



Instructions for checking overvoltage damage

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Contents

Introduction	16
Instructions for checking overvoltage damage	17
Check Schottky diode	18
Diode bridge measurement	19
Check voltage drop value between diode array pin#1 and Ground	20
Check voltage drop value between Ethernet transformer pins and Ground	21
Check termination resistors resistance in RJ-45 connector	22
Check resistance on transformer in RJ-45 connector	23
Fuse check	24
Products that do not have overvoltage instructions	25
ACCESSORIES	27
FTC11XG	28
Disassembling information	28
Instructions for checking over-voltage	31
Checking Schottky diode and diode bridge	31
Checking voltage drop value between Ethernet transformer pins and Ground	31
Checking 75 Ohm termination resistors resistance	31
FTC21	33
Disassembling information	33
Instructions for checking over-voltage	36
Checking Schottky diode and diode bridges	36
Checking voltage drop value between Ethernet transformers pins and Ground	36
Checking 75 Ohm termination resistors resistance	36
GPeRx4	38
Disassembling information	38
Instructions for checking over-voltage	39
Checking Schottky diodes	39
Checking voltage drop value between Ethernet transformer pins and Ground	39
Checking termination resistors resistance	40
Cloud Router Switch 100 series RouterBoards	41
FiberBox (CRS105-5S-FB)	42
Disassembling information	42
Instructions for checking overvoltage	44
Checking Schottky diode	44
CRS106-1C-5S	45
Disassembling information	45
Instructions for checking overvoltage	45
Checking Schottky diode	45

Checking voltage drop value between Ethernet transformer pins and Ground	45
Checking 75 Ohm termination resistors resistance	45
CRS109-8G-1S-2HnD-IN	47
Disassembling information	47
Instructions for checking overvoltage	49
Checking Schottky diode	49
Checking voltage drop value between Ethernet transformer pins and Ground	49
Checking 75 Ohm termination resistors resistance	49
CRS112-8G-4S-IN	51
Disassembling information	51
Instructions for checking overvoltage	51
CRS112-8P-4S-IN	52
Disassembling information	52
Instructions for checking overvoltage	52
Checking voltage drop value between Ethernet transformers pins and Ground	52
Checking 75 Ohm termination resistors resistance	52
CRS125-24G-1S-IN	54
CRS125-24G-1S-RM	54
CRS125-24G-1S-2HnD-IN	54
Disassembling information	54
Instructions for checking overvoltage	57
Checking Schottky diodes	57
Checking voltage drop value between Ethernet transformers pins and Ground	57
Checking 75 Ohm termination resistors resistance	58
Cloud Router Switch 304 series RouterBoard	59
CRS304-4XG-IN	60
Disassembling information	60
Instructions for checking over-voltage	62
Checking Schottky diode and diode bridge	62
Checking voltage drop value between Ethernet transformers pins and Ground	62
Checking 75 Ohm termination resistors resistance	62
Cloud Router Switch 310 series RouterBoard	64
CRS310-1G-5S-4S+IN	65
Disassembling information	65
Instructions for checking over-voltage	66
Checking Schottky diodes and diode bridge	66
Checking voltage drop value between Ethernet transformer pins and Ground	66
Checking 75 Ohm termination resistors resistance	66
CRS310-1G-5S-4S+OUT	67
Disassembling information	68
Instructions for checking over-voltage	70
CRS310-8G+2S+IN	71
Disassembling information	71
Instructions for checking over-voltage	72

Checking Schottky diode	72
Checking voltage drop value between Ethernet transformers pins and Ground	72
Checking 75 Ohm termination resistors resistance	72
Cloud Router Switch 320 series RouterBoard	74
CRS320-8P-8B-4S+	75
Disassembling information	75
Checking procedure for over-voltage	77
Checking voltage drop value between Ethernet transformer pins and Ground	77
Checking 75 Ohm termination resistors resistance	77
CRS326-4C+20G+2Q+RM	78
Disassembling information	78
Checking procedure for over-voltage	81
Checking voltage drop value between Ethernet transformer pins and Ground	81
Cloud Router Switch 504 series RouterBoard	82
CRS504-4XQ-IN	83
Disassembling information	83
Instructions for checking overvoltage	84
Checking Schottky diodes	84
Checking voltage drop value between Ethernet transformer pins and Ground	84
Checking 75 Ohm termination resistors resistance	84
Cloud Router Switch 510 series RouterBoard	86
CRS510-8XS-2XQ-IN	87
Disassembling information	87
Instructions for checking overvoltage	88
Checking Schottky diodes	88
Checking voltage drop value between Ethernet transformer pins and Ground	88
Checking 75 Ohm termination resistors resistance	88
Cloud Router Switch 520 series RouterBoard	91
CRS520-4XS-16XQ-RM	92
Disassembling information	92
Instructions for checking overvoltage	93
Checking voltage drop value between Ethernet transformer pins and Ground	93
Checking 75 Ohm termination resistors resistance	93
260 series Routerboards	94
RB260GS	95
Disassembling information	95
Instructions for checking overvoltage	95
Checking Schottky diodes	95
Checking voltage drop value between Ethernet transformer pins and Ground	95
.	98
RB260GSP	98
Disassembling information	98
Instructions for checking overvoltage	101

Checking Schottky diodes	101
Checking voltage drop value between Ethernet transformer pins and Ground	101
RB260GS (r2)	104
Dissassembling information	104
Instructions for checking overvoltage	104
Checking Schottky diodes	104
Checking voltage drop value between Ethernet transformer pins and Ground	104
RB260GSP (r2)	106
Dissassembling information	106
Instructions for checking overvoltage	106
Checking Schottky diodes	106
Checking voltage drop value between Ethernet transformer pins and Ground	106
411 series RouterBoards	108
RB411AH	109
RB411AR	110
RB411U	111
Instructions for checking overvoltage	111
Checking Schottky diodes	111
Checking voltage drop value between diode array pin1 pins and GND . .	111
Checking termination resistors in RJ-45 connector	112
RB411GL	114
Instructions for checking overvoltage	114
Checking Schottky diodes and diode bridge	114
Checking voltage drop value between diode array pin#1 and Ground . .	114
RB411L	116
Instructions for checking overvoltage	116
Checking Schottky diodes and diode bridge	116
Checking voltage drop value between diode array pin#1 and Ground . .	116
433 series RouterBoards	118
RB433AH	119
Instructions for checking overvoltage	119
Checking Schottky diodes and diode bridge	119
Checking voltage drop value between diode array pin#1 and Ground . .	120
Checking termination resistors resistance in RJ-45 connector	120
RB433GL	121
Instructions for checking overvoltage	121
Checking Schottky diodes and diode bridge	121
Checking voltage drop value between diode array pin#1 and Ground . .	122
Checking termination resistors resistance in RJ-45 connector	122
RB433UL	123
Instructions for checking overvoltage	123
Checking Schottky diodes and diode bridge	123
Checking voltage drop value between diode array pin#1 and Ground . .	124
Checking 75 Ohm termination resistors resistance	124
435 series RouterBoards	125
RB435G	126

Instructions for checking overvoltage	126
Checking Schottky diodes and diode bridge	126
Checking voltage drop value between diode array pin#1 and Ground	127
Checking termination resistors resistance in RJ-45 connector	127
450 series RouterBoards	128
RB450	129
Instructions for checking overvoltage	129
Checking Schottky diodes and diode bridge	129
Checking voltage drop value between diode array pin#1 and Ground	129
Checking termination resistors resistance in RJ-45 connector	130
RB450G	131
Instructions for checking overvoltage	131
Checking Schottky diodes and diode bridge	131
Checking voltage drop value between diode array pin#1 and Ground	131
Checking termination resistors resistance in RJ-45 connector	132
RB450Gx4	133
Instructions for checking overvoltage	133
Checking Schottky diodes and diode bridge	133
Checking voltage drop value between diode array and Ground on RJ45	133
493 series RouterBoards	136
RB493AH	137
Instructions for checking overvoltage	137
Checking Schottky diodes	137
Checking voltage drop value between diode array pin#1 and Ground	138
Checking termination resistors resistance in RJ-45 connector	138
RB493G	139
Instructions for checking overvoltage	139
Checking Schottky diodes	139
Checking voltage drop value between diode array pin#1 and Ground	139
Checking voltage drop value between Ethernet transformer pins and Ground	140
Checking termination resistors resistance in RJ-45 connector	140
751 series RouterBoards	141
RB751U-2HnD	142
Disassembling information	142
Instructions for checking overvoltage	142
Checking Schottky diodes	142
Checking voltage drop value between Ethernet transformer pins and Ground	142
800 series RouterBoards	144
RB800	145
Instructions for checking overvoltage	145
Checking diodes bridges	145
Checking voltage drop value between diode array pin#1 and Ground	145
Checking termination resistors resistance in RJ-45 connector	146
Checking 75 Ohm termination resistors resistance	146

850 series RouterBoards	148
RB850Gx2	149
Instructions for checking overvoltage	149
Checking Schottky diode and diodes bridges	149
Checking voltage drop value between diode array pin#1 and Ground	149
Checking voltage drop value between Ethernet transformer pins and Ground	150
Checking termination resistors resistance in RJ-45 connector	150
911 series RouterBoards	151
911 Lite 2 (RB911-2Hn)	152
911 Lite 5 (RB911-5Hn)	152
911 Lite 5 dual (RB911-5HnD)	152
Instructions for checking overvoltage	152
Checking Schottky diode	152
Checking voltage drop value between Ethernet transformer pins and Ground	152
Checking 75 Ohm termination resistors resistance	153
911 Lite 5 ac (RB911-5HacD)	154
Instructions for checking overvoltage	154
Checking Schottky diode	154
Checking voltage drop value between Ethernet transformer pins and Ground	154
Checking 75 Ohm termination resistors resistance	154
RB911G-2HPnD	156
RB911G-5HPnD	156
Instructions for checking overvoltage	156
Checking Schottky diode and diodes bridges	156
Checking voltage drop value between Ethernet transformer pins and Ground	156
RB911G-5HPacD	158
Instructions for checking overvoltage	158
Checking Schottky diodes	158
Checking voltage drop value between Ethernet transformer pins and Ground	158
912 series RouterBoards	160
RB912UAG-2HPnD	161
RB912UAG-5HPnD	161
Instructions for checking overvoltage	161
Checking Schottky diodes	161
Checking voltage drop value between Ethernet transformer pins and Ground	161
922 series RouterBoards	163
RB922UAGS-5HPacD	164
Instructions for checking overvoltage	164
Checking Schottky diodes	164
Checking voltage drop value between Ethernet transformer pins and Ground	164
950 series RouterBoards	166
RB951-2Hn	167
Disassembling information	167
Instructions for checking overvoltage	168
Checking Schottky diodes	168

Checking voltage drop value between Ethernet transformer pins and Ground	168
RB951G-2HnD	170
Disassembling information	170
Instructions for checking overvoltage	170
Checking Schottky diode and diodes bridges	170
Checking voltage drop value between Ethernet transformer pins and Ground	170
RB951Ui-2HnD	173
Disassembling information	173
Instructions for checking overvoltage	173
Checking Schottky diodes	173
Checking voltage drop value between Ethernet transformer pins and Ground	173
Checking termination resistors resistance in RJ-45 connector	174
RB953GS-5HnT	176
Instructions for checking overvoltage	176
Checking Schottky diodes	176
Checking voltage drop value between Ethernet transformer pins and Ground	177
Checking termination resistors resistance in RJ-45 connector	177
Checking 75 Ohm termination resistors resistance	177
Cloud Core Router 1009 series RouterBoards	180
CCR1009-7G-1C-PC	181
CCR1009-7G-1C-1S+	181
CCR1009-7G-1C-1S+PC	181
Disassembling information	181
Instructions for checking overvoltage	183
Checking Schottky diode	183
Checking voltage drop value between Ethernet transformer pins and Ground	183
Checking termination resistors resistance in RJ-45 connector	183
CCR1009-8G-1S-1S+	185
Disassembling information	185
Instructions for checking overvoltage	185
CCR1009-8G-1S	186
Disassembling information	186
Instructions for checking overvoltage	186
Cloud Core Router 1016 series RouterBoards	187
CCR1016-12G	188
Disassembling information	188
Instructions for checking overvoltage	188
Checking voltage drop value between diode array pin#1 and Ground	188
Checking voltage drop value between Ethernet transformer pins and Ground	188
Checking termination resistors resistance in RJ-45 connector	188
CCR1016-12G rev2	190
Disassembling information	190
Instructions for checking overvoltage	190
Checking voltage drop value between Ethernet transformer pins and Ground	190
Checking termination resistors resistance in RJ-45 connector	190
CCR1016-12S-1S+	192
CCR1016-12S-1S+ rev2	192

Instructions for checking overvoltage	192
Cloud Core Router 1036 series RouterBoards	193
CCR1036-8G-2S+	194
CCR1036-8G-2S+EM	194
Disassembling information	194
Instructions for checking overvoltage	194
Checking voltage drop value between Ethernet transformer pins and Ground	194
Checking termination resistors resistance in RJ-45 connector	194
CCR1036-12G-4S	196
CCR1036-12G-4S-EM	196
Disassembling information	196
Instructions for checking overvoltage	196
CCR1036-8G-2S+ rev2	197
CCR1036-8G-2S+EM r2	197
Disassembling information	197
Instructions for checking overvoltage	198
Checking voltage drop value between Ethernet transformer pins and Ground	198
Checking termination resistors resistance in RJ-45 connector	198
CCR1036-12G-4S rev2	200
CCR1036-12G-4S-EM rev2	200
Disassembling information	200
Instructions for checking overvoltage	200
Checking voltage drop value between Ethernet transformer pins and Ground	200
Checking termination resistors resistance in RJ-45 connector	200
Cloud Core Router 1072 series RouterBoards	202
CCR1072-1G-8S+	203
Disassembling information	203
Instructions for checking overvoltage	203
Checking termination resistors resistance in RJ-45 connector	203
Cloud Core Router 2004 series RouterBoards	205
CCR2004-1G-12S+2XS	206
Disassembling information	206
Instructions for checking overvoltage	207
Checking voltage drop value between Ethernet transformer pins and Ground	207
Checking 75 Ohm termination resistors resistance	208
CCR2004-16G-2S+	210
Disassembling information	210
Instructions for checking overvoltage	211
Checking voltage drop value between Ethernet transformer pins and Ground	211
Checking 75 Ohm termination resistors resistance	211
CCR2004-1G-2XS-PCIE	212
Checking procedure for over-voltage	212
Checking voltage drop value between Ethernet transformer pins and Ground	212
Checking termination resistors resistance in RJ-45 connector	213
Cloud Core Router 2116 series RouterBoards	214

CCR2116-12G-4S+	215
Disassembling information	215
Instructions for checking overvoltage	218
Checking termination resistors resistance in RJ-45 connector	218
Checking voltage drop value between Ethernet transformer pins and Ground	219
Check voltage drop value between RJ-45 connectors pins and Ground . .	219
Cloud Core Router 2216 series RouterBoards	220
CCR2216-1G-12XS-2XQ	221
Disassembling information	221
Instructions for checking overvoltage	223
Checking voltage drop value between Ethernet transformer pins and Ground	223
Checking 75 Ohm termination resistors resistance	224
ROSE Data server (RDS)	225
RDS2216-2XG-4S+4XS-2XQ	226
Disassembling information	226
Checking procedure for over-voltage	230
Checking voltage drop value between Ethernet transformers pins and	
Ground	230
Checking 75 Ohm termination resistors resistance	231
Cloud Smart Switch 318 series RouterBoard	232
CSS318-16G-2S+	233
Disassembling information	233
Checking procedure for over-voltage	234
Checking 75 Ohm termination resistors resistance	234
Checking voltage drop value between Ethernet transformer pins and Ground	234
Cloud Smart Switch 610 series RouterBoards	236
CSS610-8P-2S+IN	237
Disassembling information	237
Instructions for checking overvoltage	238
Checking Schottky diodes	238
Checking voltage drop value between Ethernet transformer pins and Ground	239
Checking 75 Ohm termination resistors resistance	239
1100 series RouterBoards	240
RB1100AHx2	241
Disassembling information	241
Instructions for checking overvoltage	242
Checking Schottky diode and diodes bridges	242
Checking voltage drop value between diode array pin#1 and Ground . .	242
Checking termination resistors resistance in RJ-45 connector	242
RB1100AHx4 Dude Edition	244
RB1100AHx4	244
Disassembling information	244
Instructions for checking overvoltage	244
Checking Schottky diode and diodes bridges	244

Checking voltage drop value between Ethernet transformer pins and Ground 244

2011 series RouterBoards	246
RB2011iL-IN	247
RB2011iL-RM	247
RB2011iLS-IN	247
RB2011UiAS-IN	247
RB2011UiAS-RM	247
RB2011UiAS-2HnD-IN	247
Indoor 2011 series RouterBoard disassembling information	248
Rackmount 2011 series RouterBoard disassembling information	248
Instructions for checking overvoltage	249
Checking Schottky diode and diodes bridges	249
Checking voltage drop value between Ethernet transformer pins and Ground	249
3011 series RouterBoards	251
RB3011UiAS-RM	252
Disassembling information	252
Instructions for checking overvoltage	253
Checking Schottky diode	253
Checking voltage drop value between Ethernet transformer pins and Ground	253
Checking 75 Ohm termination resistors resistance	253
4011 series RouterBoards	255
RB4011iGS+RM	256
RB4011iGS+5HacQ2HnD-IN	256
Disassembling information	256
Instructions for checking overvoltage	257
Checking Schottky diode and diodes bridges	257
Checking voltage drop value between Ethernet transformer pins and Ground	258
5009 series RouterBoards	259
RB5009UG+S+IN	260
Disassembling information	260
Instructions for checking overvoltage	261
Checking Schottky diode and diodes bridges	261
Checking voltage drop value between Ethernet transformer pins and Ground	261
RB5009UPr+S+IN	263
Disassembling information	263
Checking Schottky diode and diodes bridges	263
Checking voltage drop value between Ethernet transformer pins and Ground	264
Checking 75 Ohm termination resistors resistance	264
ATL series RouterBoards	265
ATL 5G R16 (ATLGM&RG520F)	266
Recommended tools	266
Disassembling information	267
Instructions for checking over-voltage	267
Checking Schottky diode and diode bridge	267

Checking voltage drop value between Ethernet transformer pins and Ground	268
Checking 75 Ohm termination resistors resistance	269
BaseBox series RouterBoards	270
BaseBox 2 (912UAG-2HPnD-OUT)	271
BaseBox 5 (912UAG-5HPnD-OUT)	271
Disassembling information	271
Instructions for checking overvoltage	273
Checking Schottky diode	273
Checking voltage drop value between Ethernet transformer pins and Ground	273
BaseBox 6 (RB912UAG-6HPnD-OUT)	274
Disassembling information	274
Instructions for checking overvoltage	274
Checking Schottky diode	274
Checking voltage drop value between Ethernet transformer pins and Ground	274
NetBox series RouterBoards	275
NetBox 5 ax	276
Disassembling information	276
Instructions for checking over-voltage	278
Checking Schottky diode	278
Checking voltage drop value between Ethernet transformer pins and Ground	279
cAP series RouterBoards	280
cAP (cAP2nD)	281
Disassembling information for V1	281
Disassembling information for V2	283
Instructions for checking overvoltage for v1	284
Checking Schottky diode	284
Checking voltage drop value between Ethernet transformer pins and Ground	284
Instructions for checking overvoltage for v2	284
Checking Schottky diode	284
Checking voltage drop value between Ethernet transformer pins and Ground	285
cAP lite (cAPL-2nD)	286
Disassembling information	286
Instructions for checking overvoltage	287
Checking Schottky diode	287
Checking voltage drop value between Ethernet transformer pins and Ground	287
cAP ac (RBcAPGi-5acD2nD)	289
Disassembling information	289
Instructions for checking overvoltage	290
Checking Schottky diode	290
Checking voltage drop value between Ethernet transformer pins and Ground	290
cAP ax	292
Disassembling information	292
Instructions for checking over-voltage	295
Checking Schottky diodes and diode bridge	295
Checking 75 Ohm termination resistors resistance	296

Checking voltage drop value between Ethernet transformers pins and Ground	296
Chateau series RouterBoards	297
Chateau 5G (D53G-5HacD2HnD-TC&RG502Q, D53G-5HacD2HnD-TC&RG520F, D53G- 5HacD2HnD&EG120K-EA)	298
Disassembling information	299
Instructions for checking overvoltage	303
Checking Schottky diode	303
Checking voltage drop value between Ethernet transformer pins and Ground	303
Chateau LTE18 ax	304
Disassembling information	305
Instructions for checking over-voltage	305
Checking Schottky diode	305
Checking voltage drop value between Ethernet transformer pins and Ground	305
Checking 75 Ohm termination resistors resistance	306
Chateau PRO ax (H53UiG-5HaxQ2HaxQ)	307
Disassembling information	307
Instructions for checking over-voltage	309
Checking Schottky diode	309
Checking 75 Ohm termination resistors resistance	309
Checking voltage drop value between Ethernet transformers pins and Ground	310
Chateau 5G R17 ax (S53UG+5HaxD2HaxD-TC&RG650E)	311
Disassembling information	311
Instructions for checking over-voltage	312
Checking Schottky diode and diode bridge	312
Checking voltage drop value between Ethernet transformers pins and Ground	313
Checking 75 Ohm termination resistors resistance	313
CME series RouterBoards	314
CME Gateway (CME22-2n-BG77)	315
Disassembling information	316
Instructions for checking over-voltage	317
Checking Schottky diode and diode bridge	317
Checking voltage drop value between Ethernet transformers pins and Ground	317
Checking 75 Ohm termination resistors resistance	318
hAP series RouterBoards	319
hAP ax3 (C53UiG+5HPaxD2HPaxD)	320
Disassembling information	321
Instructions for checking overvoltage	324
Checking Schottky diode	324
Checking voltage drop value between Ethernet transformer pins and Ground	324
hAP ax2 (C52iG-5HaxD2HaxD-TC)	326
Disassembling information	327
Instructions for checking overvoltage	328

Checking Schottky diode	328
Checking voltage drop value between Ethernet transformer pins and Ground	328
hAP ax lite and hAP ax lite LTE6 (L41G-2axD, L41G-2axD&FG621-EA)	330
Disassembling information	331
Instructions for checking overvoltage	333
Checking voltage drop value between Ethernet transformer pins and Ground	333
hEX series RouterBoards	334
hEX (E50UG)	335
Disassembling information	335
Instructions for checking over-voltage	337
Checking Schottky diodes	337
Checking voltage drop value between Ethernet transformers pins and Ground	337
Checking 75 Ohm termination resistors resistance	338
hEX S(E60iUGS)	339
Disassembling information	339
Instructions for checking over-voltage	339
Checking Schottky diodes and diode bridge	339
Checking voltage drop value between Ethernet transformers pins and Ground	340
Checking 75 Ohm termination resistors resistance	341
L009 series RouterBoards	342
L009UiGS-RM and L009UiGS-2HaxD-IN	343
Disassembling information	344
Instructions for checking overvoltage	346
Checking Schottky diode	346
Checking voltage drop value between Ethernet transformer pins and Ground	347
L23 series Routerboards	348
L23UGSR	349
Disassembling information	349
Instructions for checking over-voltage	350
Checking Schottky diodes	350
Checking voltage drop value between Ethernet transformer pins and Ground	350
Checking termination resistors resistance	350
NetMetal ax (L23UGSR-5HaxD2HaxD)	351
Disassembling information	351
Instructions for checking over-voltage	354
Cube series RouterBoard	355
Cube 60G ac and CubeSA 60Pro ac	356
Disassembling information (sealed with gaskets)	356
Disassembling information (sealed with sealant)	357
Instructions for checking over-voltage	358
Checking Schottky diode and diode bridge	358
Checking voltage drop value between Ethernet transformer pins and Ground	358
Cube 60G ac	359

Cube Lite60	359
LDF series RouterBoard	360
LDF LTE6 kit	361
Disassembling information	361
Instructions for checking over-voltage	363
Checking Schottky diode and diode bridge	363
Checking voltage drop value between Ethernet transformer pins and Ground	363
LHG series RouterBoard	365
LHGG LTE6 kit	366
Disassembling information	367
Instructions for checking over-voltage	369
Checking Schottky diode and diode bridge	369
Checking voltage drop value between Ethernet transformer pins and Ground	369
Checking 75 Ohm termination resistors resistance	370
LHGGM&EG18-EA	371
Disassembling information	372
Instructions for checking over-voltage	372
Checking Schottky diode and diode bridge	372
Checking voltage drop value between Ethernet transformer pins and Ground	372
Checking 75 Ohm termination resistors resistance	372
LHG XL 5 ax (LHG 5HaxD, LHG 5HaxD XL)	373
Disassembling information	374
Instructions for checking over-voltage	376
Checking Schottky diode	376
Checking voltage drop value between Ethernet transformer pins and Ground	376
Checking 75 Ohm termination resistors resistance	376
mANTBox series RouterBoards	377
mANTBox 52 15s	378
Disassembling information	378
Instructions for checking over-voltage	380
Checking Schottky diodes and diode bridge	380
Checking voltage drop value between Ethernet transformer pins and Ground	380
mANTBox ax 15s	381
Disassembling information	381
Instructions for checking over-voltage	383
Checking voltage drop value between Ethernet transformer pins and Ground	383
KNOT series	384
KNOT LR8 and KNOT LR9	385
Disassembling information	385
Instructions for checking over-voltage	386
Checking Schottky diode and diode bridge	386
Checking voltage drop value between RJ-45 connector pins and Ground .	387
Checking termination resistors resistance in RJ-45 connector	387
KNOT	388
Disassembling information	388

Instructions for checking over-voltage	388
wAP series	389
wAP ax	390
Disassembling information	390
Instructions for checking over-voltage	392
Checking Schottky diode and diode bridge	392
Checking voltage drop value between Ethernet transformer pins and Ground	392
Checking 75 Ohm termination resistors resistance	392
Checking termination resistors resistance in RJ-45 connector	393

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.

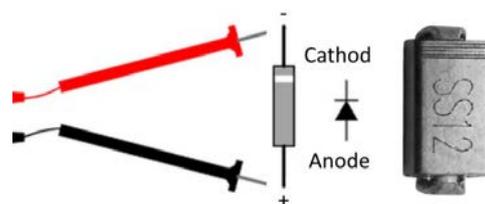
The diode needs to be checked in reverse switching, when a negative voltage is applied to the anode (multimeter black probe, "COM" probe), and a positive voltage is applied to the cathode (multimeter red probe, positive probe), see picture 2.

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 vales can be from 1,5V to 2,3V.



Picture 1

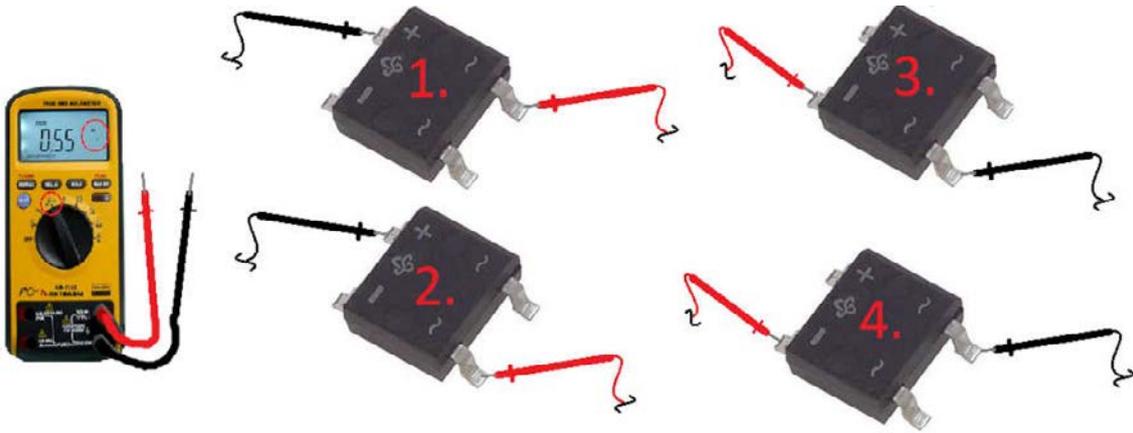


Picture 2

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.

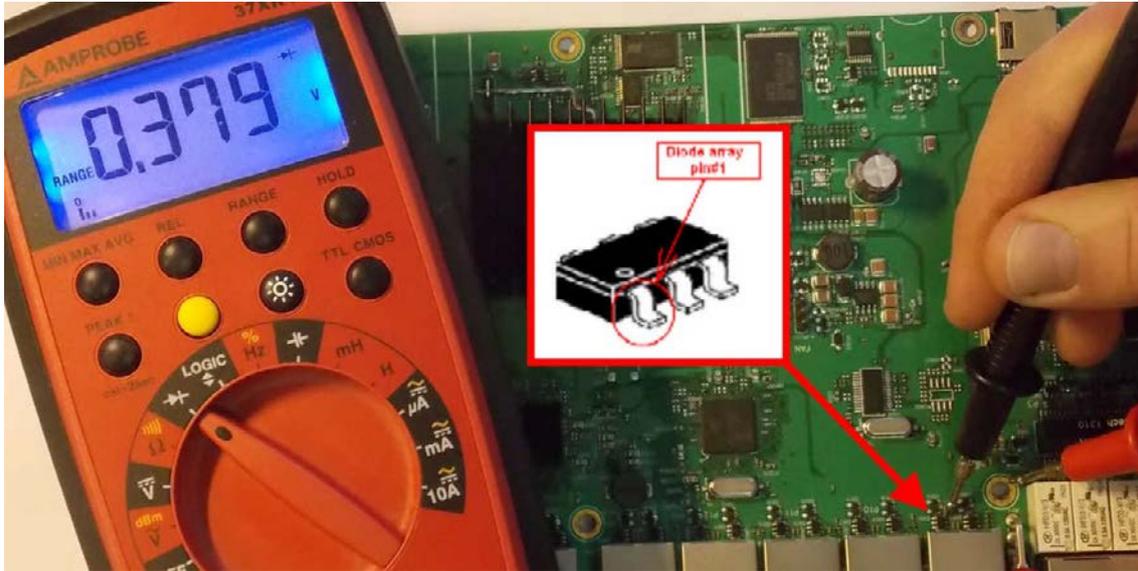
In such cases making sure that each of the bridge diodes have healthy forward voltage (0,45..0,65V) can confirm that there is no damage. In addition, the voltages obtained should not differ significantly (no more than 5%) from each other. This can be done in 4 measurements, by connecting the multi-meter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

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



Picture 6

Check resistance on transformer in RJ-45 connector

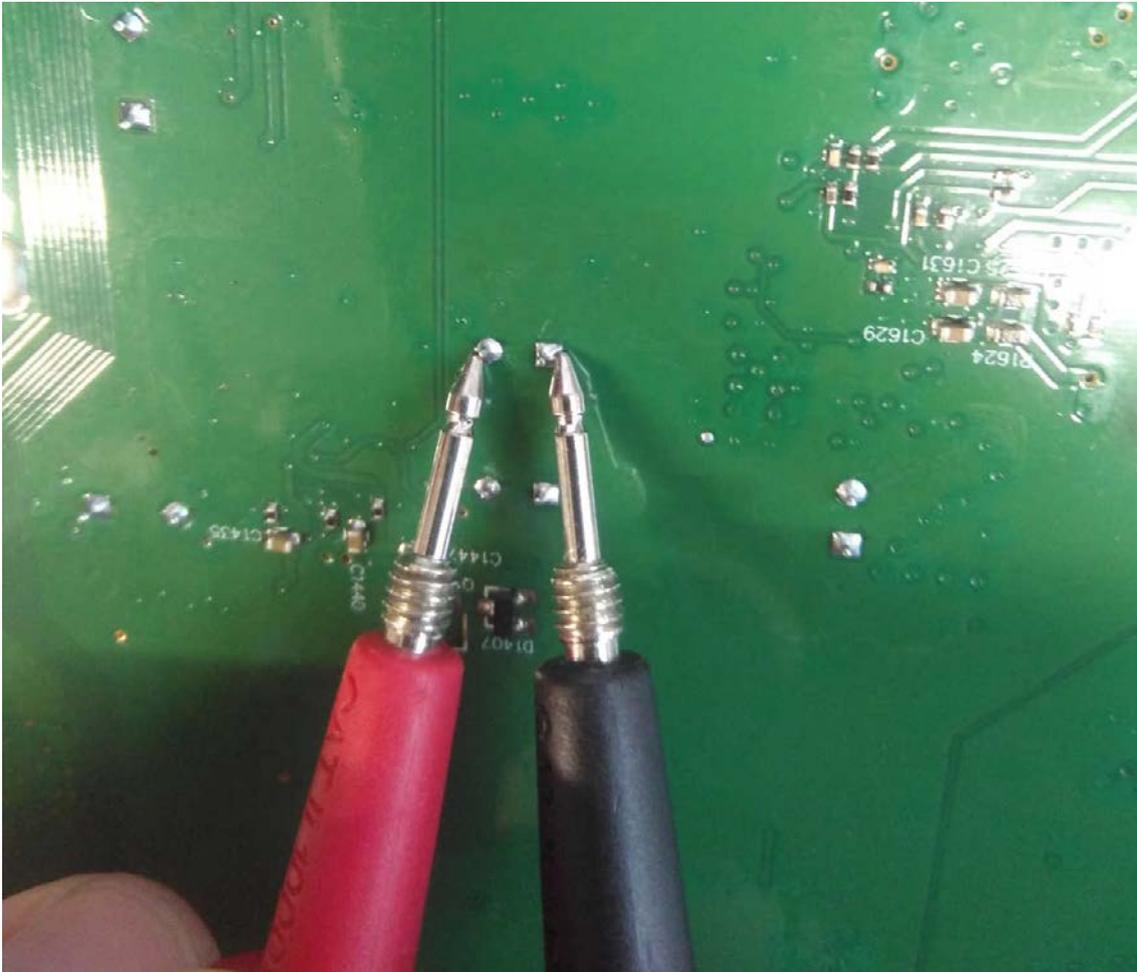
For this measurement you should take patch cord and plug it into the routerboard, see picture 7. After that measure resistance with digital multimeter. Resistance value for each twisted pair must be smaller than 5 Ohm. If resistance is higher that means line was damaged by high voltage surge.



Picture 7

Fuse check

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



Picture 8

PRODUCTS THAT DO NOT HAVE OVERVOLTAGE INSTRUCTIONS



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

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

ACCESSORIES

FTC11XG



Picture 9

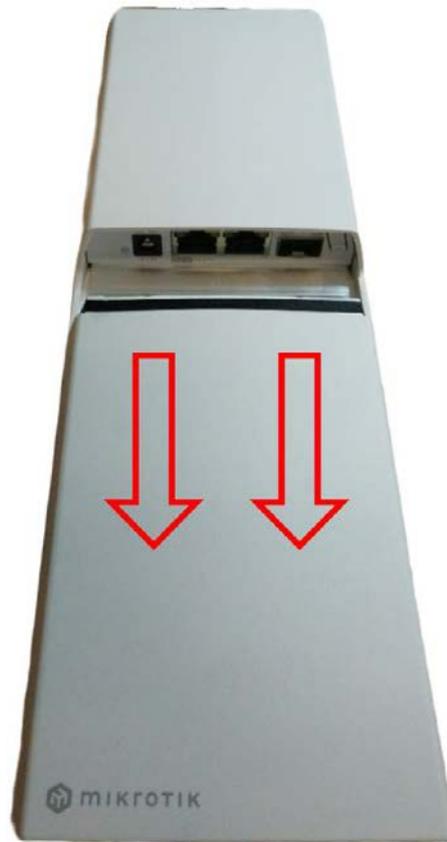
Disassembling information

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 18. Diode bridge quality measurement method is described on page 19.

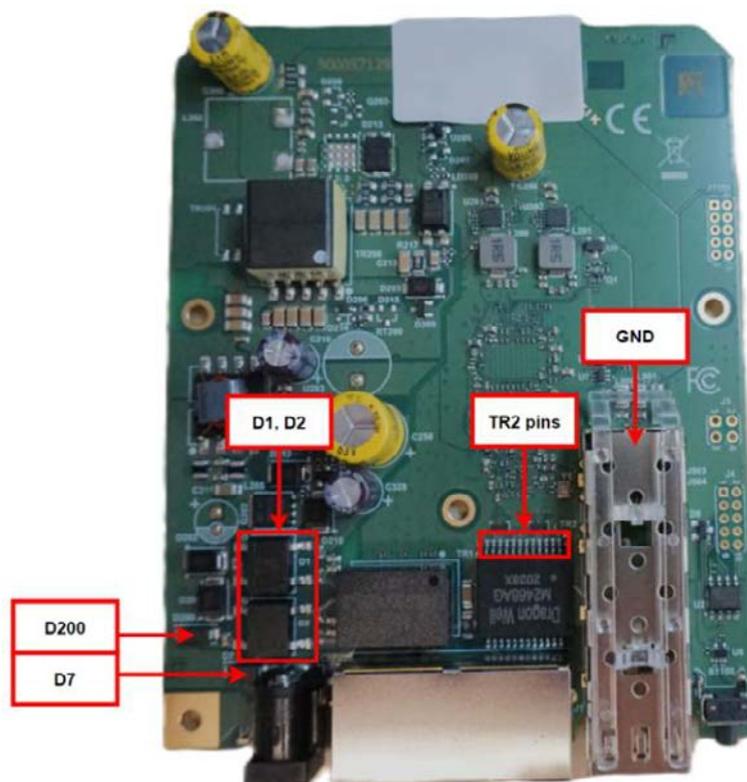
Checking voltage drop value between Ethernet transformer pins and Ground

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

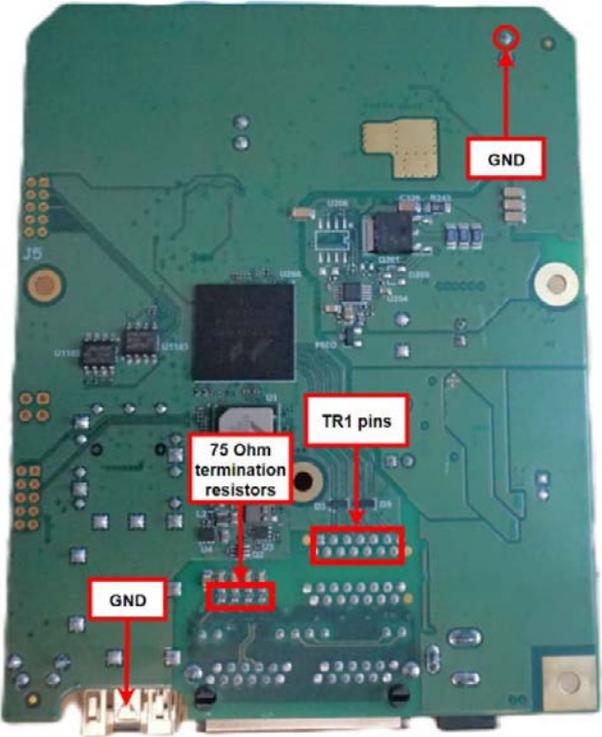
Voltage drop value should be in the range from 0,35V to 0,52V. Voltage drop measurement method is described on page 21.

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 16.



Picture 15



Picture 16

FTC21



Picture 17

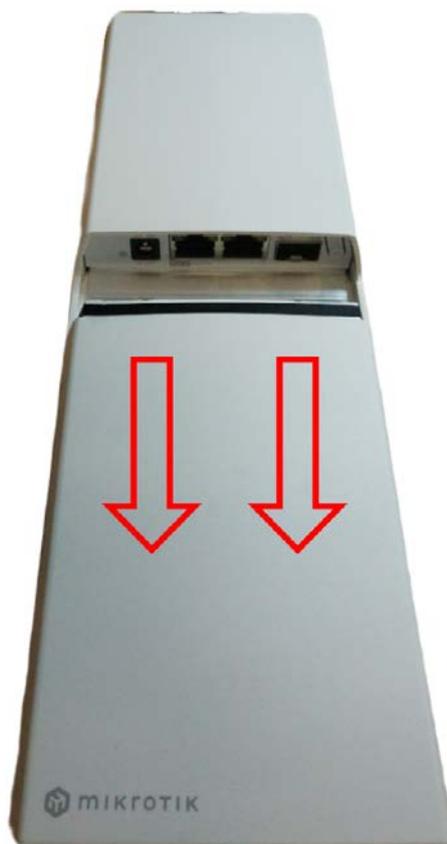
Disassembling information

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.



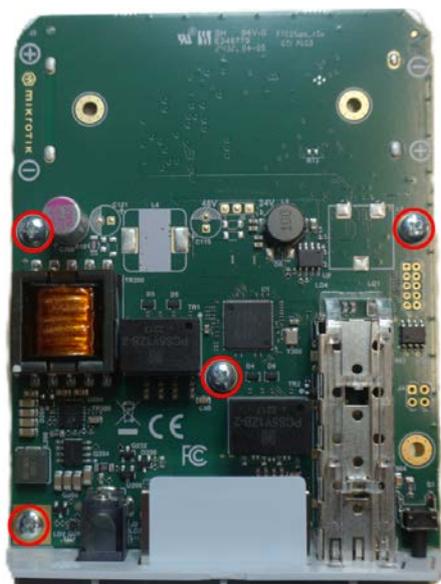
Picture 20

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 18. Diode bridge quality measurement method is described on page 19.

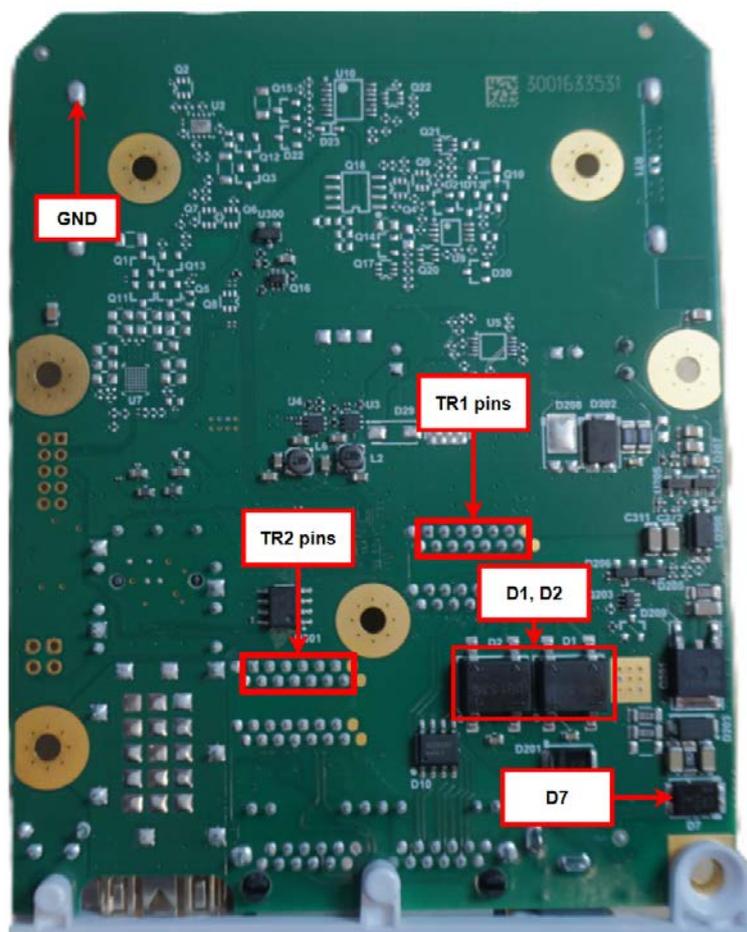
Checking voltage drop value between Ethernet transformers pins and Ground

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

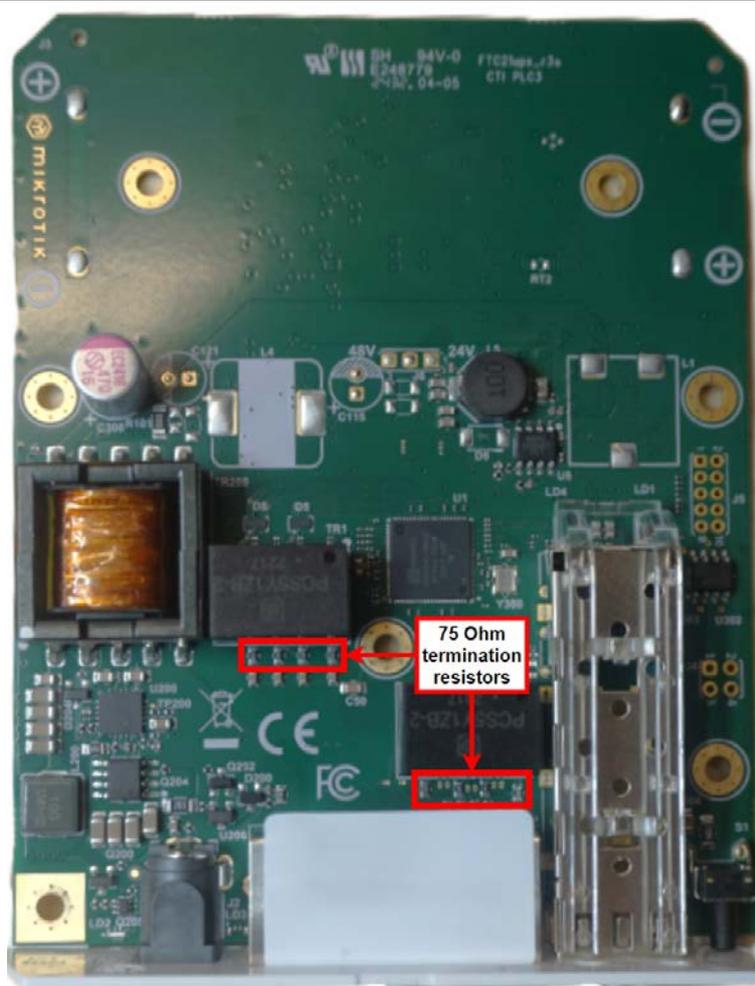
Voltage drop value should be in the range from 0,35V to 0,52V. Voltage drop measurement method is described on page 21.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 +/-1% Ohms. Location of resistors is shown in the picture 24.



Picture 23



Picture 24

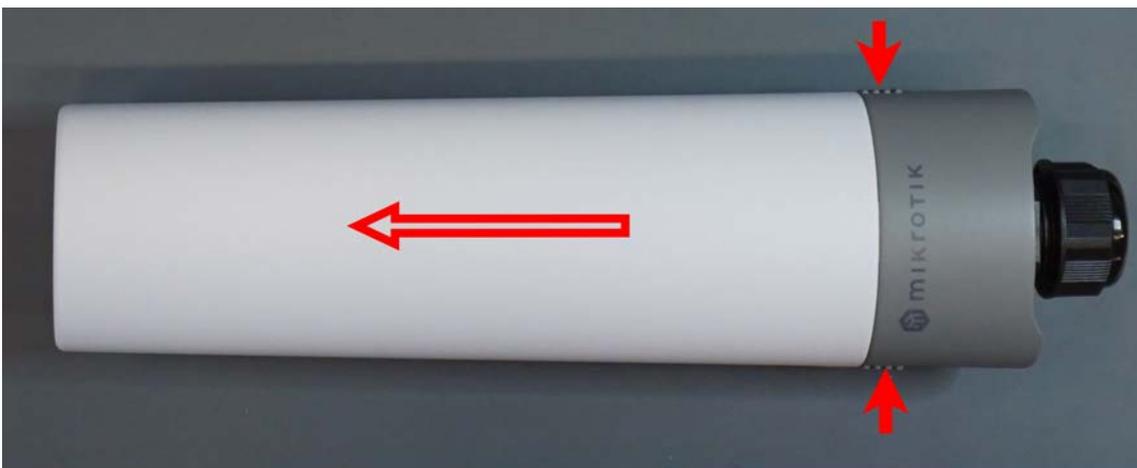
GPeRx4 (GPER14i)



Picture 25

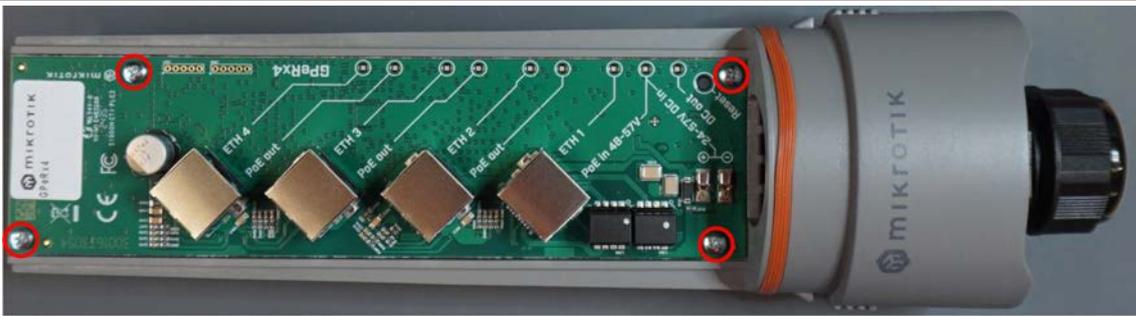
Disassembling information

Step 1: Press two tabs and remove the cover as shown in picture 26.



Picture 26

Step 2: Using the PH1 screwdriver, unscrew 4 screws. Location of the screws is shown in picture 27.



Picture 27

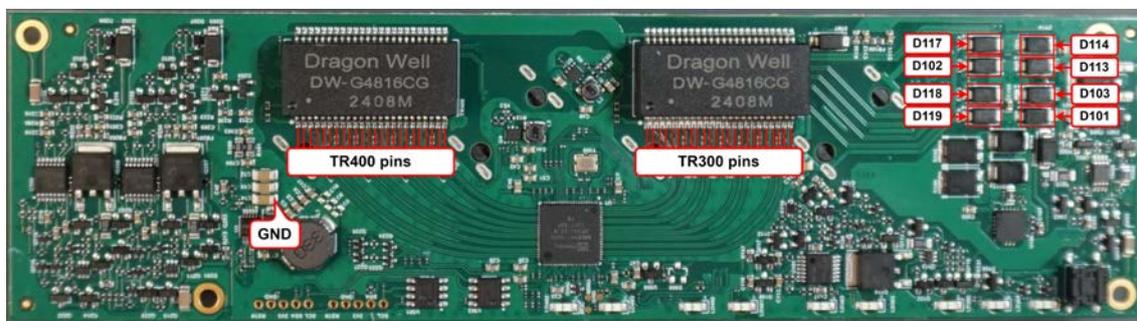
Instructions for checking over-voltage

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 28. Schottky diode quality measurement method is described on page 18.

Checking voltage drop value between Ethernet transformer pins and Ground

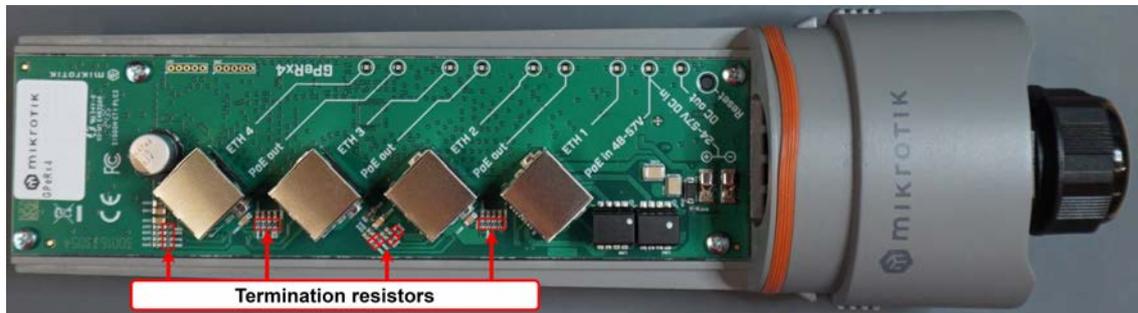
Check the voltage drop value between the Ethernet transformers TR400, TR300 pins and Ground. Test points on the transformer pins are marked with red lines, see picture 28. Voltage drop value should be in the range from 0,35V to 0,55V. Voltage drop measurement method is described on page 21.



Picture 28

Checking termination resistors resistance

Check the value of each termination resistor, it should be 75 Ohm \pm 2%. Location of resistors is shown in picture 29.



Picture 29

CLOUD ROUTER SWITCH 100 SERIES ROUTERBOARDS

FiberBox (CRS105-5S-FB)



Picture 30

Disassembling information

Step 1: Unscrew 3 mounting screws using screwdriver. Location of screws you can see in the picture 31.



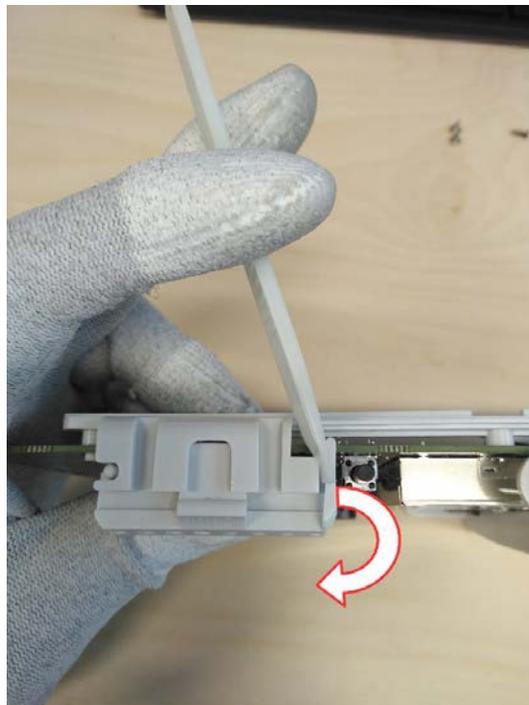
Picture 31

Step 2: Gently pull cover the direction arrows are pointing in the following picture 32.



Picture 32

Step 3: To remove LEDs cover make a movement as shown in the following picture 33.

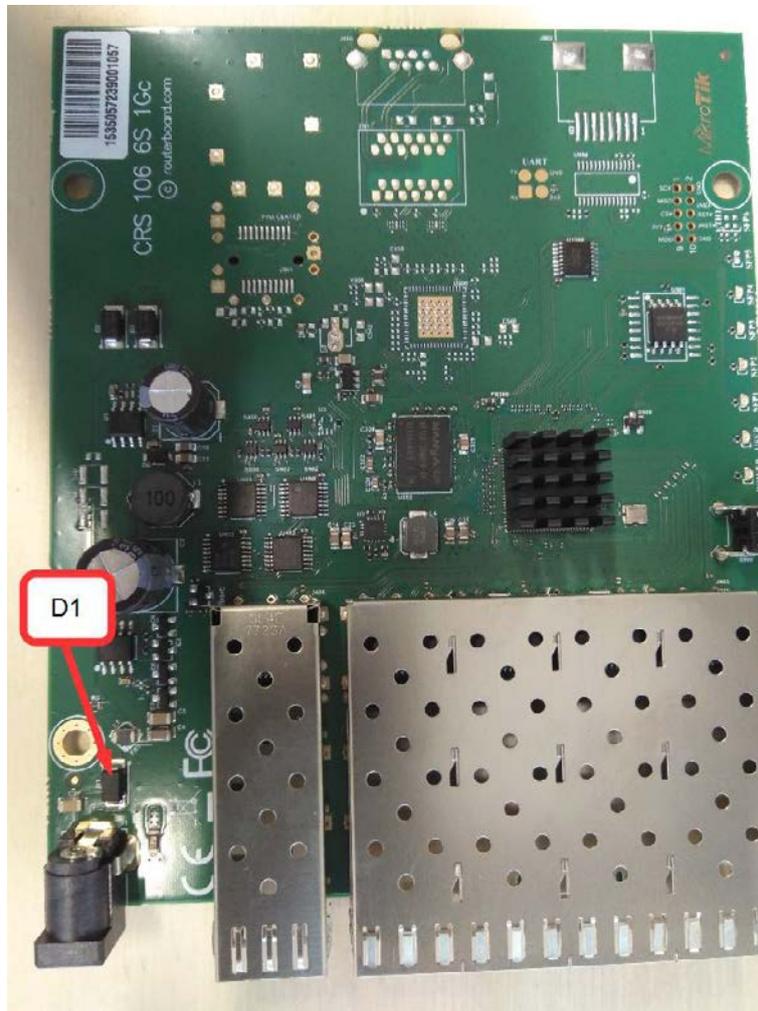


Picture 33

Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diode D1. Location of diodes on the board you can see in the picture 34. Schottky diodes quality measurement method is described on page 18.



Picture 34

CRS106-1C-5S



Picture 35

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [98](#).

Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D1, D3. Location of diodes on the board you can see in the picture [36](#). Schottky diodes quality measurement method is described on page [18](#).

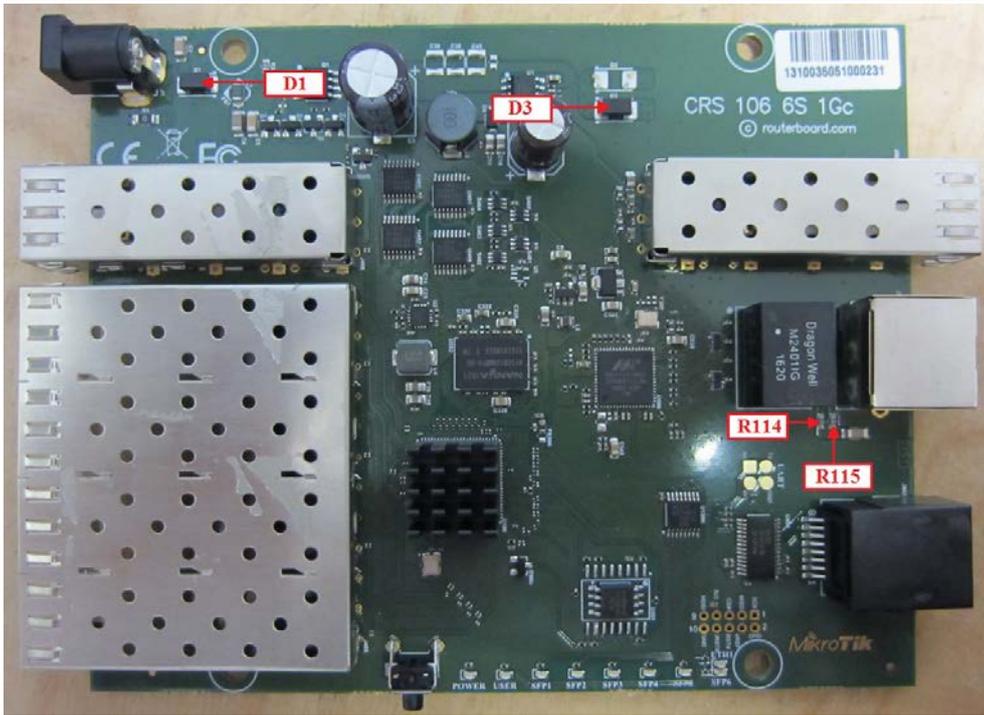
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [37](#).

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 R114, R115 resistance value. It should be 75 Ohm \pm 1%. Location of resistors on the board you can see in the picture [36](#).

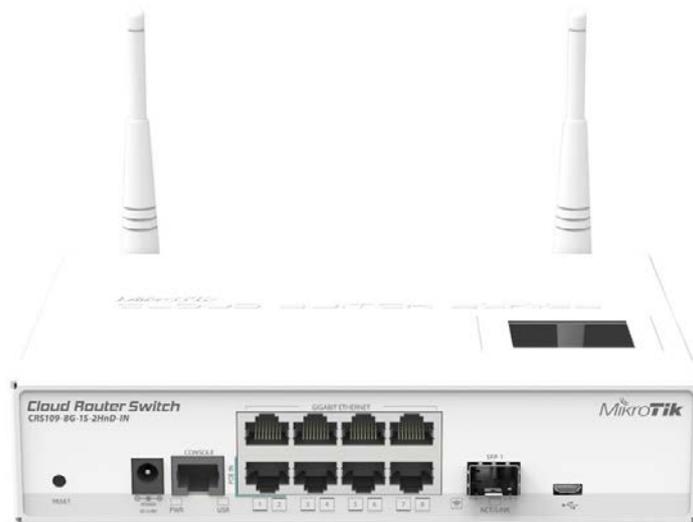


Picture 36



Picture 37

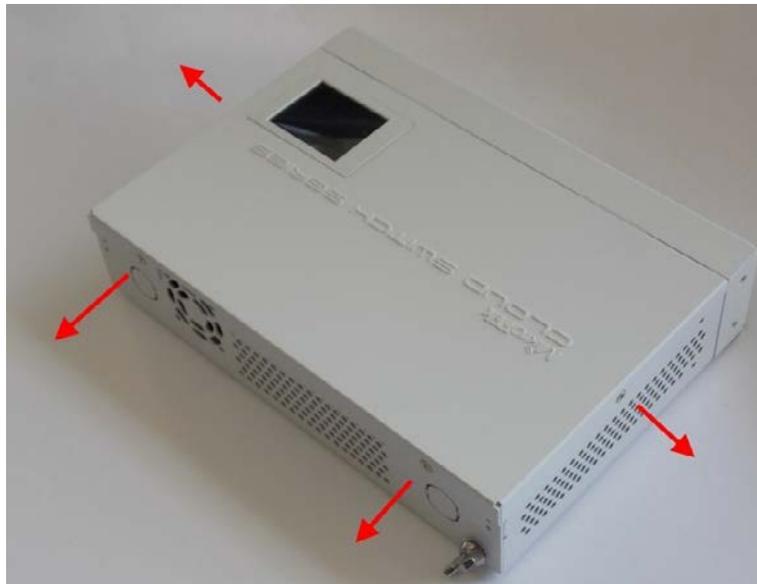
CRS109-8G-1S-2HnD-IN



Picture 38

Disassembling information

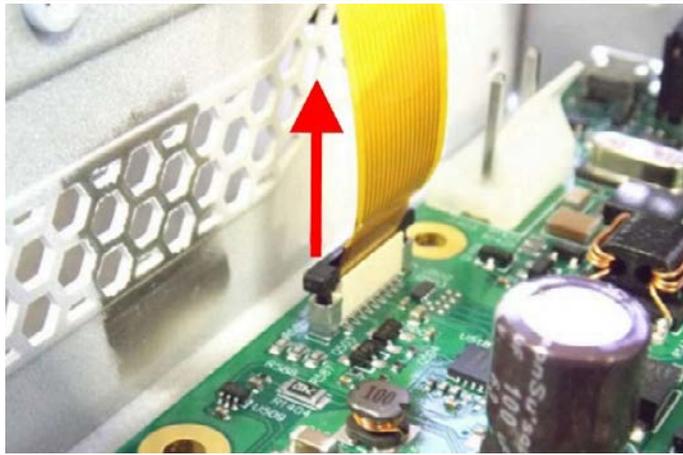
Step 1: Unscrew 4 screws using PH2 screwdriver. Location of screws you can see in the picture [39](#).



Picture 39

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



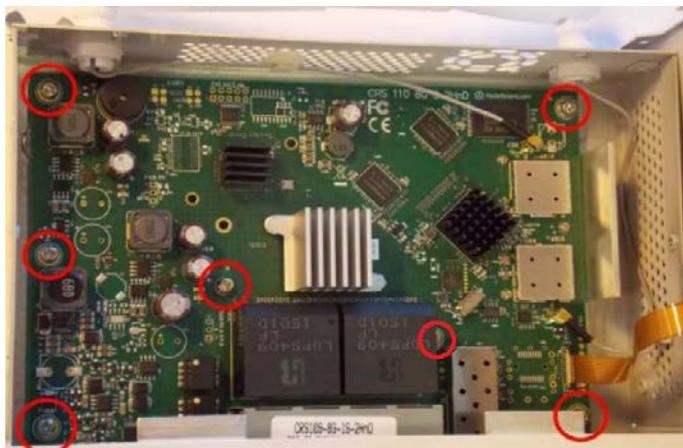
Picture 40

Step 4: Move both antenna cables into a special holes as showed in the picture 41.



Picture 41

Step 5: Unscrew 7 screws which fasten PCB to the case. Location of the screws you can see in the picture 42.



Picture 42

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 43. Schottky diodes quality measurement method is described on page 18.

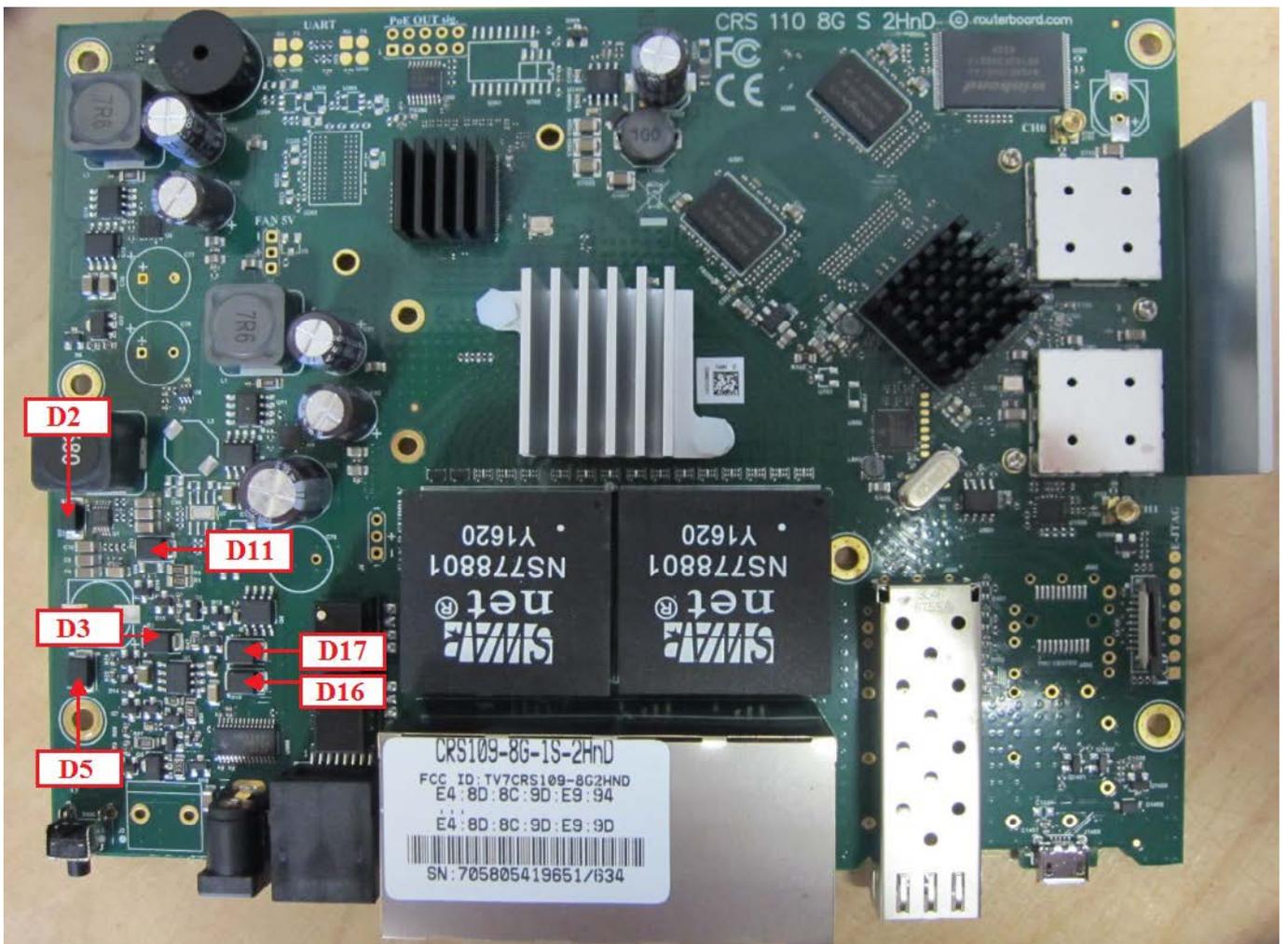
Checking voltage drop value between Ethernet transformer pins and Ground

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 44.

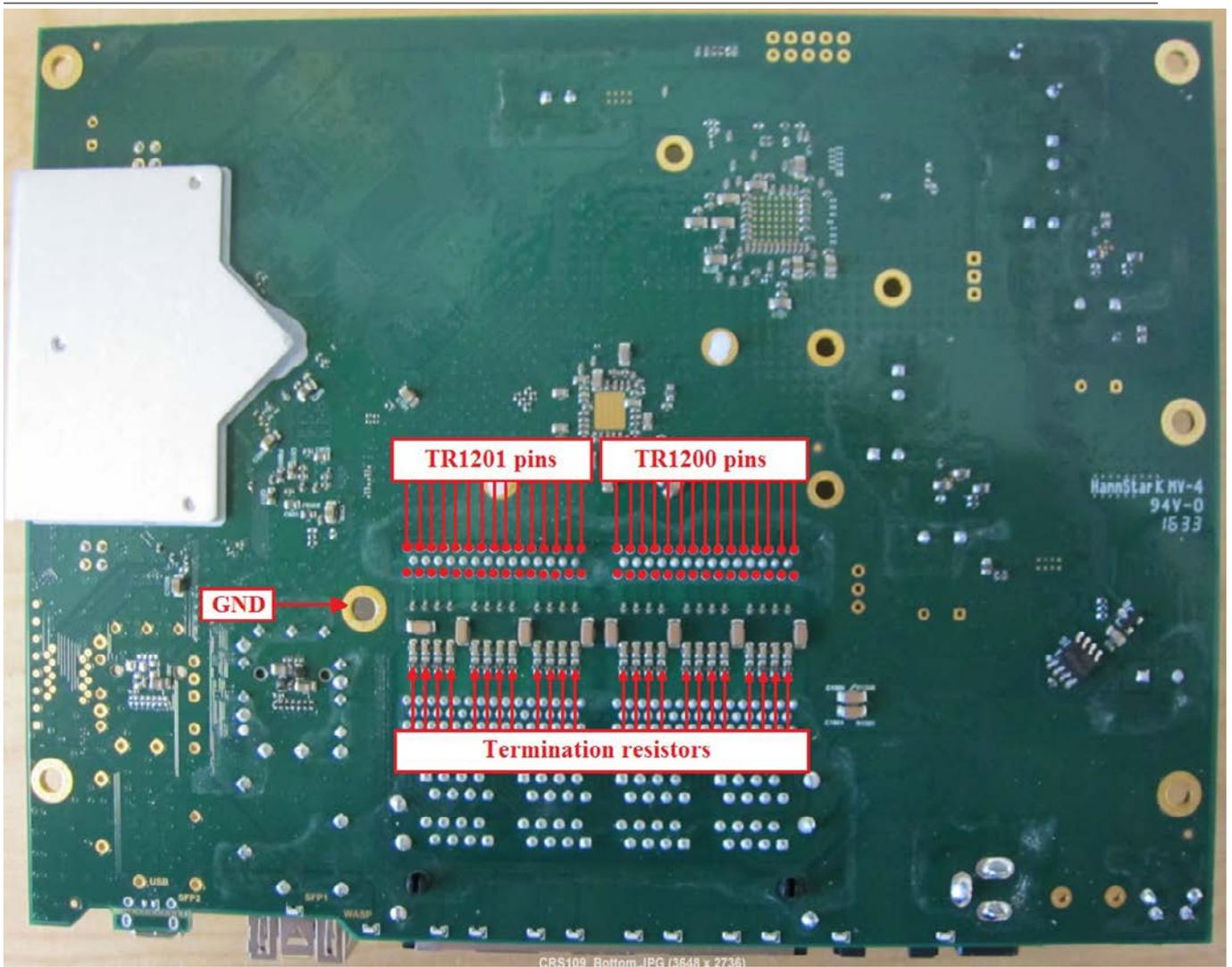
Voltage drop value should be in the range from 0,4V to 0,43V. Voltage drop measurement method is described on page 21.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm +/-1%. Location of resistors on the board you can see in the picture 44.

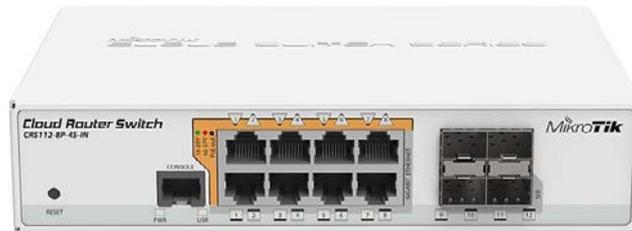


Picture 43



Picture 44

CRS112-8P-4S-IN



Picture 46

Disassembling information

Disassembly method of the board is the same as the CRS109-8G-1S-2HnD-IN board. Disassembly method is described on page 47.

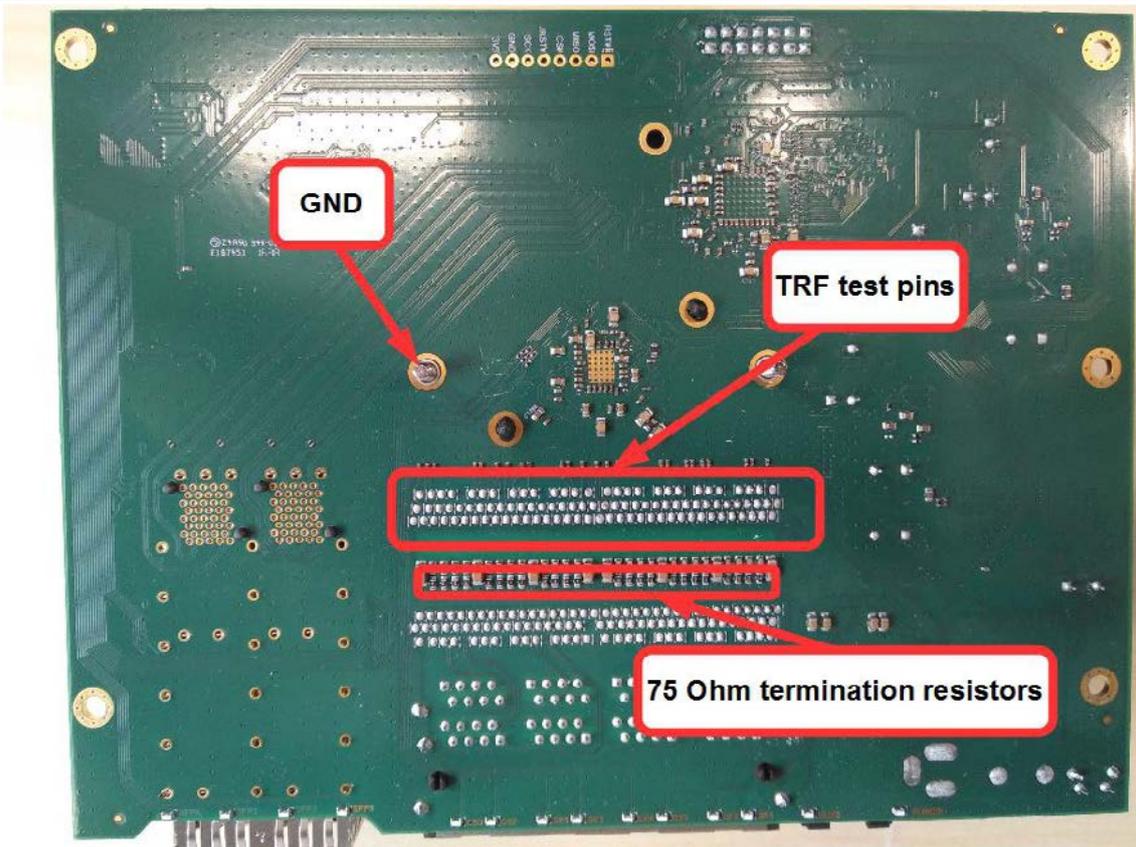
Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformers pins and Ground

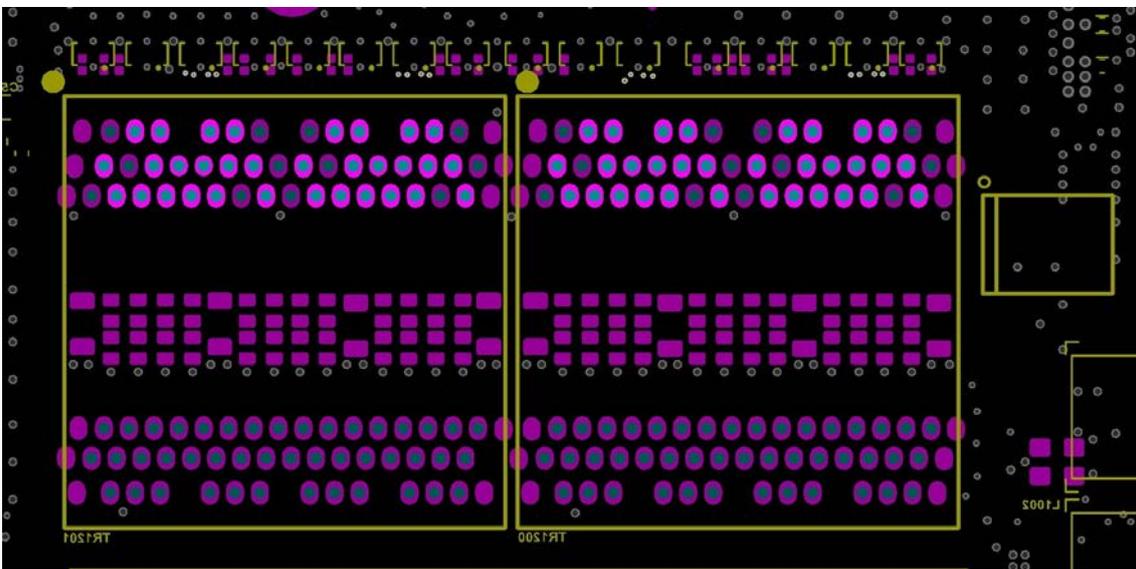
Check voltage drop value between Ethernet transformers TR1200, TR1201 pins and Ground. Test points on the transformers pins are highlighted and can be seen in picture 48. Note that the view for transformer pins are from the bottom for necessary of measurement. Voltage drop value should be in the range from 0,38V to 0,45V. Voltage drop measurement method is described on page 21.

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 47.



Picture 47



Picture 48

CRS125-24G-1S-IN



Picture 49

CRS125-24G-1S-RM



Picture 50

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



Picture 51

Disassembling information

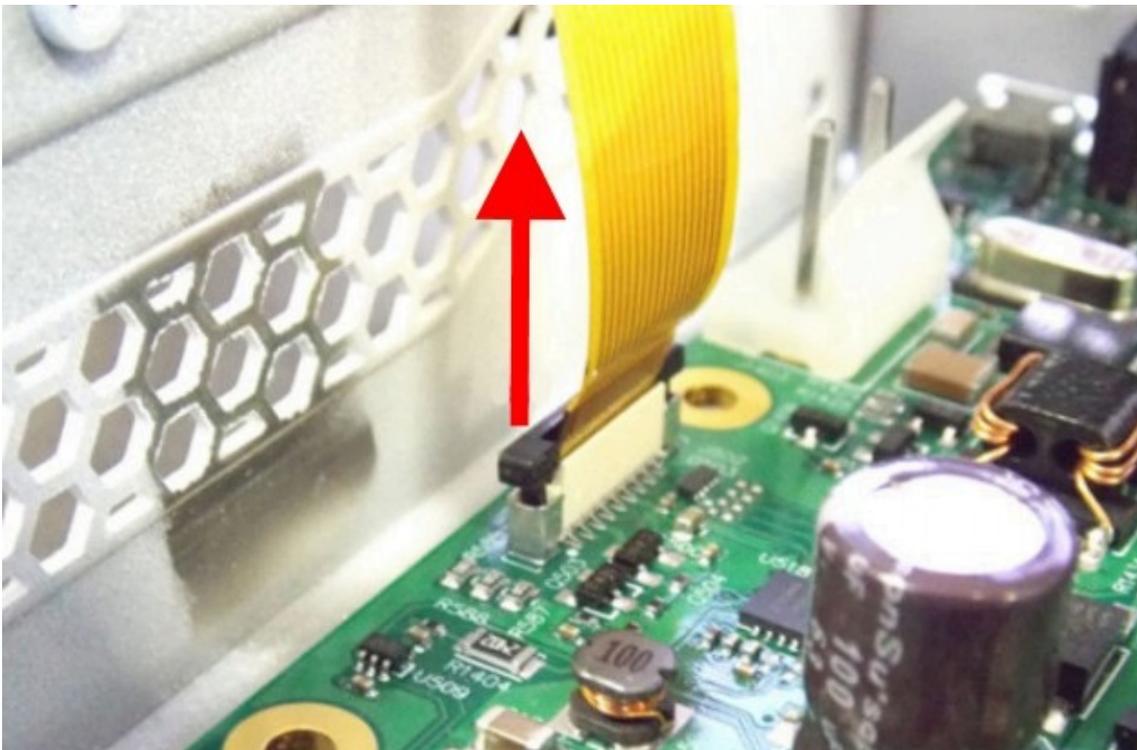
Step 1: Unscrew 5 screws (3 screws behind board case and 1 screw on the side of the board case). Location of the screws you can see in the picture [52](#).



Picture 52

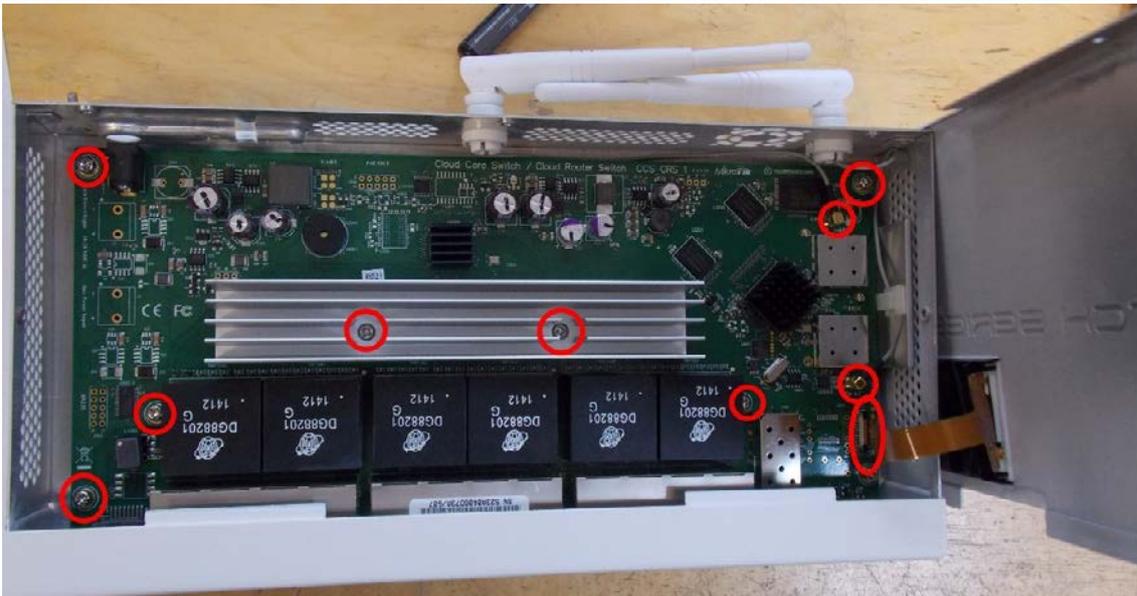
Step 2: Carefully take off the cover. Do not damage the LCD flex cable.

Step 3: Gently lift the latch vertically upward and take out LCD flex cable from FPC connector as showed in the picture 53. Do not damage the FPC connector locking drawer.



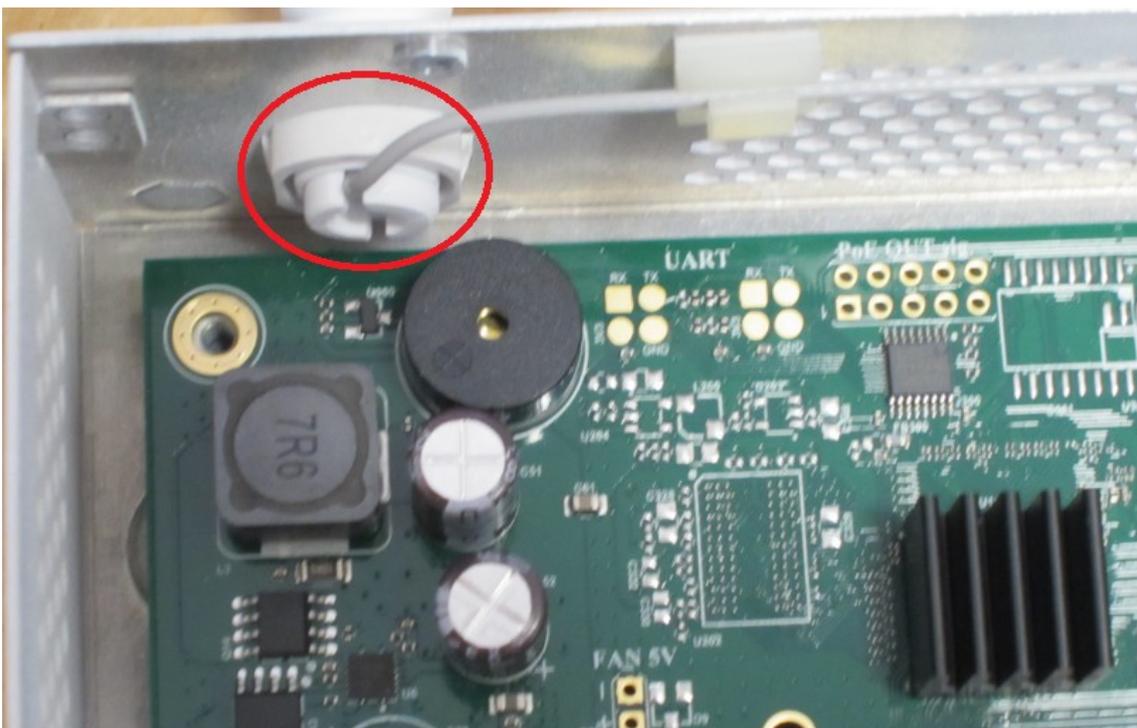
Picture 53

Step 4: Unscrew 8 screws which fasten PCB to the case. Location of the screws see in the picture 54.



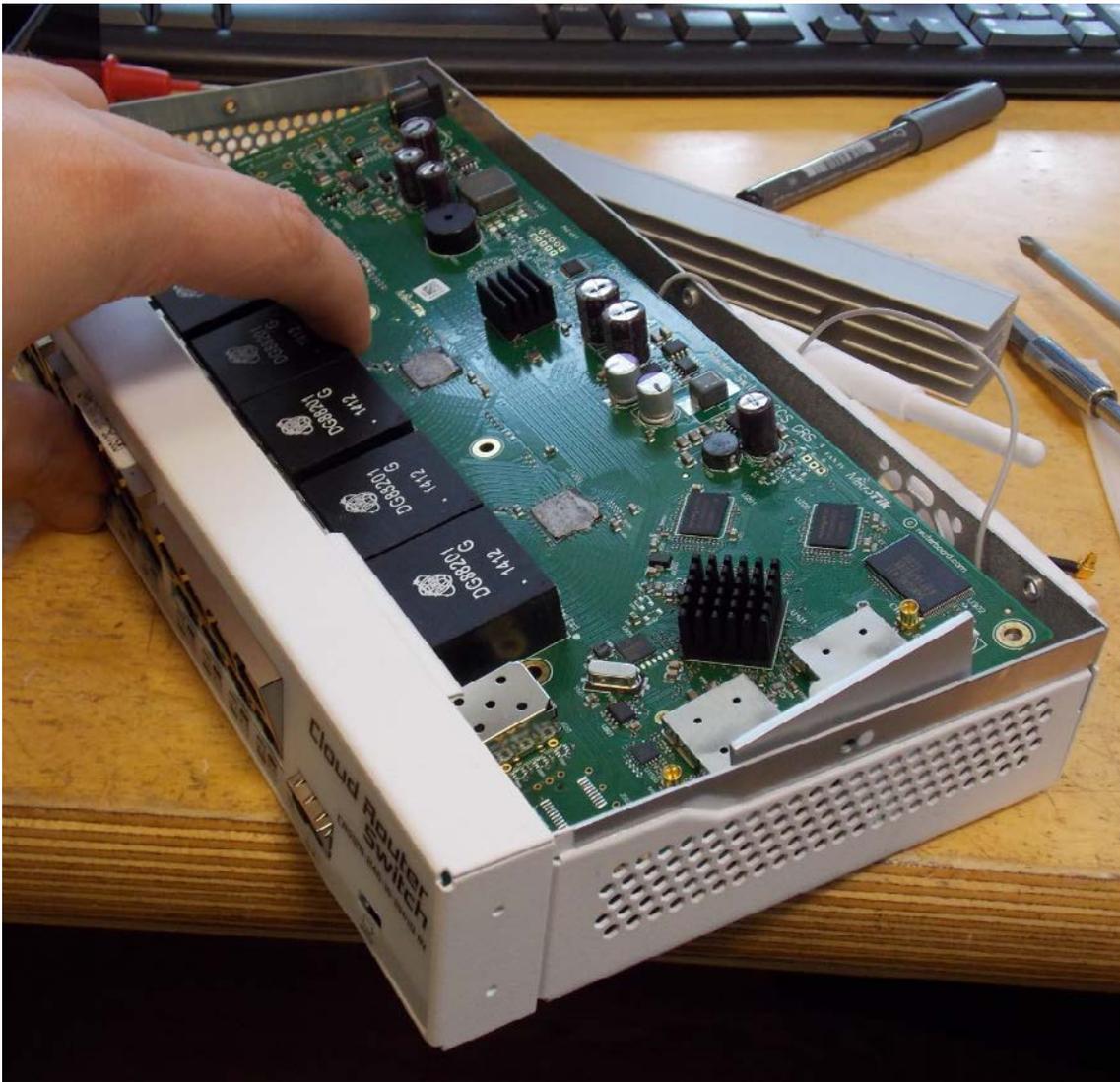
Picture 54

Step 5: Move both antenna cables into a special holes, see picture 55.



Picture 55

Step 6: Move out PCB from the case, see picture 56.



Picture 56

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 57. Schottky diode quality measurement method is described on page 18.

Checking voltage drop value between Ethernet transformers pins and Ground

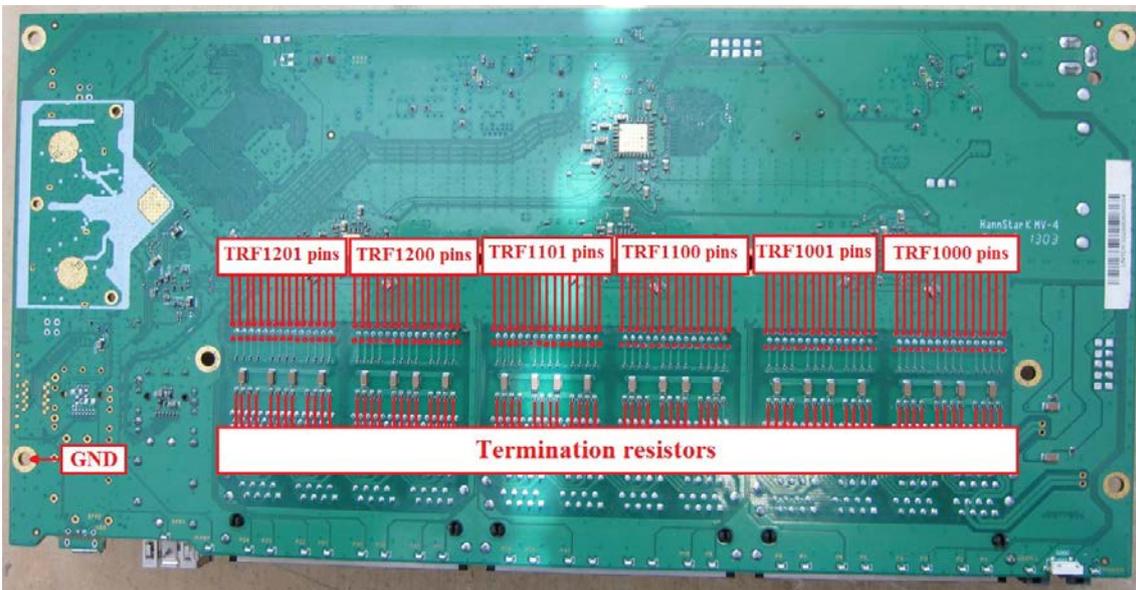
Check voltage drop value between Ethernet transformers TRF1000, TRF1001, TRF1100, TRF1101, TRF1200, TRF1201 pins and Ground. Test points on the transformers pins are marked with red dots, see picture 58. Voltage drop value should be in the range from 0,38V to 0,44V. Voltage drop measurement method is described on page 21.

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 58.



Picture 57



Picture 58

CLOUD ROUTER SWITCH 304 SERIES ROUTERBOARD

CRS304-4XG-IN



Picture 59

Disassembling information

Step 1:

Carefully peel off four silicone rubber pads, than using PH1 screwdriver unscrew four screws, see picture 60 and 61, after that remove the bottom cover and gently pull out the PCB with heat-sinks from the case.



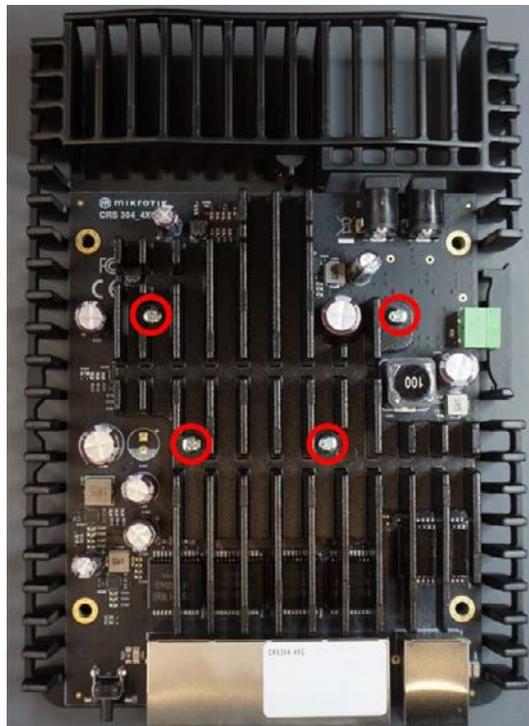
Picture 60



Picture 61

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 62.

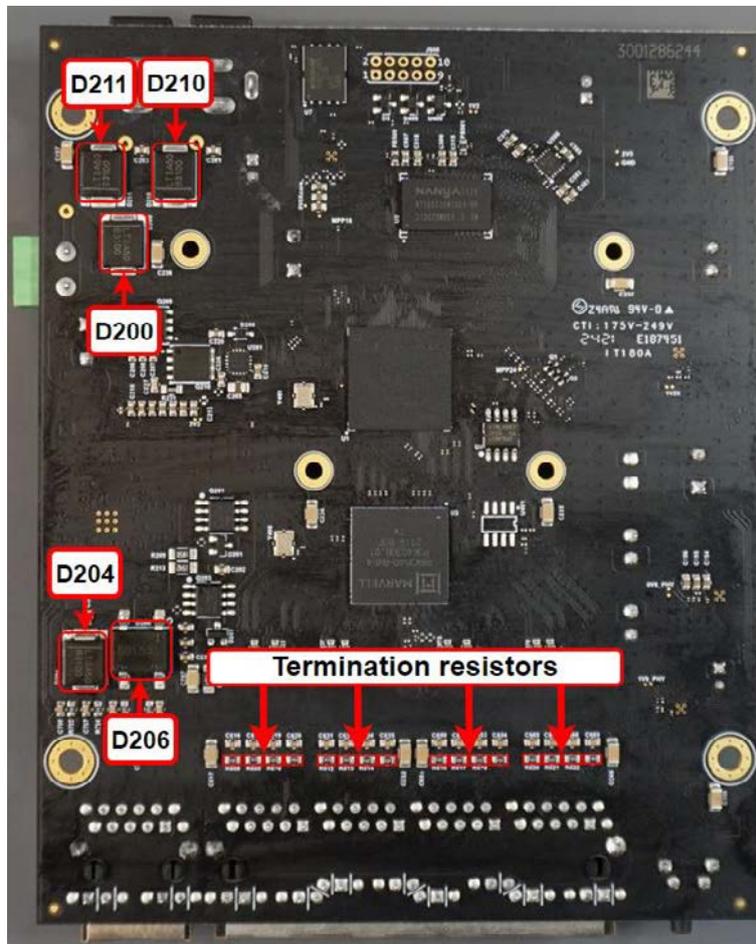


Picture 62

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 63. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.



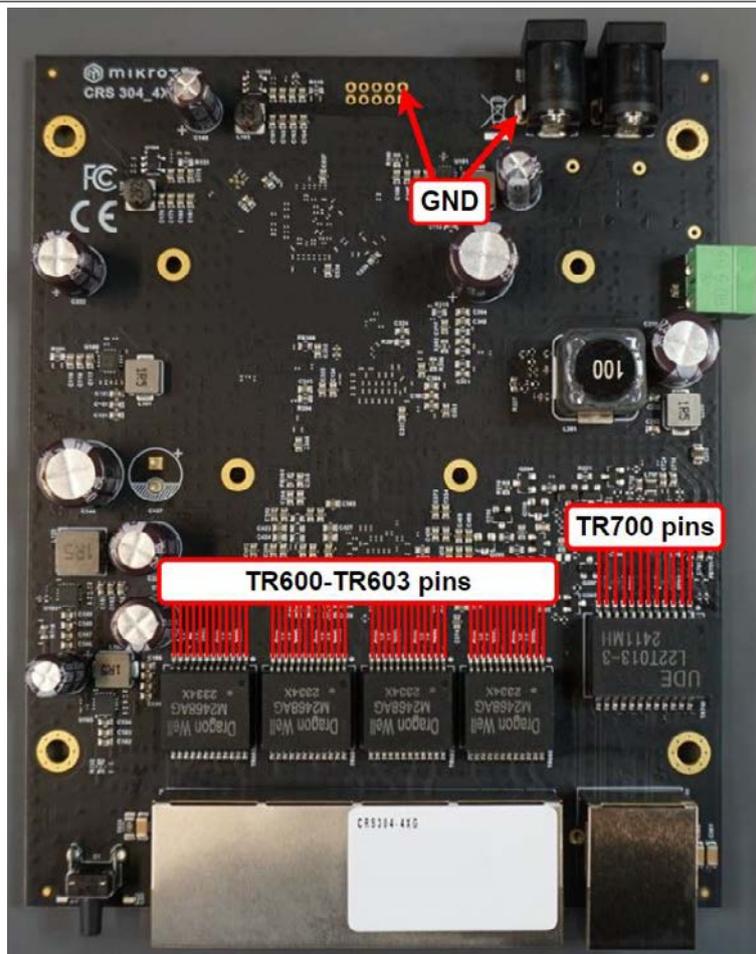
Picture 63

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 64. 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 21

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 63.



Picture 64

CLOUD ROUTER SWITCH 310 SERIES ROUTERBOARD

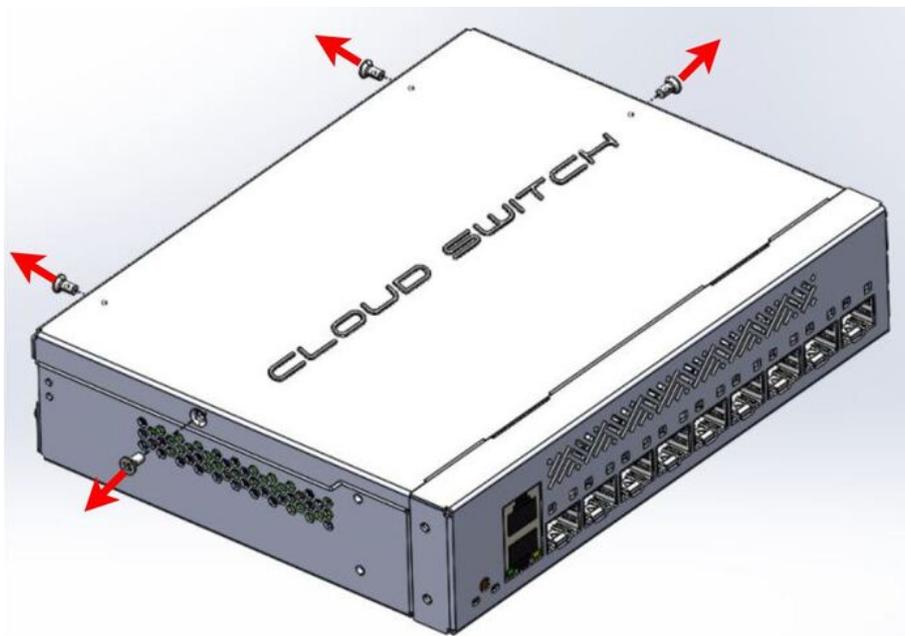
CRS310-1G-5S-4S+IN



Picture 65

Disassembling information

Unscrew 4 screws using PH2 screwdriver and carefully take off the cover. Location of the screws is shown the picture 66.



Picture 66

Instructions for checking over-voltage

Checking Schottky diodes and diode bridge

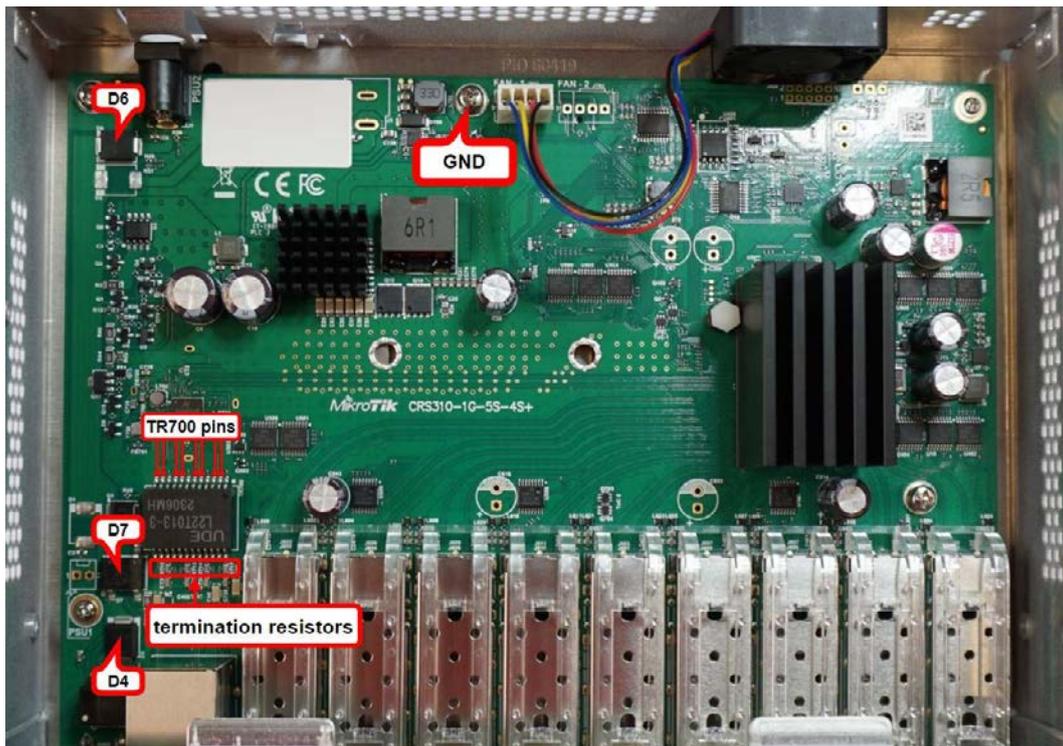
Check Schottky diodes D4, D6 and diode bridge D7. Location of the diodes on the board you can see in the picture 67. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR700 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 67. Voltage drop value should be in the range from 0,35V to 0,50V. Voltage drop measurement method is described on page 21.

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 67.



Picture 67

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



Picture 68



Picture 69

Disassembling information

Step 1:

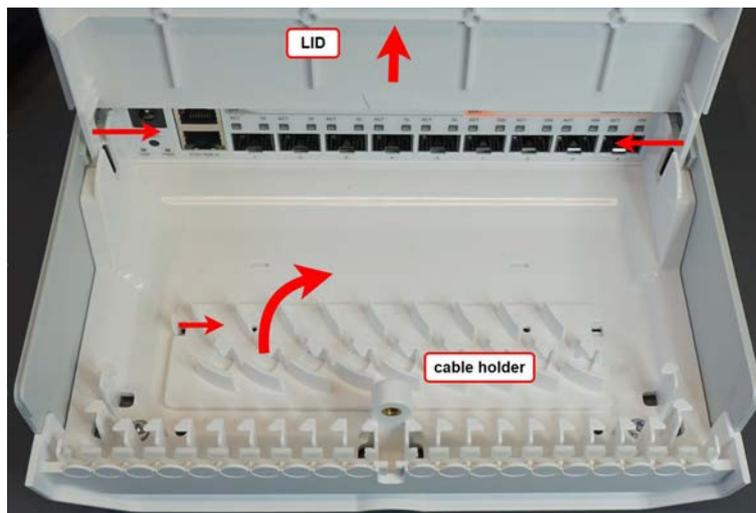
On the back of the case unscrew 9 screws using PH2 screwdriver and carefully remove the heat-sink. Location of the screws is shown the picture 70.



Picture 70

Step 2:

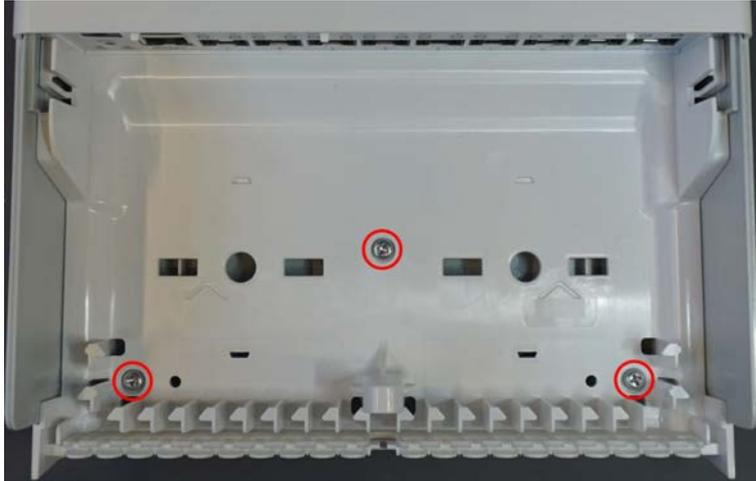
Open the lid, then disattach the lid and the cable holder, as shown in the picture 71.



Picture 71

Step 3:

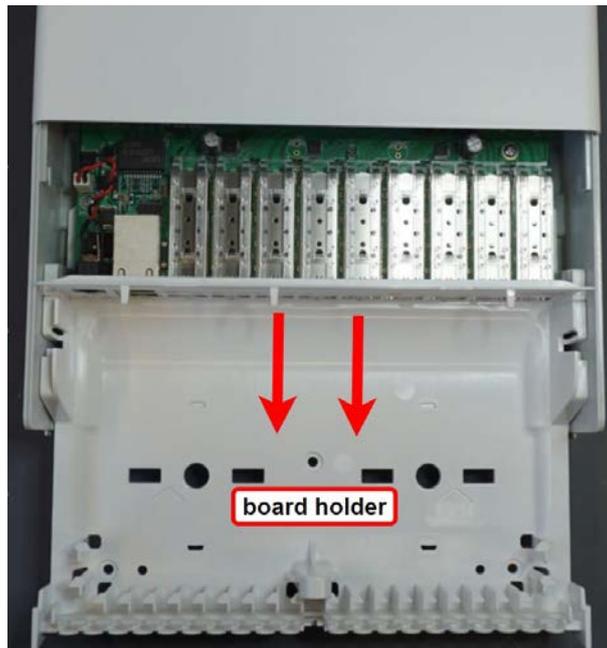
Unscrew 3 screws using PH2 screwdriver. Location of the screws is shown the picture 72.



Picture 72

Step 4:

Gently pull the board holder, as shown in the picture 73 and 74.



Picture 73



Picture 74

Instructions for checking over-voltage

Over-voltage testing procedure is the same as for the CRS310-1G-5S-4S+IN board, see page [66](#).

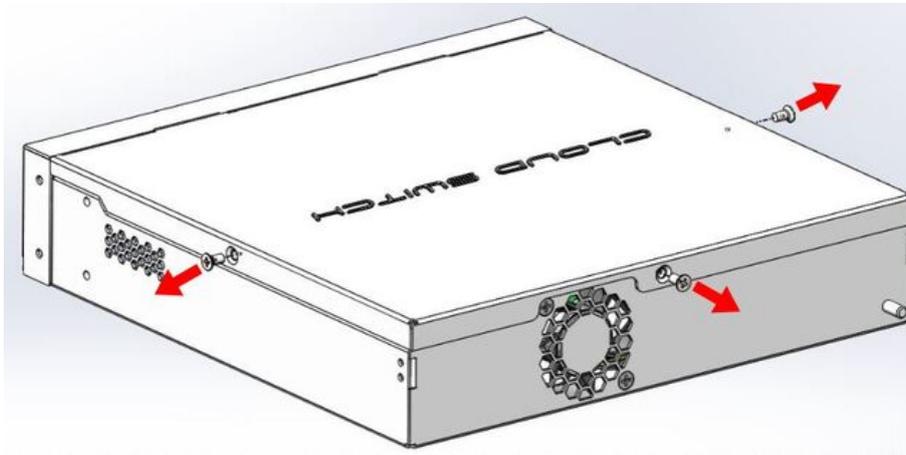
CRS310-8G+2S+IN



Picture 75

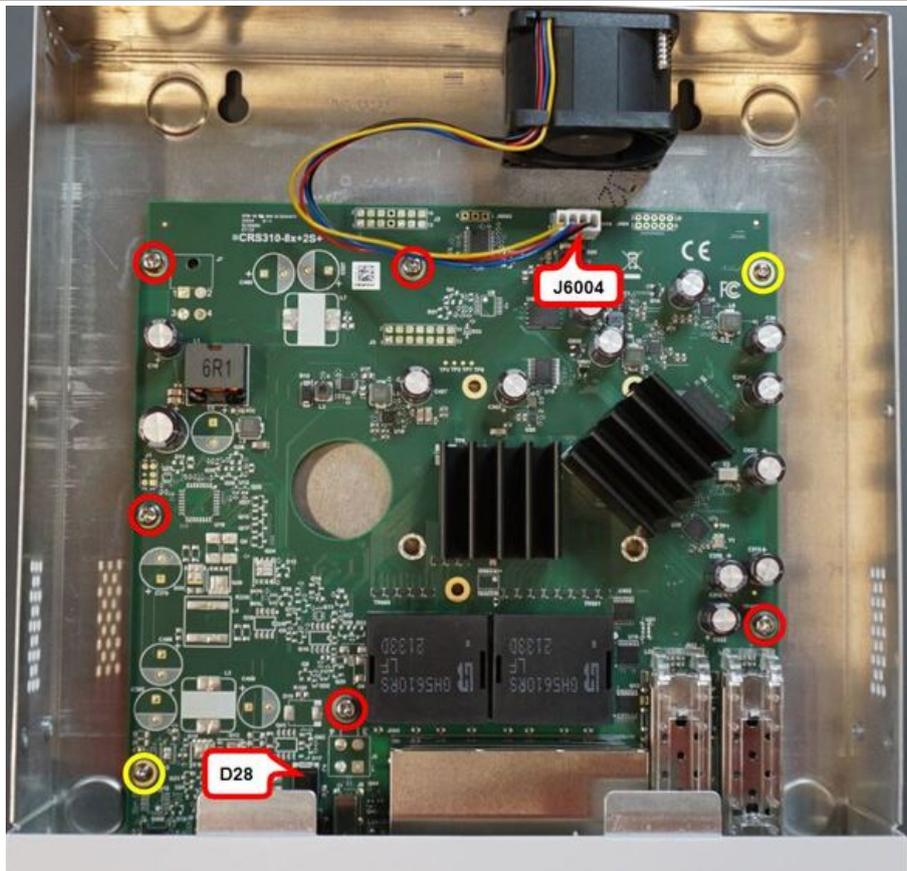
Disassembling information

Step 1: Unscrew 3 screws using PH2 screwdriver and carefully take off the cover. Location of the screws is shown the picture 76.



Picture 76

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 77.



Picture 77

Instructions for checking over-voltage

Checking Schottky diode

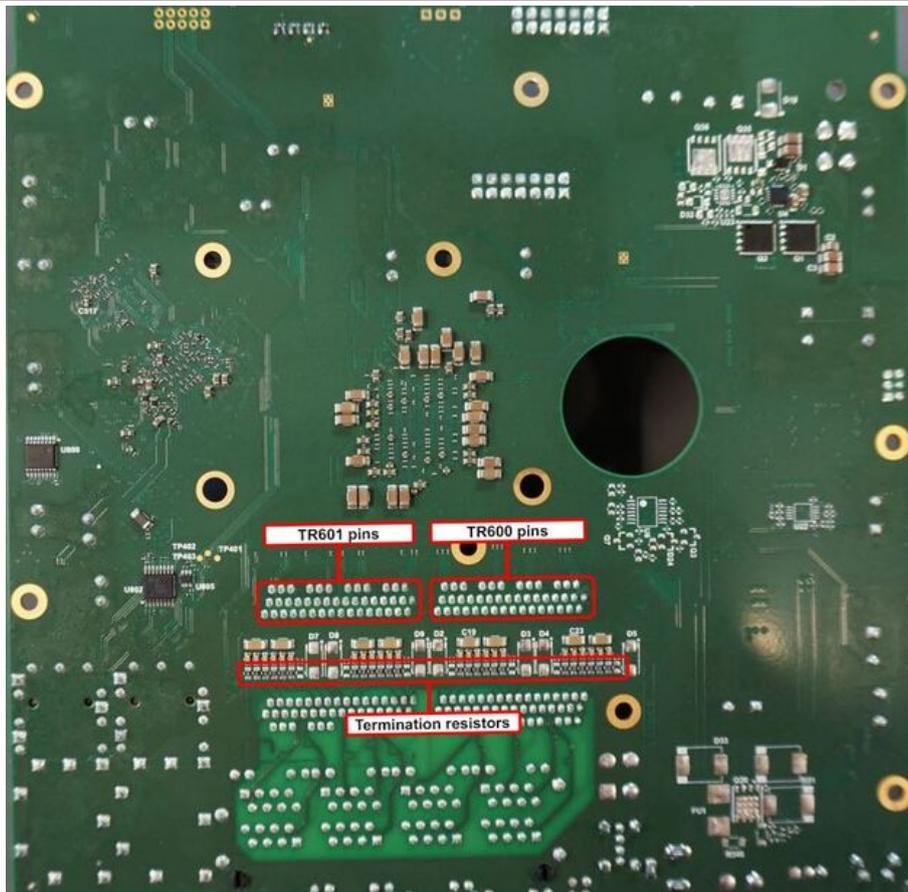
Check Schottky diode D28. Location of the diode on the board you can see in the picture 77. Schottky diode quality measurement method is described on page 18.

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 78. Voltage drop value should be in the range from 0,40V to 0,55V. Voltage drop measurement method is described on page 21.

Checking 75 Ohm termination resistors resistance

Check resistors resistance value. It should be 75 Ohm +/-1%. Location of resistors on the board you can see in the picture 78.



Picture 78

CLOUD ROUTER SWITCH 320 SERIES ROUTERBOARD

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



Picture 79

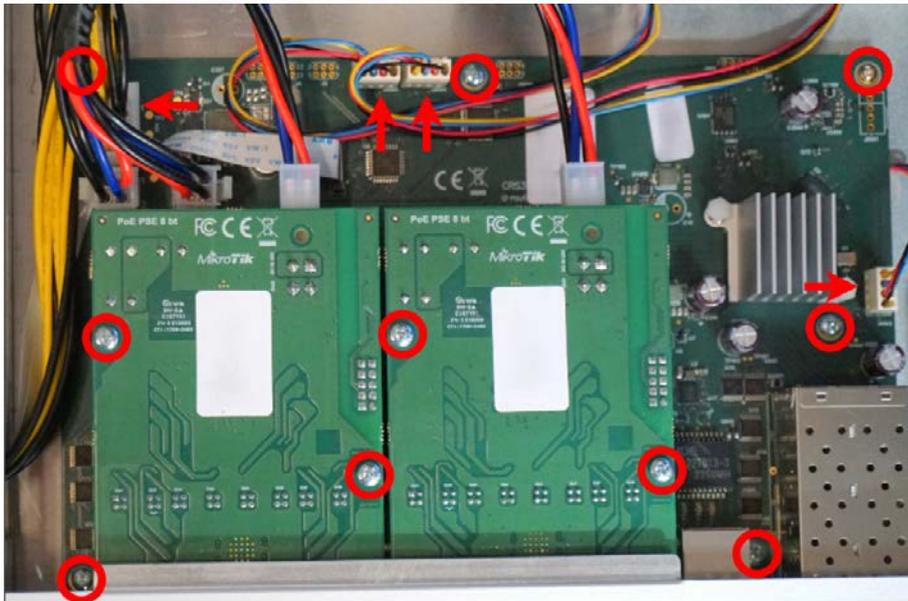
Disassembling information

Step 1: Unscrew 9 screws using a PH2 screwdriver and carefully remove the cover. Location of the screws is shown in the picture 80.



Picture 80

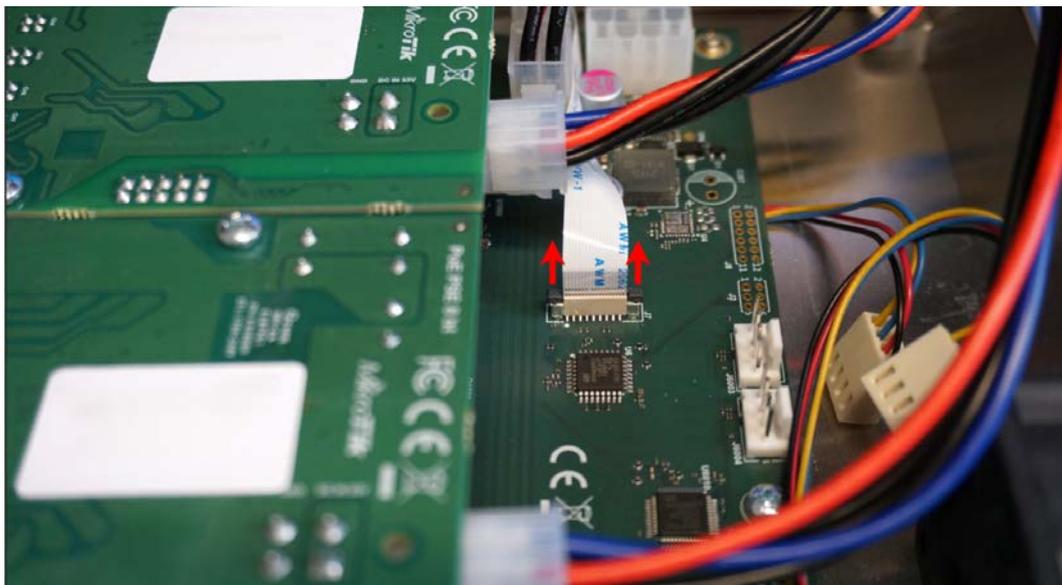
Step 2: Unscrew 10 screws using a PH1 screwdriver and unplug 4 connectors that are marked with arrows. Location of the screws and connectors is shown in the picture 81.



Picture 81

Step 3:

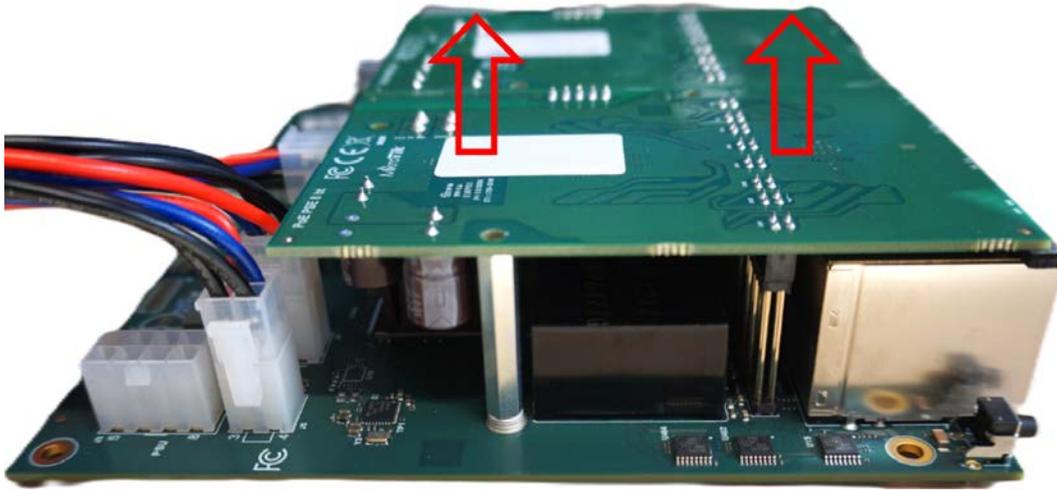
Unplug the connector by alternately pulling the left and right sides of the black pin, see picture 82.



Picture 82

Step 4:

Remove 2 boards by lifting them vertically as shown in the picture 83.



Picture 83

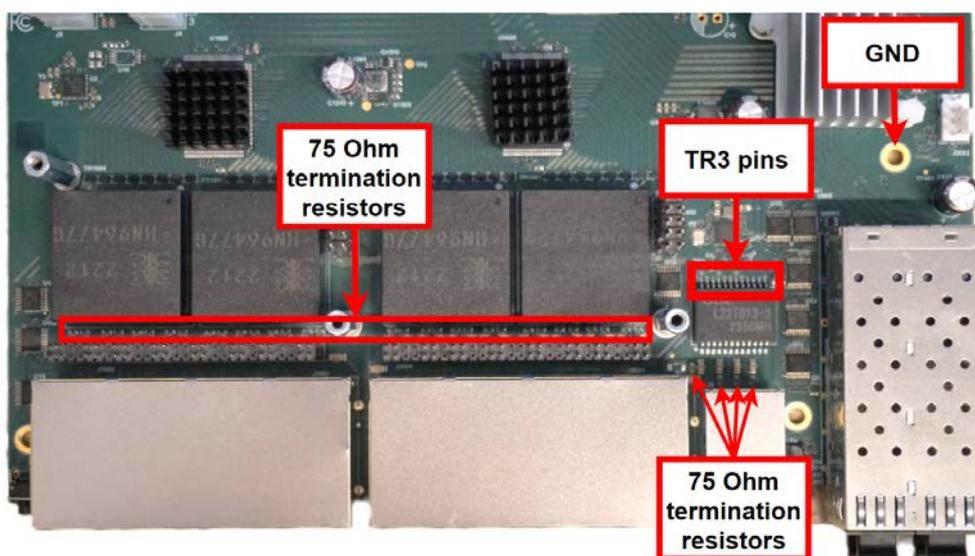
Checking procedure for over-voltage

Checking voltage drop value between Ethernet transformer pins and Ground

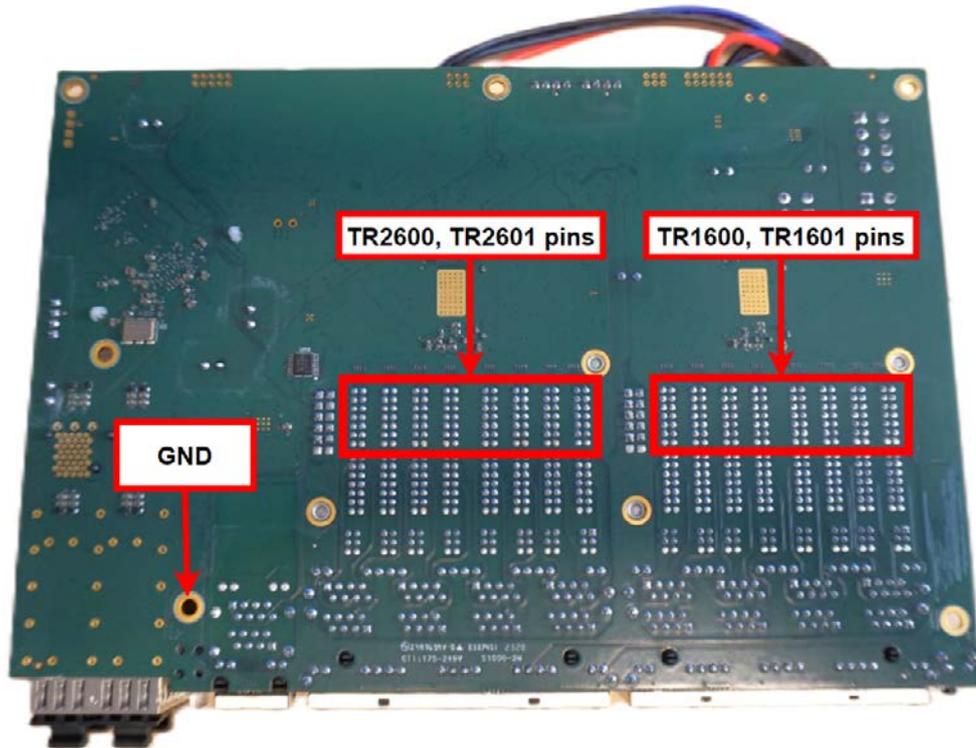
Check voltage drop value between Ethernet transformers TR1600, TR1601, TR2600, TR2601, TR3 pins and Ground. Test points you can see in the pictures 84 and 85. The voltage drop of the TR1600, TR1601, TR2600 and TR2601 transformers should be in the range from 0,30V to 0,35V or 0.60V to 0.65V and the voltage drop of the TR3 transformer should be in the range from 0,39V to 0,45V. Voltage drop measurement method is described on page 21.

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 84.



Picture 84



Picture 85

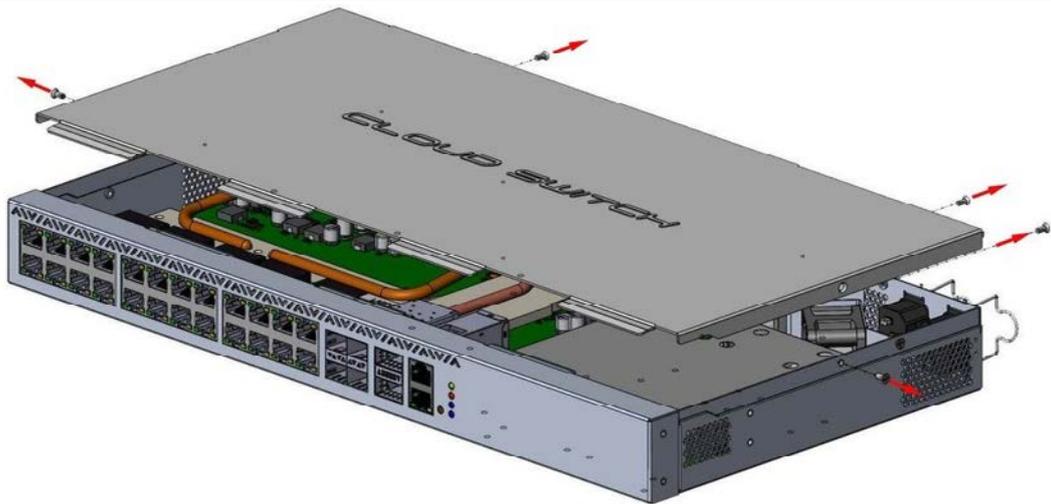
CRS326-4C+20G+2Q+RM



Picture 86

Disassembling information

Step 1: Unscrew 5 screws using PH2 screwdriver and carefully remove the cover. Location of the screws is shown the picture 87.



Picture 87

Step 2: Unscrew two screws using PH2 screwdriver, see picture 88.



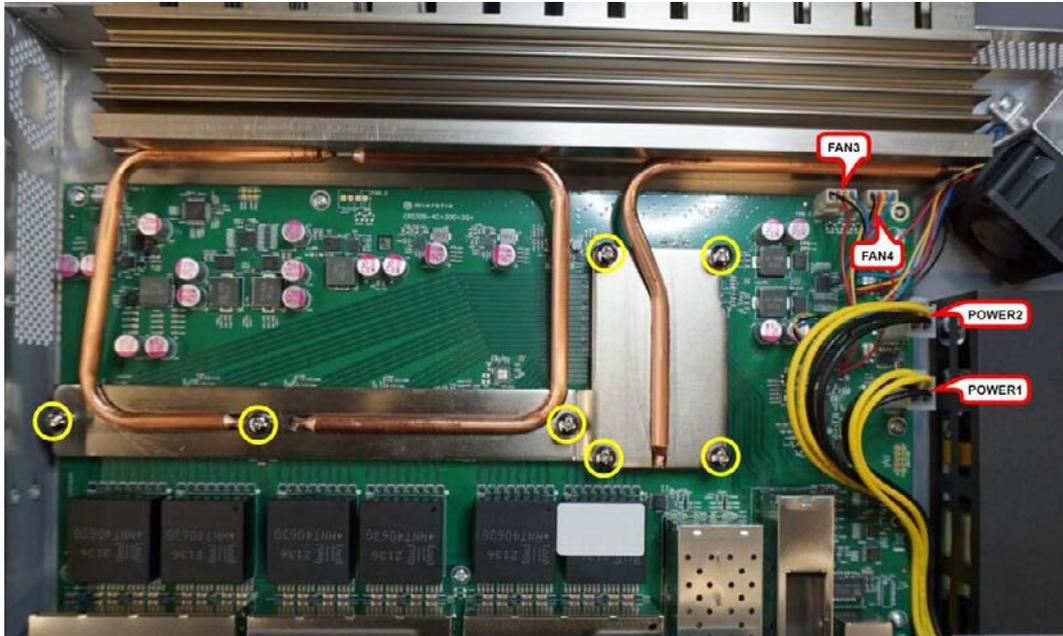
Picture 88

Step 3:

Unplug FAN and power cables, see picture 89.

Step 4:

Unscrew 7 screws using PH2 screwdriver and remove heat-sink, see picture 89.



Picture 89

Step 5:

Unscrew 8 screws using PH1 screwdriver. Location of the screws is shown the picture 90.



Picture 90

Checking procedure for over-voltage

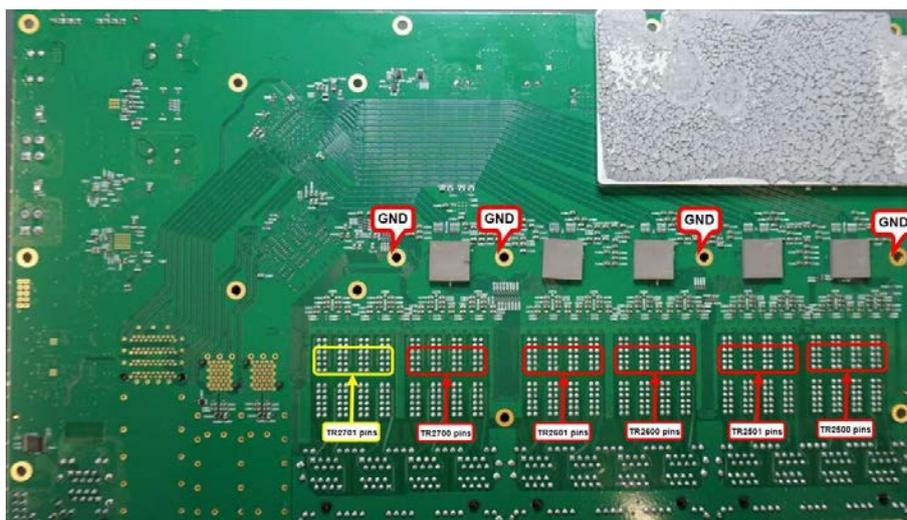
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR500 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 91. Voltage drop value should be in the range from 0,34V to 0,45V. Voltage drop measurement method is described on page 21.



Picture 91

Check voltage drop value between Ethernet transformers TR2500, TR2501, TR2600, TR2601, TR2700, TR2701 pins and Ground. Test points you can see in the picture 92. 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 21.



Picture 92

CLOUD ROUTER SWITCH 504 SERIES ROUTERBOARD

CRS504-4XQ-IN



Picture 93

Disassembling information

Step 1:

Using Phillips PH2 screwdriver unscrew 6 screws and remove the cover. Location of the screws is shown the picture 94.



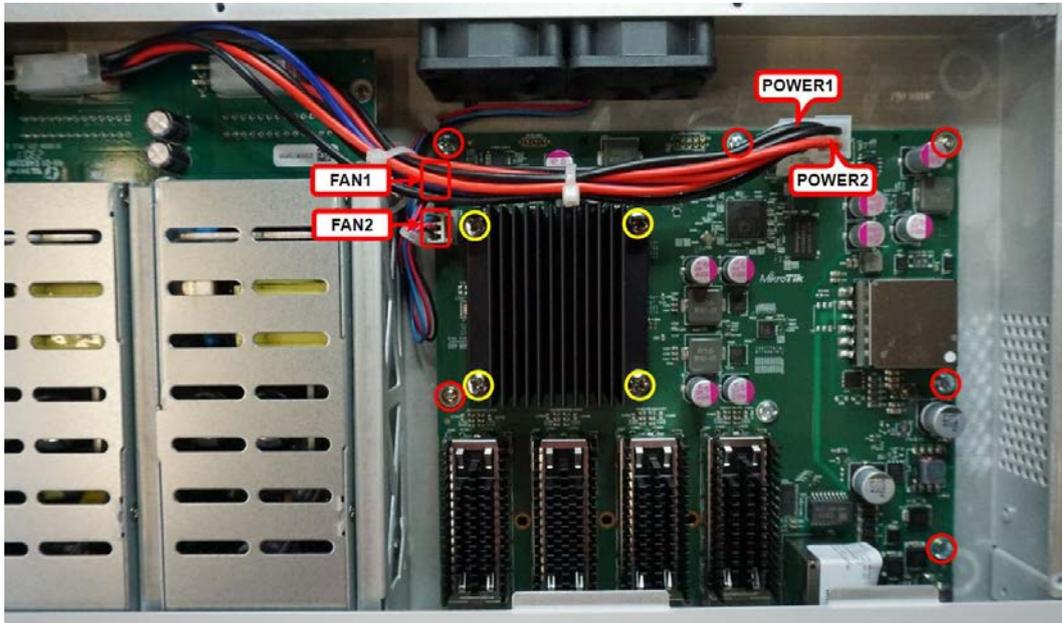
Picture 94

Step 2:

Disconnect the fan and power cables, see picture 95.

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 95.



Picture 95

Instructions for checking overvoltage

Checking Schottky diodes

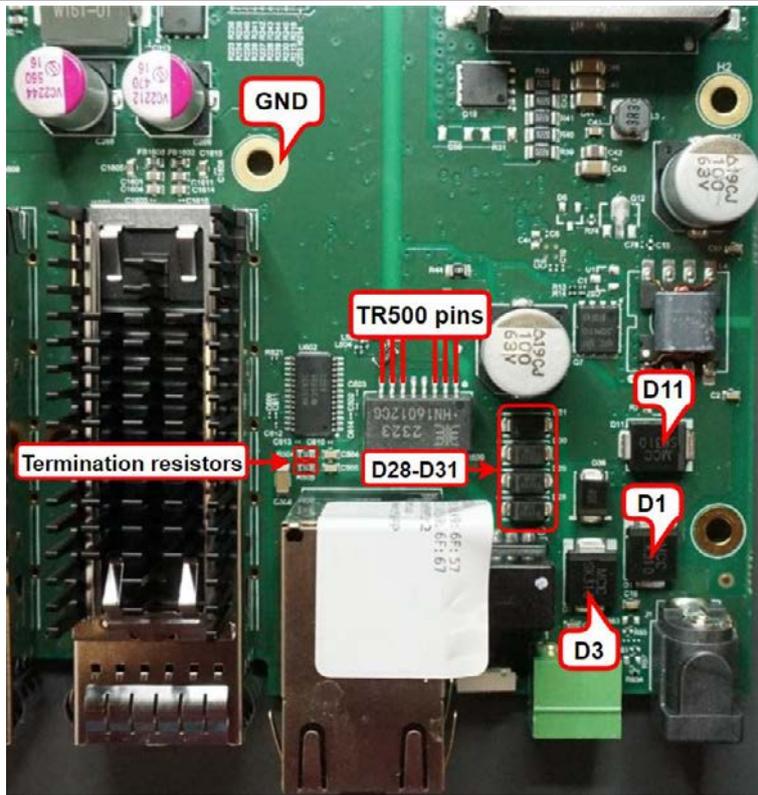
Check Schottky diodes D1, D3, D11, D28, D29, D30, D31, D32, D33, D34, D35. Location of the diodes is shown the picture 96 and 97. Schottky diode quality measurement method is described on page 18.

Checking voltage drop value between Ethernet transformer pins and Ground

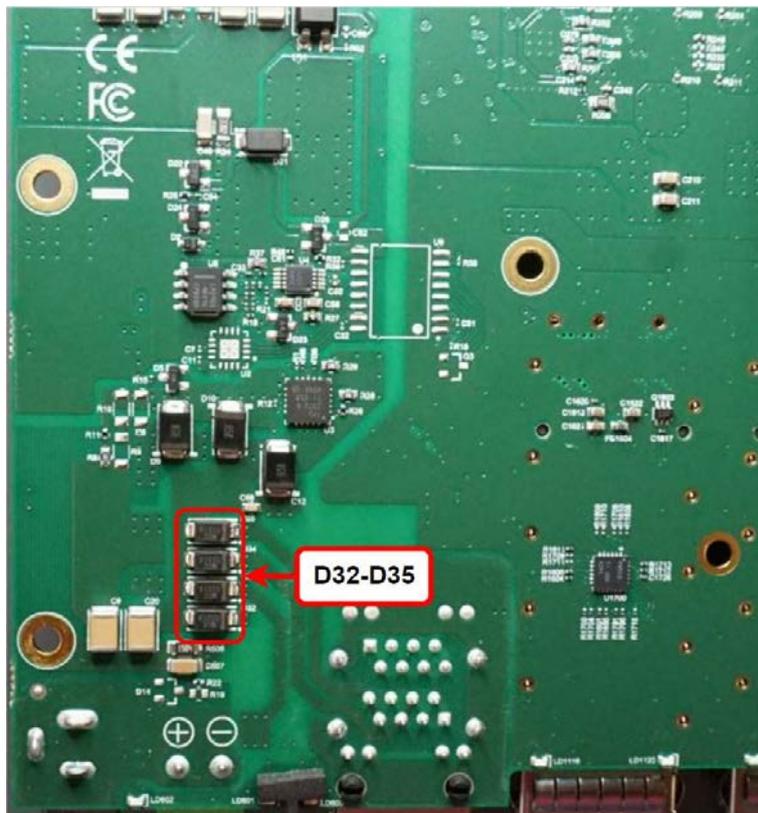
Check voltage drop value between Ethernet transformer TR500 pins and Ground. Test points on the transformer pins are marked with red lines, see picture 96. Voltage drop value should be in the range from 0,37V to 0,40V. Voltage drop measurement method is described on page 21.

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 96.



Picture 96



Picture 97

CLOUD ROUTER SWITCH 510 SERIES ROUTERBOARD

CRS510-8XS-2XQ-IN



Picture 98

Disassembling information

Step 1:

Using Phillips PH2 screwdriver unscrew 6 screws and remove the cover. Location of the screws is shown in the picture [99](#).



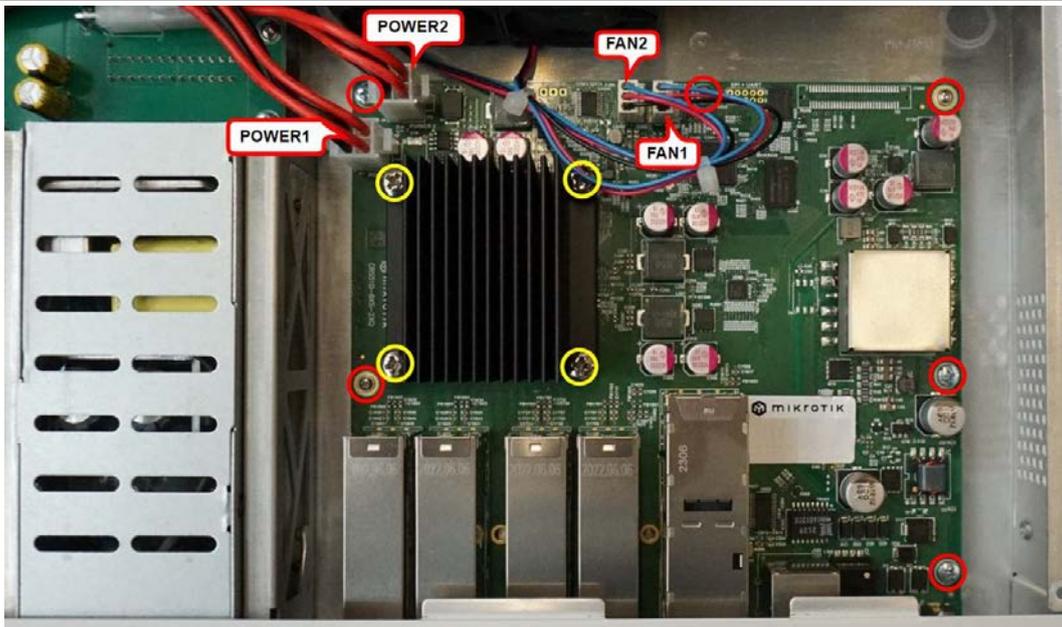
Picture 99

Step 2:

Disconnect the fan and power cables, see picture [100](#).

Step 3:

Using Phillips PH1 screwdriver unscrew 6 screws marked in red, then using Phillips PH2 screwdriver unscrew 4 screws marked in yellow and carefully remove the PCB from the case. Location of the screws is shown in the picture [100](#).



Picture 100

Instructions for checking overvoltage

Checking Schottky diodes

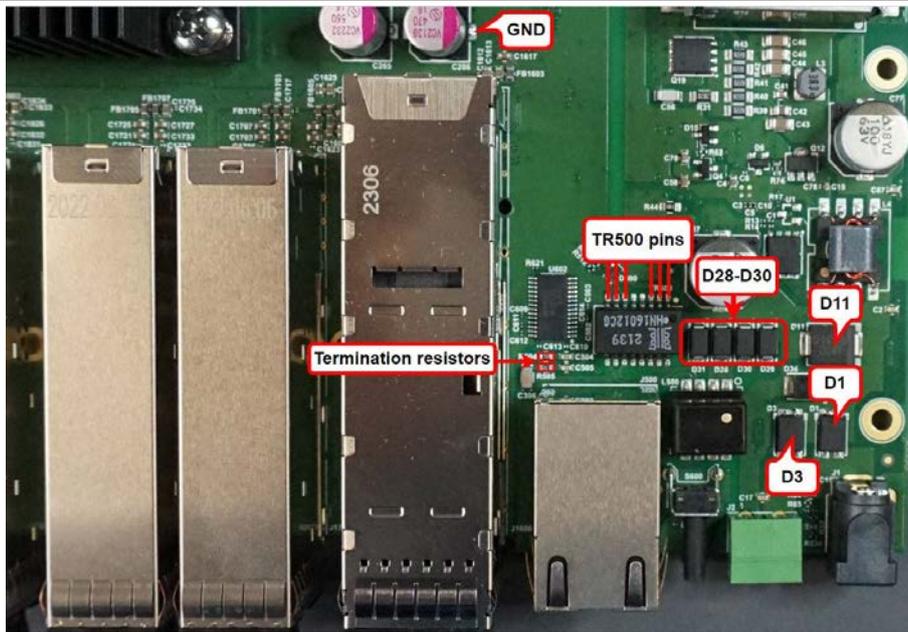
Check Schottky diodes D1, D3, D11, D28, D29, D30, D31, D32, D33, D34, D35. Location of the diodes is shown in the picture 101 and 102. Schottky diode quality measurement method is described on page 18.

Checking voltage drop value between Ethernet transformer pins and Ground

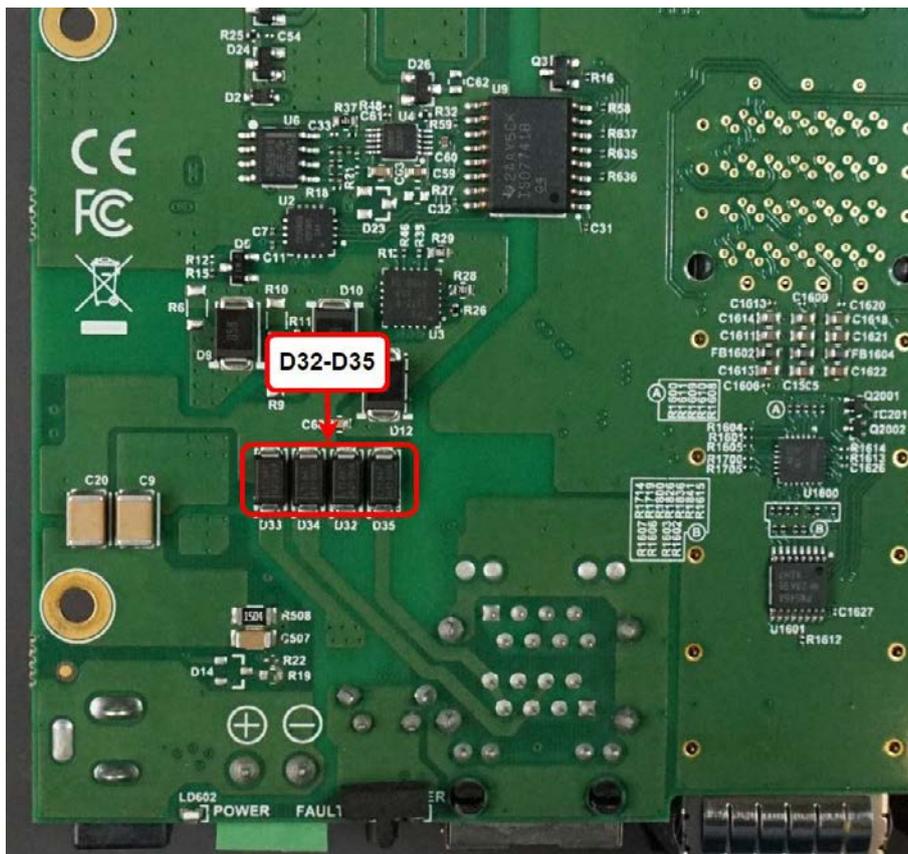
Check voltage drop value between Ethernet transformer TR500, pins and Ground (Ground test point is shown in the picture 102 and 101). Test points on the transformer pins are marked with red lines, see picture 101. Voltage drop value should be in the range from 0,37V to 0,40V. Voltage drop measurement method is described on page 21.

Checking 75 Ohm termination resistors resistance

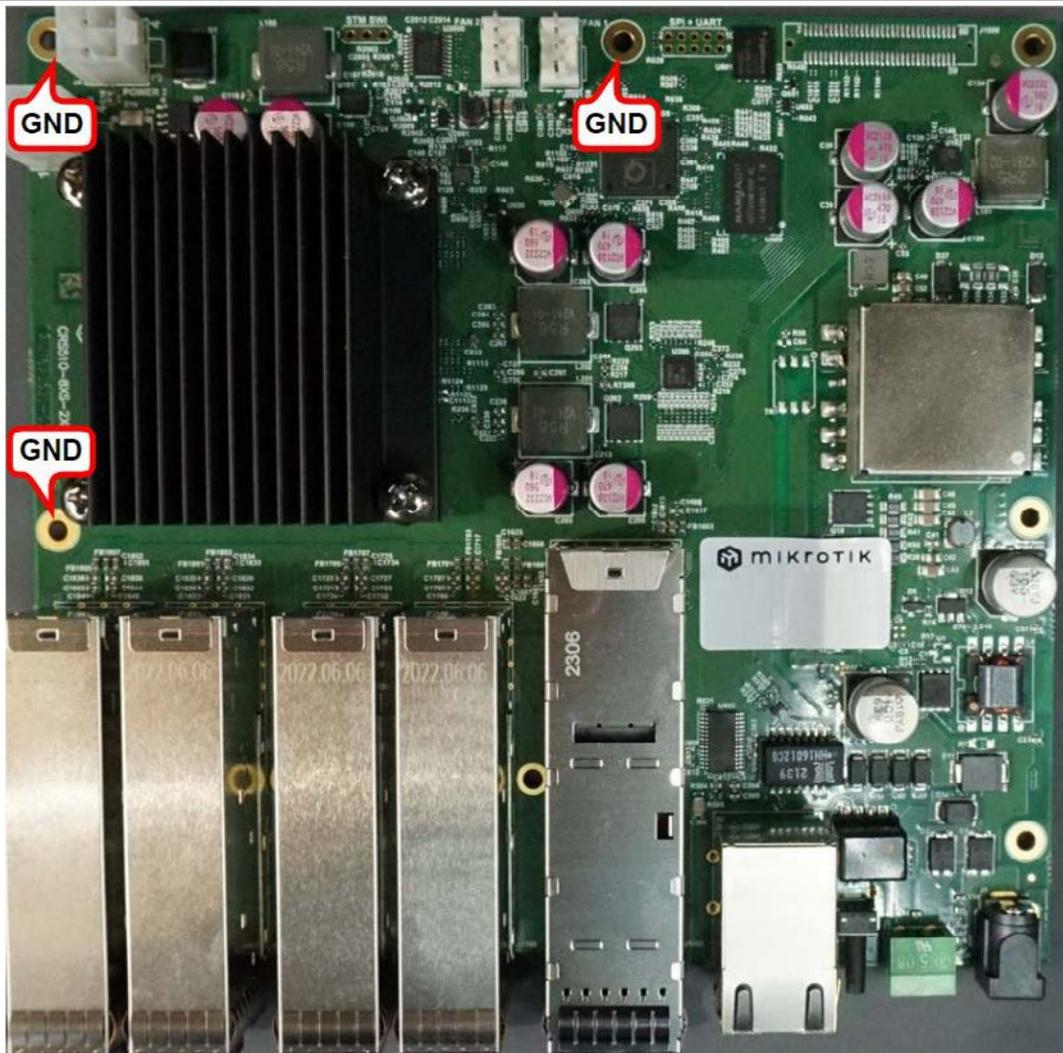
Check value of termination resistors R504 and R505. The resistance value should be 75 Ohms +/- 1%. Location of the termination resistors is shown in the picture 101.



Picture 101



Picture 102



Picture 103

CLOUD ROUTER SWITCH 520 SERIES ROUTERBOARD

CRS520-4XS-16XQ-RM



Picture 104

Disassembling information

Using Phillips PH2 screwdriver unscrew 10 screws and remove the cover. Location of the screws is shown the picture [105](#).



Picture 105

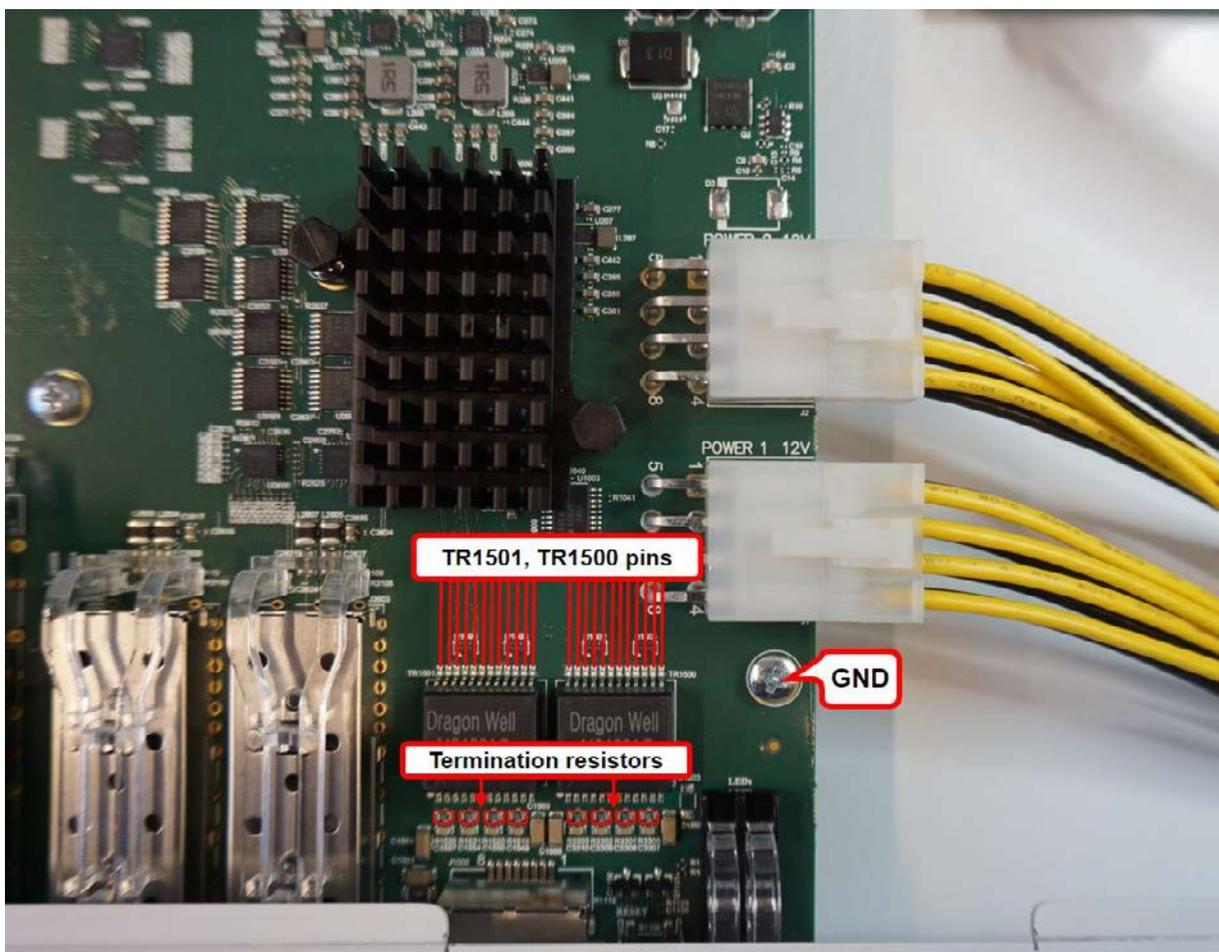
Instructions for checking overvoltage

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 106. Voltage drop value should be in the range from 0,42V to 0,47V. Voltage drop measurement method is described on page 21.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. The resistance value should be 75 Ohms +/- 1%. Location of the termination resistors is shown in the picture 106.



Picture 106

260 SERIES ROUTERBOARDS

RB260GS



Picture 107

Dissassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [98](#).

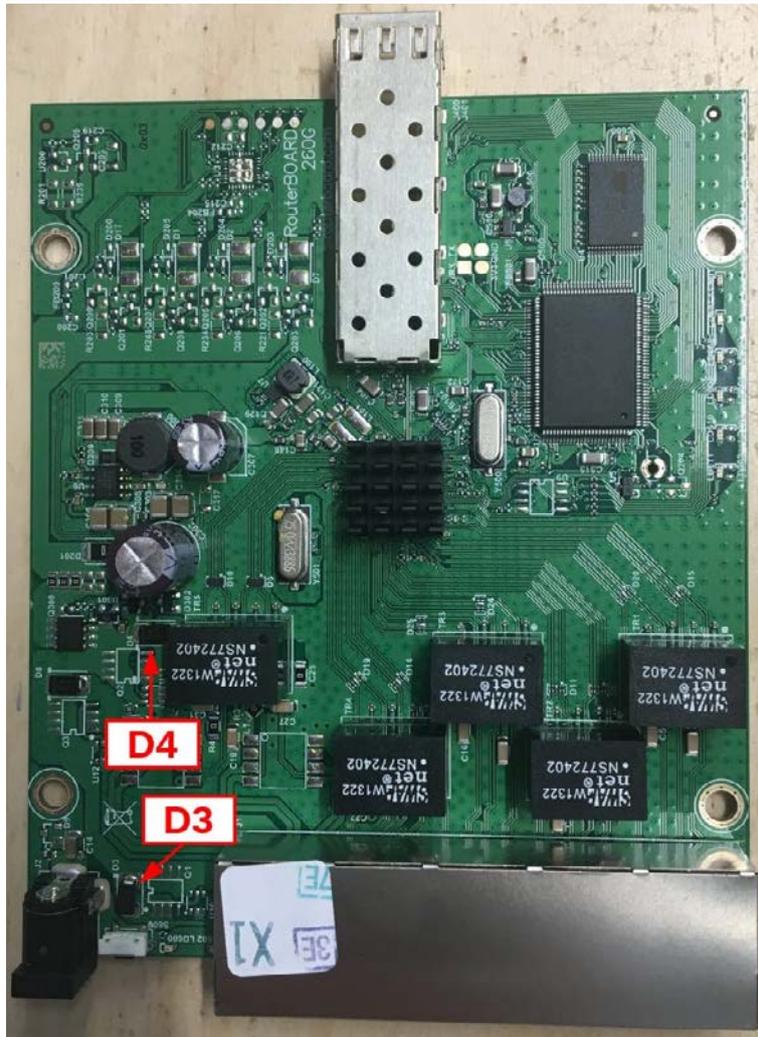
Instructions for checking overvoltage

Checking Schottky diodes

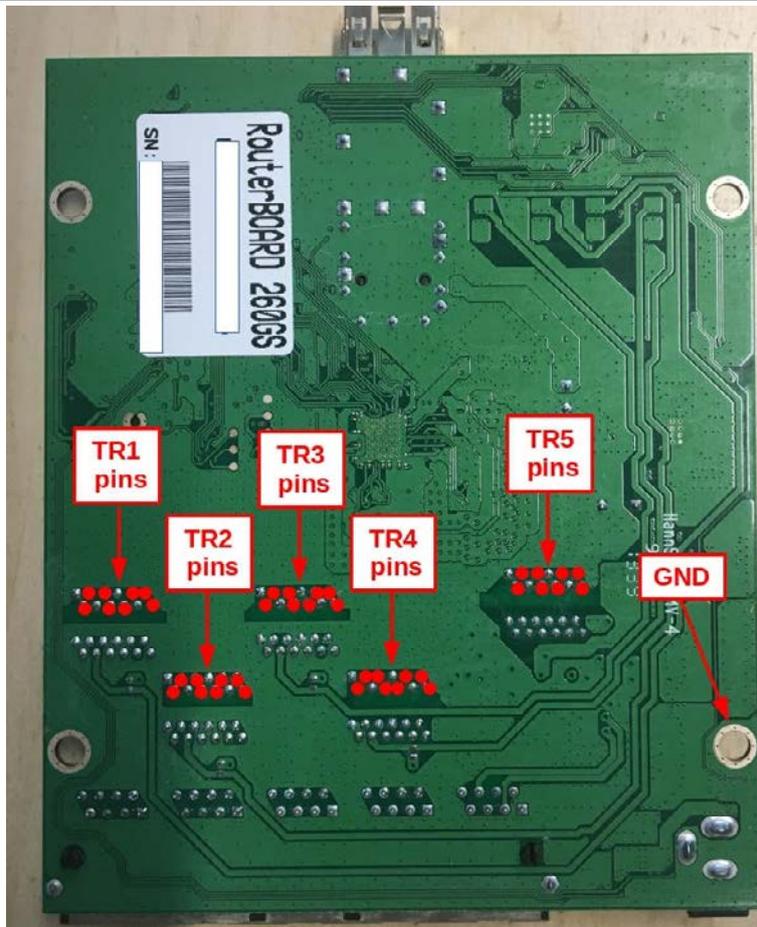
Check Schottky diodes D3, D4. Location of diodes on the board you can see in the picture [108](#). Schottky diodes quality measurement method is described on page [18](#).

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 [109](#). Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [21](#).



Picture 108



Picture 109

RB260GSP



Picture 110

Dissassembling information

Step 1:

Take off case back sticker as shown in the picture [111](#).



Picture 111

Step 2:

Take off the cover with a screwdriver as shown in the pictures [112](#) - [115](#).



Picture 112



Picture 113



Picture 114



Picture 115

Step 3:

Take out the board as shown in the picture [116](#).



Picture 116

Instructions for checking overvoltage

Checking Schottky diodes

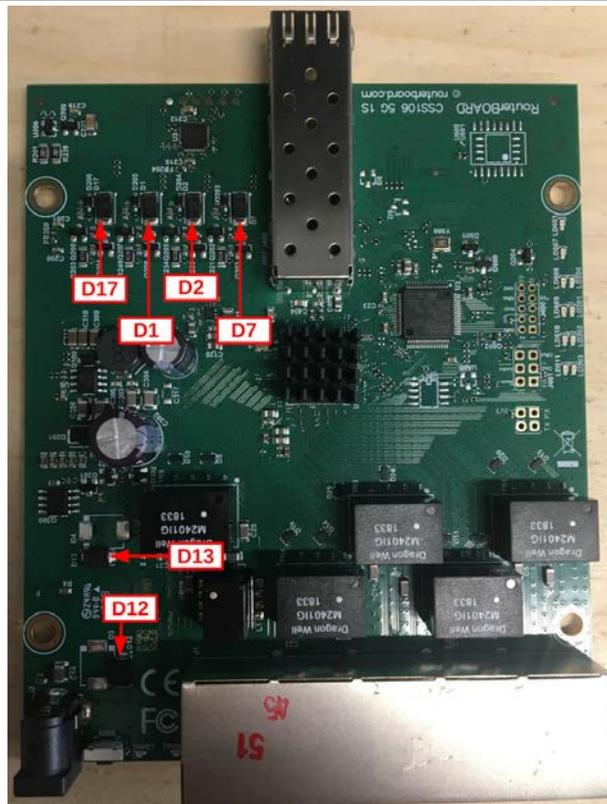
Check Schottky diodes D1-D4, D7, D17. Location of diodes on the board you can see in the picture 118. Schottky diodes quality measurement method is described on page 18.

Some boards may have different PCB layout. If the board does not correspond the PCB in picture 118, then check Schottky diodes D1, D2, D7, D12, D13, D17. Location of diodes on the board you can see in the picture 117. Schottky diodes quality measurement method is described on page 18.

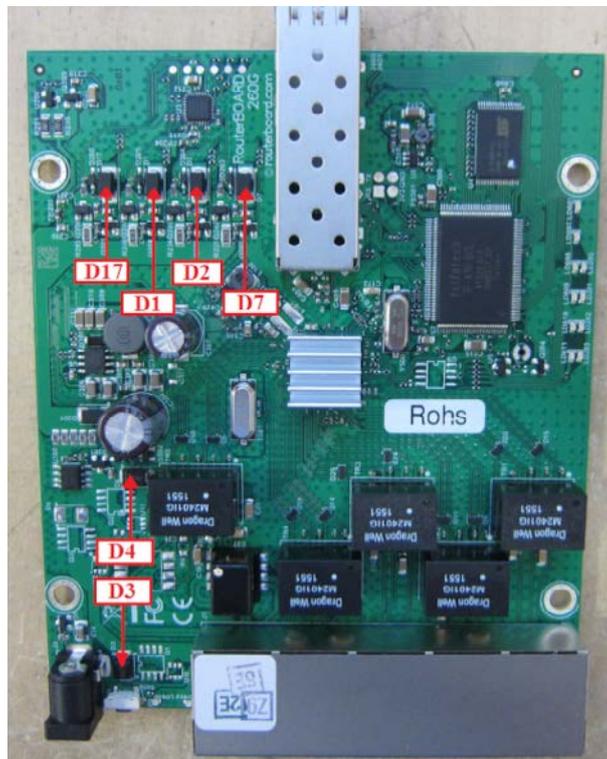
Checking voltage drop value between Ethernet transformer pins and Ground

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 119.

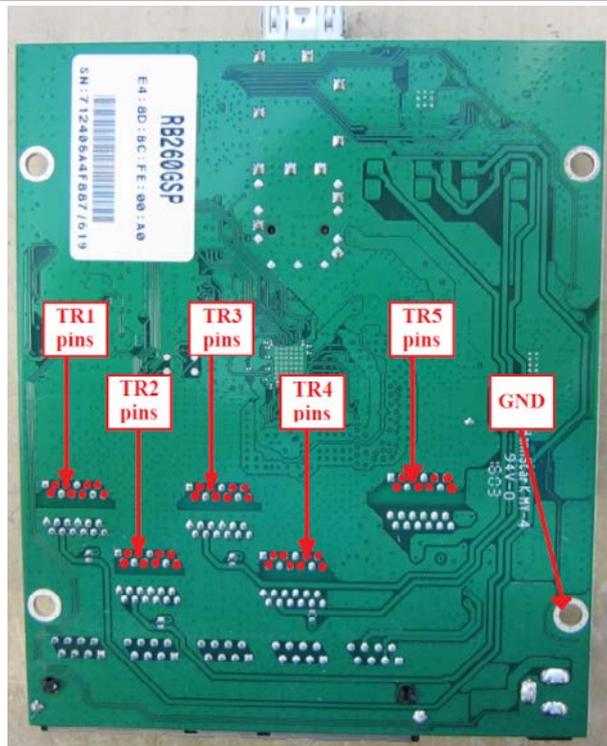
Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 21.



Picture 117



Picture 118



Picture 119

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



Picture 120

Dissassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [98](#).

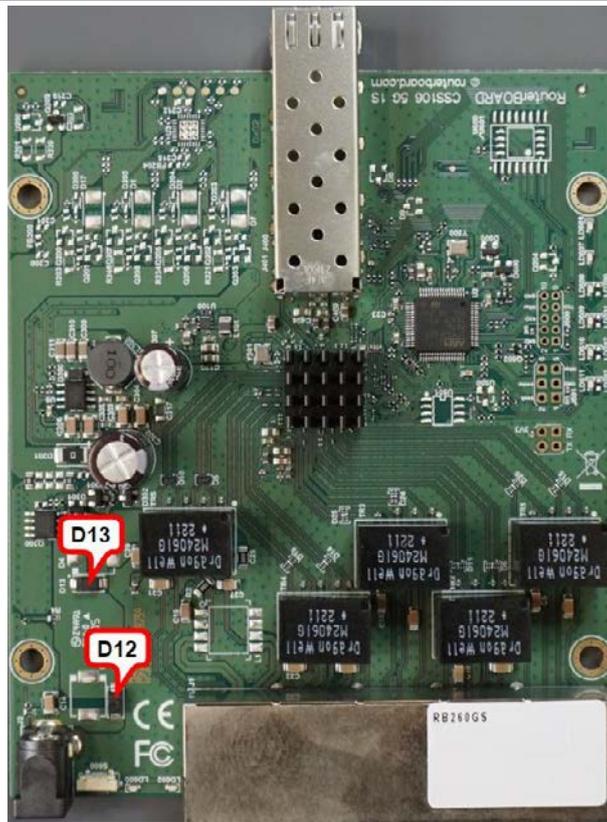
Instructions for checking overvoltage

Checking Schottky diodes

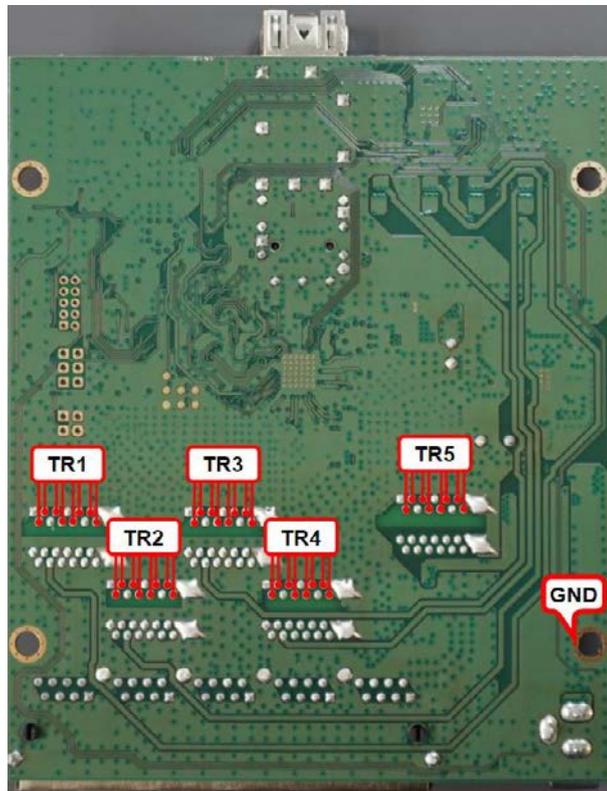
Check Schottky diodes D12 and D13. Location of diodes on the board you can see in the picture [121](#). Schottky diodes quality measurement method is described on page [18](#).

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 [125](#). Voltage drop value should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page [21](#).

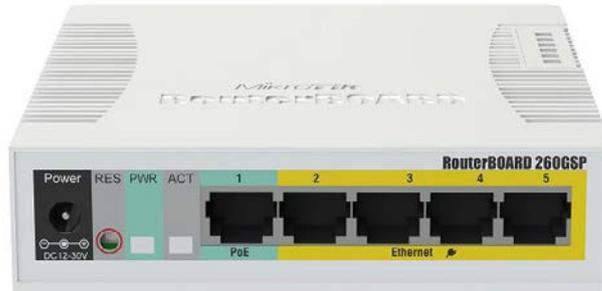


Picture 121



Picture 122

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



Picture 123

Dissassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page 98.

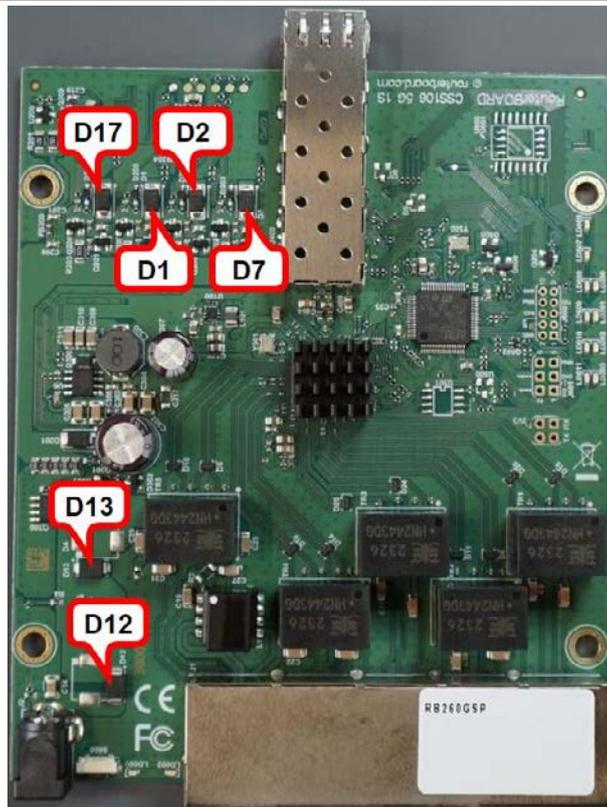
Instructions for checking overvoltage

Checking Schottky diodes

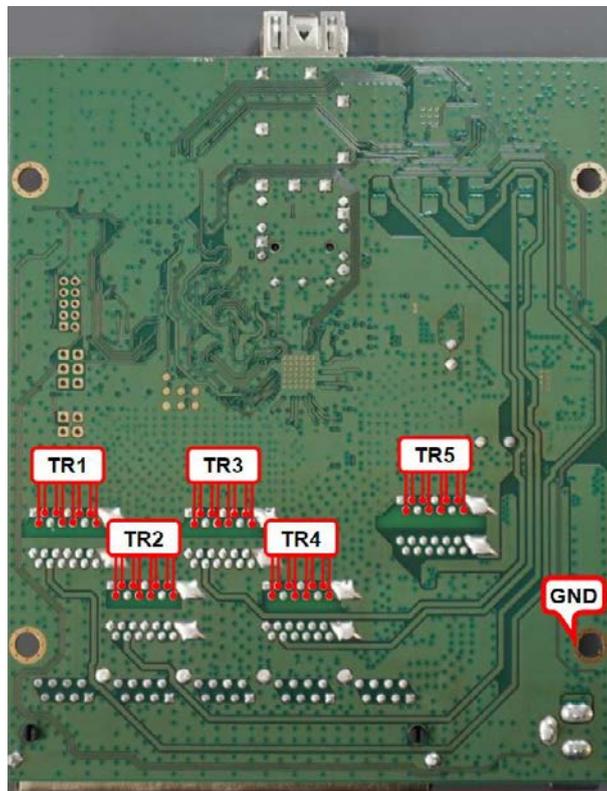
Check Schottky diodes D1, D2, D7, D12, D13, D17. Location of diodes on the board you can see in the picture 124. Schottky diodes quality measurement method is described on page 18.

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 125. Voltage drop value should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page 21.



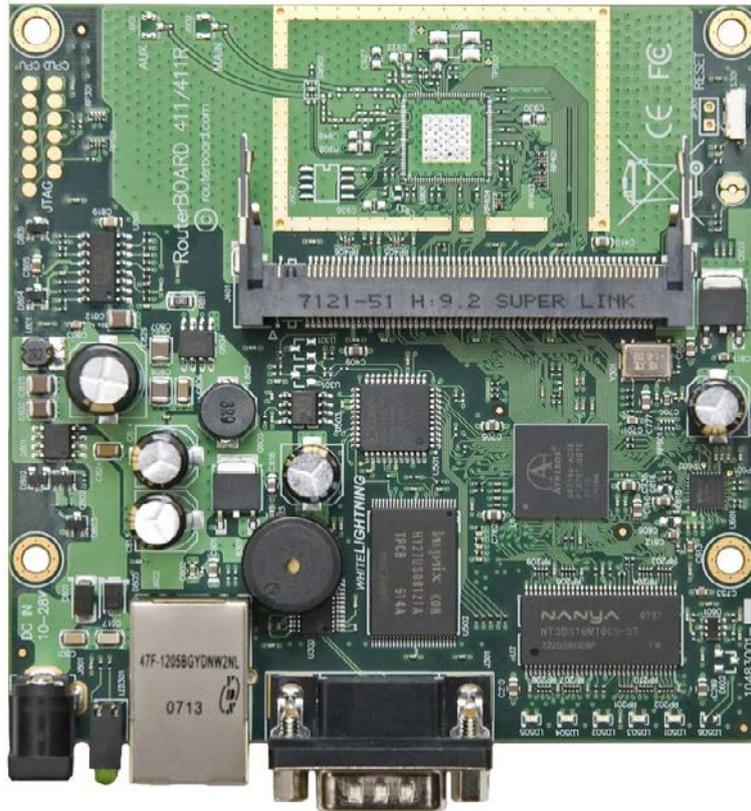
Picture 124



Picture 125

411 SERIES ROUTERBOARDS

RB411AH



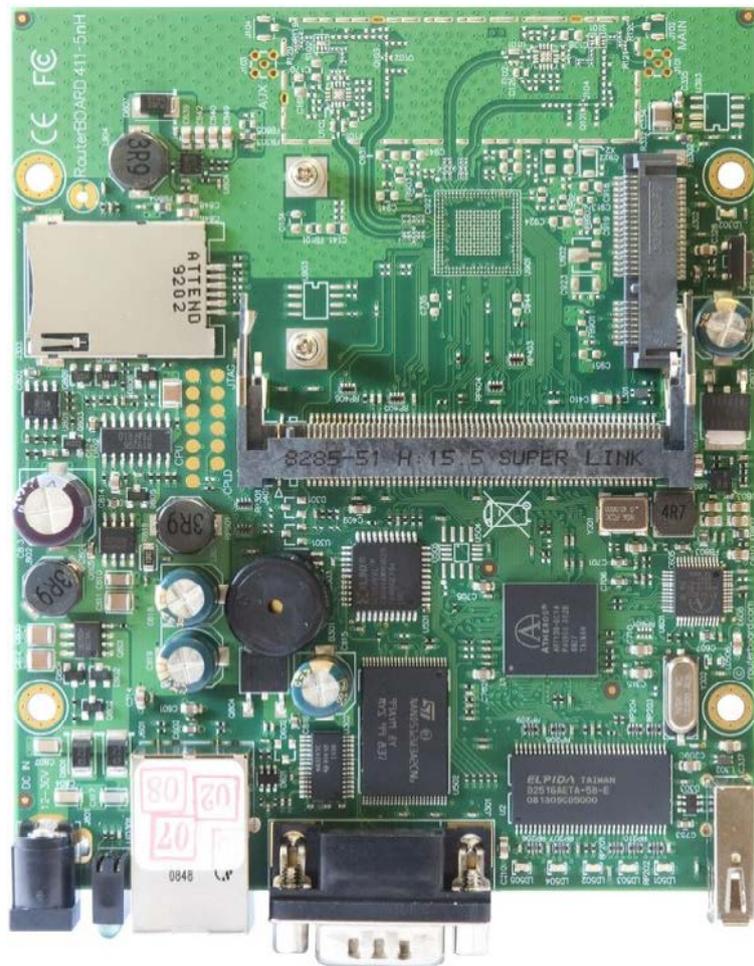
Picture 126

RB411AR



Picture 127

RB411U



Picture 128

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 [129](#). Schottky diodes quality measurement method is described on page [18](#).

Checking voltage drop value between diode array pin1 pins and GND

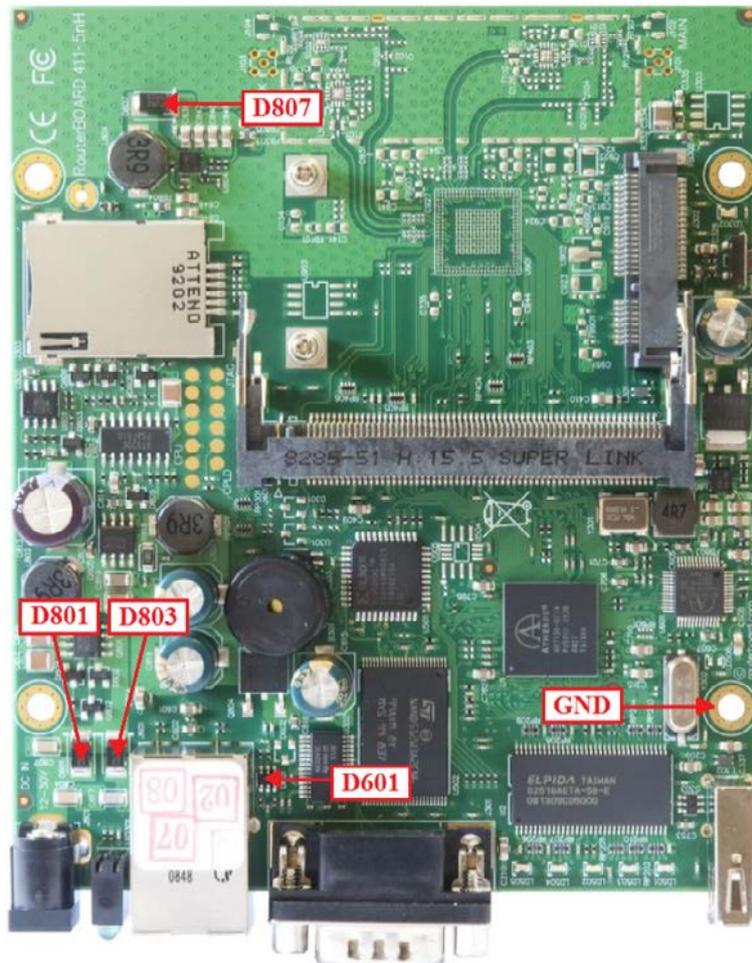
Check voltage drop value between diode array D601 pin1 and Ground. Location of diode array on the boards RB411U, RB411AR you can see in the picture [129](#), but for RB411AH in the picture [130](#).

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 [20](#).

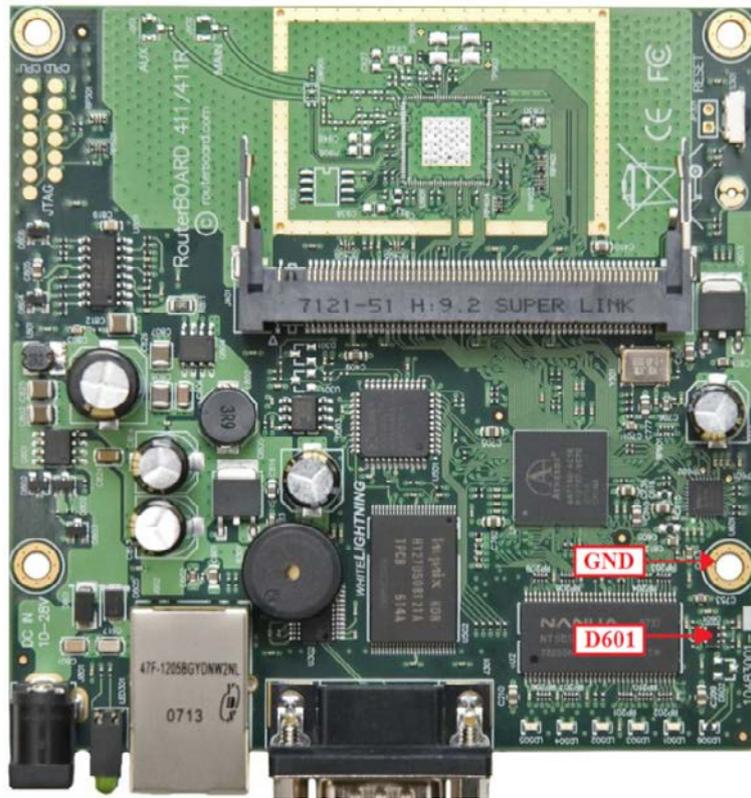
Checking termination resistors in RJ-45 connector

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 22.

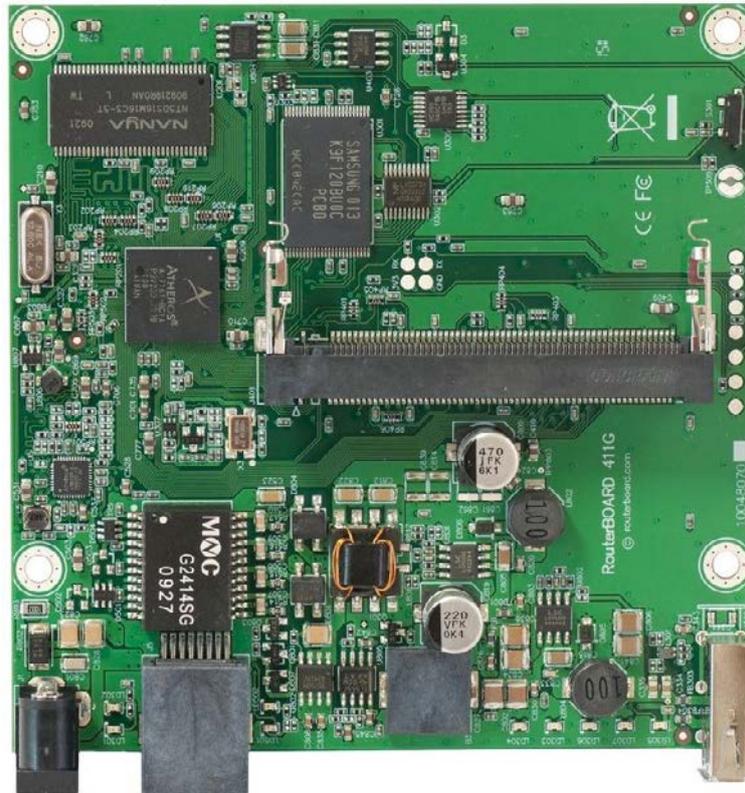


Picture 129



Picture 130

RB411GL



Picture 131

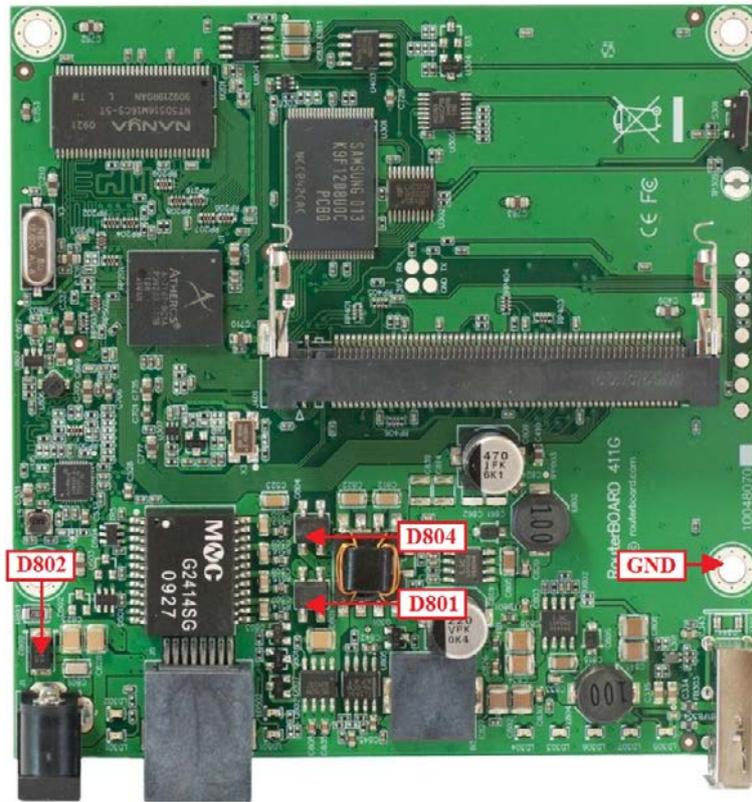
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

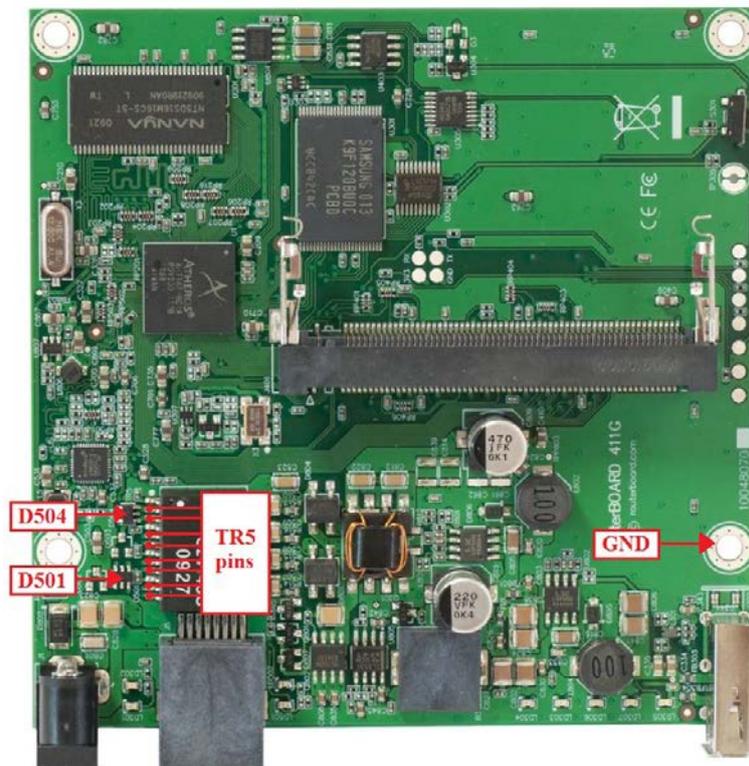
Check Schottky diode D802 and diodes bridges D801, D804. Location of diodes on the board you can see in the picture [132](#). Diodes quality measurement method is described on page [18](#).

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 [133](#). 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 [20](#).



Picture 132



Picture 133

RB411L



Picture 134

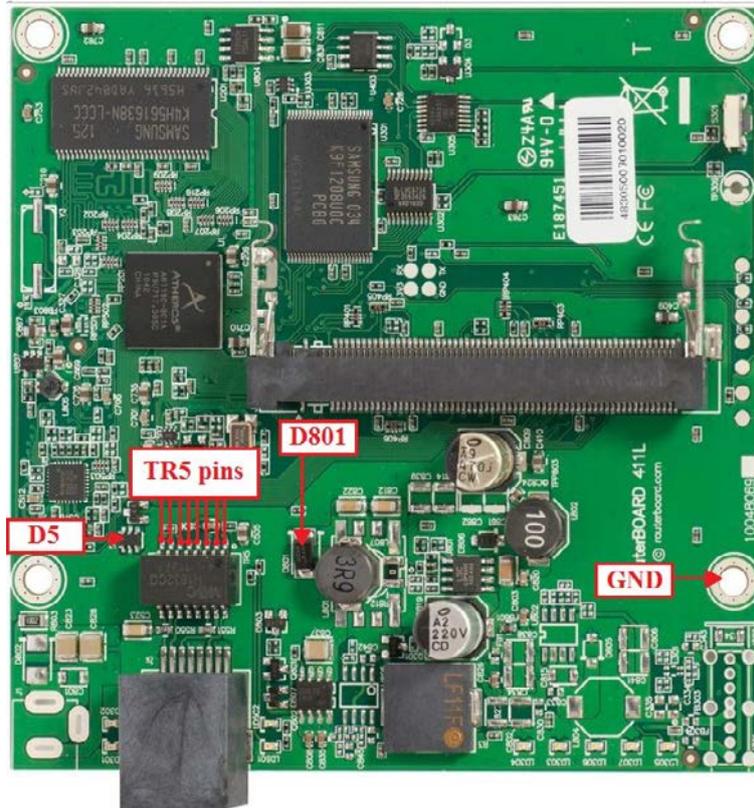
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

Check Schottky diode D801. Location of diode on the board you can see in the picture [135](#). Schottky diode quality measurement method is described on page [18](#).

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 [135](#). 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 [20](#).



Picture 135

433 SERIES ROUTERBOARDS

RB433AH



Picture 136

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

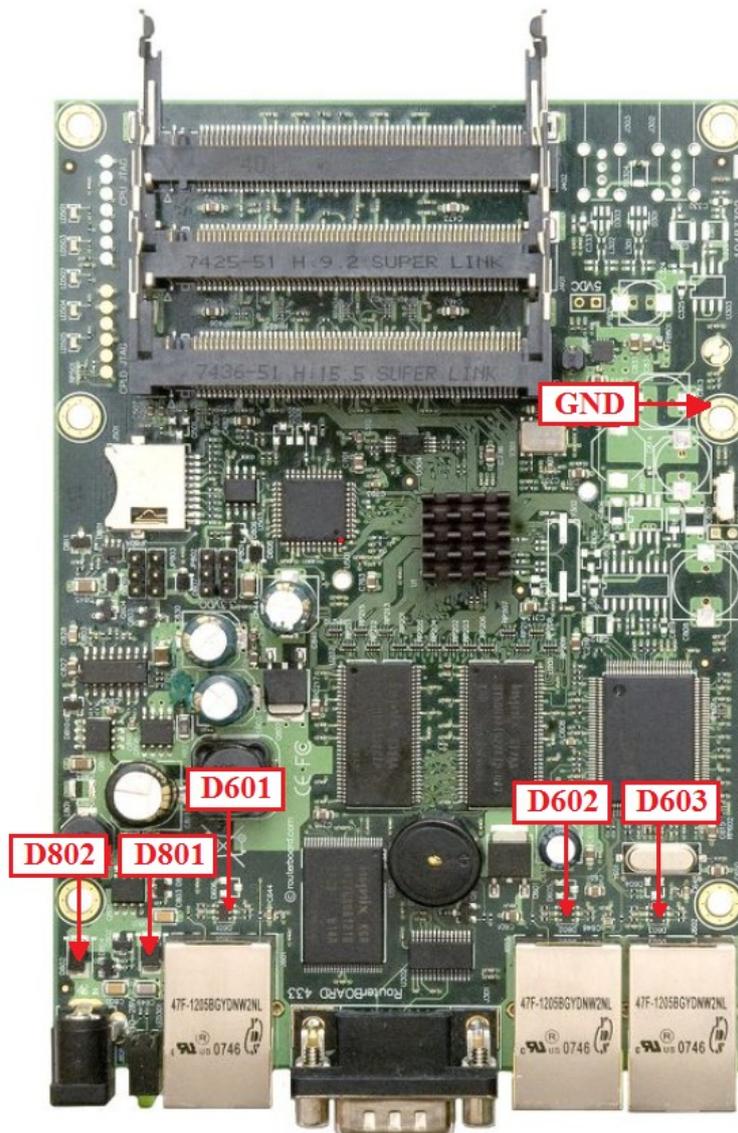
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture [137](#). Diodes quality measurement method is described on page [18](#).

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 137. Voltage drop value should be in the range from 0,4V to 0,44V. Voltage drop measurement method is described one page 20.

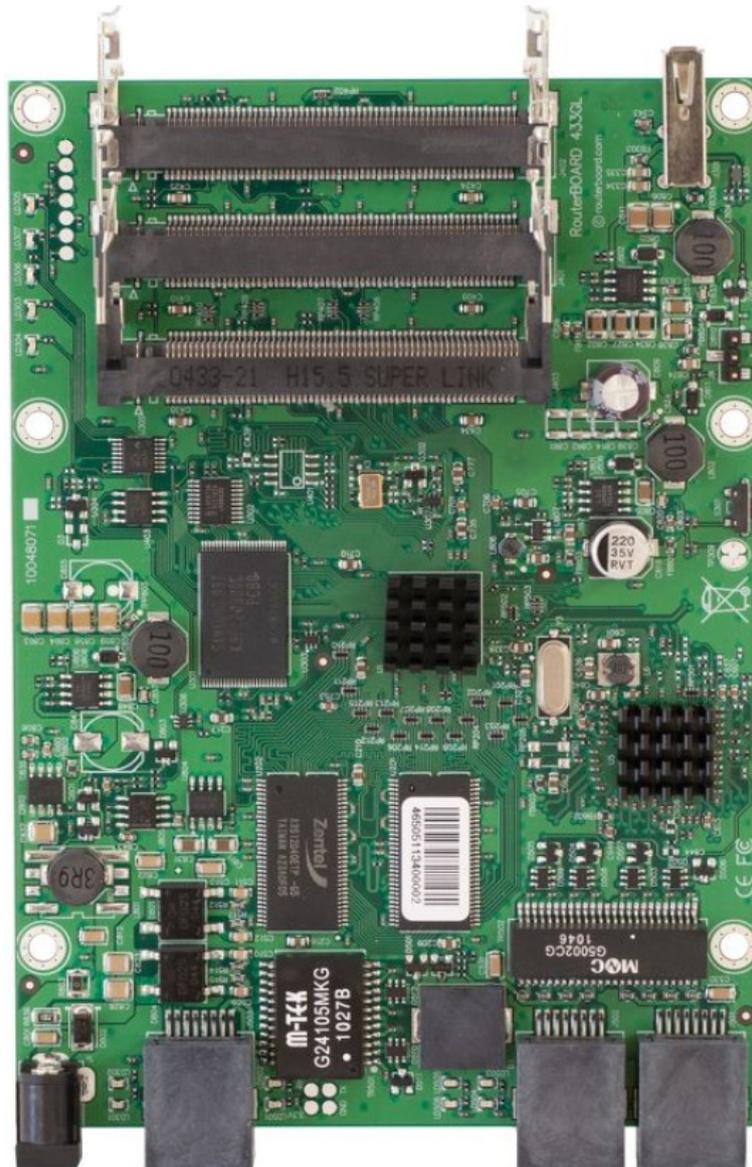
Checking termination resistors resistance in RJ-45 connector

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 22.



Picture 137

RB433GL



Picture 138

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

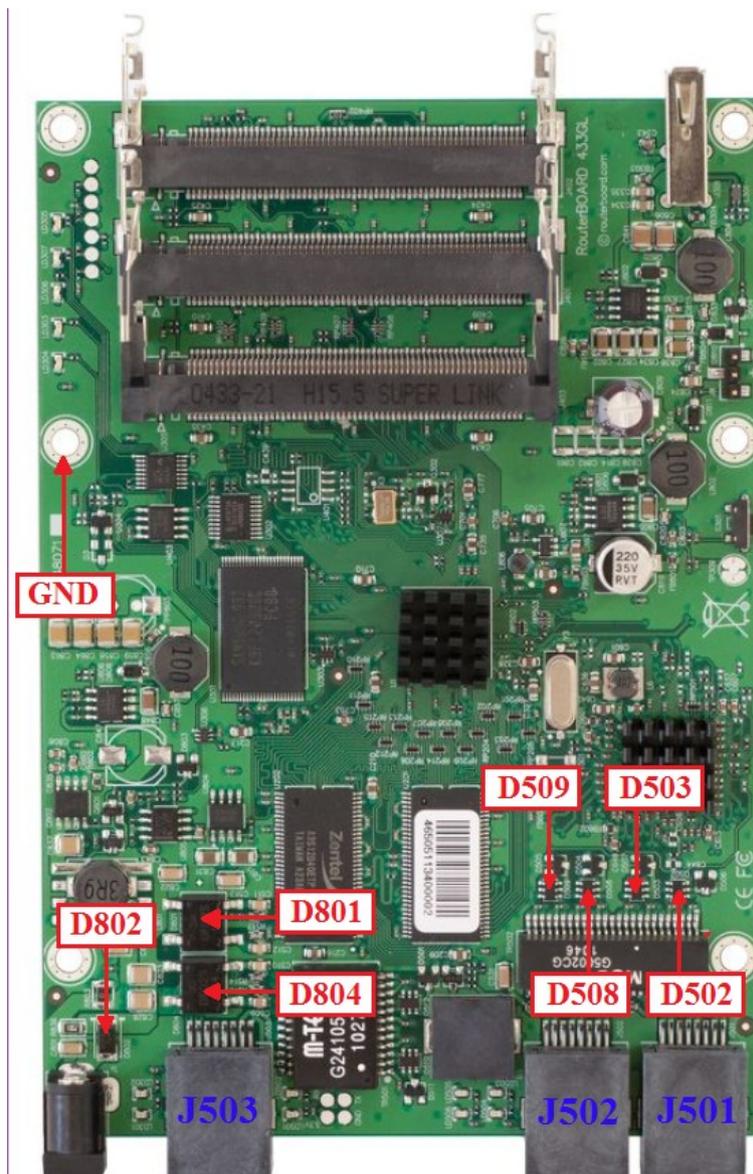
Check Schottky diode D802 and diodes bridges D801, D804. Location of diodes on the board you can see in the picture 139. Diodes quality measurement method is described on page 18.

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 139. Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described on page 20.

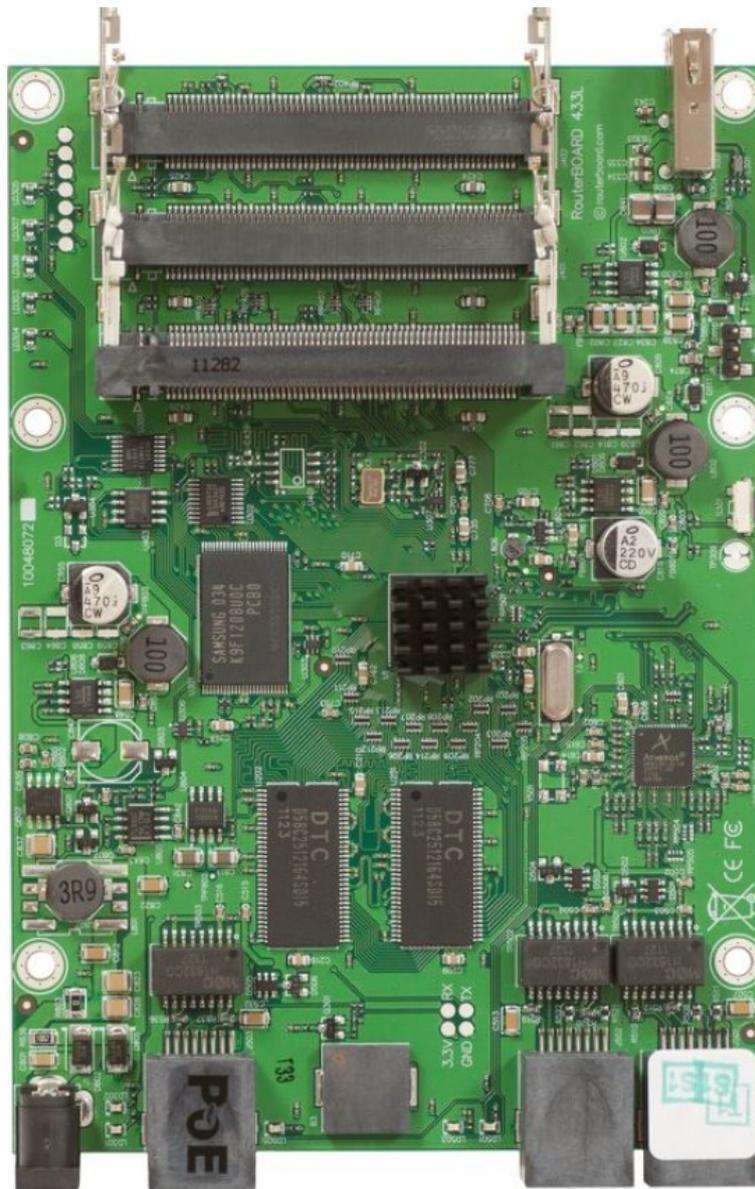
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J501-J503 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 22.



Picture 139

RB433UL



Picture 140

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

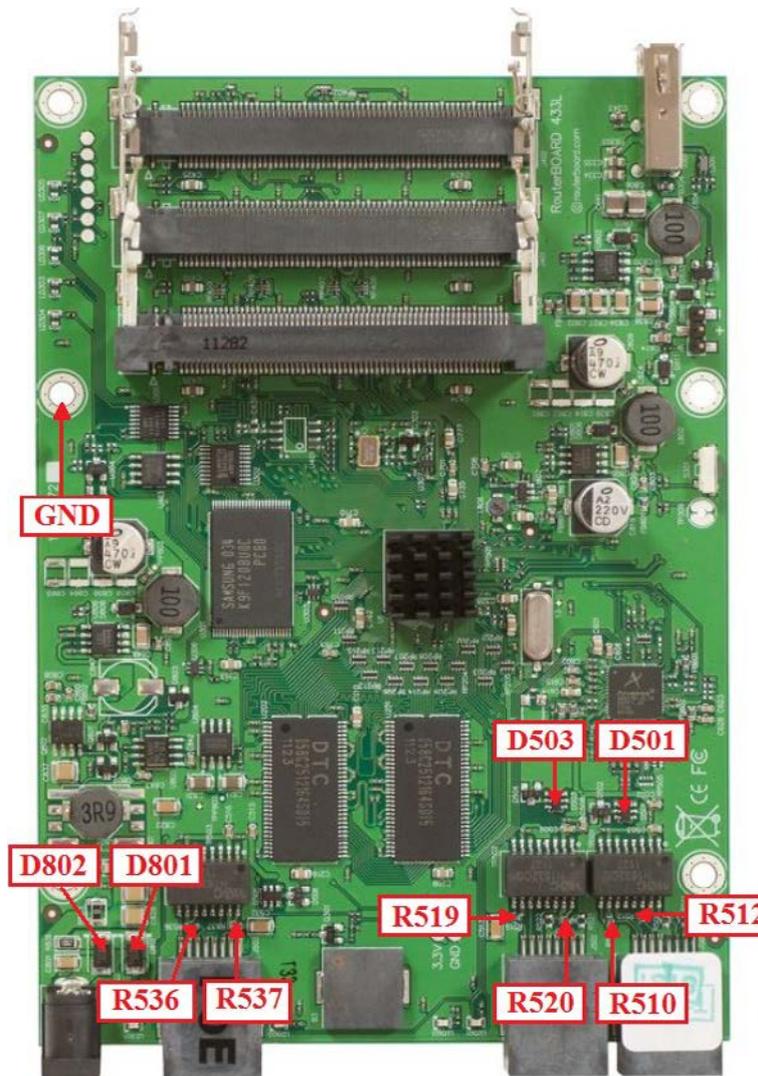
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture [141](#). Schottky diode quality measurement method is described on page [18](#).

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 141. Voltage drop value should be in the range from 0,32V to 0,36V. Voltage drop measurement method is described on page 20.

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 141.



Picture 141

435 SERIES ROUTERBOARDS

RB435G



Picture 142

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

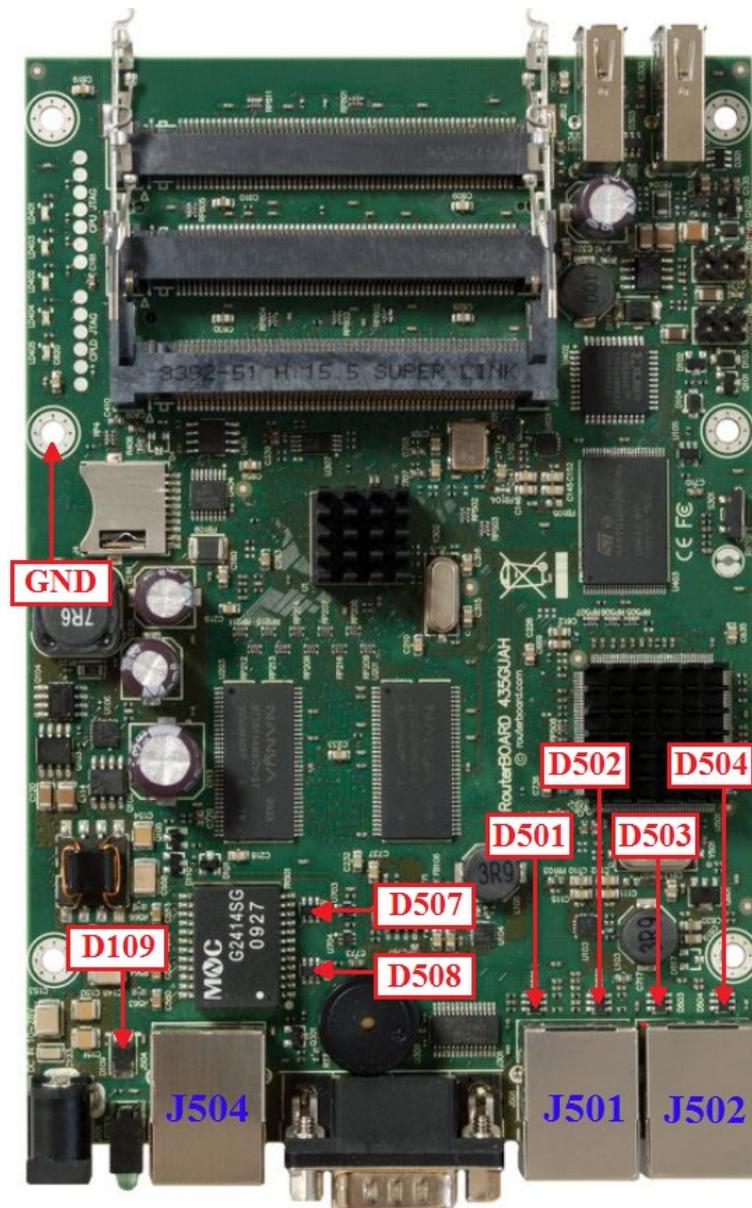
Check Schottky diode D109. Location of diode on the board you can see in the picture [143](#). Schottky diode quality measurement method is described on page [18](#).

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 143. Voltage drop value should be in the range from 0,2V to 0,24V. Voltage drop measurement method is described on page 20.

Checking termination resistors resistance in RJ-45 connector

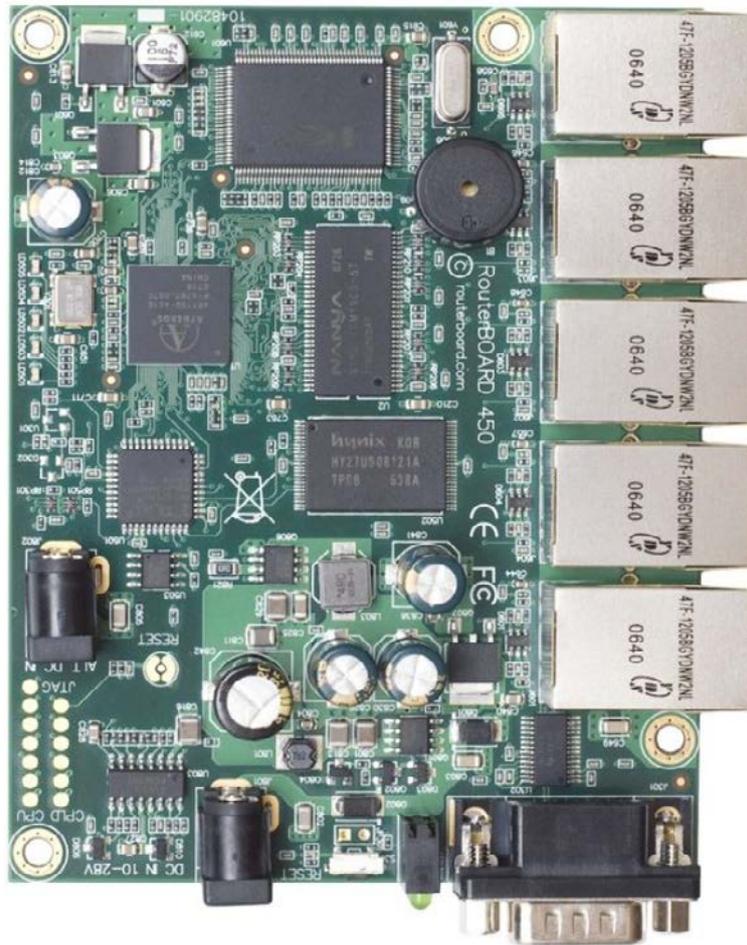
Check termination resistors resistance in J501, J502 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 22.



Picture 143

450 SERIES ROUTERBOARDS

RB450



Picture 144

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

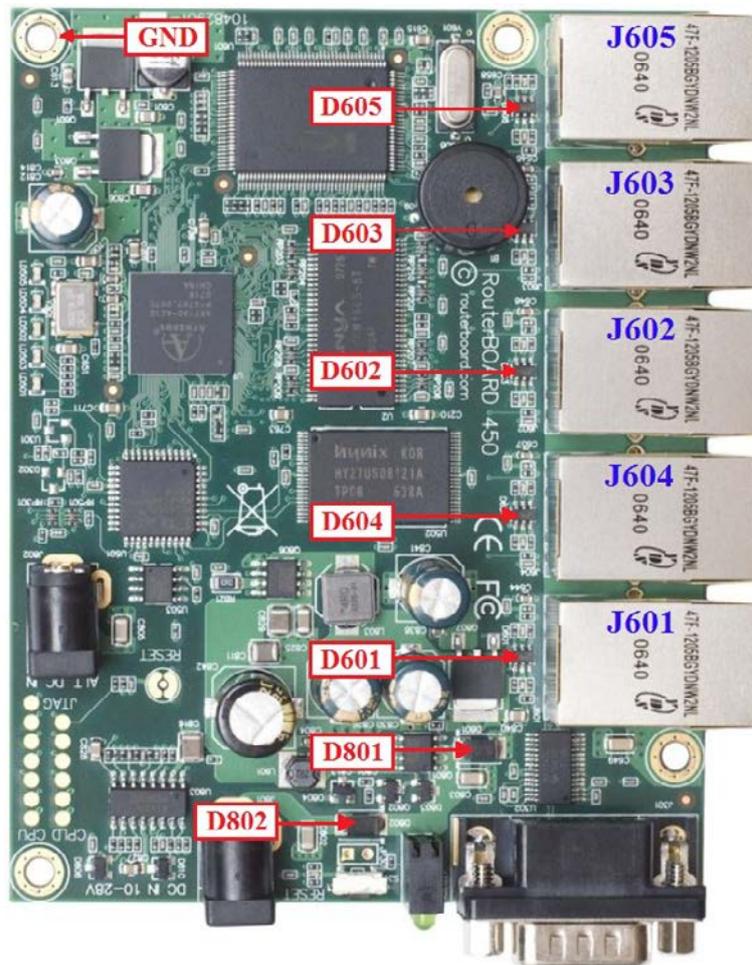
Check Schottky diodes D801, D802. Location of diodes on the board you can see in the picture [145](#). Schottky diode quality measurement method is described on page [18](#).

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 [145](#). Voltage drop value should be in the range from 0,4V to 0,44V. Voltage drop measurement method is described on page [20](#).

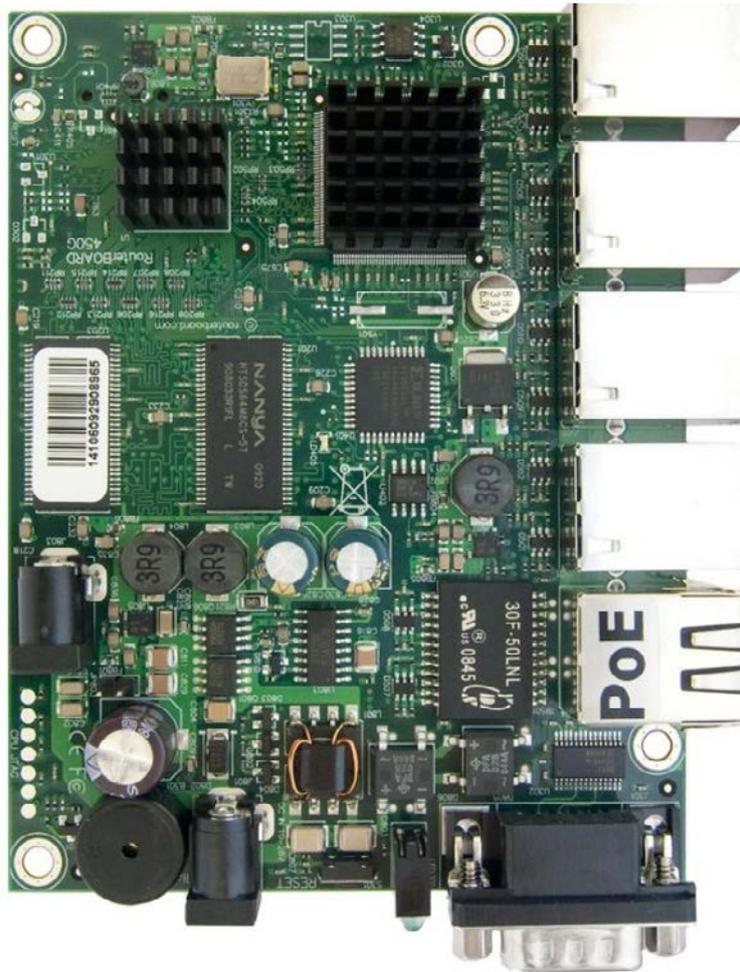
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J601-J605 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 22.



Picture 145

RB450G



Picture 146

Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

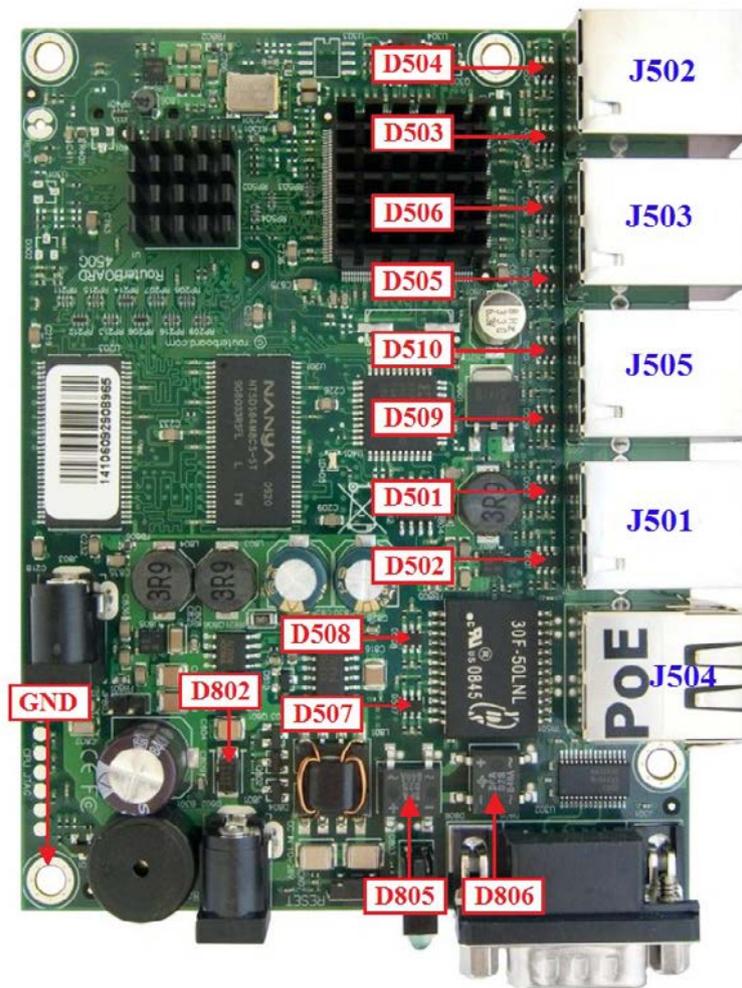
Check Schottky diode D802 and diodes bridges D805, D806. Location of diodes on the board you can see in the picture 147. Schottky diode quality measurement method is described on page 18.

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 147. Voltage drop value should be in the range from 0,2V to 0,26V. Voltage drop measurement method is described on page 20.

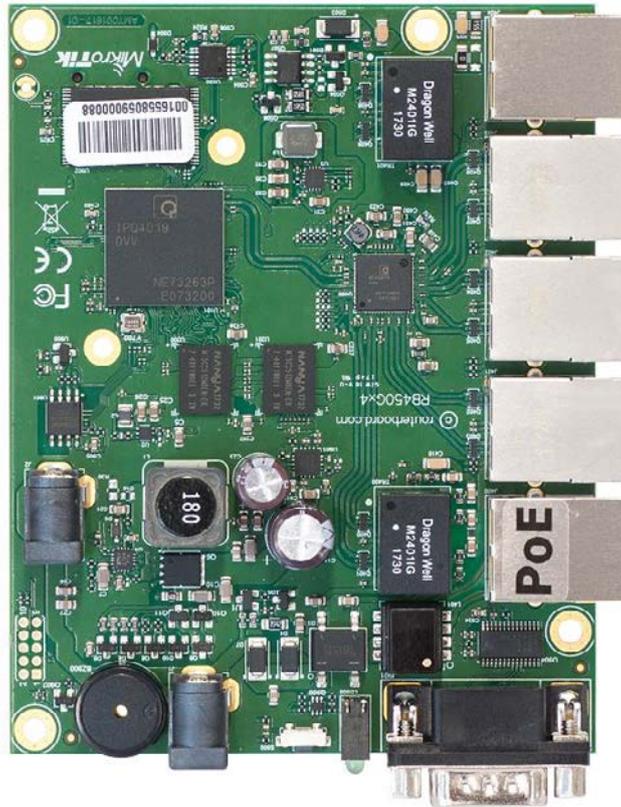
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J501-J503, J505 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 22.



Picture 147

RB450Gx4



Picture 148

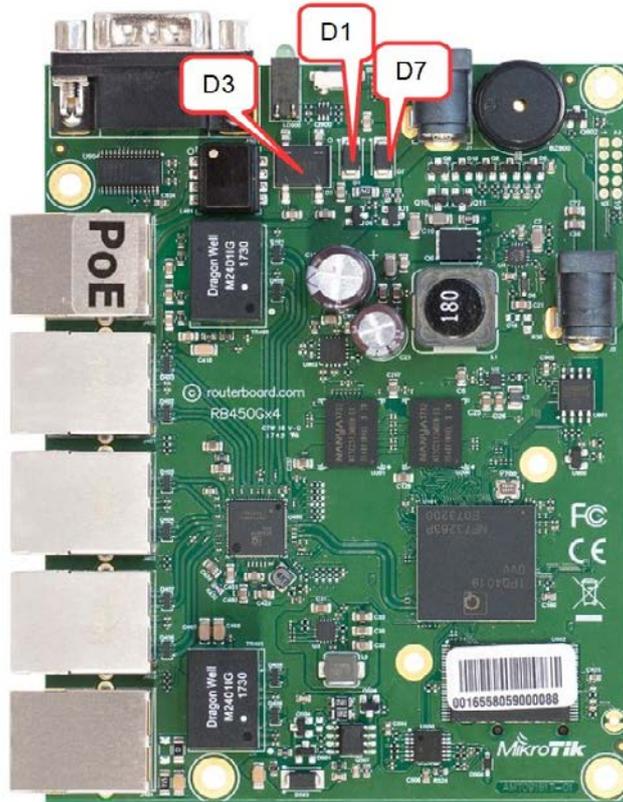
Instructions for checking overvoltage

Checking Schottky diodes and diode bridge

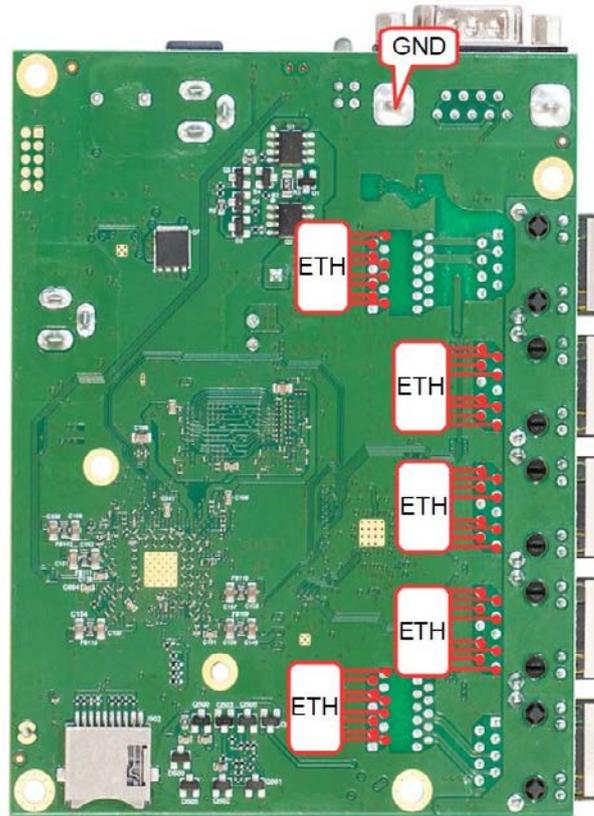
Check Schottky diode D1, D7 and diodes bridges D3. Location of diodes on the board you can see in the picture 149. Schottky diode quality measurement method is described on page 18.

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 150. Voltage drop value should be in the range from 0,36V to 0,43V. Voltage drop measurement method is described on page 21.



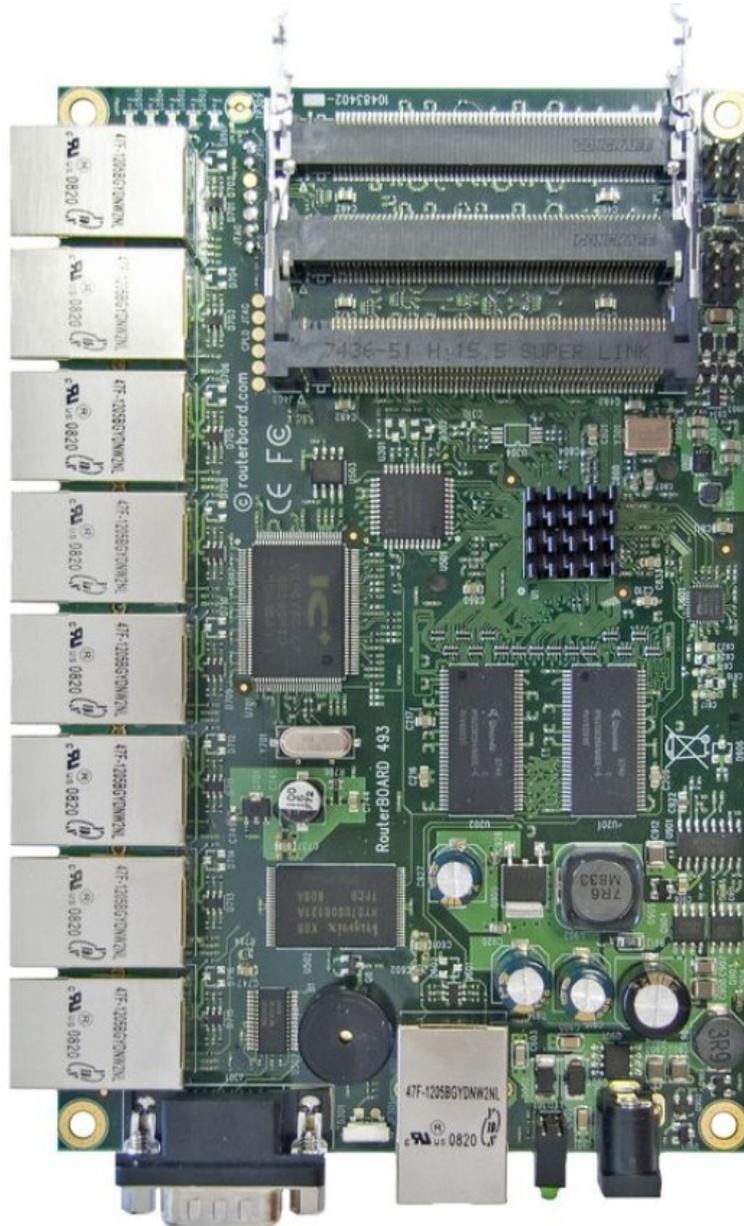
Picture 149



Picture 150

493 SERIES ROUTERBOARDS

RB493AH



Picture 151

Instructions for checking overvoltage

Checking Schottky diodes

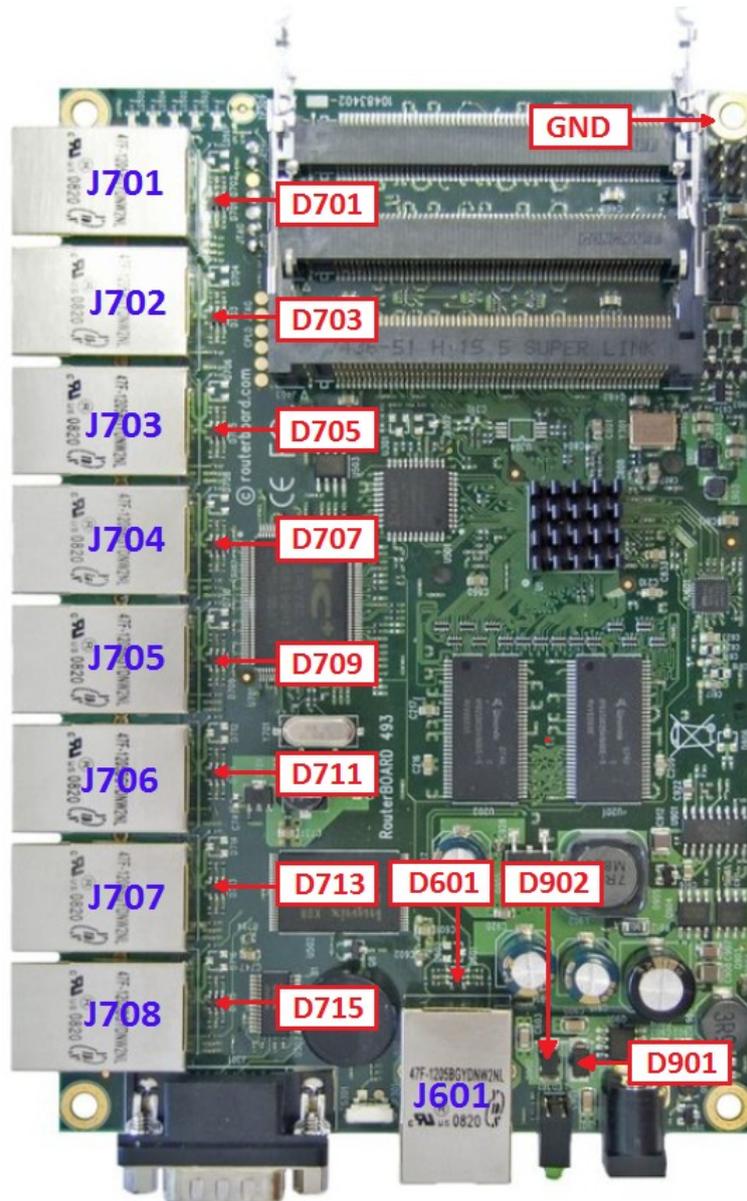
Check Schottky diodes D901, D902. Location of diodes on the board you can see in the picture [152](#). Schottky diode quality measurement method is described on page [18](#).

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 20.

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 22.



Picture 152

RB493G



Picture 153

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 [154](#). Schottky diode quality measurement method is described on page [18](#).

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

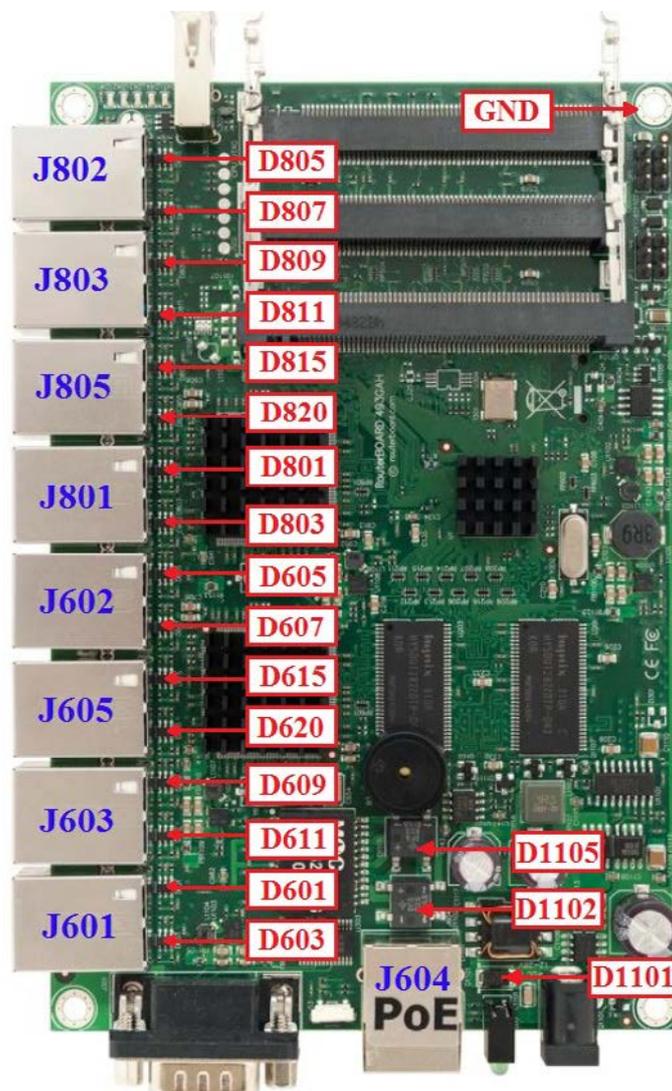
diode arrays on the board you can see in the picture 154. Voltage drop value should be in the range from 0,20V to 0,25V. Voltage drop measurement method is described on page 21.

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 154. Voltage drop value should be in the range from 0,2V to 0,25V. Voltage drop measurement method is described on page 21.

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J601-J603, J605, JJ801-J803, J805 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 23.



Picture 154

751 SERIES ROUTERBOARDS

RB751U-2HnD



Picture 155

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [98](#).

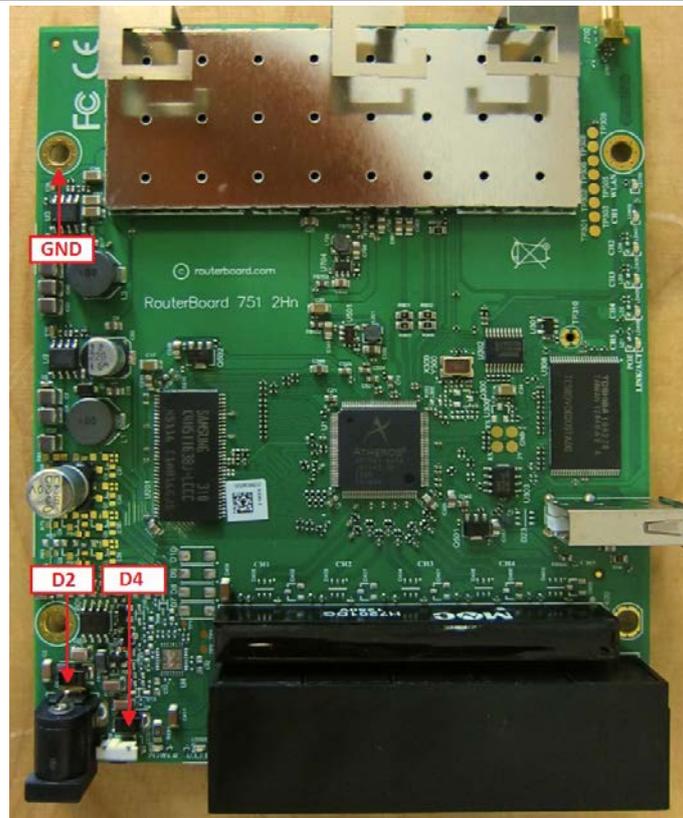
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D2, D4. Location of diodes on the board you can see in the picture [156](#). Schottky diode quality measurement method is described on page [18](#).

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 [157](#). Voltage drop value should be in the range from 0,28V to 0,32V. Voltage drop measurement method is described on page [21](#).



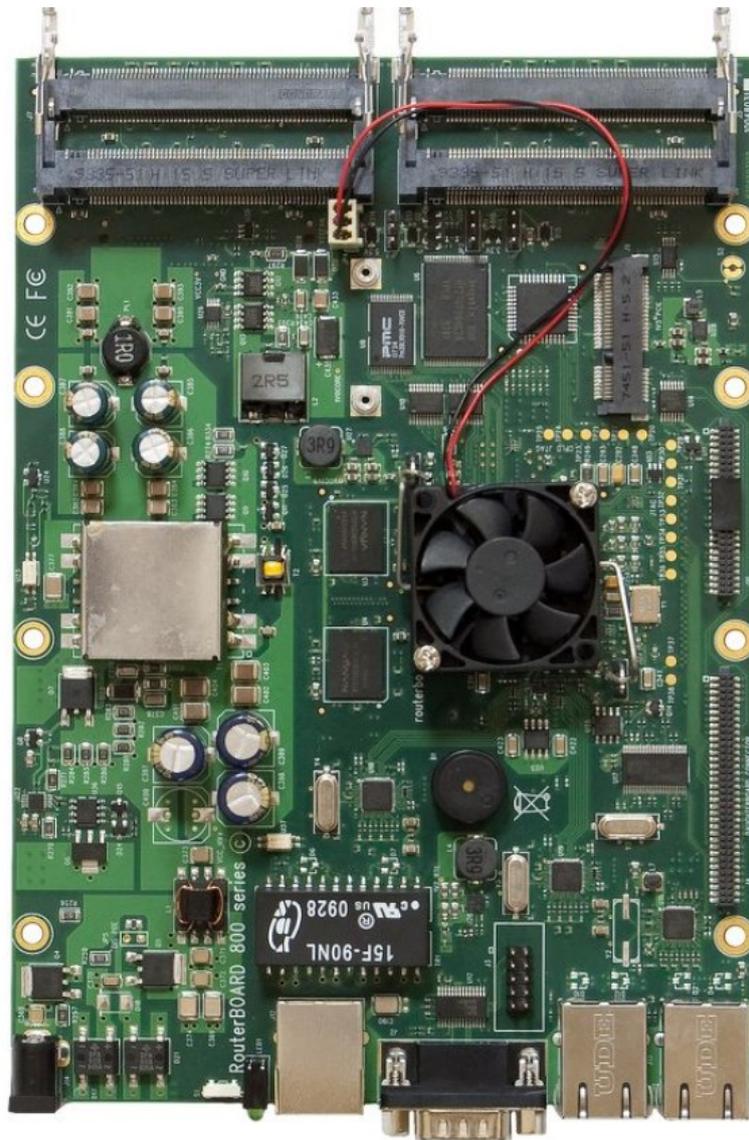
Picture 156



Picture 157

800 SERIES ROUTERBOARDS

RB800



Picture 158

Instructions for checking overvoltage

Checking diodes bridges

Check diodes bridges D17, D21. Location of diodes 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 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

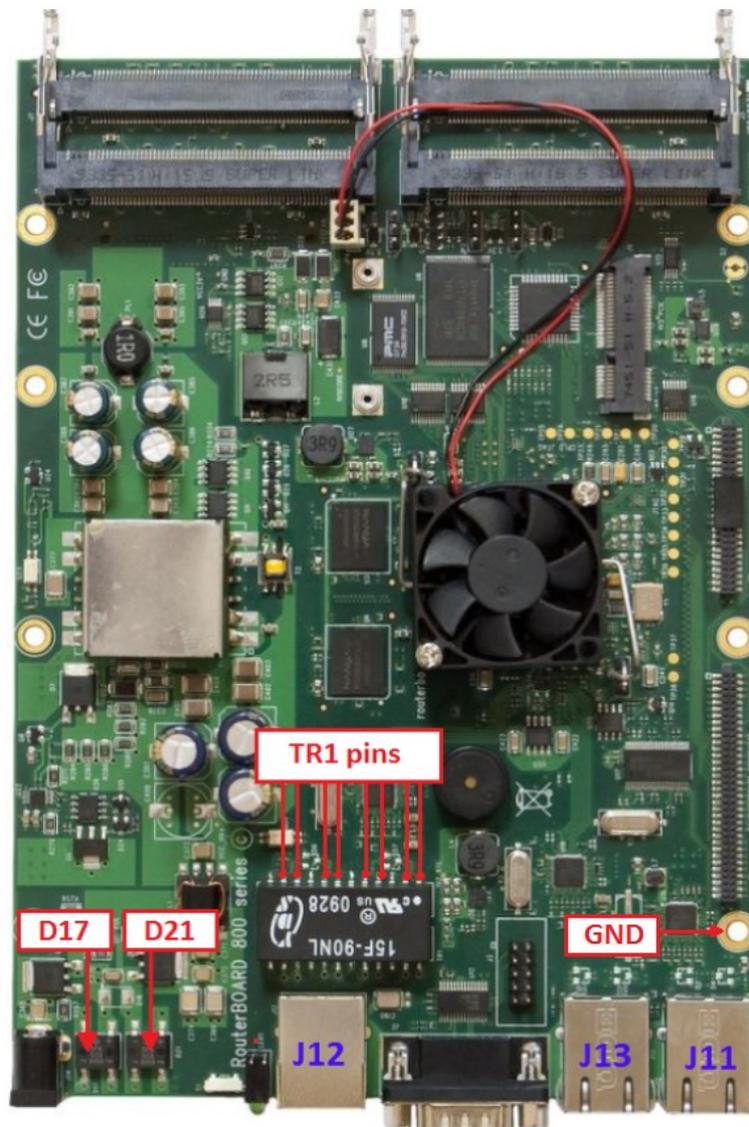
on the transformer pins are marked with red dots, see picture 160. Location of diode arrays on the board you can see in the picture 160. Voltage drop value should be in the range from 0,3V to 0,36V. Voltage drop measurement method is described on page 20.

Checking termination resistors resistance in RJ-45 connector

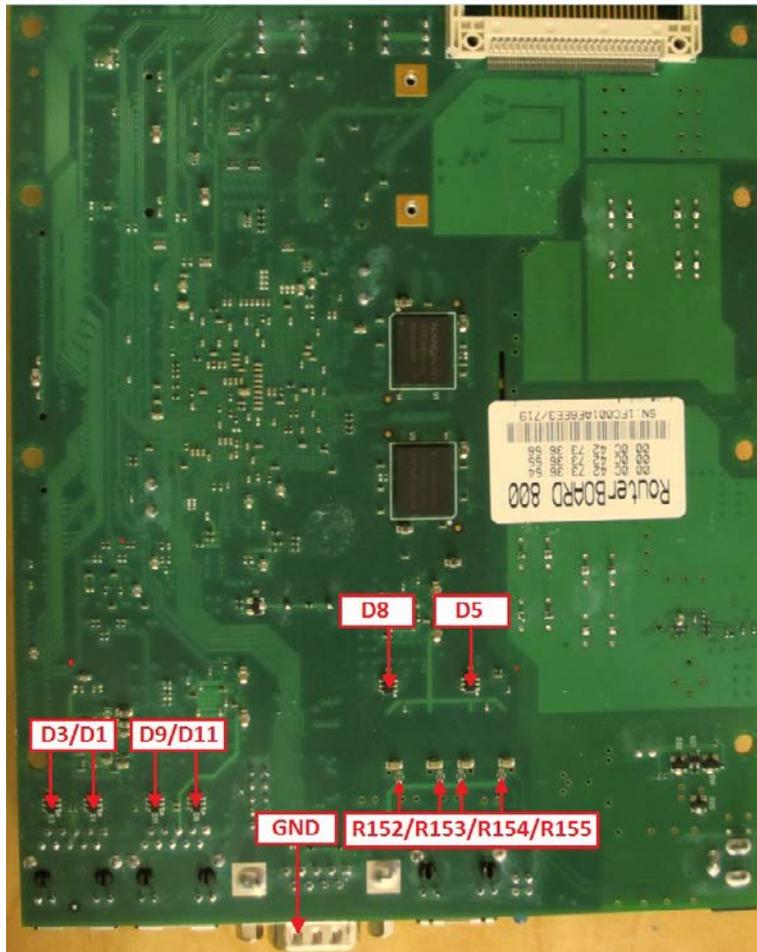
Check termination resistors resistance in J11, J13 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page 22.

Checking 75 Ohm termination resistors resistance

Check resistors R152-R155 resistance value. It should be 75 Ohm +/- 1%. Location of resistors on the board you can see in the picture 160.



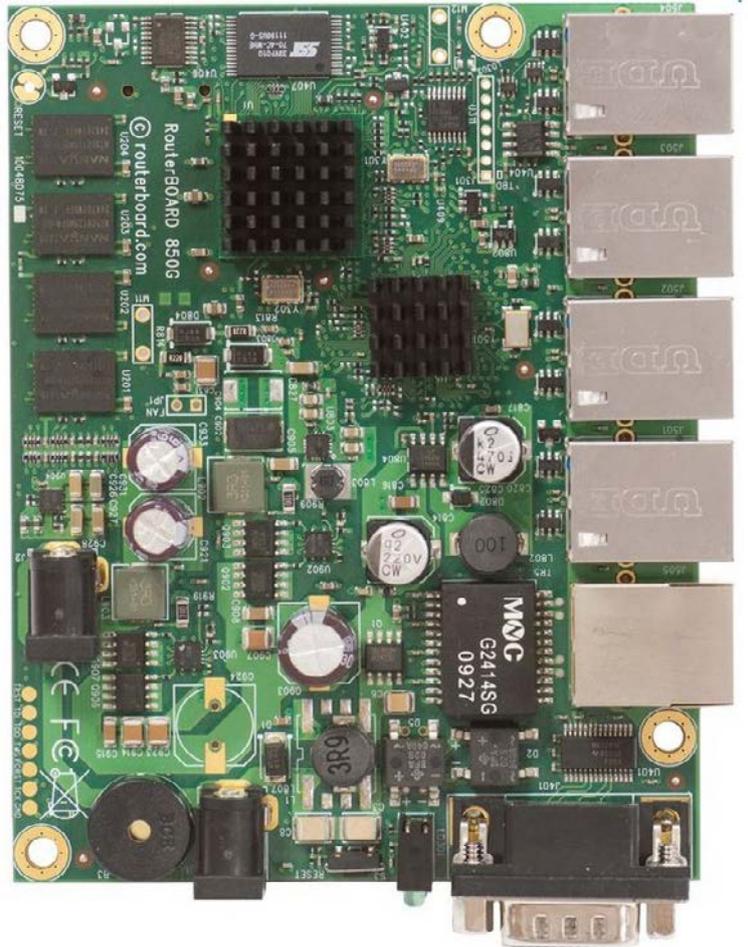
Picture 159



Picture 160

850 SERIES ROUTERBOARDS

RB850Gx2



Picture 161

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 162. Schottky diode quality measurement method is described on page 18 and for diodes bridges 19.

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

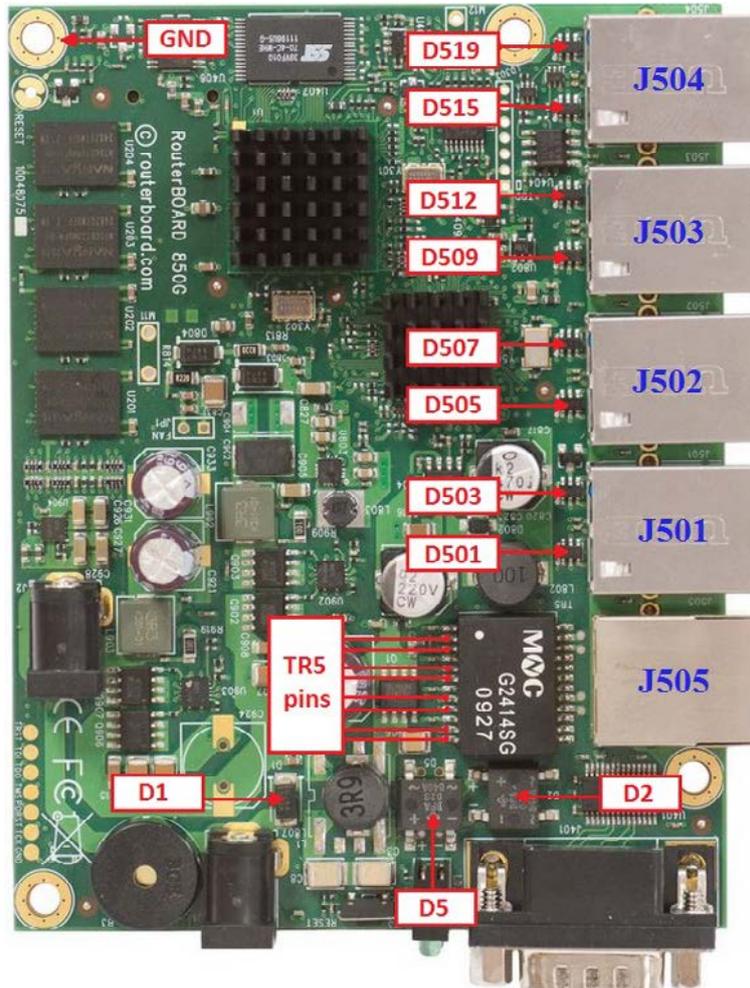
Check voltage drop value between diode arrays D501, D503, D505, D507, D509, D512, D515, D519 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 162. Voltage drop value should be in the range from 0,38 to 0,44V. Voltage drop measurement method is described on page 20.

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 162. Voltage drop value should be in the range from 0,42V to 0,48V. Voltage drop measurement method is described on page 21.

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 22.



Picture 162

911 SERIES ROUTERBOARDS

911 Lite 2 (RB911-2Hn)

911 Lite 5 (RB911-5Hn)

911 Lite 5 dual (RB911-5HnD)



Picture 163

Instructions for checking overvoltage

Checking Schottky diode

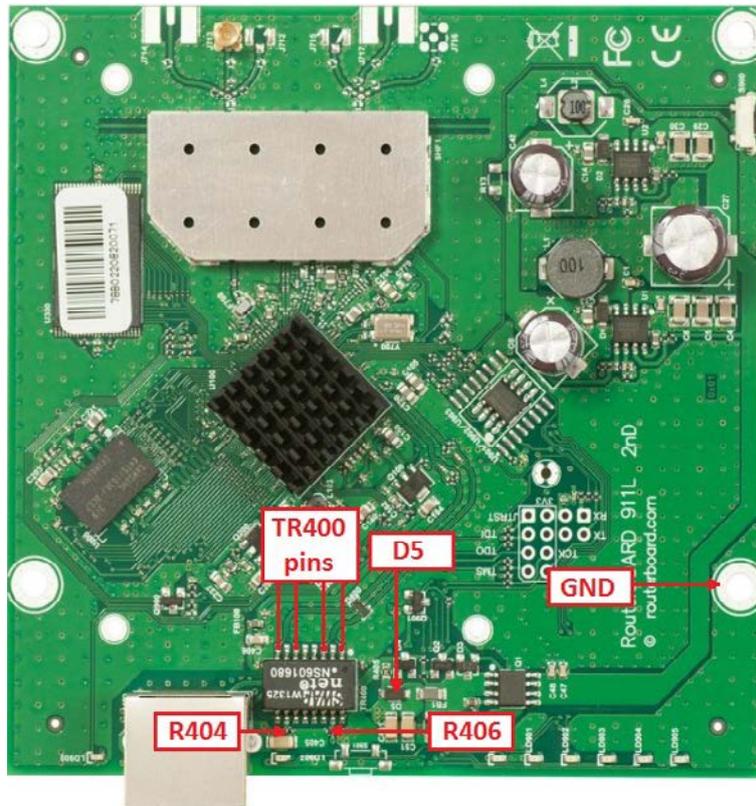
Check Schottky diode D5. Location of diode on the board you can see in the picture 164. Schottky diode quality measurement method is described on page 18.

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 164. Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page 21.

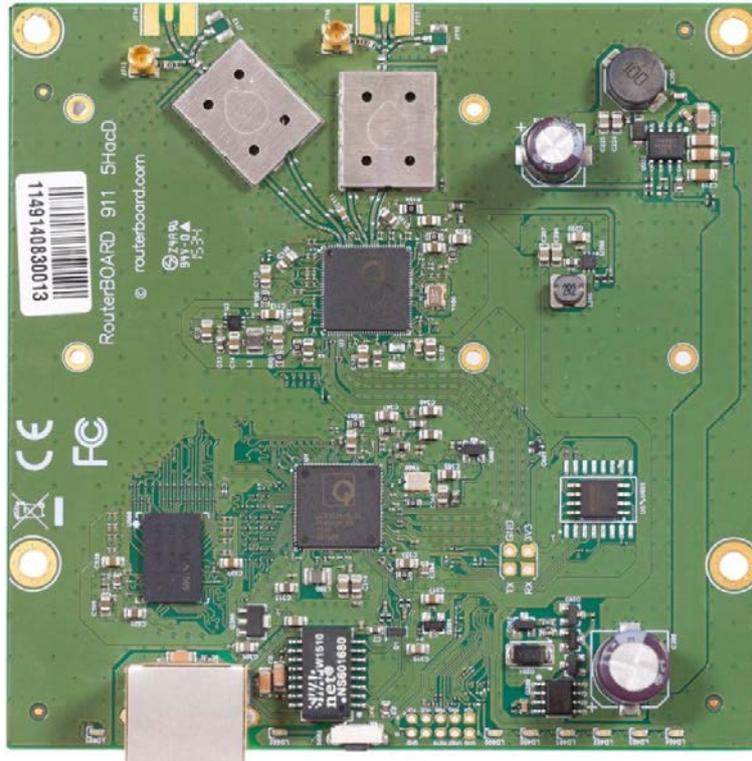
Checking 75 Ohm termination resistors resistance

Check resistors R404, R406 resistance value. It should be 75 Ohm +/- 1%. Location of resistors on the board you can see in the picture 164.



Picture 164

911 Lite 5 ac (RB911-5HacD)



Picture 165

Instructions for checking overvoltage

Checking Schottky diode

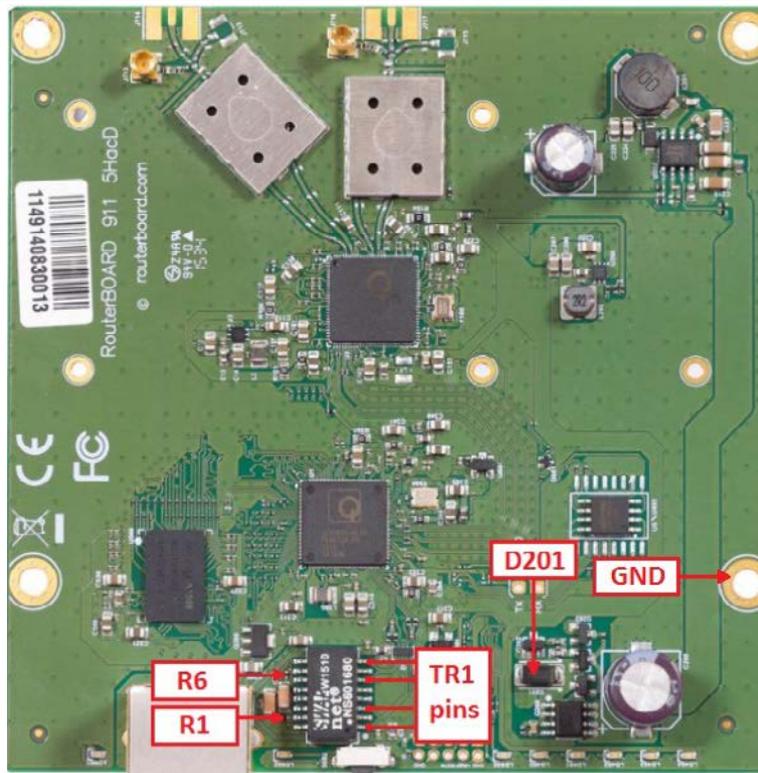
Check Schottky diode D201. Location of diode on the board you can see in the picture [166](#). Schottky diode quality measurement method is described on page [18](#).

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 [166](#). Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described on page [21](#).

Checking 75 Ohm termination resistors resistance

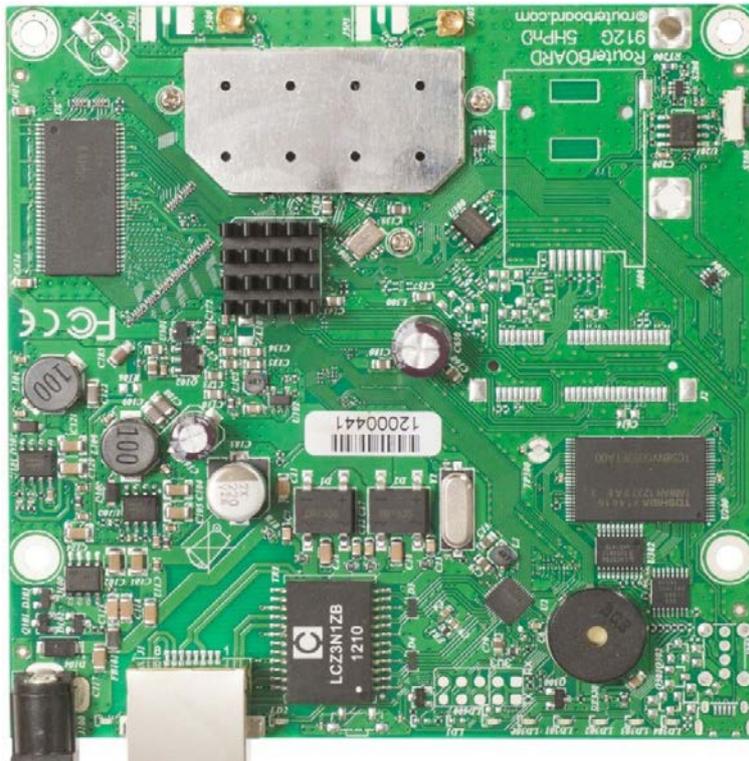
Check resistors R1, R6 resistance value. It should be 75 Ohm +/- 1%. Location of resistors on the board you can see in the picture [166](#).



Picture 166

RB911G-2HPnD

RB911G-5HPnD



Picture 167

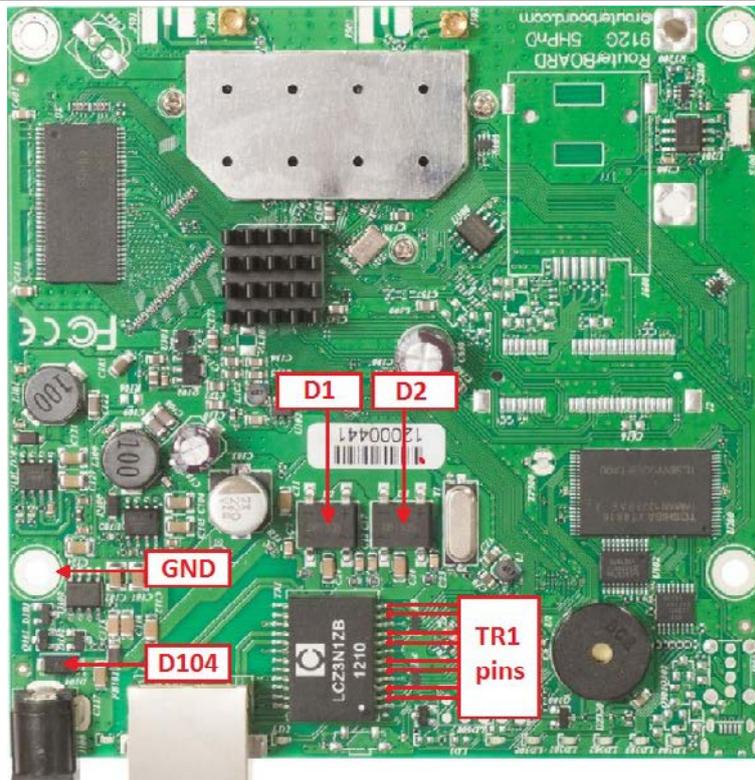
Instructions for checking overvoltage

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 168. Schottky diode quality measurement method is described on page 18. Diodes quality measurement method is described on page 19.

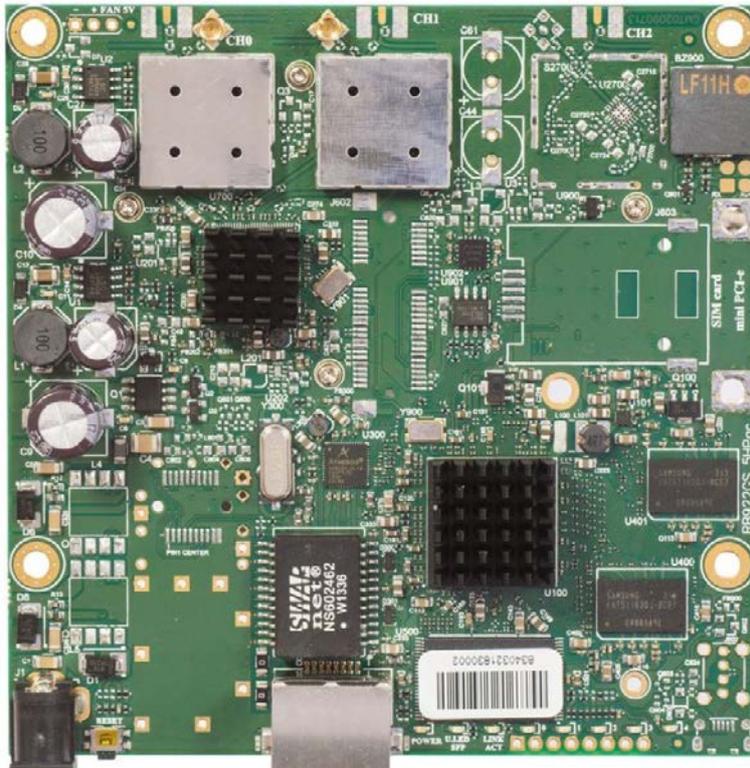
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 168. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 21.



Picture 168

RB911G-5HPacD



Picture 169

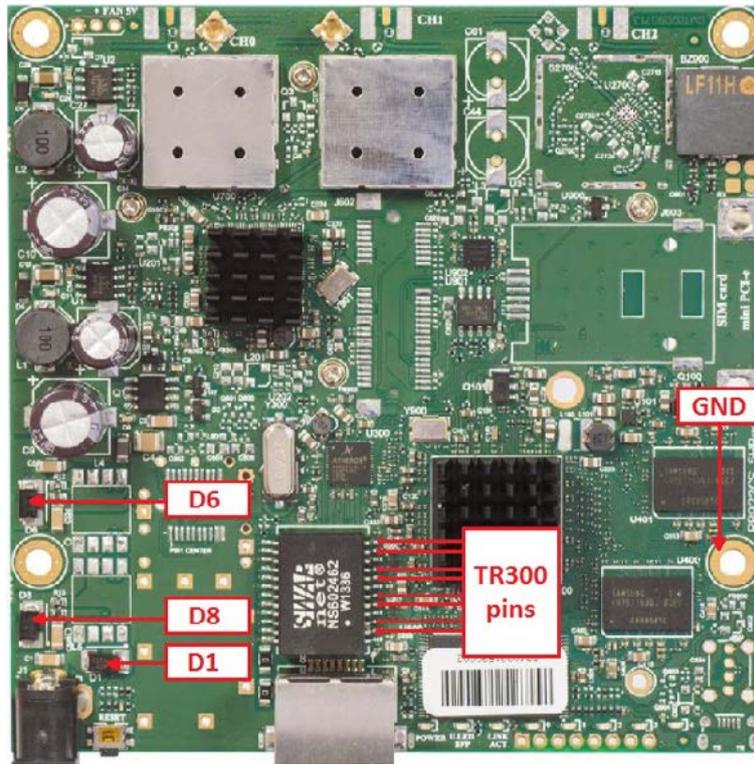
Instructions for checking overvoltage

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 170. Schottky diode quality measurement method is described on page 18.

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 170. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 21.

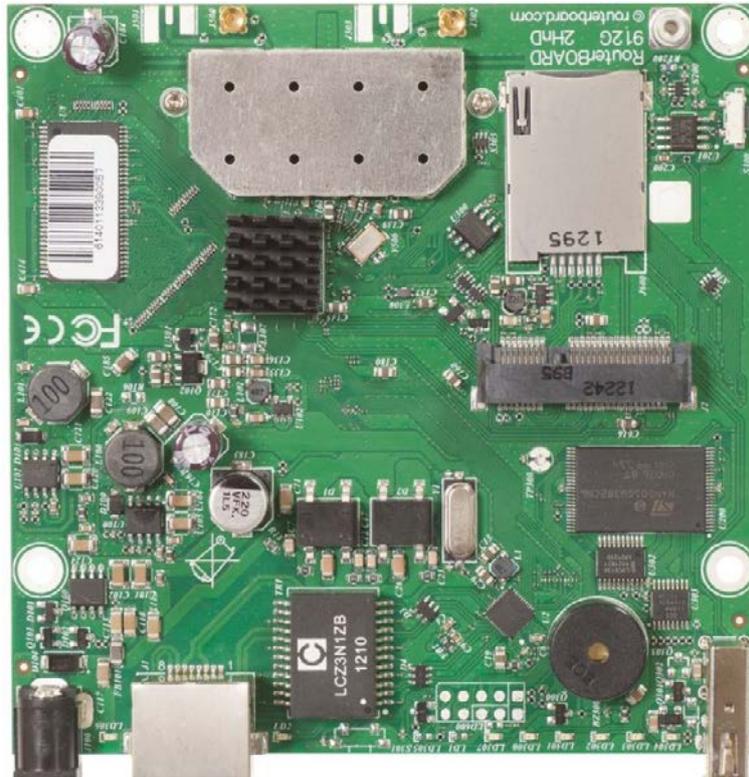


Picture 170

912 SERIES ROUTERBOARDS

RB912UAG-2HPnD

RB912UAG-5HPnD



Picture 171

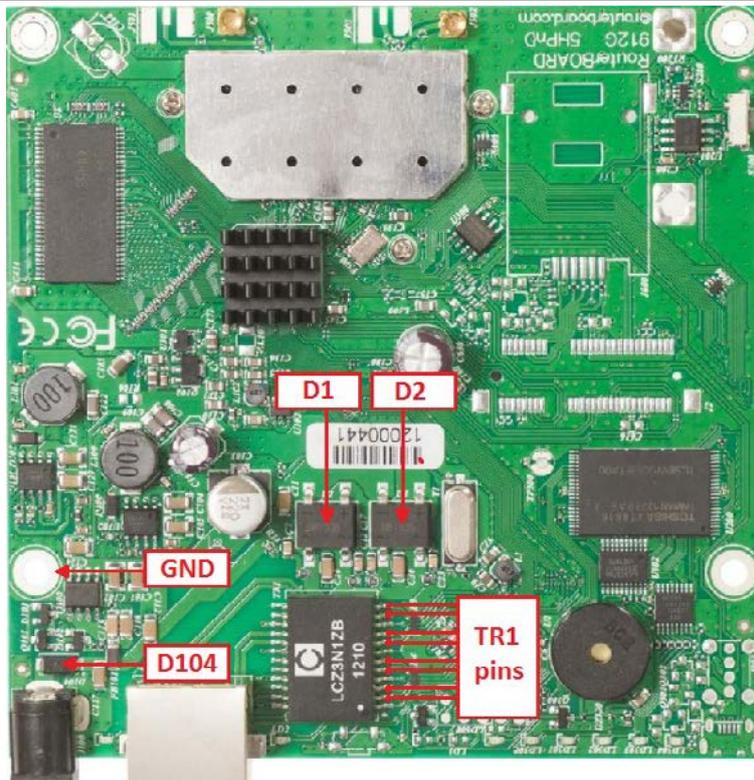
Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diode D104 and diodes bridges D1, D2. Location of diodes on the board you can see in the picture [172](#). Schottky diode quality measurement method is described on page [18](#). Diode bridge quality measurement method is described on page [19](#).

Checking voltage drop value between Ethernet transformer pins and Ground

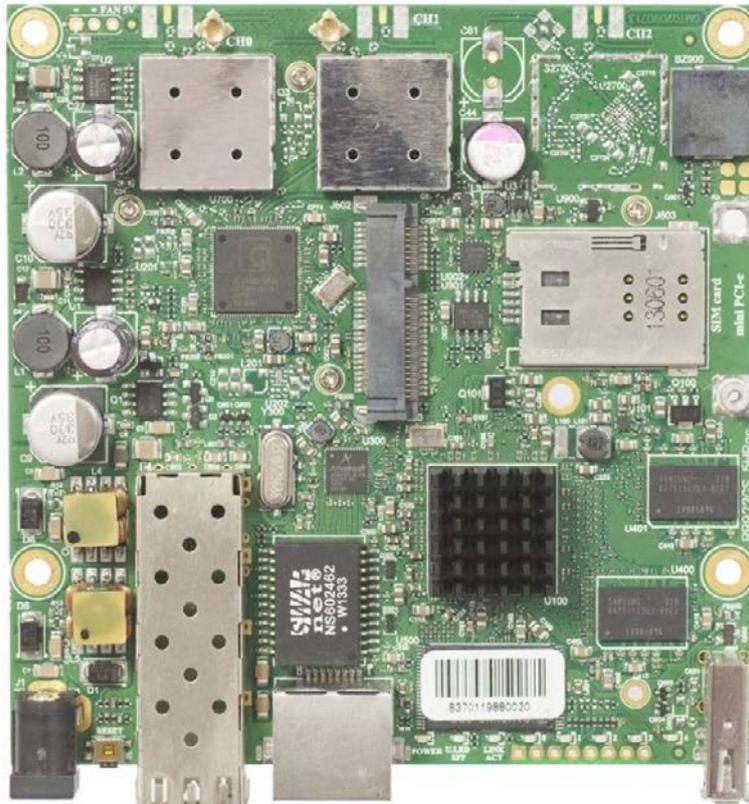
Check voltage drop value between TR1 and Ground. Test points on the transformer pins are marked with red dots, see picture [172](#). Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [21](#).



Picture 172

922 SERIES ROUTERBOARDS

RB922UAGS-5HPacD



Picture 173

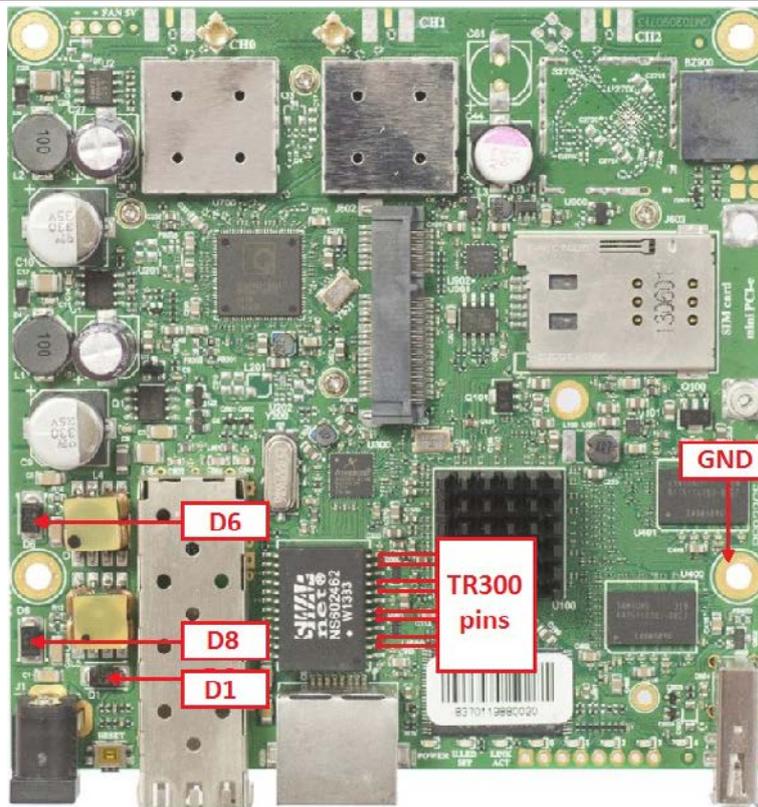
Instructions for checking overvoltage

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 174. Schottky diode quality measurement method is described on page 18.

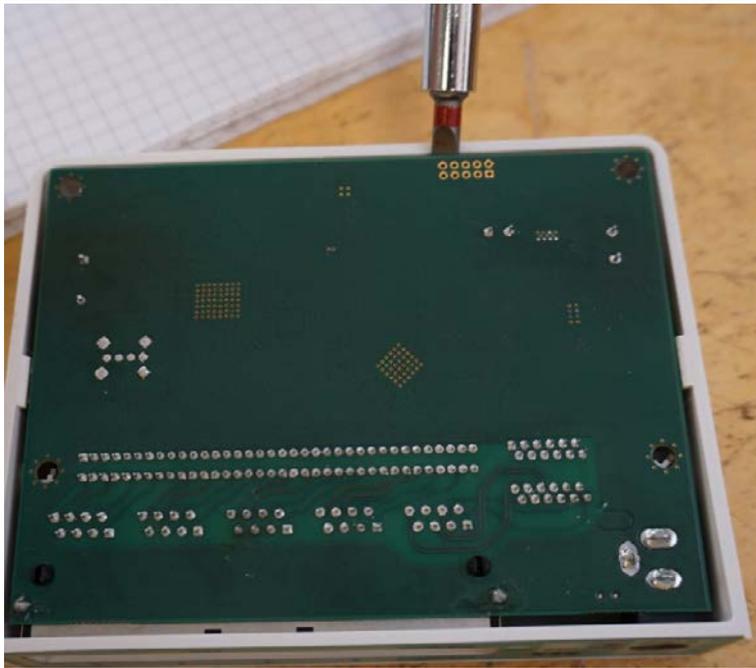
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR300 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 174. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 21.



Picture 174

950 SERIES ROUTERBOARDS



Picture 177

Instructions for checking overvoltage

Checking Schottky diodes

Check Schottky diodes D400, D402. Location of diodes on the board you can see in the picture [178](#). Schottky diode quality measurement method is described on page [18](#).

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 [179](#). Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page [21](#).



Picture 178



Picture 179

RB951G-2HnD



Picture 180

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page [98](#).

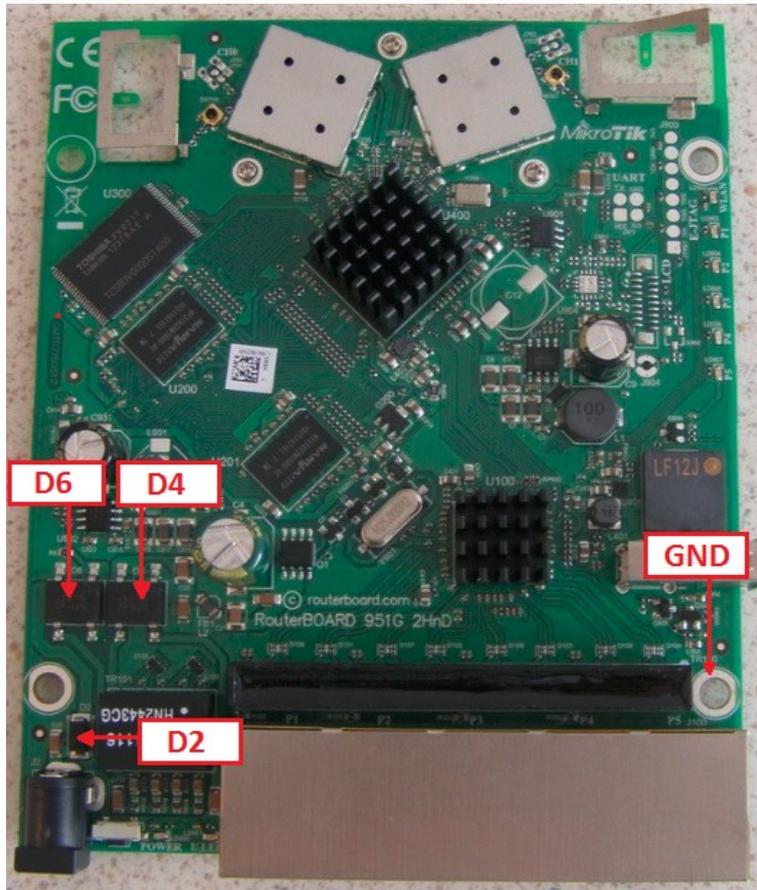
Instructions for checking overvoltage

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 [181](#). Schottky diode quality measurement method is described on page [18](#). Diode bridge 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 TR100, TR101 pins and Ground. Test points on the transformers pins are marked with red dots, see picture [182](#). 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 [21](#).



Picture 181



Picture 182

RB951Ui-2HnD



Picture 183

Disassembling information

Disassembly method of the board is the same as the RB260GSP board. Disassembly method is described on page 98.

Instructions for checking overvoltage

Checking Schottky diodes

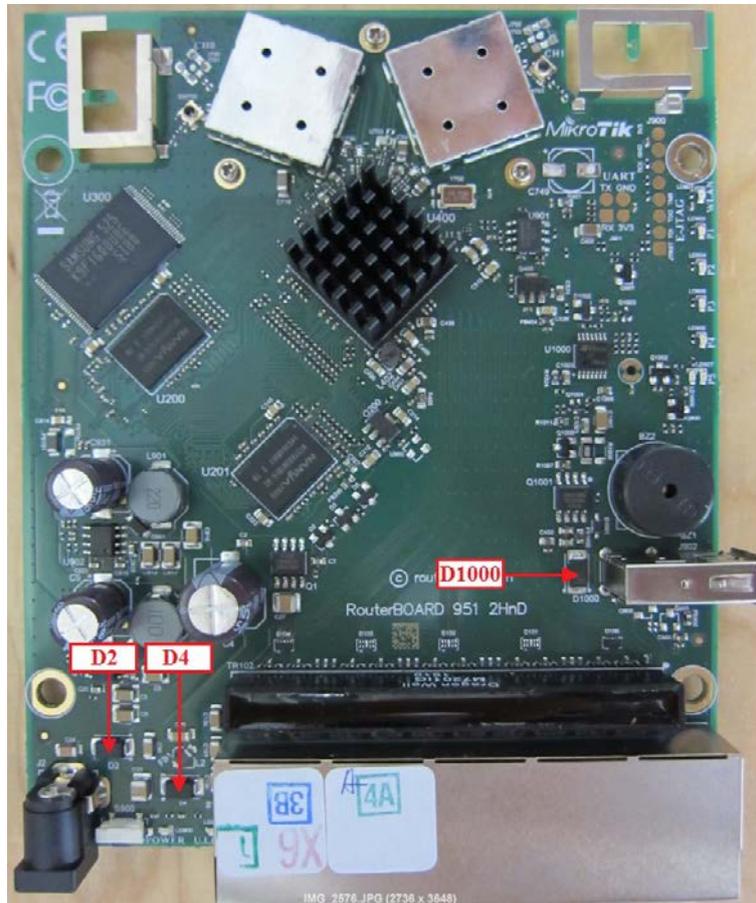
Check Schottky diodes D2, D4, D1000. Location of diodes on the board you can see in the picture 184. Schottky diode quality measurement method is described on page 18.

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 185. Voltage drop value should be in the range from 0,32V to 0,38V. Voltage drop measurement method is described on page 21.

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 $150 \text{ Ohm} \pm 4\%$. Measurement method is described on page 22.



Picture 184



Picture 185

RB953GS-5HnT



Picture 186

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 187. Schottky diode quality measurement method is described on page 18.

Checking voltage drop value between Ethernet transformer pins and Ground

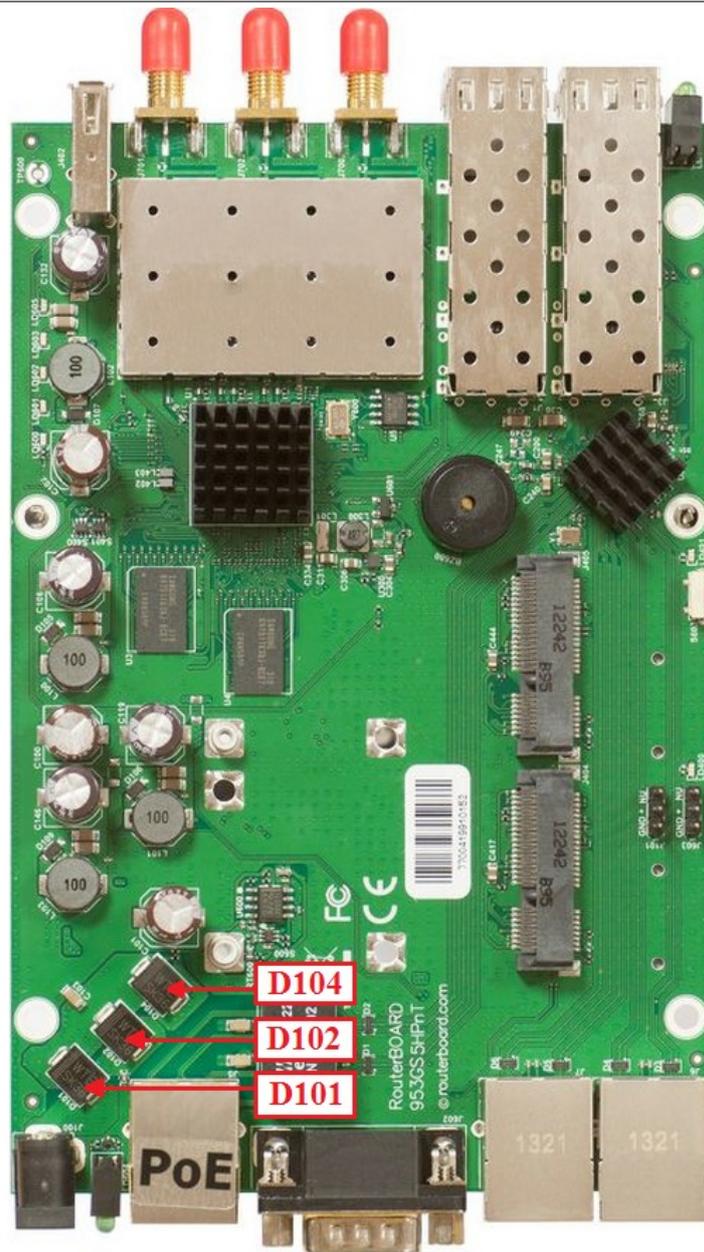
Check voltage drop value between Ethernet transformer TR1 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [188](#). Voltage drop value should be in the range from 0,42V to 0,48V. Voltage drop measurement method is described on page [21](#).

Checking termination resistors resistance in RJ-45 connector

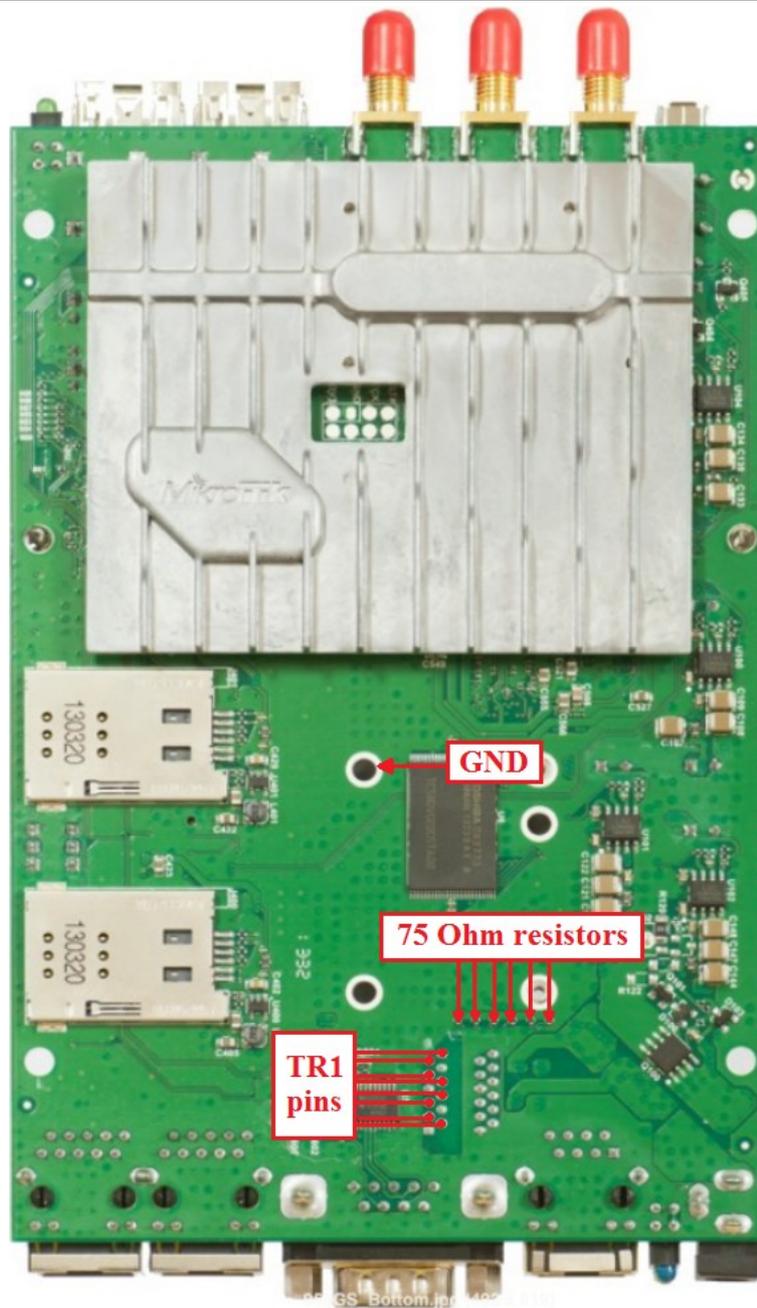
Check termination resistors resistance in J6, J7 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/- 4%. Measurement method is described on page [22](#).

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 [188](#).



Picture 187



Picture 188

CLOUD CORE ROUTER 1009 SERIES ROUTERBOARDS

CCR1009-7G-1C-PC

CCR1009-7G-1C-1S+

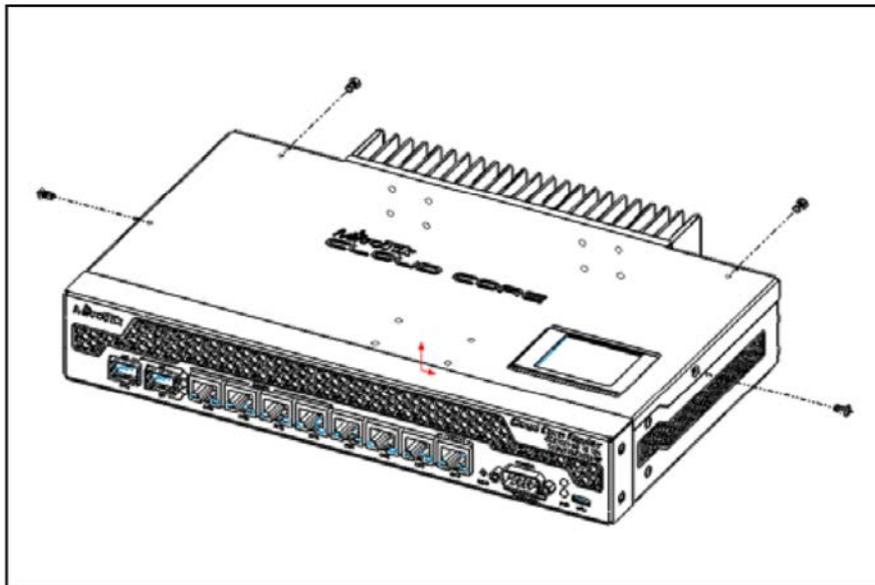
CCR1009-7G-1C-1S+PC



Picture 189

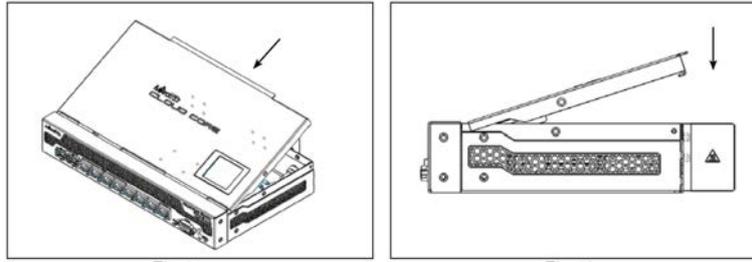
Disassembling information

Step 1: Unscrew 4 screws using PH2 screwdriver. Location of screws you can see in the picture [190](#).



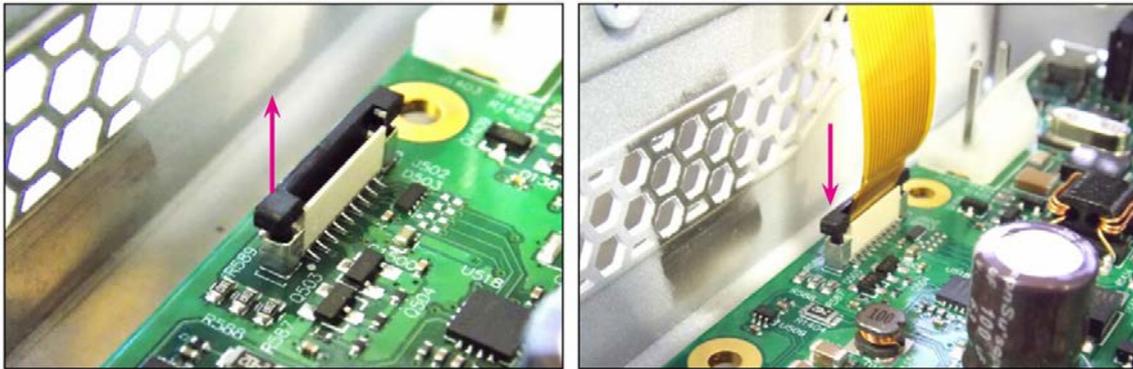
Picture 190

Step 2: Carefully take off the cover as showed in the picture [191](#). Do not damage the LCD flex cable.



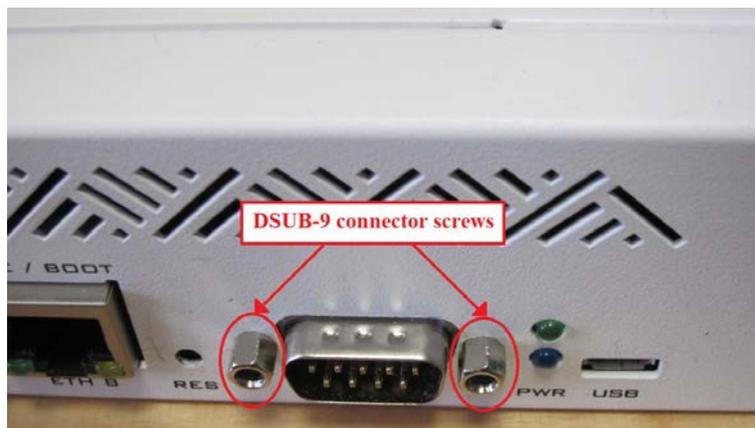
Picture 191

Step 3: Gently lift the latch vertically upward and take out LCD flex cable from FPC connector as showed in the picture 192. Do not damage the FPC connector locking drawer.



Picture 192

Step 4: Detach a male DSUB-9 connector from board case unscrewed 2 screws. Location of the screws you can see in the picture 193.



Picture 193

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 194. Schottky diode quality measurement method is described on page 18.

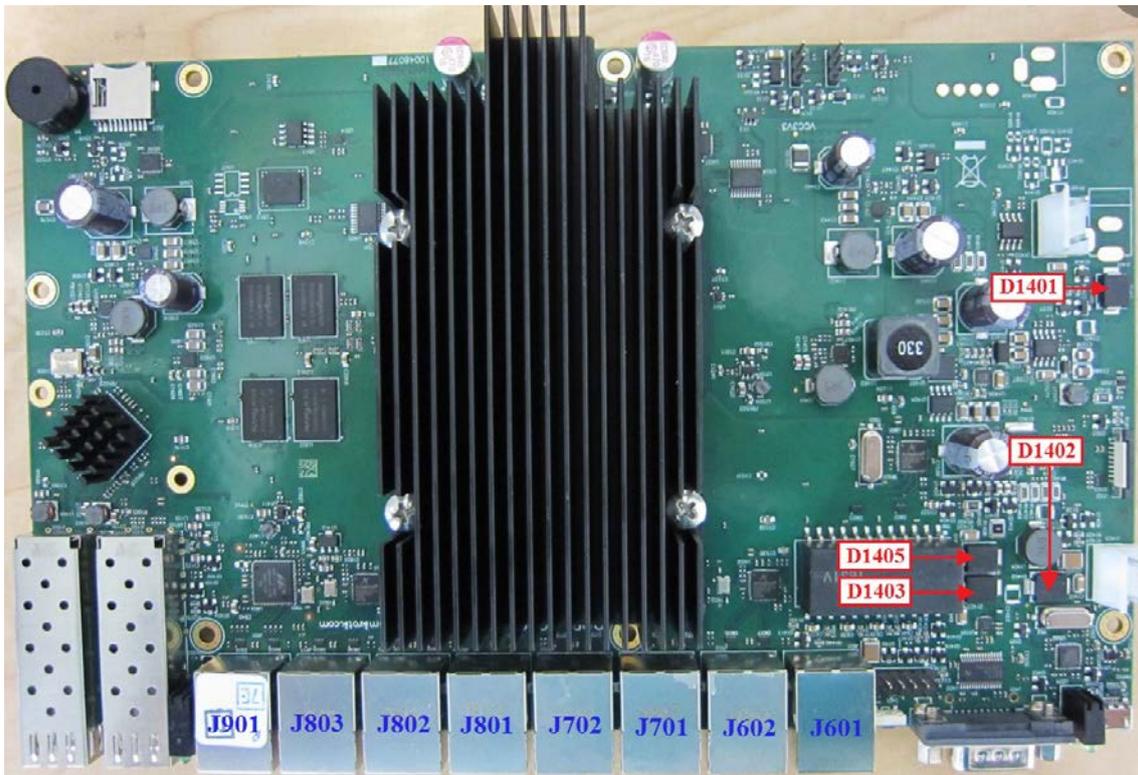
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 195. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 21.

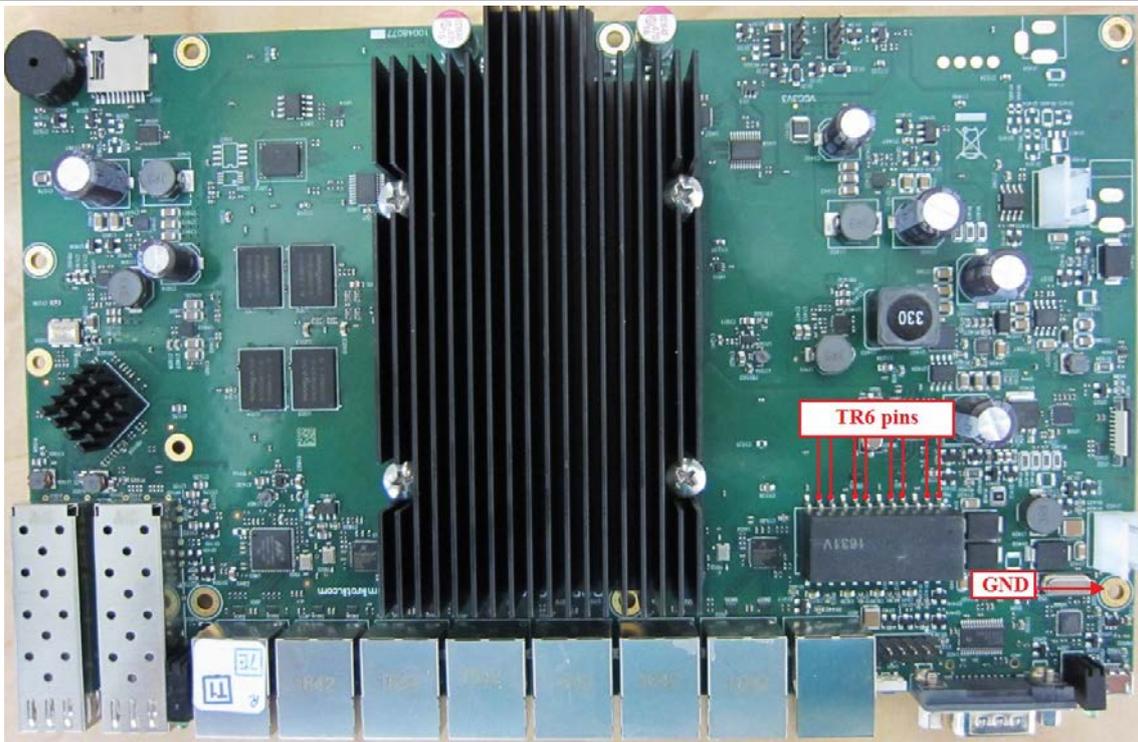
Check voltage drop value between RJ-45 connectors J602, J701, J702, J801, J802, J803 and ground. Test points are shown in picture 196. Voltage drop value should be in the range from 0,36V to 0,40V. Voltage drop measurement method is described on page 21.

Checking termination resistors resistance in RJ-45 connector

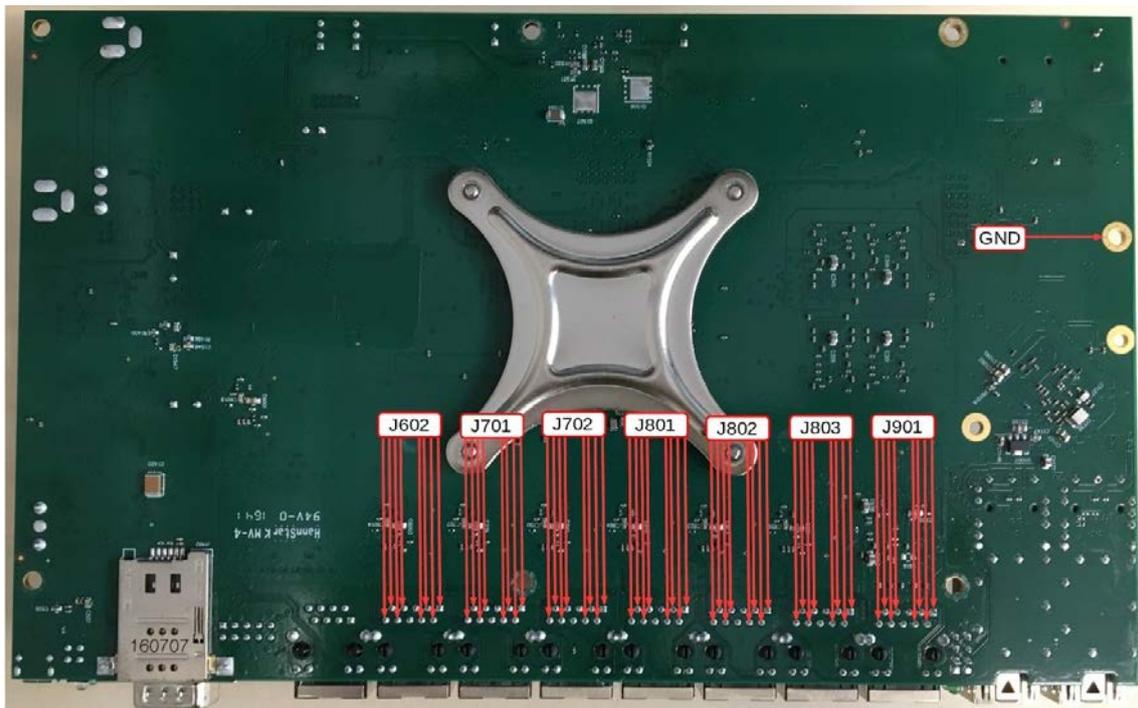
Check termination resistors resistance in J602, J701, J702, J801-J803, J901 connectors. Resistance value between Rx and Tx line must be 150 Ohm \pm 4%. Measurement method is described on page 22.



Picture 194

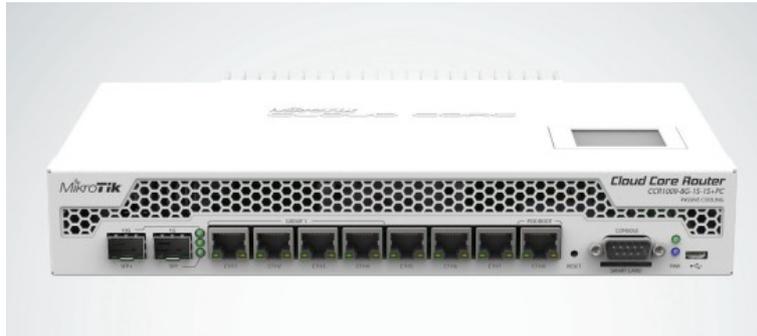


Picture 195



Picture 196

CCR1009-8G-1S-1S+



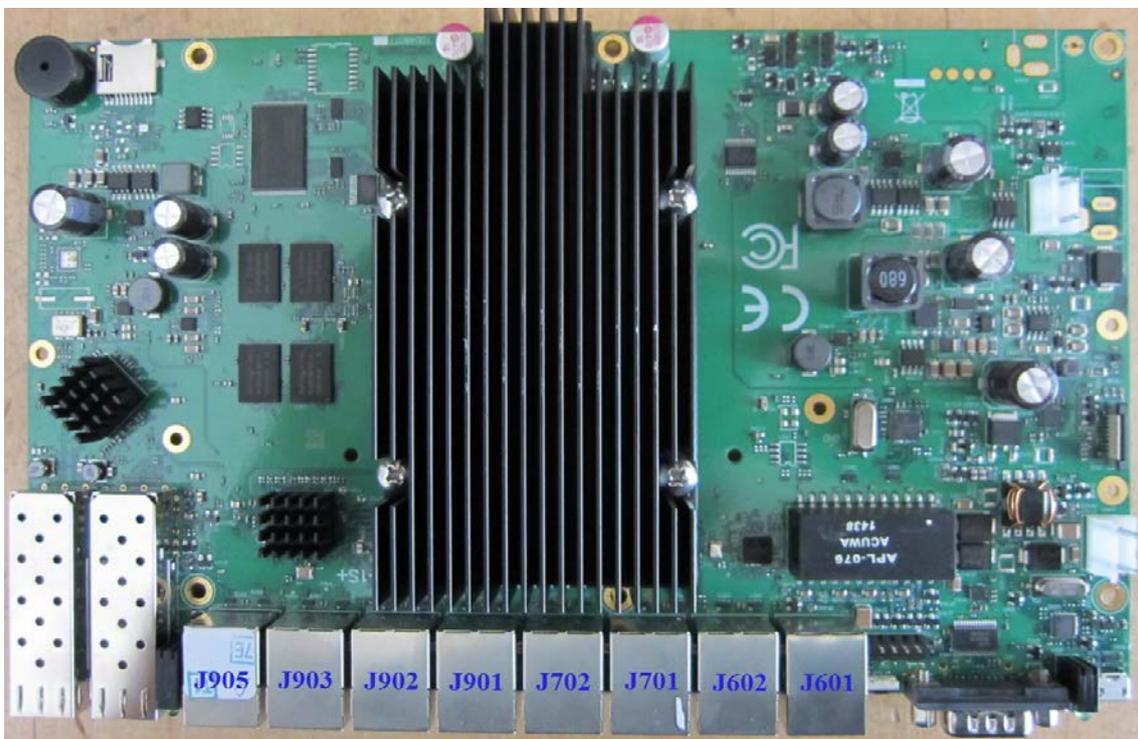
Picture 197

Disassembling information

Disassembly method of the board is the same as the CCR1009-7G board. Disassembly method is described on page [181](#).

Instructions for checking overvoltage

Over-voltage testing procedure and the layout of the components (with exception of Ethernet ports reference numbers, see picture [198](#)) on the board is the same as for CCR1009-7G boards, see on page [183](#).



Picture 198

CCR1009-8G-1S



Picture 199

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 200.



Picture 200

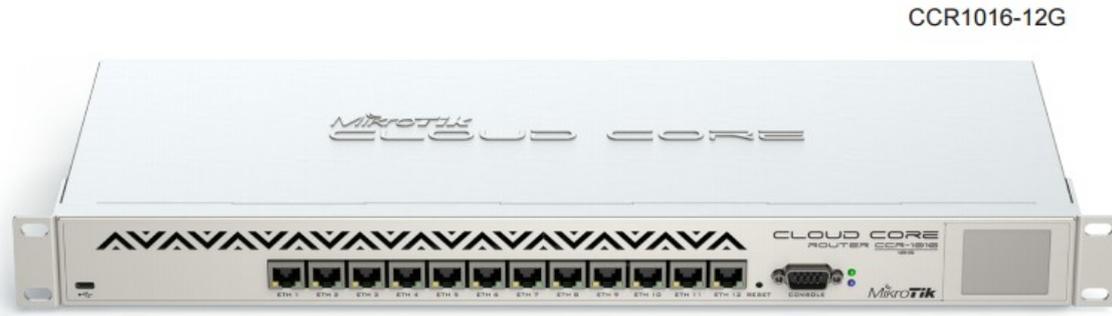
Step 2: Take off the cover.

Instructions for checking overvoltage

Over-voltage testing procedure and the layout of the components (with exception of Ethernet ports reference numbers, see picture 198) on the board is the same as for CCR1009-7G boards, see on page 183.

CLOUD CORE ROUTER 1016 SERIES ROUTERBOARDS

CCR1016-12G



Picture 201

Disassembling information

Disassembly method of the board is the same as the CCR1009-8G-1S board. Disassembly method is described on page [186](#).

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 [202](#).

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 [202](#).

Voltage drop measurement method is described on page [20](#).

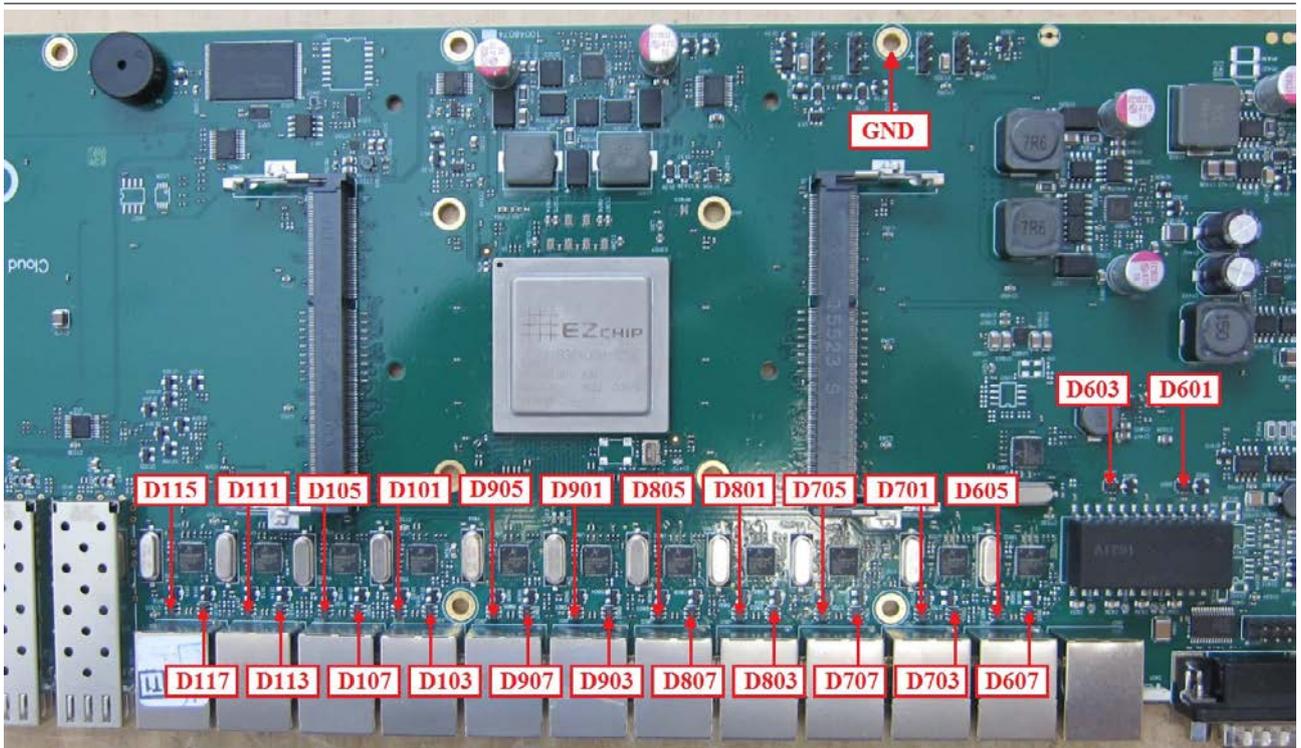
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [203](#).

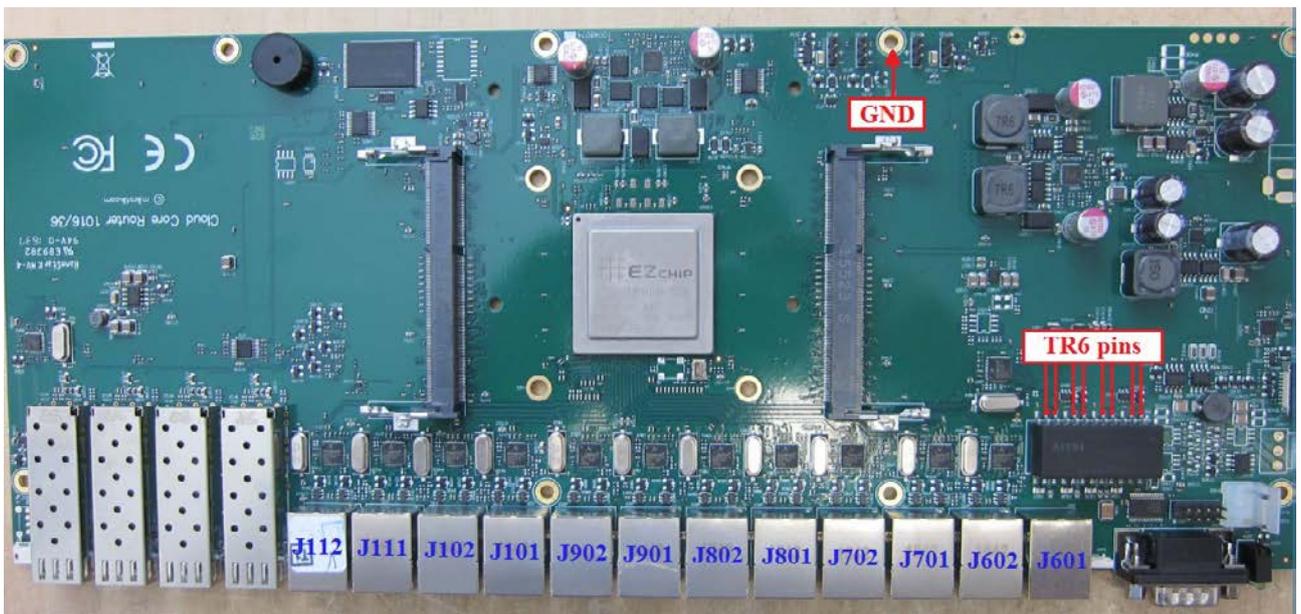
Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [21](#).

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J602, J701, J702, J801, J802, J901, J902, J101, J102, J111, J112 connectors. Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page [22](#).



Picture 202



Picture 203

CCR1016-12G rev2



Picture 204

Disassembling information

Disassembly method of the board is the same as the CCR1036-8G-2S+ rev2 board. Disassembly method is described on page [197](#).

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

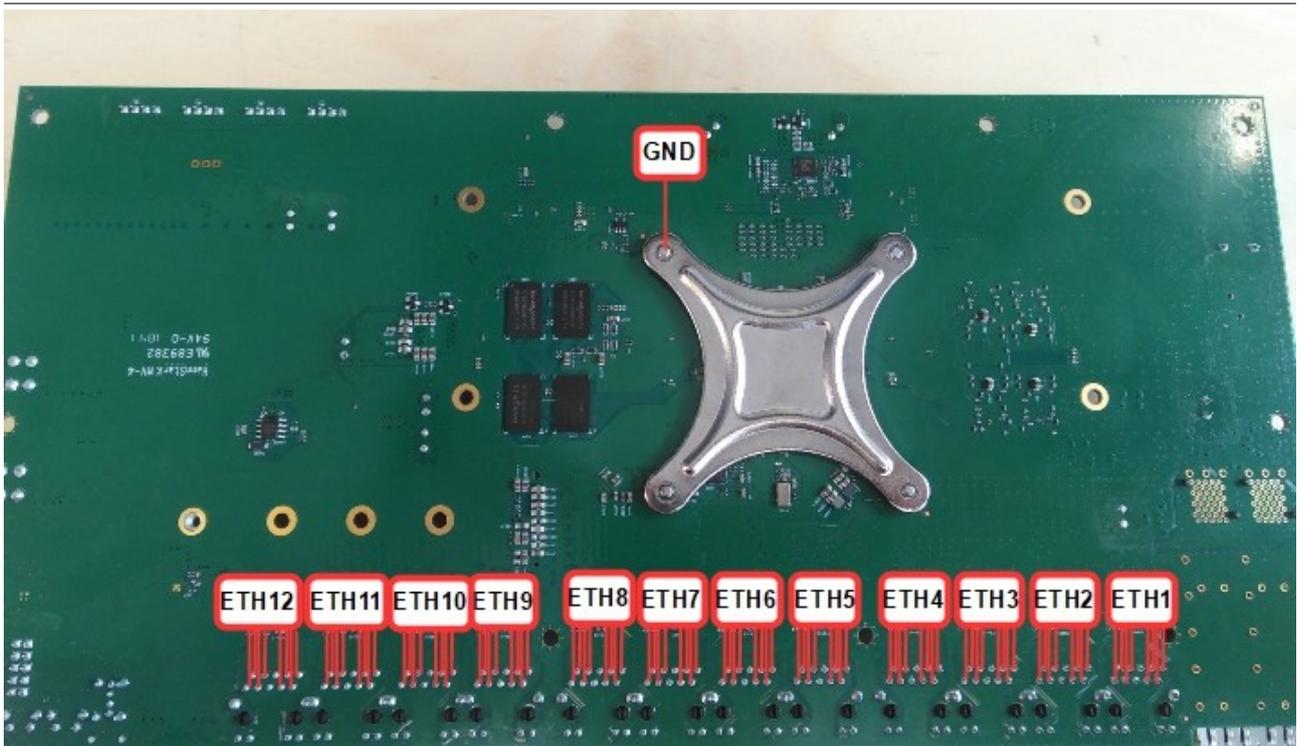
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture [205](#).

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page [21](#).

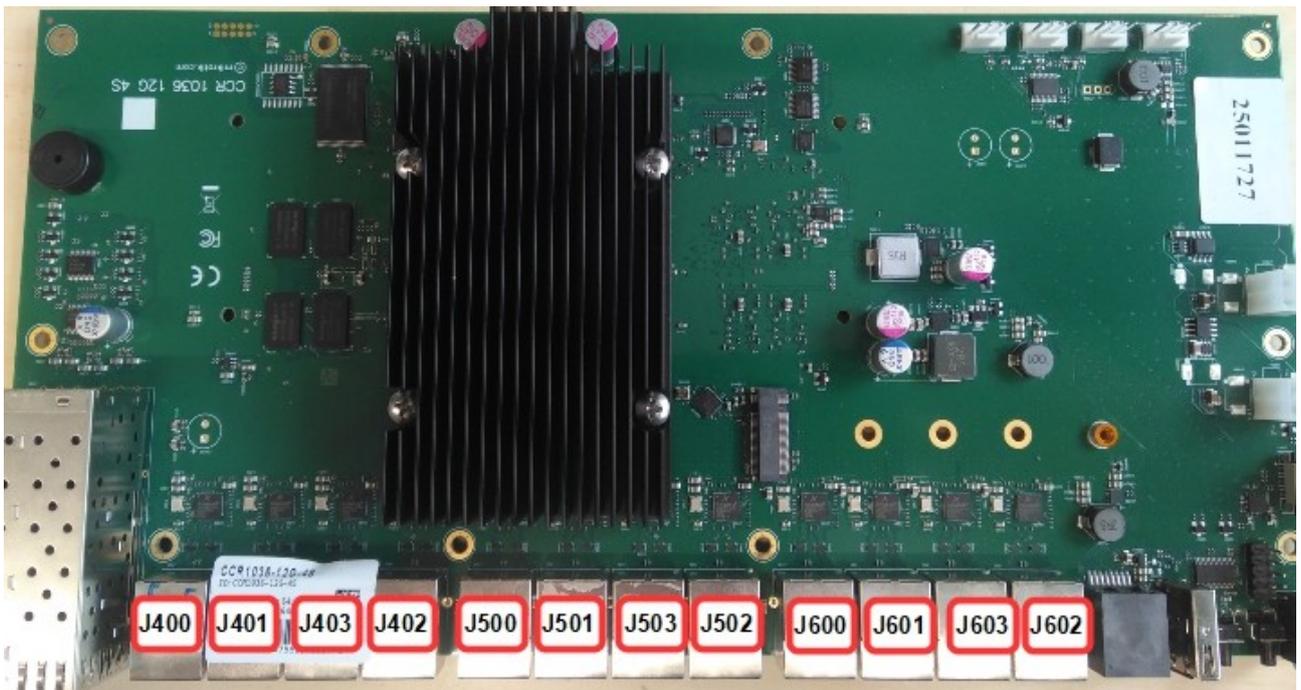
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J400 - J602 connector. RJ-45 placement is shown in picture [206](#).

Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page [22](#).



Picture 205



Picture 206

CCR1016-12S-1S+

CCR1016-12S-1S+ rev2



Picture 207

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 208

Disassembling information

Disassembly method of the board is the same as the CCR1009-8G-1S board. Disassembly method is described on page [186](#).

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

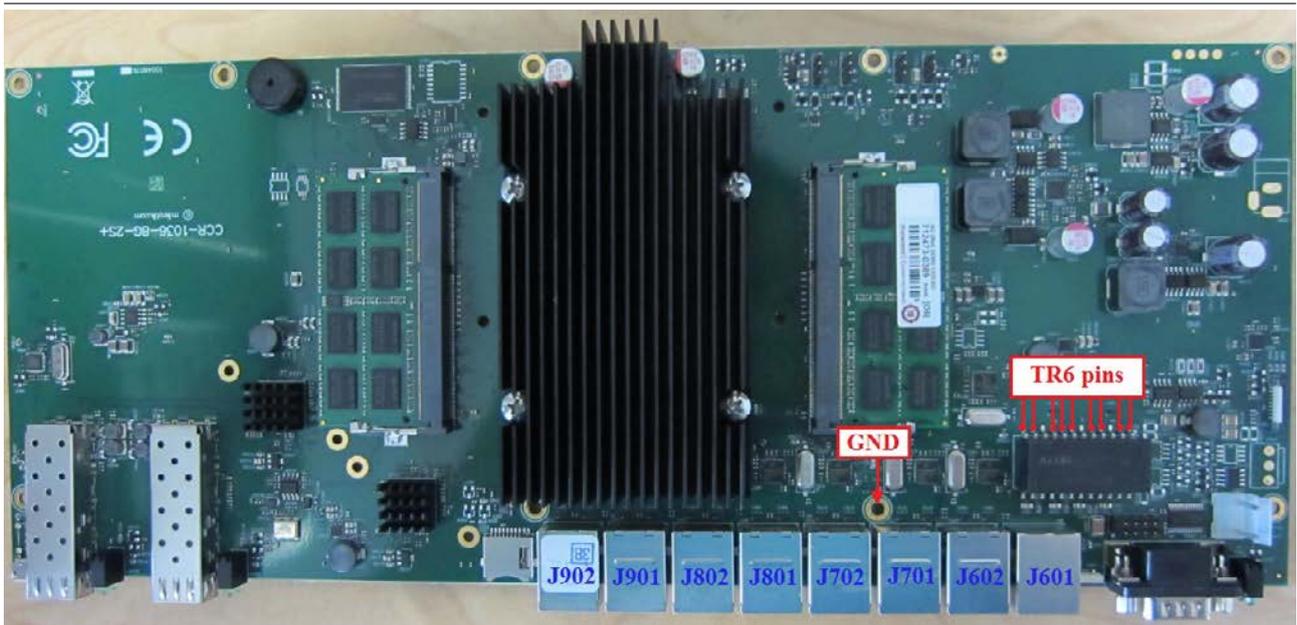
Check voltage drop value between Ethernet transformer TR6 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [209](#).

Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [21](#).

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 [209](#).

Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page [22](#).



Picture 209

CCR1036-12G-4S

CCR1036-12G-4S-EM



Picture 210

Disassembling information

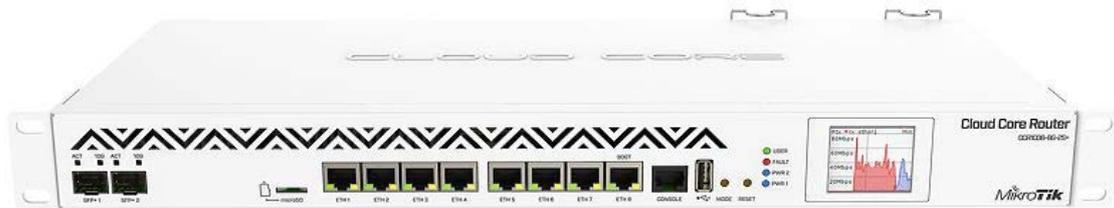
Disassembly method of the board is the same as the CCR1016-12G board. Disassembly method is described on page [188](#).

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 [188](#).

CCR1036-8G-2S+ rev2

CCR1036-8G-2S+EM r2



Picture 211

Disassembling information

Step 1: Unscrew 6 screws using PH2 screwdriver. Location of screws you can see in the picture [212](#).



Picture 212

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 [213](#). 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 213

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

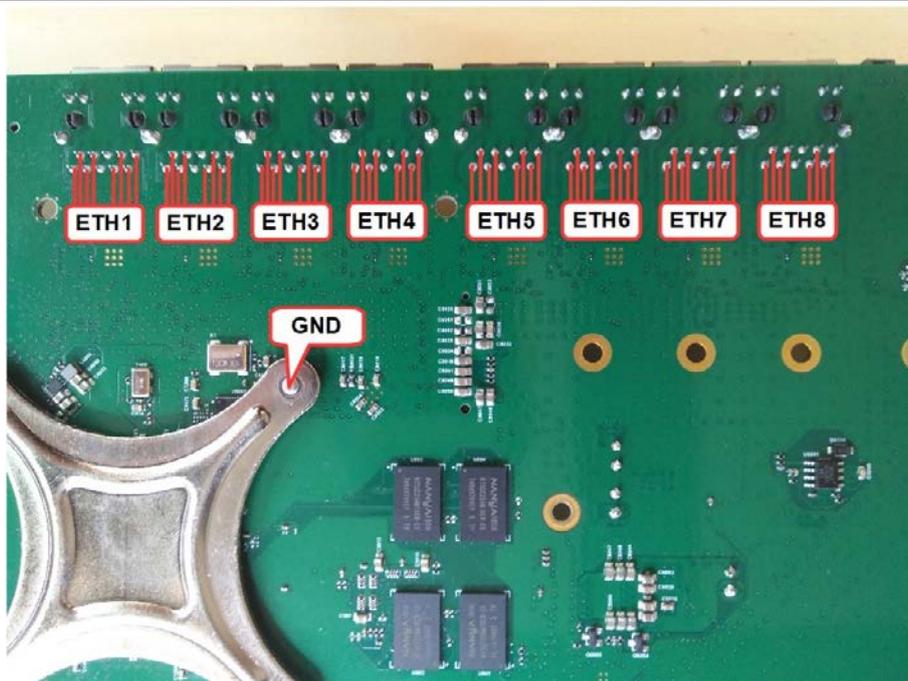
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture [214](#).

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page [21](#).

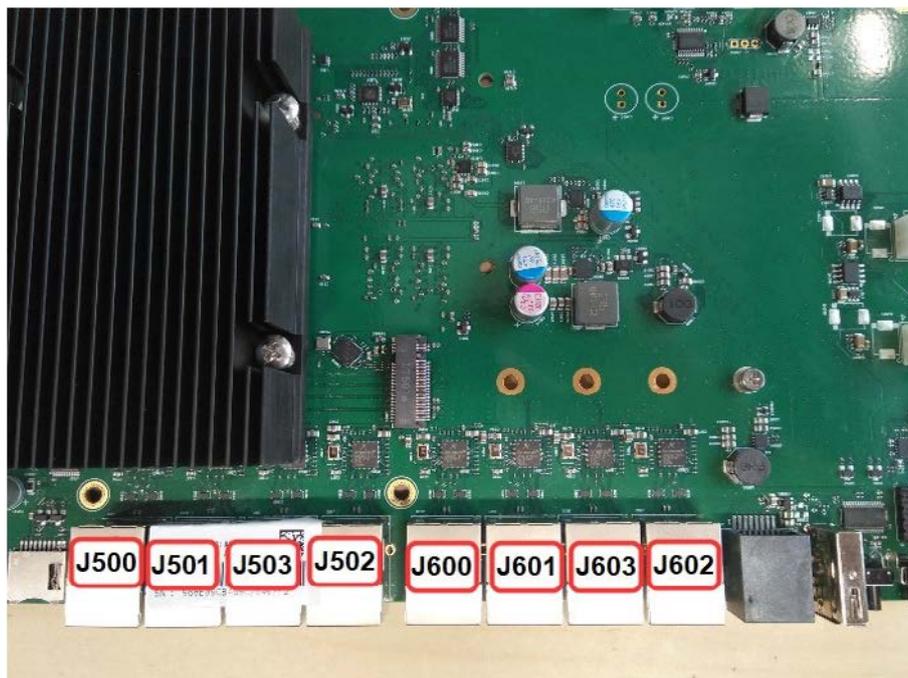
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J500, J501, J502, J503, J600, J601, J602, J603 connector. RJ-45 placement is shown in picture [215](#).

Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page [22](#).



Picture 214



Picture 215

CCR1036-12G-4S rev2

CCR1036-12G-4S-EM rev2



Picture 216

Disassembling information

Disassembly method of the board is the same as the CCR1036-8G-2S+ rev2 board. Disassembly method is described on page [197](#).

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

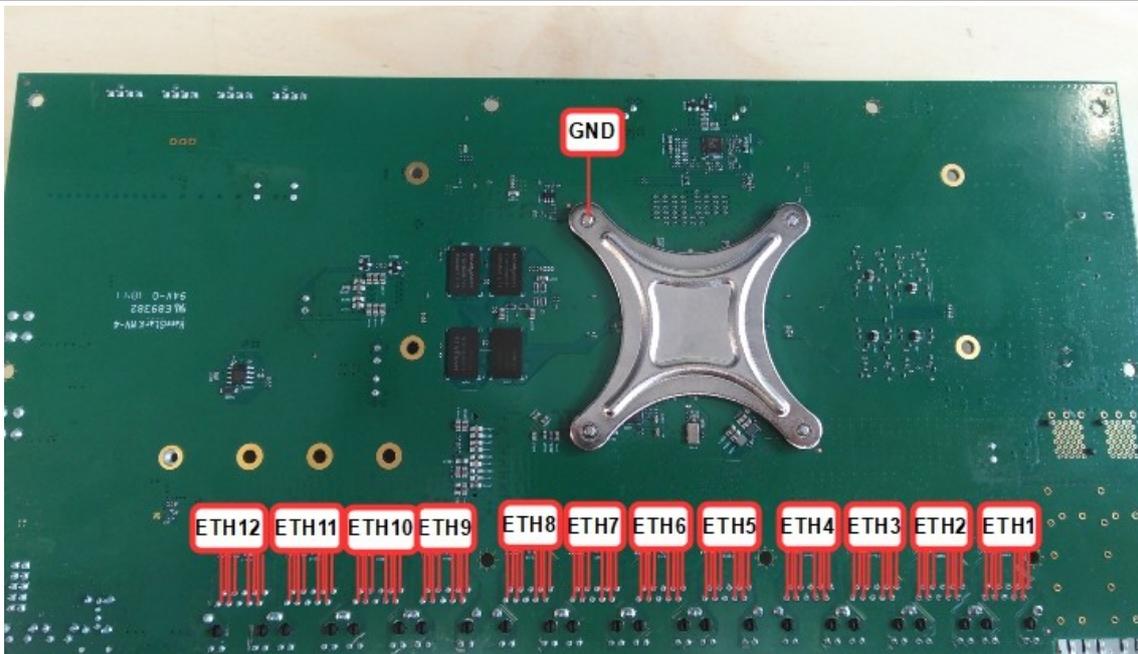
Check voltage drop value between Ethernet built in transformer pins and Ground. Test points on the RJ-45 pins are marked with red dots, see picture [217](#).

Voltage drop value should be in the range from 0,37V to 0,41V. Voltage drop measurement method is described on page [21](#).

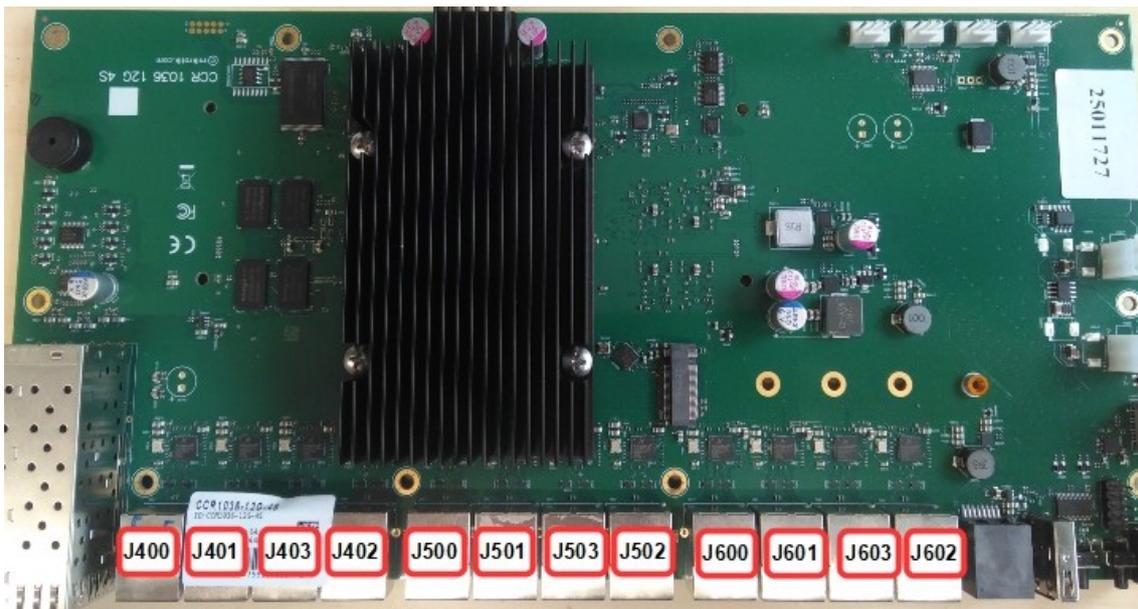
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J400 - J602 connector. RJ-45 placement is shown in picture [218](#).

Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page [22](#).



Picture 217



Picture 218

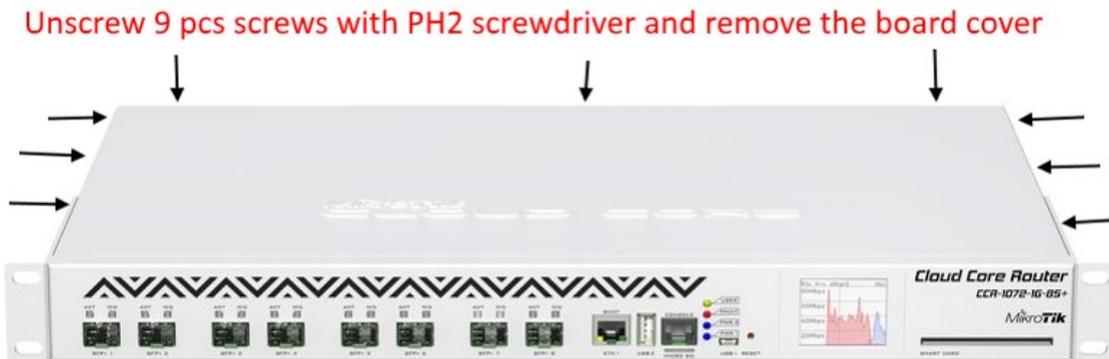
CLOUD CORE ROUTER 1072 SERIES ROUTERBOARDS

CCR1072-1G-8S+



Picture 219

Disassembling information



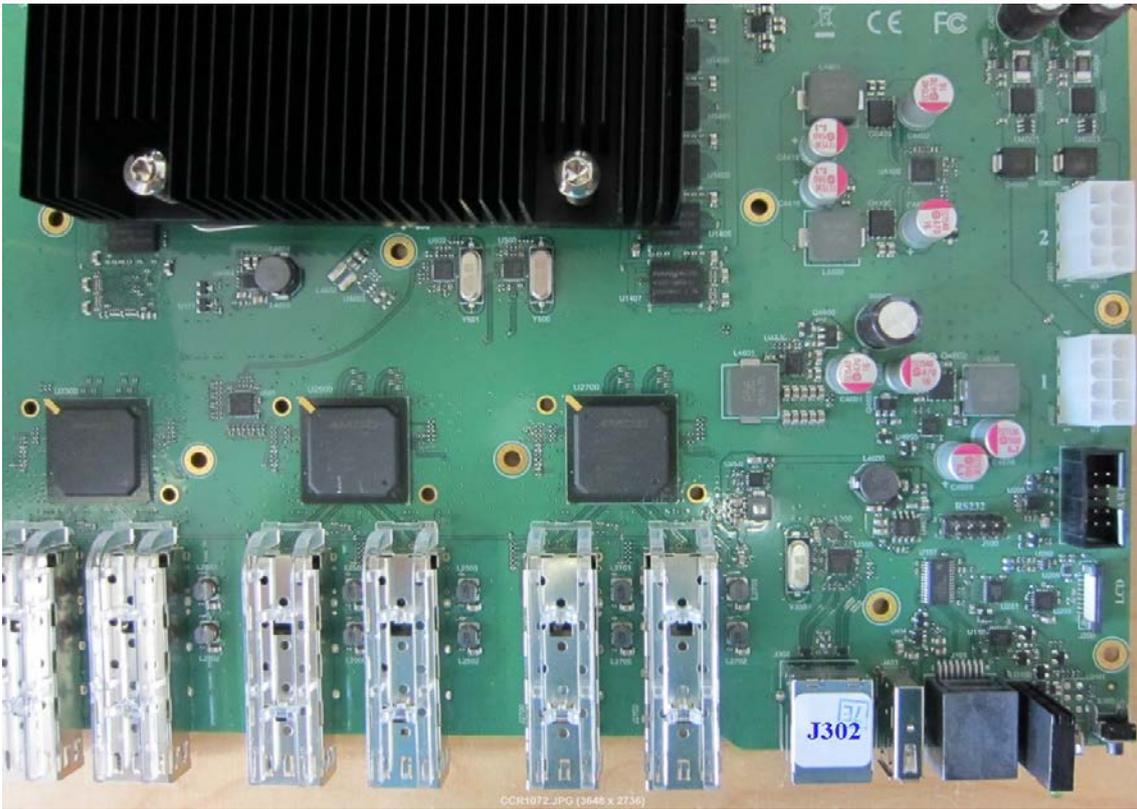
Picture 220

Instructions for checking overvoltage

Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J302 connector as shown in the picture [221](#).

Resistance value between Rx and Tx line must be 150 Ohm +/-4%. Measurement method is described on page [22](#).



Picture 221

CLOUD CORE ROUTER 2004 SERIES ROUTERBOARDS

CCR2004-1G-12S+2XS



Picture 222

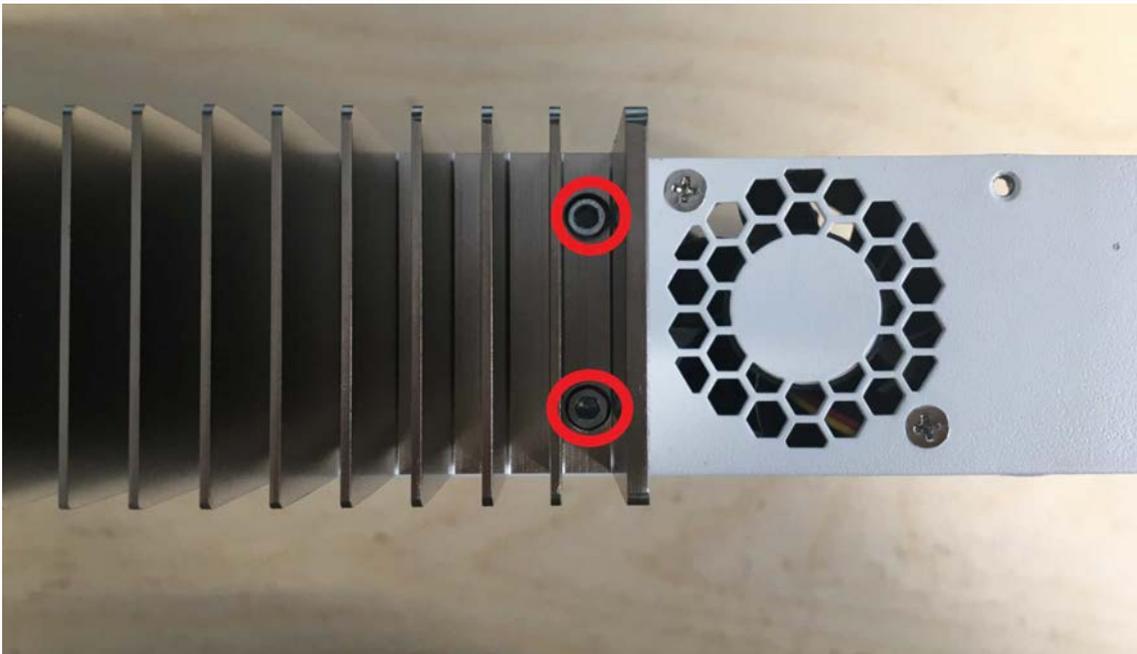
Disassembling information

Step 1: Using Phillips PH2 or similar unscrew all screws shown in picture 223.



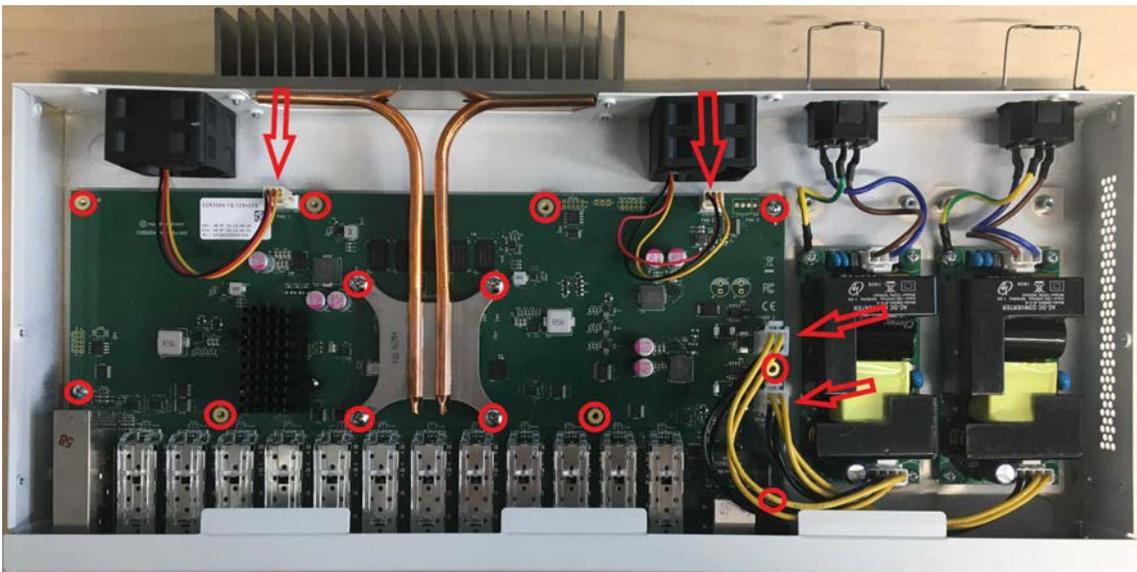
Picture 223

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 224

Step 3: Using Phillips PH1 unscrew all the screws, unplug fans and PSU power cables as shown in picture 225.



Picture 225

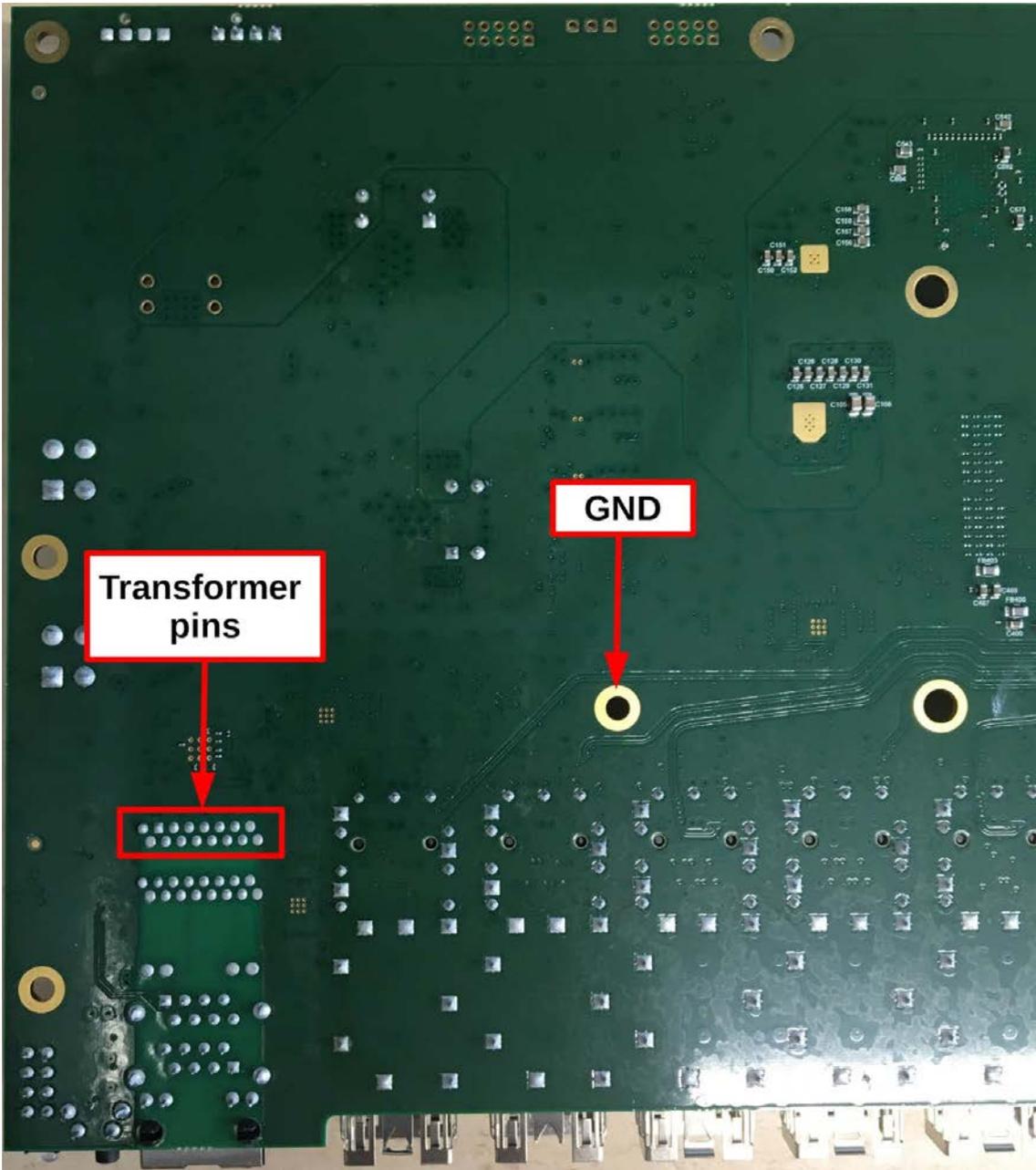
Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

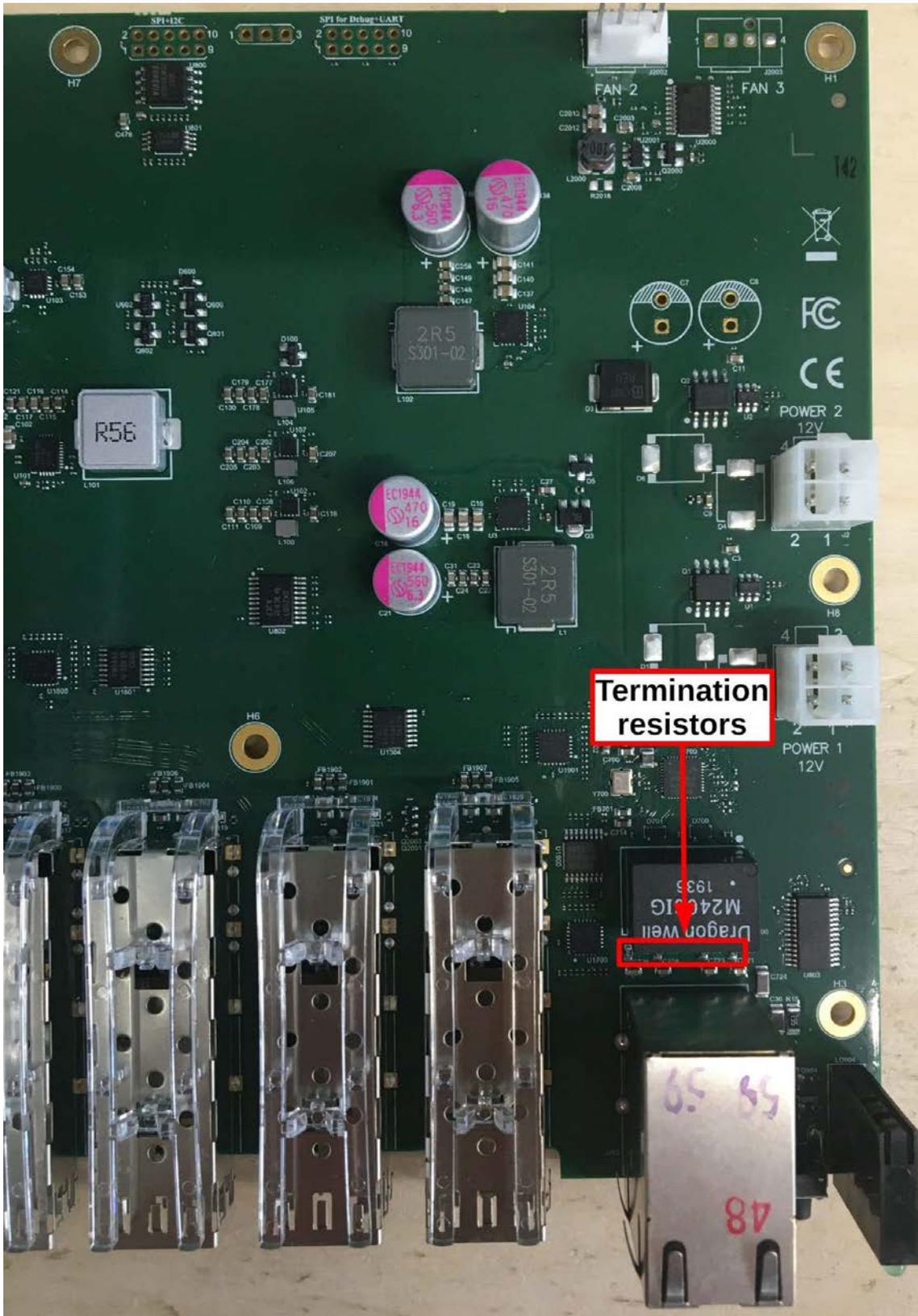
Check voltage drop value between Ethernet transformer pins and GND. Test points are marked in picture 226. Voltage drop value should be in the range from 0,34V to 0,44V. Voltage drop measurement method is described on page 21.

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 227.



Picture 226



Picture 227

CCR2004-16G-2S+



Picture 228

Disassembling information

Step 1: Using Phillips PH2 or similar unscrew all screws shown in picture 229.



Picture 229

Step 2: Take off the cover, unscrew all screws using Phillips screw driver, unplug FAN and power supply cables as showed in picture 230.

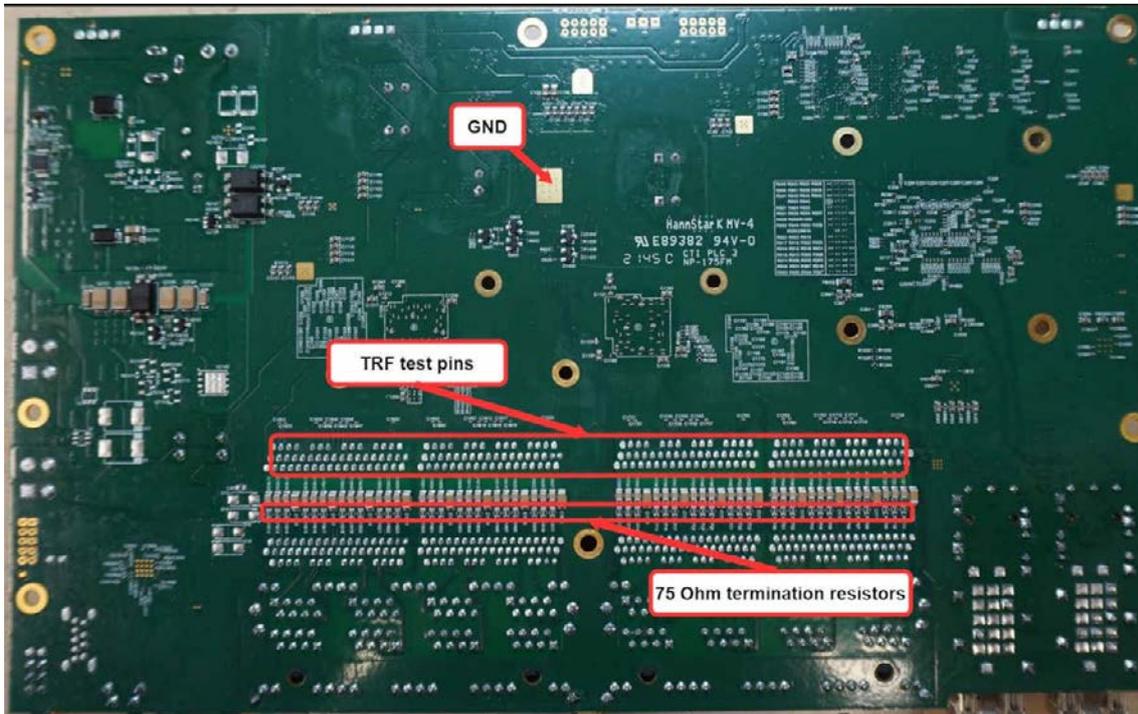


Picture 230

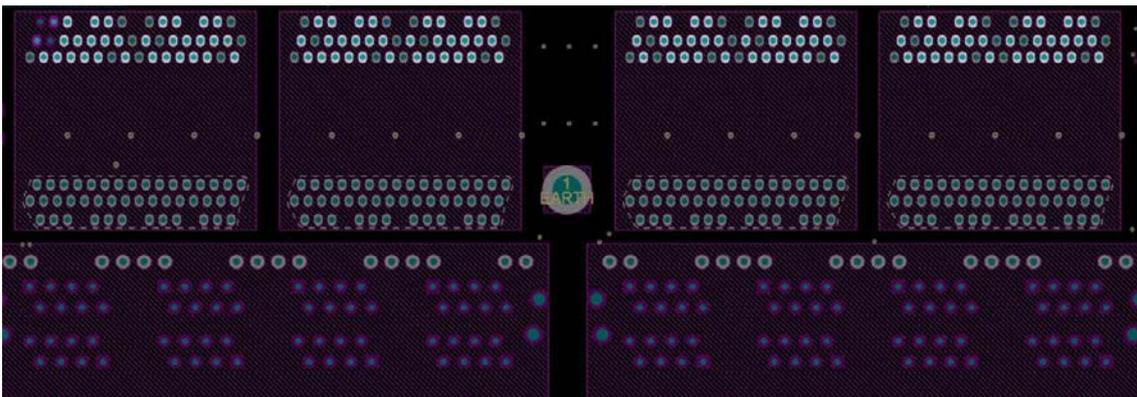
Instructions for checking overvoltage

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 232. 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 21.



Picture 231



Picture 232

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 231.

CCR2004-1G-2XS-PCIE

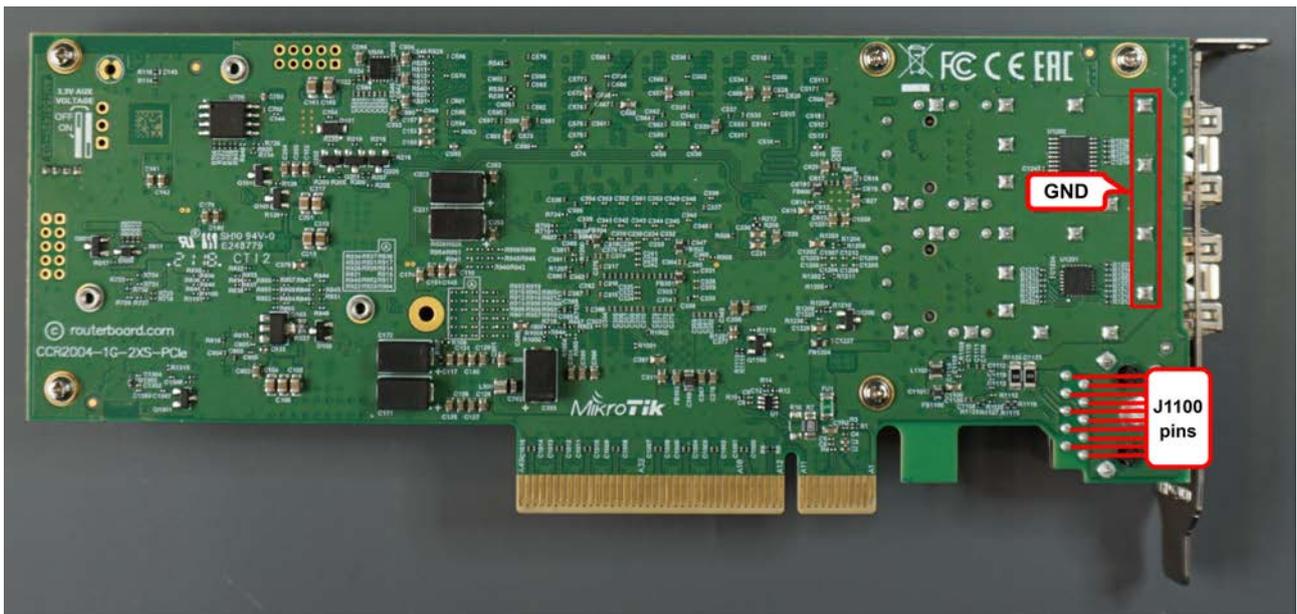


Picture 233

Checking procedure for over-voltage

Checking voltage drop value between Ethernet transformer pins and Ground

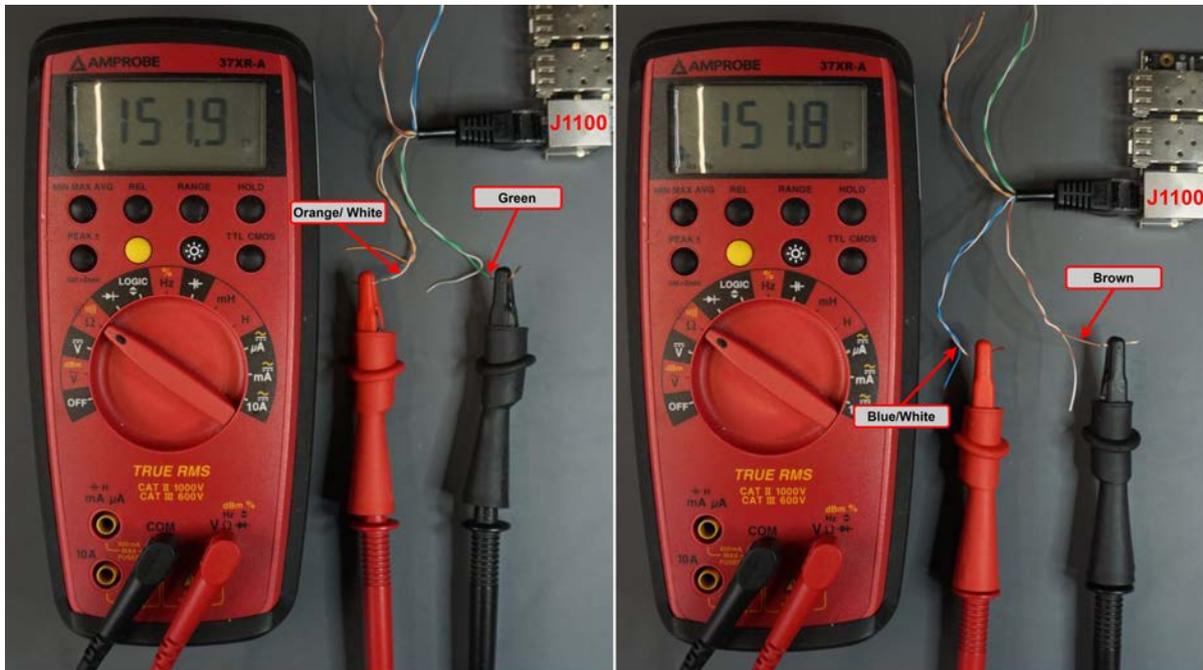
Check voltage drop value between Ethernet connector RJ45 pins and GND. Test points are marked with red lines, see picture 234. Voltage drop value should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 21.



Picture 234

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 235. 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 235

CLOUD CORE ROUTER 2116 SERIES ROUTERBOARDS

CCR2116-12G-4S+

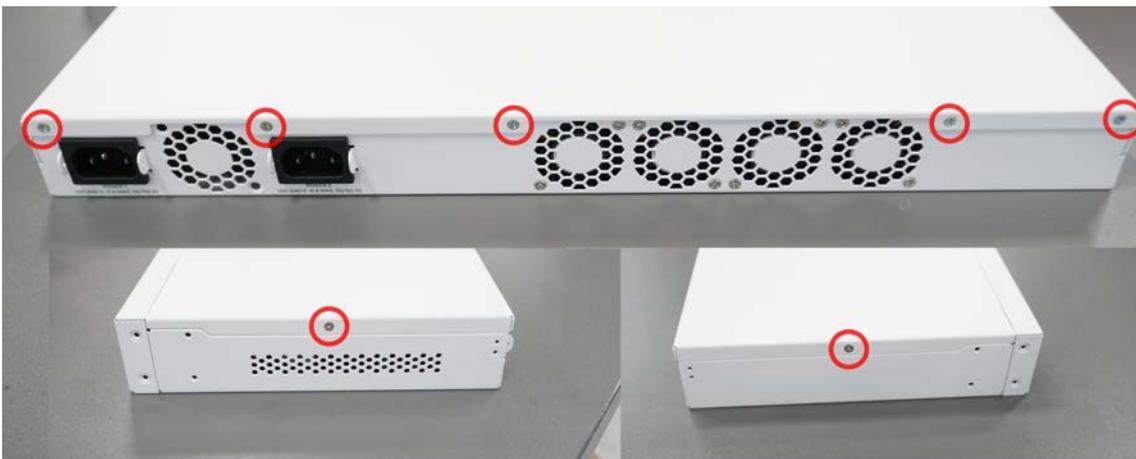


Picture 236

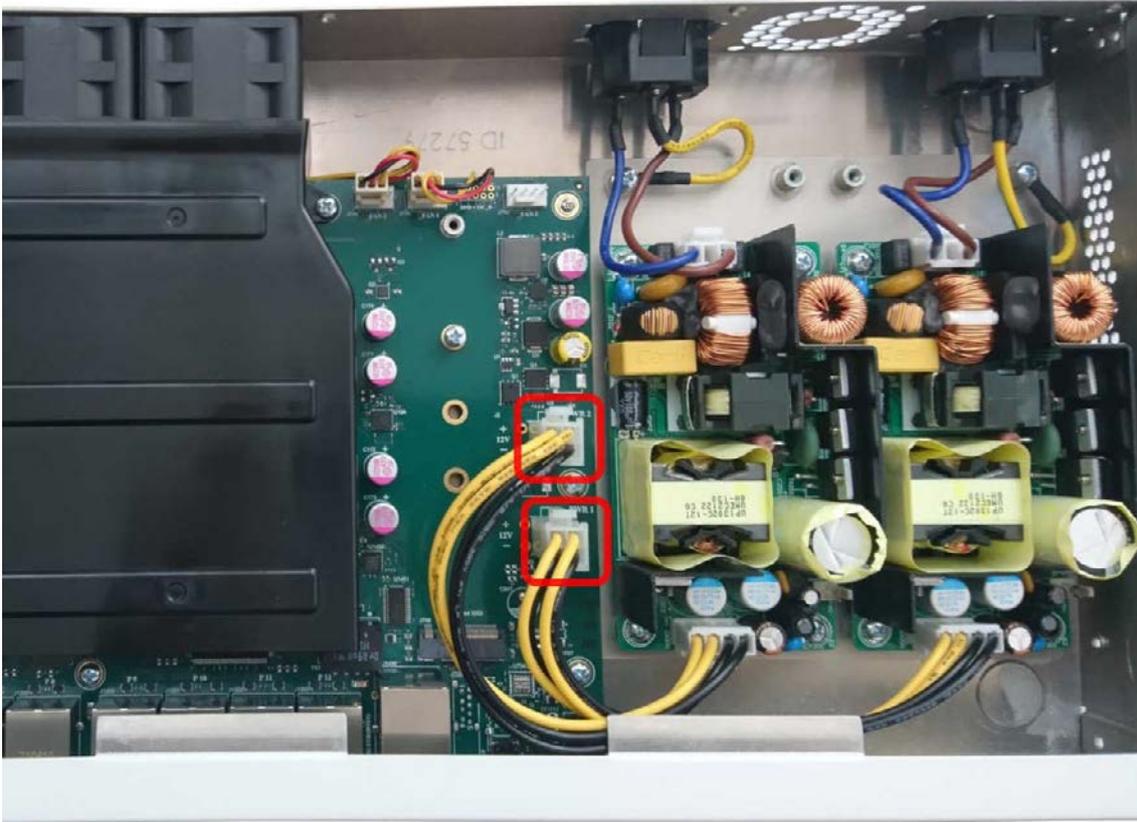
Disassembling information

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 237 and remove cover. When the cover is removed, disconnect PSUs from the board – PSU connectors are shown on picture 238. Avoid touching any other part of PSU in order to prevent possible electrical shock, board damage or equipment damage!

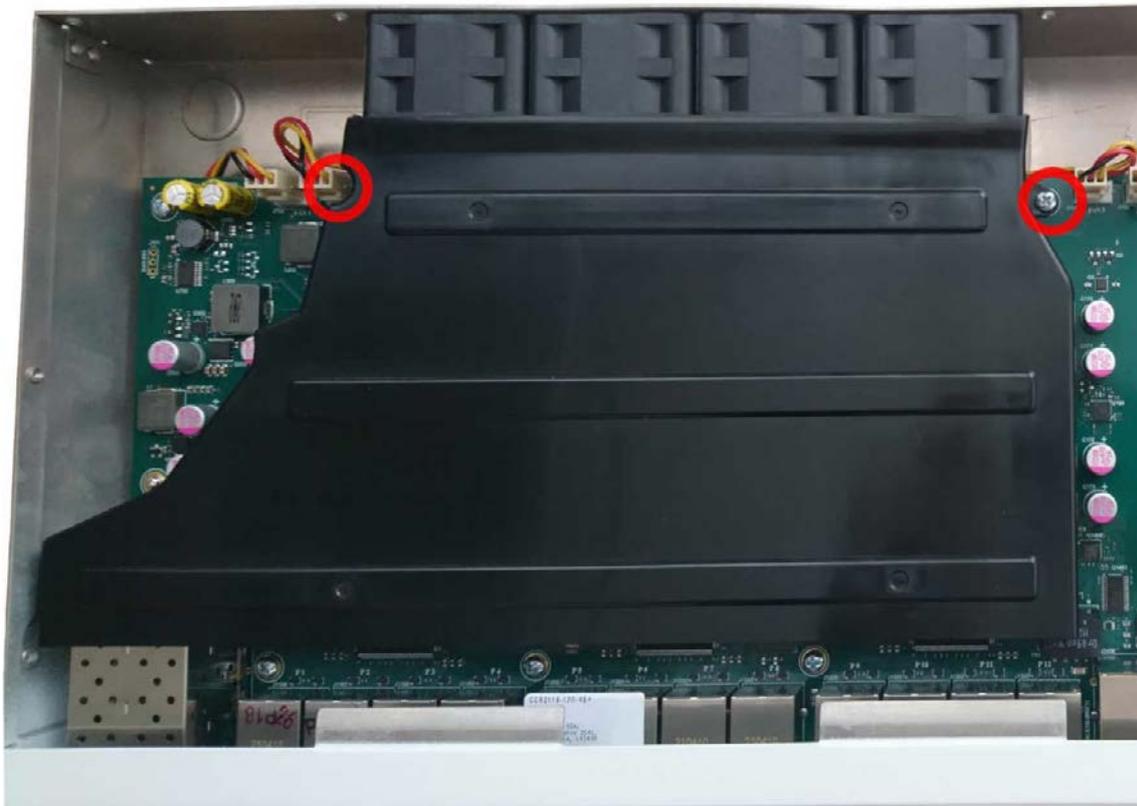
Step 2: Continue the disassembly by removing the wind tunnel, screw placement is shown on picture 239. A screw with a plastic spacer is located on the PSU side of the board, see picture 240. PH1 screwdriver is advised.



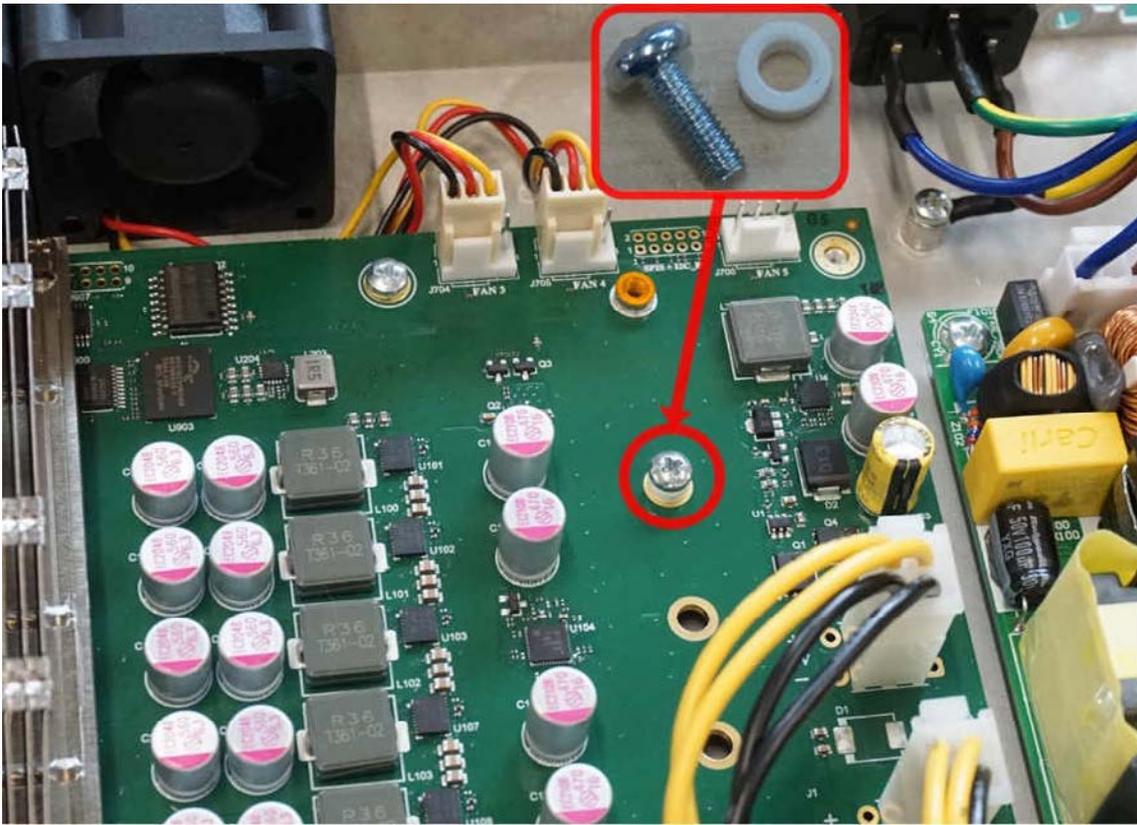
Picture 237



Picture 238

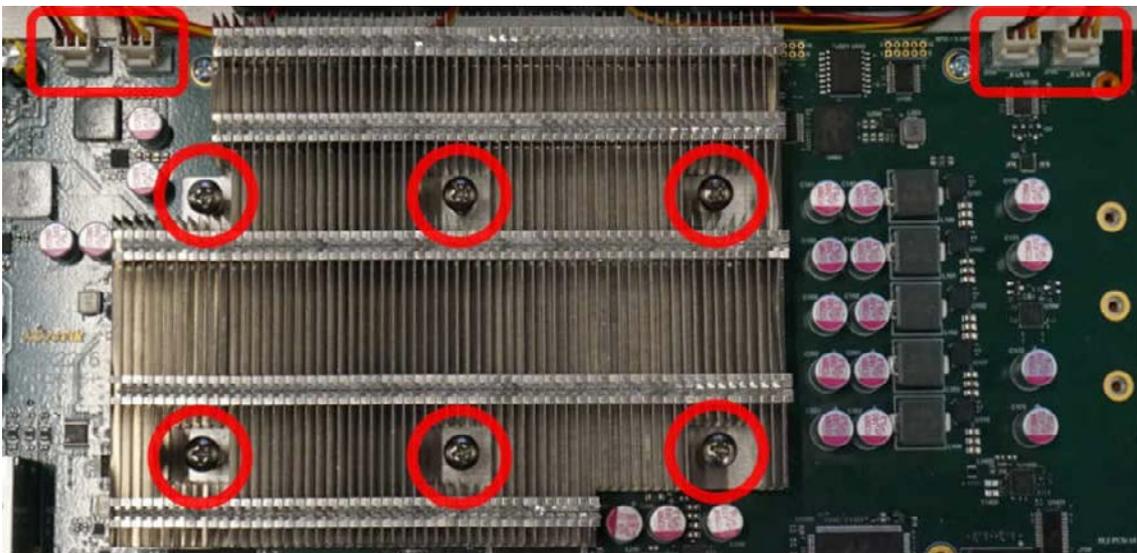


Picture 239



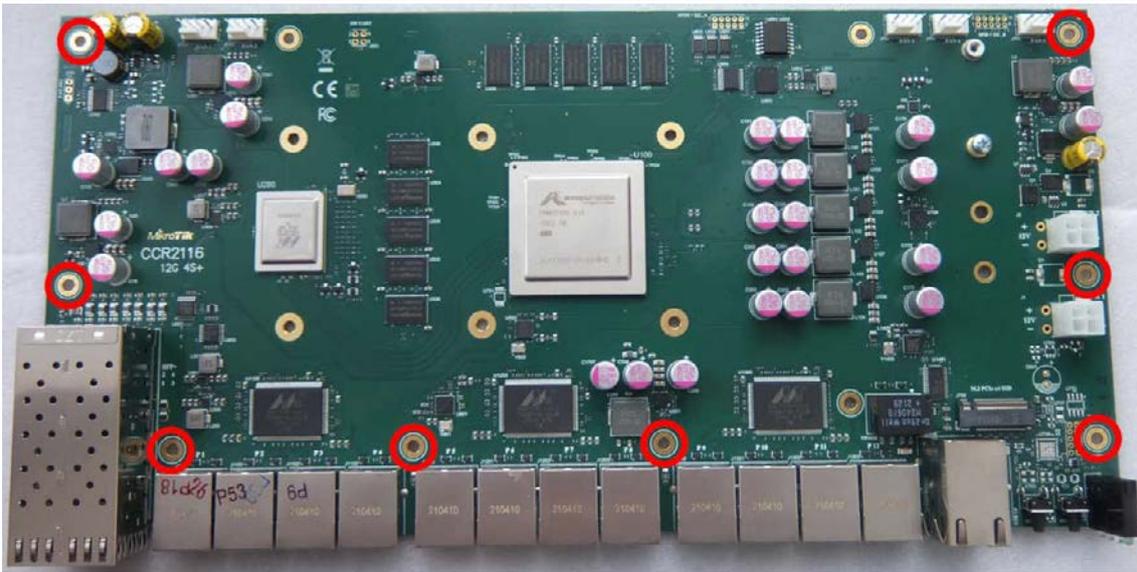
Picture 240

Step 3: Gently remove heatsink (PH2) and fan connectors indicated on picture 241.



Picture 241

Step 4: Using PH1 remove all other screws that are holding the PCB, screws position shown on picture 242.



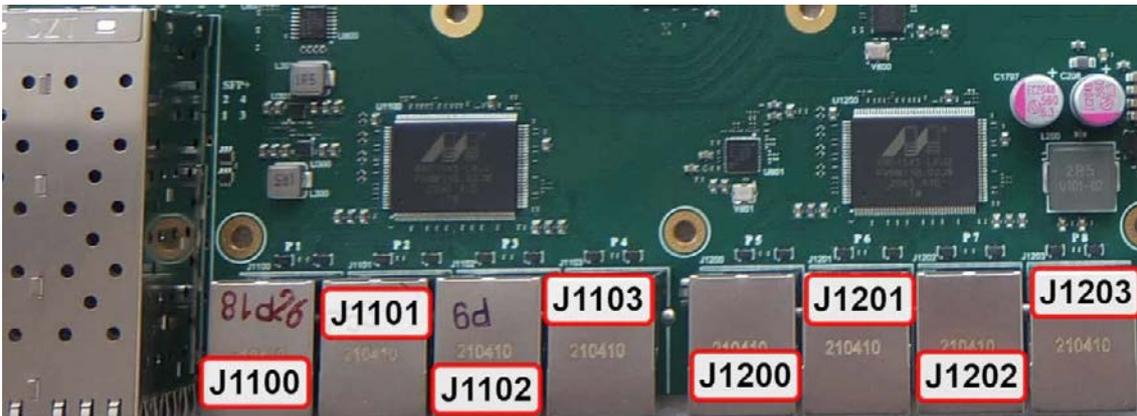
Picture 242

Instructions for checking overvoltage

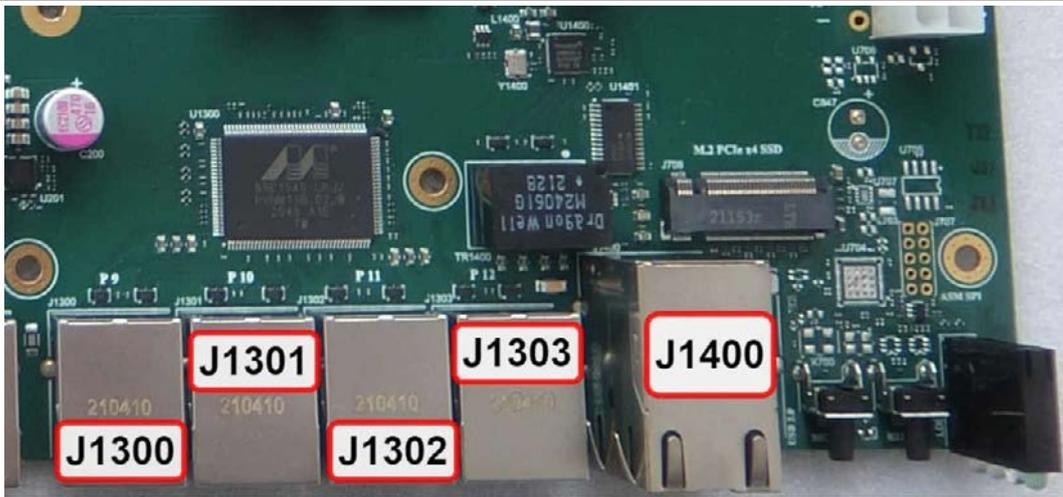
Checking termination resistors resistance in RJ-45 connector

Check resistance of termination resistors in the following connectors shown on pictures 243 and 244:

J1100, J1102, J1102, J1103, J1200, J1201, J1202, J1203, J1300, J1301, J1302, J1303, J1400.
Resistance value between Rx and Tx line must be 150 Ohm \pm 4%. Measurement method is described on page 22.



Picture 243



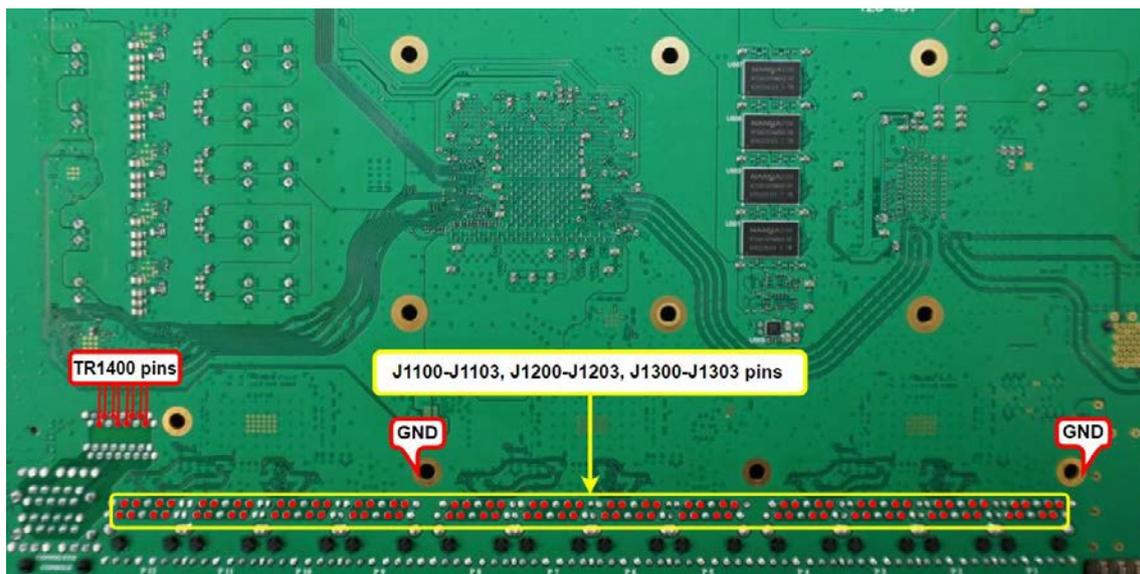
Picture 244

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 245. Voltage drop value should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page 21.

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 245. Voltage drop value should be in the range from 0,23V to 0,29V. Voltage drop measurement method is described on page 21.



Picture 245

CLOUD CORE ROUTER 2216 SERIES ROUTERBOARDS

CCR2216-1G-12XS-2XQ



Picture 246

Disassembling information

Step 1:

Using Phillips PH2 unscrew 11 side screws marked on picture [247](#) and remove the cover.



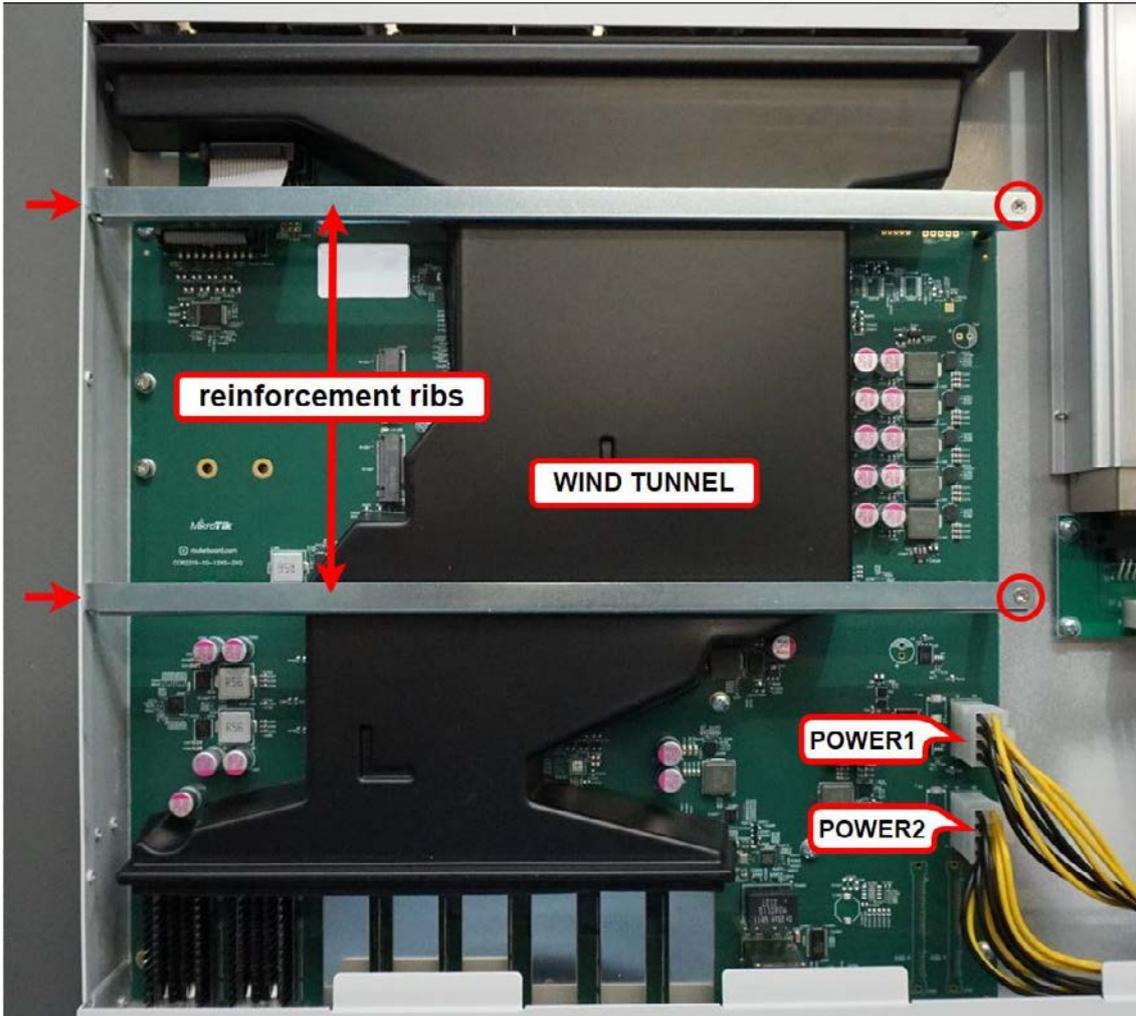
Picture 247

Step 2:

Using Phillips PH2 unscrew 2 side screws and 2 top screws, and then remove reinforcement ribs as shown in picture [248](#).

Step 3:

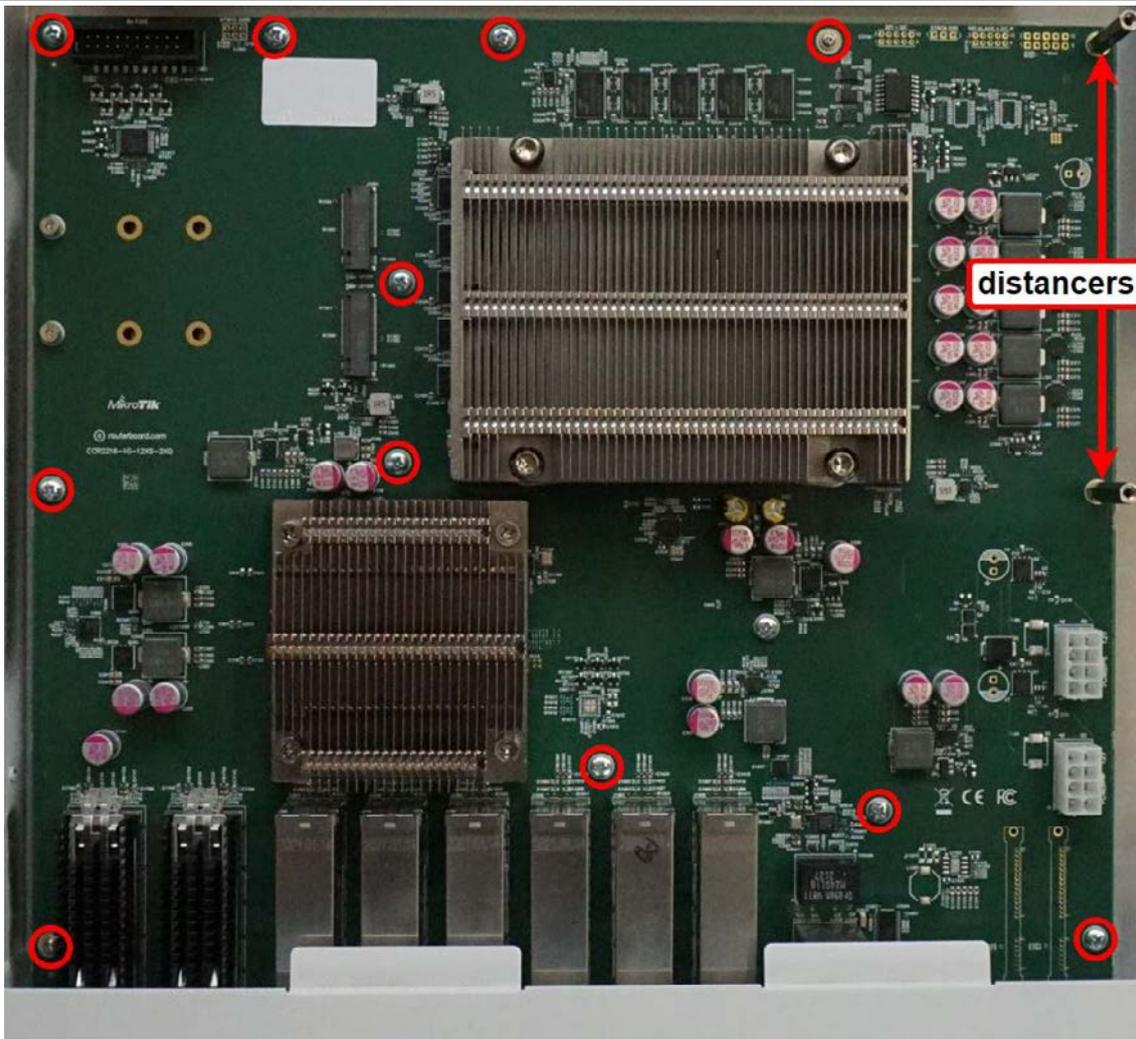
Unplug power supply connectors and gently remove the wind tunnel, see picture 248.



Picture 248

Step 4:

Using 5.5 mm Hex Nut Driver unscrew 2 distancers and using Phillips PH1 unscrew 11 screws, see picture 249.

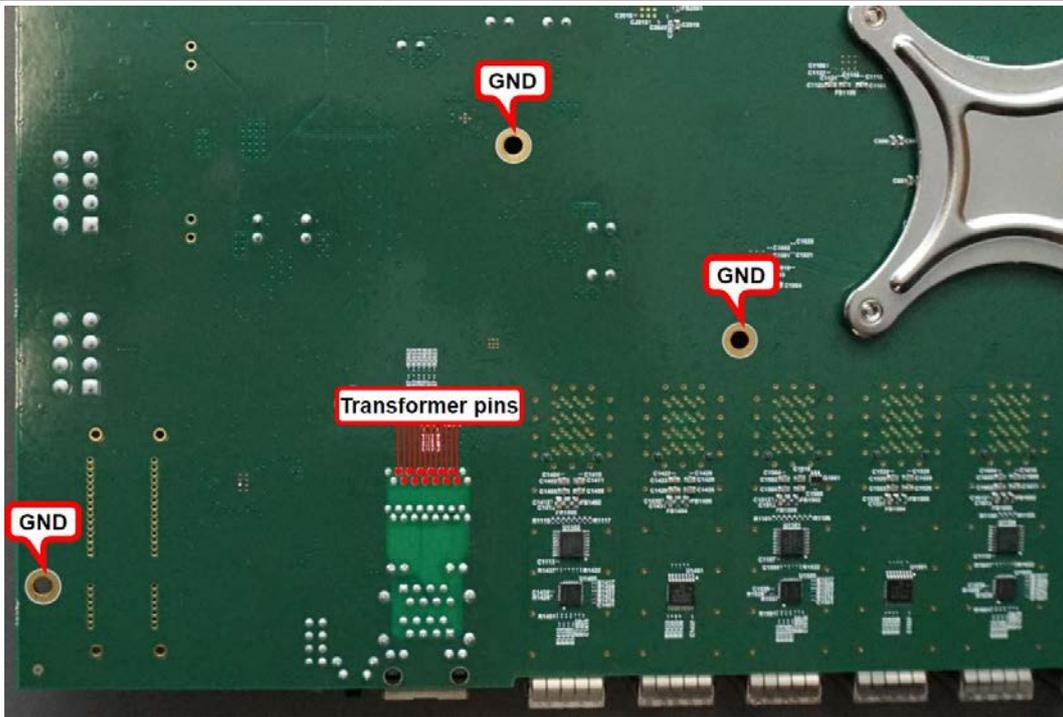


Picture 249

Instructions for checking overvoltage

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR2600 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 250. Voltage drop value should be in the range from 0,45V to 0,52V. Voltage drop measurement method is described on page 21.



Picture 250

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 251.



Picture 251

ROSE DATA SERVER (RDS)

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



Picture 252

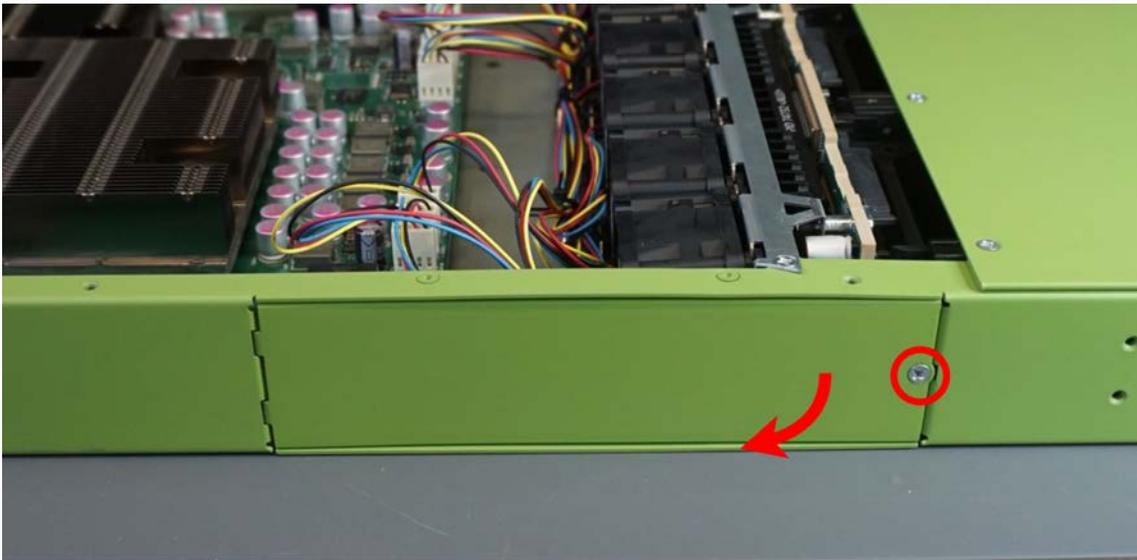
Disassembling information

Step 1: Unscrew 12 screws using Phillips PH2 screwdriver and carefully remove the cover. Location of the screws you can see in the picture [253](#).



Picture 253

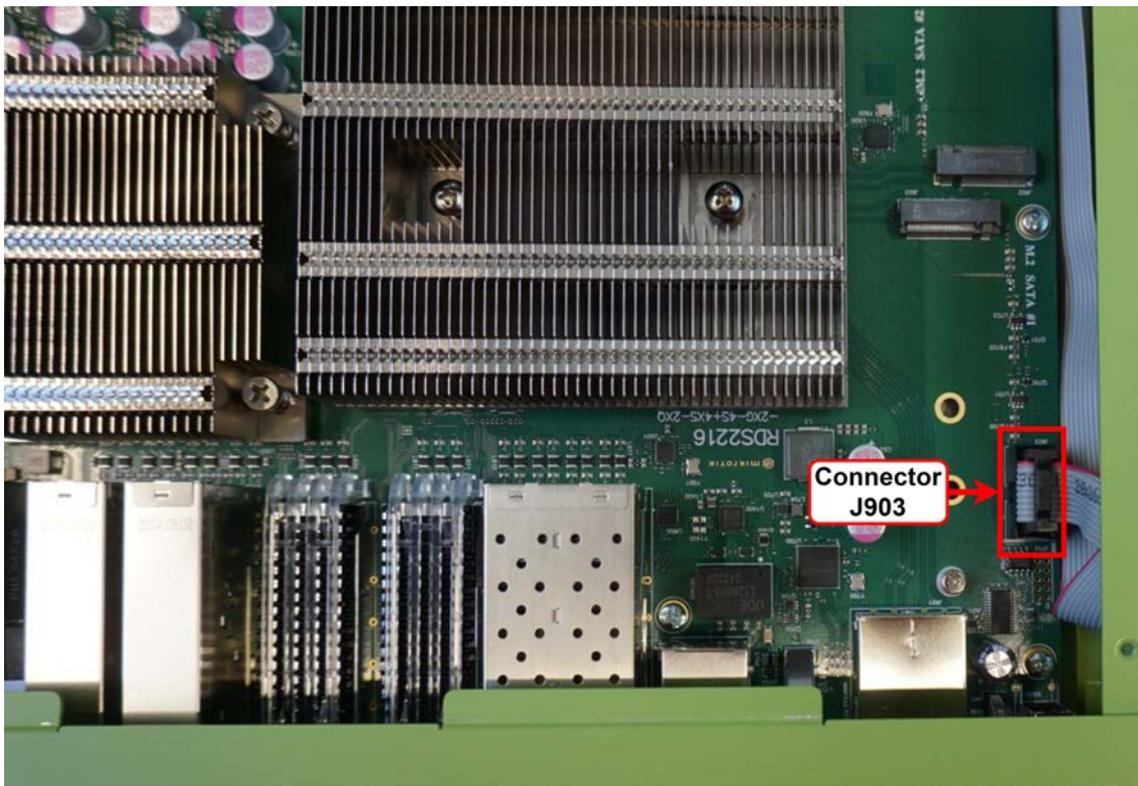
Step 2: Using Philips PH2 screwdriver unscrew the screw which is on the right side of the case and carefully remove the side cover, see picture [254](#).



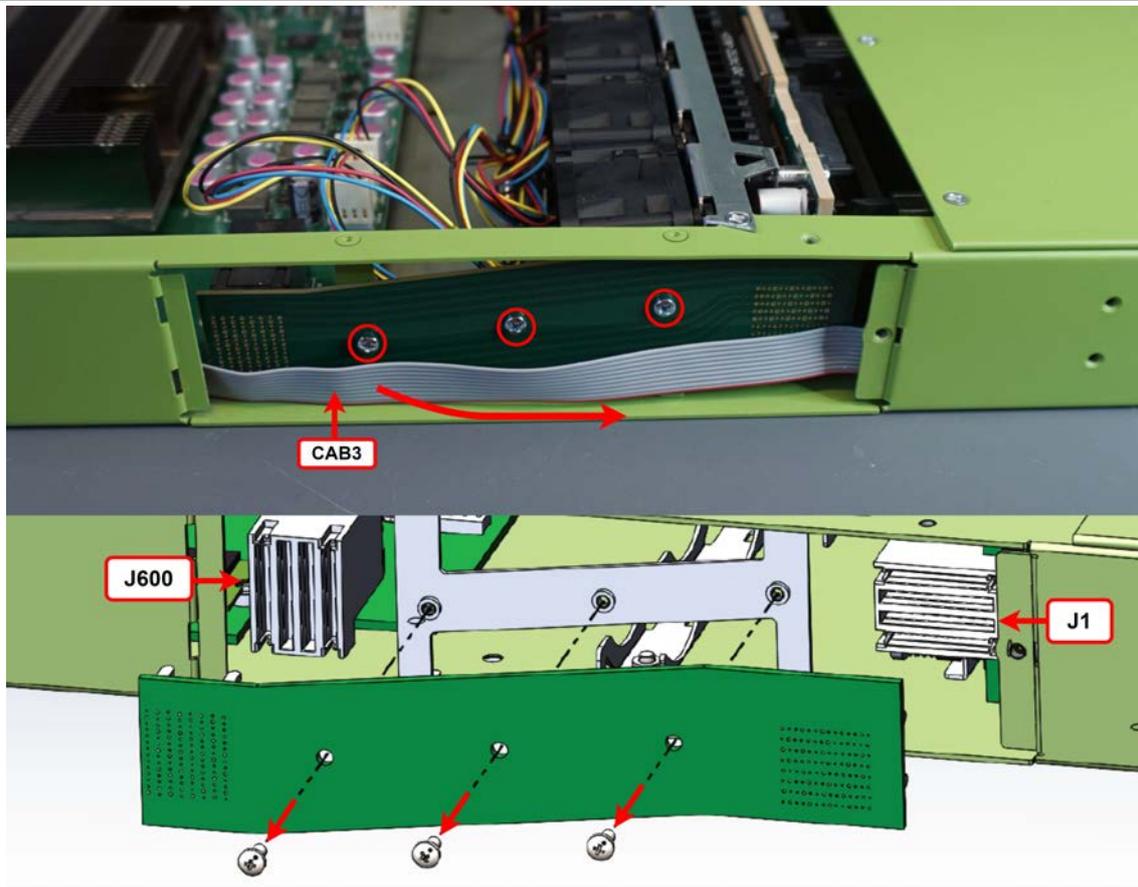
Picture 254

Step 3: Disconnect the cable CAB1 from the connector J903 and pull the cable through the side hole, see pictures 255 and 256.

Step 4: Using Philips PH2 screwdriver unscrew three screws and carefully disconnect the linking board from two connectors J600 and J1, see picture 256.



Picture 255



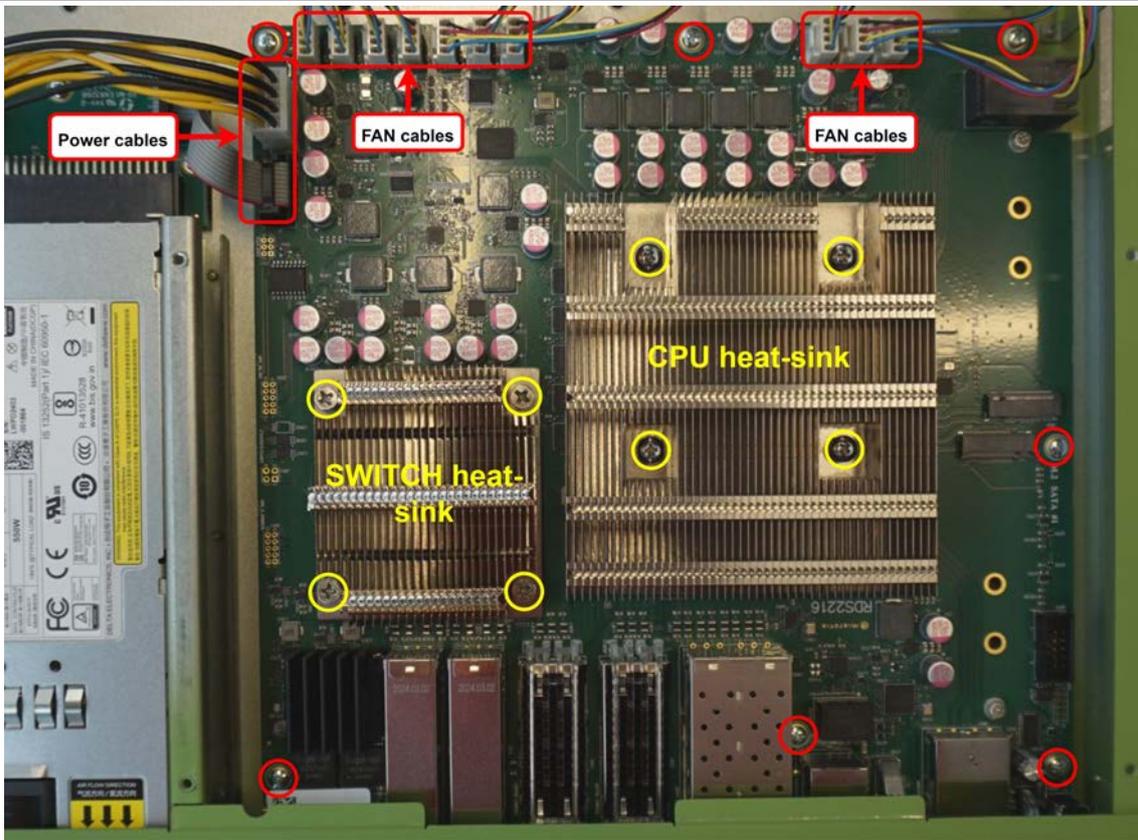
Picture 256

Step 5: Disconnect all power and FAN cables. Location of the cables you can see the picture [257](#).

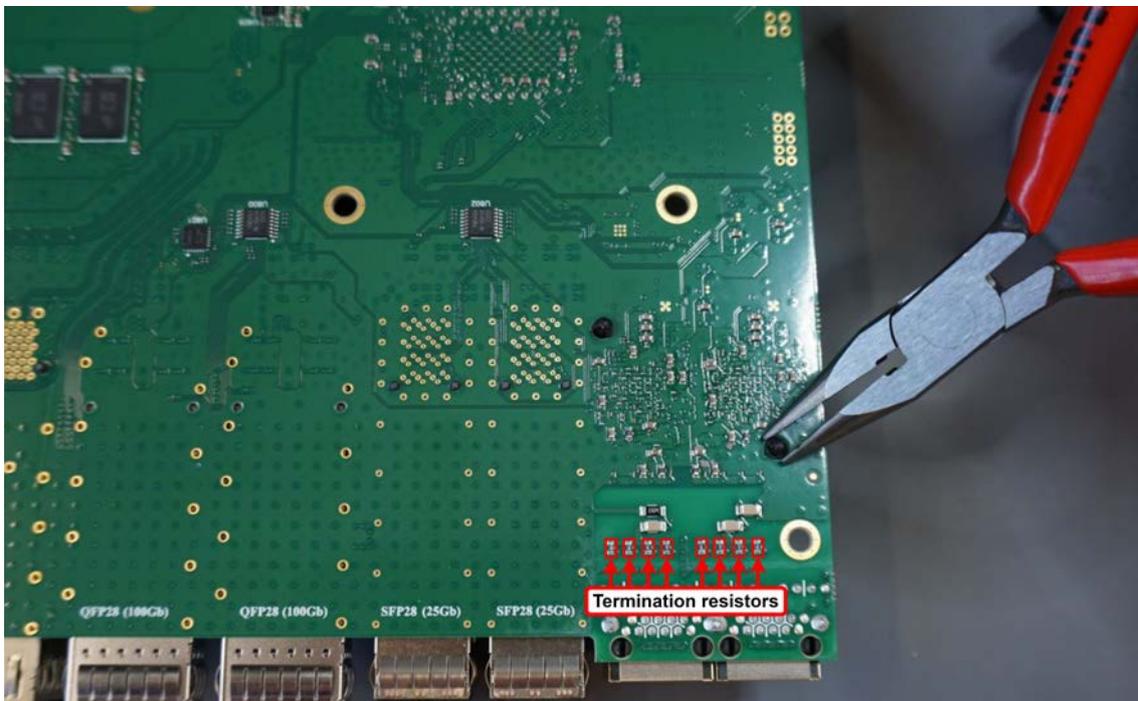
Step 6: Using Philips PH2 screwdriver unscrew eight screws which hold CPU and SWITCH heat-sinks, after that remove the heat-sinks. The screws are circled in yellow, see picture [257](#).

Step 7: Using Philips PH2 screwdriver unscrew seven screws that are circled in red and remove PCB from the case, see picture [257](#).

Step 8: Turn the PCB over and using pliers gently squeeze heat sink mount clips such that they fall through the holes, see picture [258](#).



Picture 257



Picture 258

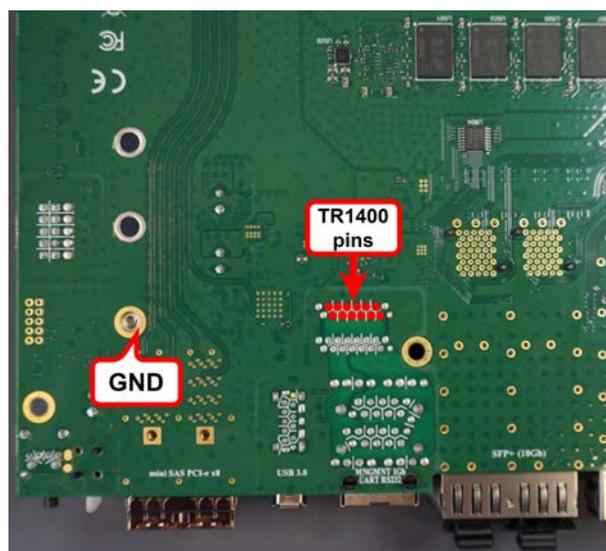
Checking procedure for over-voltage

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 259 and 260. Voltage drop value should be in the range from 0,40V to 0,50V. Voltage drop measurement method is described on page 21.



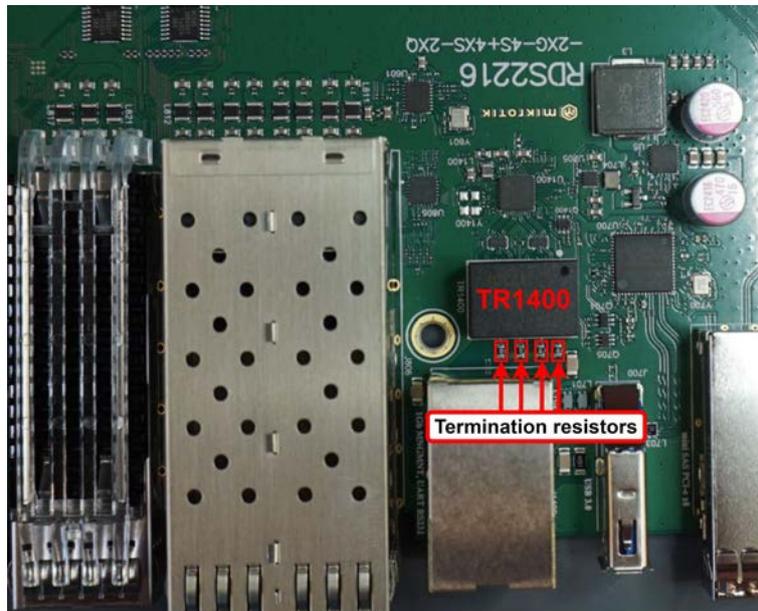
Picture 259



Picture 260

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 258 and 261.



Picture 261

CLOUD SMART SWITCH 318 SERIES ROUTERBOARD

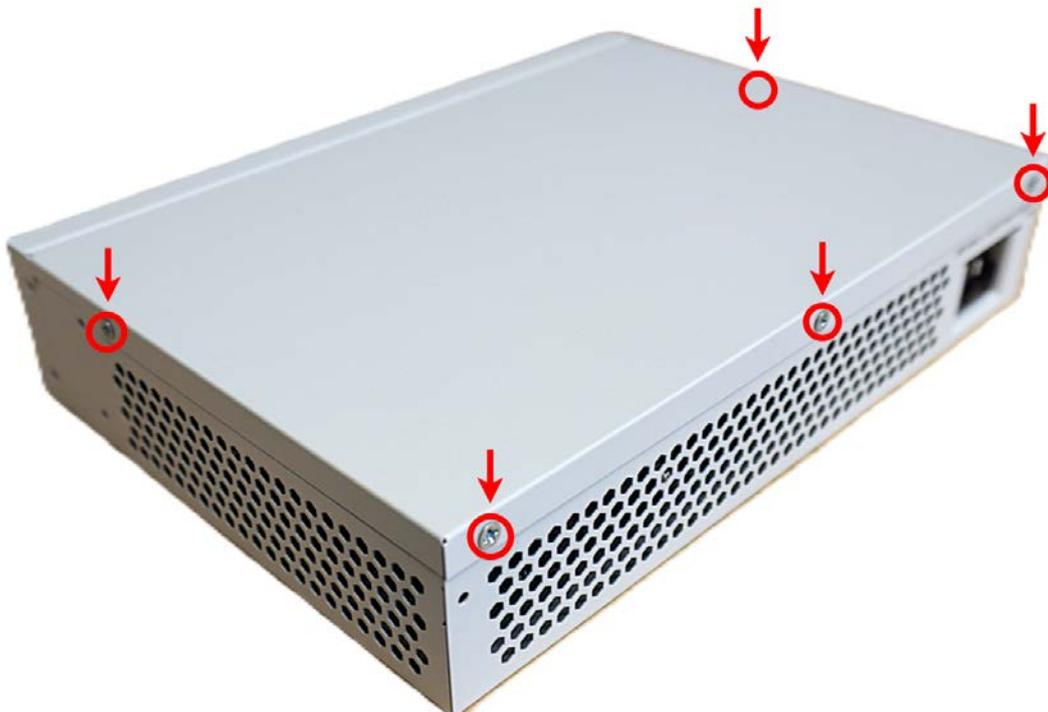
CSS318-16G-2S+



Picture 262

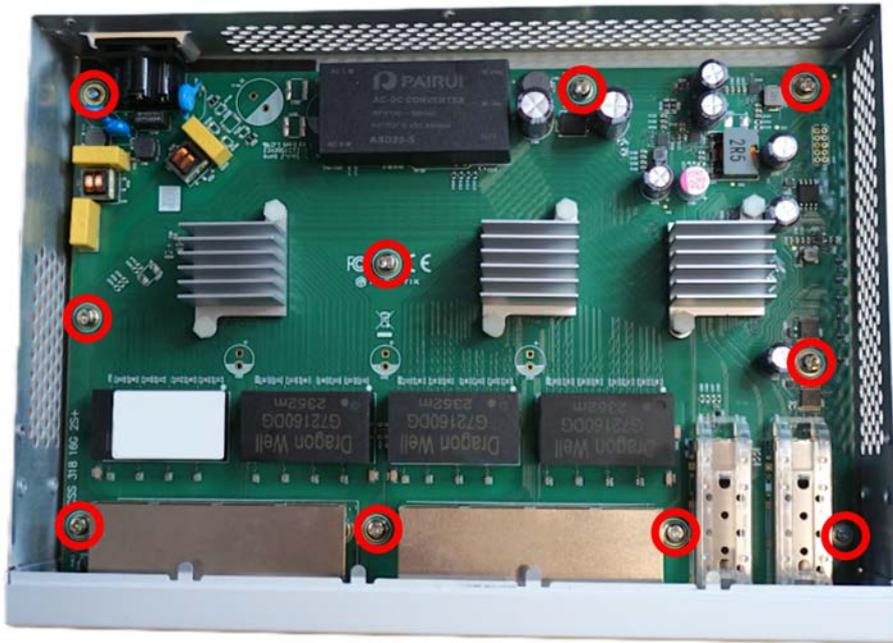
Disassembling information

Step 1: Unscrew 5 screws using a PH2 screwdriver and carefully remove the cover. Location of the screws is shown in the picture 263.



Picture 263

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 [264](#).



Picture 264

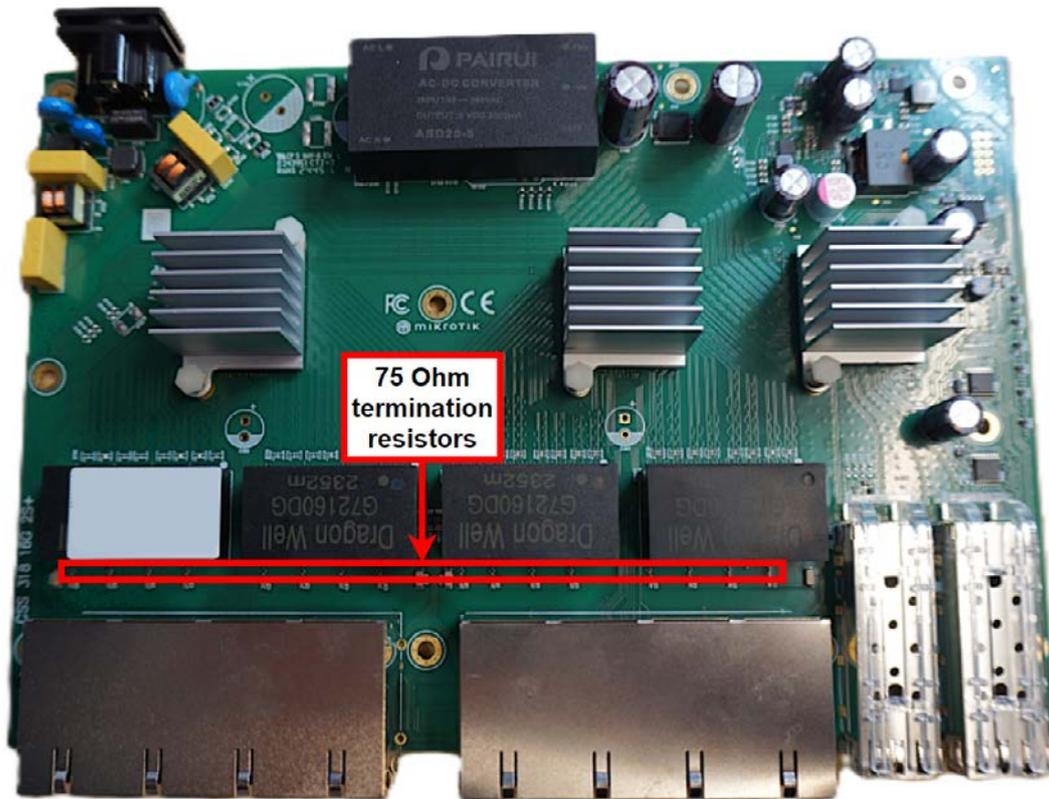
Checking procedure for over-voltage

Checking 75 Ohm termination resistors resistance

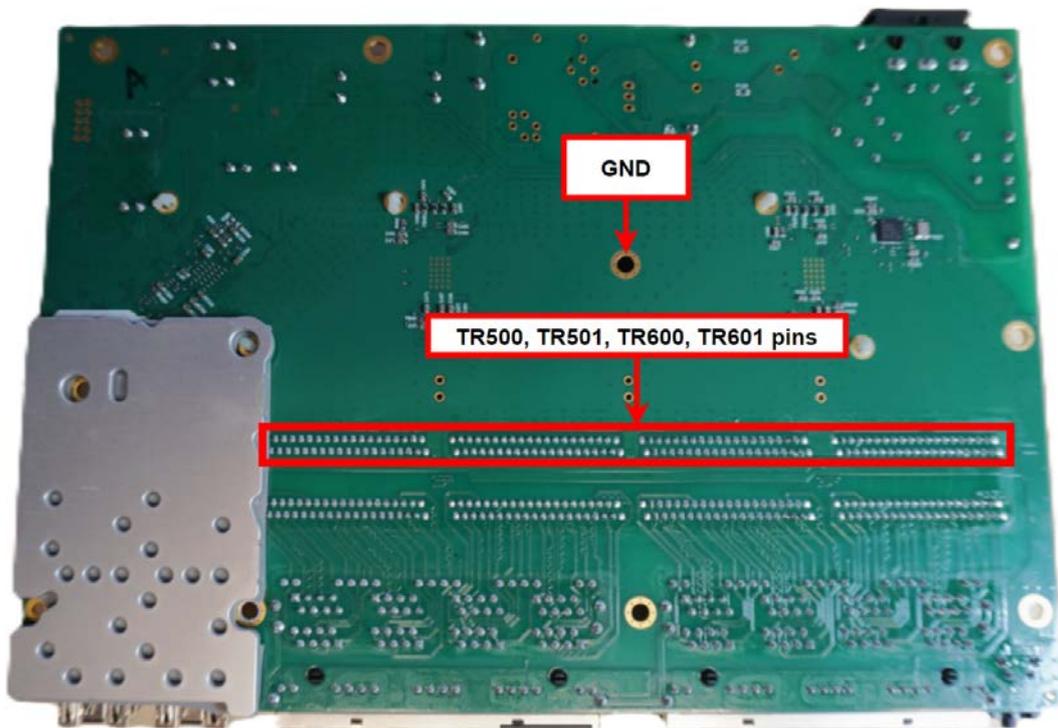
Check value of each termination resistors. It should be $75 \pm 1\%$ Ohms. Location of resistors is shown in picture [265](#).

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 [21](#).



Picture 265



Picture 266

CLOUD SMART SWITCH 610 SERIES ROUTERBOARDS

CSS610-8P-2S+IN



Picture 267

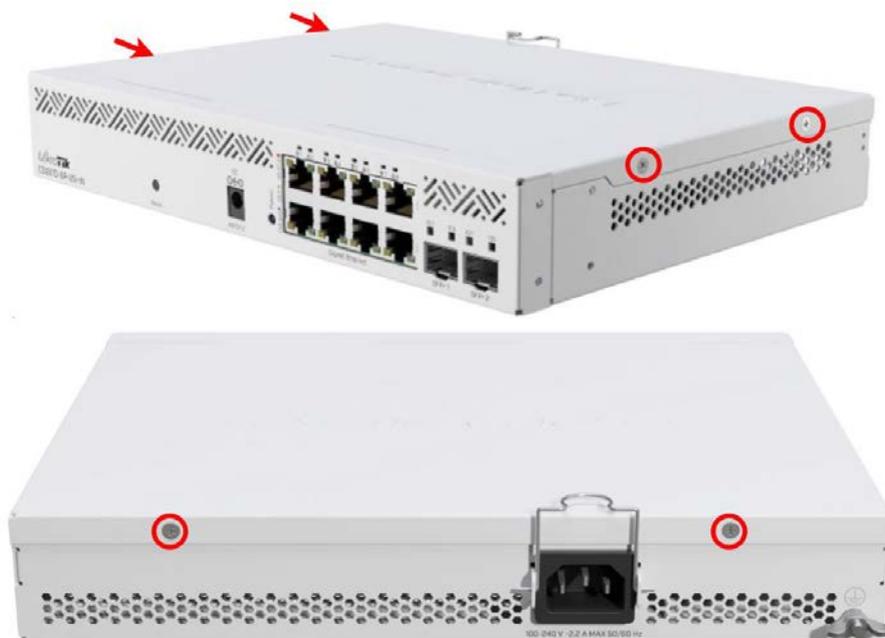
Disassembling information

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:

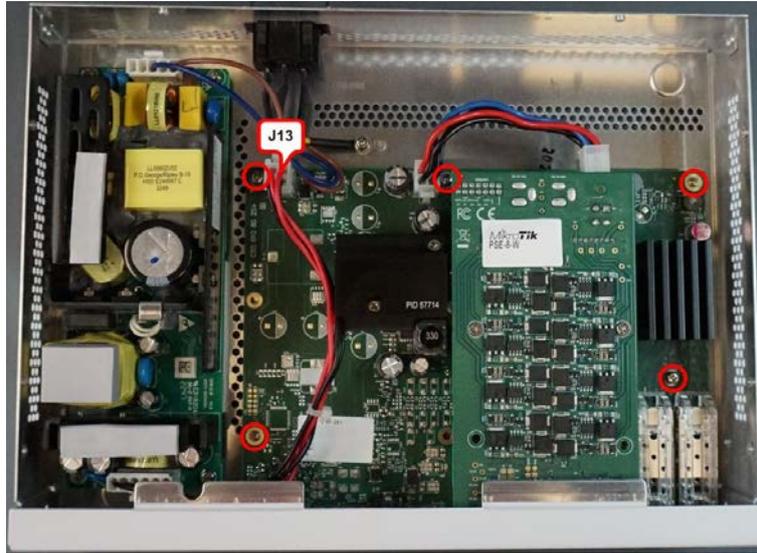
Using Phillips PH2 screwdriver unscrew 6 side screws and remove the cover, see picture 268.



Picture 268

Step 2:

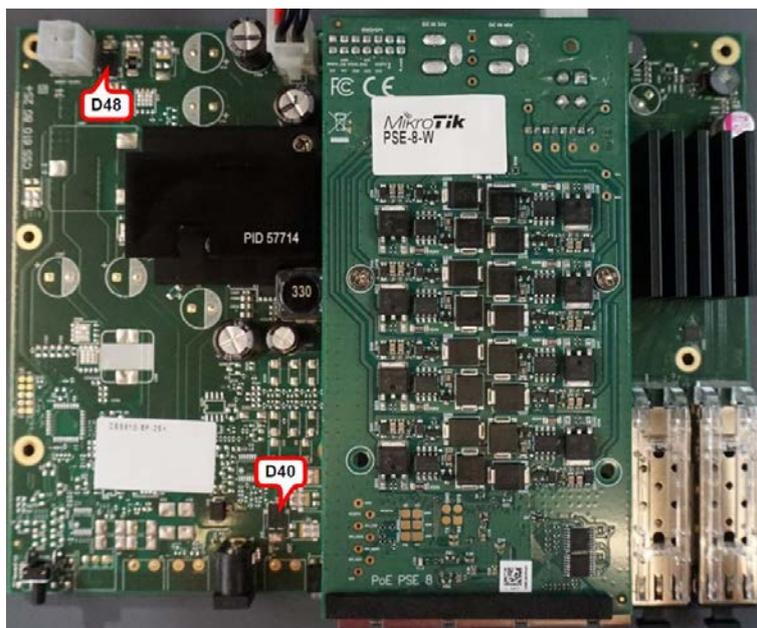
Disconnect from the board the connector J13 and using Phillips PH1 screwdriver unscrew 5 screws, see picture 269.



Picture 269

Instructions for checking overvoltage**Checking Schottky diodes**

Check Schottky diodes D40, D48. Location of the diodes you can see in the picture 270. Schottky diode quality measurement method is described on page 18.



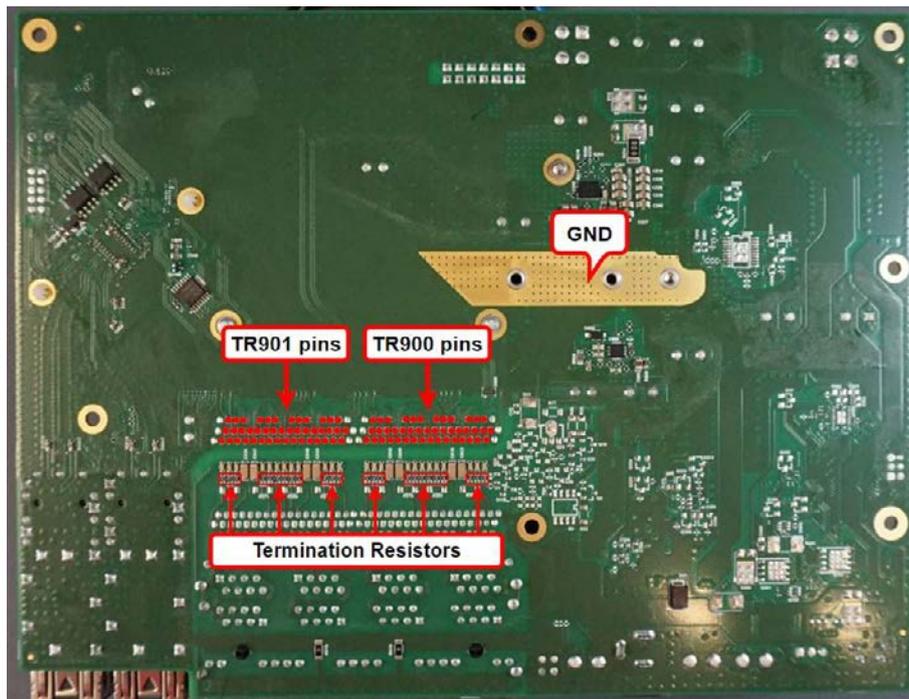
Picture 270

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 271. Voltage drop value should be in the range from 0,32V to 0,55V. Voltage drop measurement method is described on page 21.

Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 Ohms +/- 1%. Location of the termination resistors is shown in picture 271.



Picture 271

1100 SERIES ROUTERBOARDS

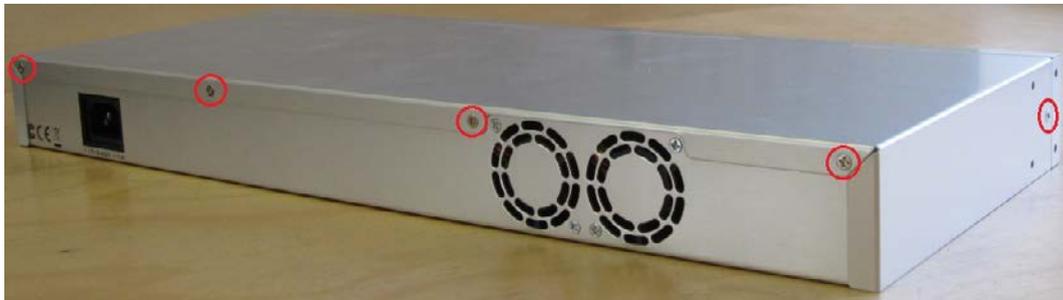
RB1100AHx2



Picture 272

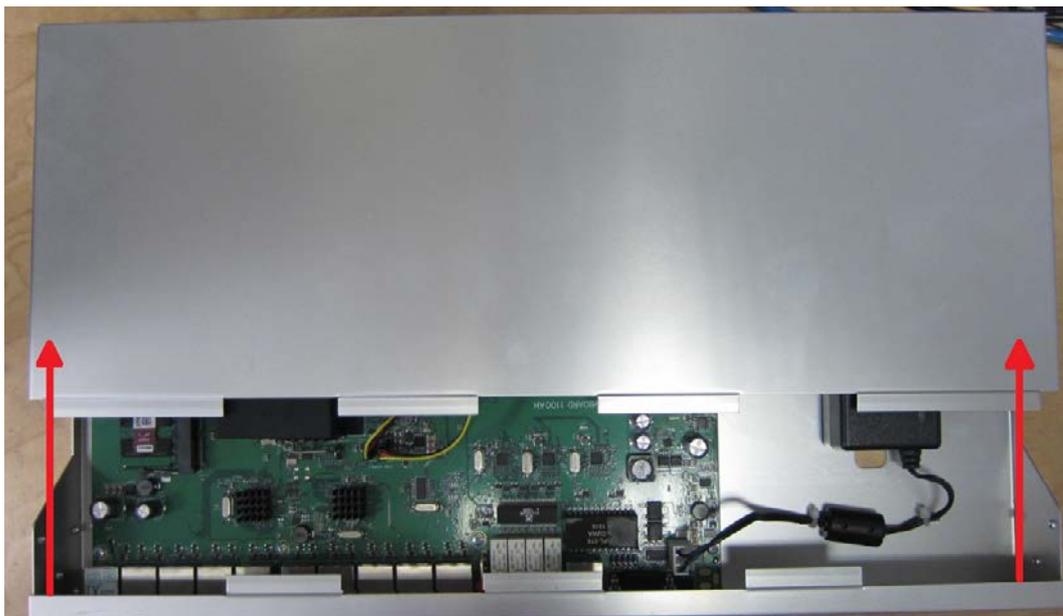
Disassembling information

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 273.



Picture 273

Step 2: Pull the cover away from you, see picture 274.



Picture 274

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 275. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

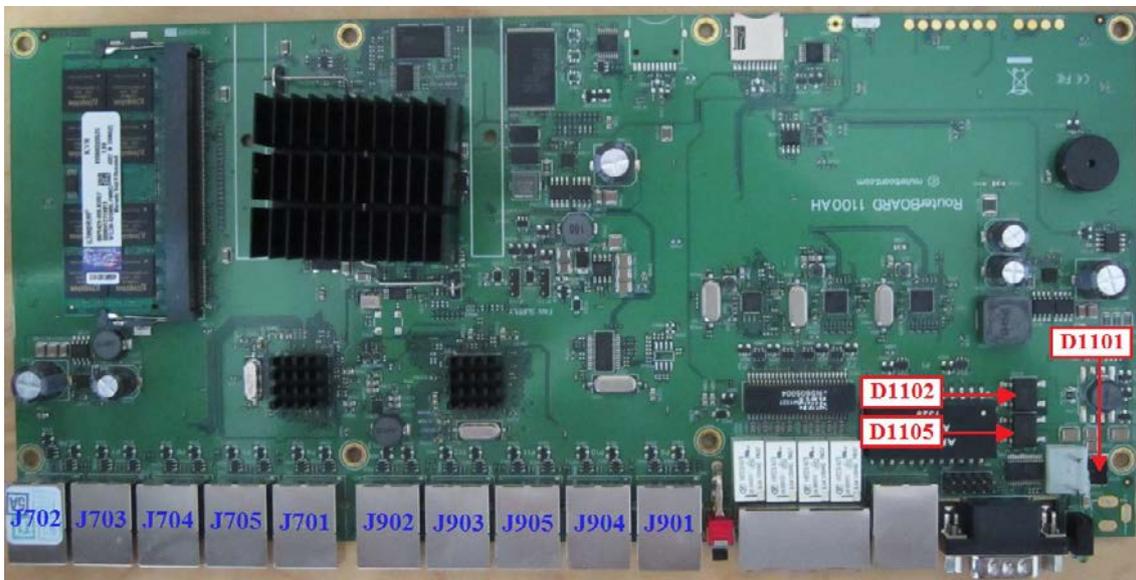
Checking voltage drop value between diode array pin#1 and Ground

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 276. Voltage drop value should be in the range from 0,3V to 0,34V. Voltage drop measurement method is described on page 20.

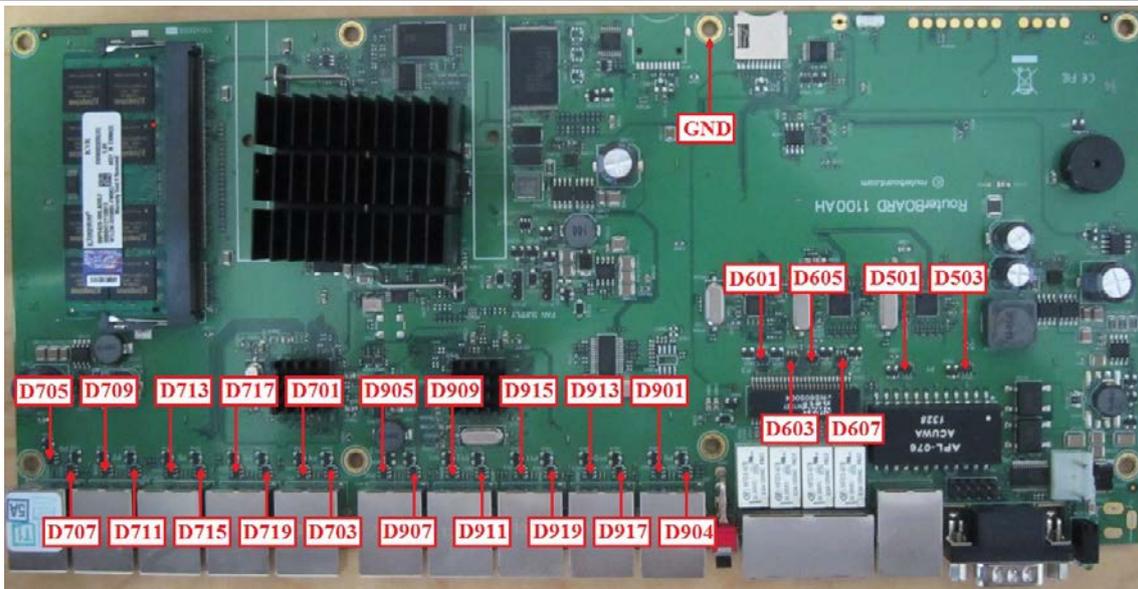
Then check voltage drop value between diode arrays D601, D603, D901, D904, D913, D917, D919, D915, D911, D909, D907, D905, D703, D701, D719, D717, D715, D713, D711, D709, D707, D705 pin#1 and Ground. Location of diode arrays on the board you can see in the picture 276.

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 22.



Picture 275



Picture 276

RB1100AHx4 Dude Edition

RB1100AHx4



Picture 277

Disassembling information

Disassembly method of the board is the same as the RB1100AHx2 board. Disassembly method is described on page [241](#).

Instructions for checking overvoltage

Checking Schottky diode and diodes bridges

Check Schottky diodes D1, D4, D11-D15 and diode bridge D9. Location of diodes on the board you can see in the picture [278](#). Schottky diode quality measurement method is described on page [18](#). Diode bridge quality measurement method is described on page [19](#).

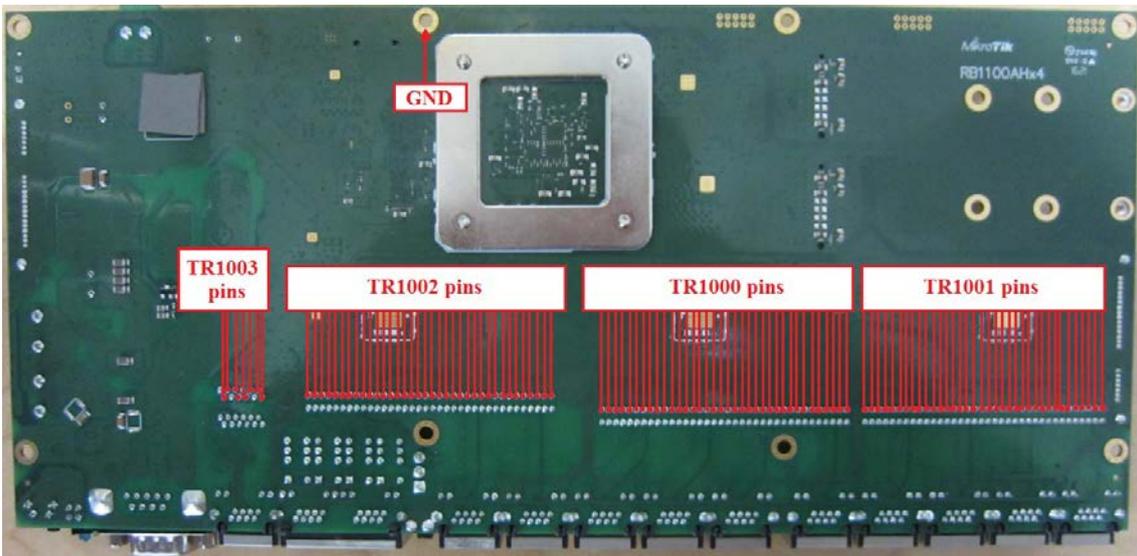
Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR1000-TR1002 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [278](#). Voltage drop value should be in the range from 0,36V to 0,4V. Voltage drop measurement method is described on page [21](#).

Check voltage drop value between transformer TR1003 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [278](#). Voltage drop value should be in the range from 0,36V to 0,4V. Voltage drop measurement method is described on page [21](#).



Picture 278



Picture 279

2011 SERIES ROUTERBOARDS

RB2011iL-IN

RB2011iL-RM

RB2011iLS-IN

RB2011UiAS-IN

RB2011UiAS-RM

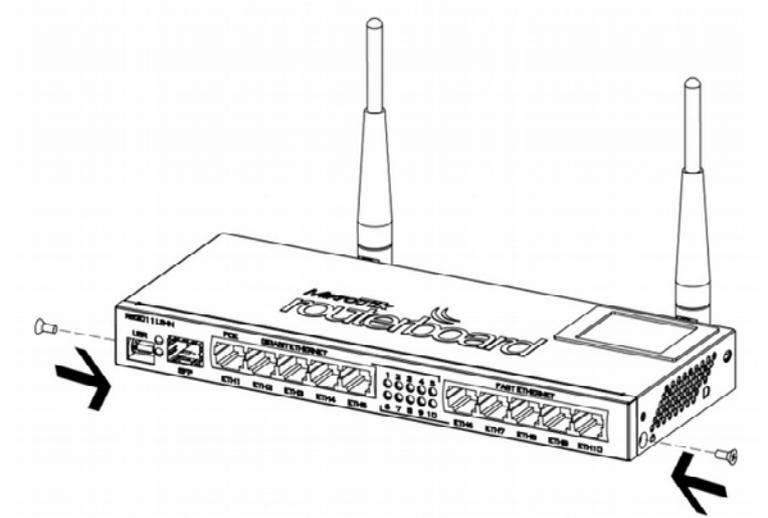
RB2011UiAS-2HnD-IN



Picture 280

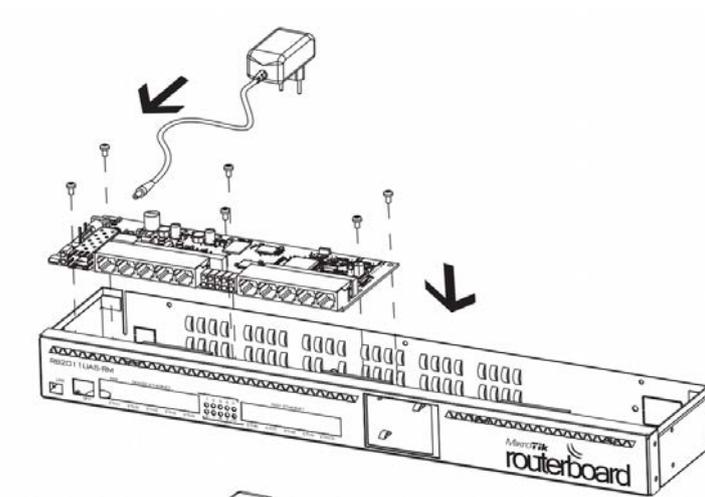
Indoor 2011 series RouterBoard disassembling information

Step 1: Unscrew 2 screws on each side of board case using PH2 screwdriver. Location of the screws you can see in the picture [281](#).



Picture 281

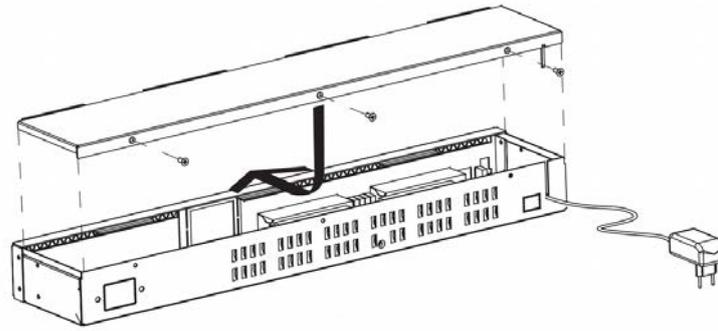
Step 2: Unscrew 6 screws which fasten PCB to routerboard case. Location of the screws you can see in the picture [282](#).



Picture 282

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 [283](#).



Picture 283

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 [284](#). Schottky diode quality measurement method is described on page [18](#). 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 [19](#).

Checking voltage drop value between Ethernet transformer pins and Ground

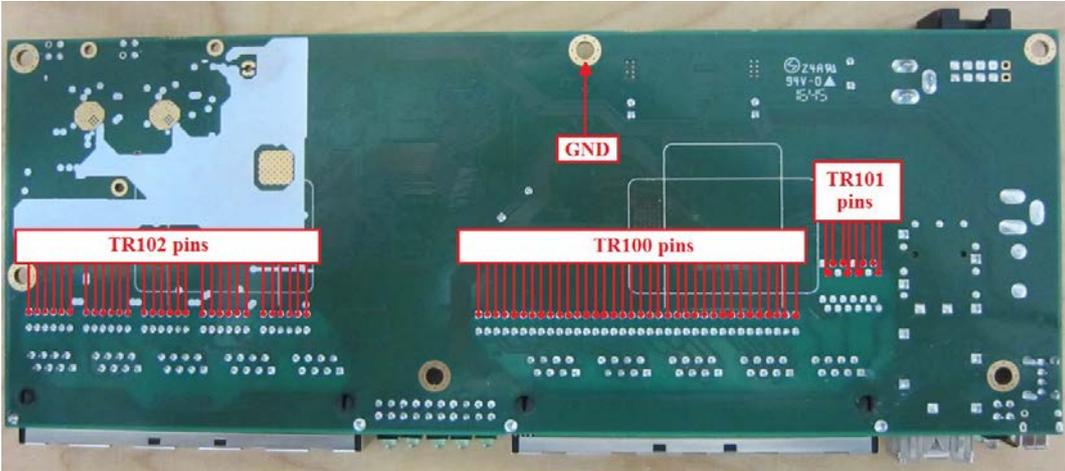
Check voltage drop value between transformer TR101 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [285](#). Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [21](#).

Check voltage drop value between transformer TR100 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [285](#). Voltage drop value should be in the range from 0,36V to 0,42V. Voltage drop measurement method is described on page [21](#).

Check voltage drop value between transformer TR102 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [285](#). Voltage drop value should be in the range from 0,3V to 0,38V. Voltage drop measurement method is described on page [21](#).



Picture 284



Picture 285

3011 SERIES ROUTERBOARDS

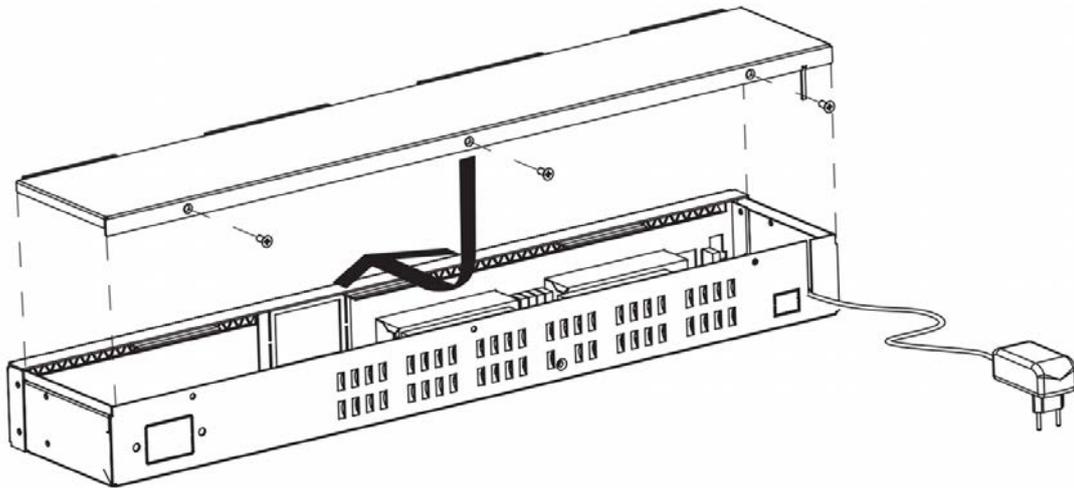
RB3011UiAS-RM



Picture 286

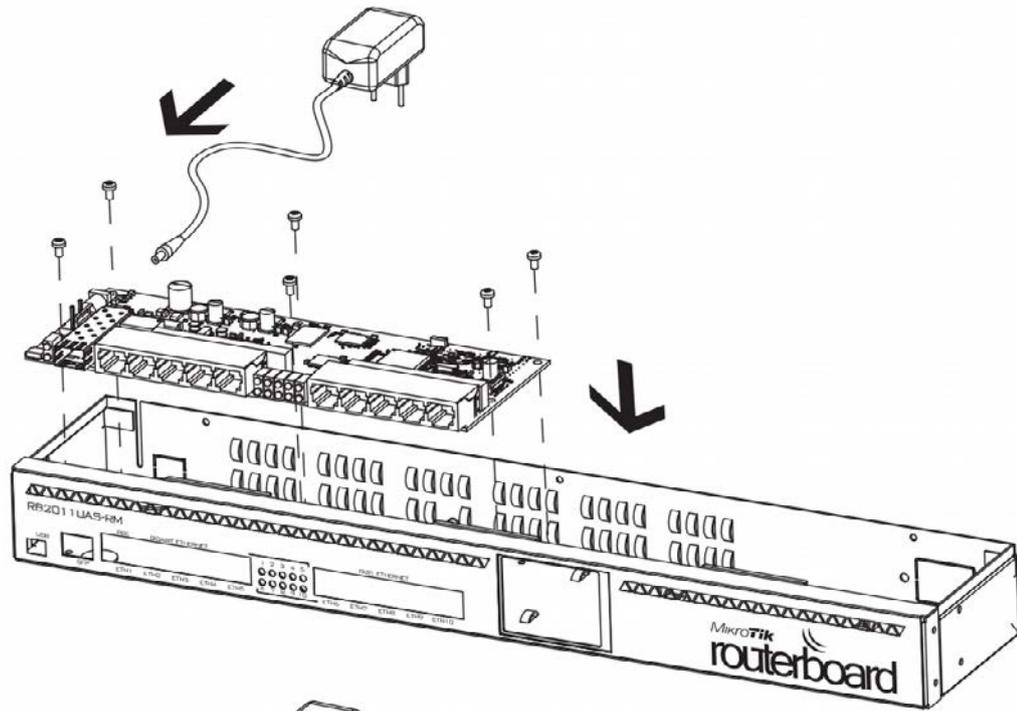
Disassembling information

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 287.



Picture 287

Step 2: Unscrew 6 screws which fasten PCB to routerboard case. Location of the screws, see picture 288.



Picture 288

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 [289](#). Schottky diode quality measurement method is described on page [18](#).

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 [290](#). Voltage drop value should be in the range from 0,4V to 0,46V. Voltage drop measurement method is described on page [21](#).

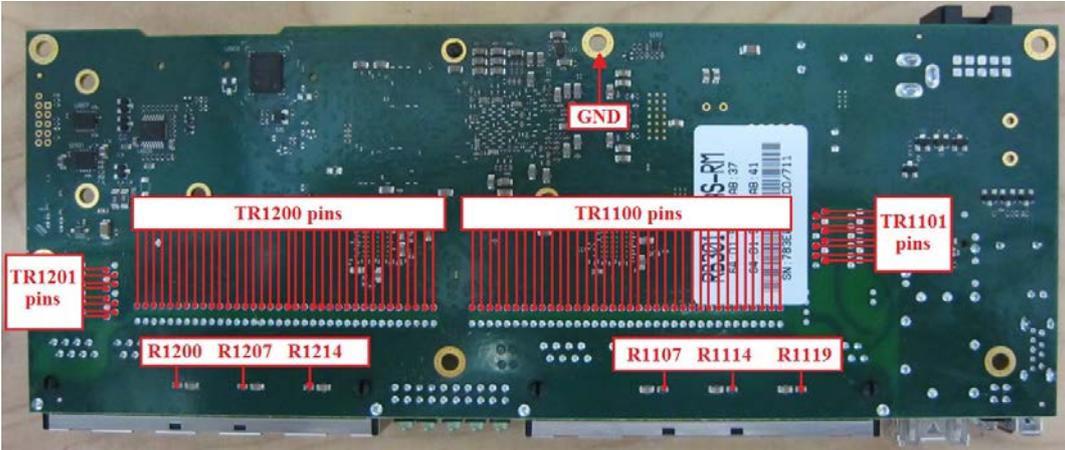
Check voltage drop value between transformer TR1100 and TR1200 pins and Ground. Test points on the transformer pins are marked with red dots, see picture [290](#). Voltage drop value should be in the range from 0,34V to 0,4V. Voltage drop measurement method is described on page [21](#).

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 [290](#).



Picture 289



Picture 290

4011 SERIES ROUTERBOARDS

RB4011iGS+RM

RB4011iGS+5HacQ2HnD-IN



Picture 291

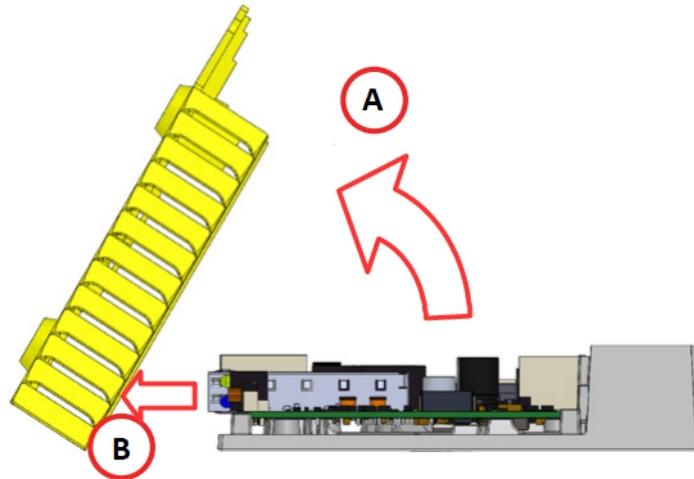
Disassembling information

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 [292](#).



Picture 292

Step 2: Lift the plastic cover according to picture 293.

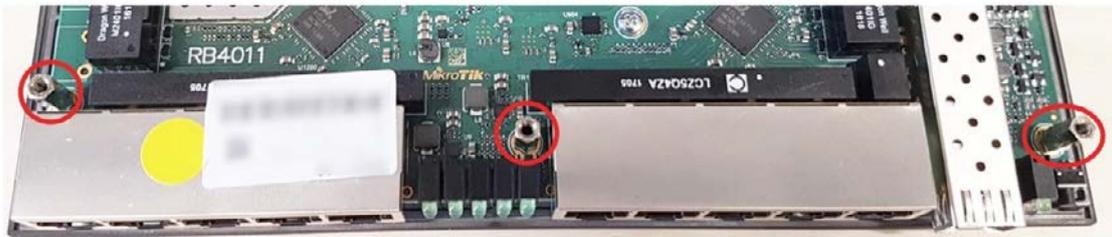


Picture 293

Step 3: Undo 3 hexagonal threaded spacers and 1 screw according to picture 294.



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



Picture 294

Instructions for checking overvoltage

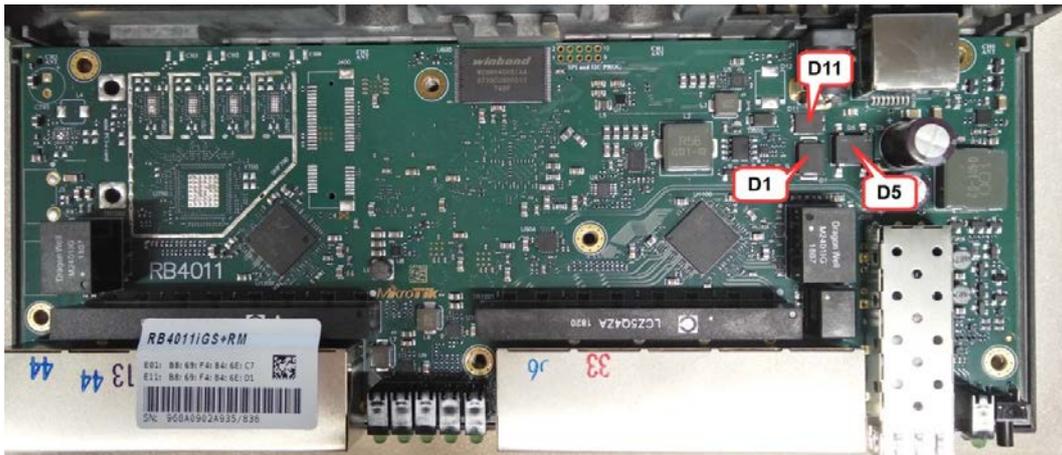
Checking Schottky diode and diodes bridges

Check Schottky diodes D11, D1 and diode bridge D5. Location of diodes on the board you can see in the picture 295. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

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 296. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 21.

Check voltage drop value between Transformer TR1001, TR1000 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 296. Voltage drop value should be in the range from 0,34V to 0,4V. Voltage drop measurement method is described on page 21.



Picture 295



Picture 296

5009 SERIES ROUTERBOARDS

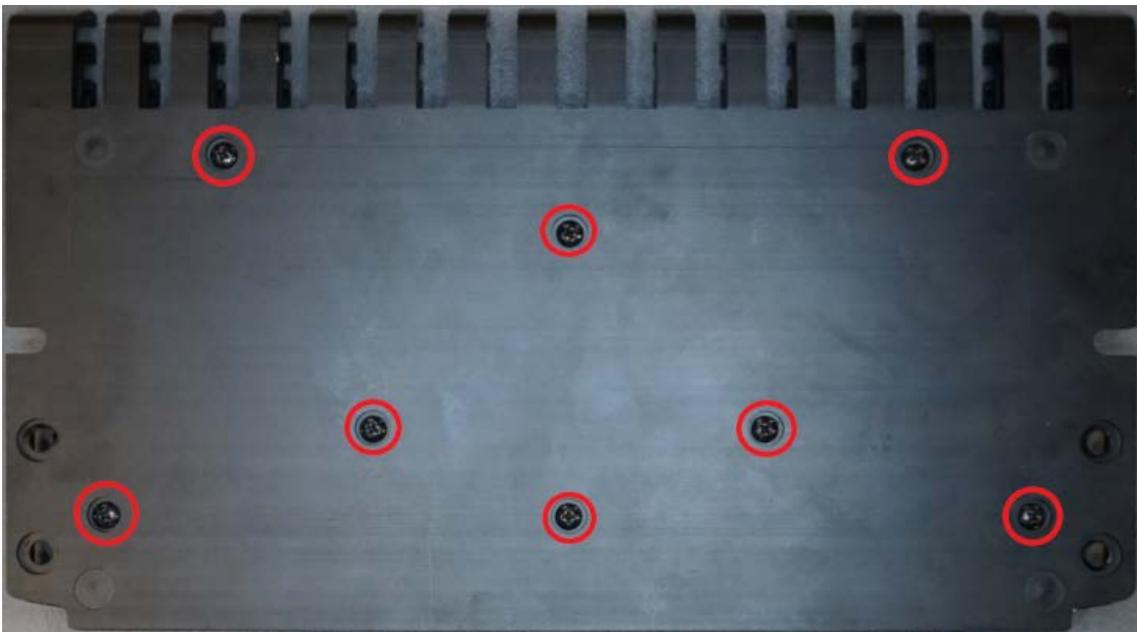
RB5009UG+S+IN



Picture 297

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 [298](#).



Picture 298

Step 2: Lift the plastic cover according to picture 299.



Picture 299

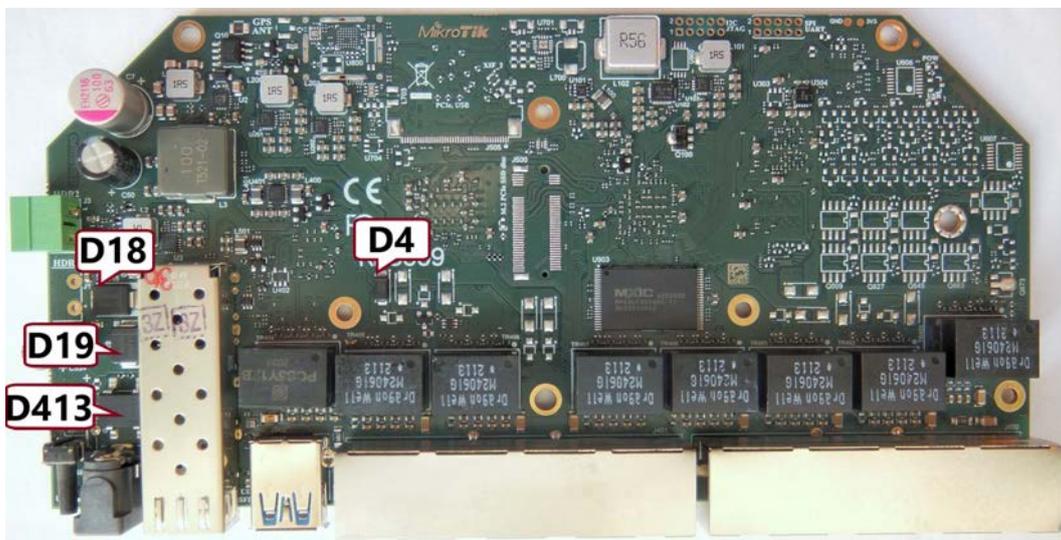
Instructions for checking overvoltage

Checking Schottky diode and diodes bridges

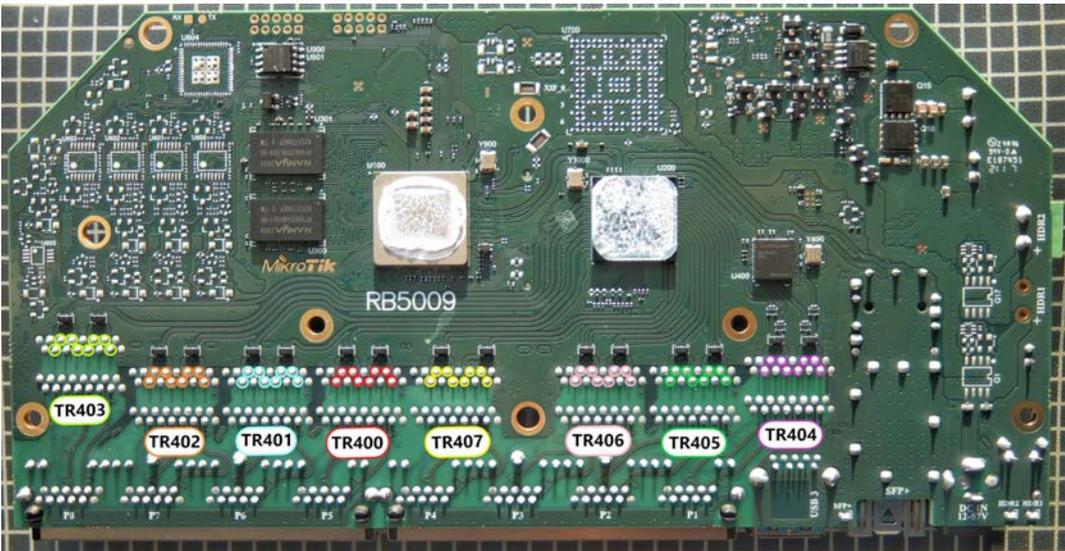
Check Schottky diodes D4, D18, D19 and diode bridge D413. Location of diodes on the board you can see in the picture 300. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

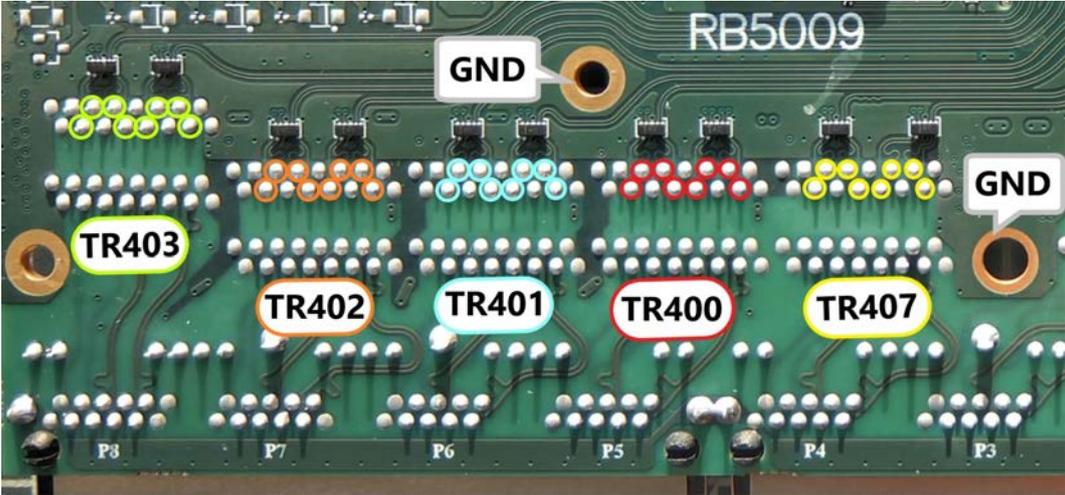
Check voltage drop value between transformers' TR400, TR401, TR402, TR403, TR404, TR405, TR406, TR407 pins and Ground (GND). Test points on the transformers' pins are marked with colored circles, see pictures 301 , 302 , 303. Voltage drop value should be in the range from 0,34V to 0,57V. Voltage drop measurement method is described on page 21.



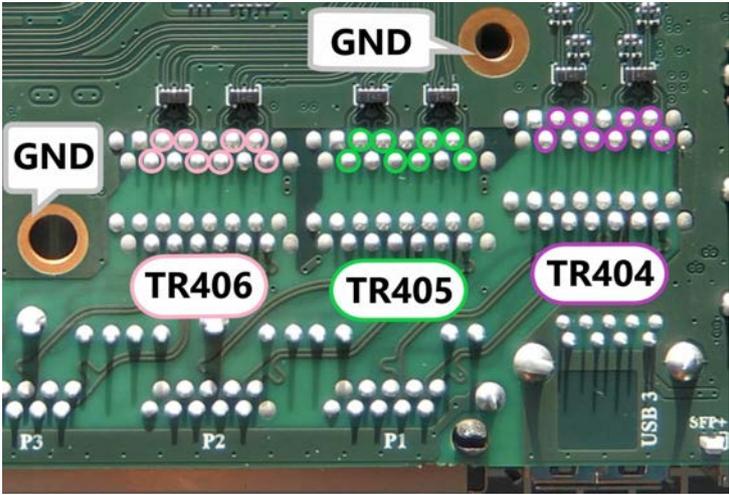
Picture 300



Picture 301



Picture 302



Picture 303

RB5009UPr+S+IN



Picture 304

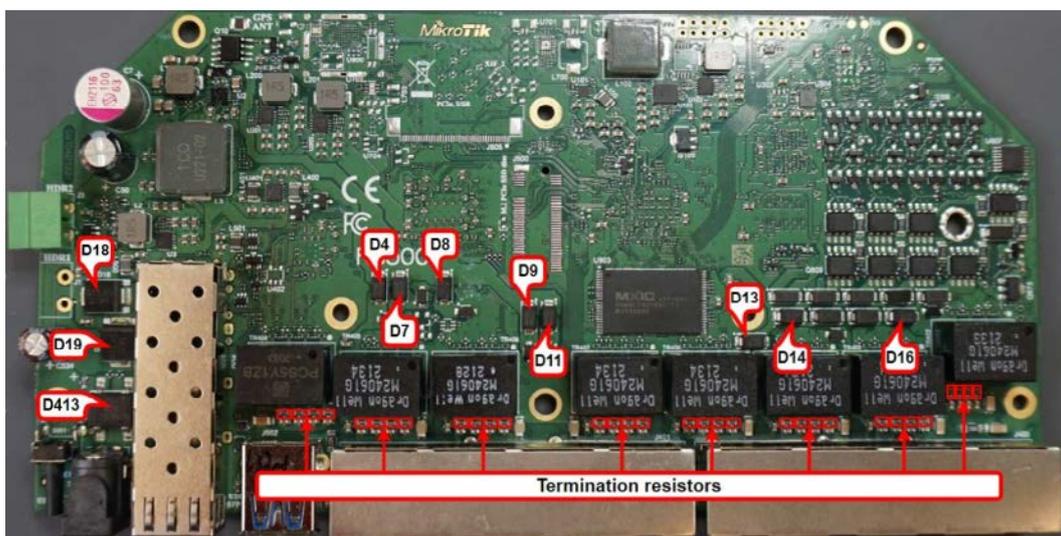
Disassembling information

Step 1:

Disassembly method of the board is the same as the RB5009UG+S+IN board. Disassembly method is described on page 297.

Checking Schottky diode and diodes bridges

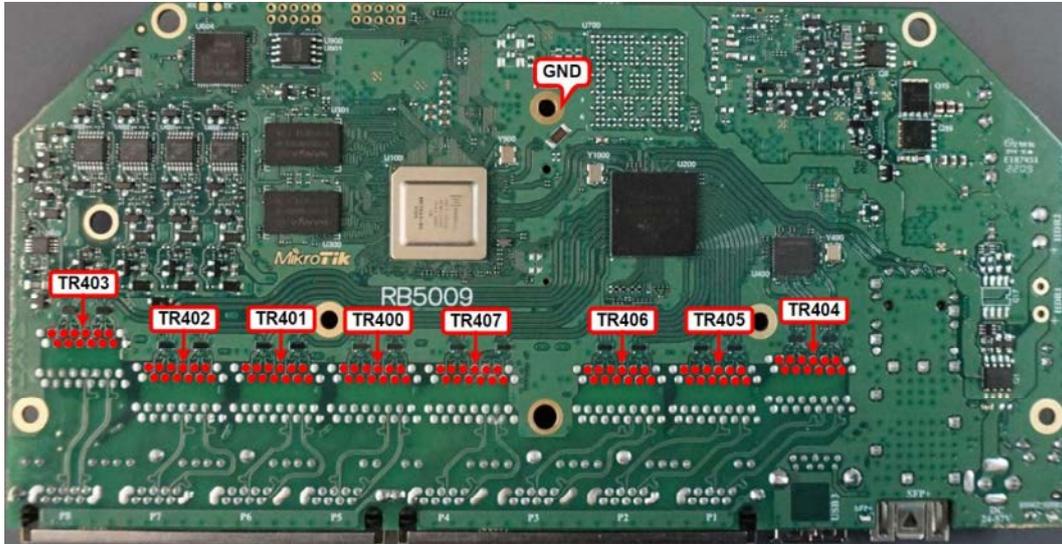
Check Schottky diodes D4, D7, D8, D9, D11, D13, D14, D16, D18, D19 and diode bridge D413. Location of diodes on the board you can see in the picture 305. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.



Picture 305

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 306. Voltage drop value should be in the range from 0,34V to 0,57V. Voltage drop measurement method is described on page 21.



Picture 306

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 305.

ATL SERIES ROUTERBOARDS

ATL 5G R16 (ATLGM&RG520F)



Picture 307

Recommended tools

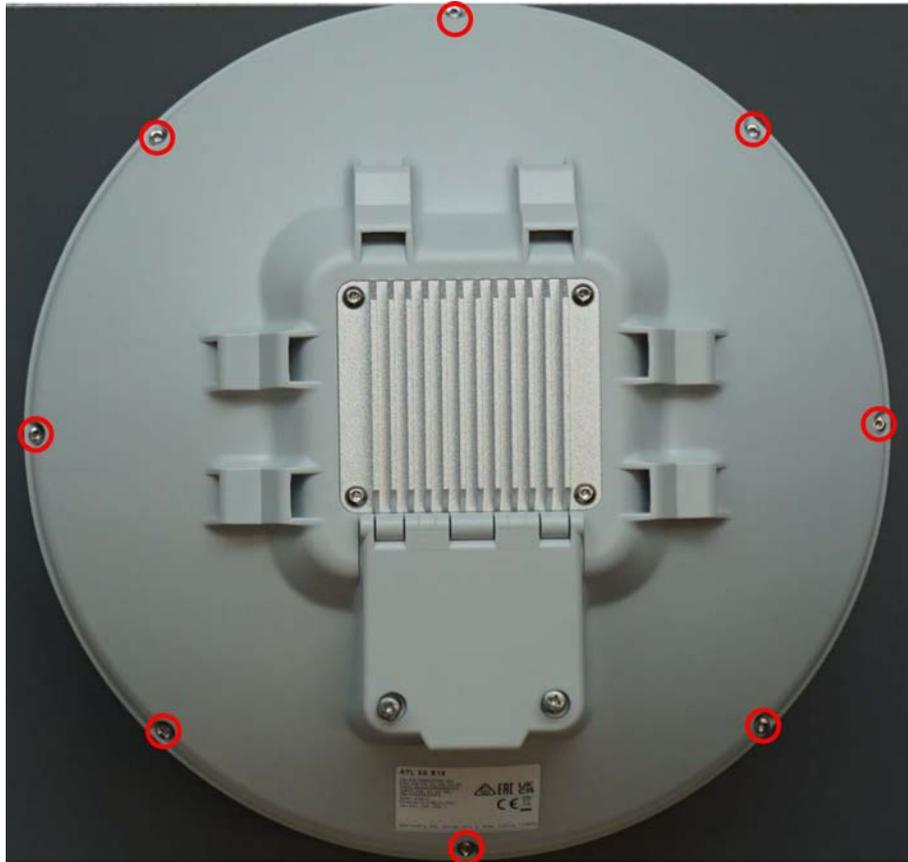
For successful measurement it is necessary to use miniature test probes, example of the miniature test probes you can see in the picture [308](#).



Picture 308

Disassembling information

Using torx T30 screwdriver unscrew eight screws, see picture 309. After this, carefully detach the cover from the case.

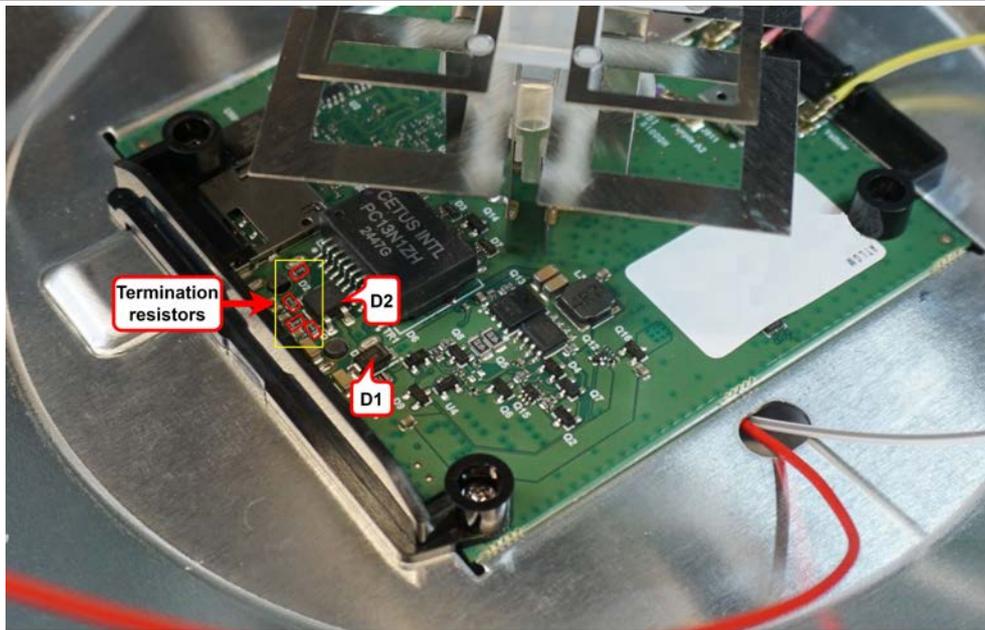


Picture 309

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

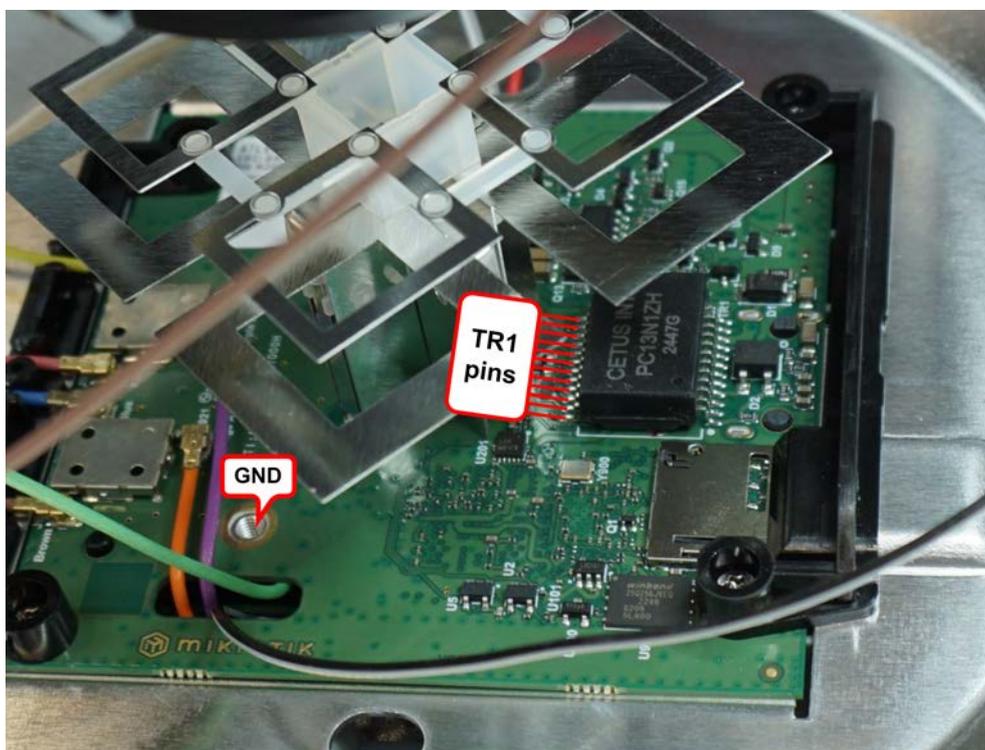
Check Schottky diode D1 and diode bridge D2. Location of the diodes on the board you can see in the picture 310. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.



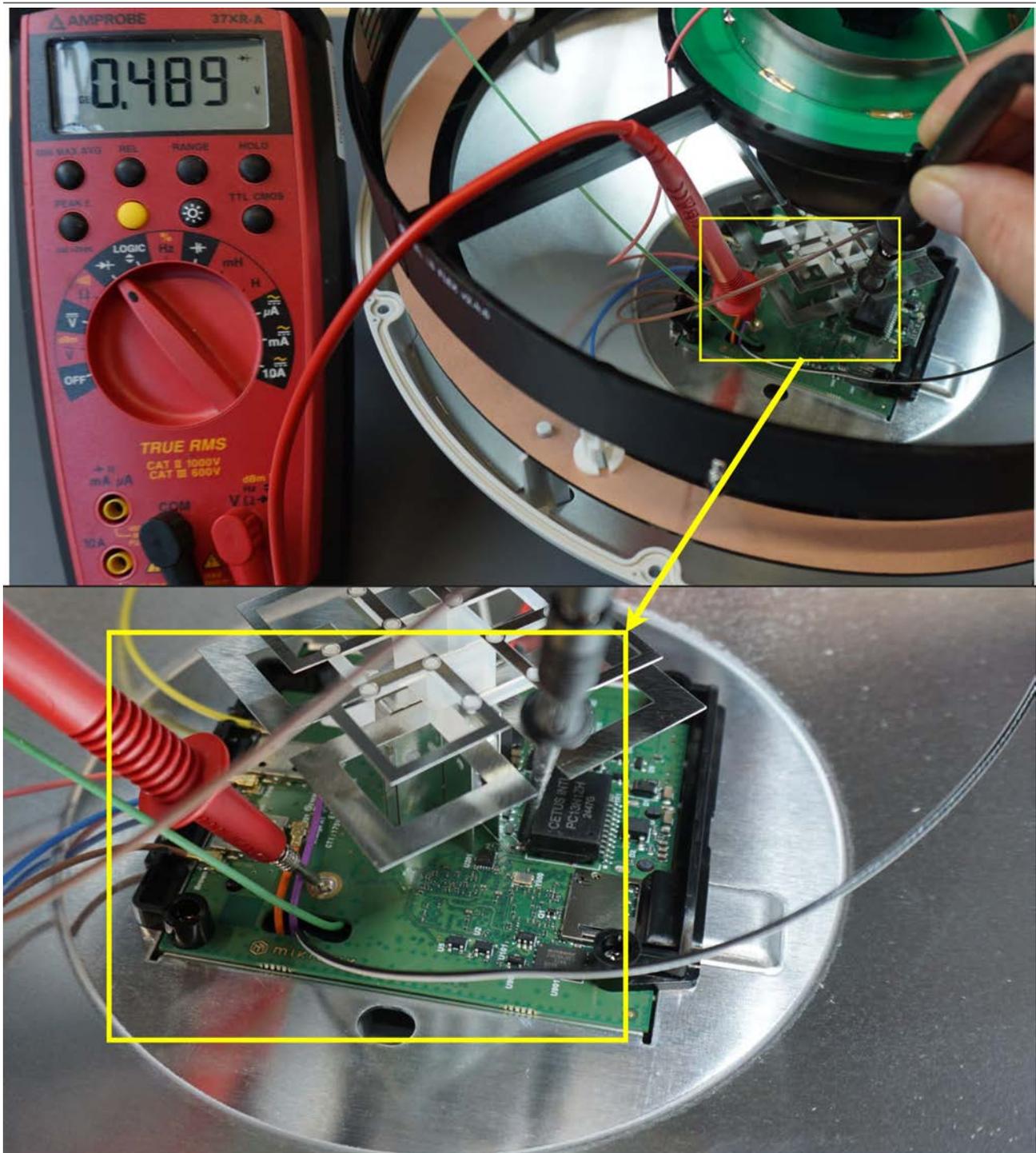
Picture 310

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformer TR1 pins and Ground, see picture 311. 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 21. An example of measurement can be seen in picture 312.



Picture 311



Picture 312

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 310.

BASEBOX SERIES ROUTERBOARDS

BaseBox 2 (912UAG-2HPnD-OUT)

BaseBox 5 (912UAG-5HPnD-OUT)



Picture 313

Disassembling information

Step 1: Remove the sticker from connector, see picture 314.



Picture 314

Step 2: Unstick 2 screws stickers from the BaseBox case base, see picture 315.



Picture 315

Step 3: Unscrew the case base from the board holder by torque T8 screwdriver. Location of 2 screws you can see in the picture 316.



Picture 316

Step 4: Take out the case base from the board holder, see picture 317.



Picture 317

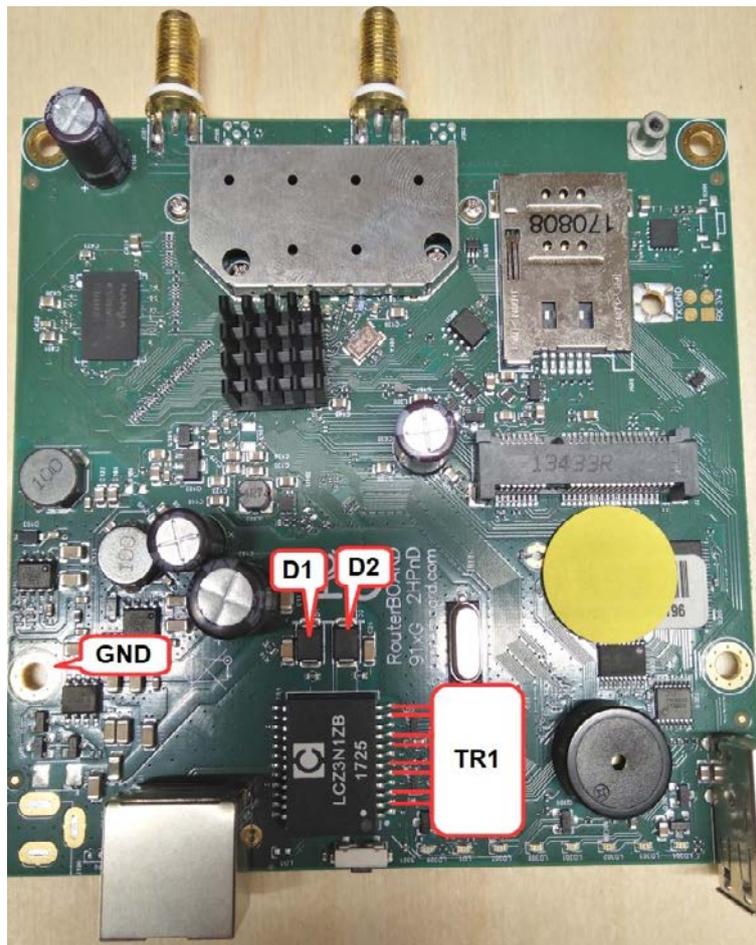
Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D1, D2. Location of diodes on the board you can see in the picture 318. Schottky diode quality measurement method is described on page 18.

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 318. Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page 21.



Picture 318

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 [271](#).

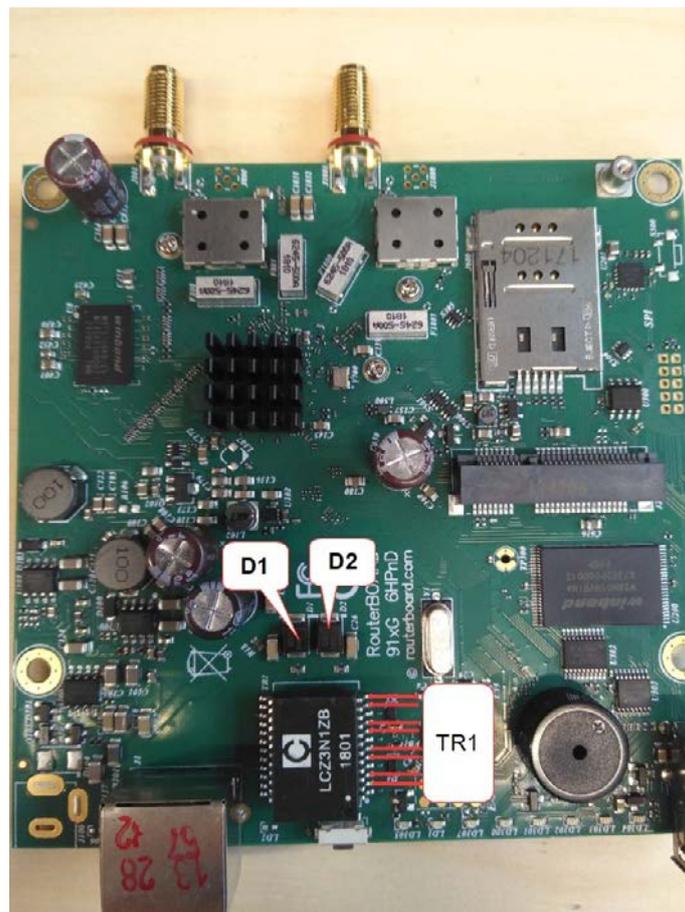
Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diode D1, D2. Location of diodes on the board you can see in the picture [319](#). Schottky diode quality measurement method is described on page [18](#).

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 [319](#). Voltage drop value should be in the range from 0,44V to 0,48V. Voltage drop measurement method is described on page [21](#).



Picture 319

NETBOX SERIES ROUTERBOARDS

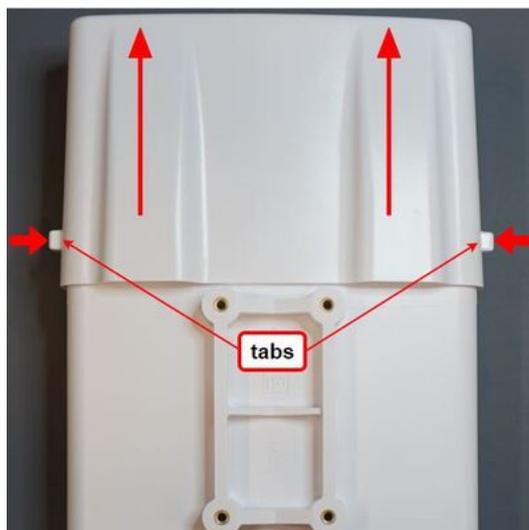
NetBox 5 ax (L11UG-5HaxD-NB)



Picture 320

Disassembling information

Step 1: Press two tabs and remove the cable cover as shown in the picture 321.



Picture 321

Step 2: Peel off two plastic stickers from the NetBox case, see picture [322](#).



Picture 322

Step 3:

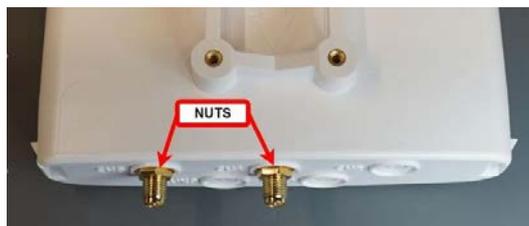
Unscrew 2 screws using torx T8 screwdriver. Location of the screws is shown the picture [323](#).



Picture 323

Step 4:

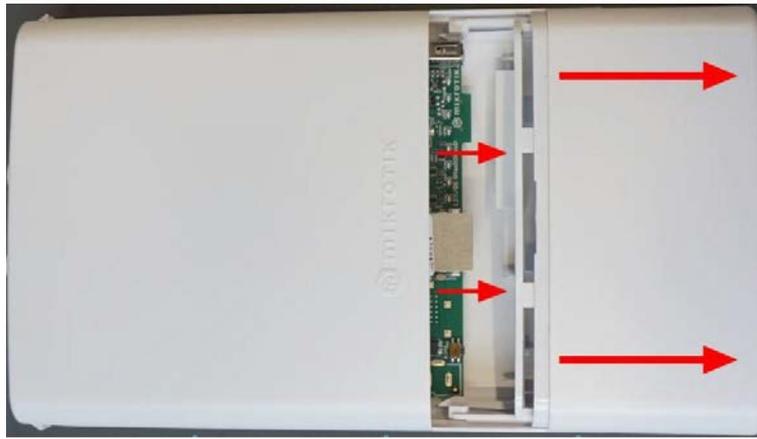
Unscrew two golden plated nuts. Location of the nuts is shown the picture [324](#).



Picture 324

Step 5:

Carefully remove the board holder and the board from the case as shown in the picture [325](#).

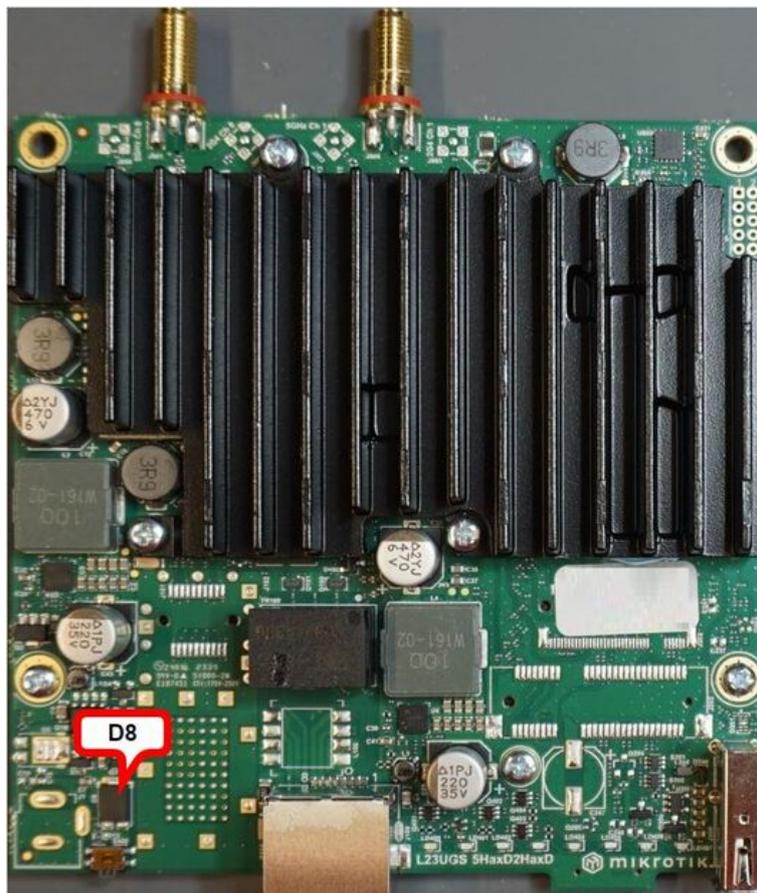


Picture 325

Instructions for checking over-voltage

Checking Schottky diode

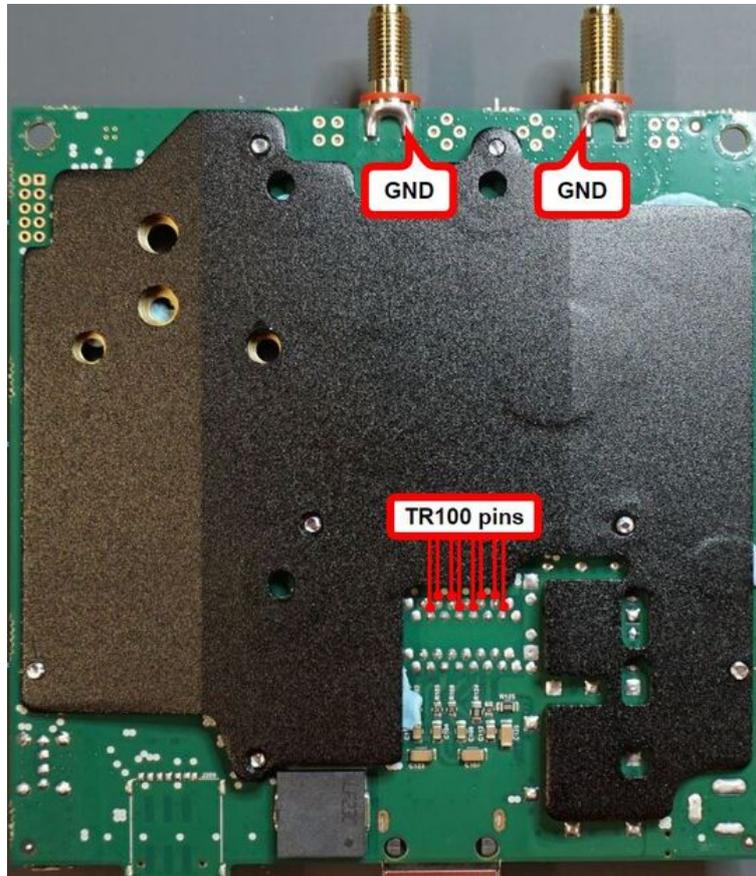
Check Schottky diode D8. Location of the diode on the board you can see in the picture 326. Schottky diode quality measurement method is described on page 18.



Picture 326

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 327. Voltage drop value should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 21.



Picture 327

CAP SERIES ROUTERBOARDS

cAP (cAP2nD)

V1



Picture 328

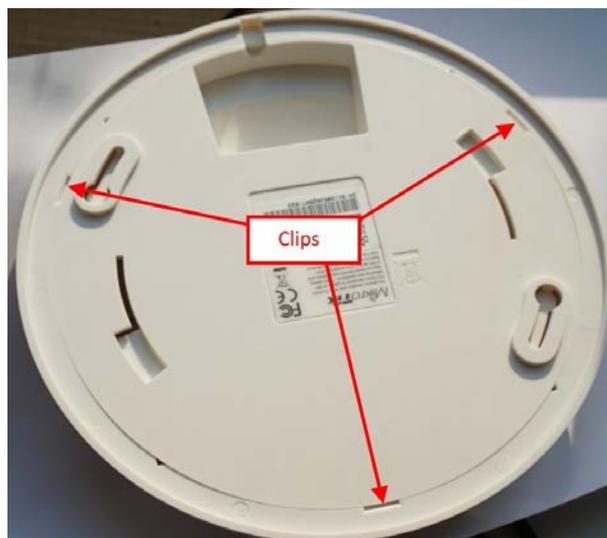
V2



Picture 329

Disassembling information for V1

Step 1: Push the router edge around clips to open the case, see pictures 330 - 331.



Picture 330



Picture 331

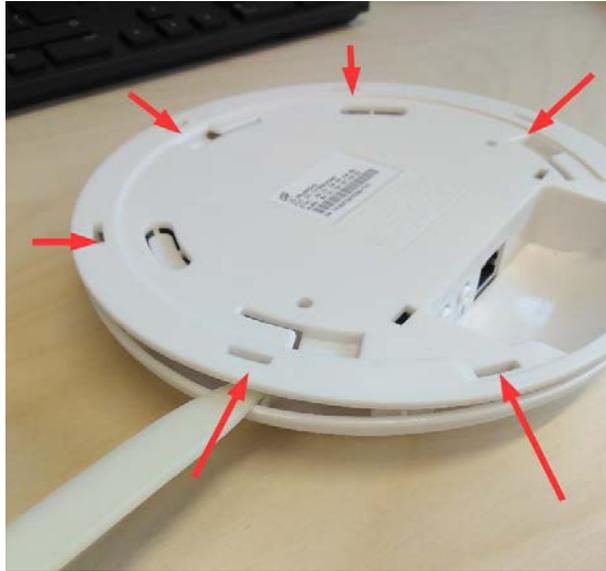
Step 2: Remove cover and take out the board from case, see picture [332](#).



Picture 332

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 333.



Picture 333

Step 2: Unscrew 2 mounting screws as shown in picture 334.



Picture 334

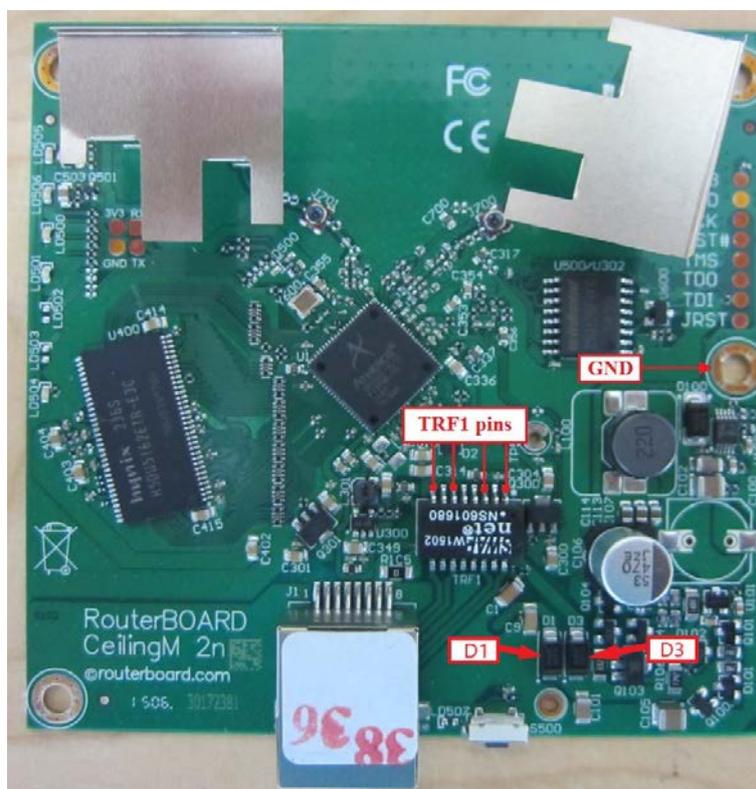
Instructions for checking overvoltage for v1

Checking Schottky diode

Check Schottky diodes D1, D3. Location of diodes on the board you can see in the picture 335. Schottky diode quality measurement method is described on page 18.

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 335. Voltage drop value should be in the range from 0,37V to 0,42V. Voltage drop measurement method is described on page 21.



Picture 335

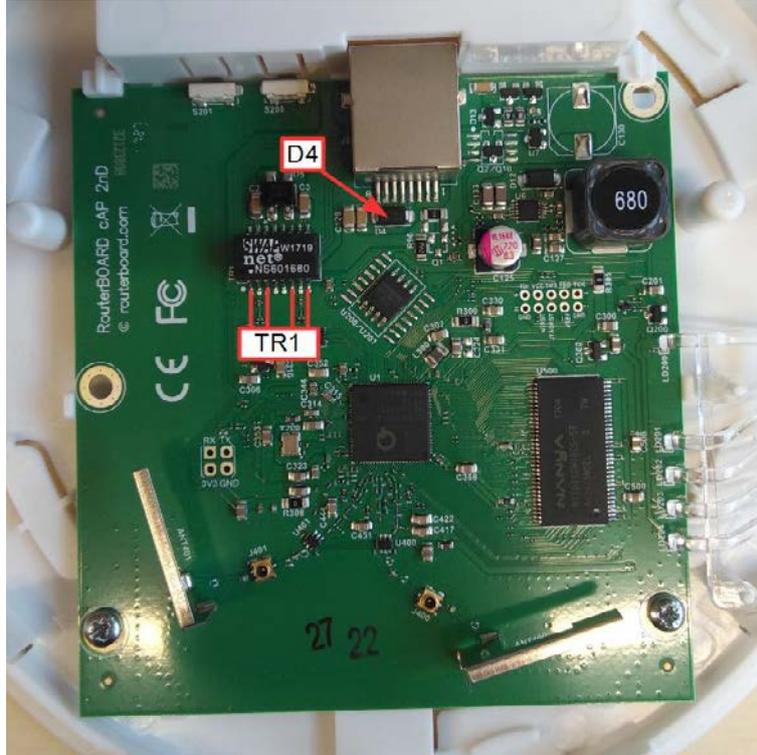
Instructions for checking overvoltage for v2

Checking Schottky diode

Check Schottky diodes D4. Location of diode on the board you can see in the picture 336. Schottky diode quality measurement method is described on page 18.

Checking voltage drop value between Ethernet transformer TRF1 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 336. Voltage drop value should be in the range from 0,37V to 0,40V. Voltage drop measurement method is described on page 21.



Picture 336

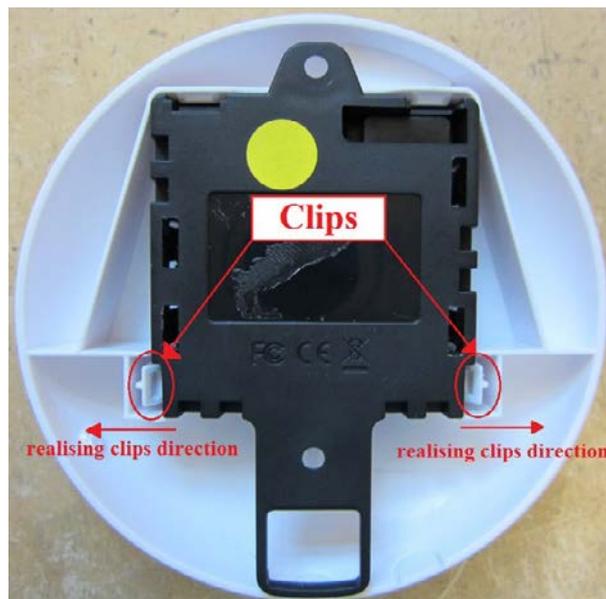
cAP lite (cAP L-2nD)



Picture 337

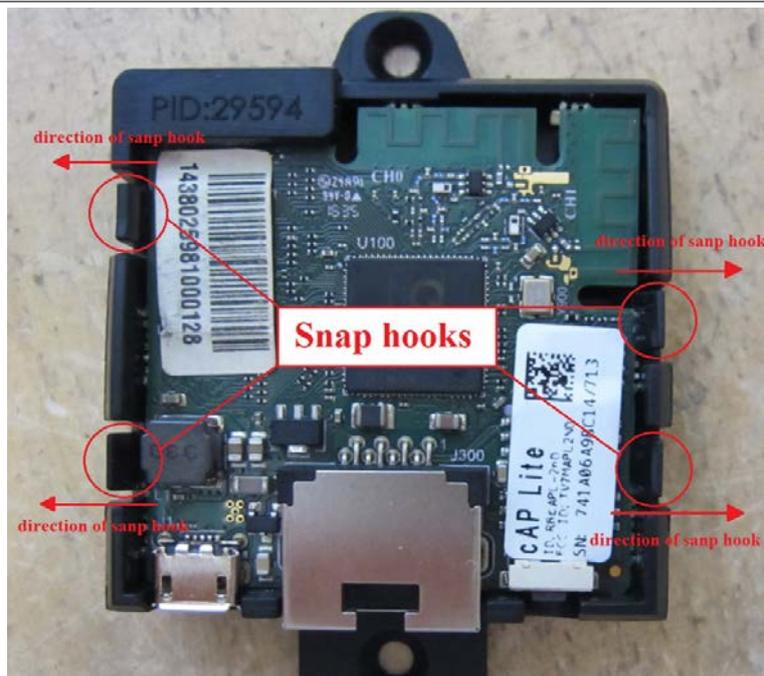
Disassembling information

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 338.



Picture 338

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 339.



Picture 339

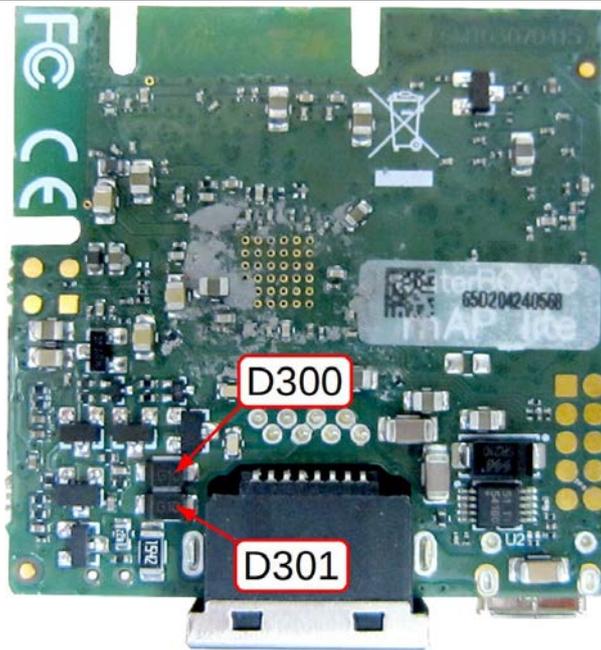
Instructions for checking overvoltage

Checking Schottky diode

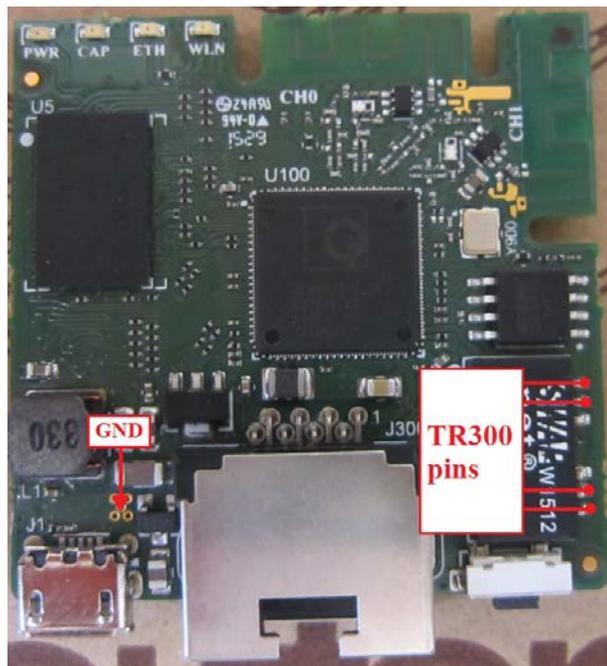
Check Schottky diodes D300, D301 on the board bottom layer, see picture 340. Schottky diode quality measurement method is described on page 18.

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 341. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 21.



Picture 340



Picture 341

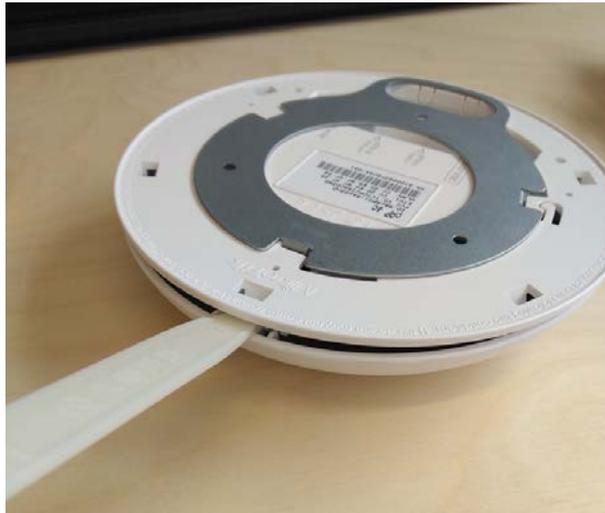
cAP ac (RBcAPGi-5acD2nD)



Picture 342

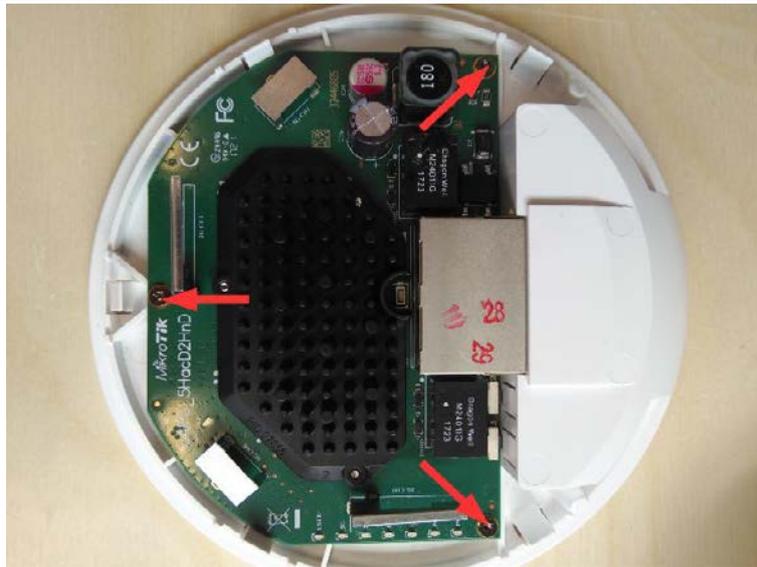
Disassembling information

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 [343](#).



Picture 343

Step 2: Unscrew 3 mounting screws as shown in picture [344](#).



Picture 344

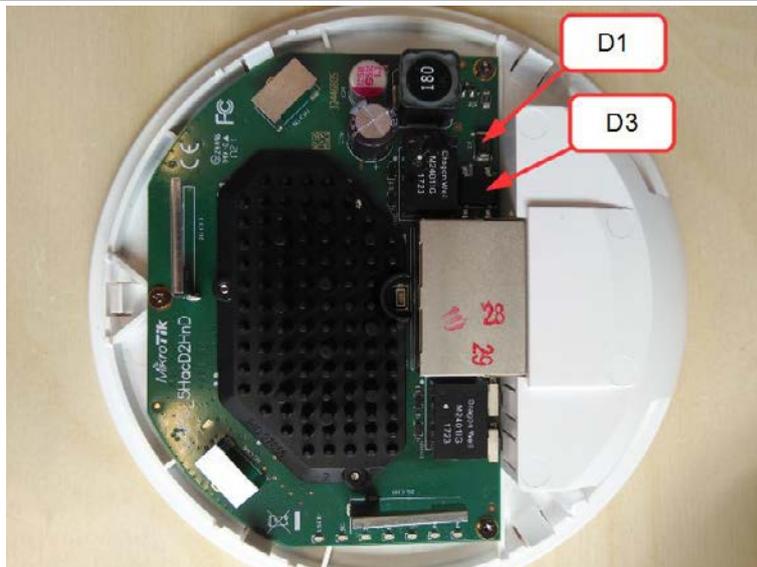
Instructions for checking overvoltage

Checking Schottky diode

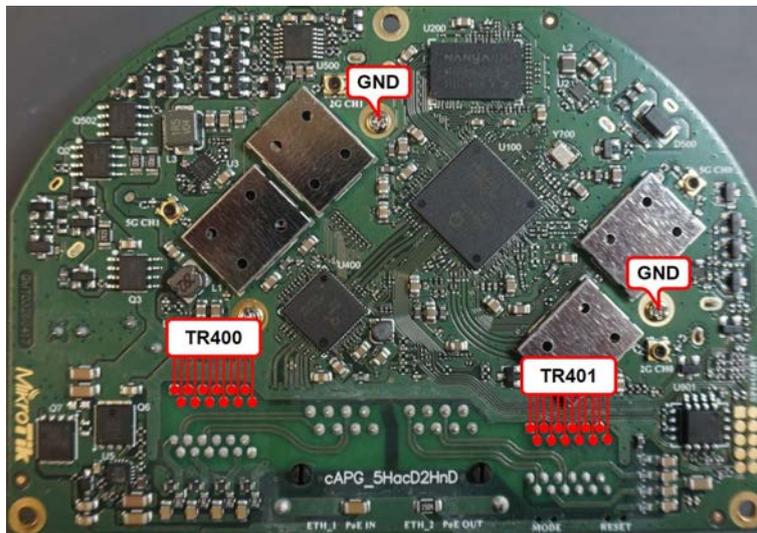
Check Schottky diodes D1 and diode bridge D3. Location of diodes on the board you can see in the picture 345. Schottky diode quality measurement method is described on page 18.

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 346. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 21.



Picture 345



Picture 346

cAP ax (cAPGi-5HaxD2HaxD)



Picture 347

Disassembling information

Tools recommended for the disassembly are plastic prying tools, such as shown on pictures [348](#) and [349](#).



Picture 348



Picture 349

Step 1:

On the back of the case unscrew 4 screws using torx T10 screwdriver. Location of the screws is shown the picture [350](#).



Picture 350

Step 2:

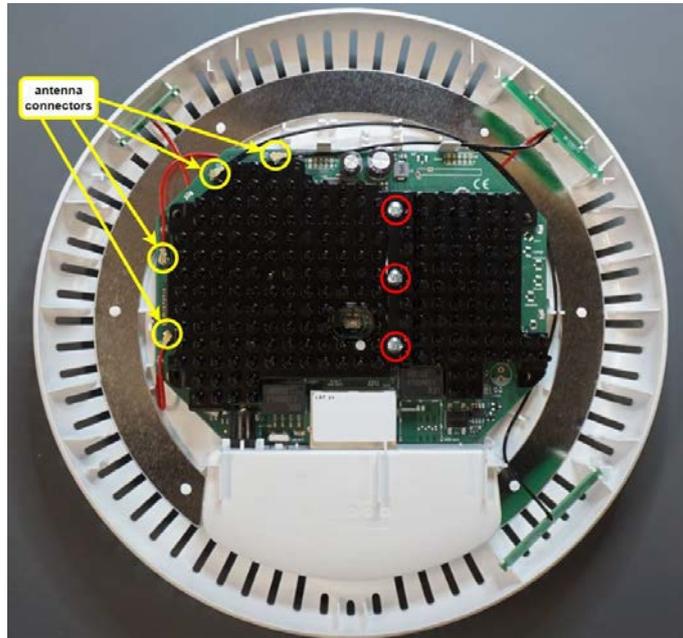
Using plastic prying tool carefully release clips around the perimeter of the case, as shown in the picture [351](#).



Picture 351

Step 3:

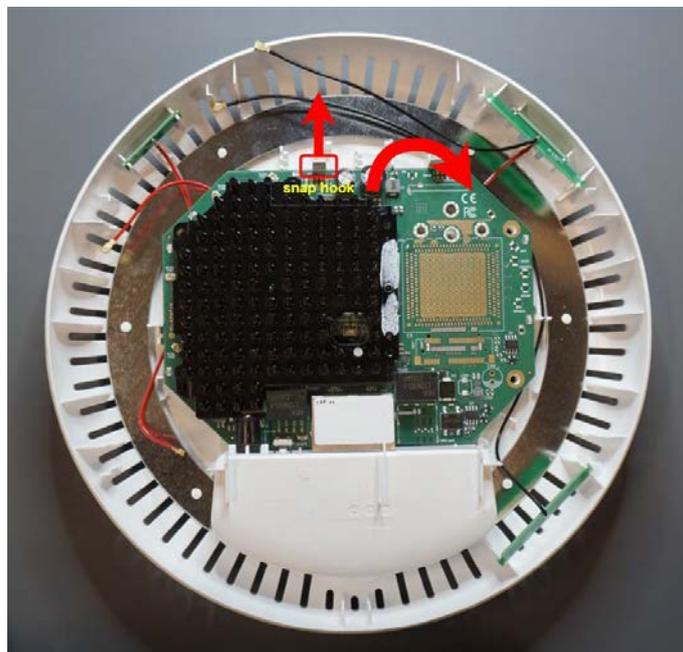
Detach antenna cables and unscrew 4 screws using PH1 screwdriver, see picture 352. Remove the right heat-sink from the board.



Picture 352

Step 4:

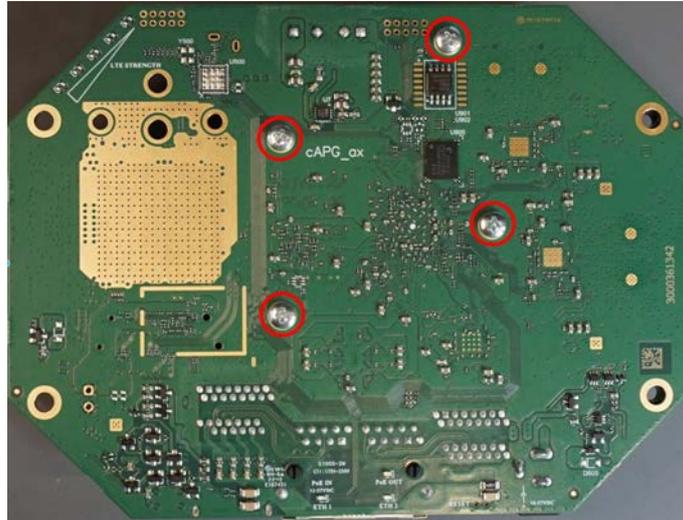
Push the snap hook away from the board and pull out the board from the case, see picture 353.



Picture 353

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 354 and 355.



Picture 354



Picture 355

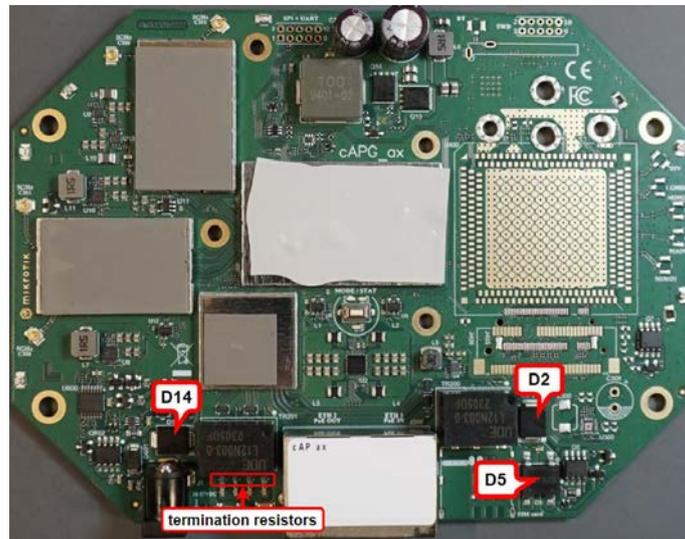
Instructions for checking over-voltage

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 356. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

Checking 75 Ohm termination resistors resistance

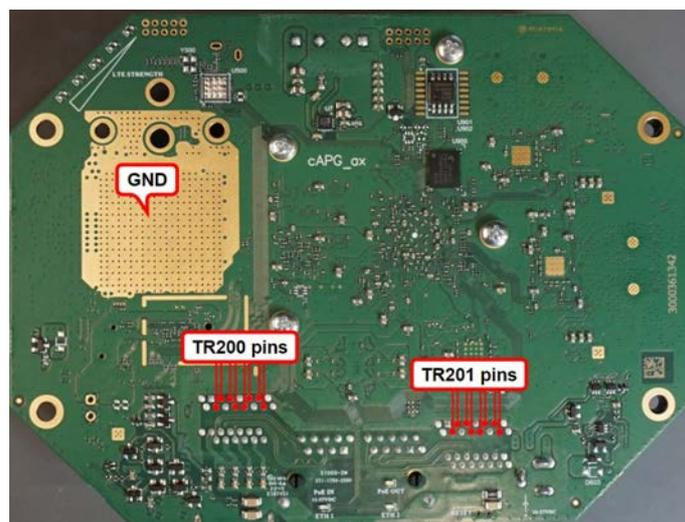
Check value of each termination resistor (there are 4 termination resistors). It should be approximately 75 Ohms. Location of resistors is shown in picture 356.



Picture 356

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 357. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.



Picture 357

CHATEAU SERIES ROUTERBOARDS

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



Picture 358

Disassembling information

Step 1: Tools recommended for the disassembly are plastic prying tools, such as shown on pictures 444 and 445, a PH1 and a T8 screwdriver. Unscrew the central screw (PH1) as shown in the picture 359.



Picture 359

Step 2: The board's cover and base parts are put together using snap fit hooks. Placement of these hooks is shown in picture 360.



Picture 360

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 444 and 445. 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 363 – 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

364, 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 361



Picture 362



Picture 363



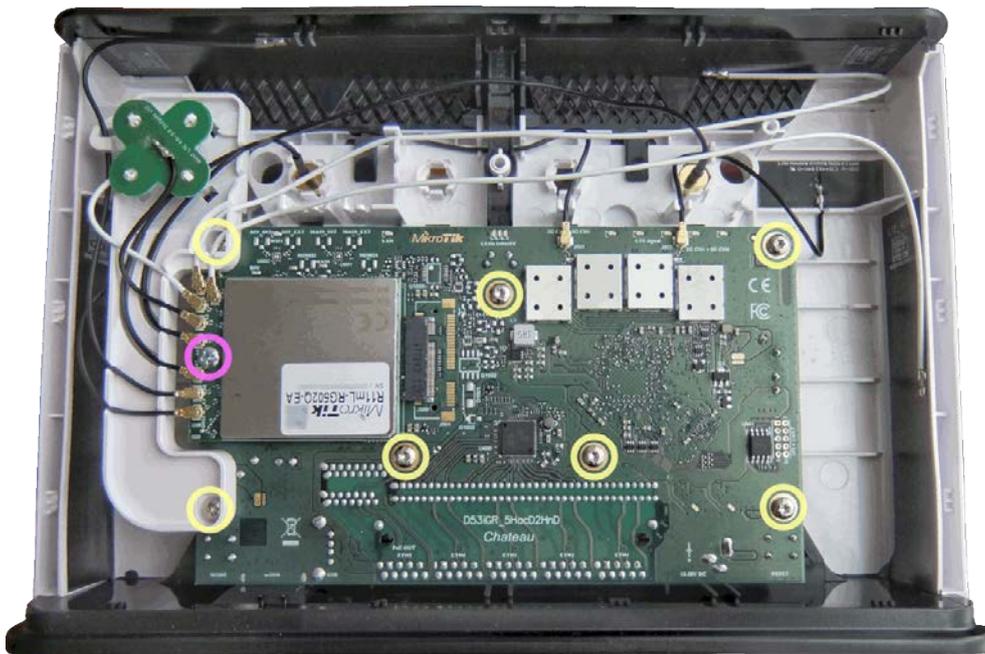
Picture 364

Step 4: Continue to release snap hooks around perimeter as shown in picture [365](#)



Picture 365

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 [366](#).



Picture 366

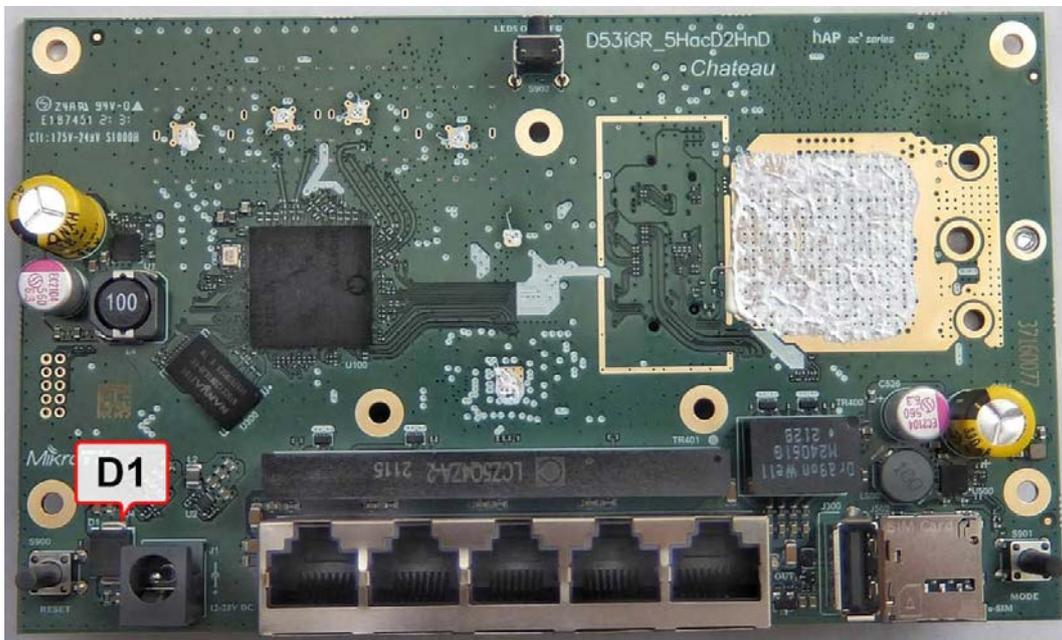
Instructions for checking overvoltage

Checking Schottky diode

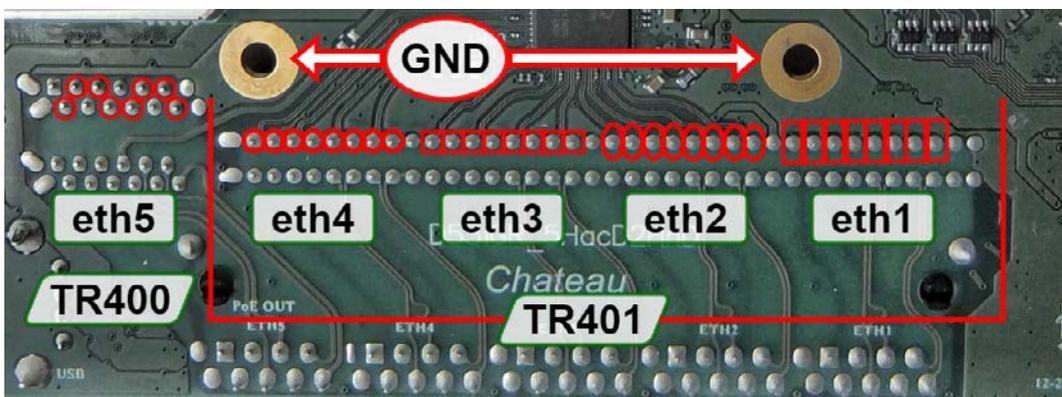
Check Schottky diodes D1. Location of diode on the board is shown in picture 367. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR400 and TR401 pins and Ground. Test points on the transformer pins are marked with red dots, see picture 368. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 21.



Picture 367



Picture 368

Chateau LTE18 ax



Picture 369

Disassembling information

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

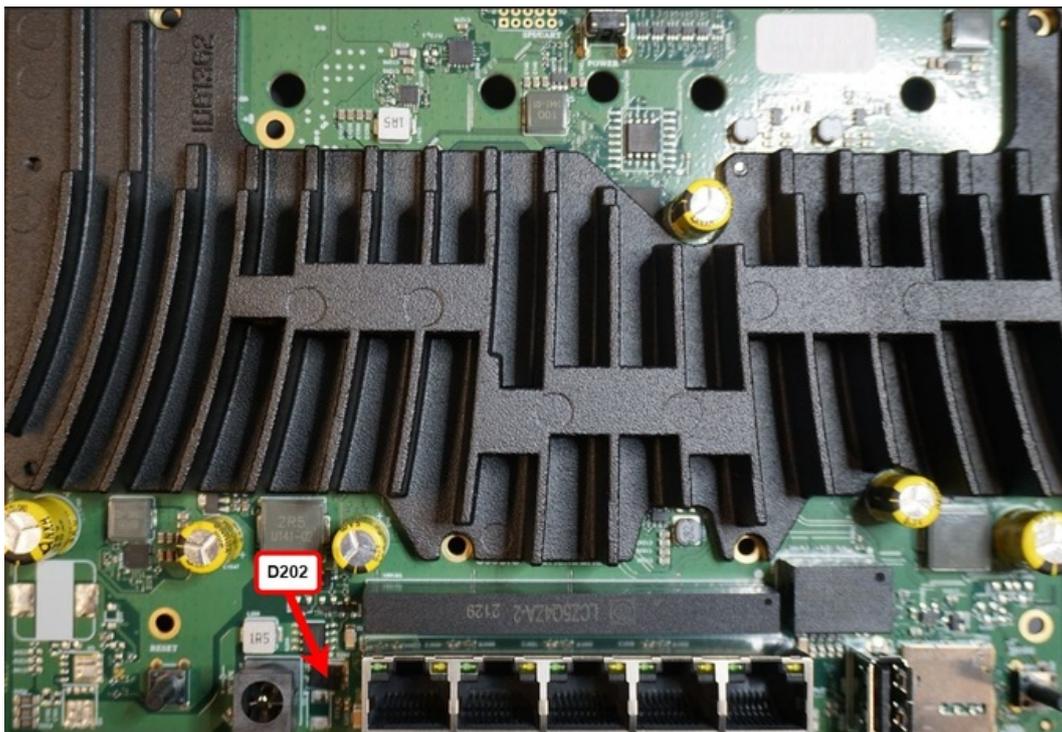
Instructions for checking over-voltage

Checking Schottky diode

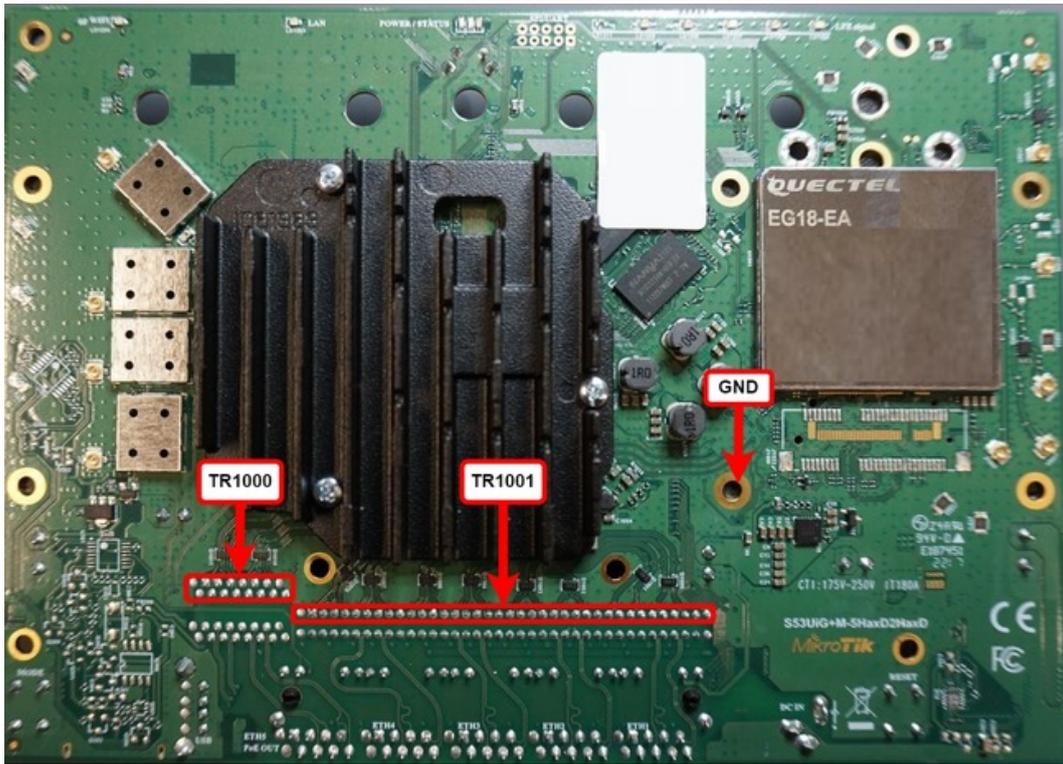
Check Schottky diode D202. Location of the diodes on the board you can see in the picture 370. Schottky diode quality measurement method is described on page 18.

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 371. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.



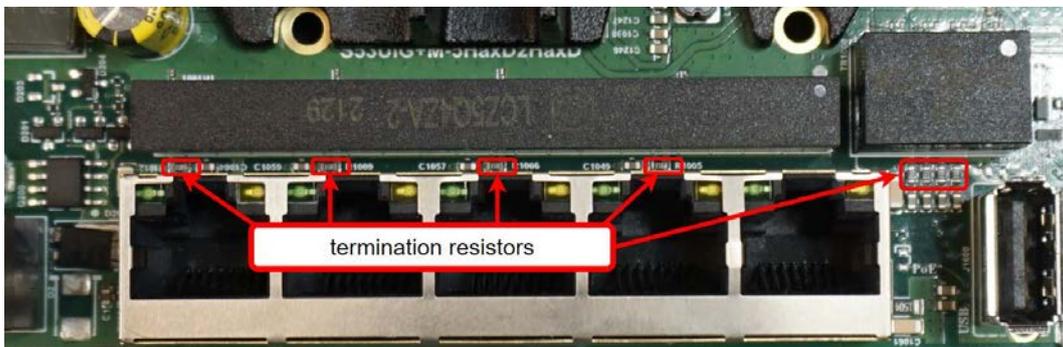
Picture 370



Picture 371

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 372.



Picture 372

Chateau PRO ax (H53UiG-5HaxQ2HaxQ)



Picture 373

Disassembling information

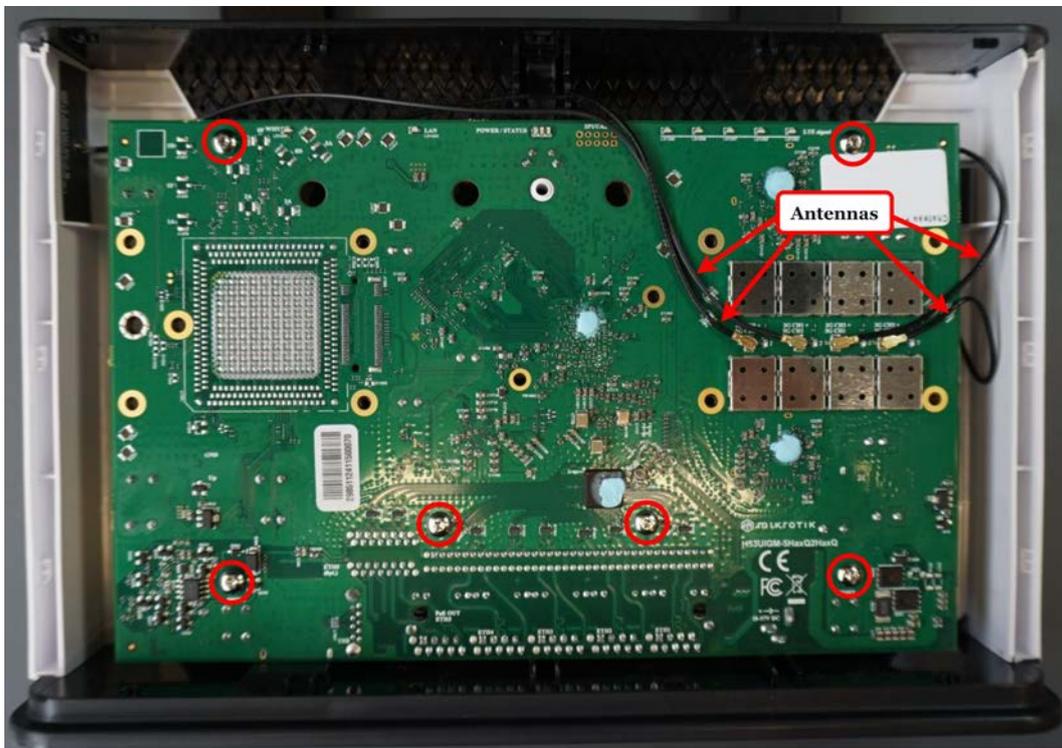
The removing of the Chateau PRO ax front cover is the same as the removing of the Chateau 5G front cover, see page 299 steps 1-4.

When the front cover of the case is removed, using the PH1 screwdriver unscrew four screws and carefully remove the heatsink, see picture 374.



Picture 374

Disconnect four antenna cables and using TORX T8 screwdriver unscrew six screws, see picture 375.



Picture 375

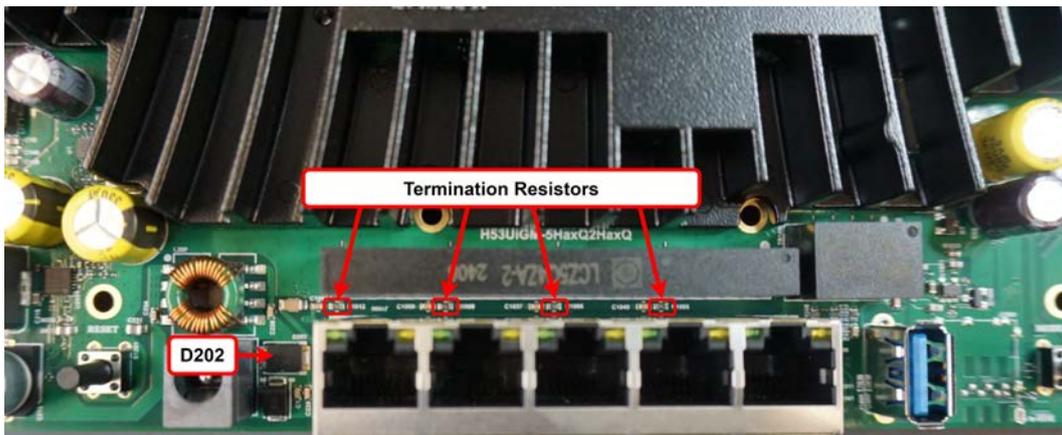
Instructions for checking over-voltage

Checking Schottky diode

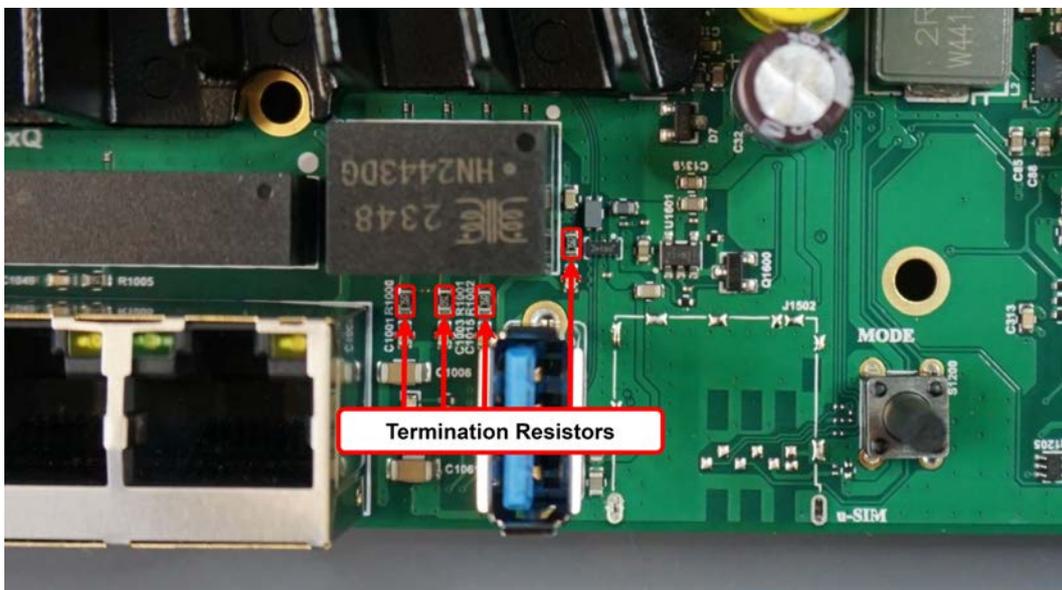
Check Schottky diode D202. Location of the diode on the board you can see in the picture 376. Schottky diode quality measurement method is described on page 18.

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 376 and 377.



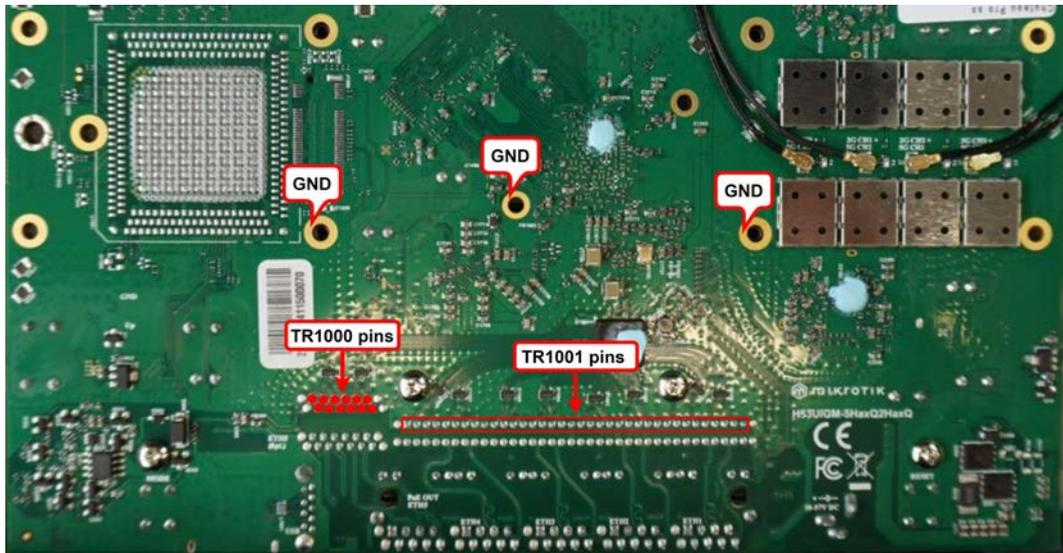
Picture 376



Picture 377

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 378. 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 21.



Picture 378

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



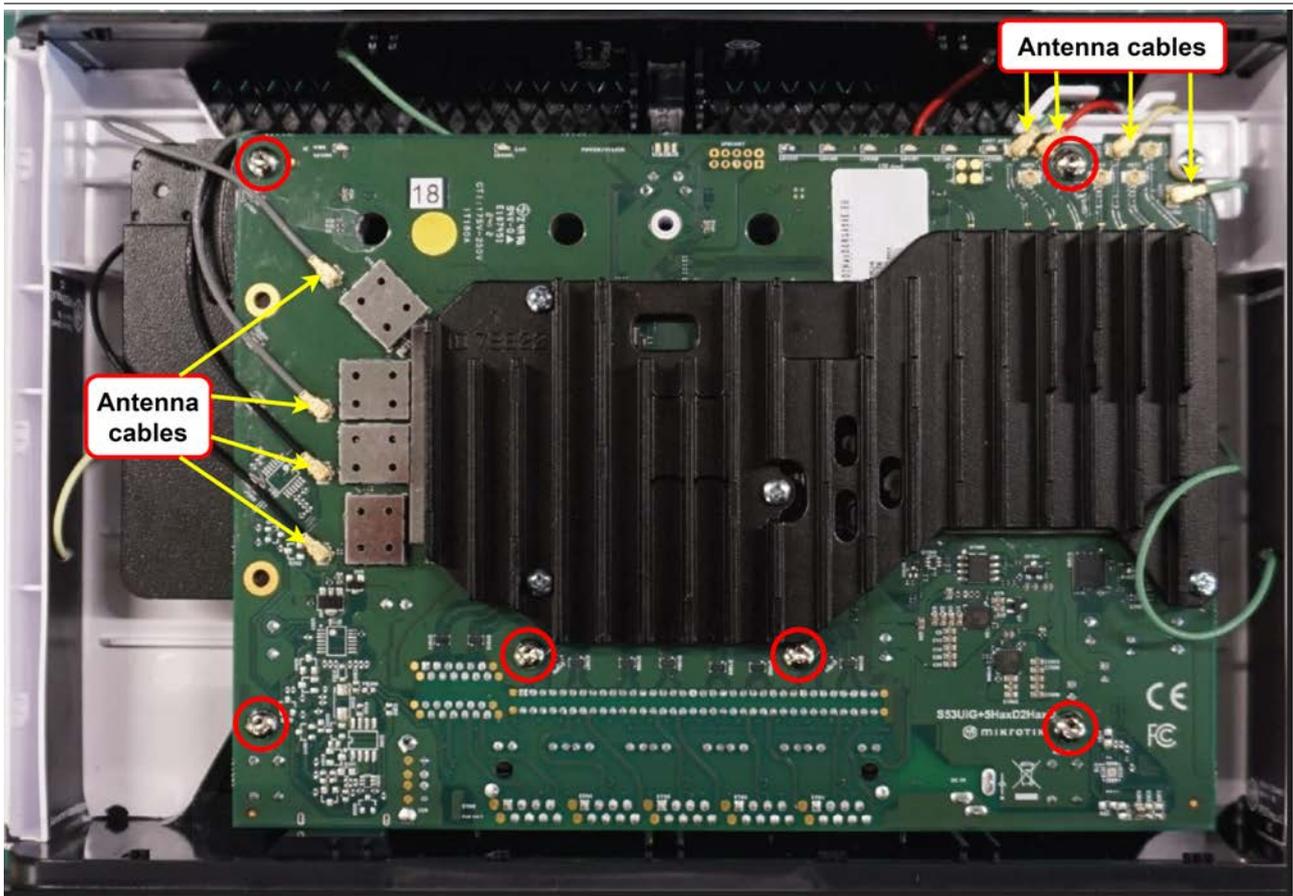
Picture 379

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 299 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 380.

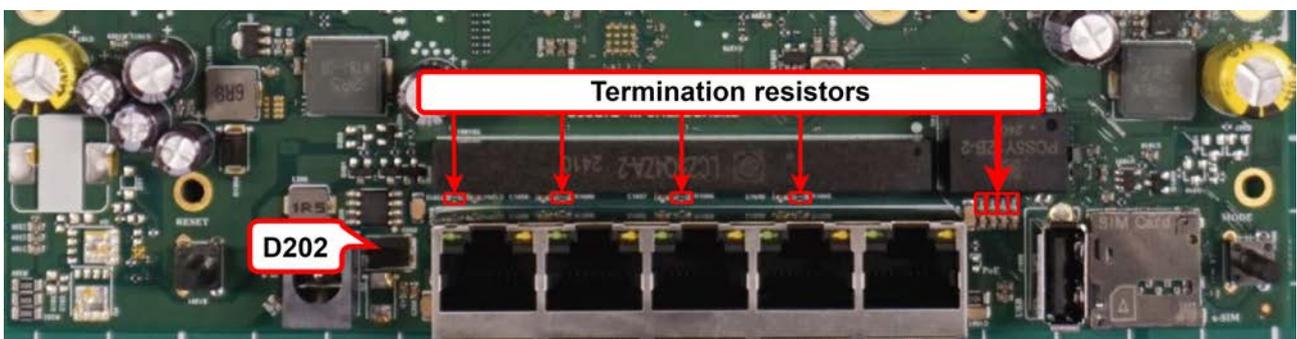


Picture 380

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

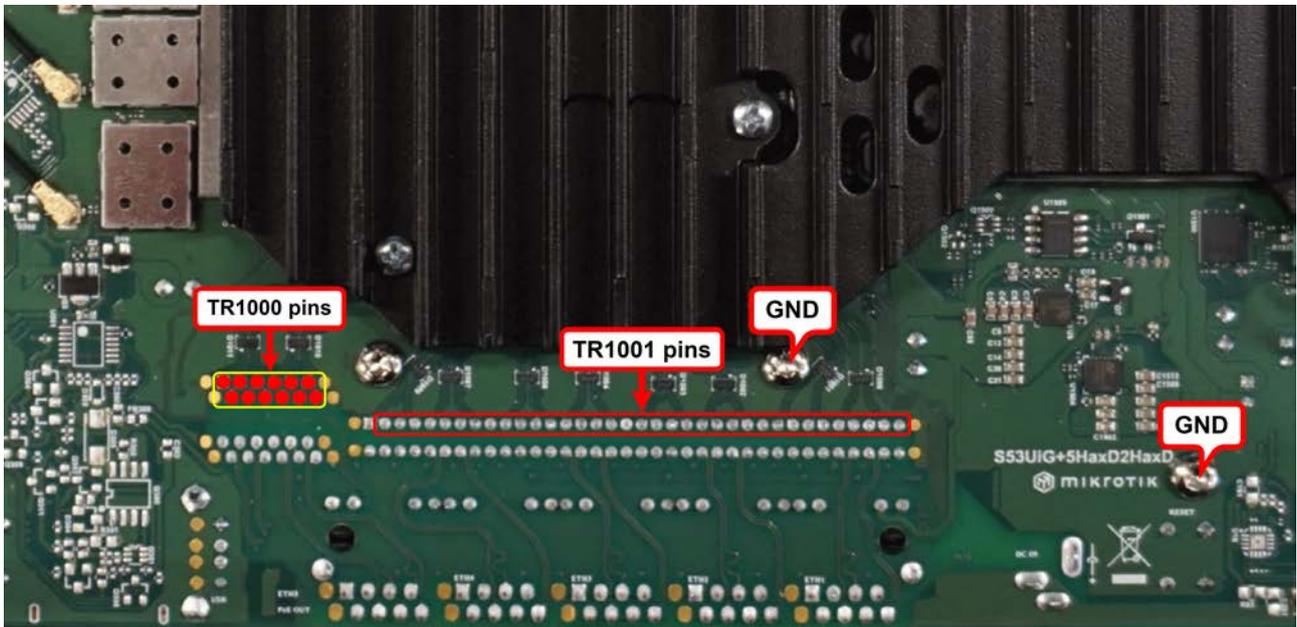
Check Schottky diode D202. Location of the diode on the board you can see in the picture 381. Schottky diode quality measurement method is described on page 18.



Picture 381

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 382. 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 21.



Picture 382

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 381.

CME SERIES ROUTERBOARDS

CME Gateway (CME22-2n-BG77)



Picture 383

Disassembling information

Step 1:

Under the bottom lid unscrew two screws using a PH2 screwdriver, see picture 384. When they are loose, slightly pull down the bottom lid to open access to Ethernet ports.



Picture 384

Step 2:

Unscrew two screws using the PH2 screwdriver, then remove the PCB from the case, see picture 385.



Picture 385

Step 3:

Unscrew two screws using the PH2 screwdriver and remove the front panel, see picture 386.



Picture 386

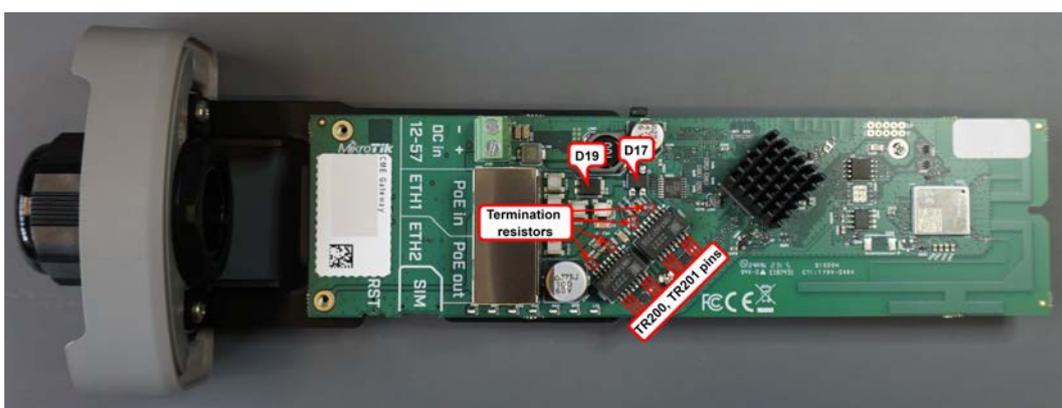
Instructions for checking over-voltage

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 387. Schottky diode quality measurement method is described on page 18. Diode bridge 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 TR200, TR201 pins and Ground, see picture 387. 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 21.



Picture 387

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 [387](#).

HAP SERIES ROUTERBOARDS

hAP ax3 (C53UiG+5HPaxD2HPaxD)



Picture 388

Disassembling information

Step 1: Tools recommended for the disassembly are plastic prying tools, such as the one shown on picture [444](#), a PH1 screwdriver and a 0,25M ethernet cable. Plug in an ethernet cable in ethernet ports 1 and 5 as shown in picture [389](#).



Picture 389

Step 2: The board is held inside the case with snap fit hooks. Placement of these hooks is shown in picture 390.



Picture 390

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 444. 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 391

Step 4: After pulling the routerboard out of the case, unscrew the two screws shown in picture [392](#)



Picture 392

Step 5: Then turn the routerboard to the other side and remove the two antenna connectors and unscrew the 6 screws shown in picture [393](#).



Picture 393

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

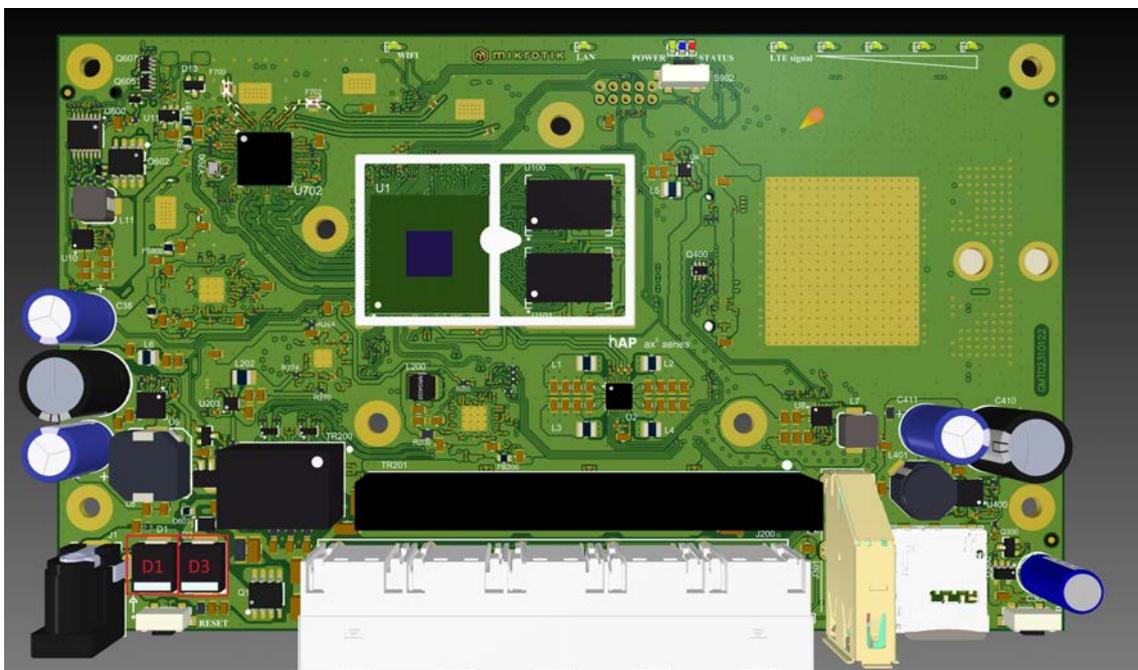
Instructions for checking overvoltage

Checking Schottky diode

Check Schottky diodes D1 and D3. The location of these diodes on the board is shown in picture 394. Schottky diode quality measurement method is described on page 18. Diode bridge 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 TR400 and TR401 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 395. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 21.



Picture 394

hAP ax2 (C52iG-5HaxD2HaxD-TC)



Picture 396

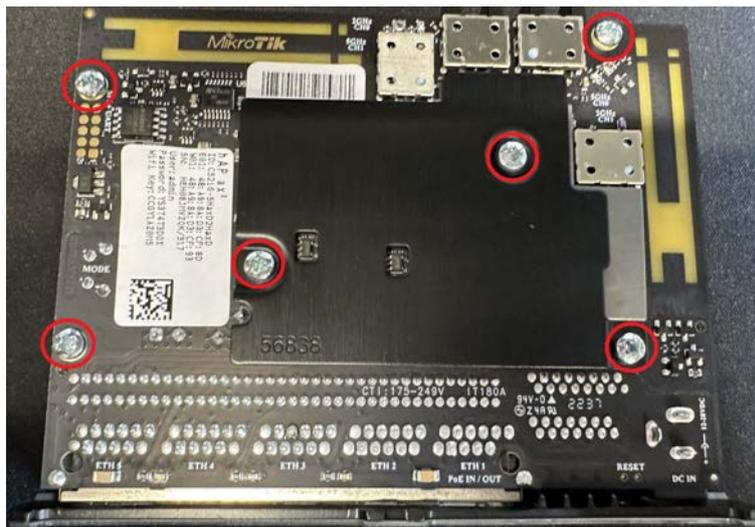
Disassembling information

Step 1: Tools recommended for the disassembly are a PH1 and TR8 screwdriver. First unscrew the two TR8 screws that are shown in picture 397. Then you can slide the board out of the case.



Picture 397

Step 2: Unscrew the six PH1 screws shown in picture 398. Now remove the top and bottom heatsinks and then you can begin the tests for checking overvoltage.



Picture 398

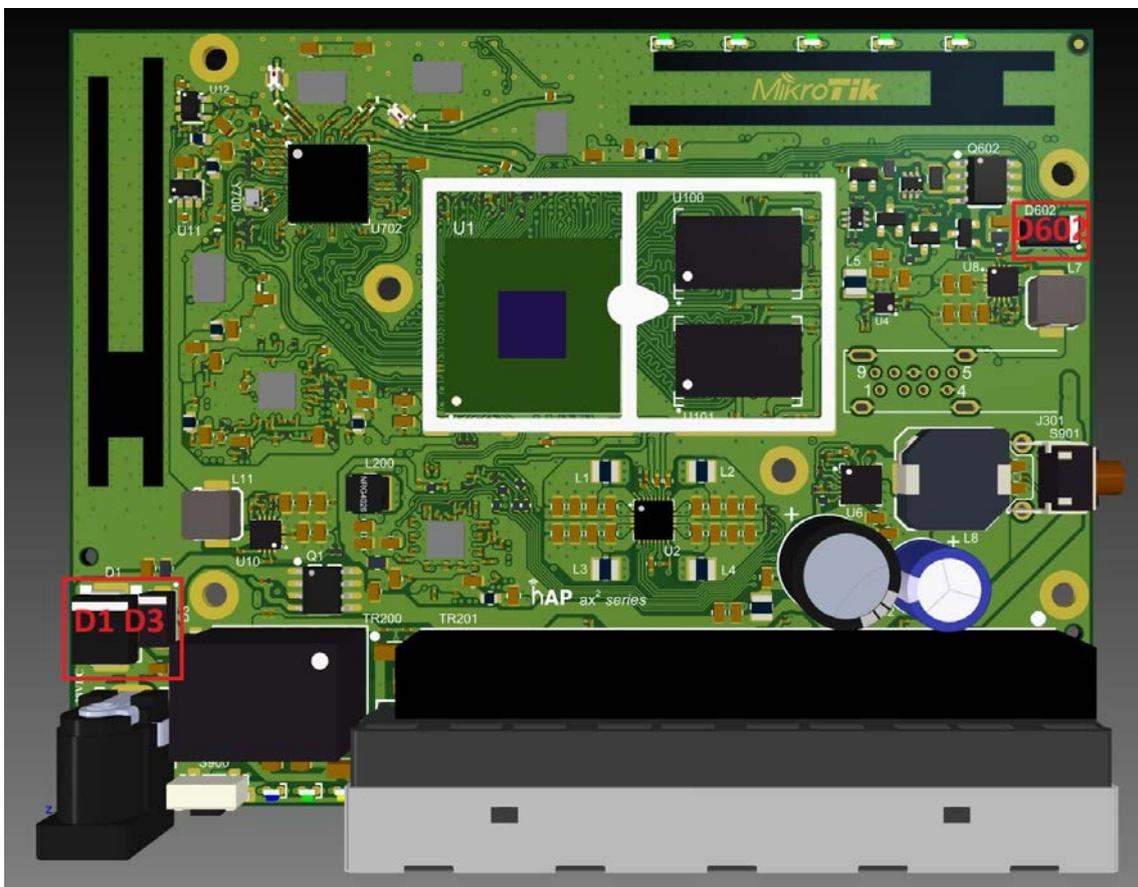
Instructions for checking overvoltage

Checking Schottky diode

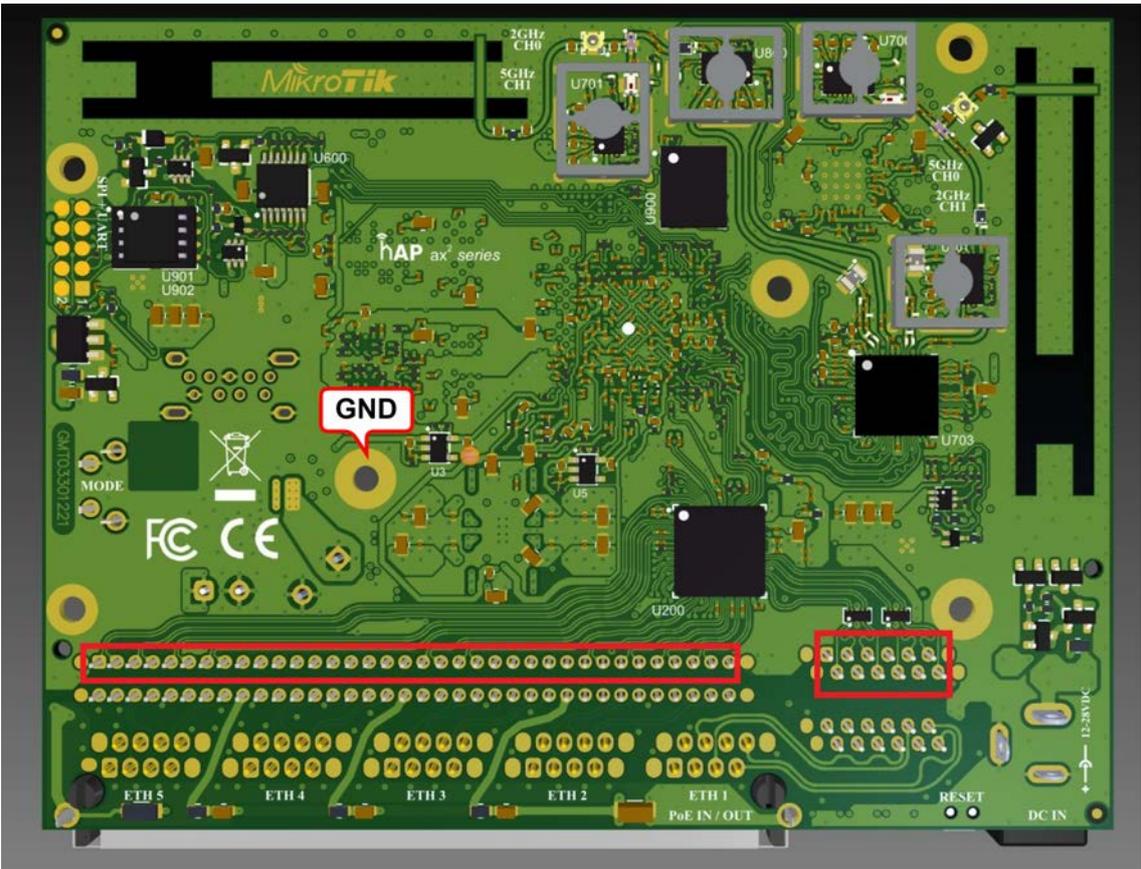
Check Schottky diodes D1, D3 and D602. The location of these diodes on the board is shown in picture 399. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR200 and TR201 pins and Ground. Test points on the transformer pins are highlighted with red lines, see picture 400. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 21.



Picture 399



Picture 400

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



Picture 401

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 403. The disassembly starts undoing six snap fit hooks that are located as shown in picture 402, 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.

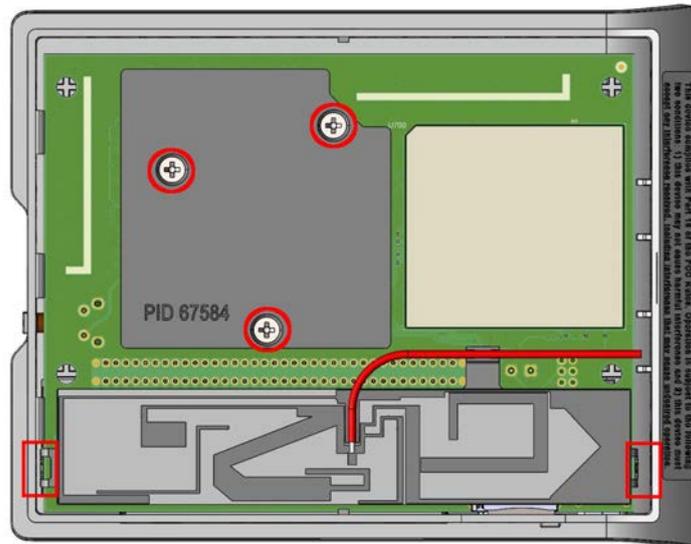


Picture 402



Picture 403

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

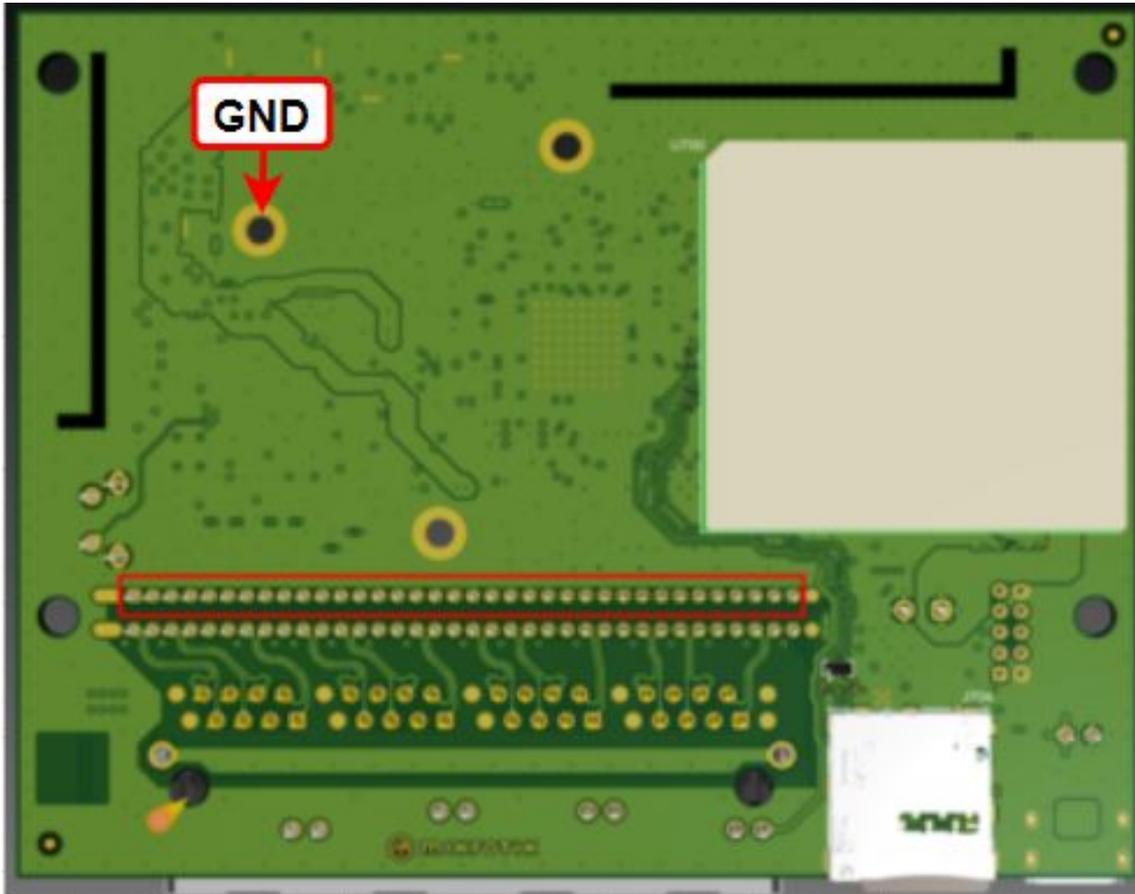


Picture 404

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 405. Voltage drop value should be in the range from 0,35V to 0,39V. Voltage drop measurement method is described on page 21.



Picture 405

HEX SERIES ROUTERBOARDS

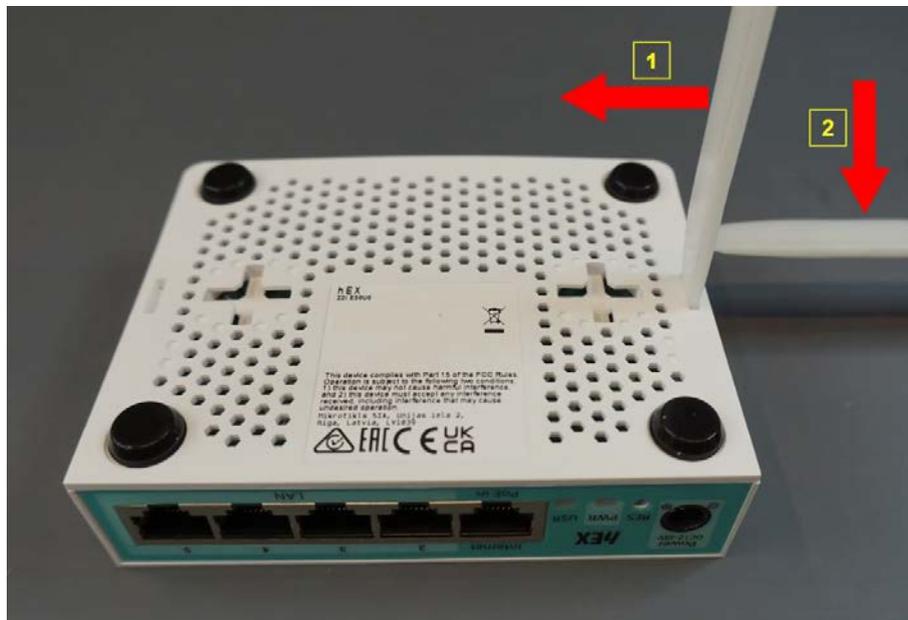
hEX (E50UG)



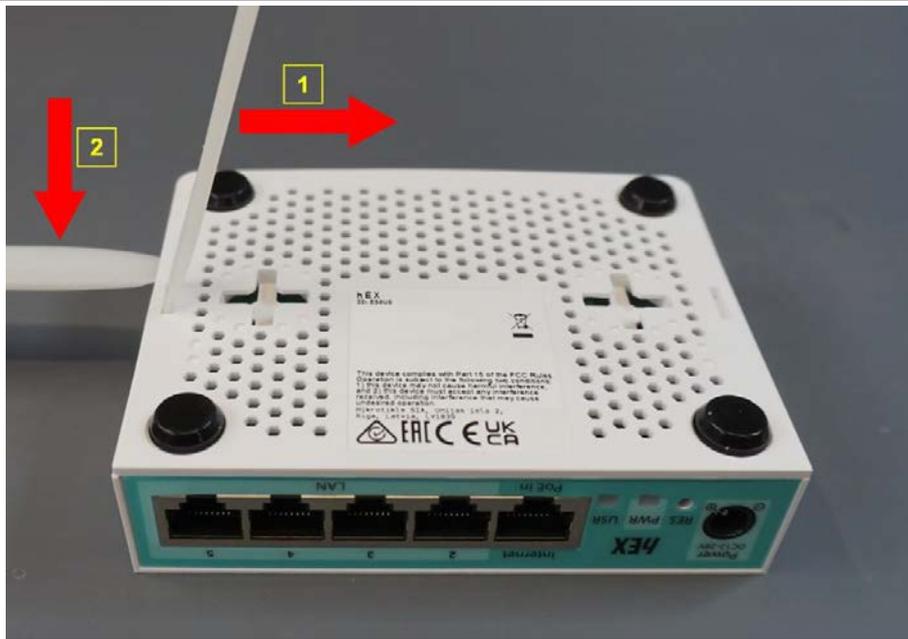
Picture 406

Disassembling information

Step 1: Using plastic prying tools remove the back cover as shown in pictures 407 and 408.

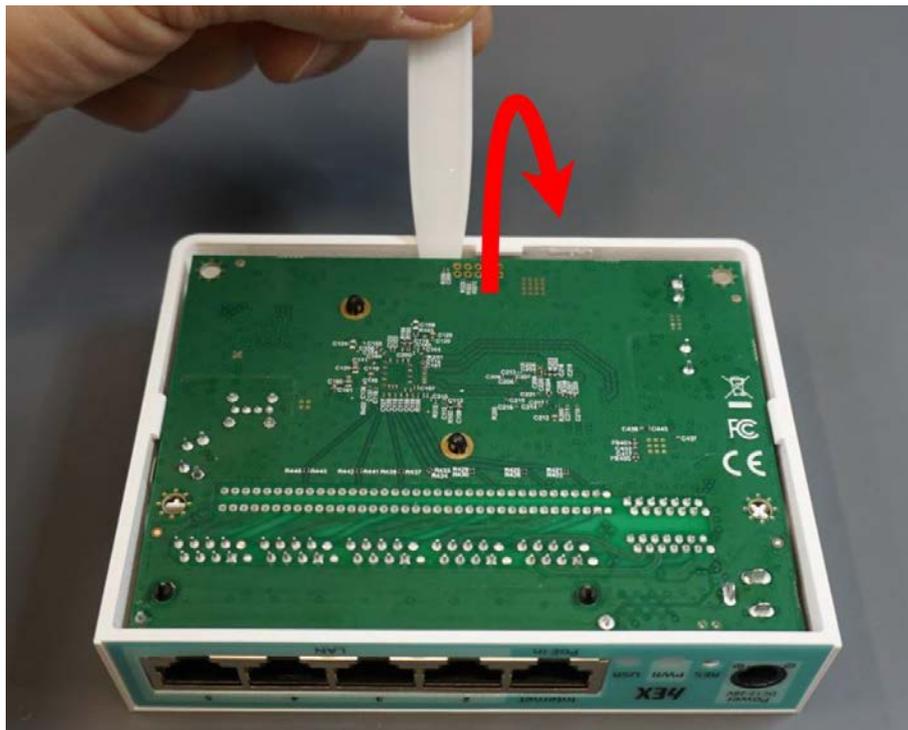


Picture 407



Picture 408

Step 2: Remove the PCB from the case, see picture 409.

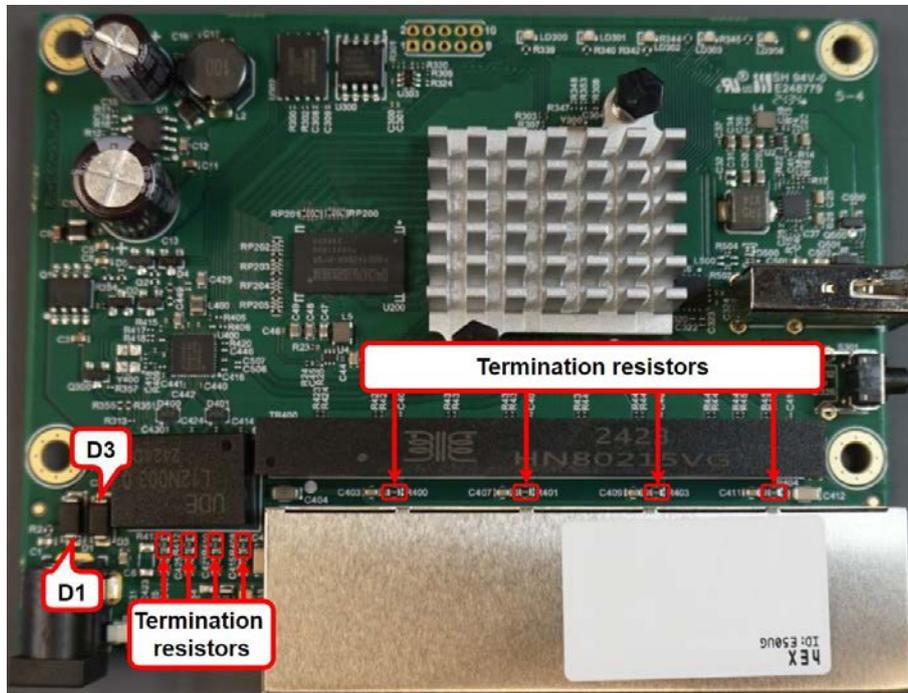


Picture 409

Instructions for checking over-voltage

Checking Schottky diodes

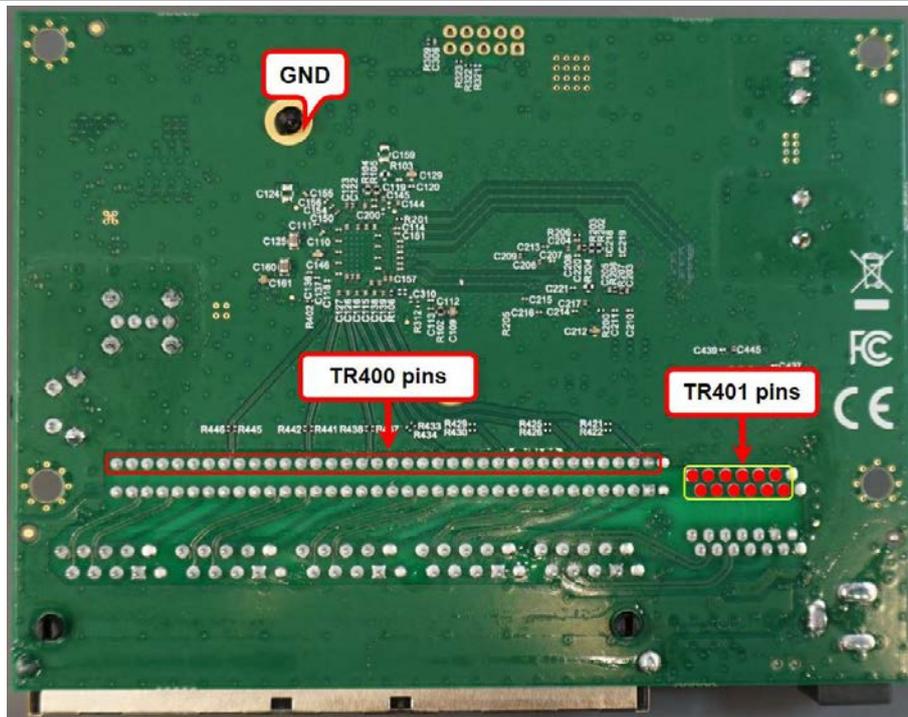
Check Schottky diodes D1 and D3. Location of the diodes on the board you can see in the picture 410. Schottky diode quality measurement method is described on page 18.



Picture 410

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR400, TR401 pins and Ground, see picture 411. 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 21.



Picture 411

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 [410](#).

hEX S(E60iUGS)



Picture 412

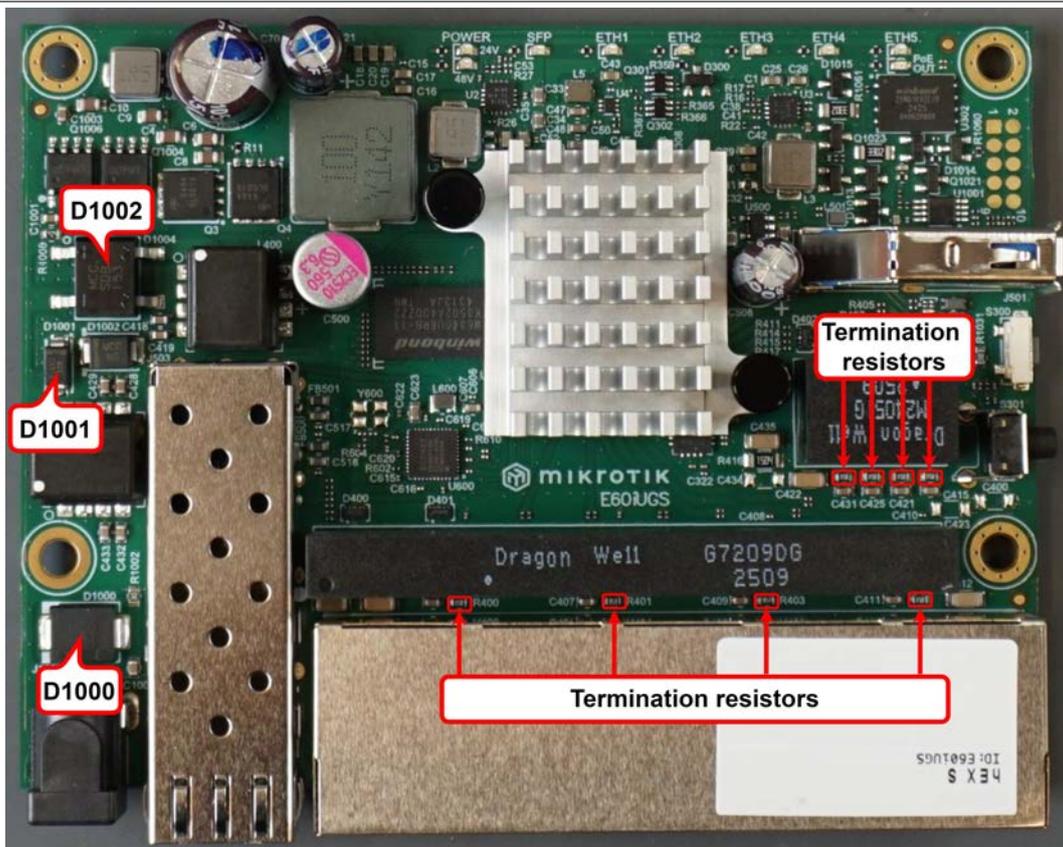
Disassembling information

Disassembling method is the same as for hEX (E50UG), see page [335](#).

Instructions for checking over-voltage

Checking Schottky diodes and diode bridge

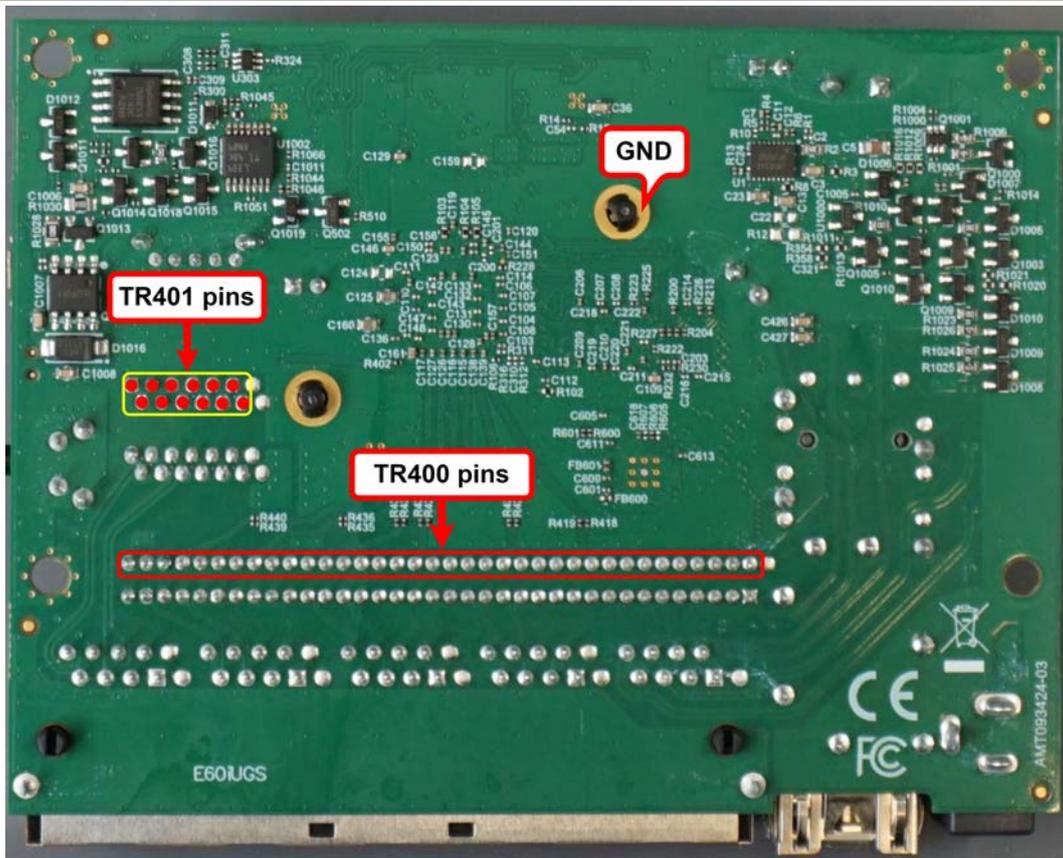
Check Schottky diodes D1000, D1001 and diode bridge D1002. Location of the diodes on the board you can see in the picture [413](#). Schottky diode quality measurement method is described on page [18](#). Diode bridge quality measurement method is described on page [19](#).



Picture 413

Checking voltage drop value between Ethernet transformers pins and Ground

Check voltage drop value between Ethernet transformers TR400, TR401 pins and Ground, see picture 414. 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 21.



Picture 414

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 413.

L009 SERIES ROUTERBOARDS

L009UiGS-RM and L009UiGS-2HaxD-IN



Picture 415

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 416. When you have finished unscrewing the screws turn the RouterBOARD around and remove the red cover as shown in picture 417.

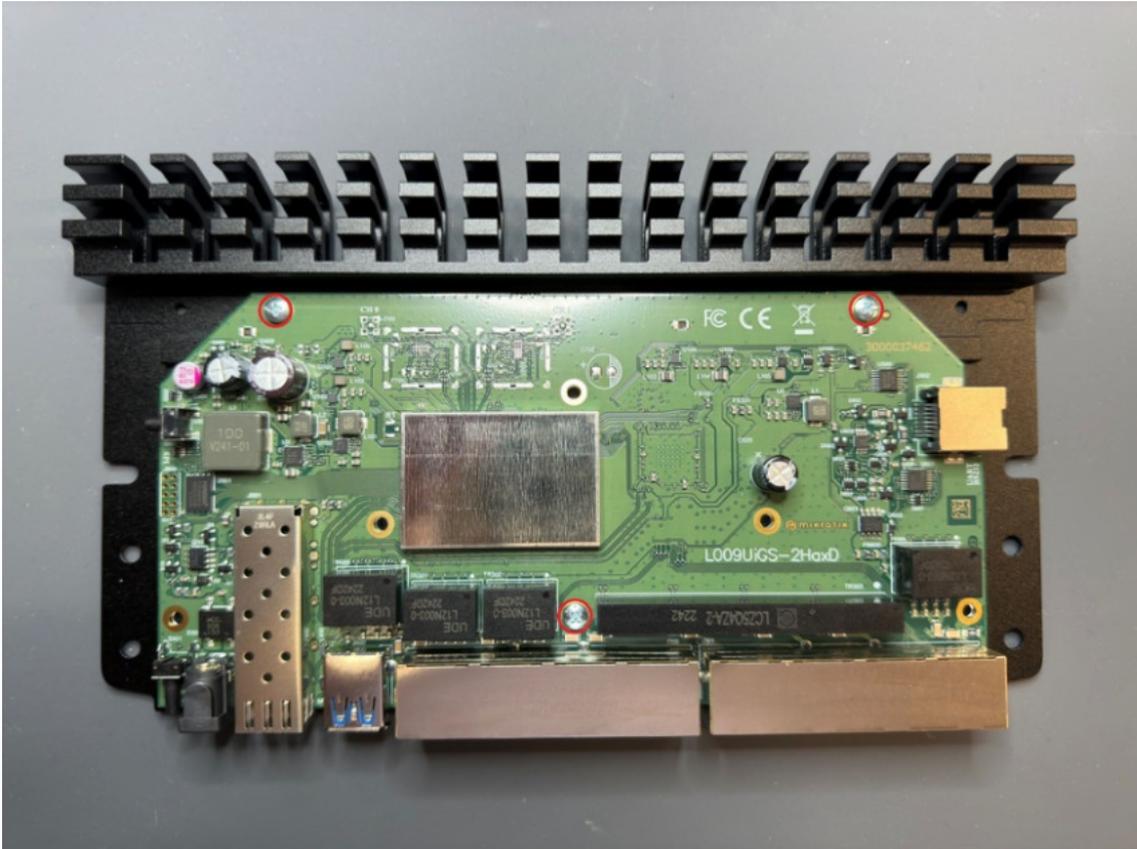


Picture 416



Picture 417

Step 2: After removing the red cover unscrew the 3 screws that are holding the RouterBOARD in place as shown in the picture 418. Now you can remove the PCB and start checking over-voltage.

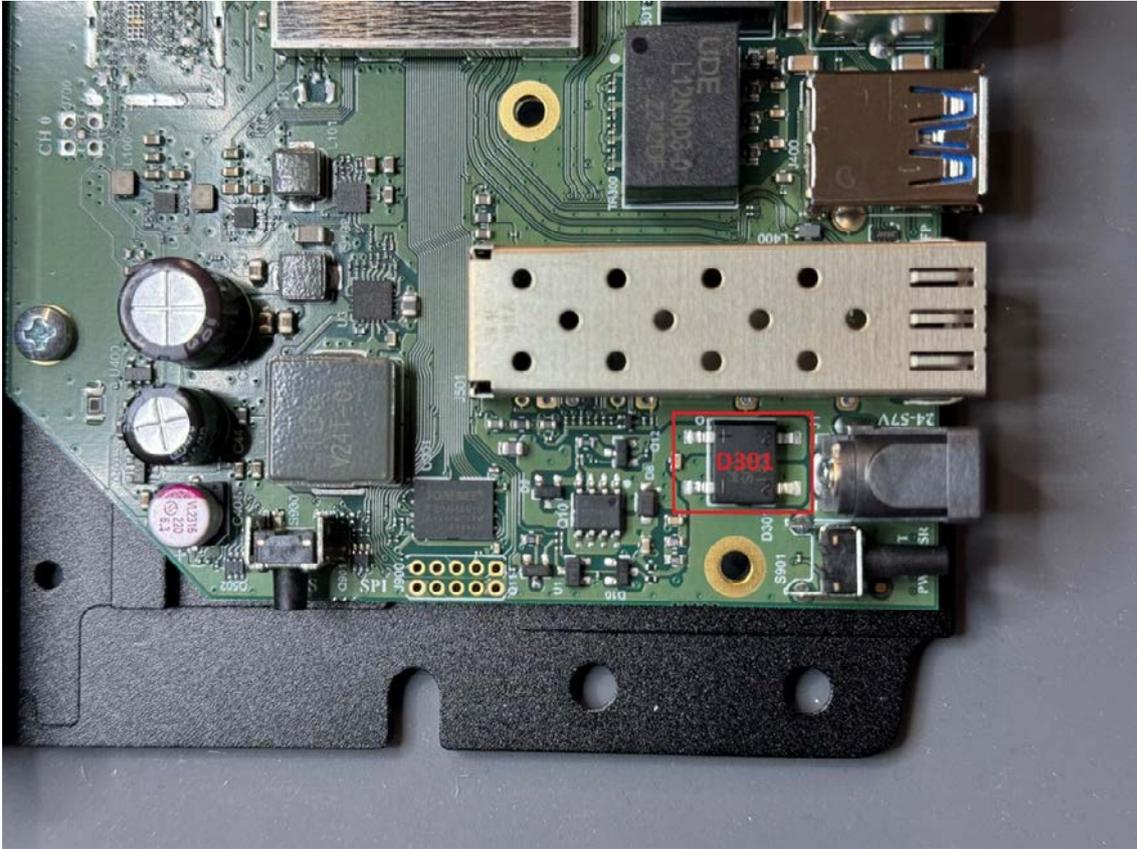


Picture 418

Instructions for checking overvoltage

Checking Schottky diode

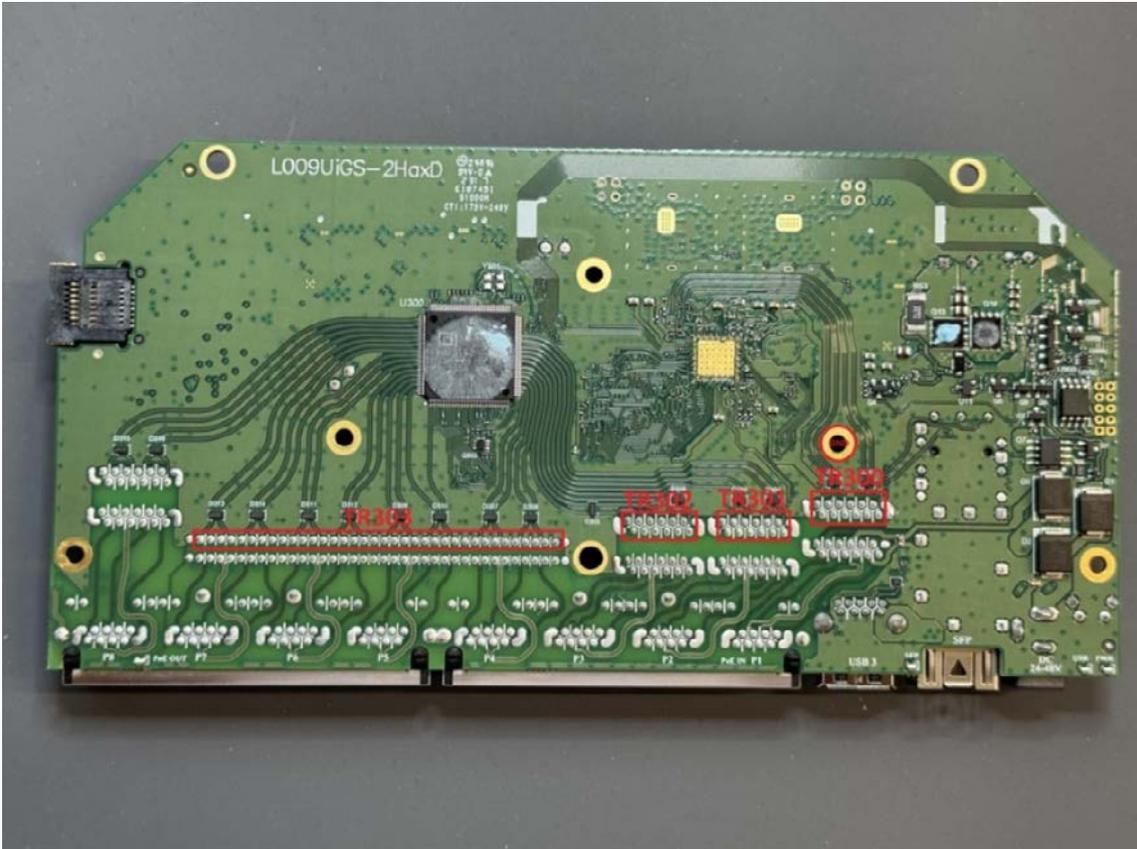
Check diode bridge D301. The location of this diode on the board is shown in picture 419. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.



Picture 419

Checking voltage drop value between Ethernet transformer pins and Ground

Check voltage drop value between Ethernet transformers TR300, TR301, TR302, TR303 pins and Ground. Test points on the transformer pins are highlighted with red squares, see picture 420. Voltage drop value should be in the range from 0,32V to 0,45V. Voltage drop measurement method is described on page 21.



Picture 420

L23 SERIES ROUTERBOARDS

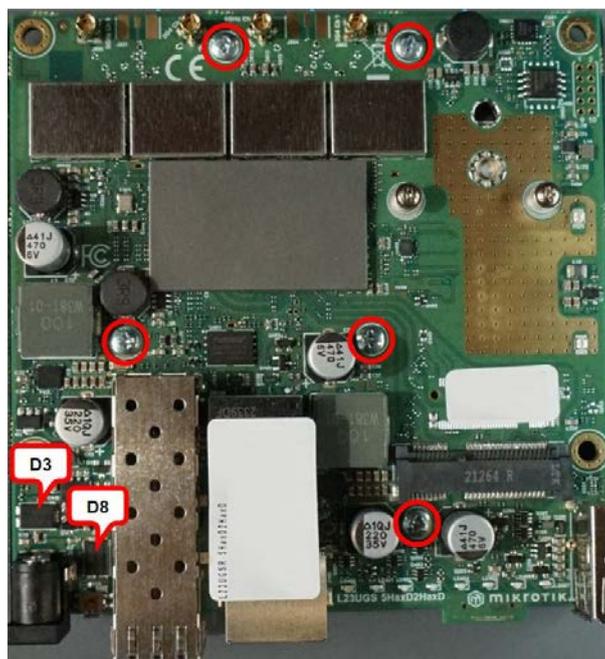
L23UGSR-5HaxD2HaxD



Picture 421

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 422.



Picture 422

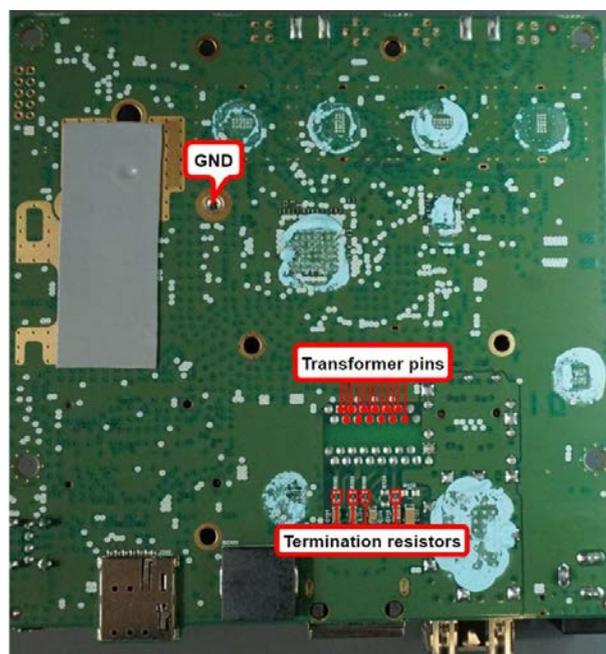
Instructions for checking over-voltage

Checking Schottky diodes

Check Schottky diodes D3, D8. Location of the diodes you can see in the picture [422](#). Schottky diode quality measurement method is described on page [18](#).

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 [423](#). Voltage drop value should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page [21](#).



Picture 423

Checking termination resistors resistance

Check value of each termination resistor, it should be 75 Ohm $\pm 2\%$. Location of resistors is shown in picture [423](#).

NetMetal ax (L23UGSR-5HaxD2HaxD)



Picture 424

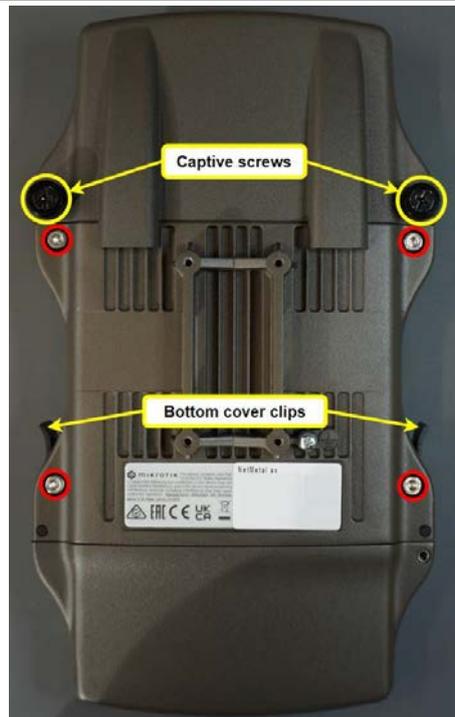
Disassembling information

Step 1:

Unscrew two captive screws and remove the top cover, see picture [425](#).

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 [425](#).



Picture 425

Step 3:

Carefully detach the rubber seal from the top part of the case, see pictures 426, 427. After that, gently peel off the label, see picture 427. Carefully separate the back part of the case from the front part of the case.



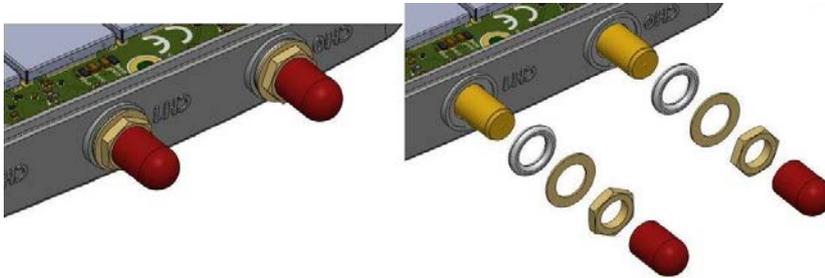
Picture 426



Picture 427

Step 4:

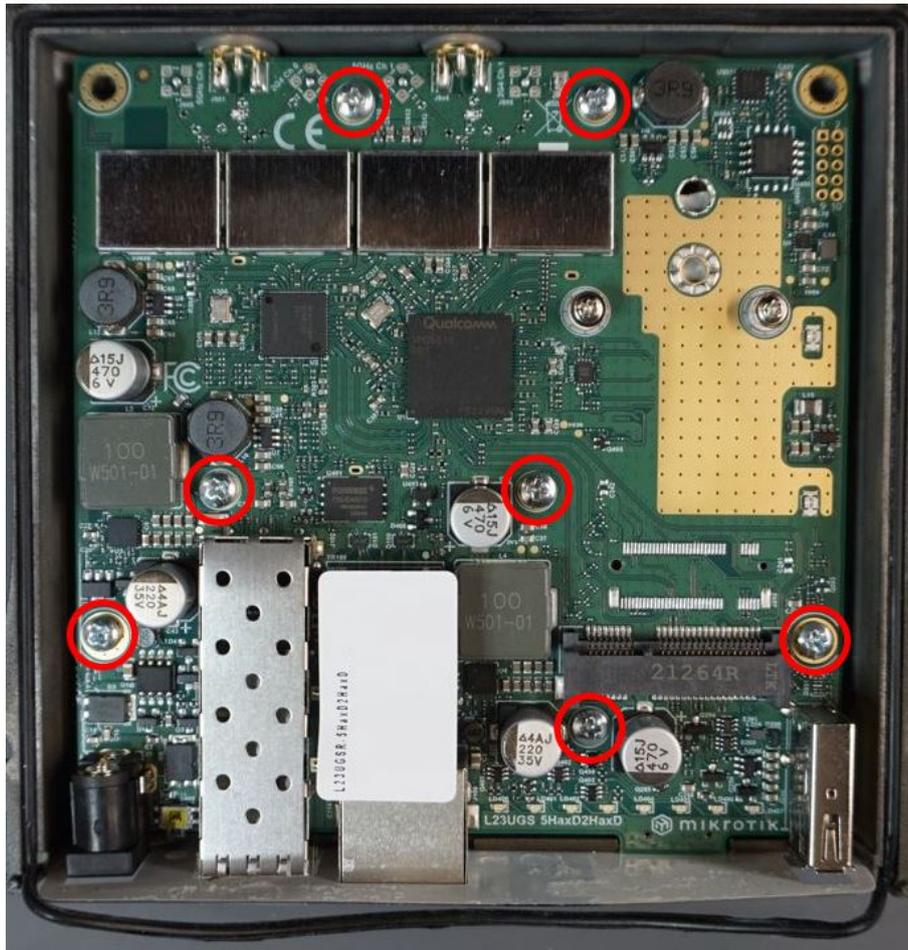
Unscrew two SMA connector nuts. After that, remove washers and transparent gaskets, see picture 428.



Picture 428

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 429.



Picture 429

Instructions for checking over-voltage

Over-voltage testing procedure is the same as for L23UGSR, see page [350](#).

CUBE SERIES ROUTERBOARD

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



Picture 430

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 in the picture 431. The disassembled case can be seen in the picture 432.



Picture 431



Picture 432

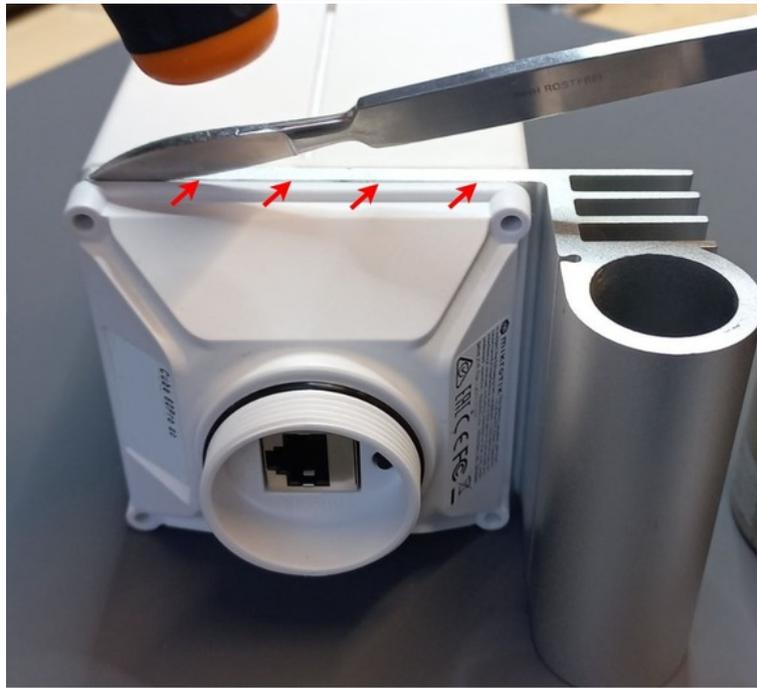
Disassembling information (sealed with sealant)

Step 1: Unscrew 4 screws using torx T10 screwdriver. Location of the screws is shown the picture 433.



Picture 433

Step 2: Using a scalpel or a sharp knife, carefully separate the cover. How to do this, see the picture 434. The cover is difficult to remove because it is glued with sealant, so be extremely cautious doing this.



Picture 434

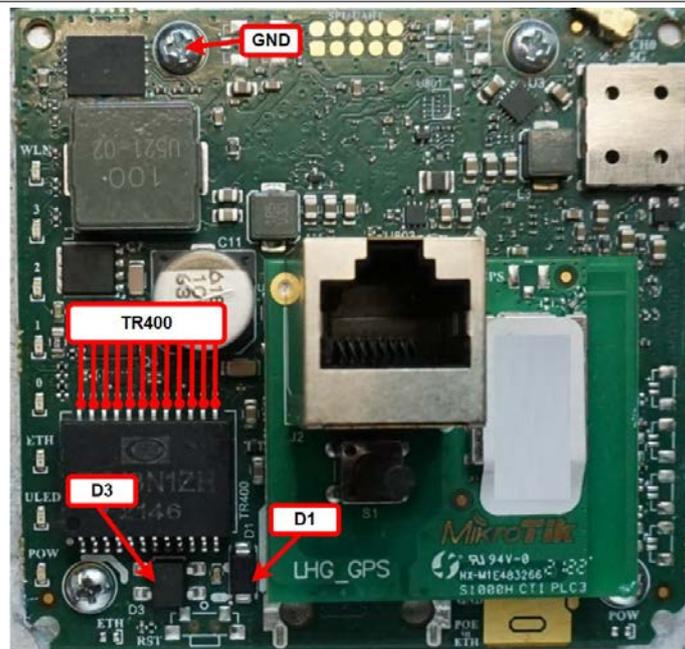
Instructions for checking over-voltage

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 434. Schottky diode quality measurement method is described on page 18. Diode bridge 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 highlighted with red lines, see picture 434. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.



Picture 435

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 436

Disassembling information

Tools recommended for the disassembly are plastic prying tools, such as shown on pictures [437](#) and [438](#).



Picture 437



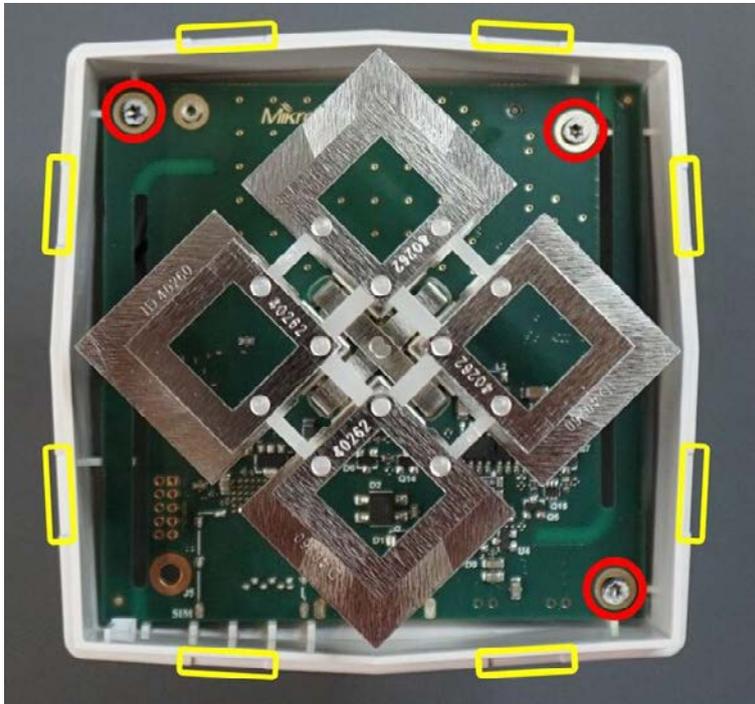
Picture 438

Step 1: Using plastic prying tools release 8 snap hooks around the perimeter of the case as shown in the picture 439. The location of the snap hooks can be seen in the picture 440 (marked in yellow).



Picture 439

Step 2: Unscrew 3 screws using torx T8 screwdriver. Location of the screws is shown in the picture 440.

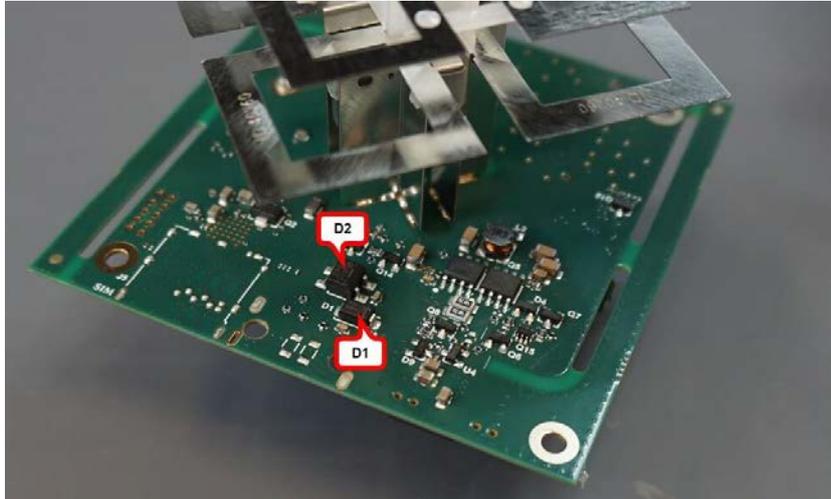


Picture 440

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

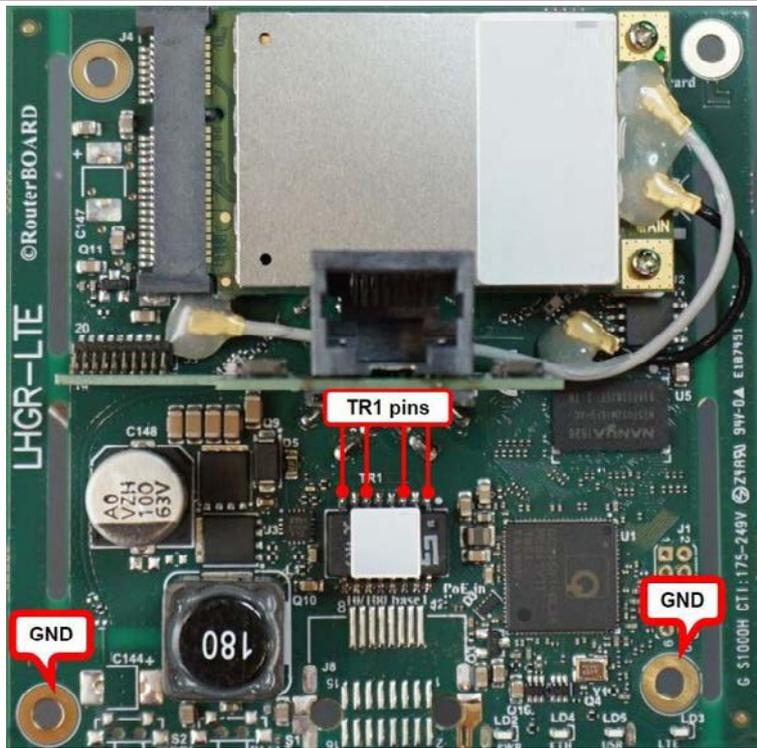
Check Schottky diode D1 and diode bridge D2. Location of the diodes on the board you can see in the picture 441. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.



Picture 441

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 442. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.



Picture 442

LHG SERIES ROUTERBOARD

LHGG LTE6 kit (RBLHGGR&R11e-LTE6)



Picture 443

Disassembling information

Tools recommended for the disassembly are plastic prying tools, such as shown on pictures [444](#) and [445](#).

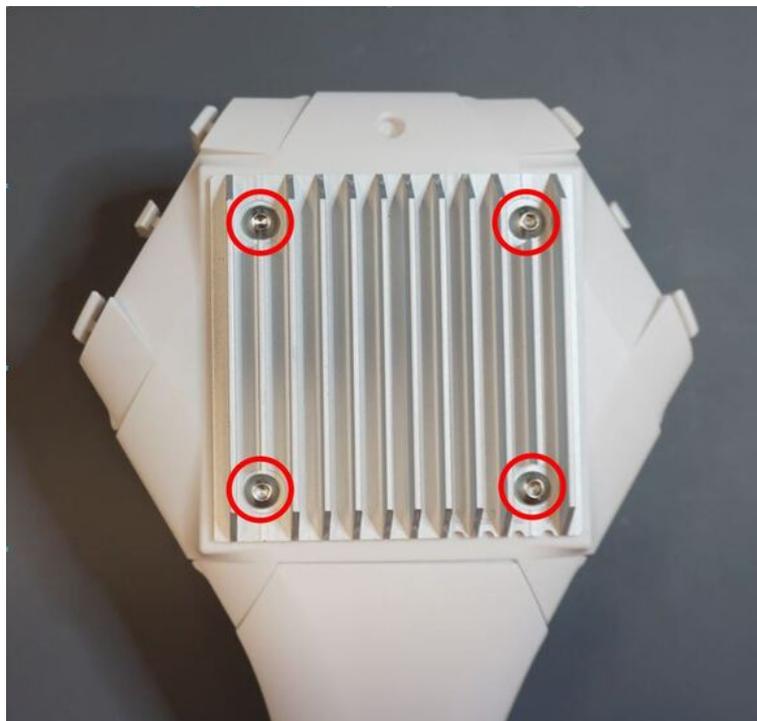


Picture 444



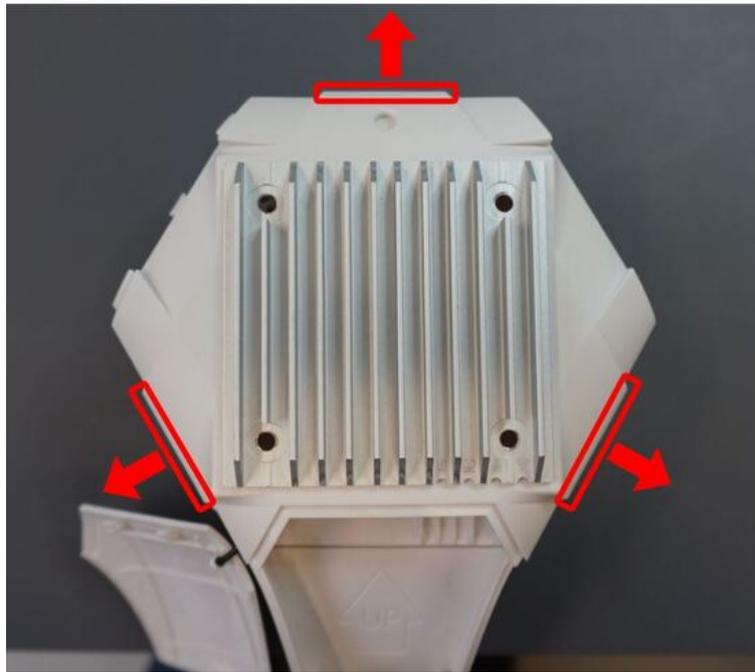
Picture 445

Step 1: Unscrew 4 screws using 2.5mm Hex screwdriver. Location of the screws is shown the picture [446](#).



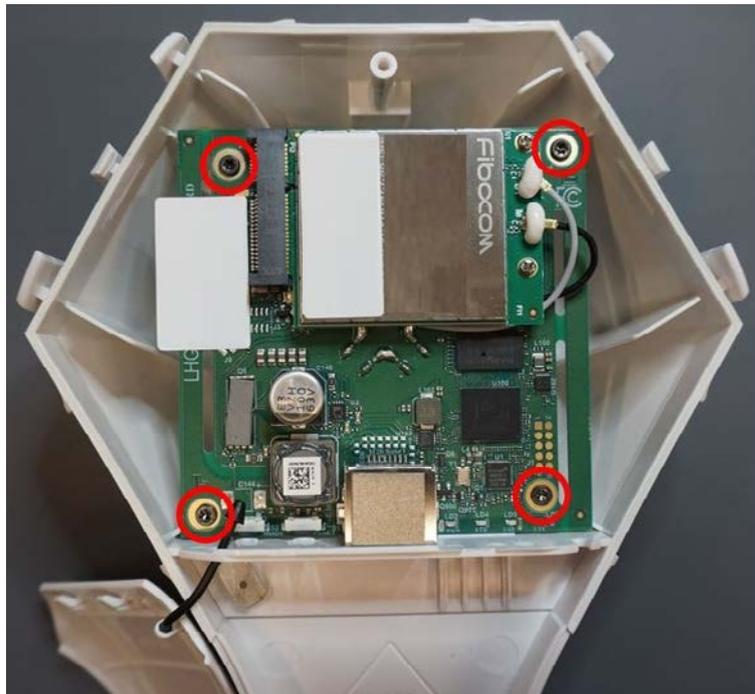
Picture 446

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 [447](#).



Picture 447

Step 3: Unscrew 4 screws using torx T8 screwdriver and remove the PCB from the case. Location of the screws is shown the picture [448](#).



Picture 448

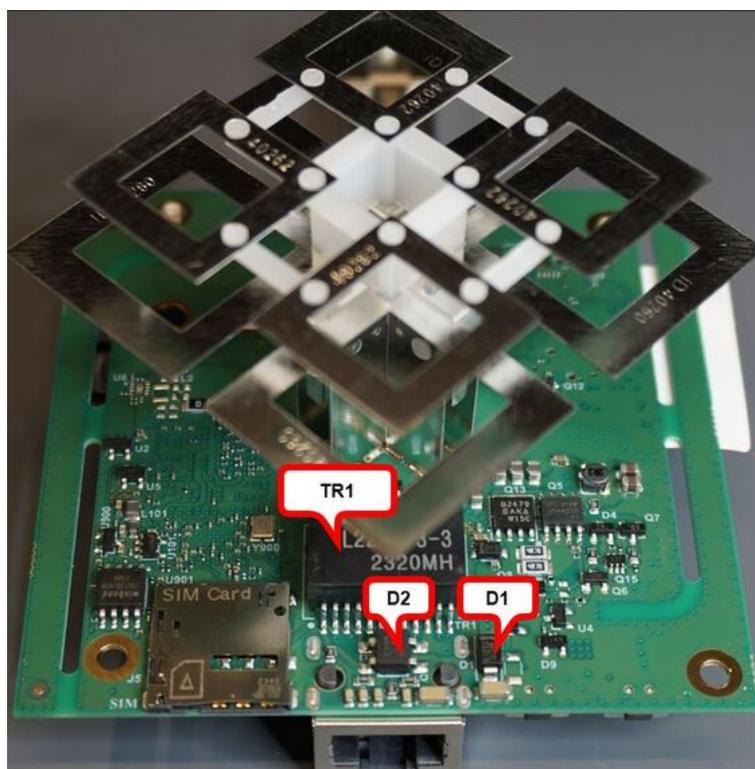
Instructions for checking over-voltage

Checking Schottky diode and diode bridge

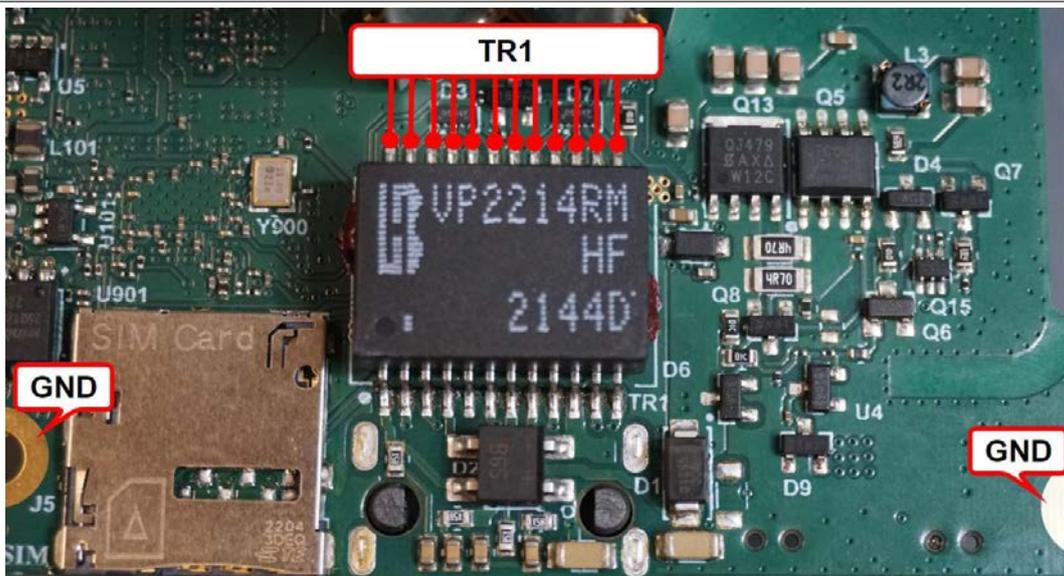
Check Schottky diode D1 and diode bridge D2. Location of the diodes on the board you can see in the picture 449. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

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 highlighted with red lines, see picture 450. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.



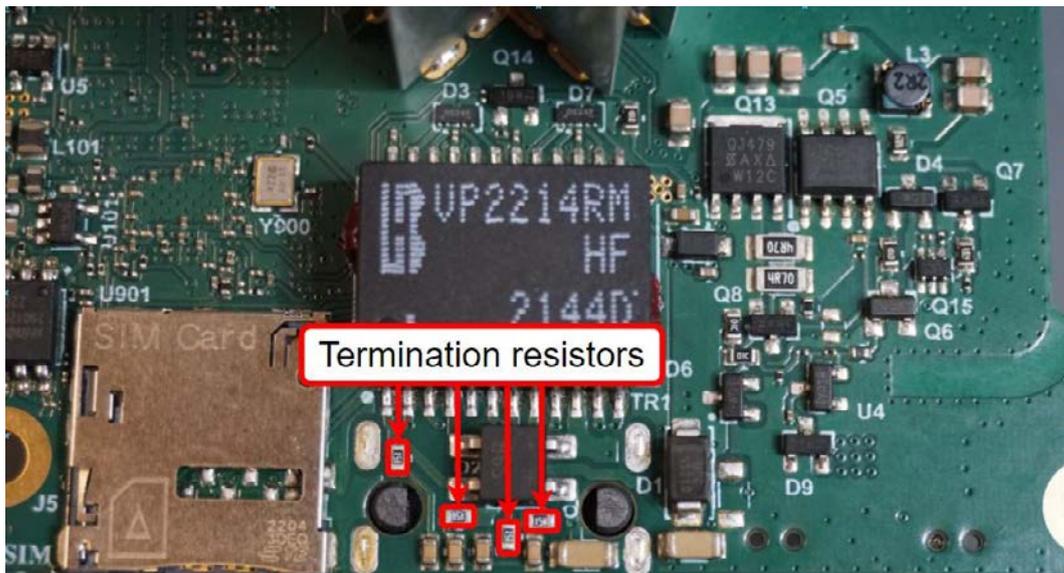
Picture 449



Picture 450

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 451.



Picture 451

LHGGM&EG18-EA



Picture 452

Disassembling information

Disassembling method is the same as for LHGG LTE6 kit, see page 446.

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

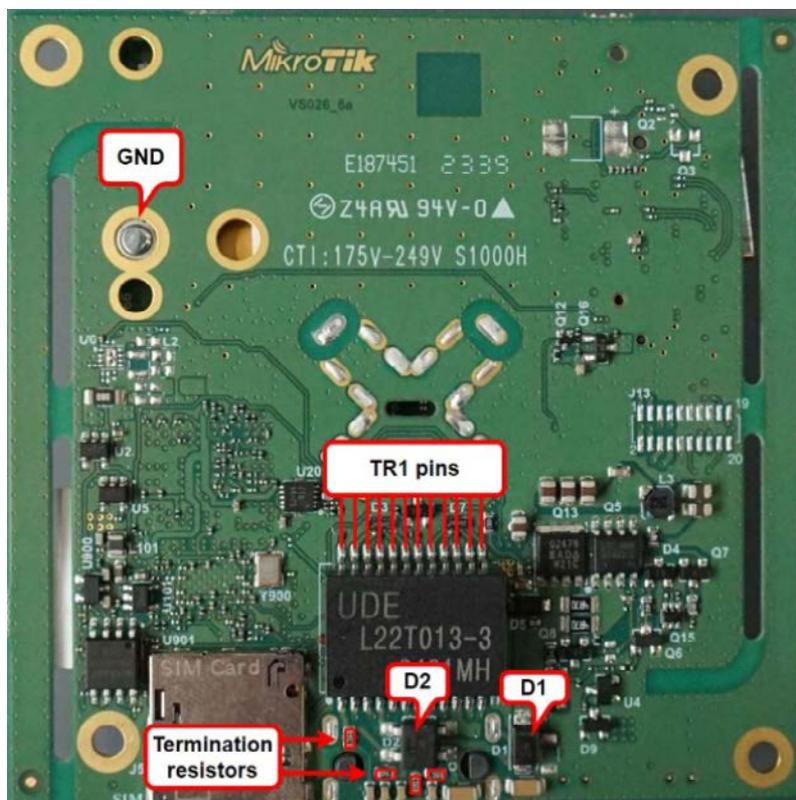
Check Schottky diode D1 and diode bridge D2. Location of the diodes on the board you can see in the picture 453. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

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 highlighted with red lines, see picture 453. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.

Checking 75 Ohm termination resistors resistance

Check value of four termination resistors. It should be 75 Ohms +/- 1%. Location of resistors is shown in picture 453.



Picture 453

LHG XL 5 ax (LHG 5HaxD, LHG 5HaxD XL)



Picture 454

Disassembling information

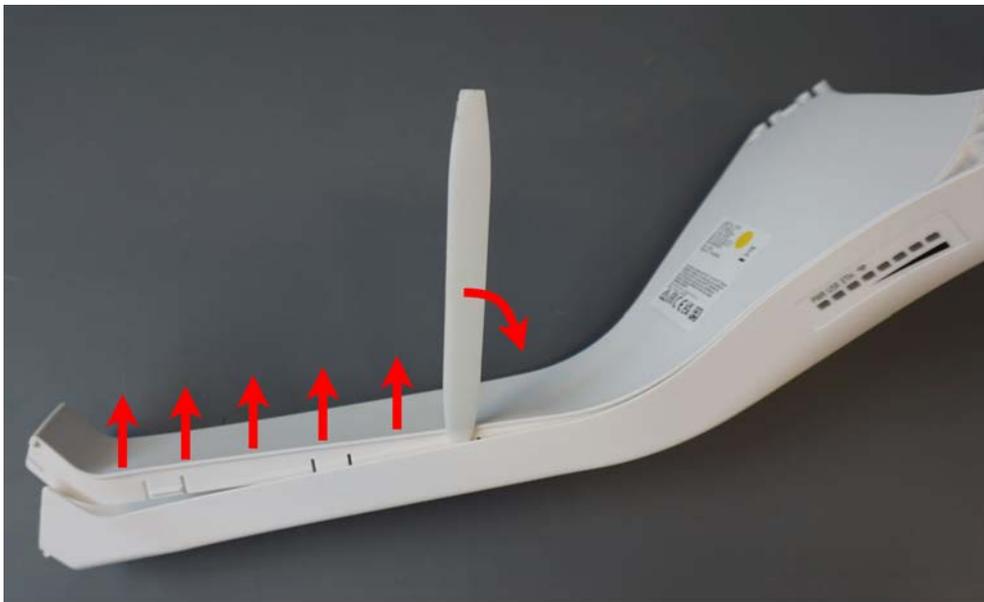
Tools recommended for the disassembly are plastic prying tools, see pictures [444](#) and [445](#).

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 [455](#), [456](#).



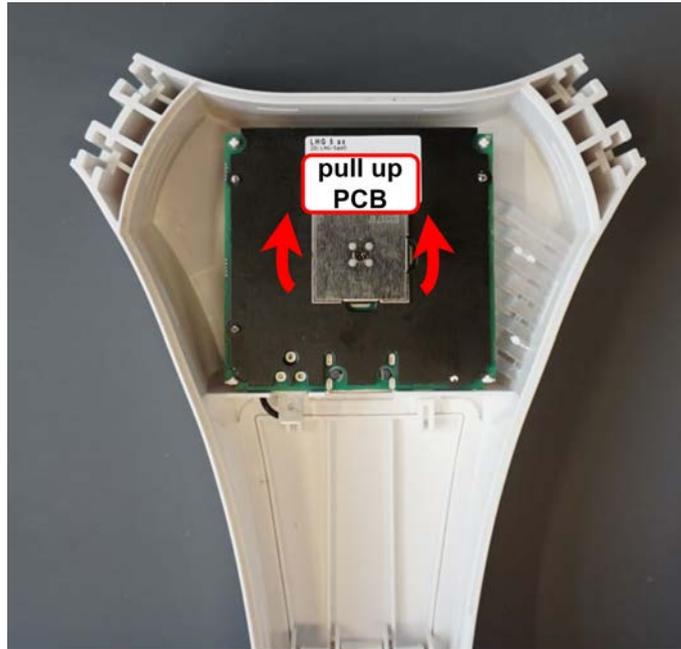
Picture 455



Picture 456

Step 2:

When the cover is removed, carefully pull the PCB out of the case, see picture [457](#).



Picture 457

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 [458](#).



Picture 458

Instructions for checking over-voltage

Checking Schottky diode

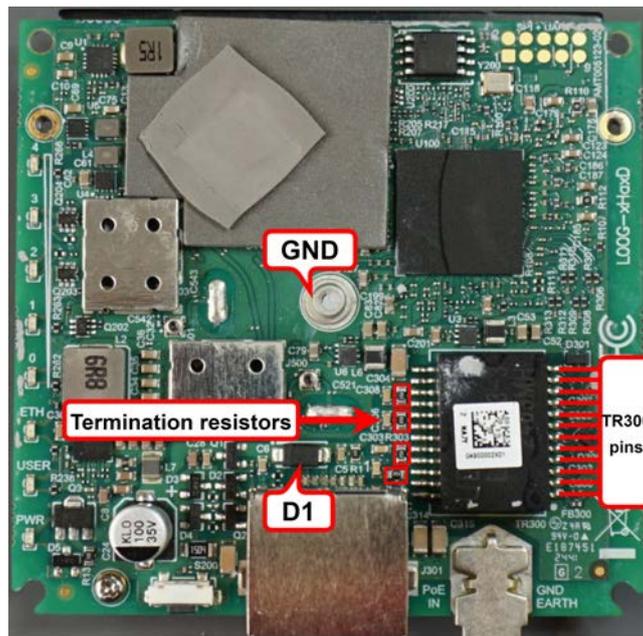
Check Schottky diode D1. Location of the diode on the board you can see in the picture 459. Schottky diode quality measurement method is described on page 18.

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 459. Voltage drop value should be in the range from 0,35V to 0,45V. Voltage drop measurement method is described on page 21.

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 459.



Picture 459

MANTBOX SERIES ROUTERBOARDS

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



Picture 460

Disassembling information

Step 1: Open the cable enclosure and unscrew the wing-nut, see picture 461.



Picture 461

Step 2:

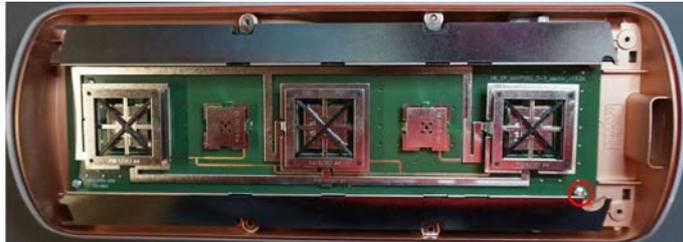
Unscrew 8 screws using torx T10 screwdriver. Location of the screws is shown the picture 462.



Picture 462

Step 3:

Remove the cover from the case and unscrew the screw (M4x16), see picture 463, then pull out the antenna board from the case.



Picture 463

Step 4:

Disconnect antenna cables and unscrew 5 screws using PH1 screwdriver and remove the board, see picture 464.

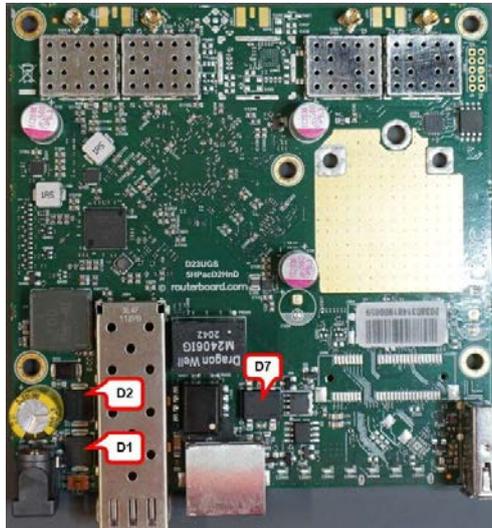


Picture 464

Instructions for checking over-voltage

Checking Schottky diodes and diode bridge

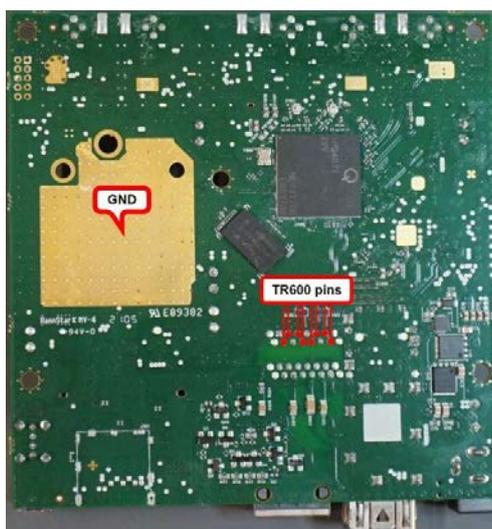
Check Schottky diodes D1, D2 and diode bridge D7. Location of the diodes on the board you can see in the picture 465. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.



Picture 465

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 466. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.



Picture 466

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



Picture 467

Disassembling information

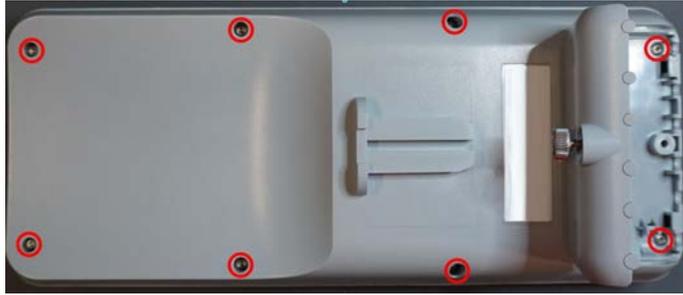
Step 1: Open the cable enclosure and unscrew the wing-nut, see picture 468.



Picture 468

Step 2:

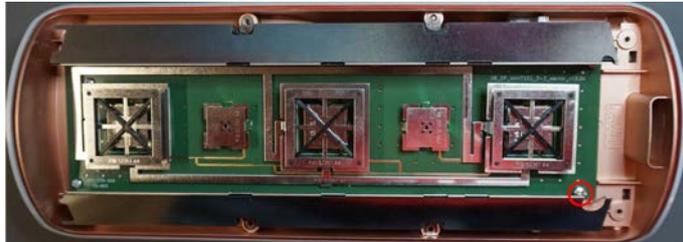
Unscrew 8 screws using torx T10 screwdriver. Location of the screws is shown the picture 469.



Picture 469

Step 3:

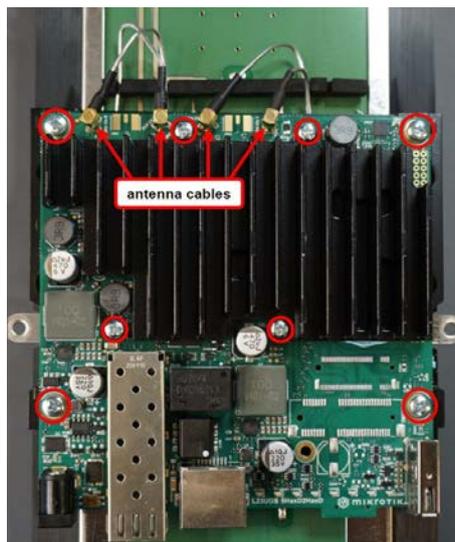
Remove the cover from the case and unscrew the screw (M4x16), see picture 470, then pull out the antenna board from the case.



Picture 470

Step 4:

Disconnect antenna cables and unscrew 8 screws using PH1 screwdriver and remove the board, see picture 464.



Picture 471

Instructions for checking over-voltage

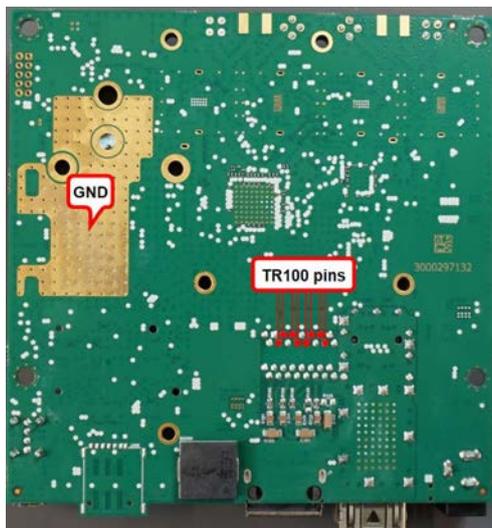
Check Schottky diodes D3, D8. Location of the diodes on the board you can see in the picture 472. Schottky diode quality measurement method is described on page 18.



Picture 472

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 473. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.



Picture 473

KNOT SERIES

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

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



Picture 474

Disassembling information

Step 1: Unscrew 1 screw using PH1 screwdriver. Location of the screw is shown the picture [475](#).



Picture 475

Step 2: Press the clips in the direction shown in the picture [476](#) at the same time lift the case up.



Picture 476

Step 3: Unscrew 6 screw using PH1 screwdriver. Location of the screw is shown the picture 477. Unplug the LR8/LR9 card from the connector and pull the circuit board out of the case.



Picture 477

Instructions for checking over-voltage

Checking Schottky diode and diode bridge

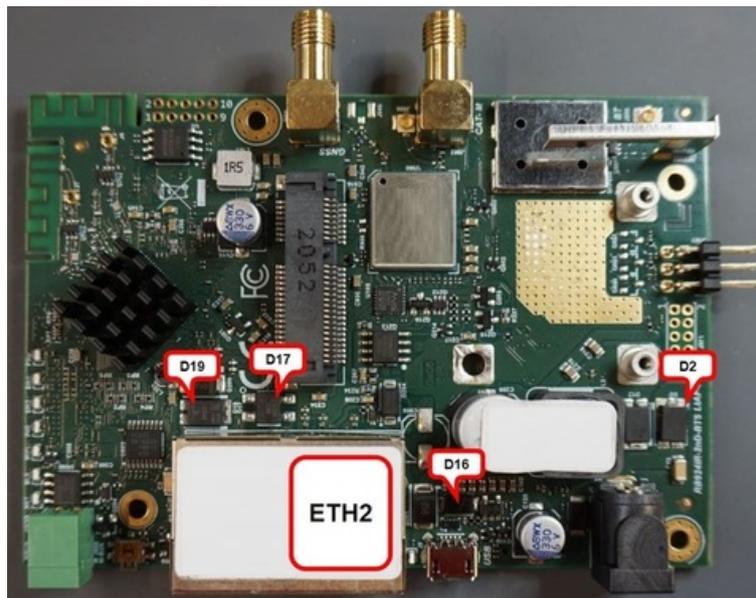
Check Schottky diodes D2, D16, D19 and diode bridge D17. Location of the diodes on the board you can see in the picture 478. Schottky diode quality measurement method is described on page 18. Diode bridge quality measurement method is described on page 19.

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

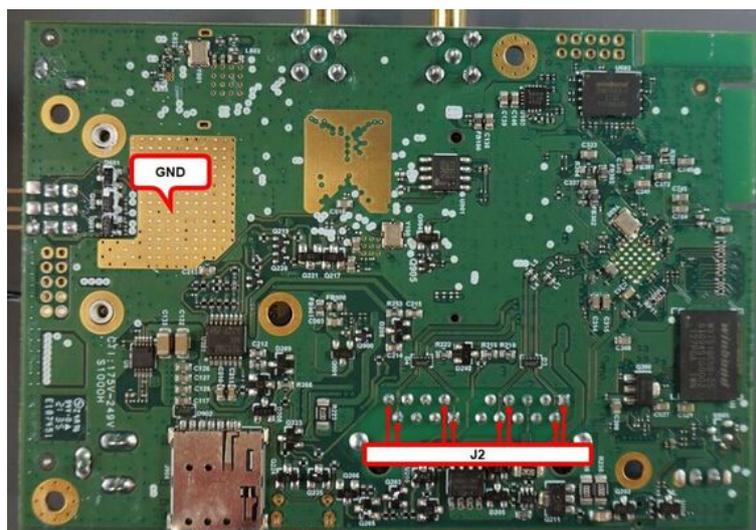
Check voltage drop value between RJ-45 (J2) connector pins and ground. Test points are shown in picture 479. Voltage drop value should be in the range from 0,35V to 0,40V. Voltage drop measurement method is described on page 21.

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 478. Resistance value between Rx and Tx line must be 150 Ohm +/-4 %. Measurement method is described on page 22.



Picture 478



Picture 479

KNOT (RB924i-2nD-BT5&BG77)



Picture 480

Disassembling information

Disassembling method is the same as for KNOT LR8 and KNOT LR9, except for step 3, see page [385](#).

Instructions for checking over-voltage

Over-voltage testing procedure is the same as for KNOT LR8 and KNOT LR9, see page [386](#).

WAP SERIES

wAP ax



Picture 481

Disassembling information

Step 1: Unscrew 1 screw using PH1 screwdriver. Location of the screw is shown the picture [482](#).



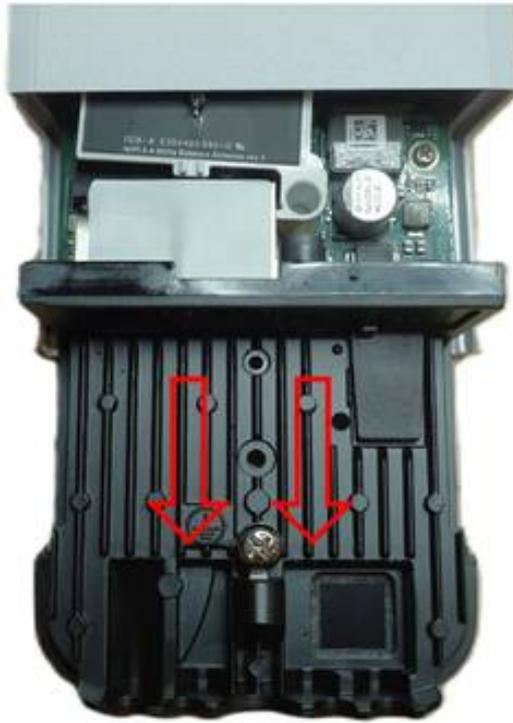
Picture 482

Step 2: Remove case cover and unscrew 1 screw using PH1 screwdriver. Location of the screw is shown the picture [483](#).



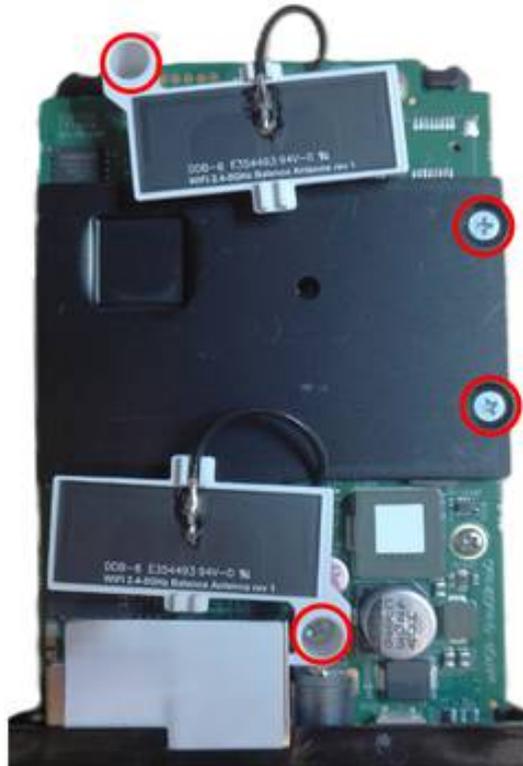
Picture 483

Step 3: Pull the metal case part in the direction shown in the picture [484](#).



Picture 484

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 485. Do not unplug antenna connectors from the circuit.



Picture 485

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 486.



Picture 486

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 487 and 488. Schottky diode quality measurement method is described on page 18. Diode bridge 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, see picture 487. Voltage drop value should be in the range from 0,40V to 0,45V. Voltage drop measurement method is described on page 21.

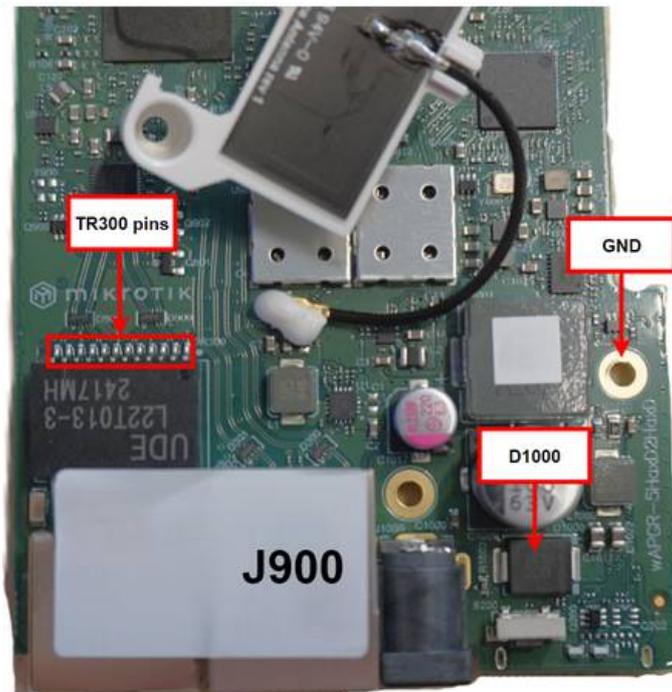
Checking 75 Ohm termination resistors resistance

Check value of each termination resistor. It should be 75 +/-1% Ohms. Location of resistors is shown in picture 488.

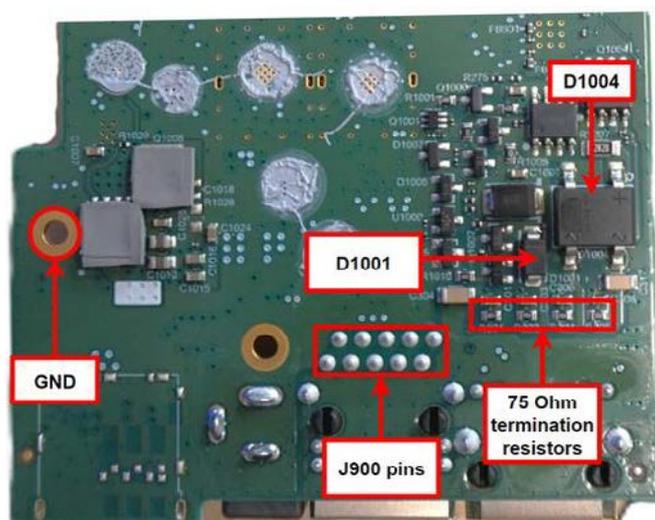
Checking termination resistors resistance in RJ-45 connector

Check termination resistors resistance in J900 connector. RJ-45 placement is shown in picture 487.

Resistance value between Rx and Tx line must be 150 Ohm \pm 4%. Measurement method is described on page 22.



Picture 487



Picture 488