

## Stereax<sup>®</sup> P180

### Extended Temperature Range Solid State Battery: -40° to + 150°C

#### Features

- ▲ Operates in Commercial, Industrial, Extended and Automotive Temperature Ranges
- ▲ Thin Form factor
- ▲ All Solid-State Construction
- ▲ Fast Charge
- ▲ High Current Pulses
- ▲ High Energy Density per Footprint
- ▲ Thousands of Cycles
- ▲ Low Self-discharge
- ▲ No Free Lithium
- ▲ Eco-friendly



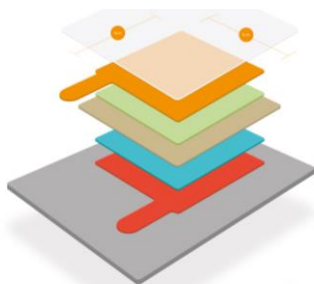
Stereax P180 solid state batteries deposited on 6" wafer

#### Physical Properties

- ▲ Active Materials Footprint: 10 x 10 mm
- ▲ Die Area 18 x 20 mm
- ▲ Thickness <sup>a</sup>: 1.0 mm
- ▲ Mass: 620 mg
- ▲ Operating temperature: -40°C to +150°C

#### Electrical Properties at +150°C

- ▲ Output Voltage (nominal): 3.4 V
- ▲ Capacity (nominal): 180 μAh
- ▲ Charging Source: 3.8 V
- ▲ Charging time to 80%: < 1 minute
- ▲ Charge/discharge cycles <sup>b</sup>: up to 4,000
- ▲ Peak current: 18 mA



Stereax P180 expanded construction diagram

Encapsulation (1.4 cm x 1.4 cm)	Cathode (1.0 cm x 1.0 cm)
Anode Current Collector (1.0 cm x 1.0 cm)	Cathode Current Collector (1.0 cm x 1.0 cm)
Anode (0.2 cm x 1.0 cm)	Substrate
Electrolyte (0.2 cm x 1.2 cm)	

a: Thickness value includes substrate (650 μm). Thinner substrates are available.

b: 5% DoD

#### General Description

The Stereax<sup>®</sup> P180 is a unique solid state battery that can operate and be stored in the extended temperature range -40°C to +150°C.

The size and performance of the Stereax<sup>®</sup> P180 solid state battery make it ideal to power autonomous sensor devices in the Internet of Things. In particular, its performance at high temperature, up to +150°C, enable the deployment of end nodes situated near hot machinery in Industry 4.0 or engines and exhausts in smart cars. At low temperature, to -40°C, such end nodes may be deployed to monitor infrastructure such as pipelines or bridges.

The Stereax<sup>®</sup> technology platform is developed by Ilika who licenses its IP portfolio and know-how based on deposition processes and materials to systems and components OEMs and manufacturers. This format allows Ilika to respond to partners' requirements more efficiently than manufacturing standardised product lines, for an optimal outcome and greater flexibility in terms of shape, capacity, life cycle ...

#### Applications

- ▲ Autonomous Sensor Devices
- ▲ Industrial
- ▲ Automotive
- ▲ Aerospace
- ▲ Infrastructure monitoring

## Specifications

Temperature	Parameter	Test conditions	Value	Unit
<b>-40°C</b>	Capacity	C/60	160	μAh
	Operating Voltage		2.9 – 4.1	V
	Max Continuous Current	C/30	6	μA
	Standard Discharge Current	C/60	3	μA
	Internal Resistance	Charge Cycle 1, 100% SoC	7500	Ω
Temperature	Parameter	Test conditions	Value	Unit
<b>+25°C</b>	Capacity	1C	180	μAh
	Operating Voltage		3 - 4	V
	Max Continuous Current	10C	1.8	mA
	Standard Discharge Current	1C	180	μA
	Cycle life	5% DoD; to 80% of rated capacity; 1C	5000	Cycles
		100% DoD to 80% of rated capacity; 1C	300	Cycles
	Internal Resistance	Charge Cycle 1, 100% SoC	120	Ω
Pulse Current	0.5 ms, every second	3.6	mA	
Temperature	Parameter	Test conditions	Value	Unit
<b>+150°C</b>	Capacity	1C	180	μAh
	Operating Voltage		3 – 3.8	V
	Max Continuous Current	50C	9	mA
	Standard Discharge Current	1C	180	μA
	Cycle life	5% DoD; to 80% of rated capacity; 1C	4000	Cycles
		100% DoD to 80% of rated capacity; 1C	200	Cycles
	Internal Resistance	Charge Cycle 1, 100% SoC	15	Ω
Pulse Current	0.5 ms, every second	18	mA	

**Note:** All specifications contained within this document are subject to change without notice.

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