

维修手册					
专案名称:	2724LV-MR				
专案编号:	S1912261	修订版次:	00	PAGE	

2724LV-MR
Service manual



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1. General information

1.1 Getting start

This manual is used as a checking and repairing guide for 2724LV-MR. 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:

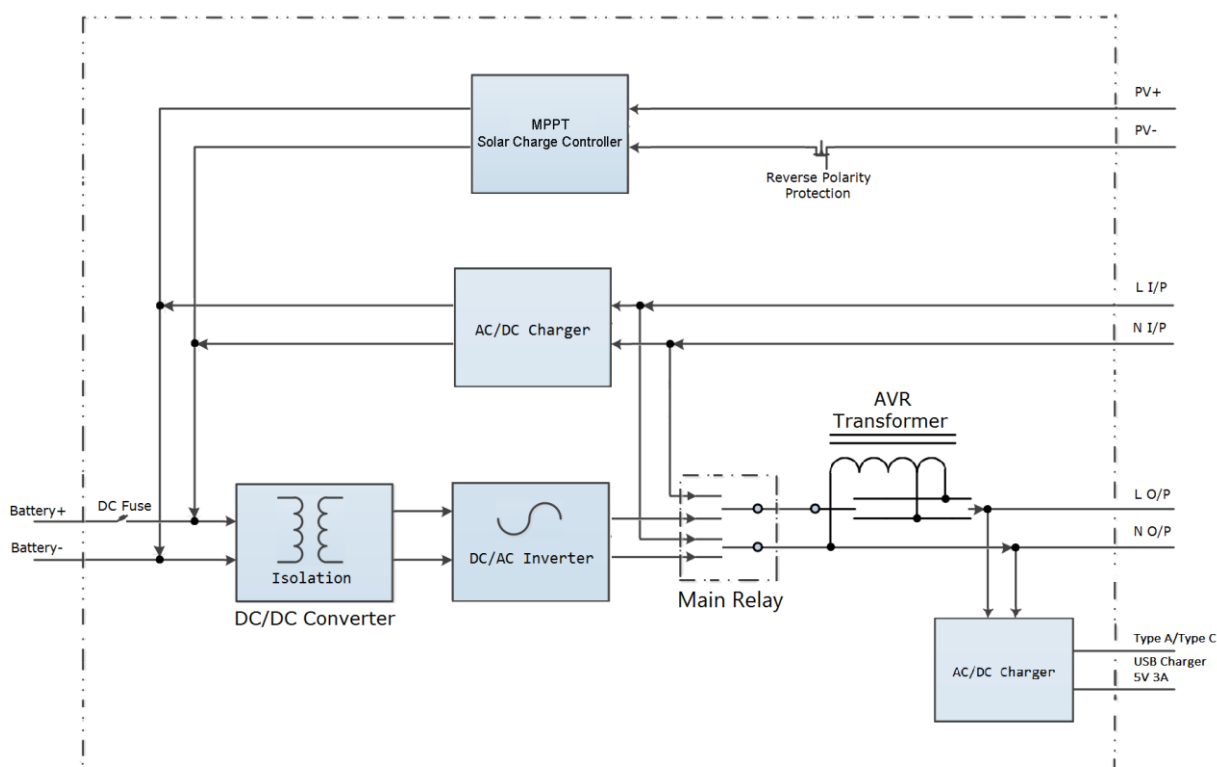
General information: This part is the basic information of the inverter; you can start to know the inverter from this chapter.

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. 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
2724LV-MR	3KVA	MPPT	1

1.4 Overview the inverter

2724LV-MR



1 Troubleshooting

1.5 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.

1.6 Fault condition

Note:

When open the top cover, please have a look first, are there any obviously damaged parts?

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. 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. 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"; 2. Check the main board by following "3.1; 3.2; 3.3; 3.4".
How to solve	Repair the main board or replace it directly.

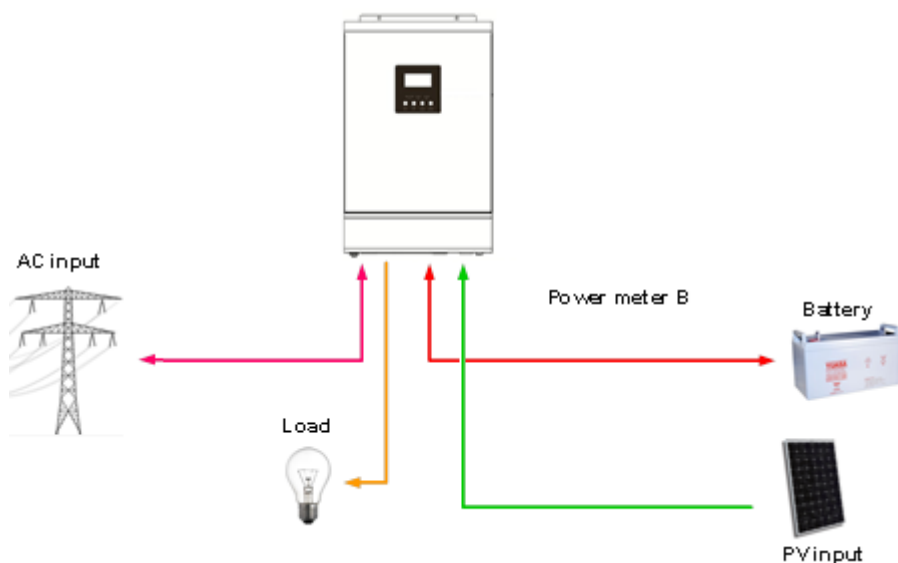
2.2.3. Warning

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; 2. Check the main board by following "3.1".
How to solve	Repair the main board or replace it directly.

1.7 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:



2. Checking and measuring guide

2.1 Check the battery side components on MAIN board

Fuse and capacitors

For 2724LV-MR FUCE 150A



Parts	Attribute	Reference values	Failure status
BAR4	Resistor	0.2 ohm	Open

C19/C40/C20/C39: (4200uF 35V)

C207: (1000uF 35V)

C70/C76: (1200uF 250V)

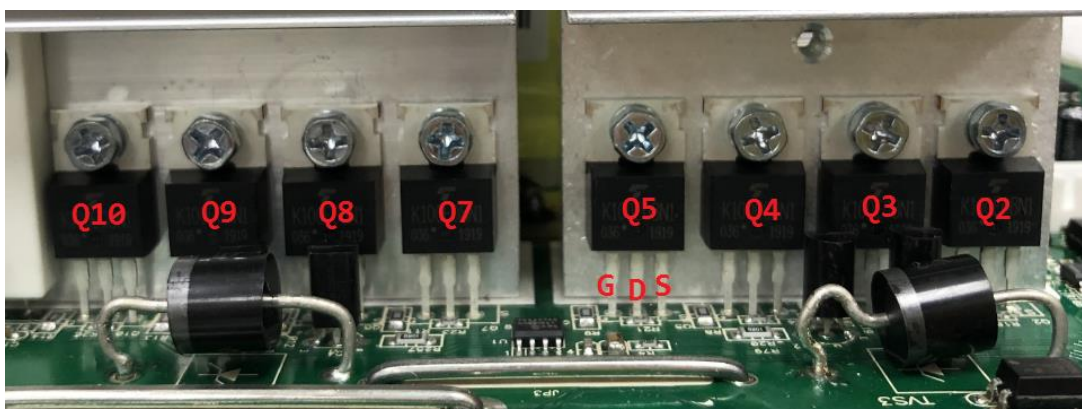


If the capacitors explode as below, they need to be replaced.



Power devices

DC/DC MOSFET: Q10/Q9/Q8/Q7 & Q5/Q4/Q3/Q2



For 2724LV-MR of the MOSFET are (TOSHIBA/TK100E08N1 214A 80V TO-220)

Parts	Attribute	Reference values	Failure status
TOSHIBA/ TK100E08N1	Resistor	GS: 5.206K GD: 5.206K DS: OL	Short or explosion
	Diode	SD: 0.463V 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.

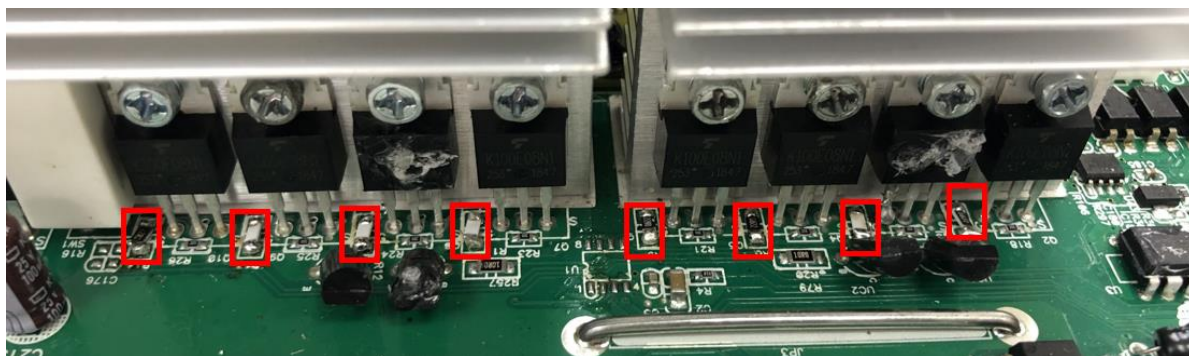
Note2: If one or more of them were damaged, please replace all of them.

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:

R14/R13/R12/R11/R9/R8/R7/R6 All of the resistors are (10R 1206)

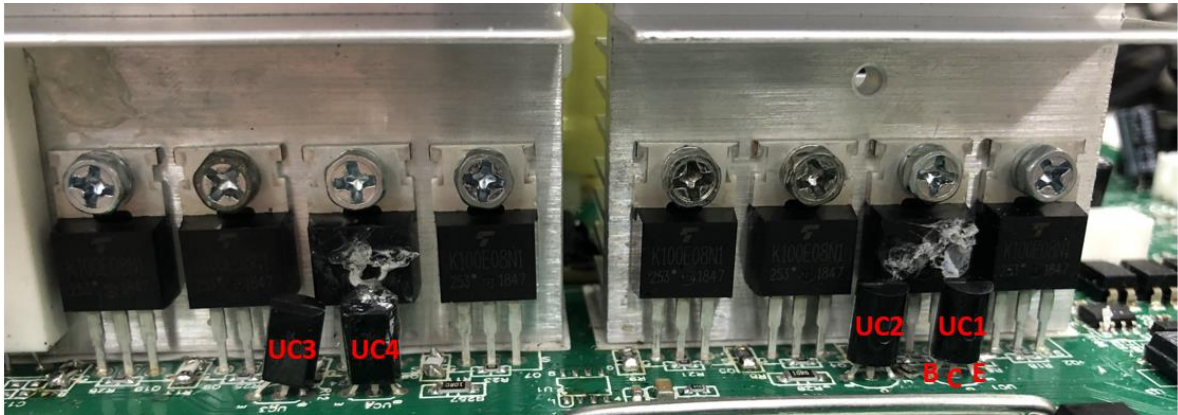


Use multimeter to measure each resistor, find the burnt resistors and replace them; don't need to replace them all.

Parts	Attribute	Reference values	Failure status
All: 10ohm	Resistor	10 ohm	Open or other values

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

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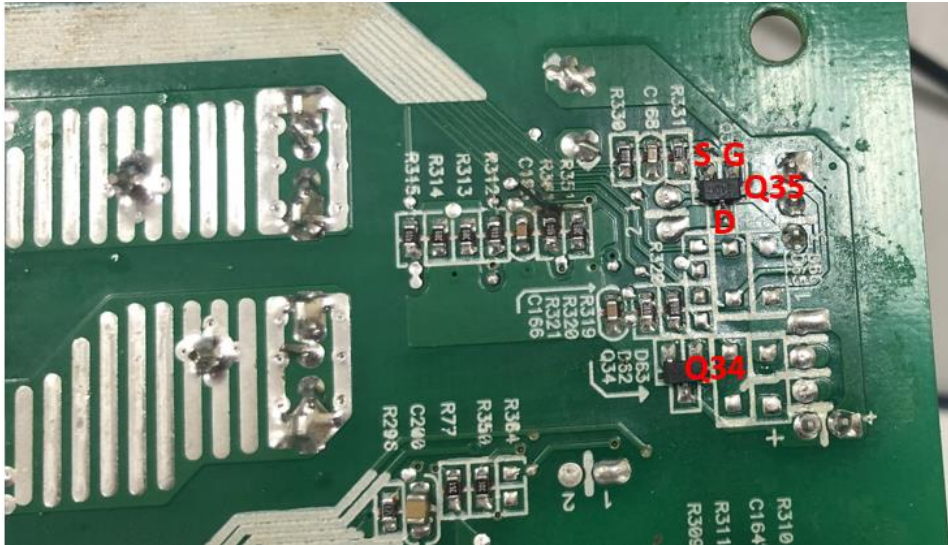


The

The UC2 and UC4 are (2SC2655 2A 50V NPN TAP TO-92)
The UC1 and UC3 are (2SA1020L-Y-T9N-B 2A 50V PNP TAP TO-92NL)

Parts	Attribute	Reference values	Failure status
UC1/UC3	Resistor	BE: 15.9M BC: 15.9M EC: 5k	Short or explosion
	Diode	BE: 0.64V BC: 1.2V CE: 0.99V	
UC2/UC4	Resistor	BE: 430k BC: 425k EC: 104k	Short or explosion
	Diode	BE: 0.64V BC: 0.64V CE: 1.56V	

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The Q34 and Q35 the MOSFET are (UTC/UT3404G 5.8A 30V NPN SOT-23 SMD)

Parts	Attribute	Reference values	Failure status
Q34/Q35	Resistor	GS: 9.95k GD: OL SD: OL	Short or explosion
	Diode	SD: 0.51V DS: OL	



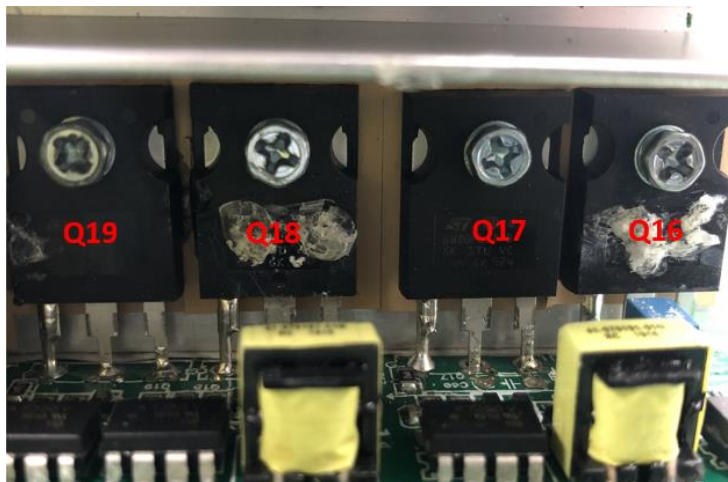
The U3 is (IC PWM CNTL ON/KA3525A)

Parts	Attribute	Reference values	Failure status
U3	Resistor	PIN13 TO PIN12: 8.8k PIN11 TO PIN12: 432k PIN14 TO PIN12: 432k	Short or explosion

2.2 Check the bus side components on MAIN board

Power devices

DC/DC IGBT: Q16/Q17/Q18/Q19



IGBTs are (IGBT ST/STGW80H65DFB 80A 650V N BULK TO-247)

Parts	Attribute	Reference values	Failure status
Q16/Q17/Q18/Q19	Resistor	GE: 49.9K ohm GC: 500k EC: 500K	Short or explosion
	Diode	EC: 0.37V 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)

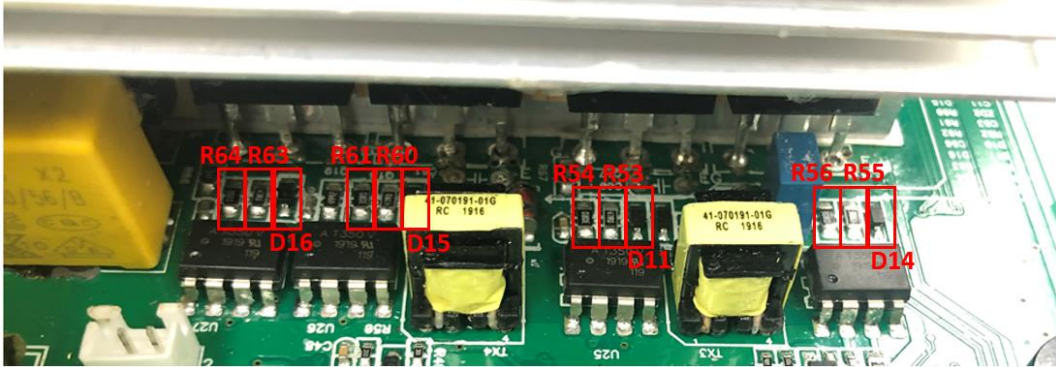
Meanwhile, we also need to check the driver tubes of these power tubes.

R54/R/R56/R61/R64: (30R 1206)

R53/R55/R60/R63: (47R 1206)

D11/D14/D15/D16: (1N4148W 0.15A 75V SMD)

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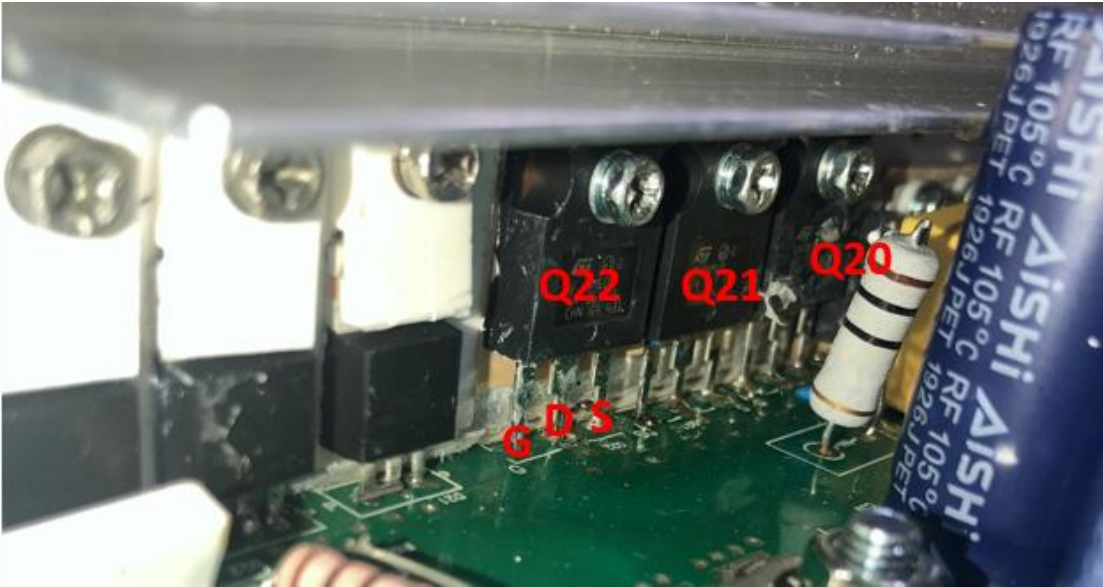
Parts	Attribute	Reference values	Failure status
R54/R/R56/R61/R64	Resistor	30 ohm	Open or other values
R53/R55/R60/R63:	Resistor	47 ohm	
D11/D14/D15/D16	Resistor	+ to -: 270k - to +: OL	Short or explosion
	Diode	+ to -: 0.6V - to +: OL	

Note1: When test the diode; please remove the R53/R55/R60/R63 from the board, or the test result is not right.

2.3 Check the INV full bridge on MAIN board

Power devices

INV IGBT: Q20/Q21/Q22



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All of the IGBT are (ON/FCH104N60F 37A 600V N BULK TO-247)

Parts	Attribute	Reference values	Failure status
Q20/Q21/Q22	Resistor	GS: 15.9k GD: 82.2k DS: 52.8k	Short or explosion
	Diode	SD: 0.43V DS: OL	

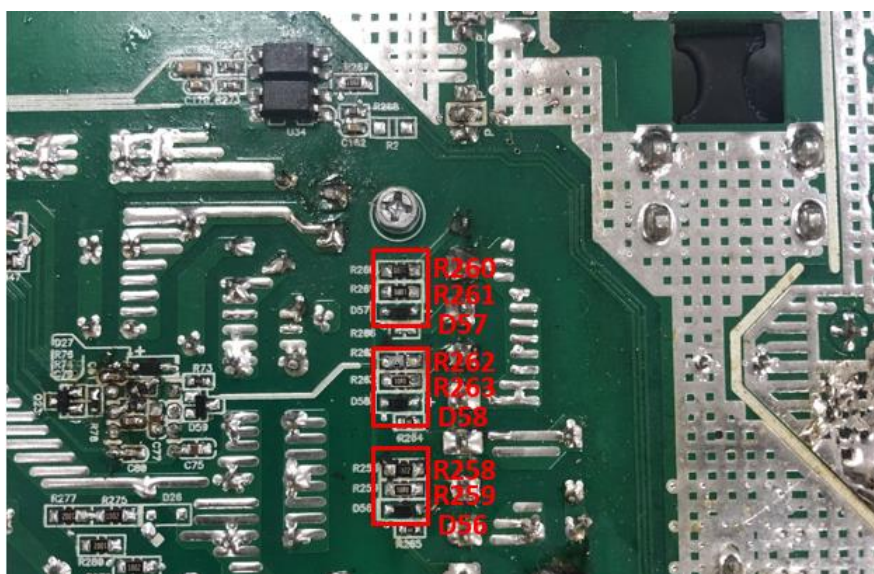
Note1: If one or more of them were damaged, please replace all of them.

Drivers

R258/R260/R262:(39R 1206)

R259/R261/R263:(10R 1206)

D56/D57/D58: (1N4148W 0.15A 75V SMD)



Parts	Attribute	Reference values	Failure status
R258/R260/R262	Resistor	39 ohm	Open or other values
R259/R261/R263	Resistor	10 ohm	Open or other values
D56/D57/D58	Resistor	+ to -: 270k - to +: OL	Short or explosion
	Diode	+ to -: 0.6V - to +: OL	

Note1: When test the diode; please remove the R259/R261/R263 from the board, otherwise the test result is not right

2.4 Check BATT and Main Power SPS on MAIN board

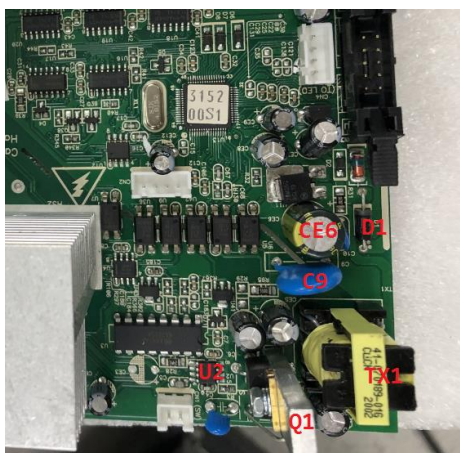
SPS

The MOSFET Q1 is (MOSFET IR/IRFB260N 56A 200V N BULK TO-220)

The U2 is (IC PWM CNTL UTC/UC3845G 8P/SOP-8 SMD)

The TX1 are (TX 17:20:20:17:20 FER EEL16)

The D1 are (D PAJ/UF204 2A 400V UFST TAP)



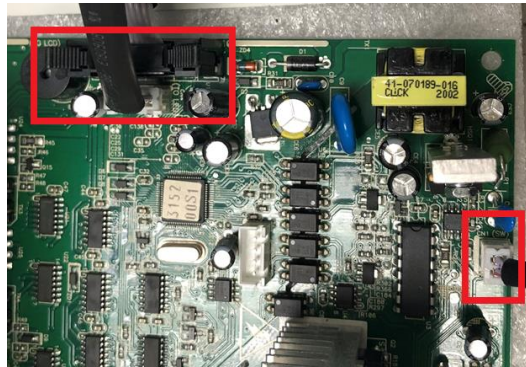
Parts	Attribute	Reference values	Failure status
D1	Diode	+ to -: 0.463V - to +: OL	Short or explosion
Q1	Resistor	GS: 45.51k GD: 44.6k SD: 115k	Short or explosion
	Diode	SD: 0.463V GS: OL	
U2	Resistor	PIN7 TO PIN5: 77.5K PIN6 TO PIN5: 45.48K	Short or other values
TX1	Resistor	PIN7 to PIN9: 0.4ohm	Short or other values

3. Disassembling guide

Remove 10 screws on top cover and rear panel.



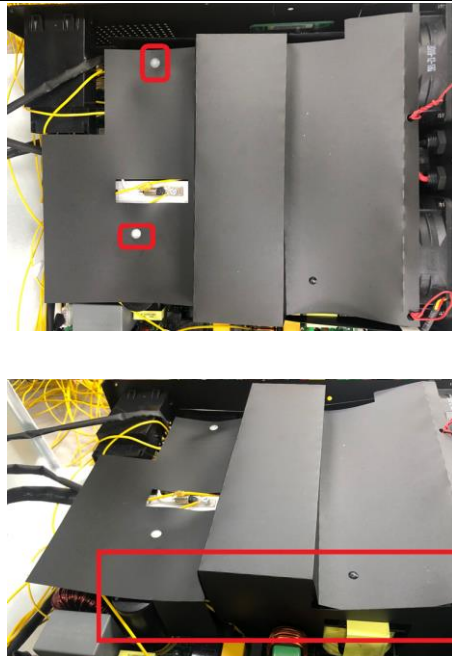
Remove LED cable and LCD cable, and take out the Remote cover.



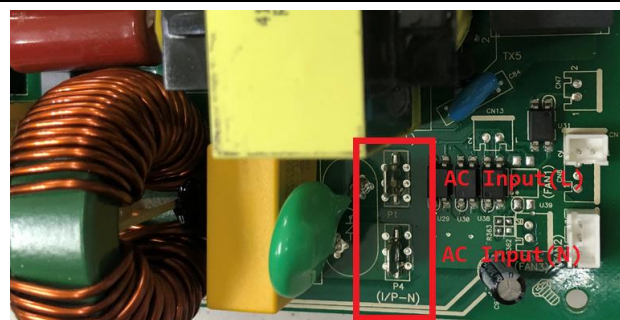
Remove the plastic screws of wind pipeline. Be careful not to damage them. You can use an oblique mouth clamp to help you to remove the clip.

Note:

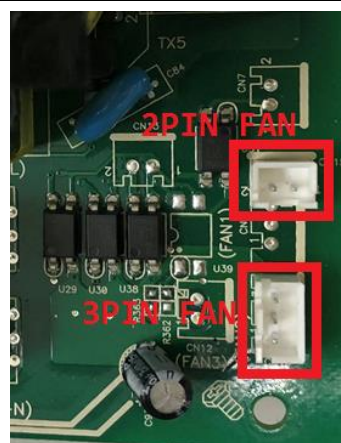
Please make sure that put the plastic sheet back and fix well. Otherwise it will affect the heat dissipation.



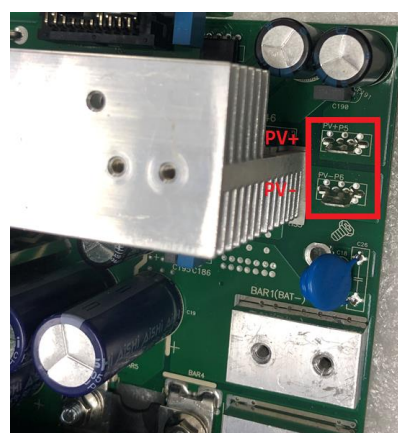
Remove I/P and
O/P cables.



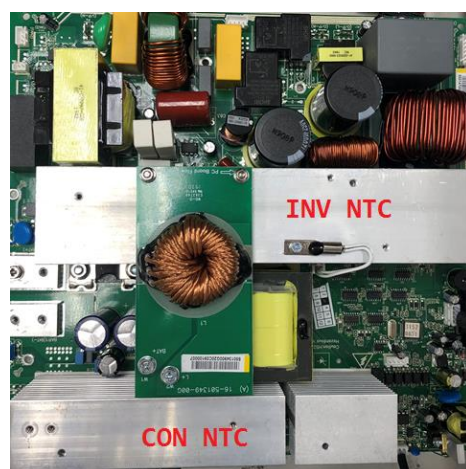
Remove the fan
cables.



Remove PV IN
cable



MPPT NTC and
Converter NTC
and INV NTC



Remove 9
screws on main
board and take
out the main
board

