freescale™
S12 MagniV

S12 MagniV Mixed-Signal MCUs

S12ZVL Family

Integrated solution for LIN applications

Overview

The S12ZVL family is part of the S12 MagniV portfolio of mixed-signal MCUs offering smart and optimized integration of high-voltage components. This new family is built upon LL18UHV technology that combines highly reliable 180 nm non-volatile memory along with the integration of high-voltage analog components on a single piece of silicon.

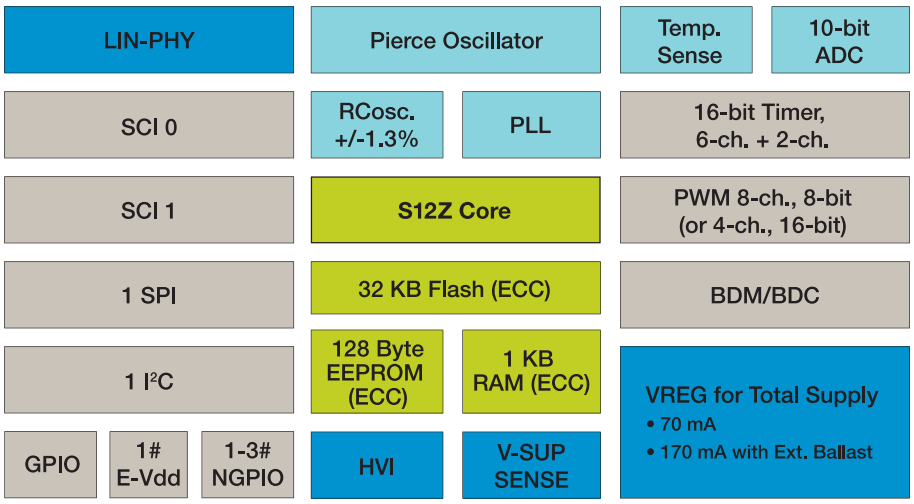
These high-voltage analog components are capable of withstanding the rigorous requirements of the automotive environment, which can occur during load dump conditions. The S12ZVL product family integrates a LIN physical layer, an ESDprotected 12 V input pin capable of ADC measurement and an automotive voltage regulator operating between 3.5 and 40 V to supply power to on- and off-chip functions such as hall sensors or RGB LEDs.

The S12ZVL family includes scalable and pincompatible MCUs offering a wide range of memory and package options. It reuses the recently introduced S12Z core, IP and tools for easy migration from existing S12 16-bit products. Additionally, S12ZVL MCUs integrate key features including ECC on all memories (flash, EEPROM and RAM) and an on-chip oscillator accurate to 1.3 percent, which eliminates the requirement of an external crystal or resonator for LIN communication.

Target Applications

- LIN nodes
- LIN user interface
- LIN actuators, sensors
- HVAC
- Lighting controls
- Ambient lighting
- Seat positioning

S12ZVL Family Block Diagram



SAFE ASSURE™
by Freescale

Key Features	Benefits
• 32MHz Bus frequency	• Improved code efficiency and core performance versus S12
• 8 to 32 KB flash	• Offers on-chip flash to store code with no need for external flash/ROM
• Up to 128 Bytes EEPROM	• Easy to use interface over data flash with a 4 Byte erasable page
• All memories (flash, RAM, EEPROM) with ECC	• Error code correction (ECC) provides high reliability
• Built-in automotive voltage regulator operating between 3.5 and 40 V	• Operates directly from car battery without the need for extra voltage regulator, saving PCB board space. Handles automotive design issues, such as double battery, crank voltage and load dump conditions
• Built-in LIN physical layer	• No need for an external LIN physical layer device, saving space and design time. Meets automotive OEM specifications for LIN conformance and EMC requirements
• EVDD and NGPIO	• EVDD able to supply 5 V/20 mA off chip, N-GPIO able to sink up to 3 x 25 mA off chip (useful for RGB-LED-drive)
• Protected 12 V input (HVI)	• Allows automotive battery voltage-level inputs (with ADC capability)
• On-chip RC oscillator trimmed to 1.3 percent tolerance	• Due to accurate on-chip clock generation, LIN communication can be done without external crystal or resonator and without the need for SW-intense synchronization

The S12ZVL family includes the first Freescale 16-bit MCU to be part of the SafeAssure program and is designed to specifically address the required ISO 26262 (ASIL A) functional safety standards.

S12ZVL StarterTRAK Evaluation Board

The Hardware Evaluation or development for the S12ZVL family is supported by the Freescale StarterTRAK series, enabeling faster time to market and offering significant value at affordable prices. Learn more at **freescale.com/StarterTRAK**.

Enablement Tools

- P&E MULTILINK
- CodeWarrior development tool suite
- Cosmic software compiler/debugger

Product Comparison Table

	S12ZVL		S12ZVLS
Application orientation	Generic		Small sensors
Package	48 LQFP	32 LQFP	32 QFN
Flash memory (ECC)	32/16/8 KB	32/16/8 KB	32/16 KB
NGPIO (GPIO with 25 mA NMOS)	3	1	3
10-bit ADC	10-ch.	6-ch.	6-ch.

SafeAssure Program Functional safety. Simplified.

Our SafeAssure functional safety program is designed to help system manufacturers more easily achieve system compliance with International Standards Organization (ISO) 26262 and 61508 functional safety standards. The program highlights Freescale solutions—hardware and software—that are optimally designed to support functional safety implementations and come with a rich set of enablement collateral. For more information, visit **freescale.com/SafeAssure**.

freescale™

To learn more, visit freescale.com/S12ZVL

Document Number: S12ZVLFS REV 1