

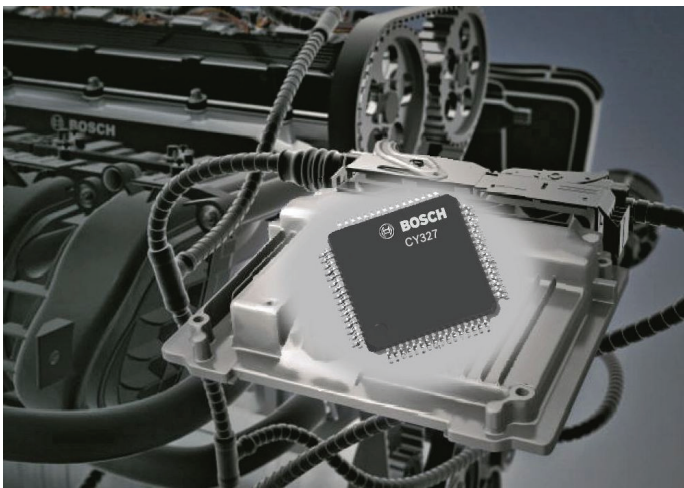
Automotive Electronics

Product Information

CY327 – System Basis IC for Powertrain



BOSCH
Invented for life



Customer benefits:

- ▶ Operation down to 3 V battery voltage, for start-stop
- ▶ Switched mode μC core supply, output voltage, adjustable from 0.9 V to 1.525 V
- ▶ Integrated CAN and LIN interfaces
- ▶ VDA E-Gas compliant
- ▶ TQFP100_ePad or TQFP64_ePad

Product brief:

CY327 is a high-end system basis IC for powertrain control units.

A configurable pre-regulator keeps the ECU running down to 3 V battery voltage. Separate 5 V and 3.3 V supplies provide power to peripheral devices, three independent 5V outputs power engine sensors.

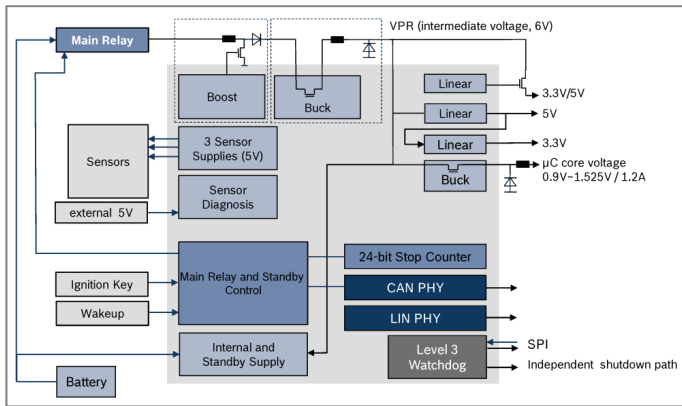
A switched mode buck converter for the μC core voltage reduces the power dissipation of your ECU by up to 4 W.

With an integrated VDA E-Gas compliant watchdog and onboard CAN and LIN interfaces, CY327 helps to minimize PCB space.

Features

- ▶ Pre-regulator with Boost & buck regulator stage.
Boost regulator function can be disabled if not used
- ▶ Linear regulator; 5.0 V \pm 2 %; 450 mA
- ▶ Linear regulator; 3.3 V \pm 2 %; 300 mA
- ▶ Control for an external linear regulator MOSFET, switchable between 3.3 V \pm 2 % or 5.0 V \pm 2 %
- ▶ Core supply: Switched buck regulator (1200 mA) with an internal switching high side MOSFET, can be set in the range 0.9V...1.525 V \pm 2% by 3 configuration pins
- ▶ Coordinated soft start-up of all regulators
- ▶ Three independent outputs 5 V, 150 mA for external sensors supply
- ▶ Main relay low side output stage with integrated clamping and diagnosis
- ▶ Reset circuit with separate additional external "T15 [ON] reset" output pin
- ▶ Bidirectional serial interface driver (LIN 2.1)
- ▶ CAN driver with wake-up capability
- ▶ VDA Level 3 Watchdog (monitoring module)
- ▶ SPI interface
- ▶ 24 bit stop counter with 1sec resolution and wake-up capability
- ▶ Ignition input [ON] (T.15 input)
- ▶ 3 Wake-up inputs

Block Diagram



Power Supply

- Pre-regulator (VPR) configurable as combined boost/buck or only as buck regulator
- Linear regulator for 5 V
- Linear regulator for 3.3 V
- Buck regulator, switched mode for 0.9...1.525 V
- 3 x sensor supplies 5 V
- Gate control for an external linear regulator MOSFET-Transistor for 3.3 V or 5.0 V

The chip temperature is measured at a hot spot location near the core voltage output stage, the overtemperature information can be read out by SPI interface

Pre-regulator

The VPR consists of a boost and a buck regulator. The boost regulator low side switching power MOSFET is external and driven by CY327.

The buck regulator switching high side MOSFET is internal.

Boost Pre-regulator

CY327 boost regulator is for keeping functionality alive down to a vehicle battery net voltage of $UBAT = 3V$ during the engine start phase.

The boost regulator works in current controlled mode with a fixed frequency of typ. 490 kHz.

Regional sales contacts

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Buck Regulator

CY327 contains a Buck regulator to reduce internal power dissipation.

The buck regulator is realized as switched PWM regulator. The switching device for this regulator is an internal n-channel MOSFET. The buck regulator works in voltage mode control with pulse width modulation at a fixed frequency of typ. 490 kHz. An internal soft start feature limits current surges from the input power supply at start up.

Core Supply

The core buck regulator works with pulse width modulation frequency at a fixed frequency of typ. 980 kHz.

Other core voltages can be selected via configuration pins.

Reset circuit

The reset-circuit monitors the 5 V supply voltage, the 3.3 V supply voltage, the core supply voltage, the central node for undervoltage, and the reset inputs.

CY327 has three reset pins:

- Reset for I/O (peripheral reset)
- Reset for digital core
- Reset for "T15 / [ON] afterrun reset"

Maximum ratings

Parameter	Min	Max	Unit
UB,(static), directly connected to battery	-0.3	40	V
Sensor supplies	-1	32	V
Main relay driver	-15V	35	V
Operating junction temperature	-40	150	°C
ESD HBM	-2	2	KV

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