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AS8221
FlexRay Standard Transceiver

1 General Description

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The AS8221 is a high speed automotive bus driver fully conforming to the FlexRay Electrical Physical Layer Specification V2.1 Rev B. The AS8221 operates as a bi-directional interface between the FlexRay Communication Controller and the twisted-pair copper wiring.

The AS8221 provides an optimized host controller interface consisting of three low-active pins. The Enable (EN) and Standby (STBN) input pins for mode handling by the microcontroller and the Error (ERRN) out pin where system, chip failures or status information are signalled to the microcontroller. Signalling logic high on the Enable and Standby pin the device will enter NORMAL mode in case no fault condition is given and in this mode the device is fully operational meaning FlexRay communication is possible. Additionally a RECEIVE-0NLY mode is implemented, which can be accessed by the microcontroller where only FlexRay streams can be received in order to avoid unwanted disturbances on the FlexRay bus while listening to the bus traffic. In the low-power modes (STANDBY and SLEEP mode) very low power consumption is achieved.

In case of undervoltage at one of the supply voltages (V_{BAT}, V_{CC}, and V_{IO}) the device will change its mode to a low-power mode (either STANDBY or SLEEP mode) and the device will signal an error accordingly. In case of low voltage is detected on both V_{BAT} and V_{CC} the device will enter the POWER-OFF mode, where no operation is possible. A safe mechanism from the low-power modes to POWER-OFF mode and vice versa is implemented ensuring that no deadlock can happen during the startup phase.

Ensuring application in safety critical environments a two wire bus-guardian interface is implemented where additional monitoring circuitries on the electronic-control-unit can activate and deactivate the transmitter and additionally on the receive enable output (RxEN) in low-power modes the wake conditions and in normal power modes the received FlexRay streams can be monitored.

A thermal sensor circuit with an integral shutdown mechanism prevents damage to the device in extreme temperature conditions. The symmetrical transient control for the high- and low-side driver for both the bus-minus (BM) and bus-plus (BP) line allows an ideal balance of communications over different network topologies, with excellent EMC performance.

2 Key Features

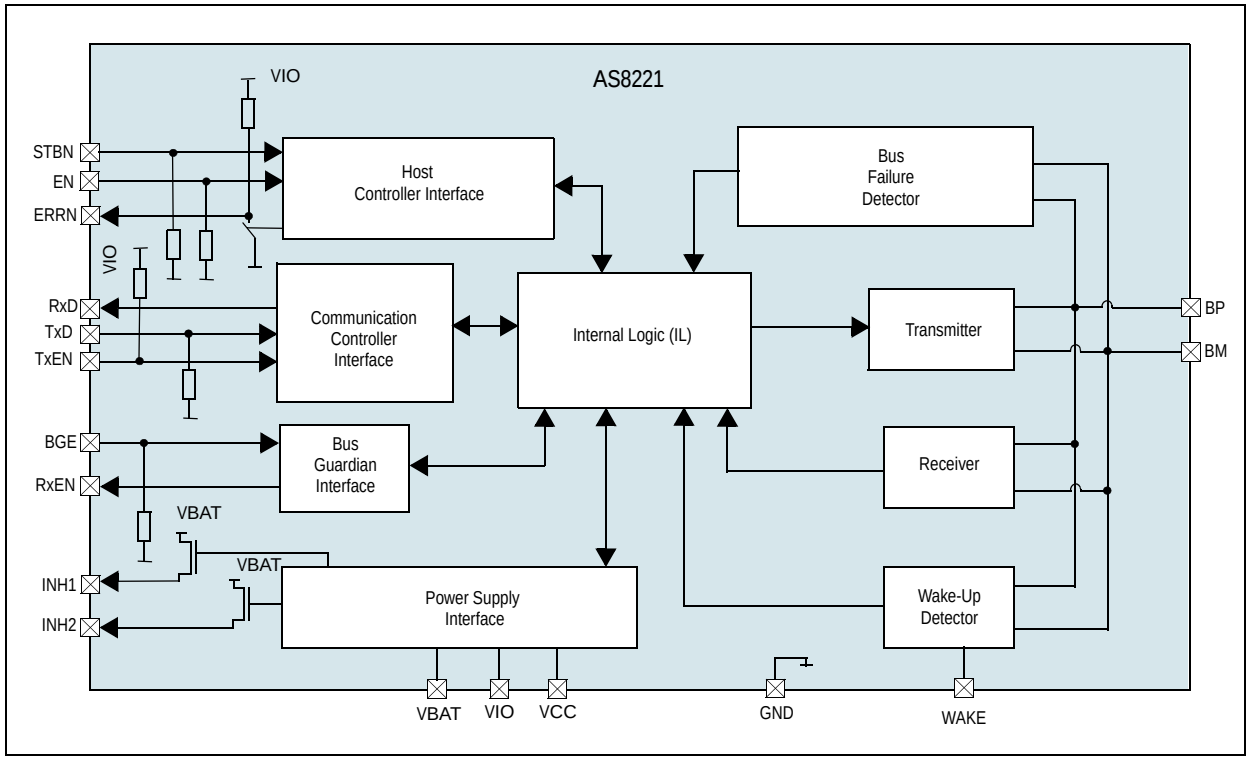
- Compliant with FlexRay Electrical Physical Layer Specification V2.1 Rev. B
- Data transfer up to 10 Mbps
- Excellent EMC performances. High common mode range insure excellent EMI
- Interface for Bus Guardian or supervision circuits
- Automatic thermal shutdown protection
- Supports 12V and 24V systems with very low sleep current
- Integrated power management system
  - Two inhibit pins for external voltage supply control
  - Local wake-up input
  - Remote wake-up capability via FlexRay bus in low-power modes
- Supports 2.5, 3, 3.3, 5 V microcontrollers, automatic adaptation to digital interface levels
- Protection against damage due to short circuit conditions on the bus (positive and negative battery voltage)
- Operating temperature range -40ºC to +125ºC
- Lead-free SSOP20 package

3 Applications

The AS8221 FlexRay Standard Transceiver is best fitting for automotive FlexRay nodes where bus wake-up and voltage regulator control for voltage supplies is needed.

The device addresses all ECUs connected to the permanent battery supply (clamp 30). The AS8221 can be used as only ECU wake-up component with very low power consumption in SLEEP mode.

Figure 1. AS8221 FlexRay Standard Transceiver Block Diagram



Ordering Information

Table 1. Ordering Information

Ordering Code	Marking	Description	Delivery Form	Package
AS8221-ASSU	AS8221	AS8221 FlexRay Standard Transceiver	Tube	SSOP20
AS8221-ASST	AS8221	AS8221 FlexRay Standard Transceiver	Tape & Reel	SSOP20

Note: All products are RoHS compliant and Pb-free.
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