

Intelligent Battery Family Product Guide

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OZ7706A

FEATURES

- ✧ Voltage Protection: High Accuracy OV: 3.3V to 4.575V, 5mV/step ; UV: 1.9V to 3.175V, 5mV/step
- ✧ Dual - Discharge Current Channels
- ✧ Discharge Current Protection: 3-level, 2-channel
 - DOC1: 10 mV to 168.75mV, 1.25mV/step; DOC2: 60mV to 260mV, 13.3mV/step
 - SC: $V_{SC} = 1.5X V_{DOC2}$
- ✧ Charge Current Protection 5 mV to 68.5mV, 0.5mV/step
- ✧ Temperature Protection: COT/DOT/CUT/DUT
- ✧ Dedicated 3.3V LDO for external micro-controller
- ✧ Simultaneous Multi - Cell Balance
- ✧ eLock and PWM control input
- ✧ End-of-Charge (EOC) function (optional)
- ✧ Cell-Tap-Open (CTO) Detection (optional)
- ✧ I2C Interface and ALERT Output to Optional External Host
- ✧ Low Power Consumption Active: <60uA (Typ) ; Sleep: < 4uA (Typ) Shutdown: < 2.5uA (Typ)

GENERAL DESCRIPTION

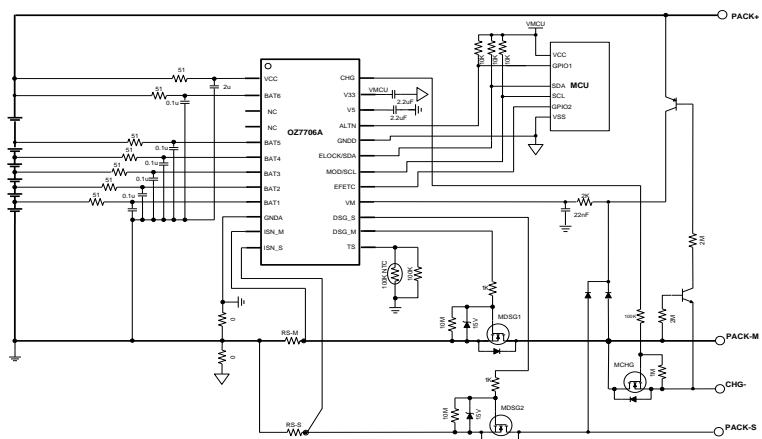
OZ7706A is a highly integrated, low cost Battery Pack Management IC for 4~6s Li-Ion/Polymer battery packs used in E-scooters, power tools, garden tools, home appliances and other applications. OZ7706A may operate standalone or host mode. A dedicated 3.3V LDO is for external host. It integrates an ADC to measure cell voltages, temperature, charge/discharge current and a safety engine which performs high accuracy and high reliable protection for the following safety events: OV, UV, COC, DOC (DOC1 and DOC2), SC, COT, DOT, CUT (Optional) and DUT (Optional).

OZ7706A provides two independent discharge current channels. The safety engine uses digital threshold values to compare with ADC digital outputs to detect DOC1 and COC. This enables high-accuracy current sense with the use of small current sense resistors (e.g. 2.5 mΩ) to reduce power dissipation and heat. OZ7706A uses one dedicated fast comparator for DOC2 detection and another for SC detection for each discharge channel. Each discharge channel has independent thresholds.

APPLICATIONS

- E-scooter
- Vacuum Cleaner or other Home Appliance
- Garden Tool, Power Tool, Energy Storage System/UPS

APPLICATION DIAGRAM



OZ7708

FEATURES

- ◇ Voltage Protection: High Accuracy OV: 3.3V to 4.575V, 5mV/step ; UV:1.9V to 3.175V, 5mV/step
- ◇ Dual - Discharge Current Channels
- ◇ Discharge Current Protection: 3-level, 2-channel
 - DOC1: 10 mV to 168.75mV, 1.25mV/step; DOC2: 60mV to 260mV, 13.3mV/step
 - SC: $V_{SC} = 1.5X$ or $2.5X V_{DOC2}$
- ◇ Charge Current Protection 5 mV to 68.5mV, 0.5mV/step
- ◇ Temperature Protection: COT/DOT/CUT/DUT
- ◇ Dedicated 3.3V LDO for external micro-controller
- ◇ Simultaneous Multi - Cell Balance
- ◇ eLock and PWM control input
- ◇ End-of-Charge (EOC) function (optional)
- ◇ Cell-Tap-Open (CTO) Detection (optional)
- ◇ I2C Interface and ALERT Output to Optional External Host
- ◇ Low Power Consumption Active: <60uA (Typ) ; Sleep: < 4uA (Typ) Shutdown: < 2.5uA (Typ)

GENERAL DESCRIPTION

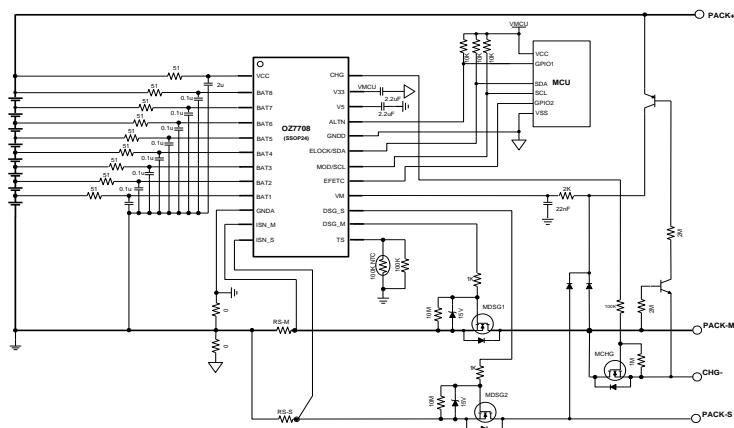
OZ7708 is a highly integrated, low cost Battery Pack Management IC for 5~8s Li-Ion/Polymer battery packs used in E-scooters, power tools, garden tools, home appliances and other applications. OZ7708 may operate standalone or host mode. A dedicated 3.3V LDO is for external host. It integrates an ADC to measure cell voltages, temperature, charge/discharge current and a safety engine which performs high accuracy and high reliable protection for the following safety events: OV, UV, COC, DOC (DOC1 and DOC2), SC, COT, DOT, CUT (Optional) and DUT (Optional).

OZ7708 provides two independent discharge current channels. The safety engine uses digital threshold values to compare with ADC digital outputs to detect DOC1 and COC. This enables high-accuracy current sense with the use of small current sense resistors (e.g. 2.5 mΩ) to reduce power dissipation and heat. OZ7706A uses one dedicated fast comparator for DOC2 detection and another for SC detection for each discharge channel. Each discharge channel has independent thresholds.

APPLICATIONS

- E-scooter
- Vacuum Cleaner or other Home Appliance
- Garden Tool, Power Tool, Energy Storage System/UPS

APPLICATION DIAGRAM



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OZ7710

FEATURES

- ✧ Standalone Protection; μ C optional
- ✧ High Accuracy Voltage Protection: OVP (Over-Voltage Protection) and UVP (Under-Voltage Protection)
- ✧ 3-level Discharge Current Protection
 - Discharge-Over-Current 1 (DOC1)
 - Discharge-Over-Current 2 (DOC2)
 - Short-Circuit (SC): $V_{SC} = 2.5 \cdot V_{DOC2}$
- ✧ Charge Current Protection
 - Charge-Over-Current (COC)
- ✧ Temperature Protection:
 - Charge-Over-Temperature (COT)
 - Charge-Under-Temperature (CUT) (optional)
 - Discharge-Over-Temperature (DOT)
 - Discharge-Under-Temperature (DUT) (optional)
 - Cell Balance Over Temperature (CBOT)
- ✧ Simultaneous Multi-Cell Balance Support
- ✧ eLock and PWM Control Input Support
- ✧ End-of-Charge (EOC) Function (optional)
- ✧ Cell-Tap-Open (CTO) Detection (optional)
- ✧ I2C Interface and ALERT Output to Optional External Host μ C
- ✧ Voltage-Based State-of-Charge Indicators (Pins for driving 4 LEDs in 28Pin package)
- ✧ Low Power Consumption

GENERAL DESCRIPTION

OZ7710 is a highly integrated, low-cost Battery Pack Protection Integrated Circuit for 5 to 10 serial cells. It can operate standalone to provide complete protections; it may be used with a host Microcontroller for more advanced management, if desired. It integrates an ADC to measure cells voltage, temperature and charge/discharge current. OZ7710 also includes a safety engine that performs high accuracy and high reliable protections: OV, UV, COC, DOC (DOC1 and DOC2), SC, COT, DOT, CUT (Optional), DUT (Optional), CBOT, CTO and EOC.

OZ7710 integrates an eLock anti-theft function. For eBike or Vacuum Cleaner battery packs, normally the discharge path is cut off when a mechanical lock or switch in the system is turned off. OZ7710 provides a pin to simplify implementation of this function.

OZ7710 integrates O2Micro's BOD™ (Balance On Demand) patented technologies, providing maximum energy per charge and longest cell cycle life. The maximum internal cell balance current is 25mA per cell; for higher cell balance current, an external cell balance circuit may be used.

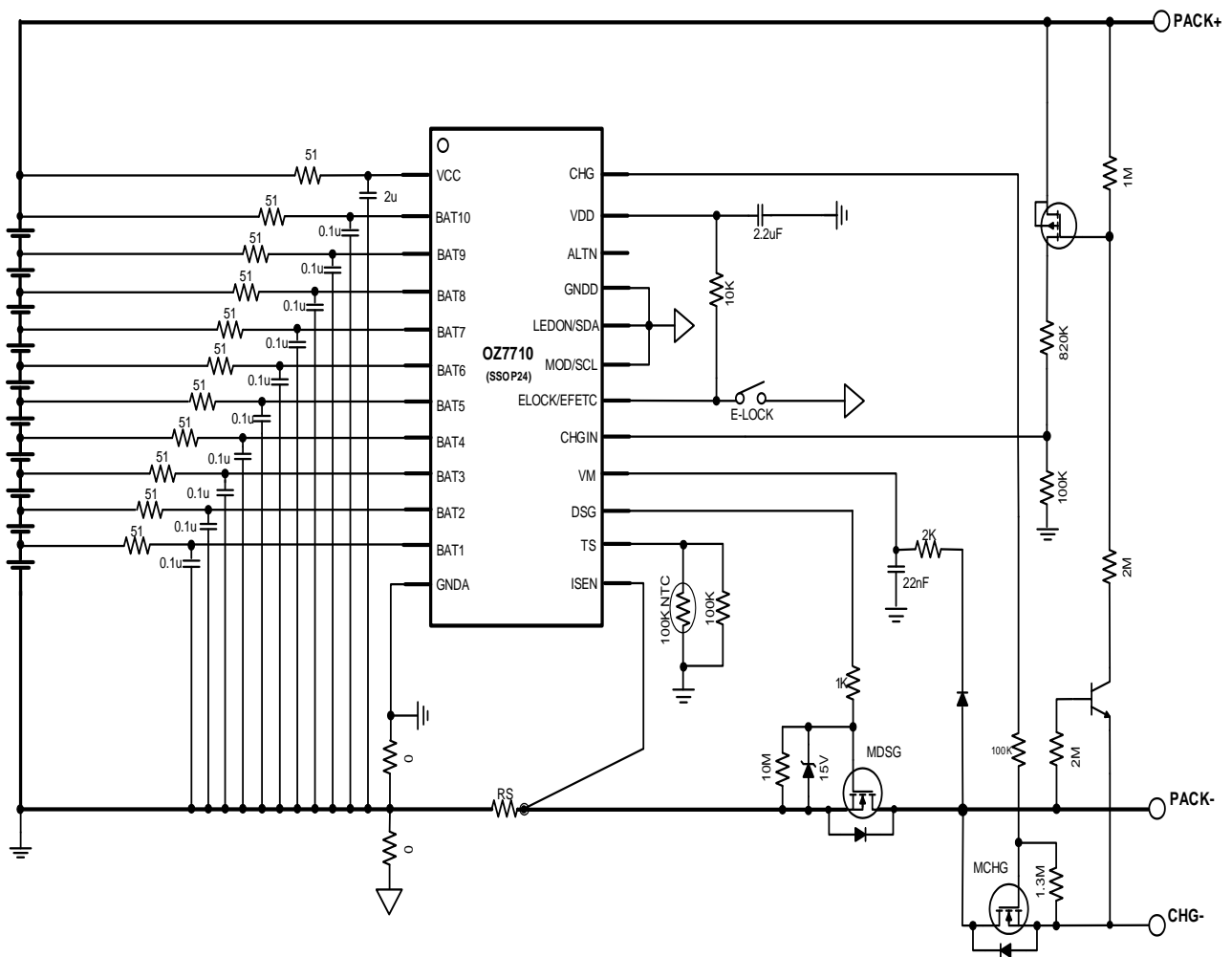
For DOC2 detection OZ7710 uses a fast comparator and a second fast comparator for Short Circuit detection.

OZ7710 provides an I2C interface enabling an external Host to access OZ7710 internal registers for reading cell voltage, temperature and battery charge/discharge current for advanced battery management.

APPLICATIONS

- Home Appliance
- E-Bike, E-scooter
- Garden Tool, Power Tool
- Energy Storage System/UPS

APPLICATION DIAGRAM



OZ7714

FEATURES

- ✧ Standalone Protection; μ C optional
- ✧ High Accuracy Voltage Protection: OVP (Over-Voltage Protection) and UVP (Under-Voltage Protection)
- ✧ 3-level Discharge Current Protection
 - Discharge-Over-Current 1 (DOC1)
 - Discharge-Over-Current 2 (DOC2)
 - Short-Circuit (SC): $V_{SC} = 2.5 \cdot V_{DOC2}$
- ✧ Charge Current Protection
 - Charge-Over-Current (COC)
- ✧ Temperature Protection:
 - Charge-Over-Temperature (COT)
 - Charge-Under-Temperature (CUT) (optional)
 - Discharge-Over-Temperature (DOT)
 - Discharge-Under-Temperature (DUT) (optional)
 - Cell Balance Over Temperature (CBOT)
- ✧ Simultaneous Multi-Cell Balance Support
- ✧ eLock function
- ✧ End-of-Charge (EOC) Function (optional)
- ✧ Cell-Tap-Open (CTO) Detection (optional)
- ✧ I2C Interface to External Host
- ✧ Low Power Consumption

GENERAL DESCRIPTION

OZ7714 is a highly integrated, low-cost Battery Pack Protection Integrated Circuit for 7 to 10 serial cells. It can operate standalone to provide complete protections; it may be used with a host Microcontroller for more advanced management, if desired. It integrates an ADC to measure cells voltage, temperature and charge/discharge current. OZ7714 also includes a safety engine that performs high accuracy and high reliable protections: OV, UV, COC, DOC (DOC1 and DOC2), SC, COT, DOT, CUT (Optional), DUT (Optional), CBOT, CTO and EOC.

OZ7714 integrates an eLock anti-theft function. For eBike or Vacuum Cleaner battery packs, normally the discharge path is cut off when a mechanical lock or switch in the system is turned off. OZ7714 provides a pin to simplify implementation of this function.

OZ7714 integrates O2Micro's BOD™ (Balance On Demand) patented technologies, providing maximum energy per charge and longest cell cycle life. The maximum internal cell balance current is 25mA per cell; for higher cell balance current, an external cell balance circuit may be used.

For DOC2 detection OZ7714 uses a fast comparator and a second fast comparator for Short Circuit detection.

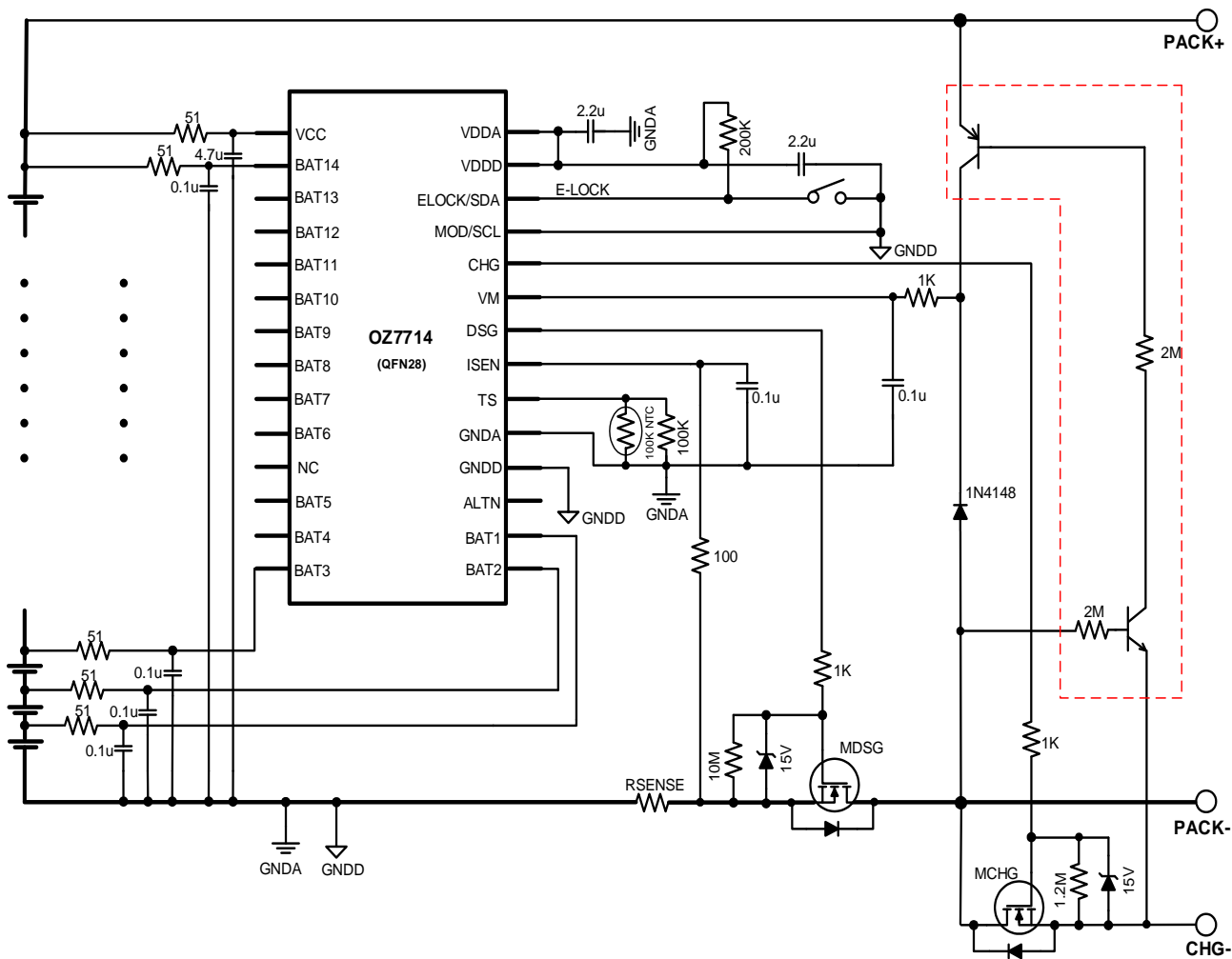
OZ7714 provides an I2C interface enabling an external Host to access OZ7714 internal registers for

reading cell voltage, temperature and battery charge/discharge current for advanced battery management.

APPLICATIONS

APPLICATION DIAGRAM

- Home Appliance
- E-Bike, E-scooter
- Garden Tool, Power Tool
- Energy Storage System/UPS



OZ93510

FEATURES

- ◇ OZ93510 is a highly integrated, high performance battery management system integrated circuit to monitor and protect up to 10 Li-Ion cells in series
- ◇ Integrates a 32Bit ARM Cortex M0 MCU with 32KBytes eFlash (8K x 32 bits)
- ◇ Extended Flash (64 or 128KBytes) for Data storage is available as package option.
- ◇ High-voltage (60V) front end to measure individual cell voltage differentially with 14-bit SAR ADC
- ◇ Accurate pack current measurement and Coulomb Counting with a 16-bit current ADC enabling SOC and SOH functionality
- ◇ Multiple serial buses: SPI, UART, and I2C.
- ◇ Up to 2 DSG drivers with fast turn-off and 2 CHG drivers
- ◇ Multiple temperature sense channels with precision internal current source
- ◇ Precision Real Time Clock with optional crystal
- ◇ Fast Over-Current/Short-Circuit protection with embedded analog comparators
- ◇ Hardware based auto-scan to improve safety
 - MCU based primary protection
 - Hardware based standalone protection as optional redundancy protection
- ◇ Up to 22 GPIOs, includes 12 general purpose ADC inputs (package dependent)
- ◇ Timers (Two 32-bit timers, Two 16-bit timers with PWM support, and Windowed WDT)
- ◇ DMA control to directly access related blocks
- ◇ Low Power consumption

GENERAL DESCRIPTION

OZ93510 is a highly integrated, high performance battery management IC that can monitor and protect from 3 to 10 cells in series. It also integrates various series communication interfaces such as SPI, I2C and UART, together with multiple general purpose IOs for function expansion.

OZ93510 integrates a 32Bit ARM Cortex M0 MCU with 32Kbytes embedded eFlash (8K x 32bits) for advanced battery pack management program storage and other non-volatile memory needs.

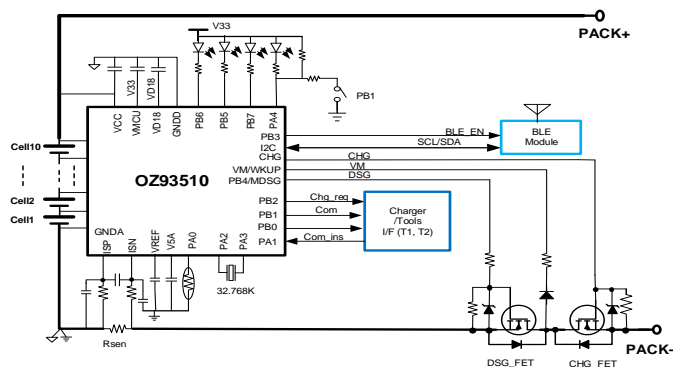
It features a high-voltage (60V) front end to measure differential cell voltages with a 14-bit ADC.

It also has accurate pack current measurement and Coulomb counting with a 16-bit current ADC enabling SOC and SOH functionality. Additional fast Over Current/Short Circuit protections are provided by real-time Comparators.

APPLICATIONS

- Cordless Vacuum Cleaners
- Power Tool
- Electric Bicycles
- Electric Motorcycles

APPLICATION DIAGRAM



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OZ93506

FEATURES

- ◇ OZ93506 is a highly integrated, high performance battery management system integrated circuit to monitor and protect up to 6 Li-Ion cells in series
- ◇ Integrates a 32Bit ARM Cortex M0 MCU with 16KBytes eFlash (4K x 32 bits)
- ◇ Extended Flash (64 or 128KBytes) for Data storage is available as package option.
- ◇ High-voltage (40V) front end to measure individual cell voltage differentially with 14-bit SAR ADC
- ◇ Accurate pack current measurement and Coulomb Counting with a 16-bit current ADC enabling SOC and SOH functionality
- ◇ Multiple serial buses: SPI, UART, and I2C.
- ◇ Dedicated FET driver for Charge/Discharge control
- ◇ Multiple temperature sense channels with precision internal current source
- ◇ Precision Real Time Clock with optional crystal
- ◇ Fast Over-Current/Short-Circuit protection with embedded analog comparators
- ◇ Hardware based auto-scan to improve safety
 - MCU based primary protection
 - Hardware based standalone protection as optional redundancy protection
- ◇ Up to 20 GPIOs, includes 8 general purpose ADC inputs
- ◇ Timers (Two 32-bit timers, Two16-bit timers with PWM support, and Windowed WDT)
- ◇ DMA control to directly access related blocks
- ◇ Low Power consumption

GENERAL DESCRIPTION

OZ93506 is a highly integrated, high performance battery management IC that can monitor and protect from 3 to 6 cells in series. It also integrates various series communication interfaces such as SPI, I2C and UART, together with multiple general purpose IOs for function expansion.

OZ93506 integrates a 32Bit ARM Cortex M0 MCU with 16Kbytes embedded eFlash (4K x 32bits) and optional additional 64K or 128Kbytes extension for advanced battery pack management data and/or code storage and other non-volatile memory needs.

It features a high-voltage (40V) front end to measure differential cell voltages with a 14-bit ADC.

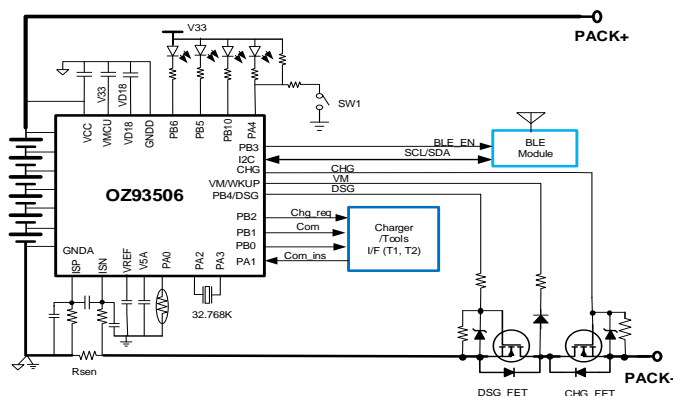
It also has accurate pack current measurement and Coulomb counting with a 16-bit current ADC enabling SOC and SOH functionality. Additional fast Over Current/Short Circuit protections are provided by real-time Comparators.

APPLICATIONS

- Cordless Vacuum Cleaners
- Power Tool, Garden Tool
- Home Appliances

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APPLICATION DIAGRAM



OZ93110

FEATURES

- ✧ Cell Voltage Measurement
 - 12-bit ADC with input range: 0V to 5.12V
 - Accuracy (at 4.25V, 23°C): $\pm 10\text{mV}$ @ typical
- ✧ Pack Current Measurement
 - 16-bit dedicated ADC with input range: -256mV to 256mV
 - Accuracy (in the whole input range) @ 23°C:
 - Gain error: 1% @ typical
 - Offset error: $\pm 100\mu\text{V}$ @ typical
- ✧ Pack Temperature Measurement
 - 12-bit ADC with input range: 0V to 2.56V
 - Accuracy (at 1V, 23°C): $\pm 2\text{mV}$ @ typical
- ✧ Multiple Level, Programable Battery Protection including:
 - Over-Voltage (OV)
 - Under-Voltage (UV)
 - Over-Current
 - Charger-Over-Current (COC)
 - Discharge-Over-Current 1 (DOC1)
 - Discharge-Over-Current 2 (DOC2)
 - Short-Circuit (SC)
 - Charge-Over-Temperature (COT)
 - Charge-Under-Temperature (CUT) (optional)
 - Discharge-Over-Temperature (DOT)
 - Discharge-Under-Temperature (DUT) (optional)
- ✧ Simultaneous Multi - Cell Balance
- ✧ Integrated Low Power 8-bit Microcontroller
 - 64k bytes EFLASH and 1k bytes SRAM
 - Optional and customized battery Gas Gauge algorithm
 - 10 GPIO ports for extended battery management (Load-off detection, LED drivers, etc.)
 - SBS V1.1 compatible
- ✧ Integrates Hardware Coulomb Counter
- ✧ Ultra-Low Power Consumption

GENERAL DESCRIPTION

OZ93110 is a highly integrated, low-cost Battery Pack Management IC for 4 to 10 serial cells Li-Ion/Polymer battery packs used in eBike, power tools, garden tools, home appliances, drone and other applications. OZ93110 integrates a highly reliable Digital-Front-End (DFE) and an 8-bit low power Microcontroller.

The DFE is responsible to converting cell and thermistor voltages to digital values with a level shifter and a 12-bit ADC.

The 8-bit Microcontroller uses the digital ADC values from the DFE to monitor each cell state and the battery pack temperature. It also performs patented “Balance On Demand (BOD)” algorithm to determine which cell needs balancing, then controls the balance switches in the DFE.

OZ93110 integrates a 15-bit +sign bit ADC for accurate COC/DOC1 protection current measurement and fast analog comparators for DOC2/SC protection.

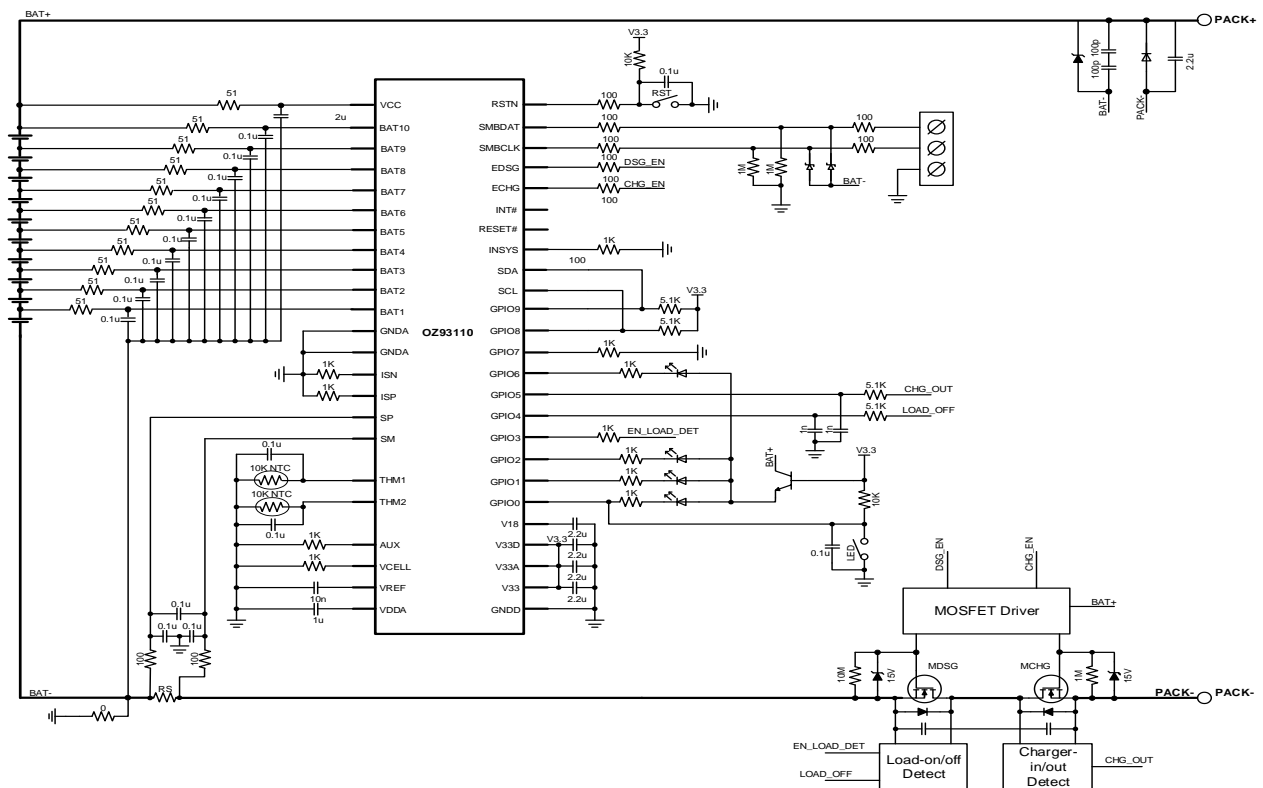
OZ93110 integrates a dedicated Coulomb Counter implementing a high precision Gas Gauge. It also supports Smart Battery Specification (SBS) V1.1. External microcontroller simply needed for system management.

The 64k bytes EFLASH and 1k bytes SRAM together with the Microcontroller provide programming space and flexibility, so it is possible to implement flexible and customized battery protection engine, power mode management and high precision Gas Gauge algorithm. The integrated 10 GPIO ports further extend the battery management ability such as Load-off detection, LEDs driver, etc.

APPLICATIONS

- Home Appliance
- E-Bike, E-scooter
- Garden Tool, Power Tool
- Energy Storage System/UPS
- Drone

APPLICATION DIAGRAM



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OZ8955

FEATURES

- ◇ High Accuracy Voltage Detection
 - Over voltage (OV) threshold range V_{OVP} : 3.6V~4.35V; $\pm 25\text{mV}$
 - Permanent Failure protection threshold range
 - $V_{PF} = V_{OVP} + (75\text{mV} \sim 250\text{mV})$; $\pm 25\text{mV}$, Release $V_{PFR} = V_{OVP}$
 - Under voltage (UV) threshold range
 - V_{UVP} : 1.9V~2.9V; $\pm 80\text{mV}$ - Hysteresis Voltage: 0V~1.0V
- ◇ Permanent Failure (PF) burn fuse protection
- ◇ Independently Adjustable OV, UV and PF delay timers
- ◇ Charging Permission (CP) condition check
- ◇ Over-Temperature (OT) Protection
- ◇ Low Power Consumption
 - Full-power mode: <25uA Max (25°C) Sleep mode: <5.5uA Max (25°C)
 - Standby mode: <3uA Max (25°C) UVLO mode: <1.5uA Max (25°C)

GENERAL DESCRIPTION

OZ8955 is a highly integrated, low cost, protection and monitoring IC for battery packs with 3, 4 or 5 Li-ion/Polymer cells. It features Over Voltage (OV), Under Voltage (UV), Charging Permission (CP), Over Temperature (OT) and Permanent Failure (PF) burn fuse protection functions to ensure safety of the battery pack used in power-tools, notebook and UPS applications. The number of cells protected by the OZ8955 is model selectable and configured by O2Micro based on requirement of the system designer.

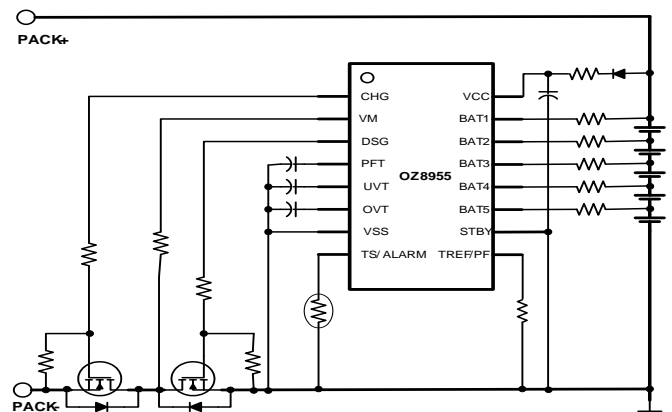
OZ8955 provides a special STBY pin to control the IC's power modes. When STBY pin is connected to V_{CC} or floating, except during OV protection state, OZ8955 enters standby mode from full power mode to save power consumption. When STBY pin is connected to V_{SS} , OZ8955 returns to full-power mode. In standby mode, OZ8955 periodically returns to full power mode to check if OV event has occurred. If OV event occurs, OZ8955 exits standby mode and continues to operate in full power mode.

OZ8955 can directly drive both the charge and discharge NMOS FET at the Pack- side.

APPLICATIONS

- Power Tools
- Notebook PC
- UPS
- Remote Controlled Vehicles

APPLICATION DIAGRAM



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OZ8957

FEATURES

- ✧ Stack multiple OZ8957 ICs to protect 8 to 21 cells in series, or more
- ✧ High Accuracy Voltage Detection
 - **OV:** V_{OVP} : 3.6 to 4.35 V; ± 25 mV, Hysteresis Voltage: 0 V, or 0.1 to 0.25 V
 - **UV:** V_{LVP} : 1.9 to 2.9 V; ± 80 mV, Hysteresis Voltage: 0 to 1.0 V
- ✧ 3-Level High Accuracy Over-Current Protection
 - **DOC1:** $V_{DOC1} = 0.025$ to 0.35 V; ± 10 mV **DOC2:** $V_{DOC2} = 2.0 * V_{DOC1}$; **SC:** $V_{SC} = 5.0 * V_{DOC1}$
- ✧ Load-open or Charger-In release for discharge protection
- ✧ Balances VCC current for each chip in stacked application (*patent pending*)
- ✧ Charging Permission (CP) condition check
- ✧ Supports NMOS-FET for charge and discharge control switch at negative pack side
- ✧ Low Power Consumption
 - Full power mode: 21 μ A (Typ) Sleep mode: 6 μ A (Typ)
 - Standby mode: 1.5 μ A (Typ) Shutdown: 0.15 μ A (Typical)

GENERAL DESCRIPTION

OZ8957 is a highly integrated, low cost, stackable IC that protects 4 to 7 cell Li-Ion/Polymer battery packs used in power-tools, e-bikes, e-scooters, notebook PCs, UPS, and other applications. OZ8957 detects OV, UV, OC and SC conditions with high accuracy.

OZ8957 detects Over Current with ± 10 mV maximum error. This enables high-accuracy current sense with the use of small resistors (e.g. 2.5 m Ω , or 5 m Ω) to reduce power dissipation and heat. OZ8957 includes three integrated comparators for 3-level Over Current Protection. These comparators provide accurate and timely protection, and include false-trigger protection.

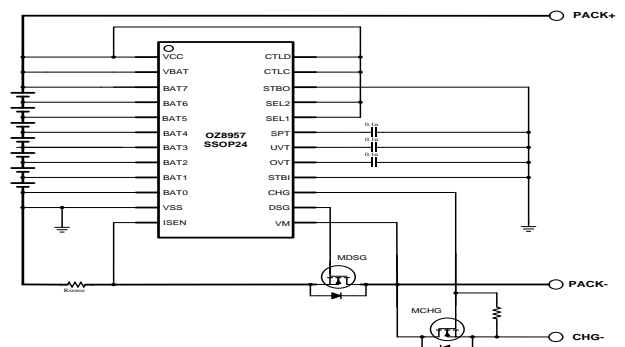
OZ8957 has two low power modes: Sleep mode and Standby mode. In Sleep mode, the typical current consumption is 6 μ A. The typical current consumption is 1.5 μ A.

OZ8957 is stackable to support applications with 8 to 21 cells, or even larger cell stacks. When stacked, the current consumed by each OZ8957 is automatically balanced.

APPLICATIONS

- Power Tools
- E-Bike/E-Scooter
- Notebook PC
- UPS
- Remote Controlled Vehicles

APPLICATION DIAGRAM



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OZ7703/4/5

FEATURES

- ❖ Voltage Protection: High Accuracy OV: 4.1V to 4.475V; 25mV/step ; UV: 2V to 3V; 100mV/step;
- ❖ Current Protection: 3-levels
 - DOC1: $V_{DOC1} = 0.025$ to 0.35 V; DOC2: $V_{DOC2} = 2.0 * V_{DOC1}$; SC: $V_{SC} = 5 * V_{DOC1}$
- ❖ Discharge Protection Release: Load-off or Charger-in Release
- ❖ Temperature Protection: COT/DOT/CUT
- ❖ Cell-Tap-Open Detection (CTO)
- ❖ Temperature-Sensor-Open Detection (TSO)
- ❖ Low Power Consumption
 - Full-power mode: 20uA (Typ)
 - Sleep mode: 4.5uA (Typ)
 - Power down: 0.5uA (Typ)

GENERAL DESCRIPTION

OZ7703/4/5 is a highly integrated, low cost IC that protects 3/4/5 cell Li-Ion/Polymer battery packs used in power tools, home appliance and other battery powered applications.

It integrates a safety engine to perform high accuracy battery protections: OV/UV/DOC1/DOC2/SC/COT/DOT/CUT

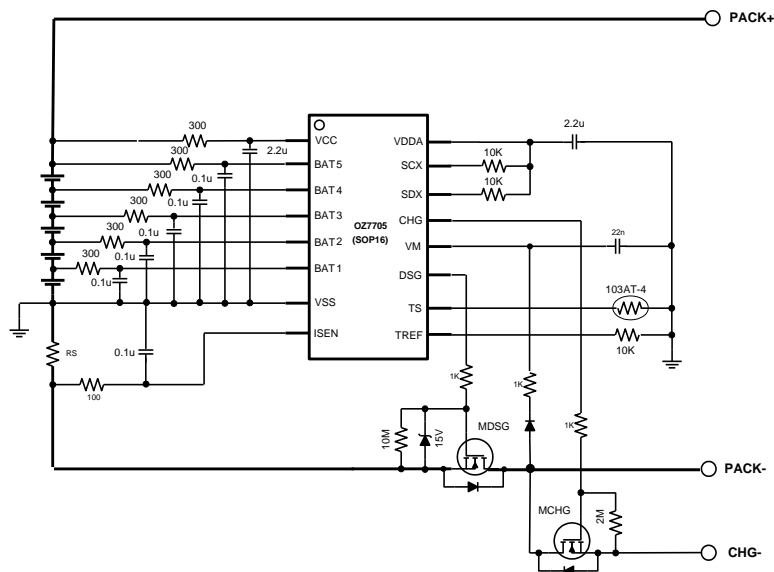
It also provides Cell-Tap-Open (CTO) detection and Temperature-Sensor-Open (TSO) detection, when any of these events occurs, OZ7703/4/5 will switch off the charge and discharge MOSFETs to ensure system safety.

OZ7703/4/5 includes three comparators for 3-levels Over-Current protection. Each level has a proper protection delay timer to avoid false-trigger.

APPLICATIONS

- Power Tools
- Home Appliance
- Remote Controlled Vehicles

APPLICATION DIAGRAM



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OZ77205

FEATURES

- ❖ Protection parameter field programming capability or preprogrammed in One-Time Programmable (EPROM) memory
- ❖ Accurate Voltage Protection
 - OV: 3.5V to 4.5V; 10mV/Step, Accuracy: $\pm 15\text{mV}$ (typ.);
 - UV: 1.2V~1.8V; 200mV/step, 1.8V~ 3.0V;100mV/step
- ❖ Current Protection: COC and 3-levels DOC
 - COC: 5~80mV, 5mV/step (optional)
 - DOC 1: $V_{\text{DOC}1} = 10\sim 160\text{mV}$; 10mV/step DOC2: $V_{\text{DOC}2} = 2.0 * V_{\text{DOC}1}$ SC: $V_{\text{SC}} = 4 * V_{\text{DOC}1}$
- ❖ Temperature Protection CUT/DUT/COT/DOT
- ❖ Cell-Tap-Open Detection (CTO) (Optional)
- ❖ Temperature-Sensor-Open Detection (TSO) (Optional)
- ❖ Cell tap filter Resistor (RF): Up to 10K Ω
- ❖ Ultra-low current consumption:
 - Active: 6 μA (CHG pin is floating); Power-Down: 0.3 μA (Typ)

GENERAL DESCRIPTION

OZ77205 is a highly integrated, cost-competitive battery protection IC that monitors 3~5 cell Li-Ion/Polymer battery packs used in power tools, home appliance and other battery powered applications.

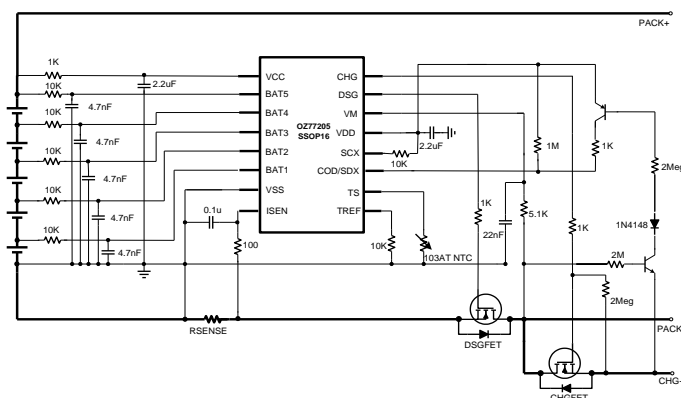
OZ77205 integrates a safety engine to perform high accuracy battery protections: OV/UV/COC(optional)/DOC1/DOC2/SC/COT(optional)/DOT(optional)/CUT(optional)/DUT(optional)

Under usual configuration, when OV, COC, COT, CUT, DUT or DOT events occur, the CHG output will be in OFF state; when UV, DOC1, DOC2, SC, DUT or DOT events occur, the DSG output will be in OFF state. When no protection events occur, CHG and DSG will be in ON state. It also provides Cell-Tap-Open (CTO) detection and Temperature-Sensor-Open (TSO) detection. When any of these events occurs, CHG and DSG will be in OFF state. OZ77205 includes three comparators for 3-levels Discharge Over-Current protection. Each level has a proper protection delay timer to avoid false-trigger.

APPLICATIONS

- Power Tools
- Cordless Vacuum Cleaners
- Battery Powered Home Appliance
- Other Lilon battery powered application

APPLICATION DIAGRAM



[Homepage](#)

OZ8975

FEATURES

- ◇ Protection for 3~5 Lilon Series Cells
- ◇ Protection parameter field programming capability or preprogrammed in One-Time Programmable (EFUSE) memory
- ◇ Accurate Voltage Protection:
 - OV: 3.5V to 4.5V; 10mV/Step Accuracy: $\pm 15\text{mV}$ (typ)
 - UV(Optional) : 1.2V~1.8V; 200mV/step; 1.8V~ 3.0V;100mV/step Accuracy: $\pm 35\text{mV}$ (typ)
- ◇ Temperature Protection CUT/COT/DOT
- ◇ Cell-Tap-Open Detection (CTO)
- ◇ Cell tap filter Resistor (RF): $10\text{K}\Omega$
- ◇ Ultra-low current consumption 0.8 μA (Typ.)

GENERAL DESCRIPTION

OZ8975 is a highly integrated, cost-competitive battery protection IC that monitors 3~5 cell Li-Ion/Polymer battery packs used in power tools, home appliance and other battery powered applications.

OZ8975 integrates a safety engine to perform high accuracy battery protection: OV/UV(optional)/COT(optional)/DOT(optional)/CUT(optional)

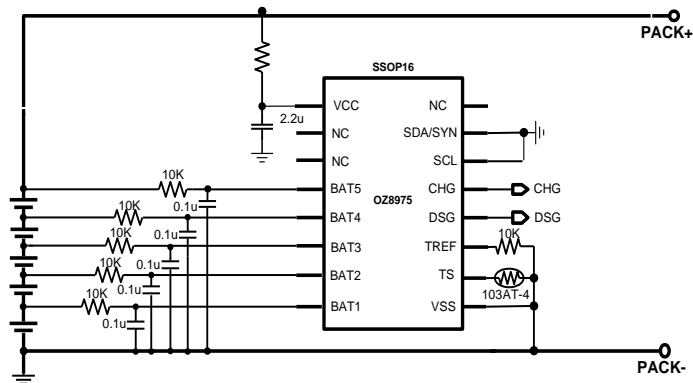
Under usual configuration, when OV, COT, CUT or DOT events occur, the CHG pin will be in OFF state; when UV or DOT events occur, the DSG pin will be in OFF state. When no protection events occur, CHG and DSG will be in ON state. To meet different application requirements, the definition (High or Low) of the ON state and OFF state of CHG and DSG are configurable, and COT, CUT, UV protection can be disabled, also the relationship between the CHG state and UV protection is selectable. OZ8975 also provides Cell-Tap-Open (CTO) detection. When this event occurs, OZ8975 will set both CHG and DSG in OFF state for fault alert.

OZ8975 provides 2 types of outputs on its CHG and DSG: Low-voltage CMOS (push-pull or open-drain selectable)(Version C) and High-voltage Open-drain (Version D).

APPLICATIONS

- Power Tools
- Home Appliance
- Other Lilon battery powered application

APPLICATION DIAGRAM



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OZ8978

FEATURES

- ✧ Protection for 5~8 Lilon Series Cells
- ✧ Protection parameter field programming capability or preprogrammed in One-Time Programmable (EFUSE) memory
- ✧ Accurate Voltage Protection:
 - OV: 3.5V to 4.5V; 10mV/Step Accuracy: $\pm 15\text{mV}$ (Typ)
 - UV(Optional) : 1.2V~1.8V; 200mV/step; 1.8V~ 3.0V;100mV/step Accuracy: $\pm 35\text{mV}$ (Typ)
- ✧ Temperature Protection CUT/COT/DOT
- ✧ Cell-Tap-Open Detection (CTO)
- ✧ Cell tap filter Resistor (RF): 10K Ω
- ✧ Ultra-low current consumption 0.9 μA (Typ.)

GENERAL DESCRIPTION

OZ8978 is a highly integrated, cost-competitive battery protection IC that monitors 5~8 cell Li-Ion/Polymer battery packs used in power tools, home appliance and other battery powered applications.

OZ8978 integrates a safety engine to perform high accuracy battery protection: OV/UV(optional)/COT(optional)/DOT(optional)/CUT(optional)

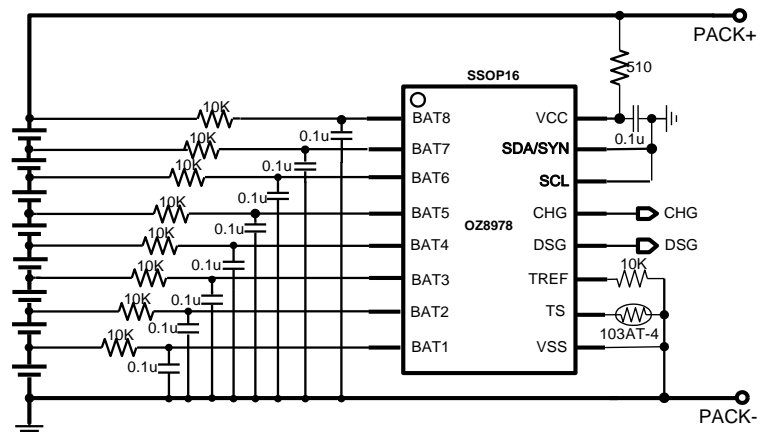
Under usual configuration, when OV, COT, CUT or DOT events occur, the CHG pin will be in OFF state; when UV or DOT events occur, the DSG pin will be in OFF state. When no protection events occur, CHG and DSG will be in ON state. To meet different application requirements, the definition (High or Low) of the ON state and OFF state of CHG and DSG are configurable, and COT, CUT, UV protection can be disabled, also the relationship between the CHG state and UV protection is selectable. OZ8978 also provides Cell-Tap-Open (CTO) detection. When this event occurs, OZ8978 will set both CHG and DSG in OFF state for fault alert.

OZ8978 provides 2 types of outputs on its CHG and DSG: Low-voltage CMOS (push-pull or open-drain selectable)(Version C) and High-voltage Open-drain (Version D).

APPLICATIONS

- Vacuum Cleaners
- Power Tools
- Home Appliance
- Other Lilon battery powered application

APPLICATION DIAGRAM



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OZ89710

FEATURES

- ◇ Protection for 5~10 Li-Ion Series Cells
- ◇ Protection parameter field programming capability or preprogrammed in One-Time Programmable (EFUSE) memory
- ◇ Accurate Voltage Protection:
 - OV: 3.5V to 4.5V; 10mV/Step Accuracy: ±15mV (typ)
 - UV: 1.2V~1.8V, 200mV/step; 1.8V~ 3.0V, 100mV/step; Accuracy: ±35mV (Typ.)
- ◇ Temperature Protection(Optional): COT/DOT/CUT
- ◇ Cell-Tap-Open Detection (CTO) (Optional)
- ◇ Cell tap filter Resistor (RF): 10KΩ
- ◇ Ultra-low current consumption 1µA (Typ.)

GENERAL DESCRIPTION

OZ89710 is a highly integrated, cost-competitive battery protection IC that monitors 5~10 cell Li-Ion/Polymer battery packs used in power tools, home appliances and other battery powered applications.

OZ89710 integrates a safety engine to perform high accuracy battery protection: OV/UV(Optional)/COT(Optional)/DOT(Optional)/CUT(Optional)

When any safety event occurs, either CHG or DSG output state will be changed. One default setting is provided in Protection State and DSG, CHG Output Summary Table. To meet different application requirements, the output type definition (Open-drain or push-pull, active high or active low) of CHG and DSG are set as user parameters in the EFUSE.

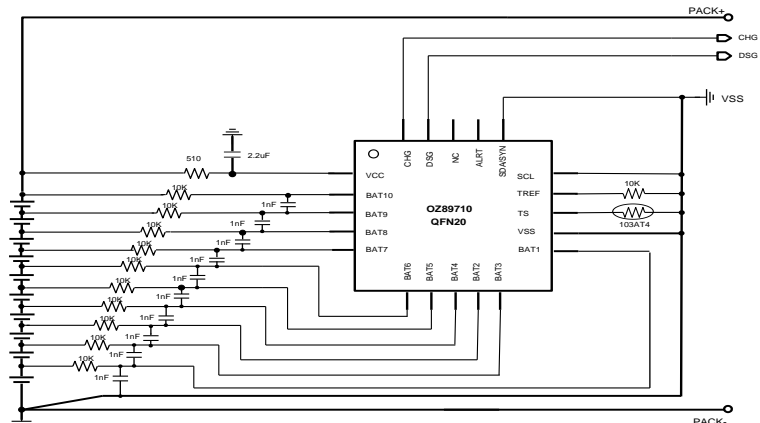
OZ89710 also provides Cell-Tap-Open (CTO) detection. When this event occurs, OZ89710 will set both CHG and DSG in Off-state for fault alert.

OZ89710 provides 2 types of outputs on its CHG and DSG: high voltage open-drain and low voltage open-drain/push-pull.

APPLICATIONS

- Vacuum Cleaners
- Power Tools
- Home Appliance
- Other Lilon battery powered application

APPLICATION DIAGRAM



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OZ89725

FEATURES

- ◇ Protection for 3~5 Lilon Series Cells
- ◇ Protection parameter field programming capability or preprogrammed in One-Time Programmable (OTP) memory
- ◇ Accurate Voltage Protection:
 - OV: 3.5V to 4.5V; 10mV/Step Accuracy: $\pm 15\text{mV}$ (typ)
 - UV (Optional) : 1.2V~1.8V, 200mV/step; 1.8V~3.0V, 100mV/step, Accuracy: $\pm 35\text{mV}$ (typ)
- ◇ Temperature Protection(Optional): COT/DOT/CUT/DUT
- ◇ Cell-Tap-Open Detection (CTO) (Optional)
- ◇ Cell tap filter Resistor (RF): Up to 10K Ω
- ◇ Ultra-low current consumption 1.2 μA (Typ.)

GENERAL DESCRIPTION

OZ89725 is a highly integrated, cost-competitive battery protection IC that monitors 3~5 cells Li-Ion/Polymer battery packs used in power tools, cordless Vacuum Cleaner and other battery powered applications.

OZ89725 integrates a safety engine to perform high accuracy battery protection: OV/UV(Optional)/COT(Optional)/DOT(Optional)/CUT(Optional)

Under normal configuration, when any of OV, COT, CUT, DOT or DUT events occurs, the CHG pin will be in OFF state; when any of UV, DOT or DUT events occurs, the DSG pin will be in OFF state. When no protection events occur, CHG and DSG will be in ON state. To meet different application requirements, the definition (High or Low) of the ON state and OFF state of CHG and DSG are configurable, and COT, CUT, DOT, DUT or UV protection can be disabled individually, also the relationship between the CHG state and UV protection is selectable. All these options are set as user parameters in the OTP.

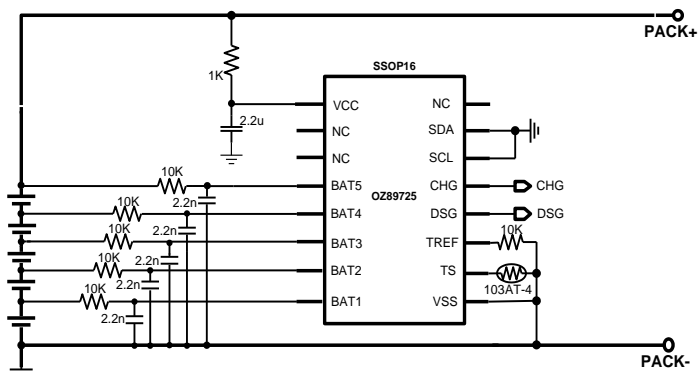
OZ89725 also provides Cell-Tap-Open (CTO) detection optionally. When this event occurs, OZ89725 will set both CHG and DSG in OFF state for fault alert.

OZ89725 provides 2 types of outputs on its CHG and DSG: push-pull and open-drain.

APPLICATIONS

- Cordless Vacuum Cleaner
- Power Tools
- Other Lilon battery powered application

APPLICATION DIAGRAM



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OZ26305

FEATURES

- ◇ Protection for 3~5 Lilon Series Cells
- ◇ Protection parameter field programming capability or preprogrammed in One-Time Programmable (OTP) memory
- ◇ Accurate Voltage Protection:
 - OV: 3.5V to 4.5V; 10mV/Step Accuracy: ±15mV (Typ)
 - UV (Optional): 1.2V~1.8V,200mV/step; 1.8V~ 3.0V,100mV/step; Accuracy: ±35mV (Typ)
- ◇ Cell-Tap-Open Detection (CTO) (Optional)
- ◇ Cell tap filter Resistor (RF): Up to 10KΩ
- ◇ Ultra-low current consumption 1.2μA (Typ.)

GENERAL DESCRIPTION

OZ26305 is a highly integrated, cost-competitive battery protection IC that monitors 3~5 cell Li-Ion/Polymer battery packs used in power tools, cordless Vacuum Cleaner and other battery powered applications.

OZ26305 integrates a safety engine to perform high accuracy battery protection: OV and UV(optional)

Under normal configuration, when OV event occurs, the CHG pin will be in OFF state; when UV event occurs, the DSG pin will be in OFF state. When no protection events occur, CHG and DSG will be in ON state. To meet different application requirements, the definition (High or Low) of the ON state and OFF state of CHG and DSG are configurable, and UV protection can be disabled, also the relationship between the CHG state and UV protection is selectable. All these options are set as user parameters in the OTP memory.

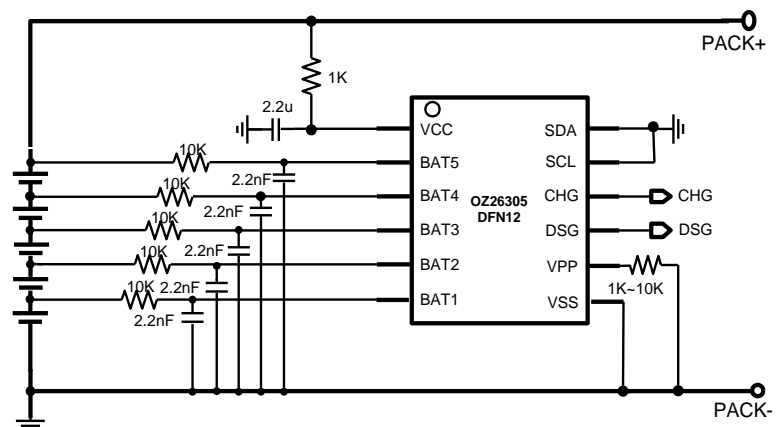
OZ26305 also provides Cell-Tap-Open (CTO) detection optionally. When this event occurs, OZ26305 will set both CHG and DSG in OFF state for fault alert.

OZ26305 provides 2 types of outputs on its CHG and DSG: push-pull and open-drain.

APPLICATIONS

- Vacuum Cleaners
- Power Tools
- Other Lilon battery powered application

APPLICATION DIAGRAM



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OZ2605

FEATURES

- ✧ High Accuracy Over-Voltage (OV) Protection
 - OV: 3.925 V to 4.720 V, 5mV/step Accuracy: ± 25 mV (25°C) , ± 30 mV (0 to 60°C)
 - OV hysteresis (V_{HYS}): 0 to 300 mV, 100mV/step
 - Internal OV delay timer (T_{OVP}): 1 to 4 seconds 1s/step
- ✧ Over-Voltage (OV) fuse burn signal
- ✧ Wide operating voltage range: 4 to 25 V
- ✧ Wide operating temperature range: -40 to 85°C
- ✧ Stackable for 6 or more series cell applications
- ✧ Low Power Consumption ($I_{VCC} + I_{BAT5}$)
 - 0.7 μ A (Typical), 1.5 μ A (Maximum) (All $V_{CELL} = 3.5$ V and -40 to 85°C)
 - 0 μ A (Typical), 0.3 μ A (Maximum) (All $V_{CELL} = 2.4$ V and -40 to 85°C)

GENERAL DESCRIPTION

OZ2605 is a stackable Over-Voltage (OV) protection IC for 1-cell, 2-cell, 3-cell, 4-cell or 5-cell Li-ion battery packs.

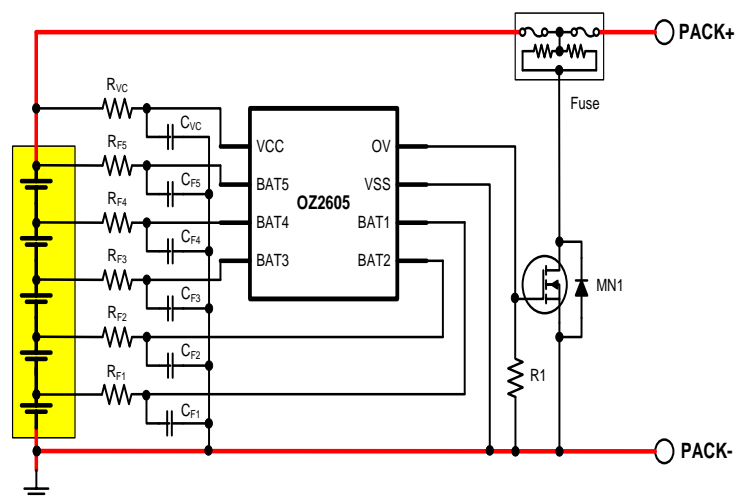
OZ2605 incorporates a precise and accurate voltage detection circuit with preconfigured over-voltage threshold limits and an internal delay circuit for over-voltage detection time. If an OV event occurs, OZ2605 protects the battery pack by driving an output pin high to blow a fuse or activate a MOSFET.

OZ2605 consumes very little current. Current consumption decreases even further when cell voltage is low, extending battery shelf life.

APPLICATIONS

- Ultrabook PC / Notebook PC / Tablet PC
- Camcorder
- Power Tools

APPLICATION DIAGRAM



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OZ2608

FEATURES

- ◇ Protection for 5~8 Lilon/Polymer Cells in series
- ◇ Protection parameter field programming capability or preprogrammed in One-Time Programmable (EFUSE) memory
- ◇ Accurate Voltage Protection:
 - OV: 3.5V to 4.5V; 10mV/Step, Accuracy: ±15mV (typ)
 - UV: 1.2V~1.8V,200mV/step;1.8V~ 3.0V, 100mV/step Accuracy: ±35mV (typ)
- ◇ Supports window based charge permission function
- ◇ Cell-Tap-Open Detection (CTO)
- ◇ Cell tap filter Resistor (RF): 10KΩ
- ◇ Ultra-low current consumption 0.9uA (Typ.)

GENERAL DESCRIPTION

OZ2608 is a highly integrated, cost-competitive battery protection IC that monitors 5~8 cell Li-Ion/Polymer battery packs used in power tools, home appliance and other battery powered applications.

OZ2608 integrates a safety engine to perform high accuracy battery protection: OV and UV (optional)

When any safety event occurs, either CHG or DSG output will be in OFF state. One default setting is provided in Protection State and DSG, CHG Output Summary Table. To meet different application requirements, the output type definition (Open drain or CMOS, active high or active low) of CHG and DSG are set as user parameters in the EFUSE.

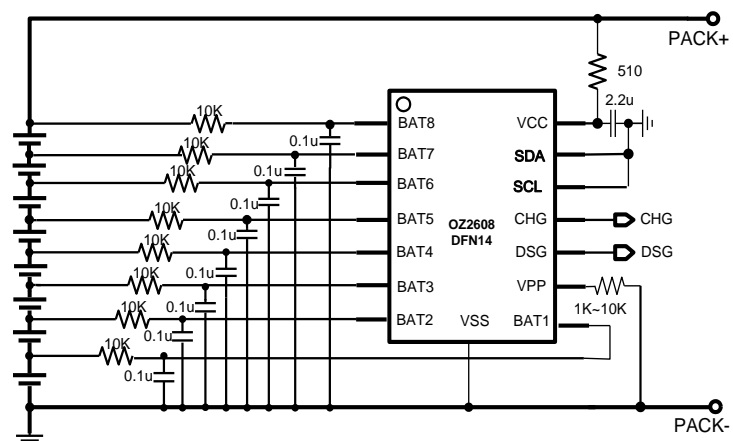
OZ2608 also provides Cell-Tap-Open (CTO) detection. When this event occurs, OZ2608 will set both CHG and DSG in Off-state for fault alert.

OZ2608 provides 2 types of outputs on its CHG and DSG: CMOS and Open-drain. The output type should be specified as ordering information.

APPLICATIONS

- Vacuum Cleaners
- Power Tools
- Home Appliance
- Other Lilon battery powered application

APPLICATION DIAGRAM



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OZ2610

FEATURES

- ◇ OV/UV Protection for 5~10 Li-Ion Series Cells
- ◇ Protection parameter field programming capability or preprogrammed in One-Time Programmable (EFUSE) memory
- ◇ Accurate Voltage Protection:
 - OV: 3.5V to 4.5V, 10mV/Step; Accuracy: $\pm 15\text{mV}$ (Typ)
 - UV (optional): 1.2V~1.8V, 200mV/step; 1.8V~ 3.0V, 100mV/step; Accuracy: $\pm 35\text{mV}$ (Typ)
- ◇ Cell -Tap-Open Detection (CTO) (Optional)
- ◇ Cell tap filter Resistor (RF): 10K Ω
- ◇ Random Cell connection support
- ◇ Ultra-low current consumption 1 μA (Typ.)

GENERAL DESCRIPTION

OZ2610 is a highly integrated, cost-effective battery protection IC that monitors 5~10 cell Li-Ion/Polymer battery packs used in power tools, home appliances and other battery powered applications.

OZ2610 integrates a safety engine to perform high accuracy battery protection: OV and UV (optional)

When any safety event occurs, either CHG or DSG output state will be changed. One default setting is provided in Protection State and DSG, CHG Output Summary Table.

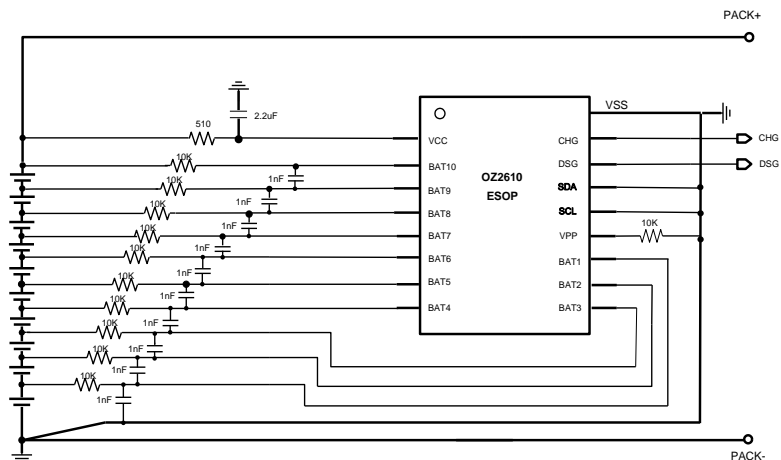
To meet different application requirements, the output type definition (Open-drain or push-pull, active high or active low) of CHG and DSG are set as user parameters in the EFUSE.

OZ2610 also provides Cell-Tap-Open (CTO) detection. When this event occurs, OZ2610 will set both CHG and DSG in Off-state for fault alert.

APPLICATIONS

- Vacuum Cleaners
- Power Tools, Garden Tools
- Home Appliance
- Other Lilon battery powered application

APPLICATION DIAGRAM



[Homepage](#)

OZ3705

FEATURES

- ✧ Low cost DFE for 3 to 5 cell Li-*Ion* battery packs
 - Cell Voltage measurements
 - Current Sense input with amplifier
 - External Temperature measurements
 - Die Temperature measurement and OHTP
- ✧ 12 bit Analog-to-Digital Converter (ADC)
- ✧ I²C BUS communication (up to 400 kHz)
- ✧ Cell balance controlled from host by I²C
- ✧ 3.3 V LDO for microcontroller supply
- ✧ Selectable thresholds for discharge over-current fault notification
- ✧ Low power consumption

GENERAL DESCRIPTION

OZ3705 integrates an Analog Front End (AFE) with a 12-Bits Analog-to-Digital Converter (ADC) creating a DFE to improve accuracy and reduce cost of battery management for applications with 3 to 5 cells in series.

OZ3705 supports cell voltages, pack temperature, pack current measurement. It also integrates fast discharge over-current detection and host notification, cell balance, die temperature measurement with over-heat protection.

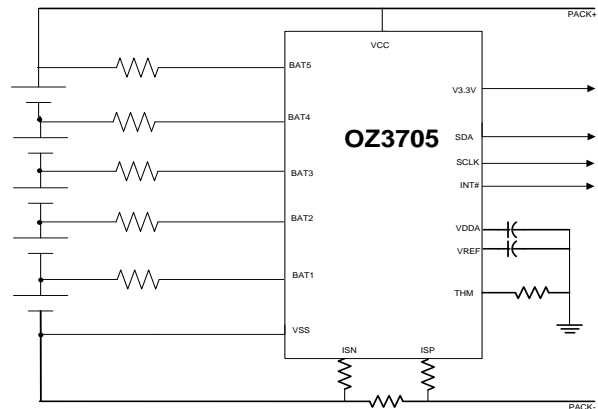
The integrated 3.3 V LDO supplies up to 3 mA. A second LDO (VDDA) supplies 5V at up to 0.2 mA for internal circuitry.

Through I²C BUS the host MCU is able to read any cell voltage between 1.5 and 5 V. Read time is ~ 350 μ s, including channel selection, ADC conversion, and I²C communication at 400 kHz.

APPLICATIONS

- Cordless Power Tools / Appliances / Battery packs
- Chargers

APPLICATION DIAGRAM



[Homepage](#)

OZ9358

FEATURES

- ◇ Analog Front End (AFE) for 3-8 Cell Li-ion/Polymer/FePO₄ battery pack
 - High precision voltage measurement: 8 inputs and an analog signal output (VOUT)
Typical accuracy: $<\pm 30\text{mV}$ (initial), $<\pm 10\text{mV}$ (calibrated); Setting time: up to 500 μs
- ◇ 16-bit $\Sigma\Delta$ ADC for high precision current measurement and Coulomb counting
- ◇ Simultaneous Multi-Cell Balance Support : Up to 13mA and controlled from host by I2C
- ◇ Permanent Failure (PF) function
 - Permanent Failure voltage (V_{PF}) Threshold: $V_{PF} = 3700 \sim 4400 \text{ mV}$, 25mV/step
- ◇ Discharge Over Current interrupt output
 - DOC: $V_{DOC} = 20 \sim 160 \text{ mV}$, 10 mV/step; SC: $V_{SC} = 40 \sim 340 \text{ mV}$, 20 mV/step
- ◇ Internal Over-Temperature Protection
- ◇ I2C BUS communication (up to 400 kHz)
- ◇ Interrupt output to external Host
- ◇ 3.3 V/5V selectable LDO for microcontroller supply; up to 30 mA
- ◇ Low Power Consumption
 - Active :90/180 μA (Typ) Standby: 5 μA /9 μA (Typ) Shutdown: 1.2 μA (Typ)

GENERAL DESCRIPTION

OZ9358 is a cost effective, advanced Analog Front End (AFE) IC to support 3 to 8 serial cells battery powered applications.

OZ9358 is designed to scale and level-shift cell voltages down to ground-referenced analog signal output (VOUT) for the Analog to Digital (A/D) converter of a host MCU.

OZ9358 integrates a low power 16-bit Sigma Delta ($\Sigma\Delta$) ADC for accurate pack current measurement and Coulomb-Counting. DOC and SC are performed by individual analog comparators for quick response output from INT#. Activates INT# pin to notify the host microcontroller of a battery anomaly event.

OZ9358 integrates a standalone safety engine to perform individual cell abnormal over voltage for safety certification activating from PF pin. OZ9358 integrates Internal Over-Temperature protection to prevent itself from over-heating.

Internal Cell-Balance switches can be controlled by an external host to perform Cell-Balancing.

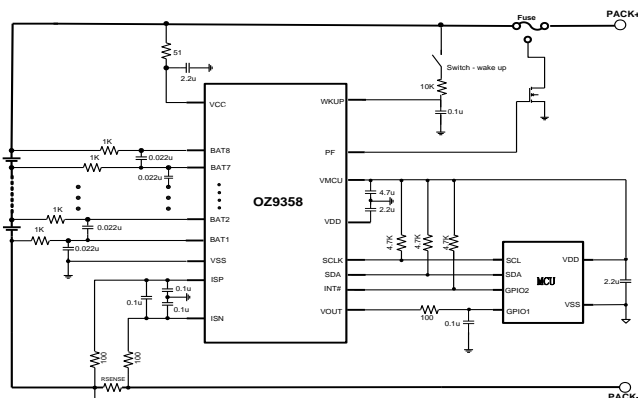
An external host communicates with OZ9358 via I2C Bus with Cyclic Redundancy Check (CRC) for maximum reliability.

APPLICATIONS

- Vacuum Cleaner or other Home Appliance
- Energy Storage System/UPS
- E-Bike, E-scooter
- Garden Tool, Power Tool

[Homepage](#)

APPLICATION DIAGRAM



OZ3710

FEATURES

- ✧ Low cost DFE for 5 to 10 cell Li-*Ion* battery packs
 - Cell Voltage measurements
 - Current Sense input with amplifier
 - External Temperature measurements
 - Die Temperature measurement and OHTP
- ✧ 12 bit Analog-to-Digital Converter (ADC)
- ✧ I²C BUS communication (up to 400 kHz)
- ✧ Cell balance controlled from host by I²C
- ✧ 3.3 V LDO for microcontroller supply: 7mA
- ✧ Selectable thresholds for discharge over-current fault notification
- ✧ Low power consumption

GENERAL DESCRIPTION

OZ3710 integrates an Analog Front End (AFE) with a 12-Bits Analog-to-Digital Converter (ADC) creating a DFE to improve accuracy and reduce cost of battery management for applications with 5 to 10 cells in series.

OZ3710 supports cell voltages, pack temperature, pack current measurement. It also integrates fast discharge over-current detection, cell balance and die temperature measurement with over-heat protection.

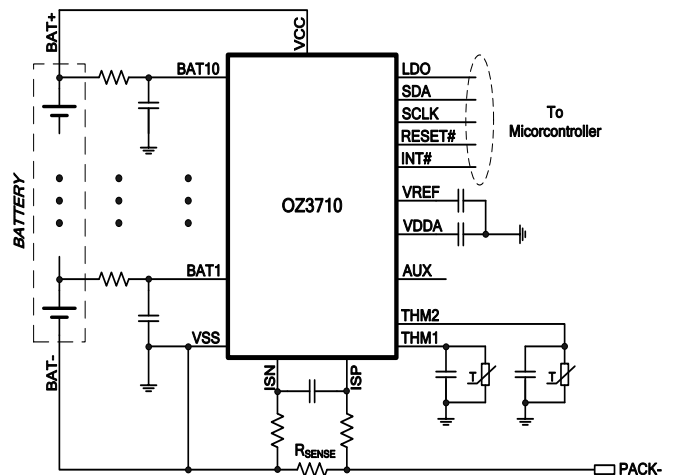
The integrated 3.3 V LDO supplies up to 7 mA. A second LDO (VDDA) supplies 5V at up to 0.2 mA for internal circuitry.

Through I²C BUS the host MCU is able to read any cell voltage between 1.5 and 5 V. Read time is ~ 350 μ s, including channel selection, ADC conversion, and I²C communication at 400 kHz.

APPLICATIONS

- Cordless Garden Tools
- E-Bikes, E-scooters
- Cordless Vacuum Cleaner
- Battery Powered Home Appliances

APPLICATION DIAGRAM



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OZ3714

FEATURES

- ✧ Highly accurate Digital Front End (DFE) with Embedded Protections
 - Voltage, Current & Temperature + Control
- ✧ 14-bit Analog to Digital Converter (SAR ADC)
 - High precision voltage measurement
 - Cell Voltage: 14 inputs, typical 5mV accuracy
 - Pack Current Sense
 - VBAT, VCC, VM, V5A and VMCU Voltage measurements
 - 2 External Temperature inputs with 2 selectable precision current sources
 - 1 Internal Temperature input
- ✧ 16-bit Analog to Digital Converter ($\Sigma\Delta$ ADC)
 - High precision current measurement and Coulomb counting (support dead band setting)
- ✧ Protection
 - Over-Voltage Protection
 - Under-Voltage Protection (UVP)
 - Discharge Current Protection
 - Discharge-Over-Current 1 (DOC1):
 - Discharge-Over-Current 2 (DOC2):
 - Short-Circuit (SC): Cycle by cycle OC/SC protection in PWM mode
 - Charge Current Protection
 - Internal Die Over-Temperature Protection
- ✧ Simultaneous Multi-Cell Balance Support
- ✧ Cell-Tap-Open (CTO) Detection Support
- ✧ Integrated low-side CHG/DSG driver
- ✧ I2C Bus Interface
- ✧ Interrupt output to external Host
- ✧ Low Power Consumption
 - Active mode: < 120 μ A (typical)
 - Sleep mode: < 12 μ A (typical)
 - Shutdown mode: < 1.6 μ A (typical)

GENERAL DESCRIPTION

OZ3714 is a highly integrated, low cost, Digital Front End (DFE) IC with integrated CHG/DSG FET drivers to support 7 to 14 serial cells in battery packs for high cell count battery powered applications.

OZ3714 integrates a 14-bit high precision Successive Approximation Register (SAR) Analog to Digital Converter (ADC) for fast cell voltages, temperature and charge/discharge current measurement. Additional high accuracy 16-bit Sigma Delta ($\Sigma\Delta$) ADC is integrated for precision current measurement and Coulomb-Counting.

OZ3714 integrates a simple, standalone safety engine that performs high accuracy and high reliability protections for the safety events including OVP, UVP, COC, DOC (DOC1 and DOC2) and SC. OVP, UVP,

COC and DOC1 are fast SAR ADC based protection. DOC2 and SCP are performed by individual analog comparators for quick response and any fault of them will turn off discharge NFET quickly by pulling DSG low and activates ALERTN pin to notify the Host microcontroller of a safety event.

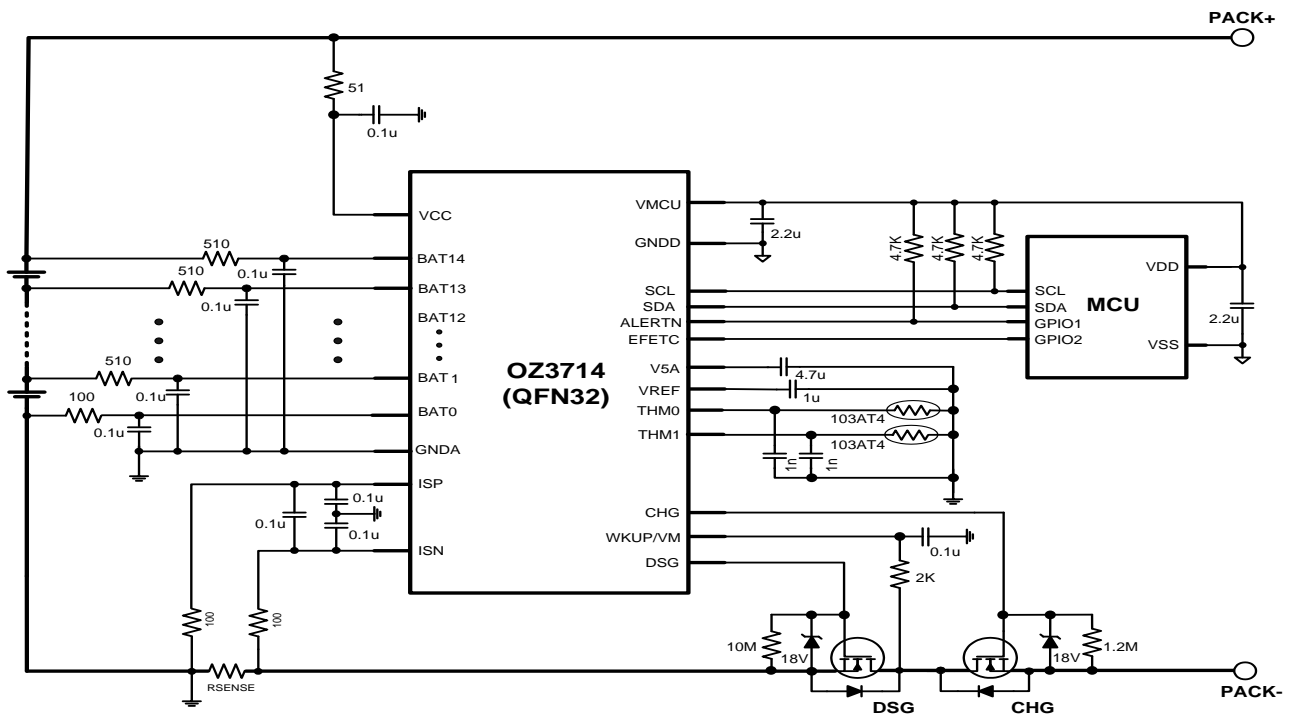
OZ3714 supports Cell Balance and Cell-Tap-Open (CTO) detection which can be controlled by an external host.

OZ3714 integrates Internal Over-Temperature protection to prevent itself from over-heating during some extreme conditions..

APPLICATIONS

- Garden Tools, Power Tools
- E-Bikes, E-scooters
- Vacuum cleaners
- Other battery powered home appliances

APPLICATION DIAGRAM



OZ37210

FEATURES

- ✧ Precision Digital Front End (DFE) with Protections
 - Voltage/Current/Temperature + Protections
- ✧ 14-bit Analog to Digital Converter (SAR ADC)
 - High precision voltage measurement
 - Cell Voltage: 10 inputs
 - Pack Current Sense
 - VBAT, VCC, VM, V5V and VMCU Voltage measurements
 - 2 External Temperature inputs with 2 selectable precision current sources
 - 1 Internal Temperature input
- ✧ 16-bit Analog to Digital Converter ($\Sigma\Delta$ ADC)
 - High precision current measurement and Coulomb counting (dead band setting)
- ✧ Protections
 - Two Level Over-Voltage Protections
 - Over-Voltage (V_{OV}) Threshold:
 - Secondary Level Over-Voltage (V_{OV2}) Threshold:
 - Under-Voltage Protection (UVP)
 - Discharge Current Protection
 - Discharge-Over-Current 1 (DOC1)
 - Discharge-Over-Current 2 (DOC2)
 - Short-Circuit (SC): Cycle by cycle OC/SC protection in PWM mode
 - Charge Current Protection
 - External Over-Temperature Protection (OTP) and Under-Temperature Protection (UTP)
 - Internal Die Over-Temperature Protection
- ✧ Simultaneous Multi-Cell Balance Support
- ✧ Cell-Tap-Open (CTO) Detection capable
- ✧ Integrated low-side CHG/DSG drivers
- ✧ I²C Communication Bus Interface
- ✧ Alert and EFETC Interface to Host
- ✧ Low Power Consumption
 - Active mode: < 150 μ A
 - Sleep mode: <11 μ A
 - Shutdown mode: <1.8 μ A

GENERAL DESCRIPTION

OZ37210 is a highly integrated, low cost, Digital Front End (DFE) IC for 5 to 10 serial cells in battery packs for high cell count battery powered applications.

OZ37210 integrates a 14-bit high precision Successive Approximation Register (SAR) Analog to Digital

Converter (ADC) to perform fast measurement of cell voltages, temperature and charge/discharge current. For Coulomb-Counting measurements OZ37210 uses a 16-bit Sigma Delta ($\Sigma\Delta$) ADC.

It integrates a standalone safety state machine to independently perform various protections including OVP (OV1 and OV2), UVP, COC, DOC (DOC1 and DOC2), SC, OTP and UTP. OVP, UVP, COC, DOC1 and OTP/UTP are fast SAR ADC based protection. DOC2 and SCP are performed by individual analog comparators for quick response and any fault of them will turn off discharge NFET quickly by pulling DSG low and activates ALERTN pin to notify the Host of a safety event.

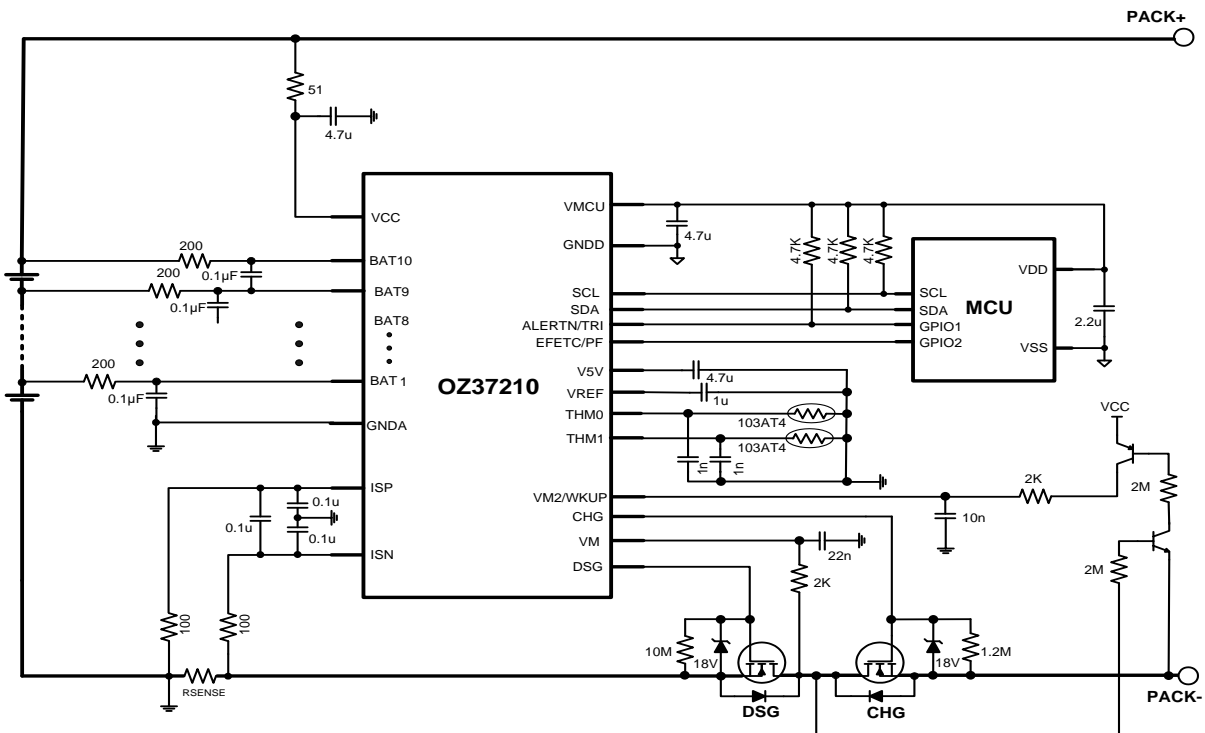
OZ37210 supports Cell Balance and Cell-Tap-Open (CTO) detection which can be controlled by an external host.

OZ37210 integrates Internal Over-Temperature protection to prevent itself from over-heating during some extreme conditions; for example, multiple cells balancing or high loads on VMCU.

APPLICATIONS

- Garden Tools, Power Tools
- E-Bikes, E-scooters
- Cordless Vacuum Cleaners
- Other Battery Powered home appliances

APPLICATION DIAGRAM



[Homepage](#)

OZ37220

FEATURES

- ✧ Highly accurate Digital Front End (DFE) with Protection and low side FETs Drivers
- ✧ 14-bit Analog to Digital Converter (SAR ADC)
 - High precision voltage measurement
 - Cell Voltage: 20 inputs
 - Pack Current Sense
 - VBAT, VCC, VM, VM2, V5A and VMCU Voltage measurements
 - 4 External Temperature inputs with 2 selectable precision current sources
 - 3 general purpose analog inputs
 - 1 Internal Temperature input
- ✧ 16-bit Analog to Digital Converter ($\Sigma\Delta$ ADC)
 - High precision current measurement and Coulomb counting
- ✧ Protections
 - Over-Voltage Protection
 - Over-Voltage (V_{OV1}) Threshold (OV1)
 - Over-Voltage (V_{OV2}) Threshold (OV2)
 - Under-Voltage Protection (UVP)
 - Discharge Current Protection
 - Discharge-Over-Current 1 (DOC1)
 - Discharge-Over-Current 2 (DOC2)
 - Short-Circuit (SC):
 - Charge Current Protection (COC)
 - Charge Temperature Protection:
 - Charge-Over-Temperature (COT)
 - Charge-Under-Temperature (CUT)
 - Discharge Temperature Protection:
 - Discharge-Over-Temperature (DOT)
 - Discharge-Under-Temperature (DUT)
 - Internal Die Over-Temperature Protection
- ✧ Simultaneous Multi-Cell Balance
- ✧ Cell-Tap-Open (CTO) Detection
- ✧ I²C Communications Bus Interface
- ✧ Interrupt output to external Host
- ✧ Low Power Consumption (typical)
 - Active mode: < 90uA
 - Sleep mode: < 10μA
 - Shutdown mode: < 2uA

GENERAL DESCRIPTION

OZ37220 is a highly integrated, low cost, Digital Front End (DFE) IC for 10 to 20 serial cells in battery packs for high cell count battery powered applications.

OZ37220 integrates a 14-bit high precision Successive Approximation Register (SAR) Analog to Digital Converter (ADC) to detect cell voltages, temperature and charge/discharge current, etc. For Coulomb-Counting measurements OZ37220 uses a 16-bit Sigma Delta ($\Sigma\Delta$) ADC.

OZ37220 integrates a simple, independent safety engine that performs high accuracy and high reliability protections for the safety events including OV, OV2, UV, UV shutdown, unbalance, THM0~THM2's OT&UT, COC, DOC (DOC1 and DOC2) and SC. OV, OV2, UV, UV shutdown, unbalance, OT/UT, COC and DOC1 are fast SAR ADC based protection. DOC2 and SC are performed by individual analog comparators for quick response and any fault of them will turn off discharge NFET quickly by pulling DSG low and activates INT pin to notify the Host of a safety event.

OZ37220 supports Cell Balance and Cell-Tap-Open (CTO) detection which can be controlled by an external host.

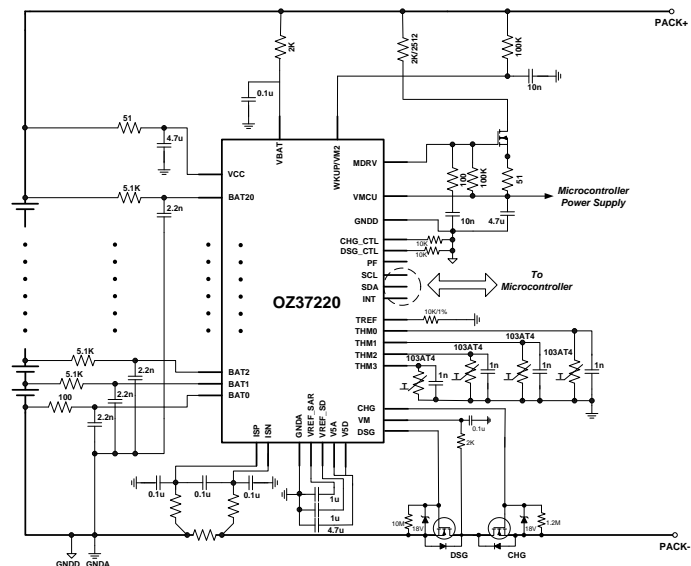
External host communicates with OZ37220 via I²C Bus with Cyclic Redundancy Check for maximum reliability.

OZ37220 integrates Internal Over-Temperature protection to prevent itself from over-heating during some extreme conditions; for example, multiple cells balancing or high loads on VMCU or MDRV

APPLICATIONS

- ESS/UPS
- Garden Tools, Power Tools
- E-Bikes, E-Scooters
- LEV (Light Electric Vehicles)

APPLICATION DIAGRAM



OZ37210DW

FEATURES

- ✧ Precision Digital Front End (DFE) with Protections
 - Voltage/Current/Temperature + Protections
- ✧ 14-bit Analog to Digital Converter (SAR ADC)
 - High precision voltage measurement
 - Cell Voltage: 10 inputs
 - Pack Current Sense
 - VBAT, VCC, VM, V5V and VMCU Voltage measurements
 - 2 External Temperature inputs with 2 selectable precision current sources
 - 1 Internal Temperature input
- ✧ 16-bit Analog to Digital Converter ($\Sigma\Delta$ ADC)
 - High precision current measurement and Coulomb counting (dead band setting)
- ✧ Protections
 - Two Level Over-Voltage Protections
 - Over-Voltage (V_{OV}) Threshold:
 - Secondary Level Over-Voltage (V_{OV2}) Threshold:
 - Under-Voltage Protection (UVP)
 - Discharge Current Protection
 - Discharge-Over-Current 1 (DOC1)
 - Discharge-Over-Current 2 (DOC2)
 - Short-Circuit (SC)
 - Charge Current Protection
 - External Over-Temperature Protection (OTP) and Under-Temperature Protection (UTP)
 - Internal Die Over-Temperature Protection
- ✧ Dual Drivers for High Side CHG/DSG NFETs
 - Fast FET Turn-ON time;
 - Very fast FET Turn-OFF time
- ✧ Simultaneous Multi-Cell Balance Support
- ✧ Cell-Tap-Open (CTO) Detection capable
- ✧ I²C Communication Bus Interface
- ✧ Alert and EFETC Interface to Host
- ✧ Low Power Consumption
 - Active mode: <150 μ A
 - Sleep mode: <12 μ A
 - Shutdown mode: <1.8 μ A

GENERAL DESCRIPTION

OZ37210DW is a highly integrated, low cost, Digital Front End (DFE) IC for 5 to 10 serial cells in battery packs for high cell count battery powered applications.

OZ37210DW integrates a 14-bit high precision Successive Approximation Register (SAR) Analog to Digital Converter (ADC) to perform fast measurement of cell voltages, temperature and charge/discharge current. For Coulomb-Counting measurements OZ37210DW uses a 16-bit Sigma Delta ($\Sigma\Delta$)ADC.

It integrates two charge pumps for high side NFET driver application. It integrates a standalone safety state machine to independently perform various protections including OVP (OV1 and OV2), UVP, COC, DOC (DOC1 and DOC2), SC, OTP and UTP. OVP, UVP, COC, DOC1 and OTP/UTP are fast SAR ADC based protection. DOC2 and SCP are performed by individual analog comparators for quick response and any fault of them will turn off discharge NFET quickly by pulling DSG low and activates ALERTN pin to notify the Host of a safety event.

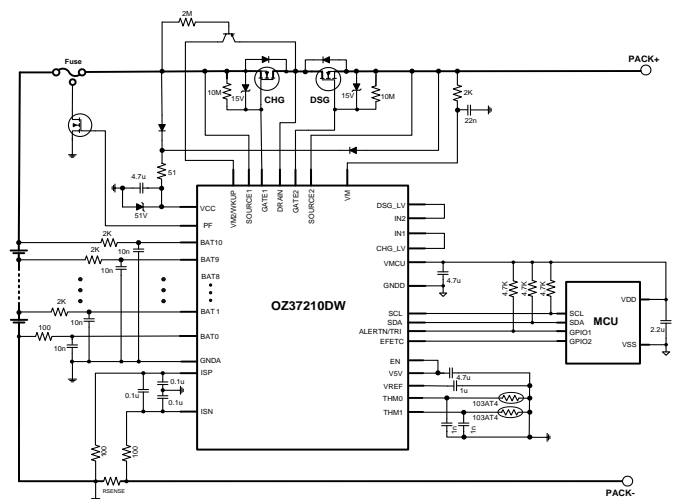
OZ37210DW supports Cell Balance and Cell-Tap-Open (CTO) detection which can be controlled by an external host.

OZ37210DW integrates Internal Over-Temperature protection to prevent itself from over-heating during some extreme conditions; for example, multiple cells balancing or high loads on VMCU.

APPLICATIONS

- Garden Tools, Power Tools
- E-Bikes, E-scooters
- Cordless Vacuum Cleaners
- Other Battery Powered Home Appliances

APPLICATION DIAGRAM



[Homepage](#)

OZ7717

FEATURES

- ✧ Highly accurate Digital Front End (DFE) with High Side Driver
 - Voltage, Current & Temperature + Control
- ✧ 14-bit Analog to Digital Converter (SAR ADC)
 - High precision voltage measurement
 - Cell Voltage: 17 inputs, typical 5mV accuracy
 - Pack Current Sense
 - VPACK, VBAT, V5 and VMCU Voltage measurements
 - 5 External Temperature inputs with 2 selectable precision current sources
 - 1 Internal Temperature input
 - 1 Auxiliary; Direct ADC input
- ✧ 16-bit Analog to Digital Converter ($\Sigma\Delta$ ADC)
 - High precision current measurement and Coulomb Counting (CC)
- ✧ High Side MOSFET drivers (Chg/Dsg)
 - Compatible with 15V to 75V battery packs
 - Hot-swap packs safely, soft start and charge management with Linear-Mode FET control
 - Strong drive ability
- ✧ Protections
 - Over-Voltage Protection
 - Discharge Current Protection
 - Discharge-Over-Current 1 (DOC1):
 - Discharge-Over-Current 2 (DOC2):
 - Short-Circuit (SC):
 - Charge Current Protection
 - Internal Die Over-Temperature Protection
- ✧ Simultaneous Multi-Cell Balance
- ✧ Cell-Tap-Open (CTO) Detection
- ✧ SPI Serial Communications Bus Interface
- ✧ Low Power Consumption
 - Active mode: < 150uA (Without CC)
 - Standby mode: < 12uA
 - Shutdown mode: < 1uA

GENERAL DESCRIPTION

OZ7717 is a highly integrated, low cost, Digital Front End (DFE) IC for 10 to 17 serial cells in battery packs for high cell count and battery powered applications. OZ7717 integrates a 14-bit high precision Successive Approximation (SAR) Analog to Digital Converter (ADC) to detect cell voltages, temperature and charge/discharge current. For Coulomb-Counting measurements OZ7717 uses a 16-bit Sigma-Delta ($\Sigma\Delta$)

current ADC.

It integrates a simple, standalone safety engine that performs high accuracy and high reliability protections for safety events including OV, COC, DOC (DOC1 and DOC2), SC and optional UV; INT pin will be activated to notify the Host microcontroller of a safety event. External Host (Microcontroller) could perform the release from those protection states.

OZ7717 integrates a charge-pump circuit to drive high-side N-channel charge and discharge MOSFETs with strong driving capability for fast response. It also provides a linear mode control for either charge FET or discharge FET to enable automatic balancing and hot swapping for multiple battery packs.

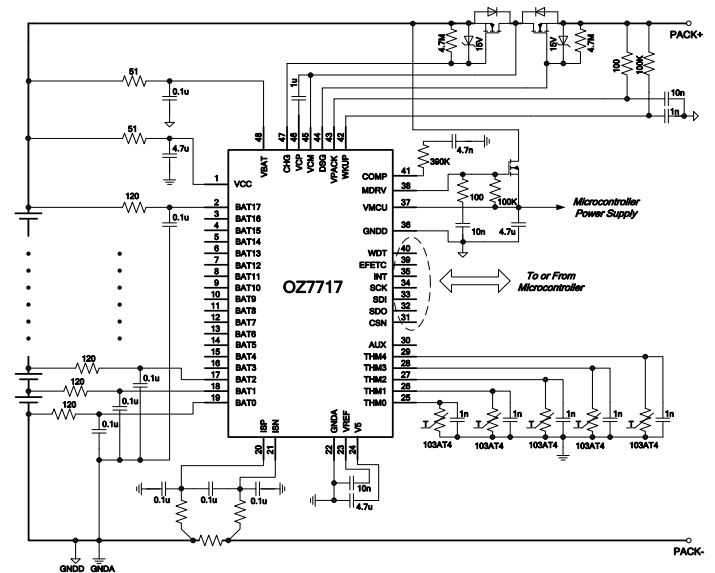
OZ7717 supports Cell Balance and Cell-Tap-Open (CTO) detection which can be controlled by an external host.

OZ7717 integrates Internal Over-Temperature protection to prevent itself from over-heating during extreme conditions.

APPLICATIONS

- ESS/UPS
- Garden Tools, Power Tools
- E-Bikes, E-Scooters, Pedelec and Pedal-Assist Bicycles
- LEV (Light Electric Vehicles)

APPLICATION DIAGRAM



[Homepage](#)

OZ3717

FEATURES

- ✧ Highly accurate Digital Front End (DFE) with High Side Driver
 - Voltage, Current & Temperature + Control
- ✧ 14-bit Analog to Digital Converter (SAR ADC)
 - High precision voltage measurement
 - Cell Voltage: 17 inputs, typical 5mV accuracy
 - Pack Current Sense
 - VPACK, VBAT, V5 and VMCU Voltage measurements
 - 3 External Temperature inputs with 2 selectable precision current sources
 - 1 Internal Temperature input
 - 1 Auxiliary; Direct ADC input
- ✧ 16-bit Analog to Digital Converter ($\Sigma\Delta$ ADC)
 - High precision current measurement and Coulomb Counting (CC)
- ✧ High Side MOSFET drivers (Chg/Dsg)
 - Compatible with 15V to 75V battery packs
 - Hot-swap packs safely, soft start and charge management with Linear-Mode FET control
 - Strong drive ability
- ✧ Protections
 - Over-Voltage Protection
 - Discharge Current Protection
 - Discharge-Over-Current 1 (DOC1):
 - Discharge-Over-Current 2 (DOC2):
 - Short-Circuit (SC):
 - Charge Current Protection
 - Internal Die Over-Temperature Protection
- ✧ Simultaneous Multi-Cell Balance
- ✧ Cell-Tap-Open (CTO) Detection
- ✧ SPI Serial Communications Bus Interface
- ✧ Low Power Consumption
 - Active mode: < 150uA (Without CC)
 - Standby mode: < 12uA
 - Shutdown mode: < 1uA

GENERAL DESCRIPTION

OZ3717 is a highly integrated, low cost, Digital Front End (DFE) IC for 10 to 17 serial cells in battery packs for high cell count and battery powered applications. OZ3717 integrates a 14-bit high precision Successive Approximation (SAR) Analog to Digital Converter (ADC) to detect cell voltages, temperature and charge/discharge current. For Coulomb-Counting measurements OZ3717 uses a 16-bit Sigma-Delta ($\Sigma\Delta$) current ADC.

It integrates a simple, standalone safety engine that performs high accuracy and high reliability protections for safety events including OV, COC, DOC (DOC1 and DOC2), SC and optional UV; INT pin will be activated to notify the Host microcontroller of a safety event. External Host (Microcontroller) could perform the release from those protection states.

OZ3717 integrates a charge-pump circuit to drive high-side N-channel charge and discharge MOSFETs with strong driving capability for fast response. It also provides a linear mode control for either charge FET or discharge FET to enable automatic balancing and hot swapping for multiple battery packs.

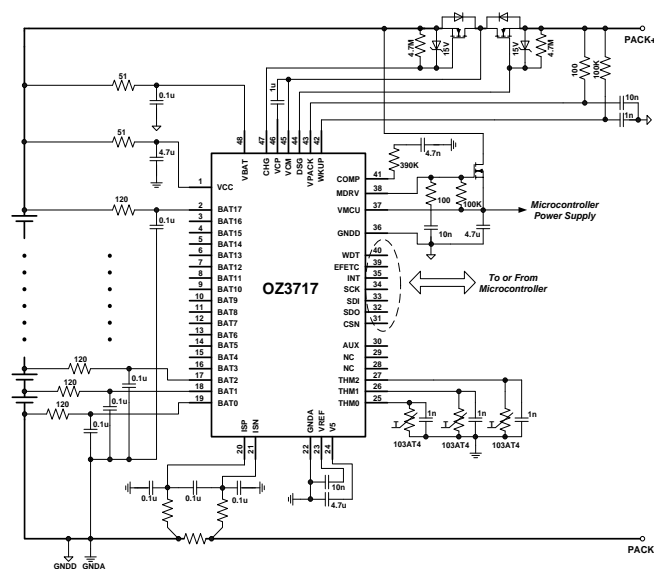
OZ3717 supports Cell Balance and Cell-Tap-Open (CTO) detection which can be controlled by an external host.

OZ3717 integrates Internal Over-Temperature protection to prevent itself from over-heating during extreme conditions.

APPLICATIONS

- ESS/UPS
- Garden Tools, Power Tools
- E-Bikes, E-Scooters, Pedelec and Pedal-Assist Bicycles
- LEV (Light Electric Vehicles)

APPLICATION DIAGRAM



OZ9212

FEATURES

- ✧ Dual-Input LDO power with priority management
- ✧ Fixed 3.3V output accuracy: $\pm 2\%$ Accuracy 3.234V~3.366V
- ✧ Output Current Range: $\leq 30\text{mA}$
- ✧ Wide operating voltage range: 4.5 to 50 V
- ✧ Wide operating temperature range: -40 to 85°C Protection:
 - Over-Current Fold-Back
 - Thermal Shutdown (Die Over-Temperature)
 - Under Voltage Lockout (UVLO)
- ✧ Fast Transient Response
- ✧ Power-Good Output - Open Drain
- ✧ Low Power Consumption Active Mode Quiescent Current: 5 μA (Typ); Shutdown mode: 0.4 μA (Typ)

GENERAL DESCRIPTION

OZ9212 is a dual-input Low Dropout (LDO) Voltage Regulator with priority setting and Power Good output.

OZ9212 incorporates dual-inputs; IN1 and IN2, but IN2 has higher priority.

- When IN2 voltage is present ($V_{\text{IN}2} \geq 4.5\text{V}$), OZ9212 will be enabled automatically, and 3.3V output is powered by $V_{\text{IN}2}$.
- When IN2 voltage is not present but IN1 voltage ($V_{\text{IN}1} \geq 7\text{V}$) is present, OZ9212 is enabled by high input of the EN pin.
- When both IN2 voltage and IN1 voltage are present, the 3.3V output will be supplied by $V_{\text{IN}2}$.

OZ9212 provides an open-drain PG (Power Good) output signal, indicating that the 3.3V output is within the normal range.

To prevent IC output circuit damage OZ9212 provides Over-Current Fold-Back to ensure safe operation during load fault conditions.

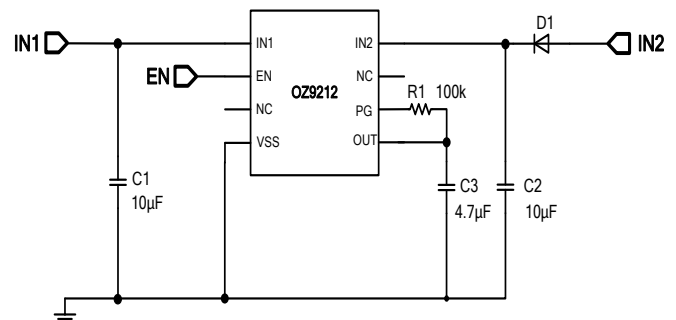
Similarly, an Under Voltage condition may result in incorrect IC operation, possibly including the output voltage dropping below 3.3V. OZ9212 protects itself and the load circuits by shutting down using Under Voltage Lockout protection circuitry.

OZ9212 provides fast transient response with excellent line and load transient performance.

APPLICATIONS

- Power Tools
- Power supplies for mobile devices

APPLICATION DIAGRAM



[Homepage](#)

OZ9211Q

FEATURES

- ✧ Fixed 5.0V or 3.3V output accuracy: $\pm 1\%$ Accuracy: 5.05V~4.95V or 3.267V~3.333V
- ✧ Output Current Range: $\leq 150\text{mA}$
- ✧ Wide operating voltage range: 5.5 to 40 V
- ✧ Wide operating temperature range: -40 to 105°C
- ✧ Protection:
 - Short circuit protection
 - Thermal Shutdown (Die Over-Temperature)
 - Under Voltage Lockout (UVLO)
- ✧ Fast Transient Response
- ✧ Power-Good Output - Open Drain
- ✧ Low Power Consumption Quiescent Current: 165 μA (Typ); Shutdown mode: 2.0 μA (Typ)

GENERAL DESCRIPTION

OZ9211Q is a high voltage Low Dropout (LDO) Voltage Regulator with only 16 μA (typ.) low power consumption at no load. It is suitable for power supplies for microprocessor for automotive, portable device.

OZ9211Q provides an open-drain PG (Power Good) output signal, indicating that the output is within the normal range.

To prevent IC output circuit damage OZ9211Q provides short-circuit protection to ensure safe operation during load fault conditions.

Similarly, an Under Voltage condition may result in incorrect IC operation, possibly including the output voltage dropping below 5.0V. OZ9211Q protects itself and the load circuits by shutting down using Under Voltage Lockout protection circuitry.

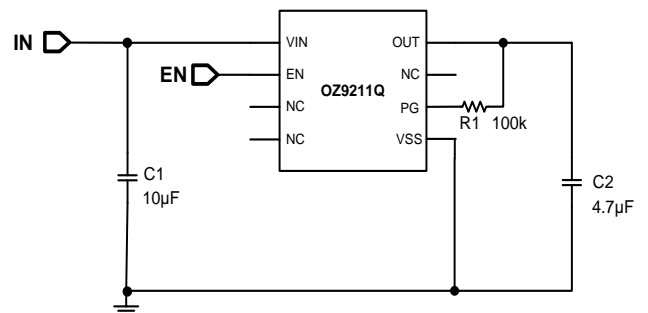
OZ9211Q provides fast transient response with excellent line and load transient performance.

OZ9211Q operates in the -40°C to 105°C temperature range.

APPLICATIONS

- Power Tools
- Power supplies for mobile devices
- Power supplies for automotive

APPLICATION DIAGRAM



[Homepage](#)

OZ9202

FEATURES

- ✧ Enables independent control of dual high-side N-MOSFET drivers for battery protection applications
- ✧ Compatible with 20V to 48V battery packs
- ✧ Low power control interface:
 - 3.3V and 5V compatible, ground referenced
 - CMOS compatible
 - Five low side control/monitor pins
 - Two logical inputs for individual switching of high-side N-MOSFETs with low-side signals
 - One logical input is FETs enable pin.
 - Two logical outputs indicate FET status
- ✧ Fast FET Turn-ON time; Very fast FET Turn-OFF time
- ✧ Very few external components
- ✧ Very low power consumption
 - < 1 μ A with both FET drivers off
 - < 20 μ A with both FET drivers on

GENERAL DESCRIPTION

OZ9202 enables a microcontroller to directly control dual high-side NMOSFETs in battery protection applications. It is suitable for protection circuits used in battery packs for power tools, appliances, Cordless Vacuum Cleaners, and other applications.

The control section of OZ9202 is typically powered from a 3.3V supply. Three low-voltage, ground-referenced CMOS compatible logic inputs enable individual control of each FET driver, as well as an enable pin with the ability to switch on or off both FET drivers simultaneously.

Additionally, the two Power FET's gate status is reported on two CMOS compatible logic outputs.

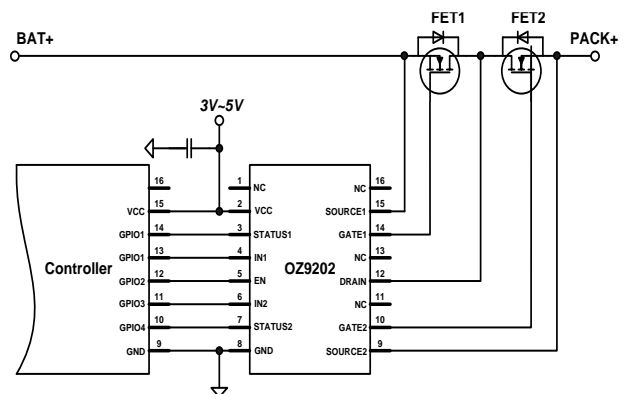
OZ9202 is built using a high-voltage process enabling two independent charge-pumps for generation of high-side FET control for up to 48V battery packs. The SOURCE, GATE, and DRAIN pins are able to withstand up to 80V, referenced to ground.

APPLICATIONS

- Battery Packs for Cordless Vacuum Cleaners
- Power Bank
- Other Battery Powered Home Appliances

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APPLICATION DIAGRAM



OZ9222

FEATURES

- ◇ Fast ON/OFF high-side N-channel MOSFET drivers
 - FET turn-on time ($C_{iss}=25nF$, $< 20\mu s$)
 - FET turn-off time ($C_{iss}=25nF$, $< 35\mu s$)
- ◇ Independent digital control for charge FET and discharge FET
- ◇ Integrates pre-charge FET control
- ◇ Scalable external capacitor-based charge pump to accommodate different numbers of FETs in parallel
- ◇ Wide battery voltage range: 8~90 V and High-voltage tolerance (120V absolute maximum rating)
- ◇ Integrates Short-Circuit (SC) protection
- ◇ Integrates Load-off and Charge-in detection
- ◇ Integrates charge pump state indicator
- ◇ Direct Microcontroller control inputs: 3.3V and 5V compatible, ground referenced
- ◇ Control Inputs CMOS level compatible
- ◇ Low power consumption
 - Charge and discharge FETs ON:
40uA (Typical)
 - Charge and discharge FETs OFF:
6uA (Typical)
- ◇ Green Package SSOP16

GENERAL DESCRIPTION

OZ2605 is a stackable Over-Voltage (OV) protection IC for 1-cell, 2-cell, 3-cell, 4-cell or 5-cell Li-ion battery packs.

OZ2605 incorporates a precise and accurate voltage detection circuit with preconfigured over-voltage threshold limits and an internal delay circuit for over-voltage detection time. If an OV event occurs, OZ2605 protects the battery pack by driving an output pin high to blow a fuse or activate a MOSFET.

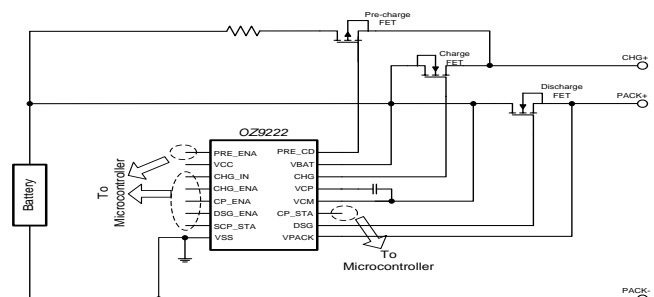
OZ2605 consumes very little current. Current consumption decreases even further when cell voltage is low, extending battery shelf conditions.

APPLICATIONS

- Power tools, E-Bikes
- UPS, ESS, LEVs

[Homepage](#)

APPLICATION DIAGRAM



OZ85211/12

FEATURES

- ✧ Built-in Seamless Buck-Boost Transition to comply with the USB Power Delivery Specification conjunct with a USB PD Controller:
- ✧ Wide Vin: 3.8V to 24V
- ✧ Programmable constant output voltage: 3V to 24V with 6mV step
- ✧ Programmable constant output current up to 9.8A with 9.6mA (typical) step
- ✧ Programmable constant output power up to 65W with 1W (typical) step
- ✧ Programmable Switching Frequency from 200kHz to 1MHz by external resistor or by synchronized input
- ✧ Controlled Slew Rate Voltage and Current Transitioning
- ✧ Built-in 2 Low Side Power NFETs
- ✧ Integrated cable compensation up to 120mΩ, IRC
- ✧ I2C Interface
- ✧ OTG for OZ85211
- ✧ Built-in Charge Pump for driving cost-effective NFET as the power channel control
- ✧ Hardware and Firmware-based Protections: OVP, UVP, OCP, SCP and IOTP with adjustable threshold and debounce time
- ✧ Shutdown Current is less than 5μA
- ✧ AEC-Q100
- ✧ Package: QFN32 OZ85211; QFN24 OZ85212

GENERAL DESCRIPTION

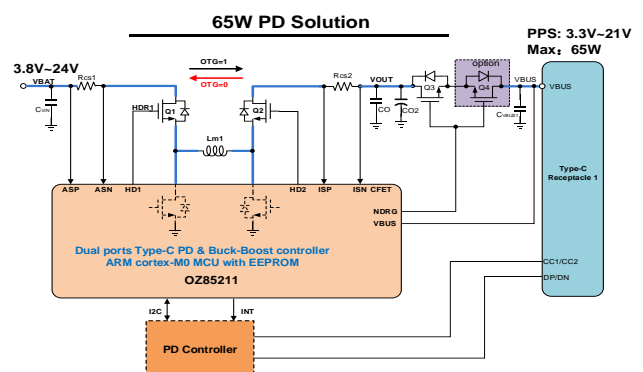
OZ85211/12 is a USB PD power profile capable synchronous Buck-Boost converter optimized for converting 1-5 cell battery voltage or adaptor voltage with two integrated low side MOSFETs.

In addition, OZ85211/12 features a programmable soft-start function and offers protection features including cycle-by-cycle current limiting, input and output voltage and current protection by both hardware designing and firmware setting, and thermal shutdown, features optional driver capacity to improve EMI performance.

APPLICATIONS

- Battery Powered Systems
- Car Chargers
- USB Power Delivery

APPLICATION DIAGRAM



[Homepage](#)

OZ85412/13

FEATURES

- ✧ Highly integrated Buck-Boost converter with embedded USB PD (Power Delivery) controller
- ✧ Optional USB PD Dual Ports Support for OZ85413
- ✧ Supports latest USB PD 3.1 specification, BC1.2
- ✧ Support Full PPS (Programmable Power Supply) with range from 3.3V to 21.0V; Built-in Constant Voltage (CV), Constant Current (CC) and Constant Power (CP) control loop for high resolution (6mV/step; 9.6mA/step)
- ✧ Built-in Seamless Transition Among Buck, Buck-Boost and Boost Operations:
 - 3.8V to 24V Input Operating Voltage, Output: 3.3V~21V with Max 65W power
 - Maximum output current up to 5A with 9.6mA (typical) step
 - Programmable Switching Frequency, it can be set from 200KHz to 2.2MHz by external Resistor or synchronized by external input clock
 - Built-in VBUS/VOOUT Fast Discharge circuit
 - Built-in 2 Low Side Power NFETs with low $R_{DS(ON)}$ and 2 Boost Drivers for High Side NFETs
 - Supports OTG(On-The-Go) Function
- ✧ Built-in 32-bit MCU subsystem:
 - ARM Cortex M0 MCU
 - 16K bytes boot ROM with ROM-API
 - 64K bytes EEPROM
 - 12K bytes SRAM
- ✧ In-System Programming or In-Application Programming by I2C, UART
- ✧ Built-in Cable Compensation algorithm
- ✧ Safety function includes Over-Voltage Protection (OVP); Input Under Voltage Lockout (UVLO); Over-Temperature Protection (OTP); Over-Current Protection (OCP), and Short-Circuit Protection (SCP) with adjustable threshold
- ✧ Shutdown Current is less than 1 μ A
- ✧ AEC-Q100
- ✧ Package: QFN48 OZ85413; QFN40 OZ85412

GENERAL DESCRIPTION

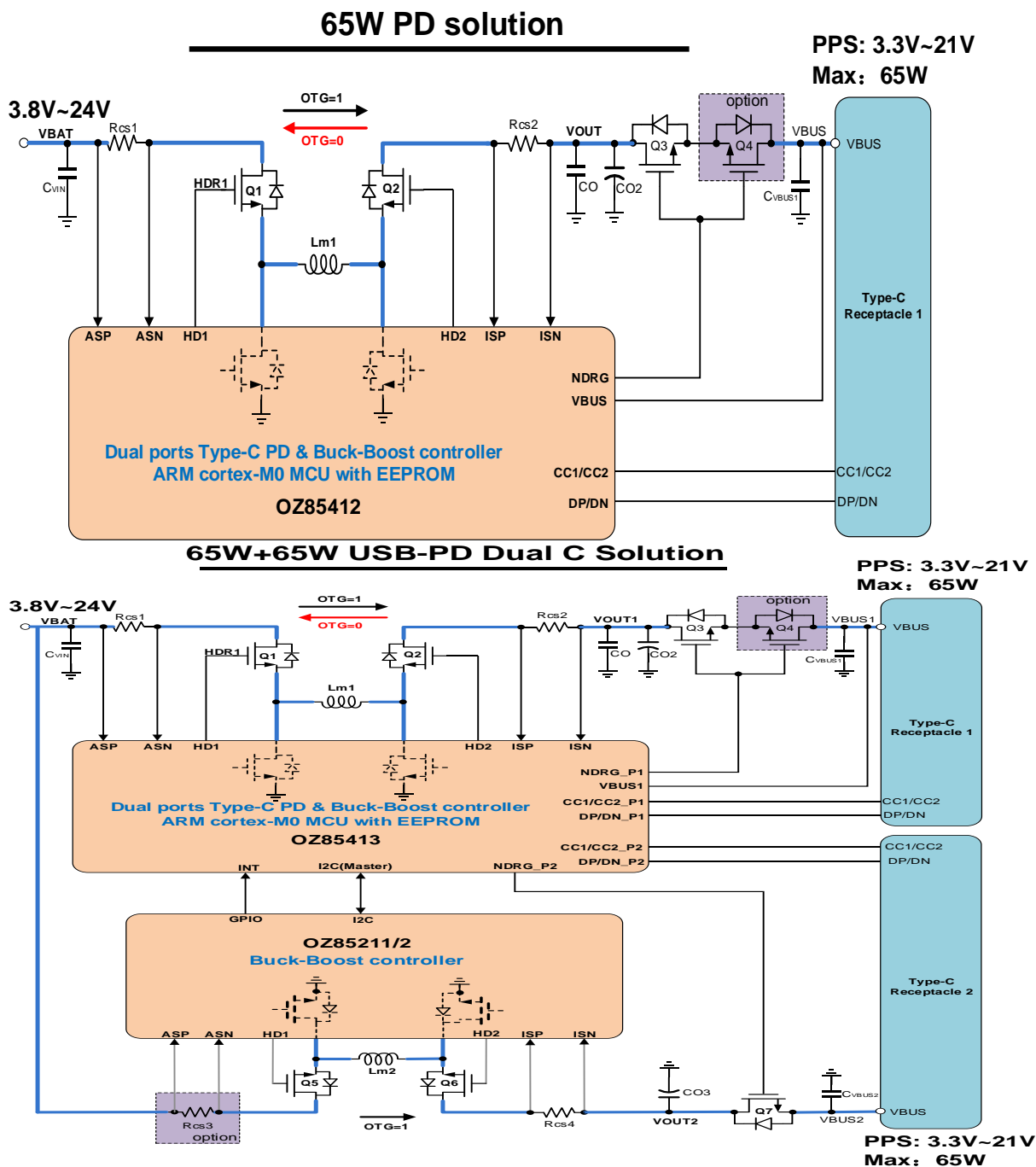
The OZ85412/13 is an automotive AEC-Q100 certified controller with highly integrated USB Type-C PD and Buck-Boost. The OZ85412/13 contains Cortex-M0 MCU, It can supports PD3.1 protocol specifications, compatible with BC1.2 and third-party proprietary communication protocols; This chip can intelligently realize boost, buck, and Buck-Boost according to input voltage and output voltage; This IC integrates independent Hardware based protections with adjustable thresholds and firmware-based

protections to enable higher safety standard for reliable system application The OZ85412/13 integrates dual low-side power MOSFETs with minimal peripheral components and simple PCB layout, providing an excellent solution for USB PD applications.

APPLICATIONS

- Automotive USB Type-C Power Delivery charger
- Car charger

APPLICATION DIAGRAM



Thank you for reading