Measurement System (system capability)

1. Resistance measure: 0.1uohm~1Kohm (Calibrator meter)
2. Resolution: +0.01uohm@10mohm R. (Calibrator meter)
3. Accuracy: ±0.060% rdg. ±0.001% fs @10mΩ range(slow)
4. Multiplexer card: Solid State Relay (SSR) with 24 channels 4 wire (Kelvin) per card. Current: 2A max per ch. Std: 2 cards, Option: 3 cards
5. Interface: Qtest own std or industry std probe card.
7. Qtest PMU accuracy:within 99.95% of Calibrator.
8. Accuracy traceability: Hioki (“Hioki” is a brand of Hioki E.E. Corporation, Japan)

Measurement using probe card( Becu probe tip)

1. >5mohm: accuracy repeatability: <0.1% of measured value.
2. >1mohm: accuracy repeatability: <0.2% of measured value

Trimming Specifications for Ultra Low

1. Trimming capability: Printed, FOS, Metal Strip, Thin Film.
2. Trim Range: 1mΩ~1Ω (check for specific trim conditions for required range)
3. Trim Accuracy for resistor >1mohm: std ±0.5%.
4. CV: >2mohm avg <0.35%.
   >4mohm avg: <0.2%
5. Trim Yield (IRV within limit): normally avg 98%.
6. Trim Speed: 5mohm (30um, printed, 1206, 946pcs, CV<0.2%, yield>98%) avg 4.8mins per panel.
7. Resistive material thickness: from 1um to 100um
8. Laser: std IR.
10. Trim type: Single/Multiple/Serpentine/Plunge/Scan/custom
11. Qtest is able to develop new trim technique/method to handle new type of chip resistors.

Site Environment Requirement

1. Power Supply: Single phase 230V/16A.
2. Room Temperature: Air Conditioned at constant temperature.
3. Compressed Air Supply: min 5 PSI, free of dust, oil and water.
4. Vacuum to expel dust from trimming within clean room.

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Qtest reserves the right to change its equipment specifications without prior notice
FUTURE LASER TRIMMING TECHNOLOGY

Trimmer capable of trimming Ultra Low resistors

Introduction: The present resistor trimming technologies were developed some 30 years ago and have not really kept up with the time. The most commonly used trimmers today are only capable of trimming from 100mohm. These are not designed for low ohm resistors. However trimming EVEN from 10mohm, the mid range trimmers struggled to be productive. Qtest has developed its capability over the last 8 years and is able to provide trim on PRINTED, MS, Foil resistors panel from 1 milli-ohm using its Ultra Low Ohm Trimmer and with very high yield of over 98% and low CV.

Qtest ULO-100V2 was designed and developed fully by Qtest’s R&D team from ground up for the ultra-low ohm trimming industry. This include the fast accurate measurement systems and laser control QTRIM algorithm.

CONTINUOUS RESEARCH PROVIDES A TOTAL SOLUTION

Qtest Trimmer can be integrated to IRV, Green or UV laser to trim different materials. It’s R&D and investigative capabilities allow interface to the most suitable cost effective laser system that can be used on the different materials to enable the effective trimming. ULO-100V2 uses IR laser to trim most of its low ohm resistors. This help to lower cost of operation in the long run.

Difficulties with Trimming Ultra Low Ohm Resistors

The most difficult problem in laser trimming of low ohm resistors is due to the heat from laser and probe contact. The heat causes changes in the resistance of the resistors under trim. The probe material and resistor contact also affect the actual measured resistance. Basically thermal emf and the change in actual resistance due to the laser heat are the main cause of low yield and high CV.

All Mid Range trimmer in the market is not designed to trim low ohm resistors.

Mid Range Trimmers trying to trim low ohm resistors!

Most trimmers in the market are designed to trim mid range resistors. The so called “low ohm trimmers” are actually mid range modified with higher rating relays and higher current drive to “TRY” to trim low ohm. This results in low yield and very high CV.

Qtest ULO-100V2 is the REAL DEAL. It is designed to specifically trim low ohm resistors!

Qtest uses 2 measurement systems to achieve the accuracy and measurement traceability needed for high yield on ultra low ohm production. Qtest own measurement system is designed for high speed measurement and trimming. It is calibrated to Hioki RM3545.

Qtest ULO100V2 is designed specially to trim ultra low ohm resistors. The most difficult type of resistor panel to trim is the printed type. It is cheap to manufacture but difficult to trim accurately.

The lower the resistance, the thicker the resistor will need to be. This will cause a problem for the laser to cut through to the substrate cleanly. Most of the laser trimmer in the market today are not able to trim through thick resistors using multiple passes. These are designed to trim using one pass only.

Qtest ULO100V2 is designed to handle this issue and therefore able to deliver high yield with low CV.

Advantage of Qtest Ultra Low Trimmer.

As mentioned earlier, all the lasers trimmer found in the market was developed years ago and designed mainly for the mid-range resistance trimming market. It is good for trimming resistance from 0.1 ohm to less than 1Mhm.

However there is a huge need for accurate ultra- low ohm resistors for the huge electrical power industry as such the solar panels, batteries, electric motors, mobile phones and thousands of electronics devices. The lower the resistance, the less heat lost.

- Qtest Precision Measurement Unit or PMU is calibrated to Hioki 3545 and is used for the fast trimming requirement. It has an accuracy of 99.95% of Hioki measured value and and average ±1ohm error in continuous measurement using all the multiplexer channels measuring the same 2mohm calibration resistor. This accurate measurement will give user a very high level of confidence in Qtest Low Ohm Trimmer.
- The ULO-100V2 is capable of trimming both Ultra Low Ohm and Thin Film. This offer the best value for money trimmer in the industry.

This is Qtest Ultra Low Ohm Trimmer advantage!