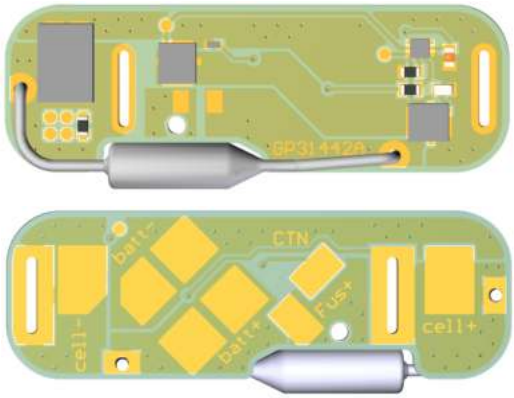
Battery safety
Single cell protection circuits

Electronic protection circuits for Li-ion 3,65 V MP xtd range of cells

[illegible] single cell protection circuits [illegible] overcharge protection [illegible] recharging [illegible] protection circuits [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]



Benefits
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

Applications
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

Designed to meet all major quality, safety and environmental standards
- [illegible]
- [illegible]

Typical applications
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

Electrical characteristics - Voltage	Typical
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Electrical characteristics - Current	[illegible]		[illegible]	
	Min	Max	Min	Max
[illegible]		[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]	
[illegible]		[illegible]		[illegible]
[illegible]	[illegible]		[illegible]	

Environmental characteristics	Value
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

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Controllers and protection

■ Cell balancing

Cell balancing is activated when a cell voltage exceeds the balancing threshold during charge. Balancing is stopped when the cell voltage falls below the threshold or when the charge is terminated. Balancing is temperature dependent and is disabled outside the operating temperature range.

■ Charging

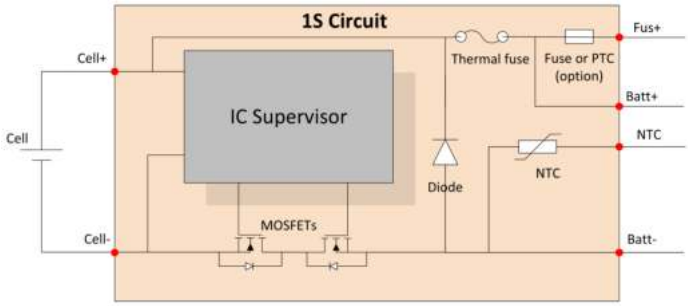
Charging is terminated when the battery voltage reaches the charge termination voltage. Charging is also terminated when the battery temperature exceeds the maximum charge temperature limit.

Cell balancing parameters	Min	Typ	Max	Tolerance
Balancing current		50 mA		±5%
Balancing threshold voltage		4.2 V		±0.05 V

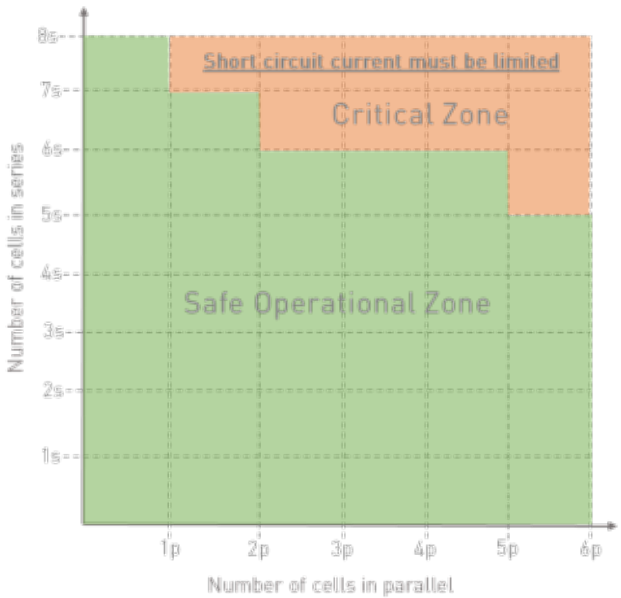
Charge termination parameters	Min	Typ	Max	Tolerance
Charge termination voltage		4.2 V		±0.05 V
Maximum charge temperature		45 °C		±2 °C

Cell balancing temperature range	Min	Typ	Max	Tolerance
Operating range	0 °C	25 °C	45 °C	±2 °C

Note: Balancing is disabled outside the operating temperature range. Charging is terminated when the battery temperature exceeds the maximum charge temperature limit. The balancing current is specified at the nominal cell voltage. Balancing is temperature dependent and is disabled outside the operating temperature range.



Schematic representation of the protection circuit. The actual implementation may vary. Refer to the datasheet for detailed pin assignments and recommended external components.



The safe operating area depends on the number of cells in series and in parallel. Operation outside the safe operating area may result in reduced cycle life or permanent damage.

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