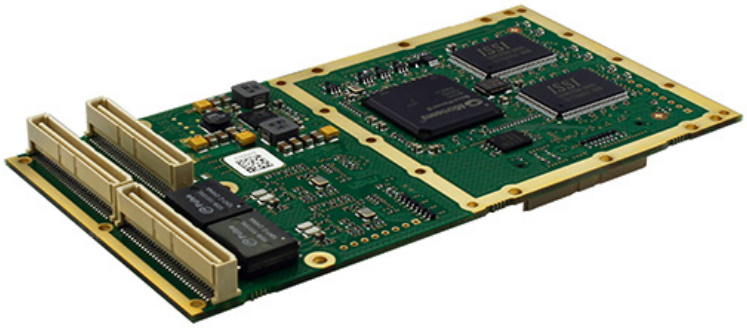
P522 – AFDX®/ARINC-664 Interface PMC

- **Two full duplex AFDX® networks**
- **Onboard AFDX® End System protocol stack implementation**
- **Interoperable with Airbus and Boeing**
- **DAL-A/B certifiable FPGA implementation**
- **Onboard CPU for SNMP and ICMP traffic**
- **Host driver with ARINC-653 compliant port API**
- **-40 to +85°C with qualified components**
- **32-bit/33-MHz PMC**



The P522 is a 32bit/33MHz PMC module with AFDX®/ ARINC-664 functionality. AFDX® is a reliable, high-speed data bus commonly used in airborne applications for sending information between avionics subsystems. Its most important features are high data integrity, redundancy and deterministic behavior.

The P522 meets all AFDX® safety and performance requirements, which makes it ideal for safety-critical inflight data transfer. The PMC module supports two full duplex AFDX® networks based on standard IEEE 802.3 Ethernet technology and applies protocol stack implementation. Up to 255 fully separated receive VLs and 64 transmit VLs allow for reliable packet transport and bounded transport latency.

The FPGA internal ARM® CPU can be used for services to offload host CPU and to reduce failure modes in the AFDX® configuration. The onboard CPU is not required to execute the AFDX® protocol and is separated from the rest of the protocol engine. Therefore, this configuration can be used for quite flexible designs, as well as very compact integrated AFDX® solutions.

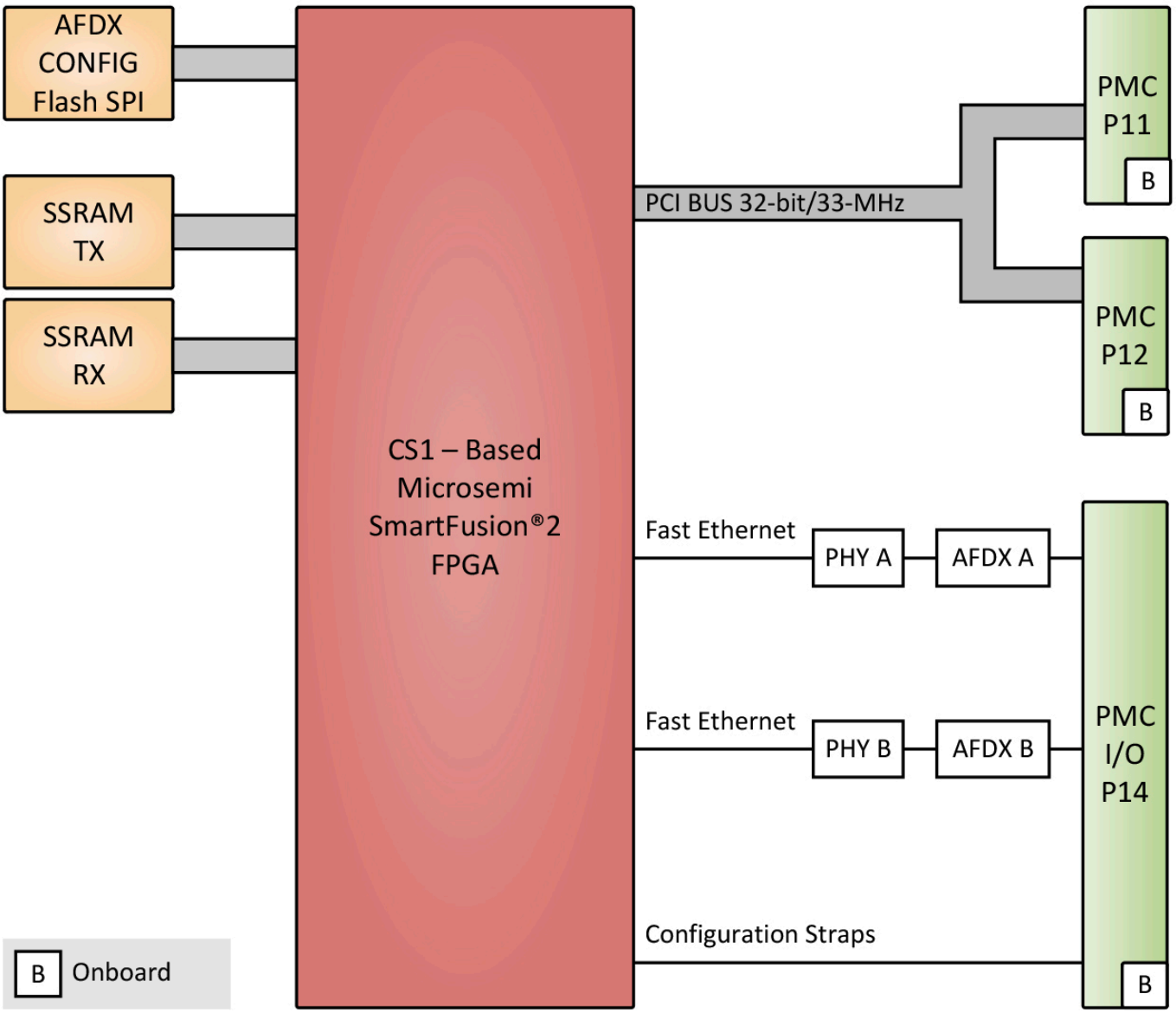
The architecture of the P522 is based on the flash based FPGA CS1, which reduces development costs, secures long-term availability and makes the whole interface very flexible as customized I/O functionality can be added anytime.

The CS1, which can be ordered as an individual chip, can be installed directly onto a large variety of boards to build an AFDX® end system, and eliminates the need for an additional module

The PMC module is certifiable to the critical safety level DAL-D, according to the avionics guidelines (DO-254).

The P522 is a PMC I/O mezzanine card suitable for any PMC compliant host carrier board. It is an ideal extension for MEN's safe computers A602 and D602.

Diagram


AFDX CONFIG Flash SPI
SSRAM TX
SSRAM RX
CS1 – Based Microsemi SmartFusion®2 FPGA
PCI BUS 32-bit/33-MHz
PMC P11
B
PMC P12
B
Fast Ethernet
PHY A
AFDX A
Fast Ethernet
PHY B
AFDX B
PMC I/O P14
Configuration Straps
B
B Onboard

Technical Data

AFDX® Usage Domain	■ Up to 255 fully separated receive VLs and 64 transmit VLs ■ Up to 32 ports per VL (total amount of 1024 ports each for TX and RX) ■ BAG between 1 ms and 128 ms (0.5 ms transmission interval)
CPU	■ ARM® Cortex®-M3 ■ 166 MHz frequency ■ Jitter of 0 ms is possible (dependent on configuration) ■ Supports full wire speed for recieve and transmit ■ Supports up to 31 different configurations ■ ICMP and SNMP service
Ethernet Interface	■ Two 10/100Base-T/TX Ethernet channels ■ Accessible on the PMC I/O connector
Memory	■ 512k x 36 SSRAM memory □ 4 MB for AFDX® receive data □ 4 MB for AFDX® transmit data □ FPGA-controlled ■ 16 MB non-volatile Flash □ For AFDX® configuration data □ FPGA-controlled
Configuration Interfaces	■ Software tool for programming AFDX® configuration ■ Configuration straps for setting FPGA parameters: □ In flight/on ground □ Equipment on left side/right side □ Maintenance mode disabled/enabled
FPGA	■ Complete AFDX® protocol implementation ■ SEU immune
PMC Characteristics (PCI)	■ Compliant with PCI Specification 2.2 ■ 32-bit/33-MHz, 3.3V V(I/O) ■ CRC-protected transfer of AFDX® messages ■ Target
Miscellaneous	■ Eight FPGA LEDs
Electrical Specifications	■ Isolation voltage: □ 1500 VAC ■ Supply voltage/power consumption: □ +5 V (-3%/+5%), tbd mA
Mechanical Specifications	■ Dimensions: conforming to IEEE 1386.1 ■ Weight: 200 g (tbd)
Environmental Specifications	■ Temperature range (operation): □ -40..+85°C (qualified components) □ Airflow: min. 1.0 m/s ■ Temperature range (storage): -40..+85°C ■ Relative humidity (operation): max. 95% non-condensing ■ Relative humidity (storage): max. 95% non-condensing ■ Altitude: -300m to +20,000m ■ Shock: certification according to DO-160 is possible ■ Bump: certification according to DO-160 is possible ■ Vibration (sinusoidal): certification according to DO-160 is possible ■ Conformal coating on request
MTBF	■ tbd
Safety	■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

Technical Data

EMC	■ Conforming to EN 55022 (radio disturbance), IEC61000-4-2 (ESD) and IEC61000-4-4 (burst)
Software Support	■ Linux (in preparation) ■ For more information on supported operating system versions and drivers see Software.

Ordering Information

Standard P522 Models	**15P522-00**	P522, AFDX® PMC, DAL D, 4 MByte RX & 4 MByte TX Memory Buffer, 64 MBit AFDX®-Configuration Flash

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