# Axpert VM IV

# Service Manual

V-RDP-004-73 A

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## 1. General information

### 1.1 Getting start

This manual is used as a checking and repairing guide for Axpert VMIV-3600 and VMIV -5600. Before read this manual, it's better to have some electrical or electronic background knowledge. With this guide, you can fix the inverter by yourself firstly.

There are five main parts of this guide:

**General information:** This part is the basic information of the inverter; you can start to know the inverter from this chapter.

**Troubleshooting:** This part will tell you how to do when you face a problem.

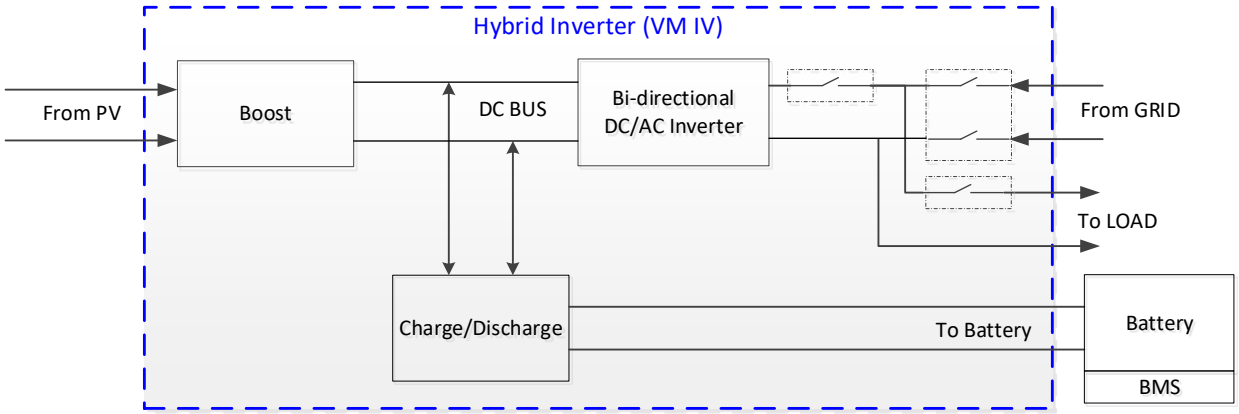
**Checking and measuring guide:** This part will teach you how to check or repair the inverter by measuring the critical components.

**Assembling guide:** This part teaches you how to take the board outside and fix the new one.

**Cables connection guide:** This part will present the signal cables connection of the inverters.

### 1.2 Basic topology introduction

The topology of the inverter shows as below:




Compare with UPS or normal inverter, INVERTER combines a solar charger inside. Solar charger can be a supplement for battery when there is not grid or for saving energy purpose. And with the solar charger, the inverter can have more working modes than UPS. For detail information please refer to our user manual.

### 1.3 Inverter family

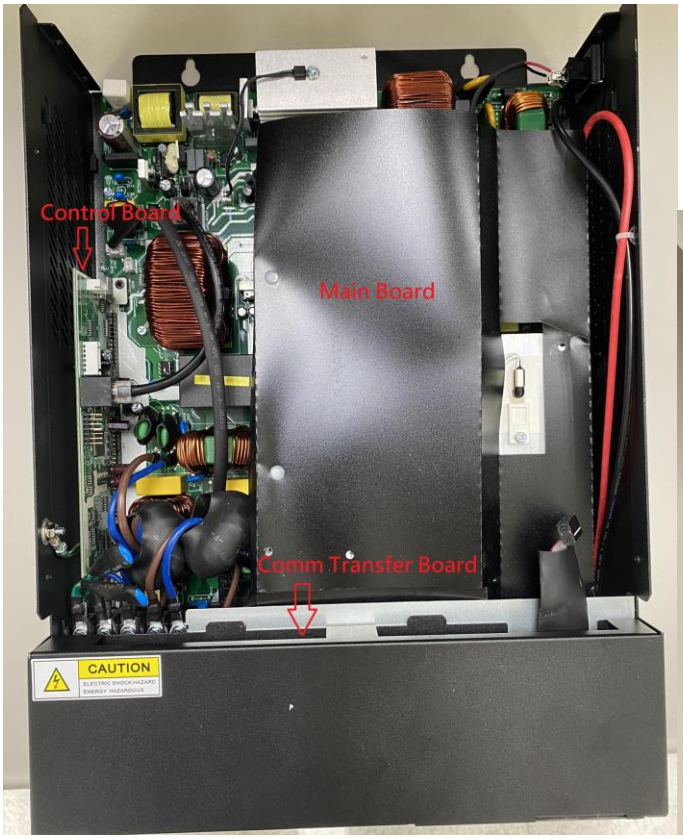
This service manual includes different models of the inverter, the table as below contains some important parameters with different models.

These models names are only neutral names; please match the real model name of your inverter to the model name in the table by comparing the typical characteristics.

| Model name | Power rating | Charger type | Charger number |
|---|---|---|---|
| Axpert VM IV 5600 | 5.6KVA | MPPT | 1 |
| Axpert VM IV 3600 | 3.6KVA | MPPT | 1 |

### 1.4 Overview the inverter

Axpert VMIV





## 2. Troubleshooting

2.1 How to do

When the inverter was faulty, normally there are two main symptoms:

- No display at all;
- Fault code or warning code on the LCD;

When the fault occurred, please help to record the fault information and follow “How to check” of part 2.2 to check the inverter, then feedback the checking result to the service center. It will be very helpful for solving the problem as soon as possible.

2.2 Fault condition

| **Note:**<br>**When open the top cover, please have a look first, are there any obviously damaged parts?**<br>**When take the main board out, please have a look around, are there any obviously damaged parts?** |
|---|

### 2.2.1. Not working at all/ No display

| | |
|---|---|
| Description | The inverter couldn’t startup completely. |
| Possible reason | 1. SPS module damaged. |
| How to check | 1. Firstly, please measure the resistor between BAT+ and BAT-. If it is not shorted, only connect the inverter with battery, and press “ON” |

| | |
|---|---|
| | button, could the inverter startup? If not, please check the fan.<br>2. If the LCD couldn't light up and fan doesn't work, please disconnect all the wires and open the top cover, and then take the main board outside by following part 4.<br>3. Check the main board by following "3.5 and 3.6" |
| How to solve | Repair the main or replace it directly. |

**2.2.2. 09 fault**

| | |
|---|---|
| Description | Bus soft start fails. |
| Possible reason | DC-DC module was damaged or BUS soft start module was damaged. |
| How to check | 1. Check the main board by following"3.6; 3.7";<br>2. Check the main board by following"3.1; 3.2; 3.3; 3.4". |
| How to solve | Repair the main board and MPPT board or replace it directly. |

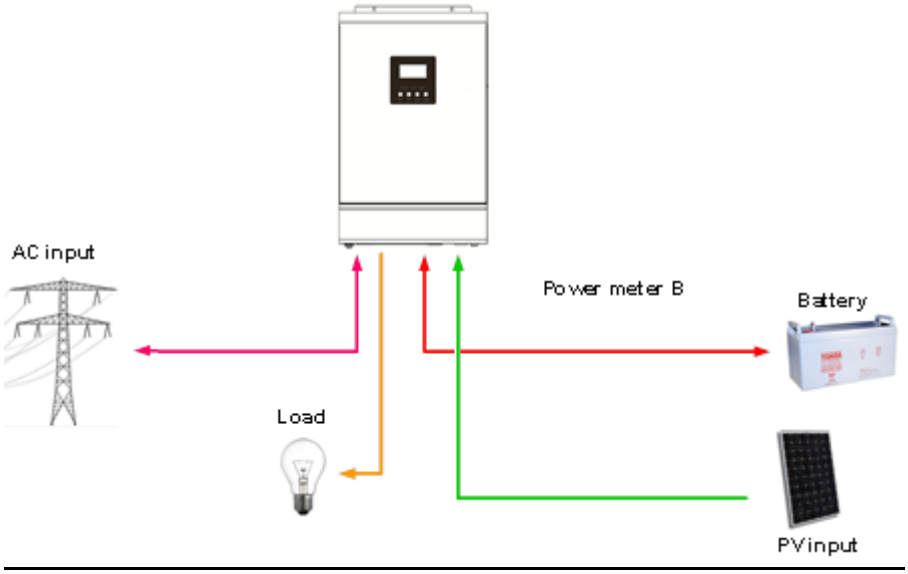
**2.2.3. Warning**

| | |
|---|---|
| Description | Battery couldn't be detected. |
| Possible reason | Wire connection or fuse was burnt. |
| How to check | 1. Check the wire connection, the priority of the battery cable;<br>2. Check the main board by following "3.1". |
| How to solve | Repair the main board or replace it directly. |

2.3 Test step

After replacing all defected components, testing steps can be used to confirm the repair result and the reliability of the Inverter.

Set up the testing system as below:



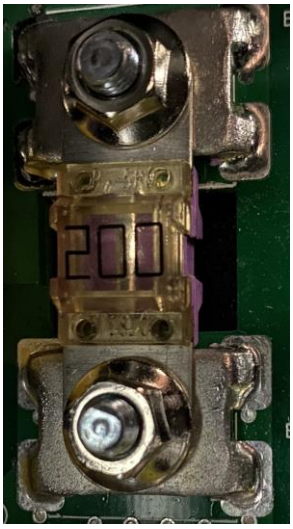
## 3. Checking and measuring guide

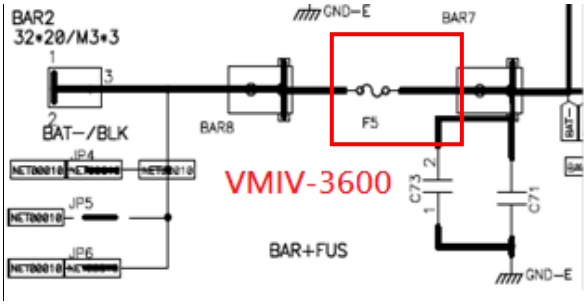
3.1 Check the battery side components on MAIN board

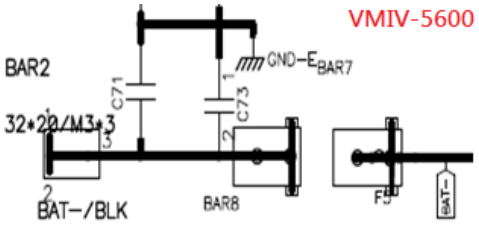
**Fuse and capacitors**

For VMIV-3600 FUCE 200A

For VMIV-5600 FUCE 200A



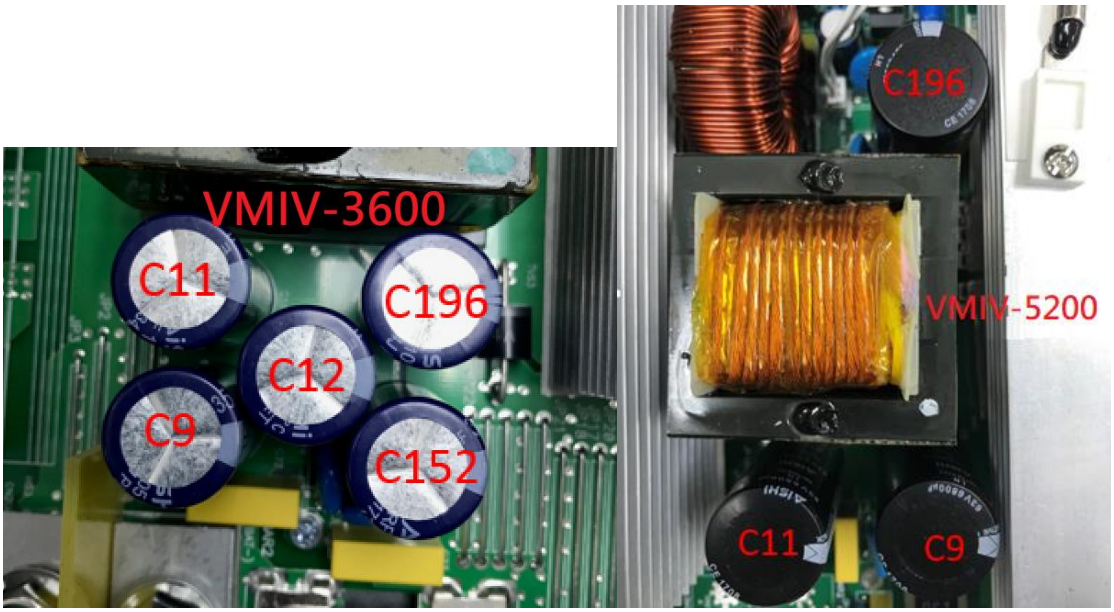



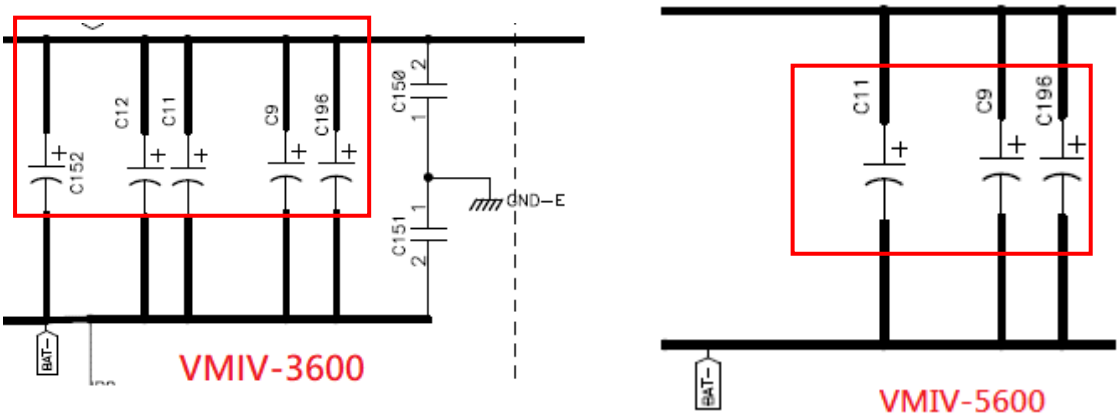




| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| F5 | Resistor | 0.1 ohm | Open |

For VMIV-3600 C9/C11/C12/C196/C152: (4200uF 35V)

For VMIV-5600 C9/C18/C196: (6800uF 63V)

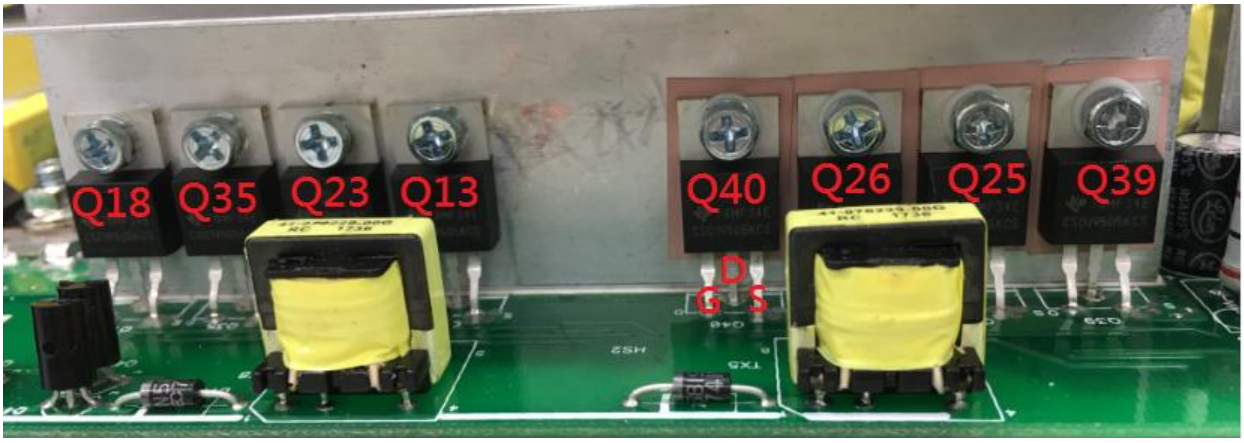


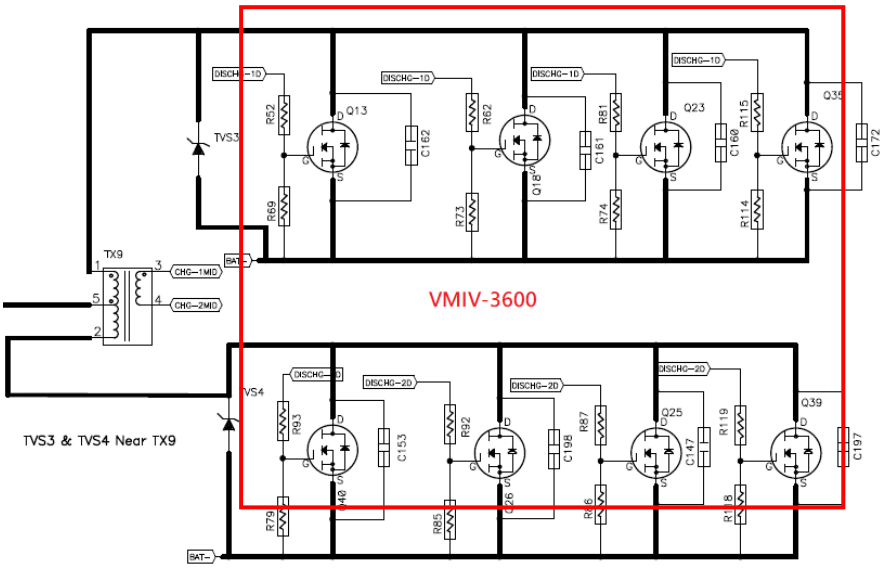

If the capacitors explode as below, they need to be replaced.

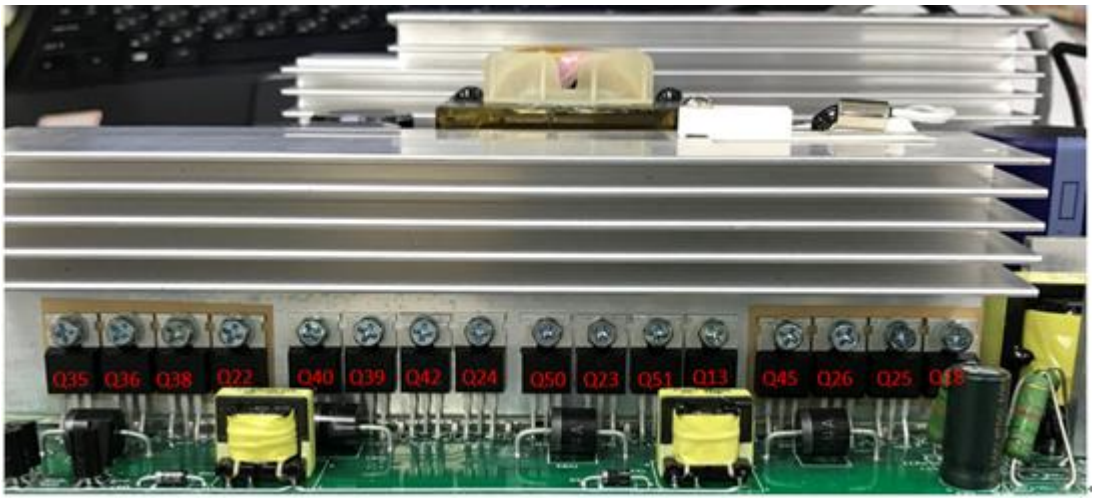
**Power devices**

DC/DC MOSFET: Q13/Q18/Q23/Q35 & Q25/Q26/Q39/Q40

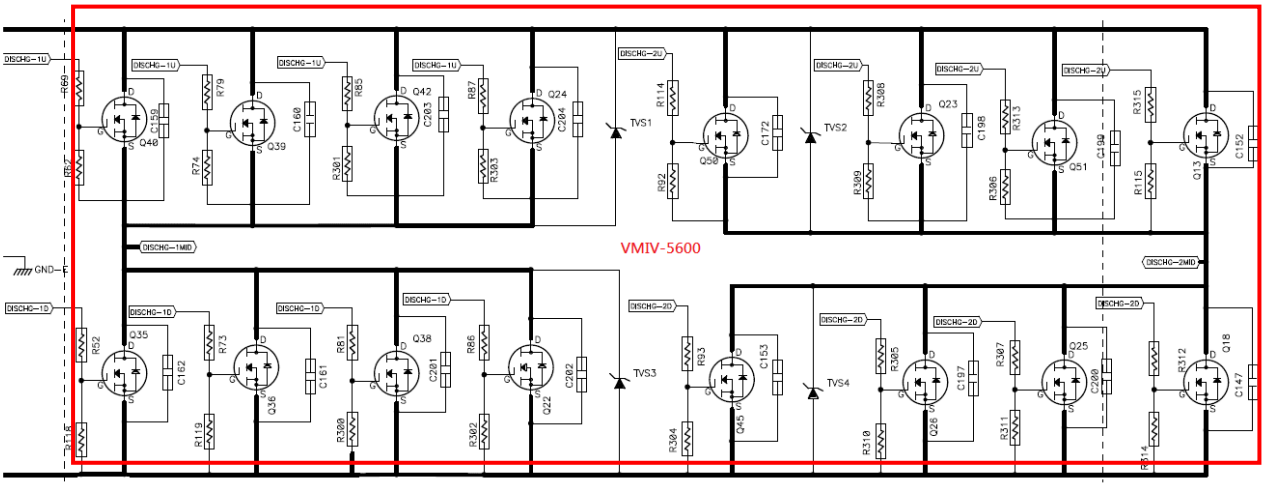



For VMIV-3600 ALL of the MOSFET are (CSD19505KCS 201A 80V TO-220)




For VMIV-5600 ALL of the MOSFET are (MOSFET TOSHIBA/TK100E08N1 214A 80V N BULK TO-220)




| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| CSD19505KCS (VMIV-3600)<br>TK100E08N1 (VMIV-5600) | Resistor | GS: 11.75k<br>GD: 115.8k<br>DS: OL | Short or explosion |
| | Diode | SD: 0.463V<br>DS: OL | |

**Note1:** When you use the multimeter to measure the resistor of the transistor, because of the capacitor in the circuit, it will cause the changing of the values when you measure the DS and GD. So we recommend you measure the diode forward voltage of SD, and the resistor of GS. These two values can reflect the situation of the transistor more correctly.

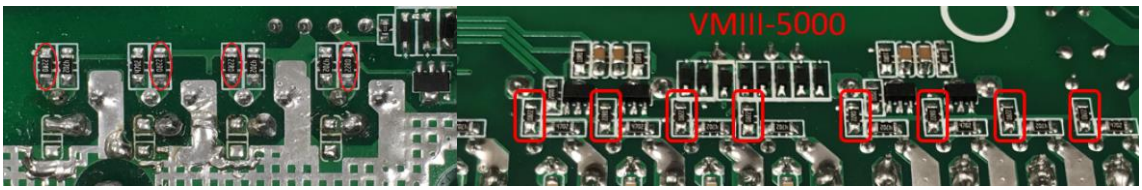
**Note2:** If one or more of them were damaged, please replace all of them.

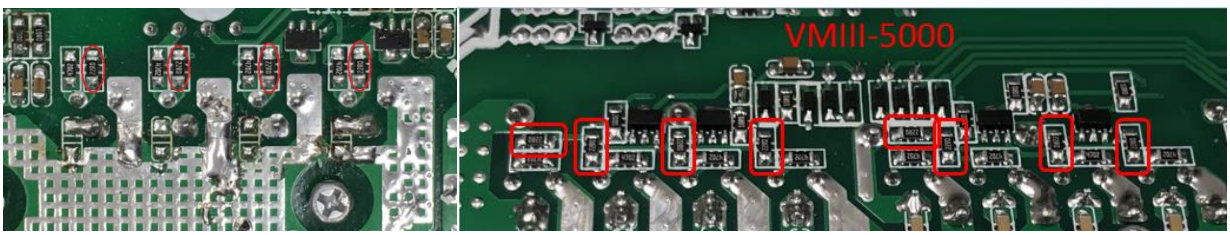
### 3.1.1. Drivers (This part is only used for repair checking)

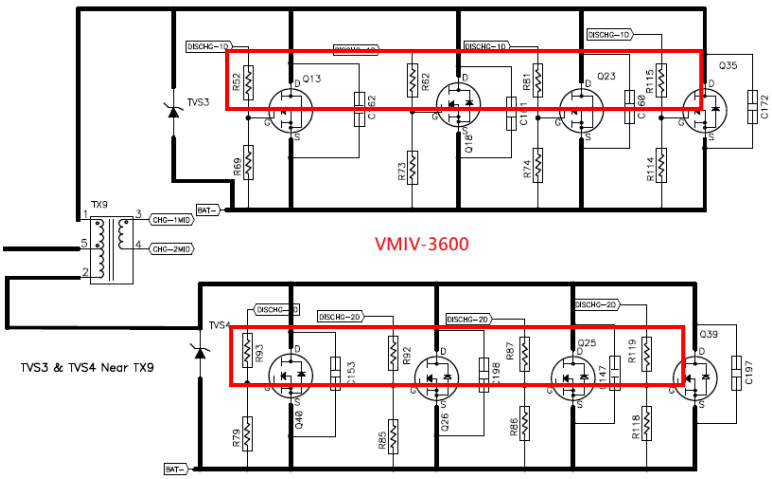
**Note:** Drivers usually need to be checked when users want to repair the boards. Because when power devices were damaged, the high voltage will rush to driver circuit through the gates of power devices.

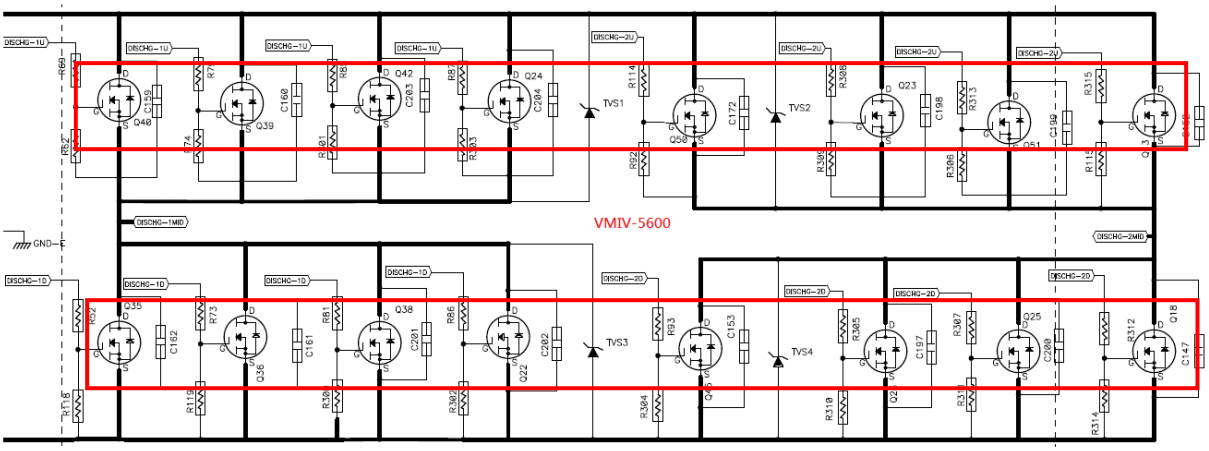
The reference of the resistors list as below:

R52/R62/R81/R87/R92/R93/R115/R119 All of the resistors are (22R 1206)



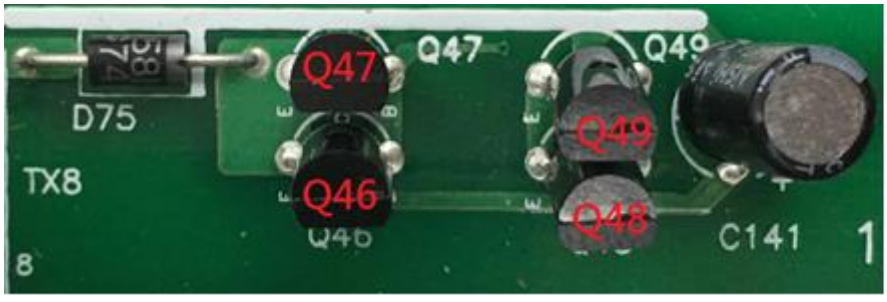


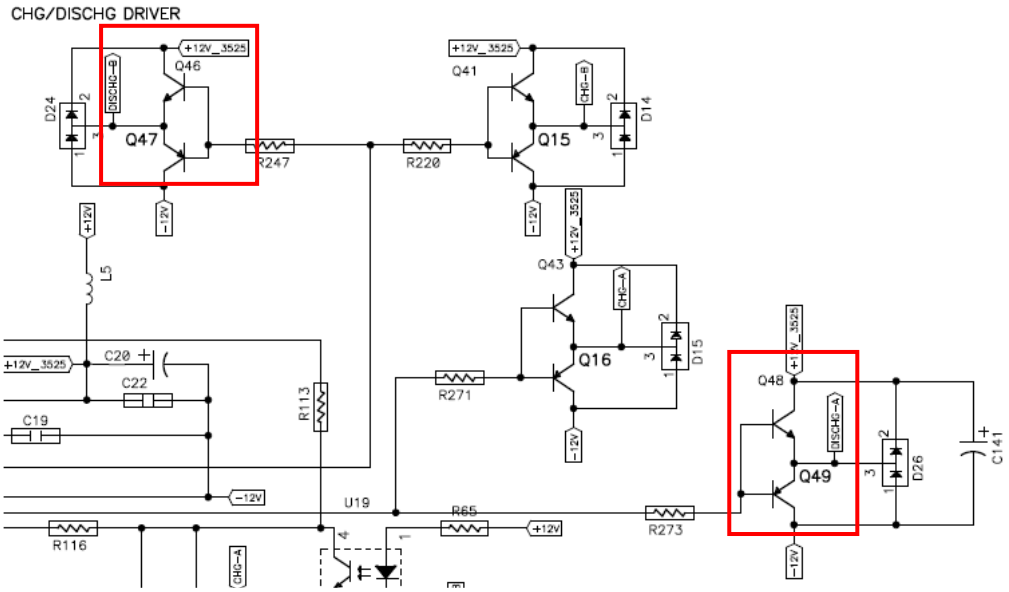




Use multimeter to measure each resistor, find the burnt resistors and replace them; don't need to replace them all.

| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| All: 22ohm | Resistor | 22 ohm | Open or other values |

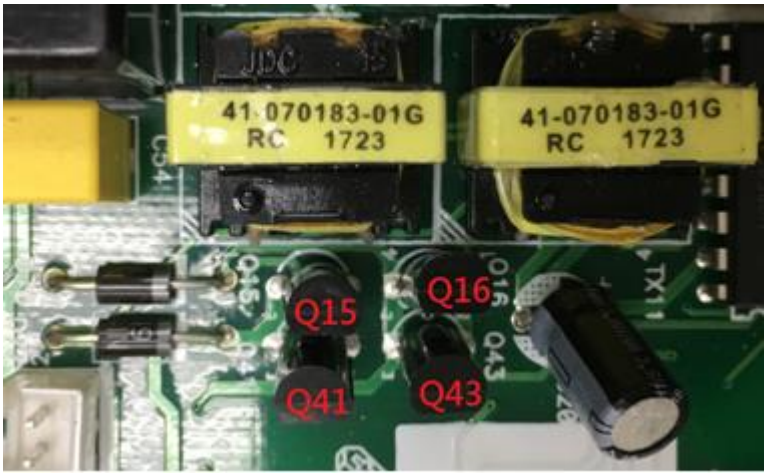
If the resistors need to be replaced, please also check the driver transistors and control IC.

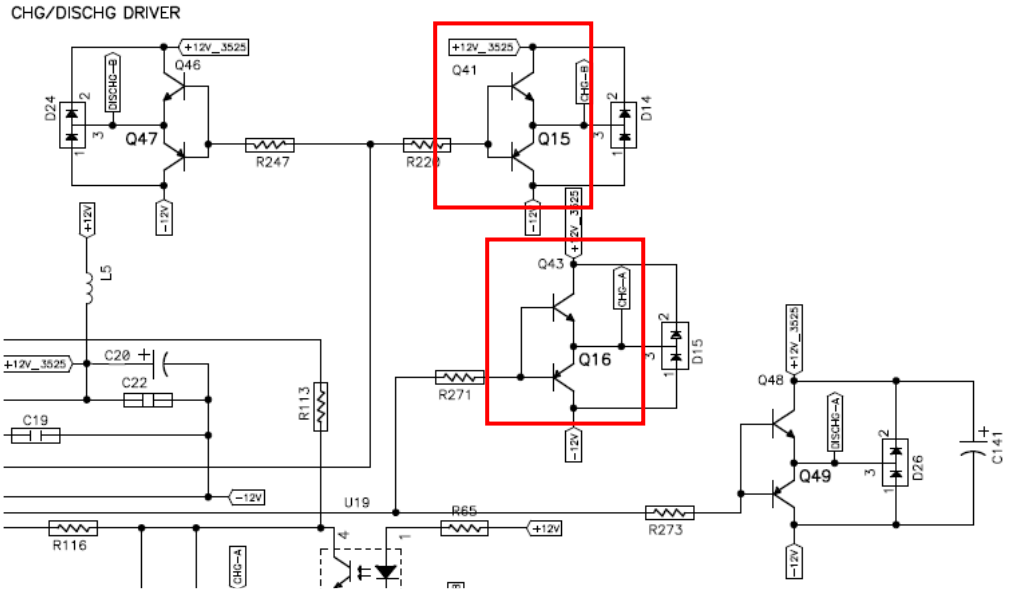



The Q46and Q48 are (2SC2655 2A 50V NPN TAP TO-92)

The Q47and Q49 are (2SA1020L-Y-T9N-B 2A 50V PNP TAP TO-92NL)



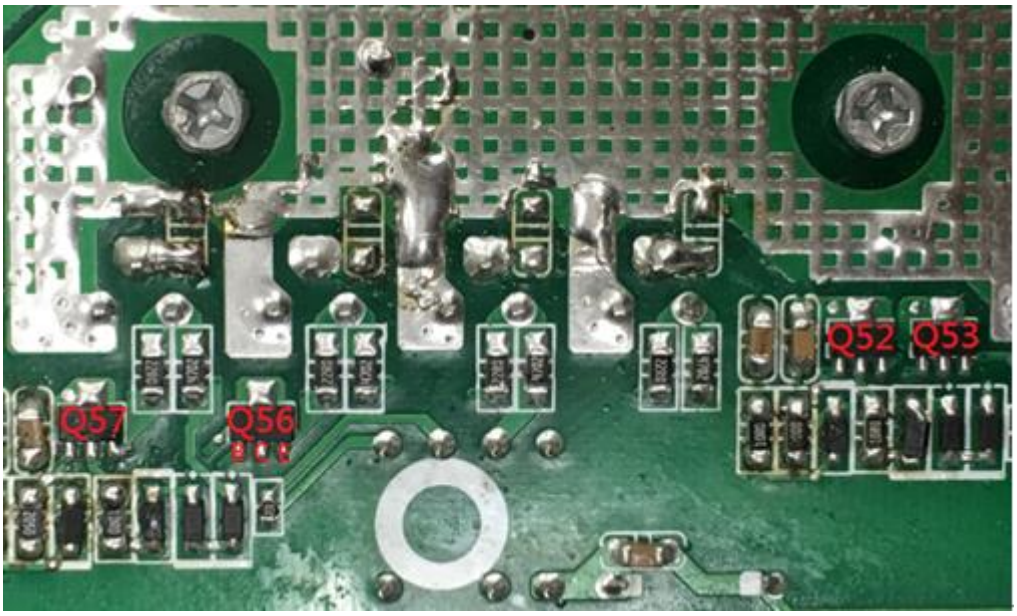


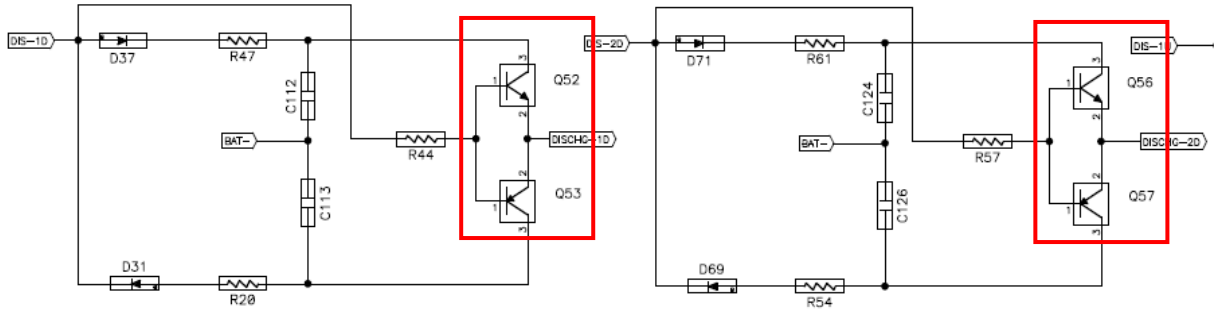

The Q41and Q43 are (2SC2655 2A 50V NPN TAP TO-92)

The Q15and Q16 are (2SA1020L-Y-T9N-B 2A 50V PNP TAP TO-92NL)

| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| Q46/Q48 | Resistor | BE: 430k<br>BC: 430k<br>EC: 16k | Short or explosion |
| | Diode | BE: 0.65V<br>BC: 0.65V<br>CE: 0.28V | |
| Q41/Q43 | Resistor | BE: 430k<br>BC: 425k<br>EC: 104k | Short or explosion |
| | Diode | BE: 0.65V<br>BC: 0.65V<br>CE: 0.28V | |
| Q47/Q49 | Resistor | BE: 430k<br>BC: 430k<br>EC: 8k | Short or explosion |
| | Diode | BE: 0.65V<br>BC: 1.75V<br>CE: 0.20V | |
| Q15/Q16 | Resistor | BE: 430k<br>BC: 430k | Short or explosion |

| | | | |
|---|---|---|---|
| | | CE: 8k | |
| | Diode | BE: 0.65V<br>BC: 1.5V<br>CE: 0.28V | |



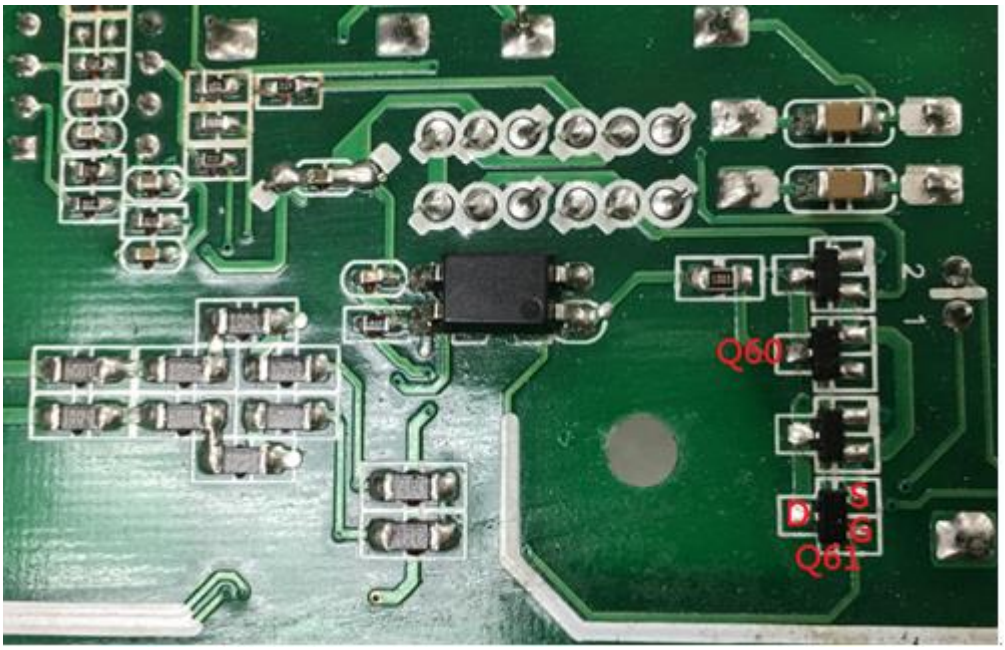



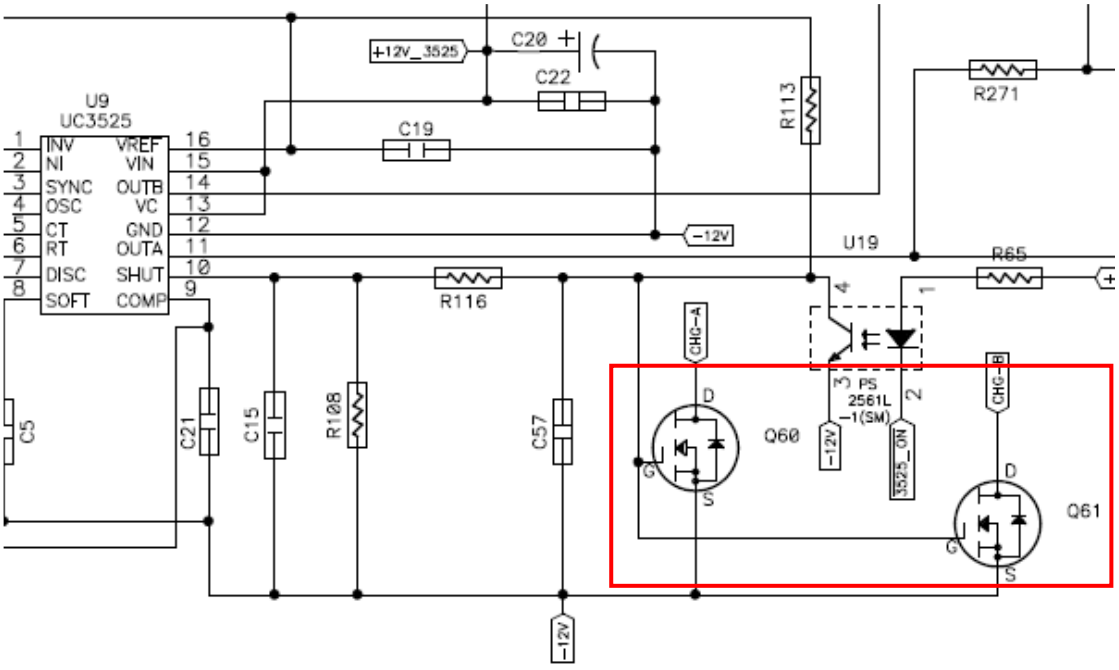

The Q52and Q56 are (2SD1624 2A 50V NPN SOT-89)

The Q53and Q57 are (2SA1020 3A 50V PNP SOT-89)

| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| Q52/Q56 | Resistor | BE: 12k<br>BC: 280k<br>CE: OL | Short or explosion |
| | Diode | BE: 0.64V<br>BC: 0.64V<br>CE: OL | |
| Q53/Q57 | Resistor | BE: 12k<br>BC: OL<br>CE: 280k | Short or explosion |

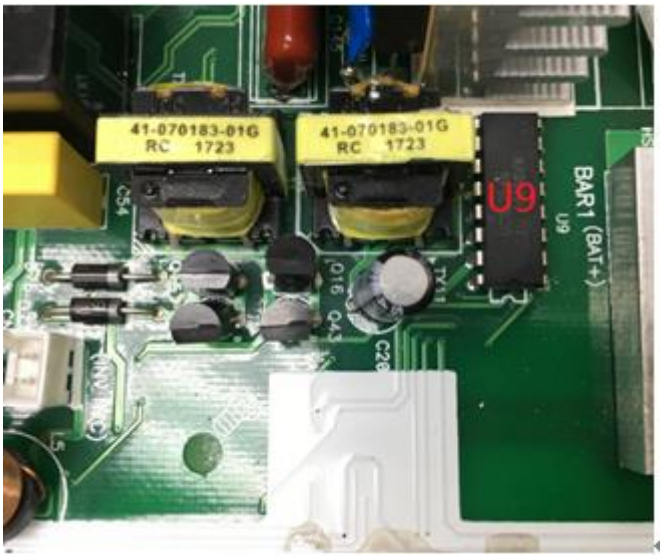
| | | | |
|---|---|---|---|
| | Diode | BE: 0.64V<br>BC: OL<br>CE: 1.09V | |

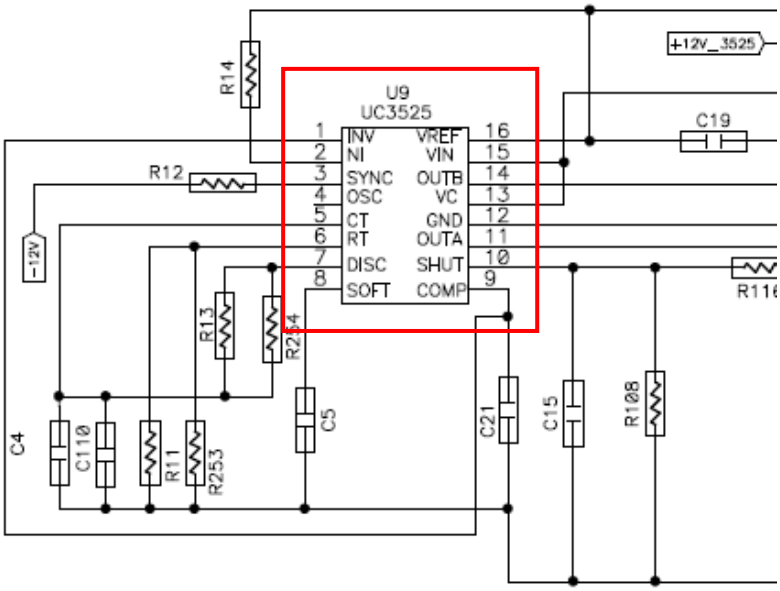



The Q60 and Q61 the MOSFET are (UT3404G 5.8A 30V NPN SOT-23 SMD)

| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| Q60/Q61 | Resistor | GS: 5.637k<br>GD: 107k<br>SD: 98k | Short or explosion |
| | Diode | SD: 0.28V<br>DS: 1.14V | |




The U9 is (IC PWM CNTL TI/UC3525AN DIP-16)

| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| U9 | Resistor | PIN13 TO PIN12: 8.8k<br>PIN11 TO PIN12: 432k<br>PIN14 TO PIN12: 432k | Short or explosion |
| **Note:** If you are not sure about these components, we recommend you replacing them all. | | | |

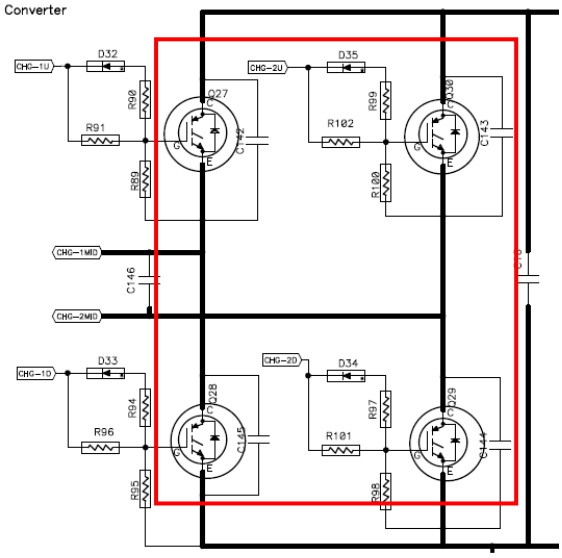
3.2 Check the bus side components on MAIN board

**Power devices**

DC/DC IGBT: Q27/Q28/Q29/Q30

For VMIV-5600 ALL of the IGBTs are (IGBT ST/STGW60H65DFB 60A 650V N BULK TO-247)

For VMIV-3600 ALL of the IGBTs are (STGW45HF60WDA 45A 600V NPN BULK TO-247)




| Parts (VMIV-3600) | Attribute | Reference values | Failure status |
|---|---|---|---|
| Q27/Q28/Q29/Q30 | Resistor | GE: 22 ohm<br>GC: 184k<br>EC: 184K | Short or explosion |
| | Diode | EC: 0.37V<br>CE: OL | |
| Parts (VMIV-5600) | Attribute | Reference values | Failure status |
| Q27/Q28/Q29/Q30 | Resistor | GE: 22 ohm<br>GC: 205k<br>EC: 205K | Short or explosion |
| | Diode | EC: 0.39V<br>CE: OL | |

**Note1:** When you use the multimeter to measure the resistor of the transistor, because of the capacitor in the circuit, it will cause the changing of the values when you measure the CE and GE. So we recommend you measure the diode forward voltage of EC, and the resistor of GE. These two values can reflect the situation of the transistor more correctly.

**Note2:** If one or more of them were damaged, please replace all of them.

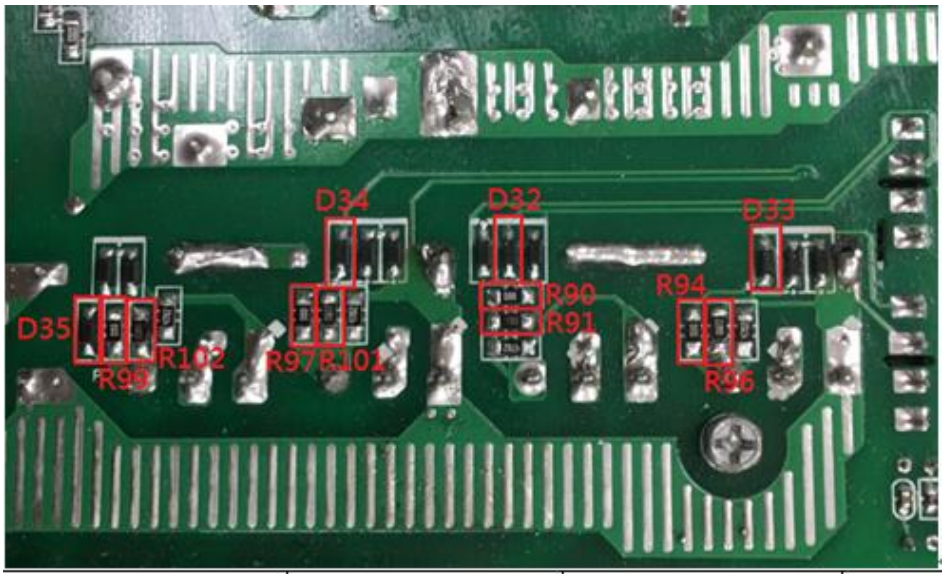
**Drivers (This part is only used for repair checking)**

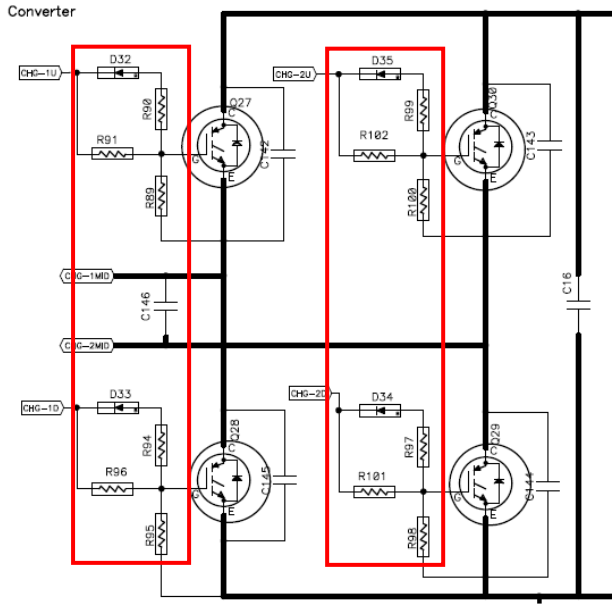
Meanwhile, we also need to check the driver tubes of these power tubes.

R91/R102/R96/R101: (22R 1206)

R90/R99/R94/R97: (0R 1206)

D32/D35/D33/D34: (1N4148W 0.15A 75V SMD)



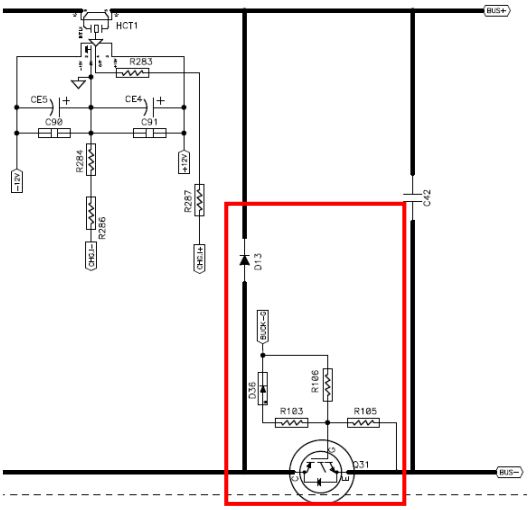

| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| R91/R102/R96/R101 | Resistor | 22 ohm | Open or other values |
| R90/R99/R94/R97 | Resistor | 0 ohm | |
| D32/D35/D33/D34[1] | Resistor | + to -: 270k<br>- to +: OL | Short or explosion |
| | Diode | + to -: 0.6V<br>- to +: OL | |
| **Note1:** When test the diode; please remove the R90/R99/R94/R97 from the board, or the | | | |

| test result is not right. |
|---|

3.3 Check the buck circuit on MAIN board

**Power devices**

BUCK MOSFET and Diode: Q31/D13

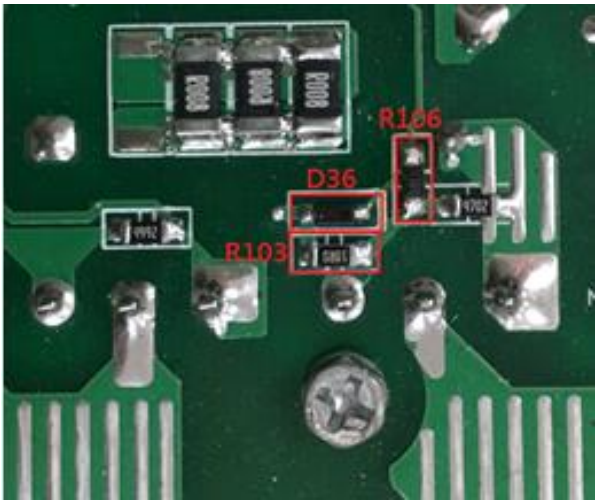

For VMIV-5600 the IGBTs Q31 is (IGBT ST/STGW60H65DFB 60A 650V N BULK TO-247)

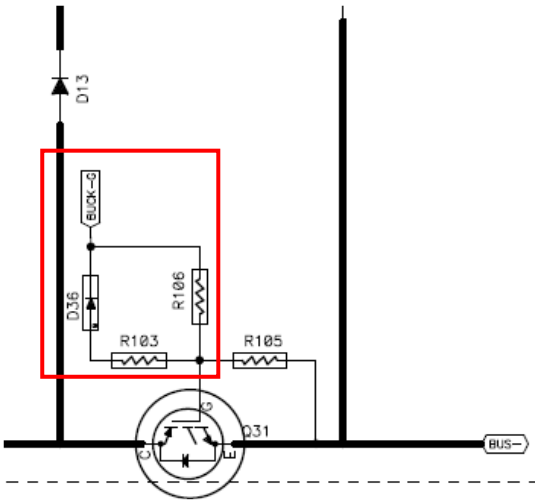
For VMIV-3600 the IGBTs Q31 is (STGW45HF60WDA 45A 600V NPN BULK TO-247)

The D13 is (RHRP1560 15A 600V UFST RAD BULK)

| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| Q31 | Resistor | GE: 22.8k<br>GC: 49.5k<br>CE: OL | Short or explosion |
| | Diode | CE: OL<br>EC: 0.393V | |
| D13 | Resistor | + to -: 195k<br>- to +: OL/OL | |
| | Diode | + to -: 0.39V<br>- to +: OL | |

**Drivers (This part is only used for repair checking)**




The R103 are (10R 1206)

The R106 are (47R 1206)

The D36 are (1N4148W 0.15A 75V SMD)

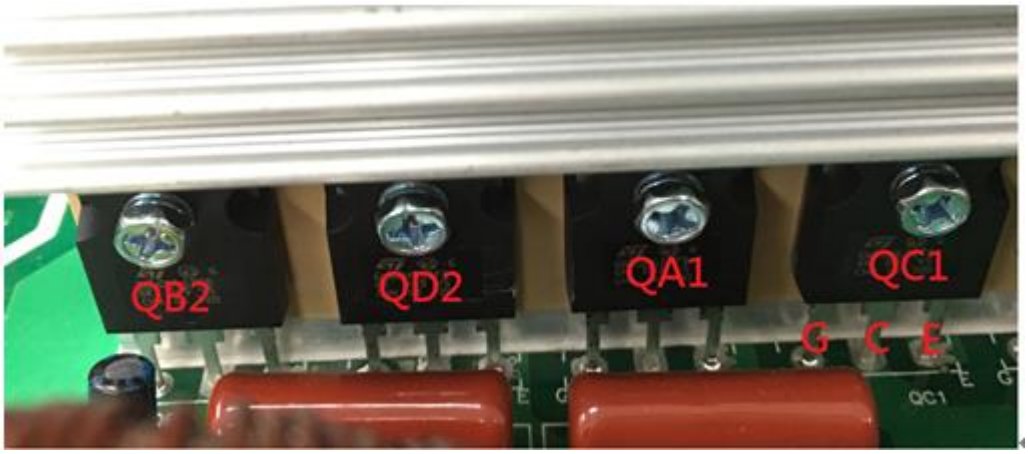
| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| R106 | Resistor | 47 ohm | Open or other values |
| R103 | Resistor | 10 ohm | |
| D36[1] | Resistor | + to -: 240k<br>- to +: OL | Short or explosion |
| | Diode | + to -: 0.6V<br>- to +: OL | |

**Note1:** When test the diode; please remove the R103 from the board, otherwise the test result is not right.

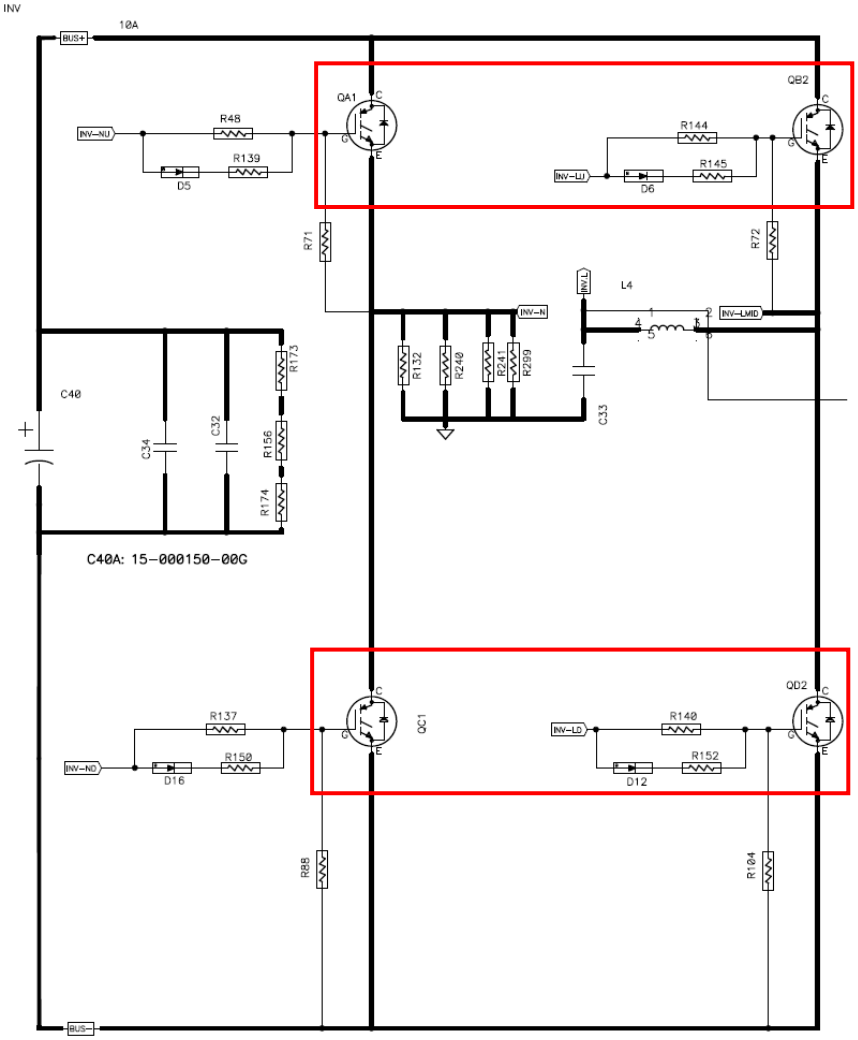
3.4 Check the INV full bridge on MAIN board

**Power devices**

INV IGBT: QA1/QC1/QB2/QD2




All of the IGBT are (STGW60H65DFB 60A 650V N BULK TO-247)




| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| QA1/QC1/QB2/QD2 | Resistor | GE: 23k<br>GC: 235k<br>CE: 700k | Short or explosion |
| | Diode | EC: 0.4V | |

| | | | |
|---|---|---|---|
| | | CE: OL | |

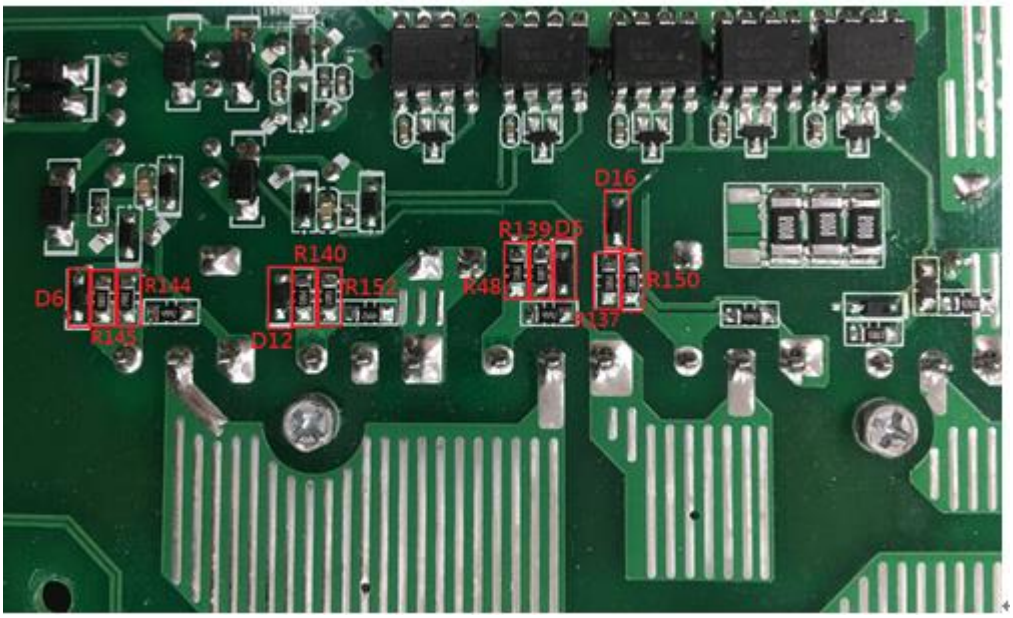
Note1: If one or more of them were damaged, please replace all of them.

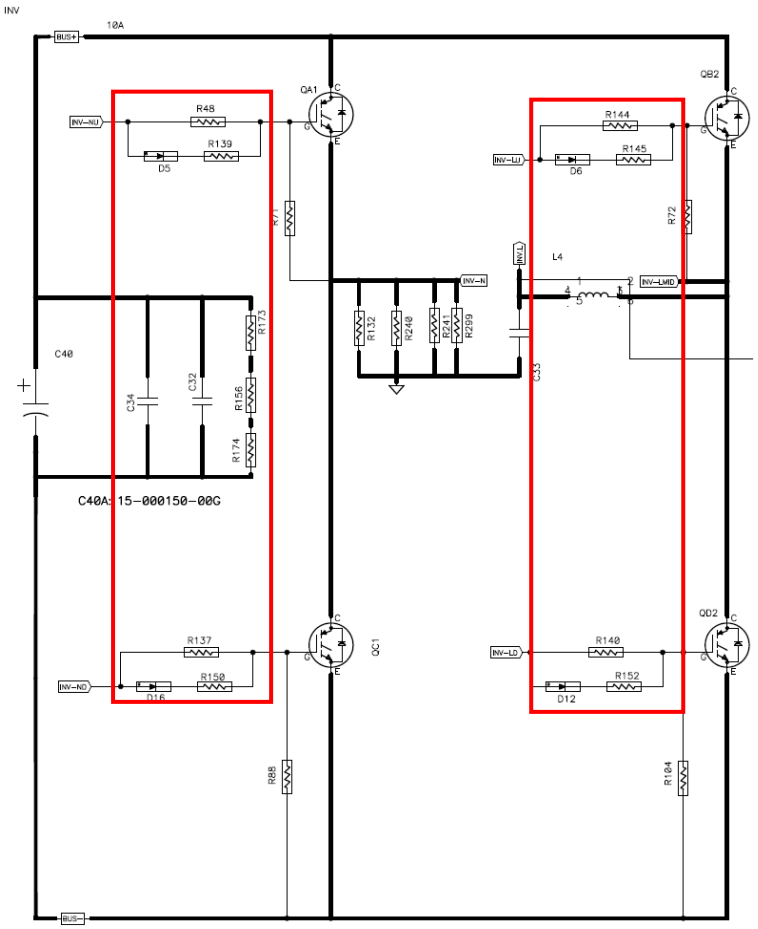
**Drivers**

R48/R144/R140/R137: (39R 1206)

R139/R145/R150/R152: (10R 1206)

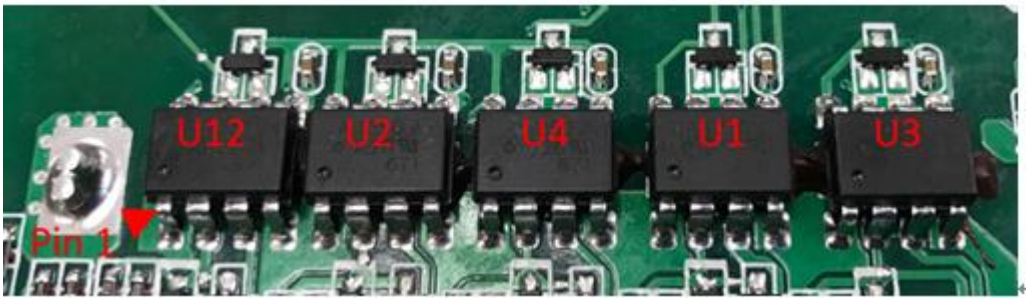
D5/D6/D12/D16: (1N4148W 0.15A 75V SMD)



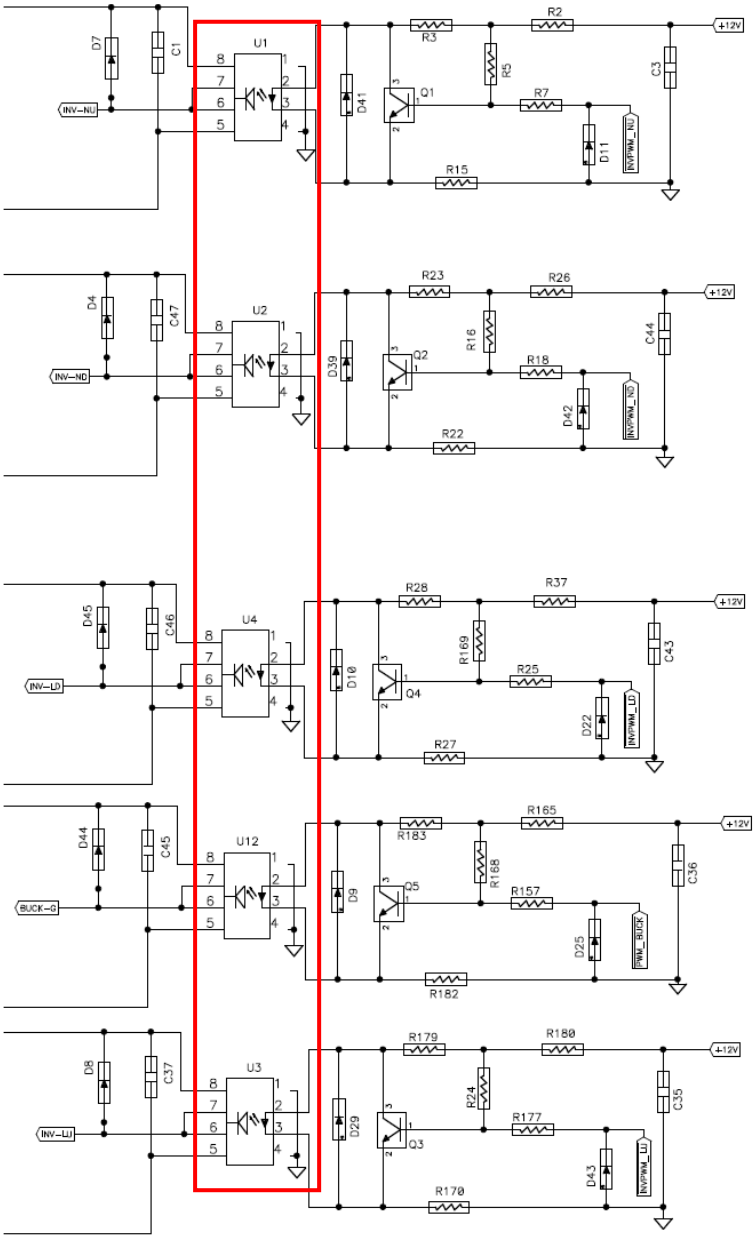



| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| R48/R144/R140/R137 | Resistor | 39 ohm | Open or other values |
| R139/R145/R150/R152 | Resistor | 10 ohm | Open or other values |
| D5/D6/D12/D16[1] | Resistor | + to -: 270k<br>- to +: OL | Short or explosion |
| | Diode | + to -: 0.6V<br>- to +: OL | |
| **Note1:** When test the diode; please remove the R139/R145/R150/R152 from the board, ortherwise the test result is not right | | | |

Optocoupler: U1/U2/U3/U4/U12




ALL of the optocoupler are (AVAGO/T350-560E DIP-8 8/300 MIL SMD)




| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| U2/U4/U12 | Resistor | PIN8 TO PIN5: 57k<br>PIN7 TO PIN5: 145k | Short or explosion |

| | | | |
|---|---|---|---|
| U1/U3 | Resistor | PIN8 TO PIN5: 355k<br>PIN7 TO PIN5: 410k | |

## 3.5 Check BATT and Main Power SPS on MAIN board

**BATT Power SPS**

For VMIV-5600 the F1 are (FUSE 3A 125V)

For VMIV-3600 the F1 are (FUSE 5A 125V)

For VMIV-5600 the NTC2 are (THERMISTOR NTC 5OHM 5A SCK13055LSY)

For VMIV-3600 the NTC2 are (NTC 5ohm 5A)

For VMIV-5600 the MOSFET Q69 are (MOSFET IR/IRF740 10A 400V N BULK TO-220)

For VMIV-3600 the MOSFET Q69 are (IRF640NPBF 18A 200V N BULK TO-220)

For VMIV-5600 the R246 are NC

For VMIV-3600 the R246 are (RES 3W 0.15ohm)

The TX2 are (TX 2:5:45:3 FER EC28)

The R245 are (RES 3W 0.15ohm)

The D61 are (MUR4100ERLG 4A 1000V UFST)

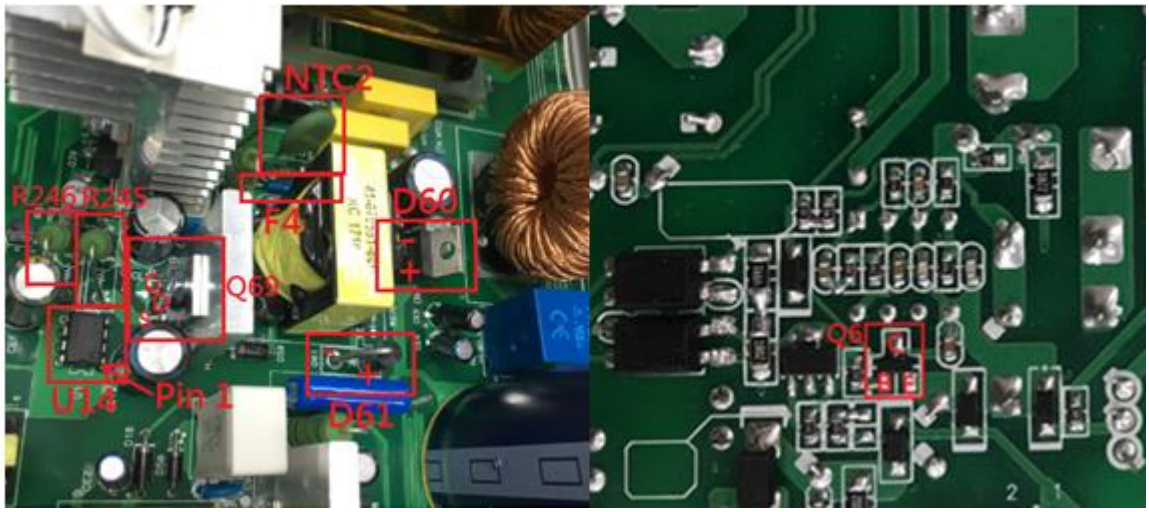
The D60 are (RHRP860 8A 600V SFST)

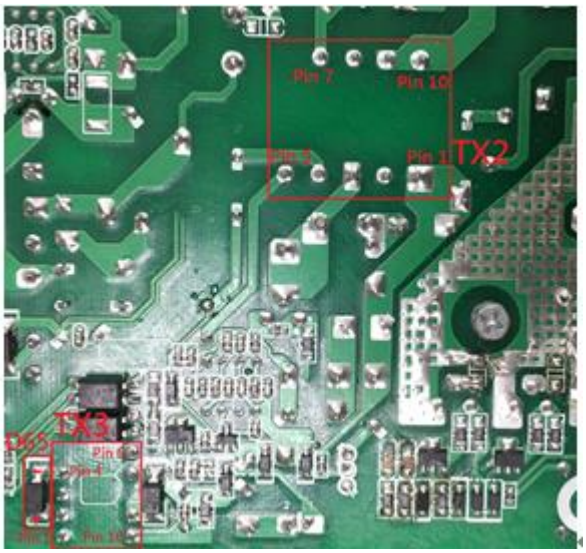
The U14 are (IC UC3845BNG DIP-8)

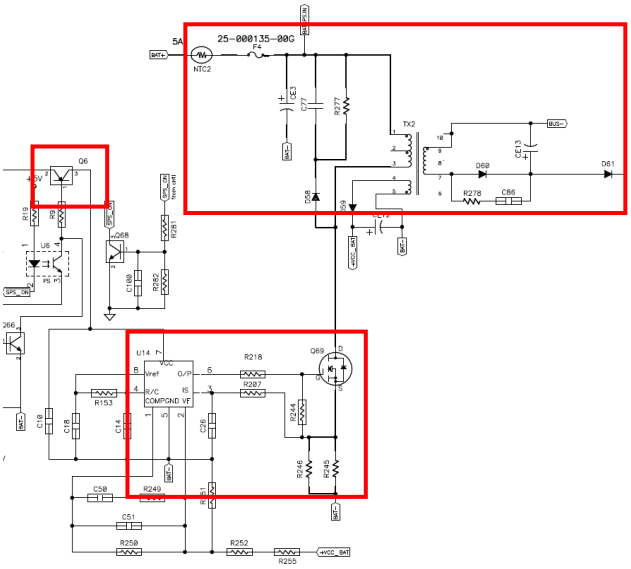
The Q6 are (PMBT2907A 0.6A 60V SMD)

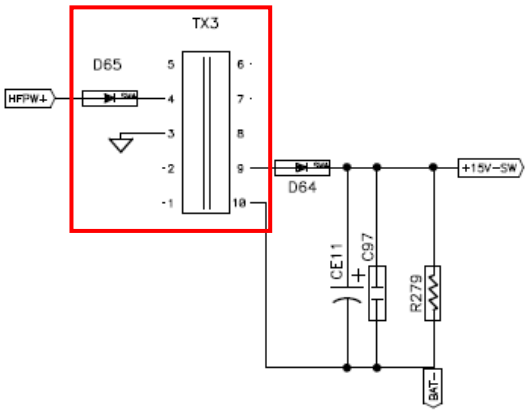
The TX3 are (TX 16:16:16 FER EE16)

The D65 are (RS1J 1A 600V SMD)





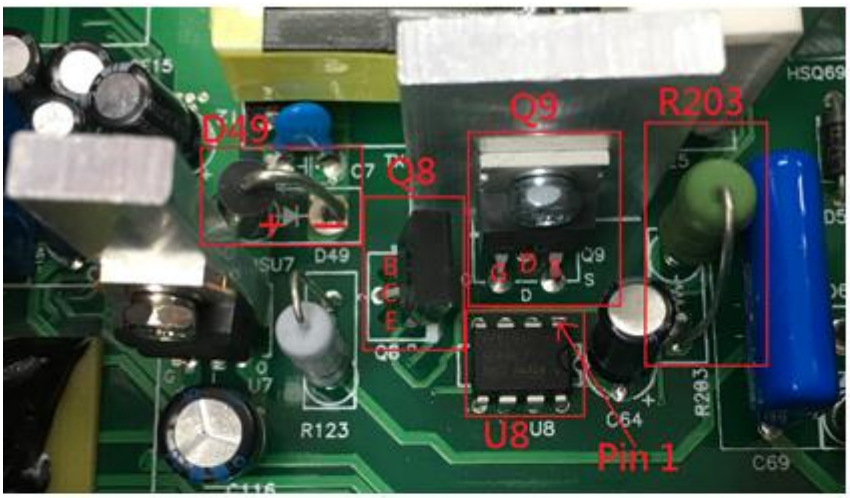




| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| F4 | Resistor | 0 ohm | Open or explosion |
| VMIV-5600 NTC2 | Resistor | 5.48ohm | Open or explosion |
| VMIV-3600 NTC2 | Resistor | 5 ohm | Open or explosion |
| D61 | Diode | + to -: 0.468V<br>- to +: OL | Short or explosion |
| D60 | Diode | + to -: 0.435V<br>- to +:OL | Short or explosion |
| VMIV-3600 R245<br>VMIV-5600 R245 | Resistor | 0.65ohm | Open or other values |
| VMIV-3600 R246<br>VMIV-5600 R245 | Resistor | 0.65ohm<br>NC | Open or mother values |
| Q69[1] | Resistor | GS: 45.51k<br>GD: 57k(VMIV-5600)<br>GD: 44.6k(VMIV-3600) | Short or explosion |

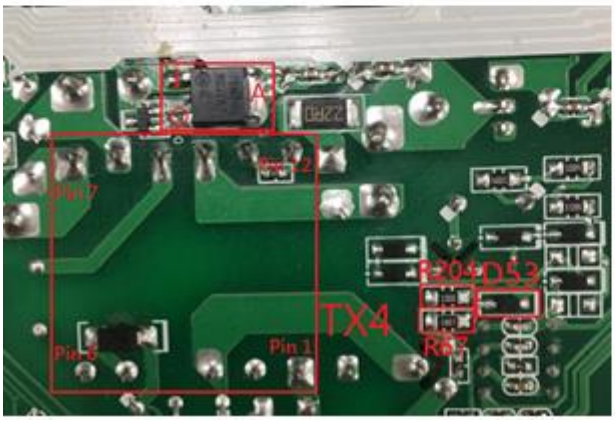
| | | | |
|---|---|---|---|
| | | SD: 528K(VMIV-5600)<br>SD: 115K(VMIV-3600) | |
| | Diode | SD: 0.463V<br>GS: OL | |
| U14 | Resistor | PIN7 TO PIN5: 77.5K<br>PIN6 TO PIN5: 45.48K | Short or other values |
| Q6 | Resistor | EB: 512k<br>CB: 456k | Short or other values |
| | Diode | CB: 0.688V<br>EB: 0.691V | |
| VMIV-5.6K TX2 | Resistor | PIN7 to PIN9: 0.57 ohm | Short or other values |
| VMIV-3.6K TX2 | Resistor | PIN7 to PIN9: 0.4ohm | Short or other values |
| TX3 | Resistor | PIN9 to PIN10: 0.3ohm | Short or other values |
| D65[2] | Diode | + to -: 0.52V<br>- to +: OL | Short or explosion |
| **Note1:** When test the Q69; please remove the R245 from the board, otherwise the test result is not right<br>**Note2:** When test the D69; please remove the D65 from the board, otherwise the test result is not right | | | |

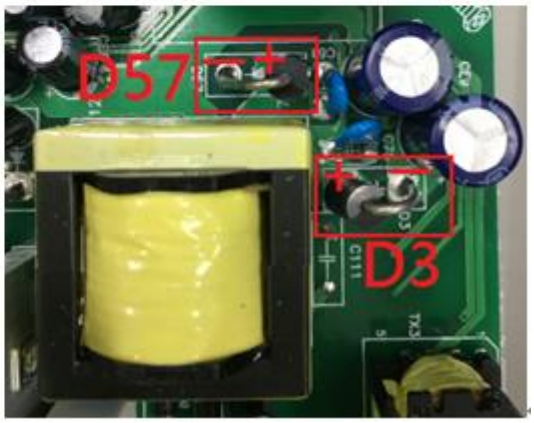
**Main Power SPS**

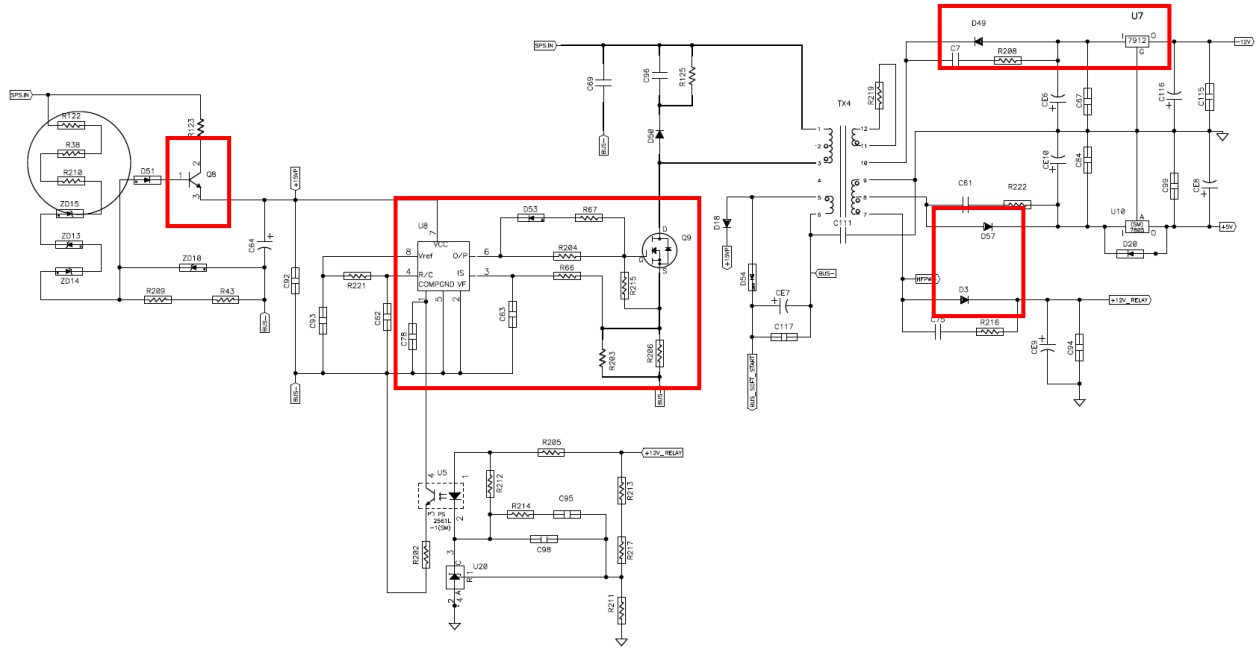
The MOSFET Q9 are (IRFBG30 3.1A 1000V TO-220)
The Q8 are (2SC5353BL 3A 750V TO-126C)
The U8 are (IC PWM UC3845BNG DIP-8)
The R203 are (RES 5W 0.5ohm)
The R204 are (RES 1/4W 100ohm 1206)
The D53 are (1N4148W 0.15A 75V SMD)
The R67 are (RES 1/4W 10ohm 1206)
The D3 are (MUR460RLG 4A 600V UFST)
The D49 and D57 are (HER303 3A 200V UFST)
The U7 are (IC L7912CV 3P TO-220)
The U10 are (IC MC78M05CDTRKG DPAK-3)
The TX4 are (TX 8:21:2:4:8:21:7 FER EC28)







| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| Q9 | Resistor | GS: 45k<br>SD: 300K | Short or explosion |
| | Diode | SD: 0.52V | |

| | | | |
|---|---|---|---|
| | | SG: 0.73V | |
| Q8 | Resistor | BC: 356k<br>BE: 413k | Short or explosion |
| | Diode | BC: 0.59V<br>BE: 0.61V | |
| U8 | Diode | PIN5 TO PIN7: 0.48V<br>PIN5 TO PIN6: 0.64V | Short or other values |
| R203 | Resistor | 0.5 ohm | Open or other values |
| R204 | Resistor | 100 ohm | Open or other values |
| D53[1] | Diode | + to -: 0.52V<br>- to +: OL | Short or explosion |
| R67 | Resistor | 10 ohm | Open or other values |
| D3 | Diode | + to -: 0.4V<br>- to +: 0.7V | Short or explosion |
| D49/D57 | Diode | + to -: 0.45V<br>- to +: OL | Short or explosion |
| U7 | Diode | PINI to PINO: 0.56V<br>PINO to PING: 0.44V<br>PINI to PING: 0.45V | Short or explosion |
| U10 | Diode | PINA TO PINI: 0.45V<br>PINA TO PINO: 0.5V | Short or explosion |
| TX4 | Resistor | PIN1 TO PIN3: 0.4 ohm | Short or other values |
| **Note1:** When test the D53; please remove the R67 from the board, otherwise the test result is not right | | | |

3.6 Check AC SPS on MPPT board

The F7 are (FUSE 3A 125V)

The NTC4 are (NTC 10 OHM 3.0A)

The REC3 are (GBU4M 4A 1000V UFST)

The D83 are (RHRP8120 8A 1200V)

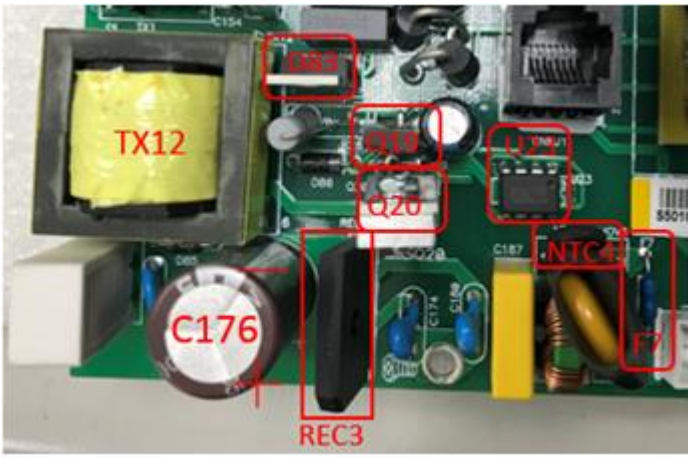
The Q20 are (IRFBG30 3.1A 1000V)

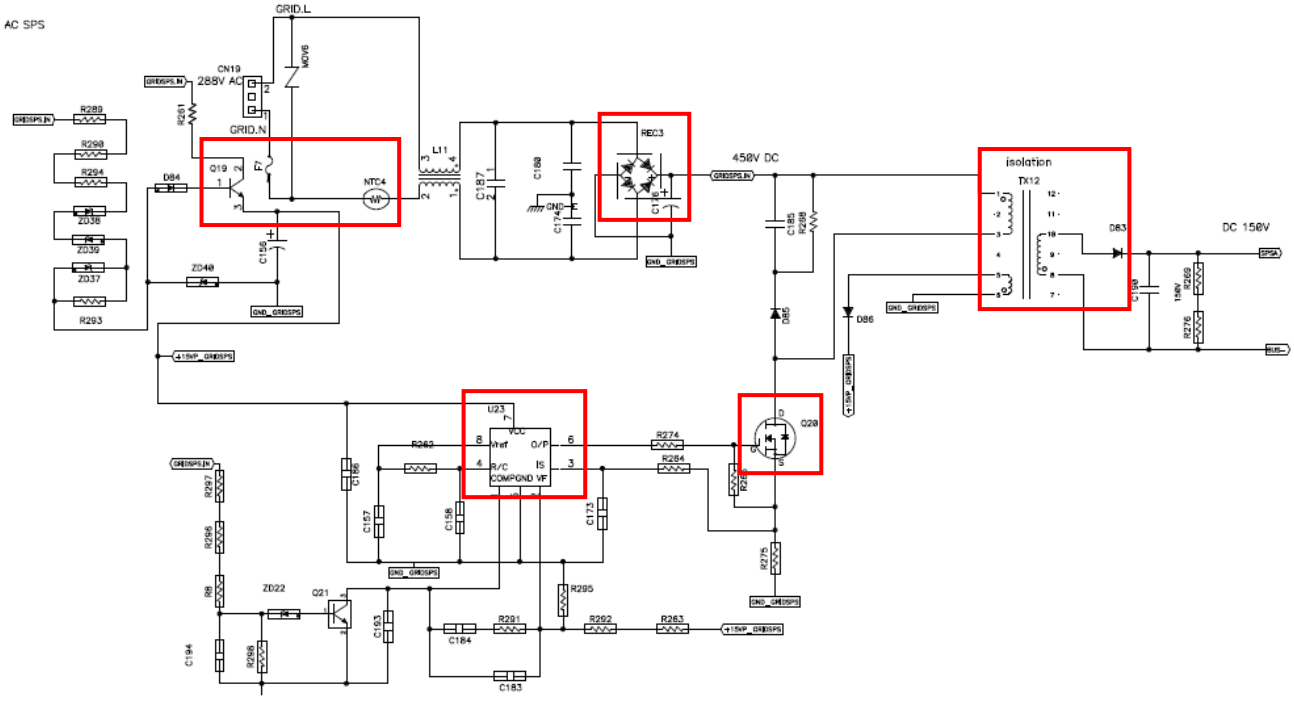
The Q19 are (2SC5353BL 3A 750V)

The U23 are (IC PWM UC3845BNG DIP-8)

The TX12 are (TX 26:4:42:27 FER EC28)

The C176 are (33uF 450V)




| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| F7 | Resistor | 0.1 ohm | Open or explosion |
| NTC4 | Resistor | 11.4 ohm | |
| D83 | Diode | + to -: 0.458V<br>- to +:OL | Short or explosion |
| Q20 | Resistor | GS: 45.27k<br>SD: 4.711K | Short or explosion |
| | Diode | SD: 0.536V<br>SG: OL | Short or other values |

| | | | |
|---|---|---|---|
| Q19 | Resistor | BC: 361.9k<br>BE: 411.6k | Short or explosion |
| | Diode | BC: 0.598V<br>BE: 0.611V | |
| U23 | Diode | PIN5 TO PIN7: 0.492V<br>PIN5 TO PIN6: 0.639V | Short or other values |
| | Resistor | PIN1 TO PIN3: ohm | Short or other values |
| C176 | Capacitance | 33uF/450V | |

3.7 Check the bus soft start circuit on MPPT board (TX1: Especially for 09 fault)

The D82 are (RHRP8120 8A 1200V UFST)

The R238 are (RES 0.62 J)

The MOSFET Q17 are (IRFBG30 3.1A 1000V TO-220)

The D67 and D73 are (MUR4100ERLG 4A 1000V UFST)

The U18 are (IC PWM UC3845BNG DIP-8)

The TX1 are (TX 55:200:44 FER EEL16)

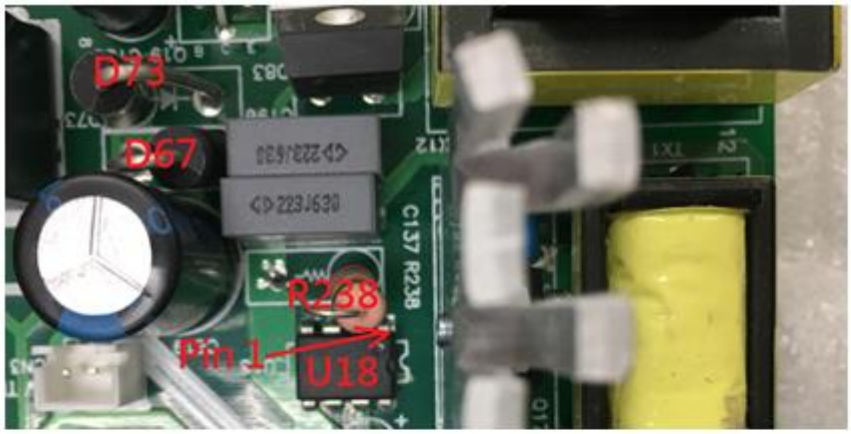
The R260 are (22R 1206)

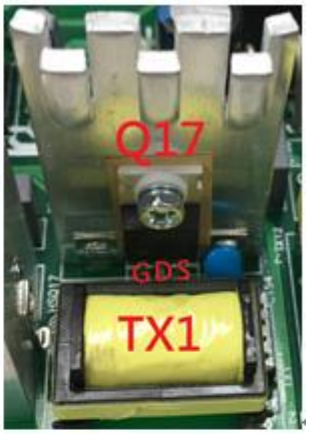
The R235 are (1KR 1206)

The R258 are (1.2KR 1206)

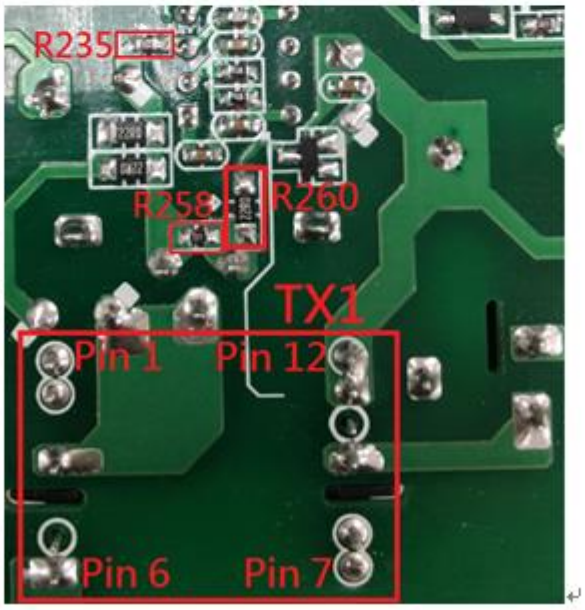
The C176 are (33uF 450V)

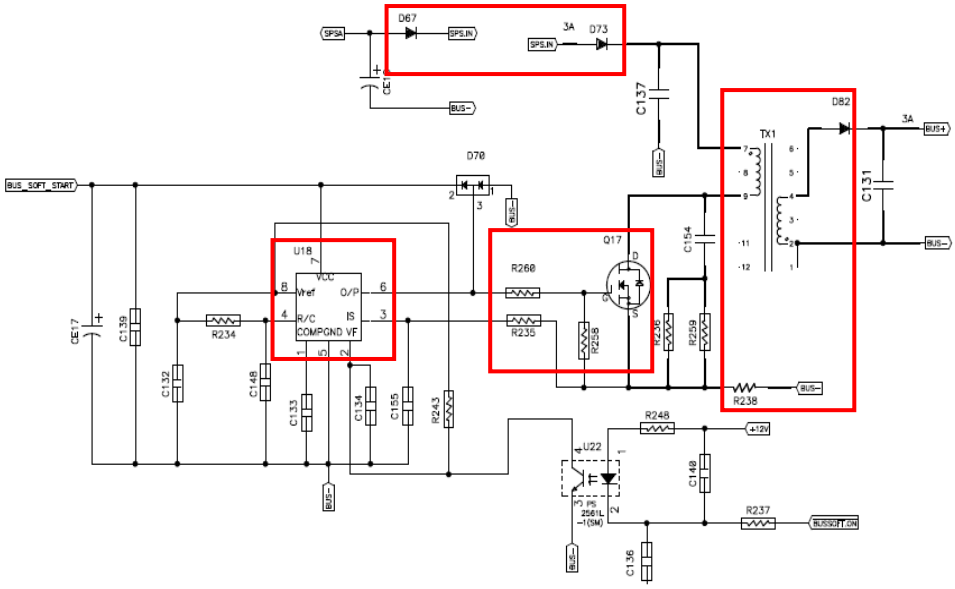
Note: If R260 is damaged, please replace U18 together.


D73
D67
R238
Pin 1
U18
C137 R238


Q17
GDS
TX1


D82
D82
HSD82


R235
R258
R260
TX1
Pin 1
Pin 12
Pin 6
Pin 7

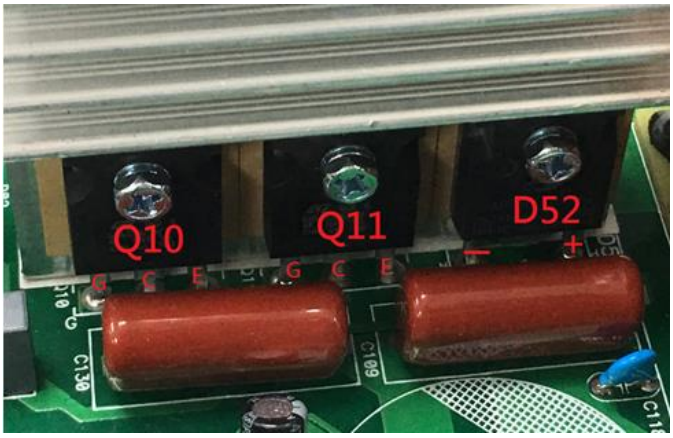

D67
SPSA
SPS.IN
3A
D73
BUS-
C137
D82
TX1
3A
BUS+
D70
BUS_SOFT_START
U18
Q17
R260
R235
C154
C131
R234
R236
R259
R238
C139
C132
C148
C133
C134
C155
R243
R248
+12V
U22
R237
BUSSOFT_ON
C136

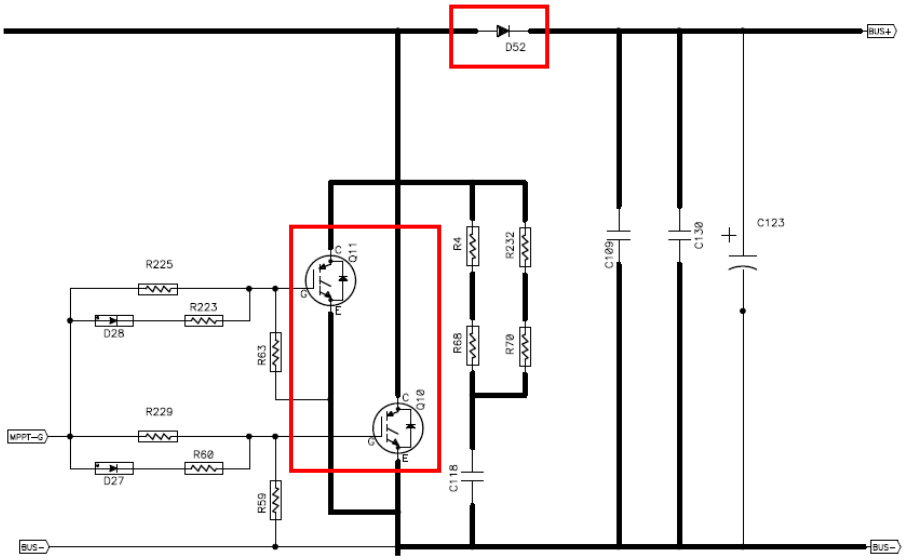
| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| D82 | Resistor | + to -: 237k<br>- to +: OL | Short or explosion |
| | Diode | + to -: 0.458V<br>- to +: OL | |
| D67/D73 | Diode | + to -: 0.47V<br>- to +: OL | Short or explosion |
| Q17 | Resistor | GS: 1.195k<br>SD: 4.692k<br>DS: OL | Short or explosion |
| | Diode | SD: 0.535V<br>DS: OL | |
| R238 | Resistor | 0.7 ohm | Open or other values |
| R235 | Resistor | 0.999K ohm | Open or other values |
| R258 | Resistor | 1.195K ohm | Open or other values |
| R260 | Resistor | 22 ohm | Open or other values |
| U18 | Resistor | PIN7 TO PIN5: 72k<br>PIN6 TO PIN5: 1.21k | Short or explosion |
| TX1 | Resistor | PIN2 to PIN4: 2.7ohm<br>PIN7 to PIN9: 1.4ohm | Short or other values |
| **When 09 fault happens, and you couldn't find other damage, please check TX1!!** | | | |

3.8 Check the Boost on MPPT board

**Power devices**

Boost IGBT Q1/Q6 and Diode D1






The D52 are (30DQ60BG 30A 600V TO-247)

The Q10 and Q11 IGBT are (STGW60H65DFB 60A 650V TO-247)

| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| Q10, Q11 | Resistor | GE: 18.29k<br>GC: 206.1k<br>CE: 358.7k | Short or explosion |
| | Diode | EC: 0.389V<br>CE: OL | |
| D52 | Diode | + to -: 0.39V<br>- to +: OL | |

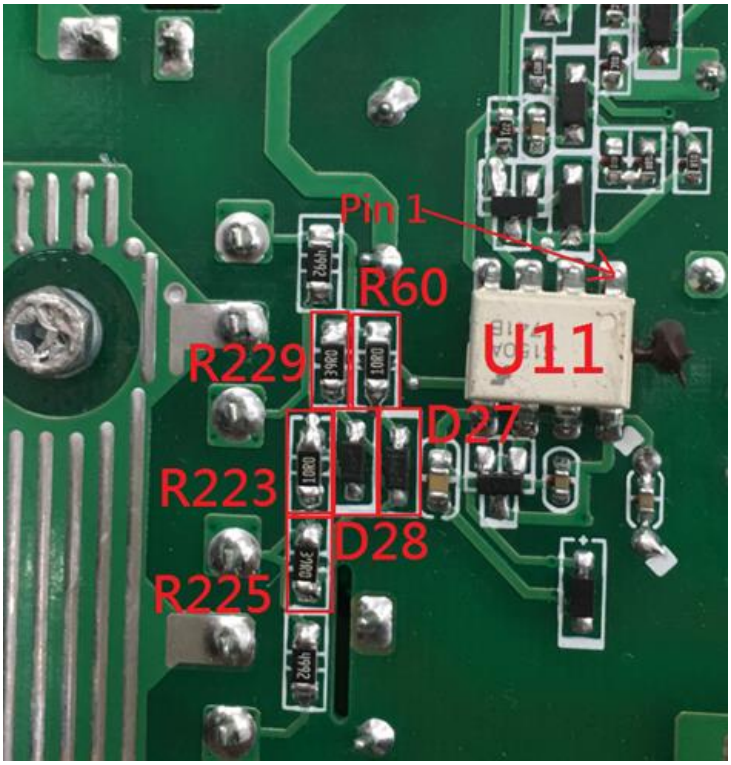
**Drivers**

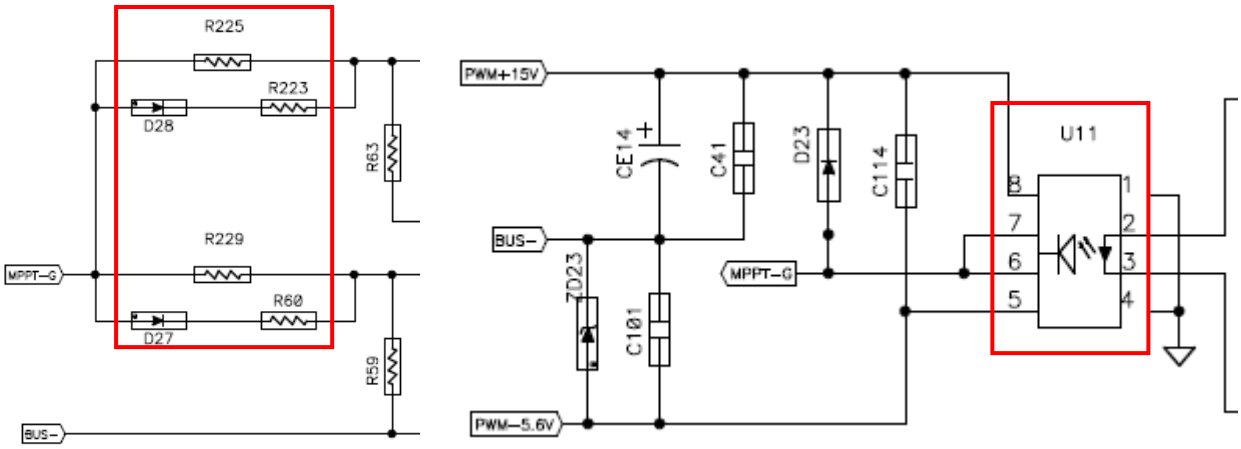
The U11 are (FOD3150ASD SO-8)

The D27 and D28 are (1N4148W 0.15A 75V SMD)

The R60 and R223 are (10R 1206)

The R225 and R229 are (39R 1206)

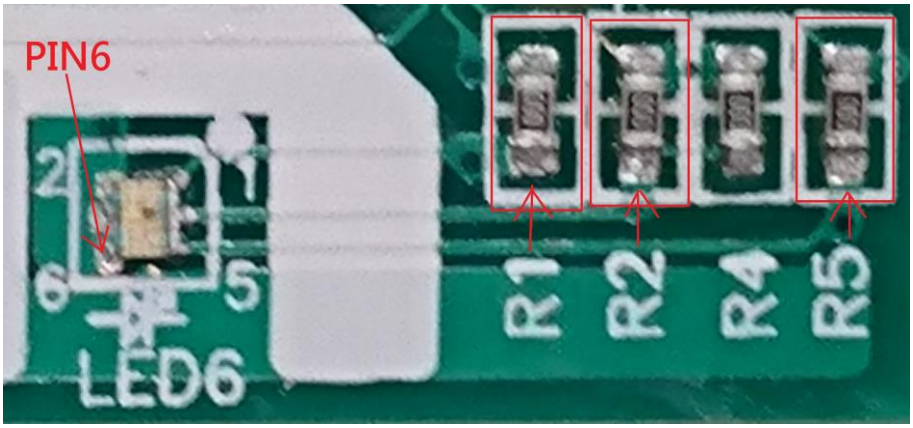


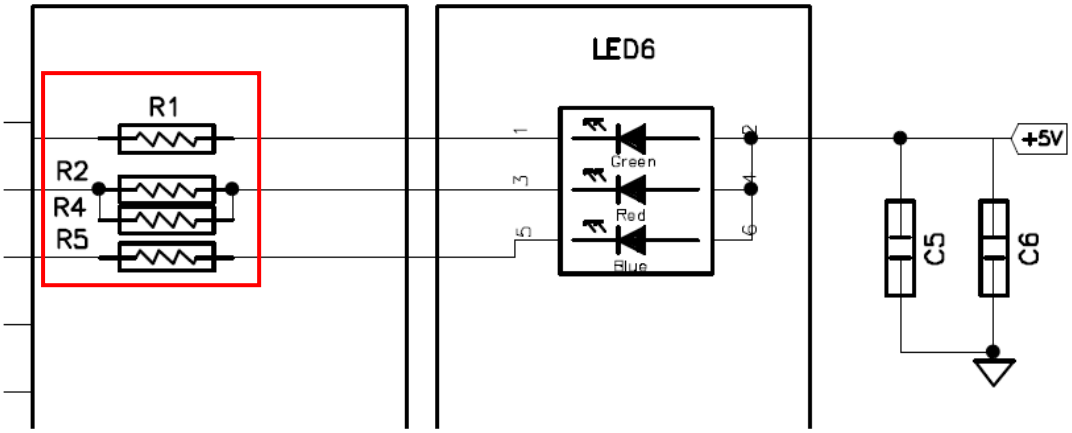




| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| U11 | Resistor | PIN8 TO PIN5: 350.7k<br>PIN7 TO PIN5: 388k | Short or other values |
| D27/ D28 | Diode | + to -: 0.6V<br>- to +: OL | Short or explosion |
| R60/ R223 | Resistor | 10 ohm | Open or other values |

| | | | |
|---|---|---|---|
| R225/ R229 | Resistor | 39 ohm | Open or other values |
| **Note:** When test the diode; please remove the R60/ R223 from the board, or the test result is not right. | | | |

3.9 Check the ED & SW board



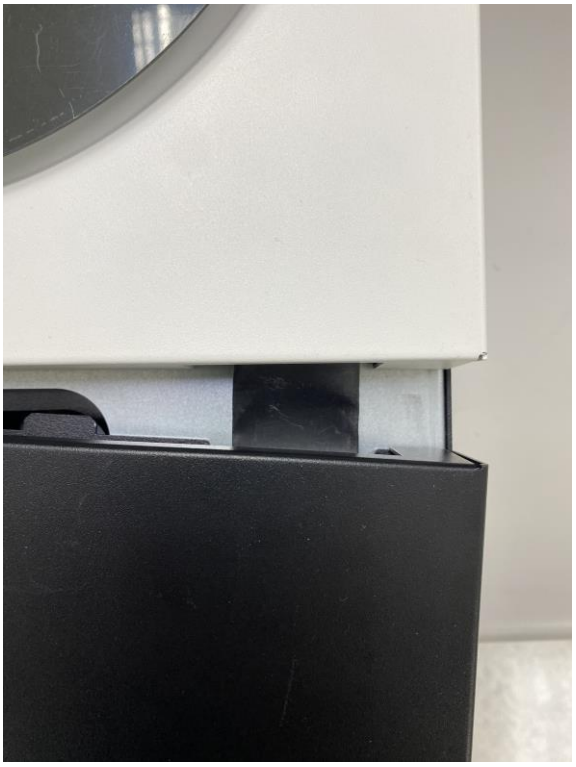

The LED6 are (RSBHGHC-A88-4T RGB 1.6*1.6 SMD)

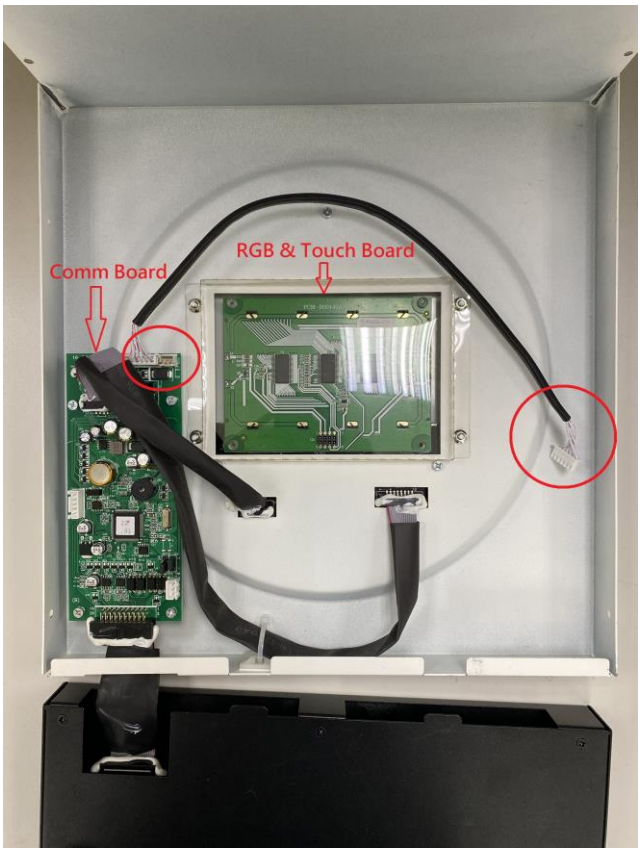
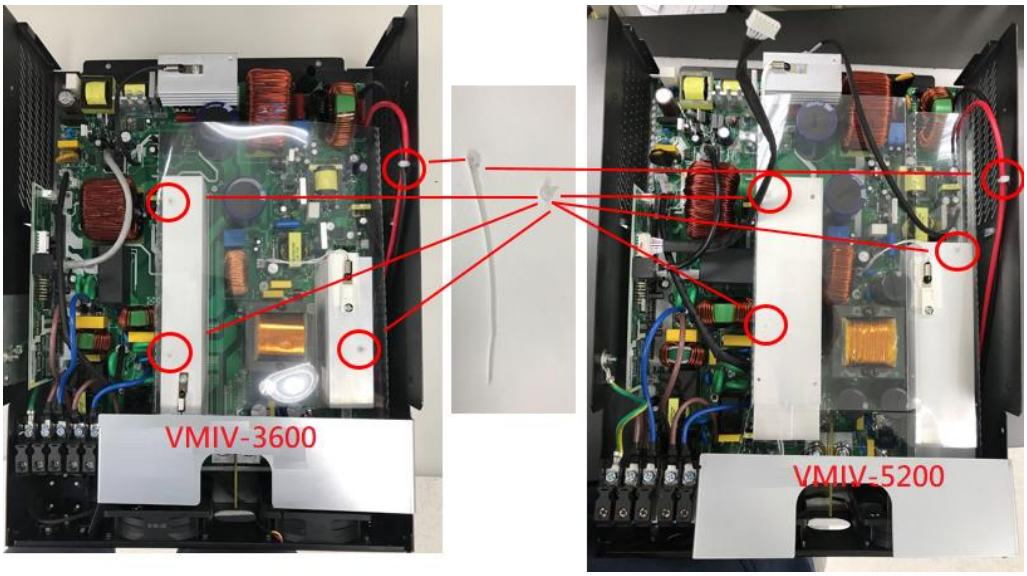
| Parts | Attribute | Reference values | Failure status |
|---|---|---|---|
| LED6 | Diode | PIN6 to R1: 1.985V<br>PIN6 to R2: 1.748V<br>PIN6 to R5: 1.988V<br>R1 to PIN6: 1.501V<br>R2 to PIN6: 1.501V<br>R5 to PIN6: 1.501V | Short or explosion |

**Drivers**

The R1 and R2 and R4 and R5 are (0R 0603)

## 4. Disassembling guide

| | |
|---|---|
| Remove 10 screws on top cover and rear panel. |  |
| Remove the remote panel and control cables. |  |

| | |
|---|---|
| Remove Bat SW cable and LCD cable, and take out the Remote cover.<br>(Note: If you just only need to replace the control board, you can replace it at this step.) |  |
| Remove the plastic screws of wind pipeline. Be careful not to damage them. You can use an oblique mouth clamp to help you to remove the clip. |  |

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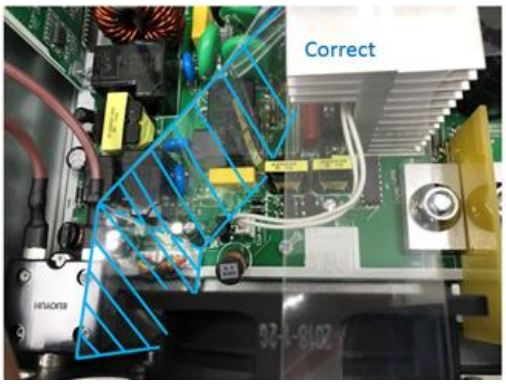
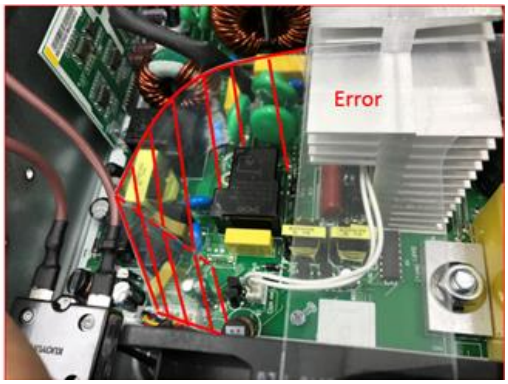
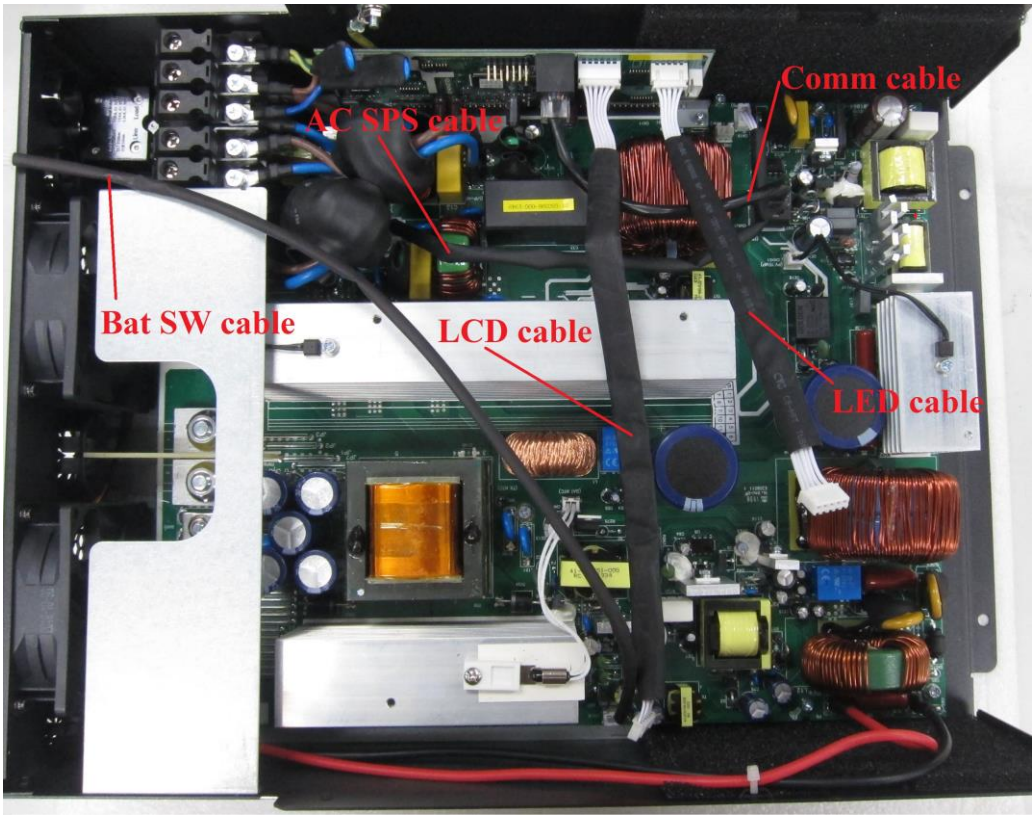
|---|---|
| **Note:**<br>**Please make sure that put the plastic sheet back and fix well. Otherwise it will affect the heat dissipation.** |   |
| Remove<br>AC SPS cable<br>Comm cable<br>LCD cable and<br>Bat SW cable. |  |

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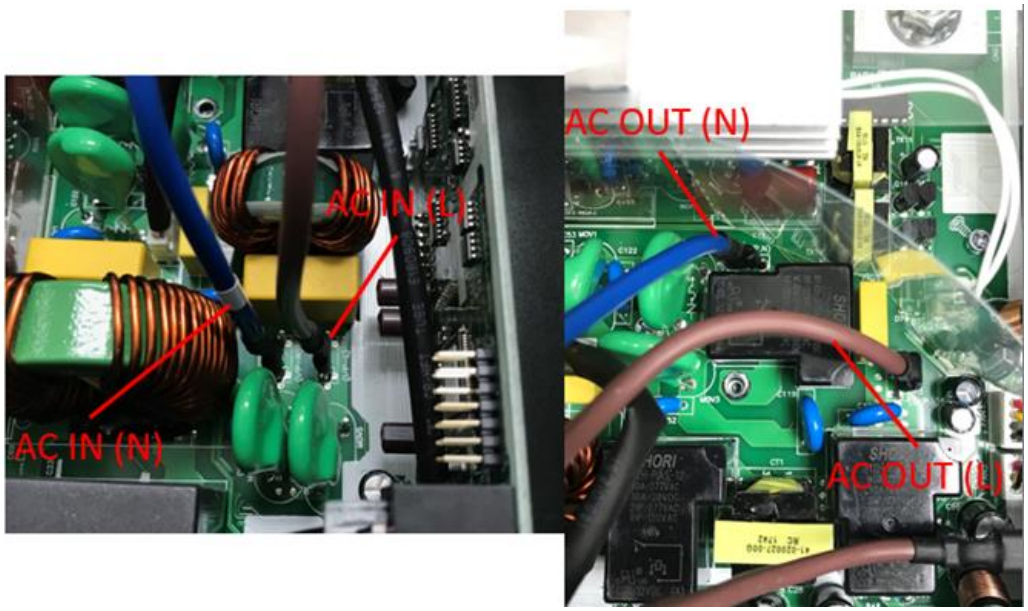
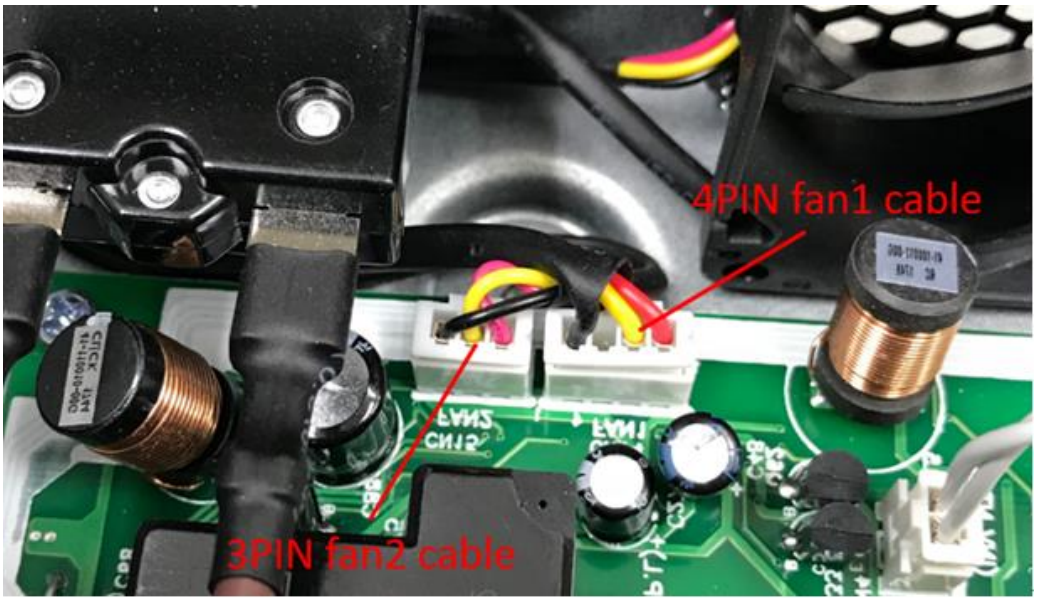
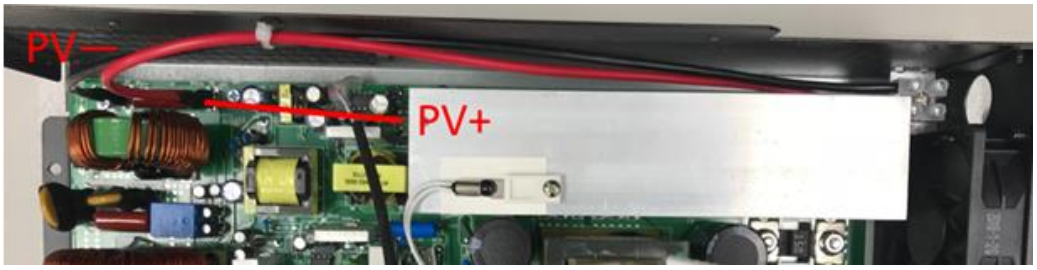
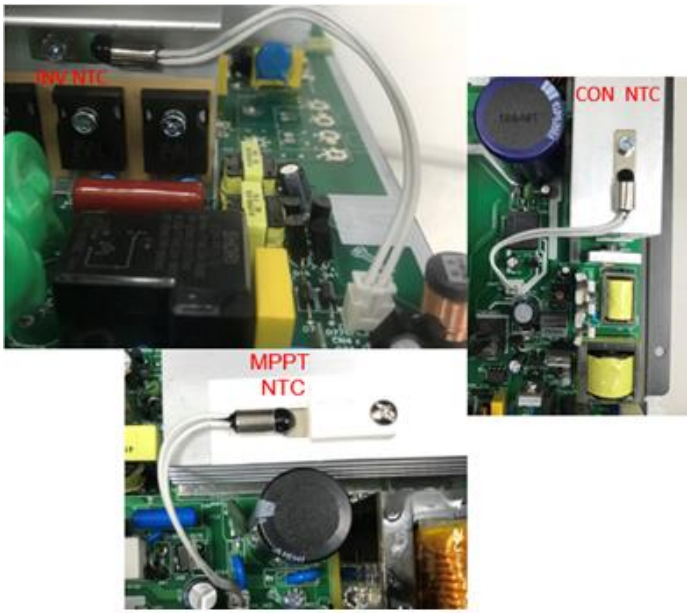
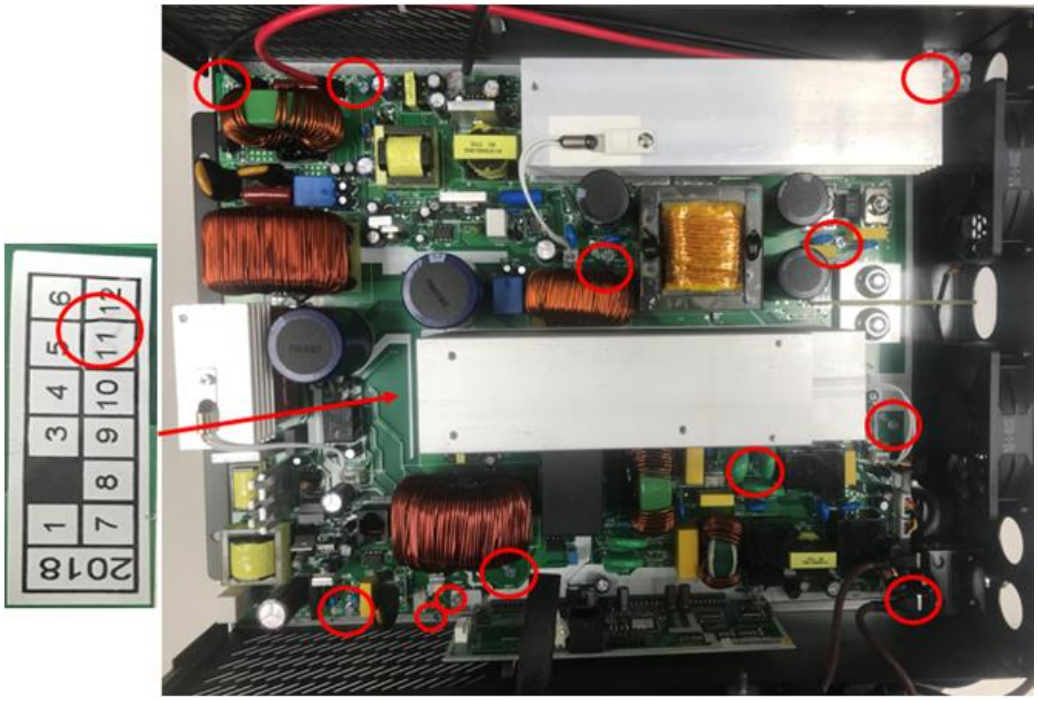
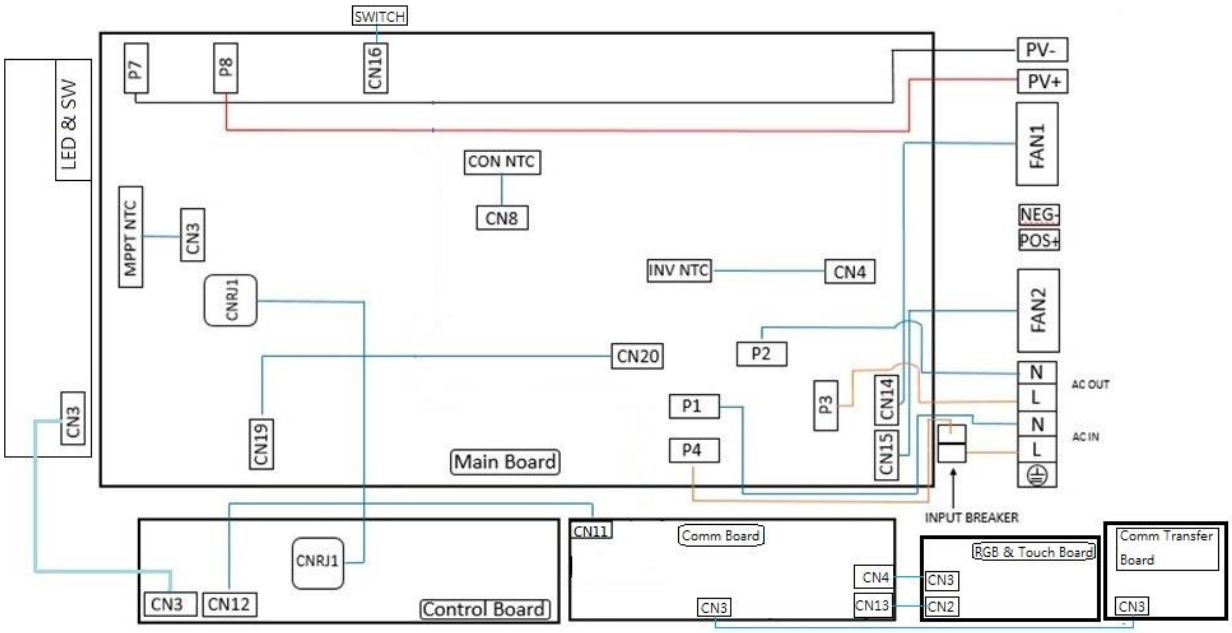
|---|---|
| Remove I/P and O/P cables. |  |
| Remove the fan cables. |  |
| Remove PV IN cable |  |

| | |
|---|---|
| MPPT NTC and Converter NTC and INV NTC |  |
| Remove 13 screws on main board, and take out the main board |  |

1.1 Total wiring diagram:

Note: Wrong connection of wires may cause inverter damage!

Please connect wires with care!


SWITCH
P7
P8
CN16
LED & SW
PV-
PV+
FAN1
CON NTC
CN8
MPPT NTC
CN3
NEG-
POS+
INV NTC
CN4
CNRJ1
FAN2
CN20
P2
N
L
AC OUT
P1
P3
CN14
N
L
AC IN
CN3
CN19
P4
CN15
Main Board
INPUT BREAKER
CN11
Comm Board
RGB & Touch Board
Comm Transfer Board
CNRJ1
CN4
CN3
CN3
CN12
Control Board
CN3
CN13
CN2
CN3