GEMINI Rugged, I/O-Rich SBC and Carrier Board for COM Express Compact Type 6 CPU Modules

DIAMOND SYSTEMS

PCIe104

Intel "Whiskey Lake" 8th Gen Core i7-2133MHz processor module

16-32GB DDR4 RAM (WL SBC model)

2x HDMI display support

Dual-channel 24-bit LVDS port with 3.3V / 5V power option

2x 10/100/1000Mbps Ethernet ports; 1 from COM module, 1 from I210 Ethernet controller via dedicated PCIe lane

4x USB 2.0, 2x USB 3.0

HDA audio

8 programmable direction digital I/O, 3.3V logic compatible

PCI/104-Express expansion socket (PCI-104 + PCIe/104 Type 1)

PCI-104 socket supports up to 4 attached PCI-104 modules

PCIe/104 socket supports up to 4x PCIe x1 and 1x PCIE x16 depending on installed COM

1 PCIe minicard socket with optional USB support

1 M.2 2242 SATA socket

1 SATA connector

TPM 2.0 via SPI interface

Baseboard and WL SBC: -40°C to +85°C operating temperature

Anatomy of a COM-based SBC

Carrier board
COM
Thermal solution

GEMINI is a COM Express Compact type 6 carrier board and SBC with PCI/104-Express and minicard I/O expansion. Feature-rich GEMINI offers the highest performance in a compact 4.0 x 4.0" / 102 x 102mm size, with its combination of COM Express CPU module and full support for PCIe/104 type 1 connectivity (PCI-104 up to 4 modules, PCIe-104 x1 up to 4 modules, and PCIe/104 x16 if supported by the installed COM). Gemini is designed to support any COM Express Compact (95x95mm) type 6 module, from Apollo Lake to Core i7 to Xeon and Ryzen.

Gemini is available as a complete SBC featuring the 8th Generation Intel Core i7 8665UE "Whiskey Lake" processor with up to 64GB SODIMM memory and -40 to +85°C operation.

GEMINI as a carrier board provides flexibility in choosing your preferred COM from among dozens of manufacturers around the world. The Gemini carrier offers early access to the latest generation of x86 processors as well as longer product lifecycles by virtue of processor independence.
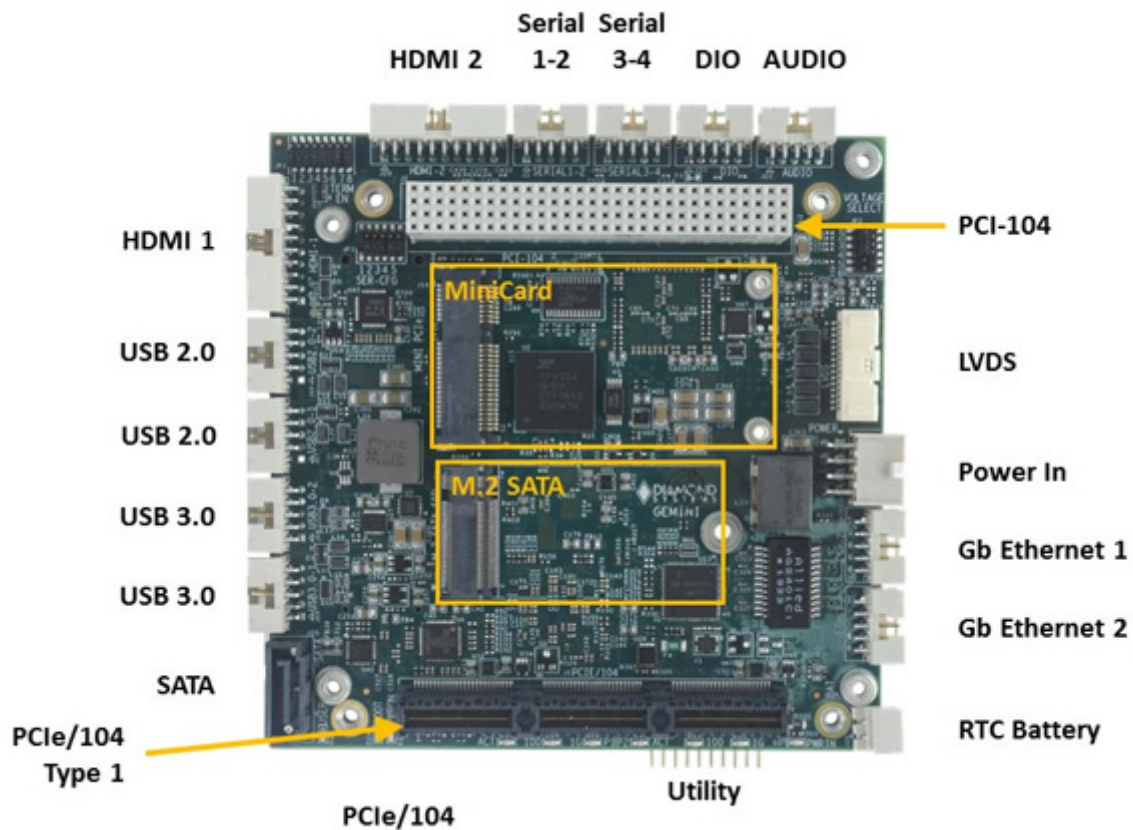
The COM Express module mounts on the bottom side of the board, with a heat spreader below it serving as a mounting platform and thermal solution. The PCI/104-Express, minicard, and M.2 expansion sockets are on the top side.

The 4.0x4.0 inch (102x102mm) board size maximizes PCB coastline for I/O connectors in the smallest feasible size for the feature set. The combination of latching I/O connectors and a thicker PCB offers

superior resistance to shock and vibration.

Gemini offers several options for mass storage. An M.2 2242 socket supports SSD up to 512GB using SLC, MLC, and TLC technology. A SATA connector can be used to connect to an external SSD.
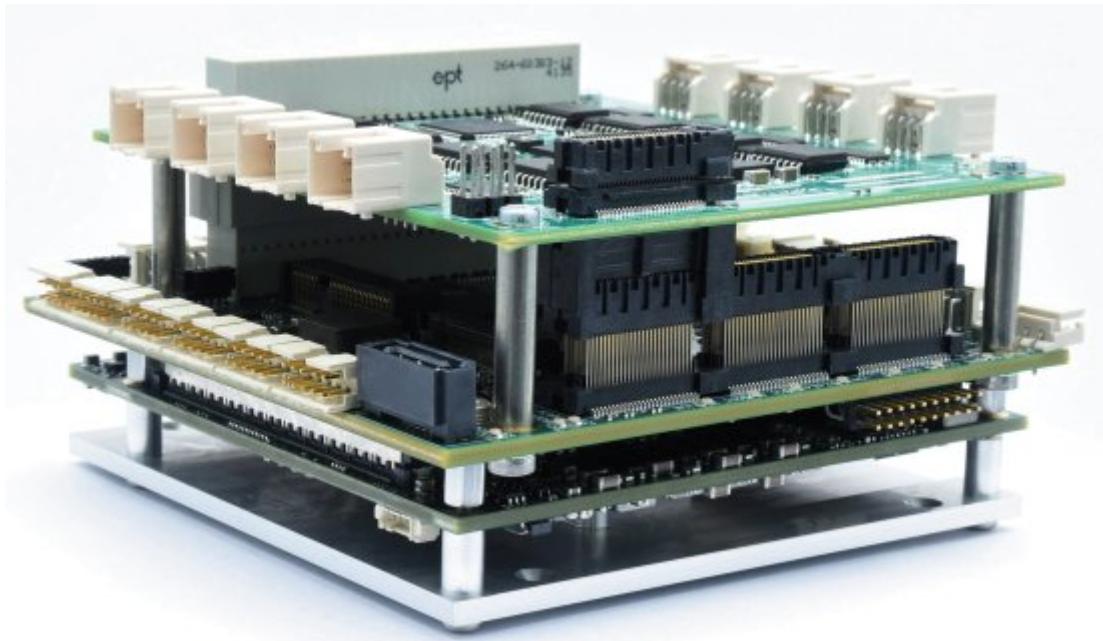
Windows 10 64-bit and Ubuntu Linux 64-bit OS support are available.

◆ I/O Expansion

Gemini offers a wide range of I/O expansion options:

- A PCIe/104 Type 1 socket supports OneBank PCIe x1 I/O modules as well as full PCIe x16 high performance graphics and expansion modules (with Xeon module installed)
- A PCI-104 socket supports up to 4 PCI-104 I/O modules
- A full-size minicard socket supports PCIe and USB minicards
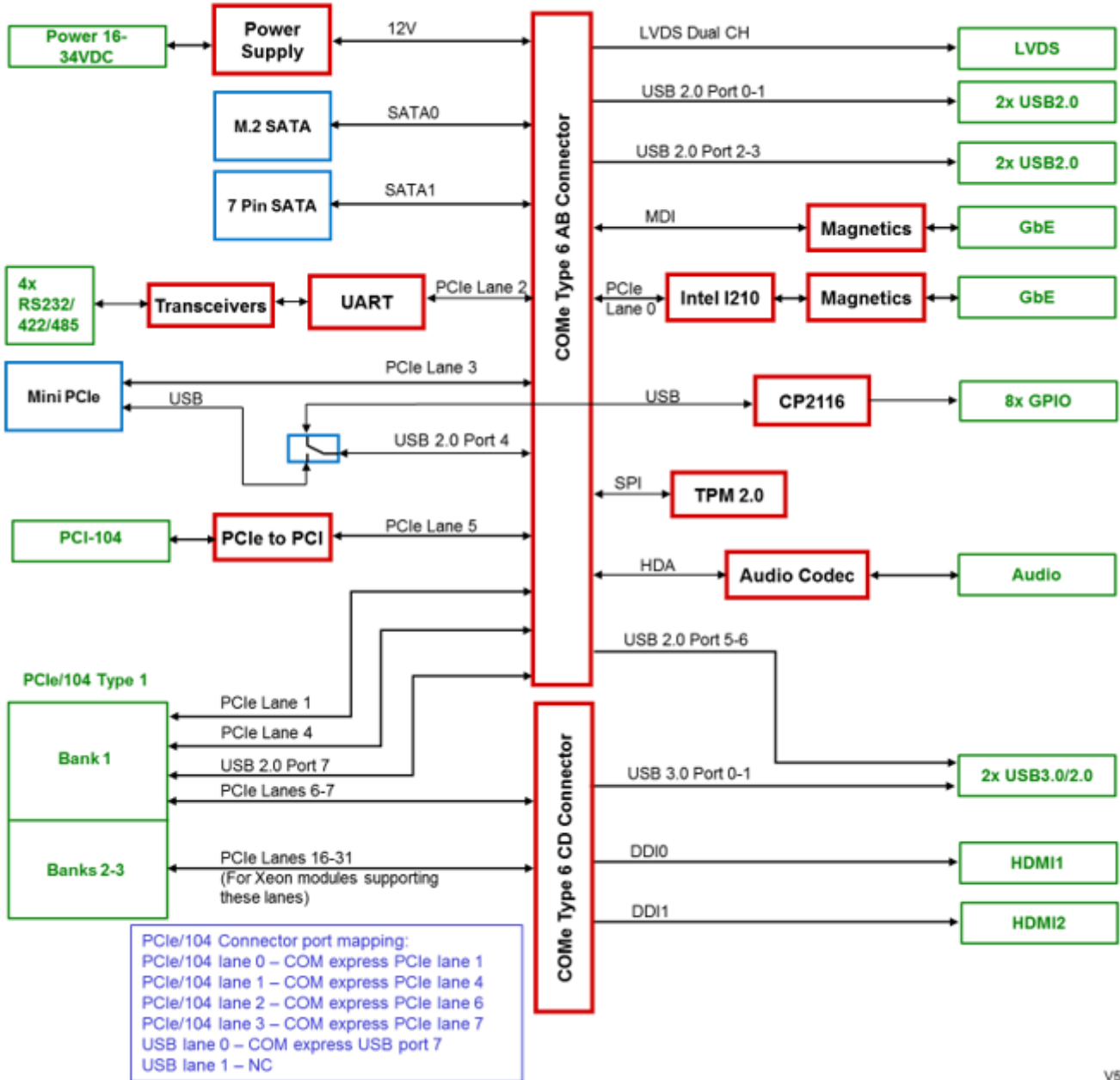- An M.2 socket supports SATA flashdisk up to 512GB SLC, MLC, and TLC

Gemini with PCIe/104 octal serial port module installed; 22mm board stacking height allows sufficient room for installed minicard + cabling
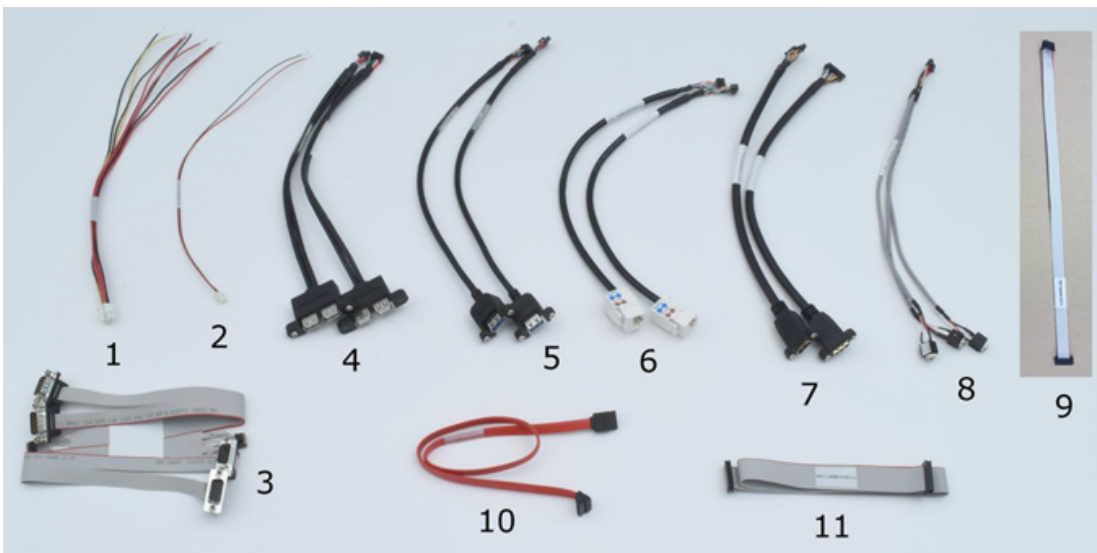
◆ **Block Diagram**

GEMINI Block Diagram (with 8x PCIe x1 available)

Whiskey Lake / Xeon COM

Cable kit

CK-GEM-01 includes the following cables:

No.	Qty	Cable	Description	Drawing
1	1	6980512	Power input cable, discrete wires	**Show**
2	1	6980524	External battery cable, discrete wires	**Show**
3	2	6980601	Dual serial port cable, 2x DB9 male	**Show**
4	2	6980602	Dual USB 2.0 cable, 2x USB 2.0 type A	**Show**
5	2	6980603	Dual USB 3.0 type A, latching	**Show**
6	2	6980604	Ethernet cable, RJ-45 socket	**Show**
7	2	6980605	HDMI Cable	**Show**
8	1	6980608	Audio cable, 3x 3.5mm jacks	**Show**
9	1	6980609	FCI latching 2x5 2mm to IC 2x5 2mm, 12"	**Show**
10	1	6989101	SATA Cable, 7-Pin Data, Straight to Right Angle, 500mm	**Show**
11	1	C-20MM-18	2x10 2mm IDC ribbon, 18"	-

◆ Specifications

Features

Processor	Intel® Core™ i7 8th Generation Processor 8665UE "Whiskey Lake"
Chipset	Integrated onto processor package
Memory	16/32GB SODIMM (WL COM)
Graphics	3 independent displays:
	2x HDMI, max resolution 4096 x 2304 @ 60Hz, 24bpp
	1x LVDS, max resolution 1920 x 1200 @ 60Hz, 24bpp
Ethernet	2 Gigabit ports: 1 10/100/1000Mbps from COM module and 1 10/100/1000Mbps via I210 Ethernet controller on carrier
USB	4x USB 2.0 and 2x USB 3.0, optional USB support via PCIe Minicard
Serial	4x multiprotocol RS-232/422/485 through SP336
Audio	HDA audio to analog audio converter
Digital I/O	8 programmable direction digital I/O, 3.3V logic compatible
Mass storage	Standard SATA, m.2 2242 socket, PCIe / USB MiniCard socket
Security	TPM module Infineon SLB 9670XQ2.0 on carrier (installed COM may also have TPM)
Expansion	PC/104-EXPRESS: 4 PCIe x1 ports, 1x PCIe x16, 1x USB2.0, and 4-slot PCI support
Form factor	101.6mm x 101.6 mm / 4.000" x 4.000"
Weight	281g / 9.9oz (complete assembly with WL COM and heat spreader)
Cooling	Conduction cooling heat spreader on bottom
Input voltage	16V-34VDC
Power consumption	Carrier board alone: 2.4W Carrier board + WL COM + 16GB RAM: 10.2W Vin = 28VDC
Operating Temp	-40° to +85°C (carrier board and WL COM; final system capability depends on the installed COM)

◆ Models and Accessories

⌕ GEMINI

available models:

GEM-BB01	Gemini carrier board, Core / Xeon PCIe configuration, 22mm PCI/104-Express; Contact factory for additional configurations	Available
GEM-WL8665UE-16G	Gemini SBC, i7-8665U 2133MHz CPU, 16GB RAM, Heat Spreader	Available
GEM-WL8665UE-32G	Gemini SBC, i7-8665UE 2133MHz CPU, 32GB RAM, Heat Spreader	Available
GEM-WL8665UE-64G	Gemini SBC, i7-8665UE 2133MHz CPU, 64GB RAM, Heat Spreader	Available

Please **login** or **signup** for an online quote request.

Cables and accessories

CK-GEM-01	CK-GEM-01 cable kit
6980512	Power input cable, discrete wires
6980524	External battery cable, discrete wires
6980601	Dual serial port cable, 2x DB9 male
6980602	Dual USB 2.0 cable, 2x USB 2.0 type A
6980603	Dual USB 3.0 type A, latching
6980604	Ethernet cable, RJ-45 socket
6980605	HDMI Cable
6980608	Audio cable, 3x 3.5mm jacks
6980609	FCI latching 2x5 2mm to IC 2x5 2mm, 12"
6989101	SATA Cable, 7-Pin Data, Straight to Right Angle, 500mm
C-20MM-18	2x10 2mm IDC ribbon, 18"

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www.diamondsystems.com | **Sunnyvale, California USA** | **+1-650-810-2500** | **sales@diamondsystems.com**