基于ADI锂电池EIS扫描技术的热失效早期预警

Boris Wang
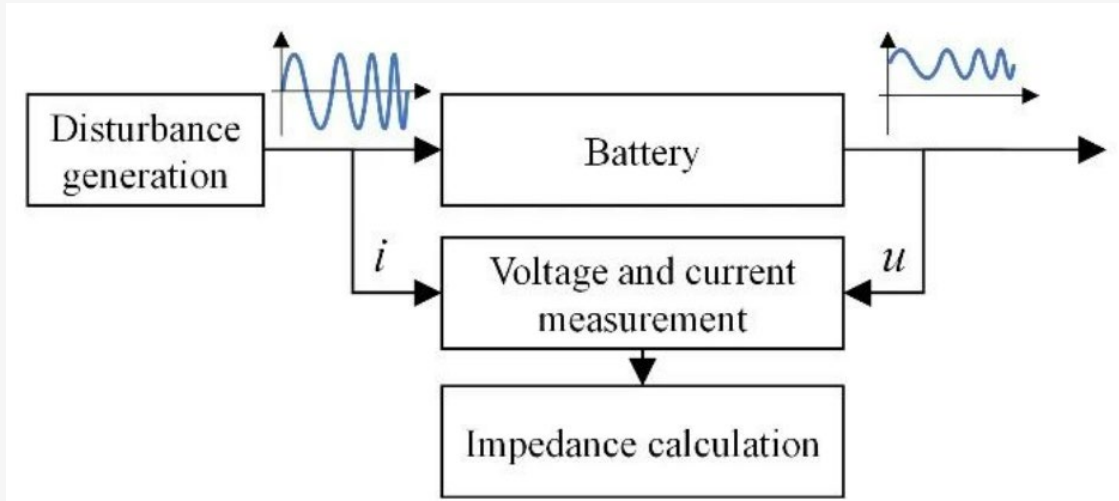
Signal Chain Specialist
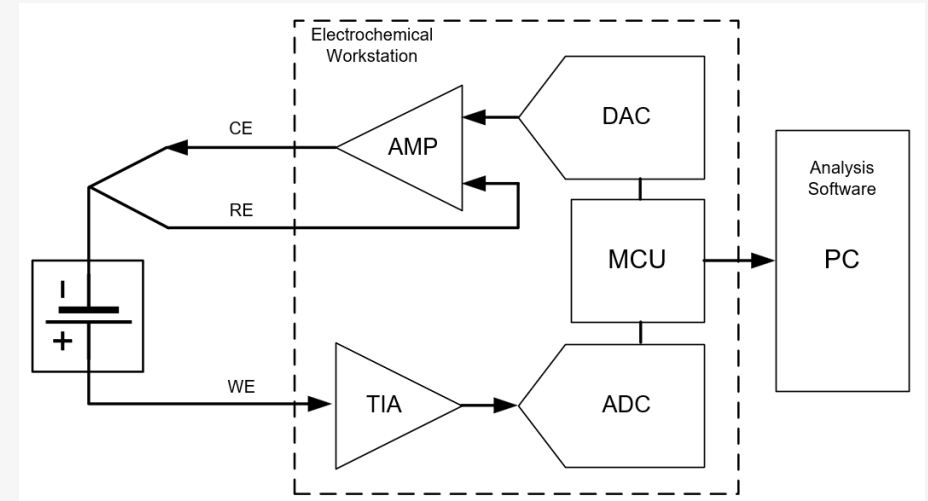
Macnica Cytech
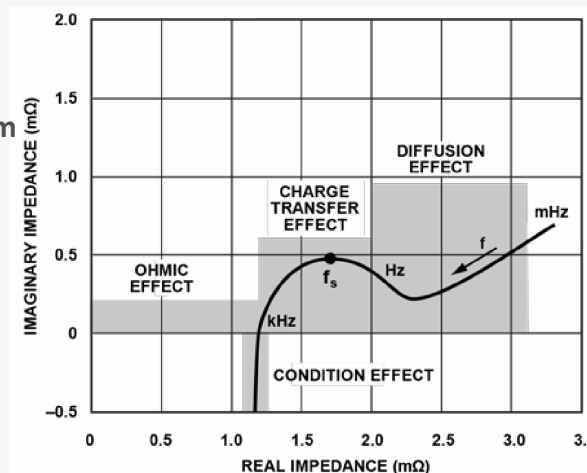
Co.Tomorrowing

MACNICA

Battery EIS Measurement

Basic method of EIS measurement

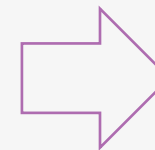

EIS using Electrochemical workstation

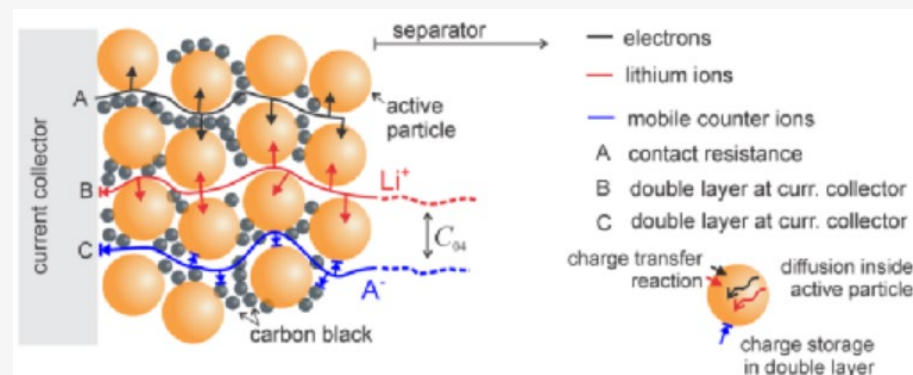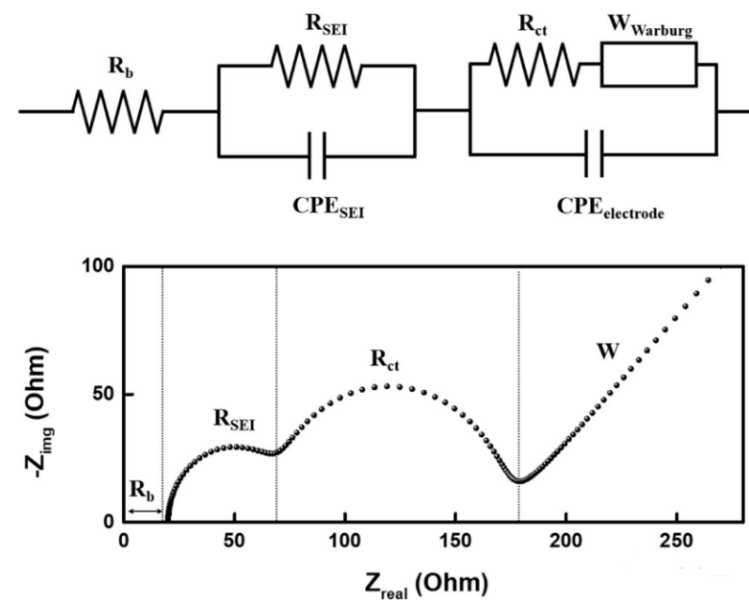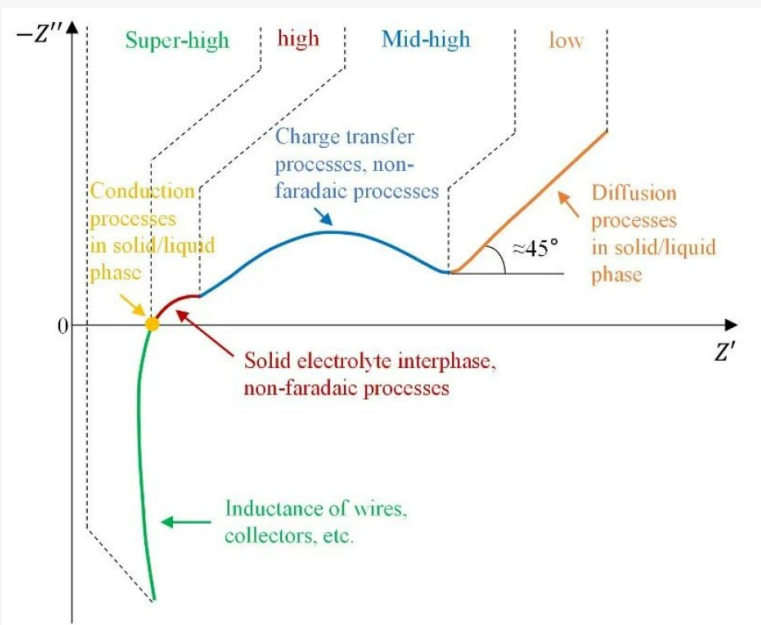**Format Nyquist diagram**
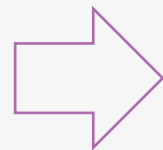
Focus on Variation
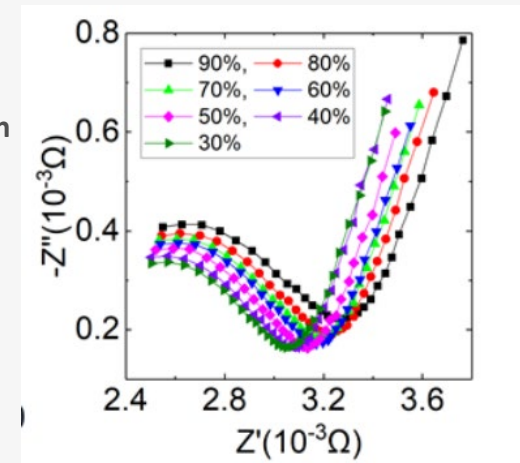
Battery EIS Measurement

Li-On Battery internal Chemical changes

➤ **Warburg Circuit Model**

Rb:
Electrolytic Resistance

SEI:
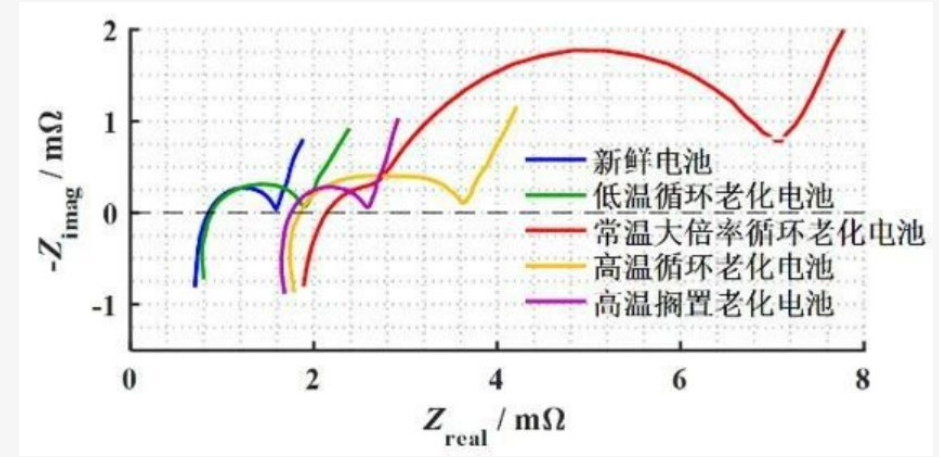**Solid electrolyte interface**

Rct:
Charge transfer Resistance

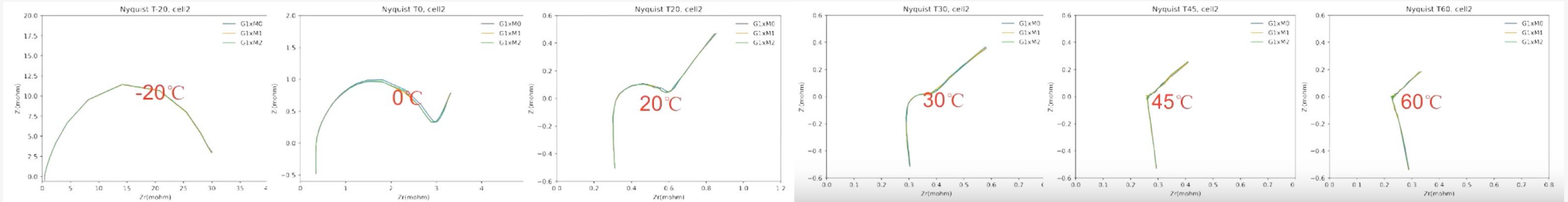**W:**
Warburg (diffusion) Impedance

Applications of Battery EIS
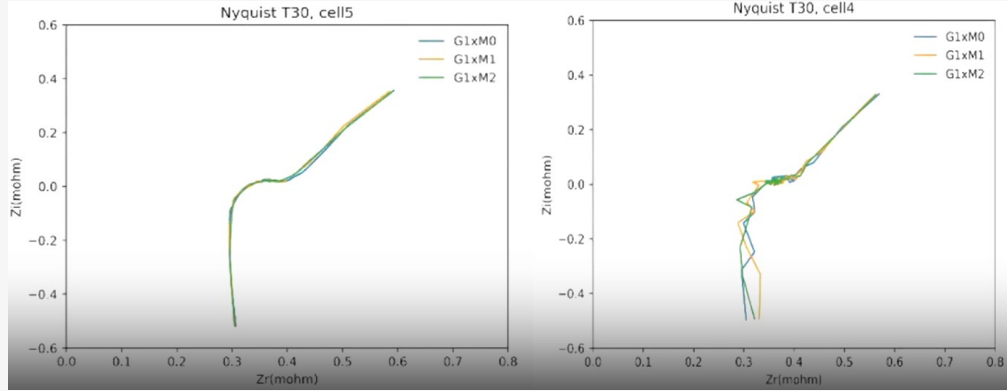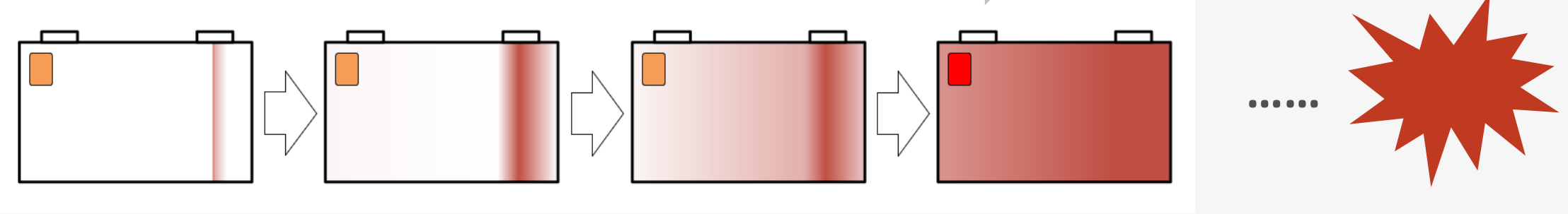

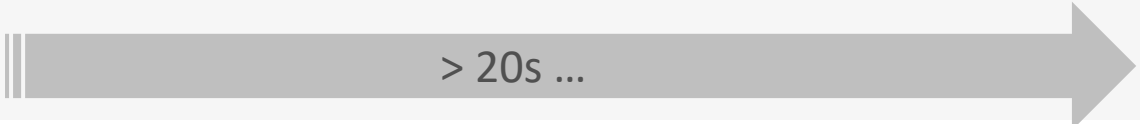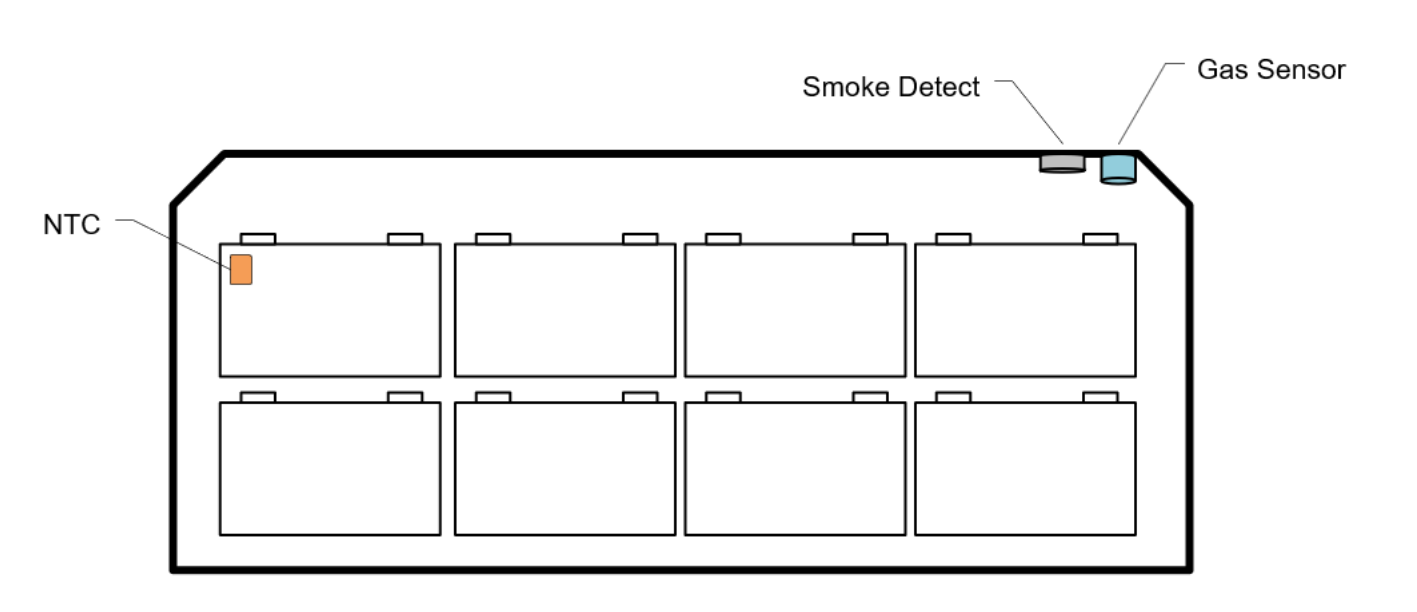➤ **Poor electrode contact**
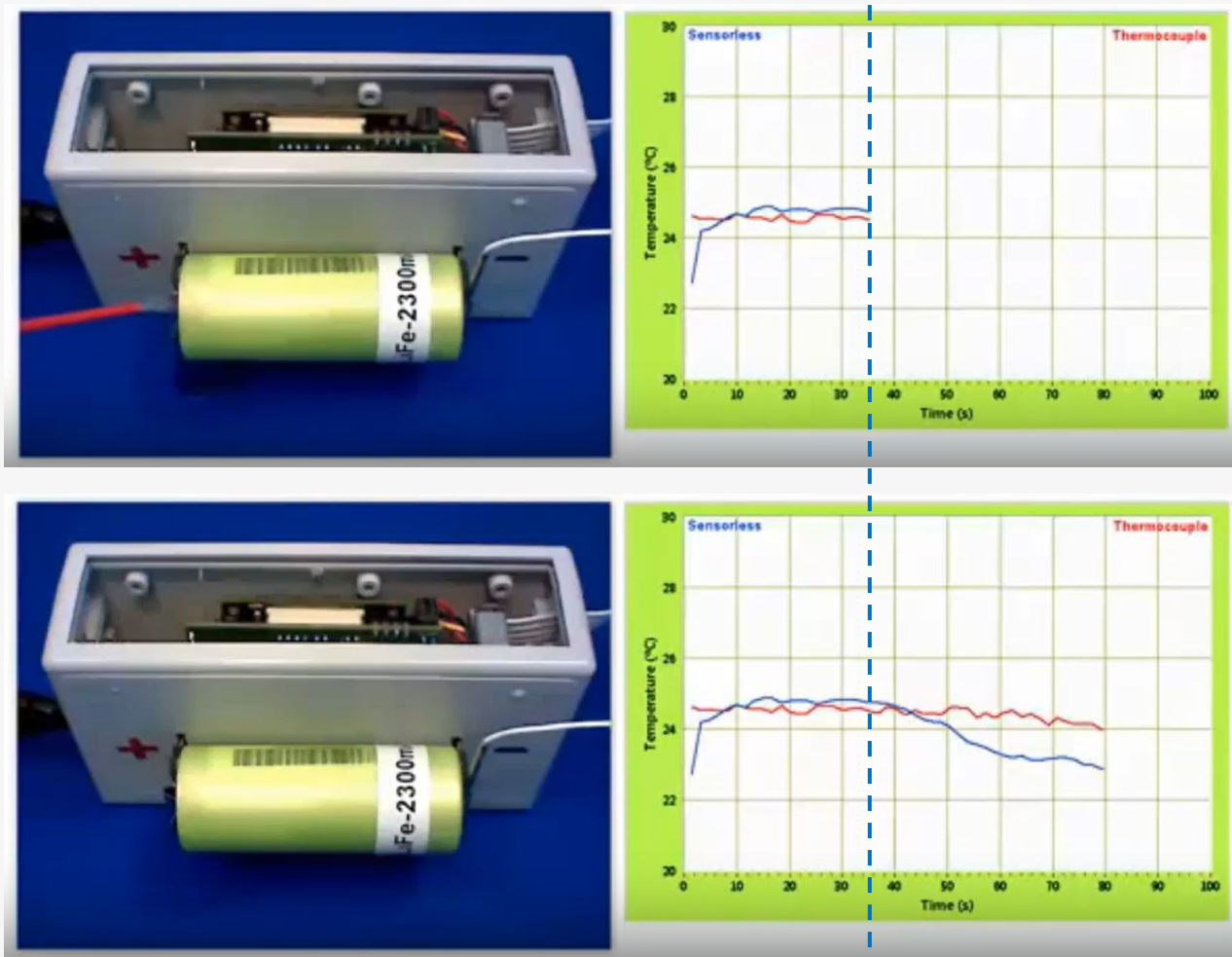

➤ **Burn-in to 80% SOH**

➤ **EIS at different Cell Temperature**

Battery Pack Thermal Monitor

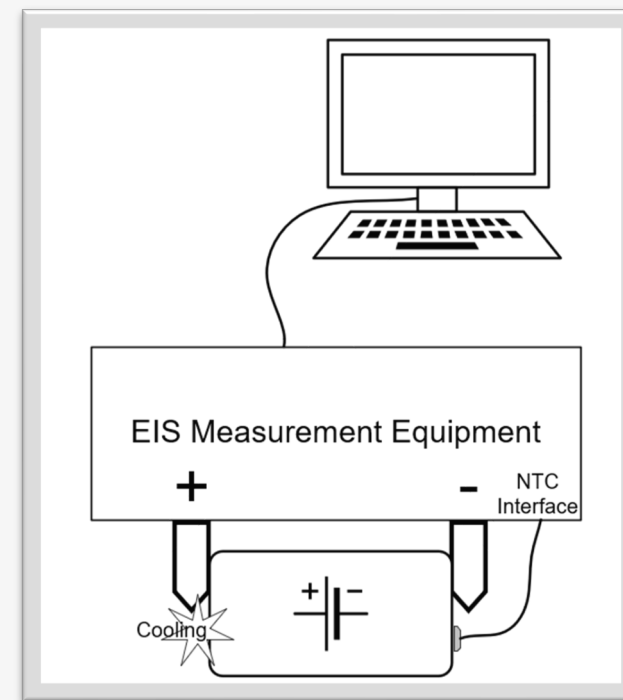**General Method of
Pack Thermal Alarm Monitor**

> 20s ...

TOO LATE !
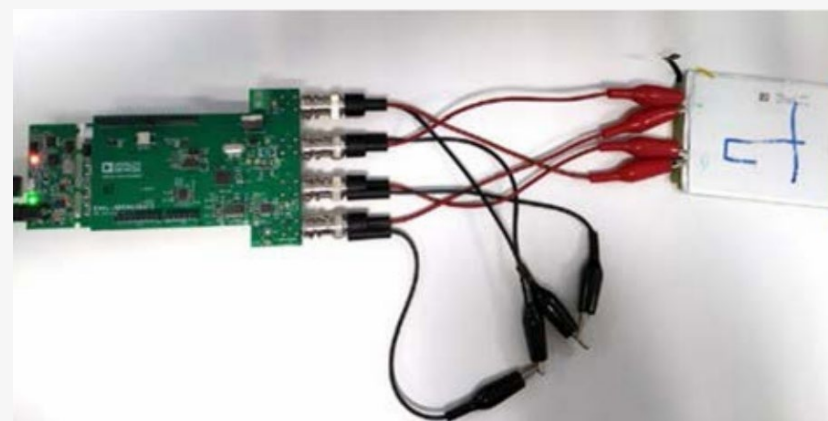
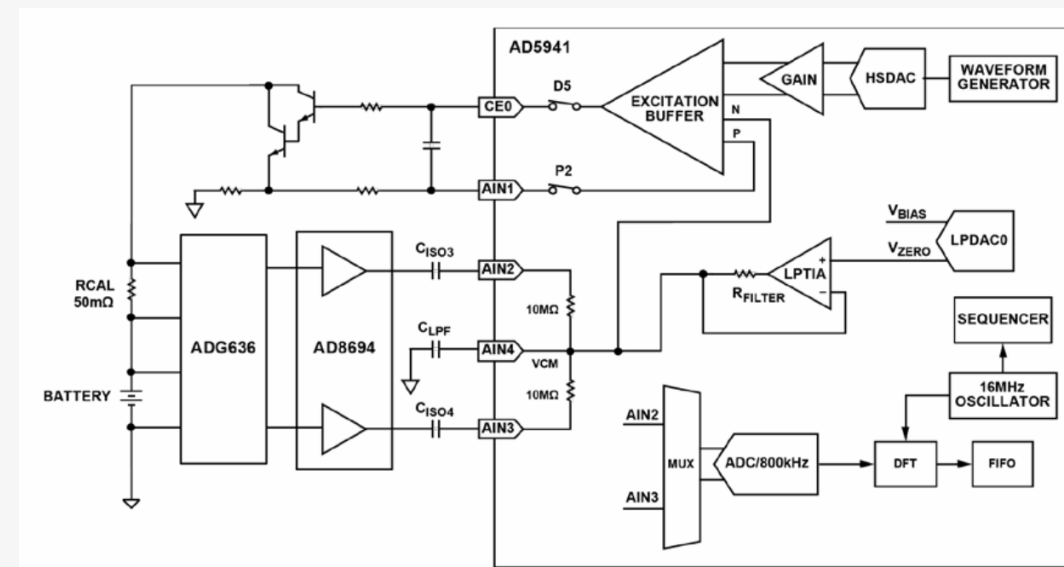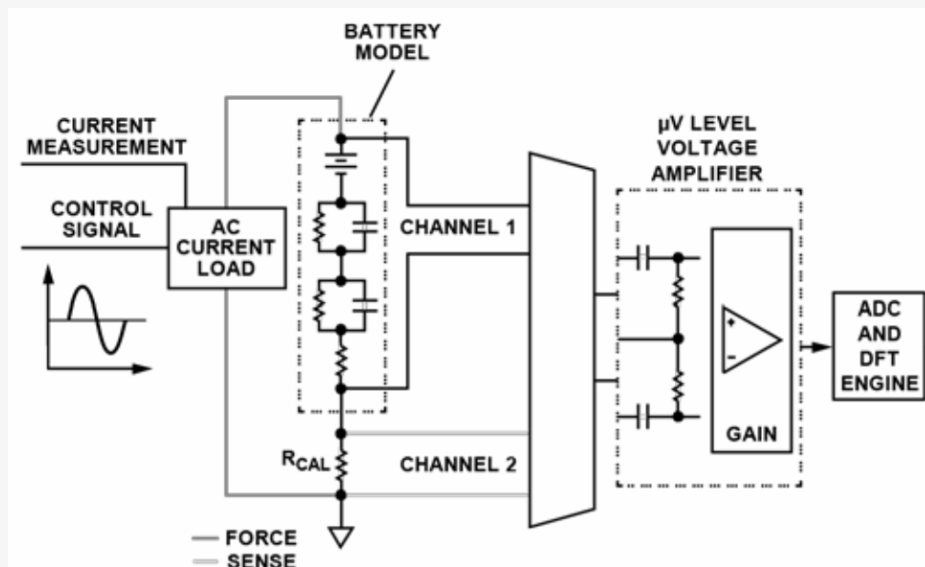# Thermal monitor of Battery EIS —— Contrast Experiment

—— Thermal forecast based on EIS

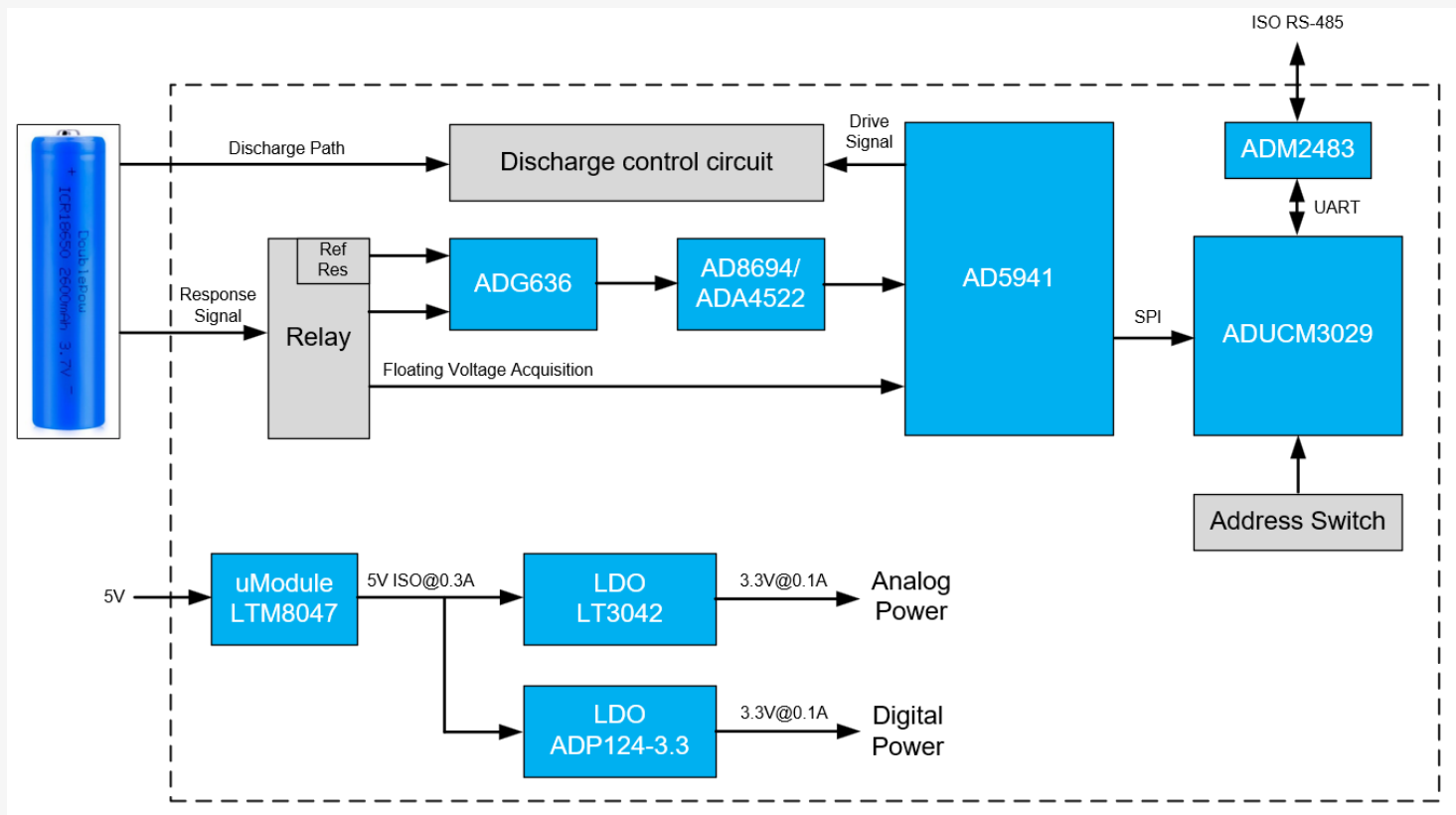—— Thermal forecast based on NTC sensor

Blue rail Falls First —— Early warning!

Sch of EIS board —— CN0510 (ADI)
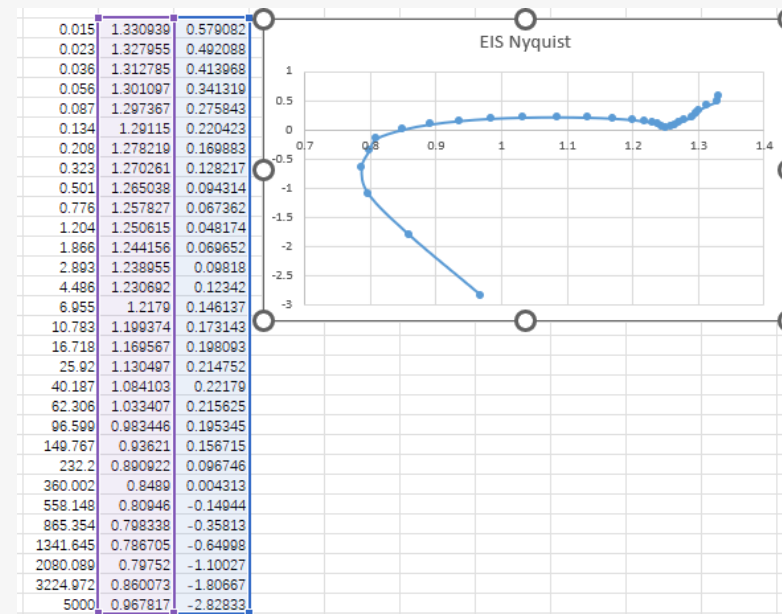

Useful for Native R&D Test!
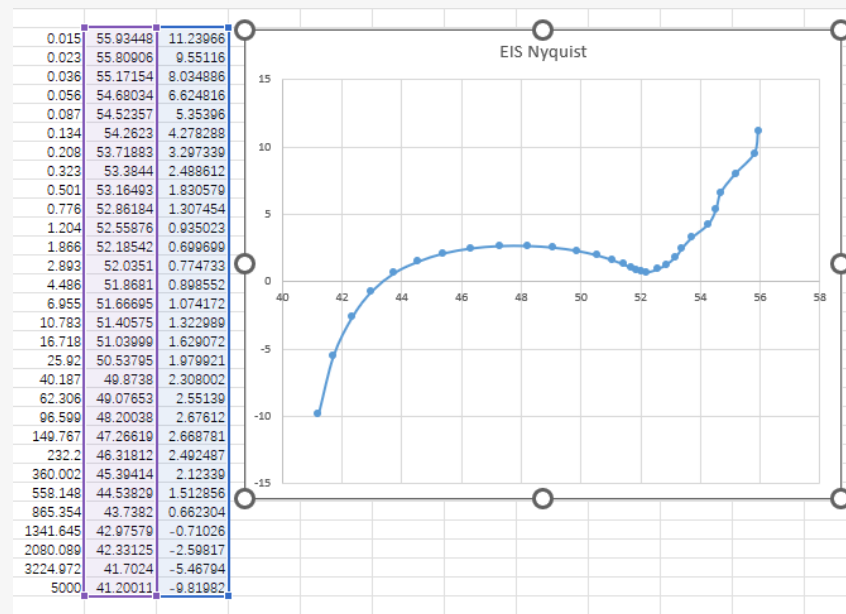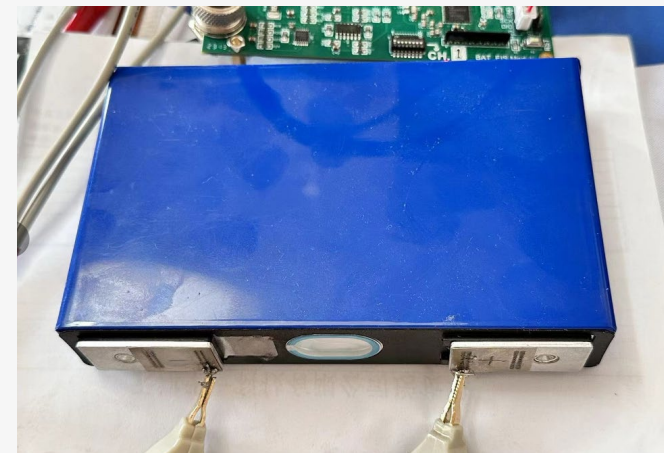
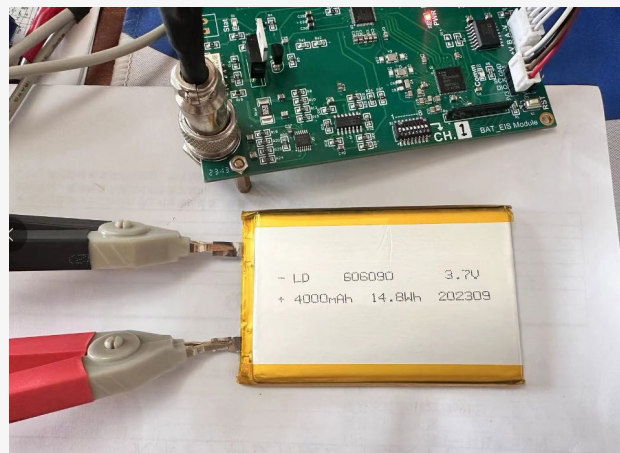# Sch of EIS board —— MCUM5941-EIS (Cytech)
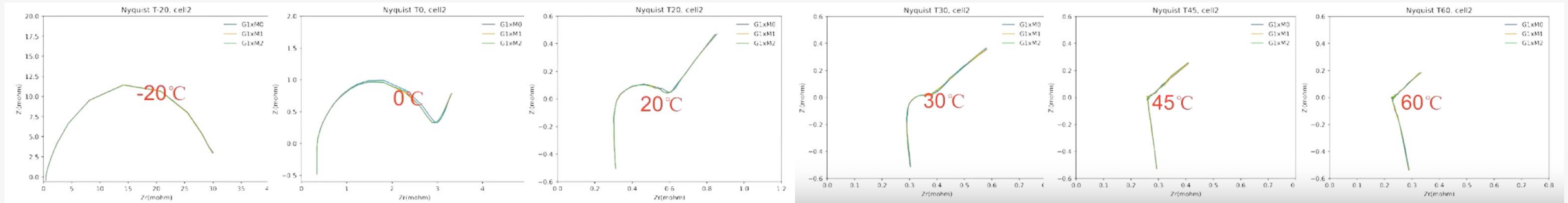

Useful for Fast Integration!
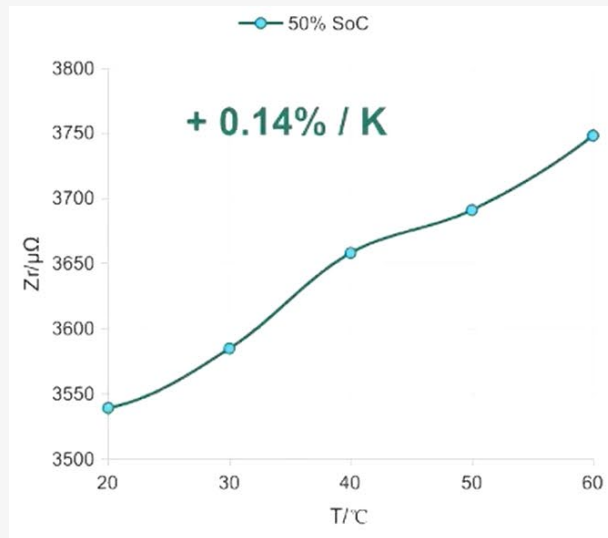
EIS Results using MCUM5941

- 15mHz——20kHz

- Floating Voltage meas

- 8Ch parallel running

- Isolated each other

- 1% repeated accuracy

- Easy used Test Clamp

- Low-res mode

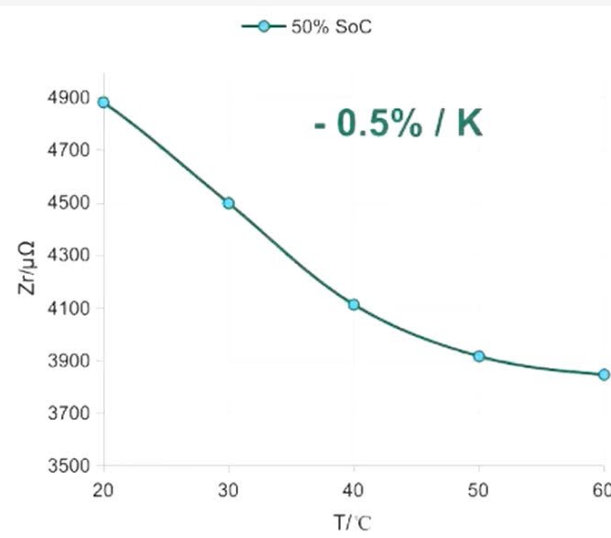- Low-freq Compensation

- Auto Calibration
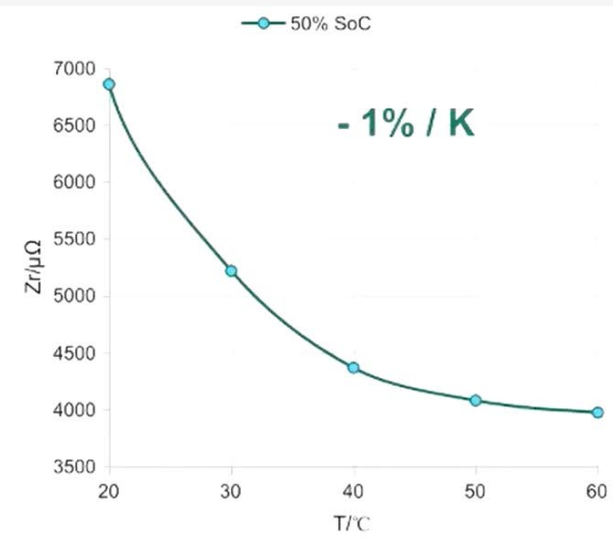
How to Monitor Thermal by EIS result

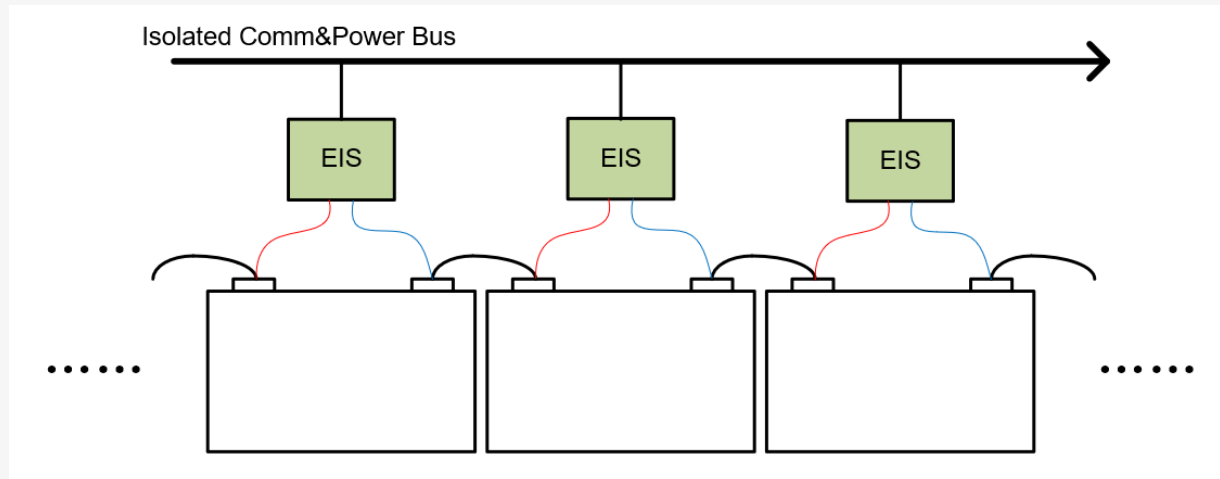Find Characteristic frequency point !

| > 1kHz | 1kHz – 1Hz | <1Hz |

EIS measurement for Multiple battery pack
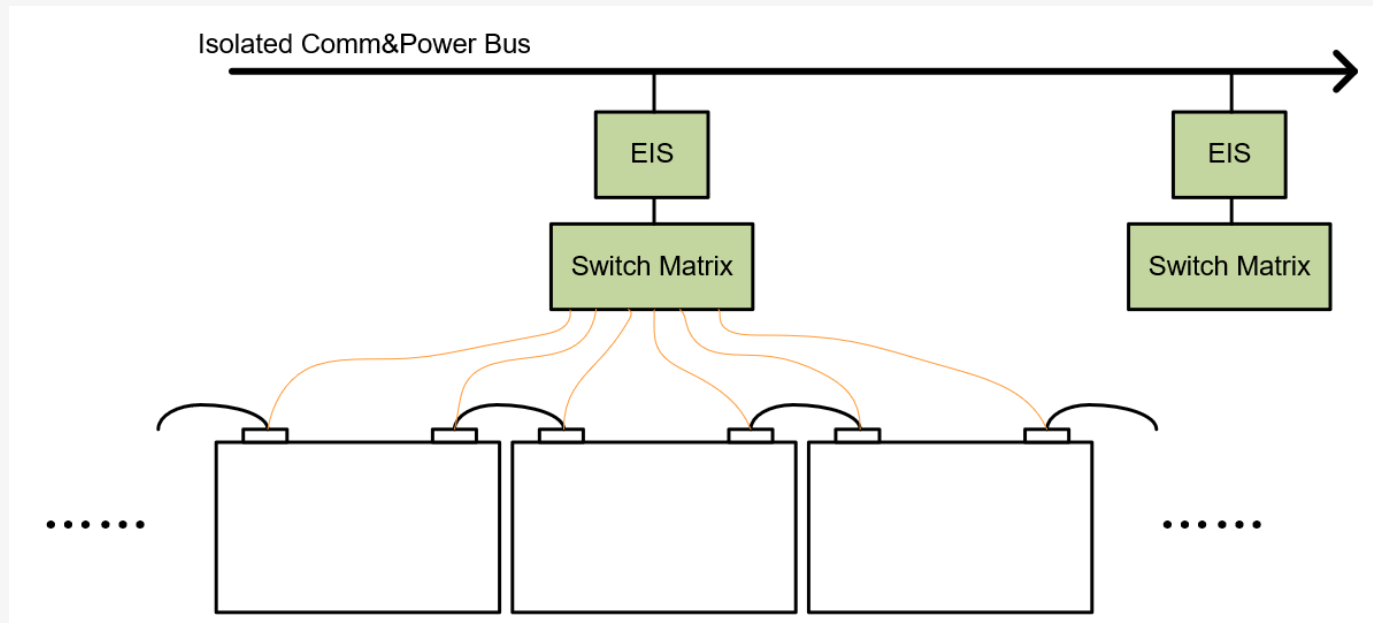
Demo Show
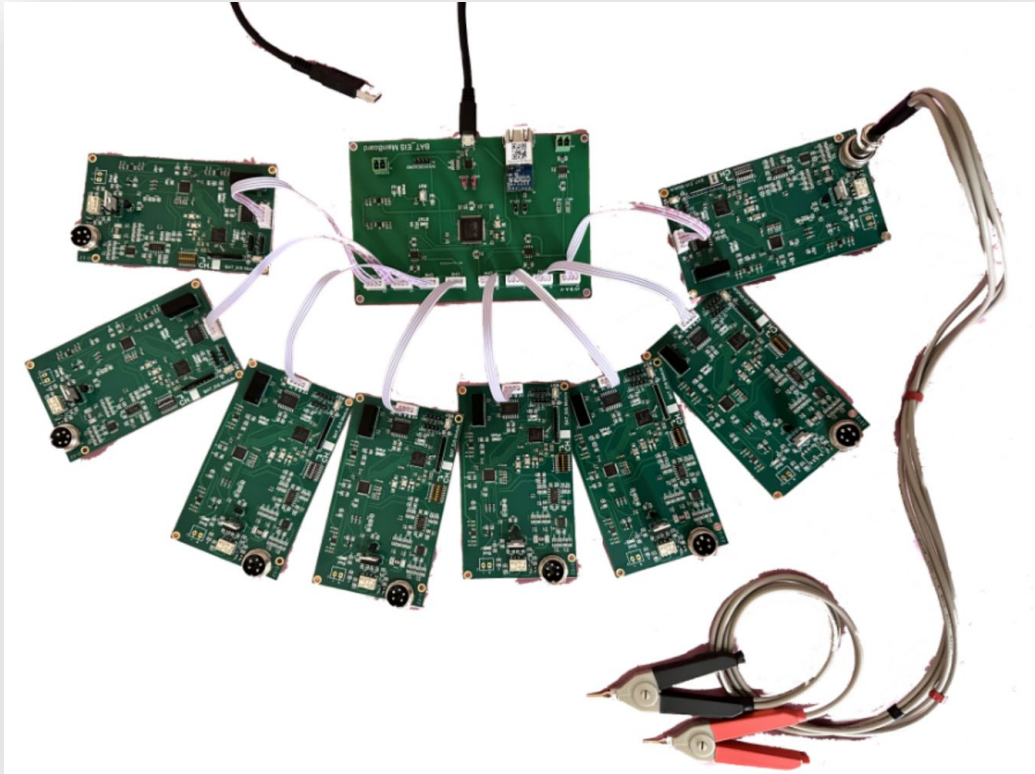
Thank You!

了解更多精彩资讯

敬请关注<骏龙电子>公众号

Co.Tomorrowing

macnica

©Macnica,Inc.