



TSPE01

Telum™ PrAMC PowerPC G4 Processor Mezzanine Module

Features

- MPC7447A PowerPC G4 processor
- 200 MHz System Bus
- Tsi109 System Controller
- DDR2-400 SDRAM
- 512 MB or 1 GB with ECC on 200 MHz Memory Bus
- 64 MB Flash memory
- 128 kB NVRAM / Real-Time Clock
- Two 1000Base-BX Ethernet port to B+ Carrier
- 10/100Base-TX to RJ-45 connector on the front panel
- Serial RS-232 port—COM1 to front panel
- Serial RS-232 port—COM2 to B+ Carrier
- Four programmable GPIO lines
- Integrated watchdog timer
- IPMI Microprocessor
- Four 32-bit general-purpose timers
- Hot Swap compatible
- Temperature Sensor
- AMC.0 compliant
- AMC.2 compliant

TSPE01 is the first PrAMC module driven by a PowerPC G4 processor to join the Telum™ AMC product family. The TSPE01 features Freescale MPC7447A PowerPC G4 processor with processing speeds up to 1 GHz. The MPC7447A includes on-chip 32 kB L1 instruction and data caches and a 1 MB L2 cache.

The TSPE01 couples the MPC7447A processor with Tundra's Tsi109 System Controller. The Tsi109 provides a 200 MHz System Bus interface, a memory controller with a 64-bit 200 MHz memory interface that services up to 1 GB of DDR2-400 SDRAM.

The Tsi109 also features a 64-bit 33 MHz PCI bus interface, three Ethernet ports: two 1000Base-BX Ethernet ports to the carrier and one 10/100Base-TX port to the front panel, and two MPSC ports that provide full-duplex RS-232 serial ports: one to the carrier and one to the front panel.

The TSPE01 provides four programmable general-purpose I/O lines to the carrier that can be configured as either inputs or outputs with individual interrupts.

The TSPE01 is equipped with a Module Management Controller that can implement Module Maintenance Controller functions as defined by the AMC.0 specification.

For easy integration, the TSPE01 is Hot Swap compliant per AMC.0.

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Processor

- MPC7447A PowerPC G4 processor with core processing speeds up to 1 GHz
- 32 kB L1 instruction and data caches
- 1 MB L2 on-chip cache
- 200 MHz System Bus interface in 60x or extended MPX modes through the Tsi109 System Controller

System Memory

- 512MB, or 1 GB of soldered DDR2-400 SDRAM
- Integrated DDR SDRAM Controller through Tsi109 System Controller
- 64-bit 200 MHz Memory Bus (72-bit with ECC)

Flash ROM

- 64 kB Flash memory on 32-bit ROM Bus
- Multiple levels of write-protection

PCI Bus

- PCI interface through the Tsi109 System Controller
- PCI Bus 0: 64-bit, 33 MHz to 10/100Base-TX Ethernet Controller

NVRAM / RTC

- NVRAM with 128 kB SRAM
- RTC function with clock and calendar

Hot Swap

- Hot Swap compliant per AMC.0
- Blue indicator LED on front panel

Module Management Controller

- IPMI Microcontroller on 32-bit ROM Bus
- IIC interface

Ethernet

- Two 1000Base-BX ports: ETH1 and ETH2 from integrated MACs in Tsi109 with independent PHY routed to B+ Carrier connector
- Single 10/100Base-TX port from Ethernet Controller on PCI Bus 0, routed to RJ-45 connector on front panel

Serial Ports

- Two full-duplex RS-232 serial I/O ports from MPSC ports in Tsi109 System Controller
- COM1: routed to 3-pin connector on front panel
- COM2: routed to B+ Carrier connector

GPIO

- Four programmable general-purpose I/O lines from integrated GPIO controller in FPGA
- Each line configurable for direction (input, output), output drive type (TTL, open-drain), input polarity (inverted, non-inverted) and interrupt masking
- Independent interrupt masking

I/O	Front Panel	B+ Carrier
COM1 (RS-232)	✓	
COM2 (RS-232)		✓
Ethernet (ETH1)		✓
Ethernet (ETH2)		✓
Ethernet (ETH3)	✓	
GPIO (0-3)		✓
IPMB-L		✓

Counter/Timers

- Four integrated 32-bit general-purpose timers

Watchdog Timer

- Integrated programmable watchdog timer through FPGA

Temperature Sensor

- CPU die and ambient temperature
- Software readable from -55° C to +125° C

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Power Requirements

- +12 V from B+ Carrier connector

Power Consumption

- +12V

Peak:	TBD
Idle (typical) *:	TBD
Inrush (120µs):	TBD
Total (peak):	TBD

* Measured at VxWorks@ prompt

Mechanical

- Single-wide full-height AMC.0 form factor
- 73.5 mm x 180.6 mm x 28.95 mm
- Weight: TBD

MTBF

- Calculations are available in accordance with MIL-HDBK-217. Please contact GE Fanuc Intelligent Platforms for latest values.

Safety

- Designed to meet the following standards:

US:	UL60950: 2001
Canada:	CSA 22.2 No 60950
EU:	EN60950: 2001

Emissions

- Designed to meet the following standards (Class A Industrial only):

US:	47CFR Part15
EU:	EN55022/A2: 2003

Humidity (non-condensing)

- Operating: up to 95% @ 30° C
- Storage: up to 95% @ 30° C

Altitude

- Operating: 4.5 km (60,000 ft.)
- Storage: 6 km (60,000 ft.)

Shock

- C-Style: 20 g / 11 ms, 3 axes, up & down, 3 hits / direction

Vibration

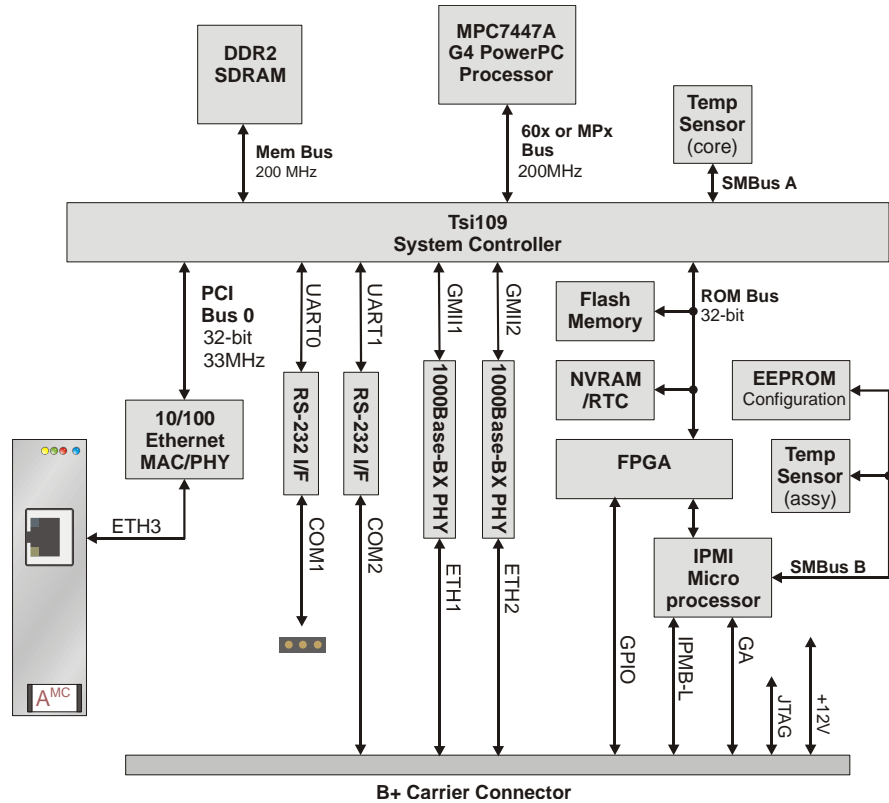
- C-Style: 0.04 g² /Hz @ 5 to 100 Hz, 60 minutes each axis

Temperature

- Operating
 - 0° C to +55° C with 10 CFM airflow
 - -5° C to +70° C with 20 CFM airflow
 - -40° C to +85° C with 40 CFM airflow
- Storage
 - -40° C to +85° C

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Block Diagram



Ordering Information

TSPE013100C
512 MB DRAM, MPC7447A 1 GHz processor

Operating Systems

Various operating systems are supported. For detailed information and current options, please 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

