

513- 1760

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

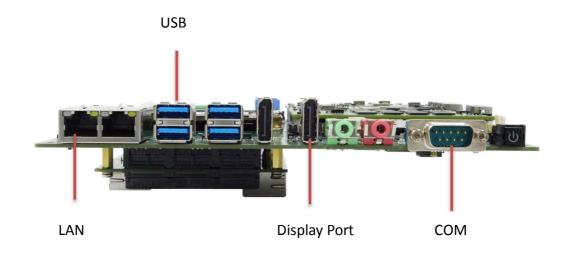
INTRODUCTION KEY FEATURE SYSTEM SPEC ORDERING INFORMATION Block Diagram



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







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

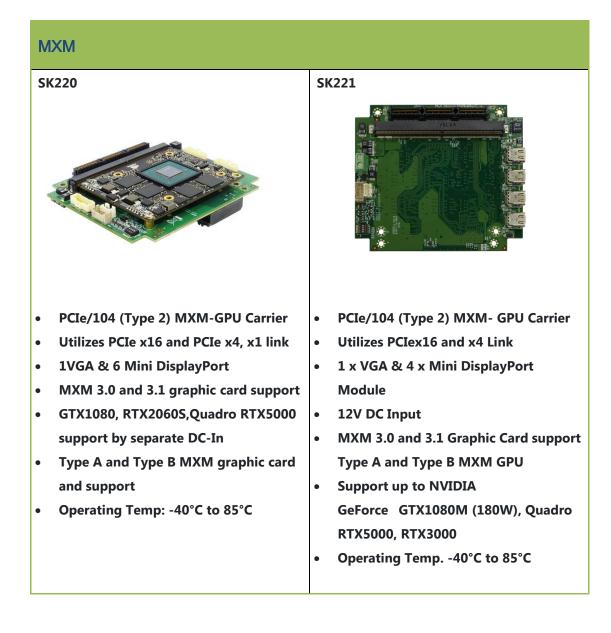
SK513 is the fanless design for pass environment test, ex: IP65, MIL-STDG. No need to find the problem until the end, and confirm the design direction as soon as possible. At the same time, SK513 use the mezzanine standard, mainly is used in industrial computers. Being mezzanines, they are always plugged 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.





NIC

SK506

SK502

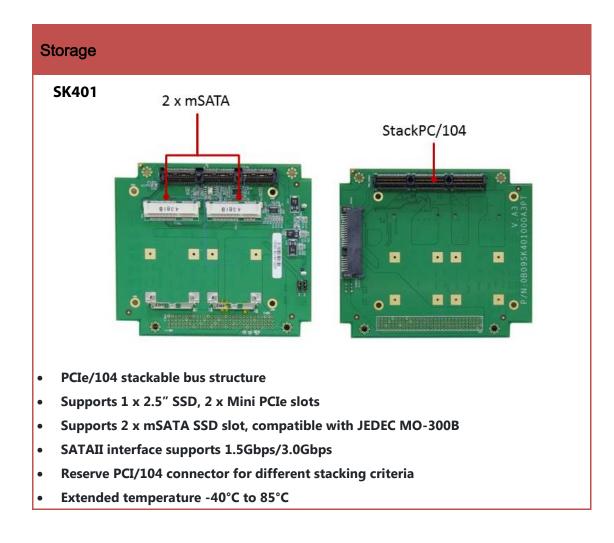


- StackPC-FPE form factor
- PCIe/104 stackable bus structure
- Reliable Ethernet technology from
 Intel i350-AM4 controllers
- total 6 independent LAN connections (2 from host board, 4 from Intel controllers)
- Flexible options for Ethernets through RJ45 or 10 pin-headers
- High-performing bridgeless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



- 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





Specifications

COM ExpressIntel® Xeon® D-1577 (Broadwell-D D1577, 16 Cores/32 Threads, 24M Cache, up to 2.10 GHz), 45W(Type 7)Intel® Xeon® D-1559 (Broadwell-D D1559, 12 Cores/24 Threads, 18M Cache, up to 2.10 GHz), 45WIntel® Xeon® D-1539 (Broadwell-D D1559, 8 Cores/16 Threads, 12M Cache, up to 2.20 GHz), 35WGPUQuadroP3000 (1280 CUDA Cores, 75W)RTX3000 (1920 CUDA Cores, 100W)RTX3000 (1920 CUDA Cores, 100W)RTX5000 (302 CUDA Cores, 10W)GFTOCERTX2060 (2176 CUDA Cores, 15W)GTX1080 (XXX CUDA Cores, 15W)GTX1080 (XXX CUDA Cores, 75W)ETHERNETLANDual Gigabit (10/100/1000) Ports 1 x Intel i210T, 1 x from COM ExpressRAN2 x RJ45Serial Port1 x RS322/422/485Audio1 x RS322/422/485Audio1 (Sock1)SATA Pore2 (up to G6b/s)(Pin header)SATA Pore2 (up to G6b/s)(Pin header)MXM UGA1 (Pin header)MXM DCIN1 (Pin header)MXD DCIN1 (Pin header)<	PROCESSOR &	SYSTEM
(Type 7) 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 OPU Quadro P3000 (1280 CUDA Cores, 75W) P5000 (2560 CUDA Cores, 100W) RTX5000 (3072 CUDA Cores, 10W) GTX1000 (1920 CUDA Cores, 175W) GTX1080 (XXX CUDA Cores, 175W) GTX1080 (XXX CUDA Cores, 175W) GTX1050Ti (768 CUDA Cores, 75W) GEForce RTX2060 (2176 CUDA Cores, 75W) GTX1050Ti (768 CUDA Cores, 75W) ETHERNET LAN Dual Gigabit (10/100/1000) Ports 1x Intel i210T, 1 x from COM Express REAR I/D USB 4 x USB 3.0 LAN 2 x R145 Serial Port 1 x 85232/422/485 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) MXM DC IN 1 (Pin header) MXM DD X 1 (Pin header) USB 2.0	COM Express	Intel® Xeon® D-1577 (Broadwell-D D1577, 16 Cores/32 Threads, 24M Cache, up
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Serial Port1 x RS232/422/485Audio1 x 3.5mm Audio Jacks (1 x MIC-IN, 1 x LINE-OUT)Display2 x DPINTERNAL I/OMXM1 (Socket)SATA Port2 (up to 6Gb/s)(Pin header)SATA Power2 (up to 6Gb/s)(Pin header)MXM VGA1 (Pin header)MXM DC IN1 (Pin header)MXM DP2 (Pin header)MXM DP2 (Pin header)MDS1 (Pin header)MXM DP3 (17) (Pin header)LVDS1 (Pin header)LVDS3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	USB	4 x USB 3.0
Audio1 x 3.5mm Audio Jacks (1 x MIC-IN, 1 x LINE-OUT)Display2 x DPINTERNAL I/OMXM1 (Socket)SATA Port2 (up to 6Gb/s)(Pin header)SATA Power2 (Up to 6Gb/s)(Pin header)MXM VGA1 (Pin header)MXM DC IN1 (Pin header)MXM DP2 (Pin header)MXM DP1 (Pin header)LVDS1 (Pin header)LVDS1 (Pin header)LVDS3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)VUSB 2.02 (Pin header)Battery Header1 (Pin header)	LAN	2 x RJ45
Display2 x DPINTERNAL I/DMXM1 (Socket)SATA Port2 (up to 6Gb/s)(Pin header)SATA Power2 (Up to 6Gb/s)(Pin header)SATA Power2 (Pin header)MXM VGA1 (Pin header)MXM DC IN1 (Pin header)MXM DP2 (Pin header)MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS1 (Pin header)LVDS3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)USB 2.0DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	Serial Port	1 x RS232/422/485
INTERNAL 1/DMXM1 (Socket)SATA Port2 (up to 6Gb/s)(Pin header)SATA Power2 (Pin header)MXM VGA1 (Pin header)MXM DC IN1 (Pin header)MXM DP2 (Pin header)MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	Audio	1 x 3.5mm Audio Jacks (1 x MIC-IN, 1 x LINE-OUT)
MXM1 (Socket)SATA Port2 (up to 6Gb/s)(Pin header)SATA Power2 (Pin header)MXM VGA1 (Pin header)MXM DC IN1 (Pin header)MXM DP2 (Pin header)MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2 (Pin header)USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	Display	2 x DP
SATA Port2 (up to 6Gb/s)(Pin header)SATA Power2 (Pin header)MXM VGA1 (Pin header)MXM DC IN1 (Pin header)MXM DP2 (Pin header)MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS Backlight1 (Pin header)COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	INTERNAL I/O	
SATA Power2 (Pin header)MXM VGA1 (Pin header)MXM DC IN1 (Pin header)MXM DP2 (Pin header)MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS Backlight1 (Pin header)COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	MXM	1 (Socket)
MXM VGA1 (Pin header)MXM DC IN1 (Pin header)MXM DP2 (Pin header)MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS Backlight1 (Pin header)COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)VentorUSB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	SATA Port	2 (up to 6Gb/s)(Pin header)
MXM DC IN1 (Pin header)MXM DP2 (Pin header)MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS Backlight1 (Pin header)COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)Vertical (Pin header)USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	SATA Power	2 (Pin header)
MXM DP2 (Pin header)MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS Backlight1 (Pin header)COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	MXM VGA	1 (Pin header)
MB DC IN1 (Pin header)LVDS1 (Pin header)LVDS Backlight1 (Pin header)COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)	MXM DC IN	1 (Pin header)
LVDS1 (Pin header)LVDS Backlight1 (Pin header)COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2 (Pin header)USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	MXM DP	2 (Pin header)
LVDS Backlight1 (Pin header)COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2 (Pin header)USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	MB DC IN	1 (Pin header)
COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2 (Pin header)USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	LVDS	1 (Pin header)
COM3 (1X10Pin, 2.0Pitch)(Pin header)(RS232/422/485)2 (Pin header)USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	LVDS Backlight	1 (Pin header)
(RS232/422/485)USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)		3 (1X10Pin, 2.0Pitch)(Pin header)
USB 2.02 (Pin header)DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)	(RS232/422/485)	
DIO8 Bit (4DI/4DO) (Pin header)Battery Header1 (Pin header)		2 (Pin header)
Battery Header 1 (Pin header)	DIO	
	eSPI/LPC	1 (Pin header)

Header	
EXPANSION S	LOT
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 MANA	GEMENT
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	- 40°C ~ 85°C
Temperature	- 40 C ~ 83 C
Storage	- 40°C ~ 85°C
Temperature	- 40 C ~ 83 C
Relative	10% to 90%, non-condensing
humidity	
Accessories	
SINK+ FAN Kit	CPU(SINK)+MXM(SINK+FAN)
STANDARD CC	IMPLIANCE
Standard	CE/FCC
Compliance	

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

