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### 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             | 12V1  |
| Core Size                  | 16-Bit  |
| Speed                      | 25MHz   |
| Connectivity               | IrDA, LINbus, SCI, SPI  |
| Peripherals                | LVD, POR, PWM, WDT  |
| Number of I/O              | 28  |
| Program Memory Size        | 48KB (48K x 8)  |
| Program Memory Type        | FLASH   |
| EEPROM Size                | 512 x 8   |
| RAM Size                   | 2K x 8  |
| Voltage - Supply (Vcc/Vdd) | 3.13V ~ 5.5V  |
| Data Converters            | A/D 6x10b   |
| Oscillator Type            | Internal  |
| Operating Temperature      | -40°C ~ 105°C (TA)  |
| Mounting Type              | Surface Mount   |
| Package / Case             | 48-LQFP   |
| Supplier Device Package    | 48-LQFP (7x7)   |
| Purchase URL               | <a href="https://www.e-xfl.com/pro/item?MUrl=&amp;PartUrl=s9s12vr48af0vlf">https://www.e-xfl.com/pro/item?MUrl=&amp;PartUrl=s9s12vr48af0vlf</a> |

# S12 MagniV Mixed Signal MCUs S12VR Family

Integrated solution for Relay Driver (eg. Windowlift/sunroof)

## Features

- Relay Driver
- Vreg for 12V Supply
- Integrated LIN Phy
- Ultra Reliable Industrial

## Product One-Sheet

Get Sample

Data Sheet

Tools

**System in a Package** – Highly integrated part ideal for space constrained relay driven DC motors on LIN Bus

**Low System Cost** – Operating straight from car battery, integrated LIN phy, LS & HS drivers, HVI's for 12 V switch interfaces, EVDD for sensor supply reduce system, qualification and manufacturing cost.

**High Reliability**– High immunity to EMI and ESD stresses, LIN 2.x compliant with +/- 8 kV ESD capability.

**Enablement** – Supported by comprehensive hardware and software solution, which reduces development costs and time to market.

## S12VR Specifications

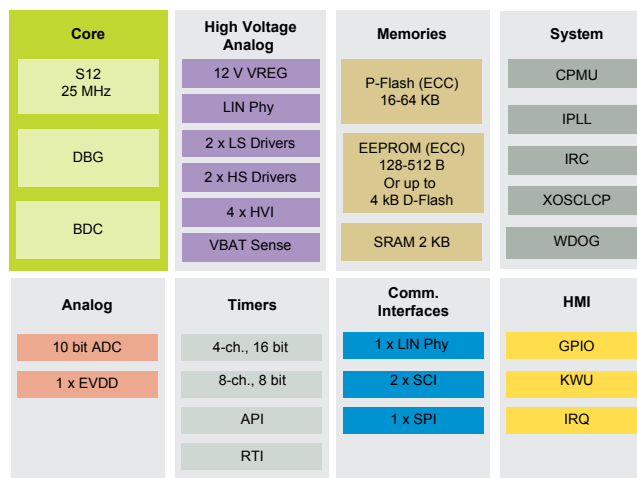
|         |                                |           |                           |
|---------|--------------------------------|-----------|---------------------------|
| Flash   | 16-64 KB                       | LS Driver | 2 (for driving relays)    |
| RAM     | 2-6 KB                         | HS Driver | 1-2                       |
| EEPROM  | 128-512 B EE or 2-4 kB D-Flash | 12V VREG  | 70 mA at 12 V             |
| Core    | S12                            | EVDD      | 1ch 5 V/20 mA (source)    |
| Speed   | 25 Mhz                         | SCI/SPI   | Up to 2/1                 |
| ADC     | 10 bit 10 channel              | Packages  | 32 LQFP, 48 LQFP          |
| HVI     | 4-6                            | Timer/PWM | 4-ch. 16 bit/4-ch. 16 bit |
| LIN Phy | 1                              | Op Range  | 5.5 V-18 V                |

## Orderable Sample Part Numbers (superset)

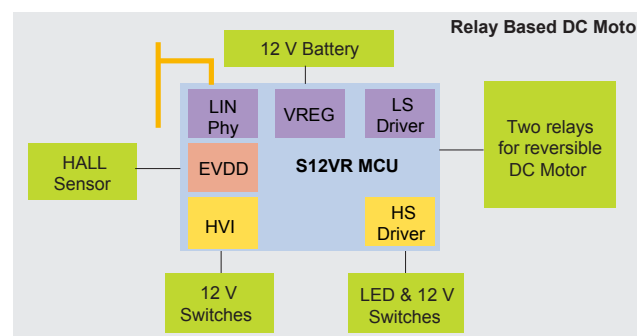
| Part Number     | Temp Range    | Package |
|-----------------|---------------|---------|
| S9S12VR64AF0MLF | -40 to 125 °C | 48 LQFP |
| S9S12VR64AF0MLC | -40 to 125 °C | 32 LQFP |
| S9S12VR32F0MLC  | -40 to 125 °C | 32 LQFP |
| S9S12VRP64F0MLF | -40 to 125 °C | 48 LQFP |

[www.nxp.com/S12VR](http://www.nxp.com/S12VR)

## Product Block Diagram



## Application Example Block Diagram



## Success Stories

- Anti Pinch Window-Lift and Sunroof Worldwide
- Power Lift Gate in Americas
- Seat Heating in China
- Small LIN node in Asia

## Target Applications

- Anti-Pinch Window Lift
- Sunroof
- Automatic Doors
- Power Lift Gate
- Seat Adjustment
- Seat Heating
- Small LIN Node

## Enablement Tools

- Evaluation Boards / Hardware
  - S12VR64EVB
  - S12VR32EVB
  - DEVKIT-S12VRP
- Reference Solutions
  - Anti-Pinch Window Lift Reference Design
- Compiler / Debugger
  - CodeWarrior
  - Cosmic
- LIN Stack