Qtest TCR Measurement System Specifications: model: QT-TCR2

1. **Resistance Measurement Range: 100mohm to 1Mohm**
2. **Measurement method**: 4 wire Kelvin
3. **Accuracy traceability** : Hioki Model 3545-02
4. **Number of resistors per measurement**: 10channel std (option20 max)
5. **Measurement time per resistor:** best case <0.1sec; worst case<0.4sec
6. **Number of WorkStation**: 3 units
   - 4.1 "Low" Temperaure: where the panel is measured at ambient or Low temperature.
   - 4.2 "Hot" Temperature: where the panel is measured at normally 100°C above the "Low" temperature.
   - 4.3 Laser "Cut"where the resistors that failed the TCR test will be cut open.
5. **Camera**: 2 units
   - 5.1 PR camera for auto alignment of the probe card to the panel/resistors. CCD resolution ±0.01mm,CCD model 5 megapixel area array camera
   - 5.2 User Aid camera to allow visual check on the probe/resistor alignment.
6. **XYZ重复定位精度-XYZ repeat positioning accuracy**:±0.02mm
7. **Fumes extractor**: One unit (use to extract fumes/debris from the cut resistors)
8. **Resistance Measurement capability resolution**: <±0.5ppm.
9. **Input and output loader**:
   - 10.1 **Panel size**: 50x60mm and 60x70mm (change kit to switch over)
   - 10.2 **Loader depth**: 98mm.
11. **Workstation panel size:** capable of handling both 50x60 and 60x70mm panels.
12. **Laser:** IR air cool.
13. **Temperature set range (Hot Workstation):** 200°C(max)
14. **Temperature set accuracy**: ±1°C of set temperature up to max 200°C.
15. **Dimension:** WxLxH: 1.3mx 1.05mx 1.8m
16. **Air Pressure**: 6kPa±10%
17. **Ambient temperature:** 0°C～40°C (no condensation)无结露）
18. **Ambient humidity**: 20～85%RH (no condensation)（无结露）
19. **Weight**: 500kg including wooden crate.
20. **Input Voltage**: 220Vac±10% Single phase.
21. **Rated Power**: <2.0KW

***Qtest reserves the right to change its specification without prior notification*.**

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Temperature Coefficient Resistance Measurement System

How do you know that the value of your trimmed resistors will still be accurate and remains within the acceptable range after installation into circuit and subjected to heat?

How many ppm has the value changed and will this resistance change affects the overall circuit performance?

All precision electrical or electronics systems need to ensure that the resistance used in the systems will be within the limits even when heated up by 100°C or to specifications.

Qtest TCR Measurement system is designed specifically to check for resistance variation when the trimmed resistors are subjected to heat.

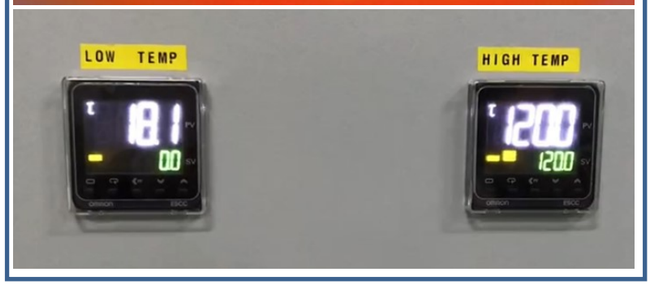
The trimmed resistor panel is first placed on to the "Low" temperature WS or Workstation. At this WS, all the resistor values are measured and saved.

After this, the panel is moved to a "High" temperature WS where the temperature of the panel is heated to 100° C above the "Low" temperature. The resistance of each resistor on the panel is again measured and the pass/ fail in ppm calculated.

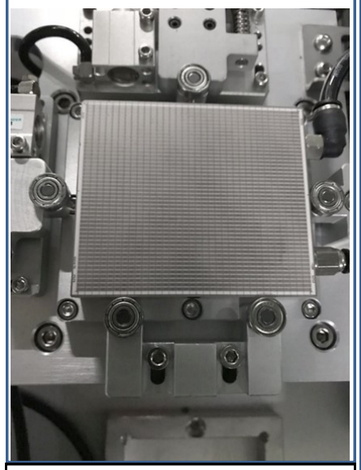
The failed resistors on the panel can be cut opened and destroyed to prevent possible contamination.

Qtest

Temperature Coefficient Measurement System Model: QT-TCR2



Universal Workstation able to handle both 50*60 and 60*70mm panels.

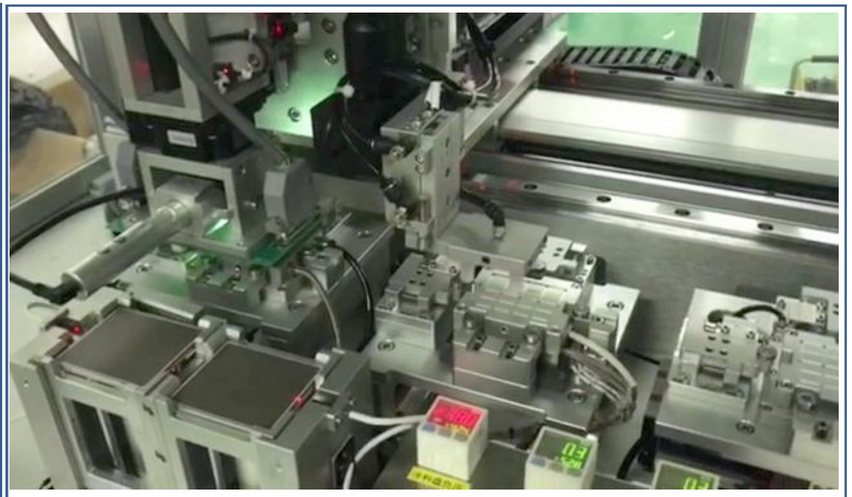


The advantage of this design is the versatility to test panel of 2 different standard sizes used in the industry.

The In-loader and Out-loader are also designed with this capability for quick changeover.

This design plus the robust built quality ensures high productivity and profitability for the user.

The temperature of the WS can be set to accuracy of ±1°C. The Low temperature WS is normally set to room ambient temperature of 25°C and the High temperature WS is set to 125°C. The change in ppm is calculated based on the difference of resistance of the resistor during Low and High Temperature.

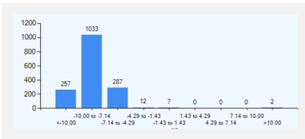


Qtest TCR Measurement System has a very robust design. This makes the system very reliable and almost maintenance free. It uses chucking method to hold the panels and uses the PR camera to further confirm the alignment of the probe pins on the resistor.

The "Hot" temperature WS can be set to a maximum of 200°C. The "Low" temperature will be at room ambient temperature.

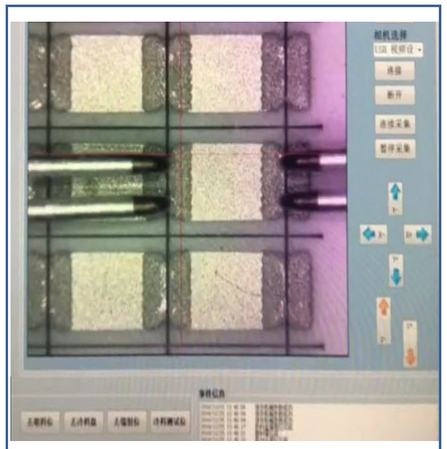
The display on the left showed the pass/fail/ cannot measure conditions of the resistors under test.

The ones in green indicated that it passed the TCR test. Those in red failed the test and those in black indicated that these resistors cannot be measured correctly. This will give a very good picture of the panel quality. For example, if all the failures are at one corner of the panel, this would mean that the material mix of these resistors may not be the same as these that passed. The main reason why resistors may fail the TCR as compared to other in the same panel will be due to the alloy mix in these resistors.



The graph on the left shows the pass/fail SD distribution.

Measurement of the resistance is by a Hioki Resistance meter specs with enough accuracy to measure to <±0.5ppm resolution.

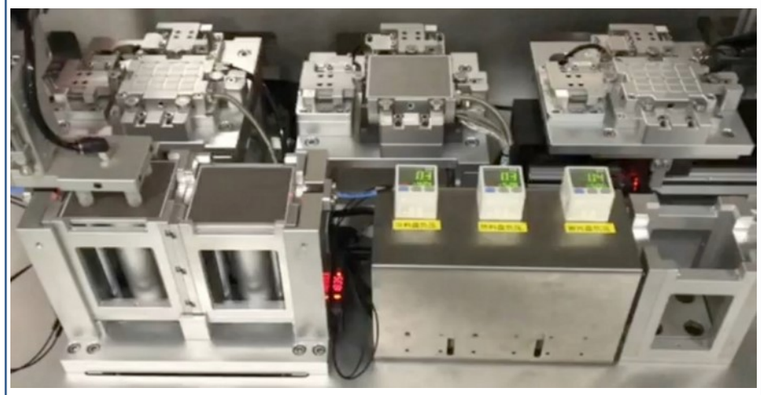


User aid camera helps user to ensure alignment is within specifications.

TCR Measurement Process:

The Qtest TCR system has 3 Workstations where the panels under test will be placed, heated to the correct temperature and then laser cut open if it fails the TCR measurement or TCRM test limits.

The measurement system is accurate to a minimum of 1ppm @ ±<0.5ppm resolution.



The 1st Workstation is for "Low" temperature test. The 2nd Workstation is for "High" temperature test. The 3rd WS is for laser cut for these resistors that failed the TCRM test limits.

After these going through the 3rd WS, the panel will be moved to the Out-loader.

Universal In-Out Loader for both 50*60mm and 60*70mm panel.

The industry standard for panels are of sizes 50*60mm and 60*70mm. The Qtest TCR System is designed with In and Out loader that is able to accomodate both these sizes. The depth of the loaders is 98mm. Depending on the thickness of the panels, and assuming it is 1mm thick, it will be able to hold 98 panels.

The In-Loader has sensors to ensure that it will only pickup one panel at any one time and avoid any breakage.

Qtest Technologies Pte Ltd is a Singapore based company. It was incorporated in 1992 and has been designing , manufacturing , selling and providing after sales services to its customers worldwide. It has a team of R&D engineers and has been building all its own measurement systems, laser control software algorithm and has the ability provide a one stop solution to its customers. This is the Qtest's Advantage!