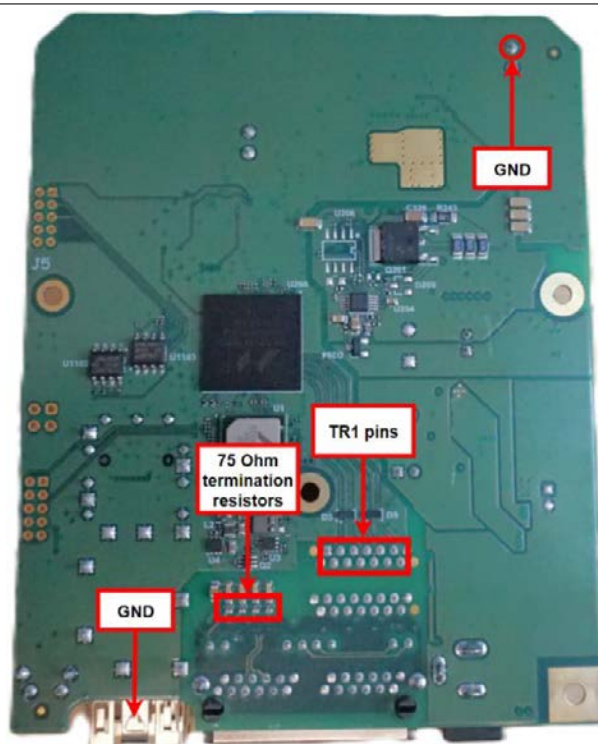
Voltage drop value should be in the range from 0,35V to 0,52V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 $\pm$ 1% Ohms. Location of resistors is shown in picture 16.



Picture 15



Picture 16

FTC21



Picture 17

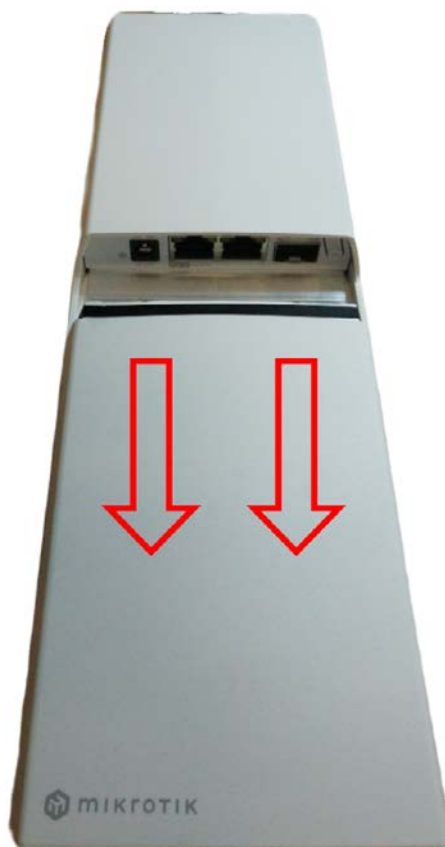
Disassembling information

Step 1: Unscrew 1 screw using a PH1 screwdriver. Location of the screw is shown the picture [18](#).



Picture 18

Step 2: Pull the case cover in the direction shown in the picture 19 and lift the cover up.



Picture 19

Step 3: Unscrew 3 screws using a TX9 screwdriver. Location of the screws is shown the picture 20.



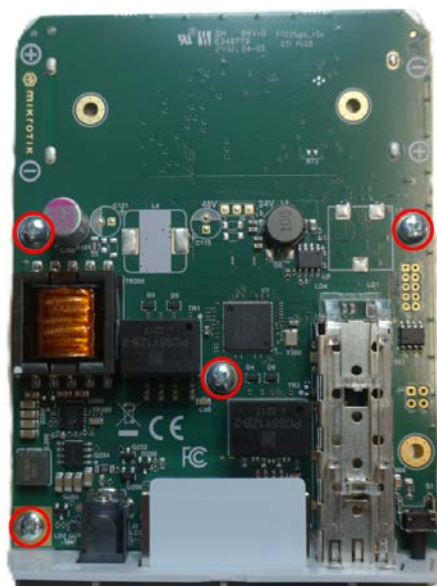
Picture 20

Step 4: Pull the printed circuit board out of the case as shown in the picture [21](#).



Picture 21

Step 5: Unscrew 4 screws using a PH1 screwdriver. Location of the screws is shown the picture [22](#).



Picture 22

Instructions for checking over-voltage

Checking Schottky diode and diode bridges

Check Schottky diode D7 and diode bridges D1, D2. Location of the diodes on the board you can see in the picture 23. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

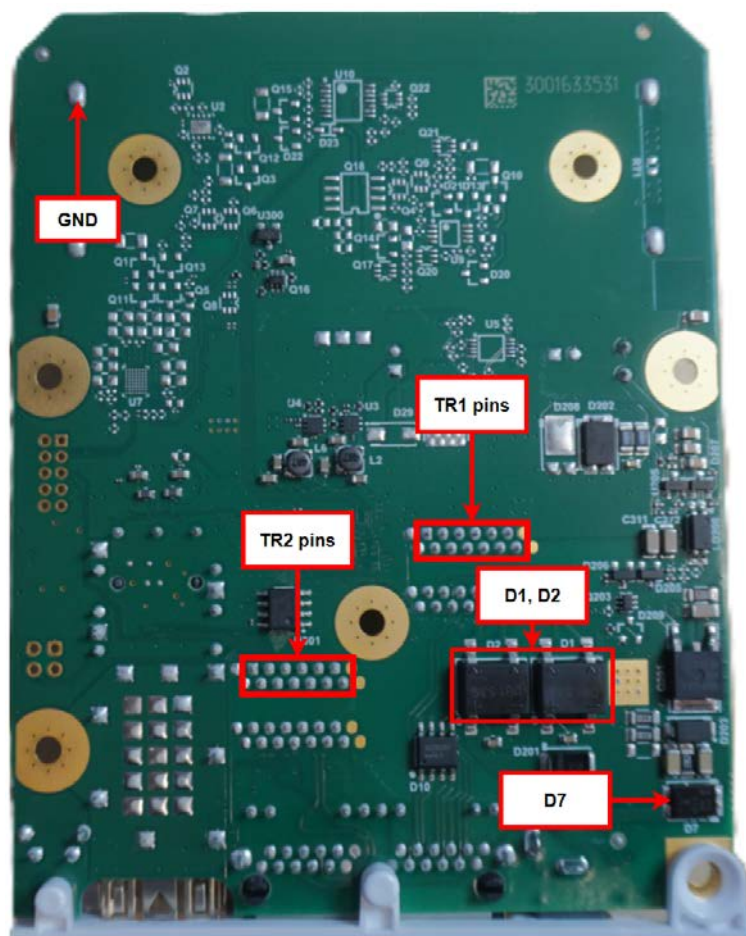
Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR1 and TR2 pins and Ground, see picture 23.

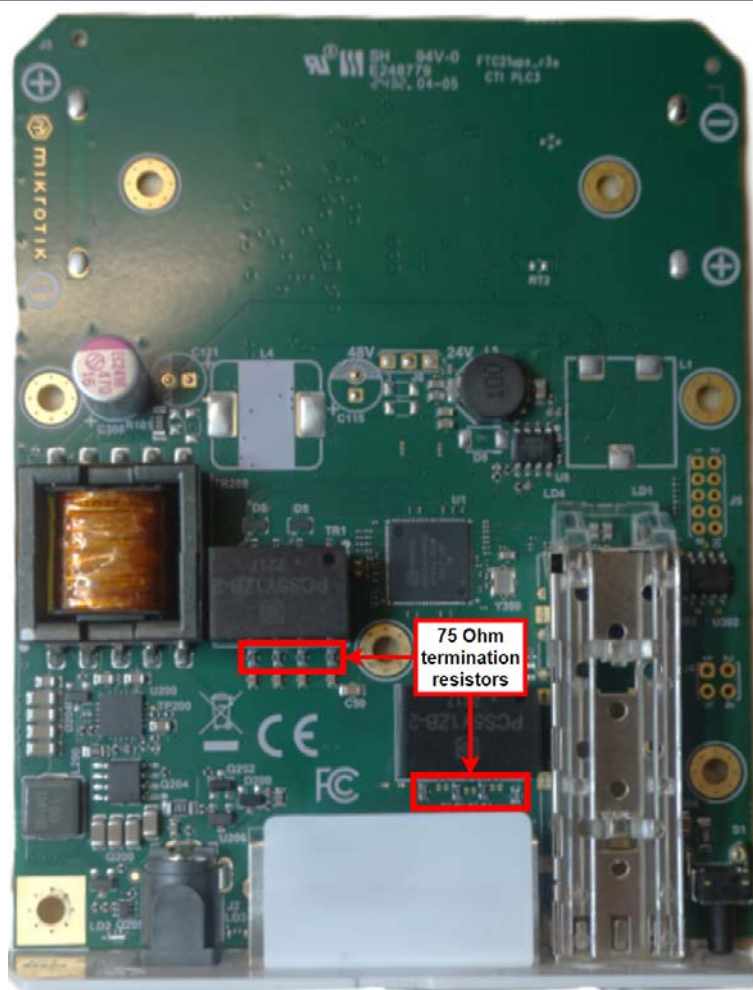
Voltage drop value should be in the range from 0,35V to 0,52V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 $\pm$ 1% Ohms. Location of resistors is shown in the picture 24.



Picture 23



Picture 24

FTC21-ups



Picture 25

Disassembling information

Step 1: Using a PH2 screwdriver, unscrew the screw that secures the cover (see picture below).



Picture 26

Step 2: Using a T10 Torx Screwdriver, unscrew 8 screws and carefully remove the front cover. Location of the screws is shown in picture 27.



Picture 27

Step 2: Using a PH1 screwdriver, unscrew 5 screws and carefully remove the PCB from the case. Location of the screws is shown in picture 28.



Picture 28

Instructions for checking over-voltage

Over-voltage testing procedure, the layout of the components on the board and measurement values is the same as for the FTC21 board, see on page 37.

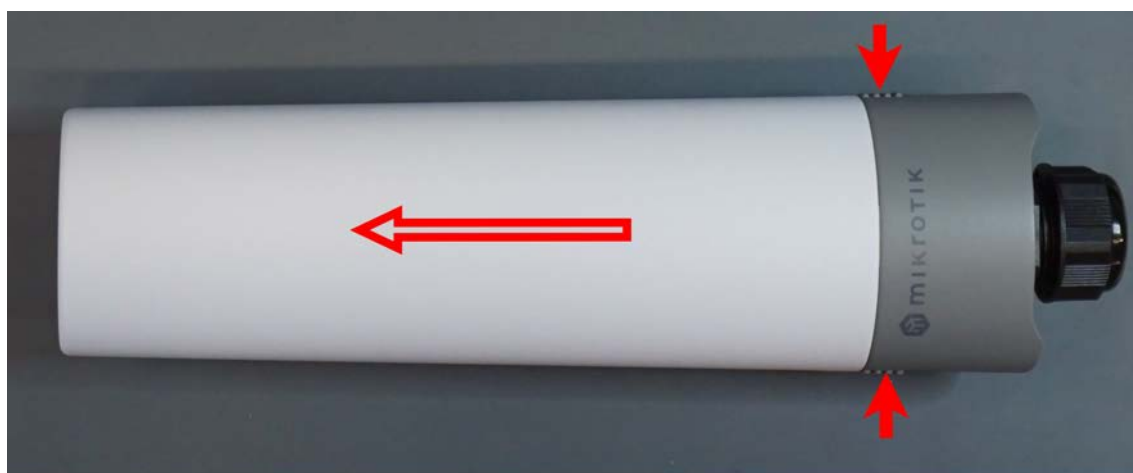
GPeRx4 (GPER14i)



Picture 29

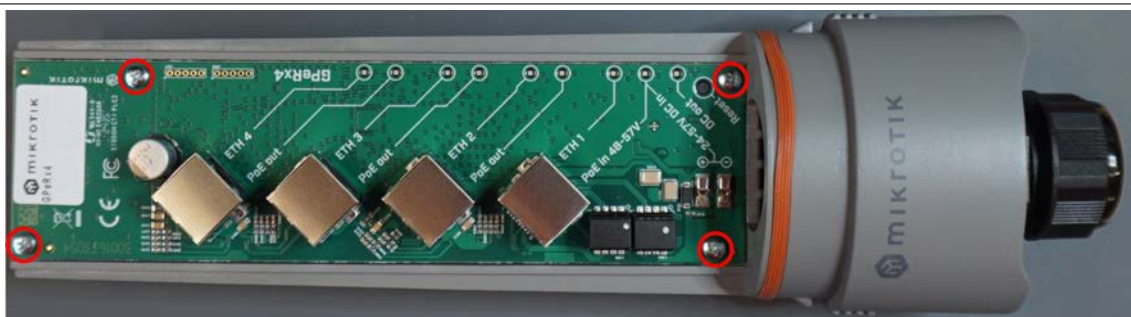
Disassembling information

Step 1: Press two tabs and remove the cover as shown in picture 30.



Picture 30

Step 2: Using the PH1 screwdriver, unscrew 4 screws. Location of the screws is shown in picture 31.



Picture 31

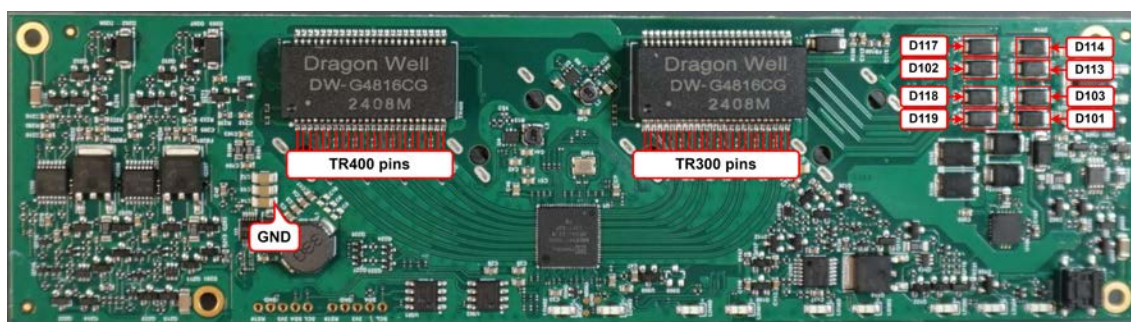
Instructions for checking over-voltage

Checking Schottky diodes

Check Schottky diodes D101, D102, D103, D113, D114, D117, D118, D119. Location of the diodes on the board you can see in picture 32. Schottky diode quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

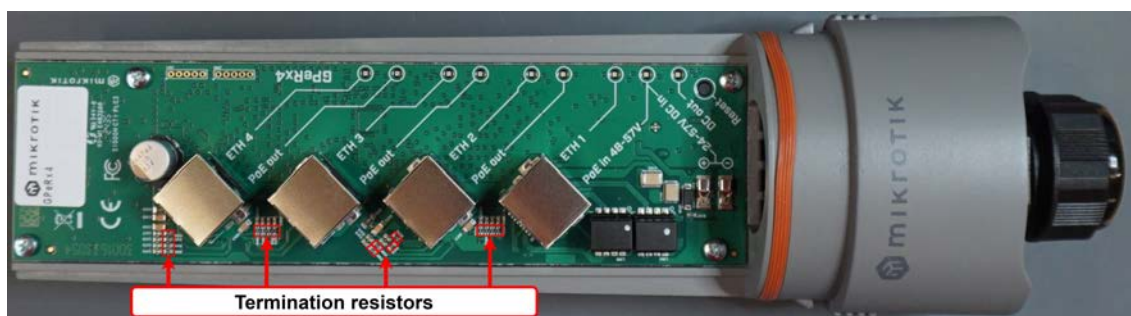
Check the voltage drop value between the Ethernet transformers TR400, TR300 pins and Ground. Test points on the transformer pins are marked with red lines, see picture 32. Voltage drop value should be in the range from 0,35V to 0,55V. Voltage drop measurement method is described on page 22.



Picture 32

Checking termination resistors resistance

Check the value of each termination resistor, it should be $75\ \Omega \pm 2\%$. Location of resistors is shown in picture 33.



Picture 33

CLOUD ROUTER SWITCH 100 SERIES ROUTERBOARDS

FiberBox (CRS105-5S-FB)



Picture 34

Disassembling information

Step 1: Unscrew 3 mounting screws using screwdriver. Location of screws you can see in the picture 35.



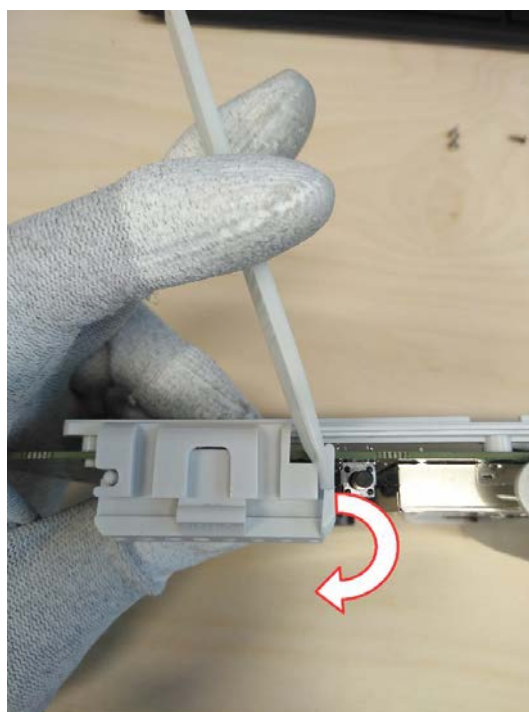
Picture 35

Step 2: Gently pull cover the direction arrows are pointing in the following picture 36.



Picture 36

Step 3: To remove LEDs cover make a movement as shown in the following picture 37.

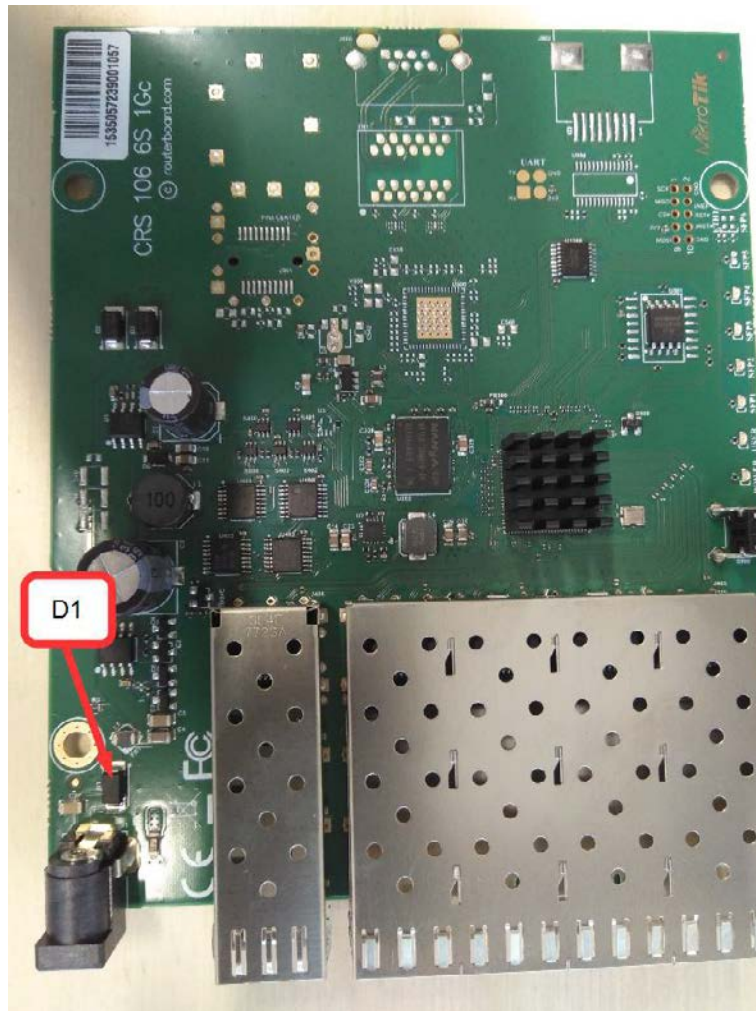


Picture 37

Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diode D1. Location of diodes on the board you can see in the picture 38. Schottky diodes quality measurement method is described on page 19.



Picture 38

CRS106-1C-5S



Picture 39

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [115](#).

Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D1, D3. Location of diodes on the board you can see in the picture [40](#). Schottky diodes quality measurement method is described on page [19](#).

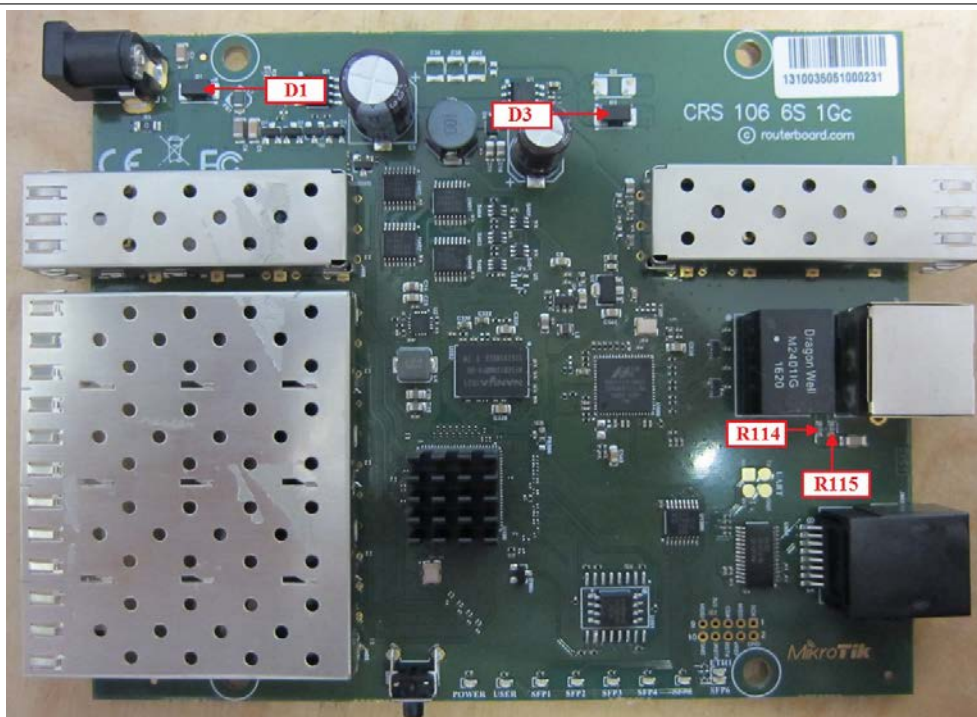
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [41](#).

Voltage drop value should be in the range from 0,32V to 0,36V. Voltage drop measurement method is described on page [22](#).

Checking 75 Ohm termination resistors resistance

Check resistors R114, R115 resistance value. It should be 75 Ohm $\pm 1\%$. Location of resistors on the board you can see in the picture [40](#).

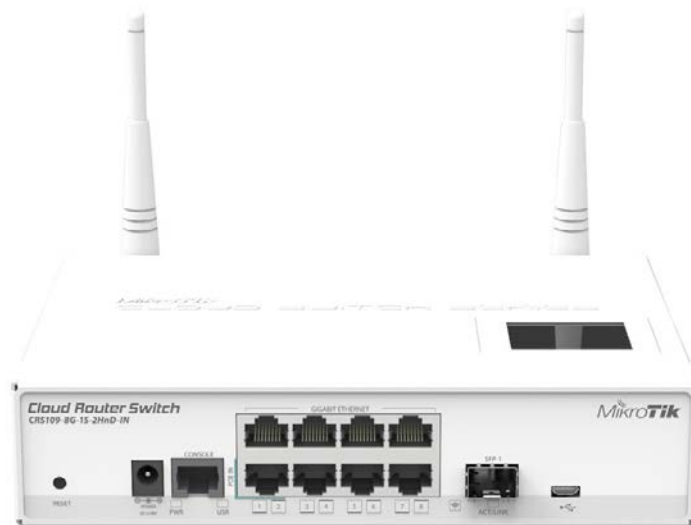


Picture 40



Picture 41

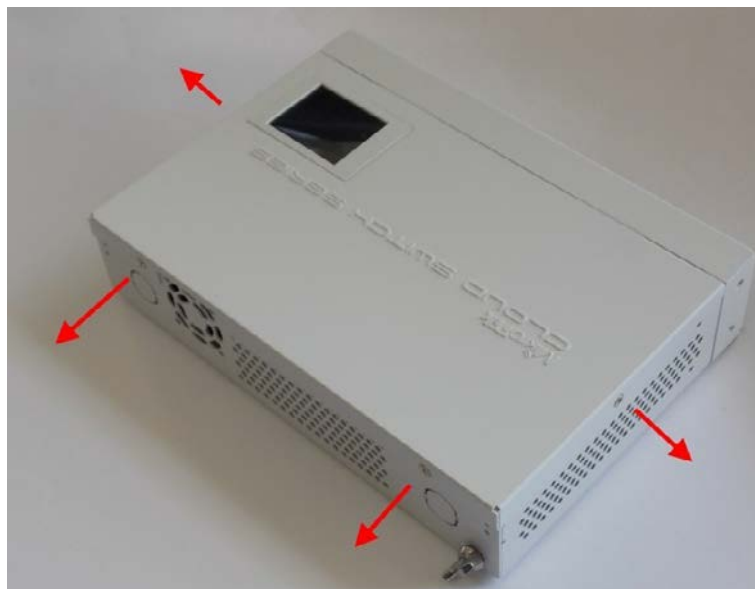
CRS109-8G-1S-2HnD-IN



Picture 42

Disassembling information

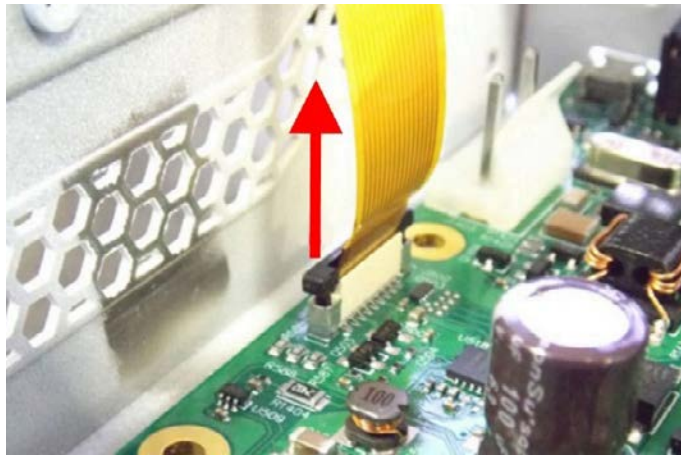
Step 1: Unscrew 4 screws using PH2 screwdriver. Location of screws you can see in the picture [43](#).



Picture 43

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 [44](#). Do not damage the FPC connector locking drawer.



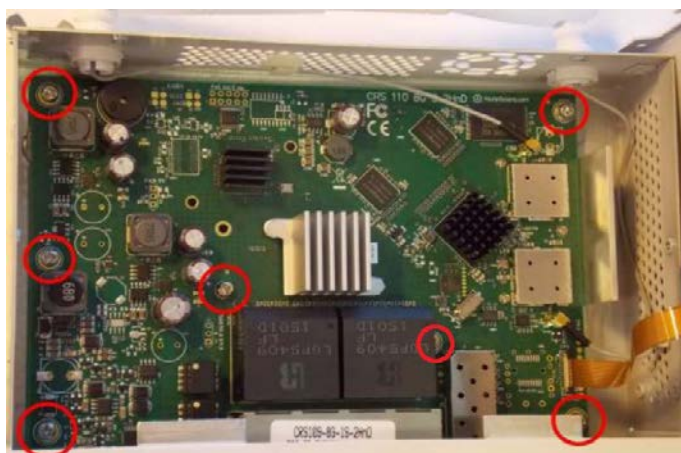
Picture 44

Step 4: Move both antenna cables into a special holes as showed in the picture 45.



Picture 45

Step 5: Unscrew 7 screws which fasten PCB to the case. Location of the screws you can see in the picture 46.



Picture 46

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 47. Schottky diodes quality measurement method is described on page 19.

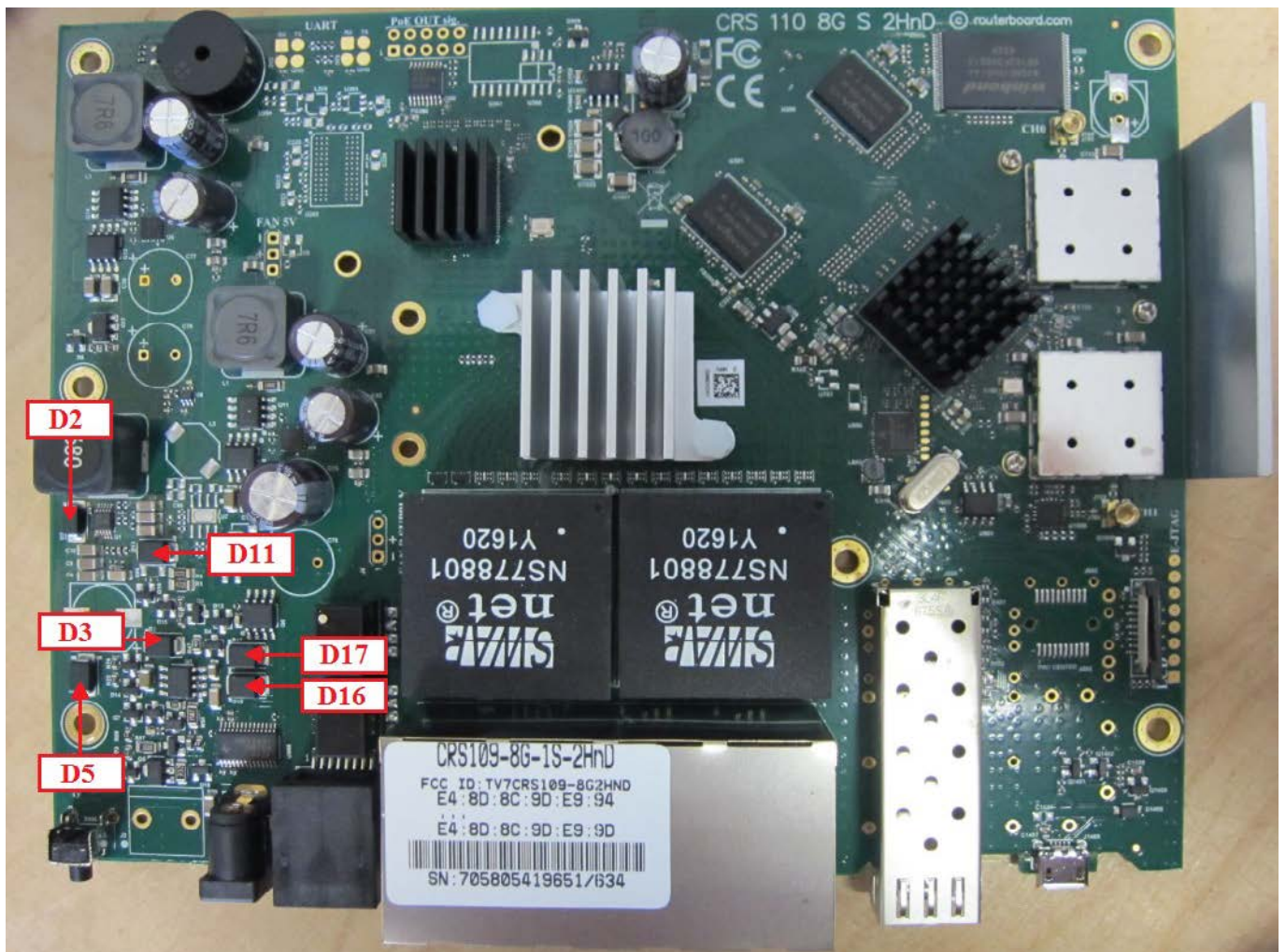
Checking voltage drop value between Ethernet transformer pins and Ground

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 48.

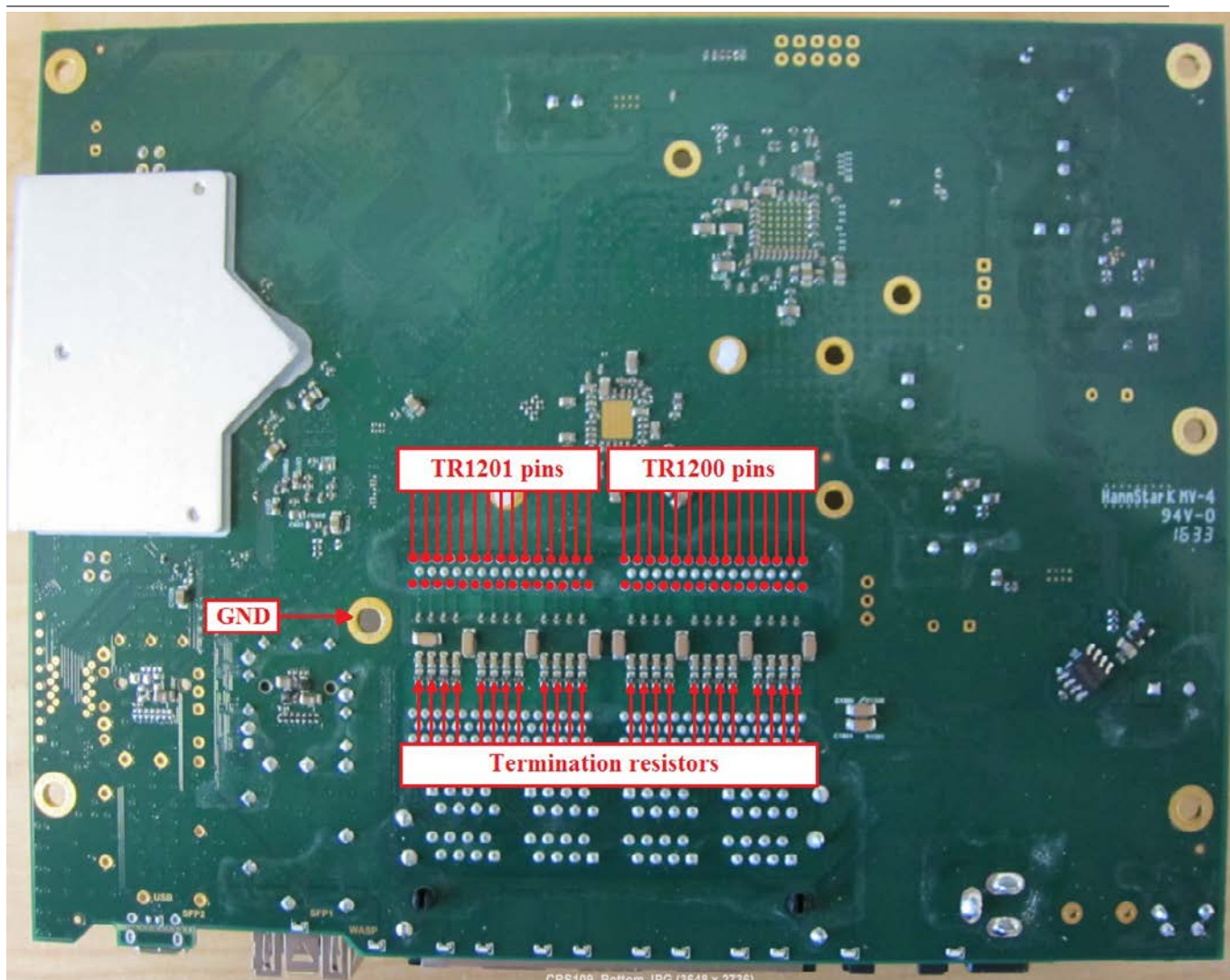
Voltage drop value should be in the range from 0,4V to 0,43V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm $\pm 1\%$. Location of resistors on the board you can see in the picture 48.



Picture 47



Picture 48

CRS112-8G-4S-IN



Picture 49

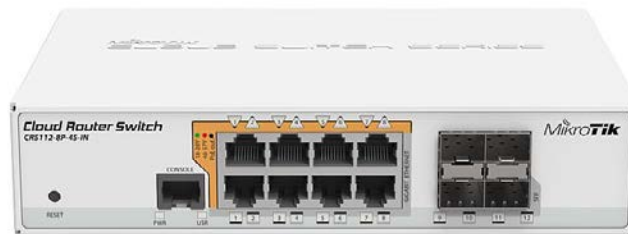
Disassembling information

Disassembly method of the board is the same as the CRS109-8G-1S-2HnD-IN board. Disassembly method is described on page 51.

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 53.

CRS112-8P-4S-IN



Picture 50

Disassembling information

Disassembly method of the board is the same as the CRS109-8G-1S-2HnD-IN board. Disassembly method is described on page 51.

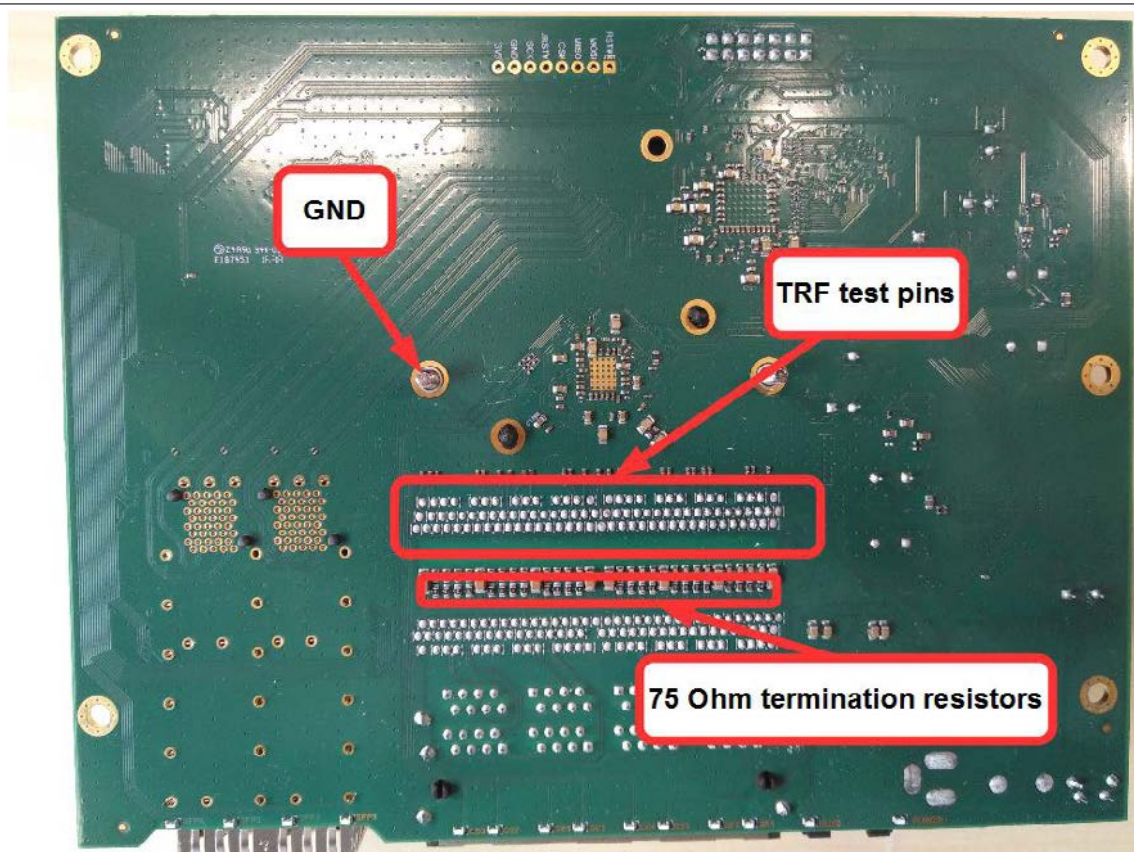
Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformers pins and Ground

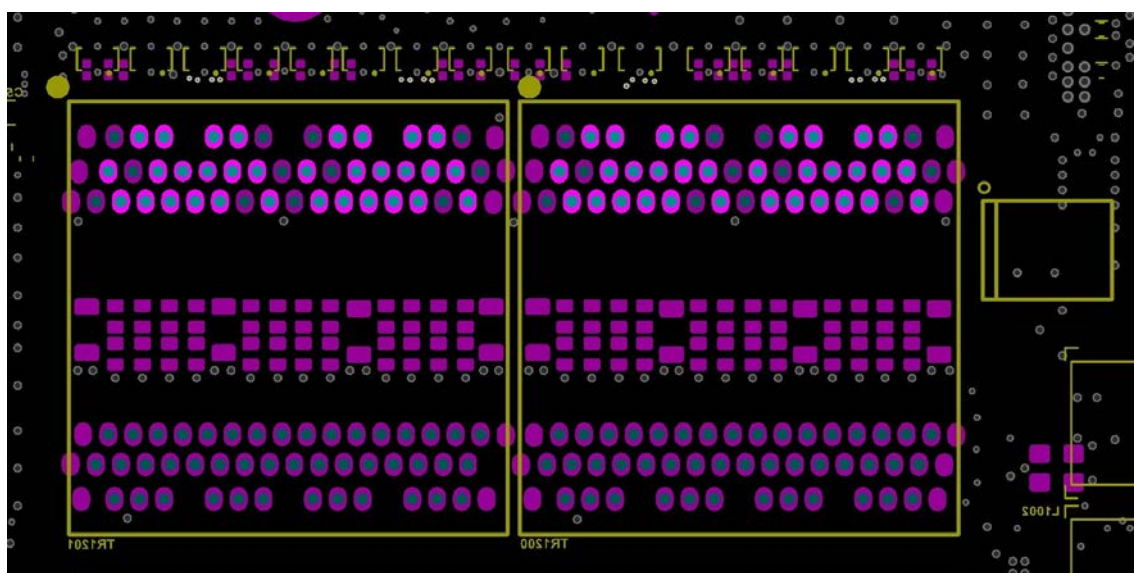
Check voltage drop value between Ethernet transformers TR1200, TR1201 pins and Ground. Test points on the transformers pins are highlighted and can be seen in picture 52. Note that the view for transformer pins are from the bottom for necessary of measurement. Voltage drop value should be in the range from 0,38V to 0,45V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm $\pm 1\%$. Location of resistors on the board you can see in the picture 51.



Picture 51



Picture 52

CRS125-24G-1S-IN



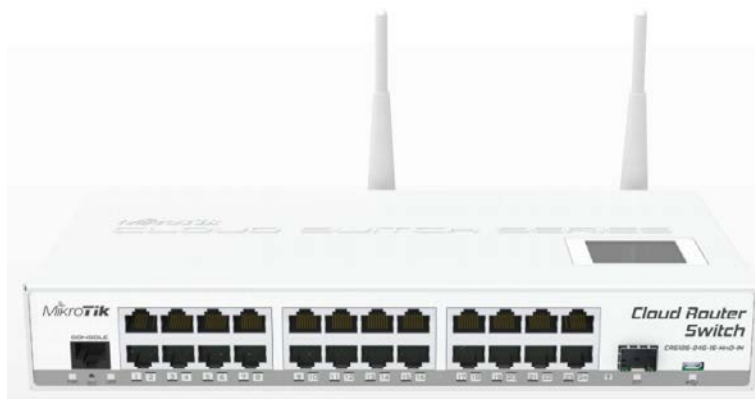
Picture 53

CRS125-24G-1S-RM



Picture 54

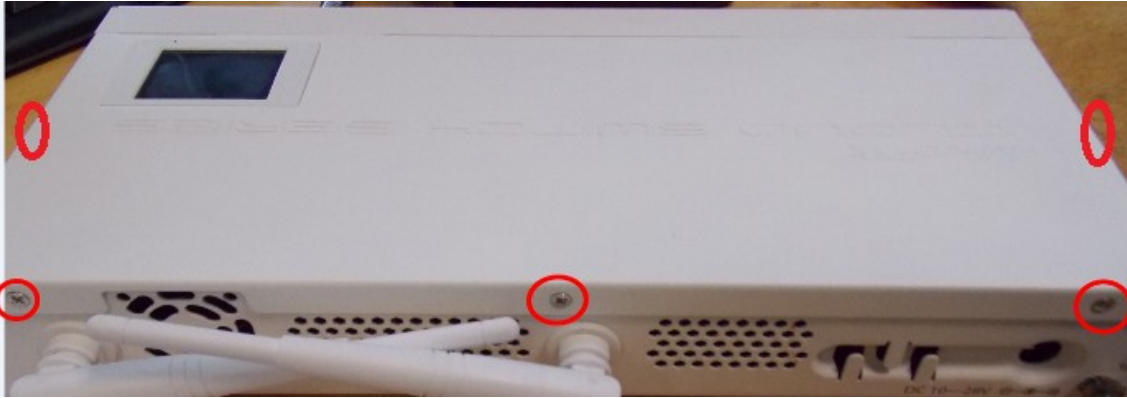
CRS125-24G-1S-2HnD-IN



Picture 55

Disassembling information

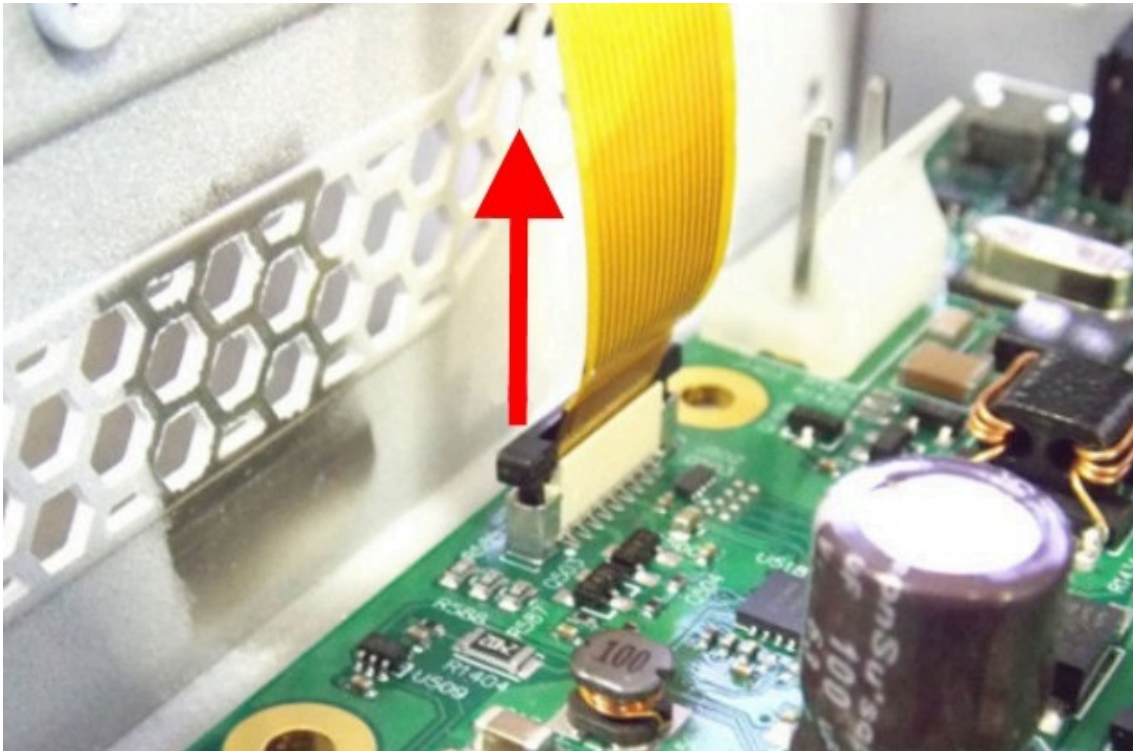
Step 1: Unscrew 5 screws (3 screws behind board case and 1 screw on the side of the board case). Location of the screws you can see in the picture [56](#).



Picture 56

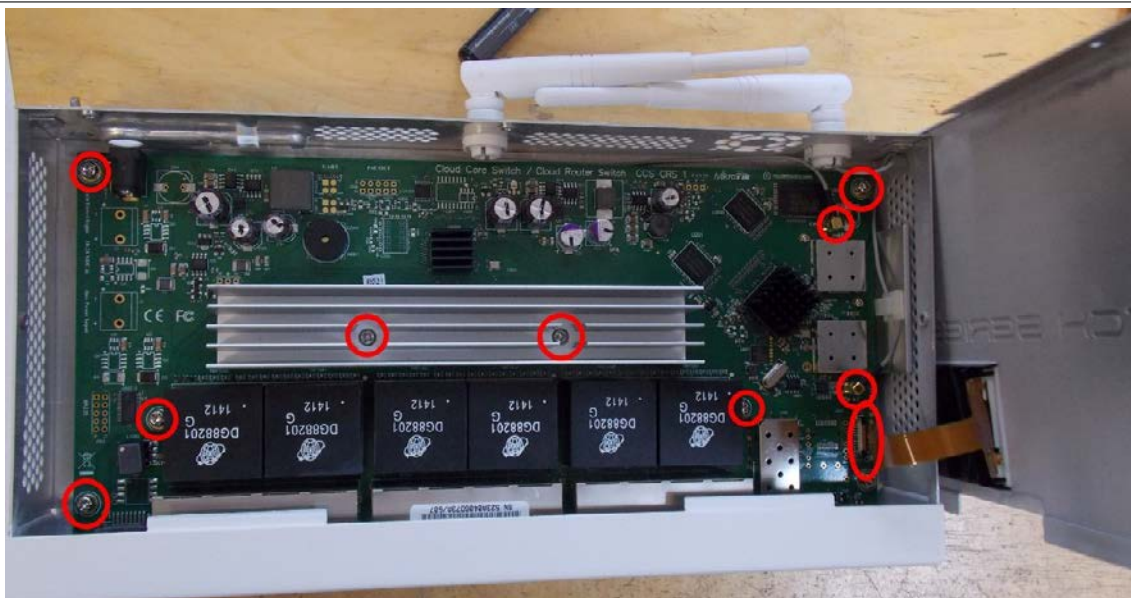
Step 2: Carefully take off the cover. Do not damage the LCD flex cable.

Step 3: Gently lift the latch vertically upward and take out LCD flex cable from FPC connector as showed in the picture 57. Do not damage the FPC connector locking drawer.



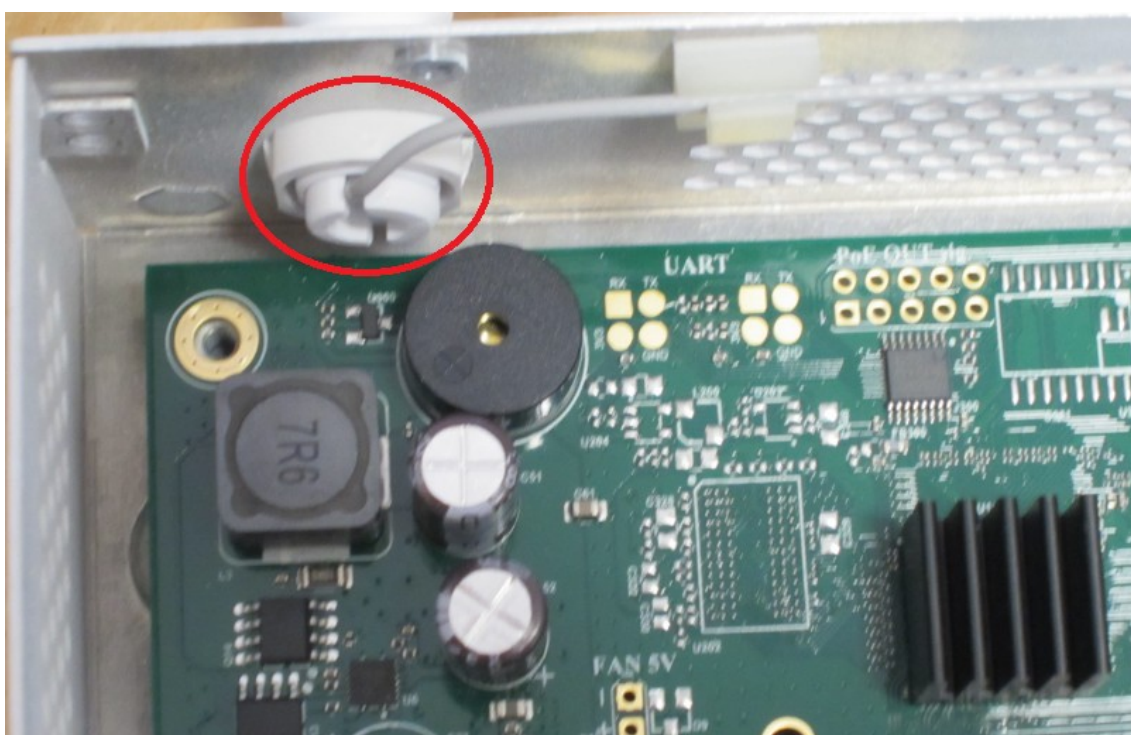
Picture 57

Step 4: Unscrew 8 screws which fasten PCB to the case. Location of the screws see in the picture 58.



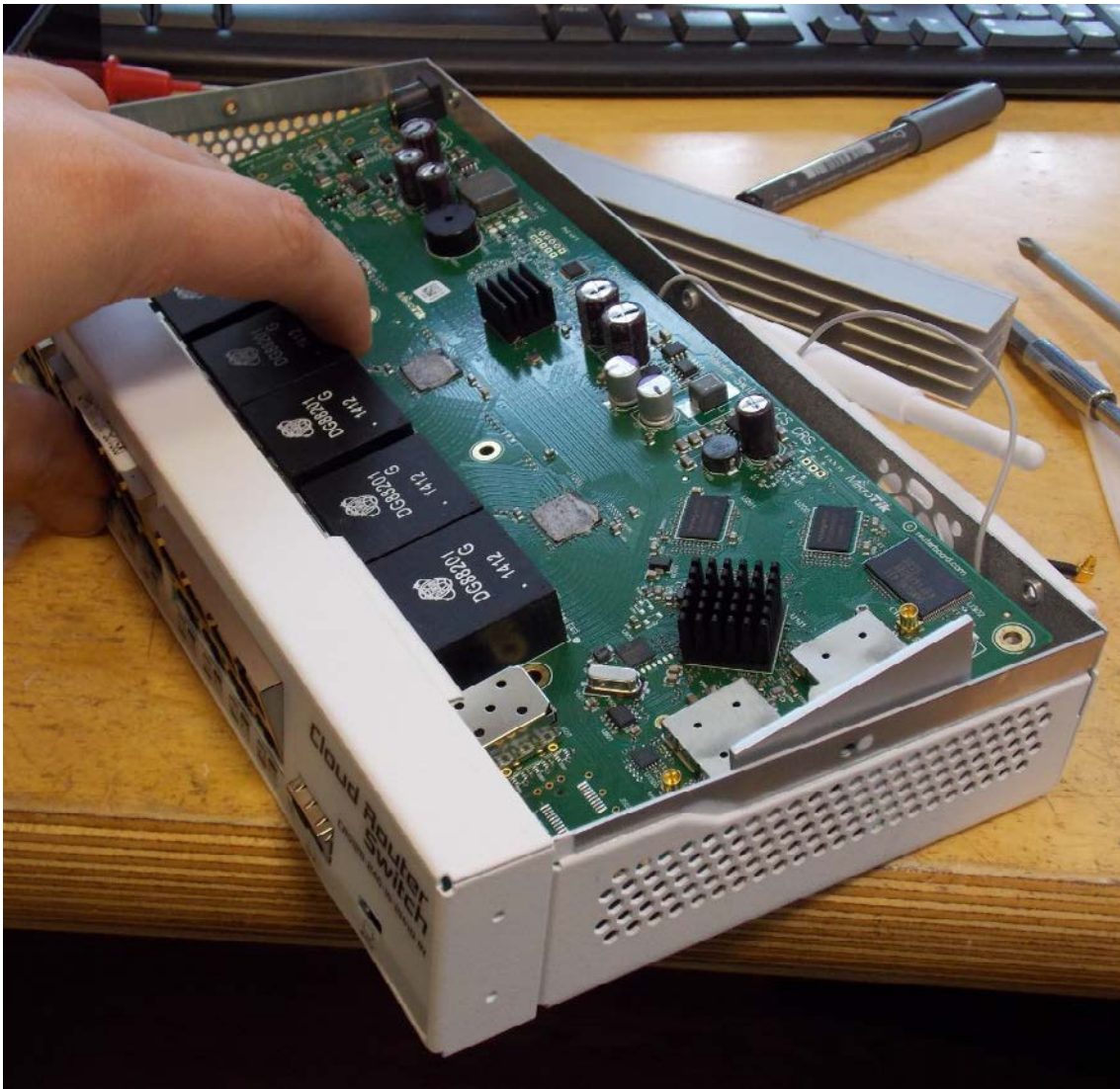
Picture 58

Step 5: Move both antenna cables into a special holes, see picture 59.



Picture 59

Step 6: Move out PCB from the case, see picture 60.



Picture 60

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 61. Schottky diode quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformers pins and Ground

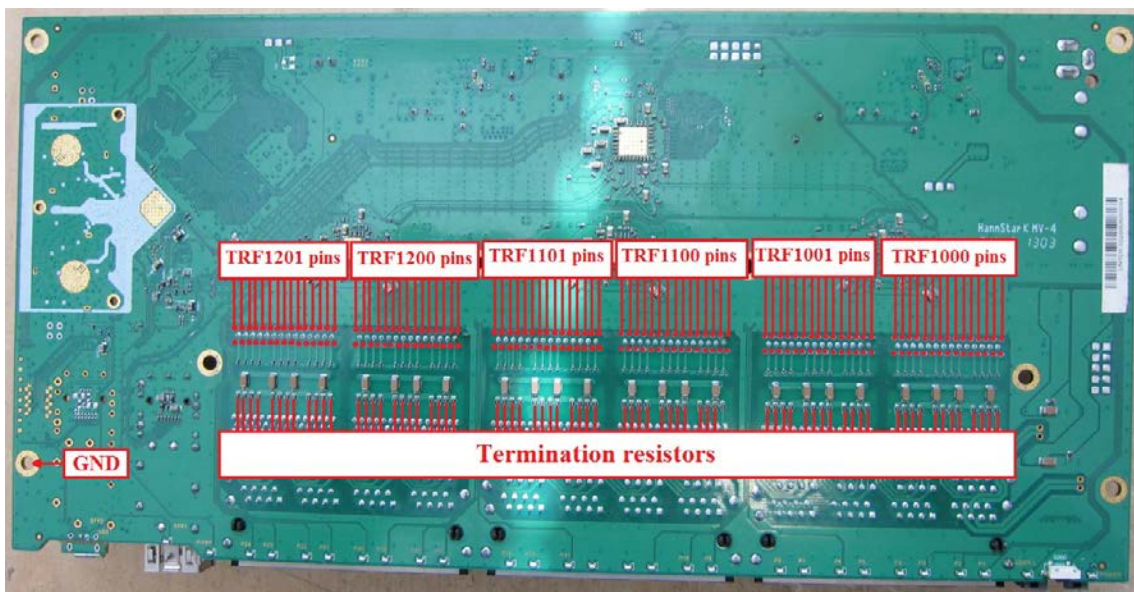
Check voltage drop value between Ethernet transformers TRF1000, TRF1001, TRF1100, TRF1101, TRF1200, TRF1201 pins and Ground. Test points on the transformers pins are marked with red dots, see picture 62. Voltage drop value should be in the range from 0,38V to 0,44V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm $\pm 1\%$. Location of resistors on the board you can see in the picture 62.



Picture 61



Picture 62

CLOUD ROUTER SWITCH 304 SERIES ROUTERBOARD

CRS304-4XG-IN



Picture 63

Disassembling information

Step 1:

Carefully peel off four silicone rubber pads, than using PH1 screwdriver unscrew four screws, see picture 64 and 65, after that remove the bottom cover and gently pull out the PCB with heat-sinks from the case.



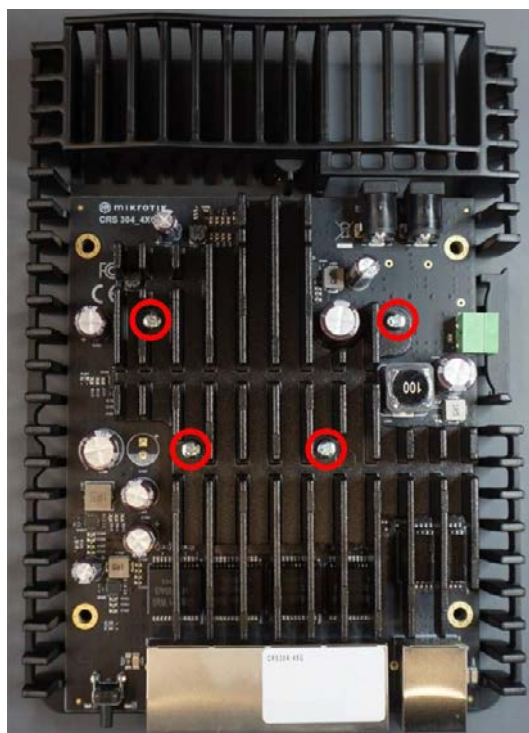
Picture 64



Picture 65

Step 1:

Using PH1 screwdriver unscrew four screws and remove the top heat-sink, then pull out the PCB from the bottom heat-sink. Location of the screw is shown the picture 66.

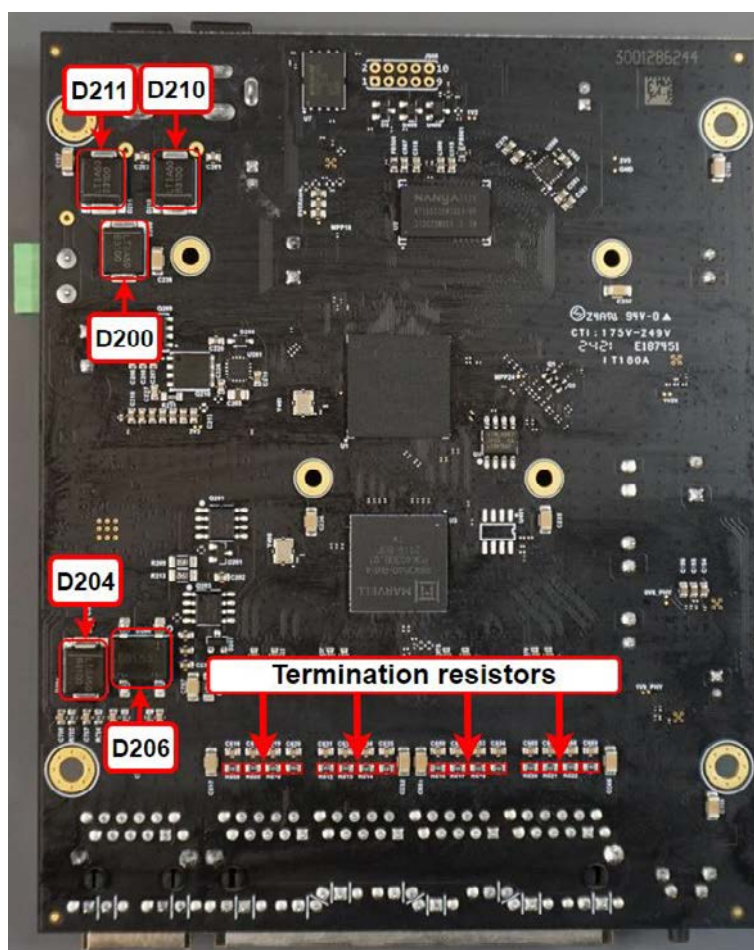


Picture 66

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

Check Schottky diodes D200, D204, D210, D211 and diode bridge D206. Location of the diodes on the PCB you can see in the picture 67. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.



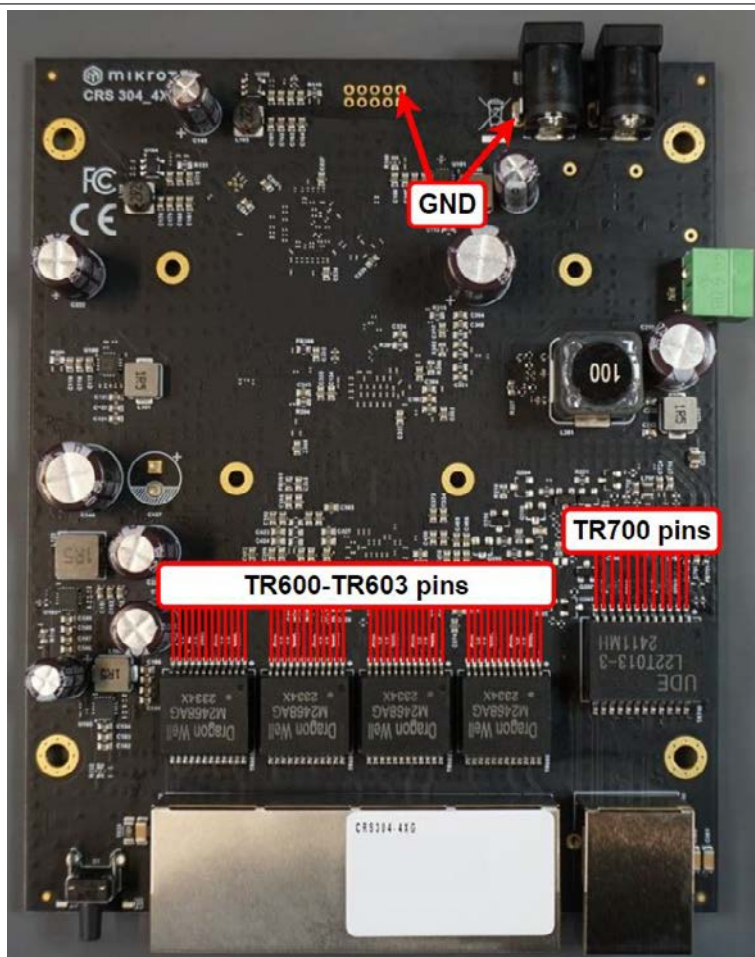
Picture 67

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR600-TR603, TR700 pins and Ground, see picture 68. Voltage drop value on the transformers TR600-TR603 should be in the range from 0,31V to 0,35V and on the transformer TR700 should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page 22

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms +/- 1%. Location of resistors is shown in picture 67.



Picture 68

CLOUD ROUTER SWITCH 310 SERIES ROUTERBOARD

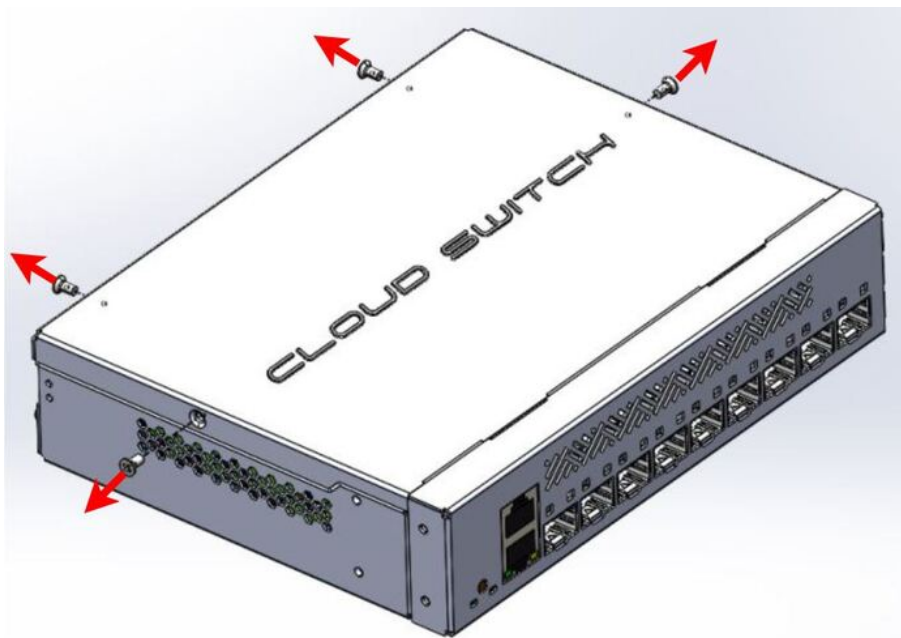
CRS310-1G-5S-4S+IN



Picture 69

Disassembling information

Unscrew 4 screws using PH2 screwdriver and carefully take off the cover. Location of the screws is shown the picture 70.



Picture 70

Instructions for checking over-voltage

Checking Schottky diodes and diode bridge

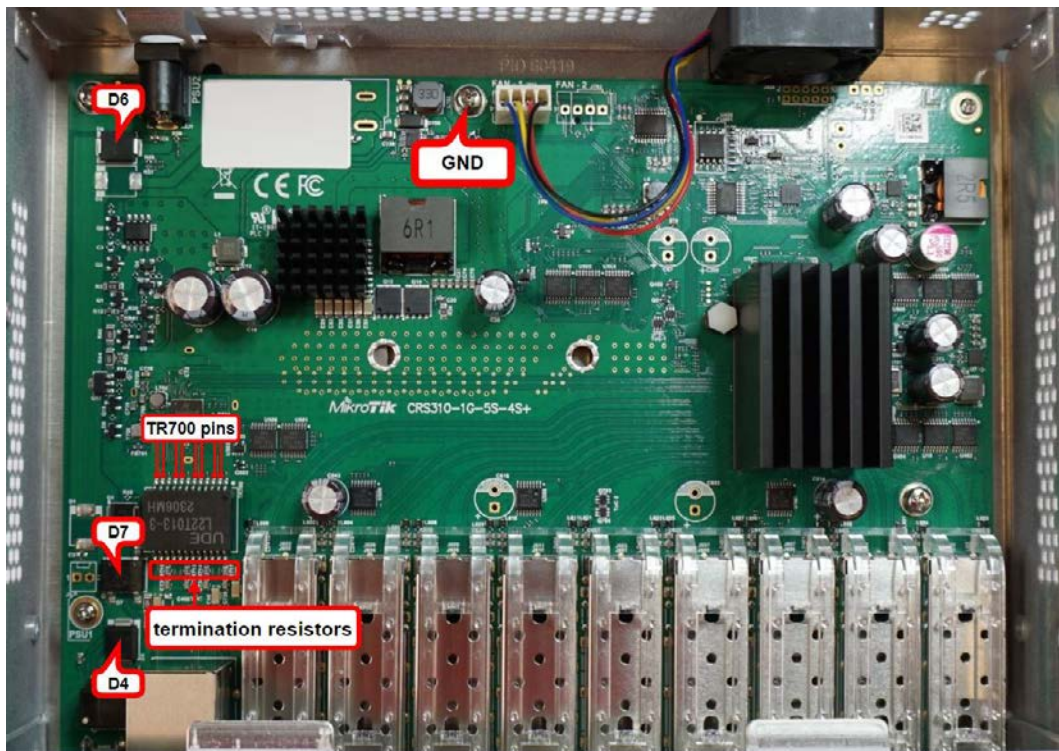
Check Schottky diodes D4, D6 and diode bridge D7. Location of the diodes on the board you can see in the picture 71. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR700 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 71. Voltage drop value should be in the range from 0,35V to 0,50V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor (there are 4 termination resistors). It should be approximately 75 Ohms. Location of resistors is shown in picture 71.



Picture 71

CRS310-1G-5S-4S+OUT (netFiber 9)



Picture 72



Picture 73

Disassembling information

Step 1:

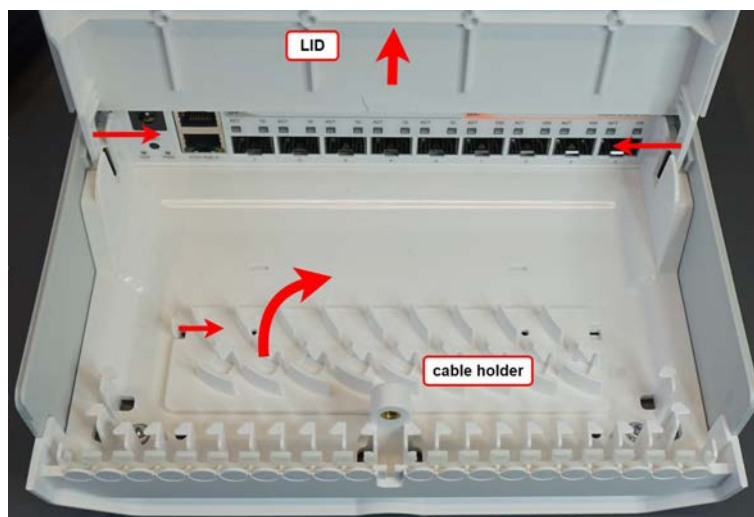
On the back of the case unscrew 9 screws using PH2 screwdriver and carefully remove the heat-sink. Location of the screws is shown the picture 74.



Picture 74

Step 2:

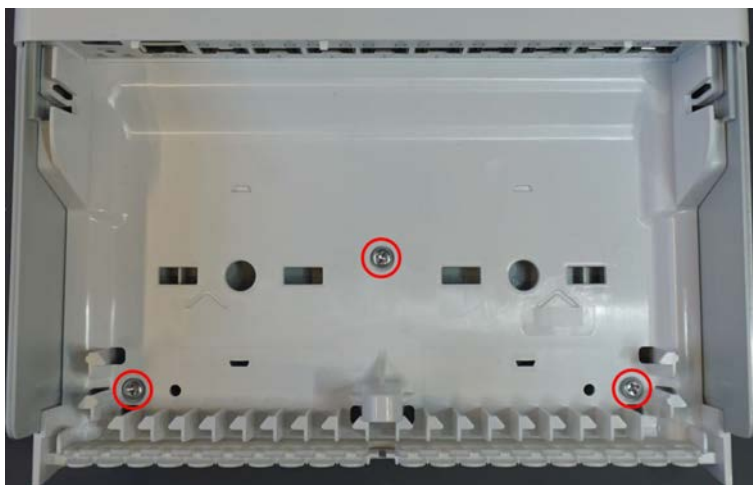
Open the lid, then disattach the lid and the cable holder, as shown in the picture 75.



Picture 75

Step 3:

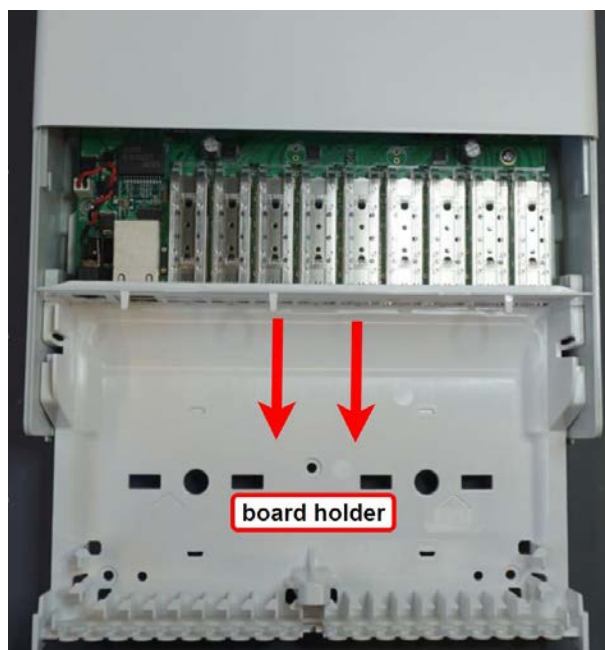
Unscrew 3 screws using PH2 screwdriver. Location of the screws is shown the picture 76.



Picture 76

Step 4:

Gently pull the board holder, as shown in the picture 77 and 78.



Picture 77



Picture 78

Instructions for checking over-voltage

Over-voltage testing procedure is the same as for the CRS310-1G-5S-4S+IN board, see page [70](#).

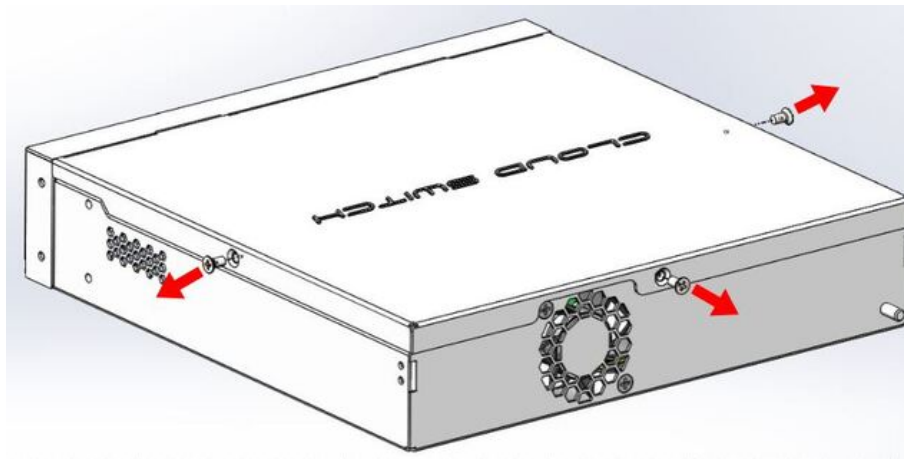
CRS310-8G+2S+IN



Picture 79

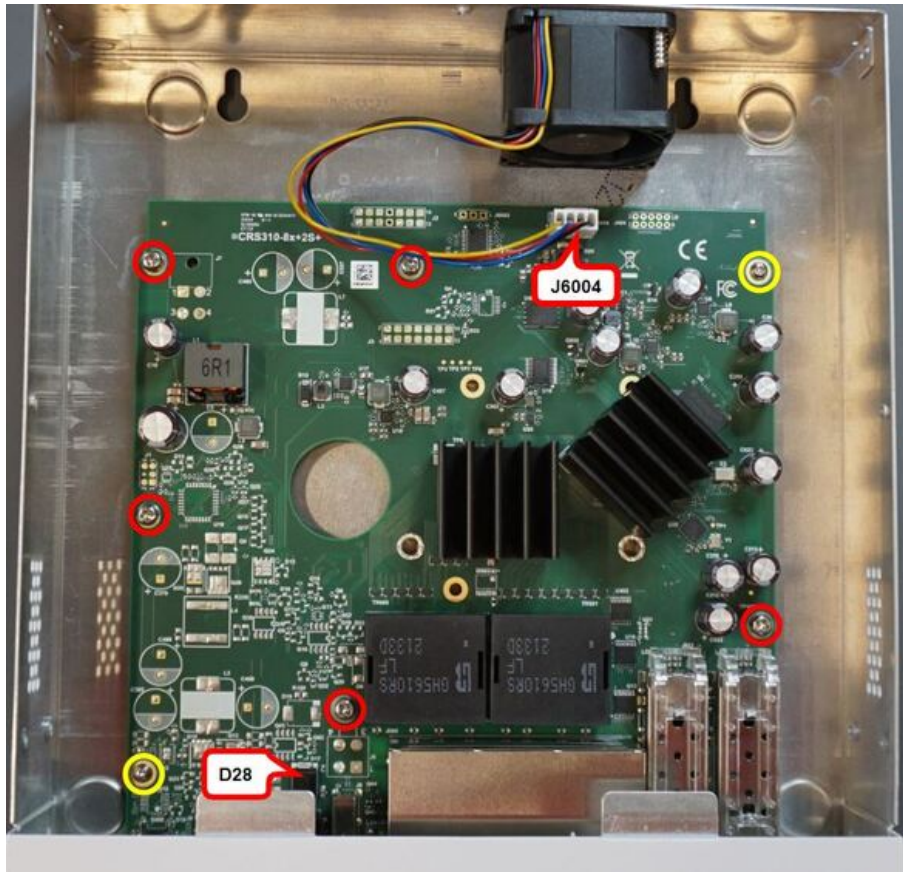
Disassembling information

Step 1: Unscrew 3 screws using PH2 screwdriver and carefully take off the cover. Location of the screws is shown the picture 80.



Picture 80

Step 2: Unscrew 8 screws, the screws marked with a yellow circle using PH1 screwdriver and the screws marked with a red circle using PH2 screwdriver. Disconnect the fan connector J6004. Location of the screws and the fan connector is shown the picture 81.



Picture 81

Instructions for checking over-voltage

Checking Schottky diode

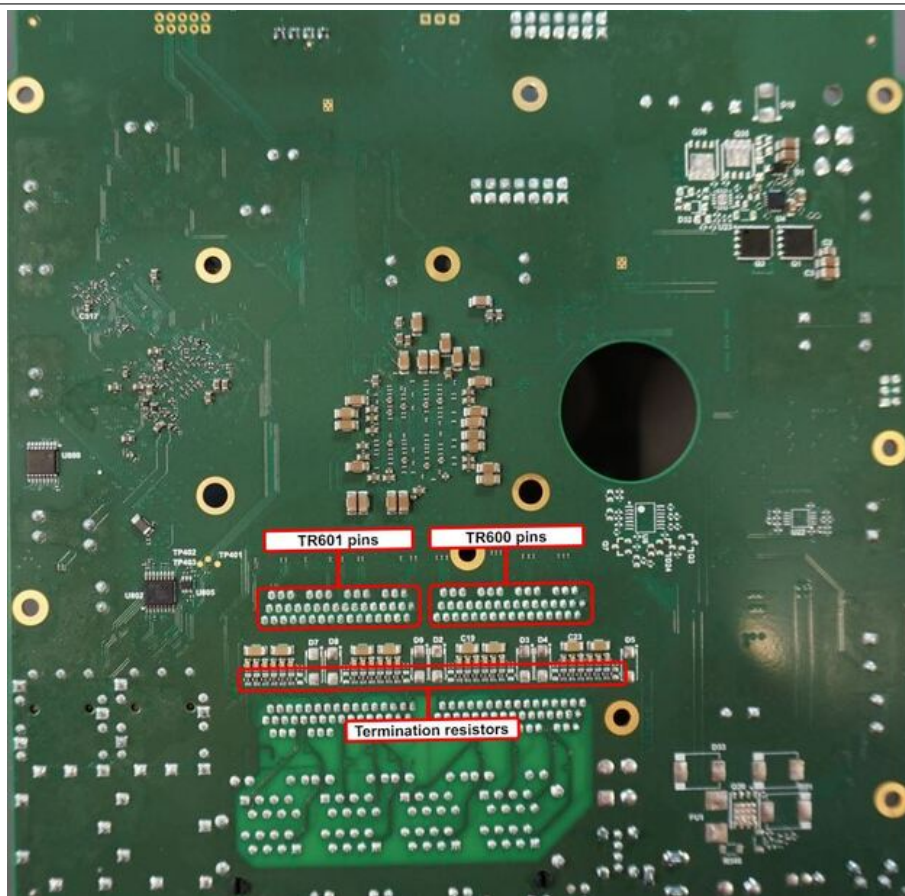
Check Schottky diode D28. Location of the diode on the board you can see in the picture 81. Schottky diode quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR600, TR601 pins and Ground. Test points on the transformers pins you can see in the picture 82. Voltage drop value should be in the range from 0,40V to 0,55V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm $\pm 1\%$. Location of resistors on the board you can see in the picture 82.



Picture 82

CLOUD ROUTER SWITCH 320 SERIES ROUTERBOARD

CRS320-8P-8B-4S+RM



Picture 83

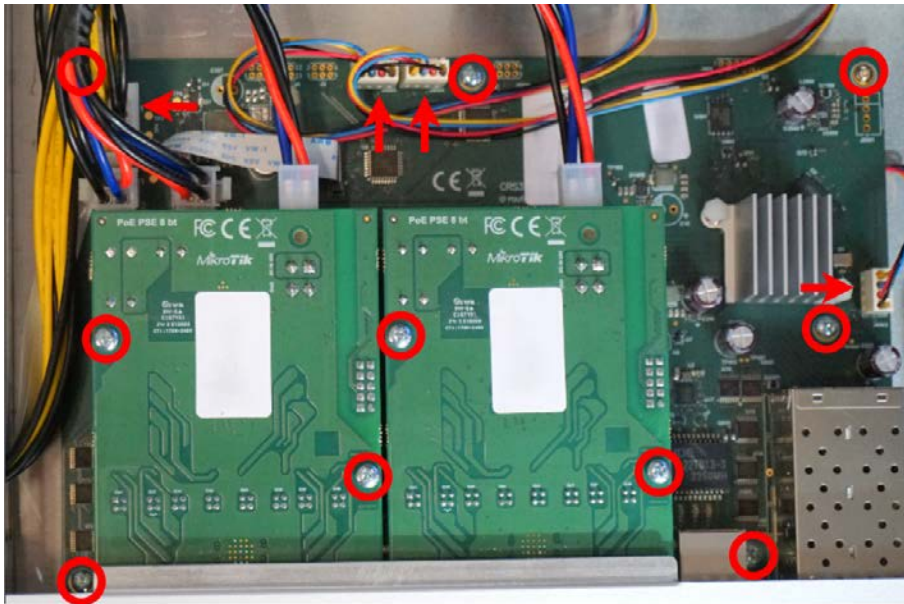
Disassembling information

Step 1: Unscrew 9 screws using a PH2 screwdriver and carefully remove the cover. Location of the screws is shown in the picture 84.



Picture 84

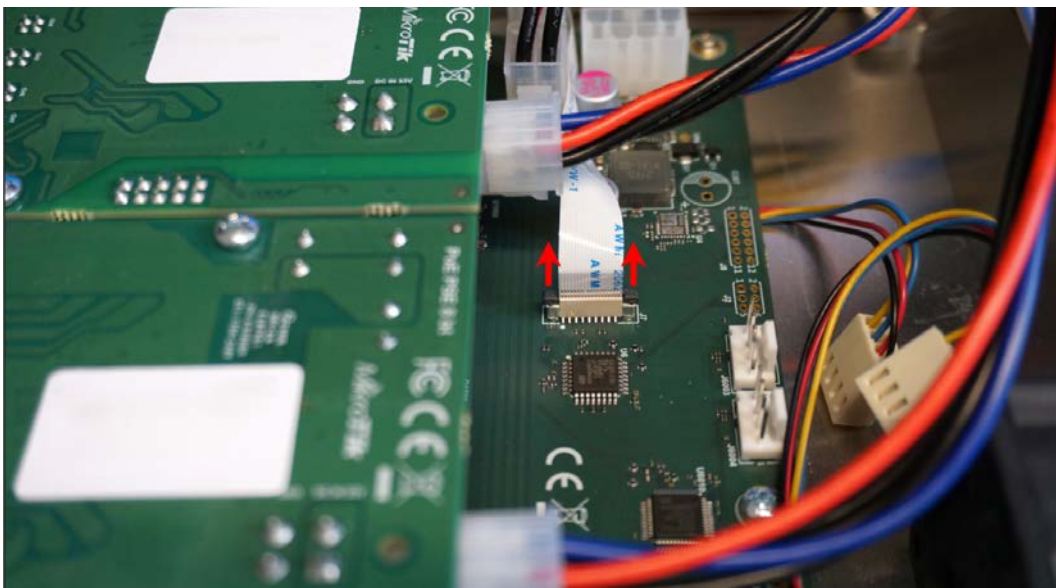
Step 2: Unscrew 10 screws using a PH1 screwdriver and unplug 4 connectors that are marked with arrows. Location of the screws and connectors is shown in the picture 85.



Picture 85

Step 3:

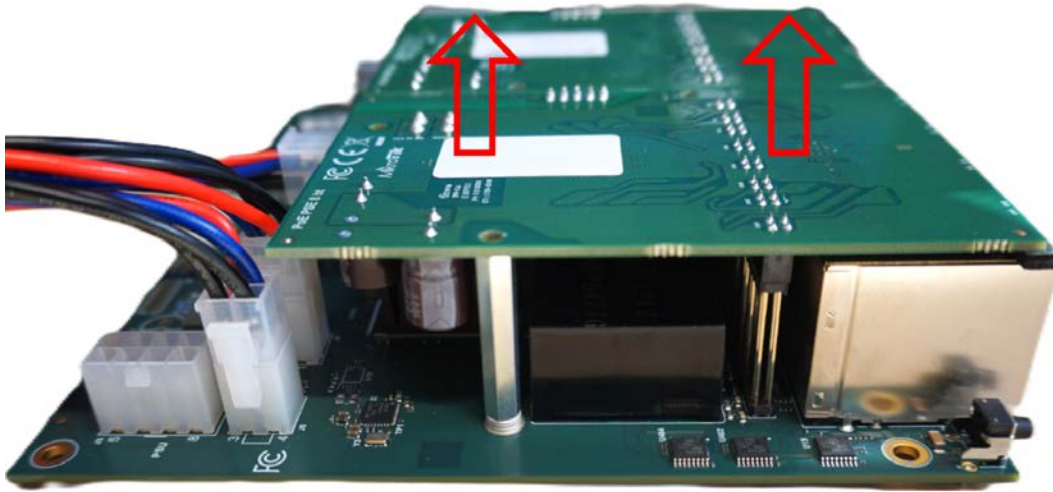
Unplug the connector by alternately pulling the left and right sides of the black pin, see picture 86.



Picture 86

Step 4:

Remove 2 boards by lifting them vertically as shown in the picture 87.



Picture 87

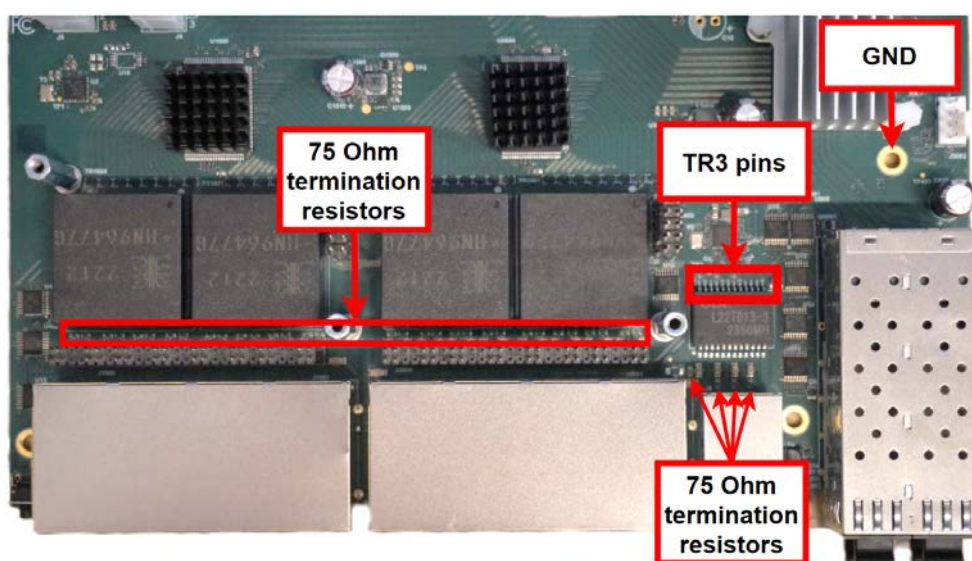
Checking procedure for over-voltage

Checking voltage drop value between Ethernet transformer pins and Ground

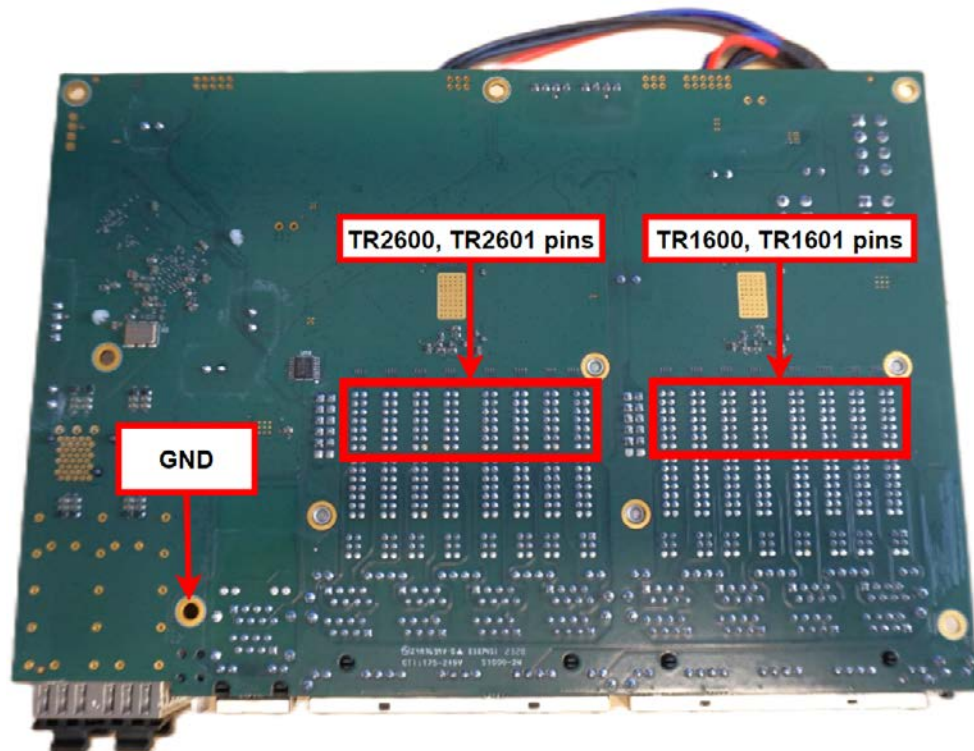
Check voltage drop value between Ethernet transformers TR1600, TR1601, TR2600, TR2601, TR3 pins and Ground. Test points you can see in the pictures 88 and 89. The voltage drop of the TR1600, TR1601, TR2600 and TR2601 transformers should be in the range from 0,30V to 0,35V or 0.60V to 0.65V and the voltage drop of the TR3 transformer should be in the range from 0,39V to 0,45V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be $75 \pm 1\%$ Ohms. Location of resistors is shown in picture 88.



Picture 88



Picture 89

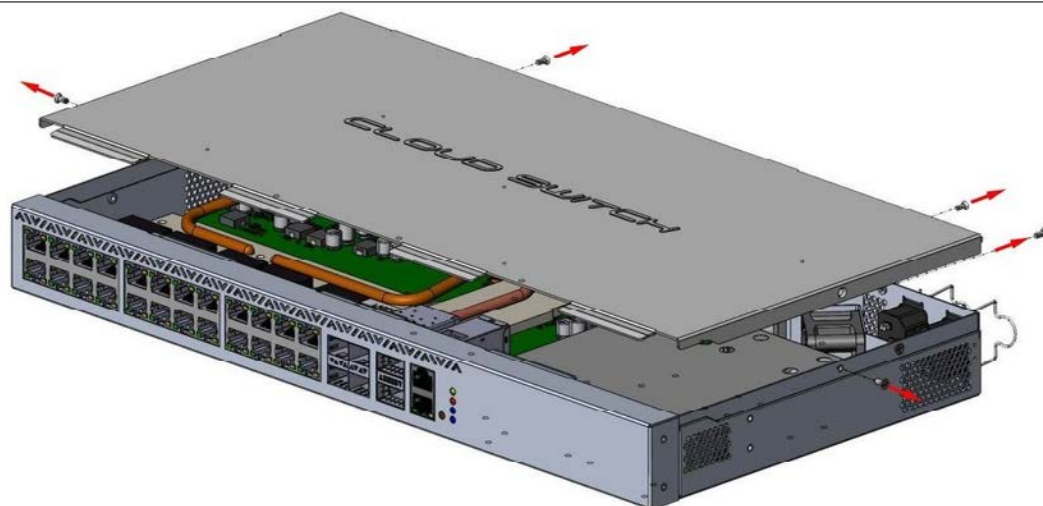
CRS326-4C+20G+2Q+RM



Picture 90

Disassembling information

Step 1: Unscrew 5 screws using PH2 screwdriver and carefully remove the cover. Location of the screws is shown the picture 91.



Picture 91

Step 2: Unscrew two screws using PH2 screwdriver, see picture 92.



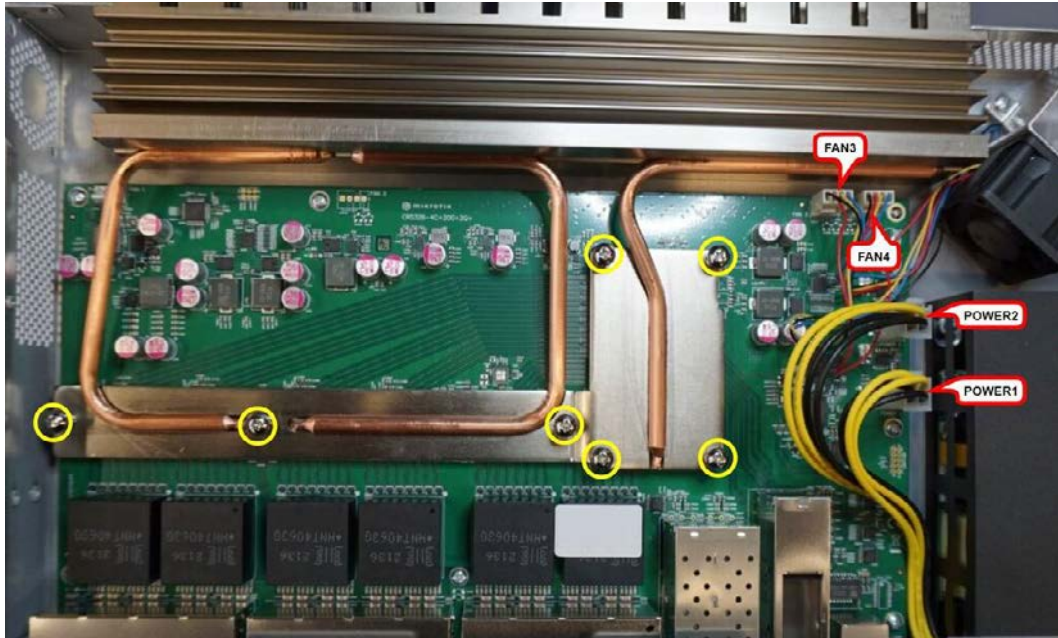
Picture 92

Step 3:

Unplug FAN and power cables, see picture 93.

Step 4:

Unscrew 7 screws using PH2 screwdriver and remove heat-sink, see picture 93.



Picture 93

Step 5:

Unscrew 8 screws using PH1 screwdriver. Location of the screws is shown the picture 94.

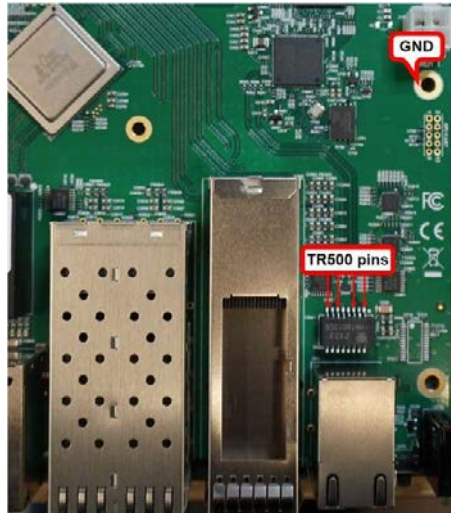


Picture 94

Checking procedure for over-voltage

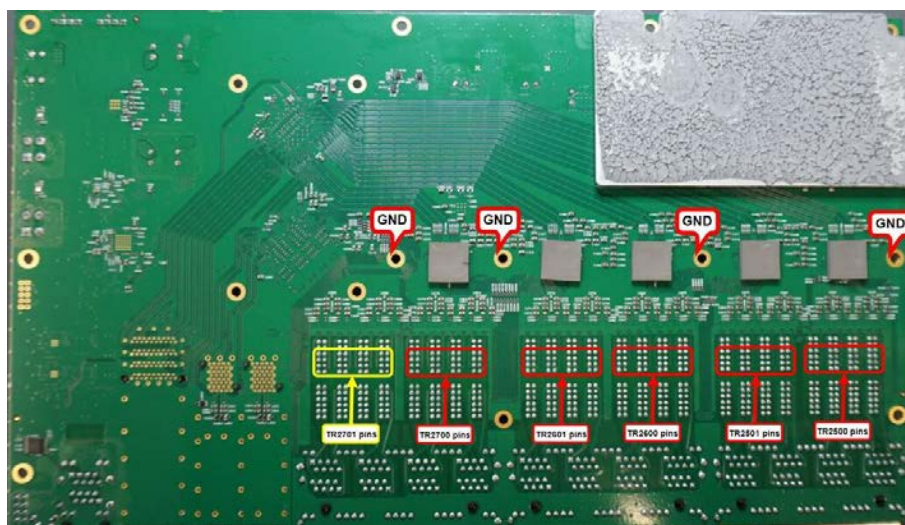
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR500 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 95. Voltage drop value should be in the range from 0,34V to 0,45V. Voltage drop measurement method is described on page 22.



Picture 95

Check voltage drop value between Ethernet transformers TR2500, TR2501, TR2600, TR2601, TR2700, TR2701 pins and Ground. Test points you can see in the picture 96. The voltage drop of the TR2500, TR2501, TR2600, TR2601 and TR2700 transformers should be in the range from 0,10V to 0,20V and the voltage drop of the TR2701 transformer should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 22.



Picture 96

CLOUD ROUTER SWITCH 418 SERIES ROUTERBOARD

CRS418-8P-8G-2S+



Picture 97

Disassembling information

Warning!!!

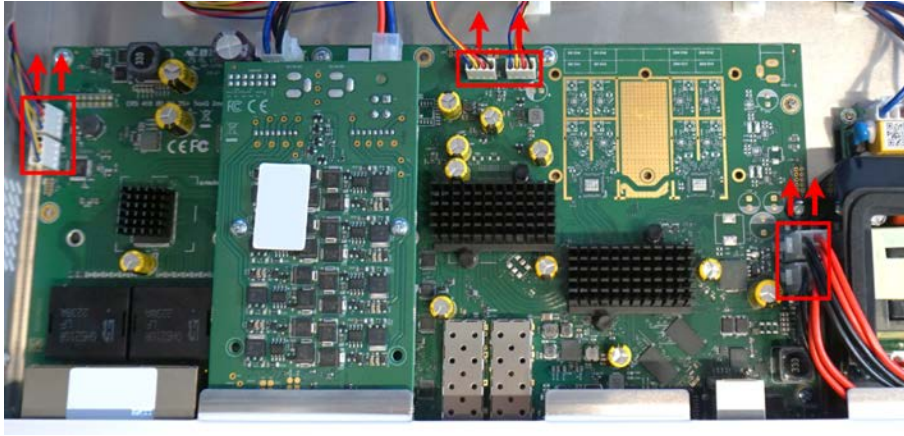
The board contains internal open frame PSU, before disassembly disconnect the routerboard power from mains and wait about 15 minutes, to allow the PSU capacitors to discharge!

Step 1: Unscrew 6 screws using a PH2 screwdriver and remove the cover. Location of the screws is shown in the picture 98.



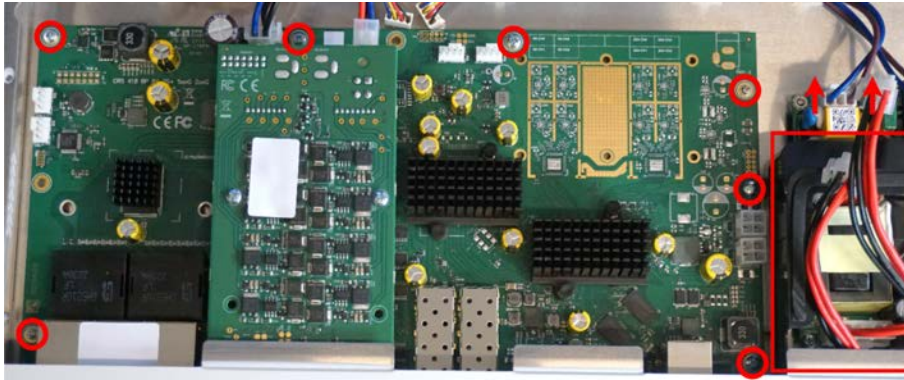
Picture 98

Step 2: Unplug 6 connectors that are marked with arrows. Location of the connectors is shown in the picture 99.



Picture 99

Step 3: Unscrew 7 screws using a PH1 screwdriver and remove power supply cover. Then gently remove board from the case. Location of the screws and power supply cover is shown in the picture 100.



Picture 100

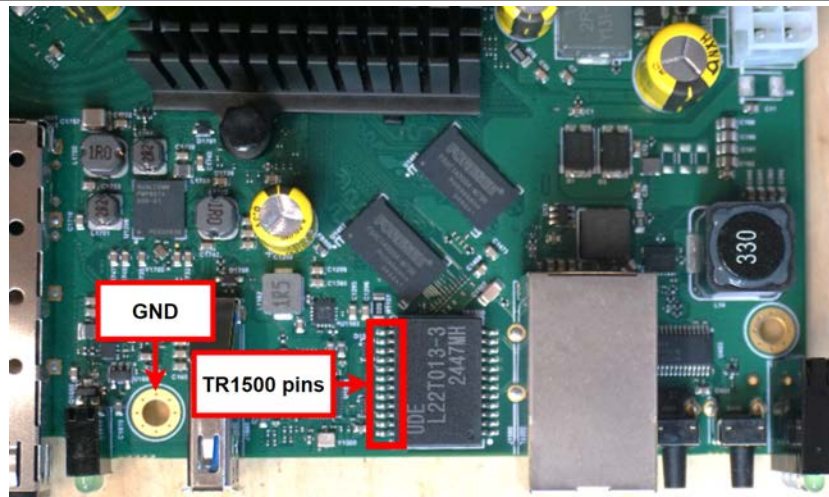
Checking procedure for over-voltage

Checking voltage drop value between Ethernet transformer pins and Ground

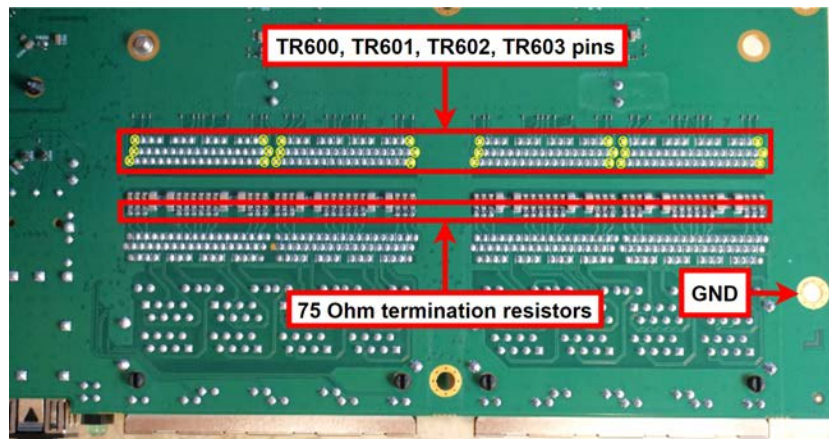
Check voltage drop value between Ethernet transformers TR1500, TR600, TR601, TR602, TR603 pins and Ground. Pins with yellow marker should not be measured! Test points you can see in the picture 101 (top side of the PCB) and 102 (back side of the PCB). The voltage drop of the transformers should be in the range from 0,25V to 0,65V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

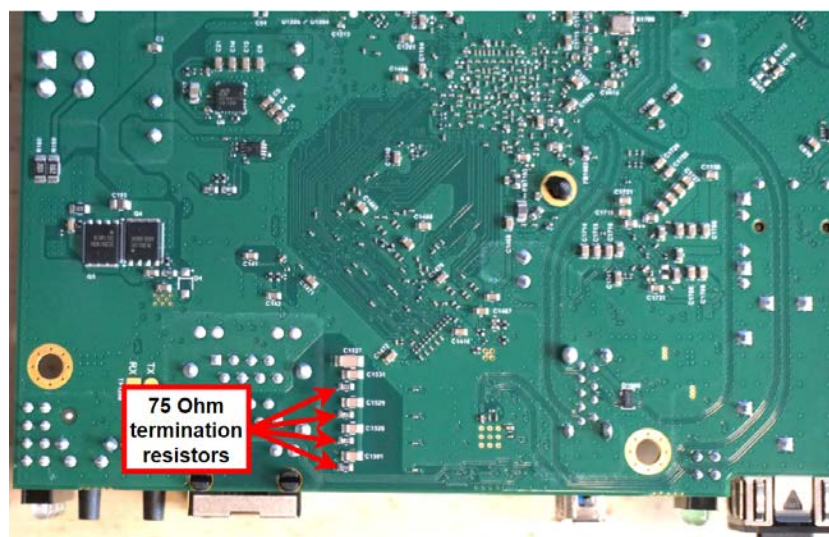
Check value of each termination resistors. It should be 75 $\pm$ 1% Ohms. Location of resistors is shown in picture 102 and 103 (back side of the PCB).



Picture 101



Picture 102



Picture 103

CRS418-8P-8G-2S+5axQ2axQ-RM



Picture 104

Disassembling information

Warning!!!

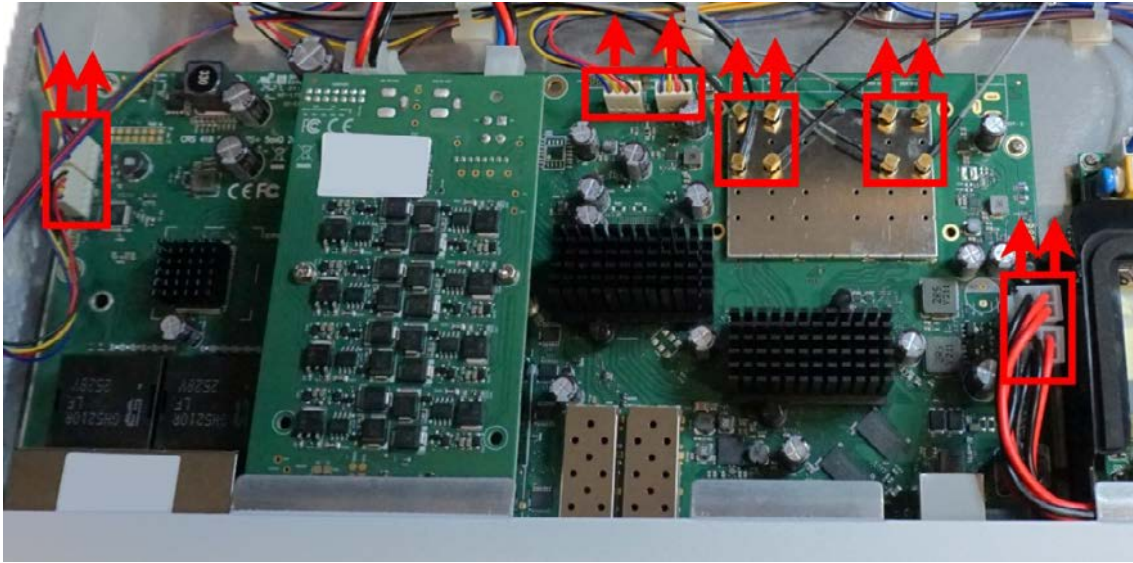
The board contains internal open frame PSU, before disassembly disconnect the routerboard power from mains and wait about 15 minutes, to allow the PSU capacitors to discharge!

Step 1: Unscrew 6 screws using a PH2 screwdriver and remove the cover. Location of the screws is shown in the picture 105.



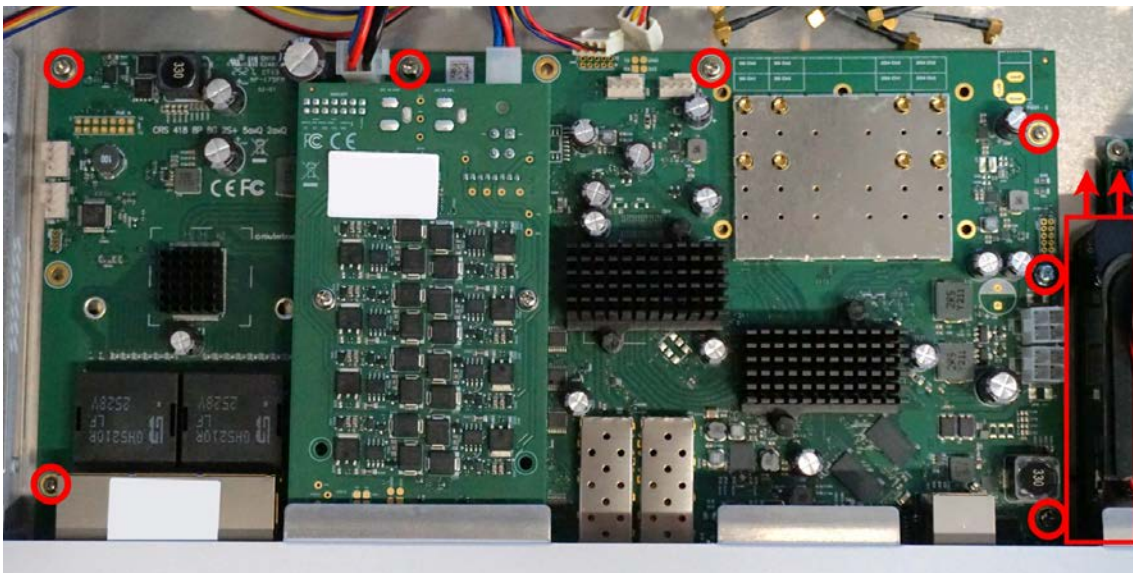
Picture 105

Step 2: Unplug 6 connectors and 8 cables that are marked with arrows. Make sure to remember all connections to reconnect them correctly after measurements are done. The location of the connectors and cables is shown in the picture 106.



Picture 106

Step 3: Unscrew 7 screws using a PH1 screwdriver and remove power supply cover. Then gently remove board from the case. Location of the screws and power supply cover is shown in the picture 107.



Picture 107

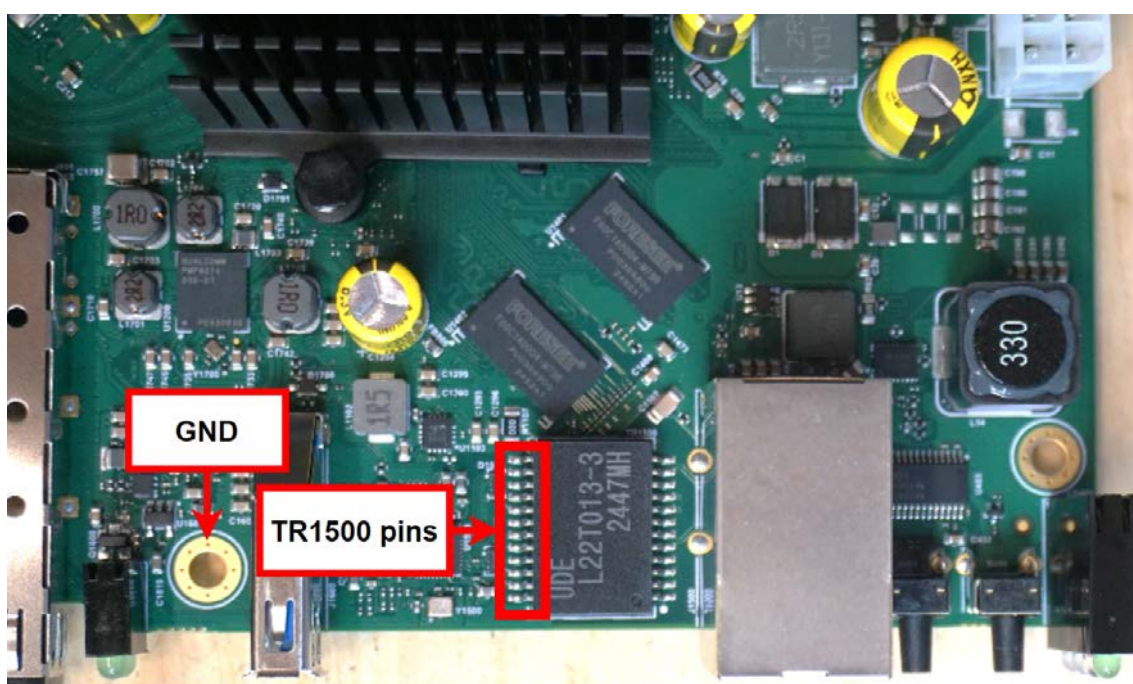
Checking procedure for over-voltage

Checking voltage drop value between Ethernet transformer pins and Ground

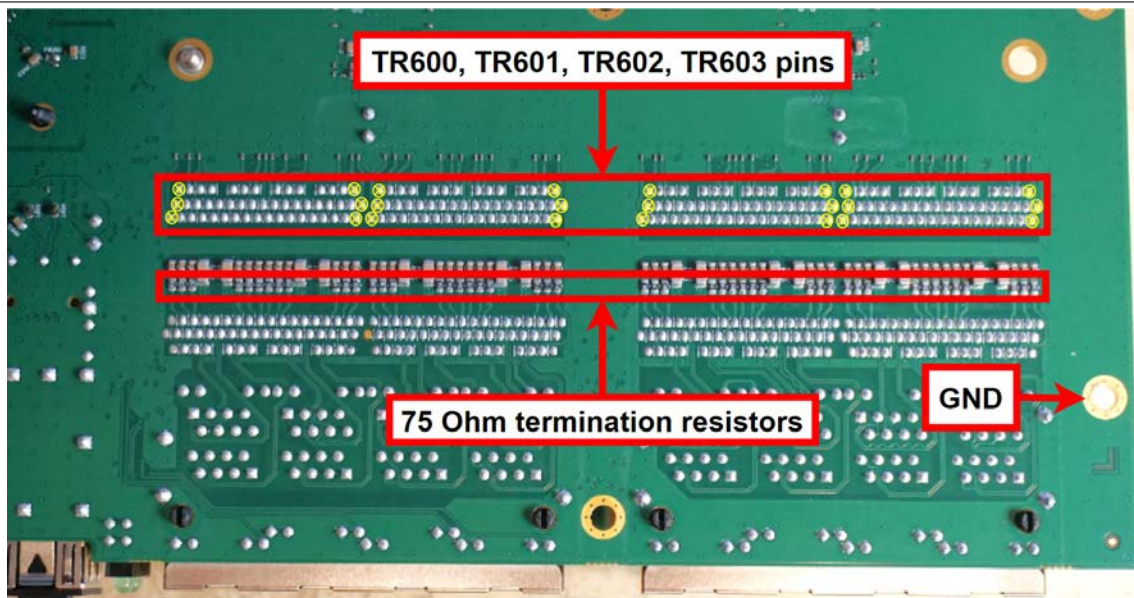
Check voltage drop value between Ethernet transformers TR1500, TR600, TR601, TR602, TR603 pins and Ground. Pins with yellow marker should not be measured! Test points you can see in the picture 108 (top side of the PCB) and 109 (back side of the PCB). The voltage drop of the transformers should be in the range from 0,25V to 0,65V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

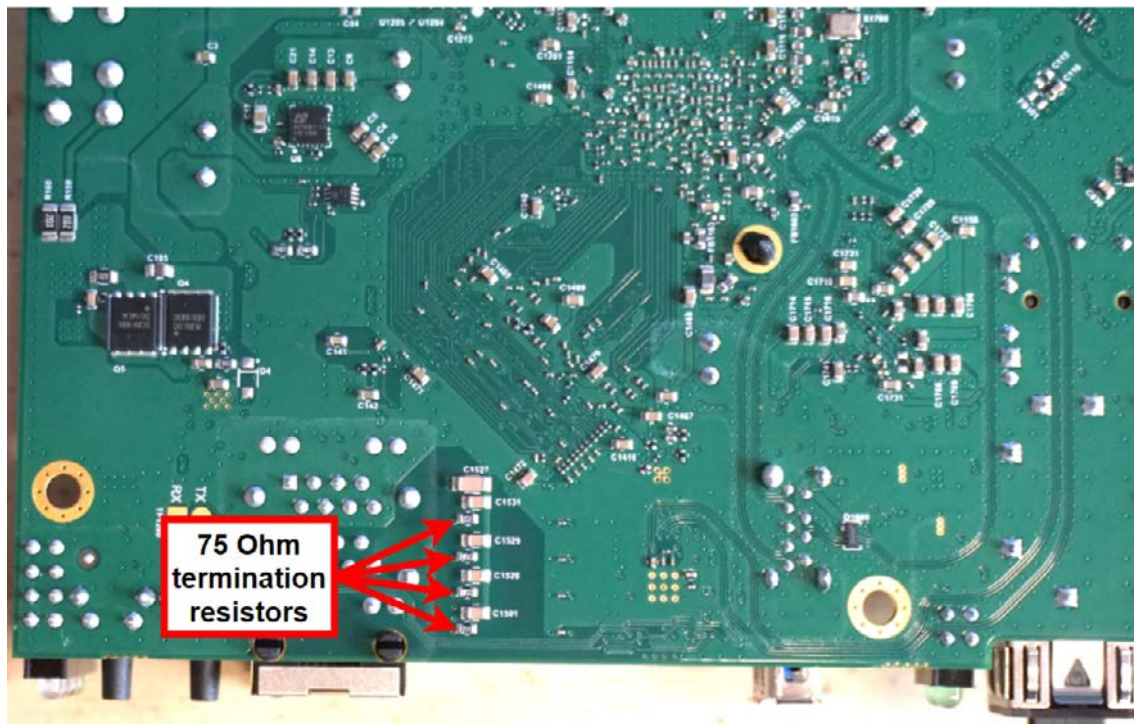
Check value of each termination resistors. It should be 75 $\pm$ 1% Ohms. Location of resistors is shown in picture 109 and 110 (back side of the PCB).



Picture 108



Picture 109



Picture 110

CLOUD ROUTER SWITCH 504 SERIES ROUTERBOARD

CRS504-4XQ-IN



Picture 111

Disassembling information

Step 1:

Using Phillips PH2 screwdriver unscrew 6 screws and remove the cover. Location of the screws is shown the picture [112](#).



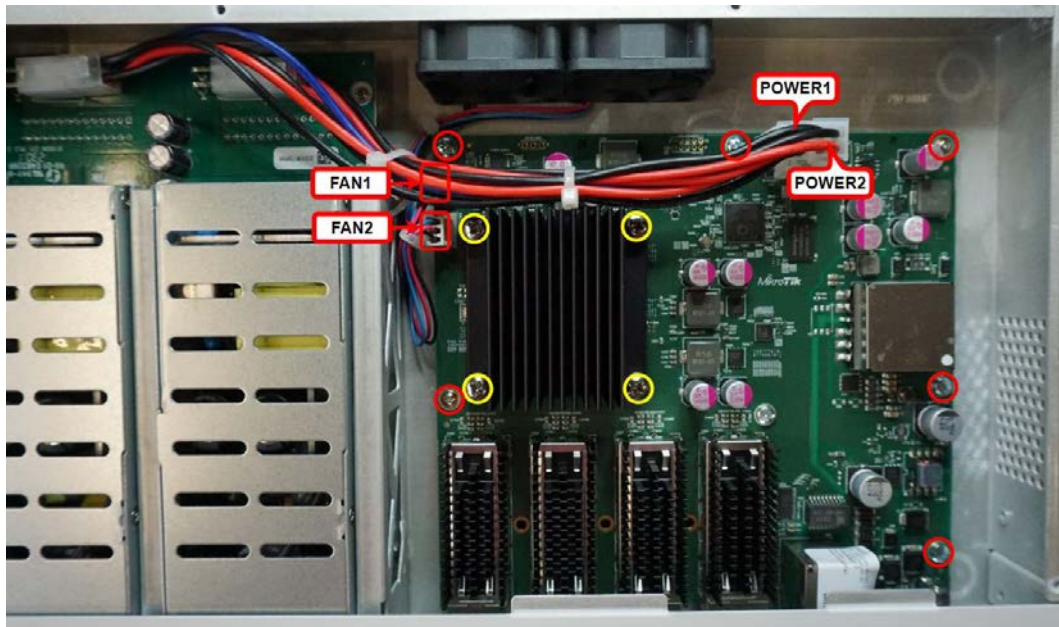
Picture 112

Step 2:

Disconnect the fan and power cables, see picture 113.

Step 3:

Using Phillips PH1 screwdriver unscrew 6 screws marked in red, than using Phillips PH2 screwdriver unscrew 4 screws marked in yellow and carefully remove the PCB from the case. Location of the screws is shown the picture 113.



Picture 113

Instructions for checking overvoltage

Checking Schottky diodes

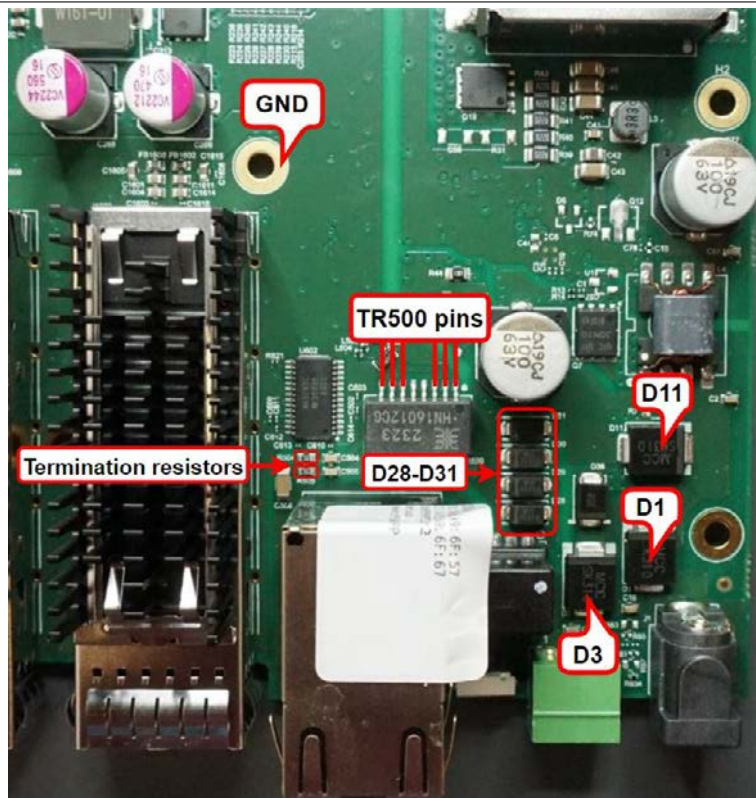
Check Schottky diodes D1, D3, D11, D28, D29, D30, D31, D32, D33, D34, D35. Location of the diodes is shown the picture 114 and 115. Schottky diode quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

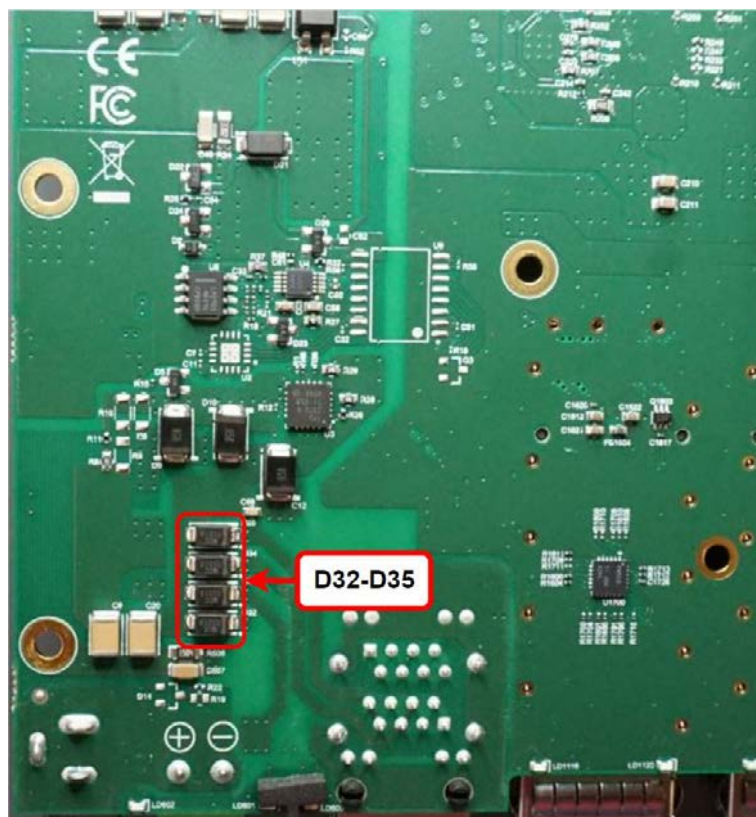
Check voltage drop value between Ethernet transformer TR500 pins and Ground. Test points on the transformer pins are marked with red lines, see picture 114. Voltage drop value should be in the range from 0,37V to 0,40V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of termination resistors R504 and R505. The resistance value should be 75 Ohms +/- 1%. Location of the termination resistors is shown in the picture 114.



Picture 114



Picture 115

CLOUD ROUTER SWITCH 510 SERIES ROUTERBOARD

CRS510-8XS-2XQ-IN



Picture 116

Disassembling information

Step 1:

Using Phillips PH2 screwdriver unscrew 6 screws and remove the cover. Location of the screws is shown the picture 117.



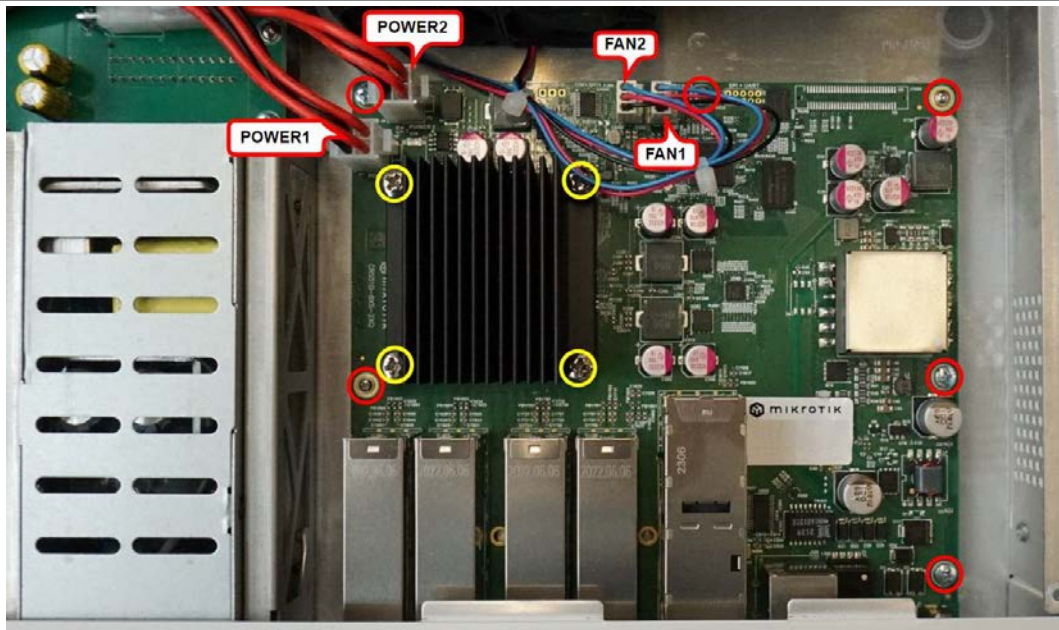
Picture 117

Step 2:

Disconnect the fan and power cables, see picture 118.

Step 3:

Using Phillips PH1 screwdriver unscrew 6 screws marked in red, than using Phillips PH2 screwdriver unscrew 4 screws marked in yellow and carefully remove the PCB from the case. Location of the screws is shown the picture 118.



Picture 118

Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D1, D3, D11, D28, D29, D30, D31, D32, D33, D34, D35. Location of the diodes is shown the picture 119 and 120. Schottky diode quality measurement method is described on page 19.

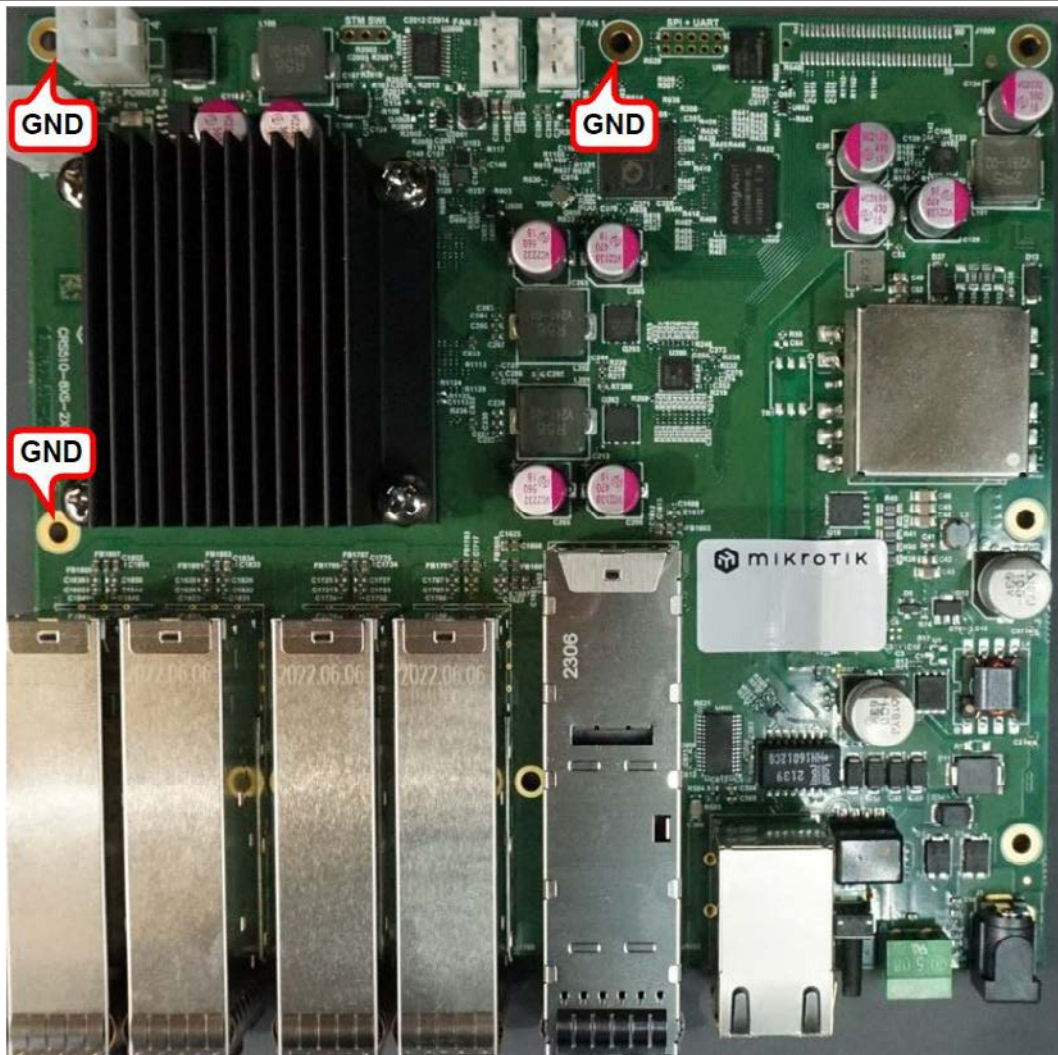
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR500, pins and Ground (Ground test point is shown in the picture 120 and 119). Test points on the transformer pins are marked with red lines, see picture 119. Voltage drop value should be in the range from 0,37V to 0,40V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of termination resistors R504 and R505. The resistance value should be 75 Ohms +/- 1%. Location of the termination resistors is shown in the picture 119.

Latest document "Instructions for checking overvoltage damage" available at <http://www.mikrotik.com> 101



Picture 121

CLOUD ROUTER SWITCH 520 SERIES ROUTERBOARD

CRS520-4XS-16XQ-RM



Picture 122

Disassembling information

Using Phillips PH2 screwdriver unscrew 10 screws and remove the cover. Location of the screws is shown the picture [123](#).



Picture 123

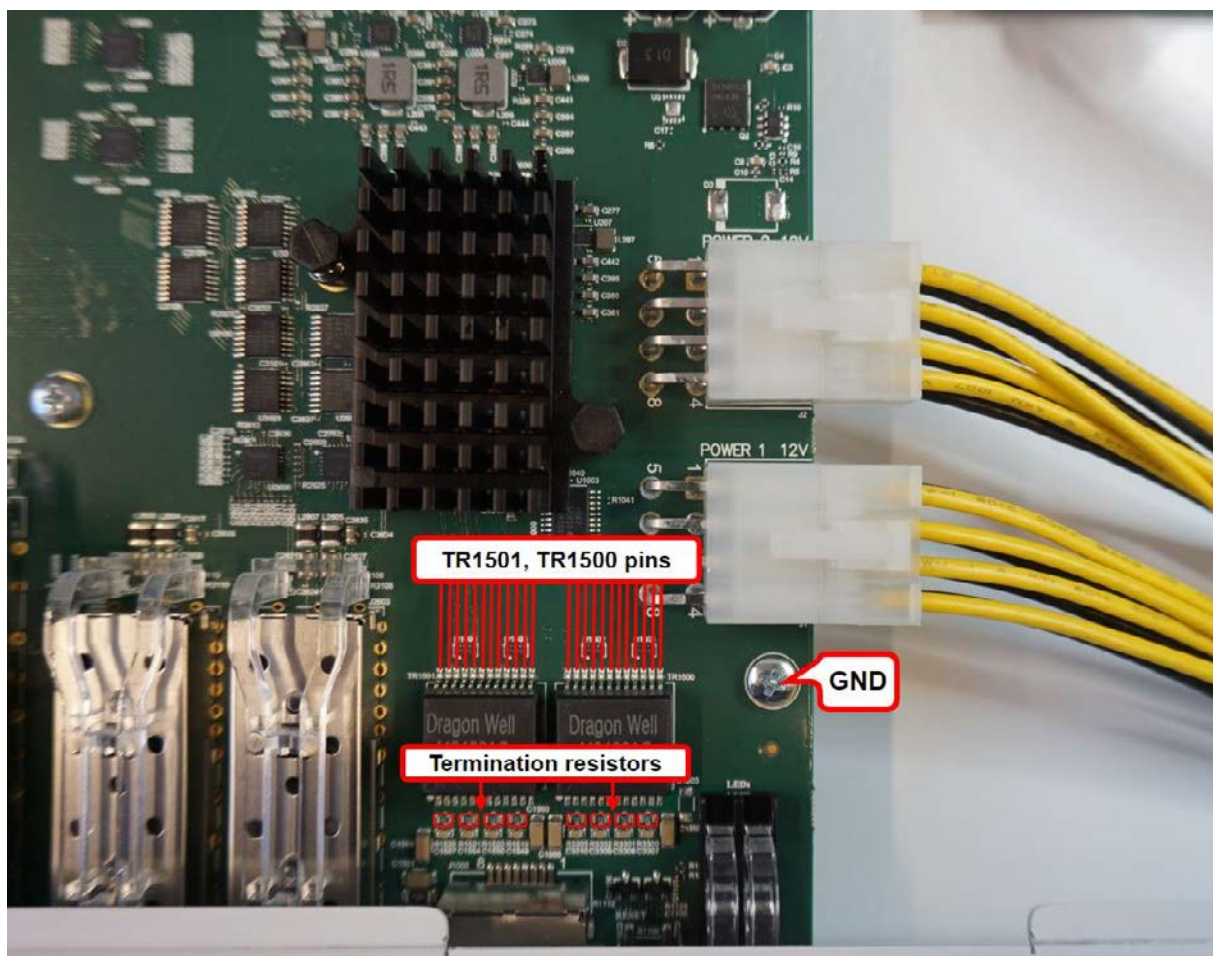
Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1500, TR1501 pins and Ground. Test points on the transformer pins are marked with red lines, see picture 124. Voltage drop value should be in the range from 0,42V to 0,47V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. The resistance value should be 75 Ohms $\pm$ 1%. Location of the termination resistors is shown in the picture 124.



Picture 124

CLOUD ROUTER SWITCH 812 SERIES ROUTESBOARD

CRS812-8DS-2DQ-2DDQ-RM



Picture 125

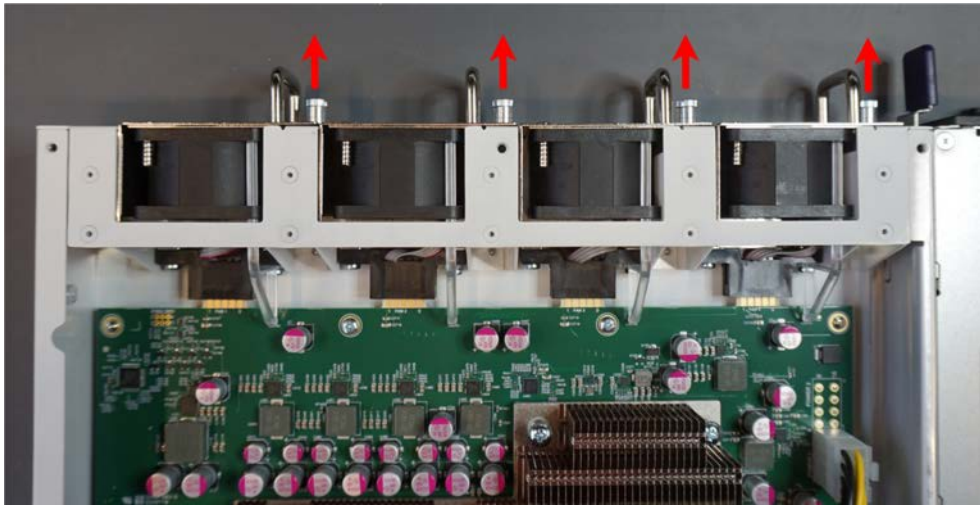
Disassembling information

Step 1: Using a Phillips PH2 screwdriver unscrew 9 screws and remove the cover. Location of the screws is shown the picture [126](#).



Picture 126

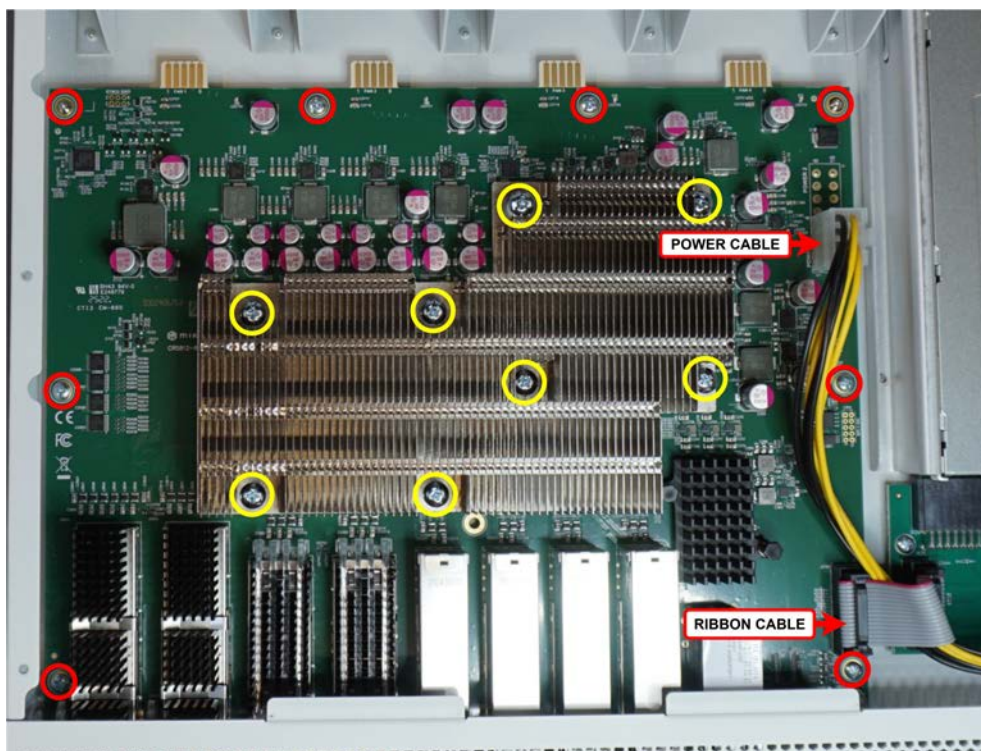
Step 2: Using a Phillips PH2 screwdriver unscrew four screws that holds the fans in place, after that disconnect the fans from the PCB, see picture 127.



Picture 127

Step 3:

Disconnect the power cable and the ribbon cable from the PCB. Using a Phillips PH2 screwdriver unscrew 8 screws (marked in yellow circles) and remove the heat-sink, then unscrew 8 screws (marked in red circles) and gently remove the PCB from the case, see picture 128.

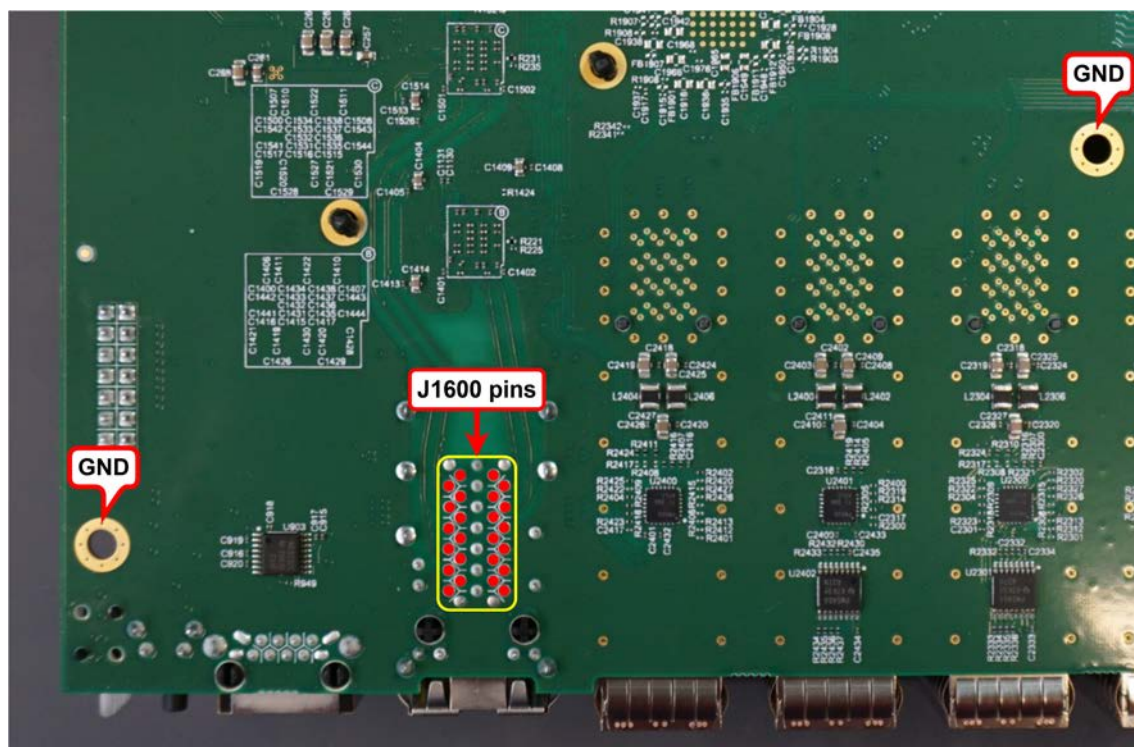


Picture 128

Instructions for checking overvoltage

Check voltage drop value between RJ-45 connector pins and Ground

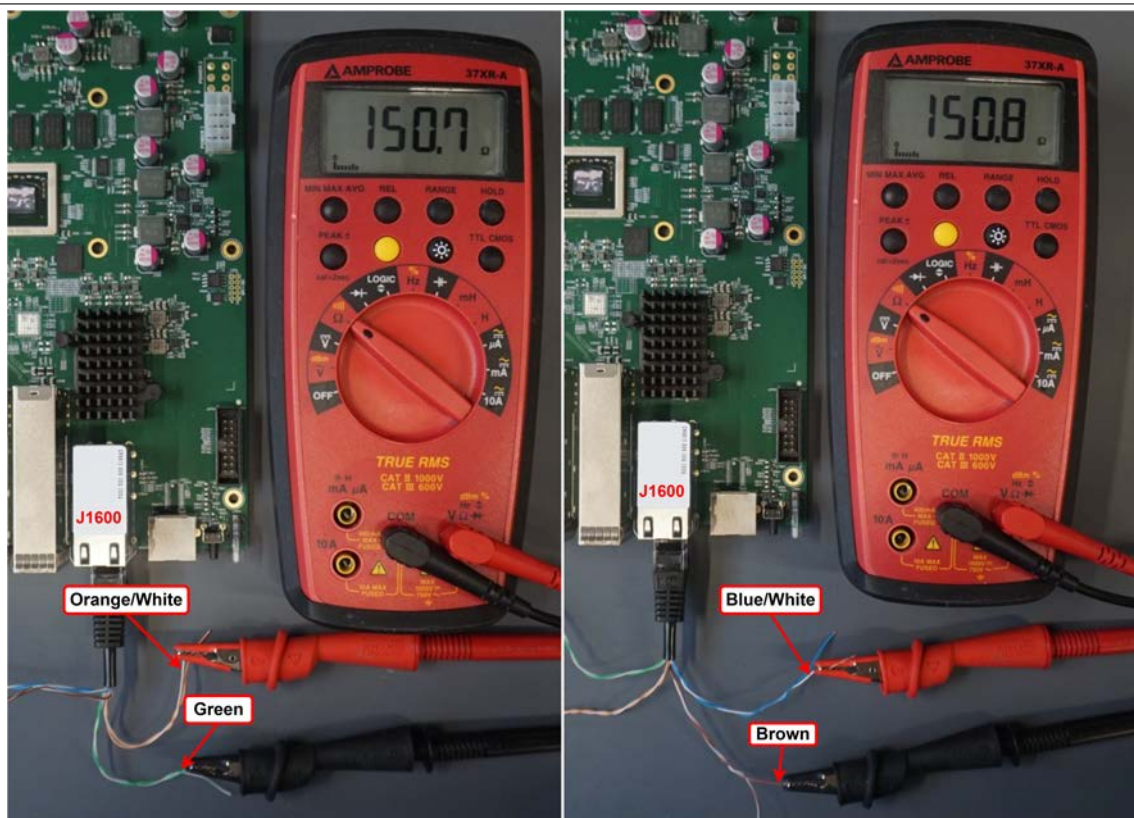
Check voltage drop value between RJ-45 connector J1600 pins and ground. Test points on the RJ-45 connector pins are marked with red dots, see picture 129. Voltage drop value should be in the range from 0,40V to 0,50V. Voltage drop measurement method is described on page 22.



Picture 129

Checking termination resistors resistance in RJ-45 connector

For this measurement you need a piece of a RJ45 plug Ethernet cable with stripped orange/white, green, blue/white and brown wires. In order to check termination resistors it is necessary to measure the resistance between the green and orange/white wires, as well the brown and blue/white wires. Resistance value should be 150 Ohm $\pm$ 4%, the example of measurement you can see in the picture 130.



Picture 130

260 SERIES ROUTERBOARDS

RB260GS



Picture 131

Dissassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [115](#).

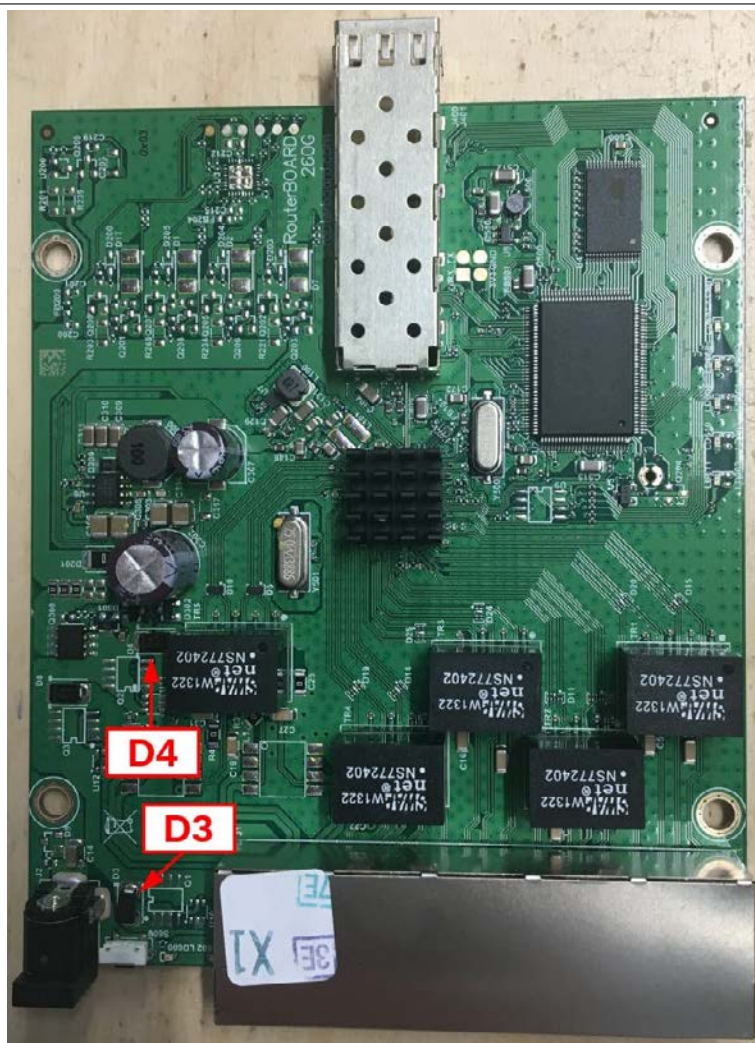
Instructions for checking overvoltage

Checking Schottky diodes

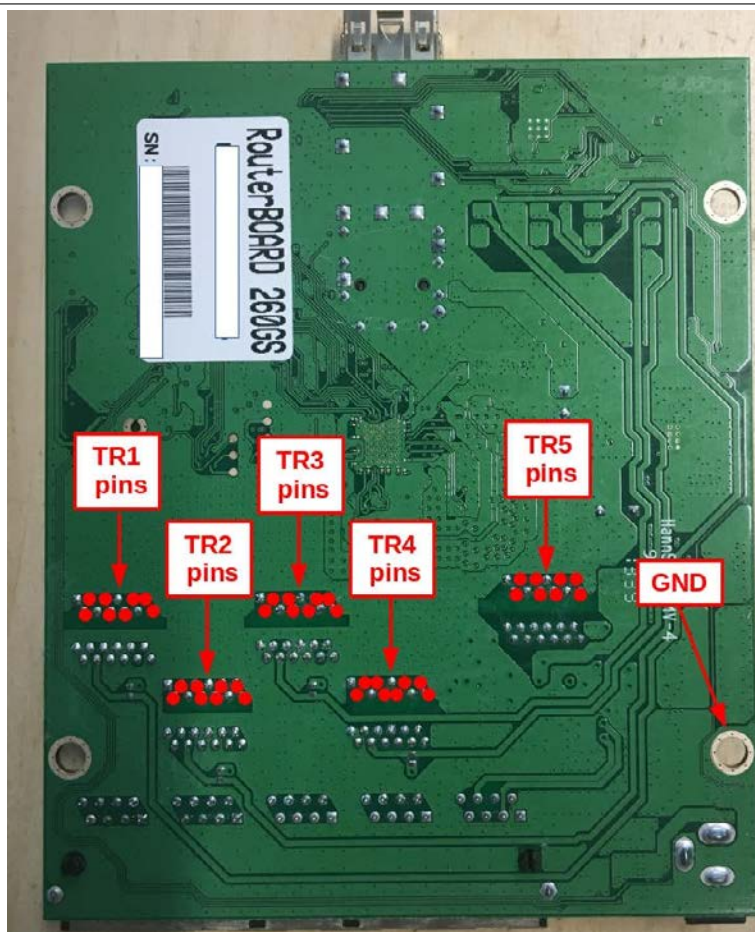
Check Schottky diodes D3, D4. Location of diodes on the board you can see in the picture [132](#). Schottky diodes quality measurement method is described on page [19](#).

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 [133](#). Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [22](#).

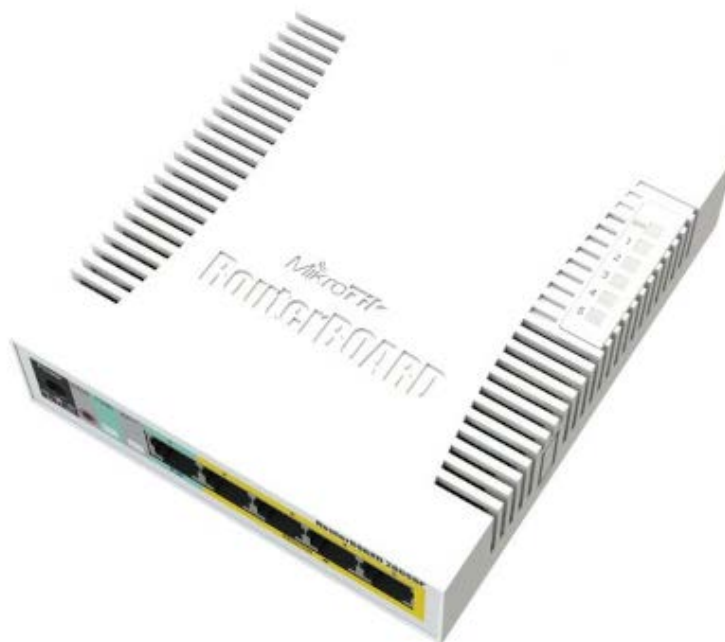


Picture 132



Picture 133

RB260GSP



Picture 134

Dissassembling information

Step 1:

Take off case back sticker as shown in the picture 135.



Picture 135

Step 2:

Take off the cover with a screwdriver as shown in the pictures 136 - 139.



Picture 136



Picture 137



Picture 138



Picture 139

Step 3:

Take out the board as shown in the picture [140](#).



Picture 140

Instructions for checking overvoltage

Checking Schottky diodes

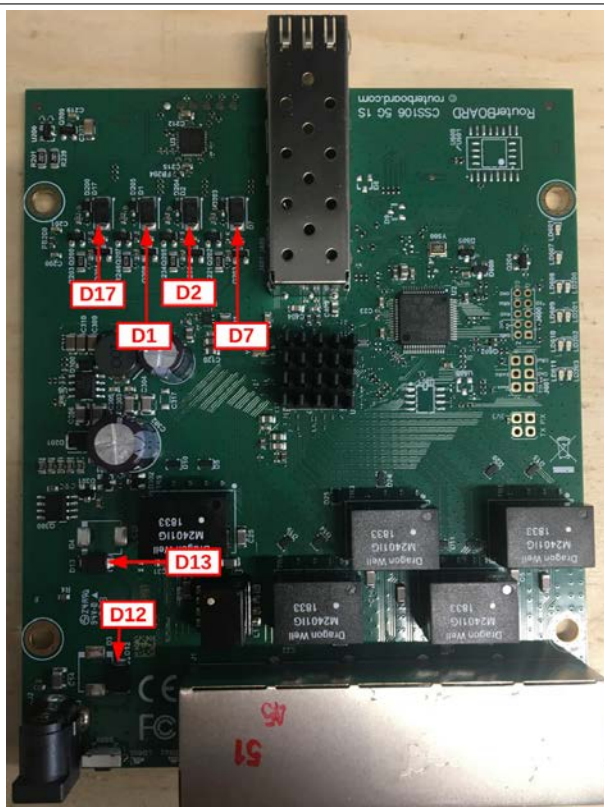
Check Schottky diodes D1-D4, D7, D17. Location of diodes on the board you can see in the picture 142. Schottky diodes quality measurement method is described on page 19.

Some boards may have different PCB layout. If the board does not correspond the PCB in picture 142, then check Schottky diodes D1, D2, D7, D12, D13, D17. Location of diodes on the board you can see in the picture 141. Schottky diodes quality measurement method is described on page 19.

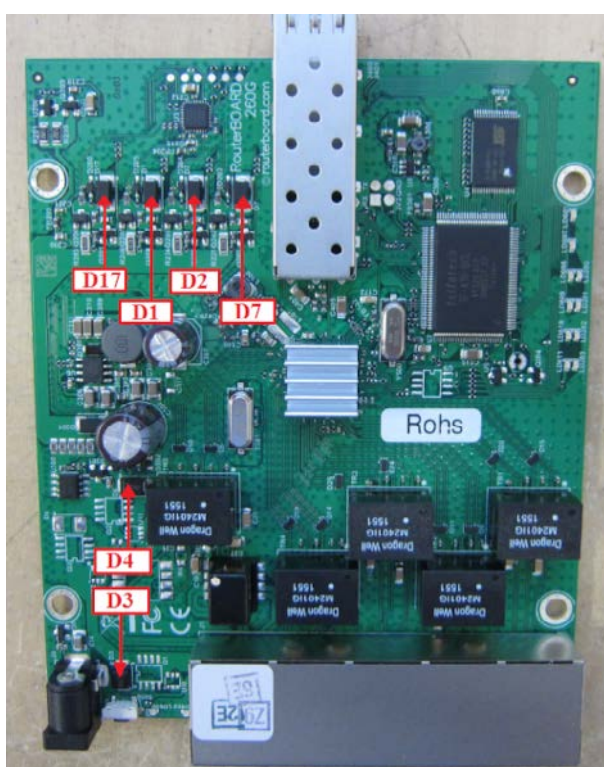
Checking voltage drop value between Ethernet transformer pins and Ground

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 143.

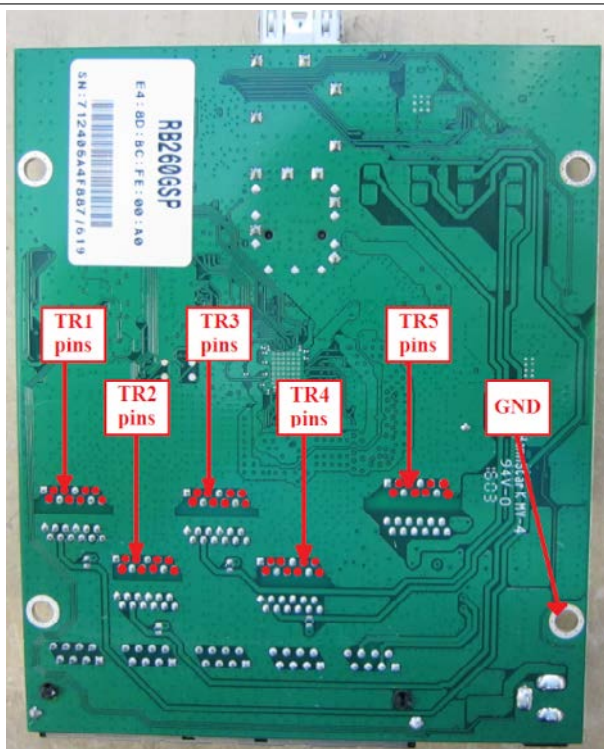
Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 22.



Picture 141



Picture 142



Picture 143

RB260GS (r2) (CSS106-5G-1S)



Picture 144

Dissassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [115](#).

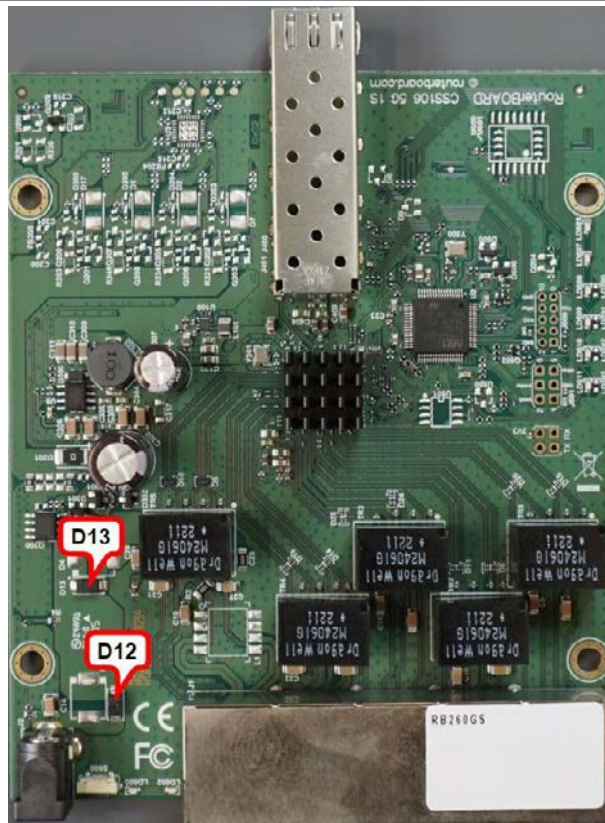
Instructions for checking overvoltage

Checking Schottky diodes

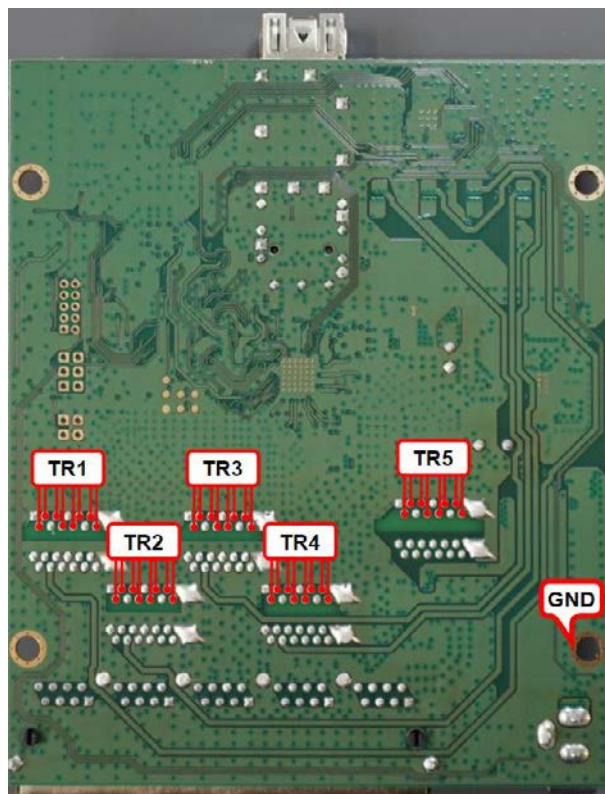
Check Schottky diodes D12 and D13. Location of diodes on the board you can see in the picture [145](#). Schottky diodes quality measurement method is described on page [19](#).

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 highlighted with red lines, see picture [149](#). Voltage drop value should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page [22](#).

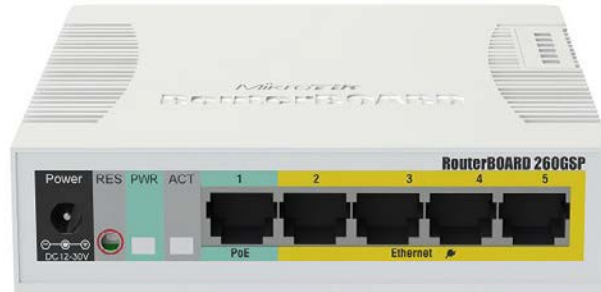


Picture 145



Picture 146

RB260GSP (r2) (CSS106-5G-1S)



Picture 147

Dissassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [115](#).

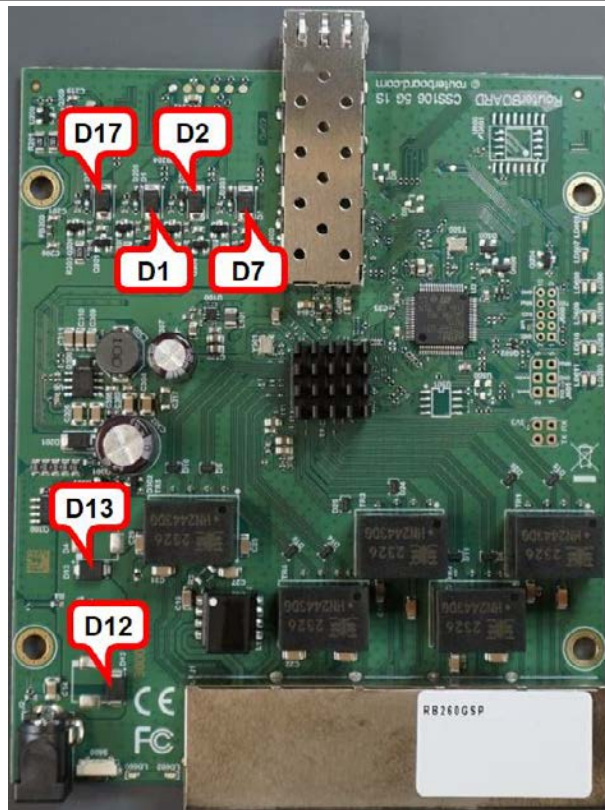
Instructions for checking overvoltage

Checking Schottky diodes

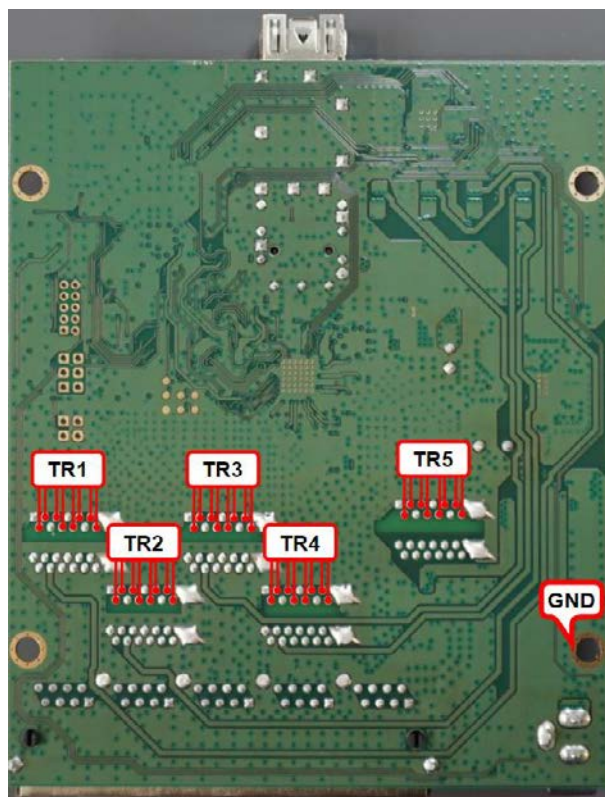
Check Schottky diodes D1, D2, D7, D12, D13, D17. Location of diodes on the board you can see in the picture [148](#). Schottky diodes quality measurement method is described on page [19](#).

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 highlighted with red lines, see picture [149](#). Voltage drop value should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page [22](#).



Picture 148

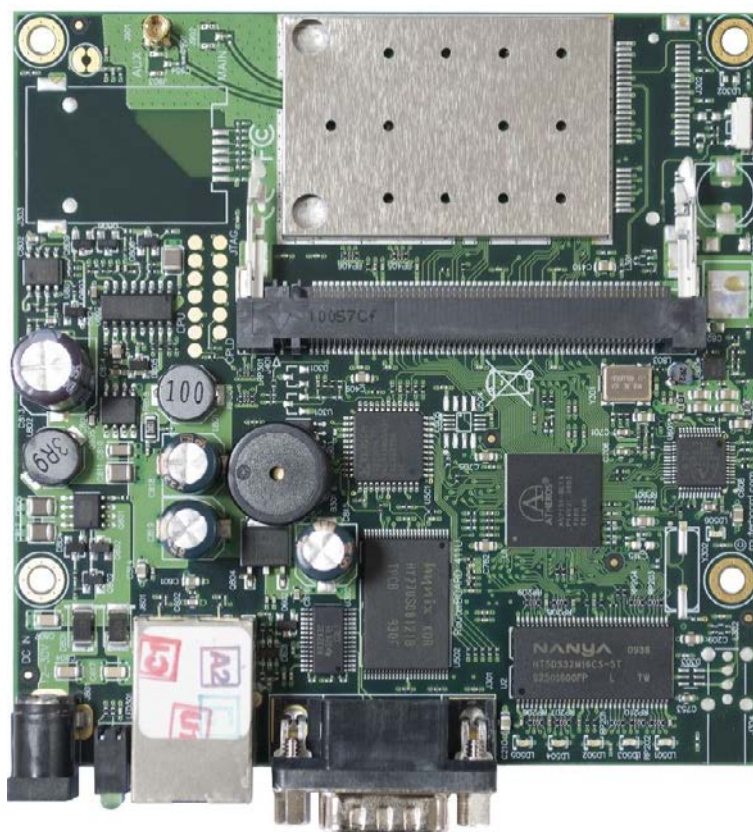


Picture 149

411 SERIES ROUTERBOARDS

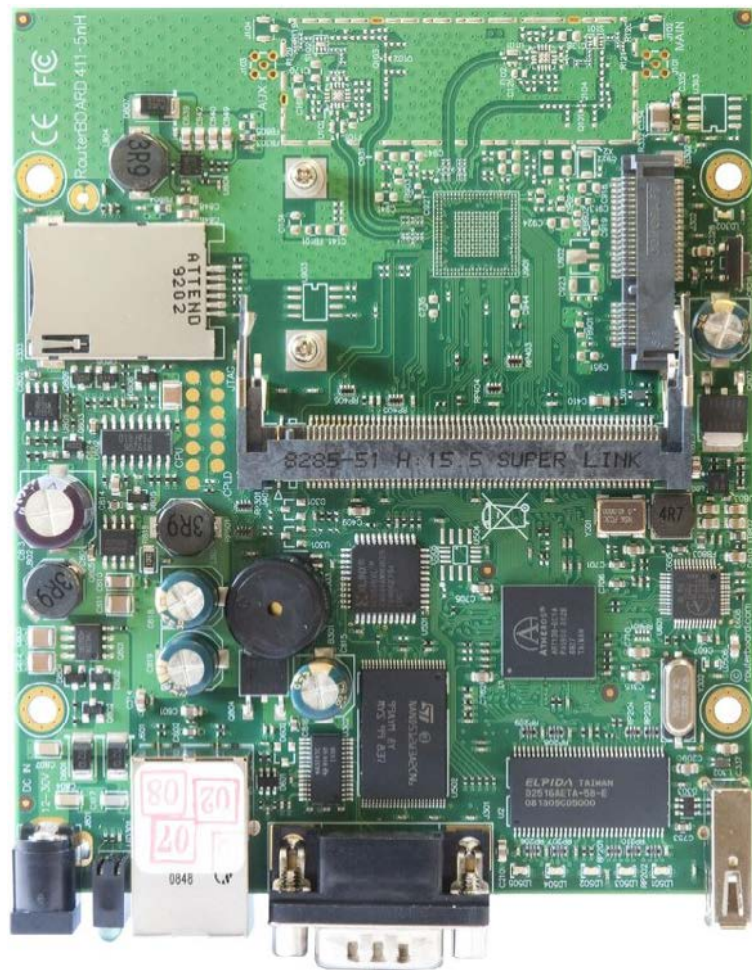


RB411AR



Picture 151

RB411U



Picture 152

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 [153](#). Schottky diodes quality measurement method is described on page [19](#).

Checking voltage drop value between diode array pin1 pins and GND

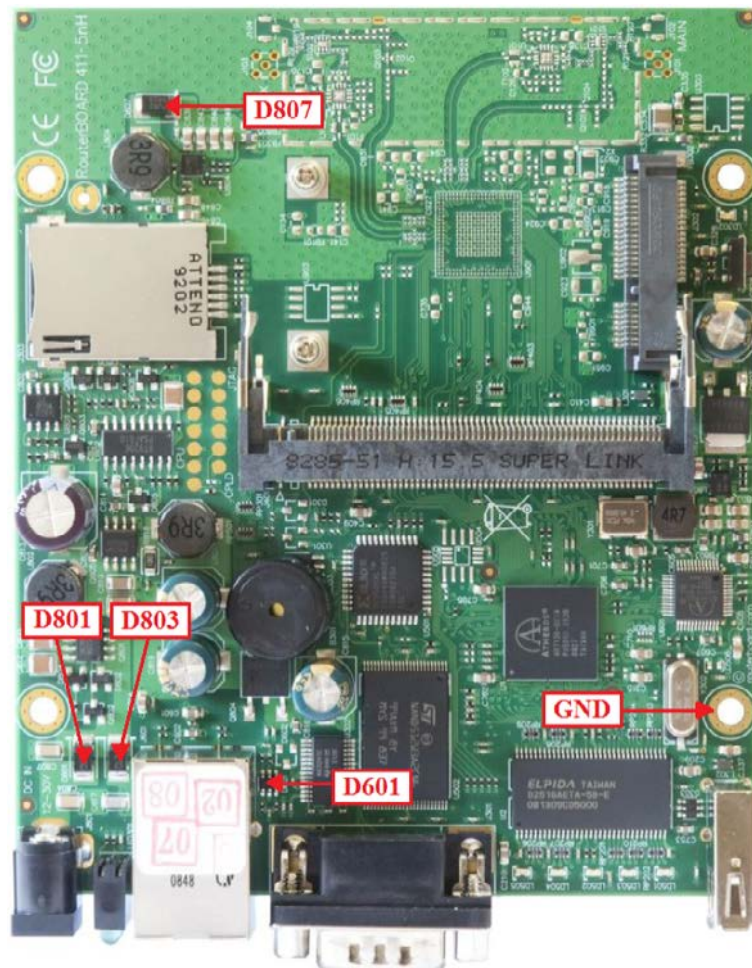
Check voltage drop value between diode array D601 pin1 and Ground. Location of diode array on the boards RB411U, RB411AR you can see in the picture [153](#), but for RB411AH in the picture [154](#).

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 [21](#).

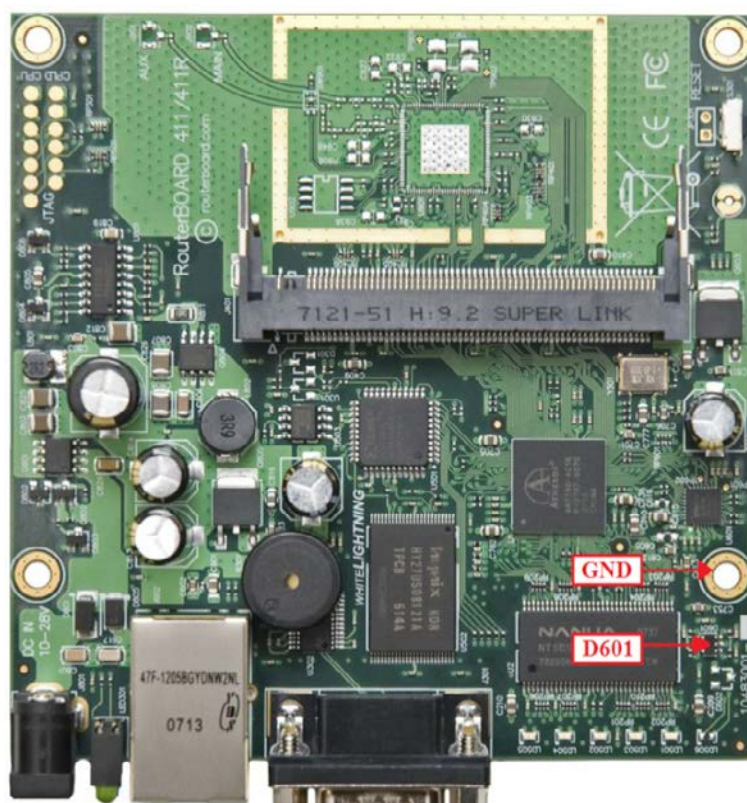
Checking termination resistors in RJ-45 connector

Check termination resistors resistance in J601 connector.

Resistance value between Rx and Tx line must be 150 Ohm $\pm$ 4%. Measurement method is described on page 23.

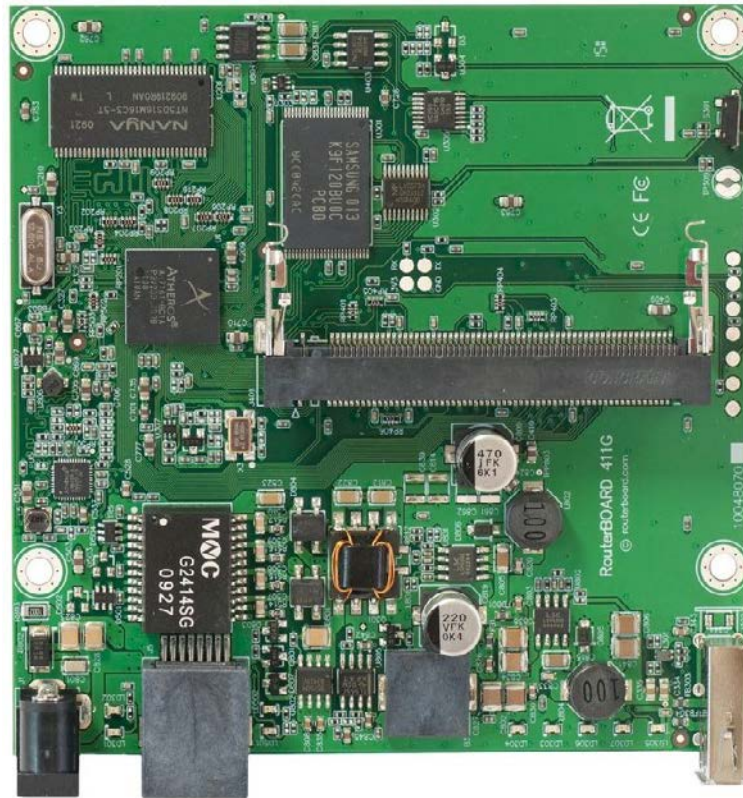


Picture 153



Picture 154

RB411GL



Picture 155

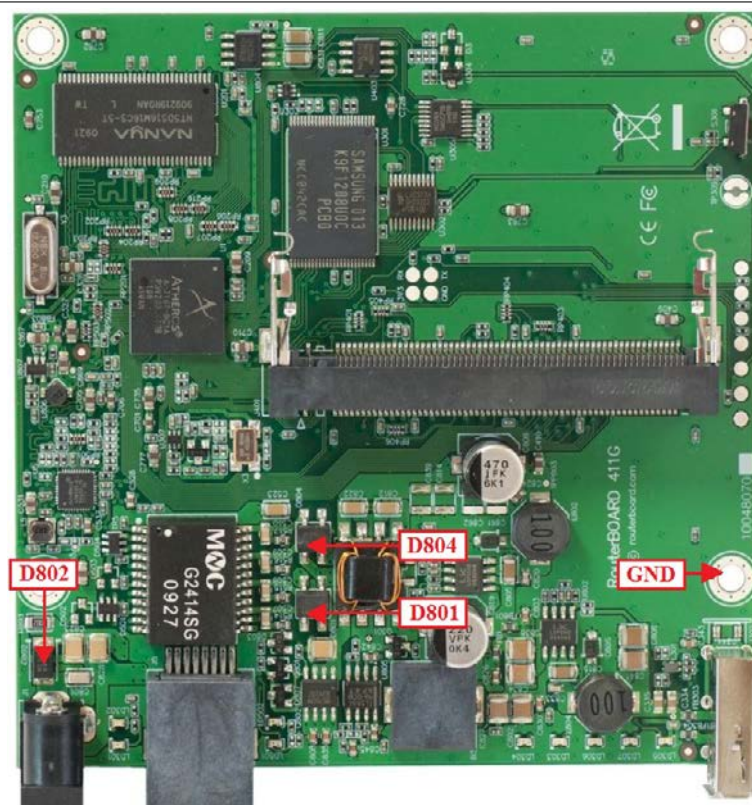
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

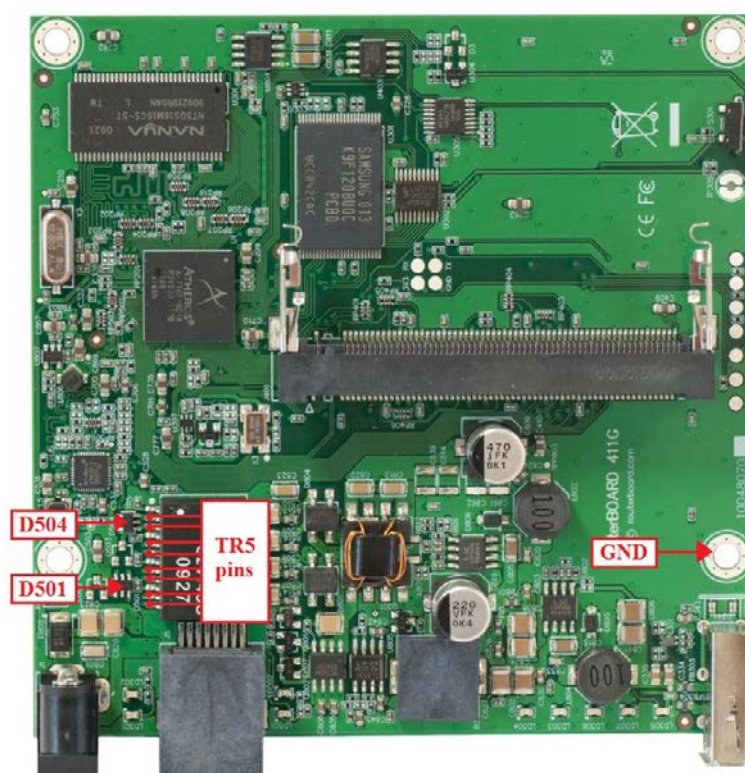
Check Schottky diode D802 and diodes bridges D801, D804. Location of diodes on the board you can see in the picture 156. Diodes quality measurement method is described on page 19.

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 157. 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 21.

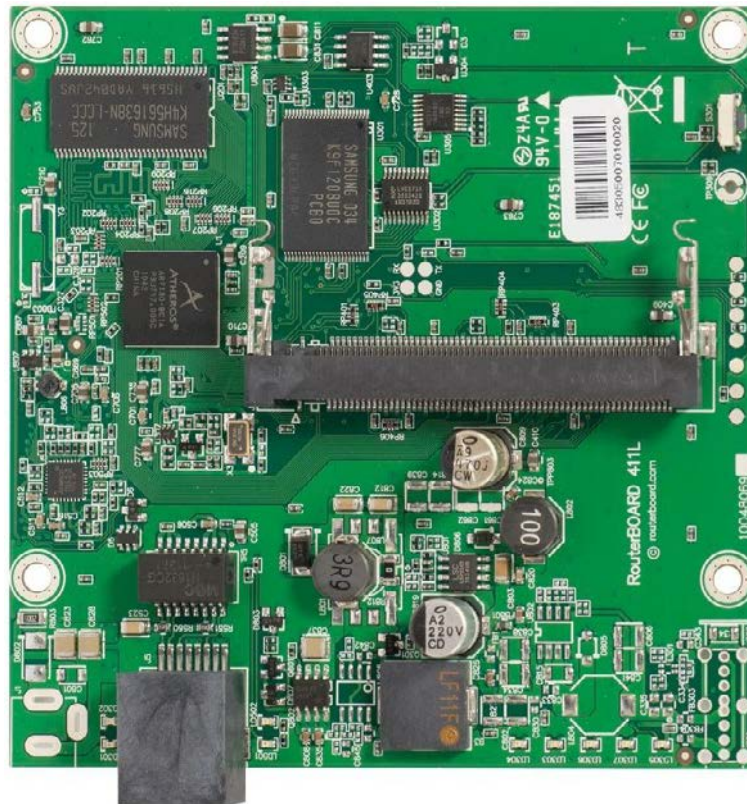


Picture 156



Picture 157

RB411L



Picture 158

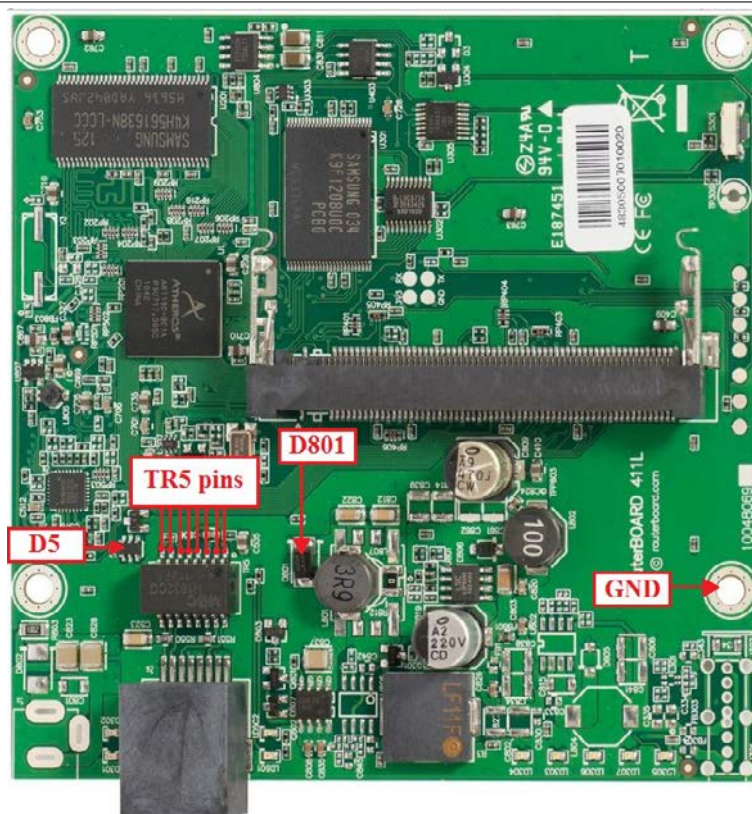
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

Check Schottky diode D801. Location of diode on the board you can see in the picture 159. Schottky diode quality measurement method is described on page 19.

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 159. 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 21.



Picture 159

433 SERIES ROUTERBOARDS

RB433AH



Picture 160

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

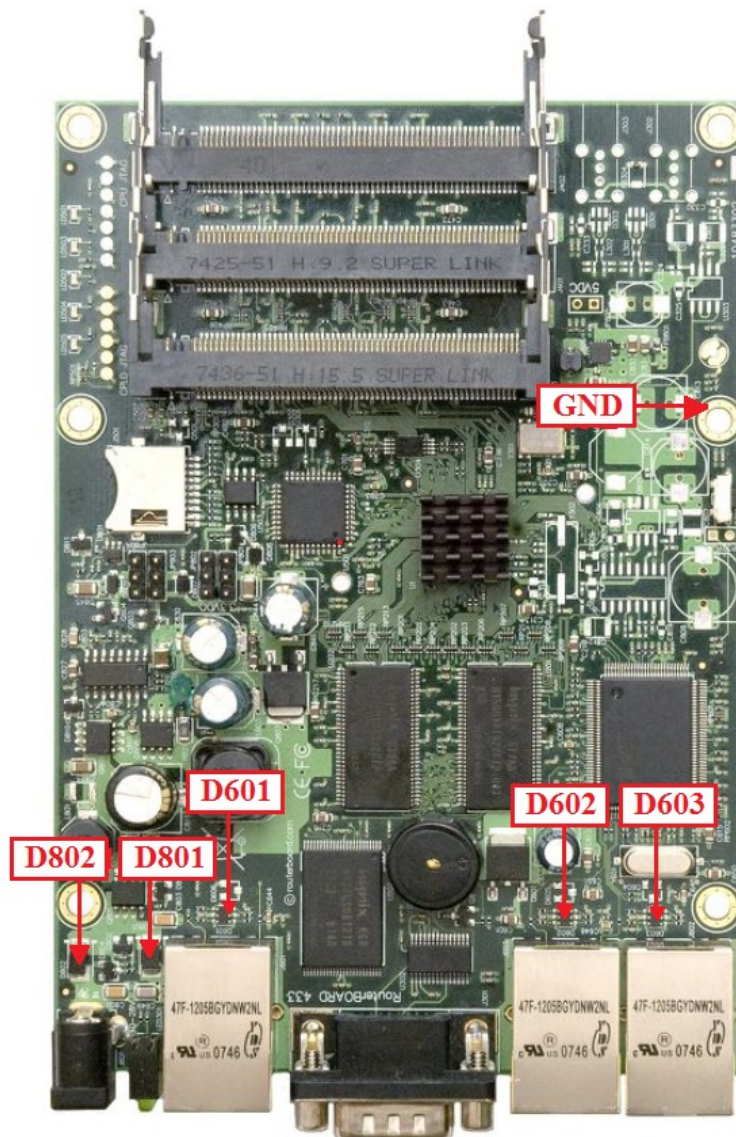
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture [161](#). Diodes quality measurement method is described on page [19](#).

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 161. Voltage drop value should be in the range from 0,4V to 0,44V. Voltage drop measurement method is described one page 21.

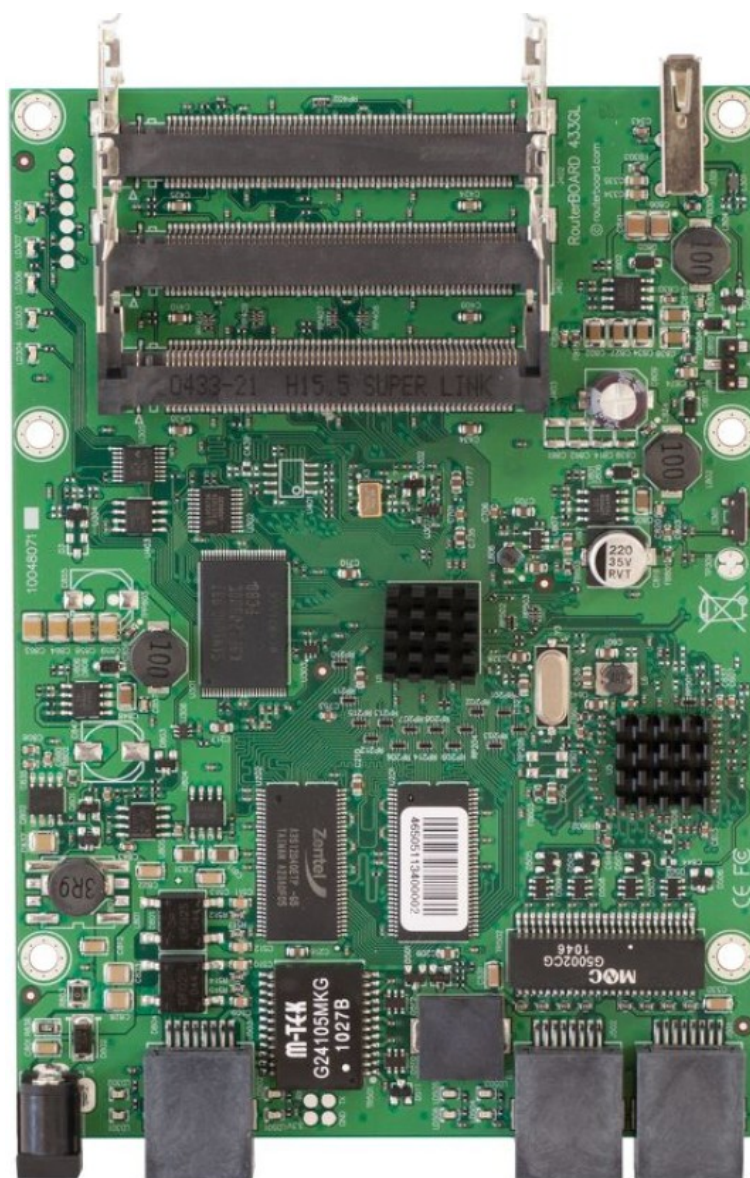
Checking termination resistors resistance in RJ-45 connector

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 23.



Picture 161

RB433GL



Picture 162

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

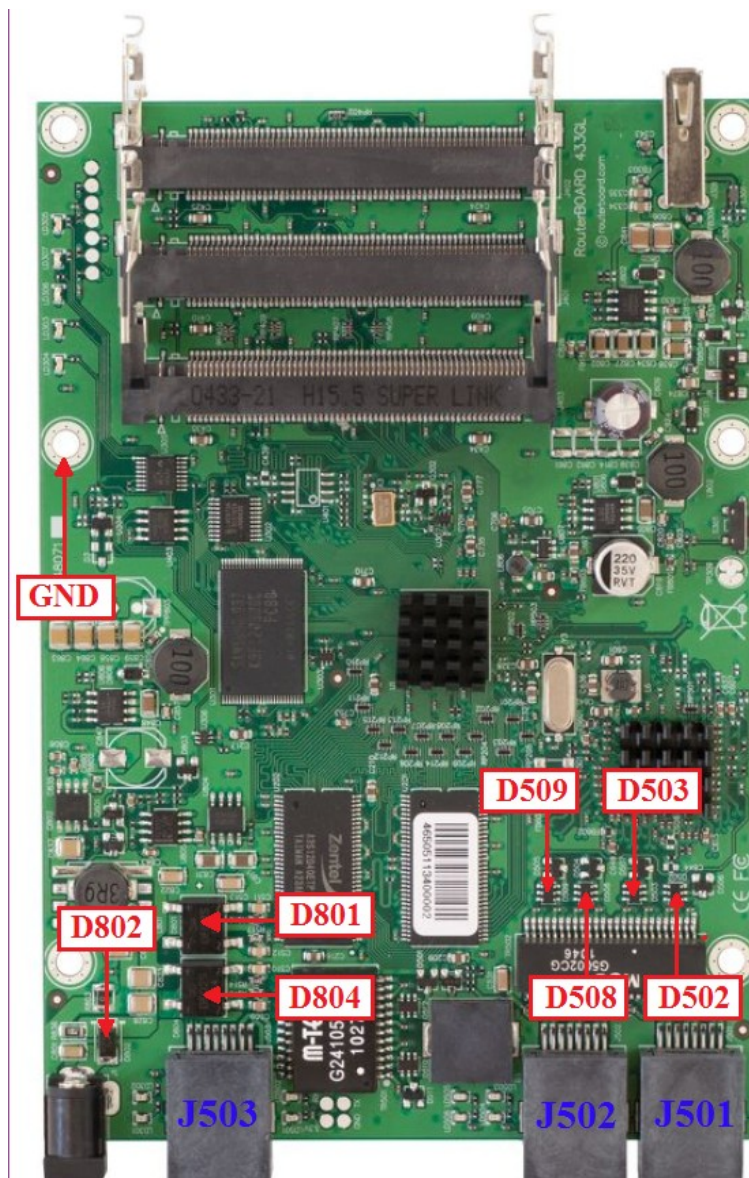
Check Schottky diode D802 and diodes bridges D801, D804. Location of diodes on the board you can see in the picture 163. Diodes quality measurement method is described on page 19.

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 163. Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described one page 21.

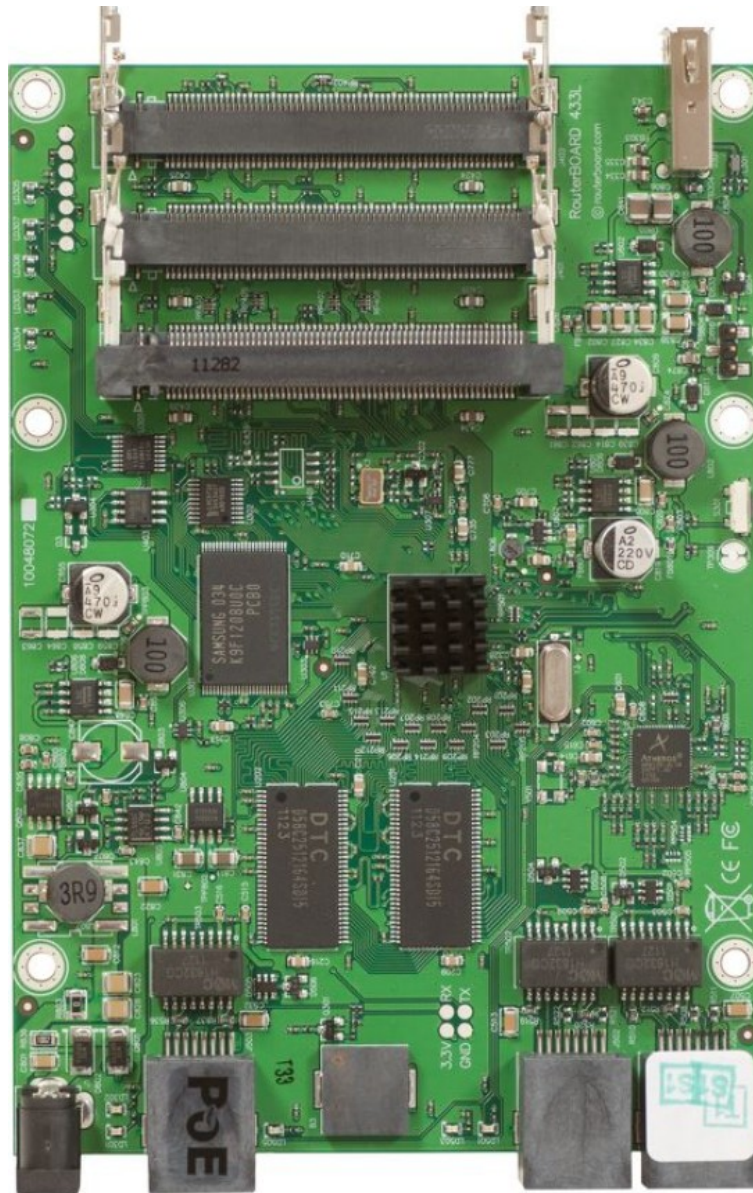
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J501-J503 connectors. Resistance value between Rx and Tx line must be 150 Ohm $\pm$ 4%. Measurement method is described on page 23.



Picture 163

RB433UL



Picture 164

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

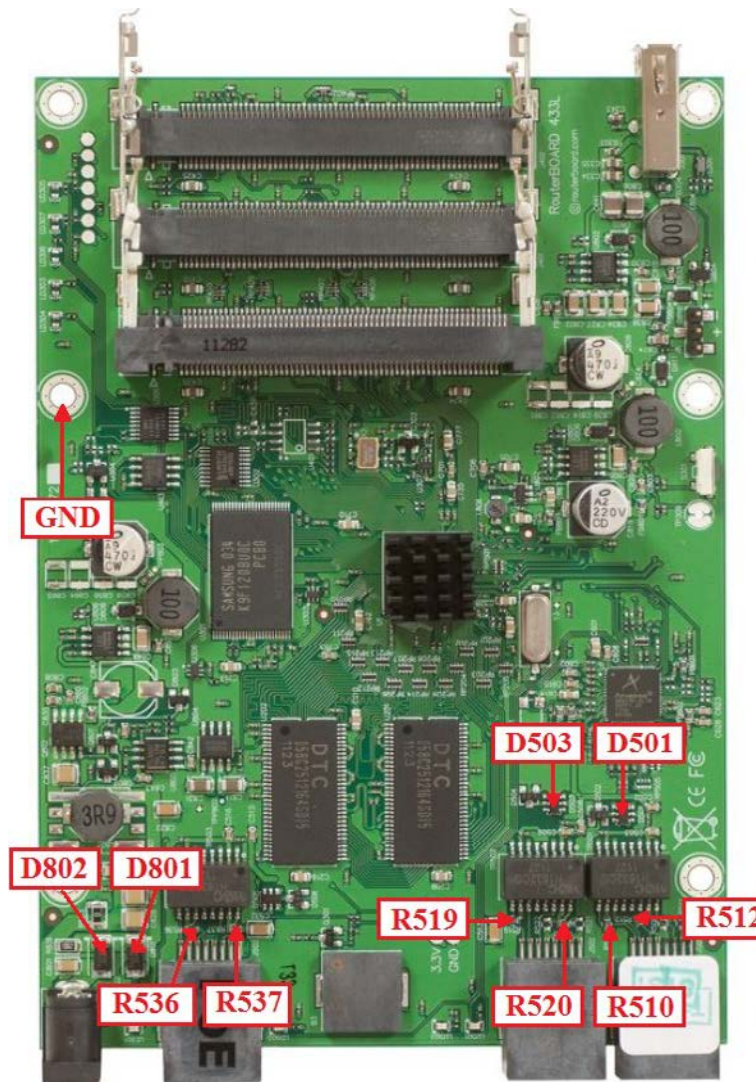
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture [165](#). Schottky diode quality measurement method is described on page [19](#).

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 165. Voltage drop value should be in the range from 0,32V to 0,36V. Voltage drop measurement method is described on page 21.

Checking 75 Ohm termination resistors resistance

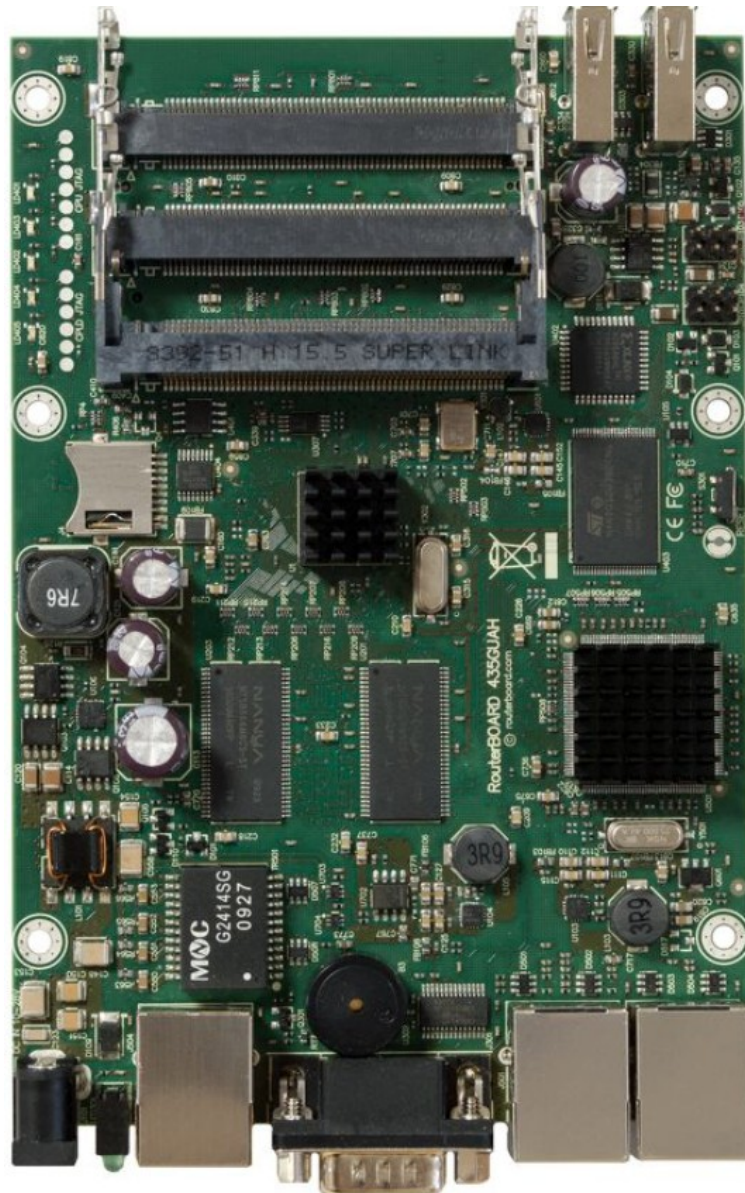
Check resistors R510, R512, R519, R520, R536, R537 resistance value. It should be 75 Ohm +/- 1%. Resistors location on the board you can see in the picture 165.



Picture 165

435 SERIES ROUTERBOARDS

RB435G



Picture 166

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

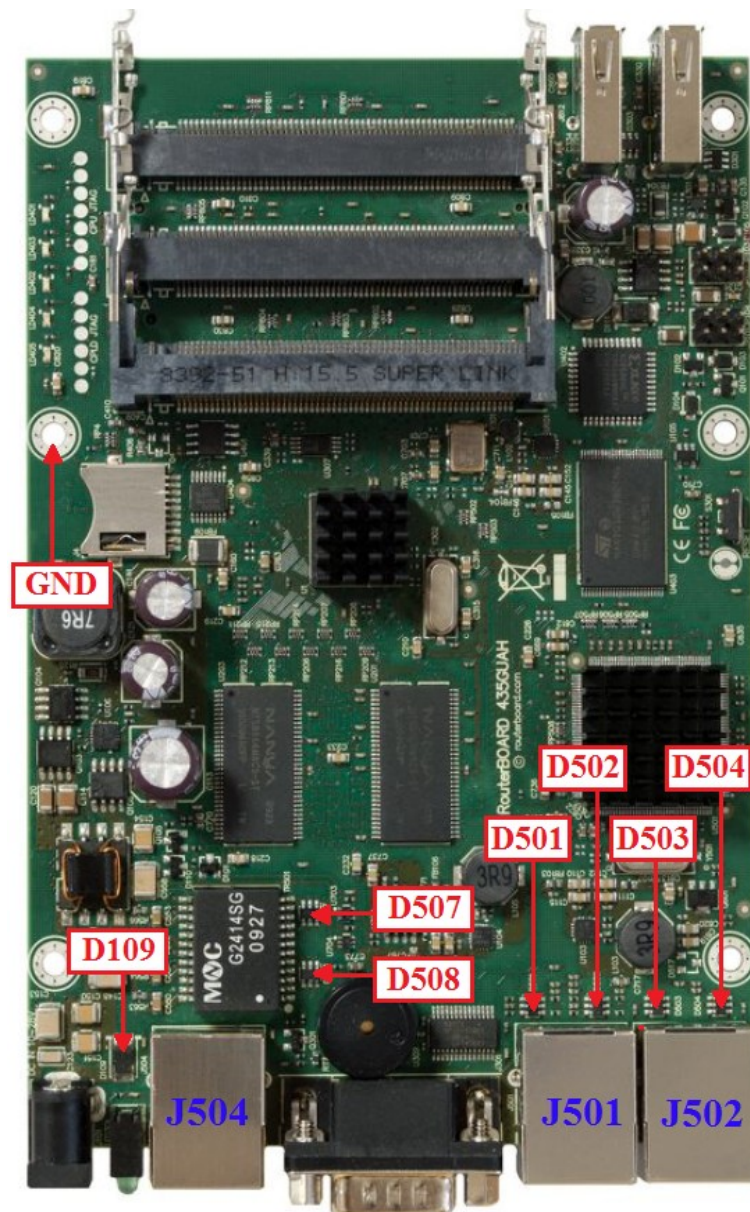
Check Schottky diode D109. Location of diode on the board you can see in the picture 167. Schottky diode quality measurement method is described on page 19.

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 167. Voltage drop value should be in the range from 0,2V to 0,24V. Voltage drop measurement method is described on page 21.

Checking termination resistors resistance in RJ-45 connector

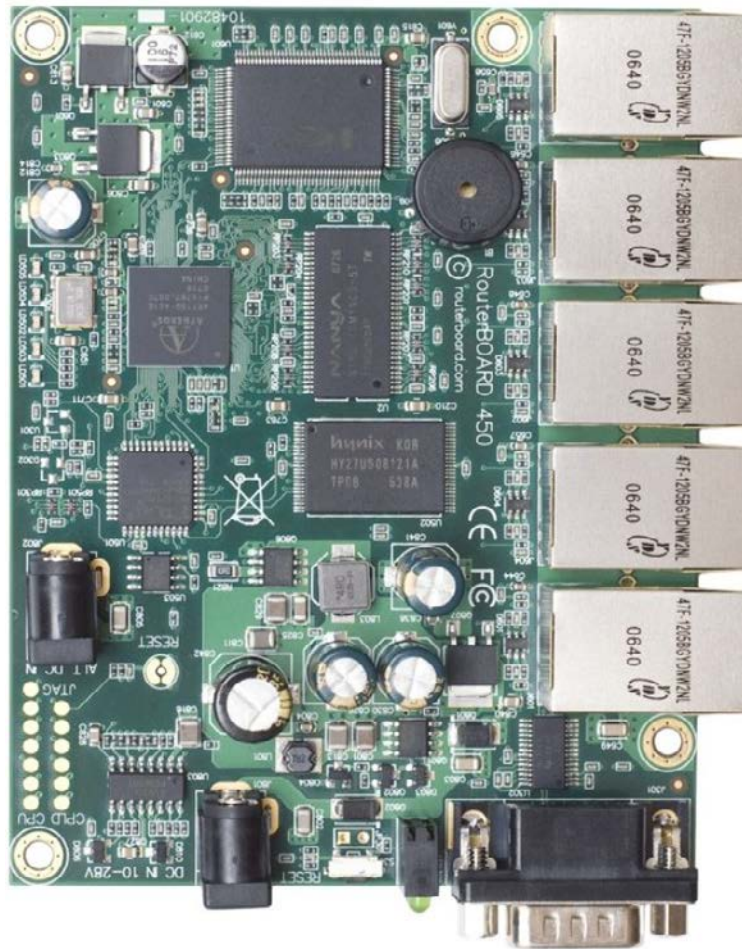
Check termination resistors resistance in J501, J502 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 23.



Picture 167

450 SERIES ROUTERBOARDS

RB450



Picture 168

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

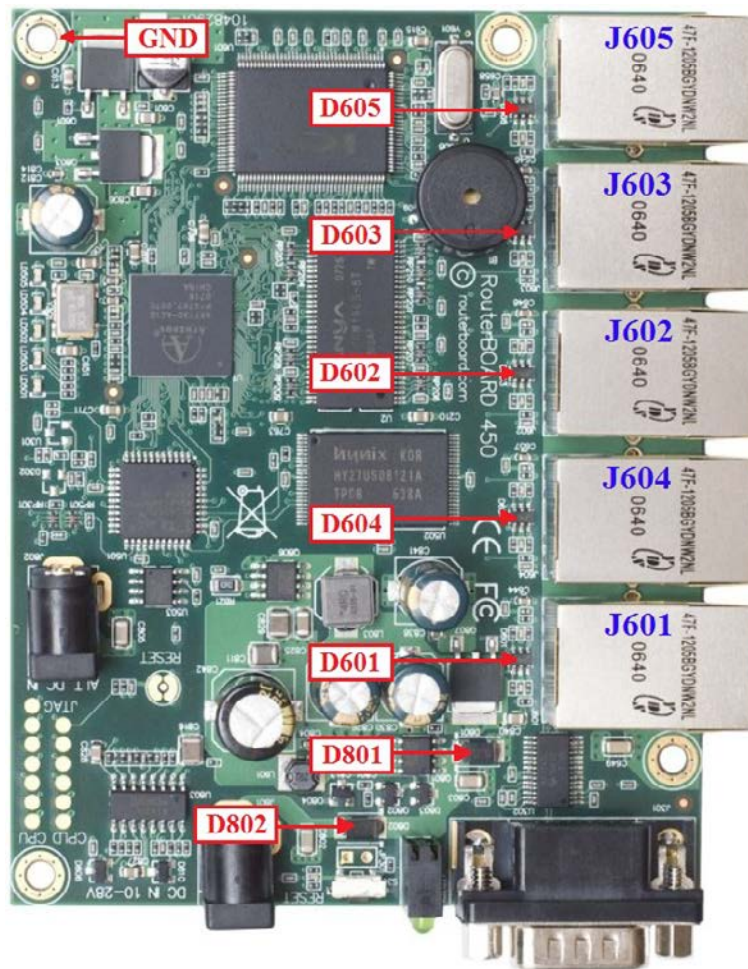
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture [169](#). Schottky diode quality measurement method is described on page [19](#).

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 [169](#). Voltage drop value should be in the range from 0,4V to 0,44V. Voltage drop measurement method is described on page [21](#).

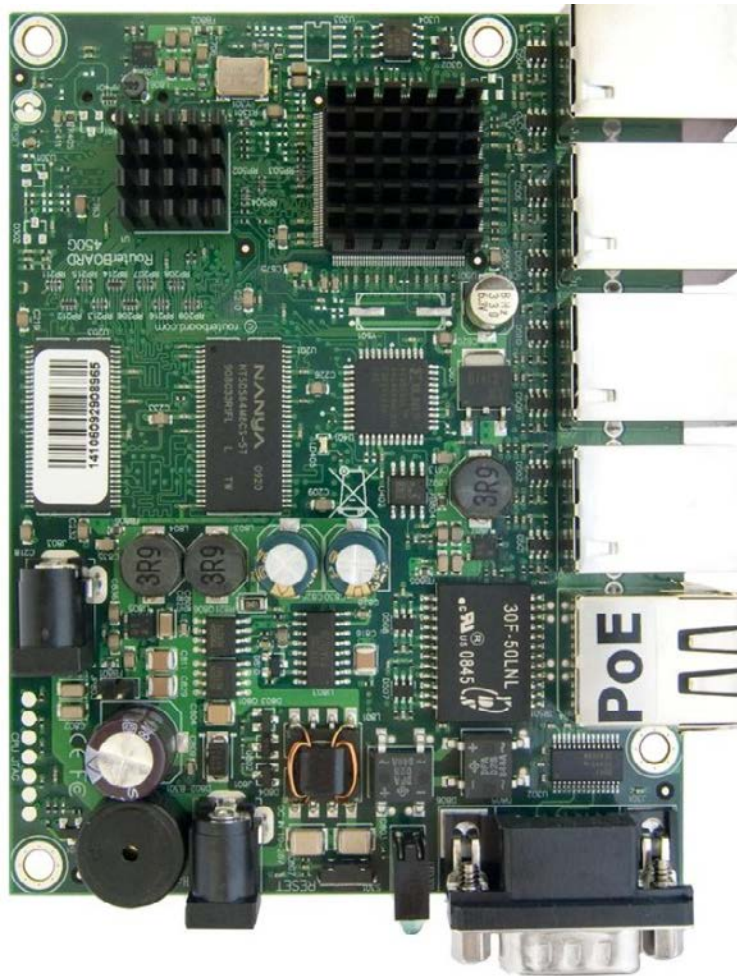
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J601-J605 connectors. Resistance value between Rx and Tx line must be 150 Ohm $\pm$ 4%. Measurement method is described on page 23.



Picture 169

RB450G



Picture 170

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

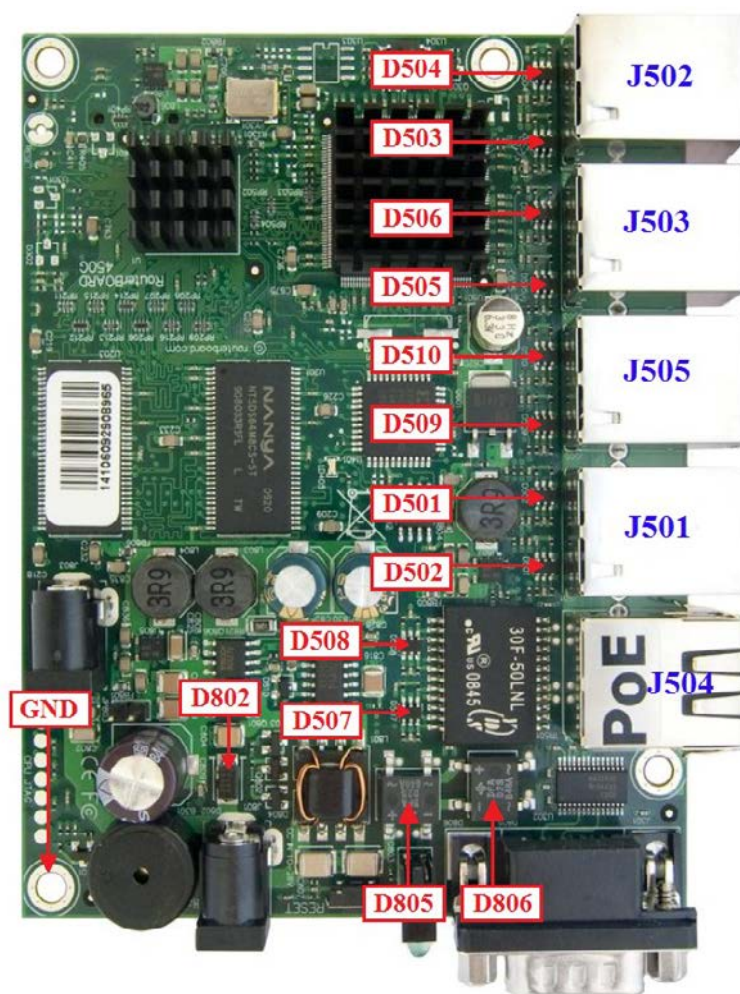
Check Schottky diode D802 and diodes bridges D805, D806. Location of diodes on the board you can see in the picture 171. Schottky diode quality measurement method is described on page 19.

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 171. Voltage drop value should be in the range from 0,2V to 0,26V. Voltage drop measurement method is described on page 21.

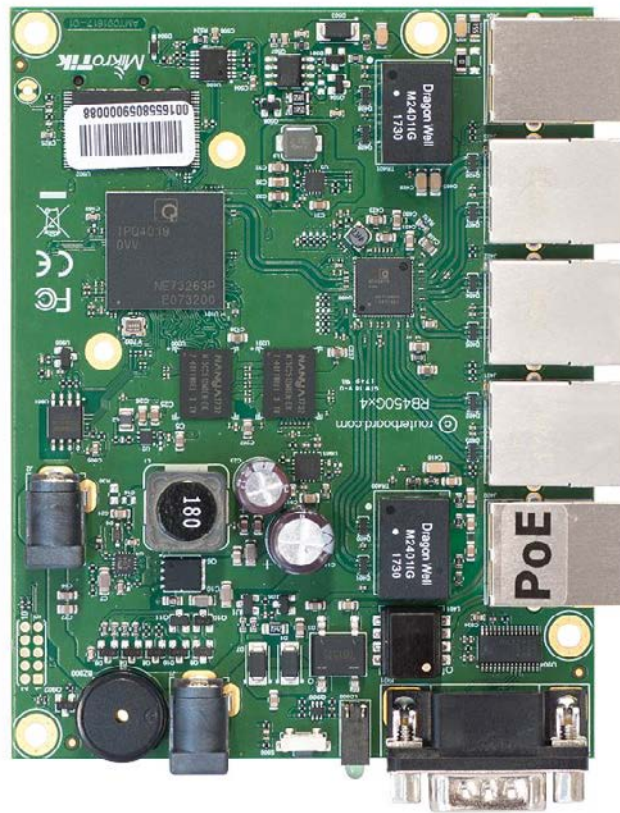
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J501-J503, J505 connectors. Resistance value between Rx and Tx line must be 150 Ohm $\pm$ 4%. Measurement method is described on page 23.



Picture 171

RB450Gx4



Picture 172

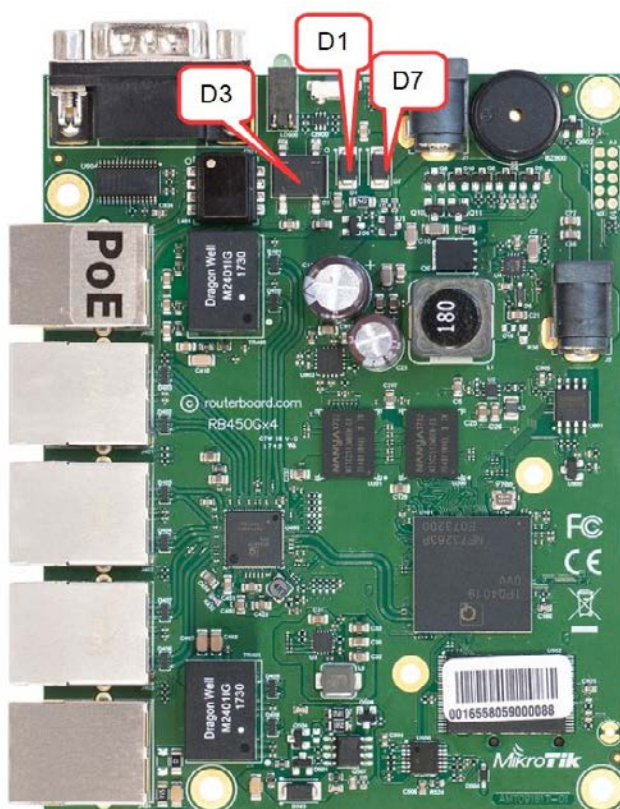
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

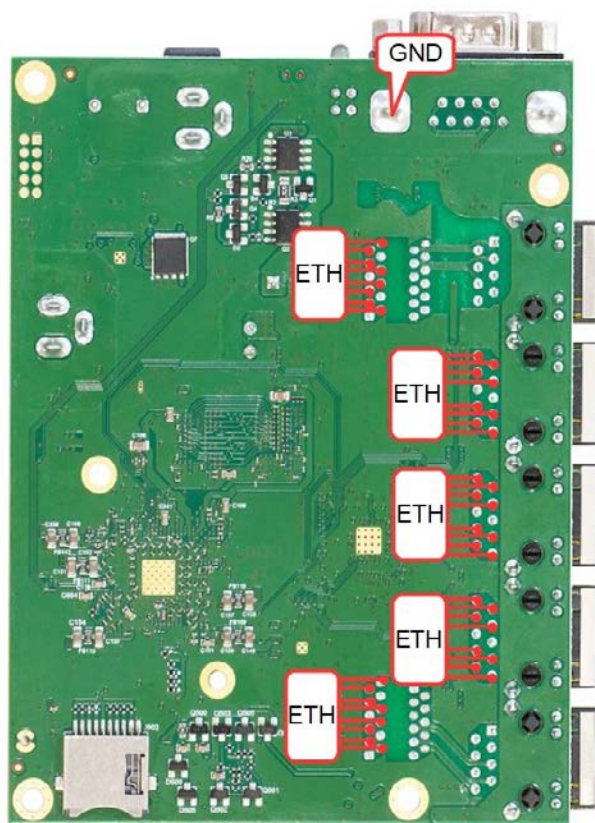
Check Schottky diode D1, D7 and diodes bridges D3. Location of diodes on the board you can see in the picture [173](#). Schottky diode quality measurement method is described on page [19](#).

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 [174](#). Voltage drop value should be in the range from 0,36V to 0,43V. Voltage drop measurement method is described on page [22](#).



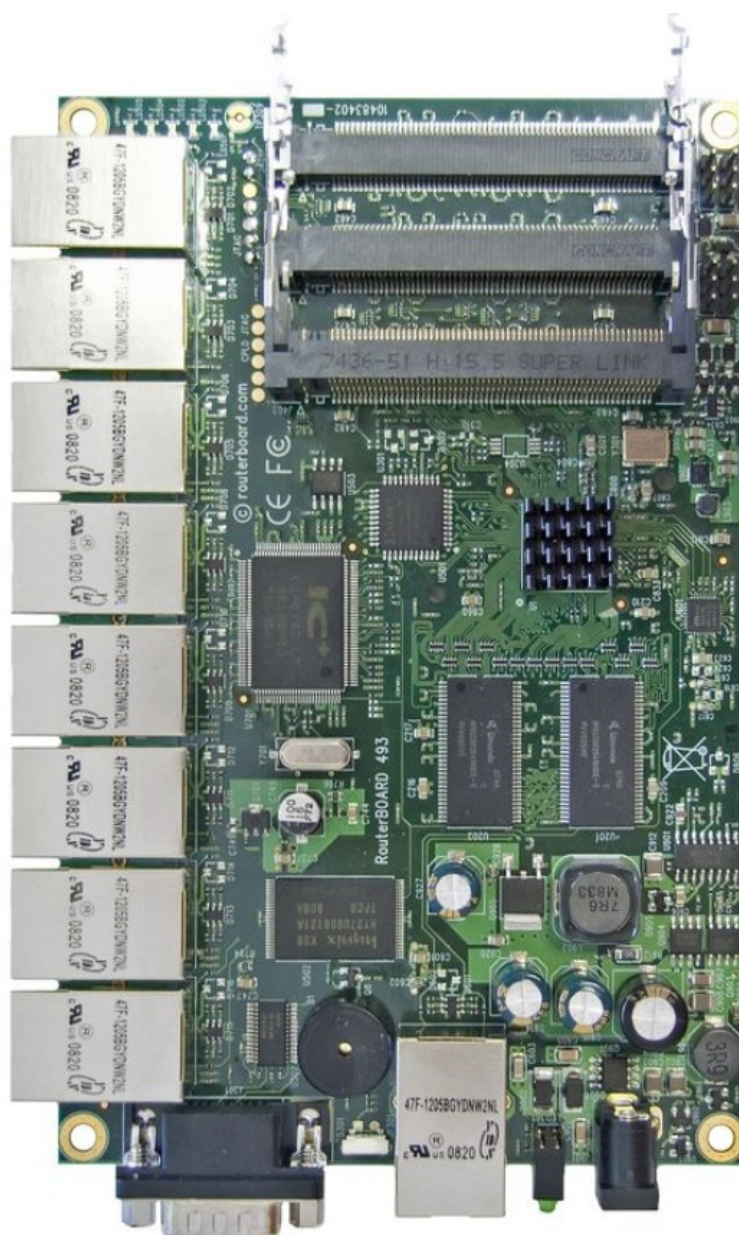
Picture 173



Picture 174

493 SERIES ROUTERBOARDS

RB493AH



Picture 175

Instructions for checking overvoltage

Checking Schottky diodes

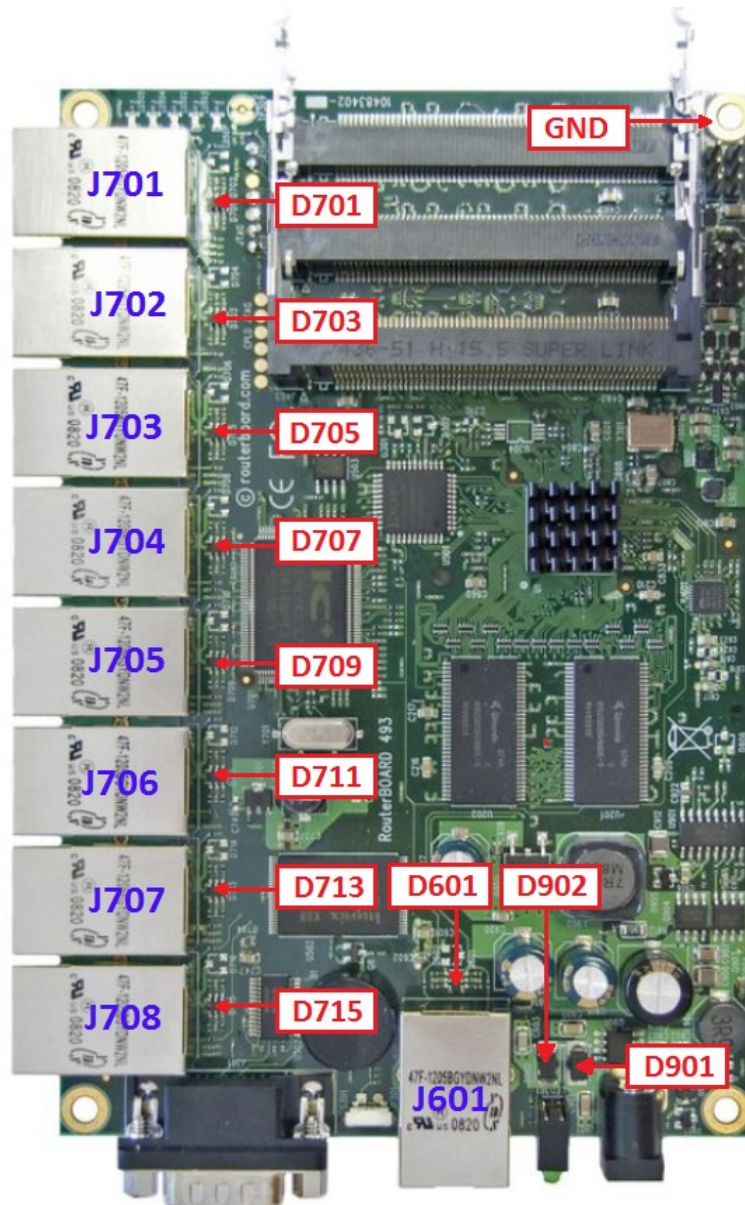
Check Schottky diodes D901, D902. Location of diodes on the board you can see in the picture [176](#). Schottky diode quality measurement method is described on page [19](#).

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 [21](#).

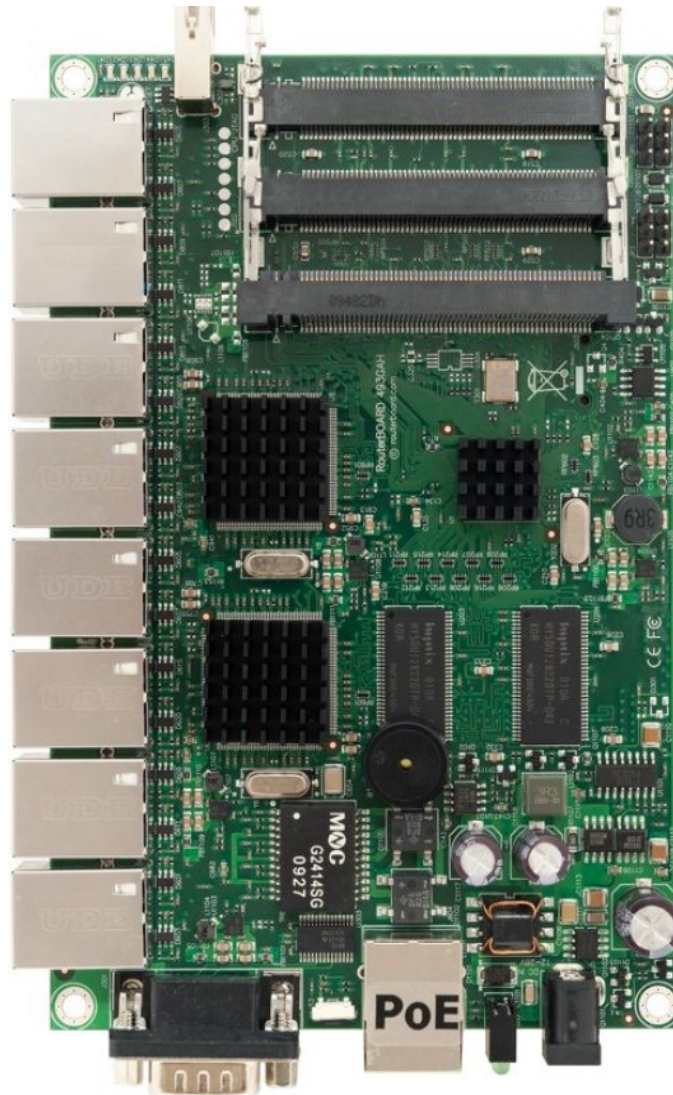
Checking termination resistors resistance in RJ-45 connector

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 [23](#).



Picture 176

RB493G



Picture 177

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 178. Schottky diode quality measurement method is described on page 19.

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

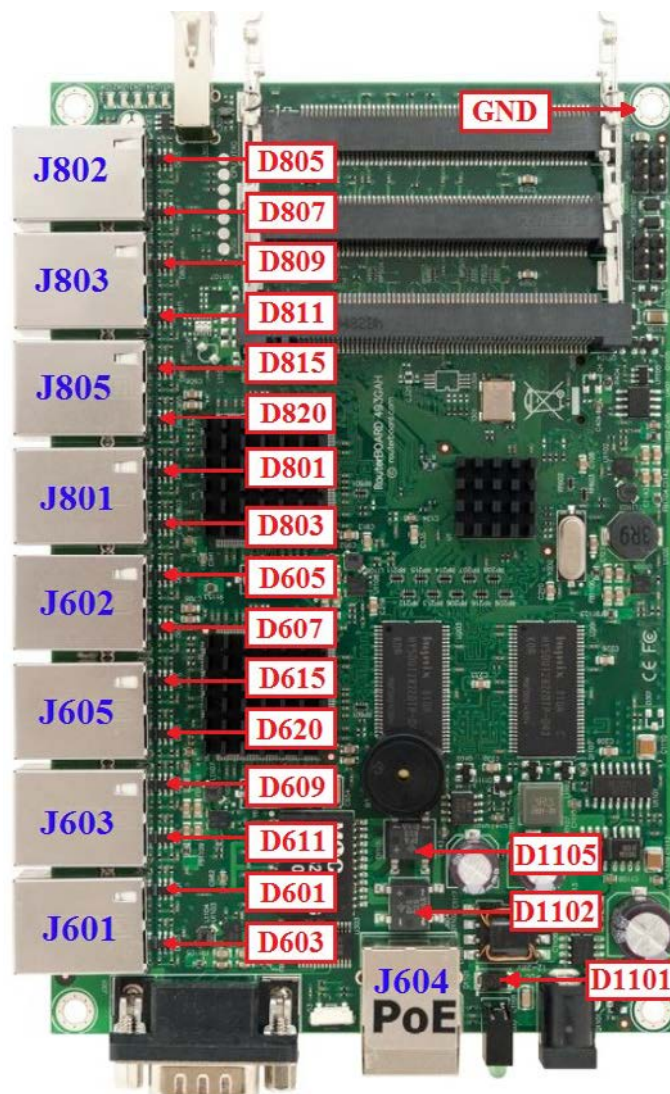
diode arrays on the board you can see in the picture 178. Voltage drop value should be in the range from 0,20V to 0,25V. Voltage drop measurement method is described on page 22.

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 178. Voltage drop value should be in the range from 0,2V to 0,25V. Voltage drop measurement method is described on page 22.

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 $\pm$ 4%. Measurement method is described on page 24.



Picture 178

751 SERIES ROUTERBOARDS

RB751U-2HnD



Picture 179

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [115](#).

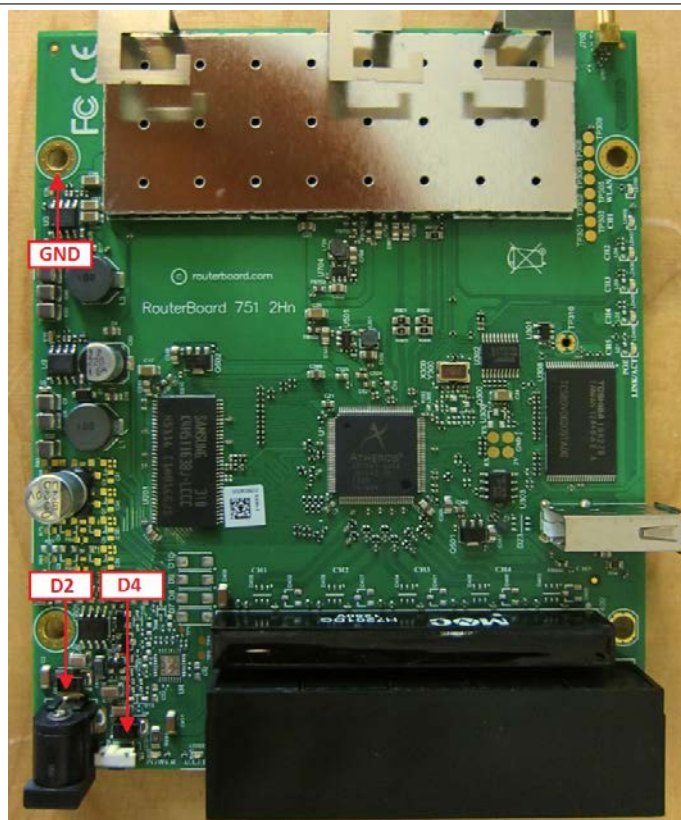
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D2, D4. Location of diodes on the board you can see in the picture [180](#). Schottky diode quality measurement method is described on page [19](#).

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 [181](#). Voltage drop value should be in the range from 0,28V to 0,32V. Voltage drop measurement method is described on page [22](#).



Picture 180



Picture 181

800 SERIES ROUTERBOARDS

RB800



Picture 182

Instructions for checking overvoltage

Checking diodes bridges

Check diodes bridges D17, D21. Location of diodes on the board you can see in the picture [183](#). Schottky diode quality measurement method is described on page [20](#).

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

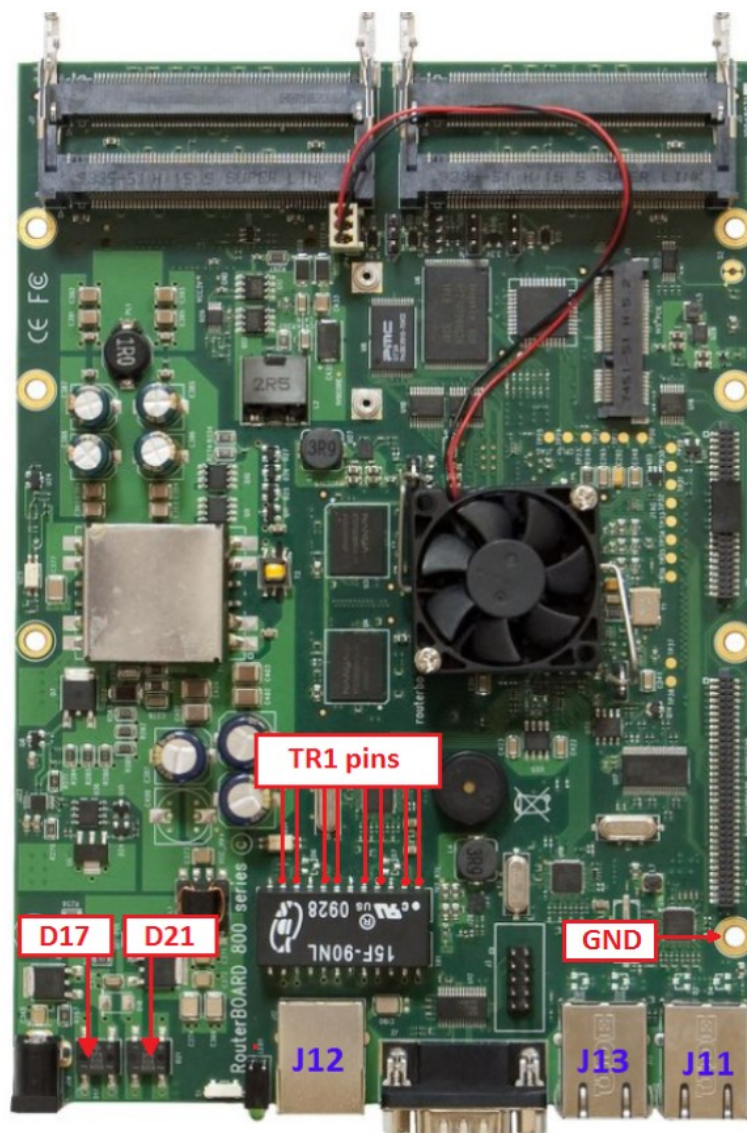
on the transformer pins are marked with red dots, see picture 184. Location of diode arrays on the board you can see in the picture 184. Voltage drop value should be in the range from 0,3V to 0,36V. Voltage drop measurement method is described on page 21.

Checking termination resistors resistance in RJ-45 connector

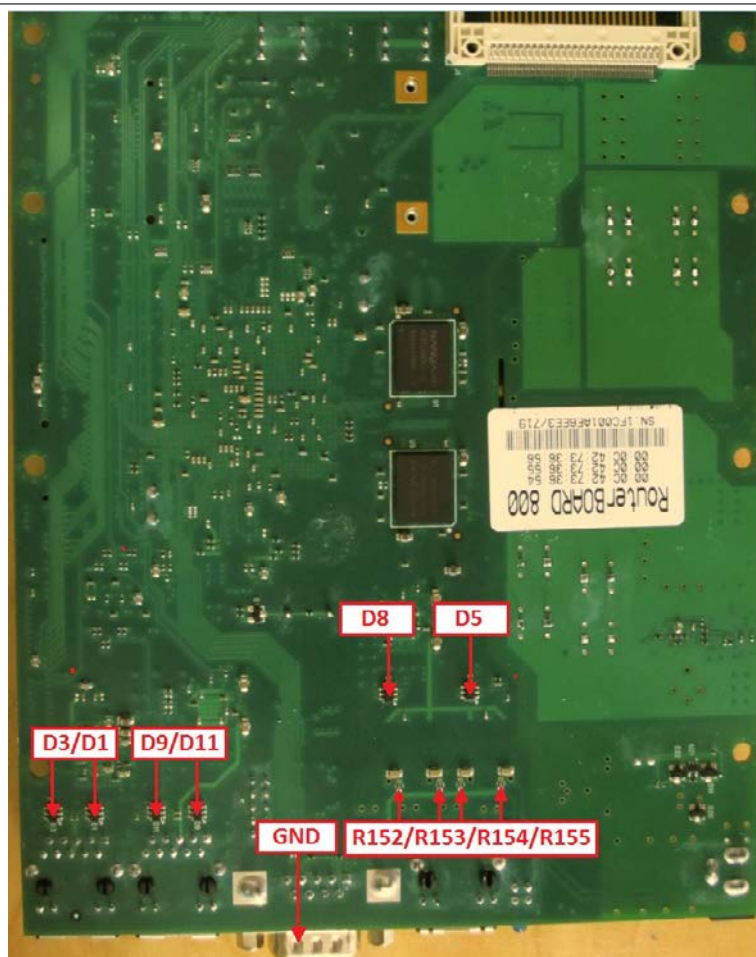
Check termination resistors resistance in J11, J13 connectors. Resistance value between Rx and Tx line must be 150 Ohm $\pm$ 4%. Measurement method is described on page 23.

Checking 75 Ohm termination resistors resistance

Check resistors R152-R155 resistance value. It should be 75 Ohm $\pm$ 1%. Location of resistors on the board you can see in the picture 184.



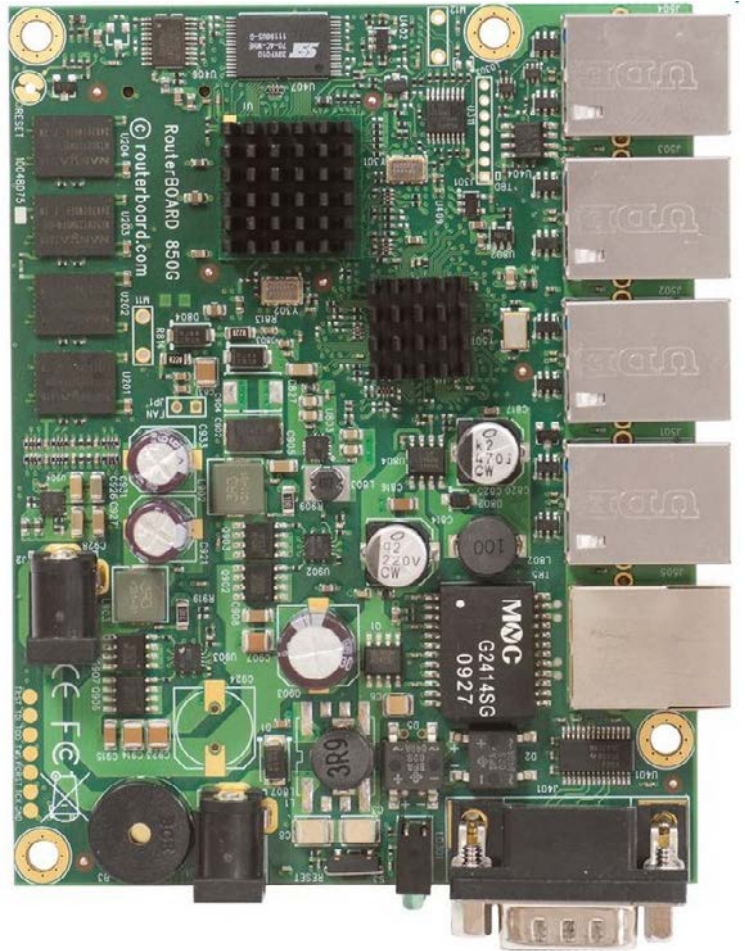
Picture 183



Picture 184

850 SERIES ROUTERBOARDS

RB850Gx2



Picture 185

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 [186](#). Schottky diode quality measurement method is described on page [19](#) and for diodes bridges [20](#).

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

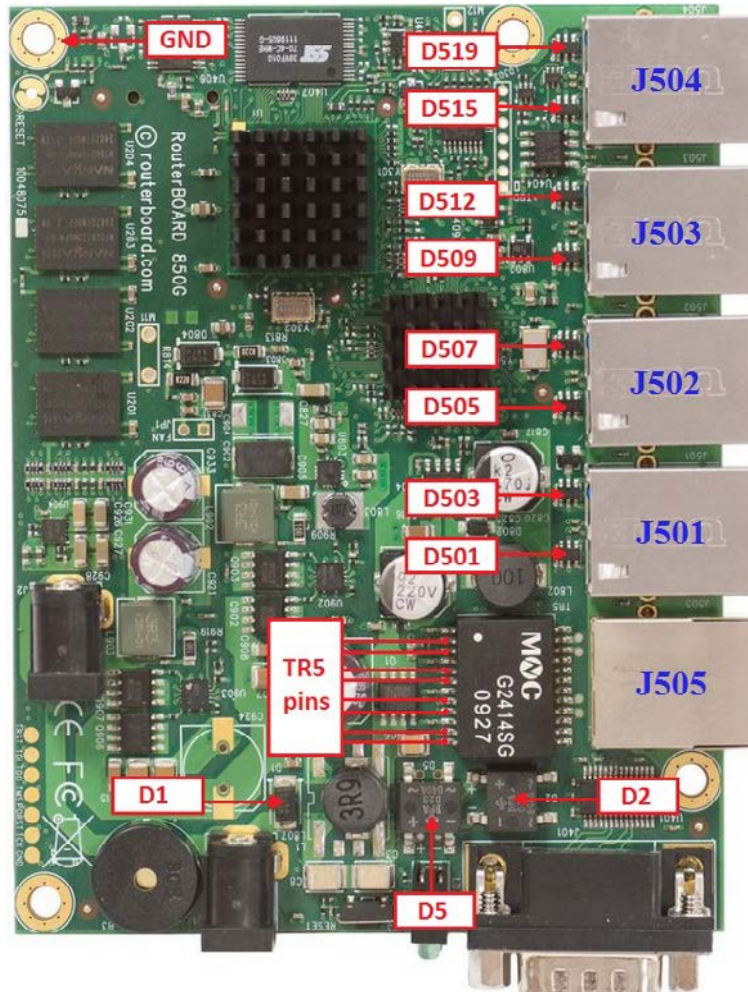
Check voltage drop value between diode arrays D501, D503, D505, D507, D509, D512, D515, D519 pin#1 and Ground. Location of diode arrays on the board you can see in the picture [186](#). Voltage drop value should be in the range from 0,38 to 0,44V. Voltage drop measurement method is described on page [21](#).

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 186. Voltage drop value should be in the range from 0,42V to 0,48V. Voltage drop measurement method is described on page 22.

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 23.



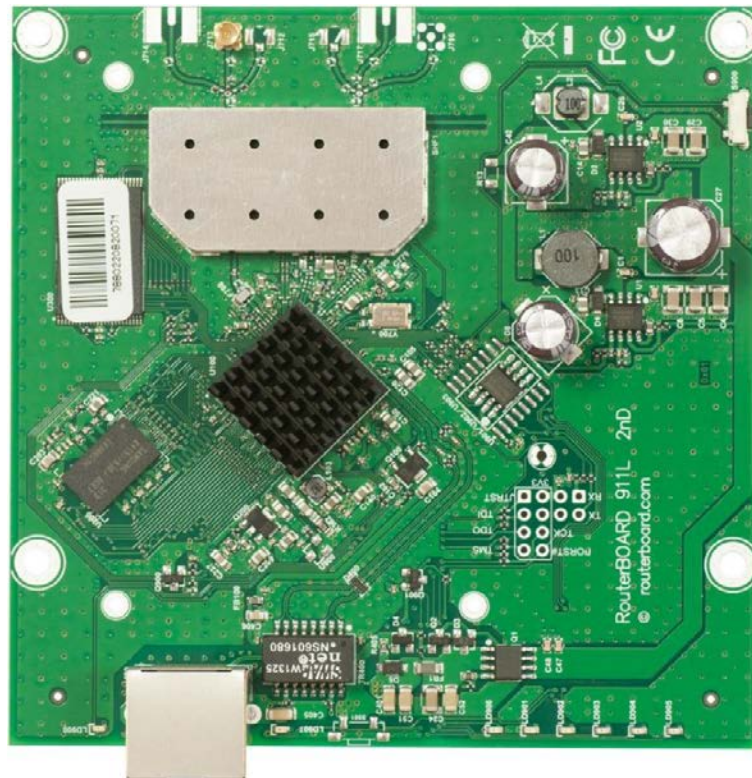
Picture 186

911 SERIES ROUTERBOARDS

911 Lite 2 (RB911-2Hn)

911 Lite 5 (RB911-5Hn)

911 Lite 5 dual (RB911-5HnD)



Picture 187

Instructions for checking overvoltage

Checking Schottky diode

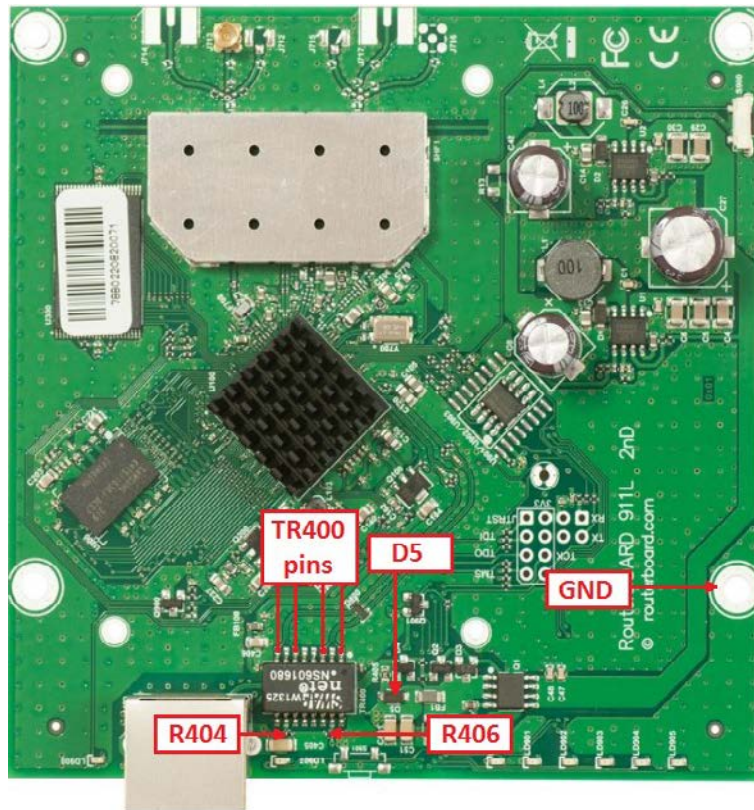
Check Schottky diode D5. Location of diode on the board you can see in the picture [188](#). Schottky diode quality measurement method is described on page [19](#).

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 [188](#). Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page [22](#).

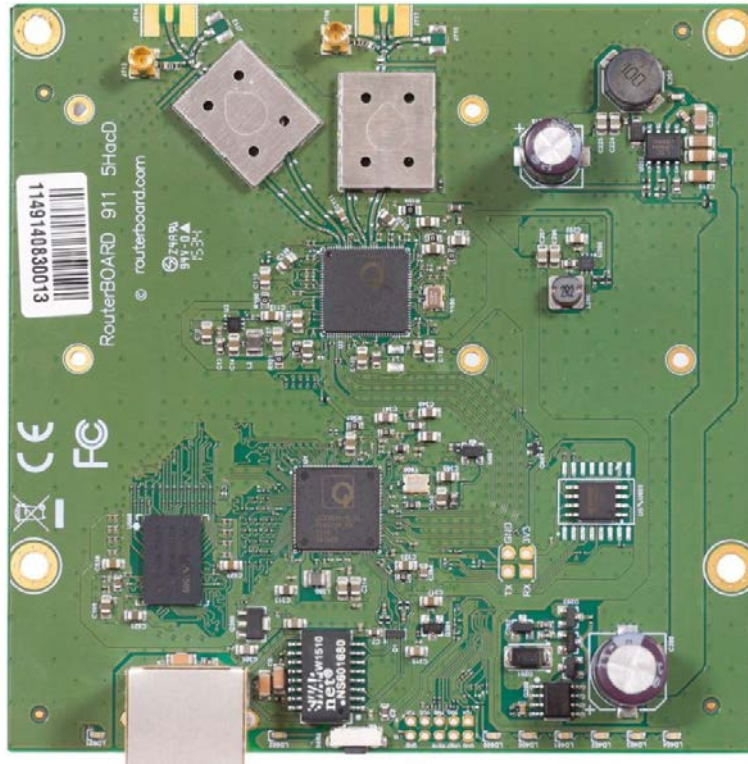
Checking 75 Ohm termination resistors resistance

Check resistors R404, R406 resistance value. It should be 75 Ohm $\pm$ 1%. Location of resistors on the board you can see in the picture 188.



Picture 188

911 Lite 5 ac (RB911-5HacD)



Picture 189

Instructions for checking overvoltage

Checking Schottky diode

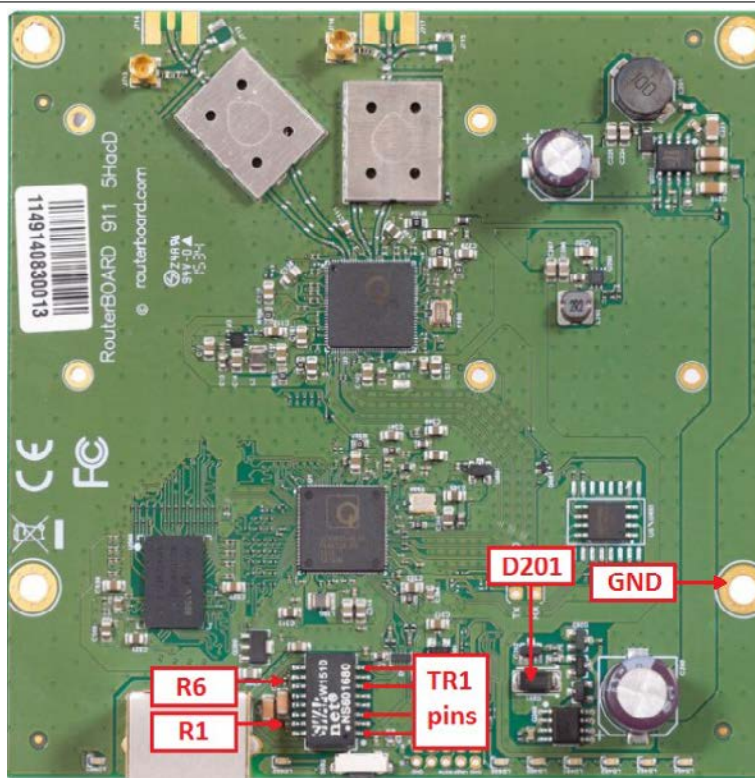
Check Schottky diode D201. Location of diode on the board you can see in the picture 190. Schottky diode quality measurement method is described on page 19.

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 190. Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

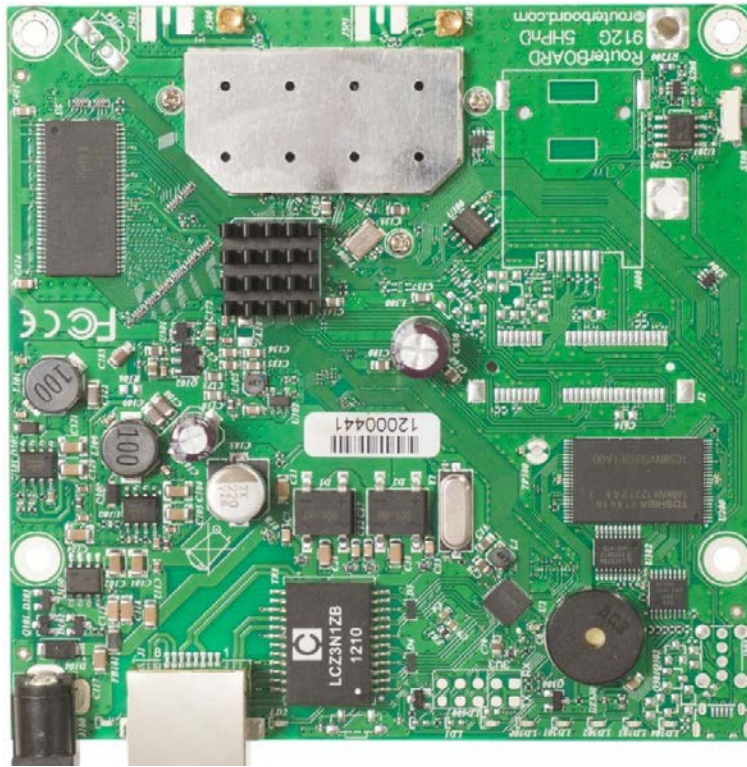
Check resistors R1, R6 resistance value. It should be 75 Ohm $\pm$ 1%. Location of resistors on the board you can see in the picture 190.



Picture 190

RB911G-2HPnD

RB911G-5HPnD



Picture 191

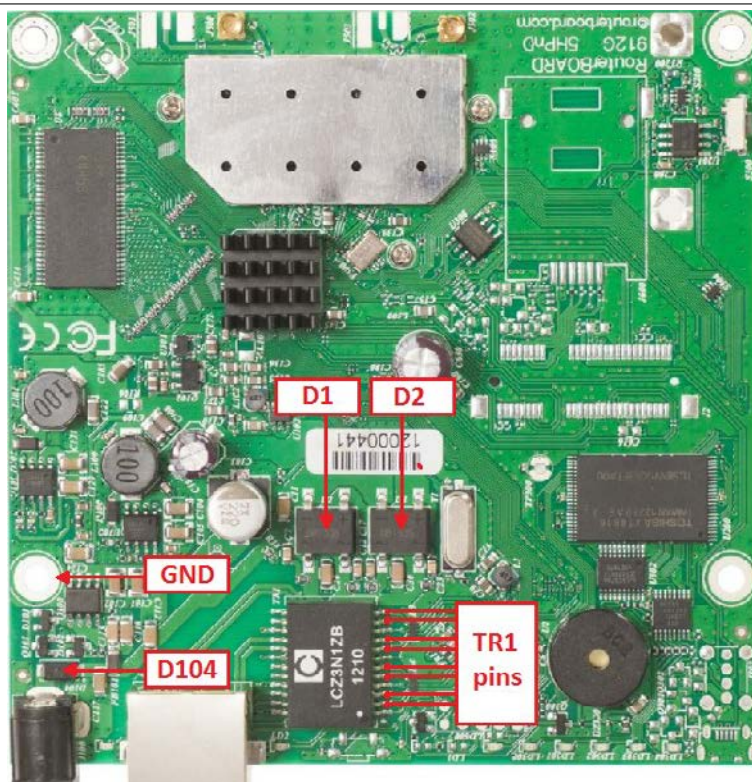
Instructions for checking overvoltage

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 192. Schottky diode quality measurement method is described on page 19. Diodes quality measurement method is described on page 20.

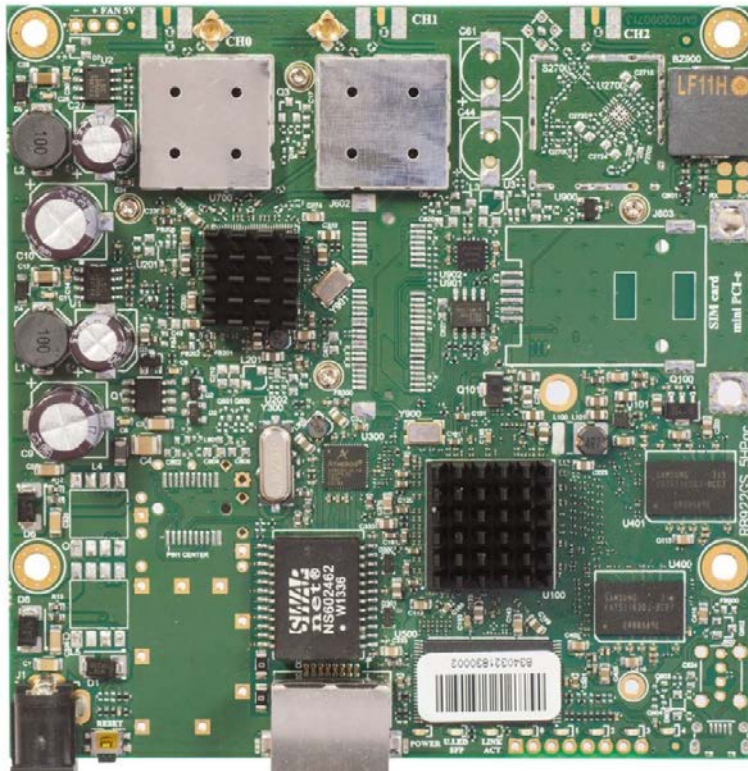
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 192. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 22.



Picture 192

RB911G-5HPacD



Picture 193

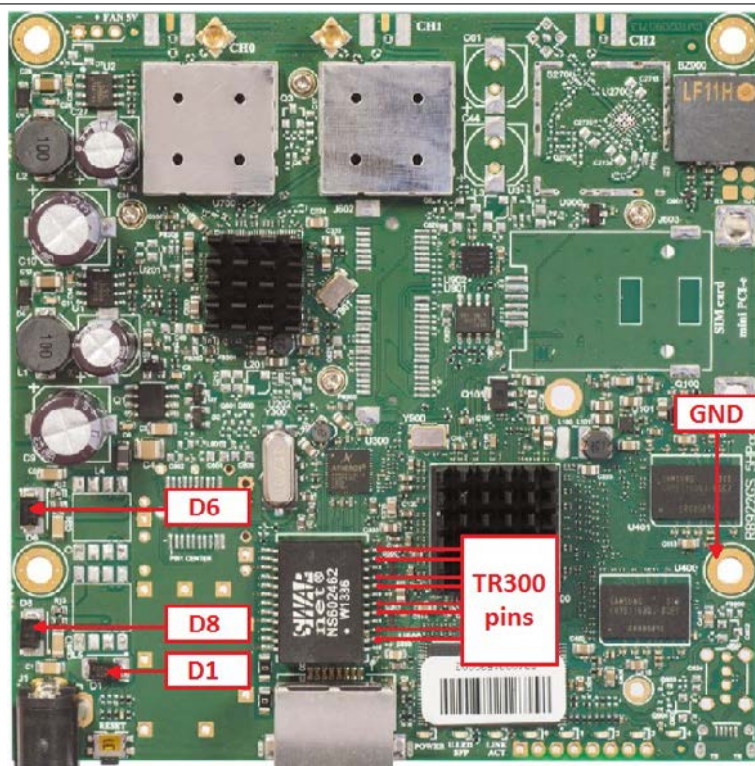
Instructions for checking overvoltage

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 194. Schottky diode quality measurement method is described on page 19.

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 194. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 22.

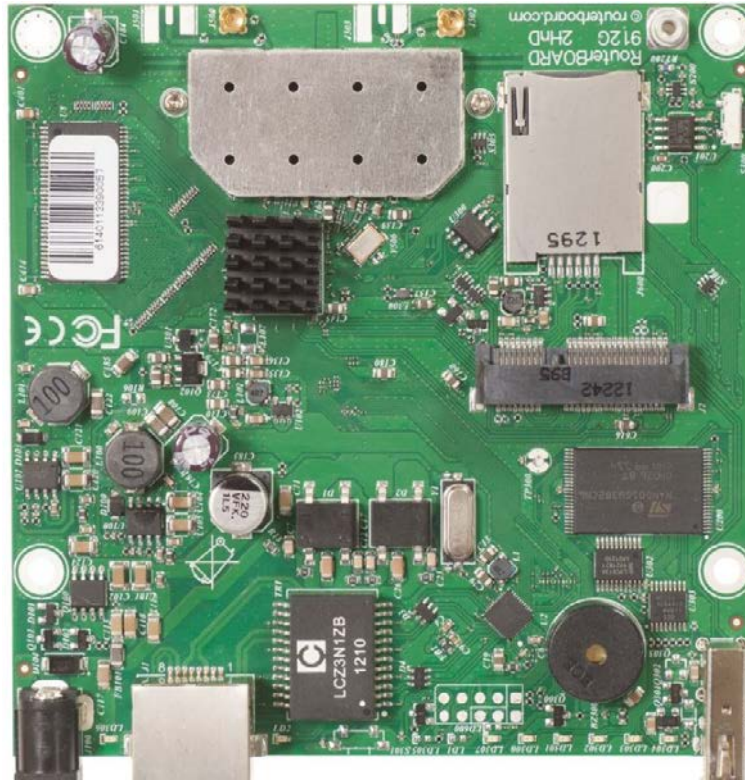


Picture 194

912 SERIES ROUTERBOARDS

RB912UAG-2HPnD

RB912UAG-5HPnD



Picture 195

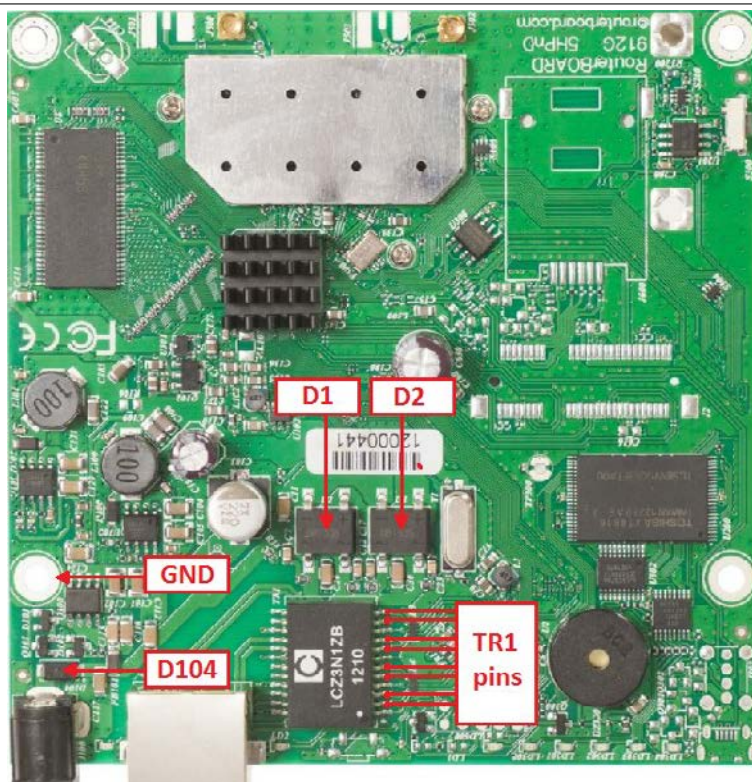
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diode D104 and diodes bridges D1, D2. Location of diodes on the board you can see in the picture 196. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

Checking voltage drop value between Ethernet transformer pins and Ground

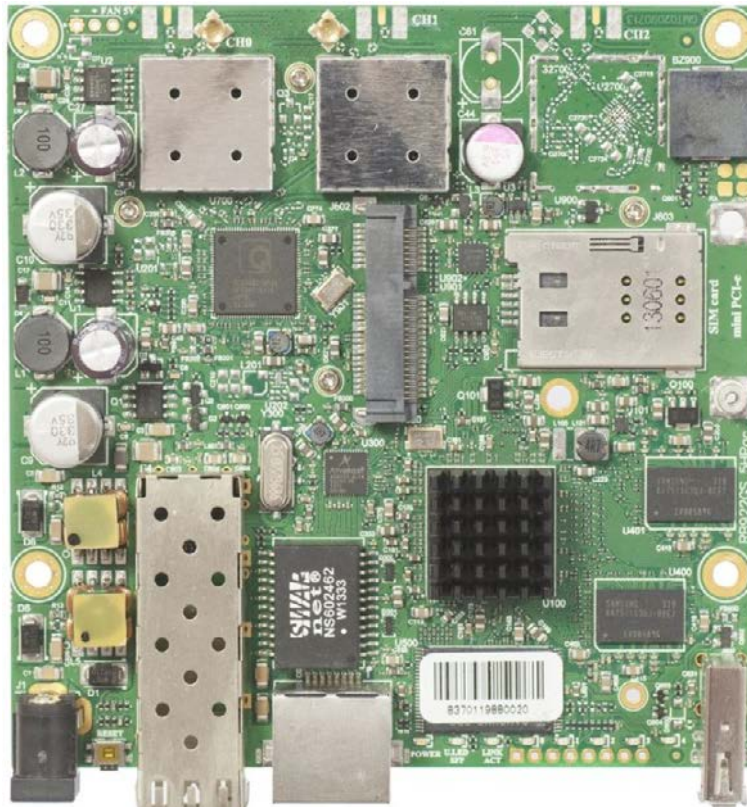
Check voltage drop value between TR1 and Ground. Test points on the transformer pins are marked with red dots, see picture 196. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 22.



Picture 196

922 SERIES ROUTERBOARDS

RB922UAGS-5HPacD



Picture 197

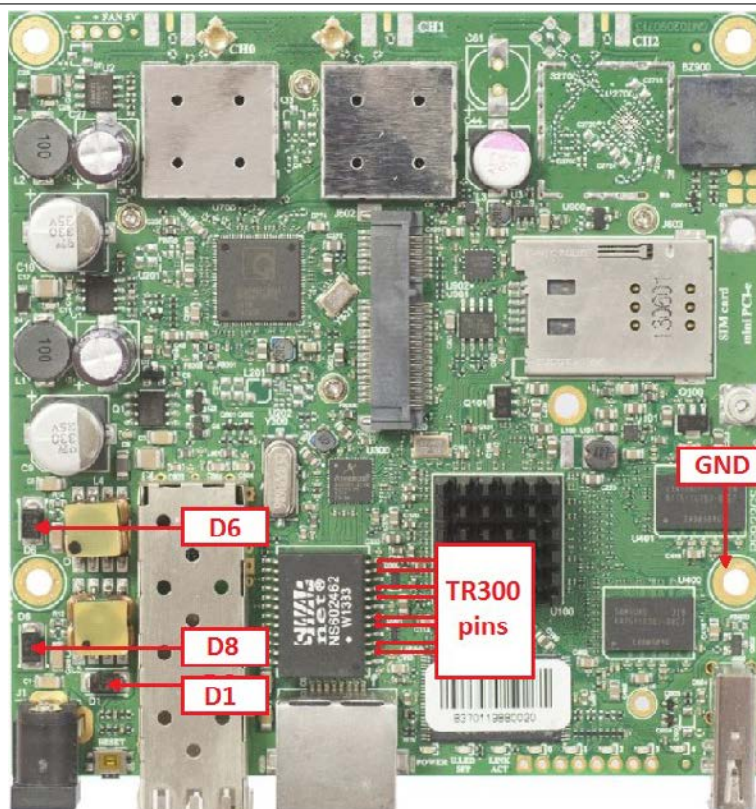
Instructions for checking overvoltage

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 198. Schottky diode quality measurement method is described on page 19.

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 198. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 22.



Picture 198

950 SERIES ROUTERBOARDS

RB951-2Hn



Picture 199

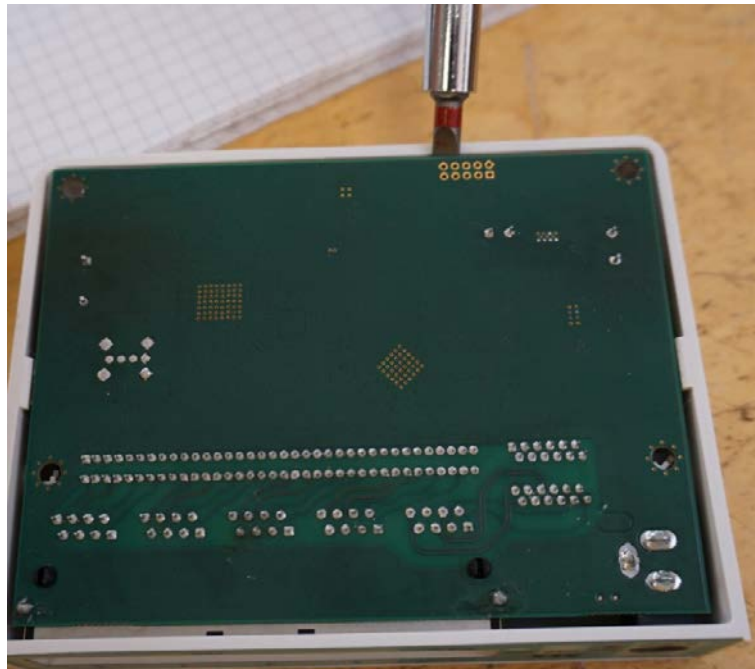
Disassembling information

Step 1: Take off the cover as shown in the picture [200](#).



Picture 200

Step 2: Take out the board as shown in the picture [201](#).



Picture 201

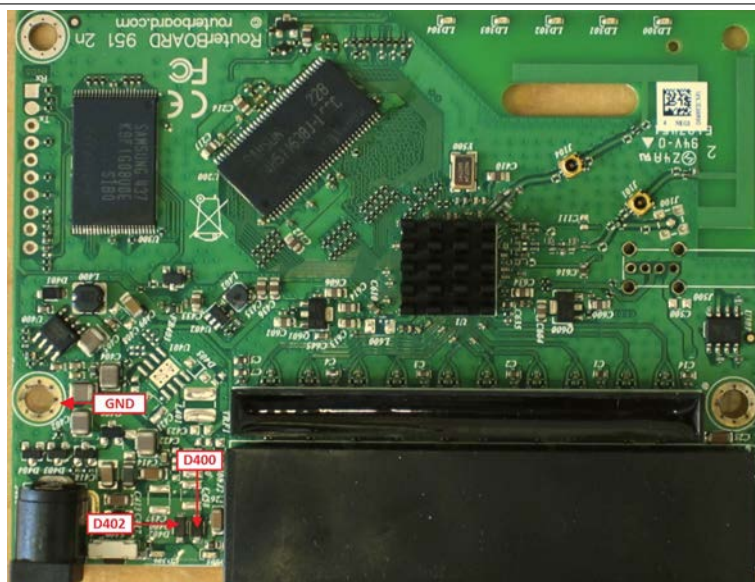
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D400, D402. Location of diodes on the board you can see in the picture [202](#). Schottky diode quality measurement method is described on page [19](#).

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 [203](#). Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page [22](#).



Picture 202



Picture 203

RB951G-2HnD



Picture 204

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [115](#).

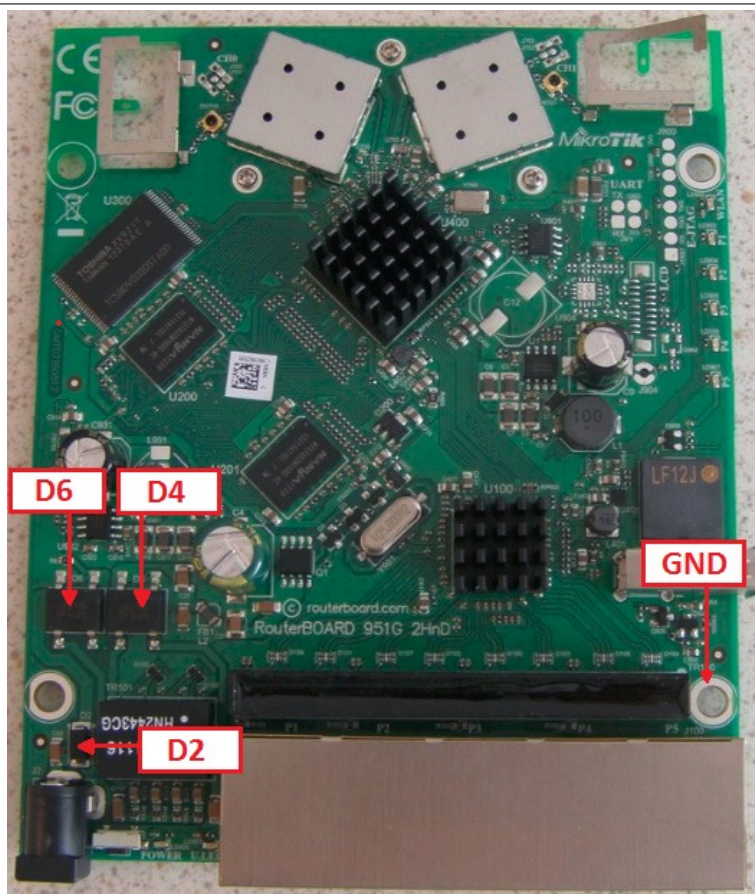
Instructions for checking overvoltage

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 [205](#). Schottky diode quality measurement method is described on page [19](#). Diode bridge quality measurement method is described on page [20](#).

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 [206](#). 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 [22](#).



Picture 205



Picture 206

RB951Ui-2HnD



Picture 207

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [115](#).

Instructions for checking overvoltage

Checking Schottky diodes

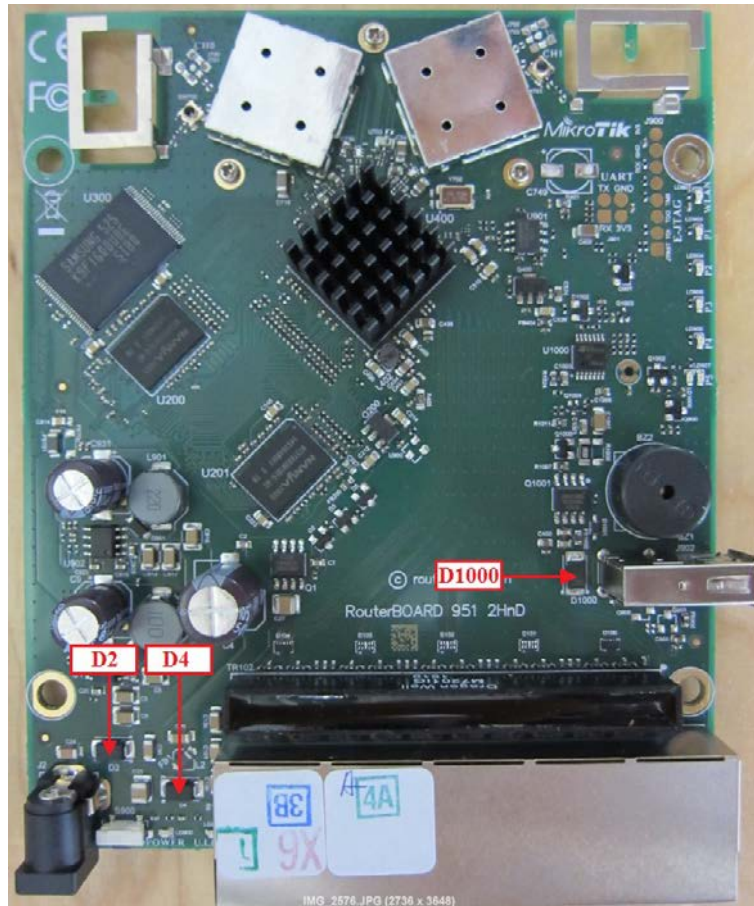
Check Schottky diodes D2, D4, D1000. Location of diodes on the board you can see in the picture [208](#). Schottky diode quality measurement method is described on page [19](#).

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 [209](#). Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page [22](#).

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 $150\ \Omega \pm 4\%$. Measurement method is described on page 23.



Picture 208



Picture 209

RB953GS-5HnT



Picture 210

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 211. Schottky diode quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

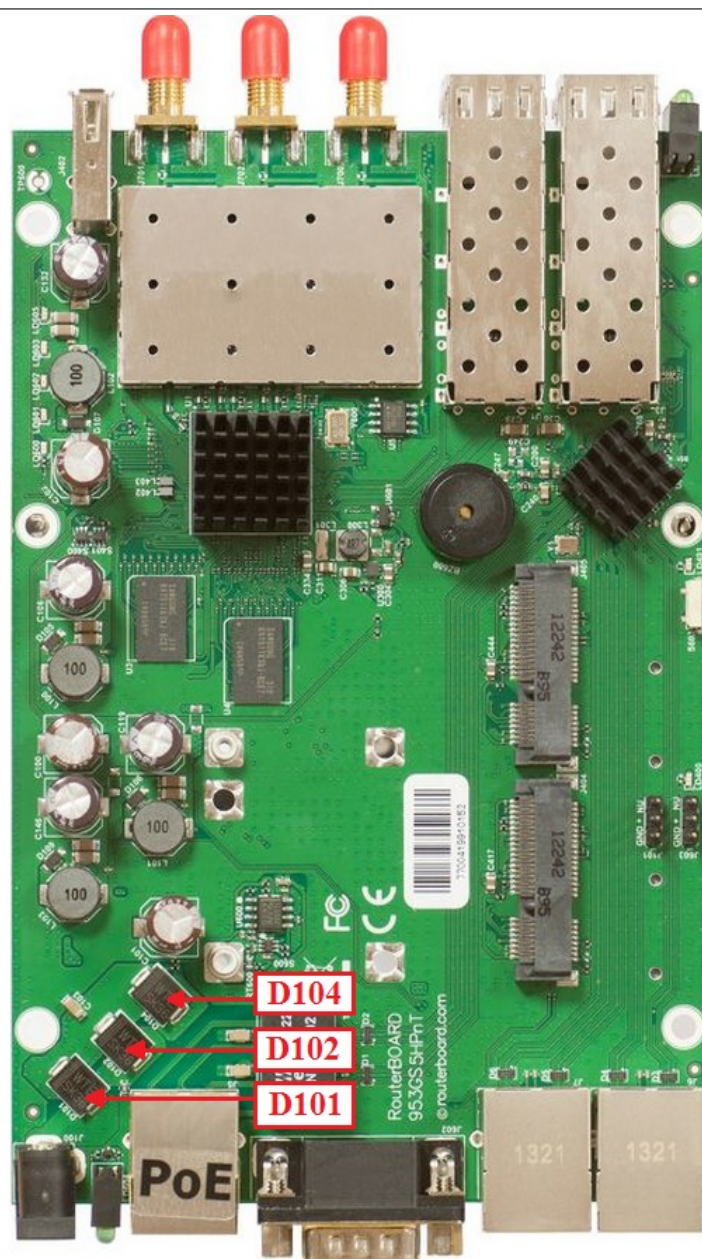
Check voltage drop value between Ethernet transformer TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [212](#). Voltage drop value should be in the range from 0,42V to 0,48V. Voltage drop measurement method is described on page [22](#).

Checking termination resistors resistance in RJ-45 connector

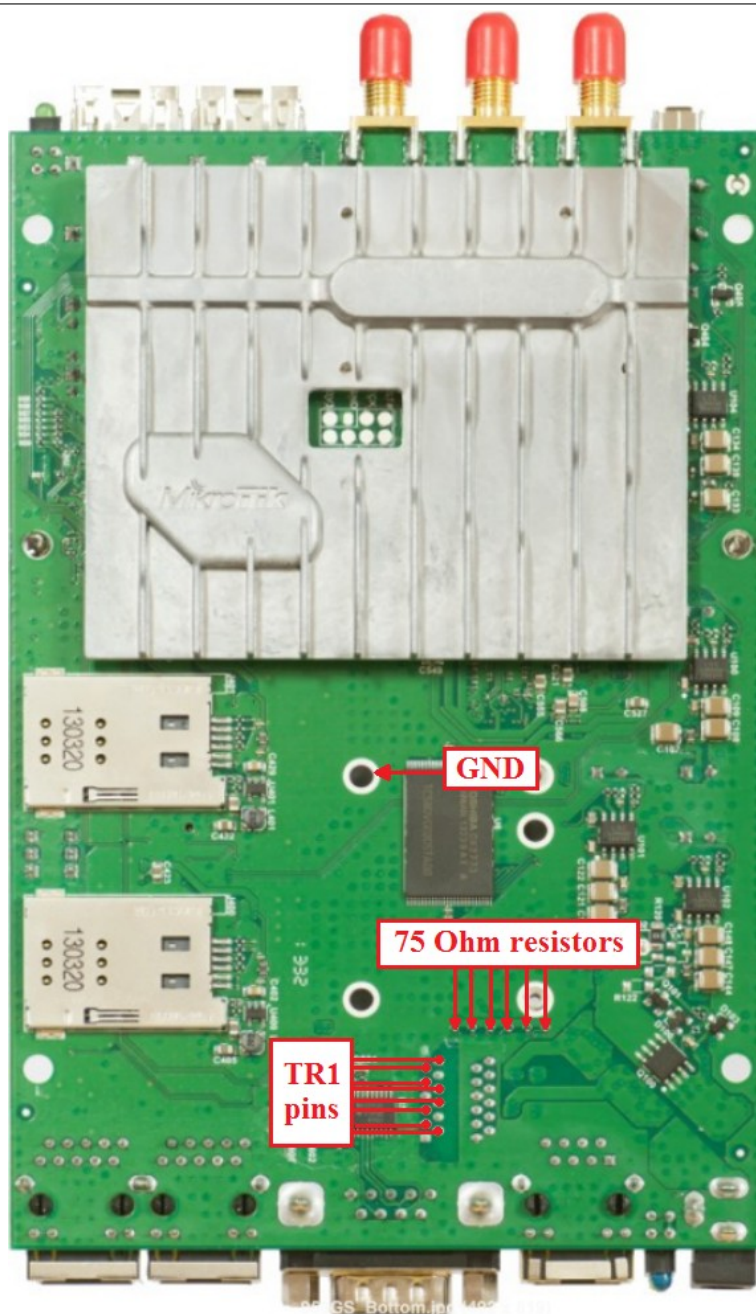
Check termination resistors resistance in J6, J7 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page [23](#).

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 [212](#).



Picture 211



Picture 212

CLOUD CORE ROUTER 1009 SERIES ROUTERBOARDS

CCR1009-7G-1C-PC

CCR1009-7G-1C-1S+

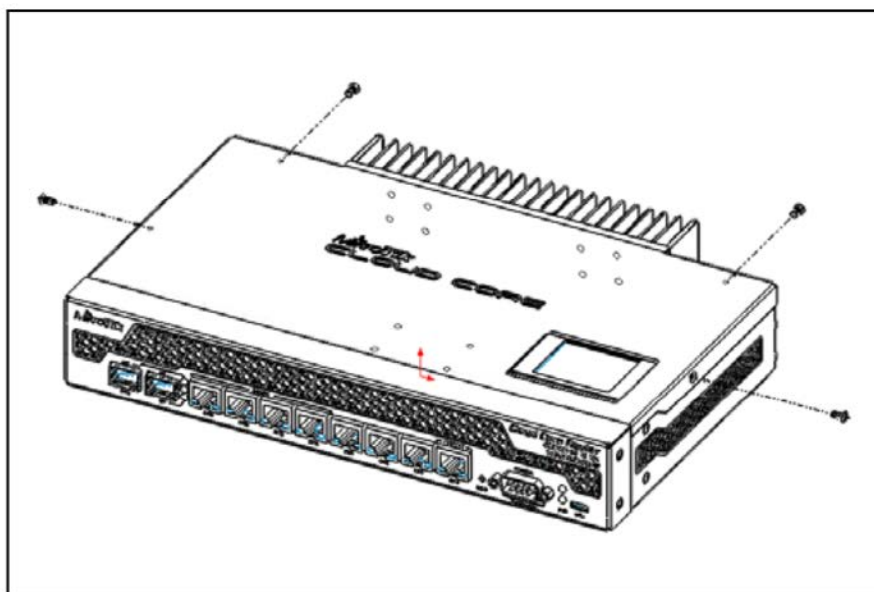
CCR1009-7G-1C-1S+PC



Picture 213

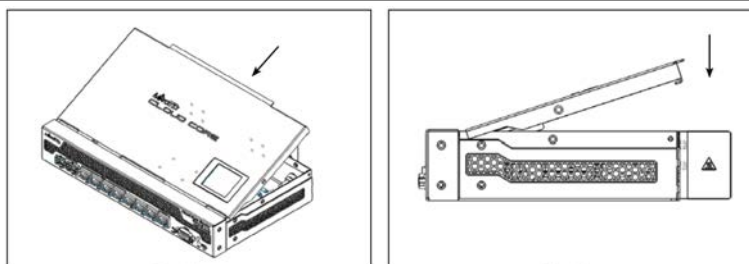
Disassembling information

Step 1: Unscrew 4 screws using PH2 screwdriver. Location of screws you can see in the picture [214](#).



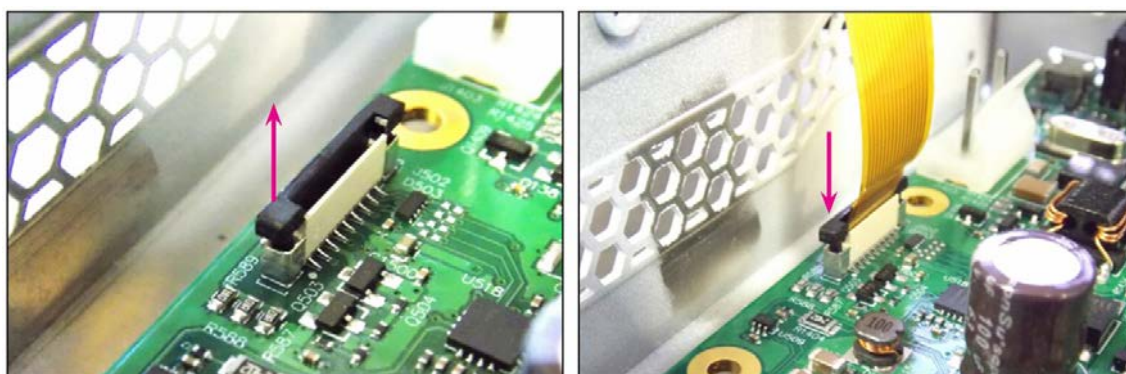
Picture 214

Step 2: Carefully take off the cover as showed in the picture [215](#). Do not damage the LCD flex cable.



Picture 215

Step 3: Gently lift the latch vertically upward and take out LCD flex cable from FPC connector as showed in the picture 216. Do not damage the FPC connector locking drawer.



Picture 216

Step 4: Detach a male DSUB-9 connector from board case unscrewed 2 screws. Location of the screws you can see in the picture 217.



Picture 217

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 218. Schottky diode quality measurement method is described on page 19.

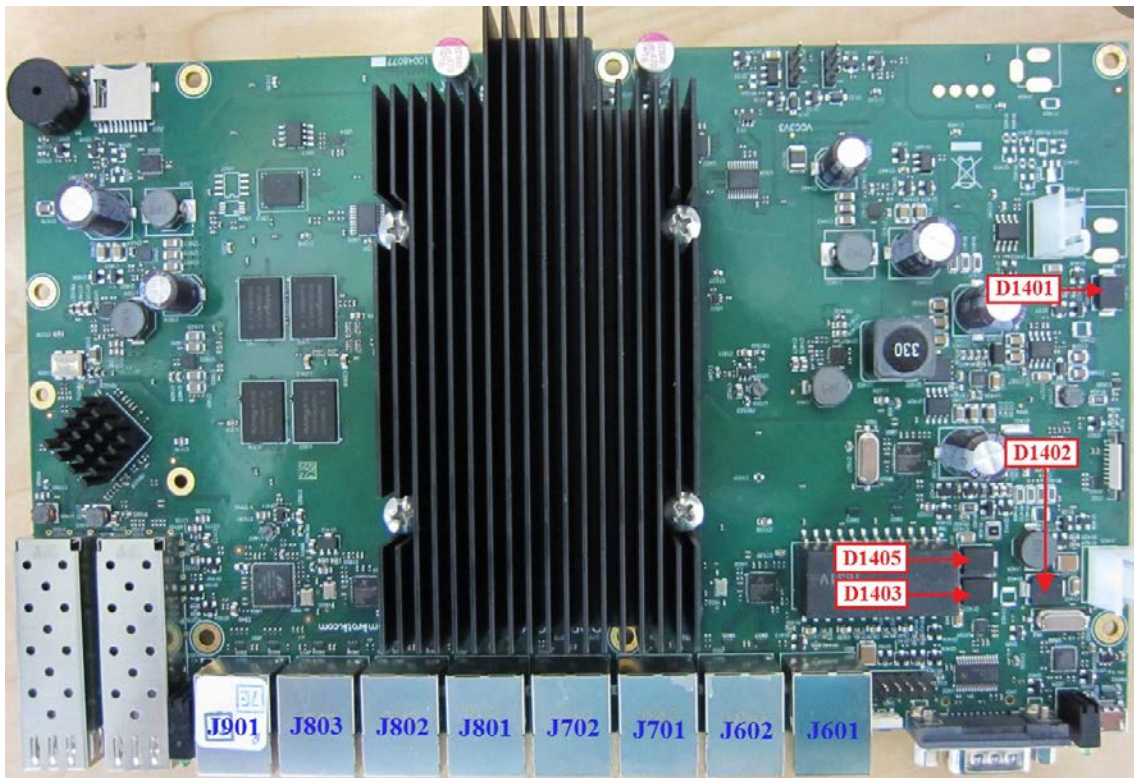
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 219. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 22.

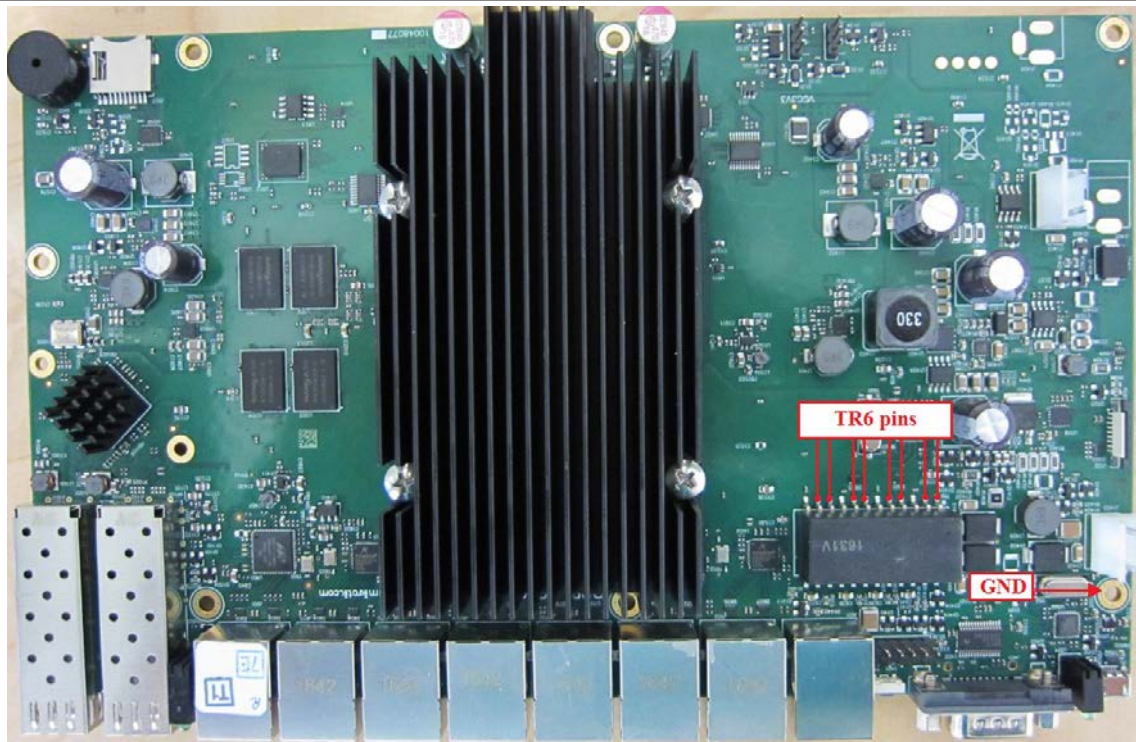
Check voltage drop value between RJ-45 connectors J602, J701, J702, J801, J802, J803 and ground. Test points are shown in picture 220. Voltage drop value should be in the range from 0,36V to 0,40V. Voltage drop measurement method is described on page 22.

Checking termination resistors resistance in RJ-45 connector

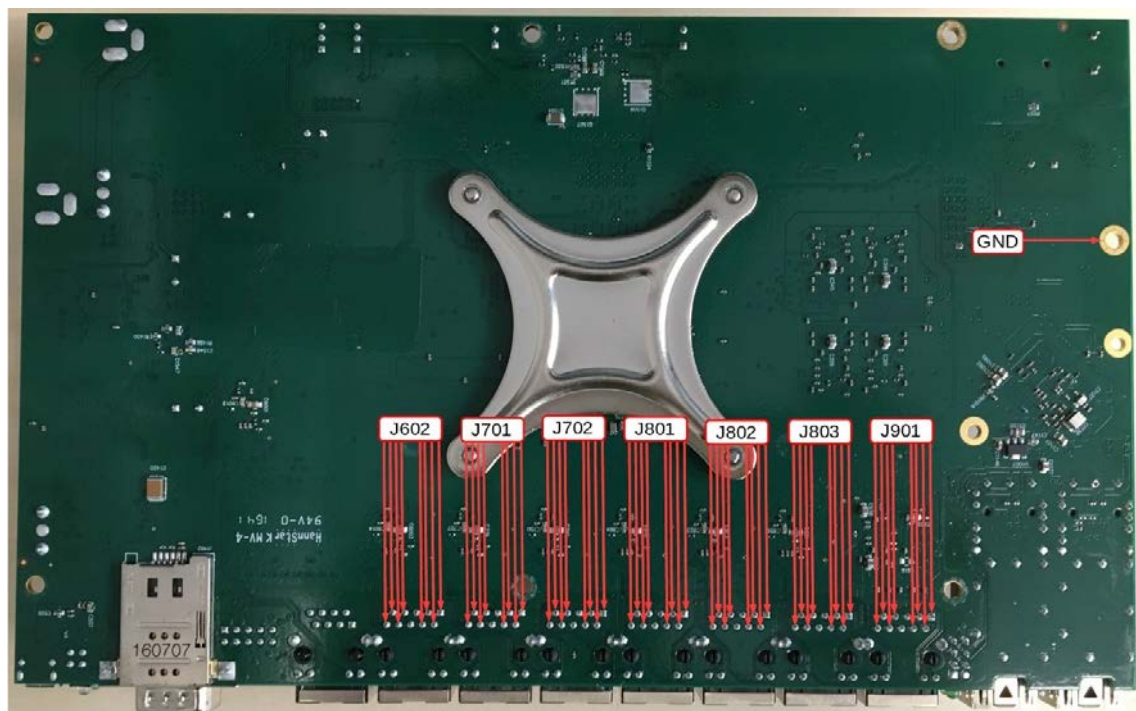
Check termination resistors resistance in J602, J701, J702, J801-J803, J901 connectors. Resistance value between Rx and Tx line must be 150 Ohm $\pm$ 4%. Measurement method is described on page 23.



Picture 218

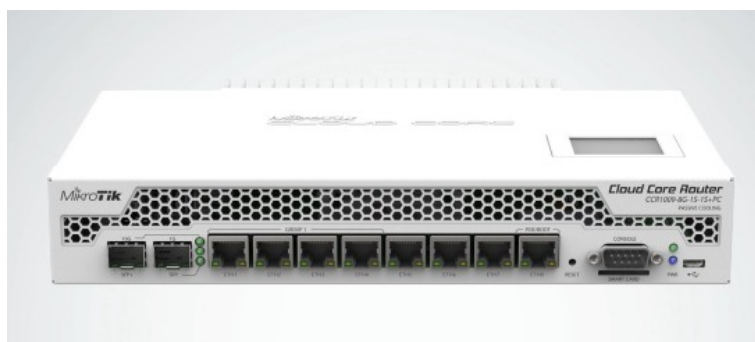


Picture 219



Picture 220

CCR1009-8G-1S-1S+



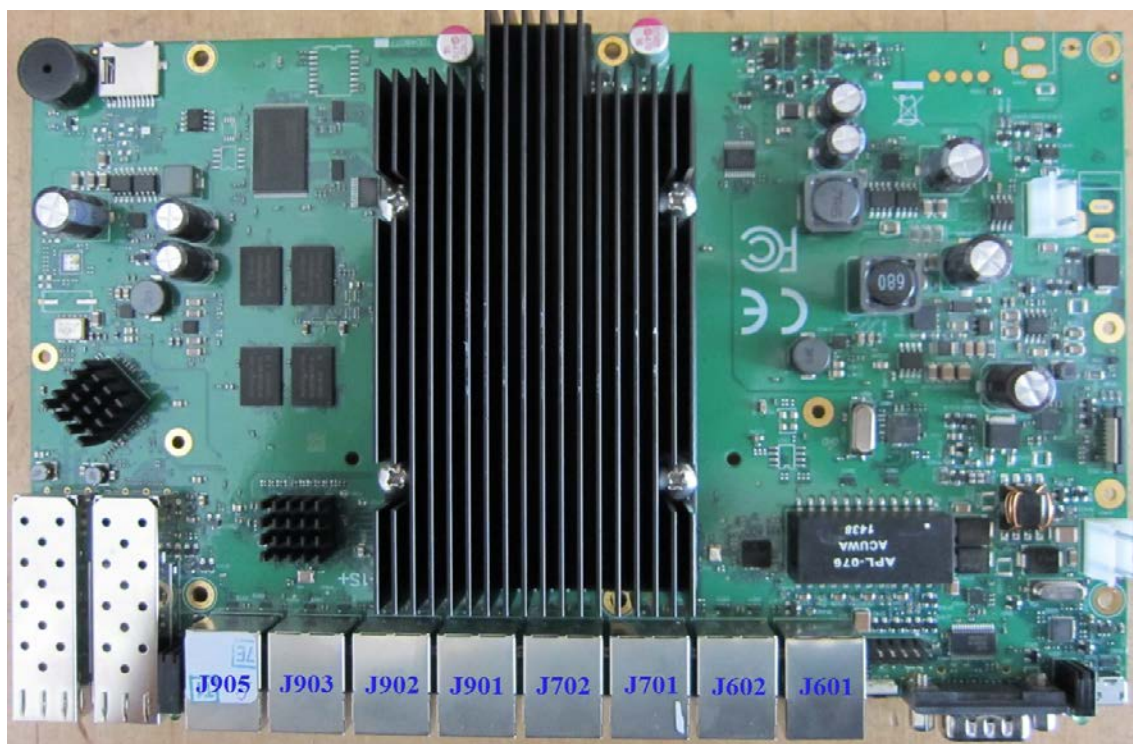
Picture 221

Disassembling information

Disassembly method of the board is the same as the CCR1009-7G board. Disassembly method is described on page [198](#).

Instructions for checking overvoltage

Over-voltage testing procedure and the layout of the components (with exception of Ethernet ports reference numbers, see picture [222](#)) on the board is the same as for CCR1009-7G boards, see on page [200](#).



Picture 222

CCR1009-8G-1S



Picture 223

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 224.



Picture 224

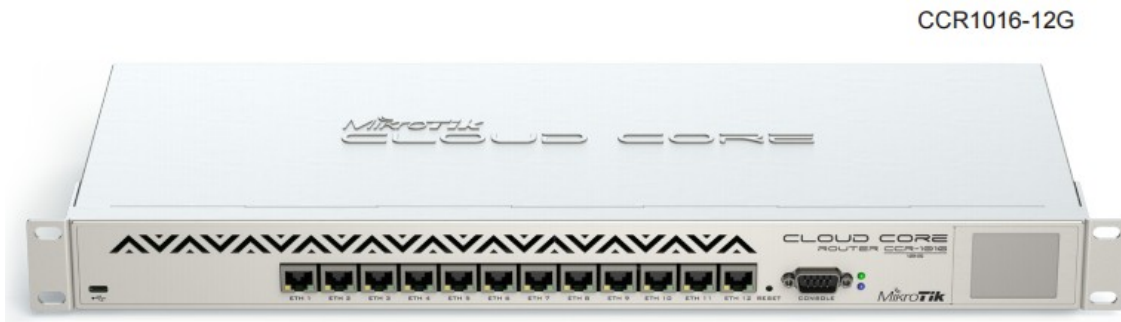
Step 2: Take off the cover.

Instructions for checking overvoltage

Over-voltage testing procedure and the layout of the components (with exception of Ethernet ports reference numbers, see picture 222) on the board is the same as for CCR1009-7G boards, see on page 200.

CLOUD CORE ROUTER 1016 SERIES ROUTERBOARDS

CCR1016-12G



Picture 225

Disassembling information

Disassembly method of the board is the same as the CCR1009-8G-1S board. Disassembly method is described on page [203](#).

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 [226](#).

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 [226](#).

Voltage drop measurement method is described on page [21](#).

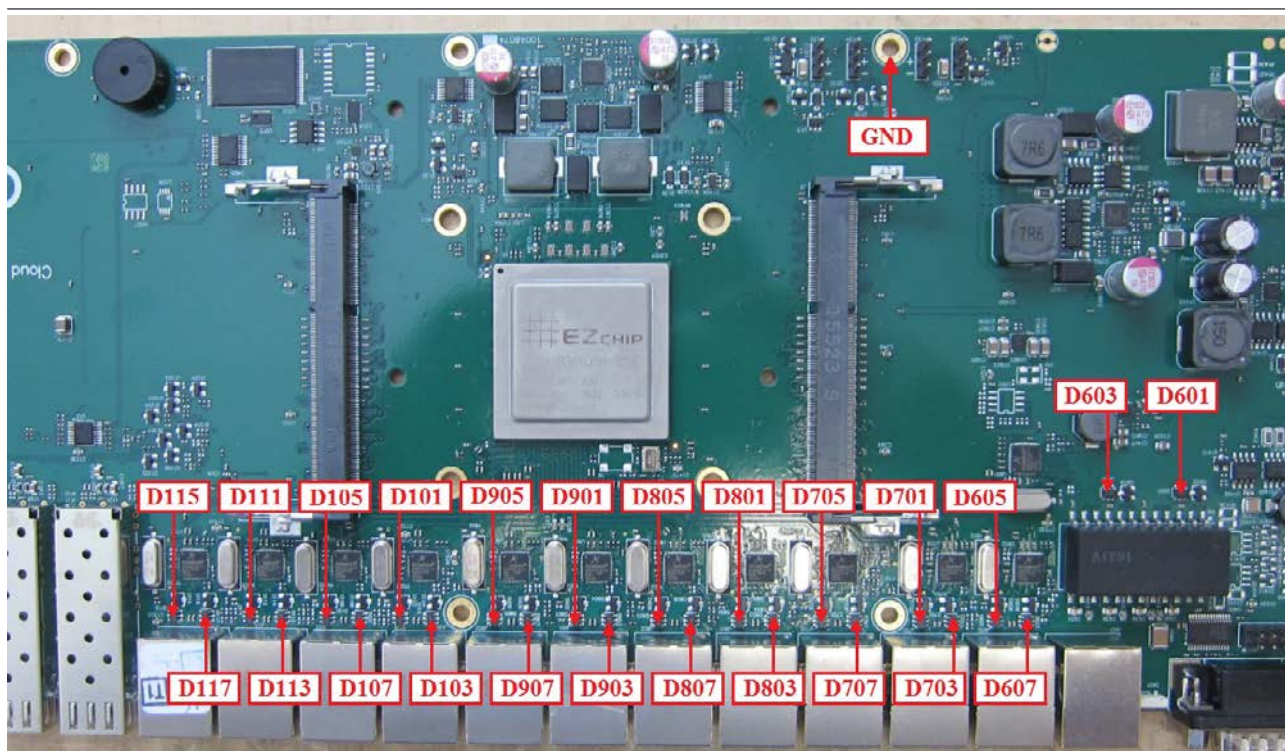
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [227](#).

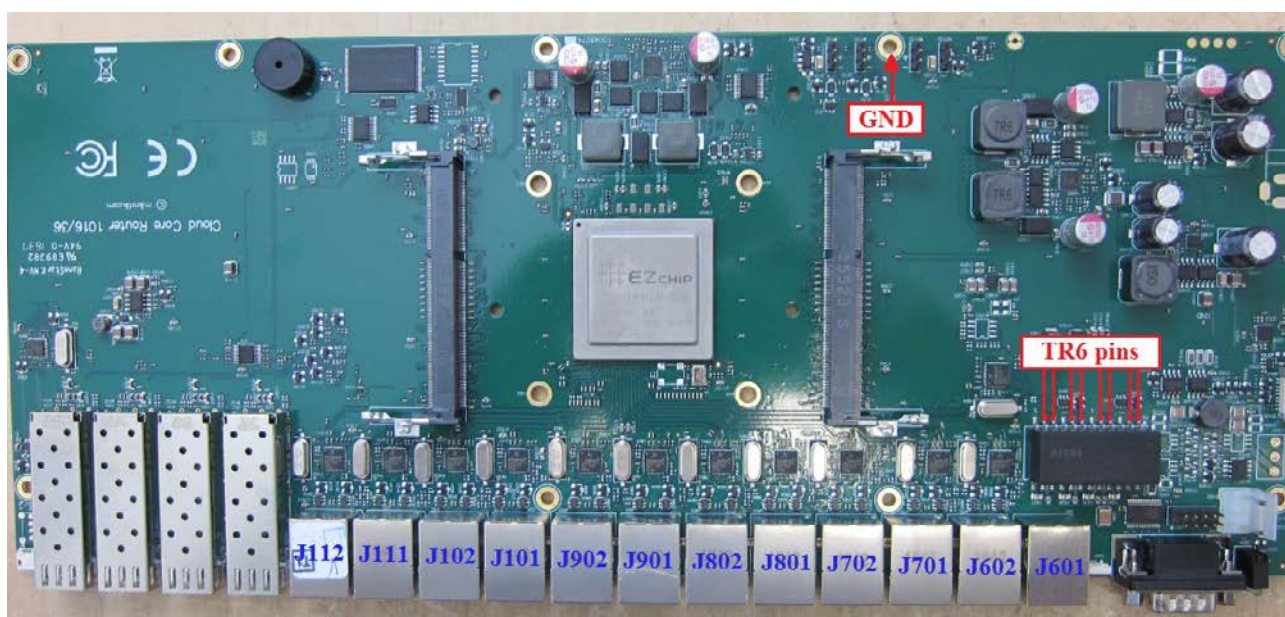
Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [22](#).

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 $\pm 4\%$. Measurement method is described on page [23](#).



Picture 226



Picture 227

CCR1016-12G rev2



Picture 228

Disassembling information

Disassembly method of the board is the same as the CCR1036-8G-2S+ rev2 board. Disassembly method is described on page [214](#).

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

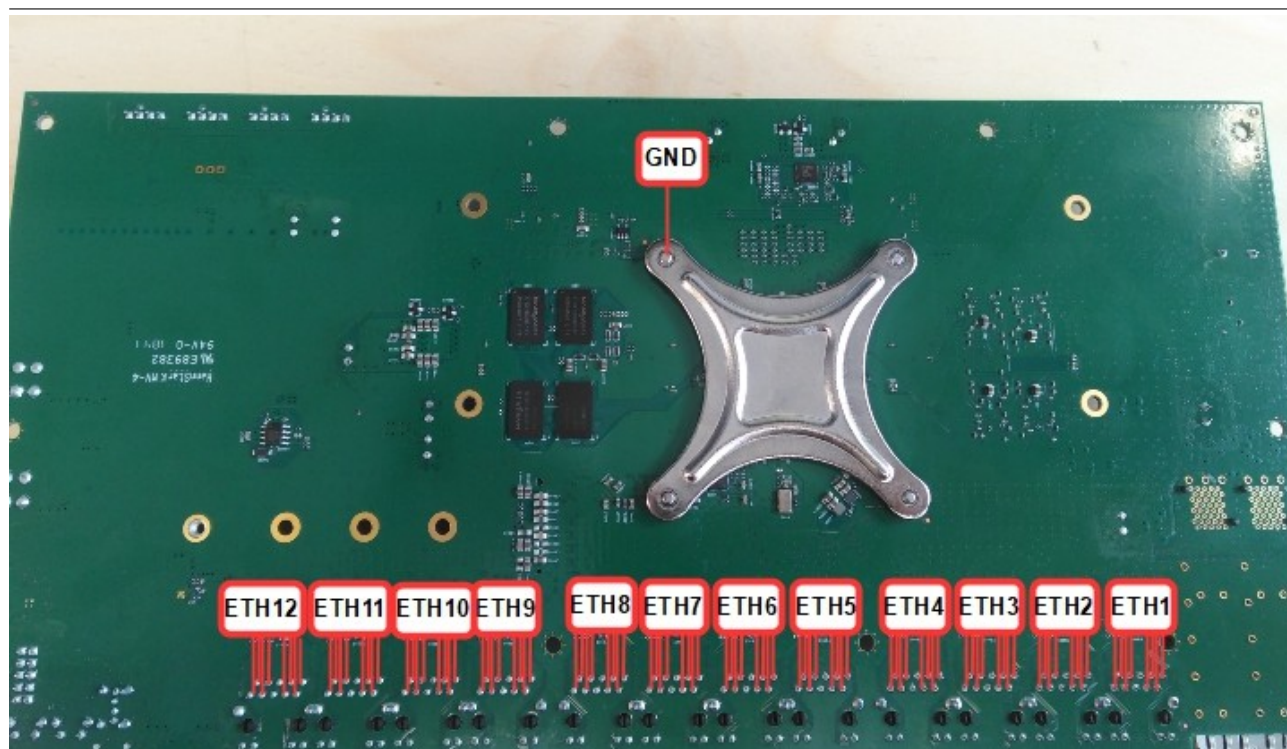
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture [229](#).

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page [22](#).

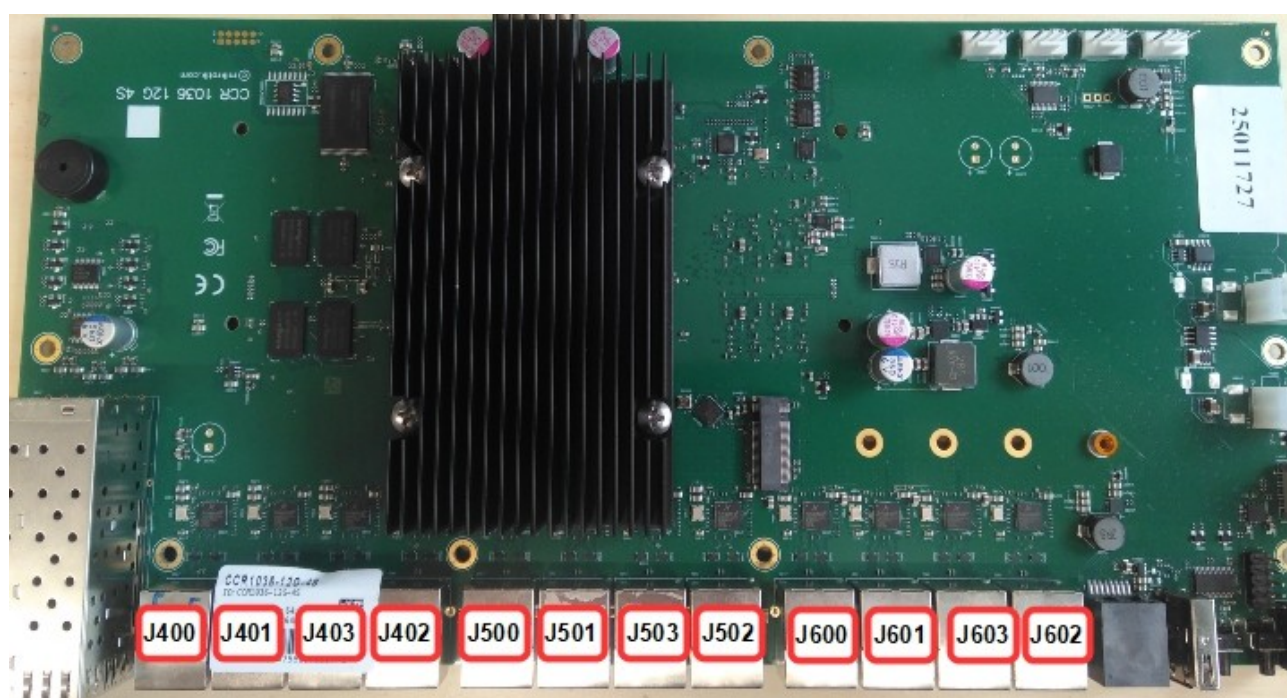
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J400 - J602 connector. RJ-45 placement is shown in picture [230](#).

Resistance value between Rx and Tx line must be 150 Ohm $\pm 4\%$. Measurement method is described on page [23](#).



Picture 229



Picture 230

CCR1016-12S-1S+

CCR1016-12S-1S+ rev2



Picture 231

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 232

Disassembling information

Disassembly method of the board is the same as the CCR1009-8G-1S board. Disassembly method is described on page [203](#).

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

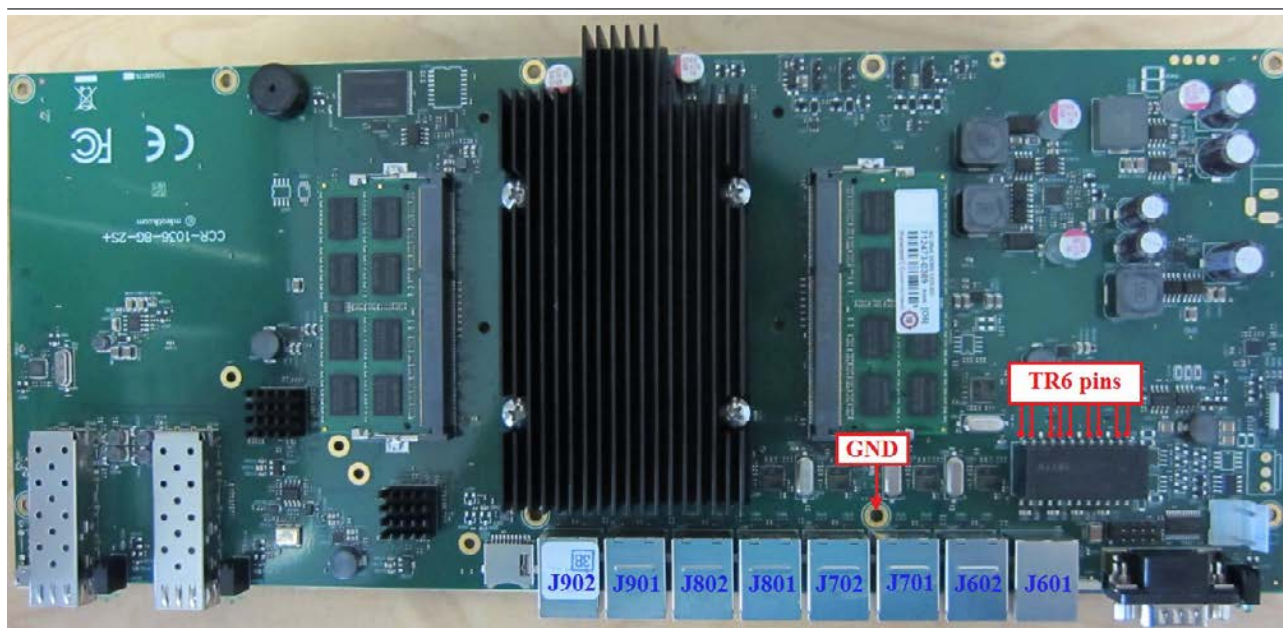
Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [233](#).

Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [22](#).

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 [233](#).

Resistance value between Rx and Tx line must be 150 Ohm $\pm 4\%$. Measurement method is described on page [23](#).



Picture 233

CCR1036-12G-4S

CCR1036-12G-4S-EM



Picture 234

Disassembling information

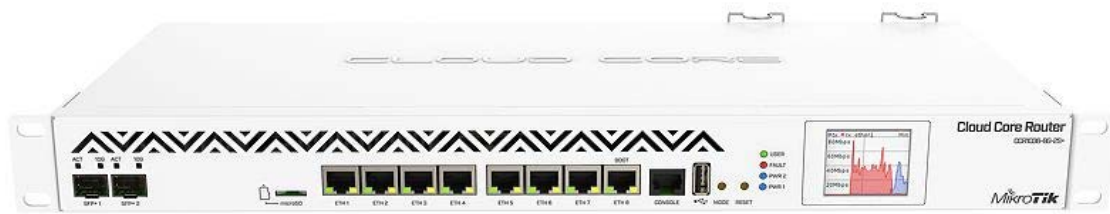
Disassembly method of the board is the same as the CCR1016-12G board. Disassembly method is described on page [205](#).

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 [205](#).

CCR1036-8G-2S+ rev2

CCR1036-8G-2S+EM r2



Picture 235

Disassembling information

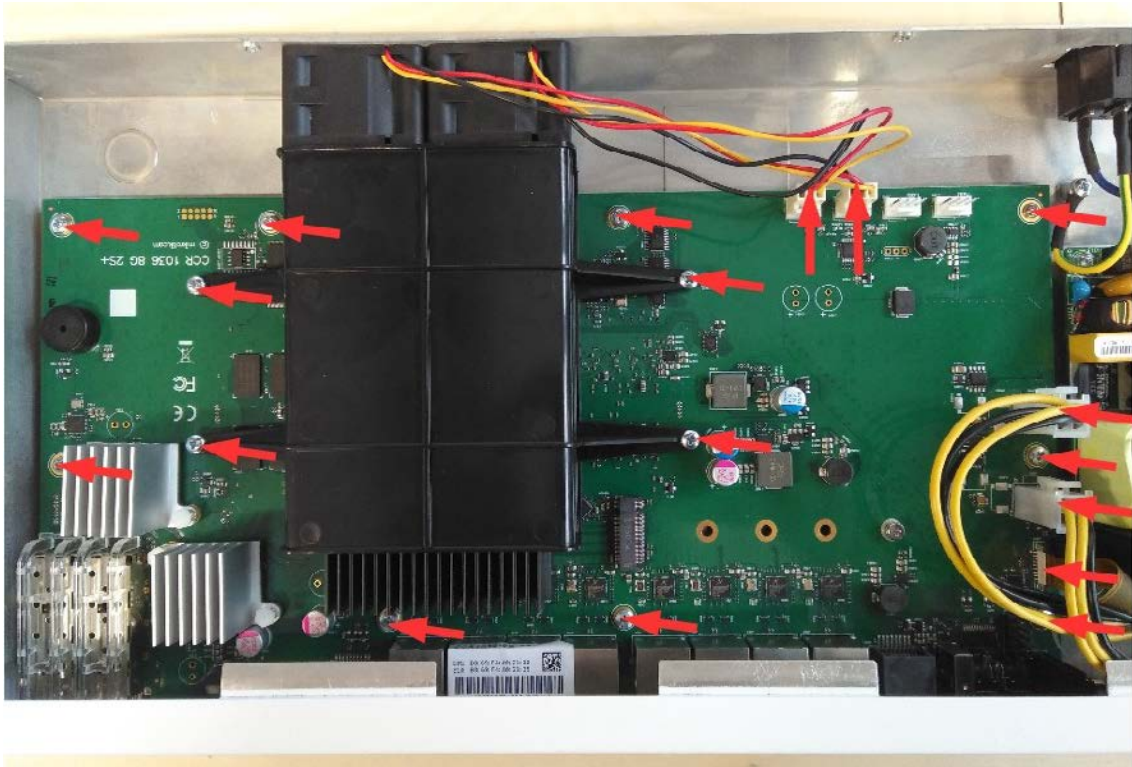
Step 1: Unscrew 6 screws using PH2 screwdriver. Location of screws you can see in the picture [236](#).



Picture 236

Step 2: Take off the cover, unscrew all screws using Philips screw driver and unplug FAN, power supply and LCD connectors as showed in the picture [237](#). 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 237

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

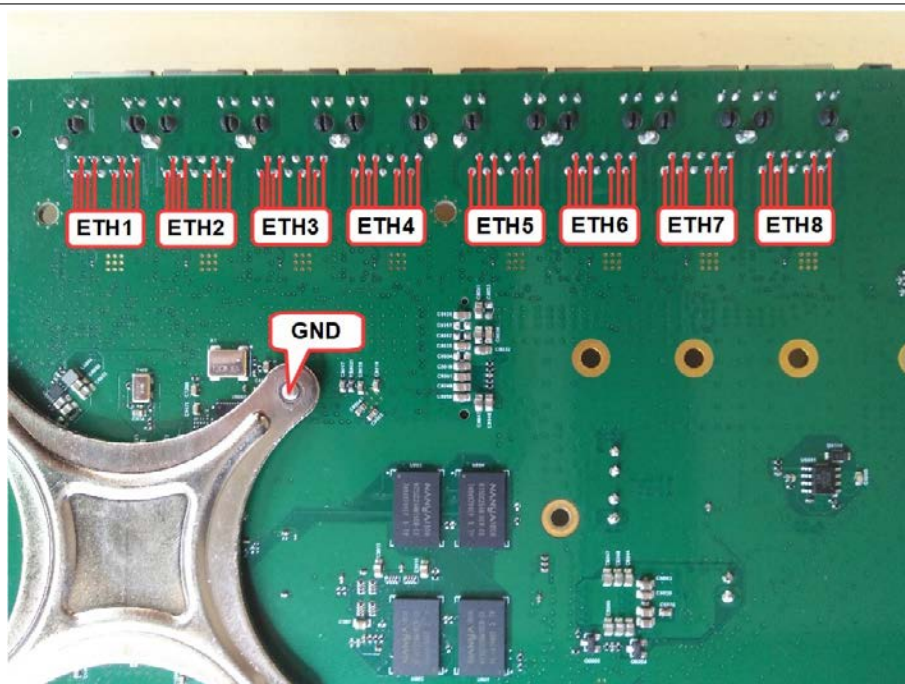
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture 238.

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page 22.

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 239.

Resistance value between Rx and Tx line must be 150 Ohm $\pm 4\%$. Measurement method is described on page 23.



Picture 238



Picture 239

CCR1036-12G-4S rev2

CCR1036-12G-4S-EM rev2



Picture 240

Disassembling information

Disassembly method of the board is the same as the CCR1036-8G-2S+ rev2 board. Disassembly method is described on page [214](#).

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

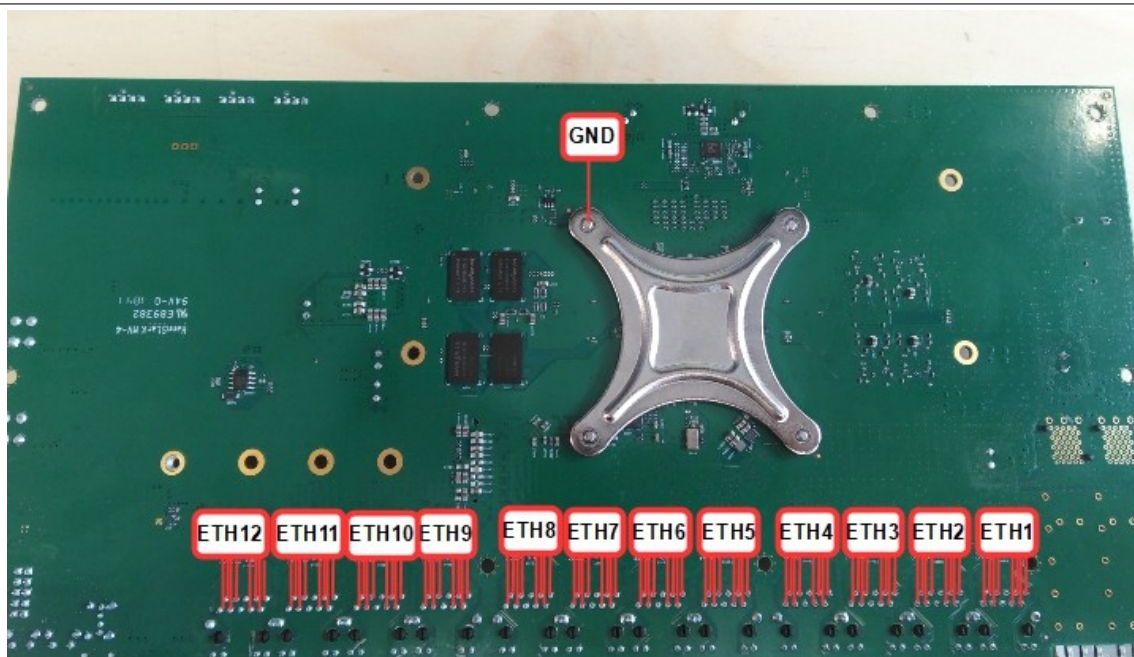
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture [241](#).

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page [22](#).

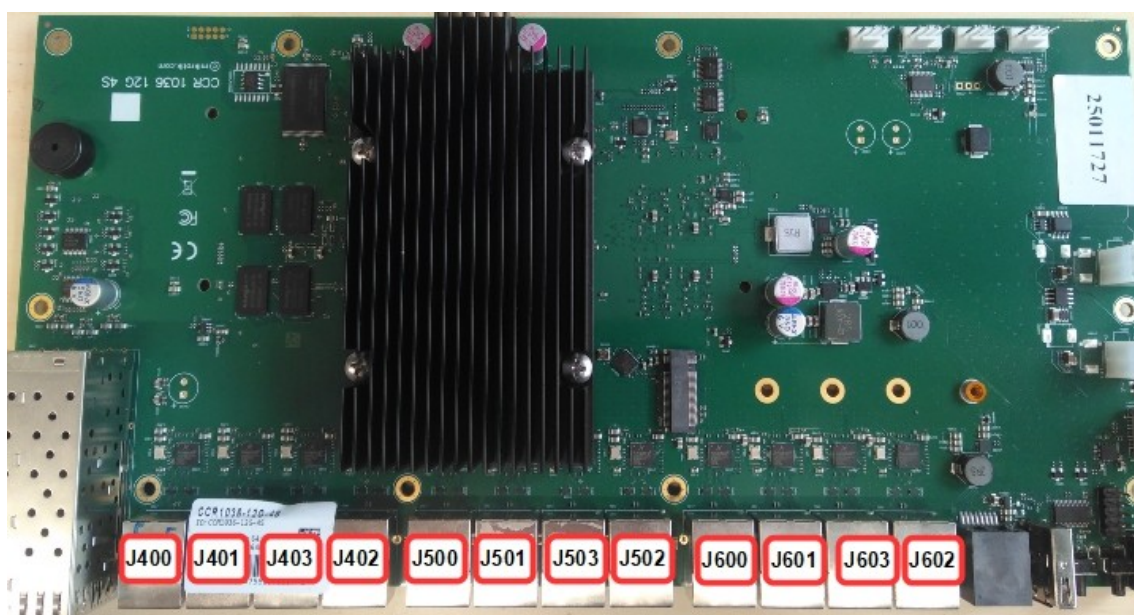
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J400 - J602 connector. RJ-45 placement is shown in picture [242](#).

Resistance value between Rx and Tx line must be 150 Ohm $\pm 4\%$. Measurement method is described on page [23](#).



Picture 241



Picture 242

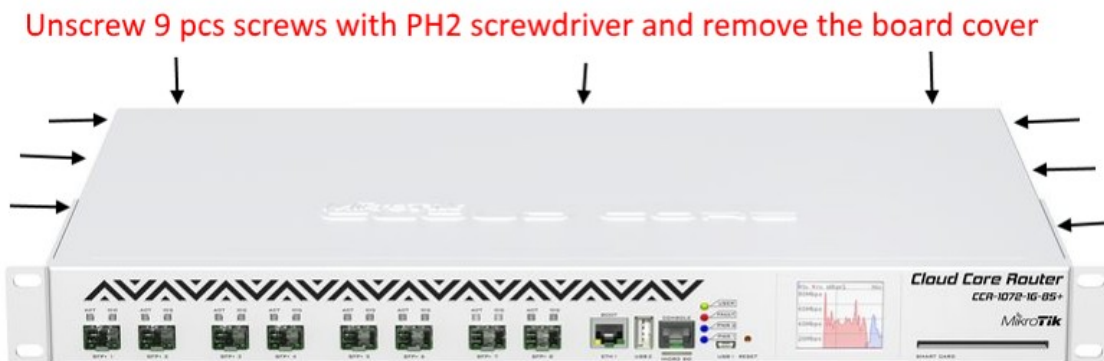
CLOUD CORE ROUTER 1072 SERIES ROUTERBOARDS

CCR1072-1G-8S+



Picture 243

Disassembling information



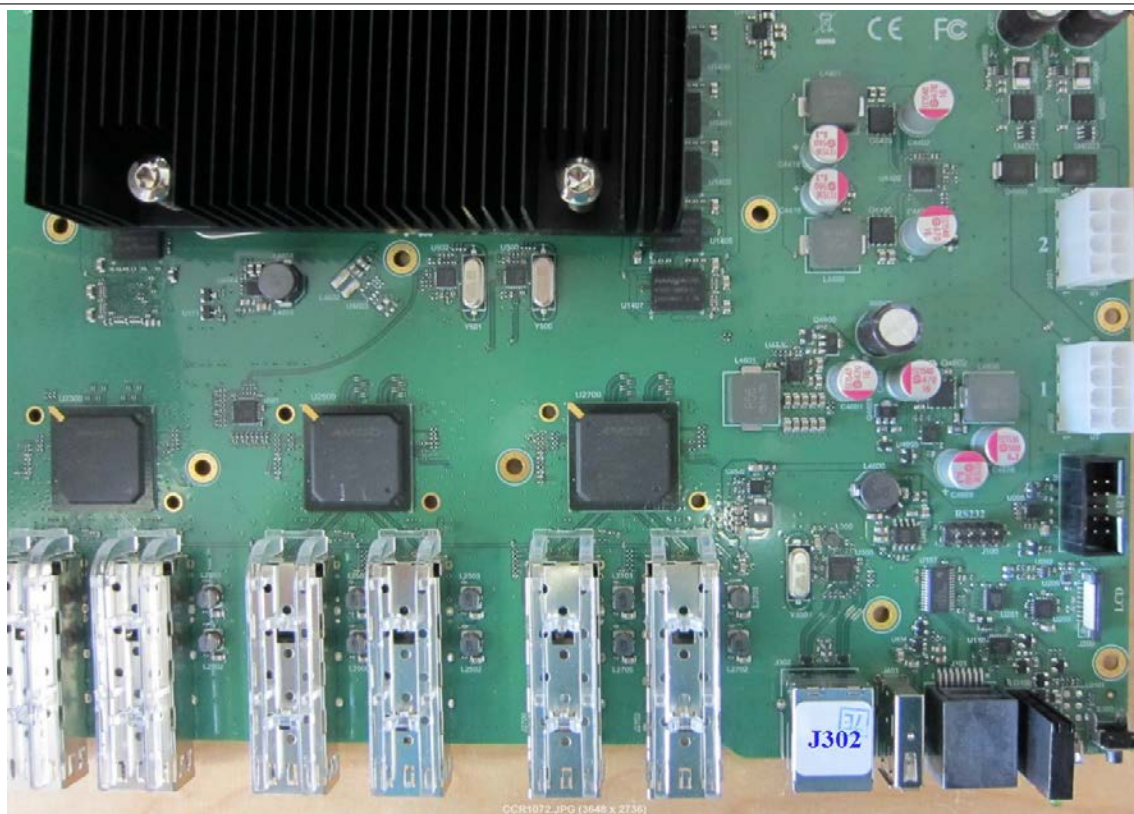
Picture 244

Instructions for checking overvoltage

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J302 connector as shown in the picture [245](#).

Resistance value between Rx and Tx line must be 150 Ohm $\pm 4\%$. Measurement method is described on page [23](#).



Picture 245

CLOUD CORE ROUTER 2004 SERIES ROUTERBOARDS

CCR2004-1G-12S+2XS



Picture 246

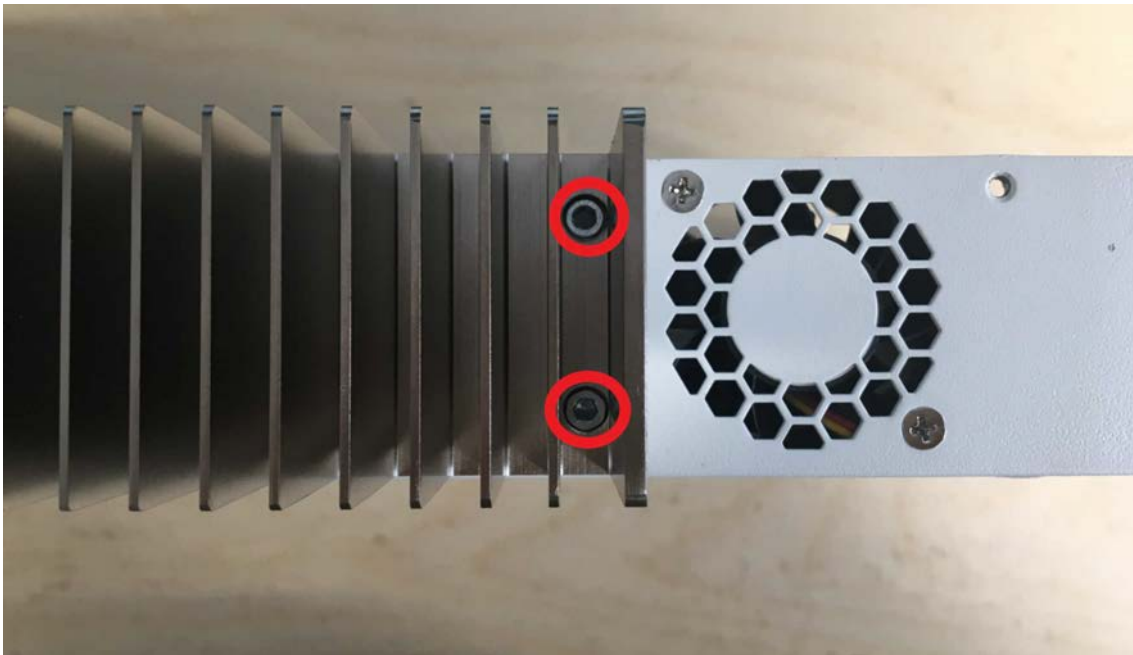
Disassembling information

Step 1: Using Phillips PH2 or similar unscrew all screws shown in picture 247.



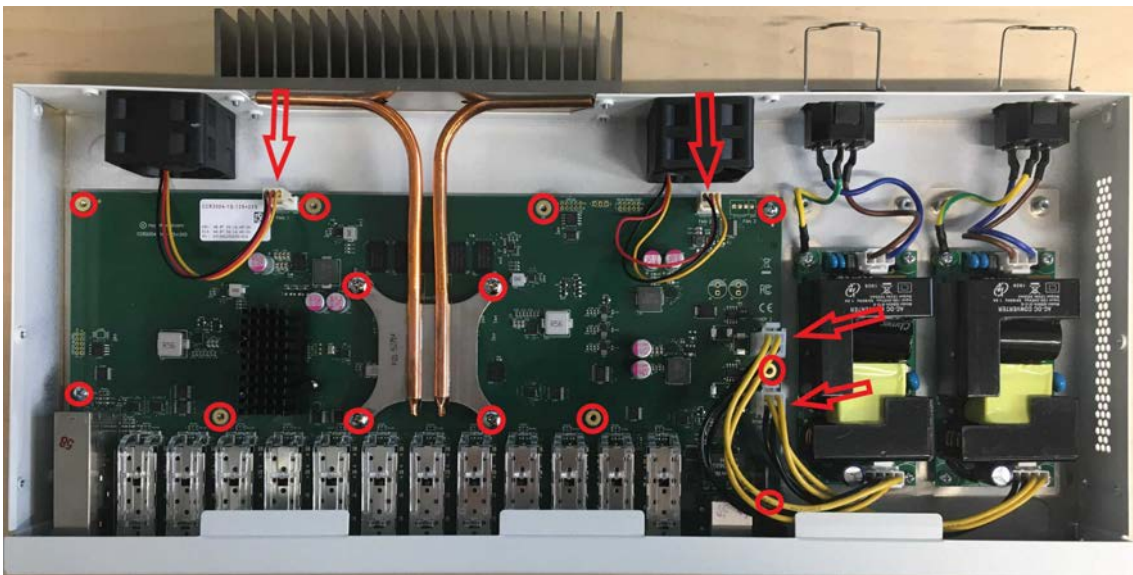
Picture 247

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 248

Step 3: Using Phillips PH1 unscrew all the screws, unplug fans and PSU power cables as shown in picture 249.



Picture 249

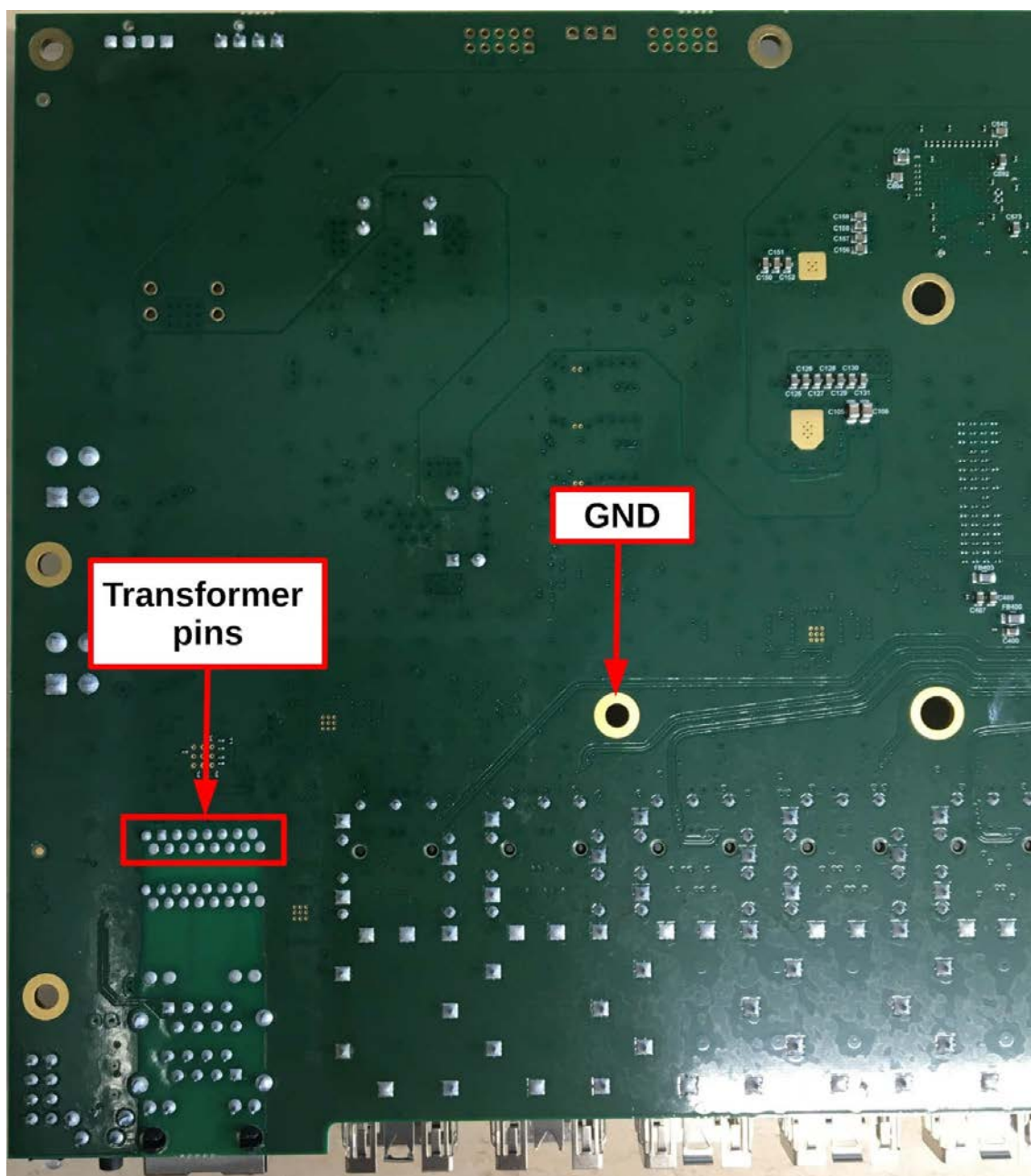
Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

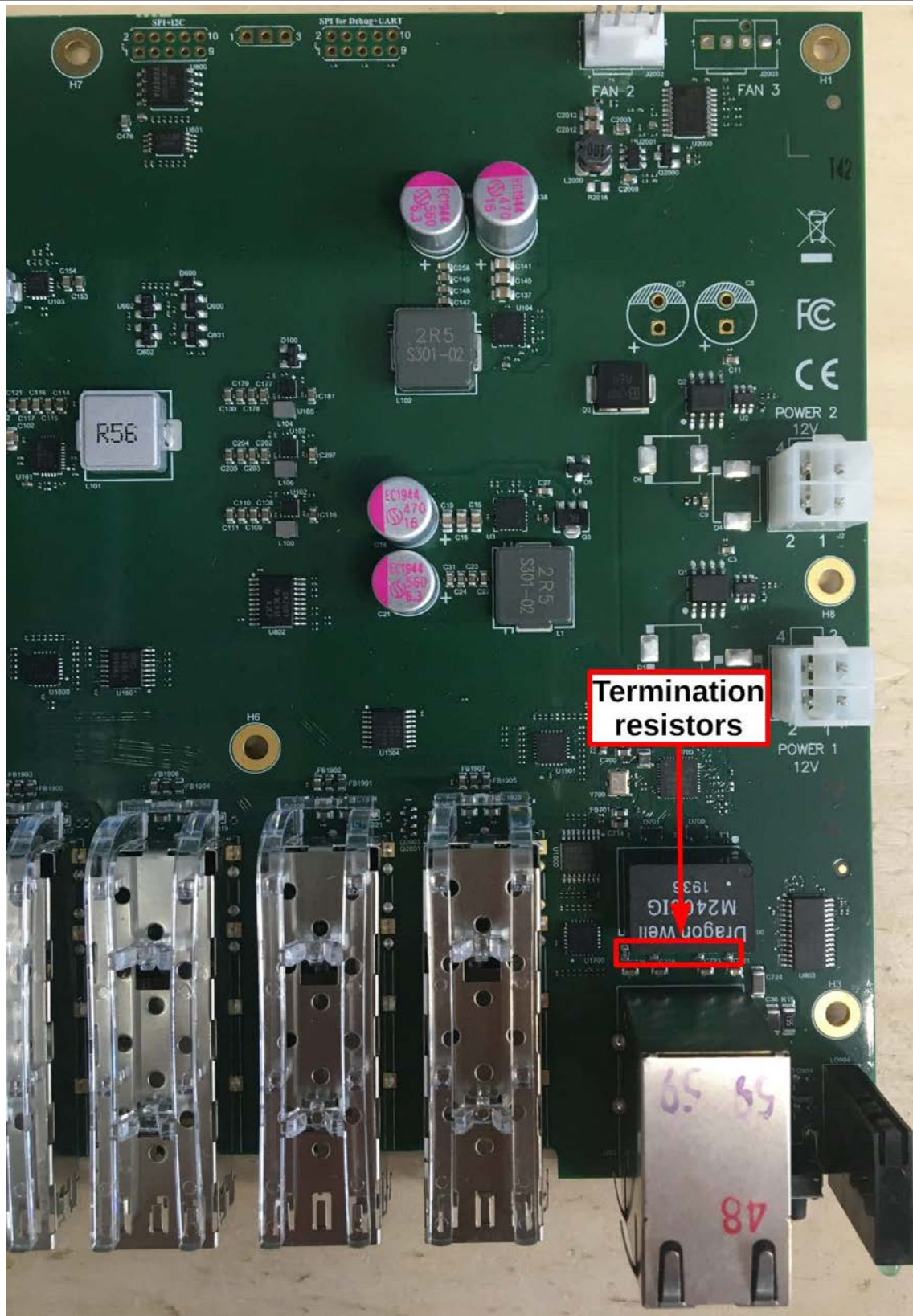
Check voltage drop value between Ethernet transformer pins and GND. Test points are marked in picture 250. Voltage drop value should be in the range from 0,34V to 0,44V. Voltage drop measurement method is described on page 22.

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 251.



Picture 250



Picture 251

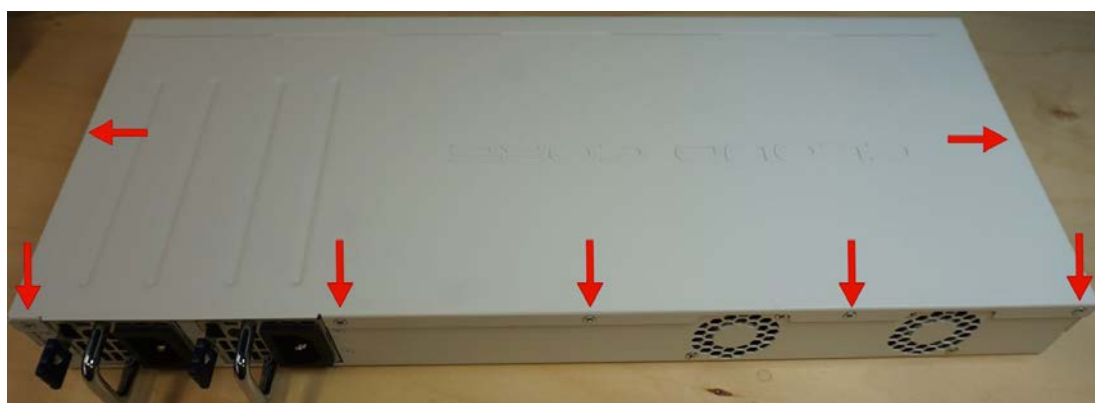
CCR2004-16G-2S+



Picture 252

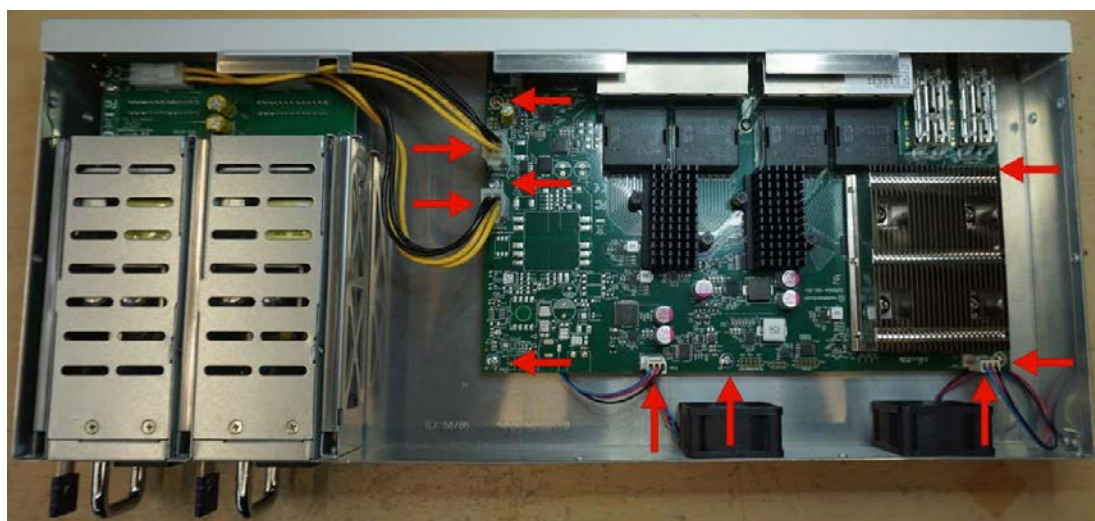
Disassembling information

Step 1: Using Phillips PH2 or similar unscrew all screws shown in picture 253.



Picture 253

Step 2: Take off the cover, unscrew all screws using Philips screw driver, unplug FAN and power supply cables as showed in picture 254.

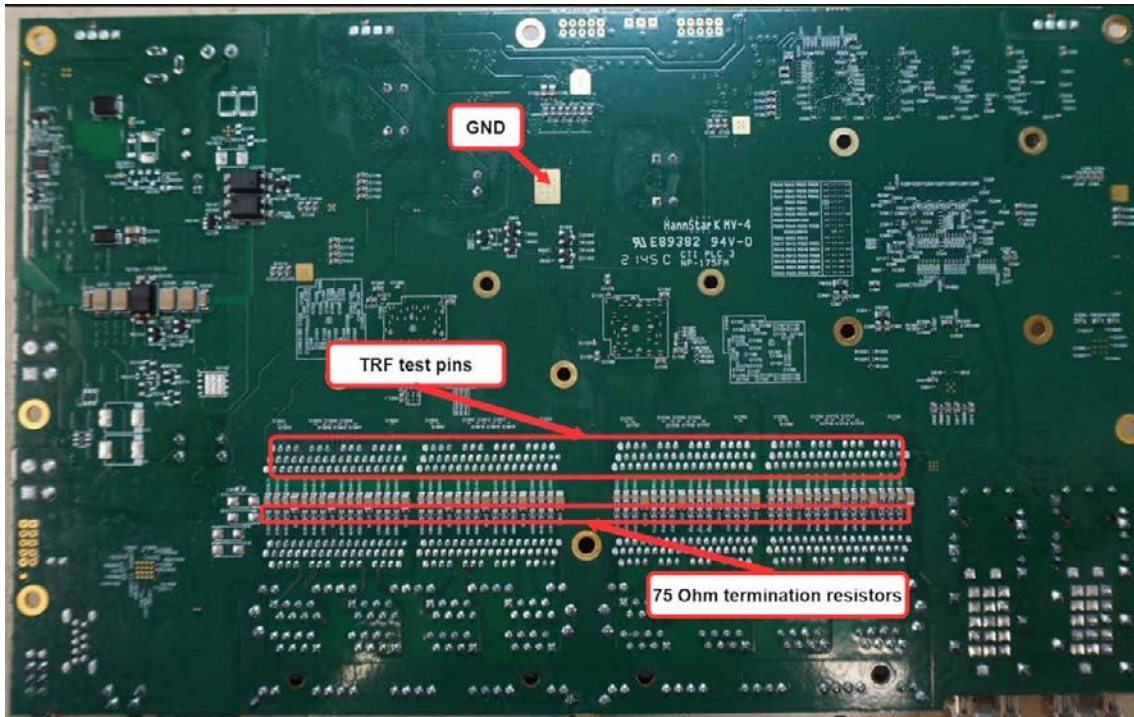


Picture 254

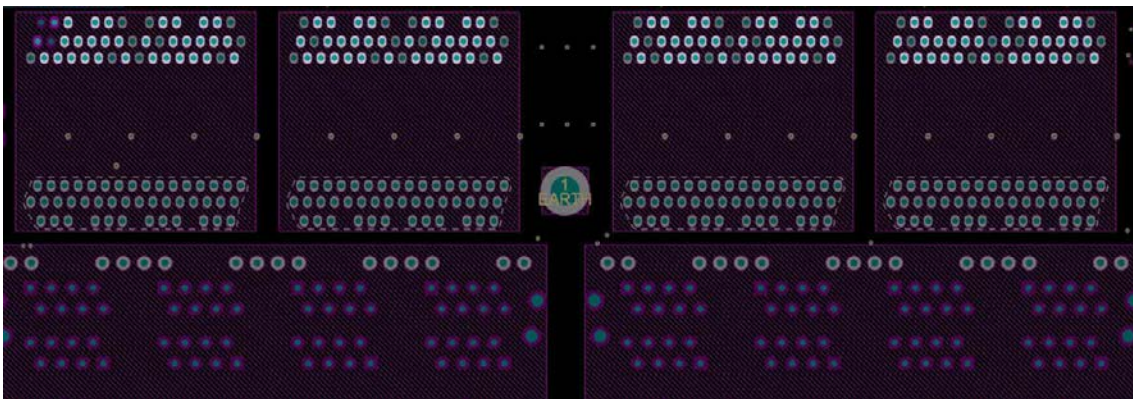
Instructions for checking overvoltage

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 256. 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 0,64V. Voltage drop measurement method is described on page 22.



Picture 255



Picture 256

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 255.

CCR2004-1G-2XS-PCIE

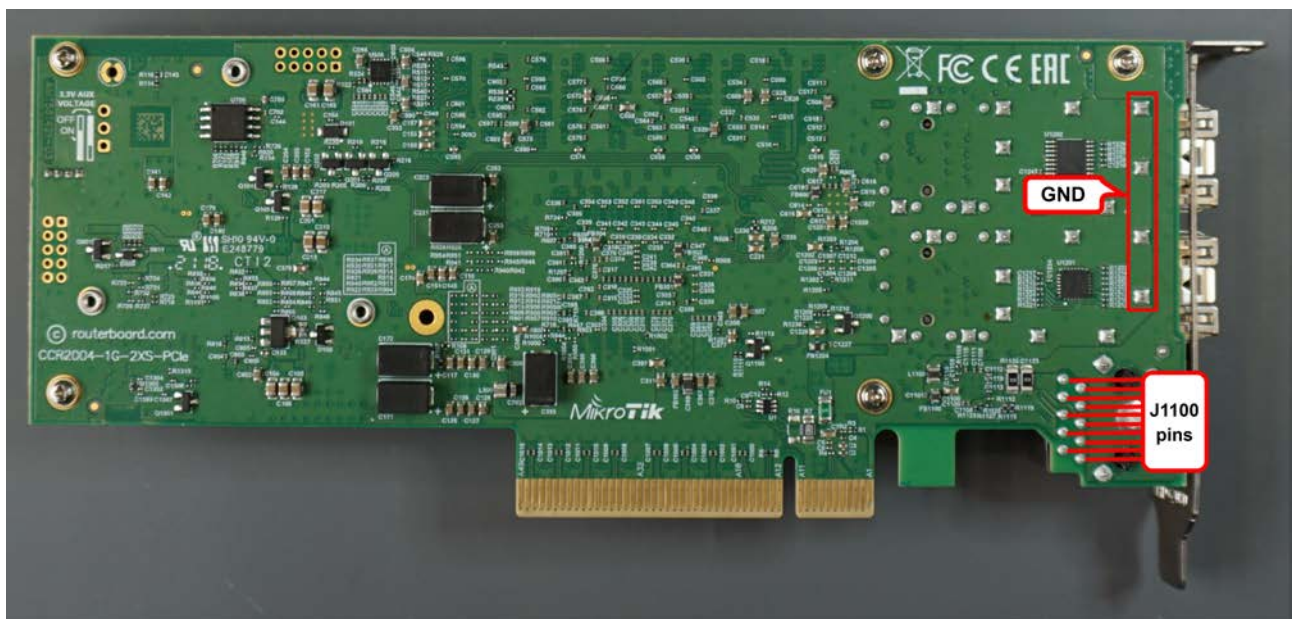


Picture 257

Checking procedure for over-voltage

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet connector RJ45 pins and GND. Test points are marked with red lines, see picture 258. Voltage drop value should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 22.



Picture 258

Checking termination resistors resistance in RJ-45 connector

For this measurement you need a piece of a RJ45 plug Ethernet cable with stripped orange/white, green, blue/white and brown wires, see picture 259. In order to check termination resistors it is necessary to measure the resistance between the green and orange/white wires, as well the brown and blue/white wires. Resistance value between wires should be 150 Ohm $\pm 4\%$, the example of measurement you can see in the picture below.



Picture 259

CLOUD CORE ROUTER 2116 SERIES ROUTERBOARDS

CCR2116-12G-4S+

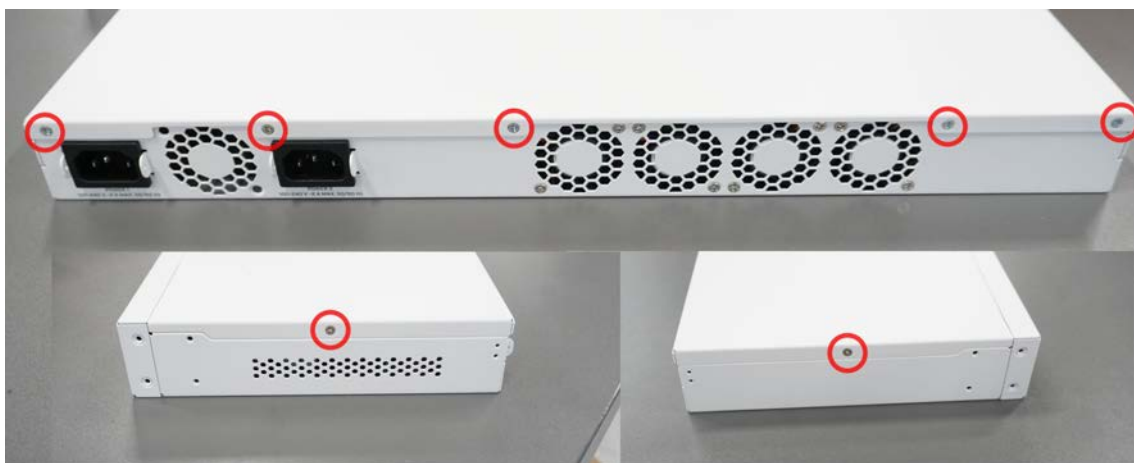


Picture 260

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 261 and remove cover. When the cover is removed, disconnect PSUs from the board – PSU connectors are shown on picture 262. Avoid touching any other part of PSU in order to prevent possible electrical shock, board damage or equipment damage!

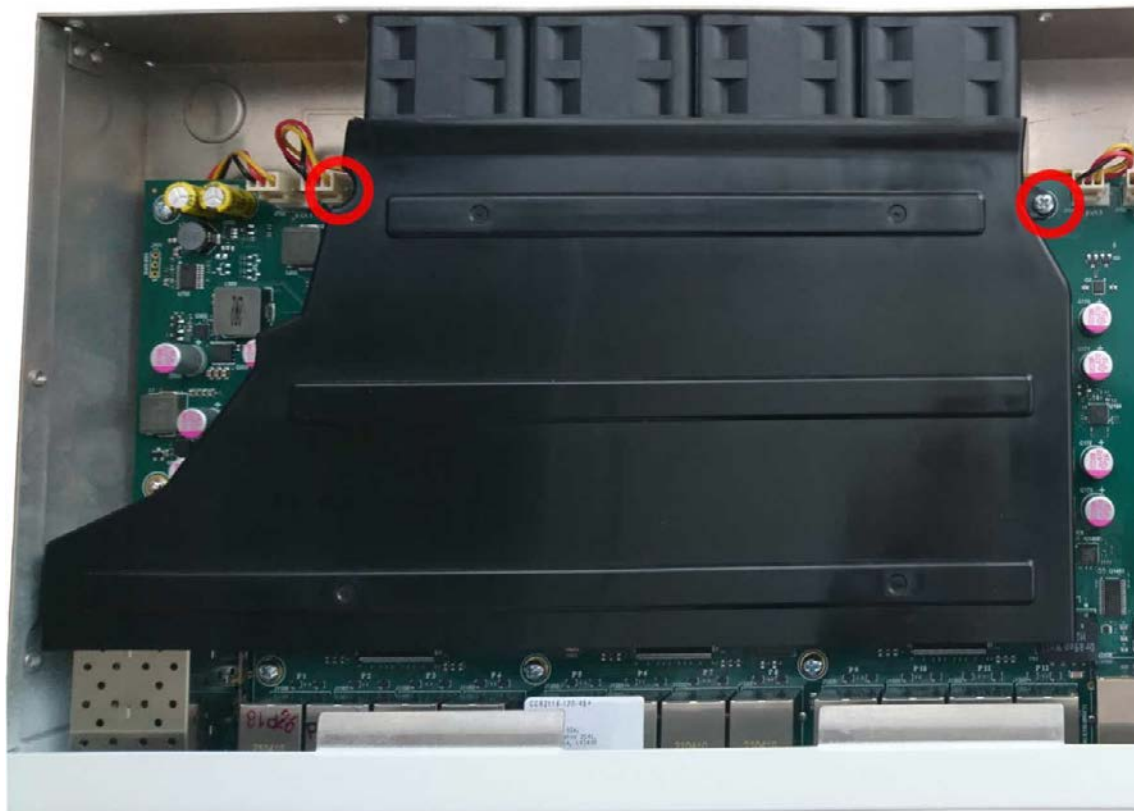
Step 2: Continue the disassembly by removing the wind tunnel, screw placement is shown on picture 263. A screw with a plastic spacer is located on the PSU side of the board, see picture 264. PH1 screwdriver is advised.



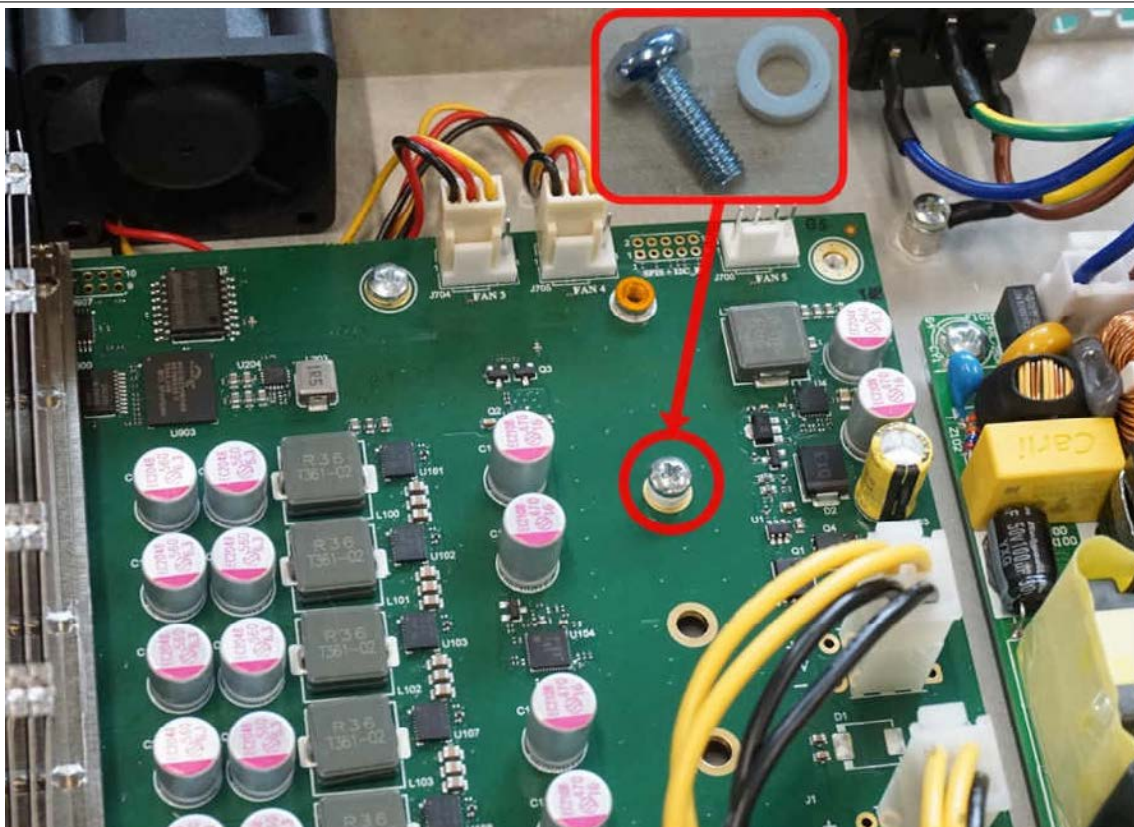
Picture 261



Picture 262

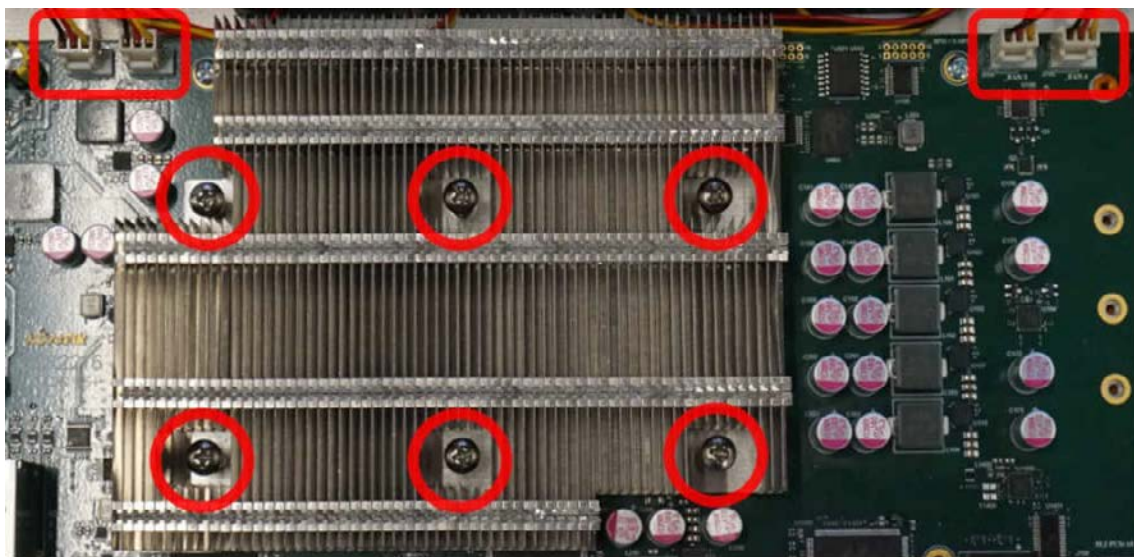


Picture 263



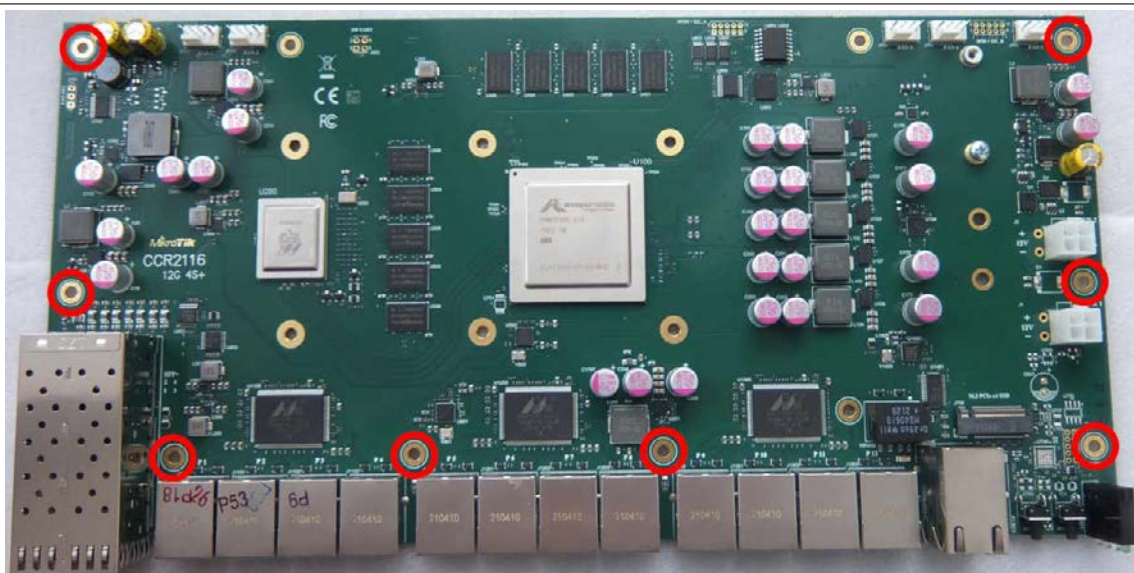
Picture 264

Step 3: Gently remove heatsink (PH2) and fan connectors indicated on picture 265.



Picture 265

Step 4: Using PH1 remove all other screws that are holding the PCB, screws position shown on picture 266.



Picture 266

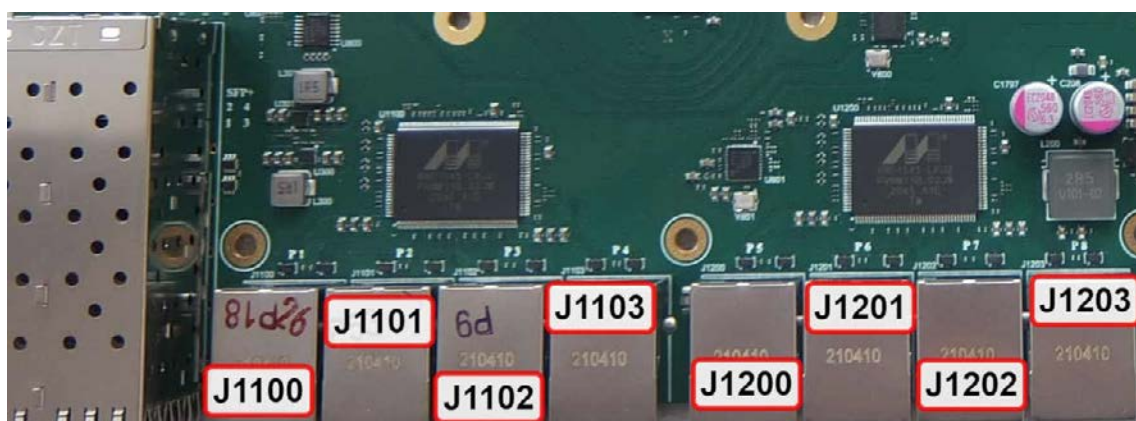
Instructions for checking overvoltage

Checking termination resistors resistance in RJ-45 connector

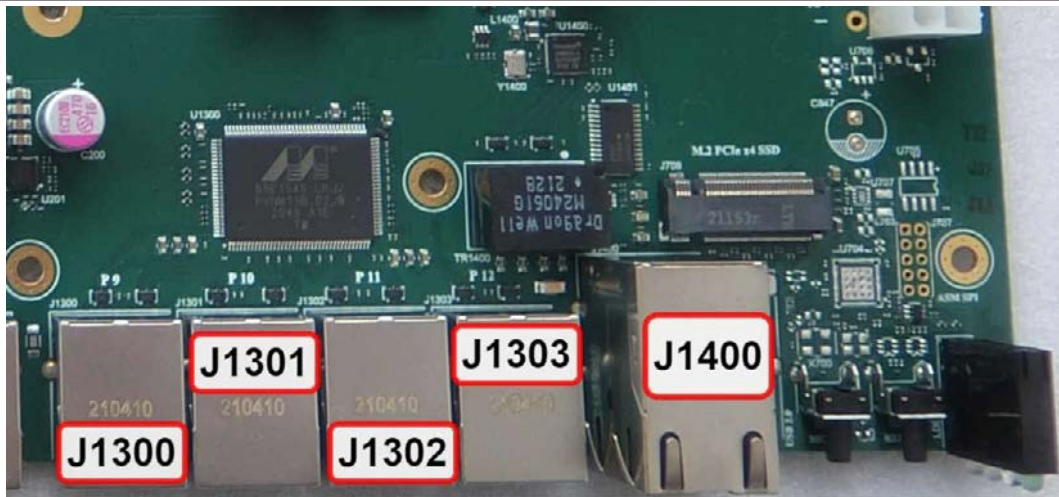
Check resistance of termination resistors in the following connectors shown on pictures 267 and 268:

J1100, J1102, J1102, J1103, J1200, J1201, J1202, J1203, J1300, J1301, J1302, J1303, J1400.

Resistance value between Rx and Tx line must be $150\ \Omega \pm 4\%$. Measurement method is described on page 23.



Picture 267



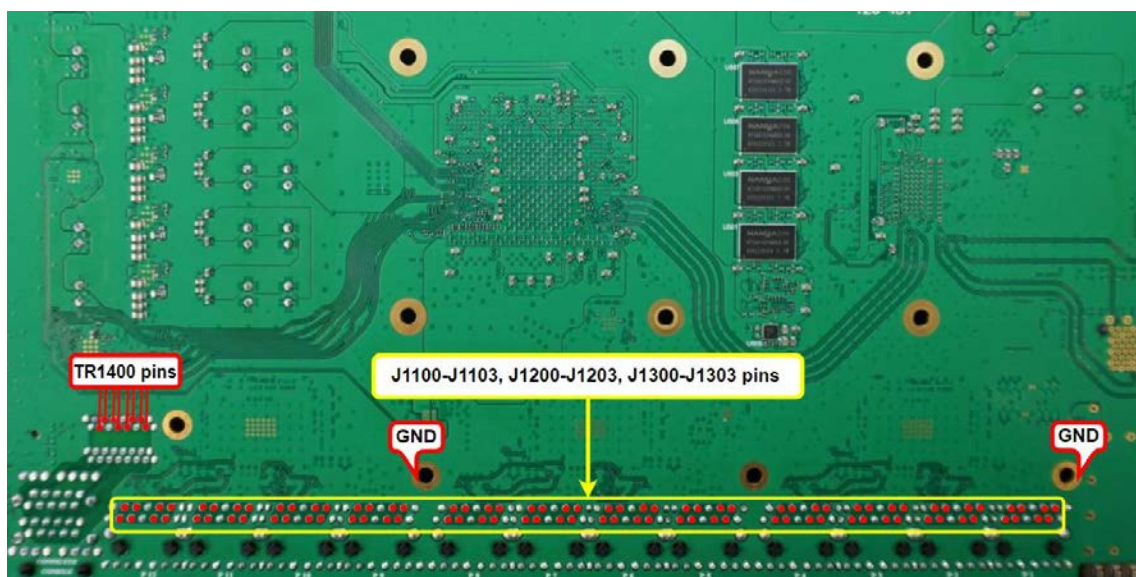
Picture 268

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1400 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 269. Voltage drop value should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page 22.

Check voltage drop value between RJ-45 connectors pins and Ground

Check voltage drop value between RJ-45 connectors J1100-J1103, J1200-J1203, J1300-J1303 pins and ground. Test points on the RJ-45 connectors pins are marked with red dots, see picture 269. Voltage drop value should be in the range from 0,23V to 0,29V. Voltage drop measurement method is described on page 22.



Picture 269

CLOUD CORE ROUTER 2216 SERIES ROUTERBOARDS

CCR2216-1G-12XS-2XQ



Picture 270

Disassembling information

Step 1:

Using Phillips PH2 unscrew 11 side screws marked on picture 271 and remove the cover.



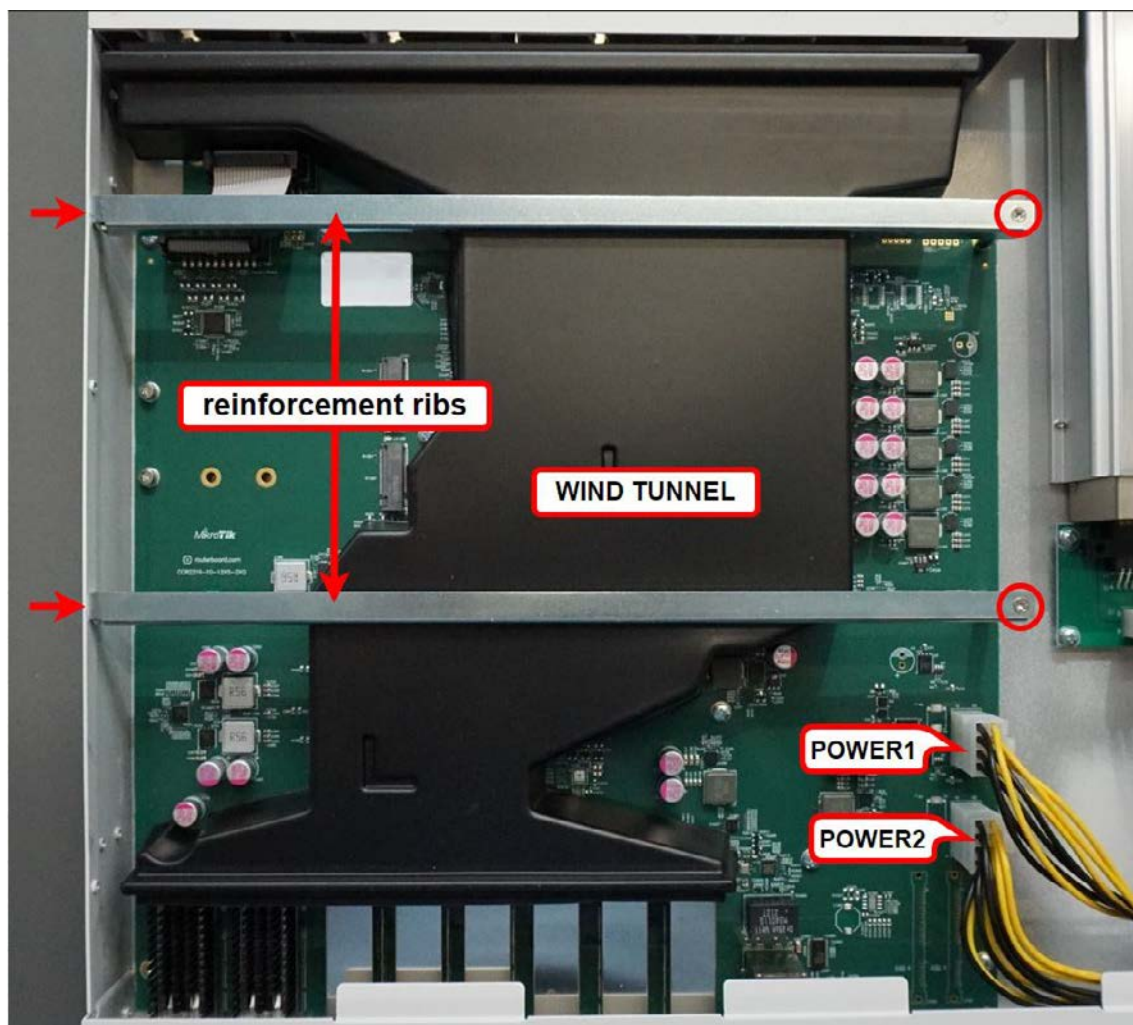
Picture 271

Step 2:

Using Phillips PH2 unscrew 2 side screws and 2 top screws, and then remove reinforcement ribs as shown in picture 272.

Step 3:

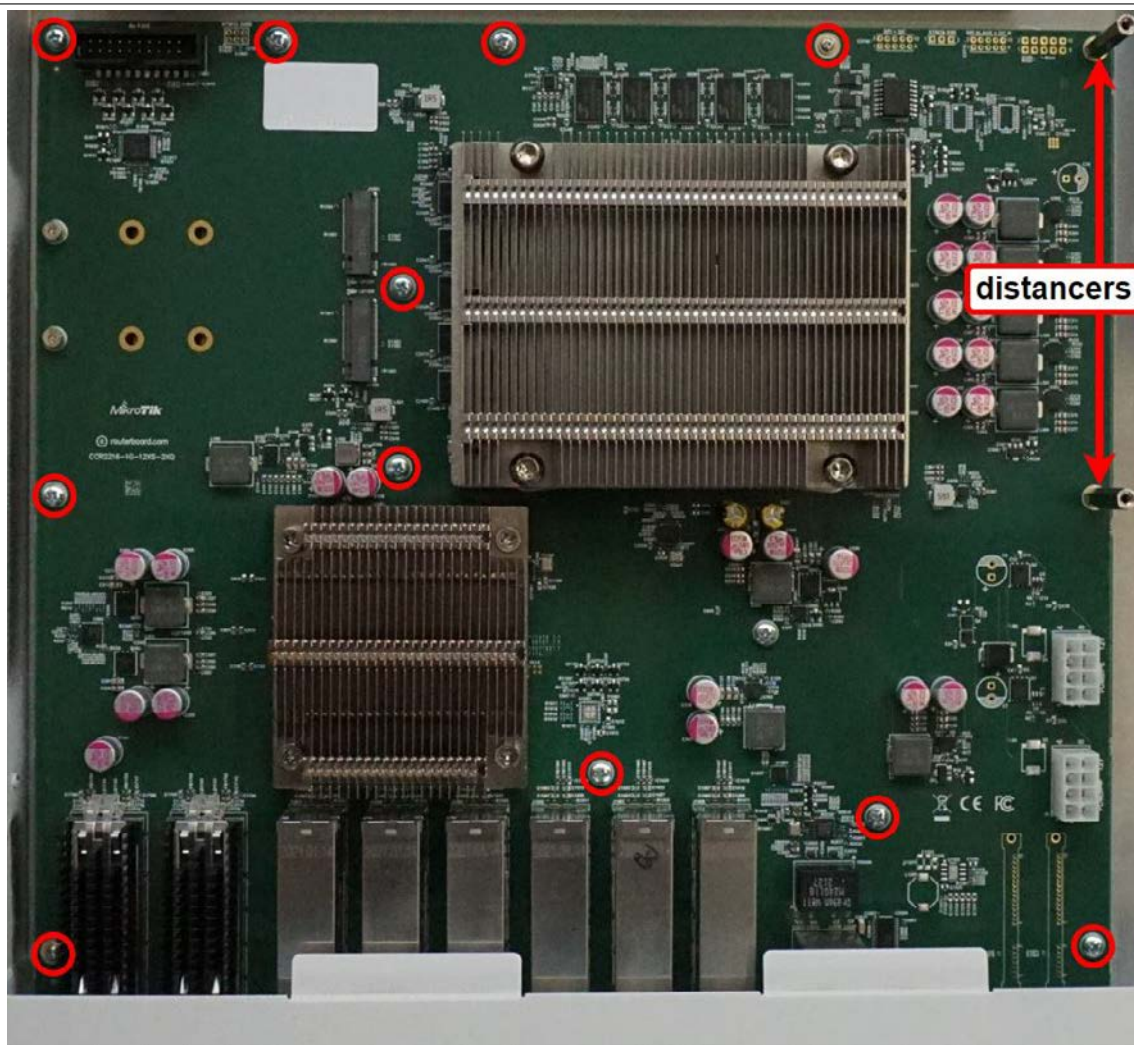
Unplug power supply connectors and gently remove the wind tunnel, see picture 272.



Picture 272

Step 4:

Using 5.5 mm Hex Nut Driver unscrew 2 distancers and using Phillips PH1 unscrew 11 screws, see picture 273.

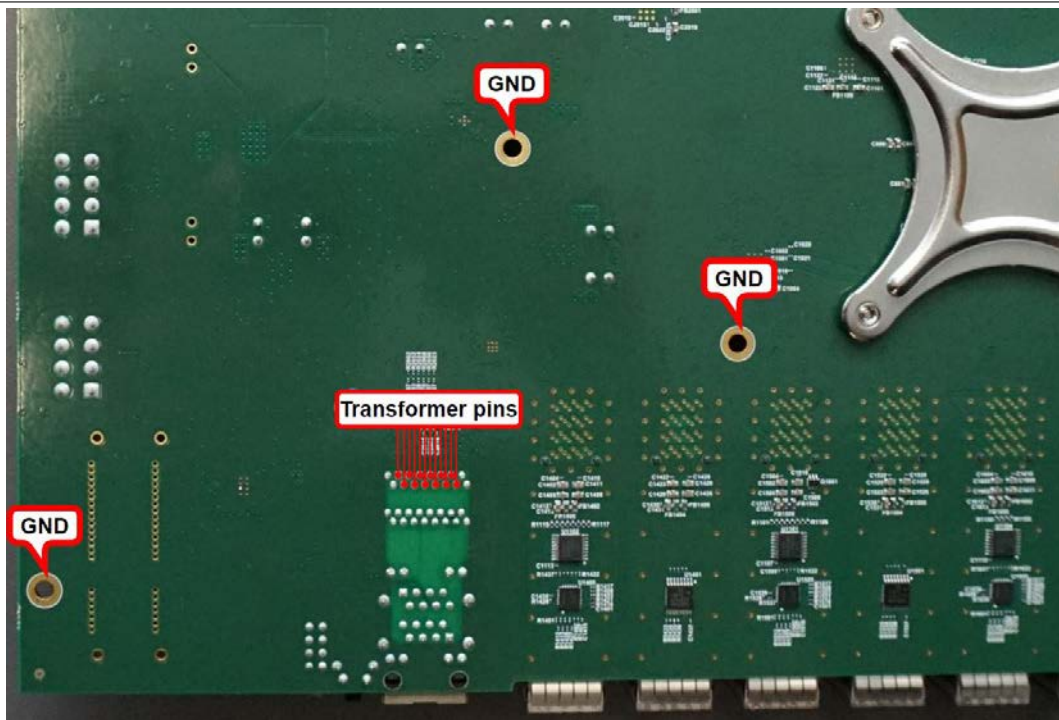


Picture 273

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

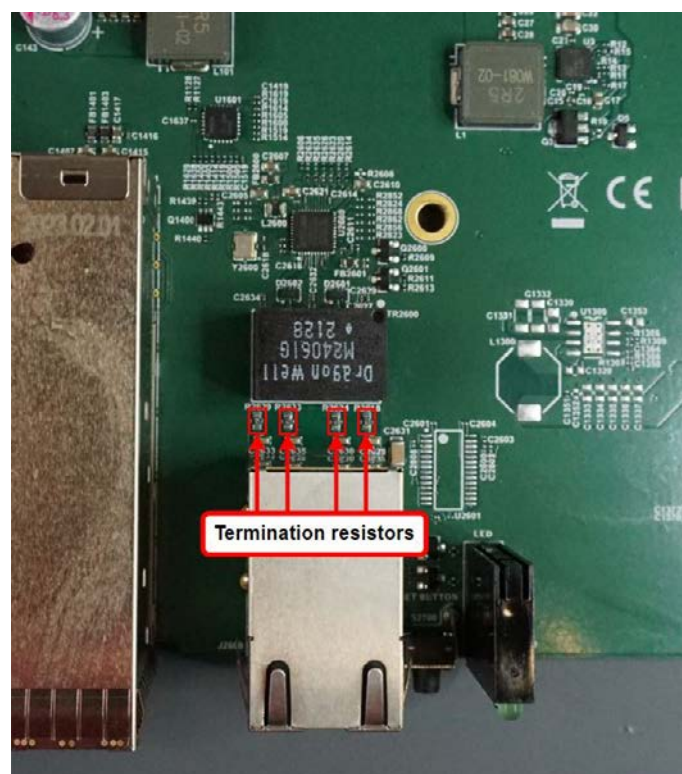
Check voltage drop value between Ethernet transformer TR2600 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 274. Voltage drop value should be in the range from 0,45V to 0,52V. Voltage drop measurement method is described on page 22.



Picture 274

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 275.



Picture 275

ROSE DATA SERVER (RDS)

RDS2216-2XG-4S+4XS-2XQ



Picture 276

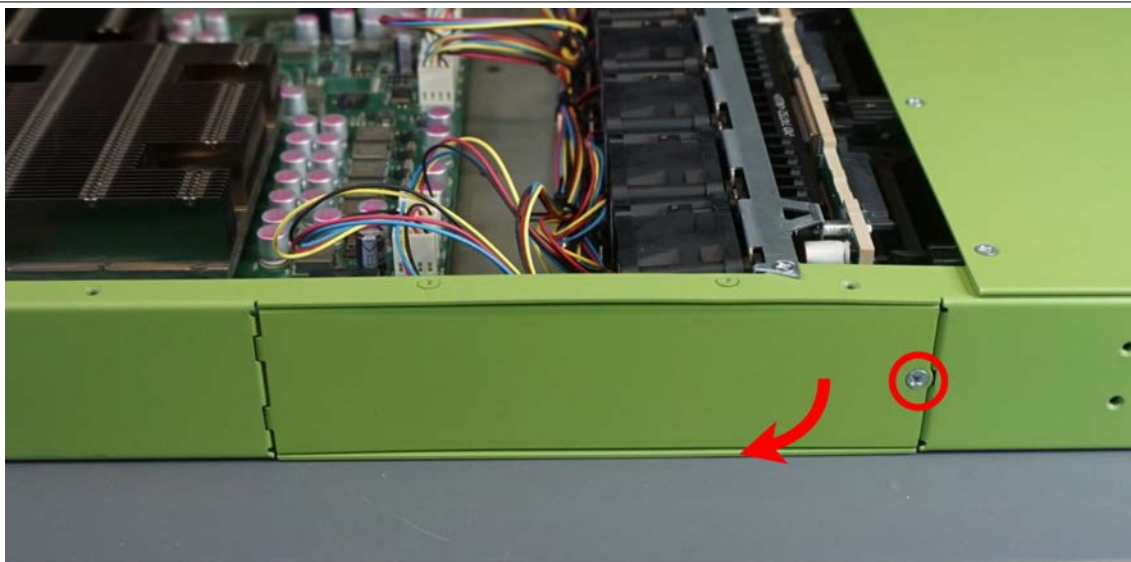
Disassembling information

Step 1: Unscrew 12 screws using Phillips PH2 screwdriver and carefully remove the cover. Location of the screws you can see in the picture 277.



Picture 277

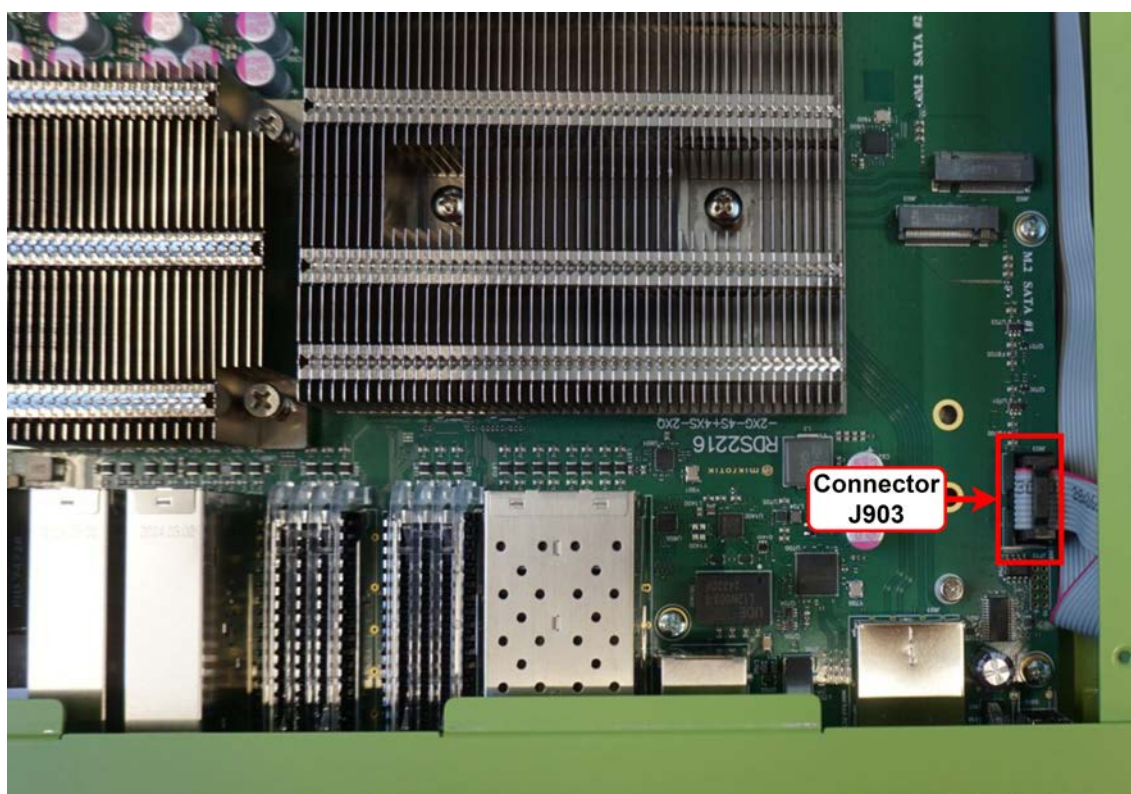
Step 2: Using Philips PH2 screwdriver unscrew the screw which is on the right side of the case and carefully remove the side cover, see picture 278.



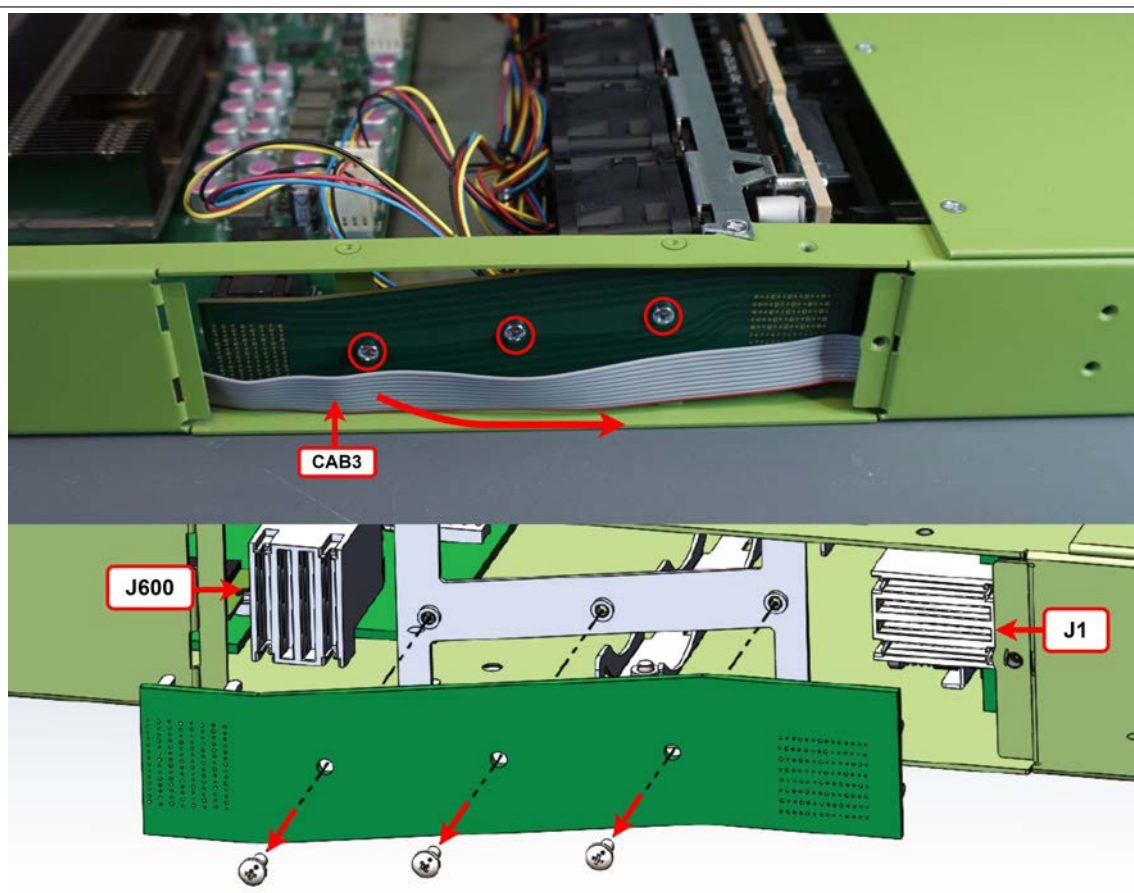
Picture 278

Step 3: Disconnect the cable CAB1 from the connector J903 and pull the cable through the side hole, see pictures 279 and 280.

Step 4: Using Philips PH2 screwdriver unscrew three screws and carefully disconnect the linking board from two connectors J600 and J1, see picture 280.



Picture 279



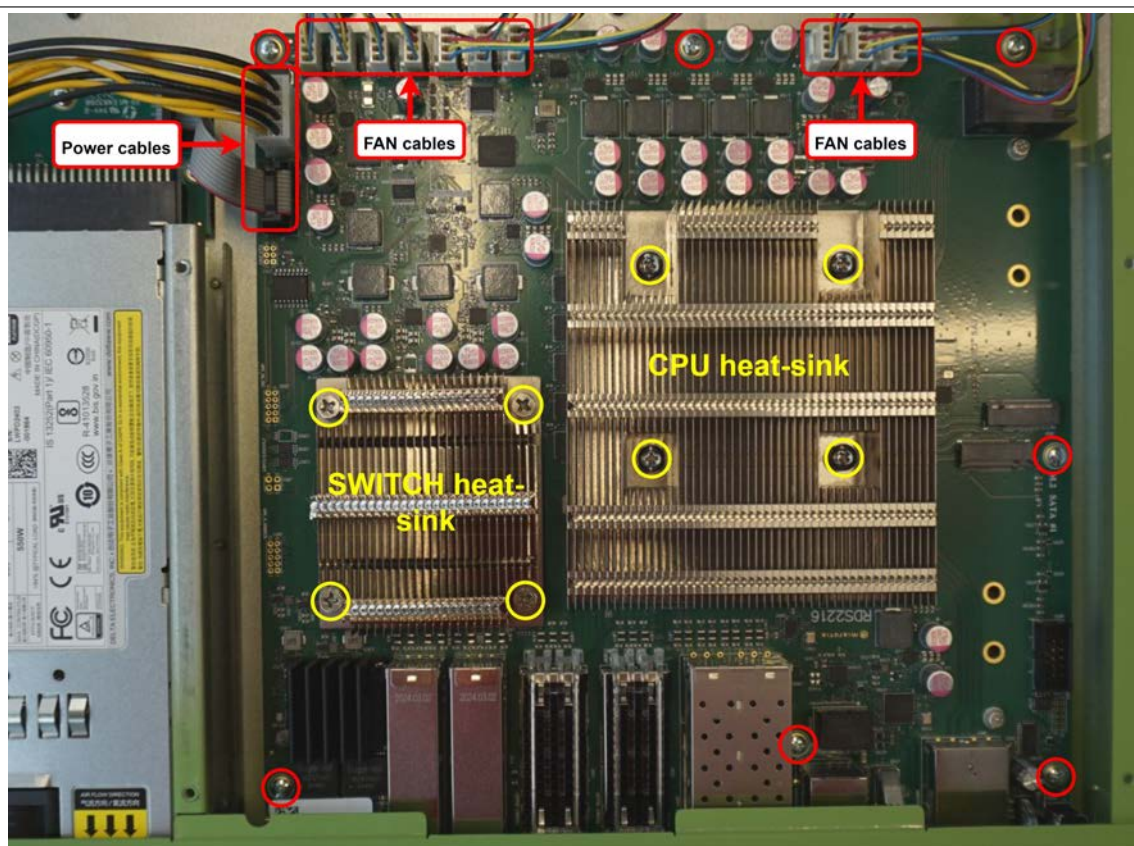
Picture 280

Step 5: Disconnect all power and FAN cables. Location of the cables you can see the picture [281](#).

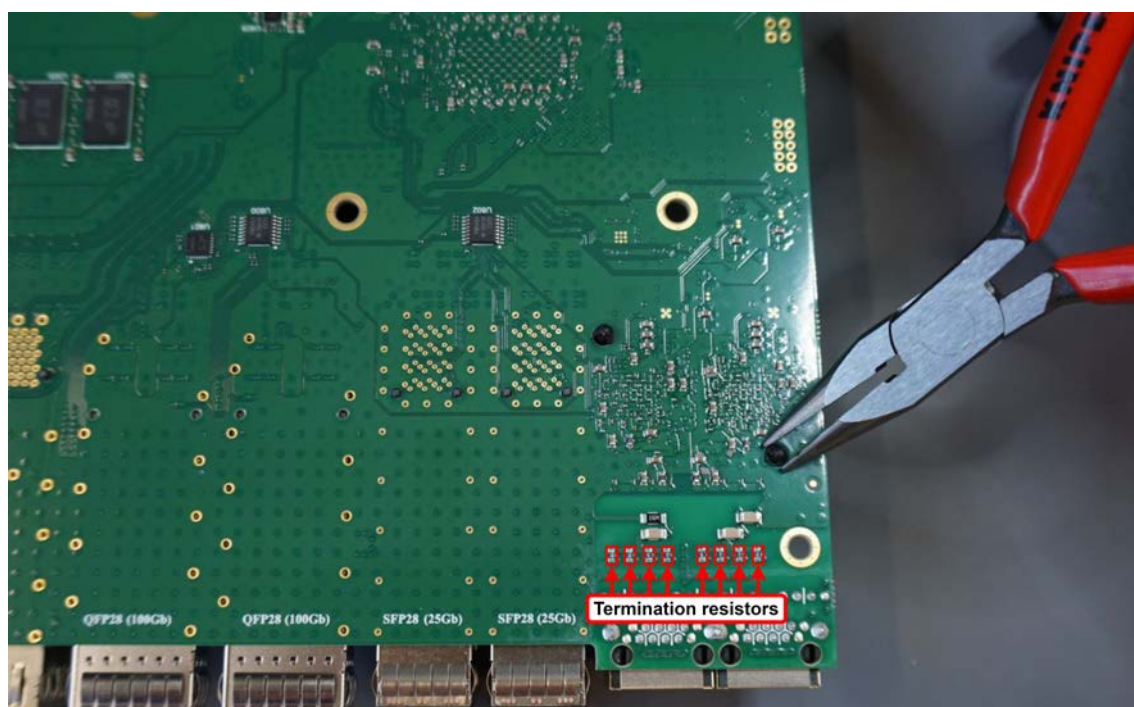
Step 6: Using Philips PH2 screwdriver unscrew eight screws which hold CPU and SWITCH heat-sinks, after that remove the heat-sinks. The screws are circled in yellow, see picture [281](#).

Step 7: Using Philips PH2 screwdriver unscrew seven screws that are circled in red and remove PCB from the case, see picture [281](#).

Step 8: Turn the PCB over and using pliers gently squeeze heat sink mount clips such that they fall through the holes, see picture [282](#).



Picture 281

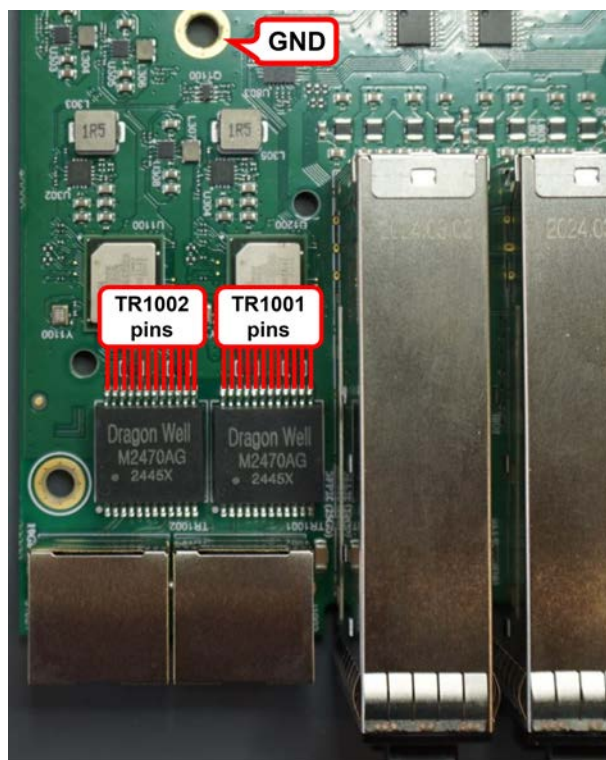


Picture 282

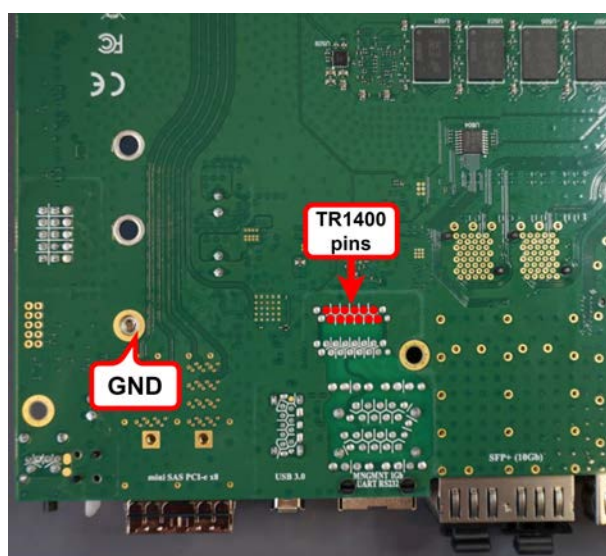
Checking procedure for over-voltage

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR1001, TR1002, TR1400 pins and GND. Test points you can see in picture 283 and 284. Voltage drop value should be in the range from 0,40V to 0,50V. Voltage drop measurement method is described on page 22.



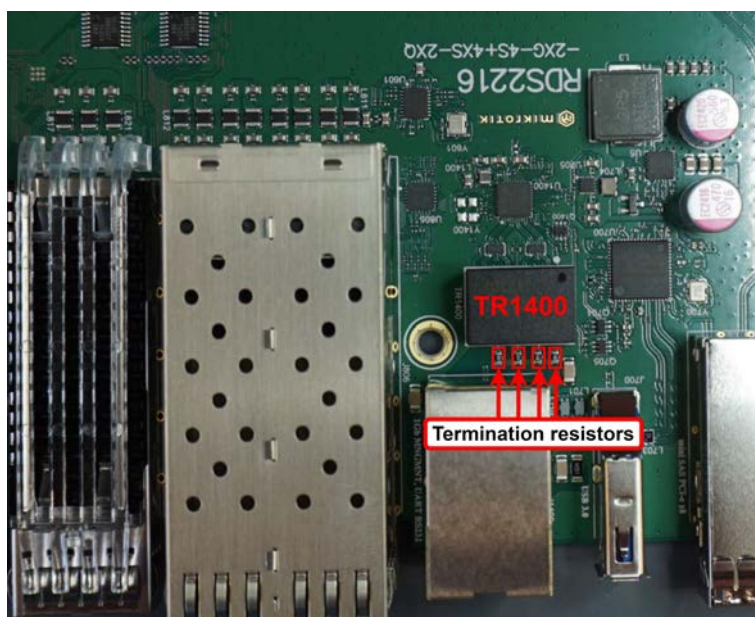
Picture 283



Picture 284

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 2%. Location of resistors is shown in picture 282 and 285.



Picture 285

CLOUD SMART SWITCH 318 SERIES ROUTERBOARD

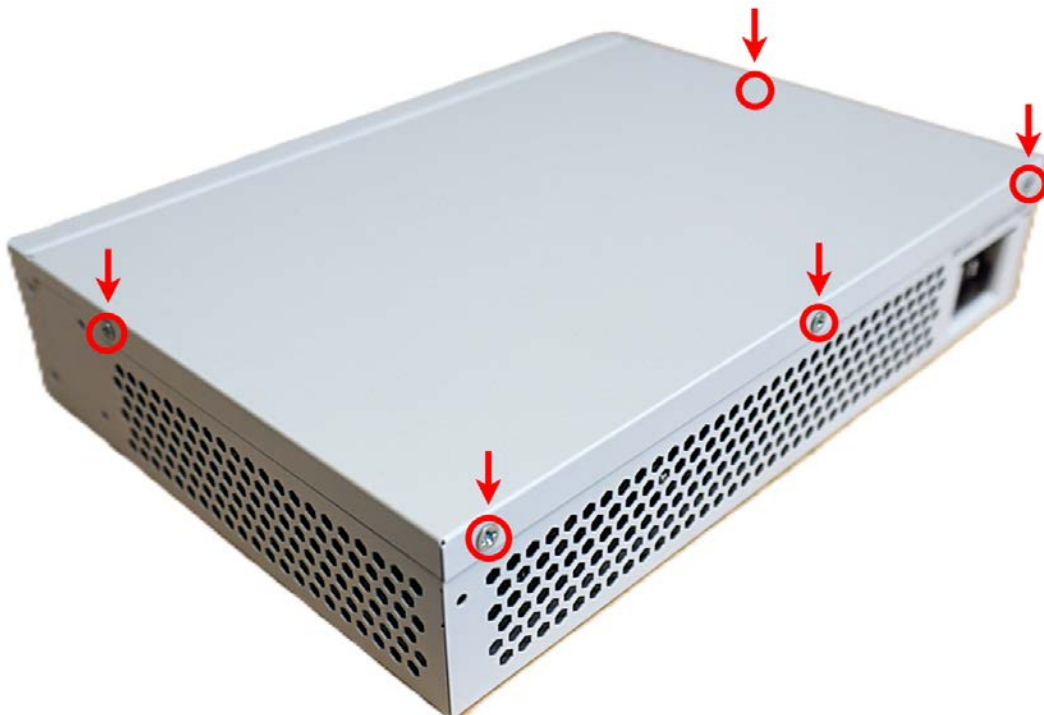
CSS318-16G-2S+



Picture 286

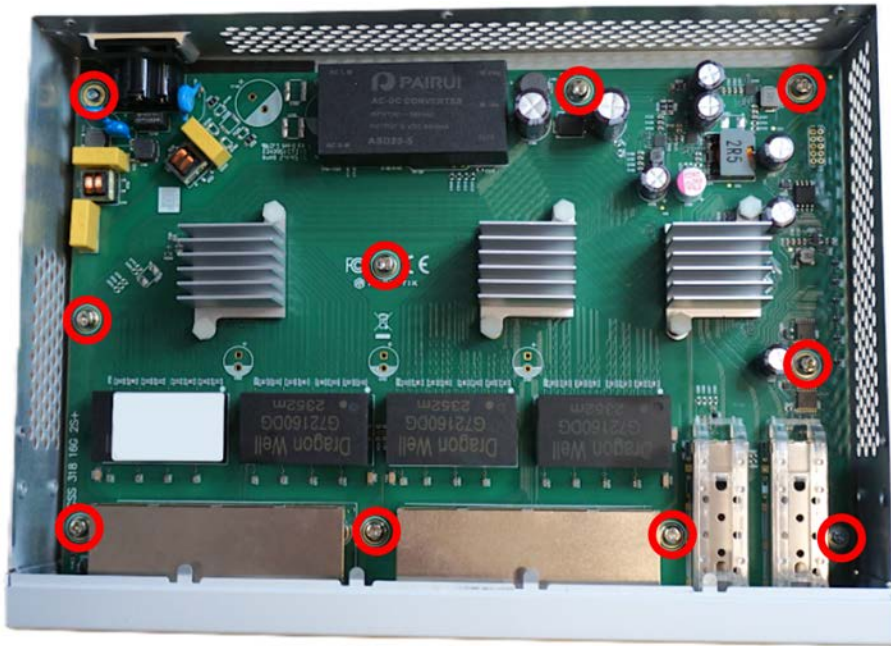
Disassembling information

Step 1: Unscrew 5 screws using a PH2 screwdriver and carefully remove the cover. Location of the screws is shown in the picture [287](#).



Picture 287

Step 2: Unscrew 10 screws using a PH1 screwdriver and gently remove board from the case. Location of the screws and connectors is shown in the picture [288](#).



Picture 288

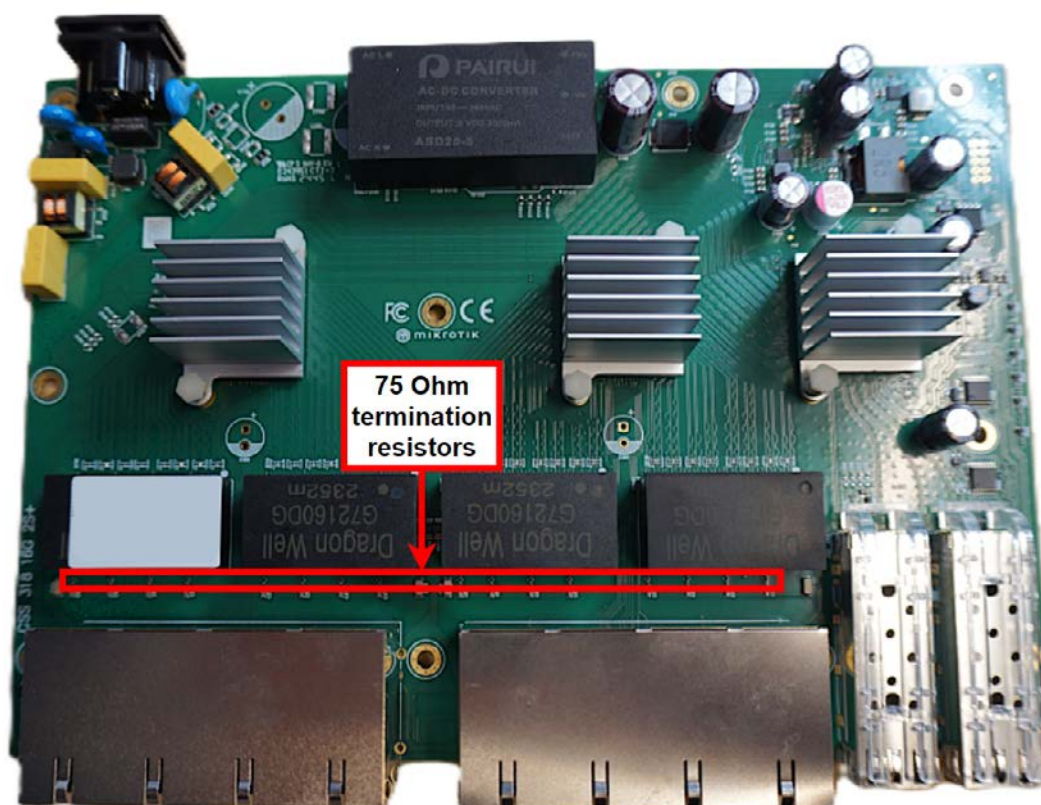
Checking procedure for over-voltage

Checking 75 Ohm termination resistors resistance

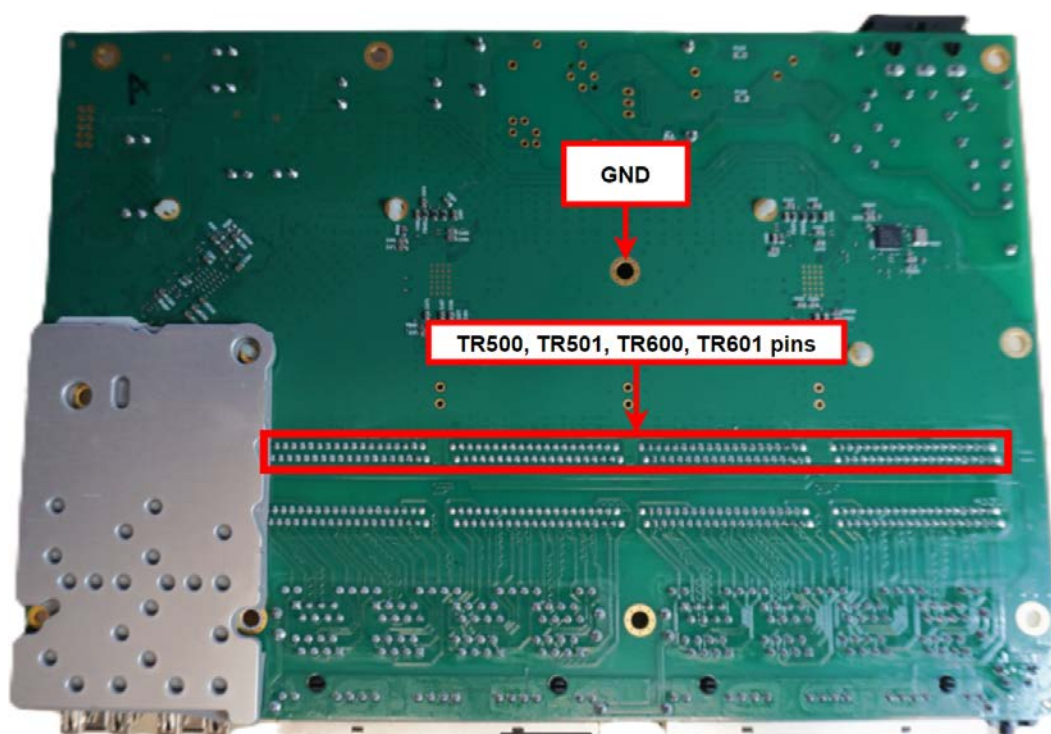
Check value of each termination resistors. It should be $75 \pm 1\%$ Ohms. Location of resistors is shown in picture [289](#).

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR500, TR501, TR600, TR601 pins and Ground. Test points you can see in the picture [??](#). The voltage drop of the TR500, TR501, TR600, TR601 transformers should be in the range from 0,25V to 0,35V. Voltage drop measurement method is described on page [22](#).



Picture 289



Picture 290

CLOUD SMART SWITCH 606 SERIES ROUTERBOARDS

GPER_x6 (CSS606-1G-2Gi-3S+OUT)

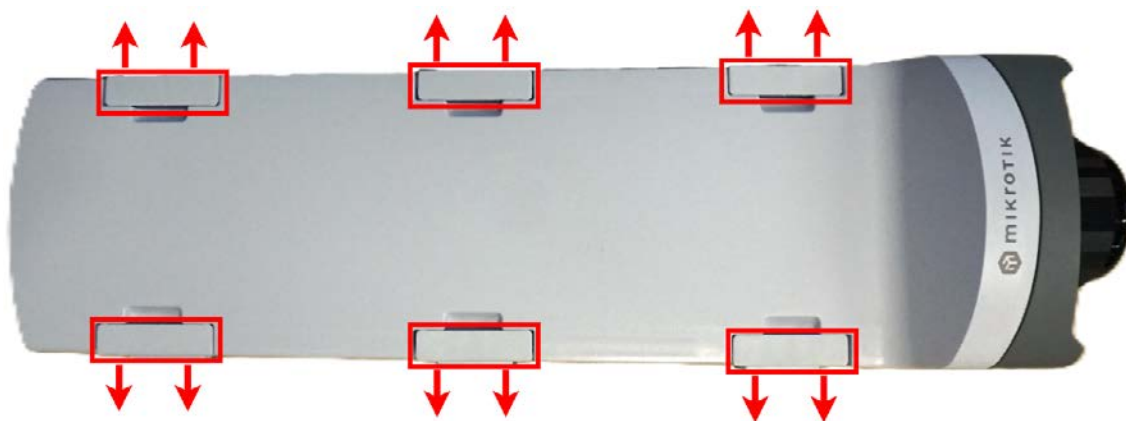


Picture 291

Disassembling information

Step 1:

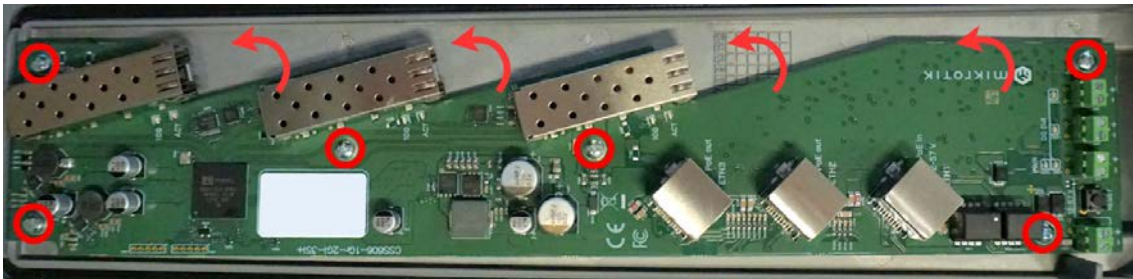
Open the latches as shown in picture 292. Unhook 3 upper latches to release the cover.



Picture 292

Step 2:

Unscrew 6 screws using a Phillips PH1 screwdriver and gently unstick the Printed Circuit Board from the case by pulling the upper side of the PCB, see picture 293. DO NOT try to pull from the left or right sides, you may brake or damage the PCB.

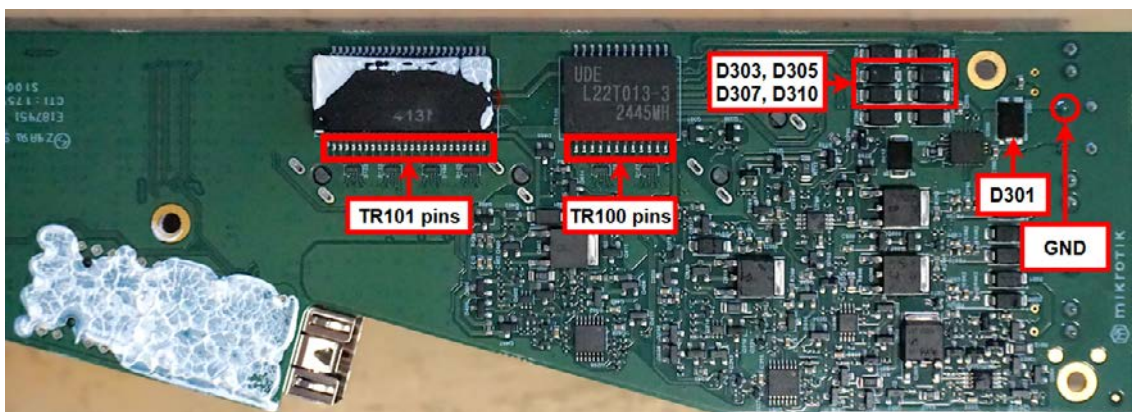


Picture 293

Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D303, D305, D307, D310 and D301. Location of the diodes you can see in the picture 294. Schottky diode quality measurement method is described on page 19.



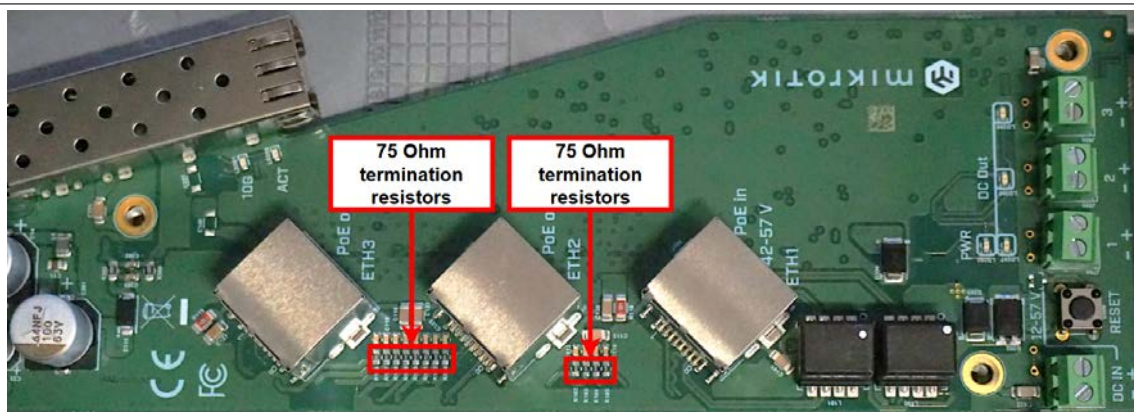
Picture 294

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR100, TR101 pins and Ground, see picture 294. Voltage drop value should be in the range from 0,30V to 0,60V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of the termination resistors is shown in picture 295.



Picture 295

CLOUD SMART SWITCH 610 SERIES ROUTERBOARDS

CSS610-8P-2S+IN



Picture 296

Disassembling information

Warning!!!

The board contains internal open frame PSU, before disassembly disconnect the routerboard power from mains and wait about 15 minutes, to allow the PSU capacitors to discharge!

Step 1:

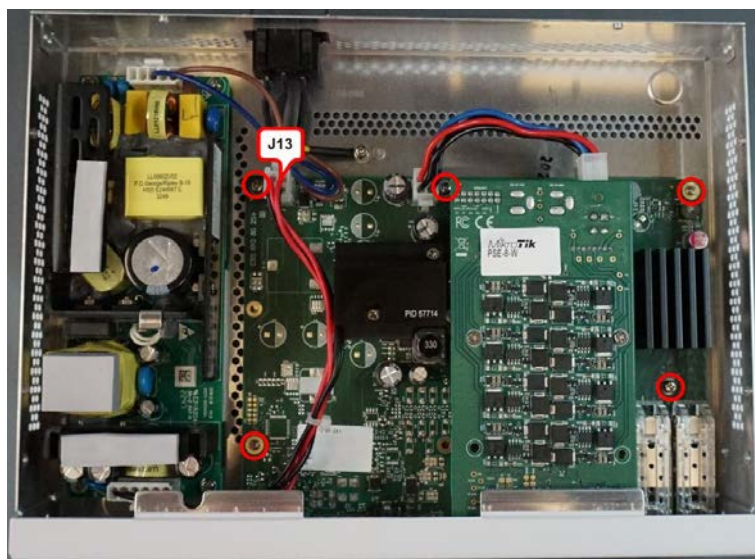
Using Phillips PH2 screwdriver unscrew 6 side screws and remove the cover, see picture 297.



Picture 297

Step 2:

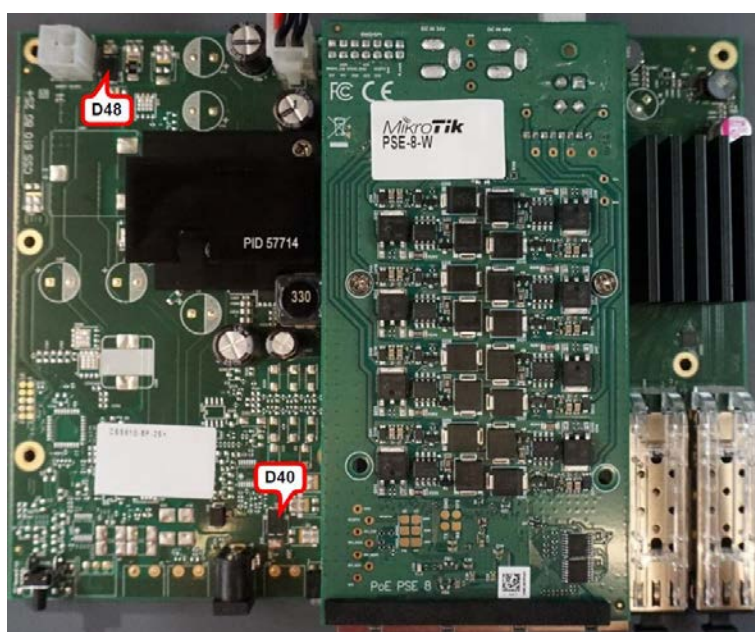
Disconnect from the board the connector J13 and using Phillips PH1 screwdriver unscrew 5 screws, see picture 298.



Picture 298

Instructions for checking overvoltage**Checking Schottky diodes**

Check Schottky diodes D40, D48. Location of the diodes you can see in the picture 299. Schottky diode quality measurement method is described on page 19.



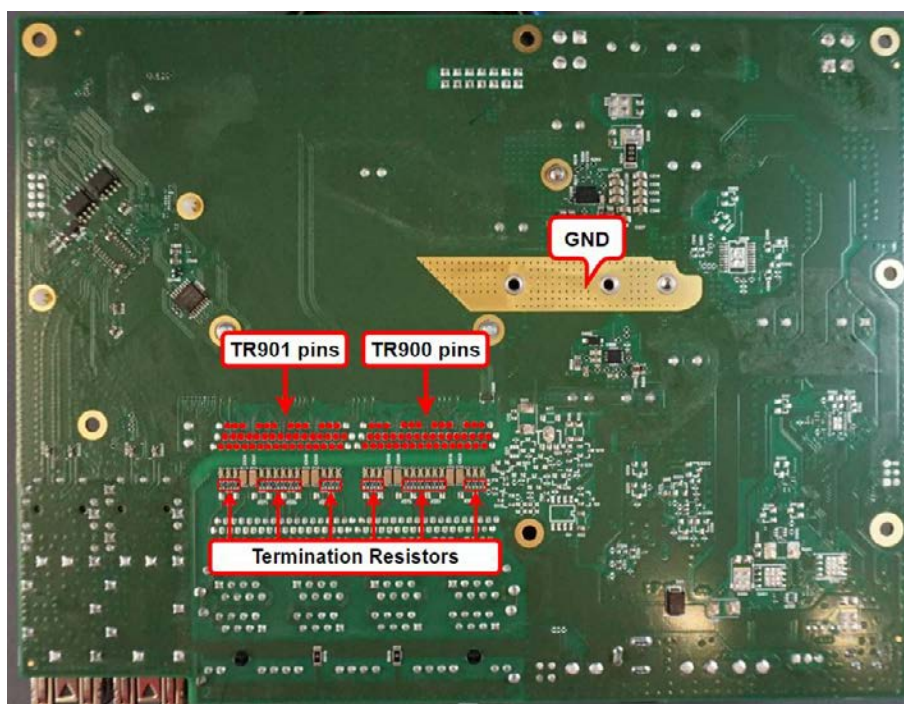
Picture 299

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR900, TR901 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 300. Voltage drop value should be in the range from 0,32V to 0,55V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of the termination resistors is shown in picture 300.



Picture 300

netPower Lite 8P (CSS610-8P-2S+OUT)



Picture 301

Disassembling information

Step 1:

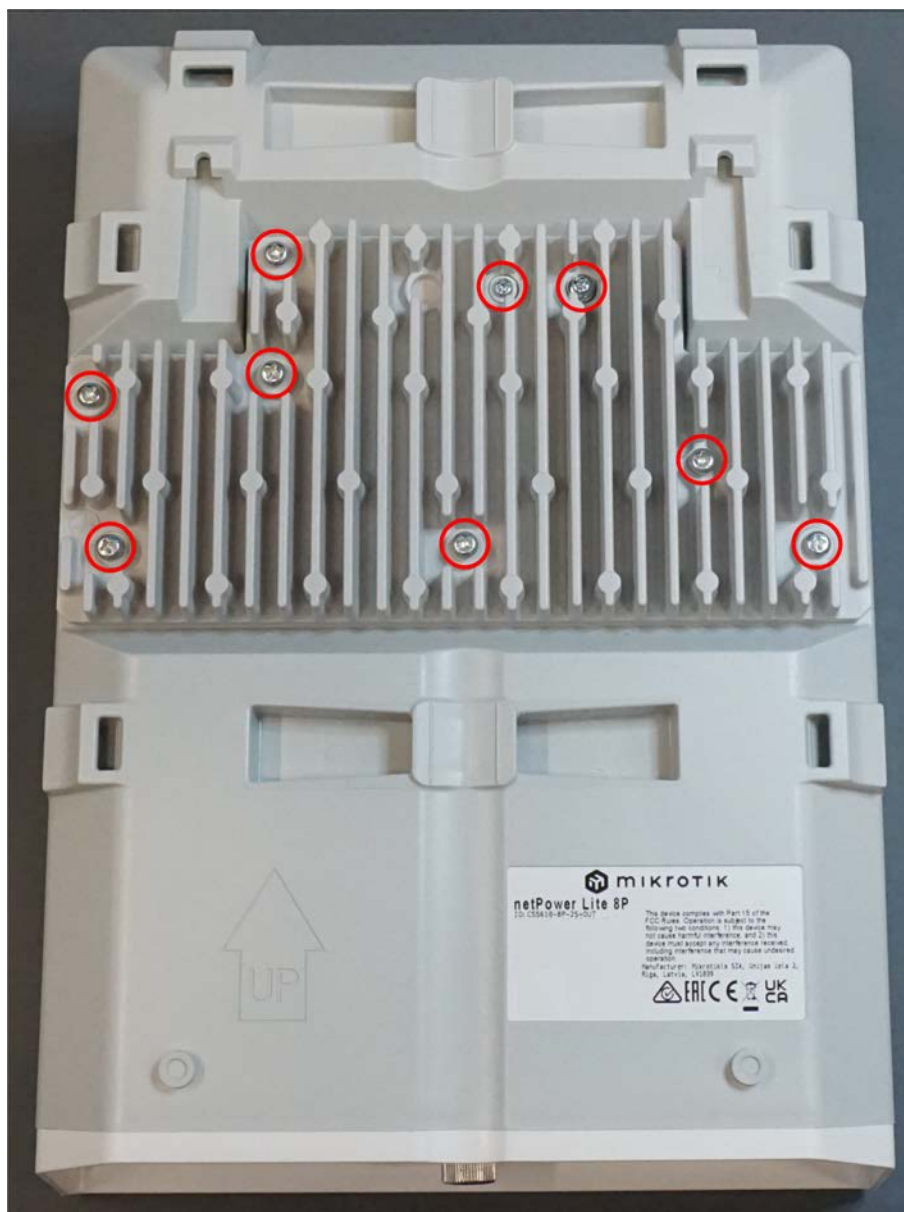
Using a Philips PH1 screwdriver, unscrew 12 screws and carefully remove the front heat-sink, see picture [302](#).



Picture 302

Step 2:

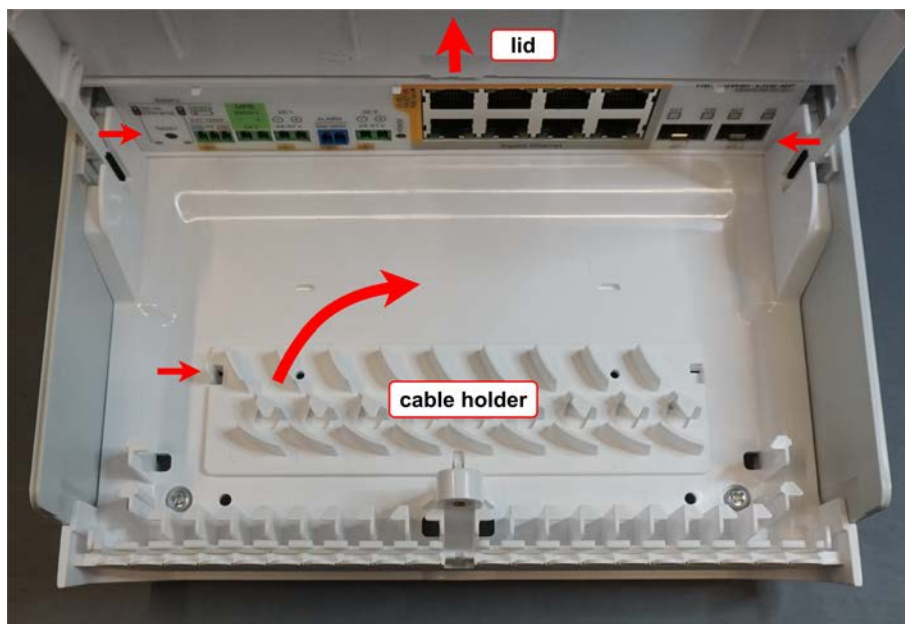
Using a Phillips PH2 screwdriver, unscrew 9 screws and carefully remove the back heat-sink, see picture 303.



Picture 303

Step 3:

Open the lid and detach the lid from the case, see picture 304. Carefully pressing the snap-fit latch inward, remove the cable holder, see picture 304.



Picture 304

Step 4:

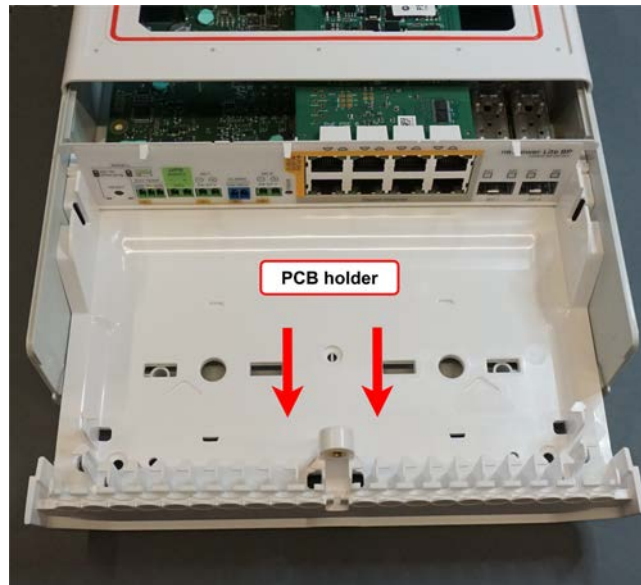
Using a Philips PH2 screwdriver, unscrew three screws, see picture 305.



Picture 305

Step 5:

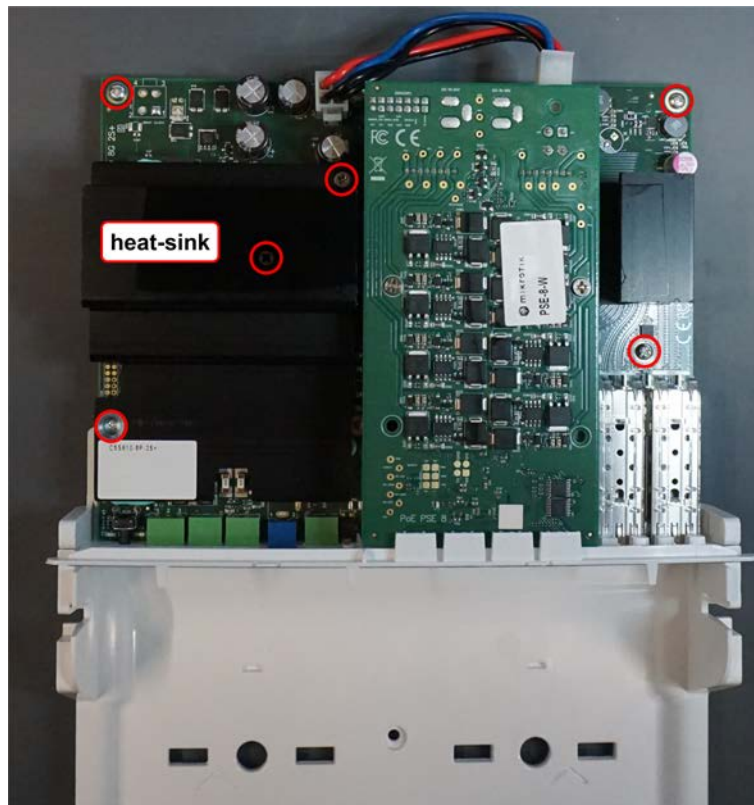
Gently pull the PCB holder from the case, as shown in the picture 306.



Picture 306

Step 6:

Using a Philips PH2 screwdriver, unscrew 6 screws and remove the heat-sink, then remove the PCB from the PCB holder, see picture 307.

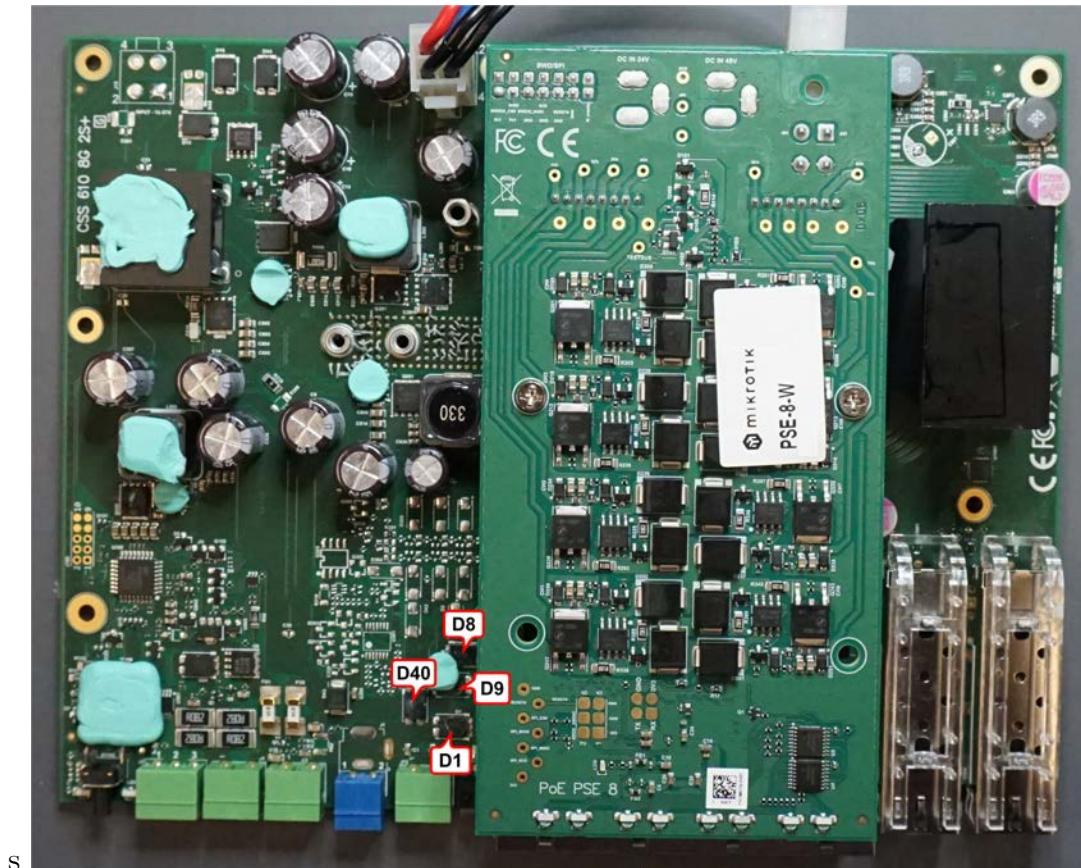


Picture 307

Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D1, D8, D9, D40. Location of the diodes you can see in the picture 308. Schottky diode quality measurement method is described on page 19.



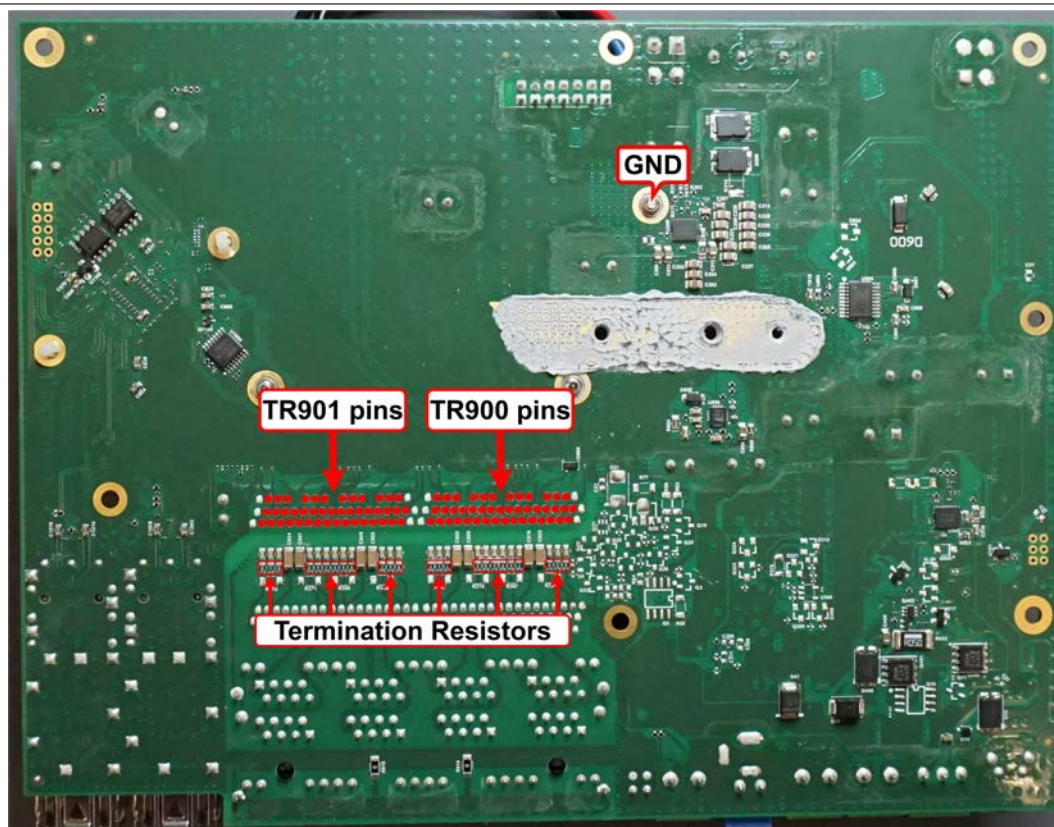
Picture 308

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR900, TR901 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 309. Voltage drop value should be in the range from 0,30V to 0,55V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of the termination resistors is shown in picture 309.



Picture 309

1100 SERIES ROUTERBOARDS

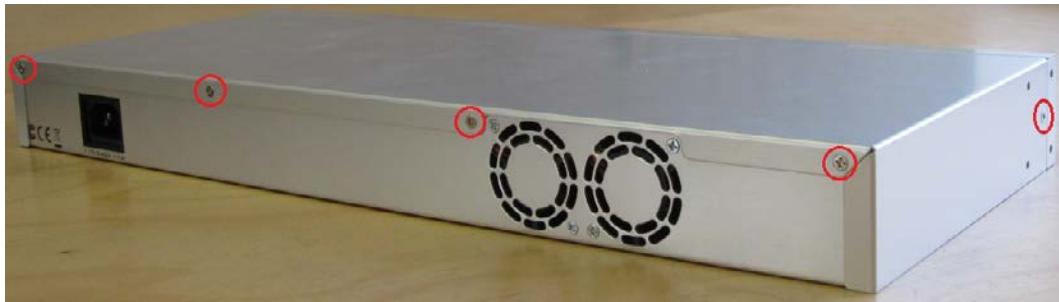
RB1100AHx2



Picture 310

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 311.



Picture 311

Step 2: Pull the cover away from you, see picture 312.



Picture 312

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 313. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

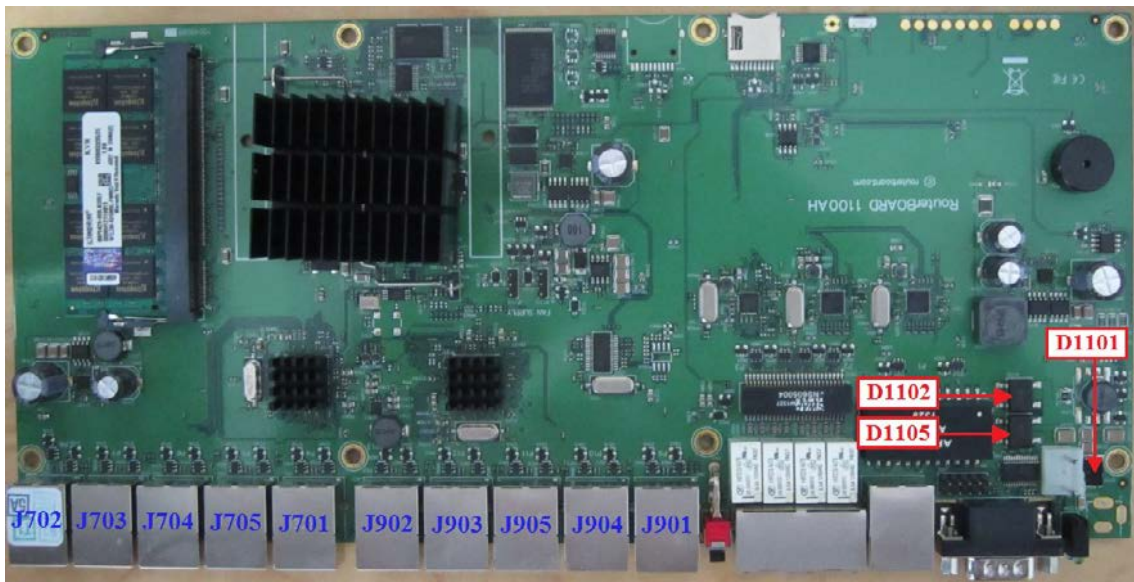
Checking voltage drop value between diode array pin#1 and Ground

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 314. Voltage drop value should be in the range from 0,3V to 0,34V. Voltage drop measurement method is described on page 21.

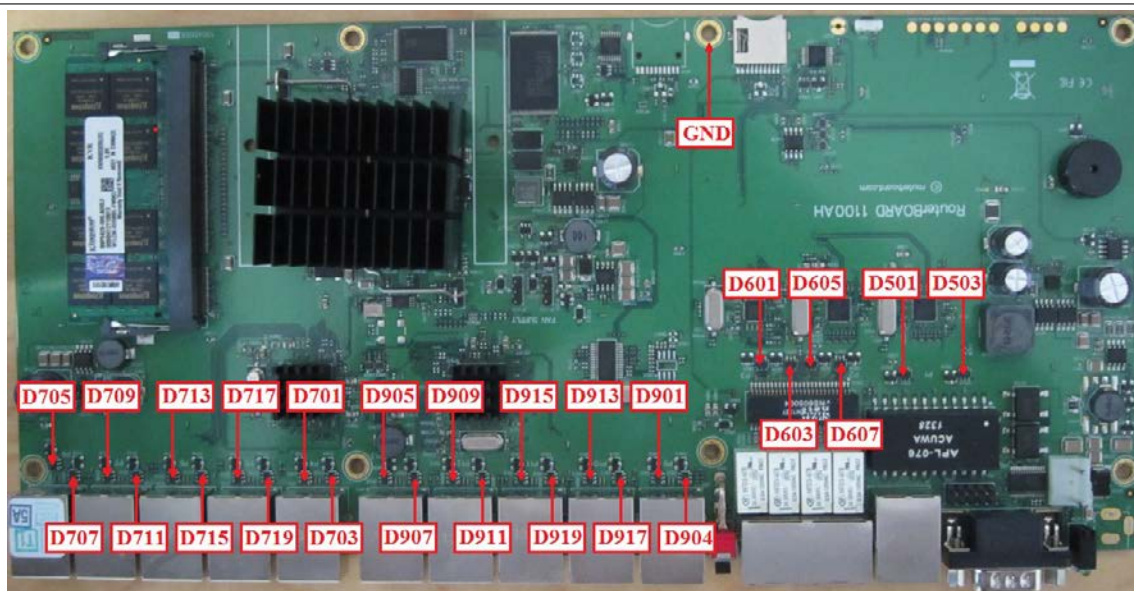
Then check voltage drop value between diode arrays D601, D603, D901, D904, D913, D917, D919, D915, D911, D909, D907, D905, D703, D701, D719, D717, D715, D713, D711, D709, D707, D705 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 314.

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 23.



Picture 313



Picture 314

2011 SERIES ROUTERBOARDS

RB2011iL-IN

RB2011iL-RM

RB2011iLS-IN

RB2011UiAS-IN

RB2011UiAS-RM

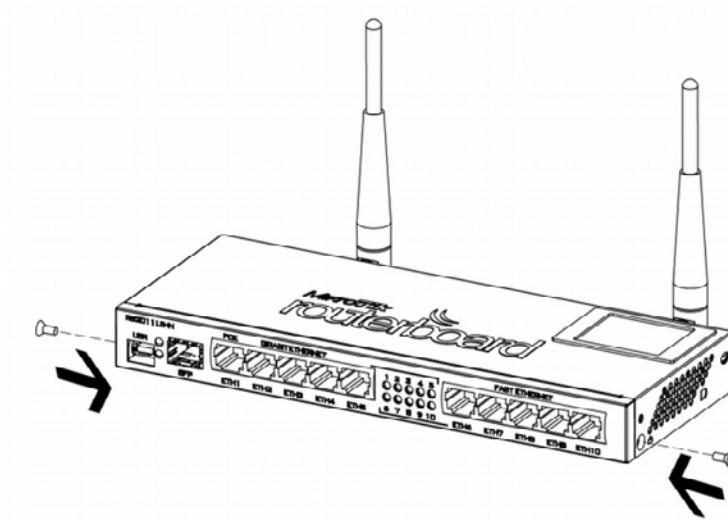
RB2011UiAS-2HnD-IN



Picture 318

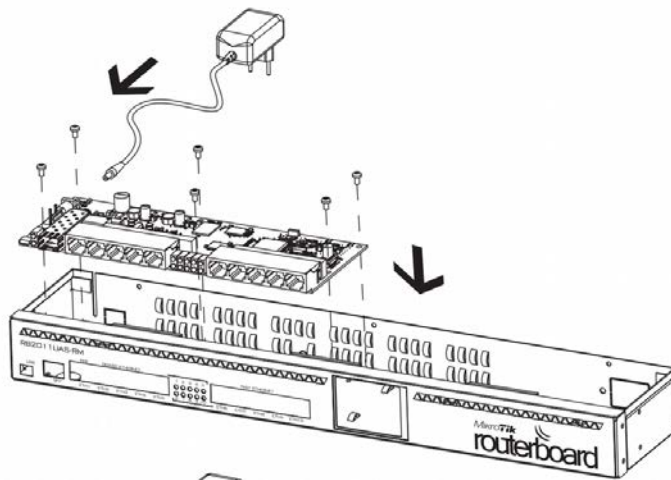
Indoor 2011 series RouterBoard disassembling information

Step 1: Unscrew 2 screws on each side of board case using PH2 screwdriver. Location of the screws you can see in the picture [319](#).



Picture 319

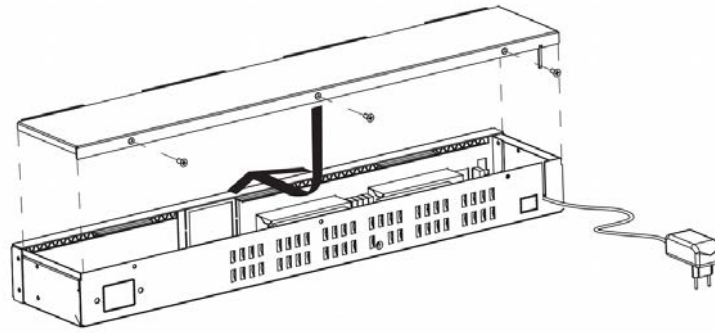
Step 2: Unscrew 6 screws which fasten PCB to routerboard case. Location of the screws you can see in the picture [320](#).



Picture 320

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 [321](#).



Picture 321

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 322. Schottky diode quality measurement method is described on page 19. 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 20.

Checking voltage drop value between Ethernet transformer pins and Ground

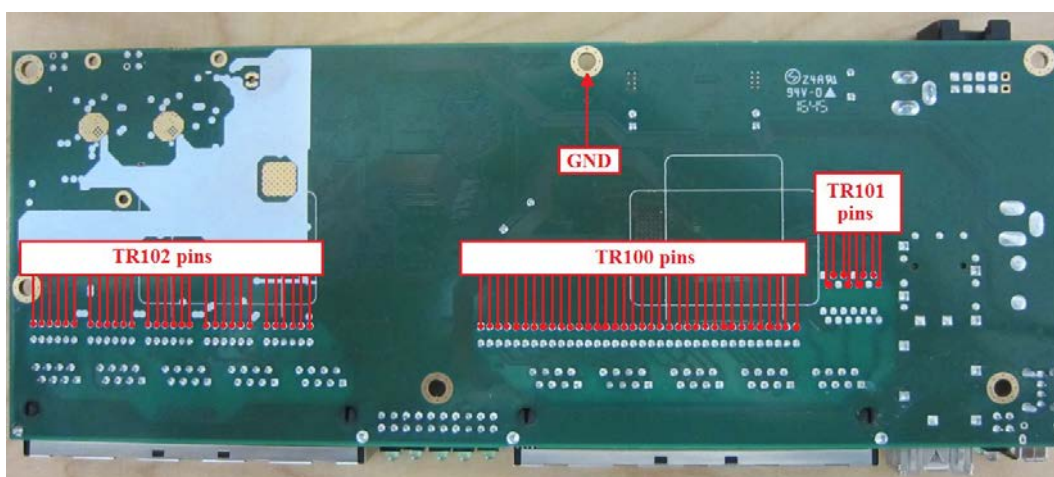
Check voltage drop value between transformer TR101 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 323. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 22.

Check voltage drop value between transformer TR100 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 323. Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described on page 22.

Check voltage drop value between transformer TR102 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 323. Voltage drop value should be in the range from 0,3V to 0,38V. Voltage drop measurement method is described on page 22.



Picture 322



Picture 323

3011 SERIES ROUTERBOARDS

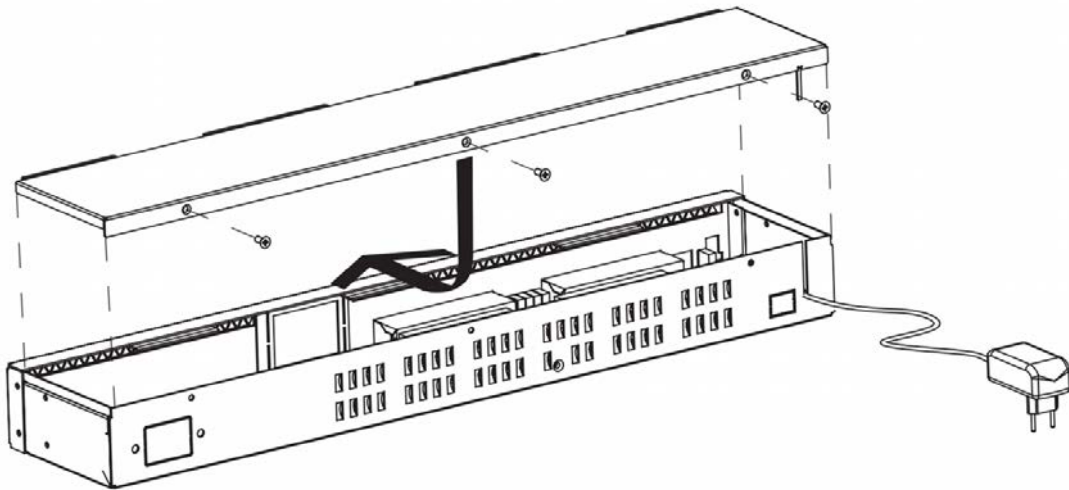
RB3011UiAS-RM



Picture 324

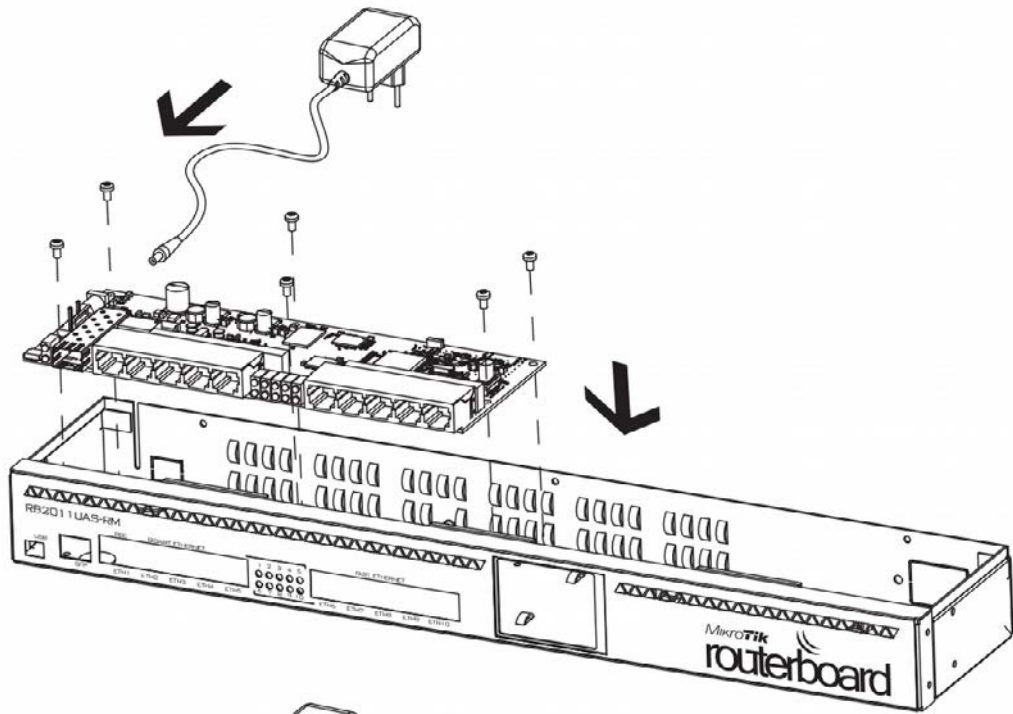
Disassembling information

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 325.



Picture 325

Step 2: Unscrew 6 screws which fasten PCB to routerboard case. Location of the screws, see picture 326.



Picture 326

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 327. Schottky diode quality measurement method is described on page 19.

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 328. Voltage drop value should be in the range from 0,4V to 0,46V. Voltage drop measurement method is described on page 22.

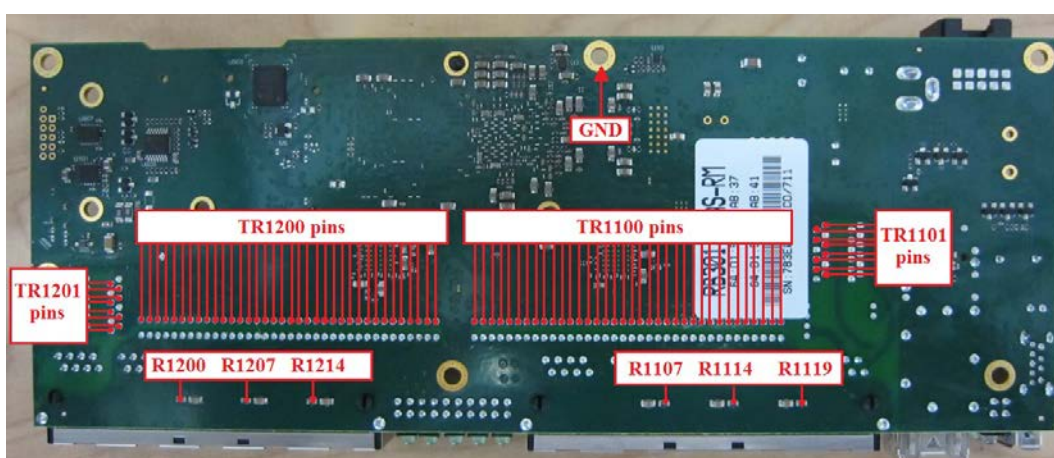
Check voltage drop value between transformer TR1100 and TR1200 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 328. Voltage drop value should be in the range from 0,34V to 0,4V. Voltage drop measurement method is described on page 22.

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 328.



Picture 327



Picture 328

4011 SERIES ROUTERBOARDS

RB4011iGS+RM

RB4011iGS+5HacQ2HnD-IN



Picture 329

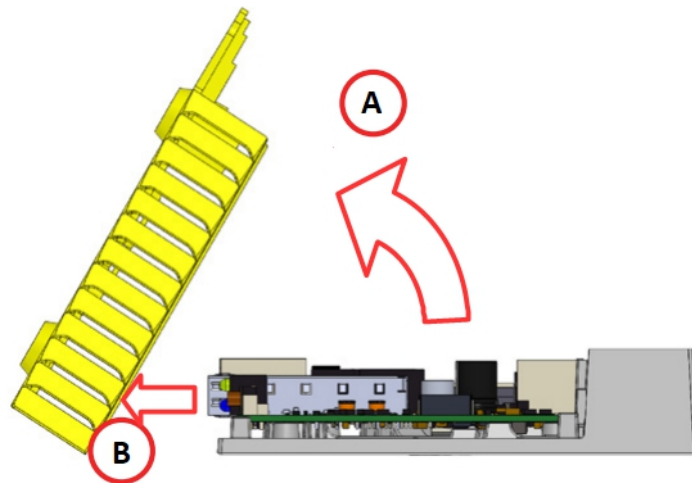
Disassembling information

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 330.



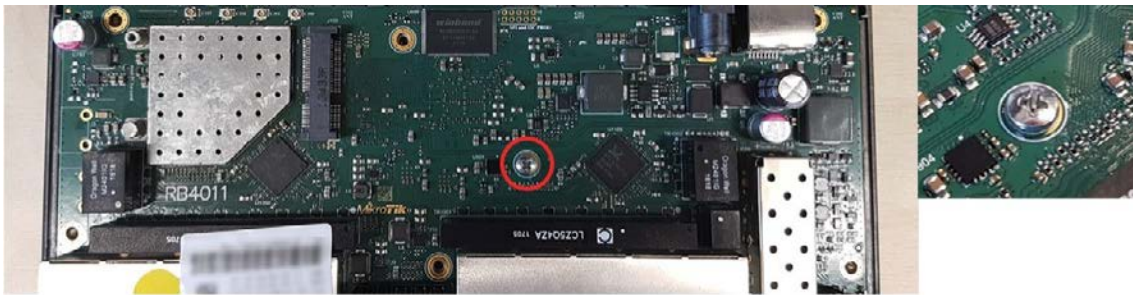
Picture 330

Step 2: Lift the plastic cover according to picture 331.

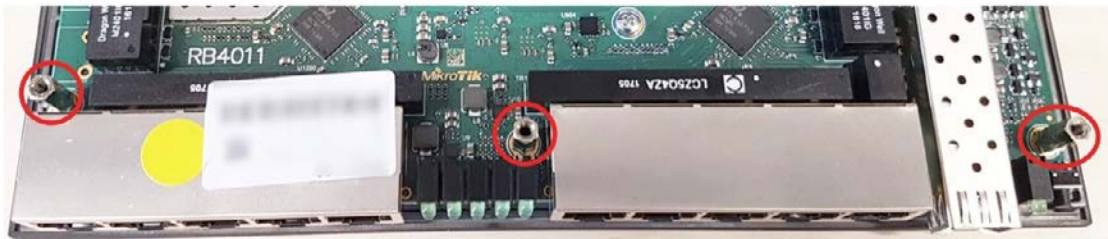


Picture 331

Step 3: Undo 3 hexagonal threaded spacers and 1 screw according to picture 332.



STEP 4
Screw in 3 pcs., "HEX SPACERS" [7]. Screwing torque 0,6 Nm.



Picture 332

Instructions for checking overvoltage

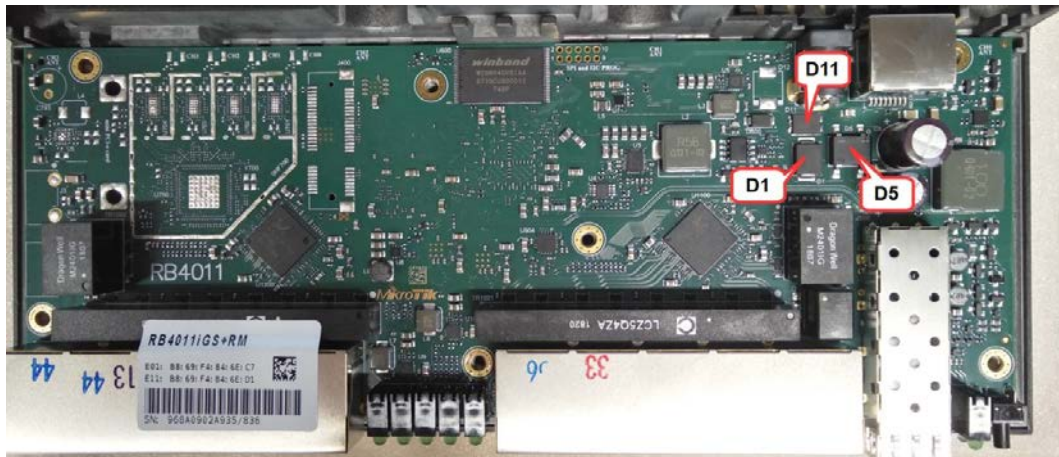
Checking Schottky diode and diodes bridges

Check Schottky diodes D11, D1 and diode bridge D5. Location of diodes on the board you can see in the picture 333. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

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 334. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 22.

Check voltage drop value between Transformer TR1001, TR1000 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 334. Voltage drop value should be in the range from 0,34V to 0,4V. Voltage drop measurement method is described on page 22.



Picture 333



Picture 334

5009 SERIES ROUTERBOARDS

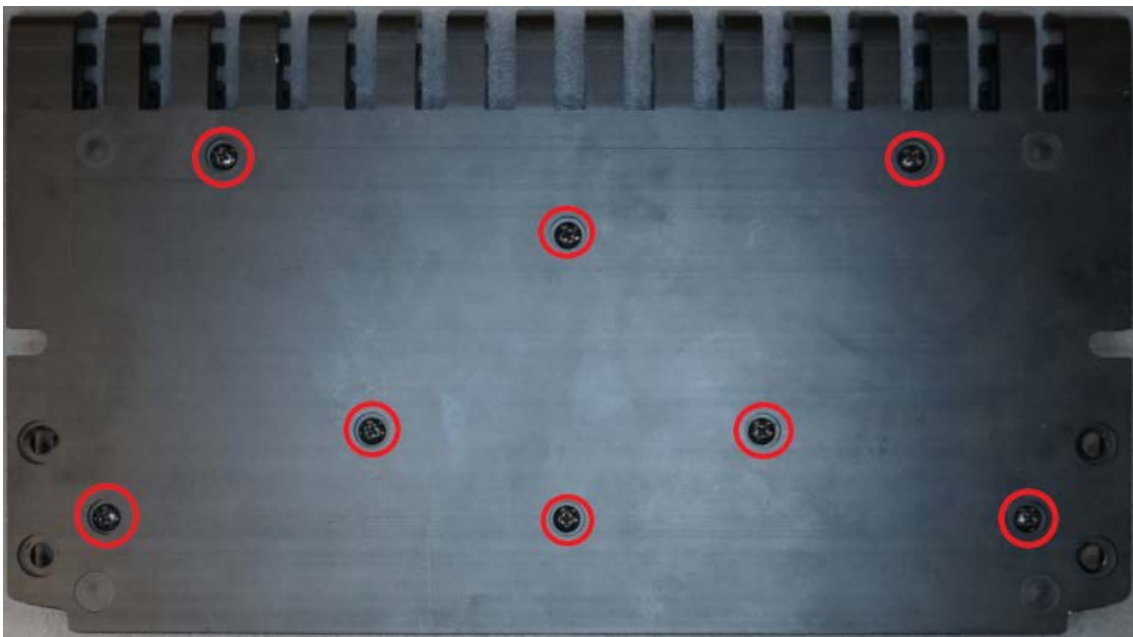
RB5009UG+S+IN



Picture 335

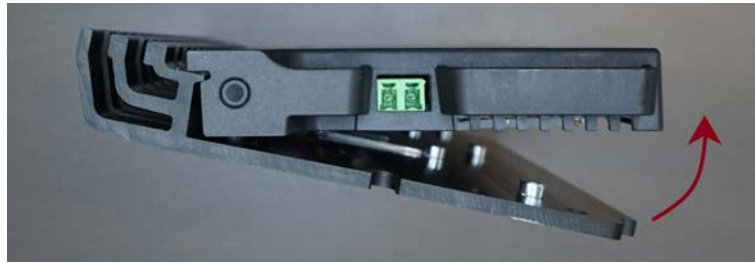
Disassembling information

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 [336](#).



Picture 336

Step 2: Lift the plastic cover according to picture 337.



Picture 337

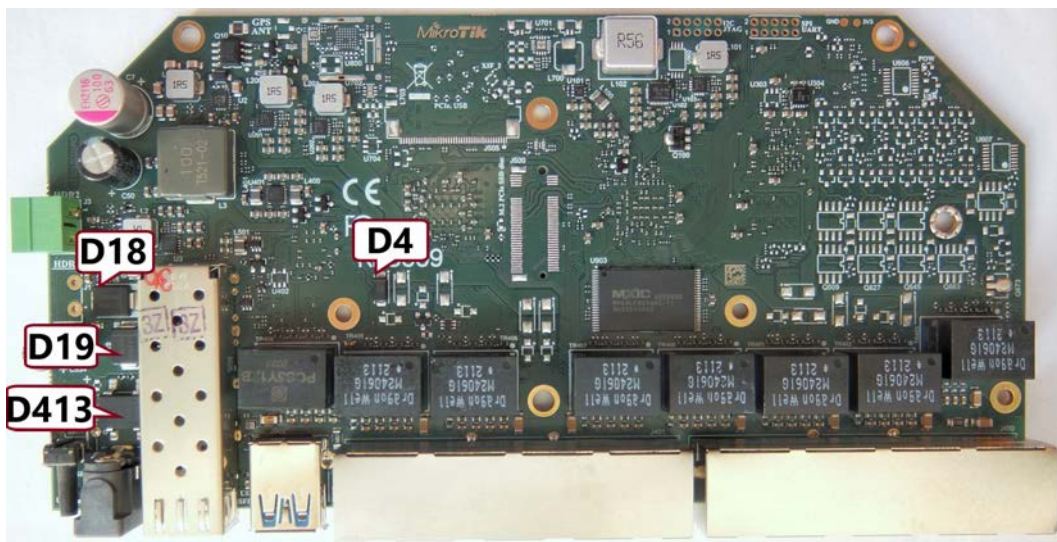
Instructions for checking overvoltage

Checking Schottky diode and diodes bridges

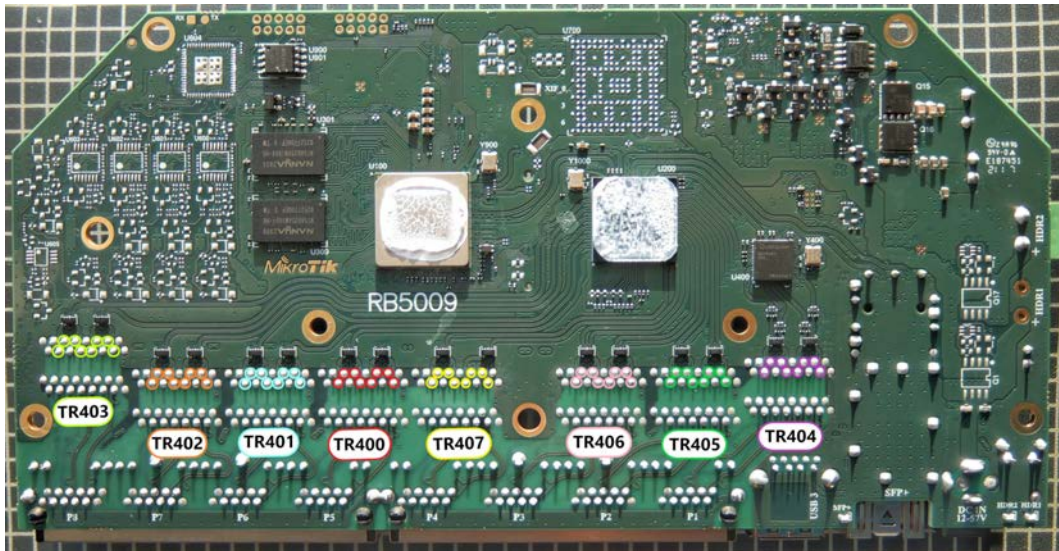
Check Schottky diodes D4, D18, D19 and diode bridge D413. Location of diodes on the board you can see in the picture 338. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

Checking voltage drop value between Ethernet transformer pins and Ground

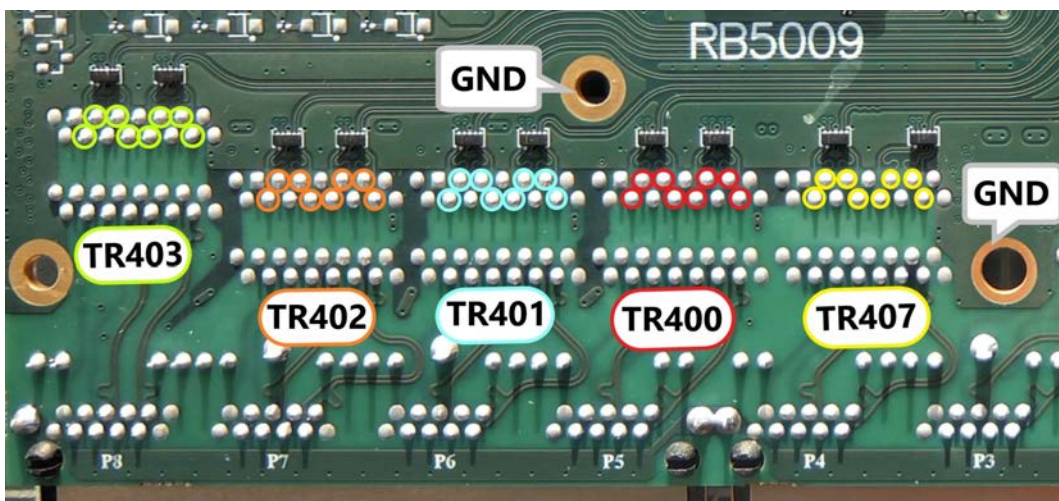
Check voltage drop value between transformers' TR400, TR401, TR402, TR403, TR404, TR405, TR406, TR407 pins and Ground (GND). Test points on the transformers' pins are marked with colored circles, see pictures 339 , 340 , 341. Voltage drop value should be in the range from 0,34V to 0,57V. Voltage drop measurement method is described on page 22.



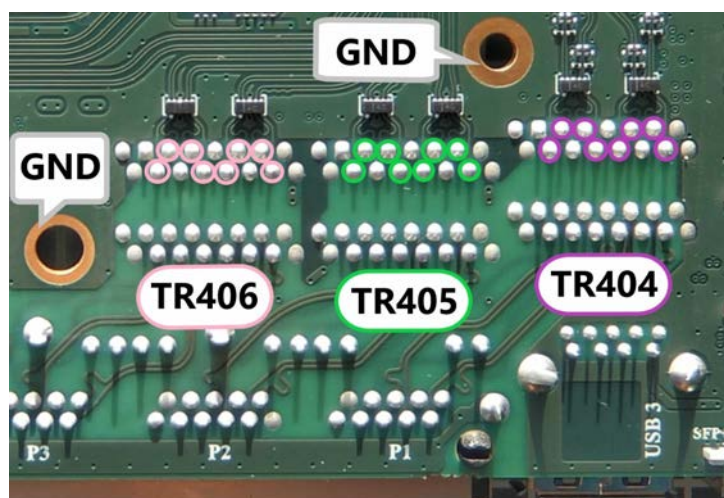
Picture 338



Picture 339



Picture 340



Picture 341

RB5009UPr+S+IN



Picture 342

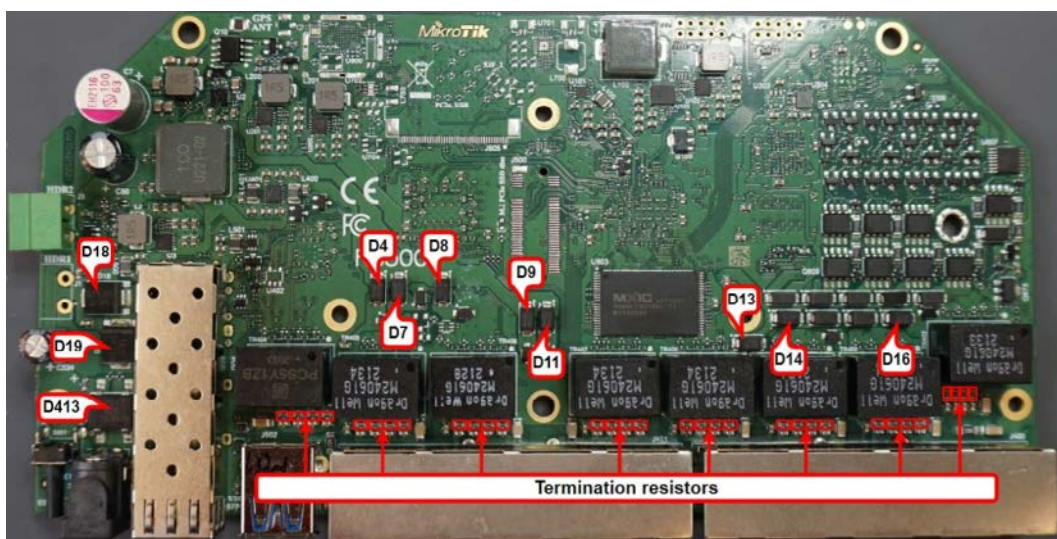
Disassembling information

Step 1:

Disassembly method of the board is the same as the RB5009UG+S+IN board. Disassembly method is described on page [335](#).

Checking Schottky diode and diodes bridges

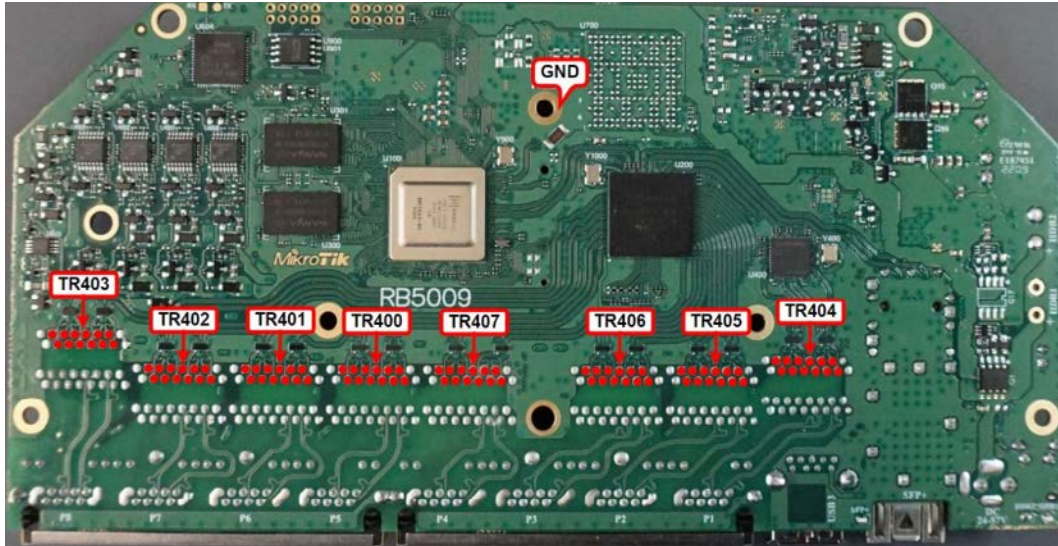
Check Schottky diodes D4, D7, D8, D9, D11, D13, D14, D16, D18, D19 and diode bridge D413. Location of diodes on the board you can see in the picture [343](#). Schottky diode quality measurement method is described on page [19](#). Diode bridge quality measurement method is described on page [20](#).



Picture 343

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 red circles, see picture 344. Voltage drop value should be in the range from 0,34V to 0,57V. Voltage drop measurement method is described on page 22.



Picture 344

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 343.

ATL SERIES ROUTERBOARDS

ATL 5G R16 (ATLGM&RG520F)



Picture 345

Recommended tools

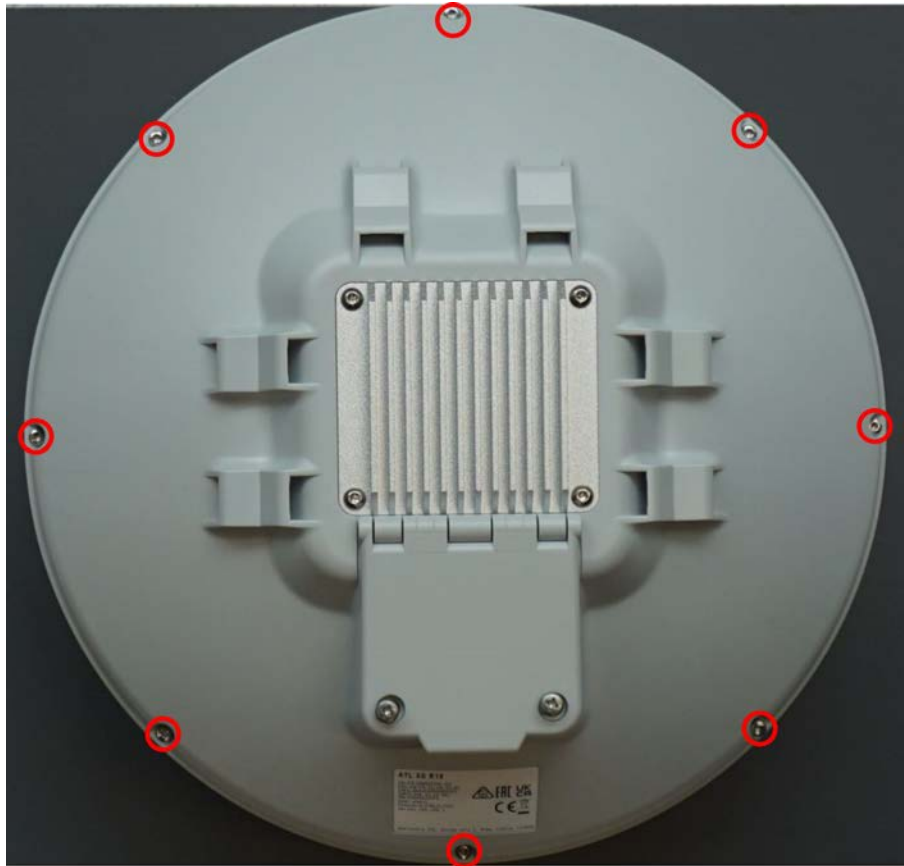
For successful measurement it is necessary to use miniature test probes, example of the miniature test probes you can see in the picture [346](#).



Picture 346

Disassembling information

Using torx T30 screwdriver unscrew eight screws, see picture 347. After this, carefully detach the cover from the case.

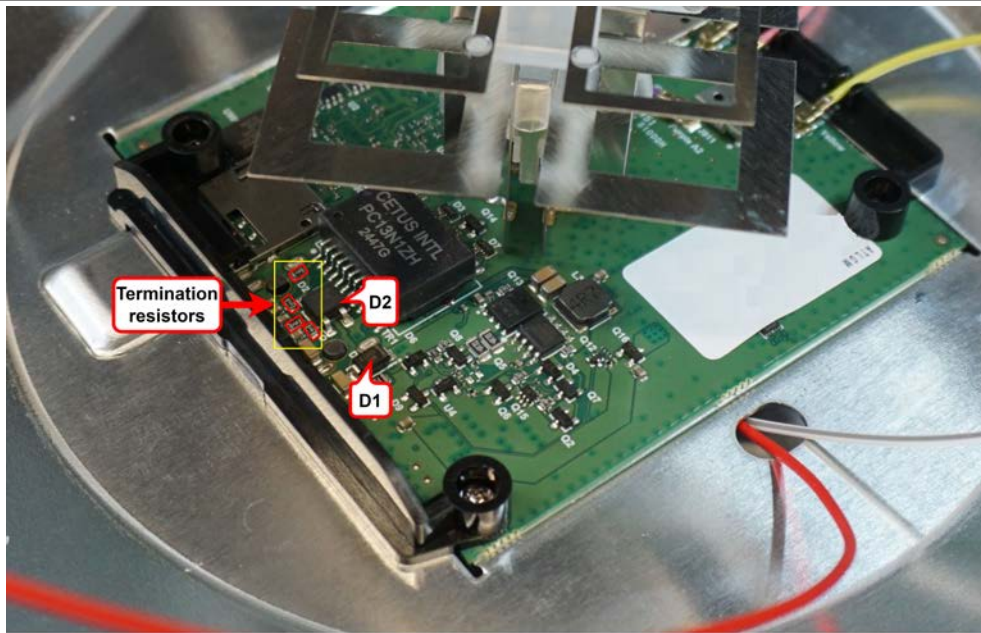


Picture 347

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

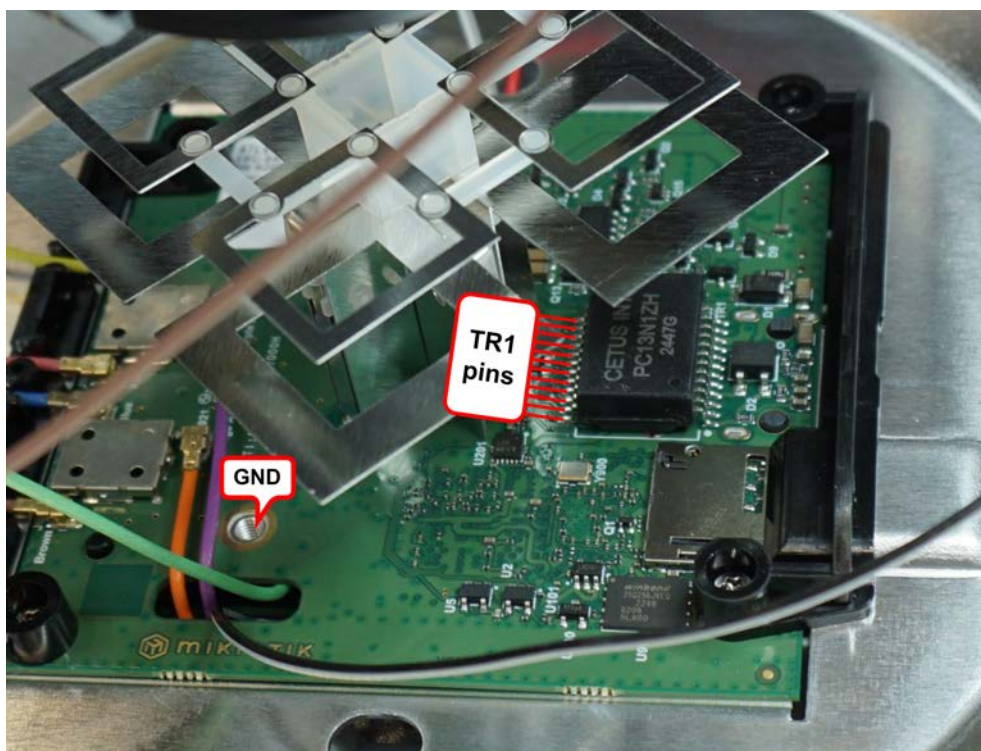
Check Schottky diode D1 and diode bridge D2. Location of the diodes on the board you can see in the picture 348. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.



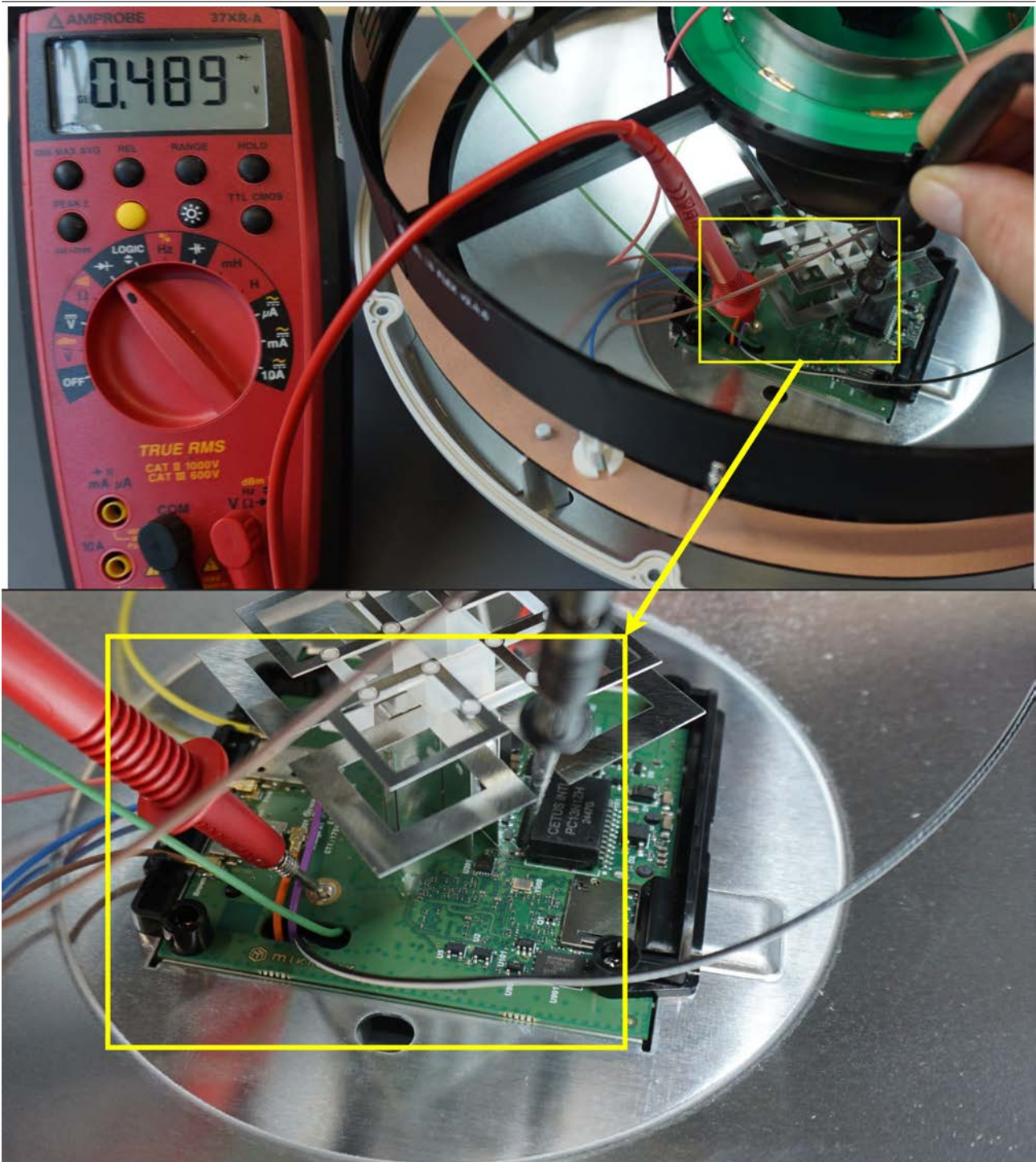
Picture 348

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground, see picture 349. Voltage drop value on the transformer should be in the range from 0,45V to 0,55V. Voltage drop measurement method is described on page 22. An example of measurement can be seen in picture 350.



Picture 349



Picture 350

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 348.

BASEBOX SERIES ROUTERBOARDS

BaseBox 2 (912UAG-2HPnD-OUT)

BaseBox 5 (912UAG-5HPnD-OUT)



Picture 351

Disassembling information

Step 1: Remove the sticker from connector, see picture 352.



Picture 352

Step 2: Unstick 2 screws stickers from the BaseBox case base, see picture 353.



Picture 353

Step 3: Unscrew the case base from the board holder by torque T8 screwdriver. Location of 2 screws you can see in the picture 354.



Picture 354

Step 4: Take out the case base from the board holder, see picture 355.



Picture 355

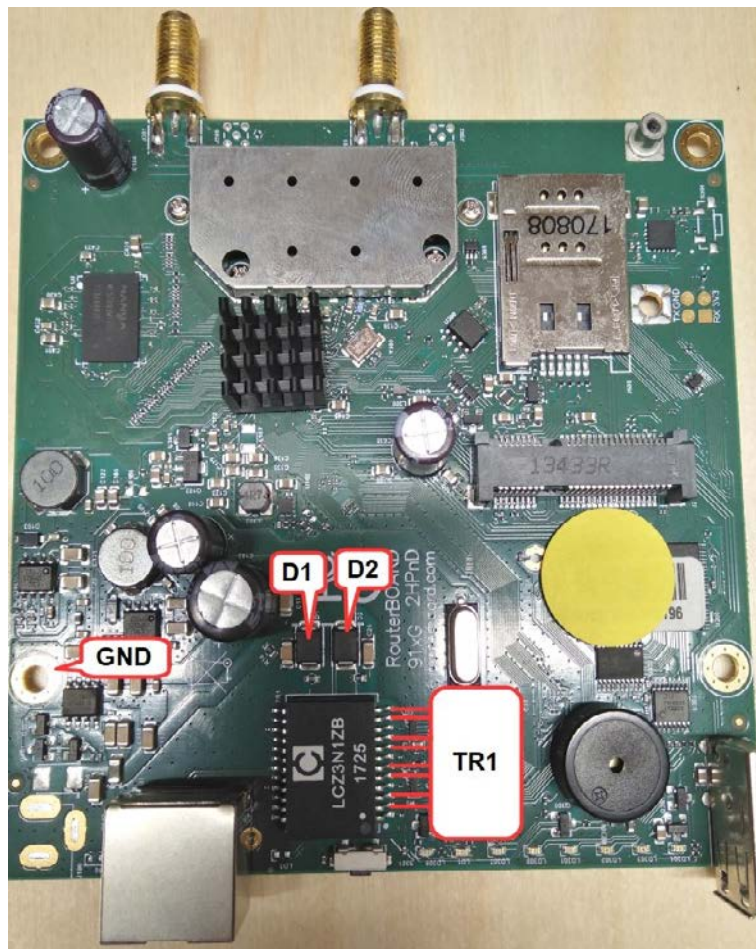
Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D1, D2. Location of diodes on the board you can see in the picture 356. Schottky diode quality measurement method is described on page 19.

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 356. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 22.



Picture 356

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 [299](#).

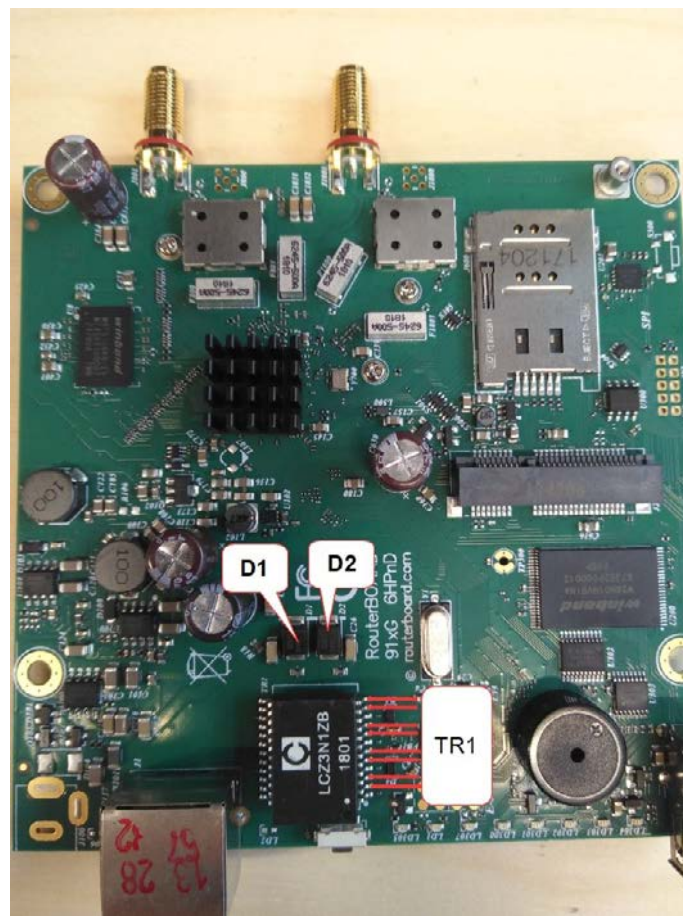
Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diode D1, D2. Location of diodes on the board you can see in the picture [357](#). Schottky diode quality measurement method is described on page [19](#).

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 [357](#). Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [22](#).



Picture 357

NETBOX SERIES ROUTERBOARDS

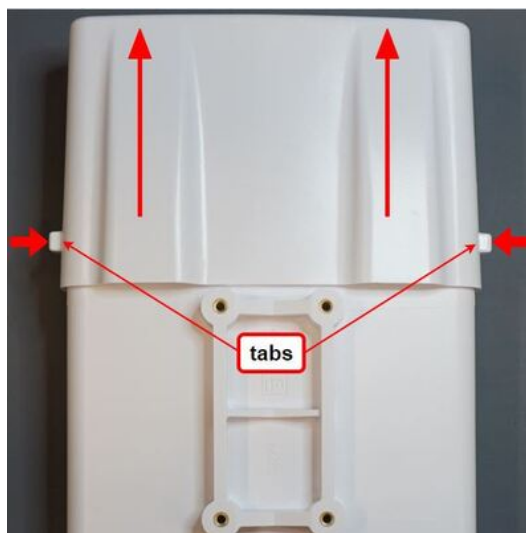
NetBox 5 ax (L11UG-5HaxD-NB)



Picture 358

Disassembling information

Step 1: Press two tabs and remove the cable cover as shown in the picture 359.



Picture 359

Step 2: Peel off two plastic stickers from the NetBox case, see picture 360.



Picture 360

Step 3:

Unscrew 2 screws using torx T8 screwdriver. Location of the screws is shown the picture 361.



Picture 361

Step 4:

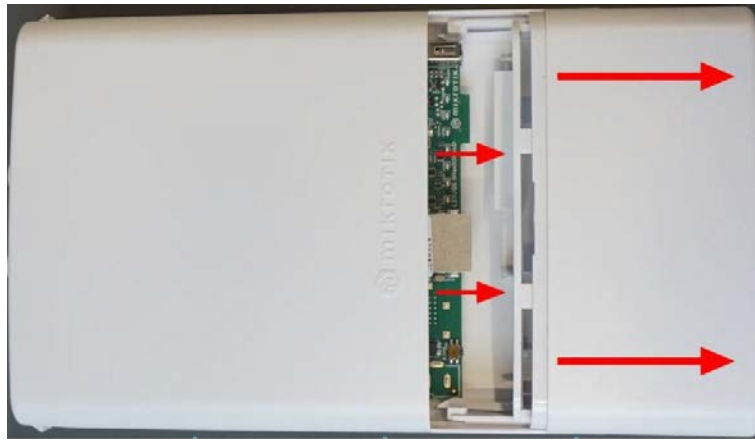
Unscrew two golden plated nuts. Location of the nuts is shown the picture 362.



Picture 362

Step 5:

Carefully remove the board holder and the board from the case as shown in the picture 363.

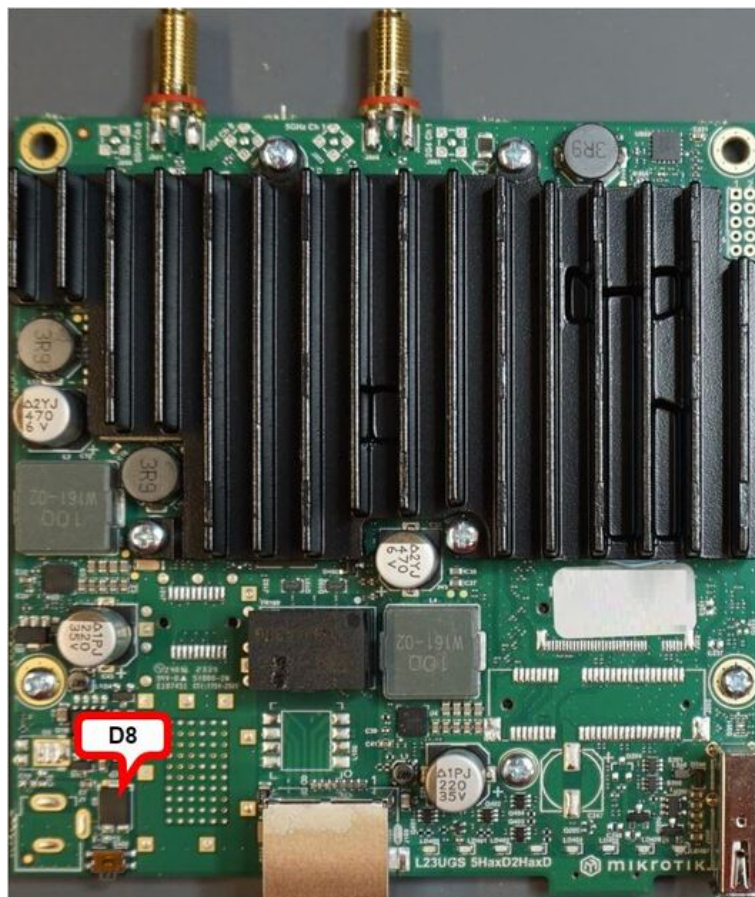


Picture 363

Instructions for checking over-voltage

Checking Schottky diode

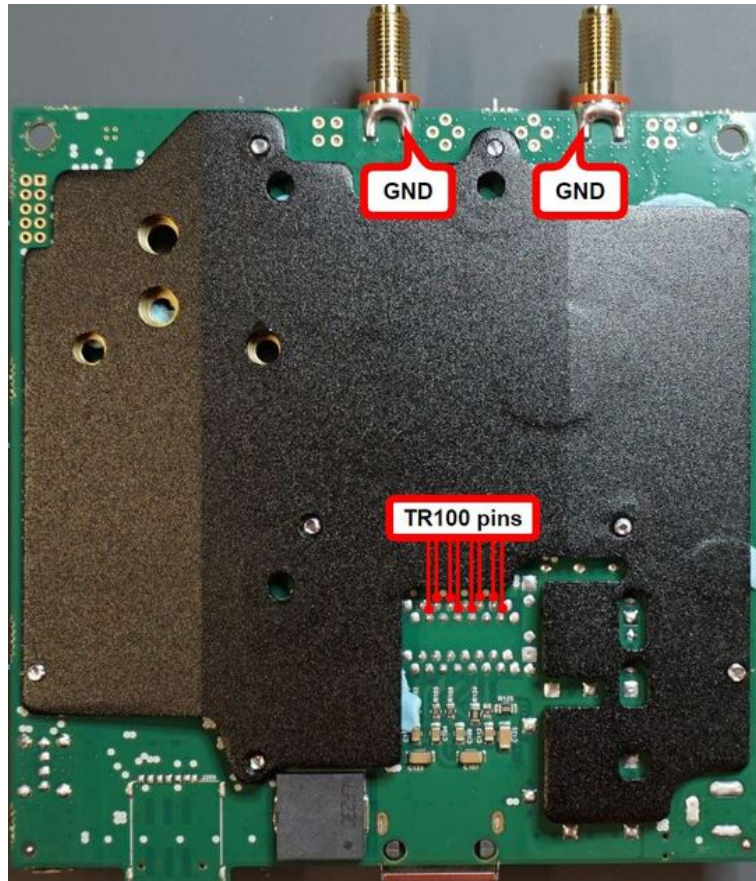
Check Schottky diode D8. Location of the diode on the board you can see in the picture 364. Schottky diode quality measurement method is described on page 19.



Picture 364

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR100 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 365. Voltage drop value should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 22.



Picture 365

CAP SERIES ROUTERBOARDS

cAP (cAP2nD)

V1



Picture 366

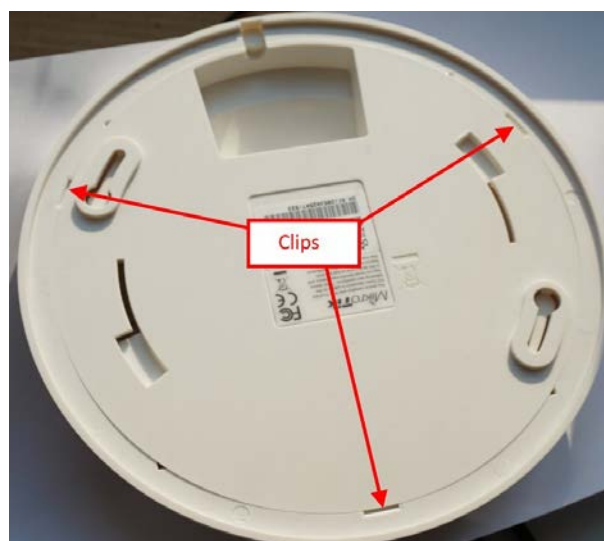
V2



Picture 367

Disassembling information for V1

Step 1: Push the router edge around clips to open the case, see pictures 368 - 369.



Picture 368



Picture 369

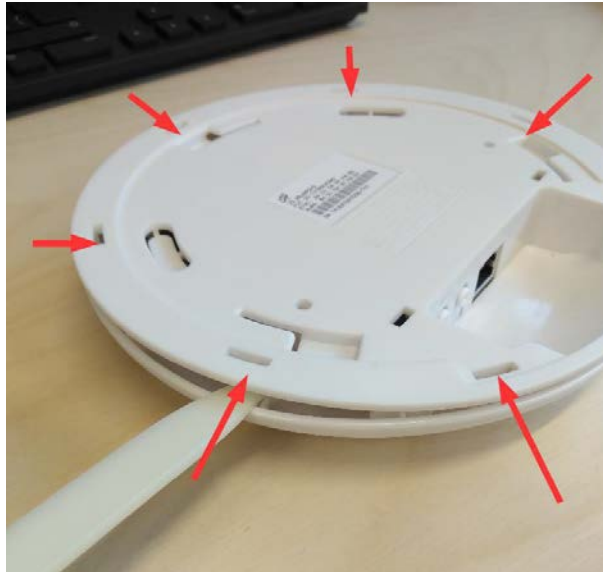
Step 2: Remove cover and take out the board from case, see picture [370](#).



Picture 370

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 371.



Picture 371

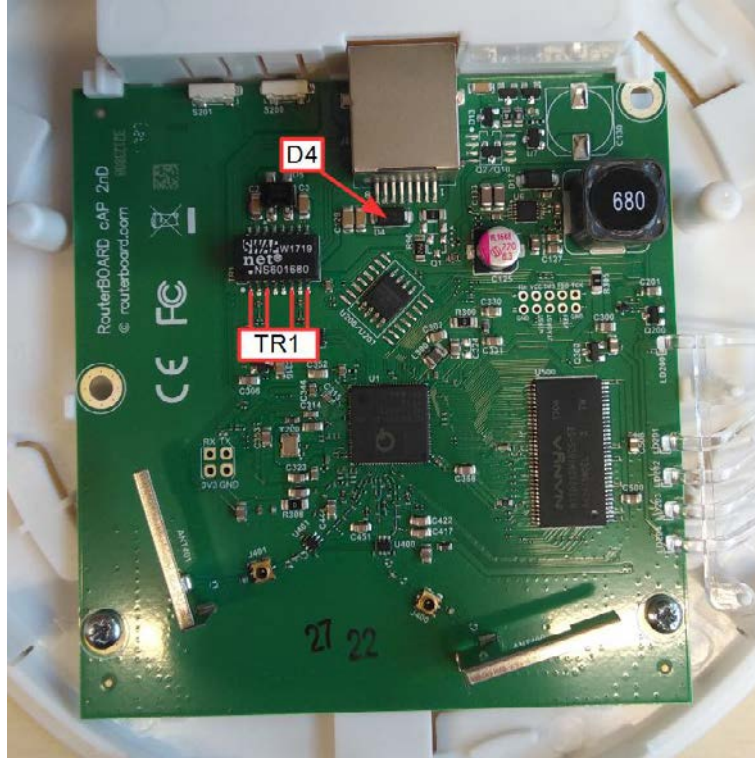
Step 2: Unscrew 2 mounting screws as shown in picture 372.



Picture 372

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 374. Voltage drop value should be in the range from 0,37V to 0,40V. Voltage drop measurement method is described on page 22.



Picture 374

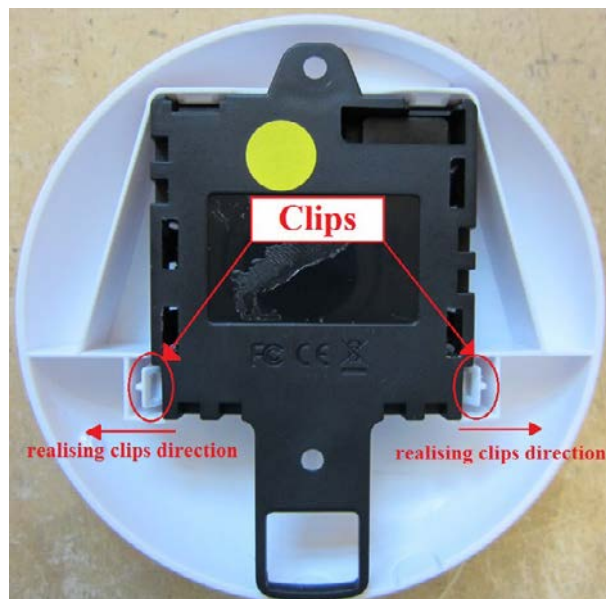
cAP lite (cAP L-2nD)



Picture 375

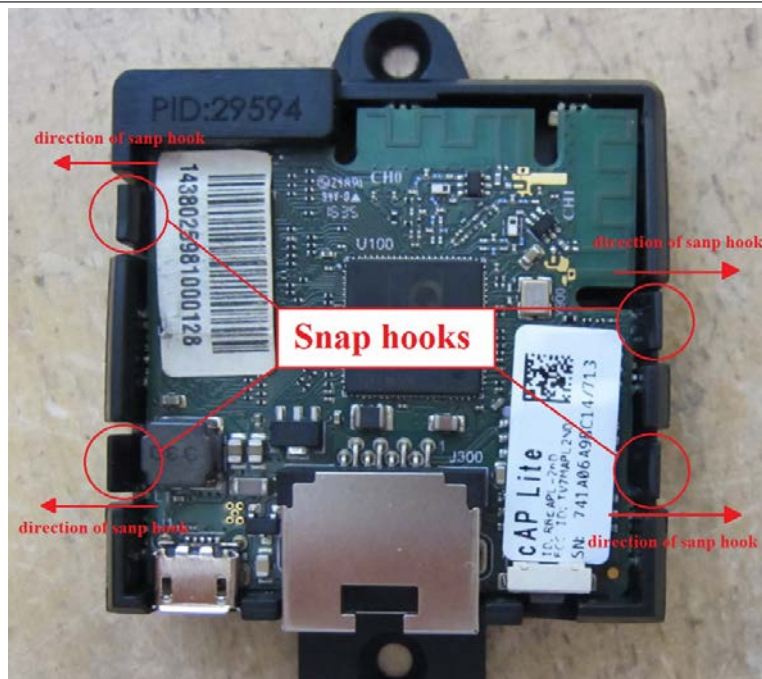
Disassembling information

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 376.



Picture 376

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 377.



Picture 377

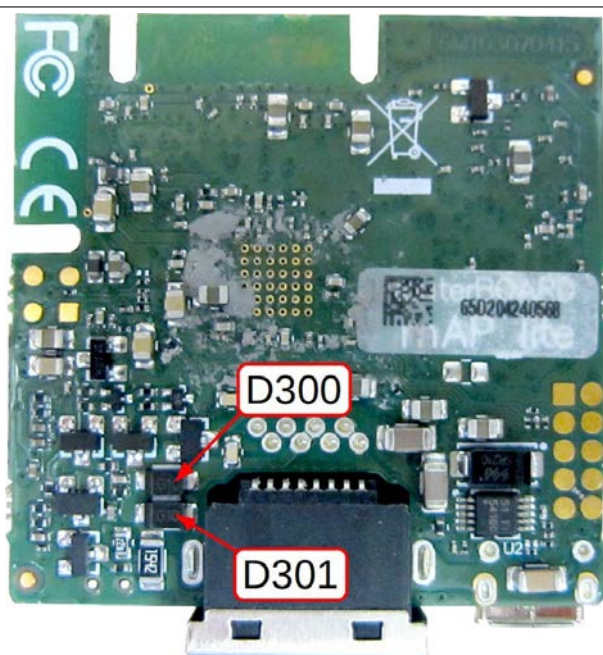
Instructions for checking overvoltage

Checking Schottky diode

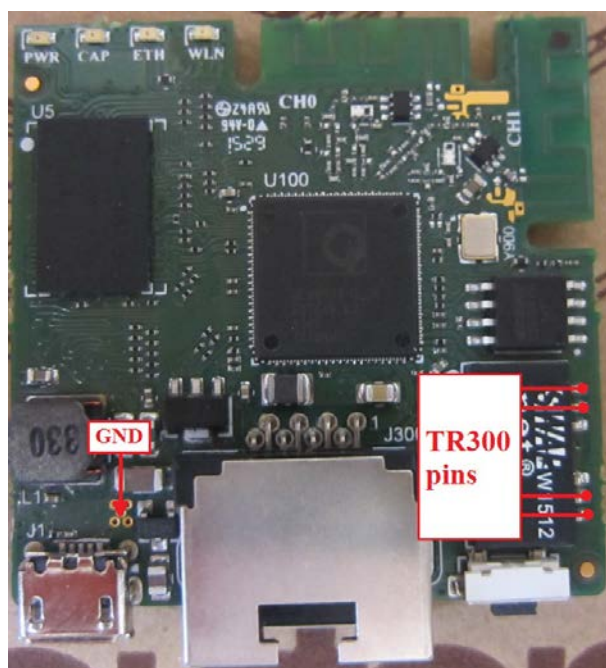
Check Schottky diodes D300, D301 on the board bottom layer, see picture 378. Schottky diode quality measurement method is described on page 19.

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 379. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 22.



Picture 378



Picture 379

cAP ac (RBcAPGi-5acD2nD)



Picture 380

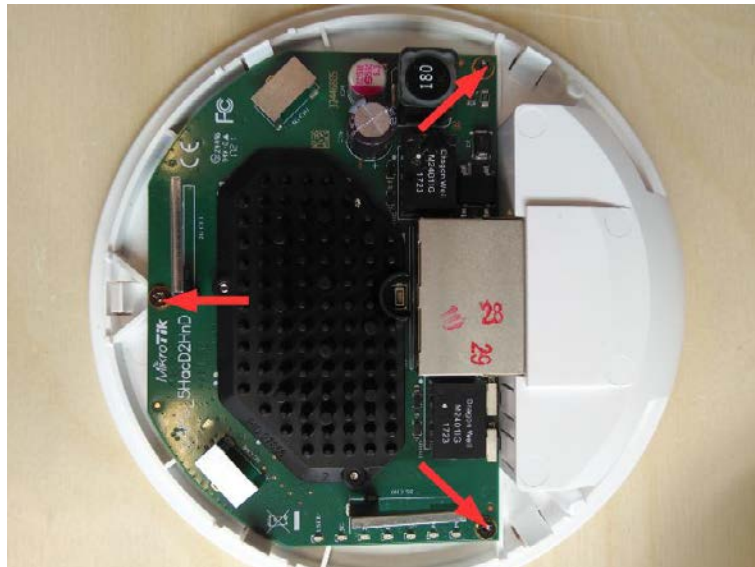
Disassembling information

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 381.



Picture 381

Step 2: Unscrew 3 mounting screws as shown in picture 382.



Picture 382

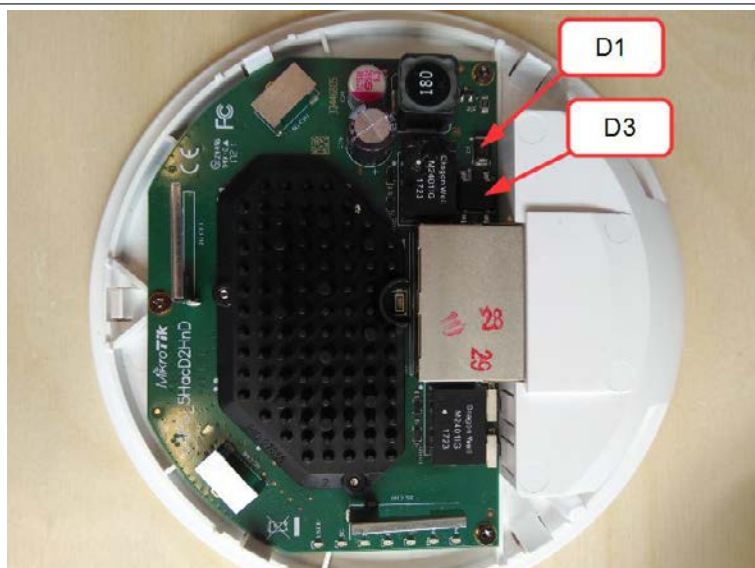
Instructions for checking overvoltage

Checking Schottky diode

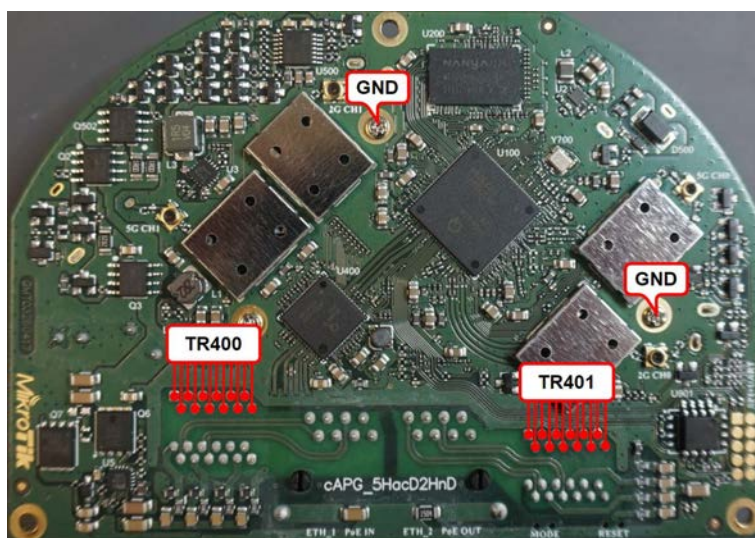
Check Schottky diodes D1 and diode bridge D3. Location of diodes on the board you can see in the picture [383](#). Schottky diode quality measurement method is described on page [19](#).

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 [384](#). Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page [22](#).



Picture 383



Picture 384

cAP ax (cAPGi-5HaxD2HaxD)



Picture 385

Disassembling information

Tools recommended for the disassembly are plastic prying tools, such as shown on pictures [386](#) and [387](#).



Picture 386



Picture 387

Step 1:

On the back of the case unscrew 4 screws using torx T10 screwdriver. Location of the screws is shown the picture [388](#).



Picture 388

Step 2:

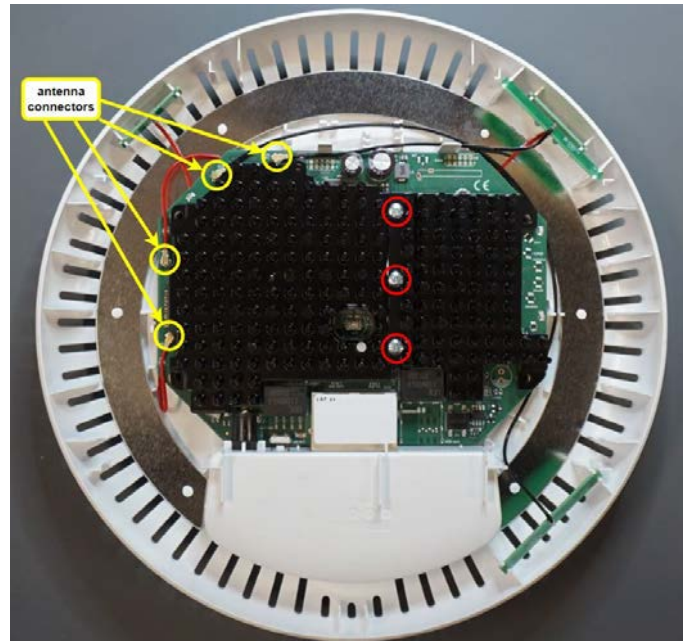
Using plastic prying tool carefully release clips around the perimeter of the case, as shown in the picture [389](#).



Picture 389

Step 3:

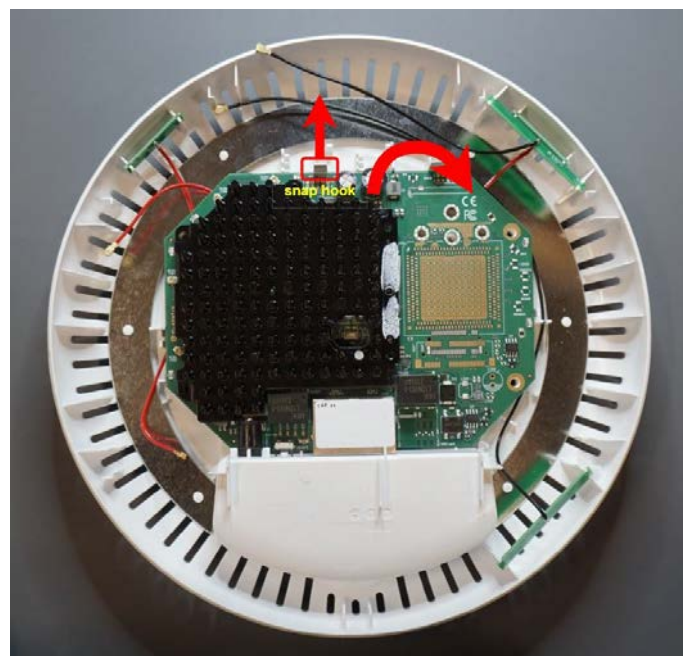
Detach antenna cables and unscrew 4 screws using PH1 screwdriver, see picture 390. Remove the right heat-sink from the board.



Picture 390

Step 4:

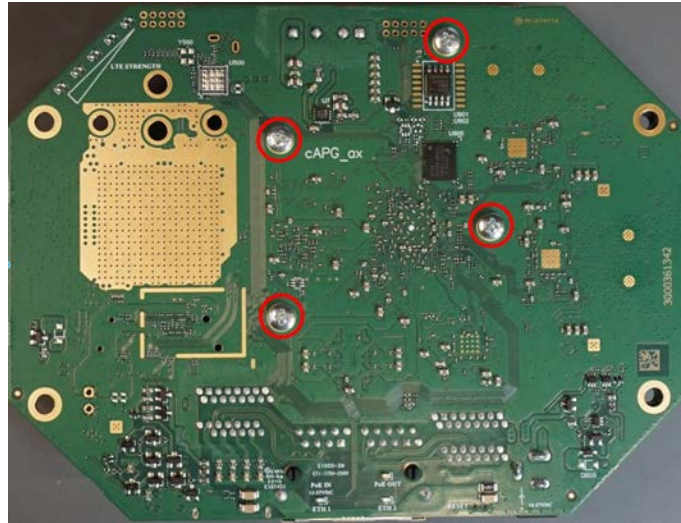
Push the snap hook away from the board and pull out the board from the case, see picture 391.



Picture 391

Step 4:

On the back side of the board unscrew 4 screws using PH1 screwdriver and from the top side of the board remove the heat-sink, see pictures 392 and 393.



Picture 392



Picture 393

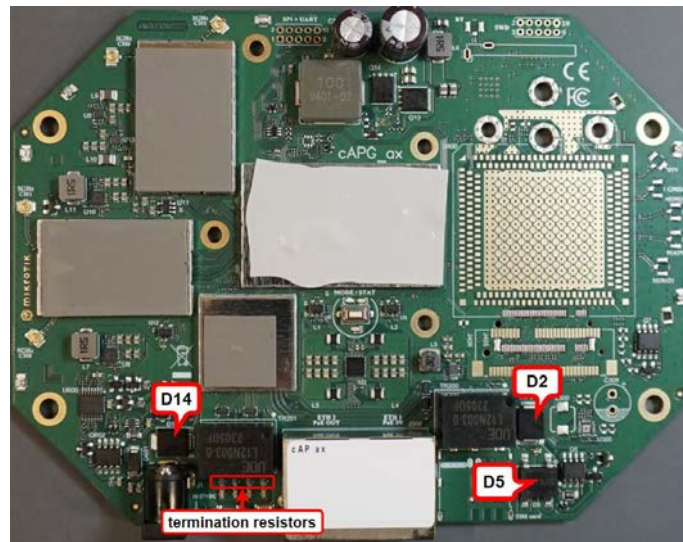
Instructions for checking over-voltage

Checking Schottky diodes and diode bridge

Check Schottky diodes D2, D14, and diode bridge D5. Location of the diodes on the board you can see in the picture 394. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

Checking 75 Ohm termination resistors resistance

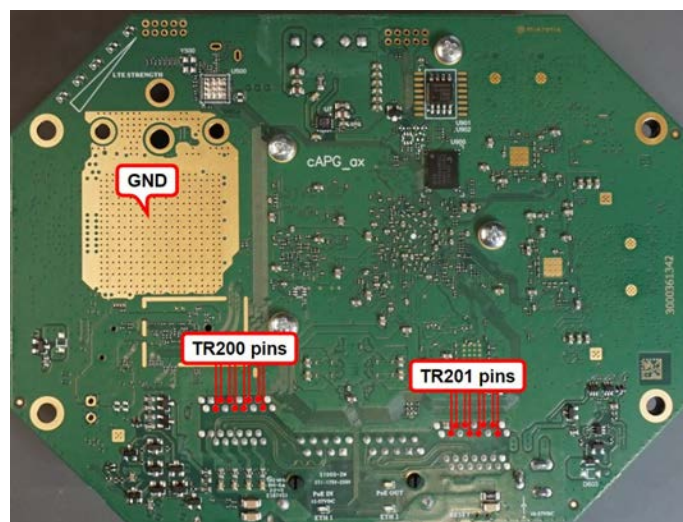
Check value of each termination resistor (there are 4 termination resistors). It should be approximately 75 Ohms. Location of resistors is shown in picture 394.



Picture 394

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR200 and TR201 pins and Ground. Test points on the transformers pins are highlighted with red lines, see picture 395. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 22.



Picture 395

CHATEAU SERIES ROUTERBOARDS

**Chateau 5G (D53G-5HacD2HnD-TC&RG502Q,
D53G-5HacD2HnD-TC&RG520F,
D53G-5HacD2HnD&EG120K-EA)**



Picture 396

Disassembling information

Step 1: Tools recommended for the disassembly are plastic prying tools, such as shown on pictures 493 and 494, a PH1 and a T8 screwdriver. Unscrew the central screw (PH1) as shown in the picture 397.



Picture 397

Step 2: The board's cover and base parts are put together using snap fit hooks. Placement of these hooks is shown in picture 398.



Picture 398

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 493 and 494. 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 401 – 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 from the flanks.

The blue prying tool is recommended to use in upper and lower parts of the case, see picture

402, 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 399



Picture 400

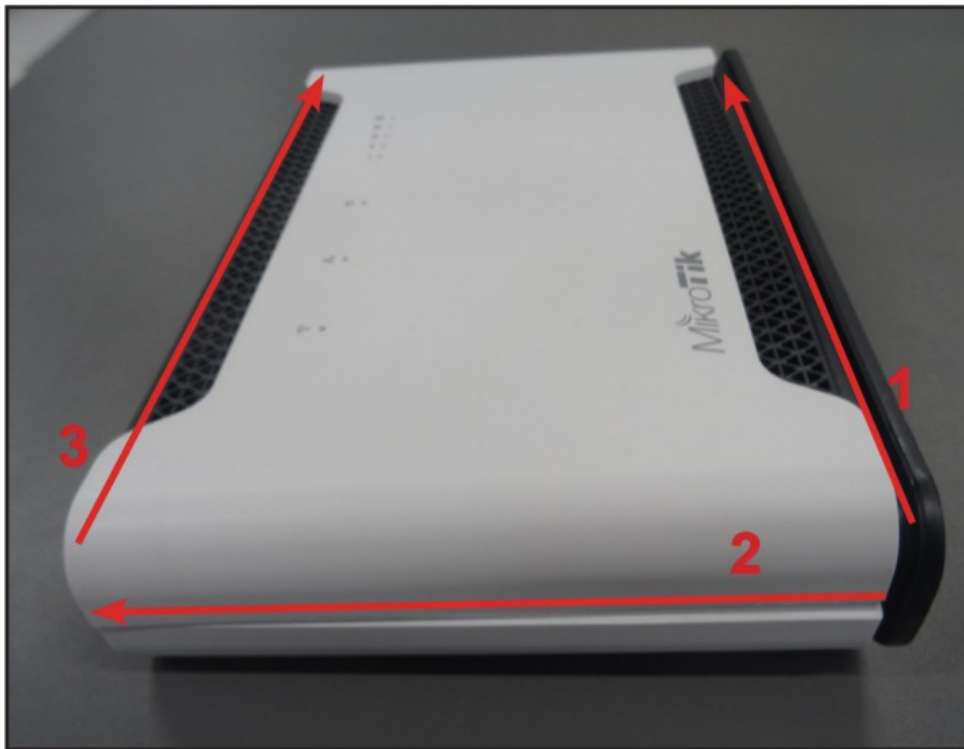


Picture 401



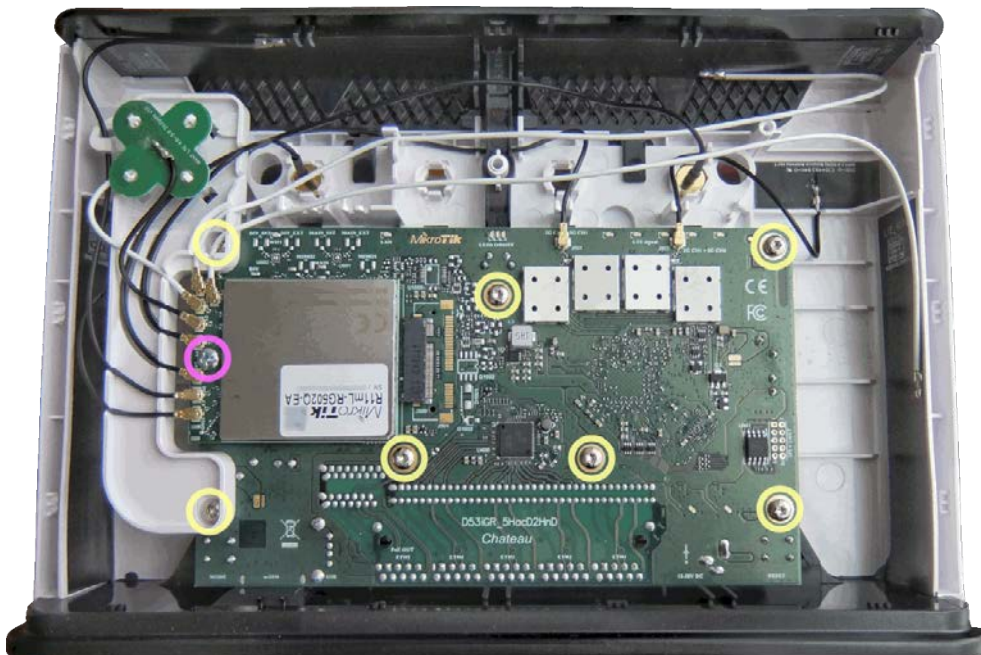
Picture 402

Step 4: Continue to release snap hooks around perimeter as shown in picture [403](#)



Picture 403

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 [404](#).



Picture 404

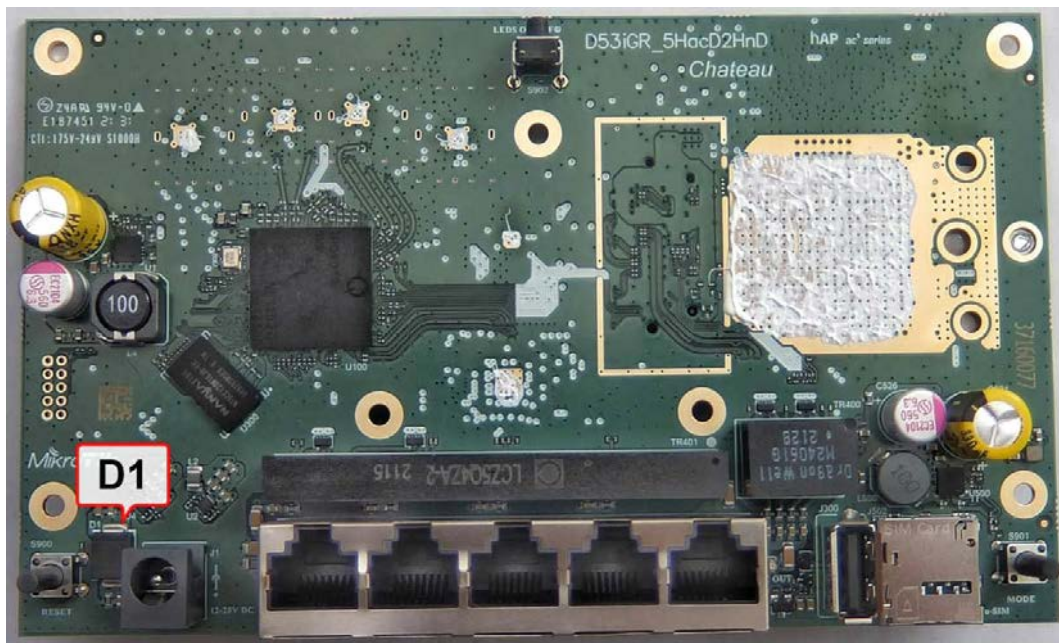
Instructions for checking overvoltage

Checking Schottky diode

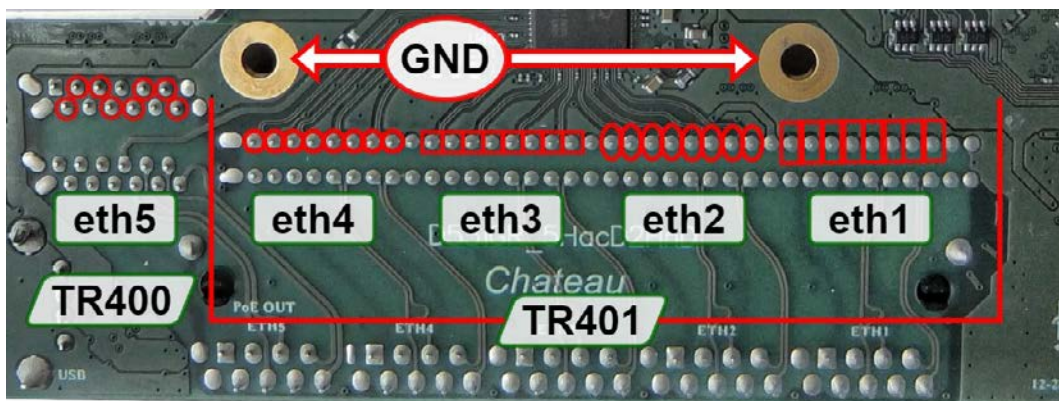
Check Schottky diodes D1. Location of diode on the board is shown in picture 405. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

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 406. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 22.



Picture 405



Picture 406

Chateau LTE18 ax



Picture 407

Disassembling information

The Chateau LTE18 ax disassemble is similar to the Chateau 5G AX, you can find description of device disassembly on page ??.

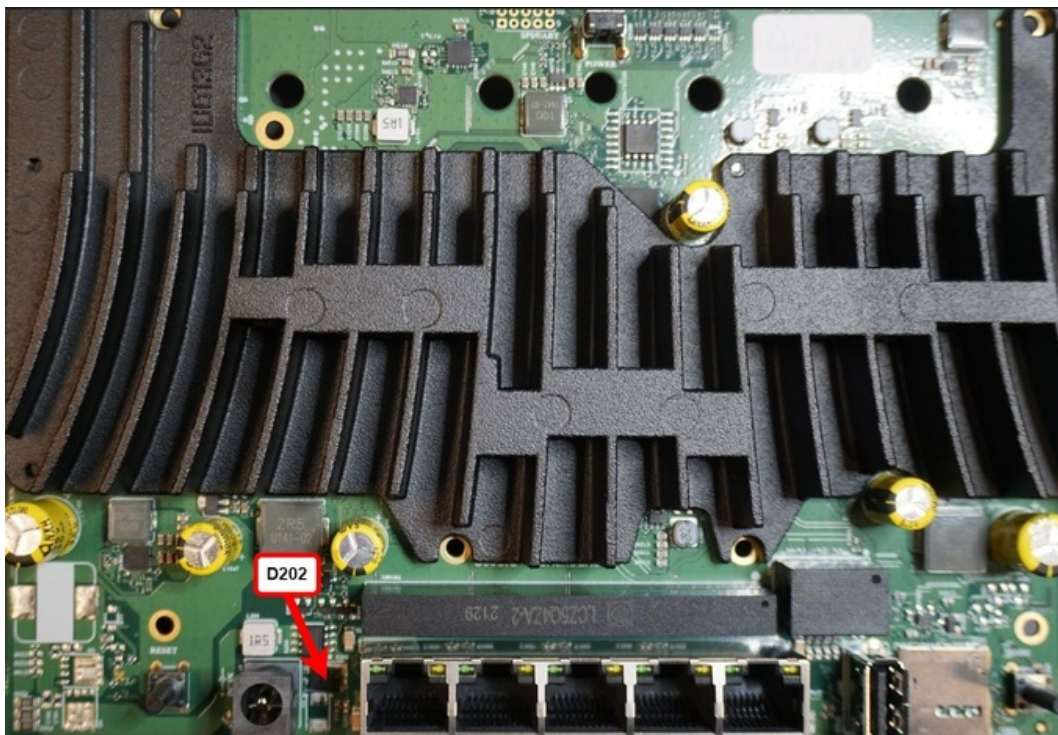
Instructions for checking over-voltage

Checking Schottky diode

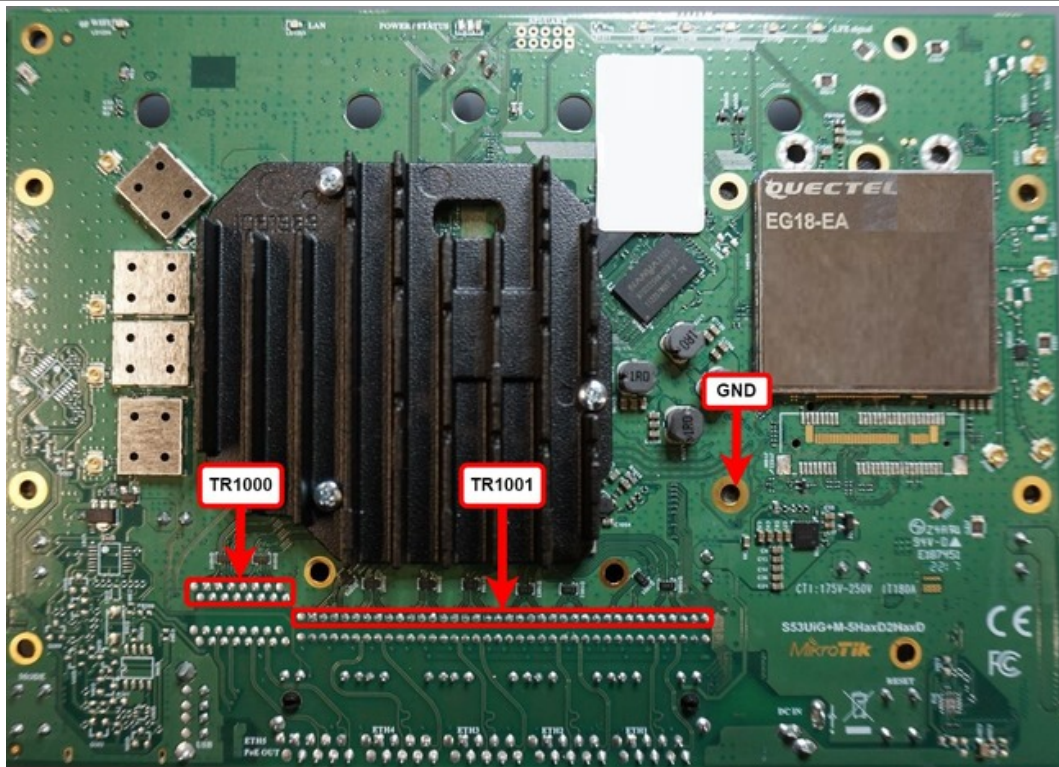
Check Schottky diode D202. Location of the diodes on the board you can see in the picture 408. Schottky diode quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1000, TR1001 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 409. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 22.



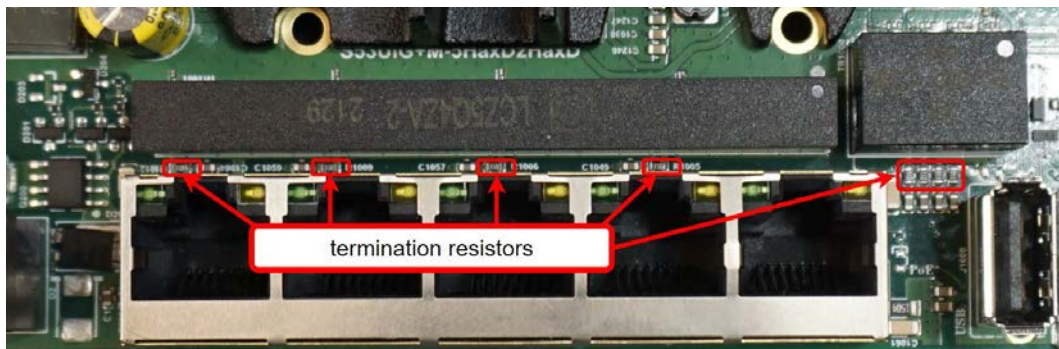
Picture 408



Picture 409

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 410.



Picture 410

Chateau PRO ax (H53UiG-5HaxQ2HaxQ)



Picture 411

Disassembling information

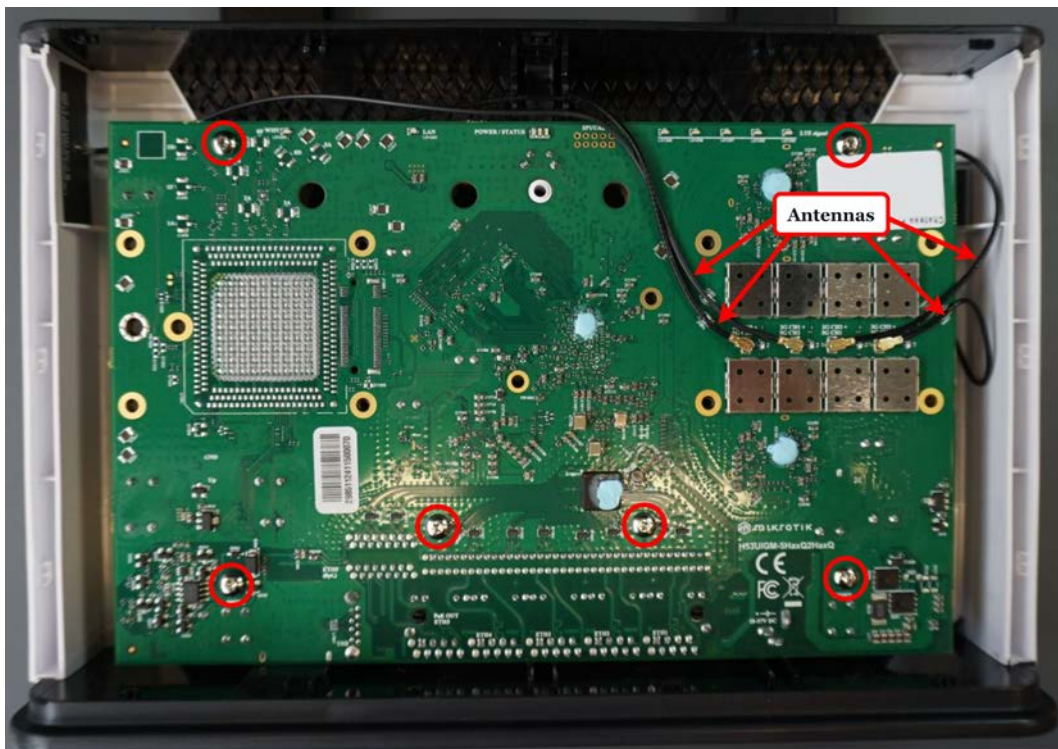
The removing of the Chateau PRO ax front cover is the same as the removing of the Chateau 5G front cover, see page 327 steps 1-4.

When the front cover of the case is removed, using the PH1 screwdriver unscrew four screws and carefully remove the heatsink, see picture 412.



Picture 412

Disconnect four antenna cables and using TORX T8 screwdriver unscrew six screws, see picture 413.



Picture 413

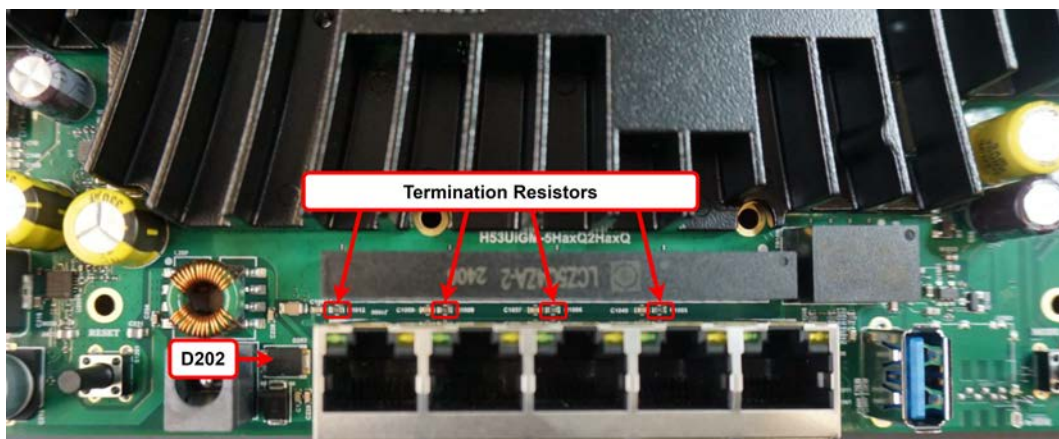
Instructions for checking over-voltage

Checking Schottky diode

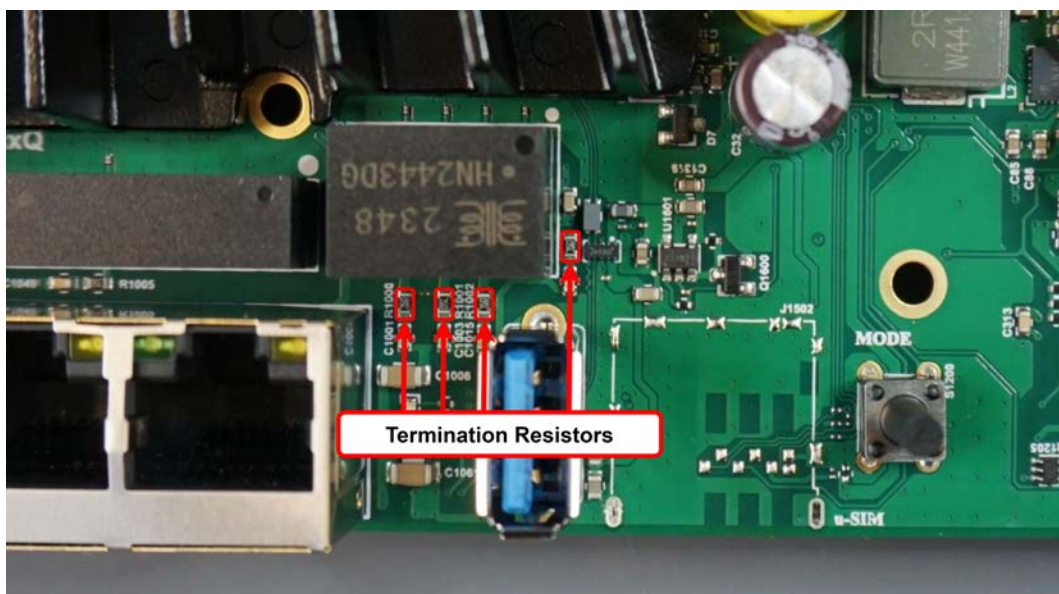
Check Schottky diode D202. Location of the diode on the board you can see in the picture 414. Schottky diode quality measurement method is described on page 19.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor, it should be 75 Ohms $\pm$ 1%. Location of resistors is shown in pictures 414 and 415.



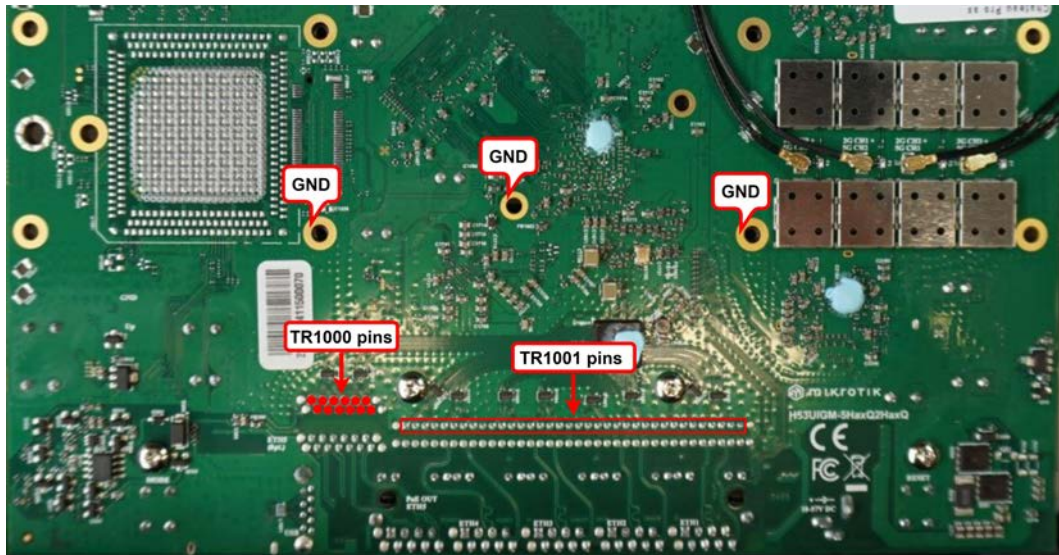
Picture 414



Picture 415

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop between Ethernet transformers TR1000, TR1001 pins and Ground, test points you can see in the picture 416. Voltage drop between pins and Ground of the transformer TR1000 should be in the range from 0,38V to 0,45V, and between pins and Ground of the transformer TR1001 in the range from 0.35V to 0.41V. Voltage drop measurement method is described on page 22.



Picture 416

Chateau 5G R17 ax (S53UG+5HaxD2HaxD-TC&RG650E)



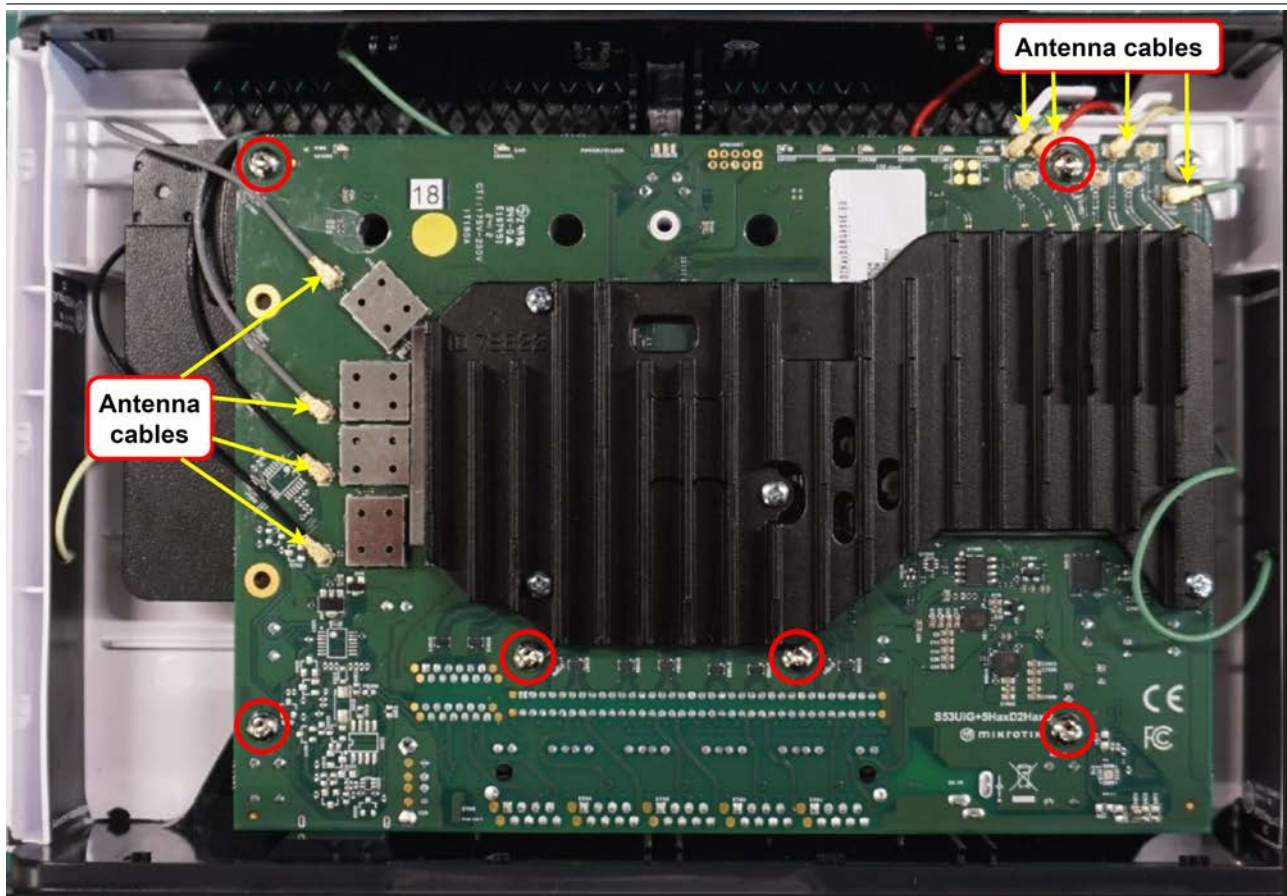
Picture 417

Disassembling information

The removing of the Chateau 5G R17 ax front cover is the same as the removing of the Chateau 5G front cover, see page 327 steps 1-4.

Step 5:

Gently remove all antenna cables and using Torx T8 screwdriver unscrew six screws. With great care remove the PCB from the case. Location of the screws and antennas you can see in the picture 418.

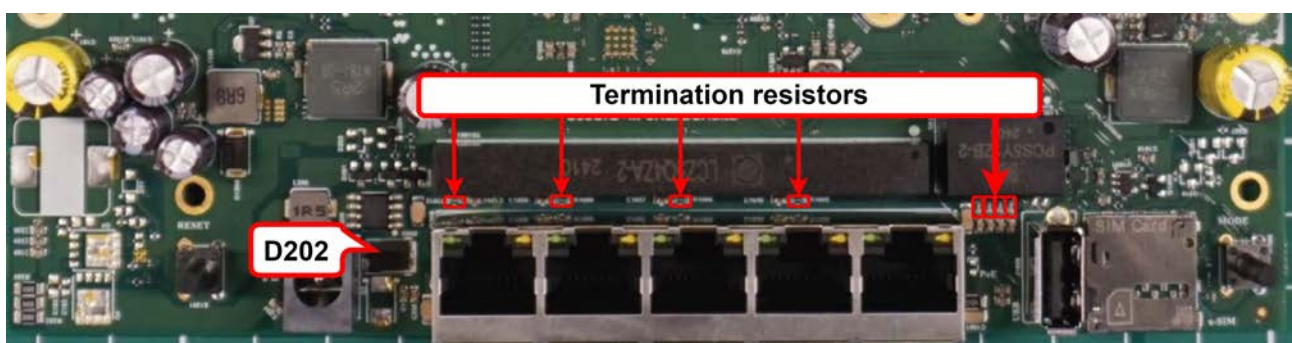


Picture 418

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

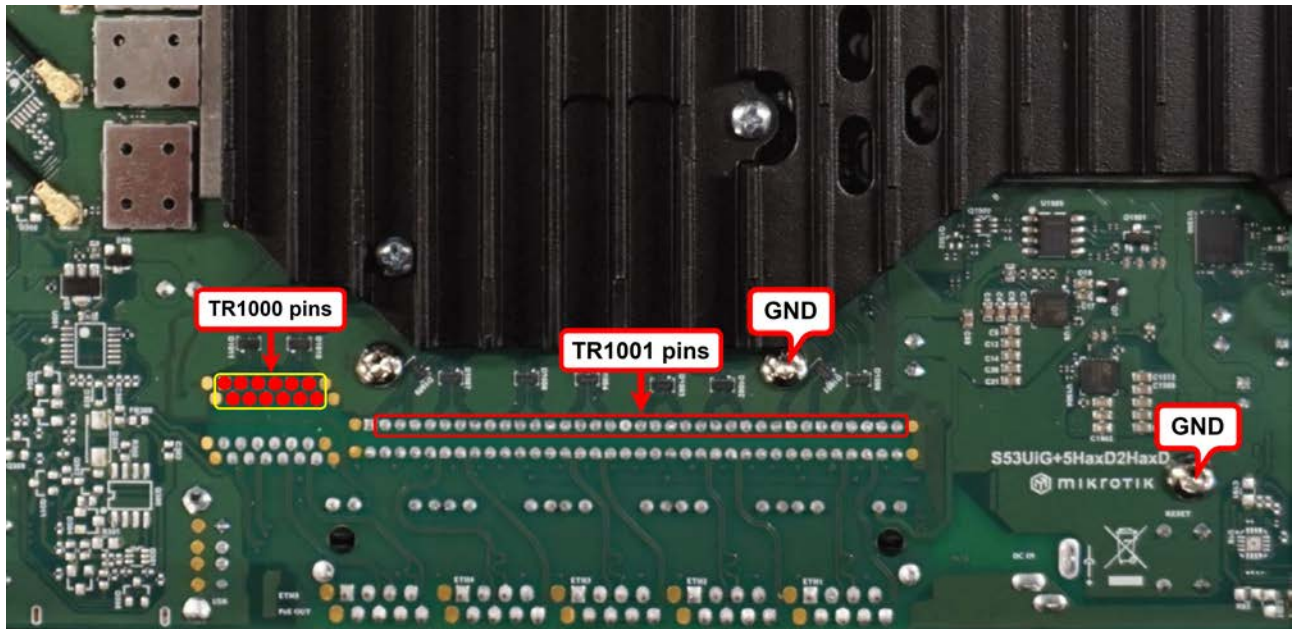
Check Schottky diode D202. Location of the diode on the board you can see in the picture 419. Schottky diode quality measurement method is described on page 19.



Picture 419

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop between Ethernet transformers TR1000, TR1001 pins and Ground, test points you can see in the picture 420. Voltage drop between pins and Ground of the transformer TR1000 should be in the range from 0,28V to 0,38V, and between pins and Ground of the transformer TR1001 in the range from 0.32V to 0.42V. Voltage drop measurement method is described on page 22.



Picture 420

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 419.

CME SERIES ROUTERBOARDS

CME Gateway (CME22-2n-BG77)



Picture 421

Disassembling information

Step 1:

Under the bottom lid unscrew two screws using a PH2 screwdriver, see picture 422. When they are loose, slightly pull down the bottom lid to open access to Ethernet ports.



Picture 422

Step 2:

Unscrew two screws using the PH2 screwdriver, then remove the PCB from the case, see picture 423.



Picture 423

Step 3:

Unscrew two screws using the PH2 screwdriver and remove the front panel, see picture 424.



Picture 424

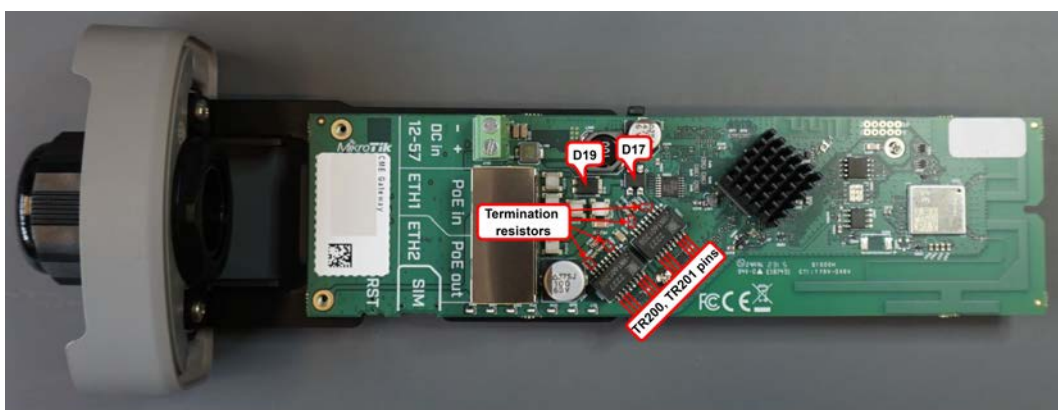
Instructions for checking over-voltage

Checking Schottky diode and diode bridge

Check Schottky diode D19 and diode bridge D17. Location of the diodes on the board you can see in the picture 425. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR200, TR201 pins and Ground, see picture 425. Voltage drop value on the transformers should be in the range from 0,32V to 0,42V. Voltage drop measurement method is described on page 22.



Picture 425

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture [425](#).

EG25 SERIES

EG25-G&SXTsq



Picture 426

Disassembling information

Step 1: Unscrew 2 screws using a PH2 screwdriver and remove the port cover. Location of the screws is shown in the picture 427.



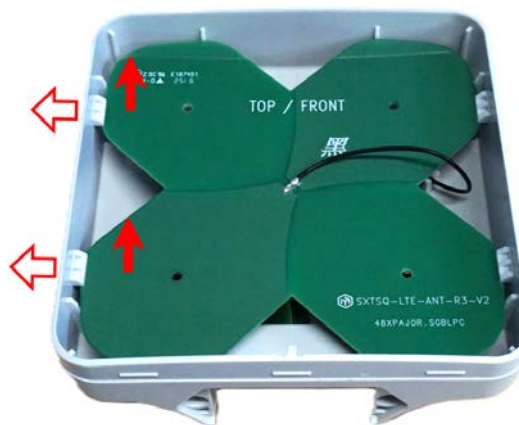
Picture 427

Step 2: Insert the plastic tool as shown in picture 428 and unclip 3 clips on each side by sliding the tool around the edge of the case. It may require additional force before the case unsticks from the rubber pad in the cover.



Picture 428

Step 3: Carefully pull the case aside in the direction shown in picture 429 and lift the antenna. It is not necessary to unplug antenna wires while doing measures.



Picture 429

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

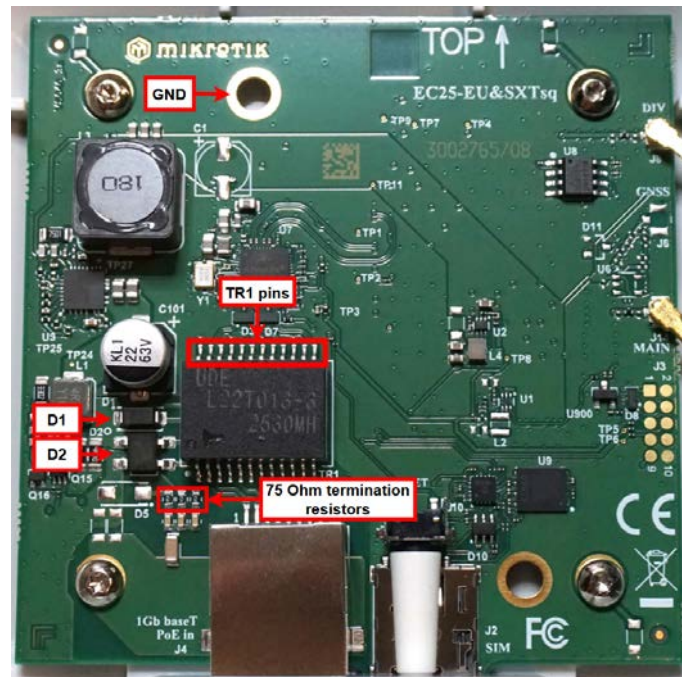
Check Schottky diode D1 and diode bridge D2. Location of the diode and diode bridge on the board you can see in the picture 430. The Schottky diode quality measurement method is described on page 19. The diode bridge quality measurement method is described on page 20.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground, see picture 430. Voltage drop value should be in the range from 0,44V to 0,47V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be $75 \pm 1\%$ Ohms. Location of resistors is shown in picture 430.



Picture 430

HAP SERIES ROUTERBOARDS

hAP ax3 (C53UiG+5HPaxD2HPaxD)



Picture 431

Disassembling information

Step 1: Tools recommended for the disassembly are plastic prying tools, such as the one shown on picture [493](#), a PH1 screwdriver and a 0,25M ethernet cable. Plug in an ethernet cable in ethernet ports 1 and 5 as shown in picture [432](#).



Picture 432

Step 2: The board is held inside the case with snap fit hooks. Placement of these hooks is shown in picture 433.



Picture 433

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 493. 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 434

Step 4: After pulling the routerboard out of the case, unscrew the two screws shown in picture 435



Picture 435

Step 5: Then turn the routerboard to the other side and remove the two antenna connectors and unscrew the 6 screws shown in picture 436.



Picture 436

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

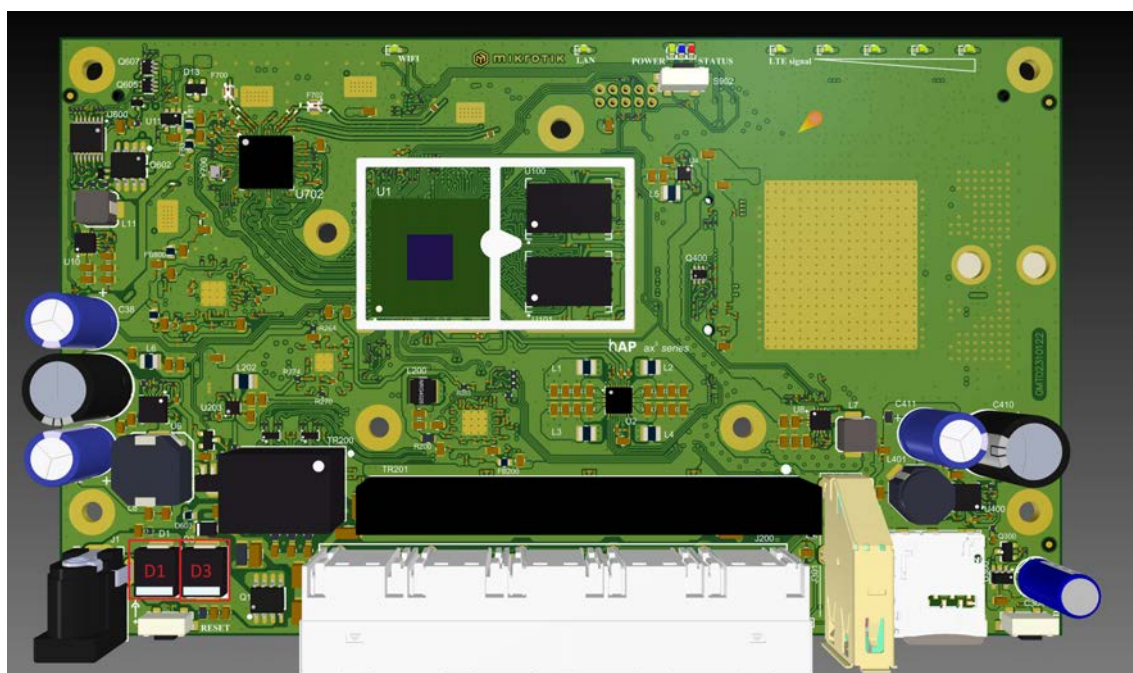
Instructions for checking overvoltage

Checking Schottky diode

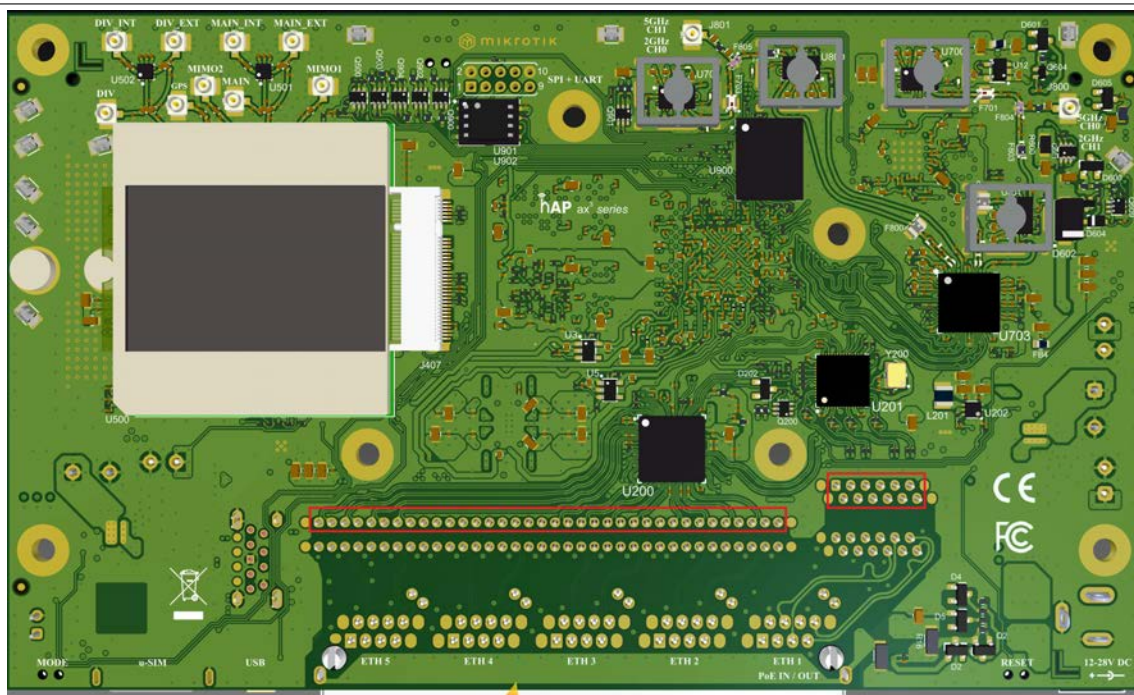
Check Schottky diodes D1 and D3. The location of these diodes on the board is shown in picture 437. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

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 438. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 22.



Picture 437



Picture 438

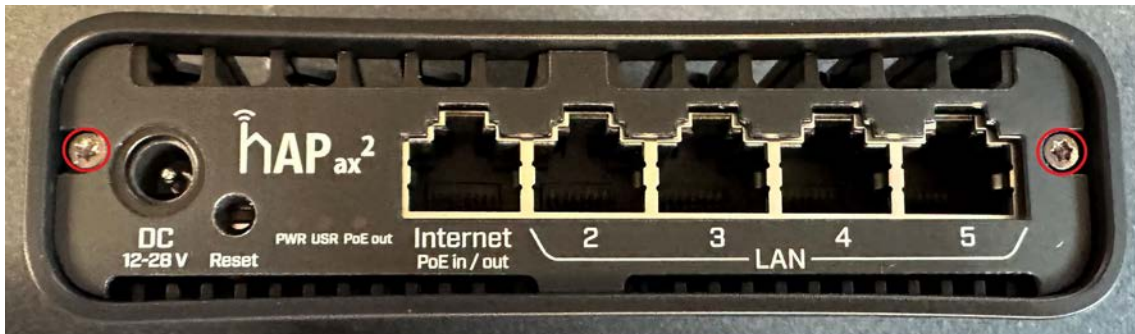
hAP ax2 (C52iG-5HaxD2HaxD-TC)



Picture 439

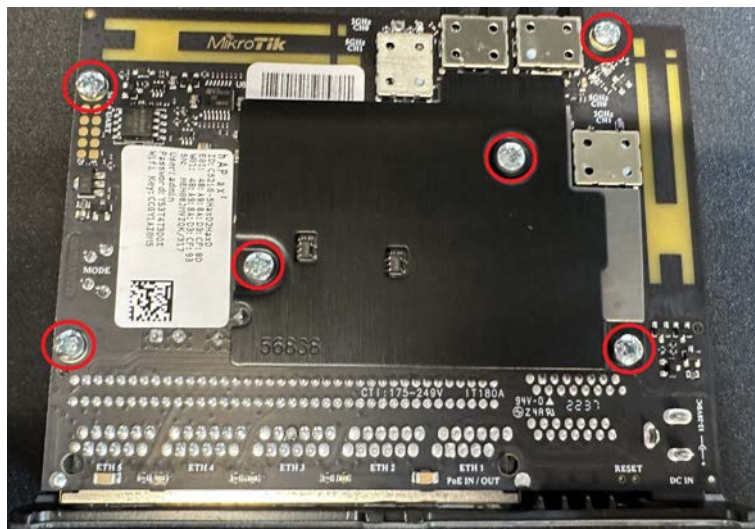
Disassembling information

Step 1: Tools recommended for the disassembly are a PH1 and TR8 screwdriver. First unscrew the two TR8 screws that are shown in picture 440. Then you can slide the board out of the case.



Picture 440

Step 2: Unscrew the six PH1 screws shown in picture 441. Now remove the top and bottom heatsinks and then you can begin the tests for checking overvoltage.



Picture 441

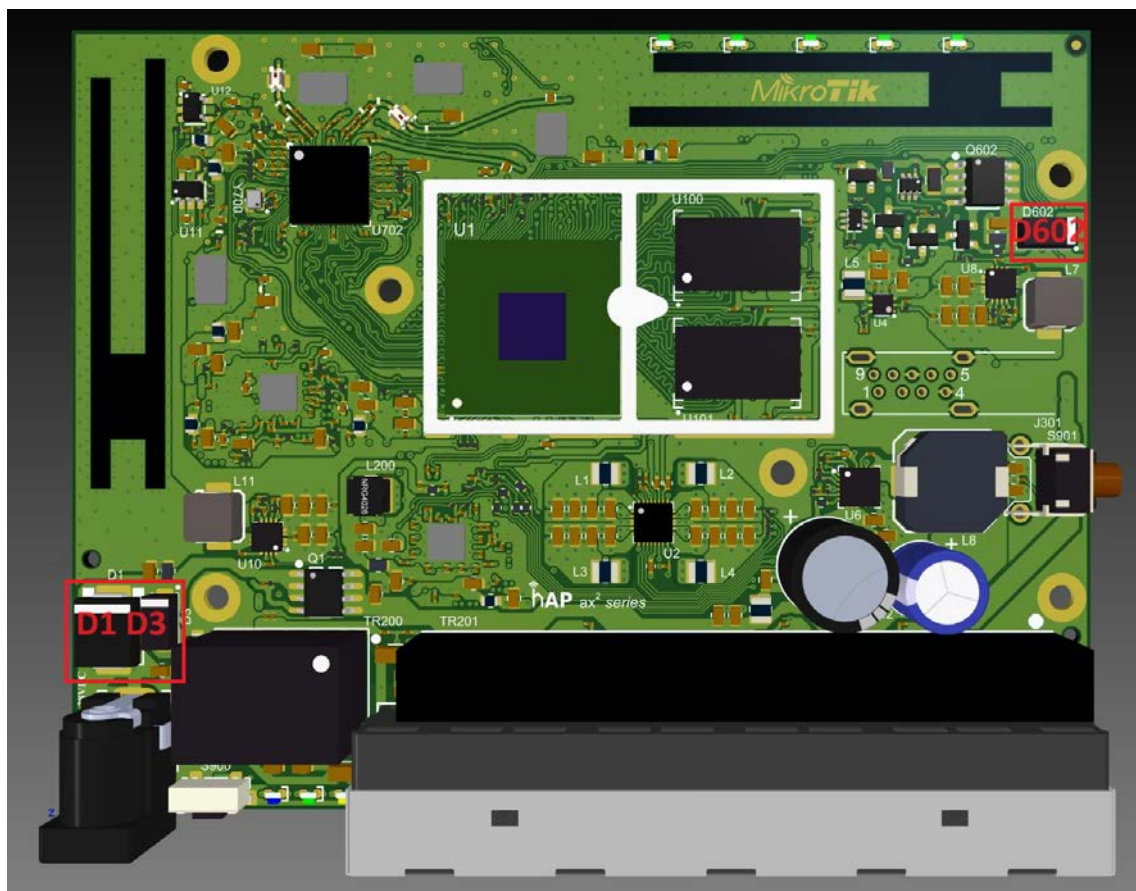
Instructions for checking overvoltage

Checking Schottky diode

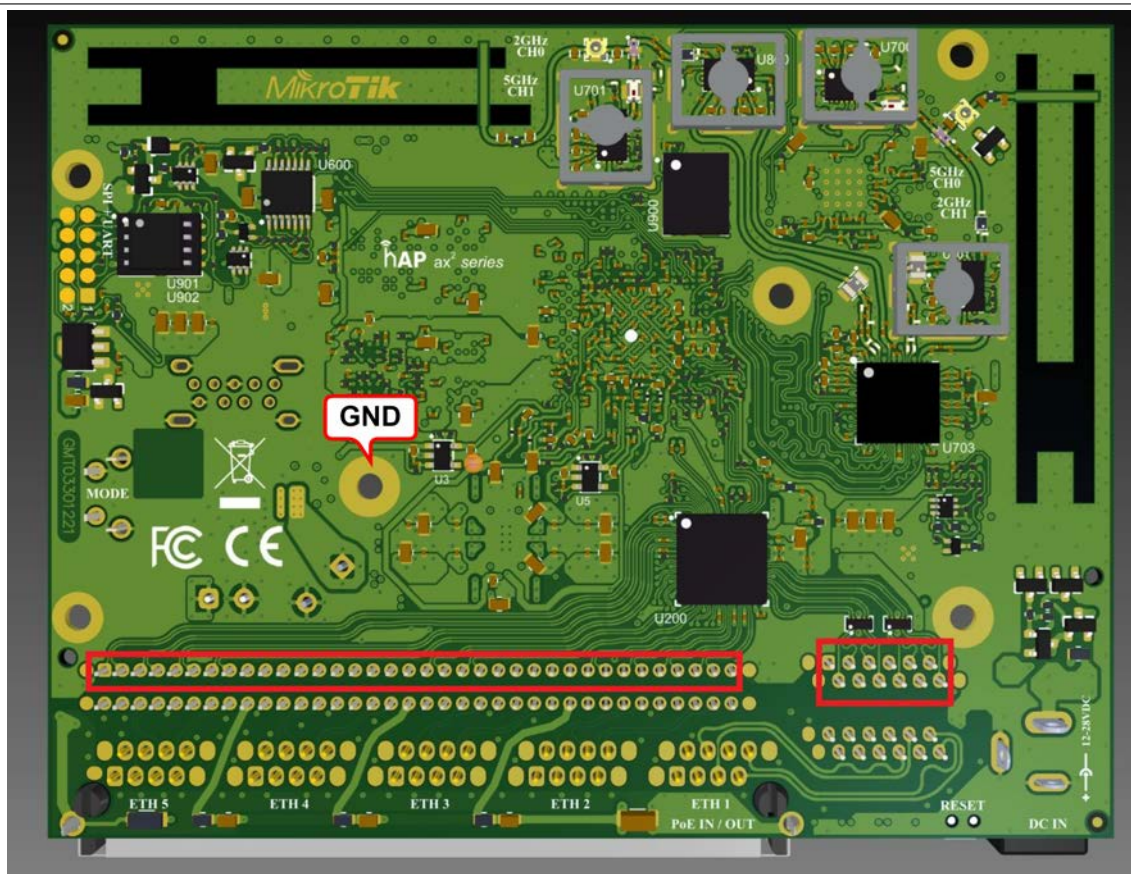
Check Schottky diodes D1, D3 and D602. The location of these diodes on the board is shown in picture 442. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

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 443. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 22.



Picture 442



Picture 443

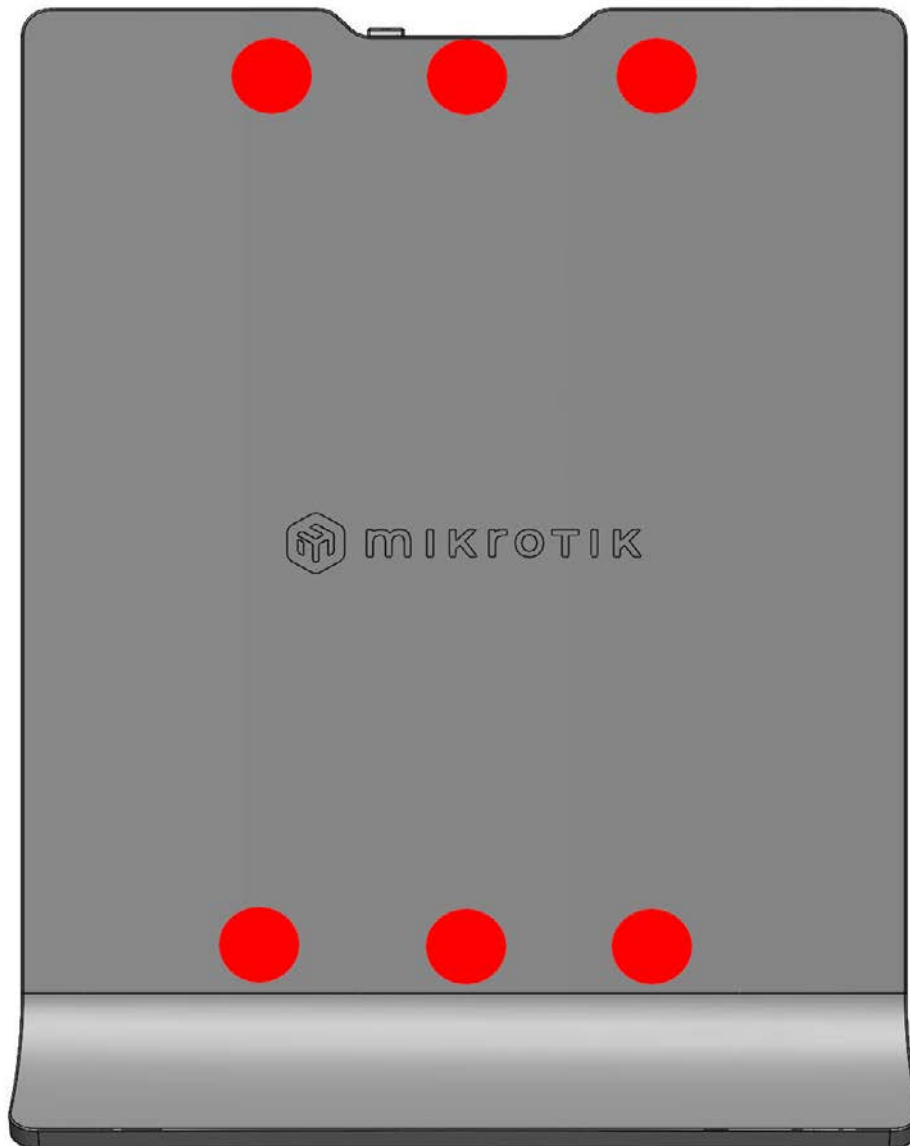
hAP ax lite and hAP ax lite LTE6 (L41G-2axD, L41G-2axD&FG621-EA)



Picture 444

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 446. The disassembly starts undoing six snap fit hooks that are located as shown in picture 445, 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.

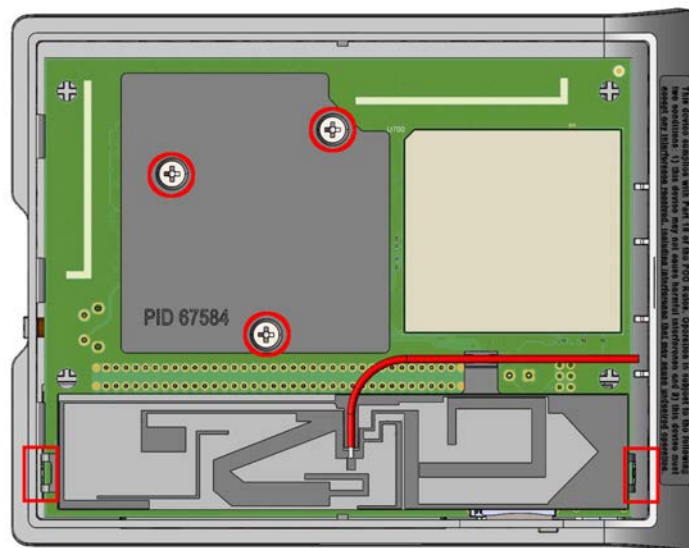


Picture 445



Picture 446

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 447. Now remove the top and bottom heatsinks and then you can begin the tests for checking overvoltage.

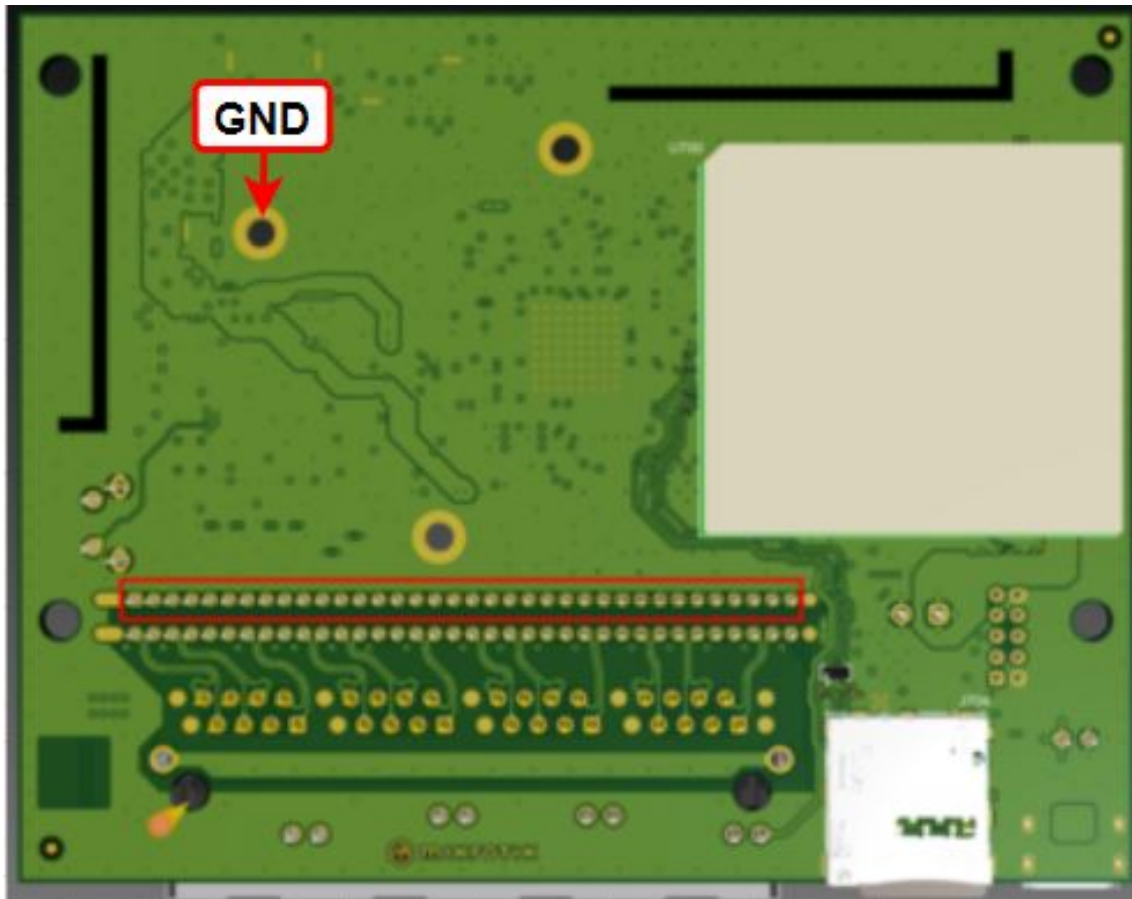


Picture 447

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 448. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 22.



Picture 448

hAP ax S (E62iUGS-2axD5axT)



Picture 449

Step 1: Using a Torx T-10 screwdriver unscrew one screw and carefully pry off the back cover, location off the screw and the clips can be seen in the picture 450.



Picture 450

Step 2: Using a Torx T-10 screwdriver unscrew four screw and carefully remove the heat-sink, see picture 451.



Picture 451

Step 3: Disconnect the antenna and remove the PCB from the case, see picture 452.



Picture 452

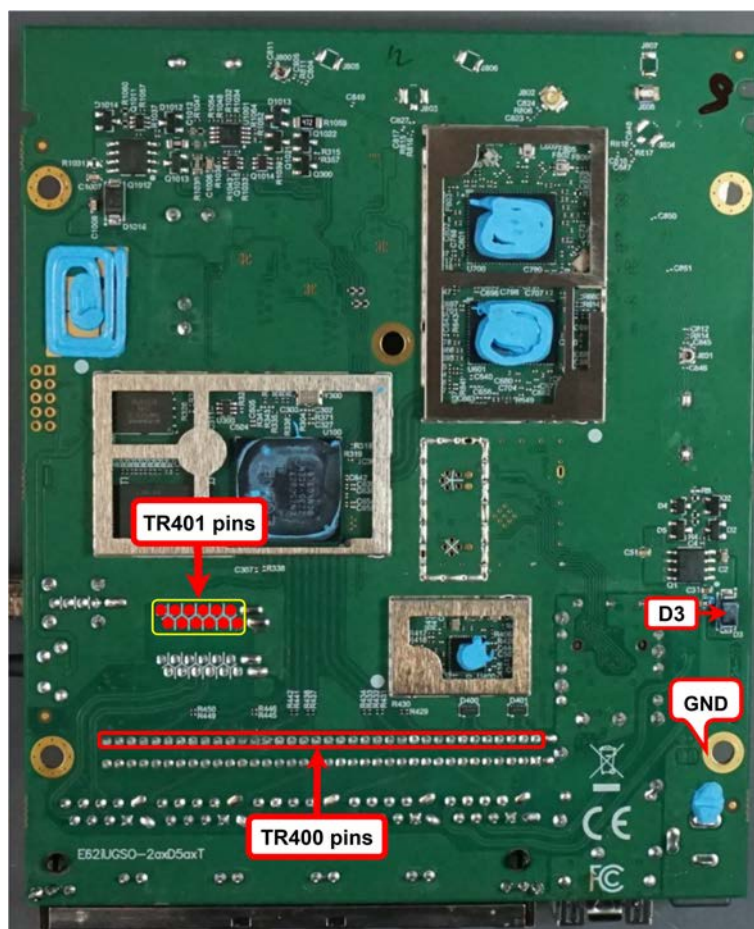
Instructions for checking over-voltage

Checking Schottky diodes

Check Schottky diodes D1 and D3. Location of the diodes on the board you can see in the pictures 453, 454. Schottky diode quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformers pins and Ground

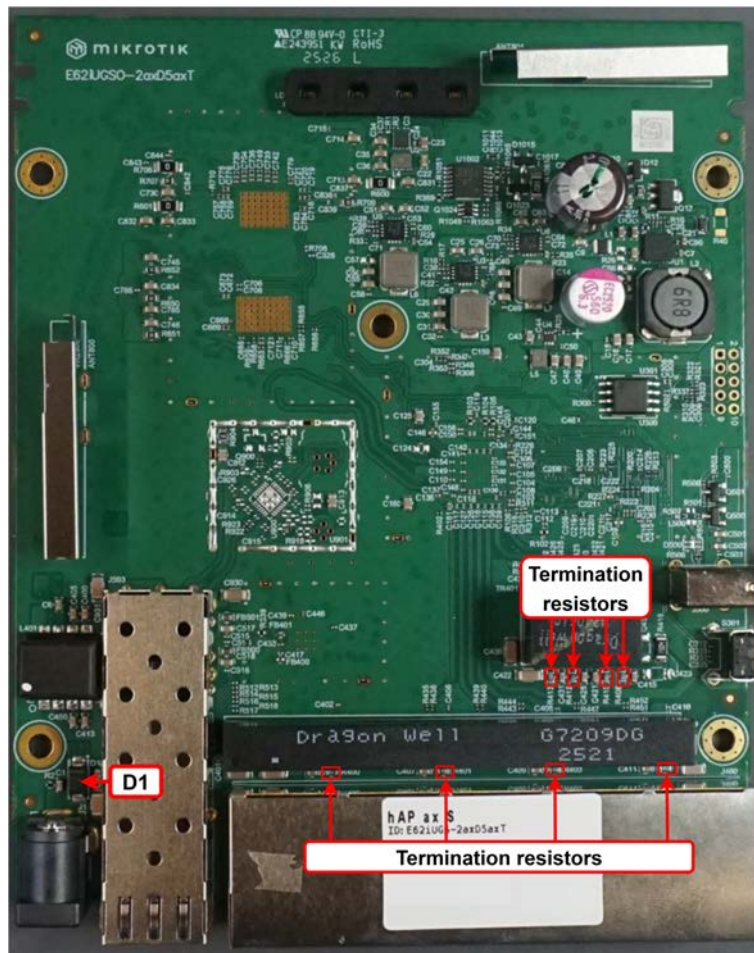
Check voltage drop value between Ethernet transformers TR400, TR401 pins and Ground, see picture 453. Voltage drop value on the transformer TR400 should be in the range from 0,30V to 0,40V and on the transformer TR401 should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 22.



Picture 453

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 454.



Picture 454

HEX SERIES ROUTERBOARDS

hEX (E50UG)



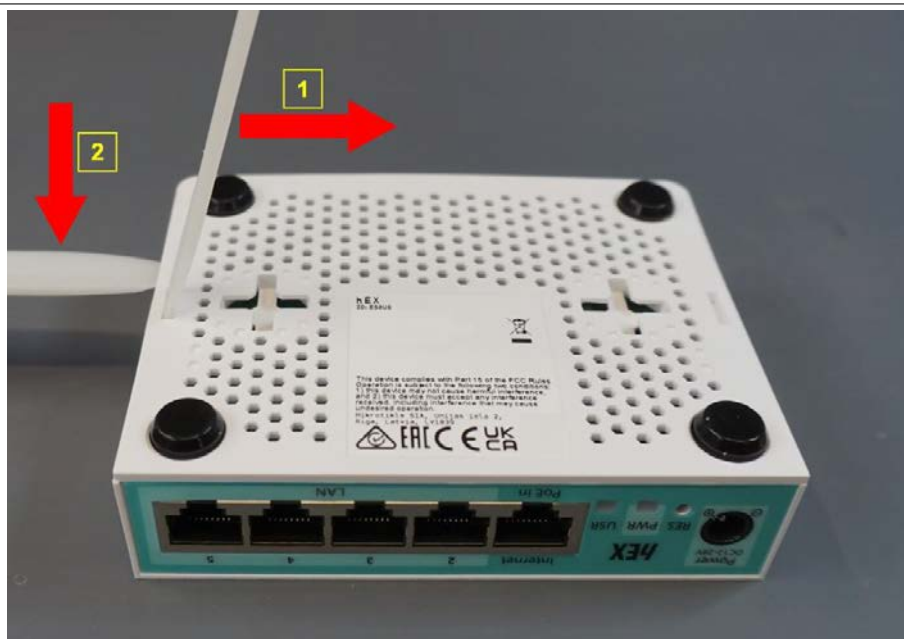
Picture 455

Disassembling information

Step 1: Using plastic prying tools remove the back cover as shown in pictures 456 and 457.

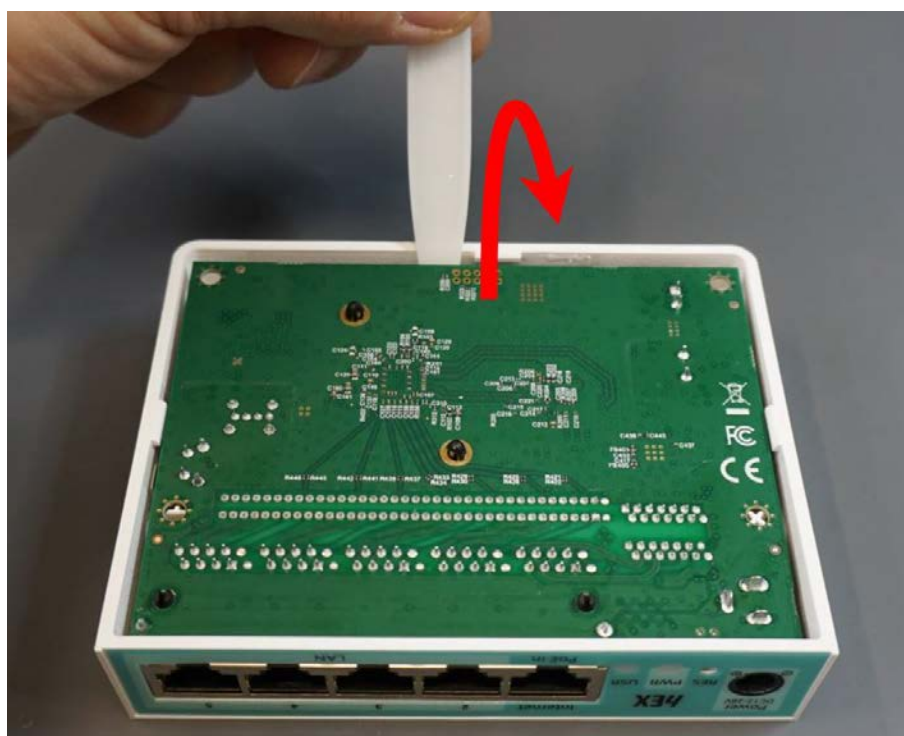


Picture 456



Picture 457

Step 2: Remove the PCB from the case, see picture 458.

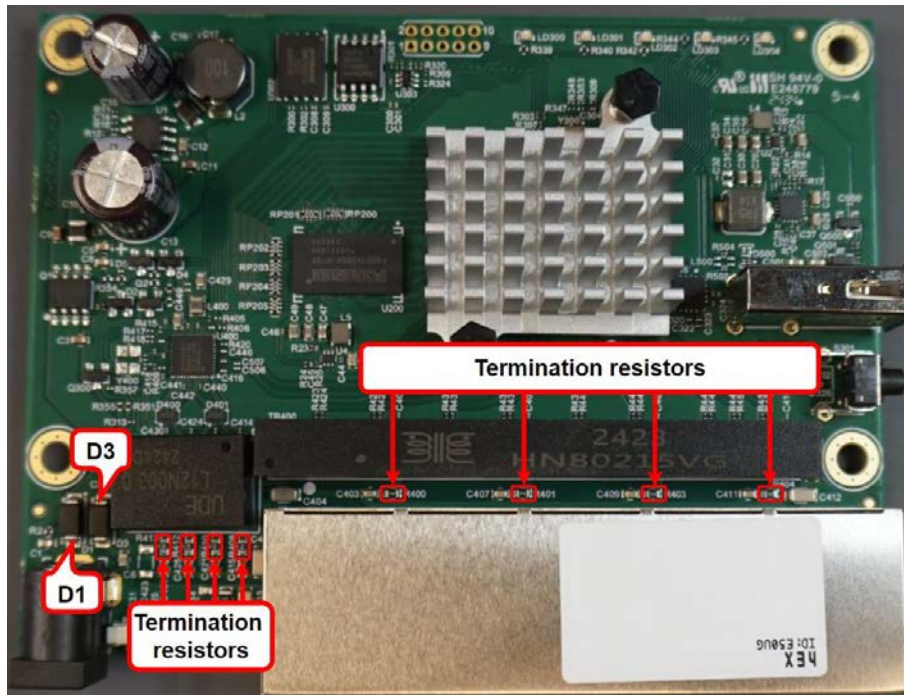


Picture 458

Instructions for checking over-voltage

Checking Schottky diodes

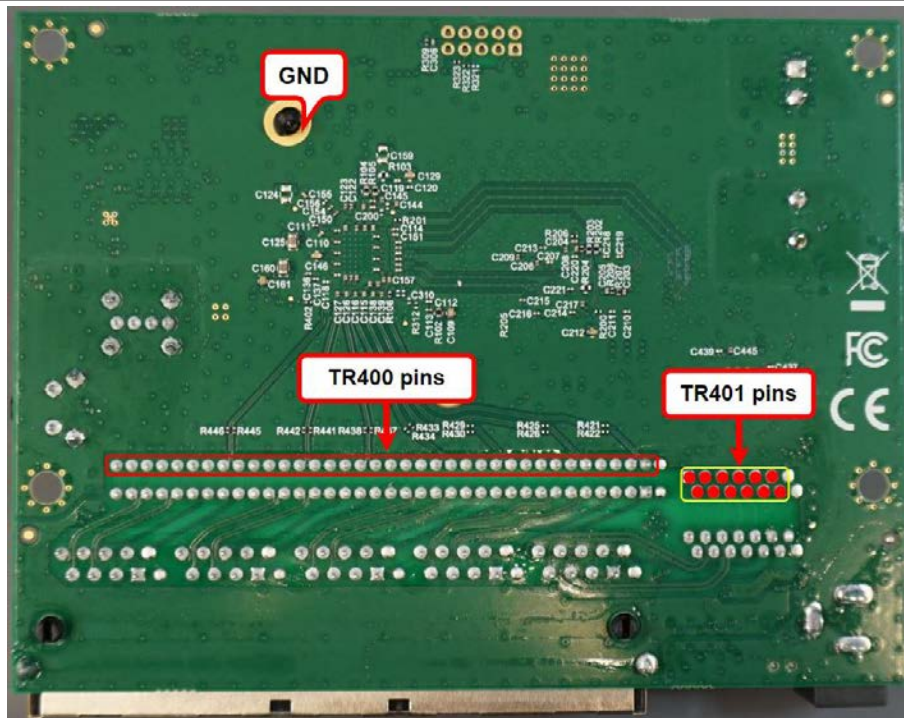
Check Schottky diodes D1 and D3. Location of the diodes on the board you can see in the picture 459. Schottky diode quality measurement method is described on page 19.



Picture 459

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR400, TR401 pins and Ground, see picture 460. Voltage drop value on the transformer TR400 should be in the range from 0,35V to 0,40V and on the transformer TR401 should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page 22.



Picture 460

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture [459](#).

hEX S(E60iUGS)



Picture 461

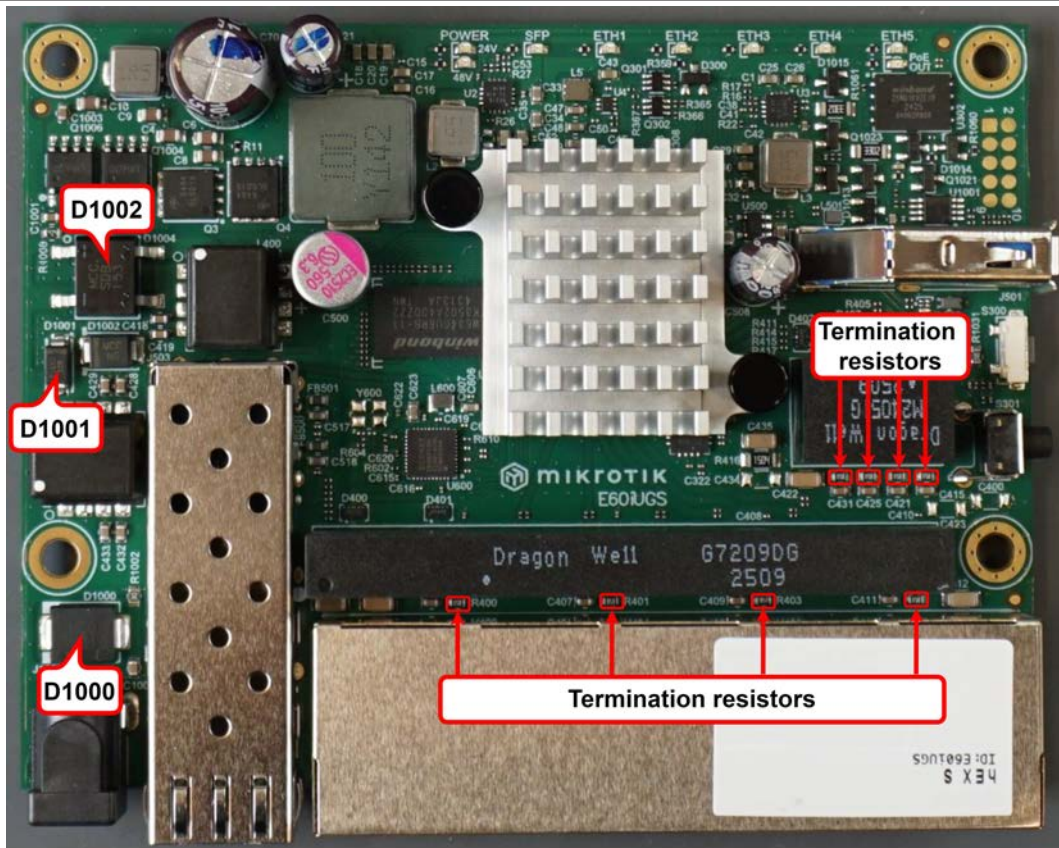
Disassembling information

Disassembling method is the same as for hEX (E50UG), see page [371](#).

Instructions for checking over-voltage

Checking Schottky diodes and diode bridge

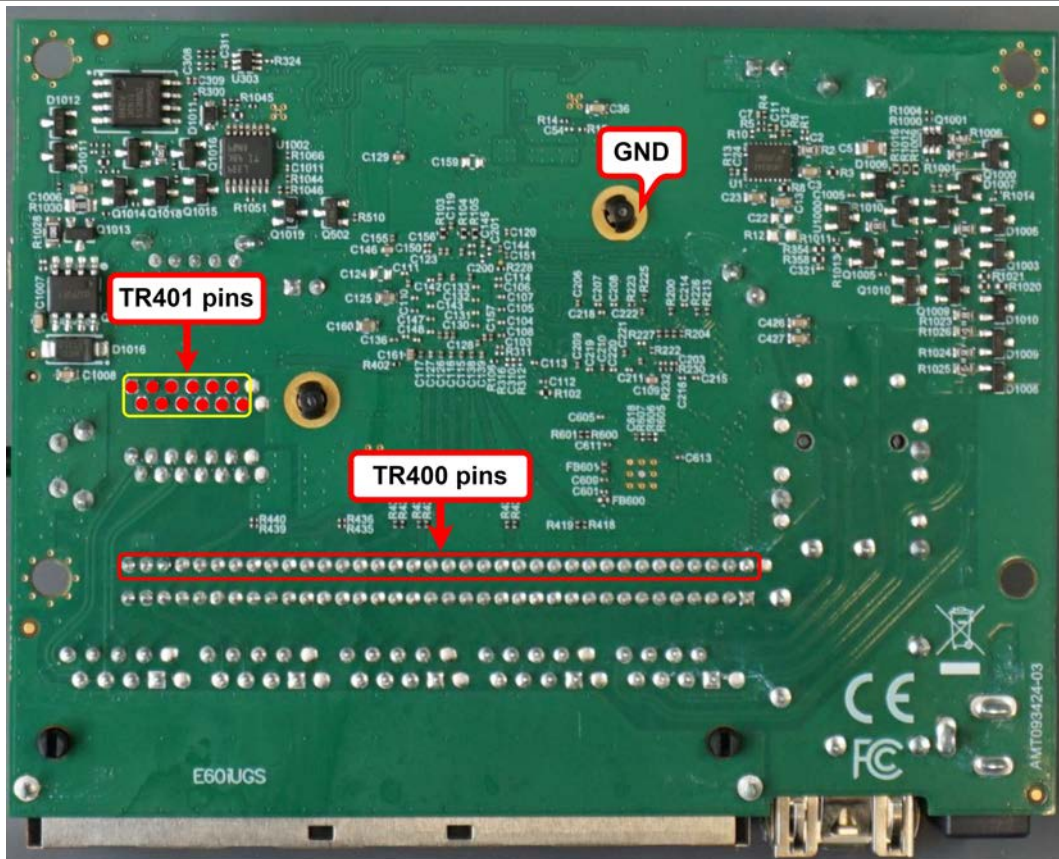
Check Schottky diodes D1000, D1001 and diode bridge D1002. Location of the diodes on the board you can see in the picture [462](#). Schottky diode quality measurement method is described on page [19](#). Diode bridge quality measurement method is described on page [20](#).



Picture 462

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR400, TR401 pins and Ground, see picture 463. Voltage drop value on the transformer TR400 should be in the range from 0,30V to 0,40V and on the transformer TR401 should be in the range from 0,37V to 0,47V. Voltage drop measurement method is described on page 22.



Picture 463

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 462.

L009 SERIES ROUTERBOARDS

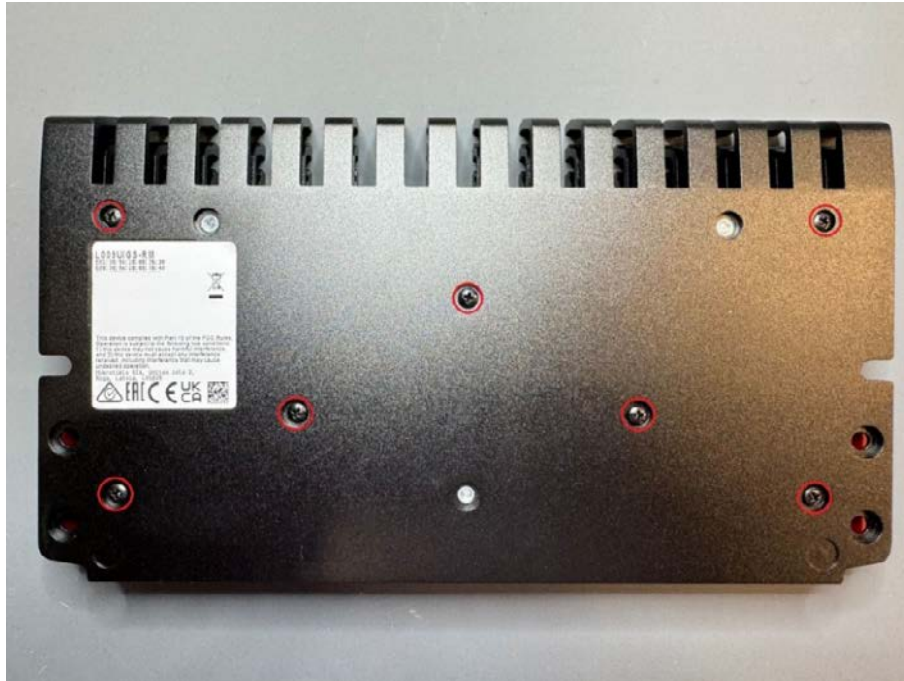
L009UiGS-RM and L009UiGS-2HaxD-IN



Picture 464

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 465. When you have finished unscrewing the screws turn the RouterBOARD around and remove the red cover as shown in picture 466.



Picture 465



Picture 466

Step 2: After removing the red cover unscrew the 3 screws that are holding the RouterBOARD in place as shown in the picture 467. Now you can remove the PCB and start checking over-voltage.

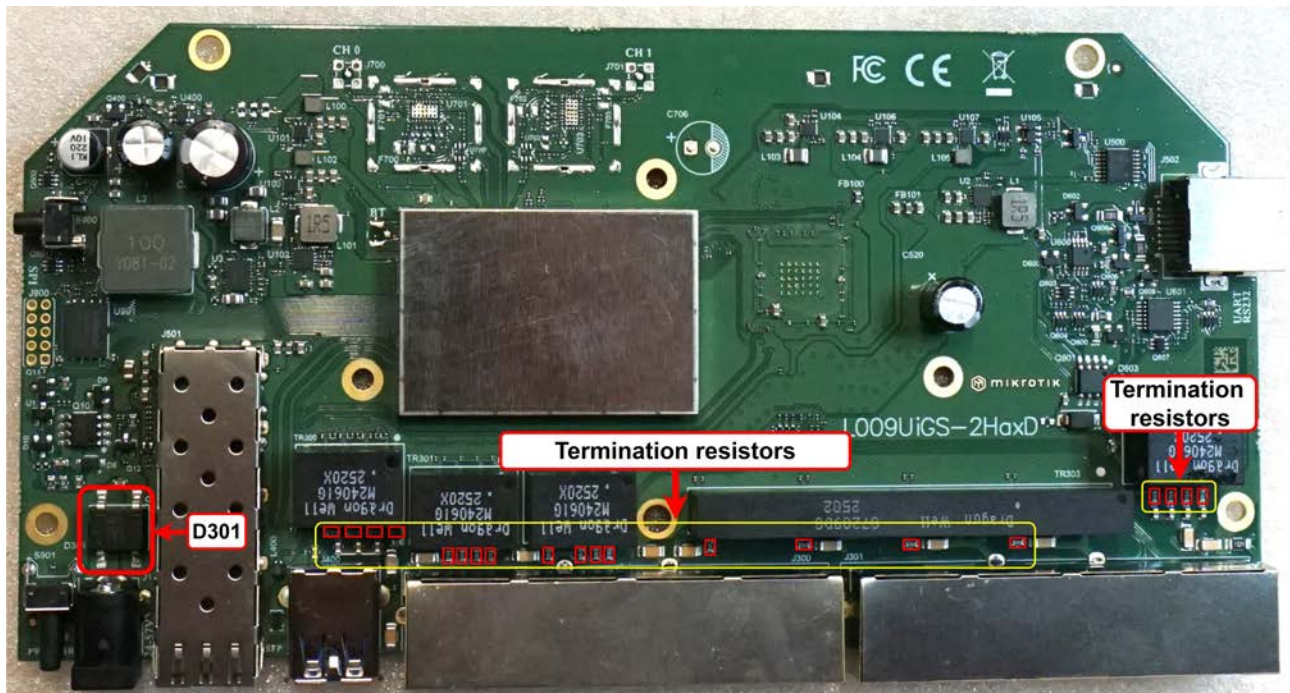


Picture 467

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

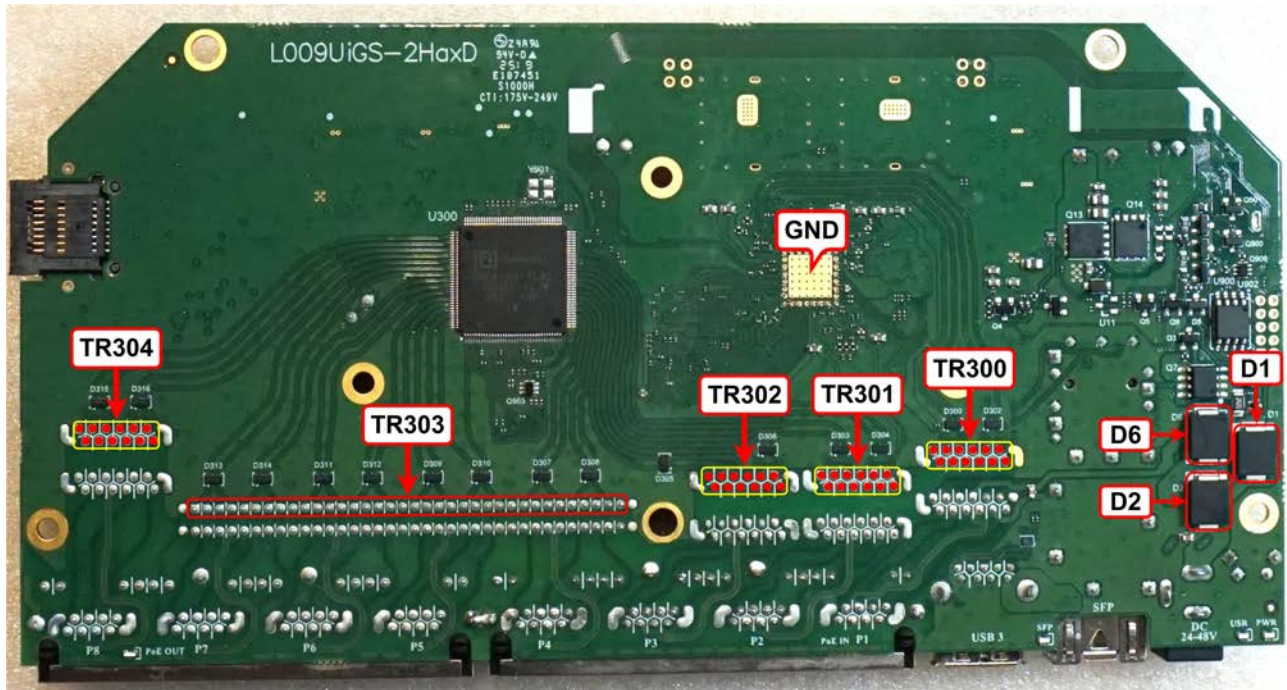
Check Schottky diodes D1, D2, D6 and diode bridge D301. The location of the diodes on the board is shown in picture 468 and 469. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.



Picture 468

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR300, TR301, TR302, TR303, TR304 pins and Ground, see picture 469. Voltage drop value should be in the range from 0,30V to 0,45V. Voltage drop measurement method is described on page 22.



Picture 469

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 468.

L23 SERIES ROUTERBOARDS

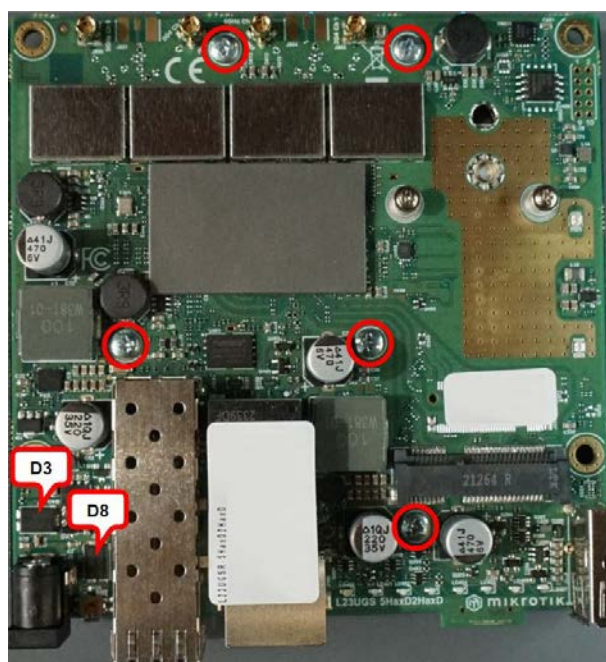
L23UGSR-5HaxD2HaxD



Picture 470

Disassembling information

Unscrew 5 screw using PH1 screwdriver and carefully detach the PCB from the heat-sink. Location of the screw is shown the picture 471.



Picture 471

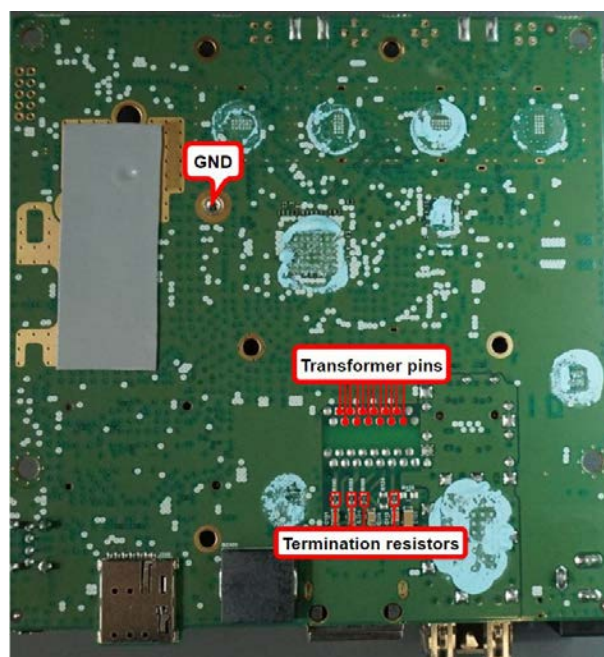
Instructions for checking over-voltage

Checking Schottky diodes

Check Schottky diodes D3, D8. Location of the diodes you can see in the picture 471. Schottky diode quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR100 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 472. Voltage drop value should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 22.



Picture 472

Checking termination resistors resistance

Check value of each termination resistor, it should be 75 Ohm $\pm 2\%$. Location of resistors is shown in picture 472.

NetMetal ax (L23UGSR-5HaxD2HaxD)



Picture 473

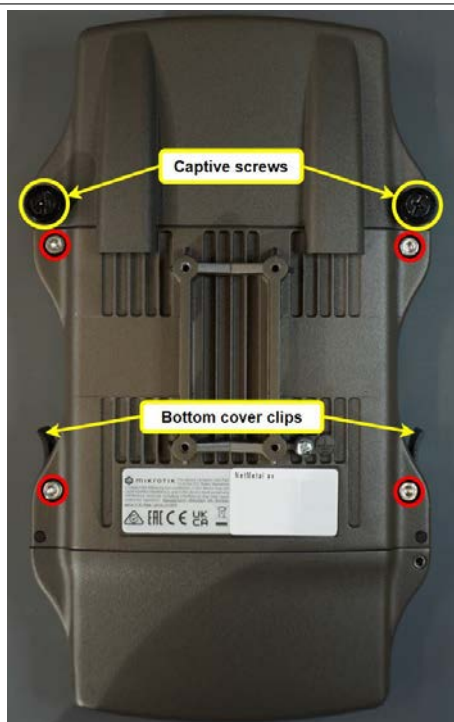
Disassembling information

Step 1:

Unscrew two captive screws and remove the top cover, see picture [474](#).

Step 2:

Using hex 3 screwdriver unscrew four screws and open the bottom cover. Location of the screws and you can see in the picture [474](#).



Picture 474

Step 3:

Carefully detach the rubber seal from the top part of the case, see pictures 475, 476. After that, gently peel off the label, see picture 476. Carefully separate the back part of the case from the front part of the case.



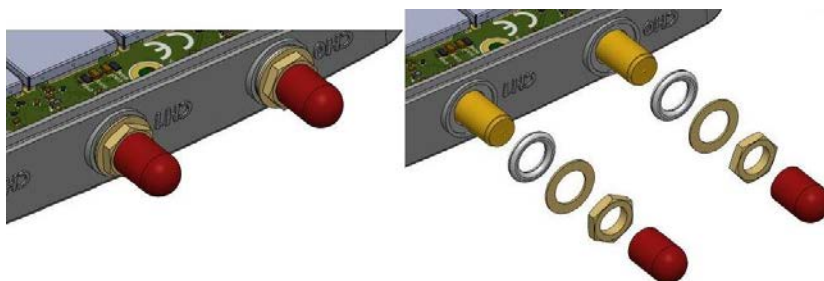
Picture 475



Picture 476

Step 4:

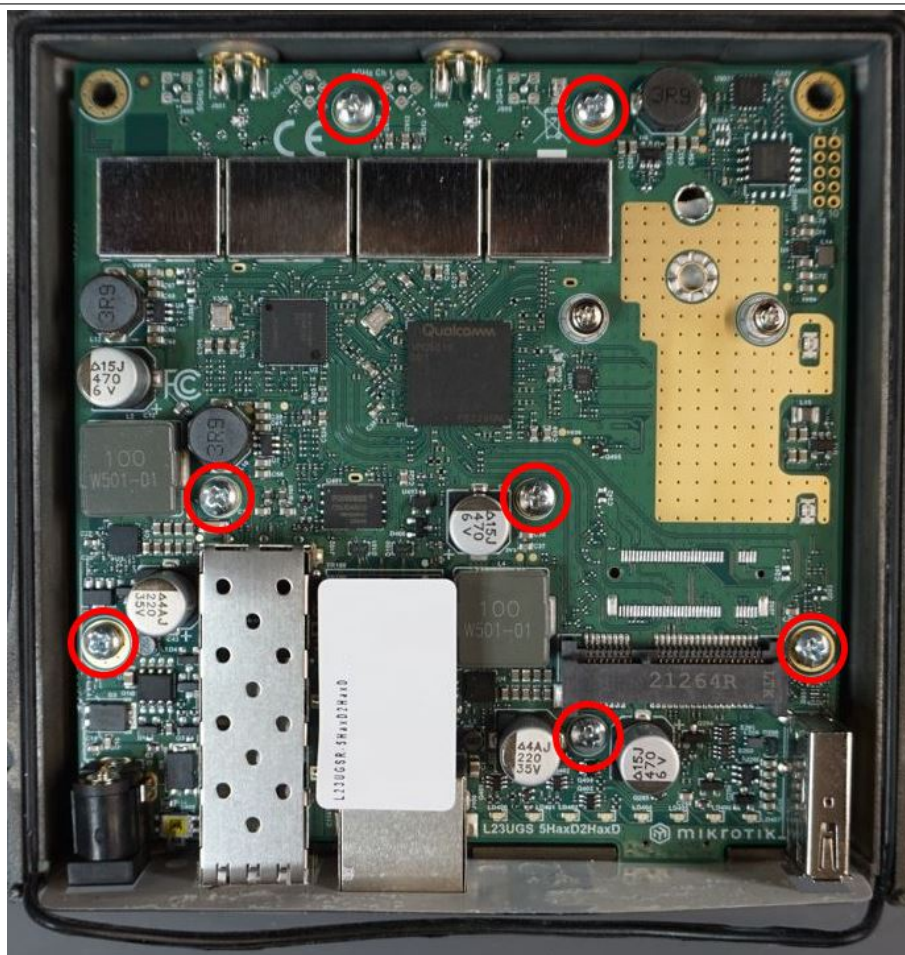
Unscrew two SMA connector nuts. After that, remove washers and transparent gaskets, see picture 477.



Picture 477

Step 4:

Using PH1 screwdriver unscrew 7 screws and pull out the PCB from the case. Location of the screws and you can see in the picture 478.



Picture 478

Instructions for checking over-voltage

Over-voltage testing procedure is the same as for L23UGSR, see page 386.

CUBE SERIES ROUTERBOARD

Cube 60G ac (CubeG-5ac60ay) and CubeSA 60Pro ac (CubeG-5ac60ay-SA)



Picture 479

Disassembling information (sealed with gaskets)

Unscrew 4 screws using torx T10 screwdriver and carefully remove the cover. Location of the screws marked in the red circles is shown the picture 480. The disassembled case can be seen in the picture 481.



Picture 480



Picture 481

Disassembling information (sealed with sealant)

Step 1: Unscrew 4 screws using torx T10 screwdriver. Location of the screws is shown the picture 482.



Picture 482

Step 2: Using a scalpel or a sharp knife, carefully separate the cover. How to do this, see the picture 483. The cover is difficult to remove because it is glued with sealant, so be extremely cautious doing this.



Picture 483

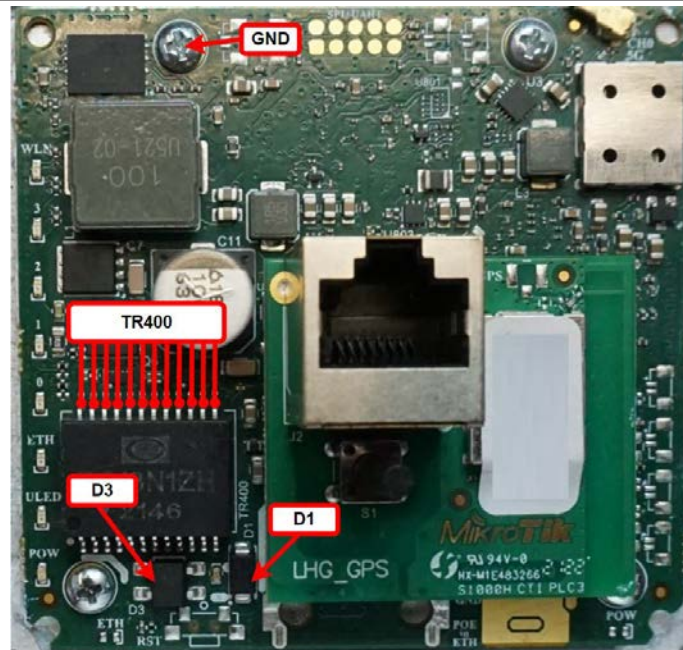
Instructions for checking over-voltage

Checking Schottky diode and diode bridge

Check Schottky diode D1 and diode bridge D3. Location of the diodes on the board you can see in the picture [483](#). Schottky diode quality measurement method is described on page [19](#). Diode bridge quality measurement method is described on page [20](#).

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 highlighted with red lines, see picture [483](#). Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page [22](#).



Picture 484

Cube 60G ac

The Cube 60G does not have over-voltage instructions because the device case cannot be disassembled.

Cube Lite60

The Cube Lite60 does not have over-voltage instructions because the device case cannot be disassembled.

LDF SERIES ROUTERBOARD

LDF LTE6 kit (RBLDFR&R11e-LTE6)



Picture 485

Disassembling information

Tools recommended for the disassembly are plastic prying tools, such as shown on pictures [486](#) and [487](#).



Picture 486



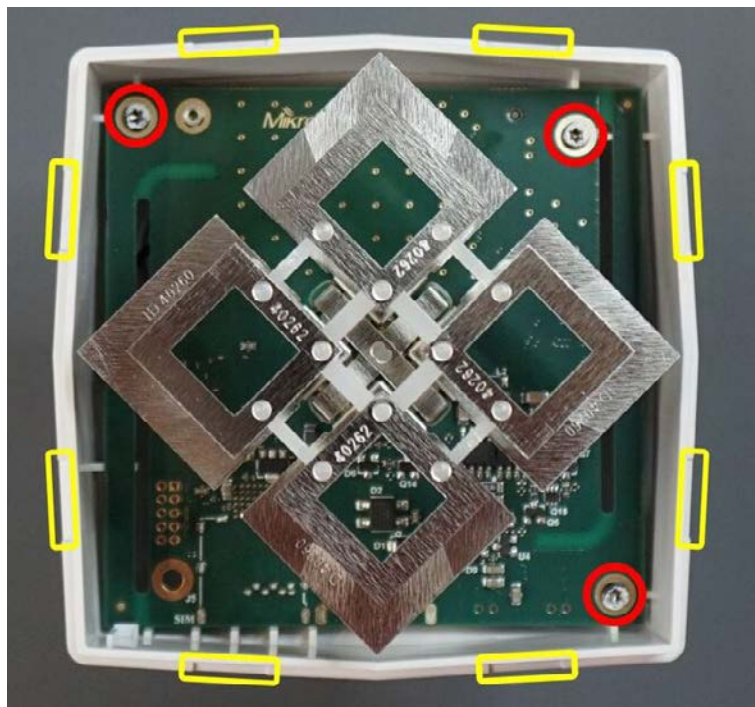
Picture 487

Step 1: Using plastic prying tools release 8 snap hooks around the perimeter of the case as shown in the picture 488. The location of the snap hooks can be seen in the picture 489 (marked in yellow).



Picture 488

Step 2: Unscrew 3 screws using torx T8 screwdriver. Location of the screws is shown in the picture 489.

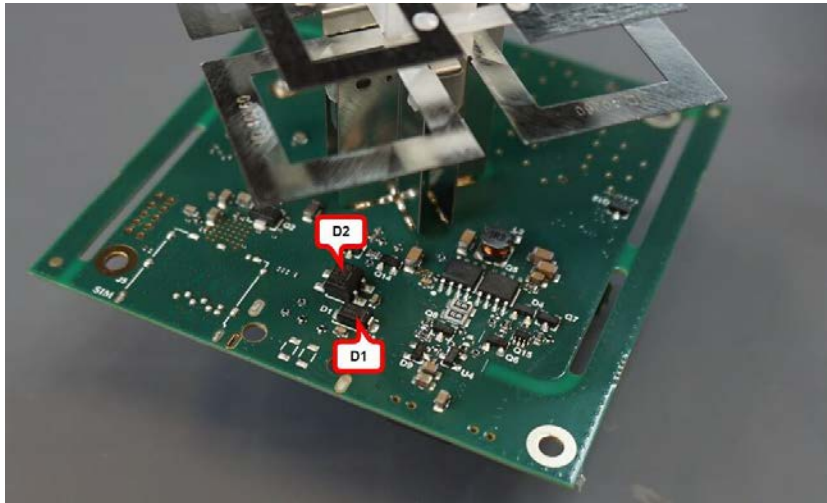


Picture 489

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

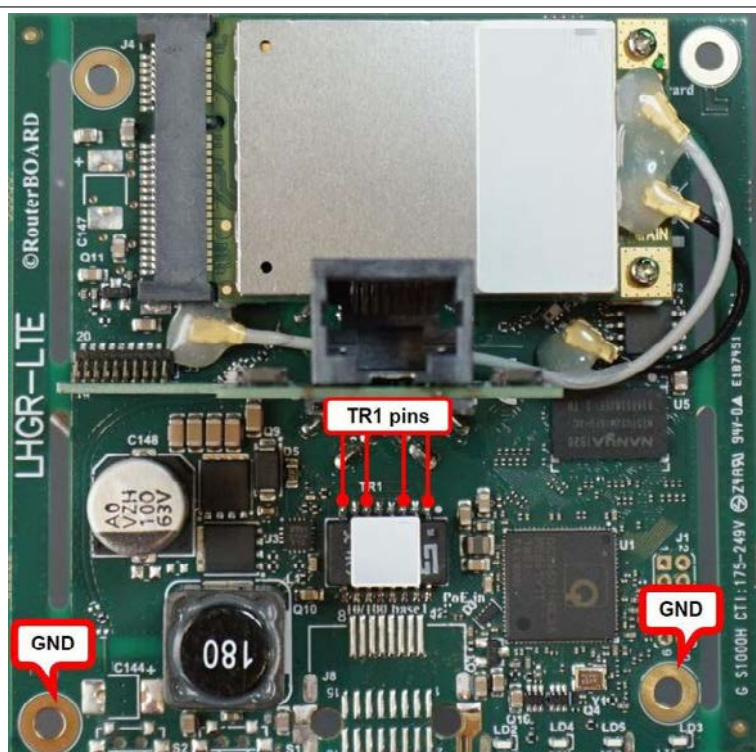
Check Schottky diode D1 and diode bridge D2. Location of the diodes on the board you can see in the picture 490. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.



Picture 490

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 highlighted with red lines, see picture 491. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 22.



Picture 491

LHG SERIES ROUTERBOARD

LHGG LTE6 kit (RBLHGGR&R11e-LTE6)



Picture 492

Disassembling information

Tools recommended for the disassembly are plastic prying tools, such as shown on pictures [493](#) and [494](#).

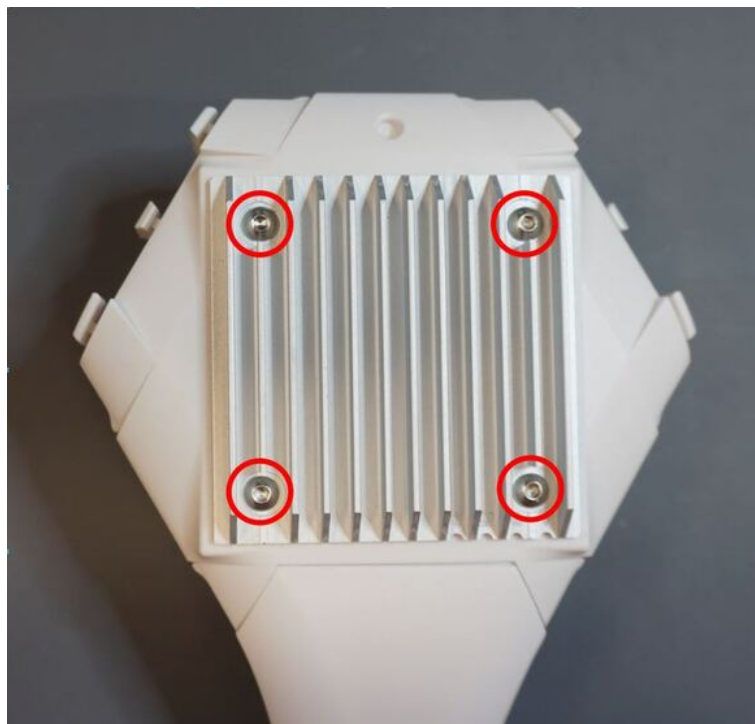


Picture 493



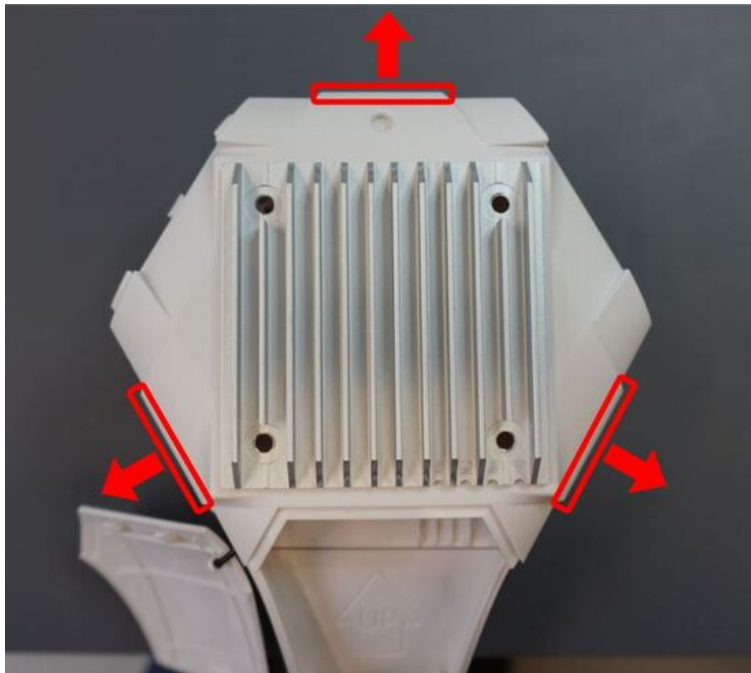
Picture 494

Step 1: Unscrew 4 screws using 2.5mm Hex screwdriver. Location of the screws is shown the picture [495](#).



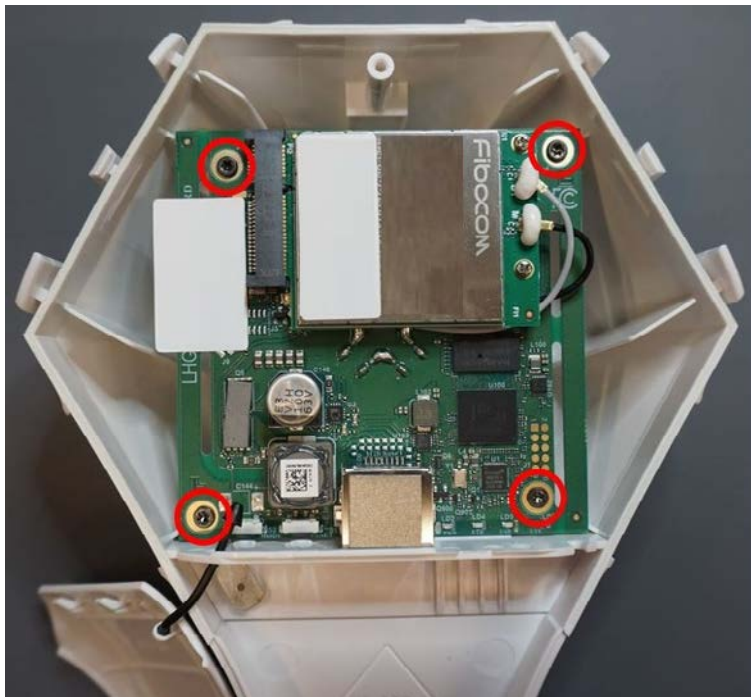
Picture 495

Step 2: Carefully move the clips outwards at the same time trying to lift the lid of the device upward. Location of the clips you can see in the picture [496](#).



Picture 496

Step 3: Unscrew 4 screws using torx T8 screwdriver and remove the PCB from the case. Location of the screws is shown the picture 497.



Picture 497

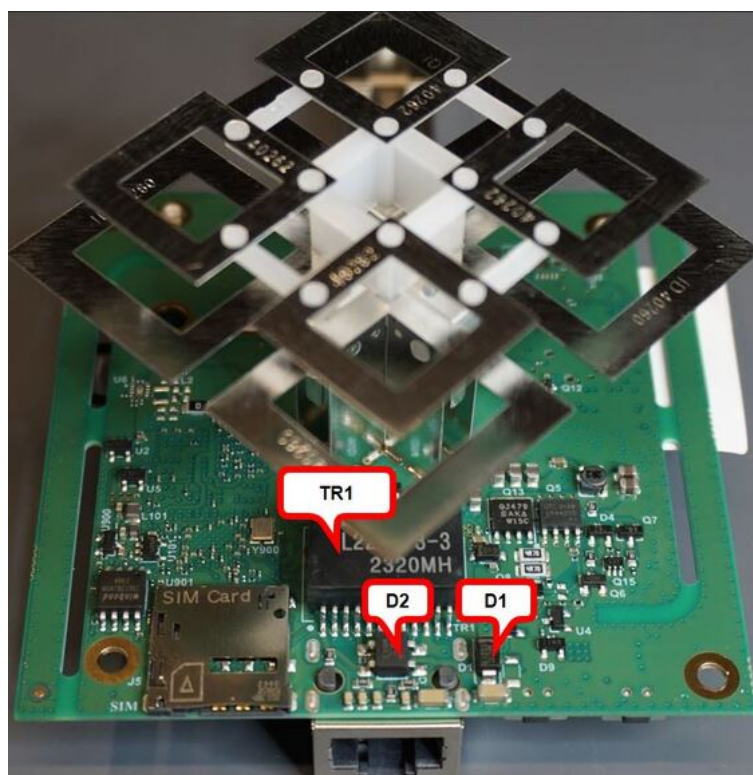
Instructions for checking over-voltage

Checking Schottky diode and diode bridge

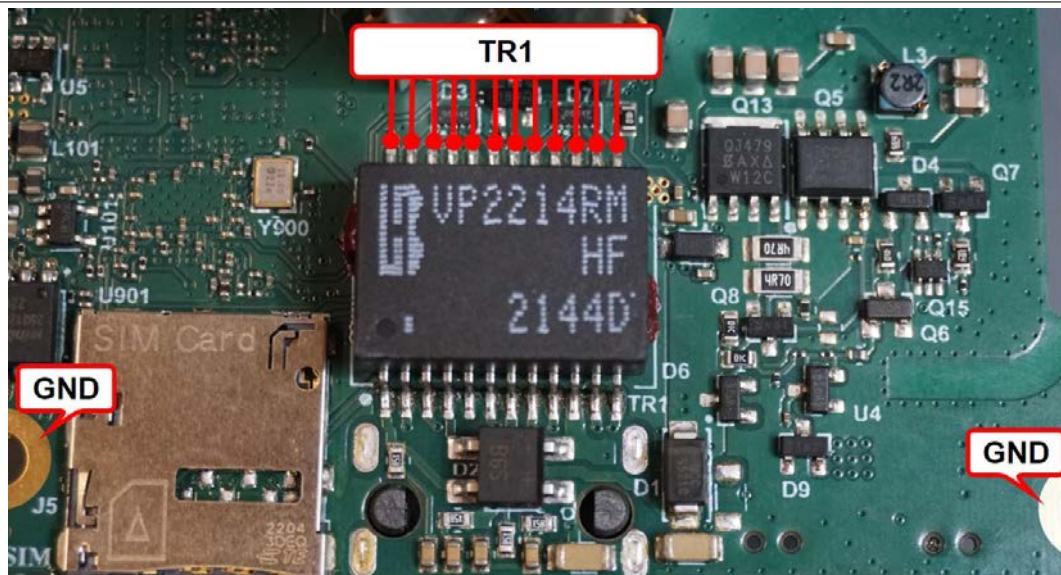
Check Schottky diode D1 and diode bridge D2. Location of the diodes on the board you can see in the picture 498. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

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 highlighted with red lines, see picture 499. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 22.



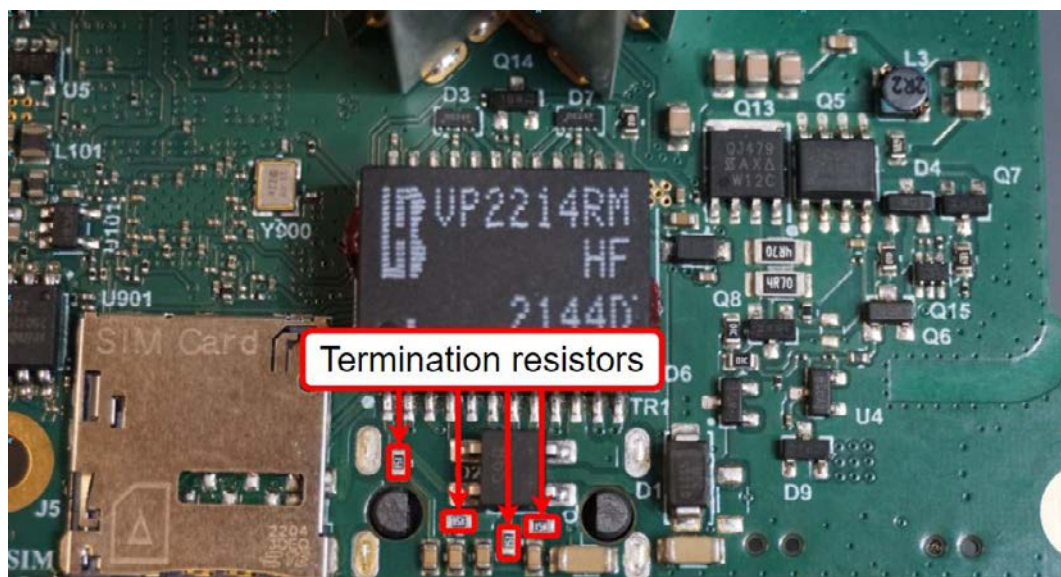
Picture 498



Picture 499

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 500.



Picture 500

LHGGM&EG18-EA



Picture 501

Disassembling information

Disassembling method is the same as for LHGG LTE6 kit, see page 495.

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

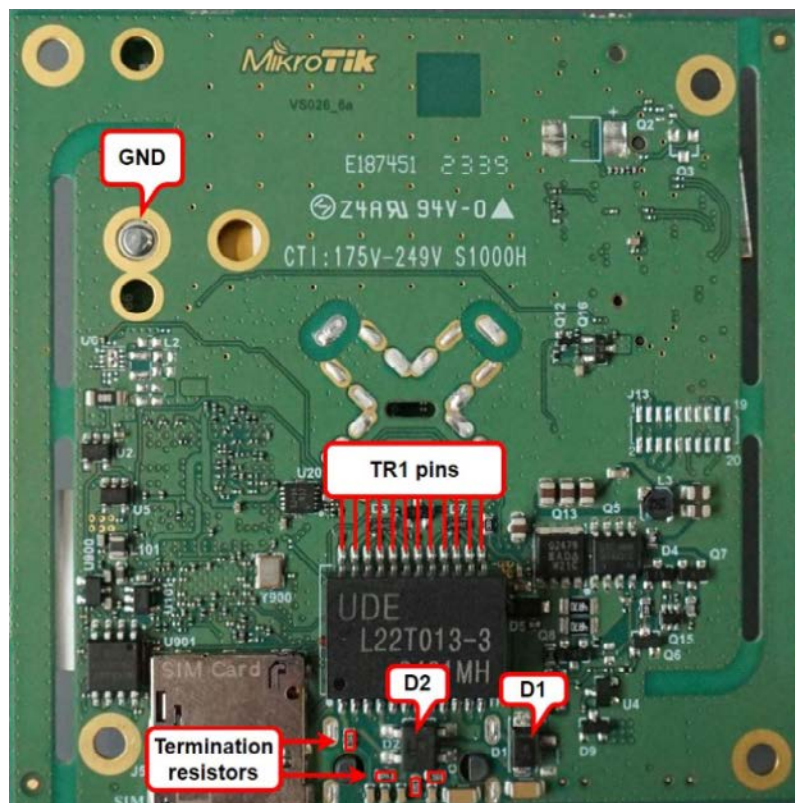
Check Schottky diode D1 and diode bridge D2. Location of the diodes on the board you can see in the picture 502. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

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 highlighted with red lines, see picture 502. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of four termination resistors. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 502.



Picture 502

LHG 5 ax (LHG-5axD) and LHG XL 5 ax (LHG-5axD-XL)



Picture 503

Disassembling information

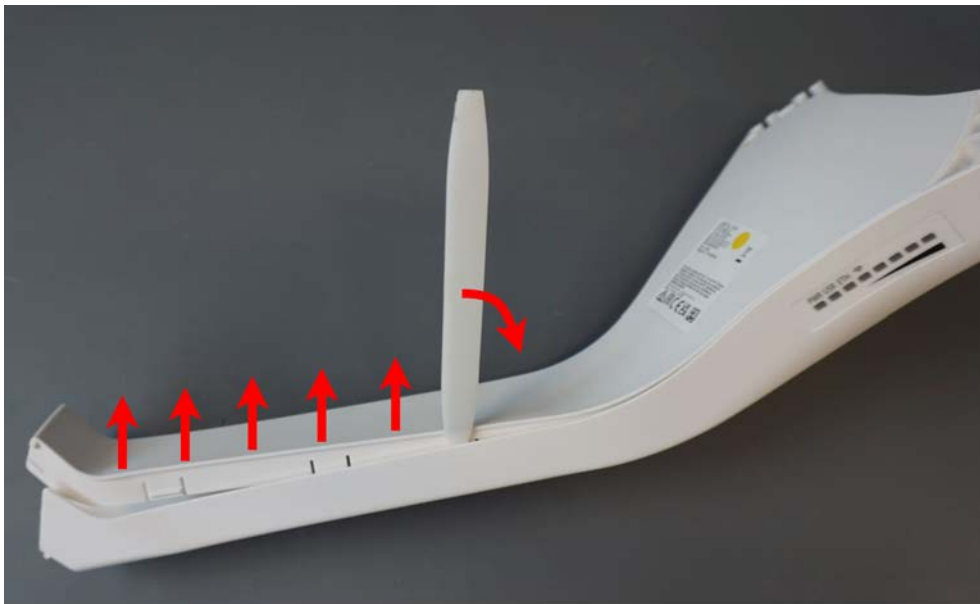
Tools recommended for the disassembly are plastic prying tools, see pictures [493](#) and [494](#).

Step 1:

The back cover is held by plastic clips. In order to open it, it is necessary to inset a plastic prying tool into the gap between the cover and the case, trying to widen the gap until the cover comes off, see pictures [504](#), [505](#).



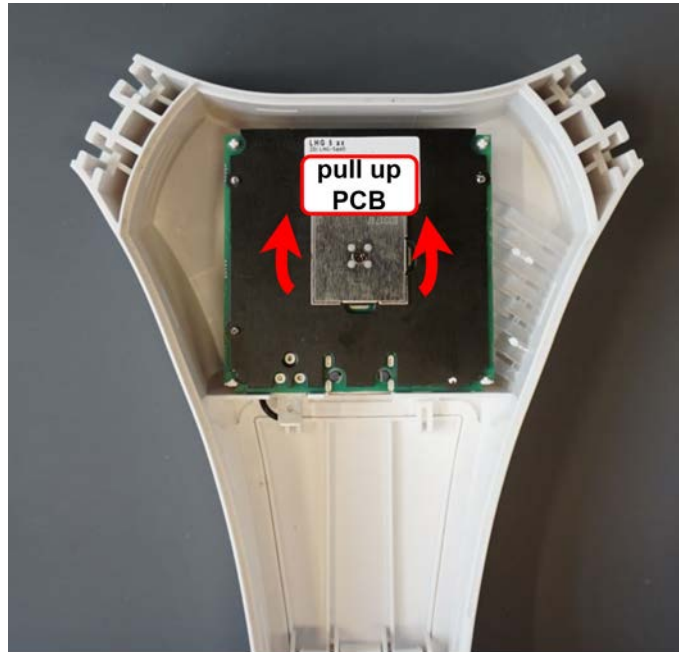
Picture 504



Picture 505

Step 2:

When the cover is removed, carefully pull the PCB out of the case, see picture 506.



Picture 506

Step 3:

Unscrew 3 screws using PH1 screwdriver and disconnect the heat-sink from the PCB. Location of screws you can see in the picture 507.



Picture 507

Instructions for checking over-voltage

Checking Schottky diode

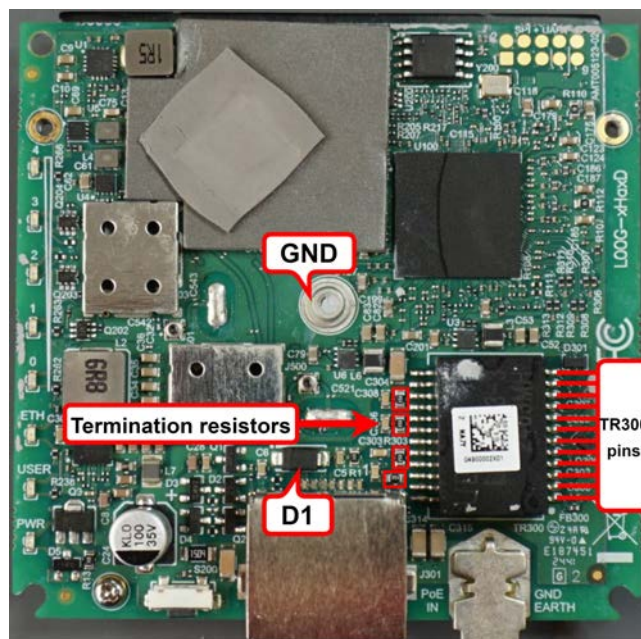
Check Schottky diode D1. Location of the diode on the board you can see in the picture 508. Schottky diode quality measurement method is described on page 19.

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 highlighted with red lines, see picture 508. Voltage drop value should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms $\pm$ 1%. Location of resistors is shown in picture 508.



Picture 508

MANTBOX SERIES ROUTERBOARDS

mANTBox 52 15s (RBD22UGS-5HPacD2HnD-15S)



Picture 509

Disassembling information

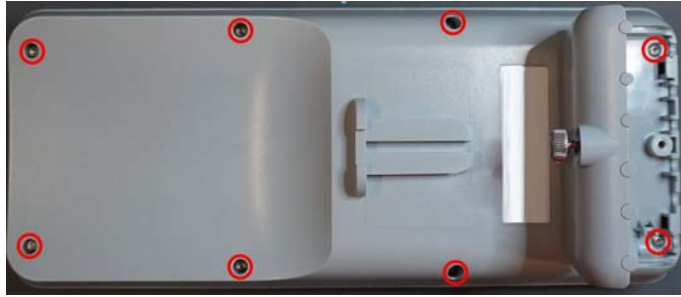
Step 1: Open the cable enclosure and unscrew the wing-nut, see picture 510.



Picture 510

Step 2:

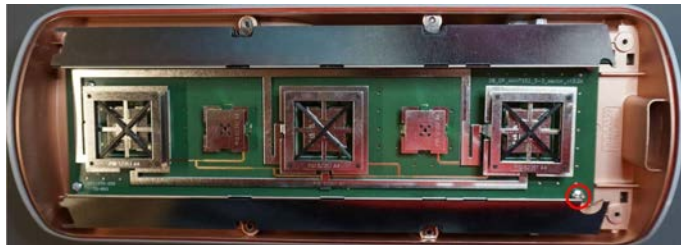
Unscrew 8 screws using torx T10 screwdriver. Location of the screws is shown the picture 511.



Picture 511

Step 3:

Remove the cover from the case and unscrew the screw (M4x16), see picture 512, then pull out the antenna board from the case.



Picture 512

Step 4:

Disconnect antenna cables and unscrew 5 screws using PH1 screwdriver and remove the board, see picture 513.

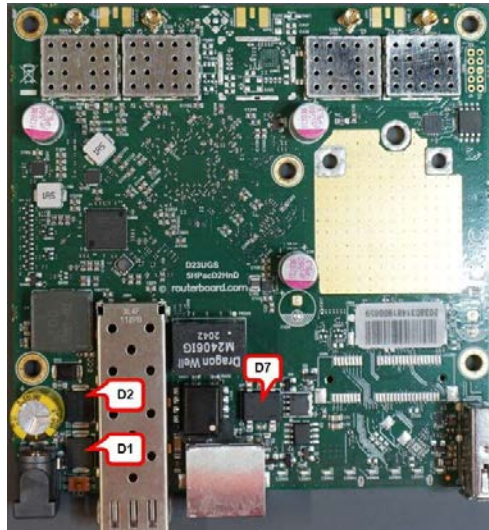


Picture 513

Instructions for checking over-voltage

Checking Schottky diodes and diode bridge

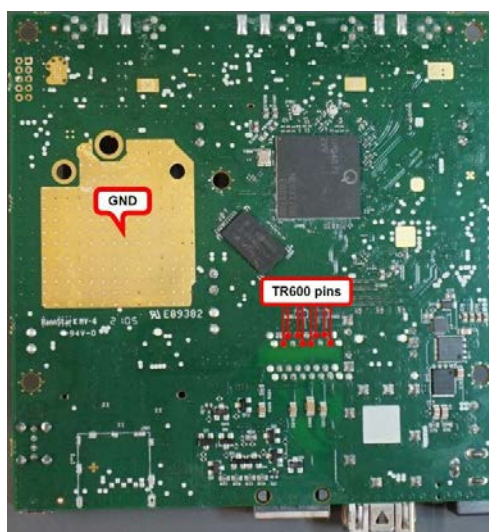
Check Schottky diodes D1, D2 and diode bridge D2. Location of the diodes on the board you can see in the picture 514. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.



Picture 514

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR600 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 515. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 22.



Picture 515

mANTBox ax 15s (L22UGS-5HaxD2HaxD-15S)



Picture 516

Disassembling information

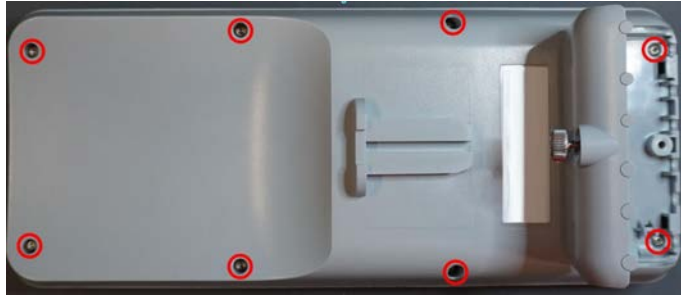
Step 1: Open the cable enclosure and unscrew the wing-nut, see picture 517.



Picture 517

Step 2:

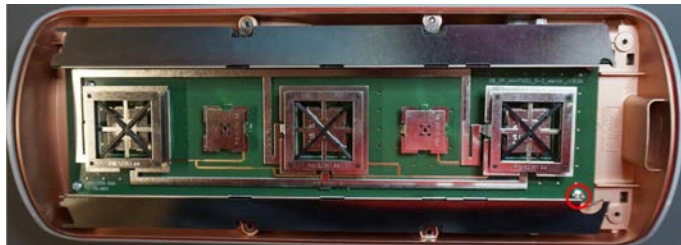
Unscrew 8 screws using torx T10 screwdriver. Location of the screws is shown the picture 518.



Picture 518

Step 3:

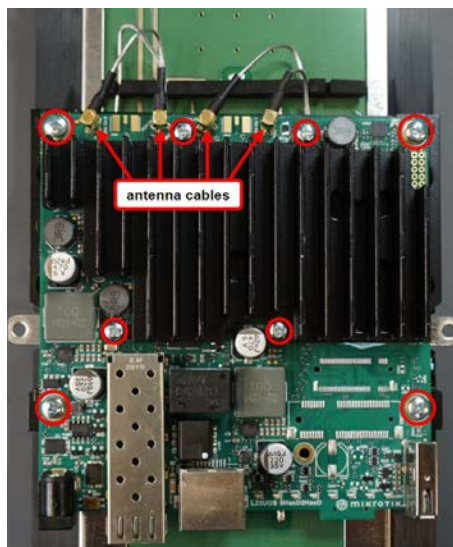
Remove the cover from the case and unscrew the screw (M4x16), see picture 519, then pull out the antenna board from the case.



Picture 519

Step 4:

Disconnect antenna cables and unscrew 8 screws using PH1 screwdriver and remove the board, see picture 513.



Picture 520

Instructions for checking over-voltage

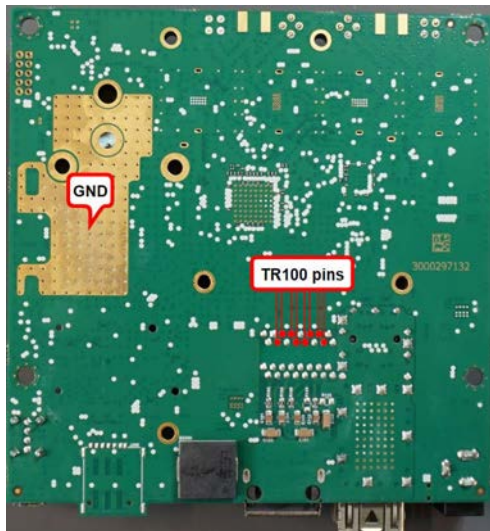
Check Schottky diodes D3, D8. Location of the diodes on the board you can see in the picture [521](#). Schottky diode quality measurement method is described on page [19](#).



Picture 521

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR100 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture [522](#). Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page [22](#).



Picture 522

KNOT SERIES

KNOT LR8 (RB924iR-2nD-BT5&BG77&R11e-LR8)

KNOT LR9 (RB924iR-2nD-BT5&BG77&R11e-LR9)



Picture 523

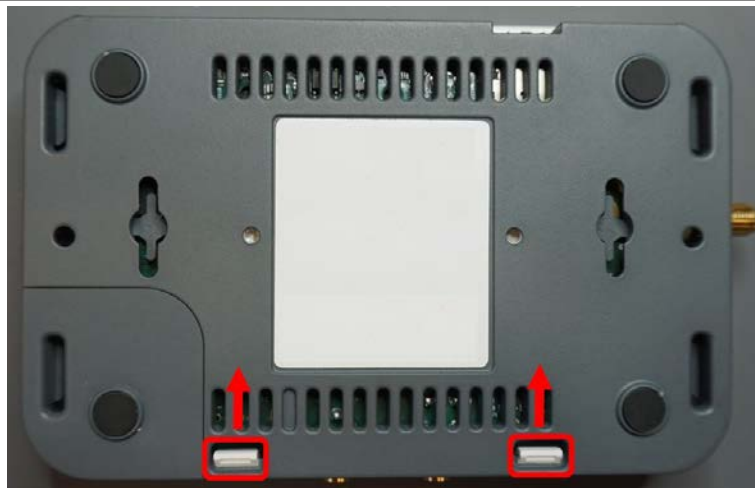
Disassembling information

Step 1: Unscrew 1 screw using PH1 screwdriver. Location of the screw is shown the picture [524](#).



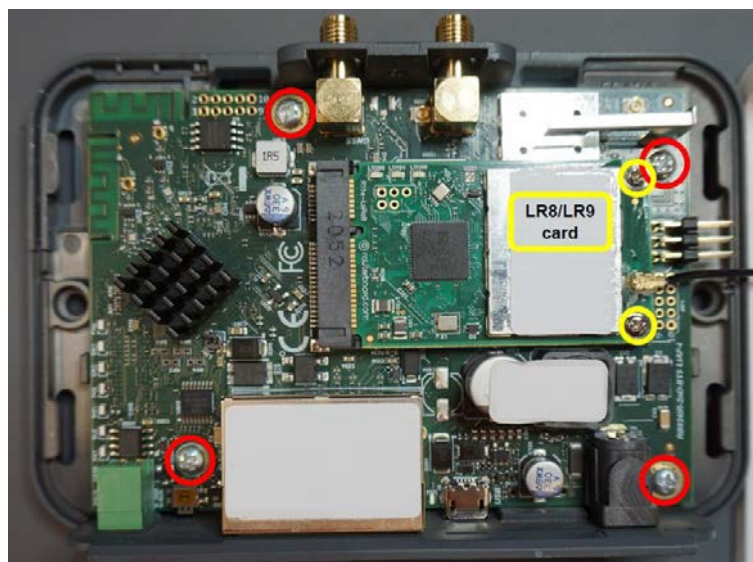
Picture 524

Step 2: Press the clips in the direction shown in the picture [525](#) at the same time lift the case up.



Picture 525

Step 3: Unscrew 6 screw using PH1 screwdriver. Location of the screw is shown the picture 526. Unplug the LR8/LR9 card from the connector and pull the circuit board out of the case.



Picture 526

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

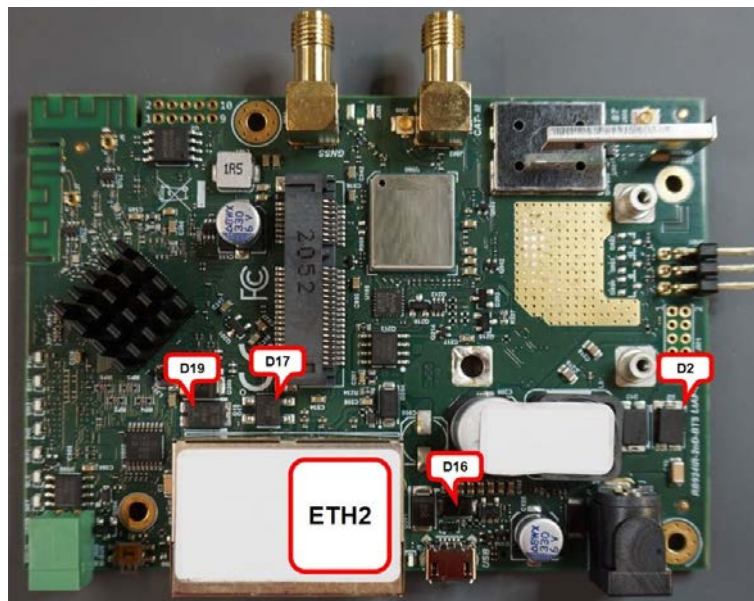
Check Schottky diodes D2, D16, D19 and diode bridge D17. Location of the diodes on the board you can see in the picture 527. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

Checking voltage drop value between RJ-45 connector pins and Ground

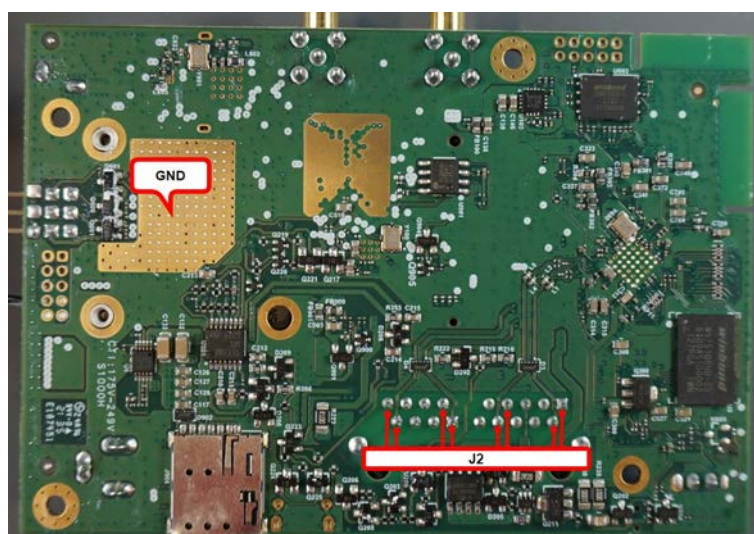
Check voltage drop value between RJ-45 (J2) connector pins and ground. Test points are shown in picture 528. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 22.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J2 connector. Only second Ethernet port (ETH2) has termination resistors, location of Ethernet port can be seen in the picture 527. Resistance value between Rx and Tx line must be 150 Ohm $\pm$ 4 %. Measurement method is described on page 23.



Picture 527



Picture 528

KNOT (RB924i-2nD-BT5&BG77)



Picture 529

Disassembling information

Disassembling method is the same as for KNOT LR8 and KNOT LR9, except for step 3, see page [421](#).

Instructions for checking over-voltage

Over-voltage testing procedure is the same as for KNOT LR8 and KNOT LR9, see page [422](#).

KNOT Embedded LTE4 (EC25-EU&KNe)



Picture 530

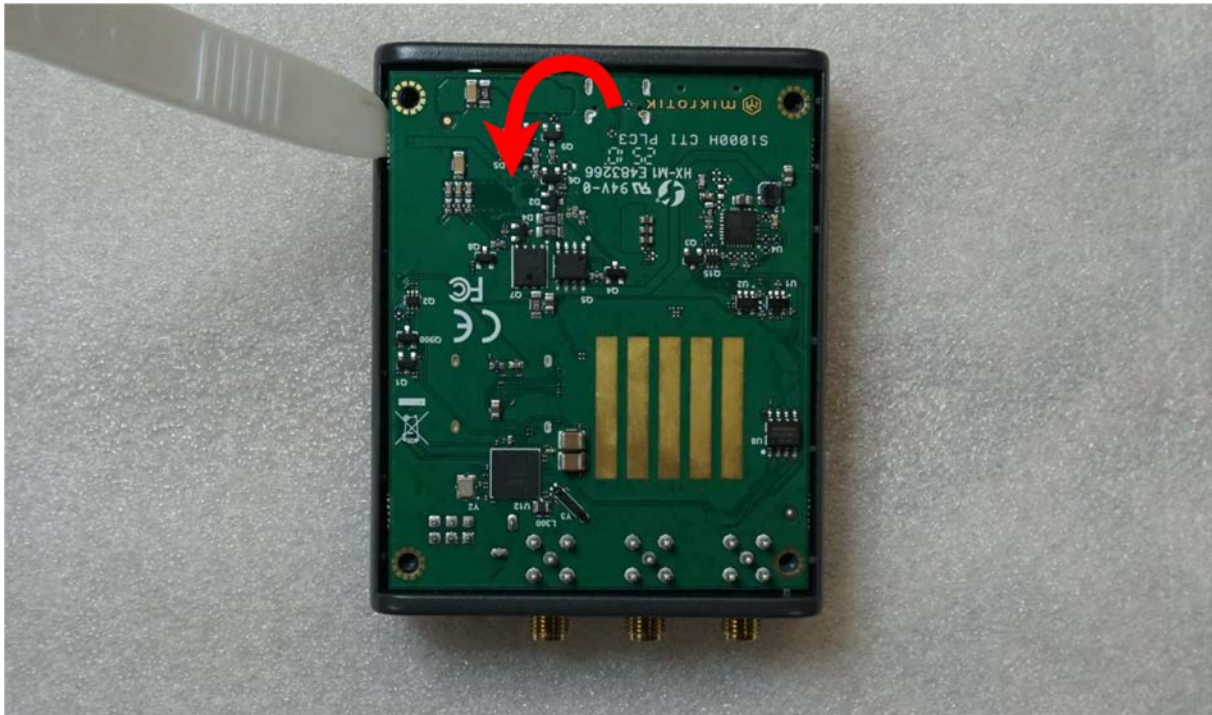
Disassembling information

Step 1: Using a TORX T8 screwdriver unscrew four screws and remove the back cover. Location of the screw is shown the picture 531.



Picture 531

Step 2: Carefully remove the PCB from the case, see picture [532](#).



Picture 532

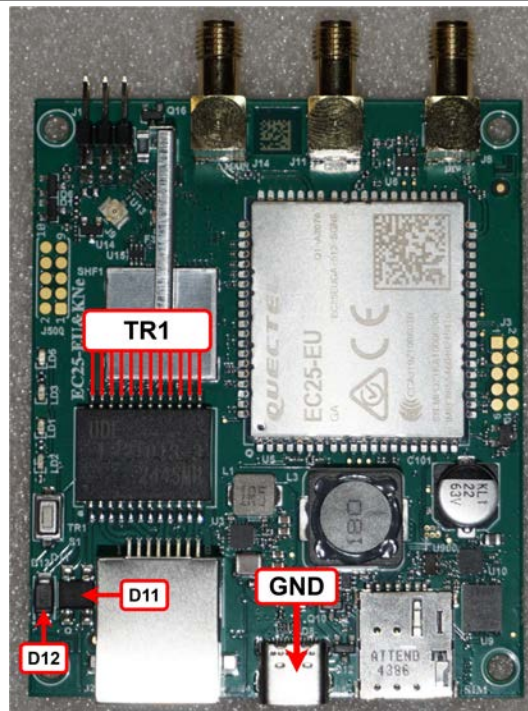
Instructions for checking over-voltage

Checking Schottky diode and diode bridge

Check Schottky diode D12 and diode bridge D11. Location of the diodes on the board you can see in the picture [533](#). Schottky diode quality measurement method is described on page [19](#). Diode bridge quality measurement method is described on page [20](#).

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground, see picture [533](#). Voltage drop value on the transformer should be in the range from 0,40V to 0,50V. Voltage drop measurement method is described on page [22](#).



Picture 533

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be $75\ \Omega \pm 1\%$. Location of resistors is shown in picture 534.



Picture 534

WAP SERIES

wAP ax



Picture 535

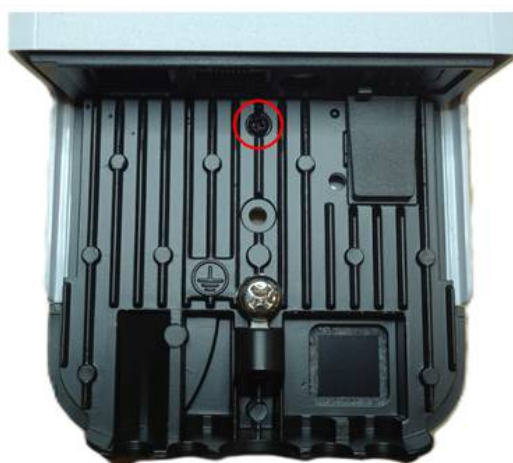
Disassembling information

Step 1: Unscrew 1 screw using PH1 screwdriver. Location of the screw is shown the picture [536](#).



Picture 536

Step 2: Remove case cover and unscrew 1 screw using PH1 screwdriver. Location of the screw is shown the picture [537](#).



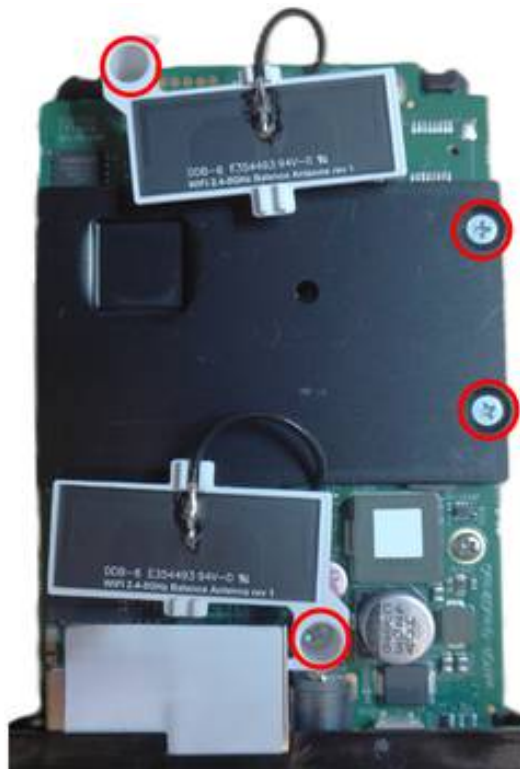
Picture 537

Step 3: Pull the metal case part in the direction shown in the picture [538](#).



Picture 538

Step 4: Pull the printed circuit board out of the case and unscrew 4 screws using a PH1 screwdriver. The location of the screws is shown in the picture 539. Do not unplug antenna connectors from the circuit.



Picture 539

Step 5: Remove the heatsink and unscrew 2 screws using a PH1 screwdriver and take out the printed circuit board out of the case. Location of the screws is shown the in picture 540.



Picture 540

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

Check Schottky diodes D1000, D1001, and diode bridge D1004. Location of the diodes on the board you can see in the pictures 541 and 542. Schottky diode quality measurement method is described on page 19. Diode bridge quality measurement method is described on page 20.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR300 pins and Ground, see picture 541. Voltage drop value should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page 22.

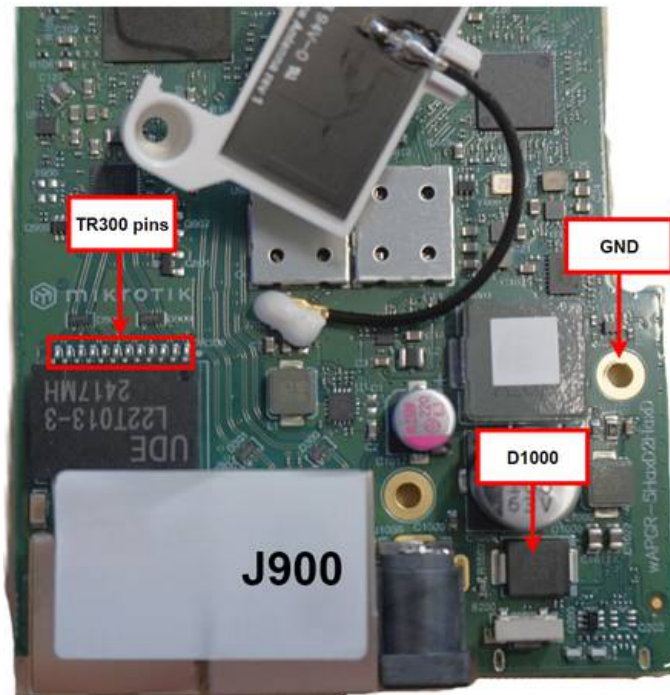
Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 +/-1% Ohms. Location of resistors is shown in picture 542.

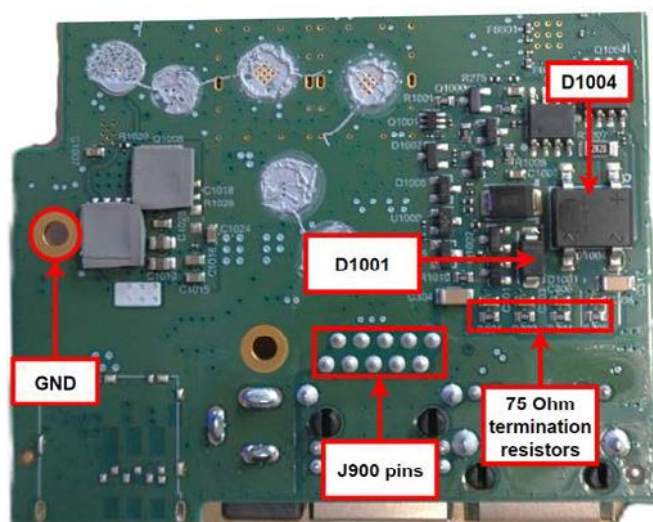
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J900 connector. RJ-45 placement is shown in picture 541.

Resistance value between Rx and Tx line must be 150 Ohm $\pm$ 4%. Measurement method is described on page 23.



Picture 541



Picture 542