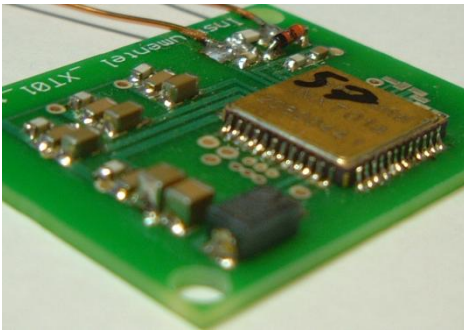


Extreme Environment Transponder with 8-bit A/D



- Extended temperature capability (-40 to +225°C)
- Silicon-on-Insulator SOI technology
- Battery free operation (inductively coupled)
- Supports Instrumentel telemetry protocol
- Constant current source
- General purpose IO
- Flexible and high speed sampling modes.
- Highly integrated, requiring few external components.
- Far field channel

Introduction

The XT01 transponder is an Application Specific Integrated Circuit (ASIC). This highly integrated device is an inductively coupled telemetry transponder, which can sample analogue sensors located in extreme environments or difficult to access places. The XT01 has been designed to be a remote tele-sensing node, capable of functioning and surviving the extreme environments in which Instrumentel Ltd has a growing reputation for deploying electronics. Examples include piston telemetry, explosion metrology and nuclear waste monitoring.

The XT01 transponder interfaces with the Instrumentel Diagnostic Hub, using a near field inductive link. To achieve this the XT01 transponder and Diagnostic Hub utilise wire wound coils. The communications channel created with the coils, enables the XT01 transponder to be powered and controlled via the Hub, and also allows the Hub to record and analyse data sampled by the transponder.

In addition the Instrumentel Ltd Diagnostic Hub is sufficiently versatile so as to be reconfigured as a Radio Frequency Identification (RFID) reader. This allows the Hub to be used as a networked reader permitting access to XT01 and standard RFID devices.

The Diagnostic Hub capable of interfacing with other suppliers' systems as well as a range of 'plug-in' modules developed by Instrumentel to provide customer specific sensing.

The Diagnostic hub is available as an expandable system, configured depending on the number of IOs required. The hub can later be expanded to provide capability up to the maximum of 32 IOs.

XT01 Specification

XT01 Core features

Architecture: High Performance Complex Single Instruction CPU

UID: Up to 48-bit unique identifier

Operating temperature Range: -30°C – +225°C

Maximum input voltage: 60V

Current consumption: <20mA

Maximum functional temperature: 250°C with performance de-rating

Clocking Options: Selectable oscillator options

Operation Features: ICT transceiver mode, PWM source, Two internal 16-bit counters, Power-on reset (POR), Radiation hardened SOI technology, Fully static design, Far field capability, High temperature clock source, Number of application specific modes, Two enhanced modes for time critical applications.

Analogue Peripherals

8-bit successive approximation Analogue to digital converter, Near field, power recovery circuit, Near field, forward path data recovery, Near field, backward path transmitter, Constant current source, Far field transmitter

Near Field

Carrier frequency: 13.56MHz

Forward path modulation scheme: ASK

Forward path modulation index: 2-20%

Forward path data rate: 3.6kbs⁻¹

Forward path coding: RZ, 1x1

Backward path modulation scheme: ASK

Backward path data rate: 200kbs⁻¹

Backward path coding: RZ

Far Field

Carrier Frequency: 27MHz

Modulation scheme: OOK

Coding scheme: RZ

Data rate: 200kbs⁻¹

Max power: 10dBm (Using matching network)

Pin out

