

LAPTOP LCD CABLE TESTER

1. Description.

The tester is designed to test the integrity of LVDS and eDP common, standard laptop LCD panel cable.

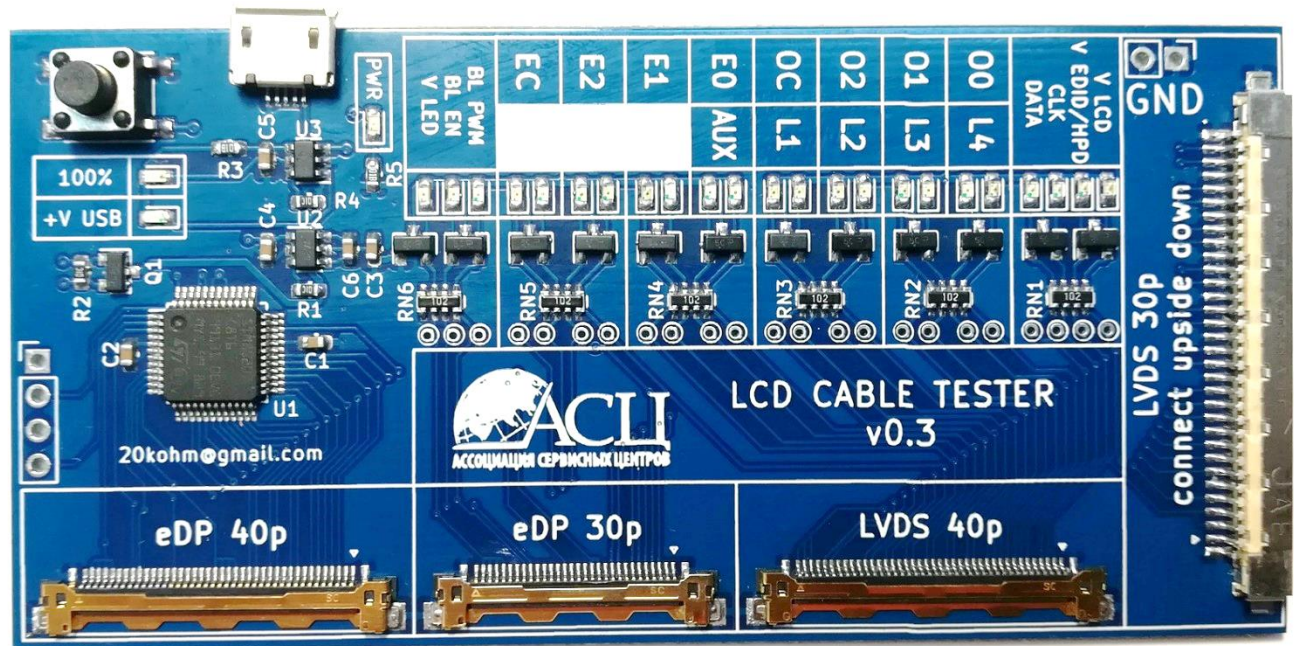
Allows you to identify damaged conductors by mechanical impact on the cable.

Also, the tester allows to determine the presence of a short circuit in the cable.

Tester connects to the cable instead of the panel.

To diagnose breakages, require a connection to the motherboard of the laptop.

Check for short circuits is performed without connection to MB.

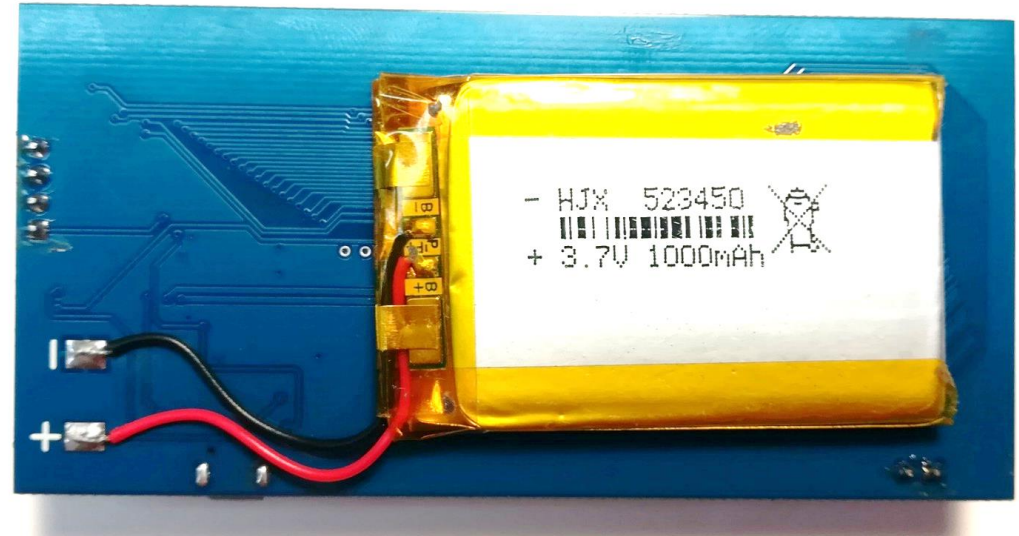


When using the tester, the motherboard must be disconnected from the power source, such as AC adapter and/or battery!

2. Power.

Tester switches on automatically when connecting a cable to any of the connectors. Powered by a Li-Ion battery. To connect it, there are solder pads on the back of the board.

Protection against reverse polarity is not provided, be careful!



Provides the function of charging the battery through the microUSB connector.

Charging current - 100 mA, can be increased to 500 mA, by replacing the resistor R4, according to the table.

The recommended battery capacity is from 200 to 1000 mAh.

Peak tester consumption is 130 mA, typical consumption is about 50 mA.

R4	Charging current (mA)
20K	50
10K	100
5K	200
4K	250
3K	300
2K	400
1,6K	500

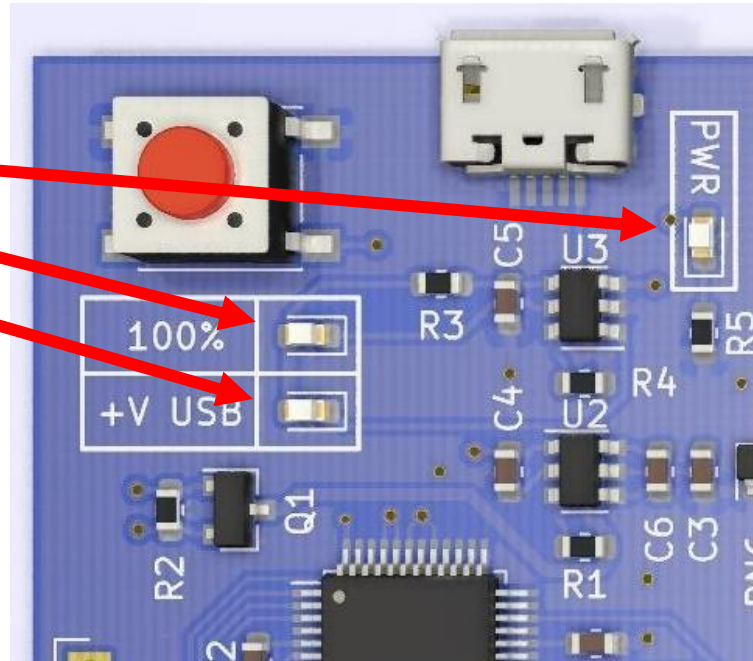
2.1 Power indication.

1. Tester powered.

2. Battery charged.

3. Battery charging.

Simultaneous burning
indicators 2 and 3, means
battery malfunction.



3. Modes.

The tester has three modes of operation:

- Alternating signal mode (works by default after switching on).
- Constant signal mode.
- Test mode for short circuit.

Modes are switched by the button.

3.1 Alternating signal mode.

The tester is connected to the LCD cable. The other end of the cable is connected to the laptop's motherboard (MB). Turning the tester on and off is automatic (using one of the GNDs).

In this mode, the tester outputs a variable signal to all lines of the interface, via LEDs and current-limiting resistors.

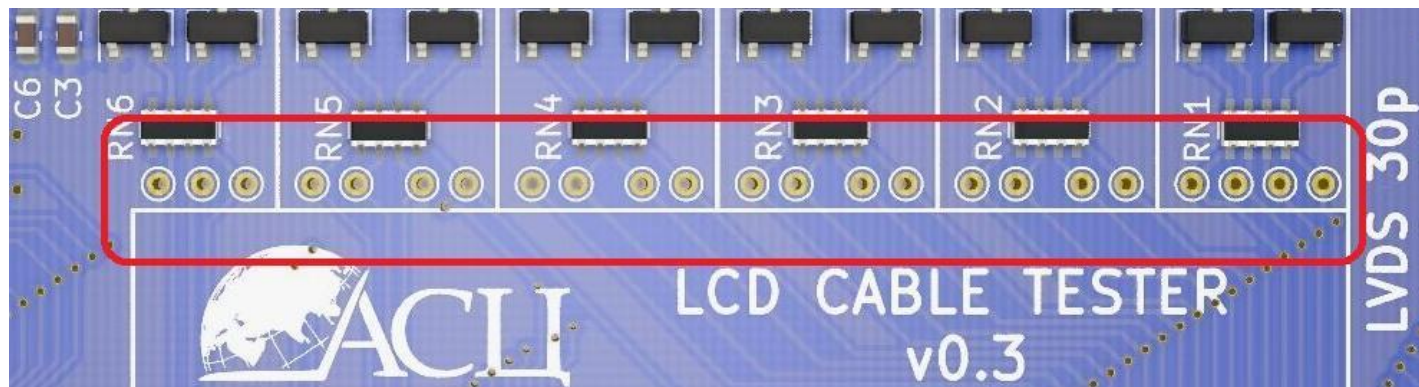
A variable signal is needed to diagnose eDP lines.

The luminescence of the LEDs determines the presence of contact or breakage of the conductors from the panel connector to MB LVDS or eDP interface lines, as well as panel power, EDID lines and backlight control lines.

The brightness of the LVDS / eDP signal lines LEDs depends of the voltage drop on the MB side, which, in some cases, can reveal short circuits or an open circuit in the CPU, GPU, PCH or transceiver in the signal pairs by distinguishing the LED glow difference, which is a signal for analysis. Also, visually, the brightness can be the same if there is a short circuit on the signal bus of one of the pairs, in this case it is recommended to compare the amplitude of the signals with an oscilloscope at the test points.

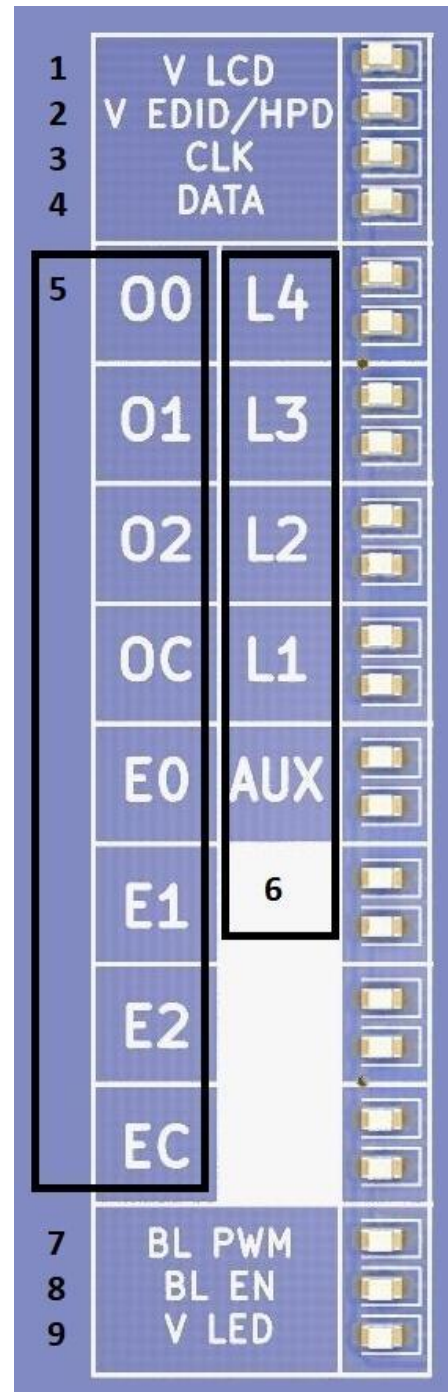
The brightness of the control lines LEDs depends of the way they are implemented in MBs - with MCU, GPU, buffer / logic elements, etc. In some cases, for example, if the signal to the MB is turned on by a FET, the glow can be very weak, even if the cable is OK.

There are also test points for oscilloscope probe. They are connected directly to the signal lines on the connectors. This allows you to analyze the signal and draw conclusions about the condition of the cable and MB.



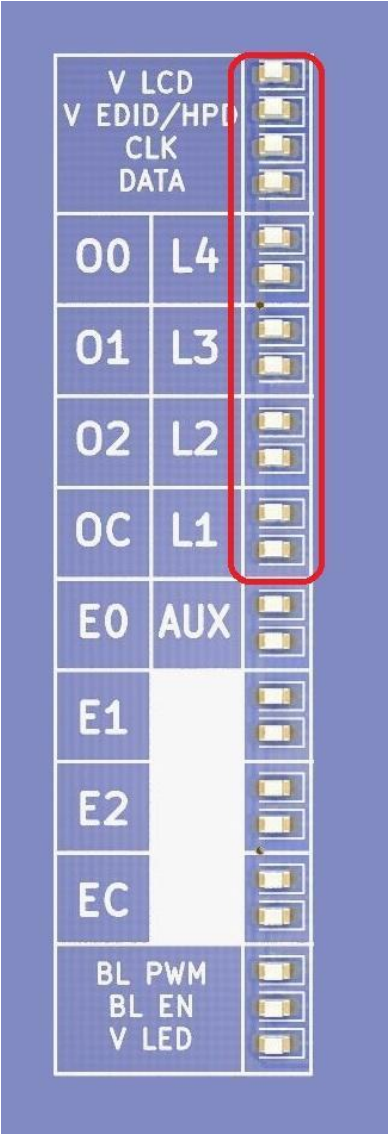
3.1.1 Indication

1. Panel power.
2. EDID power in case of LVDS panel, or HPD signal in the case of an eDP panel.
3. EDID Clock.
4. EDID Data.
5. LVDS signal lines.
6. eDP signal lines.
7. BL_PWM, backlight brightness control.
8. BL_EN, backlight enable control.
9. Backlight power. (B+).

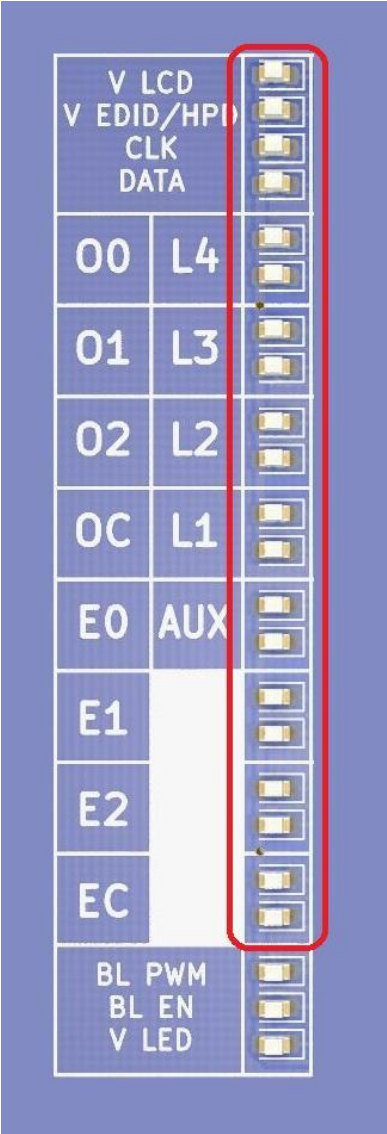


3.1.2 Tester indication with good cable on different types of connectors and panels.

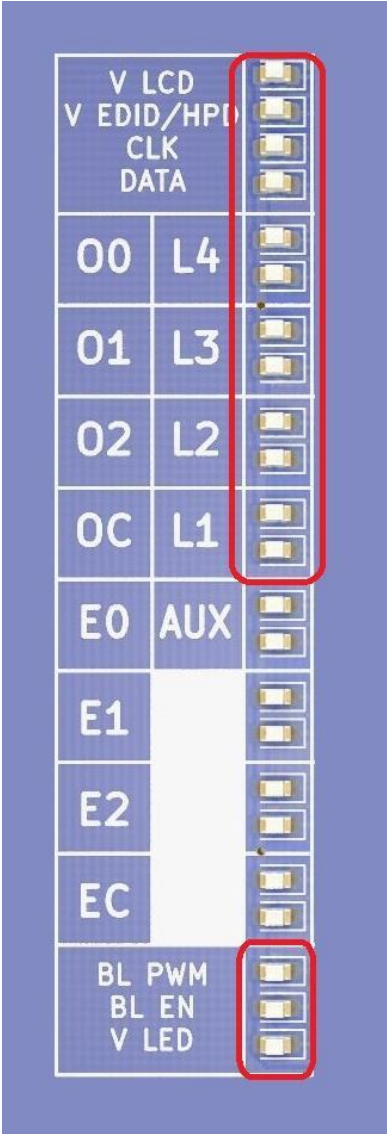
LVDS 1ch (HD)
30 pin CCFL



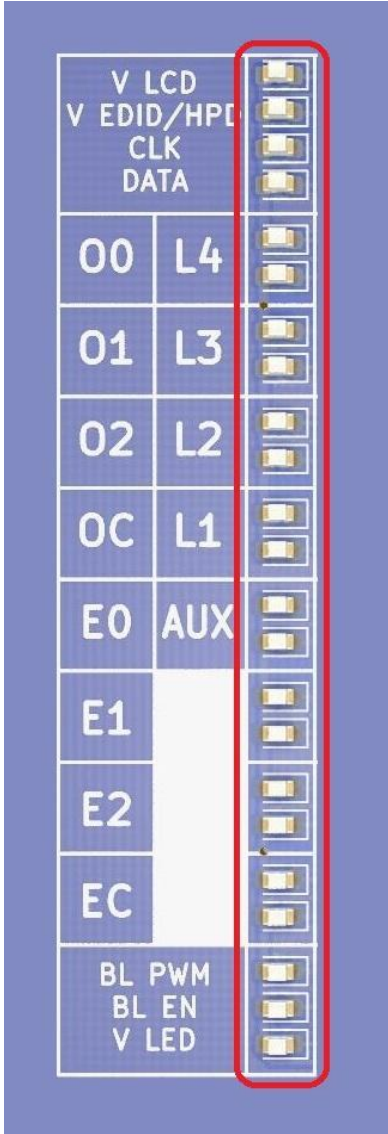
LVDS 2ch (HD+, FHD)
30 pin CCFL



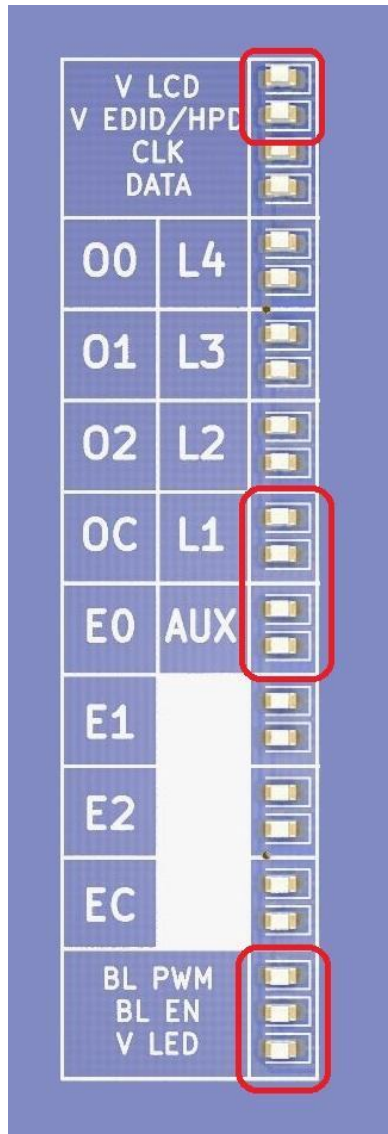
LVDS 1ch (HD)
40 pin LED



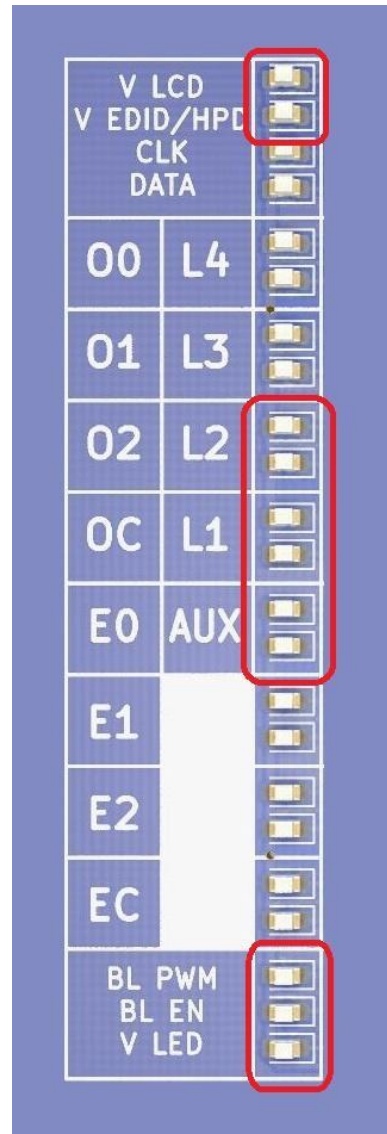
LVDS 2ch (HD+, FHD)
40 pin LED



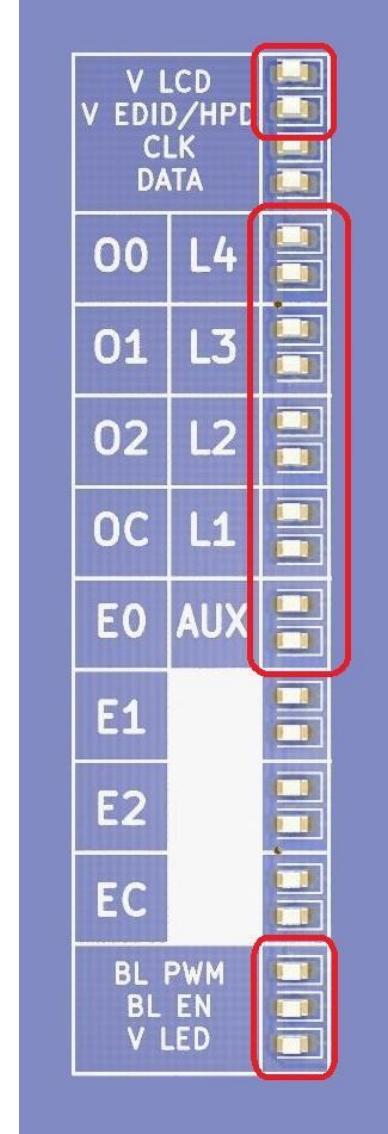
**eDP 1ch (HD)
30 pin**



**eDP 2ch (FHD)
30 pin**



**eDP 4ch (4K)
40 pin**



3.2 Constant signal mode.

In this mode, the tester generates a constant signal. This can be useful for diagnosing eDP lines (on a working board, there will be no indication on the eDP signal lines, since the direct current does not flow through the capacitors).

3.3 Test mode for short circuit.

This mode allows you to determine the presence of short circuit in the conductors of the cable.

The tester does not detect the presence of short circuit with B+ in the lines of the WEB camera, touchscreen, and other things!

Consider this when using suspicious cables!

The principle of operation is to supply constant power to the LEDs, simultaneously with the alternate shorting to GND of each test line. As a result, the “running fire” effect appears on the indicators.

If there are short circuits in the cable, two or more LEDs will glow at the same time.

More clearly, this is shown in the video. <https://youtu.be/G-WZ8IlgJo4>

3.4 Attention! The tester does not check the presence and quality of the GND in the cable. Check it yourself by multimeter, or duplication.

In cases if the tester is not powering automatically with the cable connected, short 1 pin (gate) of transistor Q1 to the GND of the tester. (The reason is incomplete or a different implementation of GND in non-compliance with the standard by the manufacturer of the cable or laptop.)

In some cases, there may be conductors in the cable from the MB side providing detection or other non-standard signals of the LCD panel. Keep this in mind when working.

(For example, EDP#_LVDS_R in MB Petra UMA, is connected to GND inside the loop)