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## Functional Safety Ready dsPIC33 and PIC24 Microcontrollers

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When implementing the safety features of safety-critical equipment using electronics, hereunder microcontrollers, it is required to comply with the applicable functional safety standards, whether it is automotive, industrial or medical applications. Necessary information about a microcontroller's failure rate and failure modes are rarely covered in the data sheet, and it is therefore imperative that the vendor of the microcontroller provides this information separately. The two most important documents are the Failure Mode Effect and Diagnostics Analysis (FMEDA) report and the Safety Manual. With these documents, the embedded designer can meet the requirements of a safety-critical design and document the use of recommended mechanisms to detect failures in the system.

### All dsPIC33 and PIC24 Microcontrollers are Suitable for Safety-Critical Designs



FMEDA reports and Safety Manuals are available for all dsPIC33 and PIC24 microcontrollers marked as "Functional Safety Ready". Register through your local [Microchip Sales Office](#) to receive the documents. If the product you want to use is not yet marked "Functional Safety Ready" – contact Microchip anyway: FMEDAs can be created on request for most products. For more information about Functional Safety Ready dsPIC33 and PIC24 products, visit the [Functional Safety Design center](#).



A large number of the dsPIC33 and PIC24 microcontrollers have been tested and qualified in accordance to the AEC-Q100 requirements, meaning they are [qualified for automotive](#) use. These products are typically Grade 1 (125°C), but can in some cases, also be provided as Grade 0 (150°C). Further, some products are available in QFN packages with wettable flanks for better soldering characteristics and lower production test cost.



Microchip has experts on functional safety in all geographies who are ready to advise and assist you in achieving safety compliance for safety-critical automotive, industrial and medical applications. Microchip can also help you find [expert consultants](#) if advanced design services are required.

### Safety Certified Development Tools

To ease the certification of safety-critical applications, Microchip offers a range of development tools targeting safety applications: The [MPLAB® X](#) and [MPLAB XC Compiler](#) Licenses for functional safety include all the documentation and reports needed to have a fully qualified ISO 26262, IEC 61508, IEC 62304 and IEC 60730 development environment, including certification by TÜV SÜD. This can be combined with the diagnostic power of the [MPLAB Code Coverage](#) tool to further simplify your functional safety certification process.



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## The Microchip Website

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Microchip provides online support via our website at <http://www.microchip.com/>. This website is used to make files and information easily available to customers. Some of the content available includes:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip design partner program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

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## Product Change Notification Service

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Microchip's product change notification service helps keep customers current on Microchip products. Subscribers will receive email notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, go to <http://www.microchip.com/pcn> and follow the registration instructions.

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## Customer Support

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Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Embedded Solutions Engineer (ESE)
- Technical Support

Customers should contact their distributor, representative or ESE for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in this document.

Technical support is available through the website at: <http://www.microchip.com/support>

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## Microchip Devices Code Protection Feature

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Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

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