


# QCT Rackgo X
# **MiniLake**

2019/10/23

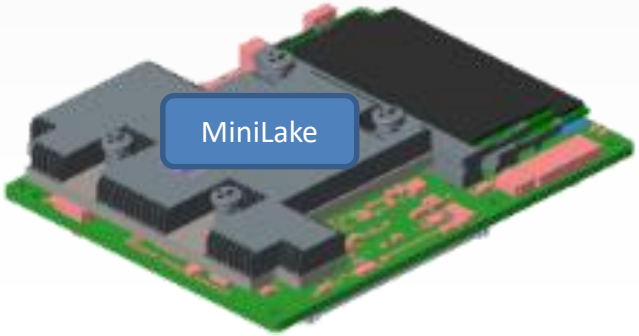
# Agenda

- Overview
- **MiniLake** Module in **Minipack** Chassis
- SCM With 1x **MiniLake** COM-e Module
- Mechanical Overview
- High Level Features
- Block Diagram
- Key Part Placement
- Stackup
- Design Files Contribution

# Overview

- **Introduction**
  - ‘‘MiniLake COM-e(Computer On Module-Express) Mezzanine Card ’’

    with Broadwell-DE CPU is the control CPU for Minipack switch system

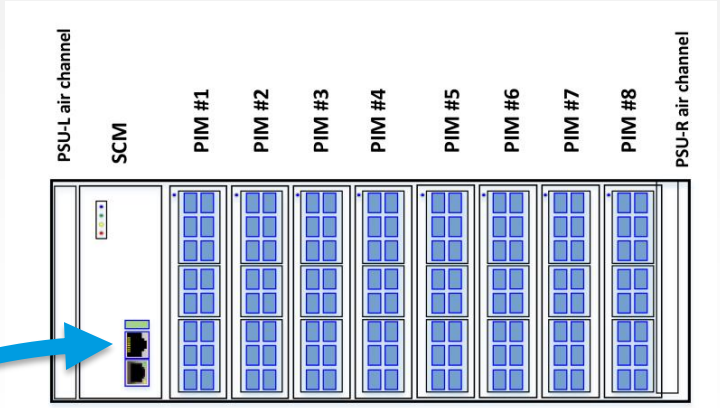


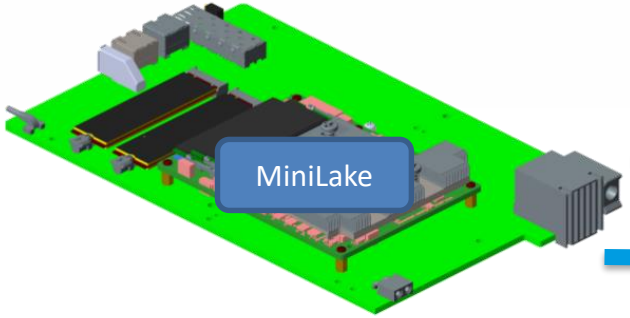

- **Contributions**
  - Design package
  - Product submission to Marketplace
    - Product Recognition: Accepted level
- **Specification Reference**
  - Facebook Minipack 128x 100GE Switch System Specification Rev 1.0
  - MiniLake COM-Express Mezzanine Card Hardware Specification Rev 1.6

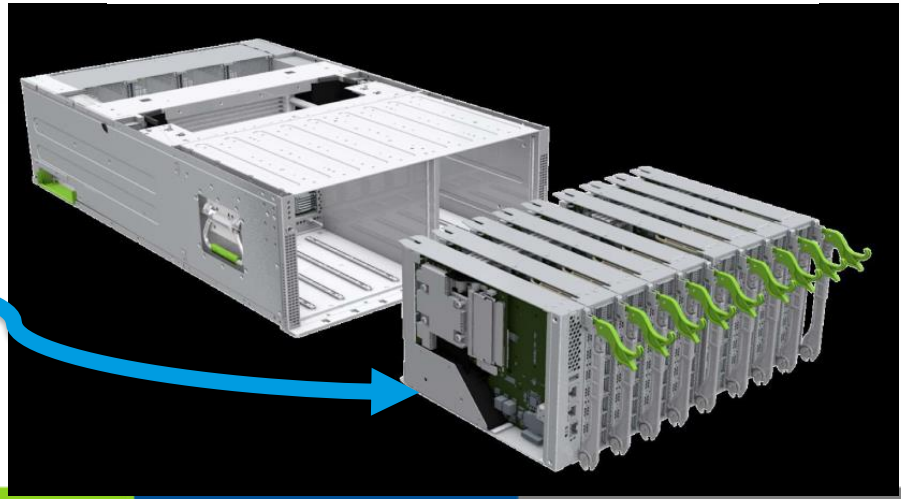
# MiniLake Module in Minipack Chassis

## Minipack chassis: EIA 19’’ rack with 4 RU height

| Dimension | Specification | Comment |
|---|---|---|
| Chassis Width | 440.4mm (17.34”) | Outer dimension |
| Chassis Depth | 738.1mm (29.06”) | Outer dimension |
| Chassis Height | 176.2mm (6.94”) | Outer dimension |

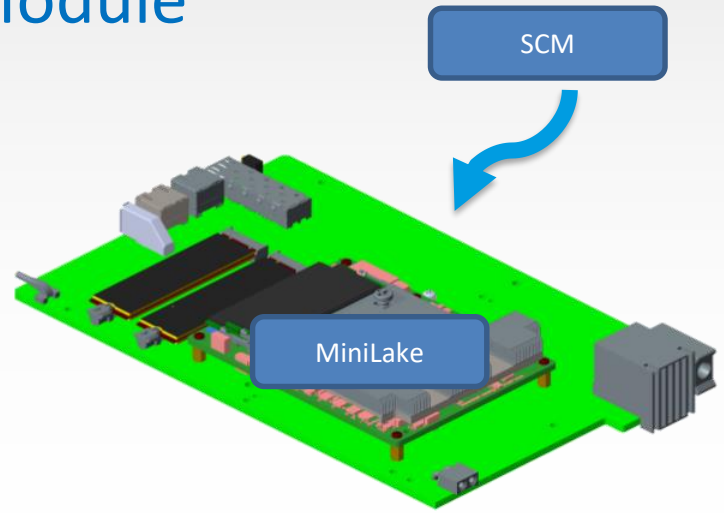


# SCM With 1x MiniLake COM-e Module

- System Control Module(SCM) includes:
  - Broadwell-DE COM-e CPU modules
  - RJ45 console port
  - RJ45/SFP OOB 10/100/1000Mbps Ethernet port
  - USB Type-A port on front panel
  - One M.2 256GB SATA SSD
  - One M.2 256GB NVMe SSD



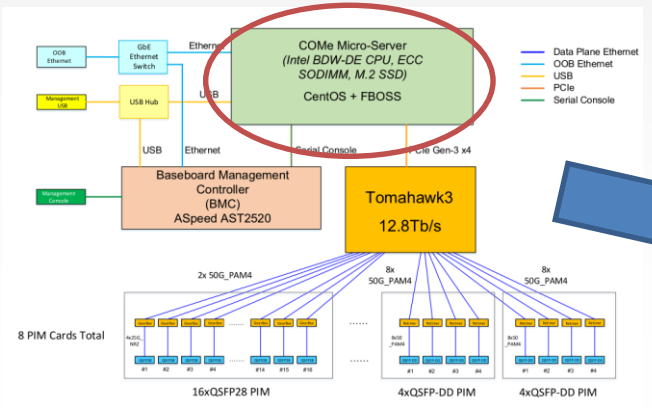

MiniLake in SCM(System Control Module)

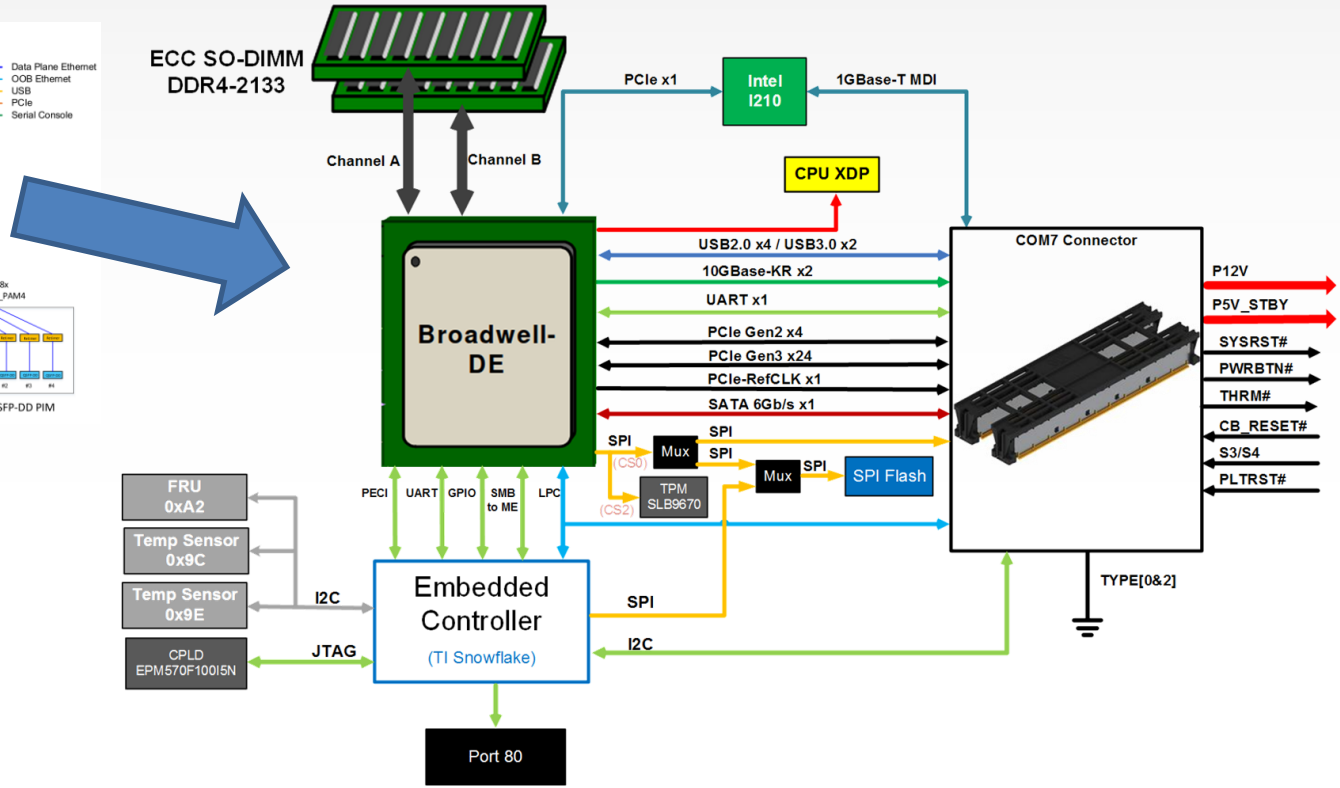


# MiniLake High Level Features

| Spec | Description |
|---|---|
| Board size (W x L ) | 95mm x 125mm (COM Express® Basic Module form factor) |
| CPU | Xeon® Processor D-1527 : 4C, 35W, 2.2 GHz |
| Memory | 2x DDR4 SODIMM slots |
| | •Support DDR4 ,speeds up to 2133 MT/s with ECC |
| | •Max Memory Capacity: 32 GB (16GB / DIMM) |
| Storage | 1x SATA 3.0 Port (6Gb/s) |
| Network | 1x 1000BAST-T (Intel® Ethernet Controller I210) |
| | 2x10GBASE-KR (Intel® Broadwell-DE integrated LAN controller) |
| PCIe | PCIe Gen3 x24 Lanes (up to Six PCIe Gen3 x4 ports)<br>PCIe Gen2 x4 Lanes (up to Four PCIe Gen2 x1 ports)<br>One PCIe CLK |
| Management Port | I2C is the primary sideband interface for server management functionality connection to BMC of carrier board |
| Bridge IC | TI Snowflake |
| I/O | 2x USB2.0 and 2x USB3.0 |
| | 1x UART port for Console |
| | 1x SPI I/F for 2nd boot flash |
| | 1x LPC I/F |
| Compliance | MiniLake conforms to PICMG COM Express Module Base Specification Revision 3.0 |

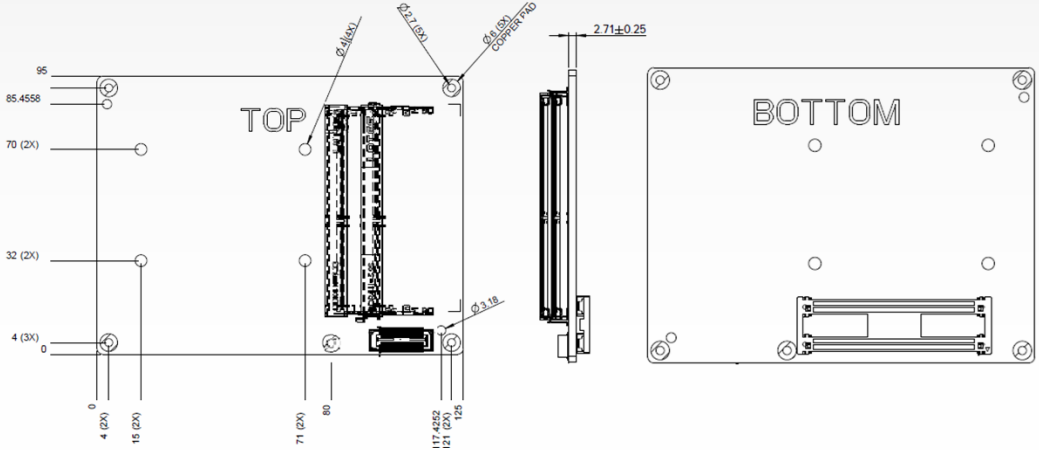
# MiniLake Block Diagram

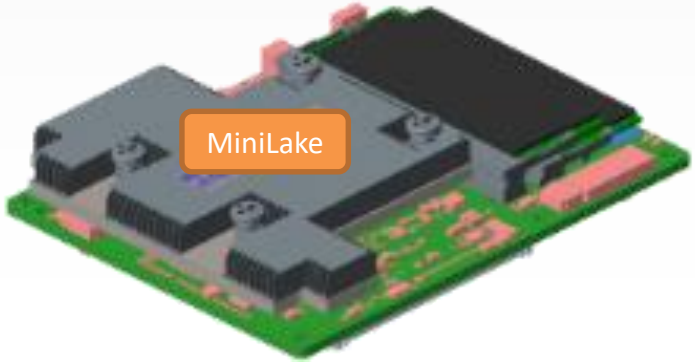


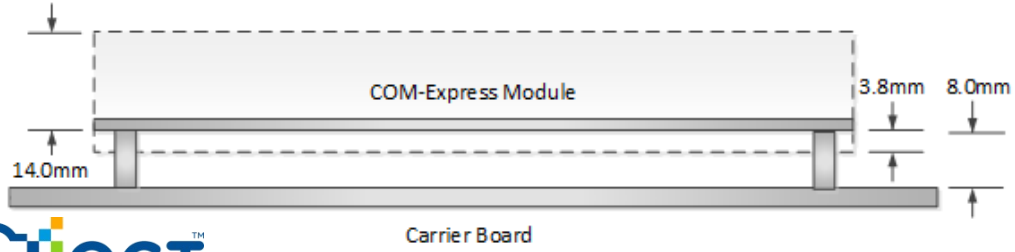
# MiniLake Mechanical Overview

- **PCB Size: 95mm(W) x125mm(L)**



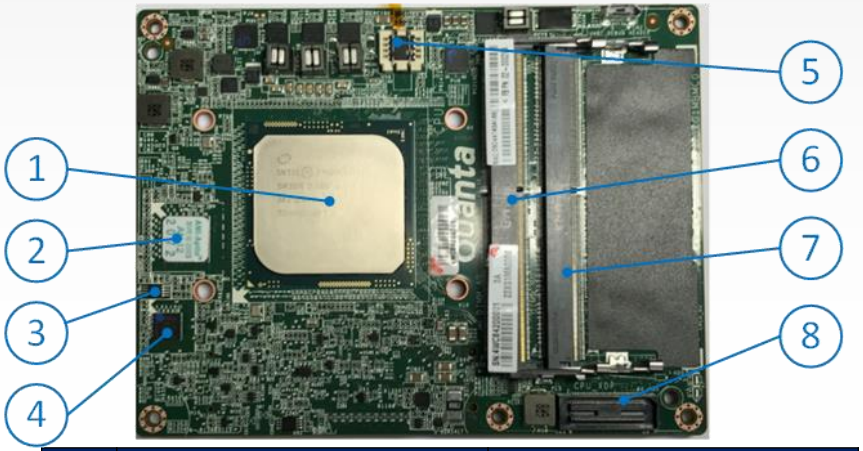




- **Clearance area on the Carrier Board.**



# MiniLake Key Part Placement

## TOP Side




| Item | Component | Note |
|---|---|---|
| 1 | SOC (INTEL Processor D-1527) | Broadwell-DE (4C/35W/2.2GHz) |
| 2 | BIC (TI Snowflake) | Embedded Controller |
| 3 | Temperature Sensor-1 (TMP75) | I2C Address: 0x9E |
| 4 | CPLD (Altera EPM570M100C5N) | |
| 5 | BIOS Flash (with Socket) | |
| 6 | DDR4 SODIMM CONN-0 | |

## BOT Side




| Item | Component | Note |
|---|---|---|
| 7 | DDR4 SODIMM CONN-1 | |
| 8 | XDP CONN | |
| 9 | Temperature Sensor-2 (TMP75) | I2C Address: 0x9C |
| 10 | 1G NIC (INTEL i210) | |
| 11 | TPM2.0 (Infineon SLB9670) | |
| 12 | COMe B2B CONN | |

# MiniLake Stackup

| Layer# | Material | Description | Copper Weight (oz) | Thickness (mil) | Tolerance (mil) |
|---|---|---|---|---|---|
| | | Soldermask | | 0.60 | |
| 1 | | TOP | 0.5+plating | 1.95 | |
| | IT-170GRA1 | PP | | 2.70 | ±0.709 |
| 2 | | GND | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | CORE | | 3.00 | ±0.709 |
| 3 | | IN1 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | PP | | 4.50 | ±0.709 |
| 4 | | GND1 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | CORE | | 3.00 | ±0.709 |
| 5 | | IN2 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | PP | | 4.50 | ±0.709 |
| 6 | | GND2 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | CORE | | 3.00 | ±0.709 |
| 7 | | IN3 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | PP | | 4.50 | ±0.709 |
| 8 | | GND3 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | CORE | | 3.00 | ±0.709 |
| 9 | | IN4 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | PP | | 4.50 | ±0.709 |
| 10 | | GND4 | 1 (RTF) | 1.30 | |
| | IT-170GRA1 | CORE | | 4.00 | ±0.709 |
| 11 | | VCC | 2 (RTF) | 2.60 | |
| | IT-170GRA1 | PP | | 5.30 | ±0.984 |
| 12 | | VCC1 | 2 (RTF) | 2.60 | |
| | IT-170GRA1 | CORE | | 4.00 | ±0.709 |
| 13 | | GND5 | 1 (RTF) | 1.30 | |
| | IT-170GRA1 | PP | | 4.50 | ±0.709 |
| 14 | | IN5 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | CORE | | 3.00 | ±0.709 |
| 15 | | GND6 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | PP | | 4.50 | ±0.709 |
| 16 | | IN6 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | CORE | | 3.00 | ±0.709 |
| 17 | | GND7 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | PP | | 4.50 | ±0.709 |
| 18 | | IN7 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | CORE | | 3.00 | ±0.709 |
| 19 | | GND8 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | PP | | 4.50 | ±0.709 |
| 20 | | IN8 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | CORE | | 3.00 | ±0.709 |
| 21 | | GND9 | 0.5 (RTF) | 0.65 | |
| | IT-170GRA1 | PP | | 2.70 | ±0.709 |
| 22 | | BOTTOM | 0.5+plating | 1.95 | |
| | | Soldermask | | 0.60 | |
| | | | Total | 102.00 | ±10% |

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# Design Files Contribution-
## 01_Electricals

- 01_Full System Board Layout Files

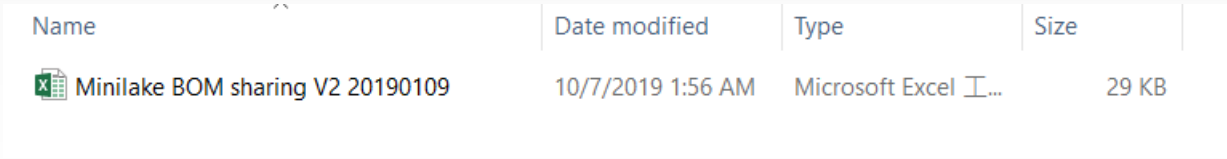
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- 02_Full System Schematic CAD Files

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| cpu_board_fab2_v01_2019_01_07 | 1/7/2019 8:45 AM | PDF File | 2,546 KB |

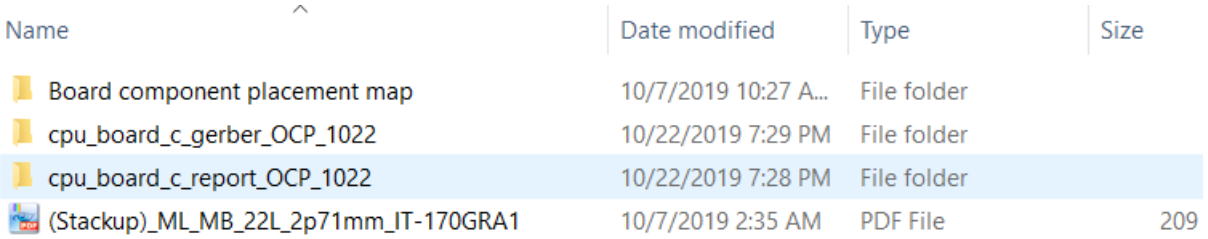
# Design Files Contribution-
# 01_Electricals

- 03_Full System Component BOM Files



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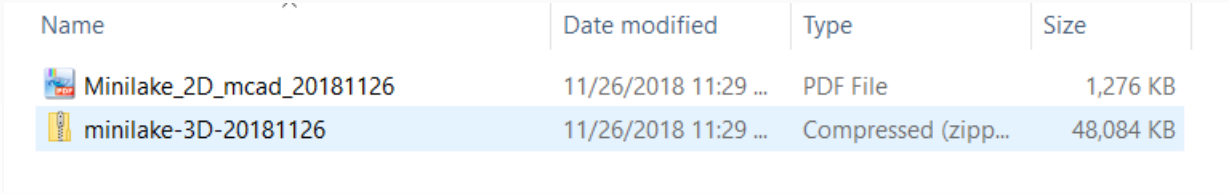
- 04_Manufacturing Files



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| cpu_board_c_report_OCP_1022 | 10/22/2019 7:28 PM | File folder | |
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# Design Files Contribution-
## 02_Mechanicals

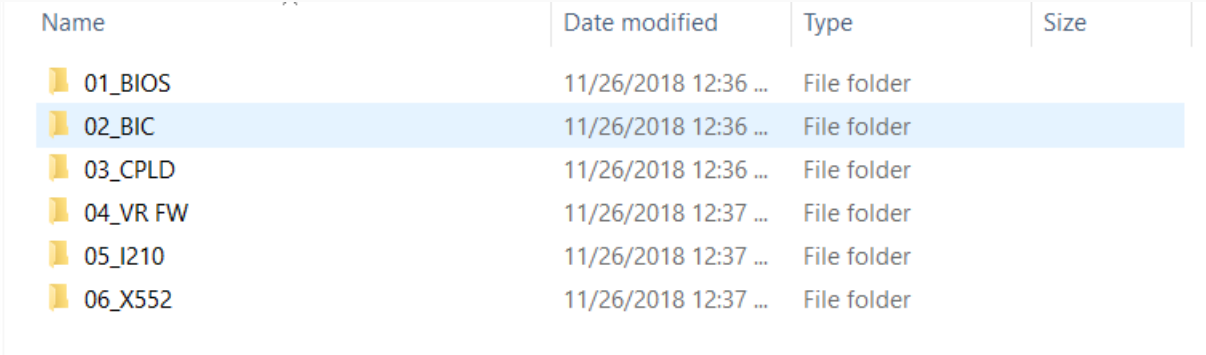
- Mechanical Step Files



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| minilake-3D-20181126 | 11/26/2018 11:29 ... | Compressed (zipp... | 48,084 KB |

# Design Files Contribution-
# 03_Software

- Software Files



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| 03_CPLD | 11/26/2018 12:36 ... | File folder | |
| 04_VR FW | 11/26/2018 12:37 ... | File folder | |
| 05_I210 | 11/26/2018 12:37 ... | File folder | |
| 06_X552 | 11/26/2018 12:37 ... | File folder | |




# Thanks!!!

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