GEMINI COM-Based SBC with WL8665UE CPU / COM Express Carrier

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

GEMINI carrier board

GEMINI complete solution with COM, memory, and heat spreader installed

FEATURES

- 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

GEMINI is a COM Express Compact type 6 carrier board and SBC with PCI/104-Express 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). Gemini is designed to support a variety of COM Express modules including Bay Trail, Apollo Lake to Core i7 8th generation and Xeon.

Gemini as a complete SBC features the 8th Generation Intel Core i7 8665UE "Whiskey Lake" processor with choice of 16GB or 32GB 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 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 is available.

◆ Overview

Gemini is designed to support a wide range of COM Express Type 6 Compact (95x95mm) modules. The standard configuration works with Core i7 and Xeon processors, enabling maximum utilization of the PCI Express lanes on the modules. With a Xeon COM installed, Gemini provides access to the PCIe x16 lanes on the PCIe/104 connector banks 2 and 3, supporting the use of high end graphics and networking expansion modules.


◆ Block Diagram

GEMINI Block Diagram (with 8x PCIe x1 available)
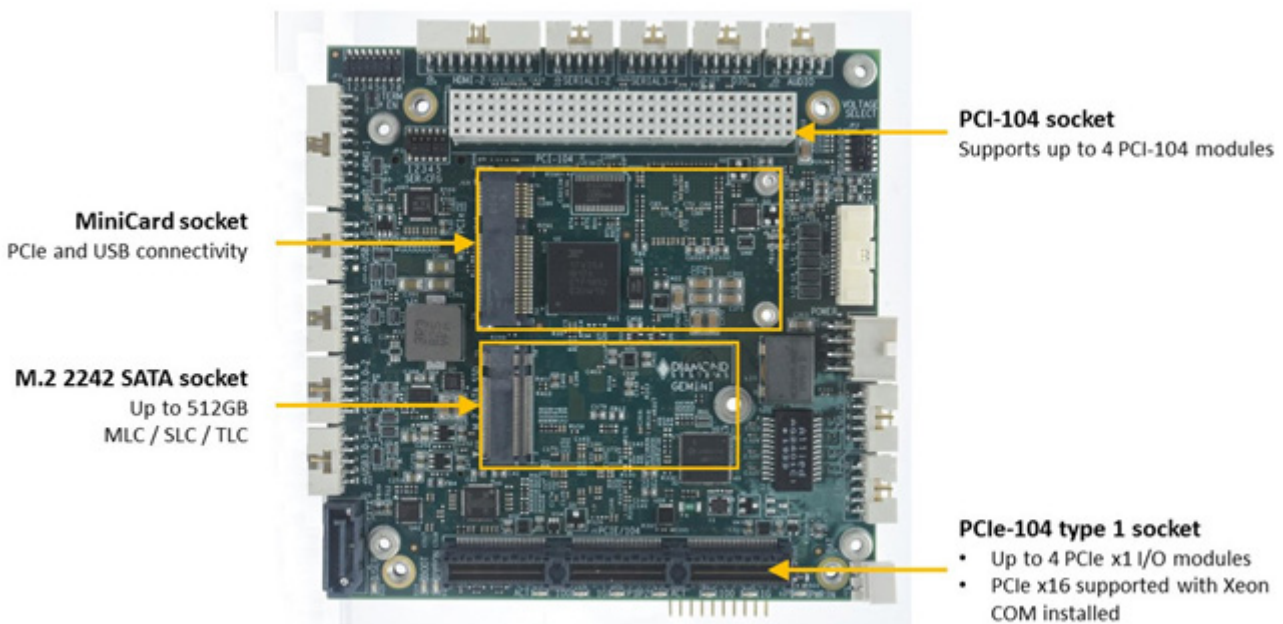
Whiskey Lake / Xeon COM
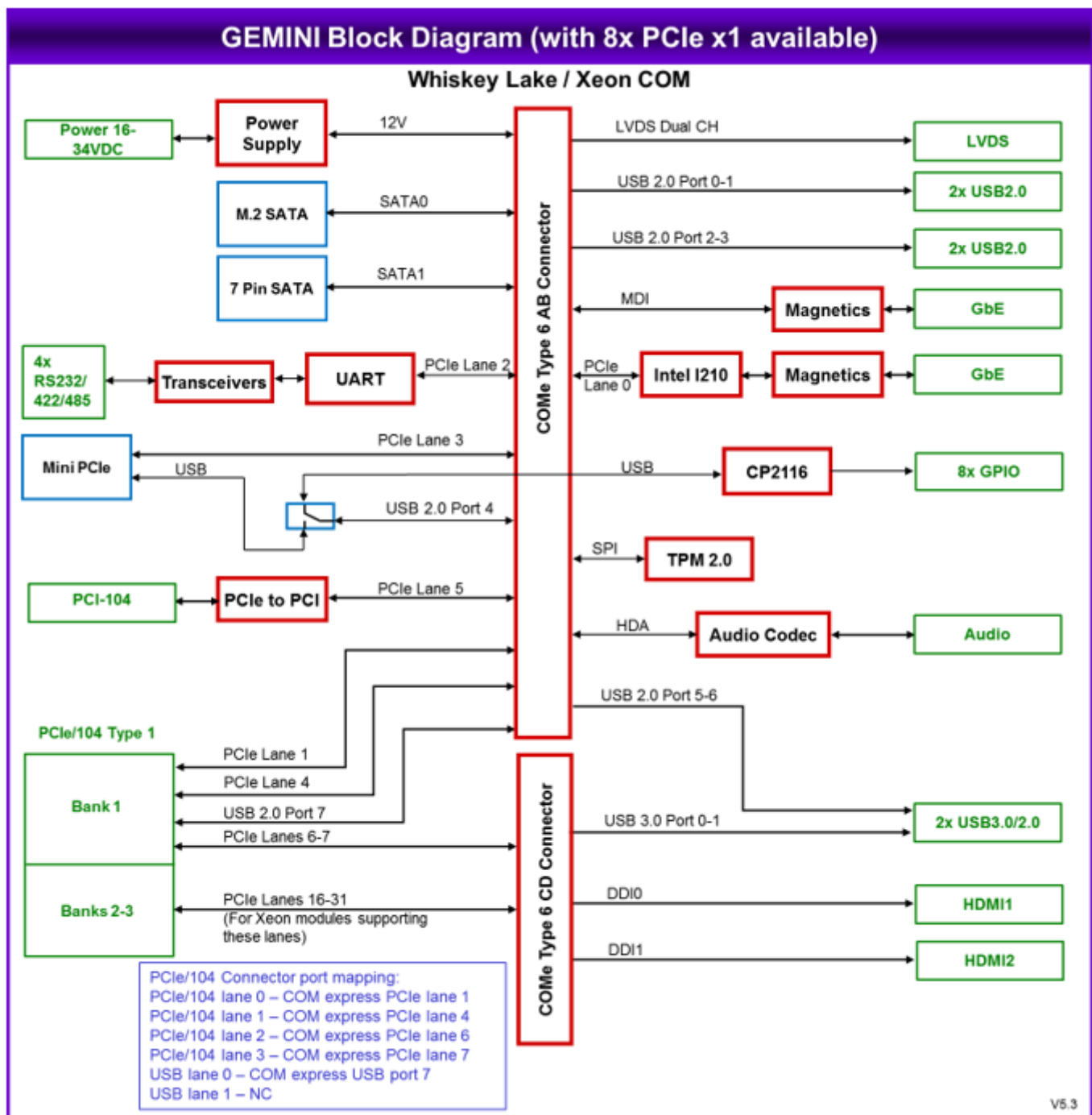
The Bay Trail / Apollo Lake configuration of Gemini utilizes a PCIe switch to increase the number of links available to support the on-board I/O as well as the PCI-104 and PCIe/104 expansion connectors. Lane mapping is optimized to provide dedicated bandwidth for the most critical features while sharing lanes for secondary features.

GEMINI Block Diagram (with PCIe Switch)
Kaby Lake / Bay Trail / Apollo Lake COM
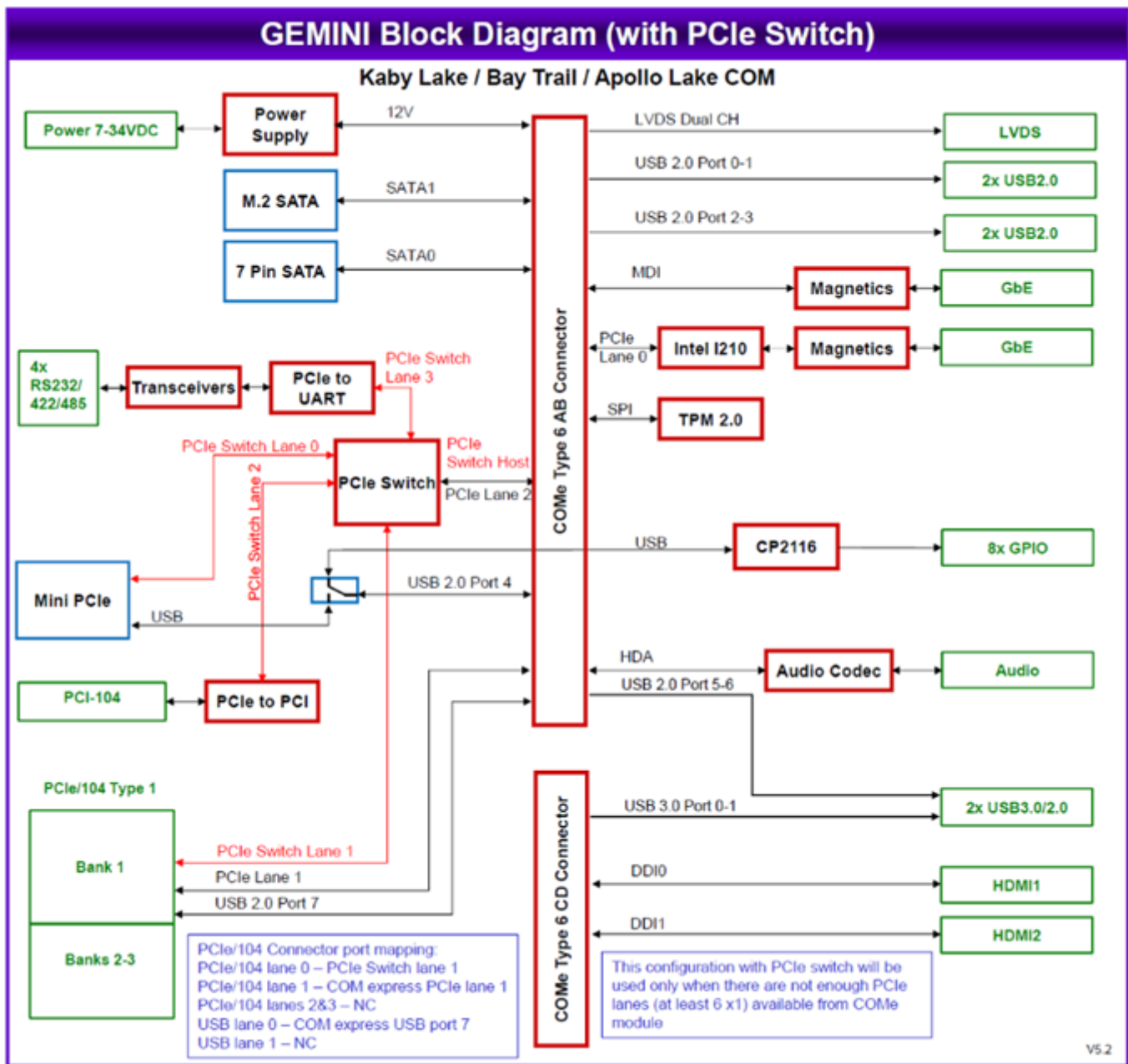
◆ **CK-GEM-01: Cable kit for GEMINI COM-Based SBC with WL8665UE CPU / COM Express Carrier**
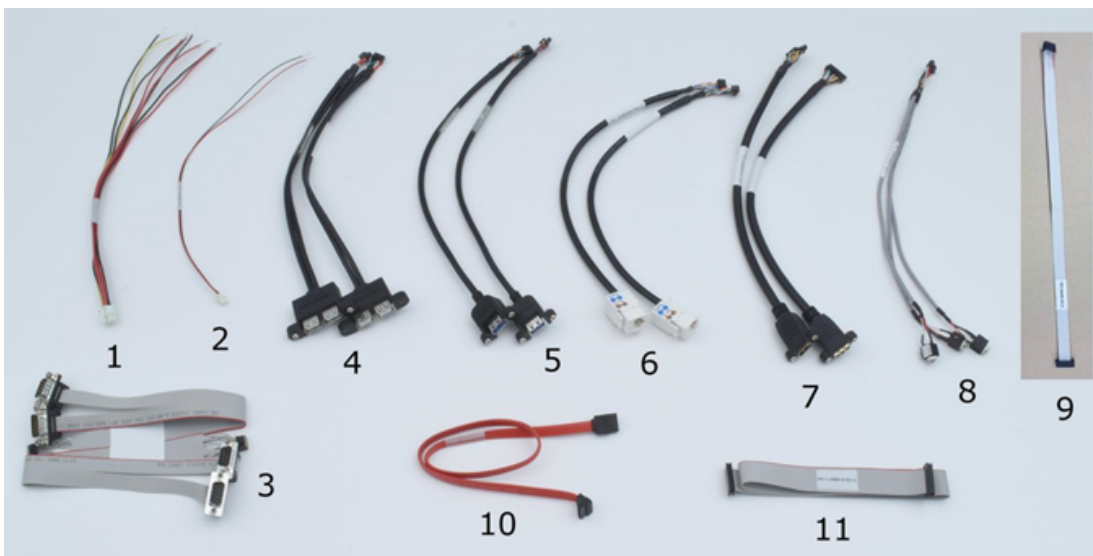
CK-GEM-01 includes the following cables:

| No.	Qty	Cable	Description	Drawing
1	1	6980512	Cable Power, 2x4 0.1" Latching	**Show**
2	1	6980524	Cable, External Battery, Molex Spox	**Show**
3	2	6980601	Dual serial, latching, 2x DB9M	**Show**
4	2	6980602	Cable, Dual USB 2.0, FCI 98414 to D	**Show**
5	2	6980603	Cable, USB 3.0, Latching, FCI 98414	**Show**
6	2	6980604	Cable, RJ-45 socket, panel mount	**Show**
7	2	6980605	HDMI Cable	**Show**
8	1	6980608	Audio cable 2mm to 3x3.5mm	**Show**
9	1	6980609	FCI latching 2x5 2mm to IC 2x5 2mm, 12"	-
10	1	6989101	SATA Cable, 7-Pin Data, Straight to Right Angle, 500mm	**Show**
11	1	C-20MM-18	2x10 2mm IDC ribbon, 18"	-

◈ I/O Features
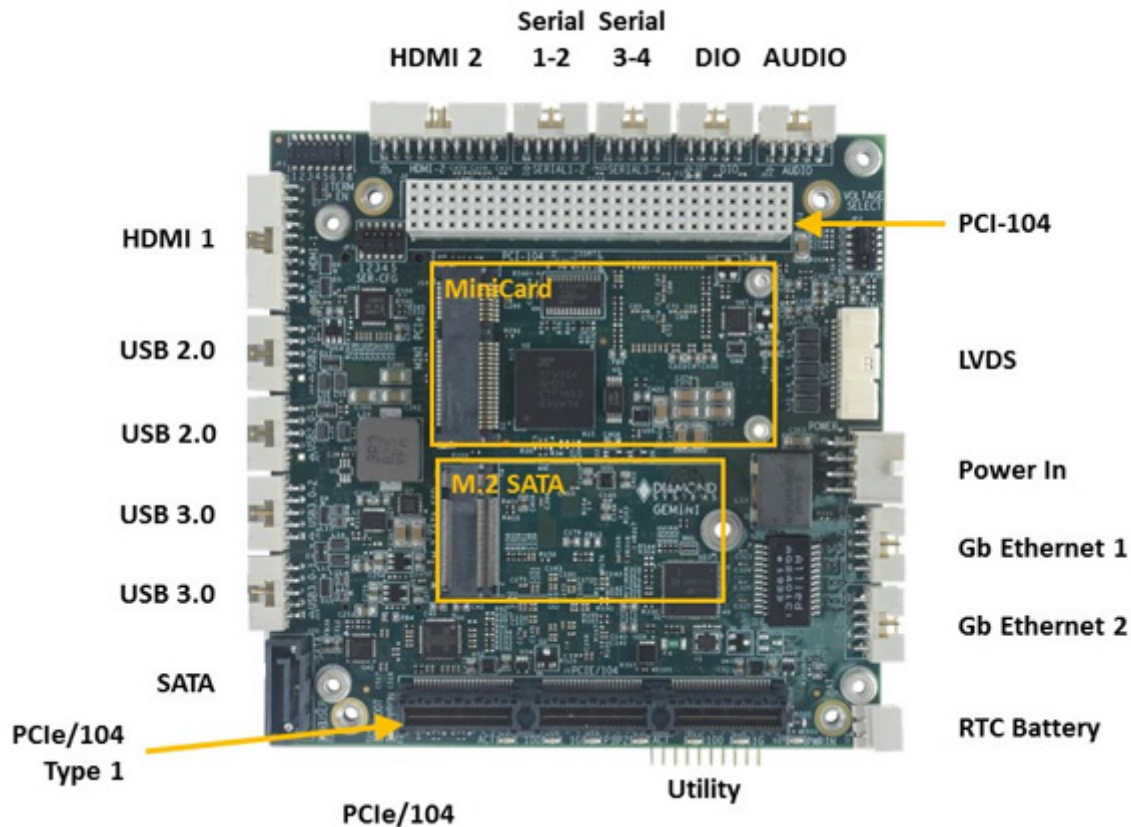
◈ I/O Expansion

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
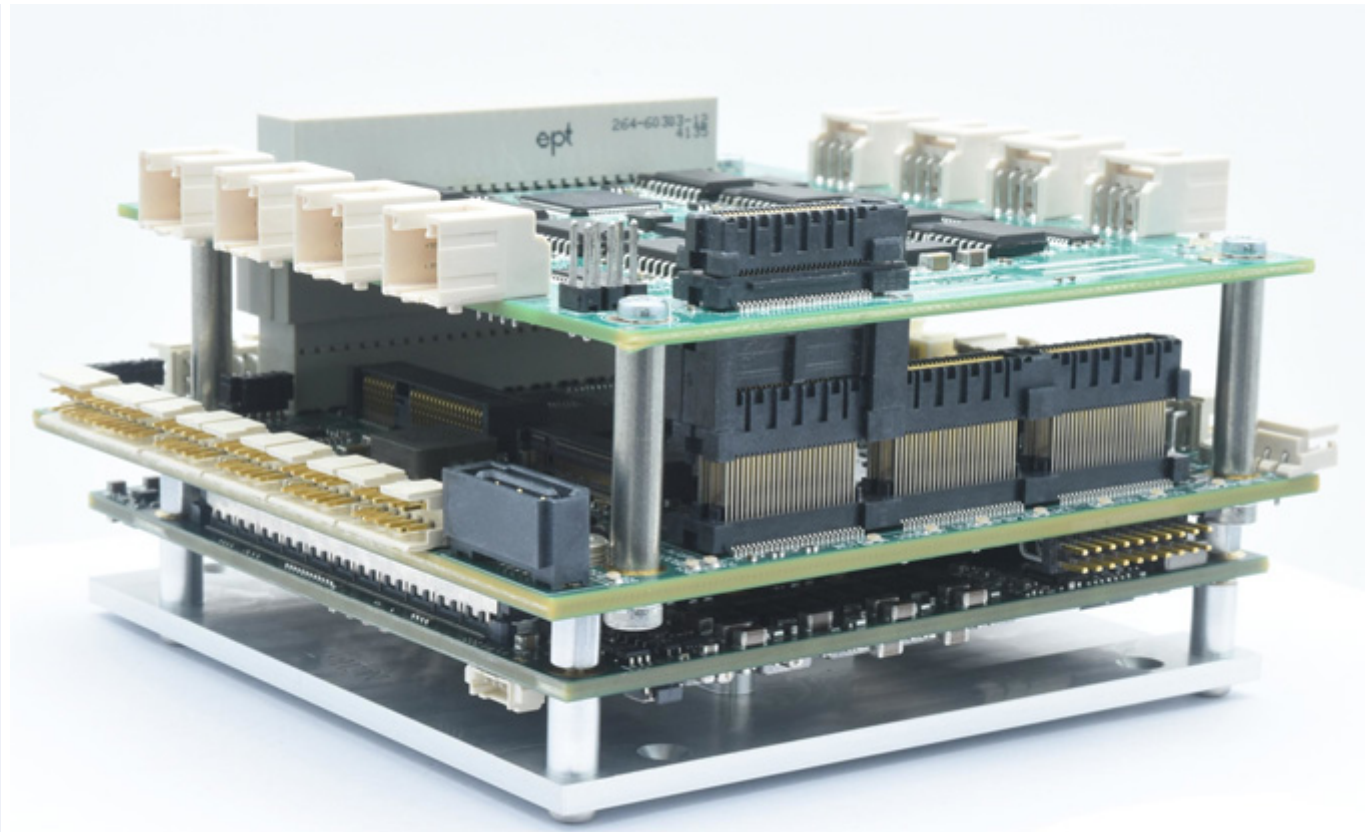
GEMINI with a PCIe/104 OneBank I/O module installed. The 22mm stacking height avoids interference with installed minicard modules and cables under the I/O board.

◆ 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 COM-Based SBC with WL8665UE CPU / COM Express Carrier

available models:

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

Please login or signup for an online quote request.

Cables and accessories

available models:

CK-GEM-01	CK-GEM-01 cable kit
6980512	Cable Power, 2x4 0.1" Latching
6980524	Cable, External Battery, Molex Spox
6980601	Dual serial, latching, 2x DB9M
6980602	Cable, Dual USB 2.0, FCI 98414 to D
6980603	Cable, USB 3.0, Latching, FCI 98414
6980604	Cable, RJ-45 socket, panel mount
6980605	HDMI Cable
6980608	Audio cable 2mm to 3x3.5mm
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"

Please login or signup for an online quote request.

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