

60 GHz Millimeter Wave Radar Technology for Li-ion Battery Inspection

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Executive Statement:

This technology introduces a non-destructive, non-contact method for inspecting the electrical properties of thin Li-ion battery electrode films using 60 GHz millimeter wave radar.

Technology Overview:

The document details a novel approach to evaluate the electrical properties of Li-ion battery electrode films without physical contact, utilizing 60 GHz mmWave radar technology. By scanning these thin films with a radar module, the system can map radar-reflection properties, revealing crucial information about film conductivity and thickness. This method overcomes the limitations of traditional, often destructive techniques, offering a significant advancement in battery manufacturing and quality control processes.

Key Advantages:

- Non-destructive evaluation of electrode films, preserving their integrity
- Non-contact measurement, avoiding damage during the drying process
- Capable of detecting changes in film conductivity and thickness
- Potential for real-time monitoring in manufacturing settings
- Improved quality control by assessing the heterogeneity of films

Problems Addressed:

- Damage to electrode films by traditional, contact-based measurement methods
- Lack of non-destructive techniques for evaluating film electrical properties
- Challenges in monitoring the drying process of electrode films
- Difficulty in assessing film quality and uniformity during production

Market Applications:

- Quality control in Li-ion battery manufacturing
- Non-destructive testing in materials science research
- Real-time monitoring systems for battery electrode production lines
- Advanced manufacturing processes requiring precise film evaluation