

# AVR® EB Product Family

## Enabling Robust and Deterministic Response to System Events

### Summary

The AVR® EB family integrates real-time control and drive functionality into the AVR's functionality. Featuring the latest Core Independent Peripherals (CIPs), these microcontrollers (MCUs) excel as stand-alone processors that will be valuable additions to any modern embedded design.

With up to 32 KB Flash, operating at up to 20 MHz across the full supply voltage range of 1.8V to 5.5V, and available in 14- to 32-pin packages, AVR EB MCUs are ready to meet the needs of a diverse range of applications.

### Designed for Demanding Control Applications

In addition to the on-board CIPs, the AVR EB family offers low-power features and 5V operation for increased noise immunity. When safety is an essential requirement for your system, these MCUs feature an Event System, Configurable Custom Logic (CCL) and advanced timer/counters with complex waveform generation and built-in hardware fault handling.

### Functional Safety



#### Functional Safety Support

The AVR EB family is recommended for safety-critical applications targeting industrial (IEC 61508) and automotive (ISO 26262) standards. Documentation, such as an FMEDA report and safety manual, are available. Safety-certified development tools are also available for these MCUs. Please contact your local Microchip sales office or your distributor for more information.

### High-Performance Peripherals

The 12-bit Analog-to-Digital Converter (ADC) with conversion speeds of 300 ksp/s provides accurate and timely analog signal acquisition. A built-in Programmable Gain Amplifier (PGA) allows you to accurately measure small signals. The Event

System allows triggers and notifications to be transmitted to other peripherals without CPU intervention, enabling robust and deterministic response to system events.

### Key Features

- Internal 20 MHz oscillator
- Up to 32 KB of Flash memory
- 12-bit ADC with up to 24 channels
- Two analog comparators with window compare function
- Built-in safety functions: Power-on Reset (POR), Brown-out Reset (BOR), Voltage Level Monitor (VLM) and Cyclic Redundancy Check (CRC) scan
- One 16-bit Timer/Counter E (TCE) with four compare channels for Pulse-Width Modulation (PWM) and Waveform Extension (WEX)
- One 24-bit Timer/Counter F (TCF) for frequency generation
- One 16-bit Real-Time Counter (RTC) that can run from an external crystal or internal oscillator
- Configurable Custom Logic (CCL) peripheral
- Up to six-channel Event System peripheral
- Configurable, internally generated reference voltage
- USART/SP/dual-mode Two-Wire Interface (TWI)
- Available with up to 28 I/Os
- Available in 14-, 20-, 28- and 32-pin packages
- 1.8V–5.5V operating voltage range
- –40° to +125° C operating temperature range

### Get Started Now

The AVR16EB32 Curiosity Nano Evaluation Kit (EV73J36A) is an excellent platform for rapid prototyping and evaluation of the AVR EB family of MCUs. It connects seamlessly to MPLAB® X, Microchip Studio and IAR Embedded Workbench Integrated Development Environments (IDEs). MPLAB Code Configurator (MCC) Melody and Atmel START—our intuitive, web-based graphical configuration tools—significantly reduce development time, giving you more savings on production costs and faster time to market. The AVR EB family is supported by GCC, MPLAB XC8 and IAR compilers. We also offer an MPLAB XC8 Functional Safety Compiler License for the AVR EB family that is certified by TÜV SÜD.

| Product          | Max CPU speed (MHz) | Flash (KB) | EEPROM (B) | SRAM (KB) | Cins  | 12-bit Differential ADC (Channels) | Analog Comparators | MVIO Pins | Zero Cross Detectors | Event System Channels | External Interrupts | Windowed Watchdog Timer (WWDT) | Configurable Custom Logic (LUTs) | USART/SPI/I2C | Timer/Counter/B (TCB) | Timer/Counter/E (TCE) | Timer/Counter/F (TCF) | Temperature Grade Options (°C) | Packages          |
|------------------|---------------------|------------|------------|-----------|-------|------------------------------------|--------------------|-----------|----------------------|-----------------------|---------------------|--------------------------------|----------------------------------|---------------|-----------------------|-----------------------|-----------------------|--------------------------------|-------------------|
| <b>AVR32EB32</b> | 20                  | 32         | 512        | 3         | 28/27 | 24                                 | 2                  | 0         | 0                    | 6                     | 28                  | 1                              | 1(4)                             | 1/1/1         | 2                     | 1                     | 1                     | Ind, 85 Ext, 125               | VQFN, TQFP        |
| <b>AVR32EB28</b> | 20                  | 32         | 512        | 3         | 24/23 | 20                                 | 2                  | 0         | 0                    | 6                     | 24                  | 1                              | 1(4)                             | 1/1/1         | 2                     | 1                     | 1                     | Ind, 85 Ext, 125               | SPDIP, SSOP, VQFN |
| <b>AVR32EB20</b> | 20                  | 32         | 512        | 3         | 18/17 | 14                                 | 2                  | 0         | 0                    | 6                     | 18                  | 1                              | 1(4)                             | 1/1/1         | 2                     | 1                     | 1                     | Ind, 85 Ext, 125               | SSOP              |
| <b>AVR32EB14</b> | 20                  | 32         | 512        | 3         | 12/11 | 8                                  | 2                  | 0         | 0                    | 6                     | 12                  | 1                              | 1(4)                             | 1/1/1         | 2                     | 1                     | 1                     | Ind, 85 Ext, 125               | SOIC, TSSOP       |
| <b>AVR16EB32</b> | 20                  | 16         | 512        | 2         | 28/27 | 24                                 | 2                  | 0         | 0                    | 6                     | 28                  | 1                              | 1(4)                             | 1/1/1         | 2                     | 1                     | 1                     | Ind, 85 Ext, 125               | VQFN, TQFP        |
| <b>AVR16EB28</b> | 20                  | 16         | 512        | 2         | 24/23 | 20                                 | 2                  | 0         | 0                    | 6                     | 24                  | 1                              | 1(4)                             | 1/1/1         | 2                     | 1                     | 1                     | Ind, 85 Ext, 125               | SPDIP, SSOP, VQFN |
| <b>AVR16EB20</b> | 20                  | 16         | 512        | 2         | 18/17 | 14                                 | 2                  | 0         | 0                    | 6                     | 18                  | 1                              | 1(4)                             | 1/1/1         | 2                     | 1                     | 1                     | Ind, 85 Ext, 125               | SSOP, VQFN        |
| <b>AVR16EB14</b> | 20                  | 16         | 512        | 2         | 12/11 | 8                                  | 2                  | 0         | 0                    | 6                     | 12                  | 1                              | 1(4)                             | 1/1/1         | 2                     | 1                     | 1                     | Ind, 85 Ext, 125               | SOIC, TSSOP       |