Brief Description

The SAP5S/SAP51 is a next-generation CMOS integrated circuit for AS-Interface networks. This low-level field bus AS-i (Actuator Sensor Interface) was designed for easy, safe, and cost-effective interconnection of sensors, actuators, and switches. It transports both power and data over the same two-wire unshielded cable. The SAP5S/SAP51 is used as part of a master or slave node and functions as an interface to the physical bus. It provides the power supply, physical data transfer, and communication protocol handling. The SAP5S/SAP51 is fully compliant with the AS-Interface Complete Specification V3.0. It is function and pin compatible with the SAP4.1 (AS2702). The SAP5S/SAP51 can be programmed by the user to operate in Standard Slave Mode, Safety Mode (SAP5S only), or Master Mode. The special AS-i Safety Mode (SAP5S only) assures short response times regarding security-related events. All configuration data are stored in an internal EEPROM that can be easily programmed by a stationary or handheld programming device. The SAP5S/SAP51 is optimized for harsh environments by its special burst protection circuitry and excellent electromagnetic compatibility.

Features

- Compliant with the AS-Interface Complete Specification V3.0
- Universal application: slaves, masters, repeaters
- Integrated safety code generator (SAP5S only)
- On-chip electronic inductor: 55mA current drive capability
- Two LED outputs to support all AS-Interface Complete Specification V3.0 status indication modes
- User programmable to operation in Standard Slave Mode, Safety Mode, or Master Mode
- Supports 5.33 and 16 MHz crystals by automatic frequency detection
- Data pre-processing functions
- Clock and communication watchdogs for high system security

Benefits

- Cost savings due to integrated Safety Code Generator (SAP5S only)
- Special burst protection circuitry
- Excellent electromagnetic compatibility

Physical Characteristics

- Operational temperature range: -25 to +85°C
- SOP16 and SOP20 package

Available Support

- IDT AS-Interface Programmer Kit USB
- IDT SAP5 Evaluation Board V2.0

Related Products

- ASI4U Universal AS-Interface IC

SAP5S/SAP51 Basic Application Circuits
## SAP5S / SAP51

### Block Diagram

- Power Supply
- Thermal Protection
- Electronic Inductor
- Power Fail Detector
- Receiver
- Transmitter
- Oscillator
- PLL
- Main State Machine
- UART
- EEPROM

### Typical Applications
- AS-i Master Modules
- AS-i Slave Modules
- AS-i Safety Modules (SAP5S only)

### Ordering Information

<table>
<thead>
<tr>
<th>Ordering Code</th>
<th>Operating Temperature</th>
<th>Package Type</th>
<th>RoHS?</th>
<th>Packaging</th>
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<tbody>
<tr>
<td>SAP5SD-A-G1-T</td>
<td>-25°C to +85°C</td>
<td>SOP20 / 300 mil</td>
<td>Yes</td>
<td>Tubes (37 parts/tube)</td>
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<tr>
<td>SAP51D-A-G1-T</td>
<td>-25°C to +85°C</td>
<td>SOP20 / 300 mil</td>
<td>Yes</td>
<td>Tape and Reel (1000 parts/reel)</td>
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<tr>
<td>SAP5SD-A-G1-R</td>
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<td>SOP20 / 300 mil</td>
<td>Yes</td>
<td>Tape and Reel (1000 parts/reel)</td>
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