

TPS-1 – PROFINET IO Single Chip Device Interface

The TPS-1 is a single-chip PROFINET interface component integrating a CPU, a 2-port switch supporting latest PROFINET specifications, the Ethernet PHYs and peripheral modules to interface to the application layer of any application building a PROFINET IO device.

The TPS-1 complements the existing PROFINET technology components ERTEC 200 and ERTEC 400 already available from Renesas Electronics. It rounds off the basic technology range of PROFINET specifically for compact devices. The interoperability among these technology components and the compliance with PROFINET specification 2.3 is ensured.

Applications

- Industrial Drives
- Compact and modular Remote I/Os

Product features

- Integrated PROFINET CPU
- Compliant with Conformance Class C
- 2 external ports, 100 Mbit/s, full duplex
- 2 integrated PHYs with auto negotiation, auto crossover
- Integrated IRT switch, 8 priority levels
- Supports RJ45 or fiber optic interfaces
- Fiber optic diagnosis via I²C interface per port
- IRT bridge-delay < 3 μs
- Hardware support for PROFINET protocols including PTCP and LLDP
- Versatile host interface for serial or parallel connection of external CPUs or local inputs/outputs
- Small package (15 x 15 mm), 1 mm ball pitch

Application interface

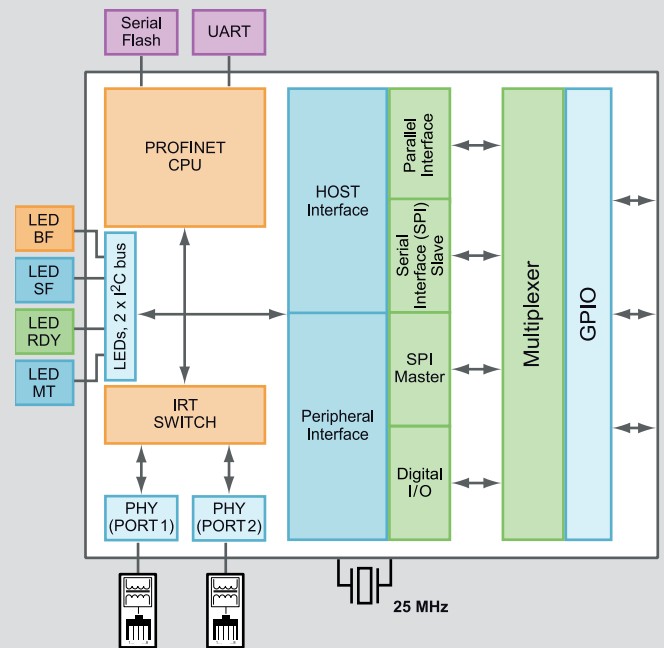
The TPS-1 provides 48 General Purpose I/O (GPIO) pins that you can individually configure according to your specific application requirements.

- 48 GPIO pins for digital IO's
- Parallel host interface
- Serial host 8- or 16-bit interface (SPI-Slave)
- Serial application interface (SPI master)
- 5 GPIO for internal signals (e.g. LEDs)

The TPS-1 interfaces to an application CPU via the internal shared memory either through the fast SPI slave interface or through the 8- or 16-bit parallel port.

Development board

A starter kit is available.



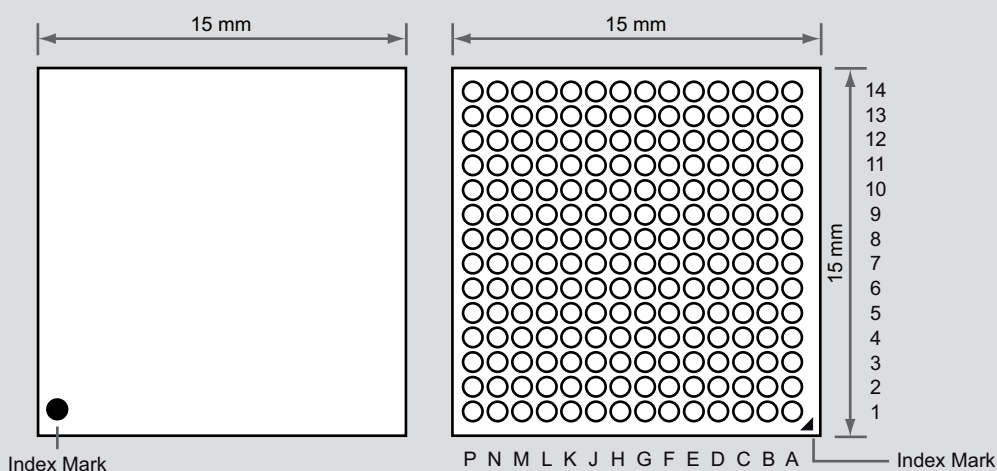
Configuration and Software

The TPS-1 is configured by a specific configuration file. It contains manufacturer data, device type data, I&M information, operating modes of the TPS-1 and further required information.

The configuration file is easily created with the configuration tool TPS Configurator, available through KW-Software.

Specification summary

Parallel host interface	Data bus width	8-bit or 16-bit
	Address area	Max. 64 KByte (segmentation possible)
	Read/Write mode	Intel mode (separate read/write line) or Motorola mode (common read/write line) / (RDY low or high active)
Serial host interface (SPI slave)	Frame format	Motorola SPI frame format; TI synchronous format; National Microwire format
	SPH	Phase angle of the SPI_CLK (Motorola-relevant)
	SPO	Polarity of the SPI_CLK (Motorola-relevant)
	SPI_Handshake	Wait mode; Busy mode
	Timeout_CNT	Watchdog for detection of SPI data stream in case of an error
PROFINET CPU	Internal microprocessor	32-bit, 100 MHz, RAM integrated
PROFINET interface	Transmission speed	100 Mbit/s, full duplex
	PROFINET connection	Two ports with auto negation and auto crossover for star and line topologies
Electrical parameters	Supply voltages	3.3 V; 1.0 V
	Power consumption	< 800 mW
	Temperature range	-45 °C up to 85 °C
Housing	Package	FPBGA 196-pins
	Dimensions	15 x 15 mm
	Ball pitch	1.0 mm



Before purchasing or using any Renesas Electronics products listed herein, please refer to the latest product manual and/or data sheet in advance.

