

Electric Vehicle (EV), Hybrid Electric Vehicle(HEV) / Manufacturing, Production line

Hi-speed Auto Test of Battery Module Terminal Welding

Completely fixture-less Auto Test Solution for LIB module terminal welding of EV

Point :

If charging of certain block performs inefficiently, it might be caused by high contacting resistance on terminals rather than bad impedance inside cell. High electrode contacting resistance caused by insufficient welding of laser welding or wire bonding, results in bad charging/discharging feature and capability declining of whole module. However, due to extreme low welding resistance, not mention to others, repeatability of contacting position only by manual test causes pretty big changing of resistance value. Thus, it is hard to show a correct PASS/FAIL judgment finally.

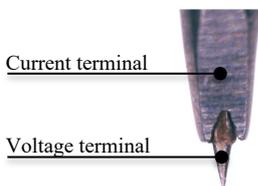
HIOKI Flying Probe Tester FA1240 offers a definite solution as [High speed], [High accuracy] and [Fixture-less] electrode welding resistance test based on ultra-high positioning repeatability, completely independent movable 4 arms and unique 4-wire probe technology.



Flying Probe Tester FA1240-60 series

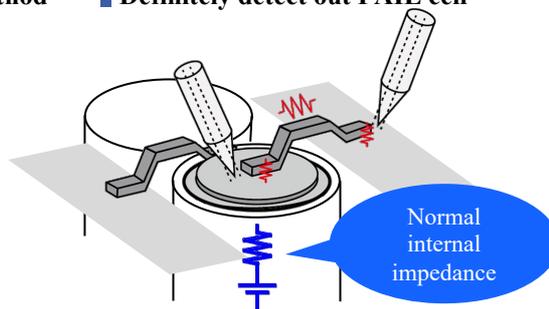
| | FA1240-61 standard model | FA1240-61 large size model |
|---|--|---|
| Test speed | Maximum 2,400 points/min. | Maximum 1,800 points/min. |
| High-Accuracy & High-Resolution DCR measurement | 4.000 mΩ range/1 μΩ min resolution (standard) 1000.000 μΩ range/1 nΩ min resolution (special order) | |
| High-Precision probing | ±100 μm (□300 μm min) | ±150 μm (□400 μm min) |
| Maximum testable area | 510 × 460 mm max | 810 × 460 mm max (810 × 610, 1200 × 610 mm max available) |
| Others | Completely fixture-less & individual movable test probes, cell position shift & terminal height alignment feature, contact check & moving retry feature. | |

Unique low resistance test method



Unique extra fine 4-wire probe achieves high accuracy measurement.

Definitely detect out FAIL cell



Quickly and efficiently detects out terminal connectivity FAIL cell in parallel circuit with same potential in block. Furtherly, it is also possible to measure internal impedance (AC-IR) by building in battery tester.

High repeatability test accuracy



The probing repeatability is extremely important for measuring ultra-low resistance with high-accuracy. Excellent probing precision and repeatability accuracy keeps exactly same measurement point, ensuring high stability measurement. Keeps stable 4-terminal measurement method even though extreme narrow space like external case edge of negative electrode of cylinder-shape cell.

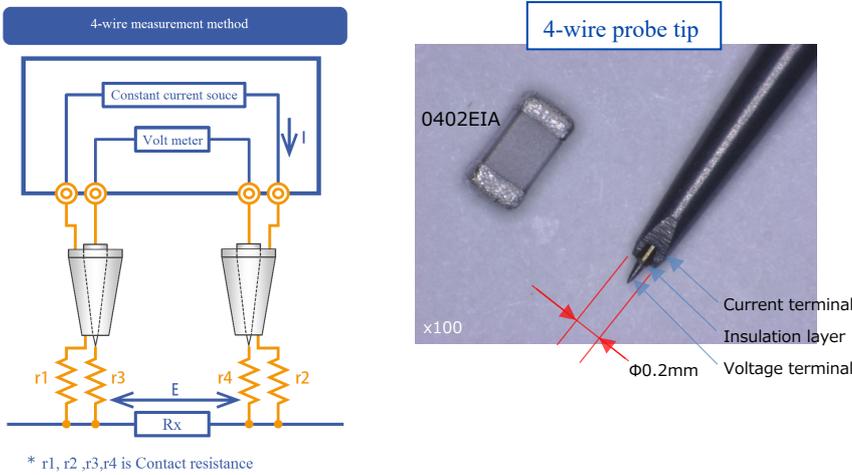
Equipment used

- Flying Probe Tester FA1240-60 series
- Process Analyzer UA1801

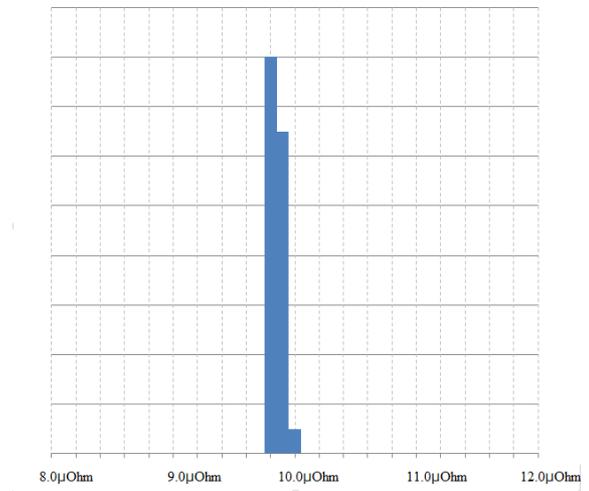
High accuracy & High stability

Min. contact space is $\square 0.3\text{mm}$ while probing repeatability accuracy is $\pm 0.05\text{ mm}$.

HIOKI 4-wire low resistance measurement technology supports high repeatability test accuracy even though Min. contact space.



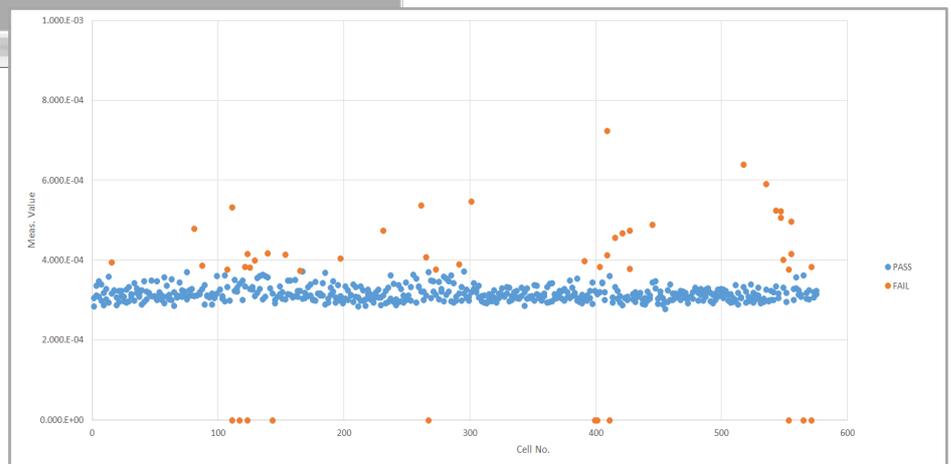
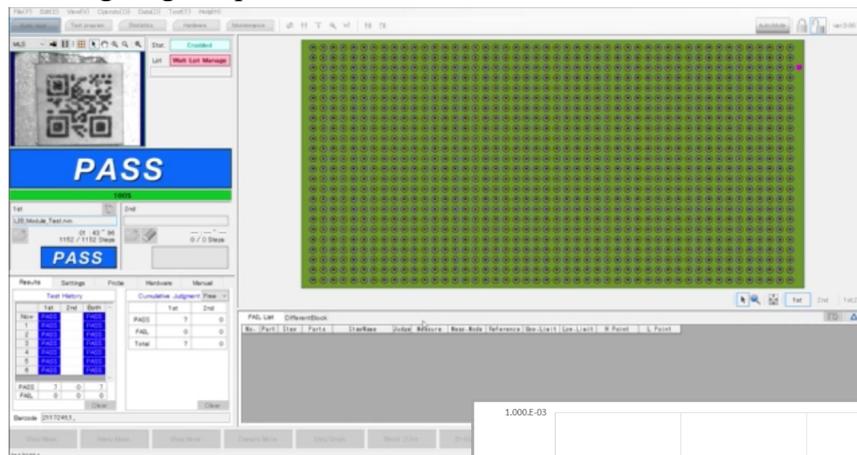
Measurement repeatability



$6\sigma = 0.275\mu\Omega$ at $10\mu\Omega$ measurement
(when using $10.0000\text{m}\Omega$ range)

Automatic PASS/FAIL judgment

According to data processing, even though extremely slight connection status could be detected out definitely by showing singular point*2 from total numeric result.



UA1801
Process analyzer
(Data analysis software)

Automatically detects out slightly connection FAIL from a population of PASS judgement by using AI tool. Definitely screens out those abnormal value that even though never be determined by absolute value only, thus finds out latent defect of welding process as earliest stage.

*1 UA1801 Process Analyzer is an optional software.

*2 It shows those values that screened out from a population by intrinsic calculating algorithm of Process Analyzer.