



S12 MagniV Mixed-Signal MCUs

S12ZVL Family

Integrated solution for LIN applications

Target Applications

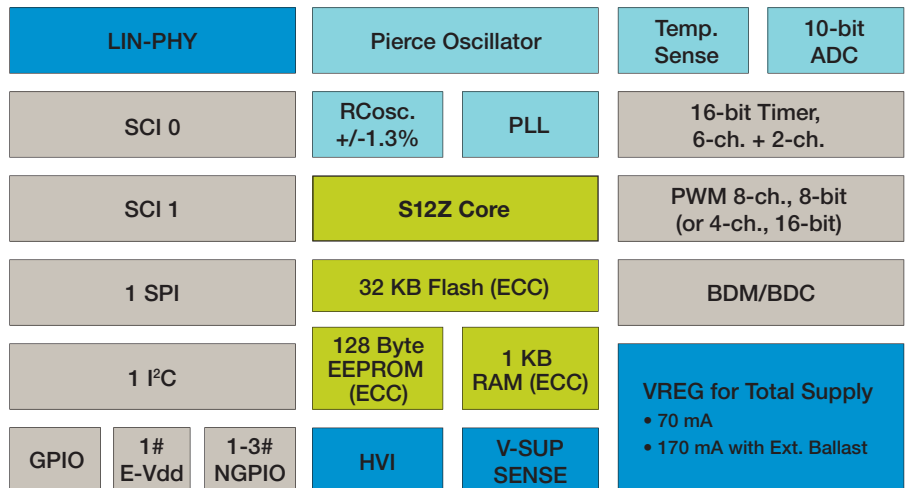
- LIN nodes
- LIN user interface
- LIN actuators, sensors
- HVAC
- Lighting controls
- Ambient lighting
- Seat positioning

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 ESD-protected 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.

S12ZVL Family Block Diagram



■ Core and Memories
 ■ Digital Peripherals
 ■ HV Analog
 ■ 5 V Analog

Key Features	Benefits
<ul style="list-style-type: none"> • S12Z core, 25 MHz bus 	<ul style="list-style-type: none"> • Improved code efficiency and core performance versus S12
<ul style="list-style-type: none"> • 8 to 32 KB flash 	<ul style="list-style-type: none"> • Offers on-chip flash to store code with no need for external flash/ROM
<ul style="list-style-type: none"> • Up to 128 Bytes EEPROM 	<ul style="list-style-type: none"> • Easy to use interface over data flash with a 4 Byte erasable page
<ul style="list-style-type: none"> • All memories (flash, RAM, EEPROM) with ECC 	<ul style="list-style-type: none"> • Error code correction (ECC) provides high reliability
<ul style="list-style-type: none"> • Built-in automotive voltage regulator operating between 3.5 and 40 V 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Built-in LIN physical layer 	<ul style="list-style-type: none"> • No need for an external LIN physical layer device, saving space and design time. Meets automotive OEM specifications for LIN conformance and EMC requirements
<ul style="list-style-type: none"> • EVDD and NGPIO 	<ul style="list-style-type: none"> • 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)
<ul style="list-style-type: none"> • Protected 12 V input (HVI) 	<ul style="list-style-type: none"> • Allows automotive battery voltage-level inputs (with ADC capability)
<ul style="list-style-type: none"> • On-chip RC oscillator trimmed to 1.3 percent tolerance 	<ul style="list-style-type: none"> • Due to accurate on-chip clock generation, LIN communication can be done without external crystal or resonator and without the need for SW-intensive synchronization

The S12ZVL family includes scalable and pin-compatible 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.

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.

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.
ASIL	A	A	A

Development Tools

S12ZVL Tower System Module and Kit

The S12 MagniV S12ZVL family will be supported by the Freescale Tower System—a modular development platform designed to save you months of development time through rapid prototyping and tool re-use. Learn more at freescale.com/Tower.

Enablement Tools

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

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.

For more information, visit freescale.com/S12ZVL

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Document Number: S12ZVLFS REV 0