



Telum™ ASLP11

High Performance Processor AMC Module

The Telum™ ASLP11 is a single width, full or mid size AMC processor board with an integrated Intel® Core™ 2 Duo processor plus 3100 integrated controller. The assembly is fully compliant to the PICMG AMC.0, R2.0, AMC.1, R2.0 (Type 8 PCI Express), AMC.2 (Type E2 Gigabit Ethernet) and AMC.3 (Serial ATA) specifications.

The Telum™ ASLP11 hosts one Core 2 Duo processor with a 1.5 GHz or higher core clock. The assembly is ready to accept higher performance Core 2 Duo processor variants when introduced by Intel.

Two banks of DDR2-400 SDRAM components are provided on the ASLP11 for a maximum of 4 GBytes of main memory with ECC. These soldered memory banks offer higher levels of mechanical shock and vibration immunity as well as a higher MTBF metric for the overall assembly. The module also hosts a 2 GByte NAND Flash array through an internal USB port and may be provisioned with higher Flash ROM capacities when required for specific applications.

The PCI-Express port on the ASLP11 may be configured as either the root controller or as an end node (target) on a PCI-Express subnet. If the ASLP11 is configured as an end node, a non-transparent bridge function is enabled at the PCI-Express interface to protect the local processor's resources from the remote root controller. The PCI-Express fabric clock FCLKA interface provides a common reference clock in order to support a spread spectrum clock (SSC) signal, and may be configured as either an input or an output on the ASLP11 to support the PCI-Express port configuration.

The Module Management Controller (MMC) on the ASLP11 supports the Intelligent Platform Management Interface (IPMI) v2.0 architecture as defined in the AMC.0 specification and is responsible for power sequencing, hot swap and overall module management. The MMC allows independent platform management between all AMC modules, carrier, power supplies, fans and other accessories in a system. This feature may be used for autonomous monitoring, logging and recovery control functions.

The AMC connector contains the following interfaces:

- Ports 0 & 1: two Gigabit Ethernet ports
- Ports 2 & 3: two S-ATA 1.0 ports
- Ports 4 - 11: monolithic x8 PCI-Express port
- Port 18: USB 2.0 port (optional)
- Port 20: COM port (optional)

Supported operating systems for the ASLP11 include standard distribution Linux and Carrier Grade Linux®.

The module is designed to operate under the NEBS Level 3 environment specifications at the host system. It is also available in an extended operating temperature version (-40° C to +55° C).

The Telum™ ASLP11 is designed for use in a broad range of applications such as wireless base stations, voice over packet, enterprise devices, test and measurement systems, and server blade applications. This, combined with a custom specific assembly service, provides optimized price and performance for a vast number of telecom applications.

Please contact GE Fanuc Intelligent Platforms for a current list of Core 2 Duo processors and OS versions supported on the ASLP11.



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Specifications

Processor – μ FCBGA, Low Power Design

- Scalable embedded processing power
- Intel® Core™ 2 Duo processor: L7400 (1.5 GHz core clock / 667 MHz FSB)
- Cache: Level 1-32 KB / Level 2 4096 KB, full speed
- High efficiency on-board switching regulator (DC/DC)
- Contact GE Fanuc Intelligent Platforms for current Core 2 Duo versions

Integrated Controller – Intel® 3100

- 667 MHz system bus to processor
- DDR2-400 / DDR2-533 memory controller with ECC
- Two PCI-Express root controllers
- S-ATA port controller with HW RAID support
- UART port controller
- USB 2.0 port controller
- GPIO interfaces
- PCI Local Bus controller
- SMBus and LPC port controllers
- Internal processor peripherals including DMA engines, timers, and interrupt controllers

PCI Express on AMC

- One PCI Express x8 link with bridge to AMC connector ports 4 – 11 (AMC.1 Type 8)
- Standard configuration: acts as root complex (Master) for external PCI Express devices (transparent bridging)
- Optional configuration: acts as end point (Slave) to permit provisioning of multiple ASLP11s in one host carrier/system (NT bridging)

Main Memory Array

- DDR2-400 SDRAM array: 2 banks soldered memory components
- 72-bit wide bus with error correction (ECC)
- Configurable capacity: 512 MByte to 4 GByte
- 4 GByte capacity dependent on availability of 2 Gbit memory components (contact GE Fanuc Intelligent Platforms for current availability information)

Flash ROM Memory Module

- Standard configuration: 2 GByte NAND Flash ROM module
- Accessed by core processor through internal USB 2.0 port
- Other Flash ROM capacities available on request

Dual Gigabit Ethernet – Intel® 82571

- Highly integrated Dual Channel Ethernet MAC / PHY Controller
- Serdes type 1000Base-BX connection on AMC connector ports 0 & 1 (AMC.2 Type E2)

S-ATA Ports

- Ultra SATA/150 sync. DMA mode up to 150 Mbytes/sec
- SATA interfaces on AMC connector ports 2 & 3 (AMC.3)

USB 2.0 Ports

- One external USB 2.0 connector at front panel
- Optional external interface at AMC connector port 18
- Internal USB interface to on-board Flash ROM array

Keyboard/Mouse

- Support via USB port

Real-time clock, CMOS RAM

- RTC 146818 compatible, no battery backup

EEPROM

- 512 kbit serial EEPROMs for non-volatile user data

Watchdog Timer

- Integrated in 3100 controller
- Two stage watchdog with independent count values
- First stage drives NMI or SMI, second stage drives reset
- Configurable granularity from 1 μ s to 10 minutes

COM Serial Port

- RS-232 Tx/D/RxD/RTS/CTS interface wired to mini USB type connector at front panel
- Optional redirect of RS-232 signals to AMC connector port 20

General Purpose Timers

- Contained in 3100 integrated controller
- Includes three timers comparators
- One-shot and periodic interrupts supported

Reference Fabric Clock FCLKA

- Common reference clock for PCI Express port
- Supports spread spectrum clock (SSC) operation as defined in the PCI Express specification
- Standard configuration: ASLP11 receives from external master
- Optional configuration: ASLP11 generates its own reference clock and drives external FCLKA bus

On-board Temperature Sensors

- CPU die and board temperature software readable from -65° C to +127° C via I2C or via IPMI
- Individual CPU internal digital die temperature sensor for each core on Core 2 Duo processor

LEDs

- Front panel LED system control
- Hot swap (blue), LED 1 (red, failure, out of service status; red/amber/green during boot for BIOS status display) and LED 2 (green, healthy) available for applications under IPMI control
- LED positions / colors per AMC.0 R2.0 Specification

MMC

- Module Management Controller as defined in AMC.0 R2.0
- Supports the Intelligent Platform Management Interface (IPMI) v2.0 architecture
- Implements full Hot Swap functionality to permit module to be inserted or removed in a powered system



Front and Rear I/O (Interconnect)

Port	Front	AMC connector
FCLKA	—	FCLKA
Eth 1	—	Port 0
Eth 2	—	Port 1
USB0	√	—
USB1	—	Port 18 (optional)
PCIe x8	—	Port 4 to 11
LEDs	√	—
SATA 1	—	Port 2
SATA 2	—	Port 3
COM	√	Port 20 (optional)

BIOS Features

- New AMI BIOS Core 8, in-system programmable Flash ROM
- CPU, memory and SATA auto-detection/selection
- Integrated Ethernet BIOS ROM
- USB Mass Storage support and booting capability (floppy, HDD, CDROM, and on-board Flash ROM array)
- Password protection, BIOS post, system BIOS shadowing
- Operation without disk, keyboard and video

Software

- Standard distribution Linux (2.6.2x tree)
- Windows® Vista™
- Contact GE Fanuc Intelligent Platforms for current release levels of standard Linux and CG Linux

Module Power Requirements

- +12V Module power
- +3.3V Advanced Management power, 0.1A max.

Power Consumption

- L7400 Core 2 Duo plus 2 GB RAM: 45W typical
- See User's Manual or contact GE FANUC Intelligent Platforms for additional power consumption information

Mechanical – PICMG AMC.0, R2.0

- Single module PCB (180.6 x 73.5 mm without front bezel)
- Mid-size module (19mm front panel) or full-size module (29mm front panel) assembly options
- Passive Heatsink provided over processor and other high thermal load components (no fans on the module)

Environment Specifications

Temperature

- Operating Range
 - Standard: 0° C to +55° C
 - Extended: -40° C to +55° C
- Storage Range
 - Standard: -40° C to +75° C
 - Extended: -40° C to +75° C

Note: Consult the User's Manual or GE Fanuc Intelligent Platforms for additional detailed information on the operating temperature behavior of the module. The ASLP11 operating temperature range is influenced by processor type and speed, operating altitude, and the type of cooling used in the host system.

Relative Humidity

- Operating: 5 – 95% @ 40° C, non-condensing
- Storage: 5 – 95% @ 40° C, non-condensing

Altitude

- Operating: Sea level to 15,000 ft. (4.5 km)
- Storage: Sea level to 40,000 ft. (12 km)

Mechanical Shock - Operating

- 12g / 6 ms, 3 axis, up & down, 5 hits / direction

Random Vibration - Operating

- 2 g rms @ 5–100 Hz, 1 hour each axis

MTBF / FIT Prediction

- Prediction calculations are available in accordance with either SR-332 or MILHDBK-217 models. Please contact GE Fanuc Intelligence Platforms for further information.

Regulatory / Statutory Certifications

- CE Mark certificate obtained
- Designed to meet:
 - FCC 47 CFR Part 15 Class A (USA)
 - EN 55022:1998/A1:2000/A2:2003 Class A ITE (EU)
 - ICES-003 Issue 3 Class A (Canada)
 - VCCI Class A ITE
 - AS/NZ CISPR 22:2002 Class A (Aus. New Zealand)
 - EN 55024:1998/A1:2001/A2:2003 (EU)
 - UL60950-1 (USA)
 - CSA 22.1 No. 60950-1-03 (Canada)
 - EN 60950-1 (EU)
- Designed to operate in a host system subjected to NEBS Level 3 environment specifications.

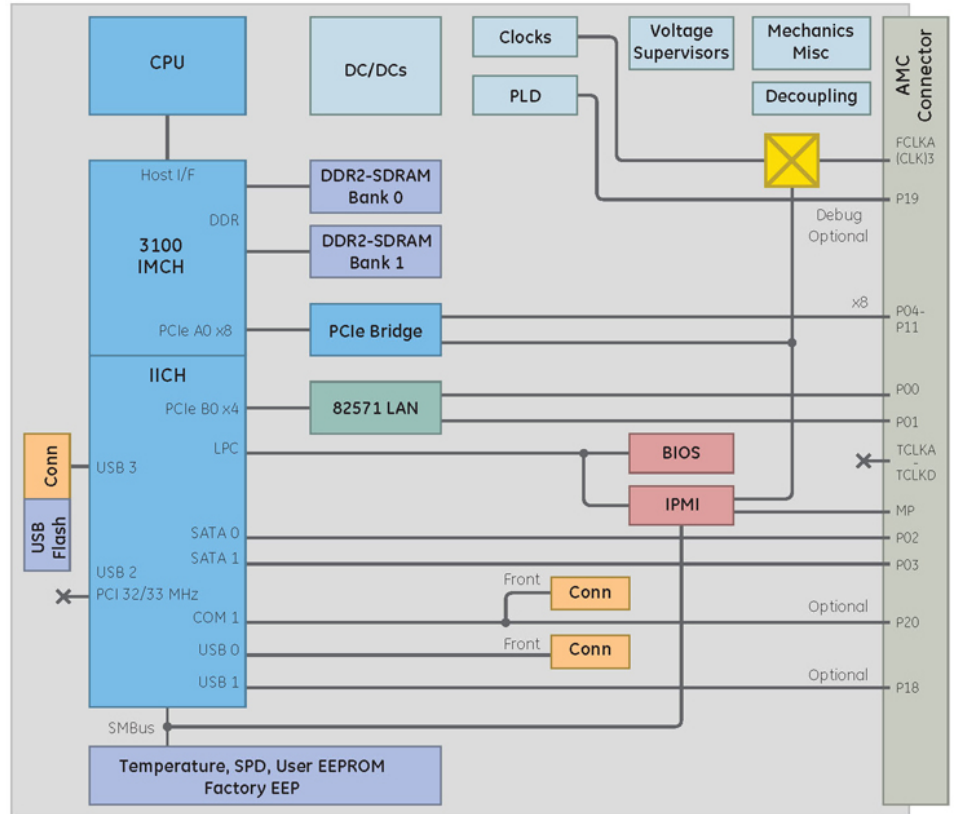
Applicable PICMG AMC Specifications

- AMC.0, R2.0 Base Specification
- AMC.1, R2.0 PCI Express on AMC Specification
- AMC.2, R1.0 Ethernet AMC Specification
- AMC.3, R1.0 AMC Storage Specification



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Block Diagram



Ordering Information

ASLP11RFCI01 Single-width, full-height, Intel® LV Core™ 2 Duo L7400 1.5 GHz, 2 GB ECC DDR2, 2 GB Flash, 2x rear GigE, 2x rear SATA, IPMI, front panel USB and serial port.

Available Operating Systems: Standard Distribution Linux and Windows Vista
For detailed information and additional options, contact GE Fanuc Intelligent Platforms

About GE Fanuc Intelligent Platforms

GE Fanuc Intelligent Platforms is a leading global provider of embedded computing solutions for a wide range of industries and applications. Our comprehensive product offering includes many types of I/O, single board computers, high performance signal processors, fully integrated, rugged systems including flat panel displays, plus high speed networking and communications products. The company is headquartered in the U.S. and has design, manufacturing and support offices throughout the world. Whether you're looking for one of our standard products or a fully custom solution, GE Fanuc Intelligent Platforms has the breadth, experience and 24/7 support to deliver what you need. For more information, visit www.gefanuc.com.

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Additional Resources

For more information, please visit the GE Fanuc Intelligent Platforms web site at:

www.gefanuc.com

