Checking procedure for overvoltage damage.

Overvoltage can be caused by following reasons: high voltage surge, lightning, electrostatics etc.

You can check if routerboard was damaged by overvoltage or not, by using following testing method:
All measurements should be made while power is turned off!

1. Check voltage drop between diode array pin#1 and Ground.
   You should measure in diode mode (hold "positive" wire on the Ground and "COM" wire on the diode array pin#1).
   Diode array pin#1 is always marked by dot mark on the diode array case (see picture 1 in the appendix).
   Diode array reference number and voltage drop values could be found in the table 1;
2. Check termination resistors resistance in RJ-45 connector. For this measurement you should take patch cord and plug it into the routerboard (see picture 2 in the appendix), and after that measure resistance of termination resistors.
   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.
   Ethernet connector reference number of each routerboard you can find in the table 1.

Table 1

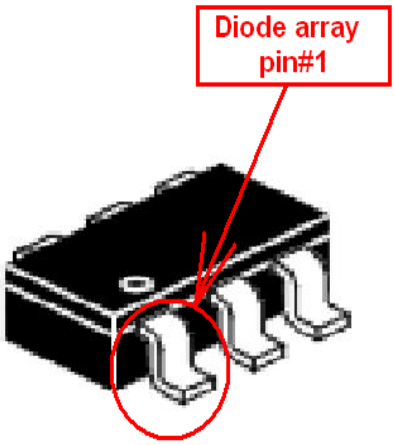
Routerboard type	**Diode array** reference number (voltage drop value, V)	**Ethernet connector** reference number
192	D2-D4; D17-D19; D21-D23 **(0,25V-0,32V)**	J6-J8; J13-J18
411, 411AH, 411AR, 411U, 411UR, 411UAHR	D601 **(0,39V-0,49V)**	J601
433, 433AH, 433UAH	D601, D602, D603 **(0,40V-0,50V)**	J601, J602, J603
433L, 433UAHL, 433UL	D505, D503, D501 **(0,30V – 0,40V)**	J503, J502, J501
433G, 433GL	D510, D512, D509, D508, D503, D502 **(0,3V-0,4V)**	J502, J501
411L, 411UHAL	D5 **(0,45V - 0,55V)**	J5
411GL	D501, D504 **(0,32V - 0,40V)**	---
450	D601-D605 **(0,30V-0,50V)**	J601-J605
450G	D501-D510 **(0,21V-0,3V)**	J501-J503; J505

493, 493A	D601 **(0,30V-0,40V)** D701, D703, D705, D707, D709, D711, D713, D715 **(0,38V-0,44V)**	J601, J701-J708
493G, 493GAH	D601, D603, D605, D607, D609, D611, D614, D615, D618, D620, D801, D803, D805, D807, D809, D811, D815, D820 **(0,21V-0,3V)**	J601-J603; J605; J801-J803, J805
711-2Hn, 711-5Hn	D400 or D401 (it should be 6 pin device) **(0,31V-0,4V)**	Check ethernet port (J4 or J400)
711G **711GA**	D100, D101 **(0,26V-0,32V)**	---
750, 750UP	Check **voltage drop** between test points and Ground (see picture 3 in the appendix). This value should be in the range from **0,28V** to **0,35V**	Check each Ethernet port in the Ethernet connector J401
750G	Check **voltage drop** between test points and Ground (see picture 3 in the appendix). It should be in the range from **0,21V** to **0,28V**	
750GL, 751G, 951G	Check **voltage drop** between transformer TRF100 pins and Ground (see picture 3 in the appendix). It should be in the range from **0,32V** to **0,4V** Check **voltage drop** between transformer TRF101 pins and Ground (see picture 3 in the appendix). It should be in the range from **0,4V to 0,5V**	
951-2n	Check **voltage drop** between test points and Ground (see picture 3 in the appendix). This voltage drop value should be in the range from **0,30V** to **0,40V**	
751U-2HnD	D405, D409, D404, D408, D403 **(0,26V – 0,33V)**	J401
1000	D18-D25 **(0,34V-0,4V)**	J6-J9
Groove 2Hn; Groove 5Hn	D1001 **(0,31V-0,4V)**	J1000
Groove 52HPn, GrooveA 52HPn	D300 **(0,4V-0,5V)**	J300
SXT-5HnD, SXT-5HPnD	D1001 (for old board version) D100 (for new board version) **(0,30V – 0,5V)**	J1000 (for old board version) J400 (for new board version)

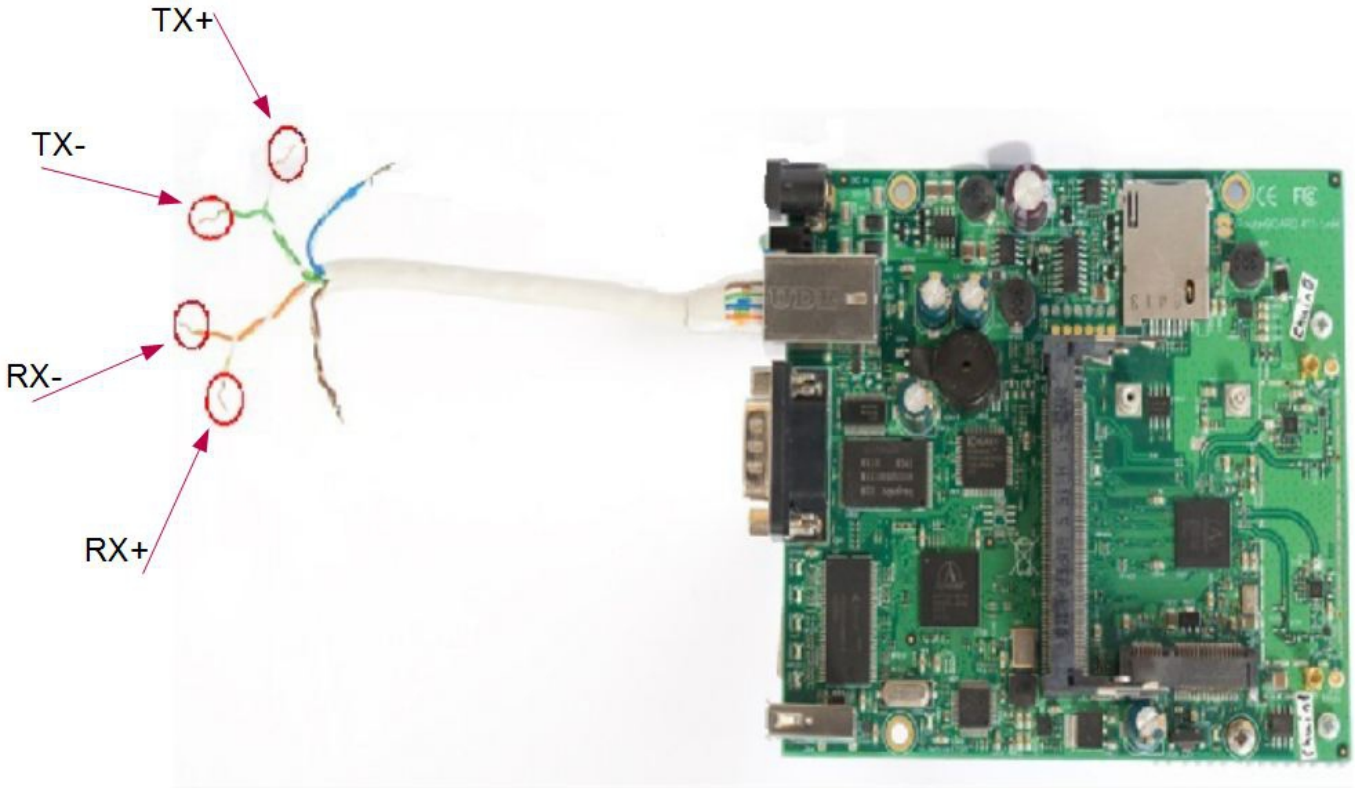
SXTG-5HnD, SXTG-2HnD, SXT SA, SXT HG	Check **voltage drop** between test points and Ground (see picture 7 in the appendix). **(0,40V – 0,50V)**	-----
SXT Lite2, SXT Lite5, SXT2nDr2, SXT5nDr2	Check **voltage drop** between test points and Ground (see picture 5 in the appendix). This voltage drop value should be in the range from **0,32V** to **0,40V**	J400
OmniTIK U-5HnD, OmniTIK UPA-5HnD	D7, D8, D11, D13, D14 **(0,28V-0,34V)**	Check 2-5 ethernet ports
1200	D505, D506, D503, D501, **(0,28V – 0,4V)** D603, D601, D702, D701, D704, D703, **(0,26V – 0,4V)** D801, D803, D817, D818, D813, D814, D809, D810. **(0,20V – 0,4V)**	Check each ethernet port (J8702, J8703, J8704, J8705, J8701, J702, J701, J601, J602, J501.)
250GS	Check **voltage drop** between test points and Ground (see picture 3 in the appendix). This voltage drop value should be in the range from **0,21V** to **0,28V**	
260GS	Check **voltage drop** between test points and Ground (see picture 8 in the appendix). This voltage drop value should be in the range from **0,4 V** to **0,5 V**	
435G	D501-D504; D507, D508 **(0,21V-0,3V)**	J501, J502
600	D401, D402, D701-DD704 **(0,32V-0,4V)**	J401, J702;
800	D1, D3, D5, D8, D9, D11 **(0,26V-0,38V)**	J11, J13
1100, 1100AH, 1100AHx2	see picture 4 in the appendix	
2011, 2011iL, 2011LS, 2011UiAS, 2011L	D115, D105 **(0,4V-0,5V)** D116, D106, D117, D107, D118, D108, D119, D109 **(0,32V - 0,4V)** D129, D128, D125, D124, D123 **(0,30V – 0,4V)**	Check each Ethernet port in the Ethernet connector J101
Metal 5SHPn, Metal 2SHPn	D1001 **(0,32V-0,42V)**	J1000

CCR1036-12G-4S, CCR1016-12G (Cloud Core Router)	D603, D602 **(0,40-0,50)** D115, D117, D111, D113, D105, D107, D101, D103, D905, D907, D901, D903, D805, D807, D801, D803, D705, D707, D701, D703, D605, D607. **(0,32-0,40V)**	J112, J111, J102, J101, J902, J901, J802, J801, J702, J701, J602
CCR1036-8G-2S+	Check **voltage drop** between test points and Ground (see picture 10 in the appendix). This value should be in the range from **0,35V** to **0,45V**	Ether1 – ether7 port
CRS125-24G-1S	Check **voltage drop** between test points and Ground (see picture 9 in the appendix). This value should be in the range from **0,35V** to **0,45V**	Ether2 - ether 24 port
911G-2HPnD, 911G-5HPnD, 912UAG-5HPnD, 912UAG-2HPnD, SEXTANT G 5HPnD, BaseBox2, BaseBox5	Check **voltage drop** between test points and Ground (see picture 6 in the appendix). This value should be in the range from **0,40V** to **0,50V**	-----

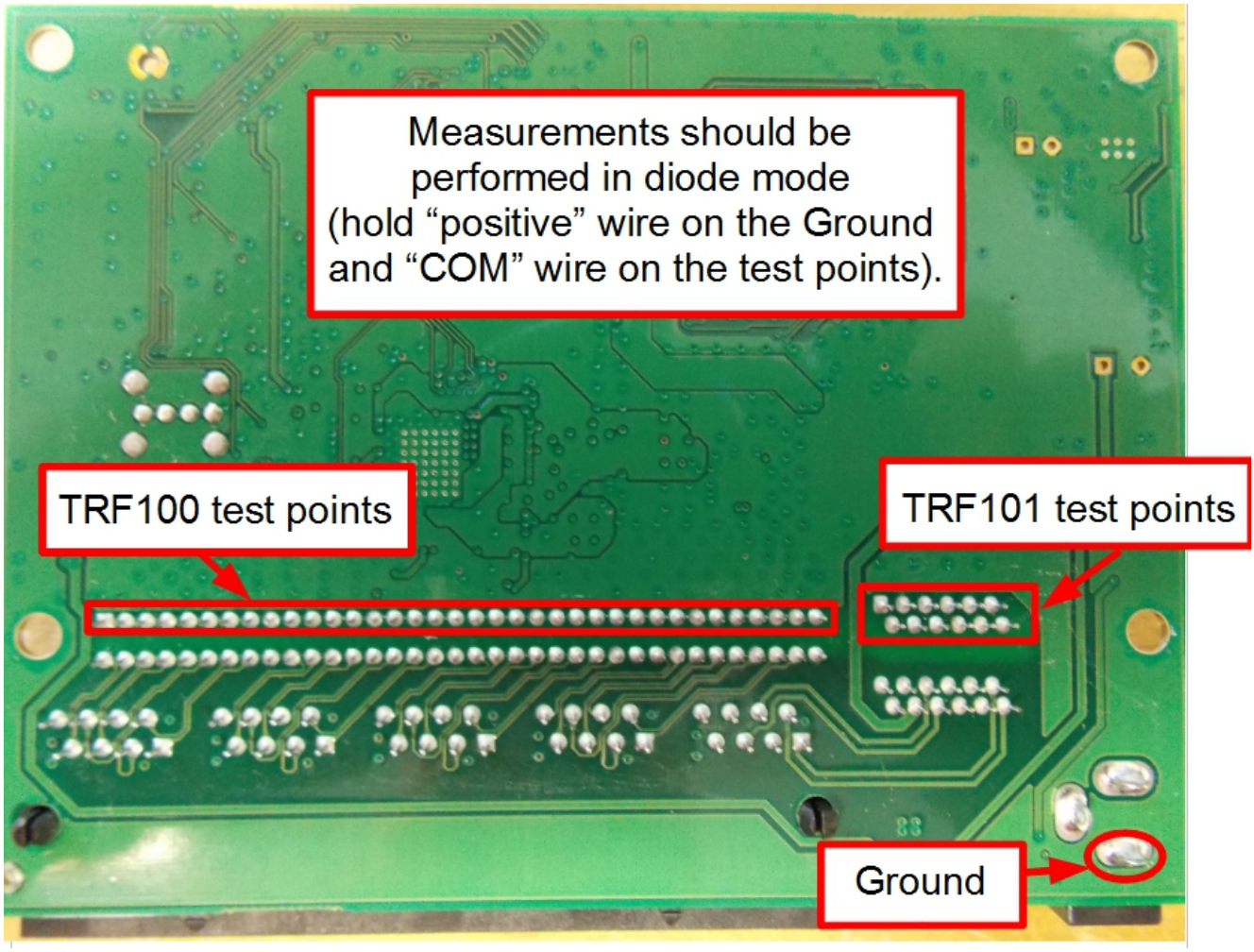
APPENDIX



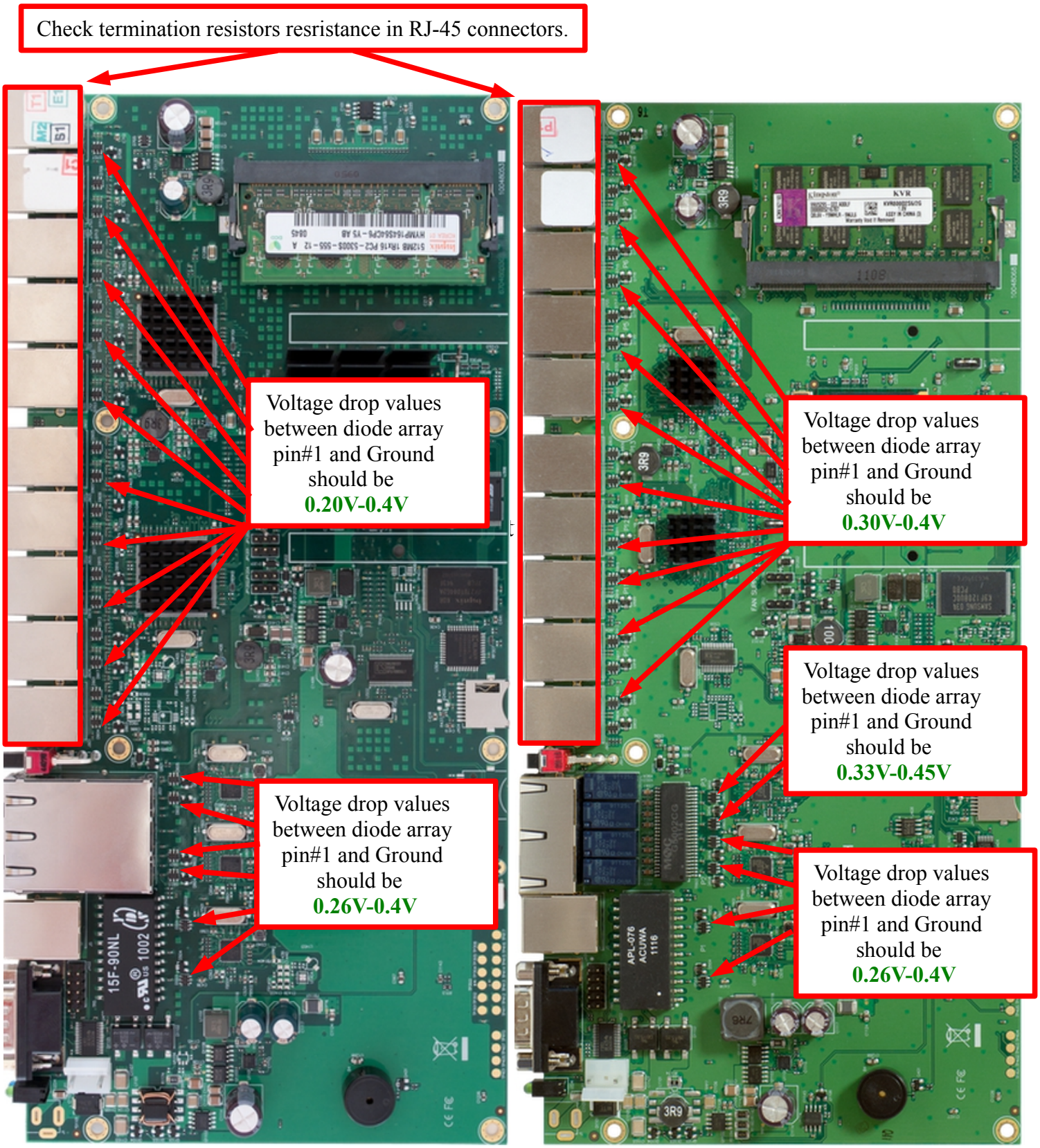
Picture 1



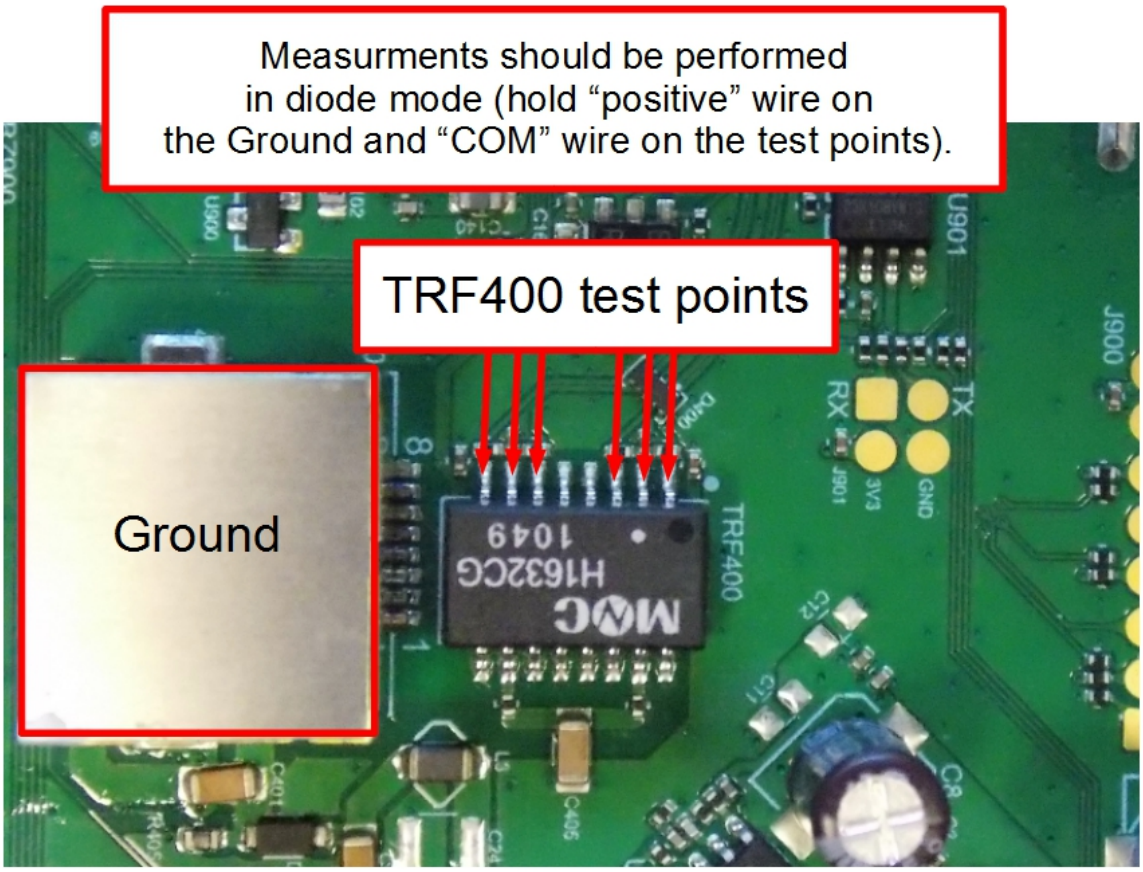
Picture 2


Measurements should be performed in diode mode (hold “positive” wire on the Ground and “COM” wire on the test points).
TRF100 test points
TRF101 test points
Ground

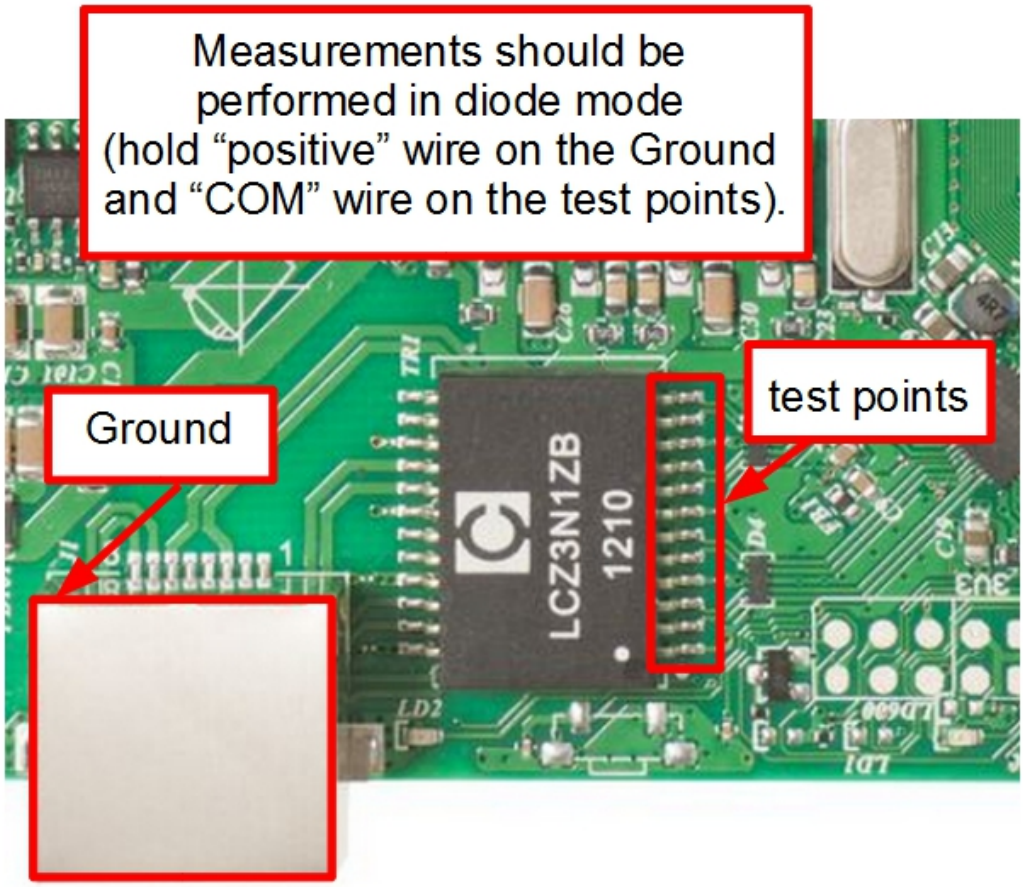
Picture 3


Check termination resistors resristance in RJ-45 connectors.
Voltage drop values between diode array pin#1 and Ground should be 0.20V-0.4V
Voltage drop values between diode array pin#1 and Ground should be 0.26V-0.4V
Voltage drop values between diode array pin#1 and Ground should be 0.30V-0.4V
Voltage drop values between diode array pin#1 and Ground should be 0.33V-0.45V
Voltage drop values between diode array pin#1 and Ground should be 0.26V-0.4V

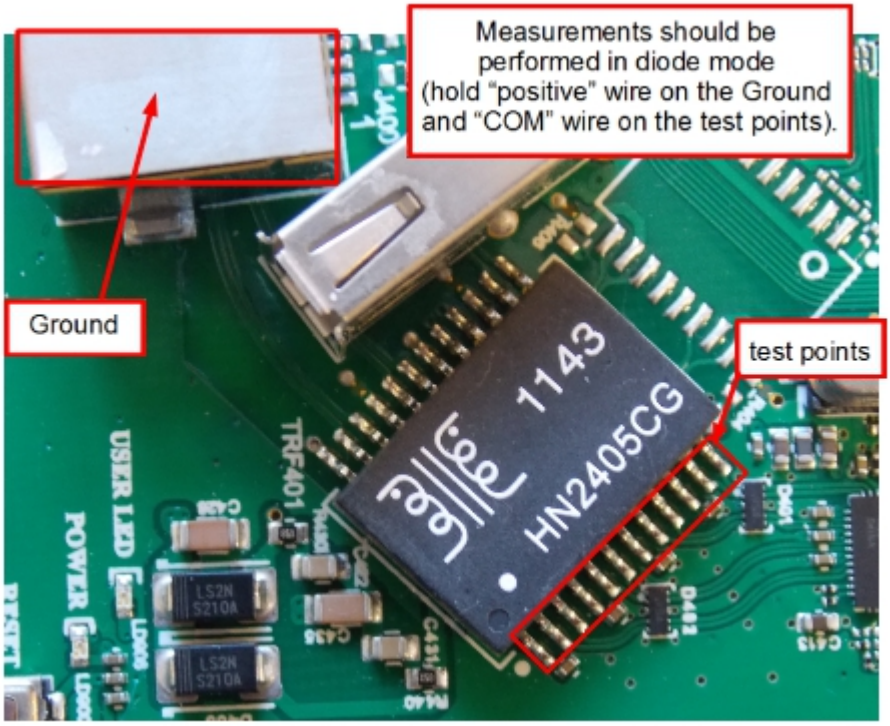
Picture 4



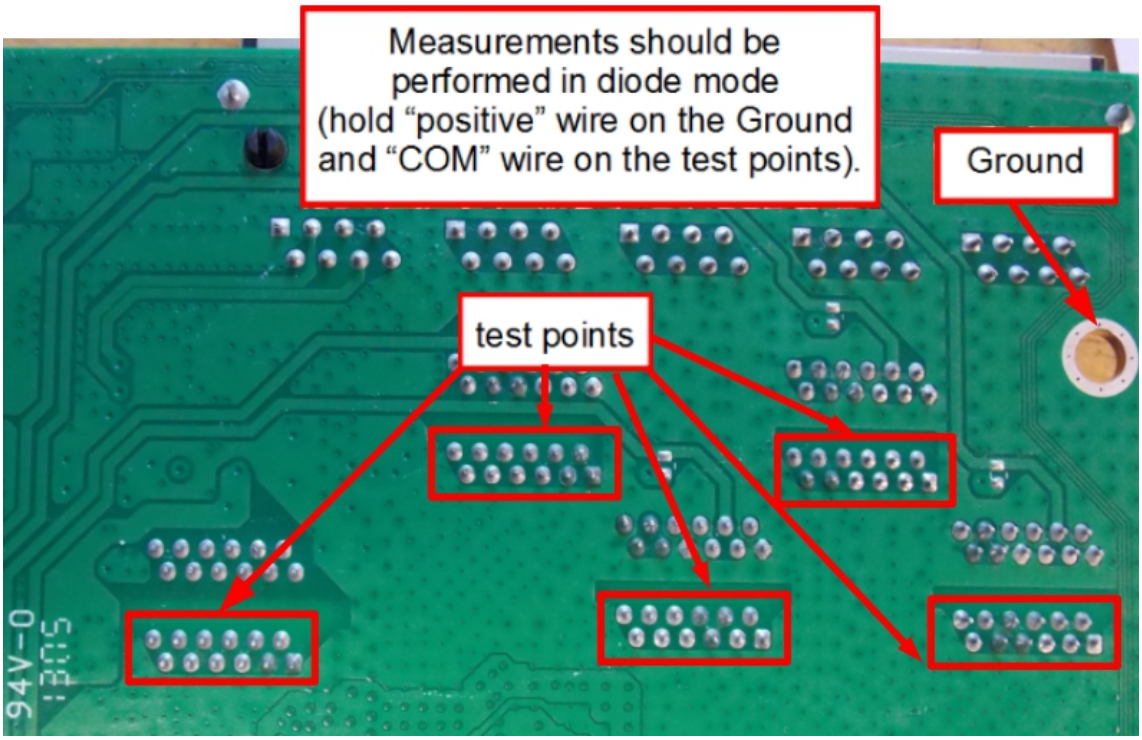
Picture 5



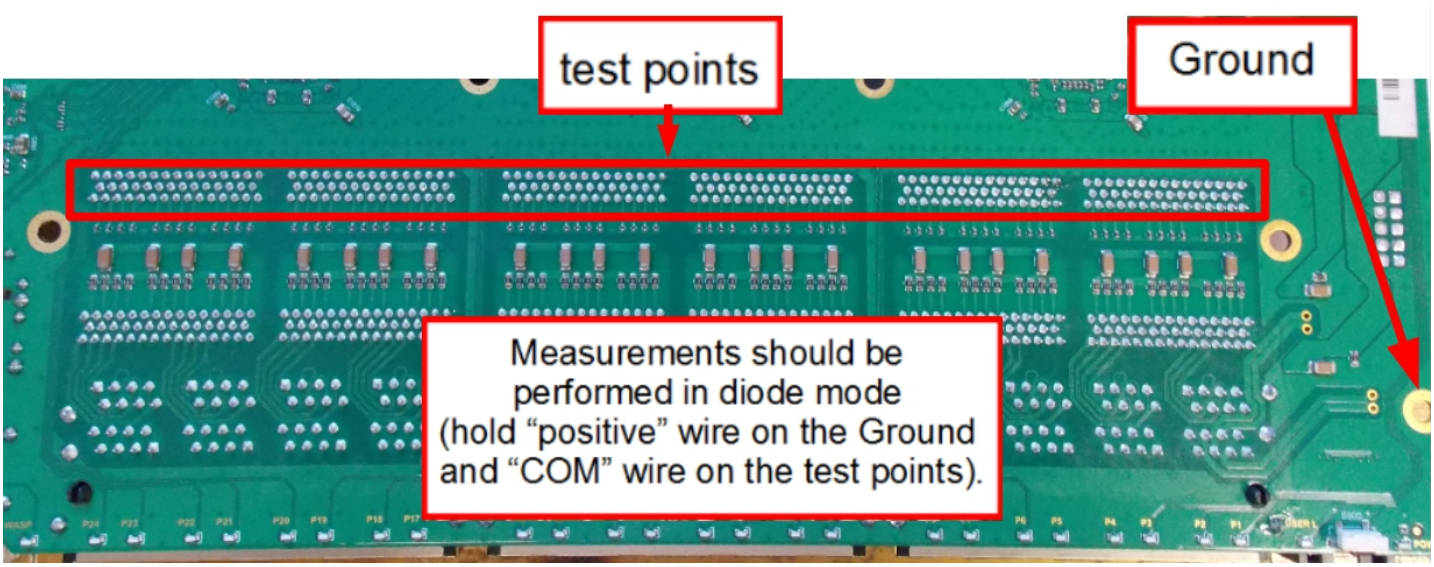
Picture 6



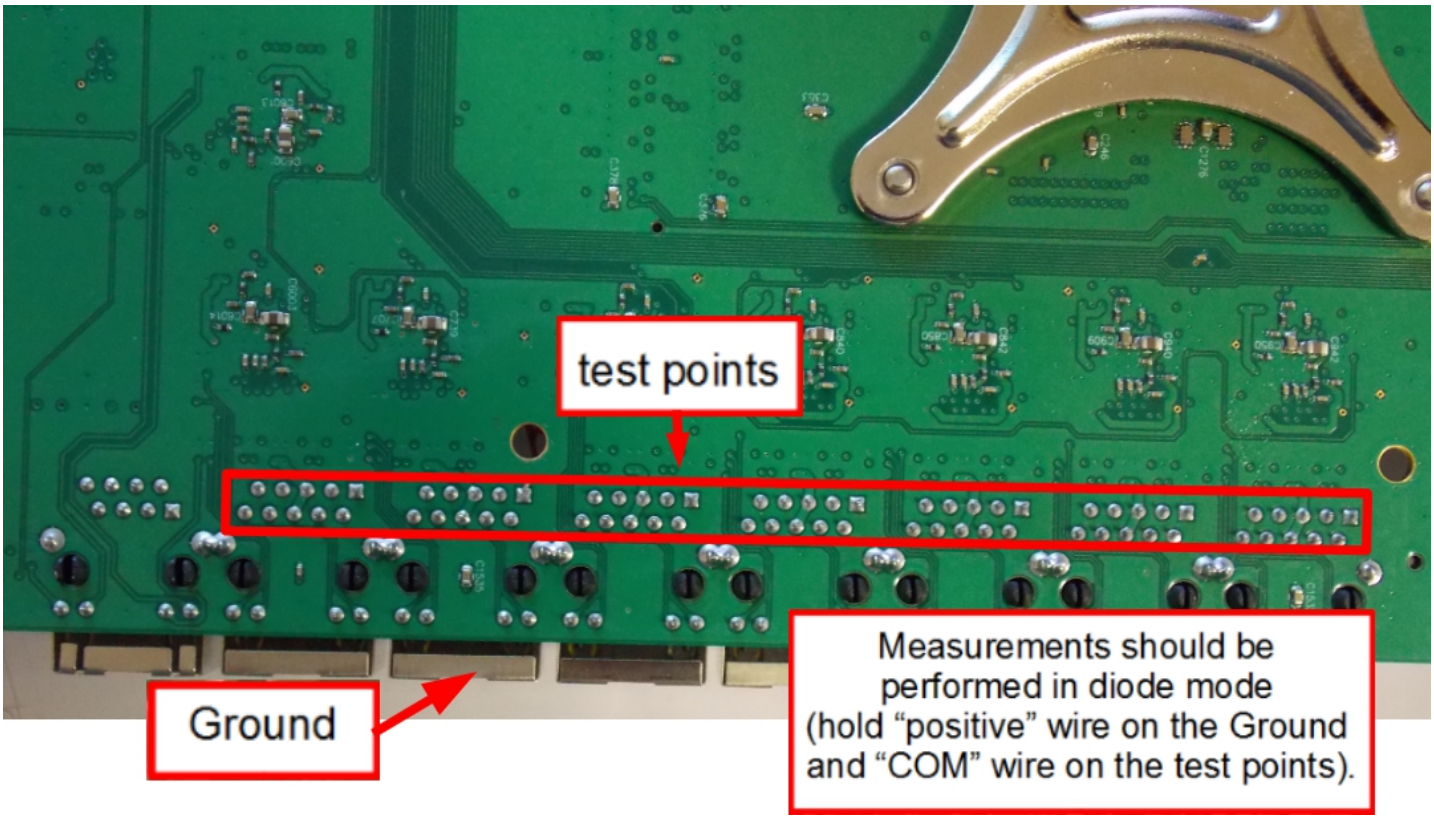
picture 7



picture 8



picture 9



picture 10