

Rugged IP65 Mission Computer

High-Performance Processing Unit For Military Navigation

TECHNICAL SPECIFICATIONS PRODUCT GUIDE



- ▶ Powerful GPU/CPU structure for sensor fusion to find out abnormal objects.
- ▶ MIL-STD-810G DDR4- XR-DIMM, which is extremely ruggedized and resistant to vibration and shock.
- ▶ MIL-STD-1275/704/461 compliant power module, protecting whole system against voltage surges, spikes and transients.





SR series-X3

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SR series-X3

Introduction

StackRack, a leading provider of military rugged computers, is pleased to declare a new upgrade of Rugged IP65 Mission Computer Stack Rack(SR) series! Compared with previous SR series-X2, SR series-X3 is based on Intel 7th Gen. i7-7820EQ BGA type quad-core processor, providing better Max Turbo Frequency up to 3.7 GHz while ensuring internal stability with no moving parts. Adopting NVIDIA GTX 1050 Ti graphics card (768 CUDA cores, 4GB GDDR5), SR series-X3 founded a highly efficient GPU/CPU structure for sensor fusion applications. Moreover, MIL-STD 810G/461/704/1275 compliance ensure the reliability and durability of SR series-X3. With further advantages, such as rugged connectors M12 and D38999, SR series-X3 is a perfect solution to military purposes, such as defense, marine navigation and aviation technology.

1. The Need For Military Navigation

In contrast with the past, Unmanned Navigation, Surveillance and Target Acquisition System are widely used in military and bring a great evolution in defense applications. For instance, Surveillance & Target Acquisition System now is applied to detecting and identifying potential enemy. Aimed at reacting promptly, the whole system needs several sensors to find out abnormal objects. So, in order to process a huge amount of data delivered from sensors, a high-performance processing unit is extraordinarily important for this system.

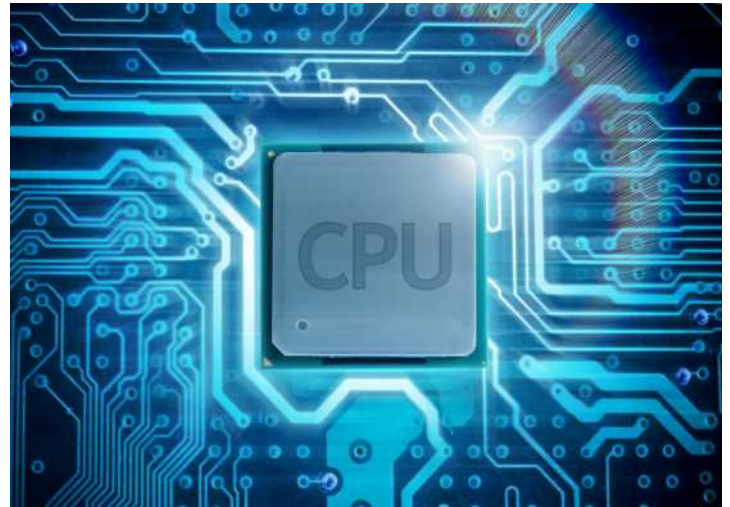


- Target Acquisition System
- Unmanned Navigation



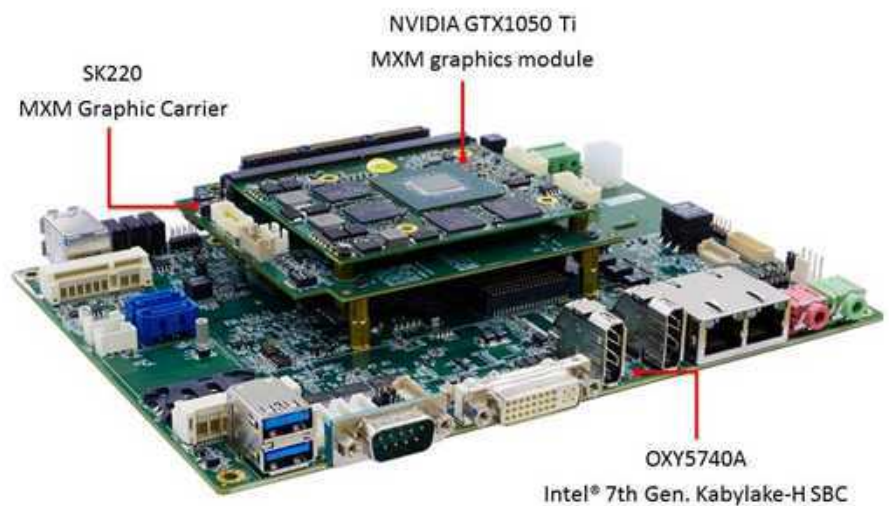


SR series-X3



2. High Performance GPU/CPU Integration

In response to the need of high-performance processing ability, SR series-X3's CPU has been upgraded to Intel 7th Gen. i7-7820EQ BGA type quad-core processor, providing better Max Turbo Frequency up to 3.7 GHz. Besides, StackRack equipped SR series-X3 with PCIe/104 GPU module which makes SR series-X3 stronger—integrating with NVIDIA GTX 1050 Ti graphics card (768 CUDA cores, 4GB GDDR5), SR series-X3 can build a powerful GPU/CPU structure for sensor fusion, which is extremely important for real-time data processing. Using an offloading process, the CPU can hand specific tasks to the GPU, and then significantly improve performance. This feature is vital for Military Navigation, Surveillance & Target Acquisition System or companies that are specialized in manufacturing and engineering computer design, scientific research, biometrics and healthcare, oil and gas, media and entertainment... etc., where a large amount of data needs to be process efficiently.





SR series-X3

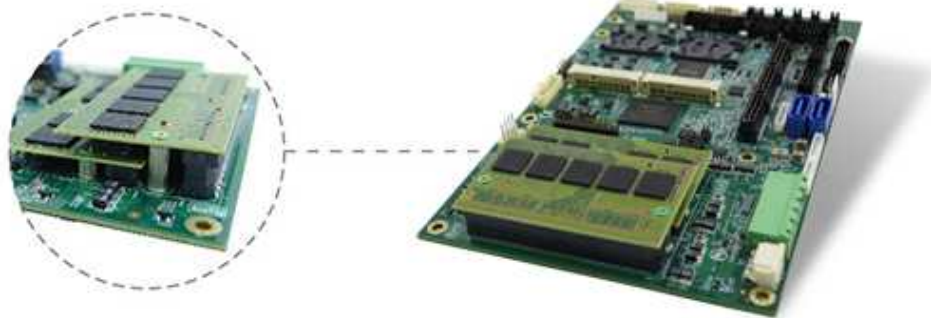
Features

1. MIL-STD 810G Guaranteed

MIL-STD tests are established by the US government to simulate how materials would hold up to harsh environments. Intending withstanding external influences, SR series-X3 is rigorously field-tested to meet or exceed MIL-STD810G criteria for extremely high & low temperature, humidity, shock, and vibration. With MIL-STD 810G compliance, SR series-X3 is undoubtedly a powerful and ruggedized military grade computer, which can overcome possible difficulties in all applications. Even in fields like mining and offshore drilling, SR series-X3 can provide equally stunning performance.

- **Extremely Rugged DDR4- XR-DIMM for Anti-Vibration&Shock**

To ease the concern that our customers may have, SR series-X3 adopts the most robust memory module—DDR4- XR-DIMM, which is extremely ruggedized and resistant to vibration and shock. Operating at high temperature, e.g., 60 degrees won't cause shut down, hence SR series-X3 is obviously appropriate for outdoor applications, where external forces can pose a threat to whole system.



- **Micro SSD Soldered On Board For Data Security**

Furthermore, Micro SSD is an undeniable advantage of SR series-X3. By using a single ball grid array (BGA) package, Micro SSD integrates key components, e.g., controller and flash in such a compact size while providing high-speed read-and-write capability. Not to mention that its characteristic Surface-Mount Technology (SMT), which means Micro SSD soldered on board can resist external forces, for instance, vibration and shock, and it's difficult to remove Micro SSD stealthily, guaranteeing data security of SR series-X3.



SR series-X3

2. MIL-STD-1275/704/461 compliance

SR series-X3 was born with MIL-STD-1275/704/461 compliant power module, protecting whole system against voltage surges, spikes and transients. By adding EMC filter design SR series-X3 is capable of providing the required level of attenuation of the unwanted signals while allowing through the wanted signals. Taking advantage of these characteristics, SR series-X3 can defeat Electromagnetic Disturbance and keep operating efficiently. Therefore, SR series-X3's products are well suited for the strictest military requirement and available deliver optimal performance in harsh conditions.

I. MIL-STD-1275

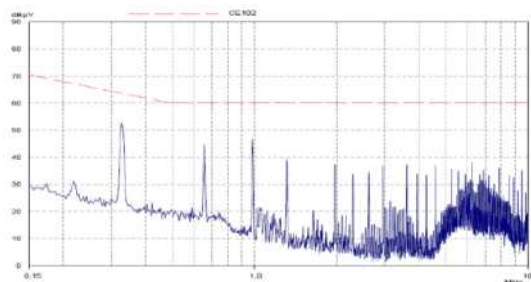
The US Department of Defense Standard MIL-STD 1275 is an immunity standard that defines a series of test conditions to be applied to the input of a 28V electrical power system within a military vehicle. These include spikes, surges, operating voltages and ripple.

II. MIL-STD-704

MIL-STD-704 Aircraft Electrical Power Characteristics that defines a standardized power interface between a military aircraft and its equipment and carriage stores, covering such topics as voltage, frequency, phase, power factor, ripple, maximum current, electrical noise and abnormal conditions (overvoltage and undervoltage), for both AC and DC systems.

III. MIL-STD-461

MIL-STD-461 is a United States Military Standard that defines how to test equipment for electromagnetic compatibility(EMC). The United States Department of Defense issued MIL-STD-461 in 1967 to integrate electromagnetic compatibility into the research and development stage for defense communications technology.



Module Compliance with MIL-STD-461C/D/E Standards

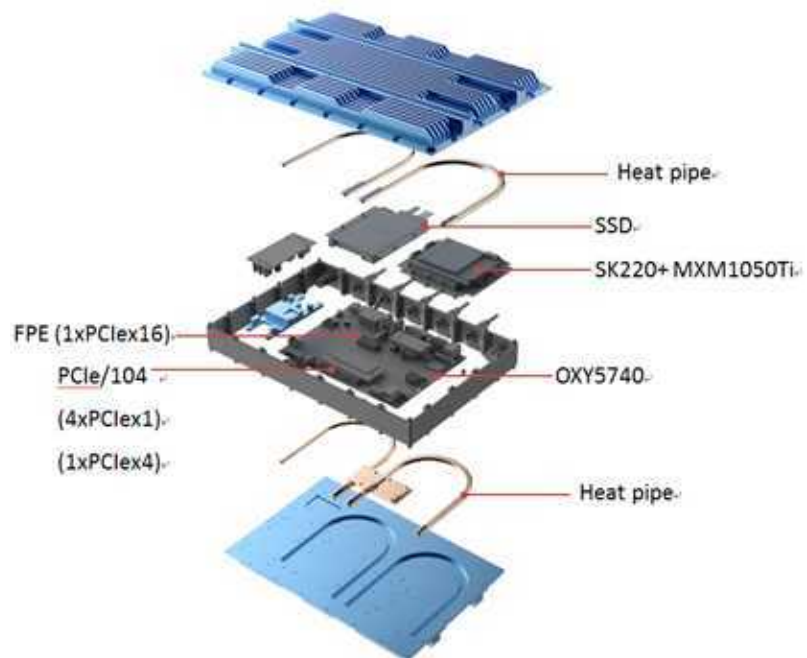
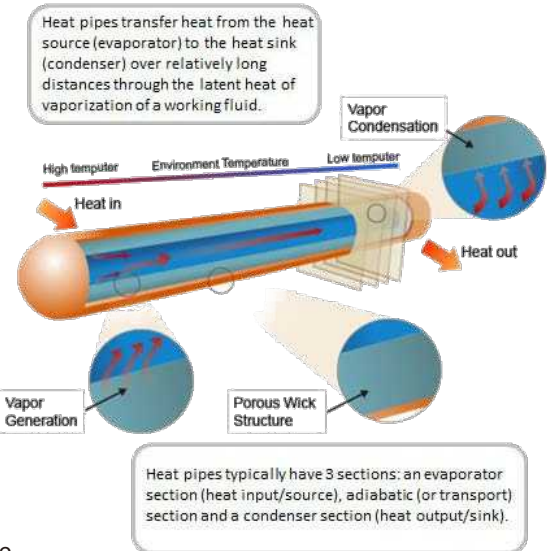




SR series-X3

3. Advanced Thermal Solutions

The unique design of StackRack's stack rack (SR) series integrate both horizontal and vertical placement. Dual-sided aluminum heat sink further secures extreme heat dissipation. In addition, StackRack incorporates exceptional heat radiating material with unique CNC cutting design, which relies heavily on the precise calculation of the efficiency of each heat dissipating component. Superior fanless design guarantees silent operation that enhances the flexibility of mobility and prevents the intrusion of dust and debris. Thus, SR series-X3 supports extended temperature operation, achieving ultimate reliability and stability.





SR series-X3

4. IP65 Classified

What's more, SR series-X3 has complete resistance to dust and water, making it even more ruggedized and reliable. With the water and dust protection up to IP65 rating, SR series-X3 can stand against the intrusion of dust, accidental contact, and water. Not just commercial grade waterproof and dustproof, it can reach Dust Tight level, which guarantees complete protection against ingress. Even the strong power of water jet won't pose a threat to it, so our customers can deploy SR series-X3 in outdoor applications without dread of possible loss caused by unpredictable invasion of water.

I. M12 Connectors

Robust and reliable M12 connectors are implemented for SR series-X3. Compact design meets rugged capability, M12 connectors can seal the connector area securely, operation can continue uninterrupted even under the most severe conditions. What makes SR series-X3 stand out from standard commercial grade product is the fact that all the connectors can be customized to U.S. Military standard connectors (D38999 series) from the famous connector manufacturer Amphenol.



II. MIL-DTL-38999 Connectors

StacRack also provides MIL-DTL-38999 Connectors as an enhanced alternative choice compared with M12. D38999 is a high-performance cylindrical connector family designed to withstand the extreme shock, exposure and vibration that are commonplace in Defense and aerospace applications. D38999 connectors are lightweight and can stand up to environmental challenges. Made with removable crimp or fixed hermetic solder contacts, these connectors provide high-vibration characteristics and are suitable for severe wind and moisture problem areas. Equipped with MIL-DTL-38999 connectors, SR series-X3 is undoubtedly durable and ruggedized enough despite operating in the harsh environment.



SR series-X3

2.5 Application



SR700-X3
Target Acquisition

Sensor fusion capability
Waterproof protection



SR100-X3
Intelligent Transportation

Advanced vibration resistance
Real-time data transmission



SR200-X3
Control Room

Multi-display support
High-speed data processing

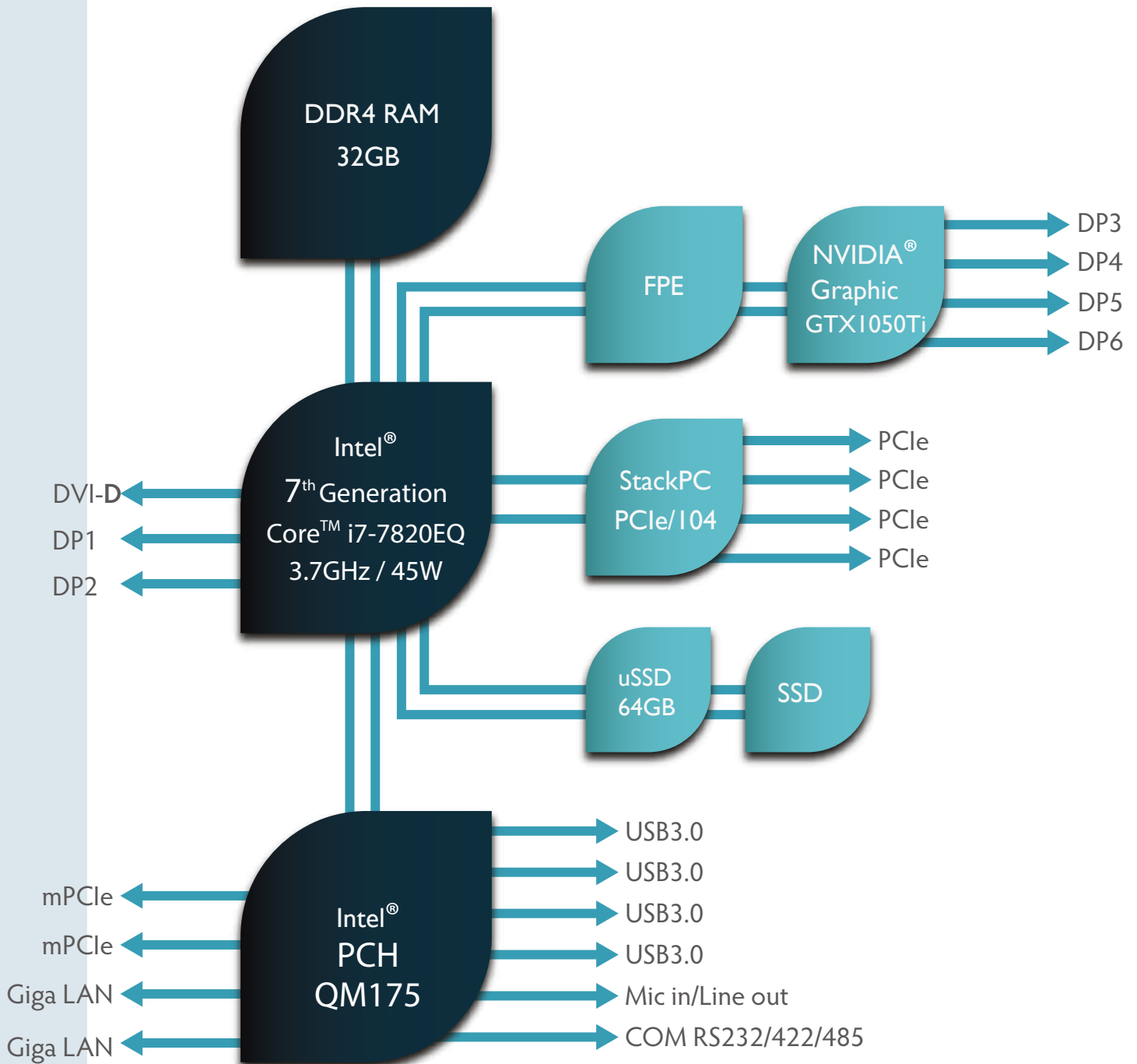
Specifications

3.1 General information

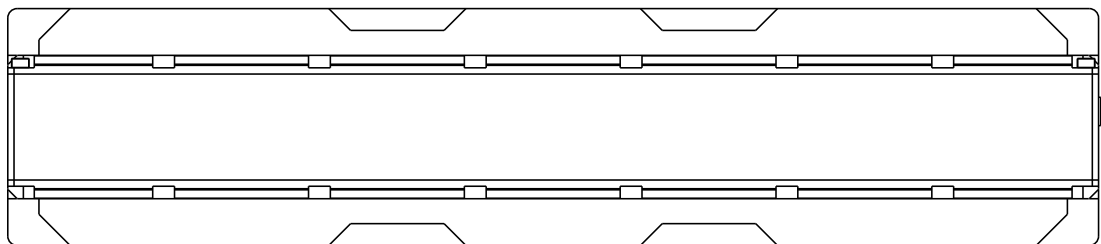
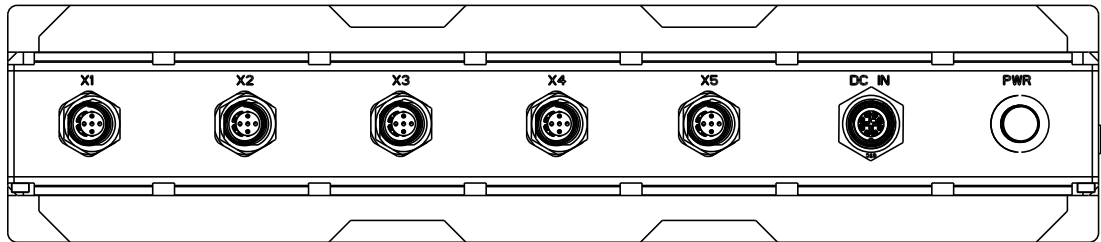
General information	
Product Name	SR700-X3
Mechanical	
Dimension	350 (W) x 230 (D) x 86 (H) mm
Weight	8.6 Kg (18.9lb)
Case	Aluminum Alloy, Corrosion Resistant
Certification	
Norms	Compliant with MIL-STD-810G standard
Conformity	EMC: CE and FCC compliance
Electrical	
Input power supply voltage	9V to 36V DC-in
Environmental	
Operating temperature	-20°C to 60°C
Operating humidity:	10 % to 90 % R.H. (40°C @ 95% RH Non-condensing)
Storage:	-40°C to 85°C
Front I/O	
Power button	Waterproof Power Button with LED backlight
Power Input	1 x DC input (Rugged M12 connector)
X1	2 x USB (Rugged M12 connector)
X2	1 x GbE LAN ,10/100/100 Mbps, (Rugged M12 connector)
X3	1 x GbE LAN ,10/100/100 Mbps, (Rugged M12 connector)
X4	1 x DVI-D (Rugged M12 connector)
X5	1 x RS232/422/485 (Rugged M12 connector)
PC Embedded	
CPU Type	Intel® Kaby Lake Core™ i7-7820EQ (3.0/3.7GHz, 4 Cores, 45W)
CPU cache	8MB
Chipset	Intel® QM175 Chipset
RAM	32 GB DDR4
Storage	Onboard Micro SSD 64GB
Display	
Graphics Card	NVIDIA GeForce® GTX 1050 Ti (768 CUDA cores, 4GB GDDR5)

MIL-STD SR700-X3

3.2 Block Diagram



APPEARANCE



DIMENSIONS

