### What is "**Embedded - Microcontrollers**"?

"**Embedded - Microcontrollers**" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

### Applications of "**Embedded - Microcontrollers**"

| Details | |
| --- | --- |
| Product Status | Active |
| Core Processor | S12Z |
| Core Size | 16-Bit |
| Speed | 32MHz |
| Connectivity | CANbus, I²C, LINbus, SCI, SPI |
| Peripherals | DMA, LCD, POR, PWM, WDT |
| Number of I/O | 78 |
| Program Memory Size | 64KB (64K x 8) |
| Program Memory Type | FLASH |
| EEPROM Size | 2K x 8 |
| RAM Size | 4K x 8 |
| Voltage - Supply (Vcc/Vdd) | 4.5V ~ 5.5V |
| Data Converters | A/D 4x10b |
| Oscillator Type | Internal |
| Operating Temperature | -40°C ~ 105°C (TA) |
| Mounting Type | Surface Mount |
| Package / Case | 100-LQFP |
| Supplier Device Package | 100-LQFP (14x14) |
| Purchase URL | https://www.e-xfl.com/pro/item?MUrl=&PartUrl=s912zvfp64f1vll |

# S12ZVH Mixed-Signal Microcontrollers

## S12 MagniV Single-Chip Solution for Automotive Instrument Clusters

Product One-Sheet

**Get Sample** | **Data Sheet** | **Tools**

**S12Z core architecture**—16-bit microcontroller at 32 MHz bus

**Cluster integration**—single-chip instrument cluster solution integrates an automotive voltage regulator operating between 5 and 18 volts

**Connectivity**—CAN, LIN, SPI, I²C, analog comparators, multiple timers with PWM functionality

**Connectivity**—CAN/LIN physical layers, LCD display controller and instrument cluster gauge drivers with stepper stall detection (SSD)
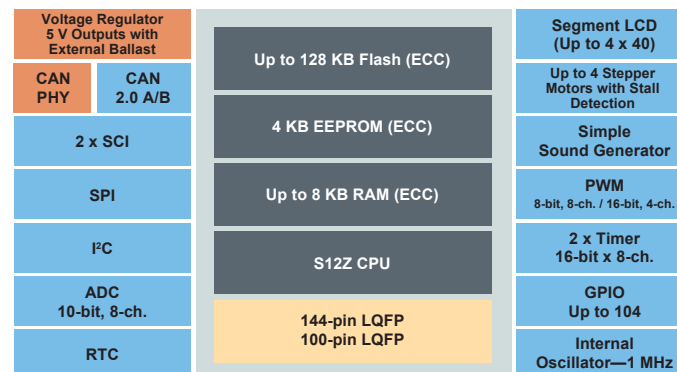
## S12ZVH Specifications

| PART NUMBER | S12ZVH128CLQ | S12ZVH128CLL | S12ZVHL64CLQ | S12ZVHL64CLL |
|---|---|---|---|---|
| PACKAGE DESCRIPTION | LQFP 144 20*20*1.4P0.5 | LQFP 100 14*14*1.4P0.5 | LQFP 144 20*20*1.4P0.5 | LQFP 100 14*14*1.4P0.5 |
| INTERNAL FLASH | 128 KB | 128 KB | 64 KB | 64 KB |
| RAM | 8 KB | 8 KB | 4 KB | 4 KB |
| EEPROM | 4 KB | 4 KB | 2 KB | 2 KB |
| STEPPER MOTOR CONTROLLER | 4 | 2 | 2 | 2 |
| LCD SEGMENTS | 40 x 4 | 32 x 4 | 40 x 4 | 32 x 4 |
| CAN PHY | 1 | – | – | – |
| LIN PHY | – | – | 1 | 1 |

## Features

- S12Z core, 32 MHz bus
- 4 KB EEPROM, 128 KB flash with ECC
- 4 up-to-four stepper motor drivers with stall detect
- CAN/LIN physical layer
- Built-in automotive voltage regulator from 5 to 18 V at -40°C to +105°C
- Real-time clock with calendaring

## S12ZVH: S12 MagniV Mixed-Signal MCU Block Diagram

Voltage Regulator 5 V Outputs with External Ballast

| CAN PHY | CAN 2.0 A/B |
| 2 x SCI | |
| SPI | |
| I²C | |
| ADC 10-bit, 8-ch. | |
| RTC | |

Up to 128 KB Flash (ECC)

4 KB EEPROM (ECC)

Up to 8 KB RAM (ECC)

S12Z CPU

144-pin LQFP / 100-pin LQFP

Segment LCD (Up to 4 x 40)

Up to 4 Stepper Motors with Stall Detection

Simple Sound Generator

PWM 8-bit, 8-ch. / 16-bit, 4-ch.

2 x Timer 16-bit x 8-ch.

GPIO Up to 104

Internal Oscillator—1 MHz

Energy Efficient Solutions by Freescale™

Product Longevity 10 15

## Target Applications

- Automotive instrument clusters
- Heating ventilation and air conditioning (HVAC)

## Enablement Tools

- S12ZVH low-cost evaluation board
  - Part number: TRK-S12ZVH128
  - Custom 4 x 40 LCD glass
  - CAN connector interfaced with MCU internal CAN PHY
  - Serial communications LIN, SCI, SPI and I²C
  - LEDs connected to PWM channels
  - Four pushbuttons connected to KBI inputs
  - Four motor control headers, 4 x 1 pins
  - 32 kHz oscillator for real-time counter
  - Piezoelectric speaker with amplification circuit
- P&E MULTILINK
- CodeWarrior development tool suite
- Cosmic software

## www.nxp.com/S12ZVH