

Atmel®



Atmel Aerospace

Rad-Hard Integrated Circuits

Company Experience

Long-term Commitment to the Aerospace Industry

Atmel® Aerospace components are all fully designed, assembled, tested, and qualified in Europe.

For nearly 30 years, Atmel has been a leading provider of highly integrated solutions to the aerospace industry. Thanks to its dual-use strategy, Atmel gives customers access to the latest commercial technology innovations through radiation hardening by design. The Atmel® Aerospace Business Unit offering of integrated circuits (ICs) is one of the most attractive and competitive on the market. It includes:

- 180nm to 65nm CMOS processes
- 180nm CMOS, 150nm SOI and 65nm CMOS ASIC libraries
- RISC rad-hard microprocessors
- Reprogrammable microprocessors
- 4Mb SRAM and EEPROM
- Memory modules
- SEU-hardened by design reprogrammable FPGA
- Spacewire communication devices

Thanks to advanced products, dedicated packaging which supports module techniques, QML-certified lines and world-class quality, Atmel is paving the way to full-system integration and system on chip solutions. The complexity of future systems solutions requires partnerships with government agencies and aerospace equipment manufacturers. Strong partnerships with these key market contributors enable Atmel to validate products and services in actual system environments. Atmel is committed for the long term to supporting the aerospace industry.

Quality Management

The ultimate goal is to reach full customer satisfaction through continuous improvement of Atmel products and services. To achieve this objective, Atmel has developed a Corporate Quality Management System that includes:

- A worldwide Quality Organization with dedicated resources for space offerings
- A robust Corporate Quality System that, beyond the traditional ISO9001-V2000 registrations, complies either with the MIL-PRF-38535 or the ESCC-QML quality systems. Atmel facilities are fully QML qualified by the U.S. DLA (Defense Logistic Agency) and the European Space Agency (ESA), covering a wide range of technologies, including the most advanced silicon and high pin count assembly techniques. This system is periodically rated by the most demanding aerospace customers, as well as the prestigious national and international space agencies, such as ESA, CNES (Centre National d'Etudes Spatiales) and NASA (National Aeronautics and Space Administration)
- The first-ever ESCC-QML qualified process for space (the Atmel 0.35µm ASIC)
- A policy of systematic continuous improvement, supported by state-of-the-art approaches, techniques and methodologies (self-assessment against business excellence models, "Six Sigma," Hoshin, etc.)
- Periodic reporting and review of actual performance by top management
- Customer satisfaction regularly measured via periodic business reviews, score cards and customer surveys



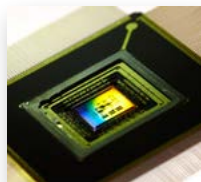
ISO 9001



ESCC-QML certification



DLA-QML certification



Atmel Rad-Hard Processors

Atmel's Unrivaled Flight Heritage

Over the last 20 years, Atmel has steadily built a space microprocessor strategy based on the SPARC® architecture. With worldwide sales of over 3500 flight models featuring the Atmel TSC695F—and already over 1,000 flight models with the Atmel AT697F—the Atmel SPARC processor roadmap boasts an unrivaled flight heritage.

	TSC695F	AT7913E	AT697F	ATF697FF
Description	32-bit SPARC V7	32-bit SPARC V8 SpaceWire Remote Terminal Controller	32-bit SPARC V8	32-bit SPARC V8 Reconfigurable with Embedded FPGA
Performance	20MIPS/5MFlops @SYSCLK = 25Mhz	40MIPS @SYSCLK=50Mhz	90 MIPS @ SYSCLK = 100MHz	90MIPS @SYSCLK=100Mz
Typ. Consumption	1W 50mW/MIPS	1W 25mW/MIPS	0.7W 8mW/MIPS	0.7W 8mW/MIPS
Operating Voltage	4.5 to 5.5V	1.65V to 1.95V (Logic) 3V to 3.6V (Buffers)	1.65V to 1.95V (Logic) 3V to 3.6V (Buffers)	1.65V to 1.95V (Logic) 3V to 3.6V (Buffers)
TID; Latch-up	>300Krad; 70MeV/mg/cm2	>300Krad; 95MeV/mg/cm2@125°C	>300Krad; 95MeV/mg/cm2@125°C	>300Krad; 95MeV/mg/cm2@125°C
Package	QFP256	QFP352/CGA349	QFP256/CGA349	QFP352
SoC integration		UART, 1553, CAN, ADC, DAC, SpW	UART, PCI	UART, PCI, FPGA
Availability and Qualification	Now ESCC and QMLV	Now ESCC and QMLV	Now ESCC and QMLV	Now ESCC and QMIV

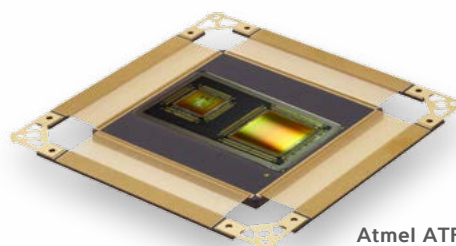
Extending the Capabilities of SPARC V8 Processors

Atmel uses innovative design techniques to optimize the SPARC V8 processor. The Atmel ATF697FF is the only solution available on the market today that combines a powerful rad-hard processor and a reprogrammable SRAM-based FPGA. It offers the best reconfigurable solution for in-flight space applications and helps our customers in case of:

- Design modifications occurring late in the process
- In-flight adjustments during trial flights
- Post-launch updates

The Atmel AT7913E SpaceWire Remote Terminal Controller is a highly integrated processor offering lower power consumption and reduced size through full system-on-chip integration. Based on the LEON2FT processor core, the AT7913E embeds the following peripherals:

- 64Kb EDAC protected on-chip memory
- ADC/DAC interface for analog acquisition/conversion
- CAN for instrument control
- SpaceWire interfaces for bridging of traffic from sensors onto a high-speed network



Atmel ATF697FF

Tools and Software for Processors

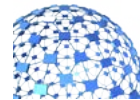
To help designers develop their applications faster and reduce time to market, Atmel provides:

- Hardware development boards with debug capabilities
- A set of embedded and demonstration software to ease software porting and fast system evaluation



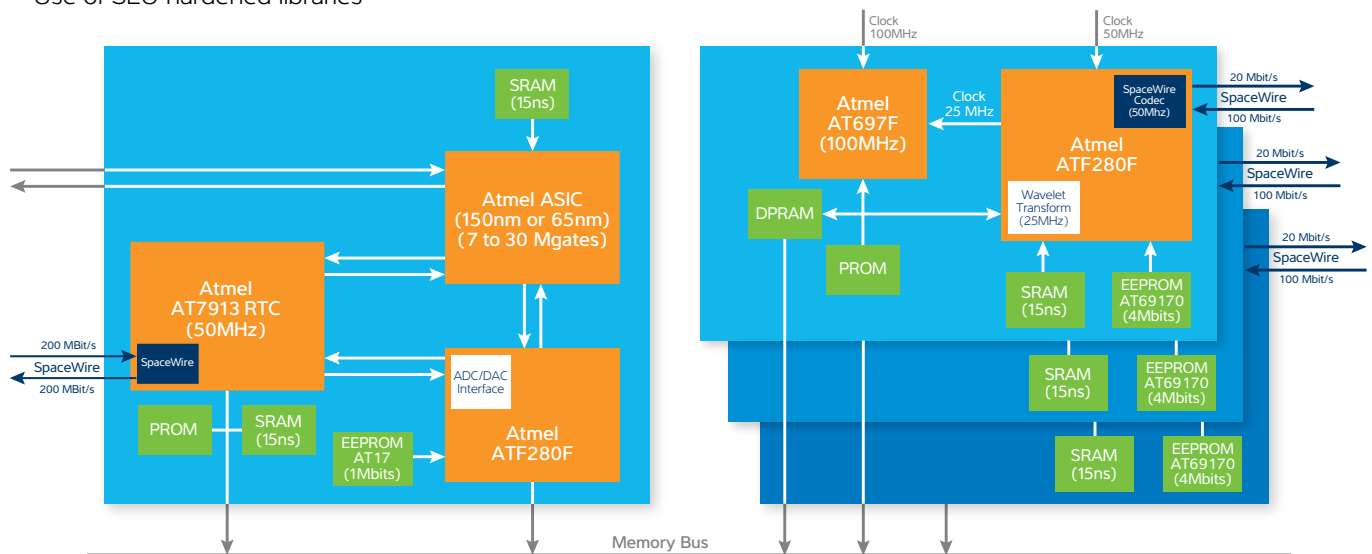
Connecting Space Systems

Atmel SpaceWire value for space applications

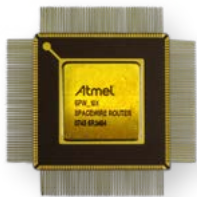


STAR-Dundee

- Compliant with the SpaceWire standard ECSS-E-ST-50-12C
- Flight Heritage in ESA, NASA, JAXA missions
- Use of SEU hardened libraries
- QMLQ & QMLV space grades with SMD
- Insure System interoperability



Atmel Hotline: sparc-applab.hotline@nto.atmel.com
 StarDundee: <http://www.star-dundee.com/products/leon-sde>



SpaceWire Router – AT7910E

- Eight SpaceWire ports and two external parallel ports
- 196-pin CQFP package
- 3.3V, LVDS
- Total dose up to 300 Krad

IPs for connectivity

- Proven & space qualified IPs for ASIC & FPGA
- Spacewire, 1553, CAN, PCI, UART, ...
- Placed & Routed for the best performances

Memories for Space

Atmel has a long track record with memories (SRAM, DPRAM, FIFO and EEPROM), and its current offering supports the space industry's efforts regarding standardization of part variations with respect to:

- Size and format
- Package
- Power consumption and speed

Part Number	Type	Process Feature Size (µm)	Format	Operating Voltage (V)	Prime Speed Spec (ns/mA)	TID (Krad)	Package
AT65609EHV	SRAM	0.35	128K x 8	4.5 – 5.5	40/50	300	FP32.4 SB32.4
M65609E	SRAM	0.35	128K x 8	3.0 – 3.6	40/50	300	FP32.4
AT60142HT*	SRAM	0.25	512K x 8	3.0 – 3.6*	17/170	300	FP36.5
AT60142H	SRAM	0.25	512K x 8	3.0 – 3.6	15/170	300	FP36.5
AT68166HT*	MCP SRAM	0.25	512K x 32	3.0 – 3.6*	20/170	300	CQFP68
AT68166H	MCP SRAM	0.25	512K x 32	3.0 – 3.6	18/180	300	CQFP68
M67025E	DPRAM	0.6	8K x 16	4.5 – 5.5	30/200	30	CQFP84
M67204H	FIFO	0.6	4K x 9	4.5 – 5.5	15/120	30	FP28.4
M67206H	FIFO	0.6	16K x 9	4.5 – 5.5	15/120	30	FP28.4
M672061H	FIFO with programmable HFF	0.6	16K x 9	4.5 – 5.5	15/120	30	FP28.4
AT28C010-12DK	Parallel EEPROM	0.6	128K x 8	4.5 – 5.5	120/80	30	FP32.4
AT17LV010-10DP	Serial EEPROM	0.35	1M x 1	3.0 – 3.6	100/10	60	FP28.4
AT69170E	Serial EEPROM	0.18	4M x 1	3.0 – 3.6	70/15	60	FP18.3

* 5V tolerant / ** Not for new designs



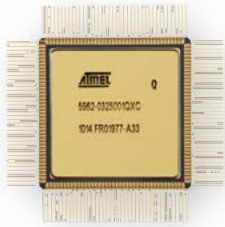
Atmel ASICs for Space

The Atmel Aerospace ASIC offering is enriched with new libraries each time the latest generation technology is introduced. As an example, the ninth generation of Aerospace ASIC technologies, the ATC 18RHA series, is a standard cell library characterized on the Atmel 0.18µm CMOS technology.

Combined with these libraries are multiple options for embedding dedicated blocks, as well as a large choice of complex hermetic packages. A MPW (multi-project wafer) service allows the users to lower the NRE.

	ATC18RHA	ATMX150RHA	AT65RHA (*)
Process	Bulk CMOS	SOI CMOS	Bulk CMOS
Feature size (µm)	0.18	0.15	0.065
Library	Digital	Mixed-signal	Digital
Usable gates (equivalent NAND2)	7M	22M	50M
Maximum toggle frequency	7.5GHz	7.5GHz	30GHz
Gate delay @25°C (ps)	40	40	15ps
Signal I/Os	>400	>700	>1000
Flip-chip I/O available	N	N	Y
5V and HV (25/45/65V) option	N	Y	N
Specific I/Os	LVDS, PCI	LVDS, PCI	HSSL, LVDS, PCI
Supply voltage	1.8/3.3/2.5V	1.8/5/3.3/2.5V	1.2/1.8/2.5/3.3V
Power consumption (nW/gate.MHz) at 20% duty cycle	<10	<10	<0.5
Analog IPs Full-custom available	PLL	ADC, DAC, PLL, ...	PLL
RAM compiler	Y	Y	Y
NVM	N	Y	N
Rad Hardness			
Functional TID (krads(Si))	300	300	300
Latch up (MeV/mg/cm ²)	>95 @ 125°C (**)	>95 @ 125°C	>60 @ 125°C
Availability	Now	Now	Now
Qualification	ESCC QML, QML-Q, QML-V, QML-V RHA	2015	2016

(*): Targets (**): Maximum rate possible with test equipment



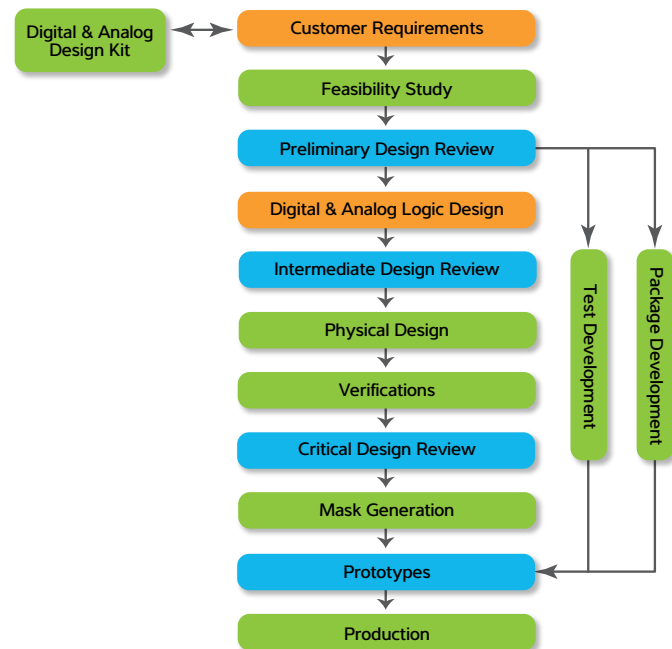
Atmel Aerospace

Rad-Hard Integrated Circuits

Robust Design Flow

The Atmel aerospace design flow uses a validated sequence of tools from RTL to GDSII.

Cadence	Floor planning, layout prototyping, signal integrity, package design
Synopsys	Logic/physical/test synthesis, physical design, power analysis, static timing analysis, formal verification, cell characterization tool
Mentor Graphics	Logic simulation, test synthesis, DRC/ARC/LVS verification
Magma	Library cell characterization
Atrenta	Power optimization, DFT, SDC/CDC verification at RTL level
Ansys	Power integrity



FPGA Retargeting to ASIC

Retargeting an FPGA to an ASIC means benefiting from the technical advantages of ASICs, such as a faster, smaller chip with lower power consumption, while maintaining the original functionality of the device. In the aerospace domain, it also offers improved reliability and radiation performance. Atmel offers an automatic FPGA retargeting service that reduces the cost and design resources.

Hotline: aerospace@nto.atmel.com

Reprogrammable FPGAs for Space

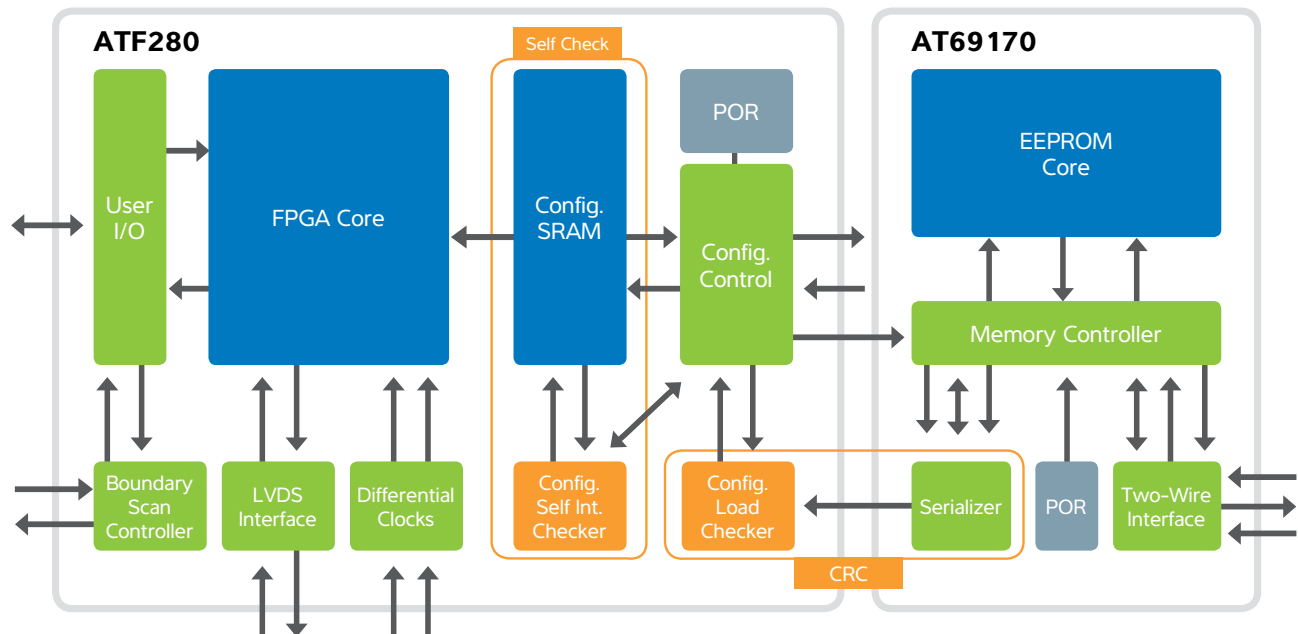
The Atmel reprogrammable FPGA family offers a new alternative for space applications that combines innovative techniques with industry-leading expertise in rad-hard by design technology. For low-gate-count designs and low power consumption applications, Atmel offers the reprogrammable AT40K FPGA. For designs requiring more gates, Atmel has significantly increased the gate count with the ATF280.

Benefits of the Atmel reprogrammable FPGA family include:

- In-system reprogrammability - Allows implementation of multiple design iterations at no additional cost
- Radiation-hardened by design
- Innovative built-in SEU protection - Users can design without using mitigation techniques, saving gate count and development resources
- Secured configuration
- Cost-effective alternative to mask-configured ASICs
- Easy development flow with no NRE cost, shorter time to market, no minimum order quantity

Features	AT40	ATF280
Technology	0.35µm CMOS	0.18µm CMOS
Unlimited re-programmability	Yes	Yes
Equivalent ASIC gates	40K	280K
User-configurable RAM (FreeRAM™)	18432 bits	115200 bits
FreeRAM access time	18 ns	10 ns
System speed	20 MHz	50 MHz
Configuration auto-checks	Yes	Yes
Number of cells (one 4-input LUT and one HDFF)	2,304	14,400
Cold-sparing and PCI-compliant I/Os	233	308
Transceivers/receivers LVDS	-	8/8
Functional TID (krads(Si))	300	300
Latch up (MeV/mg/cm ²)	70 @ 125°C (**)	95 @ 125°C(**)
Availability	Available in QML-Q and QML-V with 5962-03250 and ESCC with 9304/008	Available in QML-Q and QML-V with 5962-12225

(*): Targets (**): Maximum rate possible with test equipment

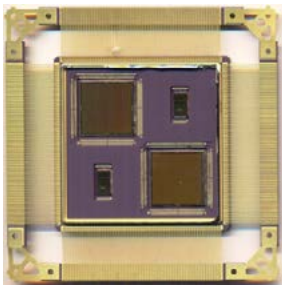


Securing FPGA Configuration

Serial EEPROM for FPGA Configuration

For FPGA configurations, Atmel not only offers use of the 1Mb EEPROM AT17LV010 qualified for space use, but also the AT69170, a 4Mb version qualified for space use in 2014.

	Process Feature Size (µm)	Format (bit)	Operating Voltage(V)	Packages	Availability
AT17LV010-10DP	0.35	1M x 1	3.0 – 3.6	FP28.4	Now
AT69170	0.18	4M x 1	3.0 – 3.6	FP18.3	2014



ATFee560

Multi-Chip Module

To reduce size and weight, Atmel has combined 2 ATF280 FPGA and 2 AT69170 EEPROM into one multichip package. This cost saving solution, the ATFEE560, is available for prototypes and qualified for space applications in 2015.

The ATF697, combining the ATF280 with the AT697 processor, permits to enhance the ATF697 capabilities with interfaces such as SpW. This cost saving solution is available for prototypes and qualified for space applications.

Development Tools and Software

Atmel FPGA Development Kits

- Fast and economical product evaluation
- Can be used to run simple demonstrations or a complete application
- A 6U C-PCI board with Atmel Aerospace EEPROMs and SRAMs and a full set of peripherals



Atmel ATF280 Evaluation Board

Space Programmer

- Multi-platform software tool with USB interface for in-situ programming of the FPGA and EEPROM

IDS System Designer

- Integrated development system for logic synthesis from a VHDL model entry or direct gate-level entry, for place and route, back annotation and final simulation

Mentor Graphics Precision®

- Comprehensive synthesis tool for Atmel FPGAs



Atmel Aerospace Product Ordering Information

Atmel Ordering Code	Package Type	Operating Voltage	Quality Level
TSC695F and TSC695FL Processors			
TSC695F-25MA-E	CQFP256	5V/25MHz	Engineering Samples
5962-0054001QXC	CQFP256	5V/25MHz	QML-Q
5962-0054001VXC	CQFP256	5V/25MHz	QML-V
5962R0054001VXC	CQFP256	5V/25MHz	QML-V RHA
951200301	CQFP256	5V/25MHz	ESCC
AT697F and ATF697FF Processors			
AT697F-2H-E	CCGA349	3.3V/100MHz	Engineering Samples
AT697F-KG-E	CQFP256	3.3V/100MHz	Engineering Samples
5962-0722402QXB	CCGA349	3.3V/100MHz	QML-Q
5962-0722402QYC	CQFP256	3.3V/100MHz	QML-Q
AT697F-2H-SV	CCGA 349	3.3V/100MHz	QML-V equiv.
5962-0722402VYC	CQFP256	3.3V/100MHz	QML-V
AT697F-2H-SR	CCGA349	3.3V/100MHz	QML-V RHA equiv.
5962R0722402VYC	CQFP256	3.3V/100MHz	QML-V RHA
ATF697FF-ZA-E	CQFP352	3.3V/100MHz	Engineering Samples
5962-1422901QXC	CQFP352	3.3V/100MHz	QML-Q
5962-1422901VXC	CQFP352	3.3V/100MHz	QML-V
5962R1422901VXC	CQFP352	3.3V/100MHz	QML-V RHA
AT697F and ATF697FF Development Kits			
AT697-EK			
ATF697-EK			
AT7913E Processors			
AT7913E-2H-E	CCGA349	3.3V/50MHz	Engineering Samples
5962-10A0301QXB	CCGA349	3.3V/50MHz	QML-Q
5962-10A0301VXB	CCGA349	3.3V/50MHz	QML-V
5962R10A0301VXB	CCGA349	3.3V/50MHz	QML-V RHA
AT7913E-2U-E	CLGA349	3.3V/50MHz	Engineering Samples
5962-10A0301QYC	CLGA349	3.3V/50MHz	QML-Q
5962-10A0301VYC	CLGA439	3.3V/50MHz	QML-V
5962R10A0301VYC	CLGA349	3.3V/50MHz	QML-V RHA
AT7913E-YC-E	CQFP352	3.3V/50MHz	Engineering Samples

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Atmel Ordering Code	Package Type	Operating Voltage	Quality Level
5962-10A0301QZC	CQFP352	3.3V/50MHz	QML-Q
5962-10A0301VZC	CQFP352	3.3V/50MHz	QML-V
AT7913E-YC-SR	CQFP352	3.3V/50MHz	QML-V RHA equiv.
Communication ICs			
AT7910EKB-E	CQFP196		Engineering Samples
5962-09A0301QXC	CQFP196		QML-Q
5962-09A0301VXC	CQFP196		QML-V
5962R09A03VXC	CQFP196	3.3V	QML-V RHA
AT40 FPGA			
AT40KEL040KW1-E	CQFP160	3.3V	Engineering Samples
AT40KEL040KZ1-E	CQFP256	3.3V	Engineering Samples
5962-0325001QXC	CQFP160	3.3V	QML-Q
5962-0325001QYC	CQFP256	3.3V	QML-Q
5962-0325001VXC	CQFP160	3.3V	QML-V
5962-0325001VYC	CQFP256	3.3V	QML-V
5962R0325001VXC	CQFP160	3.3V	QML-V RHA
5962R0325001VYC	CQFP256		QML-V RHA
930400801	CQFP160	3.3V	ESCC
930400802	CQFP256	3.3V	ESCC
AT40KFL040KW1-E	CQFP160	3.3V / 5V tolerant	Engineering Samples
AT40KFL040KZ1-E	CQFP256	3.3V / 5V tolerant	Engineering Samples
5962-0325002QXC	CQFP160	3.3V / 5V tolerant	QML-Q
5962-0325002QYC	CQFP256	3.3V / 5V tolerant	QML-Q
5962-0325002VXC	CQFP160	3.3V / 5V tolerant	QML-V
5962-0325002VYC	CQFP256	3.3V / 5V tolerant	QML-V
5962R0325002VXC	CQFP160	3.3V/ 5V tolerant	QML-V RHA
5962R0325002VYC	CQFP256		QML-V RHA
AT40 Development Kits			
AT40KEL-EK			
ATF280 FPGA			
ATF280F-2J-E	CCGA472	3.3V	Engineering Samples
ATF280F-2V-E	CLGA472	3.3V	Engineering Samples
ATF280F-YF-E	CQFP352	3.3V	Engineering Samples
ATF280F-YJ-E	CQFP256	3.3V	Engineering Samples

Atmel Ordering Code	Package Type	Operating Voltage	Quality Level
5962-1222501QXB	CCGA472	3.3V	QML-Q
5962-1222501QYC	CLGA472	3.3V	QML-Q
5962-1222501QZC	CQFP352	3.3V	QML-Q
5962-1222501QUC	CQFP256	3.3V	QML-Q
5962-1222501VXB	CCGA472	3.3V	QML-V
5962-1222501VYC	CLGA472	3.3V	QML-V
5962-1222501VZC	CQFP352	3.3V	QML-V
5962-1222501VUC	CQFP256	3.3V	QML-V
5962R1222501VXB	CCGA472	3.3V	QML-V RHA
5962R1222501VYC	CLGA472	3.3V	QML-V RHA
5962R1222501VZC	CQFP352	3.3V	QML-V RHA
5962R1222501VUC	CQFP256	3.3V	QML-V RHA
ATF280 Development Kits			
ATF280-EK			
ATFEE560 FPGA			
ATFEE560FE-ZB-E	CQFP352	3.3V	Engineering Samples
ATFEE560-ZB-MQ (1)	CQFP352	3.3V	QML-Q equiv.
ATFEE560-ZB-SV (1)	CQFP352	3.3V	QML-V equiv.
ATFEE560 Development kit			
ATFEE560-EK			

(1) Preliminary ordering information prior to SMD reference availability

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Atmel Ordering Code	Package Type	Operating Voltage	Format	Prime Speed Spec (ns/mA)	Quality Level
Serial EEPROM AT17LV010 & AT69170					
AT17LV010-10DP-E	FP28	3-3.6V	1Mx1	100/10	Engineering samples
AT17LV010-10DP-MQ					QML-Q like
AT17LV010-10DP-SV					QML-V like
AT69170F-DT-E	FP18	3-3.6V	4Mx1	70/15	Engineering samples
AT69170F-DT-MQ					QML-Q like
AT69170F-DT-SV					QML-V like
Parallel EEPROM AT28C010					
AT28C010-12DK-E	FP32	4.5-5.5V	128Kx8	120/80	Engineering samples
AT28C010-12DK -MQ					QML-Q like
AT28C010-12DK-SV/MQ					QML-V like
SRAM M65609 AT65609EHV AT60142 AT68166					
MMDJ-65609EV-40-E	FP32	3-3.6V	128kx8	40/50	Engineering samples
5962-0250101QXC					QML-Q
5962-0250101VXC					QML-V
SMDJ-65609EV-40SCC					ESCC
5962R0250101VXC					QML-V RHA
AT65609EHV-DJ40-E	FP32	4.5-5.5V	128Kx8	40/50	Engineering samples
AT65609EHV-DJ40MQ					QML-Q
AT65609EHV-DJ40SV					QML-V
AT65609EHV-DJ40SR					ESCC
AT65609EHV-C940-E	SB32	4.5-5.5V	128Kx8	40/50	Engineering samples
AT65609EHV-C940MQ					QML-Q
AT65609EHV-C940SV					QML-V
AT65609EHV-C940SR					ESCC

Atmel Ordering Code	Package Type	Operating Voltage	Format	Prime Speed Spec (ns/mA)	Quality Level		
AT60142H-DS15M-E	FP36	3-3.6V	512Kx8	15/180 (12/220)	Engineering samples		
5962-0520804QYC					QML-Q		
5962-0520804VYC					QML-V		
5962R0520804VYC					QML-V RHA		
AT60142H-DS15MSCC					ESCC		
AT60142HT-DS17M-E				17/170	Engineering samples		
5962-0520803QYC					QML-Q		
5962-0520803VYC					QML-V		
5962R0520803VYC					QML-V RHA		
AT60142HT-DS17MSCC					ESCC		
AT68166H-YS18-E	FP68	3-3.6V	4* 512Kx8	18/170	Engineering samples		
5962-0622906QYC					QML-Q		
5962-0622906VYC					QML-V		
5962R0622906VYC					QML-V RHA		
AT68166H-YS18-SCC					ESCC		
AT68166HT-YS20-E				20/165	Engineering samples		
5962-0622905QYC					QML-Q		
5962-0622905VYC					QML-V		
5962R0622905VYC					QML-V RHA		
AT68166HT-YS20-SCC					ESCC		
FIFO 67204 67206 (1) DPR 67025							
MMCP-67204HV-15-E	SB28	4.5-5.5V	4Kx9	15/120	Engineering samples		
MMDP-67204HV-15-E	FP28				Engineering samples		
5962-8956810QTC	SB28				QML-Q		
5962-8956810QNC	FP28				QML-Q		
5962-8956810VTC	SB28				QML-V		
5962-8956810VNC	FP28				QML-V		
5962D8956810VTC	SB28				QML-V RHA		
5962D8956810VNC	FP28				QML-V RHA		
SMCP-67204HV-15SCC	SB28				ESCC		
SMDP-67204HV-15SCC	FP28				ESCC		
5962-8956809QTC	SB28			QML-Q			
5962-8956809QNC	FP28			QML-Q			
5962-8956809VTC	SB28			QML-V			
5962-8956809VNC	FP28			QML-V			
5962D8956809VTC	SB28			QML-V RHA			
5962D8956809VNC	FP28			QML-V RHA			
SMCP-67204HV-30SCC	SB28			ESCC			
SMDP-67204HV-30SCC	FP28			ESCC			
FIFO 67204 67206 (1) DPR 67025							
MMCP-67204HV-15-E	SB28			4.5-5.5V	4Kx9	15/120	Engineering samples
MMDP-67204HV-15-E	FP28	Engineering samples					
5962-8956810QTC	SB28	QML-Q					
5962-8956810QNC	FP28	QML-Q					
5962-8956810VTC	SB28	QML-V					
5962-8956810VNC	FP28	QML-V					
5962D8956810VTC	SB28	QML-V RHA					
5962D8956810VNC	FP28	QML-V RHA					
SMCP-67204HV-15SCC	SB28	ESCC					
SMDP-67204HV-15SCC	FP28	ESCC					
5962-8956809QTC	SB28	QML-Q					
5962-8956809QNC	FP28	QML-Q					
5962-8956809VTC	SB28	QML-V					
5962-8956809VNC	FP28	QML-V					
5962D8956809VTC	SB28	QML-V RHA					
5962D8956809VNC	FP28	QML-V RHA					
SMCP-67204HV-30SCC	SB28	ESCC					
SMDP-67204HV-30SCC	FP28	ESCC					
FIFO 67204 67206 (1) DPR 67025							
MMCP-67204HV-15-E	SB28	4.5-5.5V	4Kx9			15/120	Engineering samples
MMDP-67204HV-15-E	FP28			Engineering samples			
5962-8956810QTC	SB28			QML-Q			
5962-8956810QNC	FP28			QML-Q			
5962-8956810VTC	SB28			QML-V			
5962-8956810VNC	FP28			QML-V			
5962D8956810VTC	SB28			QML-V RHA			
5962D8956810VNC	FP28			QML-V RHA			
SMCP-67204HV-15SCC	SB28			ESCC			
SMDP-67204HV-15SCC	FP28			ESCC			
5962-8956809QTC	SB28			QML-Q			
5962-8956809QNC	FP28			QML-Q			
5962-8956809VTC	SB28			QML-V			
5962-8956809VNC	FP28			QML-V			
5962D8956809VTC	SB28			QML-V RHA			
5962D8956809VNC	FP28			QML-V RHA			
SMCP-67204HV-30SCC	SB28			ESCC			
SMDP-67204HV-30SCC	FP28			ESCC			
FIFO 67204 67206 (1) DPR 67025							
MMCP-67204HV-15-E	SB28			4.5-5.5V	4Kx9	15/120	Engineering samples
MMDP-67204HV-15-E	FP28	Engineering samples					
5962-8956810QTC	SB28	QML-Q					
5962-8956810QNC	FP28	QML-Q					
5962-8956810VTC	SB28	QML-V					
5962-8956810VNC	FP28	QML-V					
5962D8956810VTC	SB28	QML-V RHA					
5962D8956810VNC	FP28	QML-V RHA					
SMCP-67204HV-15SCC	SB28	ESCC					
SMDP-67204HV-15SCC	FP28	ESCC					
5962-8956809QTC	SB28	QML-Q					
5962-8956809QNC	FP28	QML-Q					
5962-8956809VTC	SB28	QML-V					
5962-8956809VNC	FP28	QML-V					
5962D8956809VTC	SB28	QML-V RHA					
5962D8956809VNC	FP28	QML-V RHA					
SMCP-67204HV-30SCC	SB28	ESCC					
SMDP-67204HV-30SCC	FP28	ESCC					
FIFO 67204 67206 (1) DPR 67025							
MMCP-67204HV-15-E	SB28	4.5-5.5V	4Kx9			15/120	Engineering samples
MMDP-67204HV-15-E	FP28			Engineering samples			
5962-8956810QTC	SB28			QML-Q			
5962-8956810QNC	FP28			QML-Q			
5962-8956810VTC	SB28			QML-V			
5962-8956810VNC	FP28			QML-V			
5962D8956810VTC	SB28			QML-V RHA			
5962D8956810VNC	FP28			QML-V RHA			
SMCP-67204HV-15SCC	SB28			ESCC			
SMDP-67204HV-15SCC	FP28			ESCC			
5962-8956809QTC	SB28			QML-Q			
5962-8956809QNC	FP28			QML-Q			
5962-8956809VTC	SB28			QML-V			
5962-8956809VNC	FP28			QML-V			
5962D8956809VTC	SB28			QML-V RHA			
5962D8956809VNC	FP28			QML-V RHA			
SMCP-67204HV-30SCC	SB28			ESCC			
SMDP-67204HV-30SCC	FP28			ESCC			

Atmel Aerospace

Rad-Hard Integrated Circuits

Atmel Ordering Code	Package Type	Operating Voltage	Format	Prime Speed Spec (ns/mA)	Quality Level		
MMCP-67206HV-15-E	SB28	4.5-5.5V	16Kx9	15/120	Engineering samples		
MMDP-67206HV-15-E	FP28				Engineering samples		
5962-9317708QTC	SB28				QML-Q		
5962-9317708QNC	FP28				QML*Q		
5962-9317708VTC	SB28				QML-V		
5962-9317708VNC	FP28				QML-V		
5962D9317708VTC	SB28				QML-V RHA		
5962D9317708VNC	FP28				QML-V RHA		
SMCP-67206HV-15SCC	SB28				ESCC		
SMDP-67206HV-15SCC	FP28				ESCC		
5962-9317707QTC	SB28			QML-Q			
5962-9317707QNC	FP28			QML*Q			
5962-9317707VTC	SB28			QML-V			
5962-9317707VNC	FP28			QML-V			
5962D9317707VTC	SB28			QML-V RHA			
5962D9317707VNC	FP28			QML-V RHA			
SMCP-67206HV-30SCC	SB28			ESCC			
SMDP-67206HV-30SCC	FP28			ESCC			
MMCP-672061HV-15-E	SB28			4.5-5.5V	16Kx9	15/120	Engineering samples
MMDP-672061HV-15-E	FP28						Engineering samples
5962-9317710QTC	SB28	QML-Q					
5962-9317710QNC	FP28	QML*Q					
5962-9317710VTC	SB28	QML-V					
5962-9317710VNC	FP28	QML-V					
5962D9317710VTC	SB28	QML-V RHA					
5962D9317710VNC	FP28	QML-V RHA					
SMCP-672061HV-15SCC	SB28	ESCC					
SMDP-672061HV-15SCC	FP28	ESCC					
5962-9317709QTC	SB28	QML-Q					
5962-9317709QNC	FP28	QML*Q					
5962-9317709VTC	SB28	QML-V					
5962-9317709VNC	FP28	QML-V					
5962D9317709VTC	SB28	QML-V RHA					
5962D9317709VNC	FP28	QML-V RHA					
SMCP-672061HV-30SCC	SB28	ESCC					
SMDP-672061HV-30SCC	FP28	ESCC					
MMK2-67025EV-30-E	FP84	4.5-5.5V	8Kx16			30/200	Engineering samples
5962-9161709QZC	FP84						QML-Q
5962-9161709VZC	FP84			QML-V			
930105001	FP84			ESCC			
5962-9161706QZC	FP84			QML-Q			
5962-9161706VZC	FP84			QML-V			
930105002	FP84			ESCC			



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