

MPL AG honored by 2021 Military & Aerospace Electronics Innovators Awards

The MXCS-15xxML (MXCS Family) was recognized among the best by the 2021 Military & Aerospace Electronics Innovators Awards. An esteemed and experienced panel of judges from the aerospace and defense community recognized MPL AG as a Gold honoree.



Rugged MIL/COTS SWaP-C Server conductive cooled, with Intel Xeon CPUs

The MIL/COTS SWaP-C Server Solution was designed with the target to meet the MIL-STD-810 as well as parts of the DO-160 standards. The solution is installed in a compact IP67 housing with a total of eight D-38999 connectors including a dual fiber optical 10Gbit LAN port.

Innovative Impact

Rugged solutions used in defense, traffic or maritime applications need to withstand severe shock and vibrations as they are installed in vehicles, airplanes or ships. Generally, the interfaces of those solutions are wired to some heavy-duty connectors like MIL-DTL-38999 or similar. The critical point with those connections is the mismatch of the wires that need to be used. On the CPU board side, the wire needs to be as thin as possible and on the MIL 38999 connectors side it requires the best match for the connector pin. Generally, a rather bulky wire. Hence on both side in most cases, one does not have the right wire size and therefore needs to compromise on the wire size on both sides. This is not ideal for a reliable long-term running system.



In the described environments, continuous vibration needs to be expected, maybe combined with shock and other extreme conditions like high or low temperatures. Soldered or crimped wires have the risk, even if they have a perfect size, that the joint will break sooner or later during its operation. As described in most cases the perfect size wire cannot be chosen.

What can be done

To overcome this critical condition, MPL designed adapter PCB's that on one end interfaces directly without the need of wires to the CPU board. An on the other hand the adapter PCB is designed such that the interfaces are on individual high density lockable headers. The pins of the MIL-DTL-38999 connectors or another rugged connector are directly soldered on a Ridged-Flex PCB. The flexible part of the Ridged-Flex has a mating parts for the lockable header of the adapter PCB and the rugged connector can be installed straight into the IP67 housing. With this unique solution the connection will be reliable over the lifetime of the product and will withstand easily any shock and/or vibration condition.

This can be done as MPL designs all hardware (electronics as well as mechanics) locally at MPL AG in Switzerland with our own engineering team.

Unique Features

The unique solution is installed in a compact IP67 housing with a total of eight D-38999 connectors, including a dual fiber optical 10Gbit LAN port. The market does not provide server solution that are rugged, come without the need of a fan, and can be operated at -20°C up to 60°C. In addition, MPL's engineering team focused to eliminate as much as possible of the wires, to provide a the long-term reliability of the product.



The presented embedded server solution is unique, fanless and available in various versions. A customer can chose from various soldered CPUs with up to 16 cores out of the Intel road-map with long-term availability. Decades of experience from MPL (since 1985) in developing and producing extremely robust embedded solutions, have made the MXCS Server Family possible. With the size optimized board, SWaP-C can be achieved.

In the solution shown, the D-1587 embedded Intel CPU with 16 cores has been used. For prototyping the same electronics can be provided from stock to develop and test the SW during the time of adjusting the housing and connectors to the customer specific needs. The solution is being supplied with a conductive cooling concept. Integrated is the IPMI for remote management.

Customization is MPL's strength! Several different CPUs for the MXCS Family are available and can be chosen from. Fit, Form and Function (FFF) of the MXCS solutions and the unmatched reliability are key arguments. Shock and vibration as well as extended temperatures complete the unique design to provide a real rugged and long-term available product.

The standard MXCS Server is equipped with interfaces such as BMC, redundant AMI BIOS, USB, serial lines, and LAN ports, even 2x 10GigE fiber ports. The system also can be equipped with up to 128Gb ECCDDR4 memory that is conductive cooled. Project specific expansions can be done over internal expansion interfaces such as m.2, PCIe and PCIe/104, hence ARINC, 1553, GPS WLAN, LTE, GPIOs, CAN just to name a few. If further performance is needed we can integrate a GPU (e.g. RTX 5000 or similar over the MXM interface. This makes the powerful server solution very flexible and can be cost optimized. As mass storage, SATA, mSATA m.2 and NVMe can be chosen.

All MPL products are designed for long-term availability and the MXCS Family will be available for at least 10 years. MPL's own component stock guarantees repair for up to 20 years. Extended temperature ranges can be fulfilled and are tested in MPL's own climatic chambers according to customer's request.

The MXCS Family is 100% engineered & manufactured by MPL AG in Switzerland to meet the various flavors of MIL-STD-810 as well as parts of the DO160. The solution meets or exceeds the most common standards. Particular references are: EN 55022, EN 55024, EN 61000, MIL-STD-461E, EN 60068, EN 50155, MIL-STD-810G, EN 60601, EN 60950, CE, IEC 60945, IACS and E10.

Weblink for the MXCS-15xxML: www.mpl.ch/t2063.html

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