

## About Portwell

Portwell, Inc., a world-leading innovator in the Industrial PC (IPC) market, was founded in 1993 and entered the Industrial PC market in 1995 by developing single-board computers. Today, our continuous development of leading-edge products has resulted in strong growth in market shares and revenue, a firm place on the Taipei stock exchange (TAISDAQ), and has established Portwell as a major worldwide supplier of specialty computing application platforms and services.

Portwell, Inc. provides a complete range of industrial computing solutions, including PICMG 1.0/1.3 single board computers, COM Express and Q7 Modules, Industrial motherboards and system platforms—all delivered with advanced quality and service. Portwell serves customers in various embedded markets such as digital security surveillance, automation, transportation, gaming, medical and military.



Portwell is a Premier member of the Intel® Intelligent Systems Alliance. From modular components to market-ready systems, Intel and the 250+ global member companies of the Alliance provide the performance, connectivity, manageability, and security developers need to create smart, connected systems. Close collaboration with Intel and each other enables Alliance members to innovate with the latest technologies, helping developers take a leading role in the rise of intelligent systems.

## For More Information

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 **Portwell**  
Portwell, Inc.  
Military, Aerospace  
and Government

## Application Note



### Situation

A world-leading system integrator for military applications was looking for an Intel® based solution for their new intelligent battle management system for the US army. Key criteria were easy upgrade and maintenance. The customer selected a COM Express form factor based solutions based on the Intel QM57 chipset as the core part of the command system inside of the tank.

In the past, the customer had to design an all-in-one board from scratch and modify that design every few years to meet the ever-changing market needs. The customer decided to adopt the COM Express solution because they realized that COM Express modules can help streamline the process in five key areas:

1. Minimize current and future design risks
2. Save development time and costs during initial phase of development
3. Achieve faster time-to-market
4. Simplify the future upgrade path and scalability
5. Increase the application lifecycle.





## The Portwell COM Express Meets Intel® Core™ Processor.

Specifically, the COM Express form factor based solution safeguards development investments and lowers total cost of ownership by enabling the customer to partition the commodity host-processor COM Express module from proprietary, value-added platform building blocks, including specialty I/Os, on the carrier board of their own design. The customer decided on the Portwell PCOM-B216VG COM Express module among other elite vendors because Portwell offered them a rugged and embedded COM Express module solution with unique features tailored to meet their demands.

### Challenge



The tank is designed to perform reliably in the harsh environments like deserts or off-road combat zones. Extended temperature support is an essential criterion for stable system operation under extreme environments. The solution had to be equipped with unique features including cold start at 46°C, critical low-frequency EMI, and as-low-as-possible power consumption while maintaining maximum graphic performance. Plus, it had to be built with a strong protection mechanism that could sustain vibration to avoid data crash under unstable conditions.

### Solution

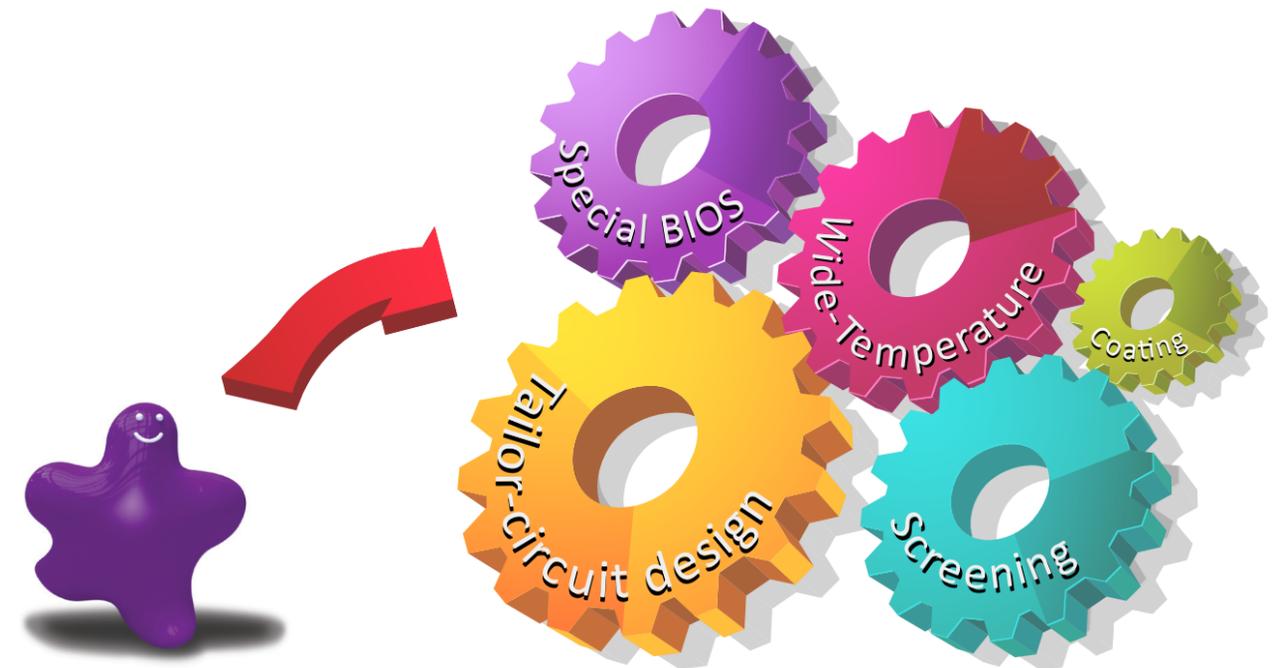


#### A truly rugged COM Express solution

From peripheral components selection, circuit design to extensive temperature validation test, Portwell had the know-how to fulfill the customer's requirement on extreme temperature, and designed a solution that could operate reliably even after a -46°C cold start. Furthermore, in order to meet the strict MIL-STD-461F standard, we perform extensive verification testings to make certain that our solution meets high-standard EMI criteria, and avoid grounding during design phases.

#### Tailor-made for rugged embedded applications

Tailor-made pin definition is one great flexibility we offer to customers looking for COM Express module solutions for unique application requirements. During the spec-in process, Portwell customized the BIOS to fine tune to the customers' complex system. We built the BIOS protection mechanism to prevent any improper data writing that might damage system boot-up, and control CPU speed to increase the efficiency of the system and also lower thermal design power (TDP). All the implemented features are design for user friendly purpose and tailor made for each specific rugged embedded solution.



#### Upgradable with time-to-market benefit

The customer first selected a Portwell solution utilizing the first generation Intel® Core™ processor family, and then has migrated to a solution based on the 3rd generation Intel® Core™ processors. Enjoying Intel x86 architecture's easy upgrading benefits, the customer needs to change only the COM Express card without extra software or hardware effort, a simple "plug and play" action that speeds up time-to-market.



# A Flexible & Rugged Solution