General-Purpose Battery Management System Communication Gateway

BMX6X02

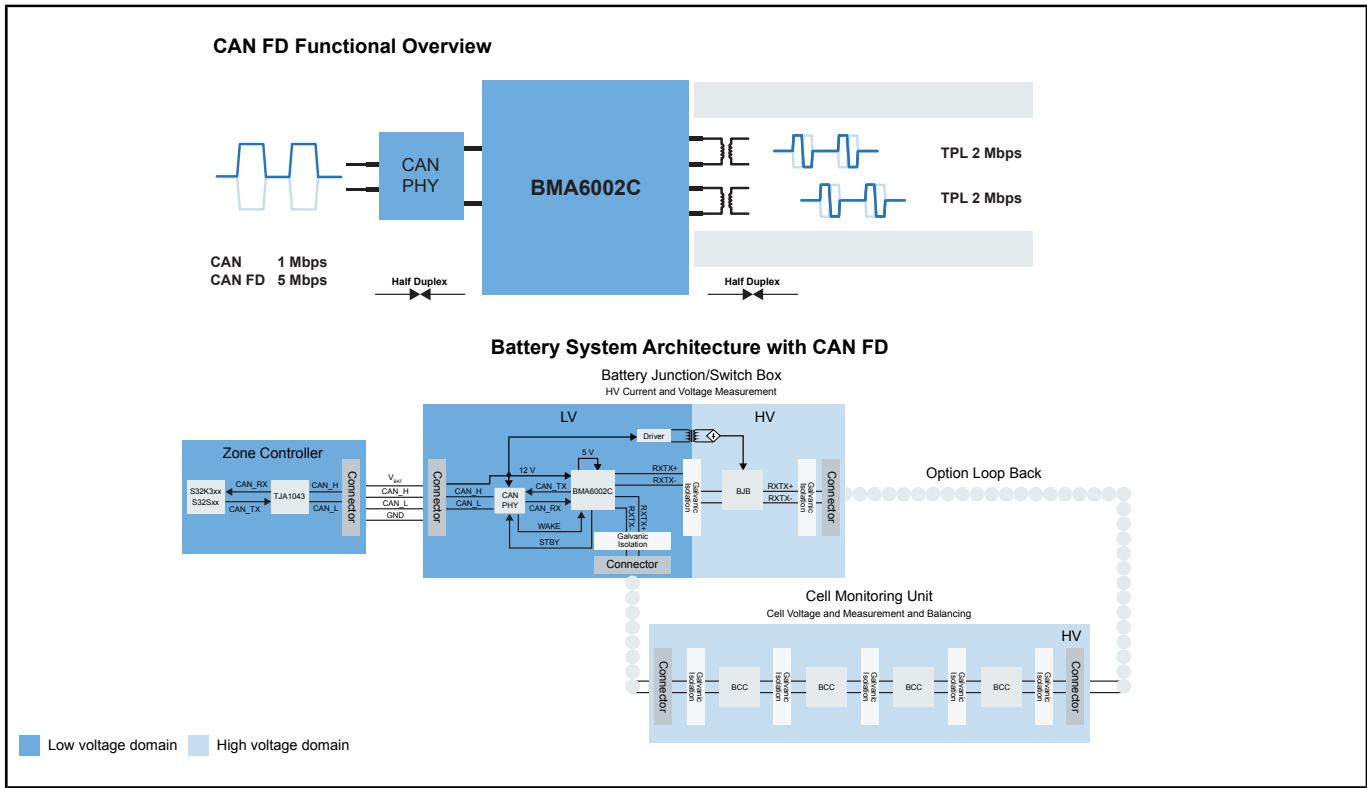**Preproduction**

Last Updated: Jan 9, 2025

The BMA6002 is a General-Purpose battery management communication gateway and transport protocol link (TPL) transceiver. The device forwards messages upcoming from different TPL (isolated daisy chain protocol of NXP) ports through a standard communication protocol. The standard communication protocol ensures compatibility with most microcontrollers available in the market.
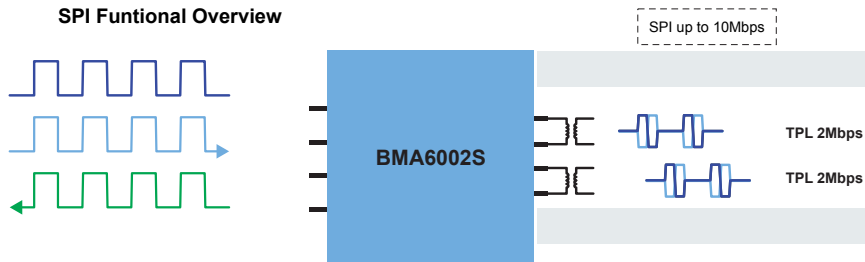
The BMA6002 is designed as a gateway for serial peripheral interface (SPI) or CAN (FD) to TPL. Integrated Serial interface to control external devices. The BMA6002 provides two TPL daisy chain ports to communicate with other isolated BMS devices in the daisy chain. Each daisy chain port supports capacitive and inductive isolated communication.
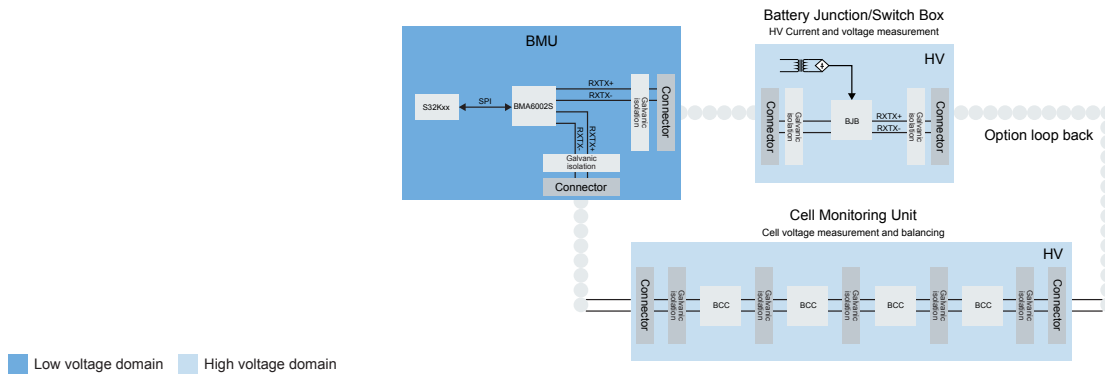
BMA6002C Block Diagram

CAN FD Functional Overview

BMA6002C

CAN PHY

TPL 2 Mbps

TPL 2 Mbps

CAN 1 Mbps
CAN FD 5 Mbps

Half Duplex

Half Duplex

Battery System Architecture with CAN FD

Battery Junction/Switch Box
HV Current and Voltage Measurement

LV

HV

Driver

BJB

Zone Controller

S32K3xx
S32Sxx

TJA1043

CAN_RX

CAN_TX

CAN_H

CAN_L

Connector

V_bat
CAN_H
CAN_L
GND

Connector

CAN_H

CAN_L

12 V

5 V

CAN PHY

BMA6002C

CAN_TX

CAN_RX

WAKE

STBY

RXTX+

RXTX-

RXTX+

RXTX-

RXTX+

RXTX-

Galvanic Isolation

Galvanic Isolation

Galvanic Isolation

Connector

Option Loop Back

Connector

Cell Monitoring Unit
Cell Voltage and Measurement and Balancing

HV

Connector

Galvanic Isolation

BCC

Galvanic Isolation

BCC

Galvanic Isolation

BCC

Galvanic Isolation

BCC

Galvanic Isolation

Connector

Low voltage domain
High voltage domain

BMA6002S Block Diagram

SPI Funtional Overview

BMA6002S

SPI up to 10Mbps

TPL 2Mbps

TPL 2Mbps

Battery System Architecture with SPI

Battery Junction/Switch Box
HV Current and voltage measurement

BMU

S32Kxx — SPI — BMA6002S

RXTX+
RXTX-

Connector
Galvanic isolation

RXTX+
RXTX-

Galvanic isolation

Connector

Connector
Galvanic isolation

BJB

RXTX+
RXTX-

Galvanic isolation
Connector

HV

Option loop back

Cell Monitoring Unit
Cell voltage measurement and balancing

Connector

Galvanic isolation

BCC

Galvanic isolation

BCC

Galvanic isolation

BCC

Galvanic isolation

BCC

Galvanic isolation

Connector

HV

Low voltage domain   High voltage domain

View additional information for General-Purpose Battery Management System Communication Gateway.

Note: The information on this document is subject to change without notice.