DK8202-AR-25 Product Brief

DKCMS® Core System Hub

The DK8202-AR-25 System Hub manages a network of DK8102-AQ-25 Cell Monitors. It synchronizes measurements and transfers data to and from the Dukosi Cell Monitors with the BMS Host controller. Communication between the Cell Monitors and the System Hub is contactless via a single RF bus antenna and utilizes Dukosi's proprietary C-SynQ® communication protocol. The System Hub has a suite of features to ensure robust and reliable communication even in the presence of interfering signals. Communication with the BMS Host controller is via SPI.

The System Hub and Cell Monitors, along with the DKCMS Library API and proprietary C-SynQ protocol, form the Dukosi Cell Monitoring System (DKCMS®).

Features

- Each DK8202-AR-25 System Hub can manage up to 216 DK8102-AQ-25 Cell Monitors
- Secure, robust, near field contactless communication to the DK8102-AQ-25 Cell Monitors via a single RF bus antenna, utilizing Dukosi's proprietary C-SynQ protocol
  - Synchronizes Cell Monitor measurements across the entire pack
  - Adaptive channel hopping, with automatic or manual channel masking
  - Automatic network recovery feature
  - RF diagnostics and configurable transmit power levels
- Time-stamping of cell measurements (with a centralized time provided by the BMS Host)
- Industry standard SPI connection to the BMS Host controller
- Wake-on-fault notifications for when the BMS is in a sleep mode
- Unique Device ID stored on-chip
- AEC-Q100 qualified

Benefits

- Each System Hub manages up to 216 DK8102-AQ-25 Cell Monitors, addressing the needs of the majority of battery packs
- Synchronous data from the entire pack enables improved analytics and reduces BMS Host processing overhead
- Near field, contactless communication using Dukosi C-SynQ protocol and a bus antenna enables:
  - Wired-like performance in a star-network configuration 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
- Adaptive channel hopping minimizes disruption caused by RF interference, giving inherent security and robustness
  - Automatic temporary channel masking can be used to temporarily mask channels where consecutive packet errors have been detected
  - Manual masking of channels is possible in advance to avoid known system interferers

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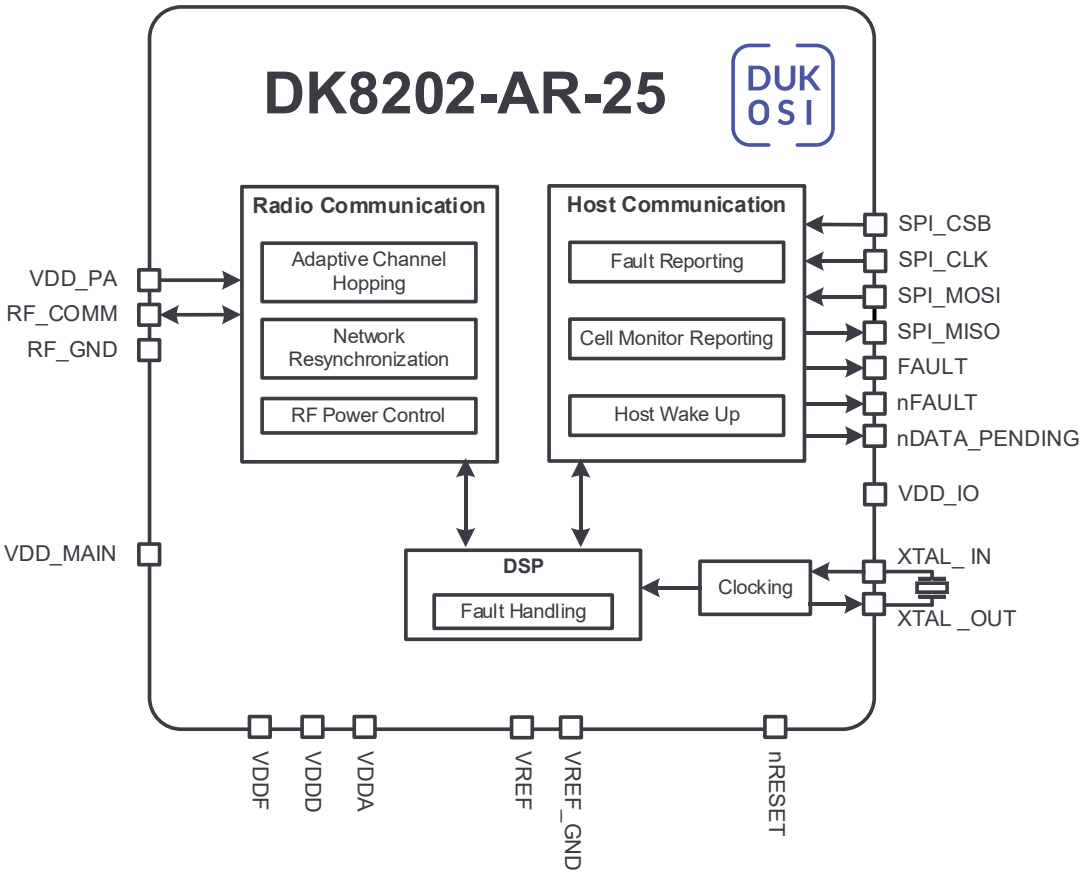
Block Diagram



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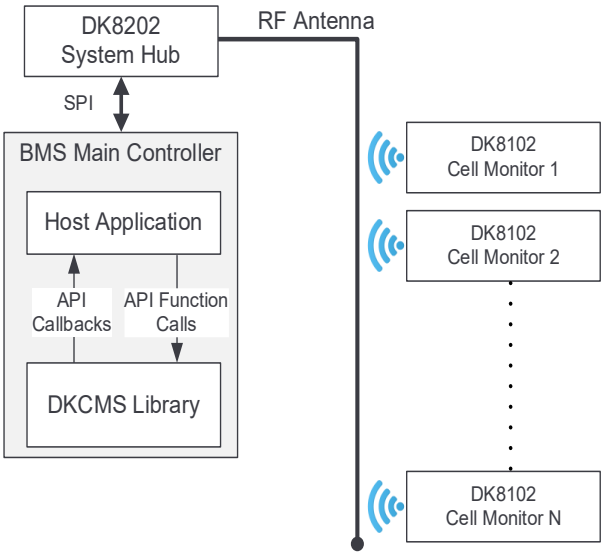
Use Case

The DK8202-AR-25 System Hub is integrated into the BMS and communicates via SPI (Serial Peripheral Interface) with its main controller. Communication to an RF bus antenna that is routed over the DK8201-AQ-25 Cell Monitors in the pack enables the formation of a contactless network. The System Hub manages the bi-directional communication between the Cell Monitors and the BMS Host controller, ensuring all Cell Monitor measurements are synchronized.



Applications

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

Key Parameters

Parameter	Typical Value (At T_A = 25 °C)	Comments
No. of Cell Monitors Supported	216	
RF Band	2.402 to 2.480 GHz	Near field communication, employing channel hopping for robustness and EMC performance
RF Data Rate	2 Mbit/s	
Operating Temperature Range	-40 °C to +105 °C	

Ordering Table

Part Number	Description	Packaging	MOQ
DK8202-AR-25/C	System Hub, AEC-Q100 qualified, 40-pin, 6 mm x 6 mm QFN package	Cut Tape	1
DK8202-AR-25/R		13” Reel	4000

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