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Automotive Smart Power – Product Selector Guide 2024

Q2

Automotive smart-power product catalogue **by functions**

Motor control	Generic drivers	System power supply	Battery management ICs
H-bridge DC motor driver	Multi-output generic driver IC	LDO voltage regulator	Battery management system
BLDC motor control	Multi-channel HS/LS driver	Power Management IC and System Basis Chip	Battery cut-off
Stepper motor control	Valve drivers		

Door zone ICs	Engine management systems	Electronic Parking Brake	Airbag Systems
Door zone	Engine management system	H-bridge DC motor pre-driver ICs for EPB	Automotive ICs for Airbag
Door lock	Alternator voltage regulator		

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Motor control

Line card
H-bridge DC motor driver

L99H02	L9960/T	L9959/T
H-Bridge DC motor pre-driver designed to control 4 external N-channel MOS transistors in bridge configuration	Integrated H-bridge for resistive and inductive loads in Single and Dual output (one or two motors per device) with flexible driving control	Single and Dual integrated H-bridge for resistive and inductive loads with current feedback output

L99UDL01	L99H92	L99MH98
Smart driver IC for multiple motor control, suitable for a wide range of applications including the centralized car lock with a single IC	DC motor pre-driver designed to control dual independent Half-bridges or a single Full-bridge	Automotive octal half-bridge pre-driver

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L99H02
Automotive H-Bridge driver

H-Bridge DC motor pre-driver designed to control 4 external N-channel MOS transistors in bridge configuration

Features

Electrical parameters

- Operating supply voltage 6V to 28V
- PWM operation up to 30kHz
- Driving stage capability 0.5 A (source), 4 Ω (sink)
- 2-stages Charge Pump for optimum MOSFET drive down to 6V

Protections

- Control of reverse battery protection MOSFETs with embedded thermal sensors
- Programmable thermal, undervoltage, overvoltage protections

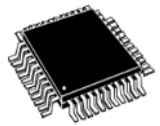
Outputs

- 1x Half Bridge or Full Bridge Gate Driver
- Current sensing amplifier

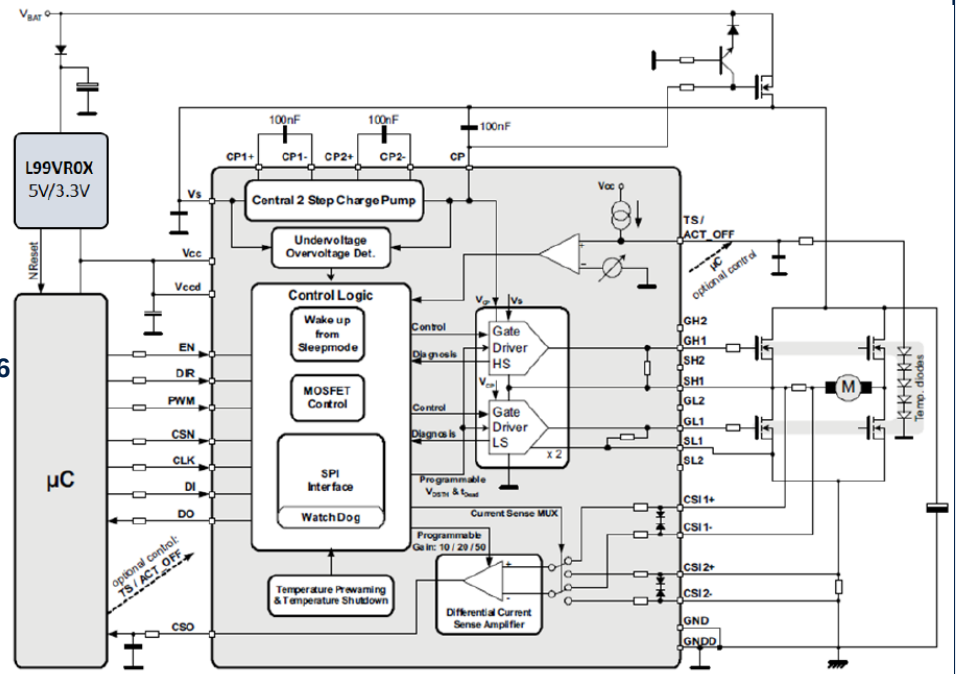
Diagnostics

- Diagnostic information via SPI for all the outputs

PowerSSO-36



LQFP32
7x7mm



L99H02
Automotive H-Bridge driver

A glance at possible applications:

Generic DC motor driving	Windscreen Wiper	Seat positioning
Power Doors	Park break	trailer brake controller
Window lift	Steering wheel	Seat Belt Pre-Tensioner

Key values

Flexible solution for DC motor driving adapting external power stage to different needs

- Free configurable current sense amplifier designed for current shunt
- Programmable cross current protection
- Four different free wheeling modes (2 active and 2 passive)

Collaterals & Tools

Product page
Datasheet,
Application Note,
Evaluation Boards,
Eval-Boards UM & GUI,
Software GUI (for EVAL-L99H02QF)
Software GUI (for EVAL-L99H02XP)

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Find out more about L99H02 **H-bridge for brushed DC motor control** applications

L9960/T
Automotive H-bridge motor control

Integrated H-bridge for resistive and inductive loads in Single and Dual output (one or two motors per device) with flexible driving control

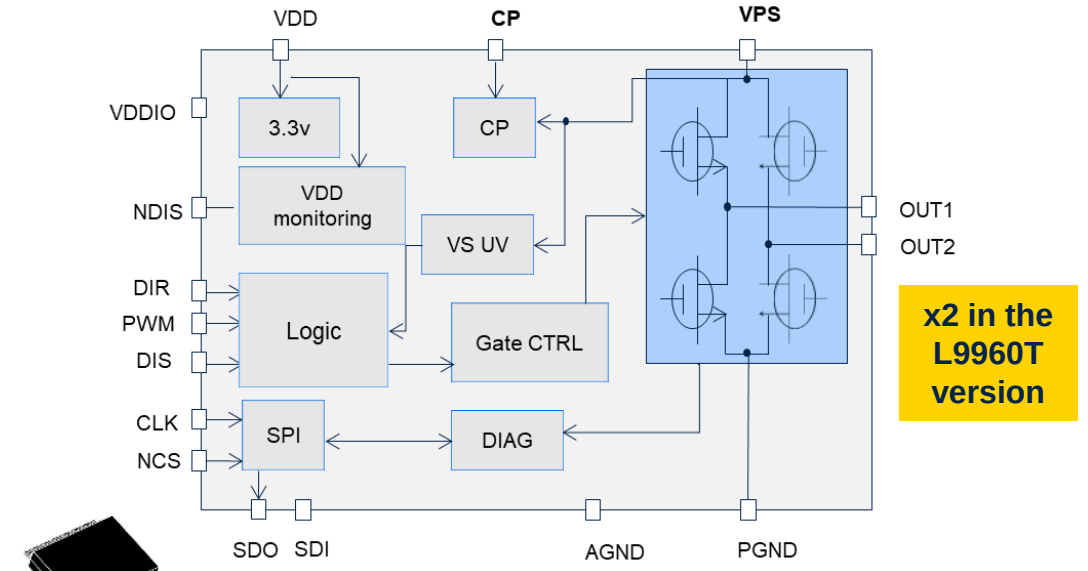
Features

Electrical parameters
- Operating battery supply voltage from 4.5V up to 28V
- Operating VDD5 supply voltage from 4.5V to 5.5V
- Logic levels compatible to 3.3V and 5V
- PWM operation up to 20kHz

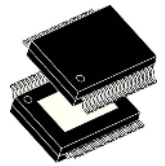
Protections
- Programmable current limitation and overcurrent thresholds
- Programmable thermal warning and shutdown thresholds
- Supply monitoring

Outputs
- 1x integrated H-bridge **(400mΩ full path)**
- Programmable current and voltage slew rates

Diagnostics
- Open load in ON state
- Off-state diag (OL, SCG, SCB)
- 16-bit serial peripheral interface for control and diagnosis



x2 in the L9960T version



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L9960/T
Automotive H-bridge motor control

A glance at possible applications:

Inductive/resistive loads (throttle control, valve control, etc.)	Seat positioning	Trunk lift
Wipers	Washer pump	Window lift

Suitable for every **DC motor control** application taking benefit of state-of-the art automotive quality

Key values

- Flexible driving strategy via configurable pins
- Selectable current/voltage slew rates for improved EMC performance
- ASIL-B solution compliant with ISO26262

Collaterals & Tools

L9960/T

- Product page: L9960, L9960T
- Datasheet
- Application note
- Selection guide: powertrain & safety, smart power for body
- Brochure

EVAL-L9960/T

- Product page: EVAL-L9960, EVAL-L9960T
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9960/T

- Product page: STSW-L9960, STSW-L9960T
- Data brief
- User manual
- License agreement

Find out more about L9960/T **H-bridge for brushed DC motor control** applications

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L9959/T
Automotive H-bridge motor control

Single and Dual integrated H-bridge for resistive and inductive loads with current feedback output

Features

Electrical parameters
- Operating battery supply voltage from 5V up to 28V
- Operating VDD5 supply voltage from 4.5V to 5.5V
- Logic level 5V compatible
- PWM operation up to 11kHz

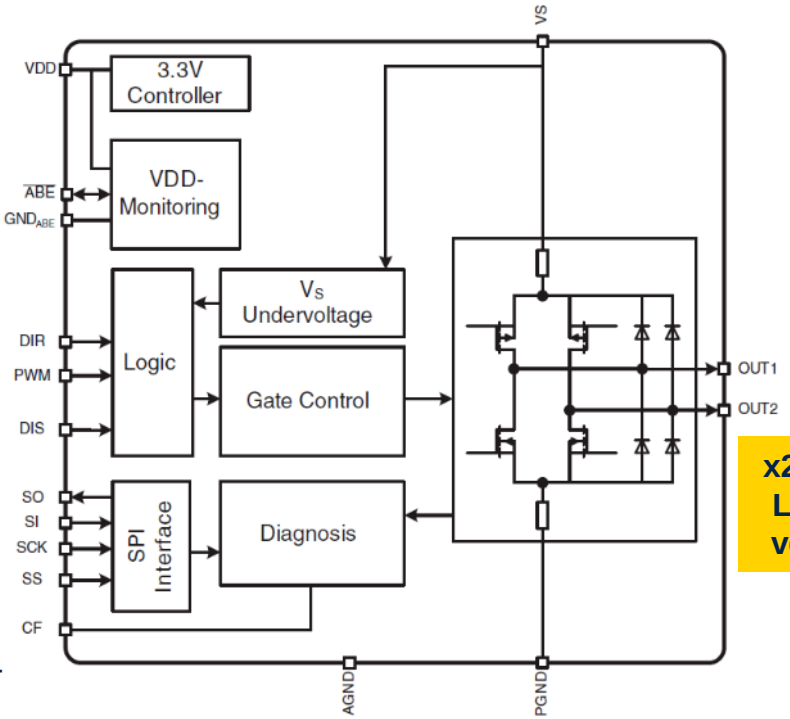
Protections
- Programmable current limitation and overcurrent thresholds
- Programmable thermal warning and shutdown thresholds
- Supply monitoring

Outputs
- 1x integrated H-bridge **(540mΩ full path)**
- Programmable current and voltage slew rates

Diagnostics
- Current feedback
- Open load in ON state
- Off-state diag (OL, SCG, SCB)
- 16-bit serial peripheral interface for control and diagnosis

PowerSSO-36

PowerSSO-24



x2 in the L9959T version

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L9959/T
Automotive motor H-bridge driver

A glance at possible applications:

Inductive/resistive loads (throttle control, valve control, etc.)	Seat positioning	Trunk lift
Wipers	Washer pump	Window lift

Suitable for every **DC motor control** application taking benefit of state-of-the art automotive quality

Key values

Flexible driving strategy via configurable pins	Current sensing monitoring and feedback on analog output	Improved PCB footprint design vs different target application

Collaterals & Tools

Product page: L9959, L9959T
datasheet,
application note,
selection guidelines,
brochure

Find out more about L9959/T **H-bridge for brushed DC motor control** applications

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L99UDL01
Automotive multichannel motor control – universal door lock

Smart driver IC for multiple motor control, suitable for a wide range of applications including the centralized car lock with a single IC

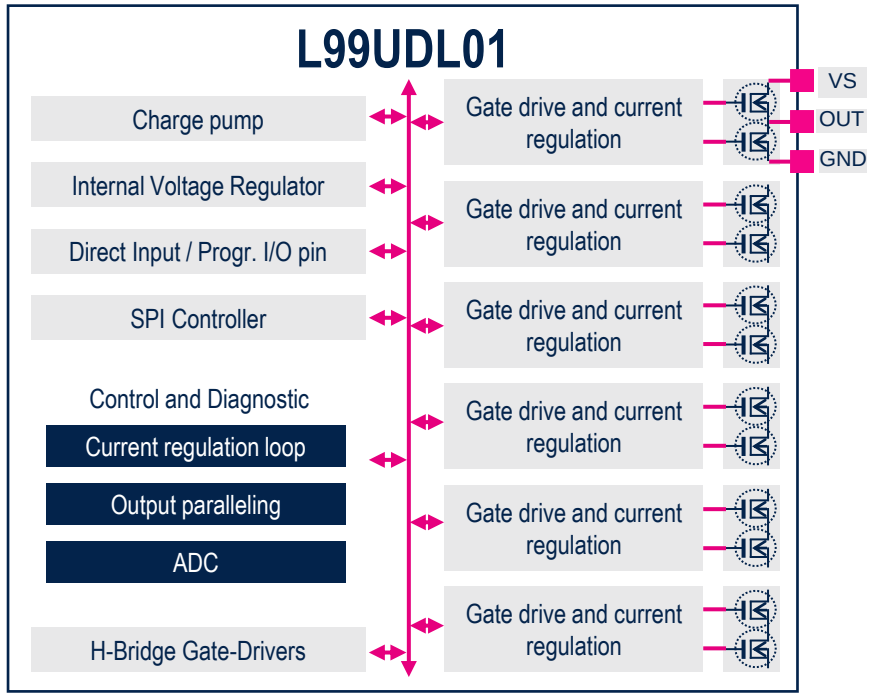
Features

Electrical parameters
- Extended Operating Range 5V to 26V
- Junction Temperature from -40ºC to 150ºC

Protections
- Overload for all outputs
- Shorted and open load detection, also in off state
- Drain-source voltage monitoring for external FETs

Outputs
- 6x Half Bridge Driver **(90mΩ)**
- 2x External Half Bridge Drivers
- Current regulation loops for each HS/LS switch
- Mechanism for paralleling up to 2x3 outputs

Diagnostics
- Open load detection for all the outputs
- Digital current monitor 10-bit resolution via SPI
- Emergency mode overriding built-in protections



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L99UDL01
Automotive multichannel motor control – universal door lock

A glance at possible applications:

Every kind of application requiring multiple smart motor control as well as:

Centralized door lock

Vending machines

Key values

Integration concept

Provide an IC that can control all door lock configurations using a minimum of external components

Reduce peak currents

Reduces the power requirements in wiring, circuit board and silicon, improving system reliability level

Multiple Motor Smart Control

Closed loop current control, output paralleling mechanism, serial control, full set of protection and diagnostics makes the device ideal also in multiple motor control applications

Collaterals & Tools

L99UDL01

- Product page
- Datasheet
- Selection guide: smartpower for body
- Brochure
- Flyer

EVAL-L99UDL01

- Product page
- Data brief

STSW-L99UDL01

- Product page
- Data brief
- User manual
- License

L99H92
Automotive motor bridge pre-driver

DC motor pre-driver designed to control dual independent Half-bridges or a single Full-bridge

Features

Electrical parameters
- Operating supply voltage up to 28V
- PWM operation up to 50kHz
- Driving stage capability 0.4 A
- 2-stages Charge Pump for optimum MOSFET drive down to 6V

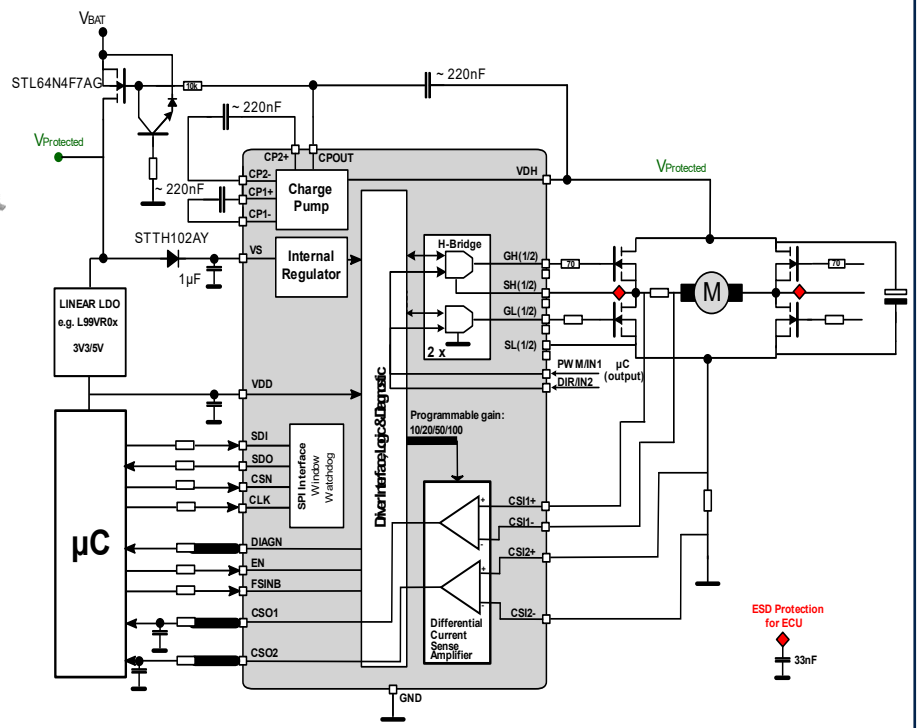
Protections
- Short-circuit protection
- Programmable dead-time
- Thermal protections
- Undervoltage and overvoltage protections

Outputs
- 2x Half Bridge or 1x Full Bridge Gate Driver
- Two independent current sense output with programmable gain and inputs

Diagnostics
- Diagnostic information via SPI for all the outputs
- Watchdog for MCU monitoring
- Diagnostic output pin connected to the microcontroller to detect a device fault

TQFP32 7x7 exposed pad

QFN32 5x5 exposed pad



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L99H92
Automotive motor bridge pre-driver

A glance at possible applications:

Sun-roof	Power trunk lift gate	Sliding doors
Window lift	Seat-belt pre-tensioners	Electric park brake system

Key values

Flexible solution for DC motor driving adapting external power stage to different needs

Programmable gate current control EMI minimization	Diagnostic output pin connected to the microcontroller to detect a device fault	Protection and safety mechanisms to reach safety requirements

Collaterals & Marketing Package

Product page
Datasheet
Application Note (Coming soon)
Evaluation Boards (Coming soon)

Find out more about L99H92 H-bridge pre-driver for brushed DC motor control applications

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L99MH98
Automotive octal half-bridge pre-driver

Integrated octal half-bridge pre-driver dedicated to control up to sixteen N-channel MOSFETs.

Features

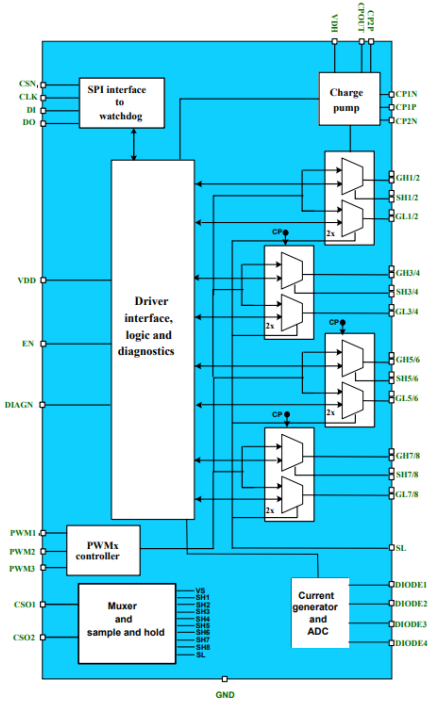
Electrical parameters
- Operating supply voltage up to 28V
- PWM operation up to 50kHz
- 2-stages Charge Pump for optimum MOSFET drive down to 6V
- Low I_Q (1.05 µA) in reset mode

Protections
- Short-circuit protection
- Programmable dead-time
- Thermal protections
- Undervoltage and overvoltage protections

Outputs
- 8x Half Bridge or 4x Full Bridge Gate Driver or single high/low side
- Two independent current sense output with programmable gain and inputs

Diagnostics
- Diagnostic information via SPI for all the outputs
- Watchdog for MCU monitoring
- Multi Fail-Safe handling of different motors: programmable switching off half-bridge driver in case of a fault detection combined (ST patented)

QFN48 7x7 exposed pad



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L99MH98
Automotive motor bridge pre-driver

A glance at possible applications:

Seat Control	Power trunk lift gate	Sliding doors
Window lift	Seat-belt pre-tensioners	Sun-roof

Key values

Supports indirect current measurement on external MOSFETs, allowing cost saving and lower system complexity, avoiding the usage of shunt resistors

Three steps Control of HS/LS allowing More efficient EMI reduction	Independent channel driver up to 2/4/8 HL/LS out of standard BDC motors control	Protection and safety mechanisms to reach safety requirements

Collaterals & Marketing Package

Product page
Datasheet
Application Note (Coming soon)
Evaluation Boards (Coming soon)

Find out more about L99MH98 Automotive motor bridge pre-driver for brushed DC motor control applications

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Line card
BLDC motor control

L9908	L9907	L99ASC03
3-phase gate driver unit (GDU) for controlling 6 N-channel FETs for brushless motors	3 phase gate driver for 6 steps or FOC controlled brushless motors compatible with 48V NET	BLDC 3-phase motor pre-driver featuring a voltage regulator for MCU power supply and an operation amplifier for motor current sensing

L9908

Automotive 3-phase motor gate driver unit

3-phase gate driver unit (GDU) for controlling 6 N-channel FETs for brushless motors

Features

Electrical parameters

- VDH motor supply voltage range from 4.5 V to 75 V for working in single (12 V systems), double (24 V systems) and 48 V battery applications
- 3.3 V internal supply voltage generated from 5 V on VDD pin
- Digital I/O compatible to 3.3 V/5 V logics

Protections

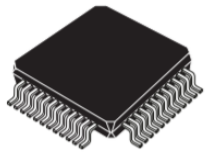
- Open load, short to GND and short to battery diagnostic in off-state
- VDD, VDH, VBP (over-voltage and under-voltage diagnostic)
- FET driver supply VPRE and VCP(under-voltage and over-voltag) diagnostic
- Full ISO26262 compliant, ASIL-D systems ready

Outputs

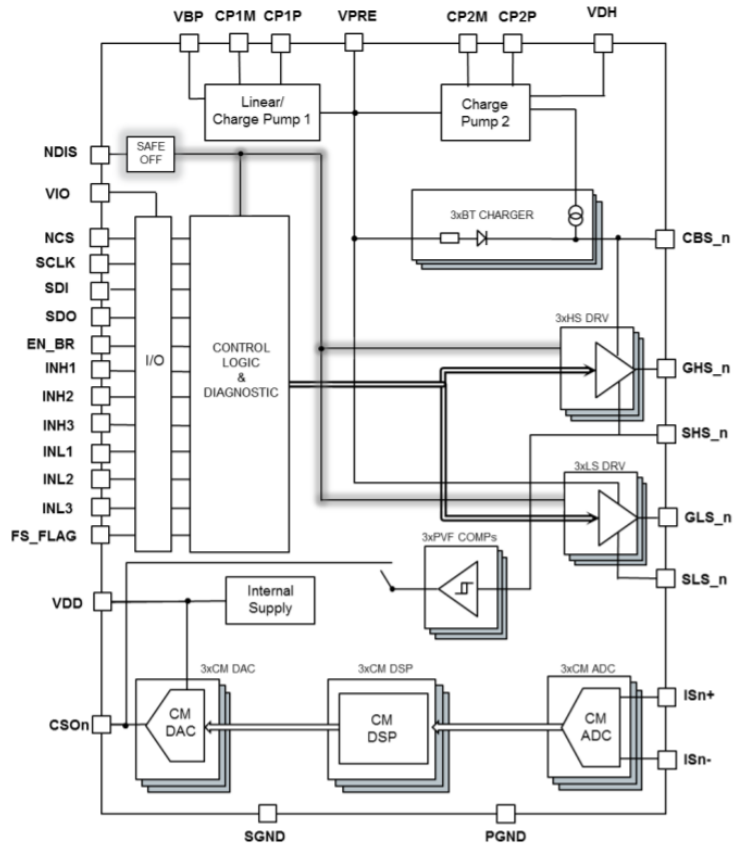
- 6 separate N-channel FET pre-drivers (0% to 100% duty cycle operation support, dedicated PWM input pin for each gate driver)
- 3 differential high accuracy current monitors for ground referred current measurements
- 3 real time phase voltage monitor channels

Diagnostics

- 32-bit - 10 MHz SPI interface with 5-bit CRC
- SPI programmable: VDS diagnostic and protection in on-state, Dead Time protection, Shoot-through diagnostic and protection
- Over-temperature diagnostic and protection with SPI programmable warning flag
- SPI Window Watchdog
- Fault status flag output



TQFP48
(exposed pad down)



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L9908
Automotive 3-phase motor gate driver unit

A glance at possible applications:

Suitable for every **BLDC motor control** application leveraging outstanding high quality and robust solutions

Generic BLDC motor driving	Electric blower/ snowblower	E-scooter traction
Electric motorbike	48V start and stop system	Electric forklift
Electric brake booster	48V Electric super charger	Electric power steering

Key values

Flexible and programmable

SPI parameter setting and full diagnostic availability

Supporting electrification requirement

Of high-efficient BLDC driven applications

ASIL-D solution

Full compliant with ISO26262

Collaterals & Tools

L9908

- Product page
- Datasheet
- Application note

EVAL-L9908

- Product page
- Data brief
- User manual
- Bill of material
- Schematics

STSW-L9908

- Product page
- Data brief
- License agreement
- User manual

Find out more about L9908 **motor driver IC for BLDC motor driving** applications

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L9907
Automotive gate driver for 3 phase BLDC motors

3 phase gate driver for 6 steps or FOC controlled brushless motors compatible with 48V NET

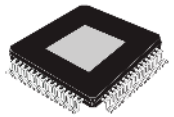
Features

Electrical parameters
- Supply voltage from 4.2V to 54V (60V 1hr)
- For 12V, 24V, 48V battery applications
- PWM operation up to 20 kHz
- Adjustable gate driver current via SPI (max 600 mA)

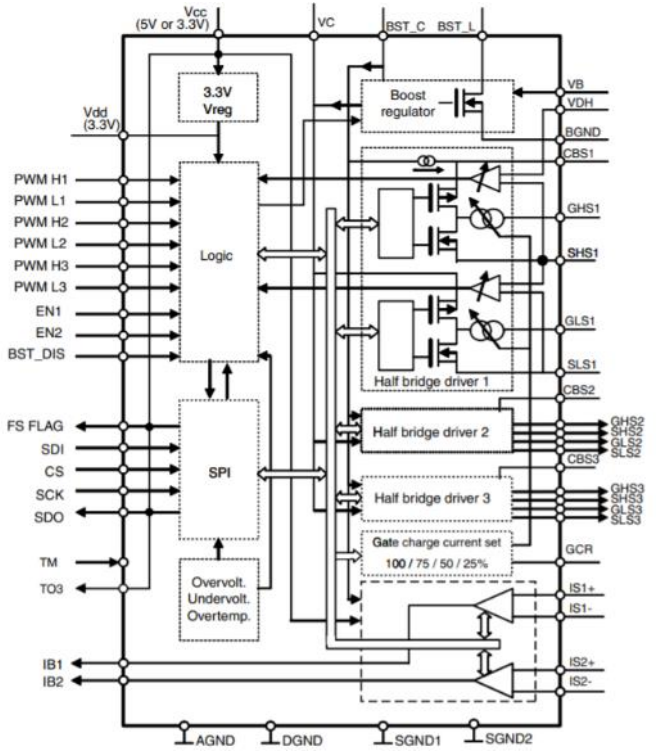
Protections
- Floating current sense amplifiers with SPI selectable amplifier gain and output offset voltage level
- Power MOSFET drain to source voltage drop measurement for overcurrent protection

Outputs
- 3 Low-Side & High-Side drivers
- Withstand -7V to 90V at the FET high-side driver pins
- 2x current sense 3.3/5V compatible

Diagnostics
- Full diagnostic through 8MHz 32-bit SPI
- Over-temperature diagnostic and shut-down, programmable deadtime, drain-source monitoring
- Status flag



LQFP64
(exposed pad up)



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L9907
Automotive gate driver for 3 phase BLDC motors

A glance at possible applications:

Suitable for every **BLDC motor control** application leveraging outstanding high quality and robust solutions

Generic BLDC motor driving	Electric blower/ snowblower	E-scooter traction
Electric motorbike	48V start and stop system	Electric forklift
Electric brake booster	48V Electric super charger	Electric power steering

Key values

Flexible and programmable

SPI parameter setting and full diagnostic availability

Supporting electrification requirement

Of high-efficient BLDC driven applications

ASIL-D solution

Full compliant with ISO26262

Collaterals & Tools

L9907

- Product page
- Datasheet
- Application note: supply voltage configuration
- Brochure

EVAL-L9907

- Product page
- Data brief
- Application note: supply voltage configuration
- User manual
- Bill of material
- Schematics

STSW-L9907

- Product page
- Data brief
- License agreement
- User manual

SPC5 motor control tool kit **FOC LIBRARY**

Find out more about L9907 **motor driver IC for BLDC motor driving** applications

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L99ASC03G

Automotive multifunctional system IC for 3-phase motor control

BLDC 3-phase motor pre-driver featuring a voltage regulator for MCU power supply and an operation amplifier for motor current sensing

Features

Electrical parameters

- Operating voltage range: 6V to 28V
- Very low current consumption in standby mode (<15 µA)
- PWM operation up to 80 kHz

Protections

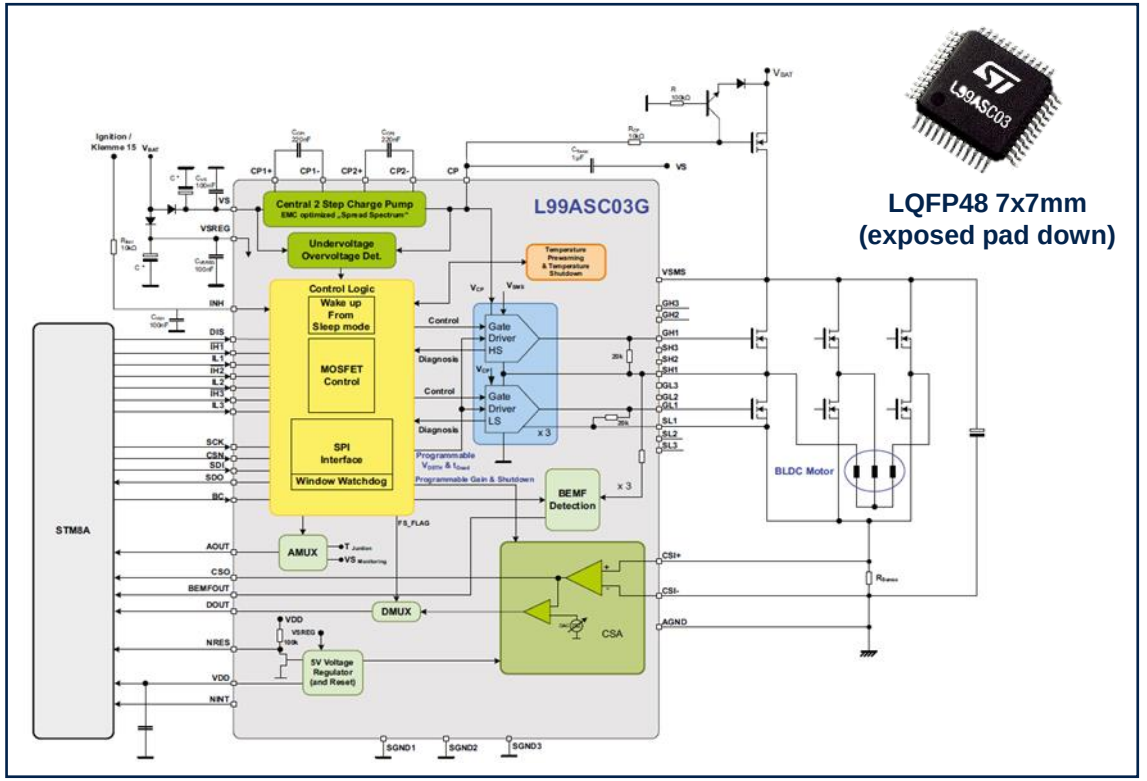
- Fail-safe functionality
- Analog multiplexer output to monitor external power supply voltages and junction temperature
- Programmable overcurrent protection
- Open load detection

Outputs

- 3x Half Bridge configurable Drivers
- 1x LDO Regulator 5V (200mA continuous mode)

Diagnostics

- SPI interface for control and diagnostics
- Back-EMF diagnostic
- Drain-source monitoring
- Open-load detection



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L99ASC03G

Automotive multifunctional system IC for 3-phase motor control

A glance at possible applications:

Suitable for every **BLDC motor control** application leveraging outstanding high quality and robust solutions

Generic BLDC motor driving	HVAC blower fans	Water pumps
Oil pumps	Fuel pumps	Window lift
Twin Clutch Control	Engine cooling fans	

Key values

- Advanced BEMF diagnostic for sensor-less applications
- Full drive of external MOSFETs down to 6 V input voltage
- Window watchdog and fail-safe functionality

Collaterals & Tools

L99ASC03

- Product page
- Datasheet
- Application note: current sense amplifier offset, PMBLDC sensorless
- Selection Guide: powertrain&safety, smartpower for body
- Brochure

EVAL-L99ASC03

- Product page
- Data brief

STSW-L99ASC03

- Product page
- Data brief
- License agreement
- User manual

Find out more about L99ASC03 **motor driver IC for BLDC motor driving** applications

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Line card
Stepper motor control

L99SM81	L99MD01	L9942
Programmable 2-phase stepper motor with micro-stepping and stall detection	Octal Half Bridge driver with SPI control for brushed DC and stepper motors	Bipolar stepper motor control with micro-stepping and programmable current profile

L99SM81
Automotive Stepper motor driver

Programmable 2-phase stepper motor with micro-stepping and stall detection

Features

Electrical parameters

- Operating voltage: 6V to 28V
- Motor current capability up to 1.35 A
- Rdson = 0.7Ω typ @ 25°C (1.3Ω max @150°C)
- Very low current consumption in standby (typ. 10µA) mode (typ. 10µA)

Protections

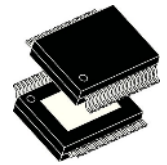
- Open load, short to battery, short to ground
- 1x programmable analog output for Tj measurement or band-gap reference
- Thermal warning and shutdown

Outputs

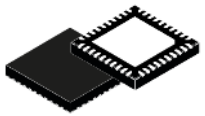
- 1x programmable analog output for Tj measurement or band-gap reference
- 2x programmable digital outputs for PWM ON duty cycles, error signals, coils voltage measurement

Diagnostics

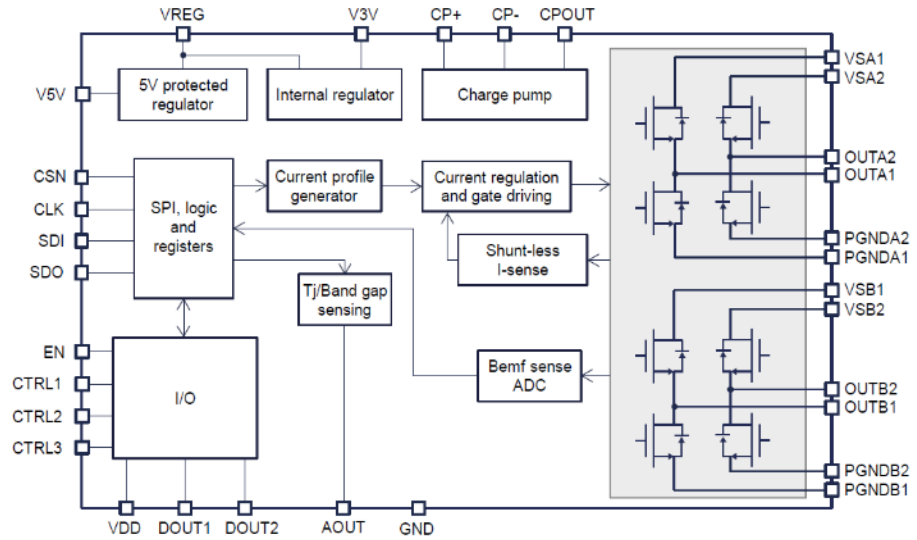
- Integrated ADC for coil voltage measurement and stall detection
- ST SPI 4.1 interface for control and
- diagnostics



PowerSSO-36



QFN40L



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L99SM81
Automotive Stepper motor driver

A glance at possible applications:

Generic stepper motor driving	Head-up display	Control valves
Active suspension	HVAC	Idle speed control
Rotating antenna	Front lighting control	

Key values

- Programmable step modes: full-step, half-step, mini-step, 1/8 micro step, 1/16 micro step
- Programmable decay modes: slow-mode, mixed-mode, 2x automatically selected modes
- Back electromotive force (BEMF) approach for motor speed readout

Collaterals & Tools

L99SM81

- Product page
- Datasheet
- Application note
- Selection guide
- Flyer
- Brochure

EVAL-L99SM81xx

- EVAL-L99SM81VQ product page
- EVAL-L99SM81VQ: Datasheet
- EVALIL99SM81VY product page
- EVAL-L99SM81VY: Datasheet

STSW-L99SM81

- Product page
- Data brief
- License agreement
- User manual

Find out more about L99SM81 **stepper motor driver for motor control** applications

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L99MD01
Automotive octal Half Bridge motor control

Octal Half Bridge driver with SPI control for brushed DC and stepper motors

Features

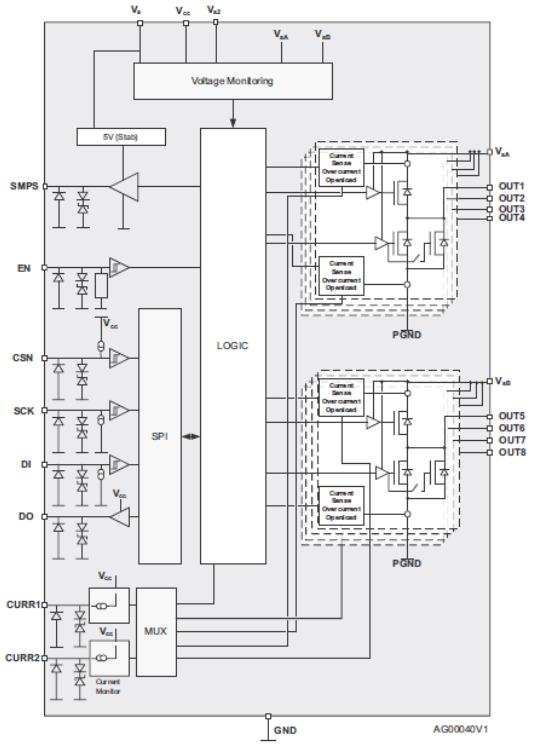
Electrical parameters
- Operating voltage range 6V to 18V
- Compatible with 5V and 3.3V logic
- Very low current consumption in standby mode typ. 5uA

Protections
- Over-current, short-circuit protection for all outputs
- Over-temperature shutdown
- Thermal pre-warning
- Cross-current protection for all outputs

Outputs
- 8x Half Bridges (**HS: 0.9Ω, LS 0.64Ω,** typ. @Tj=25°C)
- Current limit of each output at min 0.8A

Diagnostics
- Open load and overload detection
- Control and diagnostic through SPI

PowerSSO-36



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L99MD01
Automotive octal Half Bridge motor control

A glance at possible applications:

- Generic brushed DC and stepper motor driving
- HVAC applications
- Flaps control

Key values

- Driver for DC motors and stepper motors control, also, in mixed combination
- Monitoring system of the instantaneous current flowing in the selected half-bridge
- Internal switched mode power supply (SMPS) driver implementing spread spectrum technique

Collaterals & Tools

Product page
Datasheet,
Technical note: SPI protocol,
Selection guide,
Brochure

Find out more about L99MD01 **stepper motor driver for motor control** applications

L9942
Integrated stepper motor control

Bipolar stepper motor control with micro-stepping and programmable current profile

Features

Electrical parameters

- Operating battery supply from 7V up to 20V
- Operating VCC supply from 3V to 5.3V
- Very low current consumption in standby mode IS < 3 µA, typ. Tj < 85 °C
- Current regulation via PWM integrated controller and waveform programmable with look-up table

Protections

- All outputs short circuit protected with open load, overload current, temperature warning and thermal shutdown

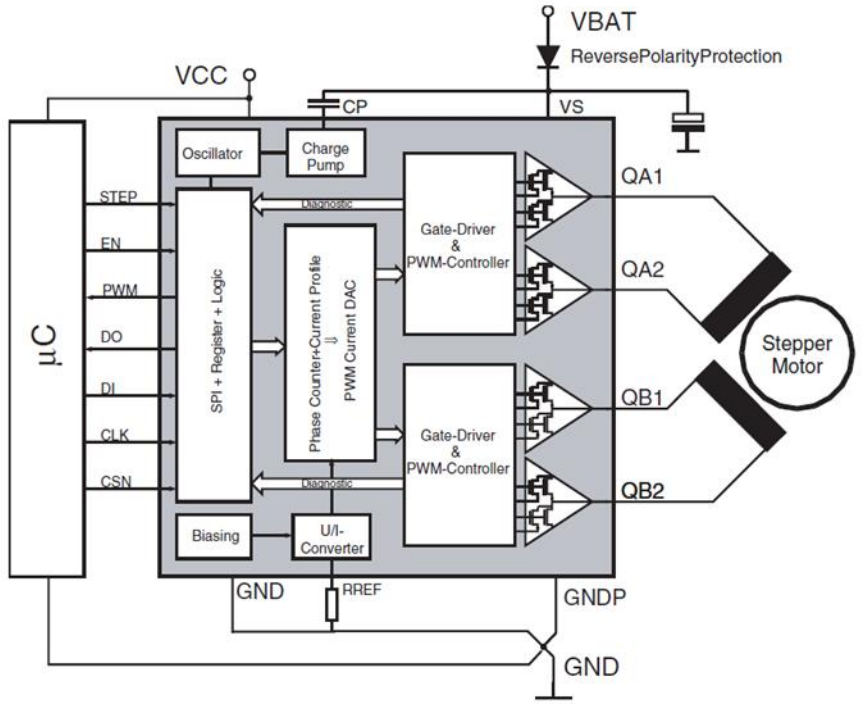
Outputs

- 2x Full bridges (**500 mΩ max. 1.3A**)

Diagnostics

- 16-bit SPI for parameter settings and diagnosis

PowerSSO-24



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L9942
Integrated stepper motor control

A glance at possible applications:

- Mirror adjustment
- Adaptive front Lighting
- Sunroof
- Tachometer
- Air conditioning flaps
- Gym bike

Key values

Current profile **slew rate programmability** for best trade-off EMC and power dissipation

Optimized BOM with embedded functionalities reducing MCU workload

Stall detection programmable threshold, minimizing the noise during alignment process

Collaterals & Tools

L9942

- Product page
- Datasheet
- Application note: back EFM stall detection algorithm, stepper motor driver for bipolar motor
- Technical article: thermal design calculations
- Brochure

EVAL-L9942

- Product page
- Data brief
- User manual, graphical interface
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9942

- Product page
- Data brief
- License agreement

Find out more about L9942 **stepper motor driver for motor control** applications

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“If only

I could find out more about motor control

This is where we come in

Generic drivers

Line card
Multi-output generic driver ICs

L99MOD50XP	L99MOD51XP	L99MOD53XP
Microcontroller-driven multifunctional actuator IC with embedded 6 Half-Bridge & 5 High-Side drivers	Microcontroller-driven multifunctional actuator IC with embedded 3 Half-Bridges & 2 High-Side drivers	Microcontroller-driven multifunctional actuator IC with embedded 5 Half-Bridge & 3 High-Sides drivers

L99MOD54XP	L99UDL01
Microcontroller-driven multifunctional actuator IC with embedded 3 Half-Bridge & 3 High-Side drivers	Smart driver IC for multiple motor control, suitable for a wide range of applications including the centralized car lock with a single IC

L99MOD50XP
Multi-purpose/multi-output IC for automotive

Microcontroller-driven multifunctional actuator IC with embedded 6 Half-Bridge & 5 High-Side drivers

Features

Electrical parameters

- Max operating voltage 28V
- Very low consumption in stand-by mode I_S < 6 µA typ; Tj ≤ 85 °C

Protections

- Over-current protection for all outputs
- Over- and Under-Voltage shutdown
- Thermal Shutdown
- Cross Current protection for half bridges
- Charge Pump output for reverse polarity protection

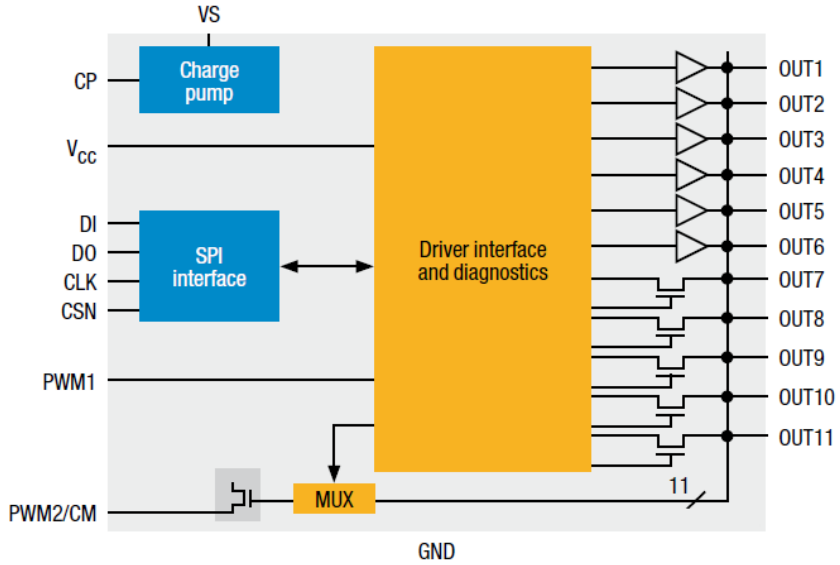
Outputs

- 2x Half-Bridge for 6A load (**150mΩ**);
- 2x Half-Bridge for 3A load (**300mΩ**);
- 2x Half-Bridge for 0.75A load (**1.6Ω**);
- 1x High-Side for 6A (**90mΩ**);
- 2x High-Side for up to 1.5A (**500mΩ**);
- 2x High-Side for 0.5A (**1.6Ω**);
- Programmable soft-start for all outputs

Diagnostics

- Open-load detection via SPI for all outputs
- Temperature Warning
- Multiplexed current monitor for all High-Side Drivers and selected Half-Bridge
- PWM control of all outputs

PowerSSO-36



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L99MOD51XP
Multi-purpose/multi-output IC for automotive

Microcontroller-driven multifunctional actuator IC with embedded 3 Half-Bridges & 2 High-Side drivers

Features

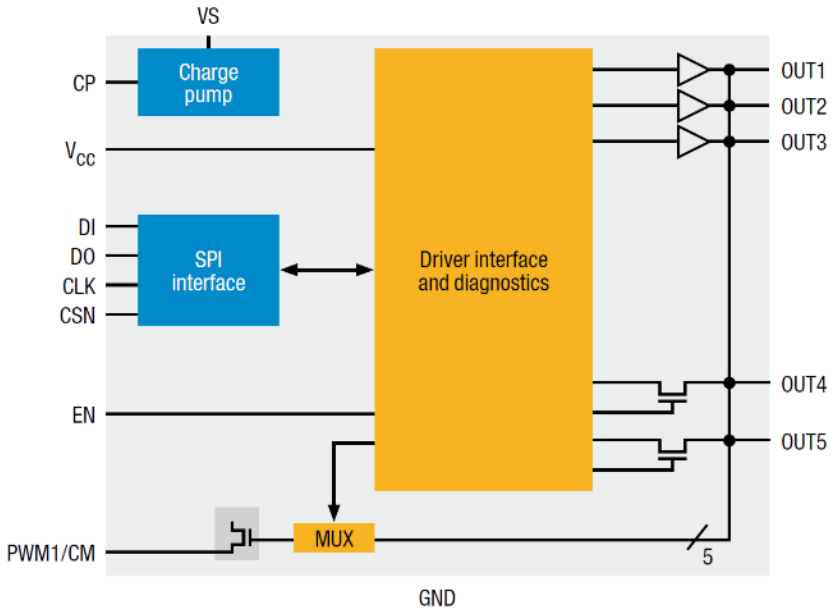
Electrical parameters
- Max operating voltage 28V
- Very low consumption in stand-by mode I_S < 3 µA typ Tj ≤ 85 °C

Protections
- Overload for all outputs
- Over- and Under-Voltage shutdown
- Thermal Shutdown
- Cross-current protection for half-bridges
- Charge Pump output for reverse polarity protection

Outputs
- 1x Half-Bridge for 7.4A load (**150mΩ**);
- 2x Half-Bridge for 5A load (**200mΩ**);
- 2x High-Side for 1.25A (**800mΩ**);
- Programmable soft-start for all outputs
- PWM control of all the outputs

Diagnostics
- Open-load detection via SPI for all the outputs
- Temperature Warning
- Multiplexed current monitor for all outputs

PowerSSO-36



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L99MOD53XP
Multi-purpose/multi-output IC for automotive

Microcontroller-driven multifunctional actuator IC with embedded 5 Half-Bridge & 3 High-Sides drivers

Features

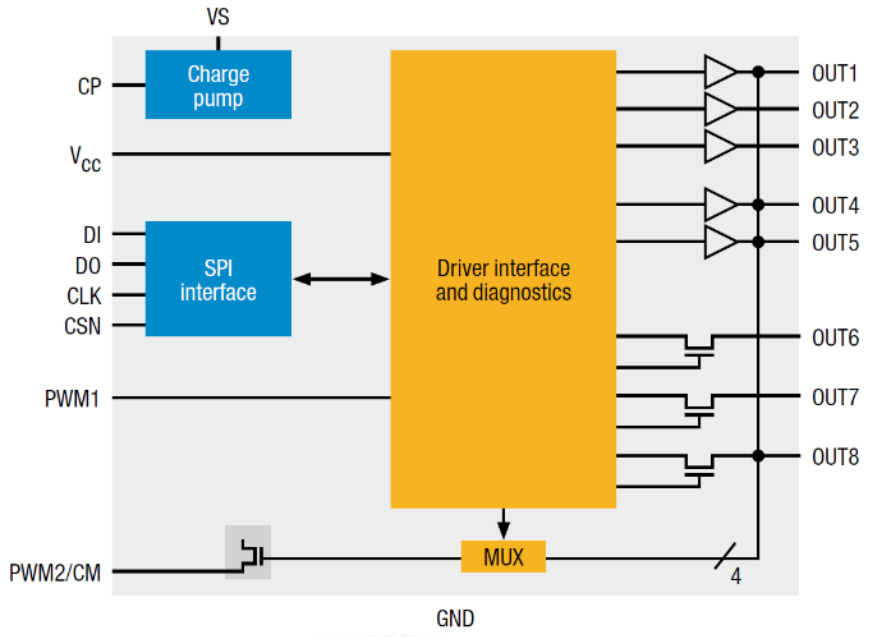
Electrical parameters
- Max operating voltage 28V
- Very low consumption in stand-by mode I_S < 6 µA typ Tj ≤ 85 °C

Protections
- Overload for all outputs
- Over- and Under-Voltage shutdown
- Thermal Shutdown
- Cross-current protection for half-bridges
- Charge Pump output for reverse polarity protection

Outputs
- 2x Half-Bridge for 6A loads (**150mΩ**)
- 3x Half-Bridge for 0.75A loads (**1.6Ω**)
- 2x High-Side for 1.5A load (**500mΩ**)
- 1x High-Side for 6A load (**100mΩ**)
- Programmable soft-start for all outputs
- PWM control of all the outputs

Diagnostics
- Open-load detection via SPI for all outputs
- Temperature Warning
- Multiplexed current monitor for selected outputs

PowerSSO-36



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L99MOD54XP
Multi-purpose/multi-output IC for automotive

Microcontroller-driven multifunctional actuator IC with embedded 3 Half-Bridge & 3 High-Side drivers

Features

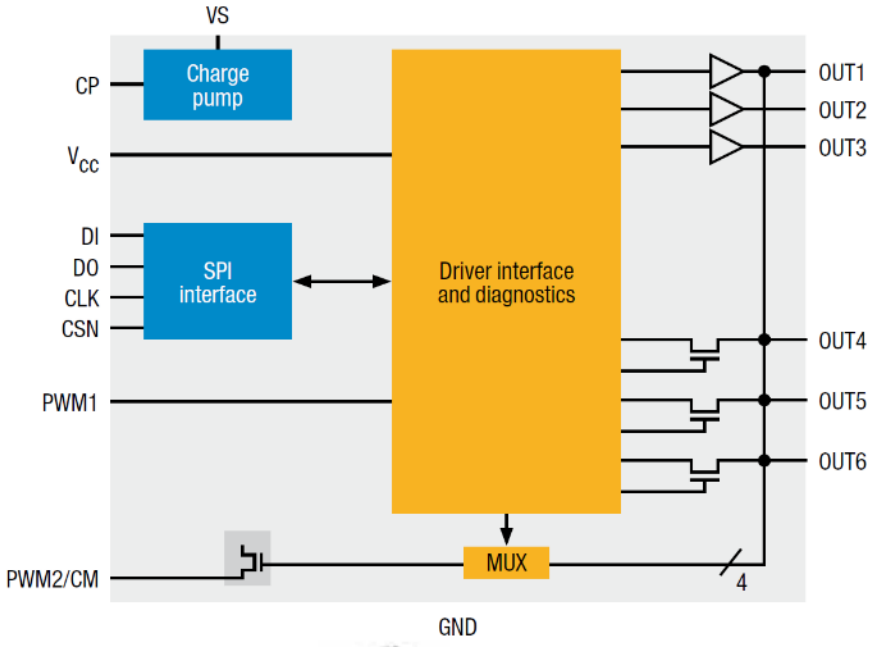
Electrical parameters
- Max operating voltage 28V
- Very low consumption in stand-by mode I_S < 6 µA typ Tj ≤ 85 °C

Protections
- Overload for all outputs
- Over- and Under-Voltage shutdown
- Thermal Shutdown
- Cross-current protection for half-bridges
- Charge Pump output for reverse polarity protection

Outputs
- 3x Half-Bridge for 0.75A loads (**1.6Ω**)
- 2x High-Side for up to 1.5A load (**0.5Ω**)
- 1x High-Side for 6A load (**100mΩ**)
- Programmable soft-start for all outputs
- PWM control of all the outputs

Diagnostics
- Open-load detection via SPI for all outputs
- Temperature Warning
- Multiplexed current monitor for all High-Side Drivers and selected Half-Bridge

PowerSSO-36



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L99MOD5xXP
Multi-purpose/multi-output driver for automotive

A glance at possible applications:

Every kind of mix of load such as DC motor, bulbs, LED strings, relay drivers…

Bulbs/LEDs
Sensors/cameras

Breakthrough solution suitable for new E/E architecture requirements

Key values

Integration concept

Enables minimization of module current consumption and I/O pins reduction

Multiple target applications

Housing on a single IC multiple half bridges, high-side and bridge drivers for external FET targeting a wide range of body applications

Flexible and programmable

SPI parameter setting and full diagnostic availability

Collaterals & Tools

L99MOD5xXP

- L99MOD50XP – Product page, Datasheet
- L99MOD51XP – Product page, Datasheet
- L99MOD54XP – Product page, Datasheet
- L99MOD53XP – Product page, Datasheet

EVAL-L99MOD50XP

- Product page
- Data brief
- User manual

STSW-L99MOD5xXP

- Product page
- Data brief
- User manual
- License

L99UDL01
Automotive multichannel motor control – universal door lock

Smart driver IC for multiple motor control, suitable for a wide range of applications including the centralized car lock with a single IC

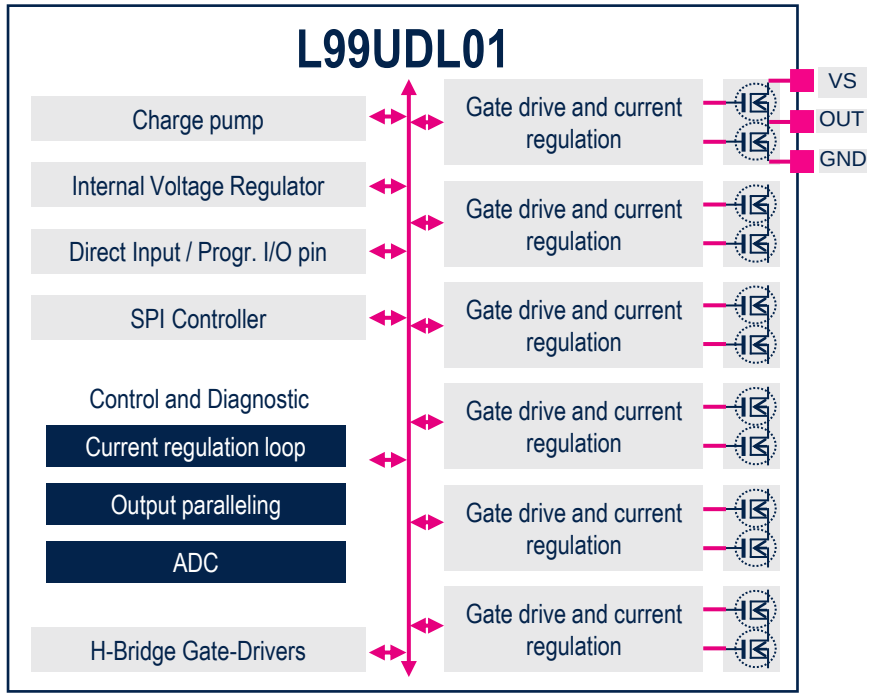
Features

Electrical parameters
- Extended Operating Range 5V to 26V
- Junction Temperature from -40ºC to 150ºC

Protections
- Overload for all outputs
- Shorted and open load detection, also in off state
- Drain-source voltage monitoring for external FETs

Outputs
- 6x Half Bridge Driver **(90mΩ)**
- 2x External Half Bridge Drivers
- Current regulation loops for each HS/LS switch
- Mechanism for paralleling up to 2x3 outputs

Diagnostics
- Open load detection for all the outputs
- Digital current monitor 10-bit resolution via SPI
- Emergency mode overriding built-in protections



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L99UDL01
Automotive multichannel motor control – universal door lock

A glance at possible applications:

Every kind of application requiring multiple smart motor control as well as:

Centralized door lock

Vending machines

Key values

Integration concept

Provide an IC that can control all door lock configurations using a minimum of external components

Reduce peak currents

Reduces the power requirements in wiring, circuit board and silicon, improving system reliability level

Multiple motor smart control

Closed loop current control, output paralleling mechanism, serial control, full set of protection and diagnostics makes the device ideal also in multiple motor control applications

Collaterals & Tools

L99UDL01

- Product page
- Datasheet
- Selection guide: smartpower for body
- Brochure
- Flyer

EVAL-L99UDL01

- Product page
- Data brief

STSW-L99UDL01

- Product page
- Data brief
- User manual
- License

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Line card
Multichannel high/low side drivers

L9826	L9301	L9026
8-channel Low-Side driver IC compatible with resistive and inductive loads	Configurable 8 Low-Side driver or 4 Low-Side & 4 High-Side driver with independent control and diagnostics	8-channel IC with 2 fixed HS drivers and 6 configurable HS/LS drivers compatible with resistive, inductive and capacitive loads

L9945	L99MC6GJ	L9800
8-channel fully configurable MOSFET pre-driver complying with 12V up to 24V battery systems	Automotive configurable 6-channel driver	Automotive octal Low Side Driver complying with 12V up to 36V battery systems

L9826
Automotive Octal Low-Side driver

8-channel Low-Side driver IC compatible with resistive and inductive loads

Features

Electrical parameters

- Digital supply voltage compatible with 5V microcontroller
- 50V clamping for inductive loads

Protections

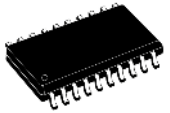
- Overcurrent and short circuit shutdown for Out 3 to 8
- Short circuit current limitation and thermal shutdown on Out1 & 2
- Out 1 & 2 Bulb inrush mode (BIM)

Output

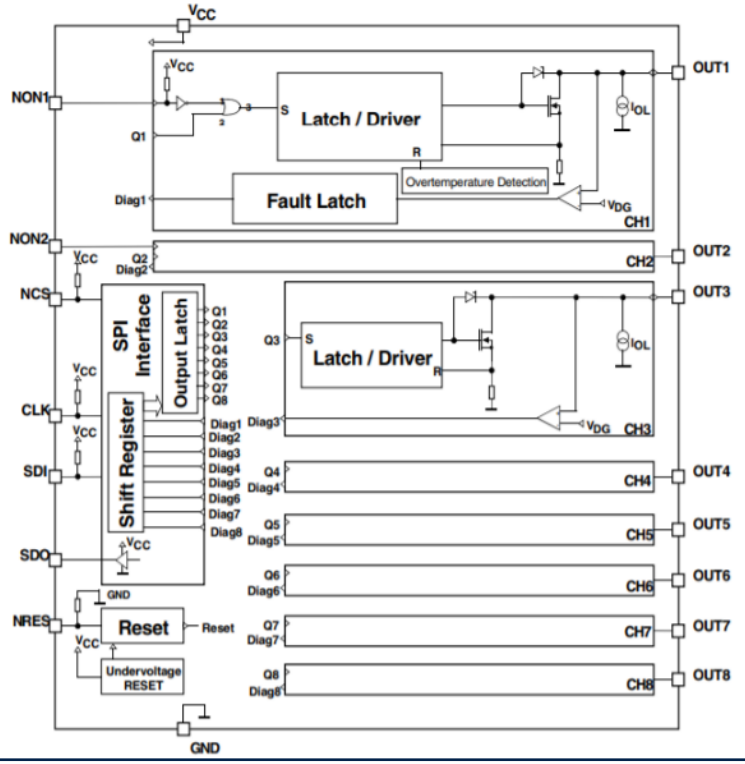
- 8x Low-Side Driver (**1.5Ω, max 450mA**)
- SPI control on all outputs, Out1 and Out2 controlled through parallel inputs

Diagnostics

- 8-bit serial peripheral interface for control and diagnosis



SO-20



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L9826
Automotive Octal Low Side driver

A glance at possible applications:

- Bulbs
- Small motors
- Resistive loads
- Capacitive loads
- Relays

Key values

- Embedding a set of features perfectly sized for small loads driving in low side configuration
- Achieving design optimization with a Solution securing minimized BOM
- Versatile device using in harsh environment using inside and outside transportation applications

Collaterals & Tools

Product page
Datasheet
Selection guides: powertrain & safety, smartpower for body

L9301
Automotive 8-channel configurable driver

Configurable 8 Low-Side driver or 4 Low-Side & 4 High-Side driver with independent control and diagnostics

Features

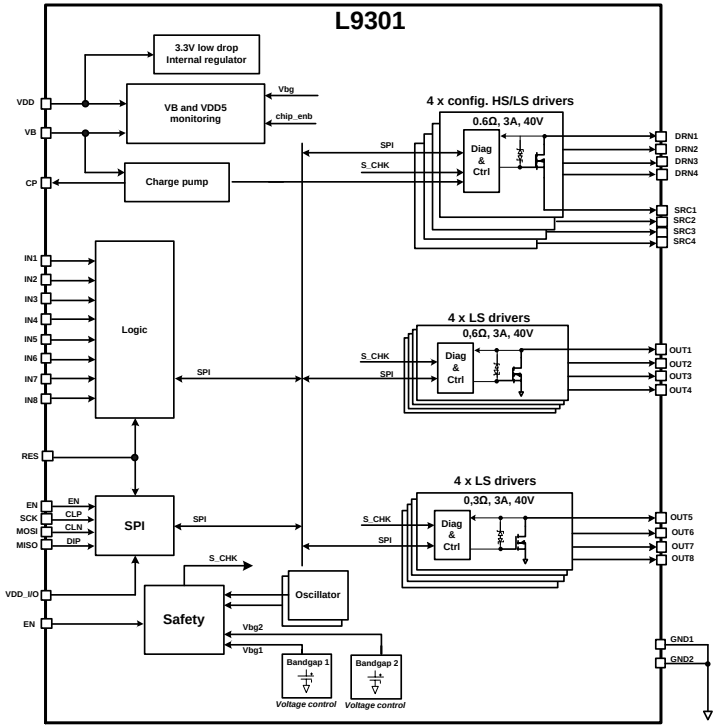
Electrical parameters
- Operating supply voltage 5V to 18V
- Operating VDD supply voltage 4.75V to 5.25V

Protections
- Overtemperature, overcurrent and shutdown protection

Outputs
- 8x configurable High-Side/Low-Side drivers (**0.6Ω, max 3A**)
- 4x Low-Side drivers (**0.6Ω, max 3A**)
- 4x Low-Side drivers (**0.3Ω, max 3A**)
- Possibility to parallel DRN/SRC1-4 and OUT1-4 in order to get 4
- x Low-Side drivers for a total 8x Low-Side drivers (**0.3Ω**)

Diagnostics
- SPI interface for outputs control and for diagnosis data communication

PowerSSO-36



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L9301
Automotive 8-channel configurable driver

A glance at possible applications:

- Generic resistive and inductive loads driver
- Automotive ABS
- Vehicle transmission
- Vehicle control unit
- Active suspensions

Key values

High flexibility

Possibility to configure HS/LS drivers and to parallelize realizing a total 8x LS drivers

Full configurability

Device parameters configuration (e.g., slew-rate, overcurrent threshold) and diagnosis via SPI

Design optimization

Low ohmic PowerMOS and improved EMC performances

Collaterals & Tools

L9301

- Product page
- Datasheet

EVAL-L9301

- Product page
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9301

- Product page
- Data brief
- User manual
- License agreement

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L9026
Automotive configurable multi-channel relay driver

8-channel IC with 2 fixed HS drivers and 6 configurable HS/LS drivers compatible with resistive, inductive and capacitive loads

Features

Electrical parameters
- Cranking compatibility down to VBATT=3V
- Digital supply voltage compatible with 3.3 and 5V microcontroller
- Very lo quiescent current

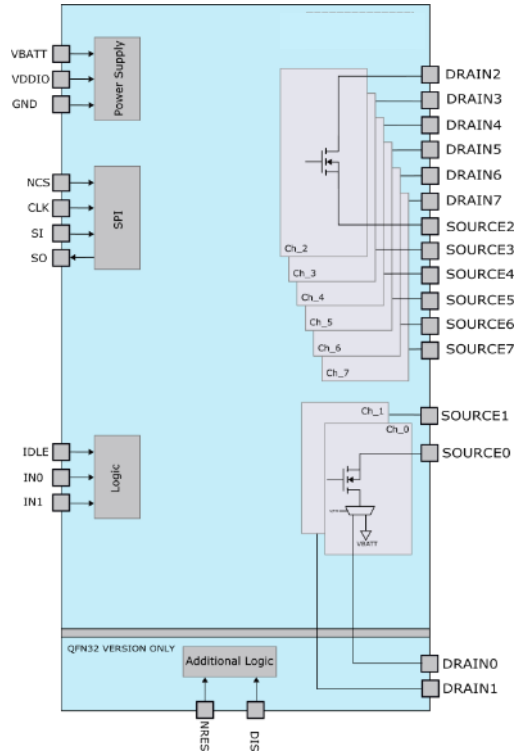
Protections
- Reverse battery protection on VBATT and on drain pins without external components
- Bulb inrush mode (BIM)
- Temperature sensor and monitoring

Outputs
- 6x configurable High-Side/Low-Side drivers
- 2x High Side Drivers
- 2x additional internal PWM generator
- Daisy Chain capability SPI, also compatible with 8-bit SPI devices

Diagnostics
- 16-bit serial peripheral interface for control and diagnosis

VFQFPN32 5x5x1mm (exposed pad down)

HTSSOP24 7.8x6.4x1mm (exposed pad down)



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L9026
Automotive configurable multi-channel relay driver

A glance at possible applications:

Bulbs	LEDs
Relays	Small motors
Resistive loads	Capacitive loads

Key values

Embedding a set of features

Reverse battery, LED mode, bulb inrush, PWM generator, limp home

Achieving efficiency

Extreme low quiescent current solution

ASIL-B solution

Solution compliant with ISO26262

Collaterals & Tools

L9026

- Product page
- Datasheet

EVAL-L9026-YO

- Product page
- Data brief
- User manual
- Bill of material
- Schematics

STSW-L9026-Y0

- Product Page
- Data brief
- User manual
- License agreement

L9800
Automotive Octal Low Side Driver

8 Low Side channel IC complying with 12V up to 36V battery systems

Features

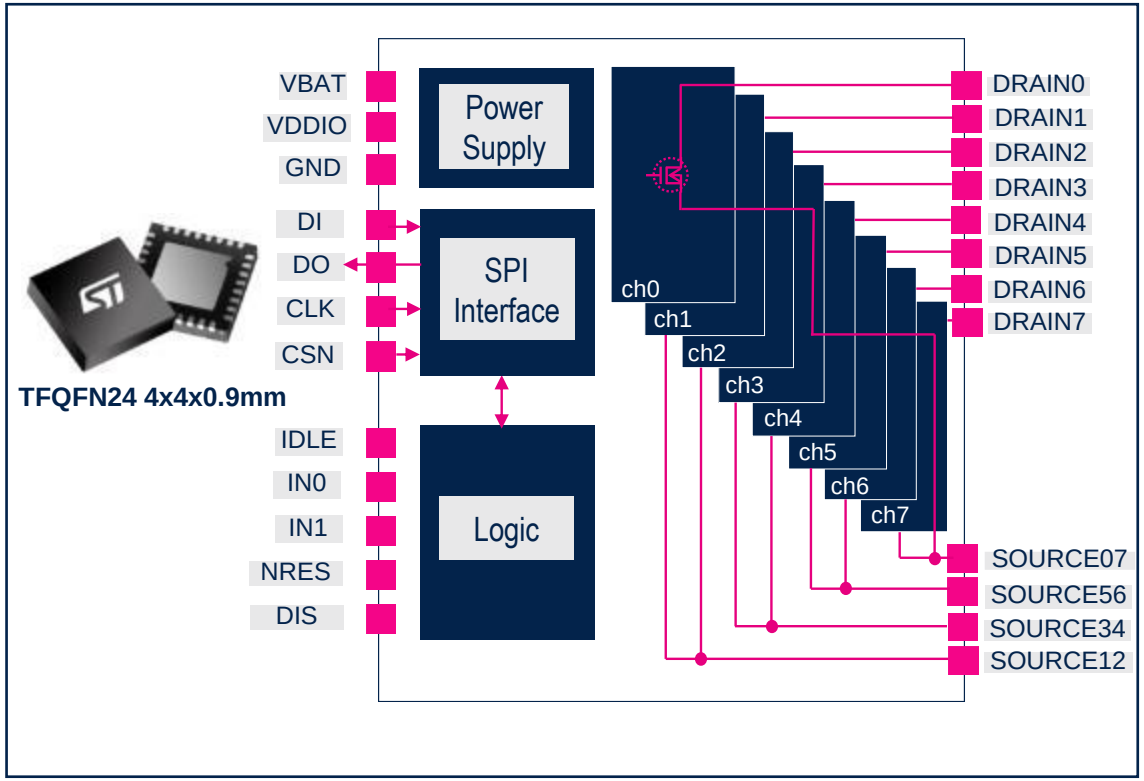
Electrical parameters
- Cranking compatibility down to VBATT=3V
- Digital supply voltage compatible with 3.3 and 5V microcontroller
- Very lo quiescent current

Protections
- Reverse battery protection on VBAT and on drain pins without external components
- Bulb inrush mode (BIM)
- Temperature sensor and monitoring

Outputs
- 8x configurable Low-Side drivers
- 2x High Side Drivers
- 2x additional internal PWM generator
- Daisy Chain capability SPI, also compatible with 8-bit SPI devices

Diagnostics
- 16-bit serial peripheral interface for control and diagnosis

TFQFN24 4x4x0.9mm



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L9800
Automotive Octal Low Side Driver

A glance at possible applications:

Bulbs	LEDs
Relays	Small motors
Resistive loads	Capacitive loads

Key values

Embedding a set of features

Reverse battery, LED mode, bulb inrush, PWM generator, limp home mode, daisy chain capability SPI

Achieving efficiency

Extreme low quiescent current solution

ASIL-B solution

Solution compliant with ISO26262

Collaterals & Tools

Product page
Datasheet
Application Note (Coming soon)
Evaluation Boards (Coming soon)

L9945
Configurable multichannel pre-driver

8-channel fully configurable MOSFET pre-driver complying with 12V up to 24V battery systems

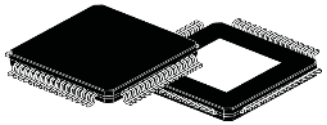
Features

Electrical parameters
- Operating battery supply voltage 3.8V to 36V
- Operating VDD supply voltage 4.5V to 5.5V

Protections
- Overcurrent monitoring
- Current limitation for H-bridge

Outputs
- Up to 8x High Side Drivers
- Up to 8x Low Side Drivers
- Up to 2x Peak & Hold
- Up to 2x H-Bridge Drivers
- All output controlled through parallel PWM inputs.

Diagnostics
- Full diagnostic for short circuit to battery, open load, short circuit to ground for each individual output
- Each output status can be constantly monitored through dedicated SPI registers



TQFP64
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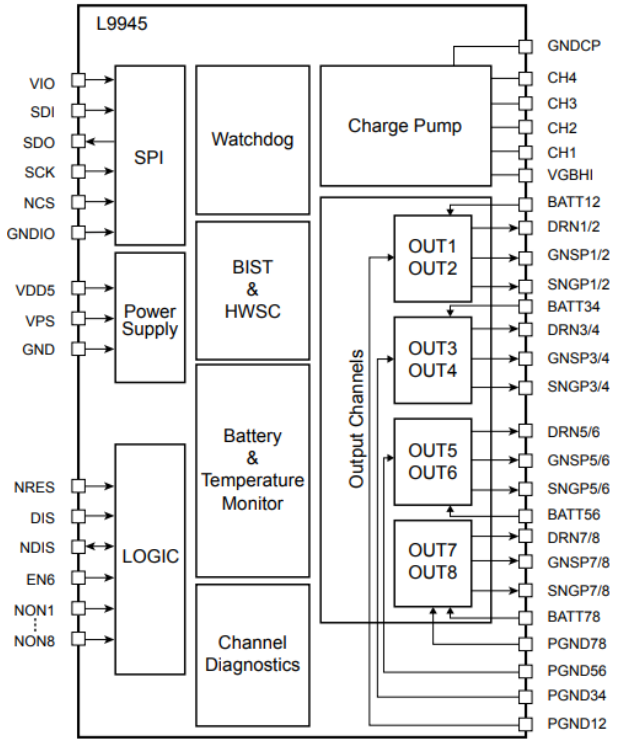

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L9945
Configurable multichannel pre-driver

A glance at possible applications:

High current inductive loads	12V applications	Automotive (EMS, VCU..)
High Current inductive loads	24V applications	Commercial Vehicle, Trucks (EMS,VCU..)
High Current inductive loads	24V applications	Industrial (DC motors, Valves..)

Key values

Configurability

All channels can be configured either as Low and High Side Drivers

Flexibility

Different kind of loads can be driven: linear or Peak and Hold solenoids, motors…

Application Coverage

From 12V up to 24V application (e.g., commercial vehicles, industrial..)

Collaterals & Tools

L9945

- Product page
- Datasheet
- Application note: charge pump stress estimation, configuring diagnostics, improving EMI, h-bridge direction switching recommendation, h-bridge configuration

EVAL-L9945

- Product page
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9945

- Product page
- Data brief
- User manual
- License agreement

L99MC6GJ
Automotive configurable 6-channel driver

Monolithic medium current output driver including 3 Low-Side & 3 independently self configuring Low-Side or High-Side drivers

Features

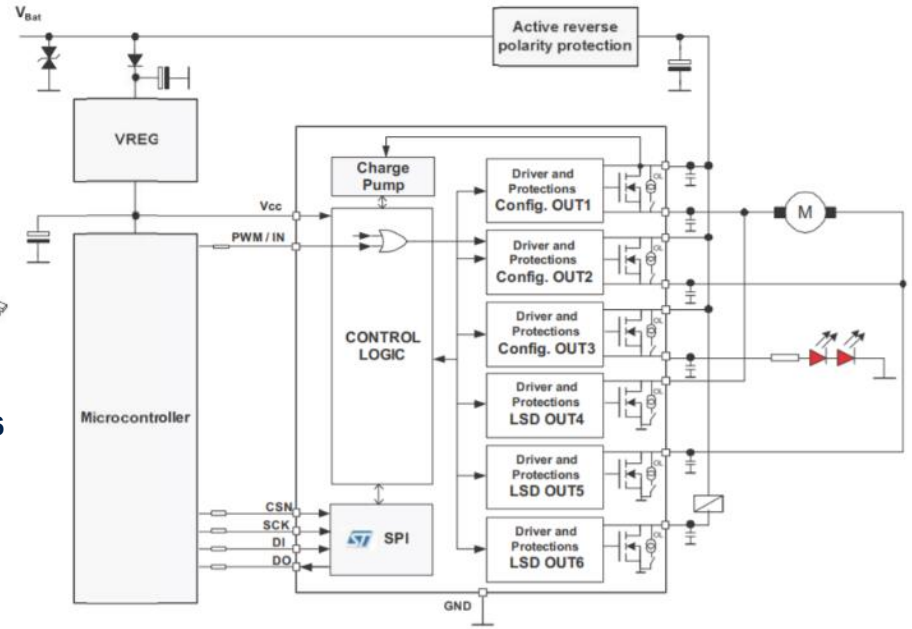
Electrical parameters
- VCC supply voltage 3V to 5.25V
- Very low current consumption in standby mode 5µA (typ)

Protections
- All outputs short-circuit protected
- All outputs overtemperature protected
- Bridge mode with crosscurrent protection
- Temperature warning

Outputs
- 3x independently self configuring High/Low-Side channels (**0.7Ω**)
- 3x Low-Side drivers (**0.7Ω**)
- Current limit of each output min 0.6A

Diagnostics
- The integrated 16-bit standard serial peripheral interface (SPI) controls all outputs and provides diagnostic information
- Configurable open-load detection in off mode

PowerSSO-16



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L99MC6GJ
Automotive configurable 6-channel driver

A glance at possible applications:

Wiper control	Mirror Adjustment
Under hood Switching Module	Body control module
Relay Driver	LED driver

Key values

High flexibility in driving different loads with 3 low-side and 3 outputs that can be used as either low-side or high-side drivers	Very low current consumption in standby mode	Internal Zener clamp for fast turn-off of inductive loads

Collaterals & Tools

Product page
Datasheet
Technical note

Line card
Valve driver

L9945	L9301	L9305
8-channel fully configurable MOSFET pre-driver complying with 12V up to 24V battery systems	Configurable 8 Low-Side driver or 4 Low-Side & 4 High-Side driver with independent control and diagnostics	4-channel configurable and independent Low-Side and High-Side current controlled drivers

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L9945
Configurable multichannel pre-driver

8-channel fully configurable MOSFET pre-driver complying with 12V up to 24V battery systems

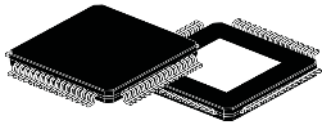
Features

Electrical parameters
- Operating battery supply voltage 3.8V to 36V
- Operating VDD supply voltage 4.5V to 5.5V

Protections
- Overcurrent monitoring
- Current limitation for H-bridge

Outputs
- Up to 8x High Side Drivers
- Up to 8x Low Side Drivers
- Up to 2x Peak & Hold
- Up to 2x H-Bridge Drivers
- All output controlled through parallel PWM inputs.

Diagnostics
- Full diagnostic for short circuit to battery, open load, short circuit to ground for each individual output
- Each output status can be constantly monitored through dedicated SPI registers



TQFP64
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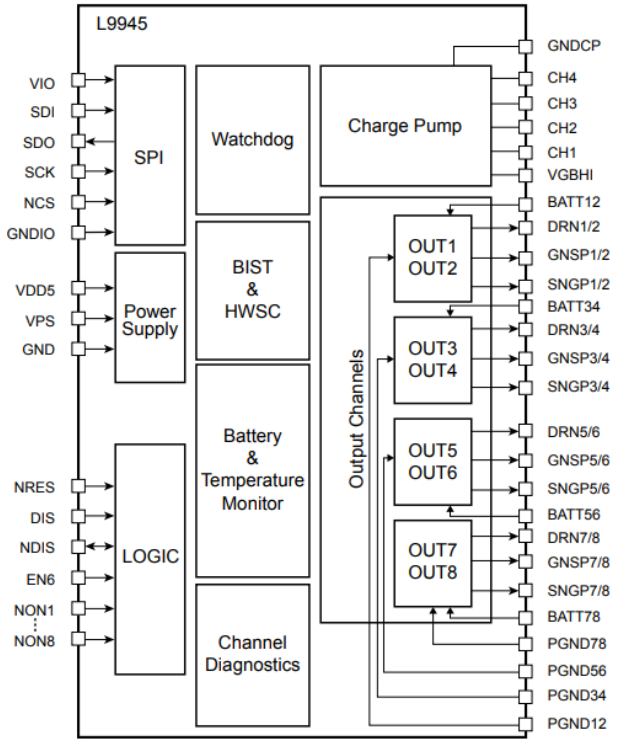

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L9945
Configurable multichannel pre-driver

A glance at possible applications:

High current inductive loads	12V applications	Automotive (EMS, VCU..)
High Current inductive loads	24V applications	Commercial Vehicle, Trucks (EMS,VCU..)
High Current inductive loads	24V applications	Industrial (DC motors, Valves..)

Key values

Configurability

All channels can be configured either as Low and High Side Drivers

Flexibility

Different kind of loads can be driven: linear or Peak and Hold solenoids, motors…

Application Coverage

From 12V up to 24V application (e.g., commercial vehicles, industrial..)

Collaterals & Marketing Package

L9945

- Product page
- Datasheet
- Application note: charge pump stress estimation, configuring diagnostics, improving EMI, h-bridge direction switching recommendation, h-bridge configuration

EVAL-L9945

- Product page
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9945

- Product page
- Data brief
- User manual
- License agreement

L9301
Automotive 8-channel configurable driver

Configurable 8 Low-Side driver or 4 Low-Side & 4 High-Side driver with independent control and diagnostics

Features

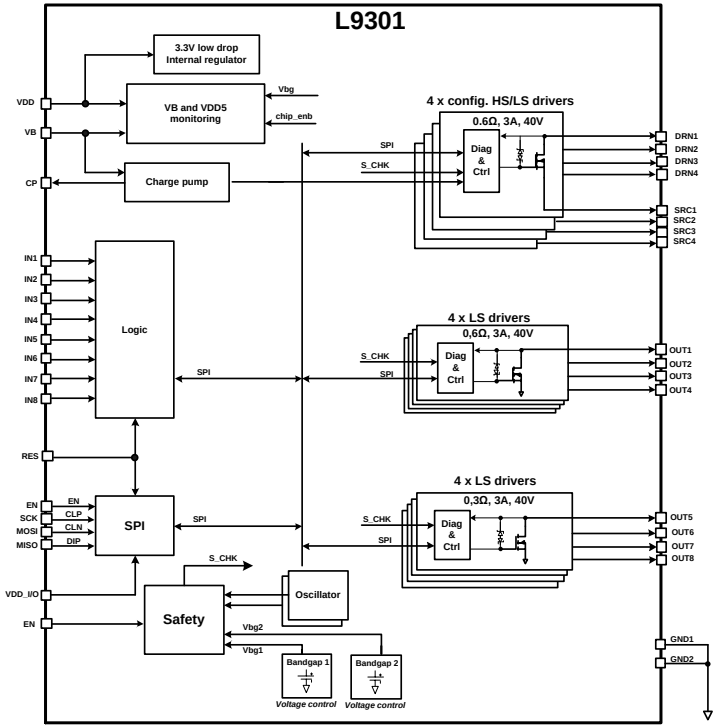
Electrical parameters
- Operating supply voltage 5V to 18V
- Operating VDD supply voltage 4.75V to 5.25V

Protections
- Overtemperature, overcurrent and shutdown protection

Outputs
- 8x configurable High-Side/Low-Side drivers (**0.6Ω, max 3A**)
- 4x Low-Side drivers (**0.6Ω, max 3A**)
- 4x Low-Side drivers (**0.3Ω, max 3A**)
- Possibility to parallel DRN/SRC1-4 and OUT1-4 in order to get 4
- x Low-Side drivers for a total 8x Low-Side drivers (**0.3Ω**)

Diagnostics
- SPI interface for outputs control and for diagnosis data communication

PowerSSO-36



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L9301
Automotive 8-channel configurable driver

A glance at possible applications:

- Generic resistive and inductive loads driver
- Automotive ABS
- Vehicle transmission
- Vehicle control unit
- Active suspensions

Key values

High flexibility

Possibility to configure HS/LS drivers and to parallelize realizing a total 8x LS drivers

Configurability

Device parameters configuration (e.g., slew-rate, overcurrent threshold) and diagnosis via SPI

Design optimization

Low ohmic PowerMOS and improved EMC performances

Collaterals & Marketing Package

L9301

- Product page
- Datasheet

EVAL-L9301

- Product page
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9301

- Product page
- Data brief
- User manual
- License agreement

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L9305
Automotive 4-channel valve driver

4-channel configurable and independent Low-Side and High-Side current controlled drivers

Features

Electrical parameters

- Operating battery supply voltage 5.5V to 19V
- Operating VDD supply voltage 4.75V to 5.5V
- Max precision accuracy 1mA (normal range 0.5-15A)

Protections

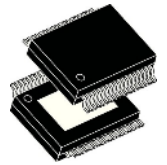
- 1-4 high side fail safe ENABLE switch pre-driver with VDS monitoring
- Redundant safe enable path
- Temperature sensor and monitoring
- Redundant current sensing for all channels

Outputs

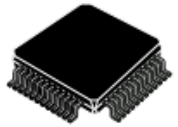
- 4x configurable High-Side/Low-Side Drivers (**375mΩ**)
- 2 operating driving modes:
  1. PWM through parallel input
  2. PWM internally generated

Diagnostics

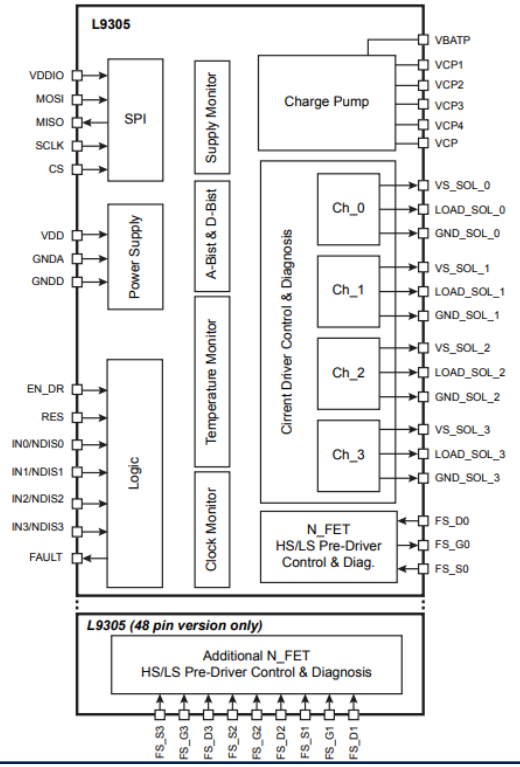
- Advanced diagnosis and monitoring using BIST



PowerSSO-36



TQFP48 exposed pad down



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L9305
Automotive 4-channel valve driver

A glance at possible applications:

High current inductive loads	12V applications	Automotive (EMS, VCU..)
High Current inductive loads	24V applications	Commercial Vehicle, Trucks (EMS,VCU..)
High Current inductive loads	24V applications	Industrial (DC motors, Valves..)

Key values

Configurability

Several parameters programmable via SPI (current set point, switching frequency

Flexibility

Two operating modes
HW: PWM signal internally generated relieving MCU tasks
SW: MCU is generating the PWM signals

Performance

High precision current control level allowing an accurate valve control

Collaterals & Marketing Package

Product page
Datasheet
Application note: charge pump stress estimation, how to improve EMI

System power supply

Line card
LDO voltage regulators

L5050	L5150	L5300
5V low drop-output linear voltage regulator in Single and Dual fully electrical isolated version for low load applications	5V low drop-output linear voltage regulator with 150 mA of output current capability	5V low drop-output linear voltage regulator with 300 mA of output current capability
L4995	**L99VR01S/J**	**L99VR02J**
5V low drop-output linear voltage regulator voltage regulator with 500mA of output current capability	Low drop-output linear voltage regulator with configurable output voltage and 200mA of current capability	Low drop-output linear voltage regulator with configurable output voltage and 500mA of current capability

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L5050
Automotive Single and Dual 5V LDO

5V low drop-output linear voltage regulator in Single and Dual fully electrical isolated version for low load applications

Features

Electrical parameters

- Operating DC supply voltage range 5.6V to 40V
- Very low current consumption in standby mode typ. 5uA

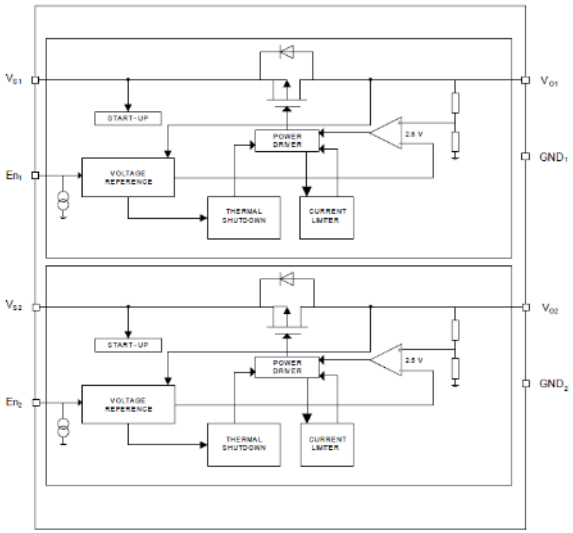
Protections

- Thermal shutdown and short circuit protection

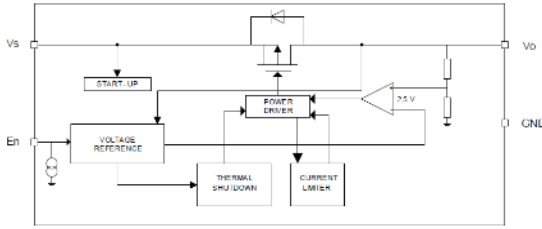
Outputs

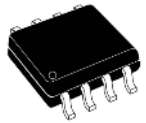
- Output voltage: **5V**
- Output current: **50 mA**
- Output voltage precision ±2 %

Dual 5V LDO

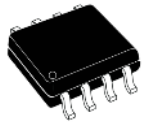


Single 5V LDO





SO-8



SO-8

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L5150
Automotive 5V LDO

5V low drop-output linear voltage regulator with 150 mA of output current capability

Features

Electrical parameters

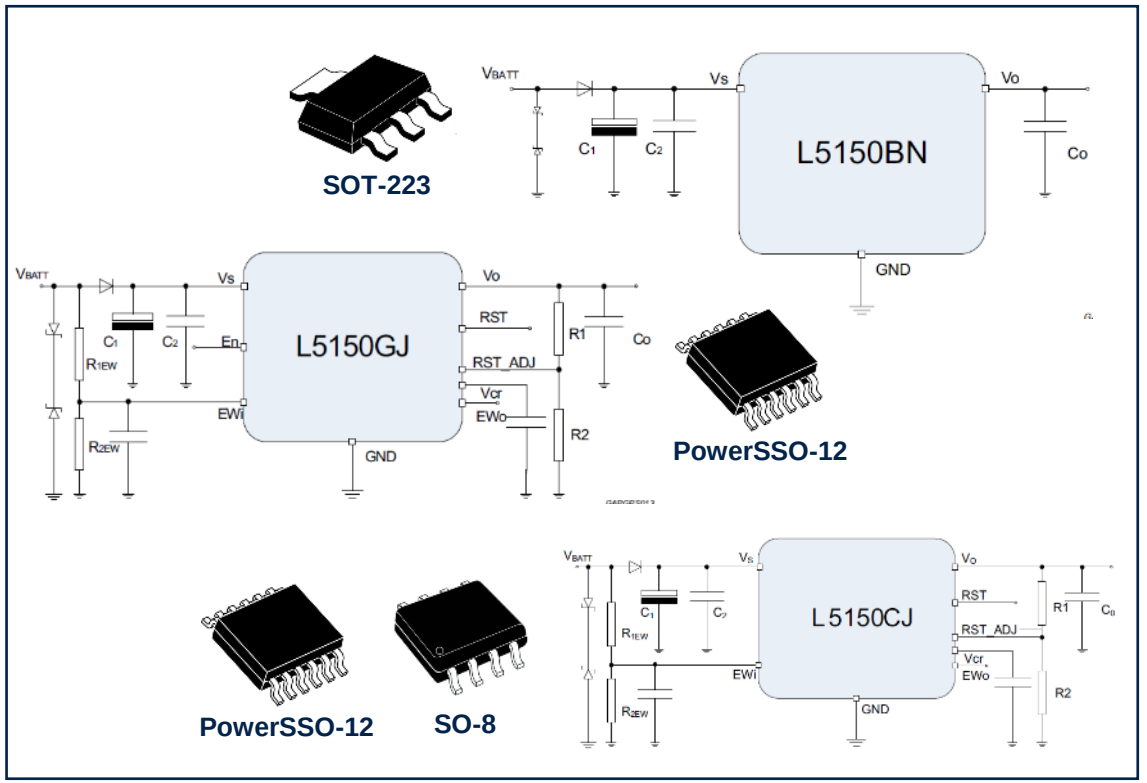
- Operating DC supply voltage range 5.6V to 40V
- Very low current consumption

Protections

- Thermal shutdown and short circuit protection

Outputs

- Output voltage: **5V**
- Output current: **150 mA**
- Output voltage precision ±2 %



L5300
Automotive 5V LDO

5V low drop-output linear voltage regulator with 300 mA of output current capability

Features

Electrical parameters

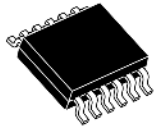
- Operating DC supply voltage range 5.6V to 40V
- Very low current consumption

Protections

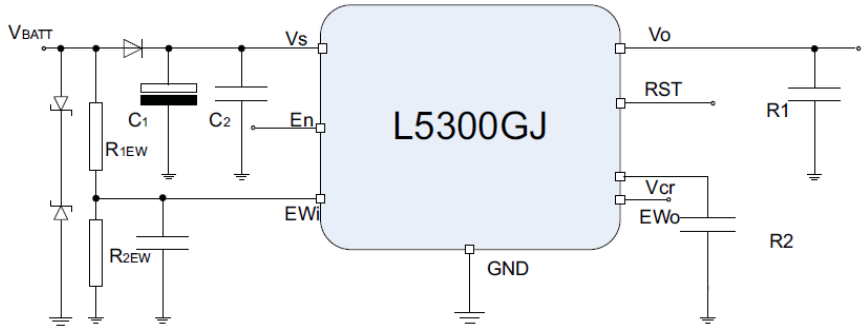
- Thermal shutdown and short circuit protection

Outputs

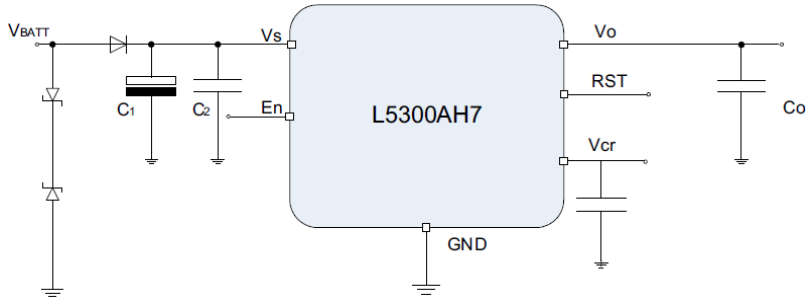
- Output voltage: **5V**
- Output current: **300 mA**
- Output voltage precision ±2 %



PowerSSO-12



HPAK



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L5xxx
Automotive 5V LDO

A glance at possible applications:

Suitable for any kind of electrical module requiring 5V power supply up to 300mA		
Keyless module	Seat heater	Sensors supply
Parking Assistance System	HVAC	Two wheelers applications
LED module	TMPS	On board charger

Key values

- Proposed in packages solution differentiated by body size and thermal performance
- Internal protection system according to the Automotive requirements
- Different electrical characteristics and features versions are available

Collaterals & Tools

L5050S: product page, datasheet
L5050D: product page, datasheet
L5150BN: product page, datasheet
L5150CJ: product page, datasheet
L5150CS: product page, datasheet
L5150CJ: product page, datasheet
L5300AH7: product page, datasheet
L5300GJ: product page, datasheet

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L4995
Automotive 5V LDO

5V low drop-output linear voltage regulator voltage regulator with 500mA of output current capability

Features

Electrical parameters

- Operating DC supply voltage range 5.6V to 31V
- Very low current consumption (typical 3µA in standby mode)

Protections

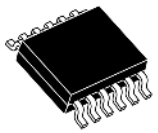
- Thermal shutdown and short circuit protection

Outputs

- Output voltage: **5V**
- Output current: **500 mA**
- Output voltage precision ±2 %

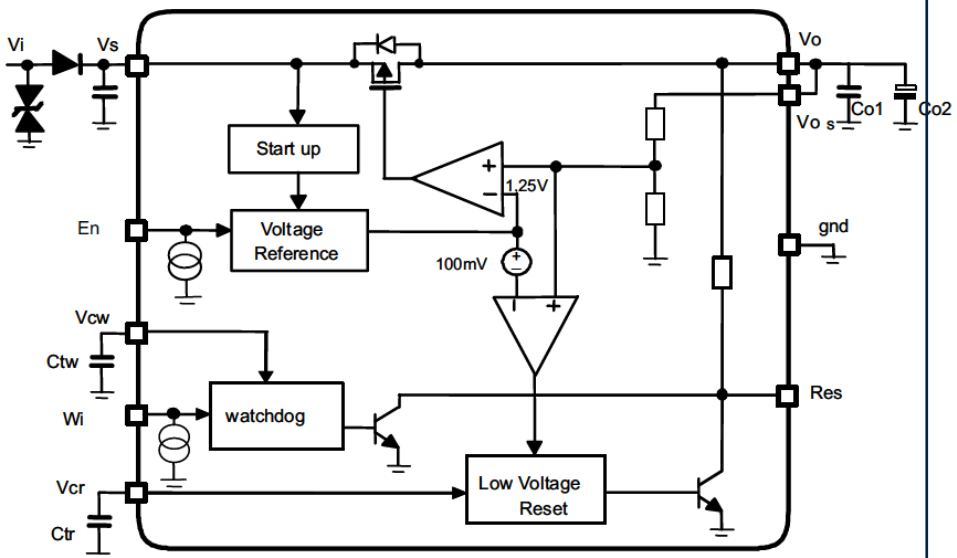
Diagnostics

- Watchdog function



PowerSSO-12

PowerSSO-24



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L4995
Automotive 5V LDO

A glance at possible applications:

Suitable for any kind of electrical module requiring 5V power supply up to 500mA		
Ignition Control Module	Transmission Control Unit	Identification Authentication Unit
Power Seat Module	Active Pedal Module	Electric Power Steering
LED driver Module	Sunroof	Battery management system

Key values

Packages solution differentiated by body size and thermal performance	Internal protection system according to the Automotive requirements	Devices of that series are differentiated for features (Enable, Watchdog)

Collaterals & Tools

Product page
Datasheet

L99VR01S/J
Automotive LDO linear voltage regulator

Low drop-output linear voltage regulator with configurable output voltage and 200mA of current capability

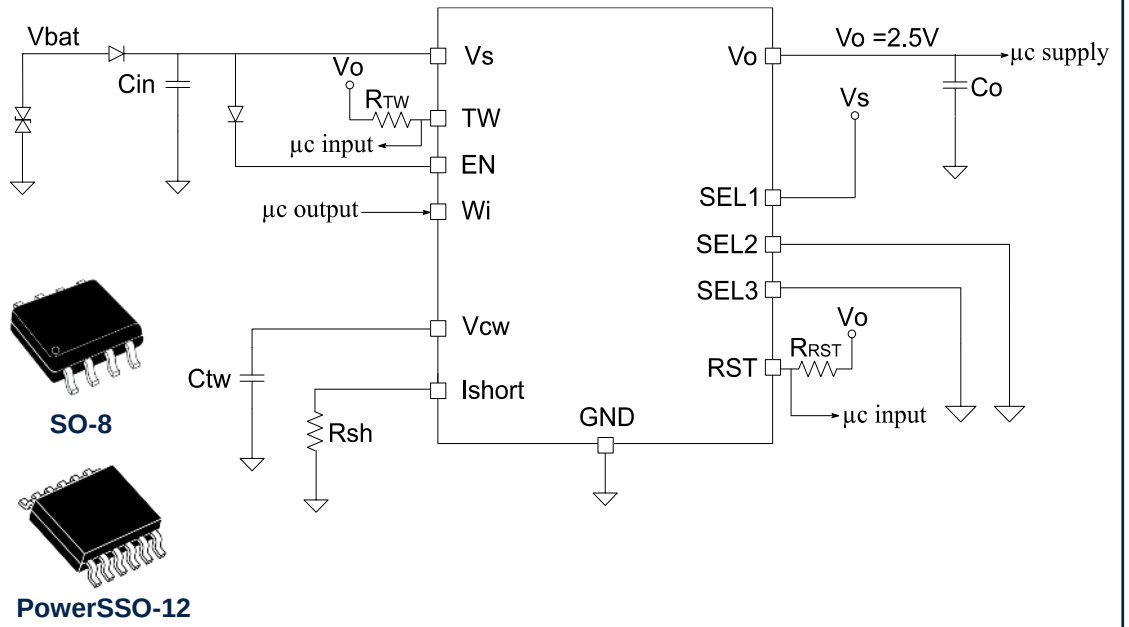
Features

Electrical parameters
- Operating DC power supply voltage from 2.15V to 28V
- Very low quiescent current Iq <1µA with regulator disabled

Protections
- Thermal shutdown and short-circuit current limitation
- Programmable short-circuit output current
- Undervoltage-lockout UVLO
- Programmable autonomous watchdog

Outputs
- User-selectable output voltage: **0.8V; 1.2V; 1.5V; 1.8V; 2.5V; 2.8V; 3.3V or 5V**
- Output voltage precision ±2%
- Output current: Io **200mA**

Diagnostics
- Advanced thermal warning and output overvoltage diagnostic (L99VR01J only)



SO-8

PowerSSO-12

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L99VR01x
Automotive LDO linear voltage regulator

A glance at possible applications:

8/16/32-bit MCU	FPGA
Infotainment & audio system	Powertrain system
Camera / sensors	Display driver

Key values

Design standardization

One configurable device from 0.8V to 5V serving multiple application needs with single part number

Family approach

Simplifying supply chain and taking benefit of cumulated higher volume on single part number

Safety requirement

Protection and safety mechanisms to reach safety requirements

Collaterals & Tools

L99VR01: product page, datasheet, flyer

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L99VR02J
Automotive LDO linear voltage regulator

Low drop-output linear voltage regulator with configurable output voltage and 500mA of current capability

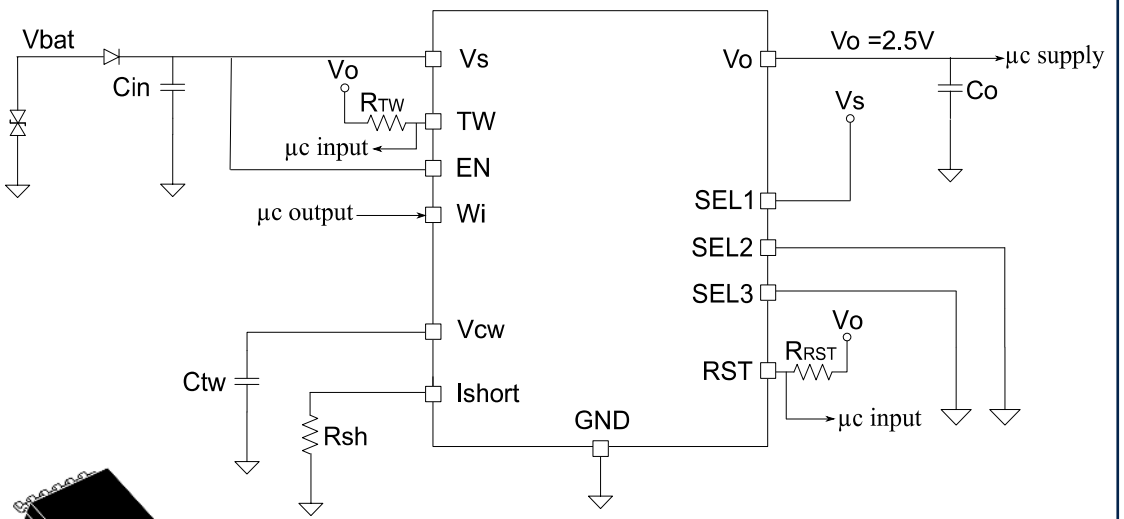
Features

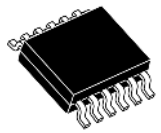
Electrical parameters
- Operating DC power supply voltage from 2.15V to 28V
- Very low quiescent current Iq <1µA with regulator disabled

Protections
- Thermal shutdown and short-circuit current limitation
- Programmable short-circuit output current
- Undervoltage-lockout UVLO
- Programmable autonomous watchdog

Outputs
- User-selectable output voltage: **0.8V; 1.2V; 1.5V; 1.8V; 2.5V; 2.8V; 3.3V or 5V**
- Output voltage precision ±2%
- Output current: Io **500mA**

Diagnostics
- Advanced thermal warning and output overvoltage diagnostic





PowerSSO-12

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L99VR02x
Automotive LDO linear voltage regulator

A glance at possible applications:

8/16/32-bit MCU	FPGA
Infotainment & audio system	Powertrain system
Camera / sensors	Display driver

Key values

Design standardization

One configurable device from 0.8V to 5V serving multiple application needs with single part number

Family approach

Simplifying supply chain and taking benefit of cumulated higher volume on single part number

Safety requirement

Protection and safety mechanisms to reach safety requirements

Collaterals & Tools

L99VR02J: product page, datasheet
L99VR02XP: product page, data-brief

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Line card
Power Management IC and System Basis Chip

L5963

Multiple voltage regulator integrating two switching DC-DC converters and one linear voltage regulator

L5965

Multiple voltage regulator integrating two Buck pre-regulators, two buck post-regulators, one boost, one LDO and voltage reference

L9001

Configurable voltage regulator with 1 buck regulator, 1 buck / linear voltage regulator and 1 linear voltage regulator

L9396

Configurable 6 rail & 4-channel sensor interface PMIC with Pre-Boost, Pre-Buck, LDOs, Vref and Tracking regulators.

SPSB081

System Basis Chip with 2 configurable output voltage rails, 4 high side drivers with CAN FD and LIN transceivers

STPM066S

Multiple voltage regulator integrating one Buck pre-regulator, one boost, one LDO and one voltage reference

STPM801

Configurable integrated Soft-Start, Hot-Swap and O-Ring with reverse input protection

STPM802

Synchronous buck-boost controller for high current demanding application

STPM098C

Dual loop, 8 phases digital multiphase controller

SPSB100

System Basis Chip with 3 configurable buck converters, 1 Boost controller, 2 LDOs and 1 high side driver

L9758

PMIC with Pre-Buck, Pre-Boost, LDOs programmable and Tracking regulators

L5963
Automotive multichannel power management

Multiple voltage regulator integrating two switching DC-DC converters and one linear voltage regulator

Features

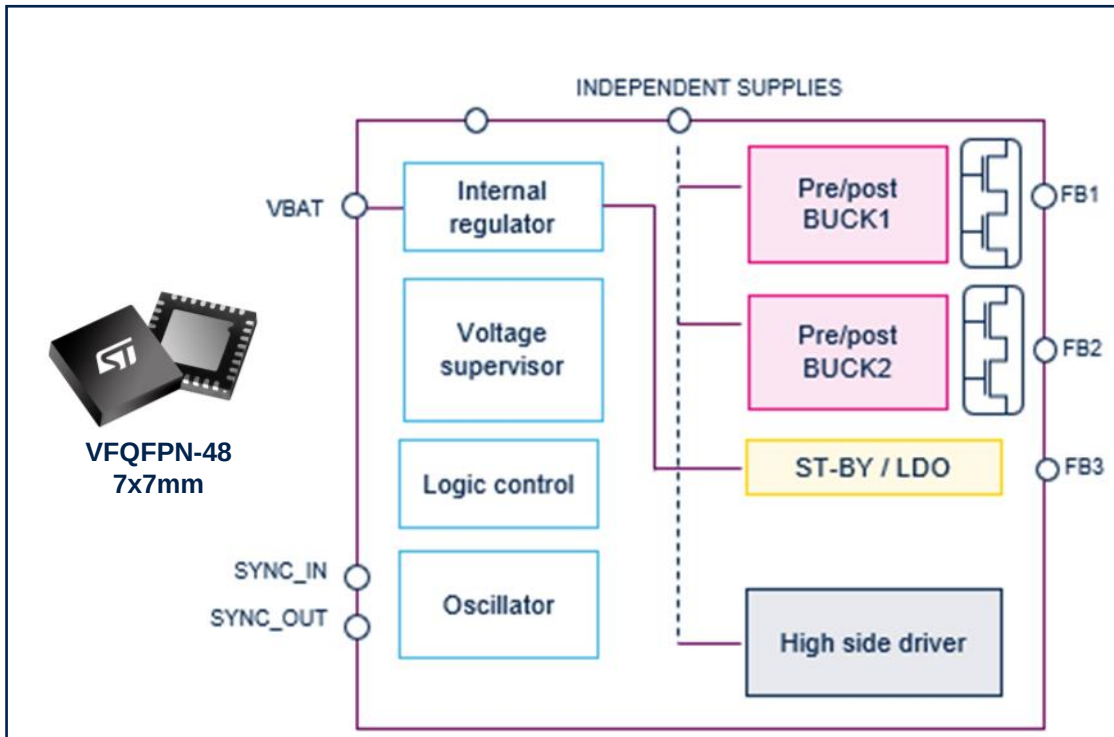
Electrical parameters
- Car passenger battery compatibility
- Extremely low quiescent current in standby conditions

Protections
- Load dump protection
- Independent thermal protection on all regulators
- Independent current limit on all regulators

Outputs
- 2x buck pre/post-regulators, min 1V, 2.5/3A max current capability, 250kHz free run, up to 2MHz with sync in
- 1x linear LDO post-regulator,250mA max current capability
- 1x high side driver, 0.5A max current capability

Diagnostics
- Power good
- Programmable under voltage battery detector

VFQFPN-48
7x7mm



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L5963

Automotive multichannel power management

A glance at possible applications:

ECU	Microcontroller power supply	Infotainment module
USB hub	Automotive sound system	Instrument cluster
Car radio		

Key values

Low interference

High operating frequency allowed by the synchronization input helps to reduce AM and FM interferences

BOM optimization

High level of integration reduces the total number of external components needed

Application Coverage

Suitable for applications when battery compatibility, load dump protection and wide input voltage range are mandatory

Collaterals & Tools

L5963

- Product page
- Datasheet
- Selection Guide: smart power solutions for car body applications
- Brochure: power management., Electric vehicle (EV) ecosystem
- Flyer: automotive multichannel power management ICs

EVAL-L5963/Q

- Product page: EVAL-L5963, EVAL-L5963Q
- Databrief
- User manual
- Evaluation board terms of use

L5965
Automotive multichannel power management

Multiple voltage regulator integrating two Buck pre-regulators, two buck post-regulators, one boost, one LDO and voltage reference

Features

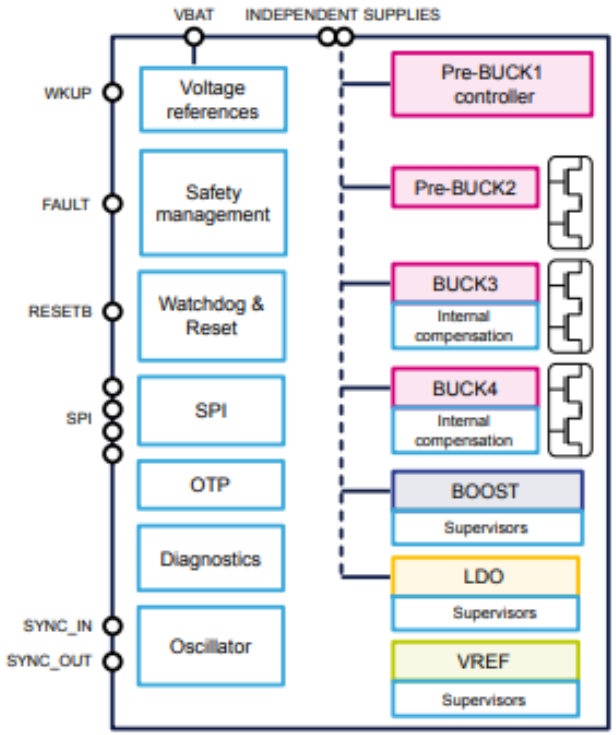
Electrical parameters
- Car passenger battery compatibility
- Power up sequence, output voltages and currents, switching frequencies programmable via OTP
- High switching frequency (>2MHz)
- Window watchdog and reset

Protections
- Undervoltage / Overvoltage / Overcurrent protections
- Over temperature detection by local thermal sensors
- Short circuit protected outputs and short to ground protection

Outputs
- 2x Buck pre-regulator (one of which is a controller)
- 2x Buck post-regulator
- 1x Boost post-regulator
- 1x linear LDO post-regulator
- 1x post precise voltage reference

Diagnostics
- ABIST, DBIST
- Fault detection pin to MCU
- Programmable diagnostic via SPI (e.g., over current limitation in case of over-load or short to ground, output voltage threshold…)

VFQFPN-48
7x7mm



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L5965
Automotive multichannel power management

A glance at possible applications:

- Processor power supply
- Microcontroller power supply
- Infotainment
- ECU
- Automotive radar system
- Automotive lidar system
- Automotive vision system

Key values

High level of integration

Up to 7 regulators embedded completing power path from the battery

Independent management

Independent regulators suppling and output voltage monitoring

Safety requirement

Offering a set of features to support applications that need to fulfill functional safety requirements

Collaterals & Tools

L5965

- Product page
- Datasheet
- Selection Guide: smart power solutions for car body applications
- Brochure: power management., Electric vehicle (EV) ecosystem
- Flyer: automotive multichannel power management ICs

EVAL-L5965

- Product page
- Data brief
- User manual
- Evaluation board terms of use

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L9001
Automotive power supply IC with multiple voltage regulators

Configurable voltage regulator with 1 buck regulator, 1 buck / linear voltage regulator and 1 linear voltage regulator

Features

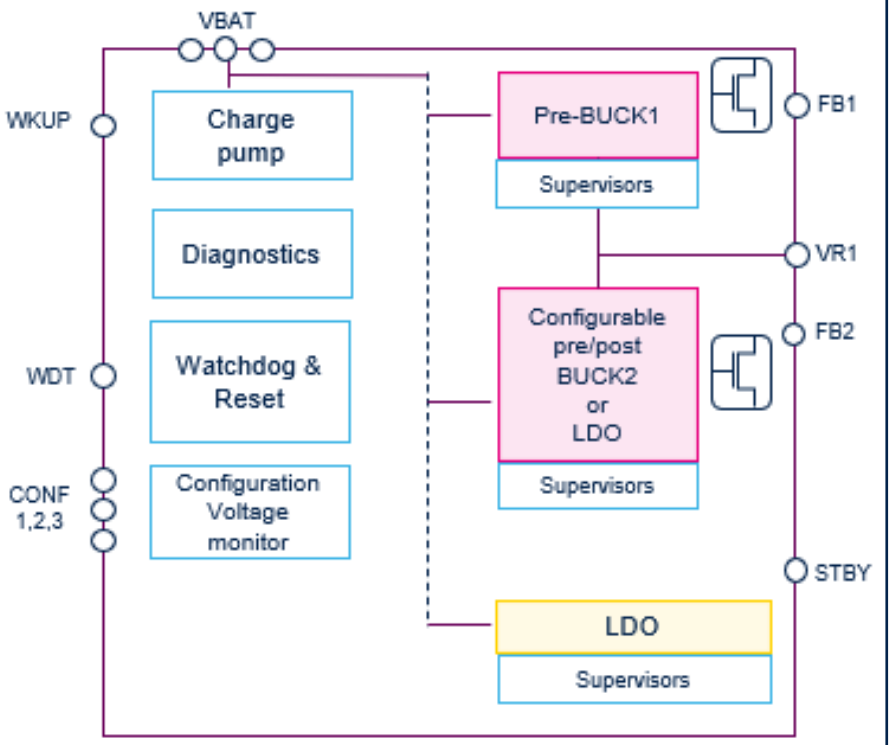
Electrical parameters
- Low power operation mode with main regulators still active and reduced power consumption from battery

Protections
- Configurable watchdog
- Over temperature shutdown
- Output under or over voltage reset generation

Outputs
- 1x Buck regulator (**3.3/5/6V, 1A**)
- 1x configurable Buck/LDO regulator (**0.8V to 5.0 V, 1A as Buck and 300 mA as LDO**)
- 1 x LDO (**3.3/5V, 100mA**)

Diagnostics
- Over-temperature, Overcurrent and undercurrent diagnosis
- 2x Voltage Monitor for overvoltage & undervoltage diagnosis on the regulators

PowerSSO-24



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L9001
Automotive power supply IC with multiple voltage regulators

A glance at possible applications:

Any kind of microcontroller power supply inside and outside transportation applications

Key values

Fully configurable

Flexible and configurable for multiple power supply schemes and applications

Integrated supervision & diagnosis

Full diagnosis functional box integration

Fail-safe functionality

Output supply supervision, overcurrent and overtemperature protection

Collaterals & Tools

L9001

- Product page
- Datasheet
- Application note: integration and performance eval
- Selection Guide: smart power solutions for car body applications
- Brochure: power management., Electric vehicle (EV) ecosystem

EVAL-L9001

- Product page
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

L9396
Automotive multiple power supply IC

Configurable 6 rail & 4-channel sensor interface PMIC with Pre-Boost, Pre-Buck, LDOs, Vref and Tracking regulators

Features

Electrical parameters

- Operating voltage: VBATP: 4.5 V to 19 V with boost; 6 V to 19 V without boost

Protections

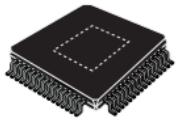
- Temperature monitoring and thermal shutdown
- Configurable and programmable double watchdog

Outputs

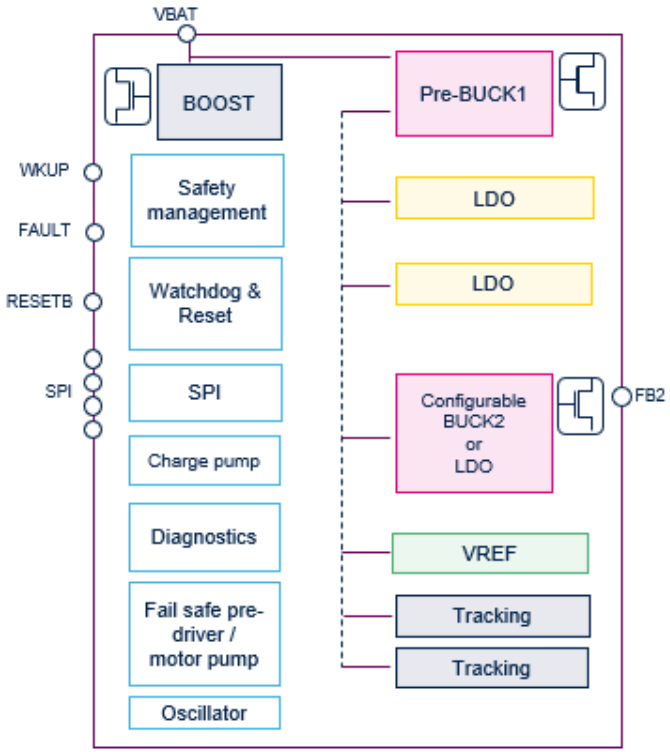
- 1x boost converter (**9V, max 0.3A, 2MHz**)
- 1x buck converter (**6.5/7.2V, max 1A, 465KHz**)
- 1x LDO VCC5 (**5V** +/-2%, **250mA**)
- 1x LDO VCC (**3.3/5V** +/-2%, **100mA**)
- 1x VCORE (0.8V to 5.0V +/-2% **max 1A switching, max 750mA linear mode**)
- 2x tracking regulators (120mA)

Diagnostics

- Voltage monitoring UV/OV on all regulated rails
- 32bit SPI with 3-bit CRC for configuration and diagnosis



TQFP64
(exposed pad down)



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L9396
Automotive multiple power supply IC

A glance at possible applications:

- Any kind of microcontroller power supply
- Braking
- Electric power steering
- Transmission
- Active suspensions
- On-board charger
- Vehicle control unit

Key values:

Flexibility

Different combinations to supply the MCU, external peripheral and sensors with wide adjustable voltage/current ranges

ASIL-D solution

Full compliant with ISO26262

Collaterals & Tools

Product page
Datasheet
Application note: L9396 configuration and layout

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SPSB081
Automotive Power Management IC with CAN FD and LIN

System Basis Chip with 2 configurable output voltage rails, 4 high side drivers with CAN FD and LIN transceivers

Features

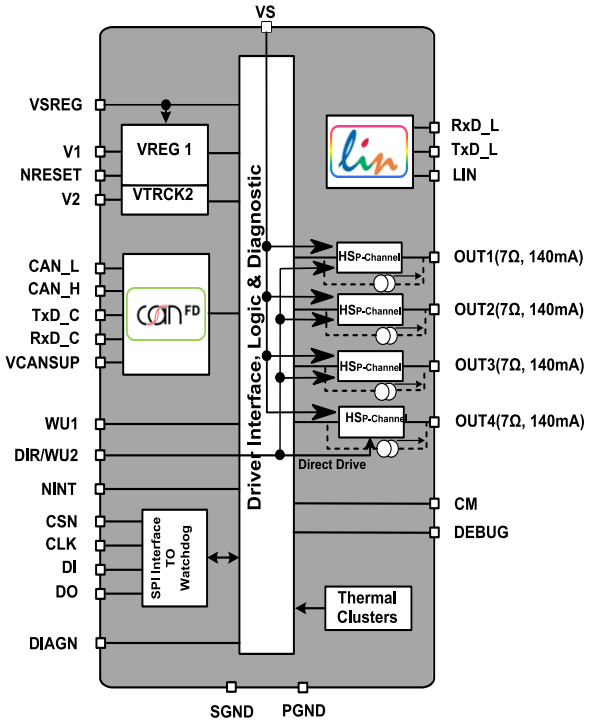
Electrical parameters
- Operating voltage: 6V < VS < 28V
- Transient Load Dump up to 40V

Protections
- Overcurrent protection for all outputs
- V1 overvoltage detection and protection
- Device contains temperature warning and protection

Outputs
- One 5 V (or 3.3 V for SPSB0813 and SPSB081C3) low-drop voltage regulator (V1) for microcontroller and peripheral supply
- One configurable 5 V or 3.3 V low-drop voltage regulator V2 selectable via SPI, tracker for peripheral supply
- Minimum current limitation of 450 mA for V1 and 400 mA for V2

Diagnostics
- DIAGN output pin for fail-safe signalization
- Current monitor output for all internal high-side drivers
- Open-load diagnosis for all outputs

QFN32 5x5 WF



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SPSB081

Automotive Power Management IC with CAN FD & LIN

A glance at possible applications:

- Any kind of microcontroller power supply
- Body Control Modules (BCM)
- Passive keyless entry and start modules
- Heating, Ventilation and Air Conditioning (HVAC)
- Seat control modules
- Gear shifters
- Fuel pump

Key values:

Flexibility

Different combinations to supply the MCU, external peripheral and sensors with configurable output voltage and embedded CAN FD & LIN transceivers

ASIL-B solution

Limited documentation available for customers that need support when dealing with ASIL requirements as per ISO 26262

Collaterals & Tools

Product page
Datasheet

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SPSB100

Automotive Power management IC for highly integrated processors

System Basis Chip with 3 configurable buck converters, 1 Boost controller, 2 LDOs and 1 high side driver

Features

Electrical parameters

- Operating voltage: 3V < VS < 29V
- Transient Load Dump up to 40V

Protections

- Overcurrent detection and limitation for all Bucks
- Device contains temperature warning and protection

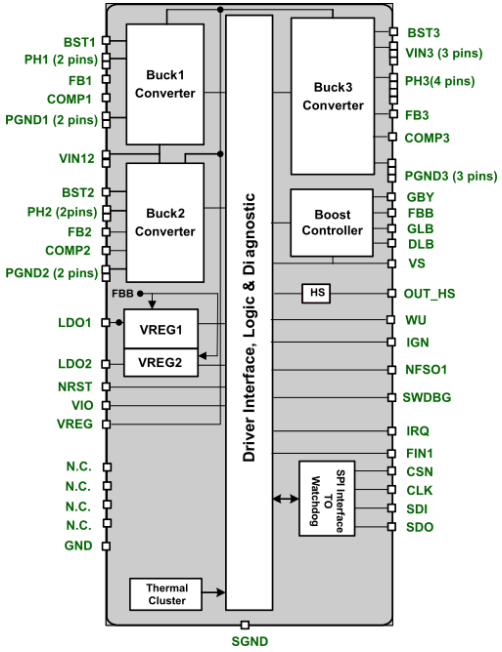
Outputs

- 2 Configurable (6.5V, 5V, 3.3V) Buck converters and typ. peak switching current limit of 3.0A @ 2.4MHz or 400kHz
- 1 Configurable (3.3V, 1.25V, 1.2V, 1.1V, 0.98V) Buck converter and typ. peak switching current limit up to 6.0A @ 2.4MHz, with fine tuning configurability around 0.98 (0.95V to 1.01V)
- One 5V voltage regulator (120mA, 2% Acc.)
- One configurable (5V or 3.3V) low drop voltage tracker of buck regulators (10mA, +/-10mV).

Diagnostics

- Dedicated Interrupt Pin for failure communication
- MCU Reset generator
- Configurable window watchdog with extended long open window up to 9s and enable/disable function through NVM bit
- 1 Fail Safe Output
- 1 input pin supporting static and dynamic error signal reporting

QFN56 8x8 WF



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SPSB100

Automotive Power management IC for highly integrated processors

A glance at possible applications:

- Any kind of microcontroller power supply
- Body Control Modules (BCM)
- Zonal Control Unit
- Vehicle Control Platform
- Automotive Gateway

Key values:

Flexibility

SPSB100 offers high level of configurability in usage allowing for a wide range of applications. Thanks to programmable NVM, SPSB100 permits to be used in different ways according to customer needs. In addition, the device host of protection and diagnostics features ensuring robust design.

ASIL-D solution

Documentation available for customers that need support when dealing with ASIL requirements as per ISO 26262

Collaterals & Tools

Product page
Datasheet

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STPM066S

4 Rail power management for automotive vision and radar systems

Power management IC for OBC MCUs, ECUs, vision and radar systems

Features

Electrical parameters

- Car passenger compatibility
- Power-up sequence, output voltages, current and switching frequencies programmable via OTP
- High switching frequency (2MHz)
- Window watchdog and reset

Protections

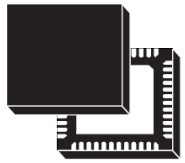
- Undervoltage / Overvoltage / Overcurrent protections
- Over temperature detection by local thermal sensors
- Short circuit protected outputs and short to ground protection
- Thermal shutdown junction temperature 175 °C

Outputs

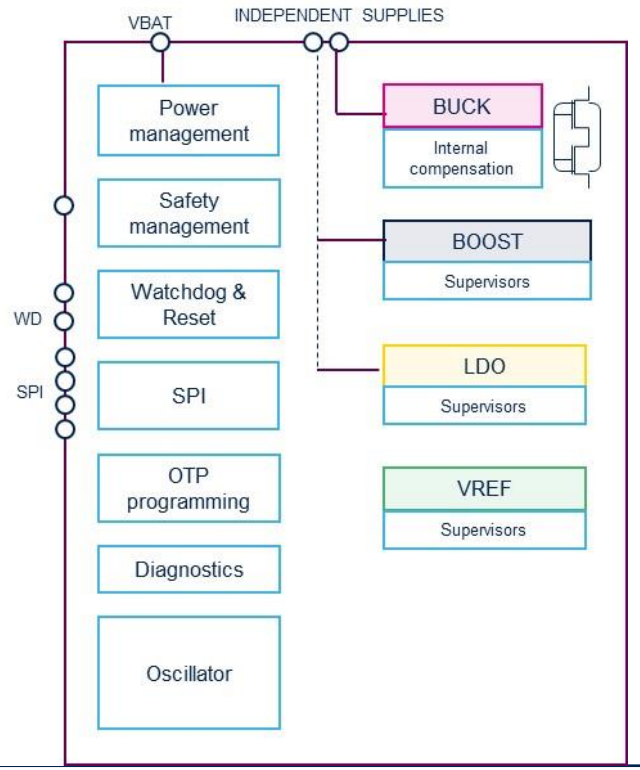
- Pre SMPS BUCK regulator, adjustable via OTP to 1.0 V, 1.1 V, 1.2 V, 1.35 V, 1.5 V, 3.3 V, 3.6 V, 5.0 V @ 1.35/2.6 A min peak current limit, 0.4/2.4 MHz
- Post SMPS BOOST regulator, adjustable via OTP to 5.0 V @ 0.3 A max load current, 7.0 V @ 0.2 A max load current, 2.4 MHz
- Post Linear regulator LDO, adjustable via OTP to 1.2 V, 1.25 V, 1.3 V, 1.8 V, 2.5 V, 2.8 V, 3.3 V, 5.0 V @ 300/600 mA max load current

Diagnostics

- Voltage monitoring, UV/OV on all regulated rails
- Digital BIST on internal logic
- Analog BIST
- Fault pin to Microcontroller
- Ground loss monitors
- SPI interface with CRC
- Adjustable window watchdog supervisors



VFQFPN-48 (7x7)



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STPM066S

Automotive multichannel power management

A glance at possible applications:

Power management of systems with single / double supply microcontrollers and CAN transceiver: OBC, ADAS, Infotainment

Key values

Fully configurable

Flexible and configurable for multiple power supply schemes and applications

Integrated supervision & diagnosis

Full diagnosis functional box integration

Fail-safe functionality

Output supply supervision, overcurrent and overtemperature protection

Collaterals & Tools

STPM066S

- Product page
- Datasheet
- Application note: external component sizing
- Brochure
- Flyer

EVAL-STPM066

- Product page
- Data brief

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STPM801

Hot swap & oring IC for high redundancy power architectures

IC with integrated Hot-Swap, Soft-Start and O-Ring and reverse input protections

Features

Electrical parameters

- Wide input voltage, from 4V to 65V, with -65V reverse protection
- Full function operating input voltage from 4V to 40V

Protections

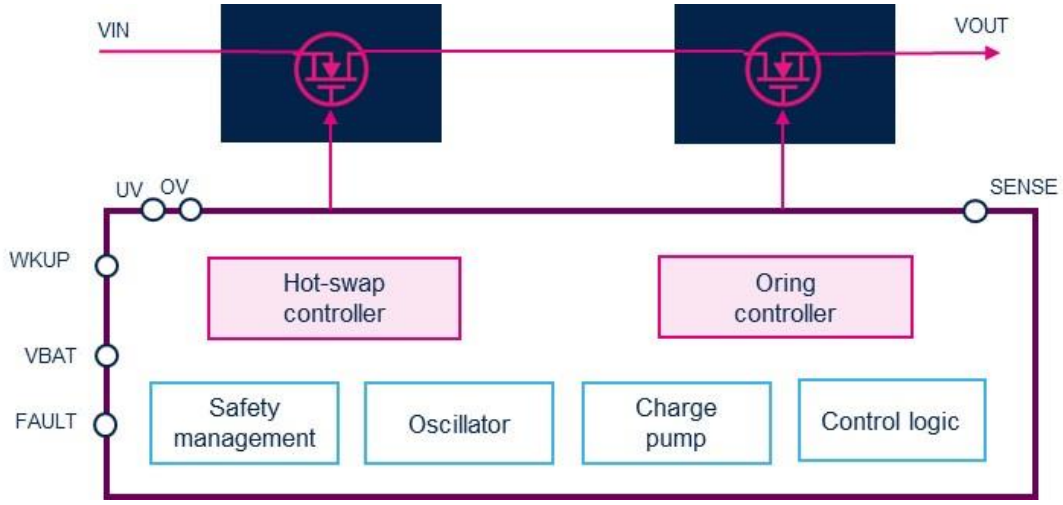
- Input overvoltage and undervoltage protections (threshold with ext divider)
- Output overcurrent protection
- Short to GND detection on Vout

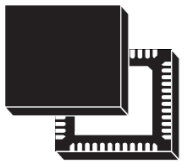
Outputs

- 2x external N-channel MOSFET pre-drivers: 1x hot-swap + 1x o-ring
- Soft start: control of hot-swap, adjustable by external capacitor
- Stand-by mode with reduced power consumption, disabling accuracy and some diagnostics
- Complies with the 16750 AC ripple test requirements (50-25kHz)

Diagnostics

- Fault pin: LOW whenever a fault condition is detected (i.e. OV, UV, OVC). Fault Table in the datasheet





Package: VFQFPN-32 (5x5mm)

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STPM801
hot swap & oring IC for high redundancy power architectures

A glance at possible applications:

- ADAS
- Redundancy applications where enhanced system reliability and uninterrupted operation is key

Key values

Wide input voltage, from 4V to 65V
Compatible with car and truck batteries

Reverse input protection
Avoid permanent damage of the load

Hot swap and Oring in the same products
High integration to protect loads from high voltage transients, furthermore it allows double battery / PCB

Collaterals & Tools

STPM801

- Product page
- Datasheet
- Application Note
- Flyer
- Press Release
- Teaser

STEVAL-STPM801

- Product page
- Databrief

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STPM802

Synchronous buck-boost controller for high current demanding application

STPM802 is a non-inverting synchronous current controlled Buck-Boost, with 4-switch single inductor architecture and integrated bootstrap diodes.
Automotive AEC-Q100 qualified and developed according to ISO26262

Features

Electrical parameters

- Wide input voltage, from 4V to 60V, with full support to 12/24V systems.
- Full function operating input voltage from 4V to 36V
- Peak drive current > 3A (max output power 250W)

Protections

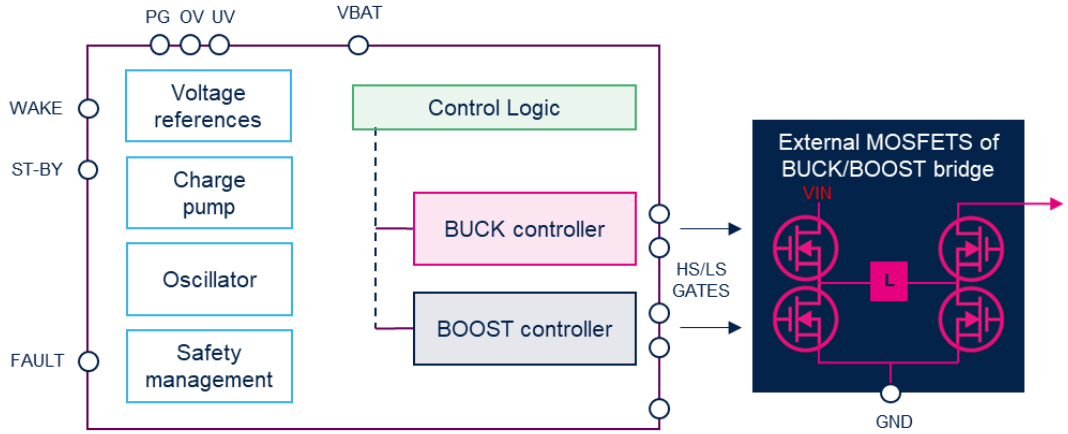
- Output overcurrent protection
- OV, UV monitoring
- Detection output short-circuit condition

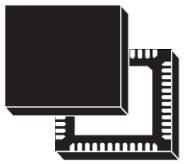
Outputs

- Soft start with external capacitor
- Adjustable Switching frequency by external resistor
- Spread Spectrum frequency modulation
- DCM at light load (discontinuous conduction mode)
- Max output power 250 W
- Automotive AEC-Q100 qualified and developed according to ISO26262

Diagnostics

- Fault pin: LOW whenever a fault condition is detected (i.e., OV, UV, OVC). Fault Table in the datasheet
- Start-up self tests: ABIST, clock self-test, ADC self-test, safety path





Package: VFQFPN-32 (5x5mm)

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STPM802

Synchronous buck-boost controller for high current demanding application

A glance at possible applications:

- ADAS
- Automotive Body
- Telematics and Networking applications
- Infotainment Systems

Key values

Wide input voltage, from 4V to 60V
Compatible with car and truck batteries

Supports ASIL D applications
Automotive AEC-Q100 qualified and developed according to ISO26262

Highly powerful
Meet applications with high current demanding

Collaterals & Tools

- Product page
- Databrief
- Application note (coming soon)
- Evaluation Board (coming soon)
- Flyer

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STPM098C

Dual loop, 8 phases digital multiphase controller

STPM098C is a dual-loop digital multi-phase buck controller with built-in NVM and PMBus™
An advanced control loop architecture based on COT (Constant On-Time) scheme provides fast transient responses and high efficiency

Features

Electrical parameters

- Input voltage 5V (AMR 20V)
- Output voltage range: 0.5V to 2V (0.05V minimum step)
- Switching frequency range: 200kHz to 1.5MHz

Protections

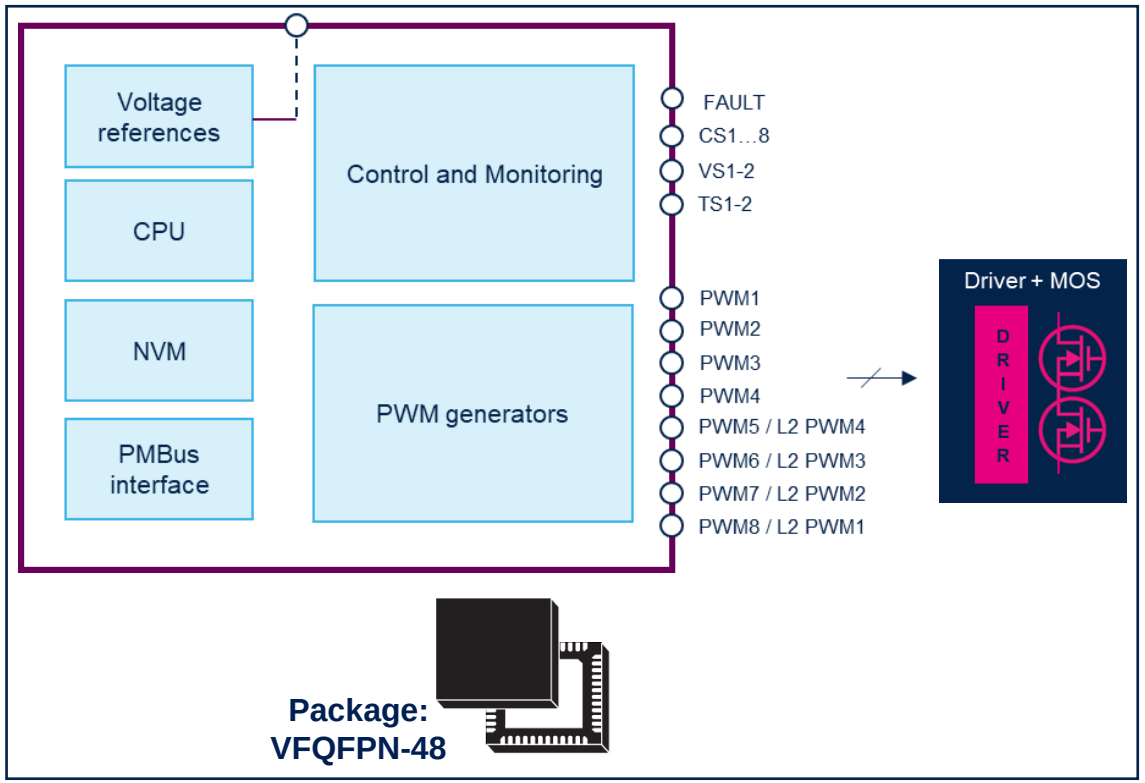
- Input / Output overcurrent protection
- Full input and output telemetry (voltage, current, temperature)
- Thermal shutdown on output stage for each loop
- Internal Overtemperature protection

Outputs

- Soft start with external capacitor
- Adjustable Switching frequency by external resistor
- Spread Spectrum frequency modulation
- DCM at light load (discontinuous conduction mode)
- Max output power 250 W
- Automotive AEC-Q100 qualified and developed according to ISO26262

Diagnostics

- Input / Output overcurrent diagnostic
- Voltage and overpower diagnostic
- Ground loss diagnostic
- Power supply pins VCC, Vref1 and Vref2 overvoltage and undervoltage diagnostic



Package:
VFQFPN-48

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STPM098C
Dual loop, 8 phases digital multiphase controller

A glance at possible applications:

- ADAS ECUs
- High Performance Computer ECUs
- CPUs for centralized architecture

Key values

Smart management of each phase.
Allow to improve efficiency and thermal performance on the overall apllication

Supports ASIL D applications
Automotive AEC-Q100 qualified and developed according to ISO26262

Highly powerful
Meet applications with high current demanding

Collaterals & Tools (coming soon)

- Product page
- Datasheet

life.augmented

L9758
Automotive multiple power supply IC

PMIC with Pre-Buck, Pre-Boost, LDOs programmable and Tracking regulators

Features

Electrical parameters

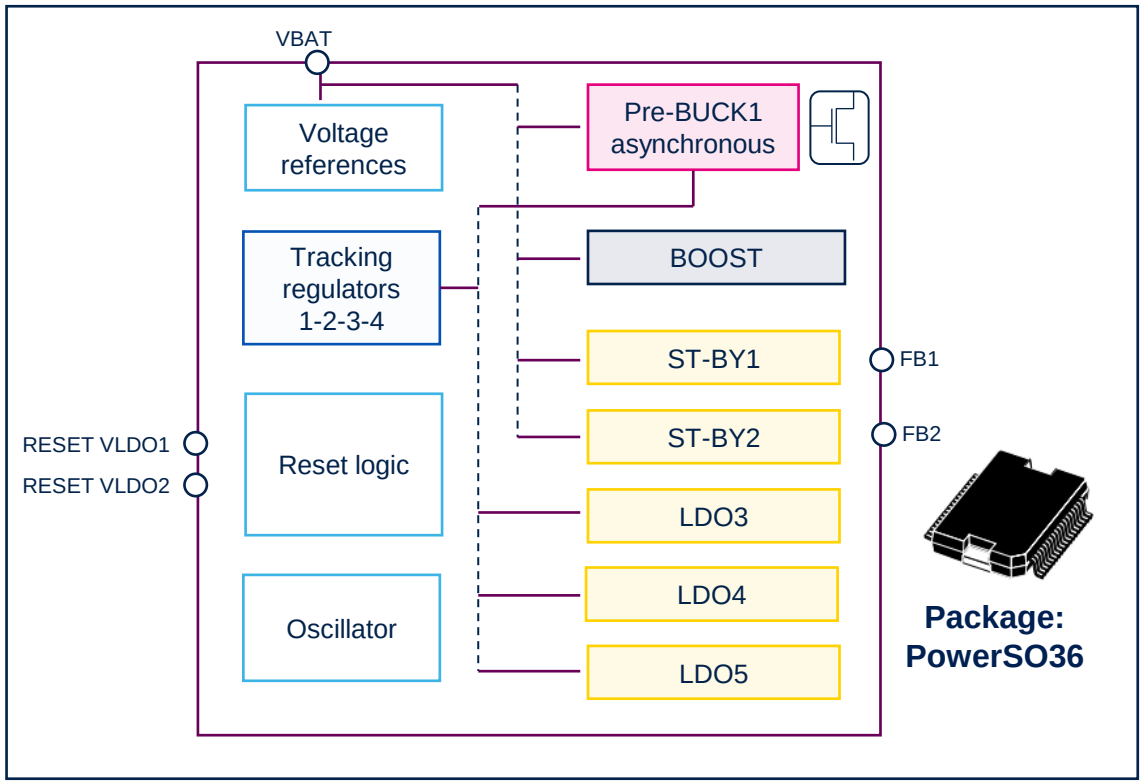
- Input voltage range compatible with car battery: -0.3 to 40 V
- Operating voltage: 4 to 26.5 V

Protections / Diagnostics

- Temperature monitoring and thermal shutdown
- Independent reset signals
- Independent st-by voltage monitor
- STANDBY_OK
- Two power supply enable signals
- Battery voltage thresholding
- Logic level thresholding

Outputs

- 1x BUCK pre-regulator, 5.5Vmin.
- 1x BOOST pre-regulator, 10V max.
- 1x LDO, 5V output, 2% accuracy @ 1A
- 1x LDO programmable 3.3V or 2.6V @ 1A
- 1x LDO programmable with external partitioning 1.5V @ 1A
- 1x LDO st-by 1V or 1.5V @ 10mA
- 1x LDO st-by 3.3V or 2.6V @ 10mA
- 4x LDO protected tracking 5V +/- 7mV @ 50mA



Package: PowerSO36

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L9758
Automotive multiple power supply IC

A glance at possible applications:

High end automotive microcontrollers used in powertrain applications.

Key values:

Flexibility
Different combinations to supply the MCU

Programmability
Programmable regulator with external pass transistor
Programmable microcontroller core voltage LDO regulator
Programmable standby memory regulator

Collaterals & Tools

Product page
Datasheet

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Battery management ICs

life.augmented

Line card
Battery management system

L9963E	L9963T	L9961
Li-ion battery monitoring and protection chip, up to 14 stacked cells and daisy chain up to 31 ICs: modular approach from 48V to 800V battery	General purpose SPI to isolated SPI transceiver for communication bridge between different voltages domains	Chip for consumer battery management applications up to 5 cells

L9963E
Automotive chip for battery management applications

Li-ion battery monitoring and protection chip, up to 14 stacked cells and daisy chain up to 31 ICs: modular approach from 48V to 800V battery

Features

Electrical parameters

- Measures 4 to 14 cells in series, no desynchronization delay between samples
- 16-bit voltage measurement with maximum error of ±2 mV in the 1.7-4.7V range, in whole operating temp range
- 18-bit current measurement with +/-0.5% sense error accuracy

Protections

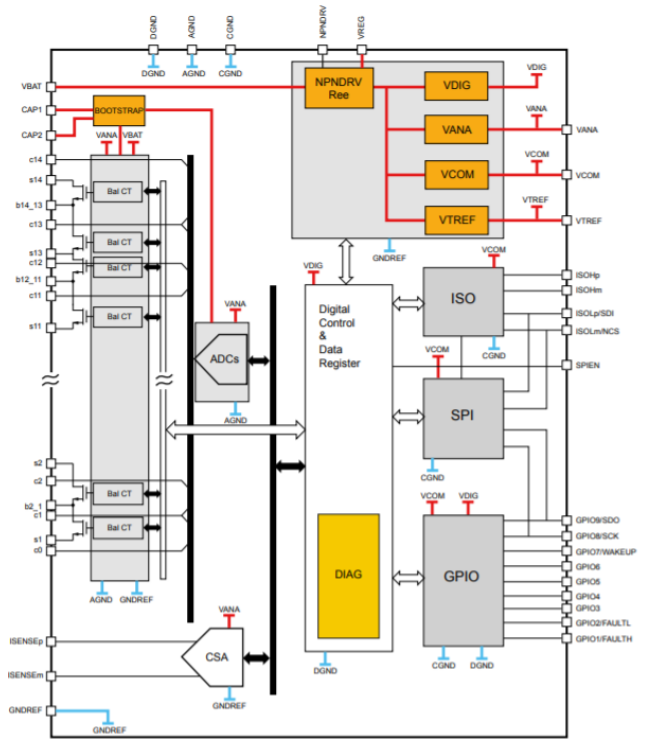
- Fully redundant cell measurement path, with ADC Swap, for enhanced safety and limp home functionality
- The device can monitor up to 7 NTCs

Outputs

- 2.66 Mbps isolated serial communication with regenerative buffer, supporting dual access ring
- Cells voltage conversion and Synchronized current measurement with coulomb counter
- Single or multiple channel cell balancing simultaneously

Diagnostics

- Intelligent diagnostic routine providing automatic failure validation.
- Redundant fault notification through both SPI Global Status Word (GSW) and dedicated FAULT line



L9963E
Automotive chip for battery management applications

A glance at possible applications:

- Electrified vehicle
- Electric motorbike
- Forklift & industrial eqpt.
- Lawnmower & blower
- Electric forklift
- E-scooter/bike

Key values

Supporting accuracy

Best-in-class cell voltage accuracy
total conversion error 2mV

High speed data transmission

Supporting fully synchronous cell voltage acquisition with 2us max desync on 800V battery pack

ASIL-D solution

Full compliant with ISO26262

Collaterals & Tools

L9963E
- Product page
- Datasheet

EVAL-L9963E-MCU
- Product page
- Data brief
- User manual

AEK-POW-BMS63EN
- Product page
- Data brief

STSW-L9963E
- Product page
- Data brief
- User manual

Find out more about L9963E for **battery management** applications

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L9963T
Isolated transceiver

General purpose SPI to isolated SPI transceiver for communication bridge between different voltages domains

Features

Electrical parameters

- Compatible both with 3.3V and 5V logics
- Low standby current consumption (VDD<64uA)

Protections & safety

- Redundant reference voltage and dual oscillator are used to guarantee independency between monitor functions

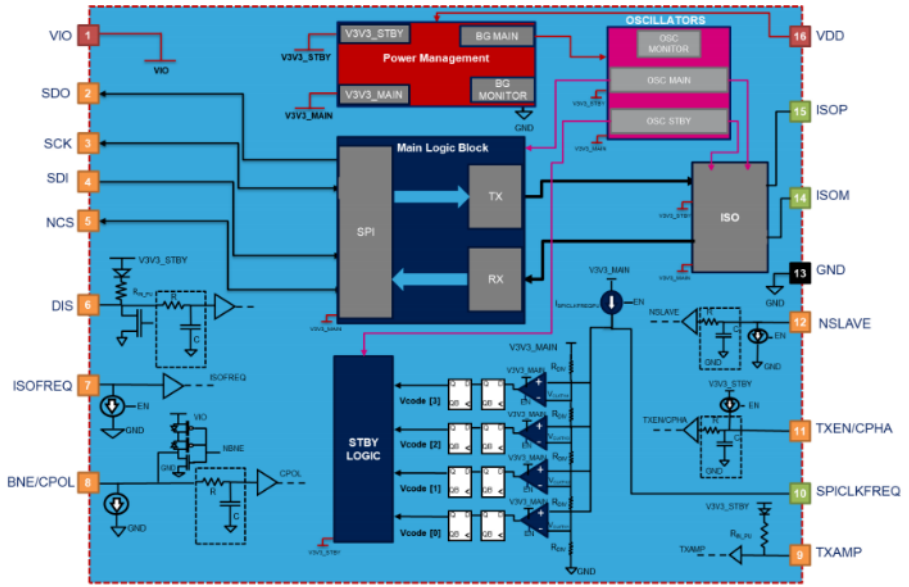
Outputs

- Supports both XFMR and Capacitive isolation
- 10 MHz SPI peripheral for SPI Slave operation. Configurable SPI frequency (250 kHz to 8MHz) for SPI Master operation
- 333kbps and 2.66 Mbps Vertical InterFace (VIF) for isolated SPI communication

Diagnostics

- Short to battery detection and balance undervoltage protection

SO16



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L9963T
Isolated transceiver

A glance at possible applications:

- Electrified vehicle
- Electric motorbike
- Forklift & industrial eqpt.
- Lawnmower & blower
- Electric forklift
- E-scooter/bike

Key values:

Flexibility

General purpose isolated transceiver compatible to any communication protocol up to 64bit

ASIL-D ready

Full compliant with ISO26262

Collaterals & Tools

L9963T

- Datasheet
- Application note: L9963 14 Cells BMC IC Evaluation Board Quick Guide

AEK-COM-ISOSPI1

- Product page
- Data brief

Find out more about L9963T for **battery management** applications

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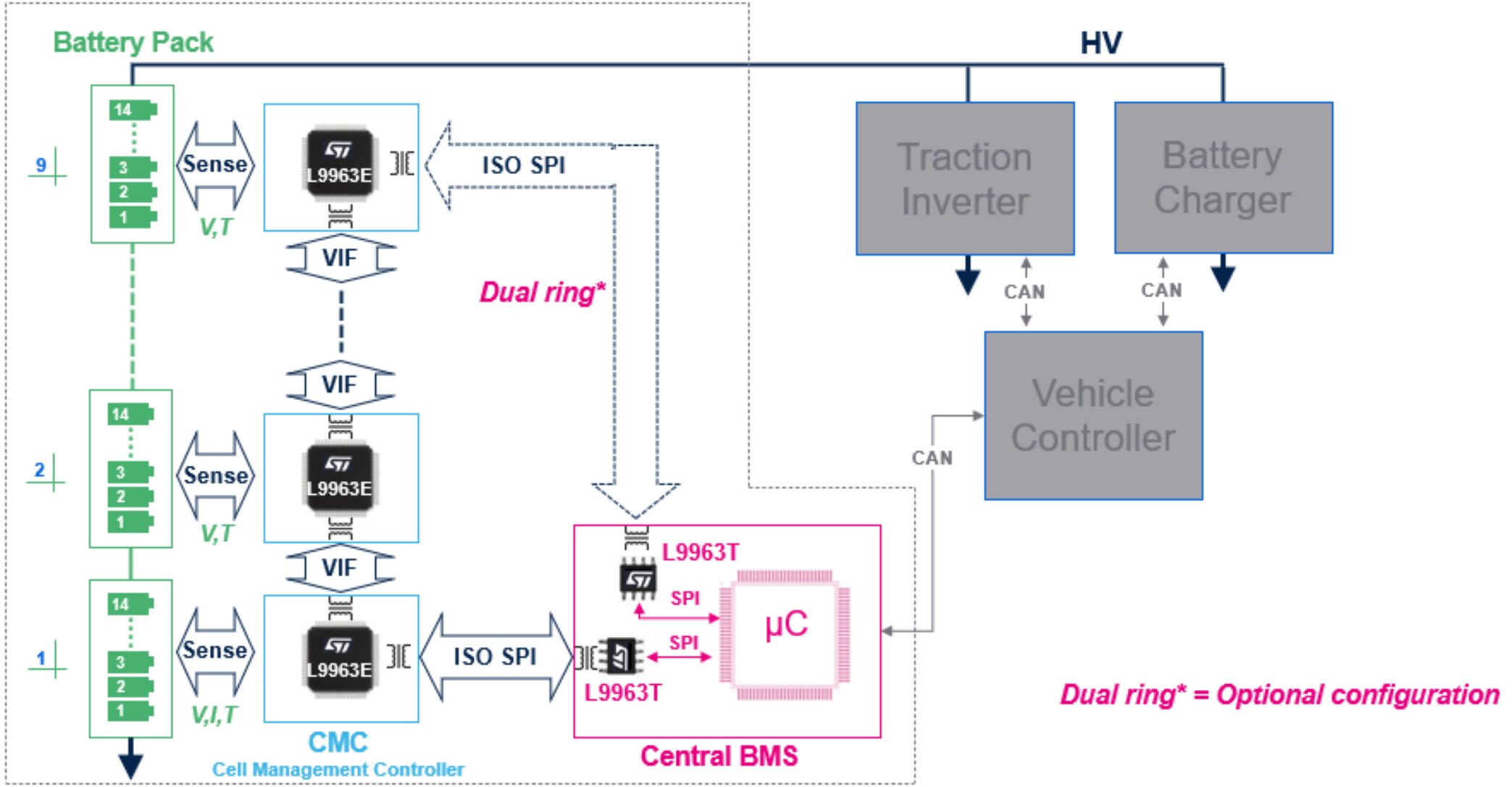
Application example of HV battery BMS based on L9963x



L9961
INDUSTRIAL Solution for Power Tools and portable devices (18V)

3-5 cells industrial solution for power tools: capability to support the expansion of li-ion battery adoption for LV applications such as battery-operated tools, e-mobility, UPS and medical portable equipment up to 20 V

Features

Electrical parameters

- Measures series cell voltages for 3, 4, or 5 cell configurations
- 16-bit signed current measurement with 0.2% maximum error after end of line calibration
- 12-bit voltage measurement with maximum error of ±15mV
- 2uA SHIP mode & 5uA STANDBY mode current consumption
- Integrated VREG system regulator 3.3V±3% @ 30mA

Protections

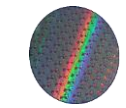
- Failsafe fuse driver
- NTC ratiometric temperature measurement, ±0.8% max. gain error

Outputs

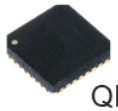
- I2C peripheral for device programming and data transfers
- Dual configurable HS/LS gate drivers for charge & discharge control
- Stack voltage measurement
- Cell balancing, 70mA per cell

Diagnostics

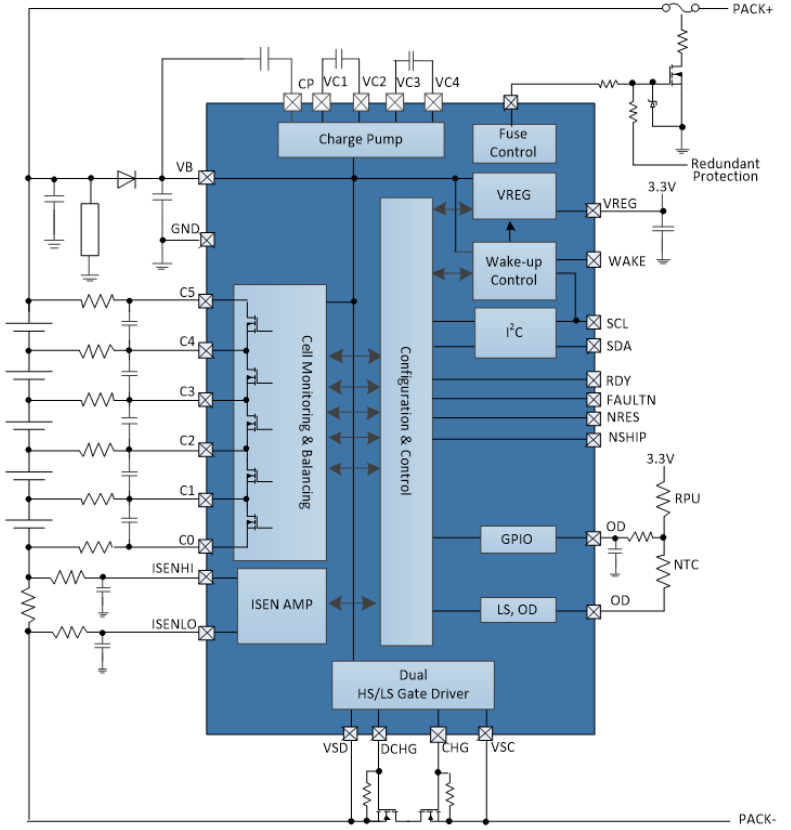
- Battery current measurement with coulomb counting & overcurrent detection
- Cell over/under voltage detection and balance undervoltage protection



BCD9sL



QFN32



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INDUSTRIAL Solution for Power Tools and portable devices (18V)

A glance at possible applications:

- Cordless power tools
- E-Bikes, Scooters, etc
- UPS Systems
- Medical & Portable Test Equipment

Key values

Accuracy

Industrial BMS best in class in terms of configurability:

-High accuracy in battery current measurements (i.e. maximum error of 0.25%);
-High accuracy in cell voltage measurements (i.e. maximum error of ± 15 mV

Configurability

Industrial BMS best in class in terms of configurability:

-I2C peripheral for device programming and data transfers over I2C bus;

-Embedded NVM for configuration parameters storage

Minimum Consumption of the Battery Pack

Very low current consumption in both deep-sleep mode (i.e. 2 µA) and standby mode (i.e. 5 µA)

Collaterals & Tools

L9961
- Product page
- Data-brief
- Datasheet
- Flyer

STEVAL-L99615C
- Product page
- Data brief
- User manual

STSW-L9961BMS
- Product page
- Data brief
- User manual

STSW-L99615C
- Product page
- Data brief
- User manual

Find out more about L9961 for **battery management** applications

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“If only

I could find out more about battery management

This is where we come in

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Line card
Battery cut-off

L9678	L9679
System Basis Chip integrating 4-channel squib drivers for emerging market solutions like battery cut-off	System Basis Chip integrating 8-channel squib drivers for emerging market solutions like battery cut-off

L9678P/-S
Automotive low end System Basis Chip

System Basis Chip integrating 4-channel squib drivers for emerging market solutions like battery cut-off

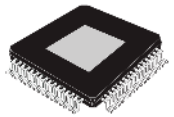
Features

Electrical parameters
- Energy reserve voltage power supply (high frequency boost regulator, 1.882 MHz, selectable output voltage, 23V or 33V ±5%
- Configurable linear power supplies (5V and 7.2V ±4%)

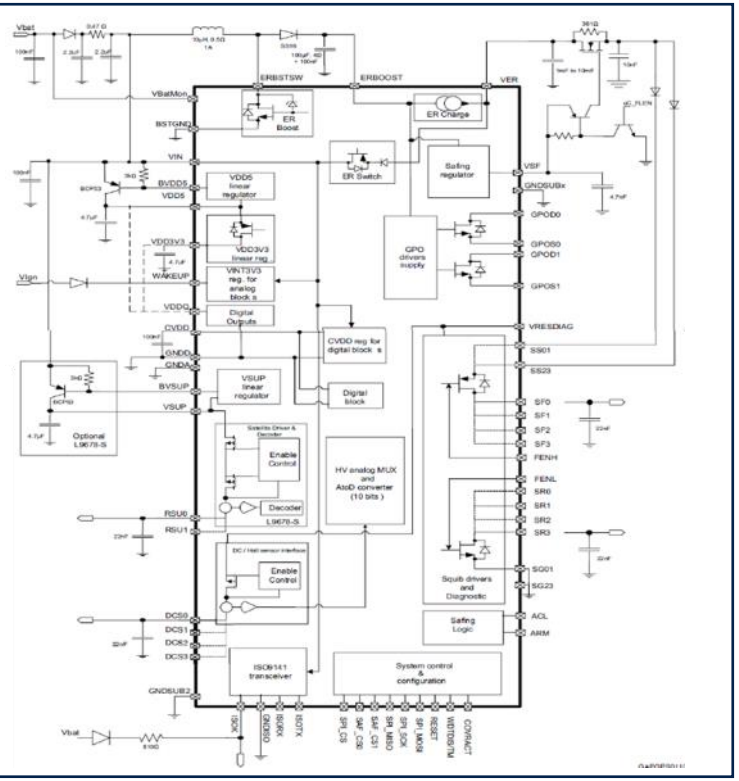
Protections
- Battery voltage monitor and shutdown control with wake-up control
- Current monitoring

Outputs
- 4-channel High-Side/Low-Side Squib drivers (max 25V)
- 2-channel PSI-5 remote sensor interface (L9678P-S version only)

Diagnostics
- Battery voltage monitor and shutdown control with wake-up
- 32bit SPI for parameter setting and diagnosis
- System voltage diagnosis through internal ADC



LQFP64
(exposed pad up)



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L9679E
Automotive mid/high end System Basis Chip

System Basis Chip integrating 8-channel squib drivers for emerging market solutions like battery cut-off

Features

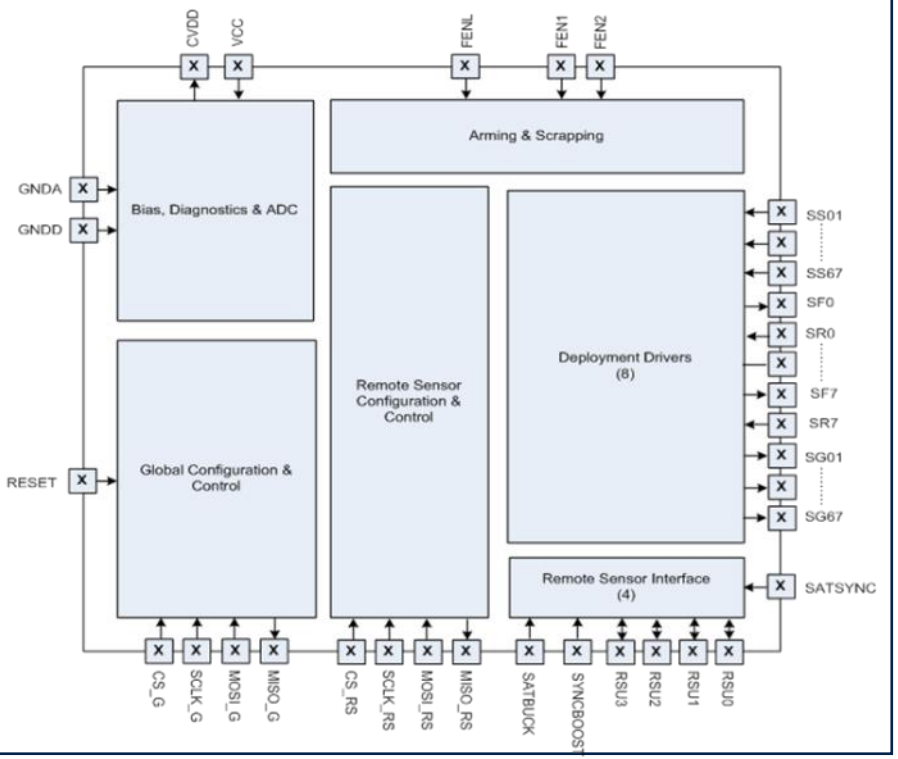
Electrical parameters
- Energy reserve voltage power supply (high frequency boost regulator, 1.882 MHz, selectable output voltage, 23V or 33V ±5%
- Configurable linear power supplies (5V and 7.2V ±4%)

Protections
- Battery voltage monitor and shutdown control with wake-up control
- Current monitoring

Outputs
- 8-channel High-Side/Low-Side Squib drivers (max 25V)
- 4-channel PSI-5 remote sensor interface

Diagnostics
- Battery voltage monitor and shutdown control with wake-up
- 32bit SPI for parameter setting and diagnosis
- System voltage diagnosis through internal ADC

TQFP48EP



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L967xx
Automotive low end System Basis Chip

A glance at possible applications:

Hazard management (battery cut-off)

Airbag

Key values

Embedded full set of feature

Integrating solution with all key functions for power supply, management block and squib deployment

Family approach

Belonging to U-chip set of devices compliant with ISO26262

Collaterals & Tools

L9678P: product page, datasheet
L9678P-S: product page, datasheet
L9679E: product page, datasheet
Application note: user configurable airbag

Door zone ICs

Line card
Door zone

L99DZ100G/GP

Microcontroller-driven multifunctional actuator driver with embedded 6 half-bridge, 10 high-side actuator and H-bridge driver

L99DZ120

Microcontroller-driven multifunctional actuator driver with embedded 4 half-bridge, 10 high-side actuator and H-bridge driver

L99DZ200G

Microcontroller-driven multifunctional actuator driver with embedded 4 half-bridge, 7 high-side actuator and Dual H-bridge driver

L99DZ300G

Microcontroller-driven multifunctional actuator driver with embedded 6 half-bridges, 10 high-side actuator, H-bridge driver, LIN and CAN FD transceivers

L99DZ100G/GP
Automotive Front Door device with LIN and HS-CAN

Microcontroller-driven multifunctional actuator driver with embedded 6 half-bridge, 10 high-side actuator and H-bridge driver

Features

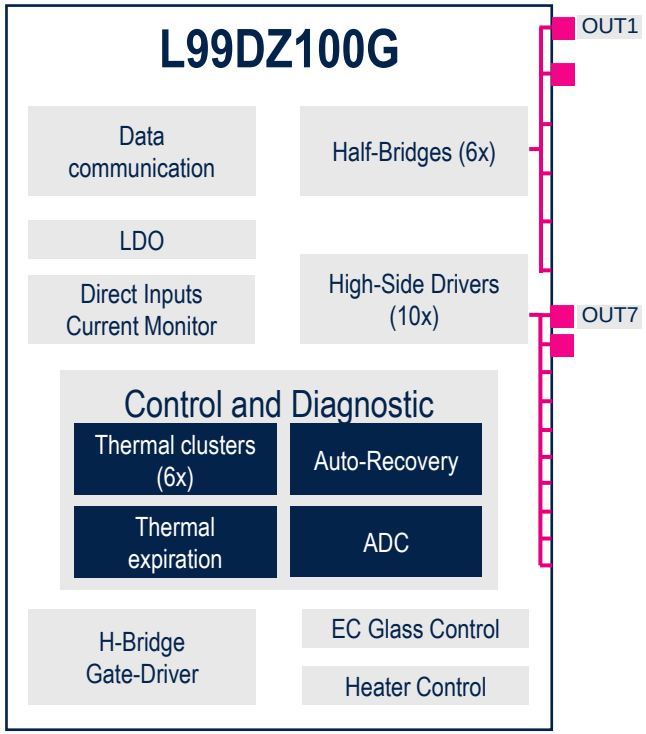
Electrical parameters
- Max operating voltage 28V
- Very low consumption in stand-by mode Is = 21 µA Typ.
- Programmable soft-start for all the outputs

Protections
- Over current for all the outputs
- Over- and Under-Voltage shutdown
- Thermal Clusters Shutdown & Thermal Expiration
- Charge pump output for reverse polarity protection
- Configurable Window Watchdog
- Isolated fail-safe block with 2 LS to pull down the gates of the external HS MOSFETs

Outputs
- 6x Half-Bridge
- 10x High-Side Drivers with duty cycle adjustment
- H-Bridge driver
- High-Side CAN and LIN communication
- 2x LDOs for MCU and sensor supply (max 250mA)

Diagnostics
- Open-load detection via SPI for all outputs
- Temperature warning
- Multiplexed current monitor for all High-Side Drivers and selected Half-Bridge
- Runtime Thermal Cluster and battery monitoring via internal ADC

LQFP64
10x10mm



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L99DZ120
Automotive Rear Door device with embedded LIN

Microcontroller-driven multifunctional actuator driver with embedded 4 half-bridge, 10 high-side actuator and H-bridge driver

Features

Electrical parameters

- Max operating voltage: 28V
- Very low consumption in stand-by mode I_S = 21 µA Typ.
- Programmable soft-start for all output

Protections

- Overcurrent for all the outputs
- Over- and Under-Voltage shutdown
- Thermal clusters shutdown & thermal expiration
- Charge pump output for reverse polarity protection
- Configurable Window Watchdog
- Isolated fail-safe block with 2 LS to pull down the gates of the external HS MOSFETs

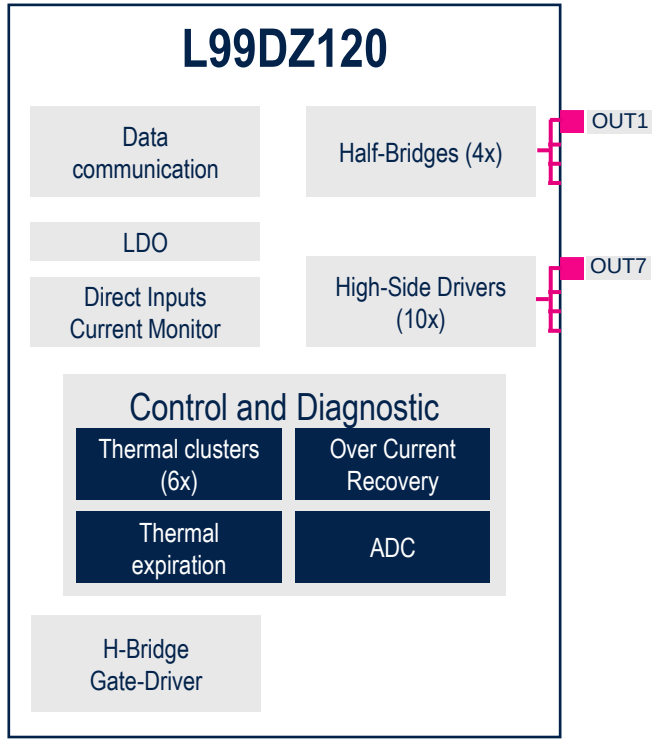
Outputs

- 4x Half-Bridge
- 10x High-Side drivers
- H-bridge driver
- 2x LDOs for MCU and sensor supply (max 250mA)
- LIN communication

Diagnostics

- Open-load detection via SPI for all outputs
- Temperature warning
- Multiplexed current monitor for all High-Side Drivers and selected Half-Bridge
- Runtime Thermal Cluster and battery monitoring via internal ADC

LQFP64
10x10mm



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L99DZ100G(P) /L99DZ120
Automotive ICs for Front and Rear doors

A glance at possible applications:

Full Front & Rear Door functionalities addressed by:

L99DZ100G(P)
L99DZ120

Key values

provide highly integrated IC embedding almost all the door functionalities using a minimum set of external components

L99DZ100G(P)

L99DZ120

Collaterals & Tools

L99DZ100G

- Product page
- Datasheet
- Selection guide: smartpower for body
- Technical note: TN1243, TN1245
- Flyer
- Brochure

L99DZ120

- Product page
- Datasheet
- Flyer: rear door system IC, L99DZ8x family
- Selection guide: smartpower for body
- Brochure

EVAL-L99DZ120

- Product page
- Data brief

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Find out more about **door module drivers for door zone** applications

L99DZ200G

Automotive Front Door device with LIN and CAN providing Dual H-bridge driving

Microcontroller-driven multifunctional actuator driver with embedded 4 half-bridge, 7 high-side actuator and Dual H-bridge driver

Features

Electrical parameters

- Max operating voltage: 28V
- Very low consumption in stand-by mode I_S = 21 µA Typ.
- Programmable soft-start for all the output

Protections

- Short circuit protection for integrated half bridges
- Overcurrent for all the outputs
- Over- and Under-Voltage shutdown
- Thermal clusters shutdown & thermal expiration
- Generator Mode for H-bridge drivers
- Charge pump output for reverse polarity protection

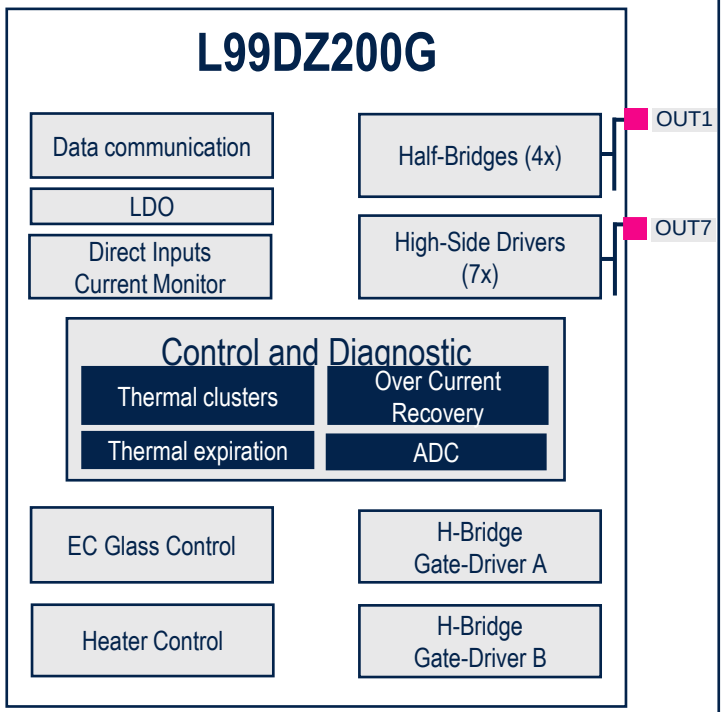
Outputs

- 4x Half-Bridge
- 7x High-Side Drivers with Duty Cycle Adjustment and Constant Current Mode
- 1x Dual H-bridge drivers
- High-Side CAN and LIN communication
- 2x voltage regulators for MCU and sensor supply (max 250mA)

Diagnostics

- Open-load detection via SPI for all outputs
- Temperature warning
- Multiplexed current monitor for all High-Side Drivers and selected Half-Bridge
- Runtime Thermal Cluster and battery monitoring via internal ADC

LQFP64
10x10mm



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L99DZ200G

Automotive Front Door device with LIN and CAN providing Dual H-bridge driving

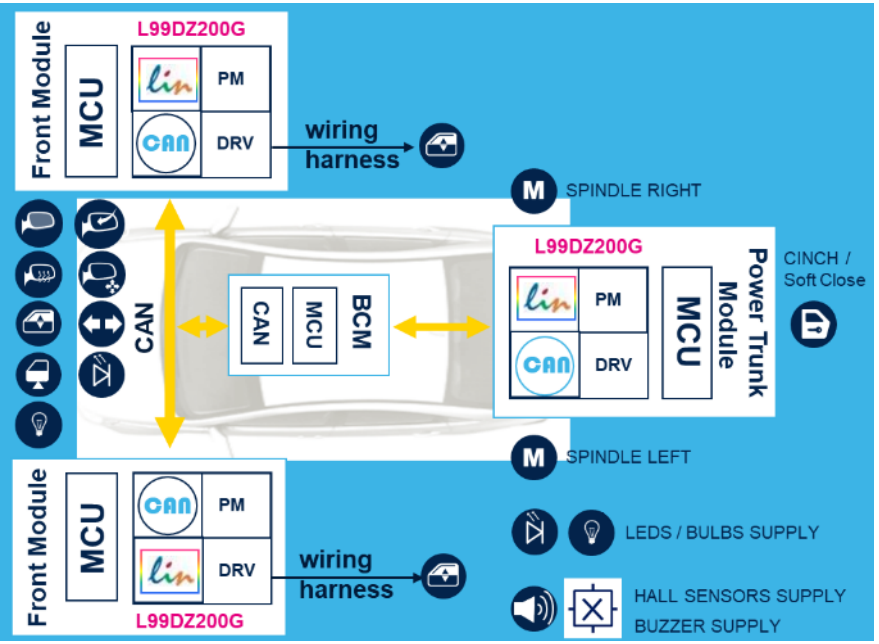
A glance at possible applications:

Power Trunk / Tailgate applications

Front drives Rear Door

Key values

A single device managing several door & trunk applications



Collaterals & Tools

Product page
Datasheet
Selection guide: smartpower for body
Brochure

Find out more about **door module drivers for door zone** applications

L99DZ300G

Microcontroller-driven multifunctional actuator driver with embedded 6 half-bridges, 10 high-side actuator, H-bridge driver, LIN and CAN FD transceivers

Features

Electrical parameters

- Max operating voltage: 28V
- Very low consumption in stand-by mode: I_S = 21 µA Typ.
- VREG1 Output current Max. value 250 mA

Protections

- Short Circuit protection for integrated half bridges
- Overcurrent for all the outputs
- Over- and Under-Voltage shutdown
- Thermal Clusters Shutdown
- Charge pump output for reverse polarity protection

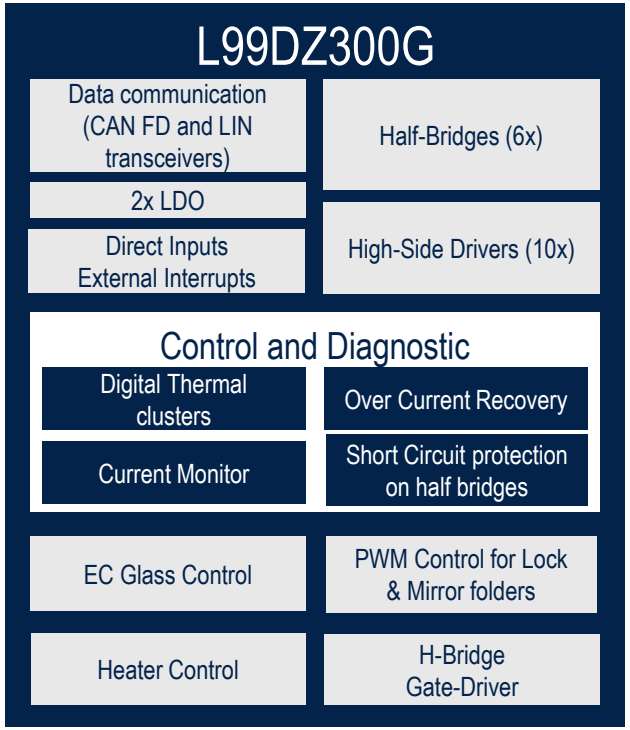
Outputs

- 6x Half-Bridge and 10x HS drivers with Constant Current Mode
- H-bridge driver
- CAN FD and LIN communication
- 2x VREGs for micro controller and sensor supply
- EC and heater control
- Programmable soft-start for all the output
- PWM input pins for controlling half bridges

Diagnostics

- Open-load detection via SPI for all outputs
- Temperature warning
- Multiplexed current monitor for all High-Side Drivers and selected Half-Bridge
- Runtime Thermal Cluster

LQFP64
10x10



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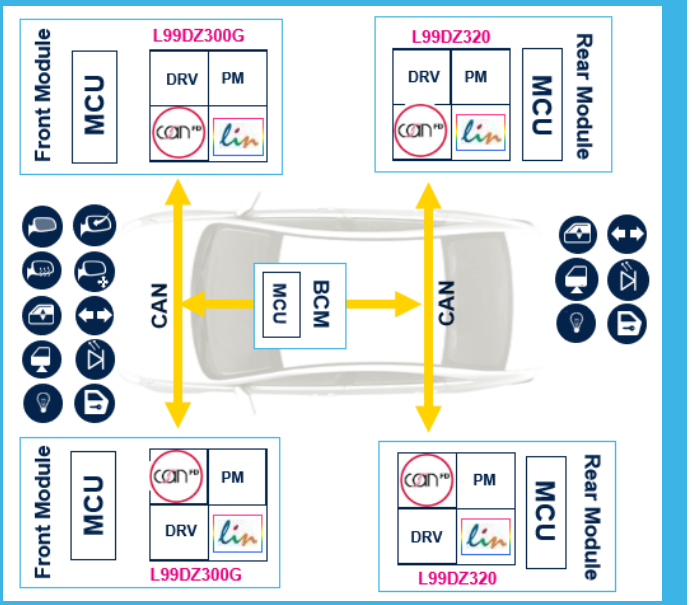
L99DZ300G
Automotive Front Door device with CAN FD and LIN

Front Door Application

Key values

A single device managing all the electronic in the front door



Collaterals & Marketing Package

L99DZ300G – Datasheet

“If only

I could find out more about door zone

This is where we come in

Line card
Door lock

L99UDL01

Smart driver IC for multiple motor control, suitable for a wide range of applications included the centralized car lock with a single IC

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L99UDL01
Automotive multichannel motor control – universal door lock

Smart driver IC for multiple motor control, suitable for a wide range of applications including the centralized car lock with a single IC

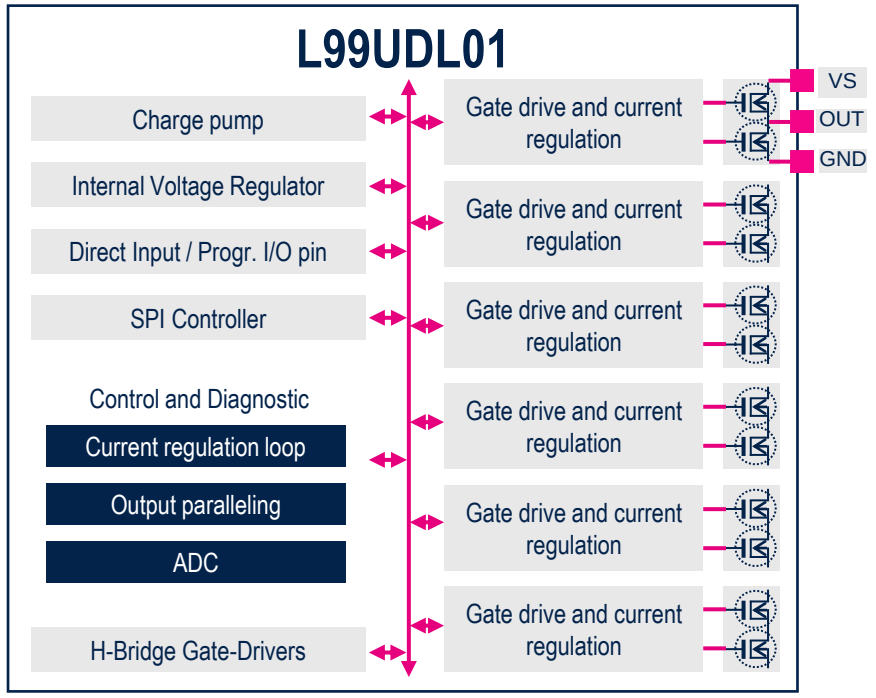
Features

Electrical parameters
- Extended Operating Range 5V to 26V
- Junction Temperature from -40ºC to 150ºC

Protections
- Overload for all outputs
- Shorted and open load detection, also in off state
- Drain-source voltage monitoring for external FETs

Outputs
- 6x Half Bridge Driver **(90mΩ)**
- 2x External Half Bridge Drivers
- Current regulation loops for each HS/LS switch
- Mechanism for paralleling up to 2x3 outputs

Diagnostics
- Open load detection for all the outputs
- Digital current monitor 10-bit resolution via SPI
- Emergency mode overriding built-in protections



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L99UDL01
Automotive multichannel motor control – universal door lock

A glance at possible applications:

Every kind of application requiring multiple smart motor control as well as:

Centralized door lock

Vending machines

Key values

Integration concept

Provide an IC that can control all door lock configurations using a minimum of external components

Reduce peak currents

Reduces the power requirements in wiring, circuit board and silicon, improving system reliability level

Multiple Motor Smart Control

Closed loop current control, output paralleling mechanism, serial control, full set of protection and diagnostics makes the device ideal also in multiple motor control applications

Collaterals & Tools

L99UDL01

- Product page
- Datasheet
- Selection guide: smartpower for body
- Brochure
- Flyer

EVAL-L99UDL01

- Product page
- Data brief

STSW-L99UDL01

- Product page
- Data brief
- User manual
- License

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Engine management systems

Line card
Engine management systems for 1/4-cylinders

L9177A

U-chip integrating all key functions for an Electronic Fuel Injection (EFI) ECU up to 2 cylinders

L9779WD

U-chip integrating all key functions for an Electronic Fuel Injection (EFI) ECU up to 4 cylinders

L9788

Multi-output integrated circuit embedding a full set of power supplies and signal processing peripherals for 4-cylinder engine management

L9780

Sensor control device with voltage controlled current source compatible with a wide range of air fuel sensors

L9966

Programmable sensor interface with up-to 15-channels used for a broad variety of analog/digital sensing and resistance measurement

L9177A
Small Engine EFI (Electronic Fuel Injection) U-chip

U-chip integrating all key functions for an Electronic Fuel Injection (EFI) ECU up to 2 cylinders

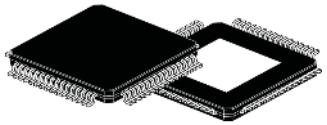
Features

Electrical parameters
- Voltage supply operation: 6V-18V (basic functionalities down to 3.9V)

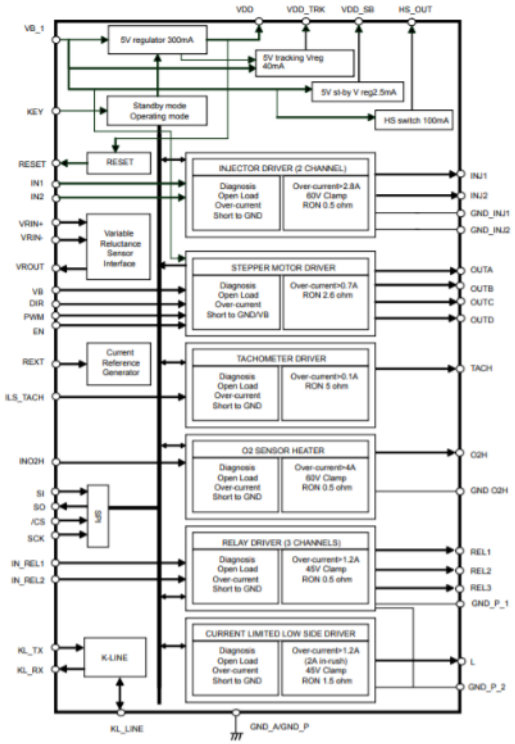
Protections
- Short to battery protection
- Short to ground protection
- Thermal shutdown protection

Inputs/Outputs
- 2-channel solenoids drivers
- 3x relay drivers
- 1x stepper motor driver
- 1x O2 sensor heater
- 2x 5V regulator (300/400mA)
- 1x 5V tracking regulator
- 1x High-Side driver min 100mA

Diagnostics
- 16-bit serial peripheral interface for control and diagnosis
- Full diagnosis via SPI (injector driver, relay and lamp driver, O2 sensor heater, tachometer, stepper motor driver, general)



TQFP64
(exposed pad down)



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L9177A
Small Engine EFI (Electronic Fuel Injection) U-chip

A glance at possible applications:

- Two wheelers
- Microcar
- Lawnmowers
- UPS / generators

Key values

Embedding a set of features

All key functions for an EFI ECU are included

Achieving Optimization

Solution with optimized BOM and form factor

EMS family

L9177A is the smallest member of a family of U-chip specifically conceived for EFI ECU

Collaterals & Tools

L9177/A

- L9177: product page, datasheet
- L9177A: product page, datasheet
- Application note: lamp switch mgmt., white paper

EVAL-L9177A

- Product page
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9177A

- Product page
- Data brief
- User manual
- License agreement

Find out more about L9177/A **engine management SBC for engine management** applications

life.augmented

L9779WD
EFI (Electronic Fuel Injection) U-chip

U-chip integrating all key functions for an Electronic Fuel Injection (EFI) ECU up to 4 cylinders

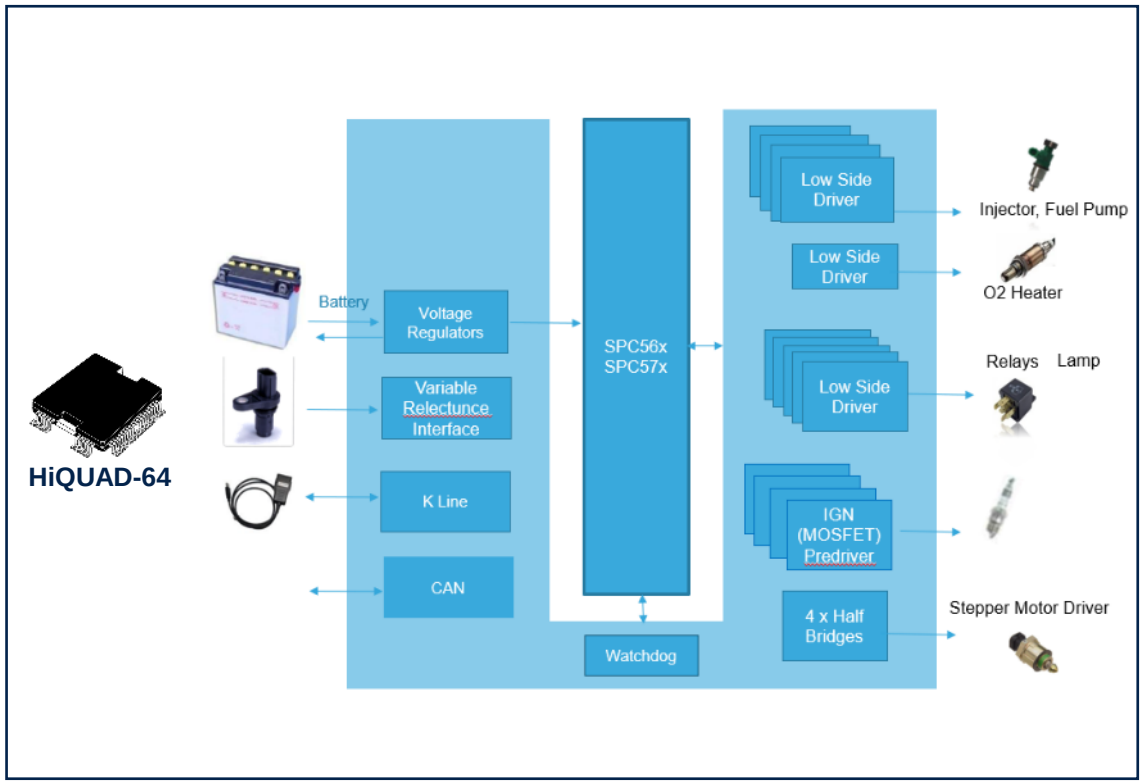
Features

Electrical parameters
- Voltage supply operation 6V-18V (basic functionalities down to 4.15V)

Protections
- Short to battery protection
- Short to ground protection
- Thermal shutdown protection

Inputs/Outputs
- 14x Low-Side Drivers
- 4x MOSFET pre-drivers
- 4x Independent Half-Bridge drivers
- 1x O2 sensor heater
- 3/5V regulator (100mA)
- 1x 5V tracking regulator

Diagnostics
- 16-bit serial peripheral interface for control and diagnosis



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L9779WD
EFI (Electronic Fuel Injection) U-chip

A glance at possible applications:

- Up to 4 cylinder 2 and 4 wheelers
- Vehicle Control Unit
- UPS/ generators
- ICE forklift

Key values

Embedding a set of features

All key functions for an EFI ECU are included. High Speed CAN also on board

Achieving Optimization

Solution with optimized BOM & form factor. High performance power dissipation package

EMS family

L9779WD is the mid end member of a family of U-chip specifically conceived for EFI ECU

Collaterals & Tools

L9779WD/-SPI

- L9779WD: product page, datasheet
- L9779WD/-SPI: product page, datasheet
- Application note: lamp switch mgmt., white paper

EVAL-L9779WD-SPI

- Product page
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9779WD-SPI

- Product page
- User manual
- License agreement

Find out more about L9779WD **engine management SBC for engine management** applications

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L9788
Automotive 4-cylinder ICE management IC

Multi-output integrated circuit embedding a full set of power supplies and signal processing peripherals for 4-cylinder engine management

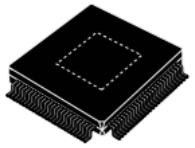
Features

Electrical parameters
- Voltage supply operation: 6V-18V (basic functionalities down to 3.9V)

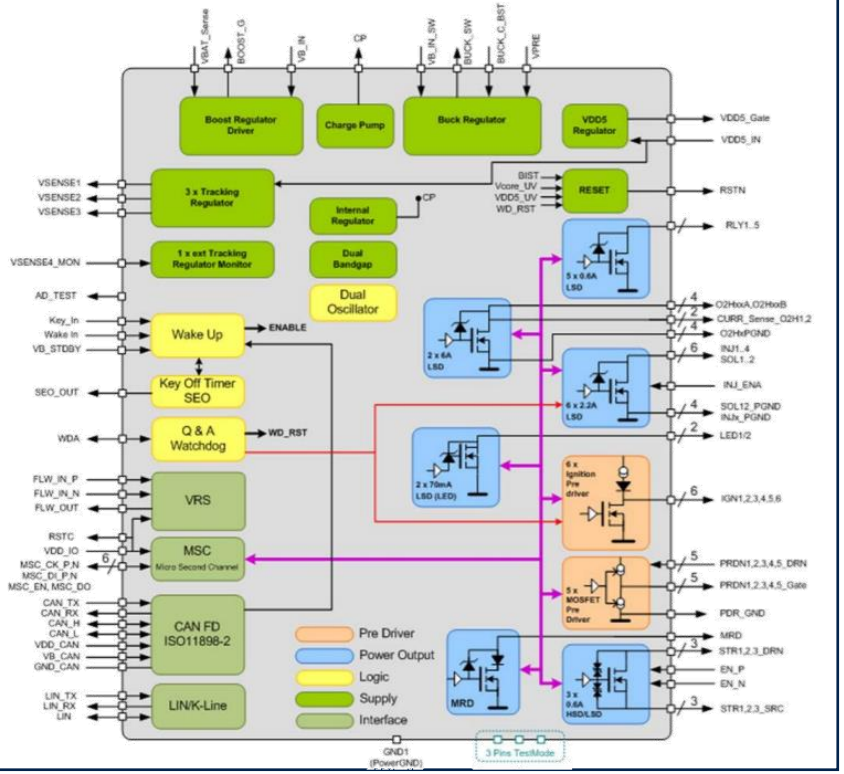
Protections
- Soft start-up of all regulators
- Battery protection
- Thermal protection

Inputs/Outputs
- 1x pre-boost & 1x pre-buck regulator
- 1x LDO 5V, 1 A
- 3x tracking regulator 5V, 150 mA
- Multiple-channels LS/HS drivers for O2H load, camshaft or solenoid, LED, injector, relay, internal or external igniter drivers including functionalities of reverse battery protection, low battery function for smart start

Diagnostics
- Temperature sensor and monitoring
- Full diagnostics via CAN-FD with wake up by CAN function



LQFP100 14x14x1.4 (exposed pad down)



- ISO26262 ready for ASIL D systems

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L9788
Automotive 4-cylinder ICE management IC

A glance at possible applications:

- Up to 4 cylinder 2 and 4 wheelers
- Vehicle Control Unit
- UPS/ generators
- ICE forklift

Key values

Flexible and programmable

Multiple-outputs with extensive programmability and with full diagnostics managed via CAN-FD

BOM Optimization

Solution with optimized BOM & form factor integrating a full set of power supplies and signal preprocessing peripherals

Functional Safety

ISO26262 ready for ASIL-D systems

Embedding a set of features

All key functions needed to control a 4 cylinders internal combustion engine are included. CAN also on board

Collaterals & Tools

L9788

- Product page
- Data brief
- Application note
- White paper

EVAL-L9788

- Product page
- Data brief
- User manual
- Board manufacturing specification
- Bill of material
- Schematics

STSW-L9788

- Product page
- Data brief
- License agreement

L9780
Automotive air sensor interface

Sensor control device with voltage controlled current source compatible with a wide range of air fuel sensors embedding also external FET drivers to control sensor heater

Features

Electrical parameters

- 5 V internal operating voltage supply

Protections

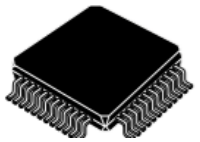
- Sensor and all I/O protection against shorts

Inputs/Outputs

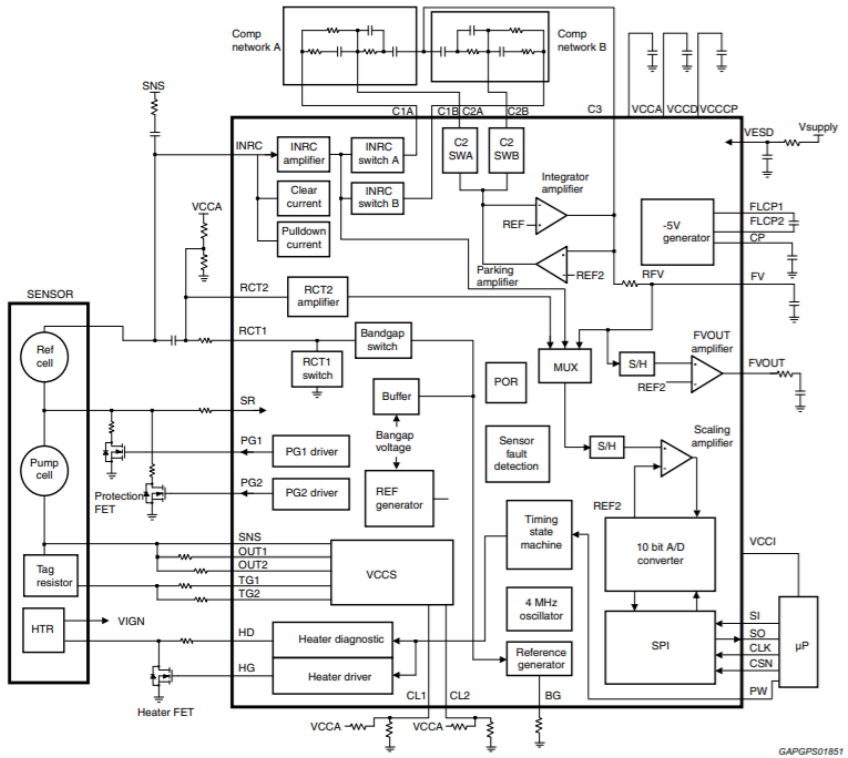
- Digital input and outputs compatible with 5 V or 3.3 V voltage supply
- 2x channels available to connect compensation networks

Diagnostics

- Fault communication via SPI
- Short to battery diagnostic on functional ground (pin SR) and on voltage from reference cell (pin INRC)



LQFP48



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L9780
Automotive air sensor interface

A glance at possible applications:

- Up to 4 cylinder 2 and 4 wheelers
- Body and chassis modules
- UPS/ generators
- ICE forklift

Key values

Flexible and programmable

All the main time values for a right sequencing of the measurement process an be configured by SPI

Features integration

L9780 drives also an external FET used to control the sensor heater

Extensive compatibility

Compatible with most sensors on the market

Collaterals & Tools

L9780

Product page
Datasheet
Selection guide: Smart power solutions for car body applications

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L9966
Automotive programmable sensor interface

Programmable sensor interface with up-to 15-channels used for a broad variety of analog/digital sensing and resistance measurement

Features

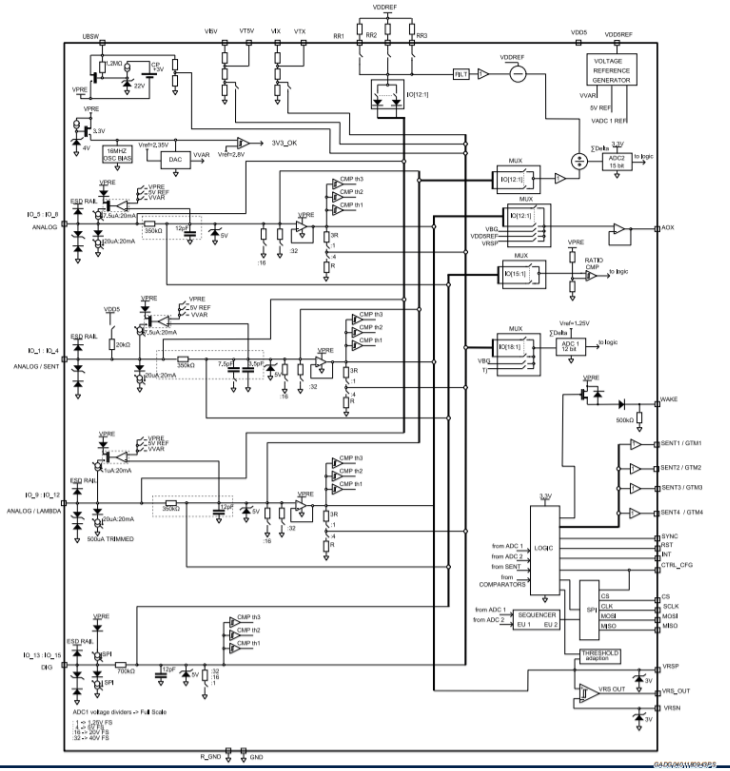
Electrical parameters
- 12 V and 24 V systems compatible
- Operating voltage supply: 5.5-36V

Protections
- Overtemperature protection

Inputs/Outputs
- 12x input channels for connection to external analog loads (4 with also λ sensor functionality, 4 with also SENT functionality)
- 3x inputs channels for connection to external digital switches
- 1x analog output channel
- 4x digital output channels

Diagnostics
- SPI interface for device configuration, diagnostics and data communication

TQFP48 7x7 mm



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L9966
Automotive programmable sensor interface

A glance at possible applications:

- Up to 4 cylinder 2 and 4 wheelers
- Body and chassis modules
- UPS/ generators
- ICE forklift

Key values

Flexible and programmable

Several inputs options and programmability for analog/digital and resistance measurement

BOM Optimization

Replacing a broad number of discrete components

Extensive compatibility

Possibility to change the sensors across different applications without modifying the PCB hardware

Collaterals & Tools

L9966

Product page
Data brief
Application note: evaluation on L9966 fitting requirements of some automotive applications, main supply power up using L9966

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Line card
Alternator voltage regulator

L9918	L9916	L9911
Alternator voltage regulator, suited for 12 V automotive systems, able to communicate with ECU through LIN communication protocol	Smart alternator voltage regulator conceived to be used in automotive application for both 12 V and 24 V systems	Monolithic multifunction alternator voltage regulator for 12V automotive applications

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L9918

Alternator voltage regulator with LIN interface

Alternator voltage regulator, suited for 12 V automotive systems, able to communicate with ECU through LIN communication protocol. NVM cells, for device parameters programmability, makes it suitable for a wide range of charging applications

Features

Electrical parameters

- Operating voltage: 12 V automotive battery voltage range

Protections

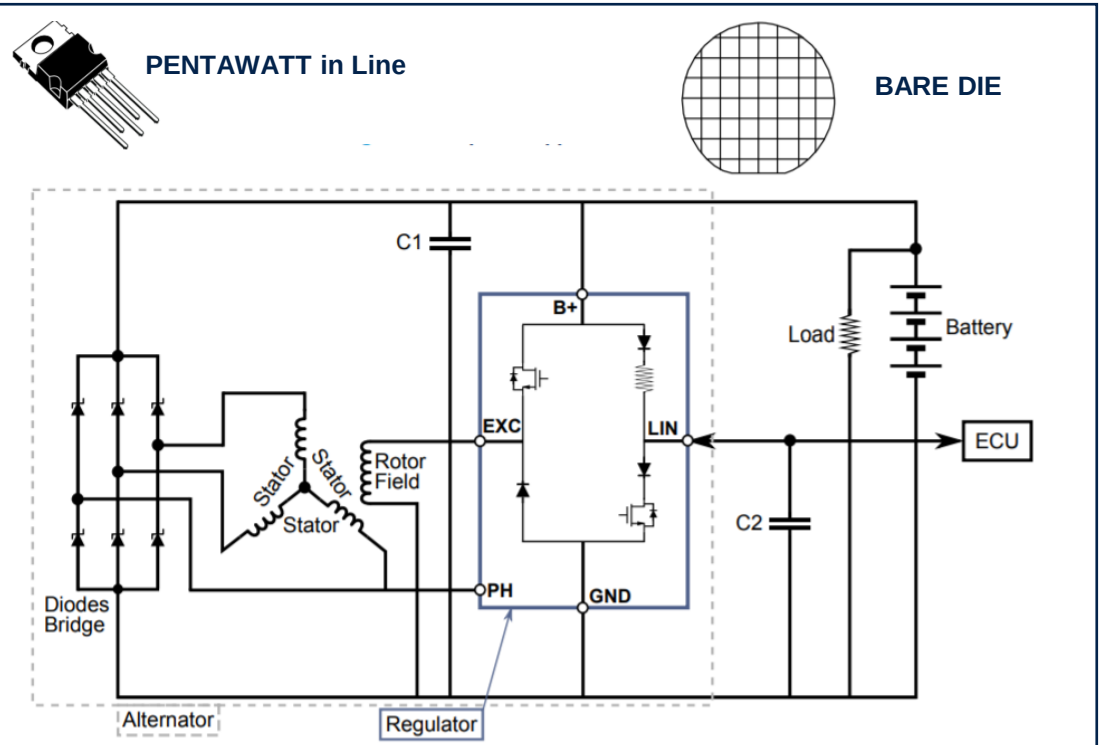
- Current limitation and overcurrent protection
- Thermal protection
- Full ISO26262 compliant, ASIL-B systems ready

Inputs/Outputs

- Closed loop voltage control
- Regulated voltage with thermal compensation function
- High side excitation driver with internal freewheeling circuit
- Load response control (LRC) and Return LRC
- Self-start activation by phase signal

Diagnostics

- Physical Layer compliant with LIN 2.2A spec.
- Data Link Layer compliant with LIN 1.3, 2.1, 2.2 and 2.2A specification
- Compliant to VDA LIN-Generator-Regulator specification



L9918

Alternator voltage regulator with LIN interface

A glance at possible applications:

- 12V automotive alternators
- 12V truck alternators

Key values

Steady Voltage on Car Loads

The device modulates the rotor current in order to keep the voltage on car loads steady to a target value whatever the vehicle demand

Flexible and programmable

NVM cells, for device parameters programmability, makes it suitable for a wide range of charging applications

Extensive compatibility

The device is suitable for alternators with different poles pair number (configurable for 5, 6, 7, 8 or 9 pole pair alternator)

Collaterals & Tools

L9918

Product page
Data-brief

L9916

Multifunction alternator voltage regulator for 12 V / 24 V on board networks

Smart alternator voltage regulator conceived to be used in automotive application for both 12 V and 24 V systems. The presence of OTP cells for parameters programmability makes it suitable for a wide range of charging application.

Features

Electrical parameters

- Operating voltage: 12 V automotive battery voltage range
- Operating voltage: 24 V automotive battery voltage range

Protections

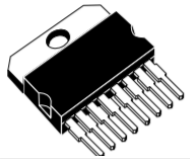
- Thermal shutdown
- Field short circuit protection
- Protected high side relay driver

Inputs/Outputs

- High side field driver
- Self-start function
- Regulated voltage thermally compensated
- Configurable parameters through OTP cells
- Lamp driver
- Load response control (LRC)

Diagnostics

- Continuous feedback to the ECU is provided through the Field Monitor output.



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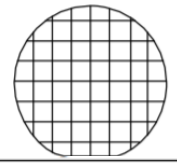

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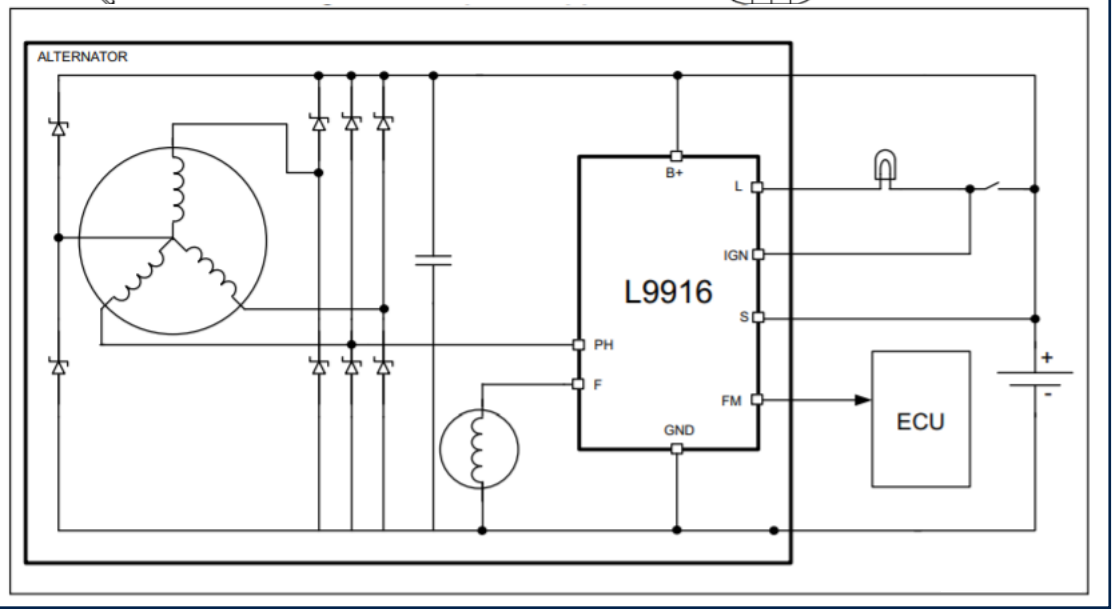

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L9916

Multifunction alternator voltage regulator for 12 V / 24 V on board networks

A glance at possible applications:

- 12V automotive alternators
- 12V truck alternators
- 24V automotive alternators
- 24V truck alternators

Key values

Steady Voltage on Car Loads

The device is able to keep the battery at its nominal value whatever the vehicle demand

Flexible and programmable

The presence of OTP cells for parameters programmability makes it suitable for a wide range of charging application

Extensive compatibility

The device is suitable for multi-phase-current alternators at 12V and 24 V systems

Collaterals & Tools

L9916

Product page
Datasheet

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L9911

Multifunction smart regulator with lamp/relay diagnostic driver

Monolithic multifunction alternator voltage regulator for 12V automotive applications. It includes the control section, the field power stage, fault diagnostic circuit which drives a warning lamp, and the protection against short circuits

Features

Electrical parameters

- Operating voltage: 12 V automotive battery voltage range

Protections

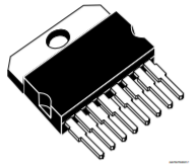
- Thermal protection
- Field short circuit protection
- Protected diagnostic lamp driver
- Protected high side relay driver

Inputs/Outputs

- High side field driver
- Load response control
- Self start function

Diagnostics

- Continuous feedback to the ECU is provided through the DFM (Field Monitor) output



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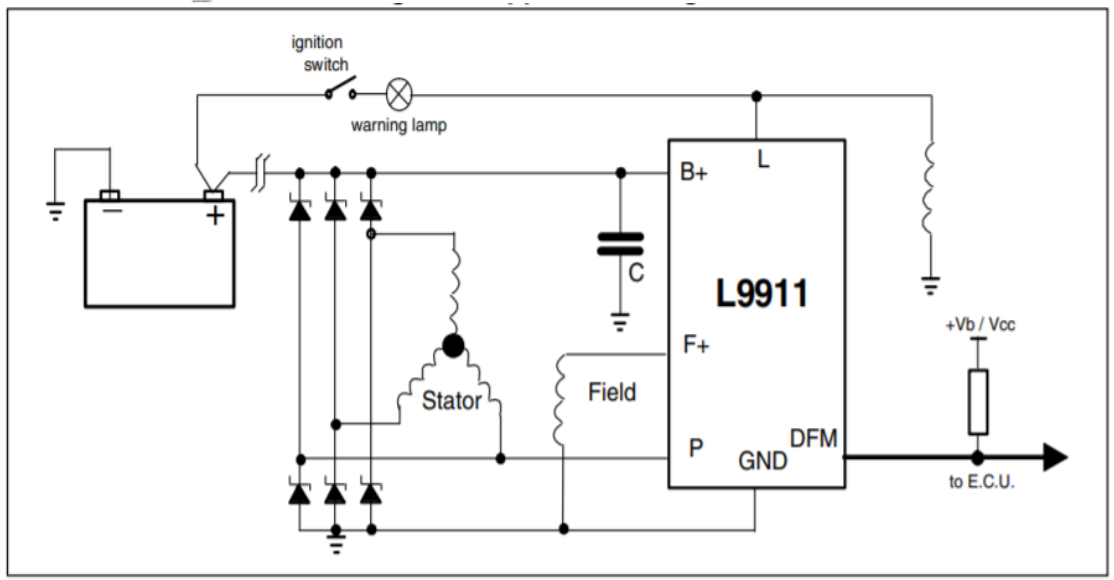

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L9911
Multifunction smart regulator with lamp/relay diagnostic driver

A glance at possible applications:

- 12V automotive alternators
- 12V truck alternators

Key values

Flexible

The internal circuit regulates the soft start characteristics (activated always at engine start) and the soft attack characteristics

Features integration

The device doesn't need, in the standard application, any external component

Fault Diagnosis

The device detects fault conditions related to the three alternator phases. Fault warnings are not displayed immediately but are delayed by a fixed time

Collaterals & Tools

L9911

Product page
Datasheet

“If only

I could find out more about engine management

This is where we come in

Electronic Parking Brake

Line card
H-bridge DC motor pre-driver ICs for Electronic Parking Brake

L9369	L9370
Dual H-Bridge DC motor pre-driver IC for EPB application: SPI controlled and designed for VDA 2.0 compliance	Dual H-Bridge DC motor pre-driver IC for EPB application: SPI controlled and designed for VDA 3.0 compliance

L9369

Automotive Dual H-Bridge pre-driver for EPB

Designed for compliance with VDA 2.0, equipped with integrated button interface for diagnostics and system wake-up, with independent integrated current and voltage measurement paths

Features

Electrical parameters

- Operating supply voltage 5.5V to 32V
- Synchronized motor current/voltage acquisition with 10 integrated fully differential channels (with VDA 2.0 compliance for accuracy)

Protections

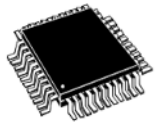
- reverse battery protection FET
- Programmable thermal, undervoltage, overvoltage , drain-source protections
- Redundant safety low-side switch-off path
- Configurable OVC detection

Outputs

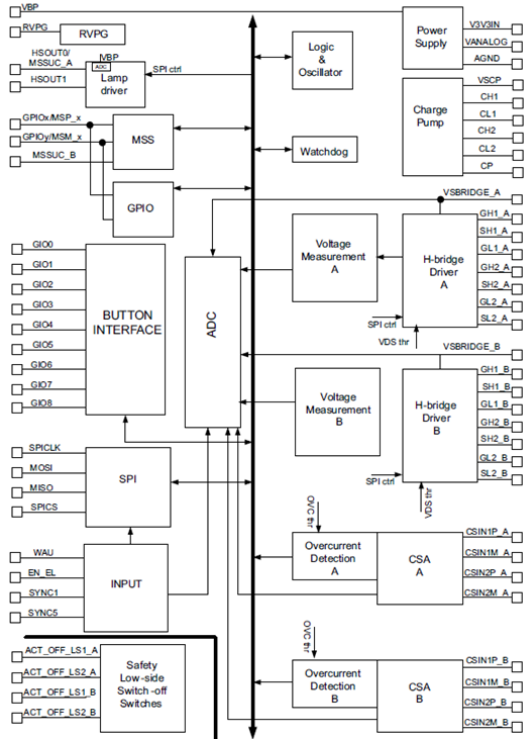
- 2x H-bridge pre-driver stages fully controlled and configured by SPI (with PWM mode option)
- 2x configurable HS / LS lamp drivers
- 4x GPIOs , also for SYS wake up in Sleep Mode (Button I/F)

Diagnostics

- Programmable and independent Motors diagnostics in Off state
- Integrated button interface for monitoring in Normal and system wake up in Sleep mode
- SPI current and voltage readouts



LQFP64



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L9369
Automotive Dual H-Bridge pre-driver for EPB

A glance at possible applications:

- Electronic Parking Brake
- Generic DC motor driving

Key values

- 4x integrated measurement paths for synchronized digital motor current acquisition (13bit resolution), Configurable LP Filter, OVC protection
- 8xGIOs for integrated Button IF diagnostics in Normal and Sleep mode with System wake pulse generation
- 2 independent, SPI controlled H-bridge pre-drivers, with redundant safety switch-off path in isolated area
- 6x integrated measurement paths for synchronized digital motor voltage acquisition (12bit), configurable LP filter Motor diagnostics in Off state
- SPI 10MHz WD and CRC
- ISO26262 compliance for ASIL-D systems
- 2x Motor Speed Sensor I/Fs
- 2x configurable HS / LS lamp drivers

Collaterals & Tools

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Find out more about L9369 and ST solutions for **Electronic Parking Brake (EPB) application**

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L9370

Automotive Dual H-Bridge pre-driver for EPB

Designed for compliance with VDA 3.0, equipped with integrated button interface for diagnostics and system wake-up, with independent integrated current and voltage measurement paths

Features

Electrical parameters

- Operating supply voltage 5.5V to 32V
- Synchronized motor current/voltage acquisition with 10 integrated fully differential channels (with VDA 3.0 compliance for accuracy)

Protections

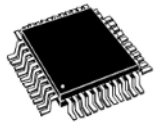
- reverse battery protection FET
- Programmable thermal, undervoltage, overvoltage , drain-source protections
- Redundant safety low-side switch-off path
- Configurable OVC detection

Outputs

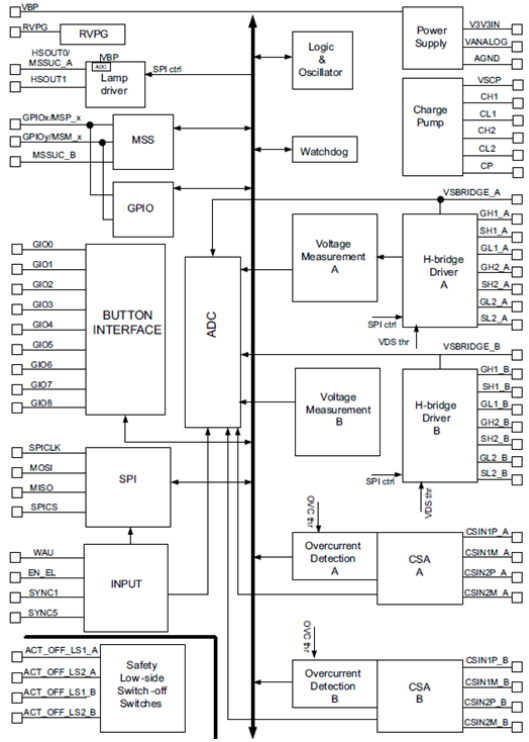
- 2x H-bridge pre-driver stages fully controlled and configured by SPI (with PWM mode option)
- 2x configurable HS / LS lamp drivers
- 4x GPIOs , also for SYS wake up in Sleep Mode (Button I/F)

Diagnostics

- Programmable and independent Motors diagnostics in Off state
- Integrated button interface for monitoring in Normal and system wake up in Sleep mode
- SPI current and voltage readouts



LQFP64



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L9370
Automotive Dual H-Bridge pre-driver for EPB

A glance at possible applications:

- Electronic Parking Brake
- Generic DC motor driving

Key values

- 4x integrated measurement paths for synchronized digital motor current acquisition (13bit resolution), Configurable LP Filter, OVC protection
- 8xGIOs for integrated Button IF diagnostics in Normal and Sleep mode with System wake pulse generation
- 2 independent, SPI controlled H-bridge pre-drivers, with redundant safety switch-off path in isolated area
- 6x integrated measurement paths for synchronized digital motor voltage acquisition (12bit), configurable LP filter Motor diagnostics in Off state
- SPI 10MHz WD and CRC
- ISO26262 compliance for ASIL-D systems
- 2x Motor Speed Sensor I/Fs
- 2x configurable HS / LS lamp drivers

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Airbag Systems

Line card
Automotive ICs for Airbag

L9691	L9690	L9689E
Advanced and complete system chip solution including power supply stage, 16-ch squib drivers, 8-ch remote sensor IF, 12-ch DC sensor IF; full ISO262622 compliance for target systems rated ASIL-D.	Advanced and complete system chip solution including power supply stage, 12-ch squib drivers, 6-ch remote sensor IF, 9-ch DC sensor IF; full ISO262622 compliance for target systems rated ASIL-D.	Airbag Product family Expansion IC including 8-ch squib drivers, 2-ch remote sensor IF, 7-ch DC sensor IF; full ISO262622 compliance for target systems rated ASIL-D.

L9691
Automotive 16ch IC for advanced Airbag application

Full ISO26262 compliance design, with flexible configuration as single IC and master/slave, integrating a high frequency power supply stage, squib drivers, PSI5 and DC sensor interfaces

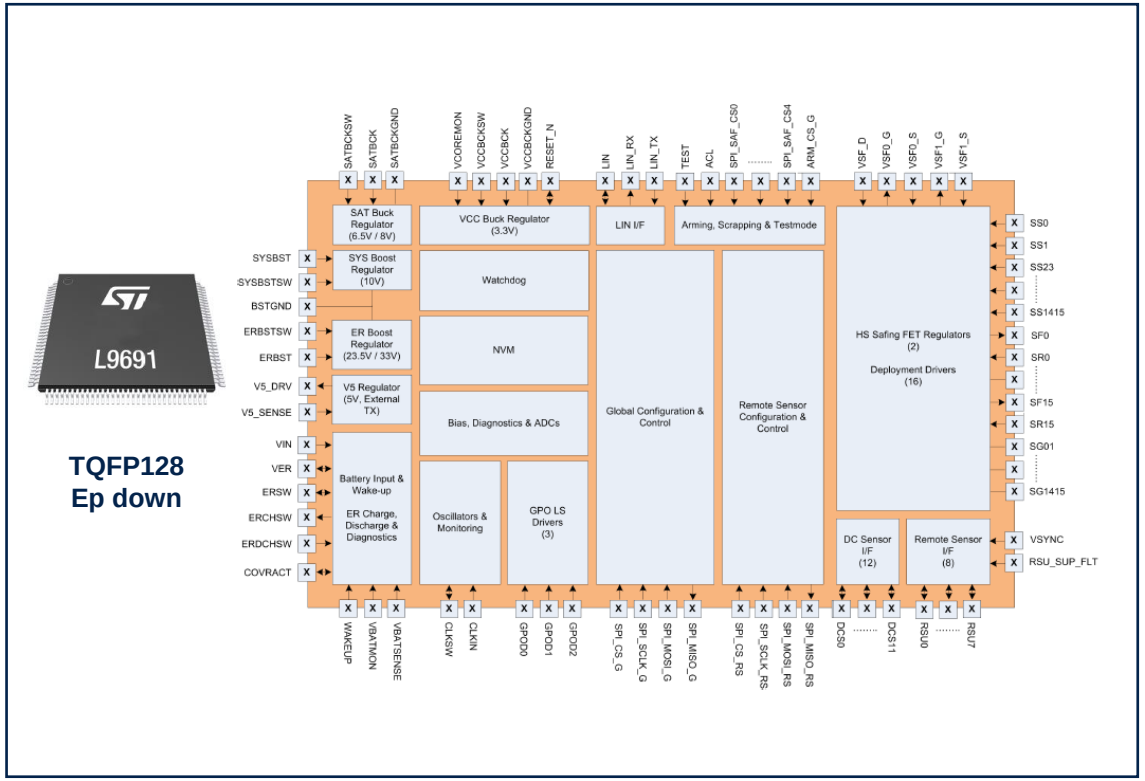
Features

Electrical parameters
- Integrated Energy reserve boost regulator 24V/33V with peak inductor regulation
- Buck for remote sensors 2MHz, 6.5V / 8V, 700mA max
- Buck Core, 2MHz, 3.3V, 450mA
- LDO 5V 135mA

Protections
- OV / UV detection on power supply, GND loss detection and shutdown on regulators
- Open and shot on squib drivers
- Current limitation on DC sensor outputs
- Short and open load on GPIOs

Outputs
- 16 ch squib drivers with user programmable deploy option, with 2 supporting LEA load
- 3 GPIOs with ON/OFF and PWM ctrl
- 1 global SPI, 1 for remote sensor SPI (SafeSPI v1.0 compatibility)

Diagnostics
- R measure on Squib driver
- 1 ADC for power supply stage
- 1 ADCs for leakage current of deployment stage
- 2 ADCs for ER cap
- 8 ADCs for remote sensor interface
- 2 ADCs for DC sensor



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L9691
Automotive 16-ch IC for Airbag application

A glance at possible applications:

Airbag

Key values

Complete System Power supply stage including Boost regulator for ER cap, microcontroller and sensor IF

12x DC sensor IF

Arming logic with independent user configuration

ADC converters for diagnostics on power supply stage, squib drivers, remote sensor and DC sensor IF

16 channels squib driver, with LEA support on 2 channels – independent HS/LS control, user programmable deployment profile

2 SPI (global+remote sensor IF)

ISO26262 compliance for ASIL-D systems

8-ch PSI5 v2.3 w SYNC pulse

3x GPIOs : ON/OFF,PWM ctrl

LIN w OCS capability

Collaterals & Tools

Databrief

Find out more about L9691 and ST solutions for **Airbag application**

L9690
Automotive 12ch IC for advanced Airbag application

Full ISO26262 compliance design, with flexible configuration as single IC and master/slave, integrating a high frequency power supply stage, squib drivers, PSI5 and DC sensor interfaces

Features

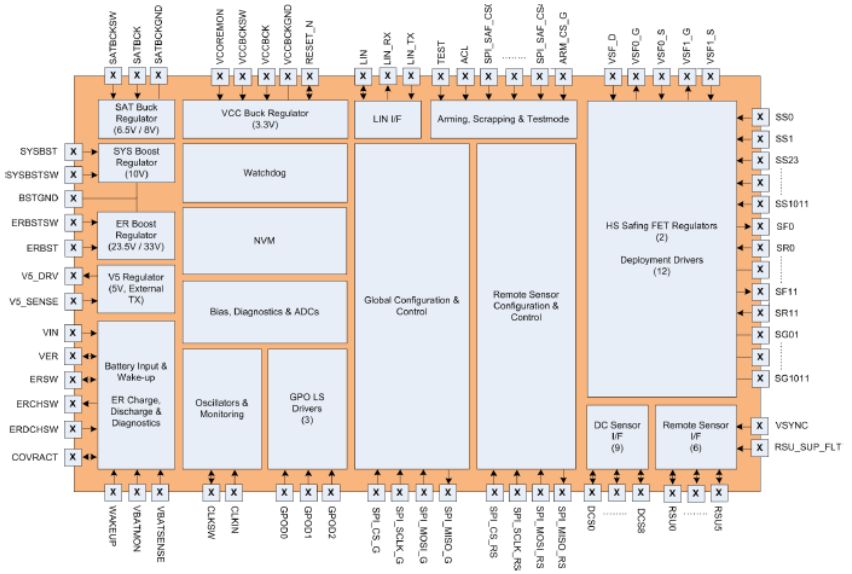
Electrical parameters
- Integrated Energy reserve boost regulator 24V/33V with peak inductor regulation
- Buck for remote sensors 2MHz, 6.5V / 8V, 700mA max
- Buck Core, 2MHz, 3.3V, 450mA
- LDO 5V 135mA

Protections
- OV / UV detection on power supply, GND loss detection and shutdown on regulators
- Open and shot on squib drivers
- Current limitation on DC sensor outputs
- Short and open load on GPIOs

Outputs
- 12 ch squib drivers with user programmable deploy option, with 2 supporting LEA load
- 3 GPIOs with ON/OFF and PWM ctrl
- 1 global SPI, 1 for remote sensor SPI (SafeSPI v1.0 compatibility)

Diagnostics
- R measure on Squib driver
- 1 ADC for power supply stage
- 1 ADCs for leakage current of deployment stage
- 2 ADCs for ER cap
- 6 ADCs for remote sensor interface
- 2 ADCs for DC sensor

TQFP128
Ep down



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L9690
Automotive 12-ch IC for Airbag application

A glance at possible applications:

Airbag

Key values

Complete System Power supply stage including Boost regulator for ER cap, microcontroller and sensor IF

9x DC sensor IF

Arming logic with independent user configuration

ADC converters for diagnostics on power supply stage, squib drivers, remote sensor and DC sensor IF

12 channels squib driver, with LEA support on 2 channels – independent HS/LS control, user programmable deployment profile

2 SPI (global+remote sensor IF)

ISO26262 compliance for ASIL-D systems

6-ch PSI5 v2.3 w SYNC pulse

3x GPIOs : ON/OFF,PWM ctrl

LIN w OCS capability

Collaterals & Tools

Databrief

Find out more about L9690 and ST solutions for **Airbag application**

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L9689E
Expansion IC for Airbag application

Completing product family with L9691 and L9690, granting the highest rate of flexibility at system configuration level

Features

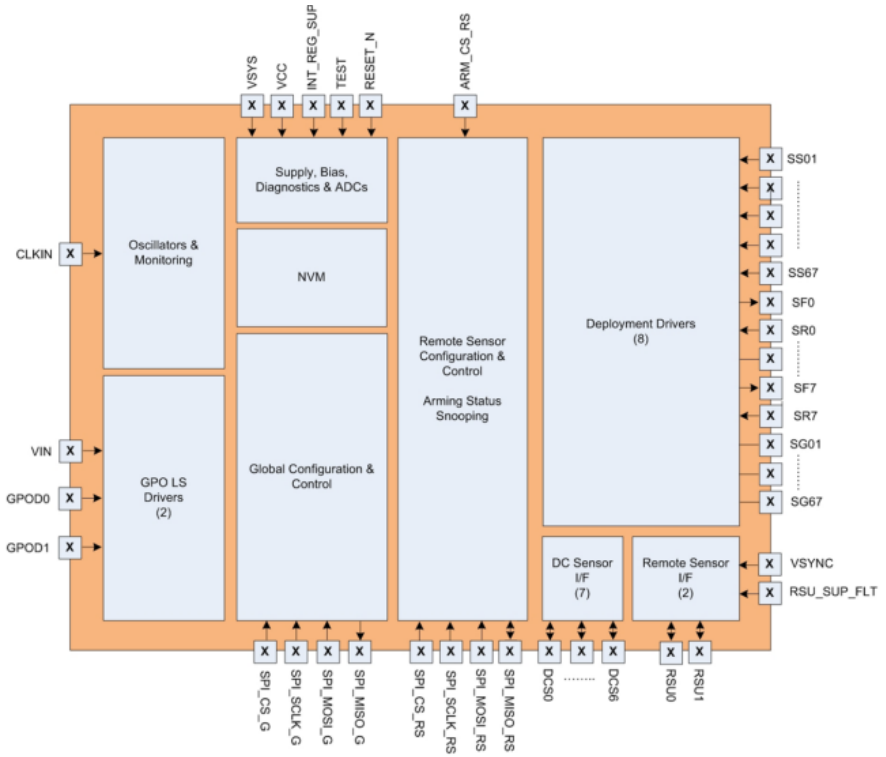
Electrical parameters
- VSYS min 4.3V (for DC sensors)
- INT_REG_SUP min 4.3V
- Satellite data with parity and CRC, 10bit, 16bit and 20bit messages, 125k or 189kbps

Protections
- OV / UV detection on power supply, GND loss detection and shutdown on regulators
- Open and shot on squib drivers
- Current limitation on DC sensor outputs
- Short and open load on GPIOs

Outputs
- 8 ch squib drivers with user programmable deploy option, with 2 supporting LEA load
- 2 GPIOs with ON/OFF and PWM ctrl
- 1 global SPI, 1 for remote sensor SPI (SafeSPI v1.0 compatibility)

Diagnostics
- R measure on Squib driver
- 1 ADC for power supply stage
- 1 ADCs for leakage current of deployment stage
- 2 ADCs for ER cap
- 6 ADCs for remote sensor interface
- 2 ADCs for DC sensor

TQFP64 Ep down



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L9689E
Expansion IC for Airbag application

A glance at possible applications:

Airbag

Key values

8 channels squib driver, with LEA support on 2 channels – independent HS/LS control, user programmable deployment profile

7x DC sensor IF

Arming logic with independent user configuration

ADC converters for diagnostics on power supply stage, squib drivers, remote sensor and DC sensor IF

2 SPI (global+remote sensor IF)

ISO26262 compliance for ASIL-D systems

2-ch PSI5 v2.3 w SYNC pulse

2x GPIOs : ON/OFF,PWM ctrl

Collaterals & Tools

Databrief

Find out more about L9689E and ST solutions for **Airbag application**

Thank you

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