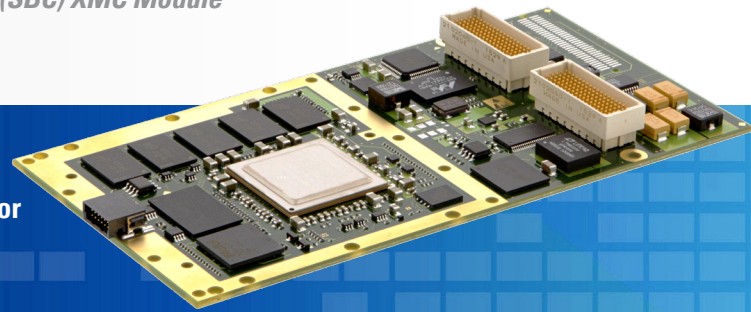


BuiltSAFE™ MFCC-8558 SBC

NXP QorIQ™ T2080 Conduction-cooled Single Board Computer (SBC) XMC Module

- Designed for DAL-C (DO-178C/DO-254) certification
- NXP QorIQ™ T2080 processor
- Low-SWaP and power options with I/O avionics interfaces or high performance video graphics
- 4x PCIe Gen2 interfaces on XMC (full mesh support)
- 1x DAL-C Fast Ethernet interface on XMC
- Maintenance/mission mode with specific hardware logic
- Safety optimized board management controller
- Backward compatibility with MFCC-8557

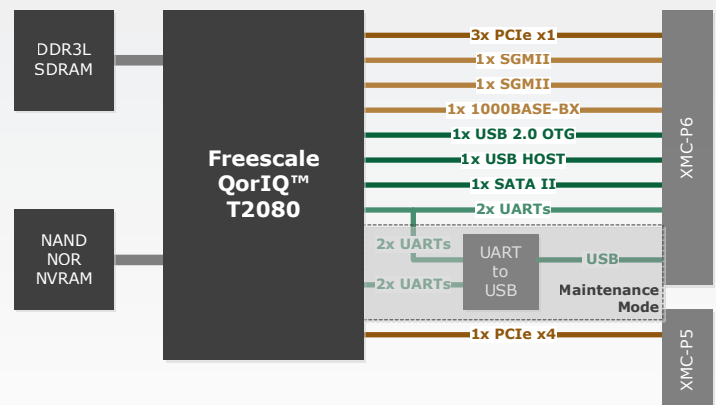


Mercury's BuiltSAFE™ products bring the highest level of flight-safety assurance to aerospace and defense applications. Our proven, reusable Design Assurance Level (DAL) certified artifacts for mission computing, avionics, networking and datalink comms processing save time and cost while decreasing risk.

Mercury's MFCC-8558 BuiltSAFE board is a DAL-C safety certifiable XMC 2.0 Single Board Computer (SBC) engineered for the most stringent aerospace and defense applications that may require certification to DO-178C/DO-254. The MFCC 8558 can be delivered with all documentation, certification evidence and supporting artifacts required to prove compliance for avionics certification.

Leveraging the MFCC-8558 ensures a smooth development process supported by Mercury's safety engineering team and their deep domain expertise. The MFCC-8558 BuiltSAFE SBC has been engineered with DAL safety certification in mind from the top down, systematically applying DO-178C/DO-254 best design practices.

The MFCC-8558 has a comprehensive set of Power-On, Continuous and Initiated Built-In-Tests and hardware components that physically disconnect maintenance interfaces during missions for built in reliability.



Pre-integration

The MFCC-8558 BuiltSAFE SBC is engineered for seamless integration with complementary building blocks with XMC 2.0 compatible mezzanine sites. Pre-integrated with BuiltSAFE 3U OpenVPX modules such as Mercury's VGP-2870 video and graphic processor card or AVIO-2353 avionics I/O card, the MFCC-8558 becomes a powerful DAL-C (DO-178C/DO-254) certifiable subsystem that is packaged in a single 3U OpenVPX slot. This approach is ideal for computation intensive video/graphics or I/O intense avionic applications.

Mercury Systems is a leading commercial provider of secure sensor and mission processing subsystems. Optimized for customer and mission success, Mercury's solutions power a wide variety of critical defense and intelligence programs.



ACQUIRE



DIGITIZE



PROCESS



STORAGE



EXPLOIT



DISSEMINATE

BuiltSAFE for Avionics

Mercury's expertise and experience in safety certifiable solutions has been built on successful execution of dozens of programs over three decades. This domain knowledge is the foundation of our BuiltSAFE portfolio of open architecture modules, systems and software for avionics, communications, video servers, and mission computing.

Technical Specifications

Compliance

XMC 2.0 (VITA-61), XMC PCIe (VITA 42.3)

Certifiable up to DAL-C (DO-178C/DO-254) – Higher upon request

Certifiable board support package: VxWorks®653 (partitioned)

Power Consumption

	minimum	typical	maximum
-	-	15W	20W

Processor

NXP QorIQ T2080 four dual threaded e6500 cores

AltiVec unit

Memory

4 GB DDR3L at 14.4 GB/s peak with ECC protection

4 GB Flash EPROM (NAND)

512MB Flash EPROM (NOR)

256 KB FRAM NVRAM

Links/Connections

3x PCIe Gen2 x1 on XMC-P6

1x PCIe Gen2 x4 on XMC-P5

1x SGMII on XMC-P6 (DAL-C) ⁽¹⁾

2x UARTs on XMC-P6 ⁽²⁾

Maintenance or DAL-E only interfaces (disabled when on mission)

1x 1000BASE-BX interface on XMC-P6 1x USB 2.0 HOST on XMC-P6

1x SGMII interface on XMC-P6 4x UARTs over USB on XMC-P6 (2)

1x USB 2.0 OTG on XMC-P6 1x SATA 2.0 on XMC-P6

⁽¹⁾ DAL-C certifiable in Fast Ethernet mode

⁽²⁾ Mutually exclusive

Ruggedization Levels

☐ A1 : 0°C to 55°C

☐ C4 : -40°C to 85°C

Safety Optimized Board Management Controller

Voltage monitoring

Temperature monitoring (thermal sensors on critical positions)

Elapsed time and real-time counter

Watchdog (short and long period)

Error reporting

Reset management

Certifiable board support package

Initialization sequence

Built-In Tests

Environmental Specifications

Condition	Limits, standards	Comments
Non-operating temperature	-55°C to 105°C [C4]	
Humidity	95%	
Altitude	-1,500 to 60,000 feet	May require conformal coating
Fungus resistance	No nutrient materials	
Workmanship	IPC-A-160 class 3	
Soldering	IPC J-STD-001 class 3	
PCB Manufacturing	IPC-A-600 class 3	
Conformal coating	IPC-CC-830	Optional
Materials	REACH compliant	ROHS variants as an option
Flammability	UL 94 Class V-0	
Quality	EN 9100:2008	

Level	Description	Cooling Type	Operating Temperature	Vibration (1 hour per axis)	Operating Shocks
A1	Commercial AC	Forced air*	0°C to 55°C [AC1]	5-100 Hz: increase at 3 dB/octave, 100-1000 Hz: 0.04 g ² /Hz, 1000-2000Hz: decrease at 6 dB/octave [V2]	20g, 11ms saw-tooth, three axes [OS1]
C4	Extended range CC	Conduction	-40°C to 85°C [CC4]	5-100 Hz: increase at 3 dB/octave, 100-1000 Hz: 0.1 g ² /Hz, 1000-2000Hz: decrease at 6 dB/octave	40g, 11ms saw-tooth, three axes

* The required air-flow is defined separately for each product

Software

- ☐ VxWorks653 board support package ☐ Linux board support package
☐ Green Hills Integrity 178 tuMP board support package

Safety Artifacts

- ☐ DO-178C certification kit* ☐ DO-254 certification kit*

*Please consult factory

Note: If the MFCC-8558 is to be used on a VME/PCPI carrier, please contact factory

Product Ordering Options

MFCC-8558AA42LN0

Freescape QorIQ T2080 XMC SBC, 4GB DDR3L, 4GB NAND, 512MB NOR, 256KB
NVRAM, conduction-cooled, 12mm stacking, standard mechanical frame

BP-5857AA

MFCC-8558AA42LN0 + 3U OpenVPX XMC carrier board CB3P-6357A043LN3

BP-5858AA

MFCC-8558AA42LN0 + 3U OpenVPX XMC carrier board CB3P-6358A043LN3

BP-5870BA

MFCC-8558AA42LN0 + 3U OpenVPX VGP-2870 video GPU board

Related Hardware Products

AVIO-2353

3U OpenVPX avionics I/O board

VGP-2870

3U OpenVPX video I/O and graphic processor

CB3P-6357A0

3U OpenVPX carrier board for MFCC-8557/8

RTM-8557A0

Rear Transition Module for CB3P-6357A0 +
MFCC-8557/8 integration

ACS-6076

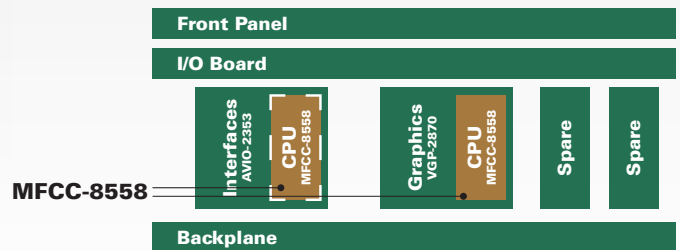
Forced air-cooled 4-slot payload, 3U OpenVPX
sealed conduction-cooled enclosure (0.8", 0.85",
1" pitch, 250 Watts) with MIL connectors

ROCK-2

3U OpenVPX, low-SWaP, rugged, modular,
pre-qualified subsystems

Less space for more functions

Mission Computer featuring stacked XMCs for low-SWaP



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