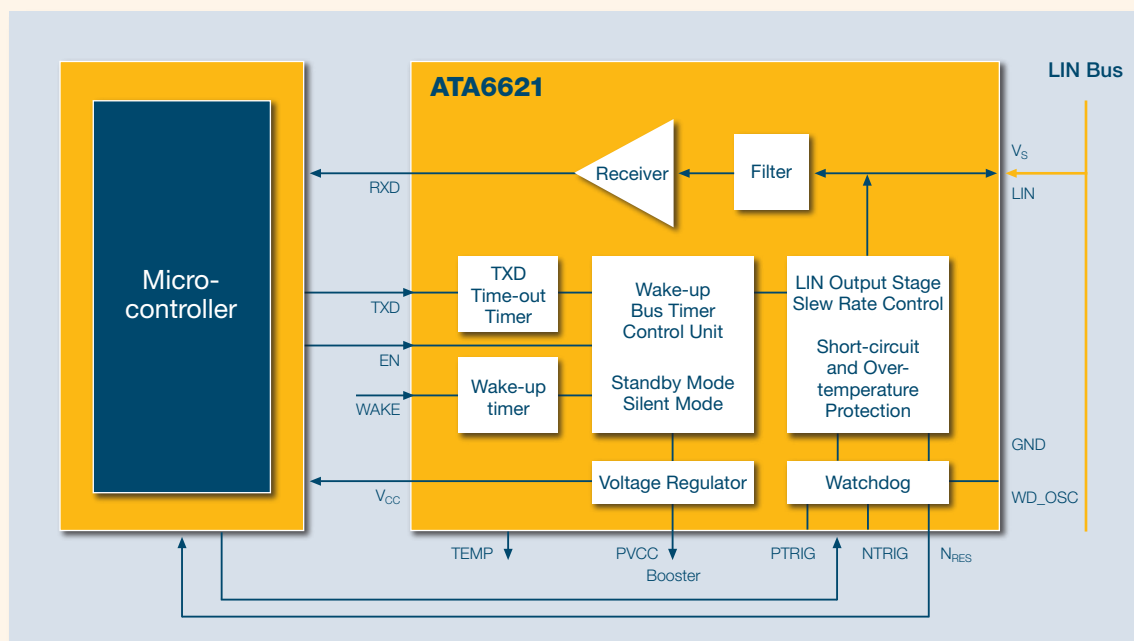


➤ System Basis Chip ATA6621

LIN Transceiver With 5V Voltage Regulator and Watchdog

The ATA6621 is a fully integrated LIN transceiver with voltage regulator and a window watchdog, and complying with the LIN specification 2.0. The combination of voltage regulator and bus transceiver enables the development of simple but powerful slave nodes in LIN bus systems.

In this QFN20 package, the voltage regulator is able to source 50 mA. It supplies the microcontroller and other ICs on the PCB. The output current of the regulator can be boosted by using an external NPN transistor. This combination makes it possible to develop simple, but powerful and cheap, slave nodes in LIN bus systems. The bus output is capable of withstanding 60V. Sleep mode (voltage regulator switched off) and silent mode (voltage regulator 5V/±7%) guarantee a very low current consumption.



Features

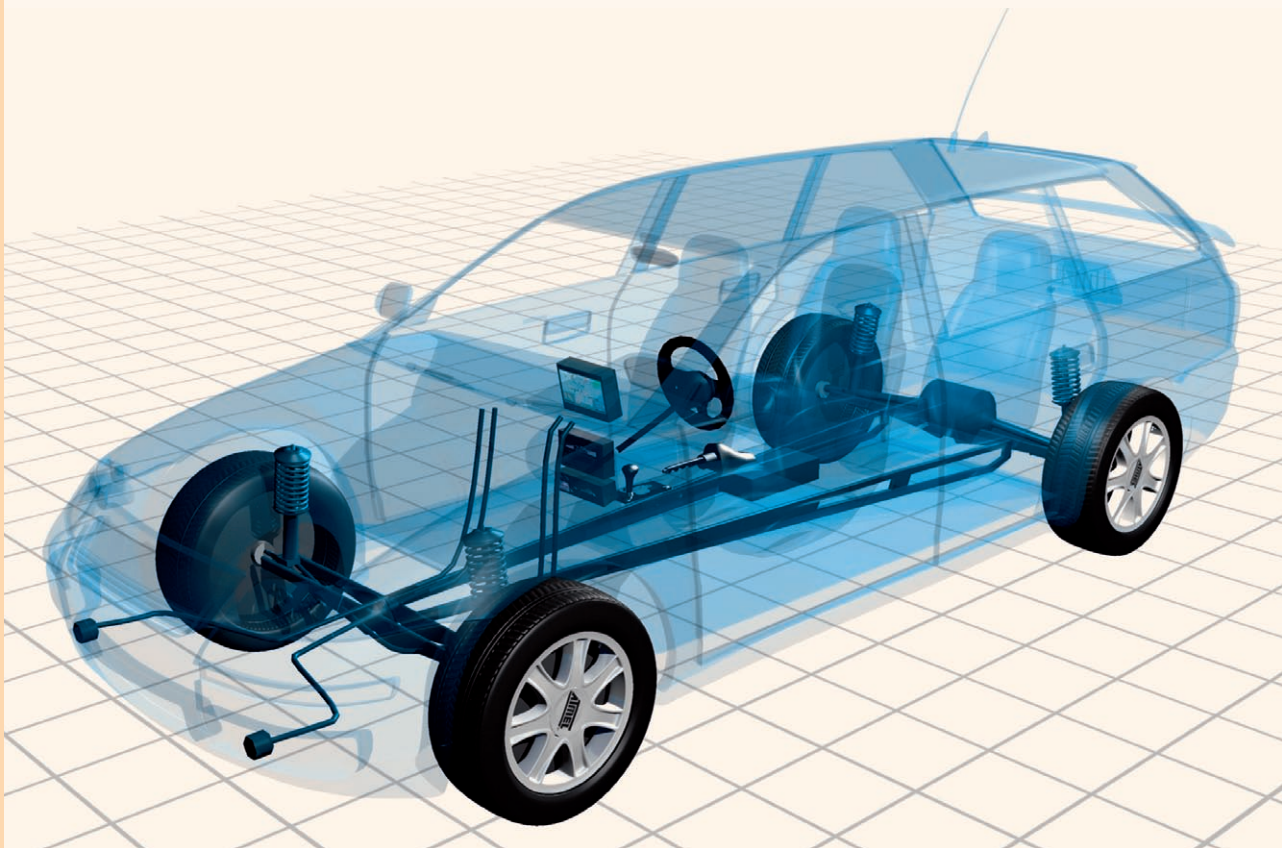
- Supply Voltage up to 40V
- Operating Voltage $V_S = 5V$ to 18V
- LIN Physical Layer According to LIN Spec. 2.0
- Baud Rate up to 20 Kbaud
- Linear Low Drop Voltage Regulator:
 - Normal Mode $V_{CC} = 5V \pm 2\%/50\text{ mA}$
 - Silent Mode $V_{CC} = 5V \pm 7\%/50\text{ mA}$
 - Sleep Mode V_{CC} Is Switched Off
- V_{CC} Undervoltage Detection and Watchdog Reset Logically Combined at Output N_{RES}
- 60V Load-dump Protection at LIN Pin (42V PowerNet)
- Bus Pin Is Overtemperature and Short-circuit-protected vs. GND and Battery
- Extended ESD Level at LIN Bus Pin and Supply VS Pin
- Wake-up Capability via LIN Bus or WAKE Pin
- Possibility to Boost the Voltage Regulator with an External NPN Transistor
- Analog Temperature Monitor Output
- Package: QFN20 5 mm x 5 mm

Benefits

- Highly Integrated (Voltage Regulator and Window Watchdog Included)
- System Costs Can Be Reduced by about 25% (No Need for Discrete Components)
- Ideally Suited for Very Small Designs Since Less Board Space Is Needed
- Outstanding ESD Protection (6 kV)
- Provides 3 Operating Modes: Sleep, Silent and Normal Mode
- Extremely Low Current Consumption (Typically 10 μA Supply Current During Sleep Mode, and 40 μA During Silent Mode)
- Current Consumption Can Be Even Further Reduced by the Device's Silent Mode Function that Is Unavailable in Other LIN2.0 Devices
- Silent Mode to Supply the Microcontroller in Sleep Mode Operation

Applications

- Automotive: Body, Safety, Powertrain
- Industrial
- Standard MUX Interface and Power Supply for all Areas



Modes of Operation

Normal Mode

This is the normal transmitting and receiving mode. All features are available. The watchdog needs a trigger signal at PTRIG or NTRIG to avoid resets at NRES.

Silent Mode

The silent mode is needed if the connected microcontroller is running in sleep mode.

In this case, the microcontroller still has to be powered. Typical applications are switch scanning in door modules, flashing of LEDs in several applications, etc. There is a strict requirement for low current consumption while the engine is switched off. The 5V regulator is in low tolerance mode (7%, 4.65V to 5.35V) and can source up to 50 mA. Supply current from VBAT is typically 40 μ A. A wake-up signal from the LIN bus changes the IC from silent mode to pre-normal mode. If EN switches to high, normal mode will be activated.

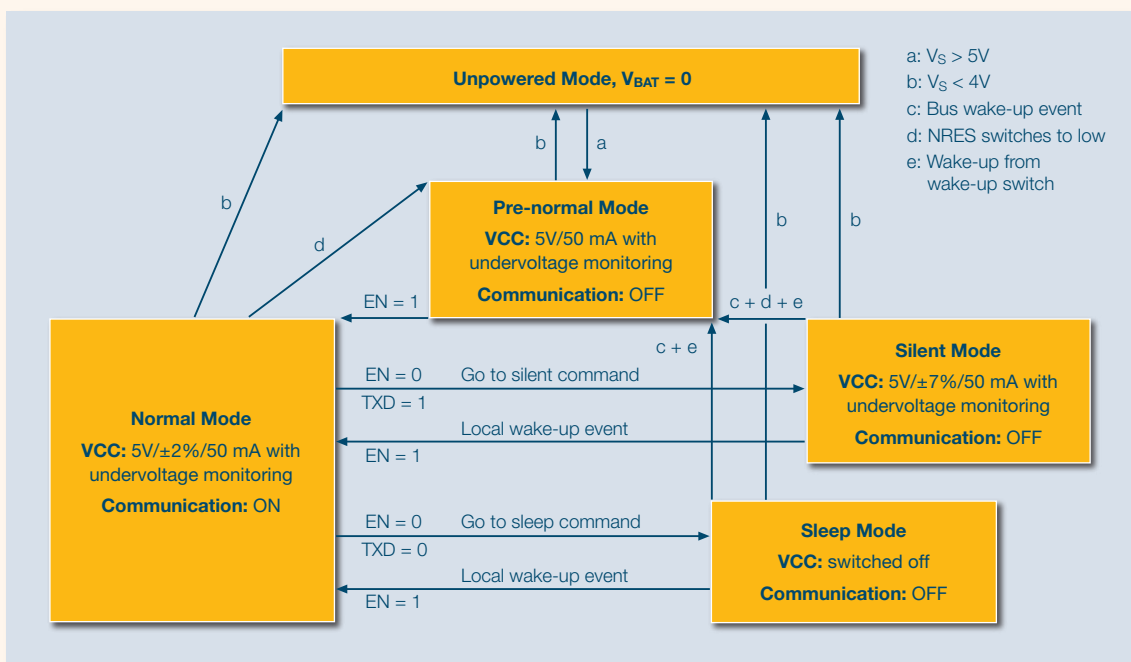
Sleep Mode

In this mode, the transmission path is disabled and the device is in low-power mode. The VCC regulator is switched off. Supply current from VBAT is typically 10 μ A. When a wake-up signal from the LIN bus or via pin WAKE is detected, the device switches to pre-normal mode. If EN switches to high, normal mode is activated.

Pre-normal Mode

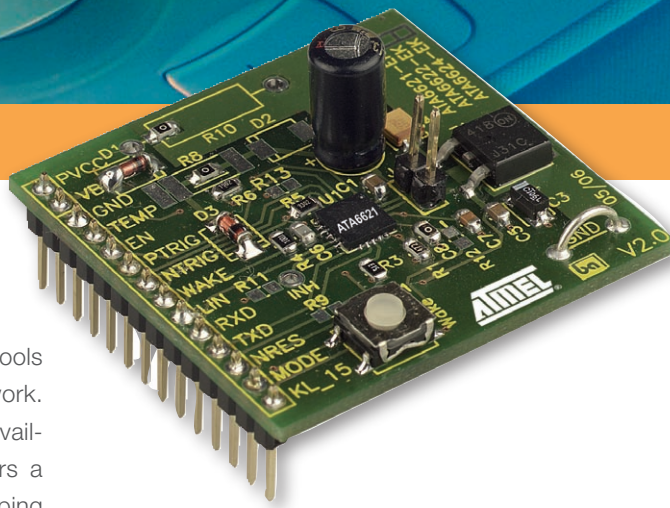
At system power-up, the device automatically switches to pre-normal mode.

The voltage regulator is switched on, VCC = 5V/2%/50 mA. NRES sends a reset to the microcontroller. The LIN communication is switched off. The ATA6621 stays in this mode until EN is switched to high.



Tools

Atmel® provides the cost-effective support tools to assist in the development of a LIN network. A development board for the ATA6621 is available. It has been designed to give designers a quick start with the IC and to allow prototyping and testing of new designs. There are a number of placeholders on the boards, which offer designers the chance to modify certain parameters. Furthermore, a LIN2.0 ANSI C software library for LIN slave nodes is available. ActiveX® components, also provided by Atmel, can be used to



create a simple PC program to emulate the LIN master node. Testing and building LIN networks is both easy and inexpensive with Atmel's hardware and software tools. The software tools can be downloaded online at <http://www.atmel.com/products/Auto> (go to Tools & Software).

Ordering Information

Extended Part Number	Package	Remarks
ATA6621-PGPW	QFN20 5 mm x 5 mm	1.5k Tape & Reel, Pb-free
ATA6621-PGQW	QFN20 5 mm x 5 mm	6k Tape & Reel, Pb-free

LIN Family Overview

Part Number	Type	Features	Supply/ Operating Voltage (V)	Load-dump Protection at LIN Pin (V)	Modes	Package	Tools
ATA6661	Stand-alone LIN Transceiver	LIN Interface	40/18 ¹	60	Pre-normal Mode Normal Mode Sleep Mode	SO8	Datasheet Appnote Software Development Board
ATA6662	Stand-alone LIN Transceiver	LIN Interface	40/27	40	Pre-normal Mode Normal Mode Sleep Mode	SO8	Datasheet Appnote Software Development Board
ATA6620	System Basis Chip (SBC)	LIN Interface + Voltage Regulator	40/18 ¹	60	Pre-normal Mode Normal Mode Sleep Mode Silent Mode	SO8	Datasheet Appnote Software Development Board
ATA6621	System Basis Chip (SBC)	LIN Interface + Voltage Regulator + Watchdog	40/18 ¹	60	Pre-normal Mode Normal Mode Sleep Mode Silent Mode	QFN20	Datasheet Appnote Software Development Board
ATA6602/03	System MCM ATA6621 + µC (AVR®)	LIN Interface + Voltage Regulator + Watchdog + AVR (ATmega 88/168)	40/18 ¹	60	Pre-normal Mode Normal Mode Sleep Mode Silent Mode	QFN48	Datasheet Appnote Software Development Board Standard AVR Tools

¹ For 40V application please also refer to the application note available at http://www.atmel.com/dyn/resources/prod_documents/doc4938.pdf

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