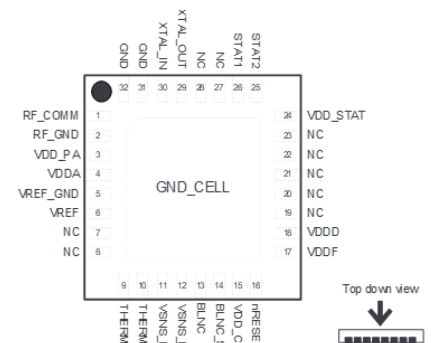


DKCMS Core Cell Monitor

The DK8102-AQ-25 Cell Monitor is an intelligent sensing, monitoring, and reporting device. The Cell Monitor is connected to each cell in a battery pack and is powered from the cell itself. It operates as an element within the Dukosi Cell Monitoring System (DKCMS) along with Dukosi's DK8202-AR-25 System Hub, proprietary protocol C-SynQ® and the DKCMS Library API.

In addition to continually monitoring voltage and temperature, the DK8102-AQ-25 checks the values against user-configured limits before reporting data to the BMS Host via the Dukosi System Hub. Communication to the System Hub is enabled by Dukosi's proprietary C-SynQ® protocol via a single bus antenna providing a reliable, contactless cell monitoring network.



Features

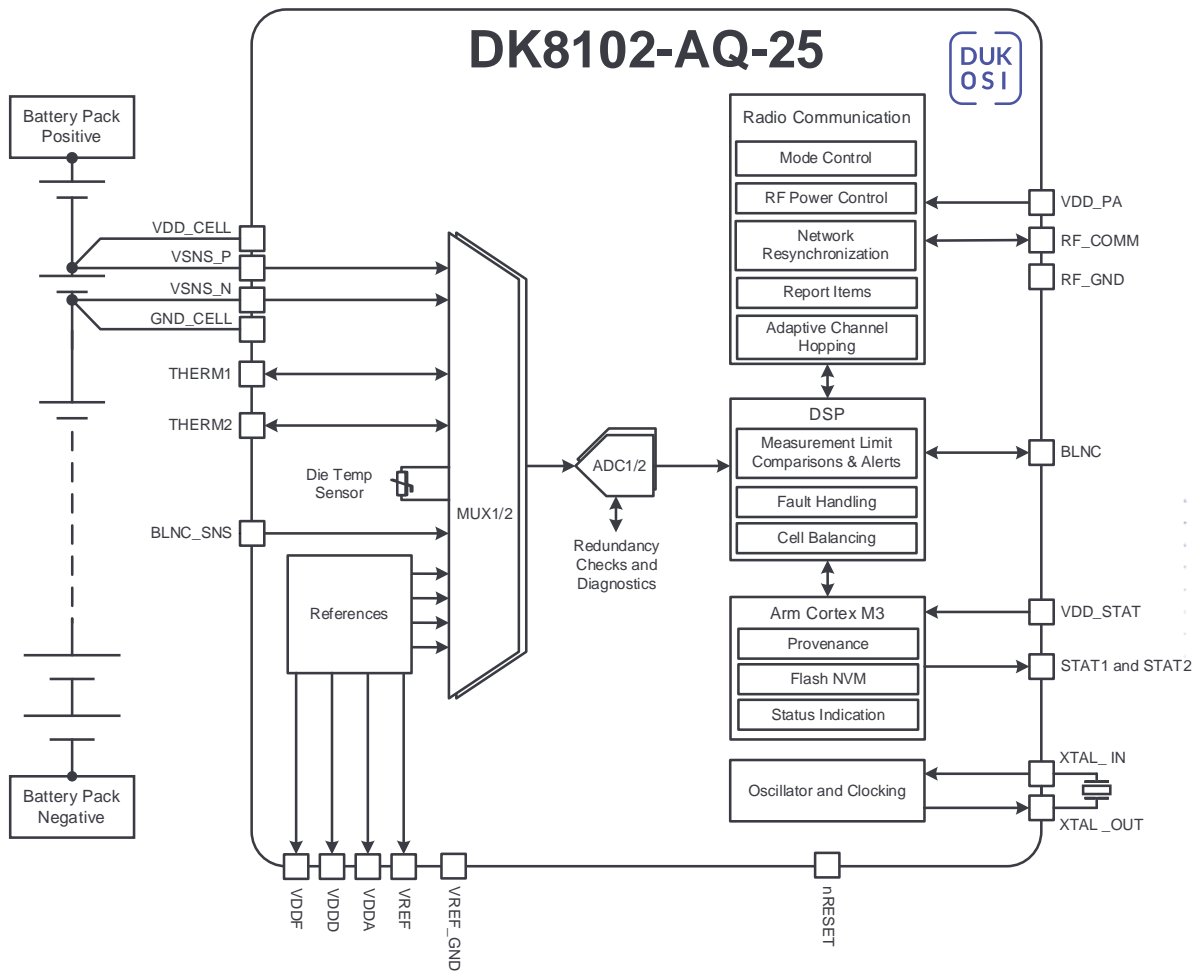
- ◆ High accuracy, per-cell voltage measurement
- ◆ Multiple temperature measurements per cell:
 - ❖ On-chip die temperature sensor
 - ❖ Additional inputs for external thermistors
- ◆ Configurable min/max limits with limit breach reporting
- ◆ Secure, robust, contactless communication to the Host via the Dukosi System Hub
- ◆ Passive cell balancing with configurable stop mechanisms
- ◆ Active, Low Power, and Hibernate modes
- ◆ Fault reporting
- ◆ Cell Passport enabling lifetime on-chip storage of cell provenance data
- ◆ Unique Cell Monitor ID stored on-chip
- ◆ AEC-Q100 qualified

Benefits

- ◆ Optimize battery utilization with high-accuracy voltage and temperature measurements and synchronization of measurements across every cell
- ◆ Enhanced safety with per-cell, 24/7 temperature and voltage monitoring
- ◆ Contactless communication using Dukosi C-SynQ and a single bus antenna enables:
 - ❖ Wired-like, star-network behavior and security, with predictable communication latency
 - ❖ Inherent isolation of the BMS from the pack HV simplifying the BMS design
 - ❖ Reduced BOM, with potential failure modes designed out as complexities associated with wire harnesses and connectors are eliminated
 - ❖ Simplified pack design, manufacturing, and test
- ◆ Enable a circular economy and sustainable battery chain with Cell Passport data stored on-chip and accessible without the need of a BMS

DKCMS Core Cell Monitor

Block Diagram



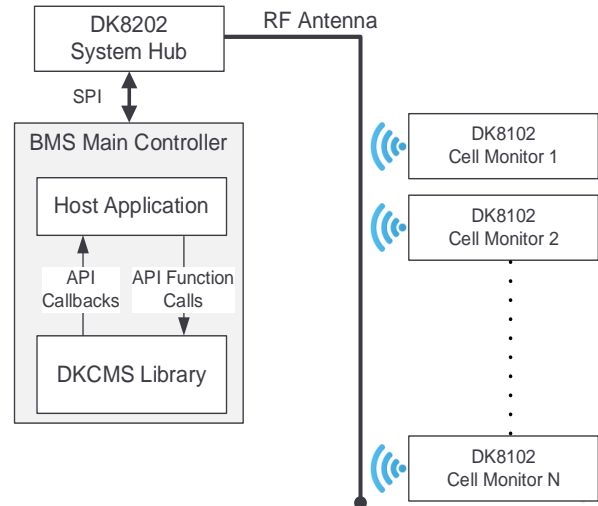
DKCMS Core Cell Monitor

Use Case

A DK8102-AQ-25 Cell Monitor is connected to each cell in a battery pack and is powered from the cell itself. Bi-directional communication between the BMS Host and each Cell Monitor is facilitated by a Dukosi DK8202-AR-25 System Hub, using the Dukosi C-SynQ[®] protocol with contactless communication via a single bus antenna.

Applications

- Multi-cell Li-ion battery systems
- Grid scale utility, commercial and industrial, and residential BESS
- Industrial power systems, and robotics
- Automotive
- Compatible with a range of cell chemistries and pack architectures



Key Parameters

| Parameter | Typical Value (At T _A = 25 °C) | Comments |
|---------------------------------------|---|--|
| Cell Voltage | 1.4 V to 5.0 V | Supports a range of cell chemistries Note Full feature set available between 2.19 V and 5 V |
| Voltage Total Measurement Error (TME) | ± 0.6 mV | |
| Die Temperature Sensor Accuracy | ± 2 °C | |
| THERM1/2 Accuracy | ± 0.6 mV | Supports up to two external thermistors |
| RF Band | 2.402 GHz to 2.480 GHz | Near-field communication, employing adaptive channel hopping for robustness and EMC performance |
| RF Data Rate | 2 Mbit/s | |
| Cell Balancing Current (max) | 200 mA | This is based on the internal NFET. Balancing currents >200 mA can be supported through the use of an external FET |
| Active Mode Rate | 10 Hz | Rate is for measurement and reporting |
| Low Power Mode Rate | 0.1 Hz | Rate is for measurement and reporting |
| Hibernate Mode Rate | 0.1 Hz | Rate is for measurement only |
| Cell Passport Data Storage | 2 KiB | |
| Operating Temperature Range | -40 °C to +105 °C | AEC-Q100 (Grade 2) |

DKCMS Core Cell Monitor

Ordering Information

| Part Number | Description | Packaging | MOQ |
|----------------|---|-----------|------|
| DK8102-AQ-25/C | Cell Monitor, AEC-Q100 (Grade 2), packaged in a 5 mm x 5 mm, 32-pin QFN | Cut Tape | 1 |
| DK8102-AQ-25/R | | 13" Reel | 5000 |

Disclaimer

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