

INTELLIGENT **POWER²**[®] *for* Mobile Communications



O₂Micro[®]
Breathing Life into Mobility

Mobile Communications Product Guide

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Mobile Communications

Mission Statement

Be the industry leader in Mobile Communications solutions for efficient, highly integrated, power management ICs.

PRODUCTS

O₂Micro's *Intelligent Power for Mobile Communications* solutions empower **Lighting, Power Management and DC/DC Converter Controller** IC products.



Lighting ICs, part of the *Intelligent Lighting* family of LED controllers, include highly efficient backlight solutions for mobile communications applications.

Power Management ICs include highly integrated, mixed signal *Battery Chargers*,

Chargers with Hybrid Power Boost technology and *Battery Monitors* designed to charge notebook batteries with unmatched efficiency and reliability and provide safe battery management.

DC/DC Converter Controller ICs are driven by Constant-Ripple-Current® technology, and are specially developed to design high efficiency power supplies.

OZ521

Boost Converter Controller

FEATURES

- Supports wide-range operating voltage
- Integrated with a 50V, 4A power MOSFET
- Supports an optional spread-spectrum switching frequency
- In applications:
 - Supports either constant-voltage or constant-current output
 - Protection includes: output over-voltage, power MOSFET over-current, over-temperature, and open rectifier diode
 - Low standby current

GENERAL DESCRIPTION

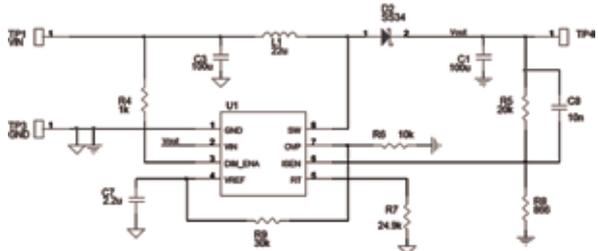
OZ521 is a boost converter controller suitable for LED lighting or general purpose DC/DC converter applications. It is designed as a current-mode controller for boost converter applications.

OZ521 integrates a 50V/4A MOSFET as the switch and compensation components for the boost converter to optimize the cost/performance of applications.

APPLICATIONS

- LED Lighting
- DC/DC Converter

APPLICATION DIAGRAM



OZ535

Compact LED Driver

FEATURES

- Operates with single cell Li-Ion battery as power supply
- 2.5V ~ 5.5V VCC operation voltage range
- Integrated 40Vds, 0.3Ω power MOSFET
- Drives up to 10 LEDs in series
- Self-adaptive operating frequency, optimizing efficiency
- Integrated PWM to analog dimming converter
- Supports up to 100:1 analog dimming ratio
- Protection includes: output over-voltage and over-current, LED short circuit to ground, and IC over-temperature
- Output capacitor discharge function in shutdown mode
- Low standby current

GENERAL DESCRIPTION

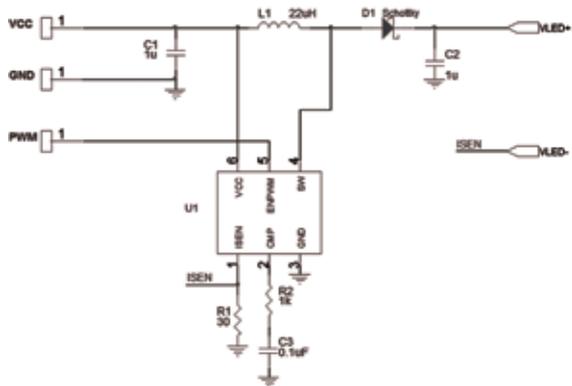
OZ535 is a high efficiency boost DC/DC converter with an integrated power MOSFET. It can drive 1 LED string with up to 10 LEDs connected in series.

OZ535 provides the user with a compact solution that requires minimum components for the boost regulator. It is suitable for portable device applications using a single cell Li-Ion battery.

APPLICATIONS

- LED Lighting
- Tablet
- Cell Phone

APPLICATION DIAGRAM



OZ536

Compact LED Driver

FEATURES

- Supports single cell Li-Ion battery operation
- Integrated 45V, 0.1 Ω power MOSFET
- Drives any number of strings of LEDs up to 6 strings maximum
- Up to 30mA current per string
- Built-in PWM to analog dimming integrator
- Up to 100:1 true analog dimming ratio
- +/-0.5% typical LED current matching
- No noise or interference to touch panel
- Protection includes: LED short circuit to ground, over-voltage, open rectifier diode, MOSFET over-current, and over-temperature
- Low standby current

GENERAL DESCRIPTION

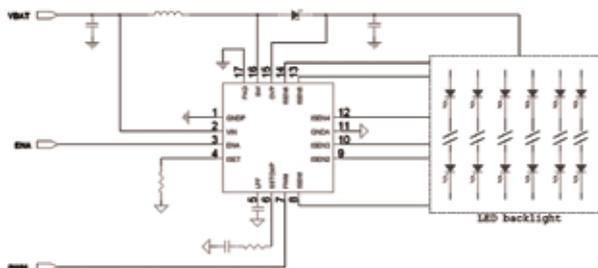
OZ536 is a highly integrated and efficient LED driver controller designed for the LCD backlight in portable applications.

OZ536 provides an integrated circuit to balance the current flow for each LED string, as well as an integrated power MOSFET for the boost converter. The on-resistance of the power MOSFET provides excellent power efficiency for battery-powered portable applications.

APPLICATIONS

- LED Lighting
- Tablet
- Cell Phone

APPLICATION DIAGRAM



OZ9956B

Six String LED Controller

FEATURES

- High frequency DC/DC power converter for LEDs
- Drives up to 6 strings in parallel
- Integrated LED current balance control circuit, and power MOSFET
- Wide input voltage range
- Up to 2.0MHz switching frequency
- External PWM dimming
- Over-voltage and over-current protection
- Soft start function

GENERAL DESCRIPTION

OZ9956B is a high efficiency, DC/DC controller that drives up to six (6) strings of LEDs in parallel configuration, with multiple LEDs in each string connected in series. It is targeted for notebook/netbook applications.

It provides six (6) LED current sense inputs in an “OR” configuration for improved backlight reliability. This allows the backlight to remain functional in the event that any string(s) is damaged during normal operation.

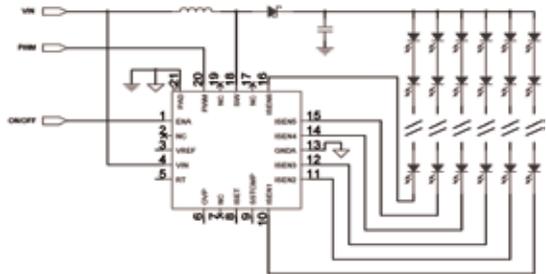
OZ9956B can receive either an analog signal or an external Pulse Width Modulation (PWM) signal for the dimming control function.

This IC provides an integrated circuit to balance the current flow through each LED string, as well as, the integrated power MOSFET.

APPLICATIONS

- Notebook/Netbook Computer

APPLICATION DIAGRAM



OZ9979

Six String LED Controller with Phase-Shift Dimming Internal MOSFET

FEATURES

- High efficiency DC/DC boost converter controller
- Integrated power MOSFET, and LED current balance control circuit
- Drives up to 6 strings in parallel
- Supports external, internal PWM and analog dimming
- Enhanced dimming resolution
- Supports 6 equal-delay PWM dimming signals
- PWM dimming frequency synchronized with external signal
- Protection includes: MOSFET over-current, over-voltage, LED short circuit detection, output short circuit/open diode, and thermal
- Soft start function

GENERAL DESCRIPTION

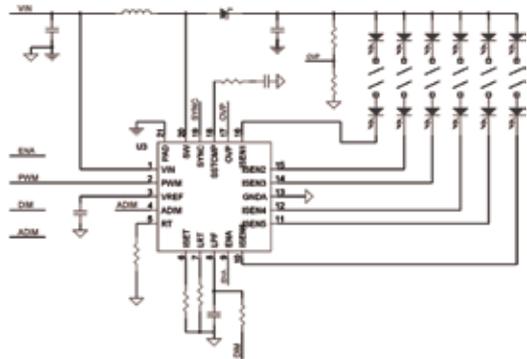
OZ9979 is a high efficiency, DC/DC controller that drives up to six strings of LEDs connected in parallel configuration; with multiple LEDs in each string connected in series. It is targeted for notebook backlight applications.

The IC provides six (6) LED current sense inputs in an “OR” configuration for improved backlight reliability. This allows the backlight to remain functional in the event that any string(s) is damaged during normal operation.

APPLICATIONS

- Notebook Computer

APPLICATION DIAGRAM



OZ9993

Low Cost White LED Controller

FEATURES

- High frequency DC/DC boost converter controller
- Supports a single cell Li-Ion battery
- Fixed 975kHz switching frequency
- Integrated power MOSFET with over-current protection
- Output over-voltage protection
- Open diode or output short circuit protection
- Thermal protection

GENERAL DESCRIPTION

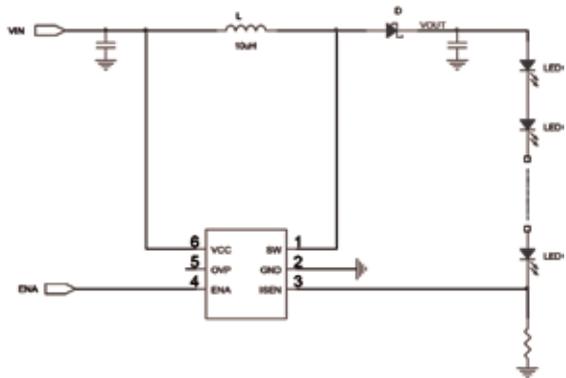
OZ9993 is a high efficiency, DC/DC controller with an integrated power MOSFET that drives one string of LEDs. It provides the user with a low cost solution that requires minimum components for the boost regulator and is suitable for applications requiring a single cell Li-Ion battery.

A soft start feature is provided to minimize in-rush current during start-up.

APPLICATIONS

- Netbook Computer
- PND
- Camcorder

APPLICATION DIAGRAM



OZ523

Step Down DC/DC Converter

FEATURES

- Supports constant voltage or constant current applications
- 1.5A continuous output current
- 0.25Ω internal Power MOSFET
- Stable control loop
- V_{OUT} from 0.8V to $0.9 \cdot V_{IN}$
- Soft start function
- Fixed switching frequency
- Low current shutdown mode
- Over-current and thermal protection

GENERAL DESCRIPTION

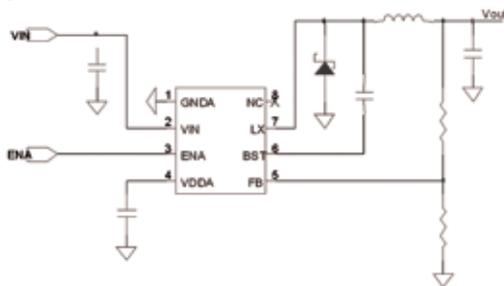
The OZ523 is a fast response PWM controller using minimum external components to achieve control loop stability in DC/DC and LED driver applications. It supports both constant voltage and constant current applications. OZ523 can operate in constant current mode to drive high power LED applications.

OZ523 is a non-synchronous step down DC/DC converter with a 0.25Ω integrated MOSFET. It supports a 1.5A continuous load current with up to 3.2A peak current. The output voltage can be user-defined from 0.8V up to $0.9 \cdot V_{IN}$ using a feedback resistor divider.

APPLICATIONS

- General Purpose DC/DC Converter
- High Power LED Driver

APPLICATION DIAGRAM



OZ524

Step Down 3A DC/DC Converter

FEATURES

- Supports constant voltage or constant current applications
- 3.0A continuous output current
- 0.12Ω internal Power MOSFET
- Stable control loop
- V_{OUT} from 0.8V to $0.9 \cdot V_{IN}$
- Soft start function
- Fixed switching frequency
- Low current shutdown mode
- Over-current and thermal protection

GENERAL DESCRIPTION

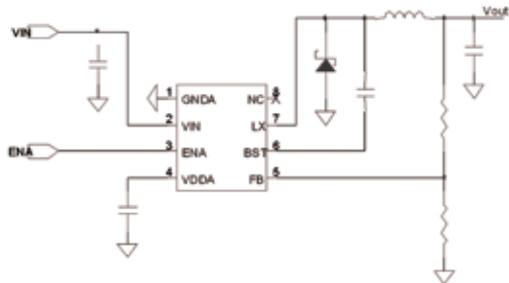
The OZ524 is a fast response PWM controller using minimum external components to achieve control loop stability in DC/DC and LED driver applications. It supports both constant voltage and constant current applications. OZ524 can operate in constant current mode to drive high power LED applications.

OZ524 is a non-synchronous step down DC/DC converter with a 0.12Ω integrated MOSFET. It supports a 3.0A continuous load current with up to 4.7A peak current. The output voltage can be user-defined from 0.8V up to $0.9 \cdot V_{IN}$ using a feedback resistor divider.

APPLICATIONS

- General Purpose DC/DC Converter
- High Power LED Driver

APPLICATION DIAGRAM



OZ526

White LED Controller

FEATURES

- High frequency DC/DC power converter for LEDs
- Integrated power MOSFET
- Integrated LED current balance control circuit
- User-defined operation frequency
- Drives 1 or 2 strings
- External PWM and Analog dimming control
- Converter output over-voltage protection
- Internal power MOSFET over-current protection
- Over-current protection for each string
- Output short circuit detection
- Open diode and thermal protection

GENERAL DESCRIPTION

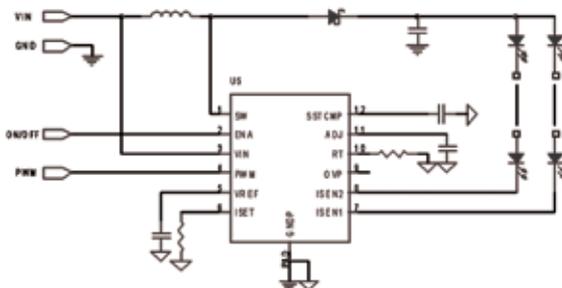
The OZ526 is a high efficiency DC/DC controller with an integrated power MOSFET that drives one string or two LED strings in parallel configuration, with multiple LEDs connected in series. It is targeted for netbook and PND (Personal Navigation Device) backlight applications.

OZ526 provides two LED current sense inputs in an “OR” configuration for improved backlight reliability. This allows the backlight to remain functioning in the event that any string(s) is damaged during normal operation. The controller receives an external Pulse Width Modulation (PWM) signal for the dimming control function.

APPLICATIONS

- GPS
- PND

APPLICATION DIAGRAM



OZ527

Automotive GPS LED Controller

FEATURES

- High power DC/DC power converter
- Integrated Power N-Channel MOSFET
- Integrated LED current balance control circuit
- Drives up to 6 strings in parallel
- User-defined string selection
- Time-shift PWM phase dimming control for low audible noise
- Operation frequency synchronization
- LED open string protection
- Output short circuit or open diode protection
- LED short circuit protection
- MOSFET over-current protection
- Shutdown under abnormal condition protection
- Thermal protection
- LED fault status output

GENERAL DESCRIPTION

The OZ527 is a high efficiency DC/DC controller that drives up to six strings connected in parallel configuration with multiple LEDs in each string connected in series.

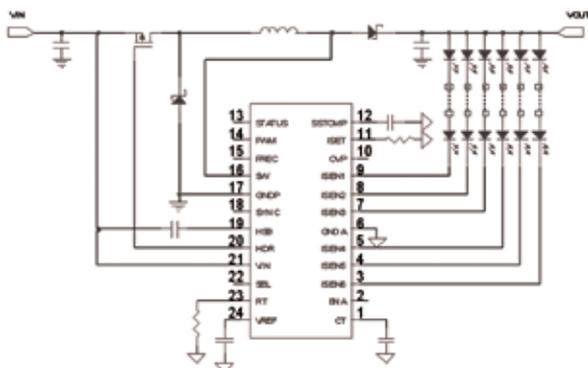
OZ527 provides 6 LED current sense inputs in an “OR” configuration to improve backlight reliability. This allows the backlight to remain functioning in the event that a string(s) is damaged during normal operation.

OZ527 supports external Pulse Width Modulation (PWM) dimming control.

APPLICATIONS

- GPS

APPLICATION DIAGRAMS



OZ528

LCD Bias Supply Controller

FEATURES

- High power DC/DC power converter
- Operation frequency synchronization
- Optional spread spectrum operation frequency
- Thermal, over-current, and over load protection
- Abnormal pulled-up output protection
- LED fault status output

Two Independent Boost Converters

- Integrated power MOSFET
- Current mode control
- Wide output range: up to 25.0V
- Adjustable power on/off delay time
- Soft start function

Negative Charge Pump

- Voltage mode control
- Adjustable power on/off delay time

Buck Converter

- Integrated power MOSFET
- Current mode control
- Soft start function

GENERAL DESCRIPTION

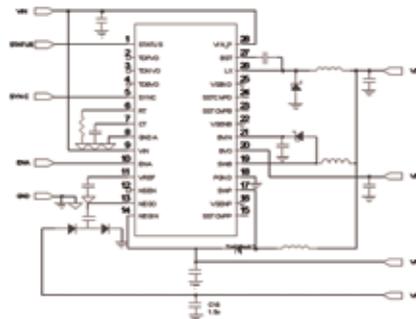
The OZ528 is a LCD panel bias power supply controller, suitable for GPS application. It generates four voltage rails for a TFT LCD panel. It includes a boost converter to provide the source voltage, buck converter to provide the logic voltage for the system, boost converter for positive gate voltage and a negative charge-pump driver to provide adjustable regulated output voltages to bias the TFT panel.

OZ528 has power-on sequencing. The buck converter is the first to start after the IC is enabled. Two boost converters and a negative charge-pump are enabled when their corresponding TIMER reaches approximately 2.0V.

APPLICATIONS

- GPS

APPLICATION DIAGRAM



Patents pending.

OZ9965

LED Controller + 2 – DC/DC

FEATURES

- Integrated LED controller and two (2) DC/DC converters
- User-defined operation frequency
- Wide input voltage range
- Thermal protection
- User-defined shutdown delay time
- LED fault status output

LED Controller

- User-defined boost topology or buck-boost topology
- Current mode control
- Drives up to 4 strings of LEDs in parallel
- User-defined string selection
- Integrated LED current balance control circuit
- External PWM dimming control
- LED open string and short circuit protection

LED Controller (cont.)

- MOSFET over-current protection
- Over load protection
- Output short circuit or open diode protection

Boost Converter

- Current mode control
- Over-voltage protection
- MOSFET over-current protection
- Over load protection
- Soft start function

General Purpose Converter

- User-defined negative buck-boost or buck topology
- Voltage mode control
- Over-voltage and over load protection
- Soft start function

GENERAL DESCRIPTION

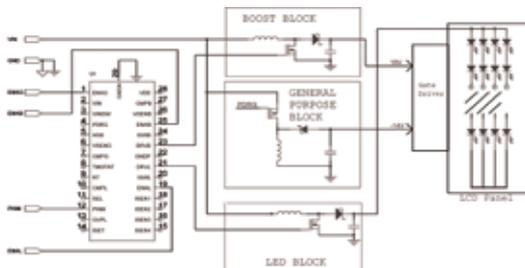
The OZ9965 is a wide input range, multi-output, power management controller for small panel LCD applications. It controls the DC/DC power conversion from a single input supply voltage to provide the power needed to drive an LED backlight module, source drivers and gate drivers used in a LCD application.

OZ9965 includes a high power LED driver controller, a boost converter, and one general purpose converter that can be configured into either a buck or negative buck-boost converter.

APPLICATIONS

- Car TV
- GPS

APPLICATION DIAGRAM



OZ9990

Four String High Power Buck/Boost LED Driver

FEATURES

- High power DC/DC power converter controller
- Drives up to 4 strings in parallel
- Integrated LED current balance control circuit
- User-defined string selection
- Operation frequency synchronization
- External PWM dimming control
- Time-shift PWM phase dimming control for low audible noise
- LED open string protection
- Output short circuit and open diode protection
- LED short circuit protection
- MOSFET over-current protection
- Thermal protection
- LED fault status output
- Soft start function

GENERAL DESCRIPTION

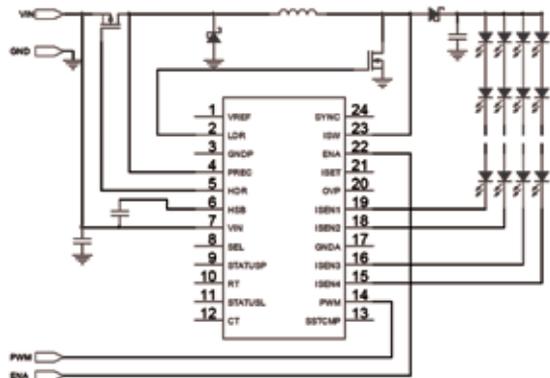
OZ9990 is a LED controller that drives up to four (4) strings connected in parallel configuration, with multiple LEDs per string connected in series. It provides four (4) LED current sense inputs in an “OR” configuration to improve backlight reliability. This allows the backlight to remain functioning in the event that any string(s) is damaged during normal operation.

OZ9990 supports external Pulse Width Modulation (PWM) dimming control, and provides an integrated circuit to balance the current flow through each LED string.

APPLICATIONS

- Car TV
- GPS

APPLICATION DIAGRAM



U.S. Patent #'s 7,498,793; 7,847,783; and more patents pending.

OZ9998A

Eight String High Power LED Controller

FEATURES

- High power DC/DC boost converter controller
- Drives up to 8 strings in parallel
- Integrated LED current balance control circuit
- User-defined string selection
- External PWM dimming control
- Time-shift PWM phase dimming control for low audible noise
- Multi-chip parallel operation for more than 8 LED strings
- MOSFET over-current protection
- LED short circuit and open string protection
- Thermal protection
- LED fault status output

GENERAL DESCRIPTION

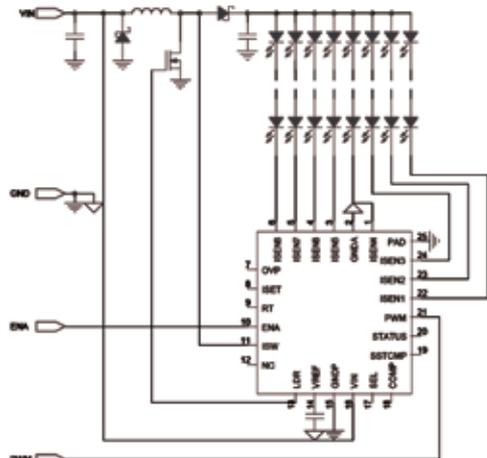
OZ9998A are high efficiency, DC/DC controllers that drive up to eight (8) strings of LEDs connected in parallel configuration, with multiple LEDs in each string connected in series. Each IC provides eight (8) LED current sense inputs in an “OR” configuration to improve backlight reliability. This allows the backlight to remain functional in the event that any string(s) is damaged during normal operation.

OZ9998A support external Pulse Width Modulation (PWM) dimming control. Plus, each provides an integrated circuit to balance the current flow through each LED string.

APPLICATIONS

- LCD Monitor
- LCD TV

APPLICATION DIAGRAM



OZ522

Charger + DC/DC PMU

FEATURES

Charger

- 550KHz switching mode charger for 1 – 4 cell Li-Ion or Li-Polymer batteries
- Supports fast charge mode
- Wake-up charging function for discharged batteries
- Built-in charge termination function
- Internal safety timer for charger
- 92% efficiency
- Automatic battery recharge
- 1% constant voltage accuracy
- Charge status indication by LED
- Battery absence detection

DC/DC Converters

- Two switch mode buck converters with under-voltage protection
- 2% voltage accuracy
- Output protection:
 - Over-current for each DC/DC converter
 - Over-voltage lockout on adapter voltage
 - Under-voltage lockout on battery voltage
- Output voltage range of 1.0V to 5.5V
- Integrated soft start function, 4ms soft start function at start-up
- ON/OFF control pin

GENERAL DESCRIPTION

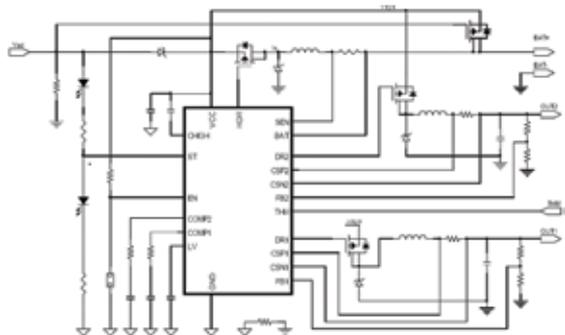
The OZ522 is a charger plus DC/DC Power Management Unit (PMU). It provides a complete charging algorithm to control 1 – 4 cell Lithium Ion (Li-Ion) batteries, used in Portable DVDs (PDVDs), and other portable electronic equipment.

It delivers a wake-up charging current for discharged batteries followed by a fast charging current to minimize the charging time, and keeps the battery regulation voltage within 1% accuracy. A battery temperature sensing scheme allows the battery to be charged within a user-defined temperature range. The switch mode charger allows use of low AC adapter voltage at high efficiency.

APPLICATIONS

- PDVD

APPLICATION DIAGRAM



OZ8071

USB Protection IC and Battery Charger

FEATURES

- USB-powered switching charger
- Dynamically allocates input power, first to the system and then to charging
- Integrated power MOSFET transistors
- USB 2.0, 3.0, and USB battery charging specification compliant
- Up to 1.5A charging current when powered from USB charging downstream port
- Protection includes: input over-voltage (6V) and under-voltage (4V), charger over-voltage, and thermal trip point 150°C
- Microcontroller controlled input current limits
- Stable with low ESR ceramic capacitors
- V_{BUS} from 4.0V to 5.5V in operation; V_{BUS} and V_{OUT} status indicators
- Supports battery voltage from 0V up to 8.8V
- Final charging voltage (CV mode) settable in the range of 8.0V to 8.8V
- Adjustable frequency from 0.5MHz to 2MHz

GENERAL DESCRIPTION

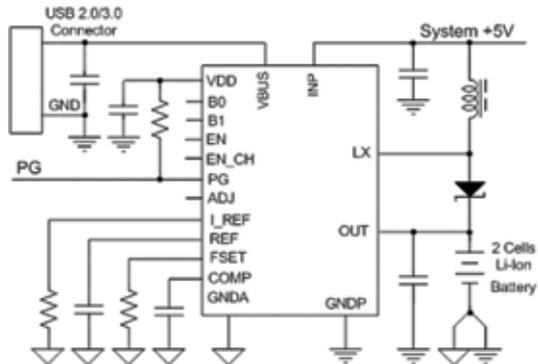
OZ8071 is a USB compliant power IC assuring 2-cell, Li-Ion battery charging; and protection of both the battery and USB upstream power bus.

When OZ8071 is connected to a USB port and not enabled, it takes, at most, 300 μ A. Once enabled, by asserting the EN pin “high,” it wakes up and limits the current taken from the USB port at the set limit. The guest system’s controller performs the handshake with the host and sets the current limit by correspondingly asserting the digital command inputs B0 and B1.

APPLICATIONS

- Camcorder, DSLR, DSC
- USB-powered Devices

APPLICATION DIAGRAM



OZ8555

Battery Charger/Boost Controller

FEATURES

- High accuracy, switched mode, 1 cell Li-Ion charger with integrated MOSFETs
- 0.5% voltage mode accuracy; 3% current mode accuracy
- Maximum charge current of 2A; 1 MHz operating frequency
- Boost output voltage accuracy $5.15V \pm 2\%$
- Integrated power by adapter switch/5V LDO for V5V rail
- Integrated power by adapter switch for VSYS rail
- Adapter current sensing with programmable adapter current limit
- Dynamic current allocation
- Integrated 3.3V LDO with 1% output accuracy
- 3.3V DC/DC input voltage selector driving signals
- Protection includes: boost over-current and over-temperature
- 12 hours safety timer
- Thermistor sensing input

GENERAL DESCRIPTION

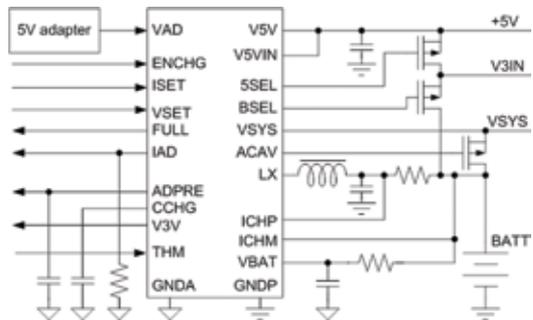
OZ8555 is a charger/boost controller specially developed for 1 cell Li-Ion-powered handheld devices such as a MID. It offers better performance at a lower cost by integrating a 5V boost converter and replacing the linear regulator with a switching mode charger. The charger has better efficiency and up to 2A charge current capability.

The boost converter is optimized to provide high efficiency over a wide load range, with a 20mA typical current consumption under no load condition.

APPLICATIONS

- 1 Cell Li-Ion handheld devices
- MID
- Smart Phone

APPLICATION DIAGRAM



OZ8556

Battery Charger/Boost Controller

FEATURES

- High accuracy, switched mode, 1 cell Li-Ion charger with integrated MOSFETs
- 0.5% voltage mode accuracy; 3% current mode accuracy
- Maximum charge current of 4A; 1 MHz operating frequency
- Boost with integrated MOSFETs operating from battery voltage >2.5V when adapter is not present
- Boost output voltage accuracy 5V \pm 2%
- Integrated 5V LDO for V5V rail
- Integrated power by adapter switch for VSYS rail
- Soft start for V5V and VSYS to avoid inrush current from adapter
- VADP can sustain 20V
- Adapter current sensing with programmable adapter current limit, accuracy 3%
- Dynamic current allocation
- Integrated 3.3V LDO with 1% output accuracy
- 3.3V DC/DC input voltage selector driving signals
- Protection includes: over-voltage for charging, boost over-current, over- and under-voltage for VADP, under-voltage threshold adjustable and over-temperature
- 12 hours safety timer
- Thermistor sensing input

GENERAL DESCRIPTION

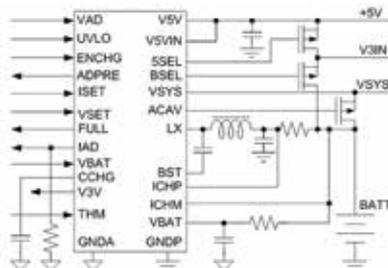
OZ8556 is a charger/boost controller specially developed for 1 cell Li-Ion-powered handheld devices such as a MID and tablet. It offers better performance at a lower cost by integrating a 5V boost converter and replacing the linear regulator with a switching mode charger. The charger has better efficiency and up to 4A charge current capability.

The boost converter is optimized to provide high efficiency over a wide load range, with a 20mA typical current consumption under no load condition.

APPLICATIONS

- 1 Cell Li-Ion handheld devices
- MID
- Tablet
- Smart Phone

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,598,718; 7,816,896; and more patents pending.

OZ8618

Battery Charge Controller with Selector

FEATURES

- Battery Charge Controller with NMOS system power selector
- NMOS synchronous Buck Converter topology
- Programmable wake-up current and voltage threshold
- High efficiency of (>95%)
- $\pm 0.5\%$ constant voltage, $\pm 5\%$ charging current, and $\pm 5\%$ input current limiting accuracies
- Outputs charging and adapter current information for monitoring
- Analog inputs to program charging current, charging voltage, and adapter current limit
- Dynamic AC adapter current allocation for maximum charging rate
- Protection includes: built-in adapter and battery under-voltage, short circuit, over-voltage, and over-current
- Built-in protection for operation at low charging current
- Automatic AC Adapter voltage detection
- Easy interface with a microcontroller
- Charges batteries of various chemistries, including Li-Ion with 2, 3, and 4 cells

GENERAL DESCRIPTION

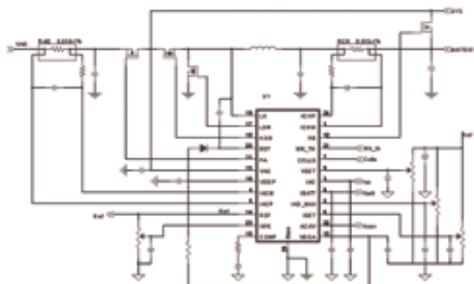
OZ8618 is a high performance battery charge controller with adapter and charging current sensing, programmable wake-up, and the required logic and drivers to manage the NMOS system's power path. It can operate as a stand-alone charger or under the supervision of a host microcontroller. It provides complete battery charging control for single battery portable systems. Multiple battery configurations may also be implemented with OZ8618 using a discrete battery selector.

OZ8618 uses two high-side current sensors. When charging with the system ON, it dynamically allocates all remaining AC adapter current not used by the system to the charger, achieving the shortest possible charging time.

APPLICATIONS

- Notebook/Netbook Computer
- Ultra Mobile Computers

APPLICATION DIAGRAM



U.S. Patent #'s 6,498,461; 6,611,129; 6,861,823; 7,202,634; 8,350,532; 8,450,977; and more patents pending.

OZ8660

Single Battery Charger Controller

FEATURES

- Highly integrated, high accuracy, single battery charge controller
- Synchronous buck converter topology with integrated power MOSFET
- System power selector with integrated power MOSFET
- Charging current up to 4A; high efficiency of >94%
- 0.5% constant voltage, $\pm 2\%$ charging current, and $\pm 2\%$ input current limiting accuracies
- Outputs adapter and battery charge/discharge current information for monitoring
- Analog inputs to program charging current, charging voltage and input current limit
- Programmable wake-up voltage threshold
- Protection includes: battery reverse connection, built-in adapter under-voltage ($8.75V \leq V_{VAD}$), built-in battery under-voltage/short circuit, over-voltage and over-current, built-in protection for operation at low charging current and over-temperature shutdown
- Dynamic AC adapter current allocation for maximum charging rate
- Automatic AC Adapter voltage detection
- Charges batteries of various chemistries, including Li-Ion with 2, 3, and 4 cells

GENERAL DESCRIPTION

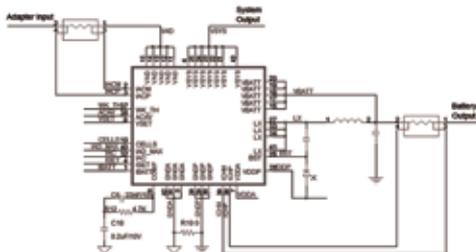
OZ8660 is a high performance battery charge controller with four power MOSFETs, from power switching and selector, integrated into one package. It has input and charging current sensing, and programmable wake-up threshold with associated logic and drivers to manage the integrated system's power path. It can operate under the supervision of a host microcontroller, and provides complete battery charging control for single battery portable systems.

OZ8660 uses two high-side current sensors. When charging with the system ON, it dynamically allocates all remaining AC adapter current not used by the system to the charger, achieving the shortest possible charging time.

APPLICATIONS

- Notebook Computer
- Portable Electronics

APPLICATION DIAGRAM



U.S. Patent #'s 6,498,461; 6,611,129; 6,861,823; 7,202,634; 8,350,532; 8,450,977; and more patents pending.

OZ8681

SMBus Level 2 Battery Charger

FEATURES

- NMOS synchronous topology with fixed frequency and >95% efficiency
- $\pm 0.5\%$ battery voltage, $\pm 3\%$ charging current and $\pm 3\%$ adapter current accuracies
- Simplified SMBus control of battery voltage, charge current and adapter input current
- 11-bit DAC battery voltage setting (1.024V – 19.200V)
- 6-bit DAC charge current setting (128mA – 8.064A)
- 6-bit DAC adapter current setting (256mA – 11.008A)
- Space-saving 16-pin QFN
- Automatic AC Adapter voltage detection
- Outputs valid adapter presence
- Outputs adapter current/battery discharge current
- Protection includes: built-in battery over-voltage, over-current, reverse connection, and embedded thermal shutdown
- Charges batteries of various chemistries, including Li-Ion with 1 to 4 cells

GENERAL DESCRIPTION

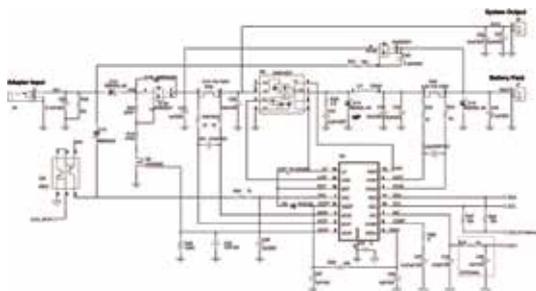
OZ8681 is a highly integrated, SMBus programmable, multi-chemistry battery charge controller with adapter current information available at the output. It is intended to be used as a smart battery charger (SBC) within a smart battery system (SBS). It uses a minimal SMBus command set to easily program the charging voltage and current, and adapter current limit. It provides complete battery charging control for single battery portable computer systems.

OZ8681 uses two high-side current sensors. When charging with the system ON, OZ8681 dynamically allocates all remaining AC adapter current not used by the system to the charger, achieving the shortest possible charging time.

APPLICATIONS

- Notebook/Netbook Computer
- Ultra Mobile Computers

APPLICATION DIAGRAM



OZ8682

SMBus Level 2 Battery Charger with Hybrid Power Boost

FEATURES

- Hybrid Power Boost feature allows battery to provide power in parallel with the AC adapter
- NMOS synchronous topology with fixed frequency and >95% efficiency
- $\pm 0.5\%$ battery voltage, $\pm 3\%$ charging current, and $\pm 3\%$ adapter current accuracies
- Simplified SMBus control of battery voltage, charge current and adapter input current
- 11-bit DAC battery voltage setting (1.024V – 19.200V); 6-bit DAC charge current setting (128mA – 8.064A); 6-bit DAC adapter current setting (256mA – 11.008A)
- Space-saving 16-pin QFN
- Automatic AC Adapter voltage detection; outputs valid adapter presence
- Outputs adapter current/battery discharge current
- Protection includes: built-in battery over-voltage, over-current, reverse connection, and embedded thermal shutdown
- Charges batteries of various chemistries, including Li-Ion with 1 to 4 cells

GENERAL DESCRIPTION

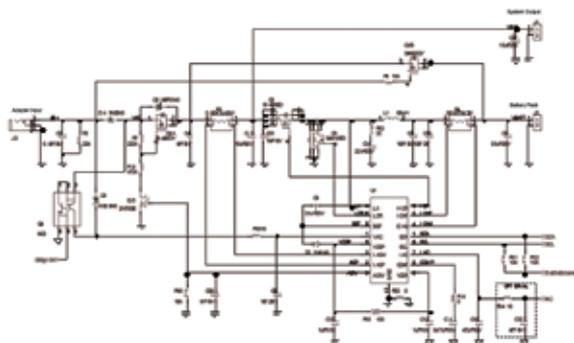
OZ8682 is a highly integrated, SMBus-programmable, multi-chemistry battery charge controller with a hybrid power boost feature. It is intended to be used as a smart battery charger (SBC) within a smart battery system (SBS), providing complete battery charging control for single battery portable computer systems.

OZ8682 uses two high-side current sensors. When charging with the system ON, OZ8682 dynamically allocates all remaining AC adapter current not used by the system to the charger, achieving the shortest possible charging time.

APPLICATIONS

- Notebook/Netbook Computer
- Ultra Mobile Computers

APPLICATION DIAGRAM



U.S. Patent #'s 6,498,461; 6,611,129; 6,861,823; 7,202,634; 7,719,236; and more patents pending.

OZ8690

SMBus Level 2 Battery Charger with Hybrid Power Boost

FEATURES

- Highly integrated, high accuracy, single battery charge controller
- Synchronous buck converter topology and system power selector with integrated power MOSFET
- High efficiency of >95%; and Hybrid Power Boost feature allows battery to provide power in parallel with the AC adapter
- $\pm 0.5\%$ charge voltage, $\pm 3\%$ charging current, and $\pm 3\%$ adapter current accuracies
- Simplified SMBus control of battery voltage, charge current and adapter input current
- 11-bit DAC battery voltage, 7-bit DAC charge current, and 6-bit DAC adapter current settings
- Programmable switching frequencies, battery depletion threshold, maximum boost current, battery learning mode and AC adapter voltage detection
- Outputs valid adapter presence, and adapter current/battery current information; and no battery charge using airplane power
- Protection includes: built-in battery over-voltage, over-current and reverse connection; built-in adapter under-voltage, over-voltage and reverse connection; and embedded thermal shutdown

GENERAL DESCRIPTION

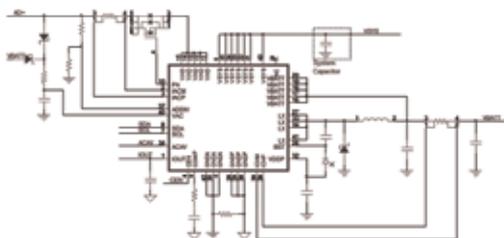
OZ8690 is a highly integrated, SMBus-programmable, multi-chemistry battery charge controller with the Hybrid Power Boost feature. It includes the logic and drivers required to manage the system's power path. It is intended to be used as a smart battery charger (SBC) within a smart battery system (SBS). It uses a minimal SMBus command set to easily program the charging voltage, charging current and adapter current limit.

OZ8690 uses two high-side current sensors. When charging with the system ON, it dynamically allocates all remaining AC adapter current not used by the system to the charger, achieving the shortest possible charging time.

APPLICATIONS

- Notebook/Netbook Computer
- Ultra Mobile Computers

APPLICATION DIAGRAM



U.S. Patent #'s 6,498,461; 6,611,129; 6,861,823; 7,202,634; 8,350,532; 8,450,977; and more patents pending.

OZ8806

Monitor + High Accuracy Coulomb Counter

FEATURES

- Efficient Smart Phone and Tablet battery monitor and high accuracy Coulomb Counter for 1-2 cell batteries
- Monitors:
 - Battery voltage
 - Temperature
 - Current for coulomb counting, state-of-charge and battery gauge
- Resides in either the Host or Battery Pack
- Supports I²C communication protocol
- OCV (Open Circuit Voltage) detection when chip is in start-up and sleep modes
- Low power consumption

GENERAL DESCRIPTION

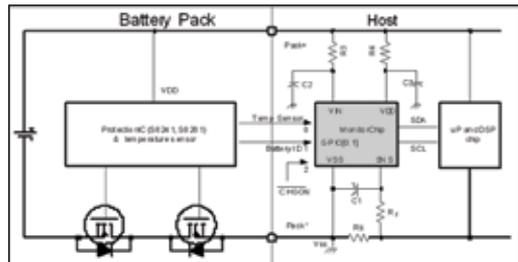
OZ8806 is a single cell battery monitor chip that can work in either the battery pack or host. It provides current-flow, voltage, and temperature measurement data to support battery capacity monitoring in cost-sensitive applications.

Current measurement and coulomb counting are accomplished by monitoring the voltage drop across an external sense resistor. Voltage measurement is accomplished through a separate voltage-sense input. GPIO (General Purpose Input Output) pins can be used to detect the battery temperature, among other purposes.

APPLICATIONS

- Tablet
- PDA/Smart Phone
- Cell Phone
- Digital Camera/
Camcorder
- Handheld Rechargeable
Battery-powered Products

APPLICATION DIAGRAM



OZ8002

Dual Channel MOSFET Driver

FEATURES

- Dual channel driver
- Operating voltage up to 35V
- Integrated bootstrap diode
- LDREN signal which can turn off low side MOSFET in light load, guaranteeing higher efficiency
- Internal pull down resistors, at PWM and LDREN pins, to disable channel not connected to controller

GENERAL DESCRIPTION

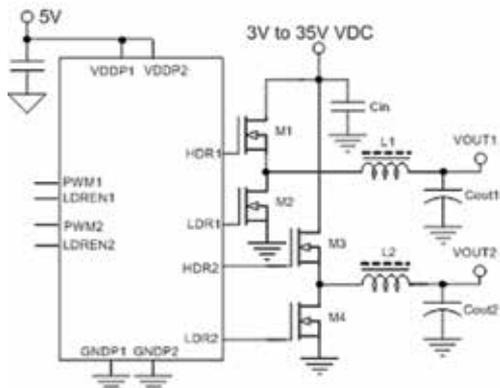
OZ8002 is a dual channel driver that can be connected to the synchronous buck controller that has no integrated driver. Integrated bootstrap diodes simplify the design and reduce the PCB area.

OZ8002 provides the LDREN signal. Together with the CRC controller (OZ8322, for example) in light load, LDREN low will turn off both the high and low side MOSFETs. This can lead to higher efficiency in light load.

APPLICATIONS

- Notebook and Tablet (where synchronous buck controller, without integrated driver)

APPLICATION DIAGRAM



OZ8013

3A Synchronous DC/DC Regulator

FEATURES

- 3A synchronous DC/DC controller with integrated MOSFETs
- Constant-Ripple-Current® (CRC) control allows designing for optimum inductor size
- High efficiency up to 94%; High light load efficiency of >85% at 10mA
- VREF accuracy of 1.5%
- Input voltage from 2.7V to 5.5V; Output voltage adjustable from 0.5V to 3.3V
- Output current up to 3A
- User-adjustable operating frequency
- Dynamic voltage change support; and Voltage feed-forward compensation
- Output Protection: latched over-voltage and under-voltage, Valley type over-current, and over-temperature
- Input Protection: under-voltage lockout on VDDA and VIN
- Power Good and ON/SKIP signals
- Soft start with OCT protection

GENERAL DESCRIPTION

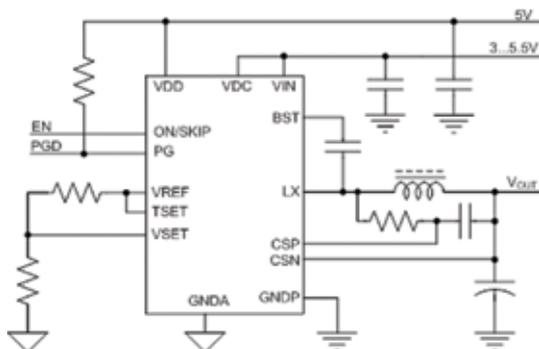
OZ8013 steps down the input voltage to low output voltages in the range of 0.5V to 3.3V. High efficiency, DC accuracy and excellent transient response make OZ8013 the perfect choice to supply low power CPU peripherals, chipset cores, and low power graphics processors.

OZ8013's voltage feed-forward compensation ensures high rejection of input voltage transients, typically occurring when the AC adapter is plugged in or removed.

APPLICATIONS

- Power Supplies for Notebook Peripherals and POL

APPLICATION DIAGRAM



OZ8033

3A Low Dropout Linear Regulator

FEATURES

- Ultra low dropout (LDO) regulator
- 170mV dropout
- 1.5% Accuracy over Line/Load/Temperature
- Fast load Transient Response
- Internal soft start function
- Protection includes: Over-current (OCP), Output Under-voltage (UVP), Under-voltage Lockout (UVLO) for VDDA and VIN, and Over-temperature (OTP)

GENERAL DESCRIPTION

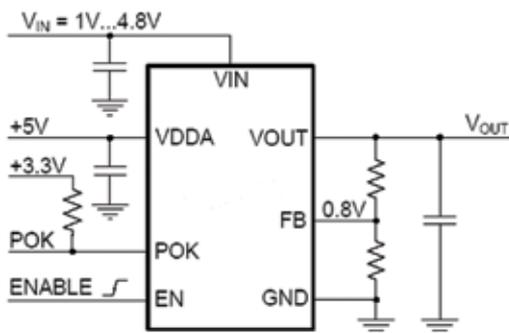
OZ8033 is a fast, high current, and ultra low dropout (LDO) regulator designed for DSP Core, front side bus VTT and other similar applications.

The device uses two power supplies: VIN and VDDA. VIN is the main supply providing the output current; VDDA is an auxiliary supply for all other internal circuitry. The voltages of both power supplies are internally monitored by the UVLO circuitry, which disables the chip when any of these voltages is lower than the safe operation threshold.

APPLICATIONS

- Notebook Computer
- Industrial Computer
- Automotive Infotainment
- FPGA
- DSP Core and I/O Voltage
- Front Side Bus VTT
- Motherboard

APPLICATION DIAGRAM



OZ8111

Ultra High Efficiency DC/DC

FEATURES

- DC/DC SMPS Controller with integrated drivers
- CRC control allows designing for optimum inductor size
- High efficiency up to 94%; High light load efficiency of >85% at 100mA
- VREF accuracy of 1.5%
- Input voltage from 3V to 25V; Output voltage adjustable from 0.5V to 2.75V
- Output current up to 30A
- User-adjustable operating frequency
- Enhanced dynamic voltage change support; and Voltage feed-forward compensation
- Output Protection: latched over-voltage and under-voltage, and Valley type over-current
- Input Protection: under-voltage lockout on VDDA and VIN
- Power Good and ON/SKIP signals
- Soft start at start-up with OCT protection
- Soft stop at shutdown

GENERAL DESCRIPTION

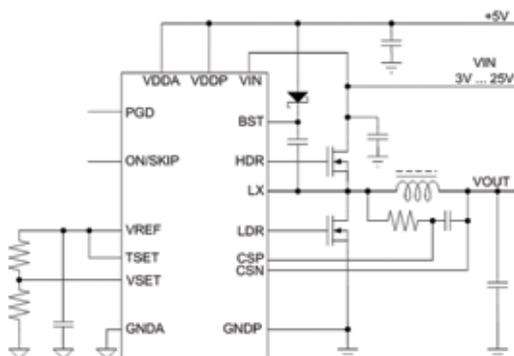
OZ8111 is a DC/DC controller providing power control for peripherals and chipsets. It steps down the high battery voltage to low output voltages in the range of 0.5V to 2.75V. High efficiency, DC accuracy and excellent transient response make OZ8111 the perfect choice to supply low voltage CPU peripherals, chipset cores, and graphics processors.

OZ8111's voltage feed-forward compensation ensures high rejection of input voltage transients, typically occurring when the AC adapter is plugged in or removed.

APPLICATIONS

- Power Supplies for Notebook Peripherals

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; and more patents pending.

OZ8116/8138

Single/Dual Ultra High Efficiency DC/DC

FEATURES

- **OZ8116:** Single DC/DC SMPS controller with integrated drivers
- **OZ8138:** Dual DC/DC SMPS controller with integrated drivers
- CRC control allows designing for optimum inductor size
- High efficiency up to 94%; High light load efficiency >85% at 100mA
- VREF accuracy of 1.5%
- Input voltage from 3V to 25V; Output voltage adjustable from 0.5V to 2.75V
- Output current – up to 15A
- Output protection: latched over-voltage and under-voltage, and over-current
- Input protection: under-voltage lockout on VDDA and VIN
- Soft start at start-up
- Soft stop at shutdown

GENERAL DESCRIPTION

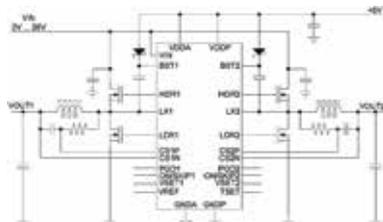
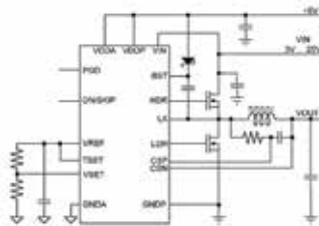
OZ8116/8138 are DC/DC Switched Mode Power Supply (SMPS) controllers specially developed to provide power control for next generation microprocessors, their peripherals and chipsets.

These ICs step down the high battery voltage to low output voltages in the range of 0.5V to 2.75V. High efficiency, DC accuracy and excellent transient response make OZ8116/8138 the perfect choice to supply low voltage CPU peripherals, chipset cores, and graphics processors.

APPLICATIONS

- Power Supplies for Notebook CPU, Microcontrollers and Peripherals
- Industrial Computer
- GPS

APPLICATION DIAGRAMS



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; and more patents pending.

OZ812

DDR/DDR2/DDR3 Integrated Power Supply

FEATURES

- DC/DC SMPS Controller with integrated drivers for VDDQ
- Integrated Linear Regulator with 2A source and sink capability for VTT
- High efficiency, up to 94%; High light load efficiency of >85% at 100mA
- VDDQ accuracy of $\pm 1\%$
- Input voltage from 3V to 30V
- Output voltage: Preset values at 2.5V or 1.8V, or adjustable from 0.5V to 2.75V
- Output current up to 15A
- Power Good and ON/SKIP signals
- Soft start and Soft stop
- CRC control allows optimum inductor size
- Dynamic voltage change support; and Voltage feed-forward compensation
- Output Protection: latched over-voltage and under-voltage, and Valley type over-current
- Input Protection: under-voltage lockout on VDDA and VIN

GENERAL DESCRIPTION

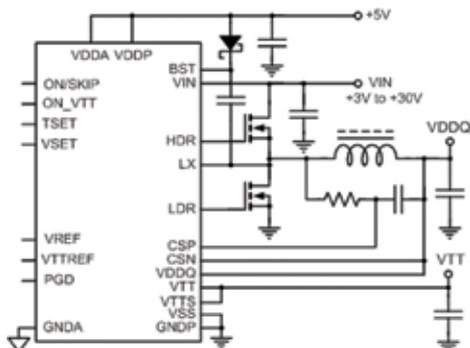
OZ812 is a DC/DC controller specially developed to design power supplies for DDR, DDR2 and DDR3 memories. It steps down the high battery voltage to low output voltages in the range of 0.5V to 2.75V and also provides the memory reference VTTREF and termination voltage VTT that accurately tracks VDDQ/2. It is compliant with the DDR, DDR2 and DDR3 specifications.

OZ812's voltage feed-forward compensation ensures high rejection of input voltage transients, typically occurring when the AC adapter is plugged in or removed.

APPLICATIONS

- Power Supplies for
DDR, DDR2 and DDR3
Memory

APPLICATION DIAGRAM



U.S. Patent #'s 6,472,897; 6,720,800; 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,319,346; 7,391,191; 7,436,222; 7,466,113; 7,598,718; 7,816,896; and more patents pending.

OZ8125

2 Phase CPU DC/DC Compliant with Intel VR12.5

FEATURES

- 2 Phase CRC DC/DC controller for CPU core with integrated drivers
- 1 Phase option through I²C port
- Supports all required VR12.5 functions
- Integrated boost diode; and High efficiency up to 94%
- Platform one time programmable maximum load current, V_{BOOT} voltage
- Platform-adjustable maximum temperature, operating frequency and slew rate through high speed I²C port
- 0.5% output voltage accuracy; and 3.5V to 25V input voltage
- 8-bit VID code DAC up to 3.04V
- Output voltage slew rate controlled at start-up, shutdown, and during VID dynamic changes
- Protection includes: latched over-voltage, cycle-by-cycle over-current, and embedded thermal
- Smart pulse skipping feature under light load condition
- User-adjustable load line slope

GENERAL DESCRIPTION

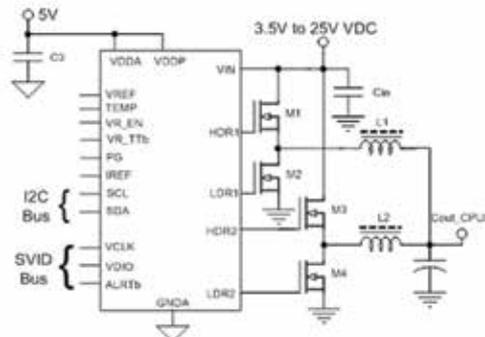
OZ8125 is a highly integrated DC/DC controller with integrated drivers. It is comprised of a dual phase controller for the CPU core rail. The output voltages can be programmed from 0.5V to 3.04V through a high speed serial bus, compliant with the VR12.5 specifications.

OZ8125 can also work as a single phase controller by disabling phase 2 through the I²C port. A single phase controller is more suitable for low power platform requirements.

APPLICATIONS

- Intel Mobile Segment Platform Core Power

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,232,784; and more patents pending.

OZ8127

2 Phase CPU DC/DC Compliant with Intel VR12.6+

FEATURES

- 2 Phase CRC DC/DC controller for CPU core with integrated drivers
- 1 Phase selection option by shorting BST2 to GND
- Supports all required VR12.6+ functions
- Integrated boost diode; and High efficiency up to 94%
- Platform one time programmable maximum load current, V_{BOOT} voltage
- Platform-adjustable maximum temperature, operating frequency and slew rate through high speed I²C port
- 0.5% output voltage accuracy; and 3.5V to 25V input voltage
- 8-bit VID code DAC up to 3.04V
- Output voltage slew rate controlled at start-up, shutdown, and during VID dynamic changes
- Protection includes: latched over-voltage, cycle-by-cycle over-current, and embedded thermal
- Smart pulse skipping feature under light load condition
- User-adjustable load line slope
- Pb-free plating; RoHS compliant

GENERAL DESCRIPTION

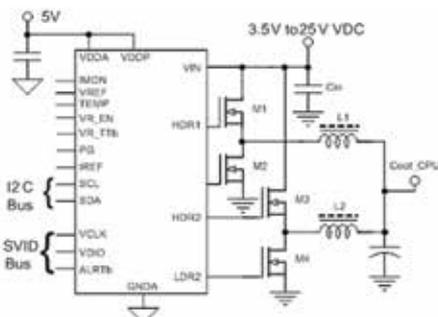
OZ8127 is a highly integrated DC/DC controller with integrated drivers. It is comprised of a dual phase controller for the CPU core rail. The output voltages can be programmed from 0.5V to 3.04V through a high speed serial bus, compliant with the VR12.6+ specifications.

By shorting the BST2 pin to GND, OZ8127 can also work as a single phase controller, which is more suitable for low power platform requirements.

APPLICATIONS

- Intel Mobile Segment Platform Core Power

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,232,784; and more patents pending.

OZ8150

Single Ultra High Efficiency DC/DC with 5V Regulator and Switch-Over

FEATURES

- Single DC/DC SMPS controller with integrated drivers, 5V/100mA and 3.3V/20mA LDOs
- CRC controller allows designing for optimum inductor size
- Integrated boost diode
- High full load efficiency up to 94%; High light load efficiency of >85% at 100mA
- V_{OUT} accuracy of 1% or better; and Input voltage from 4.5V to 24V
- Output voltage adjustable from 1V to 5.5V, and preset function 3.3V and 5V
- Output current up to 15A; LDO bootstrap switch-over if $V_{5SO} > 4.7V$; and Power Good open drain output
- Soft start at start-up; Soft stop at shutdown
- Voltage feed-forward compensation; and User-adjustable operating frequency
- Enhanced dynamic voltage change support; and Non-audio skip mode
- Output Protection: latched over-voltage and under-voltage, and Valley type over-current
- Input Protection: under-voltage lockout on VDDA

GENERAL DESCRIPTION

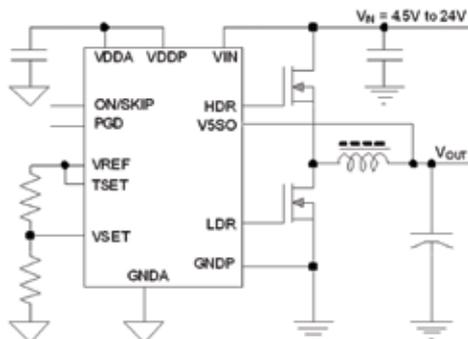
OZ8150 steps down the high battery voltage to low output voltages in the range of 1.0V to 5.5V. High efficiency, DC accuracy, and excellent transient response make OZ8150 suitable to supply low voltage CPU peripherals, chipset cores, and graphics processors.

OZ8150's voltage feed-forward compensation ensures high rejection of input voltage transients, typically occurring when the AC adapter is plugged in or removed.

APPLICATIONS

- Power Supplies for Notebook Peripherals and POL

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,143,872; and more patents pending.

OZ8153

Dual Ultra High Efficiency DC/DC with 5V Regulator and Switch-Over

FEATURES

- Dual DC/DC SMPS controller with integrated drivers, 5V/150mA and 3.3V/20mA LDOs
- Two CRC controllers; and Integrated boost diodes
- High full load efficiency up to 94%; High light load efficiency >85% at 100mA
- V_{OUT} accuracy of 1% or better; and Input voltage from 5.5V to 24V
- Output voltage adjustable from 1V to 5.5V, and presets on both channels
- Output load current up to 15A; and LDO bootstrap switch-over if $V_{5SO} > 4.7V$
- Independent ON/SKIP signals; and Power Good open drain output
- Soft start at start-up; Soft stop at shutdown
- Voltage feed-forward compensation; and User-adjustable operating frequency
- Dynamic voltage change support; and Non-audio skip mode
- Output Protection: latched over- and under-voltage, and Valley type over-current
- Input Protection: under-voltage lockout on VDDA and VIN

GENERAL DESCRIPTION

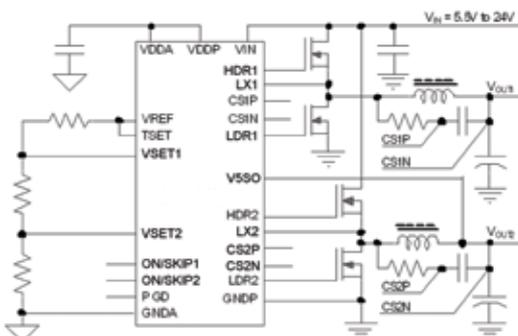
OZ8153 steps down the high battery voltage to low output voltages in the range of 1.0V to 5.5V. High efficiency, DC accuracy, and excellent transient response make OZ8153 suitable to supply the main system voltages (5V and 3.3V) to the CPU peripherals, chipset cores and graphics processors.

OZ8153's voltage feed-forward compensation ensures high rejection of input voltage transients, typically occurring when the AC adapter is plugged in or removed.

APPLICATIONS

- Power Supplies for Notebook CPUs and Peripherals

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,143,872; and more patents pending.

OZ8155

Dual Ultra High Efficiency DC/DC with 5V Regulator and Switch-Over

FEATURES

- Dual DC/DC SMPS controller with integrated drivers, and 5V/150mA LDOs
- Two CRC controllers; and Integrated boost diodes
- High full load efficiency up to 94%; High light load efficiency of >85% at 100mA
- V_{OUT} accuracy of 1% or better
- Input voltage from 5.5V to 24V
- Output voltage adjustable from 1V to 5.5V; and presets on both channels
- Output current up to 15A
- LDO bootstrap switch-over if $V_{5SO} > 4.7V$
- Independent ON/SKIP signals; and Power Good open drain outputs
- User-adjustable soft start slew at start-up; Soft stop at shutdown
- Voltage feed-forward compensation; and User-adjustable operating frequency
- Dynamic voltage change support; and Non-audio skip mode
- Output Protection: latched over-voltage and under-voltage, and Valley type over-current
- Input Protection: under-voltage lockout on V_{DDA} and V_{IN}

GENERAL DESCRIPTION

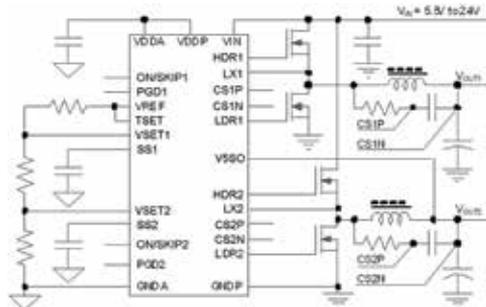
OZ8155 steps down the high battery voltage to low output voltages in the range of 1.0V to 5.5V. High efficiency, DC accuracy, and excellent transient response make OZ8155 suitable to supply low voltage CPU peripherals, chipset cores, and graphics processors.

At start-up, OZ8155's output voltage ramps up in a controlled manner with a user-adjustable slew rate. At shutdown, the output voltage is ramped down in a controlled manner with the same slew rate.

APPLICATIONS

- Power Supplies for Notebook CPUs and Peripherals

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,143,872; and more patents pending.

OZ8290

Precision DC/DC for Intel CPU

FEATURES

- Single phase controller for Low Voltage (LV) and Ultra Low Voltage (ULV) CPUs
- High efficiency up to 94%; and Integrated gate drivers and boost diode
- High output voltage accuracy
- 3V to 30V input voltage; and 7-bit VID code and adjustable boot voltage
- Output voltage slew rate controlled at start-up, shutdown, and during VID changes
- Adjustable latched over-voltage and embedded thermal protection
- Cycle-by-cycle over-current protection
- Improved input voltage transient behavior through voltage feed-forward compensation
- CRC operation for improved efficiency over wide load, input and output voltage ranges and optimized inductor value
- Smart pulse skipping feature and audible noise suppression under light load conditions
- True differential output voltage remote sensing

GENERAL DESCRIPTION

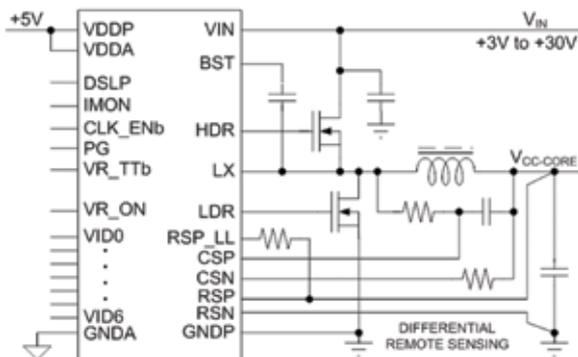
OZ8290 is a single phase, high efficiency, PWM buck DC/DC controller with integrated half-bridge drivers. The powerful embedded drivers allow single phase operation, minimizing solution parts count, cost and PCB area.

OZ8290 features patented CRC architecture with superior static and dynamic CORE voltage regulation. A precision reference, remote sensing and CRC architecture assure high output accuracy for all loads and input/output voltages.

APPLICATIONS

- LV and ULV Microprocessor Core Supply

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,232,784; and more patents pending.

OZ8291

Precision DC/DC, IMVP6+ Compliant

FEATURES

- Single phase controller for Low Voltage (LV) and Ultra Low Voltage (ULV) CPUs
- High efficiency up to 94%; and Integrated gate drivers and boost diode
- High output voltage accuracy
- 3V to 30V input voltage; and 7-bit VID code and adjustable boot voltage
- Output voltage slew rate controlled at start-up, shutdown, and during VID changes
- Adjustable latched over-voltage and embedded thermal protection
- Cycle-by-cycle over-current protection
- Improved input voltage transient behavior through voltage feed-forward compensation
- CRC operation for improved efficiency over wide load, input and output voltage ranges and optimized inductor value
- Smart pulse skipping feature and audible noise suppression under light load conditions
- True differential output voltage remote sensing

GENERAL DESCRIPTION

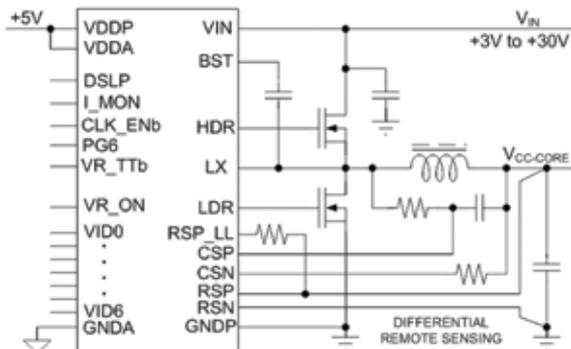
OZ8291 is a single phase, high efficiency, PWM buck DC/DC controller with integrated half-bridge drivers. It's compliant with the Intel IMVP6+ specification. The powerful embedded drivers allow single phase operation, minimizing solution parts count, cost and PCB area.

OZ8291 features patented CRC architecture which provides superior static and dynamic CORE voltage regulation. A precision reference, remote sensing and CRC architecture assure high output accuracy for all loads and input/output voltages.

APPLICATIONS

- LV and ULV Microprocessor Core Supply

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,232,784; and more patents pending.

OZ8292

Precision DC/DC, IMVP6+ and 6.5 Compliant

FEATURES

- Dual phase controller for Low Voltage (LV) and Ultra Low Voltage (ULV) Intel CPUs
- High efficiency up to 94%; and Integrated gate drivers and boost switches
- High VCC-CORE accuracy (0.5% from 0.75V to 1.5V)
- 4.5V to 24V input voltage; and 7-bit VID code and user-adjustable boot voltage
- Output voltage slew rate controlled at start-up, shutdown, and during VID changes
- Adjustable latched over-voltage and embedded thermal protection
- Cycle-by-cycle adjustable over-current protection
- Improved input voltage transient behavior through voltage feed-forward compensation
- CRC operation for improved efficiency over wide load, input and output voltage ranges
- Smart pulse skipping feature and audible noise suppression under light load conditions
- True differential output voltage remote sensing

GENERAL DESCRIPTION

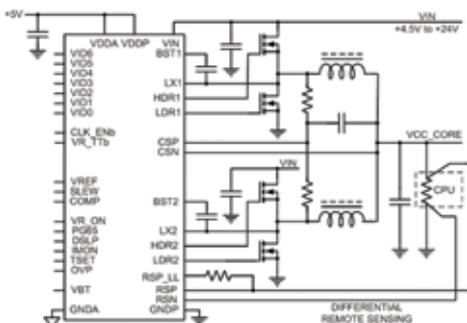
OZ8292 is a dual phase, high efficiency, PWM buck DC/DC controller with integrated half-bridge drivers. It's compliant with the Intel IMVP6 and IMVP6.5 specifications. The powerful embedded drivers allow dual phase operation, minimizing solution parts count, cost and PCB area.

OZ8292 features patented CRC architecture which provides superior static and dynamic CORE voltage regulation. A precision reference, remote sensing and CRC architecture assure high output accuracy for all loads and input/output voltages.

APPLICATIONS

- LV and ULV
Microprocessor
Core Supply

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; and more patents pending.

OZ8296

1 + 1 Phase DC/DC for Intel CPU

FEATURES

- Single phase CRC DC/DC controller with integrated drivers for CPU core and GFX
- High efficiency up to 94%; and Integrated boost diodes
- Platform-adjustable operating frequency, V_{BOOT} voltage, maximum temperature, slew rate, SKIP/NAS mode through high speed I²C port
- 0.8% output voltage accuracy
- 3V to 25V input voltage; 8-bit VID code DAC
- Output voltage slew rate controlled at start-up, shutdown, and during VID changes
- Protection includes: latched over-voltage, embedded thermal, and cycle-by-cycle over-current
- Smart pulse skipping feature and non-audio skipping (NAS) under light load conditions
- User-adjustable load line slope for each rail

GENERAL DESCRIPTION

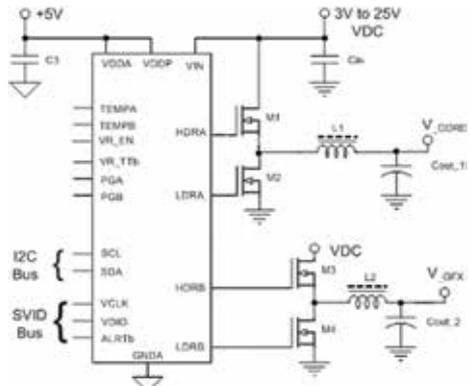
OZ8296 is a single phase, highly integrated DC/DC controller with integrated drivers the core (single phase) and GFX (single phase) rails. It supports all required IMVP7/VR12 functions. The powerful embedded drivers allow single phase operation, minimizing solution parts count, cost and PCB area.

OZ8296 features patented CRC architecture which provides superior static and dynamic CORE voltage regulation. A precision reference, remote sensing and CRC architecture assure high output accuracy for all loads and input/output voltages.

APPLICATIONS

- Notebook CPU Core and GFX Power Supplies

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,232,784; and more patents pending.

OZ8321

2 + 1 Phase DC/DC for SVI2 AMD CPU

FEATURES

- *Dual phase* CRC DC/DC controller with integrated drivers dedicated for core power; and *Single phase* CRC DC/DC controller with integrated drivers for North Bridge (NB) power
- High efficiency up to 94%; and Integrated boost diodes
- Platform-adjustable operating frequency, maximum temperature, over-current protection, slew rate, initial load line slope, initial offset, NAS/SKIP mode through high speed I²C port
- Rail A phase 2 power-on strap option on BSTA2
- 0.8% output voltage accuracy
- 5V to 25V input voltage; and 8-bit VID code DAC
- Output voltage slew rate controlled at start-up, shutdown, and VID-on-the-fly (VOTF)
- Protection includes: latched over/under-voltage, embedded thermal, and cycle-by-cycle over-current
- Smart pulse skipping feature and non-audio skipping (NAS) under light load conditions
- Low bias differential output voltage remote sensing

GENERAL DESCRIPTION

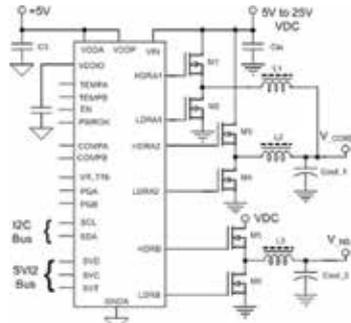
OZ8321 is a highly integrated DC/DC controller for the core (dual phase) and NB (single phase) rails. Output voltages for both are programmed through a high speed serial bus. It supports all required SVI2 functions.

OZ8321 features patented CRC architecture which provides superior static and dynamic CORE voltage regulation. A precision reference, remote sensing and CRC architecture assure high output accuracy for all loads and input/output voltages.

APPLICATIONS

- AMD Notebook CPU Core and NB Power Supplies

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,232,784; and more patents pending.

OZ83215

2 + 1 Phase DC/DC for SVI2 AMD GPU

FEATURES

- *Dual phase* CRC DC/DC controller with integrated drivers dedicated for GPU core power; and *Single phase* CRC DC/DC controller with integrated drivers for Memory power
- High efficiency up to 94%; and Integrated boost diodes
- Platform-adjustable operating frequency, maximum temperature, over-current protection, slew rate, initial load line slope, initial offset, NAS/SKIP mode through high speed I²C port
- Rail A phase 2 power-on strap option on BSTA2
- 0.8% output voltage accuracy
- 5V to 25V input voltage; and 8-bit VID code DAC
- Output voltage slew rate controlled at start-up, shutdown, and VID-on-the-fly (VOTF)
- Protection includes: latched over/under-voltage, embedded thermal, and cycle-by-cycle over-current
- Smart pulse skipping feature and non-audio skipping (NAS) under light load conditions
- Low bias differential output voltage remote sensing

GENERAL DESCRIPTION

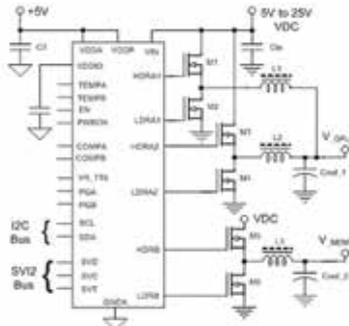
OZ83215 is a highly integrated DC/DC controller for the core (dual phase) and Memory (single phase) rails. Output voltages for both are programmed through a high speed serial bus. It supports all required SVI2 functions.

OZ83215 features patented CRC architecture which provides superior static and dynamic CORE voltage regulation. It also has the ability to send back digitally encoded voltage and current values for GPU core and Memory rails to the processor.

APPLICATIONS

- AMD Notebook GPU Core and Memory Power Supplies

APPLICATION DIAGRAM



U.S. Patent #'s 6,844,710; 6,965,221; 7,098,642; 7,202,650; 7,466,113; 7,598,718; 7,816,896; 8,232,784; and more patents pending.

OZ8380A

Dual Phase Ultra High Efficiency DC/DC for AMD SVI Mobile Processors

FEATURES

- Two independent Single Phase DC/DC controllers, with integrated drivers, for AMD CPU core power planes
- AMD serial VID code compliant
- CRC control method allows designing for optimum inductor size
- Highly efficient power conversion; and light load conversion via smart pulse skipping mode
- Ultra fast transient recovery; and 1% output voltage accuracy
- Supports more than 18A per channel
- User-adjustable switching frequency and OCP limit
- User-adjustable slew control of VDD_CORE at start-up and OTF VID code changes
- True differential output voltage remote sensing; and Open drain Power Good signal
- Voltage feed-forward compensation
- Protection includes: VIN & VDDA under-voltage lockout, latched over-voltage, and cycle-by-cycle over-current

GENERAL DESCRIPTION

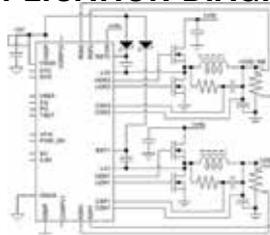
OZ8380A is a DC/DC controller specifically developed to support power supply designs accepting the AMD SVI (Serial Voltage Identification) codes. It incorporates the AMD 7-bit VID table for full range out-put conversion capability in 12.5mV increments. High efficiency under both light and heavy load conditions, DC accuracy, differential remote voltage sensing and excellent transient response make OZ8380A the solution of choice for low voltage CPU power supplies.

OZ8380A's voltage feed-forward compensation ensures high rejection of input voltage transients.

APPLICATIONS

- Power Supplies for AMD Notebook CPUs

APPLICATION DIAGRAM



U.S. Patent #'s 6,459,602; 6,472,897; 6,678,178; 6,720,800; 6,813,173; 6,844,710; 6,965,221; 7,002,817; 7,031,174; 7,098,642; 7,202,650; 7,242,598; 7,319,346; 7,436,222; 7,466,113; 7,471,533; 7,589,987; 7,598,718; 7,724,553; 7,816,896; and more patents pending.

OZ8384

Dual Phase Ultra High Efficiency DC/DC for AMD SVI Mobile Processors

FEATURES

- Dual Phase DC/DC controller for AMD
- Integrated drivers and boost diode
- AMD SVI 7-bit VID code compliant
- CRC control method allows designing for optimum inductor size
- Highly efficient power conversion up to 94%
- Highly efficient light load conversion via smart pulse skipping mode
- Ultra fast transient recovery; and 1% output voltage accuracy
- Supports up to 50A output current
- User-adjustable switching frequency and Dual OCP limit
- User-adjustable slew control of VDD_CORE at start-up and OTF VID code changes
- True differential output voltage remote sensing
- Open drain Power Good signal; VR_TTb signal; and Voltage feed-forward compensation
- Protection includes: VIN & VDDA under-voltage lockout, latched over-voltage, and cycle-by-cycle over-current

GENERAL DESCRIPTION

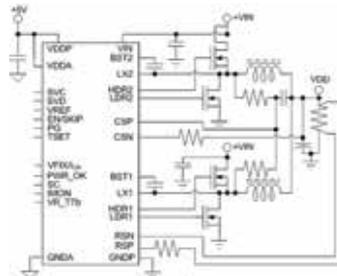
OZ8384 is a DC/DC controller specifically developed to support power supply designs for AMD SVI (Serial Voltage Identification) mobile microprocessors. It incorporates the AMD 7-bit VID table for full range output conversion capability in 12.5mV increments. High efficiency under both light and heavy load conditions, DC accuracy, remote voltage sensing and excellent transient response make OZ8384 the solution of choice for low voltage CPU conversion.

OZ8384's core topology is based on constant-ripple-current (CRC) technology.

APPLICATIONS

- Power Supplies for AMD Notebook CPUs

APPLICATION DIAGRAM



U.S. Patent #'s 6,459,602; 6,472,897; 6,678,178; 6,720,800; 6,813,173; 6,844,710; 6,965,221; 7,002,817; 7,031,174; 7,098,642; 7,202,650; 7,242,598; 7,319,346; 7,436,222; 7,466,113; 7,471,533; 7,589,987; 7,598,718; 7,724,553; 7,816,896; and more patents pending.

OZ8390E

Single Phase Ultra High Efficiency DC/DC for AMD SVI Mobile Processors

FEATURES

- Single Phase DC/DC controller with integrated drivers
- AMD SVI 7-bit VID compliant
- CRC control method allows designing for optimum inductor size
- Highly efficient power conversion (up to 94%)
- Highly efficient light load conversion via smart pulse skipping mode
- Ultra fast transient recovery; and 1% output voltage accuracy
- Supports up to 25A output current
- User-adjustable switching frequency and dual OCP limit
- User-adjustable slew control of Northbridge at start-up and OTF VID code changes
- True differential output voltage remote sensing
- Open drain Power Good and VR_TTb signal; and Voltage feed-forward compensation
- Protection includes: VIN & VDDA under-voltage lockout, latched over-voltage, and cycle-by-cycle over-current

GENERAL DESCRIPTION

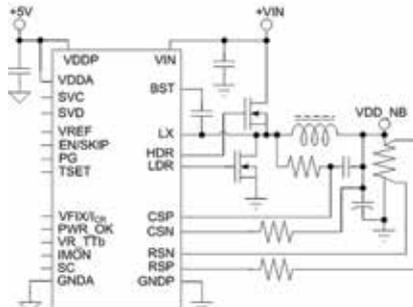
OZ8390E is a DC/DC controller specifically developed to support power supply designs for AMD SVI (Serial Voltage Identification) mobile microprocessors. It incorporates the AMD 7-bit VID table for full range output conversion capability in 12.5mV increments. High efficiency under both light and heavy load conditions, DC accuracy, remote voltage sensing and excellent transient response make OZ8390E the solution of choice for low voltage CPU power supplies.

OZ8390E's voltage feed-forward compensation ensures high rejection of input voltage transients.

APPLICATIONS

- Power Supplies for AMD Notebook CPUs

APPLICATION DIAGRAM



U.S. Patent #'s 6,472,897; 6,720,800; 6,844, 710; 6,882,214; 6,965,221; 7,098,642; 7,202,650; 7,319,346; 7,436,222; 7,466,113; 7,598,718; 7,816,896; and more patents pending.

Company Background

Founded in April 1995, O₂Micro® International Limited (NASDAQ: OIIM) designs, develops and markets innovative **power management** components for the Computer, Consumer, Industrial, Automotive and Communications markets.

O₂Micro maintains an extensive portfolio of intellectual property, and has numerous Trademark Applications and Copyright Registrations.

The company's extensive list of customers includes most of the world's leading electronics manufacturers.

For additional information, including sales office locations, please visit the O₂Micro web site at www.o2micro.com.

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