

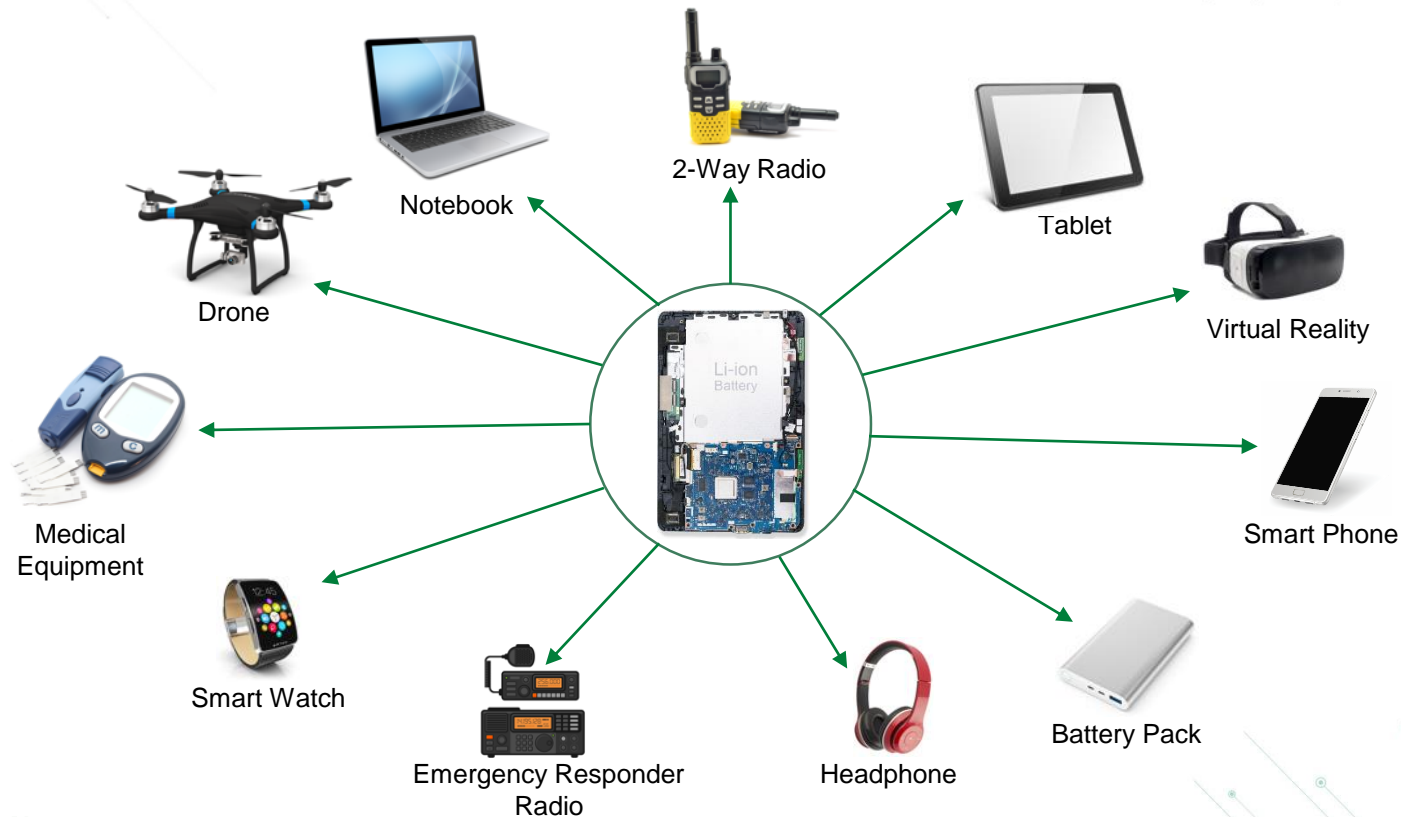


Expertise Applied | Answers Delivered

# Mobile Battery Solutions

July 2019

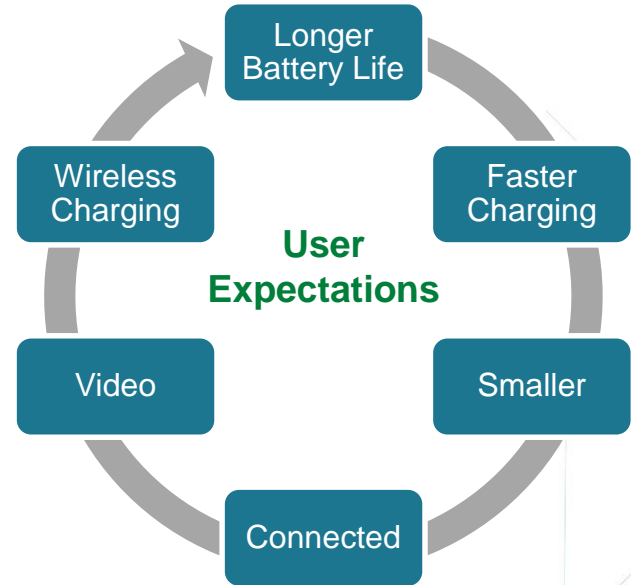
# Lithium ion battery systems – Powering mobility



# Mobile and wearable market analysis

## User behavior trends

- Increasing types of use such as mobile payments
- Capturing life's moments with photo and video
- Video calls and social media posting
- Primary navigation tool
- Fitness tracking
- Immersive video game experience
- Working on-the-go



User behaviors are driving product enhancements that require enhanced reliability

# Li-ion battery protection solutions in mobile devices

## User input controls:



- TVS Diode Array for ESD and surge protection
- EMI Filter

## Power control module:



- Power Inductor for noise filtering

## Charge & sync input:



- TVS Diode Array for ESD and surge protection
- EMI Filter

## Cellular antenna:



- Polymer ESD suppressor

## Wi-Fi and Bluetooth:



- Polymer ESD suppressor

## Li-ion battery:



- Resettable PPTC
- TVS Diode Array
- Mini-breaker



Protect

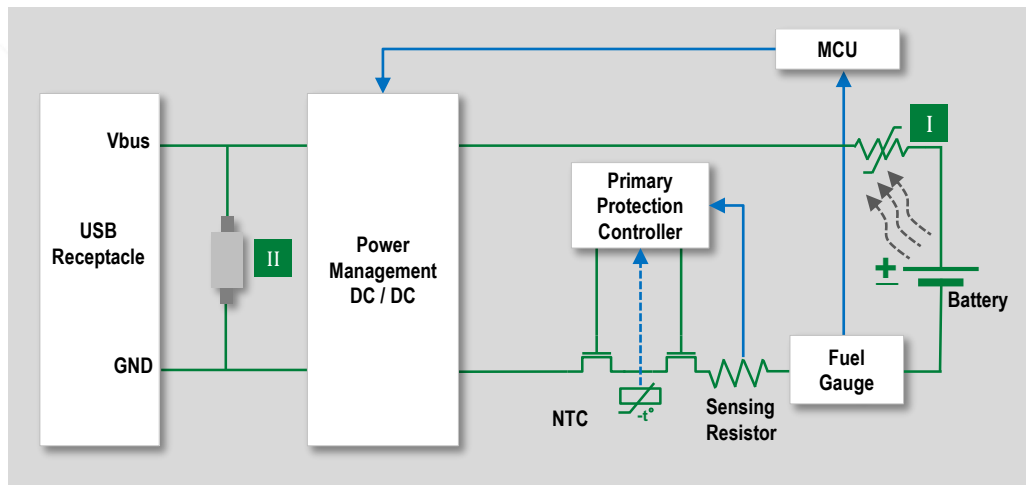


Control



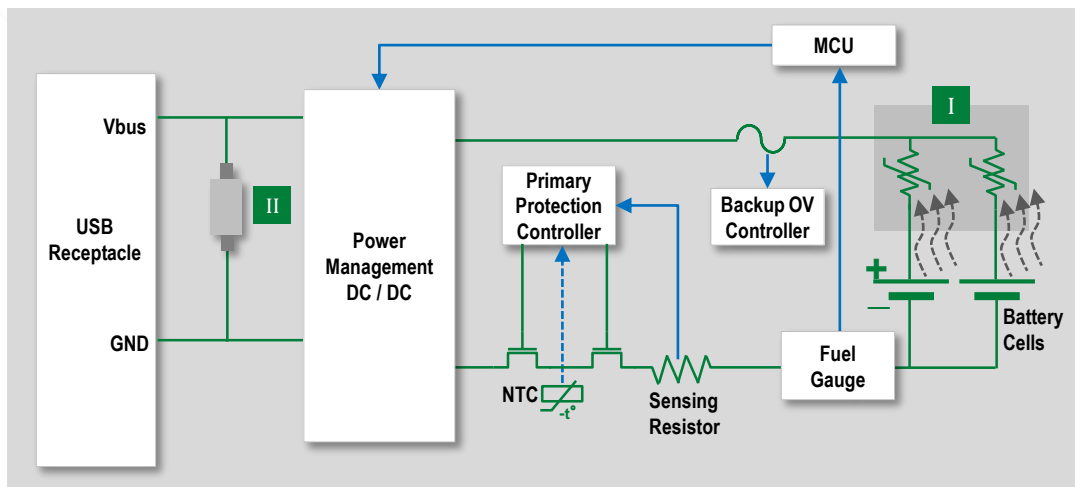
Sense

# Single battery cell



	Technology	Function in Application	Series	Benefits	Features
I	Resettable PPTC	Secondary over-temperature and overcurrent protection	<a href="#">LoRho SMD</a>	Longer battery life, sensitive thermal protection	6Vdc, milliohm resistance
II	Diode Array	ESD protection	<a href="#">SP11xx</a>	Simple design, reliable protection	30kV ESD contact, Standoff voltage ratings of 5 to 24Vdc

# Multi-cell batteries



	Technology	Function in Application	Series	Benefits	Features
I	Mini-breaker	Secondary over-temperature and overcurrent protection	<a href="#">MHP-TAC</a>	Longer battery life, sensitive thermal protection	$I_{hold}$ up to 15A, milliohm resistance, 72°C to 90°C cutoff temperature
II	Diode Array	ESD protection	<a href="#">SP11xx</a>	Simple design, reliable protection	30kV ESD contact, Standoff voltage ratings of 5 to 24Vdc

# Compliance and standards for mobile & wearable

Standard	Title	General Scope	Region
USB-IF	Universal Serial Bus specification	Supports advancement and adoption of Universal Serial Bus technology	Global
IEC 60950-1	Information technology equipment – Safety	Applicable to mains-powered or battery-powered information technology equipment, with a rated voltage not exceeding 600V	Global
IEC 62368-1	Audio/video, information and communication technology equipment – Part 1: Safety requirements	Safety of equipment within the field of audio, video, information and communication technology (rated voltage not exceeding 600V)	Global
IEC 61000-4-2	Testing – Electrostatic Discharge (ESD)	This standard is made to check the capability of the equipment to survive repetitive electrical fast transients and bursts	Global
IEC 61000-4-4	Electrical fast transient/burst immunity test	Evaluating the immunity of equipment when subjected to electrical fast transient/bursts on supply, signal, control, and earth ports.	Global
IEC 62133-2 & UL 62133-2	Safety requirements for portable sealed secondary lithium cells	Evaluating protection during various battery fault scenarios	Global

# Additional information can be found on [Littelfuse.com](https://www.littelfuse.com)

Protecting Rechargeable Li-Ion and Li-Polymer Batteries:

[https://www.littelfuse.com/~media/electronics/application\\_notes/littelfuse\\_protecting\\_rechargeable\\_li\\_ion\\_and\\_li\\_polymer\\_batteries\\_in\\_consumer\\_portable\\_electronics\\_application\\_note.pdf.pdf](https://www.littelfuse.com/~media/electronics/application_notes/littelfuse_protecting_rechargeable_li_ion_and_li_polymer_batteries_in_consumer_portable_electronics_application_note.pdf.pdf)

Circuit Protection Solutions for Lithium Cells:

[https://www.littelfuse.com/~media/electronics/application\\_notes/littelfuse\\_circuit\\_protection\\_solution\\_for\\_lithium\\_cells\\_application\\_note.pdf.pdf?hsCtaTracking=760a1f76-27b1-44c6-bb0d-7924ec2856e0%7C4c93b65c-fc01-45d1-9c62-0a009ffa645f](https://www.littelfuse.com/~media/electronics/application_notes/littelfuse_circuit_protection_solution_for_lithium_cells_application_note.pdf.pdf?hsCtaTracking=760a1f76-27b1-44c6-bb0d-7924ec2856e0%7C4c93b65c-fc01-45d1-9c62-0a009ffa645f)

Electrostatic Discharge (ESD) Suppression Design Guide:

[https://www.littelfuse.com/~media/electronics/design\\_guides/esd/littelfuse\\_esd\\_suppression\\_design\\_guide.pdf.pdf](https://www.littelfuse.com/~media/electronics/design_guides/esd/littelfuse_esd_suppression_design_guide.pdf.pdf)

Electronic Discharge (ESD) Protection Design Guide :

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Circuit Protection Solutions:

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# Why choose Littelfuse

- Global leader with broad product portfolio covering every aspect of protection, sensing, and control
- Application expertise combined with product designed guidelines to help you determine best component for your application
- Testing capabilities and assistance to support confirmation of product selection
- Standards compliance expertise including product compliance to many standards and approval support
- High-volume manufacturing, committed to the highest quality standards
- Global company with local support

We are committed to supporting your success



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