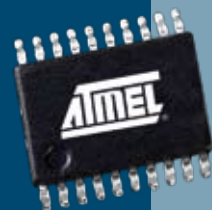
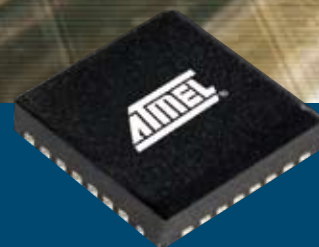




➤ **Automotive Solutions**





Atmel's Automotive Commitment

Atmel®, a globally operating manufacturer of innovative integrated circuits, has more than 25 years of automotive electronics design expertise and is a market leader in various automotive areas. With a broad scope of automotive-dedicated technologies such as BCDMOS, BCD-on-SOI and non-volatile CMOS, and automotive-qualified fabs (ISO 9001:2000, ISO

TS 16949:2002, ISO 14001:2004), Atmel is able to provide high-end products that meet the strict automotive quality demands and that make vehicles more safe, economical and convenient. Design-ins are supported by our application engineers, demonstration and evaluation kits, reference boards, software and detailed documentation.



Atmel's Automotive Products

■ Body Electronics & Powertrain

- In-Vehicle Networking (LIN)
- Drivers
- Fail-Safe ICs
- Watchdog ICs
- Flashers
- Lamp-Outage Monitoring ICs
- Airbag ICs
- Long-Time Timer ICs
- Dashboard Dimmer ICs
- High-Temperature Solutions

■ Automotive RF Solutions

- Car Access
- Tire Pressure Monitoring

■ Car Infotainment

- Car Radio
- GPS

■ Serial EEPROMs

■ Multiplexing & Standard Microcontrollers

- 4 Bit (MARC)
- 8 Bit (AVR®, 80C51)
- Networking (LIN)



Body Electronics & Powertrain

Atmel has more than 25 years experience in body electronic and powertrain designs and is a market leader in various areas (e.g., direction indicator ICs). In the ever-growing LIN Bus system segment, Atmel offers products at all integration levels from simple transceiver ICs to complex system basis chips (SBC). At higher-intergration levels, Atmel's range of AVR microcontrollers coupled with an integrated voltage regulator and watchdog provide complete SBC functionality in a single system-in-package (SiP) module.

Due to the advantages of SOI technology, the development of ICs with outstanding electromagnetic immunity (EMI and ESD) is possible. Atmel is committed to offering their customers optimal LIN solutions as the LIN area continues to develop and evolve. Atmel's driver ICs are capable of reaching environmental temperatures of 150°C and junction temper-

atures of 200°C, making their use possible in most high-temperature automotive applications.

With few external components, Atmel's driver ICs with LIN communication and Atmel's AVR micro-controllers combine to create cost-efficient motor driver modules complete with LIN functionality, which can equally be used in harsh automotive conditions.

- In-Vehicle Networking (LIN)
- Standard and High-Temperature Drivers
- Fail-Safe Systems
- Watchdogs
- Direction Indicators
- Wipe/Wash Systems
- Timers
- Dimmers



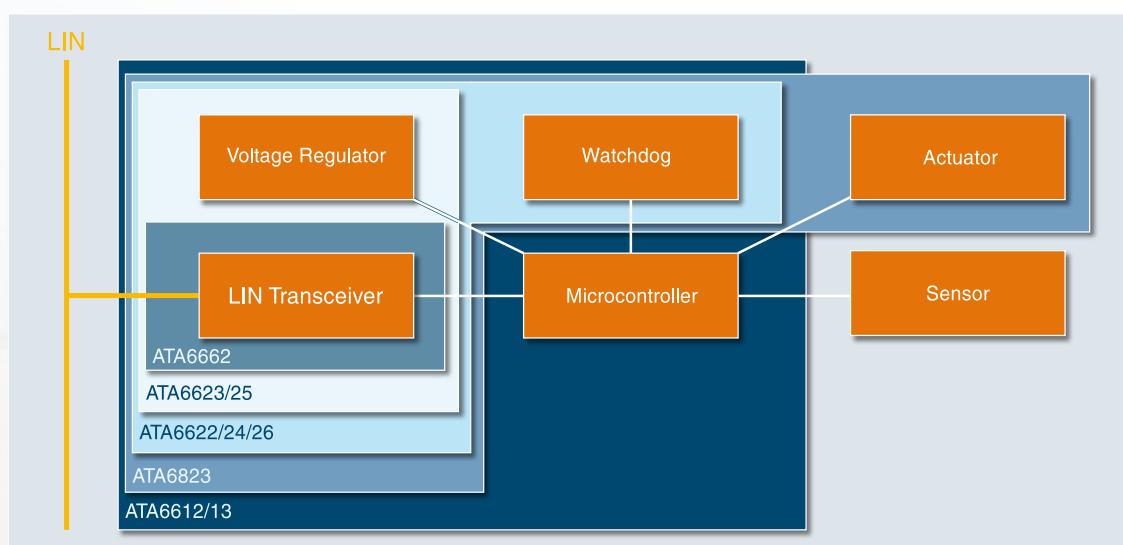
Body Electronic & Powertrain Devices



In-Vehicle Networking ICs

Atmel's modular LIN family includes simple transceiver ICs (ATA6662), complex system basis chips (ATA6622/23/24/25/26) and system-in-package

modules (ATA6612/13) with complete system integration as well as system basis chips for motor-driver applications.





LIN Family ICs

Part Number	Description	Package
ATA6612	AVR LIN-SiP, ATmega88 Microcontroller with LIN Transceiver, 5V Voltage Regulator, and Window Watchdog in Single Package	QFN48
ATA6613	AVR LIN-SiP, ATmega168 Microcontroller with LIN Transceiver, 5V Voltage Regulator, and Window Watchdog in Single Package	QFN48
ATA6622	LIN System Basis Chip with LIN Transceiver, Integrated 3.3V/50 mA Voltage Regulator and Window Watchdog	QFN20
ATA6623	LIN System Basis Chip with LIN Transceiver and Integrated 3.3V/50 mA Voltage Regulator	SO8
ATA6624	LIN System Basis Chip with LIN Transceiver, Integrated 5V/50 mA Voltage Regulator and Window Watchdog	QFN20
ATA6625	LIN System Basis Chip with LIN Transceiver and Integrated 5V/50 mA Voltage Regulator	SO8
ATA6626	LIN System Basis Chip with LIN Transceiver and Integrated 5V/50 mA Voltage Regulator without TxD Timeout Timer	QFN20
ATA6662	LIN Transceiver, Physical Layer According to Specification 2.0 (Backwards Compatible)	SO8
ATA6823	LIN System Basis Chip with H-bridge DC Motor Driver. Integrated 3.3V/5V/100 mA Power Supply, LIN Transceiver, Watchdog, 2 High-side and 2 Low-side Gate Drivers	QFN32
ATA6833	BLDC Motor System Basis Chip with 3 Half-bridge Gate Drivers, LIN Interface, Window Watchdog and Voltage Regulator	QFN48
ATA6834	BLDC Motor System Basis Chip with 3 Half-bridge Gate Drivers, LIN Interface, Window Watchdog and Voltage Regulator, T_{junction} up to 200°C	QFN48



High-Temperature Drivers



Atmel's driver ICs are also available for high-temperature applications. In mechatronic solutions, for example, turbo charger or exhaust gas recirculation systems, many flaps have to be controlled by DC motor driver ICs, which are located very close to the hot engine. Due to the advantages of Atmel's own SOI technology SMART-I.S.[®], these driver ICs can withstand ambient temperatures up to 150°C/302°F and chip temperatures up to 200°C/392°F.



High-Temperature Driver ICs

Part Number	Description	Package
ATA6824	H-bridge DC Motor Driver. System Basis Chip. Integrated 3.3V/5V /100 mA Power Supply, Serial Interface, Watchdog, 2 High-side and 2 Low-side Gate Drivers	QFN32
ATA6827	Triple Half-bridge Driver with 3 High-side and 3 Low-side Drivers, 1000 mA Current Limitation	QFN18
ATA6832	Triple Half-bridge Driver with 3 High-side and 3 Low-side Drivers, 1000 mA Current Limitation and PWM > 20 kHz	QFN18
ATA6834	BLDC Motor System Basis Chip with 3 Half-bridge Gate Drivers, LIN Interface, Window Watchdog and Voltage Regulator, T_{junction} up to 200°C	QFN48
ATA6837	Hex Half-bridge Driver with Serial Input Control, 650 mA Current Limitation	SO28, QFN24
ATA6839	Hex Half-bridge Driver with Serial Input Control, 1000 mA Current Limitation	QFN24



Standard Driver ICs

Part Number	Description	Package
T6801	Single-channel Driver; 25 mA Output with Thermal Monitoring, Thermal Shutdown, Short-circuit Protection	SO8
U6803B	Triple Driver; 3 x 25 mA Output with Thermal Monitoring, Common Thermal Shutdown, Short-circuit Protection	SO8
U6805B	Hex Driver; 6 x 25 mA Output with Thermal Monitoring, Common Thermal Shutdown, Short-circuit Protection	SO14
U6815BM	Dual Hex Driver with Serial Input Control, 6 High-side and 6 Low-side Drivers, 600 mA Current Limitation	SO28
T6816	40V Dual Hex Driver with Serial Input Control, 6 High-side and 6 Low-side Drivers, 600 mA Current Limitation	SO28
T6817	Dual Triple Driver with Serial Input Control, 3 High-side and 3 Low-side Drivers, 600 mA Current Limitation	SSO20
T6818	Triple Half-bridge Driver with Serial Input Control, 3 High-side and 3 Low-side Drivers, 1500 mA Current Limitation	SO14
T6819	Dual Triple Driver with Serial Input Control and PWM Input, 3 High-side and 3 Low-side Drivers, 1500 mA Current Limitation	SO16
U6820BM	Dual Quad Driver with Serial Input Control, 4 High-side Output Stages, 4 Low-side Output Stages, 50 mA Capability, Current Limitation	SO16
ATA6823	LIN System Basis Chip with H-bridge DC Motor Driver. Integrated 3.3V/5V/100 mA Power Supply, LIN Transceiver, Watchdog, 2 High-side and 2 Low-side Gate Drivers	QFN32
ATA6826	Triple Half-bridge Driver with Serial Input Control, 3 High-side and 3 Low-side Drivers, 1000 mA Current Limitation	SO14
ATA6828	Triple Half-bridge Driver with Serial Input Control, 3 High-side and 3 Low-side Drivers, 1500 mA Current Limitation	SO14 Heat Slug
ATA6829	Dual Triple Driver with Serial Input Control and PWM Input, 3 High-side and 3 Low-side Drivers, 1500 mA Current Limitation	SO16 Heat Slug
ATA6830	Intelligent Stepper Motor Driver; Typical Application: Headlight Adjustment	QFN28
ATA6831	Triple Half-bridge Driver with Serial Input Control and 25-kHz PWM Input, 3 High-side and 3 Low-side Drivers, 1000 mA Current Limitation	QFN18
ATA6833	BLDC Motor System Basis Chip with 3 Half-bridge Gate Drivers, LIN Interface, Window Watchdog and Voltage Regulator	QFN48
ATA6836	Hex Half-bridge Driver with Serial Input Control, 6 High-side and 6 Low-side Drivers, 650 mA Current Limitation	SO28, QFN24
ATA6838	Hex Half-bridge Driver with Serial Input Control, 6 High-side and 6 Low-side Drivers, 1.5A Current Limitation	QFN24



Airbag ICs

Part Number	Description	Package
ATA6264	Flexible Airbag Power Supply IC with Rich Set of Functionalities	QFP44
U6268B	Side Airbag Sensor Dual Interface (Satellite Interface), 50 mA Sensor Supply	SO16



Watchdog ICs

Part Number	Description	Package
ATA6020	Watchdog IC, Programmable via Metal Mask (Based on Microcontroller ATAR080)	SO20
ATA6025	Watchdog IC with Fail-safe Output, Low Power Consumption in Standby Mode	SO8
U5020M	Watchdog Timer, Active and Sleep Mode, 6 Wake-up Inputs, Enable Output	SO16
U5021M	Watchdog Timer, Active and Sleep Mode, 1 Wake-up Input, Enable Output	SO8



Lamp Outage Monitoring ICs

Part Number	Description	Package
U4793B	2 Comparators, 44 mV Threshold, Glow-plug Application, ESD Protection up to 10 kV	DIP8, SO8
U479B	2 Comparators, 8 mV Threshold, Single-lamp Application, ESD Protection up to 2 kV	DIP8



Fail-Safe ICs

Part Number	Description	Package
ATA6842	Fail-safe System IC with 4-channel Relay Driver, Power Supply, and Watchdog	QFN48
U6808B	Fail-safe IC, Watchdog Timer and Relay Driver	SO8
U6813B	Fail-safe IC, Watchdog Timer, Relay Driver, Lamp Driver, and Charge Pump	SO16



Wiper and Wash Control ICs

Part Number	Description	Package
U641B	Wipe/Wash Control with Prewash Delay, INT/WIWA Switches to VBATT	DIP8, SO8
U642B	Wipe/Wash Control without Prewash Delay, INT/WIWA Switches to VBATT	DIP8, SO8



Long-Time Timer ICs

Part Number	Description	Package
U6032B	Toggle IC for Switch-over Function, Defined Status after POR	DIP8, SO8
U6046B	Adjustable Delay Time 4s to 20h, Delay Adjustable with RC Oscillator	DIP8, SO8



Dashboard Dimmer ICs

Part Number	Description	Package
U6083B	PWM High-side Driver, 18 to 100% Duty Cycle, Minimum External Components	DIP8
U6084B	PWM High-side Driver, 0 to 100% Duty Cycle Continuously	SO16



Flasher ICs

Part Number	Description	Package
ATA6140	Twin Relay Flasher for 12/24V Applications, Standby Current < 10 μ A	SO16
U2043B	Lamp Load > 10W, 30 m Ω Shunt, Improved EMC, Pilot Lamp	DIP8, SO8
U2044B	Lamp Load > 10W, 30 m Ω Shunt, Standby Current < 10 μ A, Twin Relay Flasher	DIP14, SO14
ATA2069	Trailer Flasher for Lamp Loads > 10W	DIP8, SO8
U6043B	Lamp Load > 1W, 18 m Ω Shunt, Improved EMC, Load-dump Protected	DIP8, SO8
U643B	Lamp Load > 1W, 30 m Ω Shunt, Improved EMC, Load-dump Protected	DIP8, SO8



Automotive RF Solutions



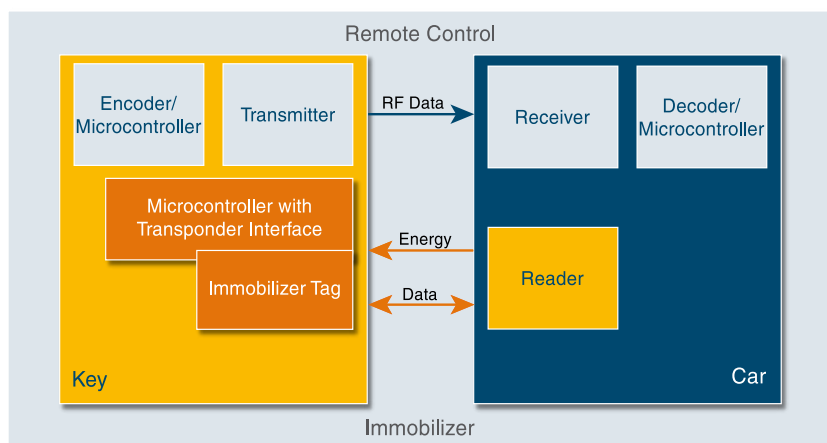
Car Access

Atmel, having launched its first dedicated car access transmitter in 1997, continues to recognize the importance of security in the automotive area, and as such offers a range of car access solutions from immobilizers to full-duplex transceivers perfect for the prevention of automotive theft. Atmel's automotive safety portfolio also features extremely secure Passive Entry Go (PEG)

solutions. Atmel provides all devices needed to design a complete car access system solution. Customers have the flexibility to create their own dedicated designs using Atmel's low-power transmitter IC, receiver IC, and microcontroller families.



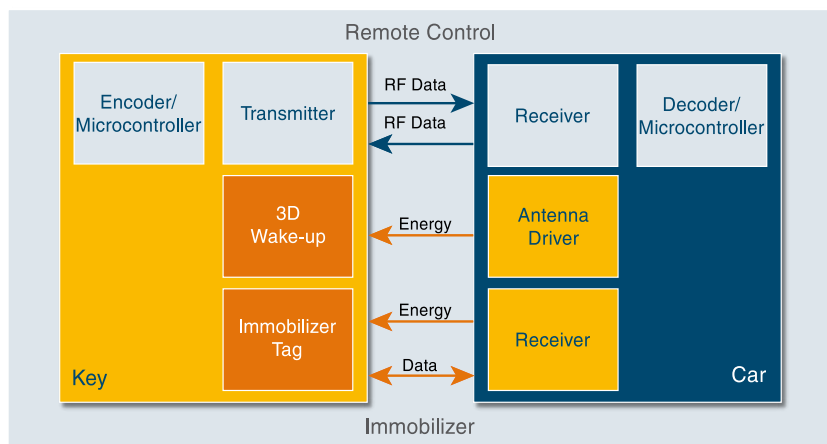
Uni-Directional System



Uni-directional RF link for the keyless entry function to open or lock the doors. The immobilizer system is built with a bi-directional LF link operating with the AUT64 crypto algorithm.



Bi-Directional System and Wake-Up Channel for PEG Solution



Bi-directional RF link for the RKE function as well as for the extremely secure duplex RF link in a Passive Entry Go system. The IF link is used for the wake-up channel in a PEG system as well as for the immobilizer function to start the RF communication.



Car Access Devices

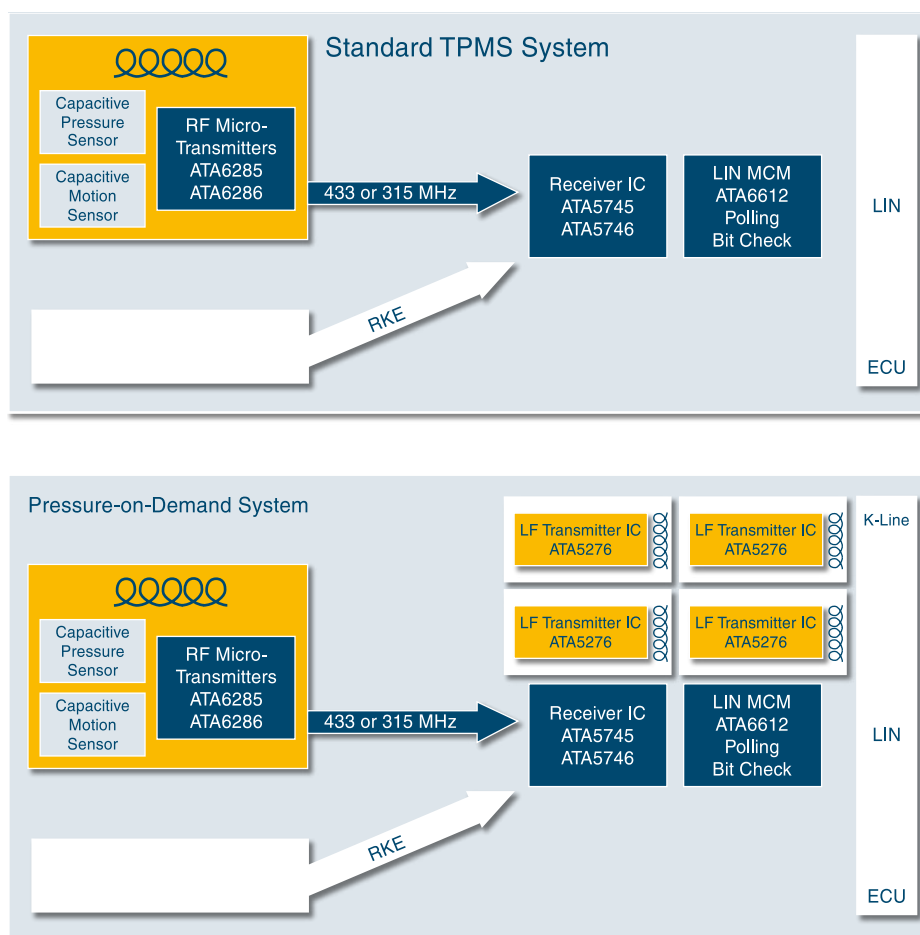
Part Number	Frequency Range [MHz]	Modulation	Description	Package
ATA3741	300–450	ASK/FSK	UHF Remote Control Receiver IC	SO20
ATA3742	300–450	ASK/FSK	UHF Remote Control Receiver IC (with RSSI)	SO20
ATA5278	100–150 kHz	ASK/PSK	Stand-alone Antenna Driver/Transmitter IC	QFN28
ATA5279	105–155 kHz	ASK/FSK	Six-fold LF Antenna Driver IC	QFN48
ATA5723	315	ASK/FSK	UHF Remote Control Receiver, 300 kHz Bandwidth RSSI Pin Compatible to ATA5724, ATA5728	SSO20
ATA5724	433	ASK/FSK	UHF Remote Control Receiver, 300 kHz Bandwidth, RSSI Pin Compatible to ATA5723, ATA5728	SSO20
ATA5728	868	ASK/FSK	UHF Remote Control Receiver, 600 kHz Bandwidth, RSSI Pin Compatible to ATA5723, ATA5724	SSO20
ATA5743	300–450	ASK/FSK	UHF Remote Control Receiver IC with High FSK Sensitivity and Automotive-compatible Data Interface, Self-polling Mode	SO20
ATA5744	300–450	ASK	Easy-to-use Transparent UHF Receiver IC	SO20 SSO20
ATA5749	315–433	ASK/FSK	Low-current Fully Integrated Fractional-N PLL Transmitter with Scalable Output Power (–0.5 to 12.5 dBm)	TSSOP10
ATA5745 ATA5746	433 315	ASK/FSK	Transparent UHF Receiver IC with Fast RKE/TPMS Switching Rate, Suited to 1 to 20 Kbits/s Manchester FSK with 4 Pro- grammable Bit-rate Ranges, High FSK Sensitivity (–114 dBm at 2.4 Kbits/s), High Blocking Capability	QFN24
ATA5756 ATA5757	315 433	ASK/FSK	UHF Transmitter ICs with Low Settling Time and Active Cur- rent Consumption	TSSOP10
ATA5760	868–870	ASK/FSK	UHF Receiver IC, Functionally Compatible to ATA5743	SO20
ATA5771 ATA5773 ATA5774	868–928 315 433	ASK/FSK	AVR Microcontroller-based RF Transmitter Family	QFN24
ATA5811 ATA5812	433.868 315	ASK/FSK	UHF Transceiver IC with Extremely Low Current Consumption and Small Size	QFN48
ATA5823 ATA5824	312.5–317.5 433–868	ASK/FSK	UHF Multi-channel Half-/Full-duplex Transceiver with Low Power Consumption	QFN48
ATARx9x	–	–	Low-power MARC4 4-bit Microcontroller	SSO20
ATAR862 ATAM862	310–330 429–439 868–928	ASK/FSK	Complete UHF Transmitter IC, Microcontroller and Transmitter PLL in One IC, Flash and ROM Versions Available	SSO24
T5750 T5753 T5754	868–928 310–330 429–439	ASK/FSK	UHF Transmitter IC with High Output Power and Wide Tem- perature Range (–40°C/F to +85°C/185°F, +125°C/257°F)	TSSOP8
TK5561	125 kHz	Manchester/ Bi-phase	Read/Write Transponder with Encryption Algorithm	Plastic Package (PP)
U2270B	100–150 kHz	Manchester/ Bi-phase	Read/Write Base Station IC	SO16
U9280M	–	–	4-bit Microcontroller plus Transponder Front End	SSO20



Tire Pressure Monitoring

Atmel offers highly integrated circuits for battery-powered sensor-gauge and base-station applications in tire pressure monitoring systems (TPMS). The TPMS product portfolio includes a low-power Flash-microcontroller RF-transmitter IC family to be used together with separate capacitive pressure or motion sensors, plus a broad range of stand-alone RF-transmitter and LF-receiver ICs that can be combined with a separate microcontroller or smart sensor devices. These TPMS ICs are suitable for temperatures up to 125°C/257°F (extended storage temperatures up to 175°C/347°F), and they provide outstanding low current consumption that helps the sensor gauges to reach a lifetime of 10-years.

The TPMS portfolio also includes an innovative transparent RF receiver IC family with very fast switching times between RKE and TPMS signals. These ICs are capable of covering all physical functions needed in combined TPMS/RKE systems. The polling mode and bit-check functions are carried out by the firmware in a separate microcontroller device, such as Atmel's LIN multi-chip module ATA6612 with integrated AVR.



A POD system is a master/slave system. In addition to direct TPMS systems, it includes a 125-kHz built-in channel for waking up sensor modules in defined duty cycles. Such systems remarkably increase the

flexibility of wheel initialization when changing tires by reprogramming the memory. Also, POD systems enable auto-location functionality, i.e., they display the precise location of a deflated wheel.



TPMS Devices



Part Number	Frequency Range [MHz]	Key Features	Package
UHF Transmitter ICs			
ATA5749	315/433	ASK/FSK, Fully Programmable by the Microcontroller, Single-board Design for Both Frequencies with Single 13 MHz Crystal Type, From 1.9V	TSSOP10
ATA5756 ATA5757	315 433	ASK/FSK UHF TPMS Transmitter ICs with Low Settling Time and Active Current Consumption	TSSOP10
UHF Receiver ICs			
ATA5723	315	UHF Remote Control Receiver, 300 kHz Bandwidth RSSI Pin Compatible to ATA5724, ATA5728	SSO20
ATA5724	433	UHF Remote Control Receiver, 300 kHz Bandwidth, RSSI Pin Compatible to ATA5723, ATA5728	SSO20
ATA5728	868	UHF Remote Control Receiver, 600 kHz Bandwidth, RSSI Pin Compatible to ATA5723, ATA5724	SSO20
ATA5745 ATA5746	433 315	Transparent UHF Receiver IC with Fast RKE/TPMS Switching Rate, Suited to 1 to 20 Kbits/s Manchester FSK with 4 Programmable Bit-rate Ranges, High FSK Sensitivity (–114 dBm at 2.4 Kbits/s), High Blocking Capability	QFN24
ATA5811 ATA5812	433 315	Fast Switching Rate between TPMS and RKE Receive Modes	QFN48
LF Antenna Driver ICs			
ATA5276	125 kHz	1.5-APP Antenna Driver IC with Frequency Self-tuning to the LF Antenna Resonance Frequency and Built-in Diagnosis Function	QFN20
Microcontroller Transmitter ICs			
ATA6285 ATA6286	315 433	Single-package Microcontroller Transmitter Including 8-bit Flash AVR Microcontroller with Capacitive Sensor Interface, 125-kHz Receiver Channel, Temperature Sensor, 90-kHz Slow-oscillation Mode	QFN32
Microcontrollers			
ATAM893		4 KB Flash-ROM/32 × 16-bit EEPROM	SSO20
ATAR890		2 KB ROM/32 × 16-bit EEPROM	SSO20
ATAR892		4 KB ROM/32 × 16-bit EEPROM	SSO20



Serial EEPROMs

Atmel's serial EEPROM automotive grade products were first introduced to the electronics industry in 1996. Over the years, Atmel has integrated rigorous Quality and Reliability systems into every step of the automotive manufacturing flow, while continuing to provide highly competitive solutions and keep pace with customers' demand. This enables Atmel

to maintain premier quality and delivery standards mandated by international automotive customers. Within its extensive product portfolio, Atmel offers automotive grade serial products in 2-wire, 3-wire, and SPI bus protocols in SOIC, TSSOP, and PDIP packages, all available in environmentally friendly "green" versions.

Safety	2-Wire Bus	3-Wire Bus	SPI Bus
Airbags		AT93C46DN-SP25-T	AT25020AN-10SQ-2.7
		AT93C56A-10SQ-2.7	AT25040AN-10SQ-2.7
		AT93C66A-10SQ-2.7	AT25080AN-10SQ-2.7
		AT93C86A-10SQ-2.7	AT25160AN-10SQ-2.7
			AT25320AN-10SQ-2.7
			AT25640AN-10SQ-2.7
			AT25128AN-10SQ-2.7
Anti-lock Brake System	AT24C02BN-SP25-T	AT93C46DN-SP25-T	AT25040AN-10SQ-2.7
	AT24C04BN-SP25-T	AT93C46A-10SQ-2.7	AT25080AN-10SQ-2.7
		AT93C56A-10SQ-2.7	AT25160AN-10SQ-2.7
		AT93C66A-10SQ-2.7	AT25320AN-10SQ-2.7
		AT93C86A-10SQ-2.7	AT25640AN-10SQ-2.7
			AT25128AN-10SQ-2.7
			AT25256AN-10SQ-2.7
Engine Control		AT93C56A-10SQ-2.7	AT25040AN-10SQ-2.7
		AT93C66A-10SQ-2.7	AT25080AN-10SQ-2.7
		AT93C86A-10SQ-2.7	AT25160AN-10SQ-2.7
			AT25128AN-10SQ-2.7
TPMS System	AT24C01BN-SP25-T	AT93C46DN-SP25-T	AT25010AN-10SQ-2.7
	AT24C02BN-SP25-T	AT93C56A-10SQ-2.7	AT25020AN-10SQ-2.7
	AT24C04BN-SP25-T	AT93C66A-10SQ-2.7	AT25040AN-10SQ-2.7
	AT24C08BN-SP25-T	AT93C86A-10SQ-2.7	
	AT24C16AN-10SQ-2.7		
Accessories	2-Wire Bus	3-Wire Bus	SPI Bus
Audio	AT24C08BN-SP25-T	AT93C46DN-SP25-T	
	AT24C16AN-10SQ-2.7	AT93C46A-10SQ-2.7	
	AT24C32AN-10SQ-2.7	AT93C56A-10SQ-2.7	
	AT24C64AN-10SQ-2.7	AT93C66A-10SQ-2.7	
		AT93C86A-10SQ-2.7	
Dashboard	AT24C01BN-SP25-T	AT93C46DN-SP25-T	AT25020AN-10SQ-2.7
	AT24C02BN-SP25-T	AT93C46A-10SQ-2.7	AT25040AN-10SQ-2.7
	AT24C04BN-SP25-T	AT93C56A-10SQ-2.7	AT25080AN-10SQ-2.7
	AT24C08BN-SP25-T	AT93C66A-10SQ-2.7	AT25128AN-10SQ-2.7
	AT24C16AN-10SQ-2.7	AT93C86A-10SQ-2.7	AT25160AN-10SQ-2.7
Driver Information	AT24C01BN-SP25-T	AT93C46DN-SP25-T	AT25010AN-10SQ-2.7
	AT24C02BN-SP25-T	AT93C56A-10SQ-2.7	AT25020AN-10SQ-2.7
	AT24C04BN-SP25-T	AT93C66A-10SQ-2.7	AT25040AN-10SQ-2.7
	AT24C08BN-SP25-T	AT93C86A-10SQ-2.7	AT25080AN-10SQ-2.7
	AT24C16AN-10SQ-2.7		AT25160AN-10SQ-2.7
TPMS System	AT24C08BN-SP25-T	AT93C46DN-SP25-T	AT25080AN-10SQ-2.7
	AT24C16AN-10SQ-2.7	AT93C56A-10SQ-2.7	AT25160AN-10SQ-2.7
	AT24C32AN-10SQ-2.7	AT93C66A-10SQ-2.7	AT25320AN-10SQ-2.7
	AT24C64AN-10SQ-2.7	AT93C86A-10SQ-2.7	AT25640AN-10SQ-2.7
	AT24C128N-10SQ-2.7		AT25128AN-10SQ-2.7
	AT24C256N-10SQ-2.7		AT25256AN-10SQ-2.7



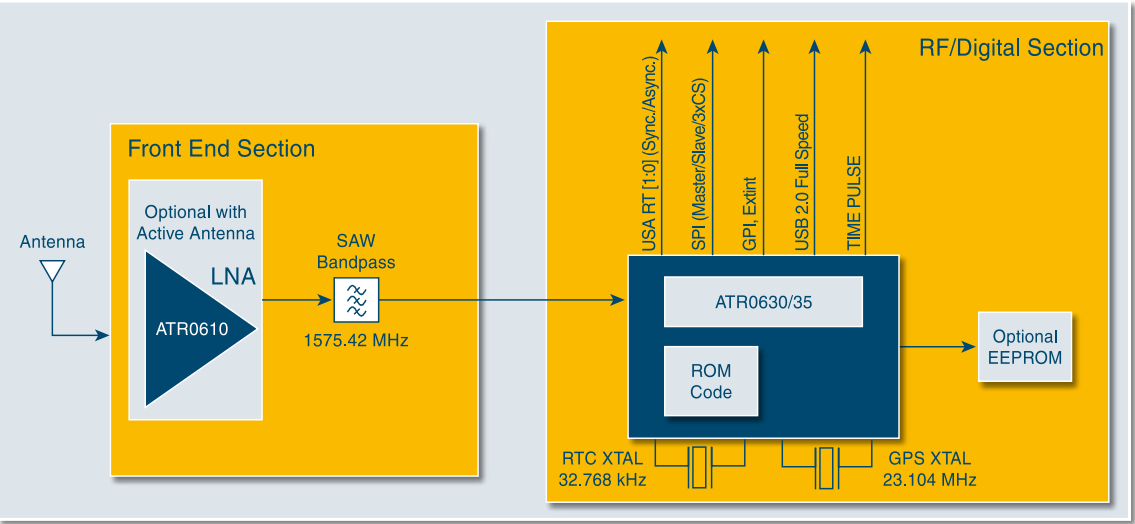
Car Infotainment



GPS/Navigation

Atmel's ANTARIS® chipset includes an RF receiver IC, a baseband IC, and an LNA. The 16-channel GPS receiver features excellent navigation accuracy along with maximum sensitivity, very fast time-to-first-fix, and extremely low power consumption (60 mW). Like its predecessor, the new-generation ANTARIS4 engine features SuperSense™ - enabled indoor GPS (–158 dBm), assisted-GPS (A-GPS) and full support of WAAS, EGNOS, and MSAS satellites.

- 16-Channel GPS Receiver (RoHS Compliant)
- Excellent Navigation Accuracy Along with Maximum Sensitivity
- Fast Time-to-First-Fix
- Immune to RF Interferences
- Extremely Low Power Consumption (62 mW for the Chipset at 1 Fix per Second)
- Significantly Reduced Bill of Materials (BOM) and System Costs, No Flash Needed Due to Highly Configurable ROM-Based Software
- Integrated USART and USB 2.0 Interface
- Supports Assisted GPS (A-GPS)
- Indoor Capability (–158 dBm) Enabled by SuperSense (Mask ROM Versions)



GPS Devices

Part Nr	Description	Package
ATR0601	ANTARIS4 GPS RF Receiver, Single IF Front End Concept, Very Low Power, Immune Against RF Interference	QFN24 (4 mm × 4 mm)
ATR0610	ANTARIS GPS LNA with Integrated Power-up Control and Output Matching (NF Min <1.6 dB)	PLL9 (1.6 mm × 2 mm)
ATR0621 ATR0621P1	ANTARIS4 GPS 16-channel Baseband Controller, ARM7TDMI®, RAM, ROM V5, up to –158 dBm Sensitivity with External Software, Low Power	BGA100 (9 mm × 9 mm)
ATR0622 ATR0622P1	ANTARIS4 GPS 16-channel Baseband Controller, ARM7TDMI, RAM, ROM V5, up to –150 dBm Sensitivity, Low Power	QFN56 (8 mm × 8 mm)
ATR0625 ATR0625P1	ANTARIS4 GPS 16-channel Baseband Controller, ARM7TDMI, RAM, SuperSense ROM V5, up to –158 dBm Sensitivity, Low Power	QFN56 (8 mm × 8 mm)
ATR0630P1	ANTARIS4 Single-chip Device, 16-channel GPS Engine, RF Receiver, Baseband Controller, ARM7TDMI®, RAM, ROM V5, up to –150 dBm Sensitivity, Low Power	BGA96
ATR0635 ATR0635P1	ANTARIS4 Single-chip Device, 16-channel GPS Engine, RF Receiver, Baseband Controller, ARM7TDMI, RAM, SuperSense ROM V5, up to –158 dBm Sensitivity, Low Power	BGA96



Car Radio

Atmel has over 30 years experience in designing broadcast radio solutions including active antenna devices and complete DAB/DAB+/DMB solutions. The car audio segment is a primary focus area for Atmel's broadcast radio activities. Atmel's in-depth radio know-how and high quality standards (ISO9001 and TS16949) enable the specific quality and performance requirements of this market.

Atmel provides entire car radio system solutions (baseband and front ends), and is focused on supporting upcoming highly integrated multi-standard broadcast radio solutions with focus on AM/FM but including HD Radio, Digital Radio Mondiale (DRM), and the DAB derivatives Digital Multimedia Broadcasting (DMB) and DAB+.



Car Radio Devices



Audio Receiver ICs

Part Number	Description	Package
ATR4251-T	Low-noise AM/FM Antenna Amplifier with AGC Function at AM and FM, and Large AM Frequency Range	SSO20
ATR4251-P	Low-noise AM/FM Antenna Amplifier with AGC Function at AM and FM, and Large AM Frequency Range	QFN24
ATR4262N1	Highly Flexible Multi-standard Broadcast Radio Front-end IC for AM/FM/DRM/HD Radio, World Tuner Concept Incl. Weather Band, Image Rejection Mixer, Flexible and Economic Filter Concept, Features Double Tuner Application, Automotive Version	QFN48
ATR4254	Low-noise AM/FM Antenna Amplifier, Excellent FM Low-noise Performance	SO16
ATR4256	Frequency Synthesizer for Radio Receivers	SSO20
ATR4258	AM/FM Car Radio Receiver for a Global Reception Concept	SSO44
T4260	AM/FM Tuner Front End for Digital Radio Solutions	SSO44



Digital Audio Broadcasting (DAB) ICs

Part Number	Description	Package
ATR2730	L-band Down-converter Inclusive PLL for DAB Receivers	SSO28
ATR2731	DAB One-chip Front-end Receiver with High Integration Level	SSO44
ATR2732M1	Highly Integrated One-chip DAB/DMB Front-end IC, Dual Band Automotive Compliant Variant	QFN65
ATR2740M1-RQHH	DAB Digital Processing Device; Highly Integrated Digital Device for DAB Radios	LQFP129



Multiplexing & Standard Microcontrollers

With a variety of microcontrollers manufactured with fully automotive qualified technologies, Atmel offers system designers powerful and flexible solutions.



AVR 8-Bit RISC Architecture

The AVR 8-bit architecture has reached a high level of acceptance in many market segments for its performance, high code density and efficient development tool set. It is especially well suited for automotive applications.



Non-Volatile Technologies

Our non-volatile technologies, embedded Flash and EEPROM memories allow the elimination of the expensive and time-consuming steps inherent in mask ROM-based microcontrollers. They also allow to build systems that can be easily reconfigured during development phases or during car maintenance.

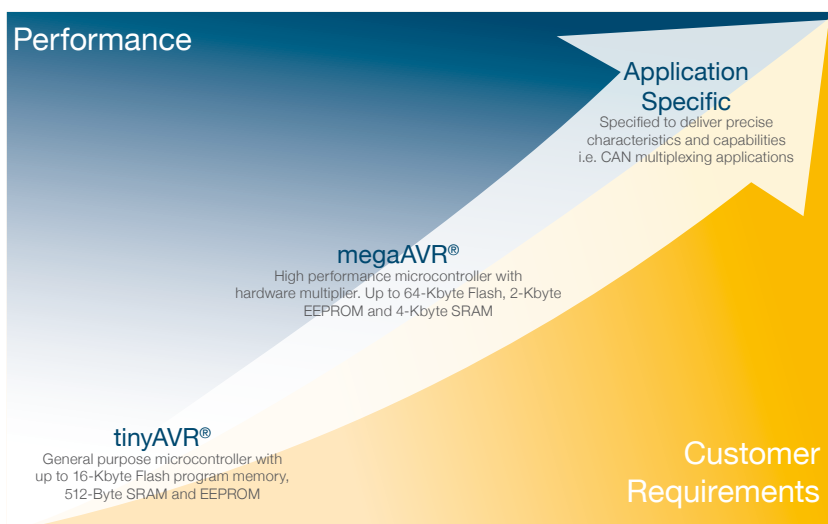


Broad Product Range

The range of devices made available to automotive already covers a variety of needs and will expand rapidly in the future. From 8- to 64-pin, from 2- to 128-Kbyte Flash, AVR's incorporate all the basic peripherals as well as powerful analog functions. Typically applications cover sensor and actuator control as well as in-vehicle networking with CAN (Controller Area Network) and LIN (Local Interconnect Network). Four different temperature ranges are available to serve the various application con-

straints. Special part numbering has been defined in order to differentiate automotive devices from standard industrial ones with special characters devoted to grade/temperature:

- Grade 3 T: -40°C; +85°C
- Grade 2 T1: -40°C; +105°C
- Grade 1 Z: -40°C; +125°C
- Grade 0 T2: -40°C; +150°C (ATmega88 only)





Multiplexing & Standard Microcontrollers



tinyAVR®

Part Number	Description	Package
ATtiny25	AVR Microcontroller with 2-Kbyte Flash MCU, 128-byte RAM, 128-byte EEPROM, 10-bit ADC, up to 16 MIPS, Internal Calibrated Oscillator	SOIC8
ATtiny45	AVR Microcontroller with 4-Kbyte Flash MCU, 256-byte RAM, 256-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	SOIC8
ATtiny85	AVR Microcontroller with 8-Kbyte Flash MCU, 512-byte RAM, 512-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	SOIC8
ATtiny24	AVR Microcontroller with 2-Kbyte Flash MCU, 128-byte RAM, 128-byte EEPROM, 10-bit ADC, up to 16 MIPS, Internal Calibrated Oscillator	SOIC14, QFN28
ATtiny44	AVR Microcontroller with 4-Kbyte Flash MCU, 256-byte RAM, 256-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	SOIC14, QFN28
ATtiny84	AVR Microcontroller with 8-Kbyte Flash MCU, 512-byte RAM, 512-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	SOIC14, QFN28
ATtiny167	AVR Microcontroller with 16-Kbyte Flash MCU, 512-byte RAM, 512-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	TSSOP20 SOIC20 VQFN32



megaAVR®

Part Number	Description	Package
ATmega48	AVR Microcontroller with 4-Kbyte Flash MCU, 512-byte RAM, 256-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable UART, Internal Calibrated Oscillator	TQFP32, QFN32
ATmega88	AVR Microcontroller with 8-Kbyte Flash MCU, 1-Kbyte RAM, 512-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable UART, Internal Calibrated Oscillator	TQFP32, QFN32
ATmega168	AVR Microcontroller with 16-Kbyte Flash MCU, 1-Kbyte RAM, 512-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	TQFP32, QFN32
ATmega164P	AVR Microcontroller with 16-Kbyte Flash MCU, 1-Kbyte RAM, 512-byte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	TQFP44, QFN44
ATmega324P	AVR Microcontroller with 32-Kbyte Flash MCU, 2-Kbyte RAM, 1-Kbyte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	TQFP44, QFN44
ATmega644P	AVR Microcontroller with 64-Kbyte Flash MCU, 4-Kbyte RAM, 2-Kbyte EEPROM, 10-bit ADC, up to 16 MIPS, LIN-capable USI, Internal Calibrated Oscillator	TQFP44, QFN44



Application-Specific Microcontrollers

Part Number	Description	Package
AT90CAN32	AVR Microcontroller with 32-Kbyte Flash MCU, 15 Message Objects CAN Controller, 2-Kbyte RAM, 1-Kbyte EEPROM, 10-bit ADC, TWI, up to 16 MIPS, LIN-capable UART	TQFP64, QFN64
AT90CAN64	AVR Microcontroller with 64-Kbyte Flash MCU, 15 Message Objects CAN Controller, 4-Kbyte RAM, 2-Kbyte EEPROM, 10-bit ADC, TWI, up to 16 MIPS, LIN-capable UART	TQFP64, QFN64
AT90CAN128	AVR Microcontroller with 128-Kbyte Flash MCU, 15 Message Objects CAN Controller, 4-Kbyte RAM, 4-Kbyte EEPROM, 10-bit ADC, 2-Wire Interface (TWI), up to 16 MIPS, LIN-capable UART	TQFP64, QFN64
ATmega32M1	AVR Microcontroller with 32-Kbyte Flash MCU, 2-Kbyte RAM, 1-Kbyte EEPROM, 6 Message Objects CAN Controller, LIN Controller, 10-bit ADC, 10-bit DAC, PSC high performance waveform controller, 64 MHz PLL for fast PWM, up to 16 MIPS	TQFP32, QFN32
ATmega32C1	AVR Microcontroller with 32-Kbyte Flash MCU, 2-Kbyte RAM, 1-Kbyte EEPROM, 6 Message Objects CAN Controller, LIN Controller, 10-bit ADC, 10-bit DAC, 64 MHz PLL for fast PWM, up to 16 MIPS	TQFP32, QFN32

Headquarters

Atmel Corporation
2325 Orchard Parkway
San Jose, CA 95131
USA
Tel: (1) 408 441-0311
Fax: (1) 408 487-2600

International

Atmel Asia
Unit 01-05 & 16, 19F
BEA Tower, Millennium City 5
418 Kwun Tong Road
Kwun Tong, Kowloon
Hong Kong
Tel: (852) 2245-6100
Fax: (852) 2722-1369

Atmel Europe
Le Krebs
8, Rue Jean-Pierre Timbaud
BP 309
78054 St Quentin-en-
Yvelines Cedex
France
Tel: (33) 1-30-60-70-00
Fax: (33) 1-30-60-71-11

Atmel Japan
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
Tel: (81) 3-3523-3551
Fax: (81) 3-3523-7581

Product Contact

Product Line
auto_control@atmel.com

Literature Requests
www.atmel.com/literature

Web Site
www.atmel.com

© 2009 Atmel Corporation. All rights reserved.

Atmel®, logo and combinations thereof, AVR®, megaAVR®, tinyAVR®, ANTARIS®, SMART-I.S.® and others are registered trademarks, or trademarks of Atmel Corporation or its subsidiaries. ARM7TDMI® is a registered trademarks of ARM Limited. Other terms and product names may be trademarks of others.

Rev.: 4622G-AUTO-02/09/00M

Disclaimer: The information in this document is provided in connection with Atmel products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Atmel products. EXCEPT AS SET FORTH IN ATMEL'S TERMS AND CONDITIONS OF SALES LOCATED ON ATMEL'S WEB SITE, ATMEL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ATMEL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS AND PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ATMEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Atmel makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and products descriptions at any time without notice. Atmel does not make any commitment to update the information contained herein. Unless specifically provided otherwise, Atmel products are not suitable for, and shall not be used in, automotive applications. Atmel's products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.



www.BDTIC.com/ATMEL