

TTE Switch Controller HiRel FM

TT6802-2-SW-C Integrated TTEthernet® Switch Controller



Key Features

- ✓ Three supported traffic classes
 - Standard Ethernet (IEEE802.3)
 - Rate-constrained (ARINC 664 part 7)
 - Time-triggered (SAE AS6802)
- ✓ 6x 100/1000 Mbit/s and 16x 100 Mbit/s Ethernet channels
- ✓ 1 MByte of internal memory
- ✓ 400 pin PBGA package
- ✓ Junction temperature: -40 °C to +125 °C
- ✓ Rad-hard design

The TTE Switch Controller HiRel is an integrated communication controller that supports standard Ethernet traffic, rate-constrained traffic according to ARINC 664 part 7, and time-triggered traffic according to the SAE AS6802 Time-Triggered Ethernet Standard. The chip is based on a radiation-hardened 65 nm design process and packaged in a cost-efficient plastic package. This ensures high reliability in harsh environments requiring radiation and latch-up tolerance for applications like launch vehicles and LEO satellites.

TT6802-Device Family for Synchronized and Non-Synchronized Functions over Ethernet

The TTE Switch Controller HiRel is part of the TT6802-device family that includes communication controllers and switches available as both industrial- and space-graded products, usable as building blocks for TTEthernet® data networks. TTEthernet® enables the integration of synchronized and non-synchronized functions in Ethernet-based distributed systems. TTEthernet® allows hard real-time functions to enjoy reserved bandwidth, full determinism and delivery jitter below 1 μ s, by simultaneously operating ARINC 664 part 7 and standard IEEE 802.3 Ethernet traffic without impact on time-critical

and synchronized functions.

Support for Single to Triple-Channel Network Architectures

TTEthernet® supports single to triple-channel multi-hop networks with system synchronization, redundancy management, fault-tolerance, fault isolation and recovery capability to enable a safety-critical system design. Distributed functions can utilize scalable QoS for different data streams and share a common Ethernet network without unintended interactions for critical traffic.

TTE Switch Controller HiRel Benefits

The TTE Switch Controller offers 6x 100/1000 Mbit/s



Application Fields

- Launcher vehicles
- LEO applications
- Space robotics

and 16 x 100 Mbit/s switching ports for high-speed data communication, 1 MByte of internal memory and an integrated LEON2FT CPU with data loading and diagnostic functionality.

With the supported set of features for fault-tolerant, high-speed (up to 1000 Mbit/s) data communication in a single device combined with superior reliability, the TTESwitch Controller HiRel is well suited for various applications, ranging from full-managed, up to 22-ports TTESwitches to on-board fault-tolerant computers.

The TTESwitch Controller HiRel is qualified for the wide temperature and radiation range required for space applications like launch vehicles and LEO satellites and is qualifiable according to international space standards.

Quality of Service and Partitioning

The TTESwitch Controller HiRel supports up to 4096 virtual links which can be separated via eight memory partitions. This allows the use of standard Ethernet traffic and time-triggered or rate-constrained traffic on the same network without interference.

General Product Features

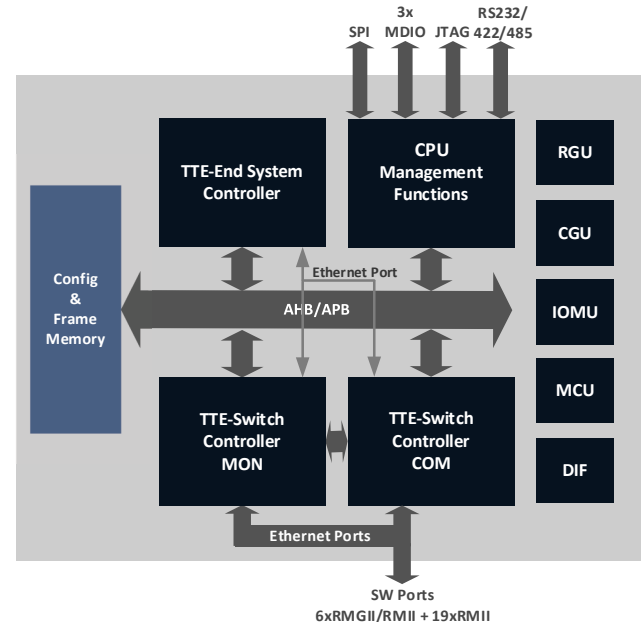
- Suitable for highly reliable, distributed real-time systems with guaranteed response time
- Support of the three TTEthernet® traffic classes:
 - Standard Ethernet (IEEE 802.3)
 - Rate-constrained (according to ARINC 664 part 7)
 - Time-triggered (according to SAE AS6802)
- 4096 Virtual Links (VLs)
- Flexible configurable periods (1 μ s granularity)
- 8 traffic partitions
- Integrated LEON2FT CPU operating at 125 MHz for device management and status monitoring
- 1 MByte internal memory

Network Connectivity

- 6 x 100/1000 Mbit/s via RGMII and
- 16 x 100 Mbit/s via RMII

Power Supply and Consumption

- Power supply 1.2 V (core) and 2.5 or 3.3 V (I/O)
- Typical power consumption of 1.5 to 2 W



Environmental

- Junction temperature range -40 °C to +125 °C
- Radiation tolerance for total dose up to 100k rad
- Latch-up immunity up to 60 MeV/cm2/mg

Package & Quality Level

- 23 x 23 x 1.9 mm (1.3 mm plastic) PBGA with 400 pins, 1 mm pitch and 600 μ m balls lead-free
- AEC-Q100 grade 2 with Burn-In
- IPC/JEDEC J-STD-033 and J-STD-020 (MSL3)

Related Products

- TTETools is a PC based toolchain that supports the generation of configuration files for the IP
- TTEEnd System Controller HiRel TT6802-2-SE-C
- TTESwitch Space 3U cPCI (EDU) cards

Ordering Codes

- 13773 (TT6802-2-SW-C – Flight Model)



TTEch Europe, Austria (Headquarters)
Phone: +43 1 585 34 34-0

TTEch North America Inc.
Phone: +1 978 933-7979

TTEch Japan
Phone: +81 52 485-5898

© TTEch. All rights reserved. All trademarks are the property of their respective holders. To the extent possible under applicable law, TTEch hereby disclaims any and all liability for the content and use of this flyer.

products@ttech.com

www.ttech.com