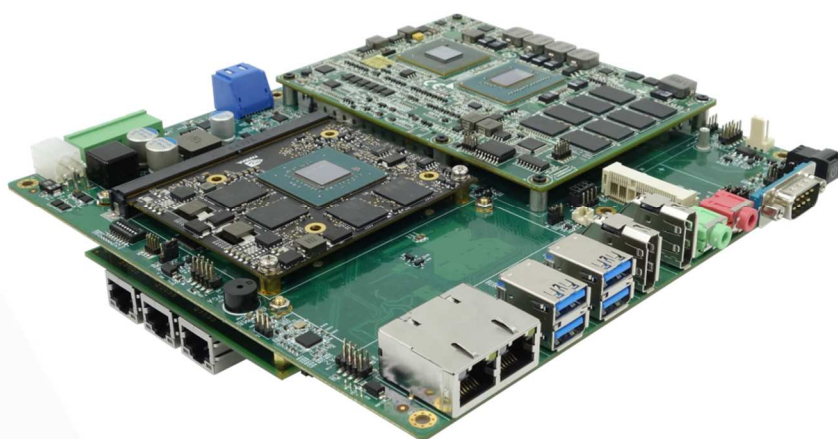




# SKY19 50513

## COM EXPRESS TYPE 6/7 CARRIER BOARD

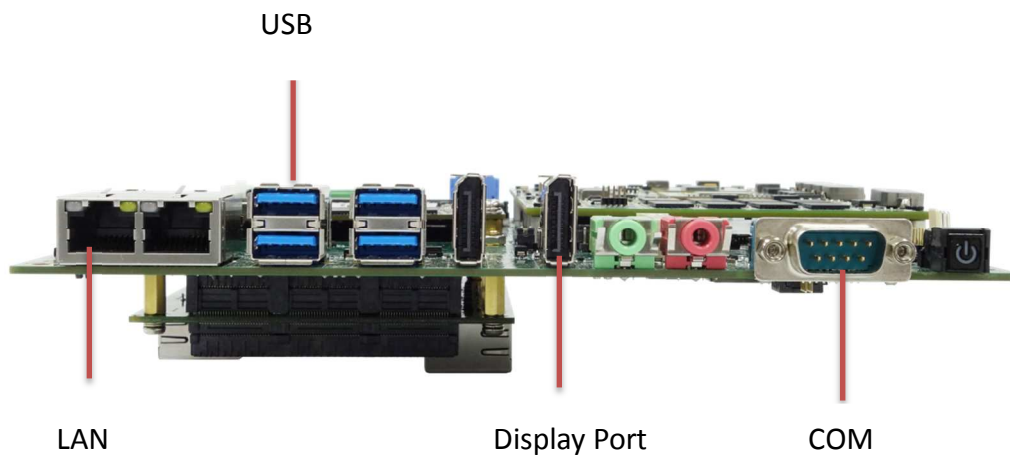


- High-End CPUs with latest generation x86 processors in a ruggedized small form factor
- Up To 6 Display port
- 2 x VGA, 1 x LVDS, 4 x COM, 6 x USB, 2 2 x mini PCIe, 1 x M.2, 2 x SATA
- 9-36V DC-IN

## 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.

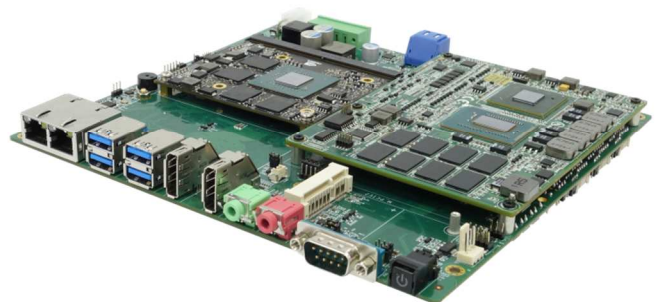
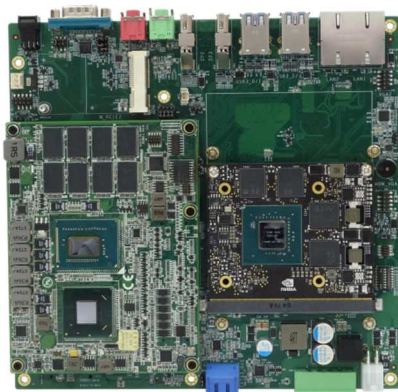
SK513 feature a range of Intel processors, up to the latest Intel Core series. SK513 are built to operate in harsh environmental conditions, the operating temperatures as low as -40°C to as hot as 85°C. From low power consumption to high performance processing power, SK513 are built to suit a wide range of computing applications from signal processing to unmanned vehicles and more.



## Key Features of SK513

- (1) Efficiency product design
- (3) Rich Expansion Slot

- (2) Fast system integration



## CPU/GPU Table

All Operating Temperature meet from 0°C to +55°C.

Could Customize the Operating Temperature from -40°C to +70°C.

### Type 6 CPU Products List

	CPU		SPEC
9th CPU	Intel® Xeon® E-2276M	45W	Coffee Lake 9th Gen, 6 x 2.8 / 4.7 GHz, 12MB cache
9th CPU	Intel® Core™ i7-9850EQ	45W	Coffee Lake 9th Gen, 6 x 2.7 / 4.4 GHz, 9MB cache
9th CPU	Intel® Core™ i7-9850HE	45W	Coffee Lake 9th Gen, 6 x 2.7 / 4.4 GHz, 9MB cache
7th CPU	Intel® Core™ i7-7820EQ	45W	Kaby Lake 7th Gen, 4 x 3.0 / 3.7 GHz, 8MB cache
6th CPU	Intel® Core™ i7-6822EQ	25W	Sky Lake 6th Gen, 4 x 2.0 / 2.8 GHz, 8MB cache
6th CPU	Intel® Core™ i7-6820EQ	25W	Sky Lake 6th Gen, 4 x 2.0 / 2.8 GHz, 8MB cache
6th CPU	Intel® Xeon® E3-1505M v6	45W	Kaby Lake 6th Gen, 4 x 3.0 / 4.0 GHz, 8MB cache
6th CPU	Intel® Xeon® E3-1505L v6	25W	Kaby Lake 6th Gen, 4 x 2.2 / 3.0 GHz, 8MB cache

### Type 7CPU Products List

	CPU		SPEC
Intel® Xeon® D	Express-BD7-D1559	45 W	Basic COM Express Type7 module with Intel Broadwell-DE D1559, 12C (eTEMP)
Intel® Xeon® D	Express-BD7-D1539	35 W	Basic COM Express Type7 module with Intel Broadwell-DE D1539, 8C (eTEMP)
Intel® Pentium®	Express-BD7-D1519	25 W	Basic COM Express Type7 module with Intel Broadwell-DE D1519, 4C (eTEMP)
Intel® Xeon® D	Express-BD7-D1577	45 W	Basic COM Express Type7 module with Intel Broadwell-DE D1577, 16C
Intel® Xeon® D	Express-BD7-D1548	45 W	Basic COM Express Type7 module with Intel Broadwell-DE D1548, 8C
Intel® Xeon® D	Express-BD7-D1527	35 W	Basic COM Express Type7 module with Intel Broadwell-DE D1527, 4C
Intel® Pentium®	Express-BD7-D1508	25 W	Basic COM Express Type7 module with Intel Broadwell-DE D1508, 2C

## GPU Products List

GPU	CUDA Cores		Average Score
NVIDIA® GeForce™ RTX 2060	1920 CUDA Core	160W	14732
NVIDIA® Quadro® P5000	2560 CUDA core	180W	12040
NVIDIA® Quadro® P3000	1280 CUDA core	75W	6522
NVIDIA® GeForce™ GTX 1080	2560 CUDA Core	180W	14691
NVIDIA® GeForce™ GTX 1660SUPER	1408 CUDA Core	120W	12705
NVIDIA® GeForce™ GTX 1050Ti	768 CUDA Core	75W	6431
NVIDIA® GeForce™ GTX 1050	640 CUDA Core	75W	5701
SK210-GT730M-StackPC	384 CUDA Core	49W	807

## 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 2290 M key (SATA only)
- PCIe/104 Expansion: 4x PCI x1, 1x PCIe x4, 5 xUSB, 1 LPC, 1X SPI



## (2) Fast system integration

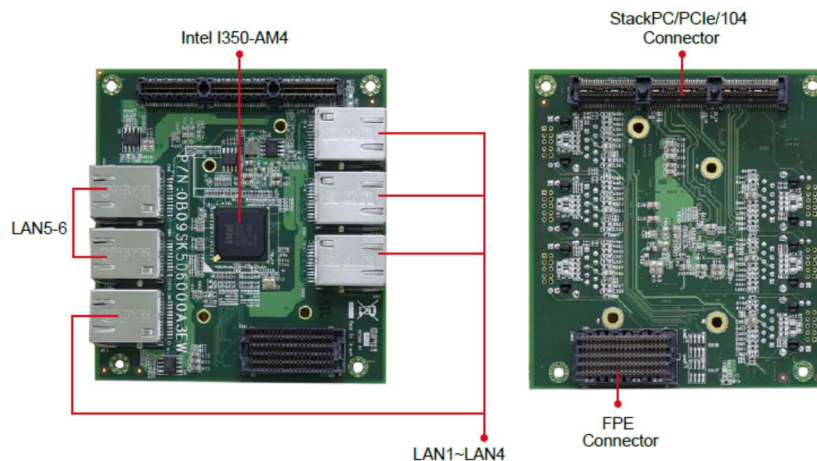
SK513 is the fanless design for pass environment test, ex: IP65, MIL-STDG. No need to find the problem until the end, and confirm the design direction as soon as possible.

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.

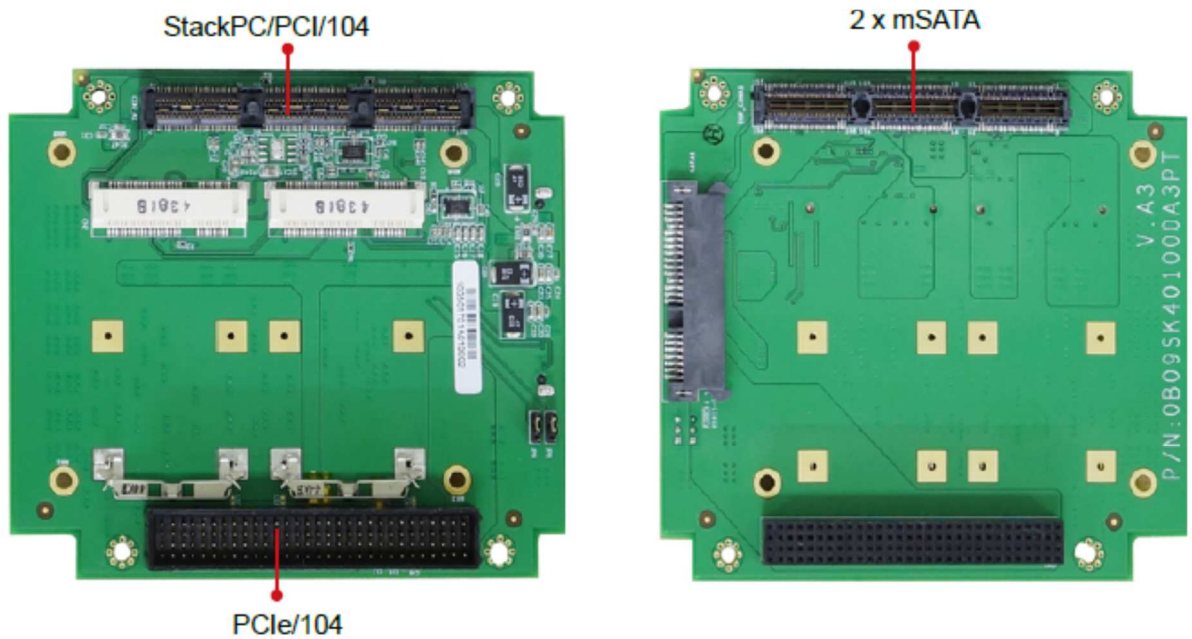
## (3) Rich Expansion Slot

SK-513 provides rich expansion to make the whole solutions easier. We could use PCIe 104 related product SK506, SK303 , SK1050 and SK1660 :

- 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 to 85°

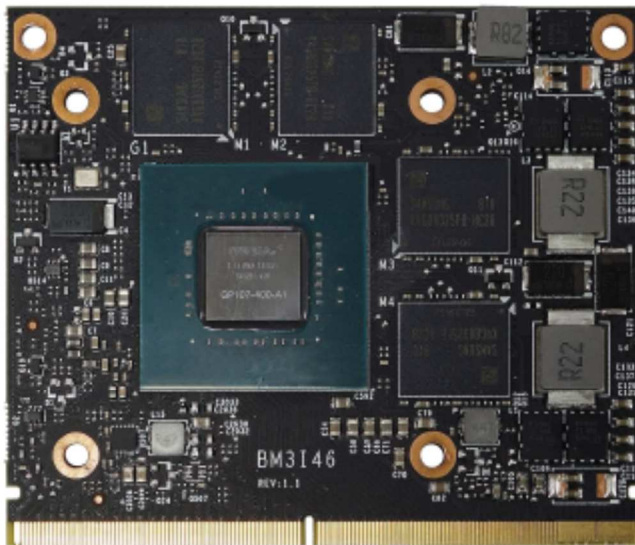


- SK401
  - StackPC form factor
  - PCIe/104 stackable bus structure
  - Reserve PCI/104 connector for different stacking criteria
  - Extended temperature -40 to 85°C



- 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 ~ 85°C
- SK1050-NVIDIA GTX1050Ti MXM 3.1 Graphics Module
  - Powered by NVIDIA GeForce® GTX1050Ti
  - MXM 3.1Type-A Module
  - High-speed 4GB GDDR5 Memory
  - 768 new-gen. Pascal architecture CUDA cores
  - Outputs 4 Channel Support

- DisplayPort 1.2 Certified, DisplayPort 1.3/1.4 Ready
- Support NVIDIA CUDATM, OptimusTM, DirectX® 12, OpenGL® 4.5



- SK1660S
  - NVIDIA GTX 1060SUPER MXM 3.1 Graphics Module
  - Powered by NVIDIA GeForce® GTX 1060SUPER
  - MXM 3.1Type-B Module
  - 192-bit, 6GB GDDR6 Memory
  - Outputs 4 Channel Support
  - Support NVIDIA CUDA, DirectX® 12, OpenGL® 4.6

# Specifications

## SYSTEM

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COM Express CPU Module (Type 6)	Intel® Xeon® E-2276M (CoffeeLake 9th Gen, 6 x 2.8/4.7 GHz, 12MB cache, 45W)
	Intel® Core™ i7-9850EQ (CoffeeLake 9th Gen, 6 x 2.7/4.4 GHz, 9MB cache, 45 W)
	Intel® Core™ i7-9850HE (CoffeeLake 9th Gen, 6 x 2.7/4.4 GHz, 9MB cache, 45W)
	Intel® Core™ i7-7820EQ (KabyLake 7th Gen, 4 x 3.0/3.7 GHz, 8MB cache, 45W)
	Intel® Core™ i7-6820EQ (SkyLake 6th Gen, 4 x 2.0/2.8 GHz, 8MB cache, 25W)
	Intel® Xeon® E3-1505L v6 (KabyLake 6th Gen, 4 x 2.2/3.0 GHz, 8MB cache, 25W)
	Intel® Xeon® E3-1505M v6 (KabyLake 6th Gen, 4 x 3.0/4.0 GHz, 8MB cache, 45W)

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COM Express CPU Module (Type 7)	Express-BD7-D1559 Basic COM Express Type7 module with Intel Broadwell-DE D1559, 12C (eTEMP)
	Express-BD7-D1539 Basic COM Express Type7 module with Intel Broadwell-DE D1539, 8C (eTEMP)
	Express-BD7-D1519 Basic COM Express Type7 module with Intel Broadwell-DE D1519, 4C (eTEMP)
	Express-BD7-D1577 Basic COM Express Type7 module with Intel Broadwell-DE D1577, 16C
	Express-BD7-D1548 Basic COM Express Type7 module with Intel Broadwell-DE D1548, 8C
	Express-BD7-D1527 Basic COM Express Type7 module with Intel Broadwell-DE D1527, 4C
	Express-BD7-D1508 Basic COM Express Type7 module with Intel Broadwell-DE D1508, 2C

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Compatibility	COM Express® TYPE 6/7
<b>DISPLAY</b>	
Display Port	2 x Display port form COM Express, 4 x outputs from GPU, 6 x total
VGA	1 x output from COM Express,
LVDS	1x18-24-bit LVDS, 1 x outputs from GPU
<b>STORAGE</b>	
SATA	2 x
M.2	1 x M key, 2280, SATA only
MSATA	1x
<b>ETHERNET</b>	
Ethernet	Dual Gigabit (10/100/1000) Ports 1x Intel i210IT, 1 x from COM Express
<b>I/Os</b>	
USB	4 x USB 3.0
Serial Port	4 x RS232/422/485
Audio	2 x 3.5mm Audio Jacks (1 x MIC, 1 x Line-Out)
<b>EXPANSION</b>	
PCIe/104	4 x PCIe x 1 1 x PCEe x 1 5 x USB 2.0 1 x LPC 1 x SPI

## MECHANICAL AND ENVIRONMENTAL

Power Type	DC-IN 9~36V
Dimension	160 x 185 mm
Operating Temp	-40 to 85°C
Storage Temp	-40 to 85°C
Relative Humidity	15% to 95%, non-condensing

## Ordering Information

Model	No.	Description
SK513	S51301	SK506 LAN port Module
SK513	S51302	SK401 PCIe Module
SK513	S51303	SK303 COM port Module
SK513	S51304	SK1050-NVIDIA GTX1050Ti MXM 3.1 Graphics Module
SK513	S51305	SK1660S-NVIDIA GTX1600SUPER MXM 3.1 Graphics Module

# Block Diagram

