UM12465

EVBMA7x2yDT1 featuring the BMA7426 battery cell controller IC

Rev. 1.0 — 11 June 2026 User manual

Document information

Information	Content
Keywords	EVBMA7x2yDT1, BMA7426, battery-cell controller, battery emulator, battery management systems
Abstract	The user manual describes how to use the EVBMA7x2yDT1 evaluation board and configure it to be compatible with the BCC24.

1 Introduction

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The user manual describes how to use the EVBMA7x2yDT1 evaluation board and configure it to be compatible with the BCC24. The EVBMA7x2yDT1 features one BMA7426 battery-cell controller-integrated circuit (IC).

The NXP analog product development board provides a platform for evaluating NXP products.

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2 Getting ready

2.1 Finding kit resources and information on the NXP website

NXP Semiconductors provides online resources for this evaluation board and its supported devices. The information page for the EVBMA7x2yDT1 evaluation board is at http://www.nxp.com/EVBMA7x2yDT1. The information page provides overview information, documentation, software and tools, parametrics, ordering information and a Getting Started tab. The Getting Started tab provides quick-reference information applicable to using the EVBMA7x2yDT1 evaluation board, including the downloadable assets referenced in this document.

2.2 Kit contents

- Assembled and tested evaluation board or module in antistatic bag
- One 40-pin battery cell cable
- One two-pin transport protocol link (TPL) cable

2.3 Required equipment

To use this kit, the following equipment is required:

- An 8-cell to 26-cell battery pack or a battery pack emulator, such as BATT26EMULATOR

3 Getting to know the hardware

3.1 Kit overview

The EVBMA7x2yDT1 serves as a hardware evaluation tool in support of NXP's BMA7426 device, see https://www.nxp.com/products/BMA742X. The BMA7426 is an electrochemical impedance spectroscopy (EIS) capable distributed cell monitoring unit (CMU) with electrical transport protocol link (eTPL) communication. EVBMA7x2yDT1 is designed for use in automotive and industrial applications. The device performs analog-to-digital conversion on the differential cell voltages and battery temperature measurements. The EVBMA7x2yDT1 can be used for rapid prototyping of BMA7426-based applications that involve voltage and temperature sensing.

The information is digitally transmitted to a microcontroller for processing. The evaluation board can be used with a gateway ICs (see https://www.nxp.com/products/battery-management/battery-communication-ics:BATT-COMMUNICATION-IC) to convert MCU SPI data bits to pulse bit information for the BMA7426 and vice versa.

3.2 Board features

The main features of the EVBMA7x2yDT1 are:

- Daisy-chain device connection
- LED indicator for operation mode
- Cell-balancing resistors (68 Ω per individual cell)
- Cell-sense input with RC filter
- GPIO: dgital I/O, ratiometric analog inputs, analog inputs with absolute measurements
- EEPROM (connected to the IC with I^2C interface) to store user-defined calibration parameters
- External access to SPI controller and I^2C pins

3.3 Block diagram

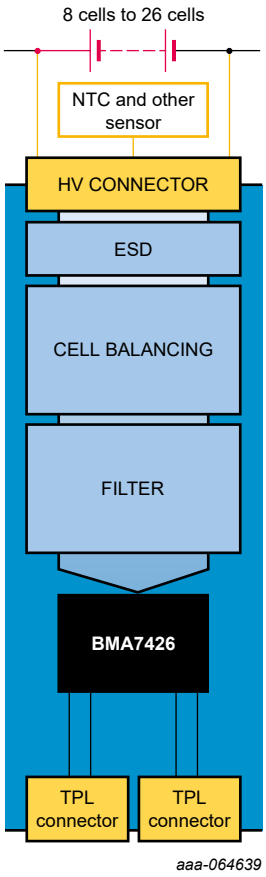

Figure 1. Block diagram

3.4 Setup description

Figure 2 shows the complete setup. The setup uses the BATT26EMULATOR to supply and emulate cell voltages for two EVBMA7x2yDT1 boards. The KIT-PC2TPLEVB enables communication with a regular PC. The evaluation GUI displays the measured voltages and allows interaction with the BMA7x2y devices. Depending on the evaluation scope, the system can use different components such as real battery cells or another TPL communication source.

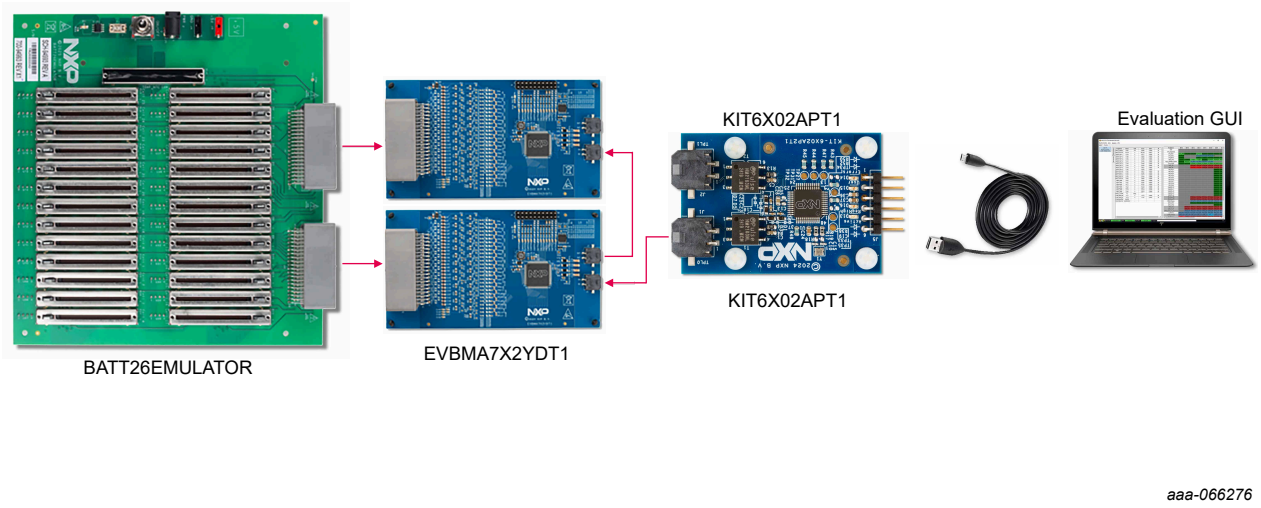

Figure 2. Setup

Download the EvaluationGUI that supports the hardware configuration from the NXP website at the following link: https://nxp.flexnetoperations.com/control/frse/product?entitlementId=236533551&lineNum=1&authContactId=99497301&authPartyId=76843761.

3.5 Board description

The EVBMA7x2yDT1 allows the user to exercise all the functions of the BMA7426 battery controller cell.

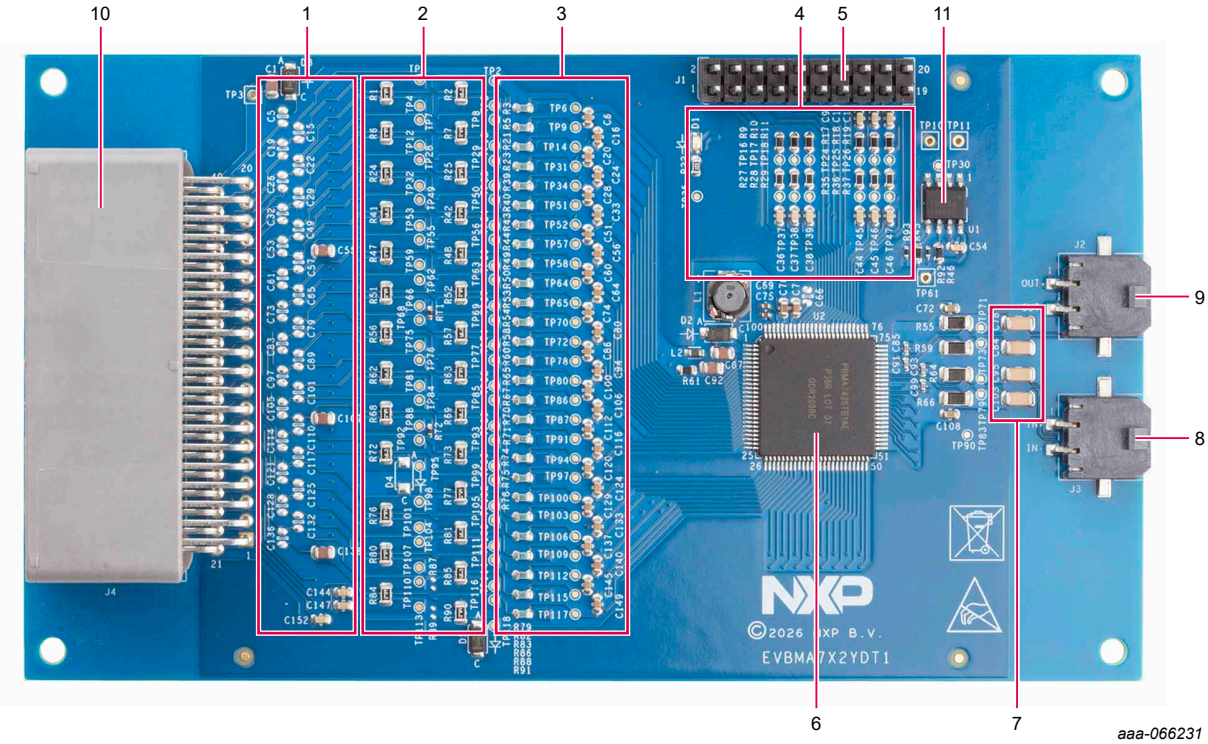

Figure 3. Board description

Table 1. Board description

Number	Name	Description
1	ESD differential capacitors	ESD protections
2	Cell balancing resistors	68 Ω per CBx pin
3	CTx low-pass filer	330 Ω/10 nF differential
4	GPIOs low-pass filter	NTC connections
5	GPIO/SPI connector	To connect external NTC or SPI/I^{2}C peripherals
6	PBMA7426TB1AE	26 cell battery cell controller IC
7	High-voltage capacitors	For communication isolation
8	MOLEX-43650-0213	Low-port communication connector – to be connected to the gateway
9	MOLEX-43650-0213	High-port communication connector – to be connected to the next node
10	JAE-MX34040NF2	40-pin connector for cells and NTC connections

3.5.1 Connectors

3.5.1.1 Battery pack connector J4

The cells and NTC connections are available on J4, see Figure 4.

Cell0 is connected between C0M(cell0M) and C1M(cell0P); Cell1 is connected between C1M(cell1M) and C2M(cell1P), and so on. Cell17 is connected between C17M (cell17M) and C17P (cell17P)

C17P-PWR and GND (pin21) are used to supply the EVBMA7x2yDT1 and are separated from C17P and C0M respectively to avoid any voltage drop because of the EVB current consumption.

For the lowest cells, cell25 is connected between C25M/C24M, cell 24 between C24M/C23M, and so on.

Refer to the board schematic for a better understanding about cells connections and stack arrangement.

Optional external 10 kΩ NTCs can be connected between each NTCx terminal and one GND terminal.

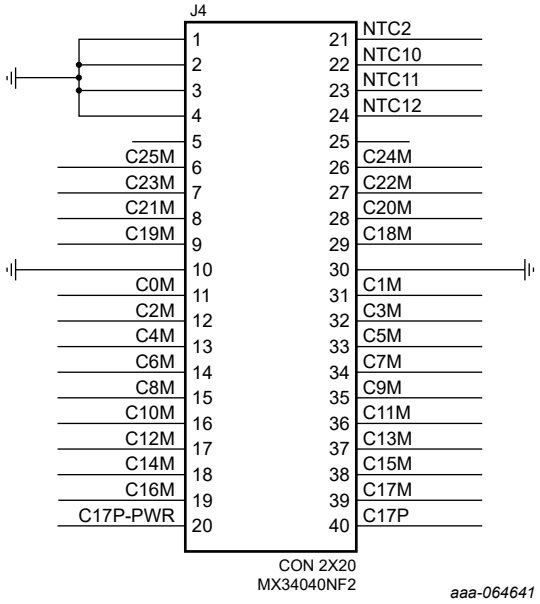

Figure 4. Cell-connector schematic

Board connector reference: MX34040NF2 (40 pins/right-angle version) - Manufacturer: JAE

Corresponding mate connector reference: MX34040SF1

Crimp reference for the mate connector: M34S75C4F1 (applicable cable 0.22 mm^2 to 0.35 mm^2)

3.5.1.2 TPL connectors

Isolated connections to upper and lower nodes should be made through J2 and J3, respectively.

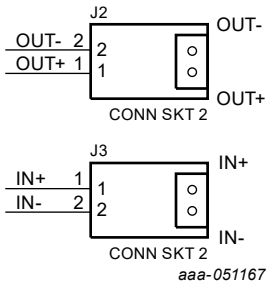

Figure 5. TPL connectors

Board connector reference: Microfit 3.0 43650-0213 (two pins/right angle version) - Manufacturer: Molex

Corresponding mate connector reference: 0436450200

Crimp reference for the mate connector: 0436450201

Twisted cable: 64920108 - Manufacturer: Kromberg & Schubert

3.6 GPIO configurations

The BMA7426 has 13 GPIO pins (GPIO0 to GPIO12) available for temperature measurements, absolute analog measurements, and other functions.

The EVBMA7x2yDT1 provides the GPIO measurements and functions as described in Table 2.

Table 2. GPIO connections

Connection	Board label	Description - BCC connection
J4-21	NTC2	AIN1 pin through low-pass filter for NTC acquisition - to be connected to an external 10 kΩ NTC (that is, NCP15XV103 J03RC) or NTC emulator (BATT26EMULATOR)
J4-22	NTC10	AIN9 pin through low-pass filter for NTC acquisition - to be connected to an external 10 kΩ NTC (that is, NCP15XV103 J03RC) or NTC emulator (BATT26EMULATOR)
J4-23	NTC11	AIN11 pin through low-pass filter for NTC acquisition - to be connected to an external 10 kΩ NTC (that is, NCP15XV103 J03RC) or NTC emulator (BATT26EMULATOR)
J4-24	NTC12	GPIO12 pin through low-pass filter for NTC acquisition - to be connected to an external 10 kΩ NTC (that is, NCP15 XV103J03RC) or NTC emulator (BATT26EMULATOR)
Onboard NTC NCP15XV103J03RC - TP18	NTC3	AIN2 pin through low-pass filter for NTC acquisition
Onboard NTC NCP15XV103J03RC - TP17	NTC4	AIN3 pin through low-pass filter for NTC acquisition
Onboard I2Ceeprom - SCL	GPIO5	GPIO5 pin
Onboard I2Ceeprom - SDA	GPIO6	GPIO6 pin
Not connected - TP61	AINA	AINA pin
J1-1	GPIO0	STROBE GPIO0/STROBE access
J1-3	GPIO4	ALARMOUT GPIO4/ALARMOUT access
J1-5	GPIO5	SCLK GPIO5/SCLK access
J1-7	GPIO6	COTI GPIO6/COTI access
J1-9	GPIO7	CITO GPIO7/CITO access
J1-11	GPIO8	CSN0 GPIO8/CSN0 access
J1-13	NTC10	AIN9 pin through low-pass filter for NTC acquisition - to be connected to an external 10 kΩ NTC (that is, NCP15XV103 J03RC) or an emulator (BATT26EMULATOR)
J1-15	NTC11	AIN10 pin through low-pass filter for NTC acquisition - to be connected to an external 10 kΩ NTC (that is, NCP15XV103 J03RC) or an emulator (BATT26EMULATOR)
J1-15	NTC12	AIN11 pin through low-pass filter for NTC acquisition - to be connected to an external 10 kΩ NTC (that is, NCP15XV103 J03RC) or an emulator (BATT26EMULATOR)
J1-17	GPIO12	GPIO12 pin direct connection

3.7 24 cells board configuration

The board can be configured to use the BMA7426 as a 24 cells device BMA7424 with an optimized BOM. In such a configuration, the primary and secondary measurement channels 25 and 24 and all associated components are removed. To get more details, refer to product documentation on https://www.nxp.com/.

Configuration of the CBM terminals:

- R87, R89 should be populated with 0 ohms resistances (0402 package)
- R90, R84 should be removed
- R85 replaced by a 100 kΩ resistance (0805 package)

Configuration of the CTM terminals:

- C149, C145 should be replaced by 0 ohms résistances (0603 package)
- R88, R91 should be removed
- R86 replaced by a 100 kΩ resistance (0603 package)

4 Installation and use of software tools

The EVBMA7x2yDT1 is not distributed with software. Multiple software bundles are available to support the EVBMA7x2yDT1 and enable quick evaluation. To select the most suitable evaluation environment, please contact NXP sales support.

5 Revision history

Revision history

Document ID	Date	Description
UM12465 v.1.0	11 June 2026	Initial version

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