

NXP’s MC33777 – Battery Junction Box Monitor IC

ASIL D device for switchable battery architectures

Revolutionizing Battery Pack Monitoring Technology for Electric Vehicles

The new NXP [MC33777](#) is the world’s first battery junction box integrated circuit (IC) to integrate sense, think and act capabilities on a single device. Compared to previous generations, it redefines battery management systems with its unparalleled performance and safety for high-voltage applications.

Current Measurement

- Four current measurement channels (supporting two ASIL D current measurements)
- Per channel, one precise measurement branch and one fast measurement branch
- Shunt temperature drift compensation based on external temperature sensor
- Overcurrent detection (threshold, di/dt calculation, melting fuse emulation)

Voltage and General-Purpose Measurements

- 16 analog inputs supporting redundant measurements.
- Decision Engine Event Manager
- Configurable decision engine to assess measurement inputs and trigger reactions
- Set of event signals (ex: high di/dt, overcurrent, overvoltage, overtemperature...)
- Triggering reactions (ex: Pyrotechnic Switch controller, MCU wake-up, GPIOs...)

Pyrotechnic Switch Controller

- Two independent controllers including driver stage
- AK-LV 16 (2012-07) compliant
- Triggering by the decision engine event manager without MCU processing
- Extensive set of diagnostics (diagnostic current, capacitor measurement, ESR measurement...)

Communication

- SPI interface and I²C interface
- MCU interface supporting SPI or TPL3

[MC33777](#) can be used in a broad range of **Automotive & Industrial** applications, including:

Automotive

- [Battery Management System \(BMS\)](#)
- [Hybrid Electric Vehicle \(HEV\) Applications](#)

Industrial

- [Energy Storage System \(ESS\)](#)
- [EV Supply Equipment \(EVSE\)](#)

NXP Programs

- This generation is included in the **15-year program NXP Product Longevity Program** ensuring a stable supply of products for your embedded designs.
- It is also part of our **Safe Assure® (Functional Safety) Program** standing for quality and reliability system-level safety requirements in accordance with **ISO 26262**.

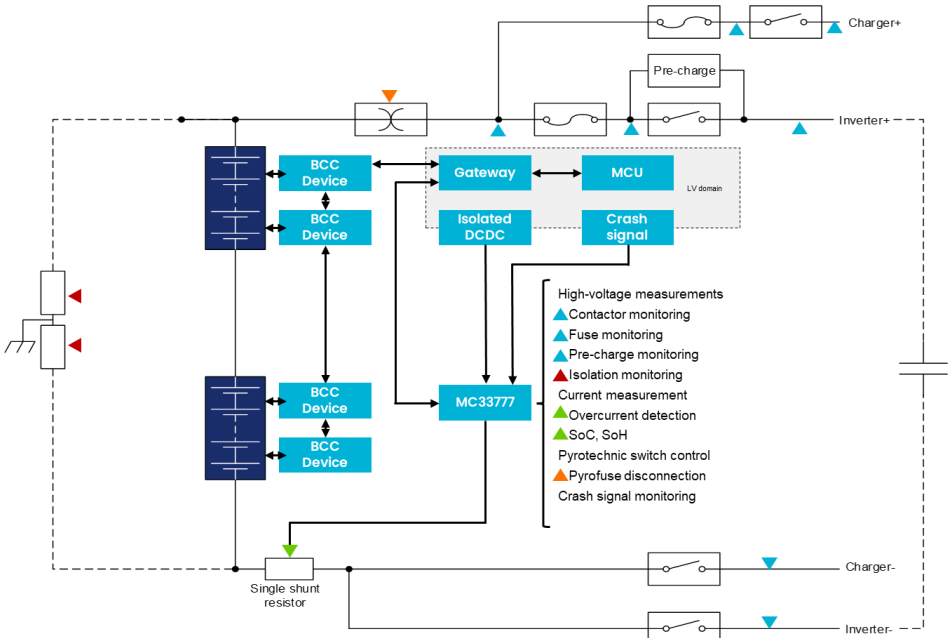


Figure 1: MC33777 application use case

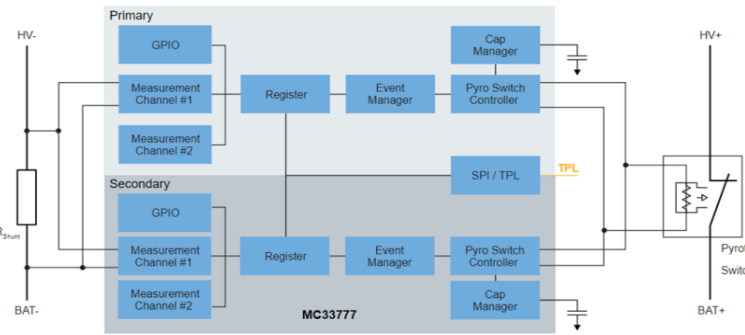


Figure 2: MC33777 simplified block diagram

MC33777 Battery Junction Box Device Family Portfolio

Part number	ASIL D Current Measurement inputs	Pyroswitch Controllers
Full feature set		
MC33777	2x	2x
Optimized feature set		
MC33779	1x	2x
MC33778	1x	1x
MC33776	1x	N/A

MC33777,6,8,9 are available for ordering NOW.
Selected Customer Market Launch on March 31, 2025

Available to selected customers only (non-disclosure agreement (NDA) required), please [contact support](#) or your local sales representative for more information.

Development Ecosystem

EVBMA777T2 MC33777A Evaluation Board with Isolated Daisy Chain

Designed to support the development of battery junction box, in automotive or industrial applications. The MC33777A supports ASIL D current measurements, voltage measurements and pyrotechnic switch control.

The board is ideal to exercise all the IC features and develop the associated software. It communicates with an isolated daisy chain.

Key Features

- Four current measurement channels (supporting two ASIL D current measurements)
- 16 analog inputs supporting redundant measurements
- Two independent pyrotechnic switch controllers including driver stage

Connectivity

- TPL communication, daisy chains support
- Isolated power supply

All MC33777 inputs/outputs accessible with connectors

Software

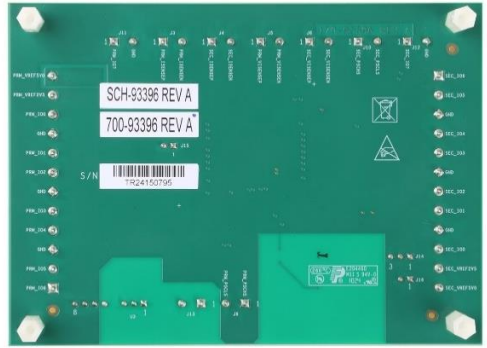
- Complex Device Drivers and Safety Libraries
- RTM release included in Gen2 SDK in June 2025.
- SDK tested on RTD 3.0.0

Evaluation GUI

<https://www.nxp.com/webapp/swlicensing/sso/downloadSoftware.sp?catid=SW-BMS-EvalGUI-D>

ScriptGUI

<https://www.nxp.com/webapp/swlicensing/sso/downloadSoftware.sp?catid=SW-BMS-ScriptGUI-D>



Key Selling Points

High-accuracy current measurement

Capable GPIOs/ANx on board

Integrated Pyroswitch Controller & Decision Engine, both ASIL D

Safe & Secure: ASIL D Compliant – Device supports up to 2x independent current paths, both with ASIL D Safety

Available Collateral






Public Collateral

- [MC33777 | Battery Junction Box Monitor IC Product Summary Page](#)
 - [MC33777A | Battery Junction Box Monitor Integrated Circuit Product Brief](#)
 - [Package SOT1510-2 – HLQFP64](#)
 - [NXP Press release–MC33777–Revolutionizes Battery Pack Monitoring Technology for EV](#)
 - [NXP SafeAssure[®] Functional Safety Program](#)
- [EVBMA777T2: MC33777A Evaluation Board with Isolated Daisy Chain Tool Summary Page](#)
 - [Getting Started with the EVBMA777T2](#)
 - [UM11884, EVBMA777T2 User Manual](#)
 - [Battery Junction Box \(BJB\) In-a-Chip: MC33777 BJB IC w/ Pyroswitch Driver and Decision Engine – Training](#)
 - [NXP Product Longevity Program](#)

Remove the below section if you want to re-send to customers

Distributors Call to Action

Use this Available Collateral to **create awareness of the product** and **promote** to potential customers looking for this solution.

DistyNet Collateral			
Enclosed 	Communicator	DistyNet 	<ul style="list-style-type: none">Six PackCompetitive AnalysisCommunicatorSuggested stockingMC33777 Distributor Extranet Images
Contact 	Contact your local NXP representative for supply and stocking inquiries. Maria Garcia Silva for NPI Launch questions. Silvio Marcon for product questions.		

Suggested stocking

Available to selected customers only (non-disclosure agreement (NDA) required), please [contact support](#) or your local sales representative for more information.

12NC	Orderable Part Number (OPN)	Suggested For Stocking	Market Launch Date	Order Date (RFS)	Approx. Qual/ Ship Date – Lead time	e-commerce	Suggested Stocking	MOQ
935464864557	MC33776ASAIAE	N	March 31 2025	Now	28 weeks	–	160	160
935464864528	MC33776ASAIAER2	N	March 31 2025	Now	28 weeks	–	–	–
935464863557	MC33776ATAIAE	N	March 31 2025	Now	28 weeks	–	160	160
935464863528	MC33776ATAIAER2	N	March 31 2025	Now	28 weeks	–	–	–
935464367557	MC33777ASAIAE*	Y	March 31 2025	Now	28 weeks	Y– March end	160	160
935464367528	MC33777ASAIAER2	N	March 31 2025	Now	28 weeks	–	–	–
935464362557	MC33777ATAIAE*	Y	March 31 2025	Now	28 weeks	Y– March end	160	160
935464362528	MC33777ATAIAER2	N	March 31 2025	Now	28 weeks	–	–	–
935464862557	MC33778ASAIAE	N	March 31 2025	Now	28 weeks	–	160	160
935464862528	MC33778ASAIAER2	N	March 31 2025	Now	28 weeks	–	–	–
935464861557	MC33778ATAIAE	N	March 31 2025	Now	28 weeks	–	160	160
935464861528	MC33778ATAIAER2	N	March 31 2025	Now	28 weeks	–	–	–
935464859557	MC33779ASAIAE	N	March 31 2025	Now	28 weeks	–	160	160
935464859528	MC33779ASAIAER2	N	March 31 2025	Now	28 weeks	–	–	–
935464858557	MC33779ATAIAE	N	March 31 2025	Now	28 weeks	–	160	160
935464858528	MC33779ATAIAER2	N	March 31 2025	Now	28 weeks	–	–	–
935460932598	EVBMA777T2	N	March 31, 2025	Now	15 weeks	Available on allocation only – No Disty stocking	–	1 pc

- Note 1: * Supersets full feature. Also available on e-commerce. Recommended for stocking.
- Note 2: Pricing is subject to change. Please reach out to your local NXP or distribution contact for the latest quotes.

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Exclusive Sample

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