



Analog, Mixed Signal and Power Management

MC33911

LIN System Basis Chip with DC Motor Pre-driver

Applications

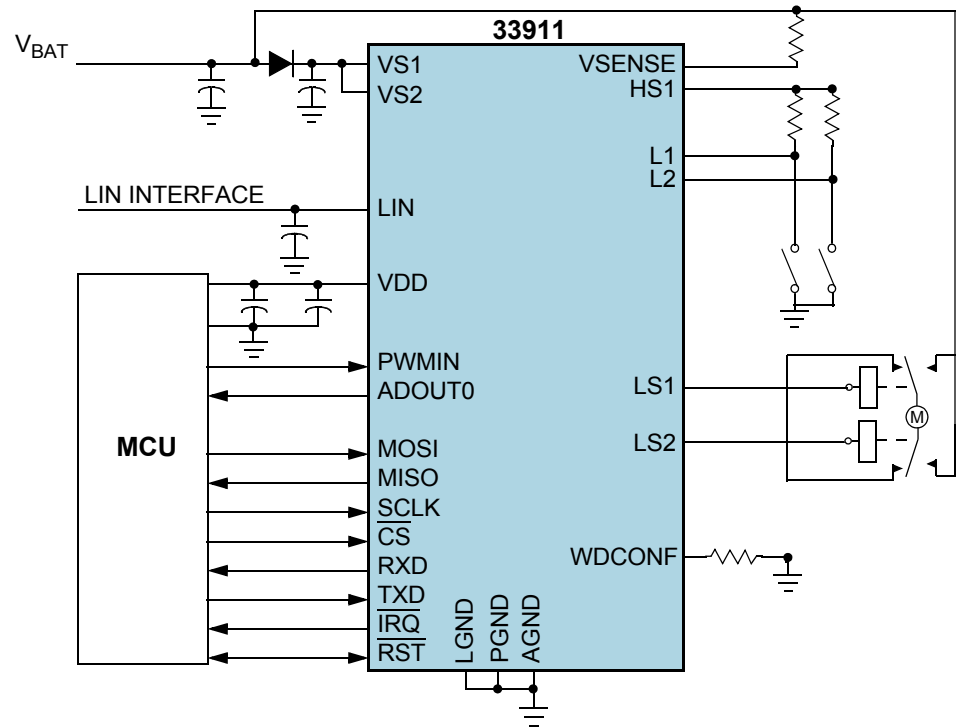
- Window Lift
- Mirror switch
- Door lock
- Sunroof
- Light control

Overview

The 33911G5 is a Serial Peripheral Interface (SPI) controlled System Basis Chip (SBC), combining many frequently used functions in an MCU based system, plus a Local Interconnect Network (LIN) transceiver. The 33911G5 has a 5.0 V, 50 mA low dropout regulator with full protection and reporting features. The device provides full SPI readable diagnostics and a selectable timing watchdog for detecting errant operation. The LIN Protocol Specification 2.0 and 2.1 compliant LIN transceiver has waveshaping circuitry that can be disabled for higher data rates. The LIN Physical Layer included inside the 33911G5 is also compliant with the SAEJ2602 Rev. 2, protocol specification approved at many car OEMs.

One 50 mA high side switch, that can be used to drive LEDs, and two 150 mA low side switches with output protection that can drive relays, used in DC motor applications. All outputs can be pulse-width modulated (PWM). Two high voltage inputs are available for use in contact monitoring, or as external wake-up inputs. These inputs can be used as high voltage Analog Inputs. The voltage on these pins is divided by a selectable ratio and available via an analog multiplexer.

MC33911 Simplified Application Drawing



Features

- Full-duplex SPI interface at frequencies up to 4.0 MHz
- LIN transceiver capable of up to 100 kbps with wave shaping
- One 50 mA high side capable to drive LEDs
- Two 150 mA low side protected switches to drive relays used in DC motor control applications
- Two high voltage analog/logic inputs
- Configurable window watchdog
- 5.0 V low drop regulator with fault detection and low voltage reset (LVR) circuitry

Questions

- Q: What are the 33911G5 key functions?
- A: The device integrates a 5.0 V, 50 mA voltage regulator, a SPI interface for diagnostics and low power management, a LIN module, one High Side, two Low Sides, and two Wake-up inputs.
- Q: What are the key features?
- A: The 33911G5 offers a configurable window watchdog, a low power mode with cyclic wake up feature, and a selectable LIN slew rate. The two low sides switches are able to drive resistive and inductive loads like a DC relay, in the case of a DC motor. The high side and low sides have PWM capability up to 10 kHz, and over-temperature and current limitation protection. The device allows the monitoring of the battery voltage, wake-up pins voltage, and the die temperature.
- Q: What is the compliancy of the device?
- A: The product is LIN2.1 and SAEJ2602-2 compliant.
- Q: What are the EMC performances of the device?
- A: The 33911G5 successfully passes the "Common EMC requirements on LIN interfaces" specification defined by Audi, BMW, Daimler, Porsche, and Volkswagen. The LIN module shows a high robustness against ESD-61000-4-2 (± 11 kV) without a bus capacitor, and a very low level in emission (50 dB μ V max at low frequency).

Parametric Table

Part Number	Max Input Voltage	Output Current	Temperature Range	Package
MC33911G5AC	40V	Internally Limited (thermal protection)	-40°C to 125°C	32 LQFP
MC34911G5AC			-40°C to 85°C	

Development Tools

Part Number	Description
KIT33912G5DGEVME	Easy to use kit that includes a friendly graphical interface, an MC33912G5EVB, and a USB to SPI adaptor.

Documentation

Document Number	Title	Description
MC33911	Data Sheet	Presents the specifications for the product
SG1002	Selector Guide	Analog and power management device comparison
SG187	Selector Guide	Automotive device comparison

Benefits

- Reduced usage of external components due to the high EMI and ESD performance
- Very low emissive device
- Official release at many car OEMs
- Internal 5.0 V regulator to supply microcontroller
- Fail Safe protection
- Low Power Management to minimize the battery discharge
- Able to control an external relay

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