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10 questions to ask a single board computer supplier.

Not all single board computers are created equal. Following are some questions you might like to ask.

01

How can you help me reduce costs?

The typical military or industrial program can have a deployed life measured in decades. As such, long term cost of ownership is a critical consideration – much more significant than initial purchase price. Ideally, any supplier will have an extensive track record of developing new products that are form-, fit- and function-compatible with their predecessors – allowing you to up-grade with minimal platform disruption at minimal cost.

The second pre-requisite for an SBC supplier is a wide-ranging, field-proven program that offers a flexible, comprehensive approach to mitigating the impact of obsolescence, enabling defensive, progressive and mixed strategies, as well as extended support, including repair.

02

How do you select parts/components and how do you secure your supply chain?

An important element of the parts selection process is that a robust, sophisti-cated counterfeit parts avoidance procedure be applied to all goods inwards.

For example, to maximize security and reliability, Abaco has a sophisticated counterfeit parts avoidance procedure. A component source approval process can also provide users with exceptional security and reliability concerns with additional peace of mind. You should ask a vendor of advanced electronics for a description of their counterfeit parts avoidance processes.

It is also important for single board computer vendors to control and secure the entire manufacturing process. All manufacturers should have the capability to manufacture entirely in-house. The advantage of in-house – rather than third party - production is that it guarantees that products cannot suffer from the insertion of parts that can potentially pose a security risk.

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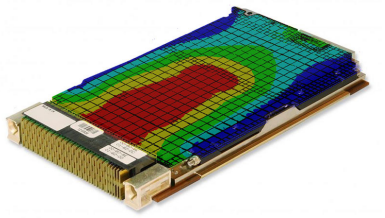
What technologies do you implement to limit the heat generated by high-performance processors?



In the SWaP-constrained environments of today's military and commercial platforms, heat management plays a vital role not only in maximizing reliability but also in delivering optimum performance. DARPA has long researched innovative cooling strategies - such as Nano Thermal Interface, Thermal Management Technology Bridge and Thermal Ground Plane.

The use of heat pipes for example, has been demonstrated to allow sufficient additional cooling beyond traditional methods that processors can be run at high temperatures yet maintain their peak performance, delivering application predictability.

SBC manufacturers need to have a range of cooling options that can be deployed to meet the challenging requirements of the most demanding programs – and the best invest in innovative heat management technologies.

What features/tools do you provide to help in the development of secure applications?

Secure applications require the support of secure hardware on which to run. The optimum security response starts at the lowest level within the system, and provides the solid foundation on which to build.

Single board computers should include a range of security features designed to assist with user-defined anti-tamper and information assurance strategies, such as volume protection, anti-tamper sensory technologies, encryption and memory sanitization. Other security functionality should include trusted/secure boot (such as Intel's Trusted eXecution Technology (TXT)) or NXP's Trusted Execution Environment (TEE)), and an inherently secure FPGA solution (such as SmartFusion2 from Microsemi, which provides a 'security hub' on which a secure strategy can be built).

What configuration management services do you offer?


Configuration Management Service

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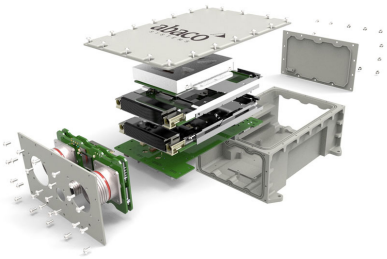
For companies who have invested significant time and effort in detailed system integration and validation, the opportunity to be an integral part of the configuration management/change approval process throughout the life of the program is an important part of their application risk-reduction.

A configuration management service (CMS) enables customers to be either informed of the changes as they occur, or be party to approval of the changes to be implemented, and management of the configuration baseline. Change approval is particularly relevant for customers who, typically, have completed the development cycle, and are ready to deploy a solution and wish to baseline the configuration.

How do you define “rugged”? Are all rugged products the same?



It is often the case that a supplier will take a product designed for commercial use in a benign environment, make changes – such as the addition of a heat sink – and declare it ‘rugged’.

In reality, ‘rugged’ should be designed in from the outset. For the most robust reliability, for example, parts will be soldered to the underlying printed circuit board – rather than being socketed. Parts can also be ‘de-rated’ in order to minimize system stress. It is possible to apply considerable ingenuity to heat paths and the use of materials in order to maximize cooling.

Optimally, every board should be temperature tested prior to shipment – with the availability of extended testing services – such as shock and vibration – for customers with specific concerns.

What processor options do you offer? Is there an optimum strategy for choosing the processors an SBC uses?

With many industrial and defense systems deployed for 7 – 20+ years, long term availability of parts is vital. Many SBC manufacturers offer a broad range of processor choices - but many of these SKUs are designed for the consumer market and are discontinued within a few years. An SBC provider should use components for which the manufacturer has committed long term support - from Intel’s embedded computing range, for example.

For many programs, ultimate performance is required. For others, minimal power consumption/heat dissipation are key. A range of performance/watt options designed to deliver an optimum solution is highly desirable. A good SBC supplier should be able to work with you to explain the trade-offs and help select the best configuration.

Do you offer multi-architecture and hybrid GPU/CPU architecture SBCs?

Intel and Power architecture multicore processors are the de facto standard for single board computers destined for use in the most demanding applications.

For the most challenging or specialist environments, compatible multiprocessor boards should be available that significantly enhance performance/slot or that are uniquely suited to applications such as graphics, video, artificial intelligence and autonomy.

Combining two Intel Core i7 processors, for example, can deliver over 600 GigaFLOPS of performance. For applications that can leverage the unique multi-core architecture of graphics processors, GPU and Intel processors can be combined to achieve well over 1.0 TeraFLOPS of throughput.

How do you help your customers develop and deploy applications as fast as possible?

The development of sophisticated, high performance applications can have a much more significant bearing on the time-to-deployment of a program than integrating and testing the underlying hardware. A complete development environment designed to minimize the cost, risk and time-to-deployment of scalable and portable high performance embedded computing solutions is needed that supports the entire development process, from design through debugging, optimization and testing.

Such a suite will ideally include an extensive range of discrete tools and libraries, as well as providing the developer with the ability to gain an intuitive understanding of how hardware resources are being used in real time to enable application tuning.

These comprehensive software tools will ideally be supported by an expert, customer-facing team experienced in the migration of HPEC applications from bench to field.

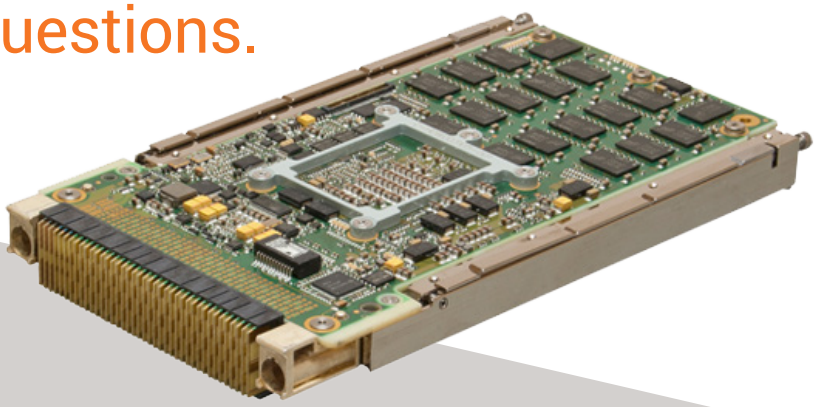
How do you maximize the reliability and availability of your SBCs?


Deployed Test Solutions

System confidence testing at start-up is vital to reliability and failure-free operation. Users need to balance the best depth of coverage for the required maximum execution time, giving a best fit to the application circumstances. Intrusive testing can provide a very high level of coverage and confidence and should be completely operating system-independent, with the test solution capable of collating results for all boards/daughter boards connected in the system.

In addition, continuous or initiated built-in test can provide enhanced levels of coverage and monitoring capability, working in collaboration with the operating system to avoid disruption to the application.

Talk to Abaco about our response to those 10 questions.



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