



Actel Automotive Solutions

FAQs

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1. What makes Actel automotive temperature semiconductors unique?

Actel's best-in-class offering delivers the industry's broadest portfolio of specialized automotive FPGAs, with densities ranging from 3,000 to 1,000,000 system gates. The Actel Automotive FPGA products feature select product and package options from both our high-reliability antifuse and our reprogrammable flash technologies. Actel antifuse automotive FPGAs certify the highest ambient and junction temperature of any existing FPGA solution on the market today (-40°C to +125°C ambient, +150°C junction). Actel also offers the industry's broadest package portfolio, certified to perform in extended temperature automotive applications. Actel's portfolio includes chip-scale packaging (CS 0.8mm pitch), fine-pitch ball grid arrays (FBGA 1.0mm pitch), and a variety of other packages detailed on the Actel website.

2. Why are Actel's products especially well-suited for the automotive environment?

The proven technology behind Actel FPGAs enables the most demanding high-reliability applications for use in the world's harshest environments. A well-known supplier to the military and aerospace community, Actel now brings the same benefits to designers of integrated automotive systems. Actel FPGAs are the optimal solution for rugged automotive applications that require high reliability and an extended temperature range. Actel's nonvolatile, single-chip solutions are also complemented by a broad line package portfolio, including chip-scale packages (CSP), fine-pitch ball grid arrays (FBGA), and others. This enables Actel to put more logic in much smaller packages, saving space and increasing design efficiency. Actel's antifuse FPGAs also have the advantage of being a single-chip solution. Since they do not need an external storage device to hold the chip's configuration data, the costs of an external boot PROM and its associated board space are eliminated.

3. What extended temperature range is covered by Actel's automotive products?

Actel's automotive solutions will include select Actel FPGAs that are offered with an additional application temperature range specifically suited for the rigorous environmental demands of the industry. Actel's automotive temperature range is defined as follows:

- Blank = Commercial (0° to +70°C)¹
- I = Industrial (-40°C to + 85°C)¹
- M = Military (-55°C to +125°C)¹
- A = Automotive (-40°C to +125°C)^{1, 2, 3}

1. All temperatures are specified as ambient.

2. +150°C junction for antifuse automotive solutions

3. +125°C junction for flash automotive solutions

4. What products are included in Actel's automotive temperature offering?

Actel's automotive temperature offering includes select devices from the flash-based APA product family, and the antifuse-based eX, SX-A, and MX product families. Select device package options for all automotive products are available for immediate delivery.

5. Are there dedicated datasheets for Actel's automotive products?

Unique device datasheets or datasheet supplements are available for all automotive products at www.actel.com/products/auto/info.asp. Actel has specially created this line of select products to meet the demanding environmental requirements of the automotive industry without sacrificing performance or price.

6. Are the Actel automotive solutions pin-for-pin compatible with commercial and industrial temperature devices?

All Actel-certified automotive solutions are pin-for-pin compatible with commercial and industrial products.

7. What tools are available from Actel to support designers of automotive electronics?

Actel's automotive FPGAs are supported by Actel's Libero™ Integrated Design Environment (IDE) and Actel's Designer software. Libero IDE, which includes Designer, is the most comprehensive FPGA design and development software available, providing start-to-finish design flow guidance and control for novice and experienced users. Libero IDE includes all necessary design tools to bring your automotive FPGA designs to market quickly with the highest possible device performance. By combining Actel's internally developed tools with EDA tools from industry leaders such as Mentor Graphics®, Synplicity®, Magma® and SynaptiCAD™ into a single package, Libero IDE provides users with a "one-stop shop" for all their needs. Libero's integrated development environment ensures complete tool interoperability, a streamlined design flow, management of all design files, and seamless passing of all design data between tools, from schematic/HDL entry through synthesis, simulation, place-and-route, and device programming.

8. Do Actel tools provide a flow for users who prefer to use their own tools?

For those who prefer to use their own design and verification tools, Actel Designer offers all the tools needed for design implementation. Designer is an interactive design tool that can import designs created with Libero or third-party schematic and HDL CAE tools. After completing design entry and functional verification using your preferred EDA packages simply import a standard EDIF, VHDL, or Verilog netlist into Designer for constraints, place-and-route, timing analysis, and STAPL/program file generation. Actel's FlashPro3 programming software is also included in Designer. Designer is compatible with the most popular design entry and verification packages from industry leaders such as Synopsys, Mentor Graphics, Magma, Cadence®, Model Technology™, and Synplicity.

9. What software release supports Actel automotive products?

Libero IDE v5.2 and Designer v5.2 provide support for Actel FPGAs, including the popular ProASIC^{PLUS} Flash family devices. Libero IDE v5.2 and Designer v5.2 are available as of February 3, 2004.

10. Actel offers a comprehensive intellectual property portfolio. Is there a specific IP available for Actel automotive products?

Intellectual property is an integral part of Actel's automotive program. Actel is pleased to announce a series of IP cores designed and optimized for use with Actel's automotive silicon. These cores are designed to complement the nonvolatile, secure, and low-power characteristics of Actel's FPGAs. Actel is continually expanding the list of available IPs. If you are looking for a particular function that you do not find here, please contact your local sales office to find out more about availability. The details of Actel's extensive IP portfolio are available on the Actel website at www.actel.com/products/ip/index.html.

11. Are Actel's automotive solutions secure from design theft?

All of Actel's products are nonvolatile, single-chip FPGAs that offer virtually unbreakable design security. Security is especially important for automotive engineers who design electronic appliances for in-the-cab electronics, because telematic and infotainment appliances rely on a subscription-based revenue model. As a result, manufacturers and service providers cannot afford to deliver easily compromised hardware.

12. Are Actel's automotive FPGAs tamper resistant?

All of Actel's automotive FPGAs offer automotive manufacturers the assurance that their systems will not undergo any unauthorized changes in the aftermarket. Many new automotive electronic powertrain control systems that previously utilized ASIC technology are now attracting the attention of a new generation of hackers. This new breed of hackers work to "tune" a variety of automotive products to enhance performance. Most commonly, tuners recalibrate the stock settings in a variety of on-board system components to modify fuel delivery, spark timing, and other control functions to increase performance. These changes will often create a vehicle that operates out of conformance with the manufacturer's specifications and warranty guidelines, but savvy tuners could offer the option of resetting to factory

settings to bring a damaged and overstressed vehicle back into compliance with the manufacturer's warranty for the possibility of illegal claims. Abating system reliability concerns that could result from tampering starts with the selection of secure underlying Actel FPGAs.

13. Are Actel's automotive products a low-power technology?

Actel's automotive solutions are an ideal choice for power-sensitive automotive applications. Both flash and antifuse FPGAs from Actel are true live-at-power-up technologies that do not exhibit large power-up current spikes or high current transitions.

The architectures do not require active circuitry to hold a charge, thus reducing power supply and thermal design problems. Actel's low-power architectures also eliminate the need for bulky heat management solutions, further reducing board space and system overhead. Both technologies have significantly lower dynamic power consumption than SRAM FPGAs, to further maximize power savings.

14. What types of applications will benefit from Actel automotive products?

Actel's automotive solutions are intended for in-cab telematics, infotainment, and body control functions, as well as under-the-hood drive train control, and safety systems. Typical applications might include audio, video, multimedia, navigation, safety retention system management, engine diagnostic and monitoring systems, and emergency response consoles. Because all Actel FPGAs are a single-chip solution, they are also especially well suited for flexible interconnect solutions between a variety of appliances, buses, and systems. Exceptional reliability and consistent performance make Actel's automotive solutions an ideal fit for point-to-point connections inside and around the perimeter of the passenger cabin and under the hood.

15. What is *telematics*?

The term originated in Europe and has entered the worldwide mainstream to describe automotive communications and information technologies. Telematics are typically products with communication links that combine wireless voice and data to provide location-specific security, information, productivity, and in-vehicle entertainment services to drivers and their passengers.

16. What are typical telematic applications and services available today?

A telematic system can provide numerous services to drivers. The most common is satellite navigation global positioning systems (GPS), but this is one of many platforms and services offered. Entertainment is one of the fastest-growing segments under the telematics umbrella. Many infotainment systems in today's vehicles integrate large video display panels, DVDs, and other advanced playbacks, along with video game inputs and/or consoles. Advanced audio products utilize digital compressed formats such as MP3, satellite radio, and digital audio broadcast (DAB). "Smart" receivers tie these applications together. Often built around a PC-type system, the receivers integrate voicemail, internet access, voice recognition, and text-to-speech translation.

17. In addition to telematics, what other types of automotive systems can use Actel's technology?

In addition to these telematic applications, Actel's Automotive FPGAs are also especially well-suited for a variety of control functions. In-the-cab airbag controls, engine diagnostic, and other safety monitoring systems may incorporate a variety of control functions that are an especially good fit for Actel FPGAs. Actel is also an ideal solution for low-speed serial data communication networks that enable in-cab point-to-point connections. Typical applications include electronic switches and levers networked through a control bus. There is already a wide variety of functions that can be controlled in both the dashboard cluster and the steering wheel control panel.

18. Is Actel ISO-certified?

Actel is ISO9001-qualified. Actel's ISO Registrar is DSCC (Defense Supply Center, Columbus) which is part of the Department of Defense (DoD).

19. Are Actel's sources QS9000-certified?

As the industry's leading supplier to the aerospace design community, Actel has established high standards of quality and reliability that will meet the automotive industry's requirements. All of the suppliers for Actel's automotive products are QS9000-certified.

20. Does Actel have additional quality certifications?

Actel has a comprehensive quality program in place that reinforces the concept of continuous improvement, and believes it must become an integral part of the business plan and corporate culture. Actel is also certified by the European quality consortium PURE (PEDS Used in Rugged Environments) and STACK International. As a valued supplier to the military, space, and avionics market, Actel also has full status as a QML supplier. Actel is a DoD QML-certified manufacturer of semiconductor devices for high-reliability applications. Actel's devices are controlled in every phase of manufacturing, testing, screening, storage, and shipment processes. The QML program is governed by Military Performance Specification MIL-PRF-38535. Actel's ISO Registrar is DSCC (Defense Supply Center, Columbus) which is part of the Department of Defense (DoD). DSCC is also our QML registrar.

For more information, visit our website at <http://www.actel.com>



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