SK513-T7BD

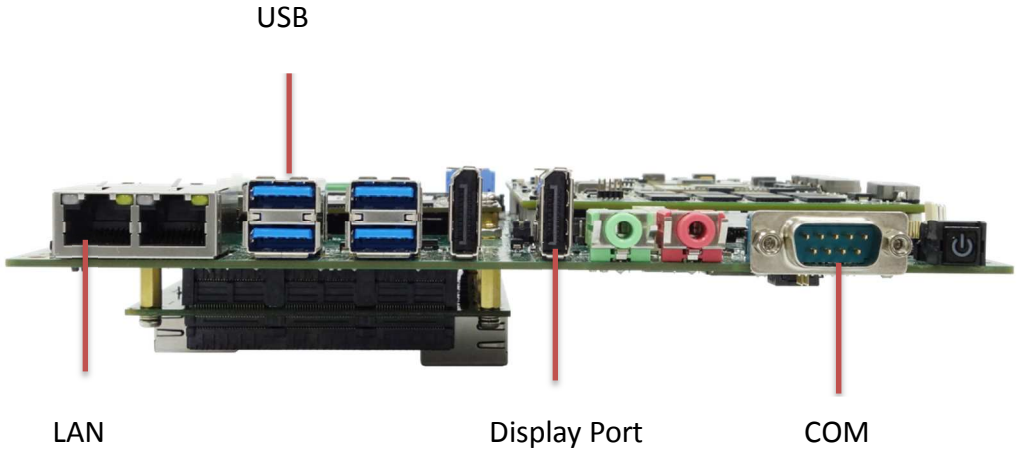
COM Express Type7 + GPU Embedded System

- **High-End CPUs with latest generation x86 processors in a ruggedized small form factor**
- **Up To 6 Display port**
- **2 x VGA, 1 x LVDS, 4 x COM, 6 x USB, 2 2 x mini PCIe, 1 x M.2, 2 x SATA**
- **9-36V DC-IN**

INDEX

Instructions

COM Express, a computer-on-module (COM) form factor, is a highly integrated and compact PC that can be used in a design application much like an integrated circuit component. The COM Express Module integrates core CPU and memory functionality, the common I/O of a PC/AT, USB, audio, graphics (PEG), and Ethernet.
SK513 feature a range of Intel processors, up to the latest Intel Core series. SK513 are built to operate in harsh environmental conditions, the operating temperatures as low as -40°C to as hot as 85°C. From low power consumption to high performance processing power, SK513 are built to suit a wide range of computing applications from signal processing to unmanned vehicles and more.

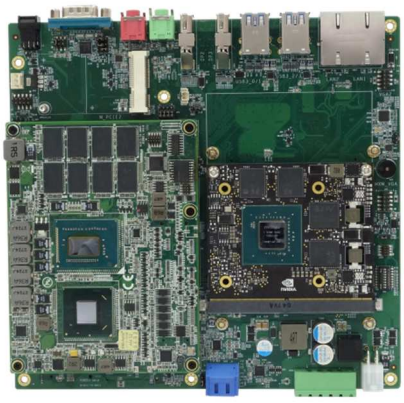


Key Features of SK513

(1)Efficiency product design

(2) Fast system integration

(3) Rich Expansion Slot



GPU Products List

GPU	CUDA Cores
Quadro	P3000 (1280 CUDA Cores, 75W) P5000 (2560 CUDA Cores, 100W) RTX3000 (1920 CUDA Cores, 80W) RTX5000 (3072 CUDA Cores, 110W)
GeForce	RTX2060 (2176 CUDA Cores, 175W) GTX1080 (XXX CUDA Cores, 180W) GTX1660S (1048 CUDA Cores, 95W) GTX1050Ti (768 CUDA Cores, 75W)

Description of Key Features

(1)Efficiency product design

In order to design all kinds of products in the shortest time, the COM Express provide a better way to improvement the process. SK513 does not only provide the COM Express carrier board, but also MXM, PCIe, M.2 and mimi PCI slot, will make the preliminary verification work more efficient. The solutions include:

- Mimi PCIe Expansion: 2x full size mimi PCIe (1 with mSATA support)
- M.2 Expansion: 1x 2280 M key (SATA only)
- PCIe/104 Expansion: 4x PCI x1, 1x PCIe x4, 5 xUSB, 1 LPC, 1X SPI

(2) Fast system integration

SK513 is the fanless design for pass environment test, ex: IP65, MIL-STDG. No need to find the problem until the end, and confirm the design direction as soon as possible.

At the same time, SK513 use the mezzanine standard, mainly is used in industrial computers. Being mezzanines, they are always plugged on a carrier PCB that supports this format. The modules communicate with their carrier over a dedicated bus, and can have all kinds of special functions. All I/O signals are mapped to two high densities, low profile connectors on the bottom side of the module. COM Express employs a mezzanine-based approach. The COM modules plug into a baseboard that is typically customized to the application. Over time, the COM Express mezzanine modules can be upgraded to newer, backwards-compatible versions. COM Express is commonly used in Industrial, Military/Aerospace, Gaming, Medical, Transportation, IoT, and Computing embedded applications.

(3) Rich Expansion Slot

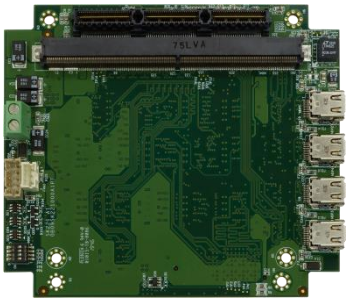
SK-513 provides rich expansion to make the whole solutions easier.

MXM

SK220

- PCIe/104 (Type 2) MXM-GPU Carrier
- Utilizes PCIe x16 and PCIe x4, x1 link
- 1VGA & 6 Mini DisplayPort
- MXM 3.0 and 3.1 graphic card support
- GTX1080, RTX2060S,Quadro RTX5000 support by separate DC-In
- Type A and Type B MXM graphic card and support
- Operating Temp: -40°C to 85°C

SK221



- PCIe/104 (Type 2) MXM- GPU Carrier
- Utilizes PCIex16 and x4 Link
- 1 x VGA & 4 x Mini DisplayPort Module
- 12V DC Input
- MXM 3.0 and 3.1 Graphic Card support Type A and Type B MXM GPU
- Support up to NVIDIA GeForce GTX1080M (180W), Quadro RTX5000, RTX3000
- Operating Temp. -40°C to 85°C

NIC

SK506

- StackPC-FPE form factor
- PCIe/104 stackable bus structure
- Reliable Ethernet technology from Intel i350-AM4 controllers
- total 6 independent LAN connections (2 from host board, 4 from Intel controllers)
- Flexible options for Ethernets through RJ45 or 10 pin-headers
- High-performing bridgeless design supporting PCI Express Gen 2.1 5GT/s
- Extended temperature -40°C to 85°C

SK502

- Intel® X710-BM2 Controller
- 2 10GbE/1GbE SFP+ ports
- PCIe Gen.3 x4 host interface
- Rugged Stackable PCIe/104 form factors
- Supports 10GBASE-SR / 10GBASE-LR / 10GBASE-DAC / 10GBASE –GBIC module
- Supports SR-IOV based virtualization

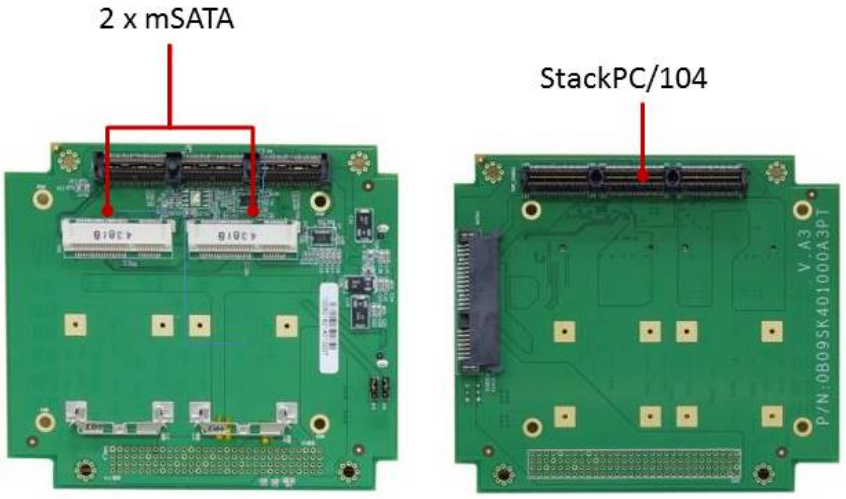
COM

SK303

- **PCI/104-Express, PCI & PCIe connectors (w/StackPC design)**
- **PCIe/104 stackable bus structure**
- **PCIe to PCI adapter function**
- **COM: 4 x RS232/422/485 with 5V/12V selectable and isolation function**
- **Extended Temp.: -40°C to 85°C**

Storage

SK401



- **PCIe/104 stackable bus structure**
- **Supports 1 x 2.5" SSD, 2 x Mini PCIe slots**
- **Supports 2 x mSATA SSD slot, compatible with JEDEC MO-300B**
- **SATAII interface supports 1.5Gbps/3.0Gbps**
- **Reserve PCI/104 connector for different stacking criteria**
- **Extended temperature -40°C to 85°C**

Specifications

Processor & System	
COM Express CPU Module (Type 7)	Intel® Xeon® D-1577 (Broadwell-D D1577, 16 Cores/32 Threads, 24M Cache, up to 2.10 GHz), 45W Intel® Xeon® D-1559 (Broadwell-D D1559, 12 Cores/24 Threads, 18M Cache, up to 2.10 GHz), 45W Intel® Xeon® D-1539 (Broadwell-D D1559, 8 Cores/16 Threads, 12M Cache, up to 2.20 GHz), 35W
GPU	
Quadro	P3000 (1280 CUDA Cores, 75W) P5000 (2560 CUDA Cores, 100W) RTX3000 (1920 CUDA Cores, 80W) RTX5000 (3072 CUDA Cores, 110W)
GeForce	RTX2060 (2176 CUDA Cores, 175W) GTX1080 (XXX CUDA Cores, 180W) GTX1660S (1048 CUDA Cores, 95W) GTX1050Ti (768 CUDA Cores, 75W)
Ethernet	
LAN	Dual Gigabit (10/100/1000) Ports 1x Intel i210IT, 1 x from COM Express
Rear I/O	
USB	4 x USB 3.0
LAN	2 x RJ45
Serial Port	1 x RS232/422/485
Audio	1 x 3.5mm Audio Jacks (1 x MIC-IN, 1 x LINE-OUT)
Display	2 x DP
Internal I/O	
MXM	1 (Socket)
SATA Port	2 (up to 6Gb/s)(Pin header)
SATA Power	2 (Pin header)
MXM VGA	1 (Pin header)
MXM DC IN	1 (Pin header)
MXM DP	2 (Pin header)
MB DC IN	1 (Pin header)
LVDS	1 (Pin header)
LVDS Backlight	1 (Pin header)
COM (RS232/422/485)	3 (1X10Pin, 2.0Pitch)(Pin header)
USB 2.0	2 (Pin header)
DIO	8 Bit (4DI/4DO) (Pin header)
Battery Header	1 (Pin header)
eSPI/LPC	1 (Pin header)

Header	
Expansion Slot	
MXM	1 (MXM3.1 Type B)
PCIe/104	1
mPCIe	2 x Full-size mini PCIe (USB+PCIe) ; 1 x with mSATA supported
SIM Slot	1
M.2	1 x M.2 2280 M-Key Slot (SATA only)
Power Management	
ACPI	ACPI 3.0
Sleep State	S0, S1, S4, S5
Mechanical and Environmental	
Form Factor	Proprietary
Power Type	9~36V DC IN(For System, 4P Terminal Block) ; 12V DC IN(For MXM, ATX 4P)
Dimension	190 mm x 185 mm (Plan)
Operating Temperature	- 40℃ ~ 85℃
Storage Temperature	- 40℃ ~ 85℃
Relative humidity	10% to 90%, non-condensing
Accessories	
SINK+ FAN Kit	CPU(SINK)+MXM(SINK+FAN)
Standard Compliance	
Standard Compliance	CE/FCC

Ordering Information	
SK513-T709Q01	CPU Board : D-1577 / MXM GPU : Quadro P3000
SK513-T709Q02	CPU Board : D-1577 / MXM GPU : Quadro P5000
SK513-T709Q03	CPU Board : D-1577 / MXM GPU : Quadro RTX3000
SK513-T709Q04	CPU Board : D-1577 / MXM GPU : Quadro RTX5000
SK513-T709G01	CPU Board : D-1577 / MXM GPU : RTX2060S
SK513-T709G02	CPU Board : D-1577 / MXM GPU : GTX1080
SK513-T709G03	CPU Board : D-1577 / MXM GPU : GTX1660S
SK513-T709G04	CPU Board : D-1577 / MXM GPU : GTX1050Ti
SK513-T710Q01	CPU Board : D-1559 / MXM GPU : Quadro P3000
SK513-T710Q02	CPU Board : D-1559 / MXM GPU : Quadro P5000
SK513-T710Q03	CPU Board : D-1559 / MXM GPU : Quadro RTX3000
SK513-T710Q04	CPU Board : D-1559 / MXM GPU : Quadro RTX5000
SK513-T710G01	CPU Board : D-1559 / MXM GPU : RTX2060S
SK513-T710G02	CPU Board : D-1559 / MXM GPU : GTX1080
SK513-T710G03	CPU Board : D-1559 / MXM GPU : GTX1660S
SK513-T710G04	CPU Board : D-1559 / MXM GPU : GTX1050Ti
SK513-T711Q01	CPU Board : D-1539 / MXM GPU : Quadro P3000
SK513-T711Q02	CPU Board : D-1539 / MXM GPU : Quadro P5000
SK513-T711Q03	CPU Board : D-1539 / MXM GPU : Quadro RTX3000
SK513-T711Q04	CPU Board : D-1577 / MXM GPU : Quadro RTX5000
SK513-T711G01	CPU Board : D-1577 / MXM GPU : RTX2060S
SK513-T711G02	CPU Board : D-1577 / MXM GPU : GTX1080
SK513-T711G03	CPU Board : D-1577 / MXM GPU : GTX1660S
SK513-T711G04	CPU Board : D-1577 / MXM GPU : GTX1050Ti

Block Diagram